Baumer
Passion for Sensors

(Y)TED
pressure switch

Main Features

- -1 … 0 bar up to 0 … 400 bar
- Robust stainless steel housing for severe industrial environments
- Abrasive and chemical resistant
- Intrinsically safe version (LCIE 03 ATEX 6300 X)
- Two threshold outputs (PNP transistors or galvanic isolation)

Applications

- Water treatment
- Pumps and compressors
- Chemical
- Energy
- Industrial gas

IP 67

Main characteristics

Measuring ranges	-1 ... 0 bar up to 0 ... 400 bar
Long term stability	≤ ± 0.2% FS/Year
Accuracy (includes linearity, hysteresis, repeatability, error of span and zero point according limit point adjustment)	≤ ± 0.5% FS

Technical specifications

Measuring principle	Thick film on ceramic
Measuring ranges	-1 ... 0 bar up to 0 ... 400 bar
Type of pressure	Relative / Absolute
Accuracy (includes linearity, hysteresis, repeatability, error of span and zero point according limit point adjustment)	≤ ± 0.5% FS
Thermal drift	≤ ± 0.15% FS/10 K
Long term stability	≤ ± 0.2% FS/Year
Process connections	See page 4

Threshold outputs

TED5	Galvanically isolated pressure switch with two thresholds as static relays, switching capacity of 400 mA at 60 VDC or 40 VAC
TED6	Pressure switch with two thresholds as PNP transistors, switching capacity of 400 mA at 24 VDC
TED7	Pressure switch with two thresholds as PNP transistors, switching capacity of 400 mA at 24 VDC
TEDM	Galvanically isolated pressure switch with Modbus communication with two thresholds as static relays, switching capacity of 400 mA at 60 VDC or 40 VAC
YTED	Intrinsically safe pressure switch with two thresholds as PNP transistors, switching capacity of 40 mA at 28 VDC
Threshold adjustment range	2% to 98% of the measurement range
Typical response time	≤ 20 ms
Repeatability of switching points	≤ ± 0.2% FS

Electrical specification

Output signal / Power supply	4 … 20 mA (2 wires) / 10 … 32 VDC 4 … 20 mA (3 wires) / 18 … 32 VDC 4 … 20 mA (2 wires - ATEX version) / 10 … 28 VDC 0...10 V / 10 ... 32 VDC Modbus / 10 ... 32 VDC
Load impedance	
Current ouput (2 wires)	$R_\Omega = (U_{supply}$-10 V) / 0,02 A
Current ouput (3 wires)	$R_\Omega \leq 400\ \Omega$
Voltage output	$R_\Omega > 5\ k\Omega$
Insulation resistance	>100 MΩ at 500 VDC

Environment

Temperature	
Storage	-40 ... +85°C
Medium	-25 ... +100°C
Ambient	-25 ... +85°C
Protection rating	IP67 (EN 60529)
Vibration IEC60068-2-6	1.5 mm p-p (10 – 55 Hz), 20 g (55 Hz – 2 KHz)
Shock IEC60068-2-27	25 falls from 1 m on concrete ground

Material

Process connection	SS 1.4404 AISI 316L
Housing	SS 1.4301 AISI 304
Diaphragm	Ceramic (96% Al_2O_3)
Sealing	NBR, EPDM, FFKM (Chemraz® 505), FKM (Viton®)

Version with galvanically isolated digital thresholds – TED5 and TEDM

The current supply to the pressure switch is electrically isolated from the threshold outputs and the threshold outputs are isolated from each other.400 mA at 60 VDC or 40 VAC.
It is possible to have a separate power supply between the TEDM (≤ 32 VDC) and the threshold contacts (≤ 60 VDC or ≤ 40 VAC).

Configuration

The three keys on the front panel are used to configure the following operating parameters:

- Switching point value for each threshold
- Switching hysteresis value for each threshold
- Active status for each threshold (NO or NC)
- Time delay of each threshold from 0 to 25 s in 0.1 s steps
- Auto-zero function
- Self test and parameter protection by a 4 digit code

Additional parameter for the TEDM:

- Modbus slave address of the pressure switch
- Parity selection

Parameter consultation

Parameters for each threshold, Modbus address (TEDM) and parity (TEDM) can be viewed whithout access code.

