

# Gas Odorization System GOE 07



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## 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)
- Measuring device for delivery rate (option)

## Specifications

### 1) Proportioning pump

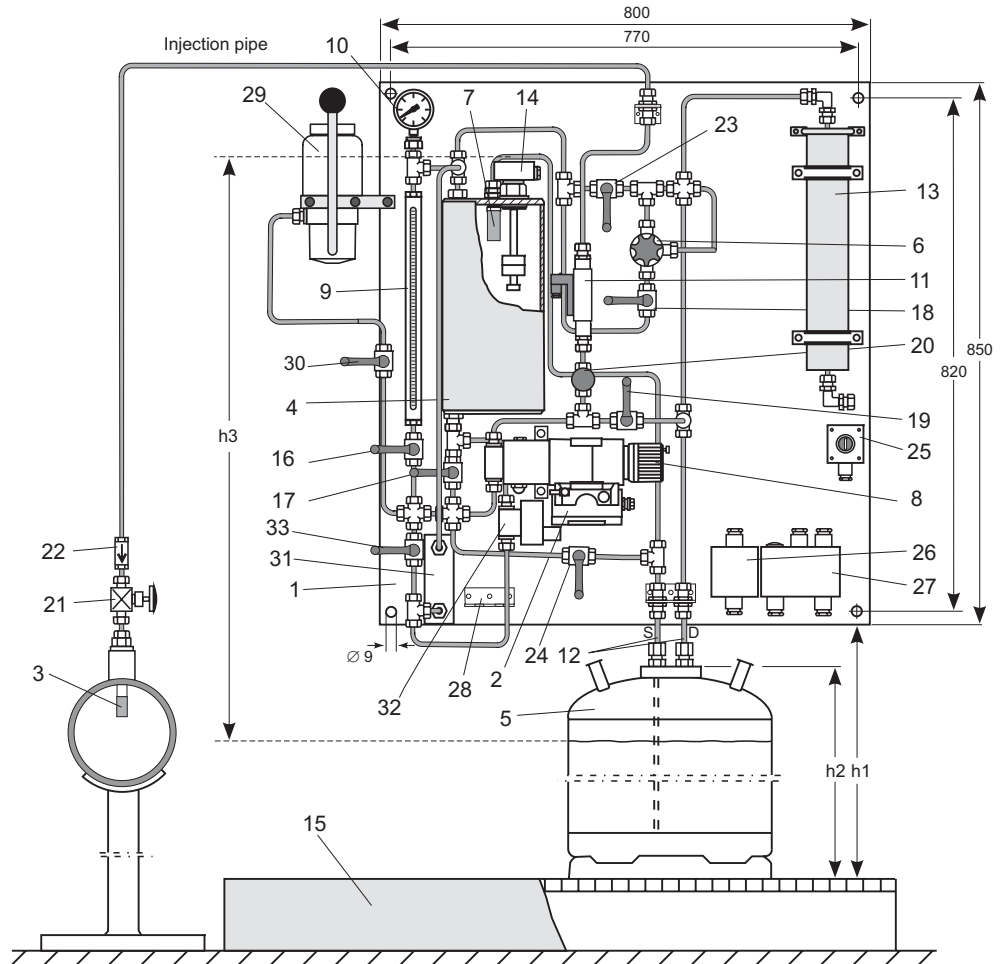
Pump type	MH-6-47	MH-6-65
Displacement (mm <sup>3</sup> /stroke) (infinitely variable)	10 - 80	12 - 150
Max. operating pressure (bar)	40	20
Max. number of strokes per hour	7200	7200
Solenoid actuator	Single solenoid actuator, degree of protection EEx e G 4 196 V DC / 100% ED/0, 133 A	
Design	Reciprocating diaphragm pump and ruby ball valves	
Parts in contact with fluids	Stainless steel, ruby, PTFE	
Injectable fluids	Liquids, e.g. tetrahydrothiophene, mercaptans	
Operating temperature range	+5°C to +40°C	

### 2) Performance data for odorization

Odorization pump type	Odorant concentration mg/Nm <sup>3</sup>	Pump strokes No. of strokes/h	Odorizable gas flow	
			Max. displacement Nm <sup>3</sup> /h	Min. displacement Nm <sup>3</sup> /h
MH-6-47	10	max. 7200 min. 60	57600 480	7200 60
	20	max. 7200 min. 60	28800 240	3600 30
MH-6-65	10	max. 7200 min. 60	108000 900	8640 72
	20	max. 7200 min. 60	54000 450	4320 36

