

Specifications

Function	Preselection up/down counter Multifunction: counters, "Batch" counters, tachometers and chronometers	
Number of presets	Current value	1 or 2
Back-lit LCD or red illuminated	Current value	5 digits
	Preset	5 digits
Height of digits	Current value	8 mm
	Preset	4 mm
Display details	-9999 • +99,999	
Simultaneous readout of count value and preset	●	

Inputs (see page 2/13)			
2 counting inputs IN1, IN2, ●			
Input modes	UP, DN, PH	4142 - 4341	
	DIR, IND, CUMUL, PH	4142 - 4342	
	DIR, IND, CUMUL, PH	4144 - 4344	
	UP, DN, DIR, IND, CUMUL PH, PH2, PH4	4192 - 4392	
Input by contact, voltage or solid state device for 3-wire and 2-wire detection using external resistor (NPN or PNP if present) ●			
Counting speed	Counters	5 kHz or 30 Hz	
	PH4	2.5 kHz	
Multifunction	Counter	Tacho.	
	UP, DOWN, DIR	7.5 kHz	9.0 kHz
	IND, CUMUL (IN1 & IN2 non simultaneous)	7.5 kHz	9.0 kHz
	IND, CUMUL (IN1 & IN2 simultaneous)	4.0 kHz	5.0 kHz
	PH, PH2	5.0 kHz (except in Batch mode: 4.0 kHz)	
	PH4	2.5 kHz	4.0 kHz
Low level	0 • 1 V $\overline{\text{---}}$		
High level	4 • 30 V $\overline{\text{---}}$		
Impedance	10 K Ω		

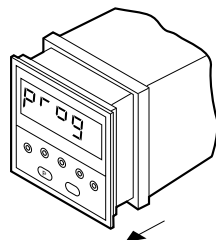
Reset		
Reset to zero or to preset	From front panel : if not protected in programming phase	●
	Electrical: by contact, voltage or solid state device (NPN or PNP if present)	●
Minimum pulse time	5 ms	
Low level	0 • 1 V $\overline{\text{---}}$	
High level	4 • 30 V $\overline{\text{---}}$	
Impedance	10 K Ω	
Option to protect against reset from front panel	●	
Scale factor (each input pulse is multiplied by this figure)	00.001 • 99.999	
Decimal point selectable for ease of reading	xxxxx, xxxx.x, xxx.xx, xx.xxx,	
Sensor supply	Version \sim	12 V $\overline{\text{---}}$ /100 mA
	Version $\overline{\text{---}}$	Un- 2 V/100 mA
Configuration settings and current count saved in EEPROM memory	●	

Outputs (see page 2/13)		
Solid state		
Type NPN open collector	●	
Maximum current	100 mA	
Maximum voltage	40 V $\overline{\text{---}}$	
Voltage drop	< 1.5 V	
Response time	< 250 μ s	
Relay		
1 changeover contact	●	
1 NO contact + 1 solid state	●	
2 NO contacts	●	
Current rating	2 A	
Maximum voltage	250 V \sim	
Max. contact rating (resistive) AC1	500 VA	
Rated current	10 mA	
Response time	< 10 ms	
Mechanical life (operations)	3 10 ⁶	
Number of operations at 2 A AC1	1.10 ⁵	
Output modes :	t = 0.1 s to 9.9 s for types 4192 and 4392	
maintained or pulsed	t = 500 ms for other types	
Single shot or repetitive (immediate auto reset).	●	
Supply (min/max values)		
Maximum consumption	Version $\overline{\text{---}}$	10 • 30 V $\overline{\text{---}}$, 20 • 55 V \sim , 80 • 260 V \sim
	Version \sim	4 W
		10 VA

