PINTER
MESS- UND REGELTECHNIK

Operating Instructions

Electronic Pressure Switch for Pressure and Vacuum

MINICOMB®-EDS

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Sample configurations are shown on the title page, hence the delivered product may differ from the depicted products.
This document was originally issued in German language.

Product Description
The product is an electronic pressure switch for measuring the pressure and / or vacuum in pressure lines of - depending on model configuration - compressed air, neutral gases, corrosive gases and liquids. The pressure switch has - depending on the version - 1 or 2 digital outputs (PNP) or 1 digital output and 1 analogue output (4-20 mA).

About these instructions
This instruction contains important information, in order to safely and properly install, operate and maintain the MINICOMB-EDS pressure switch and also information you on how to fix simple failures youself.
Before working with the MINICOMB-EDS pressure switch, make sure that you have read and understand these instructions completely.

Further documents
The MINICOMB-EDS pressure switch is a component. Please also read the instructions for the rest of your system. This includes:
- system documentation of the manufacturer

Intended use
- Only use the product in industrial applications.
- Only use the product with media, that is - depending on model configuration - compatible with aluminium / Al_2O_3 / FKM or stainless steel 1.4404 (AISI 316L) / Al_2O_3 / FKM.
- Only use the product within the specified operating conditions and performance limits.
- Please also note operating instructions of other system components, including the system documentation of the manufacturer.
- Please also note generally applicable statutory and other binding regulations of the European and national legislation and regulations in your country for accident prevention and environmental protection.
- Prevent mechanical loads on the device under any circumstances. Never use the device as a handle or shoulder. Do not place objects on it.
- You must not make alterations or modifications to the device!
- All activities with the product may only be performed by a specialist or by a trained person under the supervision of a specialist. A specialist is someone who based on their technical training, knowledge and experience and his knowledge of the relevant provisions of his assigned job is able to identify potential hazards and take appropriate safety measures. A specialist must comply with the relevant subject-specific rules. Note that there may be additional requirements in the country of use.
- Always turn off pressure and power of the relevant part of the facility before mounting the unit or unplug or plug. Secure the part from re-powering or re-pressuring. During installation hang out warning signs that warn from re-powering or re-pressuring.

The intended use also includes that you have read and understood these instructions.

Type Designation MINICOMB-EDS

Type / Part-No.		E	0	0	x	x	x	-	x	x	-	x	D	x
Model	sub-base mounting				1									
	female thread				5									
Material	Aluminium / Ceramics / FKM					1								
	Stainless Steel 1.4404 / Aluminium / Ceramics / FKM					2								
Output	1x PNP						A							
	2x PNP						B							
	1x PNP + 4 - 20 mA						C							
Pressure	relative								0					
	absolute								5					
Pressure Range	-1...0 bar								0	06				
	-1...+1 bar								0	09				
	0 - 1 bar									20				
	0 - 1,6 bar									22				
	0 - 2,5 bar									23				
	0 - 4 bar									24				
	0 - 6 bar									25				
	0 - 10 bar									26				
	0 - 16 bar									27				
	0 - 25 bar									28				
Process Connection	sub base mounting standard											P		
	1/4" female thread											4		
Further Options	without further options													O
	cleaned for O_2 service													A

Type Designation MINICOMB-EDS/HP

Type / Part-No.		E	0	0	5	x	x	-	0	x	-	4	D	x
Material	Stainless Steel 1.4301 / Aluminium / Ceramics / FKM					3								
	Stainless Steel 1.4404 / Aluminium / Ceramics / FKM					2								
Output	1x PNP						A							
	2x PNP						B							
	1x PNP + 4 - 20 mA						C							
Pressure Range	0 - 40 bar									29				
	0 - 60 bar									30				
	0 - 100 bar									31				
	0 - 160 bar									32				
	0 - 250 bar									33				
	0 - 400 bar									35				
	0 - 600 bar									48				
Further Options	without further options													O
	cleaned for O_2 service													A

