



Manual pressure sensors DW35312x DW36312x

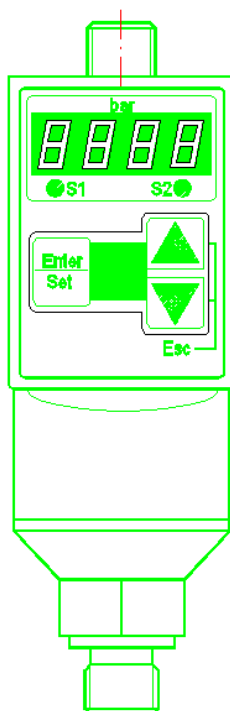


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Safety instructions

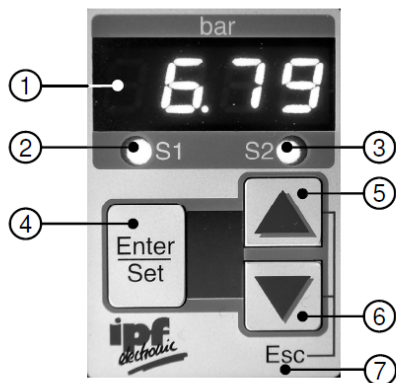
Read the product description before installing the unit. Ensure that the product is suitable for your application without any restrictions.






Non-adherence to the operating instructions or technical data can lead to personal injury and/or damage to property.

In all applications please check the compliance of the product materials (see technical data) with the media to be measured.

Never use these articles in applications where the safety of a person depends on their functionality.

Controls and indicating elements



	description	function	symbol
1	4-digit display	displays the current system pressure parameter, parameter values	
2	LED red S1	displays the switching state of output 1 lights, if the output is switched	-
3	LED red S2	displays the switching state of output 2 lights, if the output is switched	-
4	programming button Enter/ Set	selection of menu and parameters setting and saving of parameters	
5	arrow key up	setting the parameter values increasing the value (fast, keep the button pressed)	
6	arrow key down	setting the parameter values decreasing the value (fast, keep the button pressed)	
7	ESC	finishing programming without saving keyboard lock: press both the arrow keys at the <u>same time</u>	

Description of the operational controls

Display

4-digit LED display

Symbolic description:



shows the current system pressure (RUN-Mode), menu name, parameters and parameter values.



blinking display in RUN-Mode: fault report (Error).

3 x blinking in PROGRAMM mode: saving current value after pressing Enter/Set button.



The indication on the display depends on the programmed function. If one of these functions is selected in the enhanced Menu, the indication will be shown on the display.

Program button Enter/Set

Symbol:



Selection of menus and submenus as well as confirming and saving of parameter values.

Short pressing in the RUN-Mode → starting up the base menu.

Arrow keys

Symbol:



Increasing and decreasing the parameter values and scrolling of the menu.



Pressing the button continuous, the value increases or decreases in „fast-forward“ mode.

Pushing the button → the value changes step by step.

ESC- button



Symbol:



Pressing both arrow keys  +  **at the same time** results in the **ESC** function. With the ESC function you can step backwards inside the menu and parameters without saving the settings.



In order to leave all menus and submenus please press the **ESC**-button again and again until you are back in the RUN-mode.

Keyboard lock

If the device is in the RUN-Mode and you press the arrow keys  +  at the same time for at least 5 seconds, the keyboard lock will be activated.

