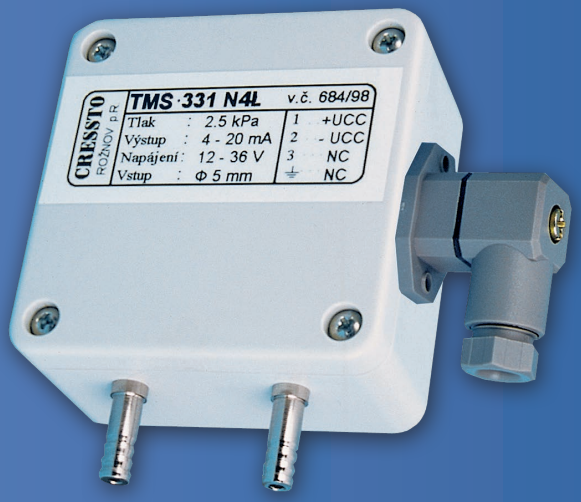
TMS

precision pressure **switch**

CRESSTO

- **switching output**
- **very high sensitivity**
- **overpressure endurance**
- **reliability**
- **small dimensions**
- **protection IP65**
- **wide temperature range**
- **display fit-out possibility**



Pressure switch is a component, which compares current pressure or pressure difference on input with preset level and output returns information if input pressure is below or above this level. In comparison with mechanical switches this electronic one has higher accuracy and reliability and better long term stability. With power actuator proper connection may this switch operate as a boolean feedback regulator.

This instrument is designed for a wide application in a branch of measurement and regulation in a range of very small pressures, especially in air-conditioning, ventilation, combustion process control, appliance design, etc. Many applications are offered in a medical technology and in the laboratory measurements. This transducer is designed for measurement of the differential pressure and this fact also includes a requirement for measurement of the relative pressures. However, it is not determined for a high common pressure measurement, such as measurement on the orifice gauges in the pressure distribution systems. It is possible to manufacture switches with pressure range higher then 100kPa, but only as a gage. The medium being measured may be a non-aggressive gas. Use of the non-aggressive liquid, which is permitted in the pressures higher than 2.5 kPa, should be consulted with manufacturer.

The whole transducer, i.e. a pressure sensor, supply, compensation and amplifying circuits as well as a filter for increase of the noise immunity are placed in a small plastic box from polycarbonate, which may be installed on a panel or DIN strip. The pressure supplies are realized by the nickel-plated brass inlets with a diameter 5 mm, which are suitable for use of a small hose, possibly a quick coupling for higher pressures. In addition, the medium comes into contact with silicon, silicone rubber and a plastic substance polyetherimide.

Electric connection into the measuring circuit is realized by a sealing arrested miniature connector type DIN 43650 - C with a cable outlet PG7, which enables to use a cable with a diameter max. 6.5 mm.

This type of instrument measures the pressure by means of a silicon diaphragm on a piezoelectric principle. Therefore this transducer attains good overload endurance, is resistant against vibrations and may work in an arbitrary position. It is an advantage for some applications to measure both the positive and negative pressure with one transducer. Electronic circuitry is realized by a surface mount technology.

Output is realized as NPN transistor with open collector. This type of output allows simply realize logic levels for direct input to regulator or connect relay for power actuator driving. On the right side of the case is LED, which indicates transistor switch-ON state. Implicitly the switch is set to transistor switch-ON with increasing pressure over preset level. Output signal can be negated by shunting jumper. Fixed hysteresis cca 1,5% from nominal range is built-in to prevent oscillations during pass over switching level. Switching level adjustment is realized by multi-turn trim-pot, which is accessible through the hole in right side, beside LED. To keep high IP protection this hole is covered by M3 screw, which must be during adjustment dismount. Switching level adjustment can be ordered directly at the manufacturer, can be adjusted experimentally or with external pressure meter, respectively by external DC voltmeter with measuring internal voltage and recalculating according formula, which is placed on the rear side of this document. Pressure switch fitted with LCD allow displaying adjusted level by press the internal button.

