

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

# NIPRESS

D□□-3□□-□  
 PRESSURE TRANSMITTER

User's manual



NIVELCO

## 1. APPLICATION

The **NIPRESS D-300** series pressure transmitter measures pressure and converts it into voltage or current. It can be used in 2- and 3-wire systems. The models' wide choice makes it suitable for many pressure measurement tasks, especially for use in hydraulic applications with relative or absolute pressure, static or dynamic measurement is required. Two different accuracy classes are available. The transmitter's design, the wide temperature range, high overload capability, and the possibility of installing the unit in any position allow their application in many 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□□-3□□-2, -6, -C, -D	D□□-3□□-3
Measurement range		-1...600 bar (0...8700 psi) (according to the order code)	
Overload capability		According to the order code	
Accuracy		$P_N \geq 0.4$ bar: $\pm 0.25\%$ , $\pm 0.5\%$ , Optional: $\pm 0.1\%$ , $\pm 0.2\%$	
Medium temperature		-40...+125 °C (-40...+257 °F)	
Ambient temperature <sup>(1)</sup>		-40...+85 °C (-40...+185 °F) (with integral cable: -5...+70 °C [-40...+158 °F])	
Materials of the wetted parts	Sensor:	1.4435 stainless steel (internal membrane)	
	Sensor sealing:	FKM (Viton), EPDM ( $P_N \leq 160$ bar) ( $P_N \leq 2320$ psi)	
	Process conn.:	1.4404 (316L) stainless steel	
Housing		1.4404 (316L) stainless steel Optional: 1.4301 (304) stainless steel	
Output		4...20 mA	0...10 V
Power supply ( $U_{Supply}$ ) <sup>(1)</sup>		8...32 V DC SIL version: 14...28 V DC	14...30 V DC
Load resistance		$R_{max} = (U_{Supply} - U_{Supply min.})/0.02$ A [Ω]	$R_{min} = 10$ kΩ
Process connection		According to the order code	
Electrical connection		ISO 4400, M12x1 / 4, integral cable	
Ingress protection		IP65 (ISO 4400) / IP67 (M12x1) / IP68 (integral cable)	
Shock-hazard protection		Class III (SELV)	
Mass		~0.2 kg (~0.44 lb)	

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

Manufacturer:

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

Type	D□□-3□□-6Ex, D□□-3□□-DEx
Ex marking	II 1G Ex ia IIC T4 Ga,  II 1D Ex ia IIIC T135°C Da
Ex reference document	drc3612a0600h_07
Power supply	10...28 V DC
Intrinsically safe data	$U_{max} = 28$ V DC, $I_{max} = 93$ mA, $P_{max} = 660$ mW, $C_i \approx 0$ nF, $L_i \approx 0$ μH The supply connections have an inner capacity of max. 27 nF to the housing.
Permissible medium temperature, atmospheric pressure	Zone 0: -20...+60 °C; $0.8 \text{ bar} \leq P_{ATM} \leq 1.1$ bar Zone 1, 2: -20...+70 °C
Connecting cable (in case of the device equipped with integral cable)	Cable capacitance: 160 pF/m Cable inductivity: 1 μH/m

### 2.1 ACCESSORIES

- User's manual
- Warranty Card
- EU Declaration of Conformity

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

NIPRESS      D □ □ - 3 □ □ - □ \*

Measuring method	Code
Relative	R
Absolute <sup>(2)</sup>	E

Process connection	Code
1/4" BSP	A
1/2" BSP	C
1/4" NPT <sup>(3)</sup>	G
1/2" NPT	H
M20x1.5	J

Range <sup>(1)</sup> / Nominal pressure (bar)	Code
-1...0 / 5	0
0...0.1 / 0.5	1
0...0.16 / 1	R
0...0.25 / 1	2
0...0.4 / 2	3
0...0.6 / 5	4
0...1 / 5	5
0...1.6 / 10	6
0...2.5 / 10	7
0...4 / 20	8
0...6 / 40	9

