EN

Operating Manual

Plug-On Display DA 46

Headquarter Western Europe / International

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1. General information

1.1 Information on the operating manual

This operating manual contains important information on proper usage of the device. Read this operating manual carefully before installing and starting up the pressure measuring device.

Adhere to the safety notes and operating instructions which are given in the operating manual. Additionally applicable regulations regarding occupational safety, accident prevention as well as national installation standards and engineering rules must be complied with!

This operating manual is part of the device, must be kept nearest its location, always accessible to all employees.

This operating manual is copyrighted. The contents of this operating manual reflect the version available at the time of printing. It has been issued to our best knowledge. However, errors may have occurred. Nöding Meßtechnik GmbH is not liable for any incorrect statements and their effects.

– Technical modifications reserved –

1.2 Symbols used

⚠ DANGER! – dangerous situation, which may result in death or serious injuries

⚠ WARNING! – potentially dangerous situation, which may result in death or serious injuries

⚠ CAUTION! – potentially dangerous situation, which may result in minor injuries

! CAUTION! – potentially dangerous situation, which may result in physical damage

☞ NOTE – tips and information to ensure a failure-free operation

1.3 Target group

⚠ WARNING! To avoid operator hazards and damages of the device, the following instructions have to be worked out by qualified technical personnel.

1.4 Limitation of liability

By non-observance of the operating manual, inappropriate use, modification or damage, no liability is assumed and warranty claims will be excluded.

1.5 Intended use

- The plug-on display DA 46 has been designed to equip transmitters with analogue output 4 … 20 mA / 2-wire or 0 … 10 V / 3-wire (pressure, temperature etc.) with a digital display. Additional up to 2 PNP open collector contacts for a limiting value control can be offered. The plug-on display has to be installed between male and female plug and is ready for work immediately. A preferred area of use is e.g. on-site process monitoring.
- It is the operator's responsibility to check and verify the suitability of the device for the intended application. If any doubts remain, please contact our sales department in order to ensure proper usage. Nöding Meßtechnik GmbH is not liable for any incorrect selections and their effects!
- The technical data listed in the current data sheet are engaging and must be complied with.

⚠ WARNING! – Danger through improper usage!

1.6 Package contents

Please verify that all listed parts are undamaged included in the delivery and check for consistency specified in your order:

- plug-on display DA46
- only with plug ISO 4400: profile seal, fastening screw
- sheet of labels
- mounting instructions

2. Product identification

The device can be identified by its manufacturing label. It provides the most important data. By the ordering code the product can be clearly identified. The programme version of the firmware, (e. g. P07) will appear for about 1 second in the display after starting up the device. Please hold it ready for inquiry calls.

3. Mechanical installation

3.1 Mounting and safety instructions

⚠ WARNING! Install the device only when currentless!

⚠ WARNING! This device may only be installed by qualified technical personnel who has read and understood the operating manual!

! Handle this high-sensitive electronic precision measuring device with care, both in packed and unpacked condition!

! There are no modifications/changes to be made on the device.

! Do not throw the package/device!

! Remove packaging only directly before starting up the device to avoid any damage!

! Do not use any force when installing the device to prevent damage of the device and the transmitter!

! The display and the plastic housing are equipped with rotational limiters. Please do only rotate the display or the housing within the limit.

3.2 General installation steps

- Carefully remove the pressure measuring device from the package and dispose of the package properly.
- Remove the cable socket or mating plug from the transmitter.

3.3 Installation steps for Binder and M12x1

- Plug the display onto the transmitter.
- Plug the cable socket or mating plug onto the transmitter and fasten it properly.

3.4 Installation steps for ISO 4400

- Plug the display onto the transmitter. Take care that the pre-mounted seal on the bottom fits correctly.
- Remove the fastening screw from the cable socket.
- Replace the pre-assembled profile seal of the cable socket with the delivered seal to ensure an ingress protection of IP 65.
- Plug the cable socket onto the plug-on display.
- Place the delivered stainless steel screw through cable socket and plug-on display and tighten it to the transmitter with a screwdriver.

3.5 Positioning of the display module

The display module is rotatable so that clear readability is guaranteed even on unusual installation positions. The display module can be turned as shown below.

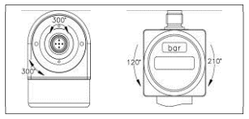


Fig. 1 display module

4. Electrical Installation

⚠ WARNING! Install the device only when currentless!

Establish the electrical connection of the device according to the technical data shown on the manufacturing label and the pin configuration and the respective wiring diagram below.