1. Mounting plate
2. Proportioning pump
3. Injection nozzle
4. Reserve tank
5. Interchangeable odorant tank
6. Hand vacuum pump
7. Sintered metal filter
8. Stroke setting unit
9. Measuring burette
10. Vacuum gauge
11. Flow monitor (option)
12. Connecting hoses
13. Activated carbon filter
14. Float switch, reserve tank
15. Stainless-steel collector
16. Stopcock, measuring burette
17. Stopcock, reserve tank
18. Stopcock, vacuum pump
19. Stopcock, starting circuit
20. Shut-off valve, injection pipe, with restrictor
21. Shut-off valve, injection nozzle
22. Non-return valve
23. Venting valve, reserve tank
24. Drain valve, reserve tank
25. Manual button
26. Connection box, proportioning pump
27. Intrinsically safe (EEx i) connection box for manual button, flow monitor and float switch
28. Hose clamp
29. Flushing device (option)
30. Shut-off valve flushing device
31. Measuring device for delivery rate ODM (option)
32. Solenoid valve for ODM
33. Shut-off valve ODM

- Max. installation height from the lower edge of the odorant tank  
h1 = 1100 mm with THT  
h2 = 900 mm with mercaptans
- Suction height  
h3 = Filling level of the odorant tank  
(Value through vacuum gauge, item 10)
- Weight without items 5, 15 approx. 30 kg



## 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 ( $\text{mm}^3$ ) 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.

