# Vaccuperm

## Vacuum chlorine gas dosing systems




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# 1. General information

## Fundamentals of disinfection

Drinking water can transmit diseases. Among these diseases are typhus, paratyphoid, cholera and diarrhoea with vomiting, as well as viral infections such as hepatitis and poliomyelitis. Legionella in shower or bathing water can provoke pulmonary diseases. Compared to the chemical contamination of water, where toxicity values are attained only slowly in general, in a drinking water epidemic infections spread dramatically in the whole supply area. The best prevention of epidemics is to use microbiologically clean non-polluted water, preferably deep ground water as drinking water. Unfortunately, in some regions this is not possible for hydrogeological or quantitative reasons. In these regions, surface water is used, which often has to be purified. Pathogens that are possibly encountered, can be removed from the water or killed by adding certain substances to the water, i.e. by disinfecting the water.

**Disinfection with chlorine**

The most widespread disinfectant used in the treatment of drinking water is chlorine, which can be applied in a variety of ways. History has taught us that, in bacteriological terms, chlorinating water is a quite safe way of disinfecting drinking water. After all, more than 100 years have passed since chlorine was used to disinfect drinking water for the first time. Many years of experience have shown that acute toxicity can be excluded, when chlorination is executed correctly.

Generally, three methods are used for the chlorination of drinking water and also process water:

- Chlorine gas dosing
- Dosing of commercial sodium hypochlorite solution or calcium hypochlorite solution
- Electrolytic sodium hypochlorite generation on site

Chlorine gas dosing offers a number of advantages, which are combined in the Vaccuperm product range.

## Principle of a Vaccuperm chlorine gas dosing system

The handling, transport and storage of chlorine for water disinfection has always been a challenge to systems engineering. This is the reason why the vacuum principle has been used in dosing systems for a long time already. With the vacuum principle, the pressure of the chlorine gas is reduced to a vacuum. In the event of a pipe breakage, no chlorine gas can escape, only ambient air is drawn in.

Vacuum chlorine gas dosing systems operate according to the vacuum principle and are composed of three basic components:

- Chlorine container (cylinder or drum) (A)
- Vacuum regulator (B)
- Dosing regulator (C)
- Injector (D)

**Chlorine container (A)**

Chlorine containers are not completely filled with liquid chlorine. Above the liquid chlorine (A2) there is chlorine gas (A1), which has evaporated from the liquid chlorine. About 1% of the maximum content of a chlorine container can be extracted continuously per hour, otherwise the container will freeze (e.g. 650 g/h can be extracted from a cylinder with 65 kg). If a larger quantity is required, it can be extracted from several containers (cylinders or drums) in parallel. As a rule, liquid chlorine is extracted when more than 40 kg/h is required. According to the ambient temperature, the chlorine storage room must be heated, so that the surface temperature of the chlorine container doesn't fall below 15 °C.

**Vacuum regulator (B)**

The vacuum regulator is a pressure reducing valve, which reduces pressure from the chlorine tank side to the negative pressure on the vacuum side. The valve opens, when sufficient vacuum is present on the outlet side. The vacuum regulator regulates the vacuum to a constant level over the whole range.

Pressure relief function (F)

In case of a small internal leakage, for example due to a dirty inlet-valve seat, the internal pressure relief function protects the vacuum system from inadmissible pressure on the vacuum side. The chlorine gas flows over the vent outlet to the chlorine adsorption filter.

Prevention of air entering the system (E)

If the chlorine cylinder is empty and there is no pressure in it, the vacuum in the system increases, which causes the diaphragm to close. This prevents air from entering the vacuum regulator during a cylinder change (only while the injector is in operation). If the chlorine cylinder is full, a sufficient inlet pressure opens the vacuum regulator automatically.

**Dosing regulator (C)**

The chlorine gas volume flow is adjusted by the dosing regulator. This can be done manually or automatically via motor control. A differential pressure regulator reduces and regulates the injector vacuum to a constant level to secure a constant and linear gas flow.

VGA-113-311, VGA-113-391 and VGS dosing regulators operate with a differential pressure regulator, which is included in the same housing.

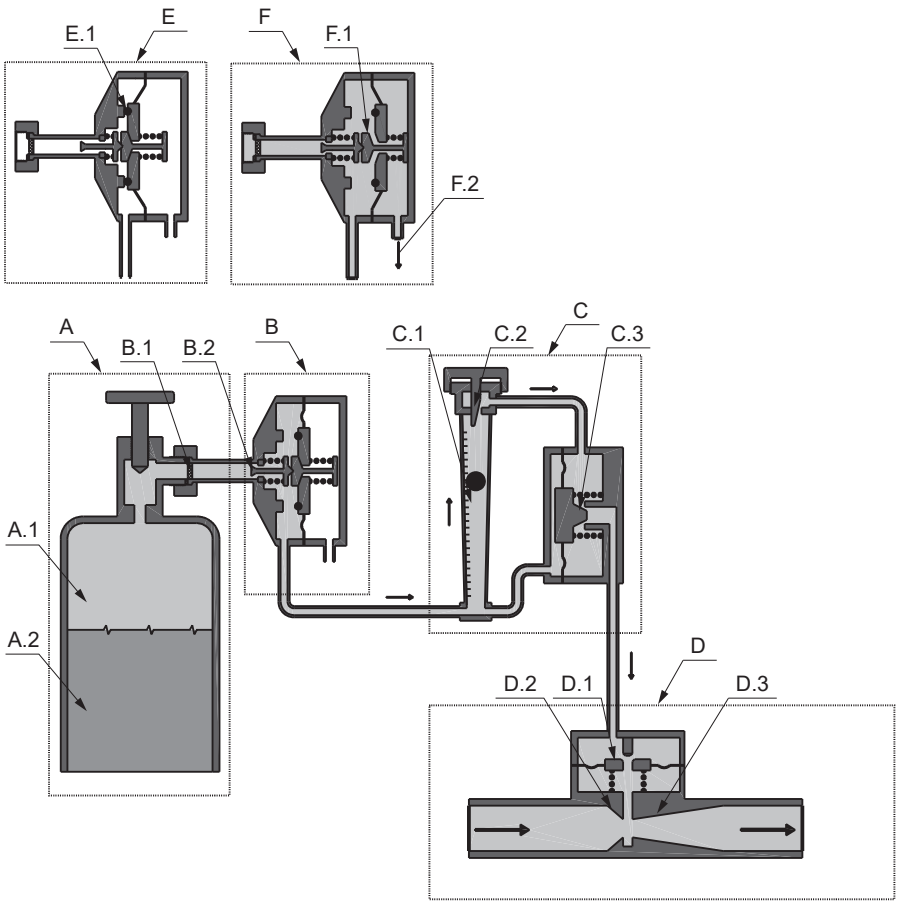
VGB-103, VGA-113-110, VGA-117-110 and VGA-117-190 dosing regulators operate without a differential pressure regulator. A constant and linear chlorine gas flow is achieved under sonic flow conditions.

Dosing regulators without a differential pressure regulator operate with VGB injectors. VGB injectors have a higher performance but require larger motive water flow and higher motive water pressure. Dosing regulators without a differential pressure regulator do not comply with DIN 19606.

**Injector (D)**

Injectors have the task to bring chlorine gas into the water flow. They operate according to the principle of a water jet pump.

The injector body comprises a nozzle followed by a diffusor. Between the nozzle and the diffusor, there is a narrow ring-shaped gap, where the chlorine gas is sucked out of the dosing line through the injector head into the water flow. A diaphragm non-return valve at the dosing line prevents the ingress of water into the dosing line after shutting down the water flow.




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*Schematic diagram of a chlorine gas dosing system*

| Pos. | Component | Pos. | Component |
|---|---|---|---|
| A | Chlorine cylinder | D | Injector |
| A.1 | Chlorine gas | D.1 | Diaphragm non-return valve |
| A.2 | Chlorine liquid | D.2 | Nozzle |
| B | Vacuum regulator | D.3 | Diffusor |
| B.1 | Inlet filter | E | Vacuum regulator with empty chlorine cylinder |

| Pos. | Component | Pos. | Component |
|---|---|---|---|
| B.2 | Inlet valve | E.1 | Vacuum seal |
| C | Dosing regulator | F | Vacuum regulator with open pressure relief valve |
| C.1 | Flowmeter | F.1 | Pressure relief valve |
| C.2 | Rate valve | F.2 | Vent outlet |
| C.3 | Differential pressure regulator | | |

## Benefits and applications

### Benefits

- Safe system using the vacuum principle
- Most economical way of disinfection
- Manufacturer has over 50 years of experience in disinfection with chlorine gas

### Applications

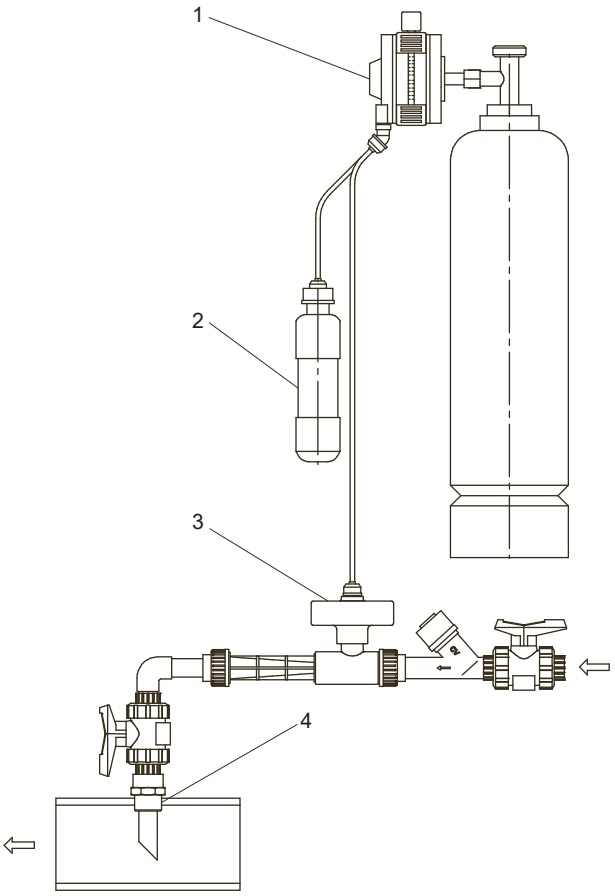
- Drinking water treatment
- Waste water treatment
- Industrial water treatment
- Cooling towers
- Swimming pools

# 2. Application overviews

## Vaccuperm - chlorine gas dosing systems up to 4 kg/h

**Low-budget chlorine extraction from one cylinder**

Vaccuperm chlorine gas dosing systems with VGB-103 compact unit.

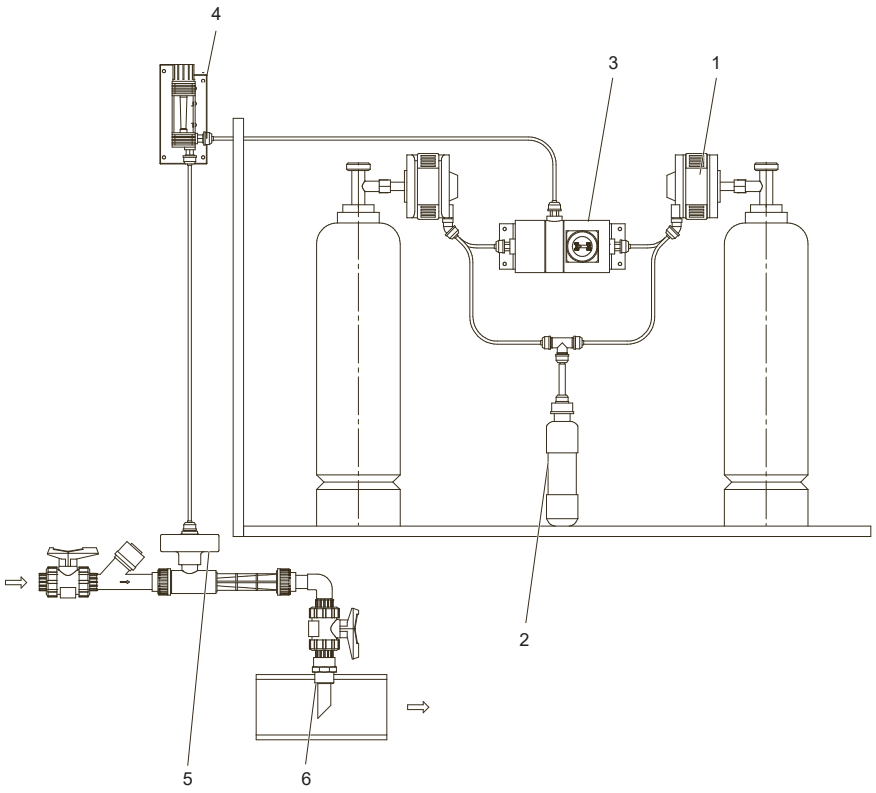



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| Pos. | Component |
|---|---|
| 1 | VGB-103 compact unit |
| 2 | Chlorine gas adsorption filter |
| 3 | VGB injector |
| 4 | Injection unit |

**Low-budget manual chlorine extraction from one or more cylinders**

Vaccuperm manual chlorine gas dosing systems with VGA-111 vacuum regulators and a VGA-113-110 dosing regulator.

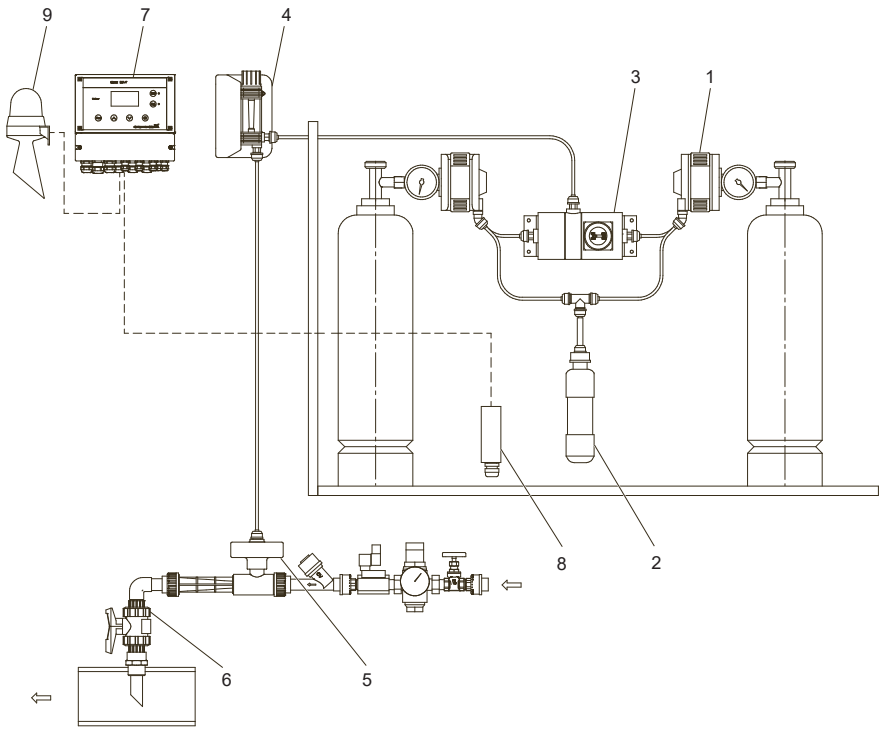



TM075191

| Pos. | Component |
|---|---|
| 1 | VGA-111 vacuum regulator |
| 2 | Chlorine gas adsorption filter |
| 3 | 189 change-over device |
| 4 | VGA-113-110 dosing regulator |
| 5 | VGB injector |
| 6 | Injection unit |

**Manual or automatic chlorine extraction from one or more cylinders**

Vaccuperm manual or automatic chlorine gas dosing systems with VGA-111 vacuum regulators and a VGA-113-311 manual dosing regulator or a VGA-113-391 automatic dosing regulator.

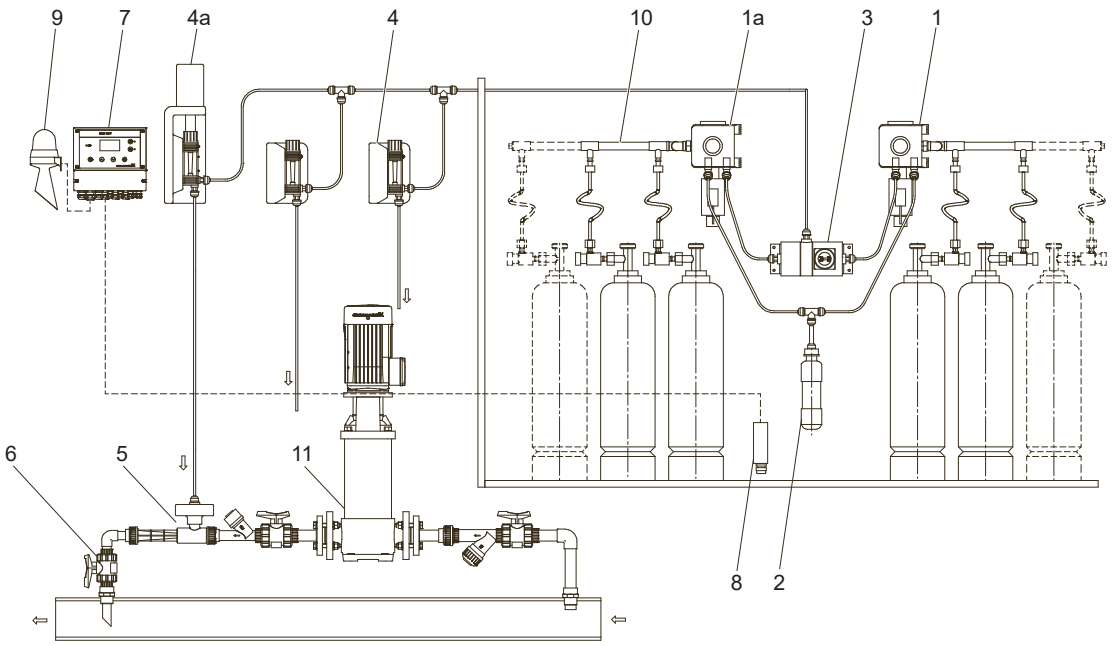



TM075192

| Pos. | Component |
|---|---|
| 1 | VGA-111 vacuum regulator |
| 2 | Chlorine gas adsorption filter |
| 3 | 189 change-over device |
| 4 | VGA-113-311 manual dosing regulator or VGA-113-391 automatic dosing regulator |
| 5 | VGA injector |
| 6 | Injection unit |
| 7 | Conex DIA-G gas warning system |
| 8 | Gas sensor |
| 9 | Horn and flashlight |

**Manual or automatic chlorine extraction from two banks of cylinders**

Vaccuperm manual or automatic chlorine gas dosing systems with VGA-111 vacuum regulators and a VGA-113-311 manual dosing regulator or a VGA-113-391 automatic dosing regulator.




TM075190

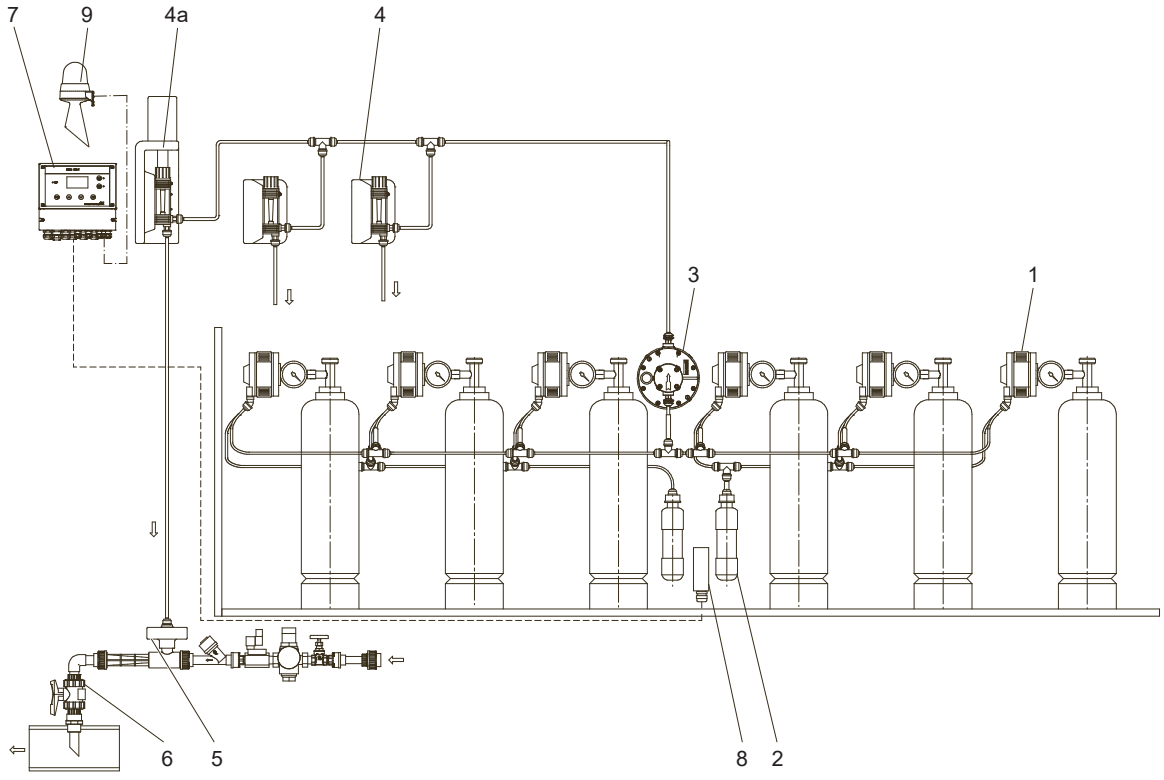
| Pos. | Component |
|---|---|
| 1 | VGA-111 vacuum regulator with heated liquid trap (pressure inlet right) |
| 1a | VGA-111 vacuum regulator with heated liquid trap (pressure inlet left) |
| 2 | Chlorine gas adsorption filter |
| 3 | 189 change-over device |
| 4 | VGA-113-311 manual dosing regulator |
| 4a | VGA-113-391 automatic dosing regulator |
| 5 | VGA injector |
| 6 | Injection unit |
| 7 | Conex DIA-G gas warning system |
| 8 | Gas sensor |
| 9 | Horn and flashlight |
| 10 | Header line for chlorine cylinders |
| 11 | CR booster pump |

**Manual or automatic chlorine extraction from several cylinders according to DIN 19606 (full-vacuum system)**

Vaccuperm chlorine gas dosing systems with VGA-111 vacuum regulators and a VGA-113-311 manual dosing regulator or a VGA-113-391 automatic dosing regulator.

Chlorine gas dosing according to DIN 19606 eliminates the risk of a chlorine leakage at the header line. This application type is also called "full vacuum system". Instead of using a pressurised header line, the vacuum regulators are connected directly to the chlorine cylinders. The vacuum regulators are directly connected to a vacuum header line. To prevent freezing of the cylinders, a vacuum regulator with flow limiting nozzle must be selected, which limits the extraction capacity to 650 g/h. In most cases, a change-over device is not used, as cylinder exchange is performed while the system is in operation.

A safety valve is needed if the injector is located outside the chlorination room. This protects the vacuum line to the injector in case of overpressure.

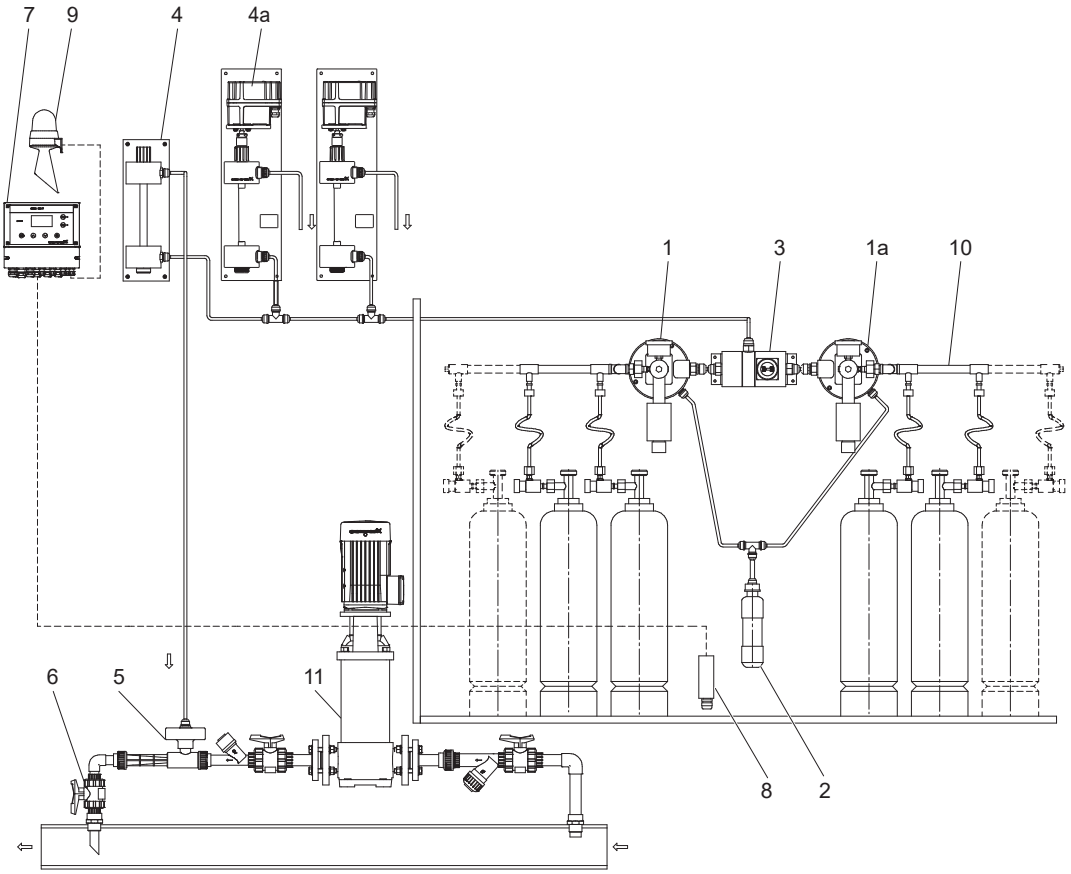



| Pos. | Component |
|---|---|
| 1 | VGA-111 vacuum regulator with flow-limiting nozzle |
| 2 | Chlorine gas adsorption filter |
| 3 | 543 safety valve |
| 4 | VGA-113-311 manual dosing regulator |
| 4a | VGA-113-391 automatic dosing regulator |
| 5 | VGA injector |
| 6 | Injection unit |
| 7 | Conex DIA-G gas warning system |
| 8 | Gas sensor |
| 9 | Horn and flashlight |

# Vaccuperm - chlorine gas dosing systems up to 10 kg/h

**Manual or automatic chlorine extraction from two banks of cylinders**

Vaccuperm manual or automatic chlorine gas dosing systems with VGA-146 vacuum regulators and a VGA-117-110 manual dosing regulator or a VGA-117-190 automatic dosing regulator.

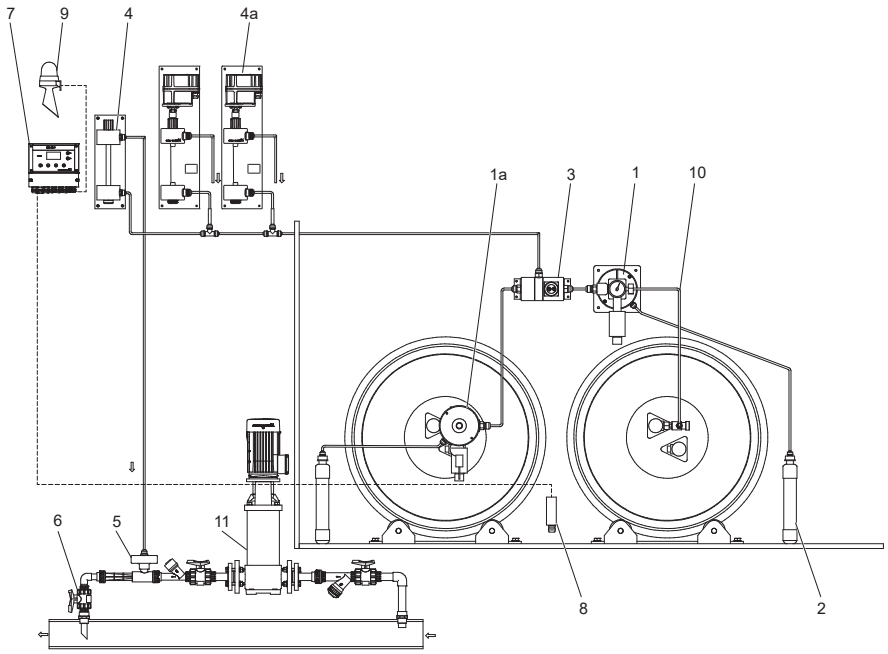



TM078773

| Pos. | Component |
|---|---|
| 1 | VGA-146 vacuum regulator with heated liquid trap (pressure inlet right) |
| 1a | VGA-146 vacuum regulator with heated liquid trap (pressure inlet left) |
| 2 | Chlorine gas adsorption filter |
| 3 | 189 change-over device |
| 4 | VGA-117-110 manual dosing regulator |
| 4a | VGA-117-190 automatic dosing regulator |
| 5 | VGB injector |
| 6 | Injection unit |
| 7 | Conex DIA-G gas warning system |
| 8 | Gas sensor |
| 9 | Horn and flashlight |
| 10 | Header line for chlorine cylinders |
| 11 | CR booster pump |

**Manual or automatic chlorine extraction from one or two drums**

Vaccuperm manual or automatic chlorine gas dosing systems with VGA-146 vacuum regulators and a VGA-117-110 manual dosing regulator or a VGA-117-190 automatic dosing regulator or VGS-141 gas dosing system.



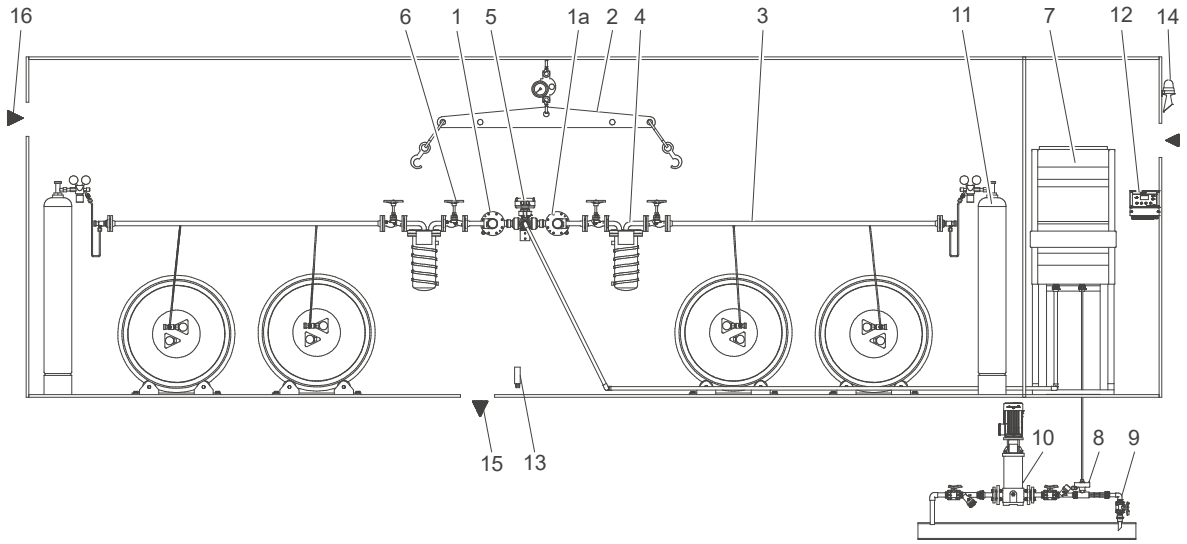

TM078774

| Pos. | Component |
|---|---|
| 1 | VGA-146 vacuum regulator with heated liquid trap (wall-mounted) |
| 1a | VGA-146 vacuum regulator with heated liquid trap (drum-mounted) |
| 2 | Chlorine gas adsorption filter |
| 3 | 189 change-over device |
| 4 | VGA-117-110 manual dosing regulator or VGS-141 gas dosing system |
| 4a | VGA-117-190 automatic dosing regulator or VGS-141 gas dosing system |
| 5 | VGB Injector for VGA-117 or VGA Injector for VGS gas dosing system |
| 6 | Injection unit |
| 7 | Conex DIA-G gas warning system |
| 8 | Gas sensor |
| 9 | Horn and flashlight |
| 10 | Header line for chlorine drum |
| 11 | CR booster pump |

# Vaccuperm - chlorine gas dosing systems up to 20 and 40 kg/h

**Manual or automatic chlorine extraction from two banks of drums without evaporator**

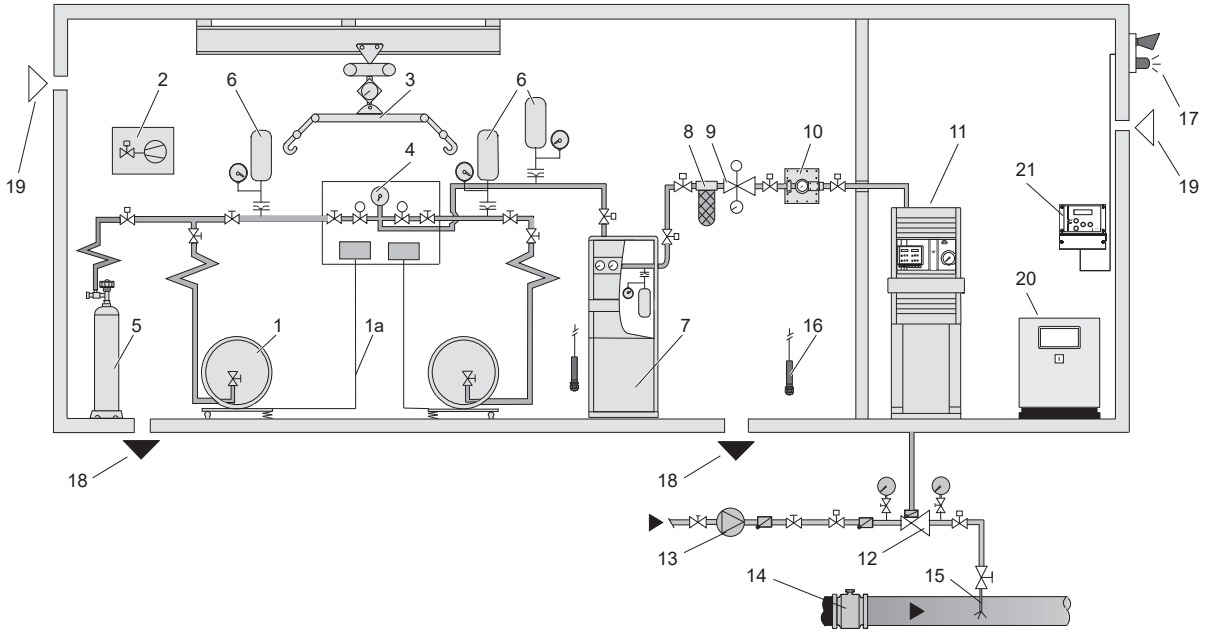
Vaccuperm manual or automatic chlorine gas dosing systems with VGS-147 vacuum regulators and a VGA-117 dosing regulator up to 20 kg/h or a VGS-143 gas dosing system.




| Pos. | Component |
|---|---|
| 1 | VGS-147 vacuum regulator with heated liquid trap (pressure inlet right) |
| 1a | VGS-147 vacuum regulator with heated liquid trap (pressure inlet left) |
| 2 | Chlorine drum lifting device |
| 3 | Header line for chlorine drums |
| 4 | LiquFilt 524 heated liquid chlorine trap with filter |
| 5 | 186 change-over device |
| 6 | Shut-off valve |
| 7 | VGA-117 dosing regulator up to 20 kg/h or VGS-143 chlorine gas dosing system |
| 8 | VGB injector for VGA-117 or VGS injector for VGS-143 |
| 9 | Injection unit |
| 10 | CR booster pump |
| 11 | Nitrogen rinsing device |
| 12 | Conex DIA-G gas warning system |
| 13 | Gas sensor |
| 14 | Horn and flashlight |
| 15 | Vent to a Grundfos chlorine gas neutralisation system |
| 16 | Ventilation of the building |

# Vaccuperm - chlorine gas dosing systems from 70 to 200 kg/h

**Manual or automatic chlorine extraction from two banks of drums with evaporator**




TM075188

| Pos. | Component |
|---|---|
| 1 | Chlorine drum |
| 1a | Chlorine drum scale |
| 2 | Controller for the pneumatic shut-off valve |
| 3 | Chlorine drum lifting device |
| 4 | 185 change over device |
| 5 | Nitrogen rinsing device |
| 6 | Expansion tank with bursting disc |
| 7 | RV171(W) evaporator |
| 8 | LiquFilt 524 heated liquid chlorine trap with filter |
| 9 | 544 pressure reducing valve |
| 10 | VGA-148 vacuum regulator |
| 11 | VGS-145 chlorine gas dosing system |
| 12 | VGS injector |
| 13 | CR booster pump |
| 14 | Flowmeter with 4-20 mA signal |
| 15 | Injection unit |
| 16 | Gas sensor |
| 17 | Horn and flashlight |
| 18 | Vent to a Grundfos chlorine gas neutralisation system |
| 19 | Ventilation of the building |
| 20 | Central control cabinet (SCADA) |
| 21 | Conex DIA-G gas warning system |

# 3. Compact unit and set

## Vaccuperm VGB-103 up to 4 kg/h

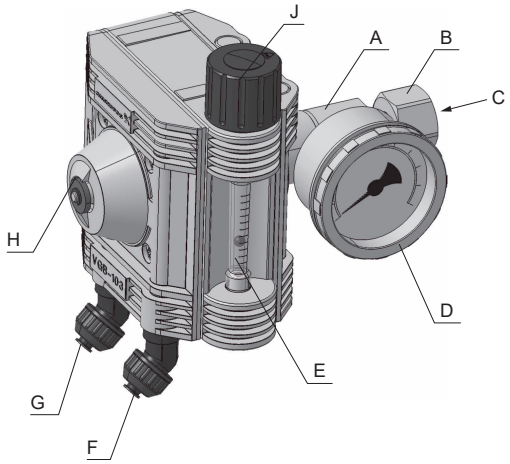
**Vaccuperm VGB-103 compact unit**

The convenient VGB-103 compact unit combines a vacuum regulator and a dosing regulator in one housing for direct mounting on a chlorine gas cylinder or header line. The VGB-103 operates under sonic flow conditions without a differential pressure regulator. A VGB injector is required.

The VGB-103 compact unit is available with the following features:

- Manual chlorine capacity adjustment
- Integrated flowmeter (floater principle)
- Various capacities
- Vacuum connections for 8/11 PE hose
- Visual indication of an empty chlorine cylinder
- Integrated pressure-relief valve
- Chlorine-resistant metal inlet valve with PTFE filter for easy maintenance
- 5 gaskets for pressure-side connections

The VGB-103 compact unit is not usable with change-over device or servomotor.




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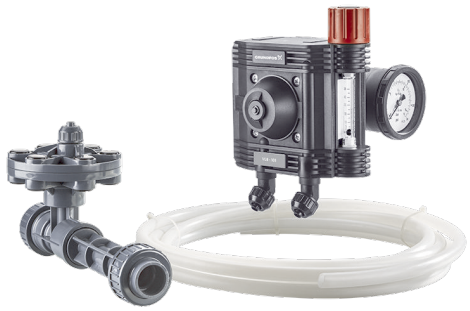
TM075174

| Pos. | Component |
|---|---|
| A | Inlet valve |
| B | Inlet, pressure connection |
| C | Filter |
| D | Pressure gauge |
| E | Flowmeter |
| F | Outlet, vacuum connection (to injector) |
| G | Outlet, vent connection |
| H | Visual indication of empty chlorine cylinder |
| J | Manual chlorine capacity adjustment |

**VGB-103 set**

The VGB-103 set is a combination of the following components ready to use:

- VGB-103 compact unit
- Pre-selected VGB injector
- Vacuum hose 8/11, 10 m



TM075175

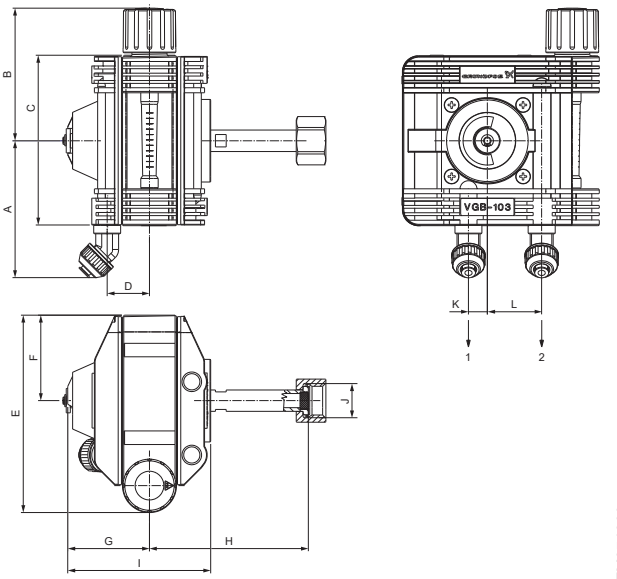
## Technical data VGB-103

| | |
|---|---|
| **VGB-103 compact unit** | |
| Medium | Chlorine gas |
| Capacity ranges | 5-100 g/h, 10-250 g/h, 25-500 g/h, 50-1000 g/h, 100-2000 g/h, 150-3000 g/h, 200-4000 g/h |
| Adjustment ratio | 1:20 |
| Accuracy | ± 4 % |
| Measuring device | According to the floater principle, measuring tube 70 mm |
| Empty indication | Visual indication of lack of chlorine |
| Material | • Enclosure: PVC<br>• Inlet valve: silver/PTFE, special alloy<br>• Springs: alloy C-4, coated<br>• Diaphragm: FEP<br>• Filter: PTFE<br>• Rate valve: PVC<br>• O-rings: FKM |
| Connections | Pressure connection inlet:<br>• Union nut 1", G 3/4<br>• Yoke USA<br>Vacuum connection outlet:<br>• PE hose 8/11<br>Vent connection outlet:<br>• PE hose 8/11 |
| Pressure gauge | Pressure range: 0 to 16 bar |
| Weight | 1.3 to 2 kg |
| **Injector** | |
| Material | • Housing: PVC<br>• Spring: alloy C-4, PTFE coated<br>• Diaphragm: FEP |
| Ambient temperature | +5 °C to +40 °C |
| Motive water temperature | +5 °C to +30 °C |
| Motive water pressure | see table below |
| Counterpressure | see table below |

### VGB-103 set, injector

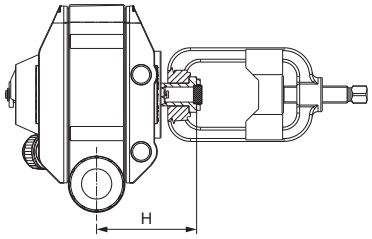
| Capacity [kg/h] | Motive water pressure [bar] | Counterpressure [bar] | Water quantity [l/h] | Water connection | Vacuum hose connection |
|---|---|---|---|---|---|
| 0.5 | 2-16 | 0-7 | 550-1350 | DN 20 | PE 8/11 |
| 1.0 | 2-16 | 0-7 | 850-2200 | DN 20 | |
| 2.0 | 2-16 | 0-7 | 1200-3300 | DN 20 | |
| 3.0 | 4-15 | 0-7 | 2500-4300 | DN 25 | |
| 4.0 | 4-8 | 0-3 | 3400-4700 | DN 25 | |

**Dimensions VGB-103**



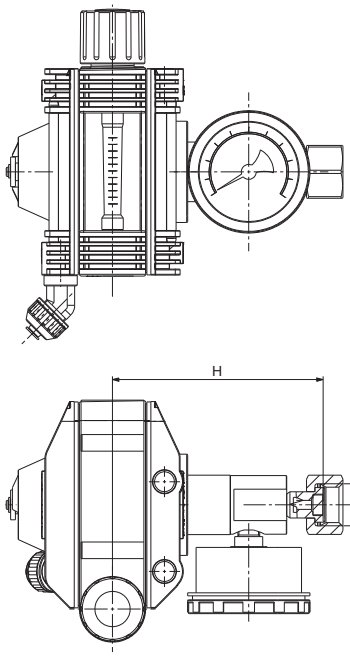

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*VGB-103, cylinder connection 1", G 3/4, without pressure gauge*



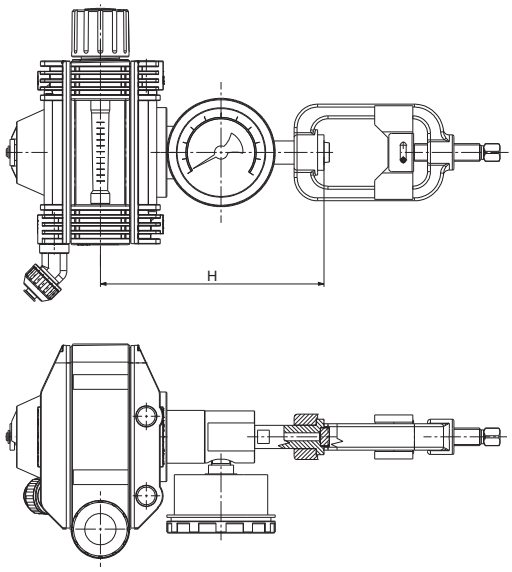

TM074085

*VGB-103, cylinder connection yoke USA, without pressure gauge*




TM075043

*VGB-103, cylinder connection 1", G 3/4 with pressure gauge*




TM075044

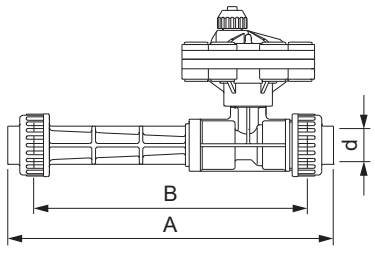
*VGB-103, cylinder connection yoke USA, with pressure gauge*

Dimensions in mm

| J | A | B | C | D | E | F | G | I | K | L |
|---|---|---|---|---|---|---|---|---|---|---|
| 1" | | | | | | | | | | |
| G 3/4 | 102 | 98 | 126 | 31.4 | 146 | 63 | 60.6 | 106 | 14 | 40 |
| Yoke USA | | | | | | | | | | |

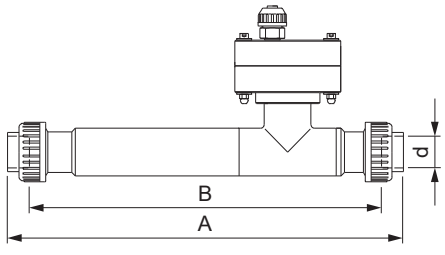
| J | Without pressure gauge | With pressure gauge |
|---|---|---|
| | H | H |
| 1" | 118 | 127 |
| G 3/4 | 71 | 153 |
| Yoke USA | 71 | 153 |

**Dimensions of injector**




*Injector DN 20*

TM041250




TM041256

*Injector DN 25*

Dimensions in mm

| d | A | B |
|---|---|---|
| DN 20 | 275 | 232 |
| DN 25 | 400 | 350 |

## Type key VGB-103

| **Type** | |
|---|---|
| **VGB-103** -250/1/11-S-1-O,B0/NRW8,10G,C3 | |
| VGB-103 | Vaccuperm compact unit/set |

| **Capacity** | |
|---|---|
| VGB-103-**250**/1/11-S-1-O,B0/NRW8,10G,C3 | |
| 100 | 5-100 g/h |
| **250** | 10-250 g/h |
| 500 | 25-500 g/h |
| 1000 | 50-1000 g/h |
| 2000 | 100-2000 g/h |
| 3000 | 150-3000 g/h |
| 4000 | 400-4000 g/h |

| **Pressure connection, inlet** | |
|---|---|
| VGB-103-250/**1**/11-S-1-O,B0/NRW8,10G,C3 | |
| **1** | 1" |
| 2 | G 3/4 |
| 3 | Yoke USA |

| **Vacuum connection, outlet** | |
|---|---|
| VGB-103-250/1/**11**-S-1-O,B0/NRW8,10G,C3 | |
| **11** | PE hose 8/11 |

| **Inlet valve** | |
|---|---|
| VGB-103-250/1/11-**S**-1-O,B0/NRW8,10G,C3 | |
| B | Basic, not for pressure gauge |
| **S** | Short, for pressure gauge |

| **Pressure gauge** | |
|---|---|
| VGB-103-250/1/11-S-**1**-O,B0/NRW8,10G,C3 | |
| 0 | Without |
| **1** | Pressure gauge without contact |

| **Filter** | |
|---|---|
| VGB-103-250/1/11-S-1-**O**,B0/NRW8,10G,C3 | |
| **O** | Filter in pressure connection |

| **Installation type** | |
|---|---|
| VGB-103-250/1/11-S-1-O,**B**0/NRW8,10G,C3 | |
| **B** | Cylinder mounting, pressure connection frontal |

| **Residual pressure device** | |
|---|---|
| VGB-103-250/1/11-S-1-O,B**0**/NRW8,10G,C3 | |
| **0** | Without |

| **Injector** | |
|---|---|
| VGB-103-250/1/11-S-1-O,B0/**NR**W8,10G,C3 | |
| N | Without |
| **NR** | Injector with diaphragm non-return valve |

| **Water connection for injector** | |
|---|---|
| VGB-103-250/1/11-S-1-O,B0/NR**W8**,10G,C3 | |
| N | Without |
| **W8** | DN 20 (20/25) (4/10 kg/h) |
| W9 | DN 25 (25/32) (10 kg/h) |

| Accessories | |
|---|---|
| VGB-103-250/1/11-S-1-O,B0/NRW8,**10**G,C3 | |
| 0 | Without |
| **10** | PE vacuum hose, 8/11, 10 m |

| Logo | |
|---|---|
| VGB-103-250/1/11-S-1-O,B0/NRW8,10**G**,C3 | |
| **G** | Grundfos |

| Product certificate | |
|---|---|
| VGB-103-250/1/11-S-1-O,B0/NRW8,10G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data for VGB-103

### VGB-103 compact unit without pressure gauge

| Capacity [g/h] | Cylinder connection | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 5-100 | 1" | VGB-103-100/1/11-B-0-O,B0/NN,0-G | 95712114 | 95759542 |
| | G 3/4 | VGB-103-100/2/11-B-0-O,B0/NN,0-G | 95712119 | 95759543 |
| | Yoke USA | VGB-103-100/3/11-B-0-O,B0/NN,0-G | 95712123 | 95759544 |
| 10-250 | 1" | VGB-103-250/1/11-B-0-O,B0/NN,0-G | 95712126 | 95759545 |
| | G 3/4 | VGB-103-250/2/11-B-0-O,B0/NN,0-G | 95712131 | 95759546 |
| | Yoke USA | VGB-103-250/3/11-B-0-O,B0/NN,0-G | 95712136 | 95759547 |
| 25-500 | 1" | VGB-103-500/1/11-B-0-O,B0/NN,0-G | 95712139 | 95759548 |
| | G 3/4 | VGB-103-500/2/11-B-0-O,B0/NN,0-G | 95712153 | 95759549 |
| | Yoke USA | VGB-103-500/3/11-B-0-O,B0/NN,0-G | 95712159 | 95759550 |
| 50-1000 | 1" | VGB-103-1000/1/11-B-0-O,B0/NN,0-G | 95712162 | 95759551 |
| | G 3/4 | VGB-103-1000/2/11-B-0-O,B0/NN,0-G | 95712167 | 95759552 |
| | Yoke USA | VGB-103-1000/3/11-B-0-O,B0/NN,0-G | 95712170 | 95759553 |
| 100-2000 | 1" | VGB-103-2000/1/11-B-0-O,B0/NN,0-G | 95712173 | 95759554 |
| | G 3/4 | VGB-103-2000/2/11-B-0-O,B0/NN,0-G | 95712178 | 95759555 |
| | Yoke USA | VGB-103-2000/3/11-B-0-O,B0/NN,0-G | 95712181 | 95759556 |
| 150-3000 | 1" | VGB-103-3000/1/11-B-0-O,B0/NN,0-G | 95759557 | 95759558 |
| | G 3/4 | VGB-103-3000/2/11-B-0-O,B0/NN,0-G | 95745942 | 95759559 |
| | Yoke USA | VGB-103-3000/3/11-B-0-O,B0/NN,0-G | 95748087 | 95759560 |
| 200-4000 | 1" | VGB-103-4000/1/11-B-0-O,B0/NN,0-G | 95759561 | 95759562 |
| | G 3/4 | VGB-103-4000/2/11-B-0-O,B0/NN,0-G | 95745943 | 95759563 |
| | Yoke USA | VGB-103-4000/3/11-B-0-O,B0/NN,0-G | 95759564 | 95759565 |

### VGB-103 compact unit with pressure gauge

| Capacity [g/h] | Cylinder connection | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 5-100 | 1" | VGB-103-100/1/11-S-1-O,B0/NN,0-G | 95712117 | 95759568 |
| | G 3/4 | VGB-103-100/2/11-S-1-O,B0/NN,0-G | 95759569 | 95759570 |
| | Yoke USA | VGB-103-100/3/11-S-1-O,B0/NN,0-G | 95759571 | 95759572 |
| 10-250 | 1" | VGB-103-250/1/11-S-1-O,B0/NN,0-G | 95712129 | 95759573 |
| | G 3/4 | VGB-103-250/2/11-S-1-O,B0/NN,0-G | 95759574 | 95759575 |
| | Yoke USA | VGB-103-250/3/11-S-1-O,B0/NN,0-G | 95759576 | 95759577 |
| 25-500 | 1" | VGB-103-500/1/11-S-1-O,B0/NN,0-G | 95712151 | 95759578 |
| | G 3/4 | VGB-103-500/2/11-S-1-O,B0/NN,0-G | 95759579 | 95759580 |
| | Yoke USA | VGB-103-500/3/11-S-1-O,B0/NN,0-G | 95759581 | 95759582 |
| 50-1000 | 1" | VGB-103-1000/1/11-S-1-O,B0/NN,0-G | 95712165 | 95759583 |
| | G 3/4 | VGB-103-1000/2/11-S-1-O,B0/NN,0-G | 95759584 | 95759585 |
| | Yoke USA | VGB-103-1000/3/11-S-1-O,B0/NN,0-G | 95759586 | 95759587 |
| 100-2000 | 1" | VGB-103-2000/1/11-S-1-O,B0/NN,0-G | 95712176 | 95759588 |
| | G 3/4 | VGB-103-2000/2/11-S-1-O,B0/NN,0-G | 95759589 | 95759590 |
| | Yoke USA | VGB-103-2000/3/11-S-1-O,B0/NN,0-G | 95759591 | 95759592 |
| 150-3000 | 1" | VGB-103-3000/1/11-S-1-O,B0/NN,0-G | 95759593 | 95759594 |
| | G 3/4 | VGB-103-3000/2/11-S-1-O,B0/NN,0-G | 95759595 | 95759596 |
| | Yoke USA | VGB-103-3000/3/11-S-1-O,B0/NN,0-G | 95759597 | 95759598 |
| 200-4000 | 1" | VGB-103-4000/1/11-S-1-O,B0/NN,0-G | 95759599 | 95759600 |
| | G 3/4 | VGB-103-4000/2/11-S-1-O,B0/NN,0-G | 95759601 | 95759602 |
| | Yoke USA | VGB-103-4000/3/11-S-1-O,B0/NN,0-G | 95759603 | 95759604 |

### VGB-103 set without pressure gauge

| Capacity [g/h] | Cylinder connection | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 5-100 | 1" | VGB-103-100/1/11-B-0-O,B0/NRW8,10-G | 95759446 | 95759447 |
| | G 3/4 | VGB-103-100/2/11-B-0-O,B0/NRW8,10-G | 95759448 | 95759449 |
| | Yoke USA | VGB-103-100/3/11-B-0-O,B0/NRW8,10-G | 95759450 | 95759451 |
| 10-250 | 1" | VGB-103-250/1/11-B-0-O,B0/NRW8,10-G | 95759452 | 95759453 |
| | G 3/4 | VGB-103-250/2/11-B-0-O,B0/NRW8,10-G | 95759454 | 95759455 |
| | Yoke USA | VGB-103-250/3/11-B-0-O,B0/NRW8,10-G | 95759456 | 95759457 |
| 25-500 | 1" | VGB-103-500/1/11-B-0-O,B0/NRW8,10-G | 95759458 | 95759459 |
| | G 3/4 | VGB-103-500/2/11-B-0-O,B0/NRW8,10-G | 95759460 | 95759461 |
| | Yoke USA | VGB-103-500/3/11-B-0-O,B0/NRW8,10-G | 95759462 | 95759463 |
| 50-1000 | 1" | VGB-103-1000/1/11-B-0-O,B0/NRW8,10-G | 95759464 | 95759465 |
| | G 3/4 | VGB-103-1000/2/11-B-0-O,B0/NRW8,10-G | 95759466 | 95759467 |
| | Yoke USA | VGB-103-1000/3/11-B-0-O,B0/NRW8,10-G | 95759468 | 95759469 |
| 100-2000 | 1" | VGB-103-2000/1/11-B-0-O,B0/NRW8,10-G | 95759470 | 95759471 |
| | G 3/4 | VGB-103-2000/2/11-B-0-O,B0/NRW8,10-G | 95759472 | 95759473 |
| | Yoke | VGB-103-2000/3/11-B-0-O,B0/NRW8,10-G | 95759474 | 95759475 |
| 150-3000 | 1" | VGB-103-3000/1/11-B-0-O,B0/NRW9,10-G | 95759476 | 95759477 |
| | G 3/4 | VGB-103-3000/2/11-B-0-O,B0/NRW9,10-G | 95759478 | 95759479 |
| | Yoke USA | VGB-103-3000/3/11-B-0-O,B0/NRW9,10-G | 95759480 | 95759481 |
| 200-4000 | 1" | VGB-103-4000/1/11-B-0-O,B0/NRW9,10-G | 95759482 | 95759483 |
| | G 3/4 | VGB-103-4000/2/11-B-0-O,B0/NRW9,10-G | 95759484 | 95759485 |
| | Yoke USA | VGB-103-4000/3/11-B-0-O,B0/NRW9,10-G | 95759486 | 95759487 |

### VGB-103 set with pressure gauge

| Capacity [g/h] | Cylinder connection | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 5-100 | 1" | VGB-103-100/1/11-S-1-O,B0/NRW8,10-G | 96680051 | 95759488 |
| | G 3/4 | VGB-103-100/2/11-S-1-O,B0/NRW8,10-G | 95759498 | 95759499 |
| | Yoke USA | VGB-103-100/3/11-S-1-O,B0/NRW8,10-G | 95759500 | 95759501 |
| 10-250 | 1" | VGB-103-250/1/11-S-1-O,B0/NRW8,10-G | 95759502 | 95759503 |
| | G 3/4 | VGB-103-250/2/11-S-1-O,B0/NRW8,10-G | 95759504 | 95759505 |
| | Yoke USA | VGB-103-250/3/11-S-1-O,B0/NRW8,10-G | 95759507 | 95759508 |
| 25-500 | 1" | VGB-103-500/1/11-S-1-O,B0/NRW8,10-G | 95759509 | 95759510 |
| | G 3/4 | VGB-103-500/2/11-S-1-O,B0/NRW8,10-G | 95759513 | 95759514 |
| | Yoke USA | VGB-103-500/3/11-S-1-O,B0/NRW8,10-G | 95759515 | 95759516 |
| 50-1000 | 1" | VGB-103-1000/1/11-S-1-O,B0/NRW8,10-G | 95759517 | 95759518 |
| | G 3/4 | VGB-103-1000/2/11-S-1-O,B0/NRW8,10-G | 95759519 | 95759520 |
| | Yoke USA | VGB-103-1000/3/11-S-1-O,B0/NRW8,10-G | 95759521 | 95759522 |
| 100-2000 | 1" | VGB-103-2000/1/11-S-1-O,B0/NRW8,10-G | 95759523 | 95759524 |
| | G 3/4 | VGB-103-2000/2/11-S-1-O,B0/NRW8,10-G | 95759525 | 95759526 |
| | Yoke USA | VGB-103-2000/3/11-S-1-O,B0/NRW8,10-G | 95759527 | 95759528 |
| 150-3000 | 1" | VGB-103-3000/1/11-S-1-O,B0/NRW9,10-G | 95759529 | 95759531 |
| | G 3/4 | VGB-103-3000/2/11-S-1-O,B0/NRW9,10-G | 95759532 | 95759533 |
| | Yoke USA | VGB-103-3000/3/11-S-1-O,B0/NRW9,10-G | 95759534 | 95759535 |
| 200-4000 | 1" | VGB-103-4000/1/11-S-1-O,B0/NRW9,10-G | 95759536 | 95759537 |
| | G 3/4 | VGB-103-4000/2/11-S-1-O,B0/NRW9,10-G | 95759538 | 95759539 |
| | Yoke USA | VGB-103-4000/3/11-S-1-O,B0/NRW9,10-G | 95759540 | 95759541 |

# 4. Vacuum regulators

## Vaccuperm VGA-111 up to 4 kg/h

The VGA-111 vacuum regulator for chlorine capacities up to 4 kg/h is intended for operation with a 189 change-over device and a VGA-113 or VGA-117 single or multiple dosing regulator.

The VGA-111 vacuum regulator is available with different thread sizes and yoke connection for various installation options:

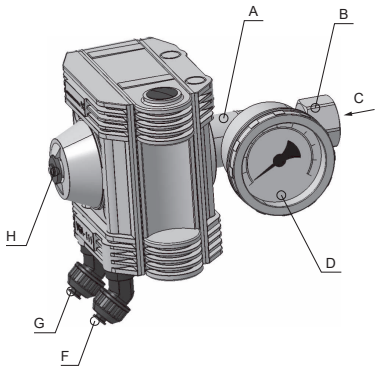
- Cylinder mounting
- Drum mounting
- Header-line mounting
- Wall mounting

The VGA-111 vacuum regulator includes:

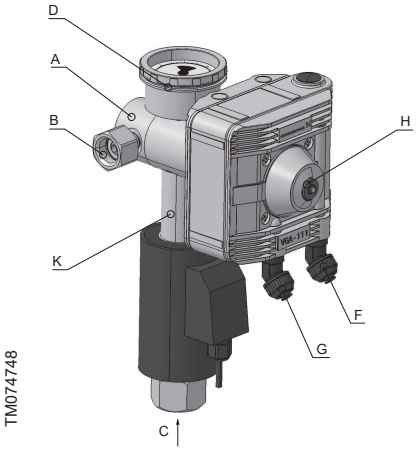
- Internal filter, easily accessible for maintenance
- Integrated pressure-relief valve
- Visual indication of empty chlorine cylinder
- 5 gaskets for pressure-side connections

Options:

- Flow-limiting nozzle for chlorine withdrawal not exceeding 650 g/h (DIN 19606)
- Residual pressure device to ensure that a chlorine cylinder is not completely emptied to prevent moisture from entering
- Chlorine-resistant pressure-gauge with or without contact for monitoring the pressure in the chlorine cylinder or drum
- Heated liquid trap to prevent liquid chlorine from entering the inlet valve (recommended for applications with chlorine drums and header lines)




*VGA-111, cylinder mounting*




TM074748

TM074756

*VGA-111, header-line mounting, with heated liquid trap*

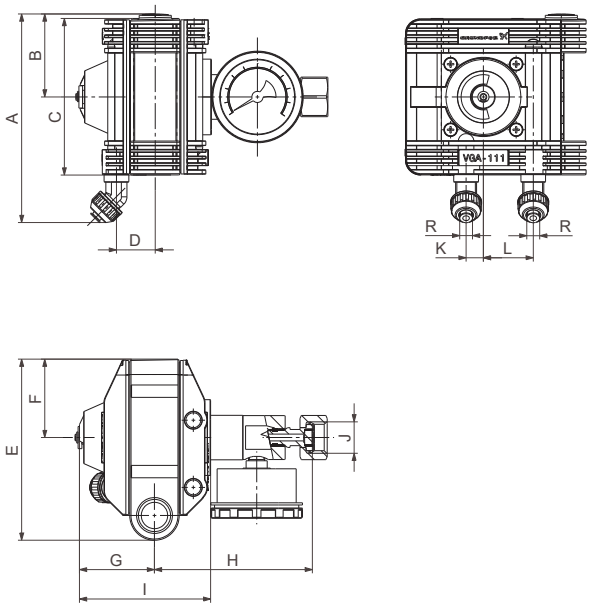
| Pos. | Component | Pos. | Component |
|---|---|---|---|
| A | Inlet valve | F | Outlet, vacuum connection |
| B | Inlet, pressure connection | G | Outlet, vent connection |
| C | Filter | H | Visual indication of empty chlorine cylinder |
| D | Pressure gauge | K | Heated liquid trap |

## Technical data VGA-111

| | |
|---|---|
| Medium | Chlorine gas |
| Capacity | Up to 4000 g/h |
| Empty indication | Visual indication of lack of chlorine |
| Material | • Enclosure: PVC<br>• Inlet valve: silver, PTFE, special alloy<br>• Springs: alloy C-4, coated<br>• Diaphragm: FEP<br>• Filter: PTFE/ceramic<br>• O-rings: FKM |
| Connections | Pressure connection inlet:<br>• Union nut 1"; G 3/4; G 5/8; 1 1/4"; G 1/2<br>• Yoke USA<br>Vacuum connection outlet:<br>• PE hose 8/11<br>Vent connection outlet:<br>• PE hose 8/11 |
| Pressure gauge | • Pressure range: 0 to 16 bar<br>• Without contact or with contact<br>• Contact (R4) closes at falling pressure<br>• Contact (R5) opens at falling pressure<br>• Max. 10 W, 75 VDC, 50 VAC, 0.5 A |
| Heater for liquid trap | Max. 12 W, 230 or 115 V, 50/60 Hz, IP54 |
| Weight | 2.4 kg; 4.4 kg (with heated liquid trap) |

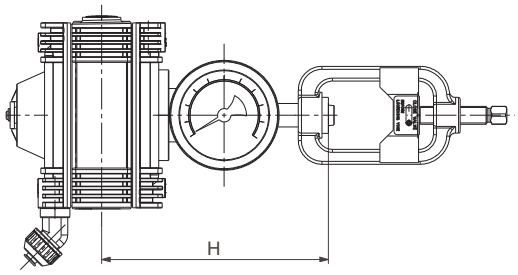
### Dimensions VGA-111

- VGA-111 with pressure gauge, for cylinder or header-line mounting




TM074743

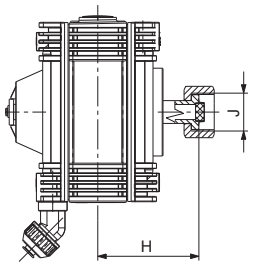
*VGA-111, pressure connection 1", G 5/8, G 3/4*



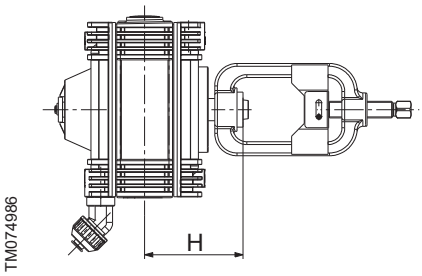

TM074746

*VGA-111, pressure connection yoke USA*

- VGA-111 without pressure gauge, for cylinder or header-line mounting




*VGA-111, pressure connection 1", G 3/4*

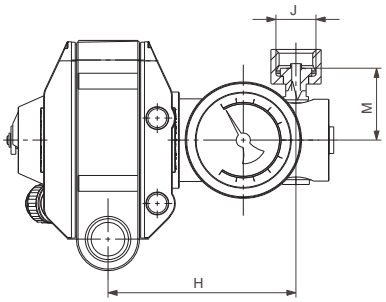



TM074986

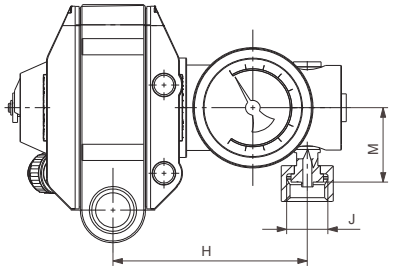
TM074987

*VGA-111, cylinder connection yoke USA*

- VGA-111 with pressure gauge and heated liquid trap, for header-line mounting




*VGA-111, pressure connection 1", G 3/4, pressure inlet left*

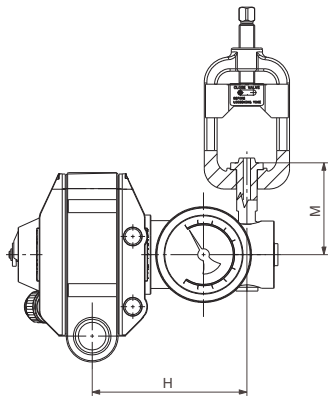



TM074749

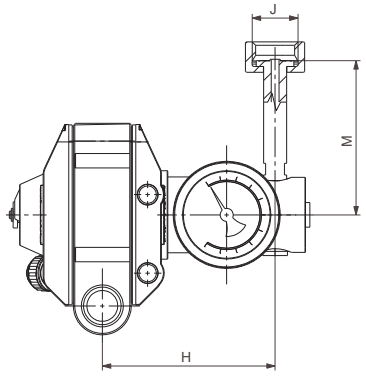
TM074754

*VGA-111, pressure connection 1", G 3/4, pressure inlet right*

- VGA-111 with pressure gauge and heated liquid trap, for drum mounting




*VGA-111, pressure connection yoke USA, pressure inlet left*

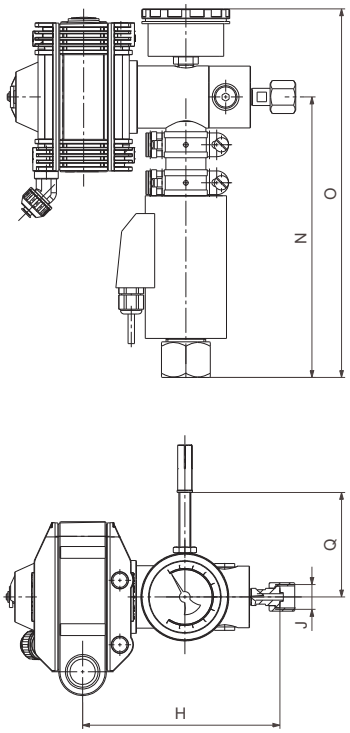



TM074751

TM074752

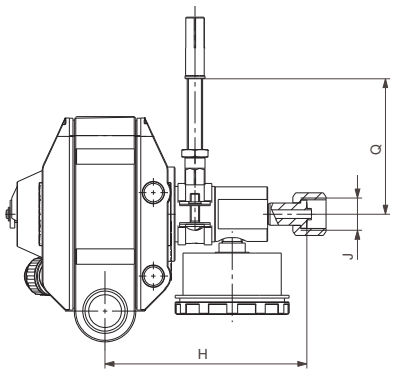
*VGA-111, pressure connection 1 ¼", pressure inlet left*

- VGA-111 for wall mounting




TM074753

*VGA-111, pressure connection G 1/2, with heated liquid trap*




TM074747

*VGA-111, pressure connection G 1/2, without heated liquid trap*

Dimensions in mm

| J | A | B | C | D | E | F | G | I | K | L | Q | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1" | | | | | | | | | | | | |
| G 5/8 | | | | | | | | | | | | |
| G 3/4 | 170 | 67 | 126 | 31 | 146 | 63 | 61 | 106 | 14 | 40 | - | 8/11 |
| Yoke USA | | | | | | | | | | | | |
| 1 ¼" | | | | | | | | | | | | |
| G 1/2 | | | | | | | | | | | 88 | |

| J | With pressure gauge | Without pressure gauge | With heated liquid trap and pressure gauge | | | |
|---|---|---|---|---|---|---|
| | H | H | H | M | N | O |
| 1" | 127 | 118 | 120 | 46 | 236 | 310 |
| G 5/8 | 127 | - | - | - | - | - |
| G 3/4 | 153 | 71 | 120 | 71 | 236 | 310 |
| Yoke USA | 153 | 71 | 120 | 71 | 236 | 310 |
| 1 ¼" | - | - | 120 | 107 | 236 | 310 |
| G 1/2 | 131 | - | 166 | - | 236 | 310 |

## Type key VGA-111

| **Type** | |
|---|---|
| **VGA-111** -4/BC/1/11-S-1R-0-O,0F-G,C3 | |
| **VGA-111** | Vacuum regulator |

| **Capacity** | |
|---|---|
| VGA-111-**4**/BC/1/11-S-1R-0-O,0F-G,C3 | |
| **4** | 4 kg/h |

| **Installation type** | |
|---|---|
| VGA-111-4/**BC**/1/11-S-1R-0-O,0F-G,C3 | |
| B | Cylinder mounting, without heated liquid trap |
| **BC** | Cylinder or header line mounting, without heated liquid trap |
| D | Drum mounting, with heated liquid trap |
| W | Wall mounting, with or without heated liquid trap |
| C | Header-line mounting, with heated liquid trap |

| **Pressure connection, inlet** | |
|---|---|
| VGA-111-4/BC/**1**/11-S-1R-0-O,0F-G,C3 | |
| **1** | 1" |
| 2 | G 3/4 |
| 3 | Yoke USA |
| 4 | G ½ copper line |
| 9 | G 5/8 |
| 14 | 1 ¼" |

| **Vacuum connection, outlet** | |
|---|---|
| VGA-111-4/BC/1/**11**-S-1R-0-O,0F-G,C3 | |
| 11 | PE hose 8/11 |

| **Inlet valve** | |
|---|---|
| VGA-111-4/BC/1/11-**S**-1R-0-O,0F-G,C3 | |
| B | Basic, not for pressure gauge without heated liquid trap |
| **S** | Short, for pressure gauge without heated liquid trap |
| L | Liquid trap, 230 V, 50/60 Hz, standard connection |
| M | Liquid trap, 115 V, 50/60 Hz, standard connection |

| **Pressure gauge** | |
|---|---|
| VGA-111-4/BC/1/11-S-**1**R-0-O,0F-G,C3 | |
| 0 | Without |
| **1** | Pressure gauge, without contact |
| 2 | Pressure gauge, contact (R4, closes at falling pressure) |
| 3 | Pressure gauge, contact (R5, opens at falling pressure) |

| **Position pressure gauge** | |
|---|---|
| VGA-111-4/BC/1/11-S-1**R**-0-O,0F-G,C3 | |
| T | Top |
| **R** | Right |
| X | Basic, not for pressure gauge |

| **Flow limiting nozzle** | |
|---|---|
| VGA-111-4/BC/1/11-S-1R-**0**-O,0F-G,C3 | |
| **0** | Without |
| 1 | With flow limiting nozzle |

| **Filter** | |
|---|---|
| VGA-111-4/BC/1/11-S-1R-0-**O**,0F-G,C3 | |
| **O** | Filter in pressure connection |
| U | Filter in inlet valve |

| **Residual pressure device** | |
|---|---|
| VGA-111-4/BC/1/11-S-1R-0-O,**0**F-G,C3 | |
| 0 | Without |
| 1 | With residual pressure device |

| **Position pressure inlet** | |
|---|---|
| VGA-111-4/BC/1/11-S-1R-0-O,0**F**-G,C3 | |
| **F** | Front |
| L | Left |
| R | Right |

| **Logo** | |
|---|---|
| VGA-111-4/BC/1/11-S-1R-0-O,0F-**G**,C3 | |
| **G** | Grundfos |

| **Product certificate** | |
|---|---|
| VGA-111-4/BC/1/11-S-1R-0-O,0F-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data for VGA-111

### VGA-111 for cylinder or header-line mounting

- Inlet valve **without** heated liquid trap

| Pressure connection | Pressure gauge | Other features | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|
| 1" | Without | | VGA-111-4/BC/1/11-B-0X-0-O,0F-G | 96680069 | 95759869 |
| | With | | VGA-111-4/BC/1/11-S-1R-0-O,0F-G | 96680135 | 95759870 |
| | Contact (R4) | | VGA-111-4/BC/1/11-S-2R-0-O,0F-G | 95723062 | 95759872 |
| | Contact (R5) | | VGA-111-4/BC/1/11-S-3R-0-O,0F-G | 95723061 | 95759874 |
| | With | Residual pressure safety device | VGA-111-4/BC/1/11-S-1R-0-O,1F-G | 96680233 | 95759876 |
| | Contact (R4) | | VGA-111-4/BC/1/11-S-2R-0-O,1F-G | 96680186 | 95759877 |
| | Contact (R5) | | VGA-111-4/BC/1/11-S-3R-0-O,1F-G | 96680115 | 95759878 |
| | With | Flow limiting nozzle, max 650 g/h | VGA-111-4/BC/1/11-S-1R-1-O,0F-G | 96680159 | 95759880 |
| | Contact (R4) | | VGA-111-4/BC/1/11-S-2R-1-O,0F-G | 95716850 | 95759881 |
| | Contact (R5) | | VGA-111-4/BC/1/11-S-3R-1-O,0F-G | 95703019 | 95759882 |
| G 3/4 | Without | | VGA-111-4/BC/2/11-B-0X-0-O,0F-G | 96680071 | 95759883 |
| | With | | VGA-111-4/BC/2/11-S-1R-0-O,0F-G | 95712192 | 95759884 |
| | Contact (R4) | | VGA-111-4/BC/2/11-S-2R-0-O,0F-G | 95759885 | 95759886 |
| | Contact (R5) | | VGA-111-4/BC/2/11-S-3R-0-O,0F-G | 95759666 | 95759887 |
| Yoke USA | Without | | VGA-111-4/B/3/11-B-0X-0-O,0F-G | 91834644 | 95759888 |
| | With | | VGA-111-4/B/3/11-S-1R-0-O,0F-G | 95759889 | 95759890 |
| | Contact (R4) | | VGA-111-4/B/3/11-S-2R-0-O,0F-G | 95759891 | 95759892 |
| | Contact (R5) | | VGA-111-4/B/3/11-S-3R-0-O,0F-G | 95759893 | 95759894 |
| G 5/8 | With | | VGA-111-4/B/9/11-S-1R-0-O,0F-G | 95759895 | 95759896 |
| | Contact (R4) | | VGA-111-4/B/9/11-S-2R-0-O,0F-G | 95759897 | 95759898 |
| | Contact (R5) | | VGA-111-4/B/9/11-S-3R-0-O,0F-G | 95759899 | 95759900 |

### VGA-111 for drum mounting

- Inlet valve **with** heated liquid trap
- Connection left, pressure gauge top-mounted

| Pressure connection | Pressure gauge | Heated liquid trap | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|
| Yoke USA | With | 230 V, 50/60 Hz | VGA-111-4/D/3/11-L-1T-0-U,0L-G | 96680201 | 95759901 |
| | Contact (R4) | | VGA-111-4/D/3/11-L-2T-0-U,0L-G | 95759902 | 95759903 |
| | Contact (R5) | | VGA-111-4/D/3/11-L-3T-0-U,0L-G | 95759904 | 95759905 |
| | With | 115 V, 50/60 Hz | VGA-111-4/D/3/11-M-1T-0-U,0L-G | 95759906 | 95759907 |
| | Contact (R4) | | VGA-111-4/D/3/11-M-2T-0-U,0L-G | 95759908 | 95759909 |
| | Contact (R5) | | VGA-111-4/D/3/11-M-3T-0-U,0L-G | 95759910 | 95759911 |
| 1 ¼" | With | 230 V, 50/60 Hz | VGA-111-4/D/14/11-L-1T-0-U,0L-G | 96680121 | 95759912 |
| | Contact (R4) | | VGA-111-4/D/14/11-L-2T-0-U,0L-G | 96680116 | 95759913 |
| | Contact (R5) | | VGA-111-4/D/14/11-L-3T-0-U,0L-G | 95759914 | 95759915 |

### VGA-111 for header-line mounting

- Inlet valve **with** heated liquid trap
- Pressure gauge top-mounted

| Pressure connection | Pressure gauge | Heated liquid trap | Pressure inlet position | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|---|
| 1" | With | 230 V, 50/60 Hz | Left | VGA-111-4/C/1/11-L-1T-0-U,0L-G | 96680132 | 95759917 |
| | Contact (R4) | | | VGA-111-4/C/1/11-L-2T-0-U,0L-G | 96680139 | 95759918 |
| | Contact (R5) | | | VGA-111-4/C/1/11-L-3T-0-U,0L-G | 95721695 | 95759919 |
| | With | 230 V, 50/60 Hz | Right | VGA-111-4/C/1/11-L-1T-0-U,0R-G | 95717322 | 95759920 |
| | Contact (R4) | | | VGA-111-4/C/1/11-L-2T-0-U,0R-G | 95733061 | 95759921 |
| | Contact (R5) | | | VGA-111-4/C/1/11-L-3T-0-U,0R-G | 96680101 | 95759922 |

| Pressure connection | Pressure gauge | Heated liquid trap | Pressure inlet position | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|---|
| G 3/4 | With | 230 V, 50/60 Hz | Left | VGA-111-4/C/2/11-L-1T-0-U,0L-G | 95712206 | 95759923 |
| | Contact (R4) | | | VGA-111-4/C/2/11-L-2T-0-U,0L-G | 95759924 | 95759925 |
| | Contact (R5) | | | VGA-111-4/C/2/11-L-3T-0-U,0L-G | 95745834 | 95759926 |
| | With | 230 V, 50/60 Hz | Right | VGA-111-4/C/2/11-L-1T-0-U,0R-G | 95758862 | 95759927 |
| | Contact (R4) | | | VGA-111-4/C/2/11-L-2T-0-U,0R-G | 95759928 | 95759929 |
| | Contact (R5) | | | VGA-111-4/C/2/11-L-3T-0-U,0R-G | 95759930 | 95759931 |

### VGA-111 for wall mounting

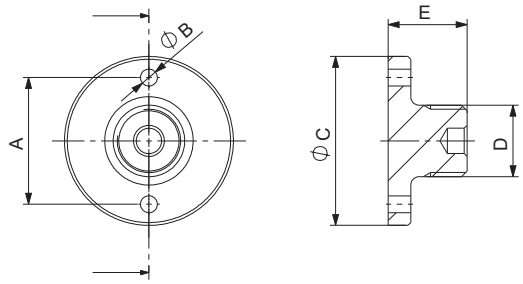
- Inlet valve **with** or **without** heated liquid trap
- Brackets for wall-mounting included

| Pressure connection | Pressure gauge | Other features | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|
| G 1/2 | With | Without liquid trap | VGA-111-4/W/4/11-S-1R-0-U,0F-G | 96680129 | 95759932 |
| | Contact (R4) | | VGA-111-4/W/4/11-S-2R-0-U,0F-G | 95759379 | 95759933 |
| | Contact (R5) | | VGA-111-4/W/4/11-S-3R-0-U,0F-G | 95719411 | 95759934 |
| G 1/2 | With | With heated liquid trap, 230 V, 50/60 Hz | VGA-111-4/W/4/11-L-1R-0-U,0F-G | 96680091 | 95759935 |
| | Contact (R4) | | VGA-111-4/W/4/11-L-2R-0-U,0F-G | 95718353 | 95759936 |
| | Contact (R5) | | VGA-111-4/W/4/11-L-3R-0-U,0F-G | 95707323 | 95759937 |

### Supporting plate for VGA-111 (accessory)

The supporting plate is fixed at a wall and intended to hold the VGA-111 during chlorine cylinder exchange.

**Dimensions of a supporting plate for VGA-111**




Dimensions in mm

| D | A | øB | øC | E |
|---|---|---|---|---|
| 1" | 45 | 6 | 60 | 28 |
| G 5/8 | | | | |
| G 3/4 | | | | |

### Order data for a supporting plate for VGA-111

| Description | Product number |
|---|---|
| Supporting plate for VGA-111, connection 1" | 96680976 |
| Supporting plate for VGA-111, connection G 3/4 | 96708811 |
| Supporting plate for VGA-111, connection G 5/8 | 98025824 |

## Vaccuperm VGA-146 up to 10 kg/h

The VGA-146 vacuum regulator for chlorine capacities up to 10 kg/h is intended for operation with a 189 change-over device and a single or multiple VGA-113, VGA-117 or VGS-141 dosing regulator.

The VGA-146 vacuum regulator is available with different thread sizes and yoke connection for various installation options:

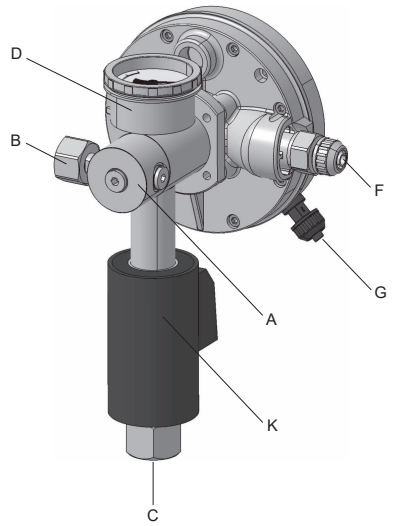
- Cylinder mounting
- Drum mounting
- Header-line mounting
- Wall mounting

The VGA-146 vacuum regulator includes:

- Internal filter, easily accessible for maintenance
- Integrated pressure relief valve
- 5 gaskets for pressure-side connection

Options:

- Chlorine-resistant pressure-gauge with or without contact for monitoring the pressure in the chlorine cylinder or drum
- Heated liquid trap to prevent liquid chlorine from entering the inlet valve (recommended for applications with chlorine drums and header lines)




TM074725

*VGA-146 with heated liquid trap*

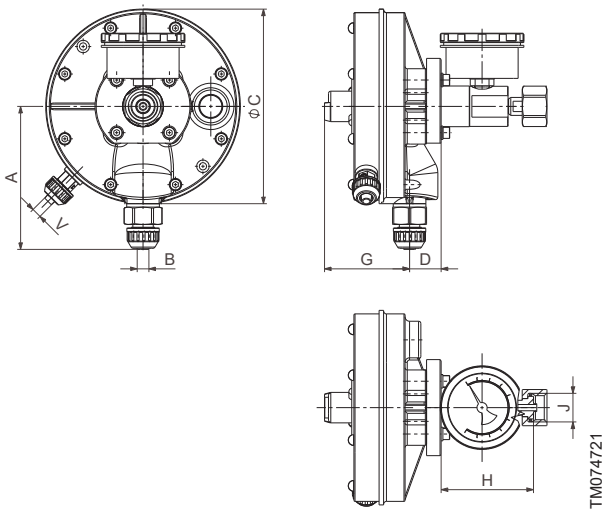
| Pos. | Component |
|---|---|
| A | Inlet valve |
| B | Inlet, pressure connection |
| C | Filter |
| D | Pressure gauge |
| F | Outlet, vacuum connection |
| G | Outlet, vent connection |
| K | Heated liquid trap |

## Technical data VGA-146

| | |
|---|---|
| Medium | Chlorine gas |
| Capacity | Up to 10 kg/h |
| Material | • Enclosure: PVC<br>• Inlet valve: silver/PTFE, special alloy<br>• Springs: alloy C-4, coated<br>• Diaphragm: FEP<br>• Filter: PTFE/ceramic<br>• O-rings: FKM |
| Connections | Pressure connection inlet:<br>• Union nut 1"; G 3/4; 1 ¼"; G 1/2<br>• Yoke USA<br>Vacuum connection outlet:<br>• PE hose 10/14<br>• PVC pipe DN 15 (order separately)<br>Vent connection outlet:<br>• PE hose 8/11 |
| Pressure gauge | • Pressure range: 0 to 16 bar<br>• Without contact or with contact<br>• Contact (R4) closes at falling pressure<br>• Contact (R5) opens at falling pressure<br>• Max. 10 W, 75 VDC, 50 VAC, 0.5 A |
| Heater for liquid trap | Max. 12 W, 230 or 115 V, 50/60 Hz, IP54 |
| Weight | 2.4 kg; 4.8 kg (with heated liquid trap) |

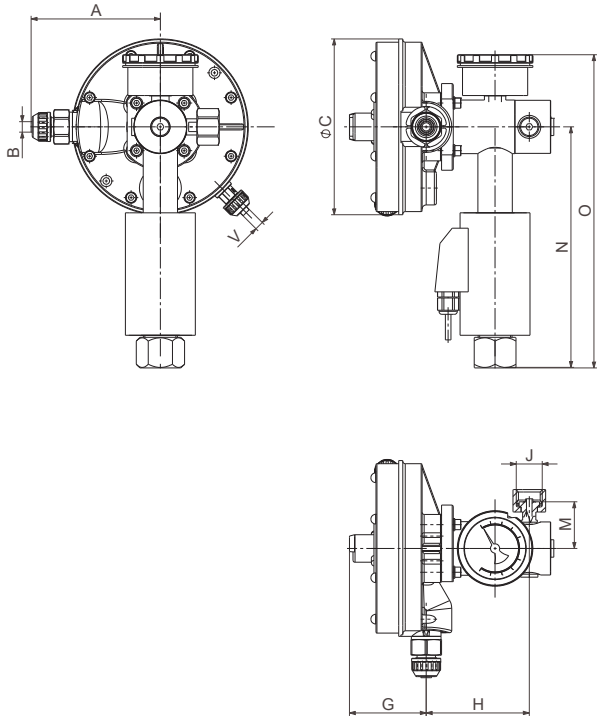
### Dimensions VGA-146

- VGA-146 without heated liquid trap, for header-line mounting

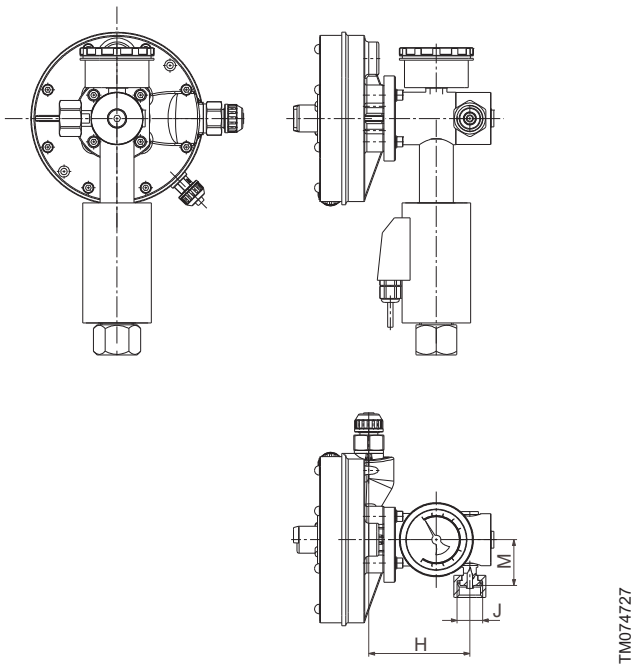



*Vaccuperm VGA-146, pressure connection 1", G 3/4; pressure inlet front*

- VGA-146 with heated liquid trap, for header-line mounting

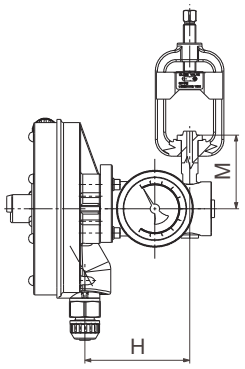



*VGA-146, pressure connection 1", G 3/4; pressure inlet left*

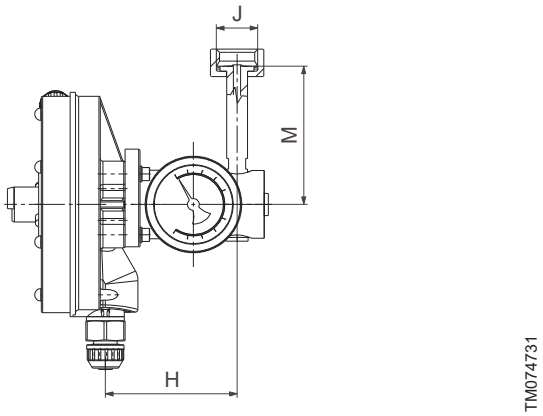



*VGA-146, pressure connection 1", G 3/4; pressure inlet right*

- VGA-146 with heated liquid trap, for drum mounting

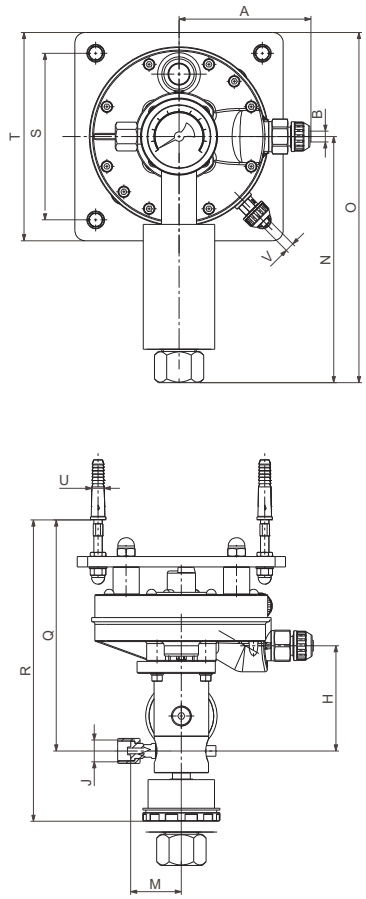



*VGA-146, pressure connection yoke USA, pressure inlet left*

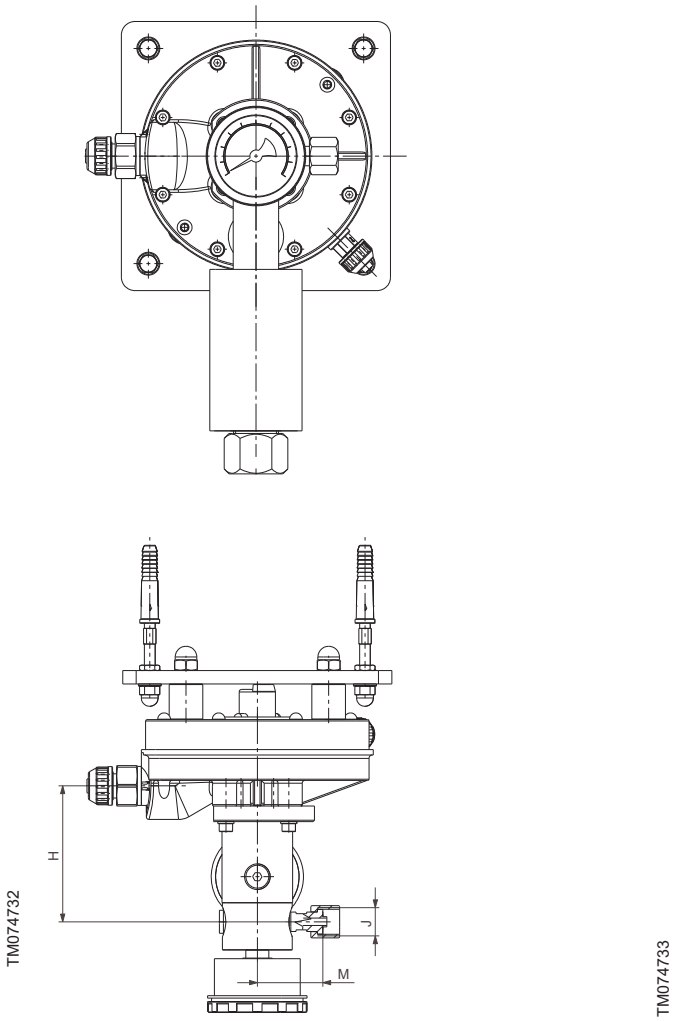



*VGA-146, pressure connection 1 ¼", pressure inlet left*

- VGA-146 with heated liquid trap, for wall mounting

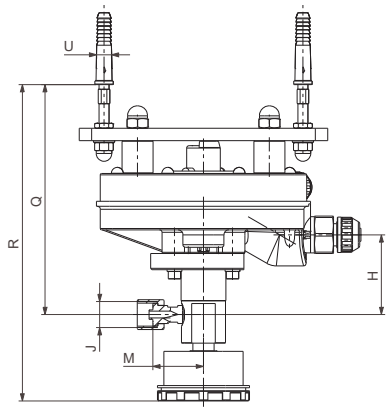



*VGA-146, pressure connection G 1/2, pressure inlet left*

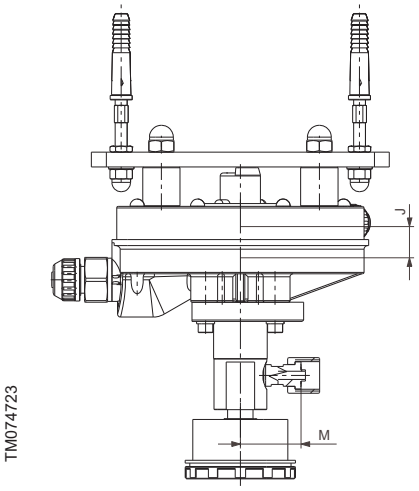



*VGA-146, pressure connection G 1/2, pressure inlet right*

- VGA-146 without heated liquid trap, for wall mounting




*VGA-146, pressure inlet left*




*VGA-146, pressure inlet right*

Dimensions in mm

| J | A | B | C | D | G | V | T | S | U |
|---|---|---|---|---|---|---|---|---|---|
| 1" | | | | | | | | | |
| G 3/4 | | | | | | | | | |
| Yoke USA | 127 | PE 10/14 | 172 | 28 | 75 | 8x11 | - | - | - |
| 1 ¼" | | | | | | | | | |
| G 1/2 | | | | | | | 200 | 160 | 10 |

| J | Without heated liquid trap | | | | With heated liquid trap | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | H | M | Q | R | H | M | N | Q | R |
| 1" | 82 | | | | | 46 | | | |
| G 3/4 | 106 | | | | | 71 | | | |
| Yoke USA | - | - | - | - | 101 | 71 | 236 | - | - |
| 1 ¼" | - | | | | | 106 | | | |
| G 1/2 | 64 | 41 | 185 | 55 | | 49 | | 222 | 290 |

## Type key VGA-146

| Type | |
|---|---|
| **VGA-146** -10/D/3/6-L-1T-U,0L-G,C3 | |
| **VGA-146** | Vacuum regulator |

| Capacity | |
|---|---|
| VGA-146-**10**/D/3/6-L-1T-U,0L-G,C3 | |
| **10** | 10 kg/h |

| Installation type | |
|---|---|
| VGA-146-10/**D**/3/6-L-1T-U,0L-G,C3 | |
| **D** | Drum mounting, with heated liquid trap |
| DC | Drum or header-line mounting, with heated liquid trap |
| W | Wall mounting, with or without heated liquid trap |
| C | Header-line mounting, with or without heated liquid trap |

| **Pressure connection, inlet** | |
|---|---|
| VGA-146-10/D/**3**/6-L-1T-U,0L-G,C3 | |
| 1 | 1" |
| 2 | G 3/4 |
| **3** | Yoke USA |
| 4 | G 1/2 copper line |
| 14 | 1 ¼" |

| **Vacuum connection, outlet** | |
|---|---|
| VGA-146-10/D/3/**6**-L-1T-U,0L-G,C3 | |
| **6** | PE hose 10/14 |

| **Inlet valve** | |
|---|---|
| VGA-146-10/D/3/6-**L**-1T-U,0L-G,C3 | |
| S | Short for pressure gauge without heated liquid trap |
| **L** | Liquid trap, 230 V, 50/60 Hz, standard connection |
| M | Liquid trap, 115 V, 50/60 Hz, standard connection |
| N | Liquid trap, 230 V, 50/60 Hz, extended connection |

| **Pressure gauge** | |
|---|---|
| VGA-146-10/D/3/6-L-**1**T-U,0L-G,C3 | |
| 0 | Without |
| **1** | Pressure gauge, without contact |
| 2 | Pressure gauge, contact (R4, closes at falling pressure) |
| 3 | Pressure gauge, contact (R5, opens at falling pressure) |

| **Position pressure gauge** | |
|---|---|
| VGA-146-10/D/3/6-L-1**T**-U,0L-G,C3 | |
| **T** | Top |
| F | Front |

| **Filter** | |
|---|---|
| VGA-146-10/D/3/6-L-1T-**U**,0L-G,C3 | |
| **U** | Filter in inlet valve |

| **Residual pressure device** | |
|---|---|
| VGA-146-10/D/3/6-L-1T-U,**0**L-G,C3 | |
| **0** | Without |

| **Position pressure inlet** | |
|---|---|
| VGA-146-10/D/3/6-L-1T-U,0**L**-G,C3 | |
| F | Front |
| L | Left |
| R | Right |

| **Logo** | |
|---|---|
| VGA-146-10/D/3/6-L-1T-U,0L-**G**,C3 | |
| G | Grundfos |

| **Product certificate** | |
|---|---|
| VGA-146-10/D/3/6-L-1T-U,0L-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data for VGA-146

### VGA-146 for drum mounting

- Inlet valve with heated liquid trap
- Connection left, pressure gauge top-mounted
- Vacuum hose connection 10/14, for vacuum pipe connection DN 15 see Pipe connection (accessory)

| Pressure connection | Pressure gauge | Heated liquid trap | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|
| Yoke USA | With | 230 V, 50/60 Hz | VGA-146-10/D/3/6-L-1T-U,0L-G | 96681252 | 95747089 |
| | Contact (R4) | | VGA-146-10/D/3/6-L-2T-U,0L-G | 96709616 | 95759964 |
| | Contact (R5) | | VGA-146-10/D/3/6-L-3T-U,0L-G | 95759965 | 95759966 |
| Yoke USA | With | 115 V, 50/60 Hz | VGA-146-10/D/3/6-M-1T-U,0L-G | 91834760 | 95759967 |
| | Contact (R4) | | VGA-146-10/D/3/6-M-2T-U,0L-G | 95759968 | 95759969 |
| | Contact (R5) | | VGA-146-10/D/3/6-M-3T-U,0L-G | 95759970 | 95759971 |
| 1 ¼" | With | 230 V, 50/60 Hz | VGA-146-10/D/14/6-N-1T-U,0L-G | 95758751 | 95759972 |
| | Contact (R4) | | VGA-146-10/D/14/6-N-2T-U,0L-G | 95759973 | 95759974 |
| | Contact (R5) | | VGA-146-10/D/14/6-N-3T-U,0L-G | 95759975 | 95759976 |

### VGA-146 for header-line mounting

- Inlet valve with or without heated liquid trap
- Pressure inlet position front, pressure gauge top-mounted (without liquid trap)
- Pressure inlet position right or left, pressure gauge top-mounted (with liquid trap)
- Vacuum hose connection 10/14, for vacuum pipe connection DN 15 see Pipe connection (accessory)

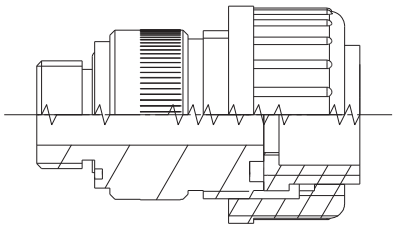
| Pressure connection | Pressure gauge | Other features | Pressure inlet position | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|---|
| 1" | Without | Without liquid trap | Front | VGA-146-10/C/1/6-S-0T-U,0F-G | 96709552 | 95759977 |
| | With | | | VGA-146-10/C/1/6-S-1T-U,0F-G | 96709553 | 95759978 |
| | Contact (R4) | | | VGA-146-10/C/1/6-S-2T-U,0F-G | 95759979 | 95759980 |
| | Contact (R5) | | | VGA-146-10/C/1/6-S-3T-U,0F-G | 95759981 | 95759982 |
| | With | With heated liquid trap, 230 V, 50/60 Hz | Right | VGA-146-10/C/1/6-L-1T-U,0R-G | 96709551 | 95759983 |
| | Contact (R4) | | | VGA-146-10/C/1/6-L-2T-U,0R-G | 96709556 | 95759984 |
| | Contact (R5) | | | VGA-146-10/C/1/6-L-3T-U,0R-G | 96681256 | 95759985 |
| | With | With heated liquid trap, 230 V, 50/60 Hz | Left | VGA-146-10/DC/1/6-L-1T-U,0L-G | 96681247 | 95759987 |
| | Contact (R4) | | | VGA-146-10/DC/1/6-L-2T-U,0L-G | 96709555 | 95759988 |
| | Contact (R5) | | | VGA-146-10/DC/1/6-L-3T-U,0L-G | 96709568 | 95759989 |
| G 3/4 | Without | Without liquid trap | Front | VGA-146-10/C/2/6-S-0T-U,0F-G | 96709578 | 95759992 |
| | With | | | VGA-146-10/C/2/6-S-1T-U,0F-G | 95712438 | 95759993 |
| | Contact (R4) | | | VGA-146-10/C/2/6-S-2T-U,0F-G | 95759990 | 95759994 |
| | Contact (R5) | | | VGA-146-10/C/2/6-S-3T-U,0F-G | 95759991 | 95759995 |
| | With | With heated liquid trap, 230 V, 50/60 Hz | Right | VGA-146-10/C/2/6-L-1T-U,0R-G | 95747984 | 95759997 |
| | Contact (R4) | | | VGA-146-10/C/2/6-L-2T-U,0R-G | 95747985 | 95759998 |
| | Contact (R5) | | | VGA-146-10/C/2/6-L-3T-U,0R-G | 95759996 | 95759999 |
| | With | With heated liquid trap, 230 V, 50/60 Hz | Left | VGA-146-10/DC/2/6-L-1T-U,0L-G | 96709566 | 95759986 |
| | Contact (R4) | | | VGA-146-10/DC/2/6-L-2T-U,0L-G | 96709615 | 95760000 |
| | Contact (R5) | | | VGA-146-10/DC/2/6-L-3T-U,0L-G | 95725732 | 95760001 |

### VGA-146 for wall mounting

- Inlet valve with or without heated liquid trap
- Pressure inlet position right or left, pressure gauge front-mounted
- Plate for wall-mounting included
- Vacuum hose connection 10/14, for vacuum pipe DN 15 see Pipe connection (accessory)

| Pressure connection | Pressure gauge | Other features | Pressure inlet position | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|---|
| G 1/2 | Without | Without liquid trap | Left | VGA-146-10/W/4/6-S-0F-U,0L-G | 96709580 | 95760005 |
| | With | | | VGA-146-10/W/4/6-S-1F-U,0L-G | 96646927 | 95760002 |
| | Contact (R4) | | | VGA-146-10/W/4/6-S-2F-U,0L-G | 96709582 | 95760003 |
| | Contact (R5) | | | VGA-146-10/W/4/6-S-3F-U,0L-G | 95708148 | 95760004 |
| | With | With heated liquid trap, 230 V, 50/60 Hz | Left | VGA-146-10/W/4/6-L-1F-U,0L-G | 96681254 | 95760009 |
| | Contact (R4) | | | VGA-146-10/W/4/6-L-2F-U,0L-G | 96681258 | 95756967 |
| | Contact (R5) | | | VGA-146-10/W/4/6-L-3F-U,0L-G | 96709610 | 95756969 |
| | Without | Without liquid trap | Right | VGA-146-10/W/4/6-S-0F-U,0R-G | 95716316 | 95760006 |
| | With | | | VGA-146-10/W/4/6-S-1F-U,0R-G | 95703408 | 95760007 |
| | Contact (R4) | | | VGA-146-10/W/4/6-S-2F-U,0R-G | 95702441 | 95760008 |
| | Contact (R5) | | | VGA-146-10/W/4/6-S-3F-U,0R-G | 95743102 | 95756966 |
| | With | With heated liquid trap, 230 V, 50/60 Hz | Right | VGA-146-10/W/4/6-L-1F-U,0R-G | 95709134 | 95759803 |
| | Contact (R4) | | | VGA-146-10/W/4/6-L-2F-U,0R-G | 96709571 | 95756968 |
| | Contact (R5) | | | VGA-146-10/W/4/6-L-3F-U,0R-G | 96709611 | 95756970 |

### Pipe connection (accessory)



TM075084

| Description | Product number |
|---|---|
| Pipe connection, DN 15 (1 unit) | 99358518 |

## Vaccuperm VGS-147 up to 40 kg/h

The VGS-147 vacuum regulator for chlorine capacities up to 40 kg/h is intended for operation with a 186-120 change-over device and a single or multiple VGA-117 or VGS-141-145 dosing regulator.

The VGS-147 vacuum regulator is available for the mounting option:

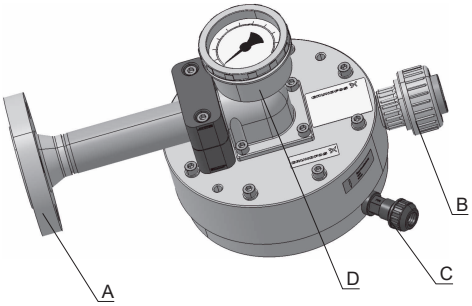
- Header-line mounting (DN 25), in combination with a LiquFilt 524 heated liquid trap

The VGS-147 vacuum regulator includes:

- Integrated pressure relief valve

Options:

- Chlorine-resistant pressure gauge with or without contact for monitoring the pressure in the header line. The R4 contact signal can also be used for triggering a 186-120 change-over device.
- Pressure inlet position left or right




TM074982



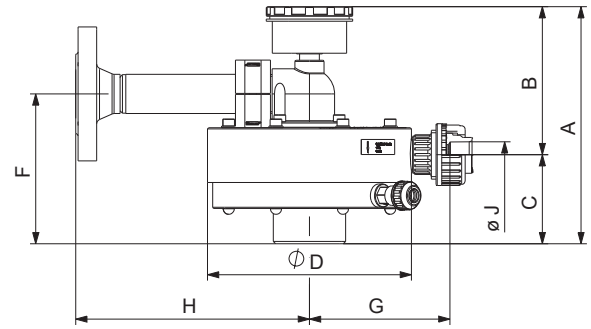

TM075177

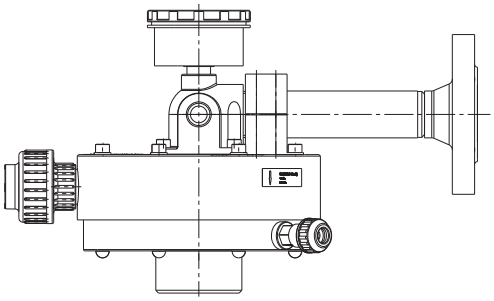
| Pos. | Component |
|---|---|
| A | Inlet, pressure connection |
| B | Outlet, vacuum connection |
| C | Outlet, vent connection |
| D | Pressure gauge |

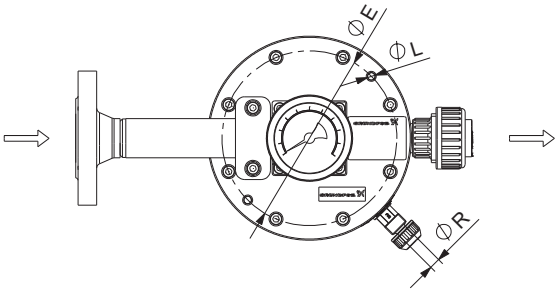
## Technical data VGS-147

| | |
|---|---|
| Medium | Chlorine gas |
| Capacity | up to 40 kg/h |
| Material | • Enclosure: PVC<br>• Inlet valve: silver/PTFE, special alloy<br>• Springs: alloy C-4, coated<br>• Diaphragm: FEP<br>• O-rings: FKM |
| Connections | • Pressure connection inlet: groove flange DN 25, PN 40 (EN 1092-1)<br>• Vacuum connection outlet: PVC pipe DN 20 (20/25)<br>• Vent connection outlet: PE hose 8/11 |
| Pressure gauge | • Pressure range: 0 to 16 bar<br>• Without contact or with contact<br>• Contact (R4) closes at falling pressure<br>• Contact (R5) opens at falling pressure<br>• Max. 10 W, 75 VDC, 50 VAC, 0.5 A |
| Weight | 4.8 kg |

### Dimensions VGS-147

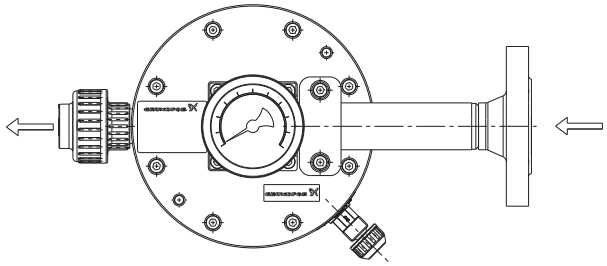





TM074983

*VGS-147, pressure inlet left*



TM074984

*VGS-147, pressure inlet right*

Dimensions in mm

| | A | B | C | øD | øE | F | G | H | J | øL | øR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VGS-147 with pressure gauge | 203.5 | 127 | 76.5 | 175 | 150 | 129 | 120.5 | 200.5 | DN 20 | 6.6 | 8/11 |
| VGS-147 without pressure gauge | 163 | 86.5 | 78.5 | 175 | 150 | 129 | 120.5 | 200.5 | DN 20 | 6.6 | 8/11 |

## Type key VGS-147

| **Type** | |
|---|---|
| **VGS-147** -40/W/16/14-S-0F-L-G,C3 | |
| **VGS-147** | Vacuum regulator |

| **Capacity** | |
|---|---|
| VGS-147-**40**/W/16/14-S-0F-L-G,C3 | |
| **40** | 40 kg/h |

| **Installation type** | |
|---|---|
| VGS-147-40/**W**/16/14-S-0F-L-G,C3 | |
| **W** | Wall/pipe mounting |

| **Pressure connection, inlet** | |
|---|---|
| VGS-147-40/W/**16**/14-S-0F-L-G,C3 | |
| **16** | Groove flange DN 25 (EN 1092) without counter flange |

| **Vacuum connection, outlet** | |
|---|---|
| VGS-147-40/W/16/**14**-S-0F-L-G,C3 | |
| **14** | PVC pipe DN 20 (20/25) |

| **Inlet valve** | |
|---|---|
| VGS-147-40/W/16/14-**S**-0F-L-G,C3 | |
| **S** | Short, for pressure gauge |

| Pressure gauge | |
|---|---|
| VGS-147-40/W/16/14-S-**0**F-L-G,C3 | |
| **0** | Without |
| 1 | Pressure gauge, without contact |
| 2 | Pressure gauge, contact (R4, closes at falling pressure) |
| 3 | Pressure gauge, contact (R5, opens at falling pressure) |

| Position pressure gauge | |
|---|---|
| VGS-147-40/W/16/14-S-0**F**-L-G,C3 | |
| **F** | Front |

| Position pressure inlet | |
|---|---|
| VGS-147-40/W/16/14-S-0F-**L**-G,C3 | |
| **L** | Left |
| R | Right |

| Logo | |
|---|---|
| VGS-147-40/W/16/14-S-0F-L-**G**,C3 | |
| **G** | Grundfos |

| Product certificate | |
|---|---|
| VGS-147-40/W/16/14-S-0F-L-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data for VGS-147

### VGS-147, up to 40 kg/h

- Pressure-side connection: groove flange DN 25 (EN 1092)
- Vacuum pipe connection: DN 20, PVC

| Pressure gauge | Pressure inlet position | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| Without | Left | VGS-147-40/W/16/14-S-0F-L-G | 95743254 | 95760755 |
| With | | VGS-147-40/W/16/14-S-1F-L-G | 95709573 | 95760756 |
| Contact (R4) | | VGS-147-40/W/16/14-S-2F-L-G | 95723280 | 95760757 |
| Contact (R5) | | VGS-147-40/W/16/14-S-3F-L-G | 95746675 | 95760758 |
| Without | Right | VGS-147-40/W/16/14-S-0F-R-G | 95760753 | 95760759 |
| With | | VGS-147-40/W/16/14-S-1F-R-G | 95734852 | 95760760 |
| Contact (R4) | | VGS-147-40/W/16/14-S-2F-R-G | 95760754 | 95760761 |
| Contact (R5) | | VGS-147-40/W/16/14-S-3F-R-G | 95746676 | 95760762 |

## Vaccuperm VGS-148 up to 200 kg/h

The VGS-148 vacuum regulator is available for 3 different chlorine capacities up to 70 kg/h, up to 120 kg/h, up to 200 kg/h and intended for operation with an evaporator, a 186-120 or 185 change-over device and a VGS-143 or VGS-145 multiple or single dosing regulator.

The VGS-148 vacuum regulator is available for the mounting option:

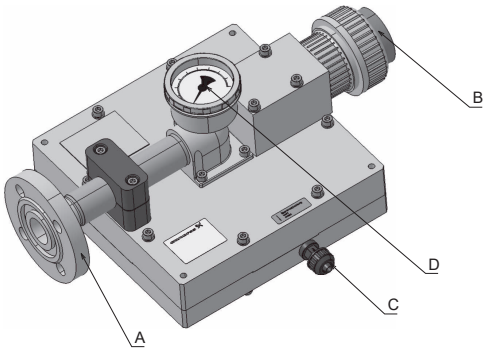
- Mounting on DN 25 piping, in combination with a LiquFilt 524 heated liquid trap and a 544 pressure reducing valve

The VGS-148 vacuum regulator includes:

- Integrated pressure relief valve

Options:

- Chlorine resistant pressure gauge with or without contact for monitoring the pressure in the header line. The R4 contact signal must be used for triggering a 186-120 change-over device.
- Pressure inlet position left or right




TM074979



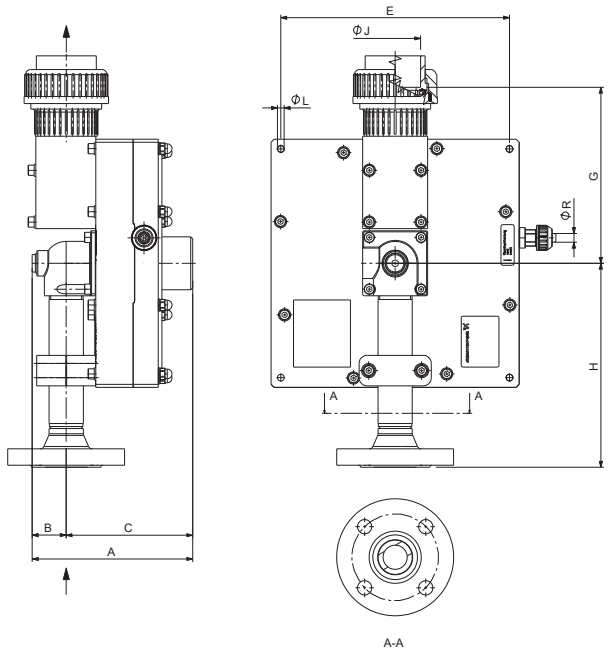
TM075178

| Pos. | Component |
|---|---|
| A | Inlet, pressure connection |
| B | Outlet, vacuum connection |
| C | Outlet, vent connection |
| D | Pressure gauge |

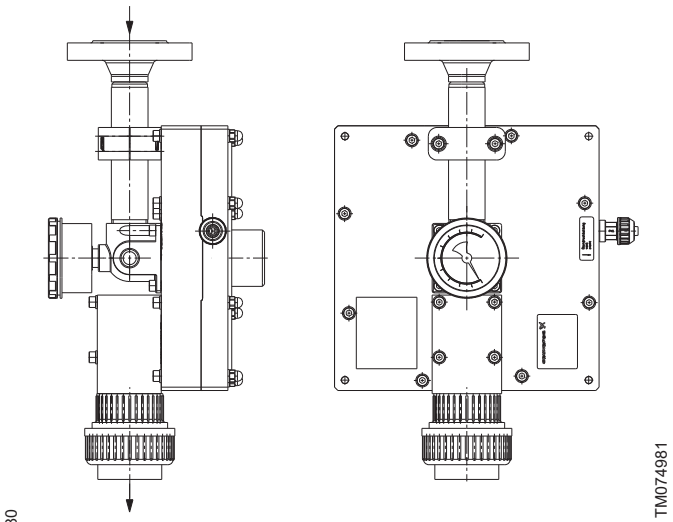
## Technical data VGS-148

| | |
|---|---|
| Medium | Chlorine gas |
| Capacity | 70 kg/h, 120 kg/h, 200 kg/h |
| Material | • Enclosure: PVC<br>• Inlet valve: silver/PTFE, special alloy<br>• Springs: alloy C-4, coated<br>• Diaphragm: FEP<br>• O-rings: FKM |
| Connections | • Pressure connection inlet: groove flange DN 25, PN 40 (EN 1092-1)<br>• Vacuum connection outlet: PVC pipe DN 40 (40/50)<br>• Vent connection outlet: PE hose 8/11 |
| Pressure gauge | • Pressure range: 0 to 16 bar<br>• Without contact or with contact<br>• Contact (R4) closes at falling pressure<br>• Contact (R5) opens at falling pressure<br>• Max. 10 W, 75 VDC, 50 VAC, 0.5 A |
| Weight | 8.0 kg |

### Dimensions VGS-148




*VGS-148 without pressure gauge, pressure inlet left*




*VGS-148 with pressure gauge, pressure inlet right*

Dimensions in mm

| | A | B | C | D | E | G | H | øJ | øL | øR |
|---|---|---|---|---|---|---|---|---|---|---|
| VGS-148 with pressure gauge | 200 | 75 | 125 | 244 | 244.9 | 173 | 200 | DN 40 | 6.6 | 8/11 |
| VGS-148 without pressure gauge | 159 | 34 | 125 | 244 | 244.9 | 173 | 200 | DN 40 | 6.6 | 8/11 |

## Type key VGS-148

| **Type** | |
|---|---|
| **VGS-148** -70/W/16/17-S-0F-L-G,C3 | |
| **VGA-148** | Vacuum regulator |

| **Capacity** | |
|---|---|
| VGS-148-**70**/W/16/17-S-0F-L-G,C3 | |
| **70** | 70 kg/h |
| 120 | 120 kg/h |
| 200 | 200 kg/h |

| **Installation type** | |
|---|---|
| VGS-148-70/**W**/16/17-S-0F-L-G,C3 | |
| **W** | Wall/pipe mounting |

| **Pressure connection, inlet** | |
|---|---|
| VGS-148-70/W/**16**/17-S-0F-L-G,C3 | |
| **16** | Groove flange DN 25 (EN 1092) without counter flange |

| **Vacuum connection, outlet** | |
|---|---|
| VGS-148-70/W/16/**17**-S-0F-L-G,C3 | |
| **17** | PVC pipe DN 40 (40/50) |

| **Inlet valve** | |
|---|---|
| VGS-148-70/W/16/17-**S**-0F-L-G,C3 | |
| **S** | Short, for pressure gauge |

| **Pressure gauge** | |
|---|---|
| VGS-148-70/W/16/17-S-**0**F-L-G,C3 | |
| **0** | Without |
| 1 | Pressure gauge, without contact |
| 2 | Pressure gauge, contact (R4, closes at falling pressure) |
| 3 | Pressure gauge, contact (R5, opens at falling pressure) |

| **Position pressure gauge** | |
|---|---|
| VGS-148-70/W/16/17-S-0**F**-L-G,C3 | |
| **F** | Front |

| **Position pressure inlet** | |
|---|---|
| VGS-148-70/W/16/17-S-0F-**L**-G,C3 | |
| **L** | Left |
| R | Right |

| **Logo** | |
|---|---|
| VGS-148-70/W/16/17-S-0F-L-**G**,C3 | |
| **G** | Grundfos |

| **Product certificate** | |
|---|---|
| VGS-148-70/W/16/17-S-0F-L-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data for VGS-148

### VGS-148, up to 70 kg/h

- Pressure-side connection: groove flange DN 25 (EN 1092)
- Vacuum pipe connection: DN 40, PVC

| Pressure gauge | Pressure inlet position | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| Without | Left | VGS-148-70/W/16/17-S-0F-L-G | 95760764 | 95760770 |
| With | | VGS-148-70/W/16/17-S-1F-L-G | 95754129 | 95760771 |
| Contact (R4) | | VGS-148-70/W/16/17-S-2F-L-G | 95727617 | 95760772 |
| Contact (R5) | | VGS-148-70/W/16/17-S-3F-L-G | 95760765 | 95760773 |
| Without | Right | VGS-148-70/W/16/17-S-0F-R-G | 95760766 | 95760774 |
| With | | VGS-148-70/W/16/17-S-1F-R-G | 95760767 | 95760775 |
| Contact (R4) | | VGS-148-70/W/16/17-S-2F-R-G | 95760768 | 95760776 |
| Contact (R5) | | VGS-148-70/W/16/17-S-3F-R-G | 95760769 | 95760777 |

### VGS-148, up to 120 kg/h

- Pressure side connection: groove flange DN 25 (EN 1092)
- Vacuum pipe connection: DN 40, PVC

| Pressure gauge | Pressure inlet position | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| Without | Left | VGS-148-120/W/16/17-S-0F-L-G | 95760778 | 95760786 |
| With | | VGS-148-120/W/16/17-S-1F-L-G | 95760779 | 95760787 |
| Contact (R4) | | VGS-148-120/W/16/17-S-2F-L-G | 95760780 | 95760788 |
| Contact (R5) | | VGS-148-120/W/16/17-S-3F-L-G | 95760781 | 95760789 |
| Without | Right | VGS-148-120/W/16/17-S-0F-R-G | 95760782 | 95760790 |
| With | | VGS-148-120/W/16/17-S-1F-R-G | 95760783 | 95760791 |
| Contact (R4) | | VGS-148-120/W/16/17-S-2F-R-G | 95760784 | 95760792 |
| Contact (R5) | | VGS-148-120/W/16/17-S-3F-R-G | 95760785 | 95760793 |

### VGS-148, up to 200 kg/h

- Pressure side connection: groove flange DN 25 (EN 1092)
- Vacuum pipe connection: DN 40, PVC

| Pressure gauge | Pressure inlet position | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| Without | Left | VGS-148-200/W/16/17-S-0F-L-G | 95760794 | 95760802 |
| With | | VGS-148-200/W/16/17-S-1F-L-G | 95760795 | 95760803 |
| Contact (R4) | | VGS-148-200/W/16/17-S-2F-L-G | 95760796 | 95760804 |
| Contact (R5) | | VGS-148-200/W/16/17-S-3F-L-G | 95760797 | 95760805 |
| Without | Right | VGS-148-200/W/16/17-S-0F-R-G | 95760798 | 95760806 |
| With | | VGS-148-200/W/16/17-S-1F-R-G | 95760799 | 95760807 |
| Contact (R4) | | VGS-148-200/W/16/17-S-2F-R-G | 95760800 | 95760808 |
| Contact (R5) | | VGS-148-200/W/16/17-S-3F-R-G | 95760801 | 95760809 |

# 5. Dosing regulators

## Vaccuperm VGA-113 up to 4 kg/h

**VGA-113-110**

The VGA 113-110 dosing regulator is used to adjust the chlorine dosing capacity manually. The dosed quantity can be read at the integrated flowmeter. The VGA-113-110 operates under sonic flow conditions without a differential pressure regulator. A VGB injector is required.

The VGA-113-110 dosing regulator is available with the following features:

- Manual capacity adjustment
- Integrated flowmeter (floater principle)
- Various capacities
- Vacuum connections for 8/11 PE hose
- Wall-mounting
- For operation with VGA-111 vacuum regulator




TM075172

**VGA-113-311**

The VGA-113-311 dosing regulator is used to adjust the chlorine dosing capacity manually. The dosed quantity can be read at the integrated flowmeter. The VGA-113-311 operates with a differential pressure regulator to control the vacuum for a high dosing accuracy. A VGA injector is required.

The VGA-113-311 dosing regulator is available with the following features:

- Manual capacity adjustment
- Integrated flowmeter (floater principle)
- Various capacities
- Vacuum connections for 8/11 PE hose
- Wall-mounting
- For operation with VGA-111 vacuum regulator



TM075328

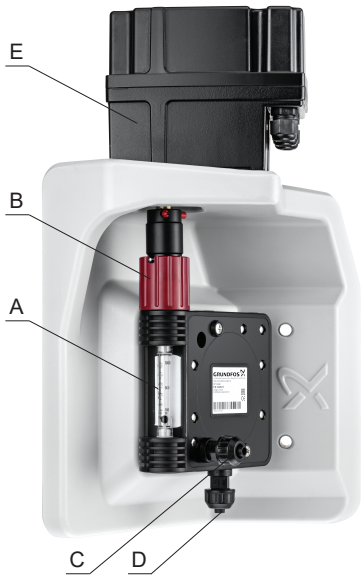
*VGA-113-311, manual capacity adjustment*

**VGA-113-391**

The VGA-113-391 dosing regulator is used to adjust the chlorine dosing capacity via servomotor. The dosed quantity can be read at the integrated flowmeter. The VGA-113-391 operates with a differential pressure regulator to control the vacuum for a high dosing accuracy. A VGA injector is required.

The VGA-113-391 dosing regulator is available with the following features:

- Manual or automatic capacity adjustment via servomotor
- Integrated flowmeter (floater principle)
- Various capacities
- Vacuum connections for 8/11 PE hose
- Wall-mounting
- For operation with VGA-111 vacuum regulator

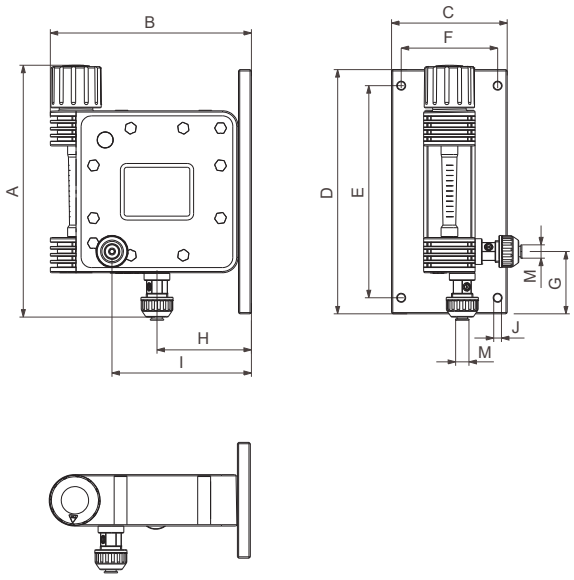



| Pos. | Component |
|---|---|
| A | Flowmeter |
| B | Adjustment knob |
| C | Inlet, vacuum connection |
| D | Outlet, vacuum connection to injector |
| E | Servomotor |

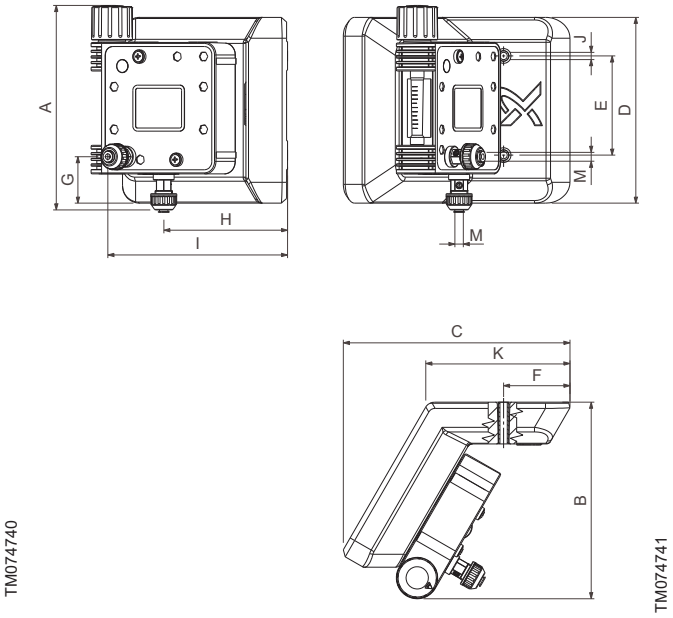
## Technical data VGA-113

| | |
|---|---|
| Medium | Chlorine gas |
| Capacity | Up to 4000 g/h |
| Adjustment ratio | 1:20 |
| Accuracy | ± 4 % |
| Measuring device | According to the floater principle, measuring tube 70 mm |
| Material | • Enclosure: PVC<br>• Springs: alloy C-4, silver-coated<br>• Diaphragm: FEP<br>• Rate valve: PVC<br>• O-rings: FKM |
| Connections | Vacuum connection: PE hose 8/11 mm |
| Weight | 0.9 kg; 3.1 kg (with servomotor) |
| Servomotor | • Supply voltage: 110-240 V 50/60 Hz or 24 VDC<br>• Input/output signal: 4-20 mA<br>• Enclosure: IP65<br>• Actuating time (1-100 %): 90 s<br>• Power consumption: 15 VA<br>• Fault relay: potential-free, NC |

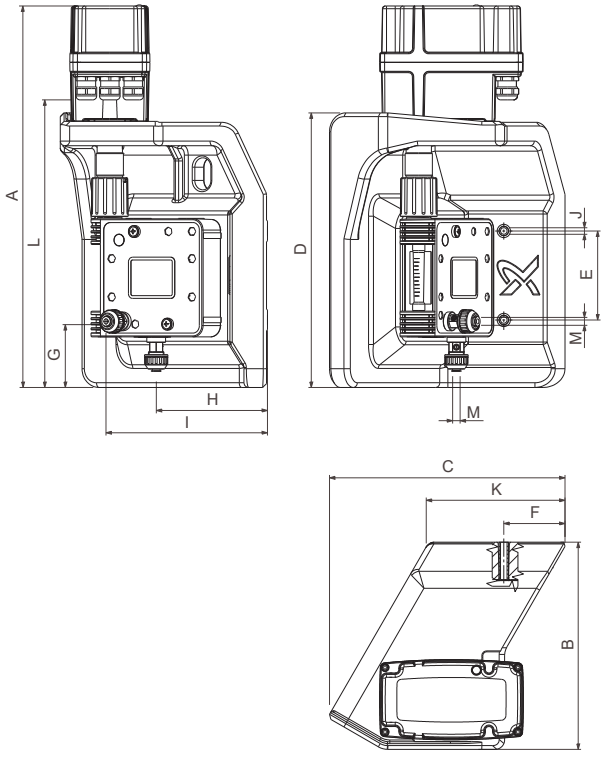
**Dimensions of VGA-113**




*VGA-113-110, manual version*




*VGA-113-311, manual version*




*VGA-113-391, automatic version with servomotor*

Dimensions in mm

| Type | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VGA-113--110 | 196 | 156 | 90 | 190 | 165 | 75 | 48.5 | 73 | 108 | 6 | - | - | 8x11 |
| VGA-113--311 | 196 | 188 | 217 | 178 | 95 | 64 | 44 | 119 | 172 | 7 | 138 | - | 8x11 |
| VGA-113--391 | 407 | 221 | 251 | 293 | 95 | 65 | 70.5 | 119 | 172 | 7 | 148 | 307 | 8x11 |

## Type key VGA-113

| Type | |
|---|---|
| **VGA-113** -25/11-M0,Y-G,C3 | |
| **VGA-113** | Dosing regulator |

| Capacity | |
|---|---|
| VGA-113-**25**/11-M0,Y-G,C3 | |
| **25** | 1-25 g/h |
| 40 | 2-40 g/h |
| 100 | 5-100 g/h |
| 250 | 10-250 g/h |
| 500 | 25-500 g/h |
| 1000 | 50-1000 g/h |
| 2000 | 100-2000 g/h |
| 3000 | 150-3000 g/h |
| 4000 | 400-4000 g/h |

| Vacuum connection, inlet/outlet | |
|---|---|
| VGA-113-25/**11**-M0,Y-G,C3 | |
| **11** | PE hose 8/11 |

| Adjustment | |
|---|---|
| VGA-113-25/11-**M0**,Y-G,C3 | |
| **M0** | Manual |
| D3 | Automatic, 110-240 V, 50/60 Hz, 4-20 mA |
| D4 | Automatic, 24 VDC, 4-20 mA |

| Differential pressure regulator | |
|---|---|
| VGA-113-25/11-M0,**Y**-G,C3 | |
| **N** | Without |
| Y | With |

| Logo | |
|---|---|
| VGA-113-25/11-M0,Y-**G**,C3 | |
| **G** | Grundfos |

| Product certificate | |
|---|---|
| VGA-113-25/11-M0,Y-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data for VGA-113

### VGA-113-110, manual capacity adjustment

| Capacity [g/h] | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| 5-100 | VGA-113-100/11-M0,N-G | 96680284 | 95758143 |
| 10-250 | VGA-113-250/11-M0,N-G | 96680286 | 95759948 |
| 25-500 | VGA-113-500/11-M0,N-G | 96680276 | 95759949 |
| 50-1000 | VGA-113-1000/11-M0,N-G | 96680275 | 95759950 |
| 100-2000 | VGA-113-2000/11-M0,N-G | 96680283 | 95759951 |
| 150-3000 | VGA-113-3000/11-M0,N-G | 96680287 | 95759952 |
| 400-4000 | VGA-113-4000/11-M0,N-G | 96680281 | 95759953 |

### VGA-113-311, manual capacity adjustment

| Capacity [g/h] | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| 1-25 | VGA-113-25/11-M0,Y-G | 95722277 | 95759940 |
| 2-40 | VGA-113-40/11-M0,Y-G | 95722278 | 95759941 |
| 5-100 | VGA-113-100/11-M0,Y-G | 95722279 | 95759942 |
| 10-250 | VGA-113-250/11-M0,Y-G | 95722280 | 95759943 |
| 25-500 | VGA-113-500/11-M0,Y-G | 95722281 | 95754102 |
| 50-1000 | VGA-113-1000/11-M0,Y-G | 95722282 | 95759944 |
| 100-2000 | VGA-113-2000/11-M0,Y-G | 95722283 | 95759945 |
| 150-3000 | VGA-113-3000/11-M0,Y-G | 95722284 | 95759946 |
| 400-4000 | VGA-113-4000/11-M0,Y-G | 95722285 | 95759947 |

### VGA-113-391, automatic capacity adjustment

Supply voltage servomotor: 110-240 V, 50/60 Hz

| Capacity [g/h] | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| 2-40 | VGA-113-40/11-D3,Y-G | 95722288 | 95759938 |
| 5-100 | VGA-113-100/11-D3,Y-G | 95722290 | 95751801 |
| 10-250 | VGA-113-250/11-D3,Y-G | 95722292 | 95754454 |
| 25-500 | VGA-113-500/11-D3,Y-G | 95722294 | 95749040 |
| 50-1000 | VGA-113-1000/11-D3,Y-G | 95722296 | 95749041 |
| 100-2000 | VGA-113-2000/11-D3,Y-G | 95722298 | 95749038 |
| 150-3000 | VGA-113-3000/11-D3,Y-G | 95722300 | 95759939 |
| 400-4000 | VGA-113-4000/11-D3,Y-G | 95722302 | 95749023 |

### VGA-113-391, automatic capacity adjustment

Supply voltage servomotor: 24 VDC

| Capacity [g/h] | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| 2-40 | VGA-113-40/11-D4,Y-G | 95760293 | 95760301 |
| 5-100 | VGA-113-100/11-D4,Y-G | 95760294 | 95760302 |
| 10-250 | VGA-113-250/11-D4,Y-G | 95760295 | 95760303 |
| 25-500 | VGA-113-500/11-D4,Y-G | 95760296 | 95760304 |
| 50-1000 | VGA-113-1000/11-D4,Y-G | 95760297 | 95760305 |
| 100-2000 | VGA-113-2000/11-D4,Y-G | 95760298 | 95760306 |
| 150-3000 | VGA-113-3000/11-D4,Y-G | 95760299 | 95760307 |
| 400-4000 | VGA-113-4000/11-D4,Y-G | 95760300 | 95760308 |

## Vaccuperm VGA-117 up to 20 kg/h

**VGA-117-110**

The VGA-117-110 dosing regulator is used to adjust the chlorine dosing capacity manually. The dosed quantity can be read at the integrated flowmeter. The VGA-117-110 operates under sonic flow conditions without a differential pressure regulator. A VGB injector is required.

The VGA-117-110 dosing regulator is available with the following features:

- Manual capacity adjustment
- Integrated flowmeter (floater principle)
- Various capacities
- Vacuum connections: 10/14 PE hose up to 10 kg/h;  PVC Pipe DN 20 for 20 kg/h
- Wall-mounting
- For operation with VGA-146 vacuum regulator up to 10 kg/h,  with VGS-147 vacuum regulator for 20 kg/h

Option:

- For DN 15 vacuum pipe connections up to 10 kg/h, see Order data for pipe connection (accessory).

**VGA-117-190**

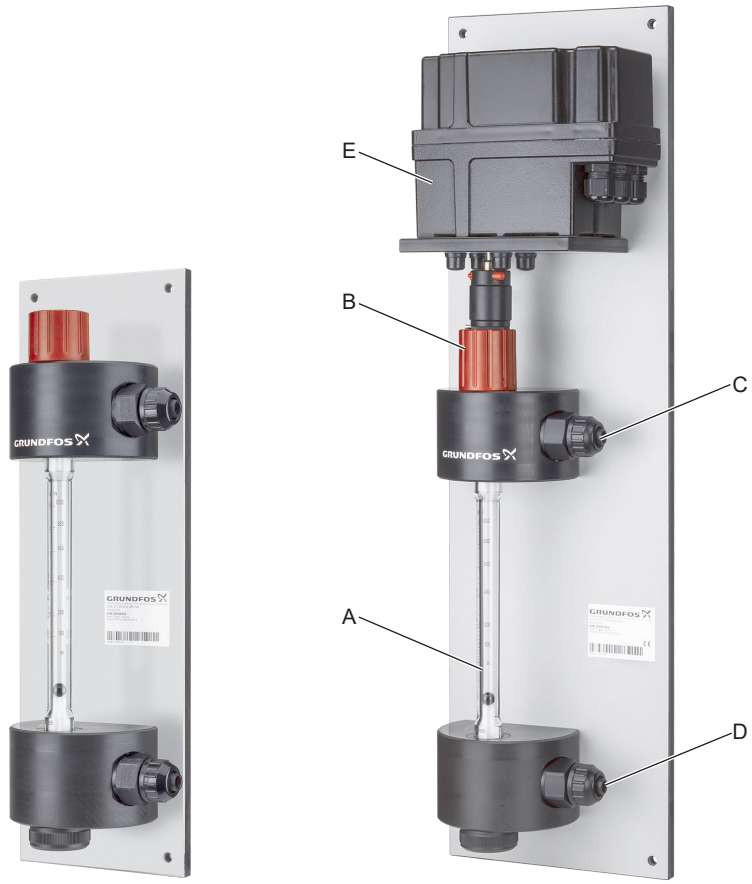
The VGA-117-190 dosing regulator is used to adjust the chlorine dosing capacity via servomotor. The dosed quantity can be read at the integrated flowmeter. The VGA-117-190 operates under sonic flow conditions without a differential pressure regulator. A VGB injector is required.

The VGA-117-190 dosing regulator is available with the following features:

- Manual or automatic capacity adjustment via servomotor
- Integrated flowmeter (floater principle)
- Various capacities
- Vacuum connections 10/14 PE hose up to 10 kg/h; PVC Pipe DN 20 for 20 kg/h
- Wall-mounting
- For operation with VGA-146 vacuum regulator up to 10 kg/h, with VGS-147 vacuum regulator for 20 kg/h

Option:

- For DN 15 vacuum pipe connections up to 10 kg/h, see Order data for pipe connection (accessory).



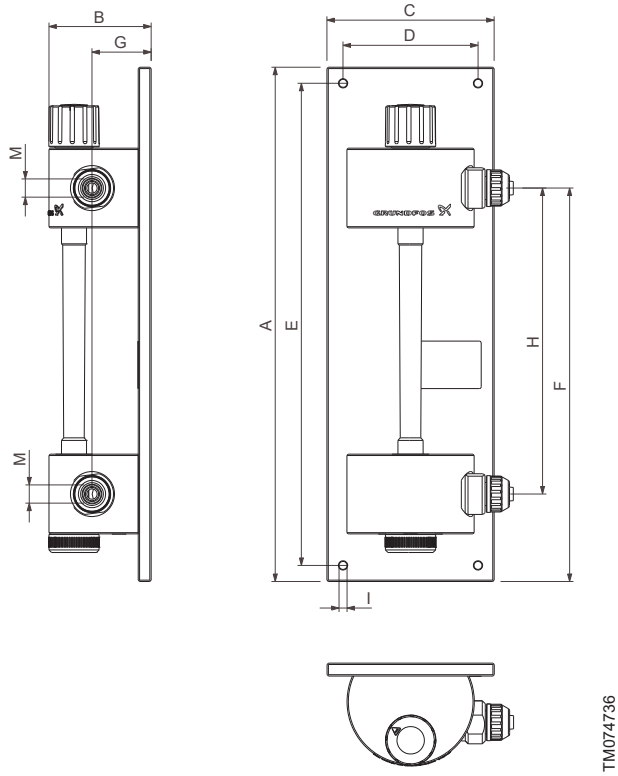

*VGA-117-110, manual capacity adjustment (left); VGA-117-190 with servomotor (right)*

| Pos. | Component | Pos. | Component |
|---|---|---|---|
| A | Flowmeter | D | Outlet, vacuum connection to injector |
| B | Adjustment knob | E | Servomotor |
| C | Inlet, vacuum connection | | |

## Technical data VGA-117

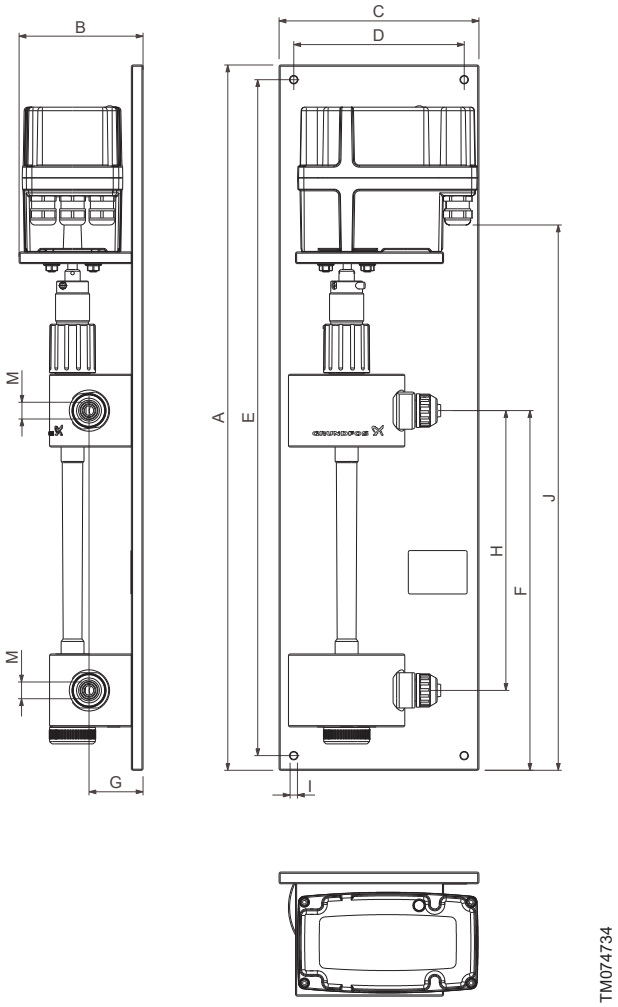
| | |
|---|---|
| Medium | Chlorine gas |
| Capacity range | Up to 20 kg/h |
| Adjustment ratio | 1:20 |
| Accuracy | ± 4 % |
| Measuring device | According to the floater principle, measuring tube 190 or 300 mm |
| Material | • Enclosure: PVC<br>• Rate valve: PVC<br>• O-rings: FKM |
| Connections | Vacuum connection<br>up to 10 kg/h: PE hose 10/14<br>for 20 kg/h: PVC Pipe DN20 |
| Weight | 1.9 kg; 4.1 kg (with servomotor) |
| Servomotor | • Supply voltage: 110-240 V 50/60 Hz or 24 VDC<br>• Input / output signal: 4-20 mA<br>• Enclosure: IP65<br>• Actuating time (1-100 %): 90 s<br>• Power consumption: 15 VA<br>• Fault relay: potential-free NC |

**Dimensions of VGA-117**




TM074736

*VGA-117-110, manual version*




TM074734

*VGA-117-190, automatic version with servomotor*

Dimensions in mm

| Type | Capacity [kg/h] | A | B | C | D | E | F | G | H | I | J | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VGA-117-110, manual | up to 10 | 400 | 79.5 | 130 | 105 | 375 | 306 | 46 | 238 | 6.2 | - | 10/14 |
| VGA-117-190, automatic | up to 10 | 600 | 105.5 | 170 | 145 | 575 | 306 | 46 | 238 | 6.2 | 464 | 10/14 |
| VGA-117-110, manual | 20 | 484 | 89.5 | 170 | 145 | 459 | 418 | 56 | 350 | 6.2 | - | DN 20 |
| VGA-117-190, automatic | 20 | 710 | 105.5 | 170 | 145 | 685 | 418 | 56 | 350 | 6.2 | 574 | DN 20 |

## Type key VGA-117

| Type | |
|---|---|
| **VGA-117** -500/6-M0,N-G,C3 | |
| **VGA-117** | Dosing regulator |

| Dosing capacity | |
|---|---|
| VGA-117-**500**/6-M0,N-G,C3 | |
| **500** | 25-500 g/h |
| 1000 | 50-1000 g/h |
| 2000 | 100-2000 g/h |
| 4000 | 400-4000 g/h |
| 6000 | 300-6000 g/h |
| 8000 | 400-8000 g/h |
| 10000 | 500-10000 g/h |
| 20000 | 1000-20000 g/h |

| Vacuum connection, inlet/outlet | |
|---|---|
| VGA-117-500/**6**-M0,N-G,C3 | |
| **6** | PE hose 10/14 |
| 14 | PVC pipe DN 20 (20/25) |

| Adjustment | |
|---|---|
| VGA-117-500/6-**M0**,N-G,C3 | |
| **MO** | Manual |
| D3 | Automatic, 110-240 V, 50/60 Hz, 4-20 mA |
| D4 | Automatic 24 VDC, 4-20 mA |

| Differential pressure regulator | |
|---|---|
| VGA-117-500/6-M0,**N**-G,C3 | |
| **N** | Without |

| Logo | |
|---|---|
| VGA-117-500/6-M0,N-**G**,C3 | |
| **G** | Grundfos |

| Product certificate | |
|---|---|
| VGA-117-500/6-M0,N-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data for VGA-117

### VGA-117-110, manual capacity adjustment

| Capacity [g/h] | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| 25-500 | VGA-117-500/6-M0,N-G | 91834652 | 95760013 |
| 50-1000 | VGA-117-1000/6-M0,N-G | 91834655 | 95760014 |
| 100-2000 | VGA-117-2000/6-M0,N-G | 91834654 | 95760015 |
| 400-4000 | VGA-117-4000/6-M0,N-G | 91834651 | 95755818 |
| 300-6000 | VGA-117-6000/6-M0,N-G | 96680442 | 95760016 |
| 400-8000 | VGA-117-8000/6-M0,N-G | 95703355 | 95760017 |
| 500-10000 | VGA-117-10000/6-M0,N-G | 96680440 | 95758579 |
| 1000-20000 | VGA-117-20000/14-M0,N-G | 92526180 | 92526189 |

### VGA-117-190, automatic capacity adjustment

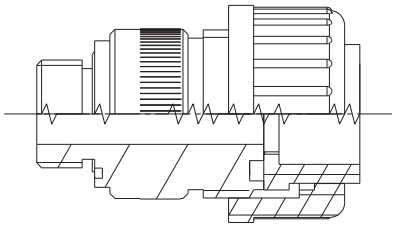
- Supply voltage: 110-240 V, 50/60 Hz

| Capacity [g/h] | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| 25-500 | VGA-117-500/6-D3,N-G | 96680467 | 95760024 |
| 50-1000 | VGA-117-1000/6-D3,N-G | 96680468 | 95760025 |
| 100-2000 | VGA-117-2000/6-D3,N-G | 96680469 | 95760026 |
| 400-4000 | VGA-117-4000/6-D3,N-G | 96680470 | 95747091 |
| 300-6000 | VGA-117-6000/6-D3,N-G | 96680471 | 95756528 |
| 400-8000 | VGA-117-8000/6-D3,N-G | 96680464 | 95760027 |
| 500-10000 | VGA-117-10000/6-D3,N-G | 96680465 | 95760028 |
| 1000-20000 | VGA-117-20000/14-D3,N-G | 92526217 | 92526218 |

- Supply voltage: 24 VDC

| Capacity [g/h] | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| 25-500 | VGA-117-500/6-D4,N-G | 95760310 | 95760317 |
| 50-1000 | VGA-117-1000/6-D4,N-G | 95760311 | 95760318 |
| 100-2000 | VGA-117-2000/6-D4,N-G | 95760312 | 95760319 |
| 400-4000 | VGA-117-4000/6-D4,N-G | 95760313 | 95760320 |
| 300-6000 | VGA-117-6000/6-D4,N-G | 95760314 | 95760321 |
| 400-8000 | VGA-117-8000/6-D4,N-G | 95760315 | 95760322 |
| 500-10000 | VGA-117-10000/6-D4,N-G | 95760316 | 95760323 |
| 1000-20000 | VGA-117-20000/14-D4,N-G | 92526240 | 92526242 |

### Pipe connection (accessory for VGA-117 up to 10 kg/h)



TM075084

| Description | Product number |
|---|---|
| Pipe connection, DN 15 (1 unit) | 99358518 |

# Vaccuperm VGS-141, VGS-143, VGS-145 chlorine gas dosing systems up to 200 kg/h

Vaccuperm VGS-141, VGS-143 and VGS-145 chlorine gas dosing systems are used for accurate adjustment of the chlorine gas dosing flow.

The VGS systems are available in the following capacity ranges:

- VGS-141: up to 10 kg/h
- VGS-143: up to 40 kg/h
- VGS-145: up to 200 kg/h

All VGS systems operate with a differential pressure regulator to control the vacuum for a high dosing accuracy. A VGA or VGS injector is required.

Option for VGS-141:

- For DN 15 vacuum pipe connection, see order data (accessory)

All VGS gas dosing systems are available in the following versions:

**VGS-14X, manual**

- Manual capacity adjustment
- Vacuum meter for monitoring the injector vacuum
- In an enclosure for floor or wall mounting

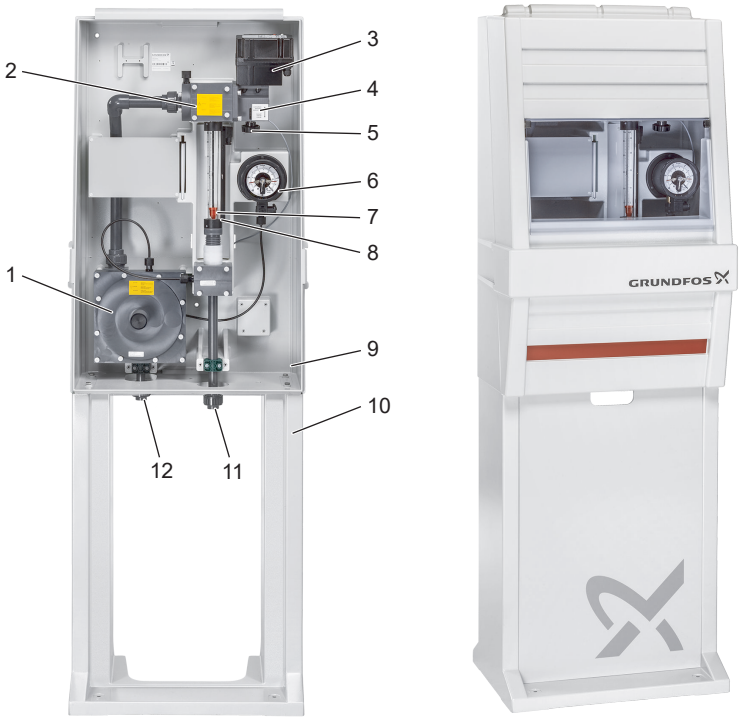
**VGS-14X, automatic**

- Manual or automatic capacity adjustment with servomotor
- Vacuum meter with contact for monitoring the injector vacuum
- Manual/automatic indication of the position of the rate-valve adjusting spindle
- In an enclosure for floor or wall mounting

**VGS-14X, advanced**

- Automatic or manual capacity adjustment with servomotor
- Vacuum meter with contact for monitoring the injector vacuum
- Manual/automatic indication of the position of the rate-valve adjusting spindle
- Flow meter scanning with 4-20 mA output
- In an enclosure for floor or wall mounting

**Overview of a Vaccuperm gas dosing system**



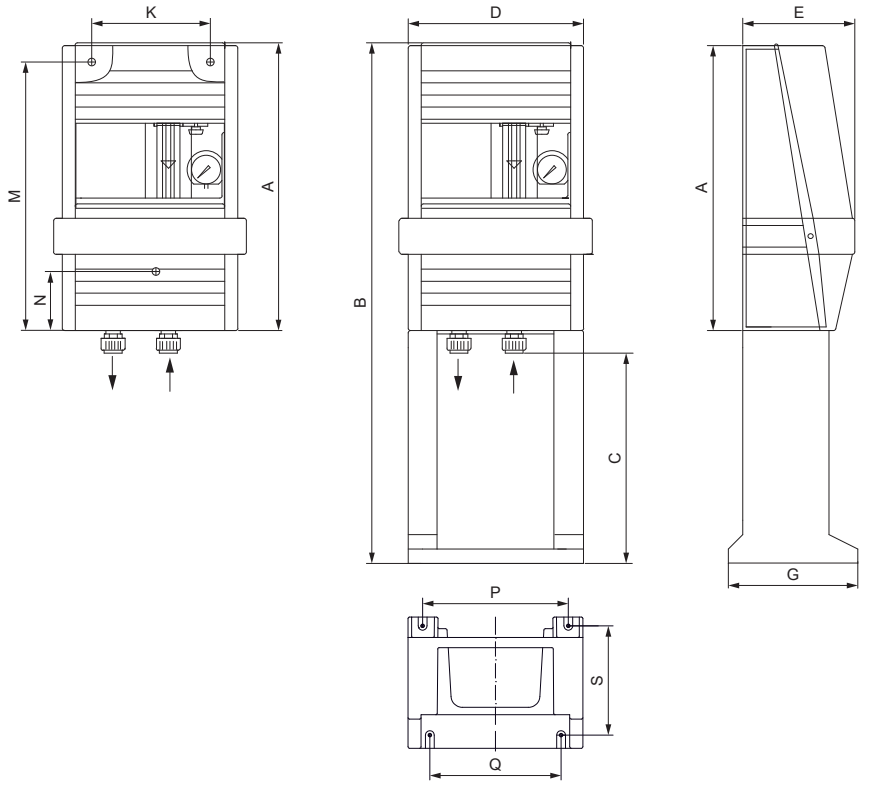

TM075295

| Pos. | Component |
|---|---|
| 1 | Differential pressure regulator |
| 2 | Linear rate valve |
| 3 | Servomotor |
| 4 | Sensor for manual or automatic indication of the position of the rate-valve adjusting spindle |
| 5 | Manual capacity adjusting knob |
| 6 | Vacuum meter for injector vacuum with or without limit contacts |
| 7 | Flowmeter according to floater principle |
| 8 | Flowmeter scanning with 4-20 mA output |
| 9 | Enclosure for wall or floor mounting |
| 10 | Foot for floor mounting |
| 11 | Inlet, vacuum connection |
| 12 | Outlet, vacuum connection to the injector |

## Technical data VGS-141, VGS-143, VGS-145

| | |
|---|---|
| Medium | Chlorine gas |
| Capacity | • VGS-141: up to 10 kg/h<br>• VGS-143: up to 40 kg/h<br>• VGS-145: up to 200 kg/h |
| Adjustment ratio | 1:20 |
| Accuracy | ± 4 % |
| Measuring device | According to the floater principle, measuring tube 300 mm |
| Material | • Enclosure: Polyurethane<br>• Chlorine-carrying pipes: PVC<br>• Springs: alloy C-4, silver-coated<br>• Diaphragm: FEP<br>• Rate valve: PVC/PTFE<br>• O-rings: FKM |
| Connections | • VGS-141: PE tube 10/14, optional connection DN 15<br>• VGS-143: PVC pipe DN 20<br>• VGS-145: PVC pipe DN 40 |
| Weight | Approx. 45 kg |
| Servomotor | • Supply voltage: 110-240 V 50/60 Hz or 24 VDC<br>• Input/output signal: 4-20 mA<br>• Enclosure: IP65<br>• Actuating time (1-100 %): 90 s<br>• Power consumption: 15 VA<br>• Fault relay: potential-free, NC |
| Flow meter scanning | 4-20 mA output signal (measuring range 1:10) |
| Contact vacuummeter | Two contacts with max. signal |
| Manual/automatic remote indication of the position of the rate valve adjusting spindle | Max. 10 W, max 0.5 A, max. 180 VDC, contact closed in servomotor position |

**Dimensions VGS-141, VGS-143, VGS-145**




Dimensions in mm

| Type | A | B | C | D | E | G | K | M | N | P | Q | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VGS-141 | | | 810 | | | | | | | | | |
| VGS-143 | 1000 | 1810 | DN 20: 760 | 610 | 390 | 450 | 505 | 940 | 200 | 500 | 450 | 375 |
| VGS-145 | | | DN 40: 730 | | | | | | | | | |

## Type key VGS-141, VGS-143, VGS-145

| Type | |
|---|---|
| **VGS-141** -2/6-M0,V-0,FL,N-0-G,C3 | |
| **VGS-141** | |
| VGS-143 | Gas dosing system |
| VGS-145 | |

| Dosing capacity | |
|---|---|
| VGS-141-**2**/6-M0,V-0,FL,N-0-G,C3 | |
| **2** | 0.1-2 kg/h |
| 4 | 0.2-4 kg/h |
| 8 | 0.4-8 kg/h |
| 10 | 0.5-10 kg/h |
| 20 | 1.0-20 kg/h |
| 40 | 2.0-40 kg/h |
| 70 | 3.5-70 kg/h |
| 120 | 6.0-120 kg/h |
| 200 | 10.0-200 kg/h |

| Vacuum connection, inlet/outlet | |
|---|---|
| VGS-141-2/**6**-M0,V-0,FL,N-0-G,C3 | |
| **6** | PE hose 10/14 |
| 14 | PVC pipe DN 20 (20/25) |
| 17 | PVC pipe DN 40 (40/50) |

| Adjustment | |
|---|---|
| VGS-141-2/6-**M0**,V-0,FL,N-0-G,C3 | |
| **M0** | Manual |
| D3 | Automatic, 110-240 V, 50/60 Hz, 4-20 mA |
| D4 | Automatic, 24 VDC, 4-20 mA |

| Vacuum meter | |
|---|---|
| VGS-141-2/6-M0,**V**-0,FL,N-0-G,C3 | |
| **V** | Vacuum meter |
| W | Contact vacuum meter |

| Flow meter scanning | |
|---|---|
| VGS-141-2/6-M0,V-**0**,FL,N-0-G,C3 | |
| **0** | Without |
| 1 | With |

| Enclosure version | |
|---|---|
| VGS-141-2/6-M0,V-0,**FL**,N-0-G,C3 | |
| **FL** | Floor mounting |
| WA | Wall mounting |

| Vacuum sensor | |
|---|---|
| VGS-141-2/6-M0,V-0,FL,**N**-0-G,C3 | |
| **N** | Without |

| Manual/automatic remote indication | |
|---|---|
| VGS-141-2/6-M0,V-0,FL,N-**0**-G,C3 | |
| **0** | Without |
| 1 | With |

| Logo | |
|---|---|
| VGS-141-2/6-M0,V-0,FL,N-0-**G**,C3 | |
| **G** | Grundfos |

| Product certificate | |
|---|---|
| VGS-141-2/6-M0,V-0,FL,N-0-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data for VGS-141, VGS-143, VGS-145

### VGS-141, manual

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 0.1-2 | Floor-mounting | VGS-141-2/6-M0,V-0,FL,N-0-G | 99897980 | 99898009 |
| 0.2-4 | | VGS-141-4/6-M0,V-0,FL,N-0-G | 99898006 | 99898011 |
| 0.4-8 | | VGS-141-8/6-M0,V-0,FL,N-0-G | 96681186 | 95759511 |
| 0.5-10 | | VGS-141-10/6-M0,V-0,FL,N-0-G | 96681187 | 95760062 |
| 0.1-2 | Wall-mounting | VGS-141-2/6-M0,V-0,WA,N-0-G | 99898012 | 99898024 |
| 0.2-4 | | VGS-141-4/6-M0,V-0,WA,N-0-G | 99898023 | 99898025 |
| 0.4-8 | | VGS-141-8/6-M0,V-0,WA,N-0-G | 95760059 | 95760065 |
| 0.5-10 | | VGS-141-10/6-M0,V-0,WA,N-0-G | 96709291 | 95760066 |

### VGS-141, automatic

- Supply voltage: 110-240 V, 50/60 Hz, 4-20 mA

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 0.1-2 | Floor-mounting | VGS-141-2/6-D3,W-0,FL,N-1-G | 99898401 | 99898424 |
| 0.2-4 | | VGS-141-4/6-D3,W-0,FL,N-1-G | 99898402 | 99898426 |
| 0.4-8 | | VGS-141-8/6-D3,W-0,FL,N-1-G | 95733739 | 95760071 |
| 0.5-10 | | VGS-141-10/6-D3,W-0,FL,N-1-G | 95711066 | 95760072 |
| 0.1-2 | Wall-mounting | VGS-141-2/6-D3,W-0,WA,N-1-G | 99898428 | 99898430 |
| 0.2-4 | | VGS-141-4/6-D3,W-0,WA,N-1-G | 99898429 | 99898443 |
| 0.4-8 | | VGS-141-8/6-D3,W-0,WA,N-1-G | 95746812 | 95760074 |
| 0.5-10 | | VGS-141-10/6-D3,W-0,WA,N-1-G | 96709393 | 95760075 |

- Supply voltage: 24 VDC, 4-20 mA

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 0.1-2 | Floor-mounting | VGS-141-2/6-D4,W-0,FL,N-1-G | 99898510 | 99898512 |
| 0.2-4 | | VGS-141-4/6-D4,W-0,FL,N-1-G | 99898511 | 99898538 |
| 0.4-8 | | VGS-141-8/6-D4,W-0,FL,N-1-G | 95760367 | 95760371 |
| 0.5-10 | | VGS-141-10/6-D4,W-0,FL,N-1-G | 95760368 | 95760372 |
| 0.1-2 | Wall-mounting | VGS-141-2/6-D4,W-0,WA,N-1-G | 99898548 | 99898550 |
| 0.2-4 | | VGS-141-4/6-D4,W-0,WA,N-1-G | 99898549 | 99898563 |
| 0.4-8 | | VGS-141-8/6-D4,W-0,WA,N-1-G | 95760375 | 95760379 |
| 0.5-10 | | VGS-141-10/6-D4,W-0,WA,N-1-G | 95760376 | 95760380 |

### VGS-141, advanced

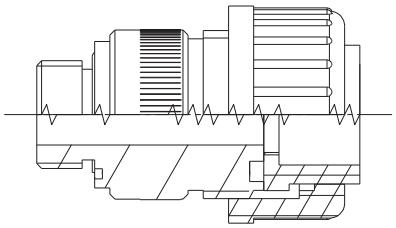
- Supply voltage: 110-240 V, 50/60 Hz, 4-20 mA

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 0.1-2 | Floor-mounting | VGS-141-2/6-D3,W-1,FL,N-1-G | 95760057 | 95760077 |
| 0.2-4 | | VGS-141-4/6-D3,W-1,FL,N-1-G | 95741637 | 95760078 |
| 0.4-8 | | VGS-141-8/6-D3,W-1,FL,N-1-G | 95709540 | 95760079 |
| 0.5-10 | | VGS-141-10/6-D3,W-1,FL,N-1-G | 95711067 | 95760080 |
| 0.1-2 | Wall-mounting | VGS-141-2/6-D3,W-1,WA,N-1-G | 95760058 | 95760081 |
| 0.2-4 | | VGS-141-4/6-D3,W-1,WA,N-1-G | 95760076 | 95760082 |
| 0.4-8 | | VGS-141-8/6-D3,W-1,WA,N-1-G | 95709539 | 95760083 |
| 0.5-10 | | VGS-141-10/6-D3,W-1,WA,N-1-G | 95711068 | 95760084 |

- Supply voltage: 24 VDC, 4-20 mA

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 0.1-2 | Floor-mounting | VGS-141-2/6-D4,W-1,FL,N-1-G | 95760386 | 95760390 |
| 0.2-4 | | VGS-141-4/6-D4,W-1,FL,N-1-G | 95760387 | 95760391 |
| 0.4-8 | | VGS-141-8/6-D4,W-1,FL,N-1-G | 95760388 | 95760392 |
| 0.5-10 | | VGS-141-10/6-D4,W-1,FL,N-1-G | 95760389 | 95760393 |
| 0.1-2 | Wall-mounting | VGS-141-2/6-D4,W-1,WA,N-1-G | 95760394 | 95760398 |
| 0.2-4 | | VGS-141-4/6-D4,W-1,WA,N-1-G | 95760395 | 95760399 |
| 0.4-8 | | VGS-141-8/6-D4,W-1,WA,N-1-G | 95760396 | 95760400 |
| 0.5-10 | | VGS-141-10/6-D4,W-1,WA,N-1-G | 95760397 | 95760401 |

### Pipe connection (accessory for VGS-141)



TM075084

| Description | Product number |
|---|---|
| Pipe connection, DN 15 (1 unit) | 99358518 |

### VGS-143, manual

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 1-20 | Floor-mounting | VGS-143-20/14-M0,V-0,FL,N-0-G | 96681214 | 95756422 |
| 2-40 | | VGS-143-40/14-M0,V-0,FL,N-0-G | 96681216 | 95760085 |
| 1-20 | Wall-mounting | VGS-143-20/14-M0,V-0,WA,N-0-G | 96681219 | 95760086 |
| 2-40 | | VGS-143-40/14-M0,V-0,WA,N-0-G | 96709434 | 95760087 |

### VGS-143, automatic

- Supply voltage: 110-240 V, 50/60 Hz, 4-20 mA

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 1-20 | Floor-mounting | VGS-143-20/14-D3,W-0,FL,N-1-G | 96681226 | 95751530 |
| 2-40 | | VGS-143-40/14-D3,W-0,FL,N-1-G | 96681234 | 95753982 |
| 1-20 | Wall-mounting | VGS-143-20/14-D3,W-0,WA,N-1-G | 95719782 | 95751948 |
| 2-40 | | VGS-143-40/14-D3,W-0,WA,N-1-G | 95719784 | 95760088 |

- Supply voltage: 24V DC, 4-20 mA

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 1-20 | Floor-mounting | VGS-143-20/14-D4,W-0,FL,N-1-G | 95760402 | 95760404 |
| 2-40 | | VGS-143-40/14-D4,W-0,FL,N-1-G | 95760403 | 95760405 |
| 1-20 | Wall-mounting | VGS-143-20/14-D4,W-0,WA,N-1-G | 95760406 | 95760408 |
| 2-40 | | VGS-143-40/14-D4,W-0,WA,N-1-G | 95760407 | 95760409 |

### VGS-143, advanced

- Supply voltage: 110-240 V, 50/60 Hz, 4-20 mA

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 1-20 | Floor-mounting | VGS-143-20/14-D3,W-1,FL,N-1-G | 95707854 | 95752307 |
| 2-40 | | VGS-143-40/14-D3,W-1,FL,N-1-G | 95703238 | 95760094 |
| 1-20 | Wall-mounting | VGS-143-20/14-D3,W-1,WA,N-1-G | 95709541 | 95760095 |
| 2-40 | | VGS-143-40/14-D3,W-1,WA,N-1-G | 95711065 | 95760096 |

- Supply voltage: 24 VDC, 4-20 mA

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 1-20 | Floor-mounting | VGS-143-20/14-D4,W-1,FL,N-1-G | 95760410 | 95760412 |
| 2-40 | | VGS-143-40/14-D4,W-1,FL,N-1-G | 95760411 | 95760413 |
| 1-20 | Wall-mounting | VGS-143-20/14-D4,W-1,WA,N-1-G | 95760414 | 95760416 |
| 2-40 | | VGS-143-40/14-D4,W-1,WA,N-1-G | 95760415 | 95760417 |

### VGS-145, manual

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 3.5-70 | Floor-mounting | VGS-145-70/17-M0,V-0,FL,N-0-G | 96681239 | 95760098 |
| 6-120 | | VGS-145-120/17-M0,V-0,FL,N-0-G | 96681240 | 95756296 |
| 10-200 | | VGS-145-200/17-M0,V-0,FL,N-0-G | 96681237 | 95757438 |
| 3.5-70 | Wall-mounting | VGS-145-70/17-M0,V-0,WA,N-0-G | 96709487 | 95760099 |
| 6-120 | | VGS-145-120/17-M0,V-0,WA,N-0-G | 95725675 | 95760100 |
| 10-200 | | VGS-145-200/17-M0,V-0,WA,N-0-G | 95717098 | 95760101 |

### VGS-145, automatic

- Supply voltage: 110-240 V, 50/60 Hz, 4-20 mA

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 3.5-70 | Floor-mounting | VGS-145-70/17-D3,W-0,FL,N-1-G | 95730259 | 95752299 |
| 6-120 | | VGS-145-120/17-D3,W-0,FL,N-1-G | 95705594 | 95752496 |
| 10-200 | | VGS-145-200/17-D3,W-0,FL,N-1-G | 96681243 | 95752191 |
| 3.5-70 | Wall-mounting | VGS-145-70/17-D3,W-0,WA,N-1-G | 95737515 | 95760102 |
| 6-120 | | VGS-145-120/17-D3,W-0,WA,N-1-G | 95742149 | 95760103 |
| 10-200 | | VGS-145-200/17-D3,W-0,WA,N-1-G | 95739681 | 95760104 |

- Supply voltage: 24 VDC, 4-20 mA

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 3.5-70 | Floor-mounting | VGS-145-70/17-D4,W-0,FL,N-1-G | 95760418 | 95760421 |
| 6-120 | | VGS-145-120/17-D4,W-0,FL,N-1-G | 95760419 | 95760422 |
| 10-200 | | VGS-145-200/17-D4,W-0,FL,N-1-G | 95760420 | 95760423 |
| 3.5-70 | Wall-mounting | VGS-145-70/17-D4,W-0,WA,N-1-G | 95760424 | 95760427 |
| 6-120 | | VGS-145-120/17-D4,W-0,WA,N-1-G | 95760425 | 95760428 |
| 10-200 | | VGS-145-200/17-D4,W-0,WA,N-1-G | 95760426 | 95760429 |

### VGS-145, advanced

- Supply voltage: 110-240 V, 50/60 Hz, 4-20 mA

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 3.5-70 | Floor-mounting | VGS-145-70/17-D3,W-1,FL,N-1-G | 96709538 | 95752306 |
| 6-120 | | VGS-145-120/17-D3,W-1,FL,N-1-G | 95715329 | 95760108 |
| 10-200 | | VGS-145-200/17-D3,W-1,FL,N-1-G | 96681238 | 95752197 |
| 3.5-70 | Wall-mounting | VGS-145-70/17-D3,W-1,WA,N-1-G | 95760109 | 95760111 |
| 6-120 | | VGS-145-120/17-D3,W-1,WA,N-1-G | 98028124 | 95760112 |
| 10-200 | | VGS-145-200/17-D3,W-1,WA,N-1-G | 95760110 | 95760113 |

- Supply voltage: 24 VDC, 4-20 mA

| Capacity [kg/h] | Enclosure version | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 3.5-70 | Floor-mounting | VGS-145-70/17-D4,W-1,FL,N-1-G | 95760430 | 95760433 |
| 6-120 | | VGS-145-120/17-D4,W-1,FL,N-1-G | 95760431 | 95760434 |
| 10-200 | | VGS-145-200/17-D4,W-1,FL,N-1-G | 95760432 | 95760435 |
| 3.5-70 | Wall-mounting | VGS-145-70/17-D4,W-1,WA,N-1-G | 95760436 | 95760439 |
| 6-120 | | VGS-145-120/17-D4,W-1,WA,N-1-G | 95760437 | 95760440 |
| 10-200 | | VGS-145-200/17-D4,W-1,WA,N-1-G | 95760438 | 95760441 |

# 6. Evaporators

The RV 171(W) automatic chlorine evaporator is specifically designed for use in large-scale chlorine dosing plants in water treatment facilities, for example 70 kg/h up to 200 kg/h. The heat transfer medium is either water containing anticorrosive and antifreeze agents (RV 171W) or oil (RV 171). Liquid chlorine is fed from storage containers into the heat exchanger of the evaporator. There it is heated up and transformed into a dry saturated gas. The evaporator is designed to minimise the possibility of recondensing.

A reliable safety concept protects the evaporator from exceeding safe operating pressure and prevents a possible chlorine emission to the atmosphere.

- A pressure gauge with two limit contacts and a thermometer with a limit contact switch off the evaporator in case of overpressure and overheating.
- A bursting disc connected to an expansion tank ensures that the highest admissible operating pressure is not exceeded. The expansion tank is dimensioned in a way to transform the overpressure gas after the bursting of the bursting disc into an uncritical pressure. No chlorine gas escapes to the atmosphere. A contact manometer indicates the bursting.

The evaporator is available in the following versions and with the following features:

- RV 171: with oil as the transfer medium
- RV 171W: with water as the transfer medium
- Two capacities: 100 kg/h and 200 kg/h
- Different voltages
- Included shut-off valves and DN 25 welding-neck flanges
- With cable-labelling
- With control cabinet
- Output signal for the shut-off function of the 544 pressure reducing valve
- Alarm signal relay

Benefits:

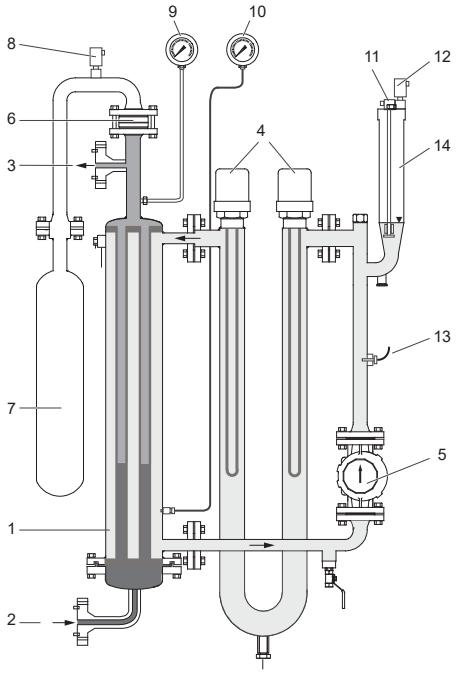
- Reliable and redundant safety concept
- Pressure gauge with two limit switches
- Thermometer with two limit switches
- Bursting disc with pressure-monitored expansion tank
- Heat exchanger designed for dry saturated gas
- 100% pressure-tested




TM075035

*Left: RV 171 evaporator; right: RV 171W evaporator*

**Functional principle RV 171W**

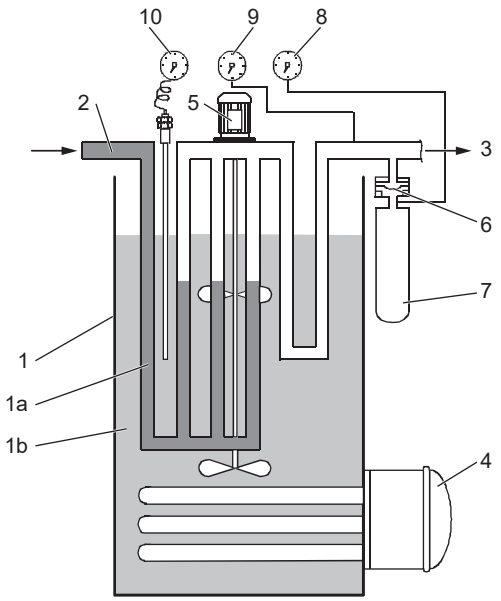



TM075105

*Schematic drawing of a water-bath evaporator*

| Pos. | Component | Pos. | Component |
|---|---|---|---|
| 1 | Heat exchanger | 8 | Pressure switch (chlorine) |
| 2 | Liquid gas connection (inlet) | 9 | Contact manometer |
| 3 | Gas connection (outlet) | 10 | Contact thermometer |
| 4 | Electric heater with safety thermo switch | 11 | Water level switch |
| 5 | Circulator pump | 12 | Pressure switch (water) |
| 6 | Bursting disc safety device | 13 | Temperature sensor |
| 7 | Expansion tank | 14 | Expansion tank heating circuit |

### Functional principle RV 171




TM075106

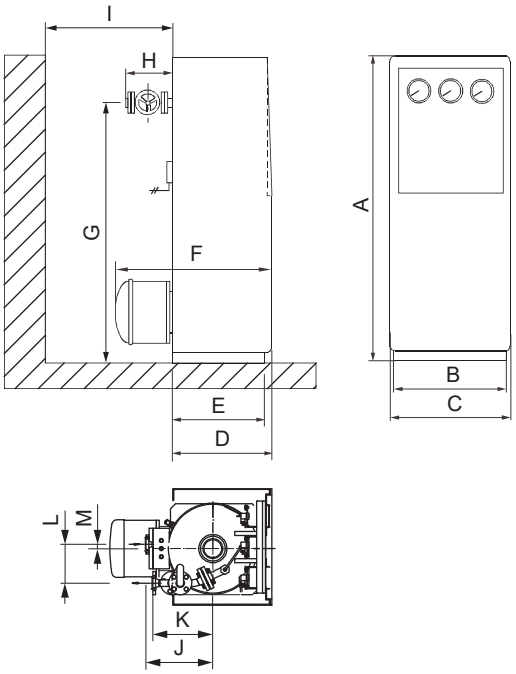
*Schematic drawing of an oil-bath evaporator*

| Pos. | Component | Pos. | Component |
|---|---|---|---|
| 1 | Oil tank | 5 | Stirrer |
| 1a | Tubular bundle | 6 | Bursting disc safety device |
| 1b | Heat transfer oil | 7 | Gas expansion tank |
| 2 | Liquid gas connection (inlet) | 8 | Contact manometer behind the bursting disc |
| 3 | Gas connection (outlet) | 9 | Contact manometer (operation manometer) |
| 4 | Electric heater | 10 | Contact thermometer |

### Technical data RV 171 and RV 171W

| | | |
|---|---|---|
| Medium | Chlorine | Chlorine |
| Heat transfer medium | Oil | Water |
| Type | RV 171-100<br>RV 171-200 | RV 171W-100<br>RV 171W-200 |
| Capacity | RV 171-100: 100 kg/h<br>RV 171-200: 200 kg/h | RV 171W-100: 100 kg/h<br>RV 171W-200: 200 kg/h |
| Heat transfer medium quantity | 100 l | 12 l |
| Max. operating pressure | 12.5 bar | 12.5 bar |
| Bursting pressure (on bursting disc) | 16 bar | 16 bar |
| Ambient temperature | 0 to +40 °C | 0 to +40 °C |
| Supply voltage | 400 V, 50/60 Hz<br>415 V, 50/60 Hz | 380 V, 50/60 Hz<br>400 V, 50/60 Hz<br>415 V, 50/60 Hz |
| Power consumption | RV 171-100: 10 kW<br>RV 171-200: 20 kW | RV 171W-100: 9 kW<br>RV 171W-200: 18 kW |
| Enclosure class evaporator | IP65 | IP65 |
| Enclosure class control cabinet | IP65 | IP65 |
| Liquid chlorine inlet connection | Groove flange DN 25, PN 40 (EN 1092-1) | |
| Chlorine gas outlet connection | Tongue flange DN 25, PN 40 (EN 1092-1) | |
| Material | • Parts in contact with chlorine: low-carbon steel, copper, brass, bronze, alloy C4, silver, PTFE, FKM<br>• Gasket: IT asbestos-free<br>• Housing: painted steel, GFK | |
| Weight | Evaporator incl. oil: 270 kg<br>Control cabinet: 40 kg | Evaporator incl. control cabinet: 210 kg |

**Dimensions RV 171 and RV 171W**

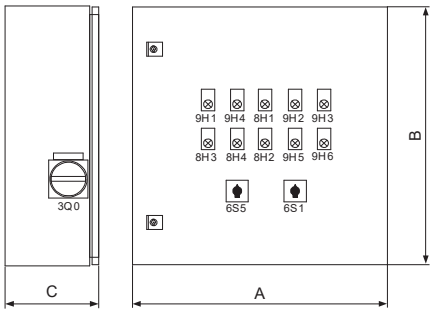



TM075117

*Evaporator RV 171*

Dimensions in mm

| A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1460 | 545 | 575 | 490 | 450 | 920 | 1214 | 300 | 700 | 331 | 297 | 191 | 21 |

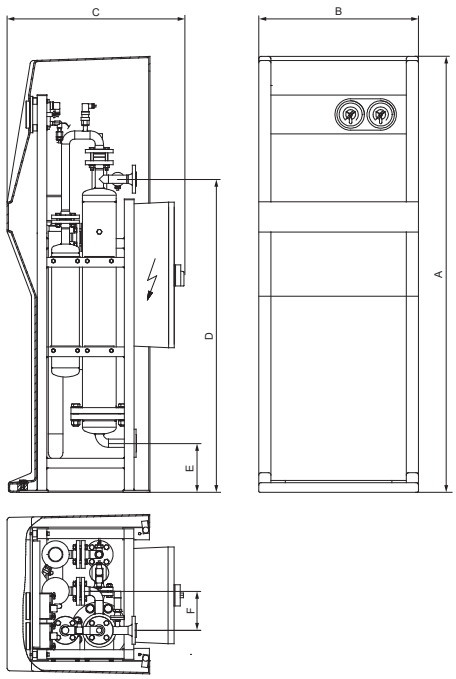



TM075118

*Control cabinet, load unit RV 171*

Dimensions in mm

| A | B | C |
|---|---|---|
| 600 | 600 | 250 |

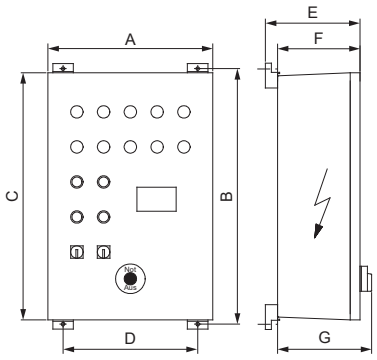



TM075119

*Evaporator RV 171W*

Dimensions in mm

| A | B | C | D | E | F |
|---|---|---|---|---|---|
| 1805 | 670 | 730 | 1293 | 203 | 150 |




TM075120

*Control cabinet, control unit RV 171W*

Dimensions in mm

| A | B | C | D | F | G |
|---|---|---|---|---|---|
| 400 | 620 | 600 | 327 | 200 | 230 |

### Type key RV 171 and RV 171W

| Type | |
|---|---|
| **RV171** -C-100/G21/1/EN-1-Y,0/Y,0-G,C3 | |
| **RV171** | Evaporator, oil bath |
| RV 171W | Evaporator, water bath |

| Medium | |
|---|---|
| RV171-**C**-100/G21/1/EN-1-Y,0/Y,0-G,C3 | |
| **C** | Chlorine |

| **Capacity** | |
|---|---|
| RV171-C-**100**/G21/1/EN-1-Y,0/Y,0-G,C3 | |
| **100** | 100 kg/h |
| 200 | 200 kg/h |

| **Supply voltage** | |
|---|---|
| RV171-C-100/**G21**/1/EN-1-Y,0/Y,0-G,C3 | |
| G11 | 380 V, 50 Hz |
| G12 | 380 V, 60 Hz |
| **G21** | 400 V, 50 Hz |
| G22 | 400 V, 60 Hz |
| G31 | 415 V, 50 Hz |
| G32 | 415 V, 60 Hz |

| **Control cabinet** | |
|---|---|
| RV171-C-100/G21/**1**/EN-1-Y,0/Y,38-G,C3 | |
| **1** | With |

| **Control cabinet labelling** | |
|---|---|
| RV171-C-100/G21/1/**EN**-1-Y,0/Y,38-G,C3 | |
| **EN** | English |
| FR | French |
| RU | Russian |
| ES | Spanish |

| **Control cabinet version** | |
|---|---|
| RV171-C-100/G21/1/EN-**1**-Y,0/Y,38-G,C3 | |
| **1** | With cable labelling |

| **Control cabinet output option** | |
|---|---|
| RV171-C-100/G21/1/EN-1-**Y**,0/Y,38-G,C3 | |
| **Y** | Output for pressure reducing valve |

| **Display** | |
|---|---|
| RV171-C-100/G21/1/EN-1-Y,**0**/Y,38-G,C3 | |
| **0** | Without |

| **Heat transfer medium** | |
|---|---|
| RV171-C-100/G21/1/EN-1-Y,0/**Y**,38-G,C3 | |
| **Y** | With oil |
| W | Water |

| **Accessories** | |
|---|---|
| RV171-C-100/G21/1/EN-1-Y,0/Y,**38**-G,C3 | |
| **38** | Welding neck flange DN 25, shut-off valve |

| **Logo** | |
|---|---|
| RV171-C-100/G21/1/EN-1-Y,0/Y,38-**G**,C3 | |
| **G** | Grundfos |

| **Product certificate** | |
|---|---|
| RV171-C-100/G21/1/EN-1-Y,0/Y,38-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

**Order data for RV 171**

- Type RV 171-100
- Power: 9 KW

| Supply voltage | Language | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 400 V, 50/60 Hz | English | RV171-C-100/G21/1/EN-1-Y,0/Y,38-G | 99612774 | 99612860 |
| | French | RV171-C-100/G21/1/FR-1-Y,0/Y,38-G | 99612780 | 99612864 |
| | Russian | RV171-C-100/G21/1/RU-1-Y,0/Y,38-G | 99612794 | 99612867 |
| | Spanish | RV171-C-100/G21/1/ES-1-Y,0/Y,38-G | 99612797 | 99612869 |
| 415 V, 50/60 Hz | English | RV171-C-100/G31/1/EN-1-Y,0/Y,38-G | 99612824 | 99612870 |
| | French | RV171-C-100/G31/1/FR-1-Y,0/Y,38-G | 99612828 | 99612872 |
| | Russian | RV171-C-100/G31/1/RU-1-Y,0/Y,38-G | 99612830 | 99612874 |
| | Spanish | RV171-C-100/G31/1/ES-1-Y,0/Y,38-G | 99612833 | 99612875 |

- Type RV 171-200
- Power: 18 KW

| Supply voltage | Language | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 400 V, 50/60 Hz | English | RV171-C-200/G21/1/EN-1-Y,0/Y,38-G | 99613101 | 99613201 |
| | French | RV171-C-200/G21/1/FR-1-Y,0/Y,38-G | 99613102 | 99613234 |
| | Russian | RV171-C-200/G21/1/RU-1-Y,0/Y,38-G | 99613113 | 99613238 |
| | Spanish | RV171-C-200/G21/1/ES-1-Y,0/Y,38-G | 99613116 | 99613242 |
| 415 V, 50/60 Hz | English | RV171-C-200/G31/1/EN-1-Y,0/Y,38-G | 99613120 | 99613267 |
| | French | RV171-C-200/G31/1/FR-1-Y,0/Y,38-G | 99613137 | 99613268 |
| | Russian | RV171-C-200/G31/1/RU-1-Y,0/Y,38-G | 99613142 | 99613271 |
| | Spanish | RV171-C-200/G31/1/ES-1-Y,0/Y,38-G | 99613154 | 99613294 |

**Order data for RV 171W**

- Type RV 171W-100
- Power: 9 KW

| Supply voltage | Language | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 380 V, 50 Hz | English | RV171W-C-100/G11/1/EN-1-Y,0/W,38-G | 95760116 | 95760117 |
| 380 V, 60 Hz | | RV171W-C-100/G12/1/EN-1-Y,0/W,38-G | 95756023 | 95760118 |
| 400 V, 50 Hz | | RV171W-C-100/G21/1/EN-1-Y,0/W,38-G | 95731304 | 95760119 |
| 400 V, 60 Hz | | RV171W-C-100/G22/1/EN-1-Y,0/W,38-G | 95731435 | 95760120 |
| 415 V, 50 Hz | | RV171W-C-100/G31/1/EN-1-Y,0/W,38-G | 95728360 | 95760122 |
| 415 V, 60 Hz | | RV171W-C-100/G32/1/EN-1-Y,0/W,38-G | 95760121 | 95760123 |
| 380 V, 50 Hz | French | RV171W-C-100/G11/1/FR-1-Y,0/W,38-G | 95760124 | 95760126 |
| 380 V, 60 Hz | | RV171W-C-100/G12/1/FR-1-Y,0/W,38-G | 95760125 | 95760127 |
| 400 V, 50 Hz | | RV171W-C-100/G21/1/FR-1-Y,0/W,38-G | 95760128 | 95760130 |
| 400 V, 60 Hz | | RV171W-C-100/G22/1/FR-1-Y,0/W,38-G | 95760129 | 95760131 |
| 415 V, 50 Hz | | RV171W-C-100/G31/1/FR-1-Y,0/W,38-G | 95760132 | 95760134 |
| 415 V, 60 Hz | | RV171W-C-100/G32/1/FR-1-Y,0/W,38-G | 95760133 | 95760135 |

- Type RV 171W-200
- Power: 18 KW

| Supply voltage | Language | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|
| 380 V, 50 Hz | English | RV171W-C-200/G11/1/EN-1-Y,0/W,38-G | 95760136 | 95760138 |
| 380 V, 60 Hz | | RV171W-C-200/G12/1/EN-1-Y,0/W,38-G | 95760140 | 95760141 |
| 400 V, 50 Hz | | RV171W-C-200/G21/1/EN-1-Y,0/W,38-G | 95760154 | 95760156 |
| 400 V, 60 Hz | | RV171W-C-200/G22/1/EN-1-Y,0/W,38-G | 95760155 | 95760157 |
| 415 V, 50 Hz | | RV171W-C-200/G31/1/EN-1-Y,0/W,38-G | 95760158 | 95760160 |
| 415 V, 60 Hz | | RV171W-C-200/G32/1/EN-1-Y,0/W,38-G | 95760159 | 95760161 |
| 380 V, 50 Hz | French | RV171W-C-200/G11/1/FR-1-Y,0/W,38-G | 95760142 | 95760143 |
| 380 V, 60 Hz | | RV171W-C-200/G12/1/FR-1-Y,0/W,38-G | 95760137 | 95760139 |
| 400 V, 50 Hz | | RV171W-C-200/G21/1/FR-1-Y,0/W,38-G | 95760144 | 95760145 |
| 400 V, 60 Hz | | RV171W-C-200/G22/1/FR-1-Y,0/W,38-G | 95760146 | 95760147 |
| 415 V, 50 Hz | | RV171W-C-200/G31/1/FR-1-Y,0/W,38-G | 95760148 | 95760149 |
| 415 V, 60 Hz | | RV171W-C-200/G32/1/FR-1-Y,0/W,38-G | 95760150 | 95760151 |

# 7. Change-over devices

Change-over devices ensure a continuous supply of a chlorine gas dosing system by changing over from the empty bank of cylinders or drums to the standby bank.

Two types of change over device are available:

- vacuum change-over devices
- pressure change-over devices

Vacuum change-over devices are installed on the vacuum side of a chlorine gas dosing system and are available in 2 options:

- 186: electrically powered
- 189: without electrical power

Pressure change-over devices are installed on the pressure side of a chlorine gas dosing system:

- 185: electrically powered

## 189 vacuum change-over device

The 189 vacuum change-over device is available for 4 kg/h and 10 kg/h. The 189 vacuum change-over device operates without electrical power. It is a diaphragm-operated system that is triggered by a rising vacuum created by an empty cylinder or drum. The bank of cylinders or drums in duty is indicated visually, optionally this indication can be remotely indicated via 2 reed contacts. The 189 change over device can be used in connection with vacuum regulators and dosing regulators up to 10 kg/h.

The 189 vacuum change-over device includes:

- Visual indication or visual indication with contact for remote indication
- Mounting bracket
- Vacuum connections for PE hose 8/11 (4 kg/h) or PE hose 10/14 (10 kg/h)

Option:

Connections for DN 15 vacuum pipe can be ordered separately (3 per device).

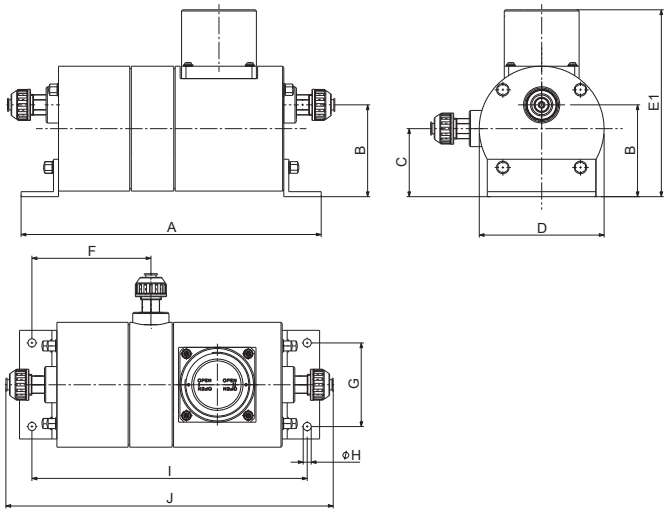



TM075121

### Technical data 189

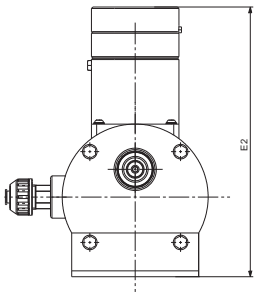
| | |
|---|---|
| Medium | Chlorine gas |
| Capacity | 4 kg/h and 10 kg/h |
| Vacuum connections | • PE hose 8/11 (4 kg/h)<br>• PE hose 10/14 (10 kg/h)<br>• Optional connection for DN 15 pipe |
| Reed contact for remote indication | 75 VDC, 1 Amp, 50 W |
| Material | PVC, silver, FEP, glass, silver-coated alloy C, FKM |
| Weight | 2 kg |

**Dimensions 189**




TM075040

*189 change-over device without contact to remote indicator*




TM075041

*189 change-over device with contact to remote indicator*

Dimensions in mm

| A | B | C | D | E1 | E2 | F | G | øH | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 241 | 73 | 54 | 100 | 149 | 185 | 95 | 67 | 6.5 | 221 | 262 |

## Type key 189

| Type | |
|---|---|
| **189** -C-4/11,11/N/0/X,X,0-G,C3 | |
| **189** | Change-over device |

| Medium | |
|---|---|
| 189-**C**-4/11,11/N/0/X,X,0-G,C3 | |
| **C** | Chlorine |

| Capacity | |
|---|---|
| 189-C-**4**/11,11/N/0/X,X,0-G,C3 | |
| **4** | 4 kg/h |
| 10 | 10 kg/h |

| Vacuum connection, inlet | |
|---|---|
| 189-C-4/**11**,11/N/0/X,X,0-G,C3 | |
| 6 | PE hose 10/14 |
| **11** | PE hose 8/11 |

| Vacuum connection, outlet | |
|---|---|
| 189-C-4/11,**11**/N/0/X,X,0-G,C3 | |
| 6 | PE hose 10/14 |
| **11** | PE hose 8/11 |

| Contact for remote indication | |
|---|---|
| 189-C-4/11,11/**N**/0/X,X,0-G,C3 | |
| **N** | Without |
| Y | Contact for remote indication |

| Control cabinet | |
|---|---|
| 189-C-4/11,11/N/**0**/X,X,0-G,C3 | |
| **0** | Without |

| Supply voltage | |
|---|---|
| 189-C-4/11,11/N/0/**X**,X,0-G,C3 | |
| **X** | Not electrical |

| Control cabinet labelling | |
|---|---|
| 189-C-4/11,11/N/0/X,**X**,0-G,C3 | |
| **X** | Without control cabinet |

| Control cabinet version | |
|---|---|
| 189-C-4/11,11/N/0/X,X,**0**-G,C3 | |
| **0** | Without control cabinet |

| Logo | |
|---|---|
| 189-C-4/11,11/N/0/X,X,0-**G**,C3 | |
| **G** | Grundfos |

| Product certificate | |
|---|---|
| 189-C-4/11,11/N/0/X,X,0-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data for 189

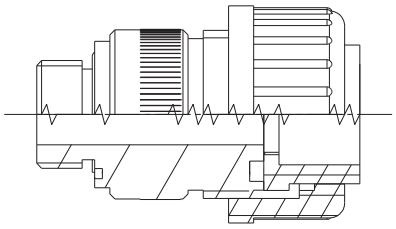
### 189 change-over device up to 4 kg/h

| Contact for remote signal transmission | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| Without | 189-C-4/11,11/N/0/X,X,0-G | 91834811 | 95749022 |
| With | 189-C-4/11,11/Y/0/X,X,0-G | 96681741 | 95749762 |

### 189 change-over device up to 10 kg/h

| Contact for remote signal transmission | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| Without | 189-C-10/6,6/N/0/X,X,0-G | 91834812 | 95751794 |
| With | 189-C-10/6,6/Y/0/X,X,0-G | 96681740 | 95750721 |

### Pipe connection for 189 change-over device (accessory)



| Description | Product number |
|---|---|
| Pipe connection, DN 15 (1 unit) | 99358518 |

# Remote indicator

The remote indicator is operated in conjunction with the 189 vacuum change-over device with contact for remote indication.

If the bank of cylinders or drums in duty is empty, the change-over device switches to the standby bank. The switching status is shown on the remote indicator. LEDs on the remote indicator show the bank of cylinders or drums in duty. Potential-free output signals for bank 1 or 2 empty and general fault are available.




TM075150

### Technical data of a remote indicator

| | |
|---|---|
| Supply voltage | 230 V, 50/60 Hz; 115 V, 50/60 Hz |
| Enclosure | IP65 |
| Input signal | Reed contact from change-over device |
| Output signal | Relay max. 250 V, 2 A, max. 250 VA |

## Order data for a remote indicator

| Supply voltage | Product number |
|---|---|
| Remote indicator, 115 V, 50/60 Hz | 95715968 |
| Remote indicator, 230 V, 50/60 Hz | 95715967 |

## 186 vacuum change-over device

The 186 vacuum change-over device can be used up to 120 kg/h. It operates with electrical power.

The 186 vacuum change-over device is controlled by the control cabinet that is triggered via contact manometers (contact R4 closes at falling pressure) on the vacuum regulator. It automatically changes over from the empty bank of cylinders or drums to the standby bank via a 3-way ball valve operated by an electric servomotor.

The 186-120 vacuum change-over device includes:

- Control cabinet
- Motorised 3-way ball valve
- Mounting bracket
- Vacuum connections DN 20, DN 32, DN 40
- Potential-free output signal: battery empty/battery duty, manual/automatic



*186 change-over device*



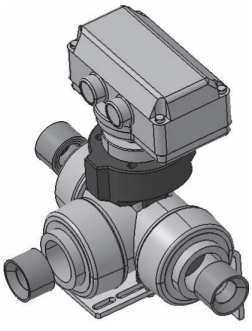
TM048981

TM078625

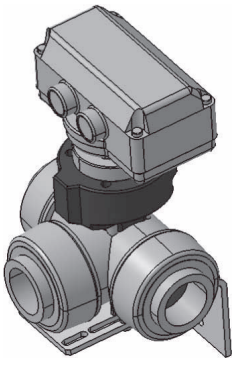
*Control cabinet for 186 change-over device*

### Technical data 186

| | |
|---|---|
| Medium | Chlorine gas |
| Capacity range | Up to 120 kg/h |
| Vacuum connection | • DN 20, DN 32, DN 40<br>• Optional connection for 8/11 PE hose or 10/14 PE hose |
| Supply voltage control cabinet | 115 V, 50/60 Hz or 230 V, 50/60 Hz |
| Enclosure class control cabinet | IP54 |
| Actuating time 0-100% | 4 seconds |
| Output signals | Potential free output signals, max. load 250 V 10A |
| Material | Parts in contact with chlorine: PVC, FKM, PTFE |
| Weight | • Change-over device: 2 kg<br>• Control cabinet: 8.5 kg |

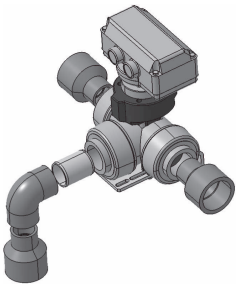


*186 change-over device, DN 20*



TM075072

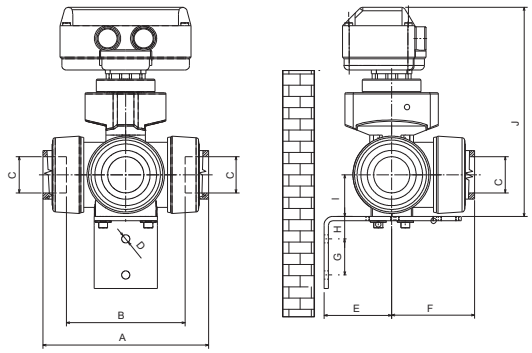
*186 change-over device, DN 32*



TM075071

*186 change-over device, DN 40*

TM075073

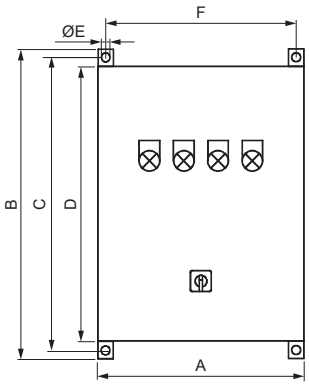



TM078900

*186 change-over device*

Dimensions in mm

| A | B | øC | øD | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|
| 183.5 | 132 | 40 | 9 | 65-130 | 92 | 40 | 25 | 46 | 231 |




TM074716

*Control cabinet for 186 change-over device*

Dimensions in mm

| A | B | C | D | øE | F |
|---|---|---|---|---|---|
| 400 | 450 | 426.5 | 400 | 9 | 349.5 |

## Type key 186

| **Type** | |
|---|---|
| **186**-C-120/S15,S15/Y/1/H,1W-G,C3 | |
| **186** | Change-over device |

| **Medium** | |
|---|---|
| 186-**C**-120/S15,S15/Y/1/H,1W-G,C3 | |
| **C** | Chlorine |

| **Capacity** | |
|---|---|
| 186-C-**120**/S15,S15/Y/1/H,1W-G,C3 | |
| **120** | 120 kg/h |

| **Vacuum connection, inlet** | |
|---|---|
| 186-C-120/**S15**,S15/Y/1/H,1W-G,C3 | |
| **S15** | PVC pipe adapter set, DN 25, DN 32, DN 40 |

| **Vacuum connection, outlet** | |
|---|---|
| 186-C-120/S15,**S15**/Y/1/H,1W-G,C3 | |
| **S15** | PVC pipe adapter set, DN 25, DN 32, DN 40 |

| **Contact for remote indication** | |
|---|---|
| 186-C-120/S15,S15/**Y**/1/H,1W-G,C3 | |
| **Y** | Contact for remote indication |

| **Control cabinet** | |
|---|---|
| 186-C-120/S15,S15/Y/**1**/H,1W-G,C3 | |
| **1** | With |

| **Supply voltage** | |
|---|---|
| 186-C-120/S15,S15/Y/1/**H**,1W-G,C3 | |
| G | Control cabinet, 230 V, 50/60 Hz |
| **H** | Control cabinet, 115 V, 50/60 Hz |

| **Control cabinet version** | |
|---|---|
| 186-C-120/S15,S15/Y/1/H,**1**W-G,C3 | |
| **1** | According to EN with cable labelling, contact input NO |

| **Accessories** | |
|---|---|
| 186-C-120/S15,S15/Y/1/H,1**W**-G,C3 | |
| **W** | Mounting bracket |

| **Logo** | |
|---|---|
| 186-C-120/S15,S15/Y/1/H,1W-**G**,C3 | |
| **G** | Grundfos |

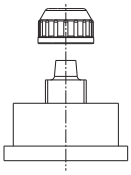
| **Product certificate** | |
|---|---|
| 186-C-120/S15,S15/Y/1/H,1W-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data for 186

### 186 vacuum change-over device

| Supply voltage | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| 115 V, 50/60 Hz | 186-C-120/S15,S15/Y/1/H,1W-G | 92539694 | 92540008 |
| 230 V, 50/60 Hz | 186-C-120/S15,S15/Y/1/G,1W-G | 92539839 | 92540020 |

### Connection nipple set for PE hose (accessory)



TM075079

*Connection nipple set for PE hose 10/14*

| Description | Product number |
|---|---|
| Connection nipple set for PE hose 10/14 (3 units) | 99695069 |
| Connection nipple set for PE hose 8/11 (3 units) | 99695117 |

# 185 change-over device

### 185-1 change-over device without bypass

The 185 change-over device is installed on the pressure side between two banks of chlorine gas cylinders or drums (gaseous or liquid chlorine). It automatically changes over from the empty bank to the standby bank.

The 185 change-over device has two independent motor valves, which can also be operated manually, so the change-over function is reliable even in case of power failure. The valves are actuated by overload-proof single-phase AC motors.

The change-over process is triggered by the contact manometer via the control cabinet. The respective motor valve closes the connection to the empty bank of chlorine gas cylinders or drums automatically. When the closing motor valve reaches its end position, the other motor valve opens the connection to the standby bank of chlorine gas cylinders or drums. The valve position is indicated at the control cabinet.

The 185 change-over device includes:

- Control cabinet
- Motorised ball valve
- Mounting bracket
- Potential-free output signal: battery empty/battery duty, manual/automatic
- Contact manometer



*185 change-over device*

TM079243



*Control cabinet*

TM079200

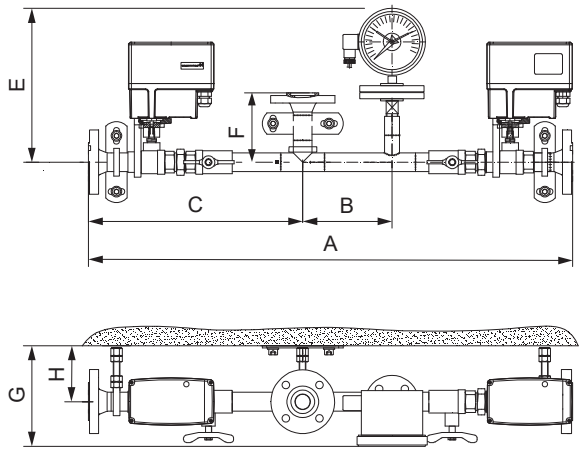
### 185-2 change-over device with bypass

Optionally, a bypass line can be included in the 185-2 change-over device. The bypass line allows continuous operation during maintenance of the ball valve motors. During maintenance, the motor valves are opened and closed in manual mode via buttons at the control cabinet.

## Technical data 185

| | |
|---|---|
| Medium | Chlorine gas, liquid chlorine |
| Capacity range | Up to 600 kg/h (liquid); up to 200 kg/h (gas) |
| Max. operating pressure | 16 bar |
| Inlet connection | Groove flange DN 25, PN 40, EN1092-1 |
| Outlet connection | Tongue flange DN 25, PN 40, EN1092-1 |
| Supply voltage control cabinet | 230 V or 115 V, 50/60 Hz |
| Enclosure class control cabinet | IP54 |
| Output signal | Potential-free output signals, max. load 250 V, 10 A |
| Material | • Pipe: low-carbon steel<br>• Valve: steel, stainless steel, PTFE<br>• Manometer: low-carbon steel, silver<br>• Gasket: IT, asbestos-free |
| Weight | • 185-1: approx. 20 kg<br>• 185-2: approx. 30 kg |

### Dimensions 185

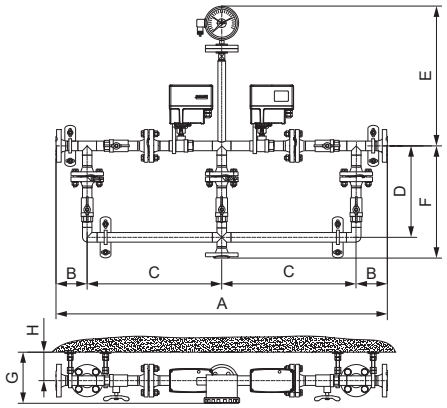



TM077120

*185 change-over device without bypass*

Dimensions in mm

| A | B | C | E | F | G | H |
|---|---|---|---|---|---|---|
| 867 | 160 | 384 | 275 | 124 | 180 | 80 |

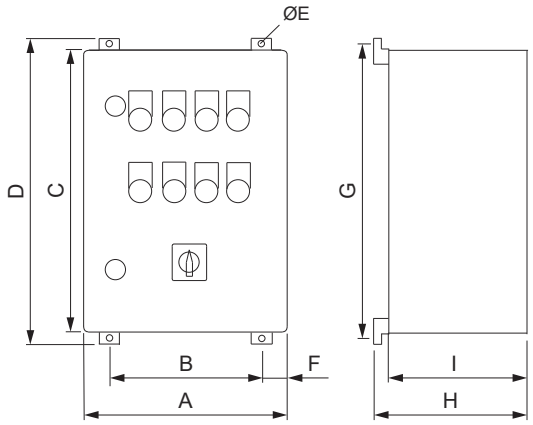



TM077121

*185 change-over device with bypass*

Dimensions in mm

| A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|
| 1170 | 110 | 475 | 340 | 396 | 493 | 180 | 80 |




TM074720

*Control cabinet for 185 change-over device*

Dimensions in mm

| A | B | C | D | øE | F | G | H | I |
|---|---|---|---|---|---|---|---|---|
| 300 | 227 | 400 | 445 | 9 | 37 | 420 | 230 | 200 |

## Type key 185

| **Type** | |
|---|---|
| **185** -1-C-200/W15,W15/Y/1/H2,1-G,C3 | |
| **185** | Change-over device |

| **Bypass** | |
|---|---|
| 185-**1**-C-200/W15,W15/Y/1/H2,1-G,C3 | |
| **1** | Without |
| 2 | With |

| **Medium** | |
|---|---|
| 185-1-**C**-200/W15,W15/Y/1/H2,1-G,C3 | |
| **C** | Chlorine |

| **Capacity** | |
|---|---|
| 185-1-C-**200**/W15,W15/Y/1/H2,1-G,C3 | |
| **200** | 200 kg/h chlorine gas, 600 kg/h liquid chlorine |

| **Connection, inlet** | |
|---|---|
| 185-1-C-200/**W15**,W15/Y/1/H2,1-G,C3 | |
| **W15** | Groove flange DN 25 (EN 1092) without counter flange |

| **Connection, outlet** | |
|---|---|
| 185-1-C-200/W15,**W15**/Y/1/H2,1-G,C3 | |
| **W15** | Tongue flange DN 25 (EN 1092) without counter flange |

| **Contact for remote manual/automatic indication** | |
|---|---|
| 185-1-C-200/W15,W15/**Y**/1/H2,1-G,C3 | |
| **Y** | With |

| **Control cabinet** | |
|---|---|
| 185-1-C-200/W15,W15/Y/**1**/H2,1-G,C3 | |
| **1** | With |

| **Supply voltage** | |
|---|---|
| 185-1-C-200/W15,W15/Y/1/**H2**,1-G,C3 | |
| G1 | Control cabinet, 230 V, 50/60 Hz |
| **H2** | Control cabinet, 115 V, 50/60 Hz |

| Control cabinet version | |
|---|---|
| 185-1-C-200/W15,W15/Y/1/H2,**1**-G,C3 | |
| **1** | According to EN with cable labelling, contact input NO |

| Logo | |
|---|---|
| 185-1-C-200/W15,W15/Y/1/H2,1-**G**,C3 | |
| **G** | Grundfos |

| Product certificate | |
|---|---|
| 185-1-C-200/W15,W15/Y/1/H2,1-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data 185

### 185-1 change-over device without bypass

| Supply voltage | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| 115 V, 60 Hz | 185-1-C-200/W15,W15/Y/1/H2,1-G | 92527959 | 92527975 |
| 230 V, 50 Hz | 185-1-C-200/W15,W15/Y/1/G1,1-G | 92527976 | 92527990 |

### 185-2 change over device with bypass

| Supply voltage | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| 115 V, 60 Hz | 185-2-C-200/W15,W15/Y/1/H2,1-G | 92528045 | 92528048 |
| 230 V, 50 Hz | 185-2-C-200/W15,W15/Y/1/G1,1-G | 92528049 | 92528060 |

### Counterflange set (accessory)

| Description | Product number |
|---|---|
| Set of welding-neck counterflanges DN 25, PN 40 (EN1092-1):<br>2 tongue flanges, 1 groove flange, screws and gaskets | 99695646 |

# 8. Injectors

## VGB, VGA, and VGS injectors

Injectors are needed to create the vacuum to transport the chlorine gas into the water.

To select the suitable injector, the following data are required:

- Counterpressure
- Motive water pressure
- Dosing capacity

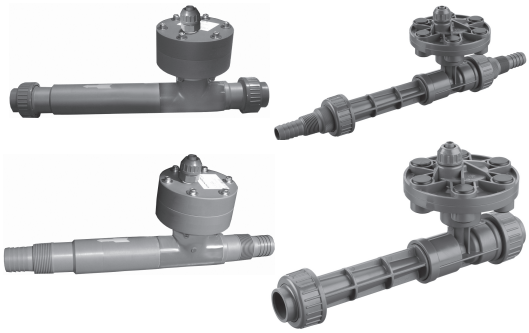
VGA and VGS injectors are used with dosing regulators with differential pressure regulator. VGB injectors are used with dosing regulators without differential pressure regulator (VGB-103, VGA-113-110, VGA-117).

The injectors are available with the following features:

- Different sizes for the whole Vaccuperm range and counterpressure range
- Different water connections
- Reliable diaphragm non-return valve
- Optional mounting bracket set (VGS injector)

Benefits

- Low operating costs and high efficiency due to the special form of the nozzle.
- Easy selection of the operating point thanks to the optimum graduation of the product range.
- The construction according to the flow allows a reduction of the pressure losses of the non-return diaphragm valve.
- A safety non-return diaphragm valve according to the floater principle protects the dosing unit disposed upstream optimally from the entry of water or chlorine solution.
- Excellent price-performance ratio.



TM074873

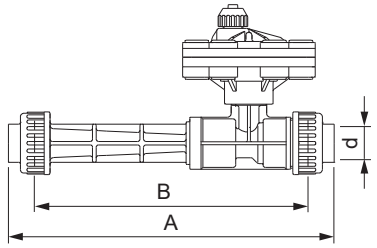
*PVC injectors for Vaccuperm gas dosing systems*

## Technical data of injectors

### Technical data

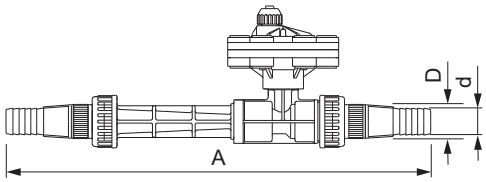
| | |
|---|---|
| Motive water pressure | See tables with order data |
| Counterpressure | See tables with order data |
| Motive water temperature | +5 °C to +30 °C |
| Ambient temperature | +5 °C to +40 °C |
| Material | • Housing: PVC<br>• Spring: alloy C4, PTFE coated<br>• Diaphragm: FEP<br>• Piston: PTFE |

**Dimensions**




TM074876

*VGB injector up to 2 kg/h and VGA injector up to 4 kg/h, connection DN 20*

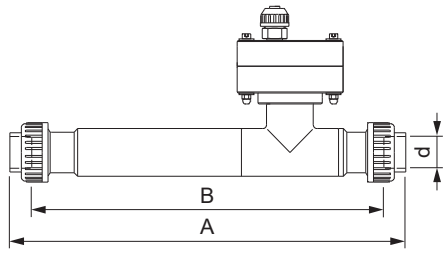



TM074872

*VGB injector up to 2 kg/h and VGA injector up to 4 kg/h, connection ¾" NPT, 1" NPT*

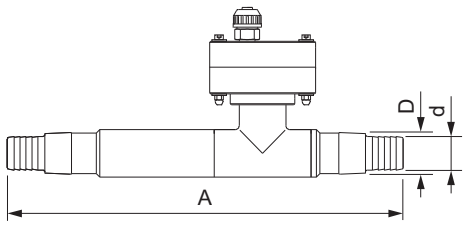
Dimensions in mm

| d | D | A | B |
|---|---|---|---|
| DN 20 | - | 275 | 232 |
| Hose 3/4" | ¾" NPT | 400 | - |
| Hose 1" | 1" NPT | 430 | - |




TM074877

*VGB injector up to 10 kg/h and VGA up to 10 kg/h, connection DN 25*

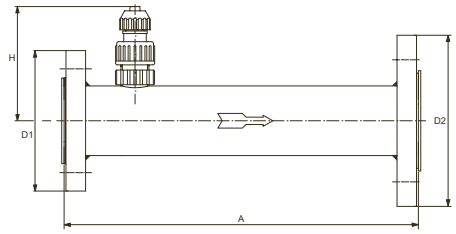



TM074875

*VGB injector up to 10 kg/h and VGA injector up to 10 kg/h, connection 1 ¼"*

Dimensions in mm

| d | D | A | B |
|---|---|---|---|
| DN 25 | - | 400 | 350 |
| Hose 1 ¼" | 1 ¼" NPT | 400 | - |

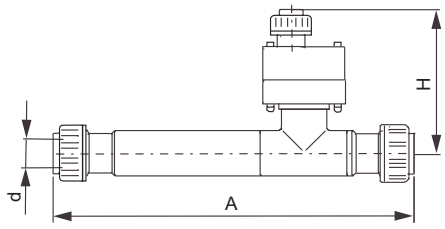



TM075187

*VGA injector up to 2 kg/h, connection flange DN 25/32*

Dimensions in mm

| D1 | D2 | A | H |
|---|---|---|---|
| DN 25 | DN 32 | 290 | 95 |

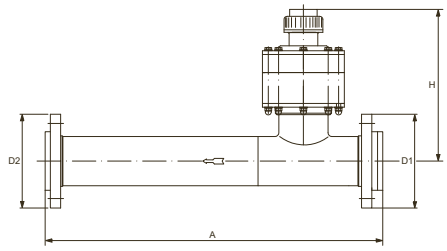



TM075037

*VGB injector 20 kg/h, and VGS injector 20 and 40 kg/h*

Dimensions in mm

| Capacity [kg/h] | d | A | H |
|---|---|---|---|
| 20 | DN 32 | 480 | 190 |
| 40 | DN 50 | 710 | 320 |




TM075186

*VGS injector 70, 120 and 200 kg/h*

Dimensions in mm

| Capacity [kg/h] | D1 | D2 | A | H |
|---|---|---|---|---|
| 70 | DN 65 | DN 65 | 650 | 325 |
| 120 | DN 80 | DN 80 | 720 | 325 |
| 200 | DN 100 | DN 100 | 825 | 370 |

## Type key of injectors

| **Type** | |
|---|---|
| **545** -C-1/0,5-7/W1,W1-11/NR,C3 | |
| **545** | Vaccuperm injector |

| **Medium** | |
|---|---|
| 545-**C**-1/0,5-7/W1,W1-11/NR,C3 | |
| **C** | Chlorine |

| **Capacity** | | | |
|---|---|---|---|
| 545-C-**1/0,5**-7/W1,W1-11/NR,C3 | | | |
| | VGA injector | VGB injector | VGS injector |
| 0.5/0 | 0.5 kg/h | | |
| **1/0.5** | 1.0 kg/h | 0.5 kg/h | |
| 2/1 | 2.0 kg/h | 1.0 kg/h | |
| 4/2 | 4.0 kg/h | 2.0 kg/h | |
| 0/3 | | 3.0 kg/h | |
| 0/4 | | 4.0 kg/h | |
| 0/6 | | 6.0 kg/h | |
| 0/8 | | 8.0 kg/h | |
| 0/10 | | 10.0 kg/h | |
| 10/0 | | | 10 kg/h |
| 20/0 | | | 20 kg/h |
| 40/20 | | 20.0 kg/h | 40 kg/h |
| 70/0 | | | 70 kg/h |
| 120/0 | | | 120 kg/h |
| 200/0 | | | 200 kg/h |

| **Counterpressure** | |
|---|---|
| 545-C-1/0,5-**7**/W1,W1-11/NR,C3 | |
| 3 | 0-3 bar |
| 6 | 3-7 bar |
| **7** | 0-7 bar |
| 16 | 5-16 bar |

| **Motive water connection, inlet** | |
|---|---|
| 545-C-1/0,5-7/**W1**,W1-11/NR,C3 | |
| **W1** | ¾" NPT |
| W2 | 1" NPT |
| W3 | 1 ¼" NPT |
| W8 | DN 20 |
| W9 | DN 25 |
| W10 | DN 32 |
| W11 | DN 50 |
| W12 | Flange DN 65 |
| W13 | Flange DN 80 |
| W14 | Flange DN 100 |
| W15 | Flange DN 25 |

| **Motive water connection, outlet** | |
|---|---|
| 545-C-1/0,5-7/W1,**W1**-11/NR,C3 | |
| **W1** | ¾" NPT |
| W2 | 1" NPT |
| W3 | 1 ¼" NPT |
| W8 | DN 20 |
| W9 | DN 25 |

| Motive water connection, outlet | |
|---|---|
| W10 | DN 32 |
| W11 | DN 50 |
| W12 | Flange DN 65 |
| W13 | Flange DN 80 |
| W14 | Flange DN 100 |
| W15 | Flange DN 25 |
| W16 | Flange DN 32 |

| Vacuum connection | |
|---|---|
| 545-C-1/0,5-7/W1,W1-**11**/NR,C3 | |
| 6 | PE 10/14 |
| **11** | PE 8/11 |
| 14 | PVC pipe DN 20 |
| 17 | PVC pipe DN 40 |

| Valve type | |
|---|---|
| 545-C-1/0,5-7/W1,W1-11/**NR**,C3 | |
| **NR** | Diaphragm non-return valve |
| BV | Ball non-return valve |

| Product certificate | |
|---|---|
| 545-C-1/0,5-7/W1,W1-11/NR,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data for injectors

### VGB injectors up to 20 kg/h

- Capacity 0.5-4 kg/h: vacuum hose connection PE 8/11
- Capacity 6-10 kg/h: vacuum hose connection PE 10/14
- Capacity 20 kg/h: vacuum pipe connection DN 20

| Capacity [g/h] | Motive water pressure [bar] | Counter-pressure [bar] | Water quantity [l/h] | Water connection | Type | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|---|---|---|
| 0.5 | 2-16 | 0-7 | 550-1350 | 3/4" hose, 3/4" NPT | 545-1000-2 | 545-C-1/0,5-7/ W1,W1-11/NR | 91836434 | 95760229 |
| | 2-16 | 0-7 | 550-1350 | DN 20 | 545-1000-1 | 545-C-1/0,5-7/ W8,W8-11/NR | 96691986 | 95760230 |
| 1 | 2-16 | 0-7 | 850-2200 | 3/4" hose, 3/4" NPT | 545-2000-2 | 545-C-2/1-7/ W1,W1-11/NR | 96729114 | 95760231 |
| | 2-16 | 0-7 | 850-2200 | DN 20 | 545-2000-1 | 545-C-2/1-7/ W8,W8-11/NR | 96693040 | 95760232 |
| 2 | 2-16 | 0-7 | 1200-3300 | 1" hose, 1" NPT | 545-4000-3 | 545-C-4/2-7/ W2,W2-11/NR | 91835792 | 95760233 |
| | 2-16 | 0-7 | 1200-3300 | DN 20 | 545-4000-1 | 545-C-4/2-7/ W8,W8-11/NR | 91836390 | 95760234 |
| 3 | 4-15 | 0-7 | 2500-4300 | 1 1/4" hose, 1 1/4" NPT | 545-3030-10001 | 545-C-0/3-7/ W3,W3-11/NR | 96729145 | 95760225 |
| | 4-15 | 0-7 | 2500-4300 | DN 25 | 545-3030-1-10000 | 545-C-0/3-7/ W9,W9-11/NR | 96729148 | 95760226 |
| 4 | 4-15 | 3-7 | 3600-4300 | 1 1/4" hose, 1 1/4" NPT | 545-3030-10001 | 545-C-0/3-7/ W3,W3-11/NR | 96729145 | 95760225 |
| | 4-15 | 3-7 | 3600-4300 | DN 25 | 545-3030-1-10000 | 545-C-0/3-7/ W9,W9-11/NR | 96729148 | 95760226 |
| | 4-8 | 0-3 | 3400-4700 | 1 1/4" hose, 1 1/4" NPT | 545-4030-10000 | 545-C-0/4-3/ W3,W3-11/NR | 96729184 | 95760227 |
| | 4-8 | 0-3 | 3400-4700 | DN 25 | 545-4030-1-10000 | 545-C-0/4-3/ W9,W9-11/NR | 96729188 | 95760228 |

| Capacity [g/h] | Motive water pressure [bar] | Counter-pressure [bar] | Water quantity [l/h] | Water connection | Type | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|---|---|---|
| 6 | 4-8 | 0-3 | 3400-4500 | 1 1/4" hose, 1 1/4" NPT | 545-6030-10000 | 545-C-0/8-6/ W3,W3-6/NR | 91835795 | 95760244 |
| | 4-8 | 0-3 | 3400-4500 | DN 25 | 545-6030-1-10000 | 545-C-0/6-3/ W9,W9-6/NR | 96732136 | 95760245 |
| | 9-15 | 3-7 | 4600-6000 | 1 1/4" hose, 1 1/4" NPT | 545-4030-10001 | 545-C-0/4-3/ W3,W3-6/NR | 91836585 | 95760246 |
| | 9-15 | 3-7 | 4600-6000 | DN 25 | 545-4030-1-10001 | 545-C-0/6-6/ W9,W9-6/NR | 95700927 | 95747092 |
| 8 | 4-8 | 0-3 | 4200-5800 | 1 1/4" hose, 1 1/4" NPT | 545-8030-10000 | 545-C-0/8-3/ W3,W3-6/NR | 96703794 | 95760256 |
| | 4-8 | 0-3 | 4200-5800 | DN 25 | 545-8030-1-10000 | 545-C-0/8-3/ W9,W9-6/NR | 95701067 | 95755276 |
| | 9-15 | 3-7 | 4700-6000 | 1 1/4" hose, 1 1/4" NPT | 545-6030-10000 | 545-C-0/8-6/ W3,W3-6/NR | 91835795 | 95760244 |
| | 9-15 | 3-7 | 4700-6000 | DN 25 | 545-6030-1-10000 | 545-C-0/6-3/ W9,W9-6/NR | 96732136 | 95760245 |
| 10 | 4-8 | 0-3 | 5200-7200 | 1 1/4" hose, 1 1/4" NPT | 545-10030-10000 | 545-C-0/10-3/ W3,W3-6/NR | 96703780 | 95760249 |
| | 4-8 | 0-3 | 5200-7200 | DN 25 | 545-10030-1-10000 | 545-C-0/10-3/ W9,W9-6/NR | 96706390 | 95760250 |
| | 9-15 | 3-7 | 6000-8000 | 1 1/4" hose, 1 1/4" NPT | 545-8030-10000 | 545-C-0/8-3/ W3,W3-6/NR | 96703794 | 95760256 |
| | 9-15 | 3-7 | 6000-8000 | DN 25 | 545-8030-1-10000 | 545-C-0/8-3/ W9,W9-6/NR | 95701067 | 95755276 |
| 20 | 3-8 | 0.5-3 | 13200-21000 | DN 50 | 545-0715 | 545-C-40/20-3/ W11,W11-14/NR | 96729072 | 95753502 |
| | 9-16 | 3.5-7 | 15000-20000 | DN 50 | 545-3715 | 545-C-40/20-6/ W11,W11-14/NR | 91836631 | 95754628 |

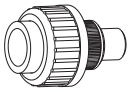
### VGA injectors up to 10 kg/h

- Capacity 0.5-4 kg/h: vacuum hose connection PE 8/11
- Capacity 10 kg/h: vacuum hose connection PE 10/14

| Capacity [kg/h] | Motive water pressure [bar] | Counter-pressure [bar] | Water quantity [l/h] | Water connection | Type | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|---|---|---|
| 0.5 | 2-16 | 0-7 | 300-780 | 3/4" hose, 3/4" NPT | 545-0500-2 | 545-C-0,5/0-7/ W1,W1-11/NR | 96729053 | 95760235 |
| | 2-16 | 0-7 | 300-780 | DN 20 | 545-0500-1 | 545-C-0,5/0-7/ W8,W8-11/NR | 96693039 | 95749042 |
| | 10-26 | 5-16 | 1100-1800 | Flange DN 25/32 | 545-1380.1 | 545-C-0,5/0-16/ W15,W16-11/BV | 96729091 | 95760236 |
| 1 | 2-16 | 0-7 | 550-1350 | 3/4" hose, 3/4" NPT | 545-1000-2 | 545-C-1/0,5-7/ W1,W1-11/NR | 91836434 | 95760237 |
| | 2-16 | 0-7 | 550-1350 | DN 20 | 545-1000-1 | 545-C-1/0,5-7/ W8,W8-11/NR | 96691986 | 95749043 |
| | 10-26 | 5-16 | 1550-2500 | Flange DN 25/32 | 545-1381.1 | 545-C-1/0-16/ W15,W16-11/BV | 96729094 | 95760238 |
| 2 | 2-16 | 0-7 | 850-2200 | 3/4" hose, 3/4" NPT | 545-2000-2 | 545-C-2/1-7/ W1,W1-11/NR | 96729114 | 95760239 |
| | 2-16 | 0-7 | 850-2200 | DN 20 | 545-2000-1 | 545-C-2/1-7/ W8,W8-11/NR | 96693040 | 95749039 |
| | 10-26 | 5-16 | 2800-4400 | Flange DN 25/32 | 545-1382.1 | 545-C-2/0-16/ W15,W16-11/BV | 96729096 | 95760240 |
| 4 | 2-16 | 0-7 | 1200-3300 | 1" hose, 1" NPT | 545-4000-3 | 545-C-4/2-7/ W2,W2-11/NR | 91835792 | 95760241 |
| | 2-16 | 0-7 | 1200-3300 | DN 20 | 545-4000-1 | 545-C-4/2-7/ W8,W8-11/NR | 91836390 | 95749024 |
| 10 | 2-8 | 0-3 | 3200-5700 | 1 1/4" hose, 1 1/4" NPT | 545-1519-10000 | 545-C-10/0-3/ W3,W3-6/NR | 95705527 | 95760242 |
| | 2-8 | 0-3 | 3200-5700 | DN 25 | 545-0518-10000 | 545-C-10/0-3/ W9,W9-6/NR | 96729062 | 95748561 |
| | 9-16 | 3-7 | 3600-5200 | 1 1/4" hose, 1 1/4" NPT | 545-4519-10000 | 545-C-10/0-6/ W3,W3-6/NR | 96729209 | 95760243 |
| | 9-16 | 3-7 | 3600-5200 | DN 25 | 545-3518-10000 | 545-C-10/0-6/ W9,W9-6/NR | 96729174 | 95751050 |

### DN 15 vacuum pipe connection (accessory)

The DN 15 vacuum pipe connection can be used for vacuum hose connections 10/14 PE.



TM075055

*Pipe connection DN 15*

| Description | Product number |
|---|---|
| Vacuum pipe connection, DN 15 | 99484784 |

### VGS injectors up to 200 kg/h

- Capacity 20-40 kg/h: vacuum pipe connection DN 20
- Capacity 70-200 kg/h: vacuum pipe connection DN 40

| Capacity [kg/h] | Motive water pressure [bar] | Counter-pressure [bar] | Water quantity [$m^3$/h] | Water connection | Type | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|---|---|---|
| 20 | 3-8 | 0.5-3 | 7-11 | DN 32 | 545-0615 | 545-C-20/0-3/ W10,W10-14/NR | 96729067 | 95749444 |
| 20 | 9-16 | 3.5-7 | 7- 11 | DN 32 | 545-3615 | 545-C-20/0-6/ W10,W10-14/NR | 96706388 | 95752421 |
| 40 | 3-8 | 0.5-3 | 13.2-21 | DN 50 | 545-0715 | 545-C-40/20-3/ W11,W11-14/NR | 96729072 | 95753502 |
| 40 | 9-16 | 3.5-7 | 15-20 | DN 50 | 545-3715 | 545-C-40/20-6/ W11,W11-14/NR | 91836631 | 95754628 |
| 70 | 3-8 | 0.5-3 | 23-37 | Flange DN 65 | 545-2816 | 545-C-70/0-3/ W12,W12-17/NR | 96729139 | 95757503 |
| 70 | 9-16 | 3.5-7 | 26-35 | Flange DN 65 | 545-5816 | 545-C-70/0-6/ W12,W12-17/NR | 96729225 | 95760251 |
| 120 | 3-8 | 0.5-3 | 40-63 | Flange DN 80 | 545-2916 | 545-C-120/0-3/ W13,W13-17/NR | 96729141 | 95748170 |
| 120 | 9-16 | 3.5-7 | 45-60 | Flange DN 80 | 545-5916 | 545-C-120/0-6/ W13,W13-17/NR | 96729228 | 95753503 |
| 200 | 3-8 | 0.5-3 | 80-125 | Flange DN 100 | 545-2016 | 545-C-200/0-3/ W14,W14-17/NR | 96729122 | 95751859 |
| 200 | 9-16 | 3.5-7 | 89-125 | Flange DN 100 | 545-5016 | 545-C-200/0-6/ W14,W14-17/NR | 96729211 | 95760252 |

### Accessories for VGS injectors

### Wall mounting set for VGS injectors

A wall mounting set for VGS injectors includes a bracket and screws.

| Injector capacity [kg/h] | Product number |
|---|---|
| 20 or 40 | 96729319 |
| 70 | 96688744 |
| 120 | 96688746 |
| 200 | 96729323 |

### Connection flange set for VGS injectors

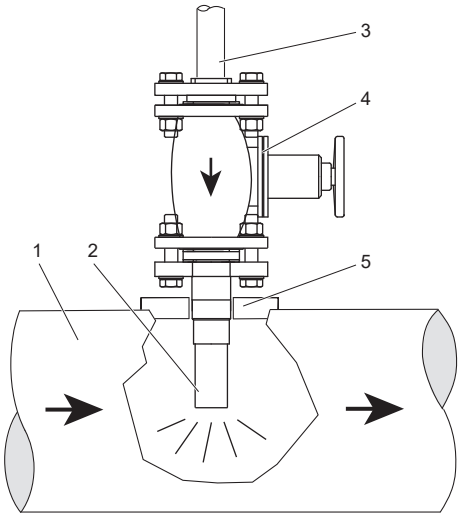
A connection flange set includes 2 sets of lapped flanges, stub flanges, gaskets, washers, screws and nuts.

| Injector capacity [kg/h] | Flange size | Product number |
|---|---|---|
| 70 | DN 65 | 96727591 |
| 120 | DN 80 | 96727592 |
| 200 | DN 100 | 96727593 |

# 9. Injection units

Injection units are used in connection with chlorine gas dosing systems for injecting the chlorine solution into the water flow to be treated. They consist of a shut-off valve with a connection for the chlorine solution coming from the injector and an injection pipe with connection thread or flange for installation in the water pipe.

Injection units are available in PVC or steel with different connection sizes. PVC injection units have a PVC shut-off ball valve. Steel injection units are equipped with a shut-off diaphragm valve.




TM075292

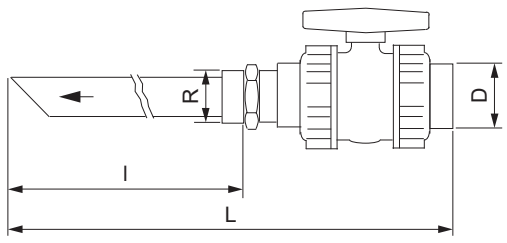
*Installation example of a steel injection unit*

| Pos. | Component |
|---|---|
| 1 | Water line |
| 2 | Injection pipe |
| 3 | Chlorine solution line |
| 4 | Shut-off valve |
| 5 | Water line installation thread |

### Technical data of injection units

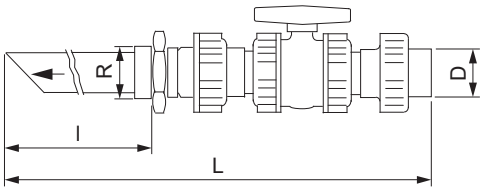
| Medium | Chlorine-water solution | | |
|---|---|---|---|
| Type | PVC ball valve<br>DN 20 - DN 32 | Steel diaphragm valve<br>DN 25 - DN 32 | Steel diaphragm valve<br>DN 50 / DN 65 / DN 80 |
| Maximum chlorine solution pressure | 10 bar | 16 bar | 10 bar |
| Water temperature | 5-35 °C | 5-35 °C | 5-35 °C |
| Ambient temperature | 0-45 °C | 0-45 °C | 0-45 °C |
| Material | • Valve body: PVC<br>• Gaskets: FKM<br>• Valve ball: PVC<br>• Connection: PVC<br>• Injection pipe: PVC | • Valve body: steel, lined with rubber<br>• Gaskets: PVC<br>• Diaphragm: EPDM/PTFE<br>• Connection: steel, lined with rubber<br>• Injection pipe: steel, lined with PVC | • Valve body: steel, lined with rubber<br>• Gaskets: PVC<br>• Diaphragm: EPDM/PTFE<br>• Connection: steel, lined with rubber<br>• Injection pipe: steel, lined with PVC |
| Weight | 0.5 - 1 kg | 6.5 - 10 kg | 22 kg / 33.5 kg / 43.5 kg |

### Dimensions of injection units



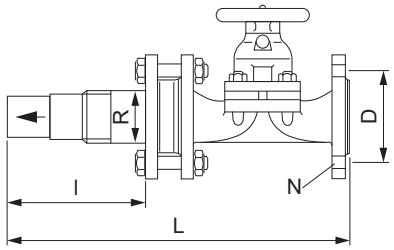

TM074759

*PVC injection unit with ball valve; installation connection G 1*



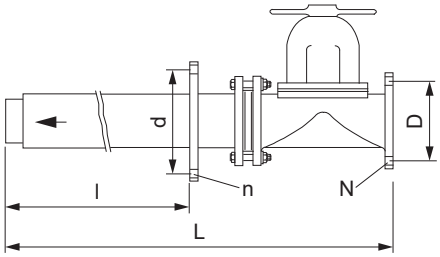

TM074760

*PVC injection unit with ball valve; installation connection G 1/4 and G 2*




TM074761

*Steel injection unit with diaphragm valve; installation connection G 1 1/2*




TM074762

*Steel injection unit with diaphragm valve; flange installation connection*

Dimensions in mm

| Installation connection (R or d) | D | l | L | n | N |
|---|---|---|---|---|---|
| DN 20 / G 1 | 25 | 155 | 298 | - | - |
| DN 25 / G 1 1/4 | 32 | 155 | 371 | - | - |
| DN 32 / G 2 | 40 | 155 | 414 | - | - |
| Flange DN 25 / G 1 1/2 | 85 | 90 | 310 | - | 4 x 12 |
| Flange DN 32 / G 1 1/2 | 100 | 90 | 310 | - | 4 x 16 |
| Flange DN 50 / Flange DN 80 | 125 | 450 | 860 | 8 x 18 | 4 x 18 |
| Flange DN 65 / Flange DN 100 | 145 | 650 | 1120 | 8 x 18 | 4 x 18 |
| Flange DN 80 / Flange DN 125 | 160 | 750 | 1240 | 8 x 18 | 8 x 18 |

### Order data for injection units

| Type | Material | Connection chlorine solution line | Installation connection (R or d) | Weight [kg] | Product number |
|---|---|---|---|---|---|
| Ball valve | PVC | PVC pipe DN 20 | G 1 | 0.3 | 96696417 |
| | | PVC pipe DN 25 | G 1 1/4 | 0.5 | 96617120 |
| | | PVC pipe DN 32 | G 2 | 1.5 | 96705808 |
| Diaphragm valve | Steel | Flange DN 25 | G 1 1/2 | 7.0 | 96727321 |
| | | Flange DN 32 | G 1 1/2 | 8.5 | 96727322 |
| | | Flange DN 50 | Flange DN 80 | 21.0 | 96727319 |
| | | Flange DN 65 | Flange DN 100 | 39.0 | 96727320 |
| | | Flange DN 80 | Flange DN 125 | 46.0 | 96727318 |

### Connection sets for steel injection units

| Connection set | Product number |
|---|---|
| PVC flange DN 25, gasket, stub flange, nuts and bolts, washers | 96727583 |
| PVC flange DN 32, gasket, stub flange, nuts and bolts, washers | 96727584 |
| PVC flange DN 50, gasket, stub flange, nuts and bolts, washers | 96727581 |
| PVC flange DN 65, gasket, stub flange, nuts and bolts, washers | 96727582 |
| PVC flange DN 80, gasket, stub flange, nuts and bolts, washers | 96727580 |

# 10. Pressure-side accessories

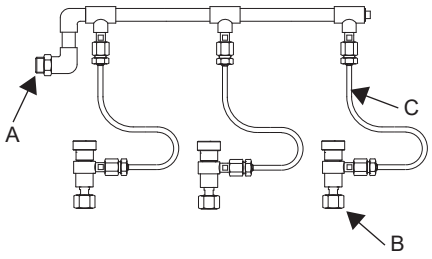
## Header lines

Header lines connect several chlorine cylinders or drums with the downstream components of the gas dosing system.
Header lines include the following:

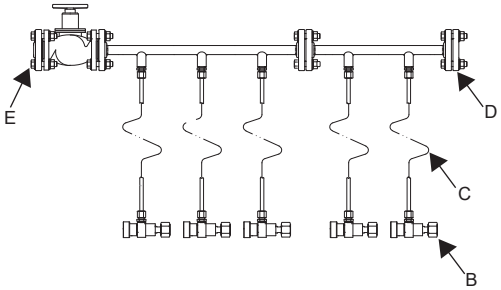
- a collector pipe for the corresponding number of cylinders or drums
- flexible lines for connecting the cylinders or drums
- the corresponding number of connection valves

**Selection of the suitable header line**

It is possible to extract 1 % per hour of the content of a chlorine cylinder or drum by weight. The needed number of cylinders or drums can be calculated based on the required total dosing quantity.



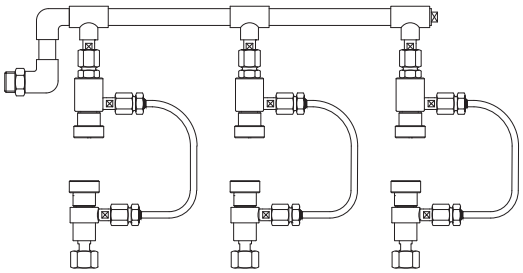

*Header line for chlorine cylinders*




TM075122

TM075123

*Header line for 5 drums*



TM078978

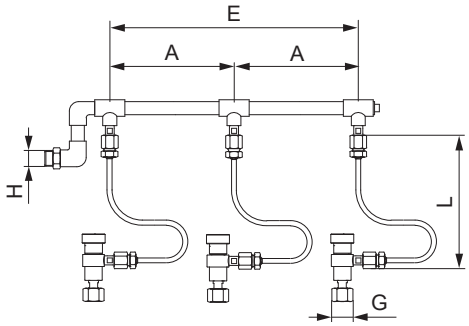
*Header lines with angle valves*

| Pos. | Component |
|---|---|
| A | Connection vacuum regulator |
| B | Connection cylinder or drum |
| C | Flexible copper line |
| D | Connection for nitrogen rinsing device |
| E | Connection for LiquFilt 524 or 185 change-over device |

### Technical data of header lines

| | |
|---|---|
| Medium | Liquid or gaseous chlorine |
| Max. pressure | 16 bar |
| Material | • Pipe: low-carbon steel<br>• Copper line: tin-plated copper<br>• Connection valve: nickel-plated brass, alloy C4, PTFE, FKM |

**Dimensions of header lines**

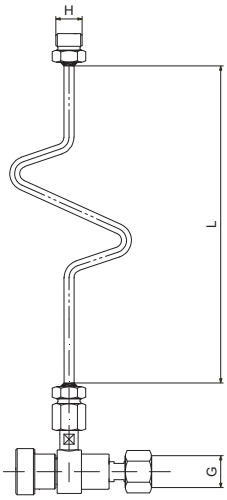



TM074880

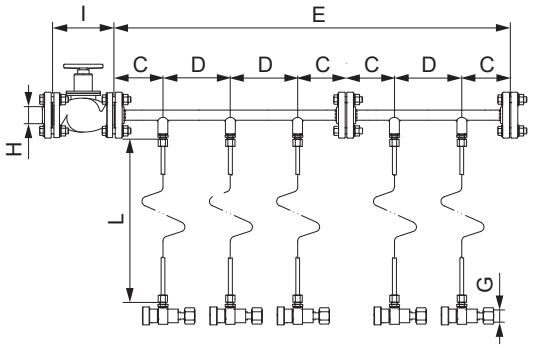
*Header line for cylinders*

Dimensions in mm

| Cylinder | A | E | G | H | L |
|---|---|---|---|---|---|
| 2 | 350 | 700 | 1" Yoke USA | 1" | 1000 |
| 3 | | 1050 | | | |
| 4 | | 1400 | | | |




*Valve connection with copper line for one drum or cylinder*




TM075124

TM075050

*Header line for 5 drums*

Dimensions in mm

| Drums | C | D | E | G | H | I | L |
|---|---|---|---|---|---|---|---|
| 1 | - | - | - | 1" Yoke USA 1 ¼" | G 1/2 | - | 2000 |
| 2 | 500 | 1000 | 2000 | | Welding neck flange DN 25 | 160 | |
| 3 | | | 3000 | | | | |
| 4 | | | 4000 | | | | |
| 5 | | | 5000 | | | | |
| 6 | | | 6000 | | | | |

## Type key of header lines

| Type | |
|---|---|
| **542** -C-2/1,1-N | |
| **542** | Header line |

| Container type | |
|---|---|
| 542-**C**-2/1,1-N | |
| **C** | Cylinder |
| D | Drum |

| Number | |
|---|---|
| 542-C-**2**/1,1-N | |
| 1 | 1 |
| **2** | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |

| Connection container | |
|---|---|
| 542-C-2/**1**,1-N | |
| **1** | 1" |
| 3 | Yoke USA |
| 14 | 1 ¼" |

| Connection vacuum regulator | |
|---|---|
| 542-C-2/1,**1**-N | |
| **1** | 1" |
| 4 | G 1/2 |
| 18 | Welding neck flange DN 25 |

| Angle valve | |
|---|---|
| 542-C-2/1,1-**N** | |
| **N** | Without |
| Y | With |

## Order data for header lines for cylinders without angle valve

| Number of cylinders | Cylinder connection 1" | | Cylinder connection yoke USA | |
|---|---|---|---|---|
| | Type designation | Product number | Type designation | Product number |
| 2 | 542-C-2/1,1-N | 96698876 | 542-C-2/3,1-N | 95704437 |
| 3 | 542-C-3/1,1-N | 96698877 | 542-C-3/3,1-N | 95715079 |
| 4 | 542-C-4/1,1-N | 96698878 | 542-C-4/3,1-N | 95760985 |

## Order data for header lines for cylinders with angle valve

| Number of cylinders | Cylinder connection 1" | | Cylinder connection yoke USA | |
|---|---|---|---|---|
| | Type designation | Product number | Type designation | Product number |
| 2 | 542-C-2/1,1-Y | 95700771 | 542-C-2/3,1-Y | 95761564 |
| 3 | 542-C-3/1,1-Y | 96728990 | 542-C-3/3,1-Y | 95761565 |
| 4 | 542-C-4/1,1-Y | 96728992 | 542-C-4/3,1-Y | 95744505 |

## Order data for header lines for drums

| Number of drums | Connection 1" | | Connection yoke USA | | Connection 1 ¼" | |
|---|---|---|---|---|---|---|
| | Type designation | Product number | Type designation | Product number | Type designation | Product number |
| 1 | 542-D-1/1,4-N | 96728935 | 542-D-1/3,4-N | 95700445 | 542-D-1/14,4-N | 96728936 |
| 2 | 542-D-2/1,18-N | 95760905 | 542-D-2/3,18-N | 95760896 | 542-D-2/14,18-N | 95752980 |
| 3 | 542-D-3/1,18-N | 95760906 | 542-D-3/3,18-N | 95760897 | 542-D-3/14,18-N | 95760902 |
| 4 | 542-D-4/1,18-N | 95760907 | 542-D-4/3,18-N | 95760898 | 542-D-4/14,18-N | 95760903 |
| 5 | 542-D-5/1,18-N | 95760908 | 542-D-5/3,18-N | 95760899 | 542-D-5/14,18-N | 95760904 |
| 6 | 542-D-6/1,18-N | 95760900 | 542-D-6/3,18-N | 96760900 | 542-D-6/14,18-N | 95760901 |

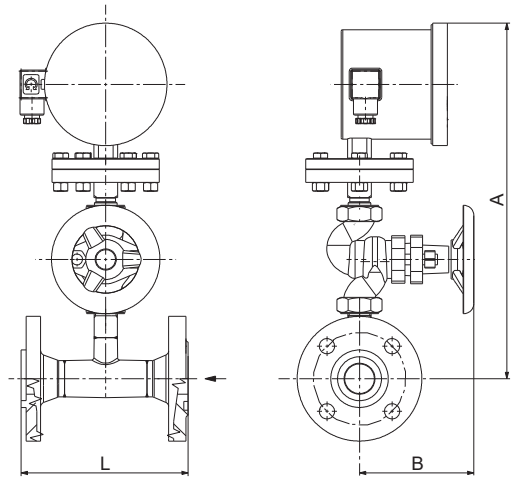
# Contact manometer with shut-off valve and T-piece

The contact manometer monitors the pressure in the pressure line. If the pressure is too high, the contact manometer gives a contact signal for an alarm before the bursting disc breaks.

### Technical data of a contact manometer with shut-off valve and T-piece

| | |
|---|---|
| Max. pressure | 16 bar |
| Inlet connection | Groove flange DN 25, PN40, EN 1092-1 |
| Outlet connection | Tongue flange DN 25, PN40, EN 1092-1 |
| Contact manometer | 2 limit contacts NO/NC |
| Material | • Pipe: steel<br>• Valve: steel, alloy C4, PTFE<br>• Manometer: steel, silver<br>• Gasket: IT, asbestos-free |
| Weight | 6.4 kg |

### Dimensions of a contact manometer with shut-off valve and T-piece




TM075075

Dimensions in mm

| D | A | B | L |
|---|---|---|---|
| DN 25 | 330 | 105 | 154 |

### Order data for a contact manometer with shut-off valve and T-piece

| Description | Product number |
|---|---|
| Contact manometer with shut-off valve and T-piece, DN 25 | 96728924 |

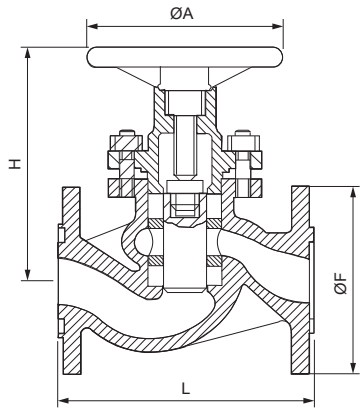
## Shut-off valve

The shut-off valve is used for pressurised liquid or gaseous chlorine.

### Technical data of a shut-off valve

| | |
|---|---|
| Max. pressure | 16 bar |
| Inlet connection | Groove flange DN 25, PN40, EN 1092-1 |
| Outlet connection | Tongue flange DN 25, PN40, EN 1092-1 |
| Material | • Housing: cast iron<br>• Piston: alloy C4<br>• Sealing: PTFE<br>• Gasket: IT, asbestos-free |

### Dimensions of a shut-off valve




TM074697

Dimensions in mm

| øA | øF | H | L |
|---|---|---|---|
| 140 | 115 | 139 | 160 |

### Order data for a shut-off valve

| Description | Product number |
|---|---|
| Shut-off valve DN 25 | 96706446 |

## Heater strip

The heater strip is wrapped around the pressure line and heats it up to prevent pressurised chlorine gas from reliquefication.

- Length 1 m
- Temperature-regulated

### Order data for a heater strip

| Description | Product number |
|---|---|
| Heater strip, 115 V, 1-phase, 50/60 Hz, 25 W | 96729274 |
| Heater strip, 230 V, 1-phase, 50/60 Hz, 25 W | 96729273 |

### Connection set for heater strip

Connection set for heater strip with cable box, screwing, slot gaskets, shrinkable sleeves and nut (for cable boxes without thread).

### Order data for a connection set for heater strip

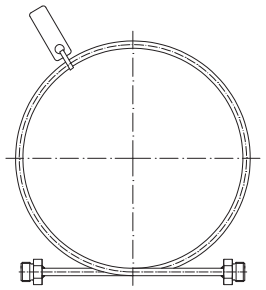
| Description | Product number |
|---|---|
| Connection set for heater strip | 96729275 |

## Copper line

The copper line connects the chlorine container with the header line or vacuum regulator. A connection valve is required between the chlorine container and the copper line.

### Technical data of a copper line

| | |
|---|---|
| Medium | Chlorine |
| Max. pressure | 16 bar |
| Material | Copper, tin-plated<br>Brass, tin-plated |



TM075133

### Order data for a copper line

| Description | Product number |
|---|---|
| 1 metre of copper line with G 1/2 connectors | 99356968 |
| 2 metres of copper line with G 1/2 connectors | 99356984 |
| 5 metres of copper line with G 1/2 connectors | 96680970 |

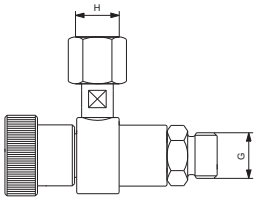
## Corner valve for header line

The corner valve is used as a shut-off valve between the copper line and the header line.

### Technical data of a corner valve

| | |
|---|---|
| Medium | Chlorine (liquid or gas) |
| Max. pressure | 16 bar |
| Material | • Valve body: brass, nickel-plated<br>• Valve piston: nickel-chrome alloy<br>• Gaskets: IT, asbestos-free<br>• Packing: PTFE<br>• O-ring: FKM |

### Dimensions of a corner valve




TM075046

| G (inlet) | H (outlet) |
|---|---|
| G 1/2 | G 1/2 |

### Order data for a corner valve

| Description | Product number |
|---|---|
| Corner valve | 96729263 |

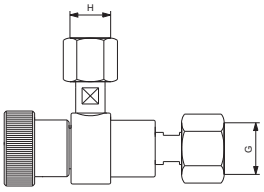
# Connection valve for cylinder and drum

The connection valve is used as a shut-off valve between the chlorine cylinder or drum and the copper line.

### Technical data of a connection valve

| | |
|---|---|
| Medium | Chlorine (liquid or gas) |
| Max. pressure | 16 bar |
| Material | • Valve body: brass, nickel-plated<br>• Valve piston: nickel-chrome alloy<br>• Gasket: IT, asbestos-free<br>• Packing: PTFE<br>• O-ring: FKM |

### Dimensions of a connection valve




TM075047

| Description | G (inlet) | H (outlet) |
|---|---|---|
| Connection valve 1" | 1" | G 1/2 |
| Connection valve G 3/4 | G 3/4 | G 1/2 |
| Connection valve 1 ¼" | 1 ¼" | G 1/2 |

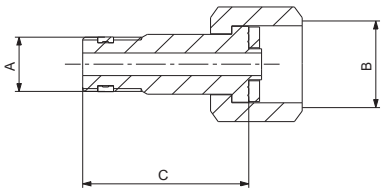
### Order data for a connection valve

| Description | Product number |
|---|---|
| Connection valve 1" | 96690367 |
| Connection valve G 3/4 | 96688687 |
| Connection valve 1 ¼" | 96690368 |

# Connection screwing for connection valve

The connection screwing is used to adapt the connection valve to different connection sizes of chlorine containers.

### Dimensions of a connection screwing for connection valve




TM075053

Dimensions in mm

| A | B | C |
|---|---|---|
| G 1/4 | G 1/2 | 39 |
| | 1" | 36 |
| | G 3/4 | 61 |
| | 1 ¼" | 49 |

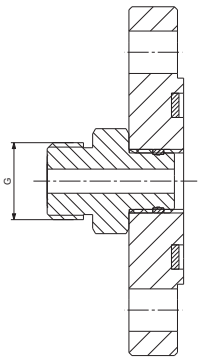
### Order data for a connection screwing for connection valve

| Description | Product number |
|---|---|
| Connection screwing G 1/2 | 96729262 |
| Connection screwing 1" | 99707722 |
| Connection screwing G 3/4 | 99709506 |
| Connection screwing 1 ¼" | 99707747 |

## Adapter flange for VGA-146 vacuum regulator

The adapter flange connects the VGA-146 vacuum regulator with the header line for chlorine drums.

**Dimensions of an adapter flange for VGA-146**




TM075083

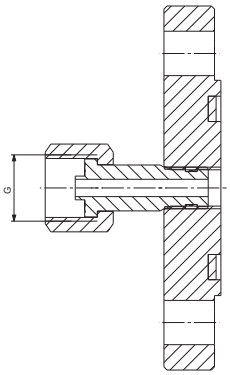
| Description | G |
|---|---|
| Adapter flange (groove flange), DN 25 | 1" |

**Order data for an adapter flange for VGA-146**

| Description | Product number |
|---|---|
| Adapter flange (groove flange), DN 25 (EN 1092-1), with 1" connection and flat gasket | 99656316 |

## Adapter flange for copper line

The adapter flange connects the copper line with the header line for chlorine drums.




TM075080

| Description | G |
|---|---|
| Adapter flange (groove flange) DN 25 | G 1/2 |

**Order data for an adapter flange for copper line**

| Description | Product number |
|---|---|
| Adapter flange (groove flange) DN 25, PN40 (EN 1092-1) with G 1/2 connection and flat gasket | 99656301 |

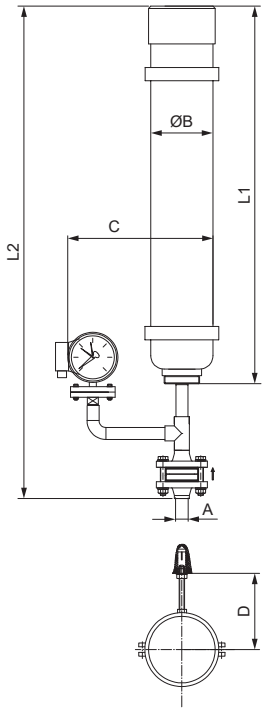
# Expansion tank

The expansion tank protects the pipework containing liquid chlorine from bursting in case of overpressure. The bursting disc before the expansion tank breaks when the pressure exceeds 16 bar. The liquid chlorine enters the expansion tank which reduces the pressure in the pipework. The contact manometer with potential-free contact NC gives a signal when the bursting disc is broken.

### Technical data of an expansion tank

| | |
|---|---|
| Medium | Liquid or gaseous chlorine |
| Volume | 10 l |
| Max. operating pressure | 12.5 bar |
| Rupture pressure (on rupture disc) | 16 bar |
| Connection | Welding neck flange DN 25 |
| Contact manometer | 1 limit contact NC |
| Material | • Pipe, cylinder: Low-carbon steel,<br>• Rupture disc: stainless steel, copper-nickel alloy<br>• Manometer: steel, silver<br>• Gasket: IT asbestos-free |
| Weight | 23 kg |

### Dimensions of an expansion tank




TM075018

*Expansion tank with bursting disc and contact manometer*

Dimensions in mm

| A | øB | C | D | L1 | L2 |
|---|---|---|---|---|---|
| DN 25 | 140 | 327 | 100-170 | 850 | 1110 |

### Order data for an expansion tank

| Description | Product number |
|---|---|
| Expansion tank with contact manometer | 96706391 |

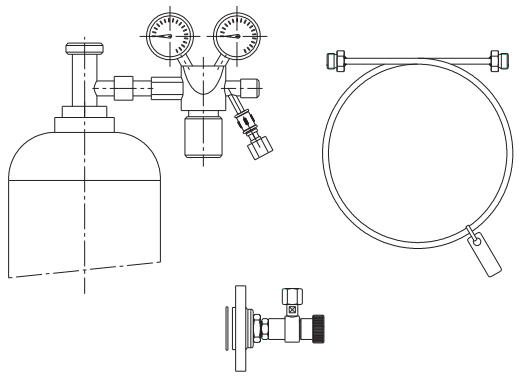
# Nitrogen rinsing device

**Order data for a nitrogen rinsing device**

The nitrogen rinsing device is used to flush the chlorine gas dosing system with nitrogen for removing the chlorine gas before working on the system. With the tongue flange the nitrogen rinsing device is connected to the header line for chlorine drums.

The nitrogen rinsing device is available with:

- 40-litre nitrogen cylinder (empty)
- Pressure reducing valve
- 2 metres of copper line
- Corner valve
- DN 25 tongue flange and flange gasket



TM075184

| Description | Product number |
|---|---|
| Nitrogen rinsing device for connection to DN 25 header lines for chlorine drums | 96726855 |

# LiquFilt 524

The LiquFilt 524 is a heated liquid trap with integrated filter for high-capacity chlorine gas dosing systems up to 200 kg/h.

It is installed before the VGS-147 or VGS-148 vacuum regulator to separate the impurities in the chlorine gas and catch and evaporate any liquid chlorine drops. The LiquFilt 524 protects the downstream dosing units from damage by liquid chlorine and prevents the obstruction of nozzles and valve seats.



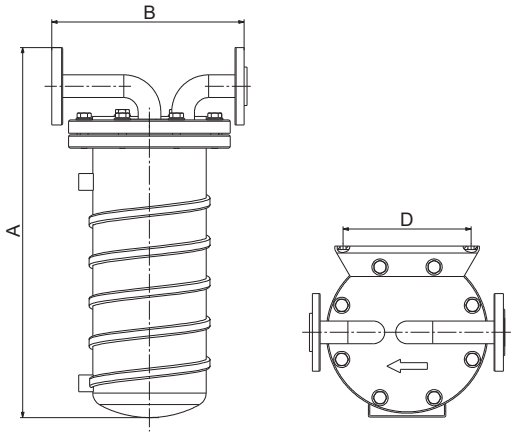
TM079275

*LiquFilt 524*

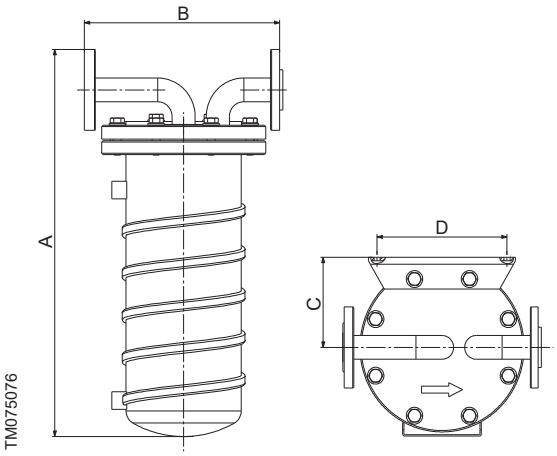
### Technical data of LiquFilt 524

| | |
|---|---|
| Medium | Chlorine gas |
| Max. capacity | 200 kg/h |
| Max. operating pressure | 16 bar |
| Inlet connection | Groove flange DN 25, PN40, EN 1092-1 |
| Outlet connection | Tongue flange DN 25, PN40, EN 1092-1 |
| Heating capacity | 80 W at 10 °C |
| Material | • Body, pipes and flanges: low-carbon steel<br>• Filter: Rockwool<br>• Gaskets: IT, asbestos-free |
| Weight | 22 kg |

### Dimensions of LiquFilt 524




*LiquFilt 524 inlet right, outlet left*




TM075076

TM075077

*LiquFilt 524 inlet left, outlet right*

Dimensions in mm

| A | B | C | D |
|---|---|---|---|
| 549.5 | 185.5 | 128 | 190 |

### Type key of LiquFilt 524

| Type | |
|---|---|
| **524 Liqufilt** -200/G/L-R,G,C3 | |
| **524 LiquFilt** | 524 LiquFilt |

| Capacity | |
|---|---|
| 524 LiquFilt-**200**/G/L-R,G,C3 | |
| **200** | 200 kg/h |

| Supply voltage | |
|---|---|
| 524 LiquFilt-200/**G**/L-R,G,C3 | |
| **G** | 230 V, 50/60 Hz |
| H | 115 V, 50/60 Hz |

| Flow direction | |
|---|---|
| 524 LiquFilt-200/G/**L-R**,G,C3 | |
| **L-R** | Left to right |
| R-L | Right to left |

| Logo | |
|---|---|
| 524 LiquFilt-200/G/L-R,**G**,C3 | |
| **G** | Grundfos |

| Product certificate | |
|---|---|
| 524 LiquFilt-200/G/L-R,G,C3 | |
| **C3** | Certificate 3.1 (EN 10204) |

### Order data for LiquFilt 524

- Inlet left, outlet right

| Supply voltage | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| 230 V, 50/60 Hz | 524 LiquFilt-200/G/L-R,G | 96696435 | 95749445 |
| 115 V, 50/60 Hz | 524 LiquFilt-200/H/L-R,G | 96727353 | 95758350 |

- Inlet right, outlet left

| Supply voltage | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| 230 V, 50/60 Hz | 524 LiquFilt-200/G/R-L,G | 96696436 | 95751129 |
| 115 V, 50/60 Hz | 524 LiquFilt-200/H/R-L,G | 96727354 | 95758351 |

## 544 pressure reducing valve

The 544 pressure reducing valve reduces the unregulated gas pressure of the gas containers to a constant operation pressure. It ensures the precise and pressure-independent functioning of the inlet valve of the vacuum regulator and prevents reliquefaction of the gas. If the reducing valve is additionally equipped with a servomotor, it protects the dosing unit against the penetration of liquefied gas by its immediate shut-off function in case of malfunctions of the system. If the operating pressure exceeds the setpoint value, the spring-cone-diaphragm system causes the valve to close. If the 544 pressure reducing valve is connected to a Conex DIA-G or DIS-G gas warning system, the valve is immediately closed in case of a gas breakout.

A wall bracket and a manometer must be ordered separately (see accessories for 544).



*Automatic pressure reducing valve*

TM075169



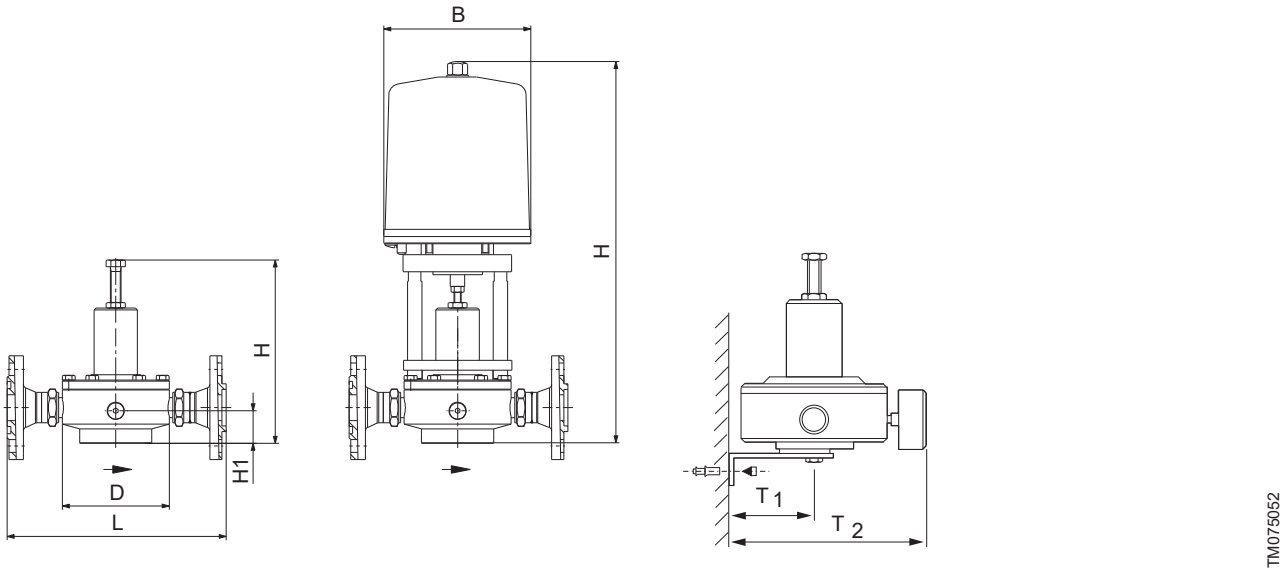
*Manual pressure reducing valved*

TM079085

### Technical data 544

| | |
|---|---|
| Medium | Chlorine gas |
| Max. capacity | 40 kg/h, 200 kg/h |
| Max. operating pressure | 16 bar |
| Counterpressure | Adjustable 2 to 3 bar |
| Inlet connection | Groove flange DN 25, PN40, EN 1092-1 |
| Outlet connection | Tongue flange DN 25, PN40, EN 1092-1 |
| Material | • Diaphragm: fine silver<br>• Valve cone: silver<br>• Valve seat: PTFE<br>• Spring: Nickel-chrome alloy, silver plated<br>• O-ring: FKM<br>• Enclosure: Brass |
| Weight | 40 kg/h without servomotor: 6 kg |
| | 200 kg/h without servomotor: 12.5 kg |
| | 40 kg/h with servomotor: 9.5 kg |
| | 200 kg/h with servomotor: 16 kg |
| Servomotor | Voltage: 230 V, 115 V, 50/60 Hz |
| | Power consumption: 20 W |
| | Enclosure: IP54 |
| | Safety function: servomotor closes in case of power failure |

## Dimensions 544




*544 pressure reducing valve*

Dimensions in mm

| Capacity [kg/h] | Manual/Automatic | H | H1 | D | B | L | T1 | T2 |
|---|---|---|---|---|---|---|---|---|
| 40 | manual | 200 | 36 | 120 | - | 243 | 128 | 240 |
| 200 | manual | 220 | 36 | 150 | - | 270 | 128 | 255 |
| 40 | with servomotor | 425 | 36 | 120 | 162 | 243 | 128 | 240 |
| 200 | with servomotor | 435 | 36 | 150 | 160 | 270 | 128 | 255 |

## Type key 544

| **Type** | |
|---|---|
| **544** -C-40-M/18,X-G,C3 | |
| **544** | Pressure reducing valve |

| **Medium** | |
|---|---|
| 544-**C**-40-M/18,X-G,C3 | |
| **C** | Chlorine |

| **Capacity** | |
|---|---|
| 544-C-**40**-M/18,X-G,C3 | |
| **40** | 40 kg/h |
| 200 | 200 kg/h |

| **Adjustment** | |
|---|---|
| 544-C-40-**M**/18,X-G,C3 | |
| **M** | Manual |
| G | Automatic, 230 V, 50/60 Hz |
| H | Automatic, 115 V, 50/60 Hz |

| **Connection** | |
|---|---|
| 544-C-40-M/**18**,X-G,C3 | |
| **18** | Groove and tongue flange DN 25 (EN 1092) |

| **Counterflange** | |
|---|---|
| 544-C-40-M/18,**X**-G,C3 | |
| **X** | Without counterflange |

| Logo | |
|---|---|
| 544-C-40-M/18,X-**G**,C3 | |
| **G** | Grundfos |

| Product certificate | |
|---|---|
| 544-C-40-M/18,X-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

### Order data 544

| Capacity [kg/h] | Connection | Manual/Automatic | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|---|---|
| 40 | Flange DN 25 | manual | 544-C-40-M/18,X-G | 95761046 | 95761047 |
| | Flange DN 25 | with servomotor 230 V, 50/60 Hz | 544-C-40-G/18,X-G | 95761090 | 95761092 |
| | Flange DN 25 | with servomotor 115 V, 50/60 Hz | 544-C-40-H/18,X-G | 95761091 | 95761093 |
| 200 | Flange DN 25 | manual | 544-C-200-M/18,X-G | 96729021 | 95761043 |
| | Flange DN 25 | with servomotor 230 V, 50/60 Hz | 544-C-200-G/18,X-G | 91835788 | 95750634 |
| | Flange DN 25 | with servomotor 115 V, 50/60 Hz | 544-C-200-H/18,X-G | 91835789 | 95761044 |

### Order data for accessories for 544

| Description | Product number |
|---|---|
| Manometer, 0-16 bar, G 1/4 | 96688685 |
| Wall-mounting bracket with fastening material | 96728842 |

## Counterflanges

### Order data for counterflanges

| Description | Product number |
|---|---|
| Flange set: pair of welding neck flanges, tongue and groove, DN 25 PN40 (EN1092-1), including screws and gaskets | 96698366 |
| Flange set: pair of threaded counter flanges, tongue and groove, R1, DN 25 PN40 (EN 1092-1), including screws and gaskets | 96727563 |
| 10 gaskets for flanges DN 25 (EN 1092-1) | 96688979 |

## Ammonia for tightness check

### Order data for ammonia

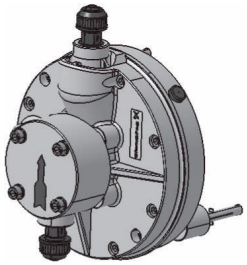
| Description | Product number |
|---|---|
| Liquid ammonia (25 %) for tightness check, 75 ml<br>(not for airfreight transport, for airfreight transport use local supplier) | 98025681 |

# 11. Vacuum-side accessories

## Safety valve

The safety valve is required according to DIN 19606 to prevent a gas leakage in the vacuum piping system. The safety valve can only be used together with the Grundfos vacuum regulator with integrated pressure relief valve. The safety valve is installed in the vacuum line as a flow-through valve in the chlorine gas storage room.

- Capacity: up to 10 kg/h
- For direct wall mounting

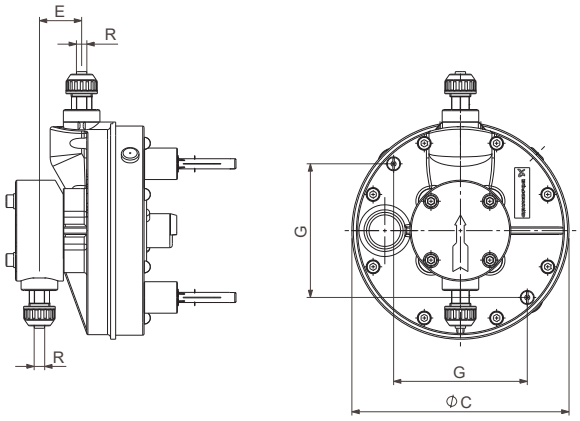


TM074758

### Technical data of a safety valve

| | |
|---|---|
| Medium | Chlorine gas |
| Capacity | Up to 10 kg/h |
| Material | • Enclosure: PVC<br>• Spring: alloy C4 silver coated<br>• Diaphragm: FEP<br>• O-ring: Viton |
| Vacuum connections | • Up to 4 kg/h: PE hose 8/11<br>• Up to 10 kg/h: PE hose 10/14 |
| Weight | 1 kg |

### Dimensions of a safety valve




TM074757

*Safety valve*

Dimensions in mm

| øC | E | G | R |
|---|---|---|---|
| 172 | 33.5 | 106 | 8/11, 10/14 |

## Type key of a safety valve

| Type | |
|---|---|
| **543** -11-11/W-G,C3 | |
| **543** | Safety valve |

| Inlet | |
|---|---|
| 543-**11**-11/W-G,C3 | |
| 6 | PE 10/14 |
| **11** | PE 8/11 |

| Outlet | |
|---|---|
| 543-11-**11**/W-G,C3 | |
| 6 | PE 10/14 |
| **11** | PE 8/11 |

| Installation type | |
|---|---|
| 543-11-11/**W**-G,C3 | |
| **W** | Wall-mounting |

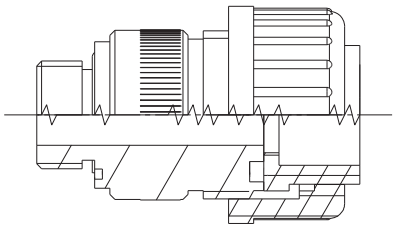
| Logo | |
|---|---|
| 543-11-11/W-**G**,C3 | |
| **G** | Grundfos |

| Product certificate | |
|---|---|
| 543-11-11/W-G,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

## Order data for a safety valve

| Connector inlet/outlet | Type designation | Product number | Product number with certificate 3.1 |
|---|---|---|---|
| PE 8/11 | 543-11-11/W-G | 96698000 | 95760039 |
| PE 10/14 | 543-6-6/W-G | 96698015 | 95747090 |

## Order data for pipe connection (accessory)



TM075084

| Description | Product number |
|---|---|
| Pipe connection, DN 15 (1 unit) | 99358518 |

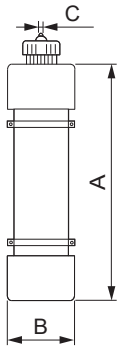
# Chlorine gas adsorption filter

### Technical data of a chlorine gas adsorption filter

The chlorine gas adsorption filter is installed at the vent outlet of the vacuum regulator. In case of a malfunction of the vacuum regulator, the adsorption filter neutralises the chlorine gas.

| | |
|---|---|
| Medium | Chlorine gas |
| Adsorption capacity | Approximately 450 g $Cl_2$ |
| Inner filter volume | 5 l |
| Material | • Enclosure: PVC<br>• Adsorbent: aluminium oxide |
| Connections | PE hose 8/11 |
| Filling weight | 4 kg |

### Dimensions of a chlorine gas adsorption filter




TM074620

Dimensions in mm

| A | B | C |
|---|---|---|
| 824 | 139 | 8/11 |

### Order data for a chlorine gas adsorption filter

| Description | Product number |
|---|---|
| Chlorine gas adsorption cylinder, filled | 96696580 |
| Refilling (4 kg adsorbent) | 96688989 |

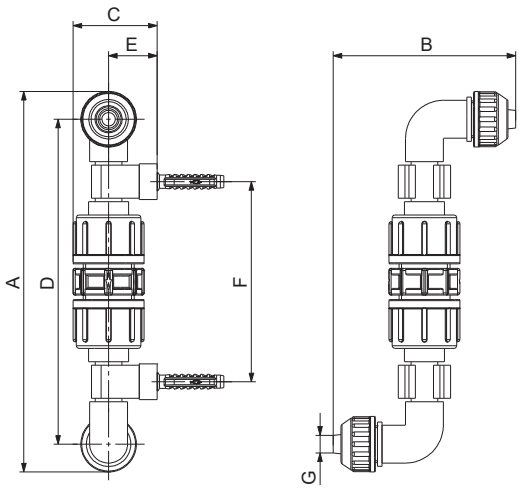
# Vacuum non-return valve

The vacuum non-return valve prevents water backflow from the injector to the dosing regulator.

### Technical data of a vacuum non-return valve

| | |
|---|---|
| Medium | Chlorine gas |
| Capacity | up to 4 kg/h |
| Material | • Valve body: PVC<br>• Spring: Tantal<br>• Ball: glass<br>• O-ring: FKM |
| Vacuum connections | PE hose 8/11 |
| Opening pressure | 0.05 bar |

### Dimensions of a vacuum non-return valve




TM075049

Dimensions in mm

| A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|
| 171 | 82 | 38 | 146 | 22 | 90+2 | 8 |

### Order data for a vacuum non-return valve

| Description | Product number |
|---|---|
| Vacuum non-return valve | 95704851 |

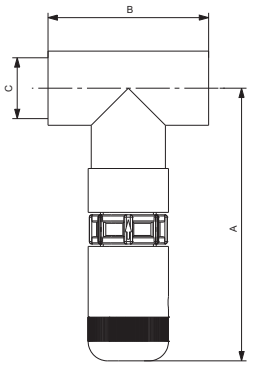
## Anti-syphoning valve

The anti-syphoning valve is installed between the booster pump and the injector. If the injection point is lower than the water unit, the anti-syphoning valve prevents syphoning when the chlorine gas dosing system is stopped.

### Technical data of an anti-syphoning valve

| | |
|---|---|
| Medium | Water |
| Material | • Housing: PVC<br>• Spring: Tantal<br>• Ball: glass<br>• O-ring: FKM |
| Connection | Piping DN 20 |
| Opening pressure | 0.05 bar |

### Dimensions of an anti-syphoning valve




TM075048

Dimensions in mm

| A | B | C |
|---|---|---|
| 112 | 66 | 25 |

### Order data for an anti-syphoning valve

| Description | Product number |
|---|---|
| Anti-syphoning valve | 96701817 |

## PE hose

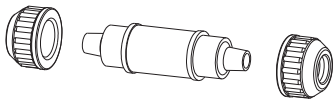
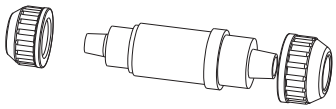
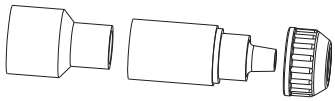
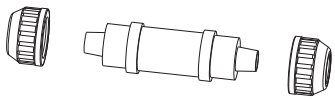
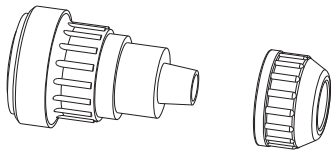
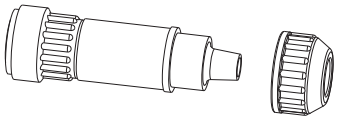
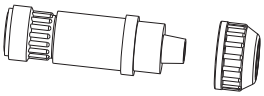
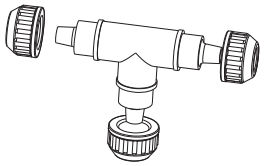
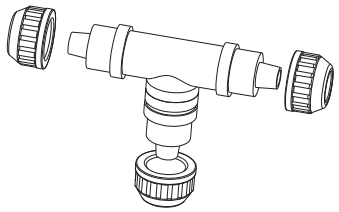
PE hoses are installed at the vacuum side of chlorine gas dosing systems up to 10 kg/h. They are available in different lengths and in sizes.

### Order data for PE hose

| Description | Product number |
|---|---|
| 8/11 mm PE hose, 10 m | 96701705 |
| 8/11 mm PE hose, 25 m | 96695982 |
| 8/11 mm PE hose, 50 m | 96727461 |
| 10/14 mm PE hose, 10 m | 91836646 |
| 10/14 mm PE hose, 25 m | 96727466 |
| 10/14 mm PE hose, 50 m | 96697538 |

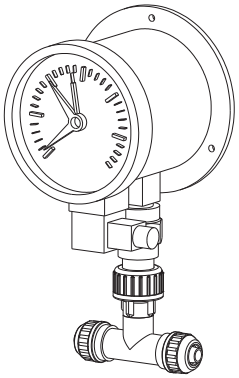
## Connectors

With these connectors, PE hoses or PVC pipes of different sizes can be connected. The threaded side includes a gasket.

| Type | Connection | Material | | Product number |
|---|---|---|---|---|
| | | Body and connection | Gasket | |
|  TM074970 | PE hose 8/11 - PE hose 8/11 | PVC | - | 99615613 |
|  TM074971 | PE hose 8/11 - PE hose 10/14 | PVC | - | 99618453 |
|  TM074972 | PE hose 8/11 - PVC pipe DN 10 or DN 15 | PVC | - | 96727463 |
|  TM074973 | PE hose 10/14 - PE hose 10/14 | PVC | - | 99618472 |
|  TM074976 | PE hose 10/14 - G 1 | PVC | FKM | 99628317 |
|  TM074977 | PE hose 8/11 - G 5/8 | PVC | FKM | 99627276 |
|  TM074978 | PE hose 10/14 - G 5/8 | PVC | FKM | 99626713 |
|  TM074974 | T-piece for PE hoses 8/11 | PVC | - | 96695978 |
|  TM074975 | T-piece for PE hoses 10/14 | PVC | - | 91835711 |

## Contact vacuum meter with PE hose connector

The contact vacuum meter indicates the injector vacuum. The min/max contact can be used for an alarm. The contact vacuum meter is supplied with wall fixing material.



TM075054

### Technical data contact vacuum meter

| | |
|---|---|
| Medium | Chlorine gas |
| Material | • Body and connection: PVC, brass<br>• Gasket: FKM |
| Vacuum connections | PE hose 10/14 |
| Contacts | Min./Max. |

### Order data for contact vacuum meter

| Description | Product number |
|---|---|
| Contact vacuum meter, 2 connections for PE hose 10/14, 2 contacts (min/max) | 96728932 |

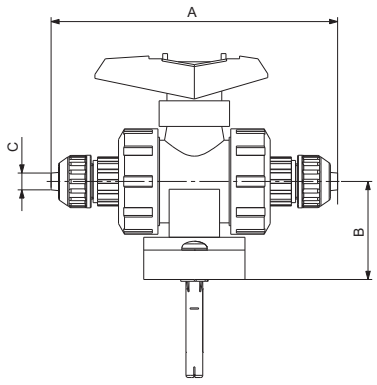
## Ball valve

The ball vale is used to shut-off the vacuum line. The ball valve is supplied with wall fixing material.

### Technical data of a ball valve

| | |
|---|---|
| Medium | Chlorine gas |
| Capacity | Up to 10 kg/h |
| Vacuum connection | PE hose: 8/11 or 10/14 |
| Material | • Body and connection: PVC<br>• Gaskets: FKM |

### Dimensions of a ball valve




TM075078

Dimensions in mm

| Connection | A | B | C |
|---|---|---|---|
| PE hose 8/11 | 136 | 46.5 | 8 |
| PE hose 10/14 | 147 | 46.5 | 10 |

### Order data for a ball valve

| Description | Product number |
|---|---|
| Ball valve for PE hose 8/11 | 96727449 |
| Ball valve for PE hose 10/14 | 96727450 |

# 12. General accessories

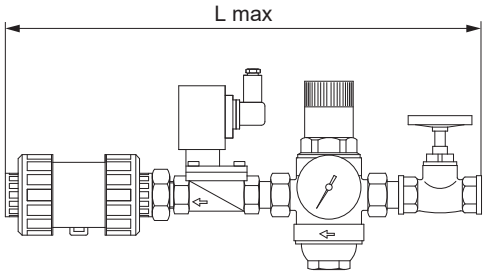
## Water unit

The water unit is a device for the regulation or control of the motive water pressure at the injector. The water unit is installed in the motive water line before the injector and must only be used with the VGA-113 dosing regulator.

### Technical data of a water unit

| | |
|---|---|
| Max. pressure | 10 bar |
| Material | Brass, NBR, FKM, PVC |

### Dimensions of a water unit




TM074634

*Water unit with shut-off valve, solenoid valve, pressure reducing valve, strainer, pressure gauge and non-return valve*

| Inlet connection | Outlet connection | $L_{max}$ [mm] |
|---|---|---|
| G 1/2 | PVC pipe 20/25 | 375 |
| G 1 | PVC pipe 25/32 | 470 |

### Type key of a water unit

| Type | |
|---|---|
| **556** -SVPRNV-G1/2-PVC,DN20,230V50Hz,C3 | |
| **556** | Water unit |

| Version | |
|---|---|
| 556-**SVPRNV**-G1/2-PVC,DN20,230V50Hz,C3 | |
| **SVPRNV** | Solenoid valve, pressure reducing valve, non-return valve |

| Water connection, inlet | |
|---|---|
| 556-SVPRNV-**G1/2**-PVC,DN20,230V50Hz,C3 | |
| **G 1/2** | G 1/2 |
| G 1 | G 1 |

| Water connection, outlet | |
|---|---|
| 556-SVPRNV-G1/2-**PVC,DN20**,230V50Hz,C3 | |
| **PVC, DN 20** | PVC pipe DN 20 (20/25) |
| PVC DN 25 | PVC pipe DN 25 (25/32) |

| Supply voltage | |
|---|---|
| 556-SVPRNV-G1/2-PVC,DN20,**230V50Hz**,C3 | |
| **230 V 50 Hz** | 230 V, 50 Hz |
| 24 VDC | 24 VDC |

| Product certificate | |
|---|---|
| 556-SVPRNV-G1/2-PVC,DN20,230V50Hz,**C3** | |
| **C3** | Certificate 3.1 (EN 10204) |

### Order data for a water unit

| Connection, inlet | Voltage | Type designation | Product number | Product number with certificate |
|---|---|---|---|---|
| G 1/2 | 230 V, 50 Hz | 556-SVPRNV-G1/2-PVC,DN20,230V50Hz | 95703314 | 95760360 |
| | 24 VDC | 556-SVPRNV-G1/2-PVC,DN20,24VDC | 95721164 | 95760361 |
| G 1 | 230 V, 50 Hz | 556-SVPRNV-G1-PVC,DN25,230V50Hz | 95704696 | 95760362 |
| | 24 VDC | 556-SVPRNV-G1-PVC,DN25,24VDC | 95745342 | 95760363 |

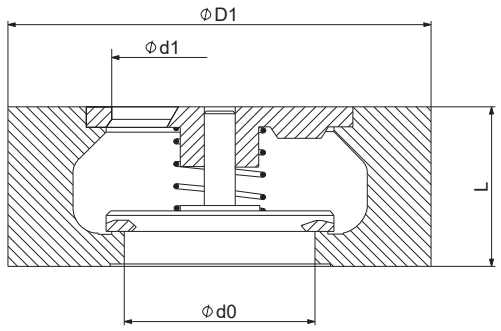
## Non-return valve for high-pressure injector

The non-return valve for high-pressure injector is installed between the flanges of the injector and the motive water pump to prevent the backflow of chlorine solution to the motive water pump.

### Technical data of a non-return valve

| | |
|---|---|
| Max. pressure | 40 bar |
| Material | Alloy C-4 |

### Dimensions of a non-return valve




TM075082

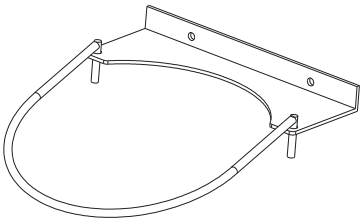
| Connection size | L | ød1 | øD1 | ødO |
|---|---|---|---|---|
| | [mm] | [mm] | [mm] | [mm] |
| DN 25 | 35.5 | 30 | 71 | 25 |

### Order data for a non-return valve

| Description | Product number |
|---|---|
| Spring-loaded non-return valve DN 25, PN 40, alloy C-4 | 95717963 |

## Chlorine cylinder holding clip

The chlorine cylinder holding clip is intended for chlorine cylinders with a diameter of 270 mm. It is mounted on the wall and holds the chlorine cylinder safely in its position in the chlorine room.



TM075179

### Technical data of a chlorine cylinder holding clip

| | |
|---|---|
| Chlorine cylinder diameter size | 270 mm |
| Material | Painted steel |

### Order data for a chlorine cylinder holding clip

| Description | Product number |
|---|---|
| Chlorine cylinder holding clip | 96726838 |

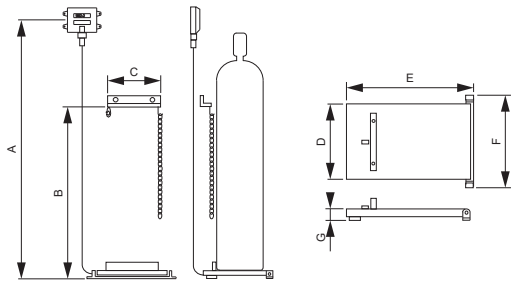
## Chlorine cylinder scale

The chlorine cylinder scale monitors the weight of the chlorine cylinder and displays the result locally or remotely.

### Technical data of a chlorine cylinder scale

| | |
|---|---|
| Chlorine cylinder size | Diameter 270 mm, max. 100 kg |
| Output signal | 4-20 mA |
| Power supply | 24 VDC |

### Dimensions of a chlorine cylinder scale




TM078897

Dimensions in mm

| A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|
| 1525 | 990-1040 | 255 | 420 | 345 | 470 | 42 |

### Order data for a chlorine cylinder scale

| Description | Product number |
|---|---|
| Chlorine cylinder scale for one cylinder up to 100 kg, with signal output 4-20 mA | 92546463 |
| Chlorine cylinder scale (2 scales) for two cylinders up to 100 kg each, with signal output 4-20 mA | 92546466 |

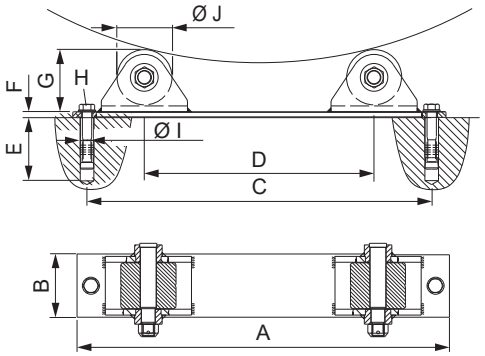
# Drum support

The drum support is used for the safe storage of a chlorine drum in the chlorine room. It is supplied in a set of two units with floor-fixing material.

### Technical data of a drum support

| Drum support | |
|---|---|
| Drum diameter | Min. 0.7 m, max. 1.96 m |
| Load | Max. 2000 kg |
| Material | • Mounting plate: painted steel<br>• Rollers and axles: nickel-plated steel |
| Weight | 2 x 23 kg |

### Dimensions of a drum support




TM074870

Dimensions in mm

| A | B | C | D | $E_{[min]}$ | F | G | H | øI | øJ |
|---|---|---|---|---|---|---|---|---|---|
| 650 | 110 | 600 | 400 | 110 | 10 | 108 | M16 | 24 | 96 |

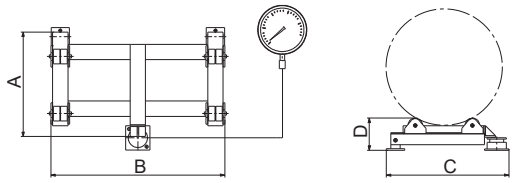
### Order data of a drum support

| Description | Product number |
|---|---|
| Drum support | 96726869 |

## Chlorine drum scale

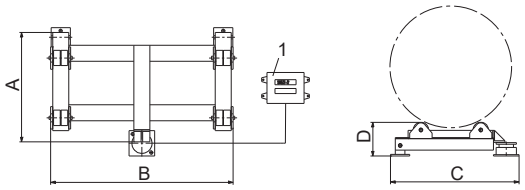
The chlorine drum scale monitors the weight of the chlorine drum and displays the result locally or remotely. The electronic indicator (1) must be ordered separately.

**Dimensions of a chlorine drum scale**



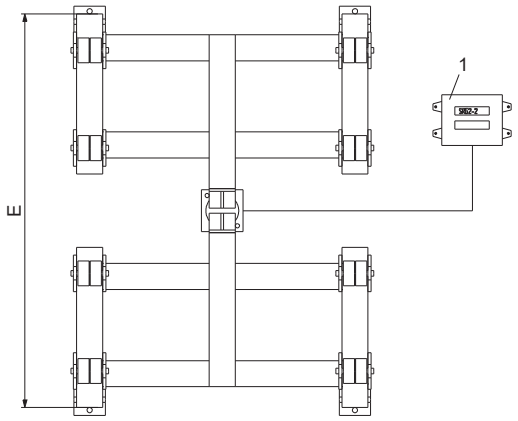

TM075180

*Chlorine drum scale for one drum with mechanical indicator*




TM075181

*Chlorine drum scale for one drum with electronic indicator (1)*




TM075182

*Chlorine drum scale for two drums with electronic indicator (1)*

Dimensions in mm

| A | B | C | D | E |
|---|---|---|---|---|
| 710 | 1120 | 780 | 203 | 1570 |

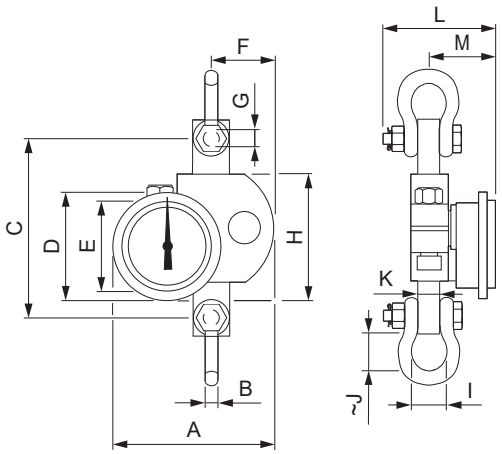
**Order data for a chlorine drum scale**

| Description | Product number |
|---|---|
| Chlorine drum scale for one drum up to 2000 kg, with mechanical indicator | 95705334 |
| Chlorine drum scale for one drum up to 2000 kg, for electronic indicator (96182511) | 98037162 |
| Chlorine drum scale for two drums up to 2000 kg each, for electronic indicator (96182511) | 99502434 |
| Electronic indicator for two input signals (up to two scales) and two adjustable 4-20 mA output signals, supply voltage 110-250 VAC, IP65 | 96182511 |

## Spring balance for cranes

The spring balance for cranes monitors the weight of the chlorine drum while it is lifted by a crane, and displays the result.

### Dimensions of a spring balance




TM074825

Dimensions in mm

| A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 175 | 16 | 192 | 120 | 100 | 69 | 20 | 138 | 42 | 50 | 25 | 131 | 74 |

### Order data for a spring balance

| Description | Product number |
|---|---|
| Spring balance for cranes, maximum capacity 2000 kg | 96726840 |

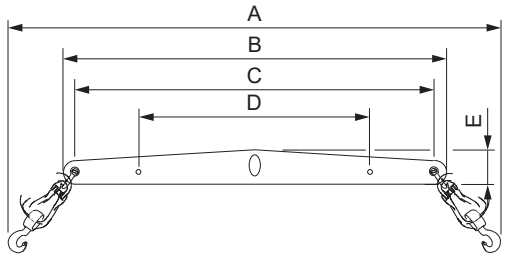
## Lifting beam

The lifting beam is used for safe clamping of the chlorine drum during lifting.

### Technical data of a lifting beam

| | |
|---|---|
| Max. lifting capacity | 2000 kg |
| Drum size | 400 l or 800 l |
| Weight | 40 kg |

### Dimensions of a lifting beam




TM074871

Dimensions in mm

| A | B | C | D | E |
|---|---|---|---|---|
| 2000 | 1620 | 1520 | 970 | 156 |

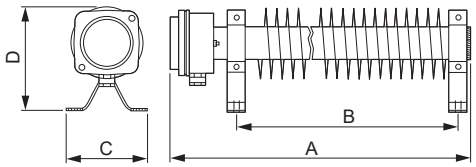
### Order data for a lifting beam

| Description | Product number |
|---|---|
| Lifting beam | 96726853 |

# Ribbed radiator

### Dimensions of a ribbed radiator

The ribbed radiator is intended for heating the chlorine cylinder storage room.




TM075283

Dimensions in mm

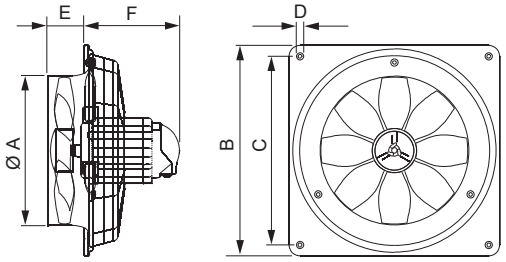
| A | B | C | D |
|---|---|---|---|
| 640 | 515 | 127 | 170 |

### Order data for a ribbed radiator

| Description | Product number |
|---|---|
| Ribbed radiator, stainless steel, 230/400 V, IP66 / IP67, 1000 W | 96726993 |
| Temperature controller (frost protector) for ribbed radiator, 230 V, 50 Hz, wall mounting | 96727000 |

# Exhauster fan

### Dimensions of an exhauster fan




TM075293

Dimensions in mm

| Description | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| Exhauster fan 1150 $m^3$/h | 217 | 345 | 305 | 8.5 | 44.5 | 193 |
| Exhauster fan 2500 $m^3$/h | 431 | 580 | 520 | 11 | 100 | 166 |
| Exhauster fan 5700 $m^3$/h | 543 | 700 | 640 | 11 | 137 | 192 |

### Order data for an exhauster fan

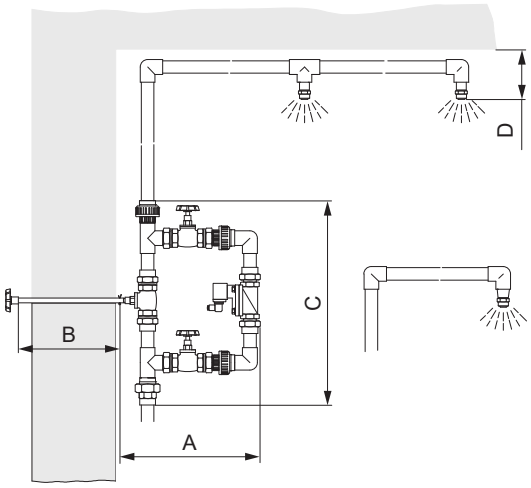
- 3-phase, 400 V, 50 Hz, IP55, with cover

| Description | Product number |
|---|---|
| Exhauster fan 1150 $m^3$/h, 65 W, 0.17 A | 96726997 |
| Exhauster fan 2500 $m^3$/h, 110 W, 0.30 A | 96726998 |
| Exhauster fan 5700 $m^3$/h, 210 W, 0.65 A | 96726999 |

## Sprinkling system

The sprinkling system is installed in the chlorine storage room. In case of a chlorine gas leakage, the chlorine is precipitated with water.

**Dimensions of a sprinkling system**




TM074874

*Sprinkling system*

Dimensions in mm

| A | B | C | D |
|---|---|---|---|
| min. 361 | min. 325 | min. 508 | min. 115 |

**Order data of a sprinkling system**

- With solenoid valve 230 V, 50 Hz

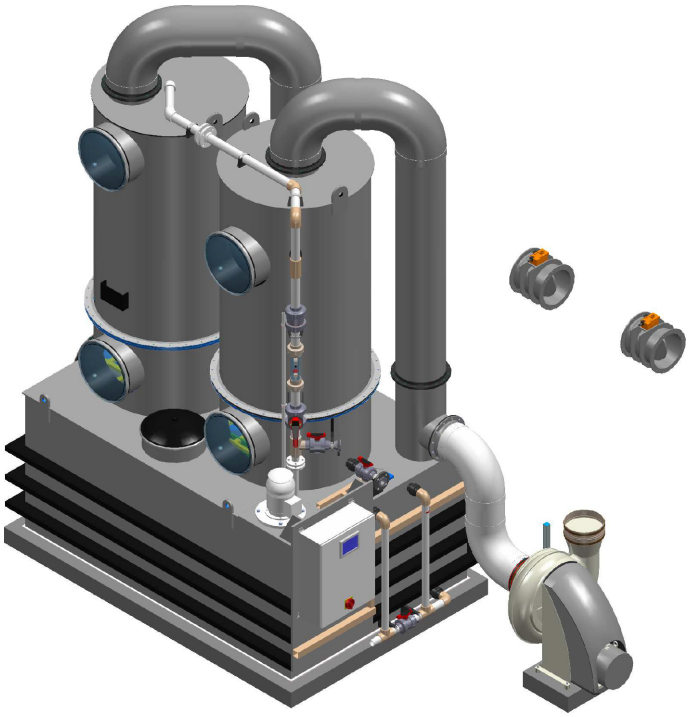
| Description | Product number |
|---|---|
| Sprinkling system with 1 nozzle | 96699653 |
| Sprinkling system with 2 nozzles | 96699654 |
| Sprinkling system with 3 nozzles | 96699696 |
| Sprinkling system with 4 nozzles | 96699698 |
| Sprinkling system with 5 nozzles | 96699700 |
| Sprinkling system with 6 nozzles | 96699699 |

## Chlorine gas neutralisation system (scrubber)

The gas neutralisation system is exclusively intended for neutralisation of chlorine gas in case of a chlorine leakage in the chlorine storage room. The chlorine gas neutralisation system is designed for operation during an emergency case only. An external gas warning device is connected to gas sensors. If the measured gas concentration is higher than the acceptable limit, the gas warning system sends a signal to start the neutralisation system. The contaminated air is sucked through the towers from the bottom to the top. Caustic soda is pumped and sprayed through the towers from the top to the bottom.

The chlorine gas neutralisation system consists of:

- 2 towers filled with Raflux rings
- NaOH storage tank
- NaOH recirculation
- extraction fan
- piping, fittings and valves for a scrubber



TM075308

### Order data for a chlorine gas neutralisation system (scrubber)

| Description | Product number |
|---|---|
| Chlorine gas neutralisation system (scrubber) for cylinder up to 200 kg | on request |
| Chlorine gas neutralisation system (scrubber) for 1 drum, max. 1000 kg | on request |

## Compressed-air respirator

### Oder data for a compressed-air respirator

| Description | Product number |
|---|---|
| Compressed-air respirator with automatic lung and panorama mask, 6-litre cylinder, 300 bars, with supporting frame | 96727001 |
| Spare cylinder | 96727002 |

## Protective PVC suit

### Order data for a protective PVC suit

| Description | Product number |
|---|---|
| Protective PVC suit with vulcanized boots and gloves | 96727018 |

# Gas mask

### Order data for a gas mask

| Description | Product number |
|---|---|
| Gas mask with threaded filter, type 900 St B 2-P2 (DIN 3181) | 96727010 |
| Spare filter for gas mask | 96688099 |
| Storage box for gas mask and filter, with shoulder strap | 96727011 |

# Rubber gloves

### Order data for rubber gloves

| Description | Product number |
|---|---|
| Rubber gloves | 96727012 |

# Rubber apron

### Order data for a rubber apron

| Description | Product number |
|---|---|
| Rubber apron | 96727013 |

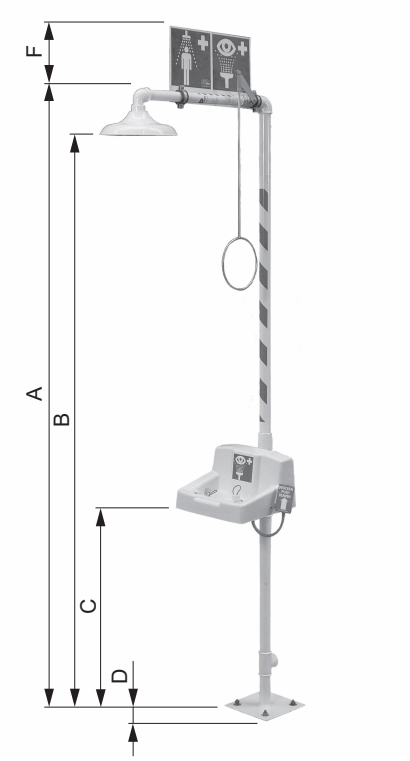
# Protective goggles

### Order data for protective goggles

| Description | Product number |
|---|---|
| Protective goggles | 96727014 |

# Body and eye shower

### Dimensions of a body and eye shower




TM075161

Dimensions in mm

| A | B | C | D | E |
|---|---|---|---|---|
| 2269 | 2115 | 1000 | 200 | 207 |

### Order data for a body and eye shower

| Description | Product number |
|---|---|
| Body and eye shower | 96727019 |

## Warning signs

### Order data for warning signs

| Description | Product number |
|---|---|
| Set of warning signs for a chlorine gas plant in German | 96699631 |
| Set of warning signs for a chlorine gas plant in English | 96727016 |

## Conex DIA-G gas warning system

The Conex DIA-G gas warning system monitors chlorine gas dosing systems and chlorine storage rooms with up to two potentiostatic sensors.

- Two output signals 4-20 mA
- Two relays (limit values) per sensor
- One alarm relay
- Sensor recognition and autocalibration



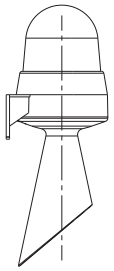

TM075162

### Order data for Conex DIA-G

| Type designation | | Voltage | Product number |
|---|---|---|---|
| Conex DIA-G-P. CLP-X-X.W-J | 1 sensor | 110/240 V, 50/60 Hz | 95700080 |
| Conex DIA-G-P. CLP-CLP-X.W-J | 2 sensors | 110/240 V, 50/60 Hz | 95700483 |

For more detailed information on Conex DIA-G see the data booklet Conex DIA-G, DIS-G.

# Battery backup, horn and flashlight



TM075183

## Order data for battery backup, horn and flashlight

| Designation | Description | Product number |
|---|---|---|
| Battery backup | • Integrated battery charging unit with I/U charging characteristic<br>• Battery management with micro controller<br>• Temperature regulation of charging voltage by sensor module<br>• Input voltage of the battery controller 115/230 V (50/60 Hz)<br>• Input current, 0.84 A/115 V to 0.42 A/230 V<br>• Max. switch-on current, 2 A/2 ms<br>• Maintenance-free lead-acid battery, 24 V/7 Ah<br>• Buffer time for operation with two sensor interfaces: >1 h | 96725709 |
| Red flashlight with horn | 24 VDC, 320 mA, IP33, 92 dB | 98037506 |
| Red flashlight with horn | 230 V, 50/60 Hz, 50 mA, IP33, 92 dB | 96730197 |

# 13. Grundfos Product Center

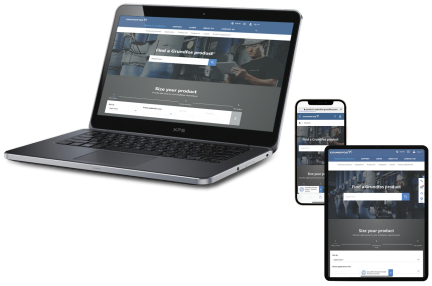
Online search and sizing tool to help you make the right choice.
From the international view, you can select your specific country to view the product range available to you.
International view: *http://product-selection.grundfos.com*

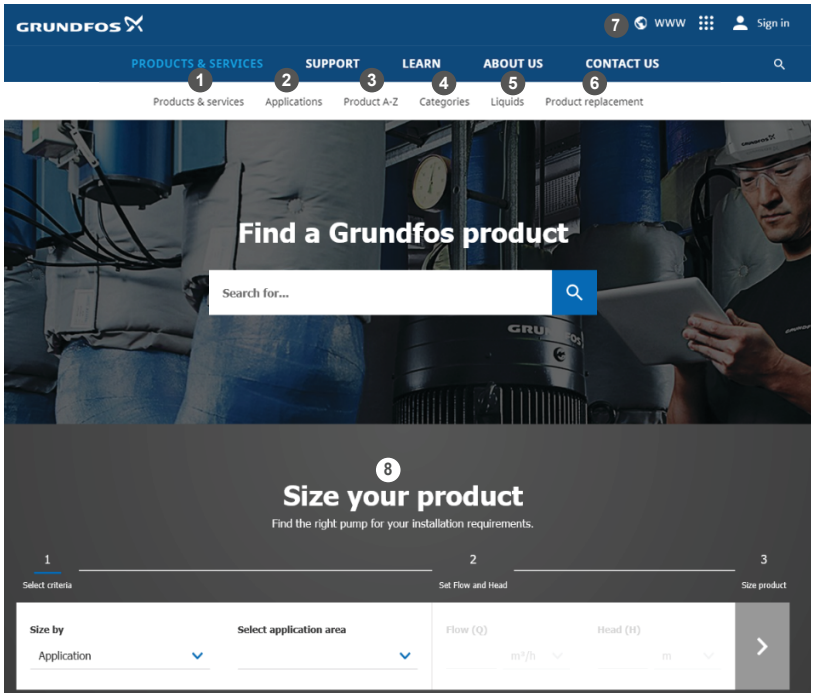
**All the information you need in one place**

Performance curves, technical specifications, pictures, dimensional drawings, motor curves, wiring diagrams, spare parts, service kits, 3D drawings, documents, system parts. The Product Center displays any recent and saved items - including complete projects - right on the main page.

**Downloads**

On the product pages, you can download installation and operating instructions, data booklets, service instructions, etc., in PDF format.






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Example: *https://product-selection.grundfos.com/uk*

| Pos. | Description |
|---|---|
| 1 | **Products & services** enables you to find products and documents by typing a product number or name into the search field. |
| 2 | **Applications** enables you to choose an application to see how Grundfos can help you design and optimise your system. |
| 3 | **Products A-Z** enables you to look through a list of all the Grundfos products. |
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| 5 | **Liquids** enables you to find pumps designed for aggressive, flammable or other special liquids. |
| 6 | **Product replacement** enables you to find a suitable replacement. |
| 7 | **WWW** enables you to select the country, which changes the language, the available product range and the structure of the website. |
| 8 | **Sizing** enables you to size a product based on your application and operating conditions. |

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