

Altivar 71

Variable speed drives for synchronous and asynchronous motors

Programming manual

Specification 383

Software V3.4

12/2009



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Before you begin

Read and understand these instructions before performing any procedure on this drive.

DANGER

HAZARDOUS VOLTAGE

- Read and understand the Installation Manual before installing or operating the ATV71 drive. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.
- The user is responsible for compliance with all international and national electrical standards in force concerning protective grounding of all equipment.
- Many parts of this variable speed drive, including the printed circuit boards, operate at the line voltage. DO NOT TOUCH.
Use only electrically insulated tools.
- DO NOT touch unshielded components or terminal strip screw connections with voltage present.
- DO NOT short across terminals PA/+ and PC/- or across the DC bus capacitors.
- Install and close all the covers before applying power or starting and stopping the drive.
- Before servicing the variable speed drive
 - Disconnect all power.
 - Place a "DO NOT TURN ON" label on the variable speed drive disconnect.
 - Lock the disconnect in the open position.
- Disconnect all power including external control power that may be present before servicing the drive. WAIT 15 MINUTES to allow the DC bus capacitors to discharge. Then follow the DC bus voltage measurement procedure given in the Installation Manual to verify that the DC voltage is less than 45 V. The drive LEDs are not accurate indicators of the absence of DC bus voltage.

Electric shock will result in death or serious injury.

CAUTION

DAMAGED EQUIPMENT

Do not operate or install any drive that appears damaged.

Failure to follow this instruction can result in equipment damage.

Documentation structure

The following Altivar 71 technical documents are available on the Schneider-Electric website (www.schneider-electric.com) as well as on the CD-ROM supplied with the drive.

Installation Manual

This describes how to assemble and connect the drive.

Programming manual

This describes the functions, parameters and use of the drive terminal (integrated display terminal and graphic display terminal). The communication functions are not described in this manual, but in the manual for the bus or network used.

Communication Parameters Manual

This manual describes:

- The drive parameters with specific information for use via a bus or communication network.
- The operating modes specific to communication (state chart).
- The interaction between communication and local control.

Manuals for Modbus, CANopen, Ethernet, Profibus, INTERBUS, Uni-Telway, FIPIO and Modbus Plus, etc.

These manuals describe the assembly, connection to the bus or network, signaling, diagnostics, and configuration of the communication-specific parameters via the integrated display terminal or the graphic display terminal. They also describe the communication services of the protocols.

Software enhancements

Since the Altivar ATV 71 was first launched, it has benefited from the addition of several new functions. Software version has now been updated to V2.8. The new version can be substituted to the previous versions without making any changes. Although this documentation relates to version V2.8, it can still be used with previous versions, as the updates merely involves the addition of new values and parameters. None of the previous versions parameters have been modified or removed. The software version is indicated on the nameplate attached to the body of the drive.

Enhancements made to version V1.2 in comparison to V1.1

Factory setting



Note 1: In version V1.1, the analog input was 0 ± 10 V. For safety reasons, in the new version this input has been set to $0 + 10$ V.

Note 2: In version V1.1, analog output AO1 was assigned to the motor frequency. In the new version, this output is not assigned at all.

With the exception of these two parameters, the factory settings of version V1.1 remain the same in the new version. The new functions are factory-set to disabled.

Motor frequency range

The maximum output frequency has been extended from 1000 to 1600 Hz (depending on the drive rating and control profile).

New parameters and functions

Menu **[1.2 MONITORING] (SUP-)**

Addition of internal states and values relating to the new functions described below.

Menu **[1.3 SETTINGS] (SEt-)**

- [\[High torque thd.\] \(ttH\)](#) page [67](#).
- [\[Low torque thd.\] \(ttL\)](#) page [67](#).
- [\[Pulse warning thd.\] \(FqL\)](#) page [68](#).
- [\[Freewheel stop Thd.\] \(FFt\)](#) page [68](#).

Menu **[1.4 MOTOR CONTROL] (drC-)**

- [\[rpm increment\] \(InSP\)](#) page [76](#).
- Extension of the following configurations to all drive ratings; previously limited to 45 kW (60 HP) for ATV71●●●M3X and to 75 kW (100 HP) for ATV71●●●N4: synchronous motor [\[Sync. mot.\] \(SYn\)](#) page [70](#), sinus filter [\[Sinus filter\] \(OFI\)](#) page [72](#), noise reduction [\[Noise reduction\] \(nrd\)](#) page [95](#), braking balance [\[Braking balance\] \(bbA\)](#) page [98](#).

Menu **[1.5 INPUTS / OUTPUTS CFG] (I-O-)**

- Input AI1 can now be configured to $0 + 10$ V or 0 ± 10 V via [\[AI1 Type\] \(AI1t\)](#) page [107](#).
- [\[AI net. channel\] \(AIC1\)](#) page [111](#).
- New methods of assigning relays and logic outputs page [118](#): rope slack, high torque threshold, low torque threshold, motor in forward rotation, motor in reverse rotation, measured speed threshold reached, load variation detection.
- Analog output AO1 can now be used as a logic output and assigned to relay functions and logic outputs, page [123](#).
- New method of modifying the scale of analog outputs page [125](#) using the parameters [\[Scaling AOx min\] \(ASLx\)](#) and [\[Scaling AOx max\] \(ASHx\)](#).
- New methods of assigning logic outputs page [126](#): signed motor torque and measured motor speed.
- New methods of assigning alarm groups page [130](#): rope slack, high torque threshold, low torque threshold, measured speed threshold reached, load variation detection.

Software enhancements

Menu [1.7 APPLICATION FUNCT.] (Fun-)

- The summing, subtraction and multiplication reference functions can now be assigned to virtual input [Network AI] (AIU1) page [151](#).
- New parameter [Freewheel stop Thd.] (FFt) page [156](#) used to set a threshold for switching to freewheel at the end of a stop on ramp or fast stop.
- Brake engage at regulated zero speed [Brake engage at 0] (bECd) page [176](#).
- Weight [Weight sensor ass.] (PES) page [183](#) can now be assigned to virtual input [Network AI] (AIU1).
- New "rope slack" function page [187](#), with the parameters [Rope slack config.] (rSd) and [Rope slack trq level] (rStL).
- Use of the ramp [Acceleration 2] (AC2) page [195](#) when starting and "waking up" the PID function.
- The torque limitation [TORQUE LIMITATION] (tOL-) page [202](#) can now be configured in whole % or in 0.1% increments using [Torque increment] (IntP) and assigned to virtual input [Network AI] (AIU1).
- New "stop at distance calculated after deceleration limit switch" function page [211](#), with the parameters [Stop distance] (Std), [Rated linear speed] (nLS) and [Stop corrector] (SFd).
- Positioning by sensors or limit switch [POSITIONING BY SENSORS] (LPO-) page [212](#) can now be configured in positive logic or negative logic using [Stop limit config.] (SAL) and [Slowdown limit cfg.] (dAL).
- Parameter set switching [PARAM. SET SWITCHING] (MLP-) page [215](#) can now be assigned to the frequency thresholds attained [Freq. Th. att.] (FtA) and [Freq. Th. 2 attain.] (F2A).
- New half-floor: [HALF FLOOR] (HFF-) menu page [229](#).

Menu [1.8 FAULT MANAGEMENT] (FLt)

- Possibility of reinitializing the drive without turning it off, via [Product reset] (rP) page [237](#).
- Possibility of reinitializing the drive via a logic input without turning it off, using [Product reset assign.] (rPA) page [237](#).
- The possibility of configuring the "output phase loss" fault [Output Phase Loss] (OPL) page [242](#) to [Output cut] (OAC) has been extended to all drive ratings (previously limited to 45 kW (60 HP) for ATV71●●●M3X and 75 kW (100HP) for ATV71●●●N4).
- The external fault [EXTERNAL FAULT] (EtF-) page [245](#) can now be configured in positive or negative logic via [External fault config.] (LEt).
- New monitoring function based on speed measurement via "Pulse input" page [252](#), via the [FREQUENCY METER] (FqF-) menu.
- New function for detecting load variation page [254](#), via the [DYNAMIC LOAD DETECT] (dLd-) menu.
- Short-circuit faults on the braking unit can now be configured via [Brake res. fault Mgt] (bUb) page [256](#).

Menu [7 DISPLAY CONFIG.]

In [7.4 KEYPAD PARAMETERS] page [284](#), the [KEYPAD CONTRAST] and [KEYPAD STAND-BY] parameters to adjust the contrast and stand-by mode of the graphic display unit.

Enhancements made to version V1.3 (S383) in comparison to V1.2

New parameters and functions

Menu [1.4 MOTOR CONTROL] (drC-)

New option of operating with Closed-loop synchronous motor page [83](#)

- [Angle auto-test] (ASA) page [84](#)
- [Angle offset value] (ASU) page [85](#)
- [Sync.CL] (FSY) assignment page [71](#) of parameter [Motor control type] (Ctt)

Menu [1.5 INPUTS / OUTPUTS CFG] (I-O-)

- [Resolver Exct. Freq.] (FrES) and [Resolver poles nbr] (rPPn) page [115](#)

Menu [1.7 APPLICATION FUNCT.] (Fun-)

- New "Inspection" function, page [227](#), with [Inspection] (ISP) and [Inspection speed] (ISrF) parameters.

Software enhancements

Enhancements made to version V1.7 (S383) in comparison to V1.3 (S383)

New parameters and functions

Menu **[1.1 SIMPLY START] (SIM-)**

- Addition of a [\[Lift\] \(LIft\)](#) macro configuration to the [\[Macro configuration\] \(CFG\)](#) parameter page [41](#)

Menu **[1.3 SETTINGS] (SEt-)**

New parameters:

- [\[Fr.Loop.Stab\] \(StA\)](#) page [56](#)
- [\[FreqLoopGain\] \(FLG\)](#) page [56](#)

Menu **[1.4 MOTOR CONTROL] (drC-)**

This menu has been reorganized with parameters now appearing in a different order and some grouped under submenus to simplify configuration.

The new submenus are as follows:

- [\[ENCODER FEEDBACK\] \(EnS-\)](#) page [75](#)
- [\[ASYNC. MOTOR\] \(ASY-\)](#) page [76](#)
- [\[SYNCHRONOUS MOTOR\] \(SYn-\)](#) page [81](#)
- [\[ANGLE TEST SETTING\] \(ASA-\)](#) page [84](#)
- [\[FLUXING BY LI\] \(FLI-\)](#) page [86](#)
- [\[AUTOMATIC TUNE\] \(tUn-\)](#) page [88](#)
- [\[SPEED LOOP\] \(SSL-\)](#) page [89](#)

New parameters:

- [\[Boost\] \(bOO\)](#) page [95](#)
- [\[Action Boost\] \(FAb\)](#) page [95](#)
- [\[Increment EMF\] \(IPHS\)](#) page [81](#)
- [\[Read motor param.\] \(rEqP\)](#) page [82](#)
- [\[Status motor param\] \(rEtP\)](#) page [82](#)
- [\[Angle setting type\] \(ASt\)](#) pages [84](#) and [87](#)
- [\[Angle auto test\] \(ASL\)](#) page [84](#)
- [\[Angle setting activ.\] \(AtA\)](#) page [85](#)
- [\[Angle setting status\] \(ASSt\)](#) page [85](#)
- [\[Speed loop type\] \(SSL\)](#) page [89](#)
- [\[Inertia Mult. Coef.\] \(JMUL\)](#) page [89](#)
- [\[Estim. app. inertia\] \(JESSt\)](#) page [89](#)
- [\[Application Inertia\] \(JAPL\)](#) page [90](#)
- [\[Fr.Loop.Stab\] \(StA\)](#) page [90](#)
- [\[FreqLoopGain\] \(FLG\)](#) page [90](#)
- [\[Feed forward\] \(FFP\)](#) page [91](#)
- [\[Bandwidth feedfor.\] \(FFU\)](#) page [91](#)

Parameters moved from menu [\[1.7 APPLICATION FUNCT.\] \(Fun-\)](#):

- [\[Motor fluxing\] \(FLU\)](#) page [86](#)
- [\[Fluxing assignment\] \(FLI\)](#) page [86](#)
- [\[Auto-tune assign.\] \(tUL\)](#) page [88](#)

Menu **[1.5 INPUTS / OUTPUTS CFG] (I-O-)**

New encoder parameters:

- [\[Encoder protocol\] \(UECP\)](#) page [116](#)
- [\[Encoder supply volt.\] \(UECU\)](#) page [116](#)
- [\[Sincos lines count\] \(UELC\)](#) page [116](#)
- [\[SSI parity\] \(SSCP\)](#) page [116](#)
- [\[SSI frame size\] \(SSFS\)](#) page [116](#)
- [\[Nbr of revolution\] \(EnMr\)](#) page [116](#)
- [\[Turn bit resolution\] \(Entr\)](#) page [116](#)
- [\[SSI code type\] \(SSCd\)](#) page [117](#)
- [\[Encoder filter activ.\] \(FFA\)](#) page [117](#)
- [\[Encoder filter value\] \(FFr\)](#) page [117](#)

Menu **[1.7 APPLICATION FUNCT.] (Fun-)**

Removal of the following parameters (now located in the [\[1.4 MOTOR CONTROL\] \(drC-\)](#) menu):

- [\[Motor fluxing\] \(FLU\)](#)
- [\[Fluxing assignment\] \(FLI\)](#)
- [\[Auto-tune assign.\] \(tUL\)](#)

Software enhancements

Enhancements made to version V1.9 (S383) in comparison to V1.7 (S383)

New parameters and functions

Menu **[1.4 MOTOR CONTROL] (drC-)**

- New method of assigning [\[Angle setting type\] \(ASt\)](#) page [87](#) : optimised measurement (without motion with memorization).

New parameter :

- [\[App. Inertia Coef.\] \(JACO\)](#) page [89](#).

Removal from the sub-menu **[ASYN. MOTOR] (ASY-)** of the following parameters (now located directly in the **[1.4 MOTOR CONTROL] (drC-)** menu):

- [\[Boost\] \(bOO\)](#) page [95](#).
- [\[Action Boost\] \(FAb\)](#) page [95](#).

Menu **[1.5 INPUTS / OUTPUTS CFG] (I-O-)**

New encoder parameters:

- [\[Coder rotation inv.\] \(Enrl\)](#) page [114](#).
- [\[Clock frequency\] \(EnSP\)](#) page [117](#).

Menu **[1.7 APPLICATION FUNCT.] (Fun-)**

- New method of assigning for the parameters set switching [\[2 Parameter sets\] \(CHA1\)](#) page [215](#) and [\[3 Parameter sets\] \(CHA2\)](#) page [215](#) : switching during braking sequence. This new assignment allows to put higher gain when the brake is open and before the starting of the ramp (useful for lift application).

New sub-menu:

- [\[TOP Z MANAGEMENT\] \(tOP-\)](#) page [231](#) (the parameter can be accessed only if an encoder card VW 3A 411 has been inserted and if [\[Encoder type\] \(EnS\)](#) = [\[AABB\] \(AAbb\)](#)).

New encoder parameter:

- [\[Stop on top Z\] \(tOSt\)](#) page [231](#).

Enhancements made to version V2.4 (S383) in comparison to V1.9 (S383)

New parameters and function

Menu **[1.7 APPLICATION FUNCT.] (Fun-)**

New sub-menu:

- [\[ROLLBACK MGT\] \(rbM-\)](#) page [181](#). Menu can be accessed:
 - only for ATV71●●●M3X drives up to 45 kW and for ATV71●●●N4 drives up to 75 kW,
 - if [\[Motor control type\] \(Ctt\)](#) page [70](#) = [\[Sync.CL\] \(FSY\)](#) or [\[FVC\] \(FUC\)](#),
 - if [\[Brake assignment\] \(bLC\)](#) page [175](#) is assigned.

New parameter of [\[ROLLBACK MGT\]](#) function:

- [\[Rollback MGT\] \(rbM\)](#) page [181](#).
- [\[Rbk Compensation\] \(rbC\)](#) page [181](#).
- [\[Rbk Damping\] \(rbd\)](#) page [181](#).

Enhancements made to version V2.8 (S383) in comparison to V2.4 (S383)

Menu **[1.7 APPLICATION FUNCT.] (Fun-)**

- The adjustment range [\[Time to restart\] \(ttr\)](#) page [177](#) can now be configured to 0 to 15.00 s.

Menu **[7 DISPLAY CONFIG.]**

- Addition in [\[7.4 KEYPAD PARAMETERS\]](#) page [284](#) parameter [\[Power up menu\]](#) to choose the menu displayed on the drive on power up.

Enhancements made to version V3.4 (S383) in comparison to V2.8 (S383)

[1.7 APPLICATION FUNCT.] (Fun-) menu

New parameters and functions

- New parameter [\[REGEN CONNECTION\] \(AFE\)](#) page [232](#), used to connect an active front end

INSTALLATION

□ 1 Consult the Installation Manual

PROGRAMMING

Procedure applicable if the factory configuration, page [11](#), and use of the [\[SIMPLY START\]](#) (SIM-) menu only are sufficient for the application.



Tips:

- Before you start programming, complete the user setting tables, page [293](#).
- Perform an auto-tuning operation to optimize performance, page [43](#).
- If you get lost, return to the factory settings, page [269](#).



Note: Check that the wiring of the drive is compatible with its configuration.

■ 2 Power up without run command

- If you are using a separate power supply for the control section, follow the instructions on page [16](#).

■ 3 Select the language, if the drive has a graphic display terminal

■ 4 Configure the [\[SIMPLY START\]](#) (5 I Π -) menu

- 2-wire or 3-wire control
- Macro configuration
- Motor parameters
 - ☞ *Perform an auto-tuning operation*
- Motor thermal current
- Acceleration and deceleration ramps
- Speed variation range

■ 5 Start

Factory configuration

Drive factory settings

The Altivar 71 is factory-set for the most common operating conditions:

- Macro configuration: Start/Stop
- **Motor** frequency: 50 Hz
- Constant torque application with asynchronous motor and sensorless flux vector control
- Normal stop mode on deceleration ramp
- Stop mode in the event of a fault: freewheel
- Linear, acceleration and deceleration ramps: 3 seconds
- Low speed: 0 Hz
- High speed: 50 Hz
- Motor thermal current = rated drive current
- Standstill injection braking current = $0.7 \times$ rated drive current, for 0.5 seconds
- No automatic starts after a fault
- Switching frequency 2.5 kHz or 4 kHz depending on drive rating
- Logic inputs:
 - LI1: forward, LI2: Forward (2 operating direction), 2-wire control on transition
 - LI3, LI4, LI5, LI6: inactive (not assigned)
- Analog inputs:
 - AI1: speed reference 0 +10 V
 - AI2: 0-20 mA, inactive (not assigned)
- Relay R1: The contact opens in the event of a fault (or drive off).
- Relay R2: Inactive (not assigned)
- Analog output AO1: 0-20 mA, inactive (not assigned)

If the above values are compatible with the application, the drive can be used without changing the settings.

Option card factory settings

The option card inputs/outputs are not factory-set.

Application functions

The tables on the following pages show the most common combinations of functions and applications, in order to guide your selection. The applications in these tables relate to the following machines in particular:

- **Hoisting:** cranes, overhead cranes, gantries (vertical hoisting, translation, slewing), lifting platforms
- **Elevators:** elevators in retrofit up to 1.2 m/s
- **Handling:** palletizers/depalletizers, conveyors, roller tables
- **Packing:** carton packers, labeling machines
- **Textiles:** weaving looms, carding frames, washing machines, spinners, drawing frames
- **Wood:** automatic lathes, saws, milling
- **High inertia:** centrifuges, mixers, unbalanced machines (beam pumps, presses)
- **Process**

Each machine has its own special features, and the combinations listed here are neither mandatory nor exhaustive.

Some functions are designed specifically for a particular application. In this case, the application is identified by a tab in the margin on the relevant programming pages.

Motor control functions

Functions	Page	Applications							
		Hoisting	Lifts	Handling	Packing	Textiles	Wood	High inertia	Process
V/f ratio	70			■			■	■	
Sensorless flux vector control	70	■	■	■	■	■	■	■	■
Flux vector control with sensor	70	■	■	■	■	■	■	■	■
2-point vector control	70	■				■			
Open-loop synchronous motor	71					■			
Closed-loop synchronous motor	71		■			■			■
Output frequency of up to 1600 Hz	76					■	■		
Motor overvoltage limiting	96					■	■		
DC bus connection (see User's Manual)	-					■			■
Motor fluxing using a logic input	86	■		■	■				
Switching frequency of up to 16 kHz	72		■			■	■		
Auto-tuning	88	■	■	■	■	■	■	■	■

Application functions

Functions on speed references

Functions	Page	Applications							
		Hoisting	Lifts	Handling	Packing	Textiles	Wood	High inertia	Process
Differential bipolar reference	104	■		■	■				
Reference delinearization (magnifying glass effect)	106	■		■					
Frequency control input	140					■			■
Reference switching	141 - 150				■				
Reference summing	149				■				
Reference subtraction	149				■				
Reference multiplication	149				■				
S ramps	152	■	■	■					
Jog operation	160			■		■			■
Preset speeds	161	■	■	■	■			■	
+ speed/- speed using single action pushbuttons (1 step)	164								■
+ speed/- speed using double action pushbuttons (2 steps)	164	■							
+/- speed around a reference	166					■			■
Save reference	168								■
Inspection	227		■						

Application functions

Application-specific functions

Functions	Page	Applications							
		Hoisting	Lifts	Handling	Packing	Textiles	Wood	High inertia	Process
Fast stop	156						■	■	
Limit switch management	169	■	■	■					
Brake control	171	■	■	■					
Load measurement	182	■	■						
High-speed hoisting	184	■							
Rope slack	187	■							
PID regulator	189								■
Torque monitoring	198			■		■			■
Motor/generator torque limit	201			■		■		■	■
Load sharing	98	■		■					
Line contactor control	205	■		■			■		
Output contactor control	207		■						
Positioning by limit switches or sensors	209			■	■				
Stop at distance calculated after deceleration limit switch	211			■	■				
ENA system (mechanical with unbalanced load)	93							■	
Parameter switching	214	■	■	■	■	■	■	■	■
Motor or configuration switching	217	■		■	■				
Traverse control	220					■			
Stop configuration	156			■		■	■	■	
Evacuation	229		■						
Half floor	229		■						
Rollback management	181		■						

Application functions

Safety functions/fault management

Functions	Page	Applications							
		Hoisting	Lifts	Handling	Packing	Textiles	Wood	High inertia	Process
Power Removal (safety function, see User's Manual)	-	■	■	■	■	■	■	■	■
Deferred stop on thermal alarm	244		■						
Alarm handling	130	■	■	■	■	■	■	■	■
Fault management	235 to 258	■	■	■	■	■	■	■	■
IGBT tests	247	■	■	■	■	■	■	■	■
Catch a spinning load	239					■	■	■	
Braking resistor thermal protection	256	■	■	■	■				
Motor protection with PTC probes	235	■	■	■	■	■	■	■	■
Undervoltage management	246					■	■	■	
4-20mA loss	248	■	■	■		■	■		■
Uncontrolled output cut (output phase loss)	242			■					
Automatic restart	238			■					
Use of the "Pulse input" input to measure the speed of rotation of the motor	252	■	■	■					
Load variation detection	254	■							

Setup - Preliminary recommendations

Turning on and configuring the drive

DANGER

UNINTENDED EQUIPMENT OPERATION

- Before turning on and configuring the Altivar 71, check that the PWR (POWER REMOVAL) input is deactivated (at state 0) in order to prevent unintended operation.
- Before turning on the drive, or when exiting the configuration menus, check that the inputs assigned to the run command are deactivated (at state 0) since they can cause the motor to start immediately.

Failure to follow these instructions will result in death or serious injury.

CAUTION

INCOMPATIBLE LINE VOLTAGE

Before turning on and configuring the drive, ensure that the line voltage is compatible with the supply voltage range shown on the drive nameplate. The drive may be damaged if the line voltage is not compatible.

Failure to follow this instruction can result in equipment damage.

Separate control section power supply

When the drive control section is powered independently of the power section (P24 and 0V terminals), whenever an option card is added or replaced, only the power section must be supplied with power next time the drive is powered up.

By default the new card would not be recognized and it would be impossible to configure it, thereby causing the drive to lock in fault mode.

Power switching via line contactor

CAUTION

- **Avoid operating the contactor frequently (premature ageing of the filter capacitors).**
- **Cycle times < 60 s may result in damage to the pre-charge resistor.**

Failure to follow this instruction can result in equipment damage.

User adjustment and extension of functions

- The display unit and buttons can be used to modify the settings and to extend the functions described in the following pages.
- **Return to factory settings** is made easy by the [\[1.12 FACTORY SETTINGS\] \(FCS-\)](#) menu, see page [267](#).
- There are three types of parameter:
 - Display: Values displayed by the drive
 - Adjustment: Can be changed during operation or when stopped
 - Configuration: Can only be modified when stopped and no braking is taking place. Can be displayed during operation.

DANGER

UNINTENDED EQUIPMENT OPERATION

- Check that changes made to the settings during operation do not present any danger.
- We recommend stopping the drive before making any changes.

Failure to follow these instructions will result in death or serious injury.

Setup - Preliminary recommendations

Starting

Important:

- In factory settings mode, the motor can only be supplied with power once the “forward”, “reverse” and “DC injection stop” commands have been reset:
 - On power-up or a manual fault reset or after a stop commandIf they have not been reset, the drive will display "nSt" but will not start.
- If the automatic restart function has been configured ([Automatic restart] (Atr) parameter in the [1.8-FAULT MANAGEMENT] (FLt-) menu, see page 238), these commands are taken into account without a reset being necessary.

Test on a low power motor or without a motor

- In factory settings mode, [Output Phase Loss] (OPL) detection page 242 is active (OPL = YES). To check the drive in a test or maintenance environment without having to switch to a motor with the same rating as the drive (particularly useful in the case of high power drives), deactivate [Output Phase Loss] (OPL = no).
- Configure [Motor control type] (Ctt) = [V/F 2pts] (UF2) or [V/F 5pts] (UF5) ([1.4-MOTOR CONTROL] (drC-) menu, see page 70)

CAUTION

- Motor thermal protection will not be provided by the drive if the motor current is less than 0.2 times the rated drive current. Provide an alternative means of thermal protection.

Failure to follow this instruction can result in equipment damage.

Using motors in parallel

- Configure [Motor control type] (Ctt) = [V/F 2pts] (UF2) or [V/F 5pts] (UF5) ([1.4-MOTOR CONTROL] (drC-) menu, see page 70)

CAUTION

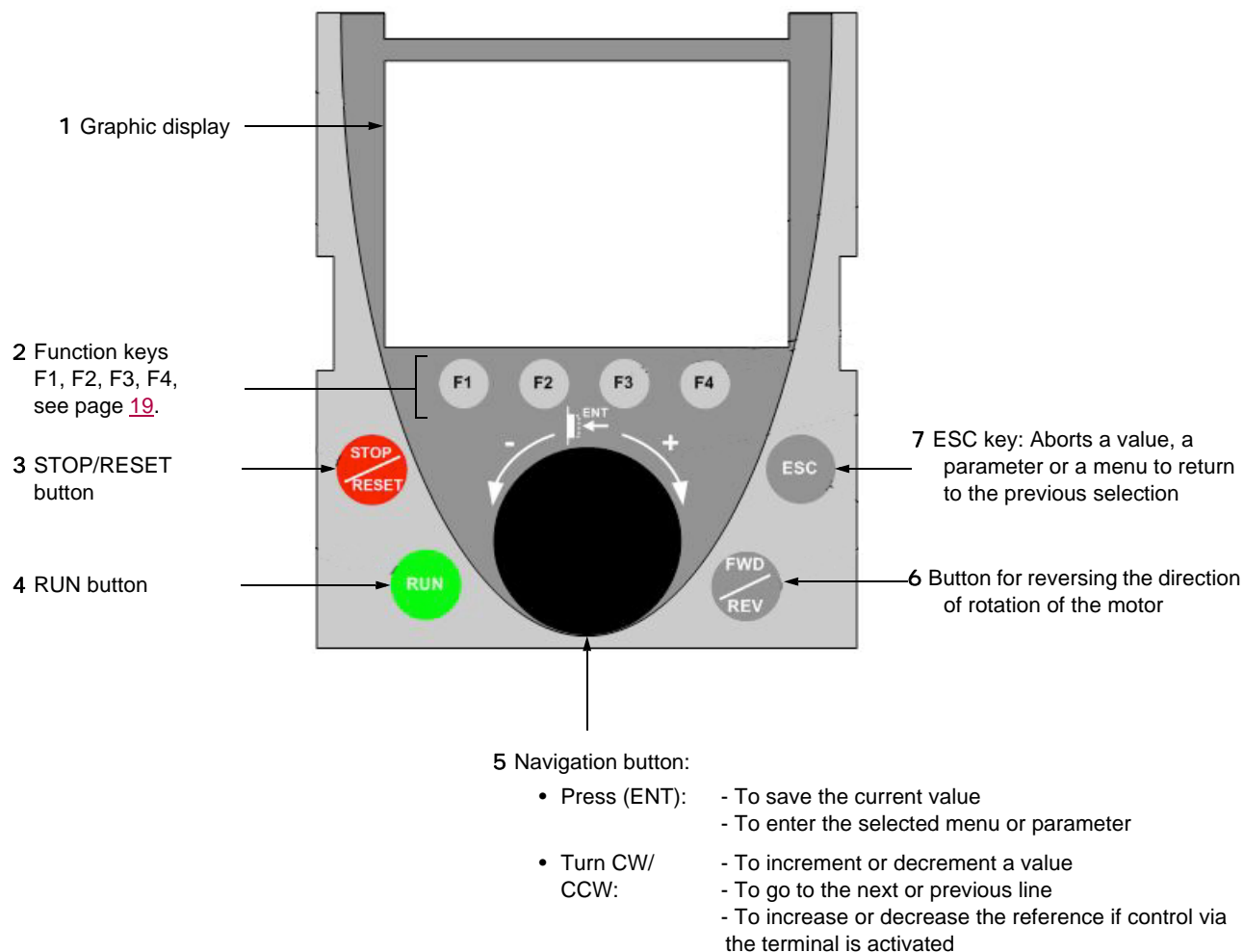
- Motor thermal protection is no longer provided by the drive. Provide an alternative means of thermal protection on every motor.

Failure to follow this instruction can result in equipment damage.

Graphic display terminal

Although the graphic display terminal is optional for low-power drives, it is a standard component on high-power drives (see catalog). The graphic display terminal can be disconnected and connected remotely (on the door of an enclosure for example) using the cables and accessories available as options (see catalog).

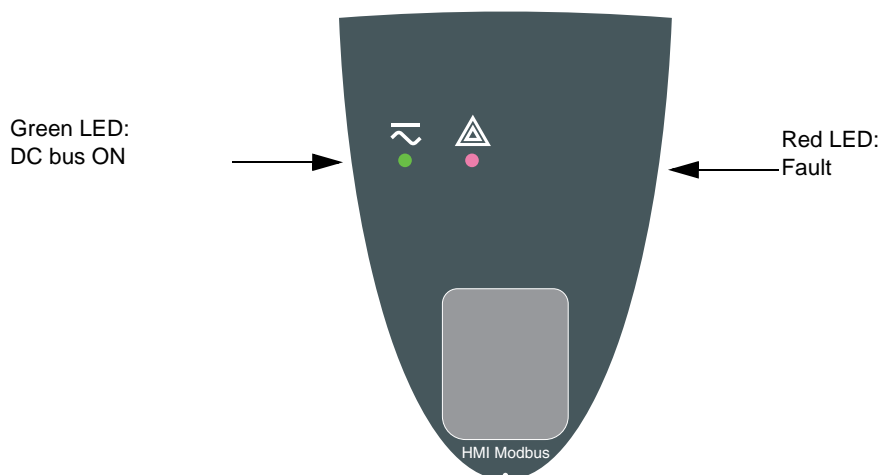
Description of terminal



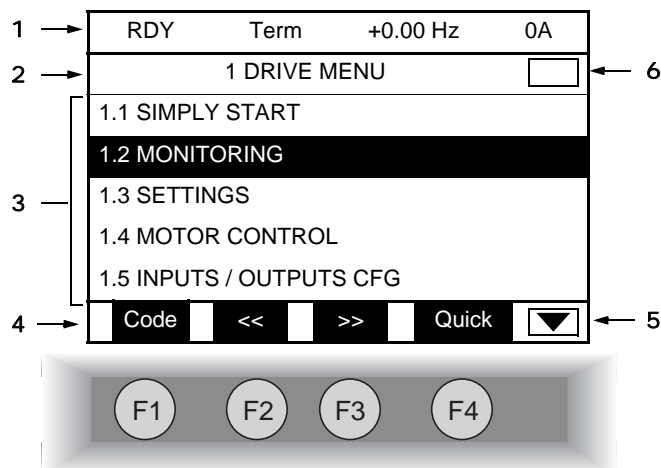
Note: Buttons 3, 4, 5 and 6 can be used to control the drive directly, if control via the terminal is activated.

Disconnected terminal

When the terminal is disconnected, 2 LEDs become visible:



Description of the graphic screen



1. Display line. Its content can be configured; the factory settings show:

- The drive state (see page [20](#))
- The active control channel:
 - Term: Terminals
 - HMI: Graphic display terminal
 - MDB: Integrated Modbus
 - CAN: Integrated CANopen
 - NET: Communication card
 - APP: Controller Inside card
- Frequency reference
- Current in the motor

2. Menu line. Indicates the name of the current menu or submenu.

3. Menus, submenus, parameters, values, bar charts, etc., are displayed in drop-down window format on a maximum of 5 lines. The line or value selected by the navigation button is displayed in reverse video.

4. Section displaying the functions assigned to the F1 to F4 keys and aligned with them, for example:

- Code **F1** : Displays the code of the selected parameter, i.e., the code corresponding to the 7-segment display.
- HELP **F1** : Contextual help
- << **F2** : Navigate horizontally to the left, or go to previous menu/submenu or, for a value, go to the next digit up, displayed in reverse video (see the example on page [21](#)).
- >> **F3** : Navigate horizontally to the right or go to next menu/submenu (going to the [2 ACCESS LEVEL] menu in this example) or, for a value, go to the next digit down, displayed in reverse video (see the example on page [21](#)).
- Quick **F4** : Quick navigation, see page [25](#).

The function keys are dynamic and contextual.

Other functions (application functions) can be assigned to these keys via the [1.6 COMMAND] menu.

If a preset speed is assigned to a function key and if the function key is pressed, the motor will run at this preset speed until another preset speed or JOG is pressed, speed reference is changed, or Stop key is pressed.

5. Indicates that there are no more levels below this display window.
 Indicates that there are more levels below this display window.

6. Indicates that this display window does not scroll further up.
 Indicates that there are more levels above this display window.

Drive state codes:

- ACC: Acceleration
- CLI: Current limit
- CTL: Controlled stop on input phase loss
- DCB: DC injection braking in progress
- DEC: Deceleration
- FLU: Motor fluxing in progress
- FST: Fast stop
- NLP: No line power (no line supply on L1, L2, L3)
- NST: Freewheel stop
- OBR: Auto-adapted deceleration
- PRA: Power Removal function active (drive locked)
- RDY: Drive ready
- RUN: Drive running
- SOC: Controlled output cut in progress
- TUN: Auto-tuning in progress
- USA: Undervoltage alarm
- ASA: Measurement of the phase-shift angle in progress
- ICC: Configuration encoder incorrect

Graphic display terminal

Example configuration windows:

RDY	Term	+0.00Hz	0A
5 LANGUAGE			
English			
Français ✓			
Deutsch			
Español			
Italiano			
<<		>> Quick	
Chinese			
Turkish			
Russian			

When only one selection is possible, the selection made is indicated by ✓
Example: Only one language can be chosen.

PARAMETER SELECTION	
1.3 SETTINGS	
Ramp increment	<input checked="" type="checkbox"/>
Acceleration	<input checked="" type="checkbox"/>
Deceleration	<input type="checkbox"/>
Acceleration 2	<input type="checkbox"/>
Deceleration 2	<input type="checkbox"/>
Edit	

When multiple selection is possible, the selections made are indicated by ☒
Example: A number of parameters can be chosen to form the [USER MENU].

Example configuration window for one value:

RDY	Term	+0.00Hz	0A
Acceleration			
9.51 s			
Min = 0.01		Max = 99.99	
<<		>> Quick	

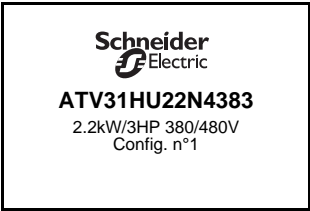
>> →

RDY	Term	+0.00Hz	0A
Acceleration			
951 s			
Min = 0.01		Max = 99.99	
<<		>> Quick	

The << and >> arrows (keys F2 and F3) are used to select the digit to be modified, and the navigation button is rotated to increase or decrease this number.

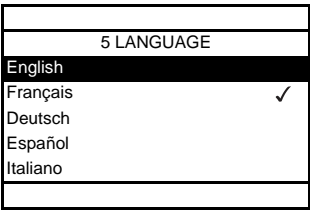
First power-up - [5. LANGUAGE] menu

The first time the drive is powered up, the user will automatically be guided through the menus as far as [1. DRIVE MENU]. The parameters in the [1.1 SIMPLY START] submenu must be configured and auto-tuning performed before the motor is started up.

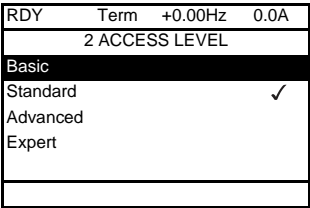


Display for 3 seconds following power-up

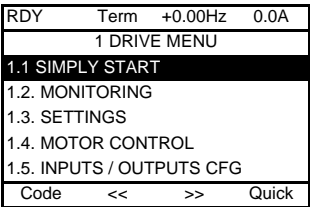
3 seconds



Automatically switches to [5 LANGUAGE] menu 3 seconds later. Select the language and press ENT.

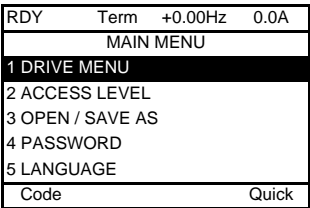


Switches to [2 ACCESS LEVEL] menu (see page 31) Select the access level and press ENT.



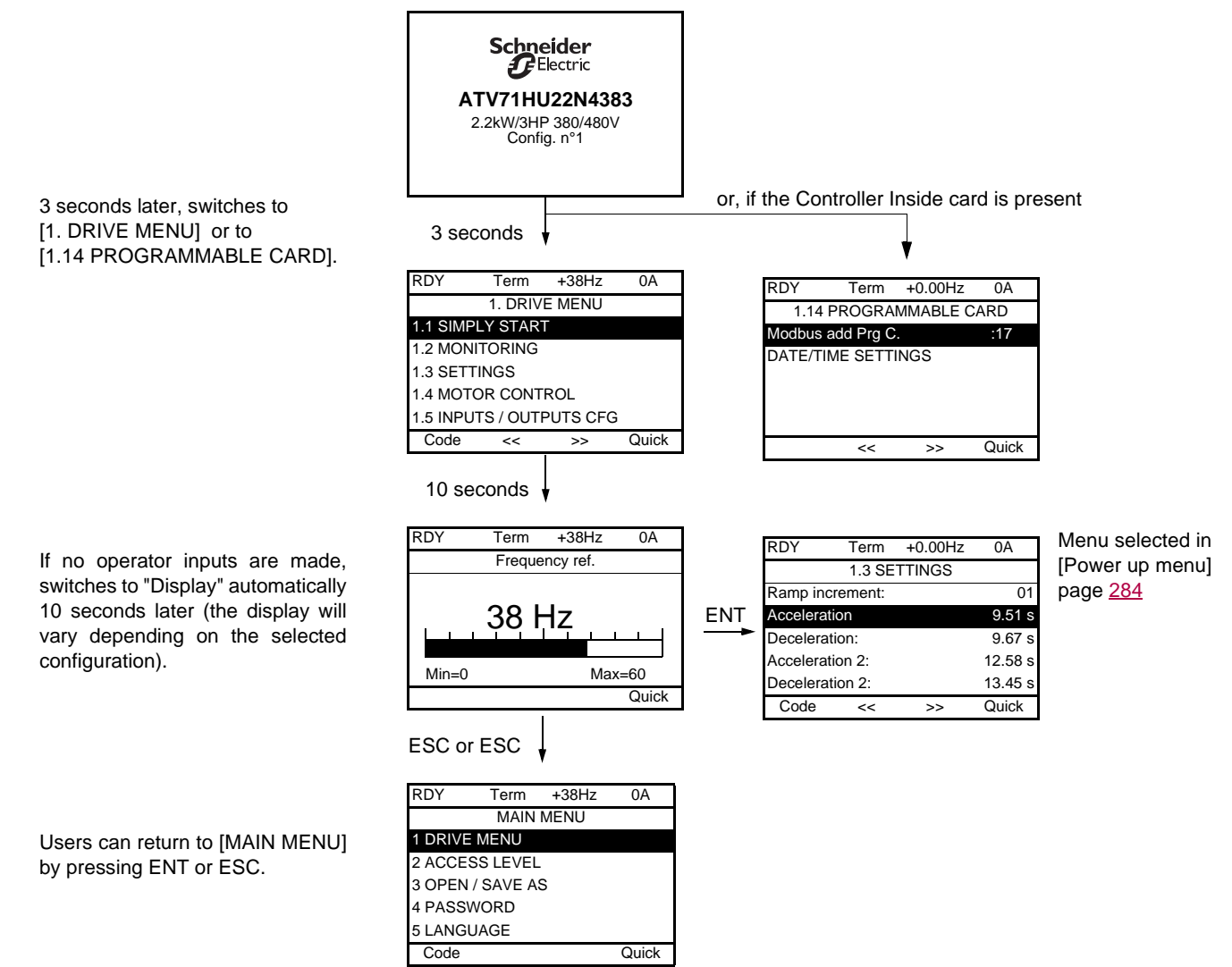
Switches to [1 DRIVE MENU] (see page 27)

ESC



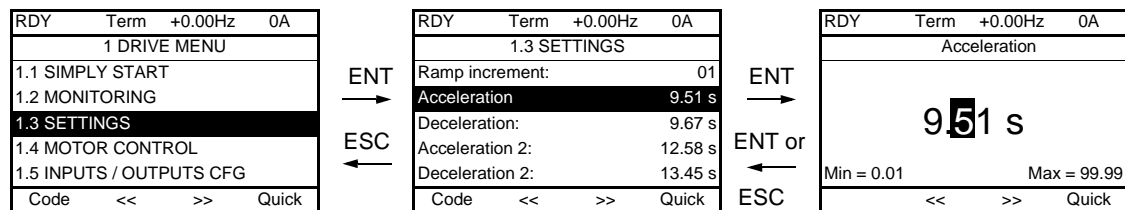
Press ESC to return to [MAIN MENU]

Subsequent power ups



Programming: Example of accessing a parameter

Accessing the acceleration ramp



Note:

- To select a parameter:
 - Turn the navigation button to scroll vertically.
- To modify a parameter:
 - Use the << and >> keys (F2 and F3) to scroll horizontally and select the digit to be modified (the selected digit changes to white on a black background).
 - Turn the navigation button to modify the digit.
- To cancel the modification:
 - Press ESC.
- To save the modification:
 - Press the navigation button (ENT).

Quick navigation

If the "Quick" function is displayed above the F4 key, you can gain quick access to a parameter from any screen.

Example:

RDY	Term	+0.00Hz	0A
1.4 MOTOR CONTROL			
Standard mot. freq: 5.0Hz IEC			
Rated motor power: 0.37 kW (0.5 HP)			
Rated motor volt.: 206 V			
Rated mot. current: 1.0 A			
Rated motor freq.: 50.0 Hz			
Code	<<	>>	Quick

Press F4 to access the Quick screen, which contains 4 selection options.

RDY	Term	+0.00Hz	0A
QUICK NAVIGATION			
RETURN TO MAIN MENU			
DIRECT ACCESS TO...			
10 LAST MODIFICATIONS			
GOTO MULTIPOINT SCREEN			
Code			

See page [285](#)

- [HOME]: Return to [MAIN MENU].

RDY	Term	+0.00Hz	0A
MAIN MENU			
1 DRIVE MENU			
2 ACCESS LEVEL			
3 OPEN / SAVE AS			
4 PASSWORD			
5 LANGUAGE			
Code			Quick

- [DIRECT ACCESS TO...]: Opens the direct access window, which will contain the text "1". The function keys << and >> (F2 and F3) can be used to select each of the numbers and the navigation button to increment or decrement the numbers: 1.3 in the example below.

RDY	Term	+0.00Hz	0A
DIRECT ACCESS TO...			
1.3			
SETTINGS			
<< >>			

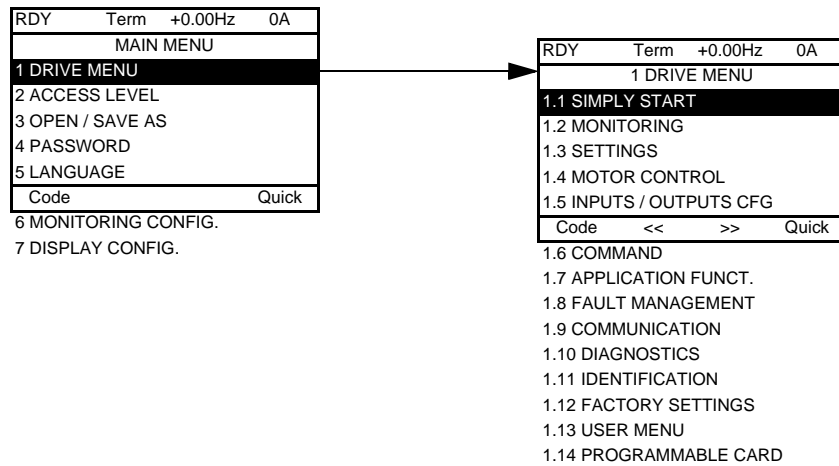
RDY	Term	+0.00Hz	0A
1.3 SETTINGS			
Ramp increment: 01			
Acceleration 9.51 s			
Deceleration: 9.67 s			
Acceleration 2: 12.58 s			
Deceleration 2: 13.45 s			
Code	<<	>>	Quick

- [10 LAST MODIFICATIONS]: Opens a window in which the last 10 parameters modified can be accessed directly.

RDY	Term	+0.00Hz	0A
10 LAST MODIFICATIONS			
Acceleration: 10 s			
ENA prop.gain: 1.2			
Rated mot. current: 15 A			
Preset speed 4: 20 Hz			
Preset speed 5: 30 Hz			
Code			

RDY	Term	+0.00Hz	0A
Rated mot. current			
15.0 A			
<< >>			

[MAIN MENU] - Menu mapping



Content of [MAIN MENU] menus

[1 DRIVE MENU]	See next page
[2 ACCESS LEVEL]	Defines which menus can be accessed (level of complexity)
[3 OPEN / SAVE AS]	Can be used to save and recover drive configuration files
[4 PASSWORD]	Provides password protection for the configuration
[5 LANGUAGE]	Language selection
[6 MONITORING CONFIG.]	Customization of information displayed on the graphic display terminal during operation
[7 DISPLAY CONFIG.]	<ul style="list-style-type: none"> Customization of parameters Creation of a customized user menu Customization of the visibility and protection mechanisms for menus and parameters

[1 DRIVE MENU]

RDY	Term	+0.00Hz	0A
1 DRIVE MENU			
1.1 SIMPLY START			
1.2 MONITORING			
1.3 SETTINGS			
1.4 MOTOR CONTROL			
1.5 INPUTS / OUTPUTS CFG			
Code	<<	>>	Quick
1.6 COMMAND			
1.7 APPLICATION FUNCT.			
1.8 FAULT MANAGEMENT			
1.9 COMMUNICATION			
1.10 DIAGNOSTICS			
1.11 IDENTIFICATION			
1.12 FACTORY SETTINGS			
1.13 USER MENU			
1.14 PROGRAMMABLE CARD			

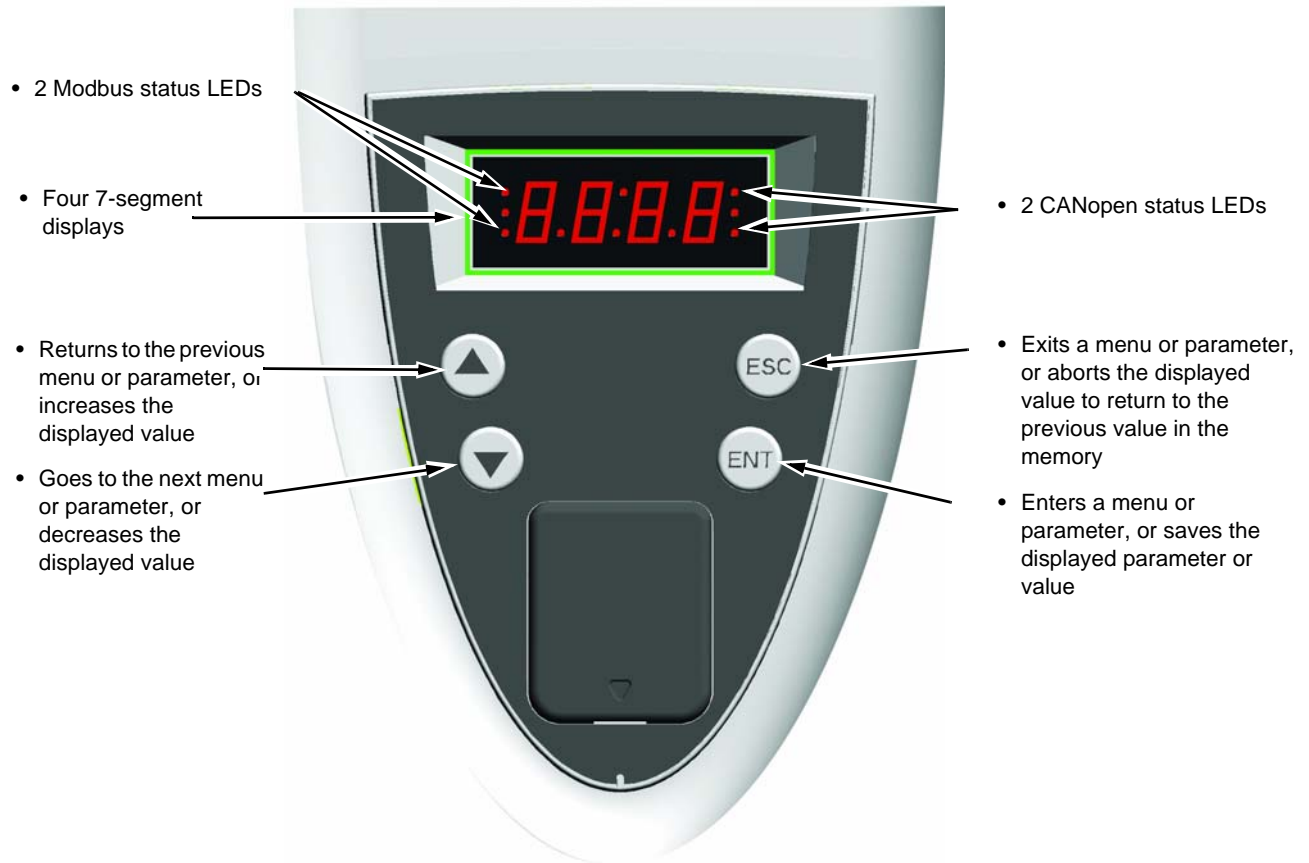
Content of [1. DRIVE MENU] menus:

[1.1 SIMPLY START]:	Simplified menu for a quick start
[1.2 MONITORING]:	Visualization of current, motor and input/output values
[1.3 SETTINGS]:	Accesses the adjustment parameters, which can be modified during operation
[1.4 MOTOR CONTROL]:	Motor parameters (motor nameplate, auto-tuning, switching frequency, control algorithms, etc.)
[1.5 INPUTS / OUTPUTS CFG]:	I/O configuration (scaling, filtering, 2-wire control, 3-wire control, etc.)
[1.6 COMMAND]:	Configuration of command and reference channels (graphic display terminal, terminals, bus, etc.)
[1.7 APPLICATION FUNCT.]:	Configuration of application functions (e.g., preset speeds, PID, brake logic control, etc.)
[1.8 FAULT MANAGEMENT]:	Configuration of fault management
[1.9 COMMUNICATION]:	Communication parameters (fieldbus)
[1.10 DIAGNOSTICS]:	Motor/drive diagnostics
[1.11 IDENTIFICATION]:	Identifies the drive and the internal options
[1.12 FACTORY SETTINGS]:	Access to configuration files and return to factory settings
[1.13 USER MENU]:	Specific menu set up by the user in the [7. DISPLAY CONFIG.] menu
[1.14 PROGRAMMABLE CARD]:	Configuration of optional Controller Inside card

Integrated display terminal

Low-power Altivar 71 drives (see catalog) feature an integrated display terminal with a 7-segment 4-digit display. The graphic display terminal described on the previous pages can also be connected to these drives as an option.

Functions of the display and the keys



Note: • Pressing ▲ or ▼ does not store the selection.

• Press and hold down (>2 s) ▲ or ▼ to scroll through the data quickly.

Save and store the selection: ENT

The display flashes when a value is stored.

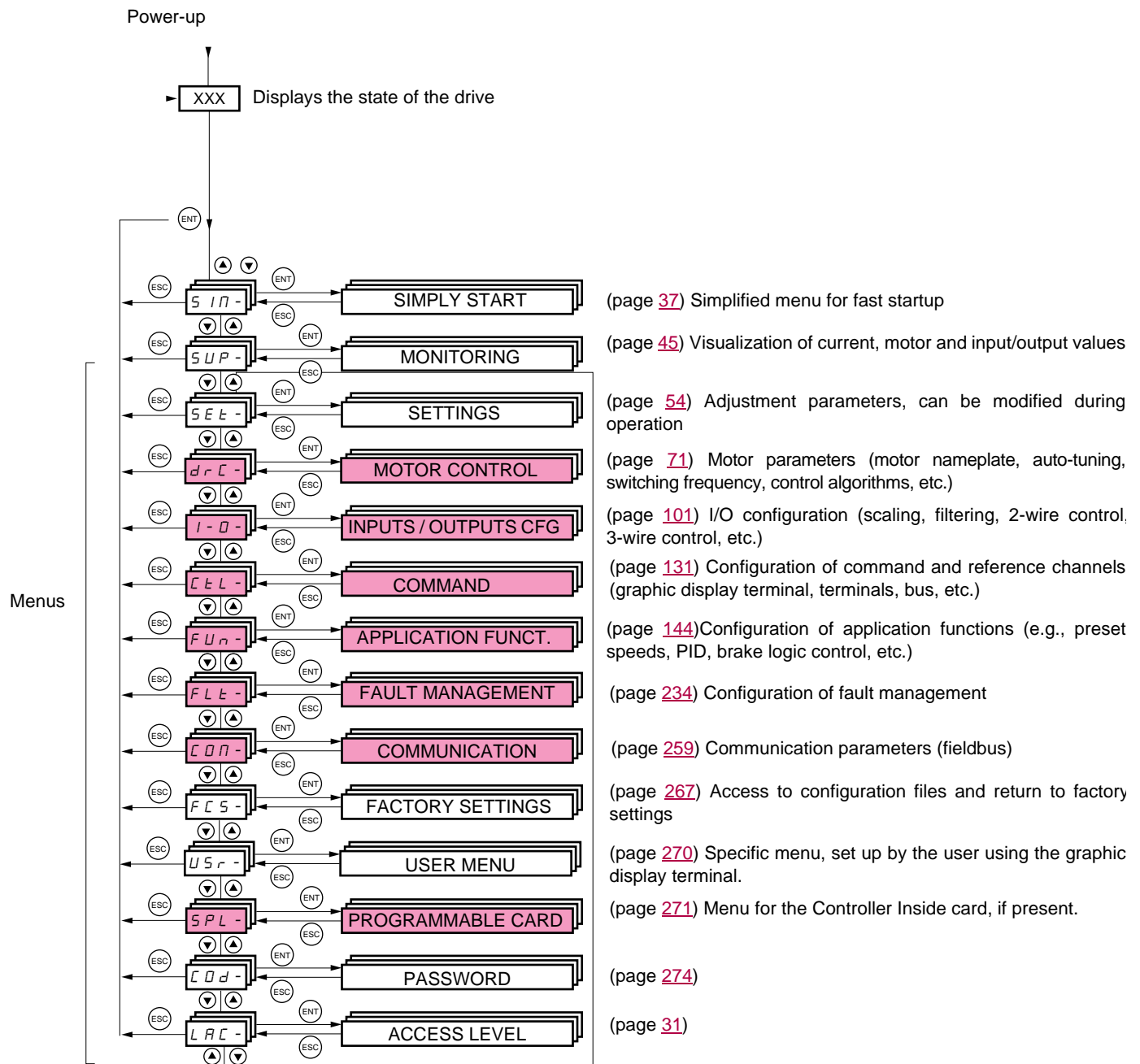
Normal display, with no fault present and no startup:

- 43.0: Display of the parameter selected in the SUP menu (default selection: motor frequency)
- CLl: Current limit
- CtL: Controlled stop on input phase loss
- dCb: DC injection braking in progress
- FLU: Motor fluxing in progress
- FSt: Fast stop.
- nLP: No line power (no line supply on L1, L2, L3)
- nSt: Freewheel stop
- Obr: Auto-adapted deceleration
- PrA: Power Removal function active (drive locked)
- rdY = Drive ready
- SOC: Controlled output cut in progress
- tUn: Auto-tuning in progress
- USA: Undervoltage alarm
- ASA: Measurement of the phase-shift angle in progress

The display flashes to indicate the presence of a fault.

Integrated display terminal

Accessing menus



A dash appears after menu and submenu codes to differentiate them from parameter codes.

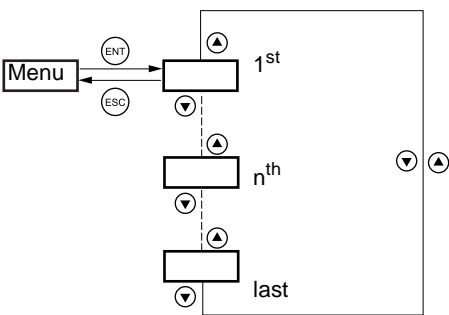
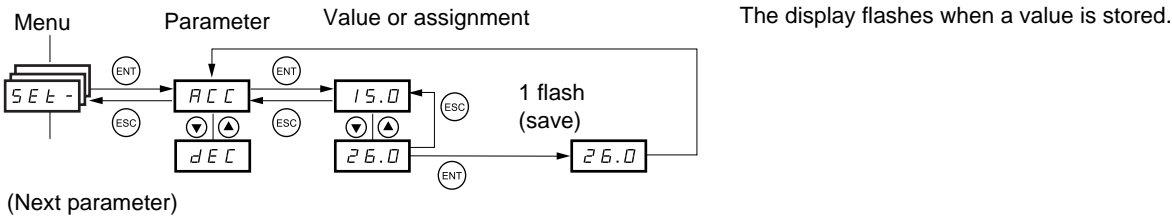
Examples: FUn- menu, ACC parameter.

The grayed-out menus may not be accessible depending on the control access (LAC) configuration.

Integrated display terminal

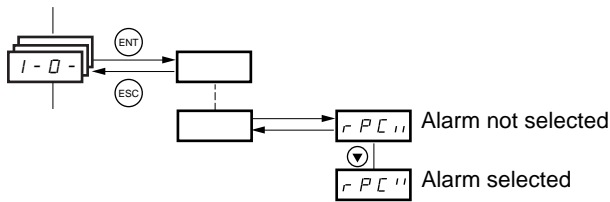
Accessing menu parameters

Save and store the displayed selection : 





All the menus are "drop-down" type menus, which means that after the last parameter, if you continue to press ▼ , you will return to the first parameter and, conversely, you can switch from the first parameter to the last parameter by pressing ▲ .

Selection of multiple assignments for one parameter



Example: List of group 1 alarms in [\[INPUTS / OUTPUTS CFG \(I-O-\)](#) menu

A number of alarms can be selected by "checking" them as follows.

The digit on the right indicates:  selected
 not selected.

The same principle is used for all multiple selections.

[2. ACCESS LEVEL] (LAC-)

With graphic display terminal

Basic

Access to 5 menus only, and access to 6 submenus only in the [1. DRIVE MENU] menu.

A single function can be assigned to each input.

RDY	Term	+0.00Hz	0A
2 ACCESS LEVEL			
Basic			
Standard			✓
Advanced			
Expert			
<<		>>	
		Quick	

RDY	Term	+0.00Hz	0A
MAIN MENU			
1 DRIVE MENU			
2 ACCESS LEVEL			
3 OPEN / SAVE AS			
4 PASSWORD			
5 LANGUAGE			
Code		<< >>	
		Quick	

RDY	Term	+0.00Hz	0A
1. DRIVE MENU			
1.1 SIMPLY START			
1.2. MONITORING			
1.3. SETTINGS			
1.11. IDENTIFICATION			
1.12. FACTORY SETTINGS			
Code	<<	>>	Quick
1.13 USER MENU			

Standard

This is the factory-set level. Access to 6 menus only, and access to all submenus in the [1. DRIVE MENU] menu.

A single function can be assigned to each input.

RDY	Term	+0.00Hz	0A
MAIN MENU			
1 DRIVE MENU			
2 ACCESS LEVEL			
3 OPEN / SAVE AS			
4 PASSWORD			
5 LANGUAGE			
Code		Quick	
6 MONITORING CONFIG.			

RDY	Term	+0.00Hz	0A
1 DRIVE MENU			
1.1 SIMPLY START			
1.2 MONITORING			
1.3 SETTINGS			
1.4 MOTOR CONTROL			
1.5 INPUTS / OUTPUTS CFG			
Code	<<	>>	Quick
1.6 COMMAND			
1.7 APPLICATION FUNCT.			
1.8 FAULT MANAGEMENT			
1.9 COMMUNICATION			
1.10 DIAGNOSTICS			
1.11 IDENTIFICATION			
1.12 FACTORY SETTINGS			
1.13 USER MENU			
1.14 PROGRAMMABLE CARD			

Advanced

Access to all menus and submenus.

Several functions can be assigned to each input.

RDY	Term	+0.00Hz	0A
MAIN MENU			
1 DRIVE MENU			
2 ACCESS LEVEL			
3 OPEN / SAVE AS			
4 PASSWORD			
5 LANGUAGE			
Code		Quick	
6 MONITORING CONFIG.			
7 DISPLAY CONFIG.			

Expert

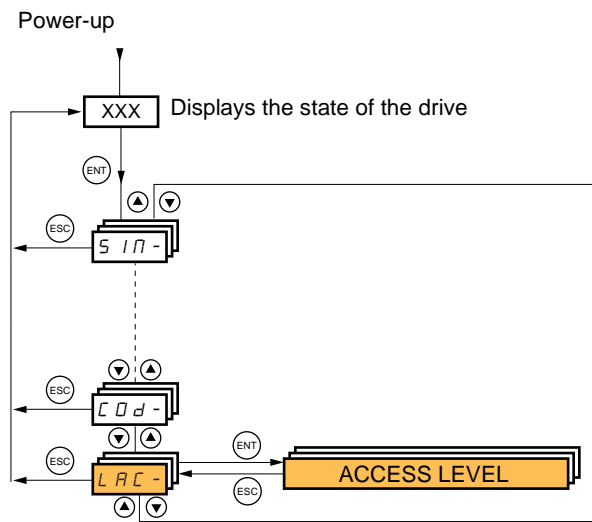
Access to all menus and submenus as for [Advanced] level, and access to additional parameters.

Several functions can be assigned to each input.

RDY	Term	+0.00Hz	0A
MAIN MENU			
1 DRIVE MENU			
2 ACCESS LEVEL			
3 OPEN / SAVE AS			
4 PASSWORD			
5 LANGUAGE			
Code		Quick	
6 MONITORING CONFIG.			
7 DISPLAY CONFIG.			

[2. ACCESS LEVEL] (LAC-)

With integrated display terminal:



Code	Name/Description	Factory setting
L A C -		Std
b A S	<ul style="list-style-type: none">bAS: Limited access to SIM, SUP, SEt, FCS, USr, COd and LAC menus. Only one function can be assigned to each input.	
S t d	<ul style="list-style-type: none">Std: Access to all menus on the integrated display terminal. Only one function can be assigned to each input.	
A d U	<ul style="list-style-type: none">AdU: Access to all menus on the integrated display terminal. Several functions can be assigned to each input.	
E P r	<ul style="list-style-type: none">EPr: Access to all menus on the integrated display terminal and access to additional parameters. Several functions can be assigned to each input.	

[2. ACCESS LEVEL] (LAC-)

Comparison of the menus that can be accessed on the graphic display terminal/ integrated display terminal

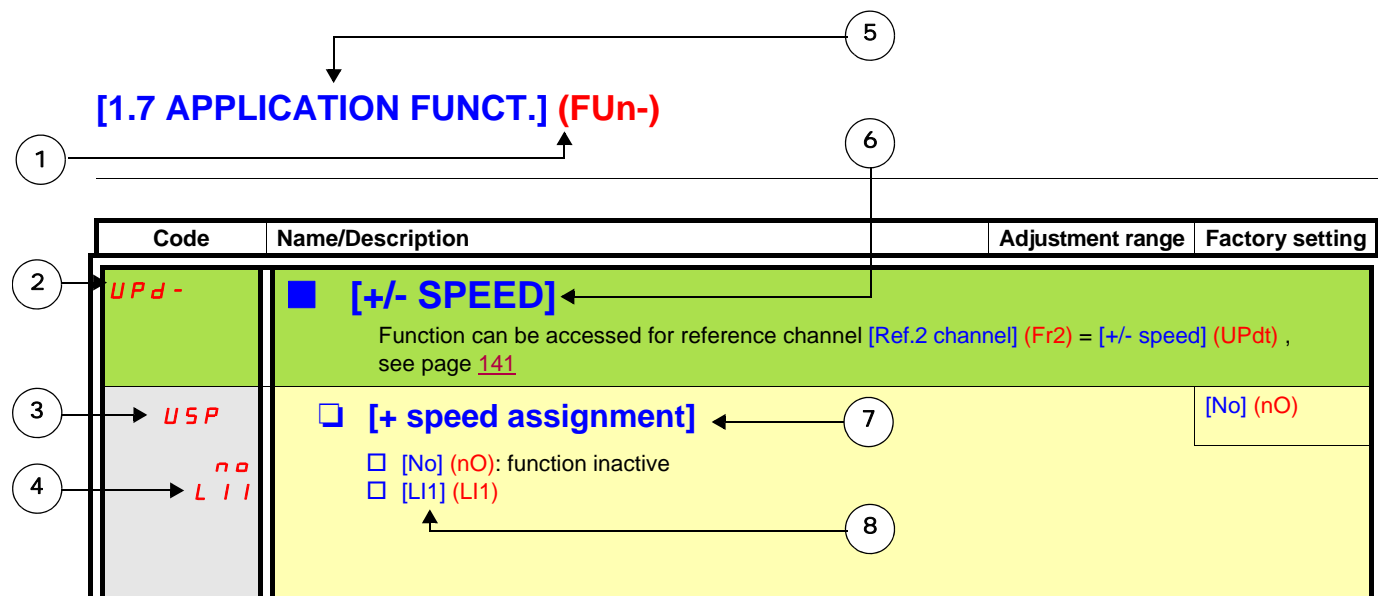
Graphic display terminal	Integrated display terminal	Access level			
[2 ACCESS LEVEL] [3 OPEN/SAVE AS] [4 PASSWORD] [5 LANGUAGE] [1 DRIVE MENU] [1.1 SIMPLY START] [1.2 MONITORING] [1.3 SETTINGS] [1.11 IDENTIFICATION] [1.12 FACTORY SETTINGS] [1.13 USER MENU] A single function can be assigned to each input.	L A C - (Access level) - C D d - (Password) - S I n - (Simply start) S U P - (Monitoring) S E t - (Settings) - F C S - (Factory settings) U S r - (User menu) A single function can be assigned to each input.	Basic b A S Standard S t d (factory setting) Advanced A d v Expert E P r			
[1.4 MOTOR CONTROL] [1.5 INPUTS / OUTPUTS CFG] [1.6 COMMAND] [1.7 APPLICATION FUNCT.] [1.8 FAULT MANAGEMENT] [1.9 COMMUNICATION] [1.10 DIAGNOSTICS] [1.14 PROGRAMMABLE CARD] (1) [6 MONITORING CONFIG.] A single function can be assigned to each input.	d r C - (Motor control) I - O - (I/O configuration) C t L - (Command) F U n - (Application functions) F L t - (Fault management) C D n - (Communication) - P L C - (Controller Inside card) (1) - A single function can be assigned to each input.				
[7 DISPLAY CONFIG.] Several functions can be assigned to each input.	- Several functions can be assigned to each input.				
Expert parameters Several functions can be assigned to each input.	Expert parameters Several functions can be assigned to each input.				

(1) Can be accessed if the Controller Inside card is present.

Structure of parameter tables

The parameter tables in the descriptions of the various menus can be used with both the graphic display terminal and the integrated display terminal. They, therefore, contain information for these two terminals in accordance with the description below.

Example:



1. Name of menu on 4-digit 7-segment display.

2. Submenu code on 4-digit 7-segment display.

3. Parameter code on 4-digit 7-segment display.

4. Parameter value on 4-digit 7-segment display.
5. Name of menu on graphic display terminal.

6. Name of submenu on graphic display terminal.

7. Name of parameter on graphic display terminal.

8. Value of parameter on graphic display terminal.



Note:

- The text in square brackets [] indicates what you will see on the graphic display terminal.
- The factory settings correspond to [Macro configuration] (CFG) = [Start/Stop] (StS). This is the macro configuration set at the factory.

Interdependence of parameter values

The configuration of certain parameters modifies the adjustment range of other parameters, in order to reduce the risk of errors. **This may result in the modification of a factory setting or a value you have already selected.**

Example:

1. [\[Current Limitation\] \(CLI\)](#) page [62](#) set to 1.6 In or left at its factory setting, 1.5 In
2. [\[Switching freq.\] \(SFr\)](#) page [62](#) set to 1 kHz (and confirmed with "ENT") restricts [\[Current Limitation\] \(CLI\)](#) to 1.36 In
3. If [\[Switching freq.\] \(SFr\)](#) is increased to 4 kHz, [\[Current limitation\] \(CLI\)](#) is no longer restricted, **but remains at 1.36 In**. If you require 1.6 In, you must **reset** [\[Current Limitation\] \(CLI\)](#).

Finding a parameter in this document

The following assistance with finding explanations on a parameter is provided:

- **With the integrated display terminal:** Direct use of the parameter code index, page [297](#), to find the page giving details of the displayed parameter.
- **With the graphic display terminal:** Select the required parameter and press **F1** : [\[Code\]](#). The parameter code is displayed instead of its name while the key is held down.

Example: ACC

RDY	Term	+0.00Hz	0A
1.3 SETTINGS			
Ramp increment:		01	
Acceleration		9.51 s	
Deceleration:		9.67 s	
Acceleration 2:		12.58 s	
Deceleration 2:		13.45 s	
Code	<<	>>	Quick

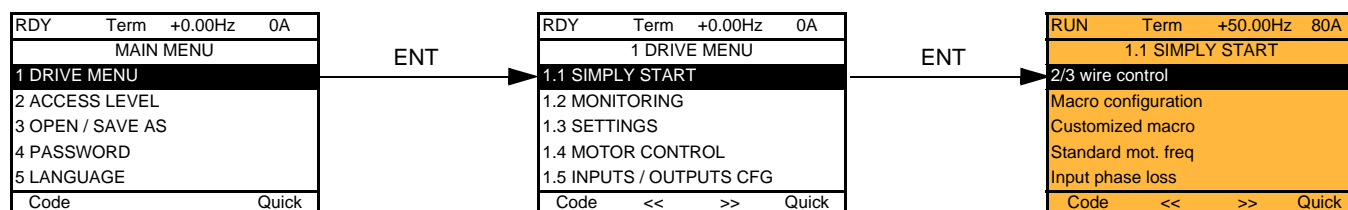
Code
→

RDY	Term	+0.00Hz	0A
1.3 SETTINGS			
Ramp increment:		01	
ACC		9.51 s	
Deceleration:		9.67 s	
Acceleration 2:		12.58 s	
Deceleration 2:		13.45 s	
Code	<<	>>	Quick

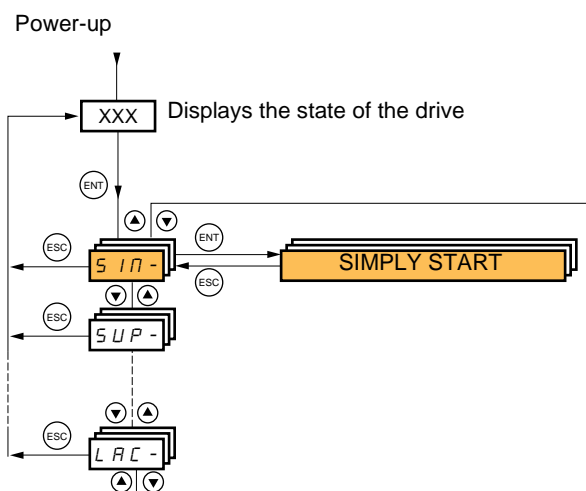
Then use the parameter code index, page [297](#), to find the page giving details of the displayed parameter.

[1.1 SIMPLY START] (SIM-)

With graphic display terminal:



With integrated display terminal:



The [1.1-SIMPLY START] (SIM-) menu can be used for fast startup, which is sufficient for the majority of applications.

The parameters in this menu can only be modified when the drive is stopped and no run command is present, with the following exceptions:

- Auto-tuning, which causes the motor to start up
- The adjustment parameters on page 44



Note: The parameters of the [1.1 SIMPLY START] (SIM-) menu must be entered in the order in which they appear, as the later ones are dependent on the first ones.

For example [2/3 wire control] (tCC) must be configured before any other parameters.

The [1.1 SIMPLY START] (SIM-) menu should be configured **on its own or before the other drive configuration menus**. If a modification has previously been made to any of them, in particular in [1.4 MOTOR CONTROL] (drC-), some [1.1 SIMPLY START] (SIM-) parameters may be changed, for example, the motor parameters, if a synchronous motor has been selected. Returning to the [1.1 SIMPLY START] (SIM-) menu after modifying another drive configuration menu **is unnecessary** but does not pose any risk. Changes following modification of another configuration menu **are not described**, to avoid unnecessary complication in this section.

Macro configuration

Macro configuration provides a means of speeding up the configuration of functions for a specific field of application.

8 macro configurations are available:

- Start/stop (factory configuration)
- Handling
- General use
- Hoisting
- Lifts
- PID regulator
- Communication bus
- Master/slave

Selecting a macro configuration assigns the parameters in this macro configuration.

Each macro configuration can still be modified in the other menus.

[1.1 SIMPLY START] (SIM-)

Macro configuration parameters

Assignment of the inputs/outputs

Input/output	[Start/Stop]	[M. handling]	[Gen. Use]	[Hoisting]	[Lift]	[PID regul.]	[Network C.]	[Mast./slave]
AI1	[Ref.1 channel]	[Ref.1 channel]	[Ref.1 channel]	[Ref.1 channel]	[Ref.1 channel]	[Ref.1 channel] (PID reference)	[Ref.2 channel] ([Ref.1 channel] = integrated Modbus) (1)	[Ref.1 channel]
AI2	[No]	[Summing ref. 2]	[Summing ref. 2]	[No]	[No]	[PID feedback]	[No]	[Torque reference]
AO1	[No]	[No]	[No]	[No]	[No]	[No]	[No]	[No]
R1	[No drive flt]	[No drive flt]	[No drive flt]	[No drive flt]	[No drive flt]	[No drive flt]	[No drive flt]	[No drive flt]
R2	[No]	[No]	[No]	[Brk control]	[Brk control]	[No]	[No]	[No]
LI1 (2-wire)	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]
LI2 (2-wire)	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]
LI3 (2-wire)	[No]	[2 preset speeds]	[Jog]	[Fault reset]	[2 preset speeds]	[PID integral reset]	[Ref. 2 switching]	[Trq/spd switching]
LI4 (2-wire)	[No]	[4 preset speeds]	[Fault reset]	[External fault]	[4 preset speeds]	[2 preset PID ref.]	[Fault reset]	[Fault reset]
LI5 (2-wire)	[No]	[8 preset speeds]	[Torque limitation]	[No]	[Fault reset]	[4 preset PID ref.]	[No]	[No]
LI6 (2-wire)	[No]	[Fault reset]	[No]	[No]	[No]	[No]	[No]	[No]
LI1 (3-wire)	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
LI2 (3-wire)	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]	[Forward]
LI3 (3-wire)	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]	[Reverse]
LI4 (3-wire)	[No]	[2 preset speeds]	[Jog]	[Fault reset]	[2 preset speeds]	[PID integral reset]	[Ref. 2 switching]	[Trq/spd switching]
LI5 (3-wire)	[No]	[4 preset speeds]	[Fault reset]	[External fault]	[4 preset speeds]	[2 preset PID ref.]	[Fault reset]	[Fault reset]
LI6 (3-wire)	[No]	[8 preset speeds]	[Torque limitation]	[No]	[Fault reset]	[4 preset PID ref.]	[No]	[No]
Option cards								
LI7 to LI14	[No]	[No]	[No]	[No]	[No]	[No]	[No]	[No]
LO1 to LO4	[No]	[No]	[No]	[No]	[No]	[No]	[No]	[No]
R3/R4	[No]	[No]	[No]	[No]	[No]	[No]	[No]	[No]
AI3, AI4	[No]	[No]	[No]	[No]	[No]	[No]	[No]	[No]
RP	[No]	[No]	[No]	[No]	[No]	[No]	[No]	[No]
AO2	[I motor]	[I motor]	[I motor]	[I motor]	[I motor]	[I motor]	[I motor]	[I motor]
AO3	[No]	[Sign. torque]	[No]	[Sign. torque]	[Sign. torque]	[PID Output]	[No]	[Motor freq.]
Graphic display terminal keys								
F1 key	[No]	[No]	[No]	[No]	[No]	[No]	Control via graphic display terminal	[No]
F2, F3, F4 keys	[No]	[No]	[No]	[No]	[No]	[No]	[No]	[No]

In 3-wire control, the assignment of inputs LI1 to LI6 shifts.

(1) To start up with integrated Modbus, [Modbus Address] (Add) must first be configured, page 261.

Note: These assignments are reinitialized every time the macro configuration changes.

[1.1 SIMPLY START] (SIM-)

Macro configuration parameters

Other configurations and settings

In addition to the assignment of I/O, other parameters are assigned only in the Hoisting, Lift and Mast./slave macro configurations.

Hoisting and lift:

- [Movement type] (bSt) = [Hoisting] (UEr) page 175
- [Brake contact] (bCl) = [No] (nO) page 175
- [Brake impulse] (bIP) = [No] (nO) page 175
- [Brake release I FW] (lbr) = [Rated mot. current] (nCr) page 175
- [Brake Release time] (brt) = 0.5 s page 176
- [Brake release freq] (blr) = [Auto] (AUtO) page 176
- [Brake engage freq] (bEn) = [Auto] (AUtO) page 176
- [Brake engage time] (bEt) = 0.5 s page 176
- [Engage at reversal] (bEd) = [No] (nO) page 177
- [Jump at reversal] (JdC) = [Auto] (AUtO) page 177
- [Time to restart] (ttr) = 0 s page 177
- [Current ramp time] (brr) = 0 s page 179
- [Low speed] (LSP) = Rated motor slip calculated by the drive, page 44
- [Output Phase Loss] (OPL) page 242 = [Yes] (YES), but it is forced to [No] (nO) if [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn). No further modifications can be made to this parameter.
- [Catch on the fly] (FLr) = [No] (nO) page 239. No further modifications can be made to this parameter.

Lift:

- [Feed forward] (FFP) = 0 % page 91

Mast./slave:

- [Motor control type] (Ctt) = [SVC I] (CUC) page 70

Note: These assignments are forced every time the macro configuration changes, except for [Motor control type] (Ctt) for the Mast./slave macro configuration, if it is configured in [FVC] (FUC).

Return to factory settings:

Returning to factory settings with [Config. Source] (FCSI) = [Macro-Conf] (InI) page 269 will return the drive to the selected macro configuration. The [Macro configuration] (CFG) parameter does not change, although [Customized macro] (CCFG) disappears.



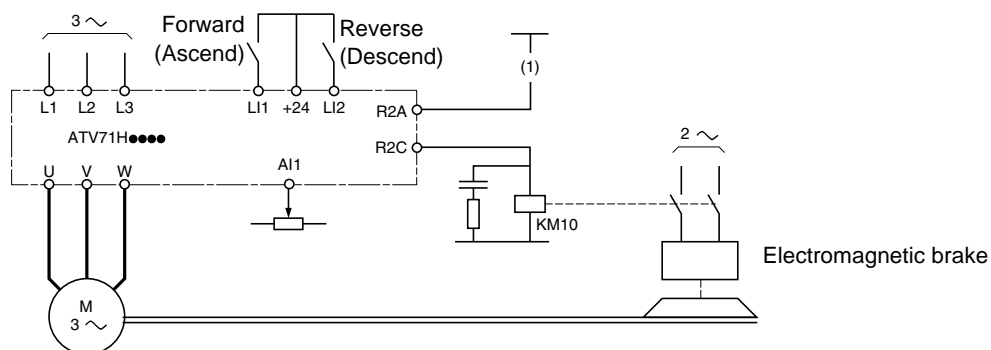
Note:

- The factory settings that appear in the parameter tables correspond to [Macro configuration] (CFG) = [Start/Stop] (StS). This is the macro configuration set at the factory.

[1.1 SIMPLY START] (SIM-)

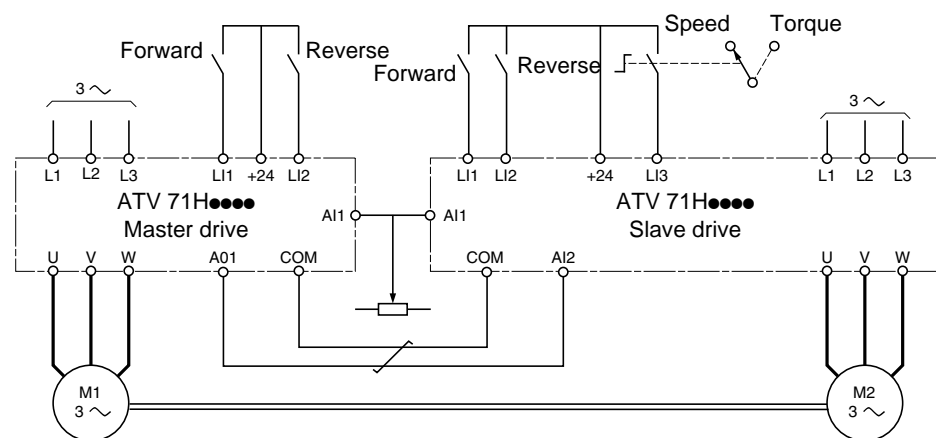
Example diagrams for use with the macro configurations

[Hoisting] (HSt) diagram



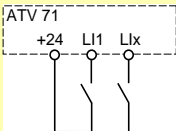
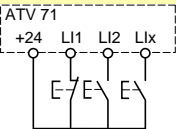


(1) A contact on the Preventa module must be inserted in the brake control circuit to engage it safely when the "Power Removal" safety function is activated (see connection diagrams in the Installation Manual).

[Mast./slave] (MSL) diagram



When the two motors are mechanically connected, the Speed/torque contact closing results in operation in Mast./slave mode. The master drive regulates the speed and controls the slave drive in torque mode to ensure distribution of the load.

[1.1 SIMPLY START] (SIM-)


Code	Name/Description	Adjustment range	Factory setting
tCC 2C 3C	<input type="checkbox"/> [2/3 wire control] <input type="checkbox"/> [2 wire] (2C) <input type="checkbox"/> [3 wire] (3C) <p>2-wire control: This is the input state (0 or 1) or edge (0 to 1 or 1 to 0), which controls running or stopping.</p> <p>Example of "source" wiring:</p>  <p>LI1: forward LIx: reverse</p> <p>3-wire control (pulse commands): A "forward" or "reverse" pulse is sufficient to command starting, a "stop" pulse is sufficient to command stopping.</p> <p>Example of "source" wiring:</p>  <p>LI1: stop LI2: forward LIx: reverse</p>		[2 wire] (2C)
	<div style="text-align: center;">  WARNING </div> <p>UNINTENDED EQUIPMENT OPERATION</p> <p>To change the assignment of [2/3 wire control] (tCC) press and hold down the "ENT" key for 2 s. The following function will be returned to factory settings: [2 wire type] (tCt) page 102 as will all functions which assign logic inputs. The macro configuration selected will also be reset if it has been customized (loss of custom settings). Check that this change is compatible with the wiring diagram used.</p> <p>Failure to follow these instructions can result in death or serious injury.</p>		
CFG StS HdG HSt GEn PId nEt MSL LIFt	<input type="checkbox"/> [Macro configuration] <input type="checkbox"/> [Start/Stop] (StS): Start/stop <input type="checkbox"/> [M. handling] (HdG): Handling <input type="checkbox"/> [Hoisting] (HSt): Hoisting <input type="checkbox"/> [Gen. Use] (GEn): General use <input type="checkbox"/> [PID regul.] (PId): PID regulation <input type="checkbox"/> [Network C.] (nEt): Communication bus <input type="checkbox"/> [Mast./slave] (MSL): Master/slave <input type="checkbox"/> [Lift] (LIFt): Lifts		[Start/Stop] (StS)
	<div style="text-align: center;">  WARNING </div> <p>UNINTENDED EQUIPMENT OPERATION</p> <p>To change the assignment of [Macro configuration] (CFG) press and hold down the "ENT" key for 2 s. Check that the selected macro configuration is compatible with the wiring diagram used.</p> <p>Failure to follow these instructions can result in death or serious injury.</p>		
CCFG YES	<input type="checkbox"/> [Customized macro] <p>Read-only parameter, only visible if at least one macro configuration parameter has been modified.</p> <input type="checkbox"/> [Yes] (YES)		

[1.1 SIMPLY START] (SIM-)

Code	Name/Description	Adjustment range	Factory setting
bFr 50 60	<input type="checkbox"/> [Standard mot. freq] <input type="checkbox"/> [50Hz IEC] (50): IEC <input type="checkbox"/> [60Hz NEMA] (60): NEMA This parameter modifies the presets of the following parameters: [Rated motor volt.] (UnS) below, [High speed] (HSP) page 44, [Freq. threshold] (Ftd) page 68, [Rated motor freq.] (FrS) and [Max frequency] (tFr) .		[50Hz IEC] (50)
IPL n0 YES	<input type="checkbox"/> [Input phase loss] <input type="checkbox"/> [Ignore] (n0): Fault ignored, to be used when the drive is supplied via a single-phase supply or by the DC bus. <input type="checkbox"/> [Freewheel] (YES): Fault, with freewheel stop. If one phase disappears, the drive switches to fault mode [Input phase loss] (IPL), but if 2 or 3 phases disappear, the drive continues to operate until it trips on an undervoltage fault. This parameter is only accessible in this menu on ATV71H037M3 to HU75M3 drives (used with a single phase supply).		According to drive rating
nPr	<input type="checkbox"/> [Rated motor power] Rated motor power given on the nameplate, in kW if [Standard mot. freq] (bFr) = [50Hz IEC] (50), in HP if [Standard mot. freq] (bFr) = [60Hz NEMA] (60).	According to drive rating	According to drive rating
UnS	<input type="checkbox"/> [Rated motor volt.] Rated motor voltage given on the nameplate. ATV71...M3: 100 to 240 V - ATV71...N4: 200 to 480 V - ATV71...S6X: 400 to 600 - ATV71...Y: 400 to 690 V	According to drive rating	According to drive rating and [Standard mot. freq] (bFr)
nCr	<input type="checkbox"/> [Rated mot. current] Rated motor current given on the nameplate.	0.25 to 1.5 In (1)	According to drive rating and [Standard mot. freq] (bFr)
FrS	<input type="checkbox"/> [Rated motor freq.] Rated motor frequency given on the nameplate. The factory setting is 50 Hz, or preset to 60 Hz if [Standard mot. freq] (bFr) is set to 60 Hz.	10 to 500 Hz	50 Hz
nSP	<input type="checkbox"/> [Rated motor speed] Rated motor speed given on the nameplate. 0 to 9999 rpm then 10.00 to 60.00 krpm on the integrated display terminal. If, rather than the rated speed, the nameplate indicates the synchronous speed and the slip in Hz or as a %, calculate the rated speed as follows: <ul style="list-style-type: none"> Nominal speed = Synchronous speed x $\frac{100 - \text{slip as a \%}}{100}$ or Nominal speed = Synchronous speed x $\frac{50 - \text{slip in Hz}}{50}$ (50 Hz motors) or Nominal speed = Synchronous speed x $\frac{60 - \text{slip in Hz}}{60}$ (60 Hz motors) 	0 to 60000 RPM	According to drive rating
tFr	<input type="checkbox"/> [Max frequency] The factory setting is 60 Hz, or preset to 72 Hz if [Standard mot. freq] (bFr) is set to 60 Hz. The maximum value is limited by the following conditions: <ul style="list-style-type: none"> It must not exceed 10 times the value of [Rated motor freq.] (FrS) It must not exceed 500 Hz if the drive rating is higher than ATV71HD37 (values between 500 Hz and 1600 Hz are only possible for powers limited to 37 kW (50 HP). 	10 to 1600 Hz	60 Hz

(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.

[1.1 SIMPLY START] (SIM-)

Code	Name/Description	Factory setting
tUn nO YES dOnE	[Auto tuning] <input type="checkbox"/> [No] (nO): Auto-tuning not performed. <input type="checkbox"/> [Yes] (YES): Auto-tuning is performed as soon as possible, then the parameter automatically changes to [Done] (dOnE). <input type="checkbox"/> [Done] (dOnE): Use of the values given the last time auto-tuning was performed. Caution: <ul style="list-style-type: none"> It is essential that all motor parameters ([Rated motor volt.] (UnS), [Rated motor freq.] (FrS), [Rated mot. current] (nCr), [Rated motor speed] (nSP), [Rated motor power] (nPr)) are configured correctly before starting auto-tuning. If at least one of these parameters is modified after auto-tuning has been performed, [Auto tuning] (tUn) will return to [No] (nO) and must be repeated. Auto-tuning is only performed if no stop command has been activated. If a "freewheel stop" or "fast stop" function has been assigned to a logic input, this input must be set to 1 (active at 0). Auto-tuning takes priority over any run or prefluxing commands, which will be taken into account after the auto-tuning sequence. If auto-tuning fails, the drive displays [No] (nO) and, depending on the configuration of [Autotune fault mgt] (tnL) page 256, may switch to [Auto-tuning] (tnF) fault mode. Auto-tuning may last for 1 to 2 seconds. Do not interrupt the process. Wait for the display to change to "[Done] (dOnE)" or "[No] (nO)".  Note: During auto-tuning the motor operates at rated current.	[No] (nO)
tUS tAb PEnd PrOG FAIL dOnE	[Auto tuning status] (for information only, cannot be modified) <input type="checkbox"/> [Not done] (tAb): The default stator resistance value is used to control the motor. <input type="checkbox"/> [Pending] (PEnd): Auto-tuning has been requested but not yet performed. <input type="checkbox"/> [In Progress] (PrOG): Auto-tuning in progress. <input type="checkbox"/> [Failed] (FAIL): Auto-tuning has failed. <input type="checkbox"/> [Done] (dOnE): The stator resistance measured by the auto-tuning function is used to control the motor.	[Not done] (tAb)
PHr AbC ACb	[Output Ph rotation] <input type="checkbox"/> [ABC] (AbC): Forward <input type="checkbox"/> [ACB] (ACb): Reverse This parameter can be used to reverse the direction of rotation of the motor without reversing the wiring.	[ABC] (AbC)

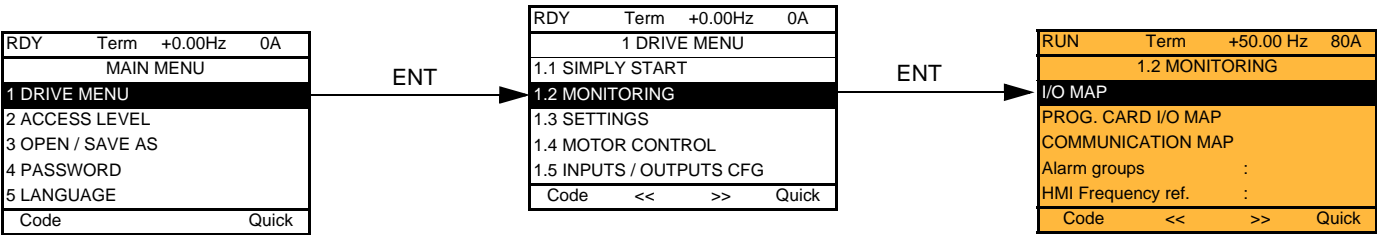
[1.1 SIMPLY START] (SIM-)

Parameters that can be changed during operation or when stopped

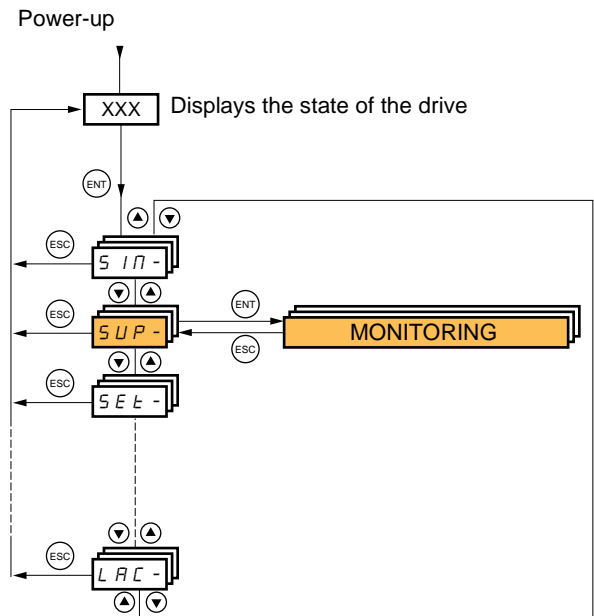
Code	Name/Description	Factory setting
IEH	<input type="checkbox"/> [Mot. therm. current] Motor thermal protection current, to be set to the rated current indicated on the nameplate.	0.2 to 1.5 In (1) According to drive rating
ACC	<input type="checkbox"/> [Acceleration] Time to accelerate from 0 to the [Rated motor freq.] (FrS) (page 42). Make sure that this value is compatible with the inertia being driven.	0.1 to 999.9 s 3.0 s
DEC	<input type="checkbox"/> [Deceleration] Time to decelerate from the [Rated motor freq.] (FrS) (page 42) to 0. Make sure that this value is compatible with the inertia being driven.	0.1 to 999.9 s 3.0 s
LSP	<input type="checkbox"/> [Low speed] Motor frequency at minimum reference, can be set between 0 and [High speed] (HSP).	0
HSP	<input type="checkbox"/> [High speed] Motor frequency at maximum reference, can be set between [Low speed] (LSP) and [Max frequency] (tFr). The factory setting changes to 60 Hz if [Standard mot. freq] (bFr) = [60Hz NEMA] (60). <div style="border: 1px solid black; padding: 10px; text-align: center;"> CAUTION For permanent magnet synchronous motors, the maximum permissible speed must not be exceeded, otherwise demagnetization may occur. The maximum speed permitted by the motor, drive chain or application must not be exceeded at any time. Failure to follow this instruction can result in equipment damage. </div>	50 Hz

(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.

