Gas Odorization System GOE 07

PRODUCT INFORMATION

Serving the Gas Industry
Worldwide
Gas Odorization System GOE 07

Features. Specifications.

Features

- Operates according to the suction method
- Safe and easy-to-operate stainless-steel design with clamping-ring connection (SWAGELOK)
- Diaphragm proportioning pump with solenoid actuator [EEx e]
  - Infinitely variable for volume-proportional odorization
  - High proportioning accuracy
- Permanently filled 5-litre reserve tank with level indicator
- Manual proportioning check
- Changing the odorant tank is possible without interrupting operation
- Integrated hand vacuum pump
  - Easy start-up for filling the reserve tank for the first time
- Venting the pump head poses no problem even if the gas line is under pressure
- Convertible to sulfur-free odorant.
- Flushing device (option)
- Odorization measuring device (option)

Specifications

1) Proportioning pump

<table>
<thead>
<tr>
<th>Pump type</th>
<th>MH-6-47</th>
<th>MH-6-65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement (mm³/stroke)</td>
<td>10 - 80</td>
<td>20 - 150</td>
</tr>
<tr>
<td>(infinitely variable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. operating pressure (bar)</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Max. number of strokes per hour</td>
<td>7200</td>
<td>7200</td>
</tr>
</tbody>
</table>

Solenoid actuator

Design

Parts in contact with fluids

Injectable fluids

Operating temperature range

Single solenoid actuator, degree of protection EEx e, G 4 196 V DC / 100% ED/0, 133 A

Reciprocating diaphragm pump and ruby ball valves

Stainless steel, ruby, PTFE

Liquids, e.g. tetrahydrothiophene, mercaptans, S-free

+5°C to +40°C

2) Performance data for odorization

<table>
<thead>
<tr>
<th>Odorization pump type</th>
<th>Odorant concentration mg/Nm³</th>
<th>Pump strokes No. of strokes/h</th>
<th>Odorizable gas flow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>max. 7200</td>
<td>min. 60</td>
<td>max. 7200</td>
</tr>
<tr>
<td>MH-6-47</td>
<td>10</td>
<td>460</td>
<td>480</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>240</td>
<td>2990</td>
</tr>
<tr>
<td>MH-6-65</td>
<td>10</td>
<td>900</td>
<td>10800</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>450</td>
<td>5400</td>
</tr>
</tbody>
</table>
Method of operation
The odorization system operates in accordance with the injection method. The volume-proportional pulses received from a measuring device for volume at base conditions cause the electromagnetically operated diaphragm proportioning pump (2) to perform strokes through a control unit. With each stroke, the pump delivers the preset odorant quantity (mm$^3$) via the injection nozzle (3) into the gas flow. The odorization pump (2) replenishes its supply of odorant by drawing odorant from the odorant tank (5) through a permanently filled 5-litre reserve tank (4). The level of the reserve tank falls only when the odorant tank is empty.

Start-up
Using an integrated hand vacuum pump (6), a vacuum is built up in the pipes upstream of the odorization pump, which first fills the reserve tank. The vacuum persists and makes the system self-priming. Afterwards, only the odorization pump still needs to be vented for 1 minute and the system is ready for operation.

Operation
The odorant quantity in mm$^3$ per stroke has to be set at the stroke setting unit of the odorization pump depending on the required odorant concentration. A scaling factor for the frequency of the control pulses has to be programmed on the associated control unit. In this way, the pulse sequence of a measuring device for volume at base conditions is turned into a suitable stroke frequency of the pump and odorization is performed in proportion to the volume.