Physical details and protection		
Immunity from micro power cuts	Version 10 • 30 V $\overline{\text{---}}$ Version 20 • 55 V \sim Version 80 • 260 V \sim	10 ms 10 ms 10 ms
Relative humidity (without condensation)	95 %	
Altitude	0 to 2000 m	
Insulation (IEC 664-1)	2.5 kV	
	Level 3	
Standards	Conforming to IEC 1000.4.2	Level 3
	Conforming to IEC 1000.4.3	Level 3
	Conforming to IEC 1000.4.4	Level 3
	Conforming to IEC 1000.4.6	Level 3
Conforming to EN 55022/11 group1 Class A		
Vibration limits (in 3 axes)	10 - 55 Hz / 0.35 mm	
Conforming to IEC 68-2-6	Self-extinguishing	
Material	●	
Connection by screw terminals	●	
Terminal capacity	2 x 1.5 mm ²	
Front panel fixing by clip	●	
Front panel protection	IP 54	
Front panel watertight seal	●	
Temperature limits	Use	0 +55 °C
	Stored	-25 +70 °C
Weight	200 g	

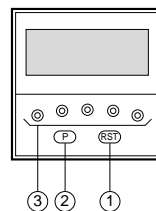
Programming

To program the counter:
Slide the inner chassis out as far as it will go. "PROG" will appear on the display. The counter is now in programming mode.
For programming, use the "P" key and the keys situated below each individual digit.

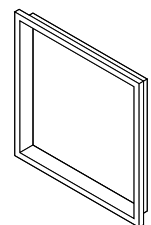


Display

- 1 - Reset
 - 2 - Access to all parameters in Prog. mode
 - 3 - Incrementation of figures and multipliers
- Selection of parameter value

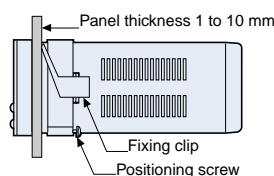
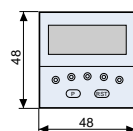
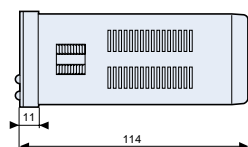


