Hitachi High-Tech
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CODE AND SPECIFICATIONS SHEET

Differential Pressure Transmitter for High Pressure

EDR-N7H

EDR-N7H is intelligent transmitter equipped with semiconductor sensers and micro processors.

STANDARD SPECIFICATIONS

Model EDR-N7H

Differential pressure range

Range Code	Measuring Span	Settable Range Limits
8000 H8000	2 to 80kPa	-80≦LRV≦80kPa, -80≦URV≦80kPa
40000 H40000	20 to 400kPa	-400≦LRV≦400kPa, -400≦URV≦400kPa
100000 H100000	400 to 1000kPa	-1000≦LRV≦1000kPa, -1000≦URV≦1000kPa

Note) URV is the input differential pressure to give 100% (20mA DC) output
LRV is the input differential pressure to give 0% (4mA DC) output

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	±0.2%	X is more than 8kPa
H8000	± [0.05 + (0.15 x 8/X)]%	X is less than 8kPa
40000	± 0.2%	X is more than 40kPa
H40000	± [0.05 + (0.15 x 40/X)]%	X is less than 40kPa
100000 H100000	± 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% : ± (linear output accuracy × 45) %
for output 1.1 to 50% : ± (linear output accuracy × 50/square root output %) %
for output more than 50% : same as linear output
※ Using the 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 to 20%.
for output more than 20%, same as the above case that zero cut is specified.

Zero adjustment Externally adjustable within ± 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℃)	Fixed Electrical Damper Time Constant
8000 H8000	Approx 0.2sec	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 φ1 capillary tube (more than 1m length) is inserted.

Storage temperature limits −40 to 85℃

Operating humidity limits 5 to 100%RH

Operating temperature limits

Ambient temperature limits −20 to 85℃ (See Fig.2)
(−10 to 60℃ for range code 100000)

Wetted parts temperature limits −20 to 120℃
(−10 to −80℃ for range code 100000)

Working pressure limits 44MPa
(not possible to use at negative pressure)

Site vibration Less than 29.4 m/s^2 continuous vibration

Temperature effect (at −20 to 60℃)

Range Code	Temperature Effect		
8000 H8000	Zero shift	±[0.05+(0.3×T/50)]%	X is more than 32kPa
		± [0.05+(0.15+0.15×32/X)×T/50]%	X is less than 32kPa
	Overall shift	±[0.05+(0.55×T/50)]%	X is more than 32kPa
		±[0.05+(0.4+0.15×32/X)×T/50]%	X is less than 32kPa
40000 H40000	Zero shift	±[0.05+(0.3×T/50)]%	X is more than 160kPa
		±[0.05+(0.15+0.15×160/X)×T/50]%	X is less than 160kPa
	Overall shift	±[0.05+(0.55×T/50)]%	X is more than 160kPa
		±[0.05+(0.4+0.15×160/X)×T/50]%	X is less than 160kPa
100000 H100000	Zero shift	±[0.05+(0.3×T/50)] %	
	Overall shift	±[0.05+(0.55×T/50)] %	

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 (℃)

Static pressure effect (at 25℃)

Range Code	Static Pressure Effect		
8000 H8000	Zero shift	±[0.05+(0.15×P/10)] %	X is more than 40kPa
		±[0.05+(0.15×40/X×P/10)] %	X is less than 40kPa
	Overall shift	±[0.05+(1.95+0.15×80/X)×P/10] %	
40000 H40000	Zero shift	±[0.05+(0.15×P/10)] %	X is more than 200kPa
		±[0.05+(0.15×200/X)×P/10] %	X is less than 200kPa
	Overall shift	±[0.05+(1.45+0.15×400/X)×P/10] %	
100000 H100000	Zero shift	±[0.05+(0.15×P/10)] %	X is more than 500kPa
		±[0.05+(0.15×500/X)×P/10] %	X is less than 500kPa
	Overall shift	±[0.05+(1.45+0.15×1000/X)×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 is MPa.