4.1 Pin configuration

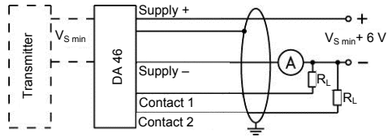
	Electrical connections			
	ISO 4400	M12x1 (5-pin), metal	Binder 723 (5-pin)	Binder 723 (7-pin) [1]
Supply +	1	1	3	3
Supply –	2	2	4	1
3-wire: Signal +	3 [2]	3 [2]	1	-
Contact 1	3 [2]	5	2	-
Contact 2	-	3 [2]	1	-
Shield	ground contact	4	5	2

[1] intended for usage with DMP 331i, DMP 333i and LMP 331i with el. connection Binder series 723 (7-pin); pins 4, 5, 6, 7 are wired through 1:1

[2] pin configuration according to version

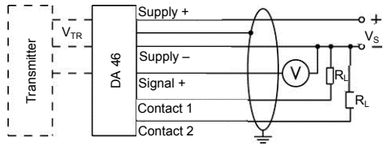
4.2 Wiring diagrams

2-wire-system (current)



$V_{S\,min}$: minimum supply of the used 2-wire transmitter

3-wire-system (voltage)



V_{TR}: supply of the used 3-wire transmitter

! For devices with cable socket, you have to make sure that the external diameter of the used cable is within the allowed clamping range. Moreover you have to ensure that it lies in the cable gland firmly and cleftlessly!

! Please note that the cable socket or mating plug has to be mounted properly to ensure the ingress protection mentioned in the data sheet.

☞ For the electrical connection a shielded and twisted multicore cable is recommended.

4.3 Supply of 2-wire-systems

The supply created by the electronics of the plug-on display is approx. 6 V_{DC}. Please take this into consideration when planning your power supply. The tolerances for the power supply can be calculated as follows:

minimum supply: $V_{S\,min} = V_{TR\,min} + 6\ V$

maximum supply: $V_{S\,max} = V_{TR\,max} + 6\ V$

$V_{TR\,min}$ = minimum supply of the used 2-wire transmitter

$V_{TR\,max}$ = maximum supply of the used 2-wire transmitter

4.4 Supply of 3-wire-systems

minimum supply:

The minimum supply of the plug-on display ($V_{S\,min}$) is 8 V. The connected transmitter is supplied by the DA 46, so the minimum supply of the transmitter must be used for the total appliance if it is higher than 8 V. The following formulas are valid:

if $V_{TR\,min} \geq 8\ V$: $V_{S\,min} = V_{TR\,min}$

if $V_{TR\,min} < 8\ V$: $V_{S\,min} = 8\ V$

$V_{TR\,min}$ = minimum supply of the used 3-wire transmitter

maximum supply:

The maximum supply of the plug-on display ($V_{S\,max}$) is 36 V. As the connected transmitter is also supplied by the plug-on display, the maximum supply does not only depend on the supply of the DA 46. If the maximum supply of the transmitter is lower than 36 V, the maximum supply of the total appliance may not exceed the transmitter's value. The following formulas are valid:

if $V_{TR\,max} \geq 36\ V$: $V_{S\,max} = 36\ V$

if $V_{TR\,max} < 36\ V$: $V_{S\,max} = V_{TR\,max}$

$V_{TR\,max}$ = maximum supply of the used 3-wire transmitter

5. Initial start-up

⚠ WARNING! Before start-up, the user has to check for proper installation and for any visible defects.

⚠ WARNING! The device can be started and operated by authorized personnel only, who have read and understood the operating manual!

⚠ WARNING! The device has to be used within the technical specifications, only (compare the data in the data sheet)!

6. Operation

6.1 Operating and display elements

The device has, according to the order max. 2 LEDs which are allocated to the resp. contacts. The LEDs will light up when the respective set point has been reached and the contact is active. The display of the measured value as well as the configuration of the individual parameters occurs menu-driven via the seven-segment display.

6.2 Configuration

The menu system is a closed system allowing you to scroll both forward and backward through the individual set-up menus to navigate to the desired setting item. All settings are permanently stored in an EEPROM and therefore available again even after disconnecting from the supply voltage. The structure of the menu system is the same for all types of devices, regardless of the number of contacts. However, they only differ by the number of menus. Following figure and the menu list shows all possible menus.

☞ Please follow the manual meticulously and remember that changes of the adjustable parameters (switch-on point, switch-off point, etc.) become only effective after pushing both buttons simultaneously and leaving the menu item.

