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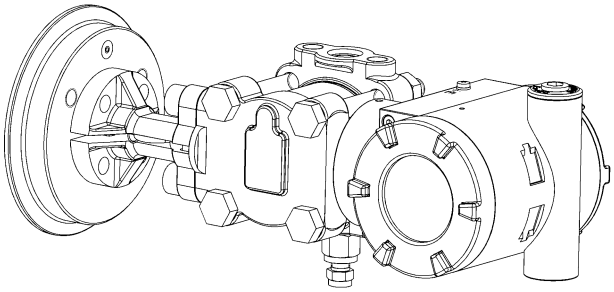
CS
CODE AND SPECIFICATIONS SHEET

Intelligent Sanitary Liquid Level Transmitter

EDR-N8FD



EDR-N8FD Sanitary Liquid Level Transmitter incorporates semiconductor sensors and microcomputer and converts measured differential pressures to 4 to 20mA DC signals with high accuracy. EDR-N8FD is suitable for measuring levels (water levels) and pressures of liquids in food process mainly using the sanitary silicon oil for the sealed liquid. Propylene glycol can be selected also depending on the application.

STANDARD SPECIFICATIONS

Model EDR-N8FD

Differential pressure range

Range Code	Measuring Span	Settable Range Limits
8000	2 to 80kPa	-80≦LRV≦80kPa, -80≦URV≦80kPa
40000	20 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%	X is 8kPa or higher
	±[0.1+(0.1×8/X)]%	X is less than 8kPa
40000	±0.2%	is 40kPa or higher
	±[0.1+(0.1×40/X)]%	is less than 40kPa

Note 1) 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.

Note 2) 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
8000	Approx. 0.05s
40000	Approx. 0.03s

・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 -0 to 60℃

Wetted parts temperature range -0 to 150℃

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

Site vibration Continuous vibration below 29.4 m/s^2

Temperature characteristics

Range Code	Temperature characteristics		
8000	Zero shift	±[0.05+(0.5×T/50)]%	X is 16kPa or higher
		±[0.05+(0.35+0.15×16/X)×T/50]%	X is less than 16kPa
	Total shift	±[0.05+(0.8×T/50)]%	X is 16kPa or higher
		±[0.05+(0.65+0.15×16/X)×T/50]%	X is less than 16kPa
40000	Zero shift	±[0.05+(0.5×T/50)]%	X is 80kPa or higher
		±[0.05+(0.35+0.15×80/X)×T/50]%	X is less than 80kPa
	Total shift	±[0.05+(0.8×T/50)]%	X is 80kPa or higher
		±[0.05+(0.65+0.15×80/X)×T/50]%	X is less than 80kPa

Note) Temperature characteristic is the percentage to the 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.

Wetted parts temperature effect 0.03kPa (10℃ variable)

Materials

Diaphragm	SUS316L
Wetted parts other than diaphragm	SUS316
Sensor body flange bolt	SCM435
Amplifier case	Aluminum alloy

Sealed liquid Sanitary silicone oil
(Relative density: 0.965, at 25℃)

Process connection High pressure: IDF4S clamp connection
Low pressure: Air open

Length of protruding part of flange 0 mm

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 μ s)
Impact test voltage: 15,000V(1.2/50 μ s)

Oil prohibition Oil-prohibitive finish

Color Light gray (anti-acid painting)

Weight Approx. 10kg

Mounting Directly mounted on tank

Accessories External adjustment/configuration magnet

ADDITIONA SPECIFICATIONS

Communication protocol HART communication

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 temperture range	Ambient temperature range: -20 to 55℃ Wetted parts temperature on low pressure side: -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

Differential pressure range

Range Code	Measuring Span		Settable Range Limits
8000	IDF2S	8 to 80kPa	-80≦LRV≦80kPa, -80≦URV≦80kPa
	IDF3S	2 to 80kPa	
40000	IDF2S/3S	40 to 400kPa	-400≦LRV≦400kPa, -400≦URV≦400kPa

Accuracy IDF2S: ±0.5%
IDF3S: ±0.5%

Wetted parts temperature effect (at 10℃) IDF2S: 0.19kPa
IDF3S: 0.05kPa

Wetted parts material

Diaphragm	SUS316L
Wetted parts other than diaphragm	SUS316L

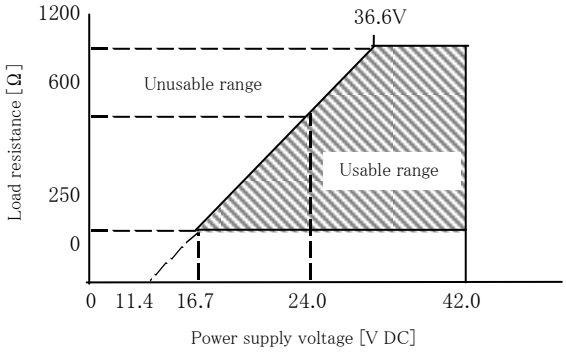
Sealed liquid

Propylene glycol	Wetted parts temperature : -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. (Operation pressure varies depending on the temperature. See Fig. 2 for proper usage.)

