**Parts Supplied with the Unit**

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mounting bracket</td>
</tr>
<tr>
<td>2</td>
<td>Nozzles G1/4</td>
</tr>
<tr>
<td>2</td>
<td>O-rings for nozzles</td>
</tr>
<tr>
<td>25</td>
<td>Filter membranes (of glass fibre)</td>
</tr>
</tbody>
</table>

**Examples of Use**

**Process gas is presented unpressurized or at negative pressure**

The sample gas is pumped by the diaphragm pump 1 (controlled by the flow meter 6), the condensate is blocked by switching the pump off through the switching unit 4 (signalled by the signal lamp 5). The condensate monitor 2 and analyzer 7 must be arranged above the sample gas conditioning chain. (The diaphragm pump is controlled by the switching unit ER 144A via output relay 1 or 2.)

**Process gas is presented unpressurized or at slight overpressure**

The sample gas is pumped by the diaphragm pump 1 (controlled by the flow meter 6), the condensate is blocked by switching the pump off and switching in a 3/2 way solenoid valve 3 (de-energized state: sample gas path to analyzer blocked) by the switching unit 4 (signalled by the signal lamp 5). The condensate monitor 2 and analyzer 7 may be arranged as desired. (The diaphragm pump and the solenoid valve are controlled by the switching unit ER 144A via output relay 1 or 2.)

**Process gas is presented at overpressure**

Process gas presented at overpressure (controlled by the flow meter 6), the condensate is blocked by switching in a 3/2 way solenoid valve 3 (de-energized state: sample gas path to analyzer blocked) by the switching unit 4 (signalled by the signal lamp 5). The condensate monitor 2 and analyzer 7 may be arranged as desired. (The solenoid valve is controlled by the switching unit ER 144A via output relay 1 or 2.)
Figure 2
Dimensional drawing of condensate monitor and panel cutout

Figure 3
Construction of condensate monitor

8.1 Filter membrane (of glass fibre)
8.2 Lower section of condensate monitor
8.3 Round cord ring
8.4 Mounting nut
8.5 Cap
8.6 Screwed cap
8.7 Nozzle with 5 mm external diameter for hose of 4 mm internal diameter
8.8 Electrodes
8.9 Connecting cable
Mounting of Condensate Monitor

CAUTION!
The vent plugs of the gas connections of the condensate monitor should only be removed immediately before connecting the sample gas lines.

Only the stainless steel model of the CGKW condensate monitor is suitable for use in Zone 1 hazardous areas.

Panel mounting

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prepare panel cutout (see Fig. 2).</td>
</tr>
<tr>
<td>2</td>
<td>Insert the lower section of the condensate monitor 8.2 into the panel cutout so that the securing lug is up.</td>
</tr>
<tr>
<td>3</td>
<td>Tighten the mounting nut 8.4 to the rear side of the panel.</td>
</tr>
<tr>
<td>4</td>
<td>Insert the filter membrane 8.1 and cap 8.5 and tighten with the screwed cap 8.6.</td>
</tr>
<tr>
<td>5</td>
<td>Connect the sample gas lines to the nozzles 8.7. The direction of flow is given by the arrow on the lower part of the condensate monitor.</td>
</tr>
</tbody>
</table>

Wall mounting

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insert the lower section of the condensate monitor 8.2 into the mounting bracket so that the securing lug is up.</td>
</tr>
<tr>
<td>2</td>
<td>Tighten the mounting nut 8.4 to the rear side of the mounting bracket.</td>
</tr>
<tr>
<td>3</td>
<td>Insert the filter membrane 8.1 and cap 8.5 and tighten with the screwed cap 8.6.</td>
</tr>
<tr>
<td>4</td>
<td>Connect the sample gas lines to the nozzles 8.7. The direction of flow is given by the arrow on the lower part of the condensate monitor.</td>
</tr>
</tbody>
</table>

A solenoid valve may be secured in the mounting bracket (spacing of mounting holes 24 and 38 mm).

Electrical connections

Connect the 2-wire connecting lead of the condensate monitor to terminals E1 and E2 of the switching unit ER 144A (see operator’s manual). The length of the connecting lead must be less than 75 m. Install the 100 kΩ resistor supplied with the unit parallel to the sensor and close to the sensor if possible.

When using the sample gas feed unit CGMF 2, the 100 kΩ resistor must be installed at terminals rt(rd) and ws(wh).

