

**Thank you for choosing NIVELCO instrument.**  
**We are convinced that you will be satisfied with our product!**

# NIPRESS

□□□-4□□□□  
 PRESSURE TRANSMITTER

User's Manual



## 1. APPLICATION

The NIPRESS D-400 series pressure transmitters measuring pressure and converting it into voltage and current output can be used in 2- and 3-wire systems.

The models' wide choice makes it suitable for most pressure measurement tasks, whether relative or absolute pressure, static or dynamic measurement is required even at high temperatures. The series is available with two different accuracy classes. It is especially suitable for pressure measurement of contaminated mediums and at the bottom (level). Standard pressure transmitting fluid is silicone oil but on request unit with liquid acceptable in the food industry is also available.

The transmitter's design, its overload capability, wide range of temperature, and the possibility to install the unit in any position allow their application in the most different industrial circumstances. Transmitters can be delivered with plug-in display UNICONT PLK-501 enabling on-site reading. Ex or SIL versions are also available.

## 2. TECHNICAL DATA

Type	D□□-4□□□-2, -6, -C, -D	D□□-4□□□-3
Range	-1 – 400 bar (-14.5 – 5800 psi) (according to the order code)	
Overload capability	According to the order code	
Accuracy	±0.5%	
	Optionally (0.4 bar ≤ P <sub>N</sub> ≤ 40 bar): ±0.25%	
Medium temperature	Filling fluid silicone oil: -40 °C ... +125 °C (-40 °F ... +257 °F), High temperature version max. +300 °C (+572 °F)	
	Filling fluid food grade oil: -10 °C ... +125 °C (+14 °F ... +257 °F), High temperature version max. +250 °C (+482 °F), Usage in vacuum max. +150 °C (+302 °F)	
Ambient temperature <sup>(1)</sup>	-40 °C ... +85 °C (-40 °F ... +185 °F)	
	-5 °C ... +70 °C (+23 °F ... +158 °F) (cable outlet without ventilation tube)	
Materials of wetted parts	Sensor	1.4435 stainless steel (diaphragm)
	Sensor sealing	FKM (Viton, max. +200 °C [+392 °F]), Optional: FFKM (recommended for medium temp. > +200 °C [+392 °F] max. 100 bar [1450 psi]), Dairy pipe, Tri-Clamp connection: without seals
	Process connection	Stainless steel: 1.4435 (316 L)
Housing	Stainless steel: 1.4404 (316 L) Optional: Stainless steel: 1.4301 (304)	
Output	4 – 20 mA	0 – 10 V
Power supply (U <sub>Supply</sub> ) <sup>(1)</sup>	8 – 32 V D C	14 – 30 V DC
Load resistance	R <sub>max</sub> = [(U <sub>Supply</sub> - U <sub>Supply min</sub> ) / 0.02 A] Ω	R <sub>min</sub> = 10 kΩ
Process connection	According to the order code	
Electric connection	ISO 4400 connection, M12 x 1 (4-pin), and integral cable version	
Ingress protection	IP65 (ISO4400) / IP67 (M12 x 1) / IP68 (integral cable version)	
Electric protection	SELV Class III	
Mass	~ 0.2 kg (4.4 lbs)	

<sup>(1)</sup> For information of Ex certified devices, see Special data for Ex certified models chart

