
# SERIES BSM

## VOLUMETRIC FLOW METER
## WET TYPE

## INDEX

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## INTRODUCTION

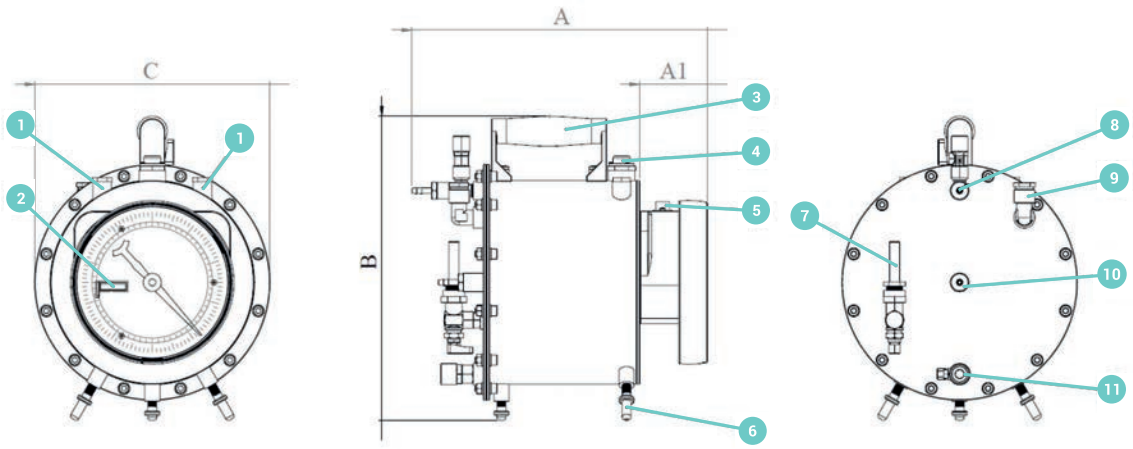
The volumetric flow meter – wet type - BSM, for decades an expression of high measuring accuracy, have been further refined and improved. In its current shape and construction, it represents an high-precision gas measuring device.

## MEASURING PRINCIPLE

The measuring chambers, separated from each other by stiff walls, are periodically filled and emptied. The rotary movement of the measuring unit (drum) is transferred by means of a mechanical coupling to the totalising device of the meter. The direct measurement of volume makes wet type BSM meter the best choice over other measurement principles The stainless steel casing, the use of high-quality materials for the drum and mechanism, ensure an high level of functionality of the instrument.

## TECHNICAL FEATURES

The accuracy of the reading is ensured by a dial with a diameter of 160 mm, divided into tenths of a litre, connected to a resettable counter. Both the indicator needle and the counter can be reset manually. The dial, circular in shape, is equipped with 2 scales:
a) an external scale for the fine reading of the values in $dm^3$
b) an internal scale for reading consumption in $dm^3$/minute
The resettable counter, which can be reset to zero, records the total consumption in $m^3$ during the time period considered (test duration time).




1. Thermometer/manometer inlet
2. Resettable counter
3. Handle
4. Level
5. Pulse gen. port
6. Levelling foot
7. Filling level indicator
8. Gas outlet
9. Filling liquid inlet
10. Gas inlet
11. Drainage spigot

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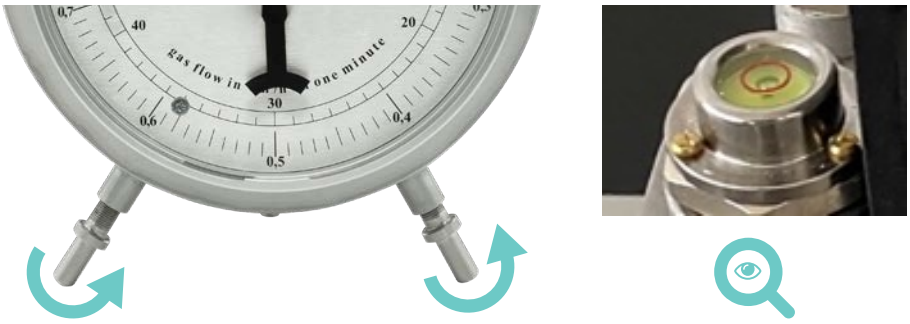
## INSTALLATION AND MEASURING

When used to control a gas meter, BSM should be connected upstream of the instrument under test.

### 4.1. POSITIONING

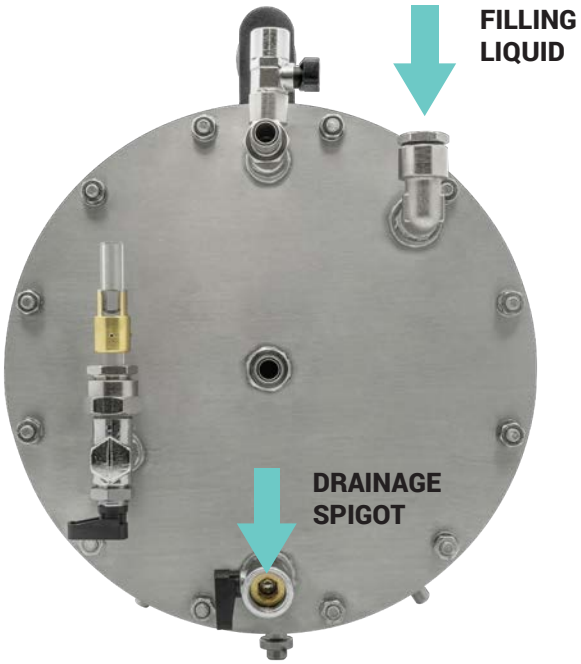
Place the BSM meter onto solid, vibration free, flat surface. Ensure that the meter is perfectly horizontal by adjusting screw feet and with visual aid of control bubble at the top.