With the stainless steel model of the condensate monitor, the 100 kΩ resistor is already integrated into the sensor.
Condensate Builtup and Sensor Break

**Condensate Builtup**

The condensate buildup will result in an electrical switching operation – indicated by the red LED “Kondensat (condensate)” on the front panel of the switching unit.

Possible causes of condensate buildup are:
- precipitation of condensate in the analyzer,
- entry of liquid from the process,
- failure to empty the condensate collecting vessel in the sample gas cooler.

**In the event of condensate buildup**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Determine the cause and rectify the fault.</td>
</tr>
<tr>
<td>2</td>
<td>Evacuate and dry out the sample gas lines and sample gas conditioning units upstream of the condensate monitor.</td>
</tr>
<tr>
<td>3</td>
<td>Evacuate, clean and dry out the condensate monitor and fit a new filter membrane (see page 6).</td>
</tr>
<tr>
<td>4</td>
<td>If applicable, empty and dry out the 3/2 way solenoid valve and downstream sample gas lines.</td>
</tr>
<tr>
<td>5</td>
<td>Once the fault has been eliminated, press the reset button on the front panel of the switching unit to restore the unit to its previous operating state.</td>
</tr>
</tbody>
</table>

**Sensor Break**

A sensor break will cause an electrical switching operation indicated by the red LED “Kabelbruch Fühlerleitung (cable break in sensor line)” on the front panel of the switching unit. The switching unit is again operational once the sensor break has been rectified.

**CAUTION!**

If the stainless steel model of the condensate monitor CGKW is in an area subject to an explosion hazard the relevant safety precautions must be observed when working on the unit.

Work may only be carried out on an explosion-protected unit after the explosion hazard has been eliminated. The unit must be checked and certified by an expert if work is carried out on parts or current circuits which are critical for explosion protection.
Filter Membrane Replacement

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loosen the retaining nut 8.4 and take off the cap 8.5.</td>
</tr>
<tr>
<td>2</td>
<td>Remove the used filter membrane 8.1 and replace it with a new membrane. When re-inserting the membrane ensure that no particles of dirt lodge between the round cord ring 8.3 serving as a seal in the condensate monitor lower section 8.2 and the sealing surface of the cap (the leakage air would result in a false measured value).</td>
</tr>
<tr>
<td>3</td>
<td>Replace the cap and secure with the screwed cap.</td>
</tr>
</tbody>
</table>

Seal Integrity Test

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Close off the sample gas outlet of the condensate monitor.</td>
</tr>
<tr>
<td>2</td>
<td>Set up an overpressure of 50 hPa (approx. 500 mm water column) on the sample gas inlet. There must not be any marked drop in pressure within 3 minutes. In the event of a pressure drop:</td>
</tr>
<tr>
<td>3</td>
<td>Check that the sample gas connectors and retaining nut 8.4 are correctly in place. If so:</td>
</tr>
<tr>
<td>4</td>
<td>Change the round cord ring 8.3 in the condensate monitor lower section 8.2.</td>
</tr>
</tbody>
</table>

Function Check of the Condensate Monitor

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loosen the retaining nut 8.4 and take off the cap 8.5.</td>
</tr>
<tr>
<td>2</td>
<td>Remove the filter membrane 8.1 and insert a moist filter membrane. The red LED “Kondensat (condensate)” on the switching unit ER 144A must light up. Further, the gas delivery pump must be switched off and/or the 3/2 way solenoid valve switched in via the two relay contacts. If the LED fails to light up or if there is no switching of the gas delivery pump and/or solenoid valve, inform ABB Service.</td>
</tr>
<tr>
<td>3</td>
<td>Remove the moist filter membrane and re-insert the old membrane. When re-inserting the membrane ensure that no particles of dirt lodge between the round cord ring 8.3 serving as a seal in the condensate monitor lower section 8.2 and the sealing surface of the cap (the leakage air would result in a false measured value).</td>
</tr>
<tr>
<td>4</td>
<td>Replace the cap and secure with the screwed cap.</td>
</tr>
<tr>
<td>5</td>
<td>Press the reset button on the front panel of the switching unit to restore the unit to its previous operating state.</td>
</tr>
</tbody>
</table>
**Description**

**Condensate monitor CGKW**

The condensate monitor CGKW is used to indicate the buildup of moisture (condensate) or another electrically conducting fluid into the sample gas line to the gas analyzer. The condensate monitor is at the same time a membrane filter so that it has a twofold function – filtering of sample gas and signalling of moisture. The filter membrane holds back the condensate for a short period. The condensate monitor and switching unit ER 144A can be combined to form a self-contained condensate trap.

**Technical Data**

<table>
<thead>
<tr>
<th>Technical data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate (air)</td>
<td>max. 300 l/h</td>
</tr>
<tr>
<td>Gas pressure $p_{\text{abs}}$</td>
<td></td>
</tr>
<tr>
<td>PVC:</td>
<td>max. 150 kPa (1.5 bar)</td>
</tr>
<tr>
<td>Stainless steel:</td>
<td>max. 200 kPa (2 bar)</td>
</tr>
<tr>
<td>Gas temperature</td>
<td></td>
</tr>
<tr>
<td>PVC:</td>
<td>max. 55 °C</td>
</tr>
<tr>
<td>Stainless steel:</td>
<td>max. 100 °C</td>
</tr>
<tr>
<td>Retention rate</td>
<td>99.99 % for particles with $\varnothing \geq 1 \mu$m</td>
</tr>
<tr>
<td>Pressure drop</td>
<td>2.5-20 hPa at a flow rate of 30-250 l/h (air)</td>
</tr>
<tr>
<td>Filter surface</td>
<td>approx. 24 cm$^2$</td>
</tr>
<tr>
<td>Dead volume</td>
<td>approx. 15 cm$^3$</td>
</tr>
<tr>
<td>Materials of gas-conducting parts</td>
<td></td>
</tr>
<tr>
<td>Case:</td>
<td>PVC or stainless steel (Mat. No. 1.4571)</td>
</tr>
<tr>
<td>Gas connections:</td>
<td>PTFE (nozzles)</td>
</tr>
<tr>
<td>Electrodes:</td>
<td>Stainless steel (Mat. No. 1.4305)</td>
</tr>
<tr>
<td>Round cord rings:</td>
<td>Viton</td>
</tr>
<tr>
<td>Filter membrane:</td>
<td>Glass fibre</td>
</tr>
<tr>
<td>Supply voltage for electrodes</td>
<td>U = 11.1 VAC</td>
</tr>
<tr>
<td>Gas connections</td>
<td>G 1/4 (DIN ISO 228/1) or nozzles for hose inside diameter 4 mm</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>Two-core cable, approx. 1 m, for connecting to the switching unit ER 144A</td>
</tr>
<tr>
<td>Mounting</td>
<td>Panel and wall mounting</td>
</tr>
<tr>
<td>Dimensions</td>
<td>85 mm x 144 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>PVC: approx. 0.59 kg</td>
</tr>
<tr>
<td>Stainless steel:</td>
<td>approx. 1.4 kg</td>
</tr>
<tr>
<td>Explosion protection</td>
<td>The condensate monitor is a device without voltage source (VDE 0165/2.91 Section 6.1.3.1.3). If the condensate monitor is being operated in the intrinsically-safe control circuit of the switching unit ER 144A, the apparatus is permitted in hazardous areas of Zones 1 and 2 up to a gas and ambient temperature of 55 °C without restriction of the explosion groups and temperature classes.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Designation</th>
<th>Symbol</th>
<th>Catalog No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter membrane (pack with 25 units)</td>
<td>8.1</td>
<td>23105-5-0801717</td>
</tr>
<tr>
<td>O-ring 60 x 3.5 NBR (round cord ring for condensate monitor lower section)</td>
<td>8.3</td>
<td>94091-4-0651635</td>
</tr>
<tr>
<td>Mounting nut (for condensate monitor lower section)</td>
<td>8.4</td>
<td>20005-4-0299104</td>
</tr>
<tr>
<td>Filter cap, PVC</td>
<td>8.5</td>
<td>20105-4-0465346</td>
</tr>
<tr>
<td>Screwed cap (for cap)</td>
<td>8.6</td>
<td>20105-4-0465347</td>
</tr>
<tr>
<td>Nozzle G1/4 (with external $\varnothing$ 5 mm for hose of internal $\varnothing$ 4 mm)</td>
<td>8.7</td>
<td>20005-4-0402180</td>
</tr>
<tr>
<td>O-ring 13 x 2 for nozzle (order nozzle and O-ring together)</td>
<td></td>
<td>94091-4-0673183</td>
</tr>
<tr>
<td>Mounting bracket</td>
<td></td>
<td>23104-4-0548765</td>
</tr>
</tbody>
</table>

1) see Figure 3, page 3