Model number

TC-4B-V

CE

Features

- Tachometer
- 4 decade devices
- LED indicator, red
- Counter frequency up to 10 kHz
- Power supply for pulse generator
- 8 adjustable operating modes
- Surface or built-in mounting
- Protection degree IP64 in accordance with DIN EN 60529 (front only)
- Shock resistance in accordance with DIN EN 60068-2-27
- Vibration resistance in accordance with DIN EN 60068-2-6

Technical data

General specifications	
Data storage	10 years, EEPROM
Programming	via toggle switches and rotary switches
Indicators/operating means	
Type	7-segment LED display, red
Number of decades	4
Display value	digit height 14,2 mm
Display interval	1 ... 9999
Decimal point	freely adjustable
Scale factor	0.1 or 1
Reset	external
Electrical specifications	
Operating voltage	90 ... 126 V AC 195 ... 264 V AC
Power consumption P_0	14 VA
Input	
Counting frequency	10 Hz / 10 kHz
Impedance	2,3 kOhm (positive logic)
Voltage	low: 0 ... 6 V DC high: 16 ... 30 V DC
Output	
Linearity	± 3 %
Transistor	PNP, open collector , 15 mA
Analogue voltage output	-
Analogue current output	-
Sensor supply	24 V DC , 50 mA
Delay times	
Reset	
External	≤ 30 ms
Time delay before availability	≤ 0,5 ms
Jumpering time	≤ 0,5 ms
Ambient conditions	
Ambient temperature	-10 ... 50 °C (263 ... 323 K)
Storage temperature	-20 ... 70 °C (253 ... 343 K)
Relative humidity	45 ... 90 % (non condensing)
Mechanical specifications	
Connection	screw terminals max. core cross-section 0.34 ... 1.5 mm^2
Mass	approx. 450 g
Dimensions	96 x 48 x 105 mm

Function

Tachometers are pulse-controlled time measuring devices.
In contrast to standard tachometers, which count the incoming pulses within a peak time, these tachometers evaluate the period of time between two consecutive input pulses (cyclic method). The period of time is assigned an adjusable multiplication factor and converted into a rotational speed in rpm or a velocity, depending on the mode of operation.

Advantage:
The cyclic method requires only one pulse per revolution and a maximum of two revolutions, in order to determine the rotational speed with high accuracy.

