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1 Purpose

1.1 Membraneless hydraulic separator (hereinafter referred to as MHS) is designed for working elastic-element manometers calibration as well as other measuring instruments (MI) used for gauge pressure measurement of gases non-compatible with industrial oils.

1.2 MHS is designed for operation with pressure generating hydraulic units working medium of which is industrial oils.

1.3 The MHS is designed for operation in laboratory conditions at the ambient air temperature of 10 to 30 °C and maximum relative humidity of 80 % or lower.

2 Technical Characteristics

Pressure separation range	0...70 MPa
Q-ty of seats for instruments under test	1 pc.
Instrument weight	10 kg
Overall dimensions (LxH), no more than.....	120×195 mm
Phases to be separated.....	oil/water ¹

3 Scope of supply (in pieces)

Membraneless hydraulic separator.....	1
Connecting nut	
M20×1.5	1
M12×1.5	1
G ¹ / ₂	1
G ¹ / ₄	1
Rubber-metal sealing ring 6.7-11-1	7
Sealing ring GOST 9833-73	
010-014-25.....	1
043-047-25.....	1
Pilot wheel of connecting nut	1
Operation manual, data sheet	1

¹Transformer oil as per GOST 10121, GOST 982, TU 38.1011025 or castor oil as per GOST18102, GOST 6757 is recommended. Output: distilled water GOST 6709-72.

4 Instrument Design and Principle of Operation

4.1 Panel overview is shown in Fig. 1.

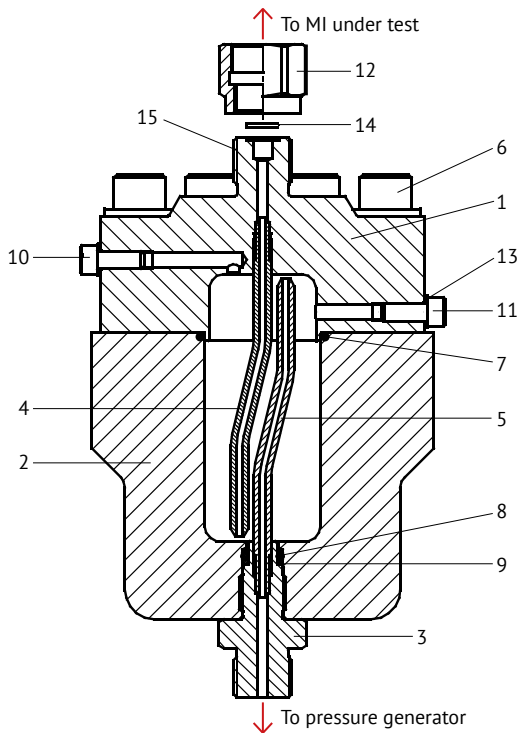


Fig. 1. Membraneless hydraulic separator:

- 1 — upper part; 2 — lower part; 3 — connector for pressure generator;
4, 5 — tube; 6 — connecting screw; 7 — housing sealing ring; 8 — fitting sealing
ring; 9 — sealing ring; 10 — screw; 11 — screw; 12 — connecting nut;
13 — rubber-metal sealing ring; 14 — rubber-metal sealing ring;
15 — connector for MI under test

4.2 MHS housing consists of the upper part 1 (Fig. 1) and the lower part 2. Both parts are tightly connected with tubes 4 and 5. To fill the MHS with working liquids, screws 10 and 11 are provided on the upper part 1. To connect MI under test, in the upper part, there is connector 15 with left thread M20x1.5 which is used for connecting nut 12 screwing on (counter-clockwise). To tighten MI under test, rubber-metal sealing 14 is used. This sealing is mounted into ring groove. This sealing ensures tightness with low torques of the connecting nut (by hand). In the lower part 2, there is screwed-in connector 3 with thread M20x1.5 for

connection with pressure generator. Connector 3 is sealed by means of round rubber ring 8 and stop ring 9. To provide tight connection between MHS and pressure generator, sealings included into the scope of supply of these units shall be used (rubber-metal sealing, rubber ring or other special elastic sealing). Upper 1 and lower 2 parts of the MHS housing are connected by means of eight screws 6, and tightness is ensured by means of round rubber ring 7.