With graphic display terminal:



With integrated display terminal:



- ➡ I/O
- ➡ I/O of the Controller Inside card if it is present
- ➡ Communication data and values
- ➡ Drive internal drive states and values (see page 51)

Move from one screen to another
(from LOGIC INPUT MAP
to FREQ. SIGNAL IMAGE)
by turning the navigation button

Access to the selected input or output configuration:
Press ENT.

RUN	Term	+50.00Hz	80A
L11 assignment			
Forward			
Pre Fluxing			
L11 On Delay	:		0 ms
<<		>>	Quick

ENT

RUN	Term	+50.00Hz	80A
A11 assignment			
Ref.1 channel			
Forced local			
Torque reference			
A11 min value:			0.0 V
A11 max value:			10.0 V
			Quick

FNT

RUN	Term	+50.00Hz	80A
LO1 assignment			
No			
LO1 delay time	:		0 ms
LO1 active at	:		1
LO1 holding time	:		0 ms
<<		>>	Quick

FNT

RUN	Term	+50.00Hz	80A
AO1 assignment			
Motor freq.			
AO1 min output	:		4 mA
AO1 max output	:		20 mA
AO1 Filter	:		10 ms
			Quick

FNT

RUN	Term	+50.00Hz	80A
RP assignment			
Frequency ref.			
RP min value	:	2 kHz	
RP max value	:	50 kHz	
RP filter	:	0 ms	
			Quick












With graphic display terminal

Controller Inside card I/O

RUN	Term	+50.00Hz	80A
PROG. CARD I/O MAP			
PROG CARD LI MAP			
PROG. CARD AI MAP			
PROG CARD LO MAP			
PROG. CARD AO MAP			
Code		Quick	

Move from one screen to another
(from PROG CARD LI MAP
to PROG. CARD AO MAP)
by turning the navigation button

- ☐ State 0
- ☐ State 1

RUN	Term	+50.00Hz	80A
PROG CARD LI MAP			
1	LI51	LI52	LI53
0			
			
			
1	LI59	LI60	
0			
<<		>>	
Quick			

RUN	Term	+50.00Hz	80A
PROG CARD AI MAP			
AI51 : 0.000 mA			
AI52 : 9.87 V			
Code		<< >> Quick	

ENT

RUN	Term	+50.00Hz	80A
AI51			
0 mA			
Min = 0.001		Max = 20,000	
<<		>> Quick	

- ☐ State 0
- ☐ State 1

RUN	Term	+50.00Hz	80A
PROG CARD LO MAP			
1	LO51	LO52	LO53
0	LO54	LO55	LO56
<<		>>	
Quick			

RUN	Term	+50.00Hz	80A
PROG. CARD AO MAP			
AO51 : 0.000 mA			
AO52 : 9.87 V			
Code		<< >> Quick	

ENT

RUN	Term	+50.00Hz	80A
AO51			
0 mA			
Min = 0.001		Max = 20,000	
<<		>> Quick	

With graphic display terminal
Communication

RUN	Term	+50.00Hz	80A
COMMUNICATION MAP			
Command Channel:		Modbus	
Cmd value:		ABCD Hex	
Active ref. channel:		CANopen	
Frequency ref.:		-12.5 Hz	
ETA state word:		2153 Hex	
Code		Quick	

W3141 : F230 Hex
W2050 : F230 Hex
W4325 : F230 Hex
W0894 : F230 Hex
COM. SCANNER INPUT MAP
COM SCAN OUTPUT MAP
CMD. WORD IMAGE
FREQ. REF. WORD MAP
MODBUS NETWORK DIAG
MODBUS HMI DIAG
CANopen MAP
PROG. CARD SCANNER

[COMMUNICATION MAP] indicates the types of bus used for control or reference, the corresponding command and reference values, the status word, the words selected in the [DISPLAY CONFIG.] menu, etc.
The display format (hexadecimal or decimal) can be configured in the [DISPLAY CONFIG.] menu.

RUN	Term	+50.00Hz	80A
COM. SCANNER INPUT MAP			
Com Scan In1 val.:		0	
Com Scan In2 val.:		0	
Com Scan In3 val.:		0	
Com Scan In4 val.:		0	
Com Scan In5 val.:		0	
Code		Quick	
Com Scan In6 val.:		0	
Com Scan In7 val.:		0	
Com Scan In8 val.:		0	

RUN	Term	+50.00Hz	80A
COM SCAN OUTPUT MAP			
Com Scan Out1 val.:		0	
Com Scan Out2 val.:		0	
Com Scan Out3 val.:		0	
Com Scan Out4 val.:		0	
Com Scan Out5 val.:		0	
Code		Quick	
Com Scan Out6 val.:		0	
Com Scan Out7 val.:		0	
Com Scan Out8 val.:		0	

RUN	Term	+50.00Hz	80A
CMD. WORD IMAGE			
Modbus cmd.:		0000 Hex.	
CANopen cmd.:		0000 Hex.	
COM. card cmd.:		0000 Hex.	
Prog. card cmd.:		0000 Hex.	
Code		Quick	

RUN	Term	+50.00Hz	80A
FREQ. REF. WORD MAP			
Ref. Modbus:		0.0 Hz	
Ref. CANopen:		0.0 Hz	
Com. card ref.:		0.0 Hz	
Prog. Card ref.:		0.0 Hz	
Code		Quick	

[COM. SCANNER INPUT MAP] and [COM SCAN OUTPUT MAP]:
Visualization of registers exchanged periodically (8 input and 8 output) for integrated Modbus and for fieldbus cards.

With graphic display terminal
Communication (continued)






RUN	Term	+50.00Hz	80A
COMMUNICATION MAP			
Command Channel:		Modbus	
Cmd value:		ABCD Hex	
Active ref. channel:		CANopen	
Frequency ref.:		-12.5 Hz	
ETA state word:		2153 Hex	
Code		Quick	
W3141 : F230 Hex			
W2050 : F230 Hex			
W4325 : F230 Hex			
W0894 : F230 Hex			
COM. SCANNER INPUT MAP			
COM SCAN OUTPUT MAP			
CMD. WORD IMAGE			
FREQ. REF. WORD MAP			
MODBUS NETWORK DIAG _____			
MODBUS HMI DIAG _____			
CANopen MAP _____			
PROG. CARD SCANNER			

The state of the LEDs, the periodic data, the address, the speed, and the format, etc., is given for each bus.

- ⊗ LED off
- ⊗ LED on

RUN	Term	+50.00Hz	80A
MODBUS NETWORK DIAG			
COM LED :		⊗	
Mb NET frames nb.			
Mb NET CRC errors			
Code		Quick	

RUN	Term	+50.00Hz	80A
MODBUS HMI DIAG			
COM LED :		⊗	
Mb HMI frames nb.			
Mb HMI CRC errors			
Code		Quick	

Communication via CANopen			
RUN	Term	+50.00Hz	80A
CANopen MAP			
RUN LED:			
ERR LED:			
PDO1 IMAGE			
PDO2 IMAGE			
PDO3 IMAGE			
Code		Quick	
Canopen NMT state			
Number of TX PDO		0	
Number of RX PDO		0	
Error code		0	
RX Error Counter		0	
TX Error Counter		0	

PDO images are only visible if CANopen has been enabled (address other than OFF) and if the PDOs are active.

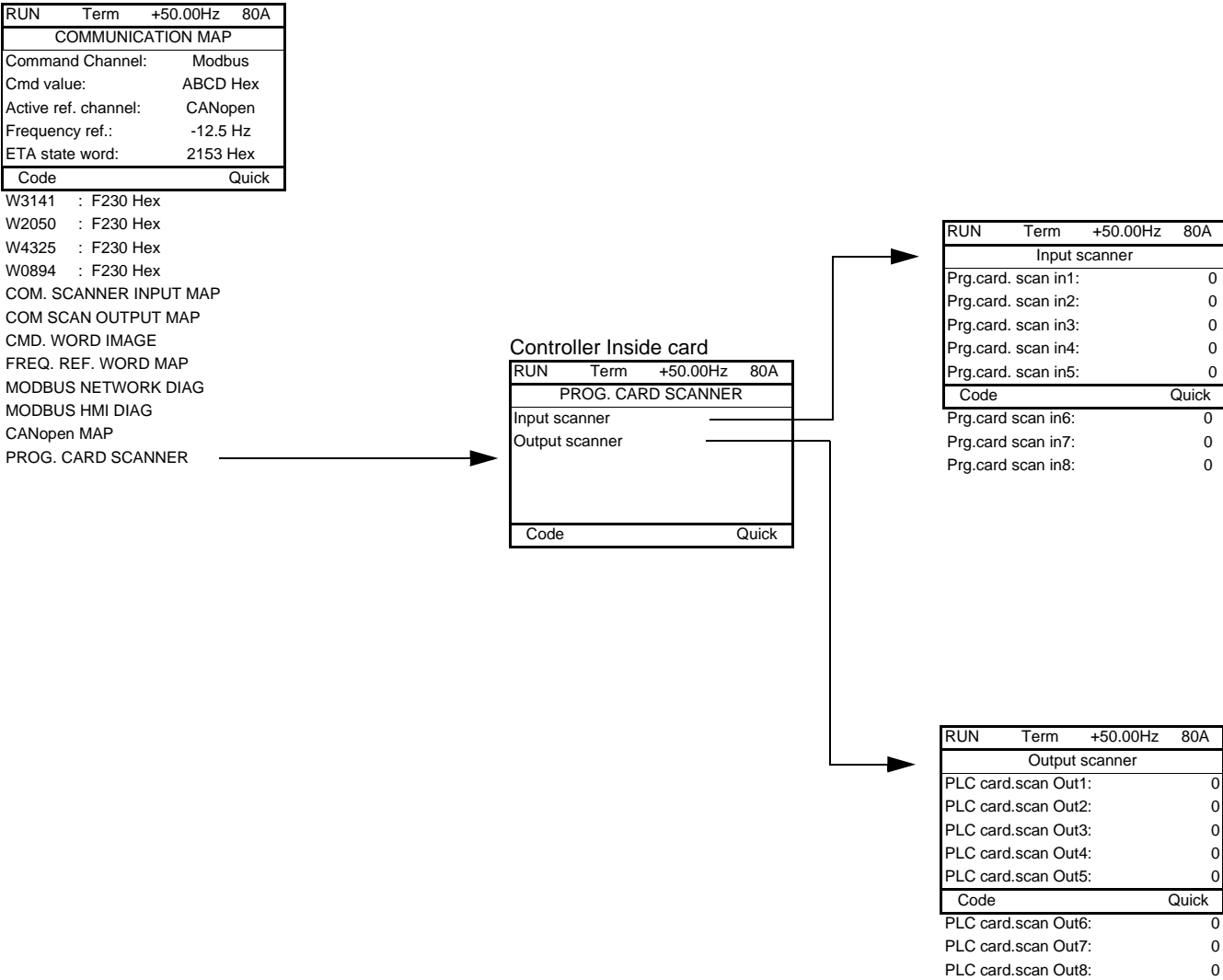
PDO configuration using the network tool.
Some PDOs cannot be used.

RUN	Term	+50.00Hz	80A
PDO1 IMAGE			
Received PDO1-1 :		FDBA Hex	
Received PDO1-2			
Received PDO1-3			
Received PDO1-4			
Transmit PDO1-1 :		FDBA Hex	
Code		Quick	
Transmit PDO1-2			
Transmit PDO1-3			
Transmit PDO1-4			

RUN	Term	+50.00Hz	80A
PDO2 IMAGE			
Received PDO2-1 :		FDBA Hex	
Received PDO2-2			
Received PDO2-3			
Received PDO2-4			
Transmit PDO2-1 :		FDBA Hex	
Code		Quick	
Transmit PDO2-2			
Transmit PDO2-3			
Transmit PDO2-4			

RUN	Term	+50.00Hz	80A
PDO3 IMAGE			
Received PDO3-1 :		FDBA Hex	
Received PDO3-2			
Received PDO3-3			
Received PDO3-4			
Transmit PDO3-1 :		FDBA Hex	
Code		Quick	
Transmit PDO3-2			
Transmit PDO3-3			
Transmit PDO3-4			

With graphic display terminal
Communication (continued)



[Input scanner] and [Output scanner]:
Visualization of registers exchanged periodically (8 input and 8 output).

[1.2 MONITORING] (SUP-)

With graphic display terminal: Drive-internal states and values

Name/Description	
[Alarm groups] (ALGr)	Current alarm group numbers
[HMI Frequency ref.] (LFr)	in Hz. Frequency reference via the graphic display terminal (can be accessed if the function has been configured).
[Internal PID ref.] (rPI)	as a process value. PID reference via graphic display terminal (can be accessed if the function has been configured).
[HMI torque ref.] (Ltr)	as a % of the rated torque. Torque reference via graphic display terminal.
[Multiplying coeff.] (MFr)	as a % (can be accessed if [Multiplier ref. -] (MA2,MA3) page 151 has been assigned)
[Frequency ref.] (FrH)	in Hz
[Torque reference] (trr)	as a % of the rated torque (can be accessed if the function has been configured)
[Output frequency] (rFr)	in Hz
[Measured output fr.] (MMF)	in Hz: The measured motor speed is displayed if an encoder card has been inserted, otherwise 0 appears.
[Pulse in. work. freq.] (FqS)	in Hz: Frequency of the "Pulse input" input used by the [FREQUENCY METER] (FqF-) function, page 253.
[Motor current] (LCr)	in A
[ENA avg speed] (AUS)	in Hz: The parameter can be accessed if [ENA system] (EnA) = [Yes] (YES) (see page 94)
[Motor speed] (SPd)	in rpm
[Motor voltage] (UOP)	in V
[Motor power] (OPr)	as a % of the rated power
[Motor torque] (Otr)	as a % of the rated torque
[Mains voltage] (ULn)	in V. Line voltage from the point of view of the DC bus, motor running or stopped.
[Motor thermal state] (tHr)	as a %
[Drv.thermal state] (tHd)	as a %
[DBR thermal state] (tHb)	as a % (can only be accessed on high rating drives)
[Consumption] (APH)	in Wh, kWh or MWh (accumulated consumption)
[Run time] (rth)	in seconds, minutes or hours (length of time the motor has been switched on)
[Power on time] (PtH)	in seconds, minutes or hours (length of time the drive has been switched on)
[IGBT alarm counter] (tAC)	in seconds (length of time the "IGBT temperature" alarm has been active)
[PID reference] (rPC)	as a process value (can be accessed if the PID function has been configured)
[PID feedback] (rPF)	as a process value (can be accessed if the PID function has been configured)
[PID error] (rPE)	as a process value (can be accessed if the PID function has been configured)
[PID Output] (rPO)	in Hz (can be accessed if the PID function has been configured)
[Date/Time] (CLO)	Current date and time generated by the Controller Inside card (can be accessed if the card has been inserted)
[- - - -] (o02)	Words generated by the Controller Inside card (can be accessed if the card has been inserted)
to	
[- - - -] (o06)	
[Config. active] (CnFS)	Active configuration [Config. n°0, 1 or 2]
[Utilised param. set] (CFPS)	[Set n°1, 2 or 3] (can be accessed if parameter switching has been enabled, see page 215)
[ALARMS] (ALr-)	List of current alarms. If an alarm is present, a ✓ appears.
[OTHER STATE] (SSt-)	List of secondary states:
	<ul style="list-style-type: none"> - [In motor fluxing] (FLX): In motor fluxing - [PTC1 alarm] (PtC1): Probe alarm 1 - [PTC2 alarm] (PtC2): Probe alarm 2 - [LI6=PTC alarm] (PtC3): LI6 = PTC probe alarm - [Fast stop in prog.] (FSt): Fast stop in progress - [Current Th. attained] (CtA): Current threshold attained ([Current threshold] (Ctd) page 67) - [Freq. Th. attained] (FtA): Frequency threshold attained ([Freq. threshold] (Ftd) page 68) - [Freq. Th. 2 attained] (F2A): 2nd frequency threshold attained ([Freq. threshold 2] (F2d) page 68) - [Frequency ref. att.] (SrA): Frequency reference attained - [Motor th. state att.] (tSA): Motor 1 thermal state attained - [External fault alarm] (EtF): External fault alarm - [Auto restart] (AUtO): Automatic restart in progress - [Remote] (FtL): Line mode control - [Auto-tuning] (tUn): Performing auto-tuning - [Undervoltage] (USA): Undervoltage alarm - [Cnfg.1 act.] (CnF1): Configuration 1 active - [Cnfg.2 act.] (CnF2): Configuration 2 active - [HSP attained] (FLA): High speed attained - [Load slipping] (AnA): Slipping alarm - [Set 1 active] (CFP1): Parameter set 1 active - [Set 2 active] (CFP2): Parameter set 2 active - [Set 3 active] (CFP3): Parameter set 3 active - [In braking] (brS): Drive braking - [DC bus loading] (dbL): DC bus loading - [Forward] (MFrd): Motor running forward - [Reverse] (MrrS): Motor running in reverse - [High torque alarm] (ttHA): Motor torque overshooting high threshold [High torque thd.] (tH) page 67. - [Low torque alarm] (ttLA): Motor torque undershooting low threshold [Low torque thd.] (tL) page 67. - [Freq. meter Alarm] (FqLA): Measured speed threshold attained: [Pulse warning thd.] (FqL) page 68.

With integrated display terminal

This menu can be used to display the drive inputs, states and internal values.

Code	Name/Description	Adjustment range	Factory setting
I 0 7 -	I/O MAP		
L 1 A -	Logic input functions		
L 1 A to L 1 4 A	Can be used to display the functions assigned to each input. If no functions have been assigned, nO is displayed. Use the ▲ and ▼ arrows to scroll through the functions. If a number of functions have been assigned to the same input, check that they are compatible.		
L 1 5 1	State of logic inputs LI1 to LI8		
	Can be used to visualize the state of logic inputs LI1 to LI8 (display segment assignment: high = 1, low = 0) <div> <p>State 1</p> <p>State 0</p> <p>LI1 LI2 LI3 LI4 LI5 LI6 LI7 LI8</p> <p>Example above: LI1 and LI6 are at 1; LI2 to LI5, LI7 and LI8 are at 0.</p> </div>		
L 1 5 2	State of logic inputs LI9 to LI14 and Power Removal		
	Can be used to visualize the state of logic inputs LI9 to LI14 and PR (Power Removal) (display segment assignment: high = 1, low = 0) <div> <p>State 1</p> <p>State 0</p> <p>LI9 LI10 LI11 LI12 LI13 LI14 PR</p> <p>Example above: LI9 and LI14 are at 1, LI10 to LI13 are at 0 and PR (Power Removal) is at 1.</p> </div>		
A 1 A -	Analog input functions		
A 1 1 A A 1 2 A A 1 3 A A 1 4 A	Can be used to display the functions assigned to each input. If no functions have been assigned, nO is displayed. Use the ▲ and ▼ arrows to scroll through the functions. If a number of functions have been assigned to the same input, check that they are compatible.		

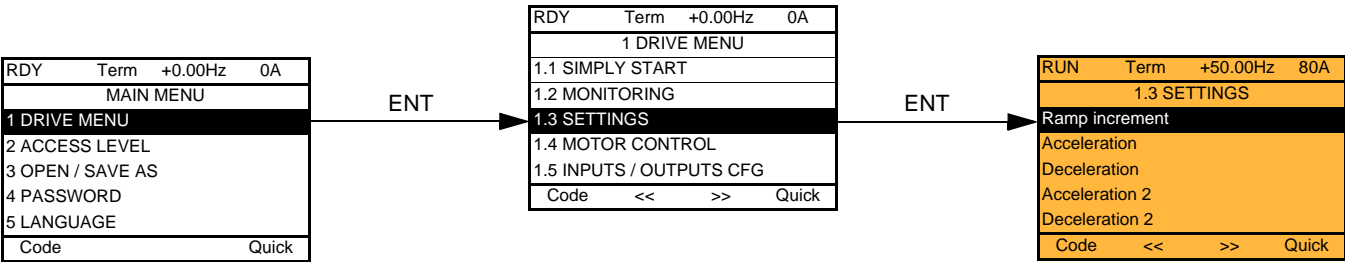
[1.2 MONITORING] (SUP-)

With integrated display terminal: Drive-internal states and values

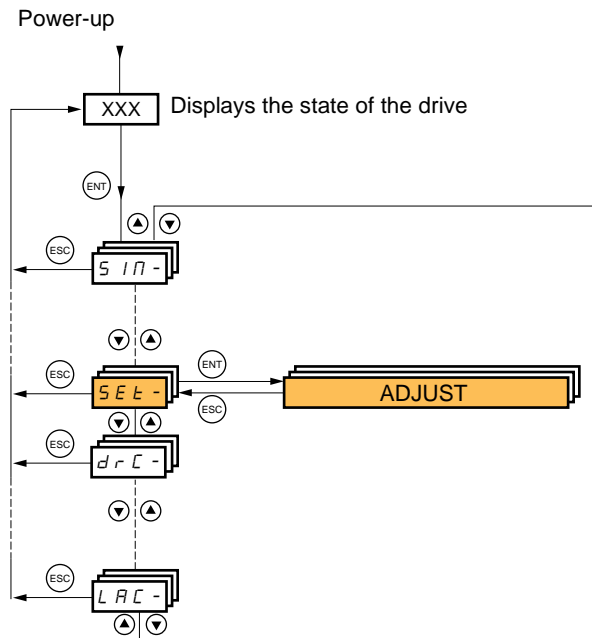
Code	Name/Description	Unit
ALGr	Alarm groups: Current alarm group numbers	
rPI	Internal PID reference: PID reference via graphic display terminal (can be accessed if the function has been configured).	as a process value
PFr	Multiplication coefficient (can be accessed if [Multiplier ref. -] (MA2,MA3) page 151 has been assigned)	%
F r H	Frequency ref.	Hz
t r r	Torque reference: Can be accessed if the function has been configured	%.
r F r	Output frequency	Hz
nnF	The measured motor speed is displayed if an encoder card has been inserted, otherwise 0 appears.	Hz
F q S	Frequency of the "Pulse input" input used by the [FREQUENCY METER] (FqF-) function, page 253 .	Hz
LCr	Motor current	A
AUS	ENA avg SPEED: The parameter can be accessed if EnA = YES (see page 94)	Hz
SPd	Motor speed	rpm
UOP	Motor voltage	V
OPr	Motor power	%
DEr	Motor torque	%
ULn	Line voltage: Line voltage from the point of view of the DC bus, motor running or stopped.	V
tHr	Motor thermal state	%
tHd	Drv thermal state	%
tHb	DBR thermal state: Can be accessed on high rating drives only.	%
APH	Power consumption	Wh, kWh or MWh
r t H	Run time: Length of time the motor has been turned on	seconds, minutes or hours
P t H	Power on time: Length of time the drive has been turned on	
tAC	IGBT alarm counter: Length of time the "IGBT temperature" alarm has been active	seconds
rPC	PID reference: Can be accessed if the PID function has been configured	as a process value
rPF	PID feedback: Can be accessed if the PID function has been configured	
rPE	PID error: Can be accessed if the PID function has been configured	
rPD	PID Output: Can be accessed if the PID function has been configured	Hz
CLD-	tIME, dAY: Current date and time generated by the Controller Inside card (can be accessed if the card has been inserted)	
o02	Word generated by the Controller Inside card (can be accessed if the card has been inserted)	
o03	Word generated by the Controller Inside card (can be accessed if the card has been inserted)	
o04	Word generated by the Controller Inside card (can be accessed if the card has been inserted)	
o05	Word generated by the Controller Inside card (can be accessed if the card has been inserted)	
o06	Word generated by the Controller Inside card (can be accessed if the card has been inserted)	
CnFS	Config. active: CnF0, 1 or 2 (can be accessed if motor or configuration switching has been enabled, see page 219)	
CFPS	Utilised param. set: CFP1, 2 or 3 (can be accessed if parameter switching has been enabled, see page 215)	

[1.3 SETTINGS] (SEt-)

With graphic display terminal:



With integrated display terminal:



[1.3 SETTINGS] (SEt-)

The adjustment parameters can be modified with the drive running or stopped.

⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

- Check that changes made to the settings during operation do not present any danger.
- We recommend stopping the drive before making any changes.

Failure to follow these instructions will result in death or serious injury.

Code	Name/Description	Adjustment range	Factory setting
<i>Inr</i> <i>0.01</i> <i>0.1</i> <i>1</i>	<input type="checkbox"/> [Ramp increment] <input type="checkbox"/> [0,01]: ramp up to 99.99 seconds <input type="checkbox"/> [0,1]: ramp up to 999.9 seconds <input type="checkbox"/> [1]: ramp up to 6000 seconds This parameter is valid for [Acceleration] (ACC) , [Deceleration] (dEC) , [Acceleration 2] (AC2) and [Deceleration 2] (dE2) .	0,01 - 0,1 - 1	0,1
<i>ACC</i>	<input type="checkbox"/> [Acceleration] Time to accelerate from 0 to the [Rated motor freq.] (FrS) (page 76). Make sure that this value is compatible with the inertia being driven.	0.01 to 6000 s (1)	3.0 s
<i>dEC</i>	<input type="checkbox"/> [Deceleration] Time to decelerate from the [Rated motor freq.] (FrS) (page 76) to 0. Make sure that this value is compatible with the inertia being driven.	0.01 to 6000 s (1)	3.0 s
<i>AC2</i> ★	<input type="checkbox"/> [Acceleration 2] See page 154 Time to accelerate from 0 to the [Rated motor freq.] (FrS) . Make sure that this value is compatible with the inertia being driven.	0.01 to 6000 s (1)	5.0 s
<i>dE2</i> ★	<input type="checkbox"/> [Deceleration 2] See page 154 Time to decelerate from the [Rated motor freq.] (FrS) to 0. Make sure that this value is compatible with the inertia being driven.	0.01 to 6000 s (1)	5.0 s
<i>tA1</i> ★	<input type="checkbox"/> [Begin Acc round] See page 153 Rounding of start of acceleration ramp as a % of the [Acceleration] (ACC) or [Acceleration 2] (AC2) ramp time.	0 to 100%	10%
<i>tA2</i> ★	<input type="checkbox"/> [End Acc round] See page 153 - Rounding of end of acceleration ramp as a % of the [Acceleration] (ACC) or [Acceleration 2] (AC2) ramp time. - Can be set between 0 and (100% - [Begin Acc round] (tA1))		10%
<i>tA3</i> ★	<input type="checkbox"/> [Begin Dec round] See page 153 Rounding of start of deceleration ramp as a % of the [Deceleration] (dEC) or [Deceleration 2] (dE2) ramp time.	0 to 100%	10%

(1) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6000 s according to [\[Ramp increment\] \(Inr\)](#).

★

These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[1.3 SETTINGS] (SEt-)

Code	Name/Description	Adjustment range	Factory setting
E A 4 ★	<input type="checkbox"/> [End Dec round] See page 153 - Rounding of end of deceleration ramp as a % of the [Deceleration] (dEC) or [Deceleration 2] (dE2) ramp time. - Can be set between 0 and (100% - [Begin Dec round] (tA3))		10%
L S P	<input type="checkbox"/> [Low speed] Motor frequency at minimum reference, can be set between 0 and [High speed] (HSP).		0 Hz
H S P	<input type="checkbox"/> [High speed] Motor frequency at maximum reference, can be set between [Low speed] (LSP) and [Max frequency] (tFr). The factory setting changes to 60 Hz if [Standard mot. freq] (bFr) = [60Hz NEMA] (60). <div style="border: 1px solid black; padding: 5px; text-align: center;"> CAUTION For permanent magnet synchronous motors, the maximum permissible speed must not be exceeded, otherwise demagnetization may occur. The maximum speed permitted by the motor, drive chain or application must not be exceeded at any time. Failure to follow this instruction can result in equipment damage. </div>		50 Hz
I E H	<input type="checkbox"/> [Mot. therm. current] Motor thermal protection current, to be set to the rated current indicated on the nameplate.	0.2 to 1.5 In (1)	According to drive rating
S P G ★	<input type="checkbox"/> [Speed prop. gain] This parameter can be accessed if [Speed loop type] (SSL) page 89 = [Standard] (Std). Speed loop proportional gain.	0 to 1000%	40%
S I E ★	<input type="checkbox"/> [Speed time integral] This parameter can be accessed if [Speed loop type] (SSL) page 89 = [Standard] (Std). Speed loop integral time constant.	1 to 1000%	100%
S F C ★	<input type="checkbox"/> [K speed loop filter] This parameter can be accessed if [Speed loop type] (SSL) page 89 = [Standard] (Std). Speed loop filter coefficient.	0 to 100%	0
S E A ★	<input type="checkbox"/> [Fr.Looping.Stab] This parameter can be accessed if [Speed loop type] (SSL) page 89 = [High perfor.] (HPF). Stability: Used to adapt the return to steady state after a speed transient, according to the dynamics of the machine. Gradually increase the stability to increase control loop attenuation and thus reduce any overspeed.	0 to 100%	20%
F L G ★	<input type="checkbox"/> [FreqLoopGain] This parameter can be accessed if [Speed loop type] (SSL) page 89 = [High perfor.] (HPF). Frequency loop gain: Used to adapt the response of the machine speed according to the dynamics. Gradually increase the gain to increase the control loop passband.	0 to 100%	20%

(1) In corresponds to the rated drive current indicated in the Installation Manual or on the drive nameplate.

★ These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[1.3 SETTINGS] (SEt-)

Standard speed loop - Parameter settings for [K speed loop filter] (SFC), [Speed prop. gain] (SPG) and [Speed time integral] (SIt)

- The following parameters can only be accessed in vector control profiles: [Motor control type] (Ctt), page 70 = [SVC U] (UUC), [SVC I] (CUC), [FVC] (FUC), [Sync. mot.] (SYn) or [Sync.CL] (FSY) if [Speed loop type] (SSL) page 89 = [Standard] (Std) and if [ENA system] (EnA) page 94 = [Non] (nO).
- The factory settings are suitable for most applications.

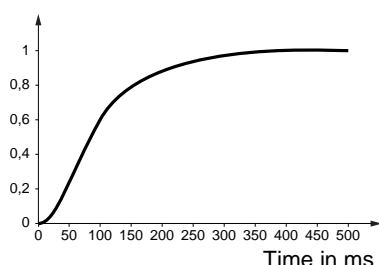
General case: Setting for [K speed loop filter] (SFC) = 0

The regulator is an "IP" type with filtering of the speed reference, for applications requiring flexibility and stability (hoisting or high inertia, for example).

- [Speed prop. gain] (SPG) affects excessive speed.
- [Speed time integral] (SIt) affects the passband and response time.

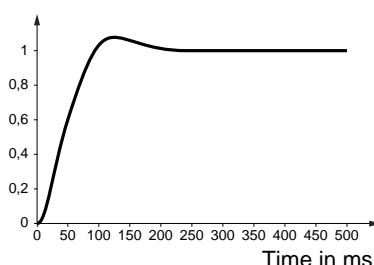
Initial response

Reference division



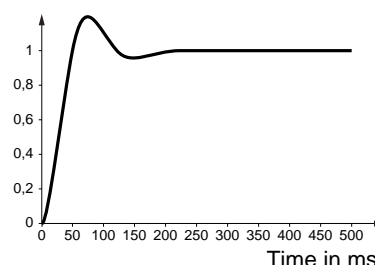
Reduction in SIT ↘

Reference division



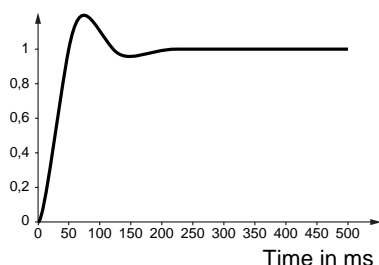
Reduction in SIT ↘↘

Reference division



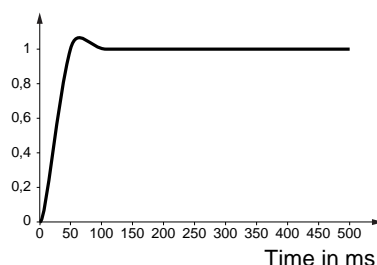
Initial response

Reference division



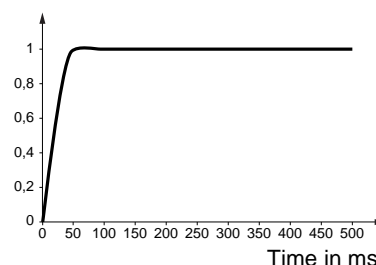
Increase in SPG ↗

Reference division



Increase in SPG ↗↗

Reference division



[1.3 SETTINGS] (SEt-)

Special case: Parameter [K speed loop filter] (SFC) not 0

This parameter must be reserved for specific applications that require a short response time (trajectory positioning or servo control).

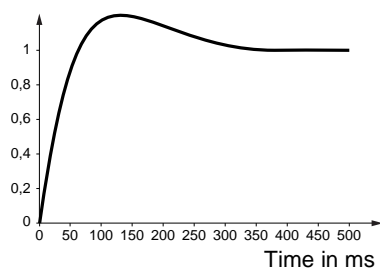
- When set to 100 as described above the regulator is a "PI" type, without filtering of the speed reference.
- Settings between 0 and 100 will obtain an intermediate function between the settings below and those on the previous page.

Example: Setting for [K speed loop filter] (SFC) = 100

- [Speed prop. gain] (SPG) affects the passband and response time.
- [Speed time integral] (SIt) affects excessive speed.

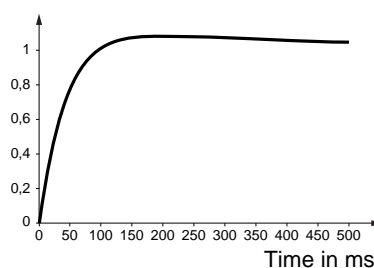
Initial response

Reference division



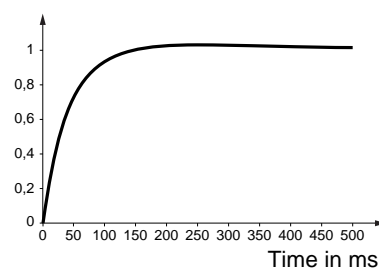
Reduction in SIT ↘

Reference division



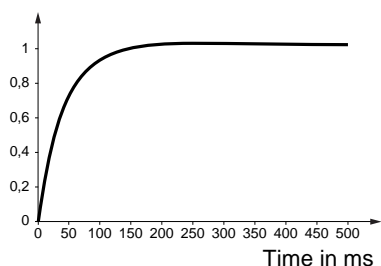
Reduction in SIT ↘↘

Reference division



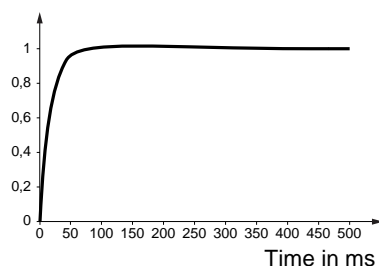
Initial response

Reference division



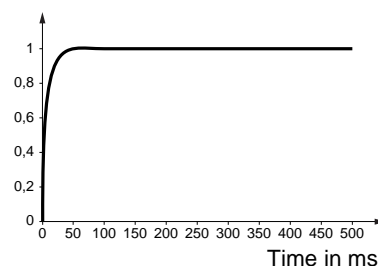
Increase in SPG ↗

Reference division



Increase in SPG ↗↗

Reference division



[1.3 SETTINGS] (SEt-)

High performance speed loop - Parameter settings for [FreqLoopGain] (FLG) and [Fr.Loop.Stab] (StA)

These parameters can only be accessed if [Speed loop type] (SSL) page 89 = [High perf.] (HPF).

Inertia

The [Estim. app. inertia] (JES*t*) parameter, page 89, is the default value of the inertia being driven, estimated by the drive based on the motor parameters. Speed loop default settings are determined by the drive from this inertia.

The value of the actual inertia being driven must be entered in the [Application Inertia] (JAP*L*) parameter, page 90. This value is then used by the drive to optimize speed loop settings, thus achieving the best results (provided that the exact value has been entered).

The [App. Inertia Coef.] (JAC*O*) parameter, page 89, is used to fix the ratio between [Estim. app. inertia] (JES*t*) page 89 and [Application Inertia] (JAP*L*).

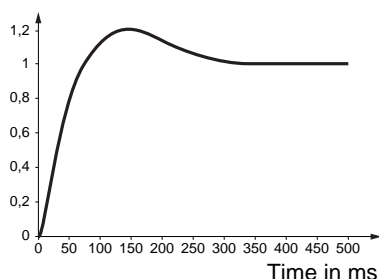
Gains

These parameters are used to adjust the response of the speed loop obtained from the inertia, in particular when this is not known.

- [Fr.Loop.Stab] (StA): Used to adapt the return to steady state after a speed transient, according to the dynamics of the machine. Gradually increase the stability to increase control loop attenuation and thus reduce any overspeed.
- [FreqLoopGain] (FLG): Used to adapt the response of the machine speed transients according to the dynamics (passband). For machines with high resistive torque, high inertia or fast cycles, increase the gain gradually.

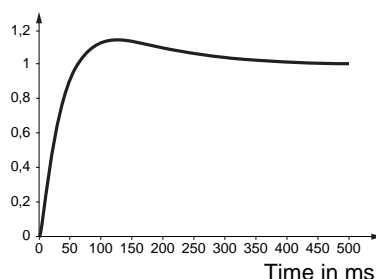
Initial response

Reference division



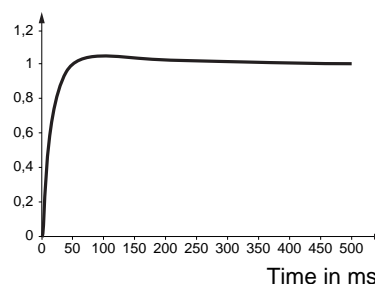
Increase in StA ↗

Reference division



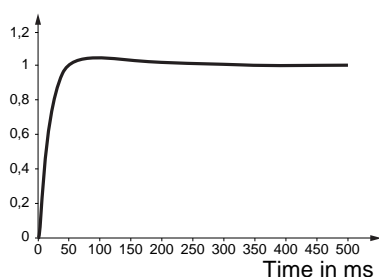
Increase in StA ↗↗

Reference division



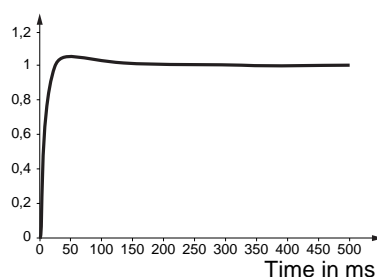
Initial response

Reference division



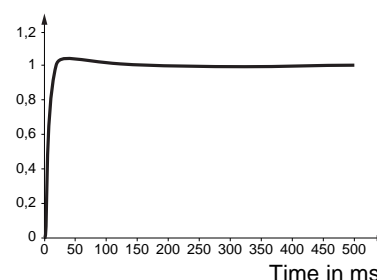
Increase in FLG ↗

Reference division



Increase in FLG ↗↗

Reference division



Expert parameters

Two parameters from the [1.4 MOTOR CONTROL] (drC-) menu are accessible at Expert level and can be used to boost dynamics if necessary. See page 90.

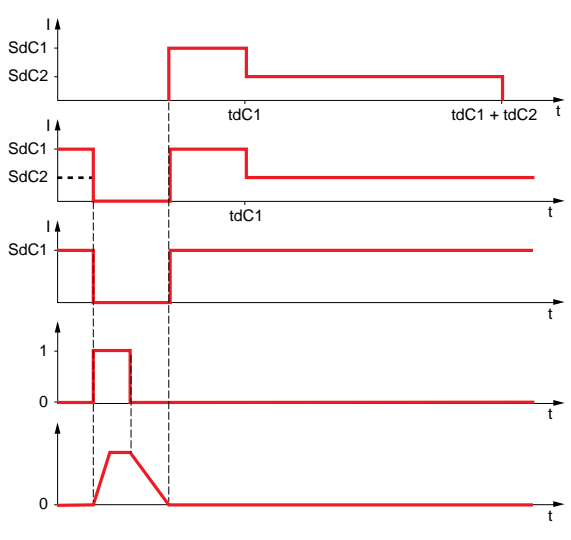
[1.3 SETTINGS] (SEt-)

Code	Name/Description	Adjustment range	Factory setting
GPE ★	<input type="checkbox"/> [ENA prop.gain] See page 94	1 to 9999	250
GIE ★	<input type="checkbox"/> [ENA integral gain] See page 94	0 to 9999	100
UF_r ★	<input type="checkbox"/> [IR compensation] See page 95	25 to 200%	100%
SLP ★	<input type="checkbox"/> [Slip compensation] See page 78	0 to 300%	100%
dCF ★	<input type="checkbox"/> [Ramp divider] See page 156	0 to 10	4
IdC ★	<input type="checkbox"/> [DC inject. level 1] See page 157 Level of DC injection braking current activated via logic input or selected as stop mode. <div style="border: 1px solid black; padding: 10px; text-align: center;">CAUTION Check that the motor will withstand this current without overheating. Failure to follow this instruction can result in equipment damage.</div>	0.1 to 1.41 In (1)	0.64 In (1)
tdI ★	<input type="checkbox"/> [DC injection time 1] See page 157 Maximum current injection time [DC inject. level 1] (IdC). After this time the injection current becomes [DC inject. level 2] (IdC2).	0.1 to 30 s	0.5 s
IdC2 ★	<input type="checkbox"/> [DC inject. level 2] See page 157 Injection current activated by logic input or selected as stop mode, once period of time [DC injection time 1] (tdI) has elapsed. <div style="border: 1px solid black; padding: 10px; text-align: center;">CAUTION Check that the motor will withstand this current without overheating. Failure to follow this instruction can result in equipment damage.</div>	0.1 In (2) to [DC inject. level 1] (IdC)	0.5 In (1)
tdC ★	<input type="checkbox"/> [DC injection time 2] See page 157 Maximum injection time [DC inject. level 2] (IdC2) for injection selected as stop mode only.	0.1 to 30 s	0.5 s

(1) In corresponds to the rated drive current indicated in the Installation Manual or on the drive nameplate.








★ These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[1.3 SETTINGS] (SEt-)


Code	Name/Description	Adjustment range	Factory setting
SdC1 ★	<input type="checkbox"/> [Auto DC inj. level 1] Level of standstill DC injection current. This parameter can be accessed if [Auto DC injection] (AdC) page 158 is not [No] (nO) This parameter is forced to 0 if [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn) or [Sync.CL] (FSY) .	0 to 1.2 In (1)	0.7 In (1)
EdC1 ★	<input type="checkbox"/> [Auto DC inj. time 1] Standstill injection time. This parameter can be accessed if [Auto DC injection] (AdC) page 158 is not [No] (nO) If [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync. mot.] (SYn) or [Sync.CL] (FSY) this time corresponds to the zero speed maintenance time.	0.1 to 30 s	0.5 s
SdC2 ★	<input type="checkbox"/> [Auto DC inj. level 2] 2 nd level of standstill DC injection current. This parameter can be accessed if [Auto DC injection] (AdC) page 158 is not [No] (nO) This parameter is forced to 0 if [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn) or [Sync.CL] (FSY) .	0 to 1.2 In (1)	0.5 In (1)
EdC2 ★	<input type="checkbox"/> [Auto DC inj. time 2] 2 nd standstill injection time. This parameter can be accessed if [Auto DC injection] (AdC) page 158 = [Yes] (YES)	0 to 30 s	0 s
AdC	SdC2	Operation 	
YES	x	Note: When [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync.CL] (FSY) : [Auto DC inj. level 1] (SdC1) , [Auto DC inj. level 2] (SdC2) and [Auto DC inj. time 2] (tdC2) are not accessible. Only [Auto DC inj. time 1] (tdC1) can be accessed. This then corresponds to a zero speed maintenance time.	
Ct	≠ 0		
Ct	= 0		
Run command			
Speed			

(1) In corresponds to the rated drive current indicated in the Installation Manual or on the drive nameplate.

[1.3 SETTINGS] (SEt-)

Code	Name/Description	Adjustment range	Factory setting
SFr	<p> [Switching freq.]</p> <p>Switching frequency setting. Adjustment range: This can vary between 1 and 16 kHz, but the minimum and maximum values, as well as the factory setting, can be limited in accordance with the type of drive (ATV71H or W), the rating and the configuration of the [Sinus filter] (OFI) and [Motor surge limit] (SUL) parameters, page 96.</p> <p>If the value is less than 2 kHz, [Current Limitation] (CLI) and [I Limit. 2 value] (CL2) page 62 are limited to 1.36 In.</p> <p>Adjustment with drive running:</p> <ul style="list-style-type: none"> - If the initial value is less than 2 kHz, it is not possible to increase it above 1.9 kHz while running. - If the initial value is greater than or equal to 2 kHz, a minimum of 2 kHz must be maintained while running. <p>Adjustment with the drive stopped: No restrictions.</p> <p> Note: In the event of excessive temperature rise, the drive will automatically reduce the switching frequency and reset it once the temperature returns to normal.</p> <p> Note: If [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync.CL] (FSY) we do not recommend setting the switching frequency to a value less than 2 kHz (in order to avoid speed instability).</p>	According to rating	According to rating
CL1	<p> [Current Limitation]</p> <p>Used to limit the motor current. The adjustment range is limited to 1.36 In if [Switching freq.] (SFr) page 62 is less than 2 kHz.</p> <p> Note: If the setting is less than 0.25 In, the drive may lock in [Output Phase Loss] (OPF) fault mode if this has been enabled (see page 242). If it is less than the no-load motor current, the limitation no longer has any effect..</p>	0 to 1.65 In (1)	1.5 In (1)
CL2	<p> [I Limit. 2 value]</p> <p>See page 204 The adjustment range is limited to 1.36 In if [Switching freq.] (SFr) page 62 is less than 2 kHz.</p> <p> Note: If the setting is less than 0.25 In, the drive may lock in [Output Phase Loss] (OPF) fault mode if this has been enabled (see page 242). If it is less than the no-load motor current, the limitation no longer has any effect..</p>	0 to 1.65 In (1)	1.5 In (1)
★	<p>CAUTION</p> <p>Check that the motor will withstand this current, particularly in the case of permanent magnet synchronous motors, which are susceptible to demagnetization. Failure to follow this instruction can result in equipment damage.</p>		

(1) In corresponds to the rated drive current indicated in the Installation Manual or on the drive nameplate.

 These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[1.3 SETTINGS] (SEt-)

Code	Name/Description	Adjustment range	Factory setting
FLU FnC FCE FnD	<input type="checkbox"/> [Motor fluxing] <input type="checkbox"/> [Not cont.] (FnC): Non-continuous mode <input type="checkbox"/> [Continuous] (FCt): Continuous mode. This option is not possible if [Angle setting type] (ASt) page 84 or 87 is [With load] (brC) or if [Auto DC injection] (AdC) page 158 is [Yes] (YES) or if [Type of stop] (Stt) page 156 is [Freewheel] (nSt). <input type="checkbox"/> [No] (FnO): Function inactive. This option is not possible if [Motor control type] (Ctt) page 70 = [SVC I] (CUC) or [FVC] (FUC). If [Motor control type] (Ctt) page 70 = [SVC I] (CUC), [FVC] (FUC) or [Sync. mot.] (SYn), the factory setting is replaced by [Not cont.] (FnC). <input type="checkbox"/> If [Motor control type] (Ctt) page 70 = [SVC V] (UUC), the factory setting is replaced by [Not cont.] (FnC) at and above 55 kW (75 HP) for ATV71●●●M3X and at and above 90 kW (120 HP) for ATV71●●●N4. If [Motor control type] (Ctt) page 70 = [Sync.CL] (FSY), [Motor fluxing] (FLU) is forced to [No] (FnO). In order to obtain rapid high torque on startup, magnetic flux needs to already have been established in the motor. <ul style="list-style-type: none"> In [Continuous] (FCt) mode, the drive automatically builds up flux when it is powered up. In [Not cont.] (FnC) mode, fluxing occurs when the motor starts up. The flux current is greater than nCr (configured rated motor current) when the flux is established and is then adjusted to the motor magnetizing current. <div style="text-align: center; border: 1px solid black; padding: 5px;"> CAUTION Check that the motor will withstand this current without overheating. Failure to follow this instruction can result in equipment damage. </div> If [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn), the [Motor fluxing] (FLU) parameter MUST be active ([No] (FnO) is not permitted); this parameter causes rotor angle detection or alignment (depending on the configuration of [Angle setting type] (ASt) page 84) and not fluxing. <ul style="list-style-type: none"> If [Brake assignment] (bLC) page 175 is not [No] (nO), the [Motor fluxing] (FLU) parameter has no effect. <div style="display: flex; align-items: center;"> Note: If [Angle setting type] (ASt) = [W/o load] (nLd), the motor may rotate one full revolution during measurement. </div>		[No] (FnO)
tLS	<input type="checkbox"/> [Low speed time out] Maximum operating time at [Low speed] (LSP) (see page 44) Following operation at LSP for a defined period, a motor stop is requested automatically. The motor will restart if the reference is greater than LSP and if a run command is still present. Caution: A value of 0 indicates an unlimited period of time. <div style="display: flex; align-items: center;"> Note: If [Low speed time out] (tLS) is not 0, [Type of stop] (Stt) page 156 is forced to [Ramp stop] (rMP) (only if a ramp stop can be configured). </div>	0 to 999.9 s	0 s
JGF 	<input type="checkbox"/> [Jog frequency] See page 160 Reference in jog operation	0 to 10 Hz	10 Hz
JGE 	<input type="checkbox"/> [Jog delay] See page 160 Anti-repeat delay between 2 consecutive jog operations.	0 to 2.0 s	0.5 s

(1) In corresponds to the rated drive current indicated in the Installation Manual or on the drive nameplate.

These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[1.3 SETTINGS] (SEt-)

Code	Name/Description	Adjustment range	Factory setting
SP 2 ★	<input type="checkbox"/> [Preset speed 2] See page 163 Preset speed 2	0 to 1600 Hz	10 Hz
SP 3 ★	<input type="checkbox"/> [Preset speed 3] See page 163 Preset speed 3	0 to 1600 Hz	15 Hz
SP 4 ★	<input type="checkbox"/> [Preset speed 4] See page 163 Preset speed 4	0 to 1600 Hz	20 Hz
SP 5 ★	<input type="checkbox"/> [Preset speed 5] See page 163 Preset speed 5	0 to 1600 Hz	25 Hz
SP 6 ★	<input type="checkbox"/> [Preset speed 6] See page 163 Preset speed 6	0 to 1600 Hz	30 Hz
SP 7 ★	<input type="checkbox"/> [Preset speed 7] See page 163 Preset speed 7	0 to 1600 Hz	35 Hz
SP 8 ★	<input type="checkbox"/> [Preset speed 8] See page 163 Preset speed 8	0 to 1600 Hz	40 Hz
SP 9 ★	<input type="checkbox"/> [Preset speed 9] See page 163 Preset speed 9	0 to 1600 Hz	45 Hz
SP 10 ★	<input type="checkbox"/> [Preset speed 10] See page 163 Preset speed 10	0 to 1600 Hz	50 Hz
SP 11 ★	<input type="checkbox"/> [Preset speed 11] See page 163 Preset speed 11	0 to 1600 Hz	55 Hz
SP 12 ★	<input type="checkbox"/> [Preset speed 12] See page 163 Preset speed 12	0 to 1600 Hz	60 Hz
SP 13 ★	<input type="checkbox"/> [Preset speed 13] See page 163 Preset speed 13	0 to 1600 Hz	70 Hz
SP 14 ★	<input type="checkbox"/> [Preset speed 14] See page 163 Preset speed 14	0 to 1600 Hz	80 Hz

★ These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[1.3 SETTINGS] (SEt-)

Code	Name/Description	Adjustment range	Factory setting
SP 15 ★	<input type="checkbox"/> [Preset speed 15] See page 163 Preset speed 15	0 to 1600 Hz	90 Hz
SP 16 ★	<input type="checkbox"/> [Preset speed 16] See page 163 Preset speed 16	0 to 1600 Hz	100 Hz
MF r	<input type="checkbox"/> [Multiplying coeff.] Multiplying coefficient, can be accessed if [Multiplier ref.-] (MA2,MA3) page 151 has been assigned to the graphic terminal	0 to 100%	100%
S r P ★	<input type="checkbox"/> [+/-Speed limitation] See page 167 Limitation of +/- speed variation	0 to 50%	10%
r P G ★	<input type="checkbox"/> [PID prop. gain] See page 193 Proportional gain	0.01 to 100	1
r I G ★	<input type="checkbox"/> [PID integral gain] See page 194 Integral gain	0.01 to 100	1
r d G ★	<input type="checkbox"/> [PID derivative gain] See page 194 Derivative gain	0.00 to 100	0
P r P ★	<input type="checkbox"/> [PID ramp] See page 194 PID acceleration/deceleration ramp, defined to go from [Min PID reference] (PIP1) to [Max PID reference] (PIP2) and vice versa.	0 to 99.9 s	0
P D L ★	<input type="checkbox"/> [Min PID output] See page 194 Minimum value of regulator output in Hz	- 500 to 500 or -1600 to 1600 according to rating	0 Hz
P D H ★	<input type="checkbox"/> [Max PID output] See page 194 Maximum value of regulator output in Hz	0 to 500 or 1600 according to rating	60 Hz
P A L ★	<input type="checkbox"/> [Min fbk alarm] See page 194 Minimum monitoring threshold for regulator feedback	See page 194 (1)	100
P A H ★	<input type="checkbox"/> [Max fbk alarm] See page 194 Maximum monitoring threshold for regulator feedback	See page 194 (1)	1000

(1) If a graphic display terminal is not in use, values greater than 9999 will be displayed on the 4-digit display with a period mark after the thousand digit, e.g., 15.65 for 15650.

★ These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[1.3 SETTINGS] (SEt-)

Code	Name/Description	Adjustment range	Factory setting
PEr ★	<input type="checkbox"/> [PID error Alarm] See page 194 Regulator error monitoring threshold	0 to 65535 (1)	100
PSr ★	<input type="checkbox"/> [Speed input %] See page 195 Multiplying coefficient for predictive speed input.	1 to 100%	100%
rP2 ★	<input type="checkbox"/> [Preset ref. PID 2] See page 197 Preset PID reference	See page 197 (1)	300
rP3 ★	<input type="checkbox"/> [Preset ref. PID 3] See page 197 Preset PID reference	See page 197 (1)	600
rP4 ★	<input type="checkbox"/> [Preset ref. PID 4] See page 197 Preset PID reference	See page 197 (1)	900
Ibr ★	<input type="checkbox"/> [Brake release I FW] See page 175 Brake release current threshold for lifting or forward movement	0 to 1.32 In (2)	0
Ird ★	<input type="checkbox"/> [Brake release I Rev] See page 175 Brake release current threshold for lowering or reverse movement	0 to 1.32 In (2)	0
brt ★	<input type="checkbox"/> [Brake Release time] See page 176 Brake release time delay	0 to 5.00 s	0 s
bIr ★	<input type="checkbox"/> [Brake release freq] See page 176 Brake release frequency threshold	[Auto] (AUtO) 0 to 10 Hz	[Auto] (AUtO)
bEn ★	<input type="checkbox"/> [Brake engage freq] See page 176 Brake engage frequency threshold	[Auto] (AUtO) 0 to 10 Hz	[Auto] (AUtO)
t bE ★	<input type="checkbox"/> [Brake engage delay] See page 176 Time delay before request to engage brake. To delay the engaging of the brake, for horizontal movement only, if you wish the brake to engage when the drive comes to a complete stop.	0 to 5.00 s	0 s

- (1) If a graphic display terminal is not in use, values greater than 9999 will be displayed on the 4-digit display with a period mark after the thousand digit, e.g., 15.65 for 15650.
- (2) In corresponds to the rated drive current indicated in the Installation Manual or on the drive nameplate.

★ These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[1.3 SETTINGS] (SEt-)

Code	Name/Description	Adjustment range	Factory setting
B E t ★	<input type="checkbox"/> [Brake engage time] See page 176 Brake engage time (brake response time)	0 to 5.00 s	0 s
J d C ★	<input type="checkbox"/> [Jump at reversal] See page 177	[Auto] (AUtO) 0 to 10 Hz	[Auto] (AUtO)
t E r ★	<input type="checkbox"/> [Time to restart] See page 177 Time between the end of a brake engage sequence and the start of a brake release sequence	0 to 15.00 s	0 s
t L I n ★	<input type="checkbox"/> [Motoring torque lim] See page 202 Torque limitation in generator mode, as a % or in 0.1% increments of the rated torque in accordance with the [Torque increment] (IntP) parameter, page 202.	0 to 300%	100%
t L I G ★	<input type="checkbox"/> [Gen. torque lim] See page 202 Torque limitation in generator mode, as a % or in 0.1% increments of the rated torque in accordance with the [Torque increment] (IntP) parameter, page 202.	0 to 300%	100%
t r H ★	<input type="checkbox"/> [Traverse freq. high] See page 225	0 to 10 Hz	4 Hz
t r L ★	<input type="checkbox"/> [Traverse freq. low] See page 225	0 to 10 Hz	4 Hz
q S H ★	<input type="checkbox"/> [Quick step High] See page 225	0 to [Traverse freq. high] (trH)	0 Hz
q S L ★	<input type="checkbox"/> [Quick step Low] See page 225	0 to [Traverse freq. low] (trL)	0 Hz
C t d	<input type="checkbox"/> [Current threshold] Current threshold for [I attained] (CtA) function assigned to a relay or a logic output (see page 118).	0 to 1.5 In (1)	In (1)
t E H	<input type="checkbox"/> [High torque thd.] High current threshold for [High tq. att.] (ttHA) function assigned to a relay or a logic output (see page 118), as a % of the rated motor torque.	-300% to +300%	100%
t E L	<input type="checkbox"/> [Low torque thd.] Low current threshold for [Low tq. att.] (ttLA) function assigned to a relay or a logic output (see page 118), as a % of the rated motor torque.	-300% to +300%	50%

(1) In corresponds to the rated drive current indicated in the Installation Manual or on the drive nameplate.

★ These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

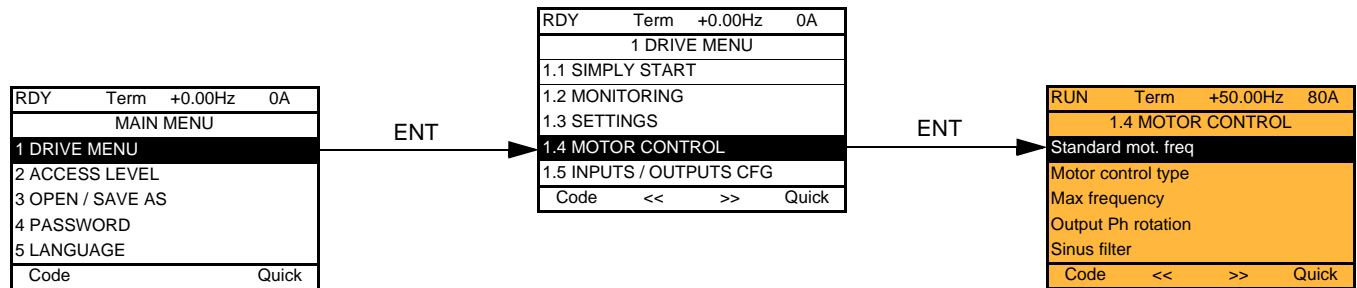
[1.3 SETTINGS] (SEt-)

Code	Name/Description	Adjustment range	Factory setting
F 9 L ★	<input type="checkbox"/> [Pulse warning thd.] Speed threshold measured by the FREQUENCY METER FqF- function, page 253 , assigned to a relay or a logic output (see page 118).	0 Hz to 30.00 kHz	0 Hz
F t d	<input type="checkbox"/> [Freq. threshold] Frequency threshold for [Freq.Th.att.] (FtA) function assigned to a relay or a logic output (see page 118), or used by the [PARAM. SET SWITCHING] (MLP-) function, page 215 .	0.0 to 1600 Hz	[High speed] (HSP)
F 2 d	<input type="checkbox"/> [Freq. threshold 2] Frequency threshold for [Freq. Th. 2 attain.] (F2A) function assigned to a relay or a logic output (see page 118), or used by the [PARAM. SET SWITCHING] (MLP-) function, page 215 .	0.0 to 1600 Hz	[High speed] (HSP)
F F L ★	<input type="checkbox"/> [Freewheel stop Thd] See page 156 This parameter supports switching from a ramp stop or a fast stop to a freewheel stop below a low speed threshold. It can be accessed if [Type of stop] (Stt) = [Fast stop] (FSt) or [Ramp stop] (rMP). <input type="checkbox"/> 0.0: Does not switch to freewheel stop. <input type="checkbox"/> 0,1 to 1600 Hz: Speed threshold below which the motor will switch to freewheel stop.	0.0 to 1600 Hz	0.0 Hz
t t d ★	<input type="checkbox"/> [Motor therm. level] See page 241 Trip threshold for motor thermal alarm (logic output or relay)	0 to 118%	100%
L b C ★	<input type="checkbox"/> [Load correction] See page 98 Rated correction in Hz.	0 to 1000 Hz	0

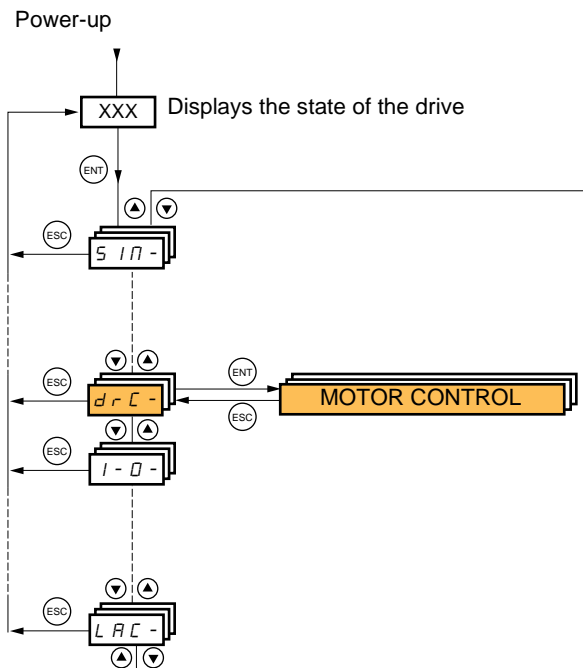
★ These parameters only appear if the corresponding function has been selected in another menu. When the parameters can also be accessed and adjusted from within the configuration menu for the corresponding function, their description is detailed in these menus, on the pages indicated, to aid programming.

[1.4 MOTOR CONTROL] (drC-)

With graphic display terminal:




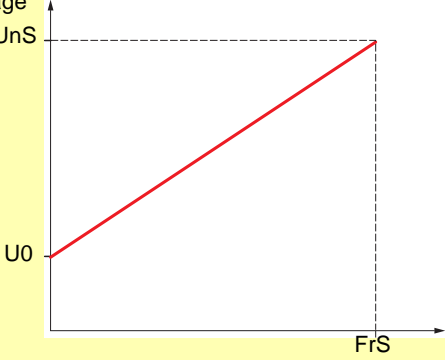
With integrated display terminal:



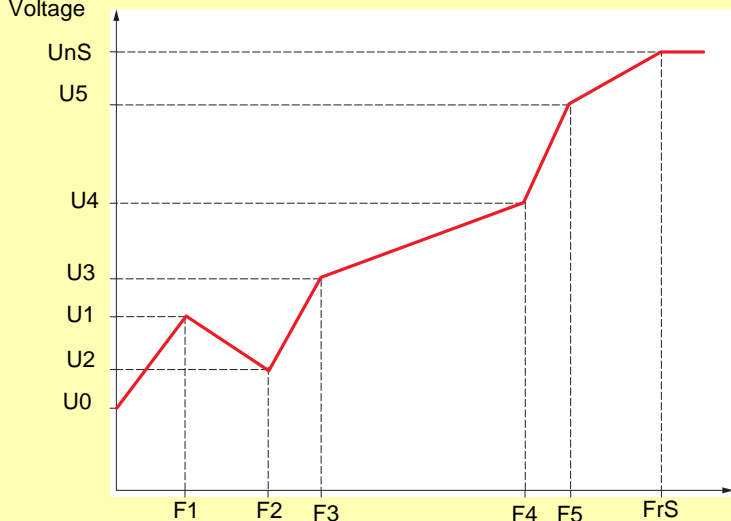


[1.4 MOTOR CONTROL] (drC-)

The parameters in the [1.4 MOTOR CONTROL] (drC-) menu can only be modified when the drive is stopped and no run command is present, with the following exceptions:





- [Auto tuning] (tUn) page 88 and [Angle auto-test] (ASA) page 84, which can cause the motor to start up.
- Parameters containing the sign (C) in the code column, which can be modified with the drive running or stopped.

Code	Name/Description	Adjustment range	Factory setting
b F r S 0 6 0	<input type="checkbox"/> [Standard mot. freq] <input type="checkbox"/> [50Hz IEC] (50): IEC <input type="checkbox"/> [60Hz NEMA] (60): NEMA This parameter modifies the presets of the following parameters: [High speed] (HSP) page 56, [Freq. threshold] (Ftd) page 68, [Rated motor volt.] (UnS) page 76, [Rated motor freq.] (FrS) page 76 and [Max frequency] (tFr) page 71.		
C t t U U C C U C F U C U F 2	<input type="checkbox"/> [Motor control type] <input type="checkbox"/> [SVC V] (UUC): Open-loop voltage flux vector control with automatic slip compensation according to the load. This type of control is recommended when replacing an ATV58. It supports operation with a number of motors connected in parallel on the same drive (if the motors are identical). <input type="checkbox"/> [SVC I] (CUC): Open-loop current flux vector control. This type of control is recommended when replacing an ATV58F used in an open-loop configuration. It does not support operation with a number of motors connected in parallel on the same drive. <input type="checkbox"/> [FVC] (FUC): Closed-loop current flux vector control for motor with encoder. This selection is only possible if an encoder card has been inserted. This function is not possible, however, when using an incremental encoder that generates signal "A" only. This type of control is recommended when replacing an ATV58F used in a closed-loop configuration. It provides better performance in terms of speed and torque accuracy and enables torque to be obtained at zero speed. It does not support operation with a number of motors connected in parallel on the same drive.  It is essential that the encoder check detailed on page 74 is performed successfully before selecting [FVC] (FUC). <input type="checkbox"/> [V/F 2pts] (UF2): Simple V/F profile without slip compensation. It supports operation with: <ul style="list-style-type: none"> - Special motors (wound rotor, tapered rotor, etc.) - A number of motors in parallel on the same drive - High-speed motors - Motors with a low power rating in comparison to that of the drive 		[SVC V] (UUC)
	Voltage  The profile is defined by the values of parameters UnS, FrS and U0.		


[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
Ctt UF5	<input type="checkbox"/> [Motor control type] (continued) <input type="checkbox"/> [V/F 5pts] (UF5) : 5-segment V/F profile: Similar to V/F 2 pts profile but also supports the avoidance of resonance (saturation).  <p>The profile is defined by the values of parameters UnS, FrS, U0 to U5 and F0 to F5.</p> $FrS > F5 > F4 > F3 > F2 > F1$		
SYn FSY	<input type="checkbox"/> [Sync. mot.] (SYn) : For permanent magnet synchronous motors with sinusoidal electromotive force (EMF) only. This selection makes the asynchronous motor parameters inaccessible, and the synchronous motor parameters accessible. <input type="checkbox"/> [Sync.CL] (FSY) : Closed-loop synchronous motor. For permanent magnet synchronous motors with sinusoidal electromotive force (EMF) only, with encoder. This selection is only possible if an encoder card has been inserted. It makes the asynchronous motor parameters inaccessible, and the synchronous motor parameters accessible. This function is not possible, however, when using an incremental encoder that generates signal "A" only.  It is essential that the encoder check detailed on page 74 is performed successfully before selecting [Sync.CL] (FSY).		
tFr	<input type="checkbox"/> [Max frequency] The factory setting is 60 Hz, or preset to 72 Hz if [Standard mot. freq] (bFr) is set to 60 Hz. The maximum value is limited by the following conditions: <ul style="list-style-type: none"> It must not exceed 10 times the value of [Rated motor freq.] (FrS) page 76 for an asynchronous motor or [Nominal freq sync.] (FrSS) page 82 for a synchronous motor. It must not exceed 500 Hz if [Motor control type] (Ctt) (page 70) is not V/F or if the drive rating is higher than ATV71HD37. Values between 500 Hz and 1600 Hz are only possible in V/F control and for powers limited to 37 kW (50 HP). In this case, configure [Motor control type] (Ctt) before [Max frequency] (tFr) .	10 to 1600 Hz	
PHr AbC ACb	<input type="checkbox"/> [Output Ph rotation] <input type="checkbox"/> [ABC] (AbC) : Forward <input type="checkbox"/> [ACB] (ACb) : Reverse This parameter can be used to reverse the direction of rotation of the motor without reversing the wiring.  Do not modify the [Output Ph rotation] (PHr) parameter when [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync.CL] (FSY). The direction of rotation must be modified, if required, before or during the encoder check procedure detailed on page 74, when [Motor control type] (Ctt) is not [FVC] (FUC) or [Sync.CL] (FSY) . Otherwise, checking and measuring procedures must be performed again ([Angle auto-test] (ASA) and [Angle offset value] (ASU) return to [No] (nO)).		[ABC] (AbC)




[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
OFI nO YES	<input type="checkbox"/> [Sinus filter] <input type="checkbox"/> [No] (nO): No sinus filter <input type="checkbox"/> [Yes] (YES): Use of a sinus filter, to limit overvoltages on the motor and reduce the ground fault leakage current. [Sinus filter] (OFI) is forced to [No] (nO) on ATV71●037M3 and ATV71●075N4.  Note: The settings for [Current Limitation] (CLI) and [I Limit. 2 value] (CL2) page 62 must be made once [Sinus filter] (OFI) has been set to [Yes] (YES) and [Motor control type] (Ctt) page 70 has been set to [V/F 2pts] (UF2) or [V/F 5pts] (UF5). This is due to the fact that for certain ratings, this configuration will result in a reduced factory setting (1.36 In) for current limitations.		[No] (nO)
	<div style="text-align: center;">CAUTION</div> <p>If [Sinus filter] (OFI) = [Yes] (YES):</p> <ul style="list-style-type: none"> [Max frequency] (tFr) page 42 must not exceed 100 Hz. Up to 45 kW (60 HP) for ATV71●●●M3X and 75 kW (100 HP) for ATV71●●●N4 [Motor control type] (Ctt) page 70 must be [V/F 2pts] (UF2), [V/F 5pts] (UF5), or [SVC V] (UUC) only. At and above 55 kW (75 HP) for ATV71●●●M3X and 90 kW (120 HP) for ATV71●●●N4 [Motor control type] (Ctt) page 70 must be [V/F 2pts] (UF2) or [V/F 5pts] (UF5) only. <p>Failure to follow this instruction can result in equipment damage.</p>		
SFr 	<input type="checkbox"/> [Switching freq.] (1) Switching frequency setting. Adjustment range: This can vary between 1 and 16 kHz, but the minimum and maximum values, as well as the factory setting, can be limited in accordance with the type of drive (ATV71H or W), the rating and the configuration of the [Sinus filter] (OFI) and [Motor surge limit.] (SUL) parameters, page 96. If the value is less than 2 kHz, [Current Limitation] (CLI) and [I Limit. 2 value] (CL2) page 62 are limited to 1.36 In. Adjustment with drive running: - If the initial value is less than 2 kHz, it is not possible to increase it above 1.9 kHz while running. - If the initial value is greater than or equal to 2 kHz, a minimum of 2 kHz must be maintained while running. Adjustment with the drive stopped: No restrictions.  Note: In the event of excessive temperature rise, the drive will automatically reduce the switching frequency and reset it once the temperature returns to normal.  Note: If [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync.CL] (FSY) we do not recommend setting the switching frequency to a value less than 2 kHz as this can cause speed instability.	According to rating	According to rating
	<div style="text-align: center;">CAUTION</div> <p>On ATV71●075N4 to U40N4 drives, if the RFI filters are disconnected (operation on an IT system), the drive's switching frequency must not exceed 4 kHz.</p> <p>Failure to follow this instruction can result in equipment damage.</p>		

(1) Parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

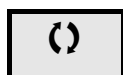
 Parameter that can be modified during operation or when stopped

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
CL I 	 [Current Limitation] (1) Used to limit the motor current. The adjustment range is limited to 1.36 In if [Switching freq.] (SFr) is less than 2 kHz.  Note: If the setting is less than 0.25 In, the drive may lock in [Output Phase Loss] (OPF) fault mode if this has been enabled (see page 242). If it is less than the no-load motor current, the limitation no longer has any effect. <div>CAUTION Check that the motor will withstand this current, particularly in the case of permanent magnet synchronous motors, which are susceptible to demagnetization. Failure to follow this instruction can result in equipment damage.</div>	0 to 1.65 In (2)	1.5 In (2)

(1) Parameter can also be accessed in the [\[1.3 SETTINGS\] \(SEt-\)](#) menu.

(2) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.



Parameter that can be modified during operation or when stopped

[1.4 MOTOR CONTROL] (drC-)

Selecting the encoder

Follow the recommendations in the catalog and the Installation Manual.



Note 1: When an encoder is used with a VW3 A3 408 or VW3 A3 409 card, it is only possible to configure the "encoder" input for speed feedback. Functions can only be configured as references or inputs with a VW3 A3 401 to 407 and VW3 A3 411 card.

Note 2: When an encoder is used with a VW3 A3 409 card, the drive remains locked in stop mode (and displays nSt) if the encoder is not fully configured.

Encoder check procedure

This procedure applies to all types of encoder.

1. Configure the parameters of the encoder used, pages [114](#) to [117](#).
2. Set [\[Motor control type\] \(Ctt\)](#) to a value other than [\[FVC\] \(FUC\)](#) and [\[Sync.CL\] \(FSY\)](#), even if it is the required configuration. For example, use [\[SVC V\] \(UUC\)](#) for an asynchronous motor and [\[Sync. mot.\] \(SYn\)](#) for a synchronous motor.
3. Configure the motor parameters in accordance with the specifications on the rating plate.
 - Asynchronous motor (see page [76](#)): [\[Rated motor power\] \(nPr\)](#), [\[Rated motor volt.\] \(UnS\)](#), [\[Rated mot. current\] \(nCr\)](#), [\[Rated motor freq.\] \(FrS\)](#), [\[Rated motor speed\] \(nSP\)](#).
 - Synchronous motor (see page [81](#)): [\[Nominal I sync\] \(nCrS\)](#), [\[Nom motor spdsync\] \(nSPS\)](#), [\[Pole pairs.\] \(PPnS\)](#), [\[Syn. EMF constant\] \(PHS\)](#), [\[Autotune L d-axis\] \(LdS\)](#), [\[IAutotune L q-axis\] \(LqS\)](#), [\[Cust. stator R syn\] \(rSAS\)](#). [\[Current Limitation\] \(CLI\)](#) must not exceed the maximum motor current, **otherwise demagnetization may occur**.
4. Set [\[Encoder usage\] \(EnU\)](#) = [\[No\] \(nO\)](#).
5. Perform auto-tuning.
6. Set [\[Encoder check\] \(EnC\)](#) = [\[Yes\] \(YES\)](#).
7. Check that the rotation of the motor is safe.
8. Set the motor rotating at stabilized speed $\approx 15\%$ of the rated speed for at least 3 seconds, and use the [\[1.2-MONITORING\] \(SUP-\)](#) menu to monitor its behavior.
9. If it trips on an [\[Encoder fault\] \(EnF\)](#), [\[Encoder check\] \(EnC\)](#) returns to [\[No\] \(nO\)](#).
 - Check the parameter settings and perform auto-tuning again (see steps 1 to 5 above).
 - Check that the mechanical and electrical operation of the encoder, its power supply and connections are all OK.
 - Reverse the direction of rotation of the motor ([\[Output Ph rotation\] \(PHr\)](#) parameter page [71](#)) or the encoder signals.
10. Repeat the operations from step 6 onwards until [\[Encoder check\] \(EnC\)](#) changes to [\[Done\] \(dOnE\)](#).
11. If necessary, change [\[Motor control type\] \(Ctt\)](#) to [\[FVC\] \(FUC\)](#) or [\[Sync.CL\] \(FSY\)](#). In the case of [\[Sync.CL\] \(FSY\)](#), go on to perform the "Procedure for measuring the phase-shift angle between the motor and the encoder" page [83](#).

[1.4 MOTOR CONTROL] (drC-)


Code	Name/Description	Adjustment range	Factory setting
EnS-	■ [ENCODER FEEDBACK] Can only be accessed if an encoder card has been inserted.		
EnC nO YES dOnE	□ [Encoder check] Check encoder feedback. See procedure on previous page. This parameter can be accessed if an encoder card has been inserted (1). <input type="checkbox"/> [Not done] (nO): Check not performed. <input type="checkbox"/> [Yes] (YES): Activates monitoring of the encoder. <input type="checkbox"/> [Done] (dOnE): Check performed successfully. The check procedure checks: - The direction of rotation of the encoder/motor - The presence of signals (wiring continuity) - The number of pulses/revolution If a fault is detected, the drive locks in [Encoder fault] (EnF) fault mode.		[Not done] (nO)
EnU nO SEC rEG PGr	□ [Encoder usage] This parameter can be accessed if an encoder card has been inserted (1). <input type="checkbox"/> [No] (nO): Function inactive. <input type="checkbox"/> [Fdbk monit.] (SEC): The encoder provides speed feedback for monitoring only. <input type="checkbox"/> [Spd fdk reg.] (rEG): The encoder provides speed feedback for regulation and monitoring. This configuration is automatic if the drive is configured for closed-loop operation ([Motor control type] (Ctt) = [FVC] (FUC) or [Sync.CL] (FSY). If [Motor control type] (Ctt) = [SVC V] (UUC) the encoder operates in speed feedback mode and enables static correction of the speed to be performed. This configuration is not accessible for other [Motor control type] (Ctt) values. <input type="checkbox"/> [Speed ref.] (PGr): The encoder provides a reference. Can only be selected with an incremental encoder card.		[No] (nO)

(1) The encoder parameters can only be accessed if the encoder card has been inserted, and the available selections will depend on the type of encoder card used. The encoder configuration can also be accessed in the [1.5 - INPUTS / OUTPUTS CFG] (I/O) menu.

[1.4 MOTOR CONTROL] (drC-)

Asynchronous motor parameters:

These parameters can be accessed if [Motor control type] (Ctt) page 70 = [SVC V] (UUC), [SVC I] (CUC), [FVC] (FUC), [V/F 2pts] (UF2) or [V/F 5pts] (UF5). In this case, the synchronous motor parameters cannot be accessed.

Code	Name/Description	Adjustment range
ASY -	■ [ASYNC. MOTOR] Can only be accessed if [Motor control type] (Ctt) page 70 = [SVC V] (UUC), [SVC I] (CUC), [FVC] (FUC), [V/F 2pts] (UF2), or [V/F 5pts] (UF5).	
nPr	□ [Rated motor power] Rated motor power given on the nameplate, in kW if [Standard mot. freq] (bFr) = [50Hz IEC] (50), in HP if [Standard mot. freq] (bFr) = [60Hz NEMA] (60).	Acc. to drive rating
UnS	□ [Rated motor volt.] Rated motor voltage given on the nameplate. ATV71...M3X: 100 to 240 V, ATV71...N4: 200 to 480 V, ATV71...S6X: 400 to 600	Acc. to drive rating
nCr	□ [Rated mot. current] Rated motor current given on the nameplate.	0.25 to 1.5 In (1)
FrS	□ [Rated motor freq.] Rated motor frequency given on the nameplate. The factory setting is 50 Hz, or preset to 60 Hz if [Standard mot. freq] (bFr) is set to 60 Hz. The maximum value is limited to 500 Hz if [Motor control type] (Ctt) (page 70) is not V/F or if the drive rating is higher than ATV71HD37. Values between 500 Hz and 1600 Hz are only possible in V/F control and for powers limited to 37 kW (50 HP). In this case, configure [Motor control type] (Ctt) before [Rated motor freq.] (FrS).	10 to 1600 Hz
InSP I 10	□ [rpm increment] Increment of parameter [Rated motor speed] (nSP). <input type="checkbox"/> [x1 rpm] (1): Increment of 1 rpm, to be used if [Rated motor speed] (nSP) does not exceed 65535 rpm. <input type="checkbox"/> [x10 rpm] (10): Increment of 10 rpm, to be used if [Rated motor speed] (nSP) exceeds 65535 rpm.  Note: Changing [rpm increment] (InSP) will restore [Rated motor speed] (nSP) to its factory setting.	
nSP	□ [Rated motor speed] Rated motor speed given on the nameplate. Adjustable between 0 and 65535 rpm if [rpm increment] (InSP) = [x1 rpm] (1) or between 0.00 and 96.00 krpm if [rpm increment] (InSP) = [x10 rpm] (10). 0 to 9999 rpm then 10.00 to 65.53 or 96.00 krpm on the integrated display terminal. If, rather than the rated speed, the nameplate indicates the synchronous speed and the slip in Hz or as a %, calculate the rated speed as follows: <ul style="list-style-type: none"> Rated speed = Synchronous speed x $\frac{100 - \text{slip as a \%}}{100}$ or Rated speed = Synchronous speed x $\frac{50 - \text{slip in Hz}}{50}$ (50 Hz motors) or Rated speed = Synchronous speed x $\frac{60 - \text{slip in Hz}}{60}$ (60 Hz motors) 	0 to 96000 rpm

(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
ASY-	■ [ASYNC. MOTOR] (continued)		
U0	<input type="checkbox"/> [U0] V/F profile setting. This parameter can be accessed if [Motor control type] (Ctt) = [V/F 2pts] (UF2) or [V/F 5pts] (UF5)	0 to 600 or 1000 V according to rating	0
U1	<input type="checkbox"/> [U1] V/F profile setting. This parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 600 or 1000 V according to rating	0
F1	<input type="checkbox"/> [F1] V/F profile setting. This parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 1600 Hz	0
U2	<input type="checkbox"/> [U2] V/F profile setting. This parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 600 or 1000 V according to rating	0
F2	<input type="checkbox"/> [F2] V/F profile setting. This parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 1600 Hz	0
U3	<input type="checkbox"/> [U3] V/F profile setting. This parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 600 or 1000 V according to rating	0
F3	<input type="checkbox"/> [F3] V/F profile setting. This parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 1600 Hz	0
U4	<input type="checkbox"/> [U4] V/F profile setting. This parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 600 or 1000 V according to rating	0
F4	<input type="checkbox"/> [F4] V/F profile setting. This parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 1600 Hz	0
U5	<input type="checkbox"/> [U5] V/F profile setting. This parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 600 or 1000 V according to rating	0
F5	<input type="checkbox"/> [F5] V/F profile setting. This parameter can be accessed if [Motor control type] (Ctt) = [V/F 5pts] (UF5)	0 to 1600 Hz	0

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
ASY -	■ [ASYNC. MOTOR] (continued)		
UC2 nO YES	<input type="checkbox"/> [Vector Control 2pt] <input type="checkbox"/> [No] (nO): Function inactive. <input type="checkbox"/> [Yes] (YES): Function active. Used in applications in which the motor rated speed and frequency need to be exceeded in order to optimize operation at constant power, or when the maximum voltage of the motor needs to be limited to a value below the line voltage. The voltage/frequency profile must then be adapted in accordance with the motor's capabilities to operate at maximum voltage UCP and maximum frequency FCP. <div style="text-align: center;"> </div>		[No] (nO)
UCP	<input type="checkbox"/> [V. constant power] This parameter can be accessed if [Vector Control 2pt] (UC2) = [Yes] (YES)	According to drive rating	According to drive rating and [Standard mot. freq] (bFr)
FCP	<input type="checkbox"/> [Freq. Const Power] This parameter can be accessed if [Vector Control 2pt] (UC2) = [Yes] (YES)	According to drive rating and [Rated motor freq.] (FrS)	= [Standard mot. freq] (bFr)
SLP ()	<input type="checkbox"/> [Slip compensation] (1) This parameter can be accessed if [Motor control type] (Ctt) is not [V/F 2pts] (UF2) or [V/F 5pts] (UF5). Adjusts the slip compensation around the value set by the rated motor speed. The speeds given on motor nameplates are not necessarily exact. <ul style="list-style-type: none"> • If slip setting < actual slip: The motor is not rotating at the correct speed in steady state, but at a speed lower than the reference. • If slip setting > actual slip: The motor is overcompensated and the speed is unstable. 	0 to 300%	100%

(1) Parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

() Parameter that can be modified during operation or when stopped

[1.4 MOTOR CONTROL] (drC-)








Asynchronous motor parameters that can be accessed in [Expert] mode

These include:

- Special parameters.
- Parameters calculated by the drive during auto-tuning, in read-only mode. For example, R1r, calculated cold stator resistance.
- The possibility of replacing some of these calculated parameters with other values, if necessary. For example, R1w, measured cold stator resistance.

When a parameter Xyw is modified by the user, the drive uses it in place of the calculated parameter Xyr.

If auto-tuning is performed or if one of the motor parameters on which auto-tuning depends is modified ([Rated motor volt.] (UnS), [Rated motor freq.] (FrS), [Rated mot. current] (nCr), [Rated motor speed] (nSP), [Rated motor power] (nPr)), parameters Xyw return to their factory setting.

Code	Name/Description	Adjustment range	Factory setting
ASY -	 [ASYNC. MOTOR] (continued)		
r 5 n	 [Stator R measured] Cold stator resistance, calculated by the drive, in read-only mode. Value in milliohms (mΩ) up to 75 kW (100 HP), and in hundredths of milliohms (mΩ/100) above 75 kW (100 HP).		
I d n	 [Idr] Magnetizing current in A, calculated by the drive, in read-only mode.		
L F n	 [Lfr] Leakage inductance in mH, calculated by the drive, in read-only mode.		
t r n	 [T2r] Rotor time constant in mS, calculated by the drive, in read-only mode.		
n 5 L	 [Nominal motor slip] Nominal slip in Hz, calculated by the drive, in read-only mode. To modify the nominal slip, modify the [Rated motor speed] (nSP) (page 76).		
P P n	 [Poles pair number] Number of pairs of poles, calculated by the drive, in read-only mode.		

[1.4 MOTOR CONTROL] (drC-)

Asynchronous motor parameters that can be accessed in [Expert] mode, continued

Code	Name/Description
ASY -	■ [ASYNC. MOTOR] (continued)
rSA	<input type="checkbox"/> [Cust stator resist.] Cold state stator resistance (per winding), modifiable value. In milliohms ($m\Omega$) up to 75 kW (100 HP), and in hundredths of milliohms ($m\Omega/100$) above 75 kW (100 HP). On the integrated display unit: 0 to 9999 then 10.00 to 65.53 (10000 to 65536).
IdA	<input type="checkbox"/> [Idw] Magnetizing current in A, modifiable value.
LFA	<input type="checkbox"/> [Lfw] Leakage inductance in mH, modifiable value.
t r A	<input type="checkbox"/> [Cust. rotor t const.] Rotor time constant in mS, modifiable value.

[1.4 MOTOR CONTROL] (drC-)

Synchronous motor parameters:

These parameters can be accessed if [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn) or [Sync.CL] (FSY). In this case, the asynchronous motor parameters cannot be accessed.



Important: For synchronous motors, it is crucial to set the current limit. See [Current Limitation] (CLI) page 73.

CAUTION

Check that the motor will withstand this current, particularly in the case of permanent magnet synchronous motors, which are susceptible to demagnetization.

Failure to follow this instruction can result in equipment damage.

Code	Name/Description	Adjustment range	Factory setting
SYn -	[SYNCHRONOUS MOTOR] Can only be accessed if [Motor control type] (Ctt) page 70 = [Sync.CL] (FSY) or [Sync. mot.] (SYn).		
nCrS	<input type="checkbox"/> [Nominal I sync.] Rated synchronous motor current given on the nameplate.	0.25 to 1.5 In (1)	Acc. to drive rating
nSPS	<input type="checkbox"/> [Nom motor spdsync] Rated synchronous motor speed given on the nameplate. On the integrated display unit: 0 to 9999 rpm then 10.00 to 60.00 krpm.	0 to 60000 rpm	Acc. to drive rating
PPnS	<input type="checkbox"/> [Pole pairs] Number of pairs of poles on the synchronous motor.	1 to 50	Acc. to drive rating
IPHS 0.1 1	<input type="checkbox"/> [Increment EMF] Increment for the [Syn. EMF constant] (PHS) parameter. <input type="checkbox"/> [0.1mV/rpm] (0.1): 0.1 mV per rpm <input type="checkbox"/> [1 mV/rpm] (1): 1mV per rpm		[0.1mV/rpm] (0.1)
PHS	<input type="checkbox"/> [Syn. EMF constant] Synchronous motor EMF constant, in 0.1 mV per rpm or 1 mV per rpm (peak voltage per phase), according to the value of [Increment EMF] (IPHS). On the integrated display unit: 0 to 9999 then 10.00 to 65.53 (10000 to 65536).	0 to 65535	Acc. to drive rating
LdS	<input type="checkbox"/> [Autotune L d-axis] Axis "d" stator inductance in mH (per phase). On motors with smooth poles [Autotune L d-axis] (LdS) = [Autotune L q-axis] (LqS) = Stator inductance L.	0 to 655.3	Acc. to drive rating
LqS	<input type="checkbox"/> [Autotune L q-axis] Axis "q" stator inductance in mH (per phase). On motors with smooth poles [Autotune L d-axis] (LdS) = [Autotune L q-axis] (LqS) = Stator inductance L.	0 to 655.3	Acc. to drive rating
rSR5	<input type="checkbox"/> [Cust. stator R syn] Cold state stator resistance (per winding) The factory setting is replaced by the result of the auto-tuning operation, if it has been performed. The value can be entered by the user, if he knows it. Value in milliohms (mΩ) up to 75 kW (100 HP), and in hundredths of milliohms (mΩ/100) above 75 kW (100 HP). On the integrated display unit: 0 to 9999 then 10.00 to 65.53 (10000 to 65536).	Acc. to drive rating	Acc. to drive rating

(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.

[1.4 MOTOR CONTROL] (drC-)


Code	Name/Description
Syn -	[SYNCHRONOUS MOTOR] (continued)
req no yes done	<div> <input type="checkbox"/> [Read motor param.] <div>[No] (no)</div> </div> <p>This parameter can only be used with BDH, BRH and BSH type motors from the Schneider-Electric range. Can only be accessed if [Encoder protocol] (UECP) page 116 = [Hiperface] (SCHP). Request to load motor parameters from the encoder EEPROM memory.</p> <ul style="list-style-type: none"> <input type="checkbox"/> [No] (no): Loading not performed or has failed. <input type="checkbox"/> [Yes] (YES): Loading is performed as soon as possible, then the parameter automatically changes to [Done] (dOnE). <input type="checkbox"/> [Done] (dOnE): Loading done. <p>The following parameters are loaded: [Angle offset value] (ASU) page 85, [Nom motor spdsync] (nSPS) page 81, [Nominal I sync.] (nCrS) page 81, [Pole pairs] (PPnS) page 81, [Syn. EMF constant] (PHS) page 81, [Cust. stator R syn] (rSAS) page 81, [Autotune L d-axis] (LdS) page 81, and [Autotune L q-axis] (LqS) page 81.</p> <p>Note:</p> <ul style="list-style-type: none"> During loading the drive is in "Freewheel Stop" state with the motor turned off. If a "line contactor" or "output contactor" function has been configured, the contactor closes during loading.
EEP tAb PrOG FAIL dOnE CUS	<div> <input type="checkbox"/> [Status motor param] <div>[Not done] (tAb)</div> </div> <p>Can only be accessed if [Encoder protocol] (UECP) page 116 = [Hiperface] (SCHP). Information on the request to load motor parameters from the encoder EEPROM memory (not modifiable).</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Not done] (tAb): Loading has not been performed, default motor parameters will be used. <input type="checkbox"/> [In Progress] (PrOG): Loading in progress. <input type="checkbox"/> [Failed] (FAIL): Loading has failed. <input type="checkbox"/> [Done] (dOnE): Loading completed successfully. <input type="checkbox"/> [Customized] (CUS): Loading completed successfully but one or more motor parameters have subsequently been modified by the user via the display terminal or serial link, or auto-tuning has been performed by [Auto-tuning] (tUn).

Synchronous motor parameters that can be accessed in [Expert] mode

Code	Name/Description
Syn -	[SYNCHRONOUS MOTOR] (continued)
r5n5	<div> <input type="checkbox"/> [R1rS] </div> <p>Cold state stator resistance (per winding), in read-only mode. This is the drive factory setting or the result of the auto-tuning operation, if it has been performed. Value in milliohms ($m\Omega$) up to 75 kW (100 HP), and in hundredths of milliohms ($m\Omega/100$) above 75 kW (100 HP). On the integrated display unit: 0 to 9999 then 10.00 to 65.53 (10000 to 65536).</p>
Fr55	<div> <input type="checkbox"/> [Nominal freq sync.] </div> <p>Motor frequency at rated speed in Hz, calculated by the drive (rated motor frequency), in read-only mode.</p>

(1) Parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

(2) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.

 Parameter that can be modified during operation or when stopped

[1.4 MOTOR CONTROL] (drC-)

Closed-loop synchronous motor

Operation on a synchronous motor in a closed loop configuration requires an encoder providing the exact position of the motor rotor. The phase-shift angle of the encoder in relation to the rotor must therefore be determined. The drive can perform this measurement automatically.

Selecting a resolver type encoder



The number of poles on the motor must be a whole multiple of the number of poles on the resolver. For example, a 6-pole resolver will not operate with an 8-pole motor.

To obtain the best resolution, we recommend selecting a resolver with the same number of poles as the motor.

Procedure for measuring the phase-shift angle between the motor and the encoder

Preliminary remarks:

Select the [Angle setting type] (ASt) measuring mode according to the type of machine being driven:

- [Angle setting type] (ASt) = [W/o load] (nLd): Measurement with motion, if the rotation of the motor is free (no load, brake released) and safe. During measurement current flows through the motor, which may cause it to rotate one full revolution.



WARNING

UNINTENDED EQUIPMENT OPERATION

Check that the rotation of the motor will not cause any dangerous movements.

Failure to follow this instruction can result in death or serious injury.

- [Angle setting type] (ASt) = [With load] (brC): Measurement without motion, motor with or without load, brake engaged or released. This mode is recommended for a lift, for example. **You must adhere to the following instructions:**
 - The motor rotor must not move during measurement, otherwise the result will be incorrect.
 - In some cases, the measurement current can cause tripping on an [Overcurrent] (OCF) fault; if so, use [W/o load] (nLd) mode. This occurs when using low-inductance motors, high-speed motors, or motors in which the rated voltage is well below the supply voltage of the drive.
 - In some cases, the measurement can cause tripping on an [Angle error] (ASF) fault. This occurs if the motor rotor has moved during measurement (only detected in closed-loop mode), a motor phase is disconnected or if the motor inductance is too high, thus limiting the measurement current (in this case, use [W/o load] (nLd) mode).
- [Angle setting type] (ASt) = [Optimised] (brCO): measurement without motion, possible with or without load, brake engaged or released. Optimization of the angle detection time starting from the second detection request, even after a power off of the product.

