

Product Information

Primus 221

The versatile diaphragm dosing pump



Primus 221 offers optimum dosing accuracy and operating convenience

The dosing flow variation is only $\pm 1,5 \%$

Primus 221 doses with a low pulsation grade

Due to the proven ALLDOS drive technology and the elaborate gear kinematics

Primus 221 meets the requirements of different dosing liquids perfectly

With various material combinations and dosing head versions

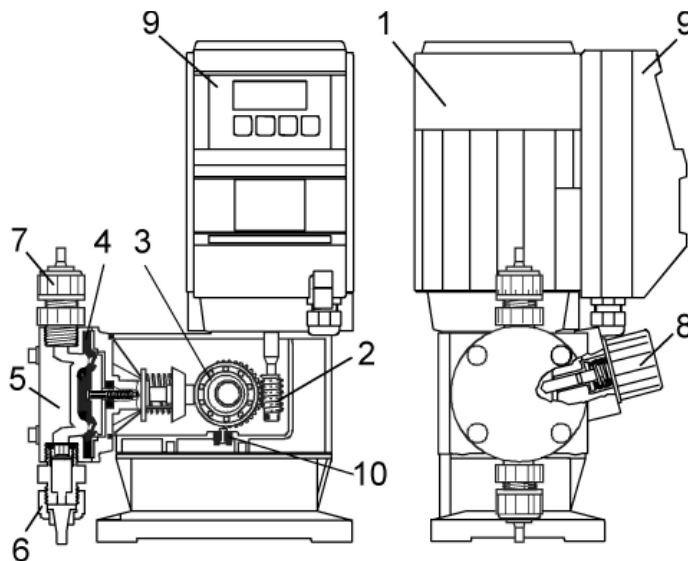
Primus 221 provides process safety

Sensors are integrated in the dosing head optionally for monitoring the dosing flow and the diaphragm

ALLDOS

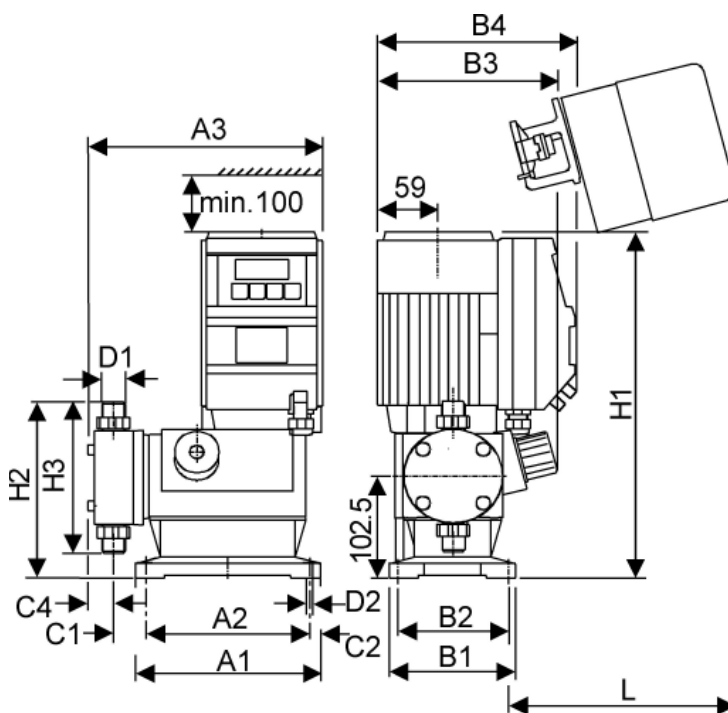
A Grundfos company

Description

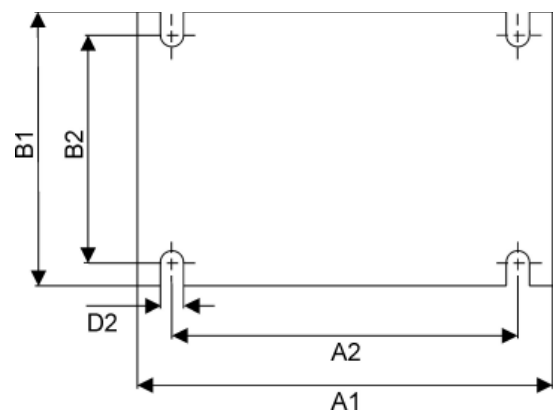


- 1 Motor
- 2 Gear
- 3 Eccentric
- 4 Dosing diaphragm
- 5 Dosing head
- 6 Suction valve
- 7 Pressure valve
- 8 Stroke length adjustment knob
- 9 Etron Profi electronics
- 10 Stroke sensor

