

## FEATURES

- Suitable to measure liquid, gas, or steam flow as well as liquid level, density and pressure
- Outputs a 4~20mA DC signal corresponding to the measured pressure
- Quick response
- Remote set-up using communications
- Self-diagnostics
- Optional status output for pressure high/low alarm



## PERFORMANCE SPECIFICATIONS

Reference accuracy of calibrated span (includes terminal-based linearity, hysteresis, and repeatability)	: $\pm 0.075\%$ or $\pm 0.1\%$ If $TD > 10$ ( $TD = URL/SPAN$ ): $\pm(0.0075 \times TD)\%$ or $\pm(0.01 \times TD)\%$
Ambient temperature effects	: $-20 \dots 65^\circ\text{C}$ : $\pm(0.15 \times TD + 0.05)\% \times \text{Span}$ Every $10^\circ\text{C}$ is $\pm 0.08\% \times \text{Span}$ ( $TD = 1$ ) $-40 \dots -20^\circ\text{C}$ & $65 \dots 85^\circ\text{C}$ : $\pm(0.2 \times TD + 0.05)\% \times \text{Span}$
Overpressure effects	: $\pm 0.05\% \times \text{Span}$
Stability	: $\pm 0.1\% \times \text{Span} / 3$ years
Power supply effects	: $\pm 0.001\% / 10\text{V}$ ( $12 \sim 42\text{V DC}$ )

## FUNCTIONAL SPECIFICATIONS

Mounting position effects	: Rotation in diaphragm plane has no effect. Tilting up to $90^\circ$ will cause zero shift up to $0.25\text{kPa}$ which can be corrected by the zero adjustment.
Output	: Two wire 4~20mA DC output with digital communications, linear or square root programmable. HART protocol are superimposed on the 4~20 mA DC signal. Output range: 3.9 mA to 20.5 mA
Failure alarm (the mode can be selected)	: Low Mode (min): 3.7 mA High Mode (max): 21 mA No Mode (hold): Keep the effective value before fault. Note: The standard setting of failure alarm is High Mode.
Response time	: The amplifier damping constant is 0.1 sec; The sensor damping constant is 0.1~1.6 sec, it depends on the range and range compression ratio. Amplifier damping time constant is adjustable from 0.1 to 60 sec by software and added to response time.
Preheat	: < 15s
Ambient temperature limits	: $-40$ to $85^\circ\text{C}$ $-20$ to $65^\circ\text{C}$ with LCD display or fluorine rubber sealing

#### FUNCTIONAL SPECIFICATIONS

Storage and transportation temperature limits	: -50 to 85°C, -40 to 85°C with LCD display		
Working pressure limits (silicone oil)	: From vacuum to upper range limits		
Explosion protected type	AA: ATEX: II 2 G D Ex db IIC T4/T5/T6 Gb Ex tb IIIC T80°C/T90°C/T130°C Ta = -40°C to +60°C	AB: ATEX: II 1 G Ex ia IIC T4-T6 Ga -40°C ≤ T <sub>amb</sub> ≤ +40°C, T6 -40°C ≤ T <sub>amb</sub> ≤ +50°C, T5 -40°C ≤ T <sub>amb</sub> ≤ +85°C, T4	AC: ATEX: II 2 D Ex ia IIIC T80°C/T95°C/T130°C Da -40°C ≤ T <sub>amb</sub> ≤ +40°C, T80°C -40°C ≤ T <sub>amb</sub> ≤ +50°C, T95°C -40°C ≤ T <sub>amb</sub> ≤ +85°C, T130°C

