

TED and YTED (ATEX) Digital pressure switches

For absolute or gauge vacuum and pressure measurements

Two threshold outputs

Thresholds: PNP transistors or galvanic isolation

4...20 mA or Modbus output signal or 0 - 10 V

Totally stainless steel, rugged build for severe industrial environments

300° swivelling version (option)

TED range digital pressure switches are intended for pressure control for industrial process management, such as level management or jack control.

Based on microprocessor technology, the TED can be programmed completely on site using code protected keys.

For use in explosive atmosphere, the YTED is approved ATEX Intrinsically safe Ex ia.

LCIE 03 ATEX 6300X

CE 0081



I M1
Ex ia I Ma



II 1 G
Ex ia IIC T6 or T5 Ga

Hazardous area : 0, 1, 2

Processing modules for output thresholds and / or 4 ... 20mA signal are also available (ref. data sheet A31.04)



Specifications (20°C)

* These characteristics are given for a "basic" TED, as featured on this documentation. When mounting on a chemical seal or any other intermediate part in relation to the process, each component should be taken into account to determine the overall characteristics.

Measurement range	Absolute pressure: 0...1 to 0...400 bar Gauge pressure: -1...0 to 0...400 bar	Materials in contact with the fluid	Ceramic, 1.4404 (316L) stainless steel, NBR seal (standard)
Display	-1999 to +9999 points. 4 digit red LEDs (8 mm high)	Connections	Electrical: TED6- TED7 and YTED: M12-5 pin connector male TED5- TEDM: M12-8 pin connector
Power supply voltage	TED6- TED7- TEDM: 10 ...32 VDC, regulated. TED5: 18 ...32 VDC, regulated Protection against polarity reversals YTED : 10...28 Vdc regulated	Connections	Pressure: G 1/2 EN837, G 1/4 EN837, G1/4 DIN 3852, G1/4 female, 1/2 NPT, 1/4 NPT, M20x1.5 Aseptic union: on request
Consumption	YTED- TED6 and TED7 < 22 mA. TED5 : 50 mA max. TEDM : Typ. 20 mA. Communicating : 100 mA	IP rating (EN 60 529)	IP 67
Load impedance	YTED- TED6 and TED7: $R_L \leq (U_{supply} - 10) / 0.02$ TED5: $R_L \leq 400 \Omega$	CE conformity	EMC directive 89/336 CE PED pressure directive 97/23/CE ATEX 94/9/CE
Output signal	YTED- TED6 and TED7: 4...20 mA (2 wires) TED5: 4...20 mA (3 wires) TEDM: Modbus communication	Resistance to vibrations (EN 60068-2-6)	1.5 mm (10 Hz ... 55 Hz) / 20 g (55 Hz ... 2 kHz)
Threshold outputs	TED6 and TED7: PNP transistors, 400 mA at 24 VDC TED5- TEDM: static relays, 400 mA at 60 VDC or 40 VAC YTED: PNP transistors, 40 mA at 28 VDC	Resistance to shocks (EN 60028-2-32)	25 drops from 1 meter onto a concrete floor
Threshold adjustment range	2% to 98% of the measurement range	Weight	530 g to 580 g depending on the version
Typical response time of the threshold outputs	≤ 20 ms	Options	
Accuracy	± 0.5% of F.S.	300° swivelling version. Code 2037	
Repeatability	± 0.2% of F.S.	Drinking water application. Code 0619	
Annual stability	≤ 0.2% of F.S.	Oxygen application (≤ 320 bar). Code 0765	
Ambient temperature	YTED: - 25 ... 70°C Ta = +40°C G: T6 Ta = +70°C G: T5 (G = Gas/Gaz) Others : -25 ... 85°C	Specific cleaning (gas application). Code 0829	
Fluid temperature:	- 25 ... 100°C	Thread locking. Code 0771	
Storage temperature:	- 40 ... 85°C	10 mm dia. hole in the connection (for G1/2, 1/2NPT, M10x1.5 connection). Code 9022	
Thermal drift	± 0.015% of F.S. /°C max.	Capacitive cell (except YTED). Code 0591	
		Mobile plugs and cables. See page 3	
		G1/2 mounted on chemical seals. Code 0592	



