Accurate measurements of gases require gas samples with stable dew points even under harsh ambient conditions.

The EGK models provide a compressor-type cooling system connected to a cooling block. The cooling block evenly dissipates the heat thus supporting the highly efficient heat exchangers. The temperature of the cooling block is regulated by the Bühler Constant Regulating System. This system allows smooth regulation and eliminates the disadvantages of the traditional on-off operating mode.

The EGK 2-19 can be supplied with one or two heat exchangers made of stainless steel, glass or PVDF. Condensate is drained by peristaltic pumps.

Filters can be installed and the filter housings may include moisture detectors.

Measurement and display of signals are by the internal micro controller and the LED display.

Due to the wide variety of combinations and pre assembled parts, a cooling system can be designed for any specific application. Contact one of Buhler’s application specialists for further information.

- Compact design: completely pre assembled and ready for connecting
- Low maintenance cost due to easy accessibility
- One or two gas paths
- Heat exchanger made of stainless steel, DURAN glass or PVDF
- Adjustable outlet dew point and alarm limits
- Self-monitoring
- Status outputs
- Ambient temperatures up to 50°C
- Nominal cooling capacity 320 kJ/h
- Dew point stability 0.1 K
- 4-20 mA analogue temperature output
- Available for wall mounting or 19" cabinet
Concept

The EGK 2-19 may include one or two heat exchangers. Optional components commonly found in conditioning system can be integrated:

- peristaltic pumps for condensate drainage
- filters
- moisture detectors

The cooler is completely configurable to meet the needs of any specific application. This modular approach combines many of the discrete functions of previous designs therefore minimizing cost and assembly time.

The condition of the filter element can be seen easily through a viewing glass. The moisture detector is easy to disassemble for maintenance.

Description of a fully assembled gas path

The sample gas is routed to the input of the heat exchanger (1,1a) made of stainless steel, glass or PVDF. The output of the heat exchanger is pre-tubed to the filter (3). The dried and filtered sample gas leaves the filter at the outlet (3a). The condensate is withdrawn by the peristaltic pump (2) which is tubed to the heat exchanger. The optional moisture detector (4) is monitored by the internal controller (5). This eliminates the need for additional controllers.

Controller (5)

The core element of the electronic circuit is the microprocessor-controlled Buhler Constant Regulating System. The front panel display (with 3 control keys) shows the cooler temperature as well as the system status. Several system parameters can be set such as outlet dewpoint, alarm limits or sensitivity of the moisture detector.

Electrical connections (6)

All signals are accessible on the top of the cooler via a Phoenix plug. The power supply is connected via a plug as well. No fixed wiring is required.
## Technical data

### Cooler

- **Warming up time after max. 15 min.** 320 kJ/h
- **Nominal cooling capacity (at 25°C)** 320 kJ/h
- **Ambient temperature** 5...50 °C
- **Factory set dew point** ca. 5 °C
- **Dew point stability static** ± 0.1 K
- **Drift over full range** ± 1.5 K
- **Temperature differential between heat exchangers** < 0.5 K
- **Max. input gas parameters** see table heat exchanger
- **Max. Pressure** see table heat exchanger possible limitations by filter or peristaltic pump (see there)

### Heat exchanger

The energy content of the sample gas and, as a result, the cooling capacity is determined by 3 parameters: gas temp. $\theta_g$, dewpoint $\theta_d$, and flow $\varsigma$. The outlet dewpoint rises with increasing energy content (heat) of the gas. The required cooling capacity is determined by the max. acceptable level of the outlet dew point.

The following table shows cooler performance assuming the following conditions: $\theta_g=40°C$ and $\theta_d=70°C$. Indicated is the $\varsigma_{\text{max}}$ in Nl/h cooled air (i.e. after the moisture has condensed).

If the real values stay below the parameters $\theta_g$, $\theta_d$, $\varsigma_{\text{max}}$ can be increased. For example, instead of $\theta_g=40°C$, $\theta_d=70°C$ and $\varsigma=280$ l/h the values $\theta_g=50°C$, $\theta_d=80°C$ and $\varsigma=220$ l/h could be achieved.

Please let us know if you want assistance or use our cooler adaption programme.

