

FOR LIQUIDS

NIVOPRESS D

HYDROSTATIC LEVEL TRANSMITTERS



3 YEARS WARRANTY @ NIVELCO – WHERE ELSE?

NIVELCO

LEVEL TRANSMITTERS

NIVOPRESS D HYDROSTATIC LEVEL TRANSMITTERS FOR LIQUIDS

MAIN FEATURES

- 0.25% accuracy
- Gauge or absolute pressure transmitter
- Piezoresistive sensor with stainless steel flush diaphragm
- Wide pressure range selection
- Temperature compensation
- HART communication
- Plug-in display
- Wide variety of process connections
- IP 65 protection
- Ex version

APPLICATIONS

- Liquids and masses in tanks and vessels
- Chemicals with dense vapour or gas layers above the surface
- Foaming liquids
- Viscous or corrosive materials



GENERAL DESCRIPTION

NIVOPRESS D hydrostatic level- and pressure transmitters operate in 2-wire systems and convert relative or absolute pressure (input signal) into 4-20 mA (output signal). The piezoresistive sensor measures the hydrostatic pressure and it compares the water head with the actual atmospheric pressure. The sensor is protected by a stainless steel flush diaphragm which transfers the pressure value to the piezoresistive sensor through silicon oil. Intelligent electronics provides on-site programming with SAP-200 plug-in display or remote programming with HART communication. Intrinsically safe (Ex ia approved) models are available for use in hazardous environments. **NIVOPRESS D** hydrostatic gauge pressure transmitters are suitable for level- and pressure measurement tasks in tanks, vessels and pipes especially in food and beverages industry (for example milk and any other food dollops) applications. The flat surface of the diaphragm avoids the risk of material build up and the maximum medium temperature of 125 °C (275 °F) allows proper (CIP) cleaning required by the regular cleaning processes of the food industry and similar hygienic applications.

OPERATION

PRINCIPLE OF LEVEL MEASURING BY HYDROSTATIC PRESSURE:

Providing constant density the level depends on the pressure head.

$$P_{\text{hydr}} = 10^{-5} \rho \cdot g \cdot h$$

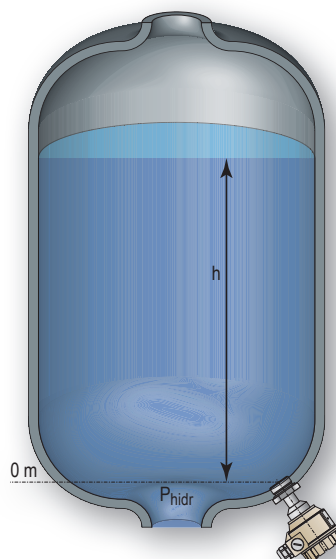
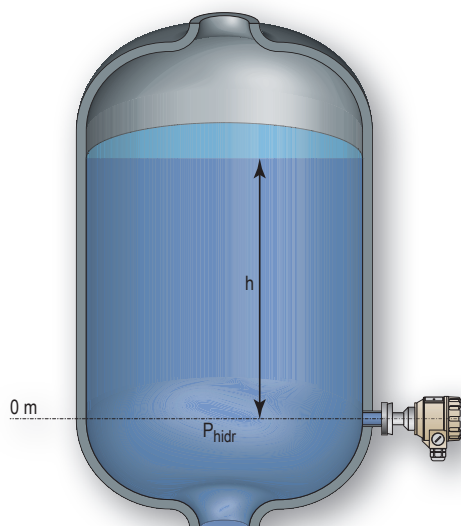
$$\downarrow$$

$$h = 10^5 \frac{P_{\text{hydr}}}{\rho \cdot g}$$

$$\downarrow$$

$$\text{Possible maximum value of „h”: } h_{\text{max}} = 10^5 \frac{P_{\text{hydr.max}}}{\rho \cdot g}$$

P_{hydr} [bar] = hydrostatic pressure
 ρ [kg/m³] = density of the medium
 g [m/s²] = gravitational acceleration
 h [m] = distance between middle of the diaphragm and level of the medium
 $P_{\text{hydr.max}}$ = highest pressure value set in the default



