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CS
CODE AND SPECIFICATIONS SHEET

Intelligent Sanitary Differential Pressure Transmitter with Remote-Sealed Diaphragm

EDR-N8SD

EDR-N8SD Sanitary Differential Pressure Transmitter incorporates semiconductor sensors and a microcomputer and converts measured differential pressures to 4 to 20mA DC signals with high accuracy.
EDR-N8SD is suitable for measuring flow volume, levels (water levels) and pressures of food processes and uses sanitary silicone oil for the sealed liquid and the propylene glycol can also be selected.
EDR-N8SD, by adopting semiconductor composite sensors, is capable of pressure measurement and communication and output.

STANDARD SPECIFICATIONS

Model EDR-N8SD

Differential pressure range

Range Code	Measuring Span	Settable Range Limits
8000	0.8 to 80kPa	−80≦LRV≦80kPa, −80≦URV≦80kPa
40000	40 to 400kPa	−400≦LRV≦400kPa, −400≦URV≦400kPa

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 signal 4 to 20mA DC

Output signal range 3.6 to 21.6mA DC (−2.5 to 110%)

Power supply voltage 11.4 to 42.0V DC

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

Communication protocol Hitachi communication

Communication line conditions

Power supply voltage: 16.7 to 42.0V DC

Load resistance: 250 to 1.2kΩ

See Fig. 1 for the relationship between power supply voltage and load resistance.

External adjustment / configuration Zero point adjustment (±100% of measured span), LRV and URV adjustment and configuration and damping time constant are configurable (however, only with indicator and when the function is enabled).

Burn-out at error Burn-up, burn-down or no burn-out can be selected. (No burn-out is configured at shipment.)

Accuracy

Range Code	Accuracy	
8000	±0.2% ±[0.1+(0.1×8/X)]%	X is 8kPa or higher X is less than 8kPa
40000	±0.2%	

Note1) Accuracy is the percentage to X. X is the absolute value of URV, LRV or the biggest value of measured span.
X's unit is kPa.
Note2) For square-root output, With zero-cut designation
Output 1.1% or less:
± (linear output accuracy × 45)%
Output 1.1 to 50%:
± (linear output accuracy × 50 / square-root output %) %
Output 50% or higher: Same as linear output
*It is possible to select whether getting the outputs under the zero-cut point zero, or the zero-cut point from an arbitrary straight line or proportional outputs through communication.
Without zero-cut designation
Output 20% or less: Straight line at 0 to 20% point
Output 20% or higher: Same as the above "With zero-cut designation".

Response time

Dead time: 0.15s(Minimum)

Damping time constant (Amplifier time constant): Electrically configurable from 0.1 to 102.4s (at 0.1s step) by using a communicator.

Sensor body time constant:

Range Code	Time constant (at 25℃)	
	Sensor body	Capillary per 1m
8000	Approx. 0.05s	Approx. 0.2s
40000	Approx. 0.03s	Approx. 0.1s

・Response time is the sum of time constants of the Sensor body and damping time constant (amplifier time constant) and dead time.

Storage temperature range -40 to 85℃

Operating humidity range 0 to 100%RH

Operating temperature range

Ambient temperature range: -10 to 60℃

Wetted parts temperature range: -20 to 150℃

Maximum operating pressure 1.0MPa (See Fig. 2 for negative pressure.)

Site vibration Continuous vibration below 29.4m/s^2

Temperature characteristics

Range Code	Temperature characteristics		
8000	Zero shift	±[0.05+(0.5×T/50)]%	X is 32kPa or higher
		±[0.05+(0.35+0.15×32/X)×T/50]%	X is less than 32kPa
	Total shift	±[0.05+(0.8×T/50)]%	X is 32kPa or higher
		±[0.05+(0.65+0.15×32/X)×T/50]%	X is less than 32kPa
40000	Zero shift	±[0.05+(0.5×T/50)]%	X is 160kPa or higher
		±[0.05+(0.35+0.15×160/X)×T/50]%	X is less than 160kPa
	Total shift	±[0.05+(0.8×T /50)]%	X is 160kPa or higher
		±[0.05+(0.65+0.15×160/X)×T/50]%	X is less than 160kPa

Note) Temperature characteristic is the percentage to X.
X is the absolute value of URV, LRV or the biggest value of measured span. X's unit is kPa.
T (℃) is temperature variation width.

