

CS

CODE AND SPECIFICATIONS SHEET

Differential Pressure Transmitter

EDR-N7P



EDR-N7P is intelligent transmitter equipped with semiconductor sensors and micro processors.

STANDARD SPECIFICATIONS

Model EDR-N7P

Differential pressure range

Range Code	Measuring Span	Settable Range Limits
8000 H8000	0.8 to 80kPa	$-80 \leq \text{LRV} \leq 80\text{kPa}$, $-80 \leq \text{URV} \leq 80\text{kPa}$
40000 H40000	20 to 400kPa	$-400 \leq \text{LRV} \leq 400\text{kPa}$, $-400 \leq \text{URV} \leq 400\text{kPa}$
100000 H100000	400 to 1000kPa	$-1000 \leq \text{LRV} \leq 1000\text{kPa}$, $-1000 \leq \text{URV} \leq 1000\text{kPa}$

Note) URV is the input differential pressure to give 100% output (20mA DC)

LRV is the input differential pressure to give 0% output (4mA DC)

Output 4 to 20mA DC

Power supply voltage 11.4 to 42.0V DC

Allowable load resistance 600Ω (at 24V DC power supply voltage)

Communication line condition

Power supply voltage 16.7 to 42.0V DC

Load resistance 250Ω to 1.2kΩ (Refer to Fig.1 for the relation between power supply voltage and load resistance)

Accuracy

Range Code	Accuracy
8000 H8000	$\pm 0.2\%$ X is more than 8kPa $\pm [0.1 + (0.1 \times 8/X)]\%$ X is less than 8kPa
40000 H40000	$\pm 0.2\%$ X is more than 40kPa $\pm [0.1 + (0.1 \times 40/X)]\%$ X is less than 40kPa
100000 H100000	$\pm 0.2\%$

Note 1) Accuracy is percent value against X, and X is the largest value among absolute value of URV, LRV and measuring span. Unit is kPa.

Note 2) When square root output, if zero cut is specified,

for output less than 1.1% : $\pm (\text{linear output accuracy} \times 45) \%$

for output 1.1 to 50% : $\pm (\text{linear output accuracy} \times 50 / \text{square root output} \%) \%$

for output more than 50% : same as linear output

※Using the DCR or the HART® type communicator, it is possible to select whether output under zero cutting point equals zero, or getting zero cutting point from arbitrary straight line.

if zero cut is not specified,

for output less than 20%, becomes the straight line between 0-20% point.

for output more than 20%, same as the above case that zero cut is specified

Zero adjustment

Externally adjustable within $\pm 100\%$ of measurement span.

Accidental burn out

Can select any one among burn up, burn down and without burn out.

Dead time

Approx. 0.4sec

Damping time constant (Amplifier time constant)

Adjustable from 0.2 to 102.4sec (0.1sec increment) electrically by the DCR or the HART® communicator.

Time constant of sensor body

Range Code	Time Constant of sensor body (at 25°C)	Fixed Electrical Damper Time Constant
8000 H8000	Approx. 0.1sec	Approx. 2sec
40000 H40000	Approx. 0.1sec	Approx. 2sec
100000 H100000	Approx. 0.1sec	Approx. 2sec

• Transmitter time constant equals to total sum of sensor body time constant, fixed electrical damper time constant, damping time constant (amplifier time constant) and dead time.

• When pressure pulsation is expected, we recommend that inner diameter $\phi 1$ capillary tube (more than 1m length) is inserted.

