

Model 264DL

ABB 2600T Series Engineered solutions for all applications



Base accuracy : $\pm 0.10\%$

Span limits

– 0.4 to 16kPa; 1.6 to 64inH₂O

Reliable sensing system coupled with very latest digital technologies

Specific design for low pressure

– optimize in-use total performance and stability

Flexible configuration facilities

– provided locally via local keys combined with LCD indicator or via hand held terminal or PC configuration platform

Multiple protocol availability

– provides integration with HART®, PROFIBUS PA and FOUNDATION Fieldbus platforms offering interchangeability and transmitter upgrade capabilities

PED compliance to sound engineering practice (SEP)

General Description

Model 264DL is a specific application transmitter using a differential design for liquid level interface and density measurements, typically for two non mixable liquids (one upon the other) of different specific gravity, in a tank.

The transmitter has a defined structure with two seals:

- one direct mount flanged flush diaphragm seal is on the high pressure side
- one remote seal, selectable wafer or flanged flush diaphragm, is fitted via capability to the low pressure side.

The seals should have the same physical characteristics (size, materials, etc.) for the two sides; these are suitable to interface tank nozzle of 2in/3in to ASME or DN50/DN80 to EN.

Functional Specifications

Range and span limits

Sensor Code	Upper Range Limit (URL)	Lower Range Limit (LRL)	Minimum Span	Compatibility (allowed seal for 264DL) Direct mount and one remote seal (max length in m)
B	4kPa 40mbar 16inH ₂ O	–4kPa –40mbar –16inH ₂ O	0.4kPa 4mbar 1.6inH ₂ O	3in/DN80 wafer or flanged flush diaphragm seal (2)
E	16kPa 160mbar 64inH ₂ O	–16kPa –160mbar –64inH ₂ O	1.6kPa 16mbar 6.4inH ₂ O	2in/DN50 wafer or flanged flush diaphragm seal (2) (•) 3in/DN80 wafer or flanged flush diaphragm seal (4)

Span limits

Maximum span = URL

IT IS RECOMMENDED TO SELECT THE TRANSMITTER SENSOR CODE PROVIDING THE TURNDOWN VALUE AS LOWEST AS POSSIBLE TO OPTIMIZE PERFORMANCE CHARACTERISTICS.

Zero suppression and elevation

Zero and span can be adjusted to any value within the range limits detailed in the table as long as:

- calibrated span \geq minimum span

Damping

Selectable time constant : 0, 0.25, 0.5, 1, 2, 4, 8 or 16s.
This is in addition to sensor response time

Turn on time

Operation within specification in less than 1s with minimum damping.

Insulation resistance

> 100M Ω at 1000VDC (terminals to earth)

Operative limits

Temperature limits °C (°F) :

Ambient (is the operating temperature)

Silicone oil filling: –20°C and +85°C (–4°F and +185°F)

Inert filling: –10°C and +85°C (+14°F and +185°F)

Lower ambient limit for LCD indicators: –20°C (–4°F)

Upper ambient limit for LCD indicators: +70°C (+158°F)

Note : For Hazardous Atmosphere applications see the temperature range specified on the certificate/approval relevant to the aimed type of protection

Process

The following table show characteristics of fill fluids when used in both seal sides of 264DL transmitter.

FILL FLUIDS (APPLICATION)	OPERATING CONDITIONS				SPECIFICATION AT 25° C (77° F)		
	Tmax @ Pabs>of	Pmin mbar abs (psia)	Tmax @ P min	Tmin	Specific gravity	Kinematic Viscosity (cSt)	Thermal expansion (x 10 ⁻³ /° C
Silicone oil-DC200 (General purpose)	150 (302) @ 0.7mbar	0.7 (0.01)	150 (302)	–20 (–4)	0.91	5	1.15
Inert – Galden (Oxygen Service)	100 (212) @ 75mbar	0.7 (0.01)	65 (150)	–10 (+14)	1.82	9	1.1
Inert – Halocarbon (Oxygen Service)	100 (212) @ 16mbar abs	4 (0.06)	70 (158)	–10 (+14)	1.87	6.3	0.864

Storage

Lower limit: –50°C (–58°F); –40°C (–40°F) for LCD indicators

Upper limit: +85°C (+185°F)

Pressure limits

Overpressure limits (without damage to the transmitter)

0.07kPa abs, 0.7mbar abs, 0.01psia (0.135kPa abs, 1.35mbar abs, 1mmHg for inert Galden or 0.4kPa abs, 4mbar abs, 3mmHg for inert Halocarbon) to transmitter sensor limit or flange rating of seal, whichever is less:

- 7MPa, 70bar, 1015psi for sensor code B
- 16MPa, 160bar, 2320psi for sensor code E
- maximum flange pressure rating (see tables below)

Rating/Class to EN 1092-1	Carbon Steel @ 120° C	AISI 316 Stainless Steel @ 20° C
PN16	16bar	16bar
PN40	40bar	40bar

The pressure limit decreases with increasing temperature above 120°C for carbon steel or 20°C for AISI 316 stainless steel, according to EN 1092-1 standards.

Rating/Class to ASME B16.5	Carbon Steel @ 100° F (38° C)	AISI 316 Stainless Steel @ 100° F (38° C)
Class 150	285psi	275psi
Class 300	740psi	720psi

The pressure limit decreases with increasing temperature above 100°F (38°C), according to ASME B16.5 standards.

Static pressure

Transmitters for differential pressure model 264DL operates within specifications between the following limits.

- sensor code B: atmosphere and 7MPa, 70bar, 1015psi
- sensor code E: atmosphere and 16MPa, 160bar, 2320psi

Proof pressure

The transmitter can be exposed without leaking to line pressure of up to 28MPa, 280bar, 4000psi or two times the flange rating of seal, whichever is less.

Meet ANSI/ISA-S 82.03 hydrostatic test requirements and SAMA PMC 27.1.

Environmental limits

Electromagnetic compatibility (EMC)

Comply with EN 61000-6-3 for emission and EN 61000-6-2 for immunity requirements and test;

Radiated electromagnetic immunity level: (according to IEC 1000-4-3, EN61000-4-3)	30V/m
Conducted electromagnetic immunity level : (according to IEC 1000-4-6, EN 61000-4-6)	30V
Surge immunity level (with surge protector): (according to IEC 1000-4-5 EN 61000-4-5)	4kV
Fast transient (Burst) immunity level: (according to IEC 1000-4-4 EN 61000-4-4)	4kV

Pressure equipment directive (PED)

Comply with 97/23/EEC following sound engineering practice (SEP).