1. First, follow the "Encoder check procedure" on page 74.
2. Set [Motor control type] (Ctt) = [Sync.CL] (FSY).
3. If you have selected [Angle setting type] (ASt) = [W/o load] (nLd): measurement without motion, check that the motor is running safely and can turn freely **without resistive or driving torque. If these conditions are not met, the resulting measurement will be inaccurate.**
4. Set [Angle auto-test] (ASA) = [Yes] (YES). The measurement is performed and [Angle auto-test] (ASA) changes to [Done] (dOnE). The [Angle offset value] (ASU) parameter changes from [No] (nO) to a numerical value proportional to the electrical angle measured ($8191 = 360^\circ$).
5. If required, configure automatic measurements using [Angle setting activ.] (AtA). If [Angle setting type] (ASt) = [W/o load] (nLd), ensure that the safety conditions outlined earlier are met at all times.
If using a relative encoder (incremental or SinCos), it is recommended that you set [Angle setting activ.] (AtA) = [Power On] (POn) or [Run order] (AUtO).
6. If an [Angle error] (ASF) fault occurs, [Angle auto-test] (ASA) returns to [No] (nO).
 - Check that the parameters and instructions relating to this procedure have been carried out correctly and perform the measurement again.




Comments

The phase-shift angle must be re-measured each time:


- The motor is changed
- The encoder is changed
- The coupling between the motor and encoder is removed
- The [Output Ph rotation] (PHr) parameter is modified
- The [Coder rotation inv.] (EnRI) parameter is modified

If a relative encoder (incremental or SinCos) is used, measurement must be repeated each time the motor is turned off/on. It is therefore recommended that you set [Angle setting activ.] (AtA) = [Power On] (POn) or [Run order] (AUtO).

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range
ASA-	■ [ANGLE TEST SETTING] Can only be accessed if [Motor control type] (Ctt) page 70 = [Sync.CL] (FSY)	
ASL brC nLd brCO	□ [Angle setting type] Mode for measuring the phase-shift angle between the motor and the encoder. <input type="checkbox"/> [With load] (brC): Measurement without motion, possible with or without load, brake engaged or released. <input type="checkbox"/> [W/o load] (nLd): Measurement with motion, only for free motors (brake released), without load. <input type="checkbox"/> [Optimised] (brCO): Measurement without motion, possible with or without load, brake engaged or released. Optimization of the angle detection time starting from the second detection request, even after a power off of the product.  Note 1: If [Angle setting type] (ASL) = [W/o load] (nLd), the motor may rotate one full revolution during measurement. Note 2: If [Motor control type] (Ctt) = [Sync. mot.] (SYn) or [Sync.CL] (FSY) then [Angle setting type] (ASL) = [Optimised] (brCO)	[With load] (brC)
ASA nO YES dOnE	□ [Angle auto-test] Measurement of the phase-shift angle between the motor and the encoder. <input type="checkbox"/> [No] (nO): Measurement not performed or has failed, or [Output Ph rotation] (PHr) has been modified, or [Coder rotation inv.] (EnRI) parameter has been modified. <input type="checkbox"/> [Yes] (YES): Measurement is performed as soon as possible, then the parameter automatically changes to [Done] (dOnE). <input type="checkbox"/> [Done] (dOnE): Use of the value given the last time the measurement was performed. Important: <ul style="list-style-type: none"> It is essential that all the motor parameters are configured correctly before performing <i>measurements</i>: <ul style="list-style-type: none"> [Nominal I sync] (nCrS), [Current Limitation] (CLI), [Nom motor spdsync] (nSPS), [Pole pairs.] (PPnS), [Syn. EMF constant] (PHS), [Autotune L d-axis] (LdS), [IAutotune L q-axis] (LqS), [Cust. stator R syn] (rSAS). Measurement is only performed if no stop command has been activated. If a "freewheel stop" or "fast stop" function has been assigned to a logic input, this input must be set to 1 (active at 0). Measurement takes priority over any run commands, which will be taken into account after the measurement sequence. If measurement fails, the drive displays [No] (nO) and changes to [Angle Error] (ASF) fault mode. Measurement may take several seconds. Do not interrupt the process. Wait for the display to change to "[Done] (dOnE)" or "[No] (nO)".  Note: If a "line contactor" or "output contactor" function has been configured, the contactor closes during measurement.	[No] (nO)
ASL nO LI1 - - -	□ [Angle auto test] Measurement of the phase-shift angle between the motor and the encoder by means of a logic input or command bit. <input type="checkbox"/> [No] (nO): Not assigned <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. Measurement is performed when the assigned bit or input changes to 1.  Note: If a "line contactor" or "output contactor" function has been configured, the contactor closes during measurement.	[No] (nO)


[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range
ASA -	■ [ANGLE TEST SETTING] (continued)	
AtA nO POn AUtO	<input type="checkbox"/> [Angle setting activ.] Activation of automatic measurement of the phase-shift angle between the motor and encoder when using a relative encoder (incremental or SinCos). <input type="checkbox"/> [No] (nO) : Function inactive. <input type="checkbox"/> [Power On] (POn) : Measurement is performed on each power-up (1). <input type="checkbox"/> [Run order] (AUtO) : Measurement is performed on each run command if necessary, i.e., if parameter [Angle offset value] (ASU) is set to [No] (nO) . This option is recommended for use with a VW3 A3 401 to 407 card or with VW3 A3 411 card, when the "line contactor" function has been configured (loss of angle on each stop) (1). If [Angle setting activ.] (AtA) = [Power On] (POn) or [Run order] (AUtO) , it is advisable to set [Angle setting type] (ASt) = [With load] (brC) .  Note: If a "line contactor" or "output contactor" function has been configured, the contactor closes during measurement.	[No] (nO)
ASU nO -	<input type="checkbox"/> [Angle offset value] Phase-shift angle between the motor and the encoder. <input type="checkbox"/> [No] (nO) : Measurement has not been performed or has failed, or [Output Ph rotation] (PHr) has been modified, or measurement has been lost due to powering down (1). <input type="checkbox"/> 0 to 8191: Phase-shift angle. 8191 corresponds to 360°.	[No] (nO)
AStS tAb PEnd PrOG FAIL dOnE CUS	<input type="checkbox"/> [Angle setting status] Information on the phase-shift angle measurement between the motor and the encoder (cannot be modified). <input type="checkbox"/> [Not done] (tAb) : Phase-shift angle not defined. <input type="checkbox"/> [Pending] (PEnd) : Measurement requested but not yet performed. <input type="checkbox"/> [In Progress] (PrOG) : Measurement in progress. <input type="checkbox"/> [Failed] (FAIL) : Measurement failed. <input type="checkbox"/> [Done] (dOnE) : Measurement performed successfully. <input type="checkbox"/> [Customized] (CUS) : The phase-shift angle value has been entered by the user via the display terminal or serial link.	[Not done] (tAb)

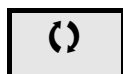
(1) Powering down causes a loss of measurement data in the following cases:

- With a VW3 A3 401 to 407 card:
 - Every time the power section is turned off, even if the drive control section has a separate power supply (for example, if the "line contactor" function has been configured).
- With a VW3 A3 409 card and a SinCos encoder:
 - Every time the power section is turned off, if the drive control section does not have a separate power supply.
 - Only when the drive control section is turned off (if it has a separate power supply via the 0 and P24 terminals).
 - If the number of poles of the resolver is not a multiple of the number of poles of the motor.

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
FL I-	■ [FLUXING BY LI] Cannot be accessed if [Motor control type] (Ctt) page 70 = [Sync.CL] (FSY).		
FLU  FnC Fct FnD	<input type="checkbox"/> [Motor fluxing] (1)		[No] (FnO)
	<input type="checkbox"/> [Not cont.] (FnC): Non-continuous mode <input type="checkbox"/> [Continuous] (Fct): Continuous mode. This option is not possible if [Angle setting type] (Ast) page 87 is [With load] (brC) or if [Auto DC injection] (AdC) page 158 is [Yes] (YES) or if [Type of stop] (Stt) page 156 is [Freewheel] (nSt). <input type="checkbox"/> [No] (FnO): Function inactive. This option is not possible if [Motor control type] (Ctt) page 70 = [SVC I] (CUC) or [FVC] (FUC). If [Motor control type] (Ctt) page 70 = [SVC I] (CUC), [FVC] (FUC) or [Sync. mot.] (SYn), the factory setting is replaced by [Not cont.] (FnC). If [Motor control type] (Ctt) page 70 = [SVC V] (UUC), the factory setting is replaced by [Not cont.] (FnC) at and above 55 kW (75 HP) for ATV71●●●M3X and at and above 90 kW (120 HP) for ATV71●●●N4. In order to obtain rapid high torque on startup, magnetic flux needs to already have been established in the motor. <ul style="list-style-type: none"> In [Continuous] (Fct) mode, the drive automatically builds up flux when it is powered up. In [Not cont.] (FnC) mode, fluxing occurs when the motor starts up. The flux current is greater than nCr (configured rated motor current) when the flux is established and is then adjusted to the motor magnetizing current.		
	<div style="text-align: center;"> CAUTION Check that the motor will withstand this current without overheating. Failure to follow this instruction can result in equipment damage. </div>		
	If [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn), the [Motor fluxing] (FLU) parameter must be active ([No] (FnO) is not permitted); this parameter causes rotor angle detection or alignment (according to the configuration of [Angle setting type] (Ast) page 87) and not fluxing. If [Brake assignment] (bLC) page 175 is not [No] (nO), the [Motor fluxing] (FLU) parameter has no effect.		
FL I nD L I I - - -	<input type="checkbox"/> [Fluxing assignment]		[No] (nO)
	<input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. Assignment is only possible if [Motor fluxing] (FLU) = [Not cont.] (FnC): <ul style="list-style-type: none"> If an LI or a bit is assigned to the motor fluxing command, flux is built up when the assigned input or bit is at 1. If an LI or a bit has not been assigned, or if the assigned LI or bit is at 0 when a run command is sent, fluxing occurs when the motor starts. 		

(1) Parameter can also be accessed in the [1.3 SETTINGS] (SE-) menu.




Parameter that can be modified during operation or when stopped

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
FL I-	■ [FLUXING BY LI] (continued)		
ASt	□ [Angle setting type]		[With load] (brC)
brC	<p>Rotor angle alignment or detection mode can be accessed if [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn). Mode for measuring the phase-shift angle between the motor and the encoder.</p>		
nLd	□ [W/o load] (nLd): Alignment with motion, only for free motors (brake released), without load.		
brCO	<p>□ [Optimised] (brCO): Measurement without motion, possible with or without load, brake engaged or released. Optimization of the angle detection time starting from the second detection request, even after a power off of the product.</p>		
	<p>Note 1: If [Angle setting type] (ASt) = [W/o load] (nLd), the motor may rotate one full revolution during measurement.</p>		
	<p>Nota 2: If [Motor control type] (Ctt) = [Sync. mot.] (SYn) or [Sync.CL] (FSY) then [Angle setting type] (ASt) = [Optimised] (brCO)</p>		

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range
tUn -	■ [AUTOMATIC TUNE]	
tUn nO YES dOnE	<input type="checkbox"/> [Auto tuning] <input type="checkbox"/> [No] (nO): Auto-tuning not performed. <input type="checkbox"/> [Yes] (YES): Auto-tuning is performed as soon as possible, then the parameter automatically changes to [Done] (dOnE). <input type="checkbox"/> [Done] (dOnE): Use of the values given the last time auto-tuning was performed. Important: <ul style="list-style-type: none"> It is essential that all the motor parameters are correctly configured before starting auto-tuning. <ul style="list-style-type: none"> Asynchronous motor: [Rated motor volt.] (UnS), [Rated motor freq.] (FrS), [Rated mot. current] (nCr), [Rated motor speed] (nSP), [Rated motor power] (nPr) page 76 Synchronous motor: [Nominal I sync.] (nCrS), [Nom motor spdsync] (nSPS), [Pole pairs] (PPnS), [Syn. EMF constant] (PHS), [Autotune L d-axis] (LdS), [Autotune L q-axis] (LqS) page 81 If at least one of these parameters (except [Syn. EMF constant] (PHS), [Autotune L d-axis] (LdS), [Autotune L q-axis] (LqS)) is modified after auto-tuning has been performed, [Auto tuning] (tUn) will return to [No] (nO) and must be repeated. Auto-tuning is only performed if no stop command has been activated. If a "freewheel stop" or "fast stop" function has been assigned to a logic input, this input must be set to 1 (active at 0). Auto-tuning takes priority over any run or prefluxing commands, which will be taken into account after the auto-tuning sequence. If auto-tuning fails, the drive displays [No] (nO) and, depending on the configuration of [Autotune fault mgt] (tnL) page 256, may switch to [Auto-tuning] (tnF) fault mode. Auto-tuning may last for 1 to 2 seconds. Do not interrupt the process. Wait for the display to change to "[Done] (dOnE)" or "[No] (nO)".  Note: <ul style="list-style-type: none"> During auto-tuning the motor operates at rated current. If the "line contactor" or "output contactor" function has been configured, the contactor closes during auto-tuning. 	[No] (nO)
Aut nO YES	<input type="checkbox"/> [Automatic autotune] <input type="checkbox"/> [No] (nO): Function inactive. <input type="checkbox"/> [Yes] (YES): Auto-tuning is performed on every power-up. Important: Same comments as for [Auto tuning] (tUn) above.	[No] (nO)
tUL nO LI1 - - -	<input type="checkbox"/> [Auto-tune assign.] Assignment of auto-tuning to a logic input or control bit. <input type="checkbox"/> [No] (nO): Not assigned <input type="checkbox"/> [LI1] (LI1) : : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. Auto-tuning is performed when the assigned bit or input changes to 1. Important: Same comments as for [Auto tuning] (tUn) above.	
tUS tAb PEnd PrOG FA IL dOnE CUS	<input type="checkbox"/> [Auto tuning state] For information only, cannot be modified. <input type="checkbox"/> [Not done] (tAb): The default stator resistance value is used to control the motor. <input type="checkbox"/> [Pending] (PEnd): Auto-tuning has been requested but not yet performed. <input type="checkbox"/> [In Progress] (PrOG): Auto-tuning in progress. <input type="checkbox"/> [Failed] (FA IL): Auto-tuning has failed. <input type="checkbox"/> [Done] (dOnE): The stator resistance measured by the auto-tuning function is used to control the motor. <input type="checkbox"/> [Customized] (CUS): Auto-tuning has been performed, but at least one parameter set by this auto-tuning operation has subsequently been modified. The [Auto tuning] (tUn) parameter then returns to [No] (nO). The following auto-tuning parameters are affected: <ul style="list-style-type: none"> [Cust stator resist.] (rSA), [ldw] (IdA), [Lfw] (LFA) and [Cust. rotor t const.] (trA) page 80 for asynchronous motors [Cust. stator R syn] (rSAS) page 81 for synchronous motors 	[Not done] (tAb)


[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
SSL -	■ [SPEED LOOP] Cannot be accessed if [Motor control type] (Ctt) page 70 = [V/F 2pts] (UF2) or [V/F 5pts] (UF5).		
SSL Std HPF	<input type="checkbox"/> [Speed loop type] Selection of speed loop type <input type="checkbox"/> [Standard] (Std): Standard speed loop <input type="checkbox"/> [High perfor.] (HPF): High-performance speed loop. We advise to deactivate [Dec ramp adapt.] (brA) = [No] (nO) (see page 155)		[Standard] (Std)
SPG ()	<input type="checkbox"/> [Speed prop. gain] (1) This parameter can be accessed if [Speed loop type] (SSL) = [Standard] (Std). Speed loop proportional gain.	0 to 1000%	40%
SIt ()	<input type="checkbox"/> [Speed time integral] (1) This parameter can be accessed if [Speed loop type] (SSL) = [Standard] (Std). Speed loop integral time constant.	1 to 1000%	100%
SFC ()	<input type="checkbox"/> [K speed loop filter] (1) This parameter can be accessed if [Speed loop type] (SSL) = [Standard] (Std). Speed loop filter coefficient.	0 to 100	0
JMUL	<input type="checkbox"/> [Inertia Mult. Coef.] This parameter can be accessed if [Speed loop type] (SSL) = [High perfor.] (HPF). Increment for [Application Inertia] (JAPL) and [Estim. app. inertia] (JEst) parameters, calculated by the drive, in read-only mode: - 0.1 gm ² , 1 gm ² , 10 gm ² , 100 gm ² , 1000 gm ²		
JEst	<input type="checkbox"/> [Estim. app. inertia] This parameter can be accessed if [Speed loop type] (SSL) = [High perfor.] (HPF). The inertia being driven is estimated by the drive according to the motor parameters, in read-only mode. Speed loop default settings are determined by the drive from this inertia. Increment given by [Inertia Mult. Coef.] (JMUL): - 0.1 gm ² , 1 gm ² , 10 gm ² , 100 gm ² or 1000 gm ²	1 to 9999	-
JACO	<input type="checkbox"/> [App. Inertia Coef.] This parameter can be accessed if [Speed loop type] (SSL) = [High perfor.] (HPF). Coefficient which fix the ratio between [Estim. app. inertia] (JEst) and [Application Inertia] (JAPL) parameters. The default value is equal to 1 or 30 if [Macro configuration] (CFG) page 41 = [Lift] (LIFt) and [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn) or [Sync.CL] (FSY). [Application Inertia] (JAPL) = [Estim. app. inertia] (JEst) x [App. Inertia Coef.] (JACO).	0.10 to 100	-

(1) Parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu. Advice on setting the parameters in this menu can be found on pages 57 to 59.

() Parameter that can be modified during operation or when stopped

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
SSL -	■ [SPEED LOOP] (continued)		
JAPL	□ [Application Inertia] This parameter can be accessed if [Speed loop type] (SSL) = [High perfor.] (HPF). The value of the actual inertia being driven must be entered in this parameter. This value is then used by the drive to optimize speed loop settings, thus achieving the best results (provided that the exact value has been entered). [Application Inertia] (JAPL) = [Estim. app. inertia] (JES _t) x [App. Inertia Coef.] (JACO), with [App. Inertia Coef.] (JACO) = 1 or 30 if [Macro configuration] (CFG) page 41 = [Lift] (LIFT) and [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn) or [Sync.CL] (FSY). Increment given by [Inertia Mult. Coef.] (JMUL): • 0.1 gm ² , 1 gm ² , 10 gm ² , 100 gm ² or 1000 gm ²  Note: If a motor parameter is modified, the estimated inertia is recalculated and updated (parameters [Estim. app. inertia] (JES _t) and [Inertia Mult. Coef.] (JMUL)). [Application Inertia] (JAPL) is also returned to its default value according to the new value of [Estim. app. inertia] (JES _t).	1 to 9999	-
	<div style="text-align: center;">⚠ DANGER</div> <div> UNINTENDED EQUIPMENT OPERATION <ul style="list-style-type: none"> If an incorrect value is entered in the [Application Inertia] (JAPL) parameter, it can cause speed instability and loss of motor control, which could lead to a sudden drop (in hoisting and lift applications, for example). The inertia may vary significantly according to the application; in general, it is very high for lifts. As such, the default value does not guarantee correct operation. It is essential to determine and enter the exact inertia value in high performance speed loop mode. </div> <div> Failure to follow these instructions will result in death or serious injury. </div>		
SE A	□ [Fr.Loop.Stab] (1)	0 to 100%	20%
()	This parameter can be accessed if [Speed loop type] (SSL) = [High perfor.] (HPF). Stability: Used to adapt the return to steady state after a speed transient, according to the dynamics of the machine. Gradually increase the stability to increase control loop attenuation and thus reduce any overspeed.		
FLG	□ [FreqLoopGain] (1)	0 to 100%	20%
()	This parameter can be accessed if [Speed loop type] (SSL) = [High perfor.] (HPF). Frequency loop gain: Used to adapt the response of the machine speed transients according to the dynamics. For machines with high resistive torque, high inertia or fast cycles, increase the gain gradually.		

(1) Parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu. **Advice on setting the parameters in this menu can be found on pages 57 to 59.**

() Parameter that can be modified during operation or when stopped

[1.4 MOTOR CONTROL] (drC-)

Parameters that can be accessed in [Expert] mode

Code	Name/Description	Adjustment range	Factory setting
SSL -	■ [SPEED LOOP] (continued)		
FFP ()	<input type="checkbox"/> [Feed forward] This parameter can be accessed if [Speed loop type] (SSL) = [High perfor.] (HPF). Percentage of the high-performance regulator feedforward term. 100% corresponds to the term calculated using the value of [Application Inertia] (JAPL) page 90.	0 to 200%	100%
FFU ()	<input type="checkbox"/> [Bandwidth feedfor.] This parameter can be accessed if [Speed loop type] (SSL) = [High perfor.] (HPF). Bandwidth of the high-performance speed loop feedforward term, as a percentage of the predefined value.	20 to 500%	100%

() Parameter that can be modified during operation or when stopped

Recommended procedure for setting the high-performance speed loop

1. Enter the motor parameters. If you subsequently modify one of these, you will have to perform this whole procedure again.
2. **The value of the actual inertia being driven must be entered** in the [Application Inertia] (JAPL) parameter, page 90.
Note: If a motor parameter is modified, the estimated inertia is recalculated and updated (parameters [Estim. app. inertia] (JEst) and [Inertia Mult. Coef.] (JMUL)). [Application Inertia] (JAPL) is also returned to its default value according to the new value of [Estim. app. inertia] (JEst).
3. Check the speed loop response time by first setting [Feed forward] (FFP) to 0 (see graphs on next page).
4. If necessary, adjust the bandwidth and stability using parameters [Fr.Loop.Stab] (StA) and [FreqLoopGain] (FLG) (see page 59).
5. To optimize ramp following, increase the feedforward parameter [Feed forward] (FFP) as indicated on the next page until the best result is obtained.
6. Under exceptional circumstances, the feedforward term bandwidth can be adjusted (as shown on the next page) to further improve ramp following or to reduce the speed reference's sensitivity to noise.

DANGER

UNINTENDED EQUIPMENT OPERATION

- If an incorrect value is entered in the [Application Inertia] (JAPL) parameter, page 90, it can cause speed instability and loss of motor control, which could lead to a sudden drop (in hoisting and lift applications, for example). The inertia may vary significantly according to the application; in general, it is very high for lifts. As such, the default value does not guarantee correct operation.
- It is essential to determine and enter the exact inertia value in high performance speed loop mode.

Failure to follow these instructions will result in death or serious injury.

[1.4 MOTOR CONTROL] (drC-)

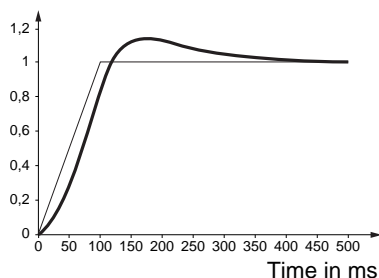
High-performance speed loop - Setting the [Feed forward] (FFP) and [Bandwidth feedfor.] (FFU) parameters

[Feed forward] (FFP)

This is used to adjust the level of dynamic torque feedforward required for accelerating and decelerating the inertia. The effect of this parameter on ramp following is illustrated below. Increasing the value of FFP allows the ramp to be followed more closely. However, if the value is too high, overspeed occurs. The optimum setting is obtained when the speed follows the ramp precisely; this depends on the accuracy of the [Application Inertia] (JAPL) parameter, page 90, and the [Encoder filter value] (FFr) parameter setting, page 117.

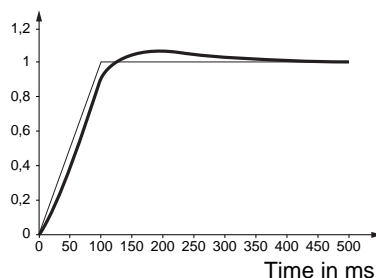
Initial response with FFP = 0

Reference division



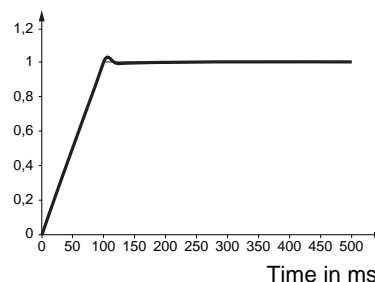
Increase in FFP ↗

Reference division



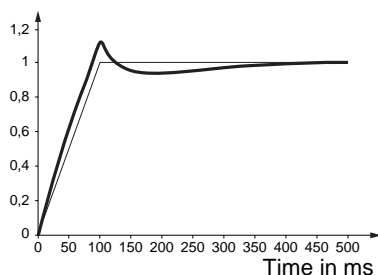
Increase in FFP ↗↗

Reference division



Increase in FFP ↗↗↗

Reference division

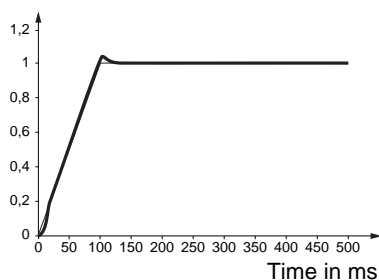


[Bandwidth feedfor.] (FFU)

This is used to adjust the bandwidth of the dynamic torque feedforward term. The effect of this parameter on ramp following is illustrated below. Decreasing the value of FFU reduces the effect of noise on the speed reference (torque ripple). However, too great a decrease in relation to the ramp settings (on short ramps) causes a delay, and ramp following is adversely affected. Increasing the value of FFU allows the ramp to be followed more closely, but also heightens noise sensitivity. The optimum setting is obtained by reaching the best compromise between ramp following and the existing noise sensitivity.

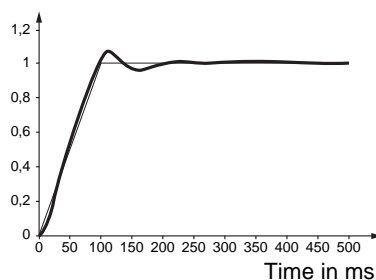
Initial response with FFU = 100%

Reference division



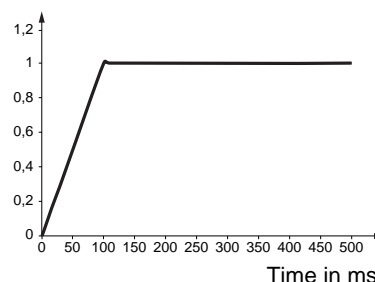
Reduction in FFU ↘↘

Reference division



Increase in FFU ↗↗

Reference division



[ENA SYSTEM]

ENA SYSTEM is a control profile designed for rotating machines with unbalanced load. **It only applies to asynchronous motors.**

It is used primarily for oil pumps. The operating principle applied:

- Allows operation without a braking resistor
- Reduces mechanical stress on the rod
- Reduces line current fluctuations
- Reduces energy consumption by improving the electric power/current ratio

[ENA prop.gain]

This setting is used to achieve a compromise between the reduced energy consumption (and/or line current fluctuations) and the mechanical stress to which the rod is subject.

Energy is saved by reducing current fluctuations and increasing the current while retaining the same average speed.

[ENA integral gain]

This setting is used to smooth the DC bus voltage.

Start up the machine with a low integral and proportional gain (proportional 25% and integral 10%) in order to avoid an overvoltage trip in the absence of a braking resistor. See if these settings are suitable.

Recommended adjustments to be made during operation:

- To eliminate the braking resistor and, therefore, the increase in the DC bus voltage:
Display the machine speed on the graphic display terminal.
Reduce the integral gain value until the machine speed drops. When this point is reached, increase the integral gain until the machine speed stabilizes.
Use the graphic display terminal or an oscilloscope to check that the DC bus voltage is stable.
- To save energy:
Reducing the proportional gain (gradually) may increase energy savings by reducing the maximum value of the line current, but it will increase speed variations and, therefore, mechanical stress.
The aim is to identify settings that will enable energy to be saved and minimize mechanical stress.
When reducing the proportional gain, it may be necessary to readjust the integral gain in order to avoid an overvoltage trip.

Note: Once the adjustments are complete, check that the pump starts up correctly. If the ENA integral gain setting is too low, this may lead to insufficient torque on startup.

[Reduction ratio]

This setting corresponds to the motor speed ahead of gearbox/speed after gearbox ratio. This parameter is used to display the average speed in Hz and the machine speed in customer units (e.g., in strokes per minute) on the graphic display terminal. In order to be displayed on the graphic display terminal, these values must be selected in the [1.2 MONITORING] (SUP-) menu.

Adjustment recommendations for prevention of tripping on an [Overspeed] (SOF) fault

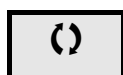
ENA SYSTEM authorizes overspeed, which can trigger an [Overspeed] (SOF) fault. To avoid this occurring, it is advisable to increase the value of the following parameters slightly:

- [Max frequency] (tFr) page [71](#)
- [Overspd. pulse thd.] (FqA) page [253](#), if the "frequency meter" function is configured

[1.4 MOTOR CONTROL] (drC-)

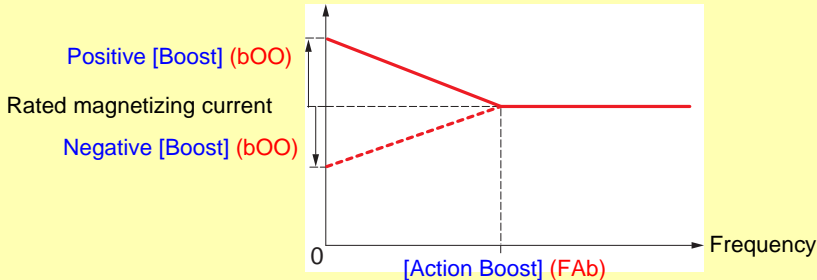
Code	Name/Description	Adjustment range	Factory setting
SSL -	■ [SPEED LOOP] (continued)		
EnA nO YES	□ [ENA system] This parameter can be accessed if [Motor control type] (Ctt) = [SVC V] (UUC), see page 70. <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [Yes] (YES): Function active		[No] (nO)
GPE ()	□ [ENA prop.gain] (1) This parameter can be accessed if [ENA system] (EnA) = [Yes] (YES)	1 to 9999	250
GIE ()	□ [ENA integral gain] (1) This parameter can be accessed if [ENA system] (EnA) = [Yes] (YES)	0 to 9999	100
rRP ()	□ [Reduction ratio] (1) This parameter can be accessed if [ENA system] (EnA) = [Yes] (YES)	10.0 to 999.9	10

(1) Parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.



Parameter that can be modified during operation or when stopped

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
b00	<input type="checkbox"/> [Boost] The parameter can be accessed if [ACCESS LEVEL] = [Expert] and if [Motor control type] (Ctt) page 70 is different from [Sync.CL] (FSY) . Adjustment of the motor magnetizing current at low speed, as a % of the rated magnetizing current. This parameter is used to increase or reduce the time taken to establish the torque. It allows gradual adjustment up to the frequency set by [Action Boost] (FAb) . Negative values apply particularly to tapered rotor motors. Magnetizing current 	-100% to 100%	0
FAb	<input type="checkbox"/> [Action Boost] The parameter can be accessed if [ACCESS LEVEL] = [Expert] and if [Motor control type] (Ctt) page 70 is different from [Sync.CL] (FSY) . Frequency above which the magnetizing current is not longer affected by [Boost] (b00) .	0 to 500 Hz	0
UFr ()	<input type="checkbox"/> [IR compensation] (1) This parameter can be accessed if [Motor control type] (Ctt) page 70 is not [V/F 2pts] (UF2) or [V/F 5pts] (UF5) . Used to optimize the torque at very low speed (increase [IR compensation] (UFr) if the torque is insufficient). Check that the [IR compensation] (UFr) value is not too high when the motor is warm (risk of instability).	25 to 200%	100%
nrd n0 YES	<input type="checkbox"/> [Noise reduction] <input type="checkbox"/> [No] (n0) : Fixed frequency. Factory setting at and above 55 kW (75 HP) for ATV71●●●M3X and at and above 90 kW (120 HP) for ATV71●●●N4. <input type="checkbox"/> [Yes] (YES) : Frequency with random modulation. Factory setting up to 45 kW (60 HP) for ATV71●●●M3X and up to 75 kW (100 HP) for the ATV71●●●N4. Random frequency modulation prevents any resonance, which may occur at a fixed frequency.		According to rating

(1) Parameter can also be accessed in the **[1.3 SETTINGS] (SEt-)** menu.

() Parameter that can be modified during operation or when stopped

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
SUL nO YES	<input type="checkbox"/> [Motor surge limit.] This function limits motor overvoltages and is useful in the following applications: <ul style="list-style-type: none"> - NEMA motors - Japanese motors - Spindle motors - Rewound motors <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [Yes] (YES): Function active This parameter is forced to [No] (nO) if [Sinus filter] (OFI) page 72 = [Yes] (YES). This parameter can remain = [No] (nO) for 230/400 V motors used at 230 V, or if the length of cable between the drive and the motor does not exceed: <ul style="list-style-type: none"> - 4 m with unshielded cables - 10 m with shielded cables 		[No] (nO)
SOP	<input type="checkbox"/> [Volt surge limit. opt] Optimization parameter for transient overvoltages at the motor terminals. Accessible if [Motor surge limit.] (SUL) = [Yes] (YES). Set to 6, 8, or 10 µs, according to the following table.		10 µs

The value of the "SOP" parameter corresponds to the attenuation time of the cable used. It is defined to prevent the superimposition of voltage wave reflections resulting from long cable lengths. It limits overvoltages to twice the DC bus rated voltage.

The tables on the following page give examples of correspondence between the "SOP" parameter and the length of the cable between the drive and the motor. For longer cable lengths, a sinus filter or a dV/dt protection filter must be used.

- For motors in parallel, the sum of all the cable lengths must be taken into consideration. Compare the length given in the table row corresponding to the power for one motor with that corresponding to the total power, and select the shorter length. Example: Two 7.5 kW (10 HP) motors - take the lengths on the 15 kW (20 HP) table row, which are shorter than those on the 7.5 kW (10 HP) row, and divide by the number of motors to obtain the length per motor (with unshielded "GORSE" cable and SOP = 6, the result is 40/2 = 20 m maximum for each 7.5 kW (10 HP) motor).

In special cases (for example, different types of cable, different motor powers in parallel, different cable lengths in parallel, etc.), we recommend using an oscilloscope to check the overvoltage values obtained at the motor terminals.

To retain the overall drive performance, do not increase the SOP value unnecessarily.

[1.4 MOTOR CONTROL] (drC-)



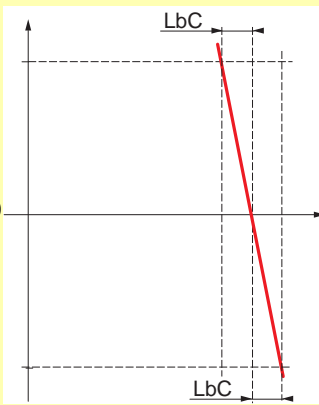
Tables giving the correspondence between the SOP parameter and the cable length, for 400 V line supply

Altivar 71	Motor		Cable cross-section		Maximum cable length in meters					
Reference	Power				Unshielded "GORSE" cable Type H07 RN-F 4Gxx			Shielded "GORSE" cable Type GVCSTV-LS/LH		
	kW	HP	in mm ²	AWG	SOP = 10	SOP = 8	SOP = 6	SOP = 10	SOP = 8	SOP = 6
ATV71H075N4	0.75	1	1.5	14	109.36 yd	76.55 yd	49.21 yd	114.83 yd	92.96 yd	71.08 yd
ATV71HU15N4	1.5	2	1.5	14	109.36 yd	76.55 yd	49.21 yd	114.83 yd	92.96 yd	71.08 yd
ATV71HU22N4	2.2	3	1.5	14	120.30 yd	71.08 yd	49.21 yd	114.83 yd	92.96 yd	71.08 yd
ATV71HU30N4	3	-	1.5	14	120.30 yd	71.08 yd	49.21 yd	114.83 yd	92.96 yd	71.08 yd
ATV71HU40N4	4	5	1.5	14	120.30 yd	71.08 yd	49.21 yd	114.83 yd	92.96 yd	71.08 yd
ATV71HU55N4	5.5	7.5	2.5	14	131.23 yd	71.08 yd	49.21 yd	114.83 yd	92.96 yd	71.08 yd
ATV71HU75N4	7.5	10	2.5	14	131.23 yd	71.08 yd	49.21 yd	114.83 yd	92.96 yd	71.08 yd
ATV71HD11N4	11	15	6	10	125.77 yd	65.62 yd	49.21 yd	109.36 yd	82.02 yd	60.15 yd
ATV71HD15N4	15	20	10	8	114.83 yd	65.62 yd	43.74 yd	109.36 yd	76.55 yd	54.68 yd
ATV71HD18N4	18.5	25	10	8	125.77 yd	65.62 yd	38.28 yd	164.04 yd	82.02 yd	54.68 yd
ATV71HD22N4	22	30	16	6	164.04 yd	65.62 yd	43.74 yd	164.04 yd	76.55 yd	54.68 yd
ATV71HD30N4	30	40	25	4	164.04 yd	60.15 yd	38.28 yd	164.04 yd	76.55 yd	54.68 yd
ATV71HD37N4	37	50	35	5	218.72 yd	71.08 yd	54.68 yd	164.04 yd	76.55 yd	54.68 yd
ATV71HD45N4	45	60	50	0	218.72 yd	60.15 yd	32.81 yd	164.04 yd	65.62 yd	43.74 yd
ATV71HD55N4	55	75	70	2/0	218.72 yd	54.68 yd	27.34 yd	164.04 yd	60.15 yd	32.81 yd
ATV71HD75N4	75	100	95	4/0	218.72 yd	49.21 yd	27.34 yd	164.04 yd	60.15 yd	32.81 yd


Altivar 71	Motor		Cable cross-section		Maximum cable length in meters					
Reference	Power				Shielded "BELDEN" cable Type 2950x			Shielded "PROTOFLEX" cable Type EMV 2YSLCY-J		
	kW	HP	in mm ²	AWG	SOP = 10	SOP = 8	SOP = 6	SOP = 10	SOP = 8	SOP = 6
ATV71H075N4	0.75	1	1.5	14	54.68 yd	43.74 yd	32.81 yd			
ATV71HU15N4	1.5	2	1.5	14	54.68 yd	43.74 yd	32.81 yd			
ATV71HU22N4	2.2	3	1.5	14	54.68 yd	43.74 yd	32.81 yd			
ATV71HU30N4	3	-	1.5	14	54.68 yd	43.74 yd	32.81 yd			
ATV71HU40N4	4	5	1.5	14	54.68 yd	43.74 yd	32.81 yd			
ATV71HU55N4	5.5	7.5	2.5	14	54.68 yd	43.74 yd	32.81 yd			
ATV71HU75N4	7.5	10	2.5	14	54.68 yd	43.74 yd	32.81 yd			
ATV71HD11N4	11	15	6	10	54.68 yd	43.74 yd	32.81 yd			
ATV71HD15N4	15	20	10	8	54.68 yd	43.74 yd	32.81 yd			
ATV71HD18N4	18.5	25	10	8	54.68 yd	43.74 yd	32.81 yd			
ATV71HD22N4	22	30	16	6				82.02 yd	43.74 yd	27.34 yd
ATV71HD30N4	30	40	25	4				82.02 yd	43.74 yd	27.34 yd
ATV71HD37N4	37	50	35	5				82.02 yd	43.74 yd	27.34 yd
ATV71HD45N4	45	60	50	0				82.02 yd	43.74 yd	27.34 yd
ATV71HD55N4	55	75	70	2/0				82.02 yd	32.81 yd	16.40 yd
ATV71HD75N4	75	100	95	4/0				82.02 yd	32.81 yd	16.40 yd

For 230/400 V motors used at 230 V, the [Motor surge limit.] (SUL) parameter can remain = [No] (nO).

[1.4 MOTOR CONTROL] (drC-)

Code	Name/Description	Adjustment range	Factory setting
Ubr 	<input type="checkbox"/> [Braking level] DC bus voltage threshold above which the braking transistor cuts in to limit this voltage. ATV71●●●●M3●: factory setting 395 V. ATV71●●●●N4: factory setting 785 V. ATV71●●●●S6X: factory setting 980 V. The adjustment range depends on the voltage rating of the drive and the [Mains voltage] (UrES) parameter, page 246 .		According to drive voltage rating
brA nO YES	<input type="checkbox"/> [Braking balance] <input type="checkbox"/> [No] (nO) : Function inactive <input type="checkbox"/> [Yes] (YES) : Function active, to be used on drives connected in parallel via their DC bus. Used to balance the braking power between the drives. The [Braking level] (Ubr) parameter must be set to the same value on the various drives. The value [Yes] (YES) is possible only if [Dec ramp adapt.] (brA) = [No] (nO) (see page 155)		[No] (nO)
LbA nO YES	<input type="checkbox"/> [Load sharing] When 2 motors are connected mechanically and therefore at the same speed, and each is controlled by a drive, this function can be used to improve torque distribution between the two motors. To do this, it varies the speed based on the torque. <input type="checkbox"/> [No] (nO) : Function inactive <input type="checkbox"/> [Yes] (YES) : Function active The parameter can only be accessed if [Motor control type] (Ctt) page 70 is not [V/F 2pts] (UF2) or [V/F 5pts] (UF5) .		[No] (nO)
LbC 	<input type="checkbox"/> [Load correction] (1) Rated correction in Hz. The parameter can be accessed if [Load sharing] (LbA) = [Yes] (YES) <div> <div>Torque</div> <div>Nominal torque</div> <div>0</div> <div>Nominal torque</div> </div>  <div>Frequency</div>	0 to 1000 Hz	0

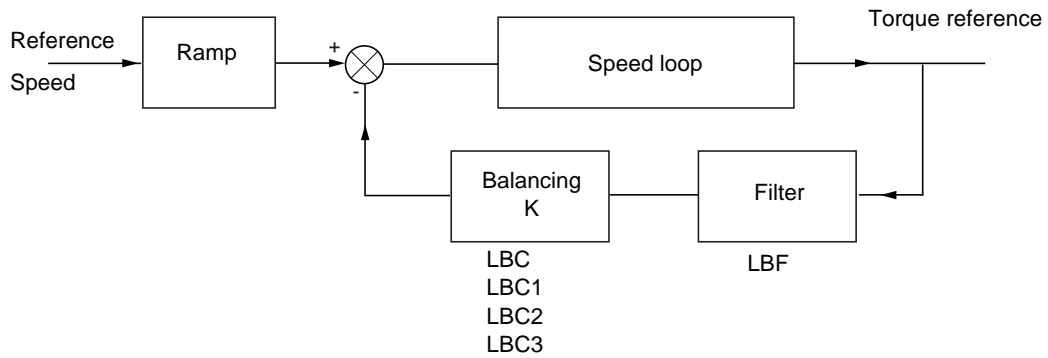
(1) The parameter can also be accessed in the [\[1.3 SETTINGS\] \(SEt-\)](#) menu.

 Parameter that can be modified during operation or when stopped.

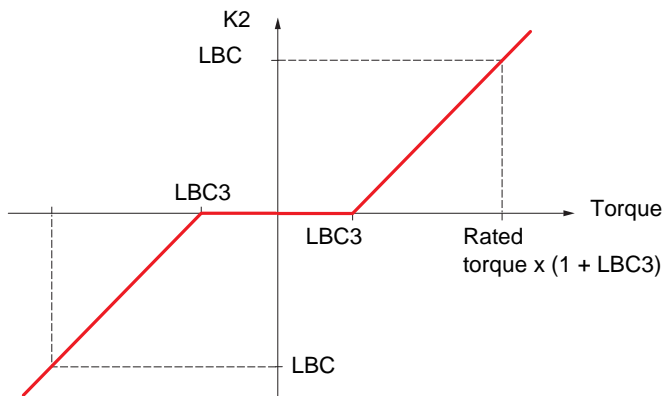
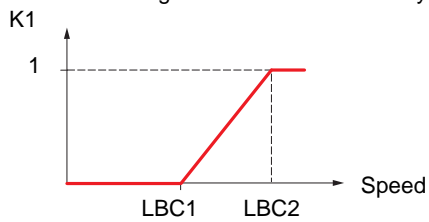
[1.4 MOTOR CONTROL] (drC-)

Load sharing, parameters that can be accessed at expert level

Principle

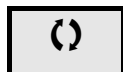


The load sharing factor K is determined by the torque and speed, with two factors $K1$ and $K2$ ($K = K1 \times K2$).



[1.4 MOTOR CONTROL] (drC-)

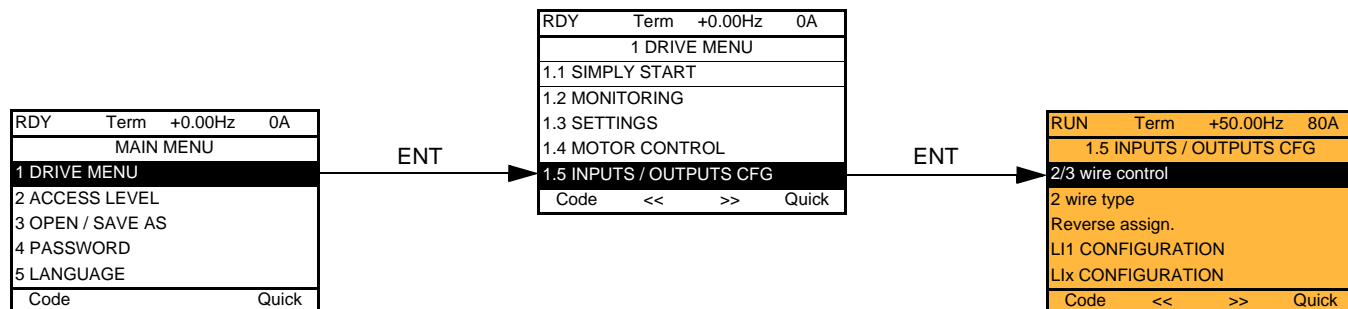
Code	Name/Description	Adjustment range	Factory setting
LbC1 ()	<input type="checkbox"/> [Correction min spd] The parameter can be accessed if [Load sharing] (LbA) = [Yes] (YES) Minimum speed for load correction in Hz. Below this threshold, no corrections are made. Used to prevent correction at very low speed if this would hamper rotation of the motor.	0 to 999.9 Hz	0
LbC2 ()	<input type="checkbox"/> [Correction max spd] The parameter can be accessed if [Load sharing] (LbA) = [Yes] (YES) Speed threshold in Hz above which maximum load correction is applied.	[Correction min spd] (LbC1) + 0.1 at 1000 Hz	0,1
LbC3 ()	<input type="checkbox"/> [Torque offset] The parameter can be accessed if [Load sharing] (LbA) = [Yes] (YES) Minimum torque for load correction as a % of the rated torque. Below this threshold, no corrections are made. Used to avoid torque instabilities when the torque direction is not constant.	0 to 300%	0%
LbF ()	<input type="checkbox"/> [Sharing filter] The parameter can be accessed if [Load sharing] (LbA) = [Yes] (YES) Time constant (filter) for correction in ms. Used in the event of flexible mechanical coupling in order to avoid instabilities.	100 ms to 20 s	100 ms



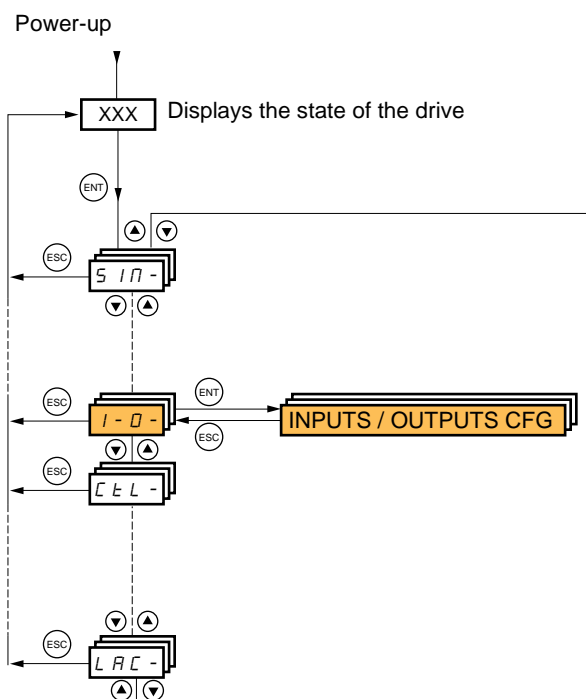
Parameter that can be modified during operation or when stopped.

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

With graphic display terminal:

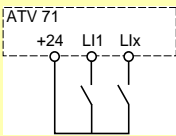
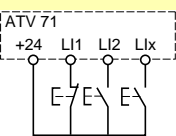


With integrated display terminal:



[1.5 INPUTS / OUTPUTS CFG] (I-O-)

The parameters in the [1.5 INPUTS / OUTPUTS CFG] (I-O-) menu can only be modified when the drive is stopped and no run command is present.

Code	Name/Description	Adjustment range	Factory setting
tCC 2C 3C	<input type="checkbox"/> [2/3 wire control] <input type="checkbox"/> [2 wire] (2C) <input type="checkbox"/> [3 wire] (3C) <p>2-wire control: This is the input state (0 or 1) or edge (0 to 1 or 1 to 0), which controls running or stopping.</p> <p>Example of "source" wiring:</p>  <p>LI1: forward LIx: reverse</p> <p>3-wire control (pulse commands): A "forward" or "reverse" pulse is sufficient to command starting, a "stop" pulse is sufficient to command stopping.</p> <p>Example of "source" wiring:</p>  <p>LI1: stop LI2: forward LIx: reverse</p>		[2 wire] (2C)
tCt LEL trn PFO	<input type="checkbox"/> [2 wire type] <input type="checkbox"/> [Level] (LEL): State 0 or 1 is taken into account for run (1) or stop (0). <input type="checkbox"/> [Transition] (trn): A change of state (transition or edge) is necessary to initiate operation, in order to prevent accidental restarts after a break in the power supply. <input type="checkbox"/> [Fwd priority] (PFO): State 0 or 1 is taken into account for run or stop, but the "forward" input always takes priority over the "reverse" input.		[Transition] (trn)
rrS nO L I I - - C I O I - - - C d O O -	<input type="checkbox"/> [Reverse assign.] <input type="checkbox"/> [No] (nO): Not assigned <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted <input type="checkbox"/> [C101] (C101) to [C115] (C115): With integrated Modbus in [I/O profile] (IO) <input type="checkbox"/> [C201] (C201) to [C215] (C215): With integrated CANopen in [I/O profile] (IO) <input type="checkbox"/> [C301] (C301) to [C315] (C315): With a communication card in [I/O profile] (IO) <input type="checkbox"/> [C401] (C401) to [C415] (C415): With a Controller Inside card in [I/O profile] (IO) <input type="checkbox"/> [CD00] (Cd00) to [CD13] (Cd13): In [I/O profile] (IO) can be switched with possible logic inputs <input type="checkbox"/> [CD14] (Cd14) to [CD15] (Cd15): In [I/O profile] (IO) can be switched without logic inputs <p>Assignment of the reverse direction command.</p>		[LI2] (LI2)




WARNING

UNINTENDED EQUIPMENT OPERATION

To change the assignment of [2/3 wire control] (tCC) press and hold down the "ENT" key for 2 s. It causes the following functions to return to factory setting: [2 wire type] (tCt) and [Reverse assign.] (rrS) below, and all functions which assign logic inputs and analog inputs. The macro configuration selected will also be reset if it has been customized (loss of custom settings). It is advisable to configure this parameter before configuring the [1.6 COMMAND] (CtL-) and [1.7 APPLICATION FUNCT.] (FUn-) menus. Check that this change is compatible with the wiring diagram used.

Failure to follow these instructions can result in death or serious injury.

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

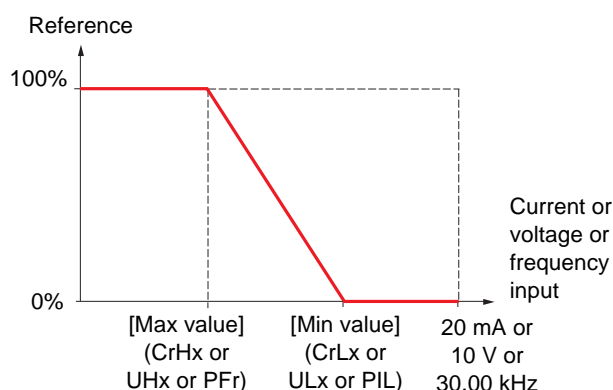
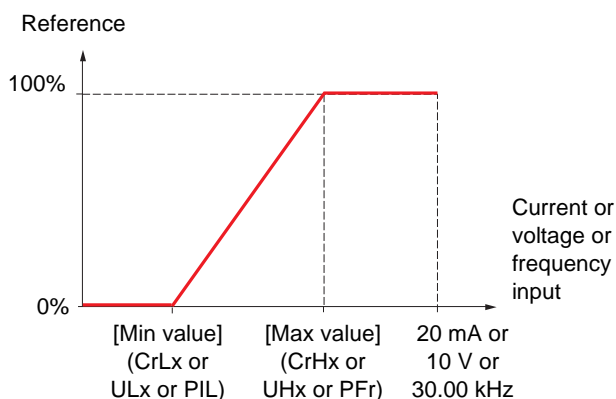
Code	Name/Description	Adjustment range	Factory setting
L I -	■ [LI1 CONFIGURATION]		
L I R	<input type="checkbox"/> [LI1 assignment] <p>Read-only parameter, cannot be configured. It displays all the functions that are assigned to input LI1 in order to check for multiple assignments.</p>		
L I d	<input type="checkbox"/> [LI1 On Delay] <p>This parameter is used to take account of the change of the logic input to state 1 with a delay that can be adjusted between 0 and 200 milliseconds, in order to filter out possible interference. The change to state 0 is taken into account without delay.</p>	0 to 200 ms	0
<div style="text-align: center;">  WARNING </div> <div> UNINTENDED EQUIPMENT OPERATION Check that the delay set does not pose a risk or lead to undesired operation. The relative order in which these inputs are taken into account may be modified according to the delay values of the various logic inputs, and thus lead to unintended operation. Failure to follow these instructions can result in death or serious injury. </div>			
L - -	■ [LIx CONFIGURATION]		
	All the logic inputs available on the drive are processed as in the example for LI1 above, up to LI6, LI10 or LI14, depending on whether or not option cards have been inserted.		

Configuration of analog inputs and Pulse input

The minimum and maximum input values (in volts, mA, etc.) are converted to % in order to adapt the references to the application.

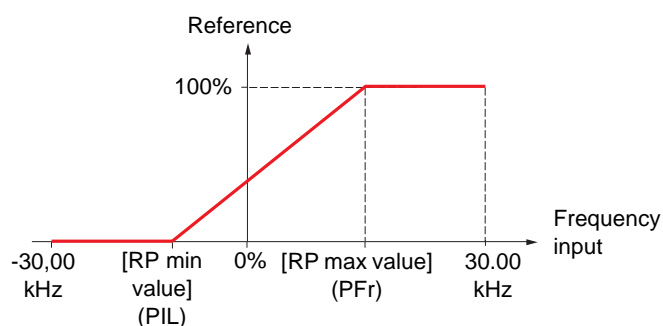
Minimum and maximum input values:

The minimum value corresponds to a reference of 0% and the maximum value to a reference of 100%. The minimum value may be greater than the maximum value:



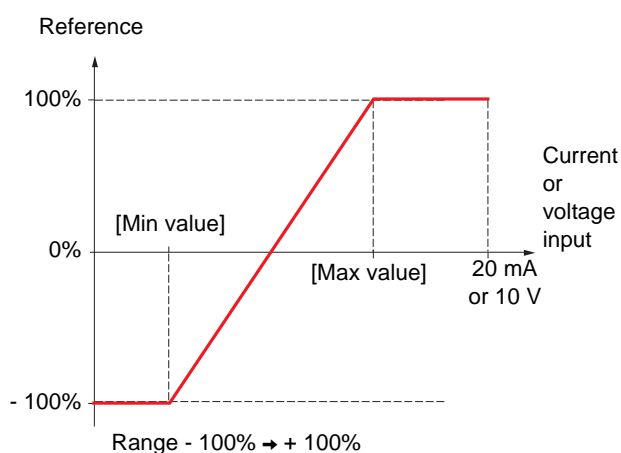
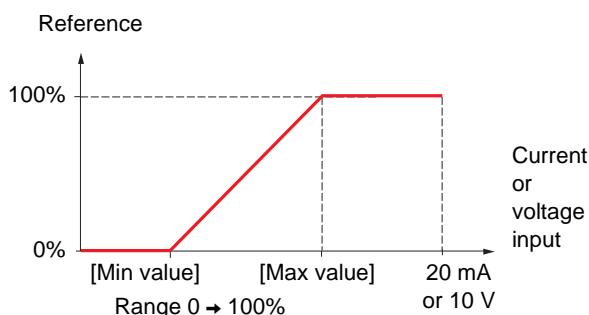
For +/- bidirectional inputs, the min. and max. are relative to the absolute value, for example, +/- 2 to 8 V.

Negative min. value of Pulse input:

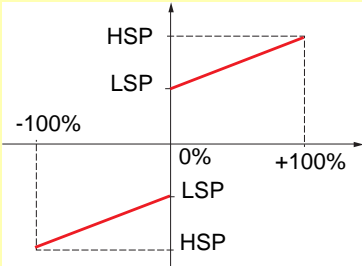
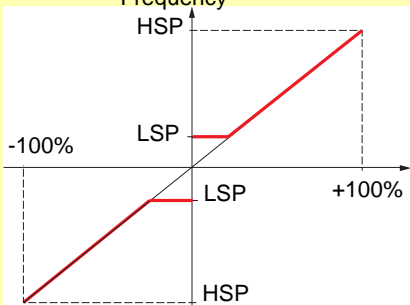
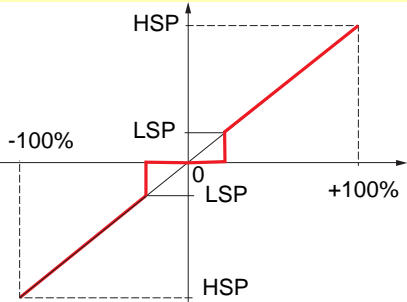
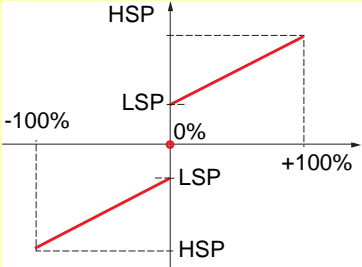


Range (output values): For analog inputs only

This parameter is used to configure the reference range to [0% → 100%] or [-100% → +100%] in order to obtain a bidirectional output from a unidirectional input.



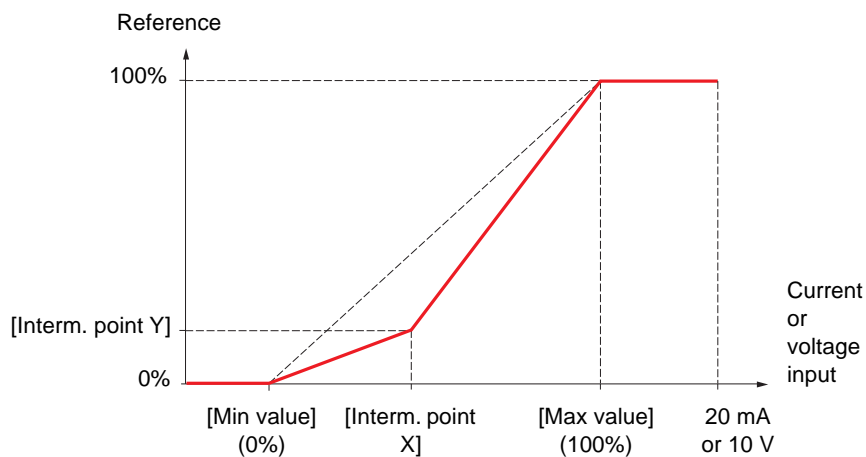
[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
bSP	[Reference template]		[Standard] (bSd)
bSd	<p><input type="checkbox"/> [Standard] (bSd)</p> <p>Frequency</p>  <p>At zero reference the frequency = LSP</p>		
bLS	<p><input type="checkbox"/> [Pedestal] (bLS)</p> <p>Frequency</p>  <p>At reference = 0 to LSP the frequency = LSP</p>		
bnS	<p><input type="checkbox"/> [Deadband] (bnS)</p> <p>Frequency</p>  <p>At reference = 0 to LSP the frequency = 0</p>		
bnS0	<p><input type="checkbox"/> [Deadband 0] (bnS0)</p> <p>Frequency</p>  <p>This operation is the same as [Standard] (bSd), except that in the following cases at zero reference, the frequency = 0:</p> <ul style="list-style-type: none"> • The signal is less than [Min value], which is greater than 0 (example 1 V on a 2 - 10 V input) • The signal is greater than [Min value], which is greater than [Max value] (example 11 V on a 10 - 0 V input). <p>If the input range is configured as "bidirectional", operation remains identical to [Standard] (bSd).</p> <p>This parameter defines how the speed reference is taken into account, for analog inputs and Pulse input only. In the case of the PID regulator, this is the PID output reference. The limits are set by the [Low speed] (LSP) and [High speed] (HSP) parameters, page 56.</p>		

Delinearization: For analog inputs only

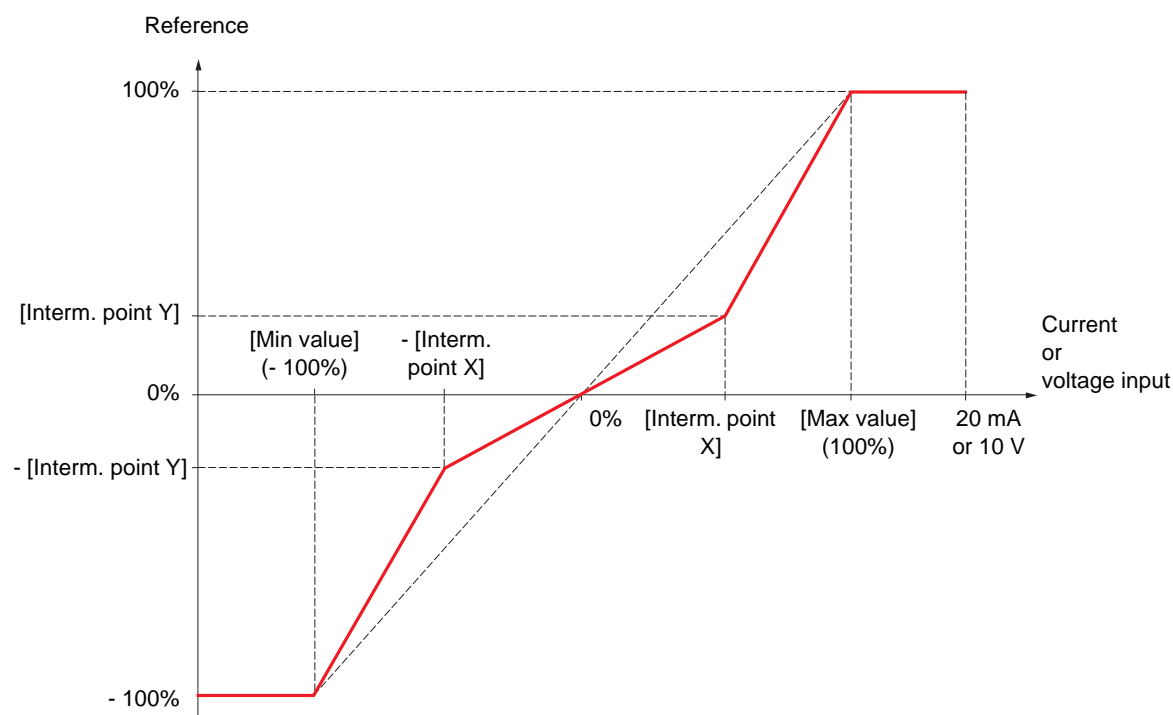
The input can be delinearized by configuring an intermediate point on the input/output curve of this input:

For range 0 → 100%



Note: For [Interm. point X], 0% corresponds to [Min value] and 100% to [Max value]

For range -100% → 100%



[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
A I I -	■ [AI1 CONFIGURATION]		
A I I A	<input type="checkbox"/> [AI1 assignment] Read-only parameter, cannot be configured. It displays all the functions associated with input AI1 in order to check, for example, for compatibility problems.		
A I I E 10U n 10U	<input type="checkbox"/> [AI1 Type] <input type="checkbox"/> [Voltage] (10U): Positive voltage input (negative values are interpreted as zero: the input is unidirectional). <input type="checkbox"/> [Voltage +/-] (n10U): Positive and negative voltage input (the input is bidirectional).		[Voltage] (10U)
U I L 1	<input type="checkbox"/> [AI1 min value]	0 to 10.0 V	0 V
U I H 1	<input type="checkbox"/> [AI1 max value]	0 to 10.0 V	10.0 V
A I I F	<input type="checkbox"/> [AI1 filter] Interference filtering.	0 to 10.00 s	0 s
A I I E	<input type="checkbox"/> [AI1 Interm. point X] Input delinearization point coordinate. • 0% corresponds to [AI1 min value] (UIL1). • 100% corresponds to [AI1 max value] (UIH1).	0 to 100%	0%
A I I S	<input type="checkbox"/> [AI1 Interm. point Y] Output delinearization point coordinate (frequency reference).	0 to 100%	0%

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
A 12 -	■ [AI2 CONFIGURATION]		
A 12A	<input type="checkbox"/> [AI2 assignment] Read-only parameter, cannot be configured. It displays all the functions associated with input AI2 in order to check, for example, for compatibility problems.		
A 12E 10U 0A	<input type="checkbox"/> [AI2 Type] <input type="checkbox"/> [Voltage] (10U): Voltage input <input type="checkbox"/> [Current] (0A): Current input		[Current] (0 A)
C r L 2	<input type="checkbox"/> [AI2 min value] The parameter can be accessed if [AI2 Type] (AI2t) = [Current] (0 A)	0 to 20.0 mA	0 mA
U I L 2	<input type="checkbox"/> [AI2 min value] The parameter can be accessed if [AI2 Type] (AI2t) = [Voltage] (10U)	0 to 10.0 V	0 V
C r H 2	<input type="checkbox"/> [AI2 max. value] The parameter can be accessed if [AI2 Type] (AI2t) = [Current] (0 A)	0 to 20.0 mA	20.0 mA
U I H 2	<input type="checkbox"/> [AI2 max. value] The parameter can be accessed if [AI2 Type] (AI2t) = [Voltage] (10U)	0 to 10.0 V	10.0 V
A 12F	<input type="checkbox"/> [AI2 filter] Interference filtering.	0 to 10.00 s	0 s
A 12L POS nEG	<input type="checkbox"/> [AI2 range] <input type="checkbox"/> [0 - 100%] (POS): Unidirectional input <input type="checkbox"/> [+/- 100%] (nEG): Bidirectional input Example: On a 0/10 V input - 0 V corresponds to reference -100% - 5 V corresponds to reference 0% - 10 V corresponds to reference + 100%		[0 - 100%] (POS)
A 12E	<input type="checkbox"/> [AI2 Interm. point X] Input delinearization point coordinate. • 0% corresponds to [Min value] if the range is 0 → 100%. • 0% corresponds to $\frac{[\text{Max value}] + [\text{Min value}]}{2}$ if the range is -100% → + 100%. • 100% corresponds to [Max value].	0 to 100%	0%
A 12S	<input type="checkbox"/> [AI2 Interm. point Y] Output delinearization point coordinate (frequency reference).	0 to 100%	0%


[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
A I3 -	■ [AI3 CONFIGURATION] Can be accessed if a VW3A3202 option card has been inserted		
A I3A	<input type="checkbox"/> [AI3 assignment] Read-only parameter, cannot be configured. It displays all the functions associated with input AI3 in order to check, for example, for compatibility problems.		
A I3E DA	<input type="checkbox"/> [AI3 Type] Read-only parameter, cannot be configured. <input type="checkbox"/> [Current] (0 A) : Current input		[Current] (0 A)
CrL3	<input type="checkbox"/> [AI3 min. value]	0 to 20.0 mA	0 mA
CrH3	<input type="checkbox"/> [AI3 max. value]	0 to 20.0 mA	20.0 mA
A I3F	<input type="checkbox"/> [AI3 filter] Interference filtering.	0 to 10.00 s	0 s
A I3L PDS nEG	<input type="checkbox"/> [AI3 range] <input type="checkbox"/> [0 - 100%] (POS) : Unidirectional input <input type="checkbox"/> [+/- 100%] (nEG) : Bidirectional input Example: On a 4 - 20 mA input - 4 mA corresponds to reference -100% - 12 mA corresponds to reference 0% - 20 mA corresponds to reference + 100% Since AI3 is, in physical terms, a bidirectional input, the [+/- 100%] (nEG) configuration must only be used if the signal applied is unidirectional. A bidirectional signal is not compatible with a bidirectional configuration.		[0 - 100%] (POS)
A I3E	<input type="checkbox"/> [AI3 Interm. point X] Input delinearization point coordinate. • 0% corresponds to [Min value] (CrL3) if the range is 0 → 100%. • 0% corresponds to $\frac{\text{[AI3 max. value] (CrH3)} - \text{[AI3 min. value] (CrL3)}}{2}$ if the range is -100% → +100%. • 100% corresponds to [AI3 max. value] (CrH3) .	0 to 100%	0%
A I3S	<input type="checkbox"/> [AI3 Interm. point Y] Output delinearization point coordinate (frequency reference).	0 to 100%	0%

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
A 14 -	■ [AI4 CONFIGURATION] Can be accessed if a VW3A3202 option card has been inserted		
A 14A	<input type="checkbox"/> [AI4 assignment] Read-only parameter, cannot be configured. It displays all the functions associated with input AI4 in order to check, for example, for compatibility problems.		
A 14E 10U 0A	<input type="checkbox"/> [AI4 Type] <input type="checkbox"/> [Voltage] (10U): Voltage input <input type="checkbox"/> [Current] (0A): Current input		[Voltage] (10U)
C r L 4	<input type="checkbox"/> [AI4 min value] The parameter can be accessed if [AI4 Type] (AI4t) = [Current] (0A)	0 to 20.0 mA	0 mA
U I L 4	<input type="checkbox"/> [AI4 min value] The parameter can be accessed if [AI4 Type] (AI4t) = [Voltage] (10U)	0 to 10.0 V	0 V
C r H 4	<input type="checkbox"/> [AI4 max value] The parameter can be accessed if [AI4 Type] (AI4t) = [Current] (0A)	0 to 20.0 mA	20.0 mA
U I H 4	<input type="checkbox"/> [AI4 max value] The parameter can be accessed if [AI4 Type] (AI4t) = [Voltage] (10U)	0 to 10.0 V	10.0 V
A 14F	<input type="checkbox"/> [AI4 filter] Interference filtering.	0 to 10.00 s	0 s
A 14L P 05 n E G	<input type="checkbox"/> [AI4 range] <input type="checkbox"/> [0 - 100%] (POS): Unidirectional input <input type="checkbox"/> [+/- 100%] (nEG): Bidirectional input Example: On a 0/10 V input - 0 V corresponds to reference -100% - 5 V corresponds to reference 0% - 10 V corresponds to reference + 100%		[0 - 100%] (POS)
A 14E	<input type="checkbox"/> [AI4 Interm.point X] Input delinearization point coordinate. • 0% corresponds to [Min value] if the range is 0 → 100%. • 0% corresponds to $\frac{[\text{Max value}] + [\text{Min value}]}{2}$ if the range is -100% → + 100%. • 100% corresponds to [Max value].	0 to 100%	0%
A 145	<input type="checkbox"/> [AI4 Interm.point Y] Output delinearization point coordinate (frequency reference).	0 to 100%	0%

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
AU I -	■ [VIRTUAL AI1]		
A I C I	□ [AI net. channel]		[No] (nO)
n O	Virtual input. This parameter can also be accessed in the [PID REGULATOR] (Pid-) submenu page 193 . [No] (nO) : Not assigned (in this case, the virtual input does not appear in the analog input assignment parameters for the functions)		
Mdb	<input type="checkbox"/> [Modbus] (Mdb) : Integrated Modbus		
CAn	<input type="checkbox"/> [CANopen] (CAn) : Integrated CANopen		
nEt	<input type="checkbox"/> [Com. card] (nEt) : Communication card (if inserted)		
APP	<input type="checkbox"/> [C.Insid. card] (APP) : Controller Inside card (if inserted)		
	Scale: the value 8192 transmitted by this input is equivalent to 10 V on a 10 V input.		
	<div style="text-align: center;"> WARNING</div>		
	UNINTENDED EQUIPMENT OPERATION If the equipment switches to forced local mode (see page 262), the virtual input remains fixed at the last value transmitted. Do not use the virtual input and forced local mode in the same configuration. Failure to follow these instructions can result in death or serious injury.		

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

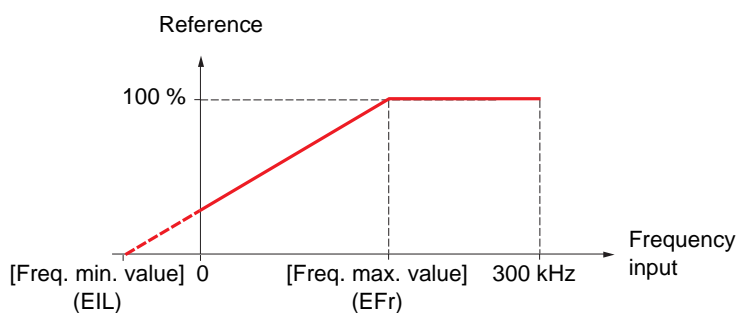
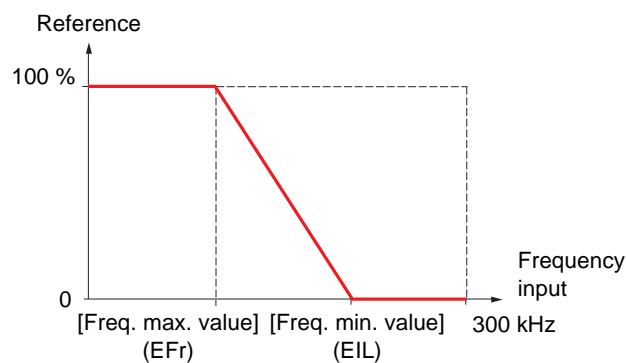
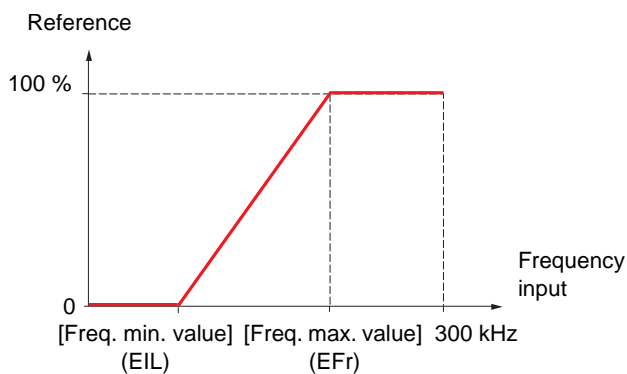
Code	Name/Description	Adjustment range	Factory setting
PL I -	■ [RP CONFIGURATION] Can be accessed if a VW3A3202 option card has been inserted		
P I R	□ [RP assignment] Read-only parameter, cannot be configured. It displays all the functions associated with the Pulse In input in order to check, for example, for compatibility problems.		
P I L	□ [RP min value] Frequency corresponding to the minimum speed	- 30.00 to 30.00 kHz	0
P F r	□ [RP max value] Frequency corresponding to the maximum speed	0 to 30.00 kHz	30.00 kHz
P F I	□ [RP filter] Interference filtering.	0 to 1000 ms	0

Configuration of the encoder input serving as a reference, with a frequency generator

This reference is not signed, therefore the directions of operation must be given via the control channel (logic inputs, for example).

Minimum and maximum values (input values):

The minimum value corresponds to a minimum reference of 0% and the maximum value to a maximum reference of 100%. The minimum value may be greater than the maximum value. It may also be negative.



A reference can be obtained at zero frequency by assigning a negative value to the minimum value.

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

The encoder configuration can also be accessed in the [1.4 MOTOR CONTROL] (drC-) menu.




Note 1: When an encoder is used with a VW3 A3 408 or VW3 A3 409 card, it is only possible to configure the "encoder" input for speed feedback. Functions can only be configured as references or inputs with a VW3 A3 401 to 407 or VW3 A3 411 card.

Note 2: When an encoder is used with a VW3 A3 409 card, the drive remains locked in stop mode (displays nSt or nLP) if the encoder is not fully configured.

Code	Name/Description	Adjustment range	Factory setting
IE n -	[ENCODER CONFIGURATION] The encoder parameters can only be accessed if an encoder card has been inserted, and the selections available will depend on the type of encoder card used.		
EnS	<input type="checkbox"/> [Encoder type] This parameter can be accessed if an incremental encoder card has been inserted. To be configured in accordance with the type of encoder used. <input type="checkbox"/> [AABB] (AAbb) : For signals A, A-, B, B- or A, A-, B, B-, Z, Z-. <input type="checkbox"/> [AB] (Ab) : For signals A, B. <input type="checkbox"/> [A] (A) : For signal A. Value cannot be accessed if [Encoder usage] (EnU) page 114 = [Spd fdk reg.] (rEG) .		[AABB] (AAbb)
EnC	<input type="checkbox"/> [Encoder check] Check encoder feedback. See procedure page 74. This parameter can be accessed if an encoder card has been inserted and if [Encoder usage] (EnU) page 114 is not [Speed ref.] (PGr) . <input type="checkbox"/> [Not done] (nO) : Check not performed. <input type="checkbox"/> [Yes] (YES) : Activates monitoring of the encoder. <input type="checkbox"/> [Done] (dOnE) : Check performed successfully. The check procedure checks: - The direction of rotation of the encoder/motor - The presence of signals (wiring continuity) - The number of pulses/revolution If a fault is detected, the drive locks in [Encoder fault] (EnF) fault mode.		[Not done] (nO)
EnU	<input type="checkbox"/> [Encoder usage] The parameter can be accessed if an encoder card has been inserted. <input type="checkbox"/> [No] (nO) : Function inactive. In this case, the other parameters cannot be accessed. <input type="checkbox"/> [Fdbk monit.] (SEC) : The encoder provides speed feedback for monitoring only. <input type="checkbox"/> [Spd fdk reg.] (rEG) : The encoder provides speed feedback for regulation and monitoring. This configuration is automatic if the drive is configured for closed-loop operation ([Motor control type] (Ctt) = [FVC] (FUC) or [Sync.CL] (FSY)). If [Motor control type] (Ctt) = [SVC V] (UUC) the encoder operates in speed feedback mode and enables static correction of the speed to be performed. This configuration is not accessible for other [Motor control type] (Ctt) values. <input type="checkbox"/> [Speed ref.] (PGr) : The encoder provides a reference. Can only be selected with an incremental encoder card.		[No] (nO)
EnrI	<input type="checkbox"/> [Coder rotation inv.] The parameter can be accessed if an encoder card has been inserted. Activation of coder rotation inversion. For some mountings, the direction of right-hand turn of the coder is reversed compare to that of the motor. In this case, the activation of this parameter is required to have a common direction of right-hand between the motor and the coder. <input type="checkbox"/> [No] (nO) : Inversion activated. <input type="checkbox"/> [Yes] (YES) : Inversion not activated		[No] (nO)

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
	■ [ENCODER CONFIGURATION] (continued)		
<i>P G I</i>	<input type="checkbox"/> [Number of pulses] Number of pulses per encoder revolution. This parameter can be accessed if a VW3 A3 401 to 407 card or VW3 A3 411 has been inserted.	100 to 1000	1024
<i>P G R</i> <i>E n C</i> <i>P t G</i>	<input type="checkbox"/> [Reference type] The parameter can be accessed if [Encoder usage] (EnU) = [Speed ref.] (PGr). <input type="checkbox"/> [Encoder] (EnC): Use of an encoder (incremental encoder only). <input type="checkbox"/> [Freq. gen.] (PtG): Use of a frequency generator (unsigned reference).		[Encoder] (EnC)
<i>E I L</i>	<input type="checkbox"/> [Freq. min. value] The parameter can be accessed if [Encoder usage] (EnU) = [Speed ref.] (PGr) and if [Reference type] (PGA) = [Freq. gen.] (PtG). Frequency corresponding to the minimum speed	- 300 to 300 kHz	0
<i>E F r</i>	<input type="checkbox"/> [Freq. max value] The parameter can be accessed if [Encoder usage] (EnU) = [Speed ref.] (PGr) and if [Reference type] (PGA) = [Freq. gen.] (PtG). Frequency corresponding to the maximum speed	0.00 to 300 kHz	300 kHz
<i>E F I</i>	<input type="checkbox"/> [Freq. signal filter] The parameter can be accessed if [Encoder usage] (EnU) = [Speed ref.] (PGr). Interference filtering.	0 to 1000 ms	0
<i>F r E S</i> <i>4</i> <i>8</i> <i>12</i>	<input type="checkbox"/> [Resolver Exct. Freq.] Resolver excitation frequency. The parameter can be accessed if a VW3 A3 408 encoder card (for resolver) has been inserted. <input type="checkbox"/> [4 kHz] (4): 4 kHz <input type="checkbox"/> [8 kHz] (8): 8 kHz <input type="checkbox"/> [12 kHz] (12): 12 kHz		[8 kHz] (8)
<i>r P P n</i> <i>2 P</i> <i>4 P</i> <i>6 P</i> <i>8 P</i>	<input type="checkbox"/> [Resolver poles nbr] Number of resolver poles. The parameter can be accessed if a VW3 A3 408 encoder card (for resolver) has been inserted. <input type="checkbox"/> [2 poles] (2P): 2 poles, max. speed 7500 rpm <input type="checkbox"/> [4 poles] (4P): 4 poles, max. speed 3750 rpm <input type="checkbox"/> [6 poles] (6P): 6 poles, max. speed 2500 rpm <input type="checkbox"/> [8 poles] (8P): 8 poles, max. speed 1875 rpm  If the number of poles of the motor is not an integer multiple of the number of poles of the resolver, it is necessary to configure the parameter [Angle setting activ.] (AtA) = [Power On] (POn) or [Run order] (AUtO).		[2 poles] (2P)

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
	■ [ENCODER CONFIGURATION] (continued) These parameters can be accessed if a VW3 A3 409 encoder card has been inserted.		
UECP <i>Und</i> <i>End</i> SCHP SC SSI	<input type="checkbox"/> [Encoder protocol] Type of encoder used. <input type="checkbox"/> [Undefined] (Und): Not defined <input type="checkbox"/> [EnDat 2.1] (End): EnDat encoder <input type="checkbox"/> [Hiperface] (SCHP): Hiperface encoder <input type="checkbox"/> [SinCos] (SC): SinCos encoder <input type="checkbox"/> [SSI] (SSI): SSI encoder		[Undefined] (Und)
UECU <i>Und</i> SU 8U 12U	<input type="checkbox"/> [Encoder supply volt.] Rated voltage of encoder used. The parameter can be accessed if [Encoder protocol] (UECP) is not [Undefined] (Und). <input type="checkbox"/> [Undefined] (Und): Not defined <input type="checkbox"/> [5 volts] (5U): 5 Volts. Only possible value if [Encoder protocol] (UECP) = [EnDat 2.1] (End). <input type="checkbox"/> [8 volts] (8U): 8 Volts <input type="checkbox"/> [12 volts] (12U): 12 Volts To make any changes to this parameter with the integrated display terminal, press and hold down the "ENT" key for 2 s for the change to be taken into account. When using the graphic display terminal, confirmation is requested.		[Undefined] (Und)
UELC <i>Und</i> -	<input type="checkbox"/> [Sincos lines count] Number of lines. This parameter can be accessed if [Encoder protocol] (UECP) = [SinCos] (SC). <input type="checkbox"/> [Undefined] (Und): Not defined <input type="checkbox"/> 1 to 10000: 1 to 10,000 lines		[Undefined] (Und)
SSCP <i>Und</i> <i>nO</i> <i>Odd</i> EUEn	<input type="checkbox"/> [SSI parity] Parity. This parameter can be accessed if [Encoder protocol] (UECP) = [SSI] (SSI). <input type="checkbox"/> [Undefined] (Und): Not defined <input type="checkbox"/> [No parity] (nO): No parity <input type="checkbox"/> [Odd parity] (Odd): Odd parity <input type="checkbox"/> [Even parity] (EUEn): Even parity		[Undefined] (Und)
SSFS <i>Und</i> -	<input type="checkbox"/> [SSI frame size] Frame length (number of bits). This parameter can be accessed if [Encoder protocol] (UECP) = [SSI] (SSI). <input type="checkbox"/> [Undefined] (Und): Not defined. Only possible value if [SSI parity] (SSCP) = [No parity] (nO). <input type="checkbox"/> 10 to 27: 10 to 25 if [SSI parity] (SSCP) = [No parity] (nO). 12 to 27 if [SSI parity] (SSCP) = [Odd parity] (Odd) or [Even parity] (EUEn).		[Undefined] (Und)
EnMr <i>Und</i> -	<input type="checkbox"/> [Nbr of revolution] Format of the number of revolutions (in number of bits). This parameter can be accessed if [Encoder protocol] (UECP) = [SSI] (SSI). <input type="checkbox"/> [Undefined] (Und): Not defined. Only possible value if [SSI frame size] (SSFS) = [Undefined] (Und). <input type="checkbox"/> 0 to 15: 0 to [SSI frame size] (SSFS) - 10 if [SSI parity] (SSCP) = [No parity] (nO). 0 to [SSI frame size] (SSFS) - 12 if [SSI parity] (SSCP) = [Odd parity] (Odd) or [Even parity] (EUEn).		[Undefined] (Und)
EnMr <i>Und</i> -	<input type="checkbox"/> [Turn bit resolution] Resolution per revolution (in number of bits). This parameter can be accessed if [Encoder protocol] (UECP) = [SSI] (SSI). <input type="checkbox"/> [Undefined] (Und): Not defined. Only value possible if [Nbr of revolution] (EnMr) = [Undefined] (Und). <input type="checkbox"/> 10 to 25: If [SSI parity] (SSCP) = [No parity] (nO), the maximum value is: [SSI frame size] (SSFS) - [Nbr of revolution] (EnMr). If [SSI parity] (SSCP) = [Odd parity] (Odd) or [Even parity] (EUEn), the maximum value is: [SSI frame size] (SSFS) - [Nbr of revolution] (EnMr) - 2.		[Undefined] (Und)

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
	■ [ENCODER CONFIGURATION] (continued) These parameters can be accessed if a VW3 A3 409 encoder card has been inserted.		
SSCd	<input type="checkbox"/> [SSI code type] Type of code. This parameter can be accessed if [Encoder protocol] (UECP) = [SSI] (SSI). <input type="checkbox"/> [Undefined] (Und): Not defined <input type="checkbox"/> [Binary code] (bIn): Binary code <input type="checkbox"/> [Gray code] (GrAY): Gray code		[Undefined] (Und)
EnSP	<input type="checkbox"/> [Clock frequency] The parameter can be accessed if [ACCESS LEVEL] = [Expert] and if [Encoder protocol] (UECP) = [SSI] (SSI) or if [Encoder protocol] (UECP) = [EnDat 2.1] (End). Clock frequency for encoder "Endat" and encoder SSI. <input type="checkbox"/> [160 kHz] (160) <input type="checkbox"/> [200 kHz] (200) <input type="checkbox"/> [300 kHz] (300) <input type="checkbox"/> [400 kHz] (400) <input type="checkbox"/> [500 kHz] (500) <input type="checkbox"/> [600 kHz] (600) <input type="checkbox"/> [700 kHz] (700) <input type="checkbox"/> [800 kHz] (800)		[500 kHz] (500)

Code	Name/Description	Adjustment range	Factory setting
	■ [ENCODER CONFIGURATION] (continued) These parameters can only be accessed when [ACCESS LEVEL] = [Expert] and an encoder card has been inserted.		
FFA	<input type="checkbox"/> [Encoder filter activ.] Activation of encoder feedback filter. <input type="checkbox"/> [No] (no): Filter deactivated <input type="checkbox"/> [Yes] (YES): Filter activated		[No] (nO)
FFr	<input type="checkbox"/> [Encoder filter value] This parameter can be accessed if [Encoder filter activ.] (FFA) = [Yes] (YES). Encoder feedback filter time constant in milliseconds. This parameter can be modified during operation.	0 to 50 ms	Acc. to encoder type

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
r I -	■ [R1 CONFIGURATION]		
r I	<input type="checkbox"/> [R1 Assignment]		[No drive flt] (FLt)
n O	<input type="checkbox"/> [No] (nO): Not assigned		
FLt	<input type="checkbox"/> [No drive flt] (FLt): Drive not faulty (relay normally energized, and de-energized if there is a fault)		
r Un	<input type="checkbox"/> [Drv running] (rUn): Drive running		
FtA	<input type="checkbox"/> [Freq. Th. attain.] (FtA): Frequency threshold attained ([Freq. threshold] (Ftd) page 68)		
FLA	<input type="checkbox"/> [HSP attain.] (FLA): High speed attained		
CtA	<input type="checkbox"/> [I attained] (CtA): Current threshold attained ([Current threshold] (Ctd) page 67)		
SrA	<input type="checkbox"/> [Freq.ref.att] (SrA): Frequency reference attained		
tSA	<input type="checkbox"/> [Th.mot. att.] (tSA): Motor 1 thermal state attained		
PEE	<input type="checkbox"/> [PID error al] (PEE): PID error alarm		
PFA	<input type="checkbox"/> [PID fdbk al] (PFA): PID feedback alarm		
AP2	<input type="checkbox"/> [AI2 Al. 4-20] (AP2): Alarm indicating absence of 4-20 mA signal on input A12		
F2A	<input type="checkbox"/> [Freq. Th 2 attain.] (F2A): Frequency threshold 2 attained ([Freq. threshold 2] (F2d) page 68)		
tAd	<input type="checkbox"/> [Th. drv. att.] (tAd): Drive thermal state attained		
rSdA	<input type="checkbox"/> [Rope slack] (rSdA): Rope slack (see [Rope slack config.] (rSd) parameter page 188)		
ttHA	<input type="checkbox"/> [High tq. att.] (ttHA): Motor torque overshooting high threshold[High torque thd.] (ttH) page 67.		
ttLA	<input type="checkbox"/> [Low tq. att.] (ttLA): Motor torque undershooting low threshold[Low torque thd.] (ttL) page 67.		
MFrd	<input type="checkbox"/> [Forward] (MFrd): Motor in forward rotation		
MrrS	<input type="checkbox"/> [Reverse] (MrrS): Motor in reverse rotation		
tS2	<input type="checkbox"/> [Th.mot2 att] (tS2): Motor 2 thermal state attained		
tS3	<input type="checkbox"/> [Th.mot3 att] (tS3): Motor 3 thermal state attained		
AtS	<input type="checkbox"/> [Neg Torque] (AtS): Negative torque (braking)		
CnF0	<input type="checkbox"/> [Cnfg.0 act.] (CnF0): Configuration 0 active		
CnF1	<input type="checkbox"/> [Cnfg.1 act.] (CnF1): Configuration 1 active		
CnF2	<input type="checkbox"/> [Cnfg.2 act.] (CnF2): Configuration 2 active		
CFP1	<input type="checkbox"/> [Set 1 active] (CFP1): Parameter set 1 active		
CFP2	<input type="checkbox"/> [Set 2 active] (CFP2): Parameter set 2 active		
CFP3	<input type="checkbox"/> [Set 3 active] (CFP3): Parameter set 3 active		
dbL	<input type="checkbox"/> [DC charged] (dbL): DC bus charging		
brS	<input type="checkbox"/> [In braking] (brS): Drive braking		
PRM	<input type="checkbox"/> [P. removed] (PRM): Drive locked by "Power removal" input		
FqLA	<input type="checkbox"/> [Fr.met. alar.] (FqLA): Measured speed threshold attained: [Pulse warning thd.] (FqL) page 68.		
MCP	<input type="checkbox"/> [I present] (MCP): Motor current present		
LSA	<input type="checkbox"/> [Limit sw. att] (LSA): Limit switch attained		
dLdA	<input type="checkbox"/> [Load alarm] (dLdA): Load variation detection (see page 255).		
AG1	<input type="checkbox"/> [Alarm Grp 1] (AG1): Alarm group 1		
AG2	<input type="checkbox"/> [Alarm Grp 2] (AG2): Alarm group 2		
AG3	<input type="checkbox"/> [Alarm Grp 3] (AG3): Alarm group 3		
P1A	<input type="checkbox"/> [PTC1 alarm] (P1A): Probe alarm 1		
P2A	<input type="checkbox"/> [PTC2 alarm] (P2A): Probe alarm 2		
PLA	<input type="checkbox"/> [LI6=PTC al.] (PLA): LI6 = PTC probe alarm		
EFA	<input type="checkbox"/> [Ext. fault al] (EFA): External fault alarm		
USA	<input type="checkbox"/> [Under V. al.] (USA): Undervoltage alarm		
UPA	<input type="checkbox"/> [Uvolt warn] (UPA): Undervoltage warning		
AnA	<input type="checkbox"/> [slipping al.] (AnA): Slipping alarm		
tHA	<input type="checkbox"/> [Al. °C drv] (tHA): Drive overheating		
bSA	<input type="checkbox"/> [Load mvt al] (bSA): Braking speed alarm		
bCA	<input type="checkbox"/> [Brk cont. al] (bCA): Brake contact alarm		
SSA	<input type="checkbox"/> [Lim T/I att.] (SSA): Torque limit alarm		
rtA	<input type="checkbox"/> [Trq. ctrl. al.] (rtA): Torque control alarm		
tJA	<input type="checkbox"/> [IGBT al.] (tJA): IGBT alarm		
boA	<input type="checkbox"/> [Brake R. al.] (boA): Braking resistor temperature alarm		
APA	<input type="checkbox"/> [Option al.] (APA): Alarm generated by the Controller Inside card.		
AP3	<input type="checkbox"/> [AI3 Al. 4-20] (AP3): Alarm indicating absence of 4-20 mA signal on input AI3		
AP4	<input type="checkbox"/> [AI4 Al. 4-20] (AP4): Alarm indicating absence of 4-20 mA signal on input AI4		
rdY	<input type="checkbox"/> [Ready] (rdY): Drive ready		

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
	■ [R1 CONFIGURATION] (continued)		
<i>r 1 d</i>	<input type="checkbox"/> [R1 Delay time] The change in state only takes effect once the configured time has elapsed, when the information becomes true. The delay cannot be set for the [No drive flt] (FLt) assignment, and remains at 0.	0 to 9999 ms	0
<i>r 1 S</i> <i>P O S</i> <i>n E G</i>	<input type="checkbox"/> [R1 Active at] Configuration of the operating logic: <input type="checkbox"/> [1] (POS) : State 1 when the information is true <input type="checkbox"/> [0] (nEG) : State 0 when the information is true Configuration [1] (POS) cannot be modified for the [No drive flt] (FLt) assignment.		[1] (POS)
<i>r 1 H</i>	<input type="checkbox"/> [R1 Holding time] The change in state only takes effect once the configured time has elapsed, when the information becomes false. The holding time cannot be set for the [No drive flt] (FLt) assignment, and remains at 0.	0 to 9999 ms	0
<i>r 2 -</i>	■ [R2 CONFIGURATION]		
<i>r 2</i> <i>b L C</i> <i>L L C</i> <i>O C C</i> <i>E b O</i> <i>t S Y</i> <i>d C O</i>	<input type="checkbox"/> [R2 Assignment] Identical to R1 (see page 118) with the addition of (shown for information only as these selections can only be configured in the [1.7 APPLICATION FUNCT.] (Fun-) menu): <input type="checkbox"/> [Brk control] (bLC) : Brake contactor control <input type="checkbox"/> [Input cont.] (LLC) : Line contactor control <input type="checkbox"/> [Output cont.] (OCC) : Output contactor control <input type="checkbox"/> [End reel] (EbO) : End of reel(traverse control function) <input type="checkbox"/> [Sync. wobble] (tSY) : "Counter wobble" synchronization <input type="checkbox"/> [DC charging] (dCO) : DC bus precharging contactor control		[No] (nO)
<i>r 2 d</i>	<input type="checkbox"/> [R2 Delay time] The delay cannot be set for the [No drive flt] (FLt) , [Brk control] (bLC) , [Output cont.] (OCC) , [DC charging] (dCO) , and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
<i>r 2 S</i> <i>P O S</i> <i>n E G</i>	<input type="checkbox"/> [R2 Active at] Configuration of the operating logic: <input type="checkbox"/> [1] (POS) : State 1 when the information is true <input type="checkbox"/> [0] (nEG) : State 0 when the information is true The configuration [1] (POS) cannot be modified for the [No drive flt] (FLt) , [Brk control] (bLC) , [DC charging] (dCO) , and [Input cont.] (LLC) assignments.		[1] (POS)
<i>r 2 H</i>	<input type="checkbox"/> [R2 Holding time] The holding time cannot be set for the [No drive flt] (FLt) , [Brk control] (bLC) , [DC charging] (dCO) , and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
r 3 -	■ [R3 CONFIGURATION] Can be accessed if a VW3A3201 option card has been inserted		
r 3	<input type="checkbox"/> [R3 Assignment] Identical to R2		[No] (nO)
r 3 d	<input type="checkbox"/> [R3 Delay time] The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
r 3 S P O S n E G	<input type="checkbox"/> [R3 Active at] Configuration of the operating logic: <input type="checkbox"/> [1] (POS): State 1 when the information is true <input type="checkbox"/> [0] (nEG): State 0 when the information is true The configuration [1] (POS) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments.		[1] (POS)
r 3 H	<input type="checkbox"/> [R3 Holding time] The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0
r 4 -	■ [R4 CONFIGURATION] Can be accessed if a VW3A3202 option card has been inserted		
r 4	<input type="checkbox"/> [R4 Assignment] Identical to R2 (see page 119)		[No] (nO)
r 4 d	<input type="checkbox"/> [R4 Delay time] The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
r 4 S P O S n E G	<input type="checkbox"/> [R4 Active at] Configuration of the operating logic: <input type="checkbox"/> [1] (POS): State 1 when the information is true <input type="checkbox"/> [0] (nEG): State 0 when the information is true The configuration [1] (POS) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments.		[1] (POS)
r 4 H	<input type="checkbox"/> [R4 Holding time] The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
LO1-	■ [LO1 CONFIGURATION] Can be accessed if a VW3A3201 option card has been inserted		
LO1 bLC LLC OCC EOO tSY dCO	<input type="checkbox"/> [LO1 assignment] Identical to R1 (see page 118) with the addition of (shown for information only as these selections can only be configured in the [1.7 APPLICATION FUNCT.] (Fun-) menu): <input type="checkbox"/> [Brk control] (bLC): Brake contactor control <input type="checkbox"/> [Input cont.] (LLC): Line contactor control <input type="checkbox"/> [Output cont.] (OCC): Output contactor control <input type="checkbox"/> [End reel] (EOO): End of reel(traverse control function) <input type="checkbox"/> [Sync. wobble] (tSY): "Counter wobble" synchronization <input type="checkbox"/> [DC charging] (dCO): DC bus precharging contactor control		[No] (nO)
LO1d	<input type="checkbox"/> [LO1 delay time] The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
LO1S POS nEG	<input type="checkbox"/> [LO1 active at] Configuration of the operating logic: <input type="checkbox"/> [1] (POS): State 1 when the information is true <input type="checkbox"/> [0] (nEG): State 0 when the information is true The configuration [1] (POS) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments.		[1] (POS)
LO1H	<input type="checkbox"/> [LO1 holding time] The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0
LO2-	■ [LO2 CONFIGURATION] Can be accessed if a VW3A3201 option card has been inserted		
LO2	<input type="checkbox"/> [LO2 assignment] Identical to LO1.		[No] (nO)
LO2d	<input type="checkbox"/> [LO2 delay time] The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
LO2S POS nEG	<input type="checkbox"/> [LO2 active at] Configuration of the operating logic: <input type="checkbox"/> [1] (POS): State 1 when the information is true <input type="checkbox"/> [0] (nEG): State 0 when the information is true The configuration [1] (POS) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments.		[1] (POS)
LO2H	<input type="checkbox"/> [LO2 holding time] The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
L03 -	■ [LO3 CONFIGURATION] Can be accessed if a VW3A3202 option card has been inserted		
L03	<input type="checkbox"/> [LO3 assignment] Identical to LO1 (see page 121).		[No] (nO)
L03d	<input type="checkbox"/> [LO3 delay time] The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
L03S POS nEG	<input type="checkbox"/> [LO3 active at] Configuration of the operating logic: <input type="checkbox"/> [1] (POS): State 1 when the information is true <input type="checkbox"/> [0] (nEG): State 0 when the information is true The configuration [1] (POS) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments.		[1] (POS)
L03H	<input type="checkbox"/> [LO3 holding time] The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0
L04 -	■ [LO4 CONFIGURATION] Can be accessed if a VW3A3202 option card has been inserted		
L04	<input type="checkbox"/> [LO4 assignment] Identical to LO1 (see page 121).		[No] (nO)
L04d	<input type="checkbox"/> [LO4 delay time] The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
L04S POS nEG	<input type="checkbox"/> [LO4 active at] Configuration of the operating logic: <input type="checkbox"/> [1] (POS): State 1 when the information is true <input type="checkbox"/> [0] (nEG): State 0 when the information is true The configuration [1] (POS) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments.		[1] (POS)
L04H	<input type="checkbox"/> [LO4 holding time] The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Use of analog output AO1 as a logic output

Analog output AO1 can be used as a logic output, by assigning DO1. In this case, when set to 0 this output corresponds to the AO1 min. value (0 V or 0 mA, for example), and when set to 1 to the AO1 max. value (10 V or 20 mA, for example).