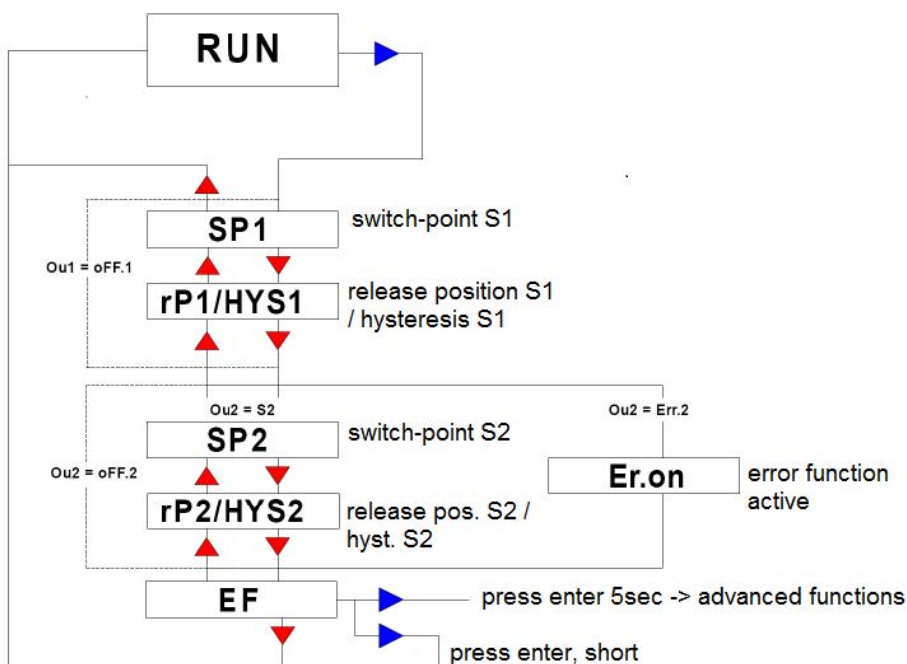
The display shows „sLOC“, blinking 3 times.

Now the adjusted settings can be read but not be changed.

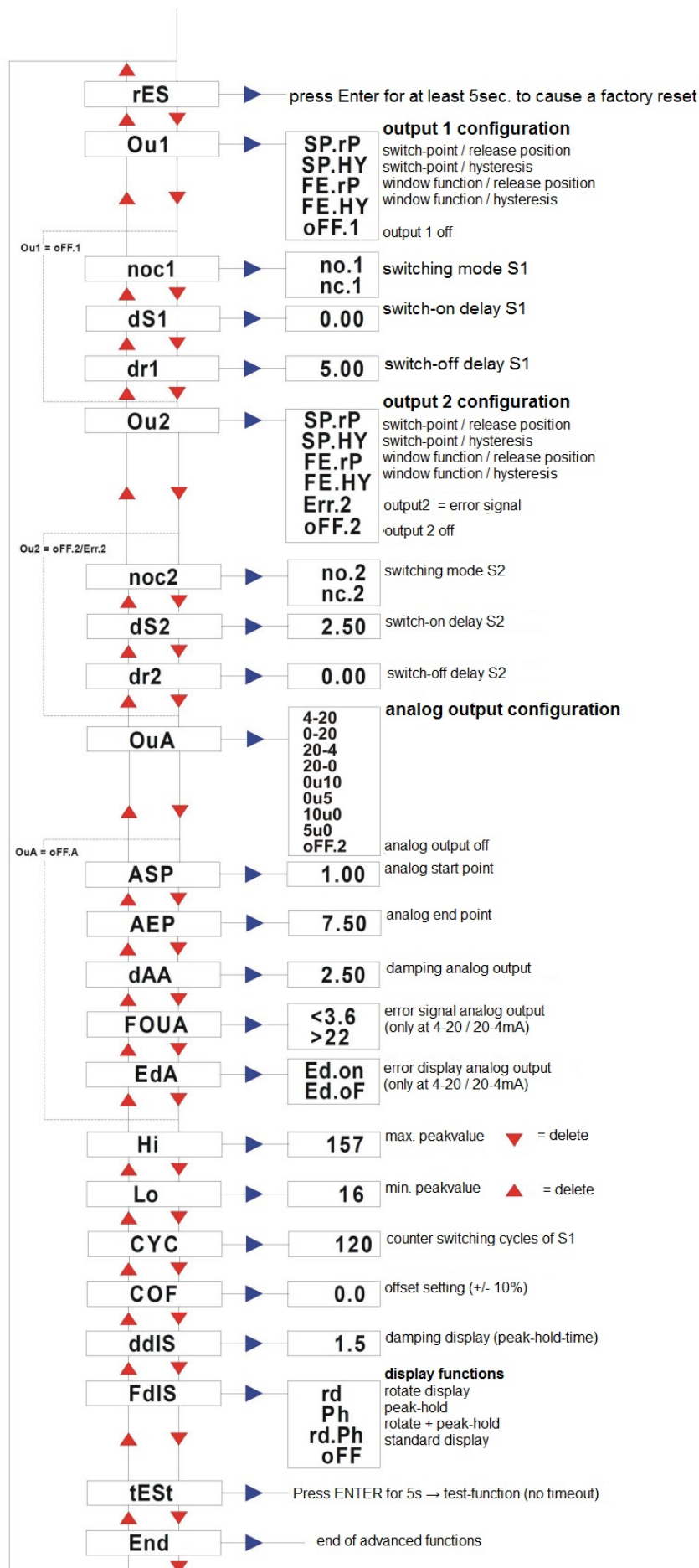
For cancelling the Keyboard Lock please press both arrow keys  +  for at least 5 seconds again.

