

# Electronic Indicating Pressure Switch/Transmitter $\epsilon$ SERIES 800/810



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## Safety Instructions and Warnings

Please read these instructions before installing and starting up the pressure switch. Failure to follow the instructions will make all guarantee, warranty and compensation claims null and void.

- Only qualified persons are permitted to install the equipment and make the electrical connection, and the correct tools must always be used.
- The limits that are specified in the technical data for the pressure switch must be complied with.
- Please note that the pressure switch can be affected or damaged by strong magnetic fields, erroneous equipotential bonding or other effects.
- The device must not be opened, painted / coated or modified.
- Damaged devices must not be started up. If damage occurs during operation, suitable measures must be taken to prevent persons or property from being put at risk by the damaged pressure switch.
- The switch must only be repaired by NOSHOK.

The accepted technical regulations and all national guidelines must always be observed and complied with.

## **Exclusion of Liability**

NOSHOK guarantees that the pressure switch is in perfect working condition when it is delivered. The basis consists of the technical data in the data sheet and these operating instructions. Liability cannot be accepted for the suitability of the pressure switch.

## **Pressure Switch Description**

The pressure switch has one analog output and one switch output or two switch outputs. The analog output is adjusted using the two buttons: AnLo and AnHi. The switch output(s) is (are) adjusted using the two buttons: set point, reset point (hysteresis / window), switching function (normally closed / normally open contact) and switching to N potential or P potential.

The password protection that can be activated is a special feature, and prevents unauthorized persons from modifying the adjusting parameters.

The optional dual rotating capability makes it possible for the electrical output and the display to be aligned independently.

## **Electrical and Mechanical Connection**

The technical regulations must be complied with during installation and dismantling.

The system must be depressurized prior to installation and dismantling.

Safety regulations must be complied with, particularly when working on the electrical system. All connections to external electrical equipment must be made in accordance with regulations.

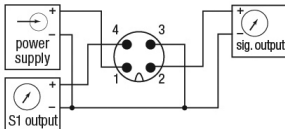
The power to system must always be switched off when the switch is being connected.

The load can be connected to ground (switching to P potential) or to the supply voltage (switching to N potential).

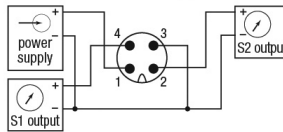
## Round Connector M 12 x 1 (4-pin or 5-pin)

| Signal                                  | Connector | Colors of Optional Wires |
|-----------------------------------------|-----------|--------------------------|
| Supply: +                               | 1         | brown                    |
| Supply: -                               | 3         | blue                     |
| Switch output S 1                       | 4         | black                    |
| Switch output S 2 or analog output      | 2         | white                    |
| Analog output - 2 switching option only | 5         | yellow/green             |

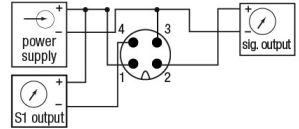
1 switching output (M12x1)  
with 4 mA to 20 mA signal  
p-switching



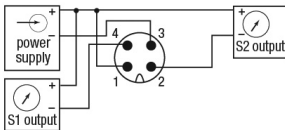
2 switching output (M12x1)  
p-switching



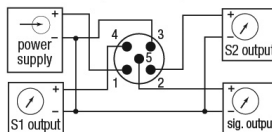
1 switching output (M12x1)  
with 4 mA to 20 mA signal  
n-switching



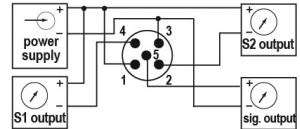
2 switching output (M12x1)  
n-switching



2 switching output (M12x1)  
with 4 mA to 20 mA signal  
p-switching



2 switching output (M12x1)  
with 4 mA to 20 mA signal  
n-switching



We recommend our accessories:

- M12x1 socket with 2m cable
  - straight version, order no.: FS-2-4P/FS-2-5P (for 5-pin connection)
  - angled version, order no.: FA-2-4P/FA-2-5P (for 5-pin connection)
  - 4 and 6 meter cables also available
- Protective cover

## Switching On and Off

The pressure switch is switched on when the supply voltage is applied. There is no on/off switch. A brief initialization phase occurs when the supply voltage is applied to the switch. The switch is then in normal operating mode. The operating pressure is shown on the display and the switch outputs are operational. Briefly pressing button S1 causes the switching point 1 setting to be displayed, and pressing button S2 causes the second switching point to be displayed.

