

SERIES 4 DIAPHRAGM PUMPS



Can be used for a wide range of applications

DIAPHRAGM PUMP ALLROUNDERS FOR INDUSTRY

sera diaphragm pumps are oscillating displacement pumps for dosing liquids. The medium to be pumped is separated from the drive by a diaphragm. This is thus protected from damaging influences of the medium. They are used everywhere where leak-free and exact dosing is important, such as for aggressive, odorous, abrasive, radioactive, flammable, viscous or toxic media.

Delivery rate adjustment by means of stroke frequency adjustment using external frequency converter and manual stroke length adjustment for optimal adaptation to every requirement.

APPLICATIONS

- Beverage industry
- Food industry
- Manufacture of paints and varnishes
- Power plants
- Water treatment
- Shipbuilding
- Electroplating
- Textile industry
- Waste water treatment

AUTOMATIC DELIVERY RATE ADJUSTMENT

- Three-phase motors suitable for frequency converter operation for stroke frequency change using an external frequency converter
- Actuators with position controllers for automatic stroke length change

OVERVIEW OF ADVANTAGES

- High dosing accuracy
- Long diaphragm service lives
- Linear control characteristics
- Leak-free
- Low-maintenance
- ATEX-compliant versions are available (not in stock)
- Unlimited dry running safety

OPTIONAL VERSIONS

- Diaphragm monitoring
- Suction height 8 mWC
- Controllable variant (C version)



VERSIONS

MATERIALS

The high quality of the materials guarantees reliable continuous operation. The optimum material is available for every requirement.

PUMP BODY AND VALVES

PVC, PP, PVDF, PP-GFP, PVDF-GFP, 1.4571

VALVE BALLS

PTFE, 1.4401

VALVE SEALS

EPDM, FPM, FEP-coated

DRIVE DIAPHRAGMS

PTFE-coated

MANUAL VENTILATION VALVE (2,4e)

PP-GFP, PVDF-GFP

DRIVE

The drive unit in each case consists of a proven motor make, coupled with stroke gearing in a robust case.

sera cases are also suitable for the harshest operating conditions. Material thickness and surface treatment even resist chemical attacks.

The flow rate is constant or continuously adjustable. This is done manually by changing the stroke length for the controllable version. The delivery rate can be adjusted automatically using the following options:

- Three-phase motors suitable for frequency converter operation for stroke frequency change using an external frequency converter
- Actuators with position controllers for automatic stroke length change

SPECIAL VERSIONS

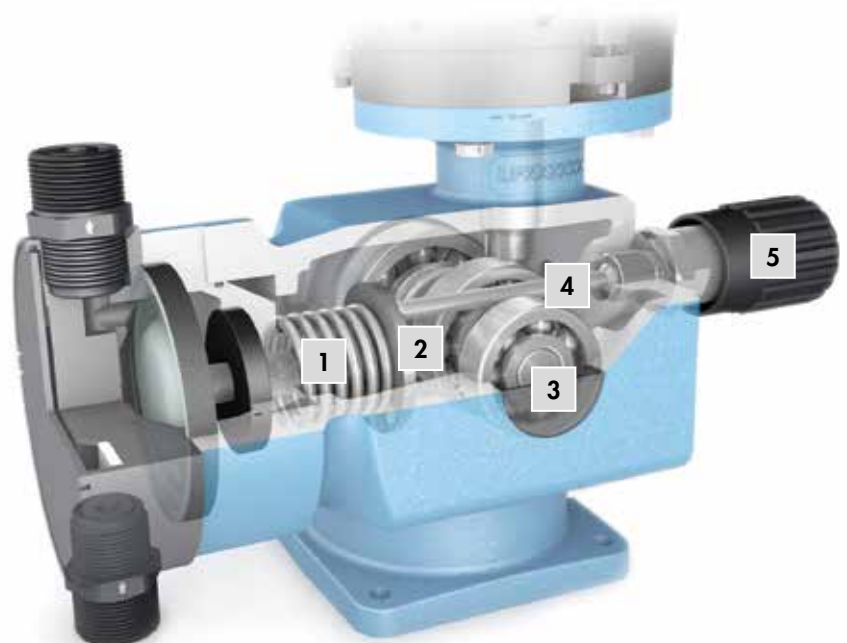
We provide the individual solution for special dosing tasks:

Among other things, pump bodies with special nominal diameters, heating equipment, valves as double valves, with spring loading, with elastic ball seats, rinsing equipment for interval or final rinsing for prevention of deposits in the pump body, attachment of stroke counter, diaphragm rupture monitoring, special materials such as titanium or Hastelloy, design that can be cleaned.

ACCESSORIES

All necessary accessory parts for the optimal installation of dosing pumps such as pressure relief valves, pressure-maintaining valves, pulsation dampers, dosing valves, dosing tanks, flow monitors etc. can be ordered from us.

1	Return spring
2	Push rod plate
3	Eccentric shaft
4	Adjusting spindle
5	Adjusting wheel



ADDITIONAL FEATURES



CONTROL ELECTRONICS

The control electronics have many advantages such as the possibility of external control using pulse or analogue signals, batch control or continuous monitoring of the diaphragm state, the flow rate and tank level.

PROFIBUS DP INTERFACE

sera dosing pumps can optionally be equipped with a control unit. The pumps of the 410.2 series keep the current C-electronics, while the new 409.2 is equipped with the innovative Pro+ board. Its design allows the later addition of a separately available bus interface. The C-electronic is available in two different executions.



FREQUENCY CONVERTER

The speed and thus the delivery rate of the dosing pump can be regulated without control electronics using a frequency converter.

PUMP BODY WITH INTEGRATED PRESSURE RELIEF VALVE

The integrated diaphragm pressure relief valve protects the pump from unacceptable overpressure when the pressure pipe is closed. It can be used for low-viscosity media without solids for a maximum flow rate of 570 l/h.



ADDITIONAL FEATURES

DIAPHRAGM MONITORING

The conductive diaphragm monitoring is performed using an electrode in combination with an evaluation unit. In the case of the controllable pumps, the electrode is directly connected to the control electronics and thus constantly monitored. In contrast, a relay is needed for the evaluation for the non-controllable pumps.



STROKE FREQUENCY SENSOR

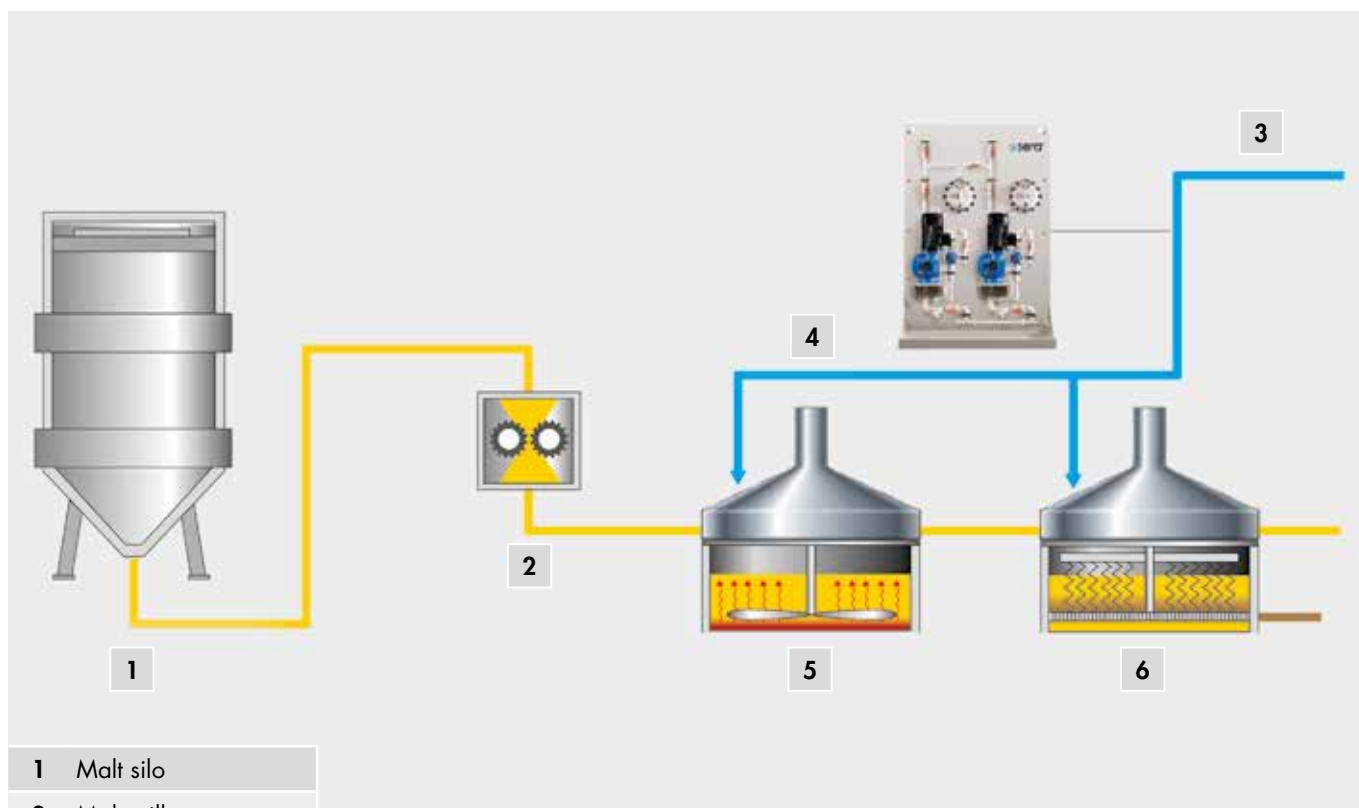
sera dosing pumps are oscillating displacement pumps with an exactly defined stroke volume for each pump stroke. The stroke frequency sensor records the individual pump strokes and forwards each individually to the evaluation unit.

ELECTRIC ACTUATOR FOR STROKE LENGTH ADJUSTMENT

Using the electric actuator for stroke length adjustment, this can be automatically adjusted by a control unit and manual adjustment is no longer needed.



APPLICATION EXAMPLE HARDENING OF BREWING WATER



- | | |
|---|--------------------|
| 1 | Malt silo |
| 2 | Malt mill |
| 3 | Fresh water supply |
| 4 | Water addition |
| 5 | Mash tun |
| 6 | Lauter tun |



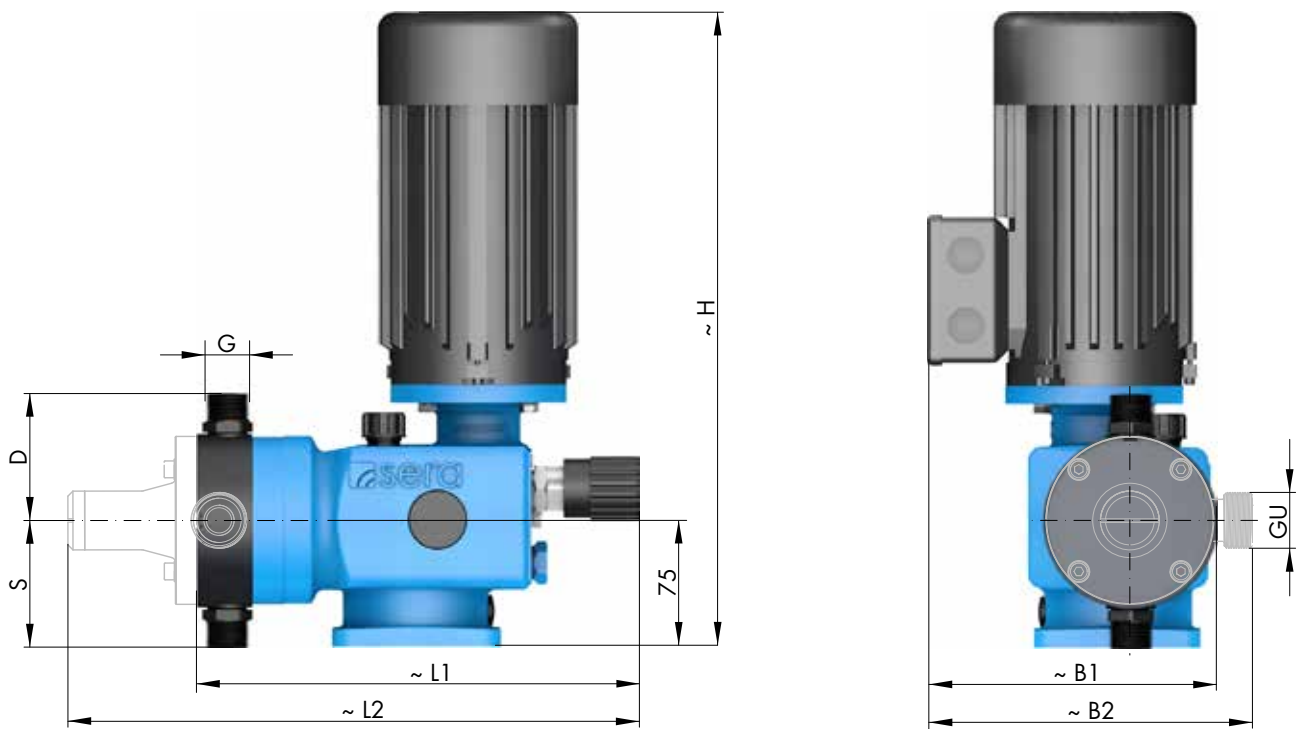
TECHNICAL DATA

DIAPHRAGM PUMP RF409.2

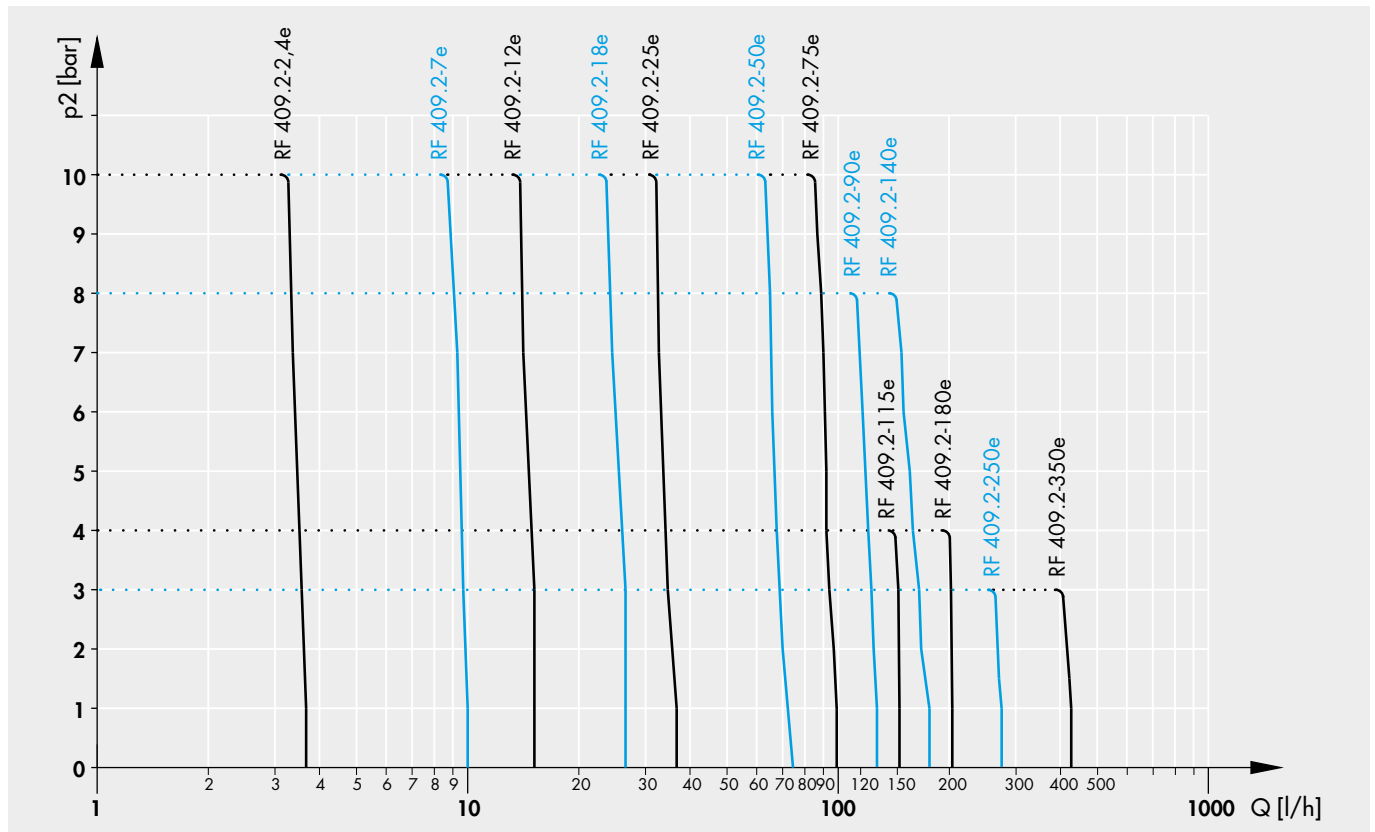
PUMP DATA		RF 409.2-...													
(* 8mWS = performance losses of nominal capacity QN of 20-25%)		....2,4e	....7,0e	....12e	....18e	....25e	....50e	....75e	....90e	....115e	....140e	....180e	....250e	....350e	
Permissible pressure p_{2max} at the pump outlet	bar	10	10	10	10	10	10	10	8	4	8	4	3	3	
Nominal capacity QN at p_{2max}	l/h	50 Hz	0-2,4	0-7,0	0-12	0-18	0-25	0-50	0-75	0-90	0-115	0-140	0-180	0-250	0-350
		60 Hz	0-2,9	0-8,4	0-14,4	0-21,5	0-30	0-60	0-90	0-108	0-138	0-168	0-216	0-300	-
Quantity per stroke	ml/stroke (100%)	0,27	0,78	2,0	3,0	2,8	8,3	8,3	15,0	19,2	15,6	20,0	41,7	38,9	
Max. suction height	mWC	3				3 (8*)				3					
Min./max. permissible pressure at the pump inlet	bar $p_{1min/max}$	-0,3/0				-0,3/0 (-0,8/0*)				-0,3/0					
Recomm. nominal diameter DN of the connecting pipes	mm	5	5	10	10	10	10	15	15	15	15	15	15	15	
Nominal stroke frequency	1/min	50 Hz	150	150	100	100	150	100	150	100	100	150	150	100	150
		60 Hz	180	180	120	120	180	120	180	120	120	180	180	120	-
Weight approx.	kg	plastic	9	9	9	9	9	9	9	11	10	11	10	13	13
		stainless steel	10	10	10	10	10	10	10	10	13	13	13	13	21	21

ELECTRICAL DATA		RF409.2-2,4e ... RF409.2-25e				RF409.2-50e ... RF409.2-350e			
Power consumption	kW	0,18				0,37			
Voltage	V DC					380-420			
Frequency	Hz					50/60			
Insulation class	ISO					F			
Enclosure	IP					55			

DIMENSIONS



CHARACTERISTICS



DIMENSIONS

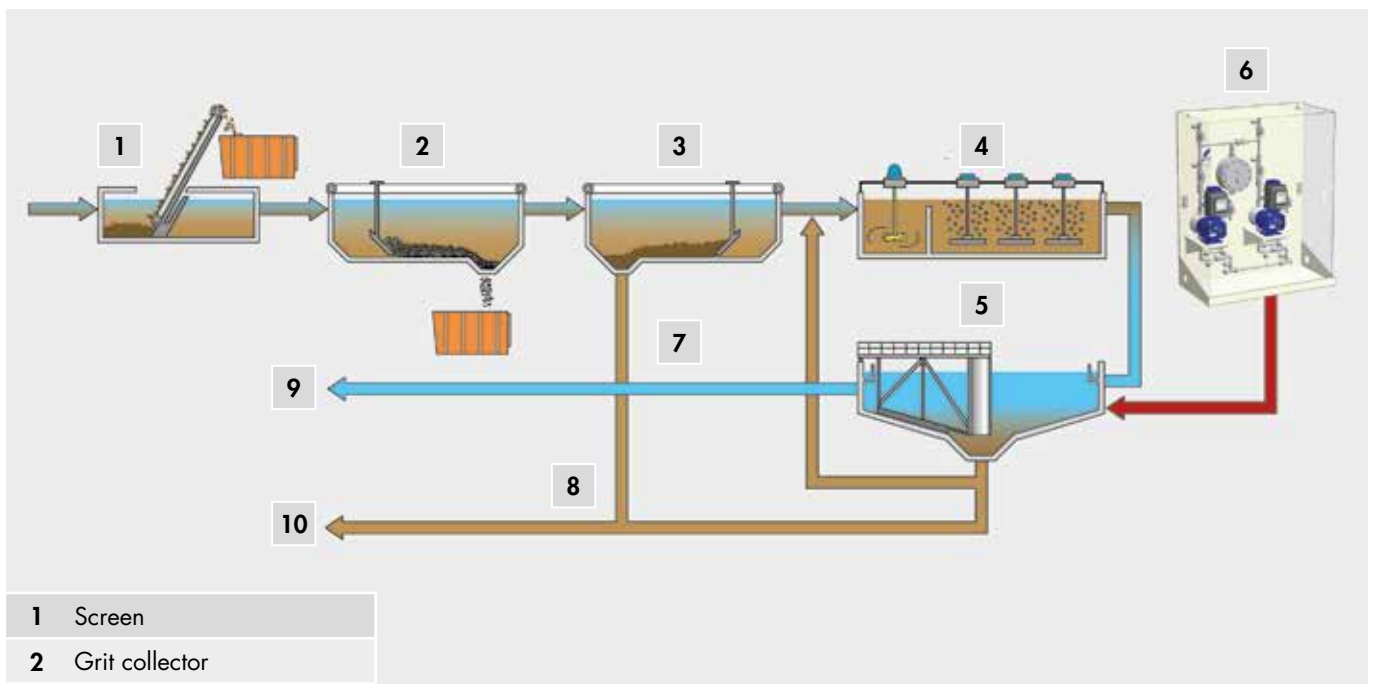
		RF 409.2-...												
		...-2,4e	...-7,0e	...-12e	...-18e	...-25e	...-50e	...-75e	...-90e	...-115e	...-140e	...-180e	...-250e	...-350e
SUCTION VALVES														
DN	Nominal width	5	5	5	8	8	8	8	8	8	8	8	20 ⁽¹⁾	20 ⁽¹⁾
G	Connection thread	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G1 1/4 ⁽¹⁾	G1 1/4 ⁽¹⁾
S	PP-FRP / PVDF-FRP	80	56	56	56	56	69	69	76	76	76	76	122	122
S	PP-FRP / PVDF-FRP ⁽²⁾	–	57	60	60	60	67	67	76	76	76	76	122	122
S	PVC-U	70	62	65	63	63	70	70	78	78	78	78	119	119
S	PVC-U ⁽²⁾	–	52	52	63	63	70	70	78	78	78	78	119	119
S	1.4571	70	57	61	61	61	68	68	76	76	76	76	122	122
S	1.4571 ⁽²⁾	–	57	61	61	61	68	68	76	76	76	76	122	122
PRESSURE VALVES														
DN	Nominal width	5	5	5	8	8	8	8	8	8	8	8	20 ⁽¹⁾	20 ⁽¹⁾
G	Connection thread	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G1 1/4 ⁽¹⁾	G1 1/4 ⁽¹⁾
D	PP-FRP / PVDF-FRP	80	64	64	64	64	69	69	76	76	76	76	122	122
D	PP-FRP / PVDF-FRP ⁽²⁾	–	57	60	60	60	67	67	76	76	76	76	122	122
D	PVC-U	70	62	65	70	70	77	77	85	85	85	85	138	138
D	PVC-U ⁽²⁾	–	65	65	70	70	77	77	85	85	85	85	138	138
D	1.4571	70	57	61	61	61	68	68	76	76	76	76	122	122
D	1.4571 ⁽²⁾	–	57	61	61	61	68	68	76	76	76	76	122	122
MAX. TOTAL HEIGHT														
H		330	330	330	330	330	370	370	370	370	370	370	370	370
MAX. TOTAL WIDTH														
B1		175	175	175	175	175	185	185	185	185	185	185	220	220
B2	(with relief valve)	–	175	175	175	175	185	185	210	210	210	210	245	245
MAX. TOTAL LENGTH														
L1		310	285	285	285	285	295	295	300	300	300	300	355	355
L2	(with relief valve)	–	345	345	345	345	360	360	370	370	370	370	435	435
RELIEF VALVE CONNECTION														
GU		–	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G1	G1	G1	G1	G1 1/4 ⁽¹⁾	G1 1/4 ⁽¹⁾

(Measurements in mm)

⁽¹⁾ DN15 / G1 at valves of PVC-U

⁽²⁾ Pump body with relief valve

APPLICATION EXAMPLE WASTE WATER TREATMENT



- 1 Screen
- 2 Grit collector
- 3 Primary settlement tank
- 4 Aeration tank
- 5 Secondary settlement tank
- 6 FeCl₃ dosing
- 7 Return sludge
- 8 Sludge
- 9 Waters
- 10 Digestion tower



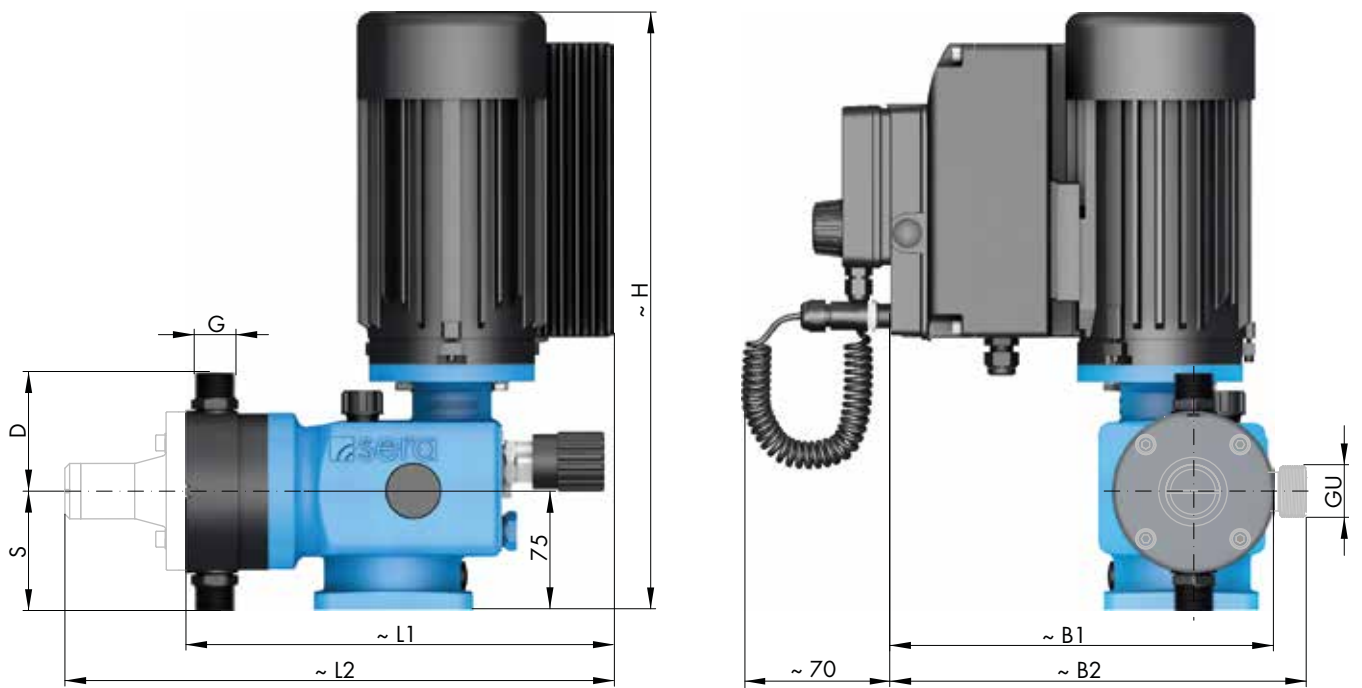
TECHNICAL DATA

DIAPHRAGM PUMP C409.2

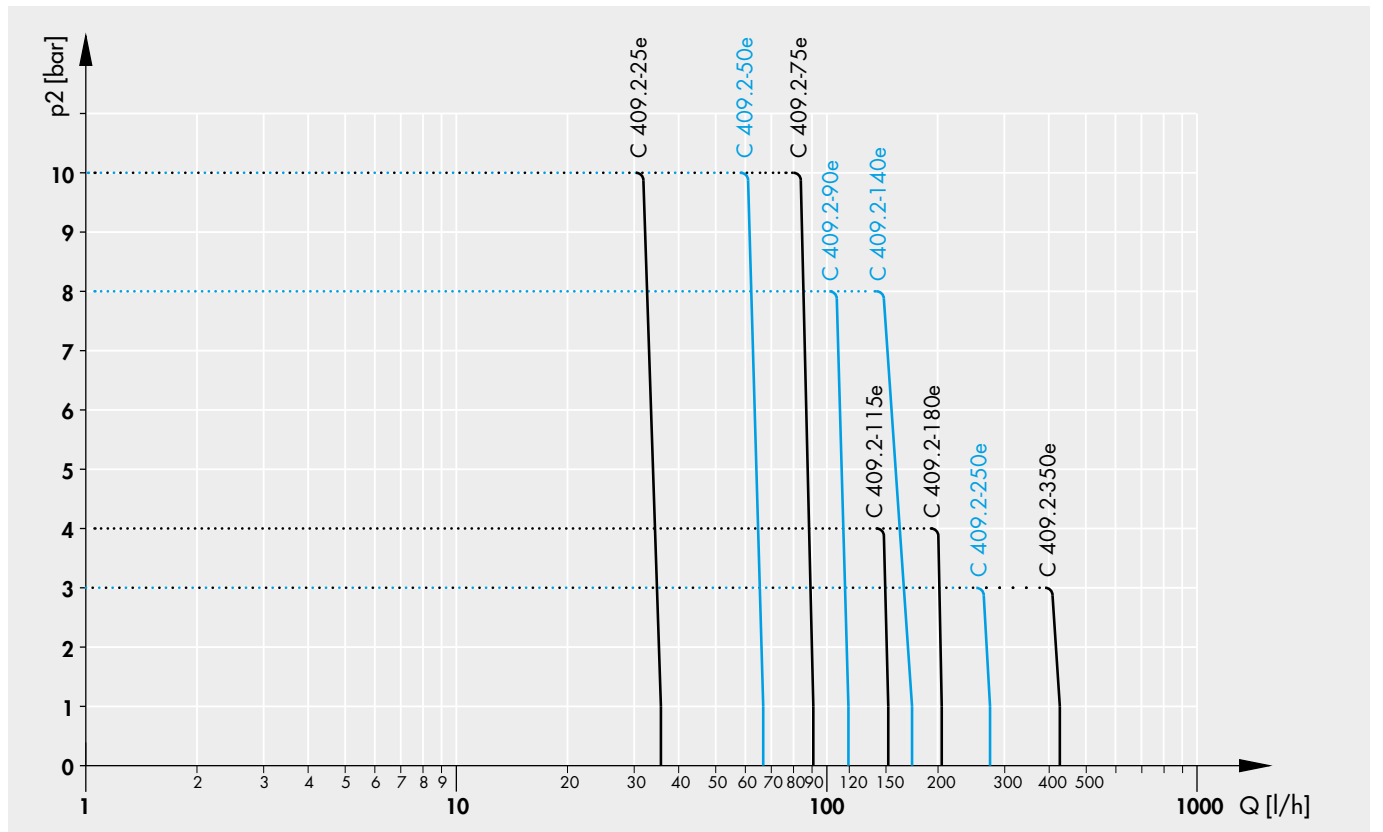
PUMP DATA			C 409.2-...								
(* 8mWS = performance losses of nominal capacity QN of 20-25%)			...-25e	...-50e	...-75e	...-90e	...-115e	...-140e	...-180e	...-250e	...-350e
Permissible pressure p_{2max} at the pump outlet	bar		10	10	10	8	4	8	4	3	3
Nominal capacity QN at p_{2max}	l/h	50/60 Hz	0-25	0-50	0-75	0-90	0-115	0-140	0-180	0-250	0-350
Quantity per stroke	ml/stroke	(100%)	2,8	8,3	8,3	15,0	19,2	15,6	20,0	41,7	38,9
Max. suction height	mWC		3 (8*)							3	
Min./max. permissible pressure at the pump inlet	bar	$p_{1min/max}$	-0,3/0 (-0,8/0*)							-0,3/0	
Recomm. nominal diameter DN of the connecting pipes	mm		10	10	15	15	15	15	15	15	15
Nominal stroke frequency	1/min	50/60 Hz	150	100	150	100	100	150	150	100	150
Weight approx.	kg	plastic	8,6	8,4	8,4	10,5	9,0	10,5	9,0	13,0	13,0
		stainless st.									

ELECTRICAL DATA		C 409.2-...	
		230 V, 50/60 Hz	115 V, 50/60 Hz
Power consumption	kW	(...-25e, ...-50e = 0,18 kW) 0,37	
Voltage	V	210 - 250	100 - 125
Frequency	Hz	50/60	
Inlet voltage, control input	V DC	5...30	
Minimum contact signal time	ms	55	
Analogue input resistance	Ω	39	
Digital output internal/external supply		PNP max. 24V DC, 30mA /max. 30V DC, 30mA	
Recommended fuse (circuit breaker)		C6A	C10A
Insulation class	ISO	F	
Enclosure	IP	55	

DIMENSIONS



CHARACTERISTICS



DIMENSIONS

		C 409.2-...								
		...-25e	...-50e	...-75e	...-90e	...-115e	...-140e	...-180e	...-250e	...-350e
SUCTION VALVES										
DN	Nominal width	8	8	8	8	8	8	8	20 ⁽¹⁾	20 ⁽¹⁾
G	Connection thread	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G1 1/4 ⁽¹⁾	G1 1/4 ⁽¹⁾
S	PP-FRP / PVDF-FRP	56	69	69	76	76	76	76	122	122
S	PP-FRP / PVDF-FRP ⁽²⁾	60	67	67	76	76	76	76	122	122
S	PVC-U	63	70	70	78	78	78	78	119	119
S	PVC-U ⁽²⁾	63	70	70	78	78	78	78	119	119
S	1.4571	61	68	68	76	76	76	76	122	122
S	1.4571 ⁽²⁾	61	68	68	76	76	76	76	122	122
PRESSURE VALVES										
DN	Nominal width	8	8	8	8	8	8	8	20 ⁽¹⁾	20 ⁽¹⁾
G	Connection thread	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G ³ / ₄	G1 1/4 ⁽¹⁾	G1 1/4 ⁽¹⁾
D	PP-FRP / PVDF-FRP	64	69	69	76	76	76	76	122	122
D	PP-FRP / PVDF-FRP ⁽²⁾	60	67	67	76	76	76	76	122	122
D	PVC-U	70	77	77	85	85	85	85	138	138
D	PVC-U ⁽²⁾	70	77	77	85	85	85	85	138	138
D	1.4571	61	68	68	76	76	76	76	122	122
D	1.4571 ⁽²⁾	61	68	68	76	76	76	76	122	122
MAX. TOTAL HEIGHT										
H		330	330	370	370	370	370	370	370	370
MAX. TOTAL WIDTH										
B1		240	240	250	250	250	250	250	285	285
B2	(with relief valve)	250	250	255	275	275	275	275	300	300
MAX. TOTAL LENGTH										
L1		285	295	295	300	300	300	300	355	355
L2	(with relief valve)	345	360	360	370	370	370	370	435	435
RELIEF VALVE CONNECTION										
GU		G ³ / ₄	G ³ / ₄	G ³ / ₄	G1	G1	G1	G1	G1 1/4 ⁽¹⁾	G1 1/4 ⁽¹⁾

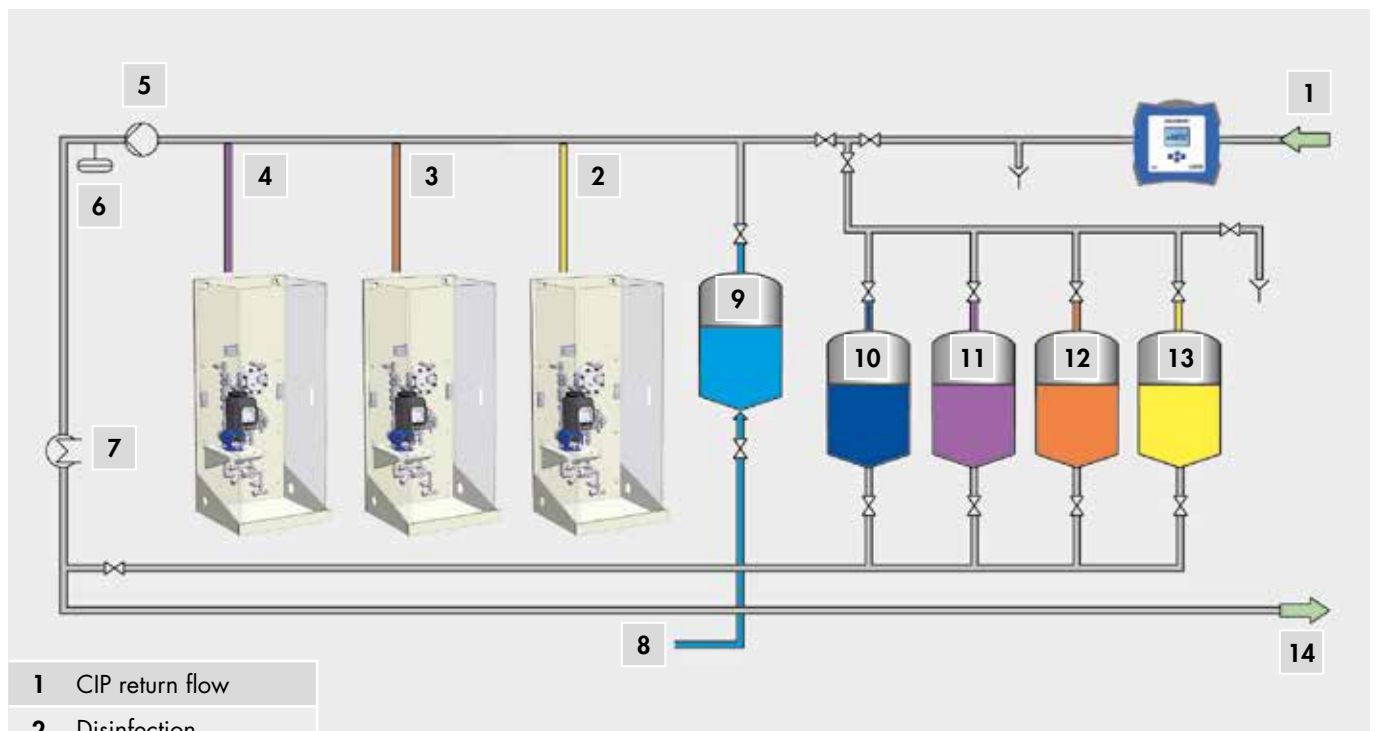
(Measurements in mm)

⁽¹⁾ DN15 / G1 at valves of PVC-U

⁽²⁾ Pump body with relief valve

APPLICATION EXAMPLE

DOSING OF CLEANING AGENTS



- 1 CIP return flow
- 2 Disinfection
- 3 Acid
- 4 Alkaline solution
- 5 Flow pump
- 6 Volume meter
- 7 Heat exchanger
- 8 Fresh water supply
- 9 Fresh water
- 10 Stack water
- 11 Alkaline solution
- 12 Acid
- 13 Disinfection
- 14 CIP flow



TECHNICAL DATA

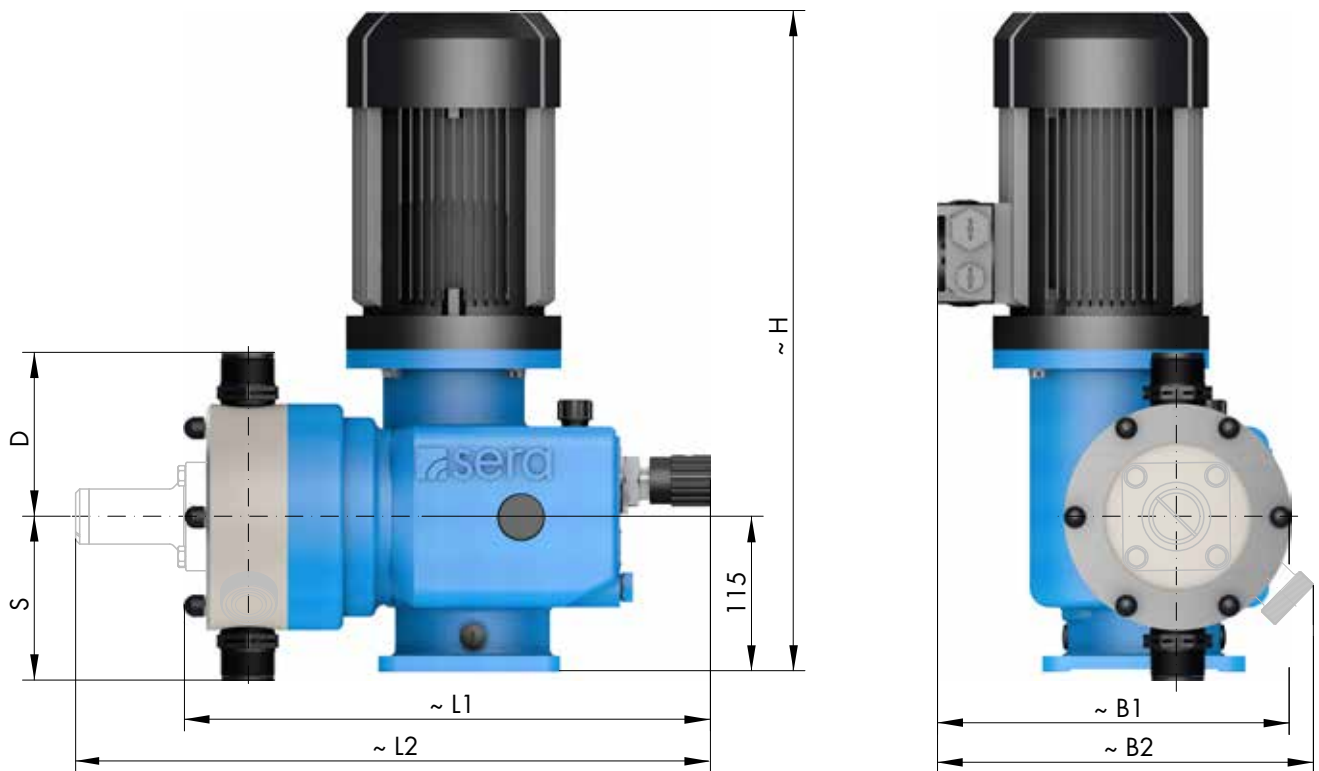
DIAPHRAGM PUMP RF410.2

PUMP DATA			RF 410.2-...			
			...280e	...570e	...900e	...1450e
Permissible pressure $p_{2max.}$ at the pump outlet	bar		8	6	5	5 *
Nominal capacity QN at $p_{2max.}$	l/h	50 Hz	0-280	0-570	0-900	0-1.450
		60 Hz	0-336	0-684	0-1.080	0-1.740
Quantity per stroke	ml/stroke (100%)		46	98	155	245
Max. suction height	mWC		5	5	3	3
Min./max. permissible pressure at the pump inlet	bar	$p_{1min/max}$	-0,5/0	-0,5/0	-0,3/0	-0,3/0
Recommended nominal diameter DN of the connecting pipes	mm		15	15	20	25
Nominal stroke frequency	1/min	50 Hz	97	97	97	97
		60 Hz	116	116	116	—
Weight approx.	kg	plastic	35	35	37	41
		stainless steel	42	42	52	59

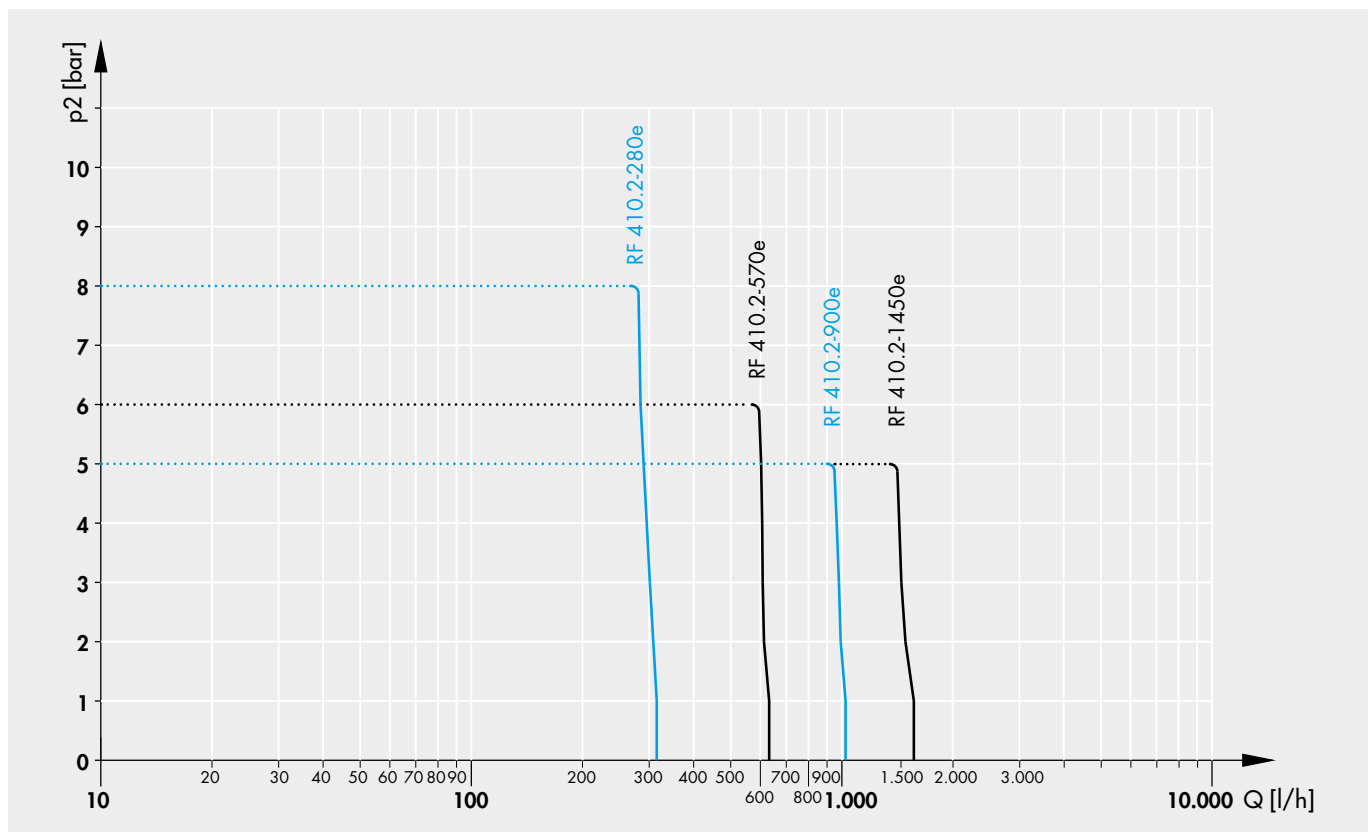
* at 60 Hz is the permissible pressure 3,5 bar

ELECTRICAL DATA			RF 410.2-...			
			...280e	...570e	...900e	...1450e
Power consumption	kW		0,75	0,75	1,1	1,5
Voltage	V		380-420			
Frequency	Hz		50/60			
Insulation class	ISO		F			
Enclosure	IP		55			

DIMENSIONS



CHARACTERISTICS



DIMENSIONS

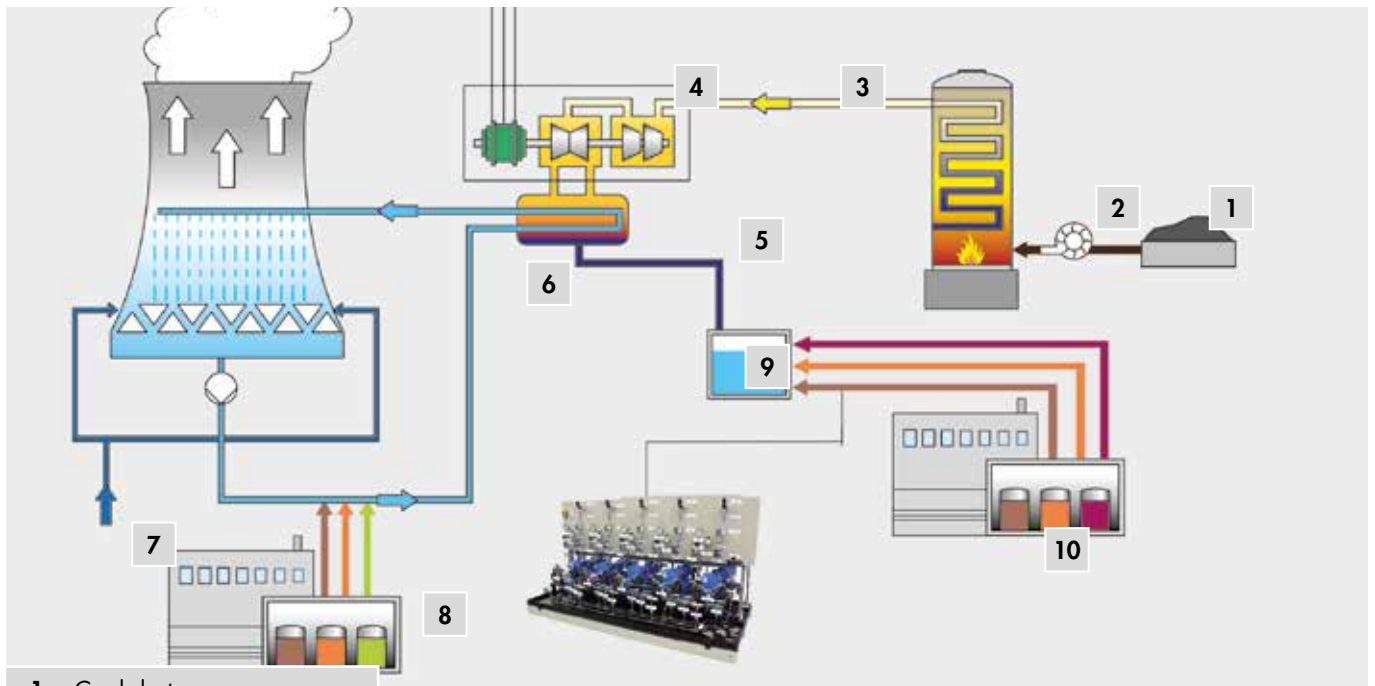
		RF 410.2-...			
SUCTION VALVES		...280e	...570e	...900e	...1450e
DN	Nominal width	20 ⁽¹⁾	20 ⁽¹⁾	20	20
G	Connection thread	G1¼ ⁽¹⁾	G1¼ ⁽¹⁾	G1¼	G1¼
S	PP-FRP / PVDF-FRP	122	122	148	148
S	PVC-U	119	119	150	150
S	1.4571	122	122	148	148
PRESSURE VALVES					
DN	Nominal width	20 ⁽¹⁾	20 ⁽¹⁾	20	20
G	Connection thread	G1¼ ⁽¹⁾	G1¼ ⁽¹⁾	G1¼	G1¼
D	PP-FRP / PVDF-FRP	122	122	148	148
D	PVC-U	138	138	170	170
D	1.4571	122	122	148	148
MAX. TOTAL HEIGHT					
H		500	500	500	540
MAX. TOTAL WIDTH					
B1		265	265	295	295
B2	(with relief valve)	280	280	–	–
MAX. TOTAL LENGTH					
L1		430	430	460	460
L2	(with relief valve)	535	535	–	–
RELIEF VALVE CONNECTION					
GU		G1¼ ⁽¹⁾	G1¼ ⁽¹⁾	–	–

(Measurements in mm)

⁽¹⁾ DN15 / G1 at valves of PVC-U

APPLICATION EXAMPLE

TREATMENT OF FEED WATER IN POWER PLANT ENGINEERING



- 1 Coal dust
- 2 Blower
- 3 Steam
- 4 Turbine
- 5 Condenser
- 6 Cooling water circuit
- 7 Air
- 8 Cooling water treatment
- 9 Feed water tank
- 10 Feed water treatment



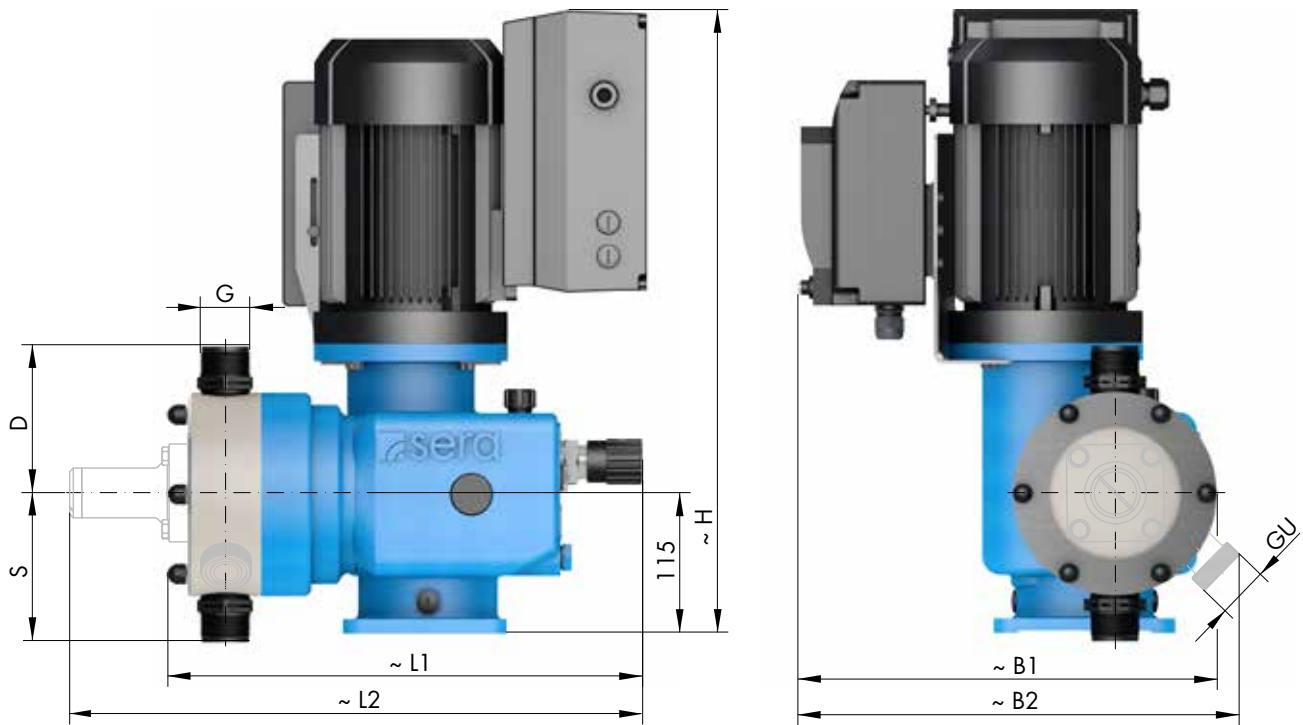
TECHNICAL DATA

DIAPHRAGM PUMP C410.2

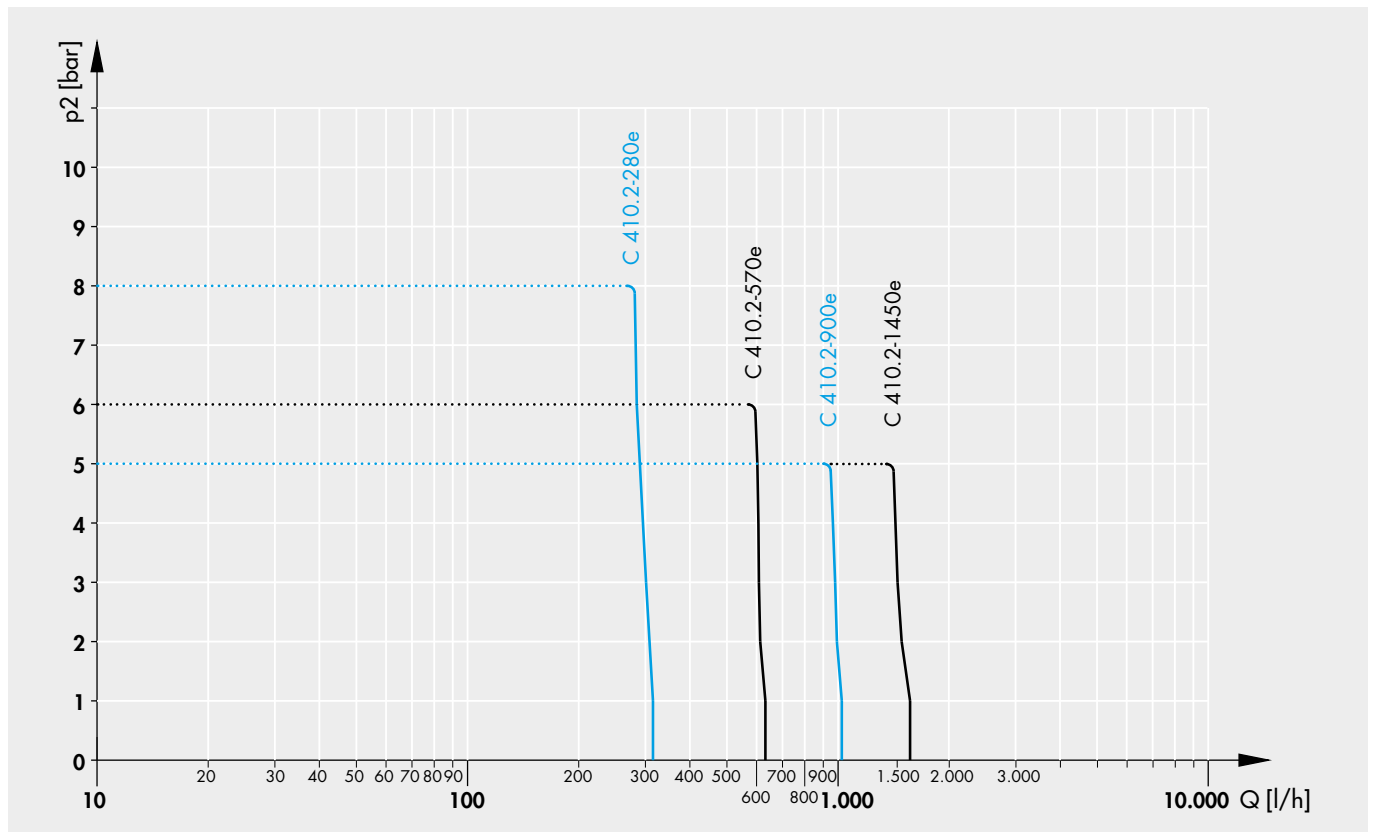
PUMP DATA			C 410.2-...			
			...280e	...570e	...900e	...1450e
Permissible pressure p_{2max} at the pump outlet	bar		8	6	5	5
Nominal capacity QN at p_{2max}	l/h	50/60 Hz	0-280	0-570	0-900	0-1.450
Quantity per stroke	ml/stroke (100%)		46	98	155	245
Max. suction height	mWC		5	5	3	3
Min./max. permissible pressure at the pump inlet	bar	$p_{1min/max}$	-0,5/0	-0,5/0	-0,3/0	-0,3/0
Recommended nominal diameter DN of the connecting pipes	mm		15	15	20	25
Nominal stroke frequency	1/min	50 Hz	97	97	97	97
Weight approx.	kg	plastic	38	38	49	49
		stainless steel	45	45	64	64

ELECTRICAL DATA			C 410.2-...			
			...280e	...570e	...900e	...1450e
Power consumption	kW		0,75	0,75	1,5	1,5
Voltage	V		380-420			
Frequency	Hz		50/60			
Inlet voltage, control input	V DC		5...30			
Minimum contact signal time	ms		55			
Analogue input resistance	Ω		100			
Digital output internal/external supply			PNP max. 15V DC, 50mA /max. 30V DC, 350mA			
Recommended fuse	(circuit breaker)		C10A			
Insulation class	ISO		F			
Enclosure	IP		55			

DIMENSIONS



CHARACTERISTICS



DIMENSIONS

		C 410.2-...			
SUCTION VALVES		...280e	...570e	...900e	...1450e
DN	Nominal width	20 ⁽¹⁾	20 ⁽¹⁾	20	20
G	Connection thread	G1¼ ⁽¹⁾	G1¼ ⁽¹⁾	G1¼	G1¼
S	PP-FRP / PVDF-FRP	122	122	148	148
S	PVC-U	119	119	150	150
S	1.4571	122	122	148	148
PRESSURE VALVES					
DN	Nominal width	20 ⁽¹⁾	20 ⁽¹⁾	20	20
G	Connection thread	G1¼ ⁽¹⁾	G1¼ ⁽¹⁾	G1¼	G1¼
D	PP-FRP / PVDF-FRP	122	122	148	148
D	PVC-U	138	138	170	170
D	1.4571	122	122	148	148
MAX. TOTAL HEIGHT					
H		520	520	520	560
MAX. TOTAL WIDTH					
B1		350	350	375	375
B2	(with relief valve)	375	375	–	–
MAX. TOTAL LENGTH					
L1		430	430	460	460
L2	(with relief valve)	535	535	–	–
RELIEF VALVE CONNECTION					
GU		G1¼ ⁽¹⁾	G1¼ ⁽¹⁾	–	–

(Measurements in mm)

⁽¹⁾ DN15 / G1 at valves of PVC-U

FOLLOW US



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