Effect of wetted parts temperature difference

Flange aperture	Effect value	
	Wetted parts temperature difference (10℃ varied)	Capillary temperature difference (1m, 10℃ varied)
IDF4S	0.10kPa	0.05kPa

Materials

Diaphragm	SUS316L
Wetted parts other than diaphragm	SUS316
Capillary	SUS316(polyethylene-covered)
Sensor body flange bolt	SCM435
Amplifier case	Aluminum alloy
Mounting plate	SPCC (anti-acid painting)
U-bolt	SUS304

Sealed liquid Silicon oil (Relative density: 0.955, at 25℃)

Process connection IDF4S Clamp connection

Length of protruding part of flange 0mm

Capillary length 5m

Wire connection G1/2

Check terminal Current output (Ampere meter is required for measurement.)

Protection grade JIS C 0920 IP67

Surge absorber Incorporated into the power input circuit
Surge tolerance:1,000A (8/20 μs)
Impact test voltage:15,000V (1.2/50 μs)

Oil prohibition Oil-prohibitive finish

Color Light gray (anti-acid painting)

Weight Approx. 10kg

Mounting Use U-bolts for 50A pipes, etc.

Accessories A set of 50A pipe mounting plate and U-bolts,
External adjustment/configuration magnet

ADDITIONAL SPECIFICATIONS

Communication protocol HART communication

Static pressure measurement (Absolute pressure measurement)

Output form: Composite converter EDB500MA outputs 1 to 5V DC that is displayed with the incorporated indicator.

Measuremrnt span: 0.5 to 5MPa abs.

Accuracy

±0.2%	X is 1MPa or higher
±0.2×(1/X)%	X is less than 1MPa

Temperature characteristics

Zero shift	±〔0.05+(1.0×T/50)〕%	X is 2MPa or higher
	±〔0.05+(0.5+0.5×2/X)×T/50〕%	X is less than 2MPa
Total shift	±〔0.05+(2.5×T/50)〕%	X is 2MPa or higher
	±〔0.05+(2.0+0.5×2/X)×T/50〕%	X is less than 2MPa

Note) Accuracy and temperature characteristics are the percentages to X. X is the absolute value of URV, LRV or the biggest value of measured span. X's unit is MPa.
T (℃) is temperature variation width.

TIIS flameproof, Oil-immersion

Applicable Standard: Exdo II CT4 X Note)
Available for use at Zone1, Zone2 groups of hazardous place.

Note) If the indicator is not equipped, please construct an external alarm indication system by scaling out of the output signal.

Operating temperature range: Ambient temperature range: -20 to 55℃
Sensor body part surface temperature: -20 to 100℃

Wire connection: Please use X-EXRCA pressure proof packing brackets (or EXPC-16B by Shimada Electric Co.,Ltd).

FM explosionproof approval (Arranging)

Applicable Standard: Explosionproof CLI,DIV 1,GPS B,C&D
Dust-ignition proof CL Ⅱ/Ⅲ,GPS E,F&G
Temperature Code T4

Operating temperature range: Ambient temperature range: -40 to 60℃
Wetted parts temperature range: -40 to 120℃

NEPSI explosionproof approval (Arranging)

Applicable Standard: Explosionproof Ex d ⅡC T4

Operating temperature range: Ambient temperature range: -40 to 60℃
Wetted parts temperature range: -40 to 120℃

Indicator

Digital indicator
Indication 5 digits, unit 7 digits, bar graph
Indication items
Individual enable/disable indication of the following items:
Automatic switching when selecting the items
Differential pressure%, Differential pressure value, Actual scale of differential pressure, Static pressure%, Static pressure value
Actual scale
Unit is selected from pressure, flow volume, height or discretionary configuration.
Configuration range: −99,999 to 99,999
Ambient temperature range: −20 to 85℃