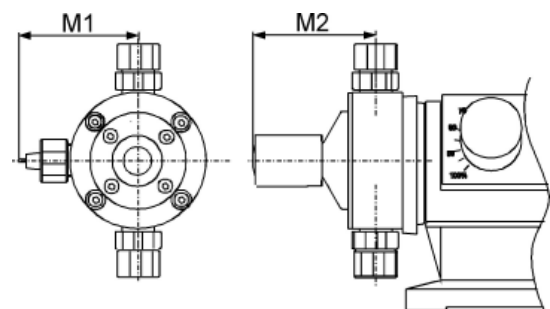
Measurements



Drilling scheme



Dosing head with integrated pressure relief valve



Head size	A1	A2	A3	B1	B2	B3	B4	L
1-4	180	159	275	123	105	175	205	227
5	180	159	323	123	105	175	205	227
6	180	159	330	123	105	175	205	227
Head size	C1	C2	C4	D1	D2	H1	H2	H3
1-4	32	10.5	25	R 5/8"	6.5	319	179	153
5	64	10.5	38	R 1 1/4"	6.5	319	192	177
6	80	10.5	40	R 1 1/4"	6.5	319	197	188

All measurements in mm (except D1)

Head size	Measurements in mm	
	M1	M2
1-4	86.5	86
5+6	125	120

Primus 221

- Capacity spectrum 4 up to 115 l/h
- Various combinations of dosing heads and materials suitable for applications in chemical engineering
- Optionally with Etron Profi electronics



Pump types

50 Hz			60 Hz			100 Hz ^{*)}			V _{stroke}	Head	Motor capacity [kW]		Connection	Order
[l/h]	[n/min]	[bar]	[l/h]	[n/min]	[bar]	[l/h]	[n/min]	[bar]	[cm ³]	size	Standard	PTC ^{*)}	PVC hose*	number
4	29	10	5	35	10	8	58	10	2.2	1	0.09	0.09	6/12	221-4
7	29	10	8	35	10	14	58	10	3.8	2	0.09	0.09	6/12	221-7
8	63	10	10	75	10	16	126	10	2.2	1	0.09	0.09	6/12	221-8
9	29	10	11	35	10	18	58	10	4.9	3	0.09	0.09	6/12	221-9
12	29	10	14	35	10	24	58	10	6.9	4	0.09	0.18	6/12	221-12
14	63	10	17	75	10	28	126	10	3.8	2	0.09	0.09	6/12	221-14
16	120	10	19	144	10	–	–	–	2.2	1	0.09	–	6/12	221-16
17	29	4	20	35	4	34	58	4	10.4	5	0.09	0.18	13/20	221-17
18	63	10	22	75	10	36	126	10	4.9	3	0.09	0.09	6/12	221-18
25	29	3	30	35	3	54	58	3	16	6	0.09	0.18	13/20	221-25
26	63	10	31	75	10	52	126	10	6.9	4	0.09	0.18	6/12	221-26
27	120	10	32	144	10	–	–	–	3.8	2	0.09	–	6/12	221-27
35	120	10	42	144	10	–	–	–	4.9	3	0.09	–	6/12	221-35
39	63	4	47	75	4	78	126	4	10.4	5	0.09	0.18	13/20	221-39
50	120	10	60	144	8	–	–	–	6.9	4	0.09	–	6/12	221-50
60	63	3	72	75	3	120	126	3	16	6	0.09	0.18	13/20	221-60
75	120	4	90	144	3.5	–	–	–	10.4	5	0.09	–	13/20	221-75
115	120	3	138	144	2.5	–	–	–	16	6	0.09	–	13/20	221-115