Humidity

Relative humidity:	up to 100% annual average
Condensing, icing:	admissible

Vibration resistance

Accelerations up to 2g at frequency up to 1000Hz (according to IEC 60068-2-6)

Shock resistance (according to IEC 60068-2-27)

Acceleration:	50g
Duration:	11ms

Wet and dust-laden atmospheres

The transmitter is dust and sand tight and protected against immersion effects as defined by EN 60529 (1989) to IP 67 (IP 68 on request) or by NEMA to 4X or by JIS to C0920. IP65 with Harting Han connector.

Hazardous atmospheres

With or without output meter/integral display

- COMBINED ATEX (Intrinsic safety and flameproof), FM and CSA ZELM approval. See below detailed classifications.
- COMBINED INTRINSIC SAFETY and FLAMEPROOF/EUROPE: ATEX/ZELM approval
 - II 1 GD T50°C, EEx ia IIC T6 (–40°C ≤ Ta ≤ +40°C)
 - T95°C, EEx ia IIC T4 (–40°C ≤ Ta ≤ +85°C)
 - II 1/2 GD T85°C, EEx d IIC T6 (–40°C ≤ Ta ≤ +75°C)
- INTRINSIC SAFETY/EUROPE: ATEX/ZELM approval
 - II 1 GD T50°C, EEx ia IIC T6 (–40°C ≤ Ta ≤ +40°C)
 - T95°C, EEx ia IIC T4 (–40°C ≤ Ta ≤ +85°C)
- TYPE "N"/EUROPE: ATEX/ZELM type examination (for HART)
 - II 3 GD T50°C, EEx nL IIC T6 (–40°C ≤ Ta ≤ +40°C)
 - T95°C, EEx nL IIC T4 (–40°C ≤ Ta ≤ +85°C)
- FLAMEPROOF/EUROPE: ATEX/CESI approval
 - II 1/2 GD T85°C, EEx d IIC T6 (–40°C ≤ Ta ≤ +75°C)
- CANADIAN STANDARDS ASSOCIATION and FACTORY MUTUAL:
 - Explosionproof: Class I, Div. 1, Groups A, B, C, D
 - Dust ignitionproof : Class II, Div. 1, Groups E, F, G
 - Suitable for : Class II, Div. 2, Groups F, G; Class III, Div. 1, 2
 - Nonincendive: Class I, Div. 2, Groups A, B, C, D
 - Intrinsically safe: Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G
 - AEx ia IIC T6/T4, Zone 0 (FM)
- STANDARDS AUSTRALIA (SAA): TS Approval
 - Intrinsically safe Ex ia IIC T4/T5 (–20°C ≤ Ta ≤ +80°C) only HART
 - No sparking Ex n IIC T4/T6 (–20°C ≤ Ta ≤ +80°C) only HART
 - Flameproof Ex d IIC T4/T6 (–20°C ≤ Ta ≤ +80°C)
 - Dust ignitionproof DIP A21 Ta T6 (–20°C ≤ Ta ≤ +80°C)
- INTRINSIC SAFETY/CHINA NEPSI approval Ex ia IIC T4-T6
- FLAMEPROOF/CHINA NEPSI approval Ex d IIC T6
- GOST (Russia), GOST (Kazakhstan), Inmetro (Brazil) based on ATEX

Electrical Characteristics and Options

HART digital communication and 4 to 20mA output

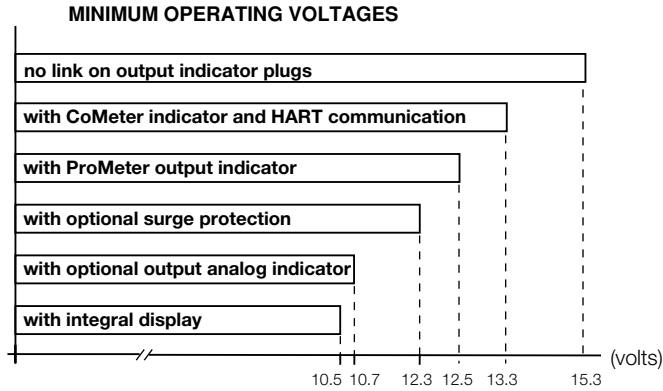
Power Supply

The transmitter operates from 10.5 to 42VDC with no load and is protected against reverse polarity connection (additional load allows operations over 42VDC).

For EEx ia and other intrinsically safe approval power supply must not exceed 30VDC.

Ripple

20mV max on a 250Ω load as per HART specifications



Load limitations

4 to 20mA and HART total loop resistance :

$$R(k\Omega) = \frac{\text{Supply voltage} - \text{min. operating voltage (VDC)}}{22.5}$$

A minimum of 250Ω is required for HART communication.

Optional indicators

Output meter

CoMeter and Prometer LCD :

5-digit (±99999 counts) programmable with 7.6mm. high (3in), 7-segment numeric characters plus sign and digital point for digital indication of output value in percentage, current or engineer unit;

10-segment bargraph display (10% per segment) for analog indication of output in percentage;

7-digit with 6mm. high (2.3in), 14-segment alphanumeric characters, for engineer units and configuration display

Analog : 36mm (1.4in) scale on 90°.

Integral display

LCD, 15 lines x 56 column dot matrix providing 2 lines indication as

- top: 5-digit (numeric) plus sign or 7-digit alphanumeric
- bottom: 7-digit alphanumeric

and additional 50-segment bargraph for indication of analog output in percentage.

User-definable matrix display mode with HART communication:

- process variable in pressure unit or
- output signal as percentage, current or engineering units

Display also indicates in/out transfer function, static pressure, sensor temperature and diagnostic messages and provides configuration facilities.

Optional surge protection

Up to 4kV

- voltage 1.2 μs rise time / 50 μs delay time to half value
- current 8 μs rise time / 20 μs delay time to half value

Output signal

Two-wire 4 to 20mA, user-selectable for linear or square root output, power of $\frac{3}{2}$ or $\frac{5}{2}$, 5th order or two 2nd order switching point selectable programmable polynomial output.

HART® communication provides digital process variable (% , mA or engineering units) superimposed on 4 to 20mA signal, with protocol based on Bell 202 FSK standard.

Output current limits (to NAMUR standard)

Overload condition

- Lower limit: 3.8mA
- Upper limit: 20.5mA

Transmitter failure mode (to NAMUR standard)

The output signal can be user-selected to a value of 3.7 or 22mA on gross transmitter failure condition, detected by self-diagnostics.

In case of CPU failure the output is driven <3.7mA or >22mA.

PROFIBUS PA output

Device type

Pressure transmitter compliant to Profiles 3.0 Class A & B; ident. number 052B HEX.

Power supply

The transmitter operates from 9 to 32VDC, polarity independent.

For EEx ia approval power supply must not exceed 17.5VDC. Intrinsic safety installation according to FISCO model.