Process connection

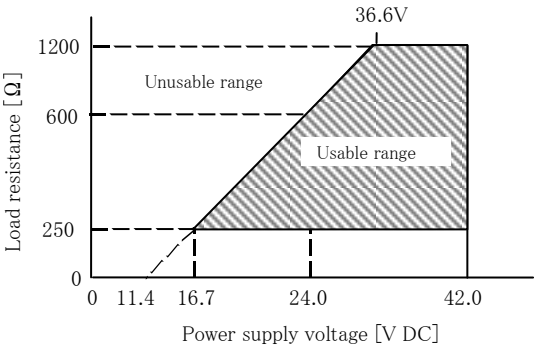
IDF2S, IDF3S Clamp connection

Length of protruding part of flange

52mm (Protruding part length of only 0mm for IDF2F)
(Protruding type can also be created only for high pressure)

Capillary length

1 to 4m (Unit: 1m)



The minimum load resistance of 250Ω is required to communicate by connecting the communicator

Fig. 1 Power supply voltage / load resistance characteristics

Differential pressure range

Range Code	Measuring Span		Configurable Range
8000	IDF2S	8 to 80kPa	−80≦LRV≦80kPa, −80≦URV≦80kPa
	IDF3S	2 to 80kPa	
40000	40 to 400kPa		−400≦LRV≦400kPa, −400≦URV≦400kPa

Accuracy

Flange aperture	Accuracy
IDF2S	±0.5%
IDF3S	±0.5%

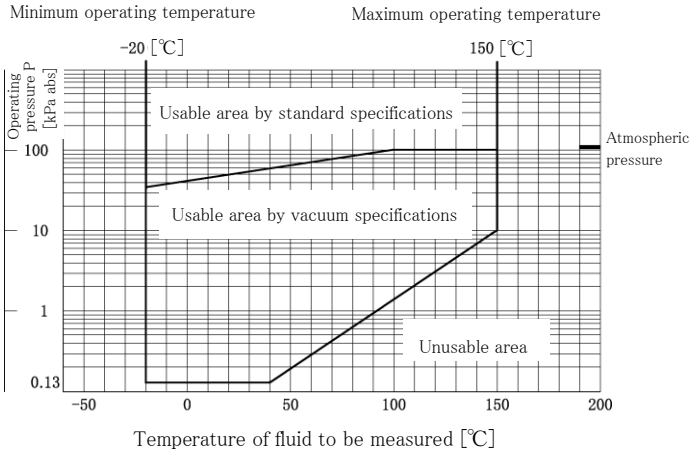


Fig. 2 Operating pressure and wetted parts temperature (Standard / Vacuum type specifications)

Effect of temperature difference

Flange aperture	Effect value	
	Wetted parts temperature difference (10℃ varied)	Capillary temperature difference (1m, 10℃ varied)
IDF2S	0.41kPa	0.34kPa
IDF3S	0.18kPa	0.07kPa

Wetted parts materials

Diaphragm	SUS316L
Other wetted parts	SUS316

Sealed liquid

Propylene glycol	Wetted parts temperature range: −20 to 150℃ Relative density: 1.037 (at 25℃) (Not available for negative pressure.)

Wetted parts condition

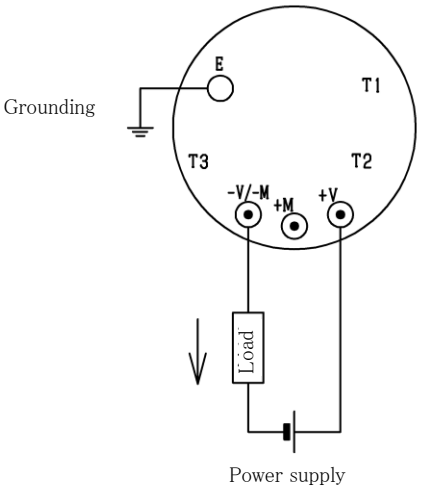
Vacuum type (Code:V)	Wetted parts temperature: −20 to 150℃ Sealed liquid is the same as the standard specifications. (Operable pressure varies depending on the temperature. See Fig. 2 for proper usage.)

Bolt material

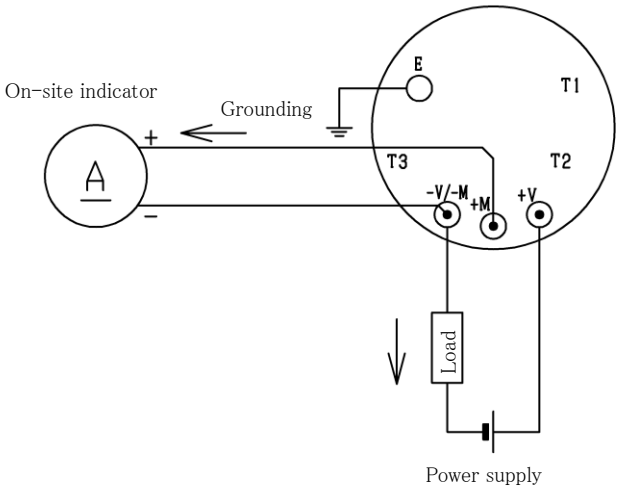
Sensor body flange bolt: SUS304

EXTERNAL CONNECTION DRAWING

Without on-site indicator



Connected with on-site indicator



Note1) Perform Class D grounding work (ground resistance of 100Ω or less) for grounding.

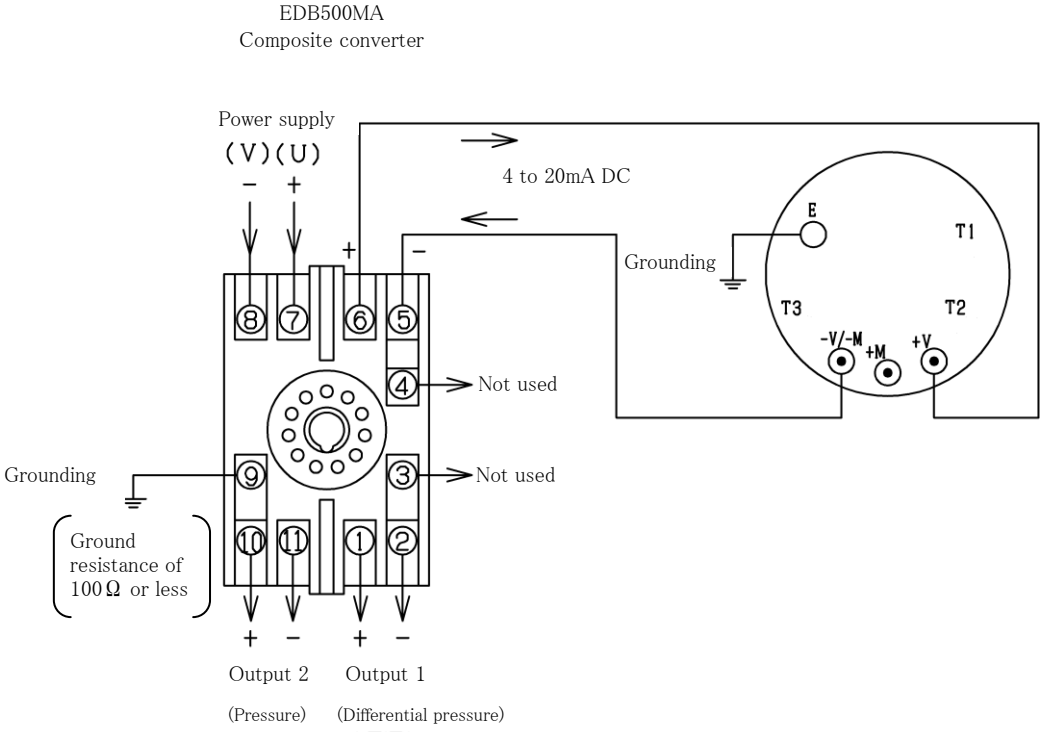
Note2) Ground either the transmitter or the receiving instrument. Be careful not to be dual-grounded.

Note3) Grounding terminals on the transmitter are located inside the terminal box and outside the amplifier case.
You can use either of the groundings.

Note4) T1, T2 and T3 terminals are not connected.

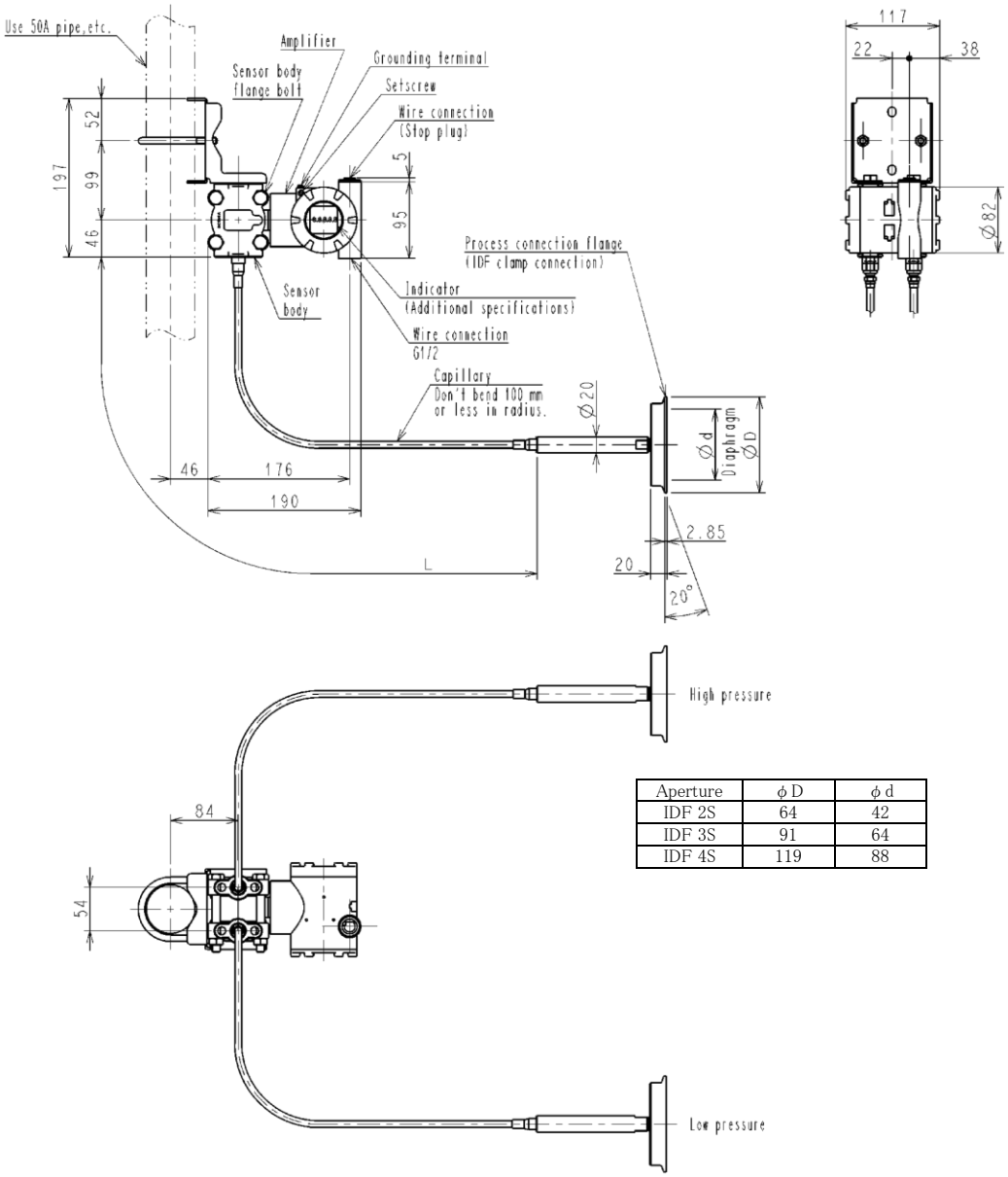
Note5) The resistance value needs to be 20Ω or less including wire resistance to connect an on-site indicator.

Connected with EDB500MA



DIMENSIONS (Unit : mm)

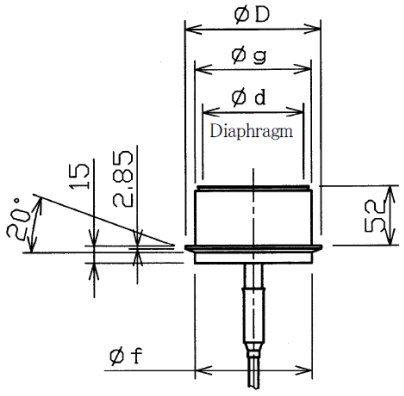
Without protruding part (E0)



Capillary length L(m)
1
2
3
4
5

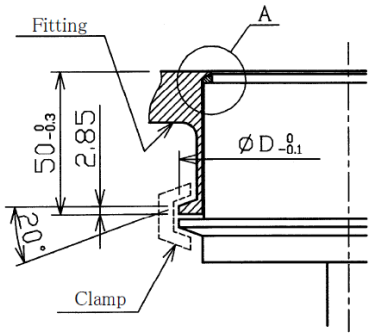
Aperture	ϕ D	ϕ d
IDF 2S	64	42
IDF 3S	91	64
IDF 4S	119	88

With protruding part

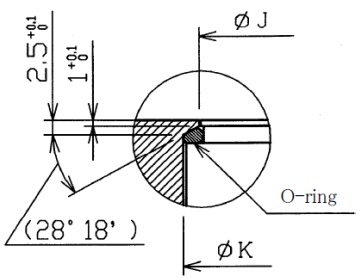


Mounting shape

Please prepare the following shape for the mounting part.



Magnification of part A



Aperture	ϕ D	ϕ g	ϕ d	ϕ f	ϕ J	ϕ K	O-ring
IDF 3S	91	76.1	64	76.7	$70.8^{+0.1}_{0}$	$76.5^{+0.1}_{0}$	G70
IDF 4S	119	101.6	88	102.5	$96.4^{+0.1}_{0}$	$102^{+0.1}_{0}$	G95

CODE TABLES

EDR-N8SD Intelligent Sanitary Differential Pressure Transmitter

Model			
EDR-N8SD			
No.	Item	Code	Remarks
1	Range Code	8000	Measuring span 0.8 to 80kPa
		40000	Measuring span 40 to 40kPa
2	Communication	–	Hitachi communication
		H	HART communication
3	Functional safety	–	None
4	Adjustment range	–	Adjust between 0 and Maximum range
		C( )	Describe adjustment range and unit sign in ( )
5	Certification	–	None
		XC	TIIS flameproof, Oil-immersion
		FM	FM explosionproof approval (Arranging)
		NEPSI	NEPSI explosionproof approval (Arranging)
6	Indicator	–	None
		M	With digital indicator (Indication 0 to 100%)
		MJ( )	With digital indicator, describe indication scale and unit sign in actual scale indication ( )
7	Flange standard	IDF2	IDF2S clamp connection
		IDF3	IDF3S clamp connection
		IDF4	IDF4S clamp connection
8	Protruding part of flange	E0	Protruding part length 0 mm
		E50	Protruding part length 52 mm For aperture 3S, 4S
		EZ50	Protruding part length High pressure 52 mm, Low pressure 0 mm For aperture 3S, 4S
9	Capillary length	1	Capillary length 1 m
		2	Capillary length 2 m
		3	Capillary length 3 m
		4	Capillary length 4 m
		5	Capillary length 5 m
10	Material	–	Diaphragm: SUS316L Wetted parts: SUS316
		316L	Diaphragm: SUS316L Wetted parts: SUS316L
11	Bolt/mounting plate material	–	Sensor body flange bolt: SCM435 Mounting plate: SPCC U-bolt: SUS304
		S304	Sensor body flange bolt: SUS304 Mounting plate: SUS304 U-bolt: SUS304
12	Sealed liquid	–	Sanitary silicone oil
		PG	Propylene glycol
13	Wetted parts conditions	–	Standard
		V	Vacuum type

Example of Code description : EDR-N8SD-8000-XC-M-IDF3-E0-5

●HART® is a registerd trademark of the Field Comm Group.
●Please read the “Instruction Manual” carefully before use.
●Appearance and specifications are subject to change partially for improvement.