Span/ Range Limits		bar	kPa	psi	kgf/cm <sup>2</sup>
<b>Gauge Pressure</b>					
D01/ D05	Span	6~60mbar	0.6~6	0.087~0.87	0.006~0.06
	Range Limits	-60~60mbar	-6~6	-0.87~0.87	-0.06~0.06
D11/ D15	Span	0.02~0.4	2~40	0.29~5.8	0.02~0.4
	Range Limits	-0.4~0.4	-40~40	-5.8~5.8	-0.4~0.4
B41	Span	0.025~2.5	2.5~250	0.3625~36.25	0.025~2.5
	Range Limits	-1~2.5	-100~250	-14.5~36.25	-1~2.5
B50	Span	0.3~30	30~3000	4.35~435	0.3~30
	Range Limits	-1~30	-100~3000	-14.5~435	-1~30
B60	Span	1~100	0.1~10MPa	14.5~1450	1~100
	Range Limits	-1~100	-0.1~10MPa	-14.5~1450	-1~100
B65	Span	2.1~210	0.21~21MPa	30.45~3045	2.1~210
	Range Limits	-1~210	-0.1~21MPa	-14.5~3045	-1~210
B70	Span	4~400	0.4~40MPa	58~5800	4~400
	Range Limits	-1~400	-0.1~40MPa	-14.5~5800	-1~400
<b>Absolute Pressure</b>					
L01/ L05	Span	0.02~0.4	2~40	0.02~0.4	0.02~0.4
	Range Limits	0~0.4	0~40	0~0.4	0~0.4
L10	Span	0.025~2.5	2.5~250	0.025~2.5	0.025~2.5
	Range Limits	0~2.5	0~250	0~2.5	0~2.5
L20	Span	0.3~30	30~3000	0.3~30	0.3~30
	Range Limits	0~30	0~3000	0~30	0~30

#### OVERLOAD PRESSURE LIMITS

Span	40kPa		250kPa (B41/L10)	3MPa (B50/L20)
	(D11)	(D15)		
OPL	1MPa	7MPa	4MPa	15MPa
Span	10MPa (B60)		21MPa (B65)	40MPa (B70)
OPL	20MPa		50MPa	50MPa
Span	6kPa		40kPa	
	(D01)	(D05)	(L01)	(L05)
OPL	1MPa	7MPa	1MPa	7MPa

#### INSTALL

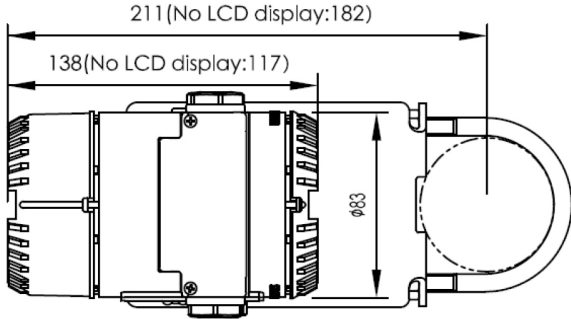
Supply & load requirements	:	24V DC supply, $R \leq (U_s - 12V) / I_{max}$ k $\Omega$ , $I_{max} = 23$ mA. Maximum voltage limited: 42V DC, Minimum voltage limited: 12V DC, 15V DC (with LCD display) 230 $\Omega$ to 600 $\Omega$ for digital communication
Electrical connection	:	The electrical connection is made via cable entry M20x1.5 The screw terminals are suitable for wire cross-sections up to 2.5mm <sup>2</sup>
Process connection	:	Default Process Connection: 1/2" NPT (F) thread, it can be changed to 1/2" NPT, G 1/2", M20x1.5 (M) thread and vacuum clamp connection

#### PHYSICAL SPECIFICATIONS

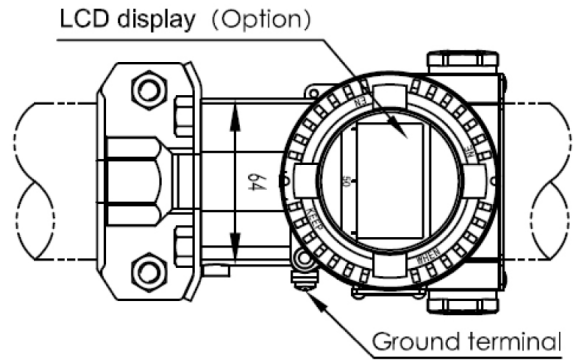
Isolating diaphragm	:	316L stainless steel/Hastelloy C
Process connector	:	316 stainless steel
Fill fluid	:	Silicone oil
Amplifier housing	:	Aluminum with epoxy resin coat
Housing gasket	:	Perbunan (NBR)
Name plate and tag	:	304 stainless steel
Weight	:	~1673 g
Degrees of protection	:	IP67