### SPECIAL DATA FOR EX CERTIFIED MODELS (ONLY FOR 4 – 20 mA / 2-WIRE)

#### ATEX approval, Ex ia

Type	D□□-4□□□-6 Ex	D□□-4□□□-D Ex
Ex marking	Ex II 1G Ex ia IIC T4 Ga, Ex II 1D Ex ia IIIC T 135°C Da	
Ex reference document	drc4612a0600h_09	
Power supply	10 – 28 VDC	
Intrinsically safe data	U <sub>max</sub> = 28 V DC, I <sub>max</sub> = 93 mA, P <sub>max</sub> = 660 mW, C <sub>i</sub> ≈ 0 nF, L <sub>i</sub> ≈ 0 mH The maximum interior capacity between the power supply connections and the metal housing is 27 nF.	
Permissible medium temperature, atmospheric pressure	Zone 0: -20 °C ... +60 °C (-4 °F ... +140 °F), 0.8 bar ≤ p <sub>atm</sub> ≤ 1.1 bar	
	Zone 1, 2: -20 °C ... +70 °C (-4 °F ... +158 °F)	
Connecting cable (in case of the device equipped with integral cable)	Cable capacitance: 160 pF/m, Cable inductivity: 1µH/m	

## 2.2 ORDER CODE (NOT ALL COMBINATIONS POSSIBLE!)

NIPRESS D □ □ □ - 4 □ □ □ - □ \*

Measurement / Temperature	Code	Process connection	Code	Range <sup>(1)</sup> / Nominal pressure (bar)	Code	Range <sup>(1)</sup> / Nominal pressure (bar)	Code	Output / Ex	Code
Relative / +125 °C-ig	R	1/2" BSP <sup>(4)</sup>	B	-1-0 / 5 <sup>(15)</sup>	0	0-6 / 40	A	4-20 mA 2-wire	2
Absolute / +70 °C-ig <sup>(2)</sup>	E	1/2" BSP <sup>(5)</sup>	C	0-0.1 / 0.5	1	0-16 / 80	B	0-10 V 3-wire	3
Relativ / +150 °C-ig	H	M20x1,5 <sup>(4)</sup>	J	0-0.16 / 1	R	0-25 / 80	C	4-20 mA 2-wire /Ex ia	6
high temperature <sup>(3)</sup>		3/4" BSP <sup>(2)</sup>	D	0-0.25 / 1	2	0-40 / 105	D	4-20 mA 2-wire SIL2	C
Relativ / +300 °C-ig	J	1" BSP	E	0-0.4 / 2	3	0-60 / 100	E	4-20 mA 2-wire SIL2 /Ex ia	D
high temperature <sup>(3)</sup>		1" NPT	S	0-0.6 / 5	4	0-100 / 200	F		
		1 1/2" BSP	F	0-1 / 5	5	0-160 / 400	G		
		3/4" Triclamp <sup>(7)</sup>	T	0-1.6 / 10	6	0-250 / 400	H		
		1" Triclamp <sup>(8)</sup>	L	0-2.5 / 10	7	0-400 / 600	J		
		1 1/2" Triclamp <sup>(9)</sup>	M	0-4 / 20	8				
		2" Triclamp <sup>(9)</sup>	N	0-6 / 40	9				
		Dairy pipe DN25 <sup>(6)</sup> <sup>(10)</sup>	O						
		Dairy pipe DN40 <sup>(6)</sup> <sup>(10)</sup>	P						
		Dairy pipe DN50 <sup>(11)</sup> <sup>(10)</sup>	R						
		DN25 / PN40 1.4404 flange <sup>(12)</sup>	I						
		DN50 / PN40 1.4404 flange <sup>(12)</sup>	Q						
		DN80 / PN16 1.4404 flange <sup>(13)</sup>	U						
		DN100 / PN16 1.4404 flange <sup>(13)</sup>	K						
		VARIVENT DN40/50 <sup>(14)</sup>	V						

\* Ex versions are marked "Ex" right after the type designation on the label  
 Ex or SIL versions are available upon special request.

Note:  
 In case of non-standard applications, the sensor type, sealing and housing, as well as the requirement for filling with food compatible oil has to be specified in the order!

<sup>(1)</sup> Custom measuring range, based on prior negotiations.

