PRODUCT INFORMATION

SERIES 4
MULTI-LAYER DIAPHRAGM PUMPS



INSPIRED. SOLUTIONS. FOR CUSTOMERS.

MULTI-LAYER DIAPHRAGM PUMPS MAXIMUM PROCESS RELIABILITY

sera multi-layer diaphragm pumps operate according to the same function principle as the conventional diaphragm pump, i.e. the oscillating diaphragm is mechanically controlled using a push rod resulting in the dosing medium being conveyed.

APPLICATIONS

- Cleaning in place
- Waste water treatment
- Exhaust gas treatment

MULTI-LAYER DIAPHRAGMS

Due to the use of the multi-layer diaphragms, safety-related demanding dosing tasks can be realised. The increased safety requirements are taken into account by, in comparison with single-layer diaphragms, significantly improved diaphragm service lives and the diaphragm monitoring (pressure switch, manometer etc.).

MULTI-LAYER DIAPHRAGM PACKAGE

This consists of three PTFE diaphragms. If the working diaphragm is damaged, this concept with the pressure-controlled diaphragm monitoring as standard ensures absolute leak tightness. Damage to the working membrane does not result in any direct failure of the dosing pump.

OVERVIEW OF ADVANTAGES

- High operational reliability due to multi-layer diaphragm technology
- Display of the diaphragm state using integrated diaphragm rupture monitoring (visually as standard / electrically optional)
- Excellent suction performance without additional components
- Can be used in explosion-protected areas using optional equipment variants

CONTROLLABLE VARIANT

- Future-proof pump concept due to integrated, multi-functional control electronics
- Easy start-up due to “Plug&Dose”
- High application reliability for viscous media due to Slow Mode technology





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, 1.4571, PP-GFP, PVDF-GFP, titanium, Hastelloy

VALVE BALLS
PTFE, 1.4401, Hastelloy

VALVE SEALS
EPDM, FPM, FEP-coated

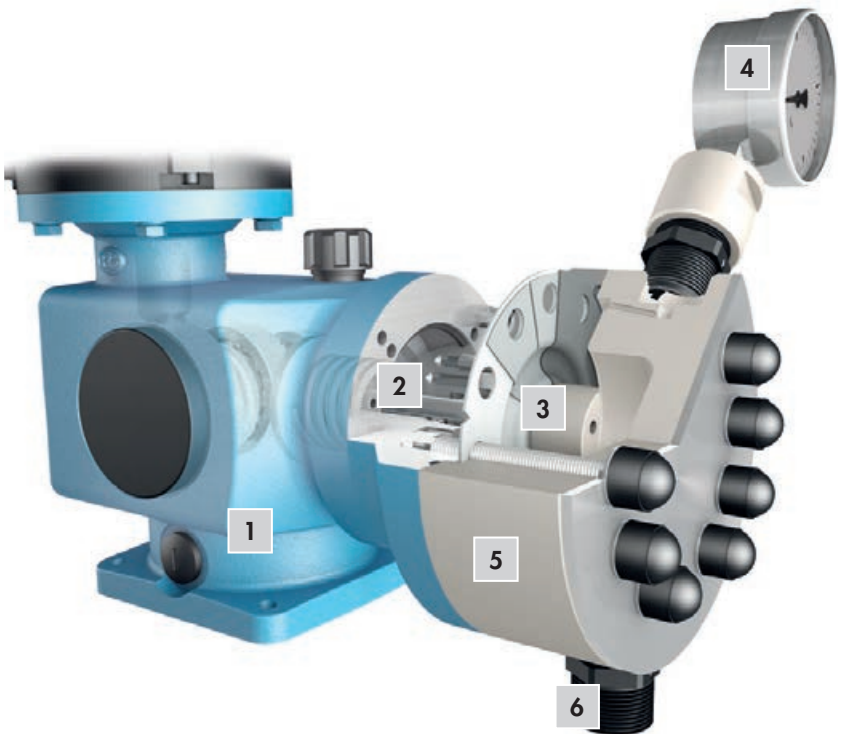
DRIVE DIAPHRAGMS
PTFE (3-layer)

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

REGULATION
The flow rate of the **sera** multi-layer diaphragm pumps is constant or continuously adjustable.
- Three-phase motors with frequency converter for stroke frequency change
- Stroke length adjustment
  The stroke length of the push rod is changed here so that the diaphragm is not completely pulled back. This results in a lower delivery volume per stroke.

