Honeywell

FEMA

PST...-R

Smart Press ELECTRONIC PRESSURE SWITCHES/TRANSMITTERS

INSTALLATION INSTRUCTIONS

GENERAL INFORMATION

Honeywell FEMA's PST...-R series Electronic Pressure Switches and Transmitters are microprocessor-controlled pressure measurement devices suitable for an extremely wide range of applications, including the precision-adjustment and monitoring of system pressures as well as the monitoring and control of pumps and compressors.

All versions feature an integrated LCD display, two LED indicator lights presenting the switching and alarm status, and an integrated rotary/push button for parameterizing and configuring the device according to user needs.

All versions feature two switching outputs (OUT1 and OUT2) configurable as normally-open (N.O.) / normally-closed (N.C.) high-side/low-side or push-pull / inverted push-pull switches. They also feature a configurable analog output. Additionally, they are equipped with a floating switch-over contact relay.

The devices are screwed directly into the pressure line / pressure vessel to be monitored. Depending upon the given version, connection is effected using either

- a G1/2" (standard manometer) process connection or
- a G3/4" (flush) process connection.

TECHNICAL DATA

Housing	polybutylene terephtalate (PBT)
Ambient temperature	-20...+60 °C
Storage temperature	-35...+80 °C
Temp. of medium	-20...+100 °C
Humidity	0...95% r.h., non-condensing
Accuracy, total	0.5% of FSO (full-scale output)
Medium temp. drift	0.3% / 10 K (250/400/600 mbar versions: 0.5% / 10 K)
Total weight	380 grams
Parts in contact with medium	
High-pressure versions	1.4571 + 1.4542
Low-pressure / flush	1.4571 + 1.4435
Process connection	
Manometer connection	G1/2" external thread
Flush connection	G3/4" external thread
Electrical connection	
Plugs	two 5-prong A-coded M12 plugs and 3-prong B-coded M12 plug
Protection class	II as per EN 60335-1 (when installed accordingly)
Protection rating	IP65 as per EN 60529
Climate class	C as per DIN IEC 60654
Power supply	14...36 Vdc, max. 100 mA (when ϑ > 50 °C: 14...30 Vdc)
EMC	compatible as per EN61326/A1
Switch outputs	
OUT1 and OUT2	configurable as N.O./N.C. high-side/low-side or as push-pull / inverted push-pull switches
Max. load	250 mA / 14...36 Vdc
Reaction time	30 ms
Switching difference	(SP and RP) configurable
Relay output	
Contact type	1 switch-over contact
Min. electrical lifetime	250,000 switching cycles
Switching performance, gold ($AgSnO_2$+Au) contacts	
AC1 (resistive)	1.5 VA (24 Vdc / 60 mA, 230 Vac / 6.5 mA)
AC15 (inductive)	unsuitable
Max. switch-on current	60 mA for < 5 ms
Min. switching perf.	50 mW (either > 5 V or > 2 mA)
Switching performance, silver ($AgSnO_2$) contacts	
AC1 (resistive)	690 VA (230 Vac / 3 A)
AC15 (inductive)	230 VA (230 Vac / 1 A)
Max. switch-on current	30 A for < 5 ms (for cos φ < 0.7: 10 A)
Min. switching perf.	500 mW (> 12 V or > 10 mA)
Diagnostic output (warning output on plug 2)	
Max. load	20 mA / 14...36 Vdc
Transmitter output (analog output)	
Voltage / current	0...10 V/4...20 mA or 10...0 V/ 20...4 mA config. in expert mode
Transient response	approx. 300 ms

HARDWARE

The electronic pressure switches/transmitters of this series provide switching and transmitting, but also relaying functionality.

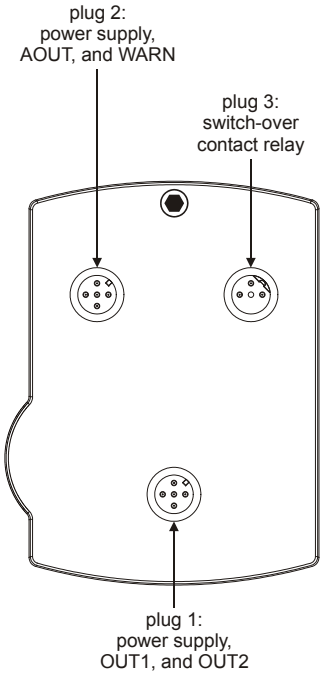

Fig. 1. PST...-R Series, rear view of housing

Two switching outputs (OUT1 and OUT2) are located on a 5-prong, A-coded (as per DIN IEC 60947-5-2) M12 plug (plug 1), which you can also use to connect the power supply. You can configure the two switching outputs as normally-open/normally-closed high-side/low-side or push-pull / inverted push-pull switches (see also Table 2 on page 8).

An analog output (AOUT) and a warning output (WARN) are likewise located on a 5-prong, A-coded (as per DIN IEC 60947-5-2) M12 plug (plug 2), which you can also use to connect the power supply. You can configure the analog output as either a 0...10 V / 10...0 V analog output or as a 4...20 mA / 20...4 mA analog output. The warning output provides feedback about the device's error status (see also section "Technical Data on the WARN Output" on page 6 and section "Error Codes" on page 8).

A switch-over contact relay output is located on a 3-prong, B-coded M12 plug (plug 3), for which a 4-prong M12 angle junction box with pre-attached cable is available as an accessory. You can configure this relay output to be coupled with either OUT1 or OUT2 or with the warning output. If you configure OUT2 as a warning output, the relay output will then likewise function as a warning output (see also section "Pin Assignment of Plug 3" on page 4). You cannot configure the relay output as a normally-open or normally-closed switch.

IMPORTANT

The switching performance of the gold ($AgSn0_2$+Au [5 µm]) switch-over contacts of the relay located on plug 3 must not be exceeded insofar as doing so will degrade the contacts, making them unusable for the specified min. switching performance; thereafter, the switching performance for silver ($AgSnO_2$) contacts (see "Technical Data" on page 1) will apply.

Pressure Ranges

Versions of these devices are available for the following pressure ranges (see also Table 6 on page 20):

- 13 different pressure ranges, from 250 mbar up to 600 bar, with a G1/2" (standard manometer) process connection, for measuring relative pressures.
- Nine different pressure ranges, from 250 mbar up to 25 bar, with a G3/4" (flush) process connection, for measuring relative pressures.
- Two different pressure ranges, 0...2 bar and 0...10 bar, with a G1/2" (standard manometer) process connection, for measuring absolute pressures.
- Two different pressure ranges, 0...2 bar and 0...10 bar, with a G3/4" (flush) process connection, for measuring absolute pressures.

Materials Coming into Contact with Medium

Pressures of up to 100 Bar

G1/2" (standard manometer) and G3/4" (flush) process connection made of stainless steel 1.4571 and 1.4435.

Pressures of up to 250 or 600 Bar

G1/2" (standard manometer) process connection made of 1.4571 and 1.4542 stainless steel.

BEFORE INSTALLATION

IMPORTANT

Installation is to be performed only by qualified personnel.

IMPORTANT

In order to comply with protection rating IP65, unused M12 plugs must be capped (using the caps available as accessories). The caps included in the shipment provide protection against contamination during transportation, only.

IMPORTANT

Regardless of the current operating mode (basic mode / expert mode), all changes to output values take effect immediately (except when OUT1[2] is configured as a N.O./N.C. high-side/low-side or push-pull / inverted push-pull switch, in which case changes take effect only after the EDIT symbol has been extinguished). However, they will be stored permanently only if confirmed (via SAVE).

⚠ CAUTION

To avoid electrical shock or damage to the device, you must ensure that all of the device's connections are without voltage before attempting to detach plugs and cables.

IMPORTANT

In order to comply with protection class II, the auxiliary power source must be reliably separated from the network power supply circuits as per DIN VDE 0106, part 101.

Before installing the device and connecting the wiring, check to ensure that you are installing the proper device version. See section "Manufacturer's Plate".

INSTALLATION

Dimensions

The housing (without process connection or plugs) has dimensions of 98 x 70 x 60 mm. The overall dimensions depend upon the number of plugs/cables and the sensor type. The geometry of the G1/2" and G3/4" connections conform to DIN EN 837.

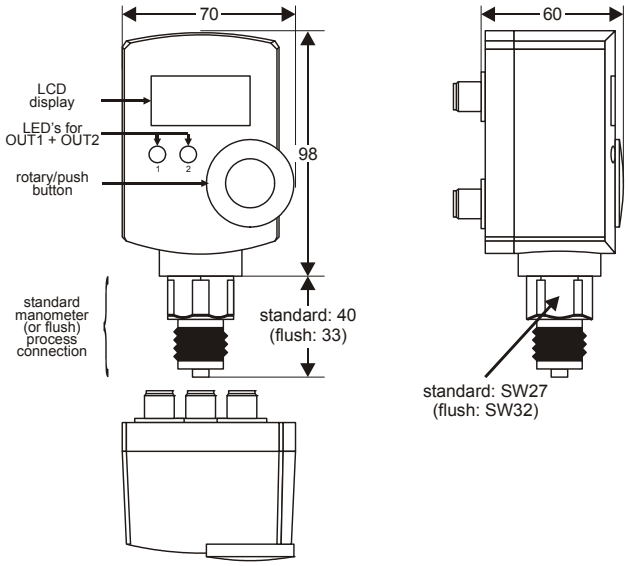

Fig. 2. Dimensions (in mm)

Mounting and Orientation

Depending upon the given model, the device is mounted directly to the pipe via a G1/2" (standard manometer) process connection (requiring a size 27 wrench) or a G3/4" (flush) process connection (requiring a size 32 wrench). This process connection serves simultaneously to fasten and secure the device in place.

Devices equipped with a G½" process connection can be secured to the wall or to a switch box by means of an optional wall attachment set (see Fig. 65 on page 19).

IMPORTANT

In order to avoid damage, never attempt to fasten the device by rotating the housing. Mount the process connection using a suitable hexagonal wrench. Mounting is to be performed by skilled personnel, only!

For optimal legibility of the display, it is recommended that the device be mounted in a vertical orientation. However, the unit can be mounted in any orientation desired.