Adaptor surround Part number 79 237 807

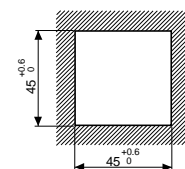


Panel cut-out
□ 49 → 50.5

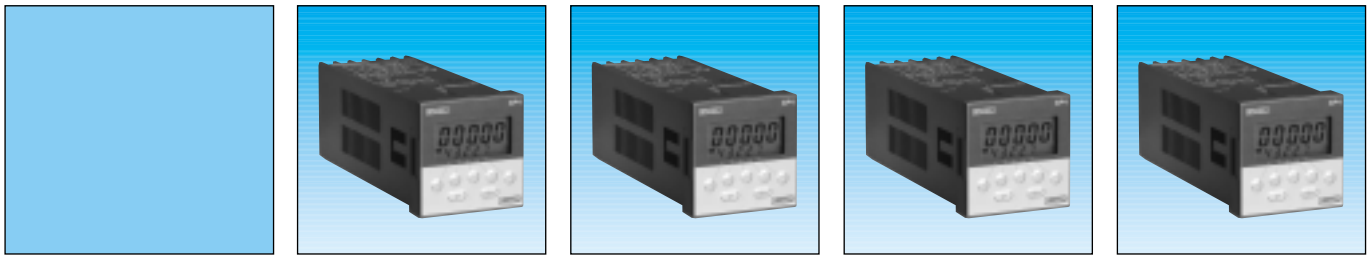
Dimensions



Panel cut-out



Back-lit LCD display



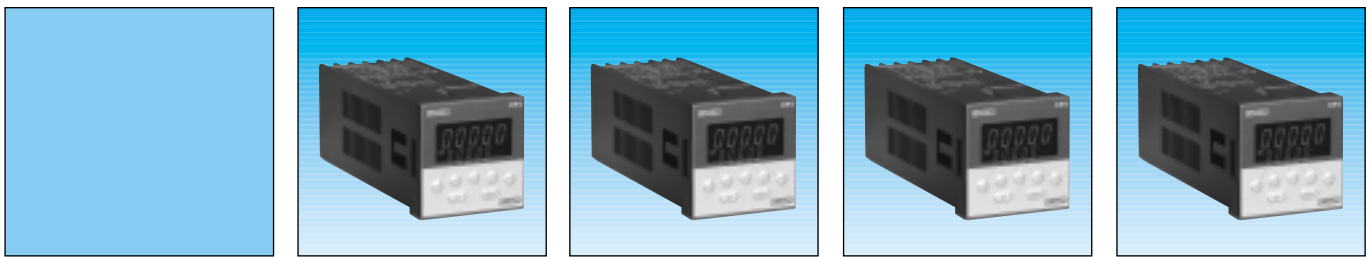
Types 4141 4142 4144 4192

Up/down counter **Multifunction**

Part numbers (and voltages)	87 618 048	87 618 018	87 618 028	87 618 068	87 618 038	87 618 078	87 618 228	87 618 268
80 • 260 V ~	87 618 044	87 618 014	87 618 024	87 618 064	87 618 034	87 618 074	87 618 224	87 618 264
20 • 55 V ~	87 618 042	87 618 012	87 618 022	87 618 062	87 618 032	87 618 072	87 618 222	87 618 262
10 • 30 V ~	—	—	—	—	—	—	—	—
Multifunction	—	—	—	—	—	—	Counter - "Batch" counter - Tachometer - Chronometer	Counter - "Batch" counter - Tachometer - Chronometer
Counting input modes	UP, DN, PH	UP, DN, PH	UP, DN, PH	UP, DN, PH	DIR, IND, CUMUL, PH	DIR, IND, CUMUL, PH	UP, DN, IND, CUMUL, DIR, PH, PH2, PH4	UP, DN, IND, CUMUL, DIR, PH, PH2, PH4
Time base (4)	—	—	—	—	—	—	99h 59min - 99min 59s - 99.99s - 24h	99h 59min - 99min 59s - 99.99s - 24h
Presets	1	1	2	2	2	2	2	2
1 changeover relay output	•	—	—	—	—	—	—	—
Output contact and solid state	—	•	—	—	—	—	—	—
contact (2)	—	—	•	—	•	—	•	—
solid state (2)	—	—	—	•	—	•	—	•

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Red illuminated display



Types 4341 4342 4344 4392

Up/down counter **Multifunction**

Part numbers (and voltages)	87 618 148	87 618 118	87 618 128	87 618 168	87 618 138	87 618 178	87 618 328	87 618 368
80 • 260 V ~	87 618 144	87 618 114	87 618 124	87 618 164	87 618 134	87 618 174	87 618 324	87 618 364
20 • 55 V ~	87 618 142	87 618 112	87 618 122	87 618 162	87 618 132	87 618 172	87 618 322	87 618 362
10 • 30 V ~	—	—	—	—	—	—	—	—
Multifunction	—	—	—	—	—	—	Counter - "Batch" counter - Tachometer - Chronometer	Counter - "Batch" counter - Tachometer - Chronometer
Counting input modes	UP, DN, PH	UP, DN, PH	UP, DN, PH	UP, DN, PH	DIR, IND, CUMUL, PH	DIR, IND, CUMUL, PH	UP, DN, IND, CUMUL, DIR, PH, PH2, PH4	UP, DN, IND, CUMUL, DIR, PH, PH2, PH4
Time base (4)	—	—	—	—	—	—	99h 59min - 99min 59s - 99.99s - 24h	99h 59min - 99min 59s - 99.99s - 24h
Presets	1	1	2	2	2	2	2	2
1 changeover relay output	•	—	—	—	—	—	—	—
Outputs contact and solid state	—	•	—	—	—	—	—	—
contact (2)	—	—	•	—	•	—	•	—
solid state (2)	—	—	—	•	—	•	—	•

