

Product Information

TrueDos® M

The pump that measures, controls and doses



TrueDos® M – what you set is what you dose

A complete control circuit in one single unit

TrueDos® M is as precise as no other pump

The linearity deviation is only $\pm 1.5\%$ within the entire adjustment range

TrueDos® M doses very small capacities down to 0.005 l/h reliably

With the integrated calibration system the dosing flow can be adjusted precisely; evidence can be provided at any time while the pump is running

TrueDos® M draws in the liquid very smoothly

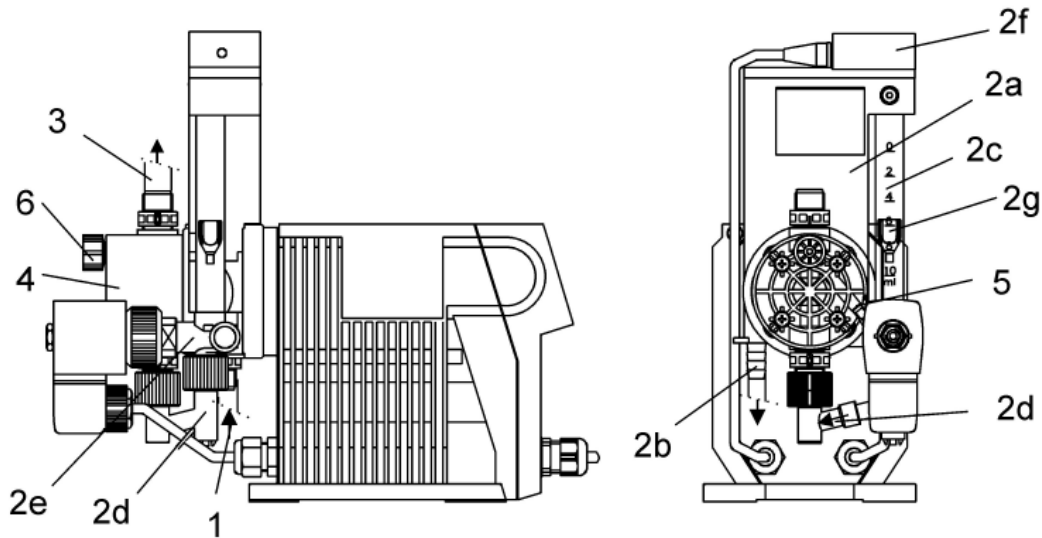
A constant stroke volume level provides an optimum draw-in also in low flows

TrueDos® M doses virtually continuously

Modern drive technology and powerful microcontroller provide optimum speed profiles and a dosing characteristic unrivalled on the market

