BDT35 – Safety process pressure gauge 100mm with output signal 4-20mA

Product description

Badotherm pressure gauge model BDT35 is the solid front, safety pattern gauge according the highest class of the EN 837-1 / 9.7.2 and ANSI B 40.1. The BDT35 stainless steel safety gauge has a solid front baffle wall and a full blow-out back. The pressure gauge is equipped with 4-20mA output signal created by a piezo resistive stainless steel measuring cell. This current output can be used for digital local indicator or the recording of the output signal. When there is power outage it is still possible to have local reading.

Design standard

EN837-1

Dial sizes, ranges & accuracy

Possibilities in ranges and accuracies are led by the dial size. Accuracy class is based on dry gauges. Liquid filling can affect the accuracy.

Dial size	Ranges	Accuracy
100mm 160mm	0...1 to 0...60 bar	1.0% (sensor accuracy 0.15%)

Mounting variation

Not all gauges are suitable for some mounting variations. For the BDT18 series the mounting variations are below.

- **type A** (10) bottom connection, direct mounting
- **type C** (11) bottom connection, surface mounting (back)

More specifically per dial size:

Dial size	A	C	D	E
100mm	•	•		

Pressure transducer

The pressure transducer is a piezo resistive sensor. The output signal is 4-20 mA with a 2 wire system or a digital RS 485 signal. The supply voltage is 10-30 V DC.

Type	Input	Output	
2 Wire	10...30 VDC	4...20 mA / RS485	With zero/span correction
2 wire	10...30 VDC	4...20 mA	

Process connection

Dial size	Standard thread	optionally	SW size
100mm 160mm	G ½ A or ½" NPT	1/4" , 3/8"	17mm

Other thread standards such as ISO 7-1 R (BSPT), or DIN 13-1 (M20x1.5) can be selected as well.

-> See datasheet "thread information" for specific thread details

Materials of construction

	BDT35
Case Bezel	AISI 304
Connection[1]	AISI 316
Sensing element[1]	TP316
Measuring cel[1]	AISI 316
Movement	Stainless steel
Pointer Dial	Aluminium
Window gasket	NBR
Blow out	AISI 304 with NBR compensation
Fill plug	NBR (HNBR for filled gauges)
Sensor seal[1]	FKM
Cable box	Polyamide 6
Mounting flanges	AISI 304
Window	Laminated safety glass

*1 wetted materials

Pressure limitations

The gauge are built to withstand harsh environments however the EN 837 limits the use of a pressure gauge according below table.

Pressure gauge

Dial size	Steady	Fluctuating	Short time
100mm	0.75 x FSV	0.67 x FSV	FSV
160mm	FSV	0.9 x FSV	1.3 x FSV

FSV: full scale value

Pressure sensor

Measuring range	Over pressure	Burst pressure	Long term stability[1]
0.5...2 bar	3x FSV	200 bar	<0.5% FSV / <4 mbar
>2...25 bar			<0.1% FSV / 0.2% FSV

Temperature limitations

The gauges can withstand ambient and process temperature up to a certain limit. The limitations on temperature are:

	Ambient	Medium
Dry case	-40°C ...+60°C	0°C...+70°C
Filled case	-20°C ...+60°C	0°C...+70°C

The variation of indication caused by the effect of temperature shall not exceed:

Pressure gauge: ± *0.4% / 10K FSV*

Piezo resistive sensor: 0.15% / 10 K FSV

Window

Standard BDT35 gauges have a laminated safety glass window.

Pointer

Standard pointer is an adjustable slotted black painted aluminum pointer. The micro adjustable pointer can be selected as an

Dial facing

The dial plate is made from aluminum and coated with UV resistant white coating. The black dial markings, scale, numbering, and interval is according the EN 837. Options like colored dial, customer logo, or colored segments are possible as well. Scale interval and numbering is following the EN837.

Limit stop

To prevent permanent damage after overpressure, or sudden vacuum on size 100, 160mm the gauge is protected by an internal limit stop on the movement that is set just below the minimum scale value and just outside the 130% maximum scale value.