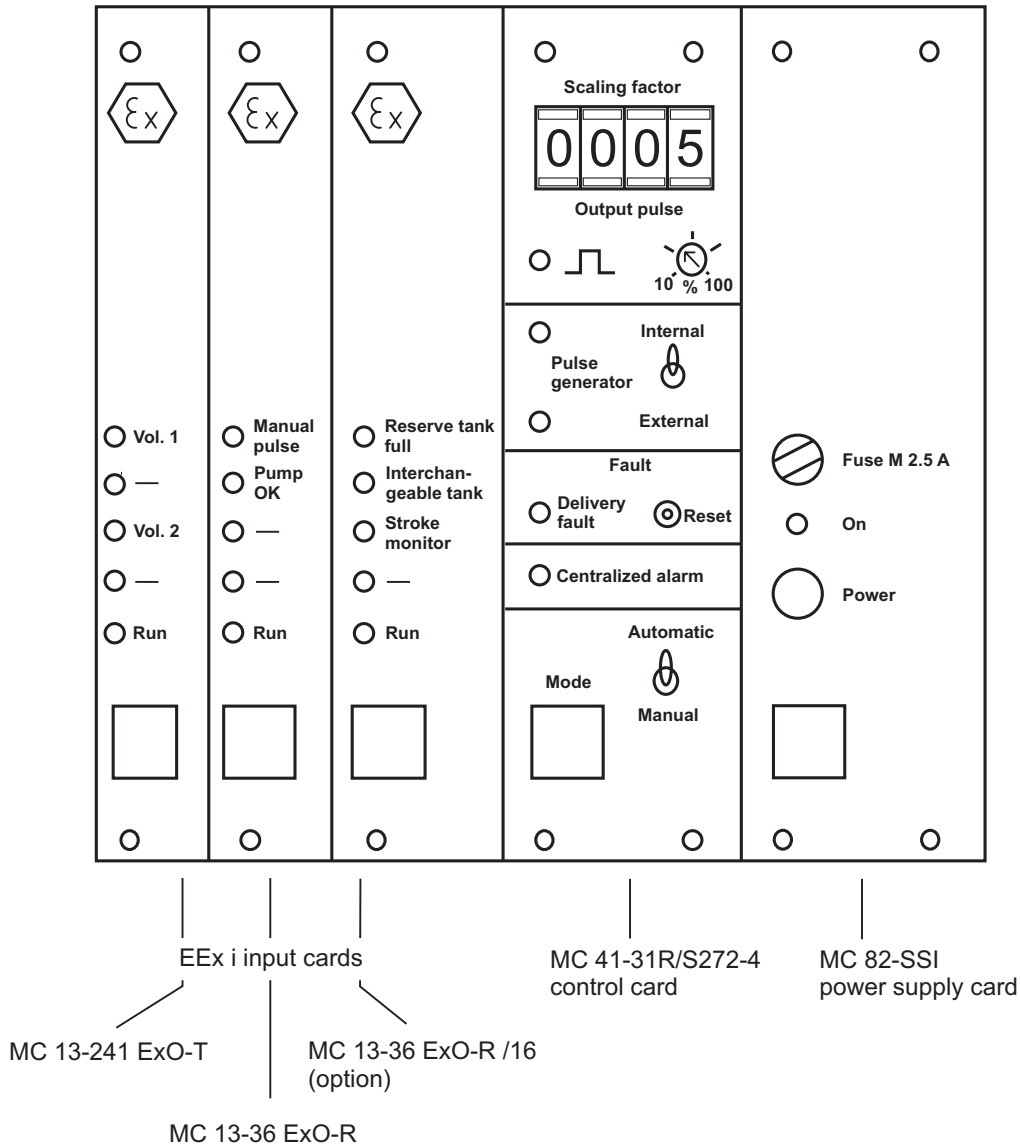
## Operation

The odorant quantity in  $\text{mm}^3$  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 ( $\text{mm}^3$  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.

## Control unit



The control unit (standard design) is supplied either in a wall-mounting enclosure (Type 7-IG 4) or installed in a 19" subrack (Typ 7-EU 4). It comprises the following modules:

- **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.



Control unit installed in a 19" subrack (Type 7-EU 4)

## 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.



Control unit installed in a wall-mounting enclosure (Type 7-IG 4)

## 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).

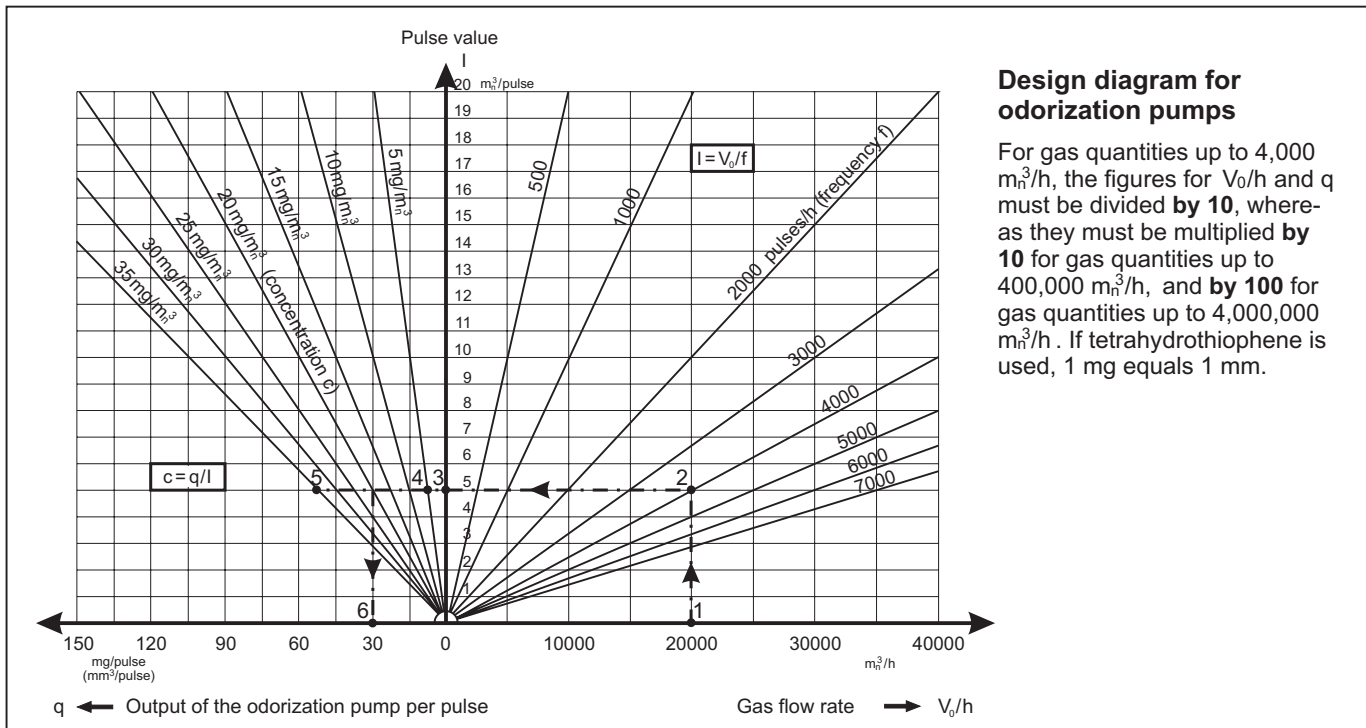
Every fault indication causes a relay to switch in the control unit. The switching contacts are connected to the terminals. In this way, fault indications can be transmitted to other devices.

## 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.

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## 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

### - 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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