Baumer

TED range – Description

Digital pressure switch range

- **TED7** 0 - 10 V output
- **TED6** Digital 2 threshold pressure switch, 4...20 mA output
- **TED5** Galvanically isolated digital 2 threshold pressure switch, 4...20 mA output
- **TEDM** Galvanically isolated digital 2 threshold pressure switch, Modbus communication
- **YTED** Digital 2 threshold pressure switch, 4...20 mA output.
ATEX Ex ia intrinsic safety approval

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. It is possible to have a separate power supply between the TEDM (32 VDC max.) and the threshold contacts (60 VDC max. or 40 VAC max.).

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 slaves (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.

Parameter configuration and consultation

Parameter configuration mode

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

- switching point value for each threshold
- Bottom switching point 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 mode

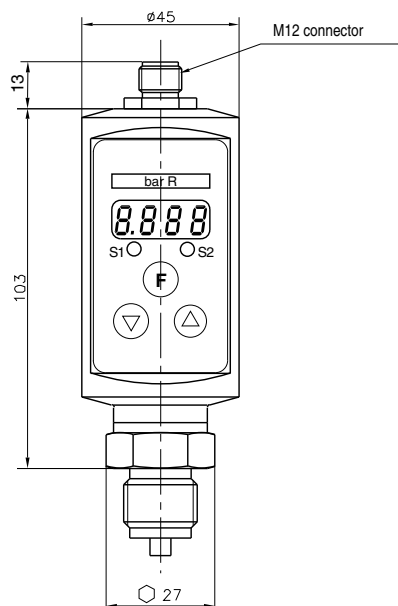
For each threshold, parameters can be viewed without access code, as modbus address and parity for TEDM.

Max. and min. value consultation

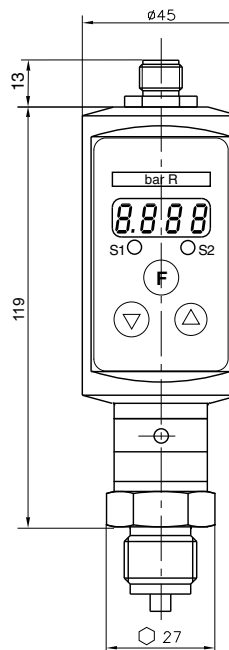
When the pressure switch is in the measurement mode it is possible to display or initialise the max. and min. pressure values saved at any time.

Dimensional drawing (mm)