5 Safety Precautions

Attention

The Section is intended for the personnel safe operation, safekeeping of MHS and the pressure metering devices used with the unit.

5.1 The unit must not be used for any operations not specified in the manual.

5.2 Prior to MI installation make sure that they are clean and connecting nozzles are serviceable.

5.3 Use only standard O-rings.

5.4 Tighten the connecting nuts finger-tight.

5.5 Pressure value specified in the manual shall not be exceeded.

5.6 Instruments can be removed from the unit only after complete pressure release (depressurization).

6 Preparation for Operation

6.1 Unpack the unit and wipe it down with clean cloth.

6.2 Mount the MHS vertically on pressure generator so that connector 15 upper side is at one level with connecting surface of the other connector. This may be done by means of special adapters with length depending on the design of used pressure generator (out of scope of supply).

6.3 Fill the MHS with technical liquids; for this:

- unscrew 10 and 11;
- fill the MHS with water through the hole in connector 15 until it is visible in screw 11 channel;
- tighten screw 11 with preliminary installed metal-rubber sealing 13;
- using pressure generator, fill the upper cavity of the MHS with oil until it leaks through screw 10 channel;
- tighten screw 10 with preliminary installed metal-rubber sealing 13.

6.4 MI to be tested shall be connected with separator using connecting nuts and metal-rubber sealings included.

7 Operation Procedure

7.1 MI calibration shall be performed in accordance with calibration methods provided for MI to be tested and in technical documents for the pressure generator.

7.2 Verify the setting accuracy of metal-rubber seals.

7.3 Mount MI to be tested on the separator seat turning connection nut by hand counterclockwise until the unit is rested against rubber-metal seal.

7.4 Tighten the connecting nuts finger-tight.

7.5 Pressure in the separator shall be changed smoothly, without thrusts and shocks.

7.6 Instruments may be removed from the unit only after complete pressure release.

Attention

Filled separator shall be mounted, demounted, moved and stored strictly in vertical position.

8 Maintenance

8.1 If required, at least once per month, the MHS shall be flushed with synthetic detergents followed by intensive flushing with fresh water.

8.2 For the MHS flushing, screws 10 and 11 shall be screwed out.

9 Storage

9.1 MHS storage in laboratory environment. During filled MHS storage in laboratory environment, be sure that it is in stable vertical position and covered with PE cap.

9.2 MHS storage in warehouse environment. Before MHS storage, maintenance operations under items 8.1, 8.2 shall be done - wipe it down with clean cloth, dry in the dryer at $80\pm5^{\circ}$ during 30 minutes, and pack in original packaging (or similar).

9.3 The unit shall be stored in a dry heated room at an air temperature no lower than $+5^{\circ}\text{C}$ and relative humidity no higher than 80 %.

10 Troubleshooting

Malfunction	Cause of the malfunction	Repair method
Water leakage beneath connecting nut	O-ring is damaged or incorrectly installed under pressure gage	Replace or change rubber-metal sealing
	The end surface of a manometer union is damaged	Replace or repair the manometer
Water or oil leakage between the upper and the lower parts of the separator	Damage of rubber seal	Replace the seal, bolts, item 6 (Fig. 1), tightening torque shall be 0.5 kg×m

11 Warranty Obligations

11.1 The Manufacturer guarantees MHS operation, provided that the operating, storage, and transportation conditions are met.

11.2 The warranty service life is 18 months.

11.3 The warranty storage life is 6 months.

11.4 The average service life is at least 8 years.

12 Claim Details

In case of a failure, prepare a certificate of required repair and submit it to the following address: «Alfapascal» LLC, 36, 2nd Paveletskaya, Chelyabinsk, 454047, Russia, phone: +7 (351) 725-74-50, e-mail: q@alfapascal.ru

13 Acceptance Certificate

Membraneless hydraulic separator, serial number _____, complies with TU 4212-003-91357274-2011 and is approved as fit for operation.

Date of issue

Responsible person _____
Signature Surname

LS

14 Packing Certificate

Membraneless hydraulic separator, serial number _____ was packed at «Alfapascal» LLC in accordance with TU 4212-003-91357274-2011.

Date of issue

Responsible person _____
Signature Surname

LS

Note

The Manufacturer reserves the right to make changes to the unit design without prior notice.