Read this document carefully before using this device. The guarantee will be expired by damaging of the device if you don't attend to the directions in the user manual. Also we don't accept any compensations for personal injury, material damage or capital disadvantages.

ENDA EC442 UP/DOWN COUNTER

Thank you for choosing ENDA EC442 COUNTER.

* 48x48mm sized.
* 2x4 digits display.
* Easy to use by front panel keypad.
* Counting up and down with a 2 channel inputs having a 90° phase shift.
* Input frequency can be selectable.
* Prescaler factor can be adjusted between 0.001 and 9.999.
* Decimal point can be adjusted between 1. and 3. digits.
* Sensor type can be selected as PNP, NPN or Encoder.
* Single set-point control is made by a single relay output.
* Output can be energized continuously or just for a time interval of 0.1 to 999.9 seconds.
* Selectable functional reset input.
* Input offset feature.
* Parameter access protection on 3 levels.
* Easy connection by removable screw terminal.
* CE marked according to European Norms.

RoHS Compliant

CE

Order Code : EC442-□□□□□□
1

Supply Voltage
230VAC...230V AC
24VAC.....24V AC
SM.....9-30V DC / 7-24V AC

TECHNICAL SPECIFICATIONS

ENVIRONMENTAL CONDITIONS	
Ambient/storage temperature	0 ... +50°C/-25 ... +70°C (with no icing)
Max. relative humidity	80% up to 31°C decreasing linearly 50% at 40°C.
Rated pollution degree	According to EN 60529 Front panel : IP60 Rear panel : IP20
Height	Max. 2000m

Do not use the device in locations subject to corrosive and flammable gases.

ELECTRICAL CHARACTERISTICS	
Supply	230V AC +10% -20% or 24V AC ±10%, 50/60Hz or optional 9-30V DC / 7-24V AC ±10% SMPS module.
Power consumption	Max. 5VA
Wiring	2.5mm² screw-terminal connections
Date retention	EEPROM (Min. 10 years)
EMC	EN 61326-1: 1997, A1: 1998, A2: 2001 (Performance criterion B for the EMC standard)
Safety requirements	EN 61010-1: 2001 (pollution degree 2, overvoltage category II)

INPUTS	
Count inpus (CP1, CP2)	2 channels (max. 9999Hz, 5V to 30V pulse)
Frequency (Hz)	25, 500, 1000, 2000, 5000, 7500Hz, 9999Hz (selectable by programming)
Minimum On and Off times for pulses	20ms for f=25Hz
	1ms for f=500Hz
	500 s for f=1kHz
	250 s for f=2kHz
	100 s for f=5kHz
	67 s for f=7,5kHz
	50 s for f=10kHz
Reset input	PNP: Positive reset (5V to 30V pulse with adjustable pulse time between 2ms and 50ms) NPN: GND terminal is connected to the RESET IN terminal.

OUTPUTS	
Control output (OUT)	Relay : 250V AC, 2A (for resistive load), NO+NC
	Open collector output (S.S. OUT): Max. 30V DC, 100mA
Auxiliary power supply	12V DC, max. 50mA (without regulation)
Life expectancy for relay	Mechanical 30.000.000 operation; Electrical 300.000 operation
Note : Relay and S.S.OUT outputs are in synchronization . When OUT relay is energized S.S. OUT transistor goes into saturation.	

HOUSING	
Housing type	Suitable for flush-panel mounting according to DIN 43 700.
Dimensions	W48xH48xD87mm
Weight	Approx. 210g (after packing)
Enclosure material	Self extinguishing plastics

While cleaning the device, solvents (thinner, benzine, acid etc.) or corrosive materials must not be used.

TERMS

(1) Counting value during run mode.
Parameter value or mnemonic parameter code during programming mode.

(2) Preset value during run mode.
Parameter value, unit or mnemonic parameter code during programming mode.

(3) Output LED.

(4) Increment key during run and programming modes.
Parameter selection key during programming mode.