Range <sup>(1)</sup> / Nominal pressure (bar)	Code
0...10 / 40	A
0...16 / 80	B
0...25 / 80	C
0...40 / 105	D
0...60 / 210	E
0...100 / 600	F
0...160 / 600	G
0...250 / 1000	H
0...400 / 1000	J
0...600 / 1000	K

Output / Ex	Code
4...20 mA, 2-wire	2
0...10 V, 3-wire	3
4...20 mA, 2-wire / Ex ia <sup>(4)</sup>	6
4...20 mA, 2-wire, SIL2 <sup>(4)</sup>	C
4...20 mA, 2-wire, SIL2 / Ex ia <sup>(4)</sup>	D

Accuracy	Code
0.25% <sup>(2)</sup>	1
0.5%	2
0.2%	6
0.1% <sup>(5)</sup>	4

\* Ex versions are marked "Ex" right after the type designation on the label.

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

<sup>(2)</sup>  $p_N \geq 0.4$  bar

<sup>(3)</sup> max. 40 bar

<sup>(4)</sup> Ex or SIL versions are available upon special request.

<sup>(5)</sup> Not in combination with SIL

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!

## 2.3 DIMENSIONS

D□C-3□□-2, -3, -6 Normal version	D□C-3□□-C, -D SIL and SIL-Ex version	Transmitter + PLK-501-2 Plug-in display	D□A-3□□-□	D□G-3□□-□	D□H-3□□-□

## 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. With pressure measurements of medium with temperature over +75 °C (+167 °F), the application of condensing device would protect the instrument against overheating and extends its lifetime.

The temperature of the condensation in the condensing devices (in the water lodge) is practically only +10...+20 °C (+18...+36 °F) higher than the ambient temperature. Using longer impulse tube its proper sloping for the necessary de-aerating and emptying has to be ensured.

Measuring low pressure values 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 if the connector's screw is not tightened properly (i.e. not appropriate sealing).

**Installation position:** The pressure transmitter has been calibrated in a vertical position with the pressure port facing down. If this position changes during installation, a slight deviation from the zero point may occur in the measured value.

### 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 the 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 is tightened properly.

For the sake of noise suppression, the transmitter housing is grounded. If the grounding of the appliance with the pressure transmitter is appropriate, no further action will be needed, else, the grounding should be performed.

#### 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 BSP thread 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 NPT thread connections

Use a suitable sealant (e.g. PTFE tape). Turn the device by hand to the correct thread and tighten it with an open-end torque wrench.

## 4. WIRING

Use a shielded and twisted multicore cable for the electrical connection. Electrically connect the device according to the "Connection of ISO 4400 plug" figure. For devices with cable gland, make sure that the external diameter of the cable used is within the allowed clamping range! Once connected the wires, tighten the gland screw firmly until the sealing is proper!

For the installation of a device with an integrated cable, the bending radiuses have to comply with the following:

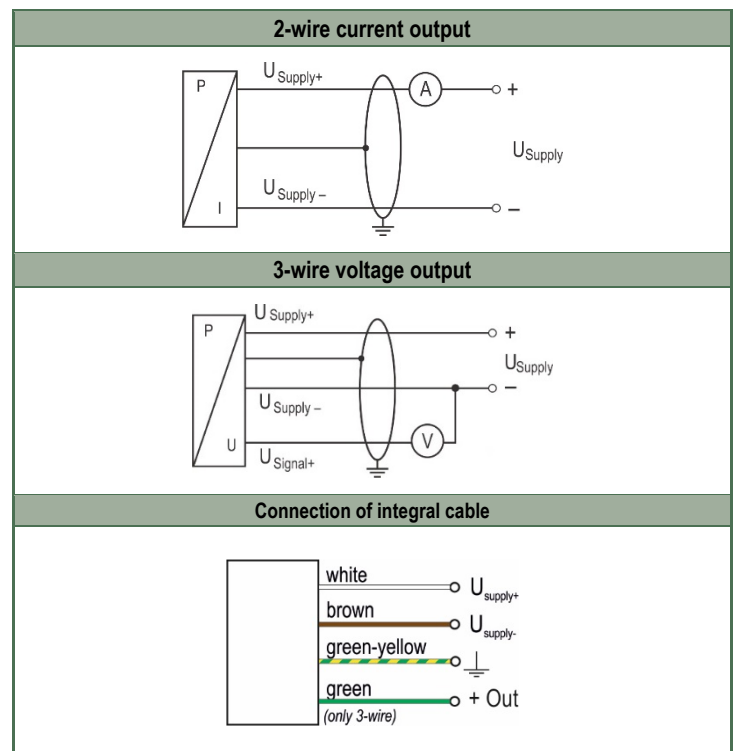
Cable without ventilation tube:

- static installation: 8-fold cable diameter,
- dynamic application: 12-fold cable diameter.

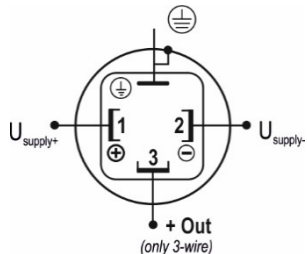
Cable with ventilation tube:

- static installation: 10-fold cable diameter,
- dynamic application: 20-fold cable diameter.

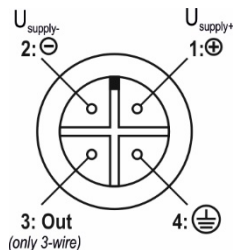
In case of devices with cable outlet and integrated ventilation tube, the PTFE filter located at the cable end on the ventilation tube must not be damaged or missing!



### Connection of ISO 4400 plug

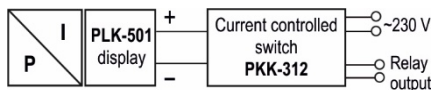


### Connection of M12x1 / 4 pin plug

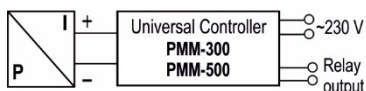


## 4.1 EXAMPLES OF ARRANGEMENTS

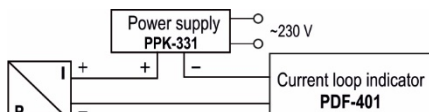
### Wiring of 2-wire pressure transmitters



Pressure transmitter

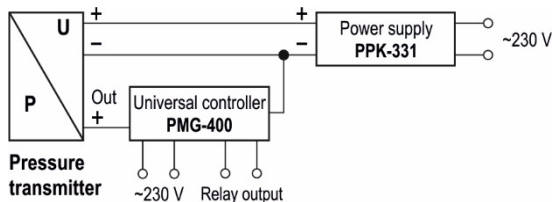


Pressure transmitter



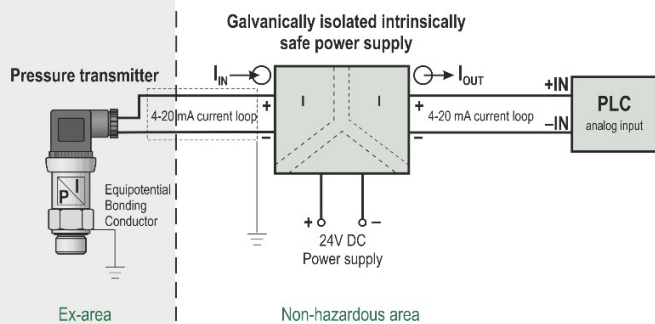
Pressure transmitter

### Wiring of 3-wire pressure transmitters



Pressure transmitter

### Wiring of 2-wire Ex ia pressure transmitters



## 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:  $-40...+100\text{ }^{\circ}\text{C}$  ( $-40...+212\text{ }^{\circ}\text{F}$ )

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NIVELCO reserves the right to change technical data without notice!