### General data

- **Housing** Stainless steel
- **Packing dimensions** appr. 555 x 430 x 340 mm
- **Weight incl. heat exchangers** appr. 15 kg
- **Weight fully equipped** 19 kg
- **Gas terminals:** Exchangers see table
  - Filter DN 4/6 / 1/4"-1/6"
  - Peristaltic pump: 5 mm
- **Media wetted materials**
  - Filter: see table
  - Exchanger: see table
  - Moisture detector: see below
  - Tubing: PTFE / Viton

### Electrical specification

- **Power supply** 115 or 230 V, 50/60 Hz, plug according to DIN 43650
- **Power consumption** 290/260 VA
- **Status contacts specs.** max. 250 V, 2 A
- **Plug type** Phoenix-plug
- **Protection class** IP 20

### Performance data

- **Heat exchanger**
  - PTS
  - PTG
  - PTV
- **Flow rate $Q_{\text{max}}$**
  - PTS-I 500 l/h
  - PTG 280 l/h
  - PTV-I 280 l/h
- **Inlet dewpoint $\theta_{d_{\text{min}}}$**
  - PTS-I 65 °C
  - PTG 65 °C
  - PTV-I 65 °C
- **Gas inlet temperature $\theta_{g_{\text{max}}}$**
  - PTS-I 180 °C
  - PTG 140 °C
  - PTV-I 140 °C
- **Max. cooling capacity $Q_{\text{max}}$**
  - PTS-I 140 kJ/h
  - PTG 63 kJ/h
  - PTV-I 63 kJ/h
- **Gas pressure $p_{\text{max}}$**
  - PTS-I 160 bar
  - PTG 3 bar
  - PTV-I 3 bar
- **Pressure drop $p$ (Q=150 l/h)**
  - PTS-I 10 mbar
  - PTG 10 mbar
  - PTV-I 10 mbar
- **Dead volume $V_{\text{dead}}$**
  - PTS-I 29 ml
  - PTG 29 ml
  - PTV-I 57 ml
- **Sample gas connections (metric)**
  - Swagelok 6 mm GL 14 (6 mm) (1/2")
  - (US) NPT 3/8" GL 25 (1/2")
  - NPT 3/8" NPT 3/8" (1/2")

### Options

#### Analogue output

- **Signal** 4-20 mA (corresponds to -20 °C to +50 °C cooler temperature)

#### Peristaltic pump

- **Operating pressure with pump** ≤ 0.5 bar
- **Hose** Norprene
- **Pump flow** 0.3 l/h
- **Vacuum** > 320 mbar
- **Pressure** > 0.5 bar

#### Filter

- **Operating pressure with filter** max. 2 bar
- **Filter surface** 42 cm²
- **Retention rate** 2µm
- **Dead volume** 28.5 ml
- **Material Filter housing** PTFE, PVDF, Duran glass (wetted parts)
- **Sealing** Viton
- **Filter element** Sintered PTFE

#### Moisture Detector FF-3-N

- **Operating pressure with FF-3-N** max. 2 bar
- **Material** PVDF, 1.4571, Epoxy 1.4576, PTFE
Dimensions

Please note: Space above the cooler for the tubing must be provided.

Please note: Leave enough space above the cooler for installation of hoses.

Ordering Hints

Please extract the part number for the cooler fulfilling your requirements from the type code below.

Please note: Each gas path should be equipped with a peristaltic pump or an automatic condensate drain.

<table>
<thead>
<tr>
<th>Part.No.</th>
<th>452X</th>
<th>0</th>
<th>EGK 2-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td></td>
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<td>Housing for wall mounting</td>
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<td>Housing for 19” cabinet</td>
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<tr>
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<td>2</td>
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<tr>
<td></td>
<td>3</td>
<td></td>
<td>115V US fittings</td>
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<tr>
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<td>4</td>
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<td>230V US fittings</td>
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<td>1</td>
<td>Single path heat exchanger / stainless steel / (PTS and PTS-I)</td>
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<td>1</td>
<td>2</td>
<td>Single path heat exchanger / glass / (PTG)</td>
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<td>3</td>
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<td>1 peristaltic pump, mounted</td>
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<td>Filter</td>
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<td>Without moisture detector</td>
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<td>1</td>
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<td>1 moisture detector, mounted</td>
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<tr>
<td>Options</td>
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<tr>
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<td>With 4 - 20 mA analogue temperature output</td>
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<td>2</td>
<td>2</td>
<td>2 Single path heat exchangers / glass / (PTG)</td>
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<td>2</td>
<td>3</td>
<td>2 Single path heat exchangers / PVDF / (PTV and PTV-I)</td>
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<tr>
<td>Condensate Discharge</td>
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<td>1 moisture detector, mounted (only possible with 1 filter)</td>
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<td>2 moisture detectors, mounted (only possible with 2 filters)</td>
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<tr>
<td>Options</td>
<td></td>
<td></td>
<td>2 moisture detectors, mounted (only possible with 2 filters)</td>
</tr>
</tbody>
</table>

1) Each heat exchanger is equipped with a peristaltic pump. The power supply of the pump has the same as for the cooler itself
2) Option "moisture detector" includes option "4 - 20 mA analogue temperature output".

Ordering Hints Spare Parts

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>91 24 03 00 27</td>
<td>Spare tube for peristaltic pump, right angle terminals</td>
</tr>
<tr>
<td>41 15 10 50</td>
<td>Filter element FE-4, Package 8 pcs.</td>
</tr>
</tbody>
</table>

DE 45 0013
02/2014
Page 4/4

We reserve the right to amend specification