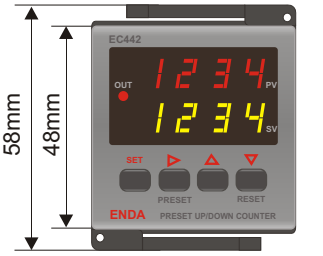
(5) Decrement or reset key during run mode.
Parameter selection or decrement key during programming mode.

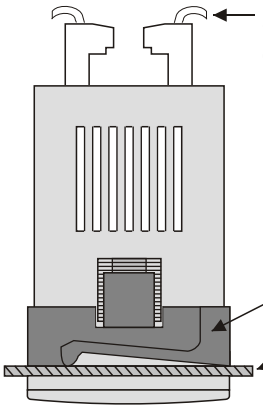
(6) Used for selecting oPt ions or digits to be changed.

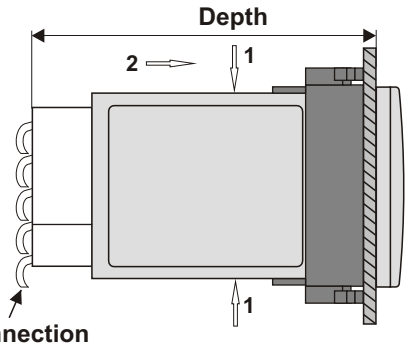
(7) Used for selecting run or programming modes or for adjusting the parameter.

(1) PV display	4 digits, seven segment red LED
(2) SV display	4 digits, seven segment yellow LED
Character height	PV display (1) : 7.1mm
	SV display (2) : 7.1mm
(3) Output LED	One red LED
(4),(5),(6),(7) Keypad	Micro switch

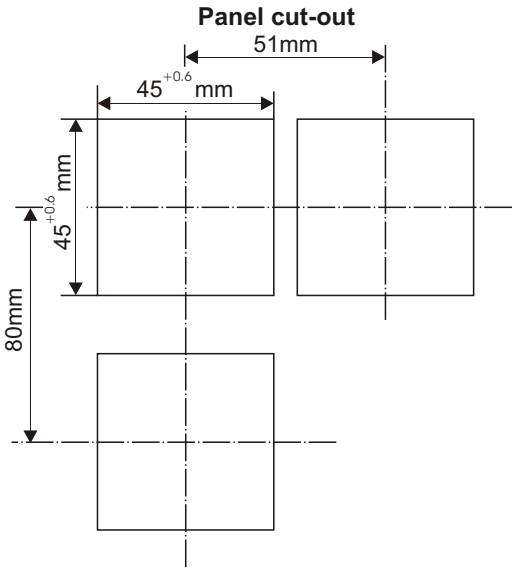
DIMENSIONS







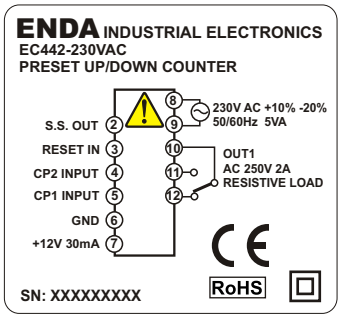
For removing the device from the panel:
- While pressing both side of the device in direction **1**, push it in direction **2.**

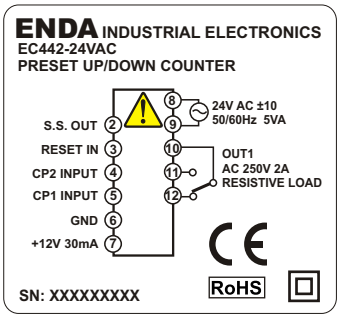


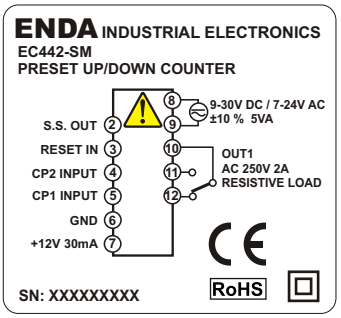
Note: 1) While panel mounting, additional distance required for connection cables should be considered.
2) Panel thickness should be maximum 9mm.
3) If there is no 100mm free space at back side of the device, it would be difficult to remove it from the panel.

