

## APZ 3240

Operation Manual

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This manual covers mounting and operation of APZ 3240 pressure transmitter (hereinafter referred to as "transmitter" or "device"); it contains technical specifications, connection instructions and other information necessary for proper operation and maintenance.

See datasheets at <http://piezus.ru> for complete specifications.

Production regulated by TOR 0131-001-16585379-2014

### 1 Design and operation

1.1 The devices are contact pressure transmitters continuously converting pressure (or level in a vessel) into a normalized unified analog or digital (HART, Modbus RTU) output signal.

1.2 Primary diaphragm of the pressure transmitter is ceramic; its housing can be made of stainless steel, polyvinyl chloride or polyvinylidene fluoride, which allows using the devices with aggressive media.

1.3 Applications: control systems, automatic regulation and metering systems in pharmaceutical, chemical, petrochemical and others industries.

### 2 Technical specifications

#### 2.1 Basic specifications

2.1.1 See the transmitter's passport and label (sticker) for its span and accuracy info.

2.1.2 See Table 1 for output signal options (factory set to order).

Table 1 - Digital output signals

Ordering code	Output signal	Power supply ( $U_{power}$ )	Load impedance	Power consumption
<b>M</b>	RS-485/Modbus RTU	12...36 V	–	<7 mA
<b>H</b>	4...20 mA / HART	12...36 V	$\geq 250$ Ohm	<26 mA

2.1.3 Digital interfaces:

- RS-485: bitrate - 4800 (factory setting), 9600, 19200, 38400 bps; Modbus RTU protocol (8 data bits + 1 stop bit, no parity control);
- HART: bitrate -- 1200 bps.

2.1.4 Consumed power, max - 1 W.

2.1.5 Permissible overpressure depends on the transmitter's span; see Table 2 for the values.

Table 2 - Transmitters parameters

Pressure range, bar		Overpressure, bar	Burst pressure, bar
gauge	absolute		
0 ... 0.04	–	4	5
0 ... 0.06	–	4	5
0 ... 0.10	0 ... 0.10	4	5
0 ... 0.16	0 ... 0.16	6	7
0 ... 0.25	0 ... 0.25	6	7
0 ... 0.40	0 ... 0.40	6	7
0 ... 0.60	0 ... 0.60	6	7
0 ... 1.0	0 ... 1.0	10	12
0 ... 1.6	0 ... 1.6	18	22
0 ... 2.5	0 ... 2.5	25	31
0 ... 4.0	0 ... 4.0	25	31
0 ... 6,0	0 ... 6,0	40	50
0 ... 10	0 ... 10	40	50

Gauge pressure transmitters with URL  $\geq 0.25$  bar are resistant to rarefaction of 1 bar. Gauge pressure transmitters with URL from 0.16 bar up are resistant to rarefaction of 0.5 bar. Gauge pressure transmitters with URL  $\leq 0.1$  bar are resistant to rarefaction of 0.3 bar.

2.1.6 Overall dimensions, mm, max -  $\varnothing 55 \times 80$  mm.

2.1.7 Weight, max - 0.5 kg.

2.1.8 Housing ingress protection (GOST 14254) - IP65.

#### 2.2 Operating conditions

2.2.1 The device was designed to operate in the following conditions:

- atmospheric pressure from 84 to 106.7 kPa (group R1 under GOST R 52931);
- ambient temperature from -50 to +85 °C;
- permissible media temperatures (depends on pressure port and seal materials):
  - 316L (1.4435) stainless steel pressure port - from -40 to +125 °C;
  - PVDF pressure port - from -30 to +125 °C;
  - PVC pressure port - from 0 to +60 °C;
- sensor exposure to liquids, gases and vapors, including aggressive media.

2.2.2 Mechanical attack resistance while in operation - F3 group under GOST R 52931.

#### 2.3 Operating limitations

- the medium should be free from crystallizable impurities, contaminations and dust;
- connect the device where the medium is still or almost still and produces no vortices;
- never allow contamination of the diaphragm with silt, sand etc when installing the transmitter;
- install a pressure snubber if the system can produce hydraulic shocks;
- use pulse tubing (pre-filled with water) when measuring vapour pressure.

### 3 Safety precautions

3.1 Circuits of the device carry no dangerous voltage (class III under GOST 12.2.007.0).

3.2 Always cut off power when connecting sensor circuits.

3.3 Pressurized medium is the source of danger. Always close the valve up the medium line when connecting or disconnecting pressure transmitters. Unplug the transmitter only after medium pressure equalizes with atmospheric pressure.

### 4 Installation instructions

4.1 Only trained specialists that have read and understood this manual are allowed to mount and operate the transmitter.

4.2 Install the transmitter with maintenance convenience (incl. mounting, dismantling) in mind. We recommend mounting the transmitter with its pressure port pointing downwards (to allow condensate draining).

**Note: it is advisable to specify the transmitter's working position when ordering low pressure transmitters (range below 40 kPa).**

4.2 If the medium is gaseous, position the transmitter so that the pressure take-off tubes slope up uniformly (1:10 min) to the device and slope down if the medium is liquid. In case such installation positions are impossible, mount settling vessels at lower portions of pressure take-off tubes for gaseous media and gas holders at their higher portions for liquid media.

4.3 Screw the transmitter into a prepared hole (must be of the required size) to expose the diaphragm to the medium. Use the seals supplied or those resistant to the medium.

4.4 Use an S46 wrench to lock the transmitter in place.



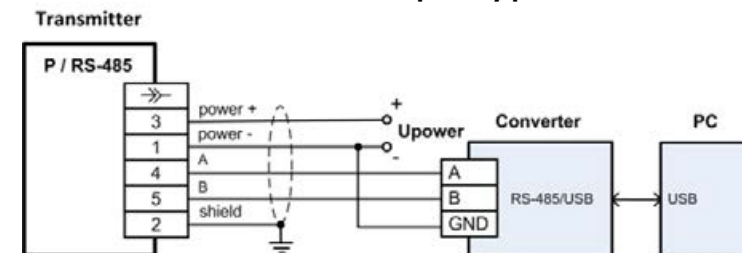
**DO NOT USE any thread seals (fiber, Teflon tape) other than supplied.**

**DO NOT CONNECT pressure transmitters to enclosed volumes filled with liquid.**

**Never hold onto the transmitter's body when screwing it in! Use the hexagon found on the housing for that purpose.**

4.5 Connect transmitter's circuits via connectors as shown in Figures 1 and 2 or via the cable built into the transmitter as described by Tables 3 and 4. Observe polarity when connecting the circuits.

**Note: transmitters come with reverse polarity protection.**



Factory settings (unless otherwise ordered by the customer): address: 1; bitrate: 9600 bod; data: 8 bit; parity check: parity check bit; stop bit: 1  
**ATTENTION: connect adapter's/controller's GND to the transmitter's minus terminal (terminal 1).**

Figure 1 - RS-485 Binder connection (example)

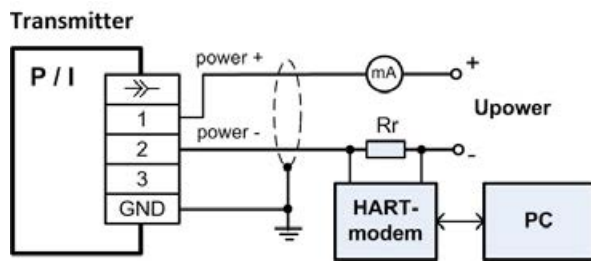


Figure 2 – Digital output connection diagram, HART, DIN 43650A

**ATTENTION!** The potential difference seen when mounting transmitters to vessels with cathodic corrosion protection can be significant, which translates into possible currents running through the signal cable when its shield is bi-grounded. As a preventive measure in such setups, you can skip connecting shield to the transmitter's ground terminal.

- DO NOT:**
- 1 allow voltage exceeding maximum specified for the transmitter;
  - 2 use any objects to touch or otherwise apply mechanical force to the diaphragm;
  - 3 use transmitters bearing visible signs of mechanical damage;
  - 4 use transmitters in inappropriate climatic conditions;
  - 5 allow medium temperatures above or below the limits specified for the transmitter; temperature above the limit may lead to medium seeping into the transmitter, temperature below the limit may render the transmitter inoperative.

Manufacturer refuses all claims, reclamations, complaints related to transmitters with damaged manufacturer seals and showing signs of damage resulting from inappropriate operation, transportation or storage.

All and any repairs are done by the manufacturer exclusively.

### 6 Transportation and storage

6.1 Use roofed transport to deliver transmitters to any destination needed; place individual packages into shipping containers if required.

6.2 Protect devices from impacts and vibrations while in transit; permissible temperature for transportation in shipping containers ranges from -50 to +85 °C.

6.3 Store devices in shipping containers in a heated (+5 to 40 °C) ventilated space.

### 7 Marking

The device bears a label (sticker) that contains the following information (Figure 3):

- 1) name of the manufacturer;
- 2) code of the device (according to the specifications);
- 3) manufacturer's trademark;
- 4) measured pressure range;
- 5) output signal range;
- 6) serial number and production date;
- 7) power supply voltage, its type and power consumption;
- 8) numbers of circuits terminals (for connector);
- 9) electric shock protection class (GOST 12.2.007.0);
- 10) ingress protection rate (GOST 14254);

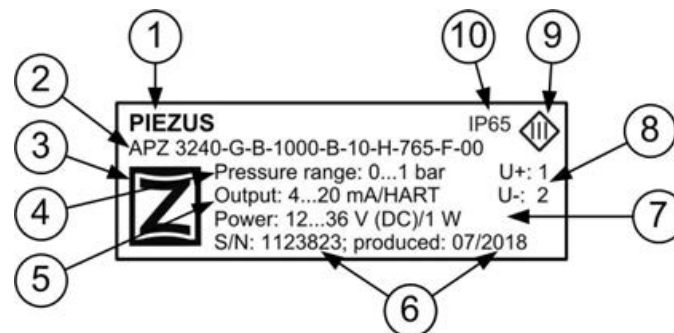


Figure 3 - Device label

### 8 Package contents

See Table 5 for package contents details.

Table 5 - Package contents

Name	Qty
APZ 3240 pressure transmitter	1 pc
Passport	1 copy
User manual (this paper)	1 copy*
Calibration leaflet (CM 62291-15)	1 copy**
* 1 copy per 10 transmitters for batch supplies to the same address.	
** Supplied by special order.	

### 9 Resource and service life

9.1 Operating mode - 24/7.

9.2 Mean time between failures, min – 100,000 h.

9.3 Average service life - 12 years (normal working conditions: non-aggressive medium, temperature at +23 ± 3 °C, no vibrations and shaking).

### 10 Disposal

10.1 Transmitter contains no precious metals.

10.2 Dispose of as prescribed by regulations adopted by the operator.

### Supplement

#### Appearance of pressure transmitters



a) metallic pressure port

b) polymer pressure port

APZ 3240 pressure transmitter with DIN 43650A

**Note: appearance may vary depending on the configuration ordered.**



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Table 3 - Analog current output and HART (2-wire line)

Transmitter circuits	Connector pins				Wires colors (cable gland)
	DIN 43650A	Binder 713	Binder 723	Buccaneer	
Power +	1	1	3	1	white
Power -	2	2	4	2	brown
shield	GND	4	5	4	yellow-green

Table 4 - RS-485 interface (4 wire line)

Transmitter circuits	Connector pins		Wires colors (cable gland)
	Binder 713	Binder 723	
Power +	3	3	white
Power -	1	1	brown
A	4	4	yellow
V	5	5	green
shield	2	2	yellow-green

**DO NOT USE** any non-standard seals when sealing the cable. Use round cable of appropriate diameter.

### 5 Operation and maintenance

Check the diaphragm (it should be clean) and electrical connections on a regular basis after putting the transmitter into operation.

Never apply high pressure to the transmitter when cleaning it.

Routine checkups of the device in use follow data specified in its passport.

See the device's passport for its calibration interval and manufacturer's warranty.