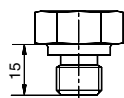
Standard version



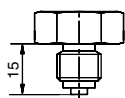
Swivelling version. Option code 0622



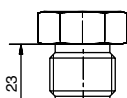
Pressure connections



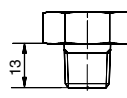
G 1/4 DIN 3852-E



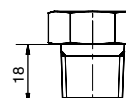
G 1/4 EN837



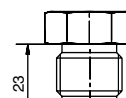
G 1/2 EN837



1/4 NPT EN837

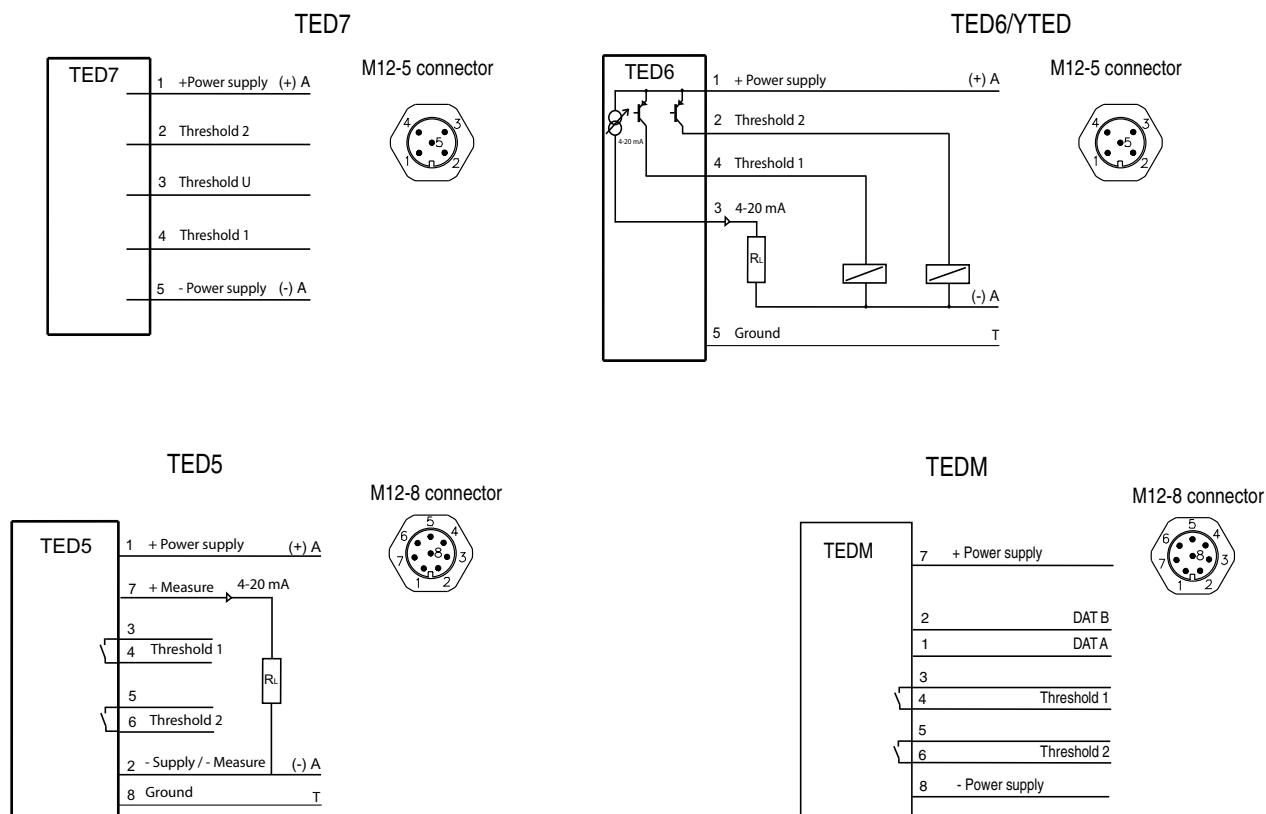


1/2 NPT EN837



M 20 x 1.5

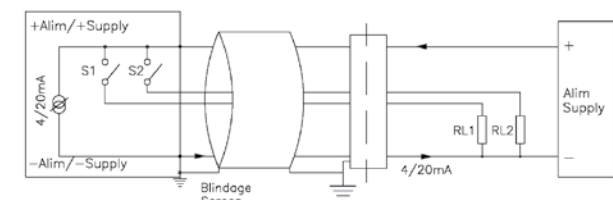
Connection diagrams



Installations YTED

Hazardous area (0, 1, 2)

Non hazardous area



$U_{max} = 28 \text{ Vcc}$
 $I_{max} = 120 \text{ mA}$
 $P = 0,8 \text{ W}$

$C_i = 13,2 \text{ nF}$
 $L_i = 0$

Important :

In area 0, the combination of the pressure switch and the safety barrier must be covered by a calculation checked by an approved body.

We offer a system of pressure switch + safety module + cable already certified by an approved body: see next page. : see data sheet A31.04 "YTED-YTTN ATEX Ex ia approved system".

Accessories

Model	Description	Code
	M12-5 pin mobile plug, screw terminal connection	2260
	Shielded moulded M12-5 pin cable, length 2 m	0604
	Shielded moulded M12-5 pin cable, length 5 m	0605
	Shielded moulded M12-5 pin cable, length 10 m	0606
	Shielded moulded M12-8 pin cable, length 2 m	0607
	Shielded moulded M12-8 pin cable, length 5 m	0608
	Shielded moulded M12-8 pin cable, length 10 m	0609

Important: TED series pressure switches have a immunity against high frequency interference. In environments with a high radiation (eg. GSM), we recommend to use screened cable.