Scope of delivery

- 1x MINICOMB-EDS Electronic Pressure Switch
- 2x mounting screw (only sub base mounting)
- 1x o-ring (only sub base mounting)
- 1x operating instructions

Technical Data MINICOMB-EDS

Technical Data	Standard	Options
Function	electronic pressure switch with display; based on ceramics sensor	
Life Cycle	at least 100 mio. switch cycles	
Pressure Ranges (relative or absolute)	0 - 1 bar; 0 - 1,6 bar; 0 - 2,5 bar; 0 - 4 bar; 0 - 6 bar; 0 - 10 bar; 0 - 16 bar; 0 - 25 bar	
Vacuum Ranges (relative)	-1...0 bar; -1...+1 bar; -1...+5 bar; -1...+9 bar; -1...+15 bar; -1...+24 bar	
Overpressure Safety (short time)	≥ 2,5x FS	on request
Burst Pressure	≥ 3,0x FS	on request
Vaccum Safety	-1 bar	
Material Enclosure	Aluminium	on request
Material Pressure Inlet (wetted)	Aluminium	Stainless Steel 1.4404 (AISI 316L)
Material Sensor (wetted)	Al_2O_3	
Material Seal (wetted)	FKM (NBR and FKM fro sub-base mouting)	on request
Permissible Media Temperature	-20...+85°C	
Permissible Ambient Temperature	-20...+85°C	
Output Signals	either 1x PNP, 2x PNP or 1x PNP with analogue output 4 - 20 mA	
Switch Accuracy, Repeatability	≤ 0,5% FS	
Accuracy Analogue Output	≤ 0,5% FS	
Longterm Stability (DIN EN 60770)	± 0,5% FS	
Switch Point / Reset Point	adjustable ≥ 0,5% FS - 100% FS / adjustable ≥ 0,5% FS from switch point	
Switching Function	adjustable, normally open, normally closed, hysteresis-mode, window-mode	
Response Time	≤ 10ms	
Switching Current DC	max. 0,5 A	
Max. Load Resistance	600 Ω	
Display	OLED	
Switch State Indicator	1 LED per channel (yellow)	
Menu Navigation	oriented to VDMA standard sheet 24574-1 (with addition plain text menu)	
Menu Language	adjustable - English, French, German, Italian, Spanish	
Supply	24 VDC (15 - 32 VDC)	on request
Power Consumption	< 50 mA	
Process Connection	either sub-base mounting or 1/4" female thread	
Electrical Connection	M12x1 plug (5-pin)	
Weight	approx. 0,3 kg	
Protection (EN 60529)	IP65 (with installed counter-plug)	
Shock Resistance (XYZ-direction)	30g, xyz, DIN EN 60068-2-27 (11ms)	
Vibration Resistance (XYZ-direction)	5g (10....150Hz), xyz DIN EN 60068-2-6	
Electromagnetic Compatibility	EMC-Directive 2004/108/EC, EN 61326-1:2013, EN 61326-2-3:2013; EN 61000-6-2:2005; EN 61000-6-4:2007 + A1:2011	
Further Functions	zero-point adjustment, adjustable switching and re-set delay, changable units, adjustable display power off, rotatable display indication, password protection	
Further Options	cleaned for O_2 service	