^{*)} Motor for frequency control

Technical data

Accuracy	Dosing flow variation < ± 1.5%, linearity < ± 4%
Adjustment of the dosing flow	By manual stroke length adjustment in a 1:1 ratio or by electronic stroke adjustment or motor frequency control
Suction height	Up to 5.5 m water column, according to the head size
Materials	Enclosure: aluminium; dosing diaphragm: NBR, PTFE-coated; dosing head and valves: please see resp. table
Weight	8 kg to 13 kg
Motor	E.g.: 3-phase motor 220-240 V/380-420 V (50/60 Hz), 440-480 V (60 Hz), IP 65/F, 90 W for other motors please see the table on page 4
Connections	Dosing head sizes 1 to 4: PVC hose 6/12; PVC Pipe 12x1.2; PP Pipe 16x2 (DN10); PVDF Pipe 16x2; stainless steel Pipe R 1/4" Dosing head sizes 5 and 6: PVC hose 13/20; PVC Pipe 25x1.9; PP Pipe 25x1.9; PVDF Pipe 25x1.9; stainless steel Pipe R 3/4"

Dosing head and valve versions

Dosing of non abrasive and non combustible liquids

Materials				
Dos. head	Valve	Valve seat	Gasket	Valve ball
PVC	PVC	Viton	Viton	Glass
PVC	PVC	EPDM	EPDM	St. steel
PVDF	PVDF	PTFE	PTFE	PTFE
PP	PP	Viton	Viton	Glass
St. steel	St. steel	Viton	Viton	St. steel

Options:

- Diaphragm breakage indication **MBS**
- Integrated pressure relief valve
- Special valves for abrasive liquids
- Stainless steel version optionally with heating flange

Motors

Motor without PTC resistor	3 AC, 220-240/380-420 V, 50/60 Hz, 440-480 V, 60 Hz, IP 65/F
Motor with PTC resistor	3 AC, 220-240/380-420 V, 50/60 Hz, 440-480 V, 60 Hz, IP 65/F, PTC
Flameproof motors	3 AC 230/400 V, 50/60 Hz, IP 65/F, EEx e II T3
Motors for Etron Profi, single-phase (1 AC)	220-240 V (50 Hz), IP 65/F 110-120 V (60 Hz), IP 65/F
Motor kits	for NEMA 42 C for IEC BG 63 B5

Electric servomotor

Description	Order number
<ul style="list-style-type: none"> • Block-proof synchronous motor with feedback potentiometer • Two limit switches 	384-711

Versions

- 230 V, 50/60 Hz, IP 55
- 115 V, 50/60 Hz, IP 55, 1-phase
- 24 V AC, 50/60 Hz, IP 55, 1-phase

Optional simplex potentiometers

100 Ω, 200 Ω, 500 Ω, 1000 Ω, 5000 Ω

Optionally with analog input 4-20 mA,
manual adjustment ON/OFF

Primus 221
with servomotor



Etron Profi microprocessor electronics

- Stroke frequency adjust. 0 to max., analog signal control 0/4-20 mA
- Contact input with multiplier and divisor
- Two-step tank empty signal, remote off switching
- Input for dosing controller and diaphragm breakage indication

Description

Etron Profi for mounting on the terminal box, 115/230 V, 50/60 Hz
Etron Profi for wall mounting, 115/230 V, 50/60 Hz,
5 m of cable to the pump

- 1.5 m of mains cable (USA 2 m)
- Mains plug versions for: Europe, Switzerland, USA, Australia
- Optionally with signal pre-alert empty or stroke signal with Hall sensor



Etron Profi for
wall mounting



Etron Profi for installation
with dosing controller

Dosing controller

for liquids with viscosity similar to water

Material	Description	Order number
PVC	221-4 up to 221-8	334-105
	221-9 up to 221-35	334-101
	221-50	334-1031
	221-75 up to 221-115	334-103
PVDF	221-4 up to 221-8	334-106
	221-9 up to 221-35	334-102
	221-50	334-1041
	221-75 up to 221-115	334-104

Signal transmission

Description	Order number
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Cable with plug, length 2 m

for contact input, analog signal input and remote On/Off	321-205
for output for pre-alert / error message and stroke signal	321-206

Cable with plug, length 5 m

for contact input, analog signal input and remote On/Off	321-207
for output for pre-alert / error message and stroke signal	321-208

