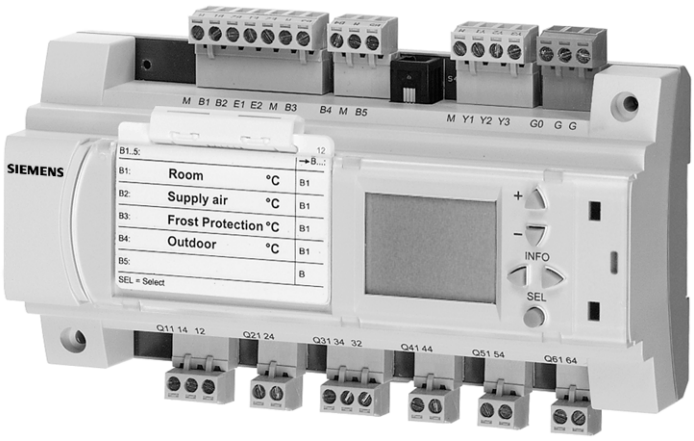
SIEMENS



POLYGYR Joker®

RWX 62...

User's Guide

Landis & Staefa Division

Table of Contents

1 Overview

1.1 Brief description

Fully autonomous electronic universal controller with up to three configurable control loops as sequence controllers with P, PI, PID mode or as digital controllers with P-mode. Universal inputs for analog or binary signals. Separate outputs for analog or binary signals. AC 24 V operating voltage. Direct entry and setting of all data on the unit; no extra tools required.

1.2 Primary application

The universal controller is primarily intended for comfort ventilating and air conditioning plants. However, the controller can also be used in comfort heating plants.

1.2.1 Controlled variables

The following variables can be controlled:

– Temperature -35...130 °C

– Relative humidity 0...100 %

– Absolute humidity 0...20 g/kg

– Enthalpy 0...100 kJ/kg

– Pressure 0...40 bar

– Pressure differential in liquid media 0…10 bar

– Pressure differential in gaseous media 0...500 Pa or 0...3.00 kPa

– Volumetric air flow 0...850 m3 /s or m3 /h or l/h

– Indoor air quality 0...2000 ppm CO2 (0...200 display)

1.2.2 Application functions

- Controller:
  - 1...3 sequence controllers with auxiliary functions and analog and digital (two-position) outputs or
  - 1...3 digital controllers with digital (two-position) outputs
- Auxiliary functions:
  - Operating mode changeover
  - Setpoint compensation
  - Switching function in dependence of outside temperature
  - Cascade control
  - Minimum and maximum limitation
  - Frost protection function
  - Message on excessive control deviation
  - Maximum priority for cooling/dehumidifying
  - Reversal of operating action of the positioning signal

1.3 Type summary

Inputs		Outputs		Type reference
Analog/Binary	Binary	Analog	Binary	
3	2	3	0	**RWX62.5030**
5	2	3	2	**RWX62.7032**
5	2	3	4	**RWX62.7034**
5	2	3	6	**RWX62.7036**

1.3.1 Documentation

Data sheet in English	**CM2N3351E**
Installation and Commissioning Guide in English including operating cards (set at 20 cards each; diff. languages avail.)	**ARG62.120EN**

1.3.2 Spare parts

Operating card holder	**PUP1.2**
Front installation frame	**ARG62.10**

1.3.3 Customized units

Landis & Staefa supplies customer-specific units on large orders; these units differ as follows from standard units with regard to configuration and/or design:

- Pre-configured applications within the standard options range
- Preset, adjustable parameters within the standard options range
- Unit with e.g., customer logo and customer-specific reference

Please contact the Landis & Staefa branch or representative in your area for customer-specific units.

1.4 Equipment combinations

The following Landis & Staefa sensors, actuators and signal converters can be connected to the POLYGYR universal controllers RWX62...:

Unit	**Data sheet no.**
• Sensor with LGNi 1000 Ω temperature measuring element	**1**7... to **1**9...
• Sensor with DC 0...10 V sensing signal	**1**7... to **1**9...
• Frost sensor QAF63... and frost monitor QAF64...	**1**821 / **1**283
• Room temperature sensor with setpoint adjuster QAA25	**1**721
• Remote setpoint adjusters FZA21.11 + FZA61.11	**1**98...
• Air damper actuators with DC 0...10 V input	**4**6...
• Valve actuators with DC 0...10 V input	**4**5...
• Control valves	**4**6...
• Signal converter SEM 61.4 for current valve control	**5**1...
• Various signal converters	**3**4...

Combinations using third-party units are possible, provided they correspond to the input and output specifications of the POLYGYR RWX62....

2 Important notes

⇒ **Read this chapter before proceeding to the next chapter!**

⇒ **This chapter contains important information regarding your own safety and that of your plant.**

2.1 Proper use

Field of use

Use the POLYGYR RWX62... only to control and monitor ventilating and air conditioning plants as well as heating plants.

Combination with other components

The controller is designed for unrestricted use with units supplied by Landis & Staefa or third-party products recommended by Landis & Staefa. For the overall configuration, pay attention to all safety-related instructions on operation and faulty behaviour as provided by the manufacturer of the third-party products.

Connecting or linking third-party units not recommended by Landis & Staefa is possible, provided the units correspond to the technical and safety-related requirements as specified in the product description.

2.2 Safety notes

2.2.1 Safety symbols in this User's Guide

⚠ The warning symbol on the left denotes special safety notes or warnings.
If you disregard these notes, injuries and/or substantial product damages may result.

⇒ Observe all special notes (arrow)!

Where are the warning symbols?

This chapter and the associated chapters in the operating instructions contain special safety notes and warnings.

Notes and warnings are used in various locations and not just where immediate danger emanates from the POLYGYR RWX62….

The warning symbol also denotes cases where improper use or incorrect plant settings may result in immediate danger.

Please observe all further safety symbols attached to the units and plant components. The corresponding safety text is located in the respective units' description or directly on the units.

2.2.2 Prerequisites for commissioning and operation

Only authorised experts trained by Landis & Staefa may commission the RWX62…

Only persons trained and made aware of possible dangers either by Landis & Staefa or authorised trainers may operate the RWX62… .

2.2.3 Active and passive safety

Active and passive safety

Active and passive safety are product-related states.
Either the product itself actively invokes a safe state (system safety, e.g., through constructed safety) or the product provides passive safety and is thus dependent on safety invoked through use.

Active system safety

Active safety for the RWX62... is achieved by means of the following:

- Safety activated by the software (self-diagnosis, plausibility tests, warning of danger, deactivation on faults, data backup on voltage failure, etc.)
- Safety guaranteed through design

Passive system safety

Passive safety for the RWX62... is achieved by means of the following:

- Separation of the configuration level from the "AUTO MODE" control mode (operators less familiar with the system may only access a few uncritical parameters such as setpoints, etc.)
- Training of commissioning personnel by Landis & Staefa (training for correct handling of the system and for adherence to safety requirements)
- Operator training which encompasses safety issues

2.2.4 General safety notes

The POLYGYR RWX62... provides state-of-the-art technology and all associated safety that, by including the circumstances, can be expected from the product.

Intended use

Prerequisite for trouble-free and safe operation of the RWX62... are correct transport, appropriate storage, correct mounting, installation and commissioning as well as careful operation.

The following safety notes not only relate to the RWX62... controller but also to the respective environment (e.g., control cabinet) and the building plants.

⚠ Observe all safety-related notes and adhere to the corresponding regulations to avoid personal injuries and damages to equipment.

⇒ Do not remove, bridge or deactivate safety equipment, safety functions and monitoring equipment.

⇒ Use the units and system components only if technically sound. Correct all faults that may impact safety.

⇒ Adhere to the required safety measures against excessive shock hazard voltages and abstain from all actions that may impair existing safety measures.

⇒ Do not remove, for example, covers, housings, or other protective equipment. Do not operate the plant or plant components if installed protective equipment is ineffective or impaired in its intended function.

⇒ Do not conduct any actions that may impair the required separation of safety extra-low voltage (AC 24 V).

⇒ Disconnect power prior to opening the control cabinet. Do not conduct any work when voltage is present.

⇒ Disconnect voltage to the plant on fuse exchanges and use only the prescribed fuse types.

⇒ Avoid electro-magnetic interference and other types of disturbance to signal and connecting lines, because they may trigger malfunctions that ultimately impair safety.

⇒ Mount and install the system and other plant components only according to the respective mounting and installation instructions.

⇒ Protect all electronic components, unprotected circuit boards, free plugs and other components connected to the inner circuits from static charges.

⇒ With regard to static charges, observe all required safety measures such as grounding, equipotential bonding, electroconductive bases (avoid high-isolation materials), etc.

2.3 Packing, storage and transport

The required packing for storage and transport depends on the following:

– Possible mechanical influences

– Possible climatic influences.

Use original packing

Use the Landis & Staefa or the supplier's original packing if average (EC standard) mechanical and climatic influences exist during transport.

Mechanical protection

Avoid external, mechanical stress to the packing (e.g., sharp or dull items). Stack the packed units only when the packing is designed to protect the contents from the extra stress.

Transport under difficult conditions

For transport under difficult conditions (e.g., in open vehicles, in the case of extraordinary jolting, when transported via ship or to sub-tropical areas), use additional or different packing designed to withstand such conditions.

Storage

Store the unit so that damaging environmental influences cannot impact the unit. Avoid recurring and especially abrupt temperature changes during storage. Temperature changes can be especially damaging if condensation occurs.

⇒ Observe the listed limit values for storage and transport as listed in chapter 13, "Technical data“ and in data sheet CM2N3351E.
If unsure, contact your supplier or Landis & Staefa.

⇒ The party responsible for damages is liable for damages incurred due to improper packing, storage and transport.

2.4 Maintenance and service

Cleaning the front

When flush panel mounting the RWX62..., the front of the unit is the only part accessible from the outside. Clean the front, if necessary, with a moist (not wet), soft, clean cloth. To remove stains, use commercial soap or neutral solutions.

⇒ Do not use scouring or plastic-eroding cleaning agents.

⇒ Avoid acidic or alkaline solutions, sprays, blows and shocks to the unit!

Faults

Call service when faults occur and you are not authorised to conduct diagnoses or correct the fault.

⚠ Only authorised personnel may conduct diagnoses, fault correction and commissioning. This also applies to work within the control cabinet (e.g., checks, fuse exchange).

⇒ Unauthorised manipulations relieve Landis & Staefa from liability. The party responsible for damages is liable for damages to the system as well as for consequential damages.

2.5 Environment, disposal

Environmental protection

The POLYGYR RWX62... does not produce any known, environmentally damaging emissions during operation.

Disposal

Please adhere to the following for disposal of defective system components or of the system after the expected product life:

- Dispose of them properly, i.e., separate the parts according to materials. The aim is to recycle as many base materials as possible at the lowest possible environmental impact.
- Do not dispose of electric and electronic waste via regular household garbage; dispose of these materials at the corresponding disposal locations.
- As a rule, dispose of all waste in an environmentally compatible manner and in accordance with environmental, recycling and disposal techniques.

2.6 Abbreviations

A list of the most commonly used and most complex abbreviations and acronyms is available at the end of this User's Guide. For better readability, the abbreviations are listed in alphabetical order.

The following abbreviations and acronyms have been used in drawings and illustrations:

AC	Alternating current	XDZ	Dead zone
B...	Universal inputs	XP	P-band
DC	Direct current		
DT	Dead time	Y	Manipulated variable
E	Digital input	Y...	Modulating output
I	Integral (controller)		
K	Degrees Kelvin	φ	Humidity
Min	Minutes	Ω	Ohms
OFF	OFF		
ON	ON	☾	Night (operation)
P	Proportional (controller)	☼	Day (normal operation)
Q	Load	❄	Frost
Q...	Output (relay contact)	⏻	Standby
s	Seconds	■	ON (active)
t	Temperature (°C)		
T	Time		
of r.	of range		
V	Volt		
w	Setpoint		
x	Actual value		

3 Mechanical design

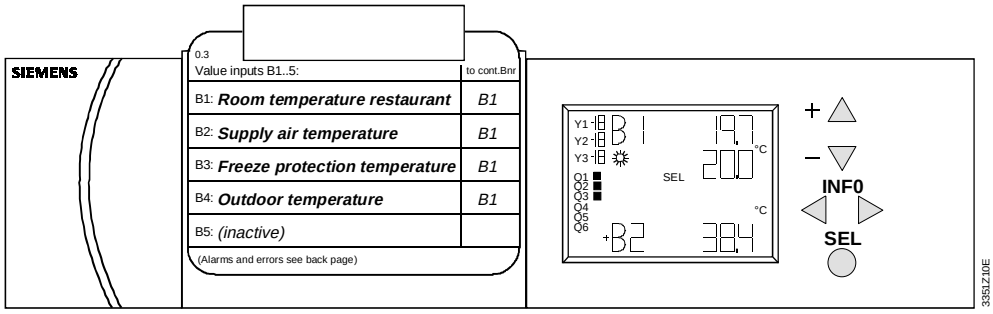
3.1 Housing

The POLYGYR RWX62... universal controller is a compact unit as defined by DIN 43 880 Gr 1 and is integrated in a closed, elegantly designed plastic housing.

Connection terminals Plug-in screw terminals.
The terminals for G, G0 are orange to allow for easy distinction.

3.2 Operating and display elements

Operate the RWX62... by actuating the operating elements on its front panel.



Transparent compartment | LCD | Operating buttons

3.2.1 Transparent compartment

The transparent compartment holds the application-specific operating instructions (operating cards). The operating cards are supplied with the universal controller. After successfully entering all data, complete the cards accordingly.

3.2.2 LCD

The following information is indicated on the LCD:

– The current operating values (maximum 3 digits)

– The functional code and the symbols

3.2.3 Operating buttons

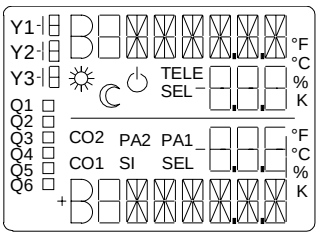
The operating buttons have the following functions:

INFO Use the INFO operating buttons to select the information picture (function code).

Use the left arrow button (<) to select the previous picture and the right (>) for the next one.
Use the right arrow (>) to acknowledge a flashing display and simultaneously proceed to the next picture.

SEL Use the SEL button to enable changes or acceptance of the settings. Flashing displays mean: the data can be changed.

+ / – Use the + / – buttons to increase or decrease the flashing data values.



The following test picture appears on the LCD for approx. 5 seconds after switching on the AC 24 V operating voltage. This picture contains all available segments. Then, the current software version is indicated. After another 5 seconds, the display automatically changes to the next current picture.

For not-yet configured devices: display of the configuration mode: CONF2/MODE. This is where HVAC specialists enter all application-specific data.

For configured devices: see chapter 5, User's Guide (AUTO MODE).

Note

All abbreviations on the LCD are listed in the fold-out at the end of this document.

4 Mounting

The following mounting options exist for control cabinet mounting:

- Mounting in a standard cabinet as per DIN 43 880
- Wall mounting on an existing top-hat rail (EN 50 022-35x7.5)
- Wall mounting using two fixing screws
- Flush panel mounting with ARG62.10 mounting frame

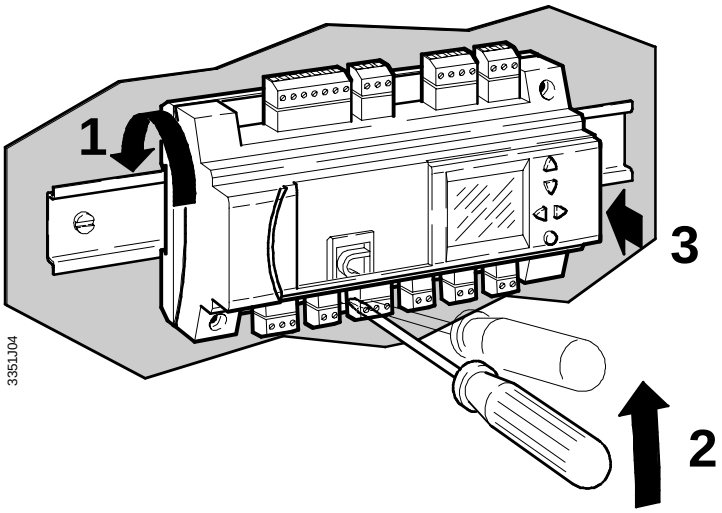
Mounting notes

For DIN rail (top-hat rail) mounting, no additional components are required (A).

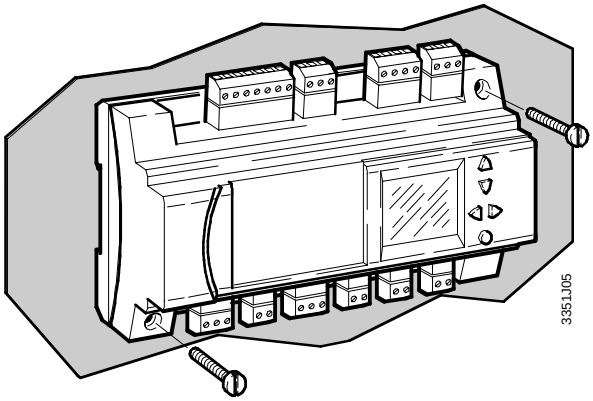
Two screws of the following size are necessary for screw mounting: dia 3.7mm (B).

For flush panel mounting, the ARG62.10 mounting frame is necessary (C).
The plug-in terminals can be connected to the litz wire before or after flush panel mounting (moveability).

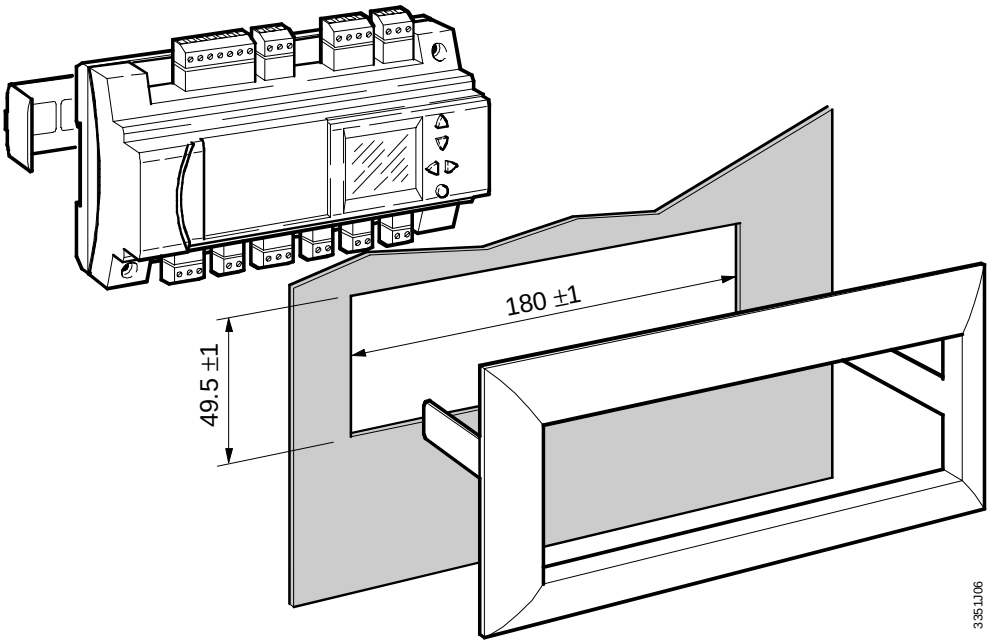
Mounting by using a DIN rail (A)



Direct mounting
on wall (B)

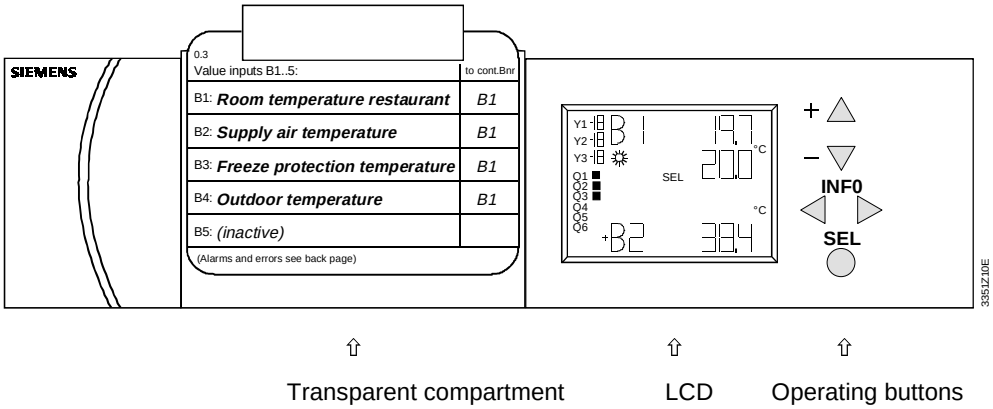


Flush panel mounting
(C)



5 Operating instructions for plant operators

5.1 Operating elements



⇧ Transparent compartment ⇧ LCD ⇧ Operating buttons

Transparent compartment

The transparent compartment holds the application-specific operating booklet (operating cards).

The operating buttons have the following functions:

INFO

Use the INFO operating buttons to select the information picture (function code).

Use the left arrow button (<) to select the previous picture and the right (>) for the next one.

Use the right arrow (>) to acknowledge a flashing display and simultaneously proceed to the next picture.

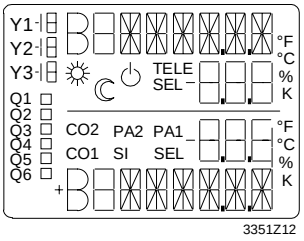
SEL

Use the SEL button to enable changes or acceptance of the settings. Flashing displays mean: the data can be changed.

+ / –

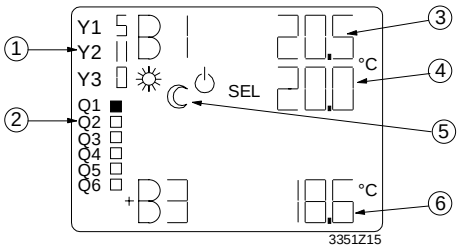
Use the + / – buttons to increase or decrease the flashing data values.

LCD



The following test picture appears on the LCD for approx. 5 seconds after switching on the AC 24 V operating voltage. This picture contains all available segments. Then, the current software version is indicated. After another 5 seconds, the display automatically changes to the next current picture.

For not-yet configured devices: Display of the configuration mode: CONF2/MODE. This is where HVAC specialists enter all application-specific data.



① Indication of all analog outputs Y e.g., Y1 5 ⩦ output signal DC 5 V

② Indication of all digital outputs Q e.g., Q1 ■ ⩦ output Q1 closed

Q2 ⩦ output Q2 open

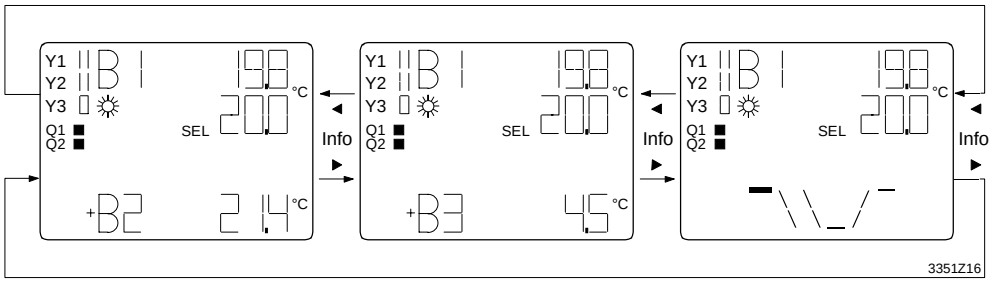
③ Indication of the main controlled variable

④ Setpoint indication

⑤ Operating indication ☼ Day operation, ☾ Night operation, ⏻ Standby (OFF, Ready)

⑥ Indication of auxiliary controller values or of the sequence diagram.

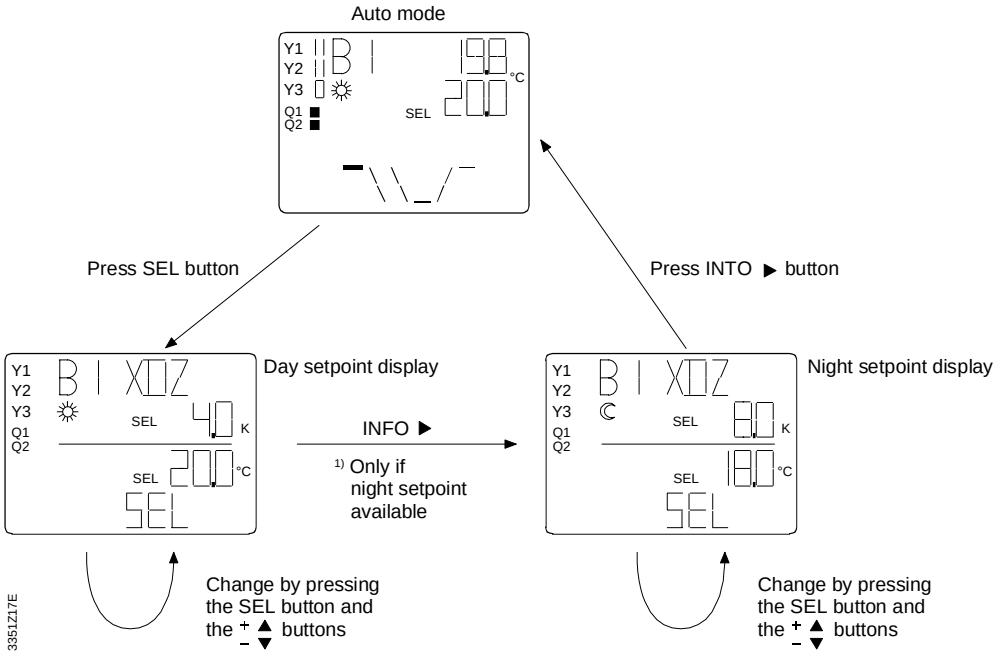
5.2 Plant operating state



You can call up all information with the help of the INFO buttons.

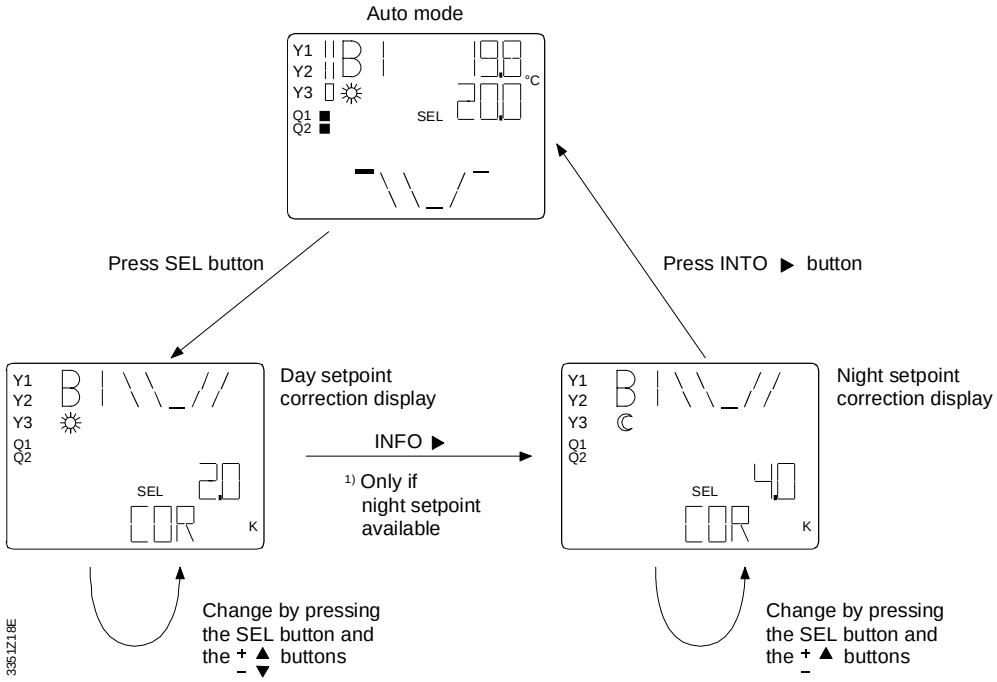
5.3 Setpoint adjustment for fixed setpoints

(See "Setpoint function description")



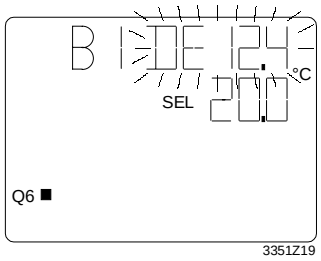
5.4 Setpoint readjustment setting for compensated setpoint

(See "Setpoint function description")



5.5 Alarm and fault display

5.5.1 Deviation alarm

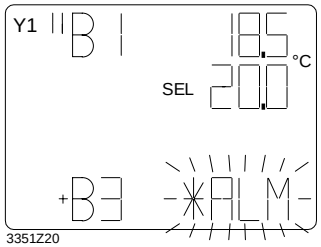


3351Z19

Meaning:

Excessive control deviation between the actual value of the main variable and the setpoint.

5.5.2 Frost alarm, frost protection thermostat ❄PROT



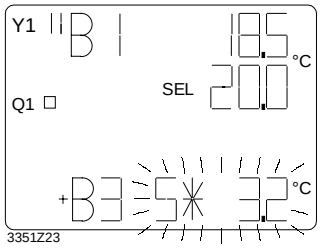
3351Z20

Meaning:

Frost alarm from frost protection thermostat
⚠ Control function inactive, Y heating outputs set to maximum heating.

During normal operation, ❄ PROT is indicated.

5.5.3 Frost alarm super frost protection function S❄PROT

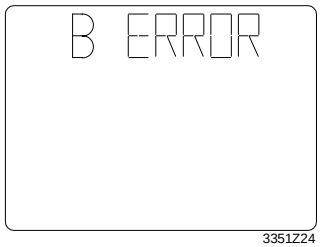


3351Z23

Meaning:

- Frost alarm for the super frost protection function
  ⚠ Control function inactive, Y heating outputs set to maximum heating, external alarm and deactivation of the fans via Q1
- Alarm acknowledgement
  On manual acknowledgement, SEL flashes
  Acknowledge by pressing the SEL button

5.5.4 Invalid measured value, sensor defect for main variable



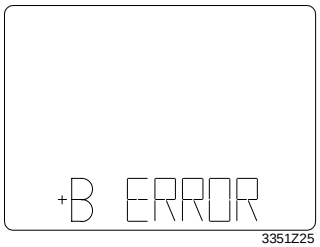
3351Z24

Meaning:

The value of the main controlled variable is outside of the valid range or the sensor is defective.

⚠ Control functions inactive, super frost protection function S ❄ PROT active

5.5.5 Invalid measured value, sensor defect for auxiliary values



3351Z25

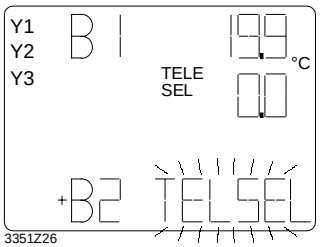
Meaning:

The corresponding measured value is outside of the valid range or the sensor is defective.

⚠ The function LIM, LIMSPE, LIMMAX, MAXPRI, MULFUN linked to the respective measured value is inactive.

The function is active when the measured value of the super frost protection function is incorrect.

5.5.6 Invalid measured value, defective remote setpoint adjuster



3351Z26

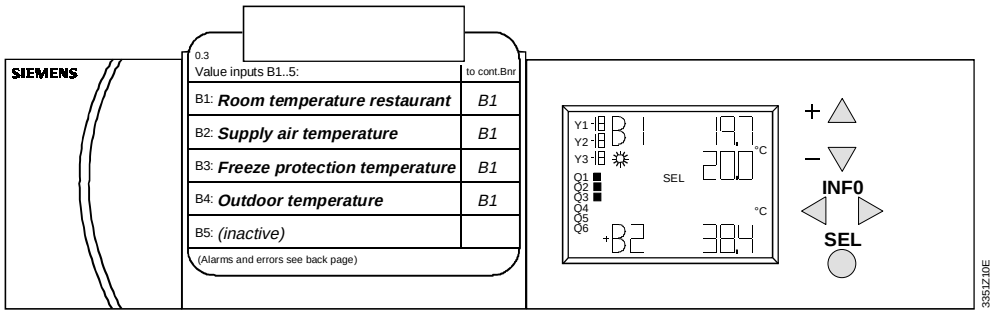
Meaning:

The remote setpoint transmitter's value is either outside of the valid range or defective.

⚠ The setpoint is set for the lower setpoint adjustment limit MINSEL.

The super frost protection function remains active.

6 Operating instructions for service technicians



⇧ Compartment for operating cards ⇧ LCD ⇧ Operating buttons

6.1.1 Operation

Enter the desired configuration and parameters via the five operating elements.

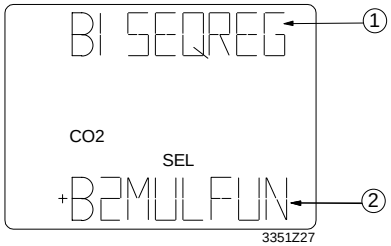
- Use the INFO button (**<**) to select the preceding picture or the INFO button (**>**) for the next picture.
- If you need to change the displayed data:
  - Press the SEL button: the display flashes (functions or parameters).
  - Change the flashing data by pressing the + or – button until the desired data is displayed.
  - Confirm by again pressing the SEL button or the right INFO button (**>**). When you use the INFO button for confirmation, the next picture appears.
- If the displayed data is correct: confirm with the right INFO key (**>**) and proceed to the next picture.

6.1.2 New configuration of the RWX62 universal controller

Both configuration and parameterization procedures are clearly defined. Easily recognisable codes guide you through the previously mentioned setting modes.

Observe the following items:

- The main controlled variable is indicated on the topmost line of the display (corresponds to the controller number) and is labelled B... ; the auxiliary control functions for the main controller are indicated in the bottom line and are labelled +B.



① Main controller B1 ② Auxiliary control function B2

- When allocating the signal outputs, changeover from Y to Q occurs via the SEL button. The allocated Y... and Q... outputs appear on the left of the display as a confirmation.
- You can automatically change from one mode to another by pressing the right INFO button (**>**).
- Functions or data that are technically impossible due to preceding entries are ignored and no longer displayed.
- The temperature variable (°C/K or °F) is shown at the right border of the display.
- The respective mode is indicated at all times on the display by means of abbreviations (CO2, CO1, PA2, PA1 or SI).
- Changeover to automatic control operation occurs after completing configuration and parameterization of all CO2, CO1, PA2, PA1 modes.
- Returning to commissioning mode from automatic control mode is possible only as per the procedures described in section "Changing parameters and configurations".

6.1.3 Changing parameters and configurations

Important

- Only specialists may change the PA..., CO..., or SI modes of a completely configured and parameterized unit.
- All automatic control and frost protection functions are ineffective in the SI, CO1, and CO2 modes.
- Each change to the CO1 and CO2 modes deletes all subsequent entries and resets them to their default values. All settings of subsequent configurations must be re-entered. (Exception: a change of the temperature display of °C/K to °F or vice versa only changes the display of all temperature values.)
- Each change in the CO... and PA... modes becomes active only on exiting the current mode.

After supplying AC 24 V, a fully configured unit starts in automatic control mode and displays the picture of the first B1 controller or a picture of a pending error message on the LCD.

In order to change over from control mode to either the PA...,CO... or SI mode, press the + and – buttons until the desired mode appears on the display. The table below contains the associated duration in seconds.

Press + / – buttons for	Mode
5 seconds	PA1 parameterization mode 1
10 seconds	PA2 parameterization mode 2
15 seconds	SI simulation mode
20 seconds	CO1 configuration mode 1
25 seconds	CO2 configuration mode 2

When the desired mode appears on the display, release the button.

After all changes are made, you can return to the automatic control mode AUTO MODE by either pressing the INFO button several times or by simultaneously pressing the + and – buttons for two seconds.

7 Configuration

7.1 Internal structure

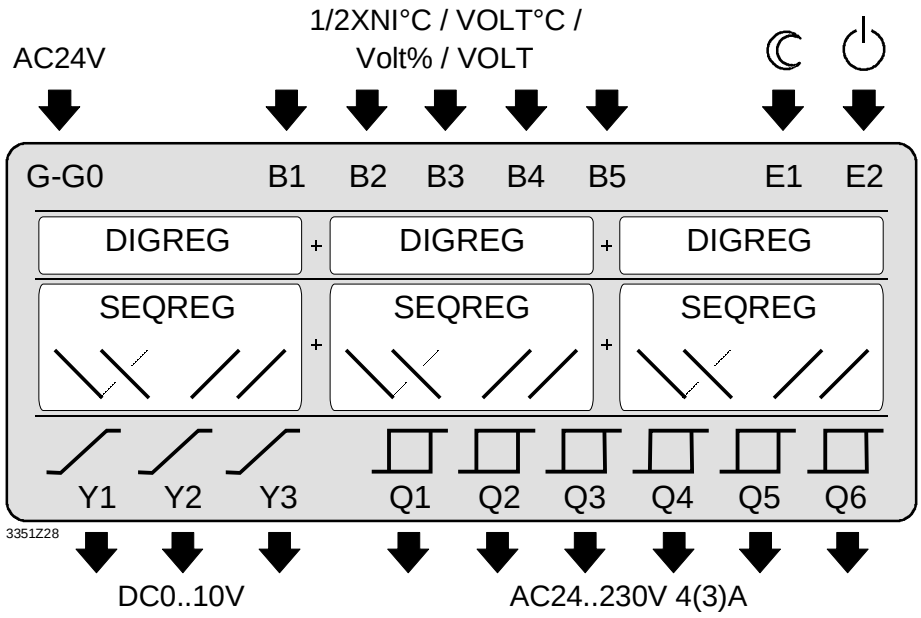
POLYGYR Joker provides a high degree of flexibility due to its free allocation of inputs and outputs to three internal universal control loops.
The control loops execute main and auxiliary functions. You can specify the desired effect by entering configurations and setting parameters.

POLYGYR Joker can alternately be used as either a sequence or digital controller. If it is encoded as a sequence controller on configuration [SEQREG], up to three mutually independent sequence control loops are available with either P, PI, or PID mode at up to four sequences each. If the POLYGYR Joker is encoded as a digital controller [DIGREG], up to three mutually independent step switches are available.
The five universal inputs (Ni1000, DC 0...10V and AC 24 V), depending on the application requirements, can be freely allocated to the internal control loops in the form of function requests.

Depending on the controller type, a maximum of three DC 0…10 V signal outputs and a maximum of six relay outputs are available. These outputs can freely be allocated to the individual sequences.

In order to provide a better understanding of POLYGYR Joker, the diagram below illustrates the internal structures.

Example: RWX62.7036 internal structure



7.2 Setting mode

Important

During configuration and parameterization, the automatic control mode is inactive.

POLYGYR Joker provides the following setting and operating modes. In order to indicate at all times the current mode, an abbreviation of the respective mode appears on the display. On delivery, the universal controller is set to the starting point of the lowest setting level: configuration mode 2.

Configuration mode 2

[CO2] Configuration starting point. This is where you allocate the inputs and outputs to the control loops. After quitting configuration mode 2, the function configurations and the input and output terminal designations are all defined. The optimal unit type is also defined.

Configuration mode 1

[CO1] Fine tuning of the configuration data, such as °C/K or °F display, P/PI or PID mode, cascade function inactive, active, etc.

Parameterization mode 2

[PA2] Setting of all fine-tuning parameters such as P-bands, integral action time, measured value corrections, actual value limitations, etc.

Parameterization mode 1

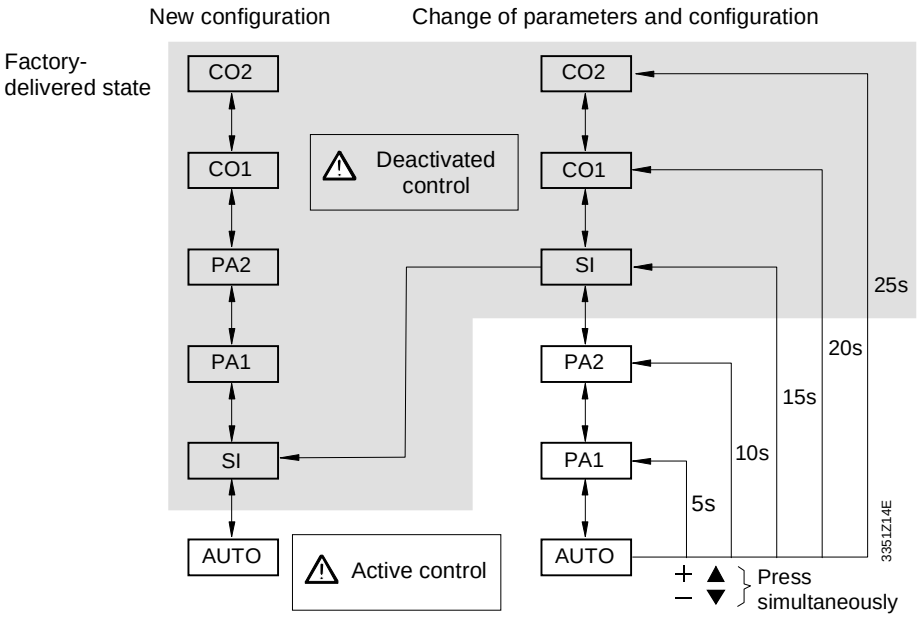
[PA1] Setting of all setpoints for both sequence controllers and associated auxiliary controllers.

Simulation mode

[SI] In the simulation mode, you can check the configured functions by entering simulated power values (sequence controller) or simulated actual values (digital controller). The sequence diagram (sequence controller only) and the output values appear on the LCD. This allows you to check both switching points and plant wiring.

Important

The control loop is inactive in the simulation mode! For the active simulation mode, the controller outputs are active according to the simulation.
Connected units such as actuators, motors (e.g., pumps), electric heating systems, chiller compressors, air conditioning units, etc., are supplied with power and begin operation. Disable plants that are not yet ready for operation. To do this, remove the relevant main fuse or disconnect the electrical connections. However, only trained specialists may remove the electrical connections. Additionally, delayed switching is ineffective in the simulation mode. When the simulation is activated with the SEL button, all Y... and Q... outputs immediately switch to the displayed value or state.

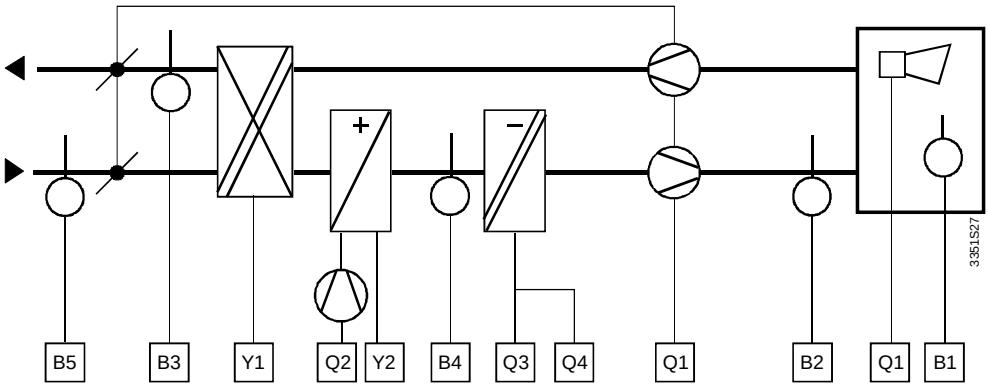


8 Implementing a plant in the controller configuration

With the help of an example, we will show you how to easily implement plant control via the POLYGYR Joker universal controller. We will explain the initial steps by means of configuration mode 2. However, not every step is explained individually. Instead, we intend to convey the configuration philosophy behind the POLYGYR joker.

Implementation is based on an easy question-answer setup. Based on the replies (settings) that you make on the individual pictures, the controller will only ask you to supply the respectively relevant information. Due to this concept as well as integrated plausibility tests, bad settings are not very likely.

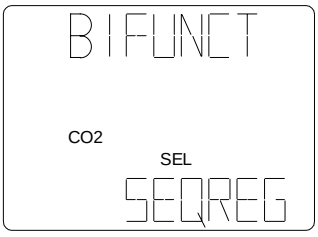
Please gather all necessary information on the plant that you want to control. Then draw a plant schematic.



Turn on the power supply for the POLYGYR Joker and start by replying to the controller questions.

8.1.1 Allocation of all universal inputs

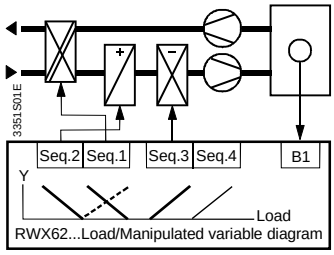
Display **Question**



3351Z61

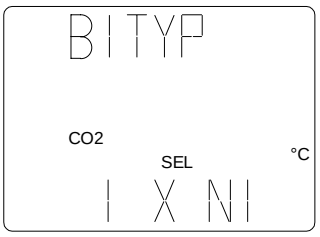
[FUNCT]
Function of the controller and of the
main controlled variable for the first controller B1 ?

☒ Sequence controller or ☐ Digital controller



Input signal type ?

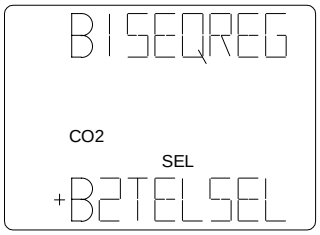
☒ 1 x Ni ☐ 2 x Ni ☐ Volt °C ☐ Volt % ☐ Volt



3351Z62

The next few steps refer to the auxiliary functions for the main controller B1.

Display **Question**

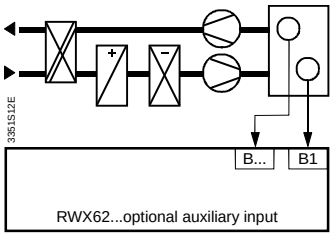


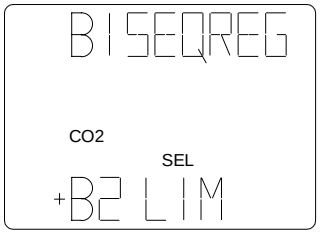
3351Zc1

[TELSEL]
Do you have a remote setpoint adjuster ?
☐ Yes

Input signal type ?
☐ Ohm ☐ Volt

☒ No; proceed to next function with "+" button





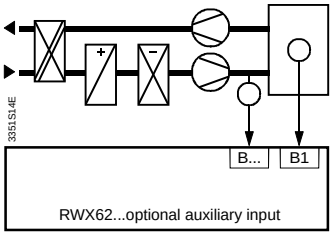
3351Zc2

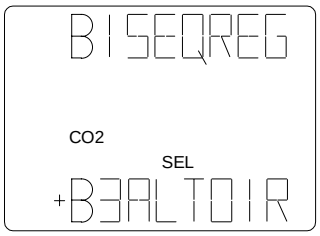
[LIM]
Do you intend to use a limitation function (e.g., supply air temperature limitation, supply air humidity…), cascade control or maximum temperature differential control ?

☒ Yes; proceed to next function with ">" INFO button

Input signal type ?
☒ 1 x Ni ☐ 2 x Ni ☐ Volt °C ☐ Volt % ☐ Volt

☐ No





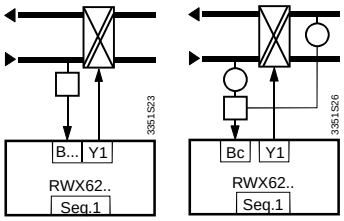
3351Zc3

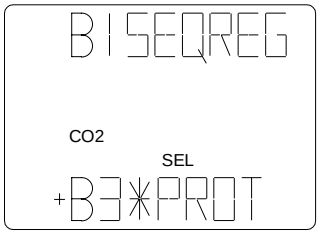
[ALTDIR]
Do you intend to implement reversal of operating action for the ER sequence (sequence 1) ?
(e.g., Maximum Economy Changeover; MEC)

☐ Yes

Input signal type ?
☐ 1 x Ni ☐ 2 x Ni ☐ Volt °C ☐ Volt % ☐ Volt
☐ DIG

☒ No; proceed to next function with "+" button



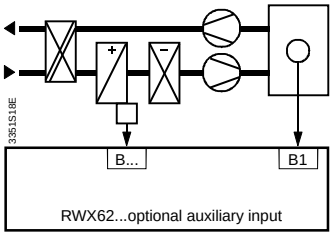


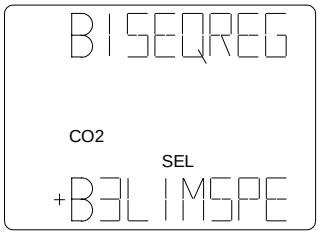
3351Zc4

[*PROT]
Do you intend to use a frost protection thermostat ?

☐ Yes

☒ No; proceed to next function with "+" button





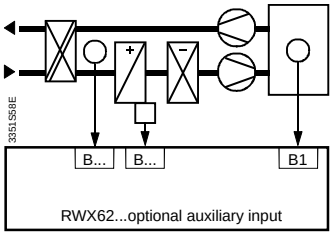
3351Zc5

[LIMSPE]
Do you intend to implement a minimum limitation (PI) that impacts the ER sequence (sequence 1) ?
(E.g., protection from icing for the ER unit)

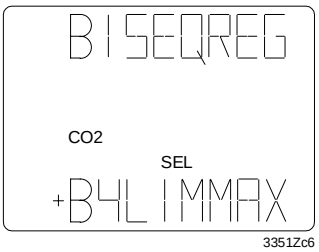
☒ Yes; proceed to next function with ">" INFO button

Input signal type ?
☒ 1 x Ni ☐ 2 x Ni ☐ Volt °C ☐ Volt % ☐ Volt

☐ No



Display: **Question:**



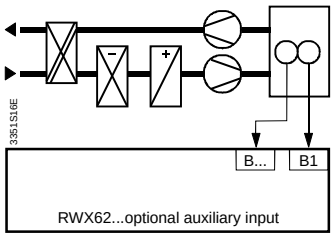
3351Zc6

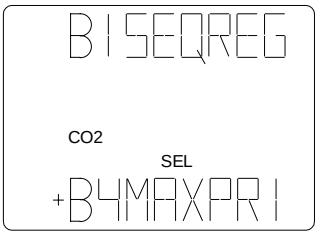
[LIMMAX]
Do you intend to implement a maximum limitation (PI) that impacts sequence 3 ?
(E.g., maximum limitation of room humidity)
☐ Yes

Input signal type ?

☐ 1 x Ni ☐ 2 x Ni ☐ Volt °C ☐ Volt % ☐ Volt

☒ No; proceed to next function with "+" button



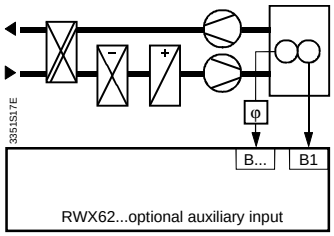


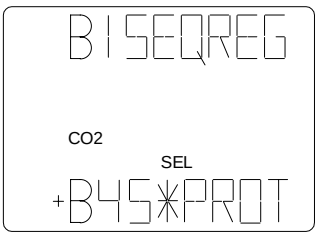
3351Zc7

[MAXPRI]
Does a dehumidifying signal of another humidity control loop exist that is to impact the cooling sequence (sequence 3) via priority control ?
(E.g., maximum limitation of room humidity)

☐ Yes

☒ No; proceed to next function with "+" button





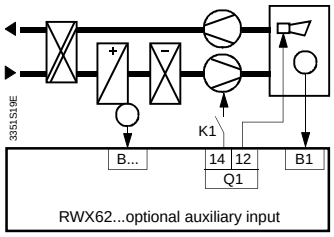
3351Zc8

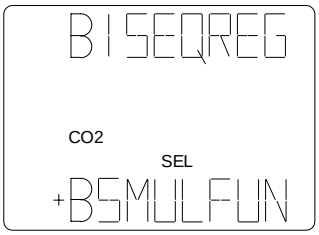
[S✻PROT]
Do you intend to use frost protection on either the air or water side of the hot water heating coil ?

☒ Yes; proceed to next function with ">" INFO button

Input signal type ?
☐ 1 x Ni ☒ Volt °C

☐ No





3351Zc9

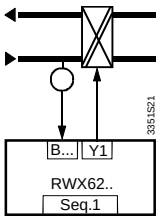
[MULFUN]

Do the following exist: summer/winter compensation of the setpoint, control of the Q switching contact in dependence of outside temperature or reversal of operating action of the ER in dependence of the measured variable or in dependence of the difference between two measured variables ?

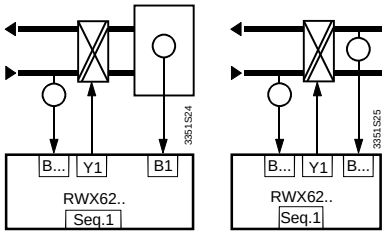
☒ Yes; proceed to next function with ">" INFO button

Input signal type ?
☒ 1 x Ni ☐ 2 x Ni ☐ Volt °C ☐ Volt % ☐ Volt

Dependent on the measured variable



Dependent on the difference between two measured variables

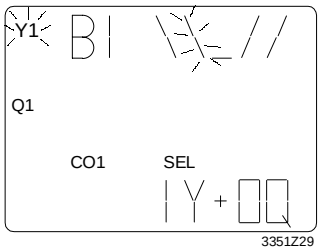


8.1.2 Allocation of outputs

After defining all inputs and the associated auxiliary functions, you need to allocate the outputs to the first sequence controller B1.

⇒ If function S❄PROT was selected, output Q1 is already occupied.

Display: **Question:**



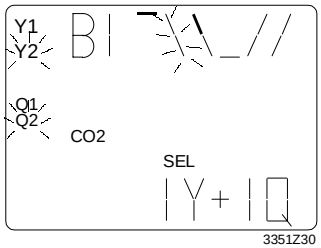
3351Z29

Sequence 1 (ER, heating, humidifying)

Modulating output signal DC 0..10V?
Y ☐ No; ☒ Yes = 1

Switching outputs ?
Q ☒ No; ☐ Yes (1...n)

Proceed to next sequence with ">" INFO button



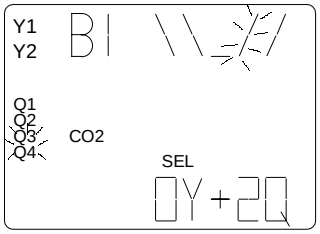
3351Z30

Sequence 2 (heating, humidifying)

Modulating output signal DC 0..10V?
Y ☐ No; ☒ Yes = 1

Switching outputs ?
Q ☐ No; ☒ Yes = (1...n)

Proceed to next sequence with ">" INFO button



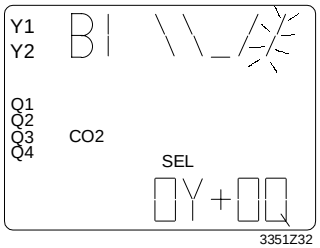
3351Z31

Sequence 3 (cooling, dehumidifying)

Modulating output signal DC 0..10V?
Y ☒ No; ☐ Yes = 1

Switching outputs ?
Q ☐ No; ☒ Yes = 2 (1...n)

Proceed to next sequence with ">" INFO button



3351Z32

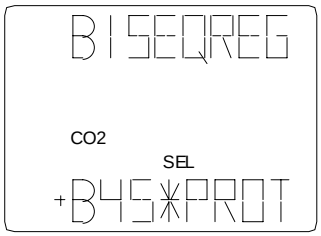
Sequence 4 (cooling, dehumidifying)

Modulating output signal DC 0..10V?
Y ☒ No; ☐ Yes = 1

Switching outputs ?
Q ☒ No; ☐ Yes = (1...n)

If there are free inputs and outputs after configuring the first control loop, an additional control loop may be configured in the POLYGYR Joker. To do this, restart at 8.1.1.

Display: **Question:**



3351Zc8

[DEVALM]
(Important! Only if a free switching output is available).

Do you want to implement an alarm in the event of large deviations of the controlled variable from the setpoint ?

DEVALM ☒ No (INACT); ☐ Yes (ACTIV)

If no more inputs and outputs are available, but not all control tasks have been allocated, add another POLYGYR Joker. In this case, we recommend that you separate the Jokers according to controlled variables, e.g., one for temperature control and one for humidity control.

After entering all of the above information, configuration mode 2 has successfully been completed: the relevant inputs and outputs are now allocated. From now on, all data required to draw an electric schematic and to order the necessary components is available; at the same time, the number of required POLYGYR Jokers is specified. All further configuration and parameterization modes are similar to the one described in this section.

9 Engineering

To engineer HVAC control loops, HVAC experts must first define the following for the desired application:

- Controller type (sequence controller or digital controller)
- Controlled variable (e.g., room temperature or room humidity, etc.)
- Type of setpoint (e.g., constant setpoint or compensated setpoint, day/night setpoint changeover, etc.)
- Type and sequential positioning of the control elements (e.g., modulating heating valve or multi-step electric heating, etc.)
- Additional functions (e.g., remote setpoint and or limitation and/or compensating variable, etc.)

We recommend that you first complete the configuration table in the commissioning report.
Once all desired items are specified, write down all parameterization values in the parameterization table. (appended, empty commissioning report).

Example for completing configuration and parameterization tables in the commissioning report

Sample: Italics denote an entry in the table that corresponds to the example

See next page

Commissioning report

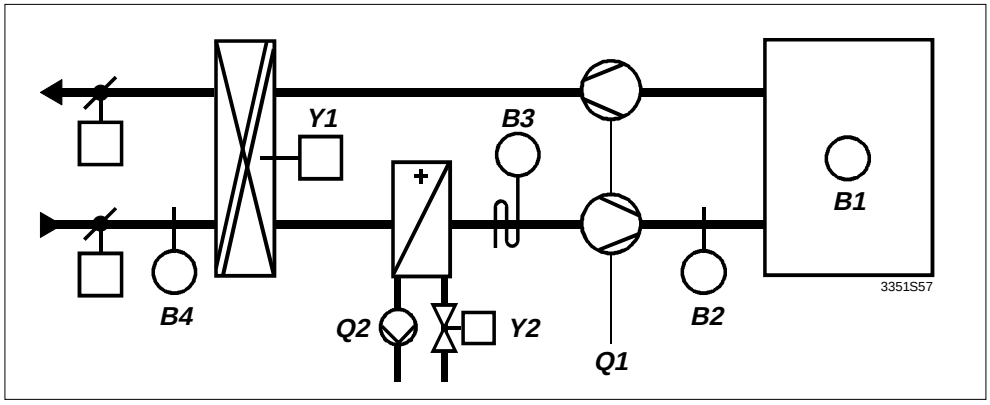
POLYGYR Joker RWX62...

Sequence controller

Plant information

Object: *Example*
Plant: *Supply and extract air plant with heating coil and heat recovery*
Date: *00. 00. 0000*
Controller type: *RWX62.7036*

Plant schematic



Q1 = Frost alarm fan release

1. Configuration tables

1.1 Allocation of inputs (see chapter 11, Universal inputs B..)

Control loop 1			Control loop 2			Control loop 3		
B	*1*	SEQREG	B		SEQREG	B		SEQREG
B		TELSEL	B		TELSEL	B		TELSEL
B	*2*	LIM	B		LIM	B		LIM
B		ALTDIR	B		ALTDIR	B		ALTDIR
B		❄PROT	B		❄PROT	B		❄PROT
B		LIMSPE	B		LIMSPE	B		LIMSPE
B		LIMMAX	B		LIMMAX	B		LIMMAX
B		MAXPRI	B		MAXPRI	B		MAXPRI
B	*3*	S❄PROT						
B	*4*	MULFUN			MULFUN			MULFUN

1.2 Description of inputs (see chapter 11, Universal inputs B..)

Input	Description	TYPE	MINSCA..MAXSCA
B1	*Room temperature*	*1 x Ni*	
B2	*Supply air temperature*	*1 x Ni*	
B3	*Frost protection*	*VOLT °C*	*0...15 °C*
B4	*Outside air temperature*	*1 x Ni*	
B5			

1.3 Allocation of outputs to the sequences (see chapter 11)

	Control loop 1 B1 SEQREG Seq. 2 Seq. 1 DT Seq. 3 Seq. 4 3351Z56				Control loop 2 B... SEQREG Seq. 2 Seq. 1 DT Seq. 3 Seq. 4				Control loop 3 B... SEQREG Seq. 2 Seq. 1 DT Seq. 3 Seq. 4			
Q1	S❄PROT *Q1*											
	Seq.2	Seq.1	Seq.3	Seq.4	Seq.2	Seq.1	Seq.3	Seq.4	Seq.2	Seq.1	Seq.3	Seq.4
Y..	*Y2*	*Y1*										
Q1												
Q2	*Q2*											
Q3												
Q4												
Q5												
Q6												
Q...	DEVALM											

1.4 Description of analog outputs

Output	Description
Y1	*Heat recovery*
Y2	*Heating coil control valve*
Y3	

1.5 Description of digital outputs

Output	Description
Q1	*Fan release, frost protection alarm*
Q2	*Heating coil pump*
Q3	
Q4	
Q5	
Q6	

1.6 Settings for the above functions

Note:

A checkmark in the associated box means: the value of the column is "selectable valid".
No checkmark in the associated box means: default value is valid.

Display	Default	Selectable	Control loop 1	Control loop 2	Control loop 3
TEMP	°C / K	°F	☐		
E1 NIGHT	INACTIV	ACTIV	☐	☐	☐
E2 STNDBY	INACTIV	ACTIV	☒	☐	☐
SEQREG	PI	P	☐	☐	☐
CASC (if LIM)	INACTIV	ACTIV	☒	☐	☐
COMP ☼ (if MULFUN)	CONST	COMP	☒	☐	☐
COMP ☾	CONST	COMP	☐	☐	☐
DIRECT (seq. 1)	REVERS	DIRECT	☐	☐	☐
OFF	OFF	ΔB - B	☒	☐	☐
Reversal of operating action X (Seq. 1)		ABS	☐	☐	☐
LOCK (for seq. 1+2)	FREE	LOCK	☐	☐	☐
LOCK (for seq. 3+4)	FREE	LOCK	☐	☐	☐

Display	Default	Selectable		
Q1 RELEAS Y... + Q...	INACTIV	ACTIV	☐	
Q1	LIN	BIN	☐	
		VAR	☐	
Q2 RELEAS Y2 + Q2	INACTIV	ACTIV	☒	
Q2	LIN	BIN	☐	
		VAR	☐	
Q3 RELEAS Y... + Q...	INACTIV	ACTIV	☐	
Q3	LIN	BIN	☐	
		VAR	☐	
Q4 RELEAS Y... + Q...	INACTIV	ACTIV	☐	
Q4	LIN	BIN	☐	
		VAR	☐	
Q5 RELEAS Y... + Q...	INACTIV	ACTIV	☐	
Q5	LIN	BIN	☐	
		VAR	☐	
Q6 RELEAS Y... + Q...	INACTIV	ACTIV	☐	
Q6	LIN	BIN	☐	
		VAR	☐	

Display	Default	Selectable		
S❄PROT	MANUAL	AUTO	☐	
		MANU3	☐	

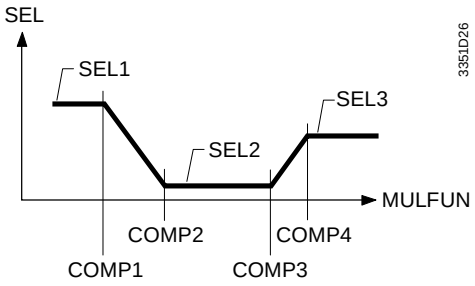
2. Parameterization tables

2.1 Setpoints CONST

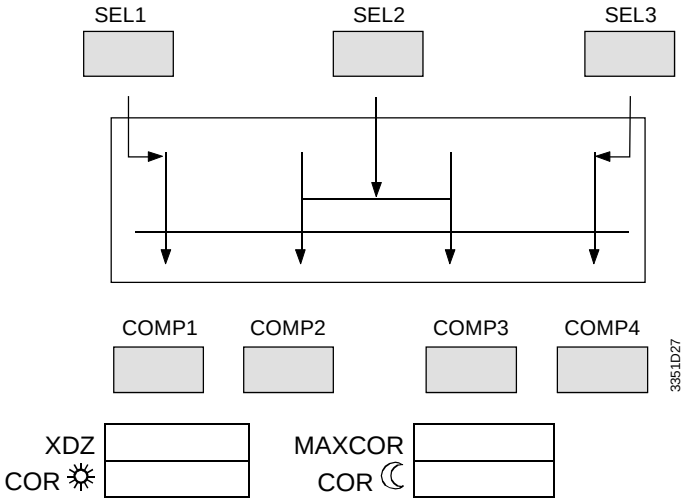
Display	Control loop 1	Control loop 2	Control loop 3
MAXSEL	*25*		
MINSEL	*10*		
XDZ☼			
SEL☼	*20*		
XDZ ☾			
SEL ☾			

2.2 Setpoints COMP

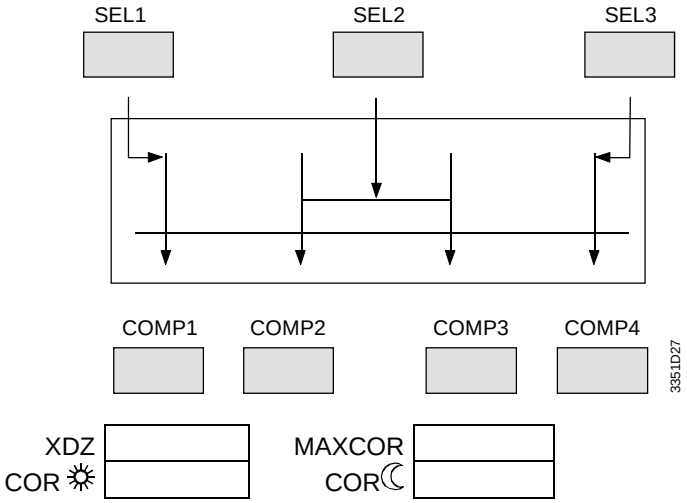
Explanations



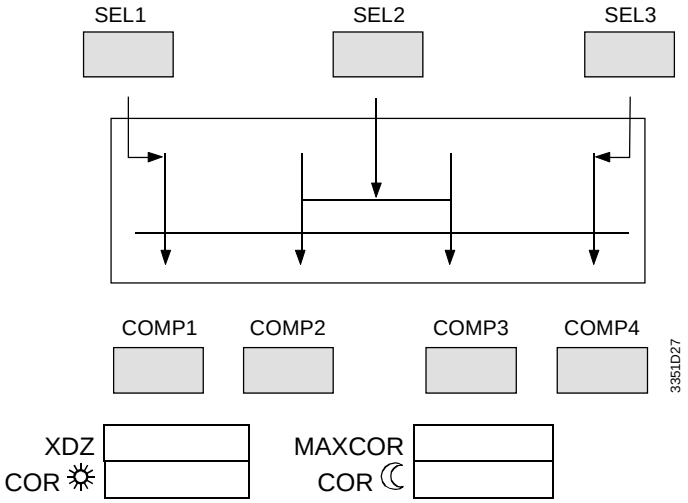
Control loop 1



Control loop 2



Control loop 3



2.3 Control parameter settings for sequence controllers

	Control loop 1				Control loop 2				Control loop 3			
	B1 SEQREG				B...SEQREG				B...SEQREG			
	Seq. 2	Seq. 1	Seq. 3	Seq. 4	Seq. 2	Seq. 1	Seq. 3	Seq. 4	Seq. 2	Seq. 1	Seq. 3	Seq. 4
DT												
P-controller XP P												
PI controller XP PI	■			■	■			■	■			■
XP FACT		■				■				■		
TN												
PID												

2.4 Control parameter settings for sequence controllers with cascade control

	Control loop 1				Control loop 2				Control loop 3			
	B1 SEQREG				B... SEQREG				B... SEQREG			
CASC XP PI	*10 K*											
CASC TN	*16 MIN*											
CASC PID	*0*											
	B... LIM				B... LIM				B... LIM			
DT												
	Seq.2	Seq.1	Seq.3	Seq.4	Seq.2	Seq.1	Seq.3	Seq.4	Seq.2	Seq.1	Seq.3	Seq.4
PI controller XP PI	■	*40 K*		■	■			■	■			■
XP FACT	*1.0*	■				■				■		
TN	*2 MIN*											

2.5 Parameter settings for auxiliary controllers

Function	Parameter	Control loop 1 B1 SEQREG	Control loop 2 B...SEQREG	Control loop 3 B...SEQREG
B LIM	XPPI			
	TN			
	MAXLIM			
	MINLIM			
	RELLIM			
B LIMSPE	XPPI			
	TN			
	SEL			
B LIMMAX	XPPI			
	TN			
	SEL			
B S❄ PROT	XPPI	*40 K*		
	TN	*2 MIN*		
	S❄ ALM	*5 °C*		
	⏻S❄ PROT	*12 °C*		
DEVALM	SEL			
ABS ΔB...-B...	SEL SEL	*2 K*		

2.6 Adjustment of sensor input signals

Parameter	B1	B2	B3	B4	B5
CORSCA	*0 K*	*0 K*	*0 K*	*0 K*	

2.7 Output signal Y

Parameter	Y1	Y2	Y3
MAXPOS	*114 %*	*114 %*	
MINPOS	*-14 %*	*-14 %*	
YQ ON (1Y + 1Q)		*5 %*	
YQ OFF (1Y + 1Q)		*0 %*	
MQ ON (RELEAS)		*2 °C*	
MQ OFF (RELEAS)		*4 °C*	

2.8 Outputs Q

Parameter	Q1	Q2	Q3	Q4	Q5	Q6
T1	*0*	*0*				
T2	*0*	*0*				
VQ ON (VAR)						
VQ OFF (VAR)						

2.9 LOCK function

Parameter	Control loop 1	Control loop 2	Control loop 3
SEQ 1+2 LOCK			
SEQ 3+4 LOCK			

10 Commissioning

Required reference documentation

The following documentation comprises all information necessary for commissioning:

- The universal controller general instructions supplied with the unit
- Commissioning report with project-specific entries
- Plant wiring diagram as well as further control documentation stored in the control cabinet or with the plant manager

Commissioning

Conduct the following checks before commissioning. If faults, differences or discrepancies are found, you must correct them. Conduct the checks even if a configuration was copied or if the controller was preconfigured.

Observe the notes in section 6.1.3. “Changing parameters and configurations”.

- Do the configurations in the universal controller agree with the connected plant?
- Are all parameters correctly set in the controller?
- Are all field devices such as sensors, actuators, etc., electrically connected and ready for operation ?
- Are all valves installed in the correct position and is manual adjustment disengaged?
- Are all plant elements operational in accordance with their functions?
- Is all safety equipment properly installed and functionally independent of the controller?
- Are the switching times set correctly for a possibly available external switching clock?
- Is the required plant power supply available?

After conducting all checks and possible corrections, check the configured functions in the simulation mode by entering simulated output power values (sequence controller) or simulated actual values (digital controller). The bar diagram for the control functions (only for the sequence controller) and the values for the output functions appear on the LCD.

For the active simulation mode, the controller outputs are active according to the simulation. Connected units such as actuators, motors (e.g., pumps), electric heating systems, chiller compressors, air conditioning units, etc. are supplied with power and begin operation. Disable plants that are not yet ready for operation. To do this, remove the relevant main fuse or disconnect the electrical connections. However, only trained specialists may remove the electrical connections. Additionally, delayed switching is ineffective in the simulation mode.

If the “AUTO MODE” control mode is activated by accidentally pressing the > INFO button, return to simulation mode by pressing the < INFO button. You can switch back and forth in simulation mode via the INFO buttons without activating the outputs. These are activated only via the SEL button.

Simulation mode

When the controller is in simulation mode, you can proceed by following the instructions in the tables below.

1. Sequence controller

Action (press buttons**)**	**Effect/Display**
	SIMUL MODE
1) INFO >	Bar drawing above shows configured controller functions of sequences 1 and 2. The bar flashes in the neutral zone. (Only configured sequences are displayed.) Outputs are inoperative.
2) SEL (Activation of outputs)	Outputs are operative in accordance with the displayed values. Display of the simulated power in % (0) flashes; (above: Seq.1; below Seq.2).
3) + or – (Change of output)	Outputs operative. Flashing display of the selected simulated output. Flashing display of the resulting output position in the bar diagram Display of the resulting outputs: e.g., Y1 5 = output 5 volts on Y1 / ■ = switched-on, e.g., B Q1■)
4) SEL (Deactivation of outputs)	Outputs again inoperative (display as 1).
5) INFO >	The bar drawing below shows the configured control function of sequences 3 and 4. The bar flashes in the neutral zone – continue as for Seq.1 and 2; (as pos. 2 to 4)
6) INFO >	Continue to next controller as above

2. Digital controller

Action (press buttons**)**	**Effect/Display**
	SIMUL MODE
1) INFO >	Display: – – – (lines instead of the simulated actual value) Outputs: OFF
2) SEL (Activation of outputs)	Outputs are activated in accordance with the displayed value. Display: Starting value of the configured control range (simulated actual value).
3) + or – (Change of control value)	Flashing display of the entered simulated actual value. Outputs are activated in accordance with the displayed value. Display: of the resulting outputs (■ = ON; e.g., Q1■)
4) SEL (Deactivation of outputs)	Outputs again deactivated (display as 1)
5) INFO >	Continue to next controller as above

Control operating mode

You can now change from simulation mode to control operating mode by pressing the **>** INFO button. The following LCD appears: AUTO MODE.

The plant starts operation

Wrap-up tasks

The unit is supplied with operating cards and installation and commissioning instructions. However, each controller type only requires a few of the operating cards. Remember to supplement the cards with the plant data. When completed, file them in the supplied white holder and store them in the transparent compartment of the universal controller. This way you will have a record of the plant data at the time of commissioning. Dispose of the cards that you do not need in an environmentally compatible manner.

Copying parameters and configurations

In order to transfer the parameters and configurations of an operating RWX62… to several devices, you need a PC, the associated program and the POLYCOPY adapter.

Install the devices as follows:

Remove the AC 24 V supply from the RWX62... and connect it to the adapter. Via a cable, establish an electrical connection of AC 24 V from the adapter to the RWX62…. Establish one bus connection each from the RWX62... to the adapter and from the adapter to the PC. All three cables required are part of the POLYCOPY adapter. After all connections are established, you can copy the entire configuration by means of a wizard. Use POLYCOPY to lock the configuration mode to prevent later changes via the keyboard.

11 Function descriptions

11.1 Selecting the control function [FUNCT]

The RWX62... can be used as a sequence controller (SEQREG) with three independent control loops or as a step switch (DIGREG) with three independent inputs.

⇒ SEQREG or DIGREG **cannot** be configured parallel in the same RWX62.

Relevant configuration steps

Display	Comments
CONF2 ... MODE	
B1 FUNCT ... SEQREG	With SEL, select SEQREG or DIGREG
B2 SEQREG ... INACT	Activate the 2nd control loop with SEL
B3 SEQREG ... INACT	Activate the 3rd control loop with SEL

11.2 Selecting the unit [TEMP]

The temperature unit in the RWX62... can be switched from °C/K to °F and vice versa. Even though selection of the unit occurs in CONF1 mode, the configured and parameterized values are not reset to the default values on unit changes.

Relevant configuration steps

Display	Comments
CONF1 ... MODE	
TEMP °C / K	With SEL, select °C / K or °F

11.3 SEQREG sequence controller

The RWX62... allows you to configure three independent control loops with auxiliary functions.

The names of the control loops match the name of the sensor for the main controlled variable. The first control loop is thus always called B1.

Priorities

The functions have the following priorities in control loop (1= highest priority)

Operating mode:

1. "OFF" via E2 [STNDBY]
2. Night operation via E1 (NIGHT)
3. Day or normal operation

Functions:

1. Delay times [T1 and T2]
2. Frost protection (❄ PROT or S ❄ PROT)
3. Activating Qs via MULFUN [RELEAS]
4. Maximum selection seq.3 [MAXPRI]
5. Auxiliary controllers seq.1 and seq.2 [LIMSPE and LIMMAX]
6. General limiter [LIM]
7. Locking sequences via MULFUN [LOCK]
8. Sequence controller [SEQREG]

11.3.1 Operating modes

11.3.1.1 Night operation via E1 (NIGHT)

You can activate night operation via the digital input E1 AC 0/24 V. This way, you can configure different setpoints for night operation. The control action of input E1 can be separately activated for all 3 control loops. When in control mode, the display indicates ☼ for day operation and ☾ for night operation for all actively selected control loops.

Relevant configuration steps

Display	Comments
CONF1 ... MODE	
B1 NIGHT ...INACT	INACT = During night operation ☾, no other setpoint is desired for this control loop With SEL, select INACT or ACTIV

11.3.1.2 "OFF" control mode via E2 [STNDBY]

You can deactivate the control mode via digital input E2 AC 0/24V. In this case, all outputs are reset to 0, but the frost protection function S❄ PROT remains active. The control action of input E2 can be separately activated for all 3 control loops.
When in control mode, the display indicates ⏻ for the corresponding control loop, provided the plant was deactivated via E2.

Relevant configuration steps

Display	Comments
CONF2 ... MODE	
B1 STNDBY ... INACT	INACT= no "OFF" via E2 on this control loop desired With SEL, select INACT or ACTIV

11.3.2 Universal inputs B...

The inputs are allocated during configuration. Each function can be selected only once per control loop. The sequence of the functions is predefined.

The following functions can be selected:

SEQREG	Main controlled variable and control loop
TELSEL	Remote setpoint
LIM	General limiter or cascade control
ALTDIR	Reversal of operating action seq.1 (poss. combination with MULFUN)
❄PROT	Frost monitor
LIMSPE	Minimum limitation acting on seq.1
LIMMAX	Maximum limitation acting on seq.3
MAXPRI	Maximum selection seq.3
S❄PROT	Modulating frost protection sensor (only for control loop B1)

MULFUN Various functions (configuration on control loop 1 acting on all three control loops):
- Moving of setpoint (summer / winter compensation)
- Switch-on of a relay when below an adjustable value (switch-on of pump on low outside air temperatures)
- Reversal of operating action seq.1 (poss. combination with ALTDIR)
- Locking of seq.1+2 or seq.3+4 for an adjustable value (locking of heating or cooling)

Each input can process an either active, passive or digital signal. However, this must be configured accordingly. Additionally, the measuring range must be indicated.

The following input types can be selected:

1 x Ni = Passive sensor LG Ni 1000 Ω at 0 °C (not adjustable for TELSEL),

2 x Ni = 2 passive sensors LG Ni 1000 Ω at 0 °C, parallel connected to mean value calculation (not adjustable for TELSEL and S❄PROT)

VOLT °C = Active signal DC 0...10 V
for all active signals that represent the temperature
Selectable scales: DC 0...10 V ≙ 0...50 °C (default)
0...130 °C
–35...+35 °C
for S❄PROT, the scale is a predefined DC 0...10 V ≙ 0...15 °C

VOLT % = Active signal DC 0...10 V
(not adjustable for S❄PROT)
for all active signals that represent %
The scale is predefined DC 0...10 V ≙ 0...100 %

VOLT = Active signal DC 50...10 V
(not adjustable for S❄PROT)
for all other active signals
The scale is either DC 0...10 V ≙ –50...+50 (default)
or: DC 0...10 V ≙ 0...MAXSCA
MAXSCA ≙ 0.10...850

DIG = Digital signal AC 0/24 V
adjustable only for ALTDIR

OHM = Passive signal 0...1000 Ω
adjustable only for TELSEL
The scale matches that of the associated main controlled variable. If the main controlled variable is a passive sensor (Ni1000), the following scale can be selected 0...1000 Ω ≙ 0...50 °C (default)
0...130 °C
–35...+35 °C

11.3.2.1 Measured value correction [CORSCA]

The measured values of the inputs B… can be corrected via CORSCA.

The measured values with S❄PROT (frost protection) can only negatively be corrected.

Adjustable values

Description	Range	Factory setting	
		Temperature	General
CORSCA B1....B5	–10... +10 K / % of r.	0 K	0
CORSCA S❄PROT	–10... 0 K	0 K	

Relevant configuration steps

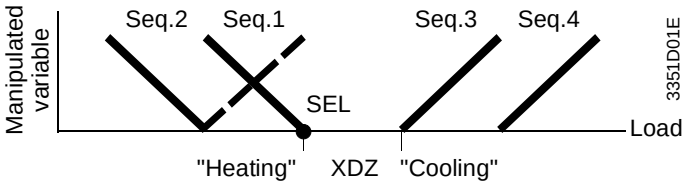
Display	Comments
CONF2 ... MODE	
B1 SEQREG... +B2 INACT	INACT= no additional auxiliary functions desired With SEL, select the function: TELSEL, LIM, ALTDIR, ❄PROT, LIMSPE, LIMMAX, MAXPRI, S❄PROT, MULFUN
B1 TYPE … 1x Ni	With SEL, select the input type: 1x Ni, 2x Ni, VOLT°C, VOLT %, VOLT, DIG, OHM
CONF1 ... MODE	
B1 MAXSCA... 50 °C B1 MINSCA ... 0 °C	Selection of scale according to input type
PARA2 ... MODE	
B1 SEQREG...CORSCA 0K	Measured value correction of the sensor inputs

11.3.3 Control function [SEQREG]

11.3.3.1 Controller structure

Each control loop may comprise a maximum of four sequences (seq.1...4) combined as follows:

- One sequence: seq.1 or seq.3
- Two sequences: seq.1+2 or seq.1+3 or seq.3+4
- Three sequences: seq.1+2+3 or seq.1+3+4
- Four sequences: seq.1+2+3+4



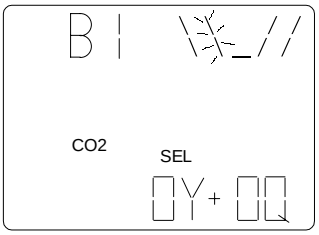
The "Heating" setpoint "SEL" is allocated to the interdependent sequences 1 and 2. The output signal acts in reverse to the load (input variable), e.g., heating. Seq.1 can be switched over to direct action, e.g., cooling.

The "Cooling" setpoint "SEL" is allocated to the interdependent sequences 3 and 4. The output signal acts directly to the load (input variable), e.g., cooling.

One analog output (Y1...3) and/or 1...6 binary outputs (Q1...6) can be allocated to each sequence; these outputs then act in the operating action of the sequence.

11.3.3.2 Allocating outputs to sequences

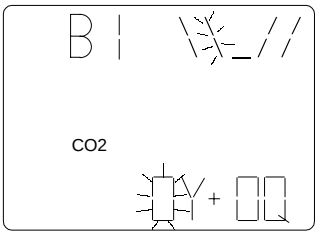
Allocation of sequences occurs in CO2 MODE.



3351Z33

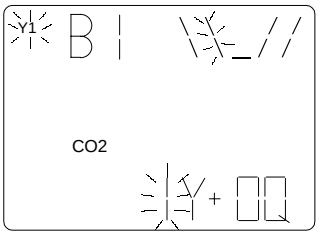
The sequence that is being configured flashes.

By pressing the "SEL“ button once, an analog output Y can be allocated.



3351Z34

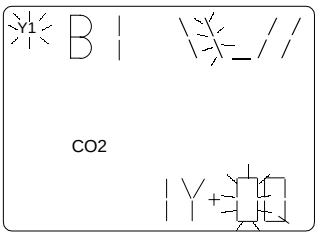
By pressing "+“ and "–", Y can be allocated.



3351Z35

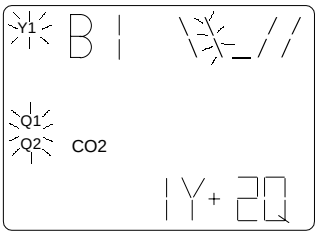
The allocated analog output flashes on the display (e.g., Y1).

By pressing again the "SEL“ button, the digital outputs Q can be allocated.



3351Z36

By pressing "+“ and "– ", the Qs are allocated.

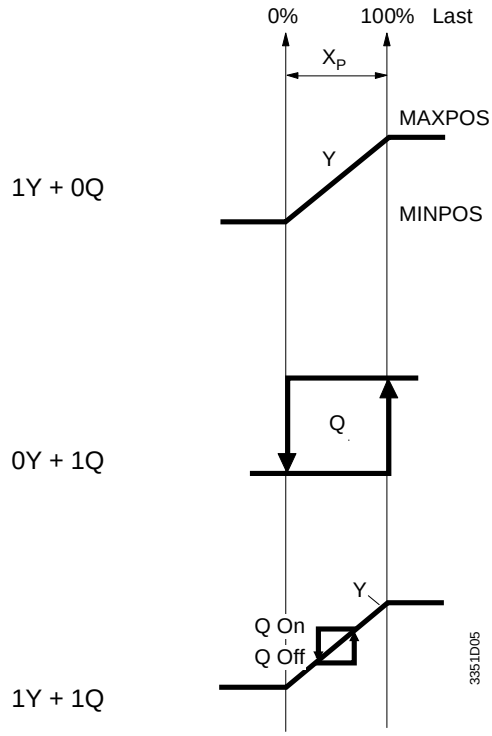


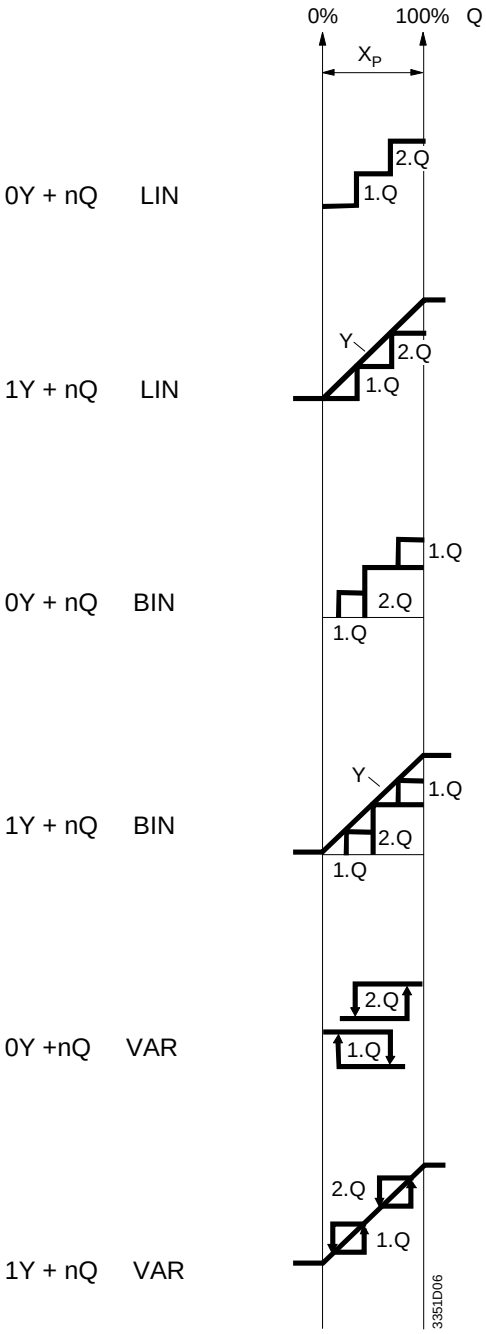
3351Z37

The allocated digital outputs flash on the display (e.g., Q1 + Q2).

Allocate further sequences by applying this method. All previously outputs allocated to control loop B1 are indicated on the display.

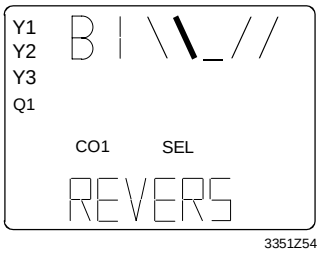
11.3.3.3 Overview of the effect of the allocated outputs

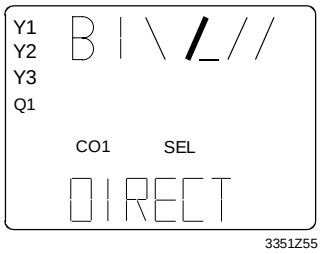




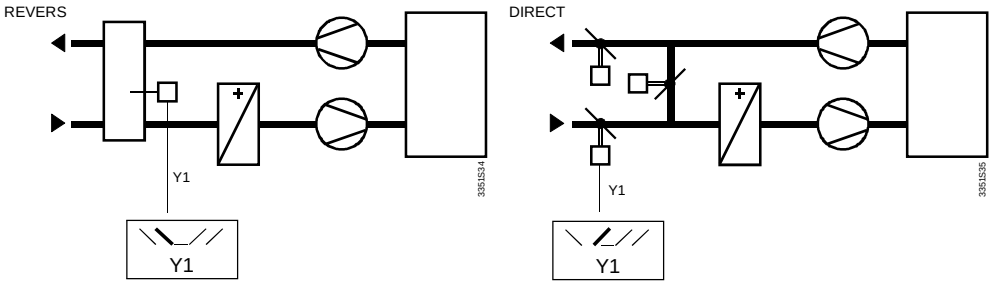
11.3.3.4 Sequence 1

The operating action of sequence 1 can be changed.





Application example

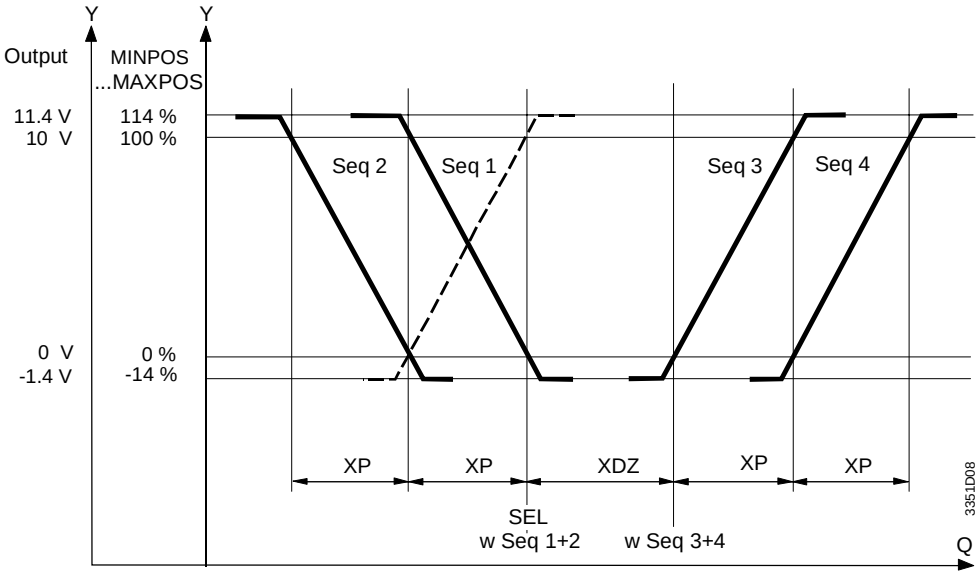


Display	Comments
CONF1 ... MODE	
B1 \ _ ... REVERS	With SEL, select the operating action

11.3.3.5 Analog output (Y…)

Wind-up, wind-down

In order to ensure that a valve or damper actuator remains locked securely or is fully open, the output signal can be increased at 14 % increments. The intersecting points of the sequences are at 0 % - 100 %:



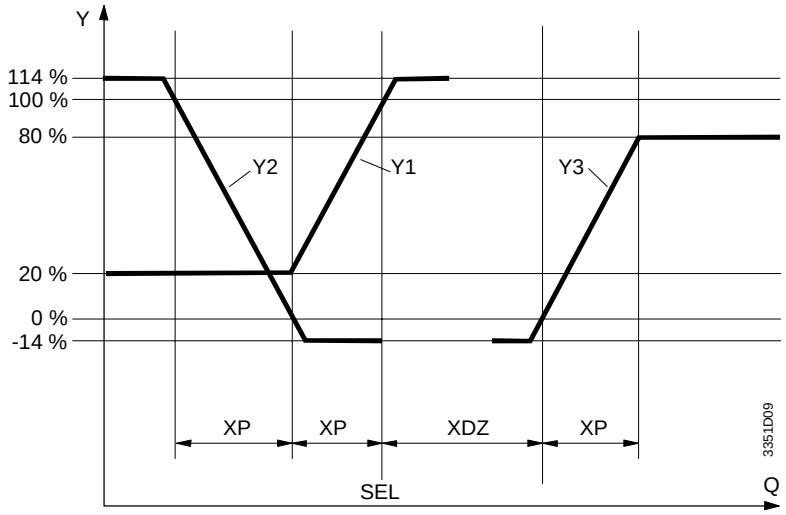
MINPOS, MAXPOS

The output values can be limited with setting parameters MINPOS and MAXPOS. (Example: Minimum limitation for outside air damper)

Example:

Parameter	Y 1	Y 2	Y 3
MAXPOS	*114 %*	*114 %*	*80 %*
MINPOS	*20 %*	*- 14 %*	*- 14 %*

Control action:



Functions S❄PROT and STNDBY override the output limitations and function MAXPRI overrides these two functions.

Adjustable values

Description	Range	Factory setting	
		Temperature	General
B1 MAXPOS	0 ...114 %		114 %
MINPOS	–14...100 % < MAXPOS Δ to MAXPOS 1 %		–14 %

Relevant configuration steps

Display	Comments
PARA2 ... MODE	
B1 MAXPOS 114 % MINPOS –14 %	With SEL, select the range of the modulating output signal

11.3.3.6 Digital output (Q...)

Delay times

For each digital output, you can set two delay times:

T1 is the switch-on delay

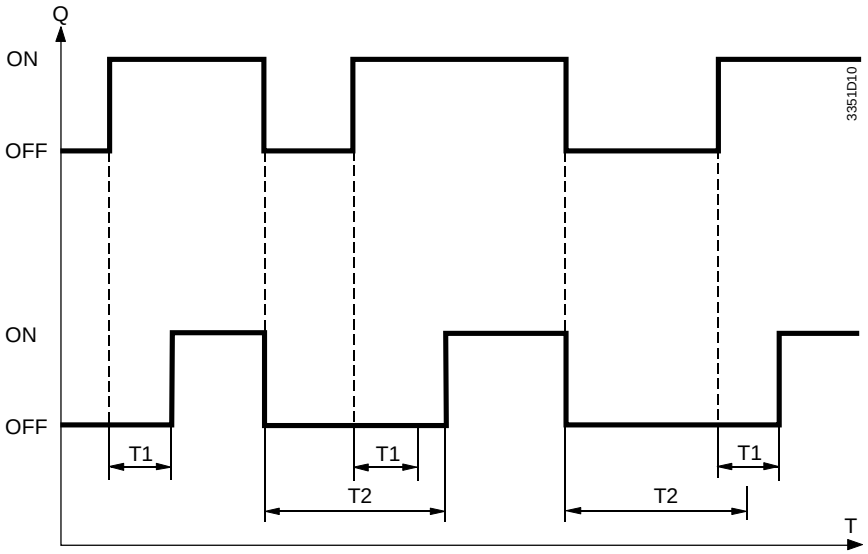
T2 is the minimum switch-off time

⚠ The delay times must be adjusted to the connected unit. During the delay times, control output calculation is not stopped. Excessive delay times may considerably slow down and disrupt the control loop !

Control action:

Output calculated by the controller

Output Q effective



Use

A T1 delay time can be used to prevent a connected unit from excessively fast activation, when a plant only briefly overshoots. Additionally, this ensures that on power-up, not all outputs are simultaneously activated (all Qs on a different T1).

A minimum T2 switch-off time helps prevent immediate reactivation after switch-off of a unit (e.g., chiller).

Adjustable values

Description	Range	Factory setting	
		Temperatur e	General
T1, T2	0, 4, 8, 15, 30, s 1, 2, 4, 8, 16, 32 min		0 s

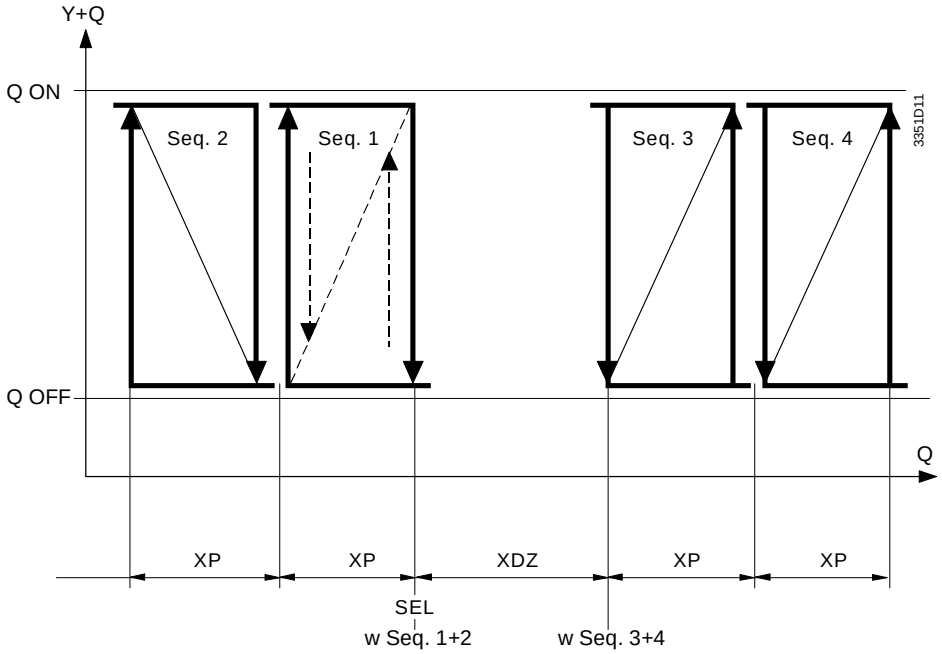
Relevant configuration steps

Display	Comments
PARA2 ... MODE	
T1 (Q...) ... 0 SEC	With SEL, select the input delay
T2 (Q...) ... 0 SEC	With SEL, select the minimum switch-off time

11.3.3.7 One digital output (0Y + 1Q)

Switching distance

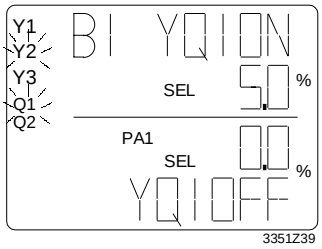
The switching distance is set using the P-band.



11.3.3.8 One analog and one digital output (1Y + 1Q)

Setting

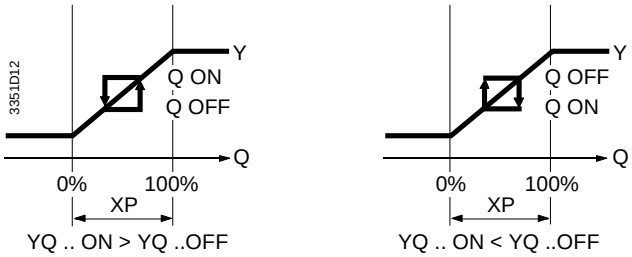
Enter the digital output switch in dependence of the analog output.



The two outputs are flashing on the display.

Operating action

The operating action of the digital output can be defined via the setting of the switching points.



Adjustable values

Description	Range	Factory setting	
		Temperature	General
YQ... ON	MINPOS...MAXPOS		5 %
YQ... OFF	MINPOS...MAXPOS Δ to ON ≥ 0.5 %		0 %

Relevant configuration steps

Display	Comments
PARA1 ... MODE	
B1 YQ1 ON 5 %	With SEL, select the switch-on point Q in dependence of Y
B1 YQ1 OFF 0 %	With SEL, select the switch-off point Q in dependence of Y

11.3.3.9 Linear step switch (n Q with LIN)

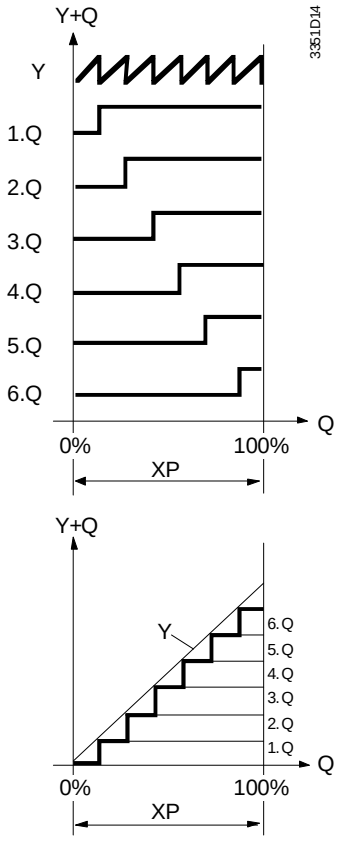
Switching steps

With the linear step switch, the digital outputs are switched at equal steps.

Additionally, a linear output can be configured.

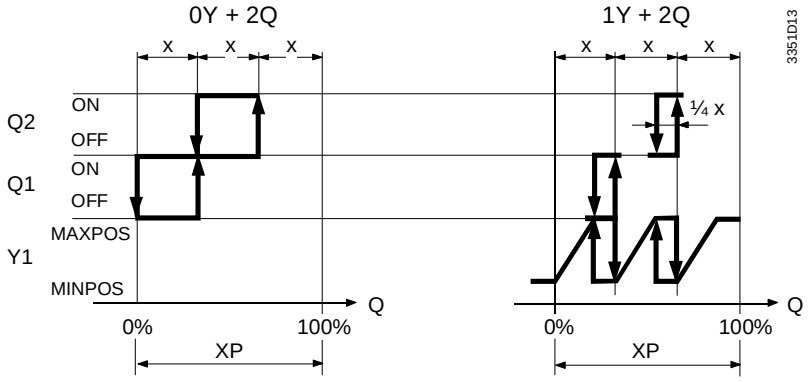
⚠ Caution: With linear step switches, the T1 and T2 delay times must be set to 0 seconds; otherwise, simultaneous switching of the outputs and thus a linear output are not ensured.

Connection of loads occurs as follows:



Switching interval

Example with 2Q



Interval x = $\frac{\text{100 \% load}}{\text{(number of Qs +1)}}$

Adjustable values

Description	Range	Factory setting	
		Temperature	General
Linear step switch [LIN]	0Y + 2...6Q 1Y + 2...6Q		0Y + 0Q

Relevant configuration steps

Display	Comments
CONF ... MODE	
B1 \ _ ...LIN	Selection of the linear step switch [LIN]

11.3.3.10 Binary step switch (n Q with BIN)

Switching steps

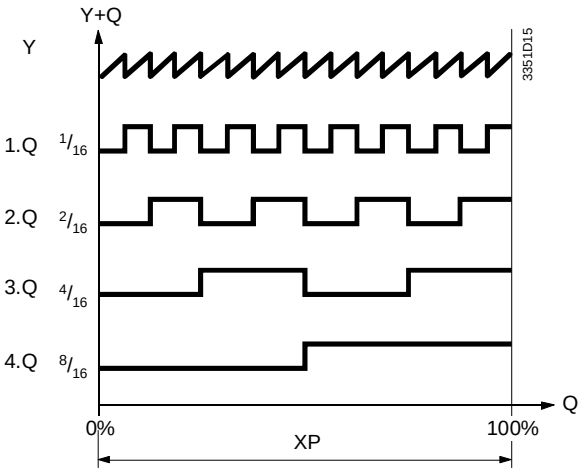
With the binary step switch, the digital outputs are connected at the following load steps:

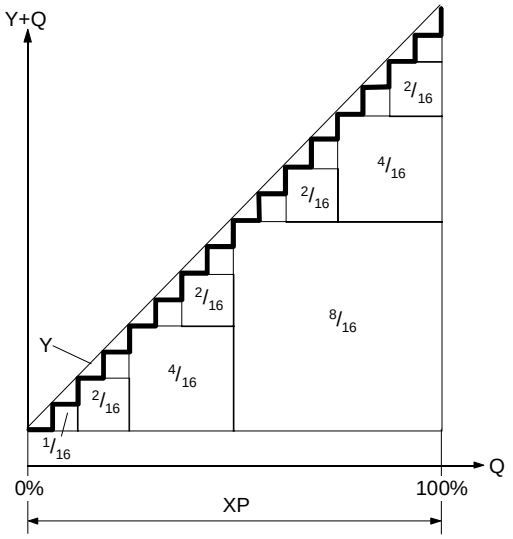
0Y+2 Q	1.Q = 1/3	2.Q = 2/3			3 switching steps
0Y+3 Q	1.Q = 1/7	2.Q = 2/7	3.Q = 4/7		7 switching steps
0Y+4 Q	1.Q = 1/15	2.Q = 2/15	3.Q = 4/15	4.Q = 8/15	15 switching steps

Additionally, a linear output can be configured.

1Y+2 Q	Y = 1/4	1.Q = 1/4	2.Q = 2/4			4 switching steps
1Y+3 Q	Y = 1/8	1.Q = 1/8	2.Q = 2/8	3.Q = 4/8		8 switching steps
1Y+4 Q	Y = 1/16	1.Q = 1/16	2.Q = 2/16	3.Q = 4/16	4.Q = 8/16	16 switching steps

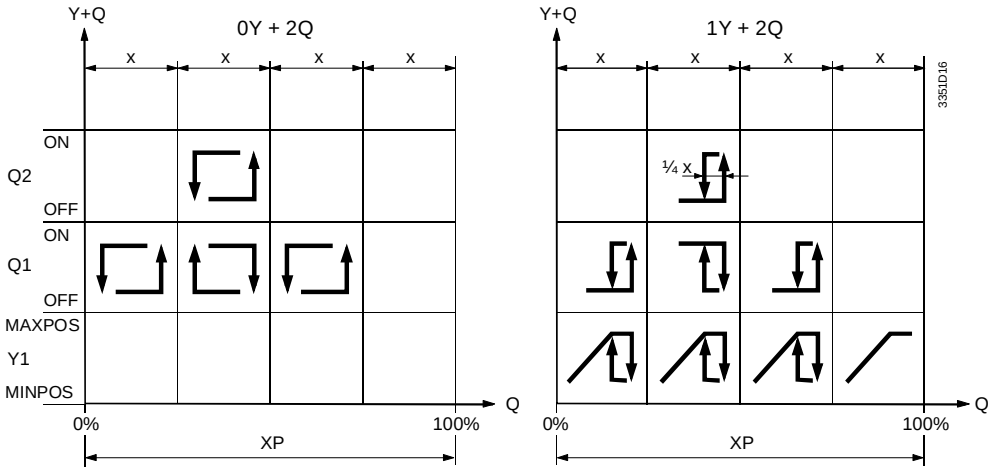
Connection of loads occurs as follows:





Switching interval

Example: with 2Q



Interval x = $\frac{\text{100 \% load}}{\text{(number of switching steps +1)}}$

⚠ Caution: With binary step switches, the T1 and T2 delay times must be set to 0 seconds. Otherwise, simultaneous switching of the outputs and thus a linear output are not ensured.

Adjustable values

Description	Range	Factory setting	
		Temperature	General
Binary step switch [BIN]	0Y + 2...4Q 1Y + 2...4Q		0Y + 0Q

Relevant configuration steps

Display	Comments
CONF ... MODE	
B1 _ ...LIN	With SEL, select the binary step switch [BIN]

11.3.3.11 Variable switching actions (nQ with VAR)

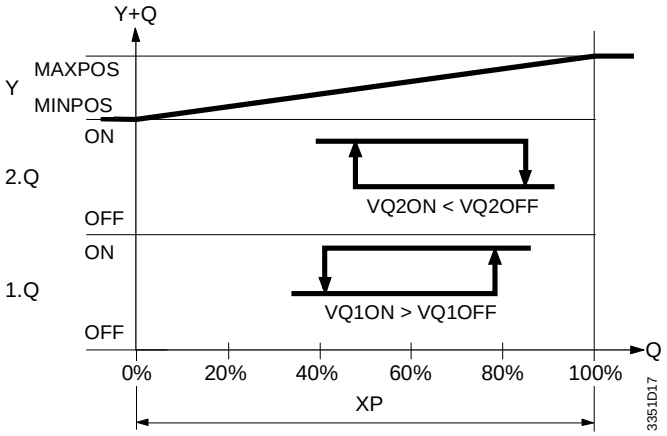
Switching steps

With variable switching actions, the digital outputs can individually be set dependent on load.
Additionally, a linear output can be configured.

The rotary action of the digital output is defined via the setting of the switching points. The digital outputs may overlap.

Switching interval

Example 1Y + 2Q



Adjustable values

Description	Range	Factory setting	
		Temperature	General
Variable step switch [VAR]	0Y + 2...6Q 1Y + 2...6Q		0Y + 0Q
VQ... ON	0...100 %		5 %
VQ... OFF	0...100 % Δ to ON ≥ 0.5 %		0 %

Relevant configuration steps

Display	Comments
CONF ... MODE	
B1 \ _ ...LIN	With SEL, select the variable step switch [VAR]
PARA1 ... MODE	
B1 VQ1 ON 5 % VQ1 OFF 0 %	With SEL, select the switch-on point Q in dependence of the load

11.3.4 Control parameters (P-bands, integral action times)

P-band

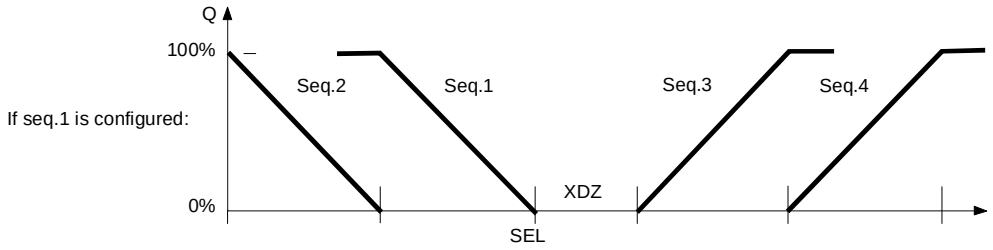
A P-band (XP P) can be allocated to each configured sequence.

PI controller

This is where you allocate the P-band (XP PI) to sequence 1.

When sequence 1 is not configured, the P-band (XP PI) is allocated to sequence 3.

All other configured sequences are set with a factor (XP FACT).



P-controller	P-band xp= setting	XP P XP P	XP P XP P		XP P XP P	XP P XP P
PI controller	P-band xp= setting	XP PI•XP FACT XP FACT	XP PI XP PI		XP PI•XP FACT XP FACT	XP PI•XP FACT XP FACT

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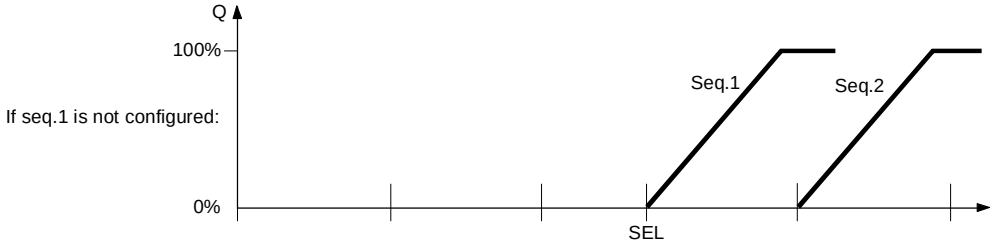

P-controller	P-band xp= setting		XP P XP P	XP P XP P
PI controller	P-band xp= setting		XP PI	XP PI•XP FACT XP FACT

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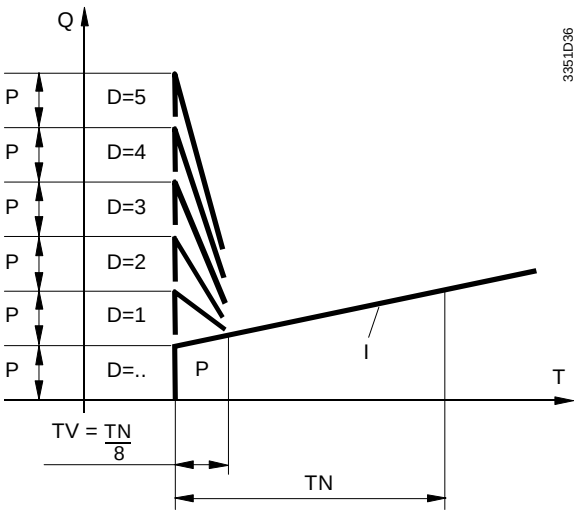
Integral action time [TN]

The integral action time with the PI controller always relates to the set P-band XP PI.

D-part

A D-part can be selected only with the PI controller. The derivative action time is defined at TV= TN/8

Control action



Dead time [DT]

Between sequence 1 and sequence 3 (DT).

In order to avoid, for instance, immediate opening of the cooling valve after the heating valve has been closed, you can specify a dead time.
Summation of the integral part is stopped during this time.

Adjustable values

Description		Range	Factory setting	
			Temperature	General
XP P	P-band P-controller	0.5...100 K / % *	0.5 °C	0.5 %
XP PI	P-band PI controller	2.5, 5.0, 10, 20, 40, 80, 160, 320 K / % *	10 K	10 %
XP FACT	P-band factor PI controller	0.25, 0.50, 1.00, 2.00, 4.00		1.00
TN	Integral action time PI controller	15, 30 s 1, 2, 4, 8, 16, 32 min		16 min
PI-D	D-part PI controller	0, 1, 2, 3, 4, 5		0
DT	Dead time	0 1, 2, 4, 8, 16, 32 min		0 min

* % relates to MAXSCA - MINSCA

Relevant configuration steps

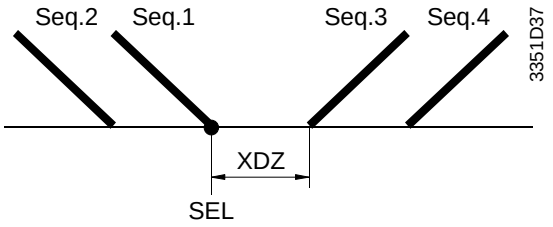
Display	Comments
PARA2 ... MODE	
B1 _// … DT 0 MIN	Dead time between seq.1 and seq.3
B1 _// … XP P 0.5 K	P-band for P-controller
B1 _// … XP PI 10 K	P-band for PI controller
B1 _// … XP FACT 1.00	P-band factor for PI controller
B1 _// … TN 16 MIN	Integral action time for PI controller
B1 _// … PID 0	D-part for PI (D) controller

11.3.5 Setpoints

11.3.5.1 Fixed setpoints

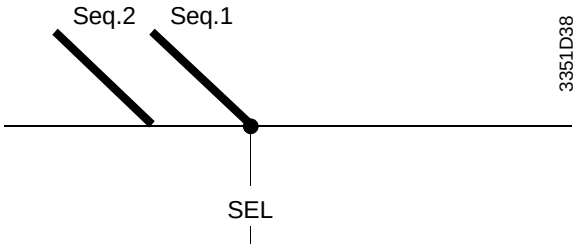
Setpoints, SEL, XDZ

You can select different setpoints for seq.1+2 and seq.3+4:



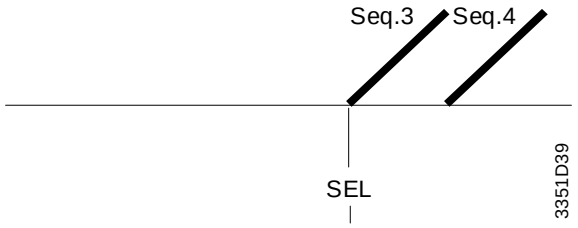
Setpoint seq.1+2 = SEL; setpoint seq.3+4 = SEL + XDZ

If only sequence 1 or sequences 1+2 are configured:



Setpoint = SEL

If only sequence 3 or sequences 3+4 are configured:



Setpoint = SEL

Setpoint limitation MINSEL, MAXSEL

The adjustable setpoint range can be limited in AUTO MODE via MINSEL and MAXSEL.

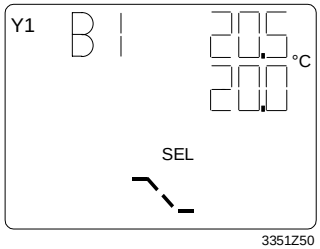
Night setpoint NIGHT

When night operation (NIGHT) was actively selected for this control loop, an additional set of setpoints can be specified for night operation.

Display

The active operating mode is indicated on the display by the symbols ☼ and ☾.

AUTO MODE indicates the current setpoint:



← Current actual value

← Current setpoint

With the SEL button, the setpoints for day and night operation can be adjusted within the limitation of MINSEL and MAXSEL.

Adjustable values

Description	Range	Factory setting	
		Temperature	General
MAXSEL (setting range for AUTO MODE)	0...100 % of r. ≥ MINSEL	35 °C	100 % of r.
MINSEL (setting range for AUTO MODE)	0...100 % of r. ≤ MAXSEL	0 °C	0 % of r.
SEL (setting for set of setpoints)	MINSEL...(MAXSEL–XDZ)	20 °C	50 % of r.
XDZ (setting for set of setpoints)	0... (MAXSEL–SEL)	0 K	0 % of r.

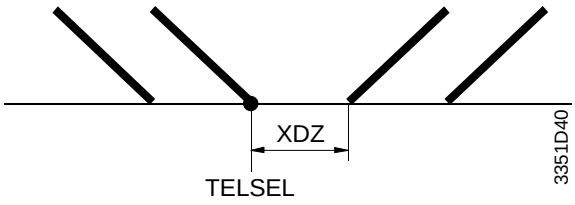
Relevant configuration steps

Display	Comments
PARA2 ... MODE	
B1 MAXSEL...35 °C MINSEL... 0 °C	Setting range for AUTO MODE
PARA1 ... MODE	
B1 XDZ 0 K SEL 20 °C	If seq. 1 **and** seq. 3 are configured If NIGHT ACTIV, a prompt for day and night setpoint appears
B1 \ _ ... SEL 20 °C	If seq.1 **or** seq.3 are configured If NIGHT ACTIV, a prompt for day and night setpoint appears

11.3.5.2 Remote setpoint [TELSEL]

Setpoint

You can set the setpoint by means of a separate remote setpoint adjuster. In this case, different setpoints for seq.1+2 and seq.3+4 are still possible.



Setpoint seq.1+2 = TELSEL; setpoint seq.3+4 = TELSEL + XDZ

When only seq.1 or seq.3 is configured, the setpoint corresponds to TELSEL.

For TELSEL, you can select a passive 0...1000 Ω or an active DC 0...10 V signal.

Input TYPE, MINSCA, MAXSCA

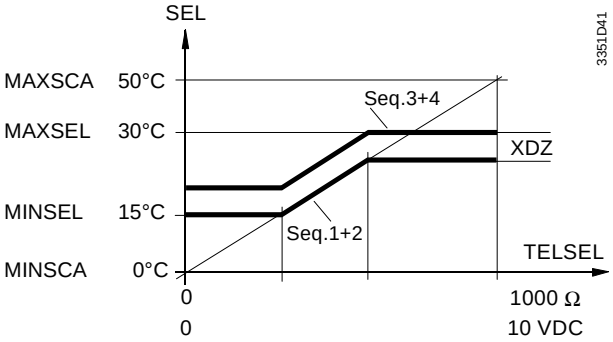
The input range for TELSEL corresponds to the input range of the main control variable B… SEQREG.

The input range for TELSEL must be specified via MINSCA... MAXSCA, if the main controlled variable B… SEQREG is a passive signal.

Setpoint limitation MINSEL, MAXSEL

The setpoint can be limited with MINSEL and MAXSEL.

Example:



Night setpoint NIGHT

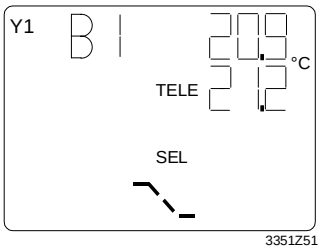
When night operation (NIGHT) was actively selected for this control loop, an additional fixed set of setpoints can be specified for night operation.

This set of setpoints is adjustable only between MINSEL and MAXSEL.

Display

The respectively active operating mode is indicated on the display by the symbols ☼ and ☾.

AUTO MODE indicates the current setpoint:



← Current actual value

← Current setpoint

With SEL, you can change the setpoint for night operation.

Adjustable values

Description	Range	Factory setting	
		Temp.	General
MAXSEL (control range TELSEL and setting range for night setpoints)	0...100 % ≥ MINSEL	35 °C	100 % of r.
MINSEL (control range TELSEL and setting range for night setpoints)	0...100 % ≤ MAXSEL	0 °C	0 % of r.
MINSCA...MAXSCA Input range	0...50 °C / 0...130 °C –35...+35 °C	0...50 °C	
XDZ	0...100 % of r.	OK.	0 % of r.

Relevant configuration steps

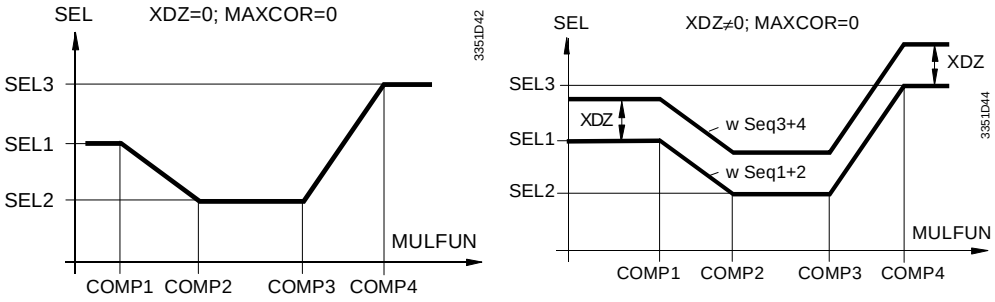
Display	Comments
CONF1 ... MODE	
B2 MAXSCA ...50 °C MINSCA ...0 °C	Selection of the input range if input B…SEQREG is passive
PARA2 ... MODE	
B1 MAXSEL ...35 °C MINSEL ...0 °C	Control range TELSEL and setting range for night setpoint
B1 XDZ ...0.0 K	Deadzone

11.3.5.3 Compensated setpoints [MULFUN, COMP]

Day setpoints

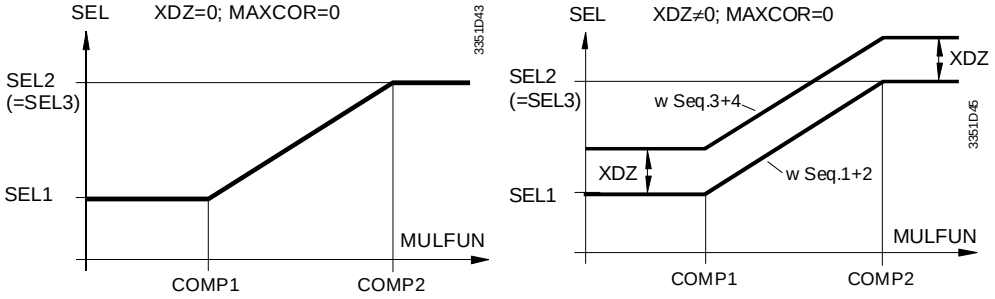
You can set summer and/or winter compensation. The setpoint is controlled via the value of input MULFUN as follows:

Summer **and** winter compensation ⇒ SEL3 ≠ SEL2



You can select different setpoints for seq.1+2 and seq.3+4.

Summer **or** winter compensation ⇒ SEL3 = SEL2



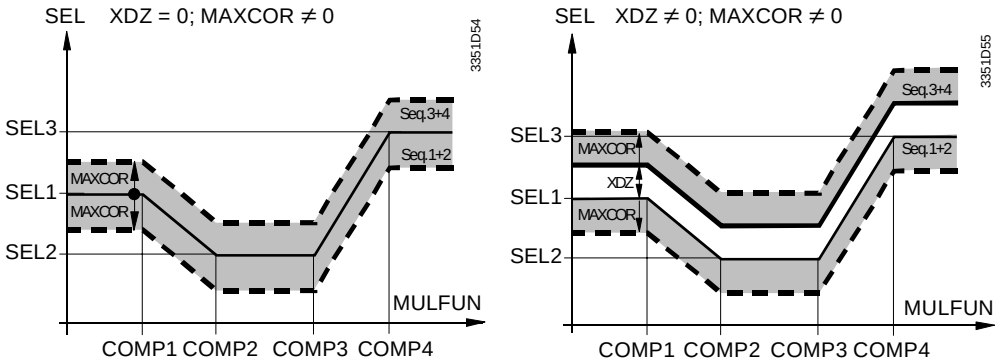
If you enter SEL3 = SEL2, prompts for COMP3 and COMP4 values no longer appear.

Setpoint correction MAXCOR

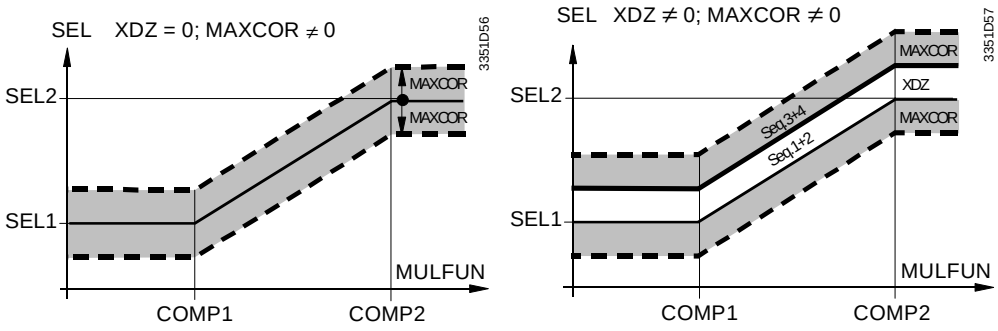
Within the range defined by MAXCOR in PARA2 MODE, the compensated setpoint can later be corrected via COR in AUTO MODE.

Control action of MAXCOR:

Summer **and** winter compensation ⇒ SEL3 ≠ SEL2



Summer **or** winter compensation ⇒ SEL3 = SEL2



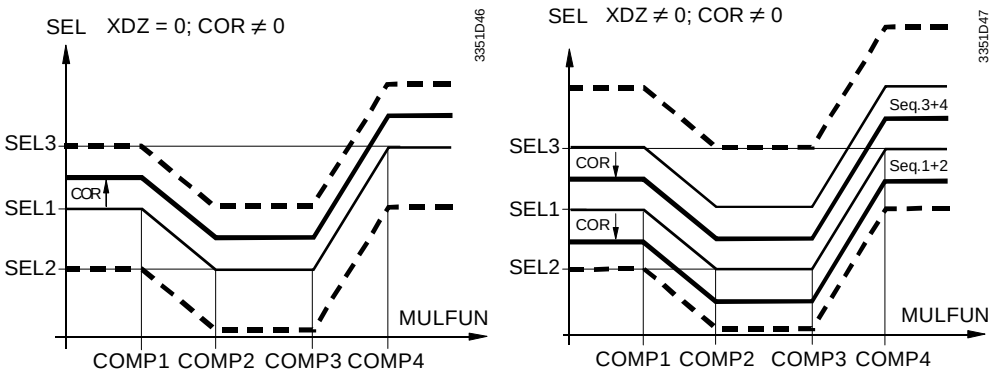
Setpoint correction COR

Shifting the setpoint of AUTO MODE.

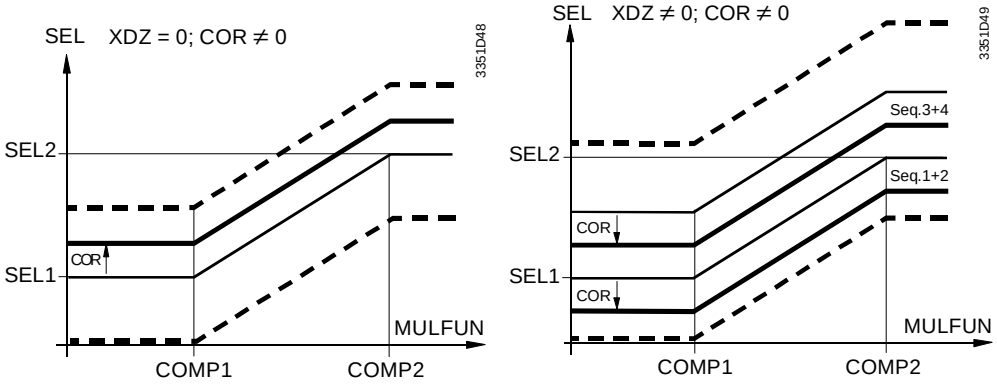
The set setpoint curve can be moved in AUTO MODE by means of parameter COR within the range –MAXCOR... +MAXCOR.

Control action of COR:

Summer **and** winter compensation ⇒ SEL3 ≠ SEL2

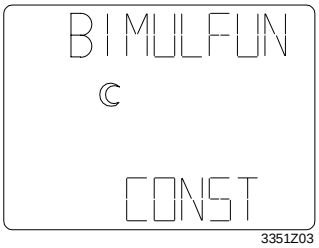


Summer **or** winter compensation ⇒ SEL3 = SEL2



Night setpoint

When night operation (NIGHT) was actively selected for this control loop, the following setpoints are available for night operation:



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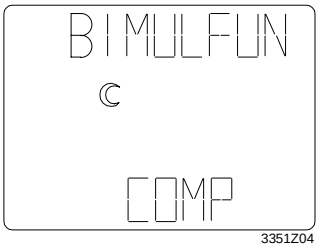
For night operation, you can define a fixed set of setpoints.



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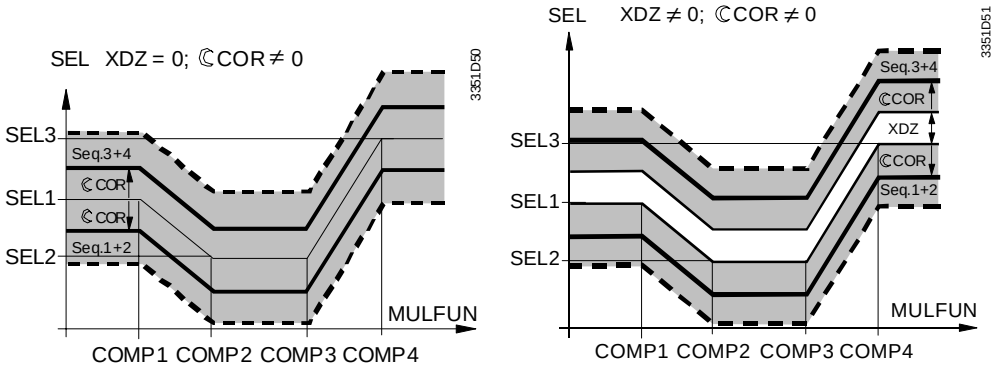
For night operation, you can define a set of setpoints in dependence of the compensated setpoint for day operation.

The respectively active operating mode is indicated on the display by the symbols ☼ and ☾ .

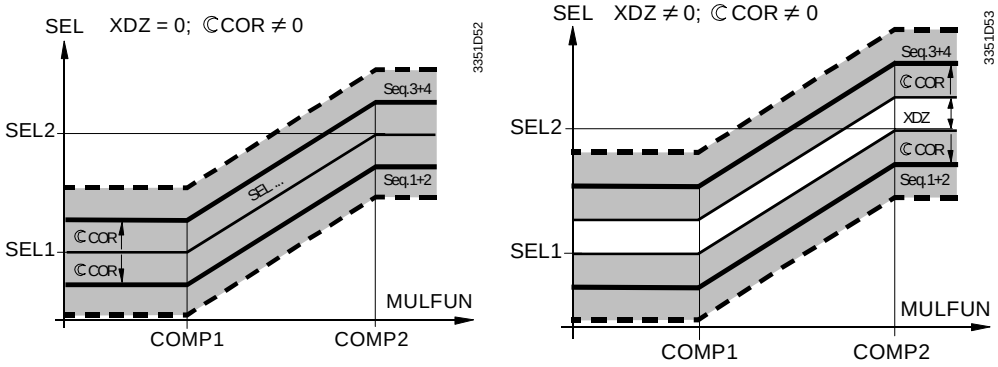
Compensated night setpoint COMP

The night setpoint can be set outside of the setpoint using ☾COR of 0…MAXCOR.

Summer **and** winter compensation ⇒ SEL3 ≠ SEL2

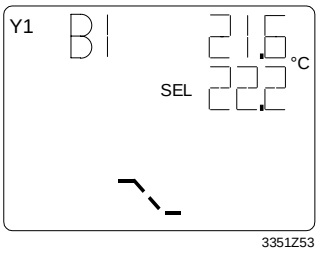


Summer **or** winter compensation ⇒ SEL3 = SEL2



Display

AUTO MODE indicates the current setpoint:



← Current actual value

← Current setpoint

With the SEL button, the setpoint correction COR for day and night operation can be changed within the adjustable limitations of MAXCOR.

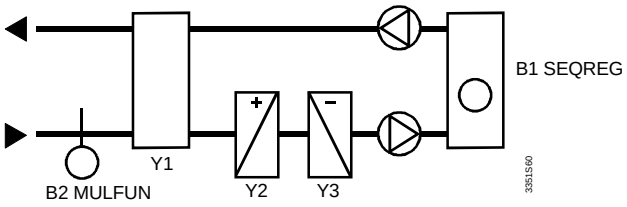
Adjustable values

Description	Range	Factory setting	
		Temp.	General
SEL 1 Setpoints	0...100 % of r.	20 °C	50 % of r.
SEL 2	0...100 % of r.	23 °C	60 % of r.
SEL 3	0...100 % of r.	= SEL2	= SEL2
COMP 1 Controlled values	0...100 % of r. < COMP 2	20 °C	50 % of r.
COMP 2	COMP1 <0...100 % of r. < COMP 3	30 °C	60 % of r.
COMP 3	COMP2 <0...100 % of r. < COMP 4	31 °C	61 % of r.
COMP 4	COMP 3 ≤ 0...100 of r.	32 °C	62 % of r.
MAXCOR limits for COR, ☼- COR and ☾-COR	0...100 % of r.	0 K	0 % of r.
☼-COR and COR shifting of setpoint	– MAXCOR... + MAXCOR	0K	0 % of r.
☾-COR shifting of night setpoint	0...MAXCOR	0K	0 % of r.

Relevant configuration steps

Display	Comments
CONF2 ... MODE	
B1 SEQREG ... +B... INACT	With SEL, MULFUN must be configured
CONF1 ... MODE	
B1 MULFUN...CONST	Set with SEL until COMP is the compensated setpoint If NIGHT ACTIV, a prompt appears for day and night operation
PARA2 ... MODE	
B1 SEL1 ... +B... MULFUN 20 °C	Setpoint SEL 1
B1 SEL2 ... +B... MULFUN 23 °C	Setpoint SEL 2
B1 SEL3 ... +B... MULFUN 23 °C	Setpoint SEL 3
B1 SEL1 20 °C ...+B... COMP 1 20 °C	Compensated value COMP 1
B1 SEL2 23 °C ...+B... COMP 2 30 °C	Compensated value COMP 2
B1 SEL2 23 °C ...+B... COMP 3 31 °C	A prompt for compensated value COMP 3 appears only if SEL 3 ≠ SEL 2
B1 SEL3 25 °C ...+B... COMP 4 32 °C	A prompt for compensated value COMP 4 appears only if SEL 3 ≠ SEL 2
B1 MAXCOR ... 0 K	Limitations for COR, ☼ COR, ☾ COR
PARA1 ... MODE	
B1 \ \ _ / / ... COR 0 K	Correction value; if NIGHT ACTIV, a prompt appears for day and night operation

Setpoint compensation for air conditioning plant with summer compensation



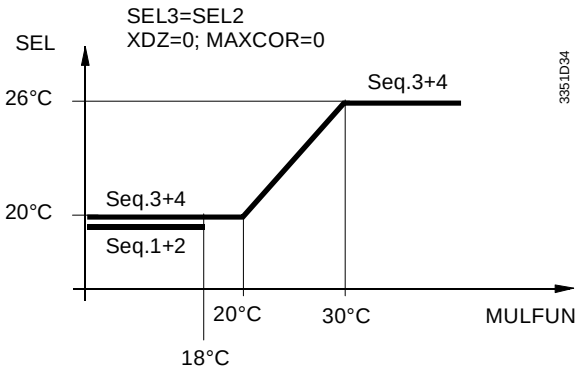
Control loop 1

B1 SEQREG

Seq. 2 | Seq. 1 | DT | Seq. 3 | Seq. 4

S❄PROT			
Seq.2	Seq.1	Seq.3	Seq.4
Y2	*Y1*	*Y3*	

Shift the setpoint as per the following diagram:

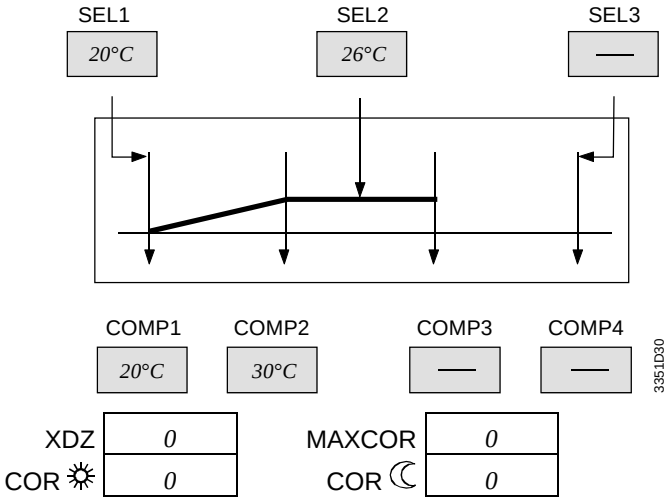


Additional requirement: heating is locked at an outside air temperature > 18 °C

Translation into configuration tables:

With LOCK, you can lock the sequences 1 and 2 for example at 18 °C.

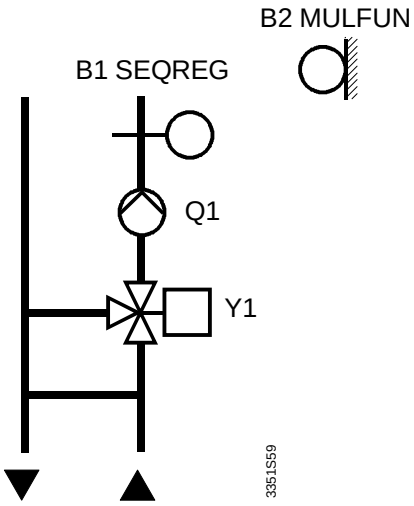
Display	Default	Selectable	Control loop 1	Control loop 2	Control loop 3
COMP ☼ (if MULFUN)	CONST	COMP	☒	☐	☐
LOCK (for seq.1+2)	FREE	LOCK	☒	☐	☐
LOCK (for seq.3+4)	FREE	LOCK	☐	☐	☐

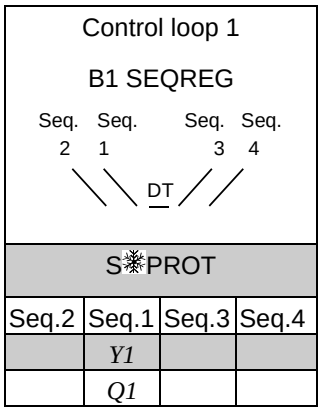


Parameter	Control loop 1	Control loop 2	Control loop 3
Seq.1+2 LOCK	*18 °C*		
Seq.1+2 LOCK			

Setpoint compensation for flow temperature control

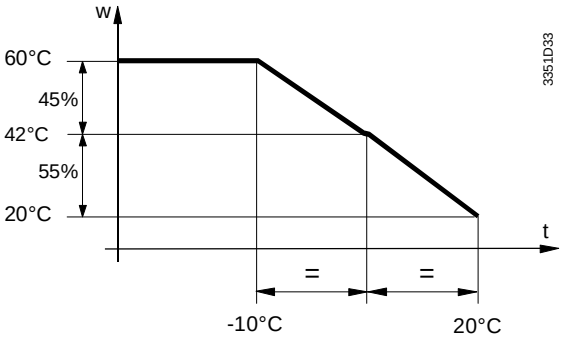
Basic diagram





Additionally: Continuous "ON" of the pump at outside air temperatures < 5 °C
Locked for: outside air temperatures > 16 °C

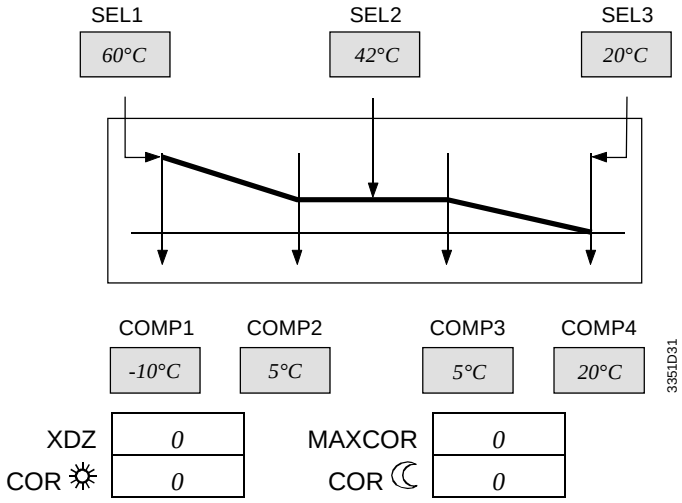
Shift the setpoint as per the following diagram:



Translation into configuration tables:

Display	Default	Selectable	Control loop 1	Control loop 2	Control loop 3
COMP ☼ (if MULFUN)	CONST	COMP	☒	☐	☐
LOCK (for seq.1+2)	FREE	LOCK	☒	☐	☐
LOCK (for seq.3+4)	FREE	LOCK	☐	☐	☐

Display	Default	Selectable	Y1+Q...	Y2+Q...	Y3+Q...
RELEAS	INACT	ACTIV	☒	☐	☐



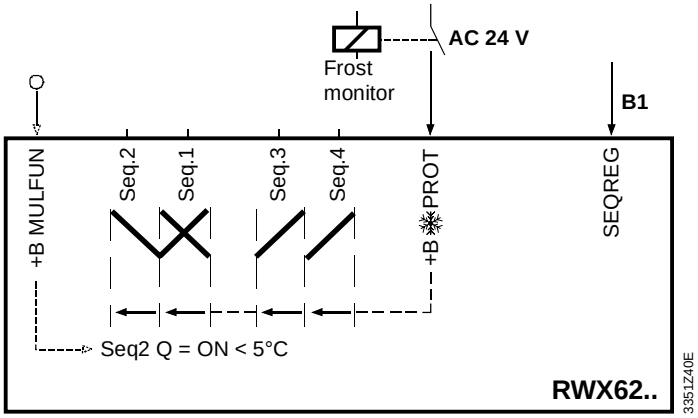
Parameter	Q1	Q2	Q3	Q4	Q5	Q6
YQ ON (1Y + 1Q)	*5 %*					
YQ OFF (1Y +1Q)	*0 %*					
MQ ON (RELEAS)	*5 °C*					
MQ OFF (RELEAS)	*6 °C*					

Parameter	Control loop 1	Control loop 2	Control loop 3
Seq.1+2 LOCK	*16 °C*		
Seq.1+2 LOCK			

11.3.6 Frost protection function

11.3.6.1 Frost monitor [❄PROT]

Mode of operation



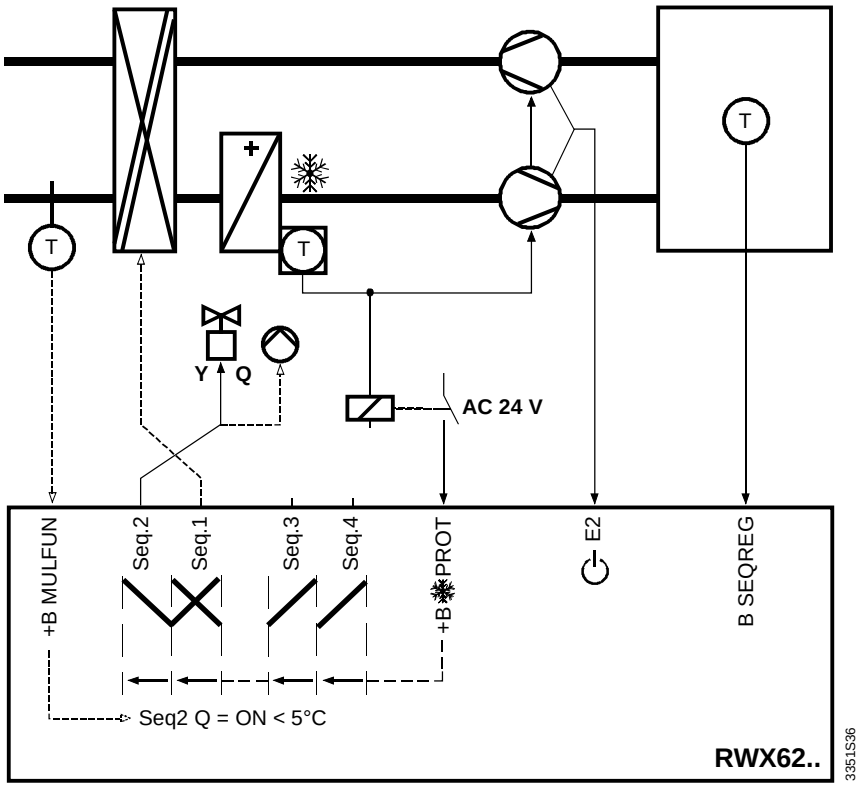
If the value is below the setpoint of the frost protection thermostat, the AC 24 V signal is interrupted. If this occurs, the following functions are triggered:

- Seq.1+2 with Y outputs move to 100 % heating output
- Seq.3+4 move to 0 %
- All signal limitations are ineffective
- The LCD indicates a frost alarm

The frost protection function may be triggered on the water or air side. As an additional protection, we recommend (mandatory for frost protection on the water side) setting the heating circuit pumps to automatic control for outside temperatures below 5 °C. However, the MULFUN function must be active in order to activate the [RELEAS] function. This function can only be programmed for outputs with 1Y (heating valve) and 1Q (heating circuit pump).

After the AC 24 V signal returns to input B…, the sequence controller resumes standard control operation.

Use



During “Standby“, all frost protection functions remain active. When control operation is disabled, all frost protection functions are also disabled.

⚠ When frost protection is active, but the heating output is insufficient (e.g., no heating water), the frost protection function cannot protect the plant from frost damage.

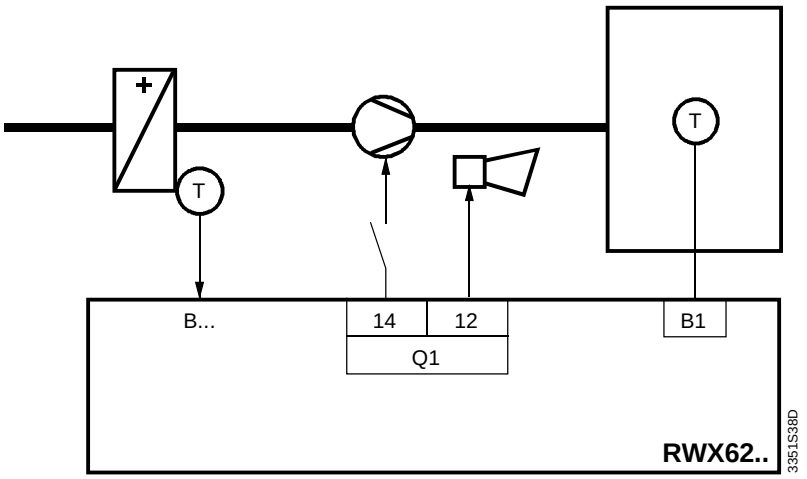
Relevant configuration steps

Display	Comments
CONF2 ... MODE	
B1 SEQREG ...+B2 INACT	With SEL, select ❄ PROT

11.3.6.2 Super frost protection PI limiter [S❄PROT]

2-phase, modulating/2-position frost protection limitation function for water heating coils with frost protection alarm contact (Q1).

Mode of operation



Q1 is predefined for the alarm output

The super frost protection function works in two phases:

1. Modulating super frost protection PI limitation phase

When the value drops below the current limiter setpoint, the limiter function with modulating PI mode overrides the current sequence controller function to retain the limit value. At the same time, the set Y signal level limitations are temporarily ineffective. (Fresh air damper fully closed for 100 % heat recovery).

- In control mode:
  - The limiter setpoint is permanently set to 7 K above the alarm setpoint
  - Limitation acts on all active sequences 1...4
- In standby mode:
  - The limiter setpoint is adjustable, but must be at least 7 K above the alarm setpoint
  - The limitation acts only on the reverse acting sequence 1+2 with Y output; defined Y signal limitations are ineffective.

2. Two-position super frost alarm phase

This phase is active only when the frost protection temperature drops below the set super frost alarm setpoint despite the previous modulating super frost PI limiter phase. This triggers the following modes:

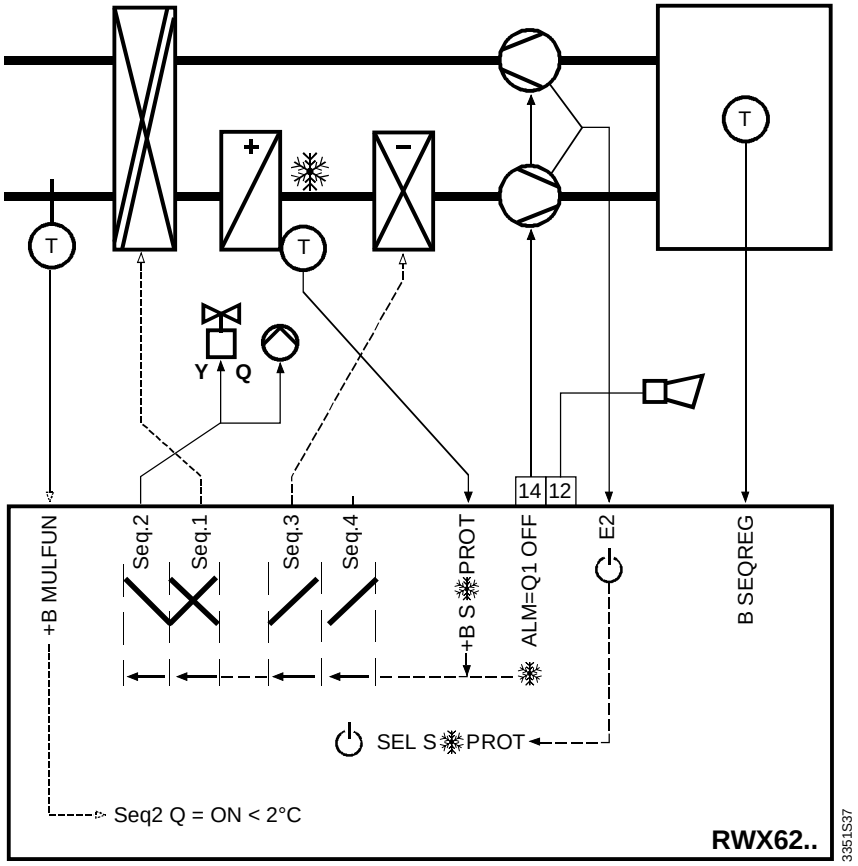
- Ventilation is deactivated via alarm contact Q1 and the external alarm is activated
- Sequences 1+2 with Y outputs move to 100 % heating output
  Signal level limitations are ineffective
- All other sequences move to zero output
- The LCD indicates a frost alarm

After the temperature exceeds the alarm setpoint by 3 K, the sequence controller resumes current operation as soon as the frost alarm has been acknowledged. The following alternative alarm acknowledgement methods are available:

- Automatic acknowledgement on temperature increase [AUTO]
- Manual acknowledgement (press button on controller) of each alarm [MANUAL]
- Manual acknowledgement (press button on controller) of ever third consecutive alarm sent within 30 minutes [MANU3]

There is a danger of frost if the alarm setpoint is set too low.
If the standby setpoint is set to above 12 °C (default value) for frost protection on the air side with an active sensor 0…15 °C, the heating valve may never fully close.

Use



The frost protection function may be triggered on the water or air side. As an additional protection, we recommend (mandatory for frost protection on the water side) setting the heating circuit pumps to automatic control for outside temperatures below 2 °C. However, the MULFUN function must be active in order to activate the [RELEAS] function. This function can only be programmed for outputs with 1Y (heating valve) and 1Q (heating circuit pump).

⚠ During standby operation, the super frost protection functions remain active. When control operation is disabled, all super frost protection functions are also disabled. The super frost alarm contact then moves to the alarm position. On failure of the super frost temperature input, the super frost protection function moves to the alarm state. When the super frost protection function is active, but the heating output is insufficient (e.g., no heating water), the super frost protection function cannot protect the plant from frost damages.

Adjustable values

Description	Range	Factory setting	
		Temperature	General
TYPE sensor type	Ni: 0...130 °C Volt °C 0...15 °C		
XP PI P-band	2.5, 5.0, 10, 20, 40, 80, 160, 320 K	40 K	
TN integral action time	15, 30 s 1, 2, 4, 8, 16, 32 min		2 min
S❄ALM alarm value	1xNi: 0...123 °C VOLT °C: 0...8 °C	5 °C	
S❄PROT setpoint Standby operation	1x Ni: 7...130 °C ≥ 7 K+ S❄ALM VOLT °C: 7...15 °C ≥ 7 K+ S❄ALM	12 °C	

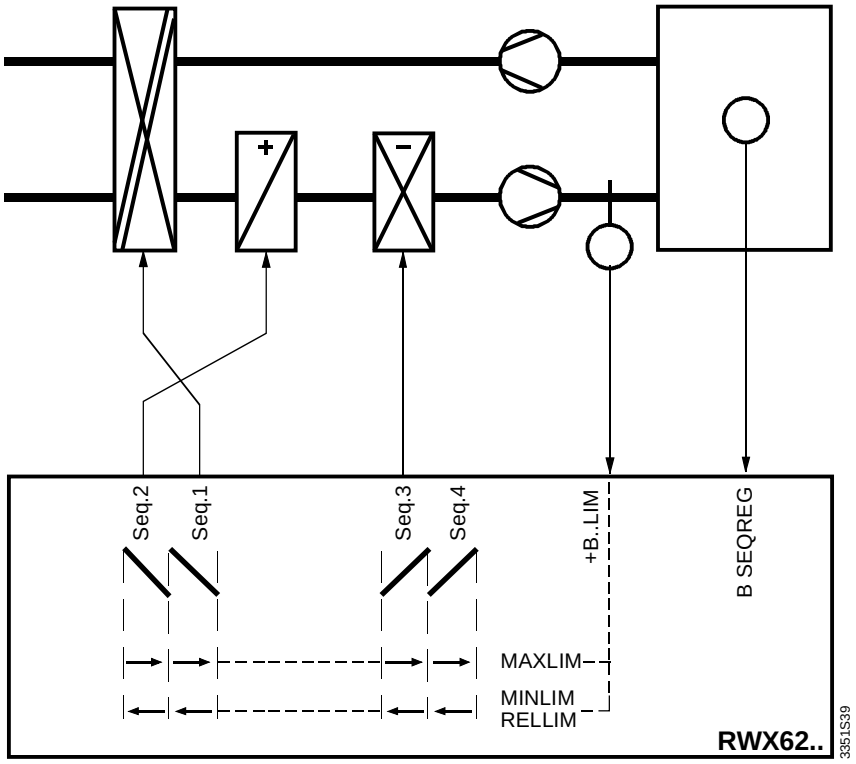
Relevant configuration steps

Display	Comments
CONF2 ... MODE	
B1 SEQREG ...+B2 INACT	With SEL, select S ❄PROT
B2 TYPE... 1xNi °C	With SEL, select the sensor type
CONF1 ... MODE	
S❄PROT...MANUAL	With SEL, select the alarm acknowledgement method MANUAL, AUTO or AUTO3
PARA2 ... MODE	
B1 S❄ PROT ... XPPI 40 K	With SEL, select the P-band
B1 S❄ PROT ... TN 2.0 MIN	With SEL, select the integral action time
PARA1 ... MODE	
B1 SEQREG ...+B2 S❄ ALM 5 °C	With SEL, select the alarm setpoint
B1 SEQREG ...+B2 S❄ PROT 12 °C	With SEL, select the setpoint for standby mode

11.3.7 Auxiliary controllers

11.3.7.1 General limiter [LIM]

Mode of operation

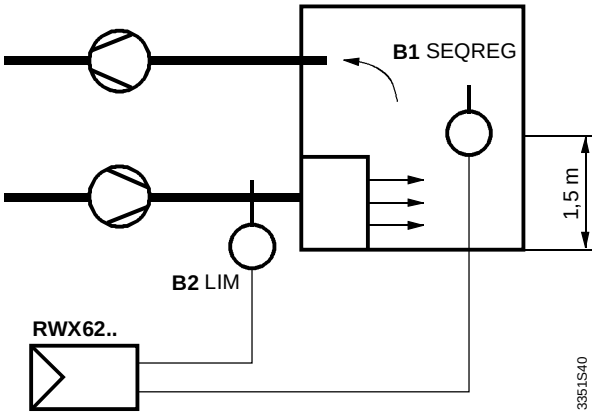


The general limiter function with PI mode allows for the following:

- Absolute maximum and minimum limitation (e.g., supply air or humidity). When the value drops below or exceeds the limitation setpoint, the limiter function with PI mode overrides the standard control function to retain the limitation setpoint.
- Maximum temperature difference limitation [RELLIM]
  (e.g., maximum difference between room temperature B1 and supply air temperature B…LIM). When dropping below the limitation setpoint, the limiter function with PI mode overrides the standard control function to maintain the limitation setpoint.

The supply air temperature cannot drop below the current room temperature actual value by more than the set temperature difference. The maximum temperature difference limitation is especially suited for source ventilation systems.

Use



Adjustable values

Description	Range	Factory setting	
		Temperature	General
B2 LIM XP PI; P-band limitation controller	2.5, 5.0, 10, 20, 40, 80, 160, 320 K / % *	40 K	40 %
B2 LIM TN; integral action time for limitation controller	15, 30 s 1, 2, 4, 8, 16, 32 min		2 min
B2 MAXLIM; maximum limitation value	0...100 % of r.	35 °C	35 %
B2 MINLIM; minimum limitation value	0...100 % of r.	15 °C	15 %
B2 RELLIM; maximum temperature difference between B1 and B...LIM	–100...0 K	–100 K	

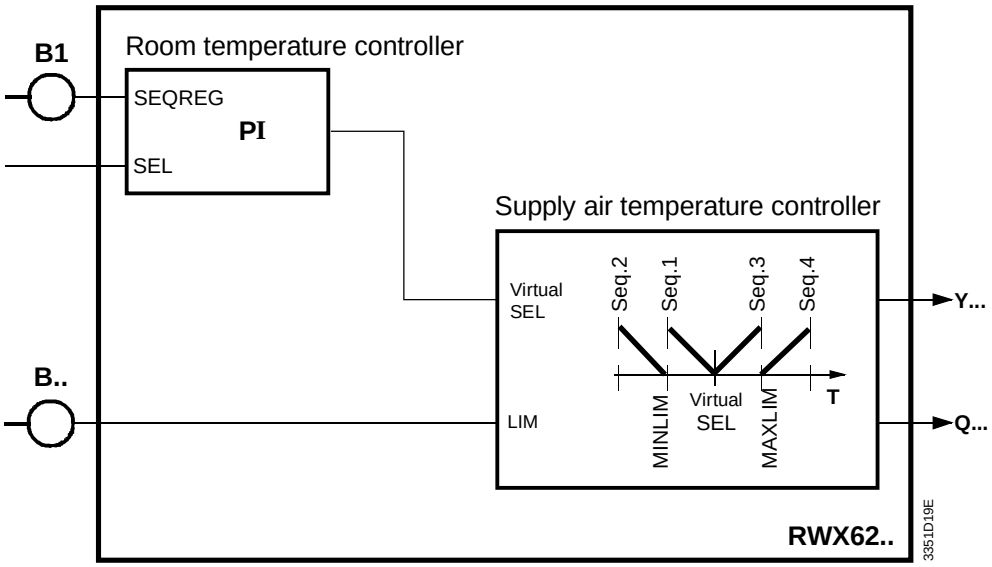
* % relates to MAXSCA - MINSCA

Relevant configuration steps

Display	Comments
CONF2 ... MODE	
B1 SEQREG... +B2 INACT	With SEL, select LIM
CONF1 ... MODE	
B1 SEQREG PI	With SEL, select control mode P or PI
B1 CASC ... INACT	Cascade control "INACT" ⇒ LIM function works as a general limiter
PARA2 ... MODE	
B2 LIM ... XP PI 40 K	With SEL, set the P-band for the limitation controller
B2 LIM ... TN 2 MIN	With SEL, set the integral action time for the limitation controller
PARA1 ... MODE	
B2 MAXLIM 35 °C MINLIM 15 °C	With SEL, set the maximum and minimum limitation value
B2 RELLIM –100 K	With SEL, select a maximum temperature differential between B1 SEQREG and B2 LIM

11.3.7.2 Temperature cascade control [LIM + CASC]

Mode of operation



You can select PI/PI room/supply air temperature cascade control in addition to the limiter function.
In this case, the PI room temperature controller defines a virtual setpoint for the PI supply air temperature controller within the limitation setpoints (MAXLIM and MINLIM).

Important:

- For cascade control, the respective B-inputs SEQREG and LIM must be configured for temperature [°C / °F]
- Only PI-PI cascades are possible
- When cascade control is selected, the function for maximum temperature difference limitation (room temperature B1 supply air temperature B...) [RELLIM] can be selected

Adjustable values

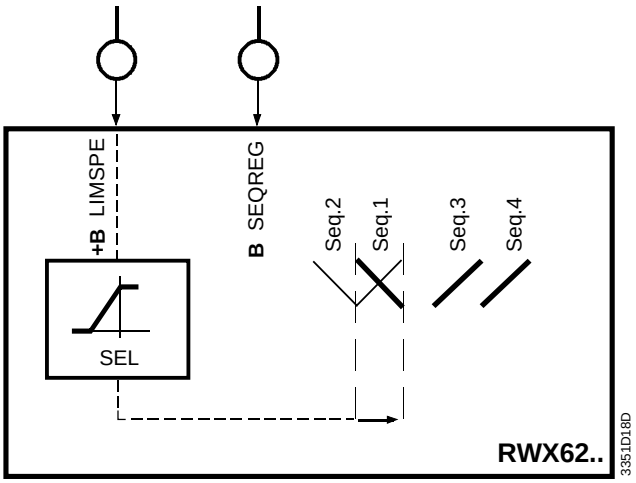
Description	Range	Factory setting	
		Temperature	General
B1 CASC XP PI; P-band room controller	2.5, 5, 10, 20, 40, 80, 160, 320 K	10 K	
B1 CASC TN; integration time room controller	15, 30 s 1, 2, 4, 8, 16, 32 min		16 min
B1 CASC PID; D-part room controller	0, 1, 2, 3, 4, 5		0
B2 \ _ / XP PI; P-band supply air controller seq. 1	2.5, 5, 10, 20, 40, 80, 160, 320 K	40 K	
B2 \ _ / XP FACT; factor for Xp per additional sequence	0.25, 0.5, 1.0, 2.0, 4.0		1.0
B2 \ _ / TN MIN; integral action time supply air controller	15, 30 s 1, 2, 4, 8, 16, 32 min		2 min
B2 MAXLIM; maximum limitation supply air temp.	0...100 % of r.	35 °C	
B2 MINLIM; minimum limitation supply air temp.	0...100 % of r.	15 °C	
B2 RELLIM; maximum temperature differential between B1 and B... LIM	–100...0 K	–100 K	

Relevant configuration steps

Display	Comments
CONF2 ... MODE	
B1 SEQREG... +B2 INACT	With SEL, select LIM
CONF1 ... MODE	
B1 SEQREG PI	Control mode of the room controller: PI !
B1 CASC... INACT	With SEL, activate cascade control CASC ACTIV ⇒ LIM function works as a cascade controller
PARA2 ... MODE	
B1 CASC... XP PI 10 K	With SEL, set the P-band for the room controller
B1 CASC... TN 16 MIN	With SEL, set the integral action time for the room controller
B1 CASC PID 0	With SEL, set the possible D-part for the room controller
B2 \ _ / ...XP PI 40 K	With SEL, set the P-band for the supply air controller sequence 1
B2 \ _ / ...XP FACT 1.0	With SEL, set the factor per each additional sequence
B2 \ _ / ...TN 2 MIN	With SEL, set the integral action time for the supply air controller
PARA1 ... MODE	
B2 MAXLIM 35 °C MINLIM 15 °C	With SEL, set the maximum and minimum limitation value
B2 RELLIM –100 K	With SEL, select a maximum temperature difference between B1 SEQREG and B2 LIM

11.3.7.3 Minimum limitation PI acting on sequence 1 [LIMSPE]

Mode of operation



When the value drops below the limitation setpoint, the limiter function with PI mode overrides the standard control function seq. 1 to maintain the limitation setpoint.

Adjustable values

Description	Range	Factory setting	
		Temperature	General
LIMSPE XP PI; P-band	2.5, 5, 10, 20, 40, 80, 160, 320 K / % *	40 K	40 %
LIMSPE TN; integral action time	15, 30 s 1, 2, 4, 8, 16, 32 min		2 min
LIMSPE; setpoint	0...100 % of r.	0.0 °C	0 %

* % relates to MAXSCA - MINSCA

Relevant configuration steps

Display	Comments
CONF2 ... MODE	
B1 SEQREG... +B2 INACT	With SEL, select LIMSPE
PARA2 ... MODE	
B2 LIMSPE... XP PI 40 K	With SEL, select the P-band limitation controller
B2 LIMSPE... TN 2.0 MIN	With SEL, select the integral action time of the limitation controller
PARA1 ... MODE	
B2 \ _ / LIMSPE 0 °C	With SEL, select the setpoint for the limitation controller

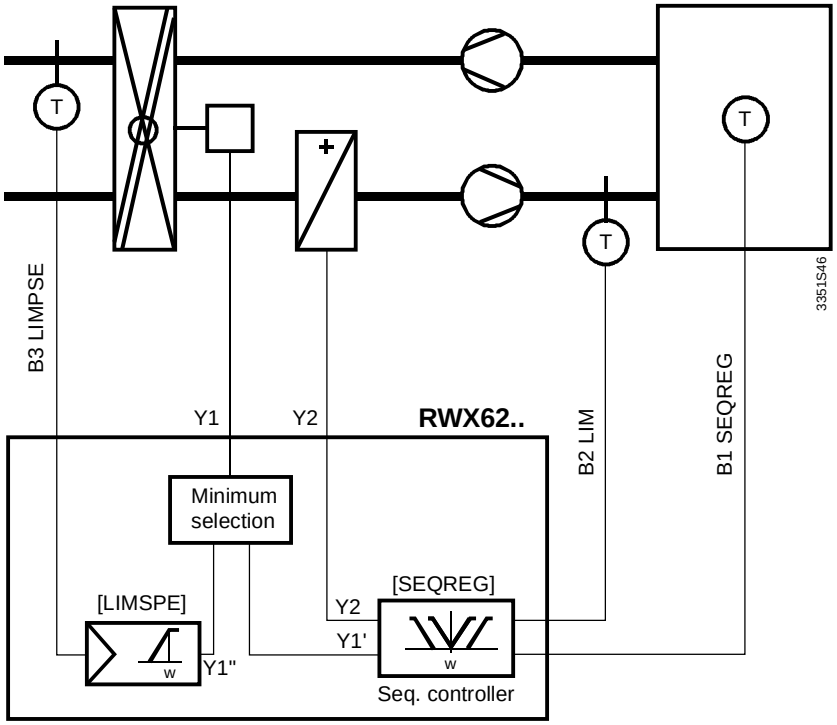
Use

Icing protection ER

The LIMSPE function allows you to implement icing protection for heat recovery units such as rotating heat exchangers, plate heat exchangers, or glycol circulation systems.

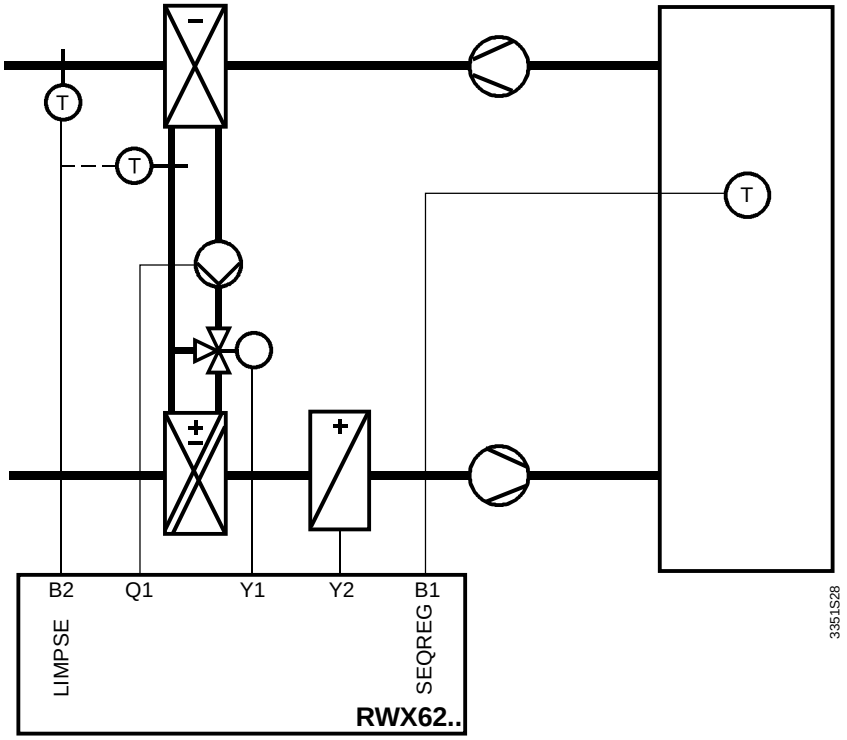
Example 1

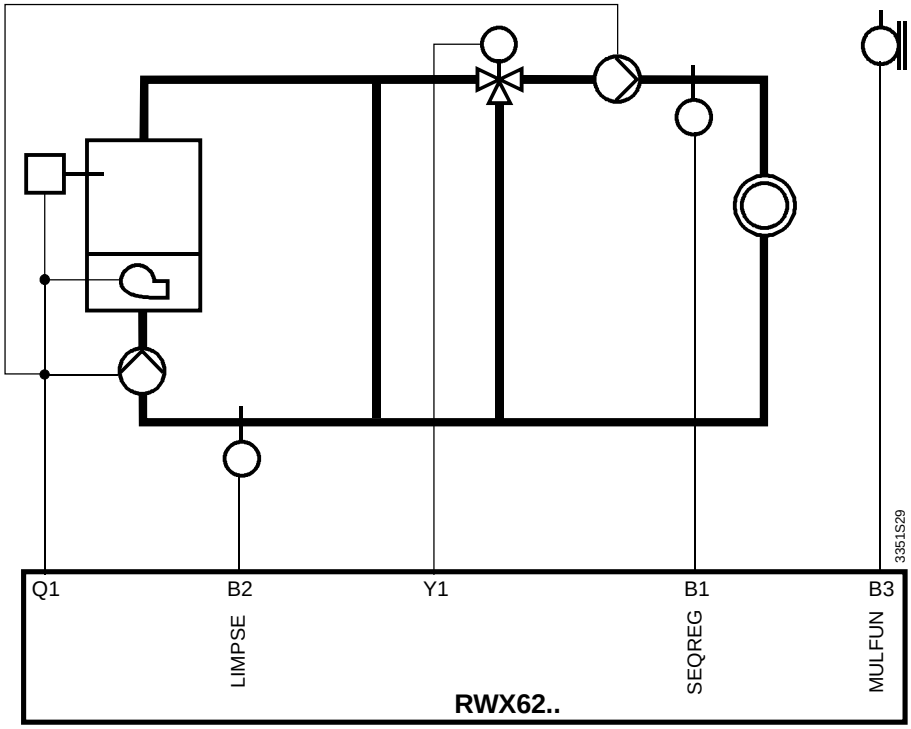
Icing protection for rotating heat exchanger



Example 2

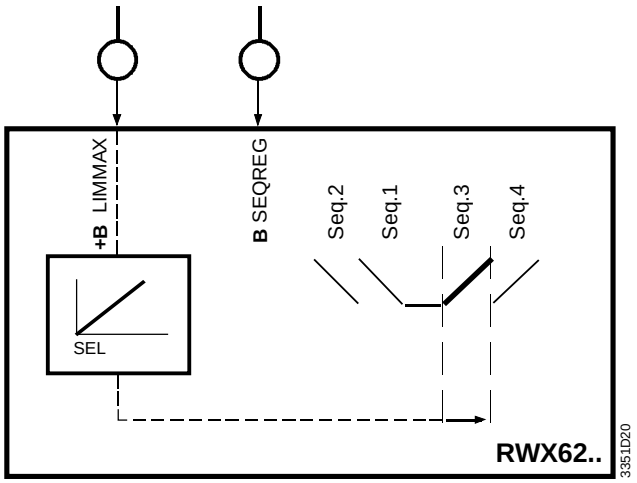
Icing protection for glycol circulation system




3351S29
Q1
B2
Y1
B1
B3
LIMPSE
SEQREG
MULFUN
RWX62..

11.3.7.4 Maximum limitation PI acting on sequence 3 [LIMMAX]

Mode of operation



When the limitation setpoint is exceeded, the limitation function with PI mode overrides the standard (room temperature) control sequence 3 to maintain the limitation setpoint.

Adjustable values

Description	Range	Factory setting	
		Temperature	General
LIMMAX XP PI; P-band	2.5, 5, 10, 20, 40, 80, 160, 320 K / % *	40K	40 %
LIMMAX TN; integral action time	15, 30 s 1, 2, 4, 8, 16, 32 min		2 min
LIMMAX; setpoint	0... 100 % of r.	35 °C	60 % of r.

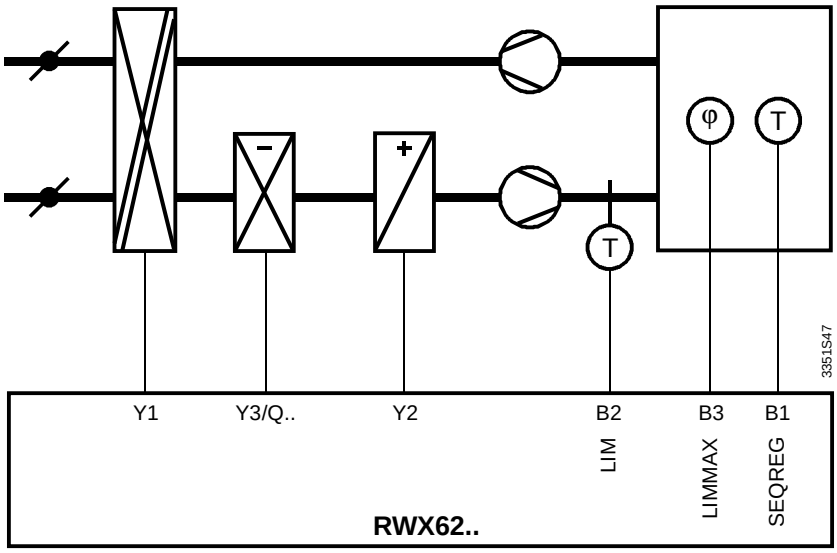
* % relates to MAXSCA - MINSCA

Relevant configuration steps

Display	Comments
CONF2 ... MODE	
B1 SEQREG... +B2 INACT	With SEL, select LIMMAX
PARA2 ... MODE	
B2 LIMMAX... XP PI 40K	With SEL, select the P-band limitation controller
B2 LIMMAX... TN 2.0 MIN	With SEL, select the integral action time of the limitation controller
PARA1 ... MODE	
B2 **\ _ /** … LIMMAX 35 °C	With SEL, select the setpoint for the limitation controller

Application example

Maximum PI room humidity limiter for cooling output control (= dehumidification) of sequence 3.

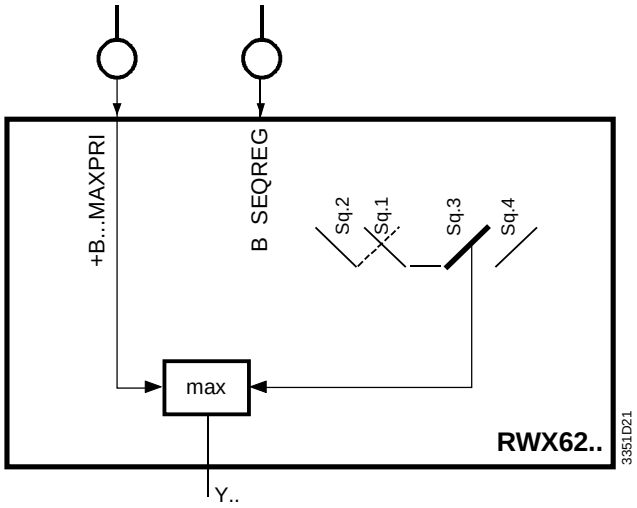


The undercooling of the supply air/room temperature resulting from dehumidification is corrected by the room temperature sequence controller via increased heating.

11.3.8 Auxiliary functions

11.3.8.1 Maximum priority control for sequence 3 [MAXPRI]

Mode of operation



With MAXPRI, a maximum selection occurs between the dehumidification signal (DC 0…10 V) of a separate humidity controller and the required cooling output (sequence 3) requested from the internal room temperature controller.

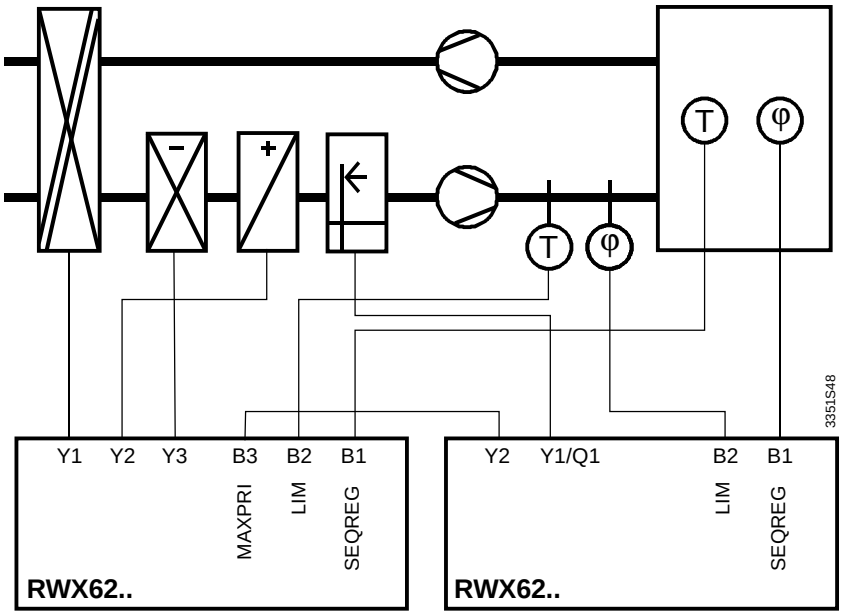
⚠

- The signal on the MAXPRI input must be a DC 0...10 V signal
- A limitation of the output signal B... MAXPOS acts only on the internal sequence 3 and not on input MAXPRI

Relevant configuration steps

Display	Comments
CONF2 ... MODE	
B1 SEQREG... +B2 INACT	With SEL, select MAXPRI

Application example



Temperature control Humidity control

The required dehumidification requested by the humidity controller is wired to the MAXPRI input. This is where a maximum selection occurs between the external dehumidification signal (connected to MAXPRI) and the internal cooling request. The possibly resulting undercooling of the supply air/room temperature is corrected by the room temperature sequence controller via increased heating.

11.3.8.2 Reversal of operating action seq.1

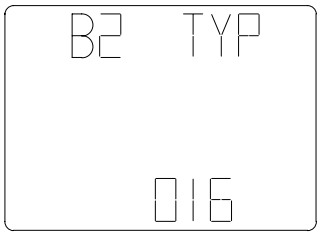
(Maximum Economy Changeover), (MEC); [MULFUN + ALTDIR]

The operating action for sequence 1 can be reversed. Reversal depends on whether the sequence was configured to REVERS (\ **** _ / /) or DIRECT (\ **/** _ / /) during normal operation.

The following changeover actions are possible:

1. Changeover from external via digital signal AC 24 V [DIG]

This signal must be configured to input ALTDIR with DIG.



2. Changeover in the case of an adjustable value [ABS]

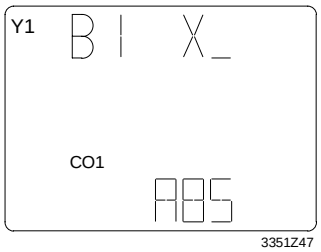
The following measured values are used:

If only MULFUN is configured: Input MULFUN

If MULFUN and ALTDIR are configured: Input ALTDIR

If only ALTDIR is configured: Input ALTDIR

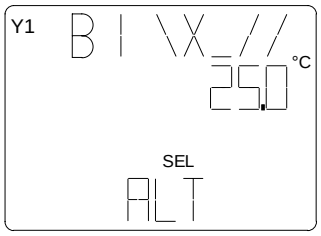
To do this, ABS must be selected at the corresponding picture.



3351Z47

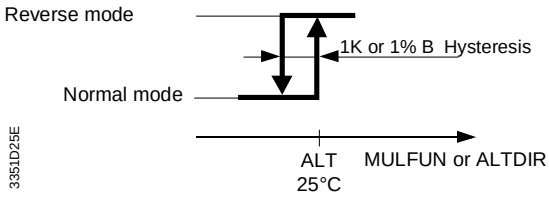
If only ALTDIR was configured, the value is automatically set to ABS and this picture does not appear.

The changeover value is indicated in the PARA1 MODE.



3351Z48

← Input of value



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3. Changeover in the case of an adjustable difference between two measured values (ΔB… -B...)

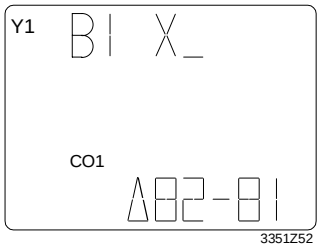
⚠ This changeover is possible only if both B are configured as temperature sensors (1xNi; 2xNi or VOLT °C).

The following measured value differences are possible:

If only MULFUN is configured: ΔB... MULFUN – B... SEQREG

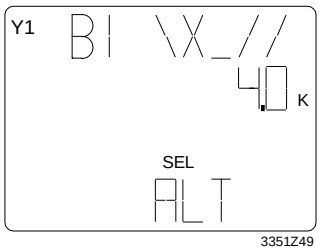
If MULFUN and ALTDIR are configured: ΔB... MULFUN – B... ALTDIR

To do this, ΔB… - B… must be selected at the corresponding picture.

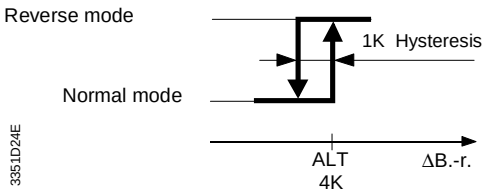


3351Z52

The changeover value is indicated in PARA 1 MODE.



← Input of value



Adjustable values

Description		Range	Factory setting	
			Temperature	General
B1 \ **X** _ / /...ALT	at ABS	0...100 % of r.	25 °C	52 % of r.
	at ΔB.-B.	0...100 K	2 K	
The switching differential is preset			1 K	1 % of r.

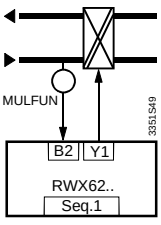
Relevant configuration steps

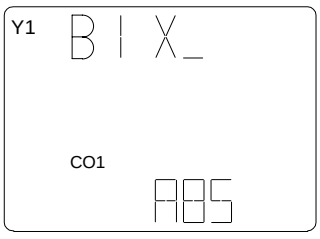
Display	Comments
CONF2 ...MODE	
B1 SEQREG... +B2 INACT	Selection of MULFUN or ALTDIR or MULFUN and ALTDIR
CONF1 ... MODE	
B1 \ **X** _ / /... OFF	Selection of changeover ABS or ΔB.-B.
PARA1 ... MODE	
B1 \ **X** _ / /... ALT 2 K	Enter setpoint for changeover

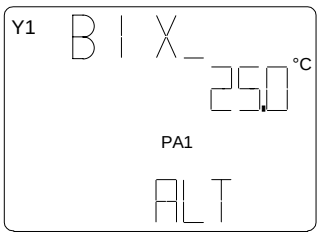
Application examples

Example 1

Changeover at an outside air temperature of 25 °C.





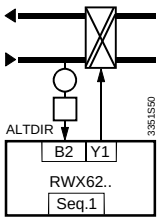


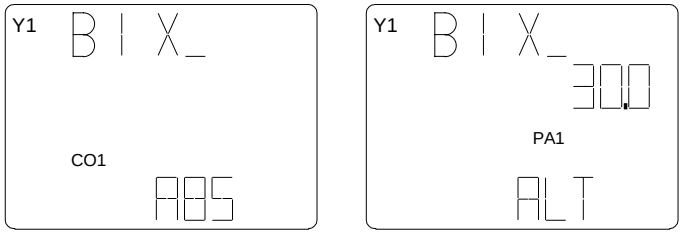
3351Z41

B2 MULFUN: Outside air temperature sensor

Example 2

Changeover on outside enthalpy of 30 kJ/kg



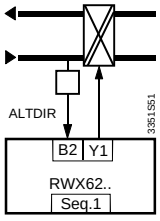


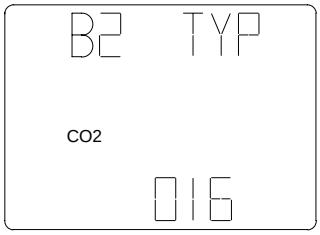
3351Z42

B2 ALTDIR: outside enthalpy sensor DC 0...10 V ≙ 0...100 kJ/kg

Example 3

Changeover via external switching unit



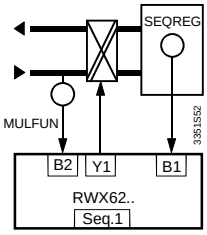


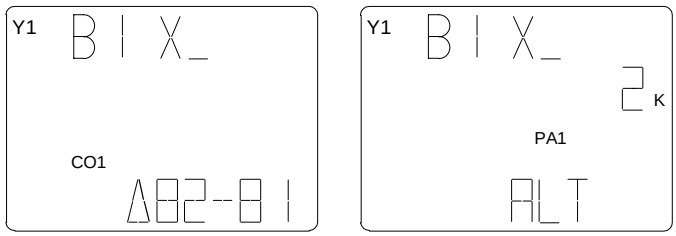
3351Z43

B2 ALTDIR: External AC 0/24 V switching unit

Example 4

Changeover on temperature difference outside air - room air = 2 K



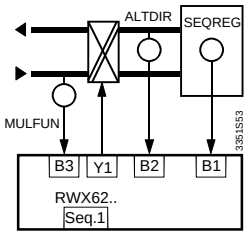


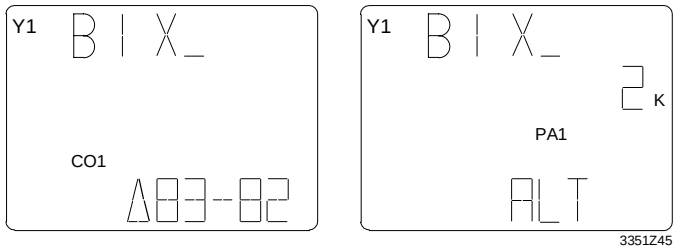
3351Z44

B1 SEQREG: Room temperature sensor
B2 MULFUN: Outside air temperature sensor

Example 5

Changeover on temperature differential outside air - extract air = 2 K





3351Z45

B1 SEQREG: Room temperature sensor

B2 ALTDIR: Extract air temperature sensor

B3 MULFUN: Outside air temperature sensor

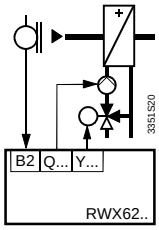
Example 6

Changeover via external enthalpy differential processor at an enthalpy differential = 2 kJ/kg

B2 ALTDIR: Enthalpy processor AQF61.1;
Enthalpy differential DC 0...10 V ≙ –50...+50 kJ/kg

11.3.8.3 Multi-function-dependent activation of a Q with MULFUN [RELEAS] for 1Y + 1Q

Mode of operation



B2 = MULFUN: Outside temperature

If the temperature measured at input MULFUN drops below the respectively specified setpoint, the Y...-dependent Q… is activated.
This function is active also during standby operation.
However, the MULFUN function must already be active in order to activate this function.
This function can only be configured for outputs with 1Y + 1Q.

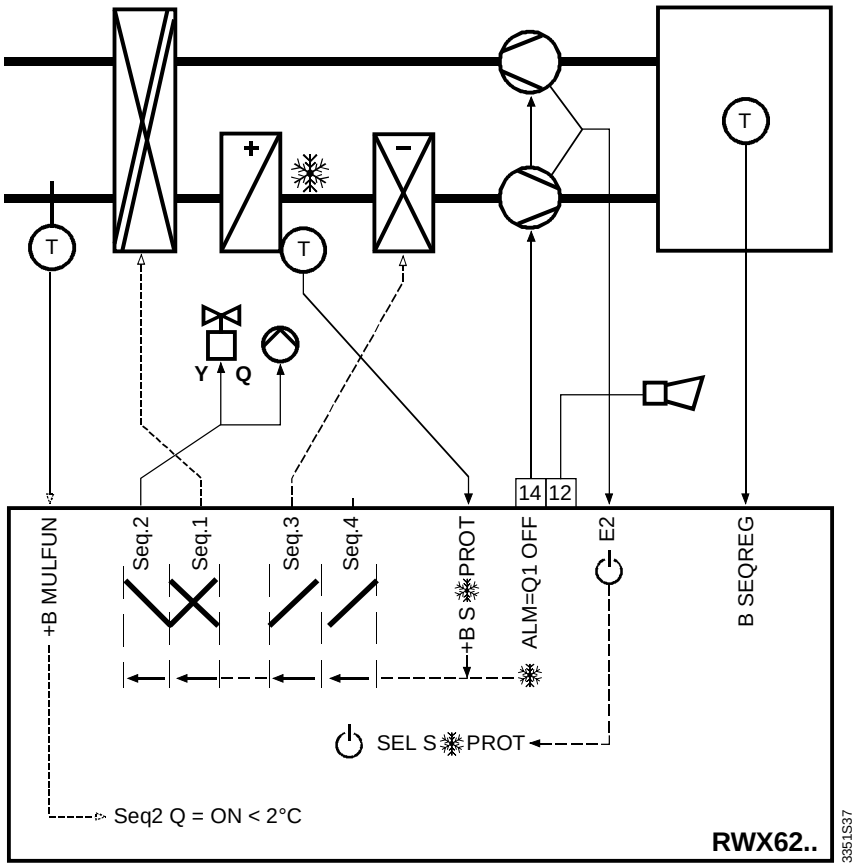
Adjustable values

Description	Range	Factory setting	
		Temperature	General
RELEAS MQ ON	0...100 % of r. MULFUN	2 °C	50 % of r.
RELEAS MQ OFF	0...100 % of r. MULFUN	4 °C	52 % of r.

Relevant configuration steps

Display	Comments
CONF1 ... MODE	
B1 RELEAS...INACT	With SEL, activate the RELEAS function
PARA1 ... MODE	
B1 MQ 1 ON 2 °C MQ1 OFF 4 °C	With SEL, select the switch-on and switch-off points

Application example
S❄ PROT and RELEAS

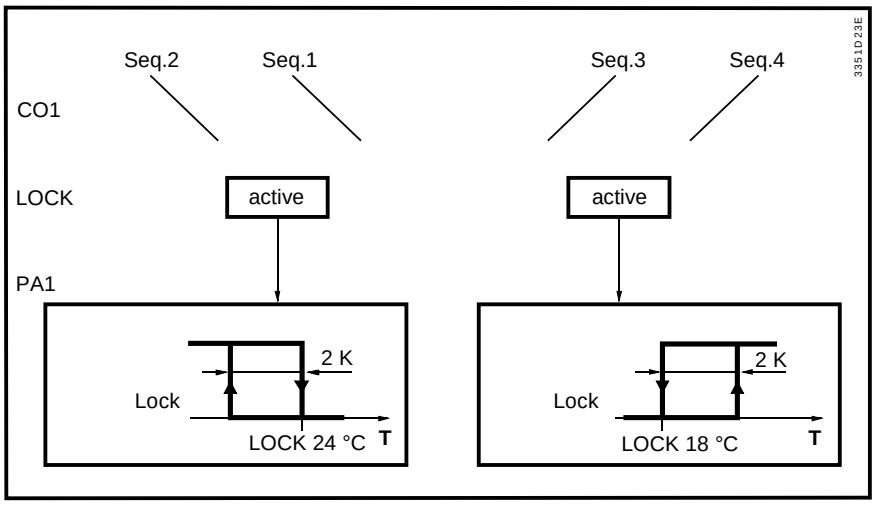


As an additional protective function, the heating circuit pump Q is automatically switched on for outside air temperatures below 2 °C.

11.3.8.4 Locking sequences via MULFUN [LOCK]

Mode of operation

The [Lock] function allows for locking individual sequences in dependence of the input variable on MULFUN (e.g., outside air temperature).



The cooling sequences can be locked on low and the heating sequences on high outside air temperatures. This ensures that, among other things, heating is not active in summer and cooling is not active in winter for compensated setpoints that are based on outside air temperature.

The LOCK function can be activated for sequences 1+2 and / or sequences 3+4. The switching differential is a permanent 2 Kelvin or 4 % of the range (of r.).
This function is active also for night operation.

⇒ Locking by means of LOCK results in a 0 % output. MINPOS and MAXPOS are further considered.
If seq. 1 is locked via LOCK, the output for DIRECT is MAXPOS, and for REVERS is MINPOS.
The reversal of operating action for sequence 1 remains active.

Adjustable values

Description	Range	Factory setting	
		Temperature	General
B1 \ \ _ LOCK...; set the locking value for sequence 1+2	0..100 % of r. MULFUN	18 °C	50 %
B1 \ \ _ LOCK...; set the locking value for sequences 3+4	0..100 % of r. MULFUN	18 °C	50 %

Relevant configuration steps

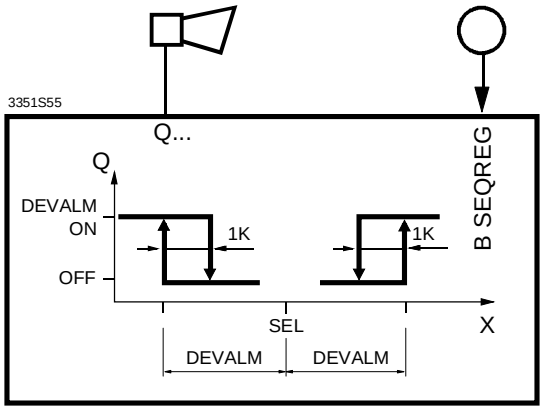
Display	Comments
CONF1 ... MODE	
B1 \ \ _ ... FREE	With SEL, activate the locking function LOCK per sequences 1+2,3+4
PARA1 ... MODE	
B1 \ _ ... LOCK 18 °C	Enter the desired locking value for the heating sequences 1+2
B1 _/ /... LOCK 18 °C	Enter the desired locking value for the cooling sequences 3+4

Application example

See: Application examples for compensated setpoint, section 11.3.5.3.

11.3.8.5 Setpoint - actual value deviation alarm [DEVALM]

Mode of operation



On long-term actual value deviations (adjustable time) outside of the set tolerance limit, a de-energized open alarm contact Q… is closed (e.g., to activate a separate alarm siren). At the same time, the deviation alarm is indicated on the LCD. After returning to the accepted actual value deviations, the deviation alarm is deactivated automatically.

The deviation alarm can be configured only if at least one switching contact Q is available and free. The next free Q will be used for this purpose.

You can specify an alarm delay via the T1 switch-on delay.

One common deviation alarm contact is available per controller for all active sequence control loops. The alarm function can be deactivated by entering an extreme setting for the corresponding DEVALM setpoints.

Adjustable values

Description	Range	Factory setting	
		Temperature	General
DEVALM Deviation alarm	0...100 % of r. Δ OFF is a fixed 1 K / % of r.	4 K	4 % of r.

Relevant configuration steps

Display	Comments
CONF2 ... MODE	
DEVALM ... INACT	With SEL, activate DEVALM
PARA1 ... MODE	
B1 \ _ / … DEVALM 4 K	With SEL, select the acceptable actual value deviation.

11.4 Digital controller [DIGREG]

11.4.1 Mode of operation

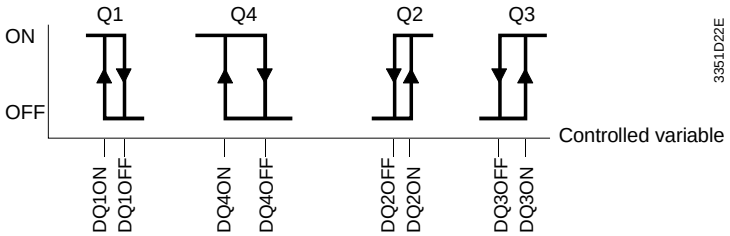
The RWX62... allows you to configure up to three independent control loops with auxiliary functions.

The names of the control loops match the name of the sensor for the main controlled variable. The first control loop is thus always called B1.

The digital controller has 1...6 binary outputs (Q1...Q6) with adjustable switch-on and switch-off points that can be distributed across the range of the input variable for each binary output Q.

Example

Digital controller with four binary outputs.



Per binary output Q, an additional T1 switch-on delay time and a minimum T2 switch-off time can be selected.

Universal inputs B

Each input can process an either active or passive signal. You can select the following signal types:

1xNi; 2xNi; VOLT °C; VOLT %; VOLT.
(For a detailed description, refer to sequence controller, section "Universal inputs B").

The measured values for the inputs B (1xNi and 2xNi) can be corrected via parameter CORSCA. Adjustable correction values –10...+10K / % of range (of r.).

Digital input E2

"OFF" control mode via E2 [STNDBY]

You can deactivate the control mode via the digital input E2 AC 0/24 V. At the same time, all Q-outputs are deactivated. The switch-on delay and minimum switch-off time are considered in this case. The control action of input E2 can be separately activated for all 3 control loops. When in control mode, the display indicates a standby symbol ⏻ for the corresponding control loop, provided the plant was deactivated via E2.

Binary outputs Q

Switching points: You can define a separate switch-on and switch-off point for each output Q.

For example: B1: DQ2 ON 22 °C

B1: DQ2 OFF 20 °C

Delay times

For each digital output, you can set two delay times.

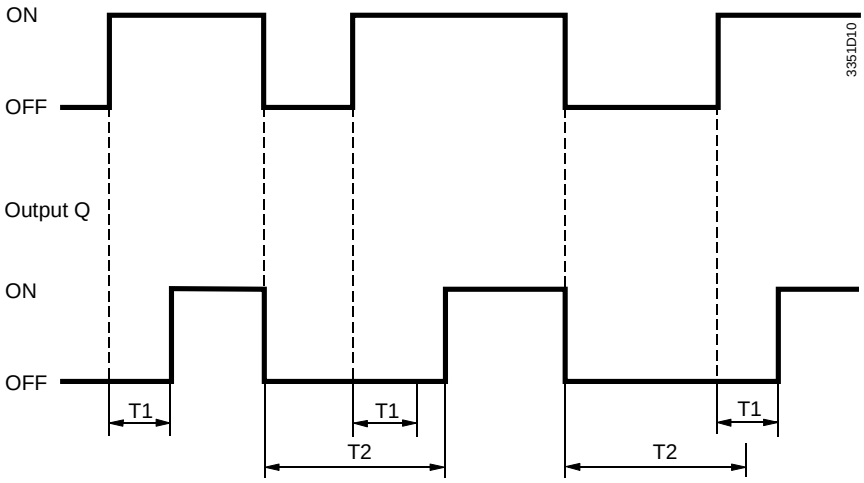
T1 is the switch-on delay

T2 is the minimum switch-off time.

Mode of operation:

Output as calculated by the controller

Output Q effective



Adjustable values:

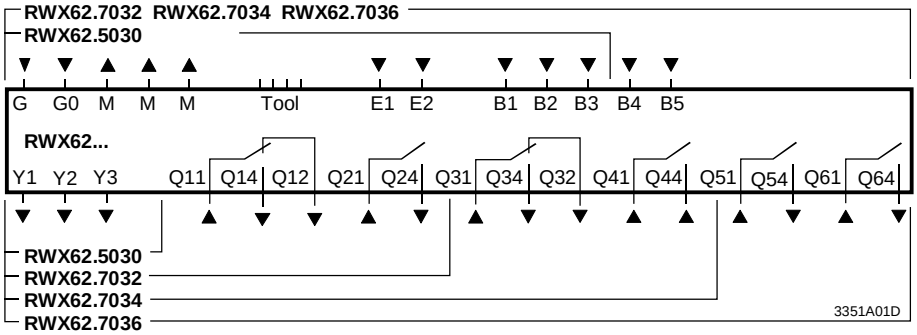
Description	Range	Factory setting	
		Temperature	General
T1, T2	0, 4, 8, 15, 30 s 1, 2, 4, 8, 16, 32 min		0 s
CORSCA B1...B5	–10...+10K / % of r.	0 K	0
DQ...ON; switch-on point	0...100 % of r.	≠ other Qs	
DQ...OFF; switch-off point	0...100 % of r.	≠ other Qs	

Relevant configuration steps

Display	Comments
CONF2 ... MODE	
B1 FUNCT... DIGREG	With SEL, select DIGREG
B1 Type ... 1x Ni	With SEL, select the input type 1x Ni, 2x Ni, VOLT°C, VOLT %, VOLT
B1 DIGREG ...1Q	Define the number of binary outputs Q for this control loop (1...6)
B2 DIGREG ... INACT	With SEL, activate the 2nd control loop
CONF1 ... MODE	
TEMP °C / K	With SEL, select unit °C / K or °F
B1 STNDBY ... INACT	With SEL, select INACT or ACTIV INACT = see page 11-38 for no OFF
PARA2 ... MODE	
T1... (Q...) ... 0 SEC	With SEL, select the switch-on delay
T2... (Q...) ... 0 SEC	With SEL, select the minimum switch-off time
PARA1 ... MODE	
B1 DQ1 ON 20 °C	With SEL, select the switch-on point
B1 DQ1 OFF 19.5 °C	With SEL, select the switch-off point

12 Diagrams

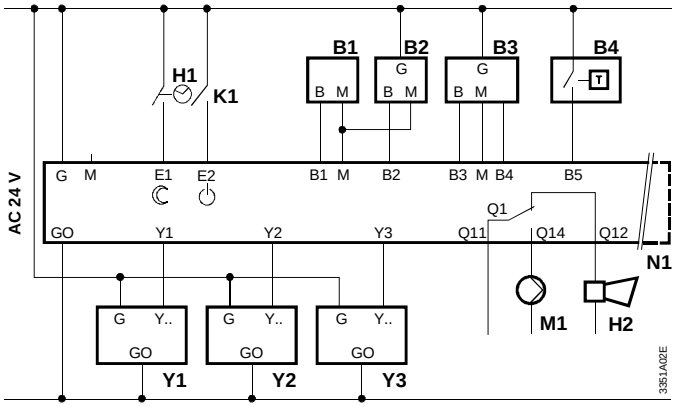
Internal diagram



G-G0: AC 24 V supply

M: Ground (G0) for signals, universal inputs, analog outputs
B: Universal input
E: Binary input
Y: Analog output
Q: Binary output, various voltages permissible
Tool: Connection for POLYCOPY
The limitation lines allocated to each type reference indicate the terminals for each controller type.

Connection diagram



B1	Sensor Ni 1000
B2	Sensor DC 0...10 V
B3	Combination sensor (temperature and humidity)
B4	Thermostat
Y1..Y3	Actuators
M1	Fan
H1	Clock (Day/Night)
H2	Horn
K1	Contact (switching to standby)
Q1	Super frost protection (relay output)
N1	Controller RWX62...

Electrical installation

The operating voltage must comply with the requirements for safety extra-low voltage (SELV) as per EN 60 730.

⚠ Use safety transformers with double insulation as per EN 60 742; they must be designed for 100 % on-time.

When using several transformers in one system, the connection terminals G0 must be galvanically connected. The POLYGYR RWX62...units are designed for operation of AC 24 V max.10 A safety extra-low voltage and are short-circuit-proof.

Supplying voltages above AC 24 V to low voltage connections may damage or destroy the controller or any other connected devices. Additionally, connections to voltages exceeding 42 V endanger personnel safety.

Mains voltages of up to max. AC 250 V must only be connected to the potential-free contacts Q.

13 Technical data

General data

⚠ Power supply	Operating voltage	AC 24 V ±20 % Q1...Q6 AC 24...230 V)
	Safety extra-low voltage SELV as per	EN 60 730
	Frequency	50 Hz / 60 Hz
Power consumption	RWX62.5030	4 VA
	RWX62.7032	5 VA
	RWX62.7034	6 VA
	RWX62.7036	7 VA
Prompting speed	Output renewal speed	1 s
Displays (LCD)	Actual values and setpoints	3-digit
	Resolution of values <100	0.1
	Resolution of values >100	1
	Resolution of ranges <10	0.01
	Analog outputs (-1...11 V)	2-digit, resolution 1 Volt / 10 %
	Binary switching outputs	OFF/ON
Environmental conditions	Transport	IEC 721-3-2
	Climatic conditions	Class 2K3
	Temperature range	–25...+70°C
	Humidity	< 95 % r.h.
	Mechanical conditions	Class 2M2
	Operation	IEC 721-3-3
	Climatic conditions	Class 3K5
	Temperature range	0...50°C
	Humidity	< 95 % r.h.
Degree of pollution	Normal pollution	EN 60 730
Degree of protection	Housing	IP 20 as per EN 60 529
	Front	IP 40 as per EN 60 529
Product standards	Automatic electrical controls for household and similar use	EN 60 730
	Energy management equipment	UL 916
Quality assurance	Production and customer service	as per ISO 9001
CE conformity	In accordance with European Union directives	
	Electromagnetic compatibility EMC	89/336 EEC
	Low voltage guideline	73/23/EEC
Standards	Emissions	EN 50 081-1
	Immunity	EN 50 82-1
	Immunity Industrial Sector *	EN 50 82-2
	Safety	EN 60 730

*The RWX62... can be used in areas as defined by “EN 50 082-2 industrial environment“, provided the following requirements are met:

1. Integration in a completely enclosed steel plate housing.
2. All connections are made with shielded lines (multiple cables with common screen permissible).
3. Connection of all line shields at the cable entry with the housing.
4. The cable shields must be connected only on the RWX62… side.

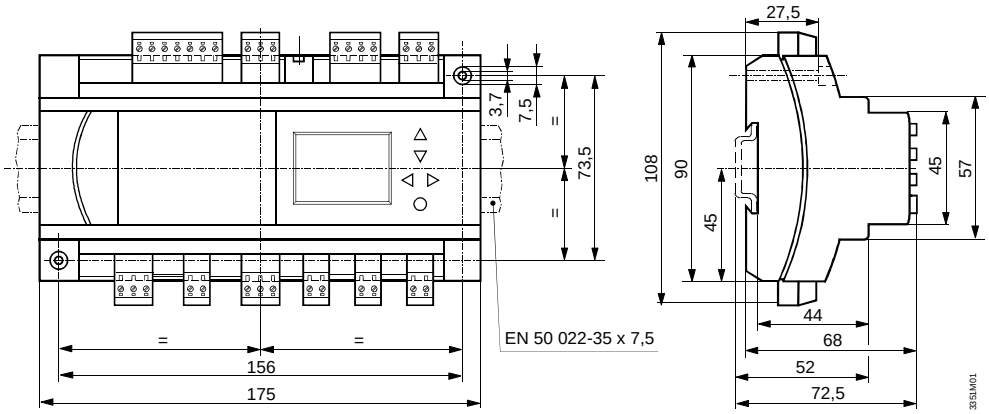
Connection terminals	Plug-in screw terminals for wires of	min. dia. 0.5 mm max. 2x1.5 mm^2 or 1x 2.5 mm^2
Tool connection	Connector plug for POLYCOPY	4-pin
Weight without packaging	RWX62.5030 RWX62.7032 RWX62.7034 RWX62.7036	0.38 kg 0.40 kg 0.44 kg 0.46 kg
Dimensions	Refer to "Dimensions" for more information	

Universal inputs B1...5

Temperature sensors (LG Ni 1000 / 0 °C)	Range Under- and overrange Resolution RWX62... accuracy Measuring voltage Measuring current Max. permissible cable length for dia. ≥ 0.6 mm	–35...130 °C –50...150 °C < 0.05 K at 0 °C –0.5K ...+0.5 K max. DC 5.0 V 2.6....3.4 mA max. 300 m (4.5 Ω total line resistance corresponds to approx. 1 K error)
Temperature sensors LG Ni 1000 (2 x LG Ni1000 / 0 °C parallel)	Range Under- and overrange Resolution RWX62... accuracy Measuring voltage Measuring current Max. permissible cable length for dia. ≥ 0.6 mm	–35...130 °C –50...150 °C < 0.1 K / 0 °C –1K...+1 K max. DC 5.0 V 3.1....3.9 mA max. 300 m (2.25 Ω total line resistance corresponds to approx. 1 K error)
Analog voltages (for measured variables in °C, % or without unit)	Range Under- and overrange Resolution RWX62... accuracy Max. current consumption Internal resistance R_i Max. permissible cable length for dia. ≥ 0.6 mm	DC 0...10 V DC -1.4...11.4 V 1.0 mV –0.1...+0.1 V at 0 V –0.25...+0.25 V at 10 V 0.11 mA ≥ 100 kΩ max. 300 m; see also information for connected unit
Remote setpoints B2...5	Range Overrange Resolution RWX62... accuracy Measured voltage Measured current Max. permissible cable length for dia. ≥ 0.6 mm	0...1000 Ω 1200 Ω 0.15 Ω –2.5 Ω...+2.5 Ω at 1000 Ω –5 Ω...5 Ω at 0 Ω max. DC 5 V 2.9....4.4 mA max. 300 m (10 Ω total line resistance corresponds to 1% error)
Binary voltage inputs	Voltage Current consumption log. 0 log. 1	AC 24 V ≤ 8 mA AC ≤ 5 V eff. AC ≥ 15 V eff.

Binary control inputs E1, E2	Polling voltage for control commands	AC 24 V
	Current consumption	≤ 8 mA
	Max. permissible cable length for dia. ≥ 0.6mm	max. 300 m
Analog outputs Y1...Y3	Range	DC 0...10 V
	Under- and overrange	DC -1.4...11.4 V
	Resolution	15 mV
	Working voltage	max. ± 1 mA
Binary switching outputs Q1...Q6	Switching output of the relay contacts Q1..Q6	
	AC voltage	AC 24...230 V, 4 A res., 3 A ind.
	DC voltage	DC max. 50 V, max. 40 W, max. 5 A
	Min. contact rating	
	for mains voltage	AC 230 V / 5 mA
	for low voltage	DC 24 V / 10 mA
	Max. switch-on current	10 A (1 s)
	Life of the relay contacts	
	Alternating voltage at 0.1 A res.	$2 . 10^7$ cycles
	at 0.5 A res.	$2 . 10^6$ cycles
	at 3 A res.	$2 . 10^5$ cycles
	Red. factor for ind. loading (cos. phi = 0.8)	0.85
	Direct voltage	$2 . 10^5$ cycles
	External fuse on input side	max. 10 A
	Changeover switch	Q1 and Q3
	ON/OFF-switch	Q2, Q4...Q6
	Insulation resistance	
	Between relay outputs and safety extra-low voltage (SELV)	AC 3750 V, as per EN 60 730 - 1
	Between relay outputs of neighbouring relays	AC 3750 V, as per EN 60 730 - 1

14 Dimensions



15 Appendix

15.1 Commissioning reports

The following eight pages contain the commissioning reports for both the sequence and the digital controller. They correspond to the sample document in the "Engineering" chapter. They are designed for use independent of this User's Guide. You can also copy them and use them as separate forms.

Commissioning report

POLYGYR Joker RWX62...

Sequence controller

Plant information

Object:
Plant:
Date:
Controller type:

Plant schematic:

1. Configuration tables

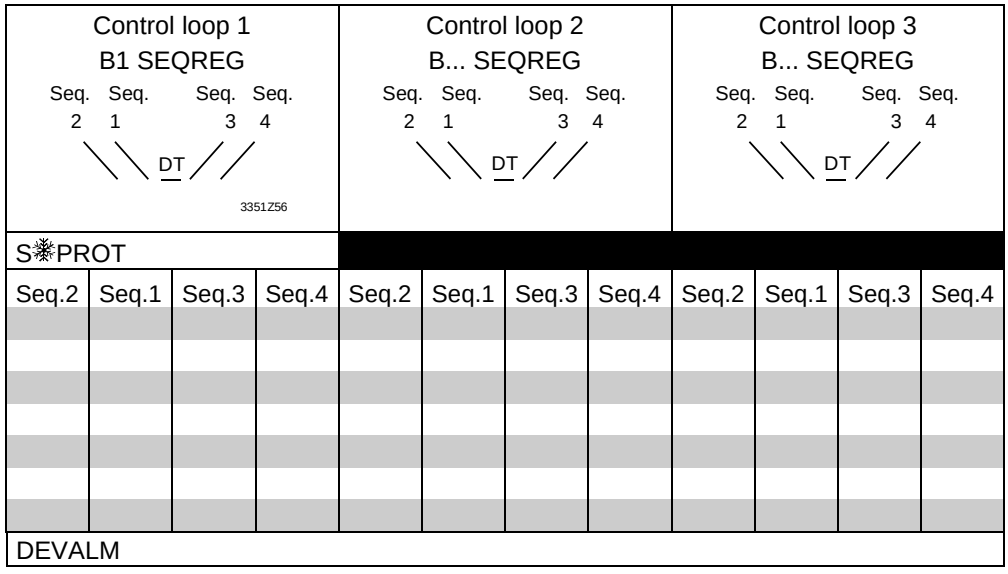
1.1 Allocation of inputs (see chapter 11, Universal inputs B..)

Control loop 1			Control loop 2			Control loop 3		
B	1	SEQREG	B		SEQREG	B		SEQREG
B		TELSEL	B		TELSEL	B		TELSEL
B		LIM	B		LIM	B		LIM
B		ALTDIR	B		ALTDIR	B		ALTDIR
B		❄PROT	B		❄PROT	B		❄PROT
B		LIMSPE	B		LIMSPE	B		LIMSPE
B		LIMMAX	B		LIMMAX	B		LIMMAX
B		MAXPRI	B		MAXPRI	B		MAXPRI
B		S❄PROT						
B		MULFUN			MULFUN			MULFUN

1.2 Description of inputs (see chapter 11, Universal inputs B..)

Input	Description	TYPE	MINSCA..MAXSCA
B1			
B2			
B3			
B4			
B5			

1.3 Allocation of outputs to the sequences (see chapter 11)



1.4 Description of analog outputs

Output	Description
Y1	
Y2	
Y3	

1.5 Description of digital outputs

Output	Description
Q1	
Q2	
Q3	
Q4	
Q5	
Q6	

1.6 Settings for the above functions

Note:

A checkmark in the associated box means: The value of the column is "selectable valid". No checkmark in the associated box means: Default value is valid.

Display	Default	Selectable	Control loop 1	Control loop 2	Control loop 3
TEMP	°C / K	°F	☐		
E1 NIGHT	INACTIV	ACTIV	☐	☐	☐
E2 STNDBY	INACTIV	ACTIV	☐	☐	☐
SEQREG	PI	P	☐	☐	☐
CASC (if LIM)	INACTIV	ACTIV	☐	☐	☐
COMP ☼ (if MULFUN)	CONST	COMP	☐	☐	☐
COMP ☾	CONST	COMP	☐	☐	☐
DIRECT (seq. 1)	REVERS	DIRECT	☐	☐	☐
OFF	OFF	∆B - B	☐	☐	☐
Reversal of operating action X (seq. 1)		ABS	☐	☐	☐
LOCK (for seq. 1+2)	FREE	LOCK	☐	☐	☐
LOCK (for seq. 3+4)	FREE	LOCK	☐	☐	☐

Display	Default	Selectable		
Q1 RELEAS Y... + Q...	INACTIV	ACTIV	☐	
Q1	LIN	BIN	☐	
		VAR	☐	
Q2 RELEAS Y... + Q...	INACTIV	ACTIV	☐	
Q2	LIN	BIN	☐	
		VAR	☐	
Q3 RELEAS Y... + Q...	INACTIV	ACTIV	☐	
Q3	LIN	BIN	☐	
		VAR	☐	
Q4 RELEAS Y... + Q...	INACTIV	ACTIV	☐	
Q4	LIN	BIN	☐	
		VAR	☐	
Q5 RELEAS Y... + Q...	INACTIV	ACTIV	☐	
Q5	LIN	BIN	☐	
		VAR	☐	
Q6 RELEAS Y... + Q...	INACTIV	ACTIV	☐	
Q6	LIN	BIN	☐	
		VAR	☐	

Display	Default	Selectable		
S❄PROT	MANUAL	AUTO	☐	
		MANU3	☐	

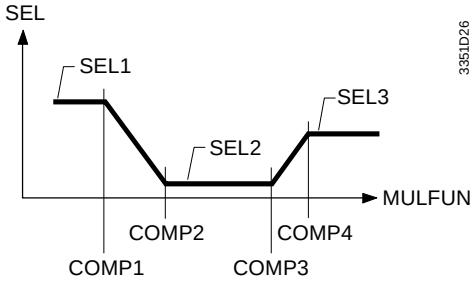
2. Parameterization tables

2.1 Setpoints CONST

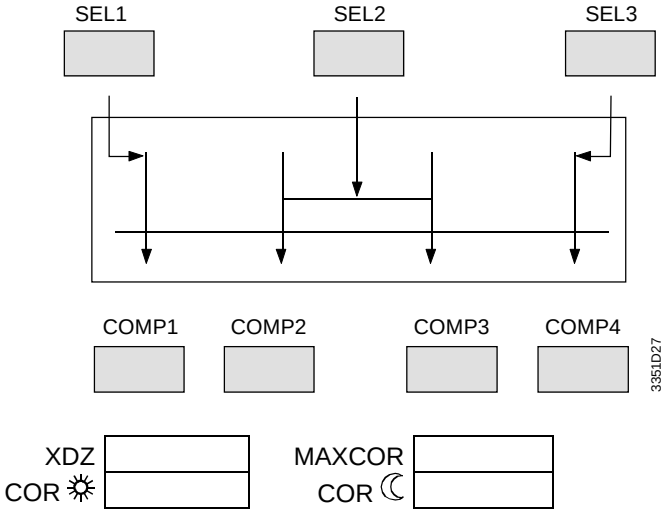
Display	Control loop 1	Control loop 2	Control loop 3
MAXSEL			
MINSEL			
XDZ☼			
SEL☼			
XDZ ☾			
SEL ☾			

2.2 Setpoints COMP

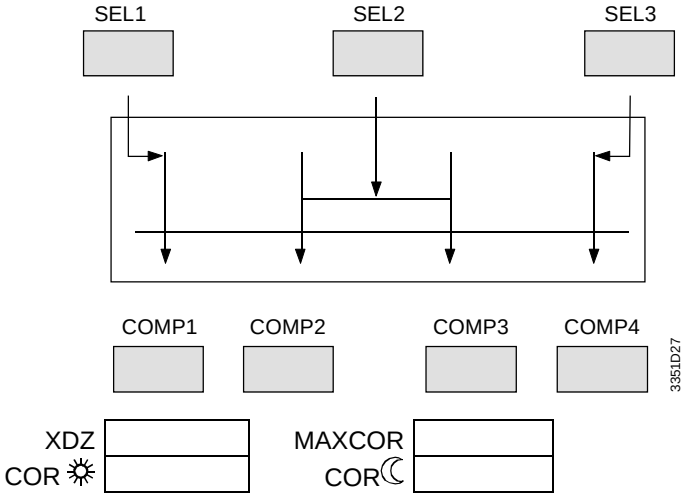
Explanations



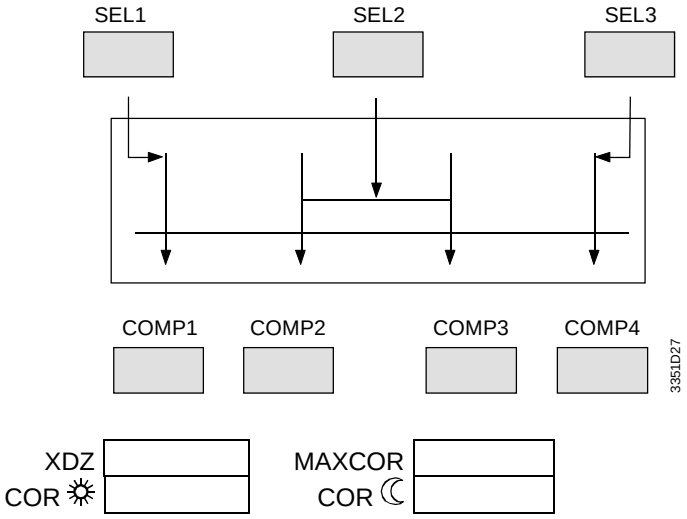
Control loop 1



Control loop 2



Control loop 3



2.3 Control parameter settings for sequence controllers

	Control loop 1 B1 SEQREG				Control loop 2 B...SEQREG				Control loop 3 B...SEQREG			
	Seq. 2	Seq. 1	Seq. 3	Seq. 4	Seq. 2	Seq. 1	Seq. 3	Seq. 4	Seq. 2	Seq. 1	Seq. 3	Seq. 4
			DT				DT				DT	
DT												
	Seq.2	Seq.1	Seq.3	Seq.4	Seq.2	Seq.1	Seq.3	Seq.4	Seq.2	Seq.1	Seq.3	Seq.4
P-controller XP P												
PI controller XP PI	■			■	■			■	■			■
XP FACT		■				■				■		
TN												
PID												

2.4 Control parameter settings for sequence controllers with cascade control

	Control loop 1 B1 SEQREG				Control loop 2 B...SEQREG				Control loop 3 B...SEQREG			
CASC XP PI												
CASC TN												
CASC PID												
	B LIM Seq. 2	Seq. 1	Seq. 3	Seq. 4	B LIM Seq. 2	Seq. 1	Seq. 3	Seq. 4	B LIM Seq. 2	Seq. 1	Seq. 3	Seq. 4
			DT				DT				DT	
DT												
	Seq.2	Seq.1	Seq.3	Seq.4	Seq.2	Seq.1	Seq.3	Seq.4	Seq.2	Seq.1	Seq.3	Seq.4
PI controller XP PI	■			■	■			■	■			■
XP FACT		■				■				■		
TN												

2.5 Parameter settings for auxiliary controllers

Function	Parameter	Control loop 1 B1 SEQREG	Control loop 2 B SEQREG	Control loop 3 B SEQREG
B LIM	XPPI			
	TN			
	MAXLIM			
	MINLIM			
	RELLIM			
B LIMSPE	XPPI			
	TN			
	SEL			
B LIMMAX	XPPI			
	TN			
	SEL			
B S❄ PROT	XPPI			
	TN			
	S❄ ALM			
	⏻ S❄ PROT			
DEVALM	SEL			
ABS ∆B...-B...	SEL			

2.6 Adjustment of sensor input signals

Parameter	B1	B2	B3	B4	B5
CORSCA					

2.7 Output signal Y

Parameter	Y1	Y2	Y3
MAXPOS			
MINPOS			
YQ ON (1Y + 1Q)			
YQ OFF (1Y + 1Q)			
MQ ON (RELEAS)			
MQ OFF (RELEAS)			

2.8 Outputs Q

Parameter	Q1	Q2	Q3	Q4	Q5	Q6
T1						
T2						
VQ ON (VAR)						
VQ OFF (VAR)						

2.9 LOCK function

Parameter	Control loop 1	Control loop 2	Control loop 3
SEQ 1+2 LOCK			
SEQ 3+4 LOCK			

Commissioning report

POLYGYR Joker RWX62...

Digital controller

Plant information

Object:
Plant:
Date:
Controller type:

Plant schematic:

1. Configuration tables

1.1 Description of inputs

Input	Description	Type	MINSCA..MAXSCA
B1			
B2			
B3			

1.2 Allocation of outputs Q to the control loops

Outputs	Control loop 1 B1 DIGREG	Control loop 2 B2 DIGREG	Control loop 3 B3 DIGREG
Q1	☐		
Q2	☐	☐	
Q3	☐	☐	☐
Q4	☐	☐	☐
Q5	☐	☐	☐
Q6	☐	☐	☐

1.3 Description of the Q outputs

Output	Description
Q1	
Q2	
Q3	
Q4	
Q5	
Q6	

1.4 Settings for the above functions

Note: A checkmark in the associated box means: the value of the column is "selectable valid".
No checkmark in the associated box means: default value is valid.

Display	Default	Selectable	Control loop 1	Control loop 2	Control loop 3
TEMP	°C /K	°F	☐		
E2 STNDBY	INACTIV	ACTIV	☐	☐	☐

2. Parameterization tables

2.1 Adjustment of sensor input signals

Parameter	B1	B2	B3
CORSCA			

2.2 Outputs Q

Parameter	Q1	Q2	Q3	Q4	Q5	Q6
T1						
T2						
DQ ON						
DQ OFF						

15.2 Input dialogs

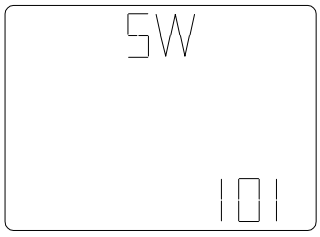
Below is a list of dialogs as they appear on the controller's display. Each dialog contains a short description detailing the features you can select or set in the respective dialog. Additionally, each dialog references the chapter in this document that provides more detailed information.

15.2.1 Sequence controller

General code names

ACTIV = active
INACT = inactive

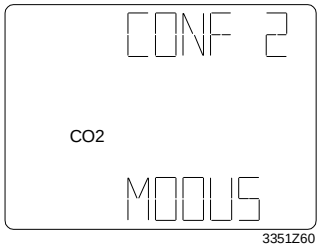
Software version



3351Z59

Software version display

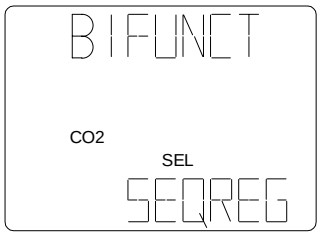
Configuration mode 2 CO2



3351Z60

Operating level display

See: Configuration level, chapter 7.2



3351Z61

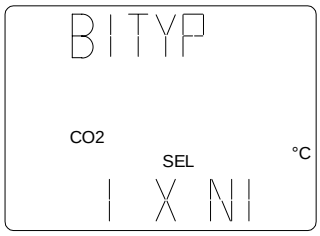
Control function selection

See: Selecting the control function, chapter 11.1

Selection:

SEQREG (default)
DIGREG

You must select SEQREG



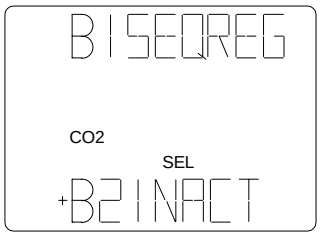
3351Z62

Selection of input type B...

See: Universal inputs B, chapter 11.3.2

Selection:

1 x Ni °C (default)
2 x Ni °C (default)
VOLT °C
VOLT %
VOLT
DIG
OHM (Default for TELSEL)



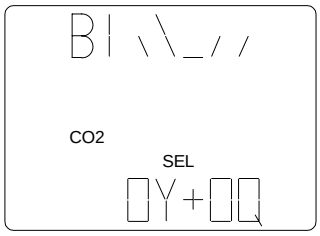
3351Z63

Selection of auxiliary function for input B...

See: Universal inputs B, chapter 11.3.2

Selection:

INACT (default)
TELSEL
LIM
ALTDIR
❄ PROT
LIMSPE
LIMMAX
MAXPRI
S❄PROT (only for control loop B1)
MULFUN (only for control loop B1)



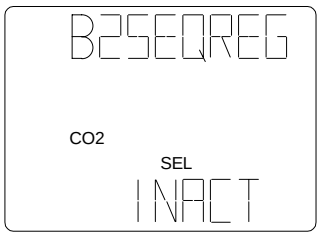
3351Z64

Allocation of outputs to sequences

See: Allocation of outputs to the sequences, chapter 11.3.3.2

Selection per sequence:

0Y + 0Q (default)
0...1Y + 0...6Q



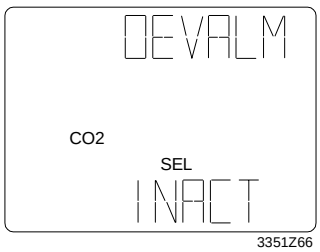
3351Z65

Activation of the second control loop

See: Selecting the control function, chapter 11.1

Selection:

ACTIV
INACT (default)



3351Z66

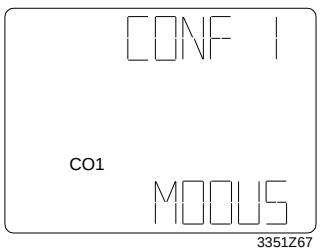
Activation of the deviation alarm

See: Setpoint actual value deviation alarm, chapter 11.3.8.5

Selection:

ACTIV
INACT (default)

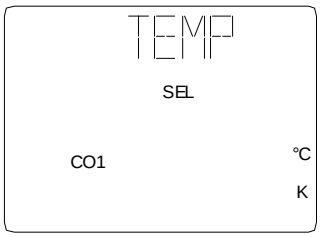
Configuration mode 1
CO1



3351Z67

Operating level display

See: Configuration, chapter 7



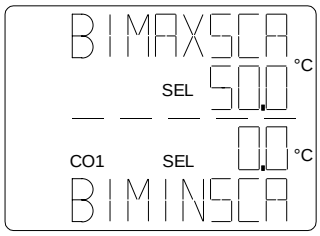
3351Z68

Selection of temperature unit

See: Selecting the unit, chapter 11.2

Selection:

°C K (default)
°F



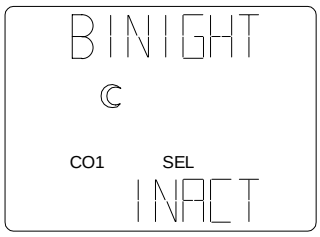
3351Z69

Selection of scale for input B...

See: Universal inputs B, chapter 11.3.2

Selection:

–35...+35 °C
0...50 °C
0...130 °C
–50...+50 °C
0...(0.10...850)



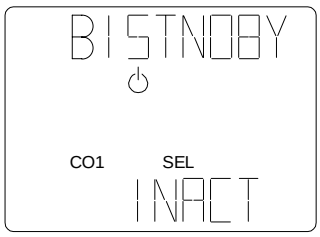
3351Z70

Activation of night operation

See: Night operation via E1, chapter 11.3.1.1

Selection:

ACTIV
INACT (default)



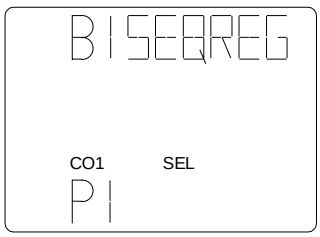
3351Z71

Activation of the standby function

See: Control operation via E2, chapter 11.3.1.2

Selection:

ACTIV
INACT (default)



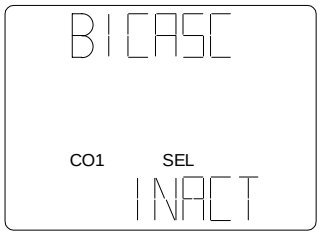
3351Z72

Selection of P or PI(D) control

See: Control parameters, chapter 11.3.4

Selection:

P
PI (default)



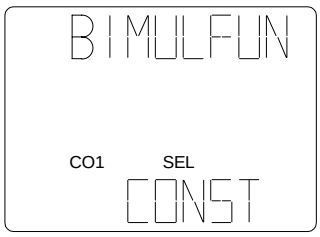
3351Z73

Activation of the cascade controller

See: Temperature cascade control, chapter 11.3.7.2

Selection:

ACTIV
INACT (default)



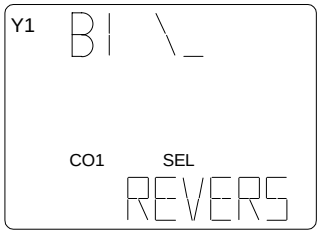
3351Z74

Selection of constant or compensated setpoint

See: Compensated setpoints, chapter 11.3.5.3

Selection:

CONST (default)
COMP



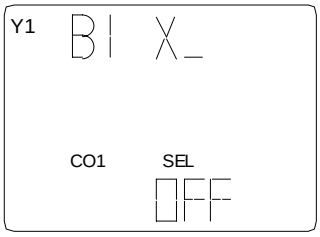
3351Z75

Selection of operating action for seq. 1

See: Sequence 1, chapter 11.3.3.4

Selection:

REVERS (default)
DIRECT



3351Z76

Activation of MEU function

(Maximum Economy Changeover)

See: Reversal of operating action seq. 1, chapter 11.3.8.2

Selection:

OFF (default)
ΔB...–B...
ABS

3351Z77

Activation of LOCK function

See: Locking sequences via MULFUN, chapter 11.3.8.4

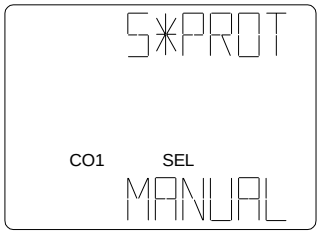
Selection:
LOCK
FREE (default)

3351Z78

Activation of RELEAS function

See: Activation of a Q via MULFUN, chapter 11.3.8.3

Selection:
ACTIV
INACT (default)

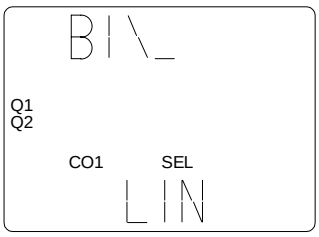


3351Z79

Selection of frost protection acknowledgement

See: Super frost protection PI limiter chapter 11.3.6.2

Selection:
MANUAL (default)
AUTO
MANU 3



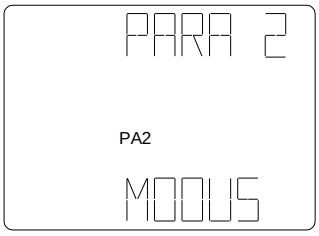
3351Z80

Selection of adding Qs

See: Allocation of outputs to the sequences, chapter 11.3.3.2

Selection:
LIN (default)
BIN
VAR

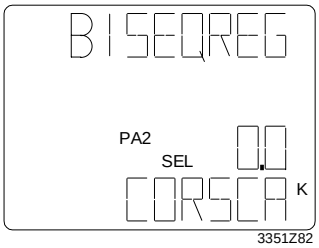
Parameterization mode 2 PA2



3351Z81

Operating level display

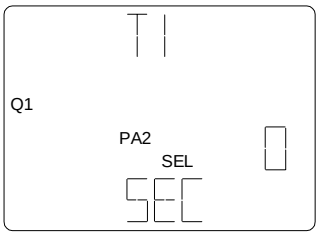
See: Configuration, chapter 7.2



3351Z82

Correction of measured variable for B...

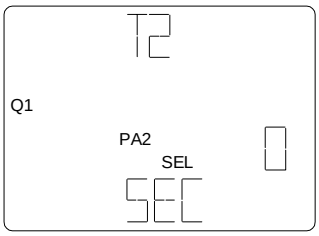
See: Measured value correction, chapter 11.3.2.1



3351Z83

Switch-on delay for Q…

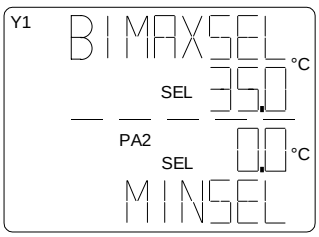
See: Digital output, chapter 11.3.3.6



3351Z84

Minimum switch-off time for Q…

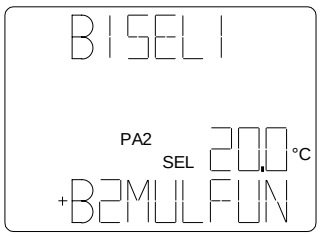
See: Digital output, chapter 11.3.3.6



3351Z85

Adjustable setpoint range

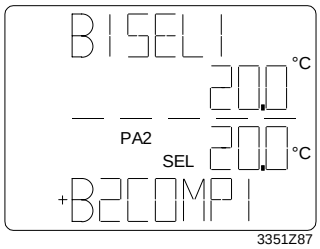
See: Fixed setpoints, chapter 11.3.5.1 and remote setpoint, chapter 11.3.5.2



3351Z86

Setpoint compensation

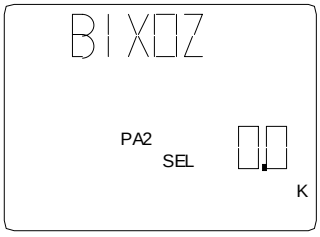
See: Compensated setpoints, chapter 11.3.5.3



3351Z87

Setpoint compensation

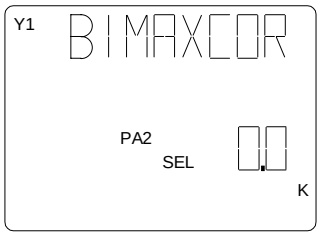
See: Compensated setpoints, chapter 11.3.5.3



3351Z88

Dead zone between setpoints

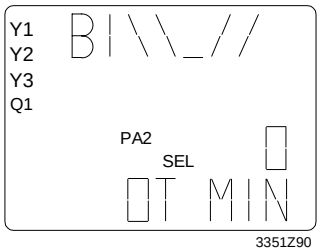
See: Remote setpoint, chapter 11.3.5.2
and compensated setpoints, chapter 11.3.5.3



3351Z89

Adjustable range of setpoint correction

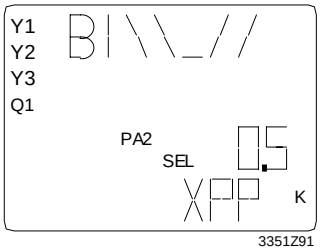
See: Compensated setpoints, chapter 11.3.5.3



3351Z90

Dead zone between sequences 1 and 3

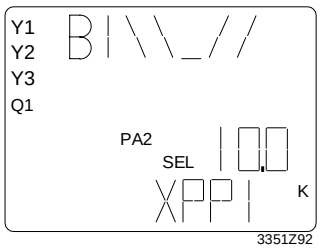
See: Control parameters, chapter 11.3.4



3351Z91

P-band for P-controller

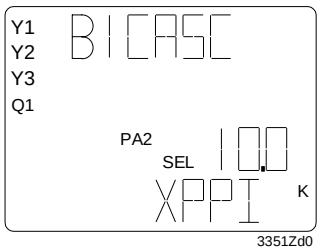
See: Control parameters, chapter 11.3.4



3351Z92

P-band for PI(D) controller

See: Control parameters, chapter 11.3.4

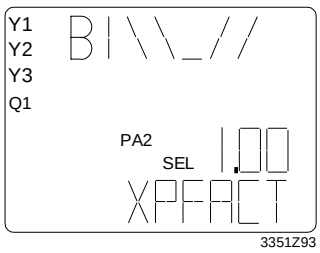


3351Zd0

P-band for PI(D)-PI cascade controller

See: Temperature cascade control,

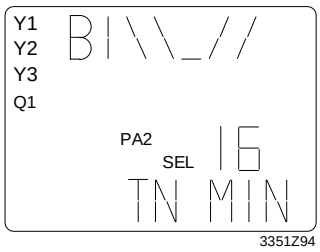
chapter 11.3.7.2



3351Z93

P-band factor for PI(D) controller

See: Control parameters, chapter 11.3.4 and temperature cascade control, chapter 11.3.7.2



3351Z94

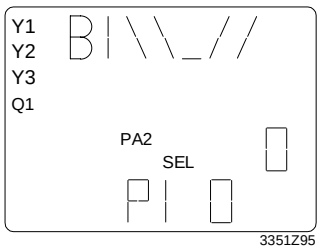
Integral action time for PI(D) controller

See: Control parameters, chapter 11.3.4

3351Zd1

Integral action time for PI(D)-PI cascade controller

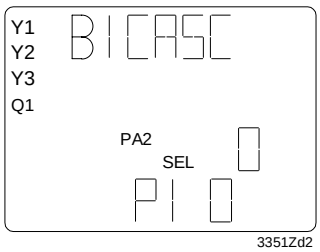
See:
Temperature cascade control, chapter 11.3.7.2



3351Z95

D-part of PI controller

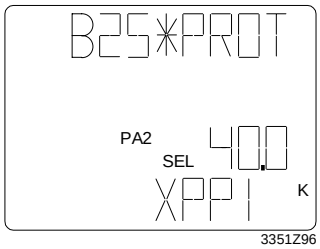
See: Control parameters, chapter 11.3.4



3351Zd2

D-part of PI(D)-PI cascade controller

See:
Temperature cascade control, chapter 11.3.7.2



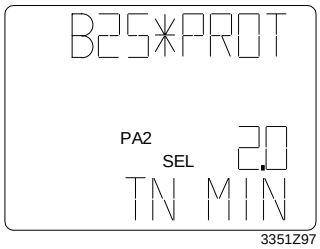
3351Z96

P-band for PI auxiliary controllers

See: Control parameters, chapter 11.3.4

LIM: See general limiter, chapter 11.3.7.1 or temp. cascade control, chapter 11.3.7.2

LIMSPE: See chapter 11.3.7.3
LIMMAX: See chapter 11.3.7.4
S❄PROT: See chapter 11.3.6.2



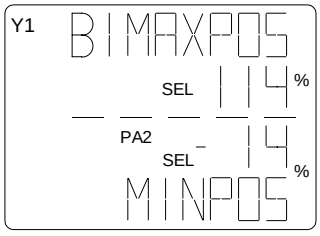
3351Z97

Integral action time for PI auxiliary controllers

See: Control parameters, chapter 11.3.4

LIM: See general limiter, chapter 11.3.7.1 or temperature cascade control, chapter 11.3.7.2

LIMSPE: See chapter 11.3.7.3
LIMMAX: See chapter 11.3.7.4
S❄PROT: See chapter 11.3.6.2

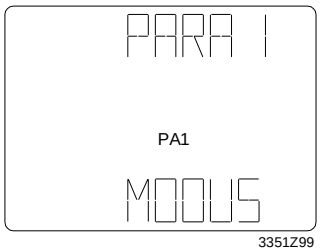


3351Z98

Limitation of output Y...

See: Analog output, chapter 11.3.3.5

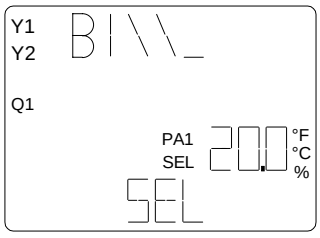
Parameterization mode 1
PA1



3351Z99

Operating level display

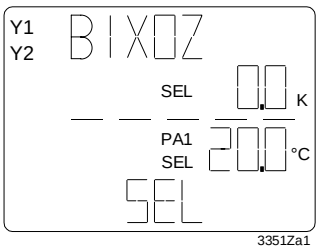
See configuration, chapter 7.2



3351Za0

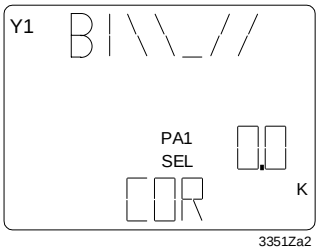
Setpoint

See compensated setpoints, chapter 11.3.5.1



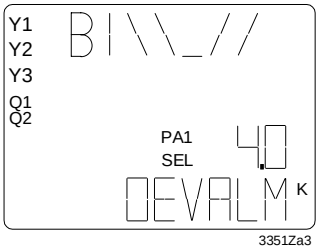
Setpoints (setpoint and dead zone)

See: Fixed setpoints, chapter 11.3.5.1



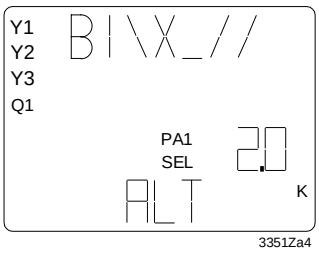
Setpoint correction

See: Compensated setpoints, chapter 11.3.5.3



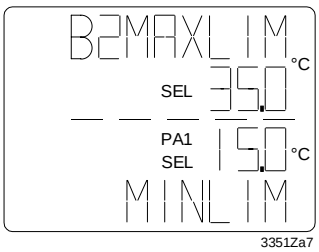
Permissible setpoint deviation

See: Setpoint/actual value deviation alarm, chapter 11.3.8.5



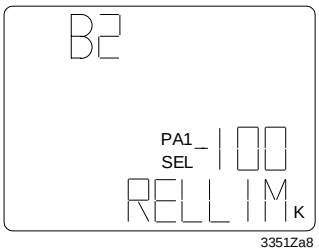
Switching point for MEU function

See: Reversal of operating action sequence 1, chapter 11.3.8.2



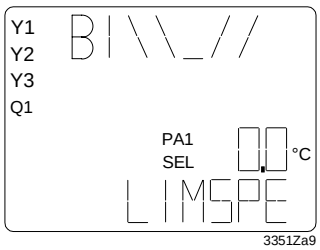
Limitation value of the LIM function

See: General limiter, chapter 11.3.7.1 and temperature cascade control, chapter 11.3.7.2



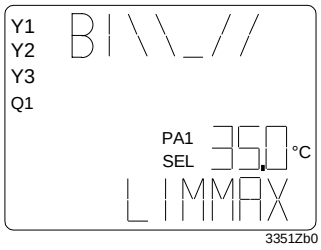
Limitation value of the RELLIM function

See: General limiter, chapter 11.3.7.1 and temperature cascade control, chapter 11.3.7.2



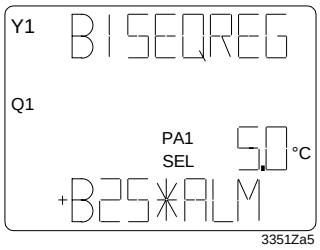
Limitation value of the LIMSPE function

See: Minimum limitation PI acting on sequence 1, chapter 11.3.7.3



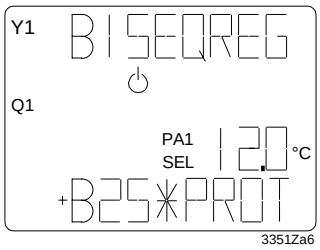
Limitation value of the LIMMAX function

See: Maximum limitation PI acting onsequence 3, chapter 11.3.7.4



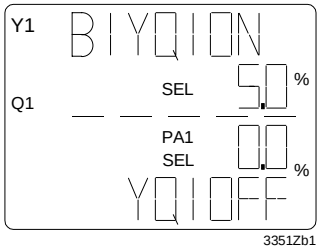
Alarm value for super frost protection function

See: Super frost protection PI limiter, chapter 11.3.6.2



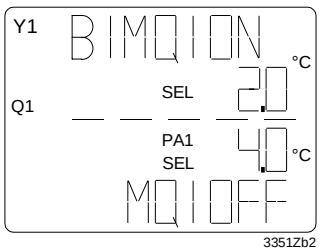
Limit value super frost protection function in standby mode

See:
Super frost protection PI limiter, chapter 11.3.6.2



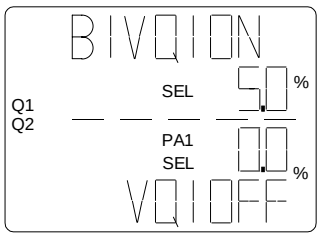
Switching points Q... with 1Y+1Q

See: One analog and one digital output, chapter 11.3.3.8



Switching points Q... with RELEAS

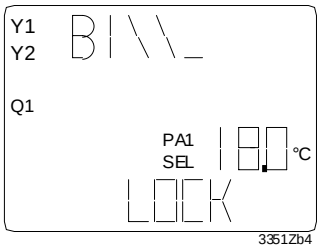
See: Activation of a Q… via MULFUN, chapter 11.3.8.3



3351Zb3

Switching points Q... with VAR

See: Variable switching actions, chapter 11.3.3.11

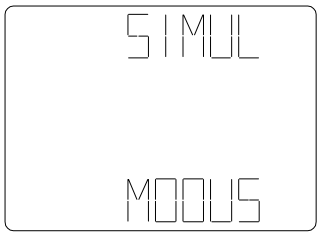


3351Zb4

Locking value for outputs with LOCK

See: Locking sequences via MULFUN, chapter 11.3.8.4

Simulation mode SI

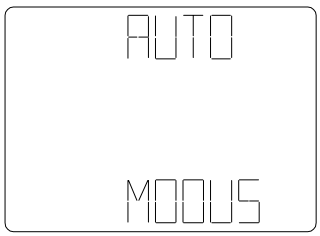


3351Zb5

Operating level display

See: Configuration, chapter 7.2 and commissioning, chapter 10

Auto mode



3351Zb6

Operating level display

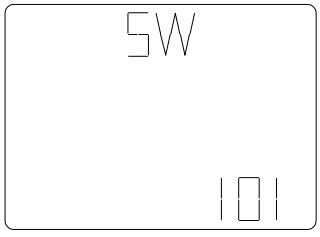
See: Configuration, chapter 7.2 and operating instructions for plant operators, chapter 5

15.2.2 Digital controller [DIGREG]

General code names

ACTIV = active
INACT = inactive

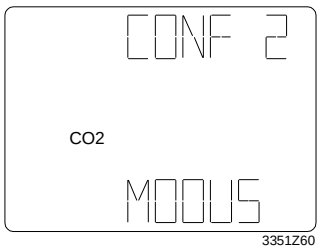
Software version



3351Z59

Software version display

Configuration mode 2
CO2

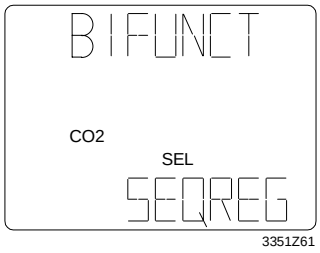


3351Z60

Operating level display

See: Configuration, chapter 7.2

CONF 2 MODE
CO2



3351Z61

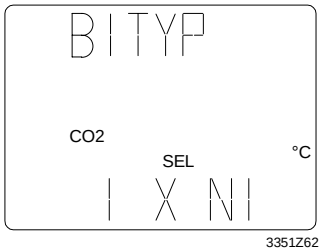
Control function selection

See: Selecting the control function, chapter 11.1

Selection:

SEQREG (default)
DIGREG

You must select DIGREG



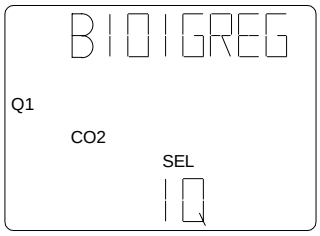
3351Z62

Selection of input type B...

See: Universal inputs B, chapter 11.3.2

Selection:

1 x Ni °C (default)
2 x Ni °C (default)
VOLT°C
VOLT %
VOLT

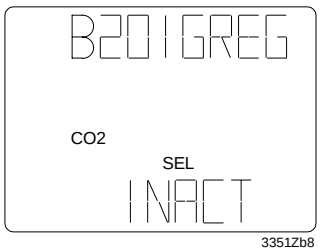


3351Zb7

Allocation of outputs to sequences

See: Digital controller, chapter 11.4

Selection:
1...6Q



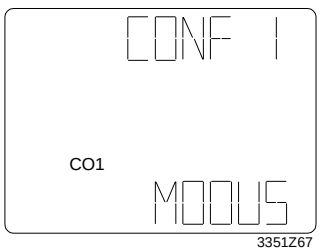
3351Zb8

Activation of the second control loop

See: Digital controller, chapter 11.4

Selection:
ACTIV
INACT (default)

Configuration mode 1
CO1

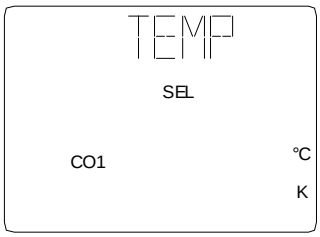


3351Z67

Operating level display

See: Configuration, chapter 7.2

CONF1 MODE
CO1



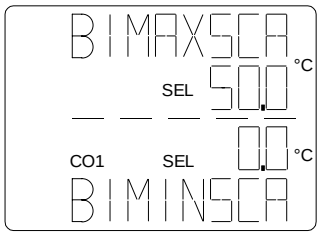
3351Z68

Selection of temperature unit

See: Selecting the unit, chapter 11.2

Selection:

°C K (default)
°F



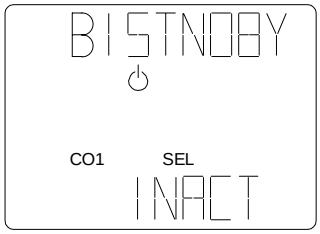
3351Z69

Selection of scale for input B...

See: Universal inputs B, chapter 11.3.2

Selection:

–35...+35 °C
0...50 °C
0...130 °C
–50...+50 °C
0...(0.10...850)



3351Z71

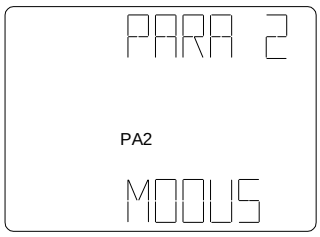
Activation of the standby function

See: Control operation via E2, chapter 11.3.1.2

Selection:

ACTIV
INACT (default)

Parameterization mode 2 PA2

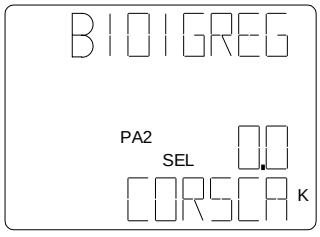


3351Z81

Operating level display

See: Configuration, chapter 7.2

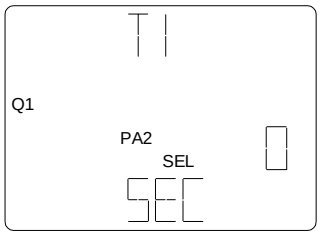
PARA 2 MODE
PA2



3351Zb9

Correction of measured variable for B...

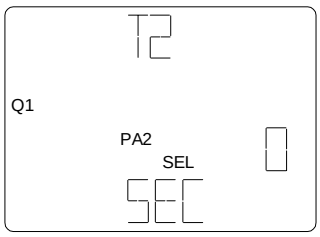
See: Digital controller, chapter 11.4



3351Z83

Switch-on delay for Q…

See: Digital output, chapter 11.3.3.6

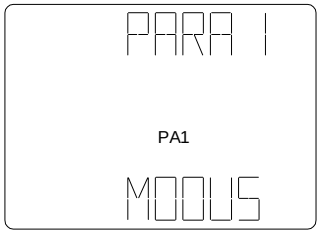


3351Z84

Minimum switch-off time for Q…

See: Digital output, chapter 11.3.3.6

Parameterization mode 1
PA1

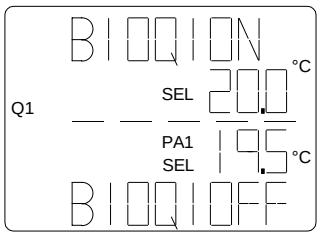


3351Z99

Operating level display

See: Configuration, chapter 7.2

PARA 1 MODE
PA1

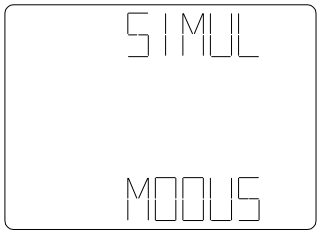


3351Zc0

Switching points Q...

See: Digital controller, chapter 11.4

Simulation mode
SI



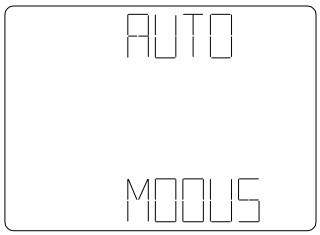
3351Zb5

Operating level display

See: Configuration, chapter 7.2
and commissioning, chapter 10

SIMUL MODE
SI

Auto mode



3351Zb6

Operating level display

See: Configuration, chapter 7.2
and operating instructions for plant operators, chapter 5

AUTO MODE

15.3 Abbreviations

ABS	Absolute value for reversal of operating action seq.1
ALT	Alternate, change, setpoint for Reversed operating action seq. 1
ACTIV	Active
ALM	Alarm
ALTDIR	Reversal of op. action seq. 1
AUTO	Alarm acknowledge S❄PROT autom.
AUTO / MODE	Automatic control operation
B**...** TYPE	Input type (e.g., sensor)
BIN	Binary (step switch)
B... (1...5)	Main controlled variable input
+B... (2...5)	Auxiliary controlled variable input
CASC	Cascade
CO...	Configuration mode...
COMP	Compensated (setpoint)
COMP1...COMP4	Compensation values of MULFUN
CONF / MODE	Start of configuration mode
CONST	Constant (setpoint)
COR	Correction (compensated setpoint)
CORSCA	Correction measured var. for input B..
DEVALM	Deviation alarm
DIG	Digital input signal AC 0/24 V
DIGREG	Digital controller
DQ	Switching of Q in DIGREG
DIRECT	Directly acting (seq.1)
DT	Dead time
FREE	Function LOCK inactive
FUNCT	Controller funct. SEQREG, DIGREG
INACT	Inactive
LIM	General limiter
LIMMAX	PI maximum limitation sequence 3
LIMSPE	PI special limitation sequence 1
LIN	Linear (step switch)
LOCK	Locking sequences via MULFUN
MANUAL	Manual alarm acknowledge S❄PROT
MANU 3	Alarm acknowledge S❄PROT only after 3 alarms within 30 minutes
MAXCOR	Maximum correction value (compensated setpoints)
MAXLIM	Maximum limitation value
MAXPOS	Max. value of positioning range (Y)
MAXPRI	Maximum priority sequence 3
MAXSCA	Max. value of scale for input B...
MAXSEL	Maximum limitation setpoint
MIN	Minutes
MINLIM	Minimum limitation value
MINPOS	Min. value of positioning range (Y)
MINSCA	Min. value of scale for input B...
MINSEL	Minimum limitation setpoint
MQ	Switching on Q after MULFUN
MULFUN	Multifunction variable
NIGHT	Setpoint changeover day/night
OFF	Reversal op. action seq.1 inactive
OHM	Input 0...1000Ω for TELSEL
❄PROT	Frost protection (thermostat)
P	Proportional (controller)
PA...	Parameterization mode...
PARA / MODE	Start of parameterization mode...
PI	Proportional / integral (controller)
Q...	Binary output (relay contact)
... Q	Output allocation digital controller
RELEAS	Switching on Q after MULFUN
RELLIM	Differential limitation value
REVERS	Reversed working order (seq.1)
SEC	Seconds
SEL	Setpoint
SEL1...3	Setpoints comp. by MULFUN
SEQREG	Sequence controller
SI	Simulation mode
SIMUL / MODE	Start of simulation mode
S❄ALM	Alarm value super frost prot.
S❄PROT	Super frost protection
❄PROT	Frost protection (thermostat)
STNDBY	Op. Changeover Normal Standby
SW	Software version
T1	Switch-on delay per Q
T2	Minimum switch-off time per Q
TELSEL	Remote setpoint seq. controller
TELE SEL	Remote setpoint display on LCD
TEMP	Temperature (°C / K or °F)
TN	Integral action time
VAR	Use Q-outputs individually
VOLT	Signal input DC 0...10 V
VOLT°C	Signal input DC 0...10 V ≙ °C
VOLT %	Signal input DC 0...10 V ≙ 0...100%
VQ	Switching of Q at VAR
XDZ	Dead zone (setpoint differential) between seq.1 and seq.3
XP P	Proportional band P-controller
XP PI	Proportional band PI controller
XPFACT	XP factor PI controller for XP PI
Y	Analog output (continuous)
...Y + ...Q	Allocation of outputs to sequence
YQ	Switching of Q through Y-output
1xNi °C	Input 1x LG Ni 1000 Ω sensor
2xNi °C	Input 2x LG Ni 1000 Ω sensor Average of 2 parallel switched sensors
ΔB...–B...	Difference of two inputs
	Reversal of operating action seq.1

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