


Dialog User Level (continued)

Dialog item	Value	Function/Description
<b>Only models with analog output:</b>		
RO2 *	0 ... xxx	Scale the analog output - start value (e. g. 0 bar = 4 mA)
ROF *	0 ... xxx	Scale the analog output - end value (e. g. 400 bar = 20 mA) (output signal start value always corresponds to the display initial value, e. g. 0 bar = 4mA) Maximum turn-down 4 : 1, i.e. at values below 25 % of the measuring range the analog output is switched off
nRH	0 ... xxx	Display of peak value „Max“ (xxxx: = max. 125 % f. s.)
CLr		Delete the maximum value memory  no = no deletion YES = delete value
Err		Error display:  OH = no error nRH = exceeding pos. measuring range n In = exceeding neg. measuring range SEn = sensor error SP 1 = error switching output 1 SP2 = error switching output 2 dAt = data error (EEProm) PrC = program error CAL = calibration error ono = error analog out

	<b>IMPORTANT</b>
When changing units from psi to bar or bar to psi, the switching point values must be changed accordingly.	
* Flashing of the mean segment signals a negative setting value.	

**Operating Instructions**  
**Dual pressure switch Switch 2000**  
**Dual Temperature Switch TempSwitch 2000**




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Software-Version: V 2.1 and higher	
Specifications are subject to changes without notice!	

## 1 Intended Applications

The dual pressure switch monitors system pressures and has up to two switching outputs and one analog output.


The dual temperature switch monitors media temperature into which the probe is immersed and has up to two switching outputs and one analog output.


 <b>DANGER</b>
<p>The switch may only be used in the specified fields of application.</p> <p>The temperature ranges must be within the permissible limits. The stated pressures and electrical load values must not be exceeded.</p> <p>Observe also the applicable national safety instructions for assembly, commissioning and operation of the switch.</p> <p>The switch is not designed to be used as the only safety relevant element in pressurized systems according to PED 97/23/EC.</p>


## 2 Safety Instructions


The safety instructions are intended to protect the user from dangerous situations and/or material damage.


In the operating instructions the seriousness of the potential risk is designated by the following signal words:

 <b>DANGER</b>
<p>Refers to imminent danger to men.</p> <p>Nonobservance may result in fatal injuries.</p>

 <b>WARNING</b>
<p>Refers to a recognizable danger.</p> <p>Nonobservance may result in fatal injuries, and destroy the equipment or plant parts.</p>

 <b>CAUTION</b>
<p>Refers to a danger.</p> <p>Nonobservance may result in light injuries and material damage to the switch and/or to the plant.</p>

 <b>IMPORTANT</b>
<p>Refers to important information essential to the user.</p>

 <b>Disposal</b>
<p>The switch must be disposed of correctly in accordance with the local regulations for electric/electronic equipment.</p> <p>The switch must not be disposed of with the household garbage!</p>

## 3 Standards

The standards applied during development, manufacture and configuration are listed in the CE conformity and manufacturer's declaration.

## 4 Warranty/Guaranty

### Warranty

Our scope of delivery and services is governed by the legal warranties and warranty periods.

### Terms of guaranty

We guaranty for function and material of the dual pressure and temperature switch under normal operating and maintenance conditions in accordance with the statutory provisions.


### Loss of guaranty


#### The agreed guaranty period will expire in case of:


- incorrect use,
- incorrect installation or
- incorrect handling or operation contrary to the provisions of these operating instructions.

No liability is assumed for any damage resulting therefrom, or any consequential damage.

## 5 Installation/Commissioning

 <b>DANGER</b>
<p>Only install or uninstall the switch when deenergized (electrically and hydraulically/pneumatically).</p> <p>Pressure connection and electrical connection must be carried out by trained or instructed personnel according to state-of-the-art standards.</p> <p>The switch must only be installed in systems where the maximum pressure <math>P_{max}</math> or the maximum temperature <math>T_{max}</math> is not exceeded (see type label).</p>

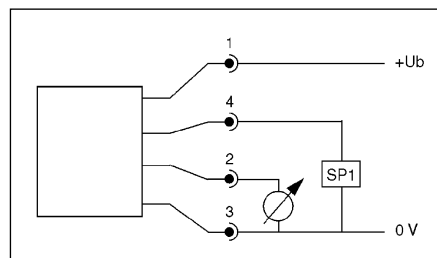
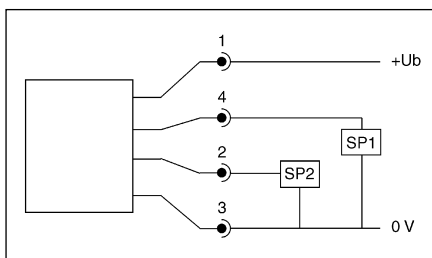
 <b>WARNING</b>
<p>Be aware of the fact that in case of operation with higher temperatures the casing surface may become very hot!</p>

 <b>CAUTION</b>
<p>Mount the pressure switch from bottom to the fitting with a wrench hex 36 (1/4") resp. 19 with 45 Nm torque.</p> <p>Do not put the switch into operation when the switch itself or the connection cable is damaged. Jolts and heavy vibrations must be avoided during transport. Even if the switch casing remains undamaged, inside parts may be damaged and cause malfunctions.</p>

Electrical connection is to be carried out dependent on the type of switch (see type label) according to the chart below. Wrong assignment of the connections may cause malfunctions or incorrect switch outputs.