## Programming

Pressing the buttons for longer (press and hold down button until display flashes) causes the current pressure to be taken over as the switching point. The hysteresis remains unchanged. If the password has been activated (see main programming mode) the programming is only accepted after the password has been entered.

The switch output(s) can be programmed using the control buttons without the presence of pressure. The programming sequence must run without interruptions. If delays of about 30 seconds occur, the switch automatically exits programming mode and switches to normal mode. All previous changes are lost.

## Status-LED Switching Output



### Password

Password protection can be activated in the main programming mode. The pressure switch is protected from unauthorized setting modifications.

If you forget the password, assistance can be obtained from NOSHOK.

The serial number of the pressure switch will be needed in this case (on the label).

### Switching Points and Hysteresis / Window

The switching point(s) can also be programmed without the presence of pressure. The decimal points are specified in the factory in accordance with the measuring / adjusting range and the associated accuracy.

### Switching Function

The switching function (normally closed / normally open contact) is defined individually for each switching point. Each switch output is programmed to switch to P potential or N potential.

# Quick Programming - User Menu

## Function of the buttons:

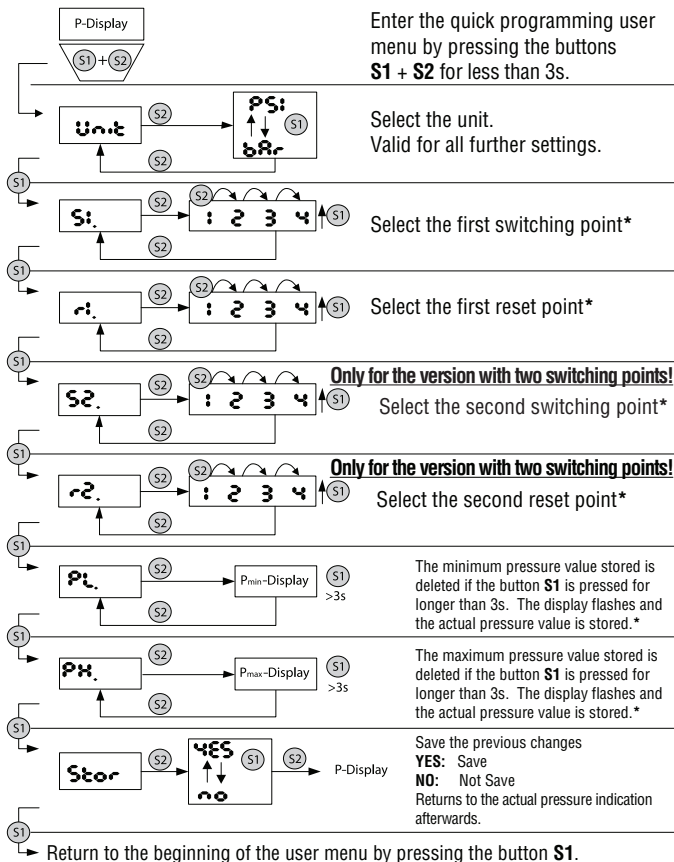
**S1** to run through the menu points, to change the value

**S2** to select menu point, to return to the menu point



= These steps are available on switches configured with the Enhanced Software Option Only.

\*The parameters which are marked with a \* can only be changed if the user is authorized in the set-up menu (CO.En). Otherwise, there will be only the display of the selected values in this menu.