### DIMENSIONAL DRAWING

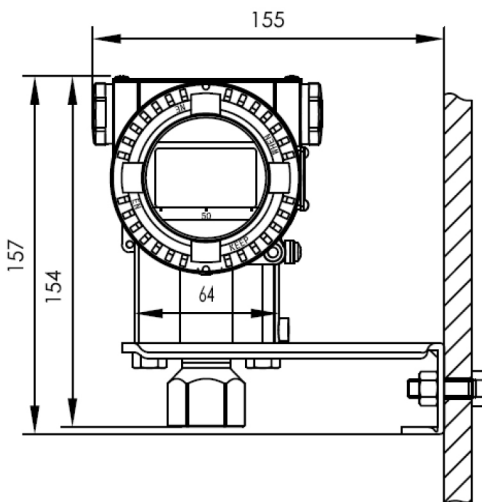
Horizontal Impulse Piping Type(side face)



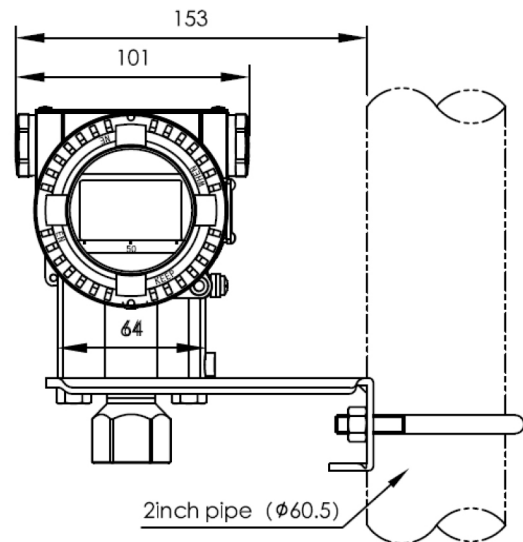
Horizontal Impulse Piping Type(front side)



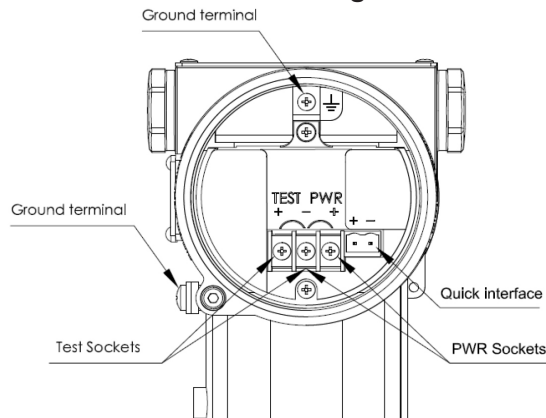
Horizontal Impulse Wall mounting Type



Vertical Impulse Piping Type



### Terminal Configuration

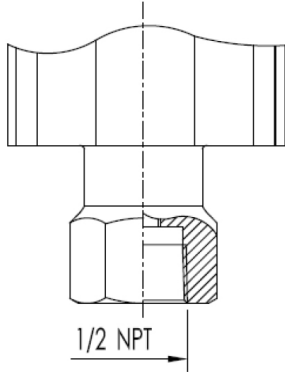


All dimensions are in mm.

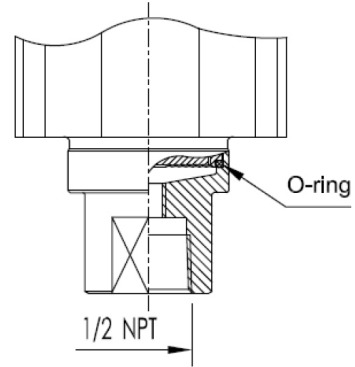
**NOTE:** Quick interface functionally equivalent to the signal terminal.