NOTE: Depending upon their installation orientation, the weight of the diaphragm and of the filling medium in the sensors of the PSTM... versions can have an effect on measurement values of up to 0.5% FS. The devices are all calibrated in the vertical position; in non-vertical orientations, deviations in measurement values are therefore possible. In the case of the PSTM... versions, vertical installation (with the device positioned above the connection pipe) is therefore to be preferred. In any case, all devices can be balanced at any time using the integrated balancing function ("SET0" shown in the display).

For optimal legibility of the display, but also to allow for more-flexible installation, the housing can be rotated on the sensor by approx. 320°.

Electrical Connection

All wiring must comply with applicable electrical codes and local ordinances (e.g. in Germany, in accordance with VDE regulations). To prevent damage to the device, the voltage at OUT1[2] must not exceed 36 Vdc. Refer to job or manufacturer's drawings for details.

IMPORTANT

In order to comply with protection class II, the auxiliary power source must be reliably separated from the network power supply circuits as per DIN VDE 0106, part 101. When correspondingly installed, the device complies with protection class II.

The connections for plugs 1 and 2 are protected against short-circuiting and incorrect polarity.

NOTE: No tampering with the device is allowed. Opening the device will invalidate the warranty.

NOTE: The devices must always be provided with power via either plug 1 and/or plug 2. It is sufficient to connect the power supply via one of these two plugs. However, in the event that power is supplied via both of these plugs, it must have the same polarity and potential.

Pin Assignment of Plug 1

All versions come equipped with plug 1, an A-coded, five-prong M12 plug (see Fig. 3).

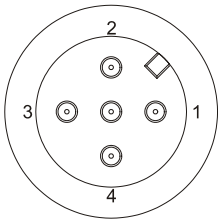

Fig. 3. A-coded M12 plug

Plug 1 has the following pin assignment:
1. Power supply (14...36 Vdc)
2. OUT2: an open-collector output which can be configured as an N.O./N.C. high-side/low-side or as a push-pull / inverted push-pull switch (see also Table 2 on page 8).
3. 0 volt
4. OUT1: an open-collector output which can be configured as an N.O./N.C. high-side/low-side or as a push-pull / inverted push-pull switch (see also Table 2 on page 8).
5. Programming interface

NOTE: The voltage provided by OUT1[2] can be as much as 2.5 V lower than the device's power supply. Thus, assuming a power supply voltage of e.g. 14 V and that the voltage at OUT1[2] is logical "high," then: 14 V ≥ "high" ≥ 11.5 V. Assuming that the voltage is logical "low," then: 2.5 V ≥ "low" ≥ 0 V.

Pin Assignment of Plug 2

All versions come equipped with plug 2, an A-coded, 5-prong M12 plug (see Fig. 3).

Plug 2 has the following pin assignment:
1. Power supply (14...36 Vdc)
2. WARN ("WARN" output; max. current load: 20 mA)
3. 0 volt
4. AOUT (which can be configured as a 0...10 V / 10...0 V output or as a 4...20 mA / 20...4 mA output, max. R_L when configured as a current output = 500 Ω)
5. Programming interface

Pin Assignment of Plug 3

All versions come equipped with plug 3, a B-coded, three-prong M12 plug (see Fig. 4).

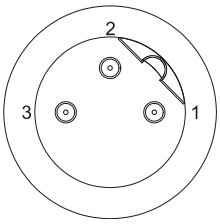

Fig. 4. B-coded M12 plug

NOTE: If inductive components are to be connected to the switch-over contact relay, it must be prevented from causing harmful interference or over-voltage.

Plug 3 has the following pin assignment:
1. common
2. N.C. (normally-closed)
3. N.O. (normally-open)

NOTE: The cable for connecting the relay is available as an accessory. Its green/yellow grounding terminal (PE) is not connected to the device (protection class II).

Technical Data on OUT1 and OUT2

- Max. current load per output: 250 mA.
- At the switch output, the voltage can diminish by as much as 2.5 V.

Example software configurations for e.g. OUT 1 are presented in Fig. 5 through Fig. 12.

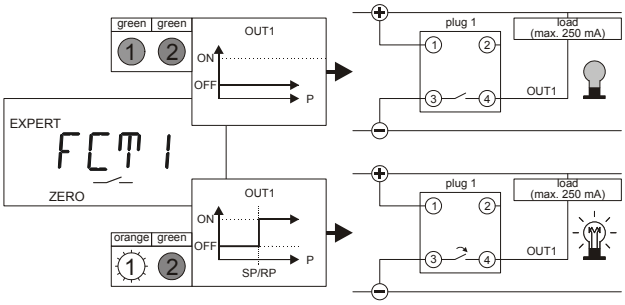

Fig. 5. OUT1 as a normally-open low-side switch

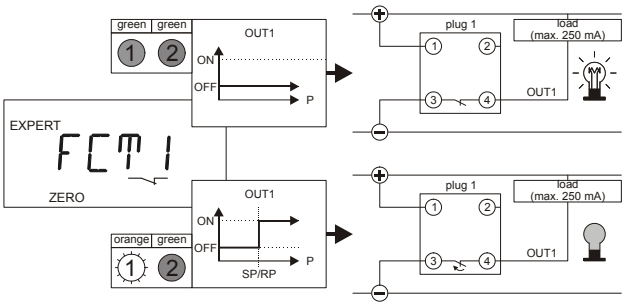

Fig. 6. OUT1 as a normally-closed low-side switch

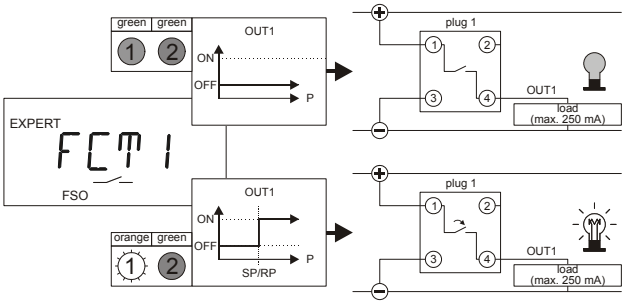

Fig. 7. OUT1 as a normally-open high-side switch

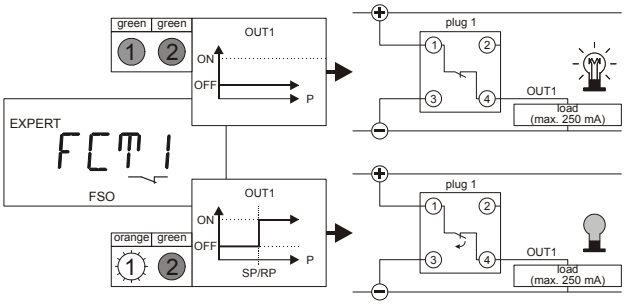

Fig. 8. OUT1 as a normally-closed high-side switch

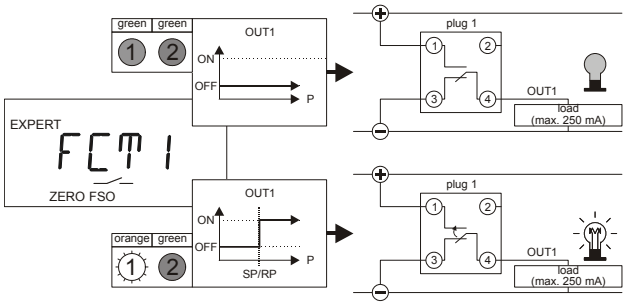

Fig. 9. OUT1 as a push-pull switch with load connected to 0 V

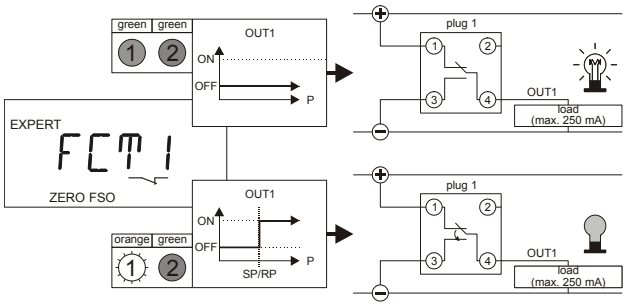

Fig. 10. OUT1 as an inverted push-pull switch with load connected to 0 V

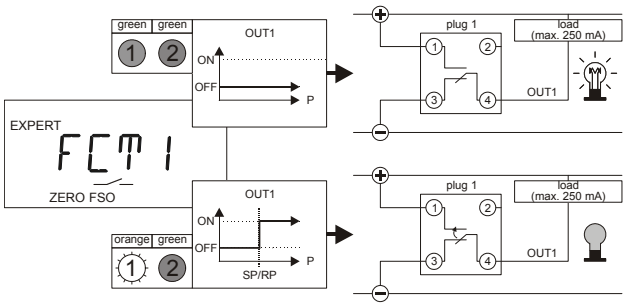

Fig. 11. OUT1 as a push-pull switch with load connected to the power supply

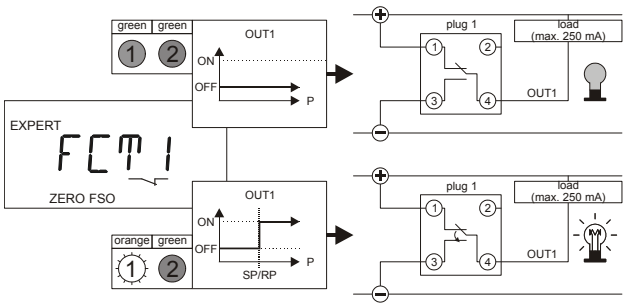

Fig. 12. OUT1 as an inverted push-pull switch with load connected to the power supply

When OUT1[2] are configured as high-side switches, then logical "high" is switched to the corresponding output. When configured as low-side switches, logical "low" is switched to the corresponding output as soon as it becomes active. In the

default shipping setting, OUT1[2] are configured as normally-open low-side open-collector switches (see Fig. 5).

Technical Data on the Analog Output (AOUT)

- configurable either as a 0...10 V / 10...0 V output or as a 4...20 mA / 20...4 mA output.
- max. R_L when configured as a current output = 500 Ω.

