PRODUCT INFORMATION

SERIES 4
PISTON DIAPHRAGM PUMPS

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PISTON DIAPHRAGM PUMPS

The stroke movement of the mechanically driven piston is transmitted hydraulically to the multi-layer diaphragm. An integrated compensating valve guarantees outstanding dosing accuracy and provides optimal overload protection: in the case of unacceptable too high counter pressure, the hydraulic fluid can escape into the compensating valve.

APPLICATIONS

- Power plant engineering
- Drinking water treatment
- Waste water treatment
- Brewery technology

MULTI-LAYER DIAPHRAGMS

Due to the use of the multi-layer diaphragms, safety-related demanding dosing tasks can be realised as the increased safety requirements are taken into account due to the diaphragm rupture signalling (pressure switch, manometer etc.). Furthermore, the diaphragm service lives are significantly longer in comparison with single-layer diaphragms. A diaphragm rupture does not result in immediate 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 monitoring (visually as standard / electrically optional)
- Excellent suction performance without additional components
- Can be used in explosion-protected areas using optional equipment variants

ADVANTAGES OF THE 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.

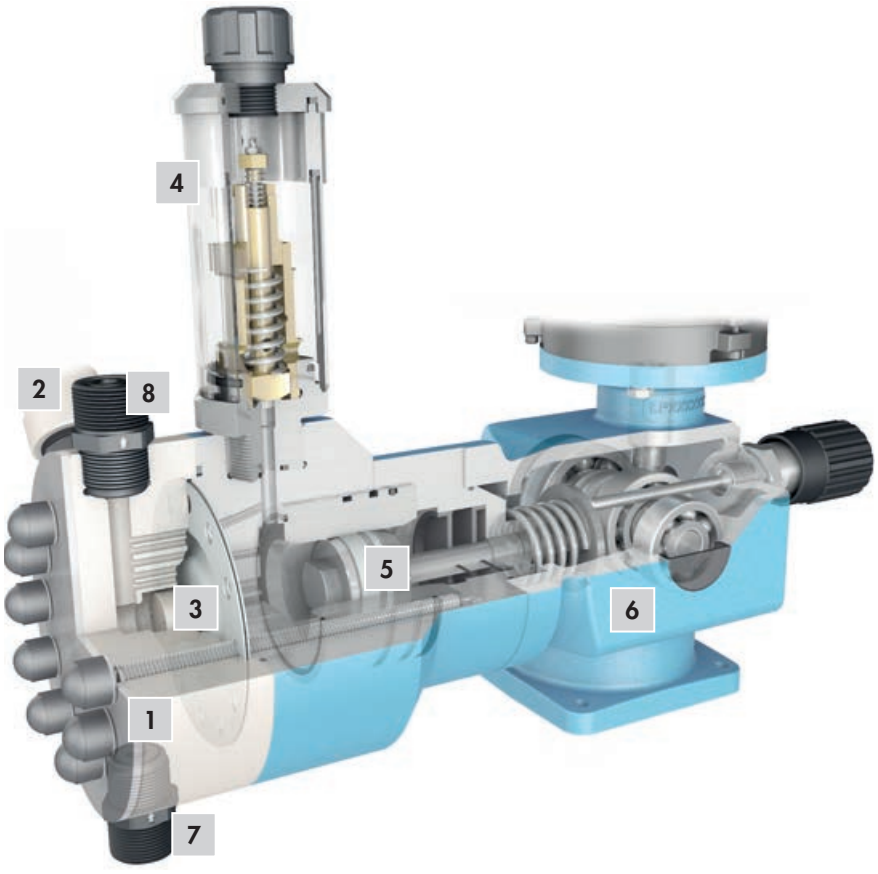
REGULATION
The flow rate of the **sera** piston diaphragm pumps is constant or continuously adjustable.
Manual flow rate adjustment using:
- Stroke length adjustment

Automatic flow rate adjustment, depending on analogue or digital input signals, using:
- Three-phase motors with frequency converter for stroke frequency change
- Actuators with position controllers for stroke length change

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	Pump body
2	Diaphragm rupture monitoring using • Manometer (RF4xx.2 - ...KM) • Pressure switch (C409.2 - ...KM)
3	Multi-layer diaphragm package • Working diaphragms • Signal diaphragms • Protective diaphragms
4	Hydraulic compensating valve
5	Piston
6	Stroke gearing
7	Suction valve
8	Pressure 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 new 409.2 is equipped with the innovative Pro+ board. Its design allows the later addition of a separately available bus interface.