6.3 Password system

To avoid a configuration by unauthorized persons, the possibility is given to lock the device by an access protection. More information is given in menu 1 of the menu list.

6.4 Unit

The unit of the values to be measured is determined on ordering. But it is also possible to change the unit later by using one of the enclosed unit labels.

6.5 Description of hysteresis and compare mode

To invert the respective modes, you have to exchange the values for the switch-on and switch-off points.

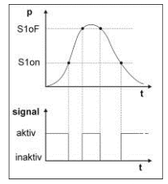


Fig. 4 compare mode inverted

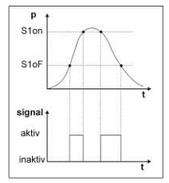


Fig. 5 compare mode

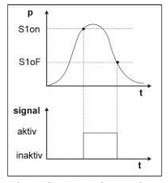


Fig. 6 hysteresis mode

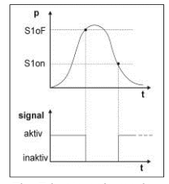
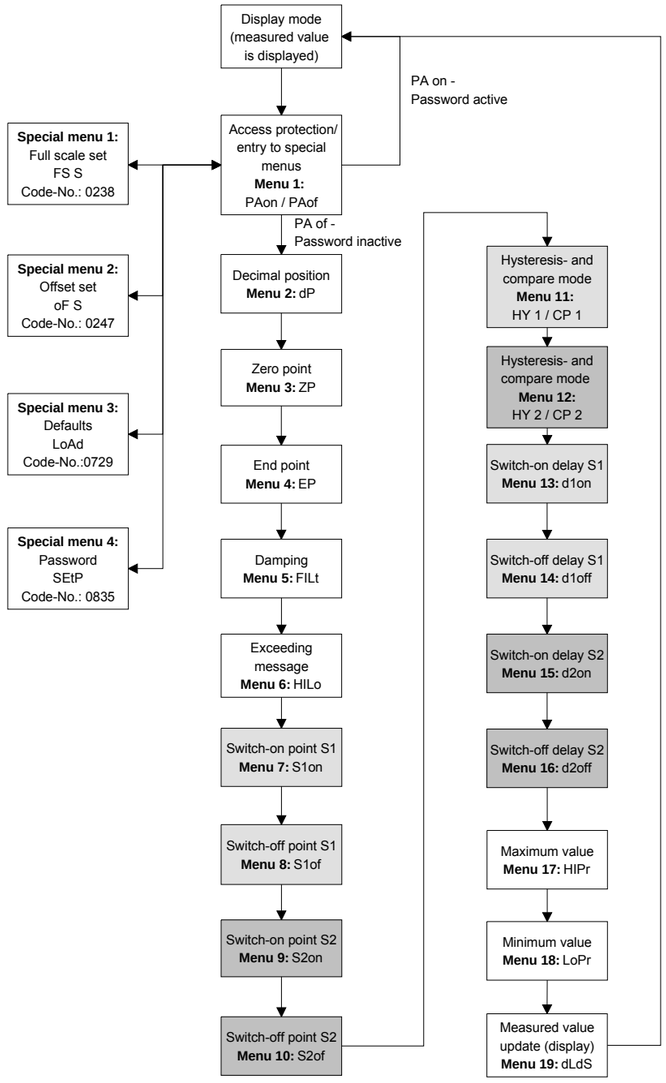


Fig. 7 hysteresis mode inverted

6.6. Structure of the menu system



6.7 Menu list

- ▲-button: move in the menu system (forward) or increase the displayed value; it will also lead you to the operating mode (beginning with menu 1)
- ▼-button: move in the menu system (backward) or decrease the displayed value; it will also lead you to the operating mode (beginning with the last menu)
- both buttons simultaneously: confirm the menu items and set values

☞ to increase the counting speed, when setting the values: keeping the respective button pushed for more than 5 seconds

Execution of configuration:

- set the desired menu item by pushing the ▲- or ▼-button
- activate the set menu item by pushing both buttons simultaneously
- set the desired value or select one of the offered settings by using the ▲- or ▼-button
- store the set value / selected setting and exit the menu by pushing both buttons simultaneously

PAon PAof	**menu 1 – access protection** PAon ➔ password **active** ➔ to deactivate: set password PAof ➔ password **inactive** ➔ to activate: set password ☞default setting for the password is "0005"; modification of the password is described in special menu 4
dP	**menu 2 – set decimal point position**
zP EP	**menus 3 and 4 – set zero point / end point** the device has been configured correctly before delivery, so a later setting of a 2-wire device is only necessary, if a differing displayed value is desired (e. g. 0 ... 100 %)
FILt	**menu 5 – set damping** this function allows getting a constant display value although the measuring values may vary considerably; the time constant for a simulated low-pass filter can be set (0.3 up to 30 sec permissible)
HILo	**menu 6 – exceeding message** set "on" or "off"
S1on	**menus 7 – set switch-on point** set the values, for the activation of contact 1 (S1on)
S1oF	**menus 8 – set switch-off point** set the values, for the deactivation of contact 1 (S1oF)
HY 1 CP 1	**menus 9 – select hysteresis or compare mode** select hysteresis mode (HY 1) or compare mode (CP 1) for contact 1 ☞compare "7.4 Description of hysteresis and compare mode"
d1on	**menus 10 – set switch-on delay** set the value of the switch-on delay after reaching contact 1 (d1on) (0 up to 100 sec permissible)
d1oF	**menus 11 – set switch-off delay** set the value of the delay after reaching switch-of point 1 (d1of) (0 up to 100 sec permissible)
HIPr LoPr	**menus 12 and 13 – maximum / minimum value display** view high pressure (HIPr) or low pressure (LoPr) during the measurement process (the value will not remain stored if the power supply is interrupted) ☞to erase: push both buttons again within one second
dLdS	**menu 14 – measured value update (display)** set the length of the update cycles for the display (0.0 up to 10 sec permissible)
special menus (to access a special menu, select the menu item "PAof" with the ▲- or ▼-button and confirm it; "1" appears in the display)	
FS S	**special menu 1 – full scale compensation** for full scale compensation, which is necessary if the indicated value for full scale differs from the real full scale value in the application: a compensation is only possible with a respective reference source, if the deviation of the measured value is within defined limits; set "0238"; confirm with both buttons; "FS S" will appear in the display; now it is necessary to place the device under pressure (the pressure must correspond to the end point of the pressure measuring range); push both buttons, to store the signal being emitted from the pressure switch as full scale; in the display the set end point will appear although the full scale sensor signal is displaced. ☞the analogue output signal (for devices with analogue output) is not affected by this change
oF S	**special menu 2 – offset compensation / position correction** set "0247";confirm menu item; if offset ≠ ambient pressure it is necessary to place the device under pressure (pressure reference has to corresponding to the zero point of the pressure measuring range); push both buttons to store the signal being emitted from the pressure switch as offset; in the display the set zero point will appear although the sensor signal in the offset is displaced ☞a position correction is necessary, if the installation position differs from the calibration position (otherwise this can cause a little deviation of the signal, which gives a wrong value indication) ☞the analogue output signal (for devices with analogue output) is not affected by this change; when displacing the offset, the full scale will also be displaced
LoAd	**special menu 3 – load defaults** set "0729; to load the defaults, push both buttons simultaneously ☞any changes carried out will be reset (password will be set on "0005")
SEtP	**special menu 4 – set password** set "0835"; confirm with both buttons; "SEtP" appears in the display; set the password using the ▲- or ▼-button (0 ... 9999 are permissible, the code numbers 0238, 0247, 0729, 0835 are exempt); confirm the password by pushing both buttons simultaneously

7. Placing out of service

⚠ WARNING! When dismantling the device, it must always be done in the depressurized and currentless condition! Check also if the medium has to be drained off before dismantling!

⚠ WARNING! Depending on the medium, it may cause danger for the user. Comply therefore with adequate precautions for purification.

8. Maintenance

In principle, this device is maintenance-free. If desired, the housing of the device can be cleaned when switched of using a damp cloth and non-aggressive cleaning solutions.

9. Disposal

The device must be disposed according to the European Directives 2002/96/EG and 2003/108/EG (on waste electrical and electronic equipment). Waste of electrical and electronic equipment may not be disposed by domestic refuse!

⚠ WARNING! Depending on the measuring medium, deposit on the device may cause danger for the user and the environment. Comply with adequate precautions for purification and dispose of it properly.

10. Warranty conditions

The warranty conditions are subject to the legal warranty period of 24 months from the date of delivery. In case of improper use, modifications of or damages to the device, we do not accept warranty claims. Damaged diaphragms will also not be accepted. Furthermore, defects due to normal wear are not subject to warranty services.

11. Declaration of conformity / CE

The delivered device fulfils all legal requirements. The applied directives, harmonised standards and documents are listed in the EC declaration of conformity, which is available online at: Additionally, the operational safety is confirmed by the CE sign on the manufacturing label.