TECHNICAL DATA

Type		NIVOPRESS D-500	NIVOPRESS D-600
Measured process value		level, pressure	
Sensor		Piezoresistive silicium sensor, with stainless steel flush diaphragm	
System		2-wire	
Power supply		10 ... 36 V DC	
Measurement range		-1 ... 400 bar bar g (-14.5 ... 5800 psi g) (as per order codes)	
Overpressure		0.5 ... 600 bar g (7.25 ... 8700 psi g) (as per order codes)	
Downscale rate		≈ 1 : 2	
Zero point offset		50% of the measurement range	
Accuracy (linearity error)		p > 0.4 bar g (5.8 psi g) ±0.25 % p ≤ 0.4 bar (5.8 psi g) ±0.5 %	
Output	Analogue	4–20 mA	
	Display	SAP-203 - 6-digit plug-in LCD display	
	Digital communication	4–20 mA + HART	
Ambient temperature		p < 100 bar g (1450 psi g): 0 °C ... +70 °C (32 °F ... 158 °F)	-30 °C ... +70 °C (-22 °F ... +158 °F), with display: -25 °C ... +70 °C (-13 °F ... +158 °F)
		Ex type: see „Special data for Ex certified models” table	
Range of temperature compensation		p < 100 bar g (1450 psi g): 0 °C ... +70 °C (32 °F ... 158 °F)	p ≤ 0.4 bar g (5.8 psi g): 0 °C ... 50 °C (32 °F ... 122 °F)
Medium temperature		-25 °C ... +125 °C (-13 °F ... 257 °F)	
Material of wetted parts	Protection diaphragm	DIN 1.4435 (316L) stainless steel	
	Process connection		
	Sealing		
Pressure transmitting medium		Silicon oil, on special request: food industry compatible oil	
Housing material		Paint coated aluminium	Plastic (PBT)
Process connection		As per order codes	
Electrical connection		2 x M20x1.5 plastic cable glands, for 6...12 mm (0.25 ... 0.5 inch) cable + 2 x NPT ½ ” internal thread for cable protective pipe terminal block for 0.5...1.5 mm ² (AWG 20 ... AWG 15) wire cross section Ex type: see „Special data for Ex certified models” table	
Electrical protection		Class III.	
Ingress protection		IP 65	
Explosion protection		See „Special data for Ex certified models” table	–
Weight		≈ 2 kg (4.4 lb)	≈ 1.6 kg (3.5 lb)

SPECIAL DATA FOR EX CERTIFIED MODELS

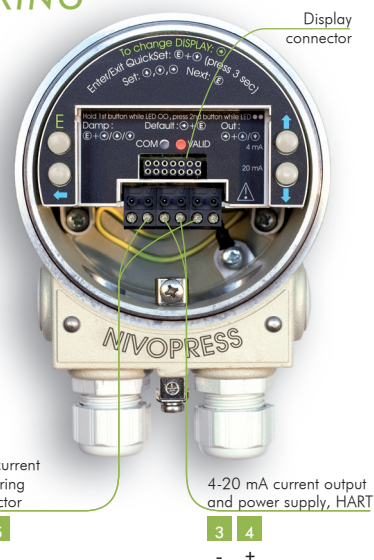
Type	NIVOPRESS D□□-500
Protection type	Intrinsically safe
Ex marking	ATEX Ⓜ II 1G EEx ia IIC T6...T4
Intrinsically safe data	U _{max} = 30 V, I _{max} = 140 mA, P _{max} = 1 W, C _i = 20 nF; L _i = 0.2 mH
Operation temperature range	Without display: -40 °C ... +70 °C (-40 °F ... +158 °F); With display: -25 °C ... +70 °C (-13 °F ... +158 °F)

NIVOPRESS D IN SYSTEM WITH A PC

The instruments with HART output can be connected to a PC using an **UNICOMM HART-USB modem**. Max. 15 normal instruments can be connected to a single HART loop. All measured values can be visualized and/or the instruments can be remote programmed via digital HART communication. Applicable software: **EView2** configuration software or **NIVISION** process visualization software.