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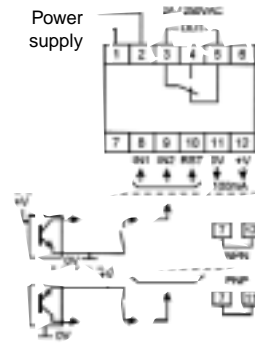
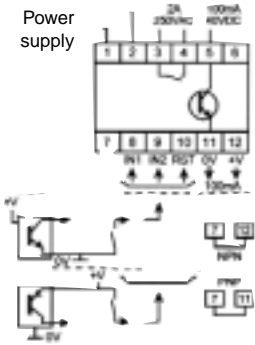
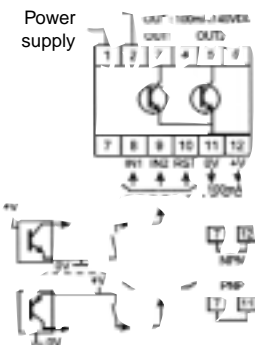
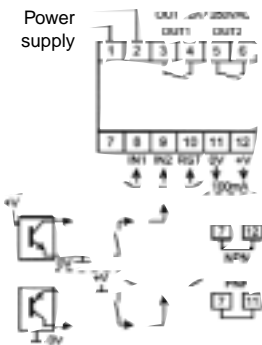
Connections

87 618 022 / 032 / 122 / 132
87 618 024 / 034 / 124 / 134
87 618 028 / 038 / 128 / 138
87 618 228 / 224 / 222
87 618 328 / 324 / 322

87 618 062 / 072 / 162 / 172
87 618 064 / 074 / 164 / 174
87 618 068 / 078 / 168 / 178
87 618 268 / 264 / 262
87 618 368 / 364 / 362

87 618 012 / 112
87 618 014 / 114
87 618 018 / 118

87 618 042/142
87 618 044/144
87 618 048-148



To order, specify:

Standard products	Standard products, non stocked	1 Part number
Example: Multifunction counter LCD 260V~ 87 618 228		

