

SWITCH 

Electronic Temperature Switch



SERIES 850

NOSHOK
INCORPORATED

Copyright

All rights to these operating instructions are reserved. These operating instructions, including extracts thereof, must not be copied or translated into other languages without our written permission.

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 temperature switch must be complied with.
- Please note that the temperature 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.

Temperature Switch Description

The temperature switch has one analog output and one switching output or two switching outputs. The switching output(s) is (are) adjusted using the two buttons: set point, reset point (hysteresis), switching function (normally closed/normally open contact).

The programmable analog output is a special feature. It can be adjusted in 0.1° steps within a span of at least 20% of the temperature range.

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.

Round Connector M 12 x 1 (4-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

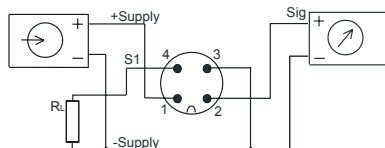
Recommended accessories:

M12x1 socket with 2m cable

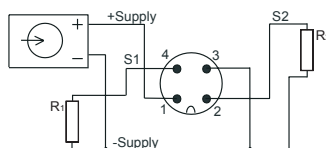
- straight version, order no.: FS-2-4P
- angled version, order no.: FA-2-4P

switching to p potential

1 switching output and 1 analog output



2 switching outputs



Switching On and Off

The temperature 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 display and the set point LED illuminate. The measuring range (min- and max. temperature) and the unit are indicated briefly. The outputs are inactive during this time.

After initialization the switch is in normal operating mode. The temperature appears on the display, the switching outputs are active and the LED's indicate the status of the switching outputs.

Programming

Briefly pressing button S1 or S2 causes the relevant set point to be displayed. The status LED's flash for as long as the set points are being displayed.

Pressing the buttons for longer (press and hold down button until display flashes) causes the current temperature to be taken over as the set point. The hysteresis remains unchanged. The switching output(s) can be programmed using the control buttons independently from the present temperature, per the programming sequence on page 6.

The programming sequence must run without interruptions. If delays of about 20 seconds or more occur, the switch automatically exits programming mode and switches to normal mode. All previous changes are lost.

Status-LED Switching Output

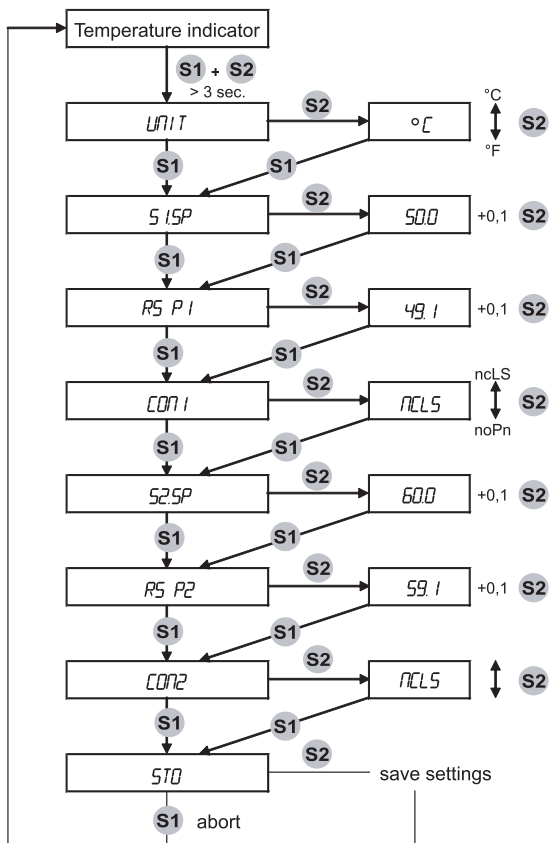


Parameter description / programming

With two switching outputs

<i>UNIT</i> ¹⁾		Temperature units
• °C	Degree Celsius	
• °F	Degree Fahrenheit	
<i>S1SP</i>	Switch 1, Set Point	Select set point for first switch
<i>RSP1</i>	Switch 1, Reset Point	Select reset point for first switch
<i>CON1</i>	Contact 1	Select contact function for first switch
• <i>NOPN</i>	normally open	Select normally open contact
• <i>NCLS</i>	normally closed	Select normally closed contact
<i>S2SP</i>	Switch 2, Set Point	Select set point for second switch
<i>RSP2</i>	Switch 2, Reset Point	Select reset point for second switch
<i>CON2</i>	Contact 2	Select contact function for second switch
• <i>NOPN</i>	normally open	Select normally open contact
• <i>NCLS</i>	normally closed	Select normally closed contact
<i>STD</i>	Store	The previous changes are only accepted if button 2 is pressed about 15 seconds after the previous button press!

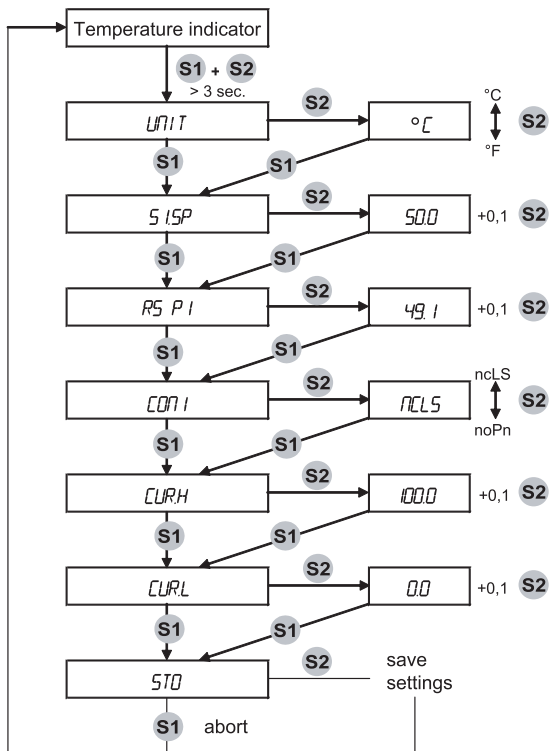
1) The pressure units setting applies immediately for the switching point settings, the reset points and for the process pressure 4-digit LED display.