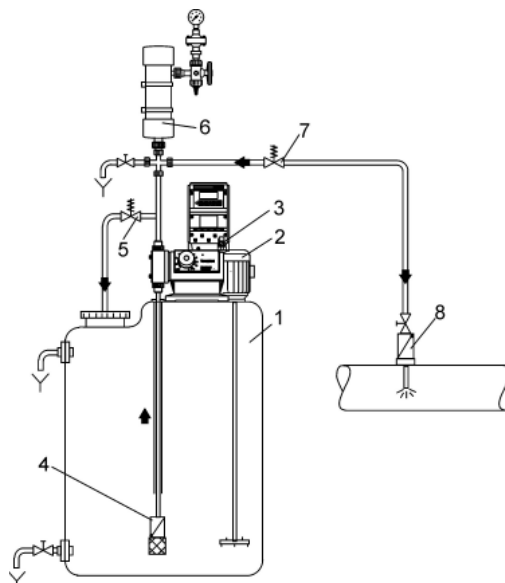
Combined plug / cable for diaphragm breakage indication and dosing controller

Combined plug, 5-poles	321-210
Cable, 5-poles, length 5 m	321-223

Fittings and accessories

Flow scheme of a complete dosing system

- 1 Dosing tank 502
- 2 Electric agitator 509
- 3 Dosing pump Primus 221
- 4 Suction line 521 with empty indication
- 5 Pressure relief valve 525
- 6 Pulsation damper 517
- 7 Pressure loading valve 525
- 8 Injection unit 522



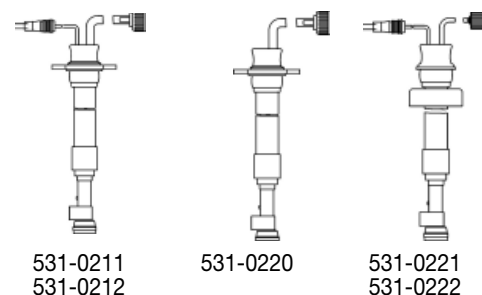
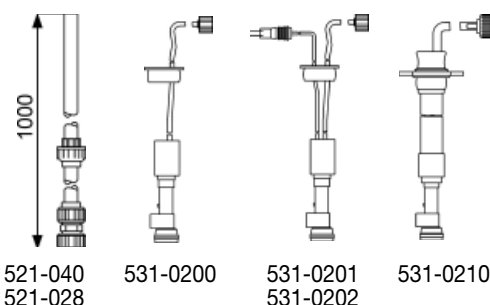
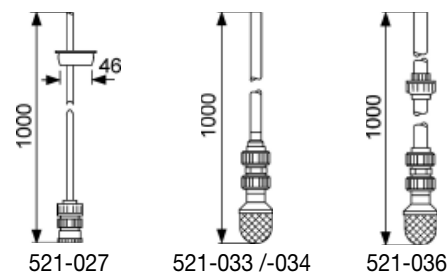
Suction line systems 521

- Foot valve with strainer filter (ball check valve)
- Flexible or rigid line

Line type	Material ¹⁾	Further equipment	Order number
PVDF Pipe 14/16	PVDF/PTFE/PTFE	without empty indication ²⁾	521-027
PVC hose 13/20	PVC/PVC/glass	without empty indication	521-033
PVC hose 19/27	PVC/PVC/glass		521-034
PVC Pipe 20/25	PVC/PVC/glass		521-036
PP Pipe 20/25	PP/PTFE/glass		521-040
PVDF Pipe 20/25	PVDF/PTFE/PTFE		521-028

1) material: valve body/valve seat/valveball

2) incl. connection Pipe



Suction line systems 531

- **Flexible line:**
PE-plug \varnothing 44 mm for tank, ceramic weight
- **Rigid line for tank:**
PE-plug \varnothing 44 mm for tanks, PVC protective tube
- **Rigid lines for containers:**
PVC protective tube, container cover according to DIN 6131, for 5-12 l containers
- **Lines with empty indication-/pre alert for pumps with electronics:**
with foot valve, N.O contact

Description	Order number		
	flexible	rigid (tanks)	rigid (containers)
without empty indication	531-0200	531-0210	531-0220
with empty indication	531-0201	531-0211	531-0221
with empty indication/pre-alert	531-0202	531-0212	531-0222

Other materials, different lengths of hoses and cables 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 an tank with or without agitator.**
For tanks with agitators, the suction line is equipped with a knurled nut.