PROCESS CONNECTIONS DESCRIPTION

**Default Process Connection (04N):**



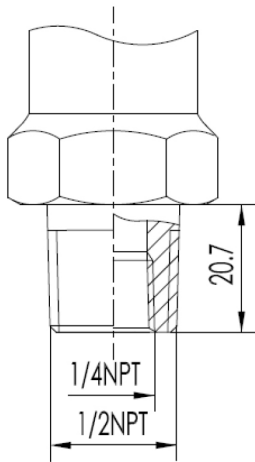
B50 / B60 / B65 / B70 / L20 Span



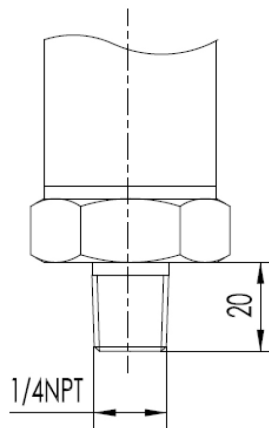
D01 / D11 / D05 / D15 / L01 / L05 / L10 / B41 Span

**Other forms of Process Connection:**

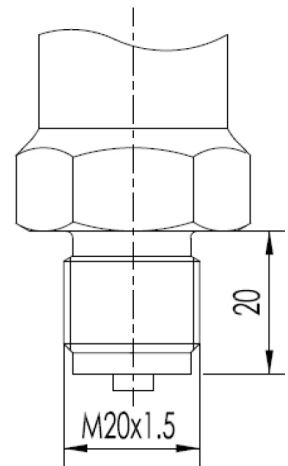
01J



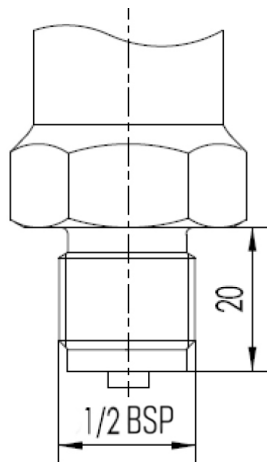
12N



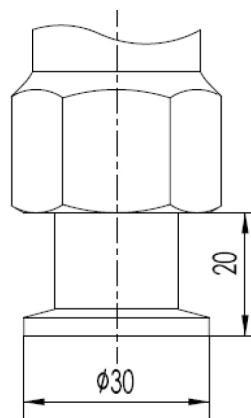
04M



14B



VC\*



\*Vacuum Clamp Connection DIN 28403 KF16 / ISO 2861

#### ORDERING CODES

##### Required

###### 1. APPROVAL

AA	Hazardous area; ATEX: II 2 G D <sup>1</sup>	
AB	Hazardous area; ATEX: II 1 G <sup>1</sup>	
AC	Hazardous area; ATEX: II 2 D <sup>1</sup>	
NA	Non-hazardous area	NA

###### 2. OUTPUT DISPLAY

HA	2-wire 4-20mA HART; +LCD	
HB	2-wire 4-20mA HART; None	HB

###### 3. PRESSURE TYPE

GA	Gauge	GA
AS	Absolute	

###### 4. APPLICATION

ST	Standard	ST
DI	Diaphragm seal	

###### 5. SENSOR RANGE; SENSOR OVERLOAD LIMIT

XXX	Refer Range Table (Page 07)	XXX
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###### 6. REFERENCE ACCURACY

CL1	±0.075% set span	
CL2	±0.1% set span	CL2

###### 7. PROCESS CONNECTION

04N	½" NPT (F)	04N
01J	½" NPT (M) (Containing ¼" NPT (F) thread)	
12N	¼" NPT (M)	
04M	M20 x 1.5 mm (F)	
14B	½" BSP (M)	
VC	Vacuum clamp connection ISO 2861 <sup>2</sup>	
XX	Refer Flange Table for the codes (Page 08)	

###### 8. ELECTRICAL CONNECTION

04M	M20 x 1.5 mm (F)	04M
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##### Additional Option

###### 9. DIAPHRAGM MATERIAL

DF	316 stainless steel - Silicone oil	DF
DC	Hastelloy C - Silicone oil	

###### 10. SPECIAL FUNCTION

N	None	N
TO	Use for Oxygen service	

###### 11. INTEGRAL INDICATOR

N	None	
LC	LCD display	LC
LB	Backlit LCD display	

###### 12. ACCESSORY

N	None	N
AL	Mounting bracket, 304 stainless steel	
AM	Mounting bracket, Carbon steel galvanized	
AP	Capillary	
AC60	Sun shade	