CONNECTION DIAGRAM

ENDA EC442 is intended for installation in control panels. Make sure that the device is used only for intended purpose. The shielding must be grounded on the instrument side. During an installation, all of the cables that are connected to the device must be free of energy. The device must be protected against inadmissible humidity, vibrations, severe soiling and make sure that the operation temperature is not exceeded. All input and output lines that are not connected to the supply network must be laid out as shielded and twisted cables. These cables should not be close to the power cables or components. The installation and electrical connections must be carried on by a qualified staff and must be according to the relevant locally applicable regulations.



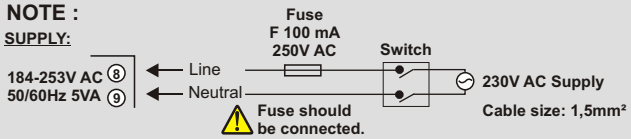




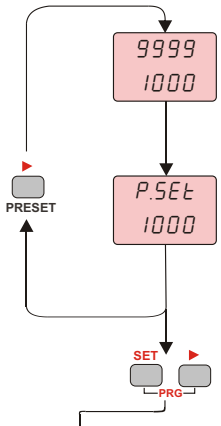
Holding screw 0.4-0.5Nm

Equipment is protected throughout by DOUBLE INSULATION.

NOTE :

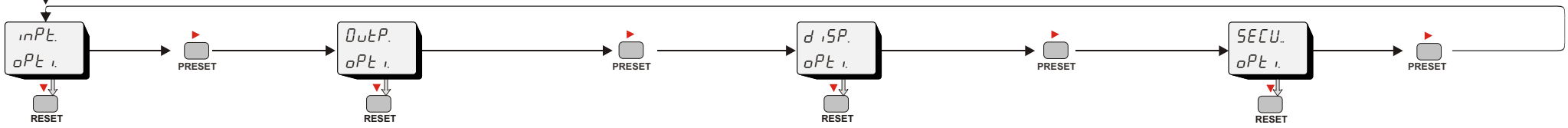


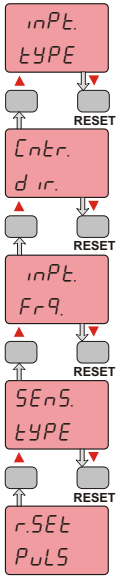
Note : 1) Mains supply cords shall meet the requirements of IEC 60227 or IEC 60245.
2) In accordance with the safety regulations, the power supply switch shall bring the identification of the relevant instrument and it should be easily accessible by the operator.



PARAMETER TABLE

inPt. oPt 1.	inPt. tYPE	CP 1U. CP2d.	CP 1U. CP2U.	CP 1U. CP2G.	CP 1U. CP2r.	UP Ph-4	UP.dn. Ph-1	UP.dn. Ph-2			dEc 1. Pnt.	0	0.0	0.00	0.000
	Cntr. dir.	d irE.	oPPo.								d iSP. CAL.	0.001	.....	9.999	
inPt. Fr9.	25 HErt	500 HErt	1000 HErt	2000 HErt	5000 HErt	7500 HErt	9999 HErt				oFFS. dAtA	0	.....	5000	
	SEnS. tYPE	nPn	PnP	Enco.							SECU. codE	1111			
	rESt PuLS	0.002 SEc.	0.005 SEc.	0.010 SEc.	0.020 SEc.	0.050 SEc.					inP.o SECU.	nonE	Prog. no	Prog. YES	
OutP oPt 1.	outP tYPE	Conf. 1	Conf. 2	Conf. 4	Conf. 5	Conf. 6	Conf. 7	Conf. 8	Conf. 9	Conf. 10	Outo. SECU.	nonE	Prog. no	Prog. YES	
	out t 1.	0000	.....	999.9							d iSo. SECU.	nonE	Prog. no	Prog. YES	
											Cntr. rSEt	no	PAnE. rSEt	rSEt inPt.	both
											dEF. SEt	no	YES		





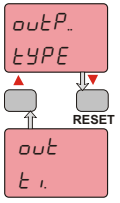
There are seven different input types. A schematic diagram of counting modes according to the input types is at the next page.
See NOTE 2 for modification.