Menu / overview

1. level



2. level





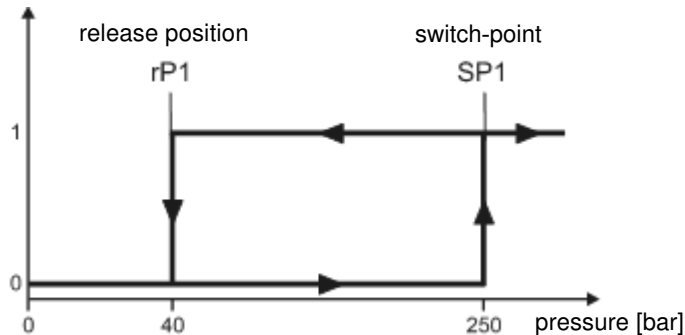
Operation modes of the switching outputs

notes:

- The following examples and descriptions of the switching output 1 (SP1) refer to the switching function „normally open“ (no). If the switching output 1 is set „normally closed“ (nc) the states are reversed.
- The minimum range between the switching outputs (SP.1 and rSP.1) is 1% of the nominal pressure; stated by the system.
- The smallest adjustable hysteresis is 1% of the nominal pressure; stated by the system.
- All examples are effective for output 2, if this output is defined as switching output (SP-2) also.

switch-point with release position

Programmed parameters: SP.1: 250.0 bar
rP.1: 40.0 bar



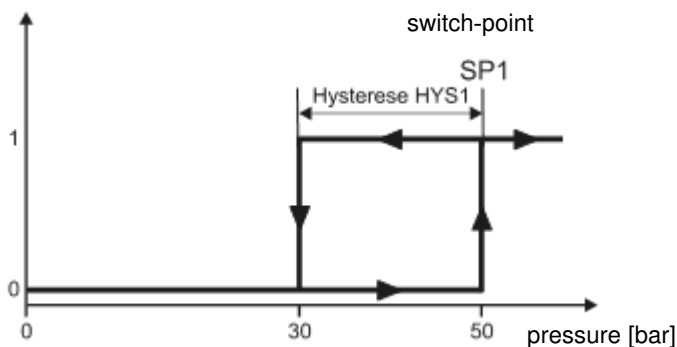
An increasing pressure up to SP.1 (e.g. 250bar), switches the output according to the adjusted switching function (no or nc). This state remains also for higher pressure.

For decreasing pressure the switching state changes with the pressure value at rP.1 (e.g. 40bar). If SP.1 will be changed, rP.1 remains the same.

The minimum range between SP1 and rSP.1 is 1% of the maximum pressure.

Switch-point with hysteresis

Programmed parameters: SP.1: 50.0 bar
HYS.1: 20.0 bar

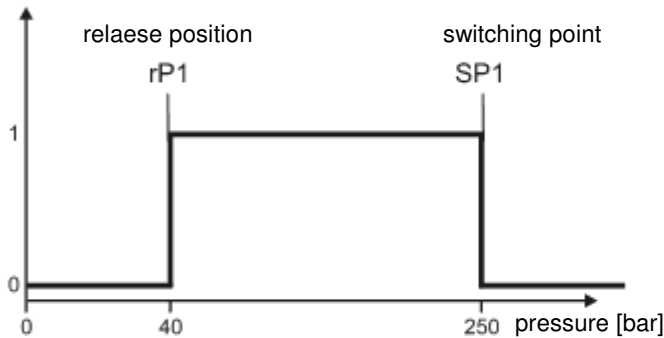


An increasing pressure up to SP.1 (e.g. 50bar) switches the output according to the adjusted switching function (no or nc). This state remains also for higher pressure.

For decreasing pressure the switching state changes after passing the hysteresis (e.g. 20bar). If SP.1 will be changed, the hysteresis HYS1 remains the same, that is the release position is (SP.1 – 20)bar.