# Main Programming - Set Up Menu

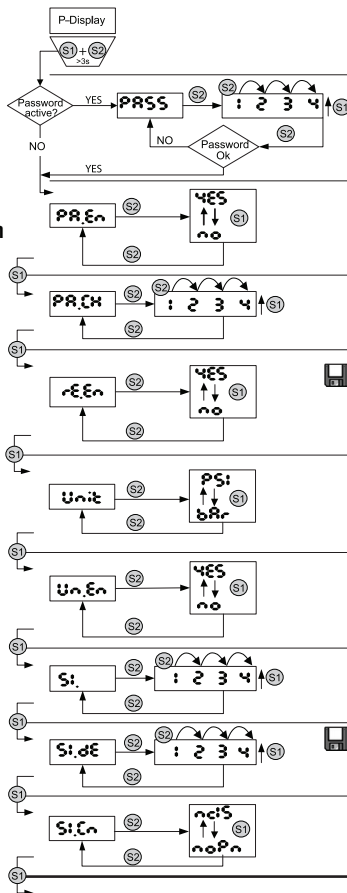
## Function of the buttons:

**S1** to run through the menu points, to change the value

**S2** to select menu point, to return to the menu point



= These steps are available on switches configured with the Enhanced Software Option Only.



Enter the user menu by pressing the buttons **S1 + S2** for at least 3s.

Only required for activated password. [PA.En]

Activate password.

**YES:** Password is required

**NO:** Password is not required

Change password.

Only possible with activated password. [PA.En]



Preset-authorization for the user  
The user has the permission

**YES:** To delete the max-min-memory

**NO:** Do not delete the max-min-memory

Choice of measuring unit.

Applies to all further settings.

Display of the measuring unit.

The measuring unit is shown in the display.

**YES:** 1s after every 10s

**NO:** Not shown

Select the first switching point.



Select delay time of the first switching output.

Range: 0.00 ... 99.99s

Resolution: 0.01s

Select contact function of the first switching point.

ncLS: Normally closed contact

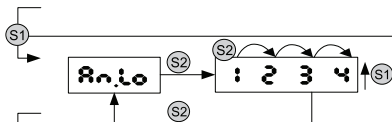
noPn: Normally open contact



# Main Programming - Continued

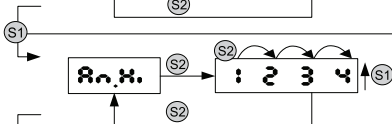
|  |                                                                                                                                                                                       |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Select the switching type of the first switching output.<br>nPn: n-switching<br>pPn: p-switching                                                                                      |
|  | Select the switching function of the first switching output.<br>hYSt: Hysteresis<br>GAtE: Gate Function                                                                               |
|  | Select the first reset point.                                                                                                                                                         |
|  | Select delay time of the first switching output.<br>Range: 0.00 ... 99.99s<br>Resolution: 0.01s                                                                                       |
|  | <b>Only for the version with two switching points!</b><br>Select the second switching point.                                                                                          |
|  | <b>Only for the version with two switching points!</b><br>Select delay time of the second switching output.<br>Range: 0.00 ... 99.99s<br>Resolution: 0.01s                            |
|  | <b>Only for the version with two switching points!</b><br>Select the contact function of the second switching output.<br>nCtS: Normally closed contact<br>nOPn: Normally open contact |
|  | <b>Only for the version with two switching points!</b><br>Select the switching type of the second switching output.<br>nPn: n-switching<br>pPn: p-switching                           |
|  | <b>Only for the version with two switching points!</b><br>Select the switching function of the second switching output.<br>hYSt: Hysteresis<br>GAtE: Gate function                    |
|  | <b>Only for the version with two switching points!</b><br>Select the second reset point.                                                                                              |
|  | <b>Only for the version with two switching points!</b><br>Select the delay time of the second reset point.<br>Range: 0.00 ... 99.99s<br>Resolution: 0.01s                             |

# Main Programming - Continued



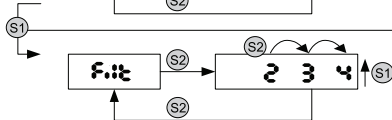
## Only for the version with analog output!