rotational speed = 1 / T x 60 min^{-1}

T = time between two pulses
min^{-1} = revolutions/minute

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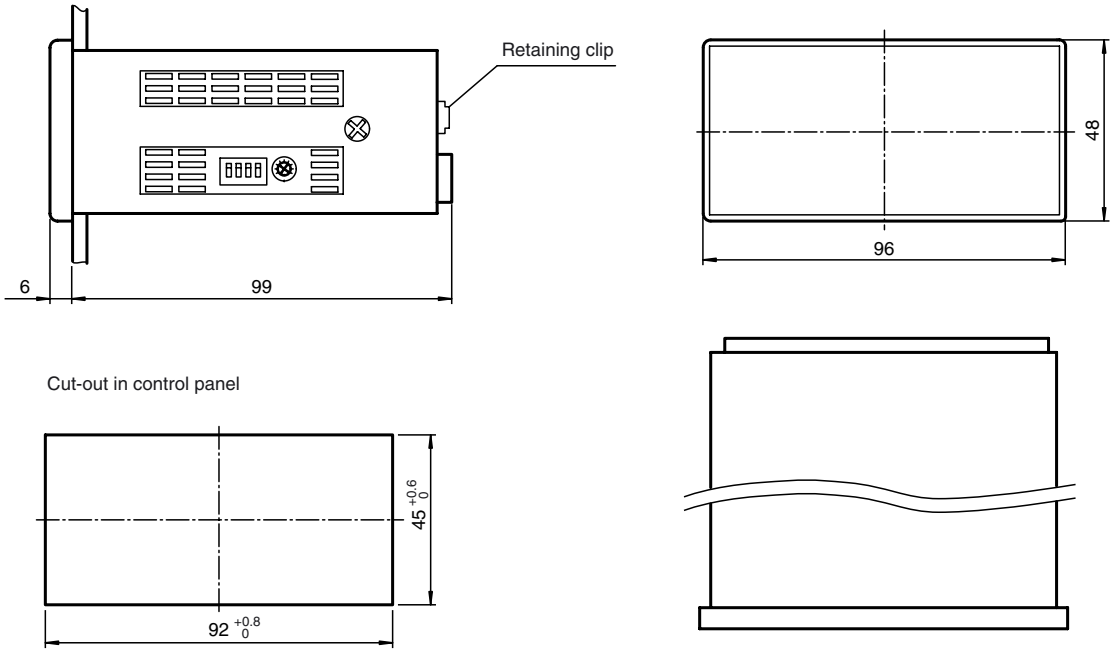
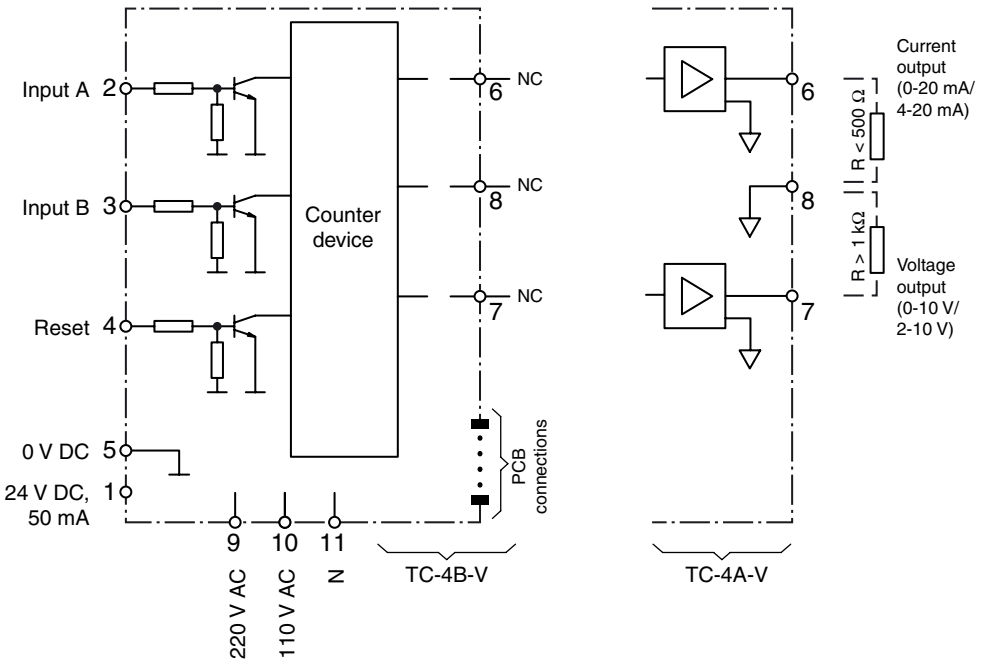
Indicating / Operating means / Dimensions



Electrical connection



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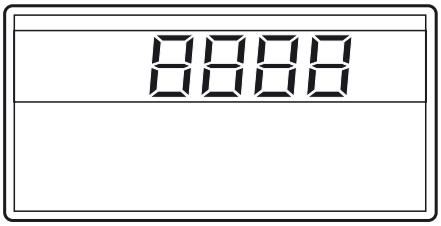
Notes