Plug M 12x1 4-pin	Model with 1 switching output	Model with 2 switching outputs	Model with 1 switching output and 1 analog output
Pin 1 brown	+Ub (15 ... 32 V DC) (15 ... 28 V DC)*	+Ub (15 ... 32 V DC) (15 ... 28 V DC)*	+Ub (15 ... 32 V DC) (15 ... 28 V DC)*
Pin 2 white	-	SP2 (0.5 A max.) (0.4 A)*	Analog
Pin 3 blue	0 V	0 V	0 V
Pin 4 black	SP1 (0.5 A max.) (0.4 A)*	SP1 (0.5 A max.) (0.4 A)*	SP1 (0.5 A max.) (0.4 A)*

\* cULus version

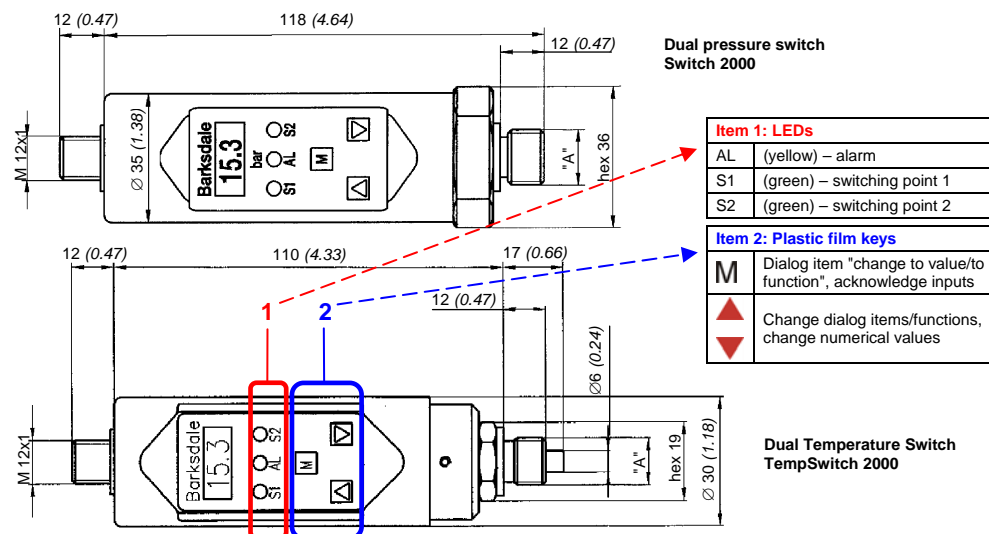


## 7 Technical Data

	Switch 2000	TempSwitch 2000
Measuring element	Piezoresistive pressure sensor with internal special steel diaphragm	Pt 100 (class B) according to DIN IEC 751
Measuring ranges	0 ... 10 bar to 0 ... 600 bar 0 ... 150 psi to 0 ... 9000 psi relative pressure	0 ... +100 °C to -30 ... +150 °C +32 ... +212 °F to -22 ... +302 °F
Display	3-digit 7-segment LED display, red, digit height 10 mm	
Transistor switching outputs PNP	1 or 2 x NO/NC function (programmable), adjustable switching time delay 0 ... 9.9 s	
Operating temperature range	-10 ... +70°C / +14 ... +158 °F	
Media temp. range	-25 ... +100°C / -13 ... +212 °F	-30 ... +150°C / -22 ... +302 °F
Process connection (fitting "A" without adapter)	G 1/4 1/4" – 18 NPT 7/16 – 20 SAE	G 1/4 1/4" – 18 NPT
Protection system/class	Nema 4, IP65/III	
Electrical connection	4-pin plug, M 12x1	
Auxiliary power	15 ... 32 V DC / 15 ... 28 V DC (cULus version)	
For further technical data and options please refer to the data sheets		

### Operating and display elements/Dimensions

Dimensions (example) in mm (inch)



### WARNING

Check the switch regularly for functioning. If the switch does not work properly, stop operation immediately!

### IMPORTANT

**Only TempSwitch 2000**  
When the rotatable display is adjusted, the switch has to be fixed with the threaded pin at the front side with a 3 Nm torque.

## 6 Maintenance/Cleaning

The switch requires no maintenance.

### CAUTION

The plastic film keys may be damaged by the use of unsuitable cleaning agents. Do not use any cleaning agents containing solvents or abrasive additives.

