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

# NIPRESS

DKS-1□3-□

PRESSURE SWITCH

User's manual


Manufacturer:
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## 1. APPLICATION

The NIPRESS DK−100 compact pressure switches with a silicon sensor and 1 or 2 PNP outputs with an optional 1–5 V analog output can be used in 3-wire systems. The design of the switch makes it suitable for pneumatics and vacuum applications, for switching non-aggressive gases or compressed air.

Besides the standard functions the electronics of the DK-100 offers many additional features for an optimal adaptation to the measuring requirements. The instrument has one or two programmable contacts whose status is indicated by differently colored LEDs. The DK-100 series pressure switches can be configured and programmed with one of the two optionally available configuration kits (CIS Set USB kit for PC or P6 programming device).

## 2. TECHNICAL SPECIFICATION

| TYPE | | DKS–1□3–□ |
|---|---|---|
| Measuring range | | −1–10 bar (−14.5−145 psig) Per order code |
| Overload tolerance | | Per order code |
| Accuracy | | 1% |
| Medium temperature | | −25°C…+85°C (−13°F…+185°F) |
| Ambient temperature | | |
| Material of wetted parts | Sensor | Silicon |
| | Seal | NBR |
| | Process connection | Aluminum |
| Housing | | PA 6.6 black |
| Output | | 1 or 2 PNP contacts, (optional analog output: 1–5 V) |
| Switching output | | Short-circuit resistant PNP output (max.: 300 mA), delay time adjustable between 10 msec up to 90 sec (step 10 msec, the switching delay is switched off by default), LED status feedback |
| Power supply ($U_{Supply}$) | | 12–30 VDC |
| Current consumption | | maximum 14 mA (without contacts) |
| Load resistance of analog output | | Optional: 3-wire voltage output: $R_{min}$ = 10 kΩ |
| Process connection | | ⅛" BSP (inner tread) |
| Electrical connection | | M8x1 |
| Electrical protection | | SELV Class III |
| Ingress protection | | IP54 |
| Weight | | ~0.025–0.035 kg (~0.055–0.077 lb) |

### 2.1 ACCESSORIES

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

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

NIPRESS D K S – 1 □ 3 – □ *

| MEASURING METHOD | CODE |
|---|---|
| Switch | K |

| PROCESS CONNECTION | CODE |
|---|---|
| ⅛" BSP (inner thread) | S |

| RANGE (1) / OVERPRESSURE [bar] | CODE |
|---|---|
| −1 – 0 / 2 | 0 |
| 0 – 1 / 2 | 5 |
| 0 – 3.5 / 7 | L |
| 0 – 10 / 13 | A |

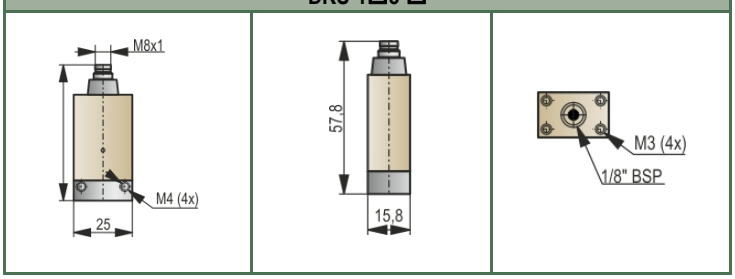
| ACCURACY | CODE |
|---|---|
| 1% | 3 |

| OUTPUT | CODE |
|---|---|
| 1 PNP switching output | 7 |
| 2 PNP switching outputs | 9 |

*(1) Custom measuring ranges are available, subject to prior agreement*

### 2.3 DIMENSIONS

DKS-1□3-□




## 3. INSTALLATION

Due to its small size and weight, it can be directly installed on tanks, pipes, machines, etc., without a mounting frame.

It is recommended to use a closing armature to replace the instrument safely during operation. A simple ball valve is suitable for lower pressures and for higher pressures (above 6 bar [87 psig]) a three-way blow-off needle-valve is recommended.

In the case of an outside installation, the unit must be protected against rain and splash water, because leakage may damage the device if the connector's screw is not tightened enough (i.e., not appropriate seal).

### 3.1 INSTALLATION INSTRUCTIONS

**Install the device only in a depressurized and disconnected state!**

CAUTION! The membrane is very vulnerable!

The transmitter housing is grounded to suppress electronic noise. If the grounding of the device is correct, no further grounding is needed, otherwise the instrument must be grounded.

When installing the device, avoid applying strong mechanical stress on the pressure port! It will result in a shift of the characteristic curve or damage the device.

**Installation steps:**
Tightening torques:
⅛" BSP: max. 3 Nm;

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

**Mounting steps for ⅛" BSP inner thread connection:**

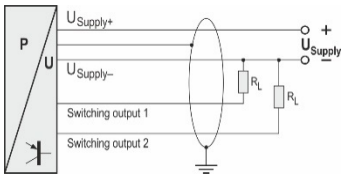
Use a suitable seal (e.g., Teflon tape, flat gasket, or O-ring) corresponding appropriate for the medium and the pressure input rating!

