Vaccuperm VGA and VGB

Chlorine gas dosing systems

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Performance diagram

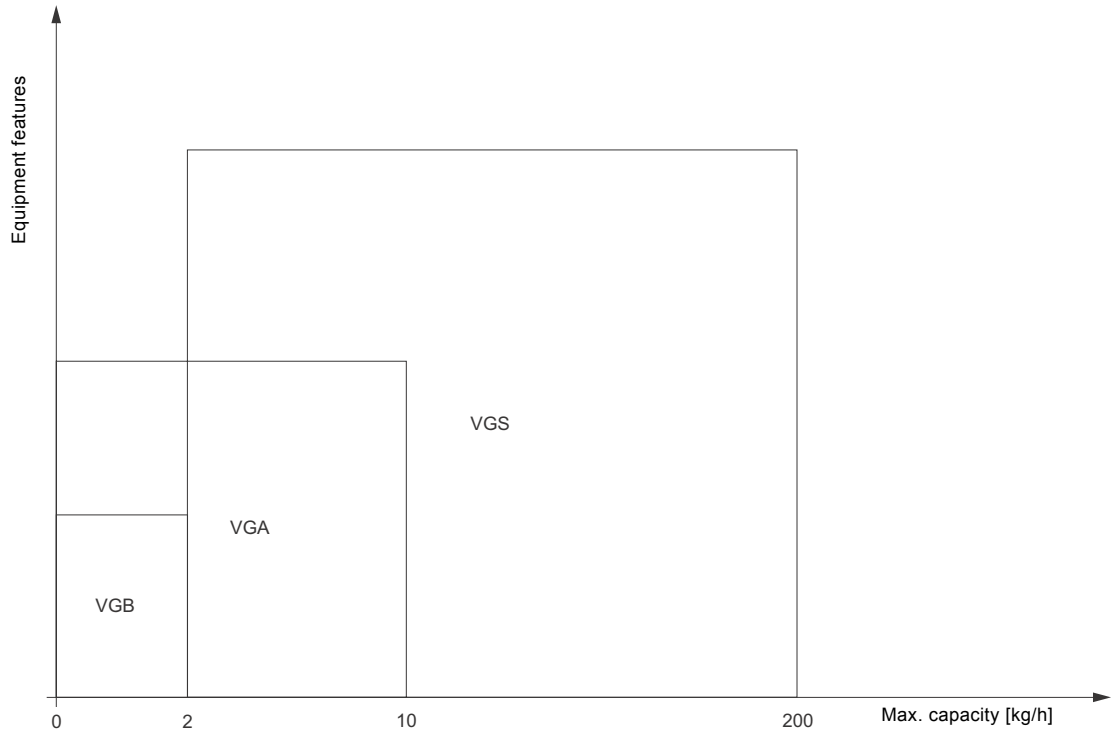

Fig. 1 Performance diagram Vaccuperm VGA, VGB, VGS

Please select your Vaccuperm chlorine gas dosing system according to this diagram.

Principle of vacuum chlorine gas dosing systems

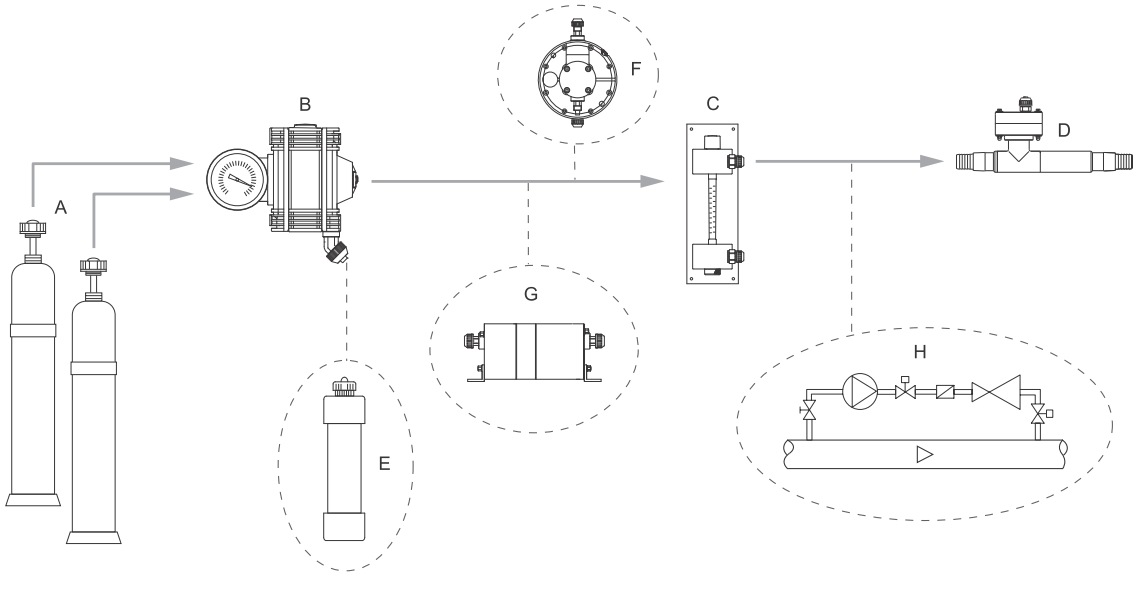

Fig. 2 Principle of a vacuum chlorine gas dosing system

Legend

Pos.	Component
A	Chlorine gas cylinder
B	Vacuum regulator
C	Dosing regulator
D	Injector
E	Adsorption cylinder (option)
F	Safety valve (option)
G	Change-over device (option)
H	Water apparatus (option)

Function of chlorine gas dosing systems

Handling, transport and storage of chlorine for the disinfection of drinking and pool water are a challenge to systems engineering. This is the reason why the vacuum principle is being used in dosing systems for a long time already. At this, the pressure of the chlorine gas is reduced to the vacuum.

This method successfully avoids chlorine gas leakage. In the event of a pipe breakage, no chlorine gas can escape, only ambient air is drawn in.

Vacuum chlorine gas dosing systems are composed of three principal components.

Vacuum regulator (B)

The vacuum regulator is a pressure reducing valve, which reduces the overpressure from the chlorine tank side to the negative pressure on the vacuum side. The valve opens, when a sufficient vacuum is present on the outlet side. Vacuum regulators with pressure gauge and a liquid trap are available for more safety.

Dosing regulator (C)

The chlorine gas volume flow is adjusted with the dosing regulator. This can be effected manually or automatically via motor control.

VGB models combine a vacuum regulator and a dosing unit in a compact enclosure. They are not available with change-over device or servomotor for dosing regulator.

Injector (D)

Injectors have the task to bring chlorine gas into the water flow. They operate according to the principle of water jet pumps. The injector body comprises a nozzle with a successional diffusor. Between the nozzle and the diffusor, there is a narrow annular gap, where chlorine gas is sucked out of the dosing line through the injector head. A diaphragm check valve at the gas supply line prevents the ingress of water into the vacuum line.

2. Construction and function

Vaccuperm VGB-103

Vaccuperm VGB-103 compact unit

- Vacuum regulator and dosing regulator in a single unit for direct mounting on a chlorine cylinder.
- Up to 2000 g/h can be extracted. The maximum extraction quantity depends on the chlorine cylinder content: It is 1 % per hour of the content by weight. For a short time (max. 10 minutes) it is possible to extract the triple of this.

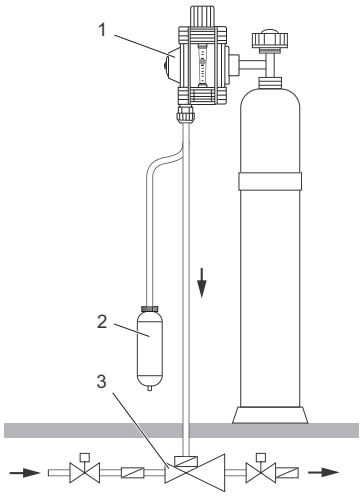

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Fig. 3 VGB-103 compact unit

Legend

Pos.	Component
1	Vaccuperm 103-100
2	Chlorine gas adsorption cylinder
3	Injector

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Fig. 4 Vaccuperm VGB-103

TM04 1306 2609

Fig. 5 Vaccuperm VGB-103 with USA yoke

Vaccuperm VGA-111, VGA-113, VGA-146, VGA-117

Dosing station for extraction from one cylinder

Combination of Vaccuperm VGA-111 and VGA-113

- Vacuum regulator for direct mounting on a chlorine cylinder.
- Dosing regulator for separate wall mounting.

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Fig. 6 Vaccuperm VGA-113 and VGA-111

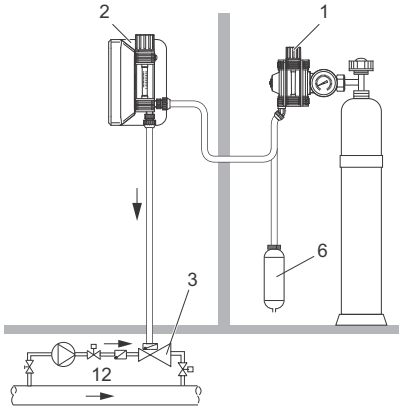

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Fig. 7 Dosing station for extraction from one cylinder (VGA-111 and VGA-113)

Pos.	Component
1	Vacuum regulator VGA for direct mounting
2	Dosing regulator VGA for serial installation
3	Injector with diaphragm check valve
6	Gas adsorption cylinder
12	Water apparatus

Dosing station for extraction from one drum

Combination of Vaccuperm VGA-146 and VGA-117

- Vacuum regulator for wall mounting (in the drum room).
- Dosing regulator for separate wall mounting.
- It is recommended to wrap a heater band around the copper line between the container and the vacuum regulator when using drums.

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Fig. 8 Vaccuperm VGA-146 and VGA-117

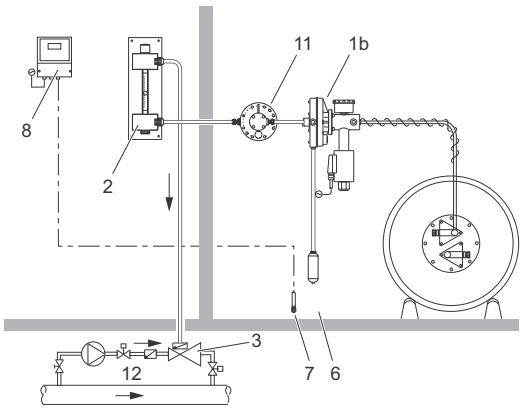

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Fig. 9 Dosing station for extraction from one drum (VGA-146 and VGA-117)

Pos.	Component
1b	Vacuum regulator VGA with liquid trap for wall mounting
2	Dosing regulator VGA for serial installation
3	Injector with diaphragm check valve
6	Gas adsorption cylinder
7	Gas sensor
8	Gas warning unit
11	Safety valve
12	Water apparatus

Dosing station for simultaneous extraction from several cylinders (full vacuum system)

Combination of several VGA-111 and VGA-113

- If more gas is required, it can be extracted from several cylinders simultaneously.
- Vacuum regulators are installed on several chlorine cylinders in series using T-pieces.
- Single or multiple dosing regulators for separate installation.

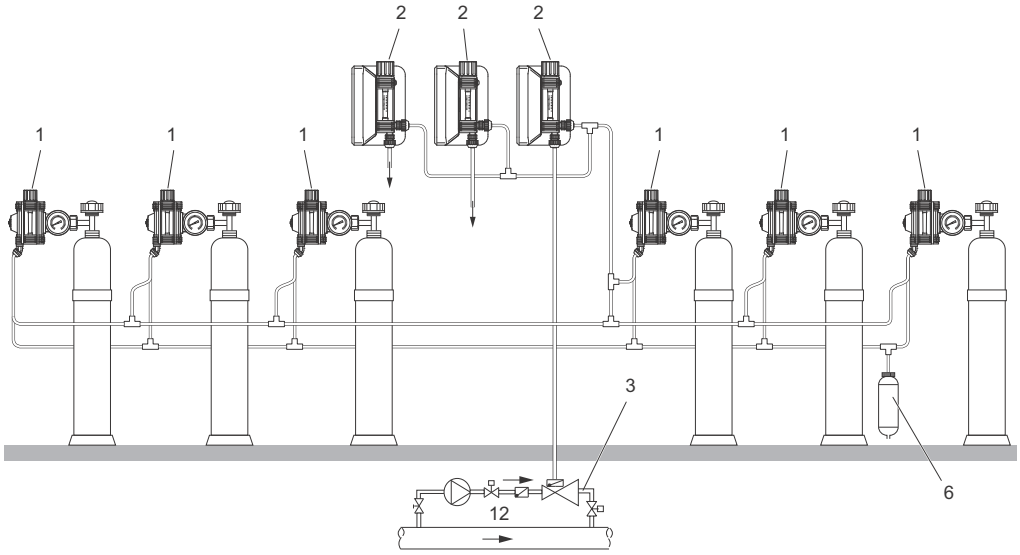

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Fig. 10 Dosing station for simultaneous extraction from several cylinders (VGA-111 and VGA-113)

Pos.	Component
1	Vacuum regulator VGA for direct mounting
2	Dosing regulator VGA for serial installation
3	Injector with diaphragm check valve
6	Gas adsorption cylinder
12	Water apparatus

Dosing station with vacuum change-over device

Combination of several VGA-111 and VGA-113

- Continuous gas dosing without interrupting the process.
- Two vacuum regulators for mounting on gas cylinder header lines.
- Up to 4 dosing regulators can be installed separately.
- If the first cylinder row is empty, the change-over device immediately changes over to the next vacuum regulator at the full chlorine cylinder row.
- The safety valve avoids excess pressure in the vacuum lines leaving the cylinder room.

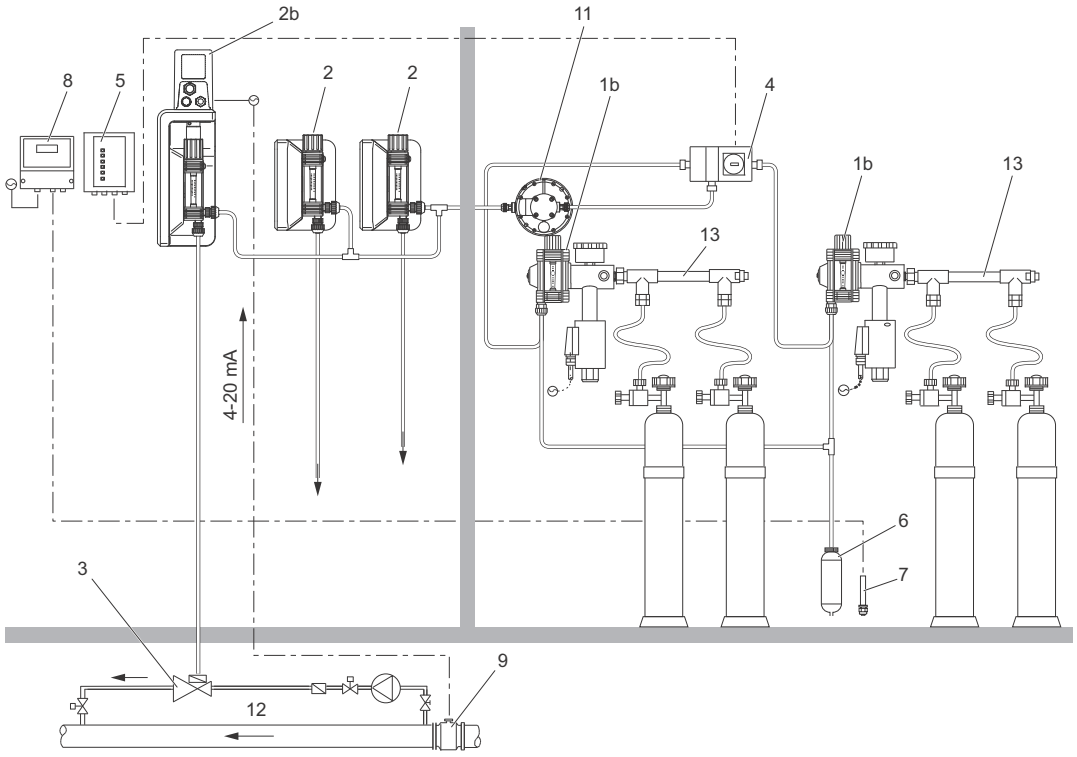

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Fig. 11 Dosing station with vacuum change-over device (VGA-111 and VGA-113)

Pos.	Component
1b	Vacuum regulator VGA with liquid trap for wall mounting
2	Dosing regulator VGA for serial installation
2b	Dosing regulator VGA with electric servomotor and current input
3	Injector with diaphragm check valve
4	Vacuum change-over device
5	Empty signal display unit
6	Gas adsorption cylinder
7	Gas sensor
8	Gas warning unit
9	Flowmeter with output for mA signal
11	Safety valve
12	Water apparatus
13	Header line

Dosing station for simultaneous extraction from several cylinders, if more than 4000 g/h are required in total

Combination of several VGA-146 and VGA-117

- If more gas is required, it can be extracted from several cylinders simultaneously.
- Vacuum regulators for mounting on header lines.
- With automatic change-over device.

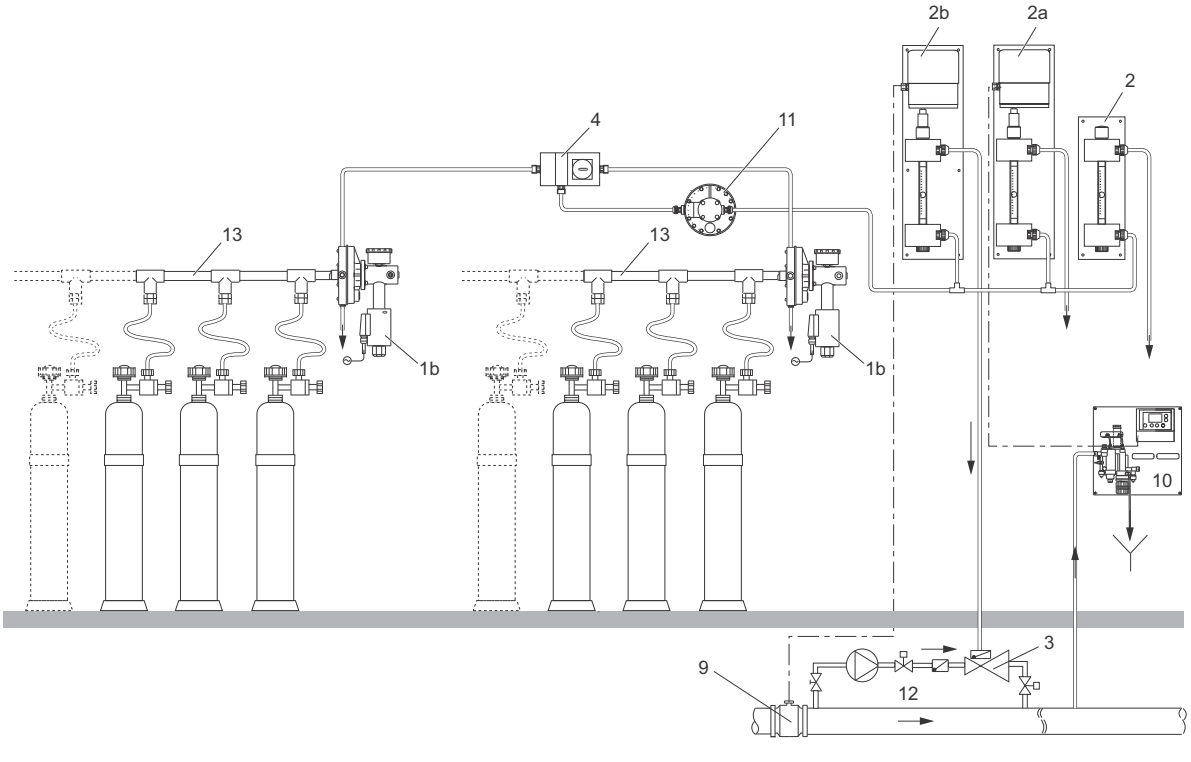

Fig. 12 Dosing station with vacuum change-over device (VGA-146 and VGA-117)

Pos.	Component
1b	Vacuum regulator VGA with liquid trap for wall mounting
2	Dosing regulator VGA for serial installation
2a	Dosing regulator VGA with electric servomotor
2b	Dosing regulator VGA with electric servomotor and current input
3	Injector with diaphragm check valve
4	Vacuum change-over device
9	Flowmeter with output for mA signal
10	Compact measuring system
11	Safety valve
12	Water apparatus
13	Header line

Dosing station with vacuum change-over device

Combination of several VGA-146 and VGA-117

- Continuous gas dosing without interrupting the process.
- Two vacuum regulators for mounting on chlorine drums, liquid traps avoid the penetration of liquefied gas.
- Several dosing regulators can be installed separately.
- If the first drum is empty, the change-over device immediately changes over to the next vacuum regulator at the full chlorine drum.
- The safety valve avoids excess pressure in the vacuum lines leaving the drum room.

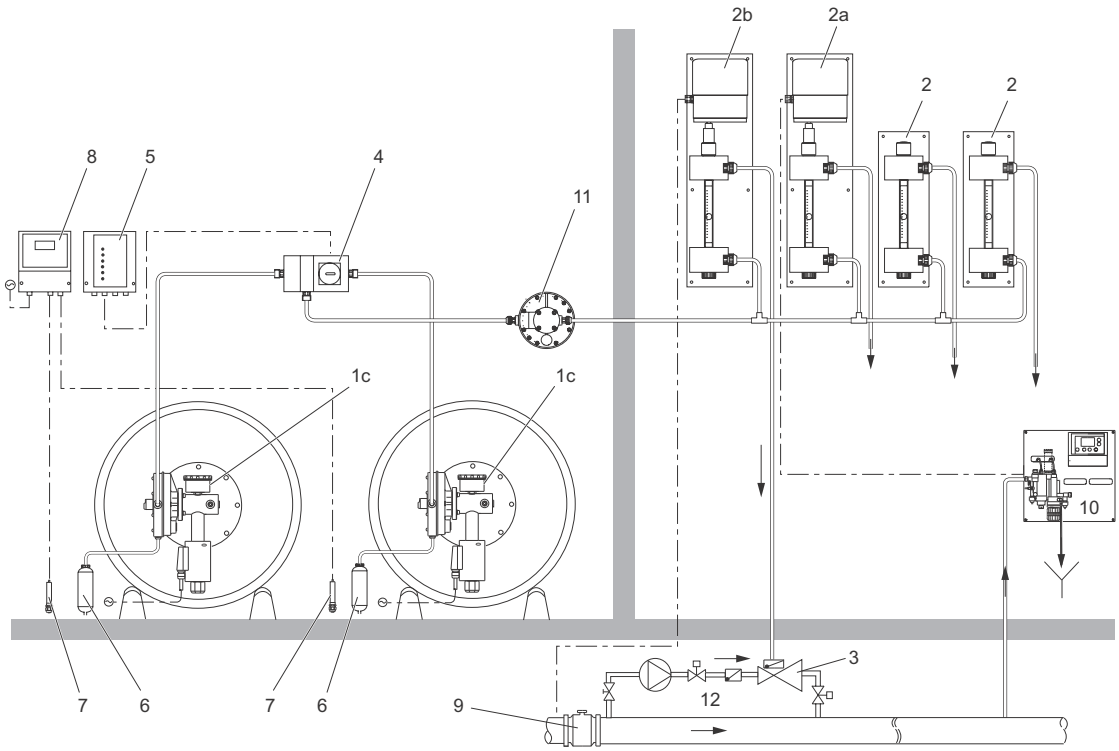

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Fig. 13 Dosing station with vacuum change-over device (VGA-146 and VGA-117)

Pos.	Component
1c	Vacuum regulator VGA with liquid trap for direct mounting
2	Dosing regulator VGA for serial installation
2a	Dosing regulator VGA with electric servomotor
2b	Dosing regulator VGA with electric servomotor and current input
3	Injector with diaphragm check valve
4	Vacuum change-over device
5	Empty signal display unit
6	Gas adsorption cylinder
7	Gas sensor
8	Gas warning unit
9	Flowmeter with output for mA signal
10	Compact measuring system
11	Safety valve
12	Water apparatus

3. Type key

Vaccuperm VGB-103

Example		VGB-103	-250	/1	-S	-1	-O	, B	0
VGB	Vaccuperm Gas Basic								
Dosing flow									
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								
Connection									
1	G 1								
2	G 3/4								
3	yoke USA								
Inlet valve									
B	simple								
S	short								
Pressure indication									
0	without								
1	with pressure gauge								
Filter									
O	external								
U	internal								
B	not applicable								
0	not applicable								

Vaccuperm VGA-111

Example		VGA-111	-B	/1	-S	-0	R	-0	-U	, N	F
VGA	Vaccuperm Gas Advanced										
Installation											
B	directly on the chlorine gas cylinder										
W	wall-mounting										
C	on a header line										
BC	directly on the chlorine gas cylinder or on a header line										
Connection											
1	G 1										
2	G 3/4										
3	yoke USA										
4	copper pipe 6/8 mm										
	Inlet valve										
B	simple										
S	short										
L	long, 230-240 V / 50-60 Hz, with liquid trap and heater										
M	long, 110-115 V / 50-60 Hz, with liquid trap and heater										
Pressure indication											
0	without										
1	with pressure gauge										
Connection pressure gauge											
X	without										
T	top										
R	right-hand-side										
Limiting nozzle for full vacuum systems											
0	without										
1	with nozzle										
Filter											
O	external										
U	internal										
N	not applicable										
F	not applicable										

Vaccuperm VGA-113

Example		VGA-113	-100	/M	0	-Y
VGA	Vaccuperm Gas Advanced					
Dosing flow						
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					
Adjustment						
M	manual					
A	automatic, 230-240 V / 50-60 Hz (not for 25 g/h)					
B	automatic, 110-115 V / 50-60 Hz (not for 25 g/h)					
Control						
0	without					
1	4-20 mA input signal					
2	direct control with 1000 Ohm feedback potentiometer					
Y	not applicable					

Vaccuperm VGA-117

Example		VGA-117	-1000	/5	-M	O	, N
VGA	Vaccuperm Gas Advanced						
Dosing flow							
1000	50-1000 g/h						
2000	100-2000 g/h						
4000	200-4000 g/h						
6000	300-6000 g/h						
8000	400-8000 g/h						
10000	500-10000 g/h						
Connection input and output							
5	PE hose 8/11 mm						
6	PE hose 10/14 mm						
7	PVC pipe DN 15 (external diameter 20 mm)						
Adjustment							
M	manual						
A	automatic, 230-240 V / 50-60 Hz						
B	automatic, 110-115 V / 50-60 Hz						
Control							
0	without						
1	4-20 mA input signal						
2	direct control with 1000 Ohm feedback potentiometer						
N	not applicable						

Vaccuperm VGA-146

Example		VGA-146	-D	/1	/6	-S	-0	R	F
VGA	Vaccuperm Gas Advanced								
Installation									
D	directly on the chlorine gas drum								
W	wall-mounting								
C	on a header line								
DC	directly on the chlorine gas drum or on a header line								
Connection									
1	G 1								
2	G 3/4								
3	yoke USA								
4	copper pipe 6/8 mm								
Output									
6	PE 10/14 mm								
7	PVC pipe DN 15 (external diameter 20 mm)								
Inlet valve									
S	short								
L	long, 230-240 V / 50-60 Hz, with liquid trap and heater								
M	long, 110-115 V / 50-60 Hz, with liquid trap and heater								
Pressure indication									
0	without								
1	with pressure gauge								
Connection pressure gauge									
T	top								
R	right-hand side								
F	front								
Pressure input									
F	front								
L	left-hand side								

4. Technical data

Vaccuperm VGB-103 compact dosing unit

Technical data

Medium	Chlorine gas
Capacity ranges	5-100 g/h, 10-250 g/h, 50-1000 g/h, 100-2000 g/h
Adjustment ratio	1:20
Accuracy	± 4 %
Measuring device	According to the floater principle, measuring tube 70 mm
Empty indication	Automatical visible signal for lack of chlorine
Materials	Enclosure: PVC Inlet valve: Silver/PTFE, special alloy Springs: Coated with nickel-chrome alloy Diaphragm: FEP Rate valve: PVC O rings: FKM Yoke: Cast iron, nickel plated
Connections	Pressure side (chlorine gas): G 3/4; G 1, yoke Vacuum safety line: PE hose 8/11 mm
Weight	1.3 up to 2 kg
Options	• Manometer 0 to 16 bars, NG 63 • Internal filter inside the vacuum regulator • External filter outside the vacuum regulator, on the connection of the gas cylinder or drum

Dimensions

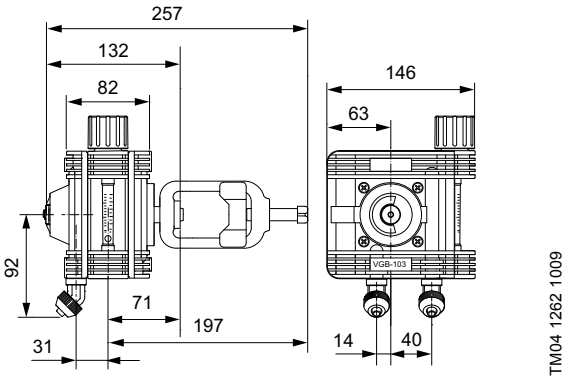

Fig. 14 Vaccuperm VGB-103

Vaccuperm VGB-103 is directly mounted on a chlorine cylinder.

Accessories

For injectors, chlorine gas adsorption cylinder and other accessories, please see the Vaccuperm accessories data booklet.

Maintenance kit for Vaccuperm VGB-103

Comprising	Product No.
Valve seats, filter, pressure spring, flat gaskets, lock washers, O-rings	96688961

Vaccuperm VGA-111 vacuum regulator

- For operation with dosing regulator VGA-113 or VGA-117.
- With inlet valve and safety overpressure valve.
- With gaskets for cylinder connection.
- Long inlet valve with liquid trap (230 V with Euro plug, 115 V with USA plug).

Technical data

Medium	Chlorine gas
Capacity range	Up to 4000 g/h
Empty indication	Automatical visible signal for lack of chlorine
Materials	Enclosure: PVC Inlet valve: Silver/PTFE, special alloy Springs: Coated with nickel-chrome alloy Diaphragm: FEP Rate valve: PVC O rings: FKM
Connections	Pressure side (chlorine gas): Union nut 1", 3/4"; copper tube 6/8 mm (1/2"), USA yoke Vacuum line: PE hose 8/11 mm Vacuum safety line: PE hose 8/11 mm
Weight	2.3 kg
Options	Manometer 0 to 16 bars for pressure indication Limiting nozzle full vacuum Internal filter inside the vacuum regulator or External filter outside the vacuum regulator, on the connection of the gas cylinder/drum Liquid trap with heater with long inlet valve

Dimensions

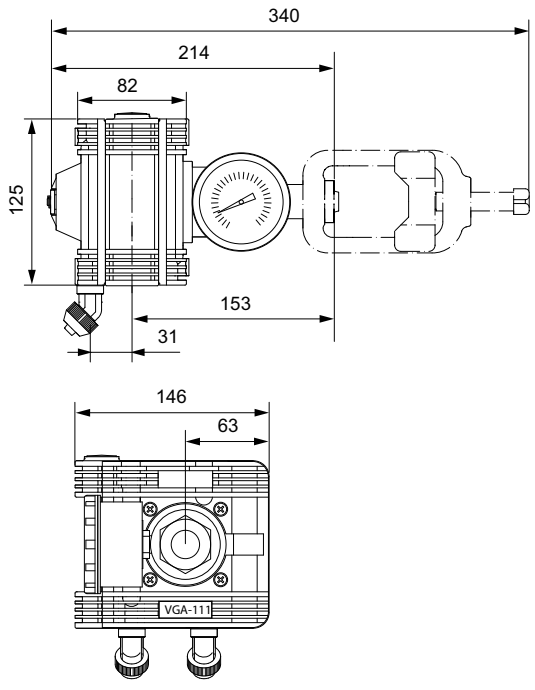

Fig. 15 VGA-111 with manometer on the right side and short inlet valve

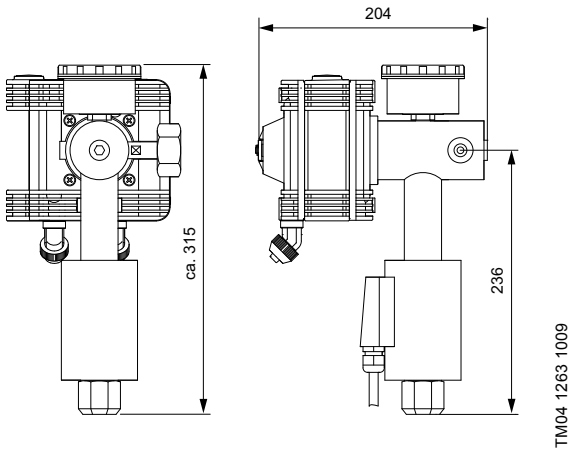

Fig. 16 VGA-111 with liquid trap

Accessories

For injector, header line, change-over device, safety valve, testing agent and other accessories, please see the Vaccuperm accessories data booklet.

Maintenance kits for VGA-111

Comprising	Product No.
Kit for VGA-111 without liquid trap: Valve seat and cartridge, filter, pressure spring, flat gasket, lock washer, O-rings	91835972
Kit for VGA-111 with liquid trap: Valve seat, filter, pressure spring, flat gasket, lock washer, O-rings	91835977

Repair kit for VGA-111

Comprising	Product No.
Diaphragm, valve seat, valve cartridge, valve cone, filter, pressure spring, flat gasket, O-rings, screws, union nuts	96688860

Vaccuperm VGA-113 dosing regulator

- For operation with vacuum regulator VGA-111.
- With compensation regulator and measuring device.
- Fastening for wall mounting included.

Technical data

Medium	Chlorine gas
Capacity range	Up to 4000 g/h
Adjustment ratio	1:20
Accuracy	± 4 %
Measuring device	According to the floater principle, measuring tube 70 mm
Materials	Enclosure: PVC Inlet valve: Silver/PTFE, special alloy Springs: Coated with nickel-chrome alloy Diaphragm: FEP Rate valve: PVC O rings: FKM
Connections	Vacuum line: PE hose 8/11 mm
Weight	0.9 kg; 3.1 kg (with servomotor)
Options	Automatic control with servomotor (4-20 mA or direct control)

VGA-113 for manual operation

Dimensions

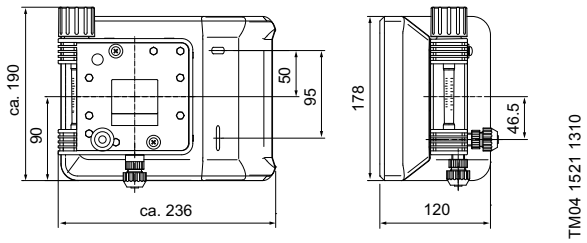

Fig. 17 Dosing regulator VGA-113 for manual operation

VGA-113 for automatic operation

- Synchronous motor with limit switches, IP55 enclosure.
- Actuating time (1-100 %): 108 s at 50 Hz, 87 s at 60 Hz.
- Power consumption: 3 VA.
- Mains voltage of servomotor 230 V (50/60 Hz) or 115 V (60 Hz).

Servomotor with 4-20 mA input

- For proportional control (direct connection to water meter).
- Manual/automatic switch.
- Trimmer for zero point/limit value.
- Keys for manual control open/close.

Servomotor with feedback potentiometer

- Connection to external controller.
- Single potentiometer 1000 Ohm.

Dimensions

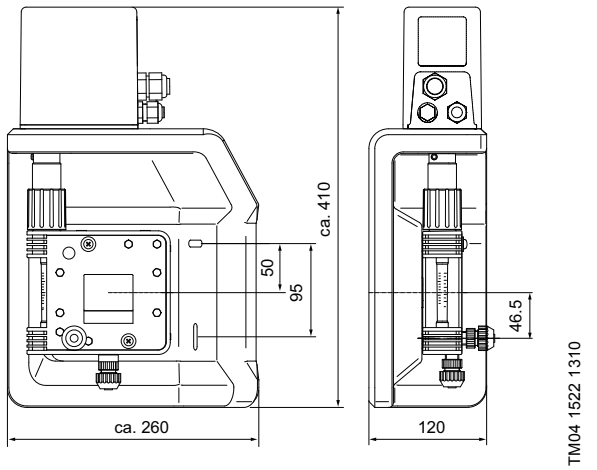

Fig. 18 Dosing regulator VGA-113 with electric servomotor

Accessories

For injector, header line, change-over device, safety valve, testing agent and other accessories, please see the Vaccuperm accessories data booklet.

Maintenance kit for VGA-113

Comprising	Product No.
Valve seat, flat gasket, lock washer, O-rings	91835974

Repair kit for VGA-113

Comprising	Product No.
Diaphragm, pressure spring, flat gasket, stopper, O-rings, screws, union nuts	96688861

Vaccuperm VGA-146 vacuum regulator

- For operation with dosing regulator VGA-117.
- With inlet valve and safety overpressure valve.
- Overpressure connection for PE hose 8/11 mm.
- Always with liquid trap, if with long inlet valve.
- 230 V with Euro plug; 115 V with USA plug (for liquid trap).
- Filter inside the vacuum regulator.
- Short connection.

Technical Data

Medium	Chlorine gas
Capacity range	Up to 10 kg/h
Materials	Enclosure: PVC Inlet valve: Silver/PTFE, special alloy Springs: Coated with nickel-chrome alloy Diaphragm: FEP Rate valve: PVC O rings: FKM
Connections	Pressure side (chlorine gas): Union nut 1"; 3/4"; yoke USA; copper pipe 6/8 mm (1/2") Vacuum safety line: PE hose 10/14 mm or PVC pipe DN 15 (external diameter 20 mm)
Weight	2 kg; 4 kg (with liquid trap)

Dimensions

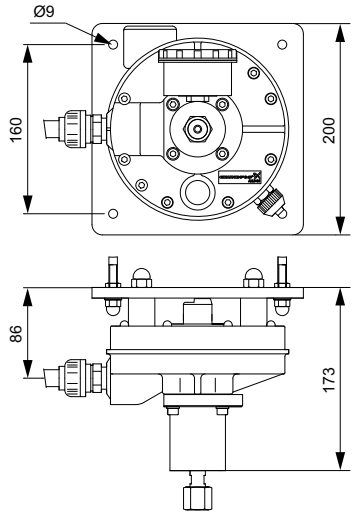

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Fig. 19 Vacuum regulator VGA-146 (wall mounting)

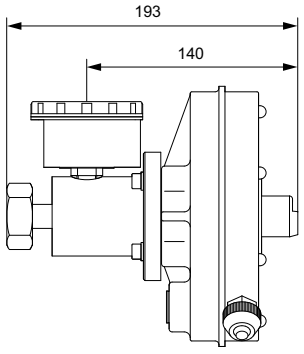

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Fig. 20 Vacuum regulator VGA-146 (mounting on header lines)

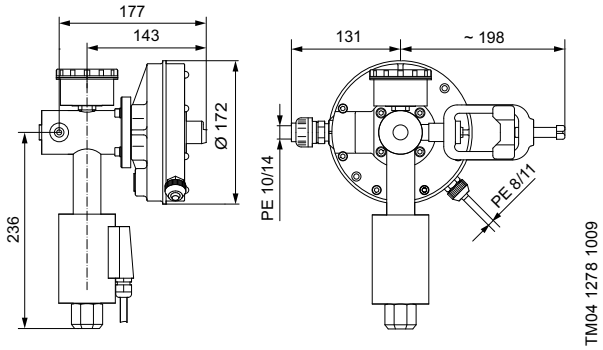

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Fig. 21 Vacuum regulator VGA-146 (with liquid trap and yoke connection)

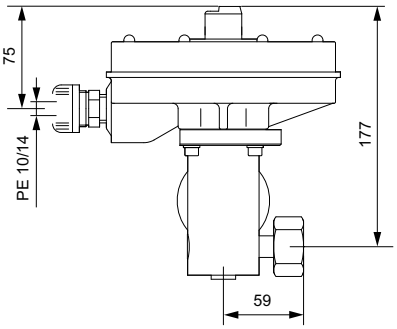

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Fig. 22 Vacuum regulator VGA-146 (with liquid trap and union nut connection)

Accessories

For injector, header line, change-over device, safety valve, testing agent and other accessories, please see the Vaccuperm accessories data booklet.

Spare parts sets for VGA-146

Comprising	Product No.
Kit for VGA-146 without liquid trap: Diaphragm, valve seat, valve cartridge, filter, pressure springs, flat gasket, O-rings	91836513
Kit or VGA-146 with liquid trap: Diaphragm, valve seat, valve cartridge, filter, pressure springs, flat gaskets, O-rings	91835842

Vaccuperm VGA-117 dosing regulator

Technical data

Medium	Chlorine gas
Capacity range	Up to 10 kg/h
Adjustment ratio	1:20
Accuracy	± 4 %
Measuring device	According to the floater principle, measuring tube 190 mm
Materials	Enclosure: PVC Inlet valve: Silver/PTFE, special alloy Springs: Coated with nickel-chrome alloy Diaphragm: FEP Rate valve: PVC O rings: FKM
Weight	2.6 kg; 3.1 kg (with servomotor)

VGA-117 for manual operation

- Operation with vacuum regulator VGA-146.
- Mounted on a plate for wall mounting.
- With manual rate valve and measuring device.
- Vacuum connection for PE hose (8/11 mm or 10/14 mm) or PVC pipe (DN 15, external diameter 20 mm).
- Without differential pressure regulator.

Dimensions

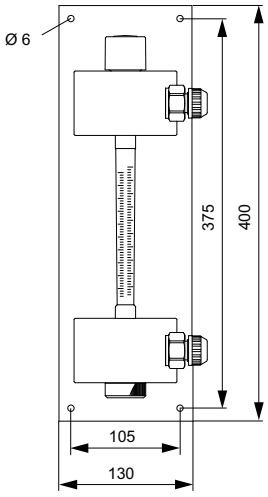

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Fig. 23 Dosing unit VGA-117 for manual operation

VGA-117 for automatic operation

- Synchronous motor with limit switches, IP55 enclosure.
- Actuating time (1-100 %): 108 s at 50 Hz, 87 s at 60 Hz.
- Power consumption: 3 VA.
- Mains voltage of servomotor 230 V (50/60 Hz) or 115 V (60 Hz).
- Without differential pressure regulator.

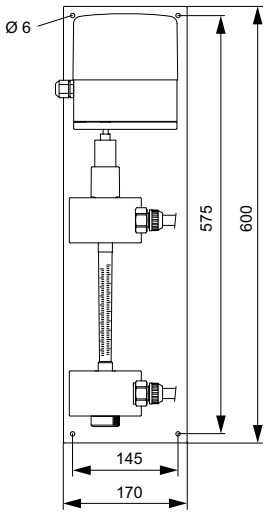
Servomotor with 4-20 mA input

- For proportional control (direct connection to water meter).
- Manual/automatic switch.
- Trimmer for zero point/limit value.
- Keys for manual control open/close.

Servomotor with feedback potentiometer

- Connection to external controller.
- Single potentiometer 1000 Ohm.
- Automatic control on request.

Dimensions



TM04 1267 1009

Fig. 24 Dosing unit VGA-117 with servomotor

Accessories

For injector, header line, change-over device, safety valve, testing agent and other accessories, please see the Vaccuperm accessories data booklet.

Spare parts sets for VGA-117

Description	Product No.
Valve seat, lock washer, compensating disc, O-rings	91835976
Valve seat, lock washer, screwings, hose connection, hoses, O-rings, grease	96689067

5. Product selection

Vaccuperm VGB-103

Max. dosing quantity [g/h]					Connection, pressure side			Inlet valve		Pressure indication		Filter		Type key	Product number
100	250	500	1000	2000	G 1	G 3/4	yoke USA	simple	short	without	manometer	external	internal		
100	250	500	1000	2000	1	2	3	B	S	0	1	O	U	Vaccuperm	
•					•			•		•		•		VGB-103-100/1-B-0-O	95712114
•					•				•	•		•		VGB-103-100/1-S-0-O	95712115
•					•				•	•			•	VGB-103-100/1-S-0-U	95712116
•					•				•		•	•		VGB-103-100/1-S-1-O	95712117
•					•				•		•		•	VGB-103-100/1-S-1-U	95712118
•						•		•		•		•		VGB-103-100/2-B-0-O	95712119
•						•			•	•			•	VGB-103-100/2-S-0-U	95712121
•						•			•		•		•	VGB-103-100/2-S-1-U	95712122
•							•	•		•		•		VGB-103-100/3-B-0-O	95712123
•							•		•	•			•	VGB-103-100/3-S-0-U	95712124
•							•		•		•		•	VGB-103-100/3-S-1-U	95712125
	•				•			•		•		•		VGB-103-250/1-B-0-O	95712126
	•				•				•	•		•		VGB-103-250/1-S-0-O	95712127
	•				•				•	•			•	VGB-103-250/1-S-0-U	95712128
	•				•				•		•	•		VGB-103-250/1-S-1-O	95712129
	•				•				•		•		•	VGB-103-250/1-S-1-U	95712130
	•					•		•		•		•		VGB-103-250/2-B-0-O	95712131
	•					•			•	•			•	VGB-103-250/2-S-0-U	95712133
	•					•			•		•		•	VGB-103-250/2-S-1-U	95712132
	•						•	•		•		•		VGB-103-250/3-B-0-O	95712136
	•						•		•	•			•	VGB-103-250/3-S-0-U	95712137
	•						•		•		•		•	VGB-103-250/3-S-1-U	95712138
		•			•			•		•		•		VGB-103-500/1-B-0-O	95712139
		•			•				•	•		•		VGB-103-500/1-S-0-O	95712140
		•			•				•	•			•	VGB-103-500/1-S-0-U	95712149
		•			•				•		•	•		VGB-103-500/1-S-1-O	95712151
		•			•				•		•		•	VGB-103-500/1-S-1-U	95712152
		•				•		•		•		•		VGB-103-500/2-B-0-O	95712153
		•				•			•	•			•	VGB-103-500/2-S-0-U	95712157
		•				•			•		•		•	VGB-103-500/2-S-1-U	95712158
		•					•	•		•		•		VGB-103-500/3-B-0-O	95712159
		•					•		•	•			•	VGB-103-500/3-S-0-U	95712160
		•					•		•		•		•	VGB-103-500/3-S-1-U	95712161
			•		•			•		•		•		VGB-103-1000/1-B-0-O	95712162
			•		•				•	•		•		VGB-103-1000/1-S-0-O	95712163
			•		•				•	•			•	VGB-103-1000/1-S-0-U	95712164
			•		•				•		•	•		VGB-103-1000/1-S-1-O	95712165
			•		•				•		•		•	VGB-103-1000/1-S-1-U	95712166
			•			•		•		•		•		VGB-103-1000/2-B-0-O	95712167
			•			•			•	•			•	VGB-103-1000/2-S-0-U	95712168
			•			•			•		•		•	VGB-103-1000/2-S-1-U	95712169
			•				•	•		•		•		VGB-103-1000/3-B-0-O	95712170
			•				•		•	•			•	VGB-103-1000/3-S-0-U	95712171
			•				•		•		•		•	VGB-103-1000/3-S-1-U	95712172
				•	•			•		•		•		VGB-103-2000/1-B-0-O	95712173
				•	•				•	•		•		VGB-103-2000/1-S-0-O	95712174
				•	•				•	•			•	VGB-103-2000/1-S-0-U	95712175
				•	•				•		•	•		VGB-103-2000/1-S-1-O	95712176
				•	•				•		•		•	VGB-103-2000/1-S-1-U	95712177
				•		•		•		•		•		VGB-103-2000/2-B-0-O	95712178
				•		•			•	•			•	VGB-103-2000/2-S-0-U	95712179
				•		•			•		•		•	VGB-103-2000/2-S-1-U	95712180
				•			•	•		•		•		VGB-103-2000/3-B-0-O	95712181
				•			•		•	•			•	VGB-103-2000/3-S-0-U	95712182
				•			•		•		•		•	VGB-103-2000/3-S-1-U	95712183

Vaccuperm VGA-111

Installation				Connection pressure side				Inlet valve				Pressure indication		Connection pressure gauge			Limiting nozzle		Filter		Type key	Product number
cylinder	wall	header line	cylinder, header line	G 1	G 3/4	yoke USA	copper pipe 6/8 mm	short	long 230 V	long 115 V	simple	without	pressure gauge	without	top	right	without	with	external	internal		
B	W	C	BC	1	2	3	4	S	L	M	B	0	1	X	T	R	0	1	O	U	Vaccuperm	
			•	•							•	•		•			•		•		VGA-111-BC/1-B-0X-0-O	96680069
			•		•						•	•		•			•		•		VGA-111-BC/2-B-0X-0-O	96680071
•						•					•	•		•			•		•		VGA-111-B/3-B-0X-0-O	91834644
			•	•				•				•				•	•		•		VGA-111-BC/1-S-0R-0-O	96680197
			•	•				•				•				•		•		•	VGA-111-BC/1-S-0R-1-U	96680200
			•	•				•				•				•	•			•	VGA-111-BC/1-S-0R-0-U	96680128
			•	•				•				•		•				•	•		VGA-111-BC/1-S-0X-1-O	96680190
			•	•				•					•			•	•		•		VGA-111-BC/1-S-1R-0-O	96680135
			•	•				•					•			•		•		•	VGA-111-BC/1-S-1R-1-U	96680117
			•	•				•					•			•	•			•	VGA-111-BC/1-S-1R-0-U	96680088
			•	•				•					•			•		•	•		VGA-111-BC/1-S-1R-1-O	96680159
			•		•			•				•				•	•		•		VGA-111-BC/2-S-0R-0-O	95712188
			•		•			•				•				•		•		•	VGA-111-BC/2-S-0R-1-U	95712189
			•		•			•				•				•	•			•	VGA-111-BC/2-S-0R-0-U	96680208
			•		•			•				•				•		•	•		VGA-111-BC/2-S-0R-1-O	95713053
			•		•			•					•			•	•		•		VGA-111-BC/2-S-1R-0-O	95712192
			•		•			•					•			•		•		•	VGA-111-BC/2-S-1R-1-U	95712193
			•		•			•					•			•	•			•	VGA-111-BC/2-S-1R-0-U	96680205
			•		•			•					•			•		•	•		VGA-111-BC/2-S-1R-1-O	95713054
	•						•	•					•			•	•			•	VGA-111-W/4-S-1R-0-U	96680129
	•						•	•					•			•		•		•	VGA-111-W/4-S-1R-1-U	95712194
	•						•		•				•		•		•			•	VGA-111-W/4-L-1T-0-U	95712196
	•						•		•				•		•			•		•	VGA-111-W/4-L-1T-1-U	95712195
	•						•		•				•			•	•			•	VGA-111-W/4-L-1R-0-U	96680091
	•						•		•				•			•		•		•	VGA-111-W/4-L-1R-1-U	95713055
	•						•			•			•			•	•			•	VGA-111-W/4-M-1R-0-U	95712197
	•						•			•			•			•		•		•	VGA-111-W/4-M-1R-1-U	95712198
	•						•			•			•		•		•			•	VGA-111-W/4-M-1T-0-U	95713056
	•						•			•			•		•			•		•	VGA-111-W/4-M-1T-1-U	95713057
		•		•					•				•		•		•		•		VGA-111-C/1-L-1T-0-O	95712202
		•		•					•				•		•			•		•	VGA-111-C/1-L-1T-1-U	95712203
		•		•					•				•		•		•			•	VGA-111-C/1-L-1T-0-U	96680132
		•		•					•				•		•			•	•		VGA-111-C/1-L-1T-1-O	95713058
		•		•						•			•		•		•		•		VGA-111-C/1-M-1T-0-O	95712204
		•		•						•			•		•			•		•	VGA-111-C/1-M-1T-1-U	95712205
		•		•						•			•		•		•			•	VGA-111-C/1-M-1T-0-U	96680163
		•		•						•			•		•			•	•		VGA-111-C/1-M-1T-1-O	95713059
		•			•				•				•		•		•		•		VGA-111-C/2-L-1T-0-O	95712207
		•			•				•				•		•			•		•	VGA-111-C/2-L-1T-1-U	95712208
		•			•				•				•		•		•			•	VGA-111-C/2-L-1T-0-U	95712206
		•			•				•				•		•			•	•		VGA-111-C/2-L-1T-1-O	95713063
		•			•					•			•		•		•		•		VGA-111-C/2-M-1T-0-O	95712210
		•			•					•			•		•			•		•	VGA-111-C/2-M-1T-1-U	95712211
		•			•					•			•		•		•			•	VGA-111-C/2-M-1T-0-U	95713064
		•			•					•			•		•			•	•		VGA-111-C/2-M-1T-1-O	95713065

Vaccuperm VGA-113

Dosing quantity [g/h]									Adjustment			Control			Type key	Product number
25	40	100	250	500	1000	2000	3000	4000	automatic 230 V	automatic 115 V	manual	without	4-20 mA	direct		
25	40	100	250	500	1000	2000	3000	4000	A	B	M	0	1	2	Vaccuperm	
•											•	•			VGA-113-25/M0	95722277
•									•				•		VGA-113-25/A1	95722286
•										•			•		VGA-113-25/B1	95722287
•									•					•	VGA-113-25/A2	95722304
•										•				•	VGA-113-25/B2	95722305
	•										•	•			VGA-113-40/M0	95722278
	•								•				•		VGA-113-40/A1	95722288
	•									•			•		VGA-113-40/B1	95722289
	•								•					•	VGA-113-40/A2	95722306
	•									•				•	VGA-113-40/B2	95722307
		•									•	•			VGA-113-100/M0	95722279
		•							•				•		VGA-113-100/A1	95722290
		•								•			•		VGA-113-100/B1	95722291
		•							•					•	VGA-113-100/A2	95722308
		•								•				•	VGA-113-100/B2	95722309
			•								•	•			VGA-113-250/M0	95722280
			•						•				•		VGA-113-250/A1	95722292
			•							•			•		VGA-113-250/B1	95722293
			•						•					•	VGA-113-250/A2	95722310
			•							•				•	VGA-113-250/B2	95722311
				•							•	•			VGA-113-500/M0	95722281
				•					•				•		VGA-113-500/A1	95722294
				•						•			•		VGA-113-500/B1	95722295
				•					•					•	VGA-113-500/A2	95722312
				•						•				•	VGA-113-500/B2	95722313
					•						•	•			VGA-113-1000/M0	95722282
					•				•				•		VGA-113-1000/A1	95722296
					•					•			•		VGA-113-1000/B1	95722297
					•				•					•	VGA-113-1000/A2	95722314
					•					•				•	VGA-113-1000/B2	95722315
						•					•	•			VGA-113-2000/M0	95722283
						•			•				•		VGA-113-2000/A1	95722298
						•				•			•		VGA-113-2000/B1	95722299
						•			•					•	VGA-113-2000/A2	95722316
						•				•				•	VGA-113-2000/B2	95722317
							•				•	•			VGA-113-3000/M0	95722284
							•		•				•		VGA-113-3000/A1	95722300
							•			•			•		VGA-113-3000/B1	95722301
							•		•					•	VGA-113-3000/A2	95722318
							•			•				•	VGA-113-3000/B2	95722319
								•			•	•			VGA-113-4000/M0	95722285
								•	•				•		VGA-113-4000/A1	95722302
								•		•			•		VGA-113-4000/B1	95722303
								•	•					•	VGA-113-4000/A2	95722320
								•		•				•	VGA-113-4000/B2	95722321

Vaccuperm VGA-117

Dosing quantity						Connection			Adjustment			Control			Type key	Product number
1000	2000	4000	6000	8000	10000	PE 8/11	PE 10/14	PVC DN15	automatic 230 V	automatic 115 V	manual	without	4-20 mA	direct		
1000	2000	4000	6000	8000	10000	5	6	7	A	B	M	0	1	2	Vaccuperm	
•						•					•	•			VGA-117-1000/5-M0	95712895
•						•			•				•		VGA-117-1000/5-A1	95712896
•						•				•			•		VGA-117-1000/5-B1	95712897
•						•			•					•	VGA-117-1000/5-A2	95712898
•						•				•				•	VGA-117-1000/5-B2	95712899
•							•				•	•			VGA-117-1000/6-M0	91834655
•							•		•				•		VGA-117-1000/6-A1	96680468
•							•			•			•		VGA-117-1000/6-B1	91834657
•							•		•					•	VGA-117-1000/6-A2	96680492
•							•			•				•	VGA-117-1000/6-B2	96680499
	•					•					•	•			VGA-117-2000/5-M0	95712900
	•					•			•				•		VGA-117-2000/5-A1	95712901
	•					•				•			•		VGA-117-2000/5-B1	95712902
	•					•			•					•	VGA-117-2000/5-A2	95712903
	•					•				•				•	VGA-117-2000/5-B2	95712904
	•						•				•	•			VGA-117-2000/6-M0	91834654
	•						•		•				•		VGA-117-2000/6-A1	96680469
	•						•			•			•		VGA-117-2000/6-B1	91834656
	•						•		•					•	VGA-117-2000/6-A2	96680493
	•						•			•				•	VGA-117-2000/6-B2	96680500
		•				•					•	•			VGA-117-4000/5-M0	95712905
		•				•			•				•		VGA-117-4000/5-A1	96680478
		•				•				•			•		VGA-117-4000/5-B1	95712906
		•				•			•					•	VGA-117-4000/5-A2	95712907
		•				•				•				•	VGA-117-4000/5-B2	95712908
		•					•				•	•			VGA-117-4000/6-M0	91834651
		•					•		•				•		VGA-117-4000/6-A1	96680470
		•					•			•			•		VGA-117-4000/6-B1	96680472
		•					•		•					•	VGA-117-4000/6-A2	96680494
		•					•			•				•	VGA-117-4000/6-B2	96680501
		•						•			•	•			VGA-117-4000/7-M0	96680446
		•						•	•				•		VGA-117-4000/7-A1	96680482
		•						•		•			•		VGA-117-4000/7-B1	95712909
		•						•	•					•	VGA-117-4000/7-A2	95712910
		•						•		•				•	VGA-117-4000/7-B2	95712911
			•				•				•	•			VGA-117-6000/6-M0	96680442
			•				•		•				•		VGA-117-6000/6-A1	96680471
			•				•			•			•		VGA-117-6000/6-B1	96680473
			•				•		•					•	VGA-117-6000/6-A2	96680495
			•				•			•				•	VGA-117-6000/6-B2	91834659
			•					•			•	•			VGA-117-6000/7-M0	96680447
			•					•	•				•		VGA-117-6000/7-A1	96680463
			•					•		•			•		VGA-117-6000/7-B1	95712912
			•					•	•					•	VGA-117-6000/7-A2	95712913
			•					•		•				•	VGA-117-6000/7-B2	95712914
				•			•				•	•			VGA-117-8000/6-M0	95703355
				•			•		•				•		VGA-117-8000/6-A1	96680464
				•			•			•			•		VGA-117-8000/6-B1	96680474
				•			•		•					•	VGA-117-8000/6-A2	96680496
				•			•			•				•	VGA-117-8000/6-B2	96680502
				•				•			•	•			VGA-117-8000/7-M0	95712915
				•				•	•				•		VGA-117-8000/7-A1	95712916
				•				•		•			•		VGA-117-8000/7-B1	95712917
				•				•	•					•	VGA-117-8000/7-A2	95712918
				•				•		•				•	VGA-117-8000/7-B2	95712919
					•		•				•	•			VGA-117-10000/6-M0	96680440
					•		•		•				•		VGA-117-10000/6-A1	96680465
					•		•			•			•		VGA-117-10000/6-B1	96680466
					•		•		•					•	VGA-117-10000/6-A2	96680497
					•		•			•				•	VGA-117-10000/6-B2	96680503
					•			•			•	•			VGA-117-10000/7-M0	96680453
					•			•	•				•		VGA-117-10000/7-A1	96680462
					•			•		•			•		VGA-117-10000/7-B1	95712920

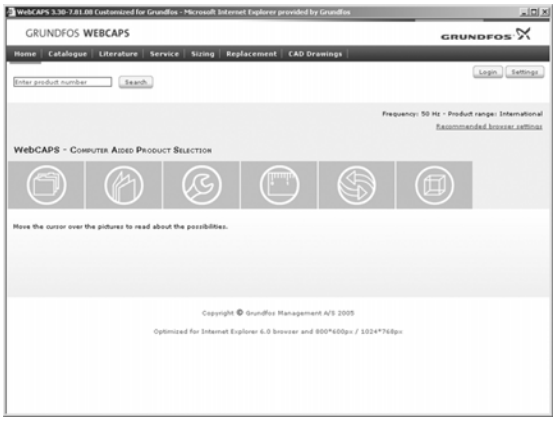
Dosing quantity						Connection			Adjustment			Control			Type key	Product number
1000	2000	4000	6000	8000	10000	PE 8/11	PE 10/14	PVC DN15	automatic 230 V	automatic 115 V	manual	without	4-20 mA	direct		
1000	2000	4000	6000	8000	10000	5	6	7	A	B	M	0	1	2	Vaccuperm	
					•			•	•					•	VGA-117-10000/7-A2	96680504
					•			•		•				•	VGA-117-10000/7-B2	95712921

Vaccuperm VGA-146

Installation				Connection pressure side				Output		Inlet valve			Pressure indication		Connection pressure gauge			Pressure input		Type Key	Product number
drum	wall	header line	drum or header line	G 1	G 3/4	yoke USA	copper pipe 6/8	PE 10/14	PVC pipe DN15	short	long 230 V	long 115 V	without	pressure gauge	top	right	front	front	left		
D	W	C	DC	1	2	3	4	6	7	S	L	M	0	1	T	R	F	F	L	Vaccuperm	
			•	•				•			•		•		•				•	VGA-146-DC/1/6-L-0TL	96709585
			•	•				•			•			•	•				•	VGA-146-DC/1/6-L-1TL	96681247
			•	•				•				•	•		•				•	VGA-146-DC/1/6-M-0TL	96709595
			•	•				•				•		•	•				•	VGA-146-DC/1/6-M-1TL	96709597
			•		•			•			•		•		•				•	VGA-146-DC/2/6-L-0TL	96709617
			•		•			•			•			•	•				•	VGA-146-DC/2/6-L-1TL	96709566
			•		•			•				•	•		•				•	VGA-146-DC/2/6-M-0TL	95712923
			•		•			•				•		•	•				•	VGA-146-DC/2/6-M-1TL	95712924
•						•		•			•		•		•				•	VGA-146-D/3/6-L-0TL	95702230
•						•		•			•			•	•				•	VGA-146-D/3/6-L-1TL	96681252
•						•		•				•	•		•				•	VGA-146-D/3/6-M-0TL	95712926
•						•		•				•		•	•				•	VGA-146-D/3/6-M-1TL	91834760
	•						•	•		•			•				•		•	VGA-146-W/4/6-S-0FL	96709580
	•						•	•		•				•			•		•	VGA-146-W/4/6-S-1FL	96646927
	•						•	•			•		•				•		•	VGA-146-W/4/6-L-0FL	96681262
	•						•	•			•			•			•		•	VGA-146-W/4/6-L-1FL	96681254
	•						•	•				•	•				•		•	VGA-146-W/4/6-M-0FL	95712927
	•						•	•				•		•			•		•	VGA-146-W/4/6-M-1FL	95701452
	•						•		•	•			•				•		•	VGA-146-W/4/7-S-0FL	95712928
	•						•		•	•				•			•		•	VGA-146-W/4/7-S-1FL	96709558
	•						•		•		•		•				•		•	VGA-146-W/4/7-L-0FL	95712929
	•						•		•		•			•			•		•	VGA-146-W/4/7-L-1FL	95713205
	•						•		•			•	•				•		•	VGA-146-W/4/7-M-0FL	95712930
	•						•		•			•		•			•		•	VGA-146-W/4/7-M-1FL	95712931
		•		•				•		•			•			•		•		VGA-146-C/1/6-S-0RF	96709583
		•		•				•		•				•		•		•		VGA-146-C/1/6-S-1RF	96681248
		•		•					•	•			•			•		•		VGA-146-C/1/7-S-0RF	96681251
		•		•					•	•				•		•		•		VGA-146-C/1/7-S-1RF	96709644
		•		•					•		•		•		•				•	VGA-146-C/1/7-L-0TL	95712932
		•		•					•		•			•	•				•	VGA-146-C/1/7-L-1TL	95712933
		•		•					•			•	•		•				•	VGA-146-C/1/7-M-0TL	95712934
		•		•					•			•		•	•				•	VGA-146-C/1/7-M-1TL	95712935
		•			•			•		•			•			•			•		VGA-146-C/2/6-S-0RF	96709626
		•			•			•		•				•		•			•		VGA-146-C/2/6-S-1RF	96709567
		•			•				•	•			•			•			•		VGA-146-C/2/7-S-0RF	96709640
		•			•				•	•				•		•			•		VGA-146-C/2/7-S-1RF	96709642
		•			•				•		•		•		•					•	VGA-146-C/2/7-L-0TL	95712938
		•			•				•		•			•	•					•	VGA-146-C/2/7-L-1TL	96709614
		•			•				•			•	•		•					•	VGA-146-C/2/7-M-0TL	95712939
		•			•				•			•		•	•					•	VGA-146-C/2/7-M-1TL	95712940

6. Further product documentation

WebCAPS

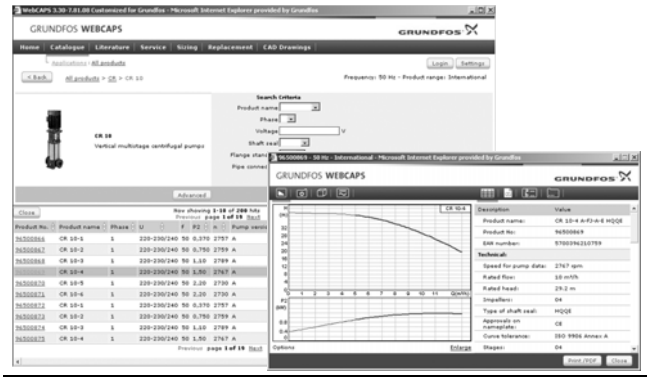


WebCAPS is a **Web**-based **C**omputer **A**ided **P**roduct **S**election program available on www.grundfos.com.

WebCAPS contains detailed information on more than 220,000 Grundfos products in more than 30 languages.

Information in WebCAPS is divided into six sections:

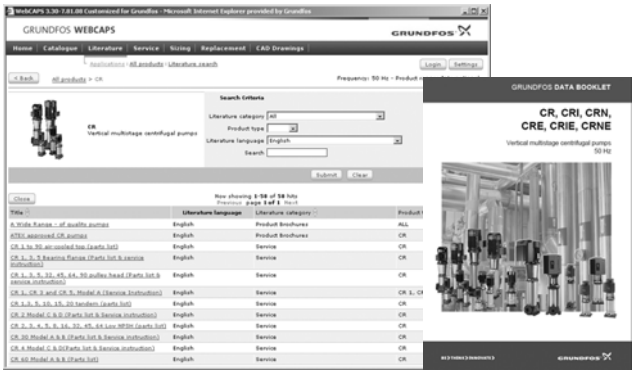
- Catalogue
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



Catalogue

Based on fields of application and pump types, this section contains the following:

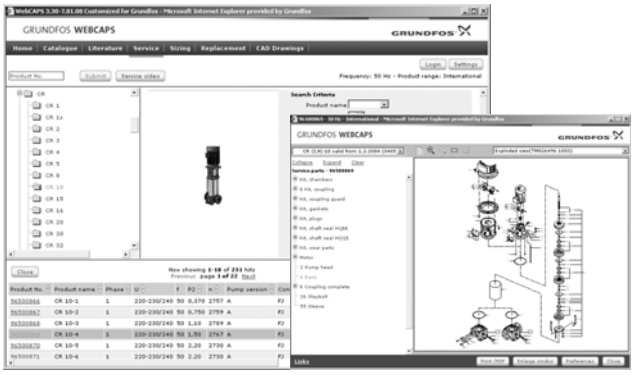
- technical data
- curves (QH, Eta, P1, P2, etc.) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



Literature

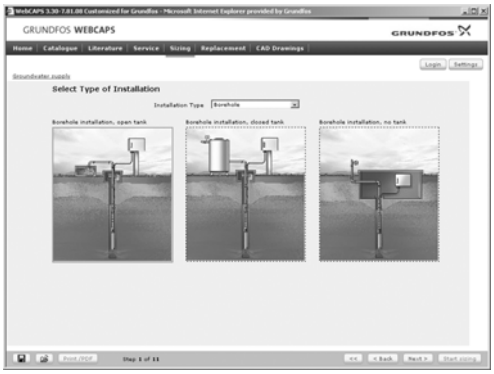
This section contains all the latest documents of a given pump, such as

- data booklets
- installation and operating instructions
- service documentation, such as Service kit catalogue and Service kit instructions
- quick guides
- product brochures.



Service

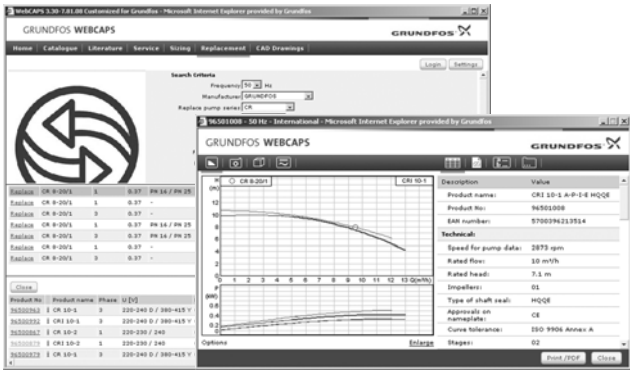
This section contains an easy-to-use interactive service catalogue. Here you can find and identify service parts of both existing and discontinued Grundfos pumps.
Furthermore, the section contains service videos showing you how to replace service parts.



Sizing

This section is based on different fields of application and installation examples and gives easy step-by-step instructions in how to size a product:

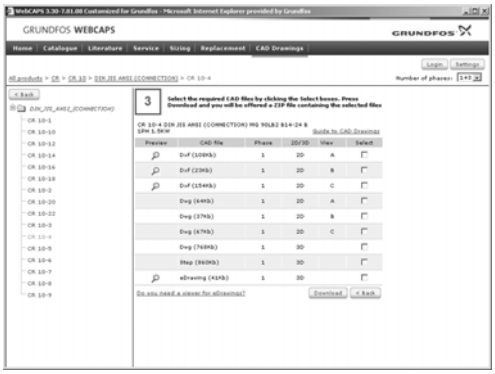
- Select the most suitable and efficient pump for your installation.
- Carry out advanced calculations based on energy, consumption, payback periods, load profiles, life cycle costs, etc.
- Analyse your selected pump via the built-in life cycle cost tool.
- Determine the flow velocity in wastewater applications, etc.



Replacement

In this section you find a guide to selecting and comparing replacement data of an installed pump in order to replace the pump with a more efficient Grundfos pump.
The section contains replacement data of a wide range of pumps produced by other manufacturers than Grundfos.

Based on an easy step-by-step guide, you can compare Grundfos pumps with the one you have installed on your site. When you have specified the installed pump, the guide will suggest a number of Grundfos pumps which can improve both comfort and efficiency.



CAD drawings

In this section, it is possible to download 2-dimensional (2D) and 3-dimensional (3D) CAD drawings of most Grundfos pumps.

These formats are available in WebCAPS:

2-dimensional drawings:

- .dxf, wireframe drawings
- .dwg, wireframe drawings.

3-dimensional drawings:

- .dwg, wireframe drawings (without surfaces)
- .stp, solid drawings (with surfaces)
- .eprt, E-drawings.

WinCAPS

Fig. 25 WinCAPS DVD

WinCAPS is a **Win**dows-based **C**omputer **A**ided **P**roduct **S**election program containing detailed information on more than 220,000 Grundfos products in more than 30 languages.

The program contains the same features and functions as WebCAPS, but is an ideal solution if no internet connection is available.

WinCAPS is available on DVD and updated once a year.

Subject to alterations

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