Measuring ranges (bar)

Measurement range	-1 +0	-1 +0.6	-1 +1.5	-1 +3	-1 +5	-1 +9	-1 +15	-1 +24	-1 +39
Max. 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

Measurement range	0 +1	0 +1.6	0 +2.5	0 +4	0 +6	0 +10	0 +16	0 +25	0 +40	0 +60	0 +100	0 +160	0 +250	0 +400
Max. over pressure	3	3	4	8	12	20	32	50	80	120	200	320	500	600
Burst pressure	7	7	7	12	18	30	48	75	120	180	300	480	600	800
Display at Measurement range	0 / 1.000	0 / 1.600	0 / 2.500	0 / 4.000	0 / 6.000	0 / 10.00	0 / 16.00	0 / 25.00	0 / 40.00	0 / 60.00	0 / 100.0	0 / 160.0	0 / 250.0	0 / 400.0

Ordering details – TED

Type	1'...4' digits	xxxxxxx
Digital 2 threshold pressure switch, 4...20 mA output	TED6	
Digital 2 galvanically isolated threshold pressure switch, 4...20 mA output	TED5	
Digital 2 threshold pressure switch, Modbus communication	TEDM	
Digital 2 threshold pressure switch, 0 - 10 V output	TED7	
Digital 2 threshold pressure switch, 4...20 mA output, ATEX Ex ia intrinsic safety	YTED*	
Pressure connection	5' digits	
G1/4	2	
G1/4 DIN 3852	B	
G 1/4 female	H	
G1/2	3	
1/4 NPT	5	
1/2 NPT	6	
M20x1,5	9	
Sensor seal	6' digits	
NBR (nitrile) standard	3	
EPDM	5	
FFKM Chemraz® 505	7	
FKM (Viton®)	9	
Measuring ranges	7'...9' digits	
bar	Bxx	
kPa	Dxx	
kg/cm²	Fxx	
psi	Hxx	
Pressure mode	10' digits	
Absolute	A	
Gauge	R	

* See data sheet A31.04 "YTED-YTTN ATEX Ex ia approved system".

code	bar kg/cm²	kPa	code	psi	A - R
59	-1 + 0	-100 + 0	59	-30"Hg + 0	- R
72	-1 + 0.6	-100 + 60	73	-30"Hg + 15	- R
74	-1 + 1.5	-100 + 150	75	-30"Hg + 30	- R
76	-1 + 3	-100 + 300	2C	-30"Hg + 60	- R
77	-1 + 5	-100 + 500	78	-30"Hg + 100	- R
79	-1 + 9	-100 + 900	79	-30"Hg + 150	- R
81	-1 + 15	-100 + 1500	81	-30"Hg + 220	- R
82	-1 + 24	-100 + 2400	82	-30"Hg + 300	- R
1L	-1 + 39	-100 + 3900	1L	-30"Hg + 600	- R
15	0 + 1	0 + 100	15	0 + 15	A R
16	0 + 1.6	0 + 160	1C	0 + 20	A R
18	0 + 2.5	0 + 250	17	0 + 30	A R
19	0 + 4	0 + 400	19	0 + 60	A R
20	0 + 6	0 + 600	21	0 + 100	A R
22	0 + 10	0 + 1000	22	0 + 160	A R
24	0 + 16	0 + 1600	23	0 + 200	A R
26	0 + 25	0 + 2500	25	0 + 300	A R
27	0 + 40	0 + 4000	26	0 + 400	A R
29	0 + 60	0 + 6000	27	0 + 600	A R
31	0 + 100	0 + 10000	30	0 + 1000	A R
33	0 + 160	0 + 16000	31	0 + 1500	A R
35	0 + 250	0 + 25000	34	0 + 3000	A R
38	0 + 400	0 + 40000	38	0 + 6000	A R

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Curve showing change of threshold state