### 4.2. FILLING

4.2.1. Rough Filling (only required for the startup of the meter)

- Remove hood to the filling liquid inlet
- Fill in sealing liquid into the filling liquid inlet until the liquid is seen in the filling level indicator (below the upper edge of golden cylinder)
- Attach hoods again
- Rotate the measuring drum several times to ensure that it is wet



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4.2.2. Fine Filling (required for each filling and refilling)

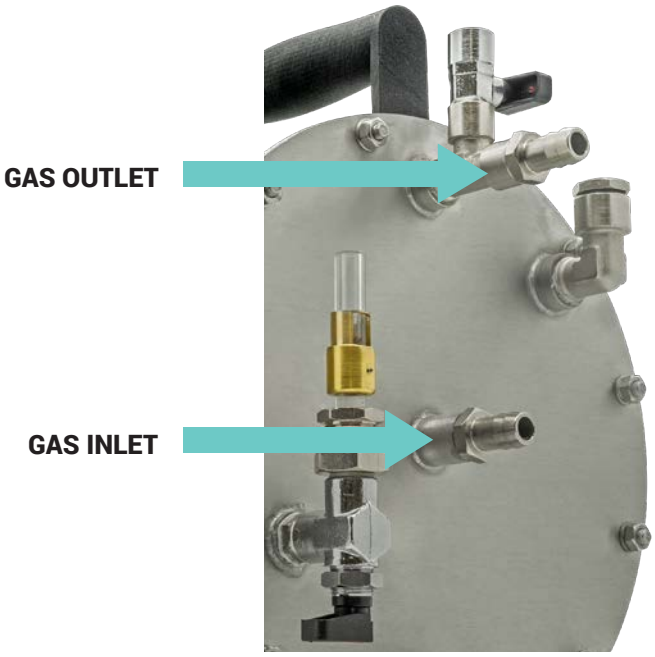
The measuring drum shall be wetted as described above.

- Then depressurize both gas inlet and outlet of the meter.
- Remove hoods again, as described above
- fill in sealing liquid slowly until the level of the liquid in the liquid level indicator reaches the the upper edge of the golden cylinder (it represents the liquid level kept during periodic calibration)
- shut again filling liquid inlet
- meter is ready to operate.

To maintain the measuring accuracy, it is recommended to check the level of the sealing liquid each day and to adjust it, if required.


## 4.3. CONNECTION

- Connect the gas pipe to the gas inlet at the rear plate.
- Connect a second pipe to the gas outlet at the rear plate to expel the gas out.
  During installation, pay attention to the correct flow direction (refer to gas inlet/outlet label on casing).
- Let the meter flow in order to perform a few revolutions




Before proceeding with tests, it is advisable to ensure that the counter and indicator needle are reset correctly, by acting as indicated below.

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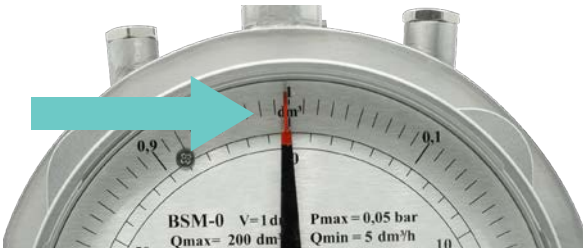
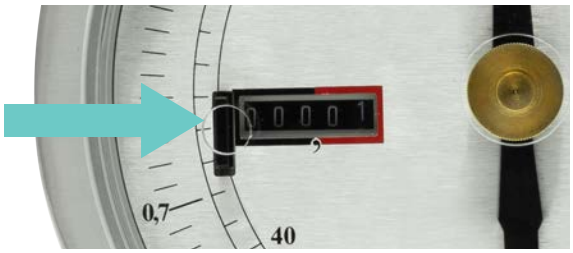
### 4.4. ZEROING INDICATOR NEEDLE

Reset the indicator needle by making an air/gas flow in the direction allowed by the meter at a flow rate < Qmax.
**Warning! Do never turn the needle by hand.**




### 4.5. RESET COUNTER

Reset the counter by pressing button repeatedly until the operation is complete. Incorrect zeroing may block the system.




Over the measuring range, the measurement error variation is less than 0.5 %. This degree of measurement accuracy is only achievable if the commissioning instructions are strictly observed. Meter is calibrated at 10 [mbar] (normal operating pressure).
**Note:** The BSM meter is of the volumetric type, which means that, in its normal operation, it is loading and unloading the measuring chambers. It is a good rule of thumb, to carry out tests with volumes corresponding to multiple number of full revolutions of the meter.

## PULSE GENERATOR (OPTION)

On request, the BSM meter can be equipped with pulse transmitters. For details on available options, connection type and output, please refer to the datasheet.

## MANTEINANCE

Bessel laboratory gas meters type BSM  are maintenance free .

## TROUBLESHOOTING

Whatever the cause and the defect generated by it, the meter is still repairable. For this reason, in the event of a defect, we recommend to contact Bessel's after-sales service, which will provide instructions for sending the meter back for inspection and recalibration.