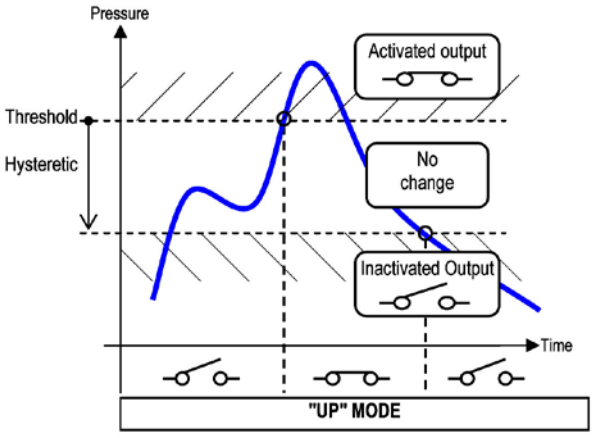
Maximum and minimum value consultation

When the pressure switch is in the measurement mode it is possible to display or initialise the maximum and minimum pressure values saved at any time.

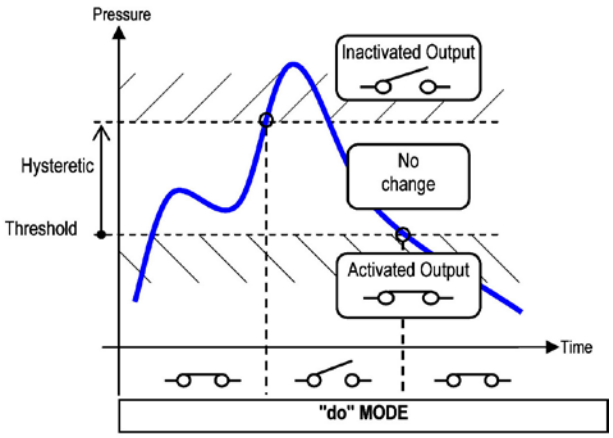
Modbus communication

The TEDM has a RS485 serial port and uses the Modbus RTU communication protocol.
The Modbus protocol is a two-way exchange protocol based on a hierarchical data base structure between a master and multiple slave stations. It enables the user to read the pressure and the status of each threshold (open or closed).
Exchange between the master and one slave: The master sends an order and waits for a reply.
Exchange between the master and all slave stations: The master broadcasts a message to all the slaves in the network and they perform the order in the message without sending a reply.
Two slave stations cannot talk together.
The bus stations are identified by addresses given by the user. These addresses range from 1 to 247.

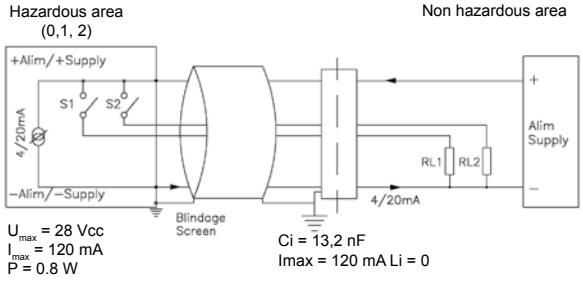
Threshold state: Decreasing



Threshold state: Increasing



Installations YTED



In area 0, the combination of the pressure switch and the safety barrier must be covered by a calculation checked by an approved body. For the application in Ex zone you have to respect the conditions mentioned in the ATEX Type Examination Certificate (LCIE 03 ATEX 6300 X). You find the certificates and manuals under http://www.baumer.com/

ATEX

I M1 Ex ia I Ma	YTED
II 1 G Ex ia IIC T6 or T5 Ga	YTED
Barrier data	$U_i \leq 28$ V $I_i \leq 120$ mA $P_i \leq 800$ mW
Capacity	$C_i \leq 13.2$ nF
Inductivity	$L_i \leq 0$ µH
Ambient temperature Ta	
Ta = +40°C	G: T6
Ta = +70°C	G: T6 (G = Gas)

Approvals

CE conformity	EMC directive 2004/108/CE in accordance with EN 61000-6-2, EN 61000-6-3, EN 61326-1 (Tab. 2) Pressure directive 97/23/CE