SPECIAL VERSIONS
We provide the individual solution for special dosing tasks:
Among other things, valves as double valves, with spring loading, attachment of stroke counter, electric actuators.

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



1	Stroke mechanism
2	Connecting rod
3	Multi-layer diaphragm package • Working diaphragm • Signal diaphragm • Protective diaphragm
4	Diaphragm monitoring using • Manometer (RF4xx.2 - ...ML) • Pressure switch (C4xx.2 - ...ML)
5	Pump body
6	Suction valve

ADDITIONAL FEATURES



CONTROL ELECTRONICS

The control electronics have many advantages such as the possibility to actuate externally via an interface, batch programming or the constant monitoring of diaphragm, flow rate and tank level.

PROFIBUS 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 an attached or external frequency converter.



ADDITIONAL FEATURES

VISUAL DIAPHRAGM MONITORING WITH MANOMETER

In the case of any damage of the working diaphragms, the pressurised medium flows through a hole to the signal manometer and causes a pointer deflection. The pump can continue to operate thanks to the multi-layer diaphragms.





DIAPHRAGM MONITORING WITH PRESSURE SWITCH

In the case of any damage of the working diaphragms, a pressure is generated at the pressure switch. The pending signal can then be processed. The pump can continue to operate thanks to the multi-layer diaphragms.

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 an 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.
Depending on the required delivery volume, the actuator then screws the adjusting spindle in and out.



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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	✗	✓

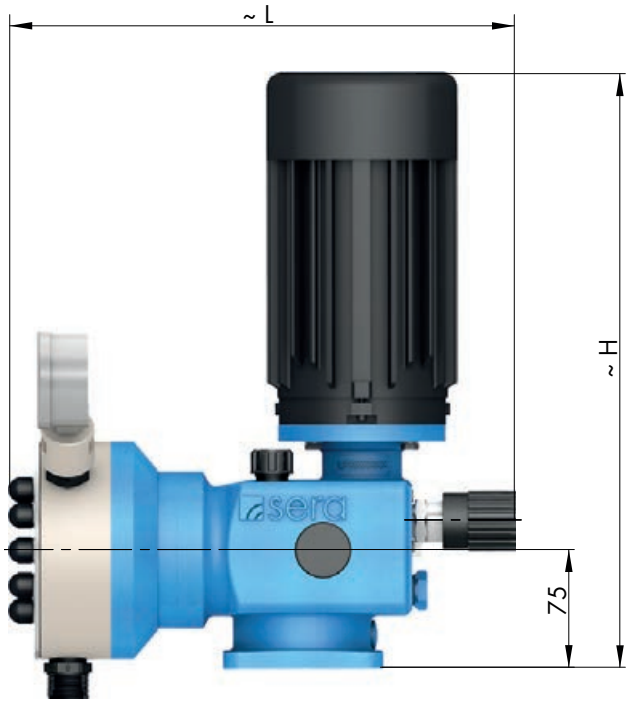
Connection & Control	Pro	Pro+
Control elements & Display	4-button control Multilangual display 4-color status indicator	Removeable handheld with two buttons and clickwheel Display with 8 languages (de, en, es, fr, nl, cs, fi, tr) 4-color status indicator
Control cable	optional	5m control cable (8-pole)
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)