<sup>(2)</sup> p ≥ 0.6 bar

<sup>(3)</sup> max. 160 bar

<sup>(4)</sup> p > 2.5 bar

<sup>(5)</sup> -1 – 40 bar-ig, max. +125 °C, levélasztó membrán nélkül

<sup>(6)</sup> 0.25 – 40 bar

<sup>(7)</sup> 4 – 8 bar

<sup>(8)</sup> 0.25 – 16 bar

<sup>(9)</sup> p ≤ 16 bar

<sup>(10)</sup> As per DIN 11851

<sup>(11)</sup> 0.25 – 25 bar

<sup>(12)</sup> max. 40 bar

<sup>(13)</sup> max. 16 bar

<sup>(14)</sup> p ≤ 10 bar

<sup>(15)</sup> max. +150 °C

<sup>(16)</sup> 0.4 bar ≤ p ≤ 40 bar

Accuracy	Code
0.25% <sup>(16)</sup>	1
0.5%	2

### 2.3 DIMENSIONS

D□C - 4□□ - □	DH□ - 4□□ - □ DJ□ - 4□□ - □ with cooling element (+300 °C [+572 °F])	DD□ - 4□□ - □	DE□ - 4□□ - □	DF□ - 4□□ - □
<p>* Length may vary depending on the pressure range <math>p_N \geq 1</math> bar</p>	<p>40 bar ≤ <math>p_N</math> ≤ 160 bar</p>	<p><math>p_N \leq 40</math> bar</p>		

D□O-4□□-□ D□P-4□□-□ D□R-4□□-□ Dairy pipe DIN 11851	D□T-4□□-□ D□L-4□□-□ D□M-4□□-□ D□N-4□□-□ Tri-Clamp	D□V - 4□□ - □ Varivent DN40/50	Transmitter + PLK-501-2 Plug-in display						
<b>Type</b>	D□O - ...	D□P - ...	D□R - ...	D□T - ...	D□L - ...	D□M - ...	D□N - ...		
<b>Dimensions</b>	DN 25	DN 40	DN 50	3/4"	1"	1 1/2"	2"		
<b>A [mm]</b>	23	32	45	14	23	32	45		
<b>B [mm]</b>	44	56	68.5	25	50.5	50.5	64		
<b>pN [bar]</b>	≥ 0.25 ≤ 40	≥ 0.25 ≤ 40	≥ 0.25 ≤ 25	≥ 4 ≤ 8	≥ 0.25 ≤ 16	≤ 16	≤ 16		

### 3. INSTALLATION

Due to its small size and weight the transmitter can be directly installed on tanks, pipes, machines, etc. without any mounting aids.

To enable the safe replacement of the instrument during operation the use of closing armature is recommended. A simple ball valve will be suitable for lower pressures and for higher pressures (above 6 bar) a three-way blow-off needle-valve can be suggested.

For measuring hydrostatic pressure for level, the unit should be thread in a stub at the tank wall possibly near to the bottom. Using longer impulse tube its proper sloping for the necessary deaerating and emptying has to be ensured. Measuring low pressures in systems with substantial height difference between the transmitter and place of measurement the hydrostatic pressure of the medium in the impulse pipe should be taken into consideration.

In case of outside installation, the unit should be protected against rain or splash water, because malfunction may occur from a leakage if the connector's screw is improperly tightened (i.e. not appropriate sealing).

#### 3.1 INSTALLATION INSTRUCTION

The measured medium – depending on its type and properties, might be hazardous to the installer. Therefore, the wear of appropriate protective clothing, gloves, and goggles are recommended.

Be careful because the membrane is very vulnerable!

Torque should only be transferred to the hexagonal screw on the instrument body (torque wrench). **The cylindrical housing of the transmitter must not be gripped and tightened with a pipe wrench!**

The plug-in electric connector can be unplugged after releasing and removing its fastening screw. The connection insert can be pushed out by a screw driver from the direction of the screw. Pushing electric cable through the cable gland it can be connected to the relevant points of the connector. Make sure that the cable gland and sealing plate of the connector will be tight.