## 8 Operation

The switch must be installed and operated only by authorized persons. Do not use any hard objects for making entries. After being switched on the Switch 2000 / TempSwitch 2000 runs through a self-test. Operation via three plastic film keys is menu-driven. These keys must **not** be touched with hard objects! If an error is recognized during the self-test or during operation, this is signalled by the (yellow) flashing alarm LED (AL).

The error can be read out in the menu **Err**. The green LEDs S1 and S2 signal the activity of the two switching points.

## 9 Programming

1		After switching on with <b>M</b> change to the first dialog item.
2	Change dialog item	Select the desired dialog item with <b>▼</b> or <b>▲</b> (see chap. 10).
3	Activate dialog item Value input/function selection	Activate the desired dialog item with <b>M</b> to change the corresponding value or the desired function.
4	Change value	Select the individual digits with <b>M</b> . Change the numerical value with <b>▼</b> or <b>▲</b> and acknowledge with <b>M</b> . If the entered value is within the permissible range, the system changes to the dialog item after input of the last digit, otherwise the 1st digit will flash again.
5	Change function	Change the function with <b>▼</b> or <b>▲</b> and acknowledge with <b>M</b> .
	Activate key lock	Simultaneously press <b>▲</b> + <b>▼</b> for at least 5 s. The display must not change during this time. When key lock is activated <b>LOK</b> appears in the display e. g. <b>u3.1°</b> .
	Key lock active	Values or functions are displayed, but cannot be changed. <b>LOK</b> appears in the display when an attempt is made to make a change.
	Deactivate key lock	Simultaneously press <b>▲</b> + <b>▼</b> for at least 5 s. The display must not change during this time. When key lock is deactivated <b>LO2</b> appears in the display e. g. <b>u3.1°</b> .
	Return to measuring mode	If no entry is made for 2 minutes, the switch automatically returns to the measuring mode <b>without</b> accepting the entries.
	Terminate programming	Press <b>M</b> for at least 5 s to change to the measuring mode.

\* Software versions no.

## 10 User Level Dialog Switch 2000/TempSwitch 2000

Dialog item	Value	Function/Description									
<b>Rct</b>	0 ... 400	Display of the actually measured value									
<b>S1</b>		Select the display unit <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"><b>nbr</b> = mbar</td> <td style="width: 33%;"><b>PSH</b> = psi x 10</td> <td style="width: 33%;"><b>hPo</b> = hPa</td> </tr> <tr> <td><b>bor</b> = bar</td> <td><b>PSI</b> = psi</td> <td><b>nPo</b> = mPa</td> </tr> </table> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"><b>°C</b> = °Celsius</td> <td style="width: 33%;"></td> <td style="width: 33%;"><b>°F</b> = °Fahrenheit</td> </tr> </table>	<b>nbr</b> = mbar	<b>PSH</b> = psi x 10	<b>hPo</b> = hPa	<b>bor</b> = bar	<b>PSI</b> = psi	<b>nPo</b> = mPa	<b>°C</b> = °Celsius		<b>°F</b> = °Fahrenheit
<b>nbr</b> = mbar	<b>PSH</b> = psi x 10	<b>hPo</b> = hPa									
<b>bor</b> = bar	<b>PSI</b> = psi	<b>nPo</b> = mPa									
<b>°C</b> = °Celsius		<b>°F</b> = °Fahrenheit									
<b>Und</b>		Activation of the unit display <b>on</b> = unit display on (every 30 s) <b>off</b> = no unit display									
<b>SP1</b>		<b>uIn</b> = window technology <b>Err</b> = error output <b>Std</b> = standard evaluation									
<b>on1*</b>	0 ... xxx	Switch-on point for SP1; if the ON value is smaller than the OFF value the switching point evaluation is falling									
<b>off1*</b>	0 ... xxx	Switch-off point for SP1									
<b>dS1</b>	0.0 s ... 9.9 s	Switch-on delay for SP1 in seconds									
<b>dr1</b>	0.0 s ... 9.9 s	Switch-off delay for SP1 in seconds									
<b>u1</b>		Inversion of switching output SP1 <b>HFS</b> = high-level-fail-save (normally open function) <b>LFS</b> = low-level-fail-save (normally closed function)									

Only models with 2nd switching contact:		
<b>SP2</b>		<b>uIn</b> = window technology <b>Err</b> = error output <b>Std</b> = standard evaluation
<b>on2*</b>	0 ... xxx	Switch-on point for SP2; if the ON value is smaller than the OFF value the switching point evaluation is falling
<b>off2*</b>	0 ... xxx	Switch-off point for SP2
<b>dS2</b>	0.0 s ... 9.9 s	Switch-on delay for SP2 in seconds
<b>dr2</b>	0.0 s ... 9.9 s	Switch-off delay for SP2 in seconds
<b>u2</b>		Inversion of switching output SP2 <b>HFS</b> = high-level-fail-save (normally open function) <b>LFS</b> = low-level-fail-save (normally closed function)