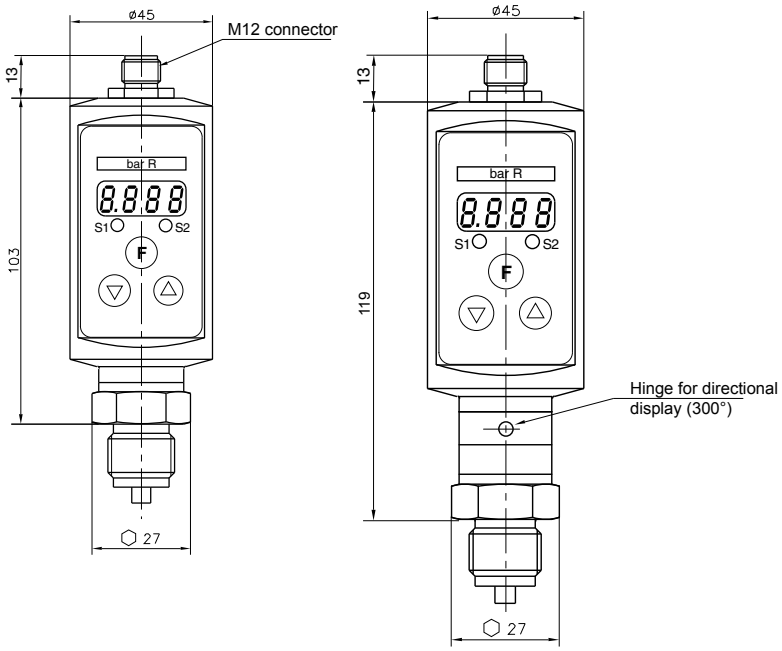
Measuring ranges and overpressure safety

	Pressure in bar								
Pressure range	-1 ... 0	-1 ... 0.6	-1 ... 1.5	-1 ... 3	-1 ... 5	-1 ... 9	-1 ... 15	-1 ... 24	-1 ... 39
Over pressure	3	3	4	8	12	20	32	50	80
Burst pressure	6	6	7	12	18	30	48	75	120
Display at measurement range	-1.000 / 0	-1.000 / 0.600	-1.000 / 1.500	-1.000 / 3.000	-1.000 / 5.000	-1.000 / 9.000	-1.00 / 15.00	-1.00 / 24.00	-1.00 / 39.00

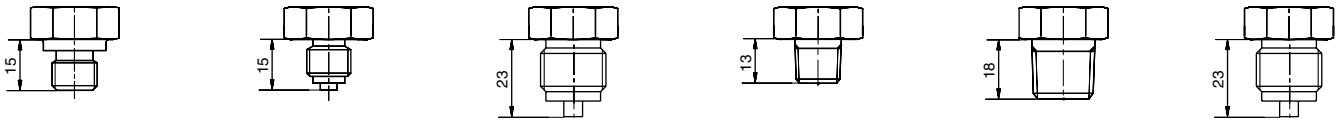
	Pressure in bar						
Pressure range	0 ... 1	0 ... 1.6	0 ... 2.5	0 ... 4	0 ... 6	0 ... 10	0 ... 16
Over pressure	3	3	4	8	12	20	32
Burst pressure	7	7	7	12	18	30	48
Display at measurement range	0/1.000	0/1.600	0/2.500	0/4.000	0/6.000	0/10.000	0/16.000

	Pressure in bar						
Pressure range	0 ... 25	0 ... 40	0 ... 60	0 ... 100	0 ... 160	0 ... 250	0 ... 400
Over pressure	50	80	120	200	320	500	600
Burst pressure	75	120	180	300	480	600	800
Display at measurement range	0/25.000	0/40.000	0/60.000	0/100.0	0/160.0	0/250.0	0/400.0

Dimensions (mm)