Select the pressure value of the analog output at 4mA/0V.



## Only for the version with analog output!

Select the pressure value of the analog output at 20mA/10V.

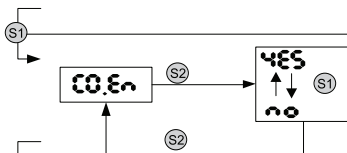


Select output filters

Range: 0.00...2.00s

Resolution: 0.01s

| Grading: | Step Size   | Range |
|----------|-------------|-------|
| 10ms     | 0.00...0.2s |       |
| 50ms     | 0.2...1.0s  |       |
| 100ms    | >1.0s       |       |



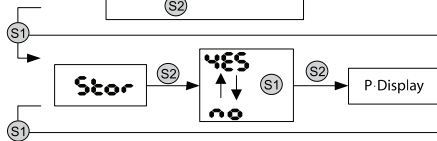
Authorization for the user.

The user has the permission

**YES:** To program

**NO:** To not program

the switching output in the user menu



Save the previous changes.

**YES:** Save

**NO:** Not Save

returns to the actual pressure indication afterwards.

Return to the beginning of the set up menu by pressing the button **S1**.

## To exit the menus

1. After the selection, the menu will automatically be closed whether the modified value is stored or not.
2. It is possible to exit the menu anytime by pressing the buttons **S1** and **S2** simultaneously.
3. If no button is pressed for 30 seconds, the menu will be closed automatically.

## Error message

1. Flashing display of the actual pressure: measured pressure outside of range.
2. Flashing of the display during the programming: An invalid value was entered.  
Examples: Switching point above/below the adjustment range, reset point above/below the adjustment range, reset point above the switching point, analog output span is smaller than 20% of the adjustment range filter more than 2s. When this happens, the buttons are locked for 3s and the switch takes over the next possible value.

