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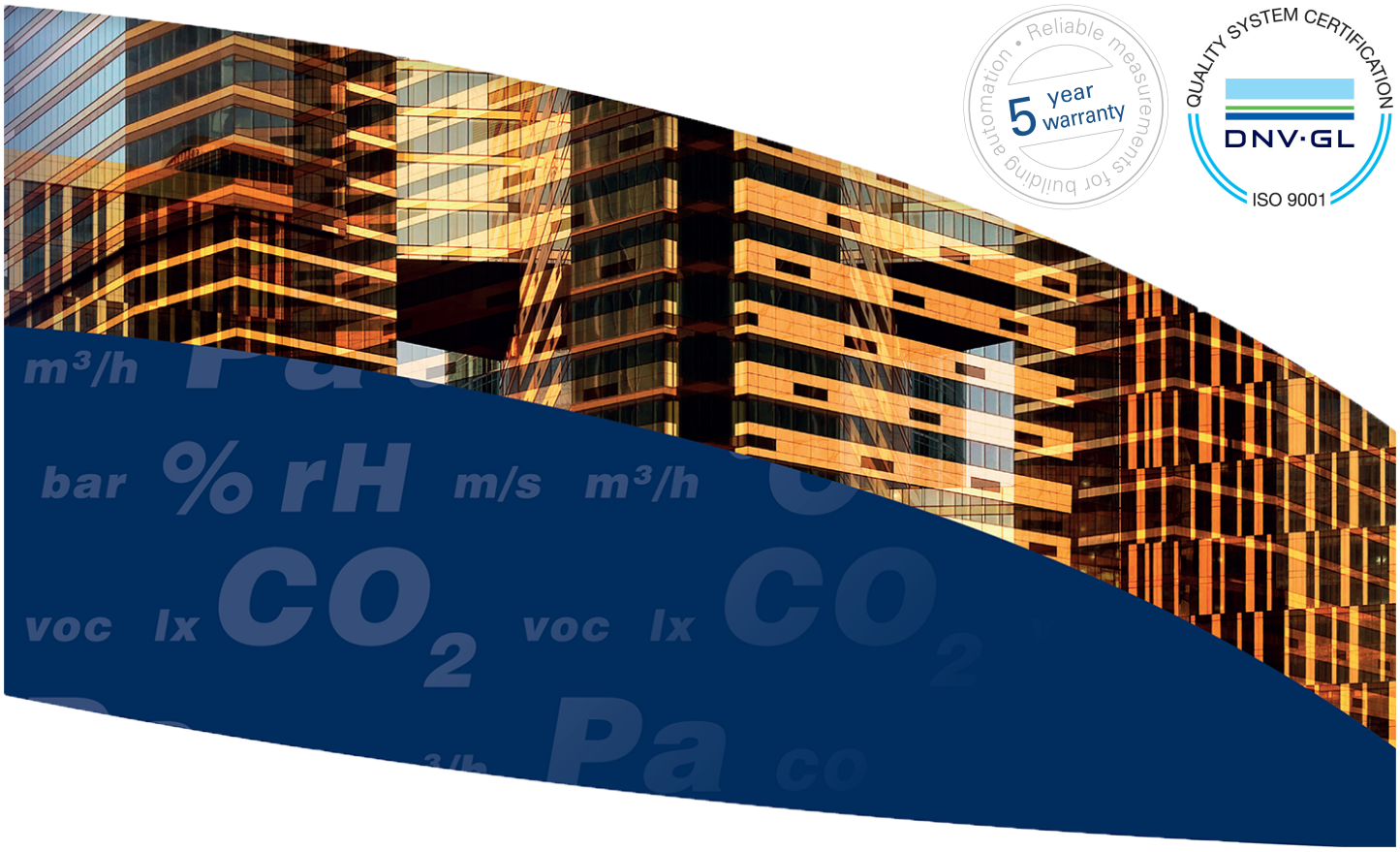
USER GUIDE

PEL 2500-MZ

Produal

Distributed by AKRIBIS





PEL 2500-MZ - Differential pressure transmitter

User Guide

PRODUAL
measure-be sure.

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1 Safety precautions

The product is developed, manufactured and tested according to high quality standards. However, instructions for safe use shall be taken account when installing, using or disposing the product or parts of product.

Read this user guide carefully before commissioning, using or servicing this device. To avoid any kind of damage to people or property, follow the instructions carefully. Produal is not liable for any hazards or damages to people or property which are caused by ignoring the using or installation instructions.

To avoid electrical shock or damage to equipment, disconnect power before installing or servicing the product. Use only a proper wiring rated for the full operating voltage and maximum current in the system even in the event of a fault.

The product condition must be checked before installation. Do not drop the product or use excessive force during installation. Do not use the product if any damages are visible.

After installation the product will be part of a system whose specifications and performance characteristics are not designed or controlled by Produal. Refer to national and local authorities to ensure that the installation is functional and safe.

The product should only be used in professionally designed applications. Unauthorised modifications are not allowed. The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or property.

In this document, there are different kind of warnings and notes. The warning and note types are defined in the following table.

Sign	Description
Warning:	The warning symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION:	The caution symbol indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
Important:	The important symbol indicates a potentially hazardous situation which, if not avoided, could result in damage to the device or property.
Note:	The note symbol indicates a useful tip or a recommended way to complete a task. These notes also provide information that is useful but not critical to the user.

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2 Commissioning

2.1 Mounting the product

Warning: Handle the product with care. Dropping the product may cause internal damage and unwanted functions in the connected system.

1. Check that the product is not damaged during transportation.
2. Select the mounting location.

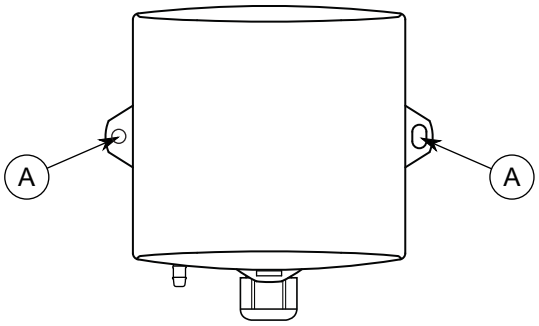
   install the transmitter above the measuring point to avoid condensation problems.

   CAUTION: Place the product outside the reach of children and animals.

   Important: The product may only be installed in a location where the ambient conditions meet the operating condition requirements.

Operating conditions	
Temperature	0...45 °C
Humidity	0...95 %rH (non-condensing)

3. Mount the product on flat surface using the mounting points.

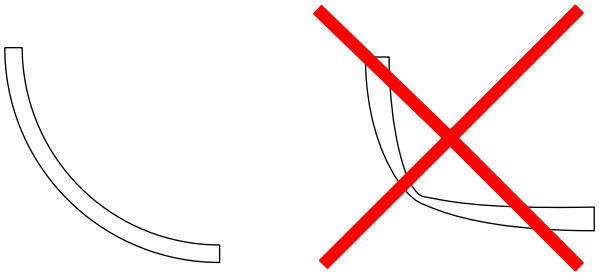


A. Mounting point

Select the mounting screws according to the mounting surface. The maximum screw diameter is 4.5 mm.

Important: Don't use excessive force when tightening the mounting screws.

4. Install the measuring hoses carefully so that the hoses don't bend too tightly.
   Too tight curves may prevent the air flow to the sensor.

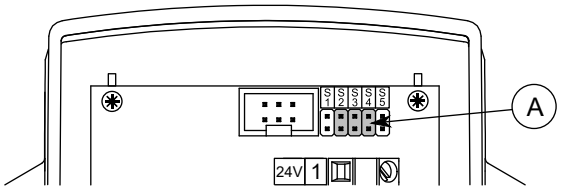


The duct overpressure is measured by connecting the measuring point to + connector and by leaving the - connection open (surrounding space pressure). Accordingly, the duct under-pressure is measured by connecting the measuring point to - connector and by leaving the + connection open.

Note: The hose length doesn't affect to the measuring accuracy. However, long hoses generate delay to the measurement.

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2.2 Selecting the measuring range



A. Pressure range selection jumpers

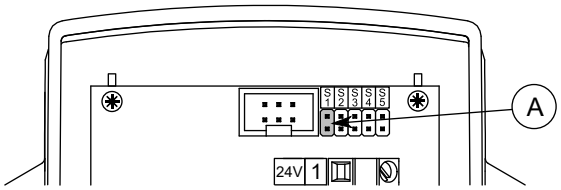
1. Disconnect the device supply voltage.
2. Open the cover.
3. Place the jumpers.

	±100	0..100	0...200	0...500	0...1000	0...1500	0...2000	[1] 0...2500
S2	● ●	■	● ●	■	● ●	■	● ●	■
S3	● ●	● ●	■	■	● ●	● ●	■	■
S4	● ●	● ●	● ●	● ●	■	■	■	■

[1] Factory setting. The 0…2500 Pa range is also used for the custom range setting.

4. Close the cover.
5. Reconnect the device supply voltage.

2.3 Selecting the time constant



A. Time constant selection jumper

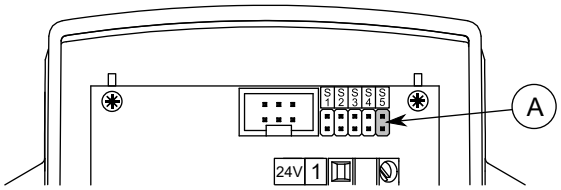
1. Disconnect the device supply voltage.
2. Open the cover.
3. Place the jumper.

	[1] 8 s	2 s
S1	■	● ●

[1] Factory setting.

4. Close the cover.
5. Reconnect the device supply voltage.

2.4 Selecting the output mode



A. Output mode selection jumper

1. Disconnect the device supply voltage.
2. Open the cover.
3. Place the jumper.

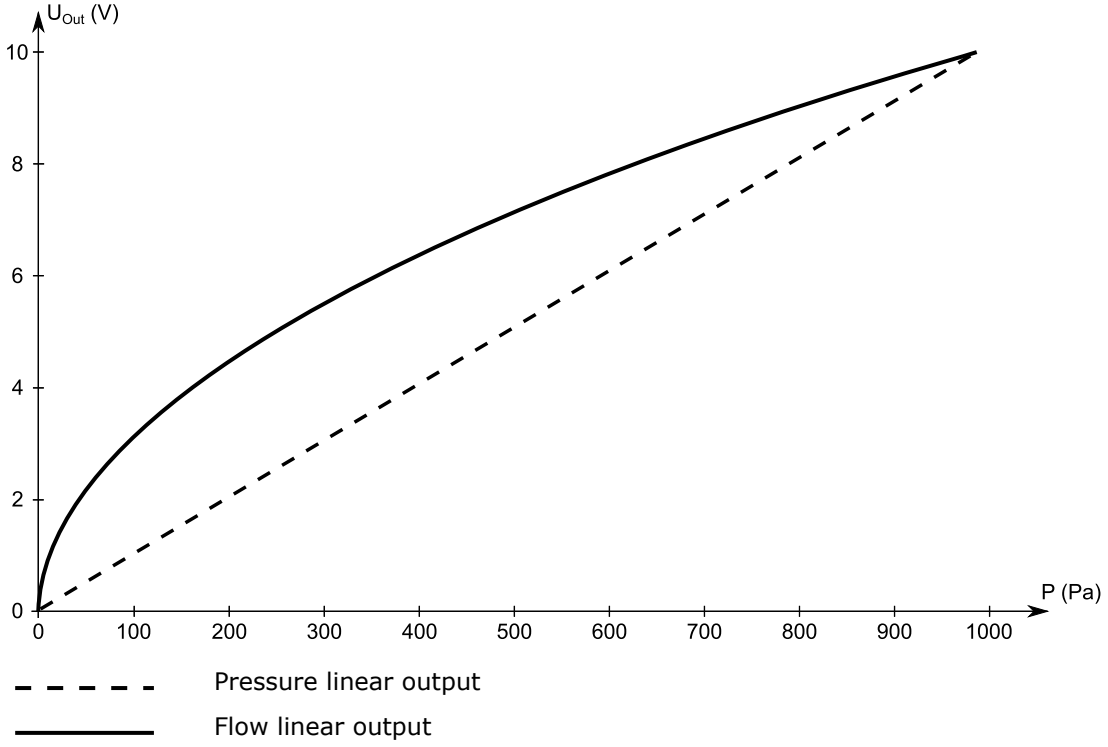
	[1] Pressure linear	Flow linear
S5	■	• •

4. Close the cover.
5. Reconnect the device supply voltage.

2.4.1 Flow linear output

When the flow linear output is selected, the transmitter outputs are converted to follow the flow across the measurement area. The conversion is made by using square root extraction method.

See the following figure for the output example in the 0…1000 Pa range:

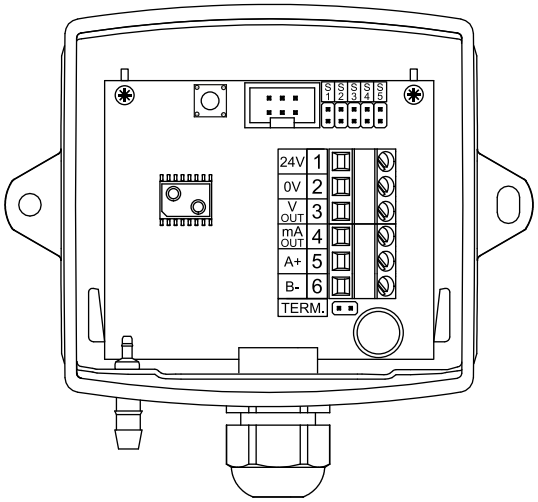


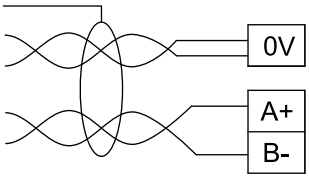
2.5 Wiring

Warning: Device wiring and commissioning can only be carried out by qualified professionals. Always make the device wirings in de-energised electricity network.

Warning: This product is appliance class III product according to IEC 60664-1. The product may only be connected to SELV (safety extra low voltage) electricity network.

CAUTION: The product may only be connected to overvoltage category III electricity network according to IEC 60664-1.



24V	Supply, 24 Vac/dc (22…28 V), < 2 VA
0V	0 V
V out	Voltage output, 0...10 / 2…10 / 0…5 Vdc, < 2 mA
mA out	Current output, 4…20 / 0…20 mA, 700 Ω
A+ *B-*	 Modbus RTU, RS-485 (M models)

The nominal wire terminal screw tightening torque is 0.6 Nm

Important: Don't use excessive force when tightening the wiring terminal screws.

CAUTION: Ensure that all covers are closed before connecting supply voltage to the product. Don't remove the covers when the supply voltage is connected.

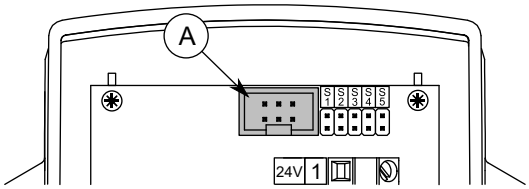
2.6 Connecting ML-SER tool to the device

1. Open the cover.

   CAUTION: When the power supply is connected, be extra careful when handling the product without the cover.

2. Disconnect the display cable.

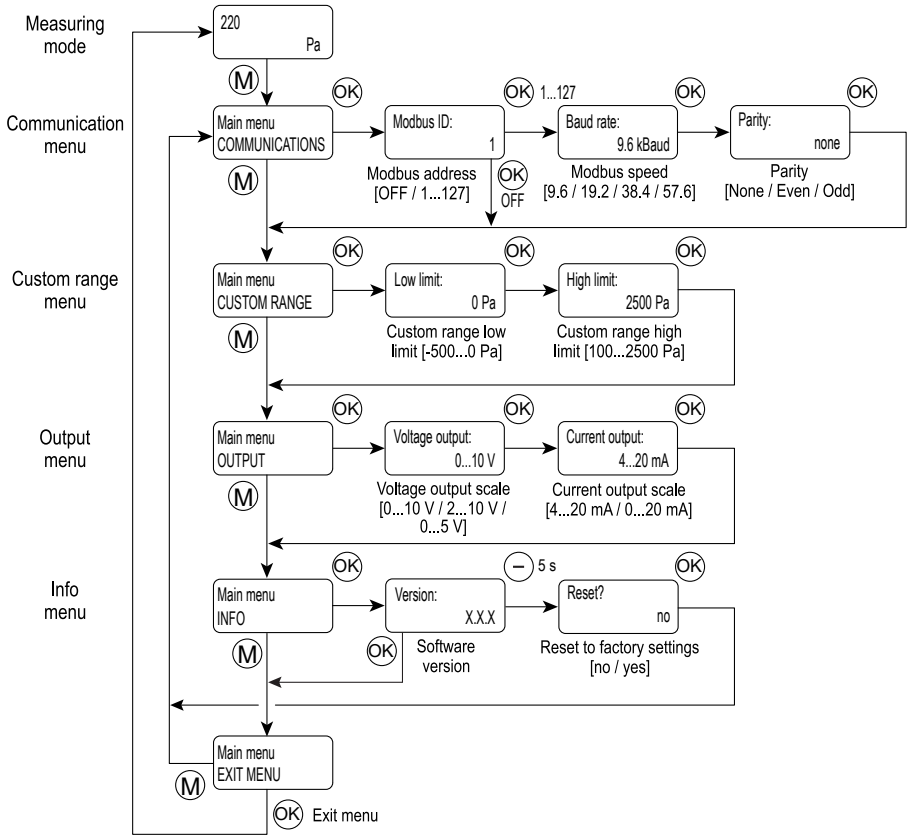
3. Connect the ML-SER cable to the display connector.



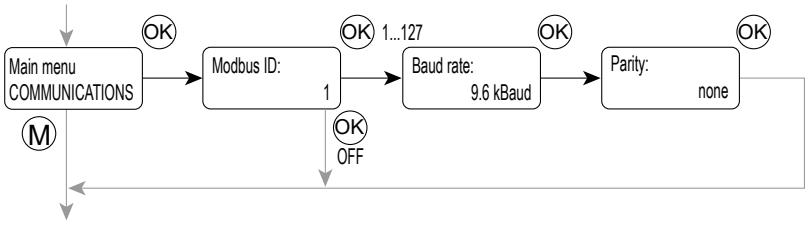
A. Display connector

2.7 ML-SER menu

ML-SER menu opens by pressing Ⓜ button. The values can be changed with ⊕ and ⊖ buttons. The menu is device-specific and the content depends on the device and installed options.



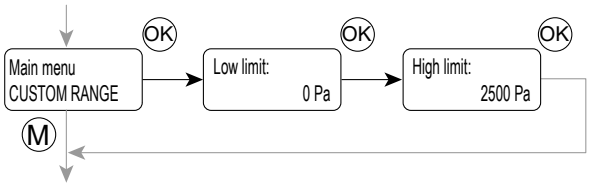
2.7.1 Communication menu



Parameter	Available values	Description
Modbus ID	*OFF / 1...127*	Modbus address.
Baud rate	*9.6 / 19.2 / 34.8 / 57.6*	Modbus speed (kbit/s).
Parity	*none / even / odd*	Bus parity.

2.7.2 Custom range menu

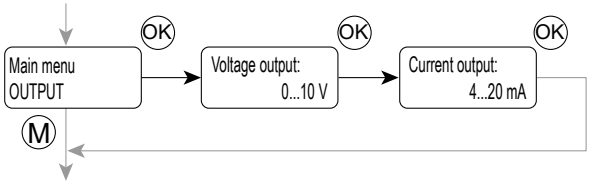
The menu is for setting the custom pressure range limits. The custom range is in use when all the pressure range selection jumpers are placed.



Parameter	Available values	Description
Low limit	*-500...0 Pa*	Pressure measurement range low limit. The value can be adjusted by 10 Pa steps.
High limit	*100...2500 Pa*	Pressure measurement range high limit. The value can be adjusted by 10 Pa steps.

2.7.3 Output menu

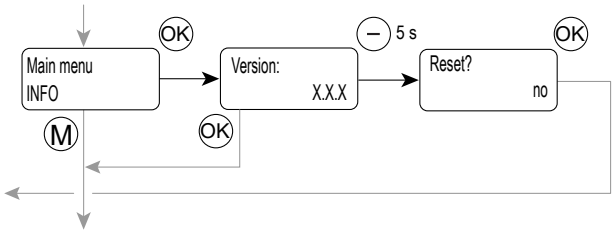
You can change the output scaling through the output menu.



Parameter	Available values	Description
Voltage output	*0...10 V / 2...10 V / 0...5 V*	Voltage output scale.
Current output	*4...20 mA / 0...20 mA*	Current output scale.

2.7.4 Info menu

You can check the device software version and reset the device to factory settings through the menu.



Parameter	Available values	Description
Version	*X.X.X*	Device software version.
Reset?	*no / yes*	Reset to factory settings.

2.7.4.1 Resetting device settings to factory defaults

1. Press ⊖ for 5 seconds in software version display.
2. Change the resetting dialog answer to *yes*.
3. Press OK button.
   The factory settings are now reset to the device.

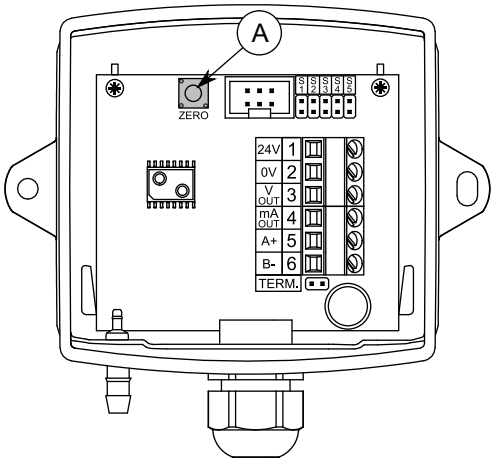
3 Maintenance

3.1 Zeroing

The possible zero point drifting can be eliminated by using the zeroing button on the circuit board.

1. Disconnect both pressure measurement hoses.
2. Open the cover.

   CAUTION: When the power supply is connected, be extra careful when handling the product without the cover.
3. Push the zeroing button for 2 seconds.



A. Zeroing button

4. Close the cover.
5. Connect the pressure measurement hoses.

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4 Modbus

4.1 Modbus properties

Protocol	RS-485 Modbus RTU
Bus speed	9600*/19200/38400/57600 bit/s
Data bits	8
Parity	none*/odd/even
Stop bits	1
Modbus ID	1*
Unit load	1/4 UL
	* factory setting

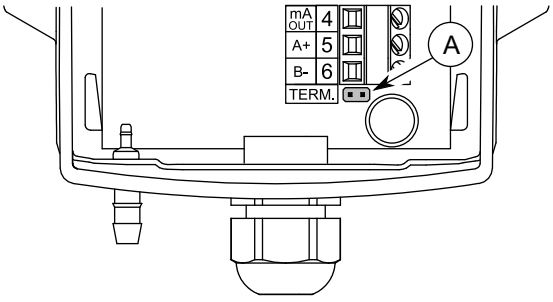
4.2 Modbus function codes

The device supports the following Modbus function codes.

Decimal	Hexa-decimal	Function
1	0x01	Read Coils
2	0x02	Read Discrete Inputs
3	0x03	Read Holding Registers
4	0x04	Read Input Registers
5	0x05	Write Single Coil
6	0x06	Write Single Register
15	0x0F	Write Multiple Coils
16	0x10	Write Multiple Registers
23	0x17	Read/Write Multiple Registers

4.3 Terminating Modbus

1. Disconnect the device supply voltage.
2. Open the cover.
3. Place the termination jumper.



A. Termination jumper

4. Close the cover.
5. Reconnect the device supply voltage.

4.4 Modbus registers

4.4.1 Input registers

Register	Parameter description	Data type	Values	Range
0	Pressure measurement value.	S16	*-32768...32768*	-32768...32768 Pa
1	Time constant.	U16	*0...60*	0...60 s
2	Selected pressure range.	U16	*0 - 1 - 2 … - 7*	0. -100...100 Pa 1. 0...100 Pa 2. 0...200 Pa 3. 0...500 Pa 4. 0...1000 Pa 5. 0...1500 Pa 6. 0...2000 Pa 7. 0...2500 Pa / custom [1)]
3	Measurement output.	S16	*0...1000*	0.0...100.0 %

[1)] The custom range is 0…2500 Pa as a default. The range can be changed by using ML-SER tool or by defining the limits to the holding registers 0 and 1 (M models).

4.4.2 Holding registers

Regis-ter	Parameter description	Data type	Values	Range	Default
0	Custom scale low limit.	S16	*-50...0*	-500...0 Pa	*0*
1	Custom scale high limit.	U16	*10...250*	100...2500 Pa	*250*
2	Voltage output scale.	U16	*0 - 1 - 2*	0. 0...10 V 1. 2...10 V 2. 0...5 V	*0*
3	Current output scale.	U16	*0 - 1*	0. 4...20 mA 1. 0...20 mA	*0*
4	Pressure measurement zeroing. The register value returns to 0 after the zeroing is complete.	U16	*0 - 1*	0. - 1. Zeroing	*0*

5 Disposal

The device is considered as electrical and electronic equipment for disposal in terms of the applicable European Directive. At the end of life the product must enter the recycling system at an appropriate collection point.

- The device must be disposed through channels provided for this purpose.
- The disposal must be completed according to the local and currently applicable laws and regulations.

Generally all metals can be recycled as material. Plastics and cardboard packaging material can be used in energy recovery. Printed circuit boards need selective treatment according to IEC 62635 guidelines. To aid recycling, plastic parts are marked with an appropriate identification code. Contact your local Produal distributor for further information on environmental aspects and recycling instructions for professional recyclers.

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