Manual proportioning check
It is possible to check the preset volume to be injected (mm$^3$ per stroke) at any time using the measuring burette (9) which is connected parallel to the reserve tank. At the same time, the measuring burette is used for checking the odorant level.
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Control unit

- MC 41-31R/S272-4 control card
  For pulse scaling and processing of faults or alarms. With various indicators and an internal pulse generator for continuous odorization.
- MC 82-SSI power supply card
  24 V supply unit for the control system; power unit for controlling the odorization pump.
- EEx i MC 13-241 ExO-T input card
  As 2-channel explosion-proof isolation of volume pulses from the area subject to explosion hazards (volume corrector, turbine meter, etc.).
- EEx i MC 13-36 ExO-R input card
  For explosion-proof isolation of signals from the manual button.
- EEx i MC 13-36 ExO-R/C16 input card (option)
  For explosion-proof isolation of signals from the flow monitor, float switch (reserve tank) and the level indicator of the odorant tank.
Control options

Basically, there are three ways to control the odorization pump:
- Through volume-proportional pulses outputted by a volume pulse transmitter. In this way, a constant level of odorant concentration can be achieved in the natural gas.
- By means of an internal 10 Hz pulse generator enabling the odorization pump to be controlled independently of the volume pulse transmitter.
- By operating the manual button, the odorization pump can be controlled independently of the volume pulse transmitter and the internal clock-pulse generator.

The pulse sequence of the signals from the volume pulse transmitter or the internal pulse generator can be converted through the control card to a pulse sequence which is appropriate for controlling the odorization pump (max. 2 Hz). Scaling ratios from 1:1 to 1:9999 can be set via four soft-touch coding switches.

If a number of input pulses has been detected which equal the preset scaling factor, the component outputs a control signal which causes the odorization pump to perform a stroke. At the same time, the output pulse indicator lights up.

Manual control is independent of the pulse scaler. Each time the manual button is pressed, a control signal is outputted to the odorization pump.

Indicators

All incoming and outgoing signals are indicated by LEDs:
- volume pulses from the area subject to explosion hazards (2 input channels)
- signals from the internal pulse generator
- pulses from the manual button
- output pulses to the odorization pump.

Fault indicators

The following faults are indicated on the control unit:
- Level warning for the reserve tank (option)
- Level warning for the interchangeable odorant tank (option)
- Delivery fault of the odorization pump (option)
- Centralized alarm (lights up when any malfunction occurs).

Every fault indication causes a relay to switch in the control unit. The switching contacts are connected to the terminals. In this way, fault indications can be transmitted to other devices.

OSG 2000 odorization control unit

Alternatively, the GOE 07 odorization system can be equipped with the OSG 2000 odorization control unit. This control system is based on a stored-program controller in conjunction with an operator and display panel. This enables the control unit to meet the individual requirements of each odorization system.

Please refer to RMG Publication No. 4.351-E for a detailed description of the OSG 2000 odorization control unit.
Design diagram for odorization pumps

For gas quantities up to 4,000 m³/h, the figures for Vₒ/h and q must be divided by 10, whereas they must be multiplied by 10 for gas quantities up to 400,000 m³/h, and by 100 for gas quantities up to 4,000,000 m³/h. If tetrahydrothiophene is used, 1 mg equals 1 mm.

Level indicator

Continuous odorant level indication is provided by the vacuum gauge (10) which is installed as standard. It is also used for checking the functional performance of the system at the same time. In the case of malfunctions or an empty odorant tank, the system cannot build up a vacuum.

Options

- **Odorant concentration monitoring**
  The odorization measuring device ODM which is installed in unpressurized section upstream of the pump is used for calculation of concentration odorant.
- **Delivery monitoring**
  The flow monitor of Type FS-01 (11) which is installed in the outlet pipe of the odorization pump monitors the delivery of the odorant into the piping with each pump stroke.
- **Level monitoring**
  Float switch (14) in the reserve tank.
- **Stainless-steel cabinet**
  For installation of the odorization system.
- **Floor stand**
  For locating the odorization system.

Accessories

- 2 flexible PTFE connecting hoses (12) with stainless-steel sheathing.
- Injection nozzle (3) with non-return valve (22) and shut-off valve (21).
- Stainless-steel safety collector (15) for odorant (50, 100 and 200 litres).
- Odorant tank for transportation and storage (5) of THT, approved by GGVE/GGVS and DVGW as per DIN 30 650 (25, 50 and 200 litres).
- Activated carbon filter as odor trap for installation in the venting pipe (13). Its location has already been provided.
- Insulating coupling for the injection pipe, dia. 6 mm, for the electrical isolation of the piping and the odorization system, with Swagelok fitting.
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For More Information
To learn more about RMG’s advanced gas solutions, contact your RMG account manager or visit www.rmg.com

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