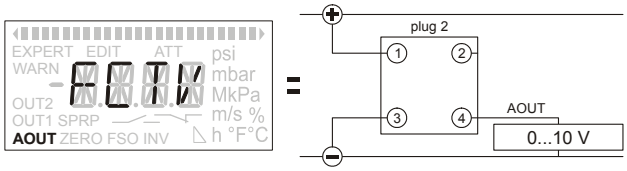

Fig. 13. AOUT as a 0...10 V analog output

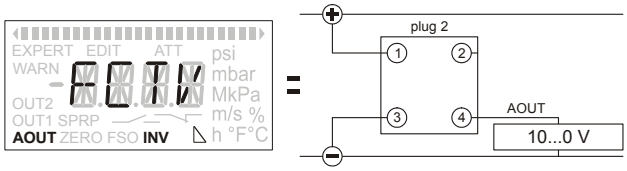

Fig. 14. AOUT as a 10...0 V analog output

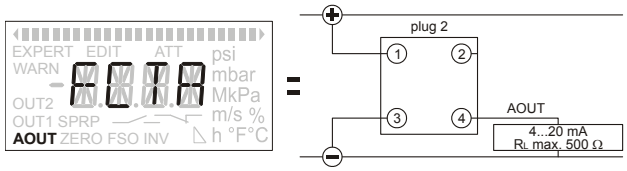

Fig. 15. AOUT as a 4...20 mA analog output

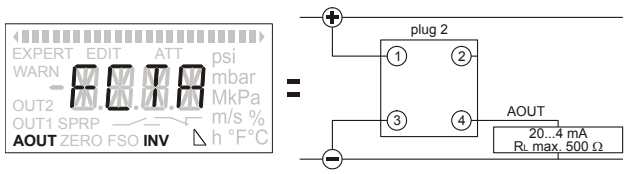

Fig. 16. AOUT as a 20...4 mA analog output

Technical Data on the WARN Output

- maximum current load: 20 mA

The WARN output (pin 2) is not configurable; rather, it is permanently wired as a high-side switch. See Fig. 17.

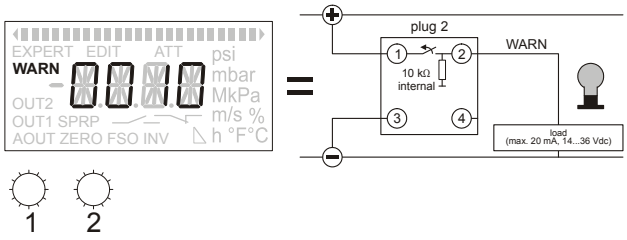

Fig. 17. WARN output (permanent high-side)

When the device recognizes an error (see section "Error Codes" on page 8), the WARN output will become active and is switched (via a pull-down resistor) to 0 V (logical "low). If the device does not recognize any error, the WARN output will remain inactive, and is switched to the power supply.

Manufacturer's Plate

The manufacturer's plate contains important technical data.

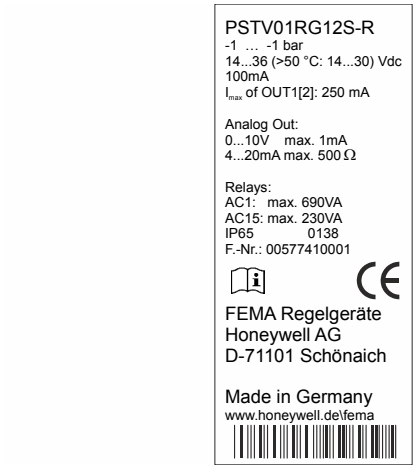

Fig. 18. Manufacturer's plate

The manufacturer's plate identifies the device model in the topmost line and below that the following information:

- the nominal pressure range,
- the permissible power supply,
- the max. permissible current load at OUT1[2],
- the max. permissible current load of and max. permissible resistance at the analog output,
- the date code,
- the manufacturing number, and
- an information symbol referring the installer to these Installation Instructions.

Hardware Features

All configuration and parameterization data is stored in the device.

Regardless of the current operating mode (basic or expert mode), changed parameters and configurations become immediately effective, but are permanently stored in the device's memory only after confirmation via SAVE.

In the event of a power loss, only permanently stored values will be again available once power has been restored. Unstored parameters and configurations are lost! In the event of a power loss during the transfer of data into device's memory (via SAVE), data may be lost.

LCD Display Screen

The LCD display screen (see Fig. 19) features a four-digit display, three decimal points, and a minus sign.

NOTE: When cleaning the display screen, use no harsh cleaning agents.

In addition to the four-digit numeric display, the LCD display screen can also present numerous additional symbols useful in operating the device:

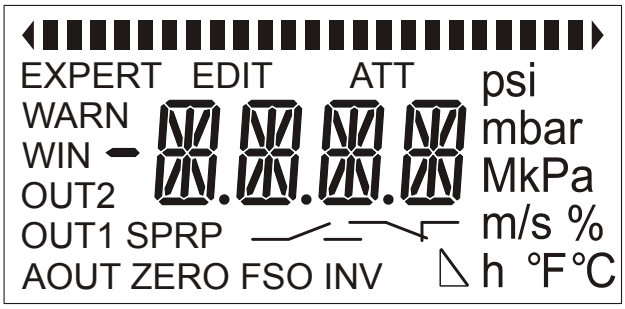

Fig. 19. LCD display screen

Bargraph (▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮) and Trend Display (◂ ▸)

The bar graph (at the top of the screen) consists of several individual segments. The trend display (to the left and right of the bar graph) consists of two arrowheads.

- When the device is displaying the current pressure, the left (◂) or right (▸) arrowhead (respectively) will appear to indicate dropping or rising pressure.
- While an output is being parameterized (in the basic mode) to act as a max. or min. pressure monitor, the right (▸) or left (◂) arrowhead (respectively) will appear.
- When an output is being configured (in the expert mode) to act as a max. or min. pressure monitor, the right (▮▮▮▸) or left (◂▮▮▮) arrowhead (respectively) together with three segments of the bar graph will appear.
- When the device is displaying the current pressure, the number of segments of the bar graph proportional to the current pressure will appear. Thus, if the current pressure is equal to the min. measurable pressure, no segments will be displayed, and if the current pressure is equal to the device's max. measurable pressure, all of the individual segments will be displayed.
- When parameterizing the device, a single segment of the bar graph (▮) will appear at a position corresponding to the set value.
- When viewing the max./min pressure or the time elapsed since the max./min pressure were registered, the max. drag indicator symbol (▮ ▮ ▮ ▸) or min. drag indicator symbol (◂ ▮ ▮ ▮), respectively, is displayed.

EDIT

After the EDIT symbol has been made to appear (see sections "Setting Parameters in the Basic Mode" and "Configuring in the Expert Mode"), values (in the basic mode) or units (in the expert mode) can be changed by rotating and pressing the RPB (rotary/push button).

Units

You may choose from among the following pressure units:
- psi,
- bar, and
- Pa.

Settings

These symbols appear during parameterization / configuration.

ATT	(Filter) attenuation
EXPERT	Expert mode (enabling the user to change measurement units, switch-points, etc.)
WARN	Warning / alarm
WIN	Window monitor (for monitoring a pressure range)
OUT1	Output 1
OUT2	Output 2
SP	Switch-point or, in the case of monitoring a pressure window (WIN), the upper or lower pressure limit
RP	Reverse switch-point or, in the case of monitoring a pressure window (WIN), the upper or lower pressure limit
—◿–	OUT1[2] configured to be an N.O. switch (FSO ***or*** ZERO also displayed) or as push-pull switch (FSO ***and*** ZERO also displayed)
—◺–	OUT1[2] configured to be an N.C. switch (FSO ***or*** ZERO also displayed) or as inverted push-pull switch (FSO ***and*** ZERO also displayed)
AOUT	Analog output (if the current pressure is outside of the span, the AOUT symbol will not be visible on the screen)
ZERO	Zero-point of the analog output. Also, it appears if OUT1[2] has been configured to be a low-side switch (i.e. the device switches logical "low" to the output)
FSO	Full-Scale Output, i.e. upper limit of the analog output. Also, it appears if OUT1[2] has been configured to be a high-side switch (i.e. the device switches logical "high" to the output)
INV ◺	Inversion of the analog signal (i.e. output is then configured as 10...0 V or 20...4 mA instead of as 0...10 V or 4...20 mA, respectively)

See also sections "Sequence of Display Screens in Basic Mode" and "Overview of Parameter", where you will find an explanation of when the various different screens will appear and for additional information on the meanings of the individual symbols.

Time-Out Function

The time-out represents a 1-minute period during which the device will remain in the basic mode or expert mode (as the case may be) without automatically reverting to the display state (whereupon already-changed but not-yet-saved values will be lost). During the time-out, any manipulation of the RPB will restart the internal clock, thus prolonging the time-out for an additional 1 minute and allowing the user to continue parameterization and/or configuration.

IMPORTANT

If the user allows (by not manipulating the RPB for 1 minute) the time-out to completely elapse, the device will automatically revert to the display state (i.e. show the current pressure), and already-changed but not-yet-saved values will be lost.

However, when the device is in the expert mode, the time-out is enabled only as long as no configuration has been changed. I.e. changing a configuration disables the time-out function.

Recognition of Implausible Settings

⚠ CAUTION

The software automatically recognizes implausible settings of SP, RP, ZERO, and FSO. The last-set value takes precedence over the first-set value. Thus, upon permanently

storing the last-set value, the first-set value will be shifted right up to the second-set value, as necessary.
In the case of an implausible setting, the corresponding LED (for OUT1 or OUT2, as the case may be) will light up red. When this setting is then stored, the value of the other output (OUT 2 or OUT1, as the case may be) will be automatically shifted. If your parameterizations are plausible, the red LED is extinguished and the current switching status is displayed. Plausible parameterizations are explained below.

Parameterizing the Device to Act as a Switch

When configuring an output as a **max. pressure monitor**, SP must be greater than RP; further, a predefined min. difference between SP and RP must be observed. If this condition is not observed, the corresponding LED will turn red, and upon permanently storing the settings, the other value (SP or RP, respectively) will be shifted; SP will then be equal to RP. The LED will remain red until the min. difference is set.

When configuring an output as a **min. pressure monitor**, SP must be less than RP; further, a predefined min. difference between SP and RP must be observed. If this condition is not observed, the corresponding LED will turn red, and upon permanently storing the settings, the other value (SP or RP, respectively) will be shifted; SP will then be equal to RP. The LED will remain red until the min. difference is set.