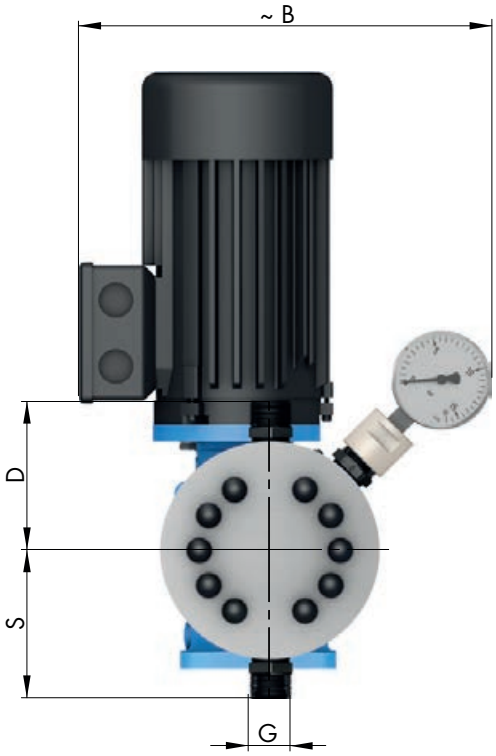
TECHNICAL DATA
MULTI-LAYER DIAPHRAGM PUMP RF409.2-ML

PUMP DATA			RF 409.2-... ML							
			11 ML	17 ML	30 ML	45 ML	72 ML	110 ML	150 ML	220 ML
Permissible pressure $p_{2max.}$ at the pump outlet	bar	plastic	10	10	10	10	10	10	4	4
		stainless steel	20	20	16	16				
Nominal capacity QN at $p_{2max.}$	l/h	50 Hz	0-11	0-17	0-30	0-45	0-72	0-110	0-150	0-220
		60 Hz	0-13	0-20	0-36	0-54	0-86	0-132	0-180	0-264
Quantity per stroke	ml/stroke	(100%)	1,8	1,8	5	5	12	12	25	24
Max. suction height	mWC		3	3	3	3	3	3	3	3
Min./max. permissible pressure at the pump inlet	bar	$p_{1min/max}$	-0,3/0	-0,3/0	-0,3/0	-0,3/0	-0,3/0	-0,3/0	-0,3/0	-0,3/0
Recommended nominal diameter of the connecting pipes	mm	DN	10	10	10	10	15	15	15	15
Nominal stroke frequency	1/min	50 Hz	100	150	100	150	100	150	100	150
		60 Hz	120	180	120	180	120	180	120	180
Weight approx.	kg	plastic	14	14	15	15	16	16	18	18
		stainless steel	16	16	17	17	18	18	24	24

ELECTRICAL DATA		RF 409.2-... ML
Power consumption	kW	0,37
Voltage	V	230/400V 50Hz, 460V 60Hz
Frequency	Hz	50/60
Insulation class	ISO	F
Enclosure	IP	55

DIMENSIONS





		RF 409.2-...							
SUCTION VALVES		**...11 ML**	**...17 ML**	**...30 ML**	**...45 ML**	**...72 ML**	**...110 ML**	**...150ML**	**...220 ML**
DN	Nominal width	5	5	8	8	8	8	20 [1]	20 [1]
G	Connection thread	G¾	G¾	G¾	G¾	G¾	G¾	G1¼ [1]	G1¼ [1]
S	PP-FRP / PVDF-FRP	83	83	90	90	94	94	127	127
S	PVC-U	88	88	93	93	97	97	124	124
S	1.4571	83	83	91	91	95	95	127	127
PRESSURE VALVES									
DN	Nominal width	5	5	8	8	8	8	20 [1]	20 [1]
G	Connection thread	G¾	G¾	G¾	G¾	G¾	G¾	G1¼ [1]	G1¼ [1]
D	PP-FRP / PVDF-FRP	83	83	90	90	94	94	127	127
D	PVC-U	88	88	100	100	104	104	143	143
D	1.4571	83	83	91	91	95	95	127	127
MAX. TOTAL HEIGHT									
H		365	365	365	365	365	365	365	365
MAX. TOTAL WIDTH									
B		270	270	275	275	275	275	290	290
MAX. TOTAL LENGTH									
L		323	323	323	323	327	327	344	344

(Measurements in mm)

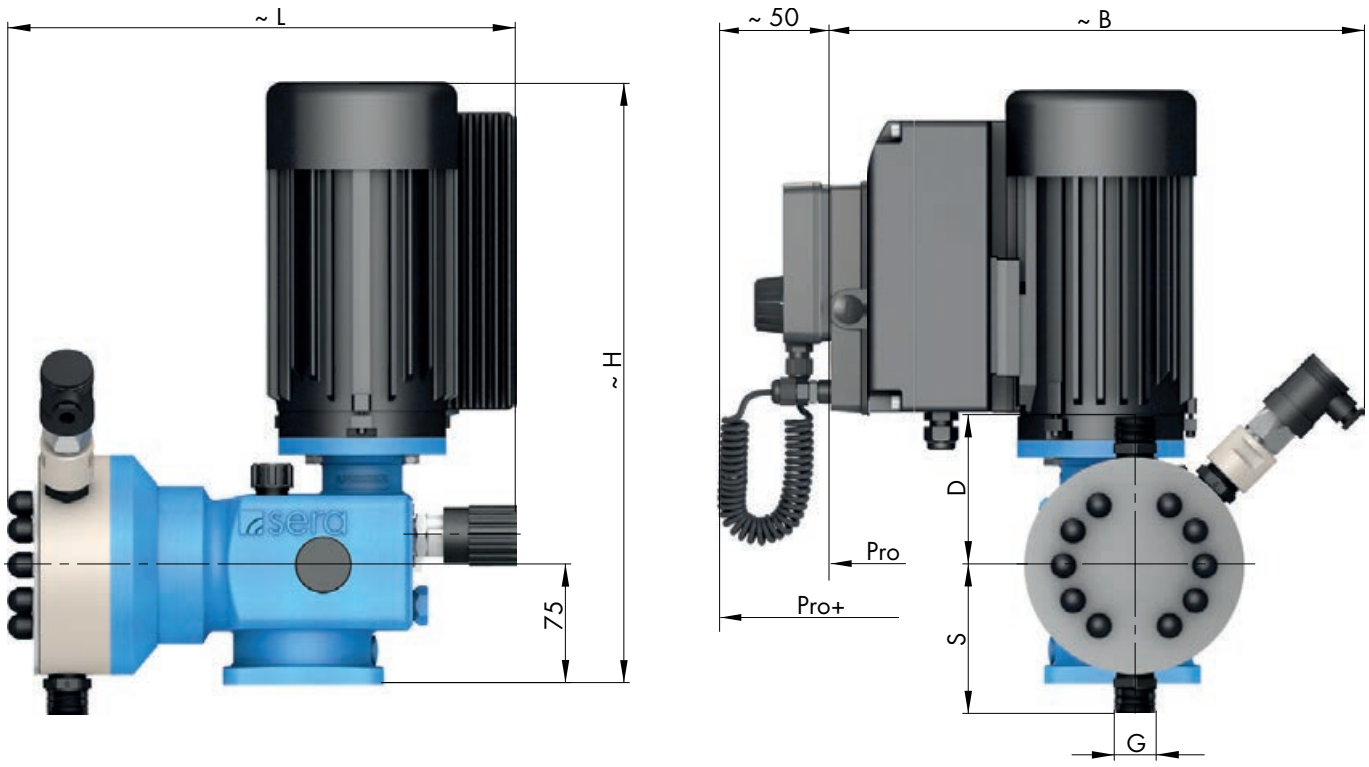
[1] DN15 / G1 at valves of PVC-U

TECHNICAL DATA
MULTI-LAYER DIAPHRAGM PUMP C409.2-ML

PUMP DATA			C 409.2-... ML Pro/Pro+							
			11 ML	17 ML	30 ML	45 ML	72 ML	110 ML	150 ML	220 ML
Permissible pressure $p_{2max.}$ at the pump outlet	bar	plastic	10	10	10	10	10	10	4	4
		stainless steel	20	20	16	16				
Nominal capacity QN at $p_{2max.}$	l/h	50/60 Hz	0-11	0-17	0-30	0-45	0-72	0-110	0-150	0-220
Quantity per stroke	ml/stroke	(100%)	1,8	1,8	5	5	5	12	25	24
Max. suction height	mWC		3	3	3	3	3	3	3	3
Min./max. permissible pressure at the pump inlet	bar	$p_{1min/max}$	-0,3/0	-0,3/0	-0,3/0	-0,3/0	-0,3/0	-0,3/0	-0,3/0	-0,3/0
Recommended nominal diameter of the connecting pipes	mm	DN	10	10	10	10	10	15	15	15
Nominal stroke frequency	1/min	50/60 Hz	100	150	100	150	100	150	100	150
Weight approx.	kg	plastic	17,5	17,5	18	18	18,5	18,5	20	20
		stainless steel	19	19	20	20	21,5	21,5	27	27

ELECTRICAL DATA		C 409.2-... ML Pro/Pro+	
		230 V, 50/60 Hz	115 V, 50/60 Hz
Power consumption	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



SUCTION VALVES	C 409.2-... ...11 ML	...17 ML	...30 ML	...45 ML	...72 ML	...110 ML	...150ML	...220 ML
DN Nominal width	5	5	8	8	8	8	20 [1]	20 [1]
G Connection thread	G¾	G¾	G¾	G¾	G¾	G¾	G1¼ [1]	G1¼ [1]
S PP-FRP / PVDF-FRP	83	83	90	90	94	94	127	127
S PVC-U	88	88	93	93	97	97	124	124
S 1.4571	83	83	91	91	95	95	127	127
PRESSURE VALVES								
DN Nominal width	5	5	8	8	8	8	20 [1]	20 [1]
G Connection thread	G¾	G¾	G¾	G¾	G¾	G¾	G1¼ [1]	G1¼ [1]
D PP-FRP / PVDF-FRP	83	83	90	90	94	94	127	127
D PVC-U	88	88	100	100	104	104	143	143
D 1.4571	83	83	91	91	95	95	127	127
MAX. TOTAL HEIGHT								
H	365	365	365	365	365	365	365	365
MAX. TOTAL WIDTH								
B	340	340	345	345	345	345	360	360
MAX. TOTAL LENGTH								
L	323	323	323	323	327	327	344	344

(Measurements in mm)

[1] DN15 / G1 at valves of PVC-U

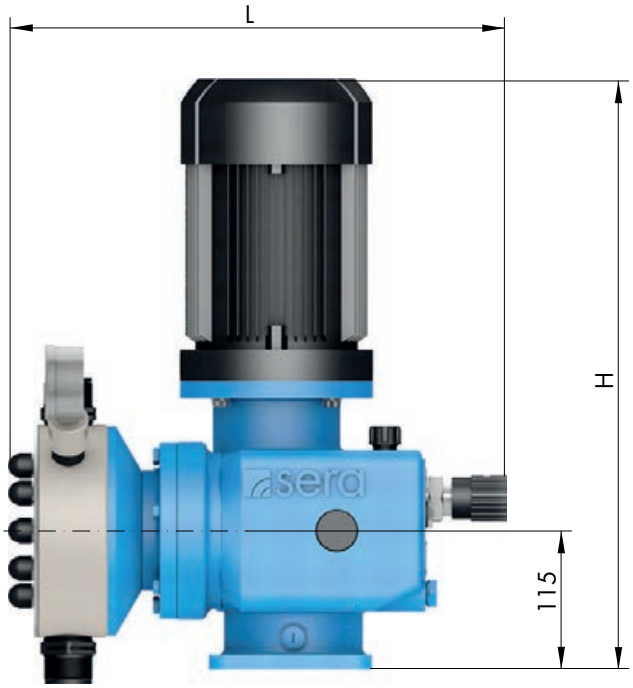
TECHNICAL DATA
MULTI-LAYER DIAPHRAGM PUMP RF410.2-ML

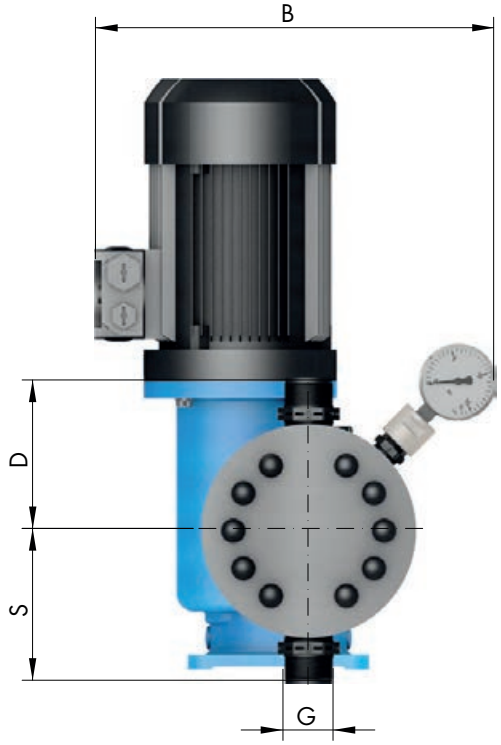
PUMP DATA			RF 410.2-135 ML	RF 410.2-500 ML	RF 410.2-1200 ML
Permissible pressure $p_{2max.}$ at the pump outlet	bar	plastic	10	10	5 *
		stainless steel	15		
Nominal capacity QN at $p_{2max.}$	l/h	50 Hz	0-135	0-500	0-1200
		60 Hz	0-162	0-600	0-1440
Quantity per stroke	ml/stroke	(100%)			
Max. suction height	mWC		3	3	3
Min./max. permissible pressure at the pump inlet	bar	$P_{1min/max}$	-0,3/0	-0,3/0	-0,3/0
Recommended nominal diameter DN of the connecting pipes	mm		15	15	20
Nominal stroke frequency	1/min	50 Hz	97	97	97
		60 Hz	116	116	–
Weight approx.	kg	plastic	36	38	41
		stainless steel	43	46	57

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

ELECTRICAL DATA		RF 410.2-135 ML	RF 410.2-500 ML	RF 410.2-1200 ML
Power consumption	kW	0,75	1,1	1,5
Nominal voltage	V	230/400V 50Hz, 460V 60Hz		
Frequency	Hz	50/60		
Insulation class	ISO	F		
Enclosure	IP	55		

DIMENSIONS





SUCTION VALVES	RF 410.2-135 ML	RF 410.2-500 ML	RF 410.2-1200 ML
DN Nominal width	20 [1]	20 [1]	20
G Connection thread	G1¼ [1]	G1¼ [1]	G1¼
S PP-FRP / PVDF-FRP	127	138	162
S PVC-U	124	132	172
S 1.4571	127	138	162
PRESSURE VALVES			
DN Nominal width	20 [1]	20 [1]	20
G Connection thread	G1¼ [1]	G1¼ [1]	G1¼
D PP-FRP / PVDF-FRP	127	138	162
D PVC-U	143	151	192
D 1.4571	127	138	162
MAX. TOTAL HEIGHT			
H	530	540	580
MAX. TOTAL WIDTH			
B	335	350	365
MAX. TOTAL LENGTH			
L	425	415	460

(Measurements in mm)

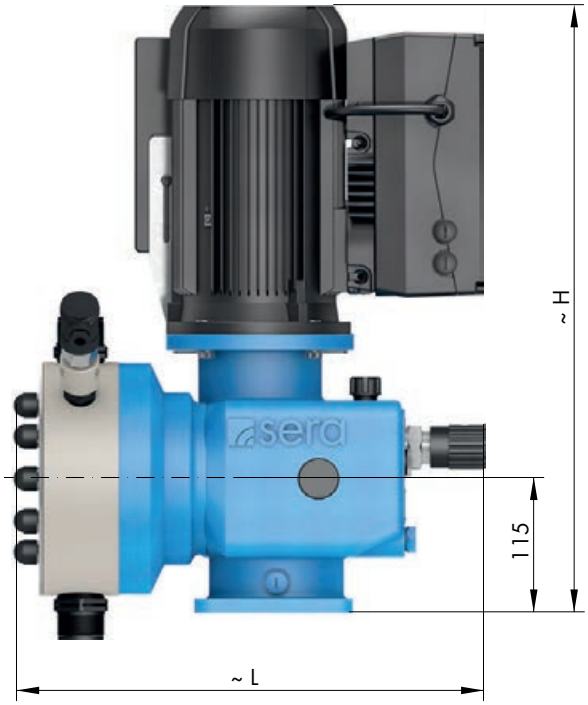
[1] DN15 / G1 at valves of PVC-U

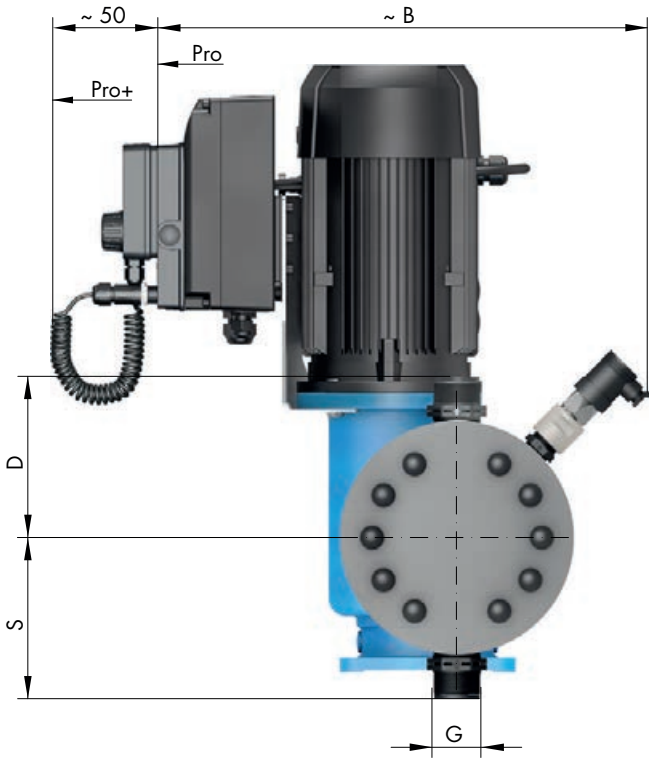
TECHNICAL DATA
MULTI-LAYER DIAPHRAGM PUMP C410.2-ML

PUMP DATA			C 410.2-135 ML	C 410.2-500 ML	C 410.2-1200 ML
Permissible pressure $p_{2max.}$ at the pump outlet	bar	plastic	10	10	5
		stainless steel	15		
Nominal capacity QN at $p_{2max.}$	l/h	50/60 Hz	0-135	0-500	0-1200
Quantity per stroke	ml/stroke	(100%)	23	85	206
Max. suction height	mWC		3	3	3
Min./max. permissible pressure at the pump inlet	bar	$p_{1min/max}$	-0,3/0	-0,3/0	-0,3/0
Recommended nominal diameter DN of the connecting pipes	mm		15	15	20
Nominal stroke frequency	1/min	50/60 Hz	97	97	97
Weight approx.	kg	plastic	40	43	45
		stainless steel	42	45	47

ELECTRICAL DATA		C 410.2-135 ML Pro+ C 410.2-500 ML Pro+	C 410.2-1200 ML Pro+
Power consumption	kW	0,75	1,1
Voltage	V	3 ~ 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	55	

DIMENSIONS



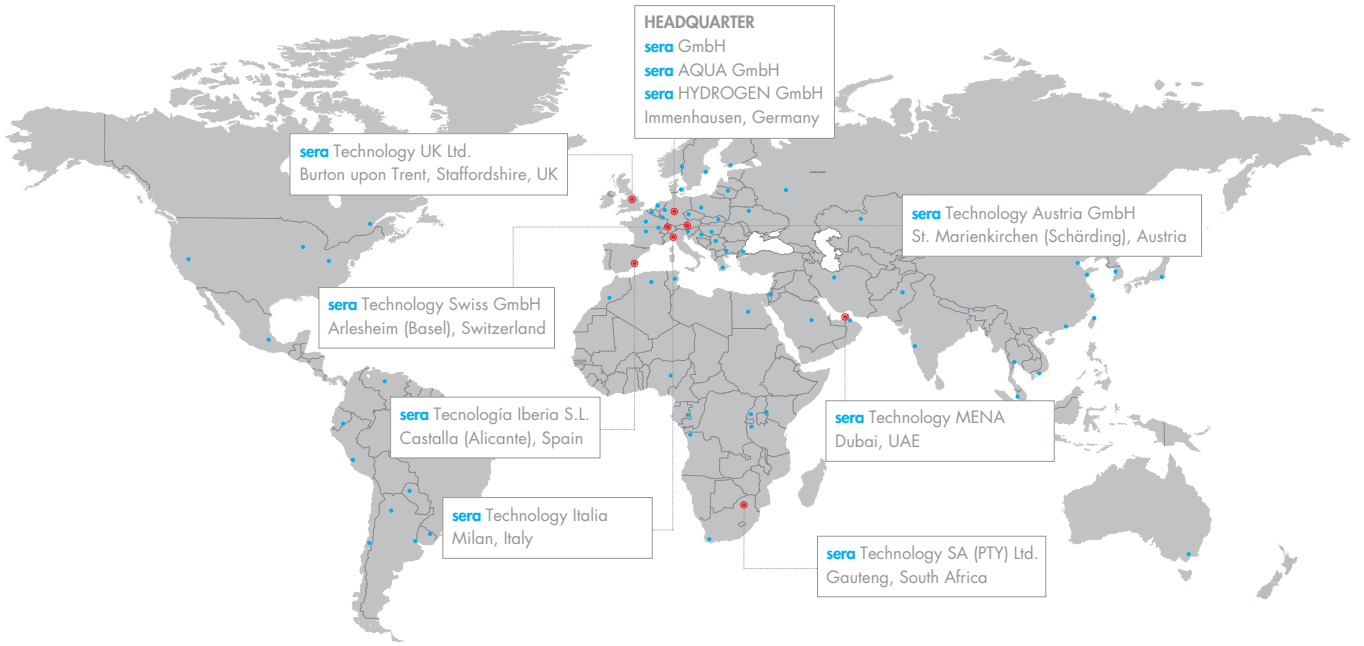


SUCTION VALVES	C 410.2-135 ML	C 410.2-500 ML	C 410.2-1200 ML
DN Nominal width	20 [1]	20 [1]	20
G Connection thread	G1¼ [1]	G1¼ [1]	G1¼
S PP-FRP / PVDF-FRP	127	138	162
S PVC-U	124	132	172
S 1.4571	127	138	162
PRESSURE VALVES			
DN Nominal width	20 [1]	20 [1]	20
G Connection thread	G1¼ [1]	G1¼ [1]	G1¼
D PP-FRP / PVDF-FRP	127	138	162
D PVC-U	143	151	192
D 1.4571	127	138	162
MAX. TOTAL HEIGHT			
H	530	530	540
MAX. TOTAL WIDTH			
B	430	440	455
MAX. TOTAL LENGTH			
L	425	415	460

(Measurements in mm)

[1] DN15 / G1 at valves of PVC-U

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