Deviating Technical Data for MINICOMB-EDS/HP

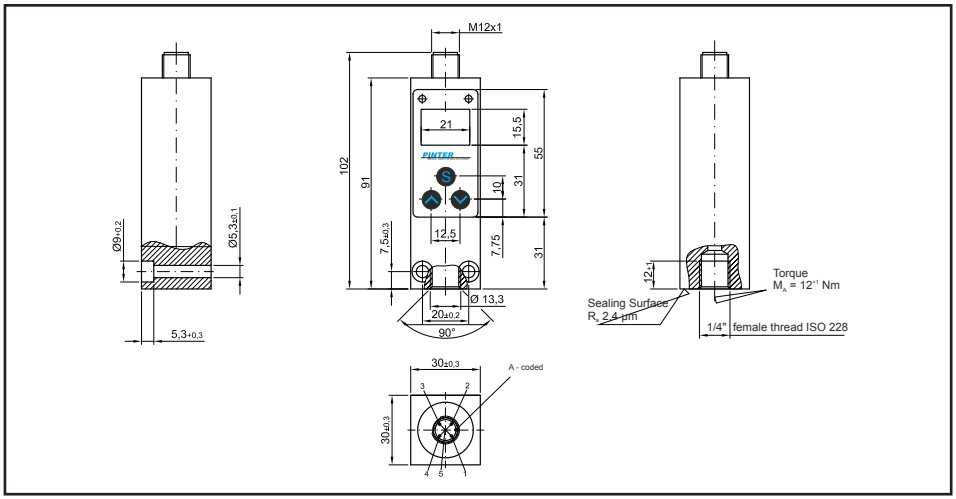
Technical Data	Standard	Options
Pressure Ranges (relative)	0 - 40 bar; 0 - 60 bar; 0 - 100 bar; 0 - 160 bar; 0 - 250 bar; 0 - 400 bar; 0 - 600 bar	
Material Pressure Inlet (wetted)	Stainless Steel 1.4301 (AISI 304)	Stainless Steel 1.4404 (AISI 316L)

Installation

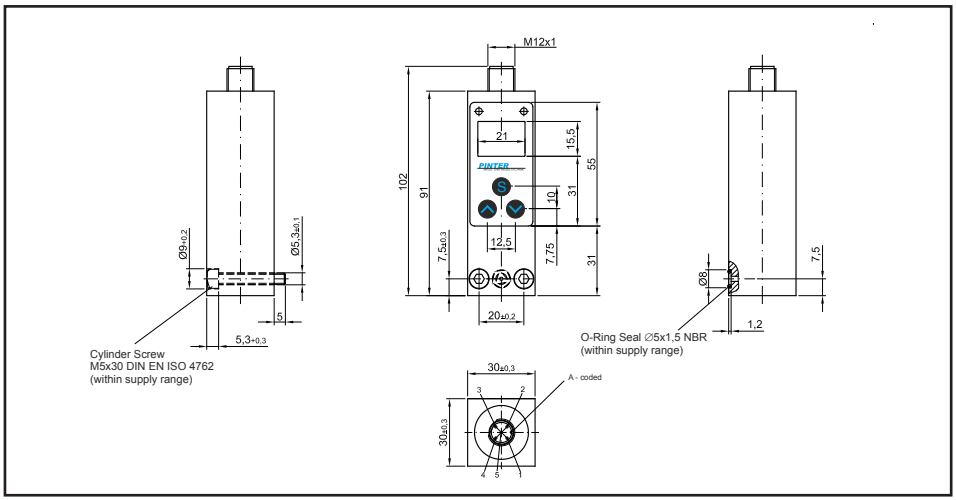
- Let the product acclimatize for several hours before installation and commissioning, as otherwise condensation water can form in the housing.
- Install and fasten the product according to the pictures.
- If the product is not properly fastened, other plant parts may be damaged by uncontrolled movements of the product, as well as personal injuries may occur. Make sure that the product is securely fastened.