Current consumption

operating (quiescent): 10.5mA

fault current limiting: 20mA max.

Output signal

Physical layer in compliance to IEC 1158-2/EN 61158-2 with transmission to Manchester II modulation, at 31.25kbit/sec.

Output interface

PROFIBUS PA communication according to Profibus DP50170 Part 2/ DIN 19245 part 1-3.

Output update time

25ms

Function blocks

2 analog input, 1 transducer, 1 physical

Integral display

LCD, 15 lines x 56 column dot matrix providing 2 lines indication as

– top: 5-digit (numeric) plus sign or 7-digit alphanumeric

– bottom: 7-digit alphanumeric

and additional 50-segment bargraph for indication of output in percentage of the analog input function block assigned to the primary variable.

User-definable matrix display mode:

– process variable in pressure units or

– primary variable in engineering units (output of transducer block) or

– output as percentage or engineering units of analog input function blocks

Display also indicates diagnostic messages and provides configuration facilities.

Secondary variable, static pressure and sensor temperature can be read.

Transmitter failure mode

On gross transmitter failure condition, detected by self-diagnostics, the output signal can be driven to defined conditions, selectable by the user as safe, last valid or calculated value. If electronic failure or short circuit occur the transmitter consumption is electronically limited at a defined value (20mA approx), for safety of the network.

FOUNDATION Fieldbus output

Device type

LINK MASTER DEVICE

Link Active Scheduler (LAS) capability implemented.

Power supply

The transmitter operates from 9 to 32VDC, polarity independent.

For EEx ia approval power supply must not exceed 24VDC (entity certification) or 17.5VDC (FISCO certification), according to FF-816.

Current consumption

operating (quiescent): 10.5mA

fault current limiting: 20mA max.

Output signal

Physical layer in compliance to IEC 1158-2/EN 61158-2 with transmission to Manchester II modulation, at 31.25kbit/sec.

Function blocks/execution period

2 enhanced Analog Input blocks/25ms max (each)

1 enhanced PID block/40ms max.

1 standard ARithmetic block/25ms

1 standard Input Selector block/25ms

1 standard Control Selector block/25ms

1 standard Signal Characterization block/25ms

1 standard Integrator/Totalizer block/25ms

Additional blocks

1 enhanced Resource block

1 custom Pressure with calibration transducer block

1 custom Advanced Diagnostics transducer block including Plugged Input Line Detection

1 custom Local Display transducer block

Number of link objects

35

Number of VCRs

35

Output interface

FOUNDATION fieldbus digital communication protocol to standard H1, compliant to specification V. 1.6; FF registration in progress.

Integral display

LCD, 15 lines x 56 column dot matrix providing 2 lines indication as

– top: 5-digit (numeric) plus sign or 7-digit alphanumeric

– bottom: 7-digit alphanumeric

and additional 50-segment bargraph for percentage indication of the analog input function block output, assigned to the primary variable.

User-definable matrix display mode:

– process variable in pressure units or

– primary variable in engineering units (output of transducer block) or

– output as percentage or engineering units of one or more selected function blocks

Display also indicates diagnostic messages. Secondary variable, static pressure and sensor temperature can be read.

Transmitter failure mode

The output signal is "frozen" to the last valid value on gross transmitter failure condition, detected by self-diagnostics which also indicate a BAD conditions. If electronic failure or short circuit occur the transmitter consumption is electronically limited at a defined value (20mA approx), for safety of the network.

Performance specifications

Stated at reference condition to IEC 60770 ambient temperature of 20°C (68°F), relative humidity of 65%, atmospheric pressure of 1013hPa (1013mbar), mounting position with vertical diaphragm and zero based range for transmitter with isolating diaphragms in AISI 316 L ss or Hastelloy and silicone oil fill and HART digital trim values equal to 4–20mA span end points, in linear mode.

Unless otherwise specified, errors are quoted as % of span.

Some performance data are affected by the actual turndown (TD) as ratio between Upper Range Limit (URL) and calibrated span.

IT IS RECOMMENDED TO SELECT THE TRANSMITTER SENSOR CODE PROVIDING THE TURNDOWN VALUE AS LOWEST AS POSSIBLE TO OPTIMIZE PERFORMANCE CHARACTERISTICS.

Accuracy rating

% of calibrated span, including combined effects of terminal based linearity, hysteresis and repeatability.

For fieldbus versions SPAN refer to analog input function block outscale range

– $\pm 0.10\%$ for TD from 1:1 to 5:1

– $\pm 0.02\% \times \frac{\text{URL}}{\text{Span}}$ for TD from 5:1 to 10:1

Multiply the values by 2 for sensor/seal combination marked (●)

Operating influences

Temperature

per 20K (36°F) ambient temperature change on transmitter sensor between the limits of –20°C to +65°C (–4 to +150°F) and per 20K (36°F) process temperature change on seals diaphragm between the process operating temperature limits

– sensor B with 3in/DN80 seals: 0.01kPa, 0.1mbar, 0.04inH₂O

– sensor E with 2in/DN50 seals: 0.03kPa, 0.3mbar, 0.12inH₂O

– sensor E with 3in/DN80 seals: 0.02kPa, 0.2mbar, 0.08inH₂O

Optional CoMeter and ProMeter ambient temperature

Total reading error per 20K (36°F) change between the ambient limits of –20 and +70°C (–4 and +158°F) :

$\pm 0.15\%$ of max span (16mA).

Static pressure (zero errors can be calibrated out at line pressure)

per 1MPa, 10bar or 145psi.

Sensor code B

– zero error: $\pm 0.15\%$ of URL

– span error: $\pm 0.15\%$ of reading

Sensor code E

– zero error: $\pm 0.08\%$ of URL

– span error: $\pm 0.08\%$ of reading

Multiply by 1.5 the errors for sensor seal combinations marked (●).

Supply voltage

Within voltage/load specified limits the total effect is less than 0.005% of URL per volt.

Load

Within load/voltage specified limits the total effect is negligible.

Electromagnetic field

Total effect : less than 0.10% of span from 20 to 1000MHz and for field strengths up to 30V/m when tested with shielded conduit and grounding, with or without meter.

Common mode interference

No effect from 100Vrms @ 50Hz, or 50VDC

Vibration effect

$\pm 0.10\%$ of URL (according to IEC 61298–3)

Physical Specification

(Refer to ordering information sheets for variant availability related to specific model or versions code)

Materials

Process isolating diaphragms (seals) (*)

AISI 316 L ss; Hastelloy C276™

Fill fluid (seals)

Silicone oil-DC200™, Inert-Galden™ or Inert-Halocarbon™ 4.2.