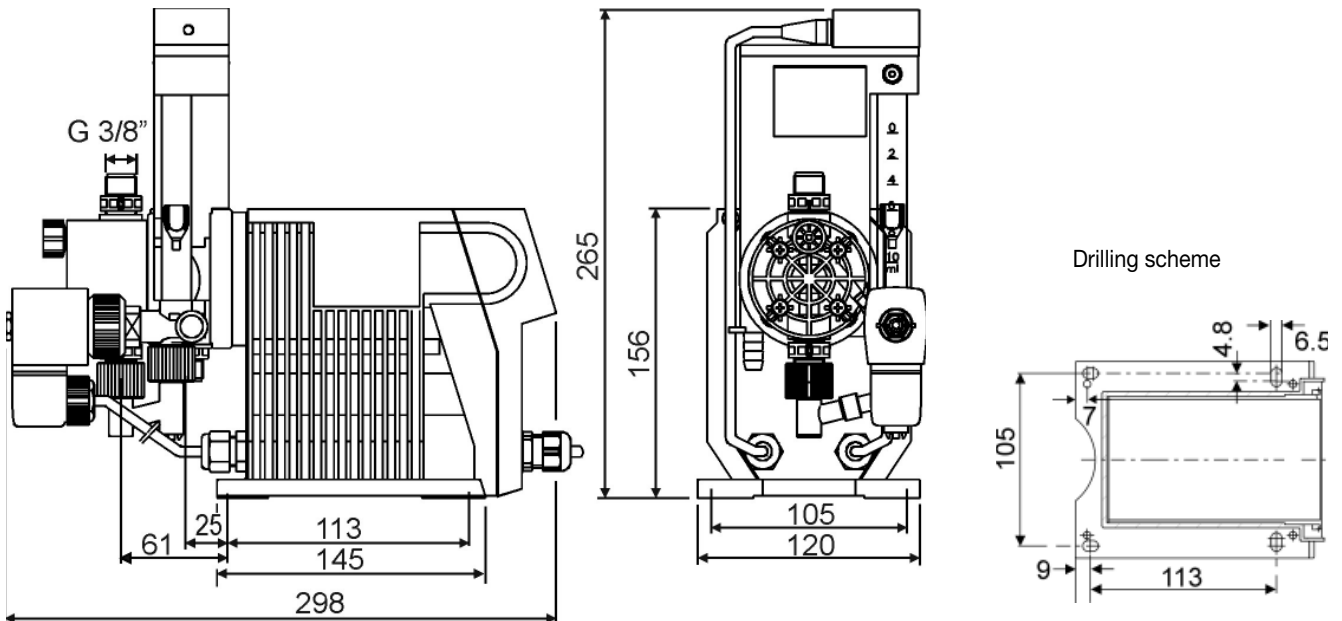
ALLDOS

TrueDos® M with Plus³ system and ultrasonic sensor



- | | | | |
|---------------------------|---|---|------------------|
| 1 | Suction line from the tank | 3 | Dosing line |
| Plus ³ system: | | | |
| 2a | Priming unit with deaeration chamber | 4 | Dosing head |
| 2b | Overflow line to the tank | 5 | Deaeration line |
| 2c | Calibrating tube | 6 | Deaeration screw |
| 2d | Line from calibrating tube to dosing head | | |
| 2e | Shut-off valve at the calibrating tube | | |
| 2f | Ultrasonic sensor | | |
| 2g | Float in the calibrating tube | | |

Measurements



Measurements in mm

TrueDos® M with Plus³ system and ultrasonic sensor

- Pump with stepping motor technology and digital flow adjustment
- Input and display of the dosing rate in l/h or gal/h
- Continuous flow measurement and set point control
- Integrated electronics for contact control, analog signal control and batch timer control
- Inputs/outputs for contact/analog signal, stroke signal and error message
- Double diaphragm dosing head with priming/deaeration chamber
- Ultrasonic sensor and solenoid valve
- Voltage options 230 V, 50/60 Hz or 115 V, 60 Hz
- Strokes per minute: max. 180 in normal operation, max. 120 in slow mode

Pump types

Normal operation				Slow mode				V _{stroke} [ml] (p = 3 bar)	Order number
Q [l/h]	p _{max} [bar]	Q [USg/h]	p _{max} [psi]	Q [l/h]	p _{max} [bar]	Q [USg/h]	p _{max} [psi]		
0.004 - 0.4 *	10	0.001 - 0.105	145	0.004 - 0.27	10	0.001 - 0.071	145	0.069	209-0.4M
0.025 - 1.9	16	0.007 - 0.50	232	0.025 - 1.2	16	0.007 - 0.32	232	0.276	209-2.2M
0.025 - 2.5	10	0.007 - 0.58	145	0.025 - 1.4	10	0.007 - 0.37	145	0.276	209-2.5M
0.055 - 4.9	10	0.015 - 1.29	145	0.055 - 3.2	10	0.015 - 0.84	145	0.587	209-5.5M

*) If the backpressure is less than 10 bars, the maximum dosing capacity of TrueDos® 209-0.4M increases up to 1.0 l/h.