Counting direction can be selected d irE. or oPPo. A schematic diagram of counting directions according to the selected input types is at the next page.
See NOTE 2 for modification.

Input frequency can be selected.
See NOTE 2 for modification.

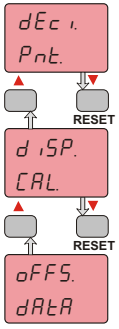
A type of sensor can be selected.
See NOTE 2 for modification.

The minimum pulse duration of the external RESET input can be selected.
See NOTE 2 for modification.



There are nine different output types. A schematic diagram of output types is at the next page.
See NOTE 2 for modification.

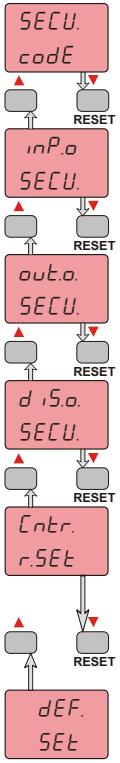
Output energizing time can be adjusted between 0.1 and 999.9 seconds.
If it is made 0.0, output is energized continuously when P.SEt value is reached.
See NOTE 1 for modification.



Decimal point can be adjusted between 1. and 3. digits.
If desired, decimal point is not included.
See NOTE 2 for modification.

Calibration (Prescaler) value can be adjusted between 0.001 and 9.999. Counter multiplies the number of pulses by the prescaler value and the result is displayed on the screen
See NOTE 1 for modification.

Offset value can be adjusted between 0 and 5000.
It means counter starts counting from the offset value when it is reset.
See NOTE 1 for modification.



Access code for entering security option menu.
This parameter should be 1111.
See NOTE 2 for modification.

nonE = No menu is seen.
Prog. no = Menu is seen but can not be programmed.
Prog. YES = Menu is seen and programming is possible.
See NOT 2. for modification.

nonE = No menu is seen.
Prog. no = Menu is seen but can not be programmed.
Prog. YES = Menu is seen and programming is possible.
See NOT 2. for modification.

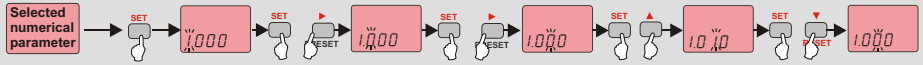
nonE = No menu is seen.
Prog. no = Menu is seen but can not be programmed.
Prog. YES = Menu is seen and programming is possible.
See NOT 2. for modification.

no = Counter can not be reset.
PAnE. rSEt = Counter can be reset by RESET key.
rSEt inPt. = Counter can be reset by the RESET input.
both = Both RESET input and the RESET key can be used for resetting.
See NOT 2. for modification.

While leaving the programming mode,
no = All the modifications are saved.
YES = Default values are set to parameters.
See NOT 2. for modification.

