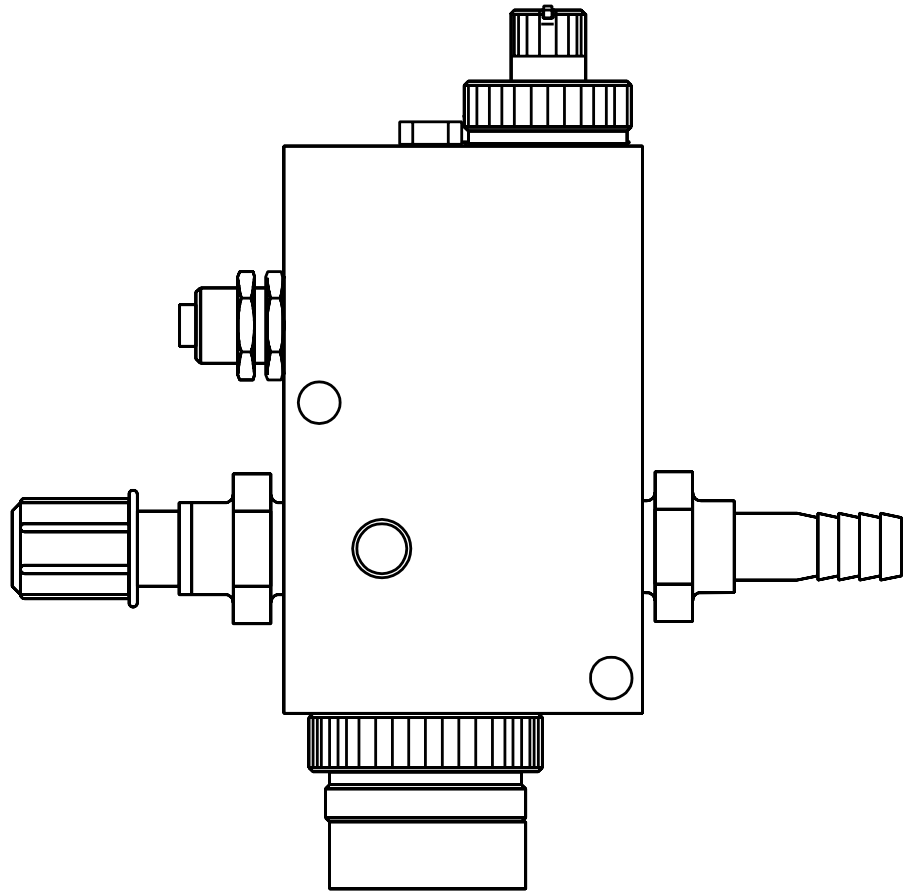


# *OCA 250* Flow Assembly for Chlorine Measurement

## Operating Instructions



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## 1. General

### 1.1 Application

The flow assembly OCA 250 was developed especially to hold the membrane-covered chlorine sensors OCS 140 or OCS 141 respectively chlorine dioxide sensors OCS 240 or OCS 241.

The assembly is equipped with two additional mounting positions for a combined redox and a combined pH electrode, e.g. types OPS 32 and OPS 31.

The plexiglass (PMMA) body of the assembly contains a needle valve for measuring water flow adjustment and a cone-shaped floating body permitting continuous visual control of the required minimum flow rate.

The microprocessor-controlled combination transmitter OCM 360 for the measuring parameters chlorine, pH, redox and temperature was designed especially for swimming pool instrumentation. When combining the OCA 250 assembly with the OCM 360 measuring transmitter, the use of an inductive proximity switch (-INS option) and the floating body permit evaluation of a flow alarm.

The assembly includes a potential matching pin for pH or redox measurement. The pH and redox electrodes can be cleaned and calibrated without requiring electrode removal. For this purpose the cap screwed onto the bottom of the assembly body is used as a calibration beaker.

### 1.2. Unpacking

- Inspect for any damaged packaging! The post office or forwarding agent must be informed of any damage. Damaged packaging material must be retained until the matter has been settled.
- Verify that the contents are undamaged! Inform the post office or forwarding agent as well as the supplier of any damage.
- Check that the delivery is complete (see chapter 1.3) and agrees with the shipping documents and your order with regard to:
  - quantity delivery
  - unit type and version according to name plate
  - operating instructions

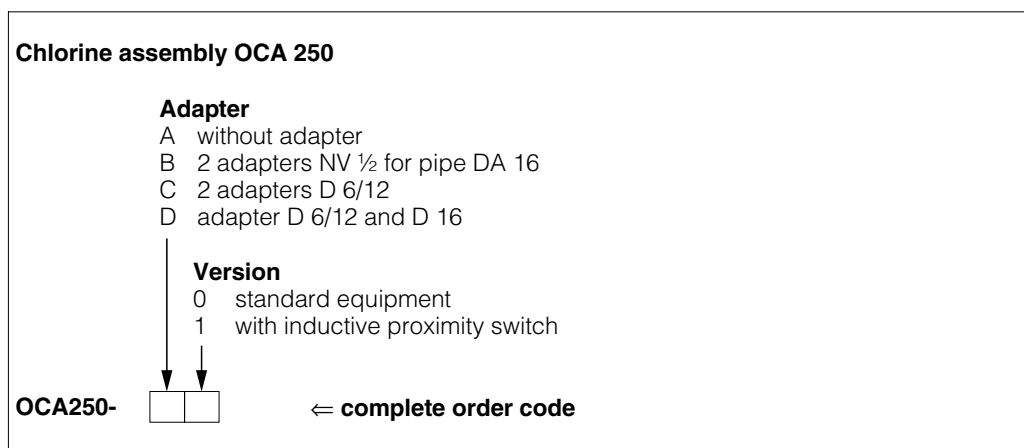
If you have any questions, consult your supplier or the Endress+Hauser sales center in your area (see back page of these operating instructions for addresses).

### 1.3 Scope of delivery

The scope of delivery comprises:

- 1 flow assembly OCA 250, version according to order code
- 1 PM adapter
- 1 copy of operating instructions OCA 250

### 1.4 Product structure



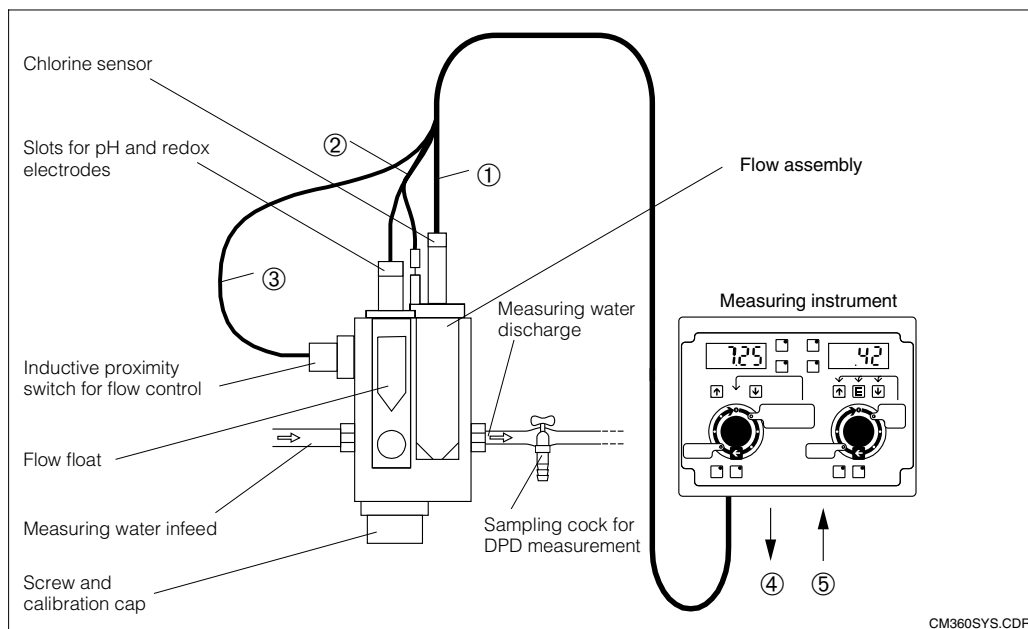
## 2. Measuring system

The fully functional measuring system comprises:

- 1 flow assembly OCA 250
- 1 chlorine sensor OCS 140 or OCS 141 or 1 chlorine dioxide sensor OCS 240 or OCS 241
- 1 pH and 1 redox electrode suitable for the assembly and the medium to be measured
- 1 measuring instrument, e.g. OCM 360
- terminated electrode cables suitable for pH or redox electrodes

### Optional:

Junction box and measuring cable (not terminated) for extended measuring cable lengths.



Complete measuring point, e.g. comprising measuring instrument OCM 360, assembly OCA 250, pH, redox and chlorine sensor, and proximity switch INS

- ① Connecting cable OCK
- ② Connecting cable OPK 1 with PM connection
- ③ Connecting cable for INS
- ④ Signal output for chlorine, pH, mV or temperature (0 / 4 ... 20 mA)
- ⑤ Power supply

Fig. 1

## 2.1 Function

The chlorine sensor OCS 140/141 respectively the chlorine dioxide sensor OCS 240/241 is installed in the upper measuring chamber.

The minimum flow rate of 30 litres per hour required for the membrane-covered chlorine sensor is controlled by means of needle valve (4), compare fig. 2 on next page. The upper edge of the floating body must be above the red bar on the plexiglass body.

If desired, an inductive proximity switch (1) can be installed which monitors the flow with reference to a "no-flow" or "low flow" situation. When the flow rate drops below the minimum flow rate, an alarm can be signalled via the OCM 360 measuring transmitter or a separate circuit (switching amplifier type INS-R; order no. 50036338), thereby eliminating the risk of overdose.

The second, lower measuring chamber for the pH and redox measuring chains becomes accessible by unscrewing the sealing cap (10). This sealing cap has an additional function: The other side of the cap also serves as a cleaning and a calibration beaker for pH and redox electrodes.

For this purpose, first remove the cap, then fill the beaker side of the cap (5) with cleaning or calibration solution and screw it back on.

Stainless steel pin (14) has been installed for pH and redox measurement. This pin is used to ground the medium to be measured or for potential matching with symmetrical high-impedance measurement.

Please refer to the operating instructions supplied with the corresponding pH, redox and chlorine measuring instruments and sensors for detailed information on calibration.

### Caution:

The plexiglass body of the assembly must not be exposed to admission pressures exceeding 4 bar (40 °C). The actual operating pressure is limited by the lowest maximum permissible pressure of the sensors installed: The maximum pressure permissible for the chlorine sensors OCS 140/141/240/241 is 1 bar, while the maximum permissible pressures for the pH and redox electrodes, depending on the electrode type (see data sheet), are between 0.6 and 6 bar.

## 3. Installation

### 3.1 Connection

The flow assembly OCA 250 is intended for pipe or hose connections. Inlet and outlet are located in the same axis.

The assembly body is equipped with G ½ couplings on both sides.

Upon request, we can supply the following:

For connection to PVC pipes: set of 2 screwed PVC nipples, type NV ½ (order no. 50003228) for adhesion to PVC pipes with  $D_o = 16$  mm (inlet and outlet).

For hose connection: set of 2 screwed PVC nipples, type SV ½ (order no. 50003232) for inflow hose connection D 6/12 and for outflow hose connection D 16.

### 3.2 Parts in contact with the medium

All parts in contact with the medium to be measured are made of PVC, PMMA, stainless steel and EPDM. The assembly can be operated at temperatures of up to 45 °C.

The construction of the OCA 250 assembly assures that the sensors remain wet even in the event of an interruption in medium flow.

### 3.3 Installation and dimensions

- The flow assembly OCA 250 must be installed upright.
- Install the required lines, for example, according to fig. 4.
- A stop valve and a dirt trap (e.g., a strainer) with a mesh size of 0.5 mm must be located upstream from the flow assembly. Pressure reducers usually contain a dirt trap, i.e. an additional dirt trap is not required when a pressure reducer is installed.
- If the medium admission pressure exceeds 4 bar, requires installation of a pressure reducer (can be supplied separately).
- Install a DN 5-8 sampling cock downstream from the flow assembly (to permit reference measurements according to the DPD method) and a stop valve if measuring water recycling is used.
- Installation of proximity switch: Screw in all the way and lock with hex nut.
- Installation of chlorine sensor OCS 140/141 or chlorine dioxide sensor OCS 240/241 (see fig. 2): Loosen and remove the clamping screw. Insert the sensor in the mounting position and firmly tighten with the clamping screw.
- Installation of pH and redox electrodes: Each electrode must be carefully inspected for shipping damage before installation. Crystallized potassium chloride salt on electrodes with a diaphragm and reference system does not affect accuracy and may be removed by rinsing with water.
- Remove the two plugs 15, place the electrodes in the openings with the Pg 13.5 threads and screw in. Sealing is provided by the O-ring on the electrode shaft.
- Vent the OCA 250 flow assembly by unscrewing screw 13 (at the time of start-up).

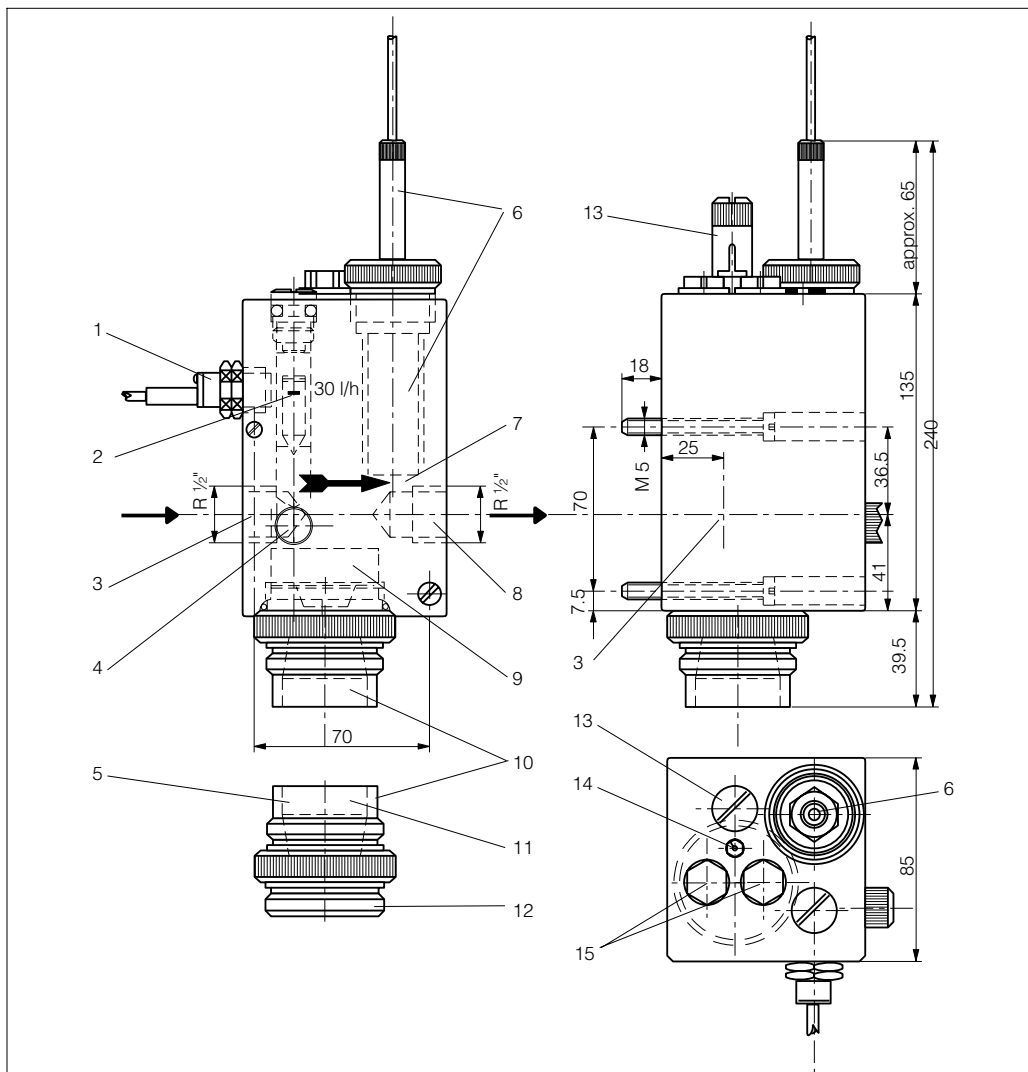


Fig. 2 OCA 250

- 1 Optional inductive proximity switch for automatic flow control
- 2 Red bar marking for flow control 30 l/h
- 3 Inlet
- 4 Needle valve for flow rates < 120 l/h
- 5 Beaker (measuring chamber) for cleaning and calibration of pH/redox electrode
- 6 Chlorine sensor OCS 140/141 or chlorine dioxide sensor OCS 240/241
- 7 Measuring chamber of chlorine sensor
- 8 Outlet
- 9 Measuring chamber of pH/redox electrode
- 10 Cap with calibration beaker
- 11 Calibration cup side
- 12 Closed side
- 13 Ventilation screw
- 14 Potential matching connector (PMC)
- 15 Mounting positions for one pH electrode and one redox



## 5. Example for installation

Fig. 4 shows a typical installation of the flow assembly OCA 250 with measuring water removal. A free outlet is not required, i.e. the medium can be returned to an intermediate vessel.

### Operating data:

Max. admission pressure of 4 bar  
(a pressure reducer is required for higher admission pressures!)

Min. flow rate of 30 l/h

Max. flow rate of 120 l/h

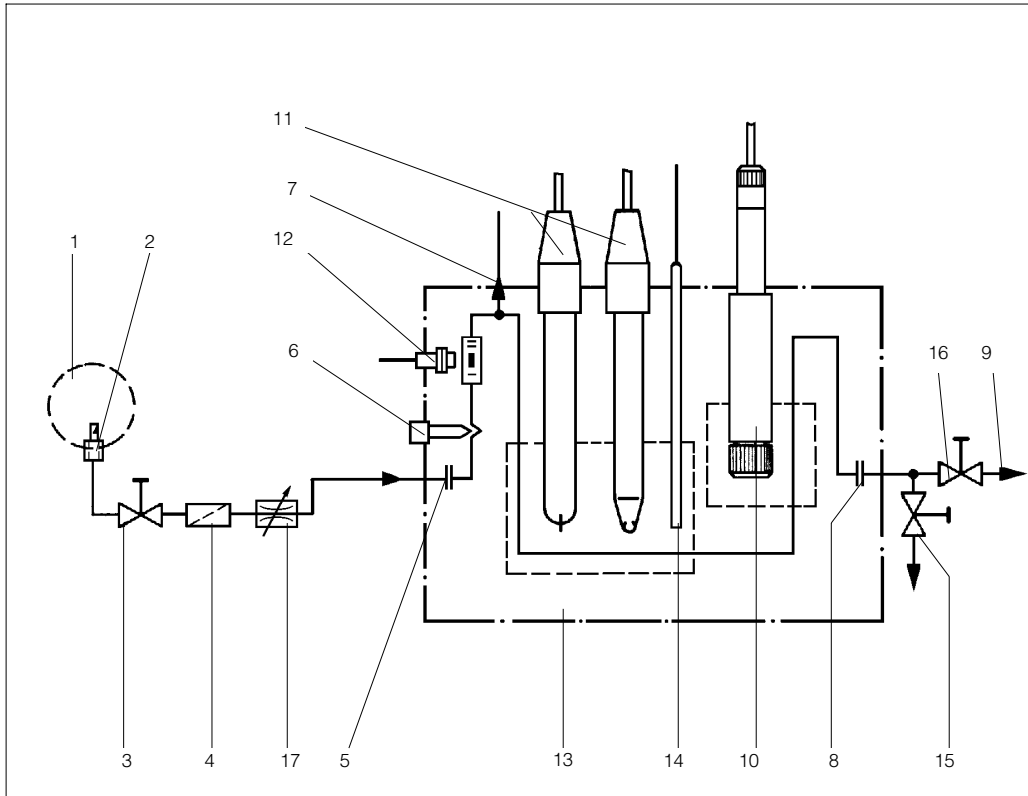


Fig. 4

- |  |  |
|--|--|
| 1 Pipe with chlorinated water  | 9 Outlet   |
| 2 Sampling pipe (to be provided by customer)   | 10 Chlorine sensor OCS 140/OCS 141 or chlorine dioxide sensor OCS 240/241                |
| 3 Stop valve (to be provided by customer)  | 11 Mounting positions for pH and redox electrodes (Pg 13.5), e.g. type OPS 31 and OPS 32 |
| 4 Dirt trap (filter), d = 0.5 mm (to be provided by customer)  | 12 Inductive proximity switch  |
| <b>Caution:</b><br>Installation of dirt trap is mandatory to prevent soiling of OCA 250 medium channels! | 13 Flow assembly OCA 250   |
| 5 G ½ thread, hose connection for D 6/12 hose  | 14 Potential matching  |
| 6 Needle valve for flow regulation (min. 30 l/h)   | 15 Sampling cock (to be provided by customer)  |
| 7 Ventilation screw  | 16 Stop valve (to be provided by customer), only required for measuring water recycling  |
| 8 G ½ thread, hose connection for D 16 hose via screwed socket, type SV ½                                | 17 Pressure reducer (with admission pressures above 4 bar)                               |

## 6. Technical data

Material of assembly body	plexiglass (PMMA)
Material of mounting parts	PVC, SS 316Ti, EPDM
Dimensions	85 x 85 x 250 mm (with electrodes)
Screwed threads for combined pH and redox electrodes	2 x Pg 13.5
Water inlet and outlet	G 1/2 internal thread
Max. permissible water admission pressure	4 bar (40 °C)
Measured water flow	30 ... 120 l/h (adjustable with needle valve)
Max. operating temperature	45°C
Max. operating pressure on chlorine sensor:	1 bar
Max. operating pressure on comb. pH or redox electrode:	e.g. OPS 31: 0.6 bar e.g. OPS 32: 0.6 bar

### Parts required for connection

For pipe connection:	NV 1/2; for transition from R 1/2" internal thread to coupling for adhesion of PVC pipe D <sub>o</sub> = 16 mm
For hose connection:	SV 1/2; for transition from R 1/2" internal thread to connection for hose D 6/12 in inlet and hose D 16 in outlet

### Mounting positions

1 chlorine/chlorine dioxide sensor	OCS 140/141 or OCS 240/241
1 combined pH electrode	(e.g. type OPS 31) with Pg 13.5
1 combined redox electrode	(e.g. type OPS 32) with Pg 13.5
1 inductive proximity switch (for flow monitoring)	INS



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