Controls and indicators, front view



Controls and indicators, rear view

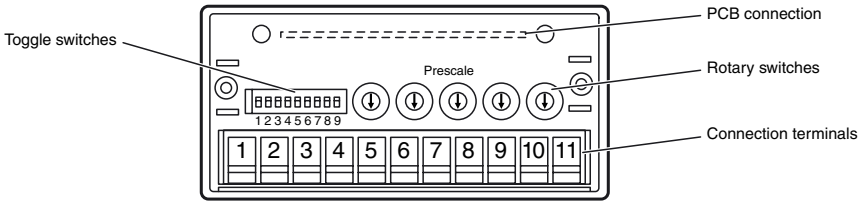


Table 1: Shift of decimal point

Switch	9999	999.9	99.99	9.999
2	OFF	ON	OFF	ON
3	OFF	OFF	ON	ON

Table 2: Operating modes

Switch / No.	1	2	3	4	5	6	7	8
4	OFF	ON	OFF	ON	OFF	ON	OFF	ON
5	OFF	OFF	ON	ON	OFF	OFF	ON	ON
6	OFF	OFF	OFF	OFF	ON	ON	ON	ON

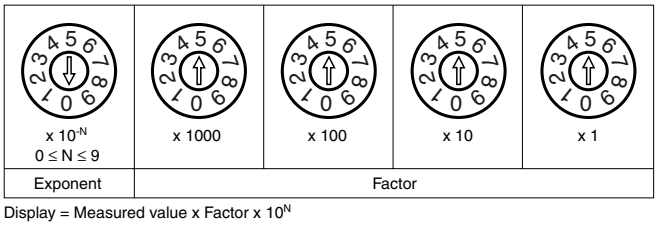
Table 3: Number of measuring cycles

Switch / No.	1	10	100	100
7	OFF	ON	OFF	ON
8	OFF	OFF	ON	ON

Note on application:
Short measuring times with fluctuating input frequency reduce the measuring accuracy. The indicator becomes irregular and difficult to read. If the number of measuring cycles is increased to 10 or 100, the measured value is averaged and the indication is more accurate and readable.

Function of the rotary switches at the back

Setting of the multiplication factors



Display = Measured value x Factor x 10^N

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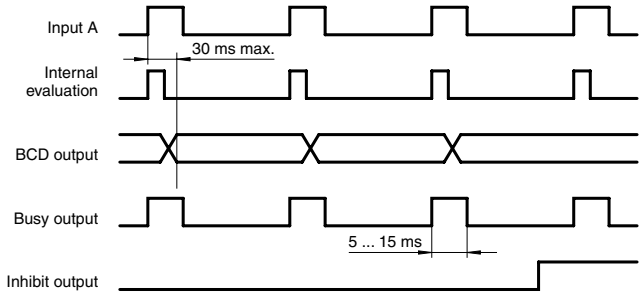
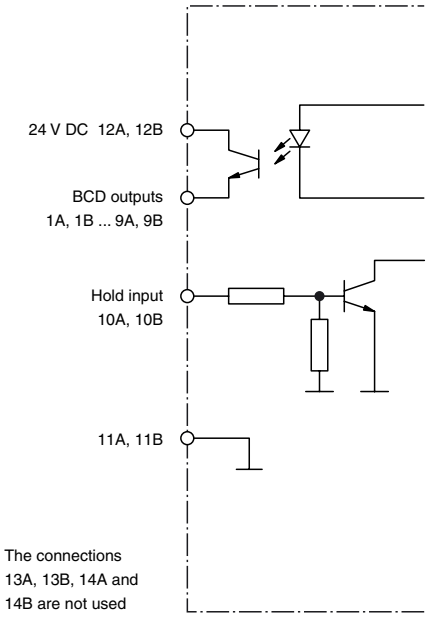
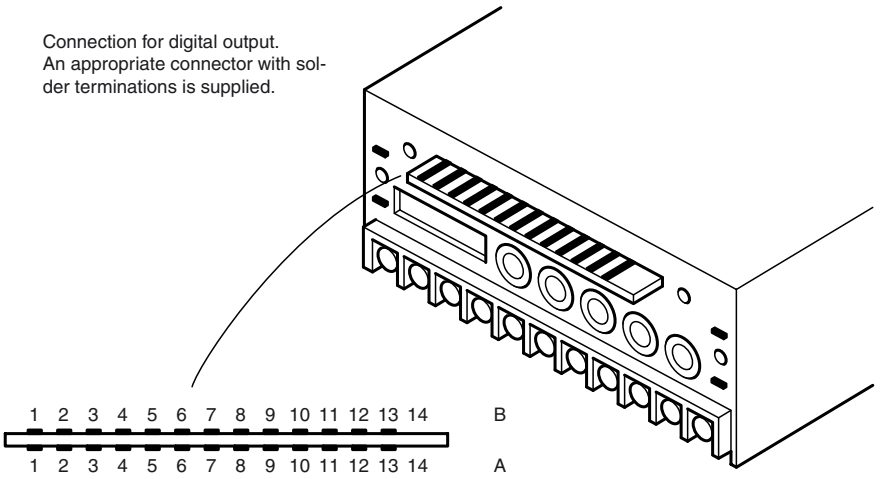
Digital outputs and inputs (TC-4B-V)





Connection for digital output.
An appropriate connector with solder terminations is supplied.



Number		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Identification on circuit board	**B**	1A	1B	2A	2B	3A	3B	4A	4B	Busy	Hold	0 V	24 V DC	NC	NC
	A	1C	1D	2C	2D	3C	3D	4C	4D	Busy	Hold	0 V	24 V DC	NC	NC
Meaning of the signals	**above B**	1	2	1	2	1	2	1	2	Busy	Hold	0 V	24 V DC	NC	NC
	below A	4	8	4	8	4	8	4	8	Busy	Hold	0 V	24 V DC	NC	NC
		Digit 1		Digit 2		Digit 3		Digit 4		Output	Input	0 V	Input		

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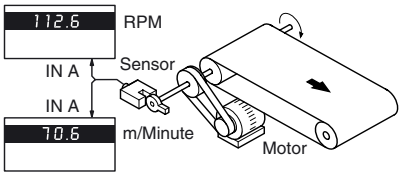
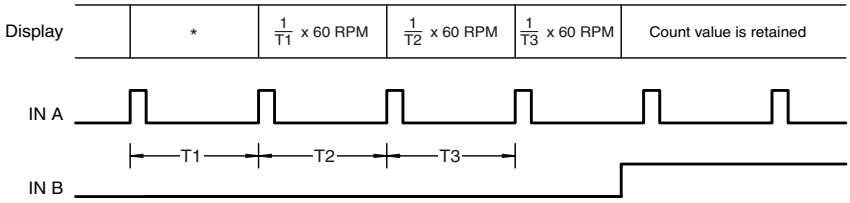
Operating modes

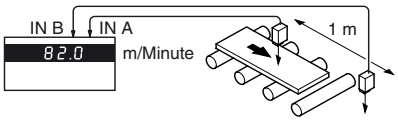
1. Rotation rate measurement

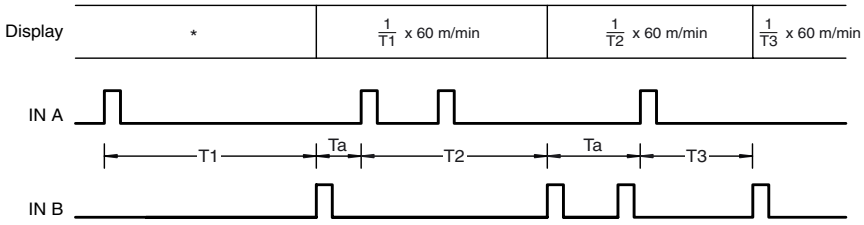
Example:
1 pulse/revolution, 1 measurement cycle, multiplication factor = 1, results in a display range of 10 ... 9999 RPM
T1 ≤ 6s, f_{Input} ≥ 0,16 Hz = 10 1/min



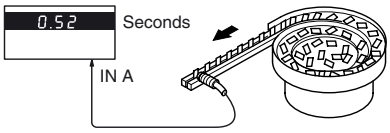


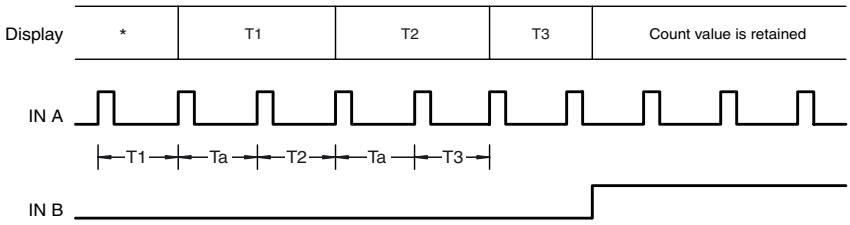
2. Speed
10 ms ≤ T1 ≤ 6 sec
Ta ≥ 30 ms



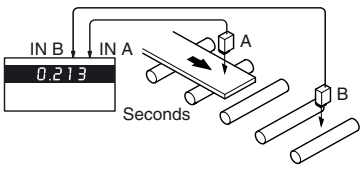


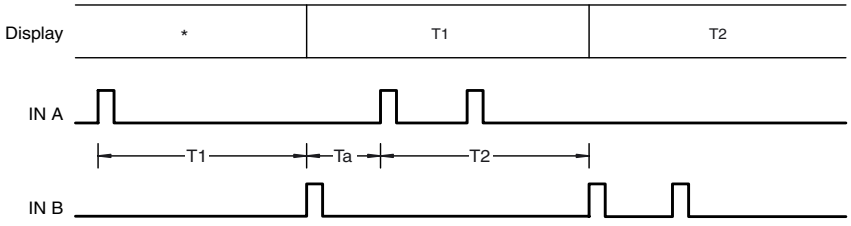
3. Cycle times
10 ms ≤ T1 ≤ 140 sec
Ta ≥ 30 ms





4. Time differences
10 ms ≤ T1 ≤ 140 sec
Ta ≥ 30 ms





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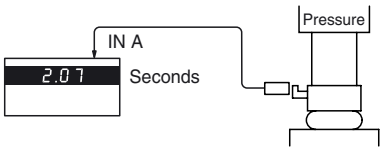
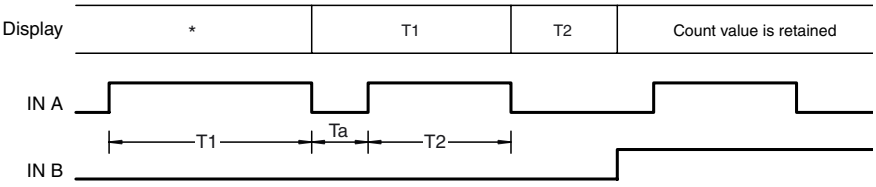
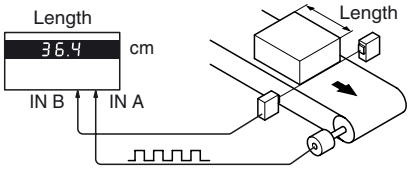
Operating modes

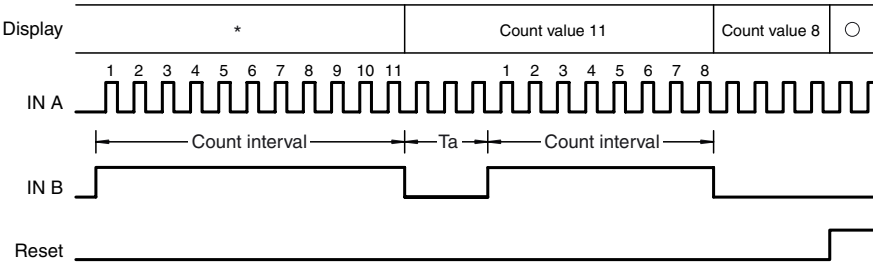
5. Time span
10 ms ≤ T1 ≤ 140 sec
Ta ≥ 30 ms



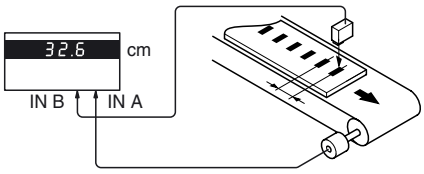


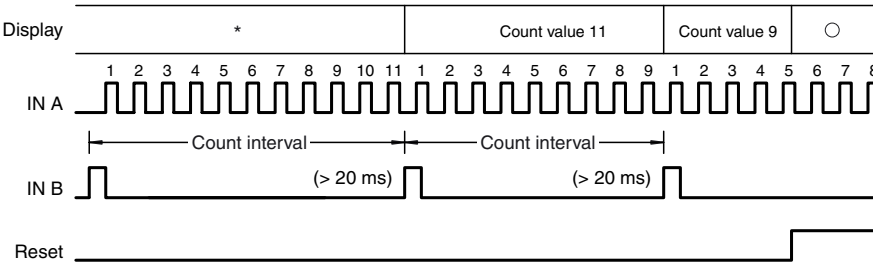
6. Pulse count A
Pulses at IN A are counted as long as IN B 1 is at logic 1
T ≥ 1 ms
Ta ≥ 20 ms



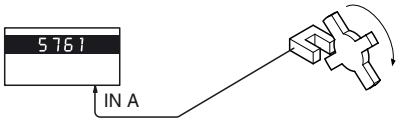


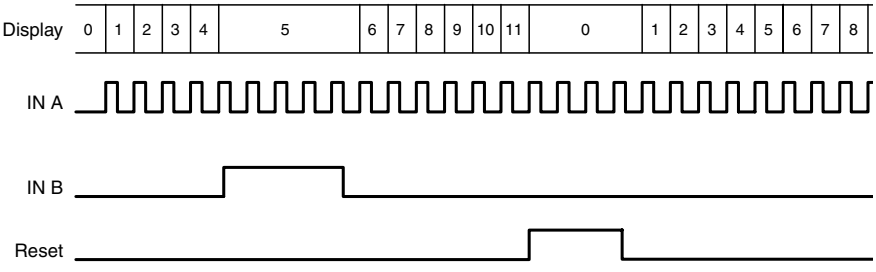
7. Pulse count B
The pulses at IN A are counted between two pulses at IN B





8. Pulse count C
The pulses at IN A are counted, logic 1 at IN B results in input pulse suppresion





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