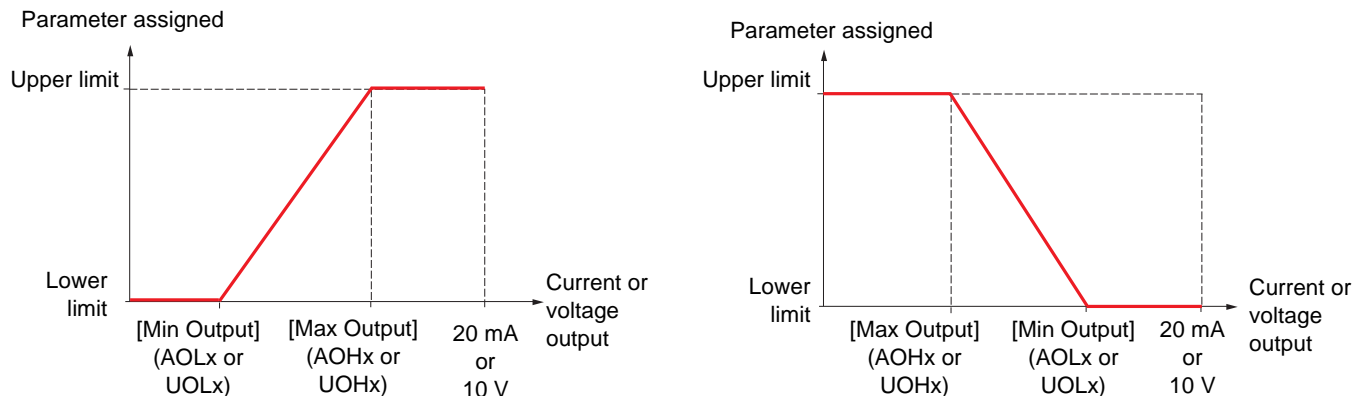
The electrical characteristics of this analog output remain unchanged. As these differ from logic output characteristics, it is important to ensure that they are compatible with the intended application.

Code	Name/Description	Adjustment range	Factory setting
DO I -	■ [DO1 CONFIGURATION]		
DO I bLC LLC OCC EbO tSY dCO	<input type="checkbox"/> [DO1 assignment] Identical to R1 (see page 118) with the addition of (shown for information only as these selections can only be configured in the [1.7 APPLICATION FUNCT.] (Fun-) menu): <input type="checkbox"/> [Brk control] (bLC): Brake contactor control <input type="checkbox"/> [Input cont.] (LLC): Line contactor control <input type="checkbox"/> [Output cont.] (OCC): Output contactor control <input type="checkbox"/> [End reel] (EbO): End of reel(traverse control function) <input type="checkbox"/> [Sync. wobble] (tSY): "Counter wobble" synchronization <input type="checkbox"/> [DC charging] (dCO): DC bus precharging contactor control		[No] (nO)
DO Id	<input type="checkbox"/> [DO1 delay time] The delay cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [Output cont.] (OCC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes true.	0 to 9999 ms	0
DO IS POS nEG	<input type="checkbox"/> [DO1 active at] Configuration of the operating logic: <input type="checkbox"/> [1] (POS): State 1 when the information is true <input type="checkbox"/> [0] (nEG): State 0 when the information is true The configuration [1] (POS) cannot be modified for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments.		[1] (POS)
DO IH	<input type="checkbox"/> [DO1 holding time] The holding time cannot be set for the [No drive flt] (FLt), [Brk control] (bLC), [DC charging] (dCO), and [Input cont.] (LLC) assignments, and remains at 0. The change in state only takes effect once the configured time has elapsed, when the information becomes false.	0 to 9999 ms	0

Configuration of analog outputs

Minimum and maximum values (output values):

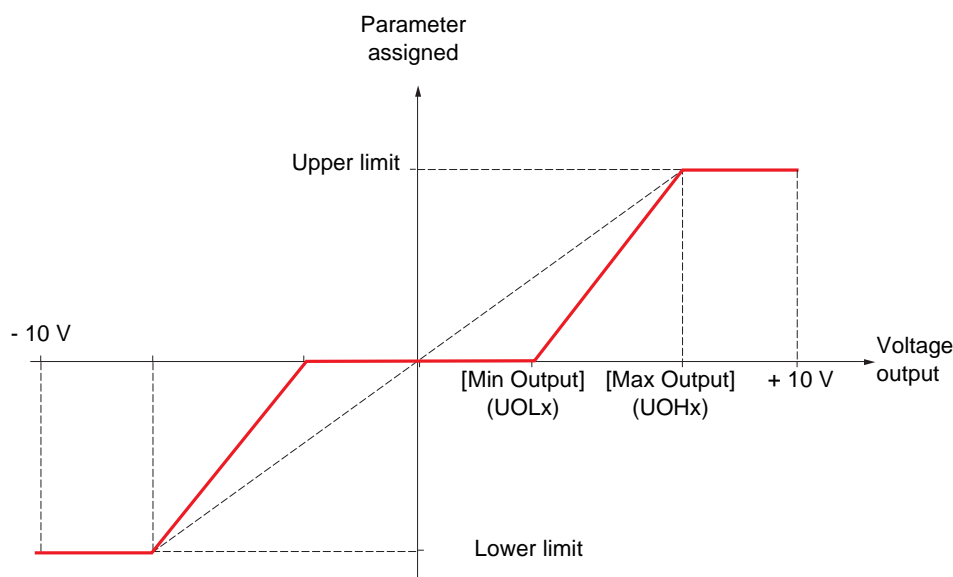
The minimum output value, in volts or mA, corresponds to the lower limit of the assigned parameter and the maximum value corresponds to its upper limit. The minimum value may be greater than the maximum value:



Outputs AO2 and AO3 configured as bipolar outputs (strongly recommended for signed parameters):

The [min Output] (UOLx) and [max Output] (UOHx) parameters are absolute values, although they function symmetrically. In the case of bipolar outputs, always set the maximum value higher than the minimum value.

The [max Output] (UOHx) corresponds to the upper limit of the assigned parameter, and the [min Output] (UOLx) corresponds to an average value between the upper and lower limits (0 for a signed and symmetrical parameter such as in the example below).



[1.5 INPUTS / OUTPUTS CFG] (I-O-)

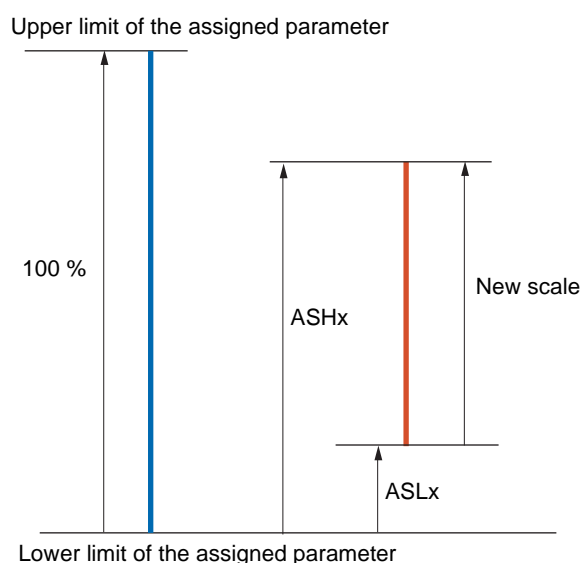
Scaling of the assigned parameter

The scale of the assigned parameter can be adapted in accordance with requirements by modifying the values of the lower and upper limits by means of two parameters for each analog output.

These parameters are given in %; 100% corresponds to the total variation range of the configured parameter, so:

- $100\% = \text{upper limit} - \text{lower limit}$ For example, [Sign. torque] (Stq) which varies between -3 and +3 times the rated torque, 100% corresponds to 6 times the rated torque.

- The parameter [Scaling AOx min] (ASLx) modifies the lower limit: $\text{new value} = \text{lower limit} + (\text{range} \times \text{ASLx})$. The value 0% (factory setting) does not modify the lower limit.
- The parameter [Scaling AOx max] (ASHx) modifies the upper limit: $\text{new value} = \text{lower limit} + (\text{range} \times \text{ASLx})$. The value 100% (factory setting) does not modify the upper limit.
- [Scaling AOx min] (ASLx) must always be lower than [Scaling AOx max] (ASHx).



Application example 1

The value of the signed motor torque at the AO2 output is to be transferred with +/- 10 V, with a range of -2 Tr to +2 Tr.

The parameter [Sign. torque.] (Stq) varies between -3 and +3 times the rated torque, or a range of 6 times the rated torque.

[Scaling AO2 min] (ASL2) must modify the lower limit by 1x the rated torque, or $100/6 = 16.7\%$ (new value = lower limit + (range x ASL2)).

[Scaling AO2 max] (ASH2) must modify the upper limit by 1x the rated torque, or $100 - 100/6 = 83.3\%$ (new value = lower limit + (range x ASH2)).

Application example 2

The value of the motor current at the AO2 output is to be transferred with 0 - 20 mA, range 2 In motor, In motor being the equivalent of a 0.8 In drive.

The parameter [I motor] (OCr) varies between 0 and 2 times the rated drive current, or a range of 2.5 times the rated drive current.

[Scaling AO2 min] (ASL2) must not modify the lower limit, which therefore remains at its factory setting of 0%.

[Scaling AO2 max] (ASH2) must modify the upper limit by 0.5x the rated motor torque, or $100 - 100/5 = 80\%$ (new value = lower limit + (range x ASH2)).

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
AO1-	[AO1 CONFIGURATION]		
AO1	<input type="checkbox"/> [AO1 assignment]		[No] (nO)
nO	<input type="checkbox"/> [No] (nO): Not assigned		
OCr	<input type="checkbox"/> [I motor] (OCr): Current in the motor, between 0 and 2 In (In = rated drive current indicated in the Installation Manual and on the drive nameplate).		
OFr	<input type="checkbox"/> [Motor freq.] (OFr): Output frequency, from 0 to [Max frequency] (tFr)		
OrP	<input type="checkbox"/> [Ramp out.] (OrP): From 0 to [Max frequency] (tFr)		
tFr	<input type="checkbox"/> [Motor torq.] (trq): Motor torque, between 0 and 3 times the rated motor torque.		
Stq	<input type="checkbox"/> [Sign. torque] (Stq): Signed motor torque, between -3 and +3 times the rated motor torque. The + sign corresponds to the motor mode and the - sign to the generator mode (braking).		
OrS	<input type="checkbox"/> [sign ramp] (OrS): Signed ramp output, between - [Max frequency] (tFr) and + [Max frequency] (tFr)		
OPS	<input type="checkbox"/> [PID ref.] (OPS): PID regulator reference between [Min PID reference] (PIF1) and [Max PID reference] (PIF2)		
OPF	<input type="checkbox"/> [PID feedback] (OPF): PID regulator feedback between [Min PID feedback] (PIF1) and [Max PID feedback] (PIF2)		
OPE	<input type="checkbox"/> [PID error] (OPE): PID regulator error between - 5 % and + 5 % of ([Max PID feedback] (PIF2) - [Min PID feedback] (PIF1))		
OPI	<input type="checkbox"/> [PID Output] (OPI): PID regulator output between [Low speed] (LSP) and [High speed] (HSP)		
OPr	<input type="checkbox"/> [Mot. power] (OPr): Motor power, between 0 and 2.5 times [Rated motor power] (nPr)		
tHr	<input type="checkbox"/> [Mot thermal] (tHr): Motor thermal state, between 0 and 200% of the rated thermal state.		
tHd	<input type="checkbox"/> [Drv thermal] (tHd): Drive thermal state, between 0 and 200% of the rated thermal state.		
tqMS	<input type="checkbox"/> [Torque 4Q] (tqMS): Signed motor torque, between -3 and +3 times the rated motor torque. The + sign and the - sign correspond to the physical direction of the torque, regardless of mode (motor or generator). Example of usage: "master-slave" with the TORQUE CONTROL (tOr-) function, page 199.		
OFrr	<input type="checkbox"/> [Meas.mot.fr] (OFrr): Measured motor speed.		
OFS	<input type="checkbox"/> [Sig. o/p frq.] (OFS): Signed output frequency, between - [Max frequency] (tFr) and + [Max frequency] (tFr)		
tHr2	<input type="checkbox"/> [Mot therm2] (tHr2): Motor thermal state 2, between 0 and 200 % of the rated thermal state.		
tHr3	<input type="checkbox"/> [Mot therm3] (tHr3): Motor thermal state 3, between 0 and 200% of the rated thermal state.		
Utr	<input type="checkbox"/> [Uns. TrqRef] (Utr): Torque reference, between 0 and 3 times the rated motor torque		
StL	<input type="checkbox"/> [Uns. TrqRef] (Utr): Signed torque reference, between - 3 and + 3 times the rated motor torque		
tqL	<input type="checkbox"/> [Torque lim.] (tqL): Torque limit, between 0 and 3 times the rated motor torque		
UOP	<input type="checkbox"/> [Motor volt.] (UOP): Voltage applied to the motor, between 0 and [Rated motor volt.] (UnS)		
dO1	<input type="checkbox"/> [dO1] (dO1): Assignment to a logic output. This assignment can only appear if [DO1 assignment] (dO1) page 123 has been assigned. This is the only possible choice in this case, and is only displayed for informational purposes.		
AO1t	<input type="checkbox"/> [AO1 Type]		[Current] (0A)
10U	<input type="checkbox"/> [Voltage] (10U): Voltage output		
0A	<input type="checkbox"/> [Current] (0A): Current output		
AO1L	<input type="checkbox"/> [AO1 min Output]	0 to 20.0 mA	0 mA
The parameter can be accessed if [AO1 Type] (AO1t) = [Current] (0A)			
AO1H	<input type="checkbox"/> [AO1 max Output]	0 to 20.0 mA	20.0 mA
The parameter can be accessed if [AO1 Type] (AO1t) = [Current] (0A)			
UO1L	<input type="checkbox"/> [AO1 min Output]	0 to 10.0 V	0 V
The parameter can be accessed if [AO1 Type] (AO1t) = [Voltage] (10U)			
UO1H	<input type="checkbox"/> [AO1 max Output]	0 to 10.0 V	10.0 V
The parameter can be accessed if [AO1 Type] (AO1t) = [Voltage] (10U)			

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
AD I -	■ [AO1 CONFIGURATION] (continued)		
ASL I	<input type="checkbox"/> [Scaling AO1 min] Scaling of the lower limit of the assigned parameter, as a % of the maximum possible variation.	0 to 100.0 %	0 %
ASH I	<input type="checkbox"/> [Scaling AO1 max] Scaling of the upper limit of the assigned parameter, as a % of the maximum possible variation.	0 to 100.0 %	100.0 %
AD IF	<input type="checkbox"/> [AO1 Filter] Interference filtering. This parameter is forced to 0 if [AO1 assignment] (AO1) = [dO1] (dO1).	0 to 10.00 s	0 s

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
AO2 -	■ [AO2 CONFIGURATION] Can be accessed if a VW3A3202 option card has been inserted		
AO2	<input type="checkbox"/> [AO2 assignment] Same assignments as AO1, without [dO1] (dO1).		[No] (nO)
AO2t 10U 0A n 10U	<input type="checkbox"/> [AO2 Type] <input type="checkbox"/> [Voltage] (10U): Voltage output <input type="checkbox"/> [Current] (0A): Current output <input type="checkbox"/> [Voltage +/-] (n10U): Bipolar voltage output.		[Current] (0A)
AO2L	<input type="checkbox"/> [AO2 min Output] The parameter can be accessed if [AO2 Type] (AO2t) = [Current] (0A)	0 to 20.0 mA	0 mA
AO2H	<input type="checkbox"/> [AO2 max Output] The parameter can be accessed if [AO2 Type] (AO2t) = [Current] (0A)	0 to 20.0 mA	20.0 mA
UO2L	<input type="checkbox"/> [AO2 min Output] The parameter can be accessed if [AO2 Type] (AO2t) = [Voltage] (10U) or [Voltage +/-] (n10U)	0 to 10.0 V	0 V
UO2H	<input type="checkbox"/> [AO2 max Output] The parameter can be accessed if [AO2 Type] (AO2t) = [Voltage] (10U) or [Voltage +/-] (n10U)	0 to 10.0 V	10.0 V
AS2L	<input type="checkbox"/> [Scaling AO2 min] Scaling of the lower limit of the assigned parameter, as a % of the maximum possible variation.	0 to 100.0 %	0 %
AS2H	<input type="checkbox"/> [Scaling AO2 max] Scaling of the upper limit of the assigned parameter, as a % of the maximum possible variation.	0 to 100.0 %	100.0 %
AO2F	<input type="checkbox"/> [AO2 Filter] Interference filtering.	0 to 10.00 s	0 s

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

Code	Name/Description	Adjustment range	Factory setting
AO3-	■ [AO3 CONFIGURATION] Can be accessed if a VW3A3202 option card has been inserted		
AO3	<input type="checkbox"/> [AO3 assignment] Same assignments as AO1, without [dO1] (dO1).		[No] (nO)
AO3t 10U 0A n 10U	<input type="checkbox"/> [AO3 Type] <input type="checkbox"/> [Voltage] (10U): Voltage output <input type="checkbox"/> [Current] (0A): Current output <input type="checkbox"/> [Voltage +/-] (n10U): Bipolar voltage output.		[Current] (0A)
AO3L	<input type="checkbox"/> [AO3 min Output] The parameter can be accessed if [AO3 Type] (AO3t) = [Current] (0A)	0 to 20.0 mA	0 mA
AO3H	<input type="checkbox"/> [AO3 max Output] The parameter can be accessed if [AO3 Type] (AO3t) = [Current] (0A)	0 to 20.0 mA	20.0 mA
UO3L	<input type="checkbox"/> [AO3 min Output] The parameter can be accessed if [AO3 Type] (AO3t) = [Voltage] (10U) or [Voltage +/-] (n10U)	0 to 10.0 V	0 V
UO3H	<input type="checkbox"/> [AO3 max Output] The parameter can be accessed if [AO3 Type] (AO3t) = [Voltage] (10U) or [Voltage +/-] (n10U)	0 to 10.0 V	10.0 V
AS3L	<input type="checkbox"/> [Scaling AO3 min] Scaling of the lower limit of the assigned parameter, as a % of the maximum possible variation.	0 to 100.0 %	0 %
AS3H	<input type="checkbox"/> [Scaling AO3 max] Scaling of the upper limit of the assigned parameter, as a % of the maximum possible variation.	0 to 100.0 %	100.0 %
AO3F	<input type="checkbox"/> [AO3 Filter] Interference filtering.	0 to 10.00 s	0 s

[1.5 INPUTS / OUTPUTS CFG] (I-O-)

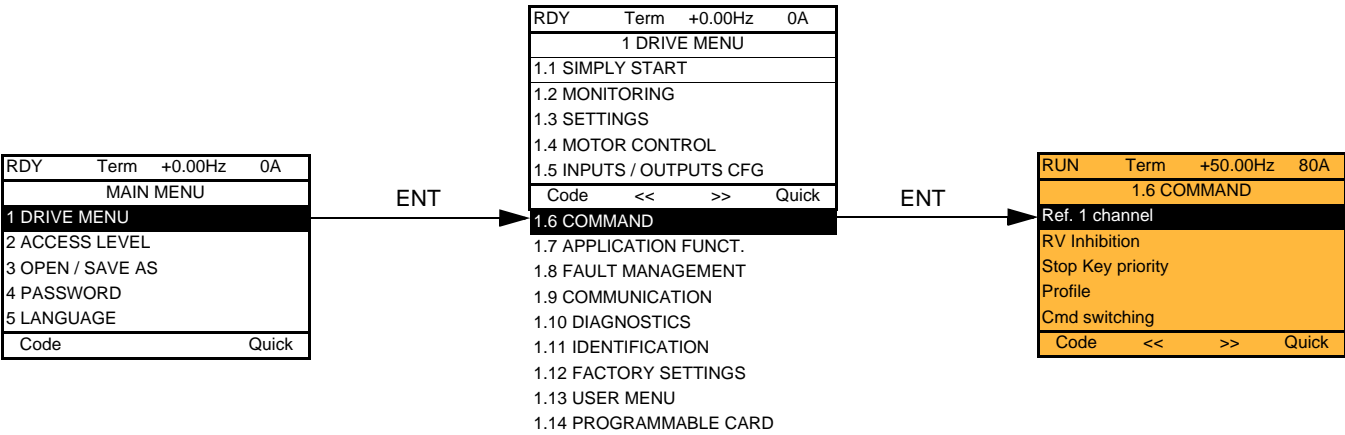
The following submenus group the alarms into 1 to 3 groups, each of which can be assigned to a relay or a logic output for remote signaling. These groups can also be displayed on the graphic display terminal (see [6 MONITORING CONFIG.] menu) and viewed via the [1.2 MONITORING] (SUP) menu.

When one or a number of alarms selected in a group occurs, this alarm group is activated.

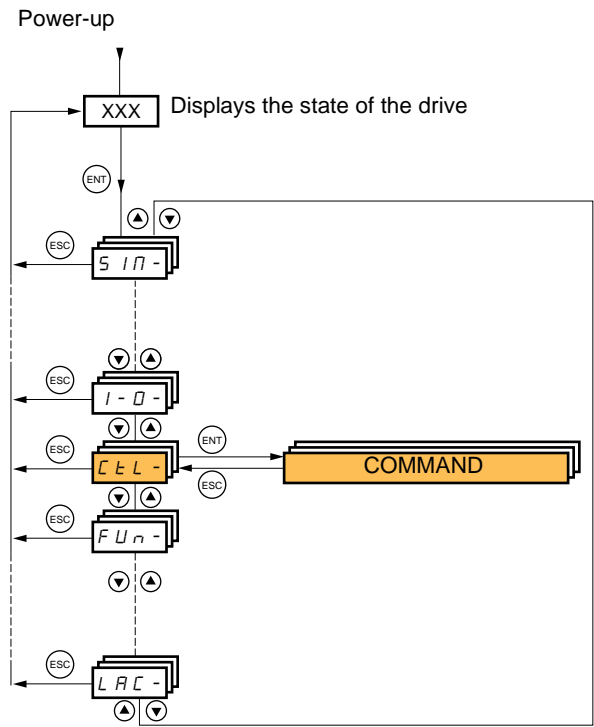
Code	Name/Description	Adjustment range	Factory setting
A1C -	■ [ALARM GRP1 DEFINITION]		
	Selection to be made from the following list:		
<i>PLA</i>	<input type="checkbox"/> [LI6=PTC al.] (PLA): LI6 = PTC probe alarm		
<i>P1A</i>	<input type="checkbox"/> [PTC1 alarm] (P1A): Probe alarm 1		
<i>P2A</i>	<input type="checkbox"/> [PTC2 alarm] (P2A): Probe alarm 2		
<i>EFA</i>	<input type="checkbox"/> [Ext. fault al.] (EFA): External fault alarm		
<i>USA</i>	<input type="checkbox"/> [Under V. al.] (USA): Undervoltage alarm		
<i>AnA</i>	<input type="checkbox"/> [slipping al.] (AnA): Slipping alarm		
<i>CtA</i>	<input type="checkbox"/> [I attained] (CtA): Current threshold attained ([Current threshold] (Ctd) page 67)		
<i>FtA</i>	<input type="checkbox"/> [Freq.Th.att.] (FtA): Frequency threshold attained ([Freq. threshold] (Ftd) page 68)		
<i>F2A</i>	<input type="checkbox"/> [Freq. Th. 2 attain.] (F2A): Frequency threshold 2 attained ([Freq. Th. 2 attain] (F2d) page 68)		
<i>SrA</i>	<input type="checkbox"/> [Freq.ref.att] (SrA): Frequency reference attained		
<i>tSA</i>	<input type="checkbox"/> [Th.mot. att.] (tSA): Motor 1 thermal state attained		
<i>tS2</i>	<input type="checkbox"/> [Th.mot2 att] (tS2): Motor 2 thermal state attained		
<i>tS3</i>	<input type="checkbox"/> [Th.mot3 att] (tS3): Motor 3 thermal state attained		
<i>UPA</i>	<input type="checkbox"/> [Uvolt warn] (UPA): Undervoltage warning		
<i>FLA</i>	<input type="checkbox"/> [HSP attain.] (FLA): High speed attained		
<i>tHA</i>	<input type="checkbox"/> [Al. °C drv] (tHA): Drive overheating		
<i>bSA</i>	<input type="checkbox"/> [Load mvt al] (bSA): Braking speed alarm		
<i>bCA</i>	<input type="checkbox"/> [Brk cont. al] (bCA): Brake contact alarm		
<i>PEE</i>	<input type="checkbox"/> [PID error al] (PEE): PID error alarm		
<i>PFA</i>	<input type="checkbox"/> [PID fdbk al.] (PFA): PID feedback alarm		
<i>AP2</i>	<input type="checkbox"/> [AI2 Al. 4-20] (AP2): Alarm indicating absence of 4-20 mA signal on input AI2		
<i>AP3</i>	<input type="checkbox"/> [AI3 Al. 4-20] (AP3): Alarm indicating absence of 4-20 mA signal on input AI3		
<i>AP4</i>	<input type="checkbox"/> [AI4 Al. 4-20] (AP4): Alarm indicating absence of 4-20 mA signal on input AI4		
<i>SSA</i>	<input type="checkbox"/> [Lim T/I att.] (SSA): Torque limit alarm		
<i>tAd</i>	<input type="checkbox"/> [Th. drv. att.] (tAd): Drive thermal state attained		
<i>tJA</i>	<input type="checkbox"/> [IGBT alarm] (tJA): IGBT alarm		
<i>rtA</i>	<input type="checkbox"/> [Torque Control al.] (rtA): Torque control alarm		
<i>bOA</i>	<input type="checkbox"/> [Brake R. al.] (bOA): Braking resistor temperature alarm		
<i>APA</i>	<input type="checkbox"/> [Option al.] (APA): Alarm generated by an option card.		
<i>UrA</i>	<input type="checkbox"/> [Regen. underV. al.] (UrA): Reserved.		
<i>rSdA</i>	<input type="checkbox"/> [Rope slack alarm] (rSdA): Rope slack (see [Rope slack config.] (rSd) parameter page 188)		
<i>ttHA</i>	<input type="checkbox"/> [High torque alarm] (ttHA): Motor torque overshooting high threshold [High torque thd.] (ttH) page 67.		
<i>ttLA</i>	<input type="checkbox"/> [Low torque alarm] (ttLA): Motor torque undershooting low threshold [Low torque thd.] (ttL) page 67.		
<i>FqLA</i>	<input type="checkbox"/> [Freq. meter Alarm] (FqLA): Measured speed threshold attained: [Pulse warning thd.] (FqL) page 68.		
<i>dLdA</i>	<input type="checkbox"/> [Dynamic load alarm] (dLdA): Load variation detection (see [DYNAMIC LOAD DETECT.] (dLd-) page 255).		
	See the multiple selection procedure on page 30 for the integrated display terminal, and page 21 for the graphic display terminal.		
A2C -	■ [ALARM GRP2 DEFINITION]		
	Identical to [ALARM GRP1 DEFINITION] (A1C-)		
A3C -	■ [ALARM GRP3 DEFINITION]		
	Identical to [ALARM GRP1 DEFINITION] (A1C-)		

[1.6 COMMAND] (CtL-)

With graphic display terminal:



With integrated display terminal:



[1.6 COMMAND] (CtL-)

The parameters in the [1.6 COMMAND] (CtL-) menu can only be modified when the drive is stopped and no run command is present.

Command and reference channels

Run commands (forward, reverse, stop, etc.) and references can be sent using the following channels:

Control	Reference
<ul style="list-style-type: none">• Terminals: logic inputs LI• Graphic display terminal• Integrated Modbus• Integrated CANopen• Communication card• Controller Inside card	<ul style="list-style-type: none">• Terminals: analog inputs AI, frequency input, encoder• Graphic display terminal• Integrated Modbus• Integrated CANopen• Communication card• Controller Inside card• +/- speed via the terminals• +/- speed via the graphic display terminal

The behavior of the Altivar 71 can be adapted according to requirements:

- [8 serie] (SE8): To replace an Altivar 58. See the Migration Manual.
- [Not separ.] (SIM): Command and reference are sent via the same channel.
- [Separate] (SEP): Command and reference may be sent via different channels.

In these configurations, control via the communication bus is performed in accordance with the DRIVECOM standard with only 5 freely-assignable bits (see Communication Parameters Manual). The application functions cannot be accessed via the communication interface.

- [I/O profile] (IO): The command and the reference can come from different channels. This configuration both simplifies and extends use via the communication interface.
Commands may be sent via the logic inputs on the terminals or via the communication bus.
When commands are sent via a bus, they are available on a word, which acts as virtual terminals containing only logic inputs.
Application functions can be assigned to the bits in this word. More than one function can be assigned to the same bit.



Note: Stop commands from the terminals remain active even if the terminals are not the active command channel.



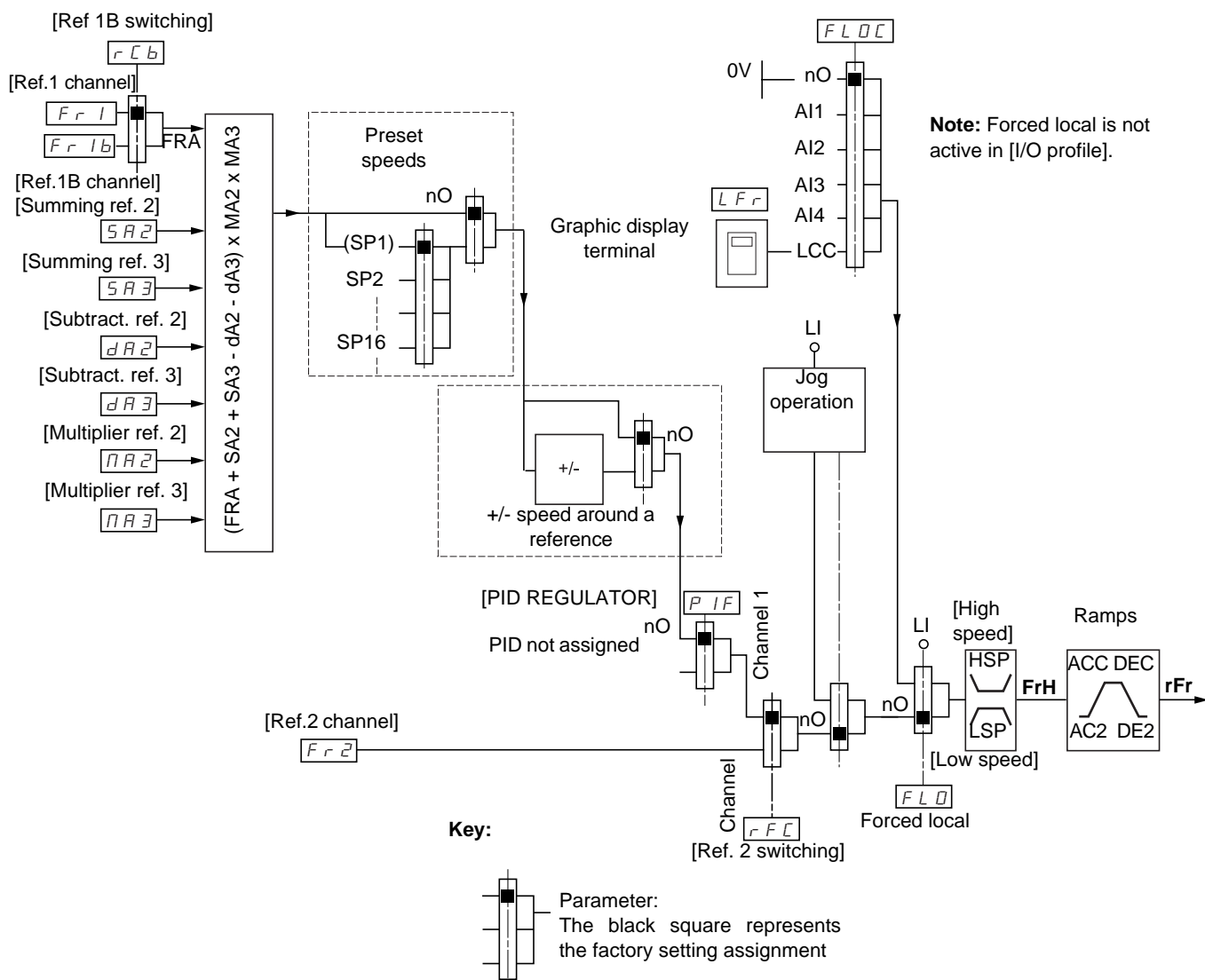
Note: The integrated Modbus channel has 2 physical communication ports:

- The Modbus network port
- The Modbus HMI port

The drive does not differentiate between these two ports, but recognizes the graphic display terminal irrespective of the port to which it is connected.

[1.6 COMMAND] (CtL-)

Reference channel for [Not separ.] (SIM), [Separate] (SEP) and [I/O profile] (IO) configurations, PID not configured



Instructions

Fr1, SA2, SA3, dA2, dA3, MA2, MA3:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card

Fr1b, for SEP and IO:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card

Fr1b, for SIM:

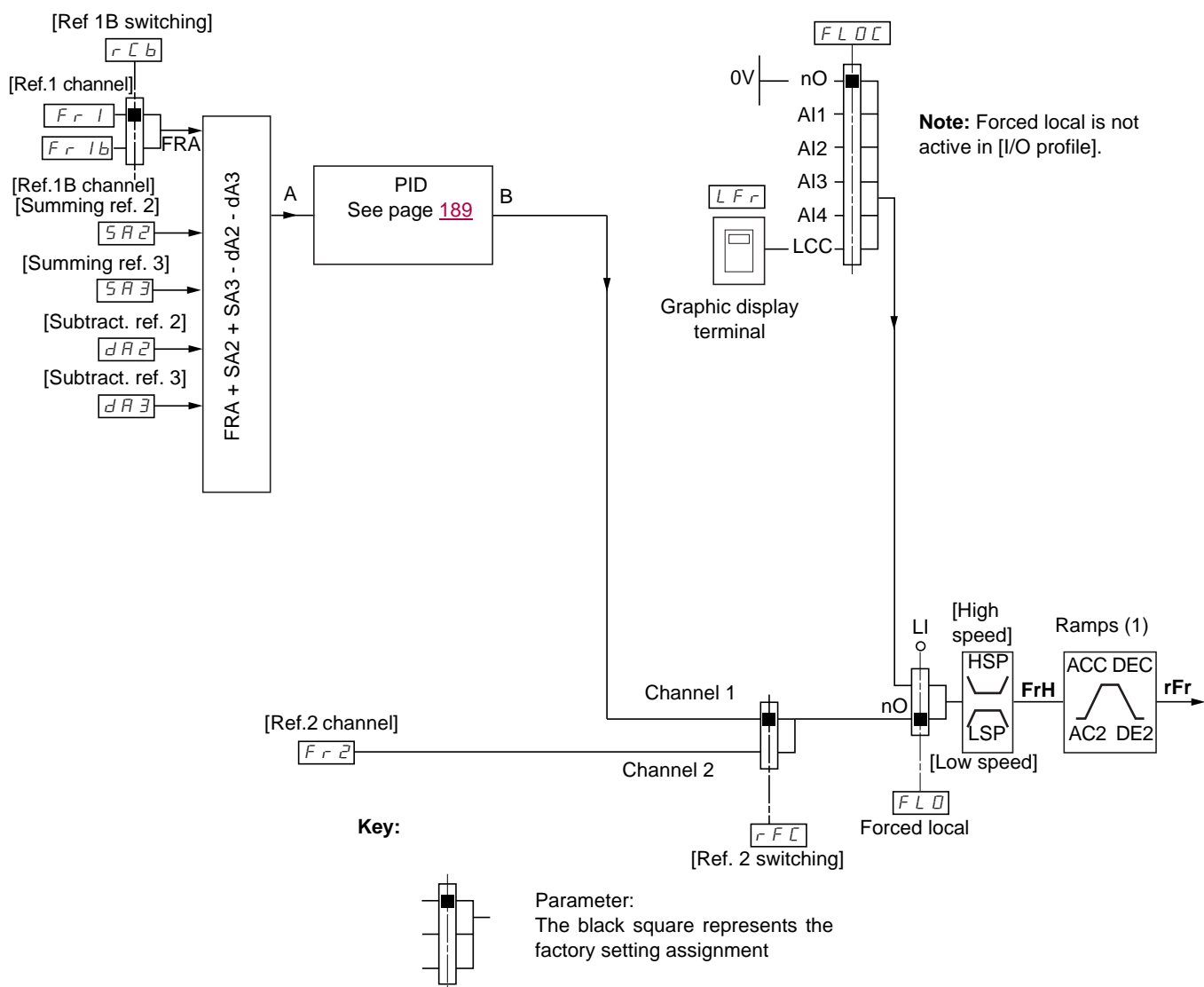
- Terminals, only accessible if Fr1 = terminals

Fr2:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card, **and +/- speed**

Note: [Ref.1B channel] (Fr1b) and [Ref 1B switching] (rCb) must be configured in the [1.7 APPLICATION FUNCT.] (Fun-) menu.

Reference channel for [Not separ.] (SIM), [Separate] (SEP) and [I/O profile] (IO) configurations, PID configured with PID references at the terminals



Instructions

Fr1:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card

Fr1b, for SEP and IO:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card

Fr1b, for SIM:

- Terminals, only accessible if Fr1 = terminals

SA2, SA3, dA2, dA3:

- Terminals only

Fr2:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card, and +/- speed

(1) Ramps not active if the PID function is active in automatic mode.

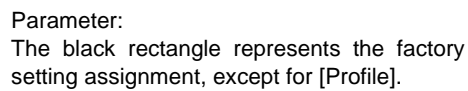
Note: [Ref.1B channel] (Fr1b) and [Ref 1B switching] (rCb) must be configured in the [1.7 APPLICATION FUNCT.] (Fun-) menu.

Example: If the reference is $Fr1 = AI1$ (analog input at the terminals), control is via LI (logic input at the terminals).



Parameters FLO and FLOC are common to reference and command.

The command channels Cd1 and Cd2 are independent of the reference channels Fr1, Fr1b and Fr2.



- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card

Command channel for [I/O profile] (IO) configuration
Separate reference and command, as in [Separate] (SEP) configuration

[Cmd channel 1]

[Cmd channel 2]

[Cmd switching]

[C C S]

[Profile]

[H C F]

I/O

Graphic display terminal

STOP

YES

[P S E]

(Stop Key priority)

LI

[F L D]

Forced local

nO

CMD

Forward Reverse STOP

Note: Forced local is not active in [I/O profile].

Commands

Cd1, Cd2:

- Terminals, graphic display terminal, integrated Modbus, integrated CANopen, communication card, Controller Inside card

Command channel for [I/O profile] (IO) configuration

Selection of a command channel:

A command or an action can be assigned:

- To a fixed channel by selecting an LI input or a Cxxx bit:
 - By selecting e.g., LI3, this action will always be triggered by LI3 regardless of which command channel is switched.
 - By selecting e.g., C214, this action will always be triggered by integrated CANopen with bit 14 regardless of which command channel is switched.
- To a switchable channel by selecting a CDxx bit:
 - By selecting, e.g., CD11, this action will be triggered by
 - LI12 if the terminals channel is active
 - C111 if the integrated Modbus channel is active
 - C211 if the integrated CANopen channel is active
 - C311 if the communication card channel is active
 - C411 if the Controller Inside card channel is active

If the active channel is the graphic display terminal, the functions and commands assigned to CDxx switchable internal bits are inactive.

Note:

- CD14 and CD15 can only be used for switching between 2 networks. They do not have equivalent logic inputs.

Terminals	Integrated Modbus	Integrated CANopen	Communication card	Controller Inside card	Internal bit, can be switched
					CD00
LI2 (1)	C101 (1)	C201 (1)	C301 (1)	C401 (1)	CD01
LI3	C102	C202	C302	C402	CD02
LI4	C103	C203	C303	C403	CD03
LI5	C104	C204	C304	C404	CD04
LI6	C105	C205	C305	C405	CD05
LI7	C106	C206	C306	C406	CD06
LI8	C107	C207	C307	C407	CD07
LI9	C108	C208	C308	C408	CD08
LI10	C109	C209	C309	C409	CD09
LI11	C110	C210	C310	C410	CD10
LI12	C111	C211	C311	C411	CD11
LI13	C112	C212	C312	C412	CD12
LI14	C113	C213	C313	C413	CD13
-	C114	C214	C314	C414	CD14
-	C115	C215	C315	C415	CD15

(1) If [2/3 wire control] (tCC) page 102 = [3 wire] (3C), LI2, C101, C201, C301, and C401 cannot be accessed.

Assignment conditions for logic inputs and control bits

The following elements are available for every command or function that can be assigned to a logic input or a control bit:

[L1] (LI1) to [L16] (LI6)	Drive with or without option
[L17] (LI7) to [L110] (LI10)	With VW3A3201 logic I/O card
[L111] (LI11) to [L114] (LI14)	With VW3A3202 extended I/O card
[C101] (C101) to [C110] (C110)	With integrated Modbus in [I/O profile] (IO) configuration
[C111] (C111) to [C115] (C115)	With integrated Modbus regardless of configuration
[C201] (C201) to [C210] (C210)	With integrated CANopen in [I/O profile] (IO) configuration
[C211] (C211) to [C215] (C215)	With integrated CANopen regardless of configuration
[C301] (C301) to [C310] (C310)	With a communication card in [I/O profile] (IO) configuration
[C311] (C311) to [C315] (C315)	With a communication card regardless of configuration
[C401] (C401) to [C410] (C410)	With Controller Inside card in [I/O profile] (IO) configuration
[C411] (C411) to [C415] (C415)	With Controller Inside card regardless of configuration
[CD00] (Cd00) to [CD10] (Cd10)	In [I/O profile] (IO) configuration
[CD11] (Cd11) to [CD15] (Cd15)	Regardless of configuration



Note: In [I/O profile] (IO) configuration, LI1 cannot be accessed and if [2/3 wire control] (tCC) page 102 = [3 wire] (3C), LI2, C101, C201, C301 and C401 cannot be accessed either.


WARNING

UNINTENDED EQUIPMENT OPERATION

Inactive communication channels are not monitored (no lock following malfunction in the event of a communication bus failure). Make sure that the commands and functions assigned to bits C101 to C415 will not pose a risk in the event of the failure of the associated communication bus.

Failure to follow these instructions can result in death or serious injury.

[1.6 COMMAND] (CtL-)


Code	Name/Description	Adjustment range	Factory setting
F r I A I 1 A I 2 A I 3 A I 4 L C C M d b C A n n E t A P P P I P G	<input type="checkbox"/> [Ref.1 channel] <input type="checkbox"/> [AI1] (AI1): Analog input <input type="checkbox"/> [AI2] (AI2): Analog input <input type="checkbox"/> [AI3] (AI3): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [HMI] (LCC): Graphic display terminal <input type="checkbox"/> [Modbus] (Mdb): Integrated Modbus <input type="checkbox"/> [CANopen] (CAn): Integrated CANopen <input type="checkbox"/> [Com. card] (nEt): Communication card (if inserted) <input type="checkbox"/> [C.Insid. card] (APP): Controller Inside card (if inserted) <input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 extension card has been inserted, <input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted		[AI1] (AI1)
r I n n O Y E S	<input type="checkbox"/> [RV Inhibition] <input type="checkbox"/> [No] (nO) <input type="checkbox"/> [Yes] (YES) Inhibition of movement in reverse direction, does not apply to direction requests sent by logic inputs. <ul style="list-style-type: none"> - Reverse direction requests sent by logic inputs are taken into account. - Reverse direction requests sent by the graphic display terminal are not taken into account. - Reverse direction requests sent by the line are not taken into account. - Any reverse speed reference originating from the PID, summing input, etc., is interpreted as a zero reference. 		[No] (nO)
P S t n O Y E S	<input type="checkbox"/> [Stop Key priority] <input type="checkbox"/> [No] (nO) <input type="checkbox"/> [Yes] (YES): Gives priority to the STOP key on the graphic display terminal when the graphic display terminal is not enabled as the command channel. Press and hold down ENT for 2 seconds in order for any change in the assignment of [Stop Key priority] (PSt) to be taken into account. This will be a freewheel stop. If the active command channel is the graphic display terminal, the stop will be performed according to the [Type of stop] (Stt) page 156 irrespective of the configuration of [Stop Key priority] (PSt).		[Yes] (YES)
C H C F S E 8 S I n S E P I O	<input type="checkbox"/> [Profile] <input type="checkbox"/> [8 serie] (SE8): ATV58 interchangeability (see Migration Manual). The [8 serie] (SE8) configuration is used to load, via PowerSuite, for example, an ATV58 drive configuration in an ATV71 that has already been set to this configuration. This assignment cannot be accessed if a Controller Inside card has been inserted.  Note: Modifications to the configuration of the ATV71 must only be made using PowerSuite when it is in this configuration, otherwise operation cannot be guaranteed. <input type="checkbox"/> [Not separ.] (SIM): Reference and command, not separate <input type="checkbox"/> [Separate] (SEP): Separate reference and command. This assignment cannot be accessed in [I/O profile] (IO). <input type="checkbox"/> [I/O profile] (IO): I/O profile When [8 serie] (SE8) is selected and [I/O profile] (IO) is deselected, the drive automatically returns to the factory setting (this is mandatory). This factory setting only affects the [1 DRIVE MENU] menu. It does not affect either [1.9 COMMUNICATION] or [1.5 PROGRAMMABLE CARD]. <ul style="list-style-type: none"> - With the graphic display terminal, a screen appears to perform this operation. Follow the instructions on the screen. - With the integrated display terminal, press ENT and hold it down (for 2 s). This will save the selection and return to the factory setting. 		[Not separ.] (SIM)

[1.6 COMMAND] (CtL-)

Code	Name/Description	Adjustment range	Factory setting
CC5 Cd1 Cd2 LI1 - - -	[Cmd switching] The parameter can be accessed if [Profile] (CHCF) = [Separate] (SEP) or [I/O profile] (IO) <input type="checkbox"/> [ch1 active] (Cd1): [Cmd channel 1] (Cd1) active (no switching) <input type="checkbox"/> [ch2 active] (Cd2): [Cmd channel 2] (Cd2) active (no switching) <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139 (not CDOO to CD14). If the assigned input or bit is at 0, channel [Cmd channel 1] (Cd1) is active. If the assigned input or bit is at 1, channel [Cmd channel 2] (Cd2) is active.		[ch1 active] (Cd1)
Cd1 tEr LCC Mdb CAn nEt APP	[Cmd channel 1] <input type="checkbox"/> [Terminals] (tEr): Terminals <input type="checkbox"/> [HMI] (LCC): Graphic display terminal <input type="checkbox"/> [Modbus] (Mdb): Integrated Modbus <input type="checkbox"/> [CANopen] (CAn): Integrated CANopen <input type="checkbox"/> [Com. card] (nEt): Communication card (if inserted) <input type="checkbox"/> [C.Insid. card] (APP): Controller Inside card (if inserted) The parameter is available if [Profile] (CHCF) = [Separate] (SEP) or [I/O profile] (IO).		[Terminals] (tEr)
Cd2 tEr LCC Mdb CAn nEt APP	[Cmd channel 2] <input type="checkbox"/> [Terminals] (tEr): Terminals <input type="checkbox"/> [HMI] (LCC): Graphic display terminal <input type="checkbox"/> [Modbus] (Mdb): Integrated Modbus <input type="checkbox"/> [CANopen] (CAn): Integrated CANopen <input type="checkbox"/> [Com. card] (nEt): Communication card (if inserted) <input type="checkbox"/> [C.Insid. card] (APP): Controller Inside card (if inserted) The parameter is available if [Profile] (CHCF) = [Separate] (SEP) or [I/O profile] (IO).		[Modbus] (Mdb)
rFC Fr1 Fr2 LI1 - - -	[Ref. 2 switching] <input type="checkbox"/> [ch1 active] (Fr1): no switching, [Ref.1 channel] (Fr1) active <input type="checkbox"/> [ch2 active] (Fr2): no switching, [Ref.2 channel] (Fr2) active <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139 (not CDOO to CD14). If the assigned input or bit is at 0, channel [Ref.1 channel] (Fr1) is active. If the assigned bit or input is at 1, channel [Ref.2 channel] (Fr2) is active.		[ch1 active] (Fr1)
Fr2 nO AI1 AI2 AI3 AI4 UPdt LCC Mdb CAn nEt APP PI PG	[Ref.2 channel] <input type="checkbox"/> [No] (nO): Not assigned. If [Profile] (CHCF) = [Not separ.] (SIM) the command is at the terminals with a zero reference. If [Profile] (CHCF) = [Separate] (SEP) or [I/O profile] (IO) the reference is zero. <input type="checkbox"/> [AI1] (AI1): Analog input <input type="checkbox"/> [AI2] (AI2): Analog input <input type="checkbox"/> [AI3] (AI3): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [+/- Speed] (UPdt): +/- Speed command <input type="checkbox"/> [HMI] (LCC): Graphic display terminal <input type="checkbox"/> [Modbus] (Mdb): Integrated Modbus <input type="checkbox"/> [CANopen] (CAn): Integrated CANopen <input type="checkbox"/> [Com. card] (nEt): Communication card (if inserted) <input type="checkbox"/> [C.Insid. card] (APP): Controller Inside card (if inserted) <input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted		[No] (nO)

[1.6 COMMAND] (CtL-)

Code	Name/Description	Adjustment range	Factory setting
<div>COPY</div> <div>nO</div> <div>SP</div> <div>Cd</div> <div>ALL</div>	<div><input type="checkbox"/> [Copy channel 1 <> 2]</div> <div>Can be used to copy the current reference and/or the command by means of switching, in order to avoid speed surges, for example.</div> <div>If [Profile] (CHCF) page 140 = [Not separ.] (SIM) or [Separate] (SEP), copying will only be possible from channel 1 to channel 2.</div> <div>If [Profile] (CHCF) = [I/O profile] (IO), copying will be possible in both directions.</div> <div><input type="checkbox"/> [No] (nO): No copy</div> <div><input type="checkbox"/> [Reference] (SP): Copy reference</div> <div><input type="checkbox"/> [Command] (Cd): Copy command</div> <div><input type="checkbox"/> [Cmd + ref.] (ALL): Copy command and reference</div> <div><div><div>- A reference or a command cannot be copied to a channel on the terminals.</div><div>- The reference copied is FrH (before ramp) unless the destination channel reference is set via +/- speed.</div></div><div>In this case, the reference copied is rFr (after ramp).</div></div>		[No] (nO)



WARNING

UNINTENDED EQUIPMENT OPERATION

Copying the command and/or reference can change the direction of rotation.
Check that this is safe.

Failure to follow these instructions can result in death or serious injury.



WARNING

UNINTENDED EQUIPMENT OPERATION

Copying the command and/or reference can change the direction of rotation.

Check that this is safe.

Failure to follow these instructions can result in death or serious injury.

[1.6 COMMAND] (CtL-)

As the graphic display terminal may be selected as the command and/or reference channel, its action modes can be configured. The parameters on this page can only be accessed on the graphic display terminal, and not on the integrated display terminal.

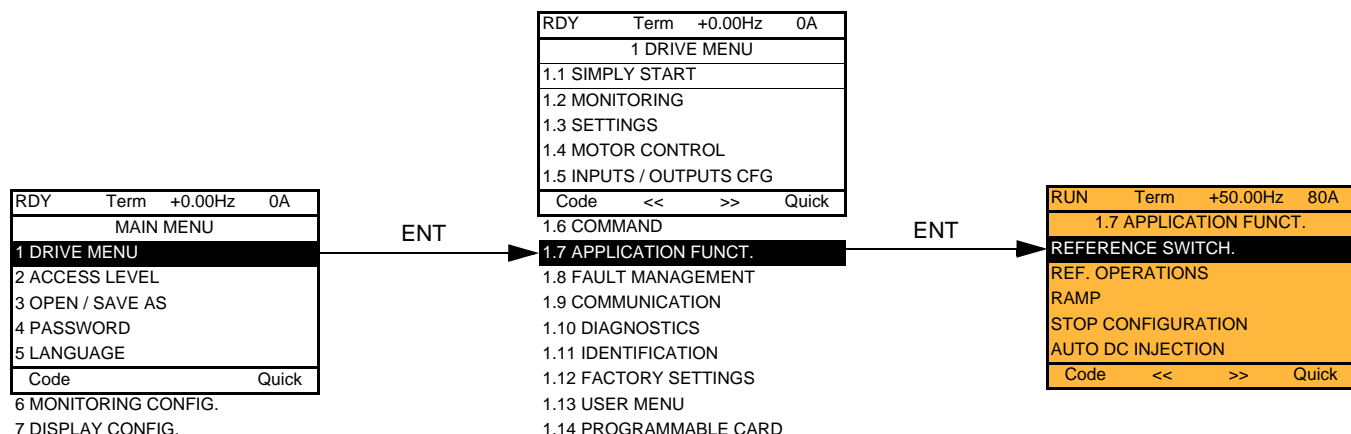
Comments:

- The display terminal command/reference is only active if the command and/or reference channels from the terminal are active with the exception of **[T/K]** (command via the display terminal), which takes priority over these channels. Press **[T/K]** (command via the display terminal) again to revert control to the selected channel.
- Command and reference via the display terminal are impossible if the latter is connected to more than one drive.
- The JOG, preset speed and +/- speed functions can only be accessed if **[Profile] (CHCF)** = **[Not separ.] (SIM)**.
- The preset PID reference functions can only be accessed if **[Profile] (CHCF)** = **[Not separ.] (SIM)** or **[Separate] (SEP)**.
- The **[T/K]** (command via the display terminal) can be accessed regardless of the **[Profile] (CHCF)**.

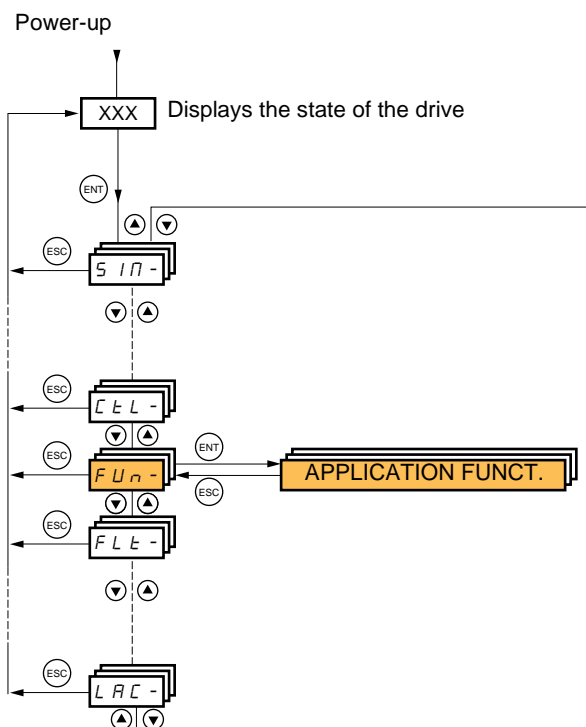
Name/Description	Adjustment range	Factory setting
<input type="checkbox"/> [F1 key assignment] <input type="checkbox"/> [No] : Not assigned <input type="checkbox"/> [Jog] : JOG operation <input type="checkbox"/> [Preset spd2] : Press the key to run the drive at the 2 nd preset speed [Preset speed 2] (SP2) page 163. Press STOP to stop the drive. <input type="checkbox"/> [Preset spd3] : Press the key to run the drive at the 3 rd preset speed [Preset speed 3] (SP3) page 163. Press STOP to stop the drive. <input type="checkbox"/> [PID ref. 2] : Sets a PID reference equal to the 2 nd preset PID reference [Preset ref. PID 2] (rP2) page 197, without sending a run command. Only operates if [Ref.1 channel] (Fr1) = [HMI] (LCC) . Does not operate with the [T/K] function. <input type="checkbox"/> [PID ref. 3] : Sets a PID reference equal to the 3 rd preset PID reference [Preset ref. PID 3] (rP3) page 197, without sending a run command. Only operates if [Ref.1 channel] (Fr1) = [HMI] (LCC) . Does not operate with the [T/K] function. <input type="checkbox"/> [+speed] : Faster, only operates if [Ref.2 channel] (Fr2) = [HMI] (LCC) . Press the key to run the drive and increase the speed. Press STOP to stop the drive. <input type="checkbox"/> [- speed] : Slower, only operates if [Ref.2 channel] (Fr2) = [HMI] (LCC) and if a different key has been assigned to [+ speed] . Press the key to run the drive and decrease the speed. Press STOP to stop the drive. <input type="checkbox"/> [T/K] : Command via the display terminal: takes priority over [Cmd switching] (CCS) and over [Ref. 2 switching] (rFC) .		[No]
<input type="checkbox"/> [F2 key assignment] Identical to [F1 key assignment] .		[No]
<input type="checkbox"/> [F3 key assignment] Identical to [F1 key assignment] .		[No]
<input type="checkbox"/> [F4 key assignment] Identical to [F1 key assignment] .		[No]
<input type="checkbox"/> [HMI cmd.] When the [T/K] function is assigned to a key and that function is active, this parameter defines the behavior at the moment when control returns to the graphic display terminal. <input type="checkbox"/> [Stop] : Stops the drive (although the controlled direction of operation and reference of the previous channel are copied (to be taken into account on the next RUN command)). <input type="checkbox"/> [Bumpless] : Does not stop the drive (the controlled direction of operation and the reference of the previous channel are copied).		[Stop]

[1.7 APPLICATION FUNCT.] (FUn-)

With graphic display terminal:




With integrated display terminal:



Summary of functions:

Code	Name	Page
<i>r E F -</i>	[REFERENCE SWITCH.]	150
<i>O A I -</i>	[REF. OPERATIONS]	151
<i>r P t -</i>	[RAMP]	152
<i>S t t -</i>	[STOP CONFIGURATION]	156
<i>A d C -</i>	[AUTO DC INJECTION]	158
<i>J O G -</i>	[JOG]	160
<i>P S S -</i>	[PRESET SPEEDS]	162
<i>U P d -</i>	[+/- SPEED]	165
<i>S r E -</i>	[+/-SPEED AROUND REF.]	167
<i>S P n -</i>	[MEMO REFERENCE]	168
<i>L S t -</i>	[LIMIT SWITCHES]	170
<i>b L C -</i>	[BRAKE LOGIC CONTROL]	175
<i>r b n -</i>	[ROLLBACK MGT]	181
<i>E L n -</i>	[EXTERNAL WEIGHT MEAS.]	183
<i>H S H -</i>	[HIGH SPEED HOISTING]	188
<i>P I d -</i>	[PID REGULATOR]	193
<i>P r I -</i>	[PID PRESET REFERENCES]	197
<i>t D r -</i>	[TORQUE CONTROL]	199
<i>t D L -</i>	[TORQUE LIMITATION]	202
<i>C L I -</i>	[2nd CURRENT LIMIT.]	204
<i>L L C -</i>	[LINE CONTACTOR COMMAND]	206
<i>O C C -</i>	[OUTPUT CONTACTOR CMD]	208
<i>L P D -</i>	[POSITIONING BY SENSORS]	212
<i>n L P -</i>	[PARAM. SET SWITCHING]	215
<i>n n C -</i>	[MULTIMOTORS/CONFIG.]	219
<i>t r D -</i>	[TRAVERSE CONTROL]	225
<i>I S P -</i>	[INSPECTION MODE]	227
<i>r F t -</i>	[EVACUATION]	228
<i>H F F -</i>	[HALF FLOOR]	229
<i>d C D -</i>	[DC BUS SUPPLY]	230
<i>t D P -</i>	[TOP Z MANAGEMENT]	231
<i>O I r -</i>	[REGEN CONNECTION]	232

[1.7 APPLICATION FUNCT.] (FUn-)

The parameters in the [1.7 APPLICATION FUNCT.] (FUn-) menu can only be modified when the drive is stopped and there is no run command, except for parameters with a  symbol in the code column, which can be modified with the drive running or stopped.



Note: Compatibility of functions

The choice of application functions may be limited by the number of I/O and by the fact that some functions are incompatible with one another. Functions that are not listed in the table below are fully compatible.

If there is an incompatibility between functions, the first function configured will prevent the others being configured.

Each of the functions on the following pages can be assigned to one of the inputs or outputs.

A single input can activate several functions at the same time (reverse and 2nd ramp for example), **The user must therefore ensure that these functions can be used at the same time.** It is only possible to assign one input to several functions at [\[Advanced\]](#) (AdU) and [\[Expert\]](#) (EPr) levels.

Before assigning a command, reference or function to an input or output, the user must make sure that this input or output has not already been assigned and that another input or output has not been assigned to an incompatible or undesirable function.

The drive factory setting or macro configurations automatically configure functions, **which may prevent other functions being assigned.** **It may be necessary to unconfigure one or more functions in order to be able to enable another.** Check the compatibility table below.

Compatibility table

	Reference operations (page 151)	+/- speed (3) (page 165)	Management of limit switches (page 170)	Preset speeds (page 162)	PID regulator (page 193)	Traverse control (page 225)	JOG operation (page 160)	Brake logic control (page 175)	Catch on the fly (page 239)	DC injection stop (page 156)	Fast stop (page 156)	Freewheel stop (page 156)	Stop on top Z (page 231)	+/- speed around a reference (page 167)	High speed hoisting (page 188)	Torque control (page 199)	Load sharing (page 98)	Positioning by sensors (page 212)	Open-loop synchronous motor (page 81)	Closed-loop synchronous motor (page 83)	Measure of the angle motor /encoder (page 84)
Reference operations (page 151)				↑	●(4)		↑									●(1)					
+/- speed (3) (page 165)						●	●									●(1)					
Management of limit switches (page 170)					●																
Preset speeds (page 162)	←						↑									●(1)					
PID regulator (page 193)	●(4)		●			●	●	●						●	●	●(1)	●	●			
Traverse control (page 225)		●			●		●							●	●	●(1)					
JOG operation (page 160)	←	●		←	●	●		●						●	●	●(1)					
Brake logic control (page 175)					●		●		●	●						●			●		●(5)
Catch on the fly (page 239)								●								●(1)					
DC injection stop (page 156)								●			●(2)	↑	●(2)						●	●	
Fast stop (page 156)										●(2)		↑	●(2)								
Freewheel stop (page 156)									←	←		←									
Stop on top Z (page 231)									●(2)	●(2)	↑										
+/- speed around a reference (page 167)					●	●	●									●(1)					
High speed hoisting (page 188)					●	●	●									●		●			
Torque control (page 199)	●(1)	●(1)		●(1)	●(1)	●(1)	●(1)	●	●(1)					●(1)	●		●	●(1)	●		
Load sharing (page 98)					●											●					
Positioning by sensors (page 212)					●										●	●(1)					
Open-loop synchronous motor (page 81)								●		●						●					
Closed-loop synchronous motor (page 83)										●											
Measure of the angle motor /encoder (page 84)								●(5)													

(1) Torque control and these functions are only incompatible while torque control mode is active.

(2) Priority is given to the first of these two stop modes to be activated.

(3) Excluding special application with reference channel Fr2 (see diagrams on pages 133 and 134).

(4) Only the multiplier reference is incompatible with the PID regulator.

(5) These 2 functions are incompatible only if [Angle setting type] (ASt) = [W/o load] (nLd).


● Incompatible functions □ Compatible functions ■ Not applicable

Priority functions (functions, which cannot be active at the same time):

← ↑ The function indicated by the arrow has priority over the other.

Stop functions have priority over run commands.

Speed references via logic command have priority over analog references.

 **Note:** This compatibility table does not affect commands that can be assigned to the keys of the graphic display terminal (see page 143).

[1.7 APPLICATION FUNCT.] (FUn-)

Incompatible functions

The following functions will be inaccessible or deactivated in the cases described below:

Automatic restart

This is only possible for control type [2/3 wire control] (tCC) = [2 wire] (2C) and [2 wire type] (tCt) = [Level] (LEL) or [Fwd priority] (PFO). See page 102.

Catch a spinning load

This is only possible for control type [2/3 wire control] (tCC) = [2 wire] (2C) and [2 wire type] (tCt) = [Level] (LEL) or [Fwd priority] (PFO). See page 102.

This function is locked if automatic injection on stop [Auto DC injection] (AdC) = [Continuous] (Ct). See page 158.

The SUP- monitoring menu (page 45) can be used to display the functions assigned to each input in order to check their compatibility.

When a function is assigned, a ✓ appears on the graphic display terminal, as illustrated in the example below:

RDY	Term	+0.00Hz	0A
1.7 APPLICATION FUNCT.			
REFERENCE SWITCH.			
REF. OPERATIONS			
RAMP			✓
STOP CONFIGURATION			
AUTO DC INJECTION			
Code	<<	>>	Quick
JOG			

If you attempt to assign a function that is incompatible with another function that has already been assigned, an alarm message will appear:

With the graphic display terminal:

RDY	Term	+0.00Hz	0A
INCOMPATIBILITY			
The function can't be assigned			
because an incompatible			
function is already selected. See			
programming book.			
ENT or ESC to continue			

With the integrated display terminal:
COMP flashes until ENT or ESC is pressed.

When you assign a logic input, an analog input, a reference channel or a bit to a function, pressing the HELP button will display the functions that may already have been activated by this input, bit or channel.

[1.7 APPLICATION FUNCT.] (FUn-)

When a logic input, an analog input, a reference channel or a bit that has already been assigned is assigned to another function, the following screens appear:

With the graphic display terminal:

RUN	+50.00Hz	1250A	+50.00Hz
WARNING - ASSIGNED TO			
Ref. 2 switching			
ENT->Continue		ESC->Cancel	

If the access level permits this new assignment, pressing ENT confirms the assignment.

If the access level does not permit this new assignment, pressing ENT results in the following display:

RUN	+50.00Hz	1250A	+50.00Hz
ASSIGNMENT FORBIDDEN			
Un-assign the present			
functions, or select			
Advanced access level			

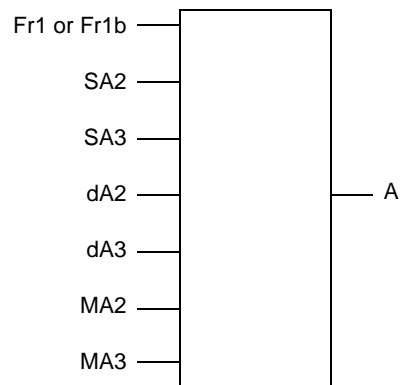
With the integrated display terminal:

The code for the first function, which is already assigned, is displayed flashing.

If the access level permits this new assignment, pressing ENT confirms the assignment.

If the access level does not permit this new assignment, pressing ENT has no effect, and the message continues to flash. It is only possible to exit by pressing ESC.

Summing input/Subtracting input/Multiplier




$$A = (\text{Fr1 or Fr1b} + \text{SA2} + \text{SA3} - \text{dA2} - \text{dA3}) \times \text{MA2} \times \text{MA3}$$

- If SA2, SA3, dA2, dA3 are not assigned, they are set to 0.
- If MA2, MA3 are not assigned, they are set to 1.
- A is limited by the minimum LSP and maximum HSP parameters.
- For multiplication, the signal on MA2 or MA3 is interpreted as a %; 100% corresponds to the maximum value of the corresponding input. If MA2 or MA3 is sent via the communication bus or graphic display terminal, an MFr multiplication variable, page [51](#) must be sent via the bus or graphic display terminal.
- Reversal of the direction of operation in the event of a negative result can be inhibited (see page [140](#)).

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
rEF -	■ [REFERENCE SWITCH.]		
rCb	<input type="checkbox"/> [Ref 1B switching] See the diagrams on pages 133 and 134 .		[ch1 active] (Fr1)
Fr1	<input type="checkbox"/> [ch1 active] (Fr1): no switching, [Ref.1 channel] (Fr1) active		
Fr1b	<input type="checkbox"/> [ch1B active] (Fr1b): no switching, [Ref.1B channel] (Fr1b) active		
LI1	<input type="checkbox"/> [LI1] (LI1)		
-	⋮		
-	⋮		
-	<input type="checkbox"/> [...] (...): See the assignment conditions on page 139 (not CDOO to CD14).		
	<ul style="list-style-type: none"> • If the assigned input or bit is at 0, [Ref.1 channel] (Fr1) is active (see page 140). • If the assigned input or bit is at 1, [Ref.1B channel] (Fr1b) is active. 		
	[Ref 1B switching] (rCb) is forced to [ch1 active] (Fr1) if [Profile] (CHCF) = [Not separ.] (SIM) with [Ref.1 channel] (Fr1) assigned via the terminals (analog inputs, encoder, pulse input); see page 140 .		
Fr1b	<input type="checkbox"/> [Ref.1B channel]		[No] (nO)
nO	<input type="checkbox"/> [No] (nO): Not assigned		
AI1	<input type="checkbox"/> [AI1] (AI1): Analog input		
AI2	<input type="checkbox"/> [AI2] (AI2): Analog input		
AI3	<input type="checkbox"/> [AI3] (AI3): Analog input, if VW3A3202 extension card has been inserted		
AI4	<input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 extension card has been inserted		
LCC	<input type="checkbox"/> [HMI] (LCC): Graphic display terminal		
Mdb	<input type="checkbox"/> [Modbus] (Mdb): Integrated Modbus		
CAn	<input type="checkbox"/> [CANopen] (CAn): Integrated CANopen		
nEt	<input type="checkbox"/> [Com. card] (nEt): Communication card (if inserted)		
APP	<input type="checkbox"/> [C.Insid. card] (APP): Controller Inside card (if inserted)		
PI	<input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 extension card has been inserted		
PG	<input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted		
	Note: In the following instances, only assignments via the terminals are possible: <ul style="list-style-type: none"> - [Profile] (CHCF) = [Not separ.] (SIM) with [Ref.1 channel] (Fr1) assigned via the terminals (analog inputs, encoder, pulse input); see page 140. - PID configured with PID references via the terminals 		

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
0A1-	<div> <div></div> [REF. OPERATIONS] </div> <p>Reference = (Fr1 or Fr1b + SA2 + SA3 - dA2 - dA3) x MA2 x MA3. See the diagrams on pages 133 and 134.</p> <p> Note: This function cannot be used with certain other functions. Follow the instructions on page 145.</p>		
SA2	<div> <div></div> [Summing ref. 2] </div> <p>Selection of a reference to be added to [Ref.1 channel] (Fr1) or [Ref.1B channel] (Fr1b).</p> <ul style="list-style-type: none"> <input type="checkbox"/> [No] (nO): No source assigned <input type="checkbox"/> [AI1] (AI1): Analog input <input type="checkbox"/> [AI2] (AI2): Analog input <input type="checkbox"/> [AI3] (AI3): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [HMI] (LCC): Graphic display terminal <input type="checkbox"/> [Modbus] (Mdb): Integrated Modbus <input type="checkbox"/> [CANopen] (CAn): Integrated CANopen <input type="checkbox"/> [Com. card] (nEt): Communication card (if inserted) <input type="checkbox"/> [C.Insid. card] (APP): Controller Inside card (if inserted) <input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted <input type="checkbox"/> [Network AI] (AIU1): Virtual input via communication bus, can be configured using [AI net. channel] (AIC1) page 111. 		[No] (nO)
	<div> <div></div> <div> <div></div> <div> WARNING </div> </div> </div> <div> UNINTENDED EQUIPMENT OPERATION <p>If the equipment switches to forced local mode (see page 262), the virtual input remains fixed at the last value transmitted.</p> <p>Do not use the virtual input and forced local mode in the same configuration.</p> <p>Failure to follow these instructions can result in death or serious injury.</p> </div>		
SA3	<div> <div></div> [Summing ref. 3] </div> <p>Selection of a reference to be added to [Ref.1 channel] (Fr1) or [Ref.1B channel] (Fr1b).</p> <ul style="list-style-type: none"> • Possible assignments are identical to [Summing ref. 2] (SA2) above. 		[No] (nO)
dA2	<div> <div></div> [Subtract. ref. 2] </div> <p>Selection of a reference to be subtracted from [Ref.1 channel] (Fr1) or [Ref.1B channel] (Fr1b).</p> <ul style="list-style-type: none"> • Possible assignments are identical to [Summing ref. 2] (SA2) above. 		[No] (nO)
dA3	<div> <div></div> [Subtract. ref. 3] </div> <p>Selection of a reference to be subtracted from [Ref.1 channel] (Fr1) or [Ref.1B channel] (Fr1b).</p> <ul style="list-style-type: none"> • Possible assignments are identical to [Summing ref. 2] (SA2) above. 		[No] (nO)
MA2	<div> <div></div> [Multiplier ref. 2] </div> <p>Selection of a multiplier reference [Ref.1 channel] (Fr1) or [Ref.1B channel] (Fr1b).</p> <ul style="list-style-type: none"> • Possible assignments are identical to [Summing ref. 2] (SA2) above. 		[No] (nO)
MA3	<div> <div></div> [Multiplier ref. 3] </div> <p>Selection of a multiplier reference [Ref.1 channel] (Fr1) or [Ref.1B channel] (Fr1b).</p> <ul style="list-style-type: none"> • Possible assignments are identical to [Summing ref. 2] (SA2) above. 		[No] (nO)

[1.7 APPLICATION FUNCT.] (FUn-)





Code	Name/Description	Adjustment range	Factory setting
r P t -	[RAMP]		
r P t	<div><div><div><div><div></div><div>[Ramp type]</div></div><div><div><div><div></div><div>[Linear] (LIn)</div></div><div><div><div><div></div><div>[S ramp] (S)</div></div><div><div><div><div></div><div>[U ramp] (U)</div></div><div><div><div><div></div><div>[Customized] (CUS)</div></div></div></div></div></div></div></div></div></div></div></div></div>	[Linear] (LIn)	
L In S U CUS	<div><div><div><div><div></div><div>[Ramp type]</div></div><div><div><div><div></div><div>[Linear] (LIn)</div></div><div><div><div><div></div><div>[S ramp] (S)</div></div><div><div><div><div></div><div>[U ramp] (U)</div></div><div><div><div><div></div><div>[Customized] (CUS)</div></div></div></div></div></div></div></div></div></div></div></div></div>		
	<div><div><div><div><div></div><div>S ramps</div></div><div><div><div><div><div></div><div>f (Hz)</div></div><div><div><div><div></div><div>FrS</div></div><div><div><div><div></div><div>0</div></div><div><div><div><div></div><div>t</div></div></div></div><div><div><div><div></div><div>t2</div></div><div><div><div><div></div><div>t1</div></div></div></div></div></div></div><div><div><div><div><div></div><div>f (Hz)</div></div><div><div><div><div></div><div>FrS</div></div><div><div><div><div></div><div>0</div></div><div><div><div><div></div><div>t</div></div></div></div><div><div><div><div></div><div>t2</div></div><div><div><div><div></div><div>t1</div></div></div></div></div></div></div></div></div><div><div><div><div><div></div><div>U ramps</div></div><div><div><div><div><div></div><div>f (Hz)</div></div><div><div><div><div></div><div>FrS</div></div><div><div><div><div></div><div>0</div></div><div><div><div><div></div><div>t</div></div></div></div><div><div><div><div></div><div>t2</div></div><div><div><div><div></div><div>t1</div></div></div></div></div></div></div><div><div><div><div><div></div><div>f (Hz)</div></div><div><div><div><div></div><div>FrS</div></div><div><div><div><div></div><div>0</div></div><div><div><div><div></div><div>t</div></div></div></div><div><div><div><div></div><div>t2</div></div><div><div><div><div></div><div>t1</div></div></div></div></div></div></div></div></div><div><div><div><div><div></div><div>Customized ramps</div></div><div><div><div><div><div></div><div>f (Hz)</div></div><div><div><div><div></div><div>FrS</div></div><div><div><div><div></div><div>0</div></div><div><div><div><div></div><div>t</div></div></div></div><div><div><div><div></div><div>tA1</div></div><div><div><div><div></div><div>tA2</div></div><div><div><div><div></div><div>t1</div></div></div></div></div></div></div><div><div><div><div><div></div><div>f (Hz)</div></div><div><div><div><div></div><div>FrS</div></div><div><div><div><div></div><div>0</div></div><div><div><div><div></div><div>t</div></div></div></div><div><div><div><div></div><div>tA3</div></div><div><div><div><div></div><div>tA4</div></div><div><div><div><div></div><div>t1</div></div></div></div></div></div></div></div></div><div><div><div><div><div></div><div>tA1: adjustable from 0 to 100%</div></div><div><div><div><div></div><div>tA2: adjustable from 0 to (100% - tA1)</div></div><div><div><div><div></div><div>tA3: adjustable from 0 to 100%</div></div><div><div><div><div></div><div>tA4: adjustable from 0 to (100% - tA3)</div></div></div></div></div></div><div><div><div><div><div></div><div>As a % of t1, where t1 = set ramp time</div></div></div></div></div></div><div><div><div><div><div></div><div>The rounding coefficient is fixed, where t2 = 0.6 x t1 and t1 = set ramp time.</div></div></div></div><div><div><div><div><div></div><div>The rounding coefficient is fixed, where t2 = 0.5 x t1 and t1 = set ramp time.</div></div></div></div><div><div><div><div><div></div><div>tA1: adjustable from 0 to 100%</div></div><div><div><div><div></div><div>tA2: adjustable from 0 to (100% - tA1)</div></div><div><div><div><div></div><div>tA3: adjustable from 0 to 100%</div></div><div><div><div><div></div><div>tA4: adjustable from 0 to (100% - tA3)</div></div></div></div></div></div><div><div><div><div><div></div><div>As a % of t1, where t1 = set ramp time</div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div>		
Inr () 0. 0 1 0. 1 1	<div><div><div><div><div></div><div>[Ramp increment]</div></div><div><div><div><div></div><div>[0.01]: Ramp up to 99.99 seconds</div></div><div><div><div><div></div><div>[0.1]: Ramp up to 999.9 seconds</div></div><div><div><div><div></div><div>[1]: Ramp up to 6000 seconds</div></div></div></div><div><div><div><div></div><div>This parameter is valid for [Acceleration] (ACC), [Deceleration] (dEC), [Acceleration 2] (AC2) and [Deceleration 2] (dE2).</div></div></div></div></div></div><div>(1)</div></div></div></div></div></div>	[0.1] (0.1)	
ACC ()	<div><div><div><div><div></div><div>[Acceleration]</div></div><div><div><div><div></div><div>Time to accelerate from 0 to the [Rated motor freq.] (FrS) (page 76) or [Nominal freq sync.] (FrSS) (page 82). Make sure that this value is compatible with the inertia being driven.</div></div></div></div></div><div>(1)</div></div></div>	0.01 to 6000 s (2)	3.0 s
dEC ()	<div><div><div><div><div></div><div>[Deceleration]</div></div><div><div><div><div></div><div>Time to decelerate from the [Rated motor freq.] (FrS) (page 76) or [Nominal freq sync.] (FrSS) (page 82) to 0. Make sure that this value is compatible with the inertia being driven.</div></div></div></div></div><div>(1)</div></div></div>	0.01 to 6000 s (2)	3.0 s

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.


(2) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6000 s according to [Ramp increment] (Inr).

() Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	■ [RAMP] (continued)		
FA1 	□ [Begin Acc round] (1) <ul style="list-style-type: none"> - Rounding of start of acceleration ramp as a % of the [Acceleration] (ACC) or [Acceleration 2] (AC2) ramp time. - Can be set between 0 and 100% - The parameter can be accessed if the [Ramp type] (rPt) is [Customized] (CUS). 	0 to 100%	10%
FA2 	□ [End Acc round] (1) <ul style="list-style-type: none"> - Rounding of end of acceleration ramp as a % of the [Acceleration] (ACC) or [Acceleration 2] (AC2) ramp time. - Can be set between 0 and (100% - [Begin Acc round] (tA1)) - The parameter can be accessed if the [Ramp type] (rPt) is [Customized] (CUS). 		10%
FA3 	□ [Begin Dec round] (1) <ul style="list-style-type: none"> - Rounding of start of deceleration ramp as a % of the [Deceleration] (dEC) or [Deceleration 2] (dE2) ramp time. - Can be set between 0 and 100% - The parameter can be accessed if the [Ramp type] (rPt) is [Customized] (CUS). 	0 to 100%	10%
FA4 	□ [End Dec round] (1) <ul style="list-style-type: none"> - Rounding of end of deceleration ramp as a % of the [Deceleration] (dEC) or [Deceleration 2] (dE2) ramp time. - Can be set between 0 and (100% - [Begin Dec round] (tA3)) - The parameter can be accessed if the [Ramp type] (rPt) is [Customized] (CUS). 		10%

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

 Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting															
	■ [RAMP] (continued)																	
<div>F r t</div>	<div><div><input type="checkbox"/> [Ramp 2 threshold]</div><div>Ramp switching threshold The 2nd ramp is switched if the value of Frt is not 0 (0 deactivates the function) and the output frequency is greater than Frt. Threshold ramp switching can be combined with [Ramp switch ass.] (rPS) switching as follows:</div><table><tr><th>LI or bit</th><th>Frequency</th><th>Ramp</th></tr><tr><td>0</td><td><Frt</td><td>ACC, dEC</td></tr><tr><td>0</td><td>>Frt</td><td>AC2, dE2</td></tr><tr><td>1</td><td><Frt</td><td>AC2, dE2</td></tr><tr><td>1</td><td>>Frt</td><td>AC2, dE2</td></tr></table></div>	LI or bit	Frequency	Ramp	0	<Frt	ACC, dEC	0	>Frt	AC2, dE2	1	<Frt	AC2, dE2	1	>Frt	AC2, dE2	0 to 500 or 1600 Hz according to rating	0 Hz
LI or bit	Frequency	Ramp																
0	<Frt	ACC, dEC																
0	>Frt	AC2, dE2																
1	<Frt	AC2, dE2																
1	>Frt	AC2, dE2																
<div><div>r P S</div><div>n D</div><div>L I 1</div><div>-</div><div>-</div><div>-</div></div>	<div><div><input type="checkbox"/> [Ramp switch ass.]</div><div><div><input type="checkbox"/> [No] (nO): Not assigned</div><div><input type="checkbox"/> [LI1] (LI1)</div><div>:</div><div>:</div><div><input type="checkbox"/> [...] (...): See the assignment conditions on page 139.</div><div>- ACC and dEC are enabled when the assigned input or bit is at 0.</div><div>- AC2 and dE2 are enabled when the assigned input or bit is at 1.</div></div></div>		[No] (nO)															
<div><div>A C 2</div><div>()</div></div>	<div><div><input type="checkbox"/> [Acceleration 2]</div><div>(1)</div><div>Time to accelerate from 0 to the [Rated motor freq.] (FrS) or [Nominal freq sync.] (FrSS) (page 82). Make sure that this value is compatible with the inertia being driven. The parameter can be accessed if [Ramp 2 threshold] (Frt) > 0 or if [Ramp switch ass.] (rPS) is assigned.</div></div>	0.01 to 6000 s (2)	5.0 s															
<div><div>d E 2</div><div>()</div></div>	<div><div><input type="checkbox"/> [Deceleration 2]</div><div>(1)</div><div>Time to decelerate from [Rated motor freq.] (FrS) or [Nominal freq sync.] (FrSS) (page 82) to 0. Make sure that this value is compatible with the inertia being driven. The parameter can be accessed if [Ramp 2 threshold] (Frt) > 0 or if [Ramp switch ass.] (rPS) is assigned.</div></div>	0.01 to 6000 s (2)	5.0 s															

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.






(2) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6000 s according to [Ramp increment] (Inr) page 152.

() Parameter that can be modified during operation or when stopped.

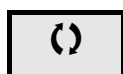
[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	■ [RAMP] (continued)		
brA	<input type="checkbox"/> [Dec ramp adapt.]		[Yes] (YES)
nO YES	<p>Activating this function automatically adapts the deceleration ramp, if this has been set at too low a value for the inertia of the load, which can cause an overvoltage fault.</p> <p><input type="checkbox"/> [No] (nO): Function inactive</p> <p><input type="checkbox"/> [Yes] (YES): Function active, for applications that do not require strong deceleration.</p> <p>The following selections appear depending on the rating of the drive and [Motor control type] (Ctt) page 70. They enable stronger deceleration to be obtained than with [Yes] (YES). Use comparative testing to determine your selection.</p> <p>When [Dec ramp adapt.] (brA) is configured on [High torq. X] (dYnX), the dynamic performances for braking are improved by the addition of a current flow component. The aim is to increase the iron loss and magnetic energy stored in the motor.</p> <p><input type="checkbox"/> [High torq. A] (dYnA) : Addition of a constant current flow component.</p> <p><input type="checkbox"/> [High torq. B] (dYnb) : Addition of a current flow component oscillating at 100 Hz</p> <p><input type="checkbox"/> [High torq. C] (dYnC) : Addition of a current flow component oscillating at 200 Hz but with a greater amplitude.</p> <p>[Dec ramp adapt.] (brA) is forced to [No] (nO) if the brake logic control [Brake assignment] (bLC) is assigned (page 175), or if [Braking balance] (bbA) page 98 = [Yes] (YES). The factory setting changes to [High torq. A] (dYnA) with certain ratings if [Sinus filter] (OFI) page 72 = [Yes] (YES).</p> <p>The function is incompatible with applications requiring:</p> <ul style="list-style-type: none"> - Positioning on a ramp - The use of a braking resistor (the resistor would not operate correctly) <p>If [Speed loop type] (SSL) = [High perfor.] (HPF), it is advisable to assign [Dec ramp adapt.] (brA) = [No] (nO) or [Yes] (YES) (see page 155).</p>		
dYnA dYnb dYnC	<p>CAUTION</p> <p>Do not use [High torq. B] (dYnb) or [High torq. C] (dYnC) configurations if the motor is a permanent magnet synchronous motor, as it will be demagnetized.</p> <p>Failure to follow this instruction can result in equipment damage.</p>		

[1.7 APPLICATION FUNCT.] (FUn-)






Code	Name/Description	Adjustment range	Factory setting
SEt -	<div> <div></div> <div>[STOP CONFIGURATION]</div> <div>  Note: Some types of stop cannot be used with all other functions. Follow the instructions on page 145. </div> </div>		
SEt rMP FSt nSt dCI	<div> <div><input type="checkbox"/> [Type of stop]</div> <div> <div>Stop mode on disappearance of the run command or appearance of a stop command.</div> <div> <input type="checkbox"/> [Ramp stop] (rMP): Stop on ramp. <input type="checkbox"/> [Fast stop] (FSt): Fast stop <input type="checkbox"/> [Freewheel stop] (nSt): Freewheel stop <input type="checkbox"/> [DC injection] (dCI): DC injection stop </div> </div> <div>  Note: If the "brake logic" function on page 175 has been enabled, or if [Low speed time out] (tLS) page 63 or 196 is not 0, only ramp type stops may be configured. </div> </div>		[Ramp stop] (rMP)
FFt 	<div> <div><input type="checkbox"/> [Freewheel stop Thd.]</div> <div>(1)</div> </div> <div> 0.0 to 1600 Hz </div> <div> 0.0 Hz </div> <div> This parameter supports switching from a ramp stop or a fast stop to a freewheel stop below a low speed threshold. It can be accessed if [Type of stop] (Stt) = [Fast stop] (FSt) or [Ramp stop] (rMP). <input type="checkbox"/> 0.0: Does not switch to freewheel stop. <input type="checkbox"/> 0.1 to 1600 Hz: Speed threshold below which the motor will switch to freewheel stop. </div>		
nSt nD LI1 - - C101 - - Cd00 -	<div> <div><input type="checkbox"/> [Freewheel stop ass.]</div> <div> <input type="checkbox"/> [No] (nO): Not assigned <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted <input type="checkbox"/> [C101] (C101) to [C115] (C115): With integrated Modbus in [I/O profile] (IO) <input type="checkbox"/> [C201] (C201) to [C215] (C215): With integrated CANopen in [I/O profile] (IO) <input type="checkbox"/> [C301] (C301) to [C315] (C315): With a communication card in [I/O profile] (IO) <input type="checkbox"/> [C401] (C401) to [C415] (C415): With a Controller Inside card in [I/O profile] (IO) <input type="checkbox"/> [CD00] (Cd00) to [CD13] (Cd13): In [I/O profile] can be switched with possible logic inputs <input type="checkbox"/> [CD14] (Cd14) to [CD15] (Cd15): In [I/O profile] can be switched without logic inputs </div> <div> The stop is activated when the input or the bit changes to 0. If the input returns to state 1 and the run command is still active, the motor will only restart if [2/3 wire control] (tCC) page 102 = [2 wire] (2C) and the [2 wire type] (tCt) = [Level] (LEL) or [Fwd priority] (PFO). If not, a new run command must be sent. </div> </div>		[No] (nO)
FSt nD LI1 - - -	<div> <div><input type="checkbox"/> [Fast stop assign.]</div> <div> <div>  Note: This function cannot be used with certain other functions. Follow the instructions on page 145. </div> <div> <input type="checkbox"/> [No] (nO): Not assigned <input type="checkbox"/> [LI1] (LI1) <div>...</div> <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. </div> </div> <div> The stop is activated when the input changes to 0 or the bit changes to 1 (bit in [I/O profile] (IO) at 0). If the input returns to state 1 and the run command is still active, the motor will only restart if [2/3 wire control] (tCC) page 102 = [2 wire] (2C) and the [2 wire type] (tCt) = [Level] (LEL) or [Fwd priority] (PFO). If not, a new run command must be sent. </div> </div>		[No] (nO)
dCF 	<div> <div><input type="checkbox"/> [Ramp divider]</div> <div>(1)</div> </div> <div> 0 to 10 </div> <div> 4 </div> <div> The parameter can be accessed if [Type of stop] (Stt) = [Fast stop] (FSt) and if [Fast stop assign.] (FSt) is not [No] (nO). The ramp that is enabled (dEC or dE2) is then divided by this coefficient when stop requests are sent. Value 0 corresponds to a minimum ramp time. </div>		

(1) The parameter can also be accessed in the [\[1.3 SETTINGS\] \(SEt-\)](#) menu.