Overpressure effect ±0.5%
(Zero shift) (when applied with maximum working pressure) (at maximum span)

Material

Diaphragm Hastelloy C (Diaphragm material shall be selected considering corrosion resistance, hydrogen permeability, etc)

Wetted parts other than diaphragm SUS316

Amplifier case Aluminium alloy

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

Finish Light gray amplifier case (acid resistant coating)

Weight Approx. 6.1kg

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

Structure

TIIS Ex explosion proof type
Flameproof
Exdo II CT4
Exdo II CT4X
Note) X is for operating condition (as below)
With meter : Abnormality code is displayed on meter to alert winking, so it is no need to build external alarm display system.
Without meter : it is necessary to build external alarm display system, output exceeds 21mA
Ambient temperature limits : −20 to 55℃
Wetted parts temperature limits: −20 to 100℃
Electrical connection
X-RCAC type pressure resistant packing fixture must be used for using pressure resistant oil filled explosion proof type products. (also applicable to use SXBM-16B made by Shimada Electric Co., Ltd.)

FM explosion proof type
Explosion proof CLI,DIV 1,GPS B,C&D
Dust-ignition proof CL Ⅱ/Ⅲ,GPS E,F&G
Temperature Code T4
NEMA 4X
Ambient temperature limits : −40 to 60℃
Wetted parts temperature limits: −40 to 120℃

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. Pressure proof oil filled explosion proof type

Wetted parts matelial

Diaphragm	Wetted Parts
SUS316L	SUS316
SUS316L (with gold plate)	SUS316

※ Material shall be selected considering corrosion resistance. In case hydrogen is present in measuring fluid, it is possible hydrogen transmission can be generated through diaphragm. If corrosion resistance is not so important, we recommend SUS316L or SUS316 with gold plating because hydrogen transmission value of these material is relatively low. (But it is difficult to prevent hydrogen transmission completely even if diaphragm of SUS316L with gold plating is applied).

Wetted parts finish No oil finish or no-oil and no water finish

Process connection Bottom connection Rc1/4 without oval flange

Replace fitting Metal fittings for renewal of old type Hitachi transmitter are supplied

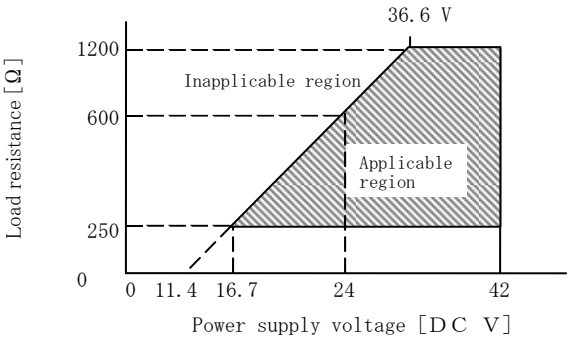
Steam jacket To be attached the sensor body (Steam temperature shall be set to get liquid contact temperature less than 120℃. But less than 100℃ for explosion proof type)

Drain vent plug Thermal insulation type

Density correction Arithmetric 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.)



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

Fig.1 Supply voltage / load resistance property of transmitter

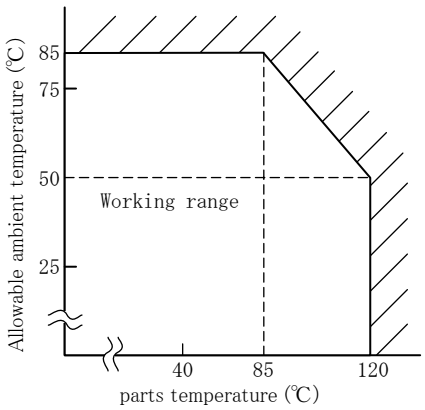
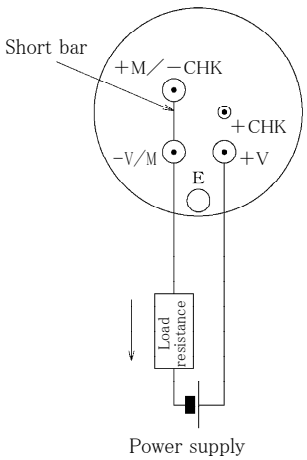


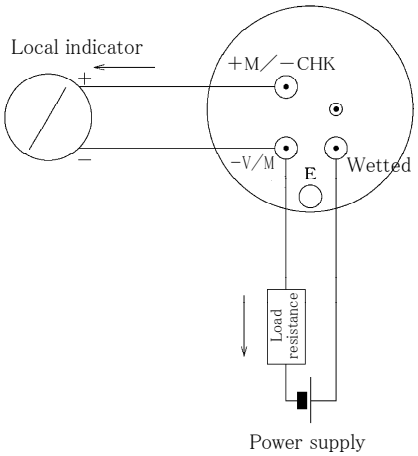
Fig.2 Wetted parts temperature and allowable ambient temperature