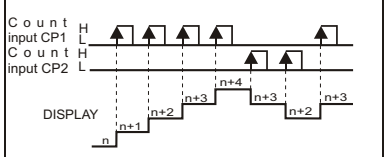
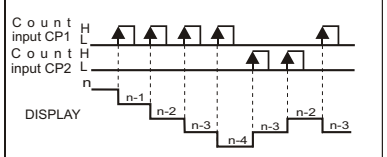
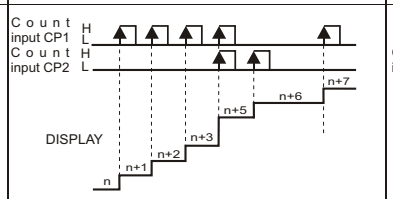
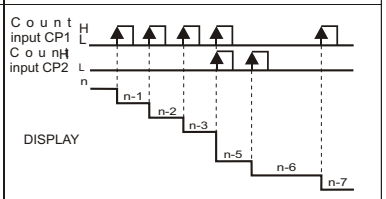
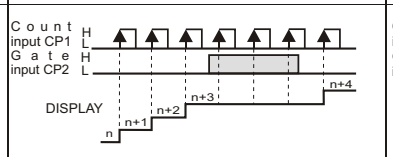
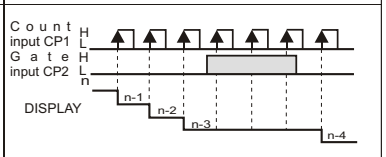
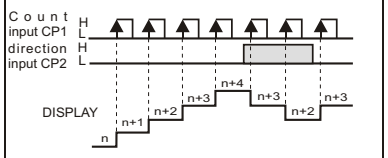
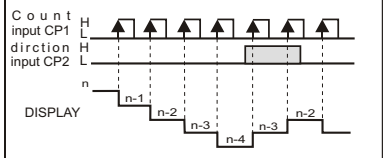
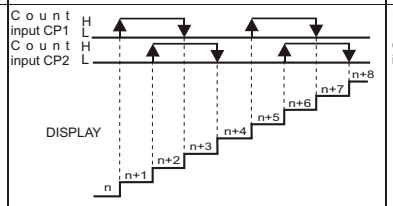
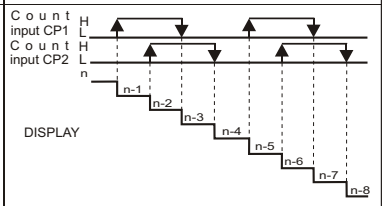
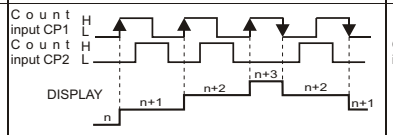
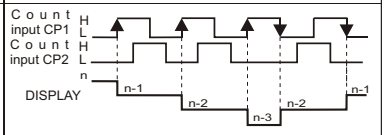
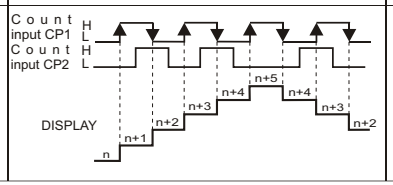
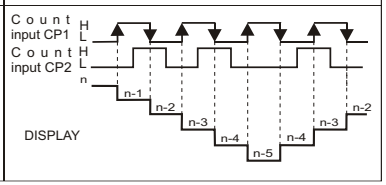
PARAMETER MODIFICATION DIAGRAM

NOTE 1 Holding SET key the value of the selected parameter is seen on the display. While holding SET key, the value of the selected parameter can be changed by using PRESET, RESET keys. In order to reset all the digits, first press and hold SET key. And then, press both and RESET keys together.



NOTE 2 To modify non-mumerical parameters, hold SET key and use RESET keys.