Preselection and multifunction counters CP4 - CP7

– Input modes

Input modes		PNP Count on rising edge NPN Count on falling edge																				
UP	1 - Input IN1 2 - Display	① ② <table border="1"><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr></table>	0	1	2	3	4	5	6													
0	1	2	3	4	5	6																
DN	1 - Input IN1 2 - Display	① ② <table border="1"><tr><td>n</td><td>n-1</td><td>n-2</td><td>n-3</td><td>n-4</td><td>n-5</td><td>n-6</td></tr></table>	n	n-1	n-2	n-3	n-4	n-5	n-6													
n	n-1	n-2	n-3	n-4	n-5	n-6																
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) 4 - Display (P → 0)	① ② ③ <table border="1"><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>2</td><td>1</td><td>0</td></tr></table> ④ <table border="1"><tr><td>n</td><td>n-1</td><td>n-2</td><td>n-3</td><td>n-2</td><td>n-1</td><td>n</td></tr></table>	0	1	2	3	2	1	0	n	n-1	n-2	n-3	n-2	n-1	n						
0	1	2	3	2	1	0																
n	n-1	n-2	n-3	n-2	n-1	n																
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) 4 - Display (P → 0)	① ② ③ <table border="1"><tr><td>0</td><td>1</td><td>3</td><td>4</td><td>5</td><td>7...</td></tr></table> ④ <table border="1"><tr><td>n</td><td>n-1</td><td>n-3</td><td>n-4</td><td>n-5</td><td>n-7...</td></tr></table>	0	1	3	4	5	7...	n	n-1	n-3	n-4	n-5	n-7...								
0	1	3	4	5	7...																	
n	n-1	n-3	n-4	n-5	n-7...																	
DIR	1 - Input IN1 pulses 2 - Input IN2 count in the opposite direction from the cycle 3 - Display (0 → P) 4 - Display (P → 0)	① ② ③ <table border="1"><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>2</td><td>1</td><td>0</td><td>1</td></tr></table> ④ <table border="1"><tr><td>n</td><td>n-1</td><td>n-2</td><td>n-3</td><td>n-2</td><td>n-1</td><td>n</td><td>n-1</td></tr></table>	0	1	2	3	2	1	0	1	n	n-1	n-2	n-3	n-2	n-1	n	n-1				
0	1	2	3	2	1	0	1															
n	n-1	n-2	n-3	n-2	n-1	n	n-1															
PH	1 - Input IN1 2 - Input IN2 } Signal 90° out of phase 3 - Display (0 → P) 4 - Display (P → 0)	① ② ③ <table border="1"><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>3</td><td>2</td></tr></table> ④ <table border="1"><tr><td>n</td><td>n-1</td><td>n-2</td><td>n-3</td><td>n-4</td><td>n-3</td><td>n-2</td></tr></table>	0	1	2	3	4	3	2	n	n-1	n-2	n-3	n-4	n-3	n-2						
0	1	2	3	4	3	2																
n	n-1	n-2	n-3	n-4	n-3	n-2																
PH 2	1 - Input IN1, counts on rising and falling edges 2 - Input IN2, direction of count reversed if IN2 in advance of IN1 3 - Display (0 → P) 4 - Display (P → 0)	① ② ③ <table border="1"><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr></table> ④ <table border="1"><tr><td>n</td><td>n-1</td><td>n-2</td><td>n-3</td><td>n-4</td><td>n-5</td><td>n-4</td><td>n-3</td><td>n-2</td><td>n-1</td></tr></table>	0	1	2	3	4	5	4	3	2	1	n	n-1	n-2	n-3	n-4	n-5	n-4	n-3	n-2	n-1
0	1	2	3	4	5	4	3	2	1													
n	n-1	n-2	n-3	n-4	n-5	n-4	n-3	n-2	n-1													
PH 4	1 - Eingang IN1 Zählen bei steigender und fallender Flanke des Impulses 2 - Eingang IN2 Zählen bei steigender und fallender Flanke des Impulses, Umkehrung der Zählrichtung, wenn IN2 vor IN1 ist. 3 - Anzeige (0 → P) 4 - Anzeige (P → 0)	① ② ③ <table border="1"><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr></table> ④ <table border="1"><tr><td>n</td><td>n-1</td><td>n-2</td><td>n-3</td><td>n-4</td><td>n-5</td><td>n-6</td><td>n-7</td></tr></table>	0	1	2	3	4	5	6	7	n	n-1	n-2	n-3	n-4	n-5	n-6	n-7				
0	1	2	3	4	5	6	7															
n	n-1	n-2	n-3	n-4	n-5	n-6	n-7															