Bolt material Sensor body flange bolt: SUS304



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

Fig. 1 Power supply voltage / load resistance characteristics

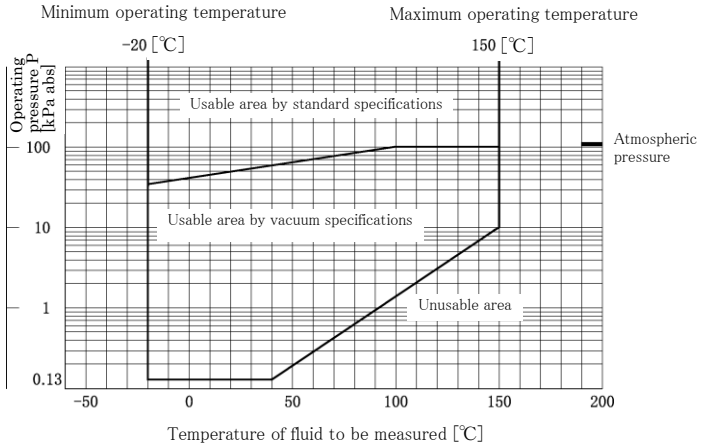
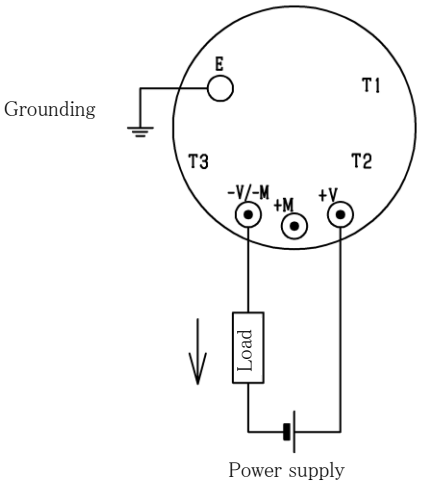


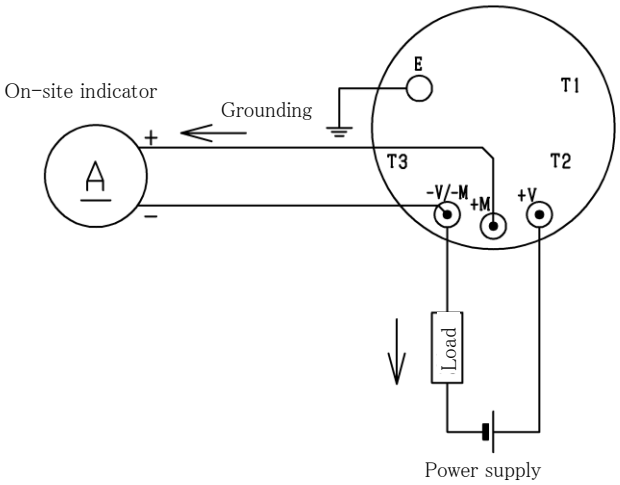
Fig. 2 Operating pressure and wetted parts temperature (Standard and Vacuum specifications)

EXTERNAL CNNECTION 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.

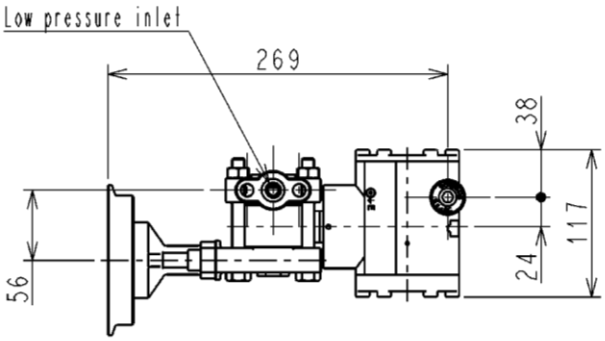
Note3) Grounding terminals on the transmitter are located inside the terminal box and outside the amplifier case. You can use either of the groundings.