Reed contact -float switch

- as tank empty signal or additional level indicator
- to plug on the suction line, with mains plug and 2 m of cable

Material	Order number	
	for 521	for 531
PVC	338-211	338-212
PP	338-211.1	338-213

Pressure relief valves 525

protect the discharge pipework from too high pressures.

- 3-way valves (head sizes 1-4)
- Bypass pressure relief valves with connected T-pieces (20/25)
- Opening pressure adjustable, pre-adjusted at factory at 10 -11 bars
- For installation in the dosing line, with standard connections
- Overflow function by diaphragm-spring system

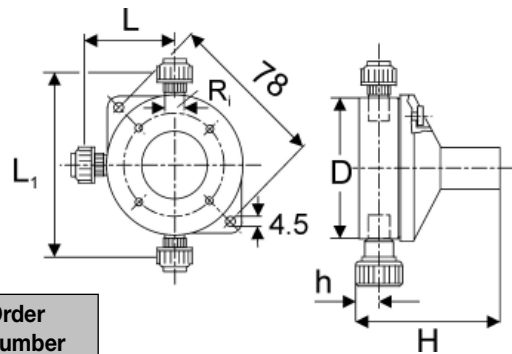
Material body /gasket	For connection at	L [mm]	L ₁ [mm]	L ₂ [mm]	H [mm]	h [mm]	ø D [mm]	Order number
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Head size 1-4

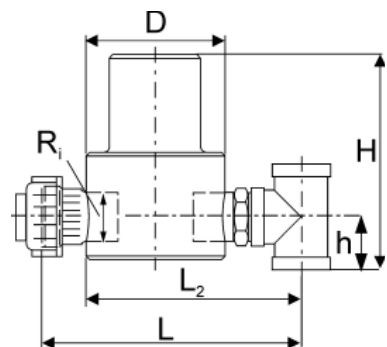
PVC / Viton or EPDM	Hose 6/12, Pipe 10/12	48	96	4	90	21	68	525-0584.1
Stainl. steel / Viton	Pipe R 1/4" female thread	–	–	–	82	11	69	525-0586
PVC / Viton or EPDM	Hose 6/12, Pipe 10/12 Opening pressure 17 bar	48	96	–	90	21	68	525-1584.1
PP / Viton	Pipe 12/16	50	140	–	90	21	68	525-0583
PP / EPDM	Pipe 12/16	50	140	–	90	21	68	525-0583.1
PVDF / PTFE	Pipe 14/16	50	140	–	90	21	68	525-0585.1

Head size 5+6

PVC / Viton	Hose 13/20, Pipe 20/25	204	–	–	149	33	90	525-3023
PVC / EPDM	Hose 13/20, Pipe 20/25	204	–	–	149	33	90	525-3023.1
PP / Viton	Hose 13/20, Pipe 20/25	206	–	–	148	32	90	525-3153
PP / EPDM	Hose 13/20, Pipe 20/25	206	–	–	148	32	90	525-3153.1
PVDF / Viton	Pipe 20/25	199	–	–	148	32	90	525-3103
PVDF / PTFE	Pipe 20/25	199	–	–	148	32	90	525-3103.1
Stainl. steel / Viton	Pipe R 3/4" female thread	–	–	134	134	33	90	525-3073



Pressure relief valves head size 1-4



Pressure relief valves head size 5+6

Pressure loading valves 525

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

- Pressure adjustable by a spring-loaded screw, pre-adjusted at the factory at approx.. 2-3 bars
- for installation into the dosing line. incl. connections

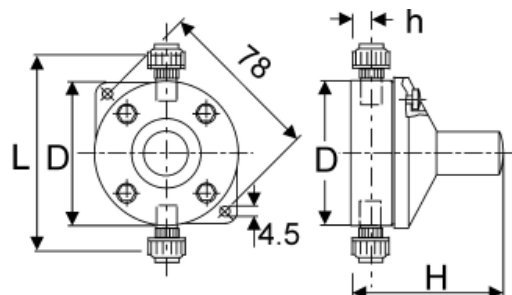
Material body /gasket	for connection at	L [mm]	H [mm]	h [mm]	ø D [mm]	d [mm]	Order number
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Head size 1-4

