

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

1. APPLICATION

NIPRESS DD-300 series differential pressure transmitters with stainless steel sensor and two pressure ports can be used in either 2- and 3-wire systems.

DD-300 series can be pressurized on both sides with fluids or gases. The differential pressure transmitter measures the difference between the positive and negative side and converts it into a proportional voltage and current output. Due to its compact size, it can be installed also in tight spaces. The DD-300 family has various measuring ranges between 0 – 16 bar (0 – 232 psig).

Transmitters can be delivered with plug-in display **UNICONT PLK-501** enabling on-site reading. Ex version is also available.

2. TECHNICAL DATA

Type		DD□-3□□-2, -6	DD□-3□□-3
Measurement range		0 – 16 bar (0 – 232 psig) (according to the order code)	
Overload capability		According to the order code	
Accuracy		±0.5% or ±1%	
Medium temperature		-25 °C ... +125 °C (-13 °F ... +257 °F)	
Ambient temperature ⁽¹⁾		-25 °C ... +85 °C (-13 °F ... +185 °F)	
Materials of the wetted parts	Sensor	1. 4435 stainless steel (316L)	
	Sensor sealing	FKM (Viton®)	
	Process conn	1. 4404 stainless steel (316 L)	
Housing		Aluminum, black anodized	
Output		4 – 20 mA	0 – 10 V
Power supply (U _{Supply}) ⁽¹⁾		12 – 36 V DC	14 – 36 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	
Ingress protection		IP65	
Electric protection		Class III (SELV)	
Mass		~0.25 kg (~0.55 lb)	

⁽¹⁾ 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	DD□-3□□-6 Ex
Ex marking	Ⓔ II 2G Ex ia IIC T4 Gb, Ⓔ II 2D Ex ia IIIC T85°C Db
Ex reference document	ddc3422a0600h_02
Ex power supply	14 – 28 V DC
Intrinsically safety data	U _{imax} = 28 V DC, I _{imax} = 93 mA, P _{imax} = 660 mW, C _{imax} = 1 nF, L _{imax} = 10 μH The maximum interior capacity between the power supply connections and the metal housing is 27 nF.
Permissible medium temperature	-25 °C ... +65 °C (-13 °F ... +149 °F)

2.2 ORDER CODE (NOT ALL COMBINATIONS POSSIBLE!)

NIPRESS D **D** □ - 3 □ □ - □ *

Measuring method	Code	Process connection	Code	Range ⁽¹⁾⁽²⁾ / Nominal pressure (bar)	Code	Accuracy ⁽²⁾	Code	Output / Ex	Code
Differential	D	½" BSP	C	0 – 0.02 / 0.2	4	0.5%	2	4 – 20 mA, 2-wire	2
		M20x1.5	J	0 – 0.04 / 0.4	6	1%	3	0 – 10 V, 3-wire	3
		7/16" UNF DIN3866	O	0 – 0.1 / 1	9			4 – 20 mA, 2-wire / Ex ia ⁽⁴⁾	6
		¼" BSP ⁽³⁾	A	0 – 0.2 / 1	B				
				0 – 0.25 / 2.5	C				
				0 – 0.4 / 2.5	D				
				0 – 0.6 / 6	E				
				0 – 1 / 6	F				
				0 – 1.6 / 16	I				
				0 – 2.5 / 16	H				
				0 – 4 / 16	Q				
				0 – 6 / 16	J				
				0 – 10 / 16	T				
				0 – 16 / 16	L				

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

⁽¹⁾ Custom measuring range, based on prior negotiations.

⁽²⁾ According to 2.2.1 Order code auxiliary chart

⁽³⁾ Inner thread

⁽⁴⁾ 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!