WIRING

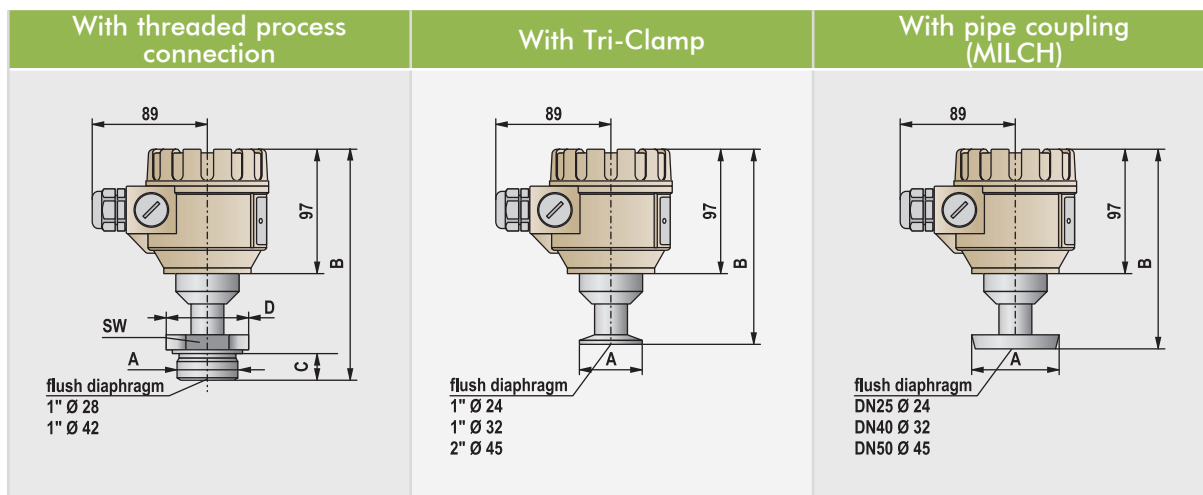


NIVOPRESS D IN HART MULTIDROP LOOP

The **MultiCONT** can handle a max. of 15 normal HART or max 4 Ex-proof HART capable NIVELCO transmitters. The digital (HART) information is processed, displayed and if needed it can be transmitted via RS485 communication line to a PC. Remote programming of the transmitters is also possible. Visualisation on PC can be accomplished with **NIVISION** process visualisation software.



DIMENSIONS



Type	DTC	DTE	DTF	DTS	DTT	Type	DTL	DTM	DTN	Type	DTO	DTP	DTR
A	1/2" BSP	1" BSP	1 1/2" BSP	1" NPT	1 1/2" NPT	Tri-Clamp	1"	1 1/2"	2"	MILCH	DN 25	DN 40	DN 50
B	190	193	185	197	189	A	50,3	50,3	64	A	44	56	68,5
C	15	19	22	26	27	B	183	183	167	B	186	170	166
D	30	50	65	52	70								
SW	27	44	55	40	55								

ORDER CODES (NOT ALL COMBINATIONS AVAILABLE)

NIVOPRESS D hydrostatic level transmitters

NIVOPRESS D ■ ■ ■ - ■ ■ ■ 1- ■ ⁽¹⁾

Version	Code	Process connection	Code	Range (gauge) / Overpressure	Code	Output / Ex	Code
2-wire transmitter	T	1/2" BSP	C ⁽²⁾⁽³⁾	-1 ... 0 bar / 3 bar	0	4-20 mA	2
2-wire transmitter + display	B	1" BSP	E ⁽⁴⁾	0 ... 0.16 bar / 0.5 bar	1 ⁽⁵⁾	4-20 mA + HART	4
		1 1/2" BSP	F	0 ... 0.25 bar / 1 bar	2 ⁽⁵⁾	4-20 mA / EEx ia	6
		1" NPT	S	0 ... 0.4 bar / 1 bar	3 ⁽⁵⁾	4-20 mA + HART / EEx ia	8
		1 1/2" NPT	T	0 ... 0.6 bar / 3 bar	4 ⁽⁵⁾		
		1" Tri-Clamp	L	0 ... 1.0 bar / 3 bar	5 ⁽⁶⁾		
		1 1/2" Tri-Clamp	M	0 ... 1.6 bar / 6 bar	6 ⁽⁶⁾		
		2" Tri-Clamp	N	0 ... 2.5 bar / 6 bar	7		
		DN 25 pipe-coupling	O	0 ... 4.0 bar / 20 bar	8		
		DN 40 pipe-coupling	P	0 ... 6.0 bar / 20 bar	9		
		DN 50 pipe-coupling	R	0 ... 10 bar / 20 bar	A		
				0 ... 16 bar / 60 bar	B		
				0 ... 25 bar / 60 bar	C		
				0 ... 40 bar / 100 bar	D		
				0 ... 60 bar / 120 bar	E		
				0 ... 100 bar / 250 bar	F		
				0 ... 160 bar / 500 bar	G		
				0 ... 250 bar / 500 bar	H		
				0 ... 400 bar / 600 bar	J		

Housing	Code
Aluminium	5
Plastic ⁽²⁾	6

Accessories and auxiliary devices to order	
SAP-203	Plug-in LCD display unit
UNICOMM SAT-304 / SAK-305	USB - HART / RS485 modem
UNICONT PGK-301	Ex isolator power supply module
NIPOWER PPK-331	24V DC power supply
UNICONT PDF-501	Universal loop display
SAS-303	EView2 configuration software

⁽¹⁾ The order code of an Ex version should end in „Ex“
⁽²⁾ Not available in Ex version
⁽³⁾ only for p ≥ 2.5 bar
⁽⁴⁾ only for p ≥ 1 bar
⁽⁵⁾ only with min 1 1/2" connection
⁽⁶⁾ only with min 1" connection

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