###### 13. ACCESSORY MOUNTED

N	None	
N2	Needle valve	N2
M2A	Two valve manifold, Remote mounting (Angled Forward)	
M2TF	Two valve manifold, Direct mounting (Straight)	
M2S	Two valve manifold, Direct mounting (Flat in line)	
AC42	Siphon	
AC50	Cooling tower	

###### 14. ADDITIONAL OPTIONS APPLY ONLY TO THE RANGE D05/D15/L05<sup>3</sup>: O-ring material

N	None	
NB	Perbunan (NBR)	
FK	Viton (FKM)	FK
ME	Teflon (PTFE)	

### 15. MARKING

N	None	
XB	Position number marked on the nameplate	
XF	SS tag plate, AISI 304 SS	XF

### Ordering Example : SPT1002-NA-HB-GA-ST-XXX-CL2-04N-04M + DF-N-LC-N-N2-FK-XF

- NOTES**
- 1.Refer to page 02
  2. Vacuum Clamp Connection ISO 2861, applies only to the range of less than 2.5 bar.
  3. Additional options apply only to the range RG/SG/SA, need to choose a suitable O-ring material according to the measuring medium, the default option is NBR.

### STANDARD RANGES

GAUGE	RANGE		"mbar"		RANGE		"psi"		SENSOR OVERLOAD LIMIT	
	-60...60	D01	-0.87...0.87	G01	1MPa					
	-60...60	D05	-0.87...0.87	G05	7MPa					
	-400...400	D11	-5.8...5.8	G11	1MPa					
	-400...400	D15	-5.8...5.8	G15	7MPa					

GAUGE	RANGE		"bar"		RANGE		"psi"		SENSOR OVERLOAD LIMIT	
	-1...2.5	B41	-14.5...36.25	S41	4MPa					
	-1...30	B50	-14.5...435	S50	15MPa					
	-1...100	B60	-14.5...1450	S60	20MPa					
	-1...210	B65	-14.5...3045	S65	50MPa					
	-1...400	B70	-14.5...5800	S70	50MPa					

ABSOLUTE	RANGE		"bar"		RANGE		"psi"		SENSOR OVERLOAD LIMIT	
	0...0.4	L01	0...5.8	Q01	1MPa					
	0...0.4	L05	0...5.8	Q05	7MPa					
	0...2.5	L10	0...36.25	Q10	4MPa					
	0...30	L20	0...435	Q20	15MPa					

### Flange Table

ANSI B 16.5								
Code	Size	Rating	Code	Size	Rating	Code	Size	Rating
A01	½"	150#	A02	½"	300#	A03	½"	600#
A04	½"	900#	A05	½"	1500#	A06	½"	2500#
A07	¾"	150#	A08	¾"	300#	A09	¾"	600#
A10	¾"	900#	A11	¾"	1500#	A12	¾"	2500#
A13	1"	150#	A14	1"	300#	A15	1"	600#
A16	1"	900#	A17	1"	1500#	A18	1"	2500#
A19	1¼"	150#	A20	1¼"	300#	A21	1¼"	600#
A22	1¼"	900#	A23	1¼"	1500#	A24	1¼"	2500#
A25A	1½"	150#	A26	1½"	300#	A27	1½"	600#
A28	1½"	900#	A29	1½"	1500#	A30	1½"	2500#
A31	2"	150#	A32	2"	300#	A33	2"	600#
A34	2"	900#	A35	2"	1500#	A36	2"	2500#
A37	2½"	150#	A38	2½"	300#	A39	2½"	600#
A40	2½"	900#	A41	2½"	1500#	A42	2½"	2500#
A43	3"	150#	A44	3"	300#	A45	3"	600#
A46	3"	900#	A47	3"	1500#	A48	3"	2500#
A49	4"	150#	A50	4"	300#	A51	4"	600#
A52	4"	900#	A53	4"	1500#	A54	4"	2500#