Bolts and nuts

AISI 316 ss bolts and nuts Class A4–50 per UNI 7323 (ISO 3506), in compliance with NACE MR0175 Class II.

Sensor housing

AISI 316 L ss.

Electronic housing and covers

Barrel version

- Aluminium alloy with baked epoxy finish;
- Copper-free content aluminium alloy with baked epoxy finish;
- AISI 316 L ss.

DIN version

- Aluminium alloy with baked epoxy finish.

Covers O-ring

Buna N.

Local zero and span adjustments:

Glass filled polycarbonate plastic (removable).

Tagging

AISI 316ss data plate attached to the electronics housing.

Calibration

Standard: at maximum span, zero based range, ambient temperature and pressure;

Optional: at specified range and ambient conditions.

Optional extras

Output indicator

plug-in rotatable type, LCD or analog.

Supplemental customer tag

AISI 316 ss tag screwed/fastened to the transmitter for customer's tag data up to a maximum of 20 characters and spaces on one line for tag number and tag name, and up to a maximum of 3 spaced strings of 10 characters each for calibration details (lower and upper values plus unit). Special typing evaluated on request for charges.

Surge protection (only as external unit for PROFIBUS PA and FF)

Test Certificates (test, design, calibration, material traceability)

Tag and manual language

Communication connectors

Process connections

on mounting flange (seal side)

Flush diaphragm flanged seal (**):

2in or 3in ASME 150 to 300 RF

DN50 or DN80 PN16–40 to EN 1092-1 Type B1

Wafer seal (backup flange not supplied)

2in, 3in to ASME

DN50, DN80 to EN

Electrical connections

Two 1/2 – 14 NPT or M20x1.5 or PG 13.5 or 1/2 GK threaded conduit entries, direct on housing.

Special communication connector (on request)

– HART : straight or angle Harting Han connector and one plug.

– FOUNDATION Fieldbus, PROFIBUS PA: M12x1 and 7/8.

Terminal block

HART version: three terminals for signal/external meter wiring up to 2.5mm² (14AWG) and three connection points for test and communication purposes.

Fieldbus versions: two terminals for signal wiring (bus connection) up to 2.5mm² (14AWG)

Grounding

Internal and external 6mm² (10AWG) ground termination points are provided.

Mounting position

Transmitter can be mounted in any position.

Electronics housing may be rotated to any position. A positive stop prevents over travel.

Mass (without options)

9kg to 12kg approx (20 to 27lb) according to specified seal(s) options; add 1.5kg (3.4lb) for AISI housing.

Add 650g (1.5lb) for packing.

Packing

Carton

™ Hastelloy is a Cabot Corporation trademark

™ DC200 is a Dow Corning Corporation trademark

™ Galden is a Montefluos trademark

™ Halocarbon is a Halocarbon Products Co. trademark

(*) Wetted parts of the transmitter.

(**) Bolts and nuts, gasket and mating flange supplied by customer.

Configuration

Transmitter with HART communication and 4 to 20 mA

Standard configuration

Transmitters are factory calibrated to customer's specified range. Calibrated range and tag number are stamped on the tag plate. If a calibration range and tag data are not specified, the transmitter will be supplied with the plate left blank and configured as follows:

Engineering Unit	kPa
4 mA	Zero
20 mA	Upper Range Limit (URL)
Output	Linear
Damping	1 sec.
Transmitter failure mode	Upscale
Software tag (8 characters max)	Blank
Optional LCD indicator/display	0 to 100.0% linear

Any or all the above configurable parameters, including Lower range-value and Upper range-value which must be the same unit of measure, can be easily changed using the HART hand-held communicator or by a PC running the configuration software SMART VISION with DTM for 2600T. The transmitter database is customized with specified flange type and material, O-ring and drain/vent materials and meter code option.

Custom configuration (option)

The following data may be specified in addition to the standard configuration parameters:

Descriptor	16 alphanumeric characters
Message	32 alphanumeric characters
Date	Day, month, year

Transmitter with PROFIBUS PA communication

Transmitters are factory calibrated to customer's specified range. Calibrated range and tag number are stamped on the tag plate. If a calibration range and tag data are not specified, the transmitter will be supplied with the plate left blank and configured as follows:

Measure Profile	Pressure
Engineering Unit	kPa
Output scale 0%	Lower Range Limit (LRL)
Output scale 100%	Upper Range Limit (URL)
Output	Linear
Hi-Hi Limit	Upper Range Limit (URL)
Hi Limit	Upper Range Limit (URL)
Low Limit	Lower Range Limit (LRL)
Low-Low Limit	Lower Range Limit (LRL)
Limits hysteresis	0.5% of output scale
PV filter	0 sec.
Address (settable by local key)	126
Tag	32 alphanumeric characters

Any or all the above configurable parameters, including Lower range-value and Upper range-value which must be the same unit of measure, can be easily changed by a PC running the configuration software SMART VISION with DTM for 2600T.

The transmitter database is customized with specified flange type and material, O-ring and drain/vent materials and meter code option.

Custom configuration (option)

The following data may be specified in addition to the standard configuration parameters:

Descriptor	32 alphanumeric characters
Message	32 alphanumeric characters
Date	Day, month, year

Transmitter with FOUNDATION Fieldbus communication

Transmitters are factory calibrated to customer's specified range. Calibrated range and tag number are stamped on the tag plate. If a calibration range and tag data are not specified, the transmitter will be supplied with the plate left blank and the analog input function block FB1 is configured as follows:

Measure Profile	Pressure
Engineering Unit	kPa
Output scale 0%	Lower Range Limit (LRL)
Output scale 100%	Upper Range Limit (URL)
Output	Linear
Hi-Hi Limit	Upper Range Limit (URL)
Hi Limit :	Upper Range Limit (URL)
Low Limit	Lower Range Limit (LRL)
Low-Low Limit	Lower Range Limit (LRL)
Limits hysteresis	0.5% of output scale
PV filter time	0 sec.
Tag	32 alphanumeric characters