With one switching output and one analog output

<i>UNIT</i> ¹⁾		Temperature units
• °C	Degree Celsius	
• °F	Degree Fahrenheit	
<i>SP</i>	Switch 1, Set Point	Select set point for first switch
<i>RSP</i>	Switch 2, Reset Point	Select reset point for first switch
<i>CON</i>	Contact 1	Select contact function for first switch
• <i>NO</i>	Normally open	Select normally open contact
• <i>NC</i>	Normally closed	Select normally closed contact
<i>CURH</i>	Current high	Select temperature value for 20mA
<i>CURL</i>	Current low	Select temperature value for 4mA
<i>STO</i>	Store	The previous changes are only accepted if button 2 is pressed about 15 seconds after the previous button press!

1) The pressure units setting applies immediately for the switching point settings, the reset points and for the process pressure 4-digit LED display.

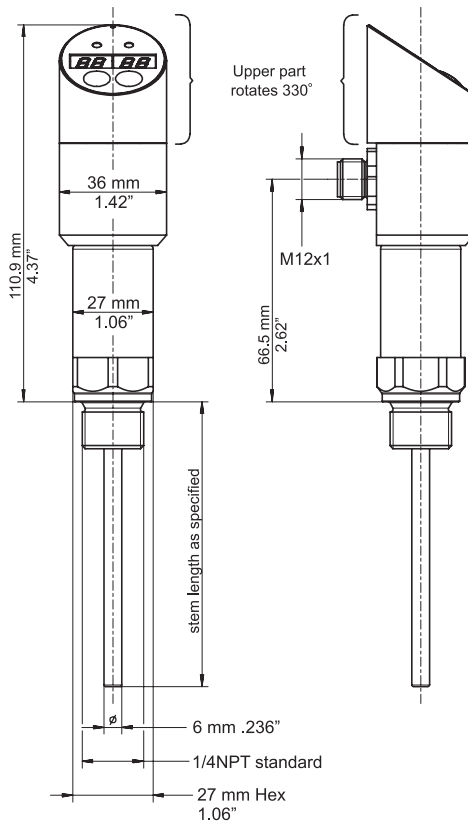


Technical data

Temperature Ranges	-58 to +392°F -58 to +752°F -58 to +1112°F -328 to +1112°F
Measurement Units	°C or °F (selectable)
Sensor	PT100 class B or PT100 class A
Supply Voltage	12...30 Vdc, overload and reverse polarity protection ripple <10%
Power Consumption	≤ 50mA, without load current
Process Connections • Fixed Thread • Compression Fitting	1/2NPT, 1/4NPT 1/2NPT Other connections on request
Materials • Process Connection • Housing	Stainless steel 1.4571 (316Ti); other materials or coatings on request Stainless steel, display cover plastic
Stem and Working Pressure	• from stem length (EL) 50mm: ø6 x 0.75mm (up to 40 bar) • from EL 50mm: ø8 x 1.75mm (up to 100 bar) • from EL 50mm: Special parts made of solid material (up to 500 bar) Fast response time version (up to 12 bar) • EL 25mm: ø3 x 0.25mm without taper • EL up to 100mm: ø6 x 0.25mm with taper to ø3 x 0.25mm • from EL 100mm: ø8 x 1.75mm with taper to ø6 x 0.25mm with taper to ø3 x 0.25mm
Outputs	2 switching outputs PNP or 1 switching output PNP and analog output 4...20mA

Switching outputs • Switching function • Switching rating • Adjustment - Set Point - Reset point	adjustable normally closed (NC) or normally open (NO) contact 100mA per switching output Programmable via the display 0.1° steps within temperature range 0.1° steps from beginning temperature range until max. set point -0.1°
Analog output Signal	4...20mA; 2-wire, programmable in 0.1° steps, span at least 20% of the temperature range
Load resistance	Dependent on the supply voltage; the relevant formula is $R = \frac{U_{\text{Supply}} - 7 \text{ V}}{0.022 \text{ A}}$
Display	4-digit 7-segment LED display, red, 7.6mm high
Accuracy	Switching output, analog output and Display: Accuracy of PT100 + 0,1% of the temperature range
Repeatability	0.05%
Electrical connection	M12 x 1 (4-Pin)
Temperature range Storage Ambient Thermal Effect	-22...+176°F -13...+158°F 0.006% of Full Scale/°F
EMV to IEC / EN 61 326	IEC 61000/4/2 ESD: B IEC 61000/4/3 HF: A IEC 61000/4/4 Burst: A IEC 61000/4/5 Surge: A IEC 61000/4/6 HF: A
Protection class	IP65 according IEC 529
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. NOSHOK recommends 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 temperature 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.

Cleaning

The exterior of the 850 Series Temperature 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 for cleaning!

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.