Parameter that can be modified during operation or when stopped.


[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	■ [STOP CONFIGURATION] (continued)		
dC I	□ [DC injection assign.] <div> <p> Note: This function cannot be used with certain other functions. Follow the instructions on page 145.</p> <p><input type="checkbox"/> [No] (nO): Not assigned</p> <p><input type="checkbox"/> [LI1] (LI1)</p> <p>⋮</p> <p><input type="checkbox"/> [...] (...): See the assignment conditions on page 139.</p> <p>DC injection braking is initiated when the assigned input or bit changes to state 1. If the input returns to state 1 and the run command is still active, the motor will only restart if [2/3 wire control] (tCC) page 102 = [2 wire] (2C) and [2 wire type] (tCt) = [Level] (LEL) or [Fwd priority] (PFO). If not, a new run command must be sent.</p> </div>		[No] (nO)
IdC 	□ [DC inject. level 1] <div> <p>(1) (3)</p> <p>Level of DC injection braking current activated via logic input or selected as stop mode. The parameter can be accessed if [Type of stop] (Stt) = [DC injection] (dCI) or if [DC injection assign.] (dCI) is not [No] (nO).</p> </div>	0.1 to 1.41 In (2)	0.64 In (2)
<div style="text-align: center;">CAUTION</div> <div>Check that the motor will withstand this current without overheating. Failure to follow this instruction can result in equipment damage.</div>			
IdC 	□ [DC injection time 1] <div> <p>(1) (3)</p> <p>Maximum current injection time [DC inject. level 1] (IdC). After this time the injection current becomes [DC inject. level 2] (IdC2). The parameter can be accessed if [Type of stop] (Stt) = [DC injection] (dCI) or if [DC injection assign.] (dCI) is not [No] (nO).</p> </div>	0.1 to 30 s	0.5 s
IdC2 	□ [DC inject. level 2] <div> <p>(1) (3)</p> <p>Injection current activated by logic input or selected as stop mode, once period of time [DC injection time 1] (tdI) has elapsed. The parameter can be accessed if [Type of stop] (Stt) = [DC injection] (dCI) or if [DC injection assign.] (dCI) is not [No] (nO).</p> </div>	0.1 In (2) to [DC inject. level 1] (IdC)	0.5 In (2)
<div style="text-align: center;">CAUTION</div> <div>Check that the motor will withstand this current without overheating. Failure to follow this instruction can result in equipment damage.</div>			
IdC 	□ [DC injection time 2] <div> <p>(1) (3)</p> <p>Maximum injection time [DC inject. level 2] (IdC2) for injection, selected as stop mode only. The parameter can be accessed if [Stop type] (Stt) = [DC injection] (dCI).</p> </div>	0.1 to 30 s	0.5 s


(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

(2) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.

(3) Warning: These settings are independent of the [AUTO DC INJECTION] (AdC-) function.


 Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

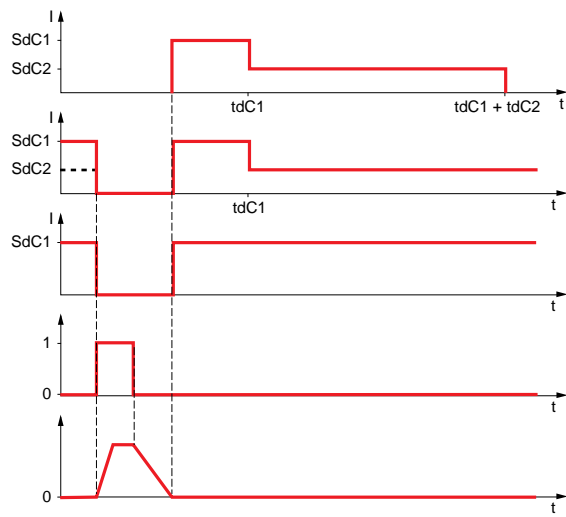
Code	Name/Description	Adjustment range	Factory setting
AdC -	■ [AUTO DC INJECTION]		
AdC () nO YES Ct	<input type="checkbox"/> [Auto DC injection] Automatic current injection on stopping (at the end of the ramp) <input type="checkbox"/> [No] (nO): No injection. <input type="checkbox"/> [Yes] (YES): Adjustable injection time. <input type="checkbox"/> [Continuous] (Ct): Continuous standstill injection. Warning: There is an interlock between this function and [Motor fluxing] (FLU) page 86. If [Motor fluxing] (FLU) = [Continuous] (Fct) [Auto DC injection] (AdC) must be [No] (nO).  Note: This parameter gives rise to the injection of current even if a run command has not been sent. It can be accessed with the drive running.		[Yes] (YES)
SdC 1 ()	<input type="checkbox"/> [Auto DC inj. level 1] (1) Level of standstill DC injection current. This parameter can be accessed if [Auto DC injection] (AdC) is not [No] (nO) and cannot be accessed if [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync.CL] (FSY). This parameter is forced to 0 if [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn).	0 to 1.2 In (2)	0.7 In (2)
EdC 1 ()	<input type="checkbox"/> [Auto DC inj. time 1] (1) Standstill injection time. The parameter can be accessed if [Auto DC injection] (AdC) is not [No] (nO). If [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync. mot.] (SYn) this time corresponds to the zero speed maintenance time.	0.1 to 30 s	0.5 s
SdC 2 ()	<input type="checkbox"/> [Auto DC inj. level 2] (1) 2 nd level of standstill DC injection current. This parameter can be accessed if [Auto DC injection] (AdC) is not [No] (nO) and cannot be accessed if [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync.CL] (FSY). This parameter is forced to 0 if [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn).	0 to 1.2 In (2)	0.5 In (2)

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

(2) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.

 Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	■ [AUTO DC INJECTION] (continued)		
<div>tdC2</div> <div>()</div>	<div>□ [Auto DC inj. time 2] (1)</div> <div>2nd standstill injection time. The parameter can be accessed if [Auto DC injection] (AdC) = [Yes] (YES)</div>	0 to 30 s	0 s
AdC	SdC2	<div>Operation</div> <div></div>	
YES	x		
Ct	≠ 0		
Ct	= 0		
Run command			
Speed			
<div>Note: When [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync.CL] (FSY): [Auto DC inj. level 1] (SdC1), [Auto DC inj. level 2] (SdC2) and [Auto DC inj. time 2] (tdC2) cannot be accessed, only [Auto DC inj. time 1] (tdC1) can be accessed. This then corresponds to a zero speed maintenance time.</div>			

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

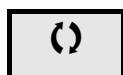
()

Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
JOG -	<div> <div> </div> <div> [JOG] </div> </div> <p>Note: This function cannot be used with certain other functions. Follow the instructions on page 145.</p>		
JOG	<div> <div> </div> <div> [JOG] </div> </div> <div> <div> <div>[No] (nO)</div> </div> </div> <p>Pulse operation.</p> <p>The JOG function is only active if the command channel and the reference channels are on the terminals.</p> <p>Selecting the assigned logic input or bit activates the function.</p> <ul style="list-style-type: none"> <input type="checkbox"/> [No] (nO): Not assigned <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted <input type="checkbox"/> [C101] (C101) to [C115] (C115): With integrated Modbus in [I/O profile] (IO) profile <input type="checkbox"/> [C201] (C201) to [C215] (C215): With integrated CANopen in [I/O profile] (IO) profile <input type="checkbox"/> [C301] (C301) to [C315] (C315): With a communication card in [I/O profile] (IO) profile <input type="checkbox"/> [C401] (C401) to [C415] (C415): With a Controller Inside card in [I/O profile] (IO) profile <input type="checkbox"/> [CD00] (Cd00) to [CD13] (Cd13): In [I/O profile] profile can be switched with possible logic inputs <input type="checkbox"/> [CD14] (Cd14) to [CD15] (Cd15): In [I/O profile] profile can be switched without logic inputs <p>The function is active when the assigned input or bit is at 1.</p> <p>Example: 2-wire control operation (tCC = 2C)</p>		
JGF ()	<div> <div> </div> <div> [Jog frequency] </div> </div> <div> <div> <div>(1)</div> </div> </div> <div> <div>0 to 10 Hz</div> </div> <div> <div>10 Hz</div> </div> <p>The parameter can be accessed if [JOG] (JOG) is not [No] (nO).</p> <p>Reference in jog operation</p>		
JGt ()	<div> <div> </div> <div> [Jog delay] </div> </div> <div> <div> <div>(1)</div> </div> </div> <div> <div>0 to 2.0 s</div> </div> <div> <div>0.5 s</div> </div> <p>The parameter can be accessed if [JOG] (JOG) is not [No] (nO).</p> <p>Anti-repeat delay between 2 consecutive jog operations.</p>		

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.



Parameter that can be modified during operation or when stopped.

Preset speeds

2, 4, 8 or 16 speeds can be preset, requiring 1, 2, 3 or 4 logic inputs respectively.




Note: You must configure 2 and 4 speeds in order to obtain 4 speeds.
You must configure 2, 4 and 8 speeds in order to obtain 8 speeds.
You must configure 2, 4, 8, and 16 speeds in order to obtain 16 speeds.

Combination table for preset speed inputs

16 speeds LI (PS16)	8 speeds LI (PS8)	4 speeds LI (PS4)	2 speeds LI (PS2)	Speed reference
0	0	0	0	Reference (1)
0	0	0	1	SP2
0	0	1	0	SP3
0	0	1	1	SP4
0	1	0	0	SP5
0	1	0	1	SP6
0	1	1	0	SP7
0	1	1	1	SP8
1	0	0	0	SP9
1	0	0	1	SP10
1	0	1	0	SP11
1	0	1	1	SP12
1	1	0	0	SP13
1	1	0	1	SP14
1	1	1	0	SP15
1	1	1	1	SP16

(1) See the diagram on page [133](#): Reference 1 = (SP1).

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
P55 -	<div> <div></div> <div>[PRESET SPEEDS]</div> <div>  Note: This function cannot be used with certain other functions. Follow the instructions on page 145. </div> </div>		
P52 nD L I I - - -	<div> <input type="checkbox"/> [2 preset speeds] </div> <div> <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) ⋮ <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. </div>		[No] (nO)
P54 nD L I I - - -	<div> <input type="checkbox"/> [4 preset speeds] </div> <div> <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) ⋮ <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. To obtain 4 speeds you must also configure 2 speeds. </div>		[No] (nO)
P58 nD L I I - - -	<div> <input type="checkbox"/> [8 preset speeds] </div> <div> <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) ⋮ <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. To obtain 8 speeds you must also configure 2 and 4 speeds. </div>		[No] (nO)
P516 nD L I I - - -	<div> <input type="checkbox"/> [16 preset speeds] </div> <div> <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) ⋮ <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. To obtain 16 speeds you must also configure 2, 4 and 8 speeds. </div>		[No] (nO)

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	■ [PRESET SPEEDS] (continued)		
SP 2 ()	<input type="checkbox"/> [Preset speed 2] (1)	0 to 1600 Hz	10 Hz
SP 3 ()	<input type="checkbox"/> [Preset speed 3] (1)		15 Hz
SP 4 ()	<input type="checkbox"/> [Preset speed 4] (1)		20 Hz
SP 5 ()	<input type="checkbox"/> [Preset speed 5] (1)		25 Hz
SP 6 ()	<input type="checkbox"/> [Preset speed 6] (1)		30 Hz
SP 7 ()	<input type="checkbox"/> [Preset speed 7] (1)		35 Hz
SP 8 ()	<input type="checkbox"/> [Preset speed 8] (1)		40 Hz
SP 9 ()	<input type="checkbox"/> [Preset speed 9] (1)		45 Hz
SP 10 ()	<input type="checkbox"/> [Preset speed 10] (1)		50 Hz
SP 11 ()	<input type="checkbox"/> [Preset speed 11] (1)		55 Hz
SP 12 ()	<input type="checkbox"/> [Preset speed 12] (1)		60 Hz
SP 13 ()	<input type="checkbox"/> [Preset speed 13] (1)		70 Hz
SP 14 ()	<input type="checkbox"/> [Preset speed 14] (1)		80 Hz
SP 15 ()	<input type="checkbox"/> [Preset speed 15] (1)		90 Hz
SP 16 ()	<input type="checkbox"/> [Preset speed 16] (1)		100 Hz
The appearance of these [Preset speed x] (SPx) parameters is determined by the number of speeds configured.			

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

() Parameter that can be modified during operation or when stopped.

+/- speed

Two types of operation are available.

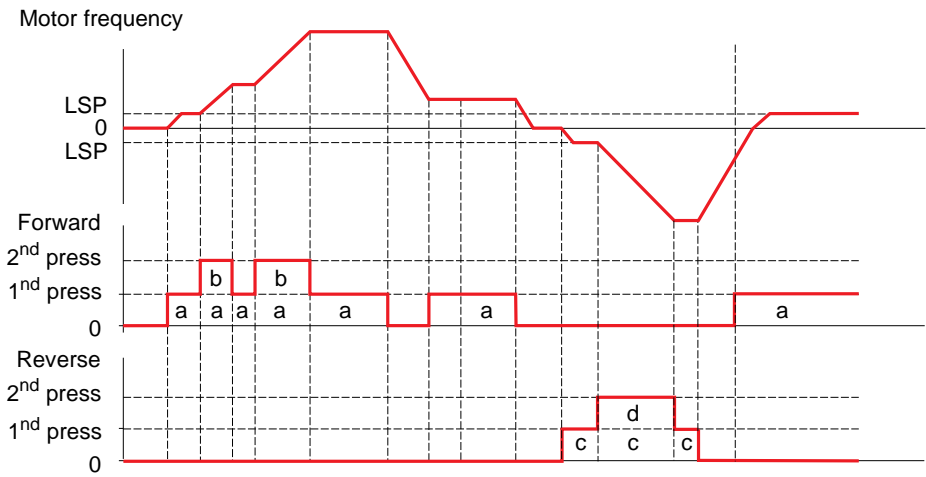
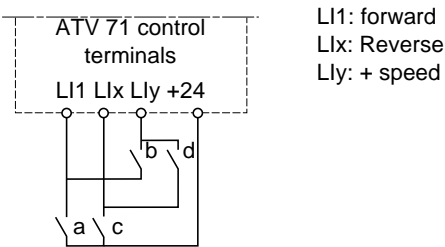
- 1. **Use of single action buttons:** Two logic inputs are required in addition to the operating direction(s).
The input assigned to the "+ speed" command increases the speed, the input assigned to the "- speed" command decreases the speed.
- 2. **Use of double action buttons:** Only one logic input assigned to "+ speed" is required.

+/- speed with double-press buttons:

Description: 1 button pressed twice (2 steps) for each direction of rotation. A contact closes each time the button is pressed.

	Released (- speed)	1 st press (speed maintained)	2 nd press (faster)
Forward button	–	a	a and b
Reverse button	–	c	c and d

Example of wiring:




Do not use this +/-speed type with 3-wire control.

Whichever type of operation is selected, the max. speed is set by [High speed] (HSP) (see page 56).

Note:
If the reference is switched via rFC (see page 141) from any one reference channel to another reference channel with "+/- speed", the value of reference rFr (after ramp) may be copied at the same time in accordance with the [Copy channel 1 --> 2] (COP) parameter, see page 142. If the reference is switched via rFC (see page 141) from one reference channel to any other reference channel with "+/- speed", the value of reference rFr (after ramp) is always copied at the same time.

This prevents the speed being incorrectly reset to zero when switching takes place.

[1.7 APPLICATION FUNCT.] (FUN-)

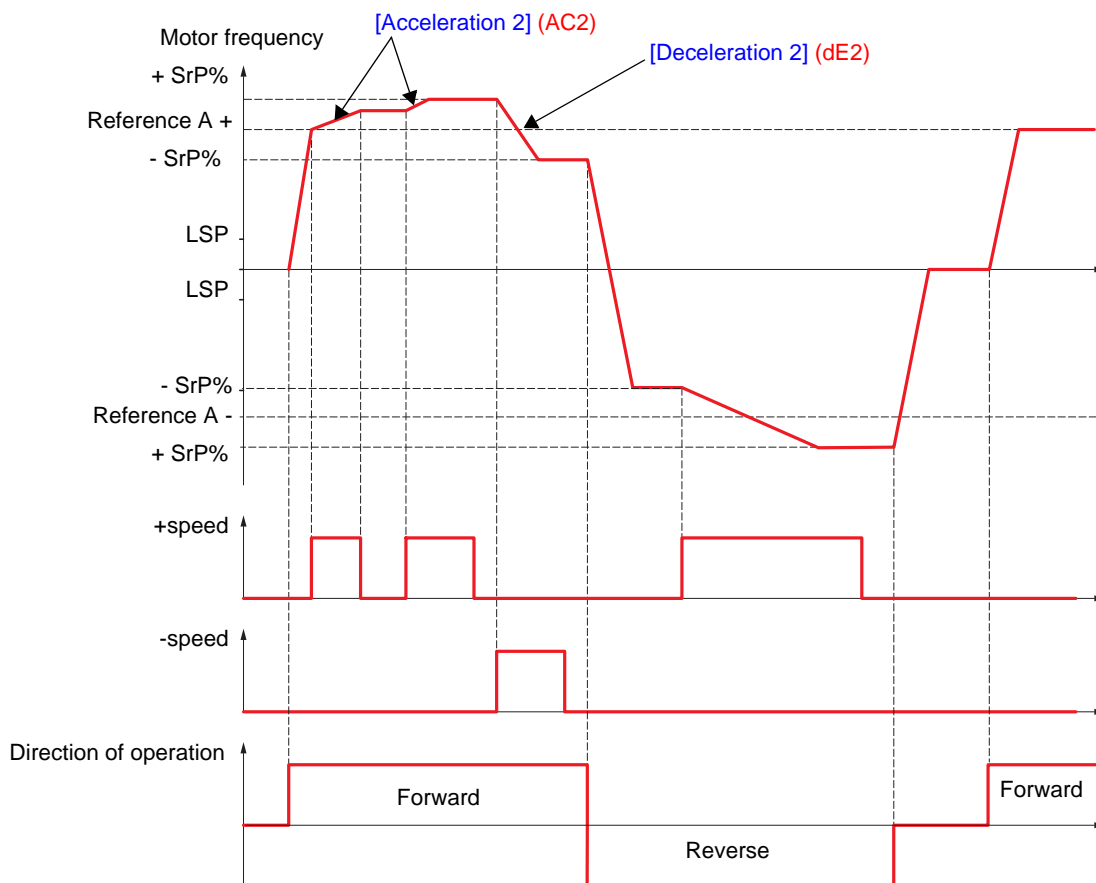
Code	Name/Description	Adjustment range	Factory setting
UPd -	<div> <div> <div></div> <div>[+/- SPEED]</div> </div> <p>Function can be accessed if reference channel [Ref.2 channel] (Fr2) = [+/-Speed] (UPdt) see page 141.</p> <p> Note: This function cannot be used with certain other functions. Follow the instructions on page 145.</p> </div>		
USP nD L I I - - C I O I - - - C d O O -	<div> <div> <div></div> <div>[+ speed assignment]</div> </div> <div> <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted <input type="checkbox"/> [C101] (C101) to [C115] (C115): With integrated Modbus in [I/O profile] (IO) <input type="checkbox"/> [C201] (C201) to [C215] (C215): With integrated CANopen in [I/O profile] (IO) <input type="checkbox"/> [C301] (C301) to [C315] (C315): With a communication card in [I/O profile] (IO) <input type="checkbox"/> [C401] (C401) to [C415] (C415): With a Controller Inside card in [I/O profile] (IO) <input type="checkbox"/> [CD00] (Cd00) to [CD13] (Cd13): In [I/O profile] can be switched with possible logic inputs <input type="checkbox"/> [CD14] (Cd14) to [CD15] (Cd15): In [I/O profile] can be switched without logic inputs </div> <p>Function active if the assigned input or bit is at 1.</p> </div>		[No] (nO)
dSP nD L I I - - C I O I - - - C d O O -	<div> <div> <div></div> <div>[-Speed assignment]</div> </div> <div> <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted <input type="checkbox"/> [C101] (C101) to [C115] (C115): With integrated Modbus in [I/O profile] (IO) <input type="checkbox"/> [C201] (C201) to [C215] (C215): With integrated CANopen in [I/O profile] (IO) <input type="checkbox"/> [C301] (C301) to [C315] (C315): With a communication card in [I/O profile] (IO) <input type="checkbox"/> [C401] (C401) to [C415] (C415): With a Controller Inside card in [I/O profile] (IO) <input type="checkbox"/> [CD00] (Cd00) to [CD13] (Cd13): In [I/O profile] can be switched with possible logic inputs <input type="checkbox"/> [CD14] (Cd14) to [CD15] (Cd15): In [I/O profile] can be switched without logic inputs </div> <p>Function active if the assigned input or bit is at 1.</p> </div>		[No] (nO)
SEr nD r R n E E P	<div> <div> <div></div> <div>[Reference saved]</div> </div> <p>Associated with the "+/- speed" function, this parameter can be used to save the reference:</p> <ul style="list-style-type: none"> When the run commands disappear (saved to RAM) When the line supply or the run commands disappear (saved to EEPROM) <p>Therefore, the next time the drive starts up, the speed reference is the last reference saved.</p> <div> <input type="checkbox"/> [No] (nO): No save (the next time the drive starts up, the speed reference is [Low speed] (LSP), see page 44) <input type="checkbox"/> [RAM] (rAM): Saved in RAM <input type="checkbox"/> [EEprom] (EEP): Saved in EEPROM </div> </div>		[No] (nO)

+/- speed around a reference



The reference is given by Fr1 or Fr1b with summing/subtraction/multiplication functions and preset speeds if relevant (see the diagram on page 133). For improved clarity, we will call this reference A. The action of the +speed and -speed buttons can be set as a % of this reference A. On stopping, the reference (A +/- speed) is not saved, so the drive restarts with reference A+ only.

The maximum total reference is always limited by [High speed] (HSP) and the minimum reference by [Low speed] (LSP), see page 56.

Example of 2-wire control:

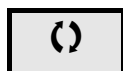


[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
SrE-	■ [+/-SPEED AROUND REF.] The function can be accessed for reference channel [Ref.1 channel] (Fr1) .  Note: This function cannot be used with certain other functions. Follow the instructions on page 145 .		
US1 nD L11 - - -	<input type="checkbox"/> [+ speed assignment] <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [L11] (LI1) ⋮ <input type="checkbox"/> [...] (...): See the assignment conditions on page 139 . Function active if the assigned input or bit is at 1.		[No] (nO)
dS1 nD L11 - - -	<input type="checkbox"/> [-Speed assignment] <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [L11] (LI1) ⋮ <input type="checkbox"/> [...] (...): See the assignment conditions on page 139 . Function active if the assigned input or bit is at 1.		[No] (nO)
SrP 	<input type="checkbox"/> [+/-Speed limitation] This parameter limits the variation range with +/- speed as a % of the reference. The ramps used in this function are [Acceleration 2] (AC2) and [Deceleration 2] (dE2) . The parameter can be accessed if +/- speed is assigned.	0 to 50 %	10 %
AC2	<input type="checkbox"/> [Acceleration 2] (1) Time to accelerate from 0 to the [Rated motor freq.] (FrS) or [Nominal freq sync.] (FrSS) page 82 . Make sure that this value is compatible with the inertia being driven. The parameter can be accessed if +/- speed is assigned.	0.01 to 6000 s (2)	5.0 s
dE2	<input type="checkbox"/> [Deceleration 2] (1) Time to decelerate from the [Rated motor freq.] (FrS) or [Nominal freq sync.] (FrSS) page 82 to 0. Make sure that this value is compatible with the inertia being driven. The parameter can be accessed if +/- speed is assigned.	0.01 to 6000 s (2)	5.0 s

(1) The parameter can also be accessed in the [\[1.3 SETTINGS\] \(SEt-\)](#) menu.

(2) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6000 s according to [\[Ramp increment\] \(Inr\)](#) page [152](#).

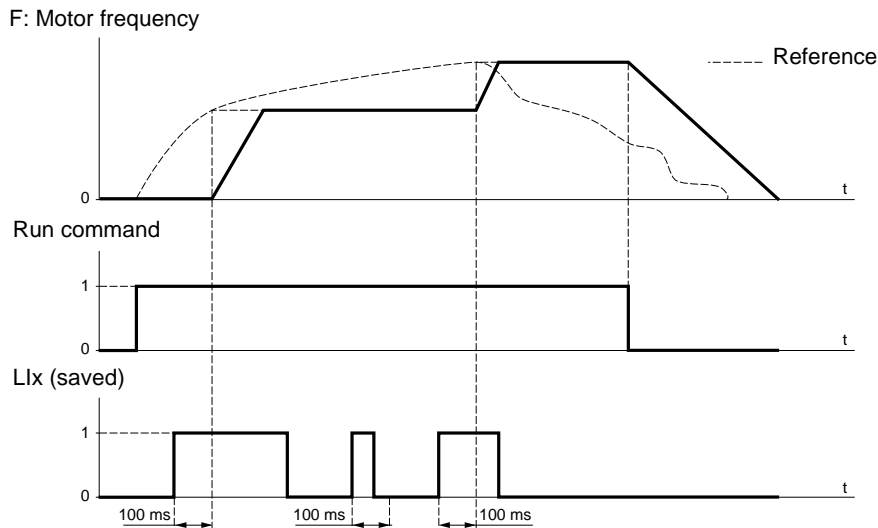


Parameter that can be modified during operation or when stopped.

Save reference

Saving a speed reference value using a logic input command lasting longer than 0.1 s.

- This function is used to control the speed of several drives alternately via a single analog reference and one logic input for each drive.
- It is also used to confirm a line reference (communication bus or network) on several drives via a logic input. This allows movements to be synchronized by getting rid of variations when the reference is set.
- The reference is acquired 100 ms after the rising edge of the request. A new reference is not then acquired until a new request is made.



Code	Name/Description	Adjustment range	Factory setting
SPn -	■ [MEMO REFERENCE]		
SPn	□ [Ref. memo ass.]		[No] (nO)
nO	□ [No] (nO): Function inactive		
L I 1	□ [L11] (LI1) to [L16] (LI6)		
-	□ [L17] (LI7) to [L110] (LI10): If VW3A3201 logic I/O card has been inserted		
L I 14	□ [L111] (LI11) to [L114] (LI14): If VW3A3202 extended I/O card has been inserted		
	Assignment to a logic input		
	Function active if the assigned input is at 1.		

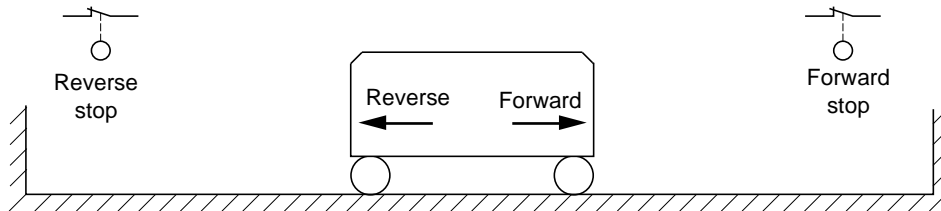
Limit switch management

This function can be used to manage trajectory limits using limit switches.


The stop mode is configurable.

When the stop contact is activated, startup in the other direction is authorized.

Example:



The stop is activated when the input is at 0 (contact open).

Code	Name/Description	Adjustment range	Factory setting
LSE -	<div> <div></div> <div>[LIMIT SWITCHES]</div> <div>  Note: This function cannot be used with certain other functions. Follow the instructions on page 145. </div> </div>		
LAF nD LII - - CIDI - - - CdDD -	<div> <div><input type="checkbox"/> [Stop FW limit sw.]</div> <div> <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted <input type="checkbox"/> [C101] (C101) to [C115] (C115): With integrated Modbus in [I/O profile] (IO) <input type="checkbox"/> [C201] (C201) to [C215] (C215): With integrated CANopen in [I/O profile] (IO) <input type="checkbox"/> [C301] (C301) to [C315] (C315): With a communication card in [I/O profile] (IO) <input type="checkbox"/> [C401] (C401) to [C415] (C415): With a Controller Inside card in [I/O profile] (IO) <input type="checkbox"/> [CD00] (Cd00) to [CD13] (Cd13): In [I/O profile] (IO) can be switched with possible logic inputs <input type="checkbox"/> [CD14] (Cd14) to [CD15] (Cd15): In [I/O profile] (IO) can be switched without logic inputs </div> </div>		[No] (nO)
LAr	<div> <div><input type="checkbox"/> [Stop RV limit sw.]</div> <div> Same assignments possible as for [Stop FW limit sw.] (LAF) below. </div> </div>		[No] (nO)
LAS rNP FSE nSE	<div> <div><input type="checkbox"/> [Stop type]</div> <div> <input type="checkbox"/> [Ramp stop] (rMP) <input type="checkbox"/> [Fast stop] (FSt) <input type="checkbox"/> [Freewheel] (nSt) When the assigned input changes to 0, the stop is controlled in accordance with the selected type. Restarting is only authorized for the other operating direction once the motor has stopped. If the two inputs [Stop FW limit sw.] (LAF) and [Stop RV limit sw.] (LAr) are assigned and at state 0, restarting will be impossible. The parameter can be accessed if [Stop FW limit sw.] (LAF) or [Stop RV limit sw.] (LAr) is assigned. </div> </div>		[Freewheel] (nSt)

Brake logic control

Used to control an electromagnetic brake by the drive, for horizontal and vertical hoisting applications, and for unbalanced machines.

Principle:


Vertical hoisting movement:

Maintain motor torque in the driving load holding direction during brake opening and closing, in order to hold the load, start smoothly when the brake is released and stop smoothly when the brake is engaged.

Horizontal movement:

Synchronize brake release with the build-up of torque during startup and brake engage at zero speed on stopping, to prevent jolting.

Recommended settings for brake logic control for a vertical hoisting application:



WARNING

UNINTENDED EQUIPMENT OPERATION
Check that the selected settings and configurations will not result in the dropping or loss of control of the load being lifted.
Failure to follow these instructions can result in death or serious injury.

- 1. Brake impulse (bIP): YES. Ensure that the direction of rotation FW corresponds to lifting the load.
For applications in which the load being lowered is very different from the load being lifted, set BIP = 2 lbr (e.g., ascent always with a load and descent always without a load).
- 2. Brake release current (lbr and lrd if BIP = 2 lbr): Adjust the brake release current to the rated current indicated on the motor.
During testing, adjust the brake release current in order to hold the load smoothly.
- 3. Acceleration time: For hoisting applications it is advisable to set the acceleration ramps to more than 0.5 seconds. Ensure that the drive does not exceed the current limit.
The same recommendation applies for deceleration.
Reminder: For a hoisting movement, a braking resistor should be used.
- 4. Brake release time (brt): Set according to the type of brake. It is the time required for the mechanical brake to release.
- 5. Brake release frequency (blr), in open-loop mode only: Leave in [Auto], adjust if necessary.
- 6. Brake engage frequency (bEn): Leave in [Auto], adjust if necessary.
- 7. Brake engage time (bEt): Set according to the type of brake. It is the time required for the mechanical brake to engage.

Recommended settings for brake logic control for a horizontal hoisting application:

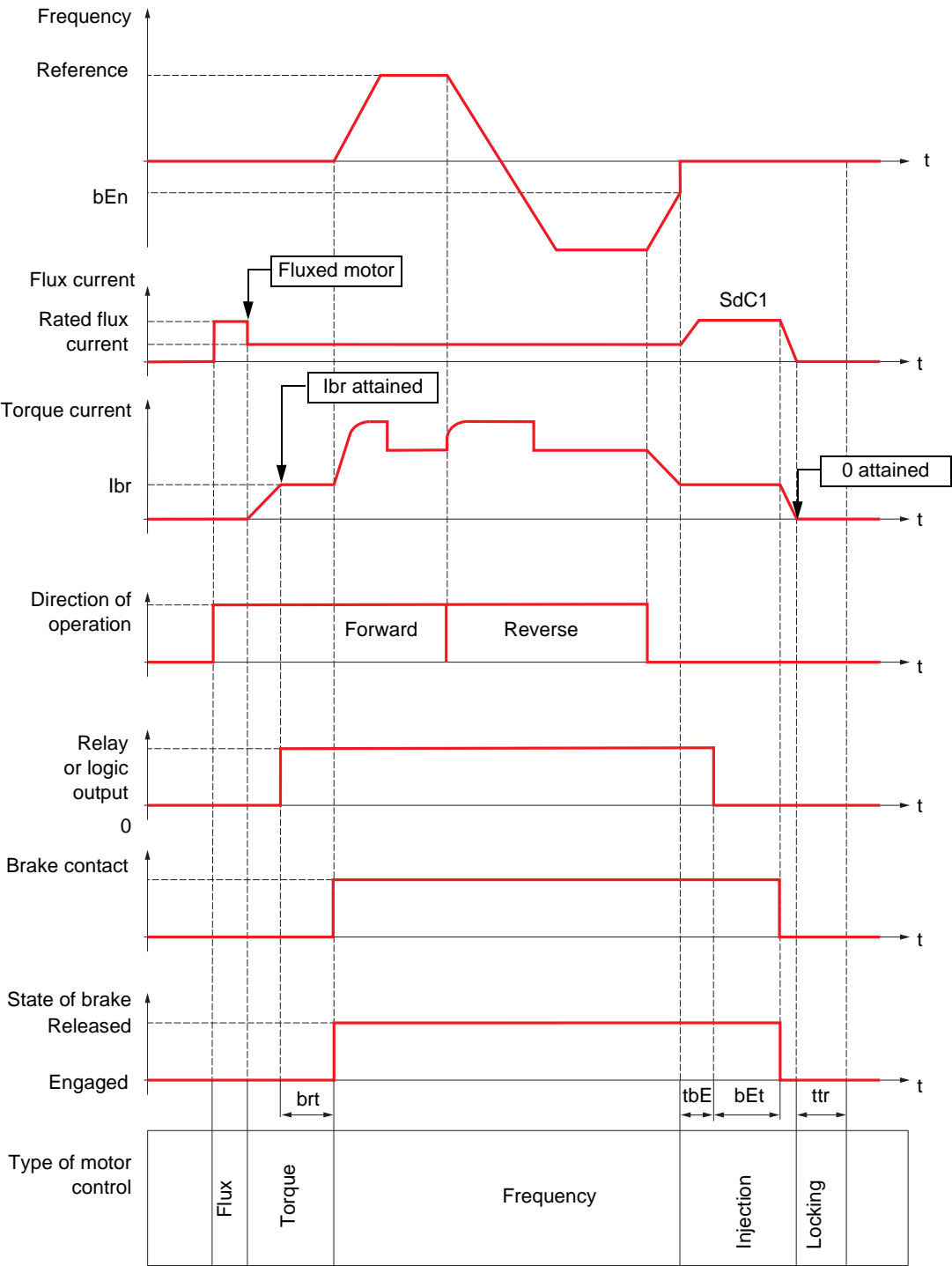
- 1. Brake impulse (bIP): No
- 2. Brake release current (lbr): Set to 0.
- 3. Brake release time (brt): Set according to the type of brake. It is the time required for the mechanical brake to release.
- 4. Brake engage frequency (bEn), in open-loop mode only: Leave in [Auto], adjust if necessary.
- 5. Brake engage time (bEt): Set according to the type of brake. It is the time required for the mechanical brake to engage.

Handling

Lifts

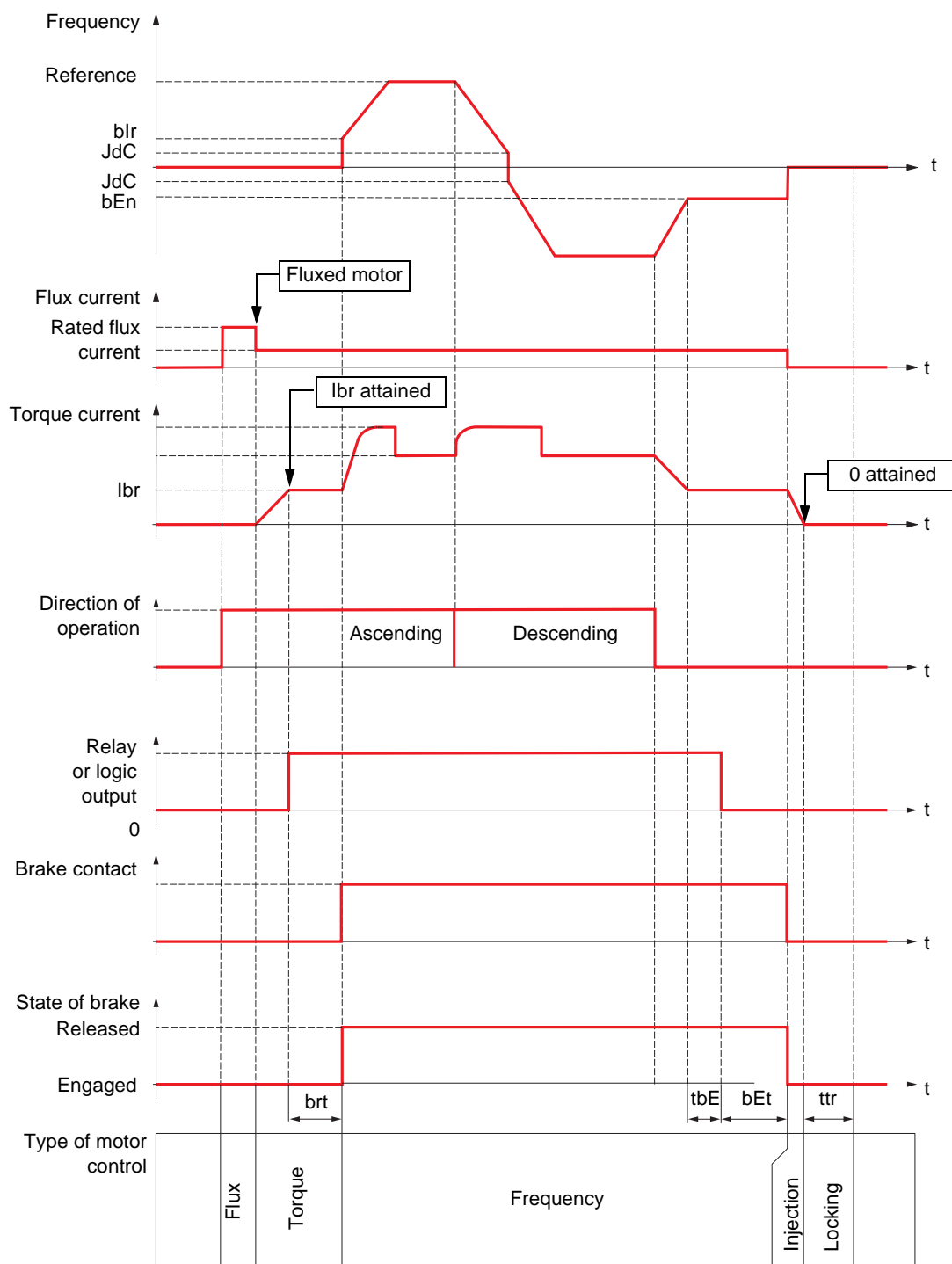
Hoisting

Brake logic control, horizontal movement in open-loop mode



- Key:
- (bEn): [Brake engage freq]
 - (bEt): [Brake engage time]
 - (brt): [Brake Release time]
 - (lbr): [Brake release I FW]
 - (SdC1): [Auto DC inj. level 1]
 - (tbE): [Brake engage delay]
 - (ttr): [Time to restart]

Brake logic control, vertical movement in open-loop mode



Key:

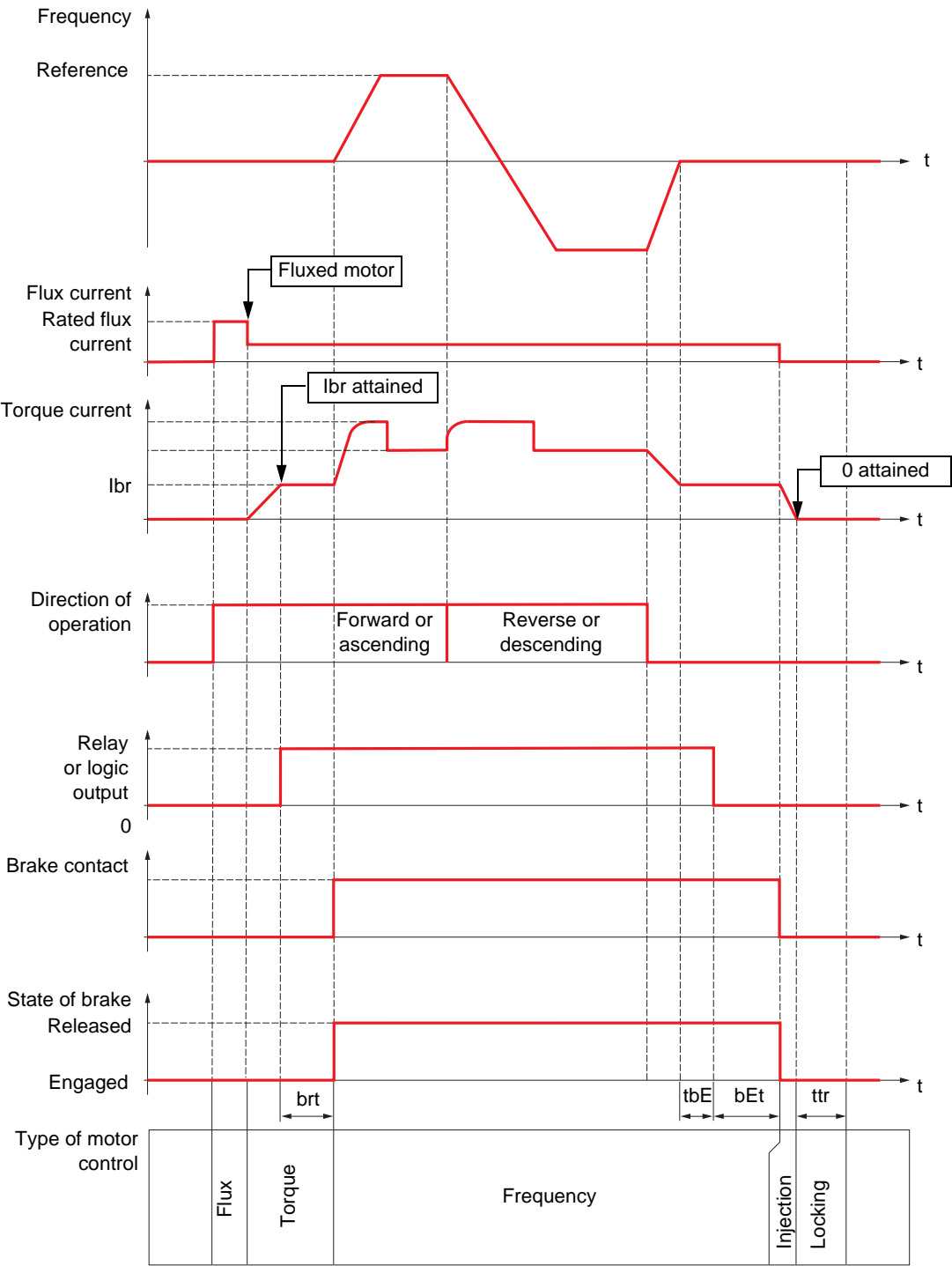
- (bEn): [Brake engage freq]
- (bEt): [Brake engage time]
- (blr): [Brake release freq]
- (brt): [Brake Release time]
- (lbr): [Brake release I FW]
- (JdC): [Jump at reversal]
- (tbE): [Brake engage delay]
- (ttr): [Time to restart]

Handling

Lifts

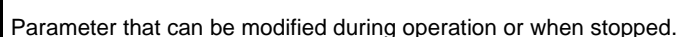
Hoisting

Brake logic control, vertical or horizontal movement in closed-loop mode



- Key:
- (bEt): [Brake engage time]
 - (brt): [Brake Release time]
 - (lbr): [Brake release I FW]
 - (tbE): [Brake engage delay]
 - (ttr): [Time to restart]

- (1) The parameter can also be accessed in the **[1.3 SETTINGS] (Set-)** menu.
- (2) It corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.




[1.7 APPLICATION FUNCT.] (FUn-)

Handling


Lifts

Hoisting

Code	Name/Description	Adjustment range	Factory setting
	■ [BRAKE LOGIC CONTROL] (continued)		
b r t ()	<input type="checkbox"/> [Brake Release time] (1) Brake release time delay	0 to 5.00 s	0
b l r ()	<input type="checkbox"/> [Brake release freq] (1) Brake release frequency threshold (initialization of acceleration ramp). The parameter can be accessed if [Motor control type] (Ctt) page 70 is not [FVC] (FUC) or [Sync.CL] (FSY) and if [Movement type] (bSt) page 175 is [Hoisting] (UEr). <input type="checkbox"/> [Auto] (AUtO): The drive takes a value equal to the rated slip of the motor, calculated using the drive parameters. <input type="checkbox"/> 0 to 10 Hz: Manual control		[Auto] (AUtO)
A U t O -			
b E n ()	<input type="checkbox"/> [Brake engage freq] (1) Brake engage frequency threshold The parameter can be accessed if [Motor control type] (Ctt) page 70 is not [FVC] (FUC) or [Sync.CL] (FSY). <input type="checkbox"/> [Auto] (AUtO): The drive takes a value equal to the rated slip of the motor, calculated using the drive parameters. <input type="checkbox"/> 0 to 10 Hz: Manual control		[Auto] (AUtO)
A U t O -			
b E C d n O -	<input type="checkbox"/> [Brake engage at 0] Brake engages at regulated zero speed. The parameter can be accessed if [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync.CL] (FSY). Can be used to engage the brake at zero speed in closed-loop mode with speed regulation. This parameter can be used to adjust the brake engage delay once zero speed has been reached. If a speed other than zero is then required, the command to release the brake is sent following torque application. <input type="checkbox"/> [No] (nO): Brake does not engage at regulated zero speed. <input type="checkbox"/> 0.0 to 30.0 s: Brake engage delay once zero speed is reached.		[No] (nO)
b b E ()	<input type="checkbox"/> [Brake engage delay] (1) Time delay before request to engage brake. To delay brake engagement, if you wish the brake to be engaged when the drive comes to a complete stop.	0 to 5.00 s	0
b E t ()	<input type="checkbox"/> [Brake engage time] (1) Brake engage time (brake response time)	0 to 5.00 s	0
S d C I ()	<input type="checkbox"/> [Auto DC inj. level 1] (1) Level of standstill DC injection current.  Note: The parameter can be accessed if [Motor control type] (Ctt) page 70 is not [FVC] (FUC) or [Sync.CL] (FSY) and if [Movement type] (bSt) page 175 is [Traveling] (HOr).	0 to 1.2 In (2)	0.7 In (2)
	<div>CAUTION</div> <div>Check that the motor will withstand this current without overheating. Failure to follow this instruction can result in equipment damage.</div>		

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

(2) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.

 Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	■ [BRAKE LOGIC CONTROL] (continued)		
bEd () nO YES	<input type="checkbox"/> [Engage at reversal] <input type="checkbox"/> [No] (nO): The brake does not engage. <input type="checkbox"/> [Yes] (YES): The brake engages. Can be used to select whether or not the brake engages on transition to zero speed when the operating direction is reversed.		[No] (nO)
JdC () AUtO -	<input type="checkbox"/> [Jump at reversal] (1) The parameter can be accessed if [Motor control type] (Ctt) page 70 is not [FVC] (FUC) or [Sync.CL] (FSY) and if [Movement type] (bSt) page 175 is [Hoisting] (UEr). <input type="checkbox"/> [Auto] (AUtO): The drive takes a value equal to the rated slip of the motor, calculated using the drive parameters. <input type="checkbox"/> 0 to 10 Hz: Manual control When the reference direction is reversed, this parameter can be used to avoid loss of torque (and consequential release of load) on transition to zero speed. Parameter is not applicable if [Engage at reversal] (bEd) = [Yes] (YES).	0 to 10.0 Hz	[Auto] (AUtO)
tEr ()	<input type="checkbox"/> [Time to restart] (1) Time between the end of a brake engage sequence and the start of a brake release sequence	0 to 15.00 s	0

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

() Parameter that can be modified during operation or when stopped.

Handling

Lifts

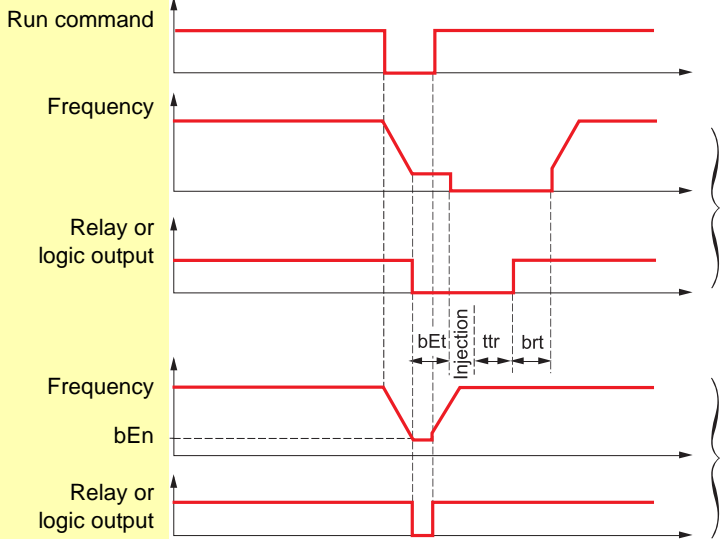
Hoisting

Handling

Lifts

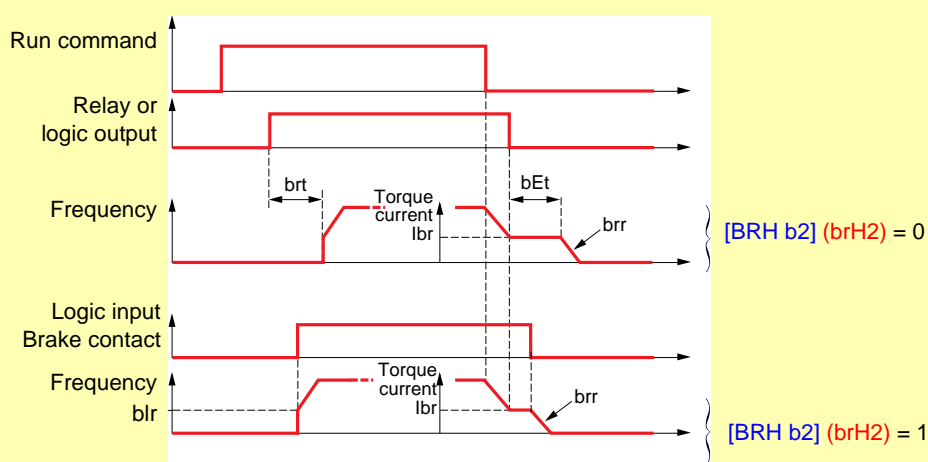
Hoisting

Brake control logic expert parameters

Code	Name/Description	Adjustment range	Factory setting
<div>brH0</div> <div>0</div> <div>1</div>	<div><input type="checkbox"/> [BRH b0]</div> <div>Selection of the brake restart sequence if a run command is repeated while the brake is engaging.</div> <div><input type="checkbox"/> [0] (0): The engage/release sequence is executed in full.</div> <div><input type="checkbox"/> [1] (1): The brake is released immediately.</div> <div>Use in open-loop and closed-loop mode.</div> <div><div>A run command may be requested during the brake engagement phase. Whether or not the brake release sequence is executed depends on the value selected for [BRH b0] (brH0).</div></div> <div></div> <div>Note: If a run command is requested during the "ttr" phase, the complete brake control sequence is initialized.</div>		0
<div>brH1</div> <div>0</div> <div>1</div>	<div><input type="checkbox"/> [BRH b1]</div> <div>Deactivation of the brake contact in steady state fault.</div> <div><input type="checkbox"/> [0] (0): The brake contact in steady state fault is active (fault if the contact is open during operation). The brF brake contact fault is monitored in all operating phases.</div> <div><input type="checkbox"/> [1] (1): The brake contact in steady state fault is inactive. The brF brake contact fault is only monitored during the brake release and engage phases.</div>		0

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
<div>brH2</div> <div>0</div> <div>1</div>	<div><div><div></div></div><div>[BRH b2]</div></div> <div>Taking the brake contact into account for the brake control sequence.</div> <div><div><div></div></div><div>[0] (0): The brake contact is not taken into account.</div><div><div></div></div><div>[1] (1): The brake contact is taken into account.</div></div> <div>Use in open-loop and closed-loop mode.</div> <div><div><div></div></div><div>If a logic input is assigned to the brake contact.</div><div><div><div></div></div><div>[BRH b2] (brH2) = 0: During the brake release sequence, the reference is enabled at the end of the time [Brake Release time] (brt). During the brake engage sequence, the current changes to 0 according to the ramp [Current ramp time] (brr) at the end of the [Brake engage time] (bEt).</div><div><div></div></div><div>[BRH b2] (brH2) = 1: When the brake is released, the reference is enabled when the logic input changes to 1. When the brake is engaged, the current changes to 0 according to the ramp [Current ramp time] (brr) when the logic input changes to 0.</div></div></div> <div><div><div><div><div>Run command</div><div>Relay or logic output</div><div>Frequency</div><div>Logic input Brake contact</div><div>Frequency blr</div></div><div></div><div><div>[BRH b2] (brH2) = 0</div><div>[BRH b2] (brH2) = 1</div></div></div></div></div>	0	
<div>brH3</div> <div>0</div> <div>1</div>	<div><div><div></div></div><div>[BRH b3]</div></div> <div>In closed-loop mode only. Management of the absence of brake contact response, if it is assigned.</div> <div><div><div></div></div><div>[0] (0): During the brake engage sequence, the brake contact must be open before the end of [Brake engage time] (bEt), otherwise the drive locks in a brF brake contact fault.</div><div><div></div></div><div>[1] (1): During the brake engage sequence, the brake contact must be open before the end of [Brake engage time] (bEt), otherwise a bCA brake contact alarm is triggered and zero speed is maintained.</div></div>	0	
<div>brH4</div> <div>0</div> <div>1</div>	<div><div><div></div></div><div>[BRH_b4]</div></div> <div>In closed-loop mode only. Activation of the speed loop at zero if a movement for which no command has been given occurs (measurement of a speed greater than a fixed min. threshold).</div> <div><div><div></div></div><div>[0] (0): No action in the event of a movement for which no command has been given.</div><div><div></div></div><div>[1] (1): If a movement occurs for which no command has been given, the drive switches to zero speed regulation, with no brake release command, and a bSA alarm is triggered.</div></div>	0	
<div>brr</div> <div>()</div>	<div><div><div></div></div><div>[Current ramp time]</div></div> <div>Torque current ramp time (increase and decrease) for a current variation equal to [Brake release I FW] (lbr).</div>	0 to 5.00 s	0 s

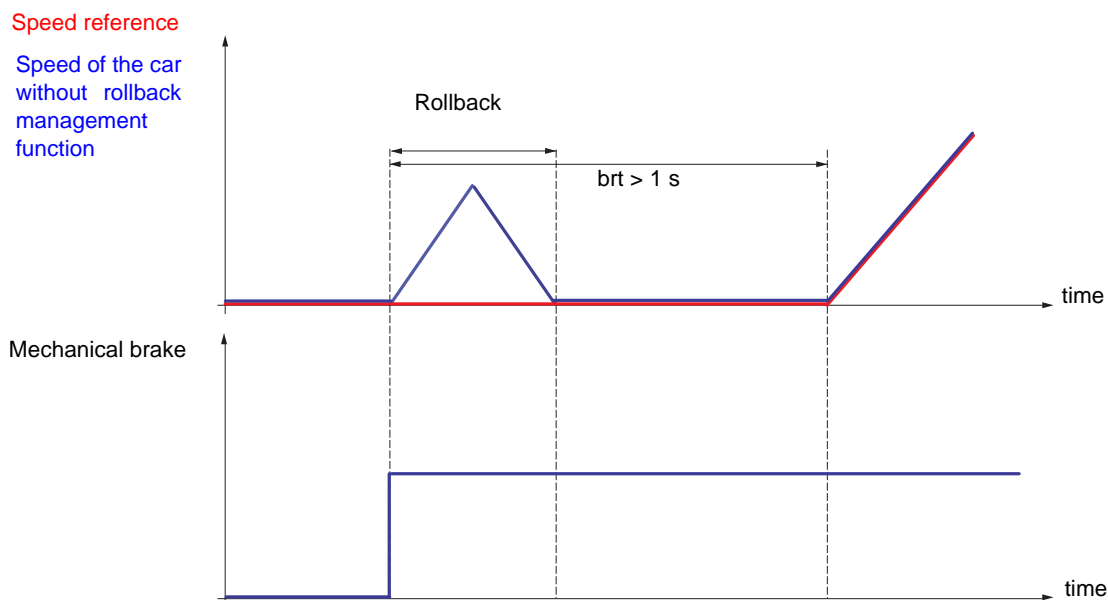


Parameter that can be modified during operation or when stopped.

Rollback management

In some lift applications (gearless with high inertia), a jerk can be felt in the car at the very beginning of the movement when the brake is opened. At this time, because no external weight sensor is used, the torque applied by the motor is not yet at the level required to hold the car. A little movement (up or down, depending on the overall balance occurs). This movement is known as "rollback".

The rollback management function is only available in closed loop ([Motor control type] (Ctt) page 70 = [Sync.CL] (FSY) or [FVC] (FUC)). It increases drive control stiffness during the mechanical brake release to cancel any movement during the brake opening time ([Brake Release time] (brt) page 176).



The [Rollback MGT] (rbM) function can be used to avoid the rollback effect once the following settings are done:

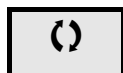
- The speed loop parameters must be set and must not be modified after the [Rollback MGT] (rbM) function activation.
- An adequate [Encoder filter value] (FFr) page 117 should be set and must not be modified after the [Rollback MGT] (rbM) function activation.
- An appropriate [Brake release I FW] (lbr) page 175 can be set to apply a current level that corresponds to the more frequent load case (about 25 % of the full load).
- The opening brake sequence must be set with adequate [Brake Release time] (brt) (typically brt > 1 second).

Adjustment recommendations:

- Good speed loop setting is essential for satisfactory rollback compensation results (good tracking of the ramp and well damped response) The speed loop setting optimization initially has to be done with the rollback function disable ([Rollback MGT] (rbM) = [No] (no)).
- It is recommended to increase gradually [Rbk Compensation] (rbC) starting from 0 until rollback motion is reduced to the desired level.
- If vibrations occur while increasing [Rbk Compensation] (rbC), it has to be reduced to stop them. It is possible to increase the damping by increasing the [Rbk Damping] (rbd) setting. It may allow to further increase the [Rbk Compensation] (rbC).
- **Note:** Elevated [Rbk Damping] (rbd) setting may amplify the encoder quantization noise, so it is recommended to keep this setting as low as possible.
- Depending on the elevator system resonant frequencies and encoder feedback resolution, there will be a practical limit on the performance of the rollback compensation function. Low resolution encoders may not allow desired rollback management.
- **Note:** Sufficient time must be allowed after the brake opening and prior the launch of the speed ramp for the rollback control stabilizes the elevator position.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Nom / Description	Adjustment range	Factory setting
rbn-	■ [ROLLBACK MGT] Menu can be accessed: - only for ATV71...M3X drives up to 45 kW and for ATV71...N4 drives up to 75 kW, - if [Motor control type] (Ctt) page 70 = [Sync.CL] (FSY) or [FVC] (FUC), - if [Brake assignment] (bLC) page 175 is assigned.		
rbn YES	□ [Rollback MGT] Activation of the Rollback management function <input type="checkbox"/> [No] (nO) <input type="checkbox"/> [Yes] (YES)		[No] (nO)
rbC ()	□ [Rbk Compensation] Parameter can be accessed if reference channel [Rollback MGT] (rbM) = [Yes] (YES) Proportionnal gain of the position controller	0 à 1000 %	100 %
rbd ()	□ [Rbk Damping] Parameter can only be accessed in [ACCESS LEVEL] = [Expert] mode and if reference channel [Rollback MGT] (rbM) = [Yes] (YES). Differential gain of the position controller.	0 à 1000 %	100 %



Parameter that can be modified during operation or when stopped.

Lifts

Hoisting

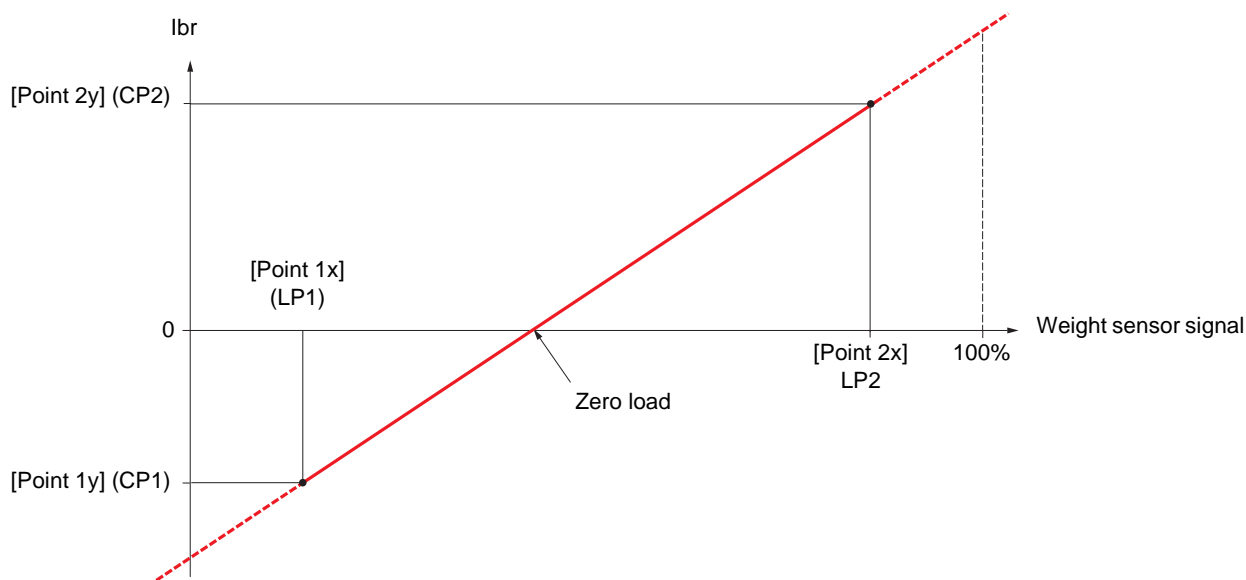
Load measurement

This function uses the information supplied by a weight sensor to adapt the current [Brake release I FW] (Ibr) of the [BRAKE LOGIC CONTROL] (bLC-) function. The signal from the weight sensor can be assigned to an analog input (usually a 4 - 20 mA signal), to the pulse-in input or to the encoder input, according to the type of weight sensor.

Examples:

- Measurement of the total weight of a hoisting winch and its load
- Measurement of the total weight of an elevator winch, the cabin and counterweight

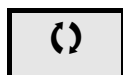
The current [Brake release I FW] (Ibr) is adapted in accordance with the curve below.



This curve can represent a weight sensor on an elevator winch, where zero load on the motor occurs when the load in the cabin is not zero.

Code	Name/Description	Adjustment range	Factory setting
ELN -	[EXTERNAL WEIGHT MEAS.]		
PES	<input type="checkbox"/> [Weight sensor ass.] Function can be accessed if brake logic control is assigned (see page 175). If [Weight sensor ass.] (PES) is not [No] (nO), [Movement type] (bSt) page 175 is forced to [Hoisting] (UEr). [Weight sensor ass.] (PES) is not authorized in [U/F 2pts] (UF2) or [U/F 5pts] (UF5). <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [AI1] (AI1): Analog input <input type="checkbox"/> [AI2] (AI2): Analog input <input type="checkbox"/> [AI3] (AI3): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted <input type="checkbox"/> [Network AI] (AIU1): Virtual input via communication bus, to be configured via [AI net. channel] (AIC1) page 111.		[No] (nO)
LP1	<input type="checkbox"/> [Point 1 X] 0 to 99.99% of signal on assigned input. [Point 1x] (LP1) must be less than [Point 2x] (LP2). The parameter can be accessed if [Weight sensor ass.] (PES) is assigned.	0 to 99.99%	0
CP1	<input type="checkbox"/> [Point 1Y] Current corresponding to load [Point 1 X] (LP1), in A. The parameter can be accessed if [Weight sensor ass.] (PES) is assigned.	-1.36 to +1.36 In (1)	- In
LP2	<input type="checkbox"/> [Point 2X] 0.01 to 100% of signal on assigned input. [Point 2x] (LP2) must be greater than [Point 1x] (LP1). The parameter can be accessed if [Weight sensor ass.] (PES) is assigned.	0.01 to 100%	50%
CP2	<input type="checkbox"/> [Point 2Y] Current corresponding to load [Point 2x] (LP2), in A. The parameter can be accessed if [Weight sensor ass.] (PES) is assigned.	-1.36 to +1.36 In (1)	0
IbrA (C)	<input type="checkbox"/> [Ibr 4-20 mA loss] Brake release current in the event of the loss of the weight sensor information. This parameter can be accessed if the weight sensor is assigned to an analog current input and the 4-20 mA loss fault is deactivated. Recommended settings: - 0 for elevators - Rated motor current for a hoisting application	0 to 1.36 In (1)	0

(1) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.



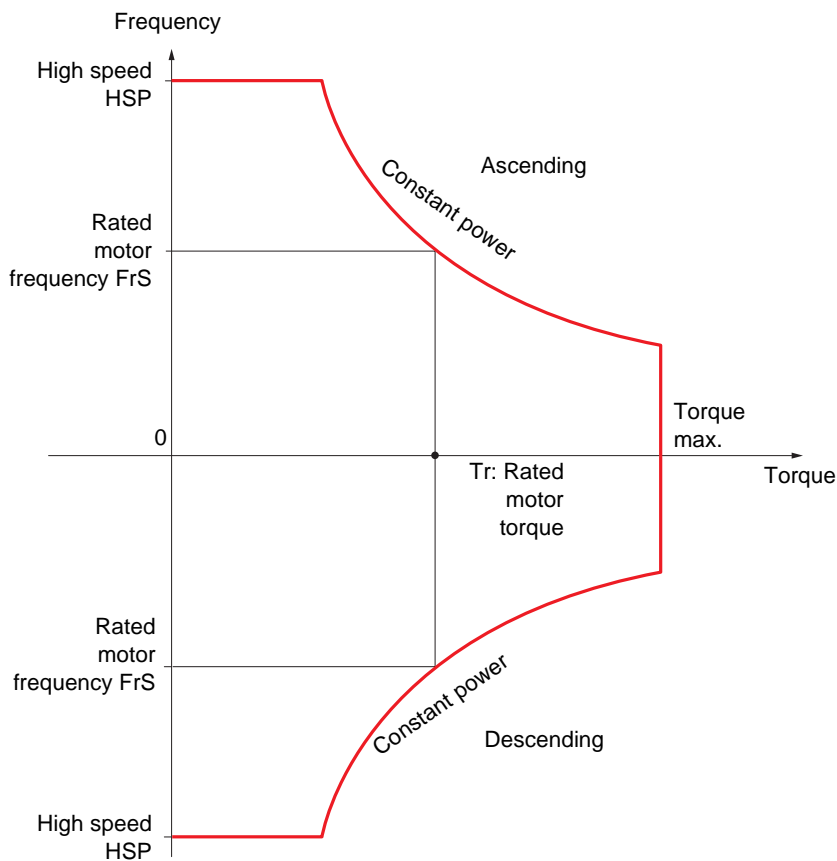
Parameter that can be modified during operation or when stopped.

High-speed hoisting

This function can be used to optimize the cycle times for hoisting movements for zero or lightweight loads. It authorizes operation at "constant power" in order to reach a speed greater than the rated speed without exceeding the rated motor current. The speed remains limited by the [\[High speed\] \(HSP\)](#) parameter, page [56](#).

The function acts on the speed reference pedestal and not on the reference itself.

Principle:



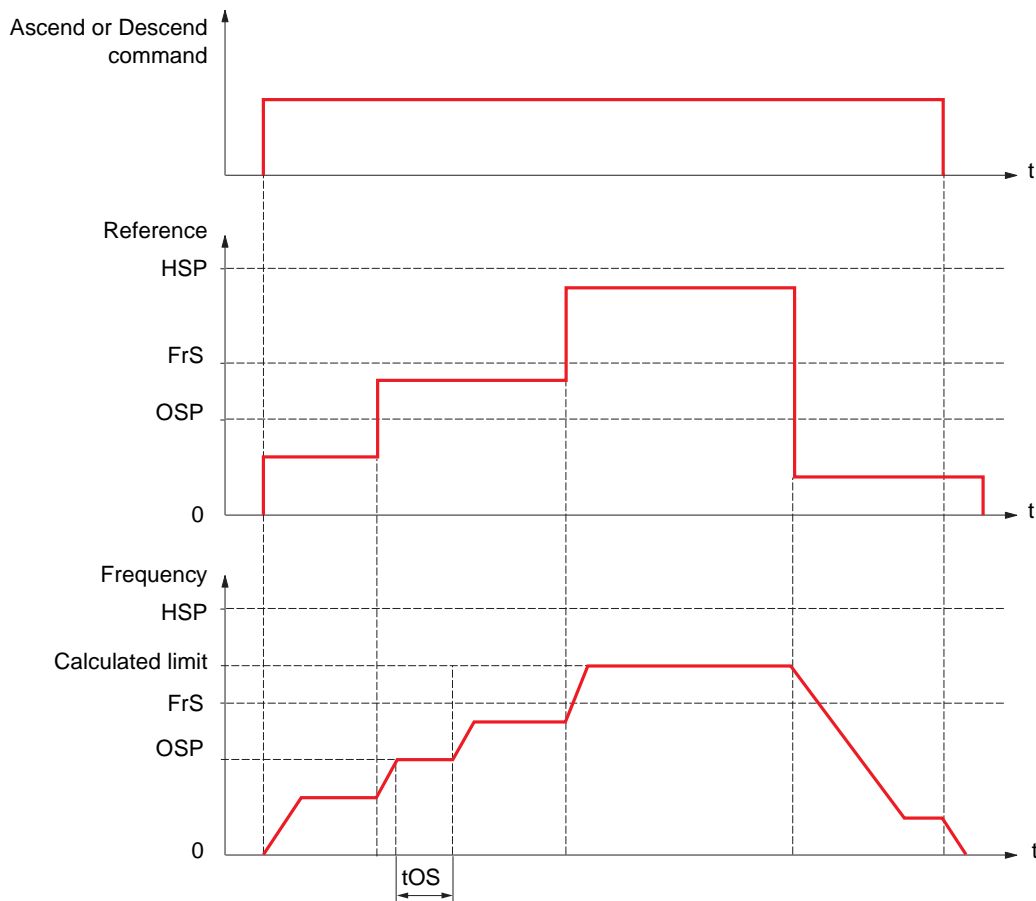
CAUTION

For permanent magnet synchronous motors, the maximum permissible speed must not be exceeded, otherwise demagnetization may occur. The maximum speed permitted by the motor, drive chain or application must not be exceeded at any time.
Failure to follow this instruction can result in equipment damage.

There are 2 possible operating modes:

- "Speed reference" mode: The maximum permissible speed is calculated by the drive during a speed step that is set so that the drive can measure the load.
- "Current limitation" mode: The maximum permissible speed is the speed that supports current limitation in motor mode, in the "Ascending" direction only. For the "Descending" direction, operation is always in "Speed reference" mode.

Speed reference mode

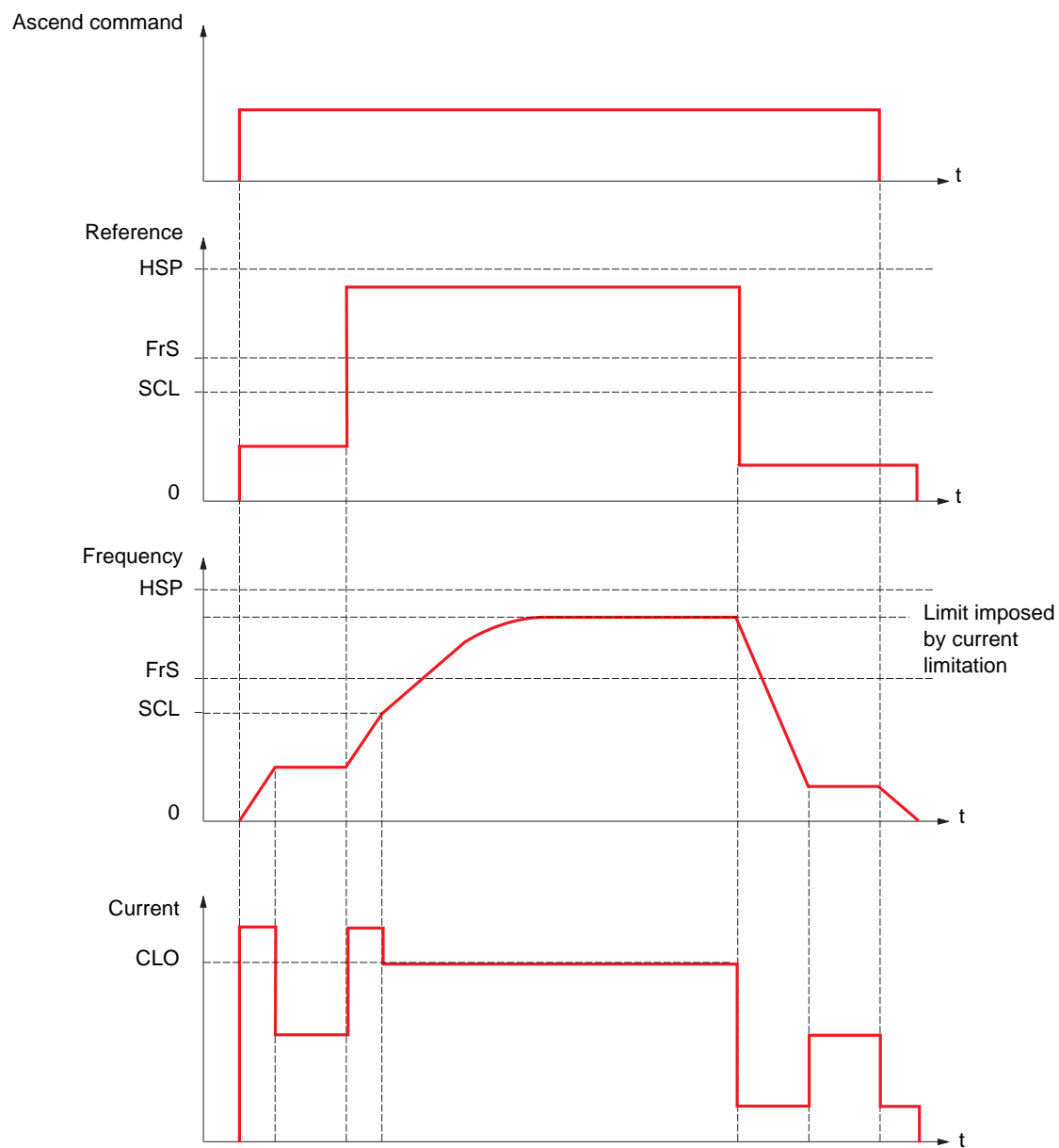


OSP: Adjustable speed step for load measurement

tOS: Load measuring time

Two parameters are used to reduce the speed calculated by the drive, for ascending and descending.

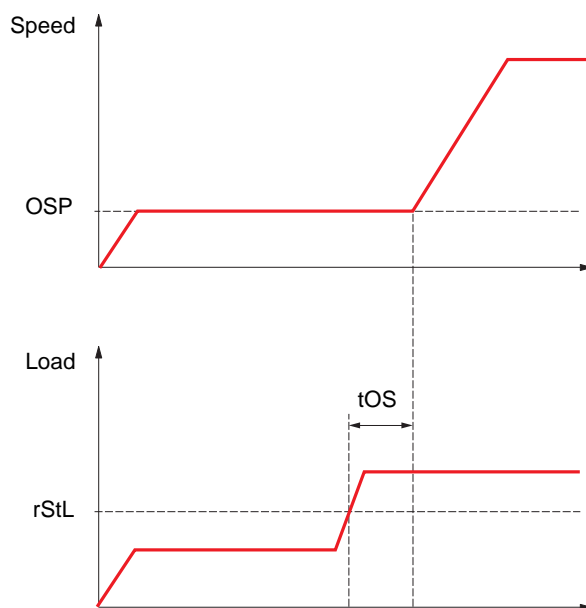
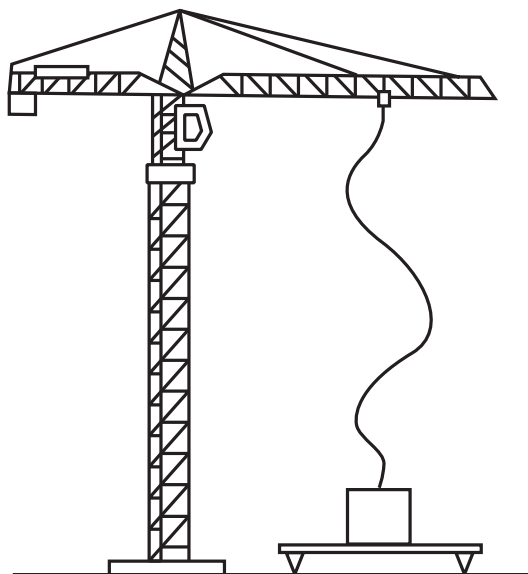
Current limiting mode




SCL: Adjustable speed threshold, above which current limitation is active
CLO: Current limitation for high-speed function

Rope slack

The "rope slack" function can be used to prevent starting up at high speed when a load has been set down ready for lifting but the rope is still slack (as illustrated below).












 **Note:** Operation will only be optimized in speed reference mode: [High speed hoisting] (HSO) = [Speed ref] (SSO).

The speed step (OSP parameters) described on page 185 is used to measure the load. The effective measurement cycle will not be triggered until the load reaches the adjustable threshold rStL, which corresponds to the weight of the hook.

A logic output or a relay can be assigned to the indication of the "rope slack" state in the [1.5 INPUTS / OUTPUTS CFG] (I-O-) menu.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
HS H -	[HIGH SPEED HOISTING]  Note: This function cannot be used with certain other functions. Follow the instructions on page 145.		
HSO nO SSO CSO	<input type="checkbox"/> [High speed hoisting] <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [Speed ref] (SSO): "Speed reference" mode <input type="checkbox"/> [I Limit] (CSO): "Current limitation" mode		[No] (nO)
COF 	<input type="checkbox"/> [Motor speed coeff.] Speed reduction coefficient calculated by the drive for Ascending direction. The parameter can be accessed if [High speed hoisting] (HSO) = [Speed ref] (SSO).	0 to 100%	100%
CO r 	<input type="checkbox"/> [Gen. speed coeff] Speed reduction coefficient calculated by the drive for Descending direction. The parameter can be accessed if [High speed hoisting] (HSO) is not [No] (nO).	0 to 100%	50%
LOS 	<input type="checkbox"/> [Load measuring tm.] Duration of speed step for measurement. The parameter can be accessed if [High speed hoisting] (HSO) is not [No] (nO).	0.1 s to 65 s	0.5 s
OSP 	<input type="checkbox"/> [Measurement spd] Speed stabilized for measurement. The parameter can be accessed if [High speed hoisting] (HSO) is not [No] (nO).	0 to FrS or FrSS (1)	40 Hz
CLD 	<input type="checkbox"/> [High speed I Limit] Current limitation at high speed. The parameter can be accessed if [High speed hoisting] (HSO) = [I Limit] (CSO). The adjustment range is limited to 1.36 In if [Switching freq.] (SFr) page 62 is less than 2 kHz.  Note: If the setting is less than 0.25 In, the drive may lock in [Output Phase Loss] (OPF) fault mode if this has been enabled (see page 242).	0 to 1.65 In (2)	In
SCL 	<input type="checkbox"/> [I Limit. frequency] Frequency threshold, above which the high-speed limitation current is active. The parameter can be accessed if [High speed hoisting] (HSO) = [I Limit] (CSO)	0 to 500 or 1600 Hz according to rating	40 Hz
rSd nO drl PES	<input type="checkbox"/> [Rope slack config.] Rope slack function. The parameter can be accessed if [High speed hoisting] (HSO) is not [No] (nO). <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [Drive estim.] (drl): Measurement of the load by estimating the torque generated by the drive. <input type="checkbox"/> [Ext. sensor] (PES): Measurement of the load using a weight sensor, can only be assigned if [Weight sensor ass.] (PES) page 183 is not [No] (nO).  Note: Operation will only be optimized if [High speed hoisting] (HSO) = [Speed ref] (SSO).		[No] (nO)
rSEL	<input type="checkbox"/> [Rope slack trq level] Adjustment threshold corresponding to a load weighing slightly upper than the hook when off-load, as a % of the rated load. The parameter can be accessed if [Rope slack trq level] (rSd) has been assigned.	0 to 100%	0%

(1) [Rated motor freq.] (FrS) page 76 for an asynchronous motor or [Nominal freq sync.] (FrSS) page 82 for a synchronous motor.

(2) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.

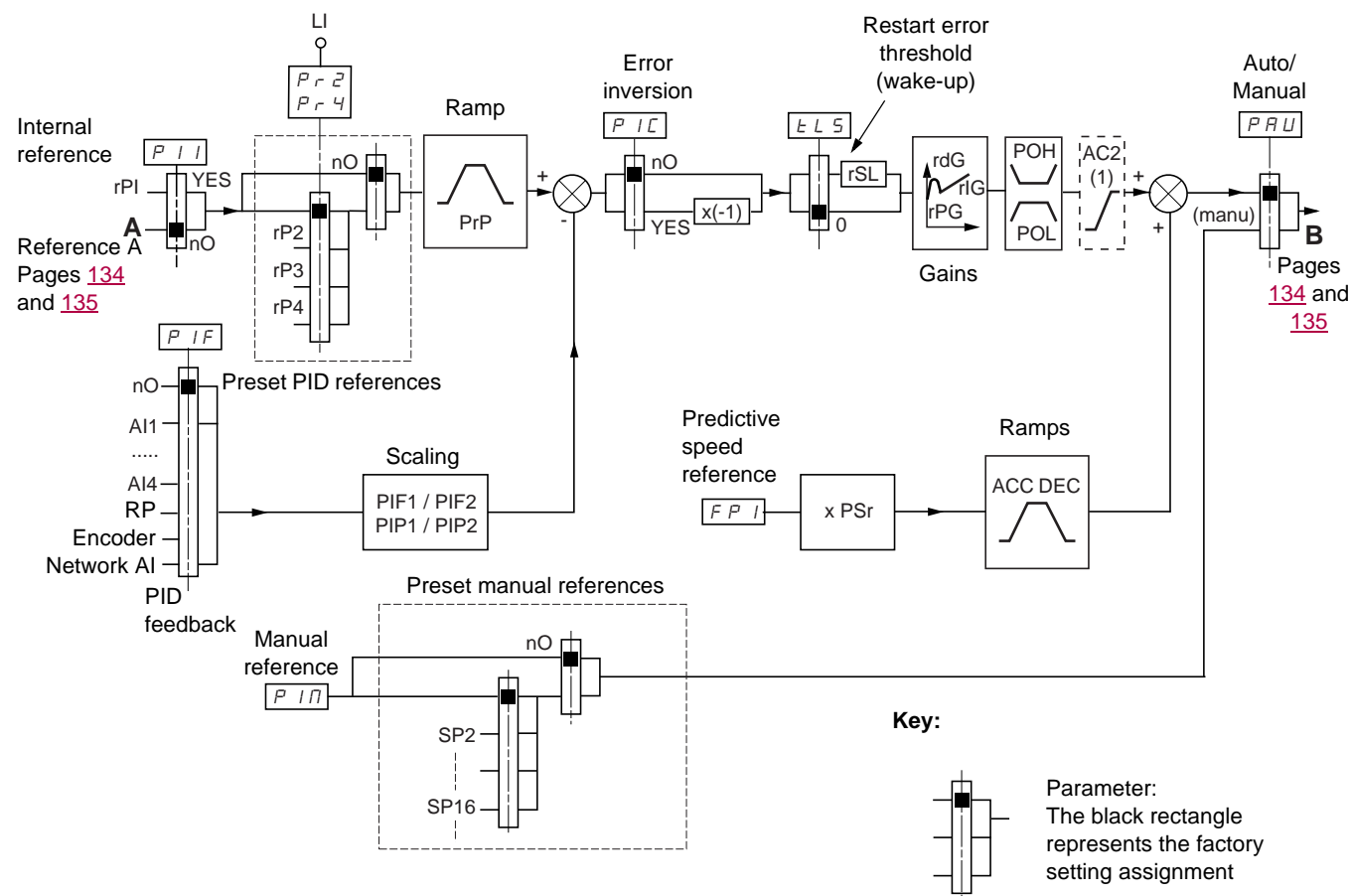


Parameter that can be modified during operation or when stopped.

PID regulator

Block diagram

The function is activated by assigning an analog input to the PID feedback (measurement).



(1) Ramp AC2 is only active when the PID function starts up and during PID "wake-ups".

PID feedback:

The PID feedback must be assigned to one of the analog inputs AI1 to AI4, to the frequency input or the encoder, according to whether any extension cards have been inserted.

PID reference:

The PID reference must be assigned to the following parameters:

- Preset references via logic inputs (rP2, rP3, rP4)
- In accordance with the configuration of [Act. internal PID ref.] (PII) pages 193:
 - Internal reference (rPI) or
 - Reference A (Fr1 or Fr1b, see page 134)

Combination table for preset PID references

LI (Pr4)	LI (Pr2)	Pr2 = nO	Reference
0	0		rPI or A
0	1		rP2
1	0		rP3
1	1		rP4

A predictive speed reference can be used to initialize the speed on restarting the process.

Scaling of feedback and references:

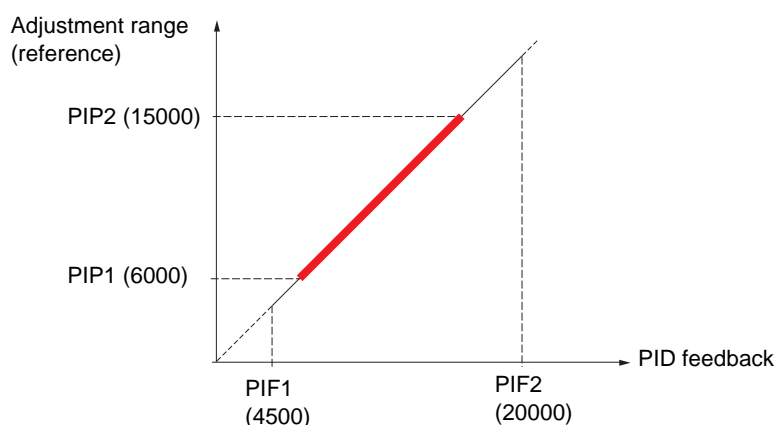
- PIF1, PIF2 parameters
Can be used to scale the PID feedback (sensor range).
This scale **MUST** be maintained for all other parameters.
- PIP1, PIP2 parameters
Can be used to scale the adjustment range, i.e., the reference. **The adjustment range MUST lie within the sensor range.**

The maximum value of the scaling parameters is 32767. To facilitate installation, we recommend using values as close as possible to this maximum level, while retaining powers of 10 in relation to the actual values.

Example (see graph below): Adjustment of the volume in a tank, between 6 m³ and 15 m³.

- Sensor used 4-20 mA, 4.5 m³ for 4 mA, 20 m³ for 20 mA, with the result that PIF1 = 4500 and PIF2 = 20000.
- Adjustment range 6 to 15 m³, with the result that PIP1 = 6000 (min. reference) and PIP2 = 15000 (max. reference).
- Example references:
 - rP1 (internal reference) = 9500
 - rP2 (preset reference) = 6500
 - rP3 (preset reference) = 8000
 - rP4 (preset reference) = 11200

The [DISPLAY CONFIG.] menu can be used to customize the name of the unit displayed and its format.



Other parameters:

- rSL parameter:
Can be used to set the PID error threshold, above which the PID regulator will be reactivated (wake-up) after a stop due to the max. time threshold being exceeded at low speed (tLS).
- Reversal of the direction of correction (PIC): If PIC = nO, the speed of the motor will increase when the error is positive, for example: pressure control with a compressor. If PIC = YES, the speed of the motor will decrease when the error is positive, for example: temperature control using a cooling fan.
- The integral gain may be short-circuited by a logic input.
- An alarm on the PID feedback may be configured and indicated by a logic output.
- An alarm on the PID error may be configured and indicated by a logic output.

"Manual - Automatic" operation with PID

This function combines the PID regulator, the preset speeds and a manual reference. Depending on the state of the logic input, the speed reference is given by the preset speeds or by a manual reference input via the PID function.

Manual reference (PIM)

- Analog inputs AI1 to AI4
- Frequency input
- Encoder

Predictive speed reference (FPI)

- [AI1] (AI1): Analog input
- [AI2] (AI2): Analog input
- [AI3] (AI3): Analog input, if VW3A3202 extension card has been inserted
- [AI4] (AI4): Analog input, if VW3A3202 extension card has been inserted
- [RP] (PI): Frequency input, if VW3A3202 extension card has been inserted
- [Encoder] (PG): Encoder input, if encoder card has been inserted
- [HMI] (LCC): Graphic display terminal
- [Modbus] (Mdb): Integrated Modbus
- [CANopen] (CAn): Integrated CANopen
- [Com. card] (nEt): Communication card (if inserted)
- [C.Insid. card] (APP): Controller Inside card (if inserted)

Setting up the PID regulator

1. Configuration in PID mode

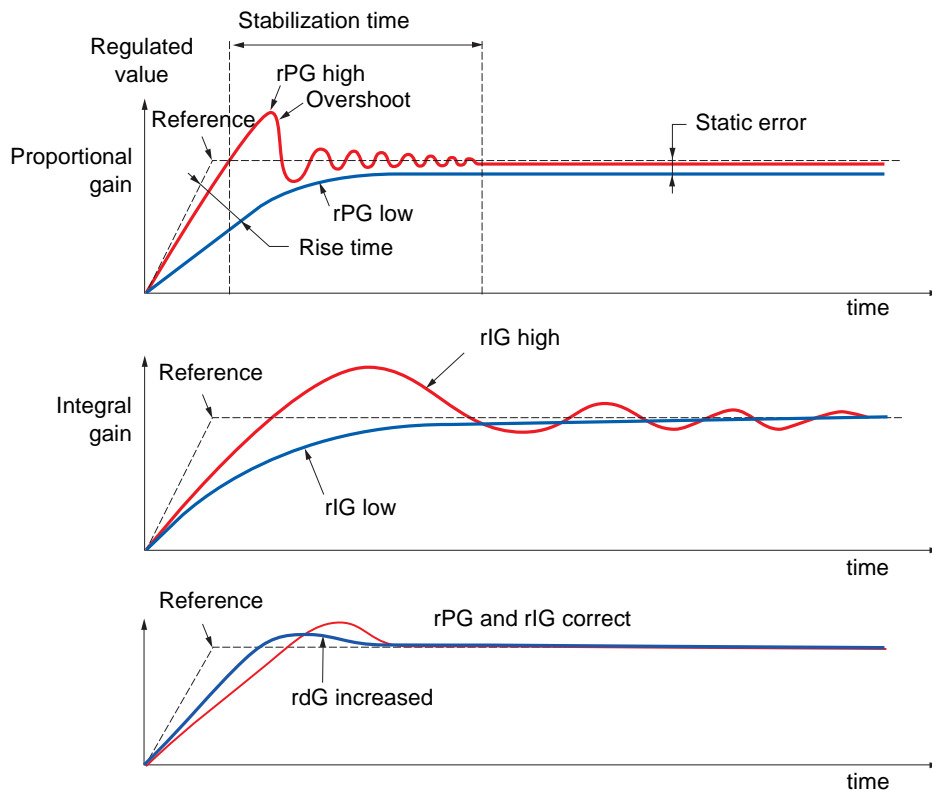
See the diagram on page [189](#).

2. Perform a test in factory settings mode (in most cases, this will be sufficient).

To optimize the drive, adjust rPG or rIG gradually and independently and observe the effect on the PID feedback in relation to the reference.

3. If the factory settings are unstable or the reference is incorrect








- Perform a test with a speed reference in Manual mode (without PID regulator) and with the drive on load for the speed range of the system:
 - In steady state, the speed must be stable and comply with the reference and the PID feedback signal must be stable.
 - In transient state, the speed must follow the ramp and stabilize quickly, and the PID feedback must follow the speed.If this is not the case, see the settings for the drive and/or sensor signal and wiring.
- Switch to PID mode.
- Set brA to no (no auto-adaptation of the ramp).
- Set the PID ramp (PrP) to the minimum permitted by the mechanism without triggering an ObF fault.
- Set the integral gain (rIG) to minimum.
- Leave the derivative gain (rdG) at 0.
- Observe the PID feedback and the reference.
- Switch the drive ON/OFF a number of times or vary the load or reference rapidly a number of times.
- Set the proportional gain (rPG) in order to ascertain the best compromise between response time and stability in transient phases (slight overshoot and 1 to 2 oscillations before stabilizing).
- If the reference varies from the preset value in steady state, gradually increase the integral gain (rIG), reduce the proportional gain (rPG) in the event of instability (pump applications), find a compromise between response time and static precision (see diagram).
- Lastly, the derivative gain may permit the overshoot to be reduced and the response time to be improved, although this will make it more difficult to obtain a compromise in terms of stability, as it depends on 3 gains.
- Perform in-production tests over the whole reference range.



The oscillation frequency depends on the system kinematics.

Parameter	Rise time	Overshoot	Stabilization time	Static error
rPG ↗	↘↘	↗	=	↘
rIG ↗	↘	↗↗	↗	↘↘
rdG ↗	=	↘	↘	=

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
P I d -	[PID REGULATOR]  Note: This function cannot be used with certain other functions. Follow the instructions on page 145.		
P I F n O A I 1 A I 2 A I 3 A I 4 P I P G A I U 1	<input type="checkbox"/> [PID feedback ass.] <input type="checkbox"/> [No] (nO): Not assigned (function inactive) In this case, none of the function parameters can be accessed. <input type="checkbox"/> [AI1] (AI1): Analog input <input type="checkbox"/> [AI2] (AI2): Analog input <input type="checkbox"/> [AI3] (AI3): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted <input type="checkbox"/> [Network AI] (AIU1): Virtual input via communication bus  Note: If the equipment switches to forced local mode (see page 262), the virtual input remains fixed at the last value transmitted.		[No] (nO)
A I C 1 n O M d b C A n n E t A P P	<input type="checkbox"/> [AI net. channel] The parameter can be accessed if [PID feedback ass.] (PIF) = [Network AI] (AIU1). This parameter can also be accessed in the [1.5 INPUTS / OUTPUTS CFG] (I-O-) menu. <input type="checkbox"/> [No] (nO): Not assigned <input type="checkbox"/> [Modbus] (Mdb): Integrated Modbus <input type="checkbox"/> [CANopen] (CAn): Integrated CANopen <input type="checkbox"/> [Com. card] (nEt): Communication card (if inserted) <input type="checkbox"/> [C.Insid. card] (APP): Controller Inside card (if inserted)		[No] (nO)
P I F 1 	<input type="checkbox"/> [Min PID feedback] (1) Value for minimum feedback. Adjustment range from 0 to [Max PID feedback] (PIF2).		100
P I F 2 	<input type="checkbox"/> [Max PID feedback] (1) Value for maximum feedback Adjustment range from [Min PID feedback] (PIF1) to 32767 (2).		1000
P I P 1 	<input type="checkbox"/> [Min PID reference] (1) Minimum process value. Adjustment range from [Min PID feedback] (PIF1) to [Max PID reference] (PIP2) (2).		150
P I P 2	<input type="checkbox"/> [Max PID reference] (1) Maximum process value Adjustment range from [Min PID reference] (PIP1) to [Max PID feedback] (PIF2) (2).		900
P I I n O Y E S	<input type="checkbox"/> [Act. internal PID ref.] Internal PID regulator reference <input type="checkbox"/> [No] (nO): The PID regulator reference is given by Fr1 or Fr1b with summing/subtraction/multiplication functions (see the diagram on page 133). <input type="checkbox"/> [Yes] (YES): The PID regulator reference is internal via parameter rPI.		[No] (nO)
r P I 	<input type="checkbox"/> [Internal PID ref.] Internal PID regulator reference This parameter can also be accessed in the [1.2 MONITORING] (SUP-) menu. Adjustment range from [Min PID reference] (PIP1) to [Max PID reference] (PIP2) (2).		150
r P G 	<input type="checkbox"/> [PID prop. gain] Proportional gain	0.01 to 100	1

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

(2) If a graphic display terminal is not in use, values greater than 9999 will be displayed on the 4-digit display with a period mark after the thousand digit, e.g., 15.65 for 15650.



Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	■ [PID REGULATOR] (continued)		
r IG ()	<input type="checkbox"/> [PID integral gain] Integral gain	0.01 to 100	1
r dG ()	<input type="checkbox"/> [PID derivative gain] Derivative gain	0.00 to 100	0
P r P ()	<input type="checkbox"/> [PID ramp] (1) PID acceleration/deceleration ramp, defined to go from [Min PID reference] (PIP1) to [Max PID reference] (PIP2) and vice versa.	0 to 99.9 s	0 s
P IC n O Y E S	<input type="checkbox"/> [PID correct. reverse] <input type="checkbox"/> [No] (nO) <input type="checkbox"/> [Yes] (YES) Reversal of the direction of correction (PIC): If PIC = nO, the speed of the motor will increase when the error is positive. Example: pressure control with a compressor. If PIC = YES, the speed of the motor will decrease when the error is positive. Example: temperature control using a cooling fan.		[No] (nO)
P O L ()	<input type="checkbox"/> [Min PID output] (1) Minimum value of regulator output in Hz	- 500 to 500 or -1600 to 1600 according to rating	0 Hz
P O H ()	<input type="checkbox"/> [Max PID output] (1) Maximum value of regulator output in Hz	0 to 500 or 1600 according to rating	60 Hz
P A L ()	<input type="checkbox"/> [Min fbk alarm] (1) Minimum monitoring threshold for regulator feedback Adjustment range from [Min PID feedback] (PIF1) to [Max PID feedback] (PIF2) (2).		100
P A H ()	<input type="checkbox"/> [Max fbk alarm] (1) Maximum monitoring threshold for regulator feedback Adjustment range from [Min PID feedback] (PIF1) to [Max PID feedback] (PIF2) (2).		1000
P E r ()	<input type="checkbox"/> [PID error Alarm] (1) Regulator error monitoring threshold	0 to 65535 (2)	100
P I S n O L I 1 - - -	<input type="checkbox"/> [PID integral reset] <input type="checkbox"/> [No] (nO) : Function inactive <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...) : See the assignment conditions on page 139. If the assigned input or bit is at 0, the function is inactive (the PID integral is enabled). If the assigned input or bit is at 1, the function is active (the PID integral is disabled).		[No] (nO)

(1) The parameter can also be accessed in the **[1.3 SETTINGS] (SEt-)** menu.

(2) If a graphic display terminal is not in use, values greater than 9999 will be displayed on the 4-digit display with a period mark after the thousand digit, e.g., 15.65 for 15650.

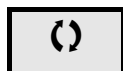
() Parameter that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
	■ [PID REGULATOR] (continued)		
FPI	□ [Speed ref. assign.] PID regulator predictive speed input <input type="checkbox"/> [No] (nO): Not assigned (function inactive) <input type="checkbox"/> [AI1] (AI1): Analog input <input type="checkbox"/> [AI2] (AI2): Analog input <input type="checkbox"/> [AI3] (AI3): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [HMI] (LCC): Graphic display terminal <input type="checkbox"/> [Modbus] (Mdb): Integrated Modbus <input type="checkbox"/> [CANopen] (CAn): Integrated CANopen <input type="checkbox"/> [Com. card] (nEt): Communication card (if inserted) <input type="checkbox"/> [C.Insid. card] (APP): Controller Inside card (if inserted) <input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted		[No] (nO)
PSr ()	□ [Speed input %] (1) Multiplying coefficient for predictive speed input. The parameter cannot be accessed if [Speed ref. assign.] (FPI) = [No] (nO).	1 to 100%	100%
PAU	□ [Auto/Manual assign.] <input type="checkbox"/> [No] (nO): The PID is always active. <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. If the assigned input or bit is at 0, the PID is active. If the assigned input or bit is at 1, manual operation is active.		[No] (nO)
AC2 ()	□ [Acceleration 2] (1) Time to accelerate from 0 to the [Rated motor freq.] (FrS). Make sure that this value is compatible with the inertia being driven. Ramp AC2 is only active when the PID function starts up and during PID "wake-ups".	0.01 to 6000 s (3)	5.0 s
PIn	□ [Manual reference] Manual speed input. The parameter can be accessed if [Auto/Manual assign.] (PAU) is not [No] (nO). <input type="checkbox"/> [No] (nO): Not assigned (function inactive) <input type="checkbox"/> [AI1] (AI1): Analog input <input type="checkbox"/> [AI2] (AI2): Analog input <input type="checkbox"/> [AI3] (AI3): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted The preset speeds are active on the manual reference if they have been configured.		[No] (nO)




(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

(2) If a graphic display terminal is not in use, values greater than 9999 will be displayed on the 4-digit display with a period mark after the thousand digit,
e.g., 15.65 for 15650.


(3) Range 0.01 to 99.99 s or 0.1 to 999.9 s or 1 to 6000 s according to [Ramp increment] (Inr) page 152.



Parameter that can be modified during operation or when stopped.

Code	Name/Description	Adjustment range	Factory setting
	■ [PID REGULATOR] (continued)		
tLS 	□ [Low speed time out] (1) Maximum operating time at [Low speed] (LSP) (see page 44) Following operation at LSP for a defined period, a motor stop is requested automatically. The motor restarts if the reference is greater than LSP and if a run command is still present. Caution: Value 0 corresponds to an unlimited period.  Note: If [Low speed time out] (tLS) is not 0, [Type of stop] (Stt) page 156 is forced to [Ramp stop] (rMP) (only if a ramp stop can be configured).	0 to 999.9 s	0 s
rSL	□ [PID wake up thresh.] If the "PID" and "Low speed operating time" tLS functions are configured at the same time, the PID regulator may attempt to set a speed lower than LSP. This results in unsatisfactory operation, which consists of starting, operating at low speed then stopping, and so on... Parameter rSL (restart error threshold) can be used to set a minimum PID error threshold for restarting after a stop at prolonged LSP. The function is inactive if tLS = 0 or if rSL = 0.	0.0 to 100.0	0
<div>  WARNING UNINTENDED EQUIPMENT OPERATION Check that unintended restarts will not present any danger. Failure to follow these instructions can result in death or serious injury. </div>			

(1) The parameter can also be accessed in the **[1.3 SETTINGS] (SEt-)** menu.

 Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

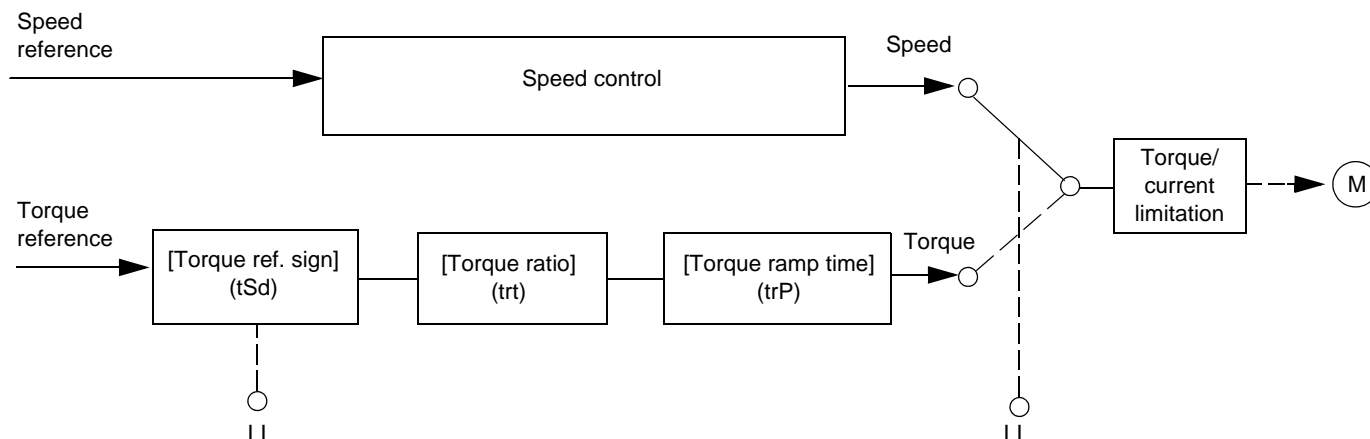
Code	Name/Description	Adjustment range	Factory setting
Pr 1-	■ [PID PRESET REFERENCES] Function can be accessed if [PID feedback ass.] (PIF) is assigned.		
Pr 2 nO L I I - - -	□ [2 preset PID ref.] <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. If the assigned input or bit is at 0, the function is inactive. If the assigned input or bit is at 1, the function is active.		[No] (nO)
Pr 4 nO L I I - - -	□ [4 preset PID ref.] Make sure that [2 preset PID ref.] (Pr2) has been assigned before assigning this function. <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. If the assigned input or bit is at 0, the function is inactive. If the assigned input or bit is at 1, the function is active.		[No] (nO)
r P 2 ()	□ [2 preset PID ref.] (1) The parameter can be accessed if [Preset ref. PID 2] (Pr2) is assigned. Adjustment range from [Min PID reference] (PIP1) to [Max PID reference] (PIP2) (2).		300
r P 3 ()	□ [3 preset PID ref.] (1) The parameter can be accessed if [Preset ref. PID 4] (Pr4) is assigned. Adjustment range from [Min PID reference] (PIP1) to [Max PID reference] (PIP2) (2).		600
r P 4 ()	□ [4 preset PID ref.] (1) The parameter can be accessed if [Preset ref. PID 4] (Pr4) is assigned. Adjustment range from [Min PID reference] (PIP1) to [Max PID reference] (PIP2) (2).		900

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

(2) If a graphic display terminal is not in use, values greater than 9999 will be displayed on the 4-digit display with a period mark after the thousand digit, e.g., 15.65 for 15650.


() Parameter that can be modified during operation or when stopped.

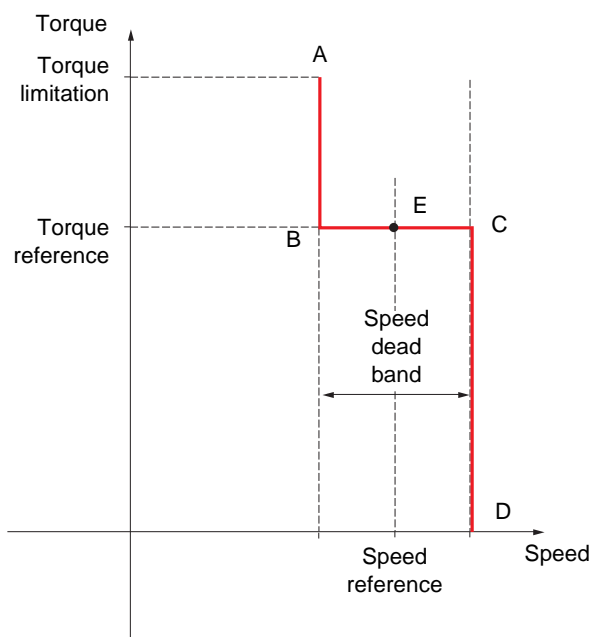
Torque regulation



The function can be used to switch between operation in speed regulation mode and operation in torque control mode. In torque control mode, the speed may vary within a configurable "deadband". When it reaches a lower or upper limit, the drive automatically reverts to speed regulation mode (fallback) and remains at this limit speed. The regulated torque is therefore no longer maintained and two scenarios may occur.

- If the torque returns to the required value, the drive will return to torque control mode.
- If the torque does not return to the required value at the end of a configurable period of time, the drive will switch to fault or alarm mode.





 WARNING
UNINTENDED EQUIPMENT OPERATION Check that the changes in the behavior of the motor do not present any danger. Failure to follow these instructions can result in death or serious injury.



- AB and CD: "Fallback" to speed regulation
- BC: Torque control zone
- E: Ideal operating point

The torque sign and value can be transmitted via a logic output and an analog output.

[1.7 APPLICATION FUNCT.] (FUn-)


Code	Name/Description	Adjustment range	Factory setting
↳ Dr -	■ [TORQUE CONTROL] This function can only be accessed for [Motor control type] (Ctt) = [SVC I] (CUC), [FVC] (FUC) or [Sync.CL] (FSY).  Note: This function cannot be used with certain other functions. Follow the instructions on page 145.		
↳ SS nD YES LI1 - - -	<input type="checkbox"/> [Trq/spd switching] <input type="checkbox"/> [No] (nO): Function inactive, thereby preventing access to other parameters. <input type="checkbox"/> [Yes] (YES): Permanent torque control <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. If the assigned input or bit is at 1: Torque control If the assigned input or bit is at 0: Speed regulation		[No] (nO)
↳ r I nD AI1 AI2 AI3 AI4 LCC Mdb CAN nEt APP PI PG	<input type="checkbox"/> [Torque ref. channel] <input type="checkbox"/> [No] (nO): Not assigned (zero torque reference). <input type="checkbox"/> [AI1] (AI1): Analog input <input type="checkbox"/> [AI2] (AI2): Analog input <input type="checkbox"/> [AI3] (AI3): Analog input, if VW3A3202 I/O card has been inserted <input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 I/O card has been inserted <input type="checkbox"/> [HMI] (LCC): Graphic display terminal <input type="checkbox"/> [Modbus] (Mdb): Integrated Modbus <input type="checkbox"/> [CANopen] (CAN): Integrated CANopen <input type="checkbox"/> [Com. card] (nEt): Communication card (if inserted) <input type="checkbox"/> [C.Insid. card] (APP): Controller Inside card (if inserted) <input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 I/O card has been inserted <input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted 100% of the reference corresponds to 300% of the rated torque.		[No] (nO)
↳ Sd nD LI1 - - -	<input type="checkbox"/> [Torque ref. sign] <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. If the assigned input or bit is at 0, the torque sign is the same as the reference. If the assigned input or bit is at 1, the torque sign is the opposite of the reference.		[No] (nO)
↳ rt 	<input type="checkbox"/> [Torque ratio] Coefficient applied to [Torque reference] (tr1).	0 to 1000%	100%
↳ rP 	<input type="checkbox"/> [Torque ramp time] Rise and fall time for a variation of 100% of the rated torque.	0 to 99.99 s	3 s
↳ St SPd YES SPn	<input type="checkbox"/> [Torque control stop] <input type="checkbox"/> [Speed] (SPd): Speed regulation stop, in accordance with the type of stop configuration (see page 156) <input type="checkbox"/> [Freewheel] (YES): Freewheel stop <input type="checkbox"/> [Spin] (SPn): Zero torque stop, but maintaining the flux in the motor. This type of operation is only possible if [Motor control type] (Ctt) = [FVC] (FUC) or [Sync.CL] (FSY).		[Speed] (SPd)
↳ Pt 	<input type="checkbox"/> [Spin time] The parameter can be accessed if [Torque control stop] (tSt) = [Spin] (SPn) Spin time following stop, in order to remain ready to restart quickly.	0 to 3600 s	1

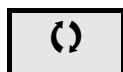


Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	■ [TORQUE CONTROL] (continued)		
dbP ()	□ [Positive deadband] Positive deadband. Value added algebraically to the speed reference. Example for dbP = 10: • If reference = +50 Hz: + 50 + 10 = 60 • If reference = - 50 Hz: - 50 + 10 = - 40	0 to 2 x [Max frequency] (tFr)	10 Hz
dbn ()	□ [Negative deadband] Negative deadband. Value subtracted algebraically from the speed reference. Example for dbn = 10: • If reference = +50 Hz: + 50 - 10 = 40 • If reference = - 50 Hz: - 50 - 10 = - 60	0 to 2 x [Max frequency] (tFr)	10 Hz
rtO	□ [Torque ctrl time out] Time following automatic exit of torque control mode in the event of a fault or alarm.	0 to 999.9 s	60
tOb	□ [Torq. ctrl fault mgt] Response of drive once time [Torque ctrl time out] (rtO) has elapsed.		[Alarm] (ALrM)
ALrM FLt	□ [Alarm] (ALrM) □ [Fault] (FLt): Fault with freewheel stop.		

-  **Note:** If the motor is equipped with an encoder assigned to speed feedback, the "torque control" function will trigger a [Load slipping] (AnF) fault. One of the following solutions should be applied:
- Set [Load slip detection] (Sdd) page 251 = [No] (nO).
 - Set [Positive deadband] (dbP) and [Negative deadband] (dbn) each to a value less than 10% of the rated motor frequency.

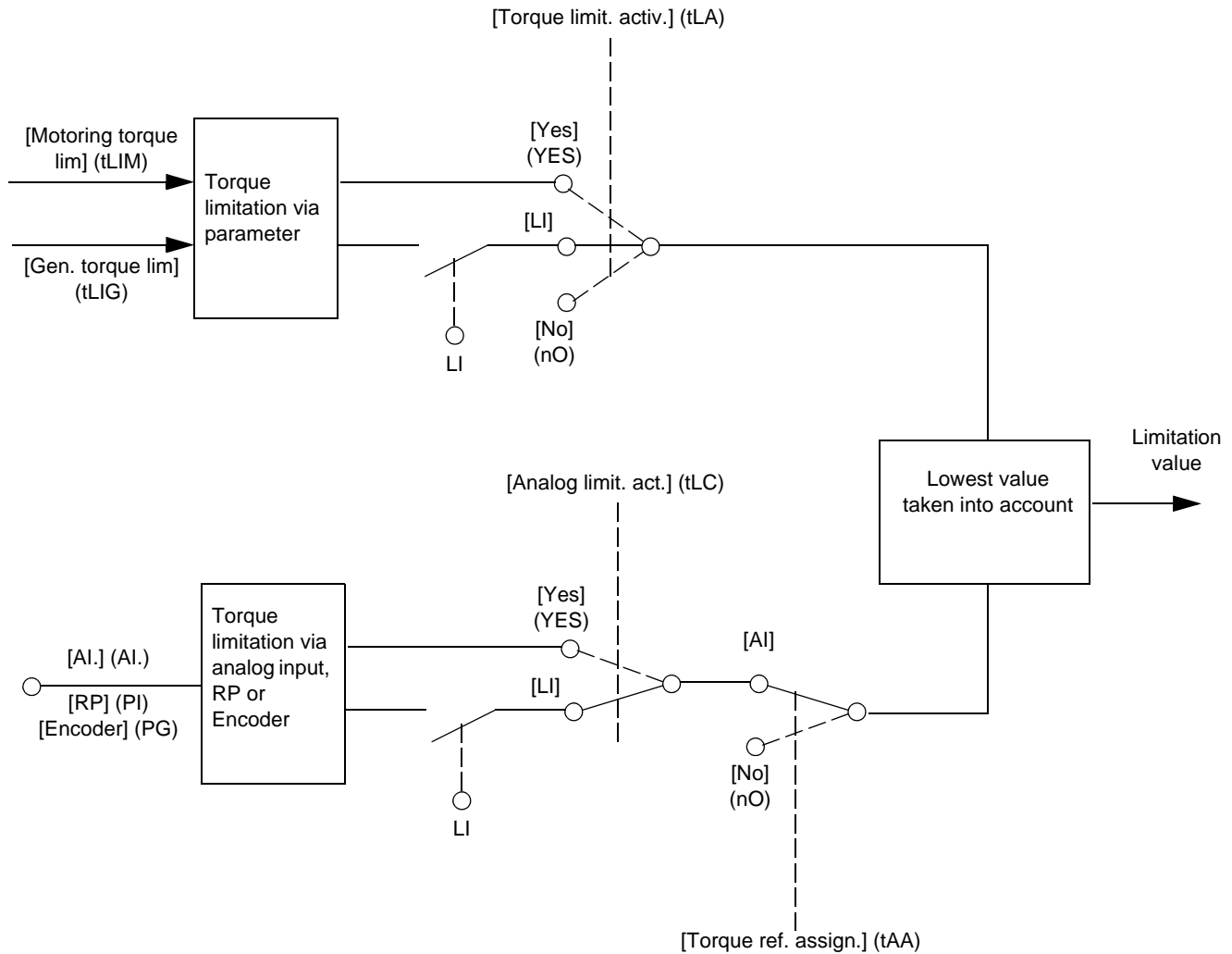
 Parameter that can be modified during operation or when stopped.

Torque limitation


There are two types of torque limitation:

- With a value that is fixed by a parameter
- With a value that is set by an analog input (AI, pulse or encoder)

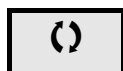
If both types are enabled, the lowest value is taken into account. The two types of limitation can be configured or switched remotely using a logic input or via the communication bus.



[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
EL -	[TORQUE LIMITATION] This function cannot be accessed in V/F profile mode.		
ELR nO YES L I I - - -	<input type="checkbox"/> [Torque limit. activ.] <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [Yes] (YES): Function always active <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. If the assigned input or bit is at 0, the function is inactive. If the assigned input or bit is at 1, the function is active.		[No] (nO)
IntP D. I I	<input type="checkbox"/> [Torque increment] The parameter cannot be accessed if [Torque limit. activ.] (tLA) = [No] (nO) Selection of units for the [Motoring torque lim] (tLIM) and [Gen. torque lim] (tLIG) parameters. <input type="checkbox"/> [0,1%] (0.1): unit 0.1%. <input type="checkbox"/> [1%] (1): unit 1%.		[1 %] (1)
EL IN (C)	<input type="checkbox"/> [Motoring torque lim] (1) The parameter cannot be accessed if [Torque limit. activ.] (tLA) = [No] (nO) Torque limitation in motor mode, as a % or in 0.1% increments of the rated torque in accordance with the [Torque increment] (IntP) parameter.	0 to 300%	100%
EL IG (C)	<input type="checkbox"/> [Gen. torque lim] (1) The parameter cannot be accessed if [Torque limit. activ.] (tLA) = [No] (nO) Torque limitation in generator mode, as a % or in 0.1% increments of the rated torque in accordance with the [Torque increment] (IntP) parameter.	0 to 300%	100%
ELR nO A I I - A I 4 P I P G A I U I	<input type="checkbox"/> [Torque ref. assign.] If the function is assigned, the limitation varies between 0% and 300% of the rated torque on the basis of the 0% to 100% signal applied to the assigned input. Examples: - 12 mA on a 4-20 mA input results in limitation to 150% of the rated torque. - 2.5 V on a 10 V input results in 75% of the rated torque. <input type="checkbox"/> [No] (nO): Not assigned (function inactive) <input type="checkbox"/> [AI1] (AI1) to <input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 I/O card has been inserted <input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 I/O card has been inserted <input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted <input type="checkbox"/> [Network AI] (AIU1): Virtual input via communication bus, to be configured via [AI net. channel] (AIC1) page 111.		[No] (nO)
<div style="text-align: center;">  WARNING </div> <div> UNINTENDED EQUIPMENT OPERATION If the equipment switches to forced local mode (see page 262), the virtual input remains fixed at the last value transmitted. Do not use the virtual input and forced local mode in the same configuration. Failure to follow these instructions can result in death or serious injury. </div>			

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.





Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	■ [TORQUE LIMITATION] (continued)		
<div> <div> <div>ELL</div> <div>YES</div> <div>LI1</div> <div>-</div> <div>-</div> <div>-</div> </div> </div>	<div> <div>□ [Analog limit. act.]</div> <div> <p>The parameter can be accessed if [Torque ref. assign.] (tAA) is not [No] (nO).</p> <p>□ [Yes] (YES): The limitation depends on the input assigned by [Torque ref. assign.] (tAA).</p> <p>□ [LI1] (LI1)</p> <p>□ [...]: See the assignment conditions on page 139.</p> <p>If the assigned input or bit is at 0:</p> <ul style="list-style-type: none"> The limitation is specified by the [Motoring torque lim] (tLIM) and [Gen. torque lim.] (tLIG) parameters if [Torque limit. activ.] (tLA) is not [No] (nO). No limitation if [Torque limit. activ.] (tLA) = [No] (nO). <p>If the assigned input or bit is at 1:</p> <ul style="list-style-type: none"> The limitation depends on the input assigned by [Torque ref. assign.] (tAA). <p>Note: If [Torque limitation] (tLA) and [Torque ref. assign.] (tAA) are enabled at the same time, the lowest value will be taken into account.</p> </div> </div>		[Yes] (YES)

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
CL 1-	■ [2nd CURRENT LIMIT.]		
LC 2 nO LI 1 - - -	<input type="checkbox"/> [Current limit 2] <input type="checkbox"/> [No] (nO): Function inactive. <input type="checkbox"/> [LI1] (LI1) ... <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. If the assigned input or bit is at 0, the first current limitation is active. If the assigned input or bit is at 1, the second current limitation is active.		[No] (nO)
CL 2 ()	<input type="checkbox"/> [I Limit. 2 value] Second current limitation The parameter can be accessed if [Current limit 2] (LC2) is not [No] (nO). The adjustment range is limited to 1.36 In if [Switching freq.] (SFr) page 62 is less than 2 kHz.  Note: If the setting is less than 0.25 In, the drive may lock in [Output Phase Loss] (OPF) fault mode if this has been enabled (see page 242). If it is less than the no-load motor current, the limitation no longer has any effect.	(1) 0 to 1.65 In (2)	1.5 In (2)
CL 1 ()	<input type="checkbox"/> [Current Limitation] First current limitation The adjustment range is limited to 1.36 In if [Switching freq.] (SFr) page 62 is less than 2 kHz.  Note: If the setting is less than 0.25 In, the drive may lock in [Output Phase Loss] (OPF) fault mode if this has been enabled (see page 242). If it is less than the no-load motor current, the limitation no longer has any effect.	(1) 0 to 1.65 In (2)	1.5 In (2)

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

(2) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.

() Parameter that can be modified during operation or when stopped.

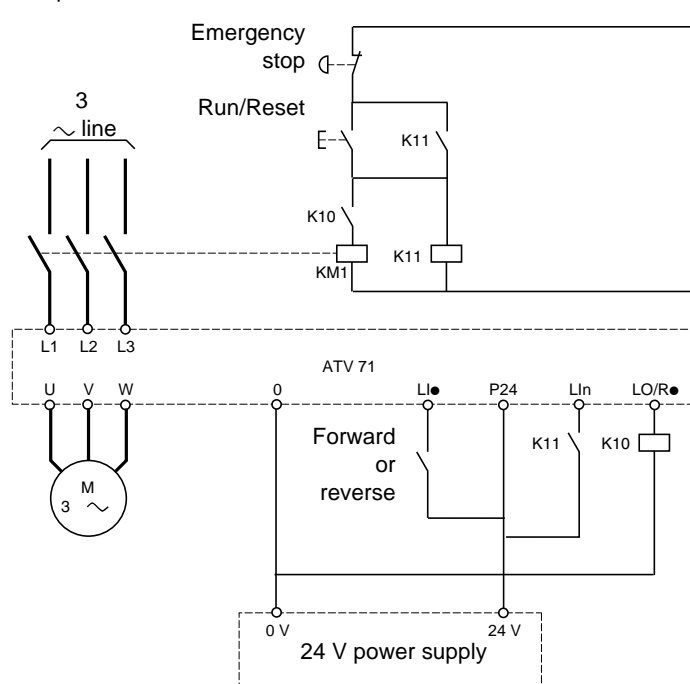
Line contactor command

The line contactor closes every time a run command (forward or reverse) is sent and opens after every stop, as soon as the drive is locked. For example, if the stop mode is stop on ramp, the contactor will open when the motor reaches zero speed.



Note: The drive control power supply must be provided via an external 24 V source.

Example circuit:



Note: The "Run/Reset" button must be pressed once the "Emergency stop" button has been released.

Li = Run command [Forward] or [Reverse]
 LO/R = [Line contactor ass.] (LLC)
 Lin = [Drive lock] (LES)

CAUTION

This function can only be used for a small number of consecutive operations with a cycle time longer than 60 s (in order to avoid premature aging of the filter capacitor charging circuit).

Failure to follow this instruction can result in equipment damage.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
LLC -	■ [LINE CONTACTOR COMMAND]		
LLC	<input type="checkbox"/> [Line contactor ass.] Logic output or control relay <input type="checkbox"/> [No] (nO): Function not assigned (in this case, none of the function parameters can be accessed). <input type="checkbox"/> [LO1] (LO1) to [LO4] (LO4): Logic output (if one or two I/O cards have been inserted, LO1 to LO2 or LO4 can be selected). <input type="checkbox"/> [R2] (r2) to <input type="checkbox"/> [R4] (r4): Relay (selection of R2 extended to R3 or R4 if one or two I/O cards have been inserted). <input type="checkbox"/> [dO1] (dO1): Analog output AO1 functioning as a logic output. Selection can be made if [AO1 assignment] (AO1) page 126 = [No] (nO).		[No] (nO)
LES	<input type="checkbox"/> [Drive lock] <input type="checkbox"/> [No] (nO): Function inactive. <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139 . The drive locks when the assigned input or bit changes to 0.		[No] (nO)
LCt	<input type="checkbox"/> [Mains V. time out] Monitoring time for closing of line contactor. If, once this time has elapsed, there is no voltage on the drive power circuit, the drive will lock with a "Line contactor" fault (LCF).	5 to 999 s	5 s

Output contactor command

This allows the drive to control a contactor located between the drive and the motor. The request for the contactor to close is made when a run command is sent. The request for the contactor to open is made when there is no longer any current in the motor.

CAUTION

If a DC injection braking function has been configured it should not be left operating too long in stop mode, as the contactor only opens at the end of braking.

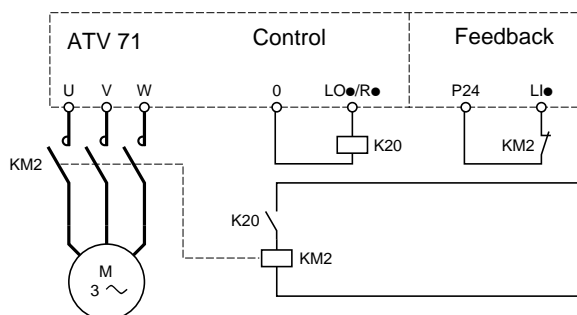
Failure to follow this instruction can result in equipment damage.

Output contactor feedback

The corresponding logic input should be at 1 when there is no run command and at 0 during operation.

In the event of an inconsistency, the drive trips on an FCF2 fault if the output contactor fails to close (Llx at 1) and on an FCF1 fault if it is stuck (Llx at 0).

The parameter [\[Delay to motor run\] \(dbS\)](#) can be used to delay tripping in fault mode when a run command is sent and the [\[Delay to open cont.\] \(dAS\)](#) parameter delays the fault when a stop command is set.



The [\[Out. contactor ass.\] \(OCC\)](#) and [\[Output contact. fdbk\] \(rCA\)](#) functions can be used individually or together.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
OCC -	■ [OUTPUT CONTACTOR CMD]		
OCC n0 LO1 - LO4 r2 - r4 dO1	<input type="checkbox"/> [Out. contactor ass.] Logic output or control relay <input type="checkbox"/> [No] (nO): Function not assigned (in this case, none of the function parameters can be accessed). <input type="checkbox"/> [LO1] (LO1) to [LO4] (LO4): Logic output (if one or two I/O cards have been inserted, LO1 to LO2 or LO4 can be selected). <input type="checkbox"/> [R2] (r2) to [R4] (r4): Relay (selection of R2 extended to R3 or R4 if one or two I/O cards have been inserted). <input type="checkbox"/> [dO1] (dO1): Analog output AO1 functioning as a logic output. Selection can be made if [AO1 assignment] (AO1) page 126 = [No] (nO).		[No] (nO)
rCA n0 LI1 - - -	<input type="checkbox"/> [Output contact. fdbk] <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. The motor starts up when the assigned input or bit changes to 0.		[No] (nO)
dbS ()	<input type="checkbox"/> [Delay to motor run] Time delay for: • Motor control following the sending of a run command • Output contactor fault monitoring, if the feedback is assigned. If the contactor fails to close at the end of the set time, the drive will lock in FCF2 fault mode. This parameter can be accessed if [Out. contactor ass.] (OCC) is assigned or if [Output contact. fdbk] (rCA) is assigned. The time delay must be greater than the closing time of the output contactor.	0.05 to 60 s	0.15
dAS ()	<input type="checkbox"/> [Delay to open cont.] Time delay for output contactor opening command following motor stop. This parameter can be accessed if [Output contact. fdbk] (rCA) is assigned. The time delay must be greater than the opening time of the output contactor. If it is set to 0, the fault will not be monitored. If the contactor fails to open at the end of the set time, the drive will lock in FCF1 fault mode.	0 to 5.00 s	0.10



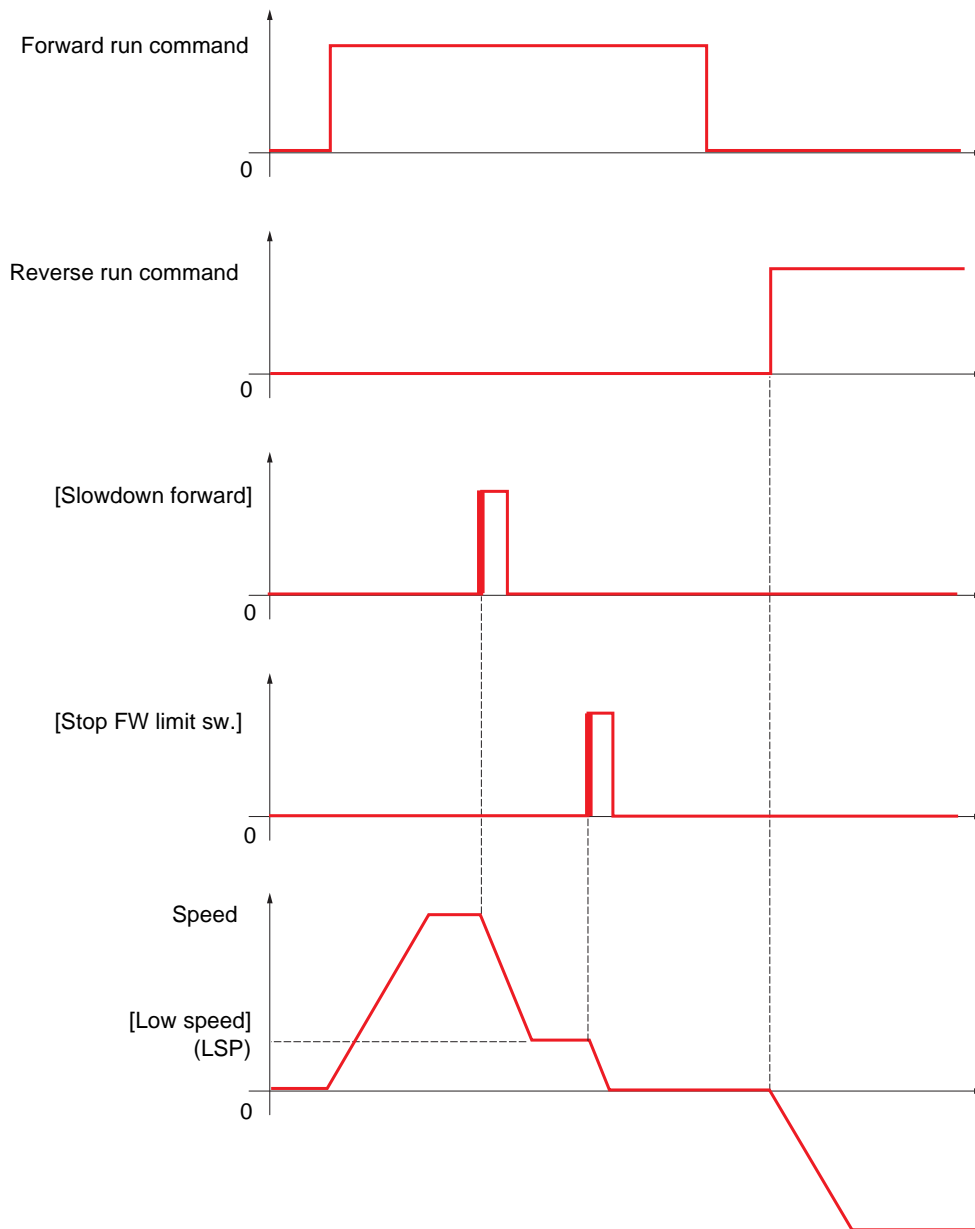
Parameter that can be modified during operation or when stopped.

Positioning by sensors or limit switches

This function is used for managing positioning using position sensors or limit switches linked to logic inputs or using control word bits:

- Slowing down
- Stopping

The action logic for the inputs and bits can be configured on a rising edge (change from 0 to 1) or a falling edge (change from 1 to 0). The example below has been configured on a rising edge:



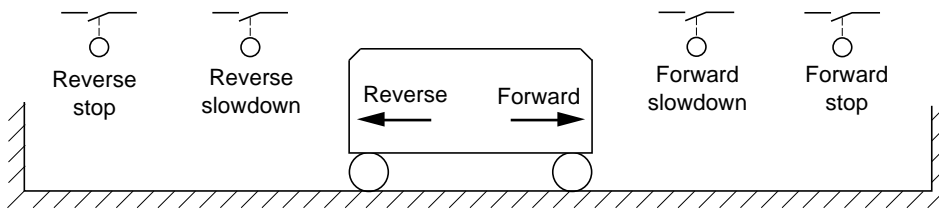
The slowdown mode and stop mode can be configured.

The operation is identical for both directions of operation. Slowdown and stopping operate according to the same logic, described below.

Example: Forward slowdown, on rising edge

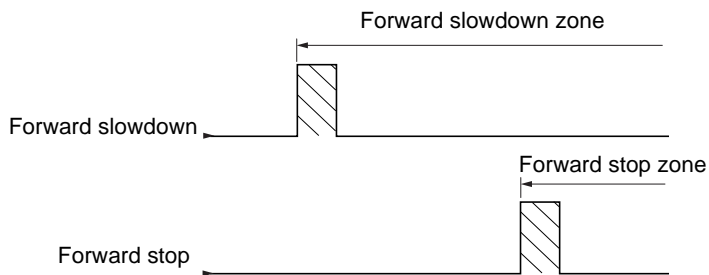
- Forward slowdown takes place on a rising edge (change from 0 to 1) of the input or bit assigned to forward slowdown if this rising edge occurs in forward operation. The slowdown command is then memorized, even in the event of a power outage. Operation in the opposite direction is authorized at high speed. The slowdown command is deleted on a falling edge (change from 1 to 0) of the input or bit assigned to forward slowdown if this falling edge occurs in reverse operation.
- A bit or a logic input can be assigned to disable this function.
- Although forward slowdown is disabled while the disable input or bit is at 1, sensor changes continue to be monitored and saved.

Example: Positioning on a limit switch, on rising edge



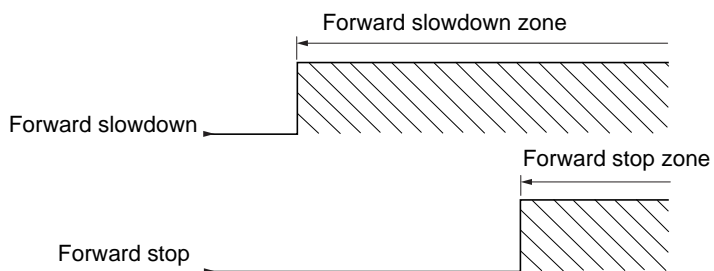
Operation with short cams:

In this instance, when operating for the first time or after restoring the factory settings, the drive must initially be started outside the slowdown and stop zones in order to initialize the function.



Operation with long cams:

In this instance, there is no restriction, which means that the function is initialized across the whole trajectory.



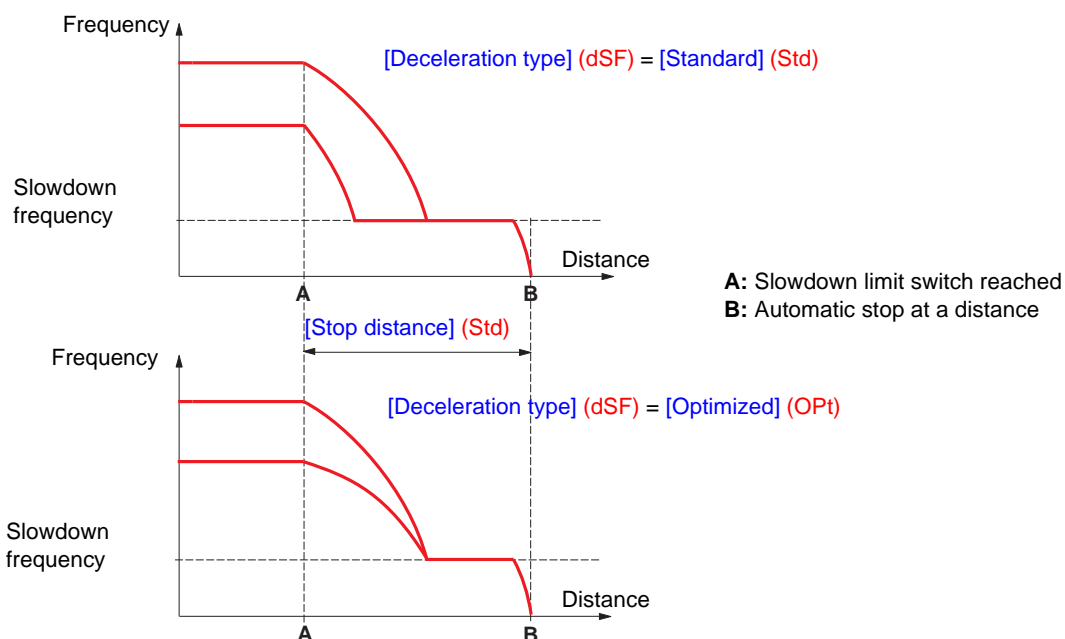
Stop at distance calculated after deceleration limit switch

This function can be used to control the stopping of the moving part automatically once a preset distance has been traveled after the slowdown limit switch.

On the basis of the rated linear speed and the speed estimated by the drive when the slowdown limit switch is tripped, the drive will induce the stop at the configured distance.

This function is useful in applications where one manual-reset overtravel limit switch is common to both directions. It will then only respond to ensure safety if the distance is exceeded. The stop limit switch retains priority in respect of the function.

The [Deceleration type] (dSF) parameter can be configured to obtain either of the functions described below:



Note:

- If the deceleration ramp is modified while stopping at a distance is in progress, this distance will not be observed.
- If the direction is modified while stopping at a distance is in progress, this distance will not be observed.


DANGER

UNINTENDED EQUIPMENT OPERATION

- Check that the parameters configured are consistent (in particular, you should check that the required distance is possible).
- This function does not replace the stop limit switch, which remains necessary for safety reasons.

Failure to follow these instructions will result in death or serious injury.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
L P D -	<div> <div></div> [POSITIONING BY SENSORS] </div> <p> Note: This function cannot be used with certain other functions. Follow the instructions on page 145.</p>		
S A F n O L I I - - C I O I - - - C d O O -	<div> <input type="checkbox"/> [Stop FW limit sw.] </div> <ul style="list-style-type: none"> <input type="checkbox"/> [No] (nO): Not assigned <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted <input type="checkbox"/> [C101] (C101) to [C115] (C115): With integrated Modbus in [I/O profile] (IO) <input type="checkbox"/> [C201] (C201) to [C215] (C215): With integrated CANopen in [I/O profile] (IO) <input type="checkbox"/> [C301] (C301) to [C315] (C315): With a communication card in [I/O profile] (IO) <input type="checkbox"/> [C401] (C401) to [C415] (C415): With a Controller Inside card in [I/O profile] (IO) <input type="checkbox"/> [CD00] (Cd00) to [CD13] (Cd13): In [I/O profile] (IO) can be switched with possible logic inputs <input type="checkbox"/> [CD14] (Cd14) to [CD15] (Cd15): In [I/O profile] (IO) can be switched without logic inputs 		[No] (nO)
S A r	<div> <input type="checkbox"/> [Stop RV limit sw.] </div> <p>Same assignments possible as for [Stop FW limit sw.] (SAF) above.</p>		[No] (nO)
S A L L O H I G	<div> <input type="checkbox"/> [Stop limit config.] </div> <p>The parameter can be accessed if at least one limit switch or one stop sensor has been assigned. It defines the positive or negative logic of the bits or inputs assigned to the stop.</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Active low] (LO): Stop controlled on a falling edge (change from 1 to 0) of the assigned bits or inputs. <input type="checkbox"/> [Active high] (HIG): Stop controlled on a rising edge (change from 0 to 1) of the assigned bits or inputs. 		[Active high] (HIG)
d A F	<div> <input type="checkbox"/> [Slowdown forward] </div> <p>Same assignments possible as for [Stop FW limit sw.] (SAF) above.</p>		[No] (nO)
d A r	<div> <input type="checkbox"/> [Slowdown reverse] </div> <p>Same assignments possible as for [Stop FW limit sw.] (SAF) above.</p>		[No] (nO)
d A L L O H I G	<div> <input type="checkbox"/> [Slowdown limit cfg.] </div> <p>The parameter can be accessed if at least one limit switch or one slowdown sensor has been assigned. It defines the positive or negative logic of the bits or inputs assigned to the slowdown.</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Active low] (LO): Slowdown controlled on a falling edge (change from 1 to 0) of the assigned bits or inputs. <input type="checkbox"/> [Active high] (HIG): Slowdown controlled on a rising edge (change from 0 to 1) of the assigned bits or inputs. 		[Active high] (HIG)

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	■ [POSITIONING BY SENSORS] (continued)		
CLS nD L I I - - -	<input type="checkbox"/> [Disable limit sw.] <p>The parameter can be accessed if at least one limit switch or one sensor has been assigned.</p> <input type="checkbox"/> [No] (nO): Not assigned <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. <p>The action of the limit switches is disabled when the assigned bit or input is at 1. If, at this time, the drive is stopped or being slowed down by limit switches, it will restart up to its speed reference.</p>		[No] (nO)
PRS rMP FSt YES	<input type="checkbox"/> [Stop type] <p>The parameter can be accessed if at least one limit switch or one sensor has been assigned.</p> <input type="checkbox"/> [Ramp stop] (rMP): On ramp <input type="checkbox"/> [Fast stop] (FSt): Fast stop (ramp time reduced by [Ramp divider] (dCF), see page 156) <input type="checkbox"/> [Freewheel] (YES): Freewheel stop		[Ramp stop] (rMP)
dSF Std OPT	<input type="checkbox"/> [Deceleration type] <p>The parameter can be accessed if at least one limit switch or one sensor has been assigned.</p> <input type="checkbox"/> [Standard] (Std): Uses the [Deceleration] (dEC) or [Deceleration 2] (dE2) ramp (depending on which has been enabled). <input type="checkbox"/> [Optimized] (OPT): The ramp time is calculated on the basis of the actual speed when the slowdown contact switches, in order to limit the operating time at low speed (optimization of the cycle time: the slowdown time is constant regardless of the initial speed).		[Standard] (Std)
Std nD -	<input type="checkbox"/> [Stop distance] <p>The parameter can be accessed if at least one limit switch or one sensor has been assigned.</p> <p>Activation and adjustment of the "Stop at distance calculated after the slowdown limit switch" function.</p> <input type="checkbox"/> [No] (nO): Function inactive (the next two parameters will, therefore, be inaccessible). <input type="checkbox"/> 0.01 yd to 10.94 yd: Stop distance range in yards.		[No] (nO)
nLS	<input type="checkbox"/> [Rated linear speed] <p>The parameter can be accessed if at least one limit switch or one sensor has been assigned.</p> <p>Rated linear speed in meters/second.</p>	0.20 to 5.00 m/s	1.00 m/s
SFd	<input type="checkbox"/> [Stop corrector] <p>The parameter can be accessed if at least one limit switch or one sensor has been assigned.</p> <p>Scaling factor applied to the stop distance to compensate, for example, a non-linear ramp.</p>	50 to 200%	100%

Parameter set switching [PARAM. SET SWITCHING]

A set of 1 to 15 parameters from the [1.3 SETTINGS] (SEt-) menu on page 54 can be selected and 2 or 3 different values assigned. These 2 or 3 sets of values can then be switched using 1 or 2 logic inputs or control word bits. This switching can be performed during operation (motor running).

It can also be controlled on the basis of one or two frequency thresholds, whereby each threshold acts as a logic input (0 = threshold not reached, 1 = threshold reached).

	Values 1	Values 2	Values 3
Parameter 1	Parameter 1	Parameter 1	Parameter 1
Parameter 2	Parameter 2	Parameter 2	Parameter 2
Parameter 3	Parameter 3	Parameter 3	Parameter 3
Parameter 4	Parameter 4	Parameter 4	Parameter 4
Parameter 5	Parameter 5	Parameter 5	Parameter 5
Parameter 6	Parameter 6	Parameter 6	Parameter 6
Parameter 7	Parameter 7	Parameter 7	Parameter 7
Parameter 8	Parameter 8	Parameter 8	Parameter 8
Parameter 9	Parameter 9	Parameter 9	Parameter 9
Parameter 10	Parameter 10	Parameter 10	Parameter 10
Parameter 11	Parameter 11	Parameter 11	Parameter 11
Parameter 12	Parameter 12	Parameter 12	Parameter 12
Parameter 13	Parameter 13	Parameter 13	Parameter 13
Parameter 14	Parameter 14	Parameter 14	Parameter 14
Parameter 15	Parameter 15	Parameter 15	Parameter 15
Input LI or bit or frequency threshold 2 values	0	1	0 or 1
Input LI or bit or frequency threshold 3 values	0	0	1



Note: Do not modify the parameters in the [1.3 SETTINGS] (SEt-) menu, because any modifications made in this menu ([1.3 SETTINGS] (SEt-)) will be lost on the next power-up. The parameters can be adjusted during operation in the [PARAM. SET SWITCHING] (MLP-) menu, on the active configuration.

Note: Parameter set switching cannot be configured from the integrated display terminal.

Parameters can only be adjusted on the integrated display terminal if the function has been configured previously via the graphic display terminal, by PowerSuite or via the bus or communication network. If the function has not been configured, the **MLP-** menu and the **PS1-**, **PS2-**, **PS3-** submenus will not appear.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
NLP -	■ [PARAM. SET SWITCHING]		
CHAR1	<input type="checkbox"/> [2 parameter sets] <div> <input type="checkbox"/> [No] (nO): Function inactive. <input type="checkbox"/> [Freq. Th.att.] (FtA): Switching via [Freq. threshold] (Ftd) page 68. <input type="checkbox"/> [Freq. Th. 2 attain.] (F2A): Switching via [Freq. threshold 2] (Ftd) page 68. <input type="checkbox"/> [Ramp Mode] (tAP): Switching during braking sequence. This new assignment allows to put higher gain when the brake is open and before the starting of the ramp (useful for lift application). </div>		[No] (nO)
nD FEA F2A tAP	<p>Frequency</p> <p>Reference</p> <p>[Brake engage freq] (bEN)</p> <p>Type of motor control</p> <p>Flux Torque Frequency Injection</p> <p>Parameter sets 2 Parameter sets 2</p>		
LI1 - - -	<input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. Switching 2 parameter sets		
CHAR2	<input type="checkbox"/> [3 parameter sets] <div> <input type="checkbox"/> [No] (nO): Function inactive. <input type="checkbox"/> [Freq. Th.att.] (FtA): Switching via [Freq. threshold] (Ftd) page 68. <input type="checkbox"/> [Freq. Th. 2 attain.] (F2A): Switching via [Freq. threshold 2] (Ftd) page 68. <input type="checkbox"/> [Ramp Mode] (tAP): Switching during braking sequence. This new assignment allows to put higher gain when the brake is open and before the starting of the ramp (useful for lift application). </div>		[No] (nO)
nD FEA F2A tAP	<p>Frequency</p> <p>Reference</p> <p>[Brake engage freq] (bEN)</p> <p>Type of motor control</p> <p>Flux Torque Frequency Injection</p> <p>Parameter sets 2 Parameter sets 3</p>		
LI1 - - -	<input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. Switching 3 parameter sets Note: In order to obtain 3 parameter sets, [2 parameter sets] must also be configured.		

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting																																																				
	■ [PARAM. SET SWITCHING] (continued)																																																						
SP5	<div>□ [PARAMETER SELECTION]</div> <p>The parameter can only be accessed on the graphic display terminal if [2 parameter sets] is not [No]. Making an entry in this parameter opens a window containing all the adjustment parameters that can be accessed.</p> <p>Select 1 to 15 parameters using ENT (a tick then appears next to the parameter). Parameter(s) can also be deselected using ENT.</p> <p>Example:</p> <table><tr><th colspan="2">PARAMETER SELECTION</th></tr><tr><th colspan="2">1.3 SETTINGS</th></tr><tr><td>Ramp increment</td><td><input checked="" type="checkbox"/></td></tr><tr><td>-----</td><td><input type="checkbox"/></td></tr><tr><td>-----</td><td><input type="checkbox"/></td></tr><tr><td>-----</td><td><input checked="" type="checkbox"/></td></tr></table>			PARAMETER SELECTION		1.3 SETTINGS		Ramp increment	<input checked="" type="checkbox"/>	-----	<input type="checkbox"/>	-----	<input type="checkbox"/>	-----	<input checked="" type="checkbox"/>																																								
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PS1-	<div>□ [SET 1]</div> <p>The parameter can be accessed if at least 1 parameter has been selected in [PARAMETER SELECTION]. Making an entry in this parameter opens a settings window containing the selected parameters in the order in which they were selected.</p> <p>With the graphic display terminal:</p> <div><table><tr><td>RDY</td><td>Term</td><td>+0.00Hz</td><td>0A</td></tr><tr><td colspan="4">SET1</td></tr><tr><td>Acceleration:</td><td></td><td>9.51 s</td><td rowspan="5">ENT →</td></tr><tr><td>Deceleration:</td><td></td><td>9.67 s</td></tr><tr><td>Acceleration 2:</td><td></td><td>12.58 s</td></tr><tr><td>Deceleration 2 :</td><td></td><td>13.45 s</td></tr><tr><td>Begin Acc round:</td><td></td><td>2.3 s</td></tr><tr><td>Code</td><td colspan="3">Quick</td></tr></table><table><tr><td>RDY</td><td>Term</td><td>+0.00Hz</td><td>0A</td></tr><tr><td colspan="4">Acceleration</td></tr><tr><td colspan="4">9.51 s</td></tr><tr><td colspan="2">Min = 0.1</td><td colspan="2">Max = 999.9</td></tr><tr><td colspan="2"><<</td><td colspan="2">>></td></tr><tr><td colspan="4">Quick</td></tr></table></div> <p>With the integrated display terminal: Proceed as in the Settings menu using the parameters that appear.</p>			RDY	Term	+0.00Hz	0A	SET1				Acceleration:		9.51 s	ENT →	Deceleration:		9.67 s	Acceleration 2:		12.58 s	Deceleration 2 :		13.45 s	Begin Acc round:		2.3 s	Code	Quick			RDY	Term	+0.00Hz	0A	Acceleration				9.51 s				Min = 0.1		Max = 999.9		<<		>>		Quick			
RDY	Term	+0.00Hz	0A																																																				
SET1																																																							
Acceleration:		9.51 s	ENT →																																																				
Deceleration:		9.67 s																																																					
Acceleration 2:		12.58 s																																																					
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Min = 0.1		Max = 999.9																																																					
<<		>>																																																					
Quick																																																							
PS2-	<div>□ [SET 2]</div> <p>The parameter can be accessed if at least 1 parameter has been selected in [PARAMETER SELECTION]. Procedure identical to [SET 1] (PS1-).</p>																																																						
PS3-	<div>□ [SET 3]</div> <p>The parameter can be accessed if [3 parameter sets] is not [No] and if at least 1 parameter has been selected in [PARAMETER SELECTION]. Procedure identical to [SET 1] (PS1-).</p>																																																						



Note: We recommend that a parameter set switching test is carried out while stopped and a check is made to ensure that it has been performed correctly.

Some parameters are interdependent and in this case may be restricted at the time of switching.

Interdependencies between parameters must be respected, even between different sets.

Example: The highest [Low speed] (LSP) must be below the lowest [High speed] (HSP).

Motor or configuration switching [MULTIMOTORS/CONFIG.]

The drive may contain up to 3 configurations, which can be saved using the [1.12 FACTORY SETTINGS] (FCS-) menu, page [267](#). Each of these configurations can be activated remotely, enabling adaptation to:

- 2 or 3 different motors or mechanisms (multimotor mode)
- 2 or 3 different configurations for a single motor (multiconfiguration mode)

The two switching modes cannot be combined.



Note: The following conditions MUST be observed:

- Switching may only take place when stopped (drive locked). If a switching request is sent during operation, it will not be executed until the next stop.
- In the event of motor switching, the following additional conditions apply:
 - When the motors are switched, the power and control terminals concerned must also be switched as appropriate.
 - The maximum power of the drive must not be exceeded by any of the motors.
- All the configurations to be switched must be set and saved in advance in the same hardware configuration, this being the definitive configuration (option and communication cards). Failure to follow this instruction can cause the drive to lock on an [Incorrect config.] (CFF) fault.

Menu and parameters switched in multimotor mode

- [1.3 SETTINGS] (SEt-)
- [1.4 MOTOR CONTROL] (drC-)
- [1.5 INPUTS / OUTPUTS CFG] (I-O-)
- [1.6 COMMAND] (CtL-)
- [1.7 APPLICATION FUNCT.] (FUn-) with the exception of the [MULTIMOTORS/CONFIG.] function (to be configured once only)
- [1.8 FAULT MANAGEMENT] (FLt)
- [1.13 USER MENU]
- [USER CONFIG.]: The name of the configuration specified by the user in the [1.12 FACTORY SETTINGS] (FCS-) menu

Menu and parameters switched in multiconfiguration mode

As in multimotor mode, except for the motor parameters that are common to the three configurations:

- Rated current
- Thermal current
- Rated voltage
- Rated frequency
- Rated speed
- Rated power
- IR compensation
- Slip compensation
- Synchronous motor parameters
- Type of thermal protection
- Thermal state
- The auto-tuning parameters and motor parameters that can be accessed in expert mode
- Type of motor control



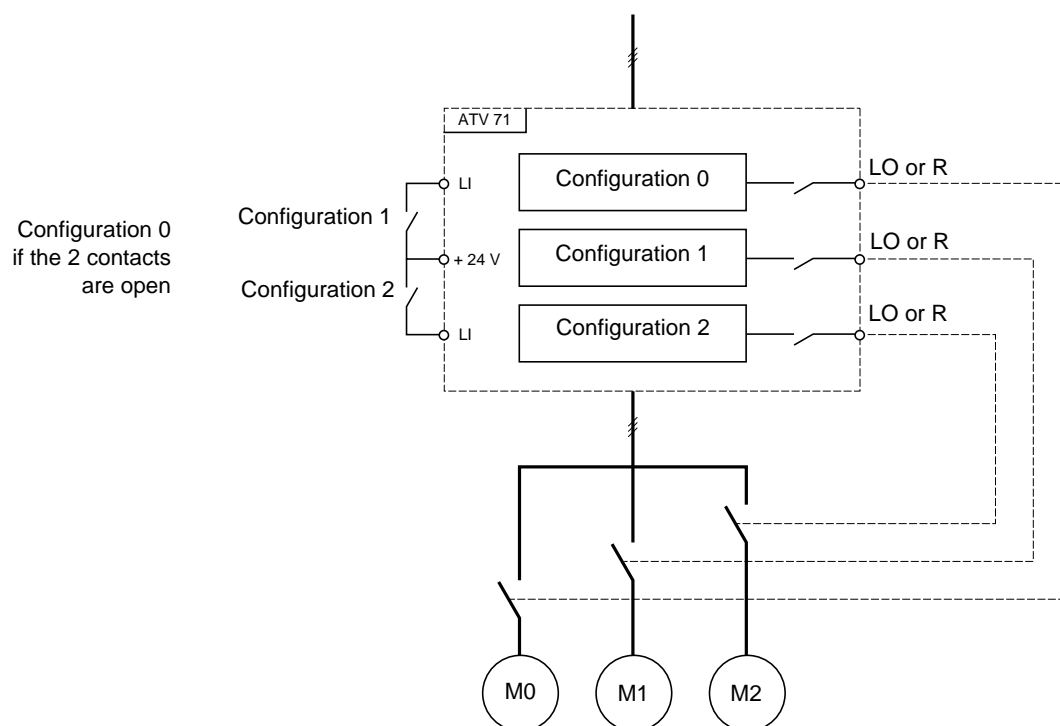
Note: No other menus or parameters can be switched.

Switching command

Depending on the number of motors or selected configuration (2 or 3), the switching command is sent using one or two logic inputs. The table below lists the possible combinations.

LI 2 motors or configurations	LI 3 motors or configurations	Number of configuration or active motor
0	0	0
1	0	1
0	1	2
1	1	2

Schematic diagram for multimotor mode



Auto-tuning in multimotor mode

This auto-tuning can be performed:

- Manually using a logic input when the motor changes
- Automatically each time the motor is activated for the 1st time after switching on the drive, if the [Automatic autotune] (AUt) parameter on page 88 = [Yes] (YES).

Motor thermal states in multimotor mode:

The drive protects the three motors individually. Each thermal state takes into account all stop times, including drive shutdowns. It is, therefore, not necessary to perform auto-tuning every time the power is switched on. It is sufficient to auto-tune each motor at least once.

Configuration information output

In the [1.5 INPUTS / OUTPUTS CFG] (I-O-) menu, a logic output can be assigned to each configuration or motor (2 or 3) for remote information transmission.



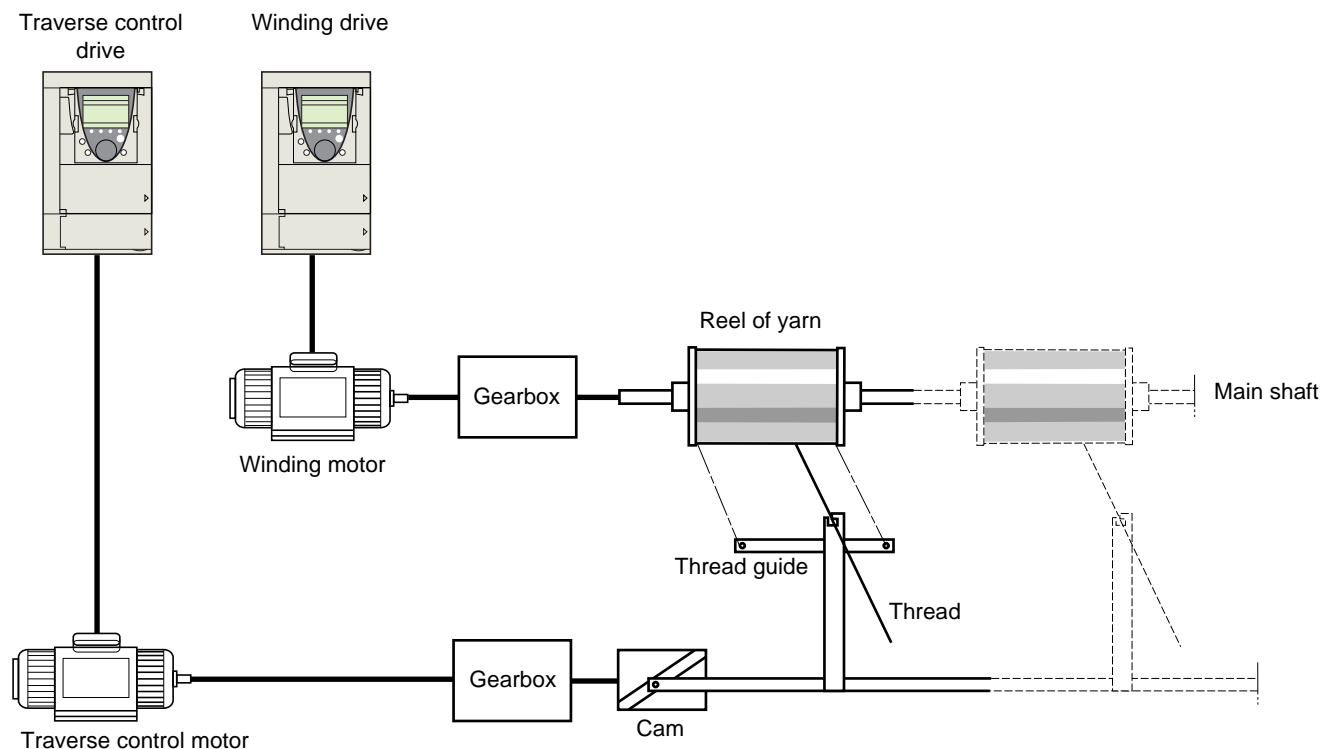
Note: As the [1.5 INPUTS / OUTPUTS CFG] (I-O-) menu is switched, these outputs must be assigned in all configurations in which information is required.

[1.7 APPLICATION FUNCT.] (FUn-)

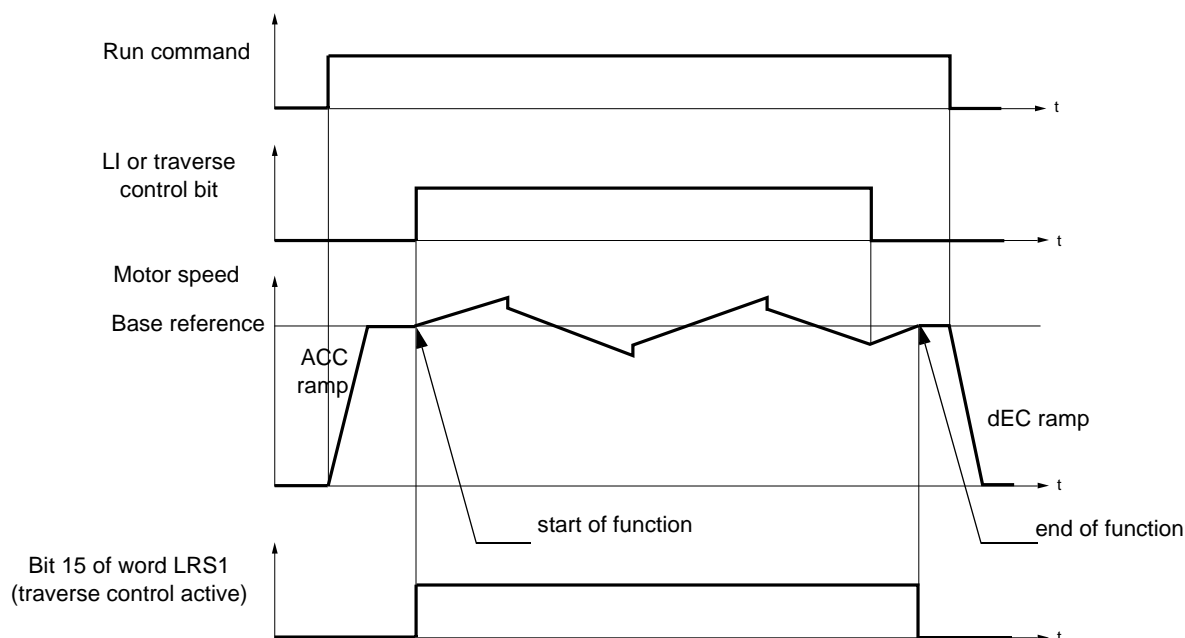
Code	Name/Description	Adjustment range	Factory setting
nnC -	■ [MULTIMOTORS/CONFIG.]		
CnF1 nO YES	<input type="checkbox"/> [Multimotors] <input type="checkbox"/> [No] (nO): Multiconfiguration possible <input type="checkbox"/> [Yes] (YES): Multimotor possible		[No] (nO)
CnF1 nO LI1 - - C111 - - -	<input type="checkbox"/> [2 Configurations] <input type="checkbox"/> [No] (nO): No switching <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted <input type="checkbox"/> [C111] (C111) to [C115] (C115): With integrated Modbus <input type="checkbox"/> [C211] (C211) to [C215] (C215): With integrated CANopen <input type="checkbox"/> [C311] (C311) to [C315] (C315): With a communication card <input type="checkbox"/> [C411] (C411) to [C415] (C415): With a Controller Inside card Switching of 2 motors or 2 configurations		[No] (nO)
CnF2 nO LI1 - - C111 - - -	<input type="checkbox"/> [3 Configurations] <input type="checkbox"/> [No] (nO): No switching <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted <input type="checkbox"/> [C111] (C111) to [C115] (C115): With integrated Modbus <input type="checkbox"/> [C211] (C211) to [C215] (C215): With integrated CANopen <input type="checkbox"/> [C311] (C311) to [C315] (C315): With a communication card <input type="checkbox"/> [C411] (C411) to [C415] (C415): With a Controller Inside card Switching of 3 motors or 3 configurations Note: In order to obtain 3 motors or 3 configurations, [2 Configurations] (CnF1) must also be configured.		[No] (nO)

Traverse control

Function for winding reels of yarn (in textile applications)



The speed of rotation of the cam must follow a precise profile to ensure that the reel is steady, compact and linear:

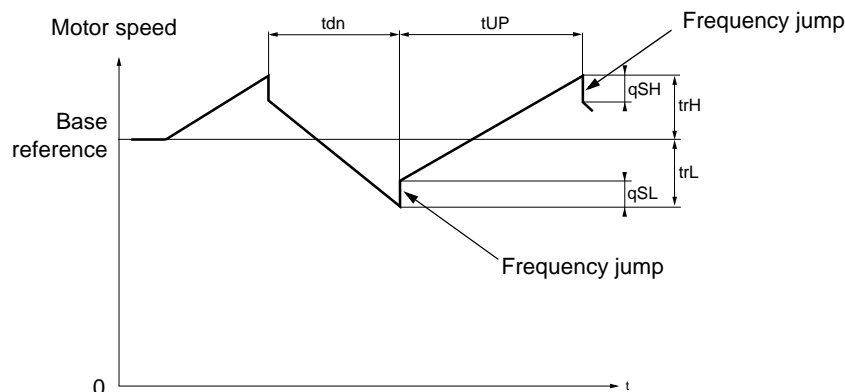


The function starts when the drive has reached its base reference and the traverse control command has been enabled. When the traverse control command is disabled, the drive returns to its base reference, following the ramp determined by the traverse control function. The function then stops, as soon as it has returned to this reference. Bit 15 of word LRS1 is at 1 while the function is active.

[1.7 APPLICATION FUNCT.] (FUn-)

Function parameters:

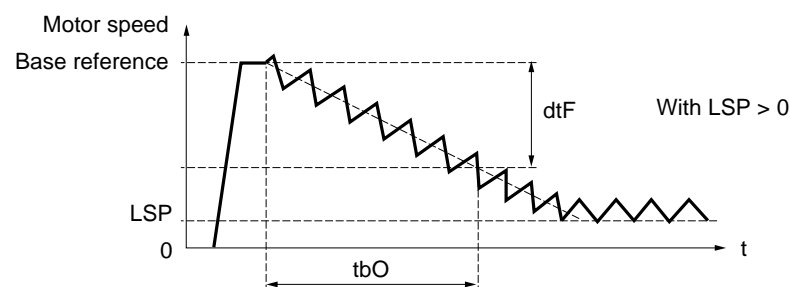
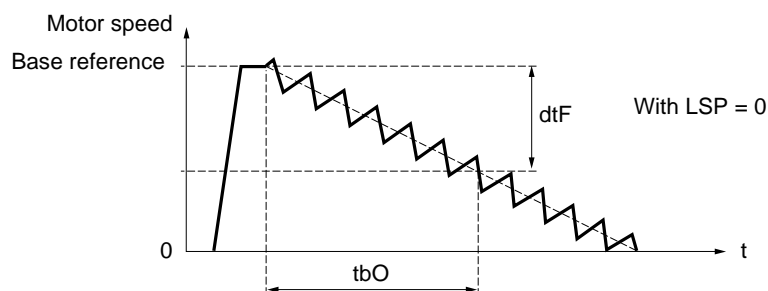
These define the cycle of frequency variations around the base reference, as shown in the diagram below:



- trC: [Yarn control]: Assignment of the traverse control command to a logic input or to a communication bus control word bit
- tdn: [Traverse ctrl. decel] time, in seconds
- tUP: [Traverse ctrl. accel.] time, in seconds
- trH: [Traverse freq. high], in Hertz
- trL: [Traverse Freq. Low], in Hertz
- qSH: [Quick step High], in Hertz
- qSL: [Quick step Low], in Hertz

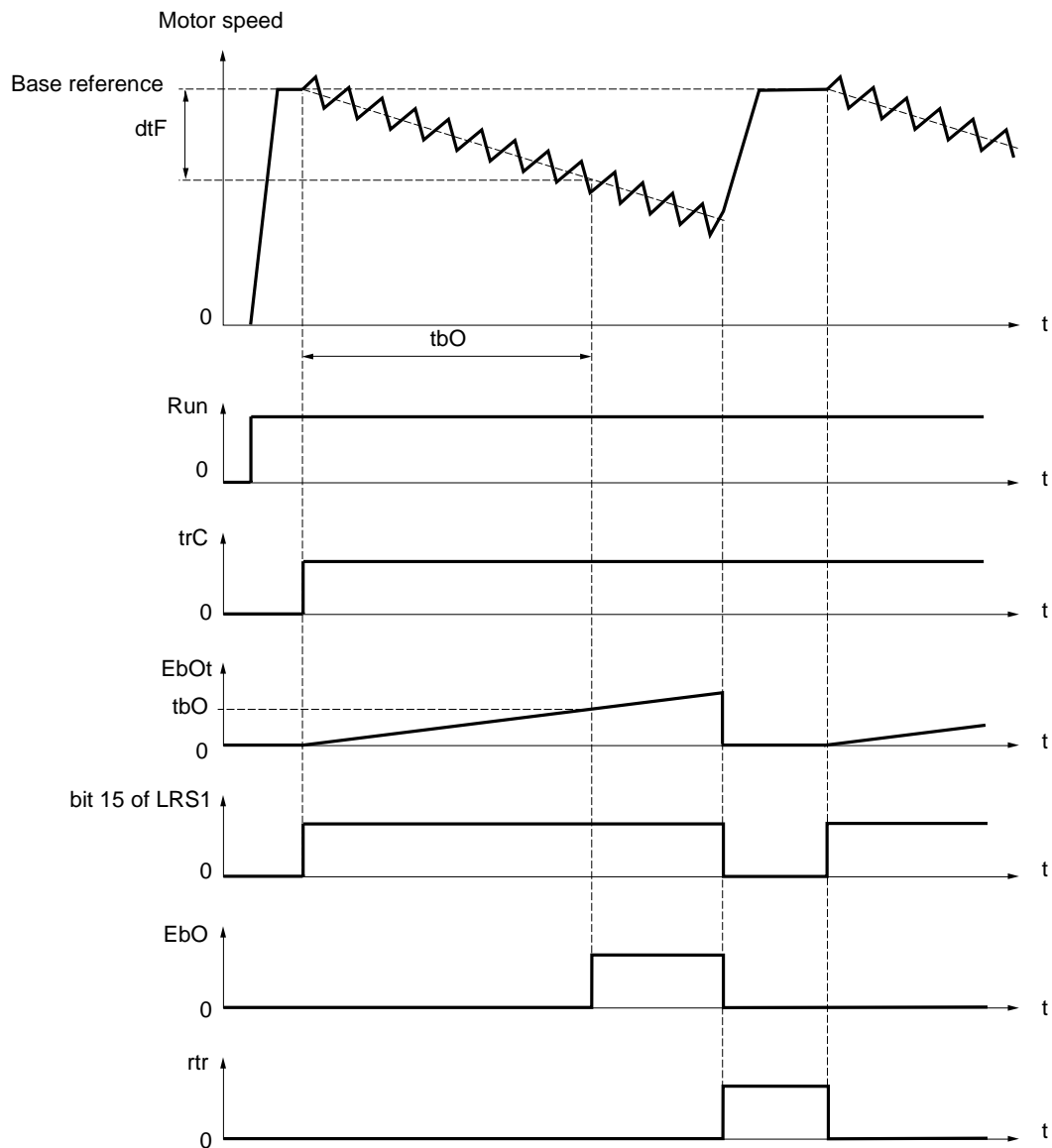
Reel parameters:

- tbO: [Reel time]: Time taken to make a reel, in minutes.
This parameter is intended to signal the end of winding. When the traverse control operating time since command trC reaches the value of tbO, the logic output or one of the relays changes to state 1, if the corresponding function EbO has been assigned.
The traverse control operating time EbOt can be monitored online by a communication bus and in the Monitoring menu.
- dtF: [Decrease ref. speed]: Decrease in the base reference.
In certain cases, the base reference has to be reduced as the reel increases in size. The dtF value corresponds to time tbO. Once this time has elapsed, the reference continues to fall, following the same ramp. If low speed LSP is at 0, the speed reaches 0 Hz, the drive stops and must be reset by a new run command.
If low speed LSP is not 0, the traverse control function continues to operate above LSP.

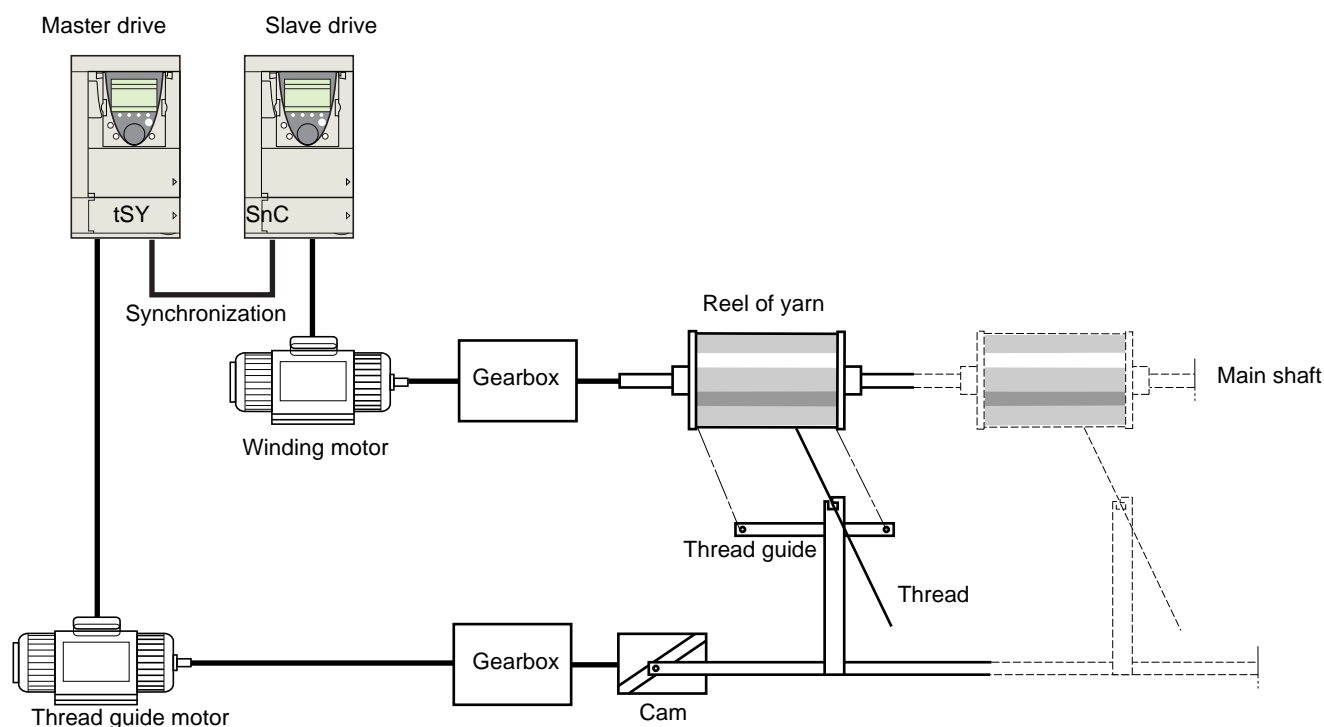


- rtr: [\[Init. traverse ctrl\]](#) Reinitialize traverse control.

This command can be assigned to a logic input or to a communication bus control word bit. It resets the EbO alarm and the EbOt operating time to zero and reinitializes the reference to the base reference. As long as rtr remains at 1, the traverse control function is disabled and the speed remains the same as the base reference. This command is used primarily when changing reels.



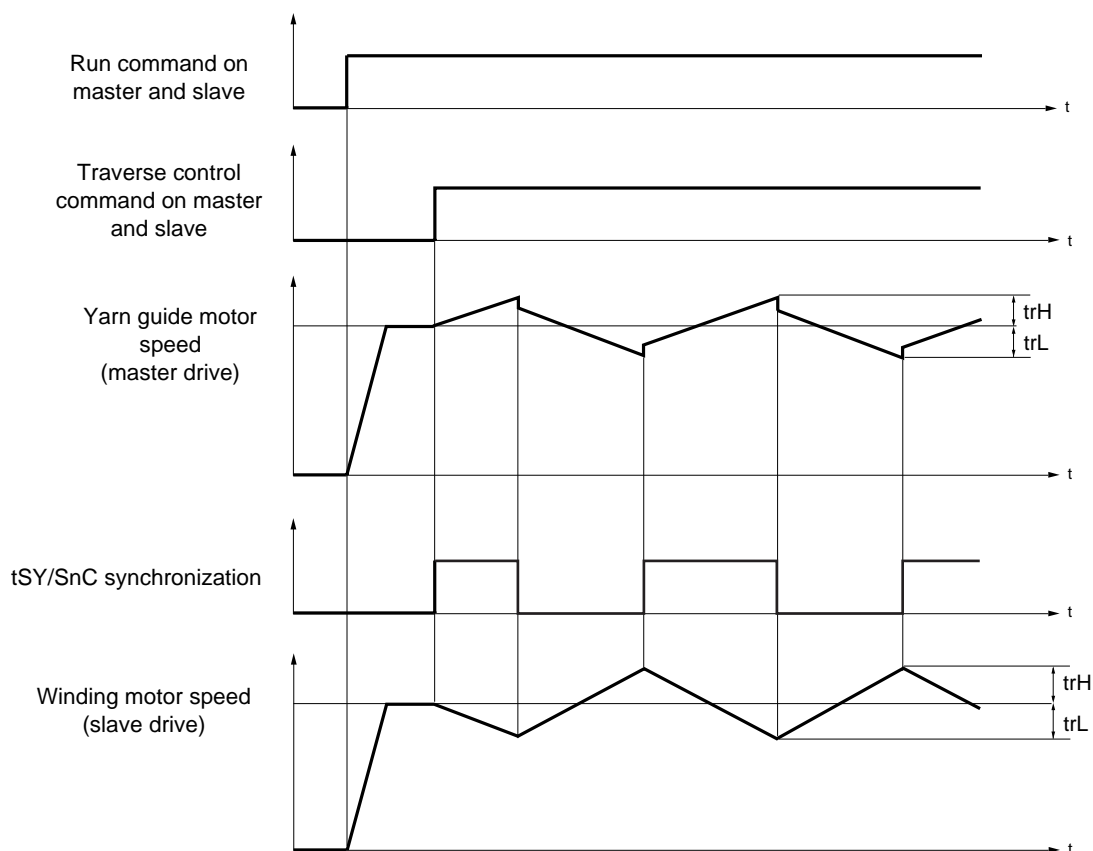
Counter wobble



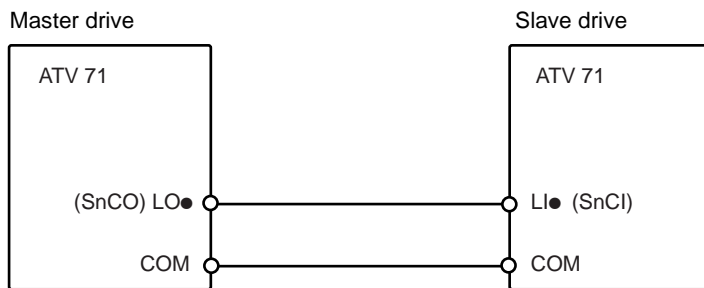
The "Counter wobble" function is used in certain applications to obtain a constant yarn tension when the "Traverse control" function is producing considerable variations in speed on the yarn guide motor (trH and trL , see page 225).

Two motors must be used (one master and one slave).

The master controls the speed of the yarn guide, the slave controls the winding speed. The function assigns the slave a speed profile, which is in antiphase to that of the master. This means that synchronization is required, using one of the master's logic outputs and one of the slave's logic inputs.



Connection of synchronization I/O




The starting conditions for the function are:


- Base speeds reached on both drives
- [Yarn control] (trC) input activated
- Synchronization signal present

Note: On the slave drive, the [Quick step High] (qSH) and [Quick step Low] (qSL) parameters should generally be left at zero.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
ErD-	[TRAVERSE CONTROL]  Note: This function cannot be used with certain other functions. Follow the instructions on page 145.		
ErC nD L I I - - -	<input type="checkbox"/> [Yarn control] <input type="checkbox"/> [No] (nO): Function inactive, thereby preventing access to other parameters. <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. The "traverse control" cycle starts when the assigned input or bit changes to 1 and stops when it changes to 0.		[No] (nO)
ErH ()	<input type="checkbox"/> [Traverse freq. high] (1)	0 to 10 Hz	4 Hz
ErL ()	<input type="checkbox"/> [Traverse Freq. Low] (1)	0 to 10 Hz	4 Hz
qSH ()	<input type="checkbox"/> [Quick step High] (1)	0 to [Traverse freq. high] (trH)	0 Hz
qSL ()	<input type="checkbox"/> [Quick step Low] (1)	0 to [Traverse Freq. Low] (trL)	0 Hz
tUP ()	<input type="checkbox"/> [Traverse ctrl. accel.]	0.1 to 999.9 s	4 s
tDn ()	<input type="checkbox"/> [Traverse ctrl. decel]	0.1 to 999.9 s	4 s
tBO ()	<input type="checkbox"/> [Reel time] Reel execution time	0 to 9999 minutes	0 minute
EBO nD LO I - LO4 r2 - r4 dO I	<input type="checkbox"/> [End reel] <input type="checkbox"/> [No] (nO): Function not assigned. <input type="checkbox"/> [LO1] (LO1) to <input type="checkbox"/> [LO4] (LO4): Logic output (if one or two I/O cards have been inserted, LO1 to LO2 or LO4 can be selected). <input type="checkbox"/> [R2] (r2) to <input type="checkbox"/> [R4] (r4): Relay (selection of R2 extended to R3 or R4 if one or two I/O cards have been inserted). <input type="checkbox"/> [dO1] (dO1): Analog output AO1 functioning as a logic output. Selection can be made if [AO1 assignment] (AO1) page 126 = [No] (nO). The assigned output or relay changes to state 1 when the traverse control operating time reaches the [Reel time] (tBO).		[No] (nO)

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

 Parameter that can be modified during operation or when stopped.

[1.7 APPLICATION FUNCT.] (FUn-)

Code	Name/Description	Adjustment range	Factory setting
	■ [TRAVERSE CONTROL] (continued)		
S n C n O L I I - - -	□ [Counter wobble] <input type="checkbox"/> [No] (nO): Function not assigned. <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. Synchronization input. To be configured on the winding drive (slave) only.		[No] (nO)
t S Y n O L O I - L O 4 r 2 - r 4 d O I	□ [Sync. wobble] <input type="checkbox"/> [No] (nO): Function not assigned. <input type="checkbox"/> [LO1] (LO1) to [LO4] (LO4) : Logic output (if one or two I/O cards have been inserted, LO1 to LO2 or LO4 can be selected). <input type="checkbox"/> [R2] (r2) to [R4] (r4) : Relay (selection of R2 extended to R3 or R4 if one or two I/O cards have been inserted). <input type="checkbox"/> [dO1] (dO1): Analog output AO1 functioning as a logic output. Selection can be made if [AO1 assignment] (AO1) page 126 = [No] (nO). Synchronization output. To be configured on the yarn guide drive (master) only.		[No] (nO)
dt F ()	□ [Decrease ref. speed] Decrease in the base reference during the traverse control cycle.	0 to 1600 Hz	0 Hz
r t r n O L I I - - -	□ [Init. traverse ctrl] <input type="checkbox"/> [No] (nO): Function not assigned. <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. When the state of the assigned input or bit changes to 1, the traverse control operating time is reset to zero, along with [Decrease ref. speed] (dtF) .		[No] (nO)

Inspection

The inspection function is designed for "elevator" applications.
It can only be accessed if the "brake logic control" and "output contactor command" functions have already been assigned.
It is used for operation at a fixed preset speed that is independent of all other references and over which it takes priority. The whole trajectory of the elevator can thus be covered and the necessary checks performed.

- This function requires:
- A logic input to control the "inspection" mode
 - An appropriate frequency reference (inspection speed)

- When the assigned logic input is at state 1, inspection mode is activated:
- When a run command is given, the motor starts up normally, with output contactor command and brake logic control, until it reaches the inspection speed.
 - When the run command is disabled, the motor changes to freewheel stop and brake logic control and output contactor command functions are triggered immediately.

Code	Name/Description	Adjustment range	Factory setting
ISP -	■ [INSPECTION MODE]		
ISP	□ [Inspection]		[No] (nO)
nO L I I - L I I 4	The parameter can be accessed if brake logic control [Brake assignment] (bLC) page 175 and [Out. contactor ass.] (OCC) page 208 are assigned. □ [No] (nO): Function not assigned □ [LI1] (LI1) to [LI6] (LI6) □ [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted □ [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted. Inspection mode is activated when the assigned input changes to state 1.		
ISrF	□ [Inspection speed]	0 to 25 Hz	12 Hz
()	Value of the "inspection" mode frequency reference. The parameter can be accessed if [Inspection] (ISP) is not [No] (nO).		

() Parameter that can be modified during operation or when stopped

Evacuation function

The evacuation function is designed for "elevator" applications. It is only accessible for ATV71●●●N4 (380/480 V) drives, up to 75 kW (100 HP) only.

When an elevator is stuck between 2 floors due to a power outage, it must be possible to evacuate its occupants within a reasonable period of time.

This function requires an emergency power supply to be connected to the drive.

This power supply is at a reduced voltage, and only allows a derated operating mode, at reduced speed, but with full torque.

The function requires:

- One logic input to control "evacuation" operation
- Reduction of the voltage monitoring threshold
- An appropriate low speed reference

Following a power outage, the drive can restart without going into [Undervoltage] (USF) fault mode if the corresponding logic input is at 1 at the same time.

CAUTION

- This input must not be at 1 when the drive is powered from the line supply. To ensure this and also avoid any short-circuits, supply changeover contactors must be used.
- Set this input to 0 before connecting the emergency power supply to the line supply.

Failure to follow these instructions can result in equipment damage.

Code	Name/Description	Adjustment range	Factory setting
r F E -	[EVACUATION] Function only accessible for ATV71●●●N4 (380/480 V) drives, up to 75 kW (100 HP) only.		
r F E -	<input type="checkbox"/> [Evacuation assign.] <input type="checkbox"/> [No] (nO): Function not assigned. <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted. Evacuation is activated when the assigned input is at 1, if the drive is stationary. Evacuation is activated when the assigned input is at 0, as soon as the drive stops.		[No] (nO)
r S U	<input type="checkbox"/> [Evacuation Input V.] Minimum permissible AC voltage value of the emergency power supply. The parameter can be accessed if [Evacuation assign.] (rFt) is not [No] (nO).	220 to 320 V	220 V
r S P ()	<input type="checkbox"/> [Evacuation freq.] Value of the "evacuation" mode frequency reference. The parameter can be accessed if [Evacuation assign.] (rFt) is not [No] (nO). The adjustment range is determined by the [Low speed] (LSP) (page 56), [Rated motor freq.] (FrS) page 76 for an asynchronous motor or [Nominal freq sync.] (FrSS) page 82 for a synchronous motor and [Rated motor volt.] (UnS) page 76 and by [Evacuation Input V.] (rSU) above. Example with an asynchronous motor: • If $LSP < (FrS \times rSU/UnS)$: $rSP_{min.} = LSP$, $rSP_{max.} = (FrS \times rSU/UnS)$ • If $LSP \geq (FrS \times rSU/UnS)$: $rSP = (FrS \times rSU/UnS)$ With a synchronous motor: Same formula using FrSS in place of FrS and 400 V in place of UnS.		5 Hz

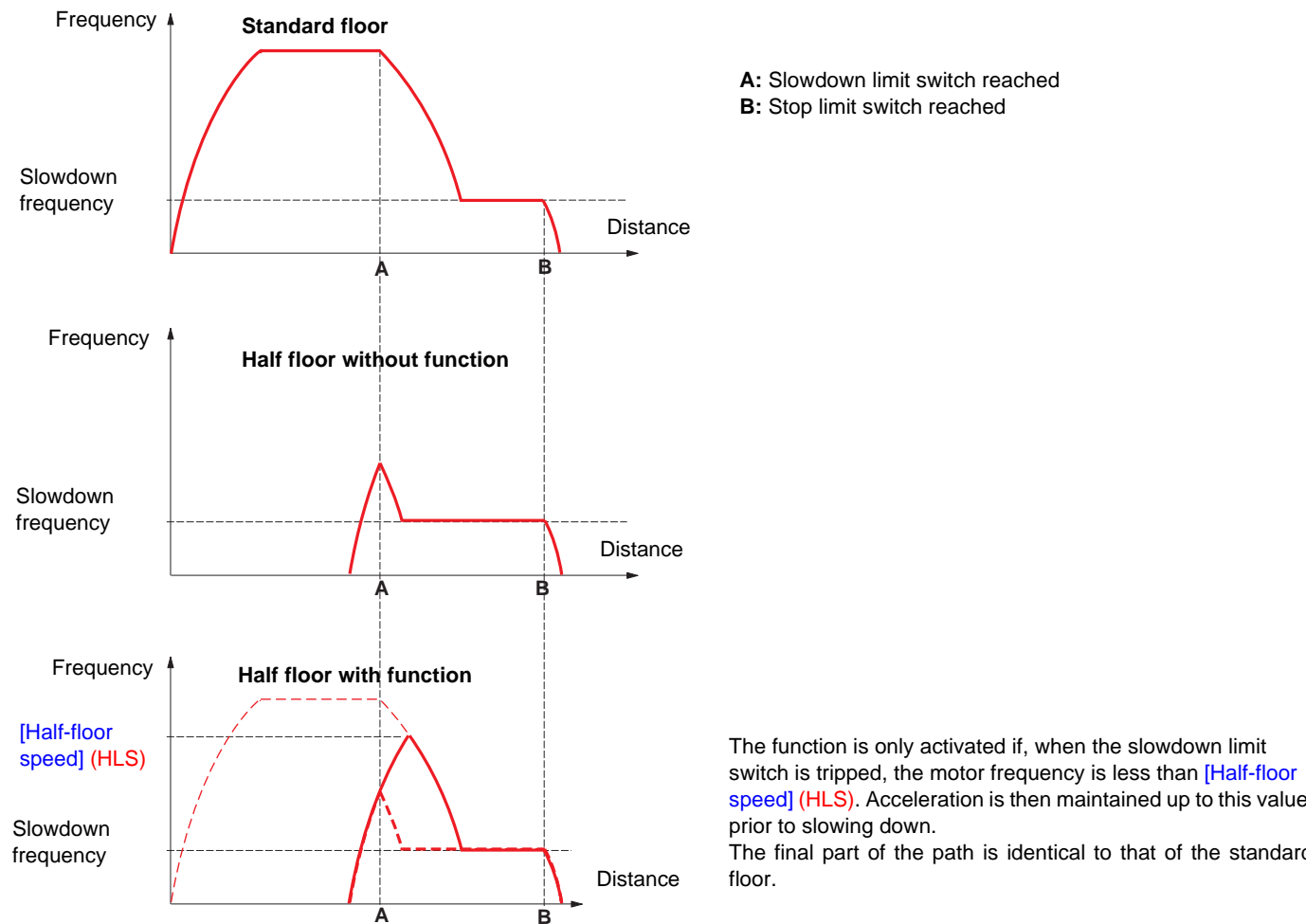


Parameter that can be modified during operation or when stopped.