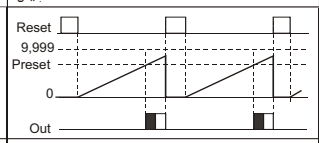
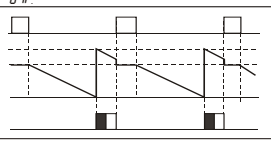
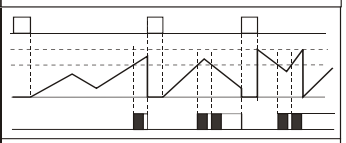
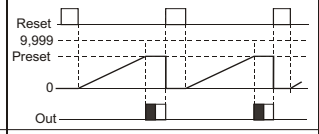
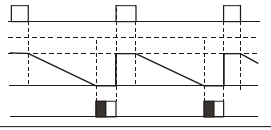
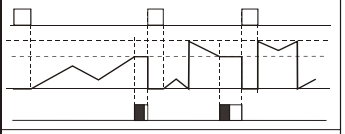
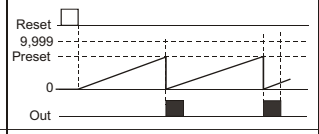
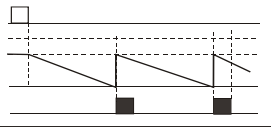
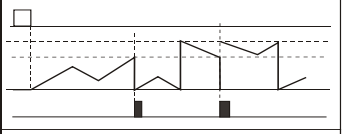
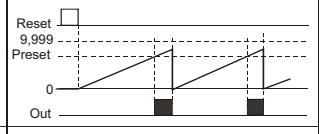
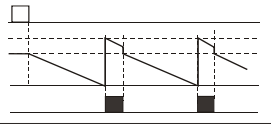
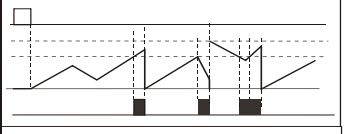
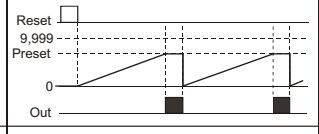
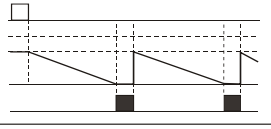
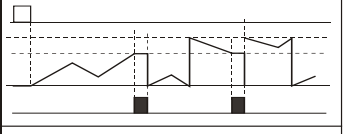
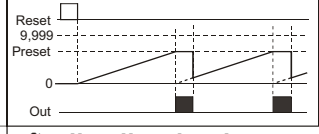
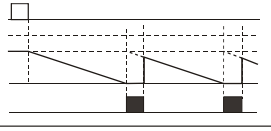
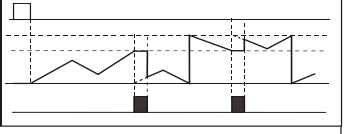
INPUT TYPES

inPt tYPE \ Cntr. dir.	dirE.	oPPo.
CP1.U. CP2.d.		
CP1.U. CP2.U.		
CP1.U. CP2.G.		
CP1.U. CP2.r.		
UP Ph-4		
UP.dn. Ph-1		
UP.dn. Ph-2		

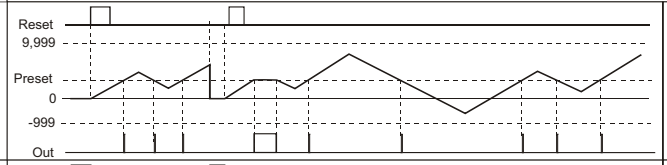
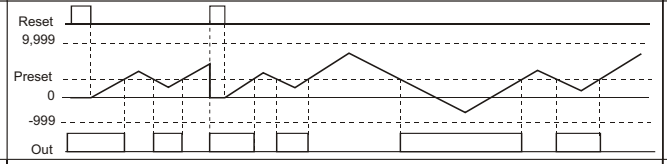
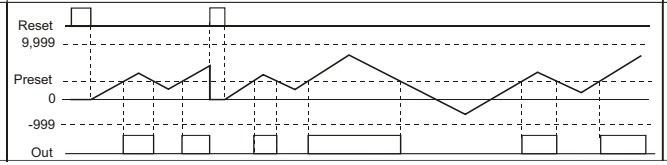
NOTE 1) ⌐¯¯¯¯¯¯¯¯¯¯¬ For PNP sensor, counter is triggered at the rising edge of the pulses.
⌐¯¯¯¯¯¯¯¯¯¯¬ For NPN sensor counter is triggered at the falling edge of the pulses.

2) For NPN sensor, if you select inPt.tYPE CP1.U. CP2.r., above diagram for Cntr.dir. dirE replaces with Cntr.dir oPPo. .