⚠ CAUTION

After setting the switch-point or reverse switch-point of an output to act as a min. or max. pressure monitor and after storing this configuration, you must check if the corresponding switch-points indeed have the desired values and that the red LED has been extinguished.

NOTE: When configuring an output to act as a **window monitor** (WIN), the only restriction applying to the relative values of SP and RP is that the min. difference be observed. SP can be greater or less than RP.

Parameterizing the Analog Output

When configuring the analog output in order to define a span (i.e. that portion of the device's total measuring range which is of particular interest to you), FSO **minus** ZERO must be greater than or equal to 50% of the device's total measuring range. If this is not the case, no error is displayed; instead, the first-set value (i.e. FSO or ZERO, as the case may be) will be automatically shifted, as necessary.

NOTE: The specified accuracy refers to the respective pressure range. E.g. at FSO minus ZERO = 50%, the accuracy then amounts to 1% of the correspondingly narrower range.

NOTE: After shifting the value of ZERO, the value of FSO must be checked and vice-versa.

If the current measured pressure is outside of the selected span (i.e. either below ZERO or above FSO), the AOUT symbol will not be visible on the screen and the current pressure will be displayed. When configured (in the expert mode) as FCTV, the analog signal is limited to 0 V or 10 V, as the case may be; when configured as FCTA, it is limited to 4 mA or 20 mA, as the case may be.

Indicator LEDs

The condition (status) of the switch outputs is indicated by means of two LEDs located below the display screen. These two LEDs can display three different colors having the following meanings:

- Orange: The corresponding output is active.
- Green: The corresponding output is not active (if specified as a WARN output, "green" likewise means that the WARN output is not active)
- When editing (EDIT) SP/RP, only the LED of that output being edited is illuminated; in the event of implausible values for RP and/or SP, the corresponding LED will light up red.
- If both indicator lights are illuminated red and the "WARN" symbol appears: WARN mode.
- If both indicator lights are illuminated, but the "WARN" symbol does not appear: Implausible RP/SP for both outputs.

Table 1. Meaning of LED indicators

LED status		meaning	
LED 1	**LED 2**	**OUT1 status**	**OUT2 status**
orange	orange	active	active
green	green	inactive	inactive
orange	green	active	inactive
green	orange	inactive	active
red	red	error (WARN) or 2x implausible	
red	--	implausible	--
--	red	--	implausible

Table 2. Potential of outputs in dependence upon their configuration and status

symbols in display	configuration	output signal	
		active	**inactive**
FSO,	N.O. high-side	"high"	floating
ZERO,	N.O. low-side	"low"	floating
FSO,	N.C. high-side	floating	"high"
ZERO,	N.C. low-side	floating	"low"
ZERO, FSO,	push-pull	"high"	"low"
ZERO, FSO,	inv. push-pull	"low"	"high"
N.O. = normally-open; N.C. = normally closed			

Error Codes

A number of different error codes can appear in the display, serving to indicate a variety of faulty states.

Table 3. Error codes

text	meaning
***1	sensor failure
**1*	power supply voltage too low
*1**	excessively low ambient temperature
*2**	excessively high ambient temperature
1***	OUT1 is overloaded
2***	OUT2 is overloaded
3***	OUT1 and OUT2 both overloaded

Rotary/Push Button (RPB)

Pushing the RPB: Pushing the RPB (rotary/push button) confirms (in certain cases: rejects) the selections you have made.
Rotating the Rotary/Push Button: When the EDIT symbol has been called up, rotating the RPB (CW or CCW) individual ticks increases or decreases (as the case may be) the given displayed value. Otherwise, rotating the RPB sweeps through a sequence of screens.

Possible Settings

Attenuation Filter (ATT Symbol)

The analog output has a transient response time of approx. 300 ms. OUT1 and OUT2 have a reaction time of 30 ms. Pressure peaks at the sensor input thus have only a qualified effect upon the corresponding output. Pressure peaks which you want to filter out above and beyond the device's low pass behavior can be attenuated using the attenuation filter (see Fig. 20).

The attenuation filter (see Fig. 31) has an effect upon the display behavior, output behavior, and switching behavior.

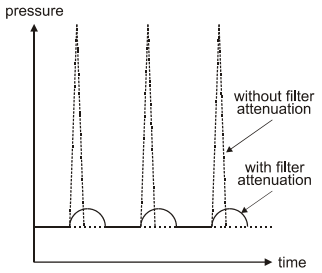

Fig. 20. Effect of filter attenuation

While the device is in the basic mode, the filter can be changed in 1% steps from 0 to 95%.

The currently-measured pressure will then be compared with the previously-measured pressure. Thus, depending upon the given filter setting, the currently-measured value is attenuated to a certain degree. This attenuation affects all outputs, i.e. OUT1[2], the analog output, and the switch-over contact relay; this is because the attenuation has a direct influence upon the measurement sensor.

The former and new measurement values (calculated values) are always given a weight of 100%.

Mathematically, the filter attenuation can be expressed as follows:

$$R[x] = M[x] * (100\% - F) + R[x - 1] * F$$

where:
- "F" is the filter attenuation in percent,
- "M[x]" is the measurement value as a function of the time "x",
- "R[x - 1]" is the displayed / outputted measurement value (calculated value) at the previous time "x - 1", and
- "R[x]" is the displayed / outputted measurement value (calculated value) at the time "x".

Example 1:
Assuming that the filter attenuation "F" has been set to 10%, then 90% of the new measurement value "M[x]" and 10% of the last previously-calculated value "R[x - 1]" will be factored into the new displayed / outputted measurement value "R[x]".

Example 2:
Assuming that the filter attenuation "F" has been set to 95%, then only 5% of the new measurement value "M[x]" and 95% of the last previously-calculated value "R[x - 1]" will be factored into the new displayed / outputted measurement value "R[x]".

Example 3:
If the filter attenuation "F" is set to OFF (= 0%), then the entire measurement value is taken as the displayed / outputted measurement value R[x]. In this case:

$$R[x] = M[x].$$

Locking/Unlocking the Device

Defining a Non-Zero Code

NOTE: The following explanations assume that the device is still in the default shipping setting (i.e. "EXPN" = not locked for configuration). Otherwise, see section "Locking the Device for Configuration ("EXPN" -> "EXPL")" on page 10.

In order to prevent the unauthorized changing of parameters and configurations, the user can define a 4-digit, non-zero code (without a minus sign, and having a value of between 0001 and 9999). This is done by going through the **expert mode's** sequence of screens until reaching the screen shown in Fig. 50:

- The text "CODE" then means that a code has not yet been defined and that the user is free to define one.
- The text "LOCK" then means that a code has already been defined and, moreover, that the device has already been locked.

Assuming that the text "CODE" has appeared, you must now press the RPB in order to confirm that you do indeed wish to define a code. "0000" will then appear in the display.

The desired code must now be defined by sequentially rotating (to select) and pressing (to confirm) the RPB for each digit of the desired code (which must be a 4-digit number between 0001 and 9999). After the fourth digit of the desired code has been defined, the text "LOCK" will appear. You should then rotate the RPB CW one tick, whereupon the "EXIT" screen (Fig. 51) will appear. After confirming this by pressing the RPB, the device will re-enter the basic mode, and the 1-minute grace period will immediately become effective (see also section "Time-Out Function" on page 7).

If a non-zero code has been defined, the following will apply:

- If the 1-minute grace period is allowed to elapse, or
- if the device is turned OFF and then ON again,

the device will immediately become locked for parameterization and configuration. It is then no longer possible to make changes to parameters or configurations without first unlocking the device; rather, parameters can then be viewed, only. Thus, a parameter can be selected (and will also be displayed), but after pressing the RPB, instead of the value

changing, the text "LOCK" will appear in the screen for 1 second, after which the unchanged value will re-appear.

In order to be able to again change parameters, it is necessary to unlock the device (also section "Unlocking a Locked Device" below).

Unlocking a Locked Device

A device locked for parameterization and configuration can be unlocked by inputting the correct code. This is done by going through the basic mode's sequence of screens (Fig. 24 to Fig. 34) and stopping at the last screen, in which the text "CODE" (instead of "EXP") will appear, thus prompting the user to input the correct code. You must now press the RPB in order to confirm that you wish to input the code. "-- -- -- --" will appear in the display.

The correct code must now be inputted by sequentially rotating (as appropriate) and pressing the RPB for each digit of the code (which must be a 4-digit number between 0001 and 9999).

If you have inputted the incorrect code, the device will remain in the basic mode and display the text "CODE".

Inputting the correct code will place the device into the expert mode. The 1-minute grace period will then immediately become effective again. The user then has the option of either remaining in the expert mode (where configurations can be viewed and changed) or of entering the basic mode.

Defining No Code (CODE = 0000)

Defining (and permanently storing) a code of 0000 (which is the default shipping setting) means that that the device will under no circumstances ever become locked. If, while in the expert mode, any parameters / configurations are then changed but not permanently stored (via SAVE), the device will nevertheless remain in the expert mode until either a SAVE or a REST (for "restore") is performed.

Locking the Device for Configuration ("EXPN" -> "EXPL")

It is possible to lock the device for configuration; thereafter, it is still possible to enter the expert mode, but it is impossible to make any changes while there. To do this, it is necessary to change the default shipping setting of "EXPN" to "EXPL". This can be done during the power-up sequence as follows:

1. Immediately after the power is turned ON, press and hold down (for approx. 5 seconds) the RPB until the software version is displayed.
2. Now rotate the RPB CW and go through the sequence of screens until you reach a screen displaying either "EXP" (indicating that as yet no code [CODE = 0000] had been defined) or "CODE" (indicating that a non-zero code has already been defined). If "EXP" appears, you can enter the expert mode and press the RPB to proceed immediately to step 3. If "CODE" appears, you must first input the correct code in order to enter the expert mode, press the RPB, and then proceed to the step 3.
3. Rotate the RPB CW until you come to a screen displaying either "CODE" (indicating that as yet no code [CODE = 0000] had been defined) or "LOCK" (indicating that a non-zero code has already been defined). Regardless, you must now press the RPB. You can now either input the same (old) code or define a new code.
4. The very next screen to appear will display either "EXPN" or "EXPL" (see Table 4 for the code-dependent meaning of this text; the first line is the default shipping setting). Changing "EXPN" to "EXPL" locks the device for configuration. Changing "EXPL" to "EXPN" unlocks the device for configuration.