Technical data

Connections	209-2.2M (16 bar)	<ul style="list-style-type: none"> • Suction side PVC (PE) hose 4/6 • Pressure side PVC hose 6/12, PP pipe 12/16 	
	209-0.4M/-2.5M/-5.5M	<ul style="list-style-type: none"> • Suction side PVC (PE) hose 4/6 • Pressure side PVC hose 4/6 	
Accuracy	Dosing flow variation < ± 1.5%, linearity deviation < ± 1.5 %		
Noise level	± 55 dB (A), tested according to DIN 45635-01-KL3		
Max. suction height <i>liquids with viscosity similar to water</i>	Normal operation and slow mode: 1.5 m WC		
Max. viscosity <i>at operating temperature</i>	209-0.4M	Normal operation	Slow mode
	209-2.2M	50 mPa s	100 mPa s
	209-2.5M	50 mPa s	100 mPa s
	209-5.5M	10 mPa s	50 mPa s
Max. admission pressure	Only suction! No flooded suction!		
Min. backpressure	1 bar on the pressure side (at the pressure joint of the pump)		
Max. temperature	<ul style="list-style-type: none"> • Max. ambient and operating temperature + 40° C • Storage temperature - 10° C to + 50° C 		
Max. relative air humidity	80 %, no condensation		
Motor / voltage	Dynamic stepping motor with gear, 230 V, 50/60 Hz or 115 V, 60 Hz power consumption 20 VA		
Enclosure, protection	Pump and electronics: material of enclosure: s PS FR GF 22; protection: IP 65		
Weight	up to max. 3.1 kg		
Plus ³ system	<ul style="list-style-type: none"> • Suitable for moderately degassing, crystallizing and/or concentrated liquids as well as very small quantities; Examples: sodium hypochlorite, flocculents, hydrochloric acid • For H₂O₂ or peracetic acid please contact us! 		

Options: voltage, display, Profibus

- **Voltage:** 110 - 240 V or 24 V DC
- **Display:** horizontal or at an angle
- **Profibus:** with or without Profibus® DP - VO incl. GSD file and address decoder document

Accessories for electronics and Profibus

Signal transmission cable incl. circular connector	Order number	
	cable length 2 m	cable length 5 m
For inputs: control contact or remote On/Off or 0/4-20 mA current in/out, 4-wire cable	321-205	321-207
For outputs: empty pre-alert or individual stroke signal or error signal, 4-wire cable	321-206	321-208
For output: current signal, 5-wire cable	321-215	
Accessories for Profibus DP	Order number	
T-splitter with M 12 connection technology <i>Necessary for every pump!</i>	321-225	
Terminating resistor M 12 <i>Necessary for every pump connected at the first and/or the last position of the bus system !</i>	321-224	

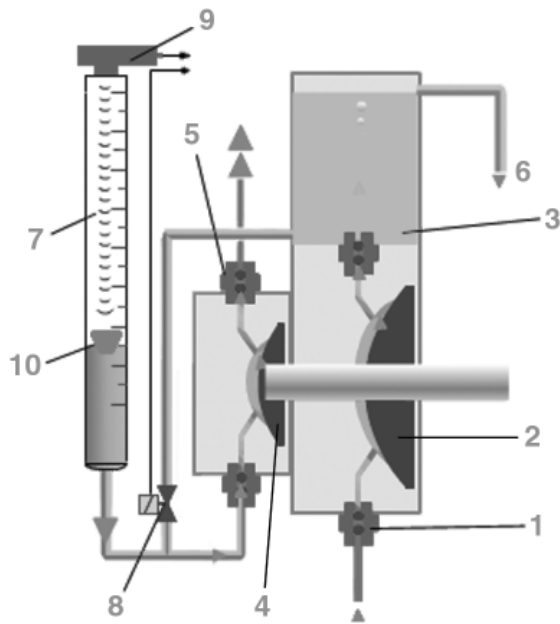
Electronic functions and electronic data

- Continuous operation: start/stop, function check, dosing head deaeration
- Memory function saves up to 65 000 pulses
- Empty tank signal: reed contact for empty signal/ pre-alert
- Integrated two step tank level indicator for the dosing system
- Stroke signal (standard) or empty pre-alert (adjustable)
- Integrated flow measurement and monitoring
- Code protection against unauthorized access
- Dosing quantity counter, with reset to 0
- Tamper-proof service hours counter
- Remote On/Off
- Hall sensor
- Profibus DP interface (option)