– Output modes

	Count in the direction of the cycle Count in the opposite direction from the cycle																								
Single shot	$PR \rightarrow 0$ $0 \rightarrow PR$ Out																								
Maintained	1 Preset $PR \rightarrow 0$ <table border="1"><tr><td>P</td><td>.....</td><td>1</td><td>0</td><td>-1</td><td>-2</td><td>.....</td><td>-1</td><td>0</td><td>1</td><td>.....</td></tr></table> $0 \rightarrow PR$ <table border="1"><tr><td>0</td><td>1</td><td>.....</td><td>P</td><td>1</td><td>P</td><td>P</td><td>P</td><td>.....</td><td>P</td><td>1</td><td>.....</td></tr></table> Out	P	1	0	-1	-2	-1	0	1	0	1	P	1	P	P	P	P	1	
P	1	0	-1	-2	-1	0	1															
0	1	P	1	P	P	P	P	1														
	2 Presets $PR \rightarrow 0$ <table border="1"><tr><td>P2</td><td>.....</td><td>P1+1</td><td>P1</td><td>P1-1</td><td>P1-2</td><td>.....</td><td>P1-1</td><td>P1</td><td>P1+1</td><td>.....</td></tr></table> $0 \rightarrow PR$ <table border="1"><tr><td>0</td><td>1</td><td>.....</td><td>P1-1</td><td>P1</td><td>P1+1</td><td>P1+2</td><td>.....</td><td>P1+1</td><td>P1</td><td>P1-1</td><td>.....</td></tr></table> Out 1	P2	P1+1	P1	P1-1	P1-2	P1-1	P1	P1+1	0	1	P1-1	P1	P1+1	P1+2	P1+1	P1	P1-1	
P2	P1+1	P1	P1-1	P1-2	P1-1	P1	P1+1															
0	1	P1-1	P1	P1+1	P1+2	P1+1	P1	P1-1														
	1 Preset $PR \rightarrow 0$ <table border="1"><tr><td>.....</td><td>1</td><td>0</td><td>-1</td><td>-2</td><td>.....</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>.....</td></tr></table> $0 \rightarrow PR$ <table border="1"><tr><td>0</td><td>1</td><td>.....</td><td>P</td><td>1</td><td>P</td><td>P</td><td>P</td><td>.....</td><td>P</td><td>1</td><td>.....</td></tr></table> Out 2	1	0	-1	-2	-1	0	1	2	3	0	1	P	1	P	P	P	P	1
.....	1	0	-1	-2	-1	0	1	2	3														
0	1	P	1	P	P	P	P	1														
	2 Presets $PR \rightarrow 0$ <table border="1"><tr><td>P2</td><td>.....</td><td>P1+1</td><td>P1</td><td>P1-1</td><td>P1-2</td><td>.....</td><td>P1-1</td><td>P1</td><td>P1+1</td><td>.....</td></tr></table> $0 \rightarrow PR$ <table border="1"><tr><td>0</td><td>1</td><td>.....</td><td>P1-1</td><td>P1</td><td>P1+1</td><td>P1+2</td><td>.....</td><td>P1+1</td><td>P1</td><td>P1-1</td><td>.....</td></tr></table> Out 1	P2	P1+1	P1	P1-1	P1-2	P1-1	P1	P1+1	0	1	P1-1	P1	P1+1	P1+2	P1+1	P1	P1-1	
P2	P1+1	P1	P1-1	P1-2	P1-1	P1	P1+1															
0	1	P1-1	P1	P1+1	P1+2	P1+1	P1	P1-1														
Repetitive cycle	$PR \rightarrow 0$ $0 \rightarrow PR$ Out 2																								
	Pulsed with auto reset to value of P2 (or P for 1 preset) (t = 500 ms) t = 0.1s to 9.9s for multifunction																								

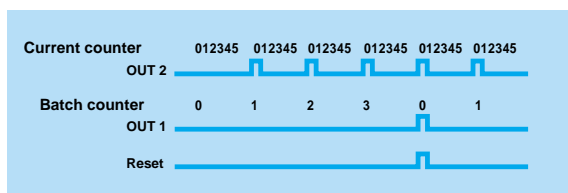
– Batch counter function

Principle
P1 is the "batch" preset.
When P2 is displayed, the value displayed on the upper digits represents the current counter value (reset to P2).
In this configuration the "RST" key on the front panel reinitialises the current value.
When P1 (batch preset) is displayed, the value displayed on the upper digits represents the value of the Batch counter.
In this configuration the "RST" key on the front panel resets the batch counter.
An "electrical" reset (RST terminal) still resets the current counter value and that of the batch counter

Example

On a packing line, bottles need to be counted into packs of 6 bottles and then dispatched in a box containing a batch of 4 packs.

P2 : current counter preset value : 00006
P1 : batch counter preset value : 00004



– Totalizer function

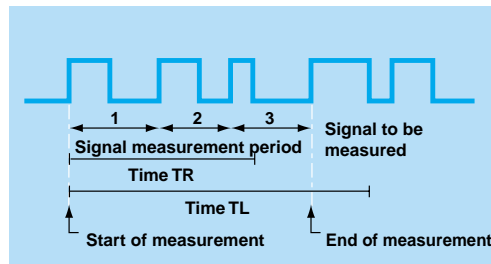
On multifunction CP7
■ Totalizer reset via front panel only
■ Current value reset via front panel and electrical