Table 4. Code-dependent meaning of text at power-up

code	text	parameterization (basic mode)	configuration (expert mode)
0000	EXPN	unlocked	unlocked
0000	EXPL	unlocked	locked
≠0000	EXPN	locked	unlocked
≠0000	EXPL	locked	locked

Lost/Forgotten Code

In the event that you have lost or forgotten your code, you can also unlock the device by means of the master code obtained from Honeywell (when contacting Honeywell, please state your device's serial number).

Operating Sequence

Power Up

After power has been supplied, the backlighting is activated, thus illuminating the LCD display, and all of the symbols appear. Further, the two LEDs are illuminated for one second (see Fig. 21).

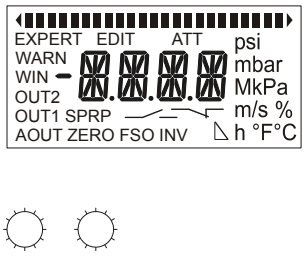

Fig. 21. LCD display screen and LEDs on power-up

Basic Mode

After one second, the display goes into the so-called ***basic mode***. The basic mode is used to display and change (i.e. to parameterize) SP/RP, ZERO, and FSO, to set the attenuation filter, to view/reset the drag (min./max.) pressure indicators, and to enter the expert mode.

In the first screen (see example in Fig. 22), the current pressure (as a digital value and bar graph), the corresponding pressure unit, and the trend (increasing / decreasing pressure) are displayed.

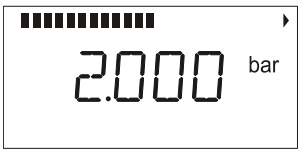

Fig. 22. LCD display screen after power-up

If the user does not manipulate the RPB for 30 seconds, and if "LED-" has been set (in the expert mode), the LCD display

screen's backlighting will be shut off automatically (see Fig. 23). If (in the expert mode) "LED+" has been set, the LCD display screen's backlighting will remain on permanently.

Fig. 23. LCD display screen 30 s after last manipulation

Sequence of Display Screens in Basic Mode

When in the basic mode, rotating the RPB one tick CW at a time results in the presentation, in the following sequence (see Fig. 24 to Fig. 35), of all of the individual screens available in this mode. At any time, you may rotate the RPB CCW to go back to earlier screens in the reverse sequence.

Display state: If the user does not manipulate the RPB for 60 seconds, regardless of the current screen, the LCD display screen will revert to the first screen displaying the pressure.

The values displayed in the following examples are valid for devices of the PST...-R series.

Fig. 24. First screen displayed in the basic mode

After rotating the RPB one tick CW, the next screen, with information about the switch-point (SP) of output 1, will be displayed (see example in Fig. 25; in this case, OUT1 has been configured as an N.O. high-side switch and as a max. pressure monitor with a switch-point of 3.000 bar).

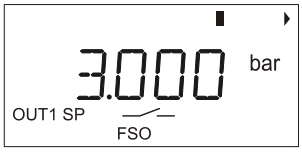

Fig. 25. Next screen after rotating the RPB

After rotating the RPB another tick CW, the next screen, with information about the reverse switch-point (RP) of output 1, will be displayed (see example in Fig. 26; in this case, OUT1 has been configured as an N.O. high-side switch and as a max. pressure monitor with a reverse switch-point of 1.000 bar).

Fig. 26. Next screen after rotating the RPB

After rotating the RPB another tick CW, the next screen, with information about the switch-point (SP) of output 2, will be displayed (see example in Fig. 27; in this case, OUT2 has been configured as an N.O. low-side switch for window monitoring, with a switch-point of 1.500 bar).

Fig. 27. Next screen after rotating the RPB

After rotating the RPB another tick CW, the next screen, with information about the reverse switch-point (RP) of output 2, will be displayed (see example in Fig. 28; in this case, OUT2 has been configured as an N.O. low-side switch for window monitoring, with a reverse switch-point of 2.800 bar).

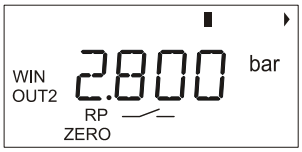

Fig. 28. Next screen after rotating the RPB

After rotating the RPB another tick CW, the next screen, with information about the zero-point (ZERO) of the analog output, will be displayed (see example in Fig. 29; in this case, the analog output has been configured with a ZERO of 0.500 bar).

Fig. 29. Next screen after rotating the RPB

After rotating the RPB another tick CW, the next screen, with information about the upper limit (FSO) of the analog output's measuring range, will be displayed (see example in Fig. 30; in

this case, the analog output has been configured with an FSO of 3.900 bar).

Fig. 30. Next screen after rotating the RPB

After rotating the RPB another tick CW, the next screen, with information about the filter attenuation, will be displayed (see example in Fig. 31; in this case, a filter attenuation of 10% has been set).

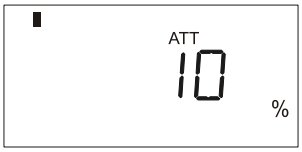

Fig. 31. Next screen after rotating the RPB

After rotating the RPB another tick CW, the next screen, with information about the min. pressure (recorded by the drag indicator) will be displayed (see example in Fig. 32; in this case, the lowest pressure recorded was 1.000 bar).

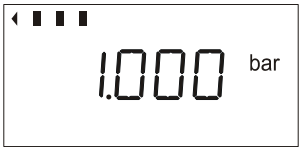

Fig. 32. Next screen after rotating the RPB

If you now press the RPB, the EDIT symbol will appear, whereupon you can make the drag indicator's timer appear by rotating the RPB one tick CW. The timer displays how long ago (in hours) the min. pressure occurred (e.g. "1.38 h" means that it occurred 1 hour and 38 minutes ago). Rotating the RPB another tick CW and then pressing it will reset the timer.

NOTE: Immediately after power-on, and until the timer has been reset, the timer function is not available (and the text "NAVL" will appear in the display).

After rotating the RPB another tick CW, the next screen, with information about the max. pressure (recorded by the drag indicator) will be displayed (see example in Fig. 33; in this case, the highest pressure recorded was 3.900 bar).

Fig. 33. Next screen after rotating the RPB

If you now press the RPB, the EDIT symbol will appear, whereupon you can make the drag indicator's timer appear by rotating the RPB one tick CW. The timer displays how long ago (in hours) the max. pressure occurred (e.g. "0.44 h" means that it occurred 44 minutes ago). Rotating the RPB another tick CW and then pressing it will reset the timer.

NOTE: Immediately after power-on, and until the timer has been reset, the timer function is not available (and the text "NAVL" will appear in the display).

After rotating the RPB another tick CW, the next and final screen will be displayed (see Fig. 34).

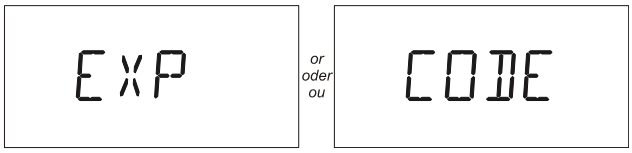

Fig. 34. Last screen after rotating the RPB

The final screen will display either "EXP" or "CODE" (see section "Unlocking a Locked Device" on how to input the code).

Upon reaching this final screen, you can return to any one of the previous screens by rotating the RPB individual ticks CCW. The previous screens will then be again displayed, though in the reverse order.

Setting Parameters in the Basic Mode

If the device has been locked for parameterization, you will be unable to do more than view values.

After having unlocked the device (see section "Unlocking a Locked Device"), however, you will be able to change values. To change a particular value (after unlocking), the display screen must first be made to present the desired parameter by going through the sequence of screens listed above until the corresponding screen is reached (see example in Fig. 35).

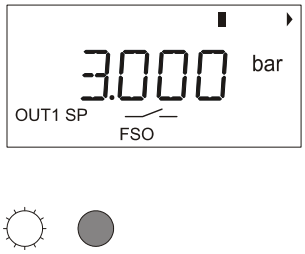

Fig. 35. Displaying the desired parameter to be edited

Press the RPB. The screen remains unchanged except that the EDIT symbol appears (see Fig. 36).

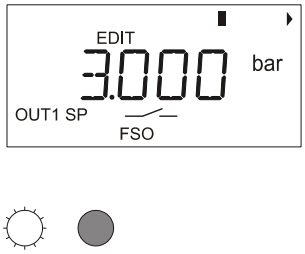

Fig. 36. Display screen after appearance of EDIT symbol

If the RPB is now rotated CW or CCW, the value will correspondingly rise or drop in increments / decrements which depend upon the model (see example in Fig. 37).

Fig. 37. Display screen after increasing value of desired parameter

After the desired value has been reached, again pressing the RPB will cause the following screen to appear (see Fig. 38). However, if no values have been changed, it is not necessary to save.

Fig. 38. Display screen after pressing the RPB: SAVE

You now have only two choices: You can either accept or reject the new value.

- Accept: Pushing the RPB now means that you want to permanently save the new value.
- Reject: Rotating the rotary/press button one tick CCW will cause the next screen to appear (see Fig. 39).

Fig. 39. Next screen after rotating back the RPB

If you now press the RPB, the new values will be rejected, and the former values will be reinstated in the permanent memory.

Sequence of Screens in Expert Mode

When in the expert mode, rotating the RPB individual ticks results in the presentation in a sequence of all of the individual screens of this mode. At any time, the sequence can be halted by pressing the RPB, whereupon parameters can be redefined/reconfigured by rotating the RPB. The values displayed in the following figures are **examples**.

In the first screen, the configuration of output 1 is displayed (see example in Fig. 40; in this case, OUT1 has been configured as a max. pressure monitor).

Fig. 40. First screen displayed in the expert mode

After rotating the RPB one tick CW, the next screen, with information about the function of output 1, will be displayed (see Fig. 41; in this case, OUT1 has been configured as an N.O. low-side switch).

Fig. 41. Function display for OUT1 in expert mode

After rotating the RPB another tick CW, the next screen, with information about the configuration of output 2, will be displayed (see Fig. 42; in this case, OUT2 has been configured as a window monitor).

Fig. 42. Next screen after rotating the RPB

After rotating the RPB another tick CW, the next screen, with information about the function of output 2, will be displayed (see Fig. 43; in this case, OUT2 has been configured as an N.C. high-side switch).