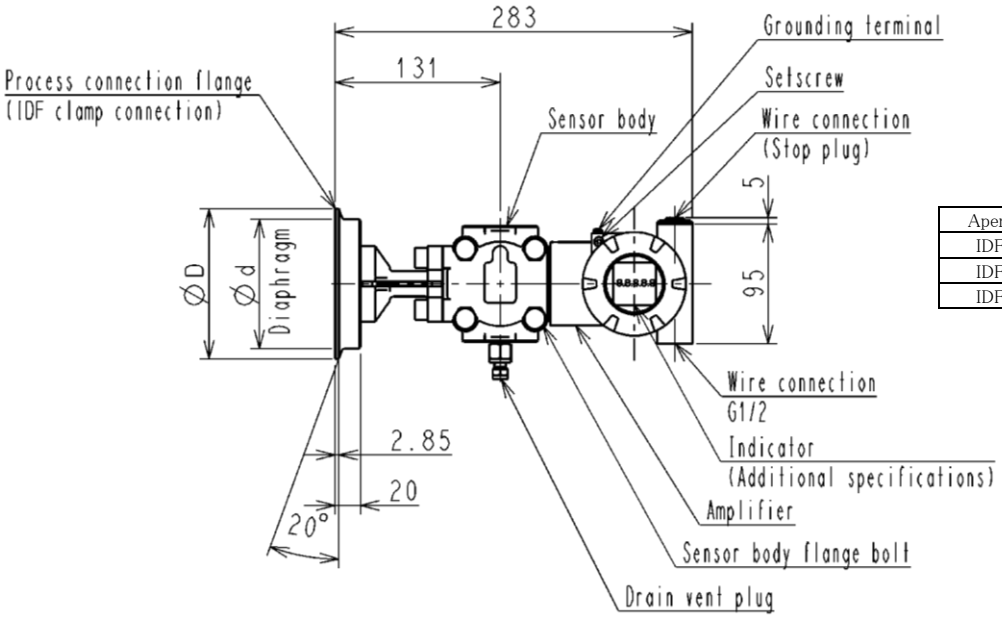
Note4) T1, T2 and T3 terminals are not connected.

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

DIMENSIONS (Unit: mm)

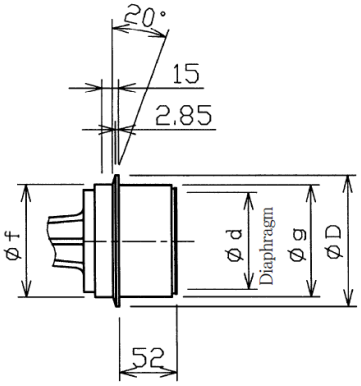
Without protruding part (E0)



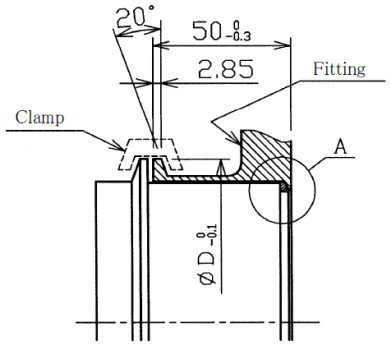


Aperture	ϕD	ϕd
IDF 2S	64	42
IDF 3S	91	64
IDF 4S	119	88

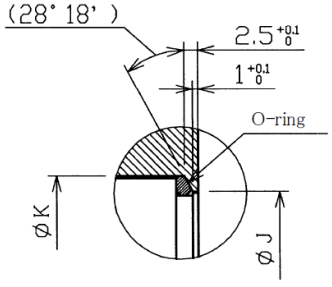
With protruding part



Mounting shape
Please prepare the following shape for the mounting part.



Magnification of part A



Aperture	ϕD	ϕg	ϕd	ϕf	ϕJ	ϕK	O-ring
IDF 2S	64	51	42	51.6	$45.8^{+0.1}_{0}$	$51^{+0.1}_{0}$	G45
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-N8FD Intelligent Sanitary Liquid Level Transmitter

Model			
EDR-N8FD			
No.	Item	Code	Remarks
1	Range Code	8000	Measuring span 2 to 80kPa
		40000	Measuring span 20 to 400kPa
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 flange part	E0	Protrusion part length 0 mm
		E50	Protrusion part length 52 mm for aperture 3S, 4S
9	Material	-	Diaphragm:SUS316L Wetted part:SUS316
		316L	Diaphragm:SUS316L Wetted part:SUS316L
10	Bolt material	-	Sensor body flange bolt :SCM435
		S304	Sensor body flange bolt : SUS304
11	Sealed liquid	-	Sanitary silicone oil
		PG	Propylene glycol
12	Wetted parts conditions	-	Standard
		V	Vacuum type

Example of Code description: EDR-N8FD-8000-XC-M-IDF3-E0

●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.