Half floor

The "half floor" function is designed for "elevator" applications. When an elevator sets off from floors and half floors, the cycle time for half floors can be too long, as the elevator does not have time to reach full speed before crossing the slowdown limit switch. As a result, the slowdown time is unnecessarily long. The "half floor" function can be used to compensate this by not triggering slowdown until the speed reaches a preset threshold [Half-floor speed] (HLS) in order that the final part of the path will be the same as for a standard floor.

The graphs below illustrate the various operating scenarios with and without the function:



Code	Name/Description	Adjustment range	Factory setting
HFF -	■ [HALF FLOOR]		
HLS	□ [Half-floor speed]		[No] (nO)
nO	Activation and adjustment of the "half floor" function. This function has priority over all speed reference functions (preset speeds, for example) with the exception of those generated via fault monitoring (fallback speed, for example).		
-	□ [No] (nO): Function inactive		
	□ 0.1 Hz to 500.0 Hz: Activation of the function by adjusting the motor frequency to be reached prior to slowing down.		

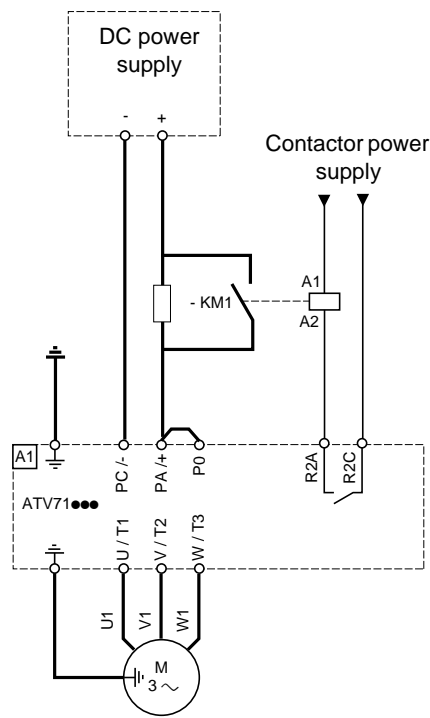
Direct power supply via DC bus

This function is only accessible for ATV71...M3 ≥ 18.5 kW (25 HP) and ATV71...N4 ≥ 18.5 kW (25 HP) drives.

Direct power supply via the DC bus requires a protected direct current source with adequate power and voltage as well as a suitably dimensioned resistor and capacitor precharging contactor. Consult Schneider Electric for information about specifying these components.

The "direct power supply via DC bus" function can be used to control the precharging contactor via a relay or a logic input on the drive.

Example circuit using R2 relay:




Code	Name/Description	Adjustment range	Factory setting
dc0 -	<div><div><div></div><div>[DC BUS SUPPLY]</div></div><div>This function is only accessible for ATV71●●●M3 drives ≥ 18.5 kW (25 HP) and ATV71●●●N4 drives ≥ 18.5 kW (25 HP).</div></div>		
dc0	<div><div><div></div><div>[Precharge cont. ass.]</div></div><div>Logic output or control relay</div><div><div><div><div></div><div>[No] (nO): Function not assigned.</div></div><div><div></div><div>[LO1] (LO1)</div><div>to</div><div>[LO4] (LO4): Logic output (if one or two I/O cards have been inserted, LO1 to LO2 or LO4 can be selected).</div></div><div><div></div><div>[R2] (r2)</div><div>to</div><div>[R4] (r4): Relay (selection of R2 extended to R3 or R4 if one or two I/O cards have been inserted).</div></div><div><div></div><div>[dO1] (dO1): Analog output AO1 functioning as a logic output. Selection can be made if [AO1 assignment] (AO1) page 126 = [No] (nO).</div></div></div></div><div><div></div><div>[No] (nO)</div></div></div>		

[1.7 APPLICATION FUNCT.] (FUn-)

Top Z management

This function is only accessible if an encoder card VW3 A3 411 has been inserted and if [Encoder type] (EnS) = [AABB] (AAbb).

This function can be used to make homing but it is necessary to have an approach speed low otherwise the drive trips in [Overbraking] (ObF) fault.

Code	Name/Description	Adjustment range	Factory setting
↳ DP -	■ [TOP Z MANAGEMENT]		
↳ D S E	<input type="checkbox"/> [Stop on top Z]		[No] (nO)
↳ n O	 Note: This function cannot be used with certain other functions. Follow the instructions on page 145.		
↳ L I I	<input type="checkbox"/> [No] (nO): Not assigned		
-	<input type="checkbox"/> [LI1] (LI1)		
-	:		
-	<input type="checkbox"/> [...] (...): See the assignment conditions on page 139.		
	The stop is activated when the input changes to 1 or the bit changes to 1 and after the detection of the following Top Z. If the input returns to state 0 and the run command is still active, the motor will only restart if [2/3 wire control] (tCC) page 102 = [2 wire] (2C) and the [2 wire type] (tCt) = [Level] (LEL) or [Fwd priority] (PFO). If not, a new run command must be sent.		

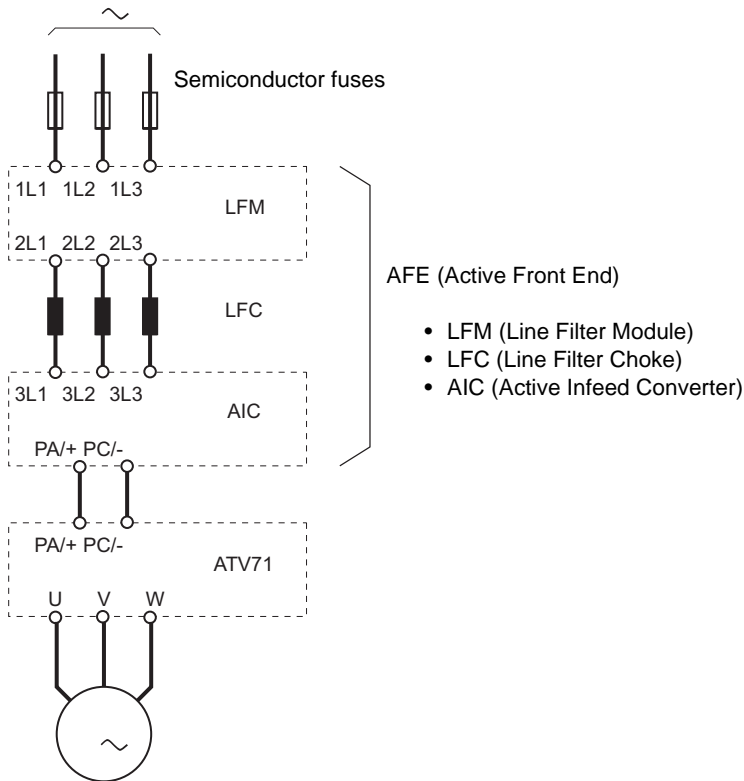
[1.7 APPLICATION FUNCT.] (FUn-)

Active Front End connection

This function is not accessible for ATV71H●●●S6X ≥ and for ATV71H●●●Y ≥ 110 kW (150 HP). (HHP range)

Direct power supply via Active Front End (AFE) reduces the mains current harmonics to less than 4% and gives enables the drive to feedback the generative energy to the mains supply.

Example circuit using one AFE for one ATV71



Code	Name/Description	Adjustment range	Factory setting
01r-	[REGEN CONNECTION]		
AFE	<input type="checkbox"/> [Regen. Connection]		[No] (nO)
nO	<input type="checkbox"/> [No] (nO): Not assigned		
YES	<input type="checkbox"/> [Yes] (YES): Function always active		
LI1	<input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6)		
-	<input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted		
-	<input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted		
C101	<input type="checkbox"/> [C101] (C101) to [C115] (C115): With integrated Modbus in [I/O profile] (IO)		
-	<input type="checkbox"/> [C201] (C201) to [C215] (C215): With integrated CANopen in [I/O profile] (IO)		
-	<input type="checkbox"/> [C301] (C301) to [C315] (C315): With a communication card in [I/O profile] (IO)		
-	<input type="checkbox"/> [C401] (C401) to [C415] (C415): With a Controller Inside card in [I/O profile] (IO)		
Cd00	<input type="checkbox"/> [CD00] (Cd00) to [CD13] (Cd15): In [I/O profile] (IO) can be switched with possible logic inputs		
-	<input type="checkbox"/> [CD14] (Cd14) to [CD15] (Cd15): In [I/O profile] (IO) can be switched without logic inputs		
	If [Profile] (CHCF) = [8 serie] (SE8), then only [Yes] (YES) and [Lix] (Lix) are available		

CAUTION

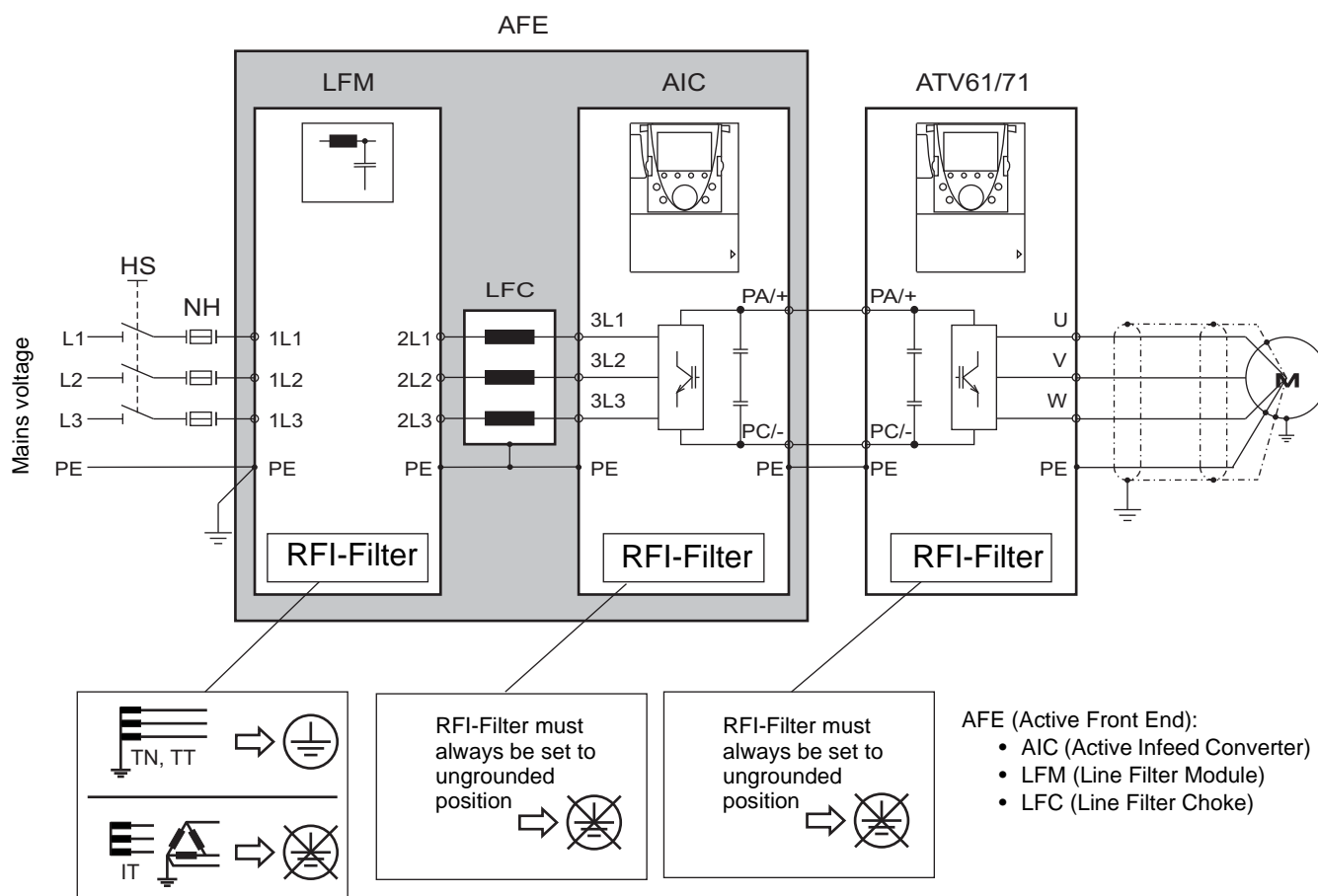
DAMAGED EQUIPMENT

It is absolutely necessary to carry out further parameter setting on all ATV71 drive connected to Active Front End (AFE). Check the list of parameter on next page.
Failure to follow this instruction can result in equipment damage.

Active Front End connection

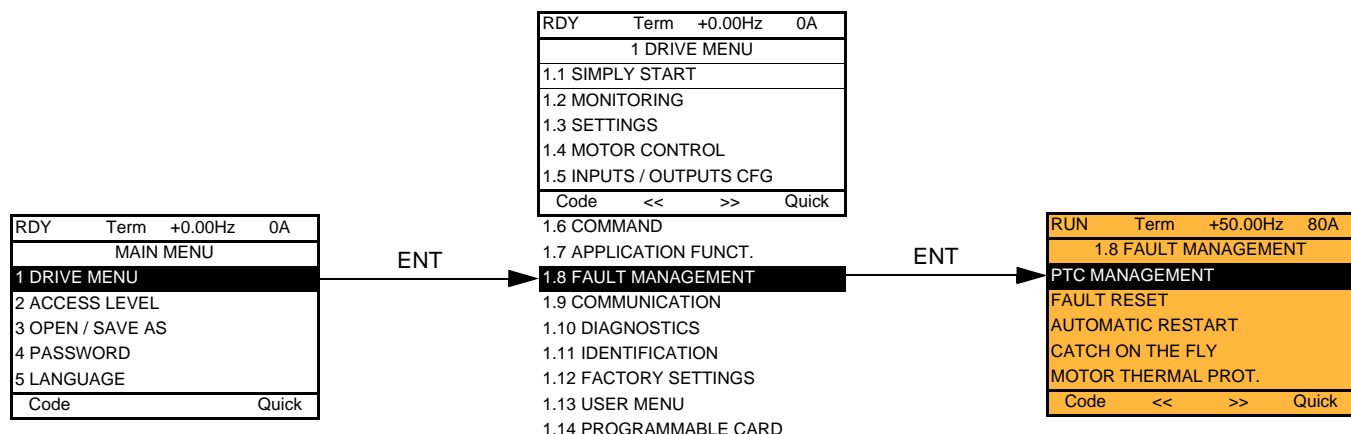
It is necessary to carry out the following settings for all frequency inverters connected to an active front end:

- Parameter [Mains voltage] (UrES) : Same setting as the active front end (Thereby the internal voltage levels of the frequency inverter are adapted).
- Parameter [Input phase loss] (IPL) has to be set to [Ignore] (nO).
- Parameter for operation with active front end [Regen. Connection] (AFE) has to be set to [Yes] (YES) (Thereby the undervoltage level of the frequency inverter is adapted to the operation with the active front end).
- Parameter [Dec ramp adapt.] (brA) is set to [nO] to inactivate this function.
- Parameter [Brake res. fault Mgt] (bUb) has to be set to [ignore] (nO) (for HHP range only).
- Parameter [Deceleration] (dEC) has to be increased for applications with high inertia to avoid overload of Active Front End. This can be prevented also by rounding the deceleration ramp with parameter [Begin Dec round] (tA3).
- Parameter [2 wire type] (tCt) has to be set on [Level] (LEL) to ensure an automatic restart after undervoltage detection of the Active Front End. An automatic restart is only possible on 2 wire control.
- The integrated RFI filter has to be always deactivated (position IT, non-grounded mains) for all ATV 71 inverter and also for the Active Infeed Converter (AIC) because there exists no direct mains connection.



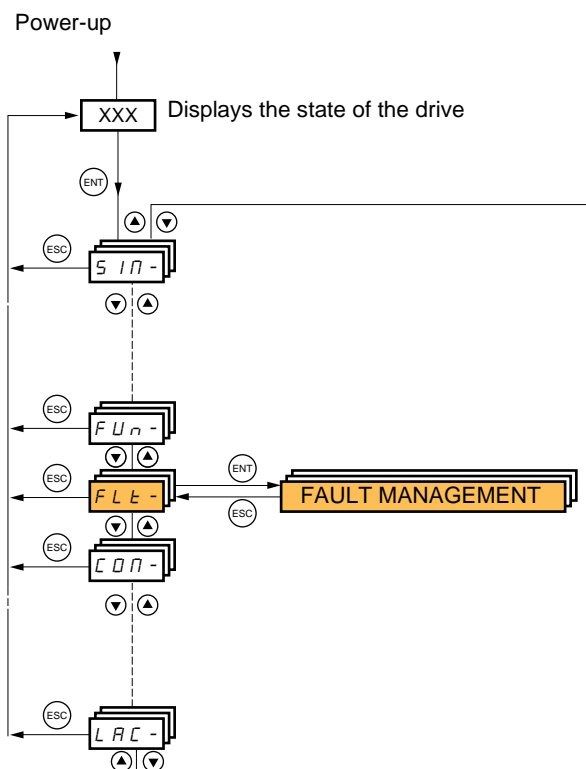
[1.8 FAULT MANAGEMENT] (FLt-)

With graphic display terminal:




With integrated display terminal:

Summary of functions:



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[1.8 FAULT MANAGEMENT] (FLt-)

The parameters in the [1.8 FAULT MANAGEMENT] (FLt-) menu can only be modified when the drive is stopped and there is no run command, except for parameters with a  symbol in the code column, which can be modified with the drive running or stopped.

PTC probes

3 sets of PTC probes can be managed by the drive in order to protect the motors:

- 1 on logic input LI6 converted for this use by switch "SW2" on the control card.
- 1 on each of the 2 option cards VW3A3201 and VW3A3202.

Each of these sets of PTC probes is monitored for the following faults:

- Motor overheating
- Sensor break fault
- Sensor short-circuit fault

Protection via PTC probes does not disable protection via I^2t calculation performed by the drive (the two types of protection can be combined).


[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
PTC -	■ [PTC MANAGEMENT]		
PTCL	<input type="checkbox"/> [LI6 = PTC probe]		[No] (nO)
nO	Can be accessed if switch SW2 on the control card is set to PTC.		
AS	<input type="checkbox"/> [No] (nO): Not used		
rdS	<input type="checkbox"/> [Always] (AS): "PTC probe" faults are monitored permanently, even if the power supply is not connected (as long as the control remains connected to the power supply).		
rS	<input type="checkbox"/> [Power ON] (rdS): "PTC probe" faults are monitored while the drive power supply is connected.		
	<input type="checkbox"/> [Motor ON] (rS): "PTC probe" faults are monitored while the motor power supply is connected.		
PTC1	<input type="checkbox"/> [PTC1 probe]		[No] (nO)
nO	Can be accessed if a VW3A3201 option card has been inserted.		
AS	<input type="checkbox"/> [No] (nO): Not used		
rdS	<input type="checkbox"/> [Always] (AS): "PTC probe" faults are monitored permanently, even if the power supply is not connected (as long as the control remains connected to the power supply).		
rS	<input type="checkbox"/> [Power ON] (rdS): "PTC probe" faults are monitored while the drive power supply is connected.		
	<input type="checkbox"/> [Motor ON] (rS): "PTC probe" faults are monitored while the motor power supply is connected.		
PTC2	<input type="checkbox"/> [PTC2 probe]		[No] (nO)
nO	Can be accessed if a VW3A3202 option card has been inserted.		
AS	<input type="checkbox"/> [No] (nO): Not used		
rdS	<input type="checkbox"/> [Always] (AS): "PTC probe" faults are monitored permanently, even if the power supply is not connected (as long as the control remains connected to the power supply).		
rS	<input type="checkbox"/> [Power ON] (rdS): "PTC probe" faults are monitored while the drive power supply is connected.		
	<input type="checkbox"/> [Motor ON] (rS): "PTC probe" faults are monitored while the motor power supply is connected.		


[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
r 5 t -	■ [FAULT RESET]		
r 5 F	□ [Fault reset] Manual fault reset <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted <input type="checkbox"/> [C101] (C101) to [C115] (C115): With integrated Modbus in [I/O profile] (IO) <input type="checkbox"/> [C201] (C201) to [C215] (C215): With integrated CANopen in [I/O profile] (IO) <input type="checkbox"/> [C301] (C301) to [C315] (C315): With a communication card in [I/O profile] (IO) <input type="checkbox"/> [C401] (C401) to [C415] (C415): With a Controller Inside card in [I/O profile] (IO) <input type="checkbox"/> [CD00] (Cd00) to [CD13] (Cd13): In [I/O profile] (IO) can be switched with possible logic inputs <input type="checkbox"/> [CD14] (Cd14) to [CD15] (Cd15): In [I/O profile] (IO) can be switched without logic inputs Faults are reset when the assigned input or bit changes to 1, if the cause of the fault has disappeared. The STOP/RESET button on the graphic display terminal performs the same function. See pages 287 to 291 for a list of faults that can be reset manually.		[No] (nO)
r P	□ [Product reset] Parameter can only be accessed in [ACCESS LEVEL] = [Expert] mode. Drive reinitialization. Can be used to reset all faults without having to disconnect the drive from the power supply. <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [Yes] (YES): Reinitialization. Press and hold down the "ENT" key for 2 s. The parameter changes back to [No] (nO) automatically as soon as the operation is complete. The drive can only be reinitialized when locked.		[No] (nO)
<div style="text-align: center;">CAUTION</div> <p>Make sure that the cause of the fault that led to the drive locking has been removed before reinitializing. Failure to follow this instruction can result in equipment damage.</p>			
r P A	□ [Product reset assign.] Parameter can only be modified in [ACCESS LEVEL] = [Expert] mode. Drive reinitialization via logic input. Can be used to reset all faults without having to disconnect the drive from the power supply. The drive is reinitialized on a rising edge (change from 0 to 1) of the assigned input. The drive can only be reinitialized when locked. <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted. To assign reinitialization, press and hold down the "ENT" key for 2 s.		[No] (nO)
<div style="text-align: center;">CAUTION</div> <p>Make sure that the cause of the fault that led to the drive locking has been removed before reinitializing. Failure to follow this instruction can result in equipment damage.</p>			

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
Atr -	■ [AUTOMATIC RESTART]		
Atr nO YES	<input type="checkbox"/> [Automatic restart] <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [Yes] (YES): Automatic restart, after locking on a fault, if the fault has disappeared and the other operating conditions permit the restart. The restart is performed by a series of automatic attempts separated by increasingly longer waiting periods: 1 s, 5 s, 10 s, then 1 minute for the following attempts. The drive fault relay remains activated if this function is active. The speed reference and the operating direction must be maintained. Use 2-wire control ([2/3 wire control] (tCC) = [2 wire] (2C) and [2 wire type] (tCt) = [Level] (LEL) see page 102).		[No] (nO)
	<div style="text-align: center;">  WARNING UNINTENDED EQUIPMENT OPERATION Check that an automatic restart will not endanger personnel or equipment in any way. Failure to follow these instructions can result in death or serious injury. </div> <p>If the restart has not taken place once the configurable time tAr has elapsed, the procedure is aborted and the drive remains locked until it is turned off and then on again. The faults, which permit this function, are listed on page 290:</p>		
tAr 5 10 30 1h 2h 3h Ct	<input type="checkbox"/> [Max. restart time] <input type="checkbox"/> [5 min] (5): 5 minutes <input type="checkbox"/> [10 minutes] (10): 10 minutes <input type="checkbox"/> [30 minutes] (30): 30 minutes <input type="checkbox"/> [1 hour] (1h): 1 hour <input type="checkbox"/> [2 hours] (2h): 2 hours <input type="checkbox"/> [3 hours] (3h): 3 hours <input type="checkbox"/> [Unlimited] (Ct): Unlimited This parameter appears if [Automatic restart] (Atr) = [Yes] (YES). It can be used to limit the number of consecutive restarts on a recurrent fault.		[5 minutes] (5)

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
FLr -	<div><div><div></div><div>[CATCH ON THE FLY]</div></div><div><div></div><div>Note: This function cannot be used with certain other functions. Follow the instructions on page 145.</div></div></div>		
FLr	<div><div><div></div><div>[Catch on the fly]</div></div><div><p>Used to enable a smooth restart if the run command is maintained after the following events:</p><ul style="list-style-type: none">• Loss of line supply or disconnection• Reset of current fault or automatic restart• Freewheel stop.<p>The speed given by the drive resumes from the estimated speed of the motor at the time of the restart, then follows the ramp to the reference speed.</p><p>This function requires 2-wire level control.</p><div><div><div></div><div>[No] (nO): Function inactive</div></div><div><div></div><div>[Yes] (YES): Function active</div></div></div><p>When the function is operational, it activates at each run command, resulting in a slight delay of the current (0.5 s max.).</p><p>[Catch on the fly] (FLr) is forced to [No] (nO) if brake logic control [Brake assignment] (bLC) is assigned (page 175) or if [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync.CL] (FSY), or if, in open-loop control, [Auto DC injection] (AdC) page 158 = [Continuous] (Ct).</p></div></div> <div><div>[No] (nO)</div></div>		
nO YES			
UCb ()	<div><div><div></div><div>[Sensitivity]</div></div><div><p>The parameter can be accessed at and above 55 kW (75 HP) for the ATV71●●●M3X and at and above 90 kW (120 HP) for the ATV71●●●N4.</p><p>Adjusts the catch-on-the-fly sensitivity around the zero speed.</p><p>Decrease the value if the drive is not able to perform the catch on the fly, and increase it if the drive locks on a fault as it performs the catch on the fly.</p></div></div> <div><div>0.4 to 15%</div><div>0.6%</div></div>		



Parameter that can be modified during operation or when stopped.

Motor thermal protection

Function:

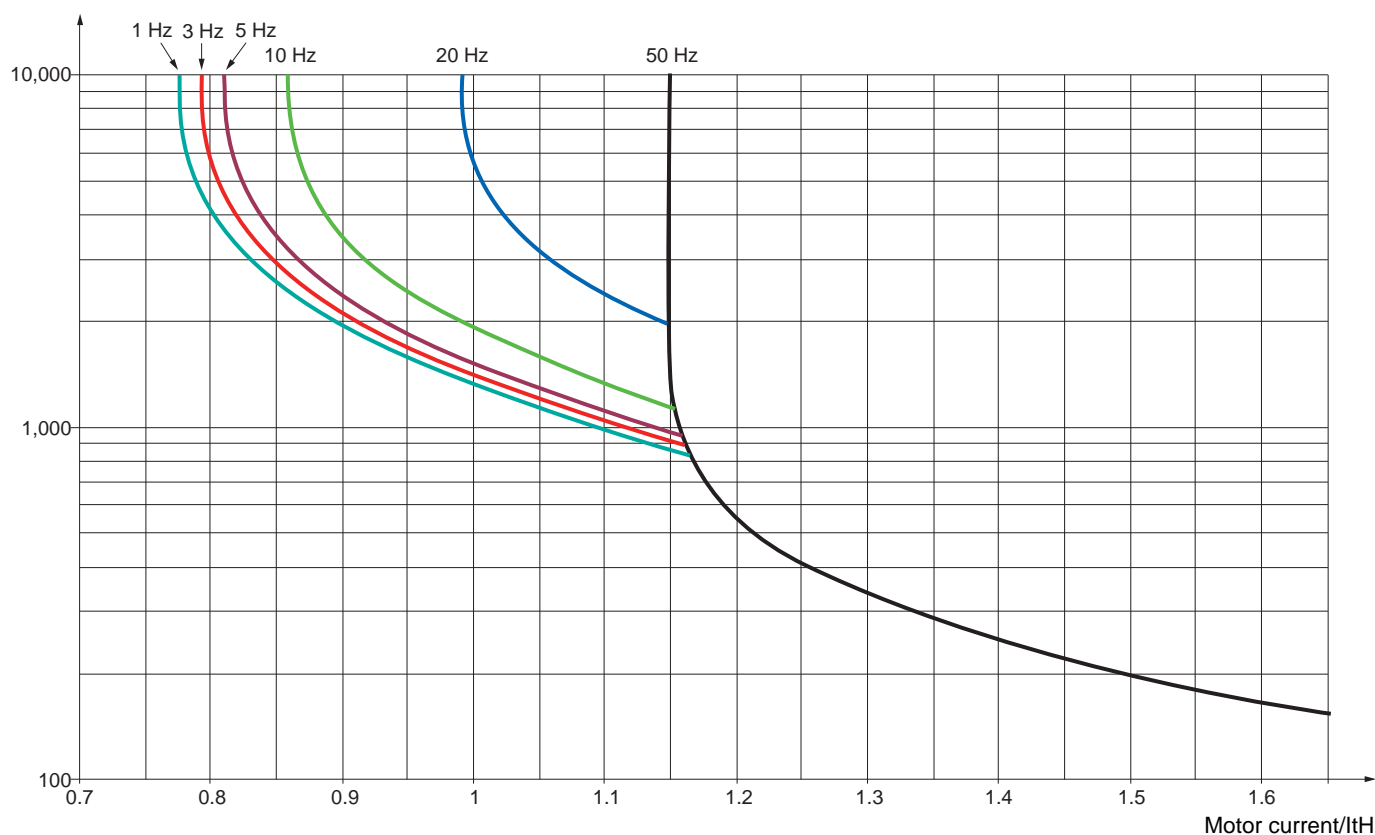
Thermal protection by calculating the I^2t .



Note: The memory of the motor thermal state is saved when the drive is switched off. The power-off time is used to recalculate the thermal state the next time the drive is switched on.

- Naturally-cooled motors:
The tripping curves depend on the motor frequency.
- Force-cooled motors:
Only the 50 Hz tripping curve needs to be considered, regardless of the motor frequency.

Trip time in seconds

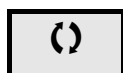


[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
EHt -	[MOTOR THERMAL PROT.]		
EHt nO ACL FCL	<input type="checkbox"/> [Motor protect. type] <input type="checkbox"/> [No] (nO): No protection. <input type="checkbox"/> [Self cooled] (ACL): For self-cooled motors <input type="checkbox"/> [Force-cool] (FCL): For force-cooled motors Note: A fault trip will occur when the thermal state reaches 118% of the rated state and reactivation will occur when the state falls back below 100%.		[Self cooled] (ACL)
EtEd ()	<input type="checkbox"/> [Motor therm. level] (1) Trip threshold for motor thermal alarm (logic output or relay)	0 to 118%	100%
EtEd2 ()	<input type="checkbox"/> [Motor2 therm. level] Trip threshold for motor 2 thermal alarm (logic output or relay)	0 to 118%	100%
EtEd3 ()	<input type="checkbox"/> [Motor3 therm. level] Trip threshold for motor 3 thermal alarm (logic output or relay)	0 to 118%	100%
OLL nO YES SEt LFF rLS rNP FSt dCI	<input type="checkbox"/> [Overload fault mgt] Type of stop in the event of a motor thermal fault. <input type="checkbox"/> [Ignore] (nO): Fault ignored. <input type="checkbox"/> [Freewheel] (YES): Freewheel stop. <input type="checkbox"/> [Per STT] (Stt): Stop according to configuration of [Type of stop] (Stt) page 156, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 102 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop. <input type="checkbox"/> [fallback spd] (LFF): Change to fallback speed, maintained as long as the fault persists and the run command has not been removed (2). <input type="checkbox"/> [Spd maint.] (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command has not been removed (2). <input type="checkbox"/> [Ramp stop] (rMP): Stop on ramp. <input type="checkbox"/> [Fast stop] (FSt): Fast stop. <input type="checkbox"/> [DC injection] (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 145.		[Freewheel] (YES)

(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) menu.

(2) Because, in this case, the fault does not trigger a stop, it is essential to assign a relay or logic output to its indication.



Parameter that can be modified during operation or when stopped.

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
OPL -	■ [OUTPUT PHASE LOSS]		
OPL nO YES OAC	<input type="checkbox"/> [Output Phase Loss] <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [Yes] (YES): Tripping on OPF fault with freewheel stop. <input type="checkbox"/> [Output cut] (OAC): No fault triggered, but management of the output voltage in order to avoid an overcurrent when the link with the motor is re-established and catch on the fly performed (even if this function has not been configured). This configuration is not possible at and above 55 kW (75 HP) for ATV71●●●M3X and at and above 90 kW (120 HP) for ATV71●●●N4 if [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn) or [Sync.CL] (FSY). <input type="checkbox"/> Note: [Output phase loss] (OPL) is forced to [No] (nO) if [Motor control type] (Ctt) page 70 = [Sync. mot.] (SYn). For other [Motor control type] (Ctt) configurations, [Output phase loss] (OPL) is forced to [Yes] (YES) if brake logic control is configured (see page 175).		[Yes] (YES)
Out ()	<input type="checkbox"/> [OutPh time detect] Time delay for taking the [Output Phase Loss] (OPL) fault into account.	0.5 to 10 s	0.5 s
IPL -	■ [INPUT PHASE LOSS]		
IPL nO YES	<input type="checkbox"/> [Input phase loss] <input type="checkbox"/> [Ignore] (nO): Fault ignored, to be used when the drive is supplied via a single phase supply or by the DC bus. <input type="checkbox"/> [Freewheel] (YES): Fault with freewheel stop. If one phase disappears, the drive switches to fault mode [Input phase loss] (IPL) but if 2 or 3 phases disappear, the drive continues to operate until it trips on an undervoltage fault. Factory setting: [Ignore] (nO) for ATV71●037M3 to U30M3, [Freewheel] (YES) for all others.		According to drive rating



Parameter that can be modified during operation or when stopped.

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
DHL -	■ [DRIVE OVERHEAT]		
DHL	<input type="checkbox"/> [Overtemp fault mgt]		[Freewheel] (YES)
nO	<p>Behavior in the event of the drive overheating</p> <p><input type="checkbox"/> [Ignore] (nO): Fault ignored.</p>		
	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>CAUTION</p> <p>RISK OF EQUIPMENT DAMAGE</p> <p>The drive and motor are no longer protected in the event of thermal alarm stops. This invalidates the warranty. Check that the possible consequences do not present any risk. Failure to follow this instruction can result in equipment damage.</p> </div>		
YES	<input type="checkbox"/> [Freewheel] (YES) : Freewheel stop.		
SE	<input type="checkbox"/> [Per STT] (Stt) : Stop according to configuration of [Type of stop] (Stt) page 156, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 102 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.		
LFF	<input type="checkbox"/> [fallback spd] (LFF) : Change to fallback speed, maintained as long as the fault persists and the run command has not been removed (1).		
rLS	<input type="checkbox"/> [Spd maint.] (rLS) : The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command has not been removed (1).		
rMP	<input type="checkbox"/> [Ramp stop] (rMP) : Stop on ramp.		
FSt	<input type="checkbox"/> [Fast stop] (FSt) : Fast stop.		
dCI	<input type="checkbox"/> [DC injection] (dCI) : DC injection stop. This type of stop cannot be used with certain other functions. See table on page 145.		
	Note : A fault trip will occur when the thermal state reaches 118% of the rated state and reactivation will occur when the state falls back below 90%.		
LHA	<input type="checkbox"/> [Drv therm. state al]	0 to 118%	100%
()	Trip threshold for drive thermal alarm (logic output or relay)		



Parameter that can be modified during operation or when stopped.

(1) Because, in this case, the fault does not trigger a stop, it is essential to assign a relay or logic output to its indication.

[1.8 FAULT MANAGEMENT] (FLt-)

Deferred stop on thermal alarm

This function is designed in particular for elevator applications. It prevents the elevator stopping between two floors if the drive or motor overheats, by authorizing operation until the next stop. At the next stop, the drive is locked until the thermal state falls back to a value, which undershoots the set threshold by 20%. Example: A trip threshold set at 80% enables reactivation at 60%. One thermal state threshold must be defined for the drive, and one thermal state threshold for the motor(s), which will trip the deferred stop.

Code	Name/Description	Adjustment range	Factory setting
SAL -	■ [THERMAL ALARM STOP]		
SAL nO YES	<input type="checkbox"/> [Thermal alarm stop] <input type="checkbox"/> [No] (nO): Function inactive (in this case, the following parameters cannot be accessed) <input type="checkbox"/> [Yes] (YES): Freewheel stop on drive or motor thermal alarm		[No] (nO)
	<div style="text-align: center;">CAUTION</div> <div> RISK OF EQUIPMENT DAMAGE The drive and motor are no longer protected in the event of thermal alarm stops. This invalidates the warranty. Check that the possible consequences do not present any risk. Failure to follow this instruction can result in equipment damage. </div>		
ELH ()	<input type="checkbox"/> [Drv therm. state al] Thermal state threshold of the drive tripping the deferred stop.	0 to 118%	100%
ELH ()	<input type="checkbox"/> [Motor therm. level] Thermal state threshold of the motor tripping the deferred stop.	0 to 118%	100%
ELH2 ()	<input type="checkbox"/> [Motor2 therm. level] Thermal state threshold of the motor 2 tripping the deferred stop.	0 to 118%	100%
ELH3 ()	<input type="checkbox"/> [Motor3 therm. level] Thermal state threshold of the motor 3 tripping the deferred stop.	0 to 118%	100%

() Parameter that can be modified during operation or when stopped.

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
E t F -	■ [EXTERNAL FAULT]		
E t F n O L I 1 - - -	<input type="checkbox"/> [External fault ass.] <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) : : <input type="checkbox"/> [...] (...): See the assignment conditions on page 139. If the assigned bit is at 0, there is no external fault. If the assigned bit is at 1, there is an external fault. Logic can be configured via [External fault config] (LEt) if a logic input has been assigned.		[No] (nO)
L E t L O H I G	<input type="checkbox"/> [External fault config] Parameter can be accessed if the external fault has been assigned to a logic input. It defines the positive or negative logic of the input assigned to the fault. <input type="checkbox"/> [Active low] (LO): Fault on falling edge (change from 1 to 0) of the assigned input. <input type="checkbox"/> [Active high] (HIG): Fault on rising edge (change from 0 to 1) of the assigned input.		[Active high] (HIG)
E P L n O Y E S S t t L F F r L S r n P F S t d C I	<input type="checkbox"/> [External fault mgt] Type of stop in the event of an external fault <input type="checkbox"/> [Ignore] (nO): Fault ignored. <input type="checkbox"/> [Freewheel] (YES): Freewheel stop. <input type="checkbox"/> [Per STT] (Stt): Stop according to configuration of [Type of stop] (Stt) page 156, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 102 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop. <input type="checkbox"/> [fallback spd] (LFF): Change to fallback speed, maintained as long as the fault persists and the run command has not been removed (1). <input type="checkbox"/> [Spd maint.] (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command has not been removed (1). <input type="checkbox"/> [Ramp stop] (rMP): Stop on ramp. <input type="checkbox"/> [Fast stop] (FSt): Fast stop. <input type="checkbox"/> [DC injection] (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 145.		[Freewheel] (YES)

(1) Because, in this case, the fault does not trigger a stop, it is essential to assign a relay or logic output to its indication.

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
U5b -	■ [UNDERVOLTAGE MGT]		
U5b	<input type="checkbox"/> [UnderV. fault mgt]		[Flt&R1open] (0)
0	Behavior of the drive in the event of an undervoltage		
1	<input type="checkbox"/> [Flt&R1open] (0): Fault and fault relay open.		
2	<input type="checkbox"/> [Flt&R1close] (1): Fault and fault relay closed.		
	<input type="checkbox"/> [Alarm] (2): Alarm and fault relay remains closed. The alarm can be assigned to a logic output or a relay.		
UrES	<input type="checkbox"/> [Mains voltage]	According to drive voltage rating	According to drive voltage rating
200	Rated voltage of the line supply in V.		
220	For ATV71ATV71...M3:		
240	<input type="checkbox"/> [200Vac] (200): 200 Volts AC		
260	<input type="checkbox"/> [220Vac] (220): 220 Volts AC		
	<input type="checkbox"/> [240Vac] (240): 240 Volts AC		
	<input type="checkbox"/> [260Vac] (260): 260 Volts AC (factory setting)		
	For ATV71...N4:		
380	<input type="checkbox"/> [380Vac] (380): 380 Volts AC		
400	<input type="checkbox"/> [400Vac] (400): 400 Volts AC		
440	<input type="checkbox"/> [440Vac] (440): 440 Volts AC		
460	<input type="checkbox"/> [460Vac] (460): 460 Volts AC		
480	<input type="checkbox"/> [480Vac] (480): 480 Volts AC (factory setting)		
	For ATV61...S6X:		
500	<input type="checkbox"/> [500Vac] (500): 500 Volts AC		
600	<input type="checkbox"/> [600Vac] (600): 600 Volts AC (factory setting)		
USL	<input type="checkbox"/> [Undervoltage level]		
	Undervoltage fault trip level setting in V. The adjustment range and factory setting are determined by the drive voltage rating and the [Mains voltage] (UrES) value.		
USt	<input type="checkbox"/> [Undervolt. time out]	0.2 s to 999.9 s	0.2 s
	Time delay for taking undervoltage fault into account		
StP	<input type="checkbox"/> [UnderV. prevention]		[No] (nO)
nO	Behavior in the event of the undervoltage fault prevention level being reached		
nns	<input type="checkbox"/> [No] (nO): No action		
	<input type="checkbox"/> [DC Maintain] (MMS): This stop mode uses the inertia to maintain the DC bus voltage as long as possible.		
rnp	<input type="checkbox"/> [Ramp stop] (rMP): Stop following an adjustable ramp [Max stop time] (StM).		
LnF	<input type="checkbox"/> [Lock-out] (LnF): Lock (freewheel stop) without fault		
Estn	<input type="checkbox"/> [UnderV. restart tm]	1.0 s to 999.9 s	1.0 s
	Time delay before authorizing the restart after a complete stop for [UnderV. prevention] (StP) = [Ramp stop] (rMP), if the voltage has returned to normal.		
UPL	<input type="checkbox"/> [Prevention level]		
	Undervoltage fault prevention level setting in V, which can be accessed if [UnderV. prevention] (StP) is not [No] (nO). The adjustment range and factory setting are determined by the drive voltage rating and the [Mains voltage] (UrES) value.		
Stn	<input type="checkbox"/> [Max stop time]	0.01 to 60.00 s	1.00 s
(↺)	Ramp time if [UnderV. prevention] (StP) = [Ramp stop] (rMP).		
Ests	<input type="checkbox"/> [DC bus maintain tm]	1 to 9999 s	9999 s
(↺)	DC bus maintain time if [UnderV. prevention] (StP) = [DC Maintain] (MMS).		



Parameter that can be modified during operation or when stopped.

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
FLt-	■ [IGBT TESTS]		
Start nO YES	<input type="checkbox"/> [IGBT test]		[No] (nO)
	<input type="checkbox"/> [No] (nO): No test <input type="checkbox"/> [Yes] (YES): The IGBTs are tested on power up and every time a run command is sent. These tests cause a slight delay (a few ms). In the event of a fault, the drive will lock. The following faults can be detected: <ul style="list-style-type: none">- Drive output short-circuit (terminals U-V-W): SCF display- IGBT faulty: xtF, where x indicates the number of the IGBT concerned- IGBT short-circuited: x2F, where x indicates the number of the IGBT concerned		

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
LFL -	■ [4-20mA LOSS]		
LFL2	<input type="checkbox"/> [AI2 4-20mA loss]		[Ignore] (nO)
nO	<input type="checkbox"/> [Ignore] (nO) : Fault ignored. This configuration is the only one possible if [AI2 min. value] (CrL2) page 108 is not greater than 3 mA or if [AI2 Type] (AI2t) page 108 = [Voltage] (10U) .		
YES	<input type="checkbox"/> [Freewheel] (YES) : Freewheel stop.		
Stt	<input type="checkbox"/> [Per STT] (Stt) : Stop according to configuration of [Type of stop] (Stt) page 156 , without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 102 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.		
LFF	<input type="checkbox"/> [fallback spd] (LFF) : Change to fallback speed, maintained as long as the fault persists and the run command has not been removed (1).		
rLS	<input type="checkbox"/> [Spd maint.] (rLS) : The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command has not been removed (1).		
rMP	<input type="checkbox"/> [Ramp stop] (rMP) : Stop on ramp.		
FSt	<input type="checkbox"/> [Fast stop] (FSt) : Fast stop.		
dCI	<input type="checkbox"/> [DC injection] (dCI) : DC injection stop. This type of stop cannot be used with certain other functions. See table on page 145 .		
LFL3	<input type="checkbox"/> [AI3 4-20mA loss]		[Ignore] (nO)
nO	<input type="checkbox"/> [Ignore] (nO) : Fault ignored. This configuration is the only one possible if [AI3 min. value] (CrL3) page 109 is not greater than 3 mA.		
YES	<input type="checkbox"/> [Freewheel] (YES) : Freewheel stop.		
Stt	<input type="checkbox"/> [Per STT] (Stt) : Stop according to configuration of [Type of stop] (Stt) page 156 , without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 102 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.		
LFF	<input type="checkbox"/> [fallback spd] (LFF) : Change to fallback speed, maintained as long as the fault persists and the run command has not been removed (1).		
rLS	<input type="checkbox"/> [Spd maint.] (rLS) : The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command has not been removed (1).		
rMP	<input type="checkbox"/> [Ramp stop] (rMP) : Stop on ramp.		
FSt	<input type="checkbox"/> [Fast stop] (FSt) : Fast stop.		
dCI	<input type="checkbox"/> [DC injection] (dCI) : DC injection stop. This type of stop cannot be used with certain other functions. See table on page 145 .		
LFL4	<input type="checkbox"/> [AI4 4-20mA loss]		[Ignore] (nO)
nO	<input type="checkbox"/> [Ignore] (nO) : Fault ignored. This configuration is the only one possible if [AI4 min. value] (CrL4) page 110 is not greater than 3 mA or if [AI4 Type] (AI4t) page 110 = [Voltage] (10U) .		
YES	<input type="checkbox"/> [Freewheel] (YES) : Freewheel stop.		
Stt	<input type="checkbox"/> [Per STT] (Stt) : Stop according to configuration of [Type of stop] (Stt) page 156 , without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 102 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop.		
LFF	<input type="checkbox"/> [fallback spd] (LFF) : Change to fallback speed, maintained as long as the fault persists and the run command has not been removed (1).		
rLS	<input type="checkbox"/> [Spd maint.] (rLS) : The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command has not been removed (1).		
rMP	<input type="checkbox"/> [Ramp stop] (rMP) : Stop on ramp.		
FSt	<input type="checkbox"/> [Fast stop] (FSt) : Fast stop.		
dCI	<input type="checkbox"/> [DC injection] (dCI) : DC injection stop. This type of stop cannot be used with certain other functions. See table on page 145 .		

(1) Because, in this case, the fault does not trigger a stop, it is essential to assign a relay or logic output to its indication.

[1.8 FAULT MANAGEMENT] (FLt-)

Parameter can be accessed in [Expert] mode.

Code	Name/Description	Adjustment range	Factory setting
InH -	■ [FAULT INHIBITION]		
InH	<input type="checkbox"/> [Fault inhibit assign.]		[No] (nO)
	To assign fault inhibit, press and hold down the "ENT" key for 2 s.		
	<div>CAUTION</div> <div>Inhibiting faults results in the drive not being protected. This invalidates the warranty. Check that the possible consequences do not present any risk. Failure to follow this instruction can result in equipment damage.</div>		
nO L I I - - -	<div><input type="checkbox"/> [No] (nO): Function inactive</div> <div><input type="checkbox"/> [LI1] (LI1)</div> <div>⋮</div> <div><input type="checkbox"/> [...] (...): See the assignment conditions on page 139.</div> <div>If the assigned input or bit is at 0, fault monitoring is active. If the assigned input or bit is at 1, fault monitoring is inactive. Active faults are reset on a rising edge (change from 0 to 1) of the assigned input or bit.</div> <div>Note: The "Power Removal" function and any faults that prevent any form of operation are not affected by this function.</div> <div>A list of faults affected by this function appears on pages 287 to 292.</div>		

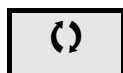
[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
CLL -	■ [COM. FAULT MANAGEMENT]		
CLL	□ [Network fault mgt]		[Freewheel] (YES)
nO YES SET	<p>Behavior of the drive in the event of a communication fault with a communication card</p> <ul style="list-style-type: none"> □ [Ignore] (nO): Fault ignored. □ [Freewheel] (YES): Freewheel stop. □ [Per STT] (Stt): Stop according to configuration of [Type of stop] (Stt) page 156, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 102 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop. 		
LFF	<ul style="list-style-type: none"> □ [fallback spd] (LFF): Change to fallback speed, maintained as long as the fault persists and the run command has not been removed (1). 		
rLS	<ul style="list-style-type: none"> □ [Spd maint.] (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command has not been removed (1). 		
rNP FSt dCI	<ul style="list-style-type: none"> □ [Ramp stop] (rMP): Stop on ramp. □ [Fast stop] (FSt): Fast stop. □ [DC injection] (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 145. 		
COL	□ [CANopen fault mgt]		[Freewheel] (YES)
nO YES SET	<p>Behavior of the drive in the event of a communication fault with integrated CANopen</p> <ul style="list-style-type: none"> □ [Ignore] (nO): Fault ignored. □ [Freewheel] (YES): Freewheel stop. □ [Per STT] (Stt): Stop according to configuration of [Type of stop] (Stt) page 156, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 102 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop. 		
LFF	<ul style="list-style-type: none"> □ [fallback spd] (LFF): Change to fallback speed, maintained as long as the fault persists and the run command has not been removed (1). 		
rLS	<ul style="list-style-type: none"> □ [Spd maint.] (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command has not been removed (1). 		
rNP FSt dCI	<ul style="list-style-type: none"> □ [Ramp stop] (rMP): Stop on ramp. □ [Fast stop] (FSt): Fast stop. □ [DC injection] (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 145. 		
SLL	□ [Modbus fault mgt]		[Freewheel] (YES)
nO YES SET	<p>Behavior of the drive in the event of a communication fault with integrated Modbus</p> <ul style="list-style-type: none"> □ [Ignore] (nO): Fault ignored. □ [Freewheel] (YES): Freewheel stop. □ [Per STT] (Stt): Stop according to configuration of [Type of stop] (Stt) page 156, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 102 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop. 		
LFF	<ul style="list-style-type: none"> □ [fallback spd] (LFF): Change to fallback speed, maintained as long as the fault persists and the run command has not been removed (1). 		
rLS	<ul style="list-style-type: none"> □ [Spd maint.] (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command has not been removed (1). 		
rNP FSt dCI	<ul style="list-style-type: none"> □ [Ramp stop] (rMP): Stop on ramp. □ [Fast stop] (FSt): Fast stop. □ [DC injection] (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 145. 		

(1) Because, in this case, the fault does not trigger a stop, it is essential to assign a relay or logic output to its indication.

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
Sdd -	■ [ENCODER FAULT] Can be accessed if the encoder option card has been inserted and the encoder is used for speed feedback (see page 75).		
Sdd nO YES	<input type="checkbox"/> [Load slip detection] <input type="checkbox"/> [No] (nO): Fault not monitored. Only the alarm may be assigned to a logic output or a relay. <input type="checkbox"/> [Yes] (YES): Fault monitored. [Load slip detection] (Sdd) is forced to [Yes] (YES) if [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync.CL] (FSY). The fault is triggered by comparison with the ramp output and the speed feedback, and is only effective for speeds greater than 10% of the [Rated motor freq.] (FrS), see page 76. In the event of a fault, the drive will switch to a freewheel stop, and if the brake logic control function has been configured, the brake command will be set to 0.		[No] (nO)
ECC nO YES	<input type="checkbox"/> [Encoder coupling] <input type="checkbox"/> [No] (nO): Fault not monitored. <input type="checkbox"/> [Yes] (YES): Fault monitored. If the brake logic control function has been configured, the factory setting changes to [Yes] (YES). [Encoder coupling] (ECC) = [Yes] (YES) is only possible if [Load slip detection] (Sdd) = [Yes] (YES) and [Motor control type] (Ctt) page 70 = [FVC] (FUC) or [Sync.CL] (FSY) and [Brake assignment] (bLC) page 175 is not [No] (nO). The fault monitored is the break in the mechanical coupling of the encoder. In the event of a fault, the drive will switch to a freewheel stop, and if the brake logic control function has been configured, the brake command will be set to 0.		[No] (nO)
ECC	<input type="checkbox"/> [Encoder check time] Encoder faults filtering time. The parameter can be accessed if [Encoder coupling] (ECC) = [Yes] (YES)	2 to 10 s	2 s
Id -	■ [TORQUE OR I LIM. DETECT]		
SSb nO YES Stt LFF rLS rMP FSt dCI	<input type="checkbox"/> [Trq/I limit. stop] Behavior in the event of switching to torque or current limitation <input type="checkbox"/> [Ignore] (nO): Fault ignored. <input type="checkbox"/> [Freewheel] (YES): Freewheel stop. <input type="checkbox"/> [Per STT] (Stt): Stop according to configuration of [Type of stop] (Stt) page 156, without fault tripping. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel (e.g., according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 102 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop. <input type="checkbox"/> [fallback spd] (LFF): Change to fallback speed, maintained as long as the fault persists and the run command has not been removed (1). <input type="checkbox"/> [Spd maint.] (rLS): The drive maintains the speed being applied when the fault occurred, as long as the fault is present and the run command has not been removed (1). <input type="checkbox"/> [Ramp stop] (rMP): Stop on ramp. <input type="checkbox"/> [Fast stop] (FSt): Fast stop. <input type="checkbox"/> [DC injection] (dCI): DC injection stop. This type of stop cannot be used with certain other functions. See table on page 145.		[Ignore] (nO)
SEd (C)	<input type="checkbox"/> [Trq/I limit. time out] (If fault has been configured) Time delay for taking SSF "Limitation" fault into account	0 to 9999 ms	1000 ms



Parameter that can be modified during operation or when stopped.

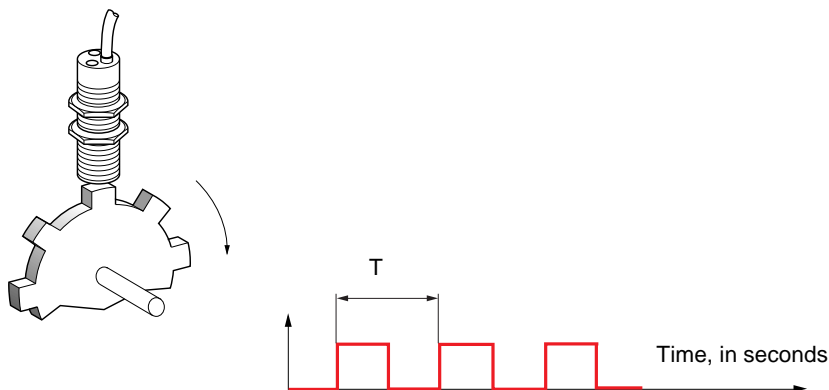
(1) Because, in this case, the fault does not trigger a stop, it is essential to assign a relay or logic output to its indication.

Use of the "Pulse input" input to measure the speed of rotation of the motor

This function uses the "Pulse input" input from the VW3A3202 extension card and can, therefore, only be used if this card has been inserted and if the "Pulse input" input is not being used for another function.

Example of use

An indexed disk driven by the motor and connected to a proximity sensor can be used to generate a frequency signal that is proportional to the speed of rotation of the motor.



When applied to the "Pulse input" input, this signal supports:

- Measurement and display of the motor speed: signal frequency = $1/T$. This frequency is displayed by means of the [\[Pulse in. work. freq.\] \(FqS\)](#) parameter, page [51](#) or [53](#).
- Overspeed detection (if the measured speed exceeds a preset threshold, the drive will trip on a fault).
- Brake failure detection, if brake logic control has been configured: If the speed does not drop sufficiently quickly following a command to engage the brake, the drive will trip on a fault. This function can be used to detect worn brake linings.
- Detection of a speed threshold that can be adjusted using [\[Pulse warning thd.\] \(FqL\)](#) page [68](#) and is assignable to a relay or logic output, see page [118](#).

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
F 9 F -	■ [FREQUENCY METER] Can be accessed if a VW3A3202 option card has been inserted		
F 9 F n 0 Y E S	<input type="checkbox"/> [Frequency meter] Activation of the speed measurement function. <input type="checkbox"/> [No] (nO) : Function inactive, In this case, none of the function parameters can be accessed. <input type="checkbox"/> [Yes] (YES) : Function active, assignment only possible if no other functions have been assigned to the "Pulse input" input.		[No] (nO)
F 9 C	<input type="checkbox"/> [Pulse scal. divisor] • Scaling factor for the "Pulse input" input (divisor). The frequency measured is displayed by means of the [Pulse in. work. freq.] (FqS) parameter, page 51 or 53 .	1.0 to 100.0	1.0
F 9 A n 0 -	<input type="checkbox"/> [Overspd. pulse thd.] Activation and adjustment of overspeed monitoring: [Overspeed] (SOF) fault. <input type="checkbox"/> [No] (nO) : No overspeed monitoring. <input type="checkbox"/> 1 Hz to 30.00 Hz : Adjustment of the frequency tripping threshold on the "Pulse input" input divided by [Pulse scal. divisor] (FqC) .		[No] (nO)
t d S	<input type="checkbox"/> [Pulse overspd delay] Time delay for taking overspeed fault into account	0.0 s to 10.0 s	0.0 s
F d t n 0 -	<input type="checkbox"/> [Level fr. pulse ctrl] Activation and adjustment of monitoring for the input Pulse input (speed feedback): [Speed fdbck loss] (SPF) fault. <input type="checkbox"/> [No] (nO) : No monitoring of speed feedback. <input type="checkbox"/> 0.1 Hz to 500.0 Hz : Adjustment of the motor frequency threshold for tripping a speed feedback fault (difference between the estimated frequency and the measured speed).		[No] (nO)
F 9 t n 0 -	<input type="checkbox"/> [Pulse thd. wo Run] Activation and adjustment of brake failure monitoring: [Brake feedback] (brF) . If brake logic control [Brake assignment] (bLC) page 175 is not configured, this parameter is forced to [No] (nO) . <input type="checkbox"/> [No] (nO) : No brake monitoring. <input type="checkbox"/> 1 Hz to 1000 Hz : Adjustment of the motor frequency threshold for tripping a brake failure fault (detection of speeds other than zero).		[No] (nO)
t 9 b	<input type="checkbox"/> [Pulse thd. wo Run] Time delay for taking brake failure fault into account.	0.0 s to 10.0 s	0.0 s

Handling

Elevators

Hoisting

Load variation detection

This detection is only possible with the "high-speed hoisting" function. It can be used to detect if an obstacle has been reached, triggering a sudden (upward) increase or (downward) decrease in the load.

Load variation detection triggers a [Dynamic load fault] (dLF) fault. The [Dyn. load Mgt.] (dLb) parameter can be used to configure the response of the drive in the event of this fault.

Load variation detection can also be assigned to a relay or a logic output.

There are two possible detection modes, depending on the configuration of high-speed hoisting:

"Speed reference" mode

[High speed hoisting] (HSO) page 188 = [Speed ref] (SSO).

Torque variation detection.

During high-speed operation, the load is compared to that measured during the speed step. The permissible load variation and its duration can be configured. If exceeded, the drive switches to fault mode.

"Current limitation" mode

[High speed hoisting] (HSO) page 188 = [Current Limit] (CSO).

On ascend, during high-speed operation, an increase in load will result in a drop in speed. Even if high-speed operation has been activated, if the motor frequency drops below the [Limit Frequency] (SCL) threshold page 188 the drive will switch to fault mode.




On descend, operation takes the form of "speed reference" mode.

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
dLd -	■ [DYNAMIC LOAD DETECT.] Load variation detection. This can be accessed if [High speed hoisting] (HSO) page 188 is not [No] (nO).		
ELd nO -	<input type="checkbox"/> [Dynamic load time] Activation of load variation detection and adjustment of time delay for taking load variation fault [Dynamic load fault] (dLF) into account. <input type="checkbox"/> [No] (nO): No load variation detection. <input type="checkbox"/> 0.00 s to 10.00 s: Adjustment of the time delay for taking fault into account.		[No] (nO)
dLd	<input type="checkbox"/> [Dynamic load time] Adjustment of the trip threshold for load variation detection, as a % of the load measured during the speed step.	1 to 100 %	100 %
dLb nO YES SEt LFF rLS rNP FSt	<input type="checkbox"/> [Dyn. load Mgt.] Behavior of the drive in the event of a load variation fault. <input type="checkbox"/> [Ignore] (nO): Fault ignored. <input type="checkbox"/> [Freewheel] (YES): Freewheel stop. <input type="checkbox"/> [Per STT] (Stt): Stop according to configuration of [Type of stop] (Stt) page 156, without tripping fault. In this case the fault relay does not open and the drive is ready to restart as soon as the fault disappears, according to the restart conditions of the active command channel, (e.g. according to [2/3 wire control] (tCC) and [2 wire type] (tCt) page 102 if control is via the terminals). Configuring an alarm for this fault is recommended (assigned to a logic output, for example) in order to indicate the cause of the stop. <input type="checkbox"/> [Fallback spd.] (LFF): Change to fallback speed, maintained as long as the fault persists and the run command has not been removed (1). <input type="checkbox"/> [Spd maint.] (rLS): The drive maintains the speed at the time the fault occurred, as long as the fault persists and the run command has not been removed (1). <input type="checkbox"/> [Ramp stop] (rMP): Stop on ramp. <input type="checkbox"/> [Fast stop] (FSt): Fast stop.		[Freewheel] (YES)

(1) Because, in this case, the fault does not trigger a stop, it is essential to assign a relay or logic output to its indication.

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
brP -	■ [DB RES. PROTECTION]		
brO nO YES FLt	<input type="checkbox"/> [DB res. protection] <input type="checkbox"/> [No] (nO): No braking resistor protection (thereby preventing access to the other function parameters). <input type="checkbox"/> [Alarm] (YES): Alarm. The alarm may be assigned to a logic output or a relay (see page 118) <input type="checkbox"/> [Fault] (FLt): Switch to fault (bOF) with locking of drive (freewheel stop).  Note: The thermal state of the resistor can be displayed on the graphic display terminal. It is calculated for as long as the drive control remains connected to the power supply.		[No] (nO)
brP 	<input type="checkbox"/> [DB Resistor Power] This parameter can be accessed if [DB res. protection] (brO) is not [No] (nO). Rated power of the resistor used.	0.1 kW (0.13 HP) to 1000 kW (1333 HP)	0.1 kW (0.13 HP)
brU 	<input type="checkbox"/> [DB Resistor value] This parameter can be accessed if [DB res. protection] (brO) is not [No] (nO). Rated value of the braking resistor in ohms.	0.1 to 200 ohms	0.1 ohms
bUF -	■ [BU PROTECTION] This can be accessed from 55 kW (75 HP) upwards for the ATV71●●●M3X and from 90 kW (120 HP) upwards for the ATV71●●●N4.		
bUb nO YES	<input type="checkbox"/> [Brake res. fault Mgt] Management of short-circuit [DB unit sh. circuit] (bUF) and overheating [Internal- th. sensor] (InFb) faults in the braking unit. <input type="checkbox"/> [Ignore] (nO): Fault ignored. Configuration to be used if there is no resistor or braking unit connected to the drive. <input type="checkbox"/> [Freewheel] (YES): freewheel stop.		[Freewheel] (YES)
EnF -	■ [AUTO TUNING FAULT]		
EnL nO YES	<input type="checkbox"/> [Autotune fault mgt] <input type="checkbox"/> [Ignore] (nO): Fault ignored. <input type="checkbox"/> [Freewheel] (YES): Freewheel stop.		[Freewheel] (YES)



Parameter that can be modified during operation or when stopped.

[1.8 FAULT MANAGEMENT] (FLt-)

Card pairing

Function can only be accessed in **[Expert]** mode.

This function is used to detect whenever a card has been replaced or the software has been modified in any way.

When a pairing password is entered, the parameters of the cards currently inserted are stored. On every subsequent power-up these parameters are verified and, in the event of a discrepancy, the drive locks in HCF fault mode. Before the drive can be restarted you must revert to the original situation or re-enter the pairing password.

The following parameters are verified:

- The type of card for: all cards.
- The software version for: the two control cards, the VW3A3202 extension card, the Controller Inside card and the communication cards.
- The serial number for: the two control cards.

Code	Name/Description	Adjustment range	Factory setting
PP I -	■ [CARDS PAIRING]		
PP I	<input type="checkbox"/> [Pairing password]	OFF to 9999	[OFF] (OFF)
	<p>The [OFF] (OFF) value signifies that the card pairing function is inactive.</p> <p>The [ON] (On) value signifies that card pairing is active and that an access code must be entered in order to start the drive in the event of a card pairing fault.</p> <p>As soon as the code has been entered the drive is unlocked and the code changes to [ON] (On).</p> <p>- The PPI code is an unlock code known only to Schneider Electric Product Support.</p>		

[1.8 FAULT MANAGEMENT] (FLt-)

Code	Name/Description	Adjustment range	Factory setting
LFF -	■ [FALLBACK SPEED]		
LFF	<input type="checkbox"/> [Fallback speed] Selection of the fallback speed	0 to 1600 Hz	0 Hz
FSE -	■ [RAMP DIVIDER]		
dCF ()	<input type="checkbox"/> [Ramp divider] (1) The ramp that is enabled (dEC or dE2) is then divided by this coefficient when stop requests are sent. Value 0 corresponds to a minimum ramp time.	0 to 10	4
dCI -	■ [DC INJECTION]		
IdC ()	<input type="checkbox"/> [DC inject. level 1] (1) (3) Level of DC injection braking current activated via logic input or selected as stop mode. <div style="border: 1px solid black; padding: 5px; text-align: center;">CAUTION Check that the motor will withstand this current without overheating. Failure to follow this instruction can result in equipment damage.</div>	0.1 to 1.41 In (2)	0.64 In (2)
tdI ()	<input type="checkbox"/> [DC injection time 1] (1) (3) Maximum current injection time [DC inject. level 1] (IdC). After this time the injection current becomes [DC inject. level 2] (IdC2).	0.1 to 30 s	0.5 s
IdC2 ()	<input type="checkbox"/> [DC inject. level 2] (1) (3) Injection current activated by logic input or selected as stop mode, once period of time [DC injection time 1] (tdI) has elapsed. <div style="border: 1px solid black; padding: 5px; text-align: center;">CAUTION Check that the motor will withstand this current without overheating. Failure to follow this instruction can result in equipment damage.</div>	0.1 In (2) to [DC inject. level 1] (IdC)	0.5 In (2)
tdC ()	<input type="checkbox"/> [DC injection time 2] (1) (3) Maximum injection time [DC inject. level 2] (IdC2) for injection, selected as stop mode only. (Can be accessed if [Type of stop] (Stt) = [DC injection] (dCI)).	0.1 to 30 s	0.5 s

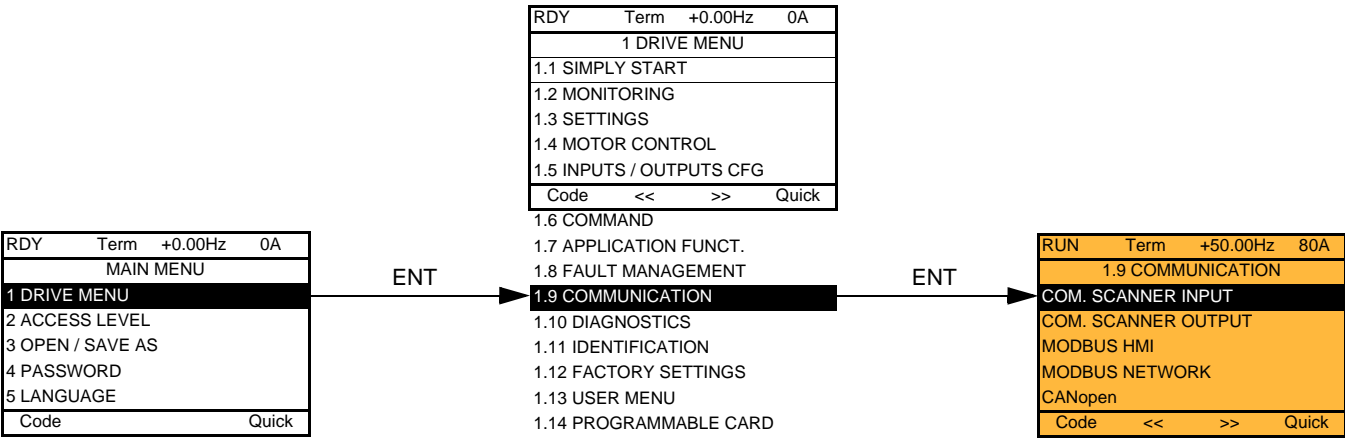
(1) The parameter can also be accessed in the [1.3 SETTINGS] (SEt-) and [1.7 APPLICATION FUNCT.] (FUn-) menus.

(2) In corresponds to the rated drive current indicated in the Installation Manual and on the drive nameplate.

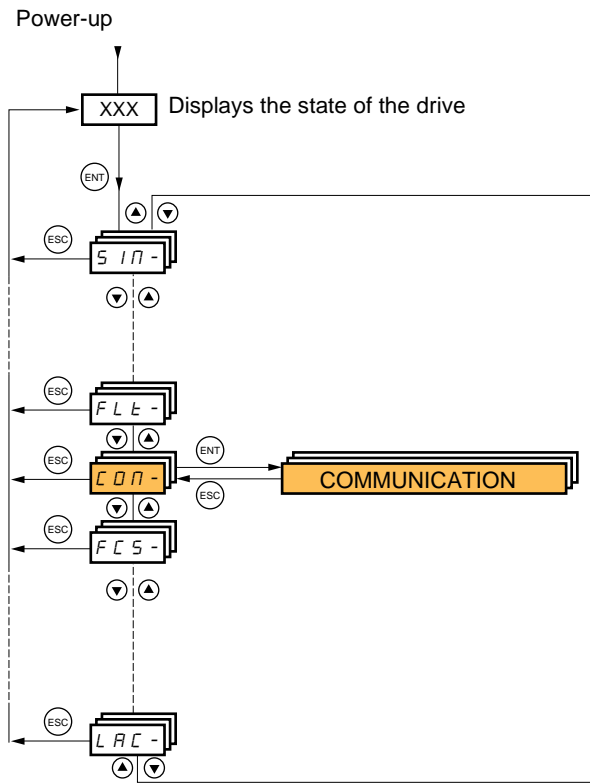
(3) Warning: These settings are independent of the [AUTO DC INJECTION] (AdC-) function.

() Parameter that can be modified during operation or when stopped.

With graphic display terminal:



With integrated display terminal:



[1.9 COMMUNICATION] (COM-)

Code	Name/Description	Adjustment range	Factory setting
	■ [COM. SCANNER INPUT] Only accessible via graphic display terminal		
nPAR1	<input type="checkbox"/> [Scan. IN1 address] Address of the 1 st input word.		3201
nPAR2	<input type="checkbox"/> [Scan. IN2 address] Address of the 2 nd input word.		8604
nPAR3	<input type="checkbox"/> [Scan. IN3 address] Address of the 3 rd input word.		0
nPAR4	<input type="checkbox"/> [Scan. IN4 address] Address of the 4 th input word.		0
nPAR5	<input type="checkbox"/> [Scan. IN5 address] Address of the 5 th input word.		0
nPAR6	<input type="checkbox"/> [Scan. IN6 address] Address of the 6 th input word.		0
nPAR7	<input type="checkbox"/> [Scan. IN7 address] Address of the 7 th input word.		0
nPAR8	<input type="checkbox"/> [Scan. IN8 address] Address of the 8 th input word.		0
	■ [COM. SCANNER OUTPUT] Only accessible via graphic display terminal		
nCAR1	<input type="checkbox"/> [Scan.Out1 address] Address of the 1 st output word.		8501
nCAR2	<input type="checkbox"/> [Scan.Out2 address] Address of the 2 nd output word.		8602
nCAR3	<input type="checkbox"/> [Scan.Out3 address] Address of the 3 rd output word.		0
nCAR4	<input type="checkbox"/> [Scan.Out4 address] Address of the 4 th output word.		0
nCAR5	<input type="checkbox"/> [Scan.Out5 address] Address of the 5 th output word.		0
nCAR6	<input type="checkbox"/> [Scan.Out6 address] Address of the 6 th output word.		0
nCAR7	<input type="checkbox"/> [Scan.Out7 address] Address of the 7 th output word.		0
nCAR8	<input type="checkbox"/> [Scan.Out8 address] Address of the 8 th output word.		0

[1.9 COMMUNICATION] (COM-)

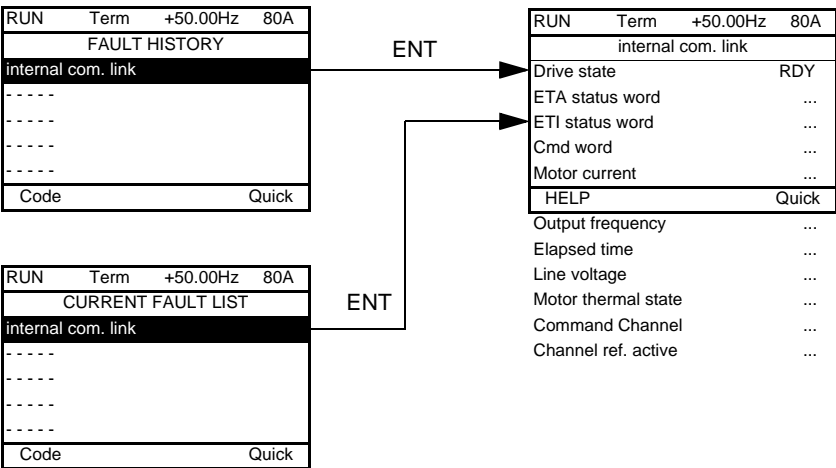
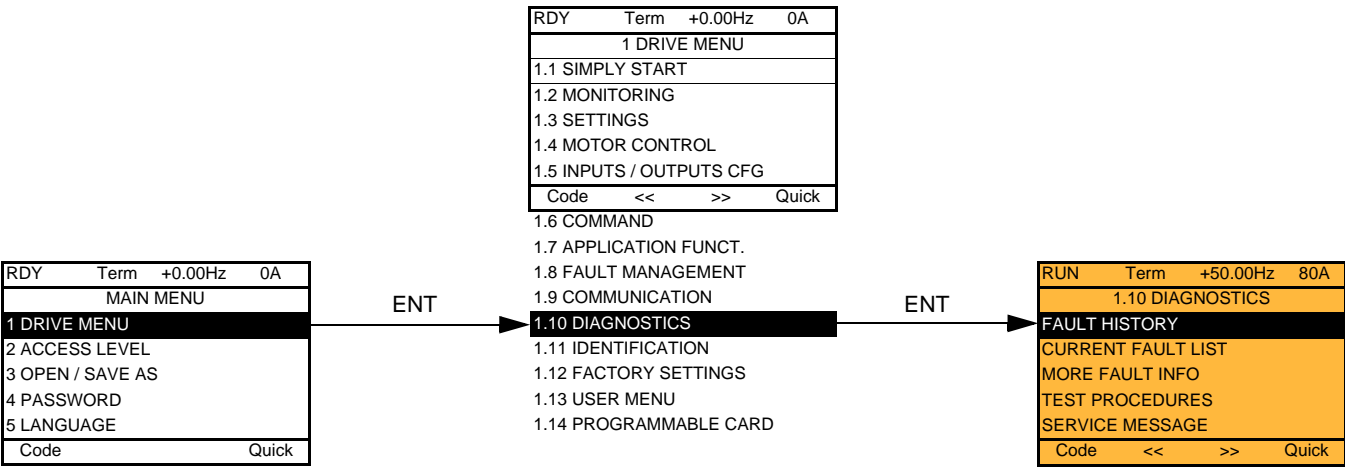
Code	Name/Description	Adjustment range	Factory setting
nd2 -	■ [MODBUS HMI] Communication with the graphic display terminal		
tbr2	<input type="checkbox"/> [HMI baud rate] 9.6 or 19.2 kbps via the integrated display terminal. 9600 or 19200 bauds via the graphic display terminal. The graphic display terminal only operates if [HMI baud rate] (tbr2) = 19200 bauds (19.2 kbps). In order for any change in the assignment of [HMI baud rate] (tbr2) to be taken into account you must: - Provide confirmation in a confirmation window if using the graphic display terminal - Press the ENT key for 2 s if using the integrated display terminal		19.2 kbps
LF02	<input type="checkbox"/> [HMI format] Read-only parameter, cannot be modified.		8E1
nd1 -	■ [MODBUS NETWORK]		
Add	<input type="checkbox"/> [Modbus Address] OFF to 247		OFF
AN0A	<input type="checkbox"/> [Modbus add Prg C.] Modbus address of the Controller Inside card OFF at 247 The parameter can be accessed if the Controller Inside card has been inserted and depending on its configuration (please consult the specific documentation).		OFF
AN0C	<input type="checkbox"/> [Modbus add Com.C.] Modbus address of the communication card OFF to 247 The parameter can be accessed if a communication card has been inserted and depending on its configuration (please consult the specific documentation).		OFF
tbr	<input type="checkbox"/> [Modbus baud rate] 4.8 - 9.6 - 19.2 - 38.4 kbps on the integrated display terminal. 4800, 9600, 19200 or 38400 bauds on the graphic display terminal.		19.2 kbps
LF0	<input type="checkbox"/> [Modbus format] 801 - 8E1 - 8n1, 8n2		8E1
tt0	<input type="checkbox"/> [Modbus time out] 0.1 to 30 s		10.0 s
cn0 -	■ [CANopen]		
AdC0	<input type="checkbox"/> [CANopen address] OFF to 127		OFF
bdC0	<input type="checkbox"/> [CANopen bit rate] 50 - 125 - 250 - 500 kbps - 1 Mbps		125 kbps
ErC0	<input type="checkbox"/> [Error code] Read-only parameter, cannot be modified.		

[1.9 COMMUNICATION] (COM-)

Code	Name/Description	Adjustment range	Factory setting
-	■ [COMMUNICATION CARD] See the specific documentation for the card used.		
LCF -	■ [FORCED LOCAL]		
FLO nO LI1 - LI14	<input type="checkbox"/> [Forced local assign.] <input type="checkbox"/> [No] (nO): Function inactive <input type="checkbox"/> [LI1] (LI1) to [LI6] (LI6) <input type="checkbox"/> [LI7] (LI7) to [LI10] (LI10): If VW3A3201 logic I/O card has been inserted <input type="checkbox"/> [LI11] (LI11) to [LI14] (LI14): If VW3A3202 extended I/O card has been inserted Forced local mode is active when the input is at state 1. [Forced local assign.] (FLO) is forced to [No] (nO) if [Profile] (CHCF) page 140 = [I/O profile] (IO).		[No] (nO)
FLOC nO AI1 AI2 AI3 AI4 LCC PI PG	<input type="checkbox"/> [Forced local Ref.] <input type="checkbox"/> [No] (nO): Not assigned (control via the terminals with zero reference). <input type="checkbox"/> [AI1] (AI1): Analog input <input type="checkbox"/> [AI2] (AI2): Analog input <input type="checkbox"/> [AI3] (AI3): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [AI4] (AI4): Analog input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [HMI] (LCC): Assignment of the reference and command to the graphic display terminal. Reference: [HMI Frequency ref.] (LFr), page 51, command: RUN/STOP/FWD/REV buttons. <input type="checkbox"/> [RP] (PI): Frequency input, if VW3A3202 extension card has been inserted <input type="checkbox"/> [Encoder] (PG): Encoder input, if encoder card has been inserted If the reference is assigned to an analog input, [RP] (PI) or [Encoder] (PG) the command is automatically assigned to the terminals as well (logic inputs)		[No] (nO)
FLOt	<input type="checkbox"/> [Time-out forc. local] 0.1 to 30 s The parameter can be accessed if [Forced local assign.] (FLO) is not [No] (nO). Time delay before communication monitoring is resumed on leaving forced local mode.		10.0 s

[1.10 DIAGNOSTICS]

This menu can only be accessed with the graphic display terminal.



This screen indicates the state of the drive at the moment the selected fault occurred.

RUN	Term	+50.00Hz	80A
MORE FAULT INFO			
Network fault	0		
Application fault	0		
Internal link fault 1	0		
Internal link fault 2	0		
Encoder Fault	0		
Code	Quick		

This screen indicates the number of communication faults, for example, with the option cards.
Number: from 0 to 65535

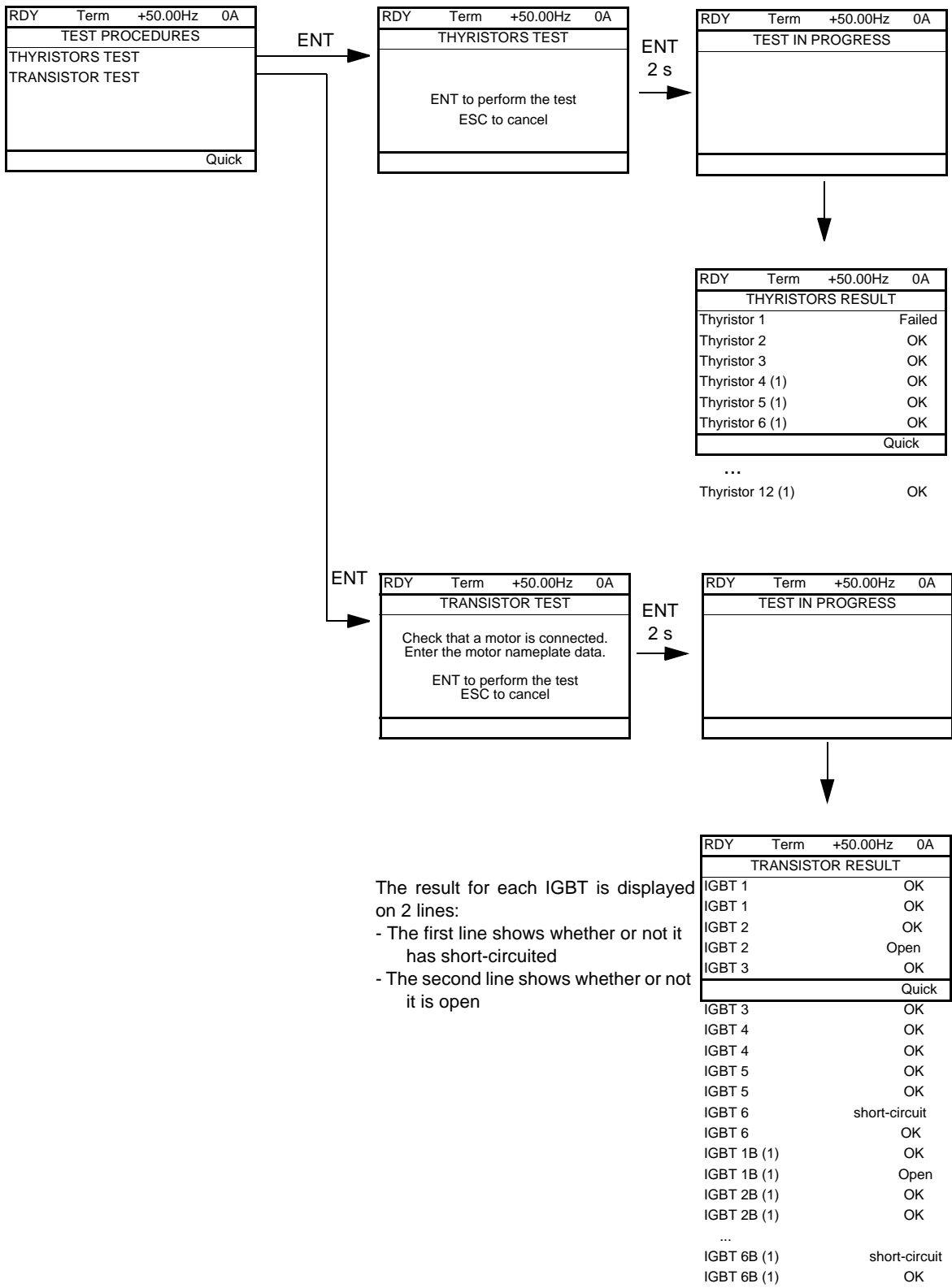
For [Encoder Fault](#), which is only visible if a VW3 A3 408 or VW3 A3 409 has been inserted, the figure displayed corresponds to one of the fault codes summarized in the table on the next page.

Summary table of types of [Encoder Fault]

Code	Description of the error
0	No error, except if the control section has a separate power supply, in which case the power section must be turned on to display the actual code.
1	Internal UE/MC communication fault (CRC fault)
2	Internal UE/MC communication fault (time out)
16	Synchronization error (PLL error)
17	Encoder signal cut or short-circuited
18	PUC emulation fault
19	Resolver: Unstable feedback signal
20	Internal card communication fault
21	Resolver: Feedback signal too weak
22	Resolver: Feedback signal too strong
23	Encoder overcurrent
32	EnDAT: CRC error
33	EnDAT: Start bit not detected
34	EnDAT: EEPROM access error
35	EnDAT: Incorrect EEPROM value
48	Hiperface: Incoherent SinCos signal
49	Hiperface: Time out
50	Hiperface: Unknown encoder
51	Hiperface: CRC error
64	SinCos: Incoherent SinCos signal
80	SSI: Parity error
81	SSI: Invalid data
96	The position is not available
4096	ABZ Esim : Top Z error

[1.10 DIAGNOSTICS]

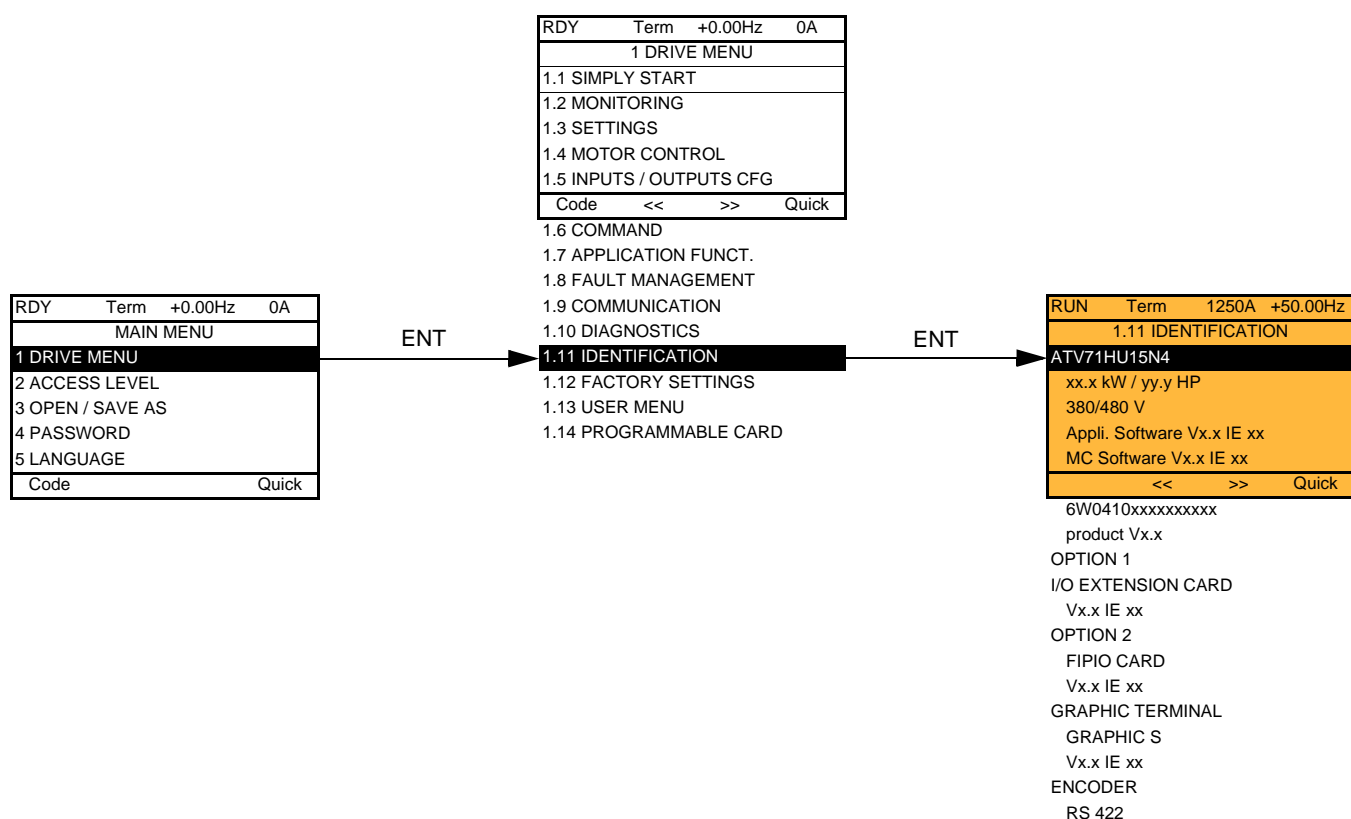
[THYRISTORS TEST] is only accessible for ATV71...M3 ≥ 18.5 kW and ATV71...N4 ≤ 18.5 kW drives.



Note: To start the tests, press and hold down (2 s) the ENT key.

(1) Test results for Thyristor 4...12 and IGBT 1B ... 6B are only accessible for ATV71EC90N4 to M14N4 and ATV71EM15Y to M24Y

[1.11 IDENTIFICATION]



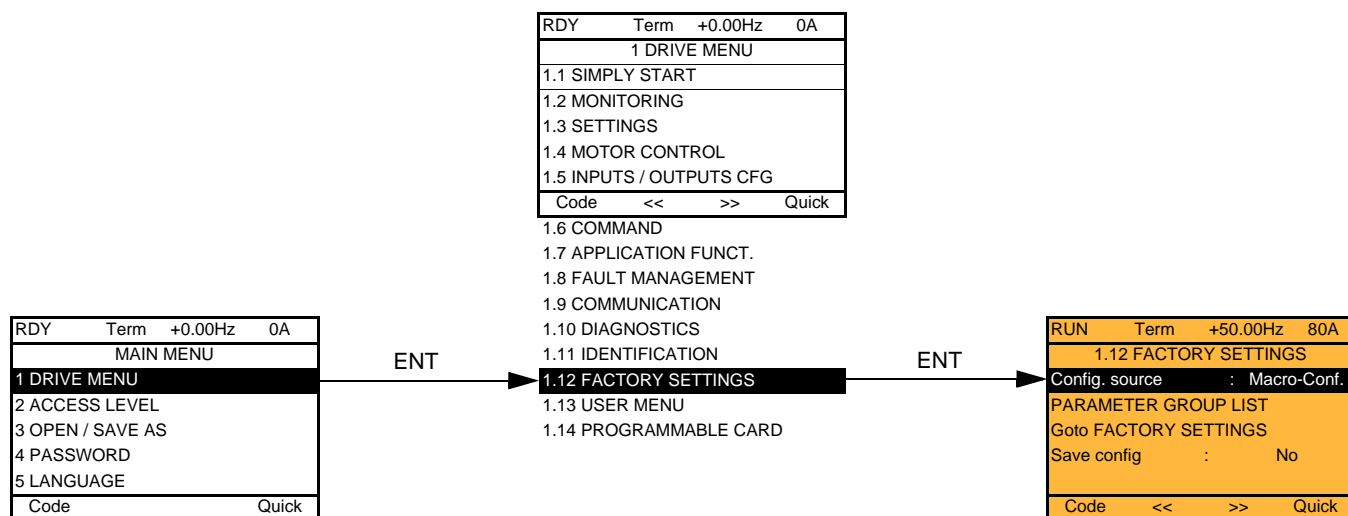
The [\[1.11 IDENTIFICATION\]](#) menu can only be accessed on the graphic display terminal.

This is a read-only menu that cannot be configured. It enables the following information to be displayed:

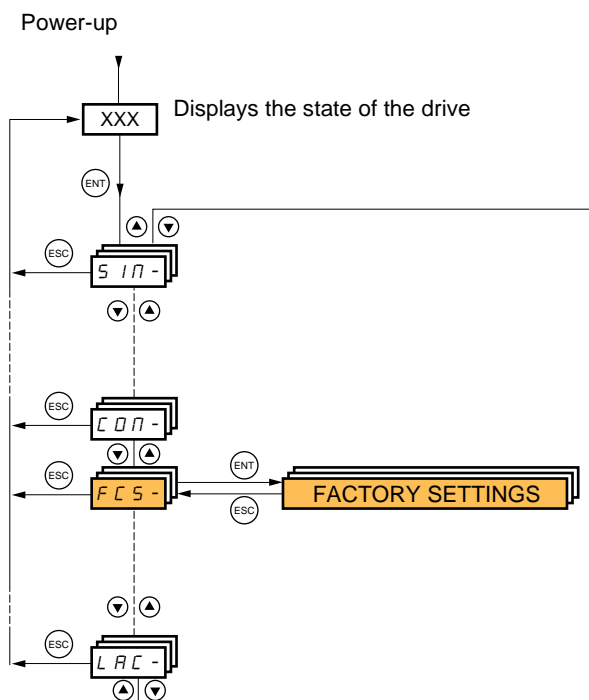
- Drive reference, power rating and voltage
- Drive software version
- Drive serial number
- Type of options present, with their software version

[1.12 FACTORY SETTINGS] (FCS-)

With graphic display terminal:



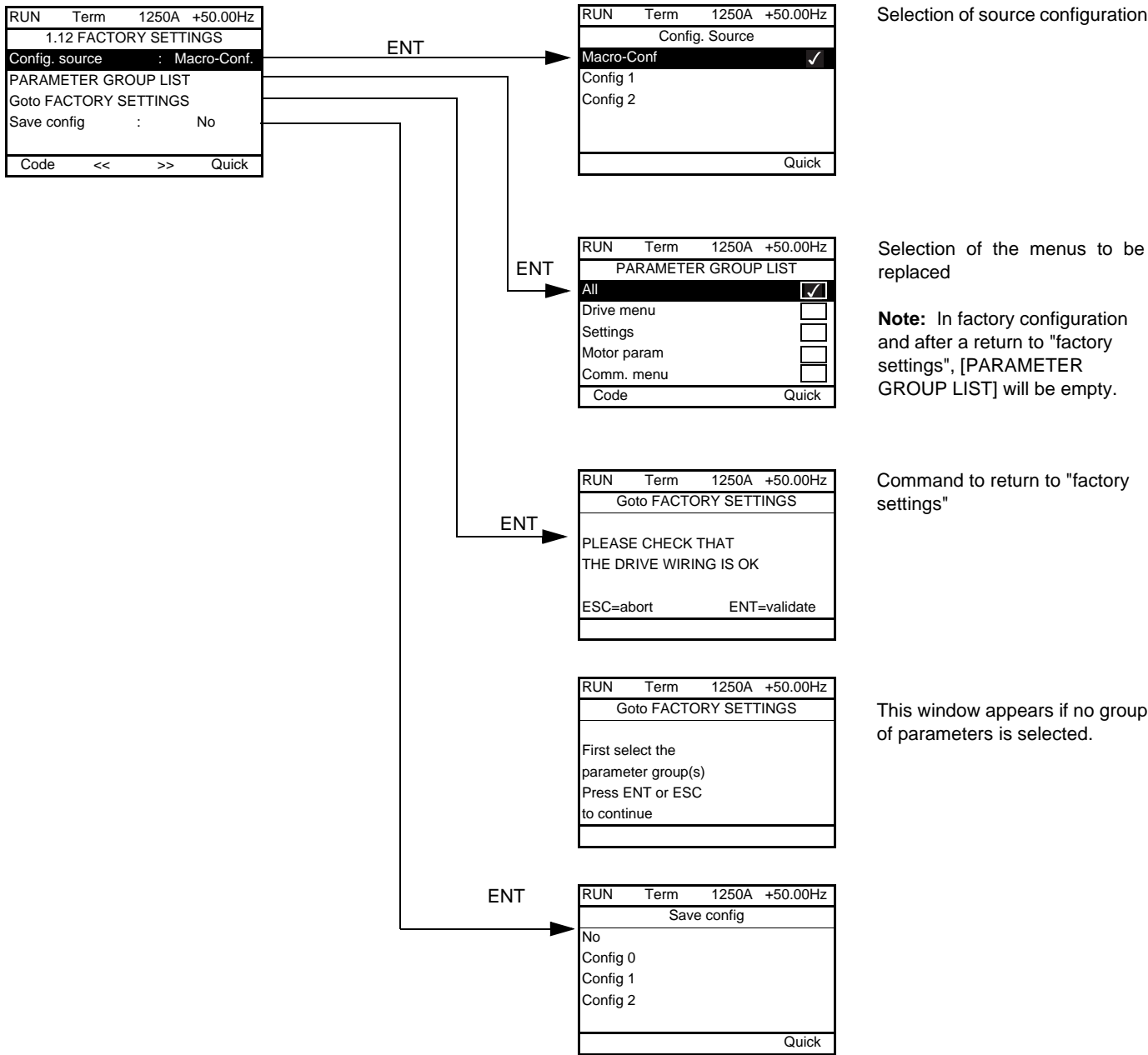
With integrated display terminal:




The [1.12 FACTORY SETTINGS] (FCS-) menu is used to:

- Replace the current configuration with the factory configuration or a previously saved configuration.
All or part of the current configuration can be replaced: select a group of parameters in order to select the menus you wish to load with the selected source configuration.
- Save the current configuration to a file.