Operating modes	Display		
manual operation <i>virtually continuous dosing</i> <i>(short suction stroke, long discharge stroke)</i>	input / display of dosing capacity in l/h or gal/h		
contact signal control <i>smooth consistent dosing</i>	input / display of dosing capacity in ml/contact	Pump type	V_{min} (ml) V_{max} (ml)
		209-0.4M	0.001 0.07
		209-2.2M / -2.5M	0.004 0.88
		209-5.5M	0.011 2.20
current signal 0(4)-20 mA with manual weighting function <i>(weighting function for the assignment between the current value and flow rate)</i>	display of dosing capacity in l/h or gal/h, <i>volumetric flow in proportion to the current signal</i>		
batch dosing (contact signal/manual)	input / display of dosing flow in ml or l and dosing capacity in l/h or gal/h		
batch dosing with timer function	> input / display of dosing flow (ml or l) > input / display of dosing capacity (l/h oder gal/h) pro Charge > input starting time of first batch: t1 = 1 min. to max. 24 h (0.0 to 999. ml) > input starting time of subsequent batches: t2 = 1 min. to max. 240 h (1.00 to 99.99 l)		
slow mode (longer suction stroke): to avoid cavitation or for dosing viscous liquids			

Inputs and outputs		Standard adjustment	with software adjustable to	Technical data
Input	contact signal	-	-	load < 12 V, 5 mA
	current signal 0(4) - 20 mA	-	-	load < 22 Ohm
	remote On/Off	N.O.	N.C.	load < 12 V, 5 mA
	tank empty signal	N.O.	N.C.	load < 12 V, 5 mA
Output	current signal 0(4) - 20 mA	-	-	load < 350 Ohm
	error signal	N.O.	N.C. / empty pre-alert	ohm load < 50 V DC/75 V AC, 0.5 A
	stroke signal	N.O.	N.C. / stroke signal	contact time 200 ms / stroke
	empty pre-alert	-	-	ohm load < 50 V DC/75 V AC, 0.5 A

Functional diagram



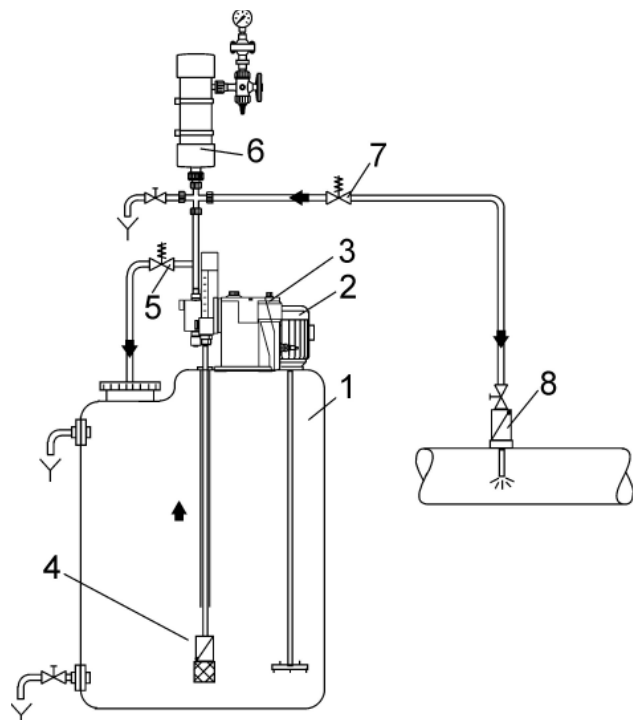
- The conveying diaphragm (2) takes a large volume of liquid out of the dosing station (tank) (1) and transfers it into the priming (deaeration) chamber (3). No problem when drawing in very small amounts.
- Any gas bubbles in the liquid are vented to the atmosphere in the priming chamber (3).
- Any excess liquid is returned to the tanks via the deaeration bypass (6).
- The separate working diaphragm (laid out for the required liter capacity) (4) and the pressure valve (5) dose the liquid from the calibration tube (7) into the process line.
- The empty calibration tube is automatically refilled. If the calibration tube is full, the solenoid valve (8) closes.
- The level sensor (9) detects the position of the float (10) with ultrasound to calculate the stroke volume of the pump. The discharge stroke period is defined, which is important to obtain the adjusted dosing flow.
- The necessary setpoint for the entered flow rate is constantly compared with the actual value. If deviation occurs, the actual value is immediately adjusted.
- **Additional advantage:** Chemical storage tanks can be exchanged without stopping the system.