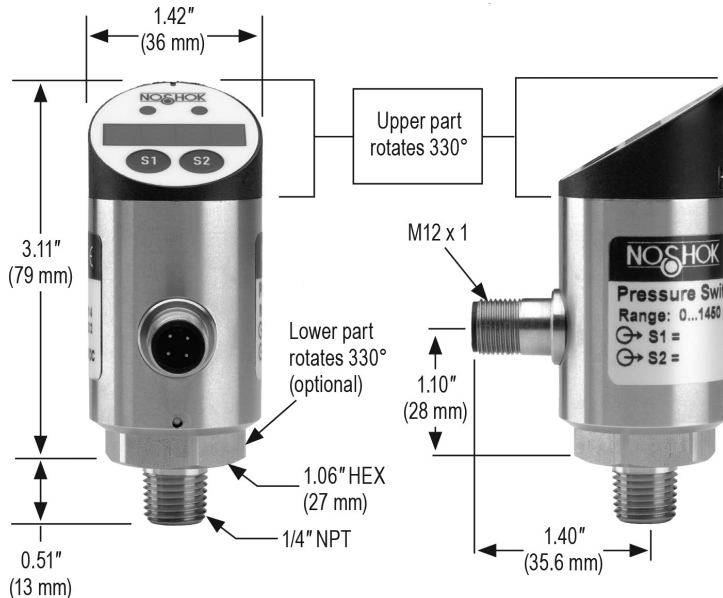
## Technical Data

|                                                                       |                                                                                                                                                                 |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Configuration                                                         | Pressure, positive or negative                                                                                                                                  |
| Pressure connection                                                   | ¼" NPT standard, other connections available on request                                                                                                         |
| Setting                                                               | Menu-guided programming using control buttons<br>Adjustable switching points, switchback points,<br>switching function<br>Programmable pressure units: bar, psi |
| Materials                                                             |                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>Measuring component</li> </ul> | Stainless steel, ceramic with NBR seal at less than 1500 psi (standard)                                                                                         |
| <ul style="list-style-type: none"> <li>Pressure connection</li> </ul> | Stainless steel                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>Housing</li> </ul>             | Stainless steel, plastic display electronics for 800 Series;<br>Black Anodized Aluminum for 810 Series                                                          |
| Load change                                                           | > 10 million pressure cycles                                                                                                                                    |
| Power Requirement                                                     | 12... 30 VDC                                                                                                                                                    |
| Power consumption                                                     | ≤ 50 mA, without load current                                                                                                                                   |
| Outputs                                                               | 2 switch outputs, programmable                                                                                                                                  |
|                                                                       | 1 programmable switch output and<br>1 programmable analog output                                                                                                |
| Switch outputs                                                        |                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>Quantity</li> </ul>            | 1 or 2 to N or P potential                                                                                                                                      |
| <ul style="list-style-type: none"> <li>Function</li> </ul>            | Normally open contact (NO) or normally closed contact (NC),<br>programmable                                                                                     |
| <ul style="list-style-type: none"> <li>Switching current</li> </ul>   | 0.5 A                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>Setting</li> </ul>             | Via display with control buttons                                                                                                                                |
| - Switching point                                                     | 1 to 100% of full scale                                                                                                                                         |

|                               |                                                                              |
|-------------------------------|------------------------------------------------------------------------------|
| - Hysteresis                  | 1 to 100% of full scale                                                      |
| • Status indication           | LED                                                                          |
| Analog output                 |                                                                              |
| • Signal                      | 4 to 20 mA, 2-wire; 0 to 10 Vdc, 3-wire                                      |
| • Load resistance             | Current output: < 500 $\Omega$ , Voltage output: > 10 k $\Omega$             |
| • Hysteresis                  | 0.3% of full scale for ceramic cell<br>0.2% of full scale for thin film cell |
| Display                       |                                                                              |
| • Type                        | 7-segment LED, red, 4 digits, character height 7.6 mm                        |
| • Digits                      | -999 ...9999                                                                 |
| • Accuracy                    | 1% of full scale                                                             |
| Repeatability                 | 0.5% of full scale (BFSL)                                                    |
| Temperature ranges            |                                                                              |
| • Storage                     | -22... +176°F                                                                |
| • Media                       | -4... +176°F                                                                 |
| • Ambient                     | -4... +176°F                                                                 |
| • Thermal Effect              | 0.017 % of Full Scale/°F                                                     |
| Electrical connection         | Round connector M 12x1; 4-pin                                                |
| Protection class              | IP 65                                                                        |
| CE - symbol                   | Interference emission and interference immunity in accordance with EN 61 326 |
| Electrical protection classes | Pole reversal and overvoltage protection                                     |
| Weight                        | 0.66 lbs                                                                     |

## DIMENSIONS

Inches (mm)



## CE – Conformity

The switch complies with all requirements of EN 61 326 with regard to interference emission and immunity for use in industrial areas. We recommend the use of shielded cables. Installation and cable routing must be carried out correctly in order to maintain the effective protection from electromagnetic interference.

## **Maintenance**

The pressure switches that are described in this document are maintenance free. The equipment will also operate in a stable state for long periods, meaning that regular adjustment or the like is not required.

Remove the device as soon as device malfunctions start to occur. The internals cannot be maintained by the customer. Replace the device or return it to the manufacturer to have it tested.

## **Troubleshooting**

No modifications must be made to the equipment. Only the manufacturer is allowed to repair the device.

## **Cleaning**

The exterior of the 800 series pressure switch can be cleaned using a soft, moistened cloth. Heavy soiling can be removed using a mild cleaning agent.

The switch must not be opened under any circumstances!

Aggressive chemicals or hard scrubbing can damage the surface, particularly the display film.

## **Disposal**

The packaging and used parts must be disposed of in accordance with the regulations of the country in which the device is installed.