[1.12 FACTORY SETTINGS] (FCS-)



[1.12 FACTORY SETTINGS] (FCS-)

Code	Name/Description
FCS I In I CFG 1 CFG 2	<input type="checkbox"/> [Config. Source] Choice of source configuration. <input type="checkbox"/> [Macro-Conf] (InI) Factory configuration, return to selected macro configuration. <input type="checkbox"/> [Config 1] (CFG1) <input type="checkbox"/> [Config 2] (CFG2) If the configuration switching function is configured, it will not be possible to access [Config 1] (CFG1) and [Config 2] (CFG2).
FrY- ALL drM SEt nOt COM PLC nOn dIS	<input type="checkbox"/> [PARAMETER GROUP LIST] Selection of menus to be loaded <input type="checkbox"/> [All] (ALL): All parameters. <input type="checkbox"/> [Drive menu] (drM): The [1 DRIVE MENU] menu without [1.9 COMMUNICATION] and [1.14 PROGRAMMABLE CARD]. In the [7 DISPLAY CONFIG.] menu, [Return std name] page 281 returns to [No]. <input type="checkbox"/> [Settings] (SEt): The [1.3 SETTINGS] menu without the [IR compensation] (UFR), [Slip compensation] (SLP) and [Mot. therm. current] (ItH) parameters <input type="checkbox"/> [Motor param] (MOt): Motor parameters, see list below. The following selections can only be accessed if [Config. Source] (FCSI) = [Macro-Conf.] (InI): <input type="checkbox"/> [Comm. menu] (COM): The [1.9 COMMUNICATION] menu without either [Scan. In1 address] (nMA1) to [Scan. In8 address] (nMA8) or [Scan.Out1 address] (nCA1) to [Scan.Out8 address] (nCA8). <input type="checkbox"/> [Prog. card menu] (PLC): The [1.14 PROGRAMMABLE CARD] menu <input type="checkbox"/> [Monitor config.] (MOn): The [6 MONITORING CONFIG.] menu <input type="checkbox"/> [Display config.] (dIS): The [7 DISPLAY CONFIG.] menu See the multiple selection procedure on page 30 for the integrated display terminal and page 21 for the graphic display terminal.  Note: In factory configuration and after a return to "factory settings", [PARAMETER GROUP LIST] will be empty.
GFS nO YES	<input type="checkbox"/> [Goto FACTORY SETTINGS] It is only possible to revert to the factory settings if at least one group of parameters has previously been selected. With the integrated display terminal: - No - Yes: The parameter changes back to nO automatically as soon as the operation is complete. With the graphic display terminal: see previous page
SCSI nO Str0 Str1 Str2	<input type="checkbox"/> [Save config] <input type="checkbox"/> [No] (nO): <input type="checkbox"/> [Config 0] (Str0): Press and hold down the "ENT" key for 2 s. <input type="checkbox"/> [Config 1] (Str0): Press and hold down the "ENT" key for 2 s. <input type="checkbox"/> [Config 2] (Str0): Press and hold down the "ENT" key for 2 s. The active configuration to be saved does not appear for selection. For example, if it is [Config 0] (Str0), only [Config 1] (Str1) and [Config 2] (Str2) appear. The parameter changes back to [No] (nO) as soon as the operation is complete.

List of motor parameters

[1.4 MOTOR CONTROL] (drC-) menu:

[Rated motor power] (nPr) - [Rated motor volt.] (UnS) - [Rated mot current] (nCr) - [Rated motor freq.] (FrS) - [Rated motor speed] (nSP) - [Auto tuning] (tUn) - [Auto tuning status] (tUS) - [Angle auto-test] (ASA) - [Angle offset value] (ASU) - [U0] (U0) to [U5] (U5) - [F1] (F1) to [F5] (F5) - [V. constant power] (UCP) - [Freq. Const Power] (FCP) - [Nominal I sync] (nCrS) - [Nom motor spdsync] (nSPS) - [Pole pairs.] (PPnS) - [Syn. EMF constant] (PHS) - [Autotune L d-axis] (LdS) - [Autotune L q-axis] (LqS) - [Cust. stator R syn] (rSAS) - [IR compensation] (UFR) - [Slip compensation] (SLP) - motor parameters that can be accessed in [Expert] mode pages 79, 80 and 82.

[1.3 SETTINGS] (SEt-) menu:

[Mot. therm. current] (ItH)

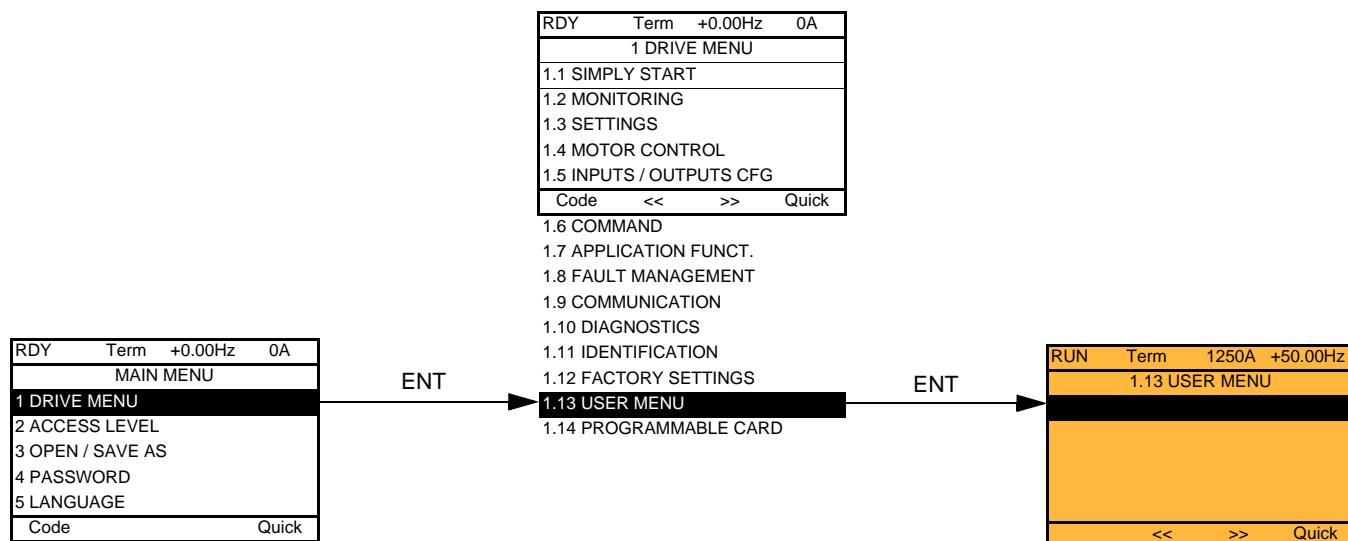
Example of total return to factory settings

1. [Config. Source] (FCSI) = [Macro-Conf] (InI)
2. [PARAMETER GROUP LIST] (FrY-) = [All] (ALL)
3. [Goto FACTORY SETTINGS] (GFS = YES)

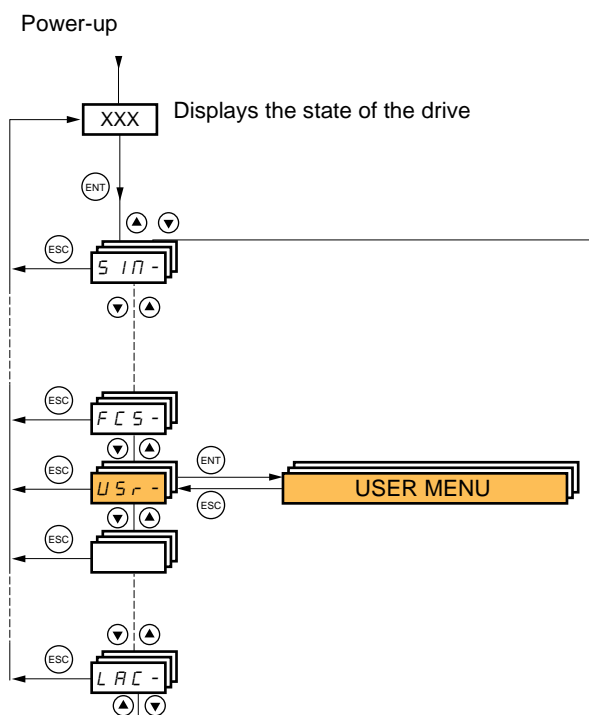
[1.13 USER MENU] (USr-)

This menu contains the parameters selected in the [7 DISPLAY CONFIG.] menu on page 280.

With graphic display terminal:



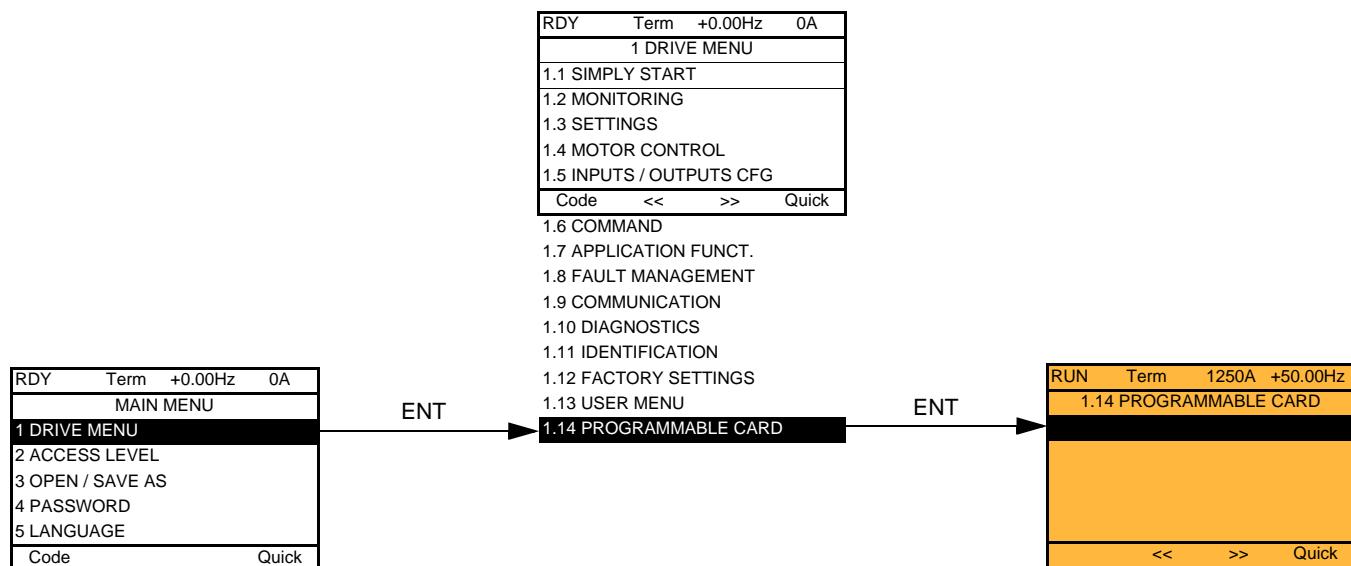
With integrated display terminal:



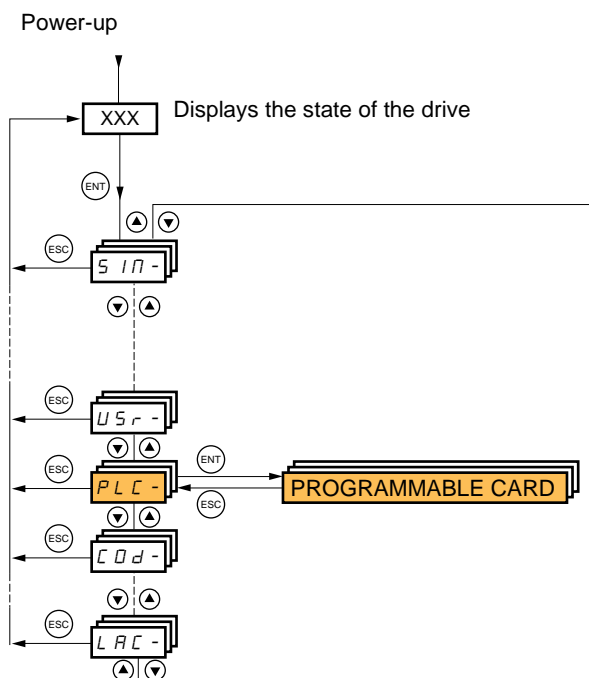
[1.14 PROGRAMMABLE CARD] (PLC-)

This menu can only be accessed if a Controller Inside card has been inserted. Please refer to the documentation specific to this card.

With graphic display terminal:

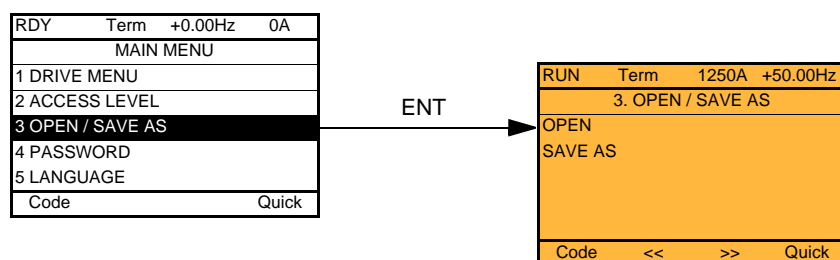


With integrated display terminal:



[3. OPEN/SAVE AS]

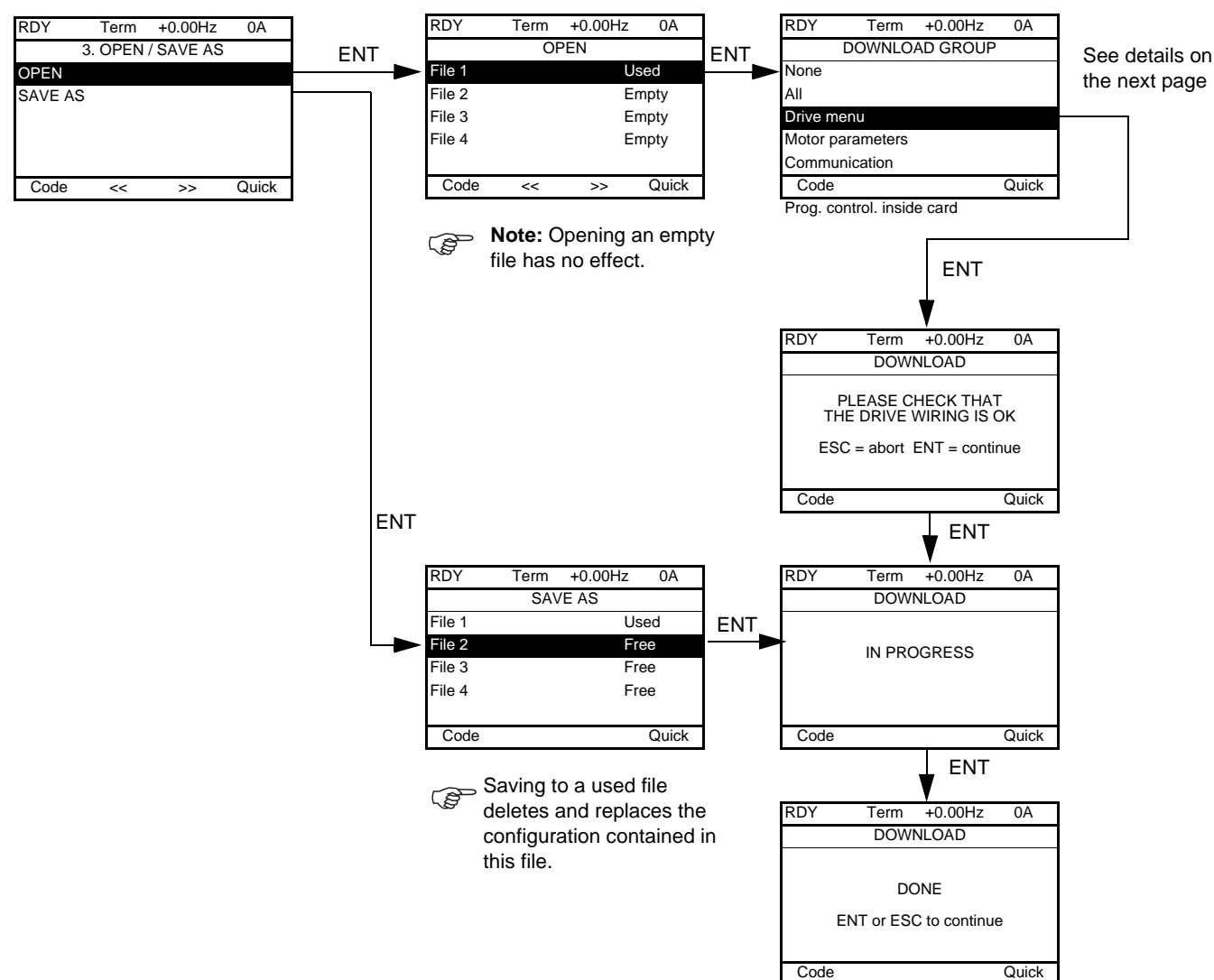
This menu can only be accessed with the graphic display terminal.



[Open]: To download one of the 4 files from the graphic display terminal to the drive.

[SAVE AS]: To download the current drive configuration to the graphic display terminal.

Note: Download between drive and graphic display terminal (and vice-versa), can be done only when the motor is stopped.



Various messages may appear when the download is requested:

- [IN PROGRESS]
- [DONE]
- Error messages if download not possible
- [Motor parameters are NOT COMPATIBLE. Do you want to continue?]: In this case the download is possible, but the parameters will be restricted.

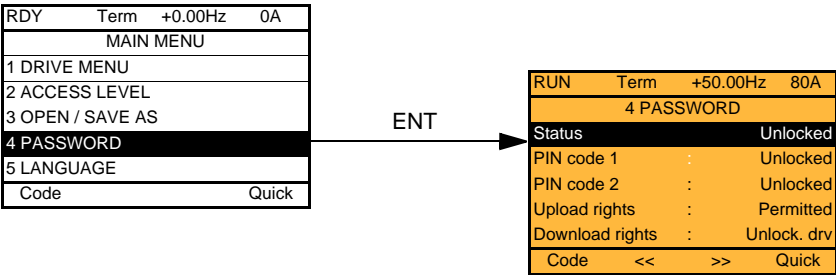
[3. OPEN/SAVE AS]

[DOWNLOAD GROUP]

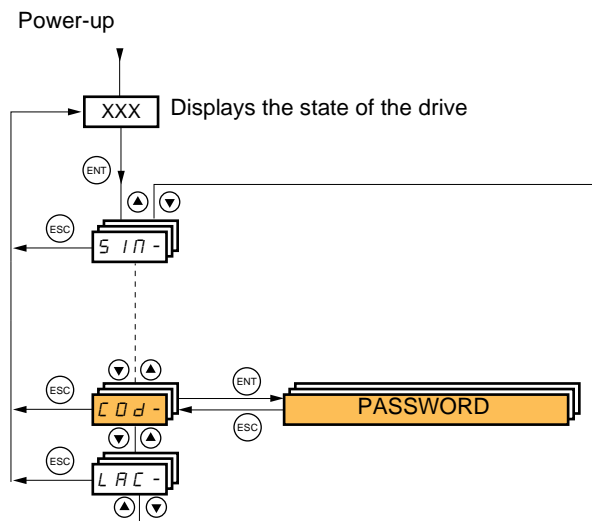
[None]:		No parameters
[All]:		All parameters in all menus
[Drive menu]:		The entire [1 DRIVE MENU] without [1.9 COMMUNICATION] and [1.14 PROGRAMMABLE CARD].
[Motor parameters]:	[Rated motor power] (nPr)	In the [1.4 MOTOR CONTROL] (drC-) menu
	[Rated motor volt.] (UnS)	
	[Rated mot. current] (nCr)	
	[Rated motor freq.] (FrS)	
	[Rated motor speed] (nSP)	
	[Auto tuning] (tUn)	
	[Auto tuning status] (tUS)	
	[Angle auto-test] (ASA)	
	[Angle offset value] (ASU)	
	[U0] (U0) to [U5] (U5)	
	[F1] (F1) to [F5] (F5)	
	[V. constant power] (UCP)	
	[Freq. Const Power] (FCP)	
	[Nominal I sync.] (nCrS)	
	[Nom motor spdsync] (nSPS)	
	[Pole pairs] (PPnS)	
	[Syn. EMF constant] (PHS)	
	[Autotune L d-axis] (LdS)	
	[Autotune L q-axis] (LqS)	
	[Cust. stator R syn] (rSAS)	
	[IR compensation] (UFr)	
	[Slip compensation] (SLP)	
	The motor parameters that can be accessed in [Expert] mode, page 79 , 80 and 82 .	
[Mot. therm. current] (ItH)	In the [1.3 SETTINGS] (SEt-) menu	
[Communication]:		All the parameters in the [1.9 COMMUNICATION] menu
[Prog. control. inside card]:		All the parameters in the [1.14 PROGRAMMABLE CARD] menu

[4. PASSWORD] (COd-)

With graphic display terminal:

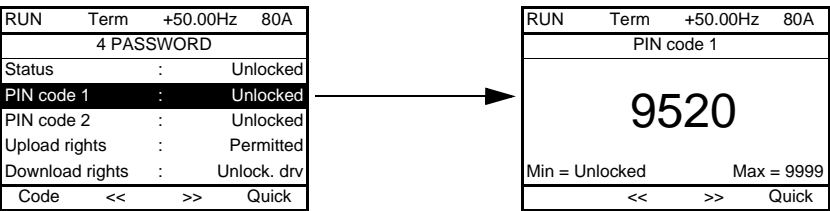


With integrated display terminal:



Enables the configuration to be protected with an access code or a password to be entered in order to access a protected configuration.

Example with graphic display terminal:



- The drive is unlocked when the PIN codes are set to [unlocked] (OFF) (no password) or when the correct code has been entered. All menus are visible.
- Before protecting the configuration with an access code, you must:
 - Define the [Upload rights] (ULr) and [Download rights] (dLr).
 - Make a careful note of the code and keep it in a safe place where you will always be able to find it.
- The drive has 2 access codes, enabling 2 access levels to be set up.
 - PIN code 1 is a public unlock code: 6969.
 - PIN code 2 is an unlock code known only to Schneider Electric Product Support. It can only be accessed in [Expert] mode.
 - Only one PIN1 or PIN2 code can be used - the other must remain set to [OFF] (OFF).

Note: When the unlock code is entered, the user access code appears.

The following items are access-protected:

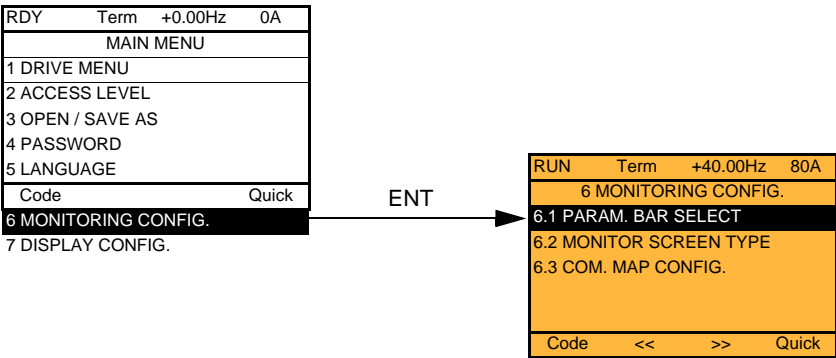
- Return to factory settings ([1.12 FACTORY SETTINGS] (FCS-) menu).
- The channels and parameters protected by the [1.13 USER MENU] as well as the menu itself.
- The custom display settings ([7 DISPLAY CONFIG.] menu).

[4. PASSWORD] (COd-)

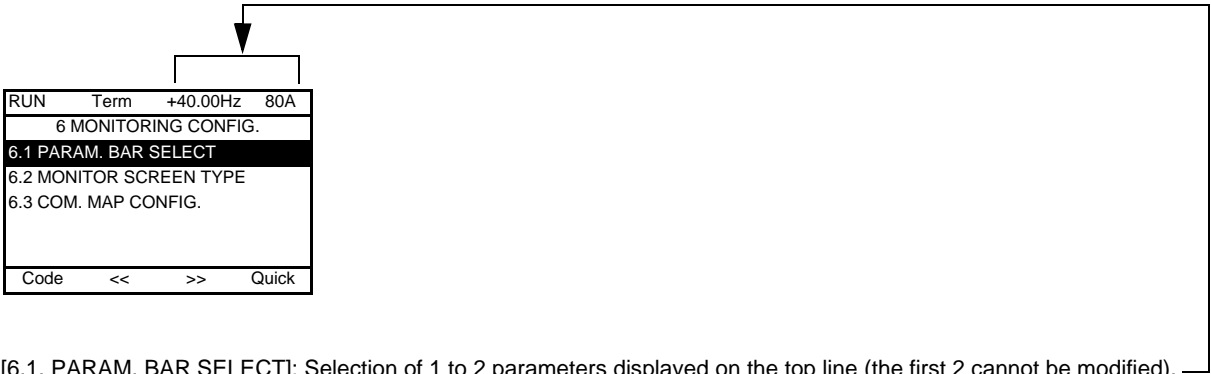
Code	Name/Description	Adjustment range	Factory setting
CSL LC ULC	<input type="checkbox"/> [Status] Information parameter, cannot be modified. <input type="checkbox"/> [Locked] (LC) : The drive is locked by a password. <input type="checkbox"/> [Unlocked] (ULC) : The drive is not locked by a password.		[Unlocked] (ULC)
COd	<input type="checkbox"/> [PIN code 1] 1 st access code. The value [OFF] (OFF) indicates that no password has been set [Unlocked] . The value [ON] (On) indicates that the drive is protected and an access code must be entered in order to unlock it. Once the correct code has been entered, it remains on the display and the drive is unlocked until the next time the power supply is disconnected. - PIN code 1 is a public unlock code: 6969.	OFF to 9999	[OFF] (OFF)
COd2	<input type="checkbox"/> [PIN code 2] Parameter can only be accessed in [Expert] mode. 2 nd access code. The value [OFF] (OFF) indicates that no password has been set [Unlocked] . The value [ON] (On) indicates that the drive is protected and an access code must be entered in order to unlock it. Once the correct code has been entered, it remains on the display and the drive is unlocked until the next time the power supply is disconnected. - PIN code 2 is an unlock code known only to Schneider Electric Product Support. When [PIN code 2] (COd2) is not set to OFF, the [1.2 MONITORING] (SUP-) menu is the only one visible. Then if [PIN code 2] (COd2) is set to OFF (drive unlocked), all menu are visible. If the display settings are modified in [7 DISPLAY CONFIG.] menu, and if [PIN code 2] (COd2) is not set to OFF, the visibility configured is kept. Then if [PIN code 2] (COd2) is set to OFF (drive unlocked), the visibility configured in [7 DISPLAY CONFIG.] menu is kept.	OFF to 9999	[OFF] (OFF)
ULr ULr0 ULr1	<input type="checkbox"/> [Upload rights] Read or copy the current configuration to the drive. <input type="checkbox"/> [Permitted] (ULr0) : The current drive configuration can always be uploaded to the graphic display terminal or PowerSuite. <input type="checkbox"/> [Not allowed] (ULr1) : The current drive configuration can only be uploaded to the graphic display terminal or PowerSuite if the drive is not protected by an access code or if the correct code has been entered.		[Permitted] (ULr0)
dLr dLr0 dLr1 dLr2 dLr3	<input type="checkbox"/> [Download rights] Writes the current configuration to the drive or downloads a configuration to the drive <input type="checkbox"/> [Locked drv] (dLr0) : A configuration file can only be downloaded to the drive if the drive is protected by an access code, which is the same as the access code for the configuration to be downloaded. <input type="checkbox"/> [Unlock. drv] (dLr1) : A configuration file can be downloaded to the drive or a configuration in the drive can be modified if the drive is unlocked (access code entered) or is not protected by an access code. <input type="checkbox"/> [Not allowed] (dLr2) : Download not authorized. <input type="checkbox"/> [Lock/unlock] (dLr3) : Combination of [Locked drv.] (dLr0) and [Unlock. drv] (dLr1) .		[Unlock. drv] (dLr1)

[6 MONITORING CONFIG.]

This menu can only be accessed with the graphic display terminal.



This can be used to configure the information displayed on the graphic display screen during operation.



[6.1. PARAM. BAR SELECT]: Selection of 1 to 2 parameters displayed on the top line (the first 2 cannot be modified).

[6.2. MONITOR SCREEN TYPE]: Selection of parameters displayed in the centre of the screen and the display mode (digital values or bar graph format).

[6.3. COM. MAP CONFIG.]: Selection of the words displayed and their format.

Name/Description

■ [6.1 PARAM. BAR SELECT]

<input type="checkbox"/> [Alarm groups]	
<input type="checkbox"/> [Frequency ref.]	in Hz: parameter displayed in factory configuration.
<input type="checkbox"/> [Torque reference]	as a %
<input type="checkbox"/> [Output frequency]	in Hz
<input type="checkbox"/> [Motor current]	in A: parameter displayed in factory configuration.
<input type="checkbox"/> [ENA avg speed]	in Hz
<input type="checkbox"/> [Motor speed]	in rpm
<input type="checkbox"/> [Motor voltage]	in V
<input type="checkbox"/> [Motor power]	in W
<input type="checkbox"/> [Motor torque]	as a %
<input type="checkbox"/> [Mains voltage]	in V
<input type="checkbox"/> [Motor thermal state]	as a %
<input type="checkbox"/> [Drv. thermal state]	as a %
<input type="checkbox"/> [DBR thermal state]	as a %
<input type="checkbox"/> [Consumption]	as a %
<input type="checkbox"/> [Run time]	as a %
<input type="checkbox"/> [Power on time]	in Wh or kWh depending on drive rating
<input type="checkbox"/> [IGBT alarm counter]	in hours (length of time the motor has been switched on)
<input type="checkbox"/> [PID reference]	in hours (length of time the drive has been switched on)
<input type="checkbox"/> [PID feedback]	in seconds (total time of IGBT overheating alarms)
<input type="checkbox"/> [PID error]	as a %
<input type="checkbox"/> [PID Output]	as a %
<input type="checkbox"/> [- - - - 02]	as a %
to	
<input type="checkbox"/> [- - - - 06]	in Hz
<input type="checkbox"/> [Config. active]	Word generated by the Controller Inside card (can be accessed if the card has been inserted)
<input type="checkbox"/> [Utilised param. set]	Word generated by the Controller Inside card (can be accessed if the card has been inserted)
	CNFO, 1 or 2 (see page 217)
	SET1, 2 or 3 (see page 216)

Select the parameter using ENT (a ☒ then appears next to the parameter). Parameter(s) can also be deselected using ENT. 1 or 2 parameters can be selected.

Example:

PARAM. BAR SELECT	
MONITORING	
-----	<input checked="" type="checkbox"/>
-----	<input type="checkbox"/>
-----	<input type="checkbox"/>
-----	<input checked="" type="checkbox"/>

Name/Description

■ [6.2. MONITOR SCREEN TYPE]

☐ [Display value type]

☐ [Digital]: Display of one or two digital values on the screen (factory configuration).

☐ [Bar graph]: Display of one or two bar graphs on the screen.

☐ [List]: Display a list of between one and five values on the screen.

☐ [PARAMETER SELECTION]

☐ [Alarm groups]

can only be accessed if [Display value type] = [List]

☐ [Frequency ref.]

in Hz: parameter displayed in factory configuration.

☐ [Torque reference]

as a %

☐ [Output frequency]

in Hz

☐ [Motor current]

in A

☐ [ENA avg speed]

in Hz

☐ [Motor speed]

in rpm

☐ [Motor voltage]

in V

☐ [Motor power]

in W

☐ [Motor torque]

as a %

☐ [Mains voltage]

in V

☐ [Motor thermal state]

as a %

☐ [Drv. thermal state]

as a %

☐ [DBR thermal state]

as a %

☐ [Consumption]

as a %

☐ [Run time]

in Wh or kWh depending on drive rating

☐ [Power on time]

in hours (length of time the motor has been switched on)

☐ [IGBT alarm counter]

in hours (length of time the drive has been switched on)

☐ [PID reference]

in seconds (total time of IGBT overheating alarms)

☐ [PID feedback]

as a %

☐ [PID error]

as a %

☐ [PID Output]

as a %

☐ [- - - - 02]

to

☐ [- - - - 06]

in Hz

☐ [Config. active]

Word generated by the Controller Inside card (can be accessed if the card has been inserted)

☐ [Utilised param. set]

Word generated by the Controller Inside card (can be accessed if the card has been inserted)

CNFO, 1 or 2 (see page 217), can only be accessed if [Display value type] = [List]

SET1, 2 or 3 (see page 216), can only be accessed if [Display value type] = [List]

Select the parameter(s) using ENT (a ☒ then appears next to the parameter). Parameter(s) can also be deselected using ENT.

PARAMETER SELECTION

MONITORING

☒

☒

Examples include:

Display of 2 digital values

RUN

Term

+35.00Hz

80A

Motor speed

1250 rpm

Motor current

80 A

Quick

Display of 2 bar graphs

RUN

Term

+35.00Hz

80A

Min

Motor speed

max

0

1250 rpm

1500

Min

Motor current

max

0

80 A

150

Quick

Display of a list of 5 values

RUN

Term

+35.00Hz

80A

MONITORING

Frequency ref. : 50.1Hz

Motor current: 80 A

Motor speed: 1250 rpm

Motor thermal state: 80%

Drv thermal state : 80%

Quick

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Name/Description
<div><div><div>■ [6.3. COM. MAP CONFIG.]</div></div></div>
<div><div><div><div><div><input type="checkbox"/> [Word 1 add. select.]</div></div><div>Select the address of the word to be displayed by pressing the <<, >> (F2 and F3) keys and rotating the navigation button.</div></div></div><div><div><div><div><input type="checkbox"/> [Format word 1]</div></div><div>Format of word 1.</div><div><div><input type="checkbox"/> [Hex]: Hexadecimal</div><div><input type="checkbox"/> [Signed]: Decimal with sign</div><div><input type="checkbox"/> [Unsigned]: Decimal without sign</div></div></div></div></div> <div><div><div><div><input type="checkbox"/> [Word 2 add. select.]</div></div><div>Select the address of the word to be displayed by pressing the <<, >> (F2 and F3) keys and rotating the navigation button.</div></div></div> <div><div><div><div><input type="checkbox"/> [Format word 2]</div></div><div>Format of word 2.</div><div><div><input type="checkbox"/> [Hex]: Hexadecimal</div><div><input type="checkbox"/> [Signed]: Decimal with sign</div><div><input type="checkbox"/> [Unsigned]: Decimal without sign</div></div></div></div>

☐ [Word 3 add. select.]

Select the address of the word to be displayed by pressing the <<, >> (F2 and F3) keys and rotating the navigation button.

☐ [Format word 3]

Format of word 3.

☐ [Hex]: Hexadecimal

☐ [Signed]: Decimal with sign

☐ [Unsigned]: Decimal without sign

☐ [Word 4 add. select.]

Select the address of the word to be displayed by pressing the <<, >> (F2 and F3) keys and rotating the navigation button.

☐ [Format word 4]

Format of word 4.

☐ [Hex]: Hexadecimal

☐ [Signed]: Decimal with sign

☐ [Unsigned]: Decimal without sign

It will then be possible to view the selected words in the [COMMUNICATION MAP] submenu of the [1.2 MONITORING] menu.
Example:

RUN

Term

+35.00Hz

80A

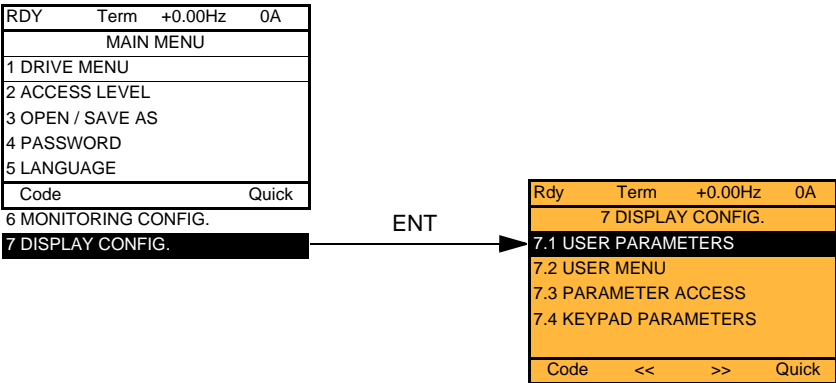
COMMUNICATION MAP

W3141: F230 Hex

<<>>Quick

[7 DISPLAY CONFIG.]

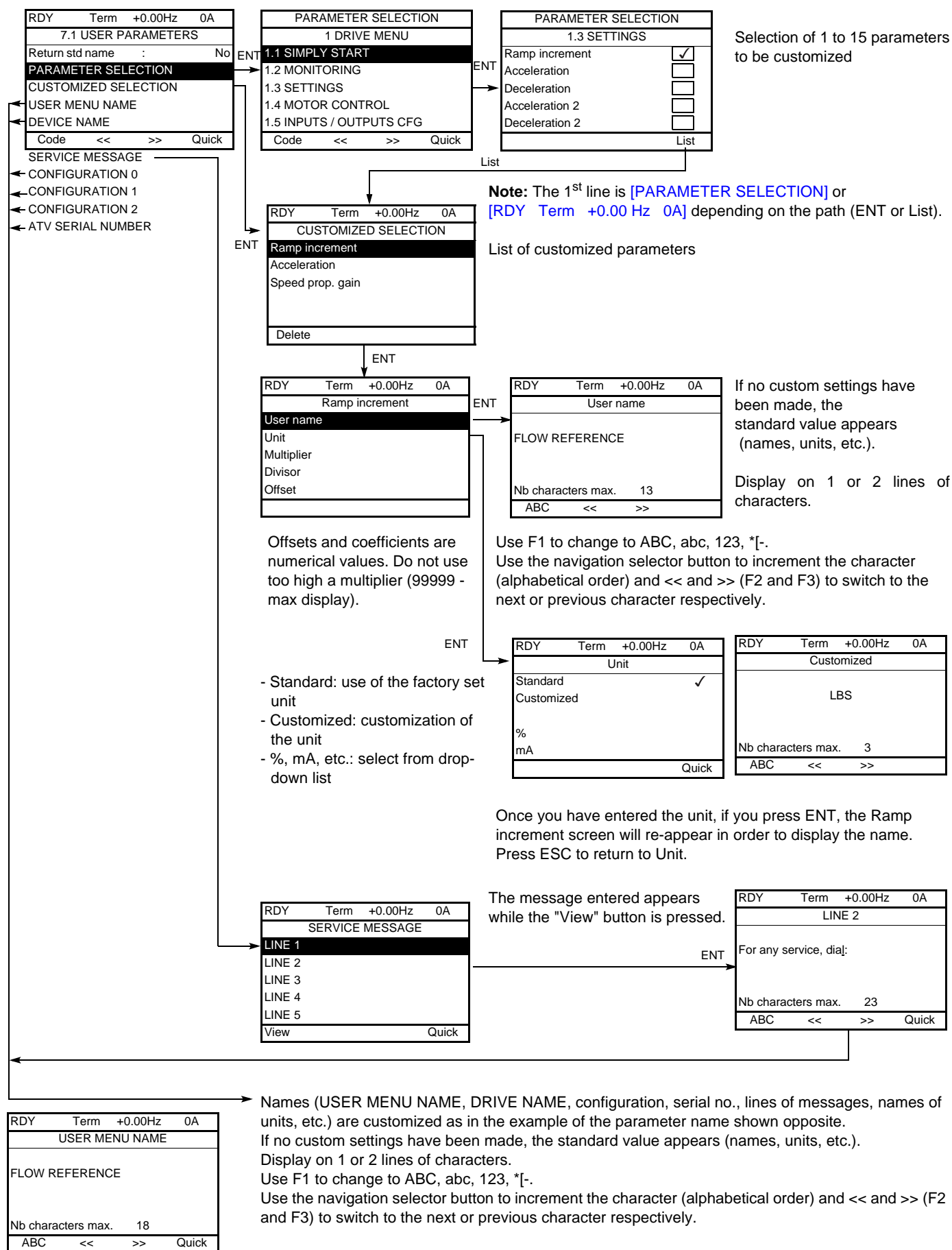
This menu can only be accessed with the graphic display terminal. It can be used to customize parameters or a menu and to access parameters.



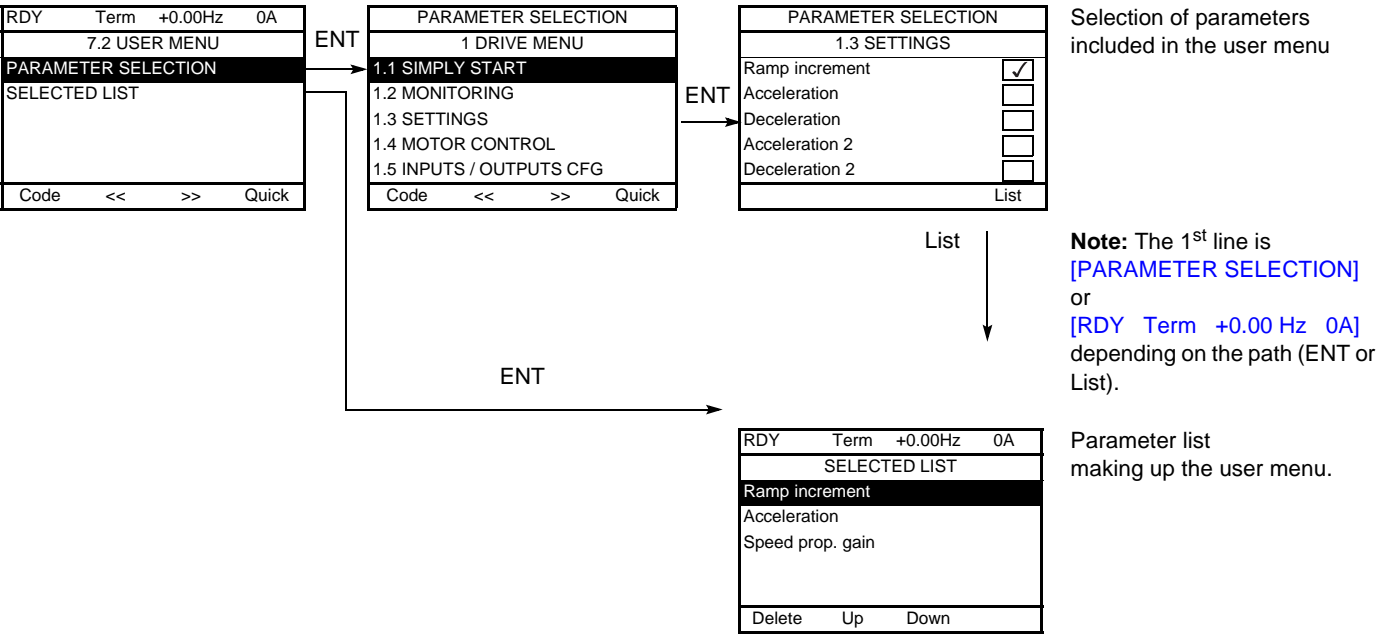
- 7.1: USER PARAMETERS: Customization of 1 to 15 parameters.
- 7.2 USER MENU: Creation of a customized menu.
- 7.3 PARAMETER ACCESS: Customization of the visibility and protection mechanisms of menus and parameters.
- 7.4 KEYPAD PARAMETERS: Adjustment of the contrast and stand-by mode of the graphic display terminal (parameters stored in the terminal rather than in the drive).Choice of the menu displayed on power up.

[7 DISPLAY CONFIG.]

If **[Return std name] = [Yes]** the display reverts to standard but the custom settings remain stored.

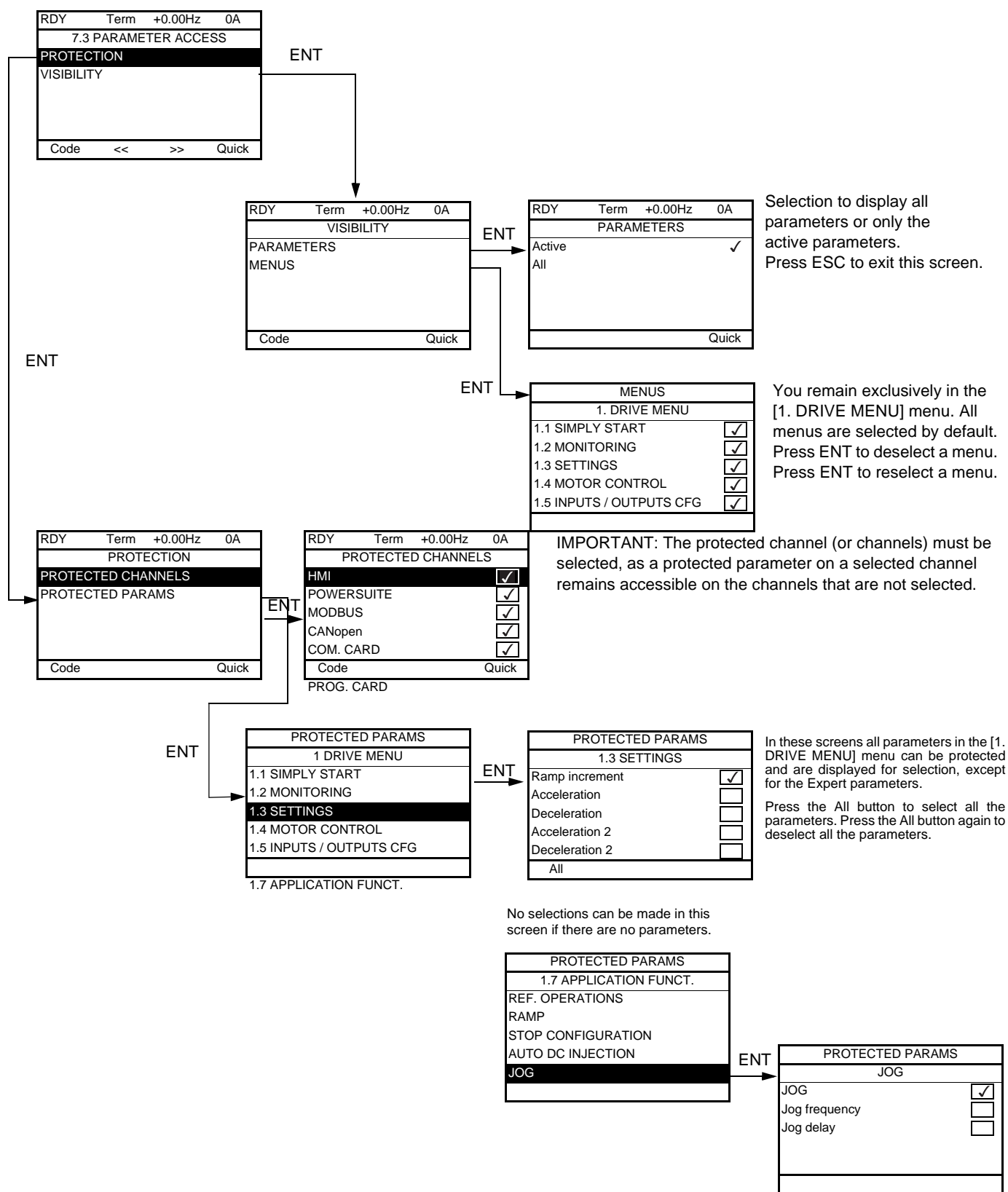


[7 DISPLAY CONFIG.]



Use the F2 and F3 keys to arrange the parameters in the list (example below using F3).

RDY	Term	+0.00Hz	0A
SELECTED LIST			
Acceleration			
Ramp increment			
Speed prop. gain			
Delete Up Down			



[7 DISPLAY CONFIG.]

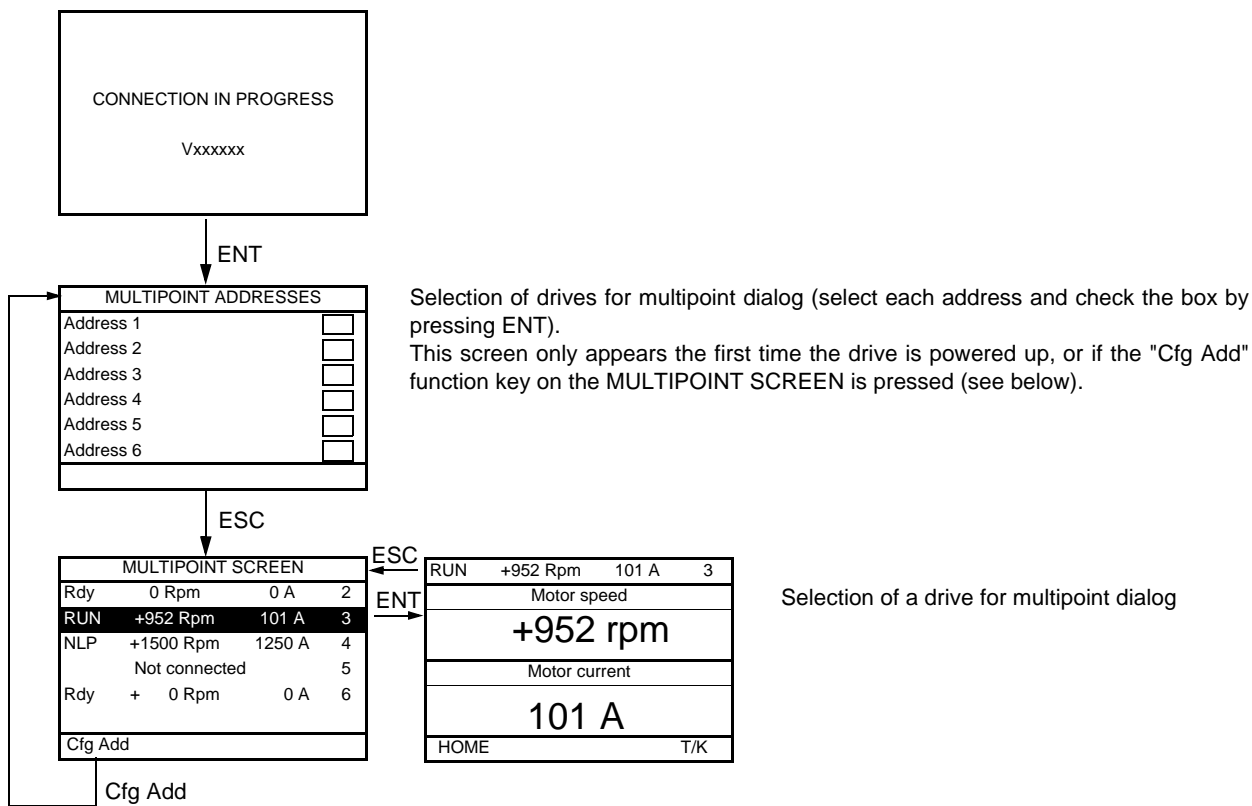
RDY	Term	+0.00Hz	0A
7.4 KEYPAD PARAMETERS			
Contrast			
Keypad stand-by			
Power up menu			
Code	<<	>>	Quick

Name/Description	Adjustment range	Factory setting
<input type="checkbox"/> [Keypad contrast] Adjustment of contrast on graphic display unit.	0 to 100 %	50 %
<input type="checkbox"/> [Keypad stand-by] Configures and adjusts the stand-by mode of the graphic display unit. <input type="checkbox"/> [No]: No stand-by mode. <input type="checkbox"/> [1] to [10]: Adjusts the time during which the terminal is to remain idle before stand-by mode is triggered, in minutes. After this idle time, the display backlight turns off and the contrast is reduced. The screen returns to normal operation when a key or the navigation button is pressed. It also returns to normal operation if the terminal exits the normal display mode, for example, if a fault occurs.		[5]
<input type="checkbox"/> [Power up menu] Choose the menu which appears on the product menu when it is powered up <input type="checkbox"/> [Drive menu.]: Display the drive menu. <input type="checkbox"/> [Sim. start]: Display the simply start menu. <input type="checkbox"/> [Monitoring]: Display the monitoring menu. <input type="checkbox"/> [Settings]: Display the setting menu. <input type="checkbox"/> [Mot. Ctrl]: Display the motor control menu. <input type="checkbox"/> [I/O Conf.]: Display the inputs outputs configuration menu. <input type="checkbox"/> [Command]: Display the command menu. <input type="checkbox"/> [Appli. fun.]: Display the application function menu. <input type="checkbox"/> [Fault mgt]: Display the fault management menu. <input type="checkbox"/> [Com.]: Display the communication menu. <input type="checkbox"/> [Diagnostics]: Display the diagnostic menu. <input type="checkbox"/> [Ident.]: Display the identification menu. <input type="checkbox"/> [Factory Set.]: Display the factory setting. <input type="checkbox"/> [User menu]: Display the user manu. <input type="checkbox"/> [Cl menu]: Display the drive menu. <input type="checkbox"/> [Main menu]: Display the main menu.		[Main menu]

[MULTIPOINT SCREEN]

Communication is possible between a graphic display terminal and a number of drives connected on the same bus. The addresses of the drives must be configured in advance in the [1.9 COMMUNICATION] menu using the [Modbus Address] (Add) parameter, page 261.

When a number of drives are connected to the same display terminal, the terminal automatically displays the following screens:



In multipoint mode, the command channel is not displayed. From left to right, the state, then the 2 selected parameters and finally the drive address appear.

All menus can be accessed in multipoint mode. Only drive control via the graphic display terminal is not authorized, apart from the Stop key, which locks all the drives.
If there is a fault on a drive, this drive is displayed.

Maintenance

Servicing

The Altivar 71 does not require any preventive maintenance. It is nevertheless advisable to perform the following regularly:

- Check the condition and tightness of the connections.
- Ensure that the temperature around the unit remains at an acceptable level and that ventilation is effective (average service life of fans: 3 to 5 years, depending on the operating conditions).
- Remove any dust from the drive.

Assistance with maintenance, fault display

If a problem arises during setup or operation, first check that the recommendations relating to the environment, mounting and connections have been observed.

The first fault detected is saved and displayed, and the drive locks.

The drive switching to fault mode can be indicated remotely via a logic output or a relay, which can be configured in the [\[1.5 INPUTS / OUTPUTS CFG\] \(I-O-\)](#) menu, see, for example, [\[R1 CONFIGURATION\] \(r1-\)](#) page [118](#).

Menu [\[1.10 DIAGNOSTICS\]](#)

This menu can only be accessed with the graphic display terminal. It displays faults and their cause in plain text and can be used to carry out tests, see page [263](#).

Clearing the fault

Disconnect the drive power supply in the event of a non-resettable fault.

Wait for the display to disappear completely.

Find the cause of the fault in order to correct it.

The drive is unlocked after a fault:

- By switching off the drive until the display disappears completely, then switching on again
- Automatically in the scenarios described for the [\[AUTOMATIC RESTART\] \(Atr-\)](#) function, page [238](#)
- By means of a logic input or control bit assigned to the [\[FAULT RESET\] \(rSt-\)](#) function, page [237](#)
- By pressing the STOP/RESET button on the graphic display terminal

Menu [\[1.2 MONITORING\] \(SUP-\)](#):

This is used to prevent and find the causes of faults by displaying the drive state and its current values.

It can be accessed with the integrated display terminal.

Spares and repairs:

Consult Schneider Electric product support.

Faults - Causes - Remedies

Drive does not start, no fault displayed

- If the display does not light up, check the power supply to the drive.
- The assignment of the "Fast stop" or "Freewheel" functions will prevent the drive starting if the corresponding logic inputs are not powered up. The ATV71 then displays **[Freewheel] (nSt)** in freewheel stop and **[Fast stop] (FSt)** in fast stop. This is normal since these functions are active at zero so that the drive will be stopped safely if there is a wire break.
- Make sure that the run command input or inputs are activated in accordance with the selected control mode (**[2/3 wire control] (tCC)** and **[2 wire type] (tCt)** parameters, page 102).
- If an input is assigned to the limit switch function and this input is at zero, the drive can only be started up by sending a command for the opposite direction (see pages 169 and 209).
- If the reference channel or command channel is assigned to a communication bus, when the power supply is connected, the drive will display **[Freewheel] (nSt)** and remain in stop mode until the communication bus sends a command.
- When an encoder is used with a VW3 A3 409 card, if the encoder is not fully configured, the drive remains locked in stop mode (displays **[NST] (nSt)** or **[NLP] (nLP)**).

Faults, which cannot be reset automatically

The cause of the fault must be removed before resetting by turning off and then back on.

AnF, ASF, brF, ECF, EnF, SOF, SPF and tnF faults can also be reset remotely by means of a logic input or control bit (**[Fault reset] (rSF)** parameter, page 237).

AnF, EnF, InFA, InFb, SOF, SPF, and tnF faults can be inhibited and cleared remotely by means of a logic input or control bit (**[Fault inhibit assign.] (InH)** parameter, page 249).

Fault	Name	Probable cause	Remedy
A I 2 F	[AI2 input]	<ul style="list-style-type: none"> • Non-conforming signal on analog input AI2 	<ul style="list-style-type: none"> • Check the wiring of analog input AI2 and the value of the signal.
A n F	[Load slipping]	<ul style="list-style-type: none"> • The encoder speed feedback does not match the reference 	<ul style="list-style-type: none"> • Check the motor, gain and stability parameters. • Add a braking resistor. • Check the size of the motor/drive/load. • Check the encoder's mechanical coupling and its wiring. • If the "torque control" function is used, see "Note" on page 200.
A S F	[Angle Error]	<ul style="list-style-type: none"> • A modification has changed the phase-shift angle between the motor and the encoder or resolver • The "Procedure for measuring the phase-shift angle between the motor and the encoder" page 83 has failed or has not been performed • for the law [Sync. mot.] (SYn), bad setting of the speed loop, when the reference goes through 0. 	<ul style="list-style-type: none"> • See comments on page 83. • Repeat the "Procedure for measuring the phase-shift angle between the motor and the encoder" page 83.
b D F	[DBR overload]	<ul style="list-style-type: none"> • The braking resistor is under excessive stress 	<ul style="list-style-type: none"> • Check the size of the resistor and wait for it to cool down • Check the [DB Resistor Power] (brP) and [DB Resistor value] (brU) parameters, page 256.
b r F	[Brake feedback]	<ul style="list-style-type: none"> • The brake feedback contact does not match the brake logic control • The brake does not stop the motor quickly enough (detected by measuring the speed on the "Pulse input" input). 	<ul style="list-style-type: none"> • Check the feedback circuit and the brake logic control circuit • Check the mechanical state of the brake • Check the brake linings
b U F	[DB unit sh. Circuit]	<ul style="list-style-type: none"> • Short-circuit output from braking unit • Braking unit not connected 	<ul style="list-style-type: none"> • Check the wiring of the braking unit and the resistor. • Check the braking resistor • The monitoring of this fault must be disabled by the [Brake res. fault Mgt.] (bUb) parameter, page 256 if there is no resistor or braking unit connected to the drive, at and above 55 kW (75 HP) for ATV71...M3X and at and above 90 kW (120 HP) for ATV71...N4.
C r F 1	[Precharge]	<ul style="list-style-type: none"> • Charging relay control fault or charging resistor damaged 	<ul style="list-style-type: none"> • Turn the drive off and then back on again • Check the internal connections • Inspect/repair the drive
C r F 2	[Thyr. soft charge]	<ul style="list-style-type: none"> • DC bus charging fault (thyristors) 	
d C F	[Differential curent Fault]	<ul style="list-style-type: none"> • Current difference between power block A and B (ATV71EC60 ... M14N4 or ATVE15...M24Y only) 	<ul style="list-style-type: none"> • Check thyristor with [TEST THYRISTORS] • Check IGBT with [TRANSISTOR TEST] • Check current transformer
E C F	[Encoder coupling]	<ul style="list-style-type: none"> • Break in encoder's mechanical coupling 	<ul style="list-style-type: none"> • Check the encoder's mechanical coupling

Faults - Causes - Remedies

Faults, which cannot be reset automatically (continued)

Fault	Name	Probable cause	Remedy
E E F 1	[Control Eeprom]	<ul style="list-style-type: none"> Internal memory fault, control card 	<ul style="list-style-type: none"> Check the environment (electromagnetic compatibility) Turn off, reset, return to factory settings Inspect/repair the drive
E E F 2	[Power Eeprom]	<ul style="list-style-type: none"> Internal memory fault, power card 	<ul style="list-style-type: none"> Check the environment (electromagnetic compatibility) Turn off, reset, return to factory settings Inspect/repair the drive
E n F	[Encoder]	<ul style="list-style-type: none"> Encoder feedback fault 	<ul style="list-style-type: none"> Check all the configuration parameters for the encoder used Refer to the [1.10 DIAGNOSTICS] menu for the value of parameter RESE. Check that the encoder's mechanical and electrical operation, its power supply and connections are all correct. If necessary, reverse the direction of rotation of the motor ([Output Ph rotation] (PHr) parameter, page 71) or the encoder signals.
F C F 1	[Out. contact. stuck]	<ul style="list-style-type: none"> The output contactor remains closed although the opening conditions have been met 	<ul style="list-style-type: none"> Check the contactor and its wiring Check the feedback circuit
H d F	[IGBT desaturation]	<ul style="list-style-type: none"> Short-circuit or grounding at the drive output 	<ul style="list-style-type: none"> Check the cables connecting the drive to the motor, and the motor insulation. Perform the diagnostic tests via the [1.10 DIAGNOSTICS] menu.
I L F	[internal com. link]	<ul style="list-style-type: none"> Communication fault between option card and drive 	<ul style="list-style-type: none"> Check the environment (electromagnetic compatibility) Check the connections Check that no more than 2 option cards (max. permitted) have been installed on the drive Replace the option card Inspect/repair the drive
I n F 1	[Rating error]	<ul style="list-style-type: none"> The power card is different from the card stored 	<ul style="list-style-type: none"> Check the reference of the power card
I n F 2	[Incompatible PB]	<ul style="list-style-type: none"> The power card is incompatible with the control card 	<ul style="list-style-type: none"> Check the reference of the power card and its compatibility.
I n F 3	[Internal serial link]	<ul style="list-style-type: none"> Communication fault between the internal cards 	<ul style="list-style-type: none"> Check the internal connections Inspect/repair the drive
I n F 4	[Internal-mftg zone]	<ul style="list-style-type: none"> Internal data inconsistent 	<ul style="list-style-type: none"> Recalibrate the drive (performed by Schneider Electric Product Support).
I n F 5	[Internal - fault option]	<ul style="list-style-type: none"> The option installed in the drive is not recognized 	<ul style="list-style-type: none"> Check the reference and compatibility of the option.
I n F 7	[Internal-hard init.]	<ul style="list-style-type: none"> Initialization of the drive is incomplete 	<ul style="list-style-type: none"> Turn off and reset.
I n F 8	[Internal-ctrl supply]	<ul style="list-style-type: none"> The control power supply is incorrect 	<ul style="list-style-type: none"> Check the control section power supply
I n F 9	[Internal- I measure]	<ul style="list-style-type: none"> The current measurements are incorrect 	<ul style="list-style-type: none"> Replace the current sensors or the power card. Inspect/repair the drive
I n F A	[Internal-mains circuit]	<ul style="list-style-type: none"> The input stage is not operating correctly 	<ul style="list-style-type: none"> Perform the diagnostic tests via the [1.10 DIAGNOSTICS] menu. Inspect/repair the drive
I n F b	[Internal- th. sensor]	<ul style="list-style-type: none"> The drive temperature sensor is not operating correctly The braking unit's temperature sensor is not operating correctly. 	<ul style="list-style-type: none"> Replace the drive temperature sensor Inspect/repair the drive Replace the braking unit's temperature sensor Inspect/repair the braking unit The monitoring of this fault must be disabled by the [Brake res. fault Mgt.] (bUb) parameter, page 256 if there is no braking unit connected to the drive.
I n F C	[Internal-time meas.]	<ul style="list-style-type: none"> Fault on the electronic time measurement component 	<ul style="list-style-type: none"> Inspect/repair the drive
I n F E	[internal- CPU]	<ul style="list-style-type: none"> Internal microprocessor fault 	<ul style="list-style-type: none"> Turn off and reset. Inspect/repair the drive.

Faults - Causes - Remedies

Faults, which cannot be reset automatically (continued)

Fault	Name	Probable cause	Remedy
OCF	[Overcurrent]	<ul style="list-style-type: none"> Parameters in the [SETTINGS] (SEt-) and [1.4 MOTOR CONTROL] (drC-) menus are not correct. Inertia or load too high Mechanical locking 	<ul style="list-style-type: none"> Check the parameters. Check the size of the motor/drive/load. Check the state of the mechanism.
PrF	[Power removal]	<ul style="list-style-type: none"> Fault with the drive's "Power removal" safety function 	<ul style="list-style-type: none"> Inspect/repair the drive
SCF1	[Motor short circuit]	<ul style="list-style-type: none"> Short-circuit or grounding at the drive output Significant earth leakage current at the drive output if several motors are connected in parallel 	<ul style="list-style-type: none"> Check the cables connecting the drive to the motor, and the motor insulation. Perform the diagnostic tests via the [1.10 DIAGNOSTICS] menu. Reduce the switching frequency. Connect chokes in series with the motor. Check the adjustment of speed loop and brake.
SCF2	[Impedant sh. circuit]		
SCF3	[Ground short circuit]		
SPF	[Speed fdback loss]	<ul style="list-style-type: none"> No resolver or encoder feedback signal No Top Z signal after the activation of the Top Z function and 2 cycles. No signal on "Pulse input", if the input is used for speed measurement 	<ul style="list-style-type: none"> Check the wiring between the encoder or resolver and the drive. Check the encoder or resolver. Check all the configuration parameters for the encoder used. Refer to the [1.10 DIAGNOSTICS] menu for the value of parameter RESE. Check the wiring of the input cable and the detector used
EnF	[Auto-tuning]	<ul style="list-style-type: none"> Special motor or motor whose power is not suitable for the drive Motor not connected to the drive 	<ul style="list-style-type: none"> Check that the motor/drive are compatible Check that the motor is present during auto-tuning If an output contactor is being used, close it during auto-tuning

Faults - Causes - Remedies

Faults that can be reset with the automatic restart function, after the cause has disappeared

These faults can also be reset by turning on and off or by means of a logic input or control bit ([Fault reset] (rSF) parameter, page 237). APF, CnF, COF, EPF1, EPF2, FCF2, LFF2, LFF3, LFF4, ObF, OHF, OLF, OPF1, OPF2, OSF, OtF1, OtF2, OtFL, PHF, PtF1, PtF2, PtFL, SLF1, SLF2, SLF3, SrF, SSF and tJF faults can be inhibited and cleared remotely by means of a logic input or control bit ([Fault inhibit assign.] (InH) parameter, page 249).

Fault	Name	Probable cause	Remedy
APF	[Application fault]	<ul style="list-style-type: none"> Controller Inside card fault 	<ul style="list-style-type: none"> Please refer to the card documentation
bLF	[Brake control]	<ul style="list-style-type: none"> Brake release current not reached Brake engage frequency threshold [Brake engage freq] (bEn) only regulated when brake logic control is assigned 	<ul style="list-style-type: none"> Check the drive/motor connection Check the motor windings Check the [Brake release I FW] (lbr) and [Brake release I Rev] (lrd) settings, page 175 Apply the recommended settings for [Brake engage freq] (bEn).
CnF	[Com. network]	<ul style="list-style-type: none"> Communication fault on communication card 	<ul style="list-style-type: none"> Check the environment (electromagnetic compatibility) Check the wiring. Check the time-out Replace the option card Inspect/repair the drive
CD F	[CANopen com.]	<ul style="list-style-type: none"> Interruption in communication on the CANopen bus 	<ul style="list-style-type: none"> Check the communication bus. Check the time-out Refer to the CANopen User's Manual
EPF 1	[External flt-LI/Bit]	<ul style="list-style-type: none"> Fault triggered by an external device, depending on user 	<ul style="list-style-type: none"> Check the device which caused the fault, and reset
EPF 2	[External fault com.]	<ul style="list-style-type: none"> Fault triggered by a communication network 	<ul style="list-style-type: none"> Check for the cause of the fault and reset
FCF 2	[Out. contact. open.]	<ul style="list-style-type: none"> The output contactor remains open although the closing conditions have been met 	<ul style="list-style-type: none"> Check the contactor and its wiring Check the feedback circuit
LCF	[input contactor]	<ul style="list-style-type: none"> The drive is not turned on even though [Mains V. time out] (LCt) has elapsed. 	<ul style="list-style-type: none"> Check the contactor and its wiring Check the time-out Check the line/contactor/drive connection
LFF 2	[AI2 4-20mA loss]	<ul style="list-style-type: none"> Loss of the 4-20 mA reference on analog input AI2, AI3 or AI4 	<ul style="list-style-type: none"> Check the connection on the analog inputs.
LFF 3	[AI3 4-20mA loss]		
LFF 4	[AI4 4-20mA loss]		
ObF	[Overbraking]	<ul style="list-style-type: none"> Braking too sudden or driving load 	<ul style="list-style-type: none"> Increase the deceleration time Install a braking resistor if necessary Activate the [Dec ramp adapt.] (brA) function, page 155, if it is compatible with the application
OHF	[Drive overheat]	<ul style="list-style-type: none"> Drive temperature too high Braking unit over temperature Phase module over temperature Rectifier over temperature 	<ul style="list-style-type: none"> Check the motor load, the drive ventilation and the ambient temperature. Wait for the drive to cool down before restarting.
OLF	[Motor overload]	<ul style="list-style-type: none"> Triggered by excessive motor current 	<ul style="list-style-type: none"> Check the setting of the motor thermal protection, check the motor load. Wait for the drive to cool down before restarting.
OPF 1	[1 output phase loss]	<ul style="list-style-type: none"> Loss of one phase at drive output 	<ul style="list-style-type: none"> Check the connections from the drive to the motor

Faults - Causes - Remedies

Faults that can be reset with the automatic restart function, after the cause has disappeared
(continued)

Fault	Name	Probable cause	Remedy
OPF2	[3 motor phase loss]	<ul style="list-style-type: none"> Motor not connected or motor power too low Output contactor open Instantaneous instability in the motor current 	<ul style="list-style-type: none"> Check the connections from the drive to the motor If an output contactor is being used, parameterize [Output Phase Loss] (OPL) = [Output cut] (OAC), page 242. Test on a low power motor or without a motor: In factory settings mode, motor phase loss detection is active [Output Phase Loss] (OPL) = [Yes] (YES). To check the drive in a test or maintenance environment, without having to use a motor with the same rating as the drive (in particular for high power drives), deactivate motor phase loss detection [Output Phase Loss] (OPL) = [No] (nO) Check and optimize the following parameters: [IR compensation] (UFR), page 95, [Rated motor volt.] (UnS) and [Rated mot. current] (nCr) page 76 and perform [Auto-tuning] (tUn) page 88.
OSF	[Mains overvoltage]	<ul style="list-style-type: none"> Line voltage too high Disturbed mains supply 	<ul style="list-style-type: none"> Check the line voltage
OTF1	[PTC1 overheat]	<ul style="list-style-type: none"> Overheating of the PTC1 probes detected 	<ul style="list-style-type: none"> Check the motor load and motor size. Check the motor ventilation. Wait for the motor to cool before restarting Check the type and state of the PTC probes
OTF2	[PTC2 overheat]	<ul style="list-style-type: none"> Overheating of the PTC2 probes detected 	
OTFL	[LI6=PTC overheat]	<ul style="list-style-type: none"> Overheating of PTC probes detected on input LI6 	
PTF1	[PTC1 probe]	<ul style="list-style-type: none"> PTC1 probes open or short-circuited 	<ul style="list-style-type: none"> Check the PTC probes and the wiring between them and the motor/drive
PTF2	[PTC2 probe]	<ul style="list-style-type: none"> PTC2 probes open or short-circuited 	
PTFL	[LI6=PTC probe]	<ul style="list-style-type: none"> PTC probes on input LI6 open or short-circuited 	
SCF4	[IGBT short circuit]	<ul style="list-style-type: none"> Power component fault 	<ul style="list-style-type: none"> Perform a test via the [1.10 DIAGNOSTICS] menu. Inspect/repair the drive
SCF5	[Motor short circuit]	<ul style="list-style-type: none"> Short-circuit at drive output 	<ul style="list-style-type: none"> Check the cables connecting the drive to the motor, and the motor's insulation Perform tests via the [1.10 DIAGNOSTICS] menu. Inspect/repair the drive
SLF1	[Modbus com.]	<ul style="list-style-type: none"> Interruption in communication on the Modbus bus 	<ul style="list-style-type: none"> Check the communication bus. Check the time-out Refer to the Modbus User's Manual
SLF2	[PowerSuite com.]	<ul style="list-style-type: none"> Fault communicating with PowerSuite 	<ul style="list-style-type: none"> Check the PowerSuite connecting cable. Check the time-out
SLF3	[HMI com.]	<ul style="list-style-type: none"> Fault communicating with the graphic display terminal 	<ul style="list-style-type: none"> Check the terminal connection Check the time-out
STF	[TORQUE TIME OUT FLT]	<ul style="list-style-type: none"> The time-out of the torque control function is attained 	<ul style="list-style-type: none"> Check the function's settings Check the state of the mechanism
SSF	[Torque/current lim]	<ul style="list-style-type: none"> Switch to torque limitation 	<ul style="list-style-type: none"> Check if there are any mechanical problems Check the parameters of [TORQUE LIMITATION] (tLA-) page 202 and the parameters of the [TORQUE OR I LIM. DETECT.] (tld-) fault, page 251.
TJF	[IGBT overheat]	<ul style="list-style-type: none"> Drive overheated 	<ul style="list-style-type: none"> Check the size of the load/motor/drive. Reduce the switching frequency. Wait for the motor to cool before restarting

Faults - Causes - Remedies

Faults that can be reset as soon as their causes disappear

The USF fault can be inhibited and cleared remotely by means of a logic input or control bit ([Fault inhibit assign.] (InH) parameter, page [249](#)).

Fault	Name	Probable cause	Remedy
CFF	[Incorrect config.]	<ul style="list-style-type: none"> Option card changed or removed Control card replaced by a control card configured on a drive with a different rating The current configuration is inconsistent 	<ul style="list-style-type: none"> Check that there are no card errors. In the event of the option card being changed/removed deliberately, see the remarks below Check that there are no card errors. In the event of the control card being changed deliberately, see the remarks below Return to factory settings or retrieve the backup configuration, if it is valid (see page 269)
CFI	[Invalid config.]	<ul style="list-style-type: none"> Invalid configuration The configuration loaded in the drive via the bus or communication network is inconsistent. 	<ul style="list-style-type: none"> Check the configuration loaded previously. Load a compatible configuration
DLF	[Dynamic load fault]	<ul style="list-style-type: none"> Abnormal load variation 	<ul style="list-style-type: none"> Check that the load is not blocked by an obstacle Removal of a run command causes a reset
HCF	[Cards pairing]	<ul style="list-style-type: none"> The [CARDS PAIRING] (PPI-) function, page 257, has been configured and a drive card has been changed 	<ul style="list-style-type: none"> In the event of a card error, reinsert the original card Confirm the configuration by entering the [Pairing password] (PPI) if the card was changed deliberately
PHF	[Input phase loss]	<ul style="list-style-type: none"> Drive incorrectly supplied or a fuse blown Failure of one phase 3-phase ATV71 used on a single-phase line supply Unbalanced load <p>This protection only operates with the drive on load</p>	<ul style="list-style-type: none"> Check the power connection and the fuses. Use a 3-phase line supply. Disable the fault by [Input phase loss] (IPL) = [No] (nO). (page 242)
USF	[Undervoltage]	<ul style="list-style-type: none"> Line supply too low Transient voltage dip 	<ul style="list-style-type: none"> Check the voltage and the parameters of [UNDERVOLTAGE MGT] (USB-), page 246

Option card changed or removed

When an option card is removed or replaced by another, the drive locks in [Incorrect config.] (CFF) fault mode on power-up. If the card has been deliberately changed or removed, the fault can be cleared by pressing the ENT key twice, which **causes the factory settings to be restored** (see page [269](#)) for the parameter groups affected by the card. These are as follows:

Card replaced by a card of the same type

- I/O cards: [Drive menu] (drM)
- Encoder cards: [Drive menu] (drM)
- Communication cards: only the parameters that are specific to communication cards
- Controller Inside cards: [Prog. card menu] (PLC)

Card removed (or replaced by a different type of card)

- I/O card: [Drive menu] (drM)
- Encoder card: [Drive menu] (drM)
- Communication card: [Drive menu] (drM) and parameters specific to communication cards
- Controller Inside card: [Drive menu] (drM) and [Prog. card menu] (PLC)

Control card changed

When a control card is replaced by a control card configured on a drive with a different rating, the drive locks in [Incorrect config.] (CFF) fault mode on power-up. If the card has been deliberately changed, the fault can be cleared by pressing the ENT key twice, which **causes all the factory settings to be restored**.

User settings tables

Menu [1.1 SIMPLY START] (SIM-)

Code	Name	Factory setting	Customer setting
E C C	[2/3 wire control]	[2 wire] (2C)	
C F G	[Macro configuration]	[Start/Stop] (StS)	
b F r	[Standard mot. freq]	[50 Hz] (50)	
n P r	[Rated motor power]	According to drive rating	
U n S	[Rated motor volt.]	According to drive rating	
n C r	[Rated mot. current]	According to drive rating	
F r S	[Rated motor freq.]	50 Hz	
n S P	[Rated motor speed]	According to drive rating	
t F r	[Max frequency]	60 Hz	
P H r	[Output Ph rotation]	ABC	
I t H	[Mot. therm. current]	According to drive rating	
A C C	[Acceleration]	3.0 s	
d E C	[Deceleration]	3.0 s	
L S P	[Low speed]	0	
H S P	[High speed]	50 Hz	

Functions assigned to I/O

Inputs Outputs	Functions assigned
LI1	
LI2	
LI3	
LI4	
LI5	
LI6	
LI7	
LI8	
LI9	
LI10	
LI11	
LI12	
LI13	
LI14	

Inputs Outputs	Functions assigned
LO1	
LO2	
LO3	
LO4	
AI1	
AI2	
AI3	
AI4	
R1	
R2	
R3	
R4	
RP	
Encoder	

User settings tables

Other parameters (table to be created by the user)

[illegible][illegible]

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+/- speed	164
+/- speed around a reference	166
[AUTO DC INJECTION]	158
[AUTOMATIC RESTART]	238
[Auto tuning]	43
Brake logic control	171
[CATCH ON THE FLY]	239
Closed-loop synchronous motor	83
Command and reference channels	132
Deferred stop on thermal alarm	244
Direct power supply via DC bus	230
[DRIVE OVERHEAT]	243
[ENA SYSTEM]	93
[ENCODER CONFIGURATION]	114
[EVACUATION]	228
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[FAULT RESET]	237
[FLUXING BY LI]	86
Half floor	229
[TOP Z MANAGEMENT]	231
High-speed hoisting	184
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[RP CONFIGURATION]	<u>112</u>
[REGEN CONNECTION]	<u>232</u>
Save reference	<u>168</u>
[STOP CONFIGURATION]	<u>156</u>
Stop at distance calculated after deceleration limit switch	<u>211</u>
Summing input/Subtracting input/Multiplier	<u>149</u>
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Torque regulation	<u>198</u>
Traverse control	<u>220</u>
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A 1 C -					130						
A 2 C -					130						
A 3 C -					130						
A C 2			55				154 167 195				
A C C	44		55				152				
A d C							158				
A d C 0									261		
A d d									261		
A 1 1 A		52			107						
A 1 1 E					107						
A 1 1 F					107						
A 1 1 S					107						
A 1 1 t					107						
A 1 2 A		52			108						
A 1 2 E					108						
A 1 2 F					108						
A 1 2 L					108						
A 1 2 S					108						
A 1 2 t					108						
A 1 3 A		52			109						
A 1 3 E					109						
A 1 3 F					109						
A 1 3 L					109						
A 1 3 S					109						
A 1 3 t					109						
A 1 4 A		52			110						
A 1 4 E					110						
A 1 4 F					110						
A 1 4 L					110						
A 1 4 S					110						
A 1 4 t					110						
A 1 C 1					111		193				
A L G r		51, 53									
A N O A									261		

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Code	Page										
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A P O C									261		
A D I					126						
A D I F					127						
A D I t					126						
A D 2					128						
A D 2 F					128						
A D 2 t					128						
A D 3					129						
A D 3 F					129						
A D 3 t					129						
A D H 1					126						
A D H 2					128						
A D H 3					129						
A D L 1					126						
A D L 2					128						
A D L 3					129						
A P H		51, 53									
A S A				84							
A S H 1					127						
A S H 2					128						
A S H 3					129						
A S L				84							
A S L 1					127						
A S L 2					128						
A S L 3					129						
A S t				84, 87							
A S t S				85							
A S U				85							
A t A				85							
A t r								238			
A U I -					111						
A U S		51, 53									
A U t				88							
b b A				98							
b C I							175				
b d C O								261			

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Code	Page										
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b E C d							176				
b E d							177				
b E n			66				176				
b E t			67				176				
b F r	42		70								
b I P							175				
b I r			66				176				
b L C							175				
b O O				95							
b r A							155				
b r H O							178				
b r H I							178				
b r H 2							179				
b r H 3							179				
b r H 4							179				
b r O								256			
b r P								256			
b r r							179				
b r t			66				176				
b r U								256			
b S P					105						
b S t							175				
b U b								256			
C C F G	41										
C C S						141					
C d I						141					
C d 2						141					
C F G	41										
C F P 5		51, 53									
C H A I							215				
C H A 2							215				
C H C F						140					
C H n							219				
C L 2			62				204				
C L I			62	73			204				
C L L								250			

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Code	Page										
	[1.1 SIMPLY START] (S I P -)	[1.2 MONITORING] (S U P -)	[1.3 SETTINGS] (S E L -)	[1.4 MOTOR CONTROL] (d r C -)	[1.5 INPUTS / OUTPUTS CFG] (I - O -)	[1.6 COMMAND] (C L L -)	[1.7 APPLICATION FUNCT.] (F U N -)	[1.8 FAULT MANAGEMENT] (F L L -)	[1.9 COMMUNICATION] (C O M -)	[1.12 FACTORY SETTINGS] (F C S -)	[4 PASSWORD] (C O d -)
C L D							188				
C L S							213				
C n F 1							219				
C n F 2							219				
C n F 5		51, 53									
C O d											275
C O d 2											275
C O F							188				
C O L								250			
C O P						142					
C O r							188				
C P 1							183				
C P 2							183				
C r H 2					108						
C r H 3					109						
C r H 4					110						
C r L 2					108						
C r L 3					109						
C r L 4					110						
C S t											275
C t d			67								
C t t				70							
d A 2							151				
d A 3							151				
d A F							212				
d A L							212				
d A r							212				
d A S							208				
d b n							200				
d b P							200				
d b S							208				
d C F			60				156	258			
d C 1							157				
d C D							230				
d E 2			55				154, 167				

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d E C	44		55				152				
d L b								255			
d L d								255			
d L r											275
d O I					123						
d O I d					123						
d O I H					123						
d O I S					123						
d S F							213				
d S I							167				
d S P							165				
d t F							226				
E b O							225				
E C C								251			
E C t								251			
E F I					115						
E F r					115						
E I L					115						
E n A				94							
E n C				75	114						
E n O r					116						
E n r I					114						
E n S					114						
E n S P					117						
E n t r					116						
E n U				75	114						
E P L								245			
E r C O									261		
E t F								245			
F I				77							
F 2				77							
F 2 d			68								
F 3				77							
F 4				77							
F 5				77							
F A b				95							

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F C P				78							
F C S I										269	
F d L								253			
F F R					117						
F F P				91							
F F r					117						
F F L			68				156				
F F U				91							
F L G			56	90							
F L I				86			86				
F L O									262		
F L O C									262		
F L O L									262		
F L r								239			
F L U			63	86			86				
F P I							195				
F 9 R								253			
F 9 C								253			
F 9 F								253			
F 9 L			68								
F 9 S		51, 53									
F 9 L								253			
F r I						140					
F r I b							150				
F r 2						141					
F r E S					115						
F r H		51, 53									
F r S	42		76								
F r S S				82							
F r L							154				
F r Y -										269	
F S L							156				
F L d			68								
G F S										269	
G I E			60	94							
G P E			60	94							

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Code	Page										
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H F F -							229				
H L S							229				
H S D							188				
H S P	44		56								
I b r			66				175				
I b r A							183				
I d A				80							
I d C			60				157	258			
I d C 2			60				157	258			
I d N				79							
I n H								249			
I n r			55				152				
I n S P				76							
I n t P							202				
I P H S				81							
I P L	42							242			
I r d			66				175				
I S P							227				
I S r F							227				
I t H	44		56								
J A C D				89							
J A P L				90							
J d C			67				177				
J E S t				89							
J G F			63				160				
J G t			63				160				
J N U L				89							
J O G							160				
L I A to L I 4 A		52			103						
L I d to L I 4 d					103						
L A F							170				
L A r							170				
L A S							170				
L b A				98							
L b C			68	98							
L b C I				100							

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Code	Page										
	[1.1 SIMPLY START] (S I P -)	[1.2 MONITORING] (S U P -)	[1.3 SETTINGS] (S E L -)	[1.4 MOTOR CONTROL] (M O T -)	[1.5 INPUTS / OUTPUTS CFG] (I - O -)	[1.6 COMMAND] (C L L -)	[1.7 APPLICATION FUNCT.] (F U N -)	[1.8 FAULT MANAGEMENT] (F L T -)	[1.9 COMMUNICATION] (C O M -)	[1.12 FACTORY SETTINGS] (F C S -)	[4 PASSWORD] (C O D -)
L b C 2				100							
L b C 3				100							
L b F				100							
L C 2							204				
L C r		51, 53									
L C t							206				
L d 5				81							
L E 5							206				
L E t								245			
L F A				80							
L F F								258			
L F L 2								248			
L F L 3											
L F L 4											
L F n				79							
L I 5 I		52									
L I 5 2		52									
L L C							206				
L O 1					121						
L O 1 d					121						
L O 1 H					121						
L O 1 5					121						
L O 2					121						
L O 2 d					121						
L O 2 H					121						
L O 2 5					121						
L O 3					122						
L O 3 d					122						
L O 3 H					122						
L O 3 5					122						
L O 4					122						
L O 4 d					122						
L O 4 H					122						
L O 4 5					122						
L P 1							183				
L P 2							183				
L 9 5				81							

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PAR2							151				
PAR3							151				
Pr		51, 53	65								
PF		51, 53									
ncA1									260		
ncA2									260		
ncA3									260		
ncA4									260		
ncA5									260		
ncA6									260		
ncA7									260		
ncA8									260		
ncr	42		76								
ncr5				81							
nL5							213				
nPAR1									260		
nPAR2									260		
nPAR3									260		
nPAR4									260		
nPAR5									260		
nPAR6									260		
nPAR7									260		
nPAR8									260		
nPr	42		76								
ncd				95							
nSL				79							
nSP	42		76								
nSP5				81							
nSt							156				
oD2		51, 53									
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<i>D d t</i>								242			
<i>D F I</i>				72							
<i>D H L</i>								243			
<i>D L L</i>								241			
<i>D P L</i>								242			
<i>D P r</i>		51, 53									
<i>D S P</i>							188				
<i>P A H</i>			65				194				
<i>P A L</i>			65				194				
<i>P A S</i>							213				
<i>P A U</i>							195				
<i>P E r</i>			66				194				
<i>P E S</i>							183				
<i>P F I</i>					112						
<i>P F r</i>					112						
<i>P G A</i>					115						
<i>P G I</i>				115	115						
<i>P H S</i>				81							
<i>P H r</i>	43			71							
<i>P I A</i>					112						
<i>P I C</i>							194				
<i>P I F</i>							193				
<i>P I F 1</i>							193				
<i>P I F 2</i>							193				
<i>P I I</i>							193				
<i>P I L</i>					112						
<i>P I n</i>							195				
<i>P I P 1</i>							193				
<i>P I P 2</i>							193				
<i>P I S</i>							194				
<i>P O H</i>			65				194				
<i>P O L</i>			65				194				
<i>P P I</i>								257			
<i>P P n</i>				79							
<i>P P n 5</i>				81							
<i>P r 2</i>							197				

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P r 4							197				
P r P			65				194				
P S 1 -							216				
P S 2 -							216				
P S 3 -							216				
P S 2							162				
P S 4							162				
P S B							162				
P S 1 B							162				
P S r			66				195				
P S t						140					
P t C 1								236			
P t C 2								236			
P t C L								236			
P t H		51, 53									
q S H			67				225				
q S L			67				225				
r 1					118						
r 1 d					119						
r 1 H					119						
r 1 S					119						
r 2					119						
r 2 d					119						
r 2 H					119						
r 2 S					119						
r 3					120						
r 3 d					120						
r 3 H					120						
r 3 S					120						
r 4					120						
r 4 d					120						
r 4 H					120						
r 4 S					120						
r R P				94							
r b P							181				
r b C							181				

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r b d							181				
r C R							208				
r C b							150				
r d G			65				194				
r E 9 P				82							
r E t P				82							
r F C						141					
r F r		51, 53									
r F t -							228				
r I G			65				194				
r I n						140					
r P								237			
r P 2			66				197				
r P 3			66				197				
r P 4			66				197				
r P R								237			
r P C		51, 53									
r P E		51, 53									
r P F		51, 53									
r P G			65				193				
r P I							193				
r P D		51, 53									
r P P n					115						
r P 5							154				
r P t							152				
r r 5					102						
r S R				80							
r S R 5				81							
r S d							188				
r S F								237			
r S L							196				
r S n				79							
r S n 5				82							
r S P							228				
r S t L							188				
r S U							228				

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r t H		51, 53									
r t O							200				
r t r							226				
S R 2							151				
S R 3							151				
S R F							212				
S R L							212				
S R r							212				
S R t								244			
S C L							188				
S C S I										269	
S d C I			61				158, 176				
S d C 2			61				158				
S d d								251			
S F C			56	89							
S F C			56								
S F d							213				
S F r			62	72							
S I t			56	89							
S I t			56								
S L L								250			
S L P			60	78							
S n C							226				
S O P				96							
S P 2			64				163				
S P 3			64				163				
S P 4			64				163				
S P 5			64				163				
S P 6			64				163				
S P 7			64				163				
S P 8			64				163				
S P 9			64				163				
S P 10			64				163				
S P 11			64				163				
S P 12			64				163				

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S P I 3			64				163				
S P I 4			64				163				
S P I 5			65				163				
S P I 6			65				163				
S P d		51, 53									
S P G			56	89							
S P n							168				
S P t							199				
S r P			65				167				
S S b								251			
S S C d					117						
S S C P					116						
S S F S					116						
S S L				89							
S t A			56	90							
S t d							213				
S t n								246			
S t O								251			
S t P								246			
S t r							165				
S t r t								247			
S t t							156				
S U L				96							
t A 1			55				153				
t A 2			55				153				
t A 3			55				153				
t A 4			56				153				
t A A							202				
t A C		51, 53									
t A r								238			
t b E			66				176				
t b O							225				
t b r									261		
t b r 2									261		
t b S								246			
t C C	41				102						

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t C t					102						
t d l			60				157	258			
t d C			60				157	258			
t d C l			61				158				
t d C 2			61				159				
t d n							225				
t d S								253			
t F O									261		
t F O 2									261		
t F r	42		71								
t H R								243, 244			
t H d		51, 53									
t H r		51, 53									
t H t								241			
t L R							202				
t L C							203				
t L d								255			
t L I G			67				202				
t L I n			67				202				
t L S			63				196				
t n L								256			
t O b							200				
t O S							188				
t O S t							231				
t 9 b								253			
t r l							199				
t r R				80							
t r C							225				
t r H			67				225				
t r L			67				225				
t r n				79							
t r P							199				
t r r		51, 53									
t r t							199				
t S d							199				

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£ S N								246			
£ S S							199				
£ S £							199				
£ S Y							226				
£ £ d			68					241, 244			
£ £ d 2								241, 244			
£ £ d 3								241, 244			
£ £ H			67								
£ £ L			67								
£ £ O								261			
£ £ r			67				177				
£ U L				88			88				
£ U n	43			88							
£ U P							225				
£ U S	43			88							
U O				77							
U 1				77							
U 2				77							
U 3				77							
U 4				77							
U 5				77							
U b r				98							
U C 2				78							
U C b								239			
U C P				78							
U E C P					116						
U E C U					116						
U E L C					116						
U F r			60	95							
U I H 1					107						
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U I L 1					107						
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U I L 4					110						
U L n		51, 53									
U L r											275
U n 5	42		76								
U O H 1					126						
U O H 2					128						
U O H 3					129						
U O L 1					126						
U O L 2					128						
U O L 3					129						
U O P		51, 53									
U P L								246			
U r E 5								246			
U S b								246			
U S 1							167				
U S L								246			
U S P							165				
U S t								246			