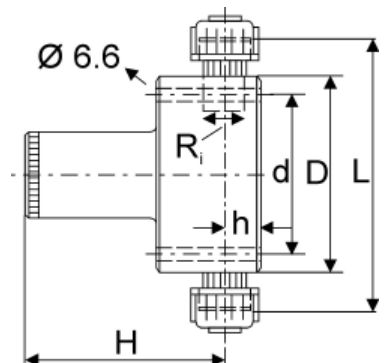
Stainl. steel / Viton	Pipe R 1/4" female thread	–	82	11	68	–	525-0571
PP / Viton	Pipe 12/16	140	90	21	68	78	525-0568
PP / EPDM	Pipe 12/16	140	90	21	68	78	525-0568.1
PVDF / PTFE	Pipe 14/16	140	90	21	68	78	525-0569.1

Head size 5+6

PVC / Viton	Hose 13/20, Pipe 20/25	149	144	28	90	72	525-1113
PVC / EPDM	Hose 13/20, Pipe 20/25	149	144	28	90	72	525-1113.1
PP / Viton	Hose 13/20, Pipe 20/25	153	144	28	90	72	525-1163
PP / EPDM	Hose 13/20, Pipe 20/25	153	144	28	90	72	525-1163.1
PVDF / Viton	Pipe 20/25	146	144	28	90	72	525-1183
PVDF / PTFE	Pipe 20/25	146	144	28	90	72	525-1183.1
Stainl. steel / Viton	Pipe R 3/4" female thread	–	144	28	90	72	525-2133



Pressure loading valves head size 1-4



Pressure loading valves head size 5+6

Adaptors for pressure relief / pressure retention valves

- For installation on the pump
- For head sizes 1-4

Material	Connection	Order number
Stainless steel	R 1/4"	529-059
PVC	Hose 6/12, Pipe 10/12	529-061
PP	Pipe 12/16	529-063
PVDF	Pipe 14/16	529-065



Primus 221 with
integrated pressure relief valve

Injection units 522

- Connection, ball check valve (Hastelloy C spring), threaded piece with integrated injection tube for installation in the coupling thread of the process line provided by the customer
- Coupling thread provided by the customer G 1/2" or G 1"

Material body/gasket /ball	Order number	l [mm]	L [mm]	T _{max} [°C]	PN [bar]	Connections
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Head size 1-4

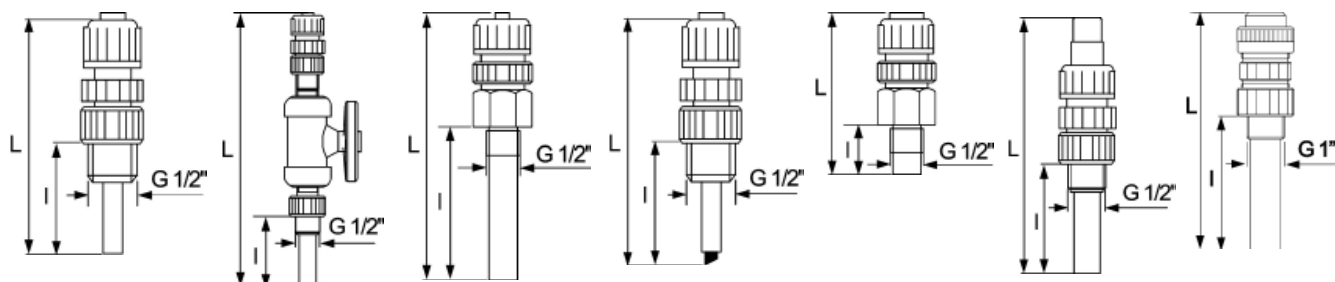
PVC / Viton / glass	522-0311	62	118	40° to 10 bar 20° to 16 bar	16	Hose 6/12 or 4/6, Pipe 10/12
PVC / EPDM / st. steel	522-0312	62	118			
PVC / Viton / glass + ball valve	522-0411	62	257			
PVC / Viton / glass + threaded piece st. steel	522-0611	62	118			
PVC / Viton / glass + lip valve	522-4931	55	114			