Check if the O-ring is intact, its surface is even and clean, and it is seated in the designated groove accurately. Screw the device into the corresponding thread by hand, and tighten the parts with a suitable torque wrench.

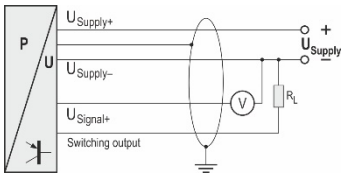
## 4. WIRING

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

**With 2 contacts (without analog output)**

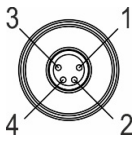



**With 1 contact and analog output**



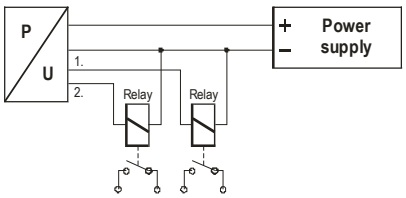

**M8x1 connection**

| Electrical connection | M8x1 (4-pin) |
|---|---|
| $U_{Supply}$ + | 1 |
| $U_{Supply}$ – | 3 |
| $U_{Signal}$ + (Analog output) | 2 |
| Switching output 1 | 4 |
| Switching output 2 (optional) | 2 |
| Shielding | housing |




### 4.1 ARRANGEMENT EXAMPLES

**Pressure switch (with 1-2 switching output)**




## 5. SPECIAL CONDITIONS OF SAFE USE

- Make sure the installation is complete with no visible defects before turning on the device
- 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!
- The metal housing of the device must be connected to the EP (equipotential) network!
- **Attention!** The device may contain partially static-charged plastic components! The presence of electrostatic charge poses a risk of sparks and ignition, therefore electrostatic charging in Ex environments must be prevented entirely!
  - Avoid friction on plastic surfaces!
  - Do not clean the device dry!
  - For example, use a wet duster!

## 6. PROGRAMMING

The configuration and programming of the pressure switch can be done in the following three ways:

A. The instrument is shipped with the factory default settings:

| Parameter | Factory setting |
|---|---|
| Switching function | n/o (normally opened) |
| Switching mode | hysteresis mode |
| Switch on point | 80% FSO |
| Switch off point | 75% FSO |
| Switch on/switch off delay | off |

B. For an extra fee, the instrument can be shipped with customer's settings already programmed in the unit.

C. The instrument is configured and programmed by the customer with one of the two optionally available configuration kits (CIS 680 USB modem for PC or P6 programming device). Using the configuration kits the following parameters can be set:

- Read all parameters (P6)
- Store all parameters (P6)
- Operating mode – hysteresis or window mode (CIS modem, P6)
- Switch-on and switch-off point (CIS modem, P6)
- Set point negation (CIS modem, P6)
- Switch on and switch off delay (CIS modem, P6)
- Teach switch-on and switch-off point (P6)
- Upload stored configurations to the switch (P6)
- Store current configurations (P6)
- Display current pressure value (P6)
- Display the limits of the measuring range (P6)

## 7. TROUBLESHOOTING

| Fault | Possible causes | Fault detection / solution |
|---|---|---|
| No output signal: | Faulty connection. | Check the connection. |
| | Broken wire. | Check all wires with a cable tester. |
| | Defective measuring device (signal input). | Check the ammeter (and its fuse) and the analog input of the signal processing unit! |
| Analog output signal too low: | Load resistance too high. | Check the value of the load resistance. |
| | Power supply failure. | Check the power supply and power / current on the transducer / transmitter. |
| Output signal slightly offset: | 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 offset in the output signal: | The diaphragm of the sensor is damaged (by overpressure or mechanically). | Check the diaphragm of the sensor, if it is damaged send the device back to the manufacturer. |

## 8. MAINTENANCE AND REPAIR

The instrument does not require regular maintenance. If necessary possible dirt deposited should be cleaned off. The warranty conditions are included in the warranty card.

Dismount the device only when it is depressurized and disconnected! Drain the medium before dismounting the device.

If necessary, clean the diaphragm carefully with a non-aggressive cleaning solution, soft brush, or sponge. Improper cleaning may cause irreparable damage to the diaphragm.

For this reason, never use sharp objects or pressurized air for cleaning the diaphragm. Before returning the device for repairs, it must be cleaned carefully, the parts in contact with the medium that might contain harmful substances must be decontaminated. Our official form (Returned Equipment Handling Form) must be enclosed. Download it from our website www.nivelco.com. The device must be sent with a declaration of decontamination. Please provide a statement in the declaration that the decontamination process is completed, the device is clean and free from harmful materials, and there are no hazardous substances on it.

## 9. STORAGE CONDITIONS

Storage temperature: −40°C...+85°C (−40°F…+185°F)

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