Function	Message
Dosing control (continuous measurement of the stroke volume)	Error message: <ul style="list-style-type: none"> • in case of sudden and extreme variations of the stroke volume
Internal empty / pre-alert signal	<ul style="list-style-type: none"> • pre-alert, if the priming chamber is not filled, the pump continues operating • before the priming chamber is completely empty, the pump displays an empty message and stops.

Dosing head and valve materials

- Doses non-abrasive and non-combustible liquids.

Dosing head	Valve	Materials		
		Gaskets	Seat	Ball
PVC	PVC	Viton	Viton	Ceramics
PVC	PVC	EPDM	EPDM	Ceramics
PP	PP	Viton	Viton	Ceramics
PP	PP	EPDM	EPDM	Ceramics



Flow scheme of a complete dosing installation

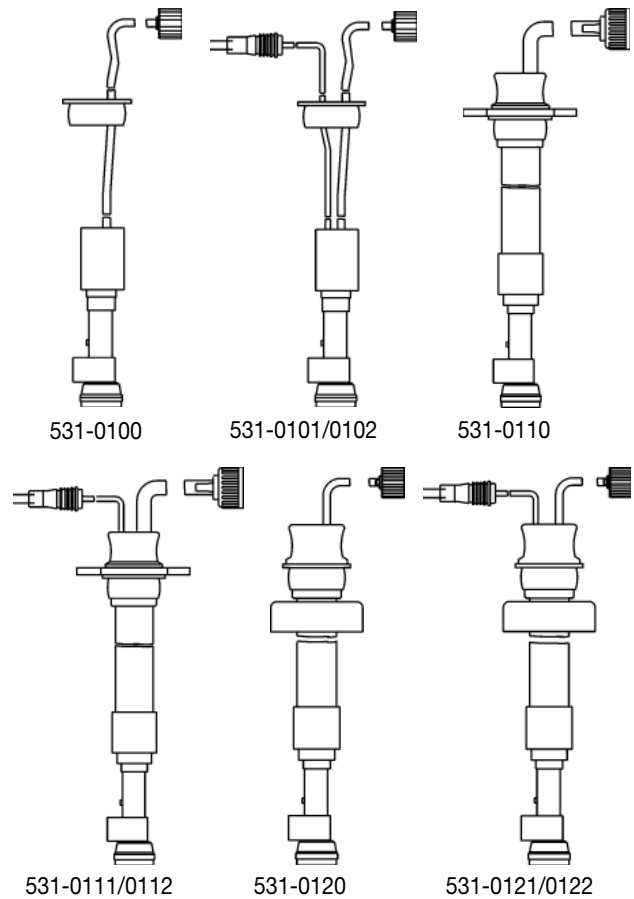
Accessories and fittings

- 1 Dosing tank 502 (see Product Information 502/509)
- 2 Electric agitator 509 (see Product Information 502/509)
- 3 Pump TrueDos® M
- 4 Suction line 531 with empty signal
- 5 Pressure relief valve 525
- 6 Pulsation damper 517 (see Product Information 516/517)
- 7 Pressure loading valve 525
- 8 Injection unit 522

Suction line systems 531

- **Flexible lines:** PE plug ø 44 mm for tank, ceramic weight
- **Rigid lines for tanks:** PE plug ø 44 mm for tank, PVC protective tube, without knurled nut for agitator operation
- **Rigid lines for containers:** PVC protective tube, container cover according to DIN 6131, for tank 5-12 l
- **Lines with empty indication (pre-alert) for electronic pumps:** with foot valve, N. O. contact, hose length 1,5 m, cable length 2 m

Description	Order number		
	flexible	rigid for tanks	rigid for containers
without empty signal	531-0100	531-0110	531-0120
with empty signal	531-0101	531-0111	531-0121
with empty signal and pre-alert	531-0102	531-0112	531-0122



Different materials, line and cable lengths on request !