Degree of protection

The BDT35 has a standard degree of protection of IP65. The values are determined according the IEC/EN 60529. Class IP66 and IP67 are available as option.

Case filling

The gauges can be filled with different kind of fill fluids. The fill fluids available are:

- BPF03 - Silicon for contacts

Restrictor Screw

All gauges can be executed with a restrictor of 0.8 or 0.3 orifice in AISI316(L). For the Alloy 400 internal the orifice is 0.8mm.

Special service

The gauges can be supplied cleaned for oxygen use. This means the gauge is assembled and tested in a special area free of oil. The gauges are individually packed in a plastic bag with marking. The symbol used is:

Certification & Declaration

Calibration

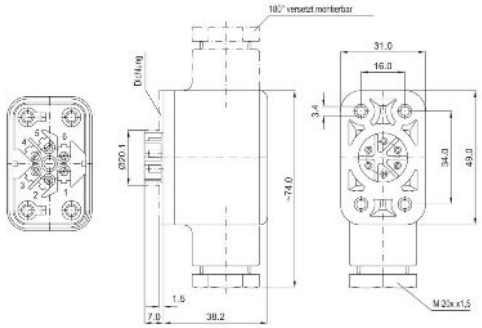
Gauges are full range calibrated as a factory standard. Optionally you can select a 5 points calibration certificate. For the BDT35 a calibration certificate of the pressure gauge as well as the pressure sensor is supplied.

EN 10204 material certificate

A material 3.1 certificate on the wetted parts can be supplied (connection and bourdon tube)

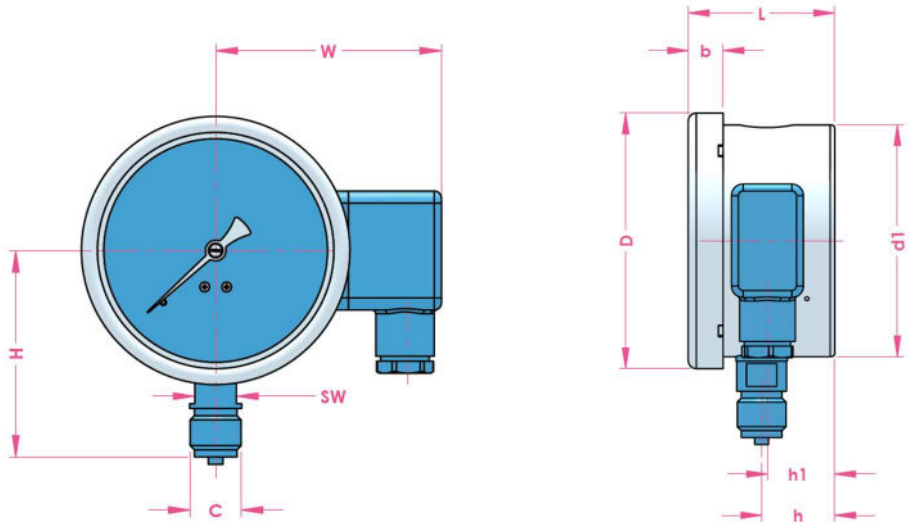
Cable terminal box

The cable terminal box is fitted on the circumference of the case, This terminal box houses the terminals for the external wiring. The connector can be removed by unloosen the Philips screw. The male and female connector are sealed by an NBR gasket. Standard this is an IP65 Universal Cable Box type B with an M20x1.5 cable gland suitable for electrical cables 7...13mm in diameter.



Dimensions table

Type A (10)



Dial size	d	d1	b	L	h	g	SW	H	weight
100	110.0	100.0	15.0	63.0	31.5	G 1/2	17	85.0	0.5 kg
160	160.0	150.0	16.0	63.0	30.0			116.0	0.8 kg