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	✗	✓

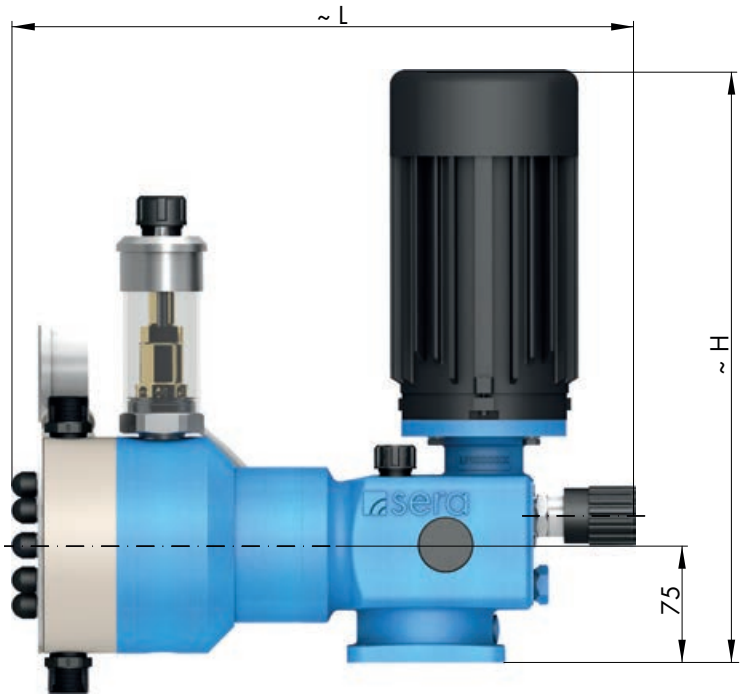
Connection & Control	Pro	Pro+
Control elements & Display	4-button control Multilangual display 4-color status indicator	Removeable handheld with two buttons and clickwheel Display with 8 languages (de, en, es, fr, nl, cs, fi, tr) 4-color status indicator
Control cable	optional	5m control cable (8-pole)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

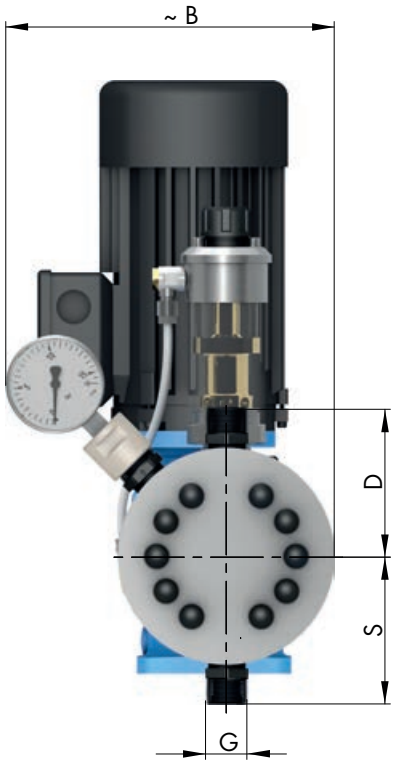
TECHNICAL DATA
PISTON DIAPHRAGM PUMP RF409.2 KM

PUMP DATA			RF 409.2-... KM					
			7,5 KM	10 KM	18 KM	45 KM	95 KM	190 KM
Permissible pressure $p_{2max.}$ at the pump outlet	bar	plastic	10	10	10	10	10	10
		stainless steel	80	80	70	35	20	10
Nominal capacity QN at $p_{2max.}$	l/h	50 Hz	0-7,5	0-10	0-18	0-45	0-95	0-190
		60 Hz	0-9,0	0-12	0-21	0-54	0-114	–
Quantity per stroke	ml/stroke	(100%)	1,25	1,1	2,0	5,0	10,6	21,1
Max. suction height	mWC		2	2	2	3	3	3
Min./max. permissible pressure at the pump inlet	bar	$p_{1min/max}$	-0,2/0	-0,2/0	-0,2/0	-0,3/0	-0,3/0	-0,3/0
Recommended nominal diameter DN of the connecting pipes	mm		10	10	10	10	15	15
Nominal stroke frequency	1/min	50 Hz	100	150	150	150	150	150
		60 Hz	120	180	180	180	180	180
Weight approx.	kg	plastic	15	15	15	18	18	18
		stainless steel	17	17	17	21	21	21