Suction lines for ALLDOS tanks

- **Please indicate the tank size!**
When ordering together with an ALLDOS dosing tank, the length of the suction line is adapted.
- **Please indicate, whether you use a tank with or without agitator!**
For tanks with agitators, the suction line is equipped with a knurled nut.

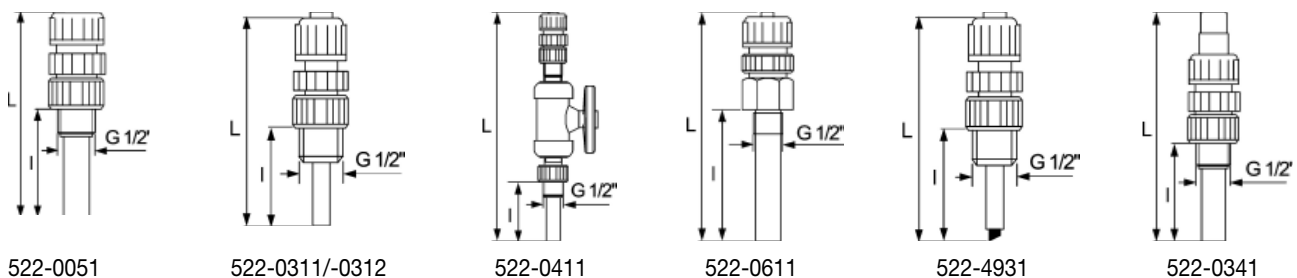
Injection units 522

Note: bushing thread G 1/2" provided by customer is necessary!

- ball check valve, spring Hastelloy C
- Threaded piece with integrated injection tube for installation into the threaded sleeve of the process line

Materials	Order number	l [mm]	L [mm]	T _{max} [°C]	PN [bar]	Connections
PP/Viton/Glass	522-0051	62	121	40°	10	Hose 4/6
PVC/Viton/Glass	522-0311	62	118	40° to 10 bar 20° to 16 bar	16	Hose 6/12 or 4/6, Pipe 10/12
PVC/EPDM/Stainless steel	522-0312	62	118			
PVC/Viton/Glass + with ball valve	522-0411	62	257			
PVC/Viton/Glass + threaded piece stainl. steel	522-0611	62	118			
PVC/Viton/Glass + with lip valve *	522-4931	55	114			
PP/Viton/Glass	522-0341	62	118	40°	10	12/16

*) especially for crystallizing liquids, such as sodium hypochlorite

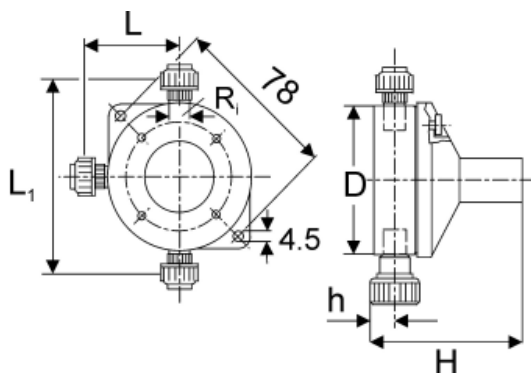


Pressure relief valves 525

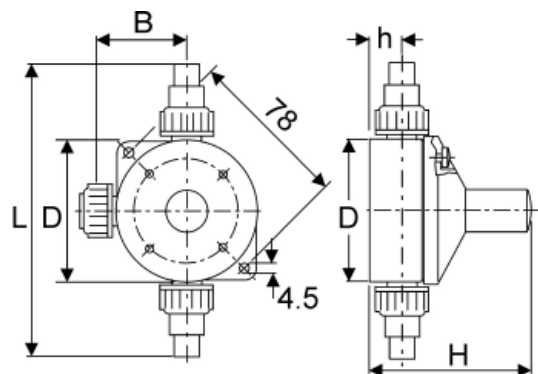
protect the line system on the discharge side against too high pressures.