Product code 100, 160mm

Code												
Example code:	**BDT35**	160	A	G12M	S363	S304	A	0	L	B50	10
TYPE												
100 mm◄	100											
160 mm◄	160											
MOUNTING												
Bottom connection - direct mounting (10) ◄	A											
Bottom connection - surface mounting (11)	C											
CONNECTION												
G 3/8" A	G38M											
G1/2◄	G12M											
1/2" NPT	N12M											
R 1/2	R12M											
M20 x 1.5	M20M											
TUBE & SOCKET MATERIAL												
AISI 316L◄	S363											
Alloy 400	A400											
CASE/BEZEL MATERIAL												
AISI 304◄	S304											
AISI 316	S300											
POINTER												
Adjustable slotted pointer◄	A											
Micro adjustable pointer	M											
LIQUID FILLING												
Dry◄	0											
BPF 03 – Silicone Contact use	3											
WINDOW												
Laminated glass (S1) ◄	L											
RANGE												
See page table 1 and table 2	....											
ACCURACY												
0,6	6											
1.0◄	10											

◄: is the sign for the standard pressure gauge
-"R" version reduced volume not possible in combination with option "_OPP" over pressure protected.
- _OPP over pressure protected option only possible in combination with mounting A or C

Tabel 1: Pressure Range code

bar		psi		MPa		kPa		kgf/cm2	
Code	Range	Code	Range	Code	Range	Code	Range	Code	Range
C36	-1...0,6	C37	30Hg/15psi	N50◂	0...1,6	D36	-100...60	E36	-1...0,6
C38	-1...1,5	C39	30Hg/30psi	N54◂	0...2,5	D38	-100...150	E38	-1...1,5
C40	-1...3	C41	30Hg/60psi	N57◂	0...4	D40	-100...300	E40	-1...3
C42	-1...5	C44	30Hg/100psi	N58	0...6	D42	-100...500	E42	-1...5
C45	-1...9	C46	30Hg/150psi	N60	0...10	D45	-100...900	E45	-1...9
C50	-1...15	C50	30Hg/220psi	N62	0...16	D50	-100...1500	E50	-1...15
C54	-1...24	C53	30Hg/300psi	N65	0...25	D54	-100...2400	E54	-1...24
B01◂	-1...0	P32◂	0...10			L01◂	-100...0	K01◂	-1...0
B04	-0,6...0	P35◂	0...15			L04	-60...0	K04	-0,6...0
B31◂	0...0,6	P37◂	0...30			L31◂	0...60	K31◂	0...0,6
B35	0...1	P40◂	0...60			L35◂	0...100	K35◂	0...1
B36◂	0...1,6	P43◂	0...100			L36◂	0...160	K36◂	0...1,6
B38◂	0...2,5	P46◂	0...160			L38◂	0...250	K38◂	0...2,5
B40◂	0...4	P48	0...200			L40◂	0...400	K40◂	0...4
B42◂	0...6	P51◂	0...300			L42◂	0...600	K42◂	0...6
B45◂	0...10	P55	0...400			L45◂	0...1000	K45◂	0...10
B50◂	0...16	P56	0...500					K50◂	0...16
B54◂	0...25	P57◂	0...600					K54◂	0...25
B57◂	0...40	P58	0...800					K57◂	0...40
B58	0...60	P59	0...1000					K58	0...60
B60	0...100	P60	0...1500					K60	0...100
B62	0...160	P61	0...2000					K62	0...160
B65	0...250	P64	0...3000					K65	0...250

◂ Ranges suitable for overpressure protected version

Table 2: Secondary scale

Dual scale option	code
PSI red	#PR
PSI black	#PB
PSI blue	#PBL
bar red	#BR
bar black	#BB
bar blue	#BBL

Add the code behind the pressure code
(eg B45#PR for 0...10 bar//psi with red scale)

Table 3: General option code

Option (start options with X_)	code
IP 66 class	_IP66
IP 67 Class	_IP67
Restrictor screw 0.8mm	_RS8
Restrictor screw 0.3mm	_RS3
Calibrated at 0°	C0
Calibrated at 180°	_C180
Cleaned for Oxygen use	_CFO
NACE ISO 15156 (MR 01 75) (alloy 400)	_N75
ATEX II2GDc-IM2c	_ATEX
3.1 material certificate	_IC31
Calibration certificate 5 points	_CC5
Calibration certificate 10 points	_CC10
Overrange protected version “P”	_OPP

_OPP only in combination with mounting A or C

Change log

Date	Change