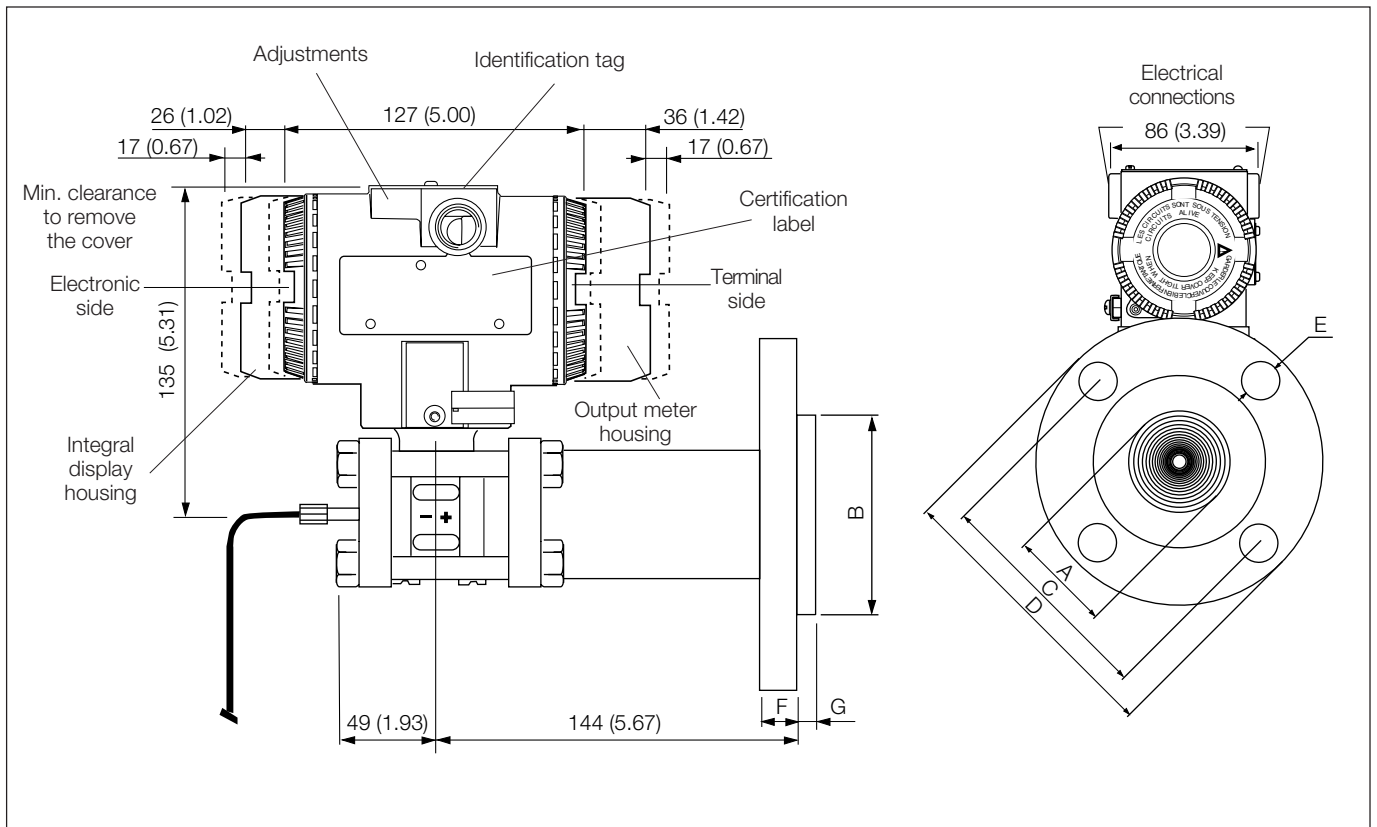
The analog input function block FB2 is configured for the sensor temperature measured in °C. Any or all the above configurable parameters, including the range values, can be changed using any host compliant to FOUNDATION fieldbus. The transmitter database is customized with specified flange type and material, O-ring and drain/vent materials and meter code option.

For any protocol available engineering units of pressure measure are :

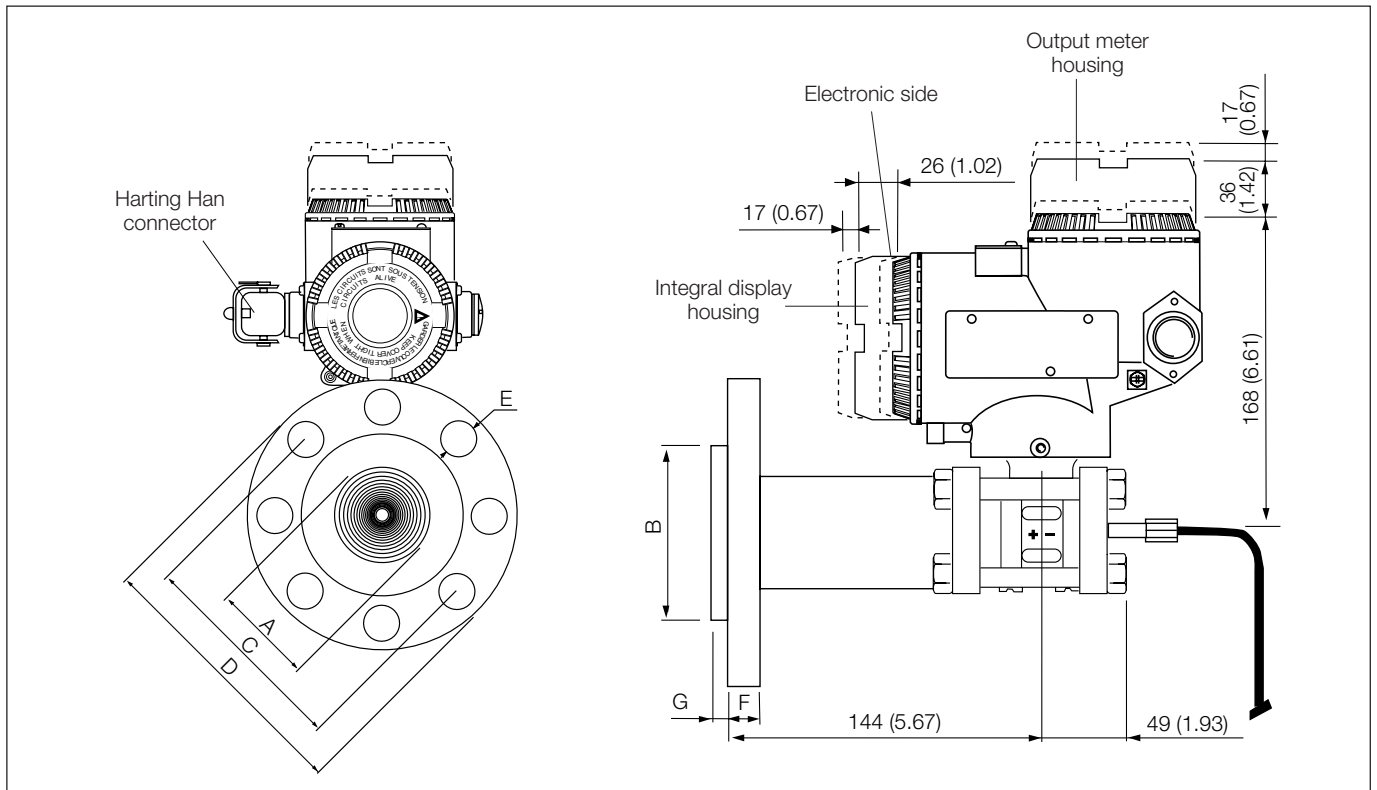
Pa, kPa, MPa
 inH₂O@4°C, mmH₂O@4°C, psi
 inH₂O@20°C, ftH₂O@20°C, mmH₂O@20°C
 inHg, mmHg, Torr
 g/cm², kg/cm², atm
 mbar, bar

MOUNTING DIMENSIONS (not for construction unless certified) - dimensions in mm (in)

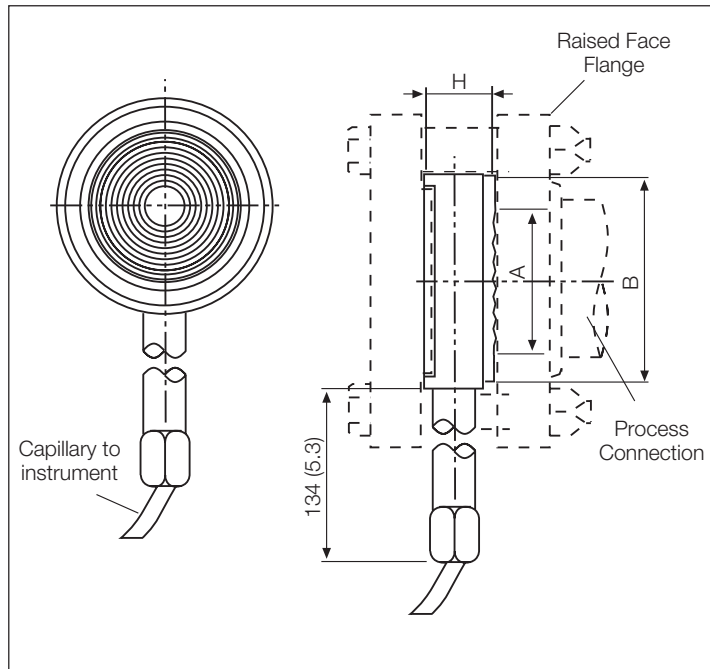
264DL with barrel housing



264DL with DIN housing

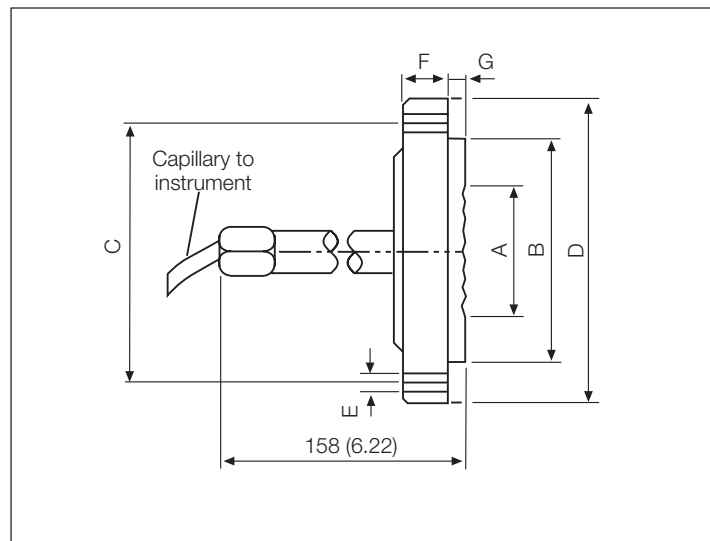


Wafer type seal



Size	DIMENSIONS mm (in)		
	A (dia)	B (dia)	H
2in	60 (2.36)	92.1 (3.62)	23 (0.9)
3in	89 (3.5)	127 (5)	23 (0.9)
DN 50	60 (2.36)	102 (4.02)	23 (0.9)
DN 80	89 (3.5)	138 (5.43)	23 (0.9)

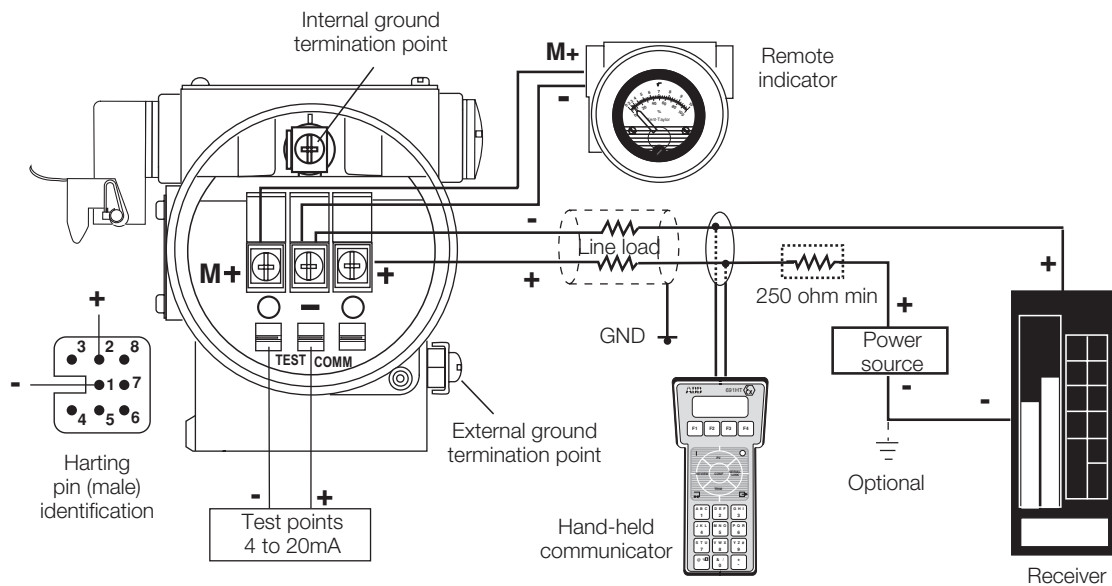
Flanged flush type seal



Size/Rating	Dimensions mm (in)							N° of holes
	A (dia)	B (dia)	C (dia)	D (dia)	E (dia)	F	G	
2in ASME CL 150	60 (2.36)	92.1 (3.62)	120.5 (4.74)	152.5 (6)	20 (0.79)	19.5 (0.77)	9.5 (0.37)	4
2in ASME CL 300	60 (2.36)	92.1 (3.62)	127 (5)	165 (6.5)	20 (0.79)	22.5 (0.88)	9.5 (0.37)	8
3in ASME CL 150	89 (3.5)	127 (5)	152.5 (6)	190.5 (7.5)	20 (0.79)	24 (0.94)	9.5 (0.37)	4
3in ASME CL 300	89 (3.5)	127 (5)	168.5 (6.63)	210 (8.26)	22 (0.86)	28.5 (1.12)	9.5 (0.37)	8
DN50 EN PN16	60 (2.36)	102 (4.02)	125 (4.92)	165 (6.5)	18 (0.71)	20 (0.79)	9.5 (0.37)	4
DN50 EN PN40	60 (2.36)	102 (4.02)	125 (4.92)	165 (6.5)	18 (0.71)	20 (0.79)	9.5 (0.37)	4
DN80 EN PN16	89 (3.5)	138 (5.43)	160 (6.3)	200 (7.87)	18 (0.71)	20 (0.79)	9.5 (0.37)	8
DN80 EN PN40	89 (3.5)	138 (5.43)	160 (6.3)	200 (7.87)	18 (0.71)	24 (0.94)	9.5 (0.37)	8

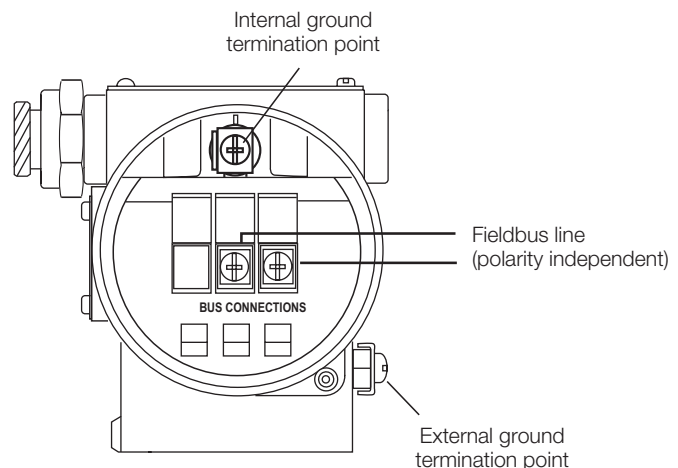
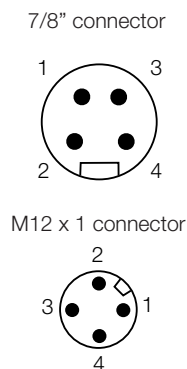
Electrical connections

HART Version



HART hand-held communicator may be connected at any wiring termination point in the loop, providing the minimum resistance is 250 ohm. If this is less than 250 ohm, additional resistance should be added to allow communications

FIELDBUS Versions



PIN (male) IDENTIFICATION		
	FOUNDATION Fieldbus	PROFIBUS PA
1	FF-	PA+
2	FF+	GROUND
3	SHIELD	PA-
4	GROUND	SHIELD

CONNECTOR IS SUPPLIED LOOSE WITHOUT MATING FEMALE PLUG

BASIC ORDERING INFORMATION model 264DL Liquid level interface and density Transmitter

Select one character or set of characters from each category and specify complete catalog number.

Refer to additional ordering information code and specify one or more codes for each transmitter if additional options are required.

BASE MODEL – 1 st to 5 th characters			2	6	4	D	L	X	X	X	X	X	X	X
Liquid level interface and density transmitter – BASE ACCURACY 0.10%														
SENSOR - Span limits – 6 th character								B	E					
0.4 and 4kPa	4 and 40mbar	1.6 and 16inH ₂ O												
1.6 and 16kPa	16 and 160mbar	6.4 and 64inH ₂ O												
HIGH PRESSURE SIDE - Size/Mounting flange rating – 7 th character								A	D	B	E	M	N	L
2in	ASME CL 150													
2in	ASME CL 300													
3in	ASME CL 150													
3in	ASME CL 300													
DN50	EN PN 16/40													
DN80	EN PN 16													
DN80	EN PN 40													
HIGH PRESSURE SIDE – Mounting flange material/Seat form (seal) – 8 th character								A	G	D	L			
Carbon steel	Form RF (raised face)	(Notes 1)												
Carbon steel	EN 1092-1 Type B1	(Notes 2)												
AISI 316 ss	Form RF (raised face)	(Notes 1)												
AISI 316 ss	EN 1092-1 Type B1	(Notes 2)												
High and Low pressure side diaphragm material / Fill fluid (wetted parts) (seals) – 9 th character								S	K	A	F	L	P	
AISI 316 L ss	Silicone oil	(Serrated finish seat)												
Hastelloy C276™	Silicone oil	(Smooth finish seat)												
AISI 316 L ss	Inert fluid - Galden	(Serrated finish seat)				(Note 3)								
Hastelloy C276™	Inert fluid - Galden	(Smooth finish seat)				(Note 3)								
AISI 316 L ss	Inert fluid - Halocarbon	(Serrated finish seat)				(Note 3)								
Hastelloy C276™	Inert fluid - Halocarbon	(Smooth finish seat)				(Note 3)								
Low pressure side seal type and capillary length in m (feet) – 10 th character														
Flanged flush	0.5 (2)												1	
Flanged flush	1 (3)												2	
Flanged flush	1.5 (5)												3	
Flanged flush	2 (7)												4	
Flanged flush	2.5 (8)	(Note 4)											5	
Flanged flush	3 (10)	(Note 4)											6	
Flanged flush	3.5 (12)	(Note 4)											7	
Flanged flush	4 (13)	(Note 4)											8	
Wafer	0.5 (2)												M	
Wafer	1 (3)												N	
Wafer	1.5 (5)												Q	
Wafer	2 (7)												S	
Wafer	2.5 (8)	(Note 4)											T	
Wafer	3 (10)	(Note 4)											U	
Wafer	3.5 (12)	(Note 4)											V	
Wafer	4 (13)	(Note 4)											Z	
Housing material and electrical connection – 11 th character														
Aluminium alloy (Barrel version)	1/2 – 14 NPT												A	
Aluminium alloy (Barrel version)	M20 x 1.5 (CM 20)												B	
Aluminium alloy (Barrel version)	Pg 13.5												D	
Aluminium alloy (Barrel version)	1/2 GK												C	
Aluminium alloy (Barrel version)	Harting Han connector	(general purpose only)								(Note 5)			E	
Aluminium alloy (Barrel version)	Fieldbus connector	(general purpose only)								(Note 5)			G	
Aluminium alloy copper-free (Barrel version)	1/2 – 14 NPT												H	
Aluminium alloy copper-free (Barrel version)	M20 x 1.5 (CM 20)												L	
Aluminium alloy copper-free (Barrel version)	Pg 13.5												N	
Aluminium alloy copper-free (Barrel version)	1/2 GK												M	
Aluminium alloy copper-free (Barrel version)	Harting Han connector	(general purpose only)								(Note 5)			P	
Aluminium alloy copper-free (Barrel version)	Fieldbus connector	(general purpose only)								(Note 5)			R	
AISI 316 L ss (Barrel version)	1/2 – 14 NPT												S	
AISI 316 L ss (Barrel version)	M20 x 1.5 (CM20)												T	
AISI 316 L ss (Barrel version)	Pg 13.5												V	
AISI 316 L ss (Barrel version)	1/2 GK												U	
AISI 316 L ss (Barrel version)	Fieldbus connector	(general purpose only)								(Note 5)			Z	
Aluminium alloy (DIN version)	M20 x 1.5 (CM 20)	(general purpose only)											J	
Aluminium alloy (DIN version)	Pg 13.5	(general purpose only)											Y	
Aluminium alloy (DIN version)	Harting Han connector	(general purpose only)								(Note 5)			K	
Output/Additional options – 12 th character														
HART digital communication and 4 to 20mA	No additional options	(Notes 6, 7)											H	
HART digital communication and 4 to 20mA	Options requested (to be ordered by "Additional ordering code")	(Note 6)											1	
PROFIBUS PA	No additional options	(Notes 6, 7)											P	
PROFIBUS PA	Options requested (to be ordered by "Additional ordering code")	(Note 7)											2	
FOUNDATION Fieldbus	No additional options	(Notes 6, 7)											F	
FOUNDATION Fieldbus	Options requested (to be ordered by "Additional ordering code")	(Note 7)											3	

ADDITIONAL ORDERING INFORMATION for model 264DL

Add one or more 2-digit code(s) after the basic ordering information to select all required options

	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Electrical certification											
ATEX Group II Category 1 GD – Intrinsic Safety EEx ia	E1										
ATEX Group II Category 1/2 GD – Flameproof EEx d	E2										
ATEX Group II Category 3 GD – Type of protection "N" EEx nL design compliance (Note 8)	E3										
Canadian Standard Association (CSA) (only 1/2–14NPT, M20 and Pg 13.5 electrical connection)	E4										
Standards Australia SAA (Not Ex ia and Ex n for PROFIBUS PA and FOUNDATION Fieldbus)	E5										
Factory Mutual (FM) approval (only with 1/2–14NPT, M20 and Pg 13.5 electrical connection)	E6										
Combined ATEX – Intrinsic Safety and Flameproof	E7										
Combined ATEX, FM and CSA (only with 1/2–14NPT, M20 and Pg 13.5 electrical connection) (Note 8)	EN										
NEPSI (China) - Intrinsic Safety Ex ia	EY										
NEPSI (China) - Flameproof Ex d	EZ										
GOST (Russia) EEx ia	W1										
GOST (Russia) EEx d	W2										
GOST (Kazakhstan) EEx ia	W3										
GOST (Kazakhstan) EEx d	W4										
Inmetro (Brazil) EEx ia (Note 8)	W5										
Inmetro (Brazil) EEx d (Note 8)	W6										
Inmetro (Brazil) EEx nL (Note 8)	W7										
Output meter											
ProMeter, Standard calibration (Note 8)	D1										
ProMeter, Special calibration (Note 8)	D2										
Analog output indicator linear 0–100% scale (Note 8)	D3										
Analog output indicator square root 0–10 scale (Note 8)	D4										
Analog output indicator, special graduation (to be specified for linear scale) (Note 8)	D5										
Analog output indicator, special graduation (to be specified for square root scale) (Note 8)	D6										
Programmable signal meter and HART configurator (CoMeter) (Note 8)	D7										
Programmable signal meter and HART configurator (CoMeter – customer configuration) (Note 8)	D8										
Integral LCD											
Digital LCD integral display								L1			
Surge											
Surge/Transient Protector (Internal for HART / 4–20mA)											
Surge/Transient Protector (External supplied loose for PROFIBUS PA and FOUNDATION Fieldbus only suitable with 1/2–14NPT and M20 electrical connection and with ATEX, FM and CSA certifications, no DUST)								S1			
Operating manual											
German									M1		
Italian									M2		
Spanish									M3		
French									M4		
Labels & tag language											
German									T1		
Italian									T2		
Spanish									T3		
French									T4		
Additional tag plate											
Laser printing of tag on stainless steel plate									I2		
Configuration											
Standard – Pressure = inH ₂ O/psi at 20° C; Temperature = deg. F										N2	
Standard – Pressure = inH ₂ O/psi at 4° C; Temperature = deg. F										N3	
Standard – Pressure = inH ₂ O/psi at 20° C; Temperature = deg. C										N4	
Standard – Pressure = inH ₂ O/psi at 4° C; Temperature = deg. C										N5	
Custom										N6	
Certificates											
Inspection certificate EN 10204–3.1 of calibration (9-point)										C1	
Certificate of compliance with the order EN 10204–2.1 of instrument design										C6	
Material traceability											
Certificate of compliance with the order EN 10204–2.1 of process wetted parts										H1	
Inspection certificate EN 10204–3.1 of process wetted parts										H3	
Connector											
Fieldbus 7/8 (Recommended for FOUNDATION Fieldbus) - (supplied loose without mating female plug)									(Notes 7, 9)		U1
Fieldbus M12x1 (Recommended for PROFIBUS PA) - (supplied loose without mating female plug)									(Notes 7, 9)		U2
Harting Han – straight entry									(Notes 6, 9)		U3
Harting Han – angle entry									(Notes 6, 9)		U4

- Note 1: Not available with DIN mounting flange code M, N, L
- Note 2: Not available with ASME mounting flange code A, D, B, E
- Note 3: Suitable for presence of strong oxidizing agent
- Note 4: Not available with 2in or DN50 seals size code A, D, M
- Note 5: Select type in additional ordering code
- Note 6: Not available with Electronic Housing code Z, R, G
- Note 7: Not available with Electronic Housing code P, E, K
- Note 8: Not available with PROFIBUS PA and FF output code 2 or 3
- Note 9: Not available with Electronic housing code U, S, T, V, H, M, L, N, D, C, A, B, J, Y

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™ Halocarbon is a Halocarbon Products Co. trademark

Standard delivery items (can be differently specified by additional ordering code)

- General purpose (no electrical certification)
- No meter/display, no mounting bracket, no surge protection
- English manual and labels
- Configuration with kPa and deg. C units
- No test, inspection or material traceability certificates

THE SELECTION OF SUITABLE WETTED PARTS AND FILLING FLUID FOR COMPATIBILITY WITH THE PROCESS MEDIA IS A CUSTOMER'S RESPONSIBILITY, IF NOT OTHERWISE NOTIFIED BEFORE MANUFACTURING.

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