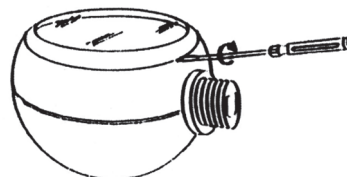


Operating Instructions

Please read carefully! **No liability can be accepted for damage caused by improper use of the captor!**

9. Cover

To protect the flow-captor against pollution and unauthorized adjustment, it is supplied with a plastic cover. Before use this cover should first be removed. This is carried out by turning the enclosed screwdriver through 90° as illustrated in the sketch below. After finishing all adjustments remove the protective pull-off sheet which covers an adhesive layer on the flow-captor face plate and press the protective cover onto the flow-captor.



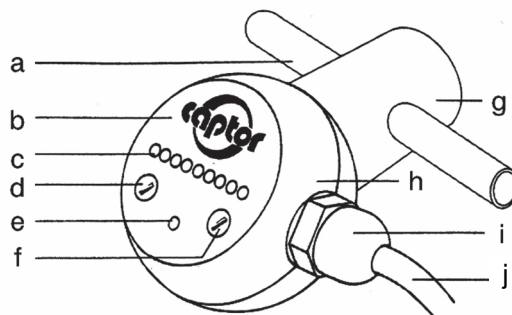
CAUTION:

To avoid loss of adhesion the inside surface of there should be kept free from dirt and oil!

Inline flow-captor 4320.12/.13, 4321.12/.13

Metering flow switch with analog display (Inline)

- Pipe of stainless steel WN 1.4571 (V4A, 316 Ti)
- Housing surface, aluminium
- Display of 9 LED's; functions:
 1. Analog display of flow from 0 to 100 %
 2. Display of set-point by flashing LED, adjustable from 1. to 8. LED
- Potentiometer for 'Set-point'
- LED for output indication "Flow-OK"
- Potentiometer for "Range"
- Sensor housing, mat. polyacetal (POM)
- Electronics housing, PBTP, glass fibre, reinf. (Ultradur ®)
- PG-9 nut (cord grip) for SW 19 spanner (wrench)
- 2 m oilflex cable 3 x 0.5 mm²

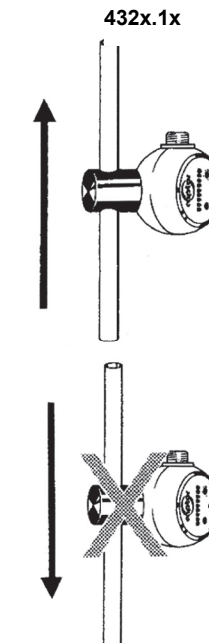
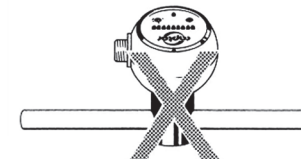
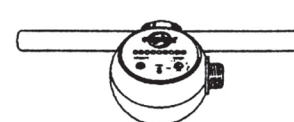


Operating Instructions

Please read carefully! **No liability can be accepted for damage caused by improper use of the captor!**

1. Mounting Position

To obtain highest accuracy and consistency of switching signal, the flow-captor should be mounted in a position of minimum turbulence. The position should be at least 100 mm upstream or downstream of bends, valves, T-pieces etc. Preferred position is in a vertical pipe with upward flow or in a horizontal pipe. Any other fitting position does not guaranty a secure operation of Inline flow-captor. The flow direction through pipe of flow-captor does not have to be specified.

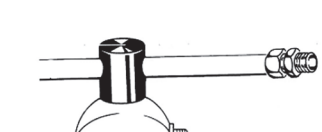


2. Mechanical Installation

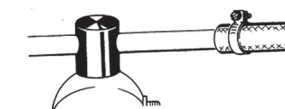
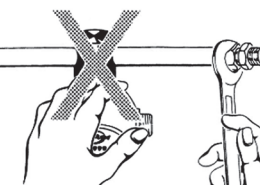
Inline flow-captors should be installed in line with the pipe by appropriate connectors.

In hose pipe: Push hose over joining pipe and secure with hose clamp.

In pipework: Dimension of pipework and pipe of Inline flow-captor should be the same.



With screw fitting (e. g. Ermeto)



With hose clamp

CAUTION:

Do not twist the sensor body around the pipe or use any torsion of that nature! Any resulting damage from such action will render the unit irreparable!

Operating Instructions

Please read carefully! **No liability can be accepted for damage caused by improper use of the captor!**

3. Electrical Connection:

Push the plug of the connecting cable into the opening of the flow-captor with light pressure (note the shape of the plug!). **It is essential to ensure that the connection contacts in the sensor (Pins) do not bend in order to ensure a fault-free connection and therefore perfect function of the sensor.** Then tighten the PG-9 cable gland with a 19 mm spanner, holding it firmly to prevent the cable from turning.

Connect cable according to connection diagram:
Supply voltage: - brown wire to + (positive)
- blue wire to - (negative)

The voltage must be kept within the specified range at all times (18 to 30 VDC incl. residual ripple). Single rectification, i.e. half-wave voltage, is not allowed.

Load i.e. a relay between black (output) and blue (-) the first LED is lit.

When power supply is switched on, the flow-captor will indicate flow for approx. 10 s (entire LED chain is lit, the green "Flow OK" LED is on and one of the 9 LED's is flashing - indicating adjusted set-point). After a time of 8 seconds the flow-captor is fully operational.

At no flow, first LED is lit - green LED is off - one of the nine LED's is flashing.

4. Medium

Scale of range on 4320.1x is related to water. Depending on viscosity and thermal conductivity, other media require a multiplier (>1) i.e. 3 to 5 x for oil.

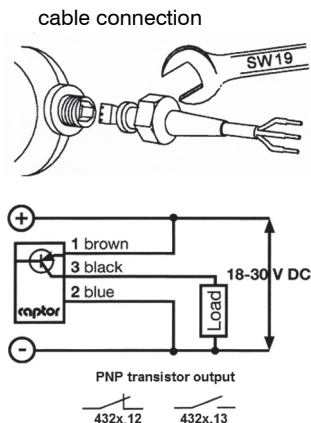
4321.1x is calibrated specifically for use with oil. The scale is equally divided between zero flow and max. flow range. Absolute values are not shown as these will vary with different types of oil.

5. Measurement of Flow Velocity (only 4320.1x)

Turn range potentiometer clockwise to maximum (3 m/s)

According to the flow rate a number of LED's will be lit. In order to read the correct flow rate, turn the range potentiometer slowly, stepwise, counter-clockwise - this allows for re-adjustment of the range - until all LED's are lit.

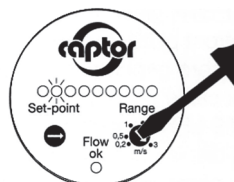
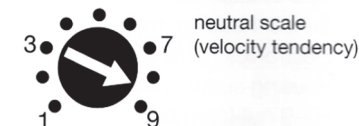
Actual flow speed is indicated by an arrow on the range pot.



Scale of 4320.1x - (water)



Scale of 4321.1x - (oil)



Operating Instructions

Please read carefully! **No liability can be accepted for damage caused by improper use of the captor!**

6. Range Adjustment

With the range potentiometer it is possible to define any measuring range between 0-20 cm/s up to 0-300 cm/s for water (approx. 0-30 cm/s up to 0-300 cm/s for oil, 4321.1x).

At the maximum flow rate, adjust the range potentiometer until all nine LED's are just lit; each LED that is lit then represents approx. 10% of the maximum flow rate.

The resolution of the set-point depends on the range adjustment, e.g. with a range of 0-2 m/s the resolution is approx. 20 cm/s per LED step, with 0-30 cm/s the resolution is approx. 3 cm/s per LED step.

7. Set-point Adjustment

The set-point can be adjusted to anywhere within 15% of the absolute minimum range and 90% of the absolute maximum range.

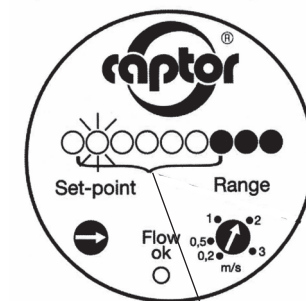
The set-point value is indicated by a flash LED, and is shown relative to the adjusted range. When the velocity passes the flow set-point, the green "Flow OK" LED changes state (the green LED is lit when the velocity is above the set-point).

Resolution is shown in steps of approx. 10 % but with care, it is possible to achieve a much finer adjustment. If the flowrate is higher than 10 % of the calibrated range, the 9. LED will flash with the double frequency of the set-point LED.

8. Response time

The response time is shortened, the closer the set-point is to the normal flow rate.

- LED flashing
- LED shining
- LED off



flow - speed
approx. 65% = 1,3 m/s

