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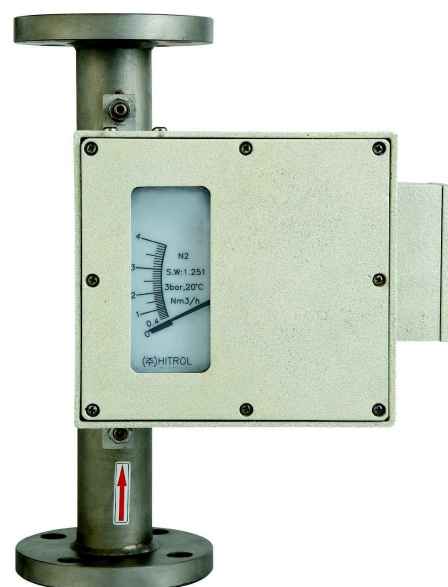
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INSTRUCTION MANUAL

ROTAMETER

HFR-981 Series



▪ HFR-981 SERIES IS

The most widely used flow meter that can be installed most easily and simply with flange or screw connection. The HFR-981 Series flowmeter operates on the float measuring principle. The measuring unit consists of a metal taper tube, inside of which a float can move up and down freely. The flow goes from bottom to top. The float changes position so that the lifting force acting on flow rate.

The use of metal tube allows for superb mechanical and be suitable for high pressure, high temperature.

For the indicator, the flow-dependent height of the float in the measuring unit is transmitted by means of a magnetic coupling and displayed on a scale.

▪ STRUCTURE

Upper/lower Flange, body, taper tube, float, guide rod

▪ INSTALLATION

1. Preparation of the pipeline

The variable-area flowmeter must be installed vertically (float measuring principle), direction of flow : upwards. Before installing, clean the pipe by blowing or flushing out. Connection is made using flange connection. The pipes should be in axial alignment with the connections on the flowmeter and free of stresses.

If necessary, suitably support the pipeline to prevent vibration from being transferred to the flowmeter.

Pipes for gas flow need to be dried before the device is installed.

Recommended : a straight unimpeded inlet run of $\geq 5 \times \text{DN}$ upstream of the device and a straight outlet run of $\geq 3 \times \text{DN}$ downstream of the device.

Arrange shutoff and control valves downstream of the flowmeter Installation.

- Optional : Straightner in body(bottom part) - the use of straightner is recommended when a straight pipe isn't enough. For example, when it is inlet run of 3D upstream of the device and a straight outlet run of 2D downstream of the device, the straightner is to be installed in the bottom body of the flowmeter. Then the accuracy of flowmeter is assured.

2. Start-up

Compare the actual operating pressure and the process temperature of the system with the figures given on the manufacturer' "TEST CERTIFICATE OF FLOWMETER" ; these should not be exceeded. Make sure of materials compatibility.

⚠ CAUTION

Open shutoff valve downstream of flowmeter slowly.

- On liquid service : carefully vent the pipeline.
- On gas service: increase pressure slowly up to operating pressure.

⚠ CAUTION

Avoid float impact (e.g. caused by solenoid valves),
as this is likely to damage measuring glass and float.

⚠ CAUTION

When installing the device in the piping, the following points must be observed:

- The HFR-981 Series devices must be installed vertically (measuring principle) with the flow direction from bottom to top.
- Screws, bolts and gaskets are to be provided by the customer and must be selected in accordance with the pressure rating of the connection or the operating pressure.
- Align the gaskets. Tighten the nuts with the tightening torques of the appropriate pressure rating.
- Control devices are to be positioned downstream of the measuring device.
- Shutoff devices are preferably to be positioned upstream of the measuring device.
- Before connecting, blow or flush out the pipes leading to the device.
- Pipes for gas flow need to be dried before the device is installed.
- Use connectors suitable for the particular device version.
- Align the pipes centrally with the connection bores on the measuring device so they are free of stresses.
- If necessary, the piping has to be supported to reduce the vibrations transmitted to the measuring device.
- The indicator housing may not be heat-insulated. The heat insulation may only reach as far as the housing fastening.

3. Measurement of liquids

Vent the pipeline during start-up.

Open valves slowly to avoid water hammer!

4. Measurement of gases

Should the float tend to oscillate, this condition can possibly be rectified by installing a throttle valve or appropriate orifice plate downstream of the flowmeter. (Please consult manufacturer)

The device should not be subjected to pulsating flows. Increase pressure slowly up to operating pressure. Basically, vary the flow rate with the aid of adjusting valves downstream of the device to prevent the float from accelerating up to the upper stop (e.g. when solenoid valves are used) and possibly damaging the measuring section.

INFORMATION! Look at the device nameplate to ensure that the device is delivered according to your order. Check for the correct fluid, connection size and rating printed on the nameplate.

Remarks: The indicated pressure losses are valid for water and air at maximum flow rate.

5. Measured value

Within the scope of routine maintenance of the system and pipelines, the flowmeter should also be inspected for signs of fouling, corrosion, mechanical wear and leaks, as well as damage to the measuring tube and indicator.

We advise that inspections be carried out at least once per year.

The device must be removed from the piping before cleaning.

⚠ CAUTION

- Pressurized pipes must be depressurized before removing the device.
 - Empty pipes as completely as possible.
 - In the case of devices used for measuring aggressive or hazardous media, appropriate safety precautions must be taken with regard to residual liquids in the measuring unit.
 - Always use new gaskets when reinstalling the device in the pipeline.
 - Avoid electrostatic charges when cleaning the surfaces. (e.g. sight window)
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