For the sake of noise suppression, the transmitter housing is grounded. If the grounding of the process is correct no further grounding is needed, otherwise the instrument should be grounded.

#### Installation steps:

Tightening torques:

1/4" BSP: max. 5 Nm; 1/2" BSP max. 10 Nm; 3/4" BSP: max. 15 Nm; 1" BSP: max. 20 Nm; 1 1/2" BSP: max. 25 Nm.

**The specified tightening torques must not be exceeded!**

#### Mounting steps for connections according to DIN 3852:

Do not use any additional sealing material such as Teflon tape! Check if the O-ring is undamaged, it has a flawless and clean surface and seats in the designated groove properly. Screw the device into the corresponding thread by hand, and tighten the parts with a suitable torque wrench.

If your device can be secured with a knurled ring, the pressure transmitter should only be tightened by hand!

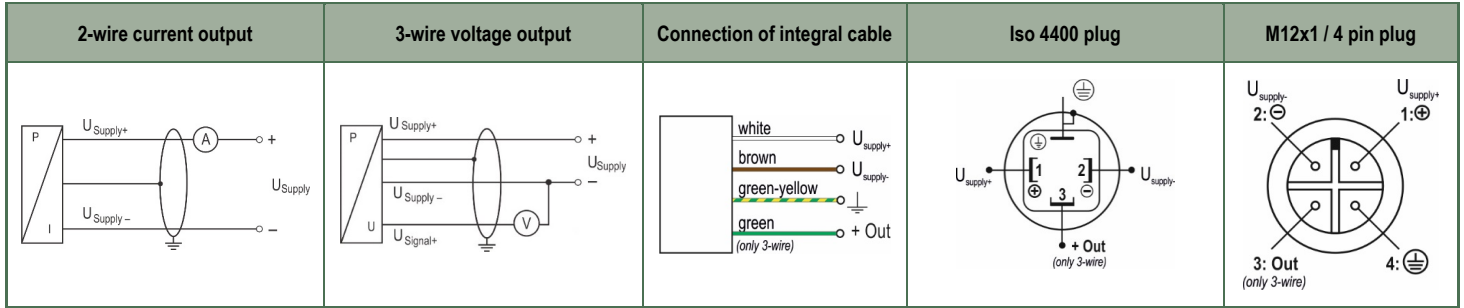
#### Mounting steps for dairy pipe connections (DIN11851):

Check the o-ring is undamaged, it has a flawless and clean surface and seated in the designated groove. Centre the dairy pipe connection in the counterpart. Screw the cup nut onto the mounting part, then tighten it using a suitable wrench.

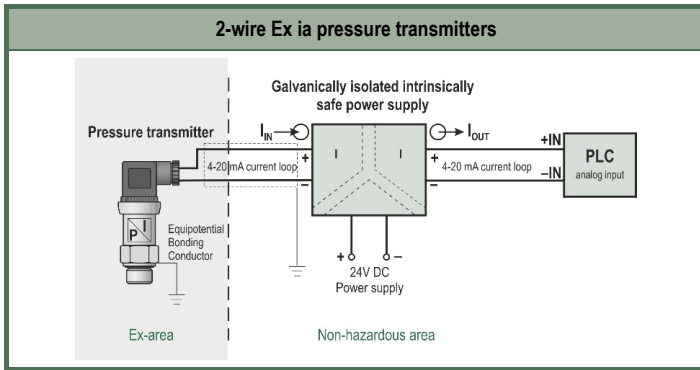
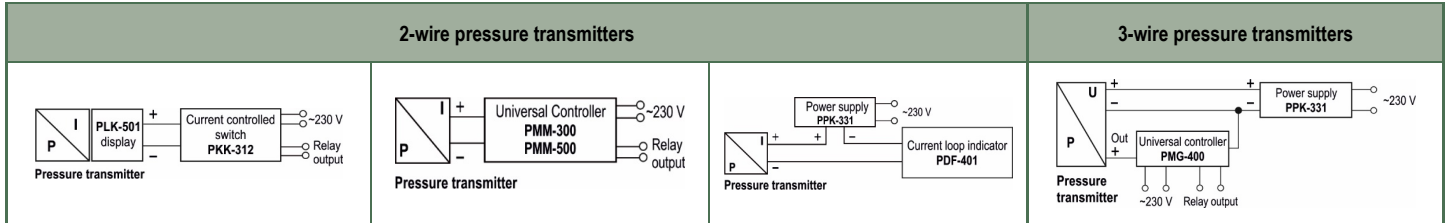
#### Mounting steps for Clamp and Varivent® connections:

Choose a suitable seal for the measured medium and pressure. Place the seal onto the corresponding mounting part. Centre the clamp connection or Varivent® connection above the counterpart with seal, then fasten the device with a suitable fastening element (e. g. half-ring or retractable ring clamp) according to the supplier's instructions.

## 4. WIRING



### 4.1 EXAMPLES OF ARRANGEMENTS



## 5. SPECIAL CONDITIONS OF SAFE USE



- Before turning on the device, make sure the installation is complete, with no defects visible.
- The device may only be used within the limitations specified in the technical specifications.
- The electrical connection of the device must be carried out in a way that the IP20 ingress protection is always ensured!
- Ex ia certified transmitters may only be operated in certified and approved intrinsically safe Ex ia IIC circuits complying with the technical data and the device's explosion protection marking.
- The metal housing of the device must be connected to the EP (equipotential) network!
- **Attention!** The devices may partially contain static charging capable plastic components. The presence of electrostatic charges may cause a risk of spark generation and ignition and therefore electrostatic charges must be completely prevented!
  - Avoid friction on plastic surfaces!
  - Do not clean the device dry!
  - For example, use a wet duster!

## 6. TROUBLESHOOTING

Fault	Possible causes	Fault detection / remedy
No output signal:	The Connection is improper.	Check the connections!
	Broken conductor/wire.	Check all wires with cable tester!
	Defective measuring device (signal input).	Check the ampere meter (and its fuse) and the analogue input of the signal processing unit!
Analog output signal too low:	Load resistance too high.	Check the value of the load resistance!
	Defective energy supply.	Check the power supply and power / current on the transducer / transmitter!
Slight shift of the output signal:	The diaphragm of the sensor is severely contaminated.	Cleaning with non-aggressive cleaning solutions, soft brush or sponge.
	The diaphragm of the sensor is calcified or crusted.	It is recommended to clean the device carefully to ensure all the dirt is completely removed.
Large shift of the output signal:	The diaphragm of the sensor is damaged (caused by overpressure or mechanically).	Check the diaphragm of the sensor, if it is damaged send the device back to the manufacturer!

## 7. MAINTENANCE AND REPAIR

The instrument does not require regular maintenance. The repair should only be carried out at NIVELCO's premises.

When disconnecting the device, it must always be done in depressurized and disconnected state! Drain the medium before disconnecting the device.

If necessary, clean the diaphragm carefully with non-aggressive cleaning solution, soft paint-brush or sponge. Improper cleaning may cause the irreparable damage of the diaphragm. For this reason, never use sharp objects or pressurized air for cleaning the diaphragm.

Before returning your device for repair, it has to be cleaned carefully, neutralize/decontaminate the parts wet from the medium might contain harmful substances. Our appropriate form ([Returned Equipment Handling Form](#)) must be enclosed after downloaded from our homepage [www.nivelco.com](http://www.nivelco.com). You should dispatch the device with a declaration of decontamination. In the declaration, you have to provide a statement that the decontamination process is completed, and, the device is clean and free from harmful material and there is no hazardous substance on it.

## 8. STORAGE CONDITIONS

Storage temperature: -40 °C ... +100 °C (-40 °F ... +212 °F)

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NIVELCO reserves the right to change technical data without notice!