Head size 1-4 stainless steel

St. steel / Viton / st. steel	522-0911	27	92	70°	16	1/4"
cooling Pipe length 1000 mm (only 522-0911)	522-096	-	-	-	-	-
St. steel / Viton / st. steel	522-0231	27	92	70°	100	1/4"
Hastelloy / PTFE / Hastelloy	522-1311	83	152	70°	100	1/4"
PP / Viton / glass	522-0341	62	118	40°	10	12/16
PVDF / PTFE / PTFE	522-0151	62	118	50°	16	12/16

Head size 5+6

PVC / Viton / glass	522-1511	60	140	20°	16	Hose 5
PVC / st. steel / glass + threaded piece st. steel	522-1411	129	205	20°	16	
PP / Viton / glass	522-0351	120	189	40°	10	Pipe 20/25
PVDF / Viton / PTFE	522-0161	120	189	60°	10	Pipe 20/25
St. steel / Viton / st. steel	522-1811	120	212	70°	100	3/4"



522-0311/-0312

522-0411

522-0611/
-1311

522-4931

522-0911/
-0231522-0341/
-0151522-1511/
-1411/-0351/
-0161/-1811

Spare parts sets

- Gaskets for the dosing head, 1 dosing diaphragm
- For plastic with connection sizes 6/12, 10/12, 12/16 and 14/16: complete valves
- For plastic with connection sizes 13/20 and bigger and for stainless steel: inner valve parts

Your choice depends on the head size and the material !

Material valve body / valve seat /gasket / valve ball	Order number according to head size					
	1	2	3	4	5	6
PVC / Viton / Viton / glass	553-520	553-521	553-522	553-523	-	-
PVC / PTFE / Viton / glass	-	-	-	-	553-544	553-547
PVC / EPDM / EPDM / st. steel	553-521-2	553-521-2	553-522-2	553-523-2	-	-
PP / Viton / Viton / glass	553-530	553-531	553-532	553-533	-	-
PP / PTFE / Viton / glass	-	-	-	-	553-545	553-548
PVDF / PTFE / PTFE / PTFE	553-535	553-536	553-537	553-538	553-546	553-549
St. steel / Viton / Viton / st. steel	553-526	553-525	553-527	553-528	-	-
St. steel / st. steel / Viton / st. steel	-	-	-	-	553-550	553-551

Connections for dosing pumps and fittings

For	Material	Pressure (PN)	Order number
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Head size 1-4

Adaptor from R 3/8" to PE hose	PVC	16	529-005
Adaptor from R 3/8" to Pipe 12 x 1.1	PVC	16	529-006
Adaptor from R 3/8" to PE hose 4/6	PVC	10	529-014
Hose 6/12	PVC	10	529-001
Pipe 12 x 1.1	PVC	10	529-002
Pipe R 1/4"	st. steel	100	529-003
Pipe 16 x 1.5 (to R 5/8" external)	PP	10	529-018
Pipe 16 x 1.5 (to R 5/8" external)	PVDF	10	529-019
Pipe 12 x 1.4 for suction side	PVDF	10	529-053
Pipe R 1/4"	Hastelloy C	100	529-017
Hose 12 / 20	PVC	10	529-020

Head size 5+6

PVC Pipe 20 / 25	PVC	10	529-023
St. steel Pipe R 3/4"	st. steel	100	529-025
Hastelloy C Pipe R 3/4"	Hastelloy C	100	529-026
PP Pipe 20 / 25	PP	10	529-027
PVDF Pipe 20 / 25	PVDF	10	529-028
PVC hose 19 / 27	PVC	10	529-029

Spare parts sets for integrated pressure relief valves

- 1 dosing diaphragm, 1 gasket, 1 ball

Material	Head size	Order number
gasket / ball		
PTFE/PTFE	1-4	553-1489
PTFE/PTFE	5+6	553-1490

Installation sets for headsize 1-4

- Suction line with foot valve and filter
- Deaeration and suction hose 1.5 m, pressure hose 5 m
- Including injection unit, connection G 1/2"

Description	Material	Order number
for pumps without electronics	PVC	553-1012
suction line without empty indication	PP	553-1014
for pumps with electronics	PVC	553-1013
suction line with empty indication	PP	553-1015

Consoles

Description	Order number
Wall console for Primus 221, lacquered steel sheet, with fastening material	539-015
Adaptor console for installation of Primus 221 on ALLDOS dosing tanks 502-0075 to -1001	539-038

Presented by: