PRODUCT INFORMATION

SERIES 4
DIAPHRAGM PUMPS

INSPIRED. SOLUTIONS. FOR CUSTOMERS.

DIAPHRAGM PUMPS - ALLROUNDERS

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

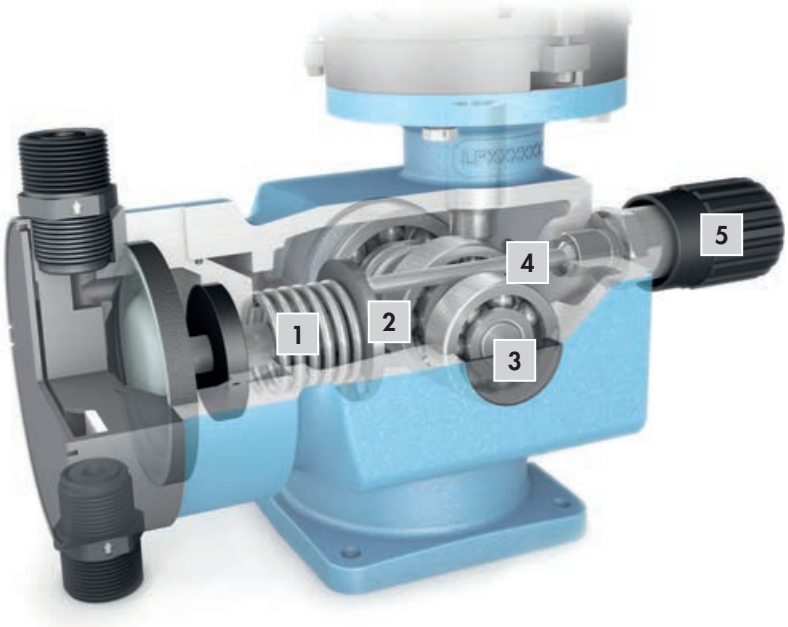
DRIVE
The drive unit in each case consists of a proven motor make, coupled with stroke gearing in a robust case.
sera cases are also suitable for the harshest operating conditions. Material thickness and surface treatment even resist chemical attacks.

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.

PROFINET INTERFACE

The control electronics of the 409.2 Pro+ series can be extended using a ProfiNet INTERFACE MODULE. This is connected directly to the electronics and provides the possibility to integrate the dosing pump into a ProfiNet network. With two ProfiNet connections it can be integrated into both ring and tree structures.

FREQUENCY CONVERTER

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

ADDITIONAL FEATURES

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.

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.

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We offer individual solutions in dosing technology for our customers.
For more information or material please contact your **sera** partner.
Please visit www.sera-web.com for our complete product range.

CONTROL ELECTRONICS (OPTION) FUNCTIONS AND MODES OF OPERATION

- Manual operation
- Manual stroke frequency adjustment
- PROFIBUS DP-VO Slave interface (option)
- External START/STOP
- Pulse operation / fractinator
- Pulse memory
- Analogue operation (0/4 ... 20 mA)
- Analogue operation standardization
- Batch dosing (manual / with timer)
- 3 LEDs for status indication
- Multiline, illuminated display
- Menu-driven parameterization
- Flow indication
- Calibration function
- 4-key operation
- 2 digital outputs (PLC)
- 1 analogue output (PLC or contact signal)
- 2 analogue/digital inputs (reversible)
- 1 digital input
- Programmable input-/output functions
- Dipahragm monitoring
- Connection/evaluation: 2-stage level monitoring
- Connection/evaluation: Flow monitoring
- Connection/evaluation: Flow metering
- Voltage 210-250V, 50/60Hz
- 3m connection calble with Euro-plug

Operating Modes & Messaging	Pro	Pro+
Manual operation	✓	✓
Pulse operation	✓	✓
Analogue operation	✓	✓
Batch operation	✗	✓
Timer	✗	✓
Interface	✗	✓
Calibration	✓	✓
Suction mode	✓	✓
Diaphragm monitoring	✓	✓
Data logging (SD-Card	✗	✓
Error messaging	Error Code + display color change	Plain text + display color change
Clock for data & time	✗	✓

Connection & Control	Pro	Pro+
Control elements & Display	4-button control Multilangual display 4-color status indicator	Removeable handheld with two buttons and clickwheel Display with 8 languages (de, en, es, fr, nl, cs, fi, tr) 4-color status indicator
Control cable	optional	5m control cable (8-pole)
In-/Output connection	✓	✓
Level connection	✓	✓
Flow monitor & measurement connection	✗	✓
Profibus/Profinet	✗	optional
Inputs	Digital pulse (NO/NC) Digital extern stop (NO/NC) Analogue 4-20mA	Digital/analogue, free parametrizable Digital/analogue, free parametrizable Digital, free parametrizable
Outputs	24V Ready to run (NO/NC) Stroke signal (NO/NC)	24V Digital, free parametrizable Digital, free parametrizable Analogue, free parametrizable
Updateable	USB (Stick)	USB (to host)

TECHNICAL DATA
DIAPHRAGM PUMP RF409.2 (<25 L/H)

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

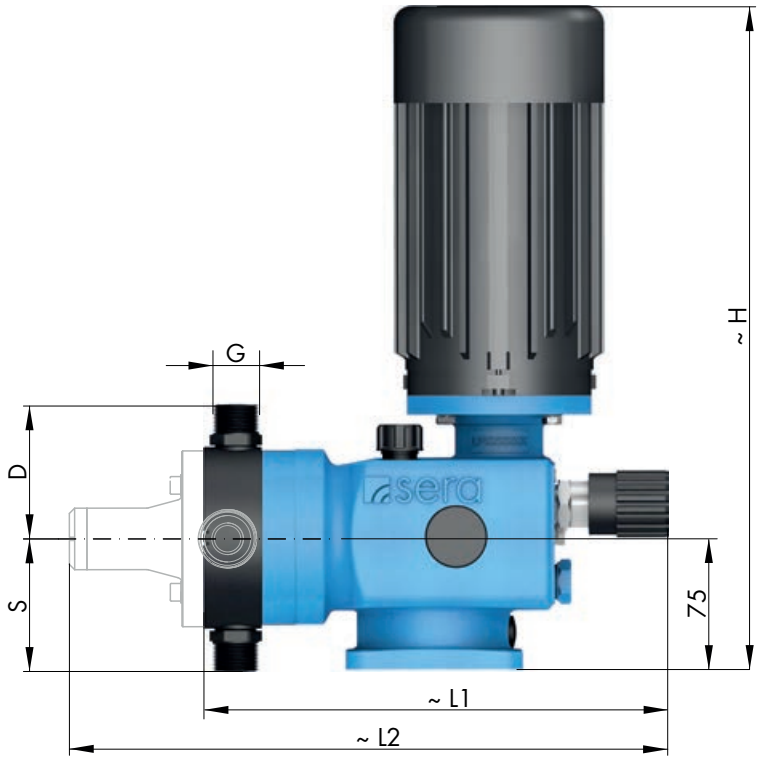
ELECTRICAL DATA		RF409.2-1,6e ... RF409.2-25e
Motor power	kW	0,18
Voltage	V	230/400V 50Hz, 460V 60Hz
Frequency	Hz	50/60
Insulation class	ISO	F
Enclosure	IP	55

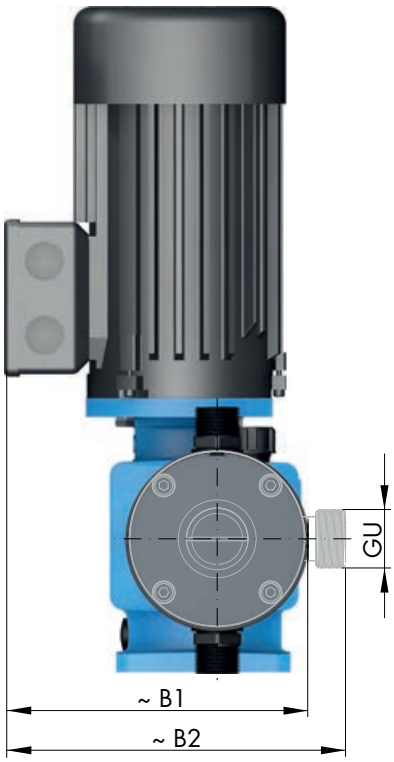
TECHNICAL DATA
DIAPHRAGM PUMP RF409.2 (>50 L/H)

PUMP DATA (* 8mWS = performance losses of nominal capacity QN of 20-25%)			RF 409.2-...							
			50e	75e	90e	115e	140e	180e	250e	350e
Permissible pressure $p_{2max.}$ at the pump outlet	bar		10	10	8	4	8	4	3	3
Nominal capacity QN at $p_{2max.}$	l/h	50 Hz	0-50	0-75	0-90	0-115	0-140	0-180	0-250	0-350
		60 Hz	0-60	0-90	0-108	0-138	0-168	0-216	0-300	-
Quantity per stroke	ml/stroke	(100%)	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	15	15	15	15	15	15	15
Nominal stroke frequency	1/min	50 Hz	100	150	100	100	150	150	100	150
		60 Hz	120	180	120	120	180	180	120	–
Weight approx.	kg	plastic	9	9	11	10	11	10	13	13
		stainless steel	10	10	13	13	13	13	21	21

ELECTRICAL DATA		RF409.2-50e ... RF409.2-350e
Motor power	kW	0,37
Voltage	V	230/400V 50Hz, 460V 60Hz
Frequency	Hz	50/60
Insulation class	ISO	F
Enclosure	IP	55

DIMENSIONS





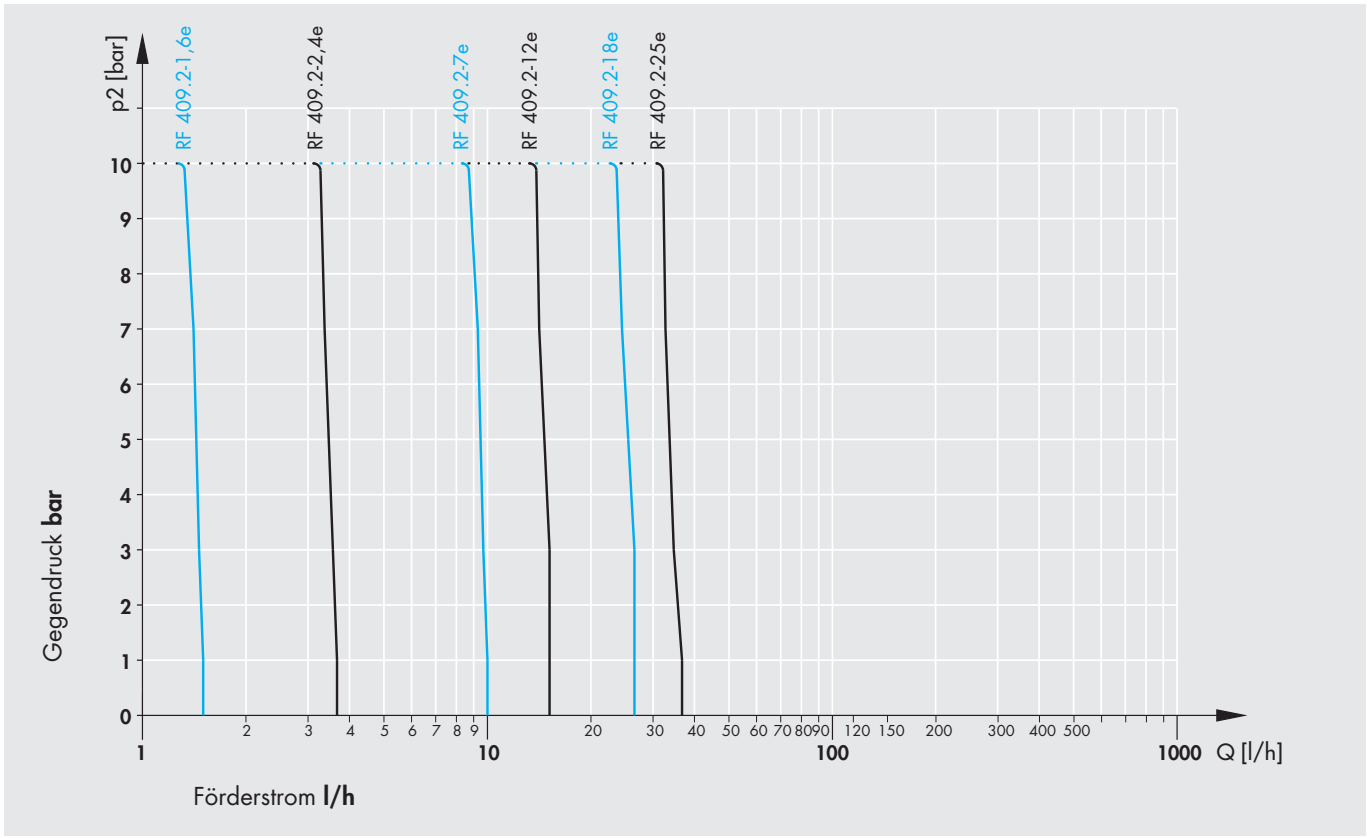
DIMENSIONS

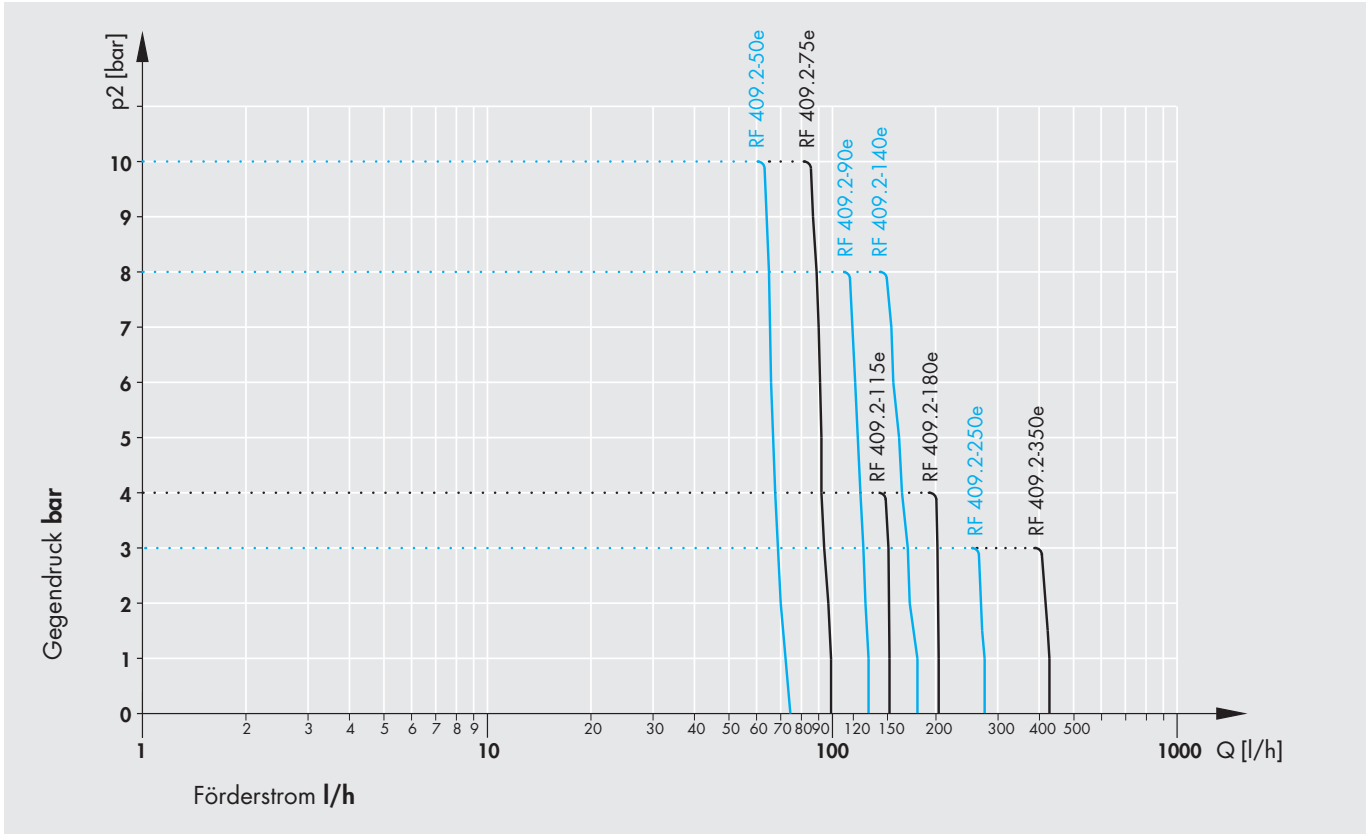
		RF 409.2-...							
	SUCTION VALVES	1,6e 2,4e	7,0e	12e	18e 25e	50e 75e	90e 115e	140e 180e	250e 350e
DN	Nominal width	5	5	5	8	8	8	8	20[1]
G	Connection thread	G¾	G¾	G¾	G¾	G¾	G¾	G¾	G1¼[1]
S	PP-FRP / PVDF-FRP	80	56	56	56	69	76	76	122
S	PP-FRP / PVDF-FRP [2]	–	57	60	60	67	76	76	122
S	PVC-U	70	62	65	63	70	78	78	119
S	PVC-U [2]	–	52	52	63	70	78	78	119
S	1.4571	70	57	61	61	68	76	76	122
S	1.4571 [2]	–	57	61	61	68	76	76	122
PRESSURE VALVES									
DN	Nominal width	5	5	5	8	8	8	8	20[1]
G	Connection thread	G¾	G¾	G¾	G¾	G¾	G¾	G¾	G1¼[1]
D	PP-FRP / PVDF-FRP	80	64	64	64	69	76	76	122
D	PP-FRP / PVDF-FRP [2]	–	57	60	60	67	76	76	122
D	PVC-U	70	62	65	70	77	85	85	138
D	PVC-U [2]	–	65	65	70	77	85	85	138
D	1.4571	70	57	61	61	68	76	76	122
D	1.4571 [2]	–	57	61	61	68	76	76	122
MAX. TOTAL HEIGHT									
H		355	355	355	355	365	365	365	365
MAX. TOTAL WIDTH									
B1		170	170	170	170	185	185	185	220
B2	(with relief valve)	–	170	170	170	190	205	205	230
MAX. TOTAL LENGTH									
L1		310	285	285	285	295	300	300	355
L2	(with relief valve)	–	345	345	345	360	370	370	435
RELIEF VALVE CONNECTION									
GU		–	G¾	G¾	G¾	G¾	G1	G1	G1¼[1]

(Measurements in mm)

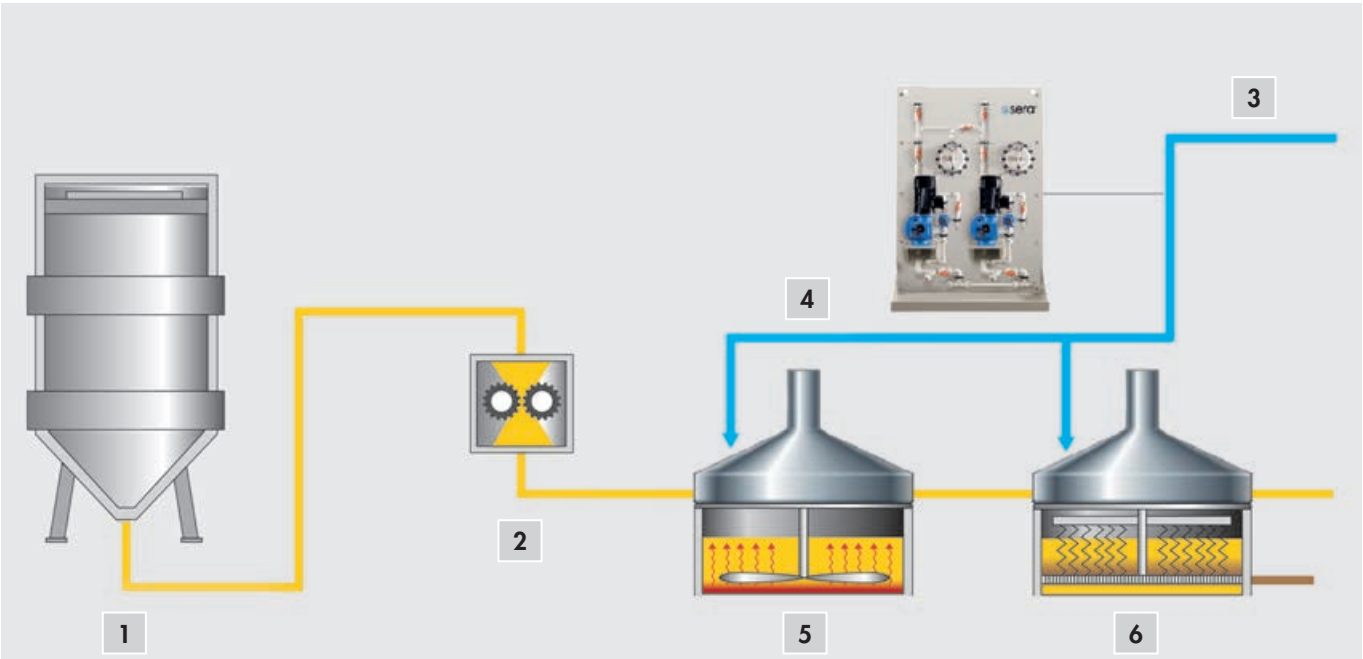
[1] DN15 / G1 at valves of PVC-U
[2] Pump body with relief valve

CHARACTERISTIC CHARTS





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 C409.2 (<25 L/H)

PUMP DATA			C 409.2-... Pro/Pro+					
			1,6e	2,4e	7,0e	12e	18e	25e
Permissible pressure $p_{2max.}$ at the pump outlet	bar		10	10	10	10	10	10
Nominal capacity QN at $p_{2max.}$	l/h	50/60 Hz	0-1,6	0-2,4	0-7	0-12	0-18	0-25
Quantity per stroke	ml/stroke	(100%)	0,27	0,27	0,78	2,0	3,0	3,0
Max. suction height	mWC		3					
Min./max. permissible pressure at the pump inlet	bar	$p_{1min/max}$	-0,3/0					
Recomm. nominal diameter DN of the connecting pipes	mm		10	10	10	10	10	10
Nominal stroke frequency	1/min	50/60 Hz	100	150	150	100	100	150
Weight approx.	kg	plastic	11	11	11	11	11	12,5
		stainless st.	13,5	13,5	13	13	13	13

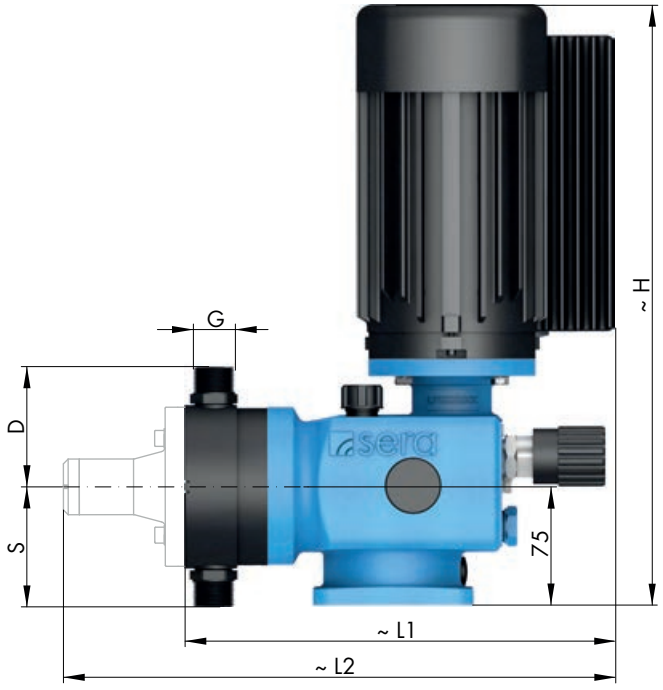
ELECTRICAL DATA		C 409.2-1,6e Pro/Pro+ ... C 409.2-25e Pro/Pro+ 230 V, 50/60 Hz	C 409.2-25e Pro/Pro+ 115 V, 50/60 Hz
Power consumption	kW	0,18	
Voltage	V	210 - 250	100 - 125
Frequency	Hz	50/60	
Inlet voltage, control input	V DC	5...30	
Minimum contact signal time	ms	55	
Analogue input resistance	Ω	39	
Digital output internal/external supply		20V DC, 30mA /... 30V DC, 30mA	
Recommended fuse	(circuit breaker)	C6A	C10A
Insulation class	ISO	F	
Enclosure	IP	55	

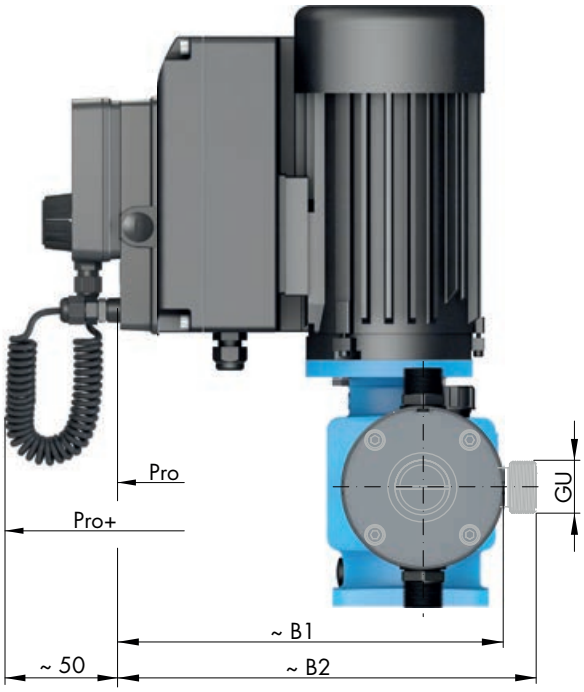
TECHNICAL DATA
DIAPHRAGM PUMP C409.2 (>50 L/H)

PUMP DATA (* 8mWS = performance losses of nominal capacity QN of 20-25%)			C 409.2-... Pro/Pro+							
			50e	75e	90e	115e	140e	180e	250e	350e
Permissible pressure $p_{2max.}$ at the pump outlet	bar		10	10	8	4	8	4	3	3
Nominal capacity QN at $p_{2max.}$	l/h	50/60 Hz	0-50	0-75	0-90	0-115	0-140	0-180	0-250	0-350
Quantity per stroke	ml/stroke	(100%)	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		15	15	15	15	15	15	15	15
Nominal stroke frequency	1/min	50/60 Hz	150	150	100	100	150	150	100	150
Weight approx.	kg	plastic	8,5	8,5	10,5	9,0	10,5	9,0	13,0	13,0
		stainless st.	14	16	16	16	16	16	24	24

ELECTRICAL DATA		C 409.2-50e Pro/Pro+ ... C 409.2-350e Pro/Pro+ 230 V, 50/60 Hz	C 409.2-350e Pro/Pro+ 115 V, 50/60 Hz
Power consumption	kW	(...-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		20V DC, 30mA /... 30V DC, 30mA	
Recommended fuse	(circuit breaker)	C6A	C10A
Insulation class	ISO	F	
Enclosure	IP	55	

DIMENSIONS





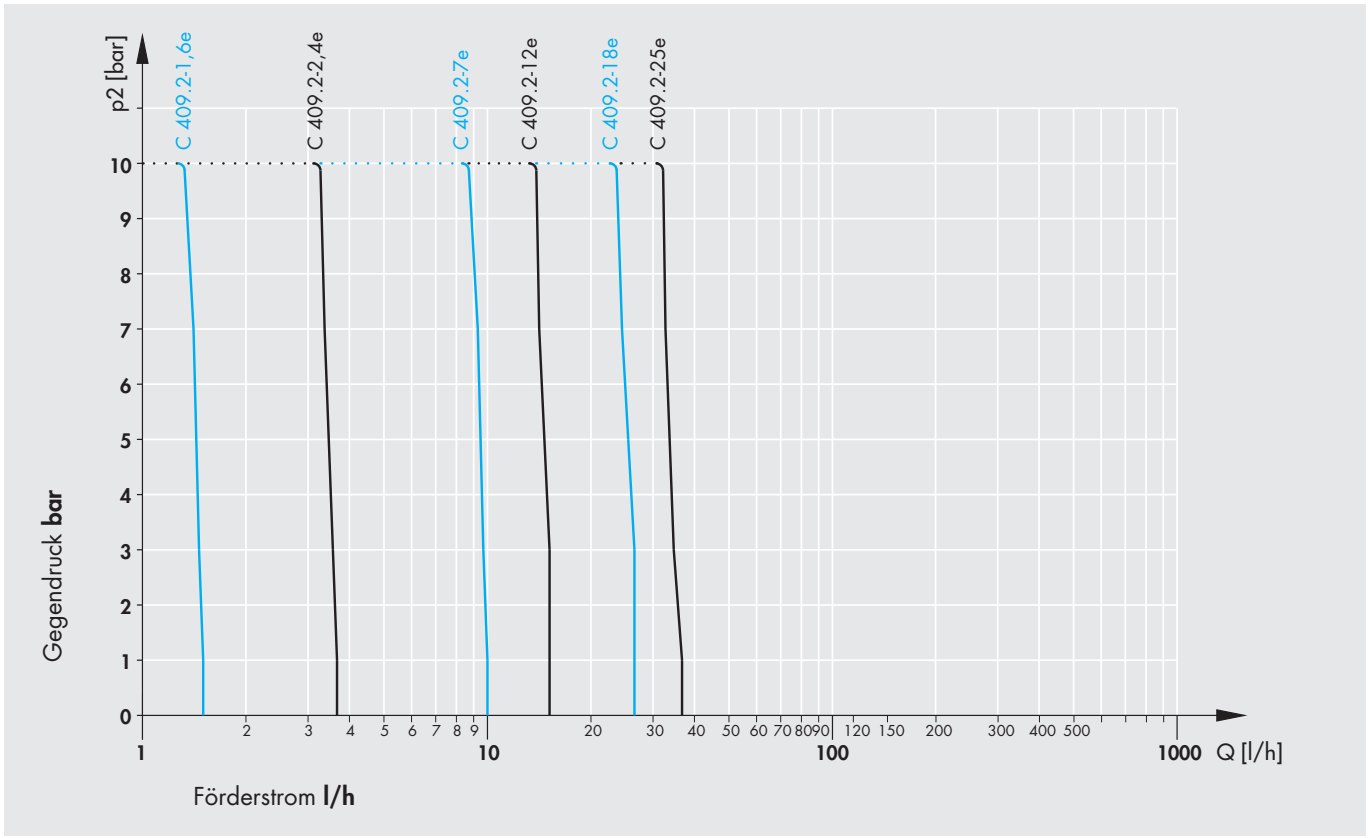
DIMENSIONS

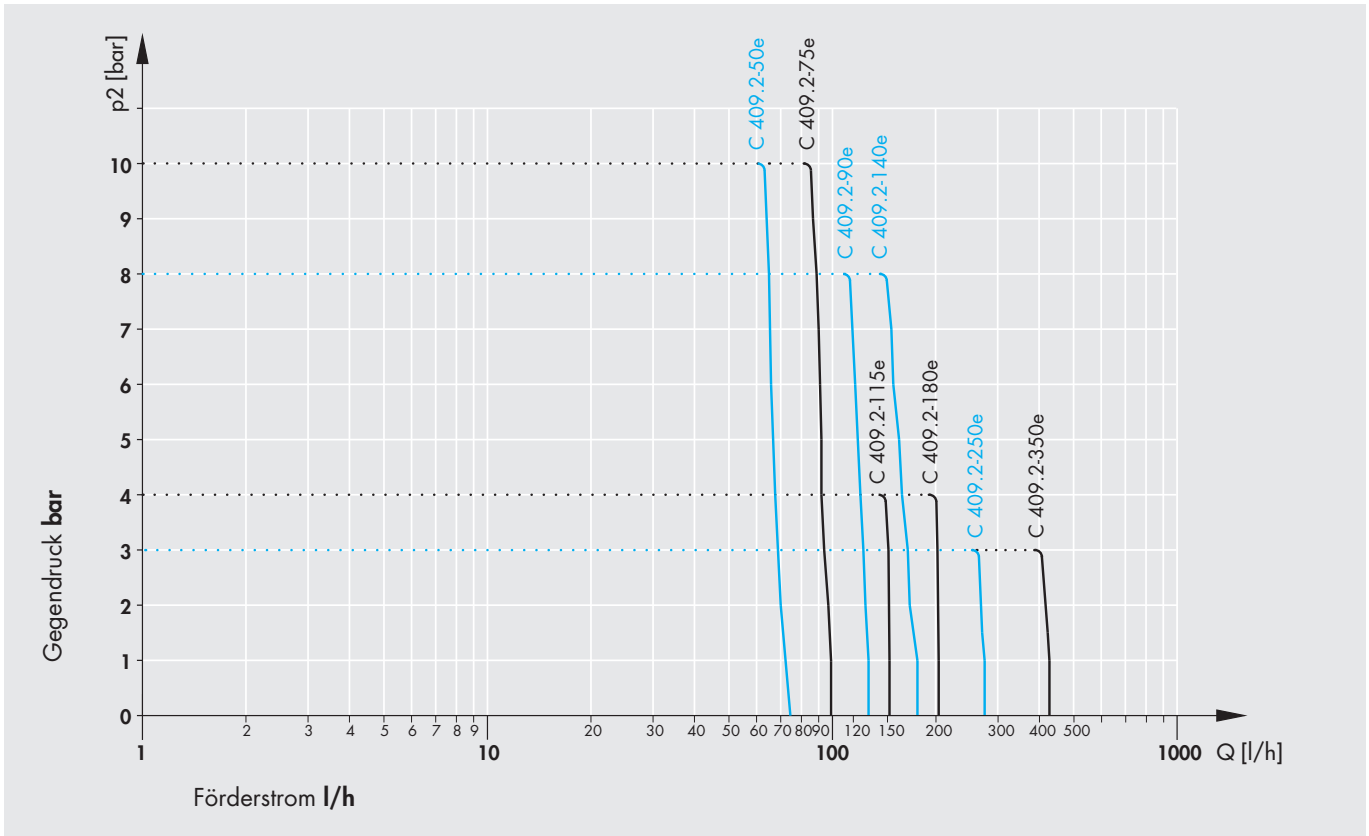
		C 409.2-...							
SUCTION VALVES		**1,6e 2,4e**	**7,0e**	**12e**	**18e 25e**	**50e 75e**	**90e 115e**	**140e 180e**	**250e 350e**
DN	Nominal width	5	5	5	8	8	8	8	20[1]
G	Connection thread	G¾	G¾	G¾	G¾	G¾	G¾	G¾	G1¼[1]
S	PP-FRP / PVDF-FRP	80	56	56	56	69	76	76	122
S	PP-FRP / PVDF-FRP [2]	–	57	60	60	67	76	76	122
S	PVC-U	70	62	65	63	70	78	78	119
S	PVC-U [2]	–	52	52	63	70	78	78	119
S	1.4571	70	57	61	61	68	76	76	122
S	1.4571 [2]	–	57	61	61	68	76	76	122
PRESSURE VALVES									
DN	Nominal width	5	5	5	8	8	8	8	20[1]
G	Connection thread	G¾	G¾	G¾	G¾	G¾	G¾	G¾	G1¼[1]
D	PP-FRP / PVDF-FRP	80	64	64	64	69	76	76	122
D	PP-FRP / PVDF-FRP [2]	–	57	60	60	67	76	76	122
D	PVC-U	70	62	65	70	77	85	85	138
D	PVC-U [2]	–	65	65	70	77	85	85	138
D	1.4571	70	57	61	61	68	76	76	122
D	1.4571 [2]	–	57	61	61	68	76	76	122
MAX. TOTAL HEIGHT									
H		355	355	355	355	355	365	365	365
MAX. TOTAL WIDTH									
B1		250	250	170	250	250	260	260	295
B2	(with relief valve)	–	250	170	250	250	285	285	310
MAX. TOTAL LENGTH									
L1		310	285	285	285	295	300	300	355
L2	(with relief valve)	–	345	345	345	360	370	370	435
RELIEF VALVE CONNECTION									
GU		–	G¾	G¾	G¾	G¾	G1	G1	G1¼[1]

(Measurements in mm)

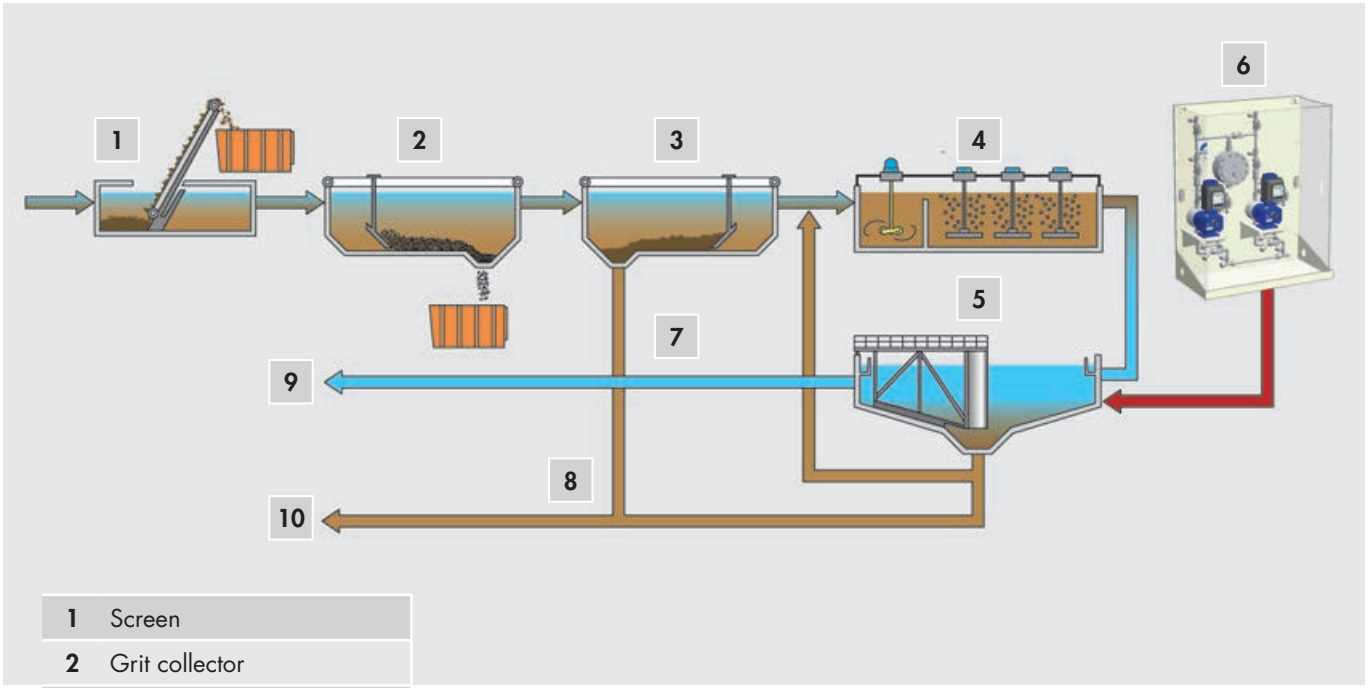
[1] DN15 / G1 at valves of PVC-U
[2] Pump body with relief valve

CHARACTERISTIC CHARTS



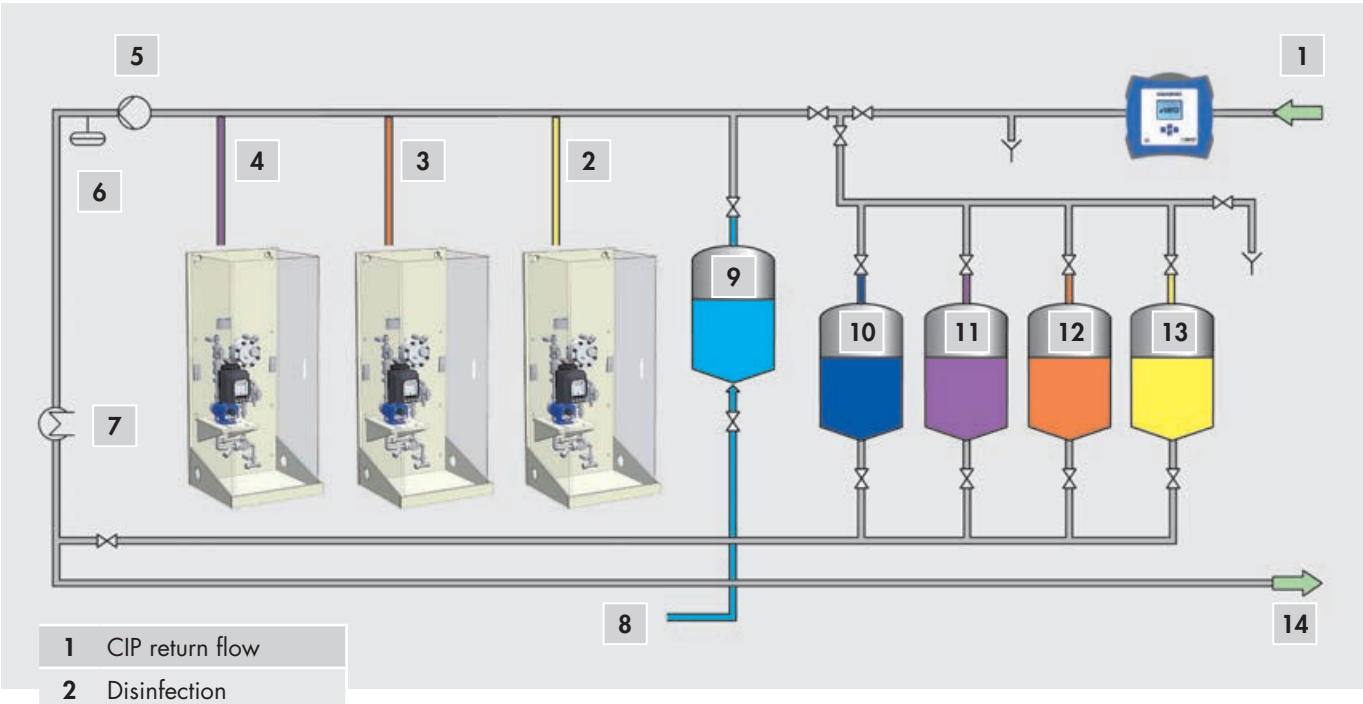


APPLICATION EXAMPLE
WASTE WATER TREATMENT



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

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

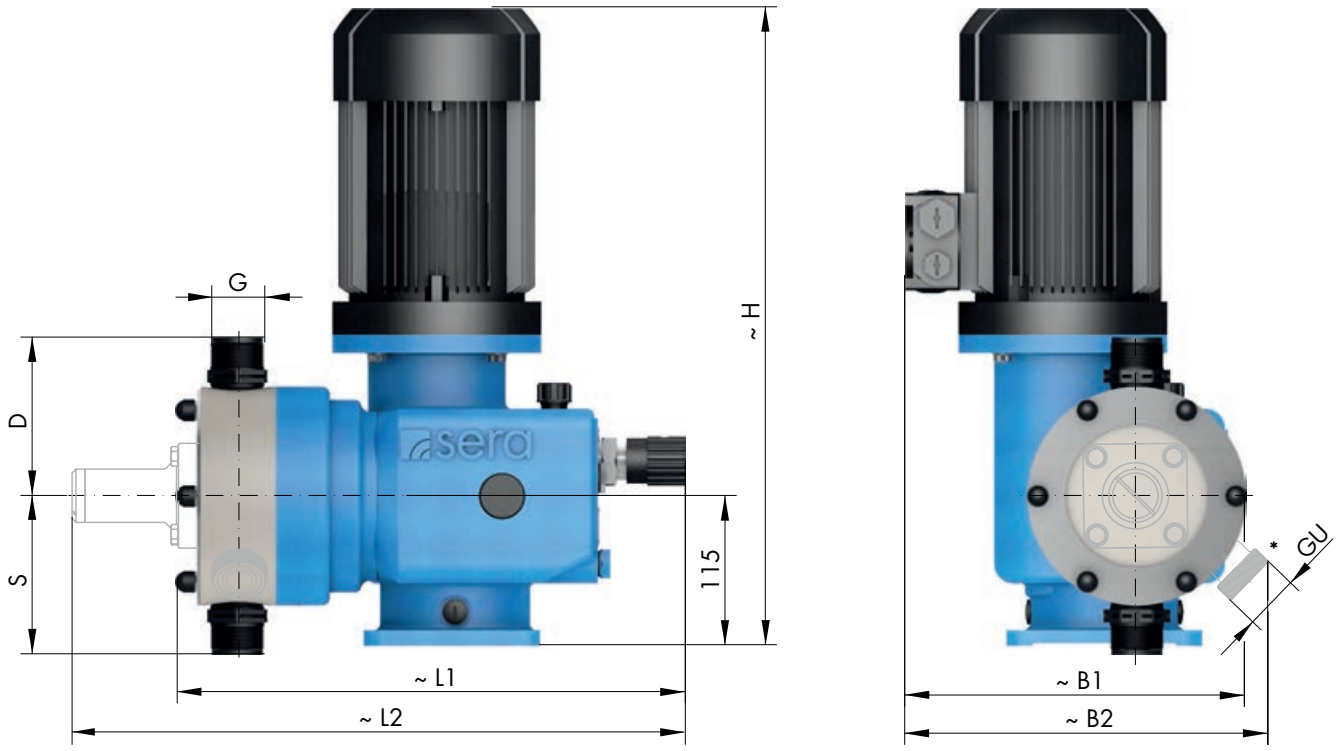
TECHNICAL DATA
DIAPHRAGM PUMP RF410.2

PUMP DATA			RF 410.2-...							
			200e	280e	450e	570e	700e	900e	1100e	1450e
Permissible pressure $p_{2max.}$ at the pump outlet	bar		8	8	6	6	5	5	5 *	5 *
Nominal capacity QN at $p_{2max.}$	l/h	50 Hz	0-200	0-280	0-450	0-570	0-700	0-900	0-1.100	0-1.450
		60 Hz	0-240	0-336	0-540	0-684	0-840	0-1.080	0-1.320	0-1.740
Quantity per stroke	ml/stroke (100%)		46	46	98	98	155	155	245	245
Max. suction height	mWC		5	5	5	5	3	3	3	3
Min./max. permissible pressure at the pump inlet	bar	$p_{1min/max}$	-0,5/0	-0,5/0	-0,5/0	-0,5/0	-0,3/0	-0,3/0	-0,3/0	-0,3/0
Recommended nominal diameter DN of the connecting pipes	mm		15	15	15	15	20	20	25	25
Nominal stroke frequency	1/min	50 Hz	76	97	76	97	76	97	76	97
		60 Hz	92	116	92	116	92	116	92	116
Weight approx.	kg	plastic	35	35	35	35	37	37	41	41
		stainl. steel	42	42	42	42	52	52	59	59

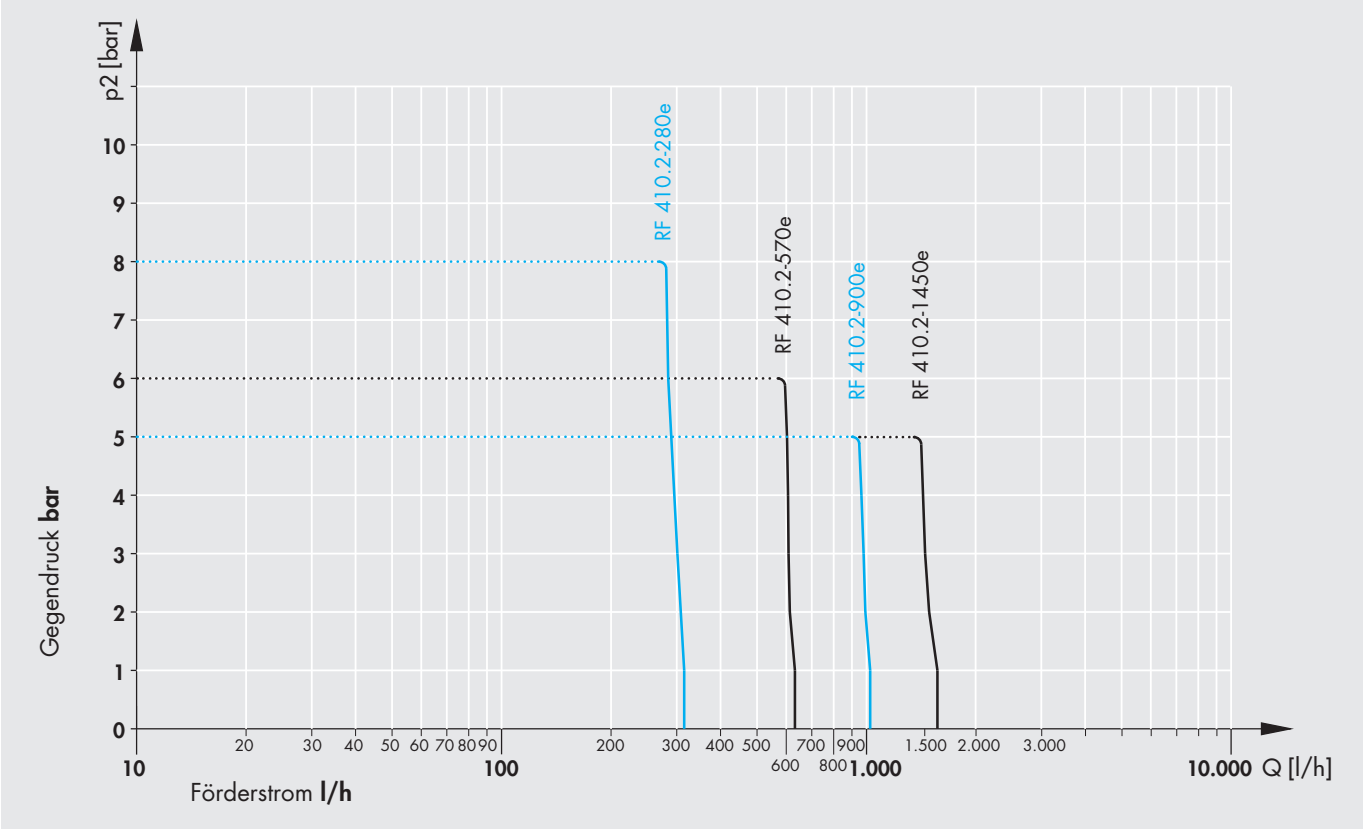
* at 60 Hz is the permissible pressure 3,5 bar

ELECTRICAL DATA		RF 410.2-...			
		200e/280e	450e/570e	700e/900e	1100e/1450e
Motor power	kW	0,75	0,75	1,1	1,5
Voltage	V	230/400V 50Hz, 460V 60Hz			
Frequency	Hz	50/60			
Insulation class	ISO	F			
Enclosure	IP	55			

DIMENSIONS



CHARACTERISTIC CHARTS



DIMENSIONS

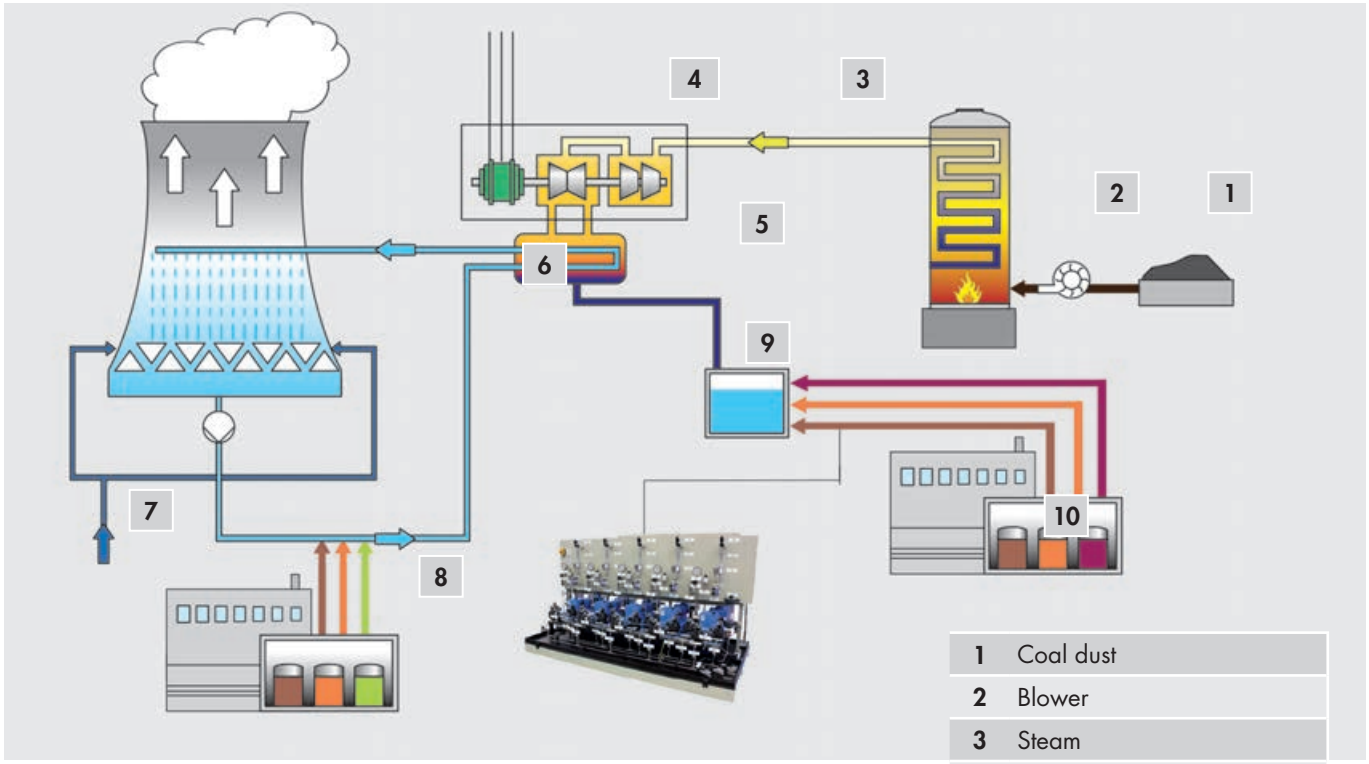
SUCTION VALVES	RF 410.2-... 200e/280e	450e/570e	700e/900e	1100e/1450e
DN Nominal width	20 [1]	20 [1]	20	20
G Connection thread	G1¼ [1]	G1¼ [1]	G1¼	G1¼
S PP-FRP / PVDF-FRP	122	122	148	148
S PVC-U	119	119	150	150
S 1.4571	122	122	148	148
PRESSURE VALVES				
DN Nominal width	20 [1]	20 [1]	20	20
G Connection 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	530	530	540	580
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



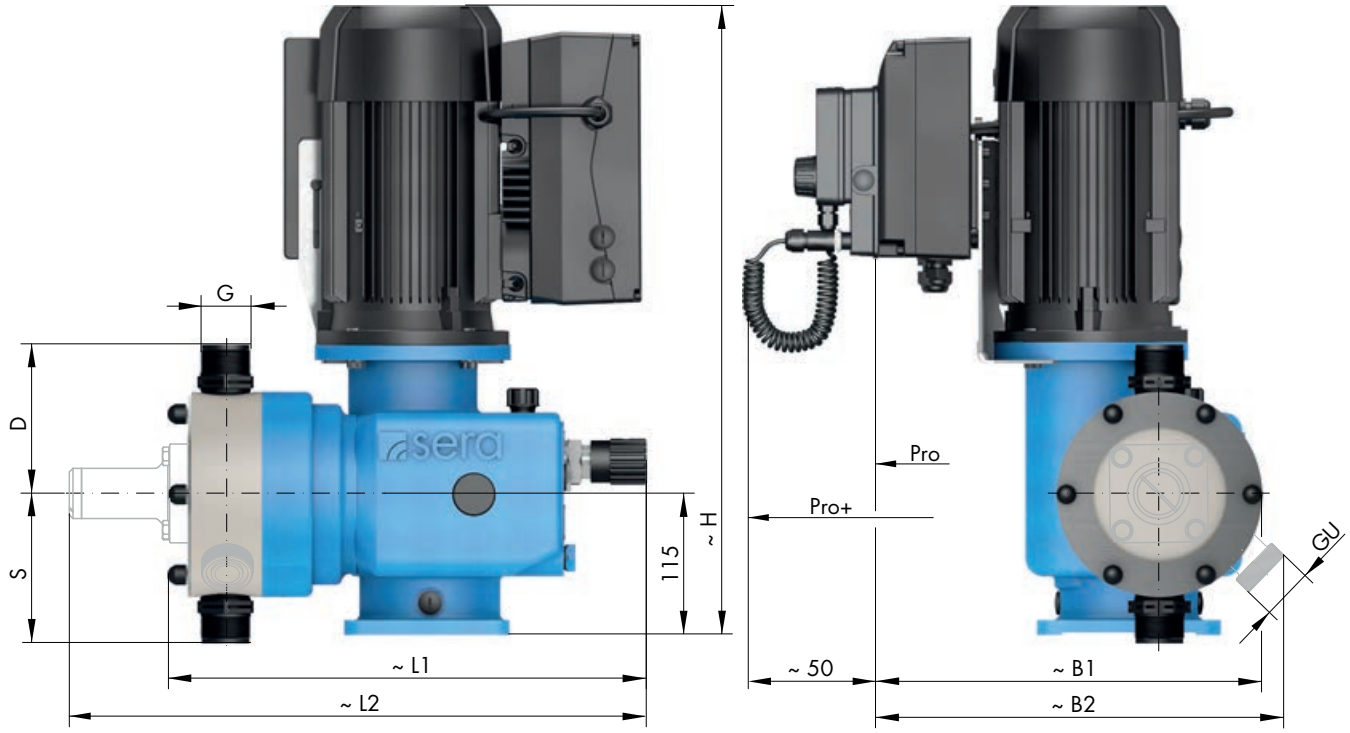
1	Coal dust
2	Blower
3	Steam
4	Turbine
5	Condenser
6	Cooling water circuit
7	Air
8	Cooling water treatment
9	Feed water tank
10	Feed water treatment

TECHNICAL DATA
DIAPHRAGM PUMP C410.2

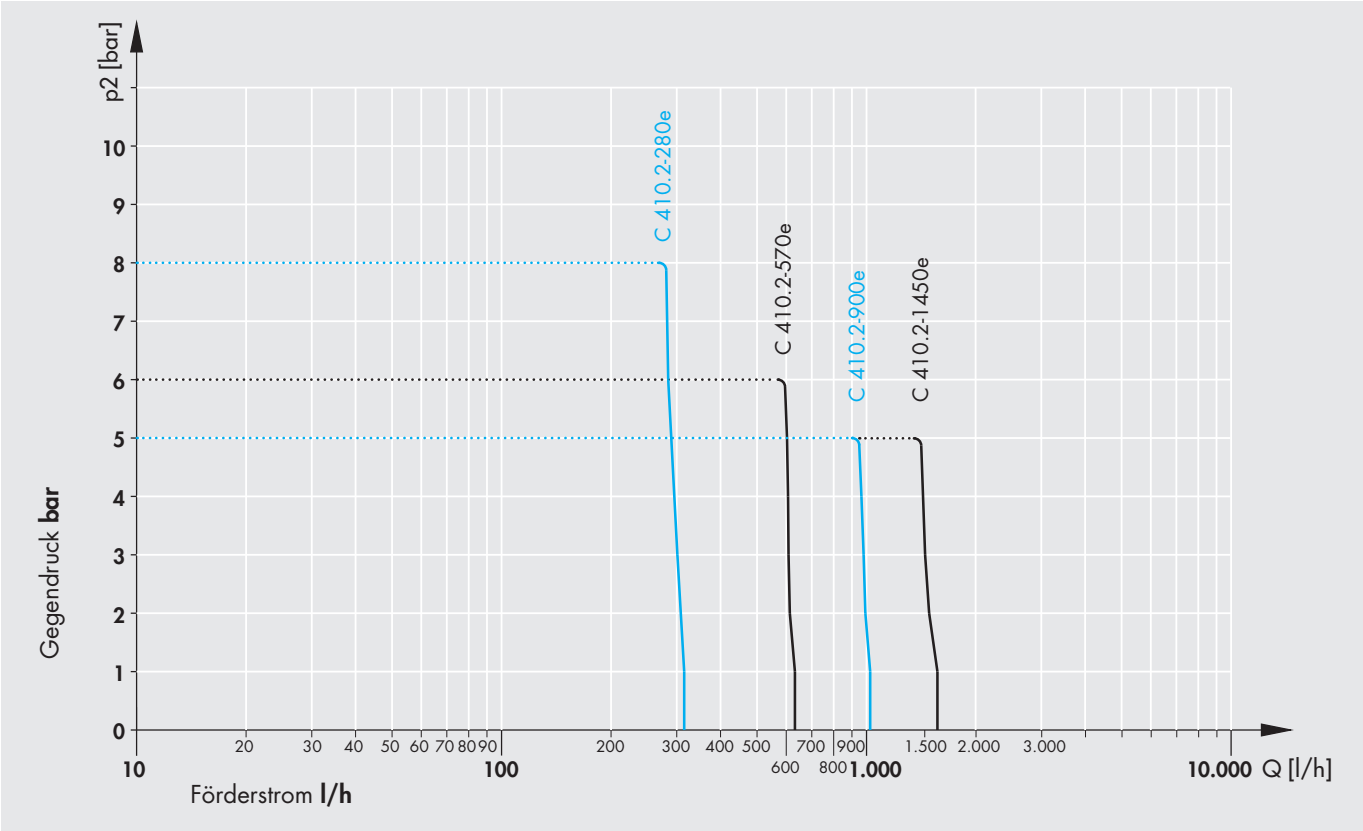
PUMP DATA			C 410.2-...							
			200e	280e	450e	570e	700e	900e	1100e	1450e
Permissible pressure $p_{2max.}$ at the pump outlet	bar		8	8	6	6	5	5	5	5
Nominal capacity QN at $p_{2max.}$	l/h	50/60 Hz	0-200	0-280	0-450	0-570	0-700	0-900	0-1.100	0-1.450
Quantity per stroke	ml/stroke	(100%)	46	46	98	98	155	155	245	245
Max. suction height	mWC		5	5	5	5	3	3	3	3
Min./max. permissible pressure at the pump inlet	bar	$p_{1min/max}$	-0,5/0	-0,5/0	-0,5/0	-0,5/0	-0,3/0	-0,3/0	-0,3/0	-0,3/0
Recommended nominal diameter DN of the connecting pipes	mm		15	15	15	15	20	20	25	25
Nominal stroke frequency	1/min	50 Hz	76	97	76	97	76	97	76	97
Weight approx.	kg	plastic	38	38	38	38	49	49	49	49
		stainless steel	45	45	45	45	64	64	64	64

ELECTRICAL DATA		C 410.2-... Pro/Pro+	
		200e ... 570e	700e ... 1450e
Power consumption	kW	0,75	1,1
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	39	
Digital output internal/external supply		20V DC, 30mA /... 30V DC, 30mA	
Recommended fuse	(circuit breaker)	C10A	
Insulation class	ISO	F	
Enclosure	IP	65	

DIMENSIONS



CHARACTERISTIC CHARTS



DIMENSIONS

	C 410.2-...			
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MAX. TOTAL WIDTH				
B1	355	355	380	380
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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

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