EXTERNAL CONNECTION

Without local indicator

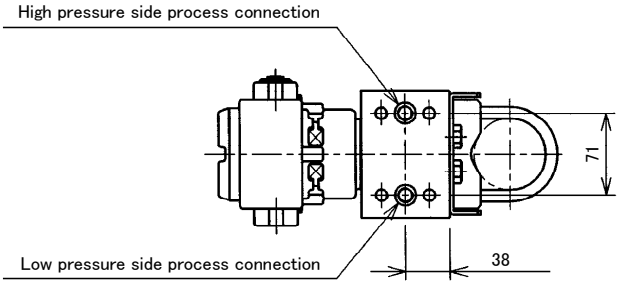


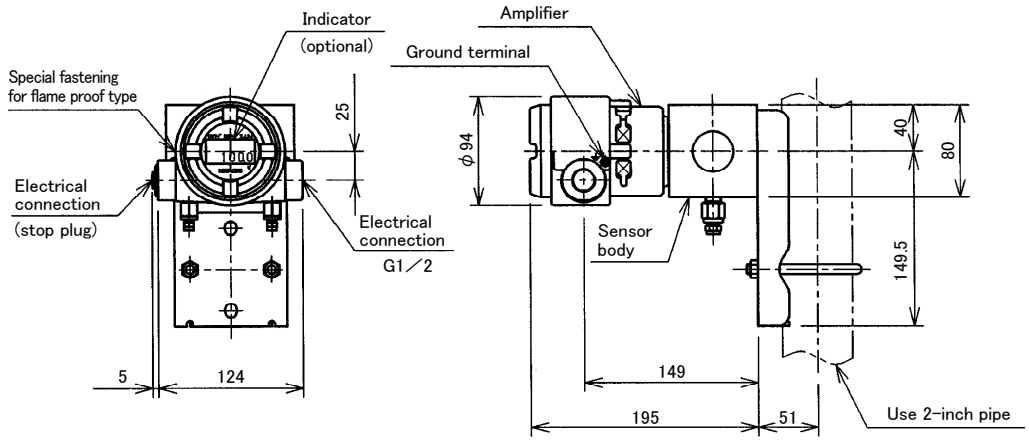
With local indicator connected



Note:
(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.

DIMENSIONS (Unit : mm)





CODE TABLES

No. Item / Model	1 / Renge code	2～10 / Option	Description
EDR-N7H			Water - proof, diaphragm material ; Hastelloy C,
	8000		wetted parts other than diaphragm ; SUS316,
	40000		top process connection Rc1/4 without oval frange,
	100000		U-bolt material, SUS304, without indicator
	H8000		HART® communication type
	H40000		
	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.
3	Certification	XC	TIIS Explosionproof standard approval
		FM	FM explosion proof approval
4	Indicator	M	Digital indicator
		MJ( )	Digital indicator and actual scale display Fill in ( ) with scale and unit mark
5	Wetted parts Material	316L316	Diaphragm ; SUS316L, Wetted parts other than diaphragm ; SUS316
		AU316	Diaphragm ; SUS316L with gold plate, Wetted parts other than diaphragm ; SUS316
6	No - oil	NL	No-oil finish
		NLW	No-oil and dehydrating finish
7	Process connections	B0	Bottom connection Rc1/4(without oval flange)
8	Replacing parts	RD78H( )	MODEL EDR75H/81H/85H
		RD78･360	MODEL EDR-75H,85H
9	Steam jachet	ST	with steam jacket
		STP	with steam jacket, drain/vent plug for winterizing type
		P	Drain/vent plug for winterizing type
10	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.

Note) Please select the material of the diaphragm in consideration of corrosion resistance.
Hastelloy C might generate the hydrogen permeation by the galvanizing steel pipe piping and the water quality, etc., and cause the output shift and the transformation of the diaphragm.
Please select small SUS316L of the hydrogen permeation when there is no problem in corrosion resistance.

●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.

Hitachi High-Tech Solutions Corporation
http://www.hitachi-hitec-solutions.com
24-14, Nishi-Shimbashi 1-chome, Minato-ku, Tokyo 105-8418, JAPAN
Tel: +81-3-3504-7311 Fax: +81-3-3504-7363

Hitachi High-Tech Control Systems Corporation
http://www.hitachi-hitec-hcs.com
500, Miyu-cho, Mito-shi, Ibaraki-ken, 319-0316, JAPAN
Tel: +81-29-257-5100 Fax: +81-29-257-5120