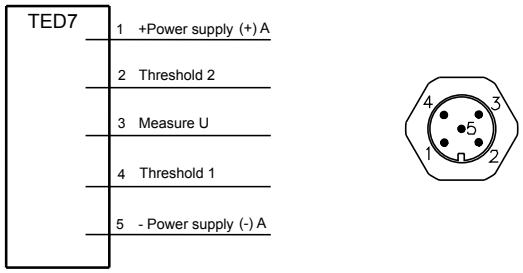
Hydraulic connections



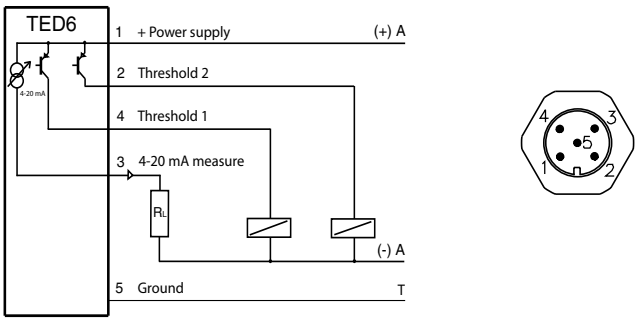
G 1/4 DIN 3852-E | G 1/4 EN837 | G 1/2 EN837 | 1/4 NPT EN837 | 1/2 NPT EN837 | M 20 x 1.5

Pin assignment

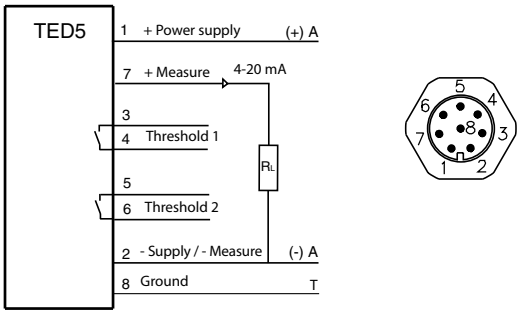
TED7 - Voltage output



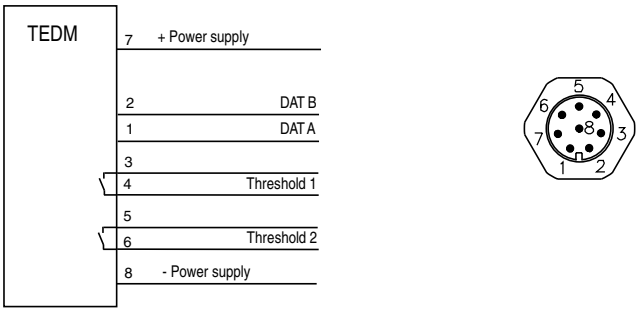
TED6/YTED - (4-20 mA, 2 wires)



TED5 - Current output (4-20 mA, 3 wires)



TEDM - Modbus output RS485



Codification (Y)TED

		_	x	.	x	.	xxx	.	x	/	xxxx
Model											
2 galv. Separated switching points, 4...20mA (3 wires)	TED5										
2 switching points, 4...20mA (2 wires)	TED6										
2 switching points, 0...10 V	TED7										
2 switching points, Modbus RS485	TEDM										
2 switching points, 4…20 mA, ATEX Ex ia intrinsic safety	YTED										
		_									
Process connection											
G 1/4 DIN 3852			B								
G 1/4 female			H								
G 1/4 EN 837			2								
G 1/2 EN 837			3								
1/4 NPT			5								
1/2 NPT			6								
M12x1.5 EN 837			9								
				.							
Sealing											
NBR					3						
EPDM					5						
FFKM (Chemraz®)					7						
FKM (Viton®)					9						
						.					
Pressure range and unit in bar											
-1...0	Only pressure type relative						B59				
-1...0.6	Only pressure type relative						B72				
-1...1.5	Only pressure type relative						B74				
-1...3	Only pressure type relative						B76				
-1...5	Only pressure type relative						B77				
-1...9	Only pressure type relative						B79				
-1...15	Only pressure type relative						B81				
-1...24	Only pressure type relative						B82				
-1...39	Only pressure type relative						B1L				
0...1							B15				
0...1.6							B16				
0...2.5							B18				
0...4							B19				
0...6							B20				
0...10							B22				
0...16							B24				
0...25							B26				
0...40							B27				
0...60							B29				
0...100							B31				
0...160							B33				
0...250							B35				
0...400							B38				
								.			
Kind of pressure											
Relative									R		
Absolute									A		
										/	
Options											
300° directional display											2037
Drinking water application											0619
Oxygen application (≤ 320 bar)											0765
Capacitive cell (except YTED)											0591
M12, 5 pins with shielded cable, length 2 m											0604
M12, 5 pins with shielded cable, length 5 m											0605
M12, 5 pins with shielded cable, length 10 m											0606
M12, 8 pins with shielded cable, length 2 m											0607
M12, 8 pins with shielded cable, length 5 m											0608
M12, 8 pins with shielded cable, length 10 m											0609