Storage temperature limits -40 to 85°C
Operating humidity limits 5 to 100%RH

Operating temperature limits

Ambient temperature limits
 -20 to 85°C (see Fig.2)
 (-20 to 60°C for range code 100000)
 Wetted parts temperature limits
 -20 to 120°C
 (-20 to 60°C for range code 100000)

Working pressure limits

Flange clamping bolt	Working pressure limits
SCM435 (Zinc plating)	15MPa
SUS304 (additional specification)	7.5MPa

(see Fig.3 and 4 for negative pressure)

Site vibration Less than 4.9m/s² continuous vibration

Temperature effect (at -20 to 60°C)

Range Code	Temperature Effect		
8000 H8000	Zero shift	$\pm[0.05+(0.4 \times T/50)]\%$ $\pm[0.05+(0.2+0.2 \times 32/X) \times T/50]\%$	X is more than 32kPa X is less than 32kPa
	Overall shift	$\pm[0.05+(0.65 \times T/50)]\%$ $\pm[0.05+(0.45+0.5 \times 32/X) \times T/50]\%$	X is more than 32kPa X is less than 32kPa
40000 H40000	Zero shift	$\pm[0.05+(0.4 \times T/50)]\%$ $\pm[0.05+(0.2+0.2 \times 160/X) \times T/50]\%$	X is more than 160kPa X is less than 160kPa
	Overall shift	$\pm[0.05+(0.65 \times T/50)]\%$ $\pm[0.05+(0.45+0.2 \times 160/X) \times T/50]\%$	X is more than 160kPa X is less than 160kPa
100000 H100000	Zero shift	$\pm[0.05+(0.4 \times T/50)]\%$	
	Overall shift	$\pm[0.05+(0.65 \times T/50)]\%$	

Static pressure effect (at 25°C)

Range Code	Static Pressure Effect		
8000 H8000	Zero shift	$\pm[0.05+(0.1 \times P/10)]\%$ $\pm[0.05+(0.1 \times 40/X) \times P/10]\%$	X is more than 40kPa X is less than 40kPa
	Overall shift	$\pm[0.05+(1.95+0.1 \times 80/X) \times P/10]\%$	
40000 H40000	Zero shift	$\pm[0.05+(0.1 \times P/10)]\%$ $\pm[0.05+(0.1 \times 200/X) \times P/10]\%$	X is more than 200kPa X is less than 200kPa
	Overall shift	$\pm[0.05+(1.45+0.1 \times 400/X) \times P/10]\%$	
100000 H100000	Zero shift	$\pm[0.05+(0.1 \times P/10)]\%$ $\pm[0.05+(0.1 \times 500/X) \times P/10]\%$	X is more than 500kPa X is less than 500kPa
	Overall shift	$\pm[0.05+(1.45+0.1 \times 1000/X) \times P/10]\%$	

Note) Static pressure effect is percent value against X, X is the largest value among absolute value of URV, LRV and measuring span. Unit is kPa. P is static pressure value, unit MPa.

Overpressure effect $\pm 0.5\%$
 (Zero shift) (at maximum working pressure application)
 (at maximum span)

Material

Diaphragm SUS316L
 Wetted parts other than diaphragm SUS316
 Amplifier case Aluminium alloy
 Flange clamping bolt SCM435 (Zinc plating)
 Mounting plate SPCC (acid resistant coating)
 U bolt SUS304

Filled liquid Silicone oil

Process connection Top connection Rc1/4 without oval flange
Electrical connection G1/2
Check terminal With output check terminal (output voltage 40 to 200mV DC)
Certifications Degree of protection JIS C 0920 IP67
Surge absorber Built-in transmitter
 Surge capacity : 1,000A (8/20 μ sec)
 Impulse test voltage : 15,000V (1.2/50 μ sec)
Finish Light gray amplifier case (acid resistant coating)
Weight Approx. 8.2kg
Installation On 2-inch pipe with U bolt.
Accessories 2-inch pipe mounting bracket and U-bolt.
 Zero adjustment magnet.

ADDITIONAL SPECIFICATION

Communication method HART[®] protocol

Pressure measurement (Absolute pressure)

Output method Communication by the DCR or the HART[®] communicator and display by built-in indicator. Alternate display of differential pressure and pressure, arbitrary scale setting of pressure (-1,750 to 1,750 range) are available by the DCR or the HART[®] communicator. Digital indicator distinguishes pressure from differential pressure displaying "P" behind numerical value. And analog output [1 to 5V] is possible by using EDB500M type exclusive distributor.

Measuring span 0.5 to 5MPa abs.

Accuracy $\pm 0.2\%$ X is more than 1MPa
 $\pm 0.2 \times (1/X)\%$ X is less than 1MPa

Temperature effect

Zero shift $\pm[0.05+(1.0 \times T/50)]\%$ X is more than 2MPa
 $\pm[0.05+(0.5+0.5 \times 2/X) \times T/50]\%$ X is less than 2MPa

Overall shift $\pm[0.05+(2.5 \times T/50)]\%$ X is more than 2MPa
 $\pm[0.05+(2.0+0.5 \times 2/X) \times T/50]\%$ X is less than 2MPa

Note) Accuracy and temperature effect are percent value against X, X is the largest value among absolute value of URV, LRV and measuring span. Unit is MPa. T is temperature variation width. (°C).

Indicator

Digital indicator 4.5 figures display (0 to 100% scale standard)
 (Can set to arbitrary scale within the range of -17,500 to 17,500)
 Scale plates various units to be stucked are supplied.

Filled liquid

Fluorine oil Wetted parts temperature limits: -20 to 120°C
 (See Fig. 5 for negative pressure)
 Specify also no-oil finish together for oxygen measurement

Silicone oil for sanitary use Wetted parts temperature limits: -20 to 120°C
 (See Fig. 6 for negative pressure)

Wetted parts finish

No oil finish or no-oil and no water finish

Process connection

Rc1/2, Rc1/4, 1/2NPT, 1/4NPT, 15A socket welding (socket screw-in type)

(with oval flange)

Flange clamping bolt SUS304

Process fluid condition

Vacuum type Wetted parts temperature limits: -20 to 120°C
 Filled liquid is same as standard specification
 (Workable pressure is different depending on temperature. Use after confirming Fig.3,4)

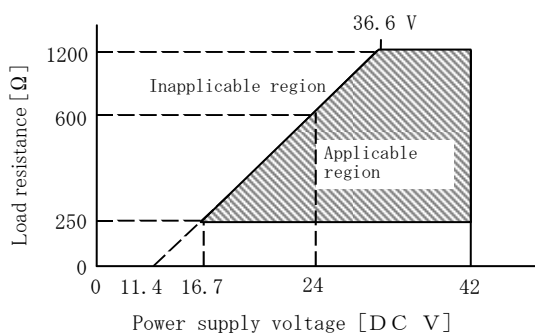
Density correction

Arithmetic processing function of density correction for measurement of liquefied gas level.

Standard installed correction table

Oxygen, Nitrogen, Argon, Butane, Carbon dioxide and Propane

Above correction table is installed as standard, be able to select by the DCR or the HART® communicator.
 (Contact us when other than above is required.)



A minimum load resistance of 250Ω shall be required to communicate by connecting to communicator.

Fig.1 Supply voltage / load resistance property of transmitter

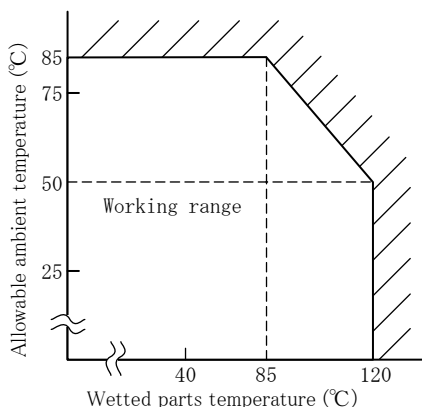


Fig.2 Wetted parts temperature and allowable ambient temperature

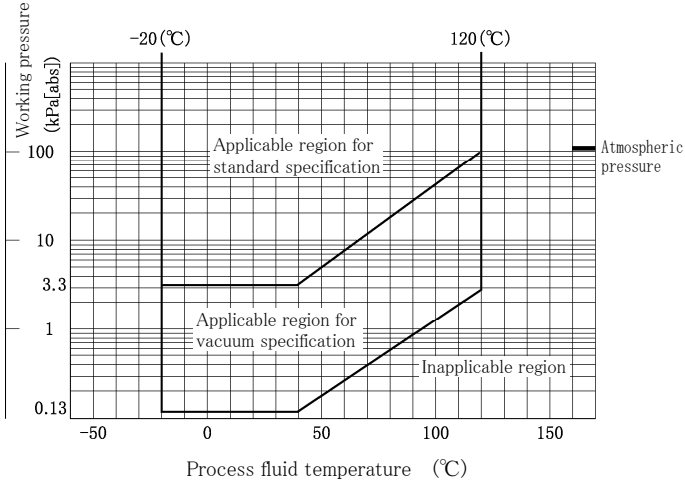


Fig.3 Working pressure and process fluid temperature
(Specification for standard or vacuum type)

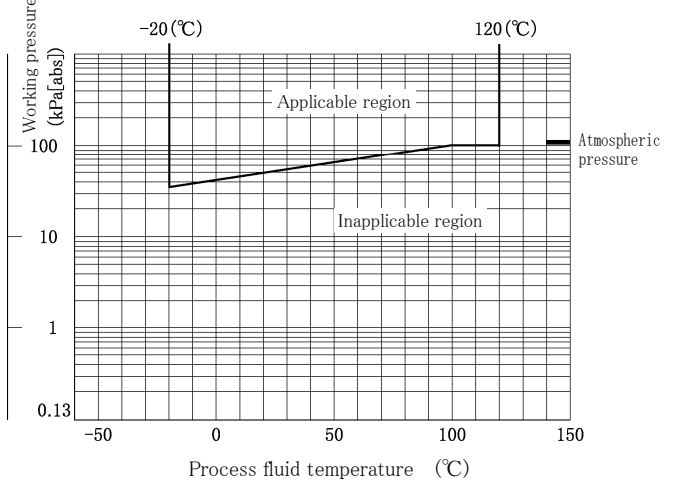


Fig.6 Working pressure and process fluid temperature
(Filled liquid : Silicone oil for sanitary use)

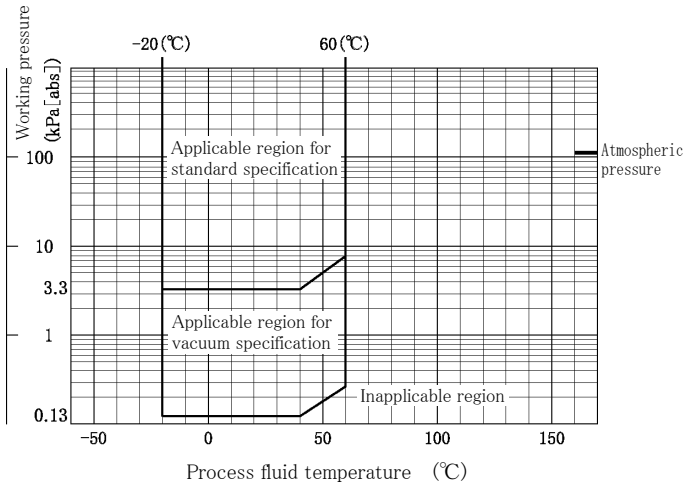


Fig.4 Working pressure and process fluid temperature
(Range code : 100000)

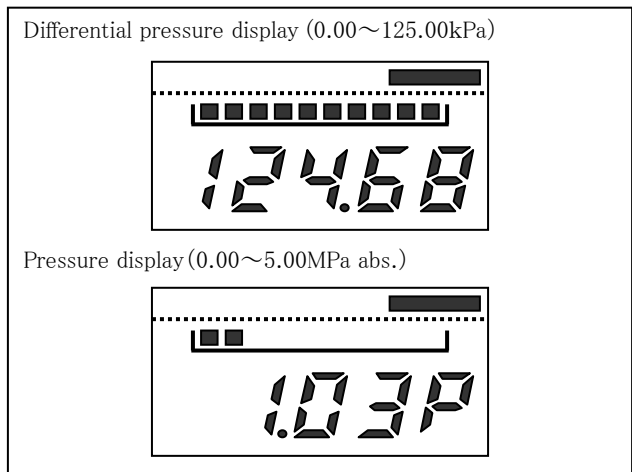


Fig.7 Alternate display of differential pressure and pressure

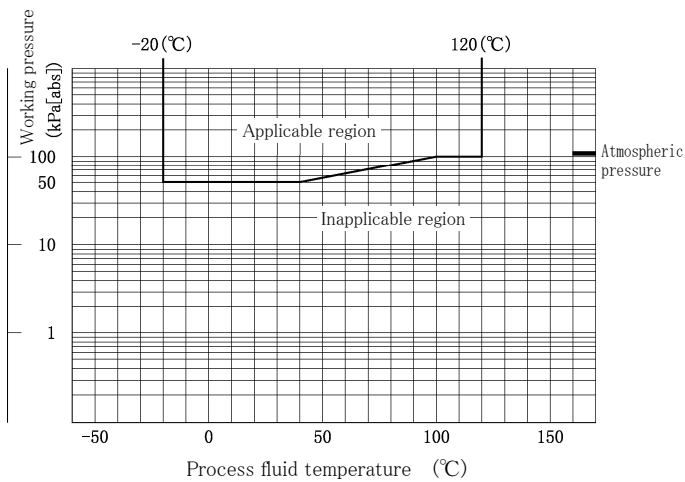
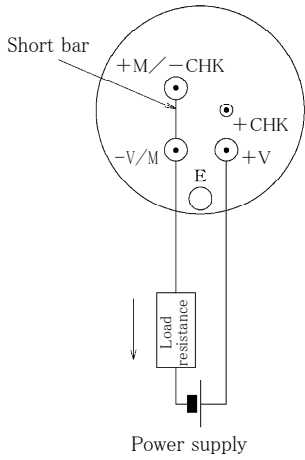


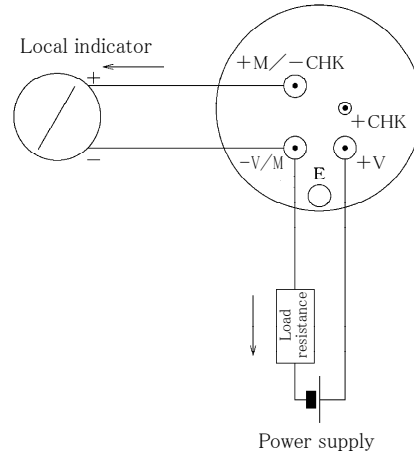
Fig.5 Working pressure and process fluid temperature
(Filled liquid : Fluorine oil)

EXTERNAL CONNECTION

Without local indicator



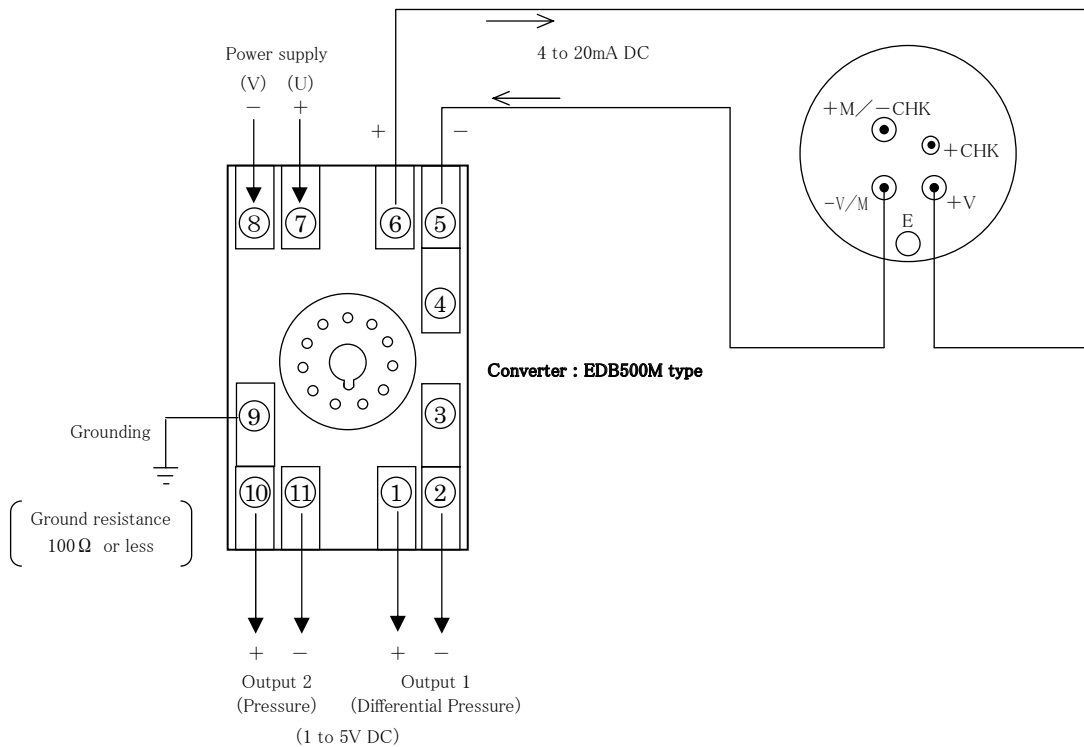
With local indicator connected



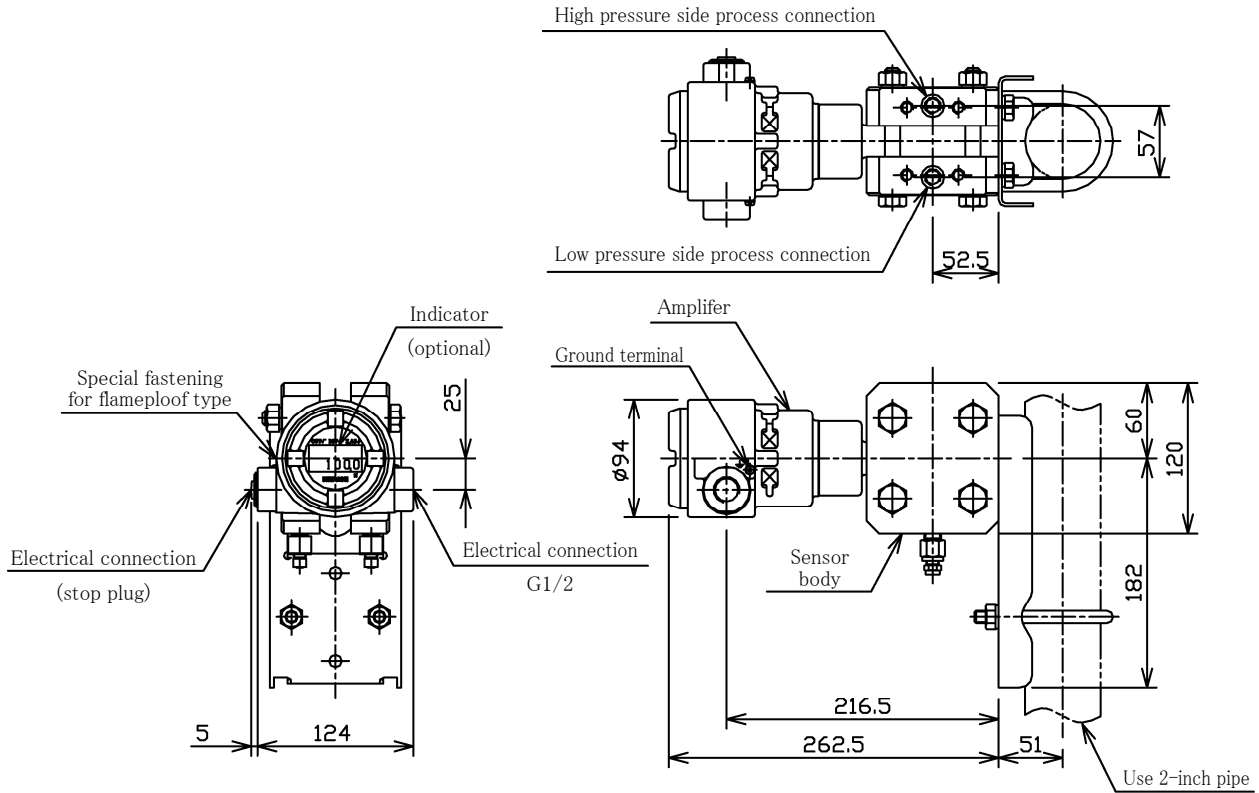
Notes:

- (1) Grounding shall be done according to class D grounding practice (grounding resistance less than 100Ω)
- (2) Grounding shall be done at one point either transmitter side or receiver instrument side, Give attention to avoid grounding at two points.
- (3) Grounding terminals on transmitter side are furnished inside of terminal box and outside of amplifier case. Either of them can be utilized.

●With EDB500M



DIMENSIONS (Unit : mm)



CODE TABLES

No., Item	1	2~9	Description
Model	Range code	Option	
EDR-N7P			Water - proof, diaphragm material ; SUS316L, wetted parts other than diaphragm ;SUS316, flange clamping bolt ;SCM435, top process connection Rc1/4 without oval flange, U - bolt material,SUS304, without indicator
	8000		
	40000		
	100000		
	H8000		
	H40000		HART® communication type
	H100000		
-- □ -- □			Select a necessary code alone among those in the optional code table below.

OPTION

No.	Item	Code	Description
2	Adjustable range	C()	Enter adjustable range and unit in parenthesis.
		CDH()	Adjustable range and the unit are filled in parentheses at the pressure measurement on a high-pressure side.
		CDL()	Adjustable range and the unit are filled in parentheses at the pressure measurement on a low-pressure side.
3	Indicator	M	Digital indicator.
		MJ()	Digital indicator and actual scale display Fill in () with scale and unit mark
4	Filled liquid	F0	Fluorine oil
		100CS	Silicon oil for sanitary use
5	No - oil	NL	No-oil finish
		NLW	No-oil and dehydrating finish
6	Process connections	R2	Top connection Rc1/2(with oval flange)
		R4	Top connection Rc1/4(with oval flange)
		N2	Top connection 1/2 - 14NPT(with oval flange)
		N4	Top connection 1/4 - 18NPT(with oval flange)
		S2	Top connection 1/2 inch pipe insertion welding(with oval flange)
		PV4	Top connection at side Rc1/4(without oval flange)
		B0	Bottom connection Rc1/4(without oval flange)
		BR2	Bottom connection Rc1/2(with oval flange)
		BR4	Bottom connection Rc1/4(with oval flange)
		BN2	Bottom connection 1/2-14 NPT(with oval flange)
		BN4	Bottom connection 1/4 - 18 NPT(with oval flange)
		BS2	Bottom connection 1/2 inch pipe insertion welding(with oval linage)
		BPV4	Bottom connection at side 1/4(without oval flange)
7	Flange clamping bolt material	F	SUS304
8	Process fluid condition	V	Vacuum type
9	Density correction	D()	Arithmetic processing function of density correction for measurement of liquefied gas level. It selects from Oxygen, Nitrogen, Argon, Butane, Carbon dioxide, and Propane and it fills it in in parentheses.

- HART[®] is a registered trademark of the HART Communication Foundation.
- Be sure to read the User's Manual to ensure correct, safe use.
- Some specifications and design are subject to change with or without notice for improvement of quality and performance.