OUTPUT TYPES

	UP COUNTER (inPt tYPE = CP1.U. / CP2.U., CP1.U. / CP2.U., UP; Ph-4; Cntr. dir. = dirE.)	DOWN COUNTER (inPt tYPE = CP1.U. / CP2.U., CP1.U. / CP2.U., UP; Ph-4; Cntr. dir. = oPPo.)	UP / DOWN COUNTER (inPt tYPE = CP1.U. / CP2.d., CP1.U. / CP2.r., UP.dn. / Ph-1, UP.dn. / Ph-2)
Conf1			
Conf2 (HOLD)			
Conf4 (Autoreset)			
Conf5 (Delayed Autoreset)			
Conf6 (Delayed Autoreset and HOLD)			
Conf7 (Autoreset and Display hold)			

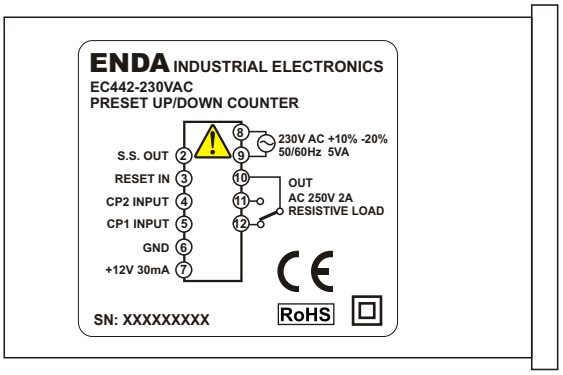
inPt tYPE = CP1.U. / CP2.d., CP1.U. / CP2.r., UP.dn. / Ph-1, UP.dn. / Ph-2

Conf8		While counter value is equal to preset value, OUT becomes active.
Conf9		While counter value is lower or equal to the preset value, OUT is active.
Conf10		While counter value is greater or equal to the preset value, OUT is active.

■ Adjusting out t. to a value between 0.1 and 999.9 seconds, a pulse output is obtained.

□ Adjusting out t. to 0.0, a continuous output is obtained.

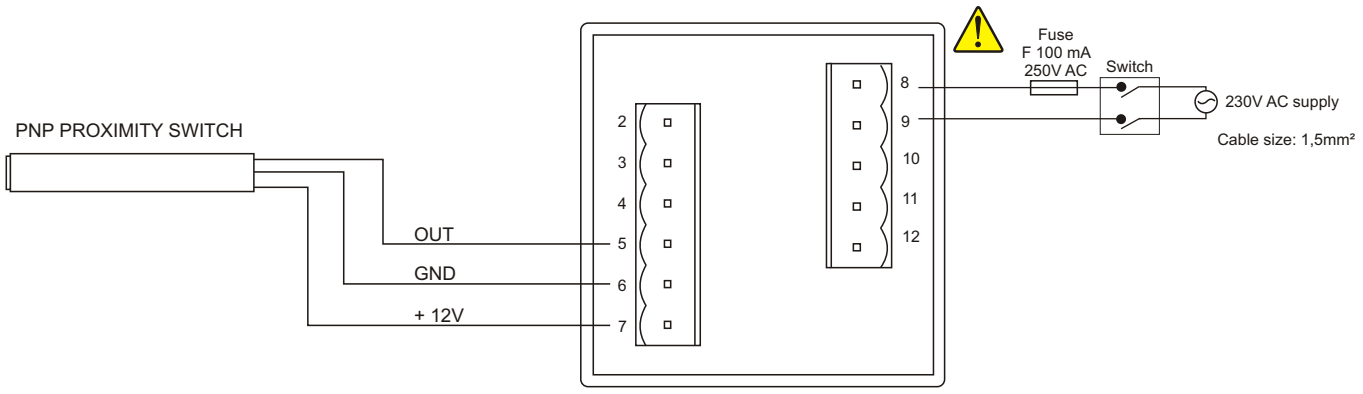
TERMINAL CONNECTIONS

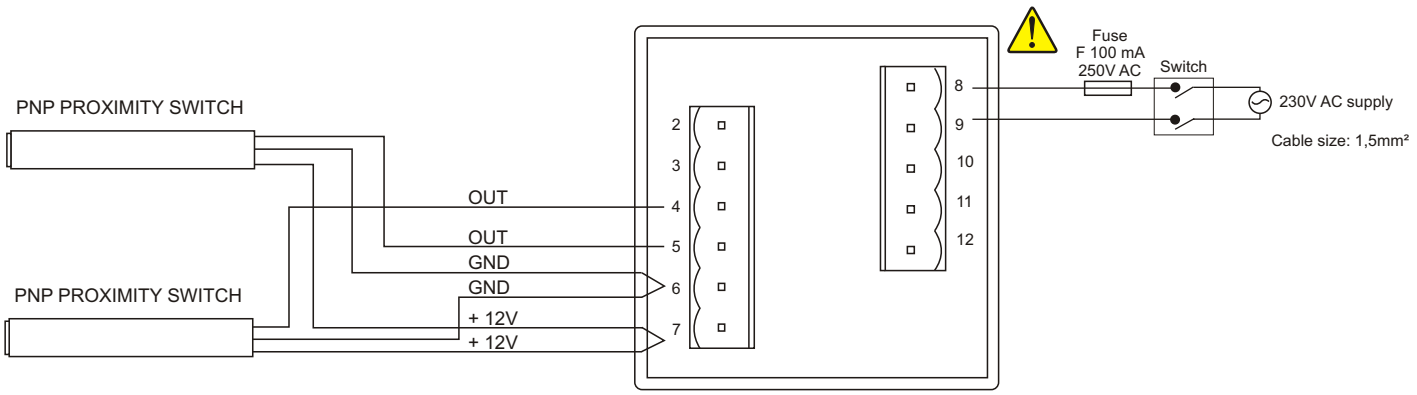


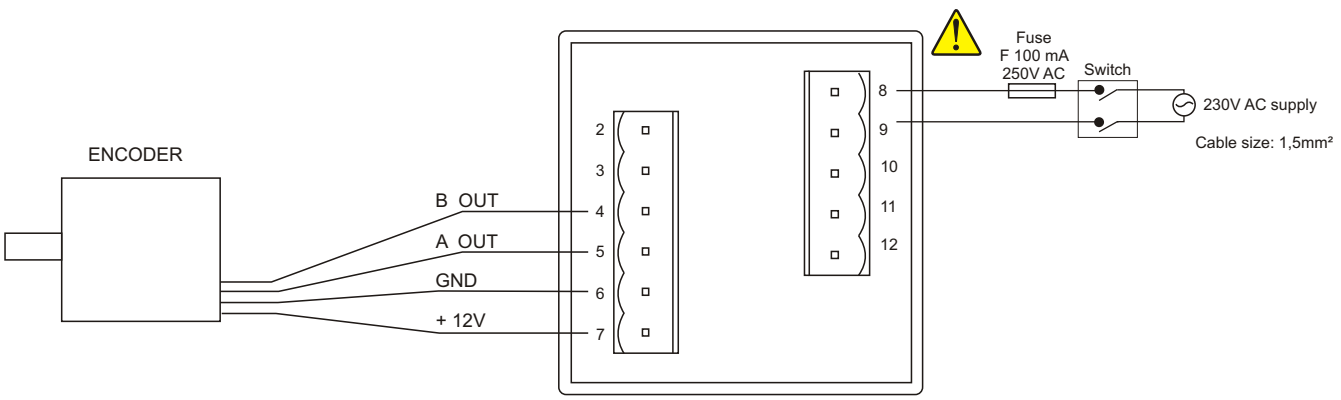
Terminal descriptions

2 : Solid state out (Max 30V 100mA, open collector NPN).
3 : Reset input.
4 : Input for clock pulse 2 (Max 30V 7.5kHz).
5 : Input for clock pulse 1 (Max 30V 7.5kHz).
6 : GND.
7 : +12V 30mA auxiliary power supply output for sensors.
8,9 : SUPPLY inputs.
10,11,12 : Relay contacts (Max 2A 250V AC).

TYPICAL SENSOR CONNECTIONS







NOTE: NPN PROXIMITY SWITCH connection is the same as PNP PROXIMITY SWITCH connection.

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