

CS

CODE AND SPECIFICATIONS SHEET

Sanitary Differential Pressure Transmitter with Diaphragm Displacement Device

EDR-N7SD



EDR-N7SD is intelligent transmitter equipped with semiconductor sensors and micro processors.

STANDARD SPECIFICATIONS

Model EDR-N7SD

Differential pressure range

Range Code	Measuring Span	Settable Range Limits
8000 H8000	0.8 to 80kPa	$-80 \leq LRV \leq 80\text{kPa}$, $-80 \leq URV \leq 80\text{kPa}$
40000 H40000	40 to 400kPa	$-400 \leq LRV \leq 400\text{kPa}$, $-400 \leq URV \leq 400\text{kPa}$

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** 600 Ω (at 24V DC power supply voltage)
- Communication line condition**
 - Power supply voltage 16.7 to 42.0V DC
 - Load resistance 250 Ω to 1.2k Ω
 - (Refer to Fig. 1 for the relation between power supply voltage and load resistance)

Accuracy

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

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 DCR or the HART® communicator, it is possible to select whether output under zero cutting point equals to 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%.
 for output more than 20%, same as 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 DCR of the HART® communicator.

Time constant of sensor body

Range Code	Time Constant (at 25°C)	
	Sensor Body	Per 1m of Capillary Tube
8000 H8000	Approx. 0.2sec	Approx. 0.3sec
40000 H40000	Approx. 0.1sec	Approx. 0.2sec

• Transmitter time constant equals total sum of the above time constant of sensor body, capillary time constant, amplifier setting time constant and dead time

Storage temperature limits -40 to 85°C

Operating humidity limits 5 to 100%RH

Operating temperature limits
 Ambient temperature limits -10 to 60°C
 Wetted parts temperature limits -20 to 150°C

Site vibration Less than 29.4m/s² continuous vibration

Working pressure limits

Less than 0.98MPa.
(See Fig.2 for negative pressure)

Temperature effect

Range Code	Temperature Effect	
8000 H8000	Zero shift $\pm[0.05+(0.5 \times T/50)]\%$	X is more than 32kPa
	$\pm[0.05+(0.35+0.15 \times 32/X) \times T/50]\%$	X is less than 32kPa
40000 H40000	Overall shift $\pm[0.05+(0.8 \times T/50)]\%$	X is more than 32kPa
	$\pm[0.05+(0.65+0.15 \times 32/X) \times T/50]\%$	X is less than 32kPa
40000 H40000	Zero shift $\pm[0.05+(0.5 \times T/50)]\%$	X is more than 160kPa
	$\pm[0.05+(0.35+0.15 \times 160/X) \times T/50]\%$	X is less than 160kPa
40000 H40000	Overall shift $\pm[0.05+(0.8 \times T/50)]\%$	X is more than 160kPa
	$\pm[0.05+(0.65+0.15 \times 160/X) \times T/50]\%$	X is less than 160kPa

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

Material

Diaphragm	SUS316L
Wetted parts other than diaphragm	SUS316
Capillary tube	SUS316(polyethylene covered)
Amplifier case	Aluminum alloy
Mounting plate	SPCC (acid resistant coating)
U bolt	SUS304

Filled liquid Silicone oil

Process connection IDF4S clamp connection

Flange extension length 0mm (connection diameter 80A)

Capillary tube length 5m

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 μsec)
Impulse test voltage: 15,000V (1.2/50 μsec)

Finish Light gray amplifier case (acid resistant coating)

Weight Approx. 10kg

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 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 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 4.5figures display (0 to 100% scale standard)

(Can set to arbitrary scale within the range of -17,500 to 17,500)

Scale plates for variou units to be sticked are supplied.

Prosess connection

IDF 2S, IDF 3S clamp connection

Extension length of flange

52mm(only 0mm extension length for IDF 2F)

Capillary tube length

1~4(1m unit)

Range of differential pressure

Range code	Measuring span		Settable range limits
8000 H8000	IDF 2S	8~80kPa	$-80 \leq LRV \leq 80kPa, -80 \leq URV \leq 80kPa$
	IDF 3S	2~80kPa	
40000 H40000	40~400kPa		$-400 \leq LRV \leq 400kPa, -400 \leq URV \leq 400kPa$

Accuracy

Flange diameter	Accuracy
IDF 2S	$\pm 0.5\%$
IDF 3S	$\pm 0.5\%$

Influence of temperature difference

Flange diameter	Influence value	
	Wetted parts temperature difference ($\pm 10^\circ C$ variation)	Temperatere Difference of capillary (1m, $\pm 10^\circ C$ variation)
IDF 2S	$\pm 0.41kPa$	$\pm 0.34kPa$
IDF 3S	$\pm 0.18kPa$	$\pm 0.07kPa$

Wetted parts material

Diaphragm SUS316L

Other wetted parts SUS316L

Filled liquid

Propylene glycol Working temperature range : $-20 \sim 150^\circ C$
Specific gravity : 1.037 (at $25^\circ C$)
(not possible to use under negative pressure)

Liquid contact condition

Vacuum type Liquid contact temperature : -20~150°C
 Filled liquid is same as standard specification
 (Workable pressure is different depending on
 temperature. Use after confirming Fig.2)

Density correction

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

Standard
 installed
 correction table

Oxygen, Nitrogen, Argon, Butane, Carbon
 oxide 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)

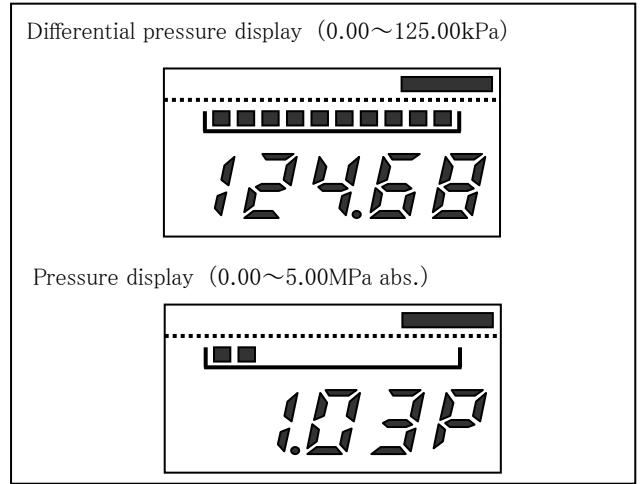
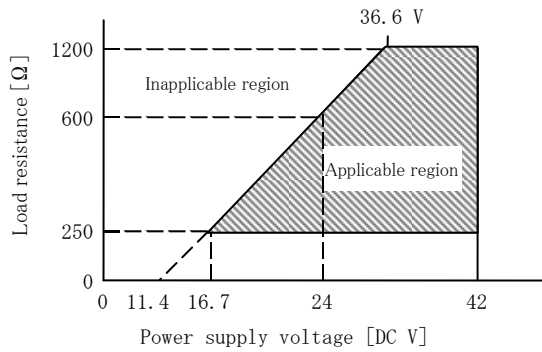


Fig.3 Alternate display of differential pressure and pressure



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

Fig.1 Supply voltage / load resistance
 property of transmitter

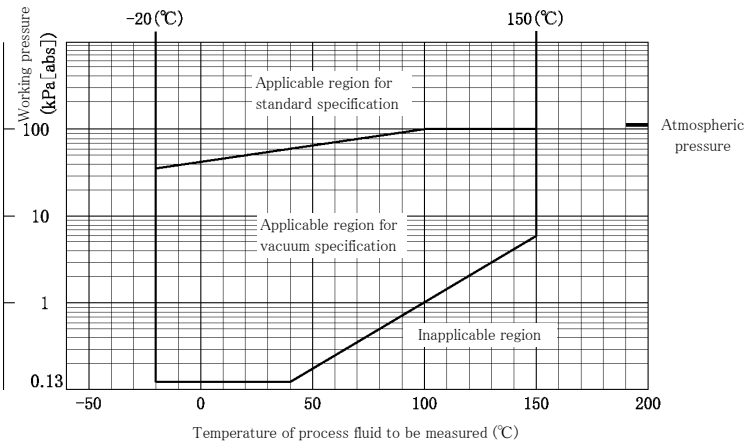
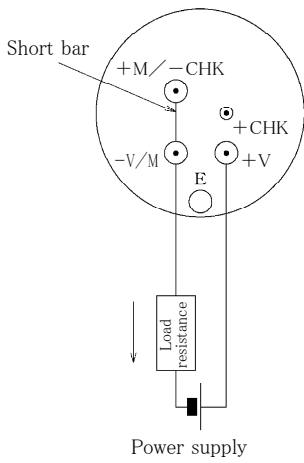


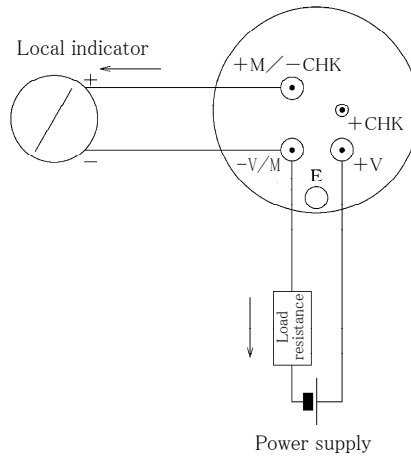
Fig.2 Working pressure and process fluid temperature

EXTERNAL CONNECTION

Without local indicator



With local indicator connected

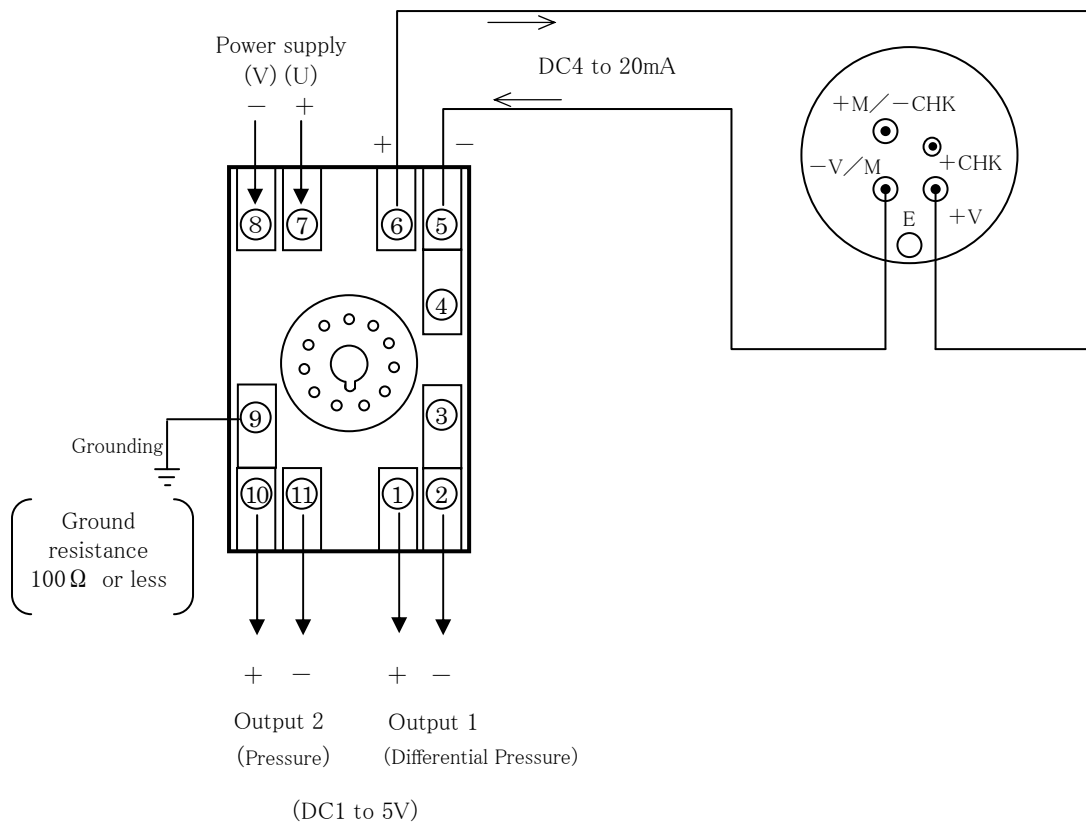


Notes:

- (1) Grounding shall be done according to class D grounding practice (grounding resistance less than $100\ \Omega$)
- (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.

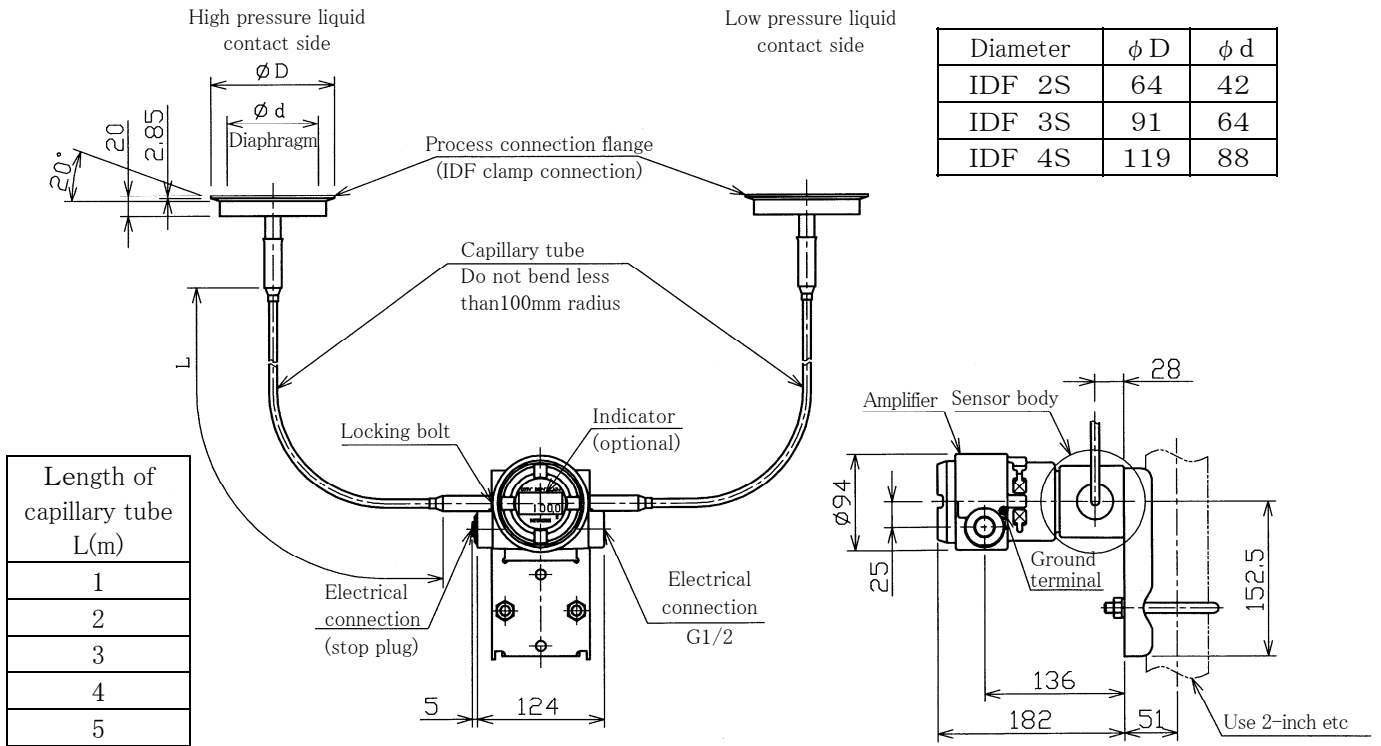
● With EDB500M

Converter : EDB500M type

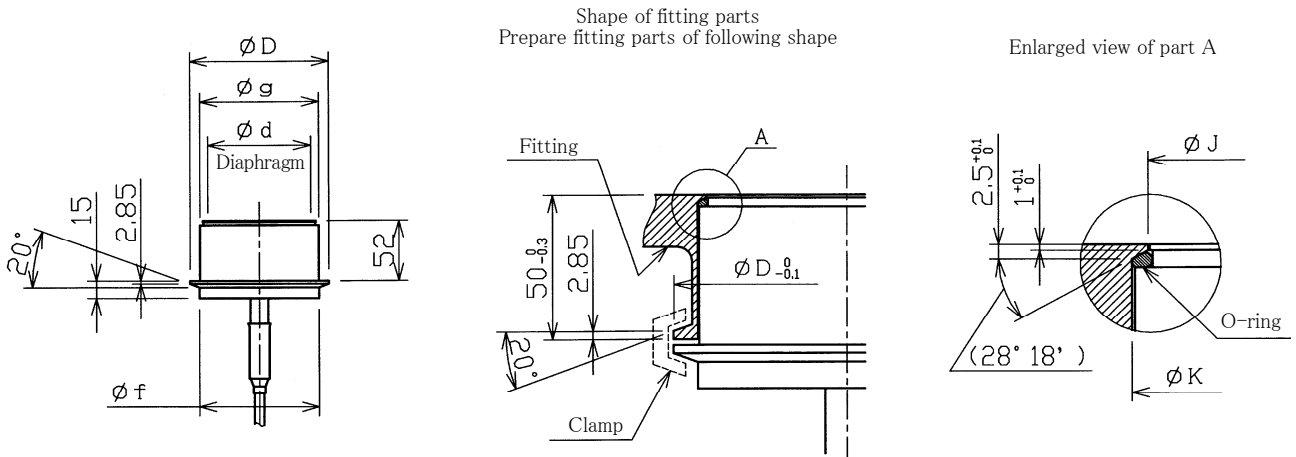


DIMENSIONS (Unit : mm)

● Without extension (E0)



● With extension (E50)



Diameter	ϕD	ϕg	ϕd	ϕf	ϕJ	ϕK	O-ring
IDF 3S	91	76.1	64	76.7	$70.8^{+1.0}_0$	$76.5^{+1.0}_0$	G70
IDF 4S	119	101.6	88	102.5	$96.4^{+1.0}_0$	$102^{+1.0}_0$	G95

CODE TABLES

No. Item	1	5	6	7	2~4,8~11	Description
Model	Range code	Flange standard	Flange extension	capillary length	Option code	
EDR-N7SD						Water-proof, diaphragm material : SUS316L , wetted parts other than diaphragm : SUS316, without indicator.
	8000					
	40000					
	H8000					HART® communication type
	H40000					
	IDF4					IDF 4S clamp connection
		E0				Flange extension length : 0mm
			5			Capillary tube length : 5m
					- <input type="checkbox"/> - <input type="checkbox"/>	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	Certification	XC	TIIS Explosion proof standard approval
		FM	FM explosion proof approval
4	Indicator	M	With Digital indicator
		MJ()	Digital indicator and actual scale display Fill in () with scale and unit mark
5	Flange standard	IDF2	IDF 2S clamp connection
		IDF3	IDF 3S clamp connection
6	Flange extension length	E50	52mm (only 0mm extension length for IDF 2S)
		EZ50	High pressure side extension length : 52mm(only 0mm extension length for IDF2S) Low pressure side extension length : 0mm
7	Capillary tube length	1	1m
		2	2m
		3	3m
		4	4m
8	Material	316L	Diaphragm ; SUS316L, Other wetted parts ; SUS316L
9	Filled liquid	PG	Propylene glycol
10	Process fluid conditions	V	Vacuum type
11	With temperature compensation function	SA	With temperature compensation function for capillary tube

- 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.