The switches may be supplied by a DC voltage in a range 12–36 V. Change of the supply voltage within this range has not any practical impact on the measurement accuracy. Under the cover, there are placed short-circuiting jumpers for selection of the damping time constant.

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Technical parameters:

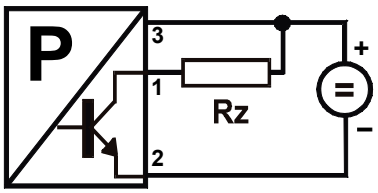
Nominal pressure range Relative version	± 100 Pa až ± 100 kPa up to 1MPa
Overpressure to 2 kPa from 2 kPa to 20 kPa from 20 kPa to 100 kPa over 100 kPa	20 kPa 50 kPa 300 % nominal range 200 % nominal range
Error	max. 2% ± 2Pa
Zero temperature error	typ. 0,2 % max. 0,3%/10°C
Span temperature error	typ. 0,2 % max. 0,3 %/10°C
Compensated temp. range	0 ÷ 70°C
Operating temp. range	-20 ÷ +85°C *
Storage temperature	-25 ÷ +100°C *
Supply voltage	12 ÷ 36V ss
Supply current	< 15 mA
Output load current	max. 100 mA
Operated position	arbitrary
Protection	min. IP 65
Weight	cca 100g
Common-mode pressure for differential version	max. 100kPa

* with display -20 ÷ 55°C

Operating instructions:

- Before connection of the transducer into the pressure circuit, it is necessary to verify that the pressure being measured corresponds to the nominal range of this transducer. Even a transient loading over the maximum allowable overpressure may cause a destruction of the measuring diaphragm!
- If you measure a pressure of such media which are not non-aggressive gases, it is necessary to verify the transducer material resistance.
- In case of the liquid media measurement, avoid its freezing – there is a danger of the measuring sensor destruction!

Schematic connection:



Rz is loading resistor or relay coil

Pin assignments: valid for connector DIN 43650 C

	open collector
+ supply voltage	3
- supply voltage	2
output	1
shielding	⊥

How to order this device:

Such an order shall include a type of transducer, a required pressure range, possibly a display if required. As an accessory, there may be delivered polyethylene or silicone hose of the specified length as well as quick couplings.

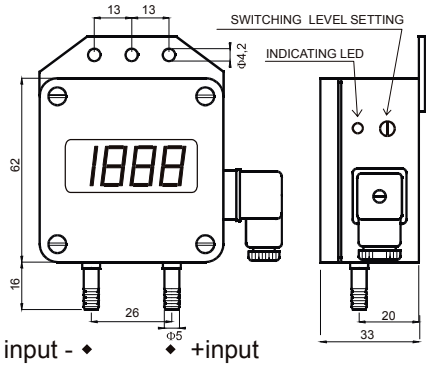
10.2008

Legend:

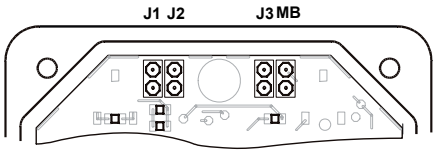
TM S 3 3 8 N 4 L

Construction	
standard	T
with display	D
Pressure measurement	
differential	
absolute	A
Exponent of pressure range	
10^2 Pa (hundreds Pa)	2
10^3 Pa (units kPa)	3
10^4 Pa (tens kPa)	4
10^5 Pa (hundreds kPa)	5
other	0
Multiplicand of pressure range	
1,0	1
1,6	2
2,5	3
4,0	4
6,0	6
other	0
Membrane material	
silicon	8
Case material	
polycarbonat	N
Electrical connectioní	
connector DIN 43650 C (micro)	4
Electrical output	
open collector	L
supplemental marking	

Dimensions:



Adjustment parts: (under cover)



Time damping

J1	OFF	ON	OFF	ON
J2	OFF	OFF	ON	ON
τ [s]	0	1	2	3

Output logic
valid for $P > P_{switch}$

J3	Output
OFF	L
ON	H

Switching level setting by way of voltage on MB:

$$P_{switch} = P_{nominal} \times U_{MB} [V]$$

If there is no other request, switch is set during production flow to $P_{switch} = 50\% P_{nominal}$