Window function with release position

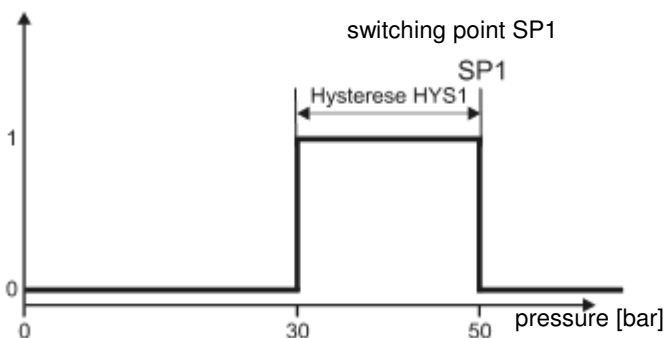
Programmed parameters: SP.1: 250.0 bar
rP.1: 40.0 bar



Due to the window function, the monitoring of a defined pressure range is possible. As soon as the pressure reaches the adjusted range between rP.1 (40bar) and SP.1 (250bar), the output switches according the chosen switching function (no or nc). The switching state changes if the pressure leaves the adjusted pressure range. The values for the switching point and the release point have to be defined separately. If SP.1 changes, rP.1 will remain the same.

Window function with hysteresis

Programmed parameters: SP.1: 50.0 bar
HYS.1: 20.0 bar



If the pressure hits the adjusted window between (SP.1-HYS.1) and SP.1 (50bar), the output switches according to the adjusted switching function (no or nc). The switching function changes when leaving the window. If SP.1 changes, the hysteresis will not change, e.g. the release position is (SP.1 – 20)bar.

Operating modes

RUN-Mode

Normal operating mode

At power on the unit is in the Run mode. It carries out its measurement and evaluation functions and provides output signals according to the set parameters.

The display shows the current system pressure. The yellow LED indicates the switching state of the output.

Display mode

Indication of parameters and the set parameter value.

When the *Enter/Set* button is pressed briefly, the unit passes to the Display mode which allows parameter values to be read. The internal sensing, processing and output functions of the unit continue as if in Run mode.

The parameter values can be read and adjusted.

Pressing the arrow key „downwards“ briefly, scrolls through the adjustable parameters.

Pressing the *Enter/Set* button briefly, indicates the adjusted parameter value.

Pressing the arrow key „downwards“ or „upwards“ briefly, changes the parameter value step by step. Pressing the arrow key continuous changes the value fast.

Pressing the *Enter/Set* button safes the adjusted value, the Display blinks three times.

The unit now operates with the „new adjusted“ value.

Returning to the RUN-Mode: Press the *ESC* button.

Enhanced menu/ Programming mode

Setting of the parameter values and programming the main functions.

The unit changes to the programming mode if „EF“ is set in the main menu and the *Enter/Set* button is pressed for at least 5s.

The internal sensing, processing and output functions of the unit continue as if in Run mode.

Pressing the arrow key „downwards“ briefly, scrolls through the adjustable parameters.






Pressing the *Enter/Set* button briefly, indicates the adjusted parameter value

Pressing the arrow key „downwards“ or „upwards“ briefly, changes the parameter value step by step. Pressing the arrow key continuous changes the value fast.

Pressing the *Enter/Set* button safes the adjusted value, the Display blinks three times.

The unit now operates with the „new adjusted“ value.



Returning to the RUN-Mode: Press the *ESC* button several times.

programming		
button	display	description
 1X	SP1	Press the Enter/Set button briefly to get into the main menu. Press the Enter/Set button again. The current value for switch-point S1 will be displayed.* Set the parameter value with the arrow keys. Confirm the set value with the Enter/Set button.
 1X	rP1 / HYS1	Press the Enter/Set button. The current value for the release position S1 respectively the hysteresis will be displayed.* Set the requested value with the arrow keys. Confirm the value with the Enter/Set button.
 1X		Output 2 is set as switching output SP2 / rP2 respectively HYS2. Changes can be made as described above. Output 2 gives an error signal: Er.On As soon as the Outputs become inactive, EF will be displayed.
 1X	EF	Press Enter/Set or  briefly to get into the RUN Mode. Press the Enter/Set button continuously for min. 5sec to get into the advanced functions. A point is blinking in the display as long as the button is pressed. Changes inside the menu items can be made as described above. The possible menu items can be seen in the parameter list.

*a flashing point on the display indicates that a value can be changed.
After confirming the set value the displayed value will blink three times.

Parameter list	
SP1	Switching point S1
HYS1 / rP1	Hysteresis S1 / release point S1
SP2	Switching point S2
HYS2 / rP2	Hysteresis S2 / release point S2
EF	This menu item encloses a sub menu which contains further parameters. Press the Enter/Set for at least 5s to get access to these parameters.
rES	Reset (getting back to the factory settings) Press the Enter/Set button at least for 5s to reset the system. Thereafter the unit returns into the RUN Mode automatically.

Ou 1	<p>Configuration of output1: Four switching functions are possible:</p> <table border="1"> <tr> <td>SP.HY</td><td>switch-point / hysteresis</td></tr> <tr> <td>SP.rP</td><td>switch-point / release position</td></tr> <tr> <td>FE.HY</td><td>window function / hysteresis</td></tr> <tr> <td>FE. rP</td><td>window function / release position</td></tr> <tr> <td>oFF.1</td><td>output 1 „off“</td></tr> </table>	SP.HY	switch-point / hysteresis	SP.rP	switch-point / release position	FE.HY	window function / hysteresis	FE. rP	window function / release position	oFF.1	output 1 „off“		
SP.HY	switch-point / hysteresis												
SP.rP	switch-point / release position												
FE.HY	window function / hysteresis												
FE. rP	window function / release position												
oFF.1	output 1 „off“												
noc 1	<p><i>noc 1 is only active if in Ou 1 a switching function is set.</i> Function of switching output S1: no.1 (normally open) nc.1 (normally closed)</p>												
ds 1	<p><i>ds 1 is only active if in Ou 1 a switching function is set.</i> on-delay timer function S1</p>												
dr 1	<p><i>ds 1 is only active if in Ou 1 a switching function is set.</i> off-delay timer function S1</p>												
Ou 2	<p>Configuration output 2: Four switching functions, the error signal or 4 analog functions are possible:</p> <table border="1"> <tr> <td>SP.HY</td><td>switch-point / hysteresis</td></tr> <tr> <td>SP.rP</td><td>switch-point / release position</td></tr> <tr> <td>FE.HY</td><td>window function / hysteresis</td></tr> <tr> <td>FE. rP</td><td>window function / release position</td></tr> <tr> <td>Err. 2</td><td>error signal</td></tr> <tr> <td>oFF.2</td><td>output 2 „off“</td></tr> </table>	SP.HY	switch-point / hysteresis	SP.rP	switch-point / release position	FE.HY	window function / hysteresis	FE. rP	window function / release position	Err. 2	error signal	oFF.2	output 2 „off“
SP.HY	switch-point / hysteresis												
SP.rP	switch-point / release position												
FE.HY	window function / hysteresis												
FE. rP	window function / release position												
Err. 2	error signal												
oFF.2	output 2 „off“												
noc 2	<p><i>noc 2 is only active if Ou 2 is set as switching function.</i> Function of switching output S2: no.2 (normally open) nc.2 (normally closed)</p>												
dS 2	<p><i>ds 2 is only active if Ou 2 is set as switching function.</i> ready-on delay-time S2</p>												
dr 2	<p><i>dr 2 is only active if Ou 2 is set as switching function.</i> ready-on delay-time S2</p>												
Ou A	<p>analog output configuration: 4-20 analog signal 4-20mA 0-20 analog signal 0-20mA 20-4 analog signal 20-4mA 20-0 analog signal 20-4mA 0u10 analog signal 0-10V 0u5 analog signal 0-5V 10u0 analog signal 10-0V 5u0 analog signal 5-0V oFF.A analog output off</p>												

ASP	ASP is only active, if in Ou A an analog signal was set. Analog starting point: The pressure value (low pressure), where the analog signal starts.
AEP	AEP is only active, if in Ou A an analog signal was set. Analog end point: The pressure value (high pressure), where the analog signal ends. Note: The minimum range between analog starting and end point is 20% of the measuring range for the devices of type DW35 and 50% for the DW36 type.
dAA	dAA is only active if in Ou an analog signal was set. Damping the analog output: This function filters peak values of short duration or high frequencies. dAA-value = response time between changing the pressure and the analog signal in seconds.
FOUA	FOUA is only active if in OU A an analog signal was set. Error signal of the analog output: The analog output signal is <3.6mA or >22mA (for 4-20mA/ 20-4mA only)
EdA	Error display of the analog output (for 4-20mA/ 20-4mA only)
HI	Saving the max. pressure value of the system. The highest value is displayed.  = delete memory
LO	Saving the min. pressure value of the system. The lowest value is displayed.  = delete memory
CYC	counter switching cycles of S1
COF	zero-point calibration The internal measurand (operating value of the sensors) is offset compared to the real measurand. adjustment range: +/- 10% of the measuring span.
ddIS	damping of display (Peak-Hold-Time)
FdIS	display functions: rd rotate display Ph Peak-Hold. Temporary display of peak values Rd. Ph rotate display + peak hold oFF standard display

tEst	<p>Press Enter/Set button for 5s, then test-function (no Timeout) With the Test-function you can check the adjusted parameters without influence for the system. The display starts with indicating the current pressure. Due to the arrow keys the displayed value can be increased or decreased. All parameters react as if the real pressure would increase or decrease. Leave the Test Mode with ESC.</p>
END	<p>End of enhanced functions. Press the Enter/Set button twice to get into the RUN mode again.</p>

The units come with an optical interface that allows all parameters to be set and adjusted by a PC or notebook.

The suitable interface cable and Windows-Software can be ordered with the article number AD000011.

With the Software you are able to adjust all functions described above.

Mounting and electrical connection

Before mounting and removing the unit: Make sure that no pressure is applied to the system.

Stellen Sie vor Ein- und Ausbau des Sensors sicher, dass die Anlage druckfrei ist.

Mount the pressure sensor DW35 on a G1/4 – process connection.

Mount the pressure sensor DW36 on a G1/8 – process connection.

After mounting the sensor mechanically, the control panel can be rotated by 350°.

Do not touch the opening of the pressure connection with a sharp object.

This causes irreparable damage to the partition!

The unit must be connected by a suitably qualified electrician. The national and international regulations for the installation of electrical equipment must be observed. Voltage supply to EN50178.

The device shall be supplied from an isolating source and protected by an overcurrent device. Disconnect power before connecting the unit as follows:

+U _B :	brown	(2)	N.C.	white	(1)
GND:	blue	(7)	N.C.	pink	(6)
analog output:	green	(3)	N.C.	red	(8)
switching output S1:	yellow	(4)			
switching output S2:	grey	(5)			

NOTE: Use a shielded cable socket (e.g. VK205A21), in order to avoid interferences.

Implementing / operation

After mounting, electrical connection and programming, please check the safety of the unit.

Fault indications during operation

display	cause	effect on the outputs	elimination
OL	overload exceeding the measuring range (sensor-limit) > 120%Pnominal		-limit the system pressure to Pnominal. If necessary use a unit with higher measuring range
UL	underload system pressure is lower than the measuring range		
SC1	short circuit S1	analogue output= error signal*	- check wiring - check load of S1
SC2	short circuit S2	analogue output= error signal*	- check wiring - check load of S2.
SC	short circuit S1 and S2	analogue output= error signal	- check wiring - check load
ERR	sensor defect, internal error	-S1 and S2 are switched off - analogue output = error signal*	contact manufacturer
AO	if current output is selected: analogue-output open of voltage output is selected: short-circuit or voltage is applied		- check wiring - check burden resistance. NOTE: If this indication is undesired, the menu item Eda can be set Ed.of .

* the error signal of the analogue output appears only, if in Ou2 an analogue signal (4-20mA oder 20-4mA) was set.
The error signal (< 3.6mA or >22mA) can be set in menu item FOuA.

Factory settings	
OU 1	SP.rP
OU 2	4 - 20
SP 1	50% of nominal pressure
rP 1	10% of nominal pressure
SP 2	75% of nominal pressure
rP 2	10% of nominal pressure

technical data

pressure range [bar]	see list of articles
excess pressure [bar]	50% of nominal pressure (PN) for DW35 (6bar for DW36)
pressure pick-up	peak value memory every 2ms (display via PC)
operating voltage	12 to 32V DC, reverse polarity protection (15 to 32V DC, if operated with voltage output)
voltage drop	< 2V
current consumption	< 60mA
switching outputs	2 x pnp-switching, no/nc 1A short circuit protection
time delay	0 to 20s, adjustable
operating position adj. range	1 to 100% of PN,
release position	0 to 99% of PN
switching frequency	max. 125Hz
repeatability	< ±0,1% of accumulated value
current output	0/4 to 20mA, 20 – 0/4mA
error recognition	max. 0,1% if line breakage (current) - short-circuit (voltage ≥1V)
rise time	5ms (10% - 90% of PN)
muting	0 to 20s, adjustable
linearity error	max. ±0.25% of PN
system pressure display	4 x 7 segment LED-Display
switching function display	2x LED red
operating temperature	-20 °C to +80 °C
temperature drift	< ±0,2% / 10K (-10 °C to +70 °C)
conn. to pressure system	DW35: G1/4A, SW 22 (DW36: G1/8, SW 22)
sensor head material	stainless steel 1.4435 / ceramic
housing material	PA6.6, polyester
system of protection	IP65 to EN 60529
electrical connection	M12 connector, 8-pin
optical interface	9600 Baud, via optical adapter at USB-Port

dimensional drawings

fig.1: DW35xxxx

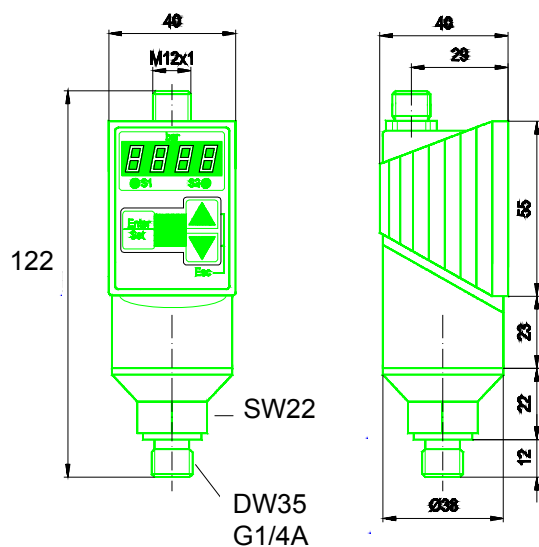
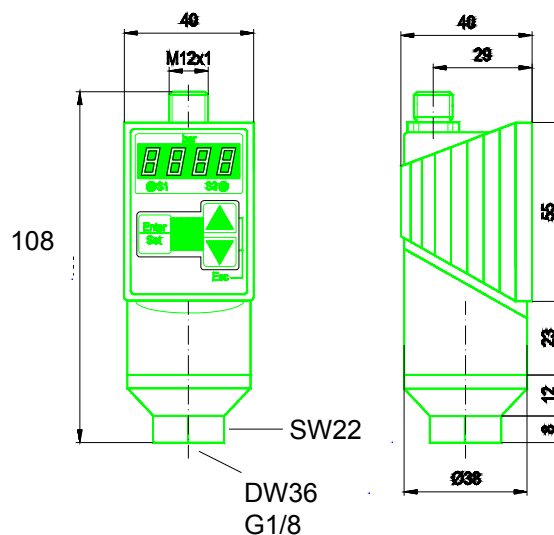


fig.2: DW36xxxx



list of articles

article-no.	design	description	housing	voltage	output	current	connection	fig.
DW36312H	36-G1/8	-0.5 to +0.5bar, ceramic	polyester/V4A	12-32V DC	pnp,no/nc,analog	2x1A	M12-conn8pin	1
DW36312J	36-G1/8	-1 to +1bar, ceramic	polyester/V4A	12-32V DC	pnp,no/nc,analog	2x1A	M12-conn8pin	1
DW363120	36-G1/8	-1 to 0bar, ceramic	polyester/V4A	12-32V DC	pnp,no/nc,analog	2x1A	M12-conn8pin	1
DW363121	36-G1/8	0 to 1bar, ceramic	polyester/V4A	12-32V DC	pnp,no/nc,analog	2x1A	M12-conn8pin	1
DW35312D	35-G1/4A	10bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,analog	2x1A	M12-conn8pin	2
DW35312F	35-G1/4A	50bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,analog	2x1A	M12-conn8pin	2
DW353124	35-G1/4A	100bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,analog	2x1A	M12-conn8pin	2
DW35312G	35-G1/4A	200bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,analog	2x1A	M12-conn8pin	2
DW353126	35-G1/4A	400bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,analog	2x1A	M12-conn8pin	2
DW353127	35-G1/4A	600bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,analog	2x1A	M12-conn8pin	2
DW35312K	35-G1/4A	-1 ... +10bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,analog	2x1A	M12-conn8pin	2
AY000060		accessories		mounting clip				w/o
AD000011		accessories		opt. interface	USB connection, software		1.5m cable	w/o

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