NIPRESS

DD□-3□□-□

DIFFERENTIAL
PRESSURE TRANSMITTER

User's manual



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2.1 ACCESSORIES

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

2.2.1 ORDER CODE AUXILIARY CHART

		Nominal pressure, P _N (Max. Static pressure, P _{max}) [bar]					
		0,2 (0,5)	0,4 (1)	1 (3)	2,5 (6)	6 (20)	16 (60)
Differential pressure range, P _D [bar]	0 – 0,02	±1%					
	0 – 0,04	±1%	±1%				
	0 – 0,1	±0,5%	±1%	±1%			
	0 – 0,2	±0,5%	±0,5%	±1%			
	0 – 0,25		±0,5%	±1%	±1%		
	0 – 0,4		±0,5%	±1%	±1%		
	0 – 0,6			±0,5%	±0,5%	±1%	
	0 – 1,0			±0,5%	±0,5%	±1%	
	0 – 1,6				±0,5%	±0,5%	
	0 – 2,5				±0,5%	±0,5%	±1%
	0 – 4					±0,5%	±0,5%
	0 – 6					±0,5%	±0,5%
0 – 10						±0,5%	
0 – 16						±0,5%	

Accuracy P _N > 1 bar:	±0.5%, if $\frac{1}{5} \leq \frac{P_D}{P_N} \leq \frac{1}{1}$
	±1%, if $\frac{1}{10} \leq \frac{P_D}{P_N} < \frac{1}{5}$
Accuracy P _N ≤ 1 bar:	±0.5%, if $\frac{1}{2} \leq \frac{P_D}{P_N} \leq \frac{1}{1}$
	±1%, if $\frac{1}{10} \leq \frac{P_D}{P_N} < \frac{1}{2}$

Note:

Please note that for starting up, the device has to be stressed by pressure simultaneously at both pressure ports. Otherwise the sensor could be damaged.

For one-sided pressure admission, the permissible static pressure (one-sided) must be attended.

2.3 DIMENSIONS

DDA – 3□□ – □ 1/4" BSP (Inner thread)	DDC – 3□□ – □ 1/2" BSP	DDO – 3□□ – □ 7/16" UNF DIN 3866

3. INSTALLATION

To enable the replacement of the instrument during the operation is uninterrupted, the use of closing armature is recommended. A simple ballcock valve will be suitable for lower pressures, but for higher ones (above 6 bar [87 psig]) a three-way blow-off needle-valve is suggested.

The pressure ports of the device are marked. Ensure that the higher pressure must be connected with input "P+", the lower pressure must be connected with input "P-" pressure port!

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).

Select the operating position, so that splashed and condensed water can be drained off. Stationary liquid on sealing surfaces must be avoided! If the device has cable outlet, the outgoing cable must be routed downwards.

The device can be installed in-, or out-doors.

Do not expose the device to direct sunlight when using outdoors! If you do so, direct solar radiation might cause the permissible operating temperature of the device is exceeded. This is to be particularly avoided in case if the device is used in any explosion-hazardous area!

For mounting the device, 4 mounting threads (M4x10) are provided.

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 is recommended.

Remove the packaging and protective cap just before the beginning of the assembly to avoid the damage of the diaphragm. Keep the protective cap!

In case if the installing of the unit is not immediate, the protective cap must be reinstated as soon as possible! Treat any unprotected diaphragm with utmost care; as this part can be damaged very easily.

Torque should only be transferred to the hexagonal screw on the instrument body (torque wrench).

Pushing the electric cable through the cable gland it can be connected to the relevant points of the connector (ISO 4400). Make sure that the cable gland and sealing plate of the connector is tightened properly.

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

Install the device only in depressurized and disconnected state!

When installing the device, avoid high mechanical stresses on the pressure port! This will result in a shift of the characteristic curve or to damage.

Installation steps:

Tightening torques:

1/2" BSP: max. 50 Nm;

1/4" BSP: Inner thread, max. 20 Nm;

7/16" UNF: max. 30 Nm.

The specified tightening torques must not be exceeded!

Installation steps for inner thread process connection:

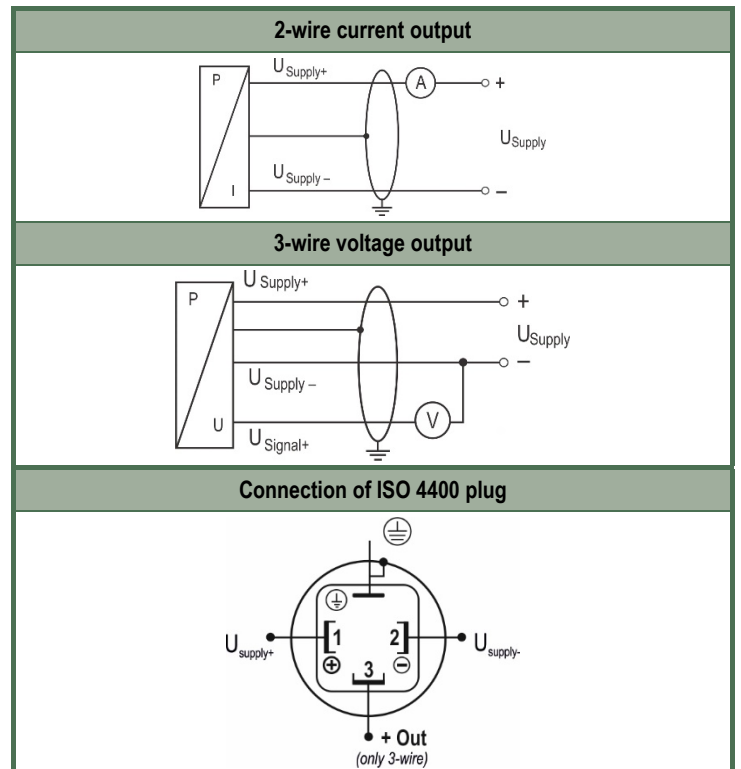
Do not use any additional sealing material such as Teflon tape!

Use a sealing ring with the correct diameter for both pressure ports. Check if the O-ring is intact, its surface even and clean and seat in the designated groove accurately. Screw the device into the corresponding thread by hand, and tighten the parts with a suitable torque wrench.

4. WIRING

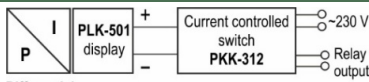
Use a shielded and twisted multicore cable for the electrical connection.

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!

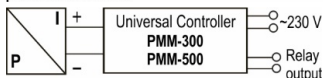


4.1 EXAMPLES OF ARRANGEMENTS

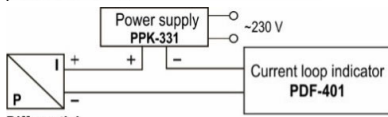
Wiring of 2-wire Ex ia pressure transmitters



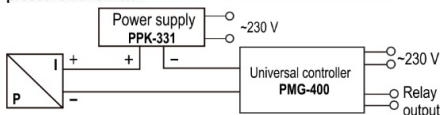
Differential pressure transmitter



Differential pressure transmitter

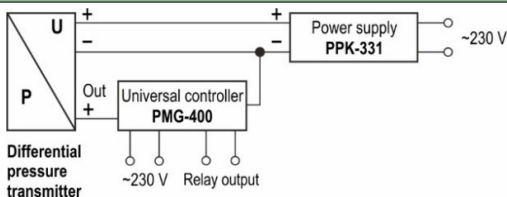


Differential pressure transmitter



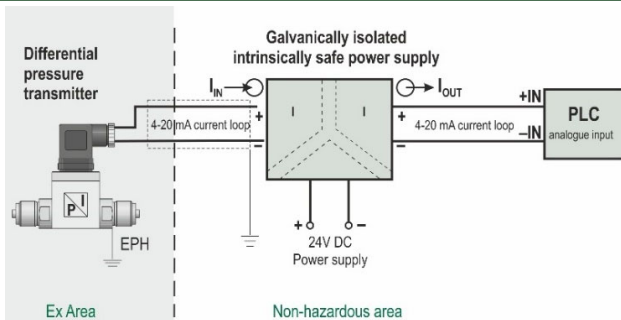
Differential pressure transmitter

Wiring of 3-wire pressure transmitters



Differential 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!
- The aluminum content of the die-cast aluminum alloy case exceeds the limit, which requires the device must be protected against any possible sources of spark or ignition resulted by impact or friction effects in an Ex environment.

6. TROUBLESHOOTING

Fault	Possible causes	Fault detection / remedy
No output signal:	Connected incorrectly.	Check the connections!
	Conductor/wire breakage.	Check all wires with cable tester!
	Defective measuring device (signal input).	Check the amperemeter (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!
	Supply voltage too low.	Check the power supply and power /current on the transducer/transmitter!
A 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 carefully and remove dirt.
A 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!
Incorrect output signal:	Reverse polarity of the pressure ranges	Ensure that the higher pressure has to be connected with input "P ₊ "

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 official form ([Returned Equipment Handling Form](#)) must be enclosed after downloaded from our homepage 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.