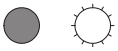

Fig. 43. Function display for OUT2 in expert mode

After rotating the RPB another tick CW, the next screen, with information about the function of the analog voltage output (FCTV) or analog current output (FCTA), will be displayed (see Fig. 44).

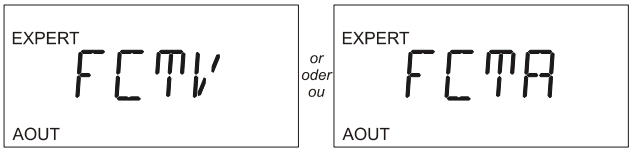

Fig. 44. Next screen after rotating the RPB

The "V" means that the analog output is configured for 0...10 V. By causing the INV ◺ symbol to appear, this can be changed to 10...0 V.

The "A" means that the analog output is configured for 4...20 mA. By causing the INV ◺ symbol to appear, this can be changed to 20...4 mA.

After rotating the RPB another tick CW, the next screen, with information about the switch-over contact relay, will be displayed (see example in Fig. 45; in this case, the relay has been coupled with OUT1).

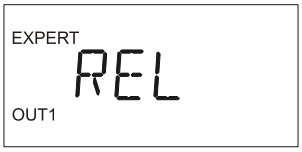

Fig. 45. Next screen after rotating the RPB

After rotating the RPB another tick CW, the next screen, with information about the unit of pressure, will be displayed (see Fig. 46). In this example, the device has been configured for bars.

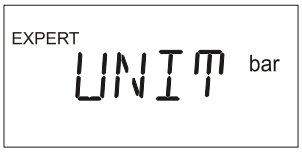

Fig. 46. Next screen after rotating the RPB

After rotating the RPB another tick CW, the next screen will be displayed (see Fig. 47).

Fig. 47. Next screen after rotating the RPB

After pressing the RPB, the current measured pressure will be displayed. If this pressure deviates from the actual pressure, you should balance the device. See section "Balancing the Device" below.

Balancing the Device

Balancing is a hidden function which can be carried out only immediately after switching the device on and while in the expert mode.

To balance the device, proceed as follows:
1. Immediately after turning ON the power (i.e. during the power-up sequence), press and hold down (for approx. 5 seconds) the RPB until the software version is displayed. Enter the expert mode and select SET0.
2. Rotate the RPB until the actual pressure is displayed.

If, however, the beginning of the measuring range should be balanced (in the case of the PSTV01...: the zero-point or minus 1 bar), proceed as follows:

1. Immediately after turning ON the power (i.e. during the power-up sequence), press and hold down (for approx. 5 seconds) the RPB until the software version is displayed. Enter the expert mode and select SET0.
2. Rotate the RPB CCW until both LEDs illuminate red.
3. Rotate the RPB CW until the displayed value is zero and the two red LEDs are extinguished.

If you wish to return the device to its original default settings, you must rotate the RPB until the left (◖) and right (◗) trend arrow heads appear simultaneously.

IMPORTANT

Due to possible sensor drift, we recommend balancing the device annually.

After rotating the RPB another tick CW, the next screen, with information about adjusting the display backlighting, will be displayed (see Fig. 48). In this example, the LED has been set to remain ON permanently (+).

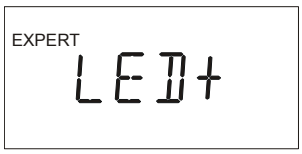

Fig. 48. Next screen after rotating the RPB

After rotating the RPB another tick CW, the next screen, with information about simulation modes, will be displayed (see Fig. 49). In this example, the simulation mode has been turned OFF.

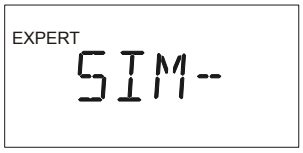

Fig. 49. Next screen after rotating the RPB

See also section "Configuring/Executing Simulation Modes" on page 17 for an explanation of how to configure and execute simulation modes.

After rotating the RPB another tick CW, the next screen, with information about the code or lock, will be displayed (see Fig. 50). If no code has been set (i.e. code = 0000), the left display will appear; if a code has been set (i.e. code = 0001 to 9999), the right display will appear.

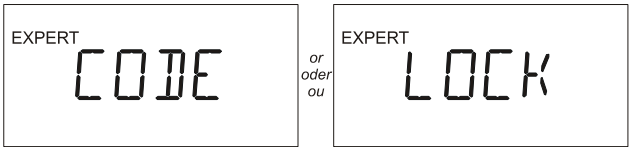

Fig. 50. Next screen after rotating the RPB

After rotating the RPB another tick CW, the final screen of the expert mode will be displayed (see Fig. 51).

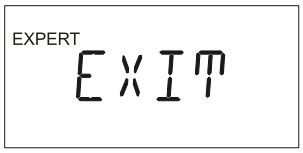

Fig. 51. Final screen after rotating the RPB

You can return to any of the previous screens by rotating the RPB individual ticks CCW. The previous screens will be again displayed, though in the reverse order.

NOTE: If, while in the expert mode, no configuration is changed, following the time-out (one minute), the device will revert to the basic mode.

NOTE: If, while in the expert mode, a value is changed, the device will remain at that position of the sequence of screens until the user defines a value via either "SAVE" or "REST."

Configuring in the Expert Mode

The screen must be made to present the desired parameter by going through the sequence of screens listed above until the corresponding screen is reached (see example in Fig. 52).

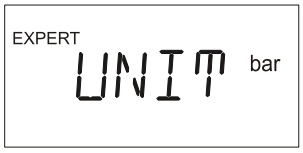

Fig. 52. Displaying the desired parameter to be edited

Press the RPB. The screen remains unchanged except that the EDIT symbol now appears (see example in Fig. 53).

Fig. 53. Display screen after appearance of EDIT symbol

If the user now again presses the RPB, the screen will revert to its appearance in Fig. 52. If, however, the RPB is rotated CW or CCW, different configuration options (in this example: other units, e.g. psi) will appear accordingly.

Fig. 54. Display screen after selecting a different unit

If the user now again presses the RPB, the screen will revert to its appearance in Fig. 52, though with a new unit (namely: psi). If, however, the RPB is instead rotated to the end of the sequence, the "EXIT" screen will appear (see Fig. 55).

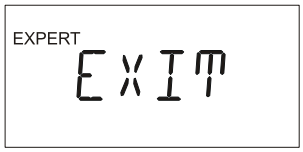

Fig. 55. Display screen after rotating the RPB to the end of the display sequence

You can now press the RPB to confirm that you want to exit the editing sequence, and then rotate the RPB CW or CCW (as the case may be) until either "SAVE" (see Fig. 56) or "REST" (see Fig. 57) appears in the screen.

Fig. 56. Display screen after rotating the RPB to "SAVE"

You now have only two choices: You can either accept or reject the new parameters. Pushing the RPB now means that you want to permanently save the new parameters. Rotating the rotary/press button one tick CW will cause the next screen to appear (see Fig. 57).

Fig. 57. Display screen after rotating the RPB to "REST"

If the user now presses the RPB, the new values will be rejected, and the former values will be reinstated in the

permanent memory. Following either the "REST" or "SAVE" screen, the device will revert to the basic mode.

Example Configurations in the Expert Mode

NOTE: When configuring an output as a max. or min. pressure monitor or window monitor (WIN), it may occur that the LED of the corresponding output will light up red. This indicates that the software has assigned SP and RP implausible values (e.g. SP = RP). In this case, you will have to enter the basic mode and change the values of SP and/or RP so that the red LED is extinguished. Furthermore, the red LED also lights up when the current pressure is displayed in the basic mode or when the settings are implausible.

Configuration of an Output as a Max. Pressure Monitor

When one of its output has been configured as a max. pressure monitor, the device serves to monitor and act upon changes of pressure relative to a pre-selected upper limit (SP). The corresponding output will then switch as soon as this upper limit is exceeded. On the basis of this switching process, a controller could then e.g. reduce the pressure. As soon as the pressure drops below the reverse switch-point (RP), the output will revert to its initial state. Thus, the switching process is triggered when the pressure rises above SP, while the reverse switching process is triggered when the pressure drops below RP!

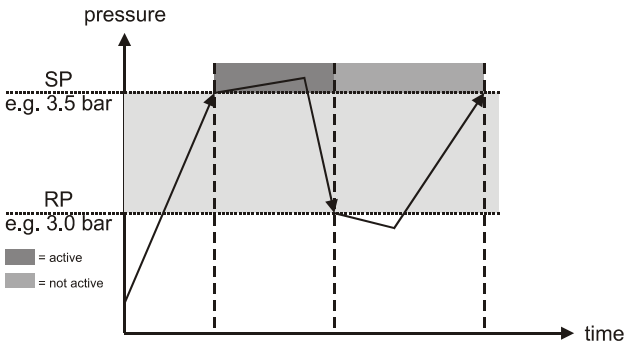

Fig. 58. Max. pressure monitor

Example:

Fig. 59. Output 1 configured as a max. pressure monitor

Configuration of an Output as a Min. Pressure Monitor

When one of its output has been configured as a min. pressure monitor, the device serves to monitor and act upon changes of pressure relative to a pre-selected lower limit (SP). The corresponding output will then switch as soon as the pressure drops below the set min. value. On the basis of this switching process, a controller could then e.g. increase the pressure. As soon as the pressure rises above the reverse switch-point (RP), the device will revert to its initial state. Thus, the switching process is triggered when the pressure drops below SP, while the reverse switching process is triggered when the pressure rises above RP!

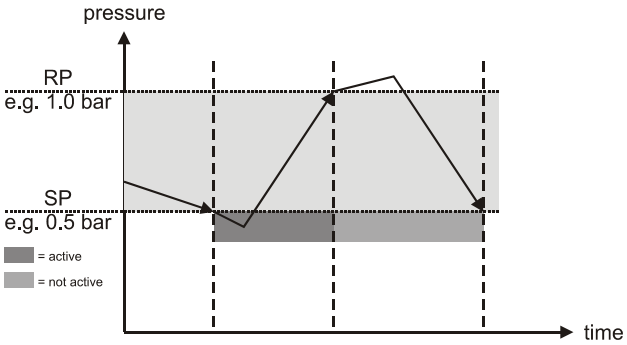

Fig. 60. Min. pressure monitor

Example:

Fig. 61. Output 1 configured as a min. pressure monitor

Configuration of an Output as a Window Monitor

When one of its outputs has been configured as a window monitor, the device serves to monitor and act upon changes of pressure beyond a pre-selected range. The corresponding output will then switch as soon as the pressure leaves the set range. On the basis of this switching process, a controller could then e.g. increase or decrease the pressure, as appropriate. As soon as the pressure returns to the pre-selected range, the device will revert to its initial state. Thus, the switching process is triggered when the pressure leaves the pre-selected range, though with a certain degree of hysteresis (in order to prevent uncontrolled switching on the part of the pressure controller).

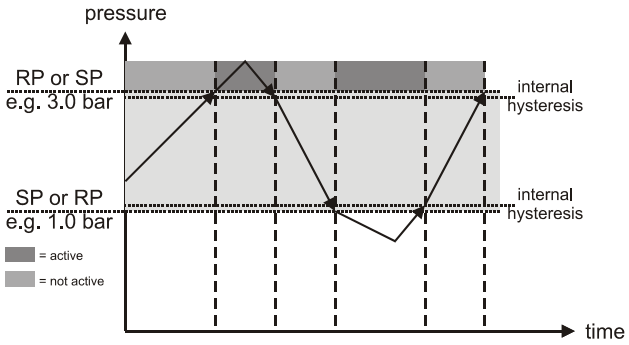

Fig. 62. WIN pressure monitor

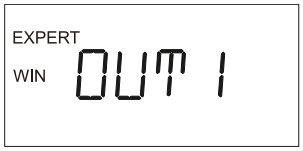

Fig. 63. Output 1 configured as a "WIN" monitor

NOTE: When configuring an output as a **window monitor** (WIN), the only restriction applying to the relative values of SP and RP is that the min. difference be observed. SP can be greater or less than RP.

Configuring/Executing Simulation Modes

There are two simulation modes: SIM1 and SIM2.

The purpose of SIM1 is to allow the user to test his configurations by rotating the RPB (which simulates increasing / decreasing pressure) and simultaneously observing if the LED's are lit at the appropriate pressure values and if the corresponding information (text, symbols) appears in the display.

The purpose of SIM2 is to allow the user to test his configurations by observing the outputs switching alternately. Specifically, the user can test the installation's reaction time in the range of from 300 ms to 20 s (corresponding to a range of 0...100%; see also Table 5).

Table 5. Set values and corresponding switch periods

set value	switch period
0%	approx. 300 ms
1%	approx. 500 ms
5%	approx. 1 s
10%	approx. 2.5 s
50%	approx. 10 s
100%	approx. 20 s

To set up a simulation mode, proceed as follows:
1. Enter the expert mode.
2. Rotate the RPB CW until "SIM-" appears.
3. Press the RPB. The EDIT symbol will appear.
4. Rotate the RPB CW until SIM1 or SIM2 (as desired) appears.
5. Press the RPB; the EDIT symbol will disappear.
6. Rotate the RPB CW until the text "EXIT" appears. Press the RPB to confirm that you wish to exit the expert mode. It is not necessary to save the simulation mode which you have just set up – this is done automatically. However, after approx. 30 minutes, the simulation will be automatically terminated and the device will return to normal operation.

To execute SIM1, proceed as follows:
1. Immediately after completing the set-up described above, the device is in the basic mode, and the FSO (full-scale output) is displayed. Press the RPB; the EDIT symbol will appear.
2. Rotate the RPB CW and/or CCW, thus simulating increasing/decreasing pressure. OUT1, OUT2, the switch-over contact relay output, the analog output, and also the min./max. pressure drag indicators will all react as though actual pressure were being applied. Thus, as long as the simulation is running, the device's display screen will display information and the two LED's will light up / change color / go out just as though actual pressure were being applied. As long as the simulation is running, the text "SIM1" will be displayed every ten seconds for five seconds. After a while (approx. 30 minutes), the simulation mode is deactivated automatically.

To execute SIM2, proceed as follows:
1. Immediately after completing the set-up described above, the device is in the basic mode, and the FSO (full-scale output) is displayed. Press the RPB; the EDIT symbol and a value of 100.0% (meaning "max. switching period") will appear.
2. Set the desired value of between 0.0% (min. switching period = approx. 300 ms) and 100.0% (max. switching period = approx. 20 s) by rotating the RPB CW and/or CCW. OUT1, OUT2, the switch-over contact relay output, the analog output, and also the min./max. pressure drag indicators will all react as though actual pressure were being applied. Thus, as long as the simulation is running, the device's display screen will display information and the two LED's will light up / change color / go out just as though actual pressure were being applied. As long as the simulation is running, the text "SIM2" will be displayed every ten seconds for five seconds. After a while (approx. 30 minutes), the simulation mode is deactivated automatically.

Warn Function

Besides pin 2 of plug 2, which is permanently wired as a high-side switch serving as a warning output, it is also possible to configure OUT2 (i.e. pin 2 of plug 1) as a warning output.

In the event that the power supply voltage drops below a critical level, or in the event of a sensor defect, operation outside of the permitted temperature range, or overloading of OUT1 and OUT2, the two LEDs will both light up red.

Fig. 64. OUT2 configured as a warning output

FACTORY SETTINGS

feature		factory setting
OUT1	definition	max. pressure monitor
	function	normally-open low-side output
	SP	two-thirds of FSO
	RP	one third of FSO
OUT2	definition	pressure window monitoring
	function	normally-open low-side output
	SP	two-thirds of FSO
	RP	one third of FSO
AOUT	function	non-inverted (normal, i.e.: 0...10 V)
	ZERO	lower limit of measuring range
	FSO	upper limit of measuring range
REL		coupled with OUT1
Filter (ATT)		OFF (= 0)
Unit		bar
Code		0000 (= no code / unlocked), EXPN

ACCESSORIES

The following accessories are not included in the shipment, but can be ordered:

- A-coded 5-prong M12 female angled connector.
- B-coded 4-prong M12 female angled connector for relay, with pre-attached connection cable.
- additional protective caps for unused connections (in order to meet the requirements of the IP65 protection rating).
- factory setting of parameters and configuration.
- AST1 wall attachment set, see Fig. 65.

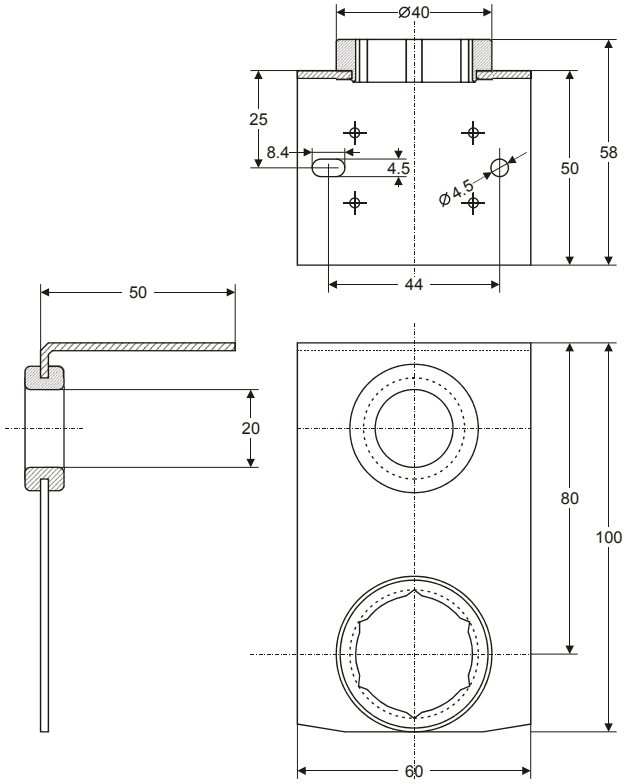

Fig. 65. AST1 wall attachment set

LITERATURE

See also PST...-R Electronic Pressure Switches/Transmitters - Product Data (EN0B-0346GE51).

Additional information and technical documentation in electronic format are available under the following URL's:

www.honeywell.de/fema

and

www.fema.biz

MASTER CODE

In the event that you have lost or forgotten your code, you can also unlock the device by means of the master code obtained from Honeywell (when contacting Honeywell, please state your device's serial number).

PRESSURE RANGES, CONNECTIONS, AND EQUIPMENT OF MODELS

Table 6. Pressure ranges, connection, and equipment of models

pressure range (bar)	type of pressure	bursting pressure (bar)	max. pressure (bar)	temperature drift (%/10 K)	process connection	equipment
						switch, transmitter, and relay
-1...+1	relative	≥ 10	6	0.3	G1/2"	PSTV01RG12S-R
0...0.25	relative	≥ 10	1	0.5*	G1/2"	PSTM250RG12S-R
0...0.4	relative	≥ 10	2	0.5*	G1/2"	PSTM400RG12S-R
0...0.6	relative	≥ 10	2	0.5*	G1/2"	PSTM600RG12S-R
0...1	relative	≥ 10	6	0.3	G1/2"	PST001RG12S-R
0...1.6	relative	≥ 10	6	0.3	G1/2"	PST002RG12S-R
0...4	relative	≥ 20	12	0.3	G1/2"	PST004RG12S-R
0...10	relative	≥ 50	30	0.3	G1/2"	PST010RG12S-R
0...25	relative	≥ 125	75	0.3	G1/2"	PST025RG12S-R
0...60	relative	≥ 300	180	0.3	G1/2"	PST060RG12S-R
0...100	relative	≥ 500	300	0.3	G1/2"	PST100RG12S-R
0...250	relative	≥ 1600	500	0.3	G1/2"	PST250RG12S-R
0...600	relative	≥ 1800	1000	0.3	G1/2"	PST600RG12S-R
-1...+1	relative	≥ 10	6	0.3	G3/4"	PSTV01RG34F-R
0...0.25	relative	≥ 10	1	0.5*	G3/4"	PSTM250RG34F-R
0...0.4	relative	≥ 10	2	0.5*	G3/4"	PSTM400RG34F-R
0...0.6	relative	≥ 10	2	0.5*	G3/4"	PSTM600RG34F-R
0...1	relative	≥ 10	6	0.3	G3/4"	PST001RG34F-R
0...1.6	relative	≥ 10	6	0.3	G3/4"	PST002RG34F-R
0...4	relative	≥ 20	12	0.3	G3/4"	PST004RG34F-R
0...10	relative	≥ 50	30	0.3	G3/4"	PST010RG34F-R
0...25	relative	≥ 125	75	0.3	G3/4"	PST025RG34F-R
0...2	absolute	≥ 10	6	0.3	G1/2"	PST002AG12S-R
0...10	absolute	≥ 50	30	0.3	G1/2"	PST010AG12S-R
0...2	absolute	≥ 10	6	0.3	G3/4"	PST002AG34F-R
0...10	absolute	≥ 50	30	0.3	G3/4"	PST010AG34F-R

NOTE*: Depending upon their installation orientation, the weight of the diaphragm and of the filling medium in the sensors of the PSTM... versions can have an effect on measurement values of up to 0.5% FS. The devices are all calibrated in the vertical position; in non-vertical orientations, deviations in measurement values are therefore possible. In the case of the PSTM... versions, vertical installation (with the device positioned above the connection pipe) is therefore to be preferred. In any case, all devices can be balanced at any time using the integrated balancing function ("SET0" shown in the display).

OVERVIEW OF PARAMETERIZATION AND CONFIGURATION

activity / situation	LCD display shows		parameters adjustable in	
	symbols	digital values / text	basic mode	expert mode
Current Pressure Is Displayed[1]				
current pressure	▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮, unit	digital value	-	-
OUT1 is active	OUT1	-	-	-
OUT2 is active	OUT2	-	-	-
AOUT (pressure betw. ZERO & FSO)	AOUT	-	-	-
pressure is rising	▸	-	-	-
pressure is dropping	◂	-	-	-
warning	WARN	digital value	NO	NO
Parameterizing Output 1 [Output 2]				
SP	▮, OUT1 [OUT2], SP	digital value	YES	NO
RP	▮, OUT1 [OUT2], RP	digital value	YES	NO
first limit of window (WIN)	▮, OUT1 [OUT2], SP	digital value	YES	NO
second limit of window (WIN)	▮, OUT1 [OUT2], RP	digital value	YES	NO
Configuring Output 1 [Output 2]				
max. pressure monitor (SP>RP)	EXPERT, SP, RP, ▮▮▮▸	OUT1 [OUT2]	NO	YES
min. pressure monitor (SP<RP)	EXPERT, SP, RP, ◂▮▮▮	OUT1 [OUT2]	NO	YES
window monitor (WIN)	EXPERT, WIN	OUT1 [OUT2]	NO	YES
output 2 as WARN	EXPERT, WARN	OUT2	NO	YES
N.C. low-side open-collector OUT1[2]	EXPERT, ⌐‾, ZERO	FCT1 [FCT2]	NO	YES
N.O. low-side open-collector OUT1[2]	EXPERT, _/‾, ZERO	FCT1 [FCT2]	NO	YES
N.C. high-side open-collector OUT1[2]	EXPERT, ‾⌐, FSO	FCT1 [FCT2]	NO	YES
N.O. high-side open-collector OUT1[2]	EXPERT, _/‾, FSO	FCT1 [FCT2]	NO	YES
output 1 [2] as "push-pull"	EXPERT, _/‾, ZERO, FSO	FCT1 [FCT2]	NO	YES
output 1 [2] as inverted "push-pull"	EXPERT, ‾⌐, ZERO, FSO	FCT1 [FCT2]	NO	YES
Parameterizing the Analog Output				
first limit (ZERO) of range	▮, AOUT, ZERO	digital value	YES	NO
second limit (FSO) of range	▮, AOUT, FSO	digital value	YES	NO
Configuring the Analog Output				
0...10 V voltage-controlled output	EXPERT, AOUT	FCTV	NO	YES
10...0 V voltage-controlled output	EXPERT, AOUT, INV ◺	FCTV	NO	YES
4...20 mA current-control output	EXPERT, AOUT	FCTA	NO	YES
20...4 mA current-control output	EXPERT, AOUT, INV ◺	FCTA	NO	YES
Configuring the Relay				
relay coupled with output 1	EXPERT, OUT1	REL	NO	YES
relay coupled with output 2	EXPERT, OUT2	REL	NO	YES
relay configured as alarm output	EXPERT, WARN	REL	NO	YES
Configuring Unit				
unit	EXPERT, Pa / bar / psi	UNIT	NO	YES
Parameterizing Filter				
attenuation	▮, ATT, %	digital value or OFF	YES	NO
Locking / Unlocking Device Using a Code				
unlocked (code = 0000)	-	EXP	YES	NO
locked (code ≠ 0000)	-	CODE, digital value	YES	NO
Changing Code				
device is locked	EXPERT	LOCK	NO	YES
device is unlocked	EXPERT	CODE	NO	YES

[1]The same symbols appearing in the expert mode are also visible in the basic mode, where they indicate the current configuration of the given output. Exceptions: If an output has been configured to act as a max. / min. monitor, in the basic mode, ▸ and ◂ appear instead of ▮▮▮▸ and ◂▮▮▮.

OVERVIEW OF PARAMETERIZATION AND CONFIGURATION (CONTINUED)

activity / situation	LCD display shows		parameters adjustable in	
	symbols	digital values / text	basic mode	expert mode
Resetting the display lighting				
ON continuously	EXPERT	LED+	NO	YES
turned OFF	EXPERT	LED-	NO	YES
Drag indicator				
max. pressure measured	▮ ▮ ▮ ▸, pressure unit	digital value	YES	NO
time since max. pressure measured	▮ ▮ ▮ ▸, EDIT, h	digital value or NAVL	YES	NO
min. pressure measured	◂ ▮ ▮ ▮, pressure unit	digital value	YES	NO
time since min. pressure measured	◂ ▮ ▮ ▮, EDIT, h	digital value or NAVL	YES	NO
storage reset	◂ ▮ ▮ ▮[▮ ▮ ▮ ▸], EDIT	RSET	YES	NO
Simulation modes				
configuring a simulation mode	EXPERT, EDIT	SIM- or SIM1 or SIM2	NO	YES
execute pressure simulation (SIM1)	▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮, EDIT	digital value, SIM1	YES	NO
execute switch simulation (SIM2)	▮, %, EDIT	digital value, SIM2	YES	NO
Hidden functions (just after switching-on the device, press the RPB until "V..." appears in the display)				
expert mode locked	EXPERT, EDIT	EXPL	NO	YES
expert mode unlocked	EXPERT, EDIT	EXPN	NO	YES
balancing the device	◂, ▸, ▮, EXPERT, EDIT, pressure unit	digital value	NO	YES

OVERVIEW OF SCREENS

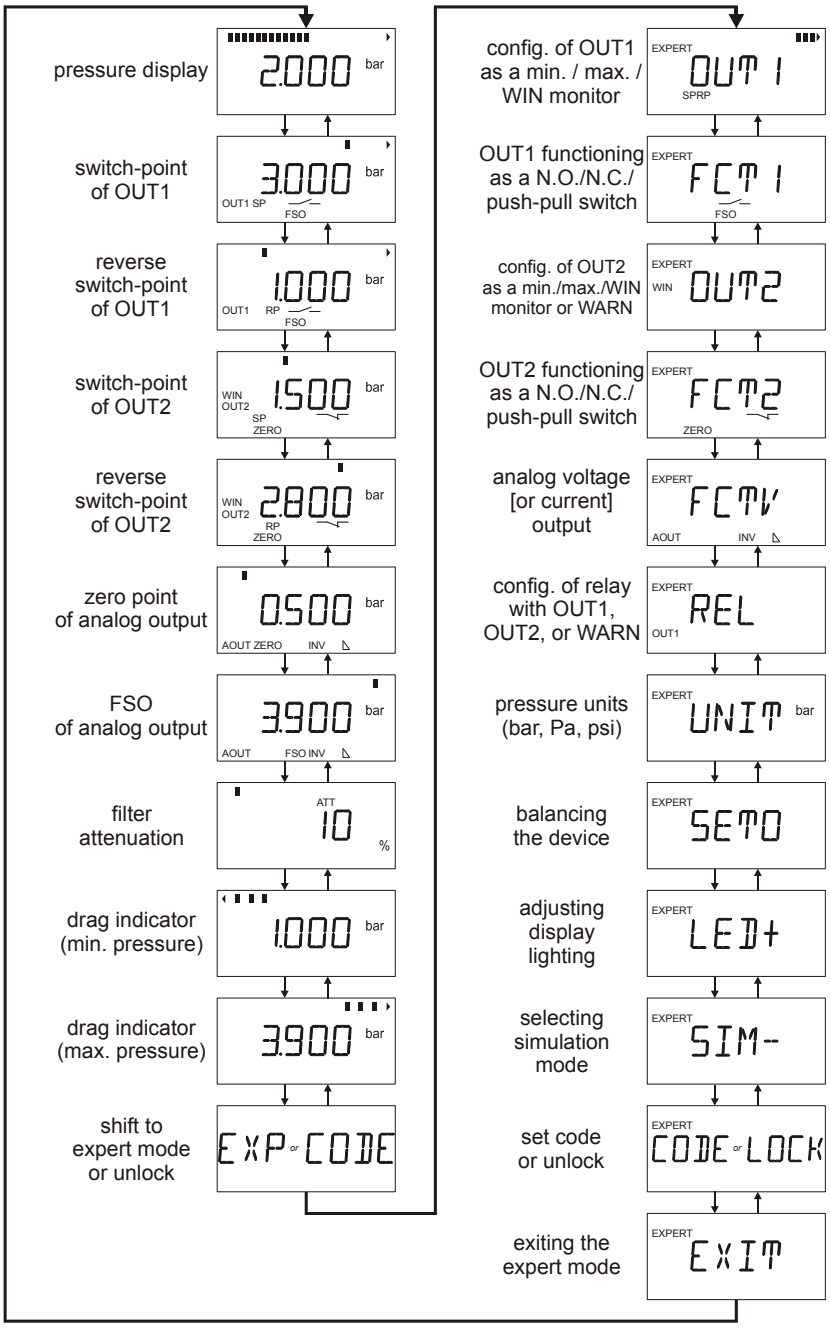

Fig. 66. Overview of screens in the basic mode (left) and expert mode (right)

NOTES