Dimensions

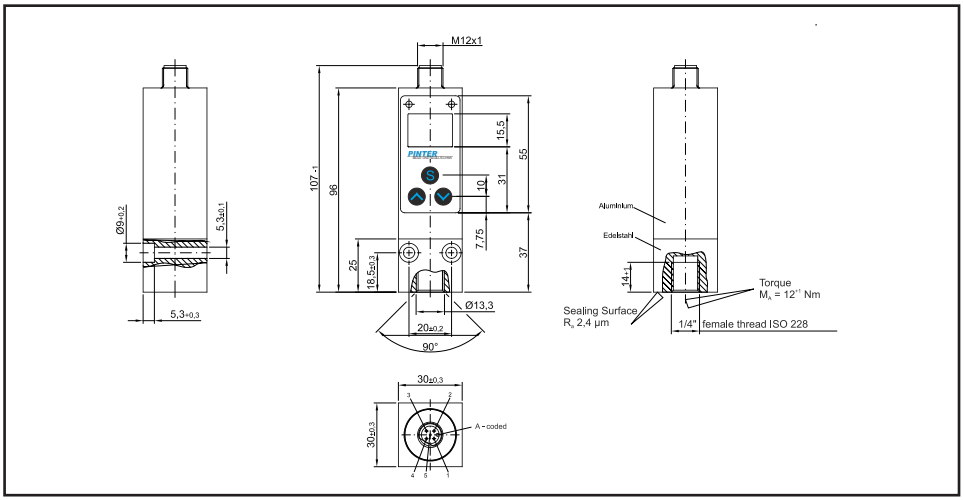
MINICOMB-EDS
version with female thread



MINICOMB-EDS
version with sub-base mounting



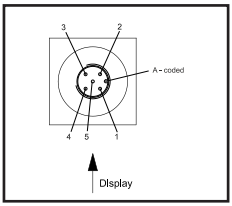
MINICOMB-EDS/HP
version with female thread



Electrical connection

- Route cables so that nobody can trip over them.
- Only use harmonized (color-coded or number) cables. Make sure of the correct connection of the cables!
- Connect the product accurding to the pictures.
- If the product is not properly connected electrically, the protection type can not be guaranteed. Make sure the plug is securely connected.

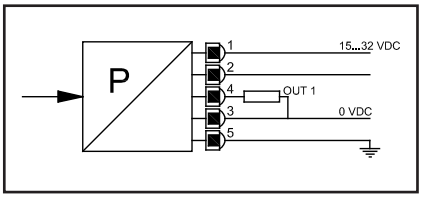
Pin Assignment



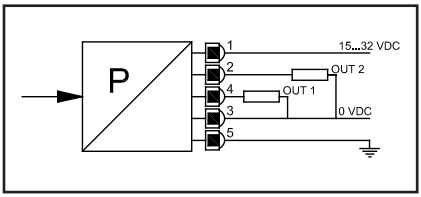
Pin	Description	cable color (cable available as sep.acc.)
1	+Ub	brown
2	OUT2 (PNP) / 4 - 20 mA	white
3	0 Volt	blue
4	OUT1 (PNP)	black
5	FE	grey

Circuit Diagrams

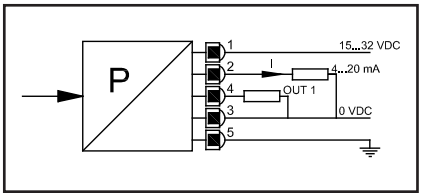
1P
1 PNP - output



2P
2 PNP - outputs



1PA
1 PNP - output + 1 analogue output 4 - 20 mA



Commissioning, Parameter Setup

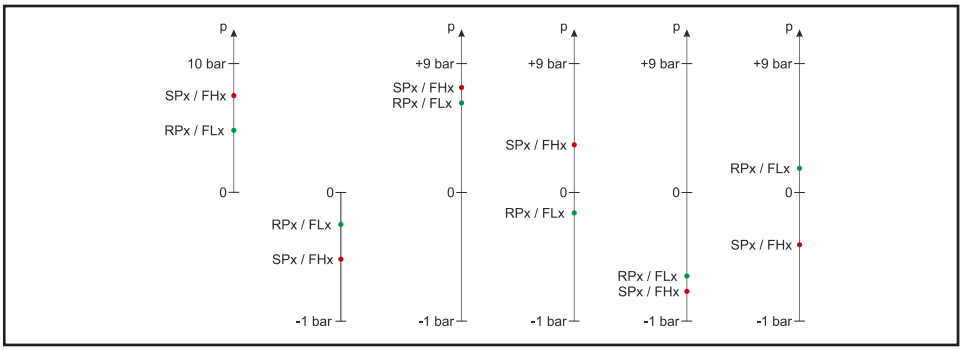
- Before starting make sure that all gaskets and seals and screwed connections are installed correctly.
- Set the desired parameters.
- Set parameters can be reviewed in the individual menu items.
- Most important parameters can be reviewed on the status-display quickly.
- Parameters can be set during operation.
- Please note that a change in the parameters during operation can affect the reliability of the system!

Parameters, Description, Values, Factory Defaults

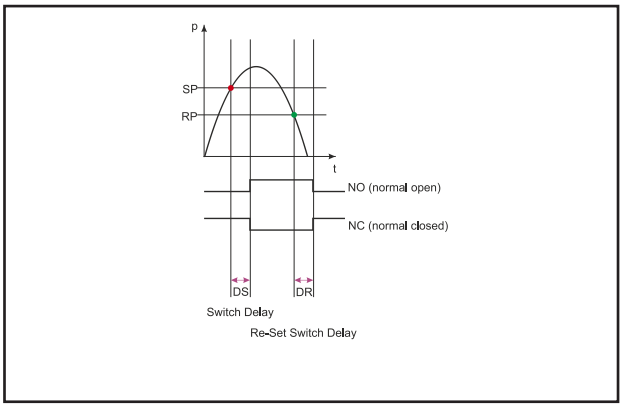
Parameters	Description	Values	Factory Defaults
SP1 / FH1	set point 1 or upper window value 1	OFF; >= 0,5% FS up to 100% FS	75% FS
RP1 / FL1 [1]	re-set point 1 or lower window value 1	0% FS up to SP -0,5% FS (+0,5% FS if SP < 0)	74,5% FS
SP2 / FH2 [2]	set point 2 or upper window value 2	OFF; >= 0,5% FS up to 100% FS	25% FS
RP2 / FL2 [1,2]	re-set point 2 or lower window value 2	0% FS up to SP -0,5% FS (+0,5% FS if SP < 0)	24,5% FS
DS1	switch delay 1	OFF; 0,2 up to 50 s	OFF
DR1	re-set switch delay 1	OFF; 0,2 up to 50 s	OFF
DS2 [2]	switch delay 2	OFF; 0,2 up to 50 s	OFF
DR2 [2]	re-set switch delay 2	OFF; 0,2 up to 50 s	OFF
OU1	switching function 1	HNO (hystersis function, normally open) HNC (hystersis function, normally closed) FNO (hystersis function, normally open) FNC (hystersis function, normally closed)	HNO
OU2 [2]	switching function 2	HNO (hystersis function, normally open) HNC (hystersis function, normally closed) FNO (hystersis function, normally open) FNC (hystersis function, normally closed)	HNO
OUA [3]	configuration analogue output	I (4 - 20 mA = 0 - 100% FS) I INV (4 - 20 mA = 100 - 0% FS)	I
UNI	pressure unit	bar; mbar; MPa; kPa; psi; %	bar
DISP	autom. display shut-off	OFF; 1 - 60 min	OFF
DISR	display rotation	NO (standard display) YES (display rotated by 180°)	NO
ZERO	zero correction	NO; 1% FS [4]	NO
PASS	password protection	NO; 0000 - 9999	NO
LANG	language for text menu	DE; EN; ES; FR; IT; OFF	DE

[1] menu item not available, when corresponding output is turned OFF
[2] only 2P
[3] only 1PA
[4] for pressure ranges ≤ 4 bar max zero correction +/- 50 mbar

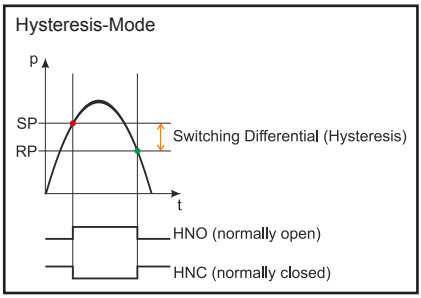
Setpoint
It is not possible to adjust RPx > SPx or FLx > FHx.
In general SPx or FHx is leading:
if SPx/FHx > 0 bar, RPx/FLx = 0% FS up to SP -0,5% FS
if SPx/FHx < 0 bar, RPx/FLx = SP +0,5% FS up to 100% FS



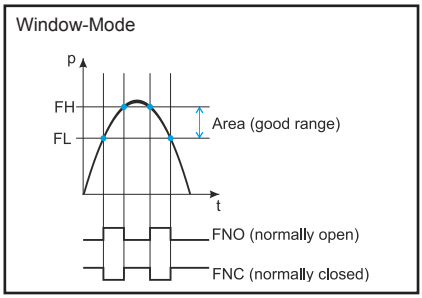
Switch Delay
By adjusting switch delay and re-set switch delay you can change the time between the detection of a pressure signal and the switch-over of the digital output(s).
Note that a delayed signal transmission might possibly have an impact on plant safety.



Switching Function

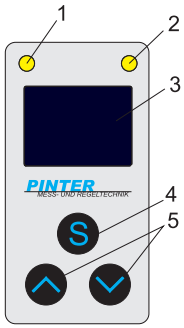


In Hysteresis-Mode both switching point SP and reset point RP can be adjusted freely. The switch switches back when the RP is reached.
This allows, for example, a simple 2-point control.



With the Window-Mode defined areas can be monitored. If the process pressure is within the defined range the output is either closed or open.

Display and 3-button control panel



1. LED for Switch Output 1
2. LED for Switch Output 2
3. Display (Pressure Indicator, Operating Modes, Menu)
4. Menu Key / Menu Item Selection / Parameter Confirmation
5. Keys for Menu Navigation/ Parameter Change

Display

Standard-Display
Standard view with information about output configuration, pressure unit and pressure value.
exemplary view of a 2P-version with output 1 configured HNC and output 2 configured FNO.

row 1	output configuration(s)
row 2	pressure unit
row 3	pressure value

Standard view with information about output configuration and pressure value **with activated zero correction.**
exemplary view of a 2P-version with output 1 configured HNC and output 2 configured FNO.

row 1	output configuration(s)
row 2	zero correction value and pressure unit
row 3	pressure value

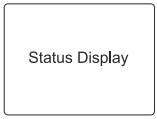
Standard view **in case of an error**

row 1	description of error
row 2	description of error
row 3	Error Code

Menu
exemplary view of a 2P-version with output 1 configured HNC and output 2 configured FNO.

Basic Functions

„Standard-Display"



please refer to „Status Display" for more information

Set Value for Switching Point 1

Increase or Decrease Value of Switching Point 1

Confirm Setting and go back to upper Menu.

Set Value for Reset Point 1

Increase or Decrease Value of Reset Point 1

Confirm Setting and go back to upper Menu.

Set Value for Upper Window 2

Increase or Decrease Value of Upper Window 2

Confirm Setting and go back to upper Menu.

Set Value for Lower Window 2

Increase or Decrease Value of Lower Window 2

Confirm Setting and go back to upper Menu.

please refer to „Extended Features" for more information

Return to the parent menu item by pressing + .
The device returns to the Standard-Display if no button is pressed for 5 seconds.

Extended Features

„Extended Features“

S

Reset device to factroy defaults.

S

choose YES or NO

S

confirm choice
Device restarts on YES.

set value for switch delay 1

S

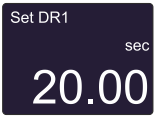
increase or decrease value

S

confirm choice and return to parent menu

set value for re-set switch delay 1

S



increase or decrease value

S

confirm choice and return to parent menu

set value for switch delay 2 (only 2P)

S

increase or decrease value

S

confirm choice and return to parent menu

set value for re-set switch delay 2 (only 2P)

S

increase or decrease value

S

confirm choice and return to parent menu

choose configurati-on for output 1

S

choose
HNC, HNO, FNC or FNO

S

confirm choice and return to parent menu

choose configuration for output 2 (only 2P)

choose
HNC, HNO, FNC or FNO

confirm choice and return to parent menu

choose configuration for output 2 (only 1PA)

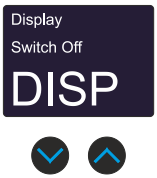
choose I or I INV

confirm choice and return to parent menu

choose pressure unit

choose
mbar, bar, kPa, MPa, psi or %

confirm choice and return to parent menu



set value for automatic display shut-off

increase or decrease value

confirm choice and return to parent menu

set display rotation

choose YES or NO

confirm choice and return to parent menu

set zero correction

choose YES or NO

on YES the actual pressure value will be set as zero. NO deactivates zero correction.

set language for text menu

choose
DE, EN, ES, FR, IT or OFF

confirm choice and return to parent menu

please refer to „Password Protection“ for more information

Password Protection
Protect setting to prevent tampering.
In order to protect the settings and to prevent unintentional setting or tampering the configuration can be password protected, ie access to the menu via the „S“ button is disabled.
In protected mode, a warning message is displayed when pressing the „S“ button and the user is prompted for the password.

Set Password Protection

NOT activate password protection

confirm choice and return to parent menu

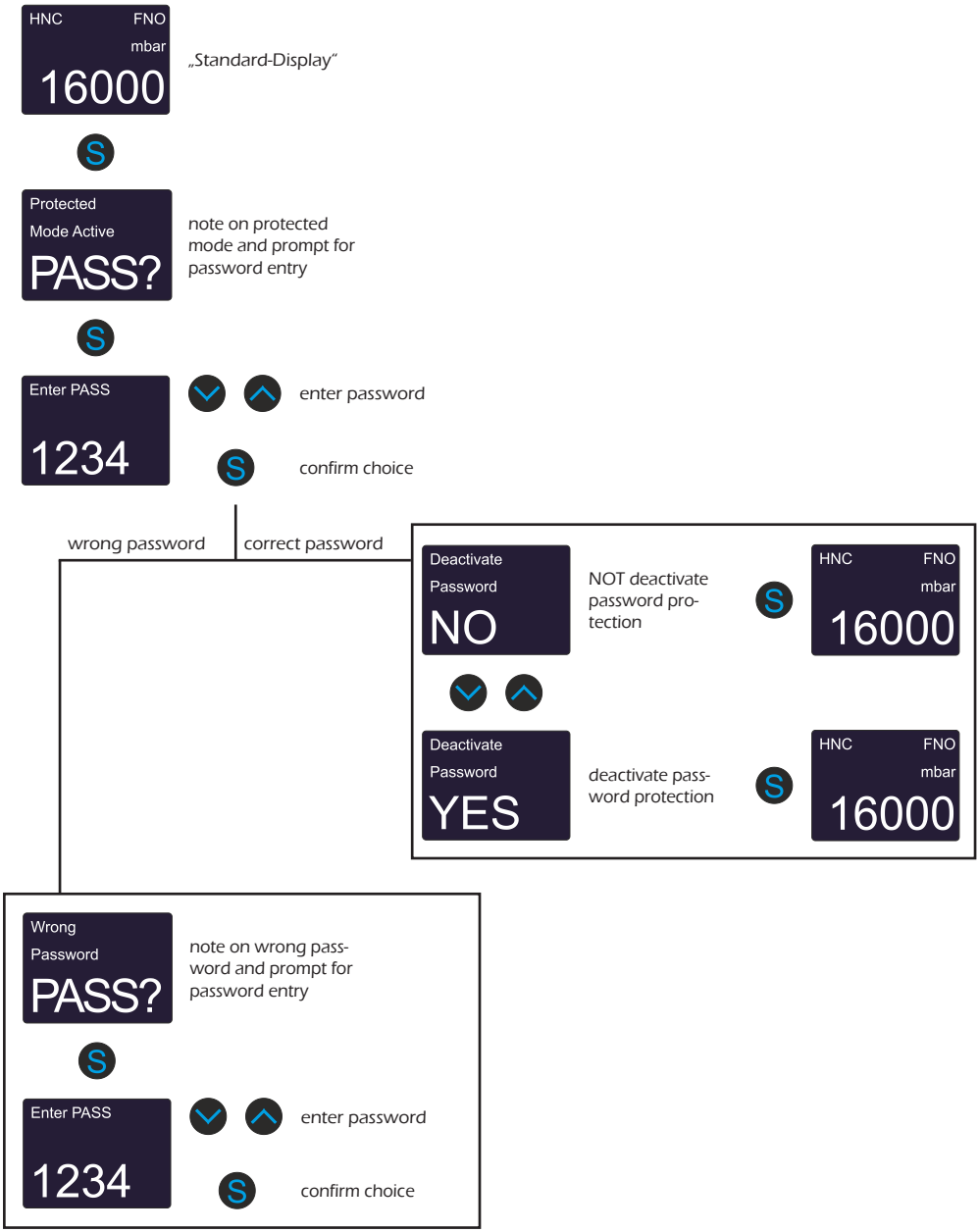
Enable password protection and continue to set password

choose password

confirm choice and return to parent menu

NOTE
The password protection is only active after returning to the Standard-Display.

Jump in the menu with activated password protection



Resetting password protection on lost password
Resetting password protection on lost password is only possible at the factory or by an authorized partner.

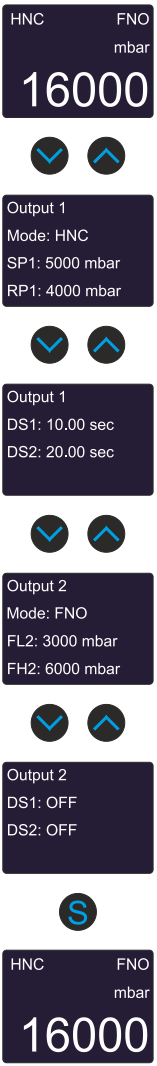
Status-Display

Summarized information on parameters for each output.

Access to the status display is also possible with activated password protection. So a simple check of the settings is possible any time, but an adjustment of the parameters is not possible with activated password protection.

1P version

2P version



1PA version

During operation

- The product is maintenance free. In case of technical problems, please contact PINTER.
- Clean the product with a slightly damp cloth only. Use water and if necessary a mild detergent. Never use solvents or abrasive cleaners or aggressive cleaners.
- Set parameters can be reviewed in the individual menu items.
- Most important parameters can be reviewed on the status-display quickly.
- Parameters can be set during operation.
- Please note that a change in the parameters during operation can affect the reliability of the system!

Error and Warning Messages

Display	Text Menu	Reason	Correction
OL [1]	Over Pressure	applied pressure > 100% FS	operate the unit within the permissible specification
UL [1]	Low Pressure	applied pressure < 0% FS	operate the unit within the permissible specification
ERR3 [2]	Over Voltage	supply voltage > 32 VDC	correct supply voltage
ERR3 [3]	Low Voltage	supply voltage < 15 VDC	correct supply voltage
ATT2	Out of Range	try to make zero point correction out of specified range	press S button to acknowledge the message. Make zero-point correction within the specified range.
PASS?	Protected Mode active	try to jump into the menu with password protection active.	Enter password and disable password protection.

[1] all devices have an overrun of approx. +/- 5% FS bevor the error message is displayed.
[2] on continuesly applied supply voltage of > 35 VDC the electronics will be damaged
[3] if the supply voltage falls < 15 VDC the error message will be displayed and the digital output/s will be shut down.
On 1PA versions the analogue output will be set to 3,6 mA.
If the supply voltage falls < 8 VDC the device is being switched off.

Dismounting, Disposal

- Turn off power supply and pressure supply
- Dismount the product by dissolving and removing all connections
- Dispose of the device according to the regulations of your country.

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