- 3-way valves, incl. connections
- Overflow function by a diaphragm spring system, diaphragm PTFE
- Opening pressure adjustable, at factory approxiametly 11 bar

Materials	Connections	B [mm]	L [mm]	H [mm]	h [mm]	ø D [mm]	Order number
PP/Viton	Hose 4/6	48	96	90	21	68	525-0582
PP/EPDM	Hose 4/6	48	96	90	21	68	525-0582.1
PP/Viton	Pipe 12/16	50	140	90	21	68	525-0583
PP/EPDM	Pipe 12/16	50	140	90	21	68	525-0583.1
PVC/Viton or EPDM/PTFE	Hose 6/12, Pipe 10/12 Opening pressure 17 bar	49	140	90	21	68	525-1584.1



Pressure relief valve PVC



Pressure relief valve PP

Pressure loading valves 525

necessary, if the dosing system has no backpressure, if the backpressure varies or if the injection point is situated below the pump.

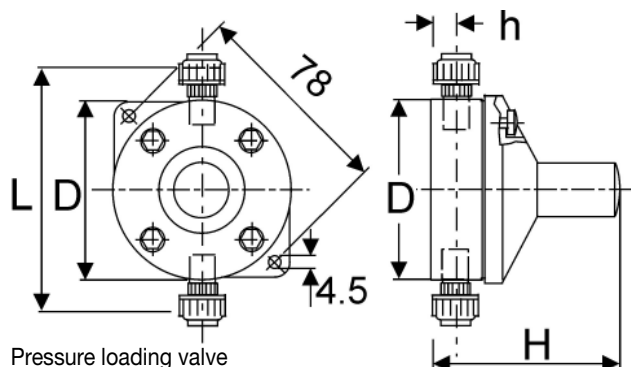
- Adjustable by a spring-loaded screw, adjusted by the factory approx. 2 to 3 bars, incl. connections

Materials	Connections	L [mm]	H [mm]	h [mm]	ø D [mm]	Order number
PP/Viton	Hose 4/6	96	90	21	68	525-0565
PP/EPDM	Hose 4/6	96	90	21	68	525-0565.1
PVC/Viton or PVC/EPDM	Hose 4/6 or 6/12	96	90	21	68	
PP/Viton	Pipe 12/16	140	90	21	68	525-0568
PP/EPDM	Pipe 12/16	140	90	21	68	525-0568.1

Adapters

for the installation of pressure relief and loading valves on pumps.

Materials	Order number
PVC	529-454
PP	529-455



Pressure loading valve

Installation sets

for pumps up to 10 bar.

- Suction line with foot valve and filter
- Deaeration and suction hose 1.5 m, pressure hose 5 m
- Including injection unit, connection G 1/4"

Description	Material	Order number
Pumps with electronics	PVC	553-049
Suction line with empty signal	PP	553-064

Spare parts sets

- 4 suction/pressure valve
- Gaskets for dosing head and valves
- 1 deaeration cartridge
- 1 dosing diaphragm
- Screws for the dosing head

Materials	Order number
-----------	--------------

for 209-0.4M

PVC/Viton/Ceramics	553-1487
PVC/EPDM/Ceramics	553-1492
PP/Viton/Ceramics	553-1493
PP/EPDM/Ceramics	553-1494

for 209-2.2M / -2.5M / -5.5M

PVC/Viton/Ceramics	553-1486
PVC/EPDM/Ceramics	553-1495
PP/Viton/Ceramics	553-1496
PP/EPDM/Ceramics	553-1497

Transparent cover

- For dirt protection: optional for pumps with horizontal display
- Material: Makrolon

Wall console

- With fastening material

Description	Order number
PE black	539-006



TrueDos® 209-0.4 M

Presented by: