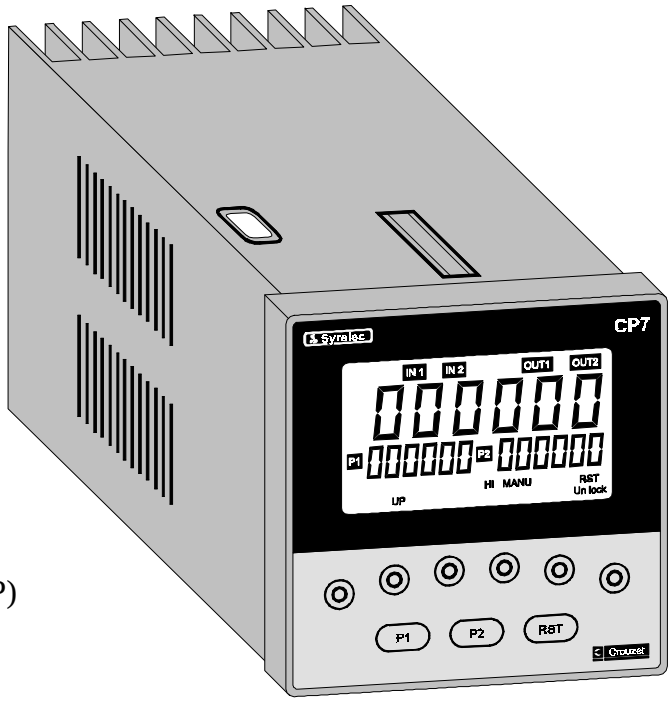
INSTALLATION MANUAL
UP / DOWN COUNTER
7141 / 7142 - 7341 / 7342
NTR 804 C



Main characteristics

The 7X41 and 7X42 counters are format 72 x 72, with 6 decades, 2 presets maximum and a back-lit LCD display. The unit slides out from the front and the programming mode can be accessed in this position. Configuration settings and current value are saved in EEPROM memory.

Display : 6 digits, height : 10 mm
71XX : back-lit LCD
73XX : red display

Inputs

2 inputs IN1 and IN2, 1 inhibit input.
8 input modes : UP, DOWN, CUMUL, DIR, IND PHASE, PHASE 2, PHASE 4.
Input by contact, voltage or solid-state device (NPN or PNP)
Counting frequency : 5 KHz / 2.5 KHz in Phase 4
30 Hz in debounce mode (LOW).
Low level : 0 to 1 V ⎓
High level : 4 to 30 V ⎓

Version	10/30 V	20/55 V	80/260 V
Power consumption	4 W	5 VA	10 VA

Reset

Reset to zero or to preset - From front panel : if not protected in programming phase.
- Electrical : by contact, voltage or solid-state device (NPN or PNP).

Minimum pulse time : 5 ms.
Impedance : 10 KΩ
Scale factor : 00.0001 to 99.9999
Decimal point : XXXXXX, XXXXX.X, XXXX.XX or XXX.XXX or XX.XXXX
Sensor supply : version ~ : 12 VDC (± 2 V from 30 mA to 100 mA)
version ⎓ : Un - 2 V / 100 mA (Un : supply voltage)
Low level : 0 to 1 V ⎓
High level : 4 to 30 V ⎓

Solid-state output NPN

Maximum current : 100 mA
Maximum voltage : 40 VDC
Maximum response time : 250 µs

Relay output

7X41 : 1 changeover relay - 1RT
7X42 : 2 changeover relay - 2RT
Current rating : 2 A
Minimum current : 100 mA
Output modes : maintained or pulsed (t = 500 ms)
Single shot or repetitive cycle (immediate auto reset)
Maximum voltage : 250 VAC
Maximum response time : 10 ms
Number of operations : 10^5 min. (in AC1 1800 op./H)

Supply

10 VDC min to 30 VDC max - 20 VAC min to 55 VAC max - 80 VAC min to 260 VAC max
Immunity from micro power cuts : t max = 10 ms
AC version : 50/60 Hz

Presentation and environment

Material	: Self-extinguishing	Front panel fixing by clip.
Connection by screw terminals.		Front panel protection : IP54 a/c IEC 60529
Terminal capacity	: 2 x 1.5 mm²	Front panel watertight seal
Recommended screwdriver	: 3 to 5 mm	Weight : 250 g
Recommended tightening torque	: 0.5 - 0.6 Nm (M3 screw / IEC 60947-1)	

Climatic conditions

		Standard
Operating temperature	: 0 °C to + 55 °C	IEC 60068-2-14
Humidity	: 30 to 93 % (-3% +2%)	IEC 60068-2-30
Storage temperature	: - 25 °C to + 70 °C	IEC 60068-2-1/IEC 60068-2-2
Storage humidity	: < 70 %	
Altitude	: 0 to 2000 m	

Mechanical protection

Continuous vibrations	: 10 to 55 Hz	IEC 60068-2-6
Amplitude	: 0.35 mm.	

Immunity to electromagnetic interference (EN 50082-2/95)

Type	Standard	Level	
Electrostatic discharges	IEC/EN 61000-4-2	3	Air : 8 KV Contact : 6 KV
Electromagnetic field	IEC/EN 61000-4-3 (ENV 50140/204)	3	10 V/m from 80 MHz to 1 GHz / 900 MHz
Rapid transients	IEC/EN 61000-4-4	3	Supply : 2 KV I/O : 1 KV
Common mode radio frequency	IEC/EN 61000-4-6 (ENV 50141)	3	10 Veff (0.15 to 80 MHz)

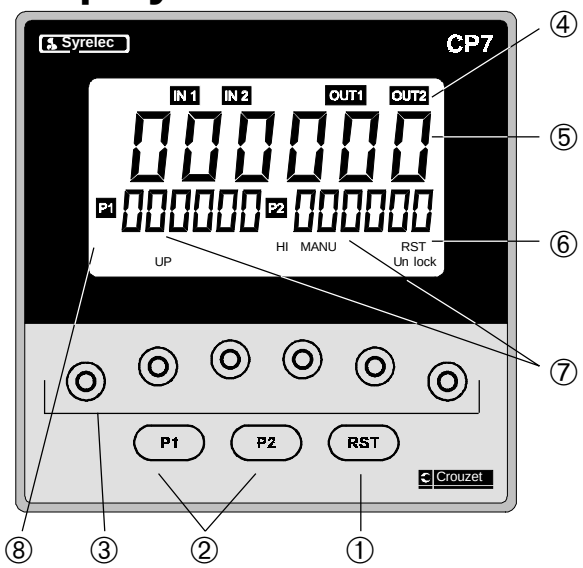
Emission in electromagnetic compatibility (EN 50081-2/93)

Conducted to terminals	EN 55022/11 Group 1	Class A	0.15 MHz to 30 MHz
Radiated	EN 55022/11 Group 1	Class A	30 MHz to 1 GHz

This is a class A product.
In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Insulation (IEC 60664-1): 2.5 KV : Overvoltage category : 2 ; Degree of pollution : 3

Display



① Reset.
② Access to presets in user mode. Scroll through steps in installer mode (P1).
③ Selection of the various parameters and incrementation of figures (one key per figure).
④ Display of input and output status.
⑤ Display of current value.
⑥ Reset front panel protection indicator.
⑦ Display of preset value.
⑧ Program display (permanent in Run mode).

Installation

- Check that the power supply voltage used corresponds to the voltage range accepted by the unit.
  3 models are available, which accept voltage ranges of 10 to 30 VDC, 20 to 55 VAC or 80 to 260 VAC.
- Wire the power supply to terminals 1 and 2.
- Program the unit. Refer to the programming screen.
- Wire the inputs and outputs (see electrical connection diagrams).

Changing preset values (user and installer)

- Press key "P1" or "P2" which corresponds with the parameter to be modified.
- Press the key which corresponds with the figure to be incremented.

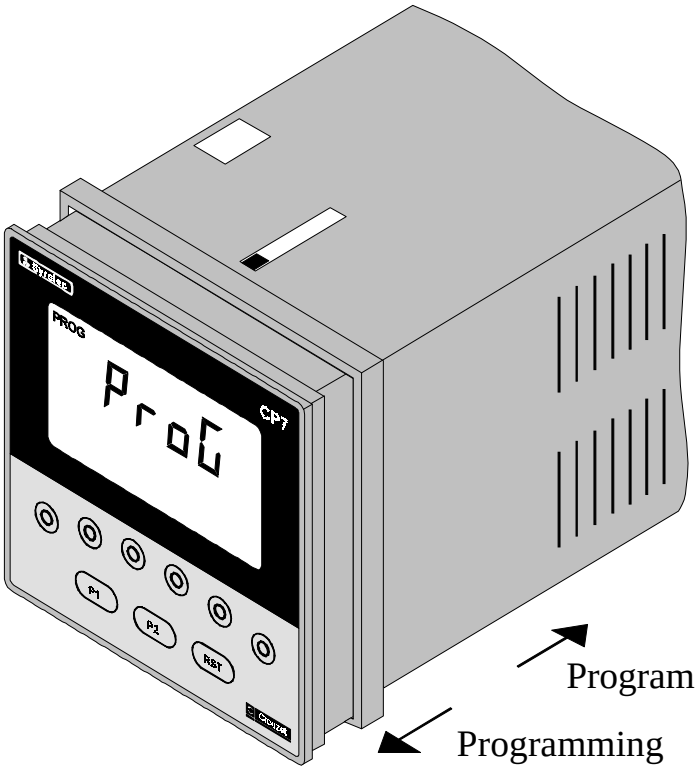
When these values are changed, they are confirmed by pressing P.

Programming

Factory configuration on delivery :

Counting mode ..... Mode = PHASE
Counting speed ..... Speed = HI
Reset to 0 ..... RST = 0
Type of cycle ..... Manual = Manu

Output maintained ..... Out = ⌐¬
Parameter protection ..... = None
Decimal point ..... = None
Preset values ..... P1 = 1500
P2 = 2000
Scale factor ..... coef = 01.0000



Programming backup

Programming

Programming is performed using the "P1" key and the keys situated under each figure.

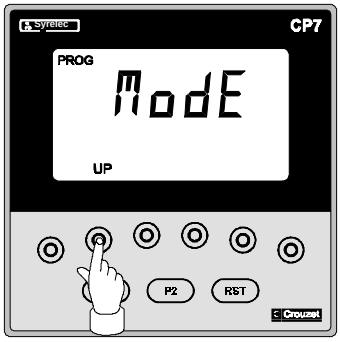
To program the counter :

Slide out the inner chassis of the unit to about halfway.
"Prog" will appear on the display.
The unit is in programming mode.



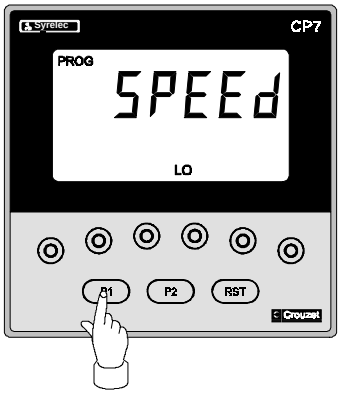
The "P1" key is used to scan all the parameters which can be modified (mode, speed, type of cycle, decimal point, scale factor, type of reset).
Press the "P1" key to go to the first programming step.

8 choices are then available (by pressing keys 0 to 5 : the 6 keys perform the same function) :



Mode	Function
UP	(Upcount on the rising edge of input 1) the "RST" key will reset implicitly to "000000".
DOWN	(Downcount on the rising edge of input 1) the "RST" key will reset implicitly to P2.
CUMUL	Total (IN1 + IN2).
DIR	Directional.
IND	Independent (IN1 - IN2).
PHASE	(Upcount on the rising edge of input 1 if IN2 is at 0) (Downcount on the falling edge of input 1 if IN 2 is at 0).
PHASE 2	Phase x 2.
PHASE 4	Phase x 4.

Pressing "P1" again confirms the selected mode and passes to the speed programming phase. There are 2 choices available (by pressing keys 0 to 5) :



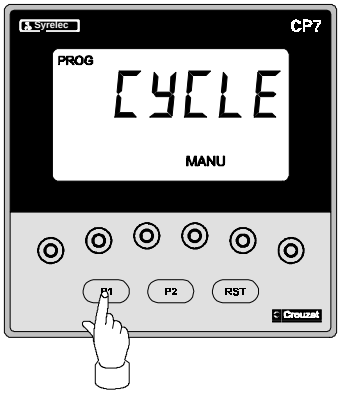
Low
(low speed) : counting speed is limited to 30 Hz.



HIGH
(high speed) : counting speed is limited to 5 KHz, 2.5 KHz in Phase 4.

← The 6 keys perform the same function.

Pressing "P1" again confirms the selected speed and passes to the cycle programming phase. There are 2 choices available (by pressing keys 0 to 5) :



Manu



Auto
(automatic cycle)

← The 6 keys perform the same function.

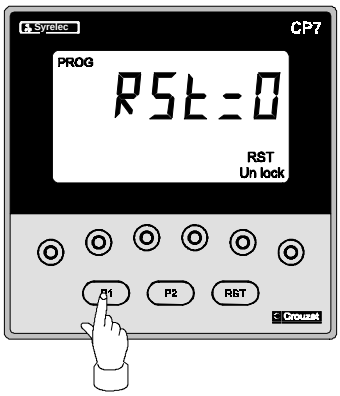
In "UP" mode

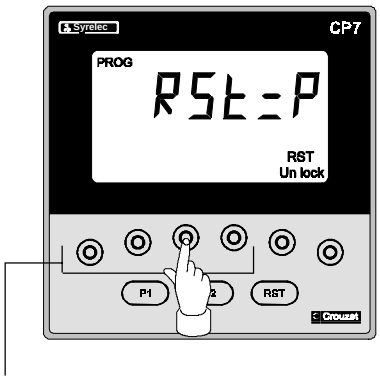
When the count value equals P2* the current value is reset to 0, counting is not interrupted, output 2 is activated for 500 ms.

In "Down" mode

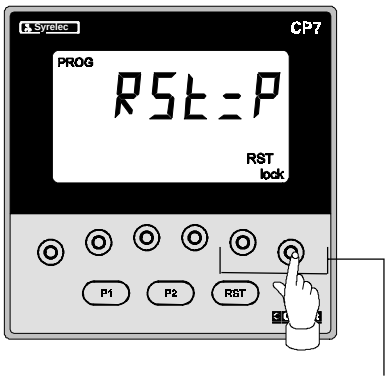
When the count value equals 0 the current value is reset to P2*, counting is not interrupted, output 2 is activated for 500 ms.

Pressing "P1" again confirms the selected cycle and passes to the phase for programming the type of counting and RST protection.





The 4 keys perform the same function.



2 keys for modifying RST protection

Type of counting

2 choices available (by pressing keys 2-5) :

UP : RST = 0 : (pressing RST on the front panel or the "RST" = 1 input resets the current value to 0 and counting goes from 0 to P).

DOWN : RST = P : (pressing RST on the front panel or the "RST" = 1 input resets the current value to P2* and counting goes from P to 0).

RST protection

2 choices available (by pressing key 0 or 1) :

RST lock : pressing "RST" on the front panel is inhibited.

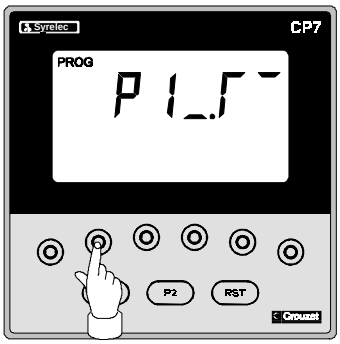
Otherwise, pressing the "RST" key on the front panel is valid and executes a reset to 0 or to P2*.

(* : P1 on 7X41)

Pressing "P1" again confirms the type of counting selected and passes to the OUT1 output programming phase. 2 choices available (by pressing keys 0 to 5) :



Pulsed output



Maintained output

← The 6 keys perform the same function.

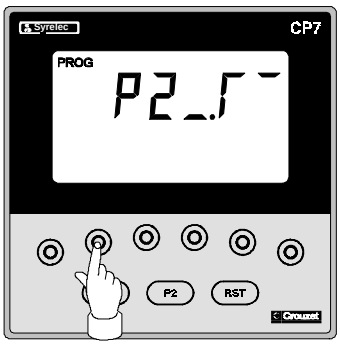
Pressing "P1" again confirms the type of output 1 selected and passes to :

- 7X42, OUT2 output programming phase.
- 7X41, the next step.

2 choices available (by pressing keys 0 to 5) :



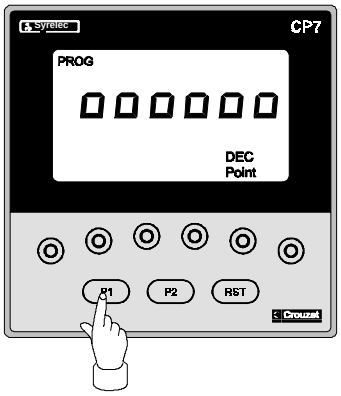
Pulsed output

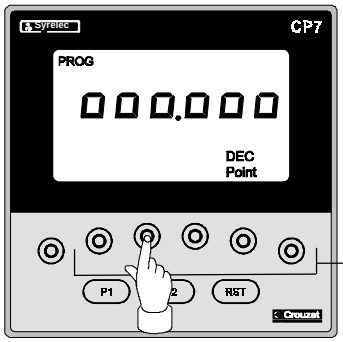


Maintained output

← The 6 keys perform the same function.

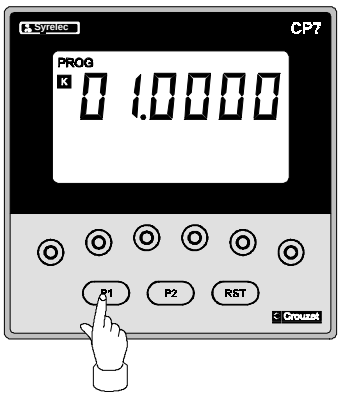
Pressing "P1" again confirms the type of output 2 selected and passes to the decimal point programming phase. 5 choices available (by pressing keys 0 to 4). Each key 0 to 4, is associated with a decimal point position.



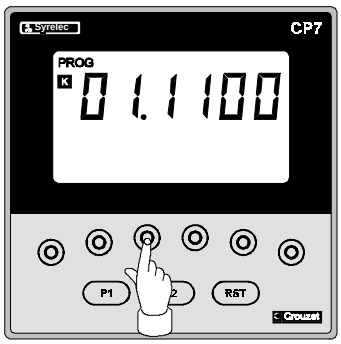


Each key corresponds to a decimal point position

Pressing "P1" again confirms the decimal point selected and passes to the scale factor programming phase. Each key, 0 to 5, modifies the associated decade, d0 to d5, (d0 = units).







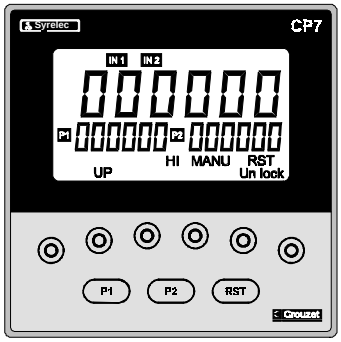
← Each key corresponds to a decade.

Pressing "P1" again confirms the scale factor selected and returns to the mode programming phase.

Sliding the unit back in exits the programming mode and saves the various parameter settings.

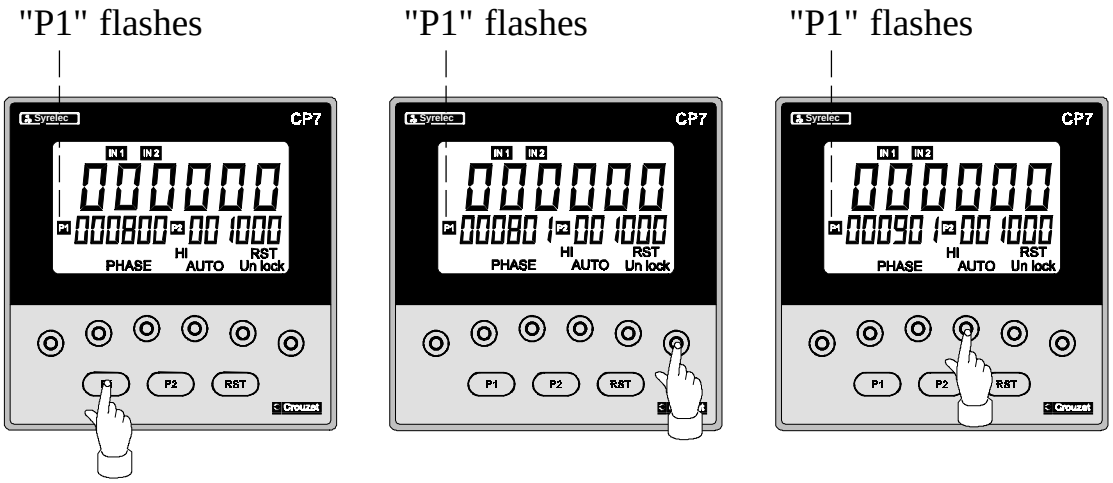
Description of " RUN " mode

In this mode, known as "normal mode", the symbols "IN1, IN2, RST, OUT1, OUT2" are displayed according to the status of the corresponding elements.



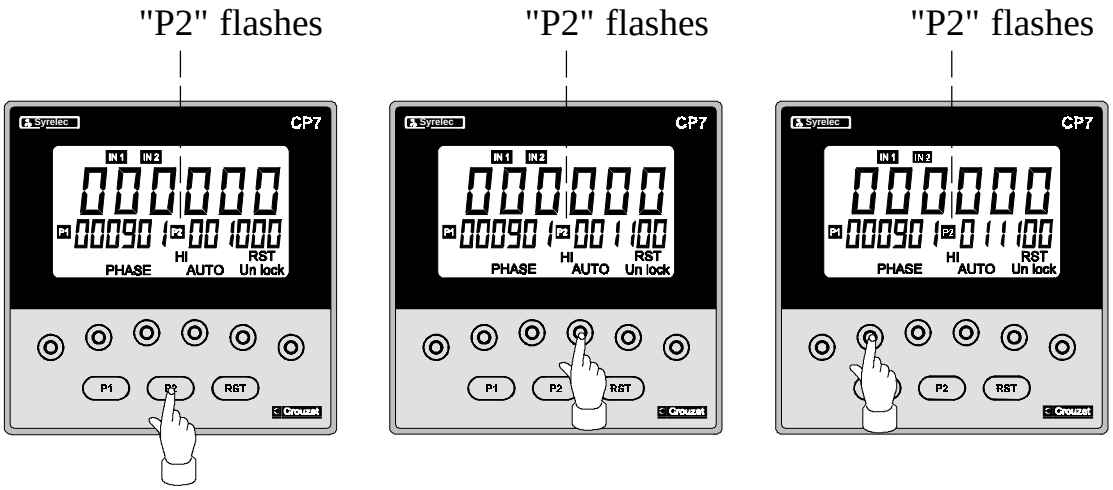
The current value is permanently displayed.

Pressing "P1" accesses the P1 modification.
Each time keys 0 to 5 are pressed, the corresponding decade is incremented.



← Each key corresponds to a decade.

Press "P2" : programming of P1 and access to P2 modification.
Each time keys 0 to 5 are pressed, the corresponding decade is incremented.



← Each key corresponds to a decade.

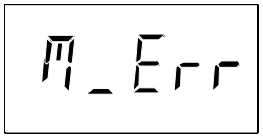
"P1" or "P2" flashes. If no key is pressed for 6 s, the figure will return to its previous value.
Press "P1" again : programming of P2 and return to normal mode.

Description of backup

Backup performs 2 functions :

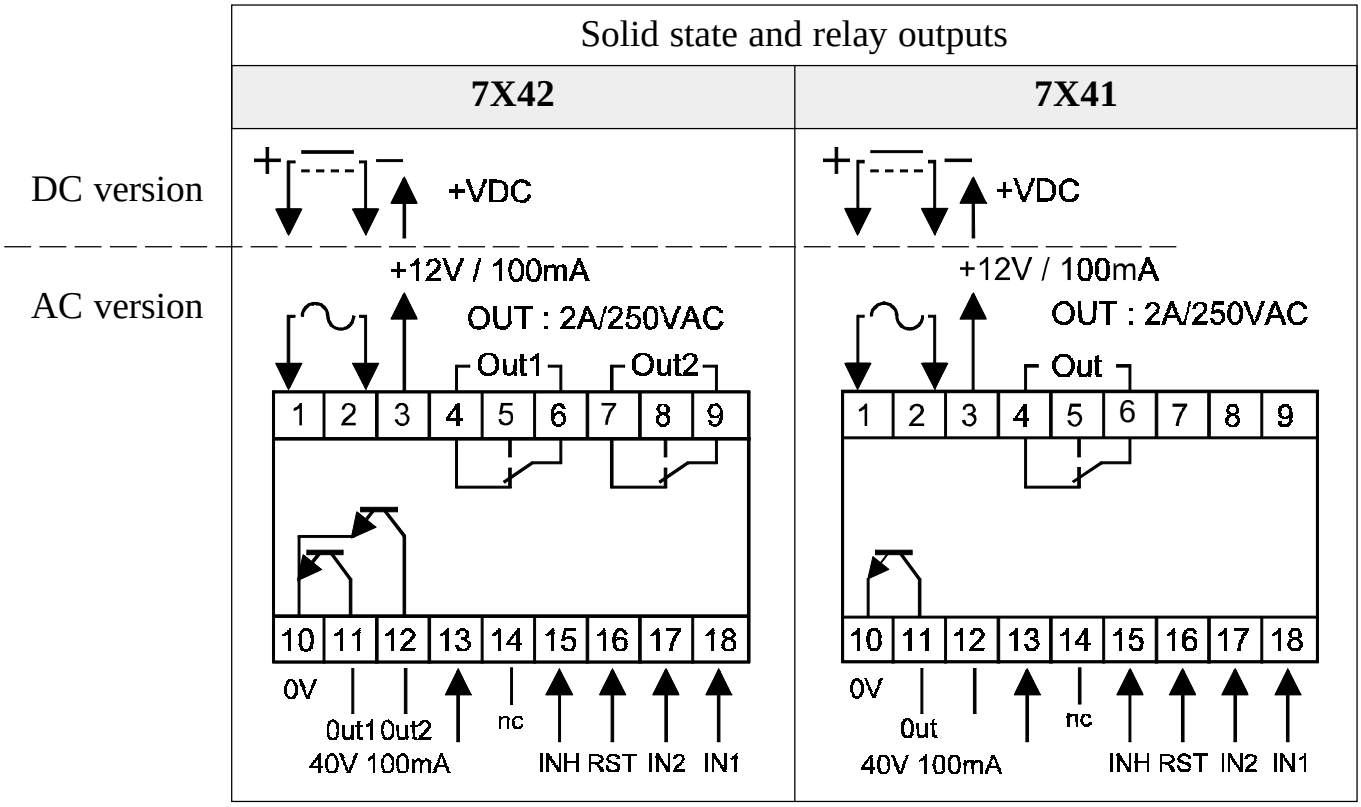
- It memorises the programmed parameters (in programming mode).
- It saves the current value of the counter during loss of power and restores it when power returns.

The coherence of the saved data is checked on power-up ; if there is an error the counter is inhibited and the display shows :

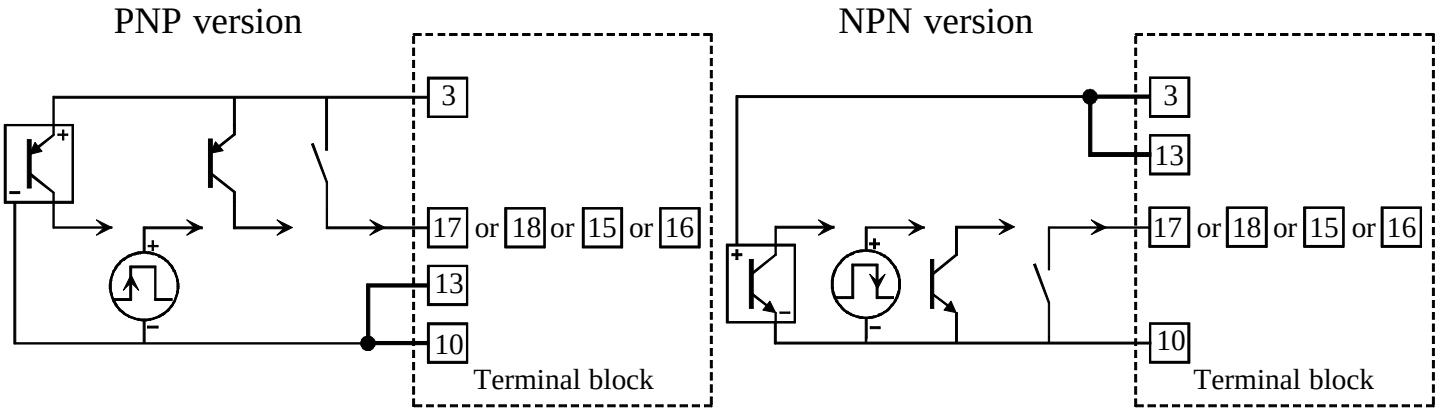


It will then be necessary to change to " PROG " mode to enter/confirm the parameters.

Wiring diagrams

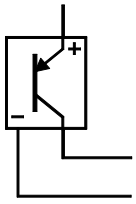


Input wiring



Key

OUT	Output (7X41)
OUT1	Output 1 (7X42)
OUT2	Output 2 (7X42)
INH	Inhibit input
IN1	Input 1
IN2	Input 2
RST	Electrical reset



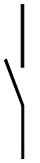
3-wire sensor



Open collector transistor

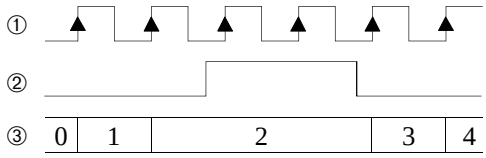
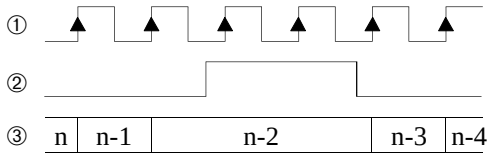
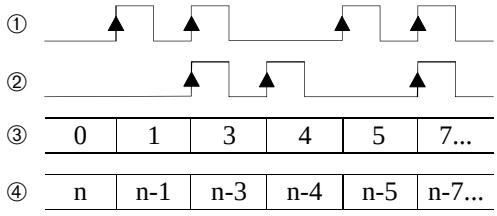
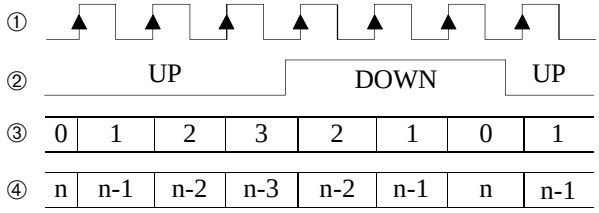
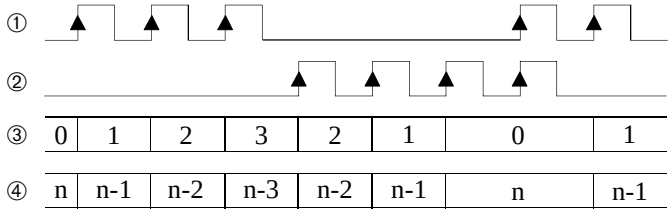
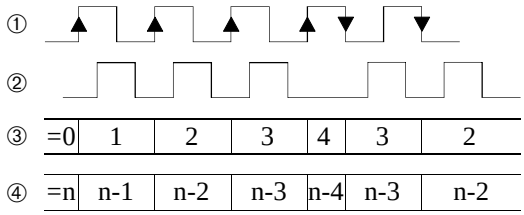
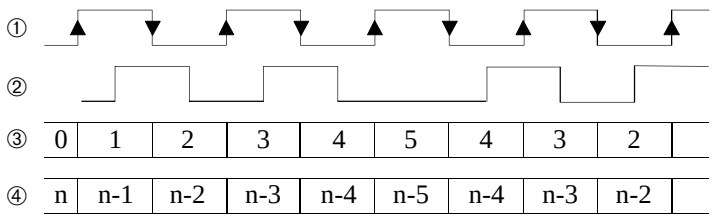
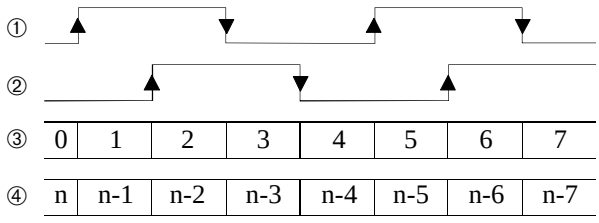


Voltage level



Contact

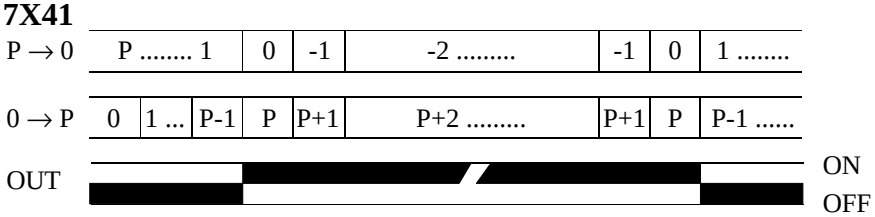
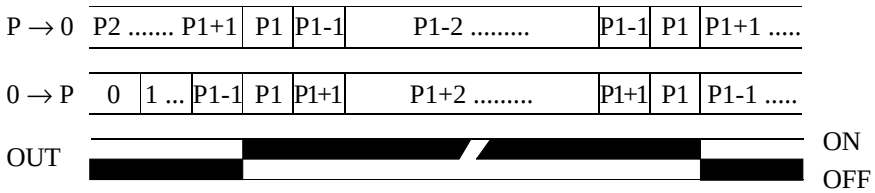
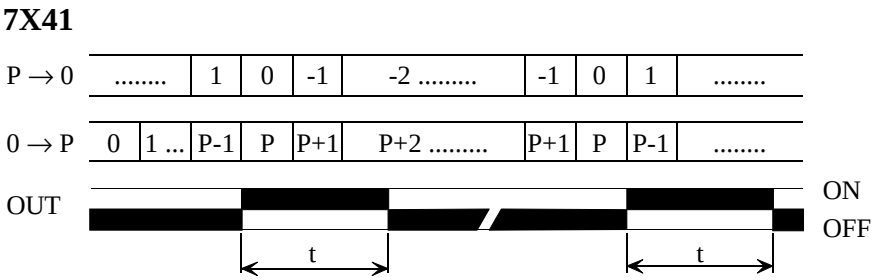
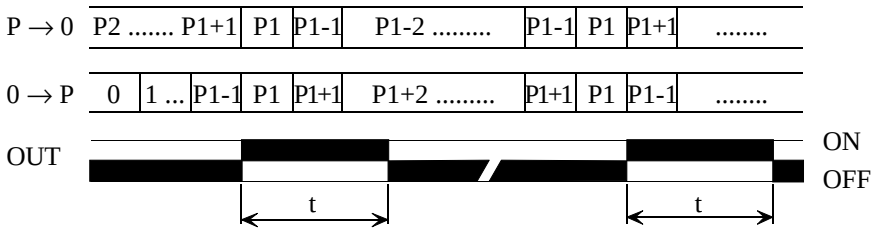
Input modes

Functions	Diagrams	PNP count on rising edge (NPN count on falling edge)
UP		① Input IN1 ② Inhibit input ③ Display
DOWN		① Input IN1 ② Inhibit input ③ Display
CUMUL		① Input IN1, count in the direction of the cycle ② Input IN2, count in the direction of the cycle ③ Display (0 → P) up/down counter 2 channels ④ Display (P → 0) up/down counter 2 channels
DIR		① Input IN1 input pulses ② Input IN2 reversal of counting direction ③ Display (0 → P) up/down counter 1 channel ④ Display (P → 0) up/down counter 1 channel
IND		① Input IN1, count in the direction of the cycle ② Input IN2, count in the opposite direction from the cycle ③ Display (0 → P) up/down counter 2 channels ④ Display (P → 0) up/down counter 2 channels
PHASE		① Input IN1 ⎫ 90° out of phase signals ② Input IN2 ⎭ ③ Display (0 → P) ④ Display (P → 0)
PHASE 2		① Input IN1 count on rising and falling edge ② Input IN2 reversal of counting direction if IN2 ahead of IN1 ③ Display (0 → P) ④ Display (P → 0)
PHASE 4		① Input IN1 count on rising and falling edge ② Input IN2 count on rising and falling edge, reversal of counting direction if IN2 ahead of IN1 ③ Display (0 → P) ④ Display (P → 0)

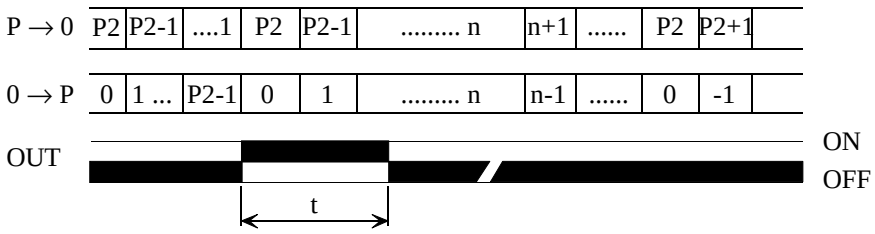
Output modes

Displayed symbols	Functions	
	A ⟷ B	A - Count in the direction of the cycle. B - Count in the opposite direction from the cycle.

Single shot MANU

-.F.-	**7X41**  **7X42** 	Maintained
-.P.-	**7X41**  **7X42** 	Pulsed t = 500 ms (transient pulse)

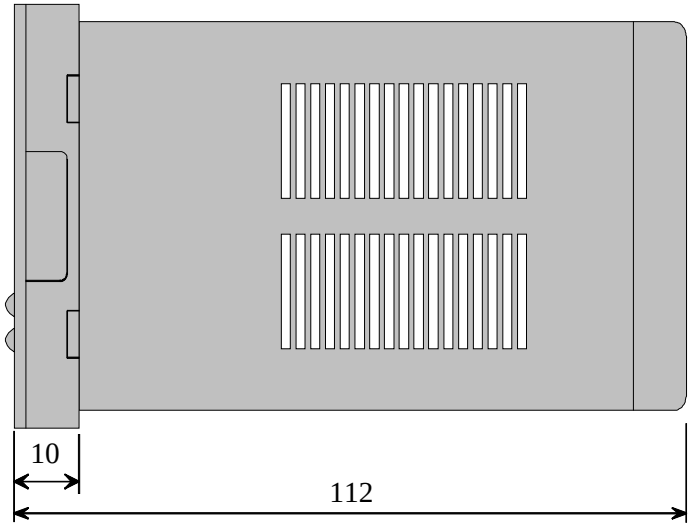
Repetitive cycle AUTO

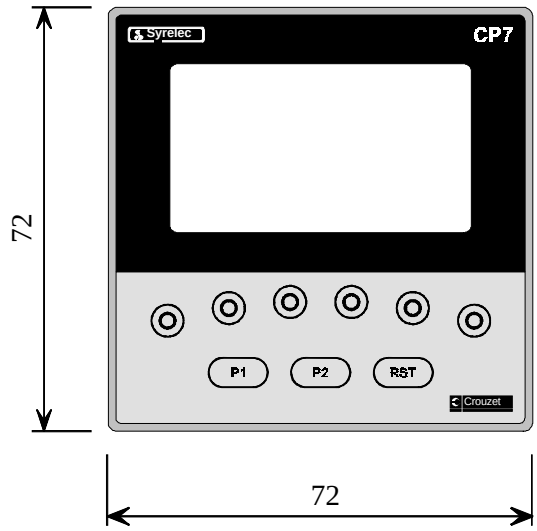
-.A.-		Pulsed with auto reset to value of P2 (or P1 for 7X41). t = 500 ms

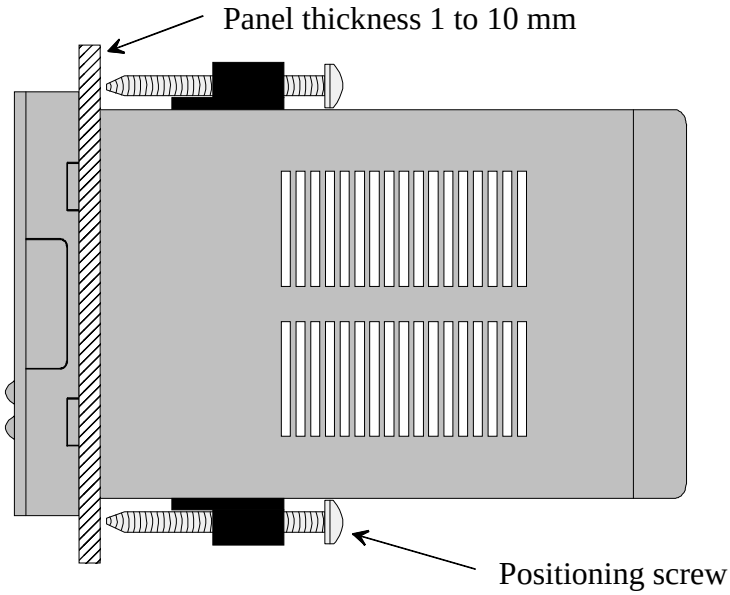
Operating precautions

We recommend that counters should be placed with other measuring or control devices, and kept away from power switches.

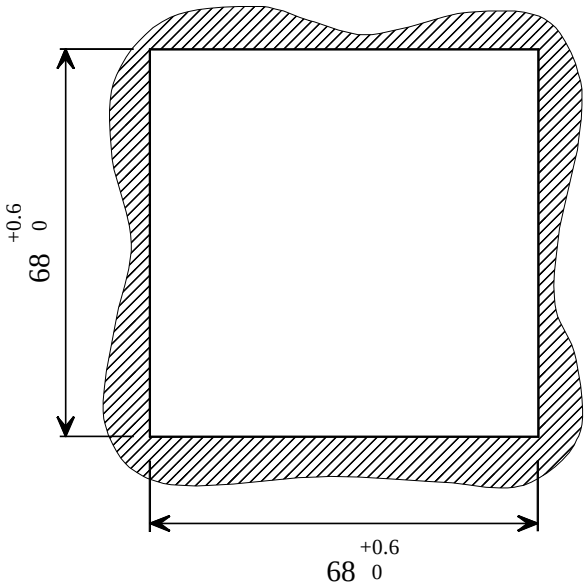
Dimensions



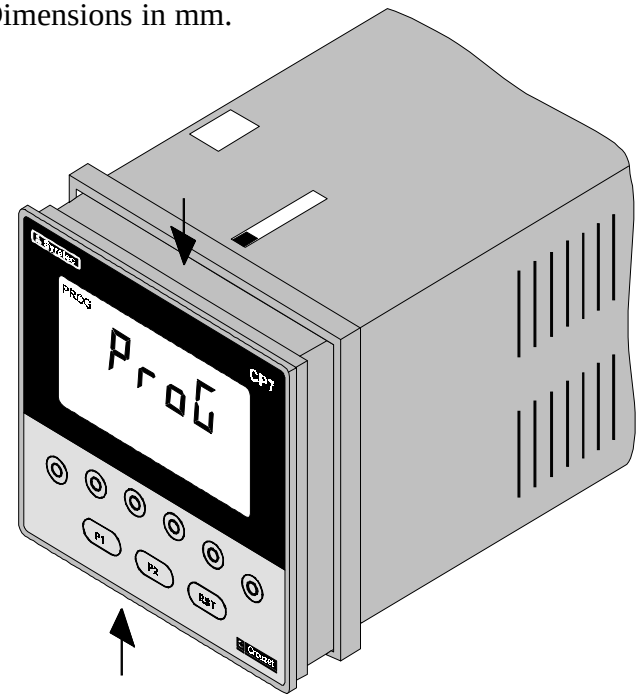




Panel cut-out



Dimensions in mm.



Slide-out electronics for easy maintenance. To remove, push in the direction of the arrows.