

DW35311x
DW36311x
pressure sensors

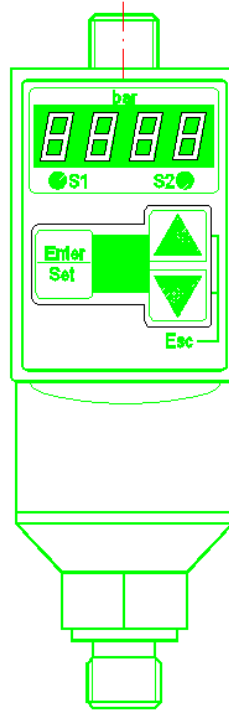


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Safety instructions

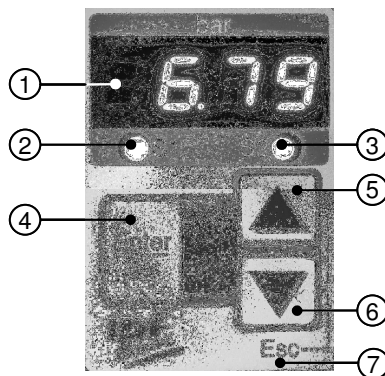
Read the product description before installing the unit. Ensure that the product is suitable for your application without any restrictions.





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

In all applications check 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	265.4
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 <i>(fast, keep the button pressed)</i>	
6	arrow key down	setting the parameter values decreasing the value <i>(fast, keep the button pressed)</i>	
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:

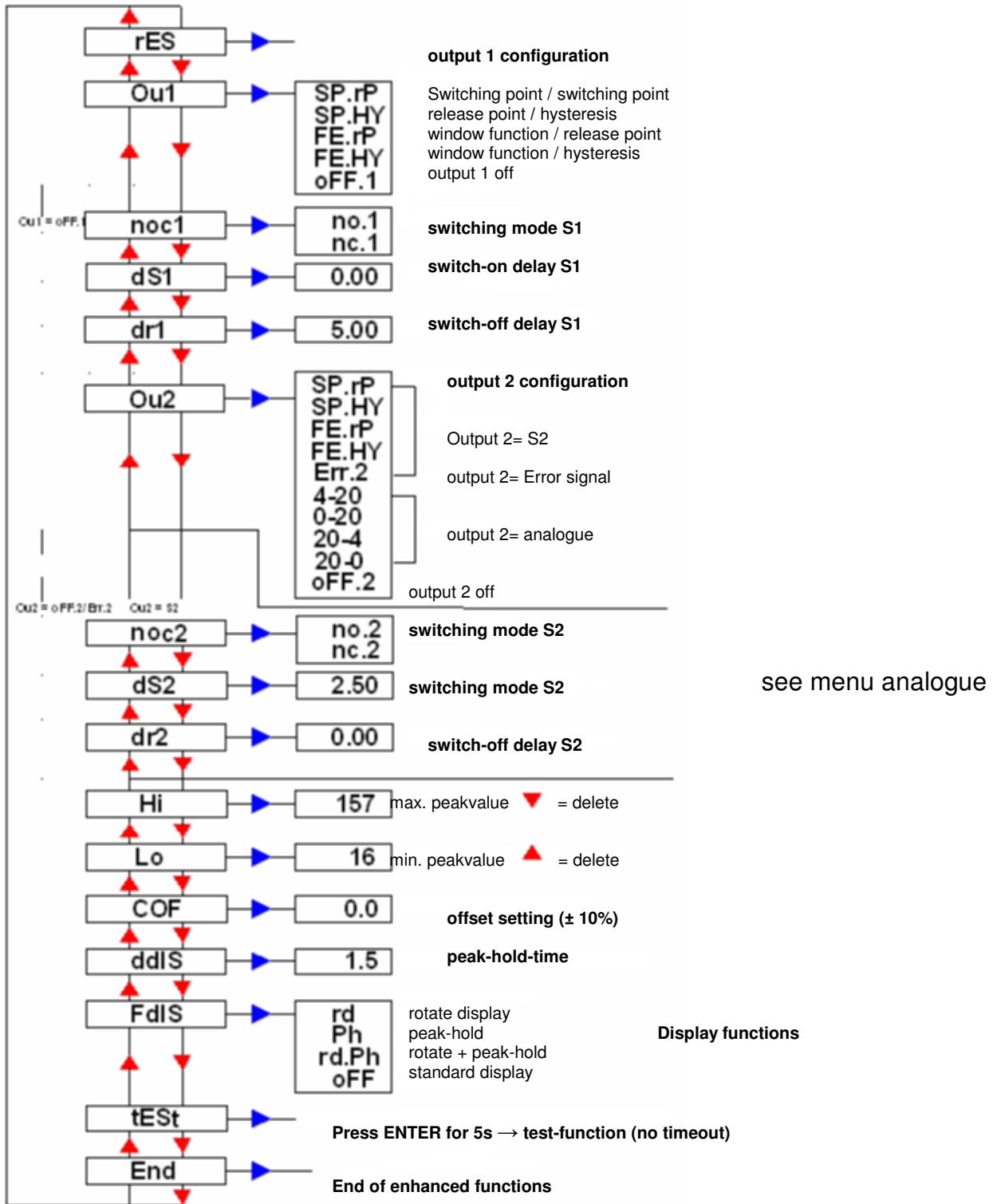


Increasing and decreasing the parameter values and scrolling of the menu.

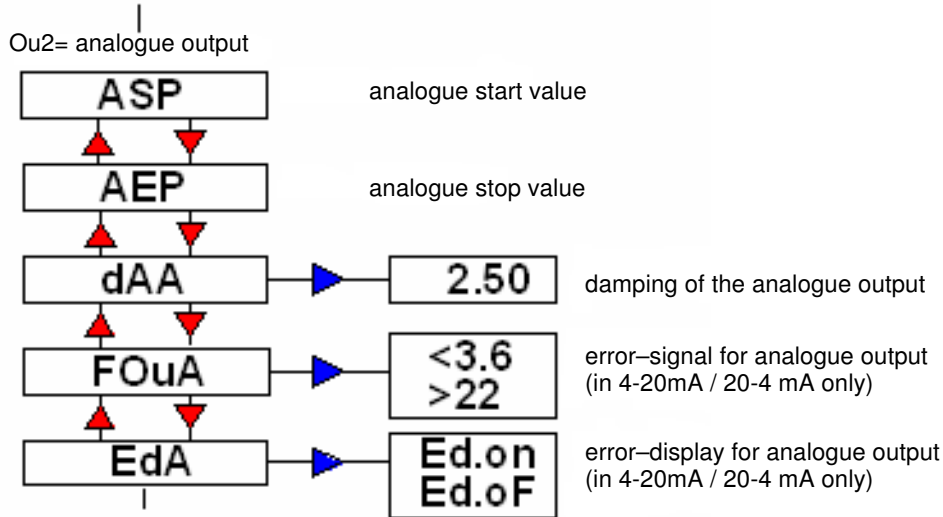
Pressing the button continuous, the value increases or decreases in „fast-forward“ mode.

Pushing the button → the value changes step by step.

2. level



Menu analogue (active only if in OU 2 an analogue signal is set)



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.

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 switching point S1 will be displayed.* Set the parameter value with the arrow keys. Confirm the setted value with the Enter/Set button.
 1X	rP1 / HYS1	Press the Enter/Set button. The current value for the release point 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 analogue output: A.On 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. 5s to get into the enhanced 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.

<p>Ou 1</p>	<p>Configuration of output1: Four switching functions are possible: SP.HY switching point / hysteresis SP.rP switching point / release point FE.HY window function / hysteresis FE. rP window function / release point oFF.1 output 1 „off“</p>
<p>noc 1</p>	<p><i>noc 1 is active if in Ou 1 a switching function is set.</i> Switching function of switching output S1: no.1 (normally open) nc.1 (normally closed)</p>
<p>ds 1</p>	<p><i>ds 1 is active if in Ou 1 a switching function is set.</i> on delay timer function S1</p>
<p>dr 1</p>	<p><i>ds 1 is active if in Ou 1 a switching function is set.</i> off delay timer function S1</p>
<p>Ou 2</p>	<p>Configuration output 2: Four switching functions, the error signal or four analogue functions are possible: SP.HY switching point / hysteresis SP.rP switching point / release point FE.HY window function / hysteresis FE. rP window function / release point Err. 2 error signal 4-20 analogue signal 4-20mA 0-20 analogue signal 0-20mA 20-4 analogue signal 20-4mA 20-0 analogue signal 20-4mA oFF.2 output 2 „off“</p>
<p>ASP</p>	<p><i>ASP is active if in Ou 2 an analogue signal was set.</i> Analogue starting point: The pressure value (low pressure) where the analogue output starts.</p>
<p>AEP</p>	<p><i>AEP is active if in Ou 2 an analogue signal was set.</i> Analogue end point: The pressure value (higher pressure), where the analogue signal ends. Note: The minimum range between starting point and end point is 20% of the measuring range for the DW35 type; and 50% of the measuring range for the DW36 type.</p>

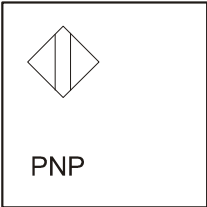
dAA	<i>dAA is active if in Ou 2 an analogue signal was set.</i> Damping the analogue output This function filters peak values of short duration or high frequency. dAA-value = response time. Period of time between the changing of the pressure and the analogue signal. (unit, seconds).
FOUA	<i>FOUA is active if in OU 2 an analogue signal was set.</i> Error signal of the analogue output. The analogue output signal is <3,6mA or >22mA (for 4-20/ 20-4 only)
EdA	Error display of the analogue output. (for 4-20mA/ 20-4mA only)
noc 2	<i>noc 2 is active if in Ou 2 a switching function is set.</i> Switching function of switching output S2: no.2 (normally open) nc.2 (normally closed)
dS 2	<i>ds 2 is active if in Ou 2 a switching function is set.</i> on delay timer function S2
dr 2	<i>ds 2 is active if in Ou 2 a switching function is set.</i> off delay timer function S2
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.
COF	zero-point calibration The internal measurand (operating value of the sensor) is offset compared to the real measurand. adjustment range: +/-10% of the measuring span.
ddIS	Damping of the 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	
<p>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!</p>	
<p>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:</p>	
	<p>bn (1) ———— ○ + U_B</p> <p>wh (2) ———— ○ Analog / Sp2</p> <p>bk (4) ———— ○ Sp1</p> <p>bl (3) ———— ○ 0V</p> <p style="font-size: small;">bn=braun, wh=weiß, bk=schwarz, bl=blau Klemmenbezeichnung der Kabeldose in Klammern</p>

NOTE: Use a shielded cable socket (e.g. VK205321), 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	elemination
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]	150% of nominal pressure (P_N)
pressure detection	peak value memory every 2msec (display via PC)
operating voltage U_B	12 ... 32V DC, reverse polarity protection (15 ... 32V DC, if operated with voltage output)
voltage drop	< 2V
current consumption	< 60mA
switching outputs	2 x pnp-switching, no/nc, 250mA short-circuit protection
time delay	0 to 20sec, on-/off-delay adjustable separately
adjustment range switch- point release position	1 ... 100% of P_N , 0 ... 99% of P_N
sampling frequency	max. 125Hz
repeatability	< $\pm 0.1\%$ of accumulated value
current output	0/4 ... 20mA, 20 ... 0/4mA, start- and end-point selectable
burden	max. $R_L [\Omega] = (U_B - 8V) / 20mA$
voltage output	0 ... 5/10V, 5/10 ... 0V, start- and end point selectable
burden	min. 5k Ω
error recognition	analog outp. if line breakage (current) - short-circuit (voltage, $\geq 1V$)
rise time	5msec (10% ... 90% of P_N)
damping	0 ... 20sec, adjustable
linearity deviation system	max. $\pm 0.25\%$ of P_N
pressure display	4 x 7 segment LED-display
switching function display	2x LED red
display damping	0 ... 20sec, adjustable
operating temperature	-20 °C ... +80 °C
temperature drift	< $\pm 0.2\%$ / 10K (-10 °C ... +70 °C)
conn. to pressure system	DW35: G1/4A, SW 22 (DW36: G1/8, SW 22)
sensor head material	stainless steel 1.4435
housing material	PA6.6, polyester
degree of protection	IP65 acc. EN 60529
electrical connection	M12 connector, 4-pin
optical interface	9600 Baud, via optical adapter at USB-Port

dimensional drawings

fig.1: DW35xxxx

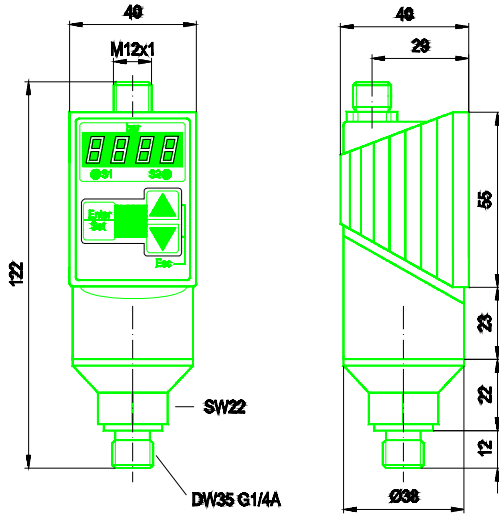
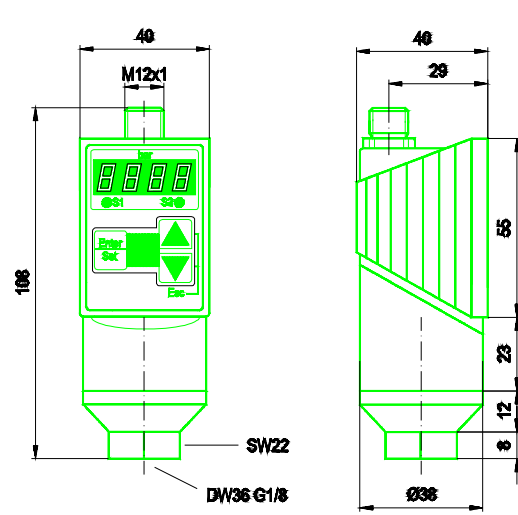


fig.2: DW36xxxx



list of articles

article-no	design	description	housing	voltage	output	connection	fig.
DW36311H	36-G1/8	-0.5 to +0.5bar, ceramic	polyester/V4A	12-32V DC	pnp,no/nc,0/4-20mA	M12-conn4pin	2
DW36311J	36-G1/8	-1 to +1bar, ceramic	polyester/V4A	12-32V DC	pnp,no/nc,0/4-20mA	M12-conn4pin	2
DW363110	36-G1/8	-1 to 0bar, ceramic	polyester/V4A	12-32V DC	pnp,no/nc,0/4-20mA	M12-conn4pin	2
DW363111	36-G1/8	0 to 1bar, ceramic	polyester/V4A	12-32V DC	pnp,no/nc,0/4-20mA	M12-conn4pin	2
DW35311D	35-G1/4A	10bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,0/4-20mA	M12-conn4pin	1
DW35311F	35-G1/4A	50bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,0/4-20mA	M12-conn4pin	1
DW353114	35-G1/4A	100bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,0/4-20mA	M12-conn4pin	1
DW35311G	35-G1/4A	200bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,0/4-20mA	M12-conn4pin	1
DW353116	35-G1/4A	400bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,0/4-20mA	M12-conn4pin	1
DW353117	35-G1/4A	600bar, stainless steel	polyester/V4A	12-32V DC	pnp,no/nc,0/4-20mA	M12-conn4pin	1
AD000011		accessories		opt. interface	USB connection, software	1.5m cable	w/o