ELECTRICAL DATA		RF 409.2-... KM
Motor power	kW	0,37
Voltage	V	230/400V 50Hz, 460V 60Hz
Frequency	Hz	50/60
Insulation class	ISO	F
Enclosure	F	55

DIMENSIONS





	RF 409.2-... KM		
SUCTION VALVES	**7,5KM/10KM**	**18KM/45KM**	**95KM/190KM**
DN Nominal width	8	8	8
G Connection thread	G¾	G¾	G¾
S PP-FRP / PVDF-FRP	83	95	95
S PVC-U	88	97	97
S 1.4571	84	95	95
PRESSURE VALVES			
DN Nominal width	8	8	8
G Connection thread	G¾	G¾	G¾
D PP-FRP / PVDF-FRP	83	95	95
D PVC-U	88	104	104
D 1.4571	84	95	95
MAX. TOTAL HEIGHT			
H	365	365	365
MAX. TOTAL WIDTH			
B	195	210	210
MAX. TOTAL LENGTH			
L	350	405	405

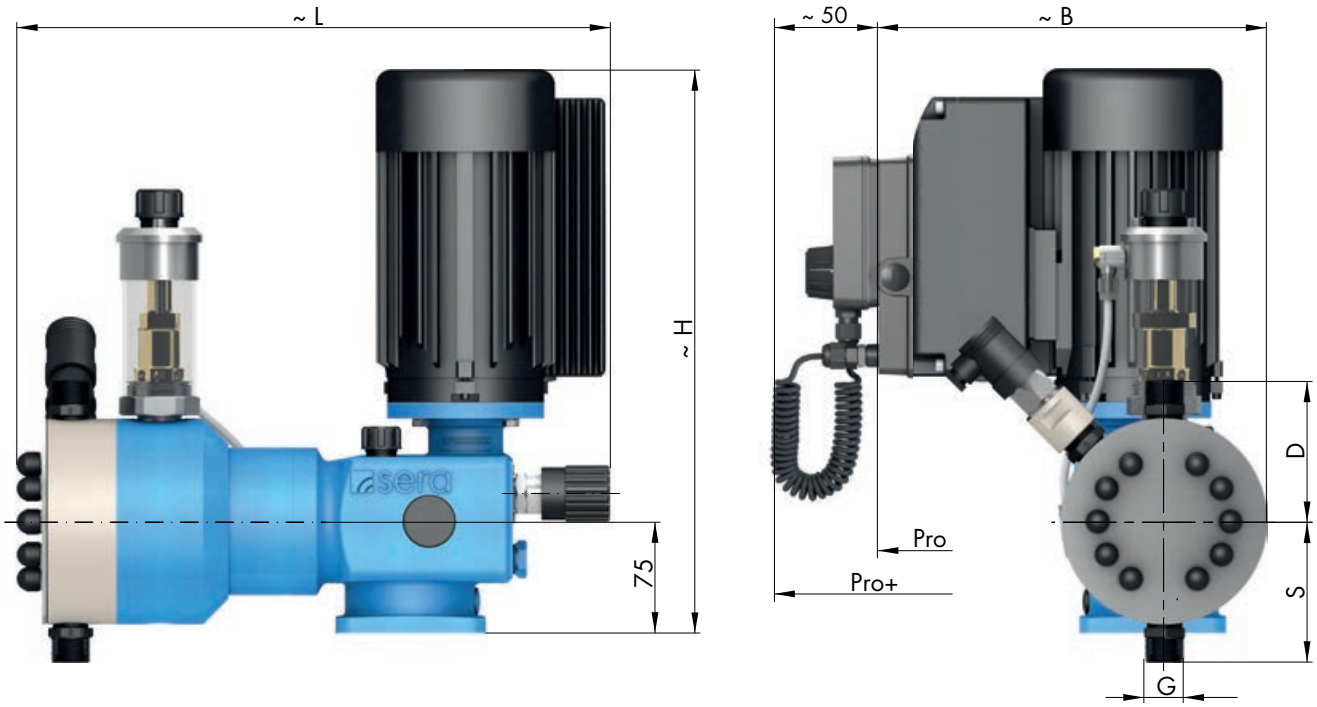
(Measurements in mm)

TECHNICAL DATA
PISTON DIAPHRAGM PUMP C409.2 KM PRO+

PUMP DATA			C 409.2-... KM Pro/Pro+					
			7,5KM	10KM	18KM	45KM	95KM	190KM
Permissible pressure $p_{2max.}$ at the pump outlet	bar	plastic	10	10	10	10	10	8
		stainless st.	80	80	50	25	16	8
Nominal capacity QN at $p_{2max.}$	l/h	50/60 Hz	0-7,5	0-10	0-18	0-45	0-95	0-190
Quantity per stroke	ml/stroke	(100%)	1,25	1,1	2,0	5,0	10,6	21,1
Max. suction height	mWC		2	2	2	3	3	3
Min./max. permissible pressure at the pump inlet	bar	$p_{1min/max}$	-0,2/0	-0,2/0	-0,2/0	-0,3/0	-0,3/0	-0,3/0
Recommended nominal diameter DN of the connecting pipes	mm		10	10	10	10	15	15
Nominal stroke frequency	1/min	50/60 Hz	100	150	150	150	150	150
Weight approx.	kg	plastic	17	17	17	20	20	21
		stainless st.	19	19	19	23	23	24

ELECTRICAL DATA		C 409.2-... KM 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



		C 409.2-... KM		
SUCTION VALVES		**7,5KM/10KM**	**18KM/45KM**	**95KM/190KM**
DN	Nominal width	8	8	8
G	Connection thread	G¾	G¾	G¾
S	PP-FRP / PVDF-FRP	83	95	95
S	PVC-U	88	97	97
S	1.4571	84	95	95
PRESSURE VALVES				
DN	Nominal width	8	8	8
G	Connection thread	G¾	G¾	G¾
D	PP-FRP / PVDF-FRP	83	95	95
D	PVC-U	88	104	104
D	1.4571	84	95	95
MAX. TOTAL HEIGHT				
H		365	365	365
MAX. TOTAL WIDTH				
B		255	270	270
MAX. TOTAL LENGTH				
L		350	403	403

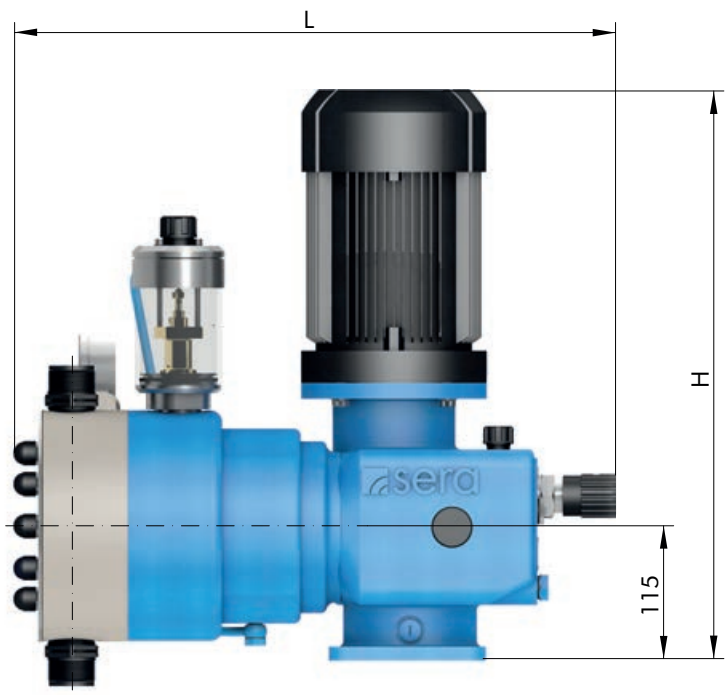
((Measurements in mm)

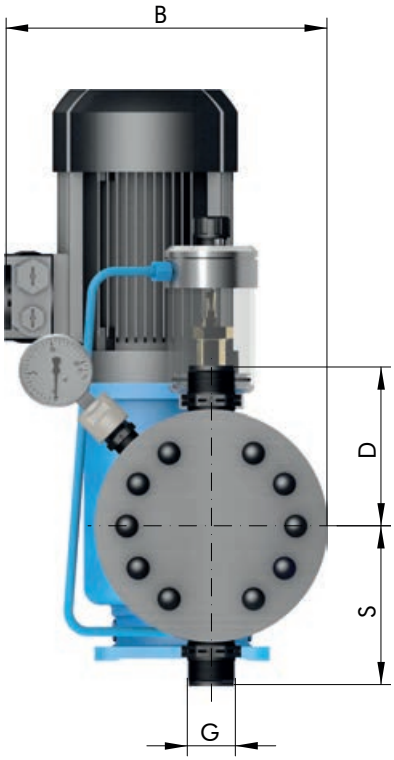
TECHNICAL DATA
PISTON DIAPHRAGM PUMP RF410.2 KM

PUMP DATA			RF 410.2-... KM											
			30KM	38KM	60KM	76KM	120KM	150KM	250KM	310KM	400KM	510KM	700KM	850KM
Permissible pressure $p_{2max.}$ at the pump outlet	bar	plastic	10	10	10	10	10	10	10	10	10	10	11	8
		stainless steel	80	80	70	70	40	40	20	20	14	14	8	8
Nominal capacity QN at $p_{2max.}$	l/h	50 Hz	0-30	0-38	0-60	0-76	0-120	0-150	0-250	0-310	0-400	0-510	0-700	0-850
		60 Hz	0-36	0-45	0-72	0-90	0-144	0-180	0-300	0-372	0-480	–	–	0-1.020
Quantity per stroke	ml/stroke	(100%)	6,5	6,5	13	13	25,8	25,8	53,3	53,3	87,6	87,6	120,3	186,4
Max. suction height	mWC		2	2	2	2	3	3	3	3	3	3	3	3
Min./max. permissible pressure at the pump inlet	bar	$p_{1min/max}$	-0,2/0	-0,2/0	-0,2/0	-0,2/0	-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	8	8	8	8	15	15	15	15	15	15	20	20
Nominal stroke frequency	1/min	50 Hz	76	97	76	97	76	97	76	97	76	97	97	76
		60 Hz	116	116	116	116	116	116	116	116	92	–	–	92
Weight approx.	kg	plastic	54	54	54	54	54	54	54	54	54	54	64	64
		stainless steel	60	60	60	60	60	60	60	60	60	60	82	82

ELECTRICAL DATA		RF 410.2-... KM		
		30KM/38KM	60KM/76KM	120KM ... 850KM
Power consumption	kW	0,75	1,1	1,5
Voltage	V	230/400V 50Hz, 460V 60Hz		
Frequency	Hz	50/60		
Insulation class	ISO	F		
Enclosure	F	55		

DIMENSIONS





		RF 410.2-... KM					
SUCTION VALVES		30KM/38KM	60KM/76KM	120KM/150KM	250KM/310KM	400KM/510KM	700KM/850KM
DN	Nominal width	8	8	20 [1]	20 [1]	20 [1]	20
G	Connection thread	G¾	G¾	G1¼ [1]	G1¼ [1]	G1¼ [1]	G1¼
S	PP-FRP / PVDF-FRP	94	94	138	138	138	162
S	PVC-U	97	97	132	132	132	172
S	1.4571	95	95	138	138	138	162
PRESSURE VALVES							
DN	Nominal width	8	8	20 [1]	20 [1]	20 [1]	20
G	Connection thread	G¾	G¾	G1¼ [1]	G1¼ [1]	G1¼ [1]	G1¼
D	PP-FRP / PVDF-FRP	94	94	138	138	138	162
D	PVC-U	104	104	151	151	151	192
D	1.4571	95	95	138	138	138	162
MAX. TOTAL HEIGHT							
H		530	540	580	580	580	580
MAX. TOTAL WIDTH							
B		255	260	285	285	285	310
MAX. TOTAL LENGTH							
L		495	495	533	533	533	580

(Measurements in mm)

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

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