Multifunction counters CP4 - CP7

Tachometer function

Measurement principle

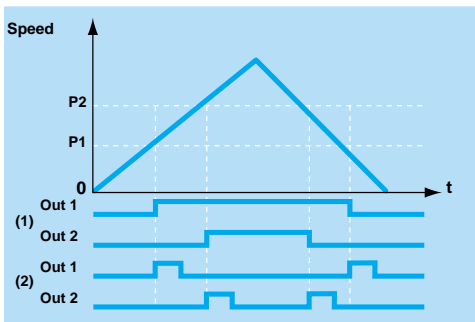
Measurement begins on a rising edge of the signal to be measured. The measurement time is greater than TR, but less than TL. Measurement stops at the end of the current period (3), after TR. If the period (3) does not end before TL, the measurement result will be zero (0).



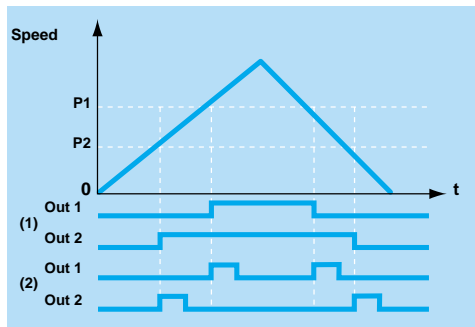
The outputs are updated each time measurement ends according to the selected output mode.

- **Maintained output** : output active if the measured speed is greater than the preset speed.
- **Pulsed output** : output activated during time T, when the preset threshold is crossed.

Measurement precision : $100 + (200 / TR)$ PPM
 Example : for TR = 1s → 300 PPM (0.03%)



(1) Maintained output (2) Pulsed output



Application example

You wish to display a linear speed of 2.00 m/s for a drive pulley rotating at 300 rpm. A sensor on this pulley delivers one pulse per revolution, ie :

$$V = \frac{N_s \cdot C_{\text{cof}} \cdot RPX}{n}$$

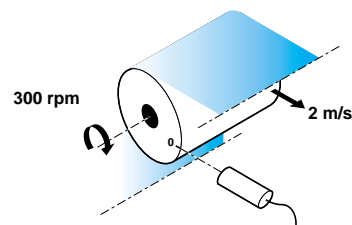
Required display : $V = 2.00$ (result in m/s → $RPX = 1$)

Given that : $n = 1$

$$N_s = \frac{300}{60} = 5$$

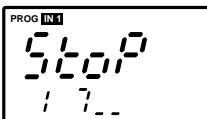
Hence $C_{\text{cof}} = \frac{V \cdot n}{N_s \cdot RPX} \rightarrow C_{\text{cof}} = \frac{200 \cdot 1}{5 \cdot 1} = 40$

In addition, the decimal point is positioned in the hundreds (xxxx.xx). Selection of TR : you wish the measurement to be updated every 2 seconds if TR = 2s. Selection of TL > TR, for example TL = 3s.

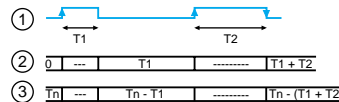


The tachometer function can also be used to calculate a flow rate.

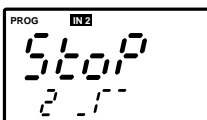
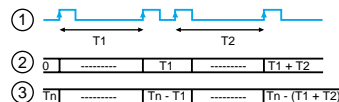
Chronometer function (Precision : 150 ppm)



- 1 - Input IN1
- 2 - Display (0 → PR), 1-channel pulse measurement
- 3 - Display (PR → 0), 1-channel pulse measurement



- 1 - Input IN1
- 2 - Display (0 → PR), 1-channel pulse measurement
- 3 - Display (PR → 0), 1-channel pulse measurement



- 1 - Input IN1 (start counting)
- 2 - Input IN2 (stop counting)
- 3 - Display (0 → PR), measurement on 2 separate channels
- 4 - Display (PR → 0), measurement on 2 separate channels

