



Mahar Fan Abzar Co.

Pulsation damper

516 / 517

Operation manual



Please read Operation and Servicing Manual completely and retain for future reference!

Mahar Fan Abzar

Imprint

**Pulsation damper 516 / 517
Operation Manual**

Version 1.0

Issued by

ALLDOS Eichler GmbH
Reetzstraße 85 • 76327 Pfinztal (Söllingen)
Postfach 1160 • 76317 Pfinztal
Germany

Tel. +49 72 40 61-0 / Fax. +49 72 40 61-211

Mail: alldos.de@alldos.com
Internet: www.alldos.com

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Mahar Fan Abzar

1 General

1.1 General advice

This Technical Information document contains all the instructions required for commissioning and operating the pulsation damper.

- Technical data
- Instructions for commissioning, operating and maintenance
- Safety information

If you require further information or if any problems arise which are not discussed in detail in this document, contact ALLDOS directly to obtain the information needed.

1.2 Using this document

Sections marked **WARNING**, **CAUTION** and **NOTE** have the following meanings:



Warning

Risk of accidents and injury!



Caution

Risk of malfunction or damage to the device!



Note

There is an exceptional feature.

1.3 Guarantee

A guarantee claim in the sense of our general conditions of sale and delivery will only be recognised if:

- The component has been used in accordance with this Technical Information document
- The component has not been opened or incorrectly handled in any manner
- Installation, service and repairs are only carried out by authorised and qualified personnel
- Only original spare parts are used for repairs
- Only components approved by ALLDOS are used throughout the entire dosing plant.

Typical parts subject to wear are excluded from the guarantee, e.g.

- Seals, O-rings, diaphragms

The safety instructions specified in this document must be observed at all times.

2 Safety

The component has left the factory in a safe and satisfactory condition.

In order to maintain this condition and ensure safe operation, the user must observe the instructions and warning notes provided in this Technical Information.

If safe operation is no longer possible, the component must be shut down and secured against unintentional operation. This is the case:

- If the component is visibly damaged
- If the component no longer seems operational
- Following long periods of storage under unfavourable conditions

2.1 Use of the component

ALLDOS pulsation dampers 516 and 517 are used to dampen pressure pulsations in plants with ALLDOS dosing pumps within the framework of the applications described in this operation manual.



Warning

Other applications are regarded as improper use and are not permitted. ALLDOS Eichler GmbH accepts no liability for any damage resulting from such use.

2.2 Obligations of the operator

The operator of the plant is responsible for

- compliance with country-specific safety regulations
- training of operating personnel
- provision of prescribed protective gear
- organising of regular maintenance.

2.3 Avoidance of danger



Warning

Risk of explosion!

*Do not introduce oxygen into a pulsation damper with separating diaphragm.
Use only compressed air or nitrogen.*

Do not exceed the maximum permitted pressure.

Make sure the materials are chemically resistant to the dosing medium used.

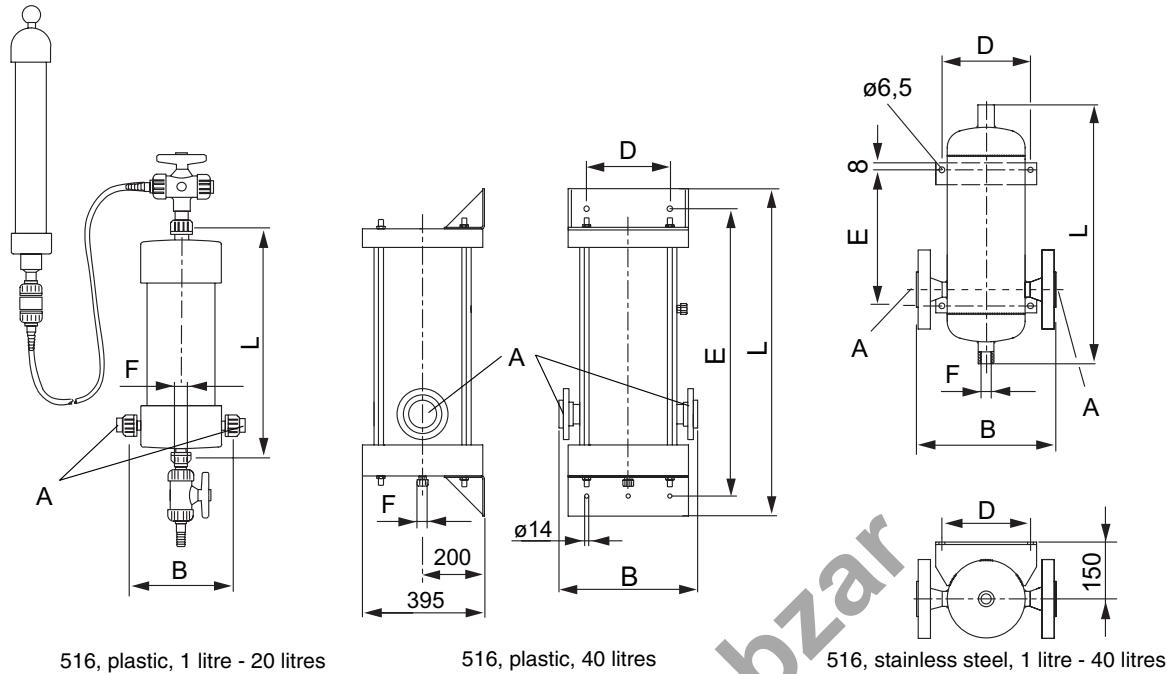


Note

ALLDOS pulsation dampers are not subject to the German Pressure Vessel Code (German Pressure Vessels Regulation).

3 Technical data

3.1 Suction side pulsation damper 516

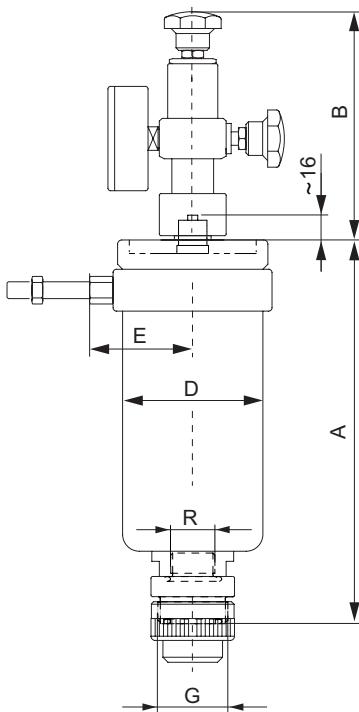


Type	Materials		Connections	Vol. (l)	p _{max} (bar)	B	D	E	F	L
	Body	Gaskets	A							
516-4132	PVC	EPDM	Pipe DN15 (G1")	1	2	160	—	—	DN 10	388
516-4133	PVC	Viton	Pipe DN15 (G1")	1	2	160	—	—	DN 10	388
516-4011	PVDF	PTFE	Pipe DN10 (G 3/4")	1	6	145	—	—	DN 10	524
516-513	1.4301	—	R 1/4" (G 1/4")	1	40	159	—	155	R 1/4"	295
516-4231	PVC	EPDM	Pipe DN25 (G1 1/2")	3	2	194	—	—	DN 10	643
516-4232	PVC	Viton	Pipe DN25 (G1 1/2")	3	2	194	—	—	DN 10	643
516-4021	PVDF	PTFE	Pipe DN20 (G 3/4")	3	6	145	—	—	DN 10	1035
516-523	1.4301	—	R 3/4" (G 3/4")	3	40	213	—	215	R 1/4"	375
516-4332	PVC	Viton	Pipe DN32 (G 2 1/4")	5	2	220	—	—	DN 10	900
516-4331	PVC	EPDM	Pipe DN32 (G 2 1/4")	5	2	220	—	—	DN 10	900
516-533	1.4301	—	R 3/4" (G 3/4")	5	25	248	170	245	R 1/4"	395
516-444	PVC	Viton	Flange DN 32	10	32	280	160	—	DN 8	787
516-544	1.4301	—	Flange DN 32	10	16	248	170	500	R 1/4"	645
516-464	PP	Viton	Flange DN 50	20	6	320	200	—	DN 10	800
516-4641	PP	Viton	Flange DN 65	20	6	320	200	—	DN 10	800
516-554	1.4301	—	Flange DN 50	20	6	363	273	255	R 1/4"	500
516-5541	1.4301	—	Flange DN 65	20	6	363	273	255	R 1/4"	500
516-474	PP	Viton	Flange DN 50	40	4	450	270	930	DN 10	1060
516-4741	PP	Viton	Flange DN 65	40	4	450	270	930	DN 10	1060
516-564	1.4301	—	Flange DN 50	40	4	363	273	755	R 1/4"	1000
516-5641	1.4301	—	Flange DN 65	40	4	363	273	755	R 1/4"	1000

Dimensions in mm

3.2 Pressure side pulsation damper 517 with separating diaphragm

Technical data



Type	Materials		Connections		Vol. (l)	P _{max} (bar)	A	B	D	E
	Body	Diaphragm	G (external)	R (internal)						
517-2111	PVC	Viton	DN8 (G 5/8")	G 3/8"	0,07	10	123	120	60	58
517-2112	PVC	EPDM	DN8 (G 5/8")	G 3/8"	0,07	10	123	120	60	58
517-2121	Stainless steel	Viton	DN8 (G 5/8")	G 3/8"	0,07	200	118	136	55	53
517-2122	Stainless steel	EPDM	DN8 (G 5/8")	G 3/8"	0,07	200	118	136	55	53
517-2141	PP	Viton	DN8 (G 5/8")	G 3/8"	0,07	10	123	120	60	58
517-2142	PP	EPDM	DN8 (G 5/8")	G 3/8"	0,07	10	123	120	60	58
517-2211	PVC	Viton	DN8 (G 5/8")	G 1/2"	0,15	10	160	120	80	67
517-2212	PVC	EPDM	DN8 (G 5/8")	G 1/2"	0,15	10	160	120	80	67
517-2221	Stainless steel	Viton	DN8 (G 5/8")	G 1/2"	0,15	180	143	136	70	64
517-2222	Stainless steel	EPDM	DN8 (G 5/8")	G 1/2"	0,15	180	143	136	70	64
517-2241	PP	Viton	DN8 (G 5/8")	G 1/2"	0,15	10	160	120	80	67
517-2242	PP	EPDM	DN8 (G 5/8")	G 1/2"	0,15	10	160	120	80	67
517-2253	PVDF	PTFE	DN8 (G 5/8")	G 1/2"	0,15	20	205	136	64	58
517-2311	PVC	Viton	DN20 (G 1 1/4")	G 3/4"	0,35	10	198	120	90	71
517-2312	PVC	EPDM	DN20 (G 1 1/4")	G 3/4"	0,35	10	198	120	90	71
517-2321	Stainless steel	Viton	DN20 (G 1 1/4")	G 1/2"	0,35	130	192	136	80	67
517-2322	Stainless steel	EPDM	DN20 (G 1 1/4")	G 1/2"	0,35	130	192	136	80	67
517-2341	PP	Viton	DN20 (G 1 1/4")	G 3/4"	0,35	10	198	120	90	71
517-2342	PP	EPDM	DN20 (G 1 1/4")	G 3/4"	0,35	10	198	120	90	71
517-2353	PVDF	PTFE	DN20 (G 1 1/4")	G 1/2	0,3	20	270	136	78	67

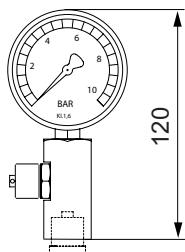
Type	Materials		Connections		Vol. (l)	P _{max} (bar)	A	B	D	E
	Body	Diaphragm	G (external)	R (internal)						
517-2411	PVC	Viton	DN20 (G 1 ¹ / ₄ "")	G 3/4"	0,65	10	258	120	100	78
517-2412	PVC	EPDM	DN20 (G 1 ¹ / ₄ "")	G 3/4"	0,65	10	258	120	100	78
517-2421	Stainless steel	Viton	DN20 (G 1 ¹ / ₄ "")	G 3/4"	0,65	50	233	136	90	67
517-2422	Stainless steel	EPDM	DN20 (G 1 ¹ / ₄ "")	G 3/4"	0,65	50	233	136	90	67
517-2441	PP	Viton	DN20 (G 1 ¹ / ₄ "")	G 3/4"	0,65	10	258	120	100	78
517-2442	PP	EPDM	DN20 (G 1 ¹ / ₄ "")	G 3/4"	0,65	10	258	120	100	78
517-2453	PVDF	PTFE	DN20 (G 1 ¹ / ₄ "")	G 3/4"	0,7	20	253	136	98	78
517-2511	PVC	Viton	DN20 (G 1 ¹ / ₄ "")	G 1"	1,4	10	323	120	130	92
517-2512	PVC	EPDM	DN20 (G 1 ¹ / ₄ "")	G 1"	1,4	10	323	120	130	92
517-2521	Stainless steel	Viton	DN20 (G 1 ¹ / ₄ "")	G 3/4"	1,4	40	273	136	110	78
517-2522	Stainless steel	EPDM	DN20 (G 1 ¹ / ₄ "")	G 3/4"	1,4	40	273	136	110	78
517-2541	PP	Viton	DN20 (G 1 ¹ / ₄ "")	G 1"	1,4	10	323	120	130	92
517-2542	PP	EPDM	DN20 (G 1 ¹ / ₄ "")	G 1"	1,4	10	323	120	130	92
517-2553	PVDF	PTFE	DN20 (G 1 ¹ / ₄ "")	G 3/4"	1,4	20	323	136	112	84
517-2611	PVC	Viton	DN32 (G 2")	G 1"	2,6	10	362	120	160	107
517-2612	PVC	EPDM	DN32 (G 2")	G 1"	2,6	10	362	120	160	107
517-2621	Stainless steel	Viton	DN32 (G 2")	G 1"	2,6	30	332	136	140	90
517-2622	Stainless steel	EPDM	DN32 (G 2")	G 1"	2,6	30	332	136	140	90
517-2641	PP	Viton	DN32 (G 2")	G 1"	2,6	10	362	120	160	107
517-2642	PP	EPDM	DN32 (G 2")	G 1"	2,6	10	362	120	160	107
517-2653	PVDF	PTFE	DN32 (G 2")	G 1"	2,6	20	357	136	158	107
517-2711	PVC	Viton	DN32 (G 2")	G 1 ¹ / ₂ "	5,6	10	495	120	198	127
517-2712	PVC	EPDM	DN32 (G 2")	G 1 ¹ / ₂ "	5,6	10	495	120	198	127
517-2721	Stainless steel	Viton	DN32 (G 2")	G 1 ¹ / ₂ "	5,6	40	451	136	170	127
517-2722	Stainless steel	EPDM	DN32 (G 2")	G 1 ¹ / ₂ "	5,6	40	451	136	170	127
517-2741	PP	Viton	DN32 (G 2")	G 1 ¹ / ₂ "	5,6	10	495	120	198	127
517-2742	PP	EPDM	DN32 (G 2")	G 1 ¹ / ₂ "	5,6	10	495	120	198	127
517-2753	PVDF	PTFE	DN32 (G 2")	G 1"	5,6	20	527	136	158	107
517-2811	PVC	Viton	DN65 (flange)	G 2"	9,5	10	560	120	250	133
517-2812	PVC	EPDM	DN65 (flange)	G 2"	9,5	10	560	120	250	133
517-2821	Stainless steel	Viton	DN65 (flange)	G 2"	9,5	30	502	136	220	111/119
517-2822	Stainless steel	EPDM	DN65 (flange)	G 2"	9,5	30	502	136	220	111/119
517-2841	PP	Viton	DN65 (flange)	G 2"	9,5	10	560	120	250	133
517-2842	PP	EPDM	DN65 (flange)	G 2"	9,5	10	560	120	250	133
517-2853	PVDF	PTFE	DN65 (flange)	G 1 ¹ / ₄ "	9,5	20	525	136	212	111/113

Dimensions in mm

**Note**

The preload pressure of the pulsation damper is set in the factory by default to 2.7 bar, or to a different value on request.

3.2.1 Pressure gauge for pressure side pulsation damper 517 with separating diaphragm (option)



Description

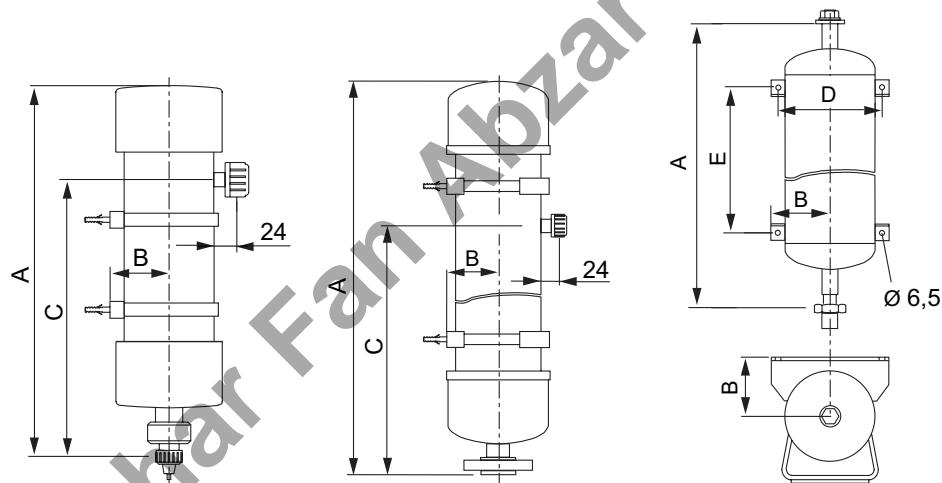
Without pressure gauge (standard version)

For pulsation dampers made of plastic, filled with compressed air via G 1/4" connection, pressure load PN 10 (bar)

For pulsation dampers made of stainless steel, filled with compressed air via G 1/4" connection, pressure load PN 25, PN 60, PN 160, PN 250 (bar)

3.3 Pressure side pulsation damper 517 without separating diaphragm

Technical Data



517 Plastic: 0.35 - 5.0 litres

517 Plastic: 10 - 40 litres

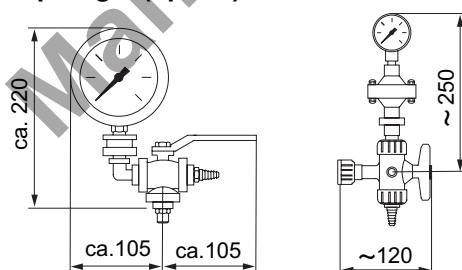
517 Stainless steel: 0.35 - 40 litres

Type	Materials		Connections G (external)	Vol. (l)	A	B	C	D	E
	Body	Gasket							
517-0611	PVC	Viton	PE tube DN 4	0,35	202	47	127	—	—
517-0612	PVC	EPDM	PE tube DN 4	0,35	202	47	127	—	—
517-0623	1.4301	—	1.4571 pipe R 1/4"	0,35	215	50	—	83	85
517-0641	PP	Viton	PE tube DN 4	0,35	202	47	127	—	—
517-0642	PP	EPDM	PE tube DN 4	0,35	202	47	127	—	—
517-0651	PVDF	Viton	PVDF pipe DN 4	0,35	202	47	127	—	—
517-0652	PVDF	EPDM	PVDF pipe DN 4	0,35	202	47	127	—	—
517-0711	PVC	Viton	PVC tube/pipe DN 8	1	351	60	260	—	—
517-0712	PVC	EPDM	PVC tube/pipe DN 8	1	351	60	260	—	—
517-0723	1.4301	—	1.4571 pipe R 1/4"	1	277	65	—	110	125
517-0741	PP	Viton	PP pipe DN 10	1	278	60	165	—	—
517-0742	PP	EPDM	PP pipe DN 10	1	278	60	165	—	—
517-0751	PVDF	Viton	PVDF pipe DN 10	1	278	60	165	—	—
517-0752	PVDF	EPDM	PVDF pipe DN 10	1	278	60	165	—	—
517-0811	PVC	Viton	PVC tube/pipe DN20	3	764	60	675	—	—
517-0812	PVC	EPDM	PVC tube/pipe DN20	3	764	60	675	—	—
517-0823	1.4301	—	1.4571 pipe R 3/4"	3	355	87	—	150	160

Type	Materials	Connections G (external)	Vol. (l)	A	B	C	D	E
	Body	Gasket						
517-0841	PP	Viton	PP pipe DN 20	3	655	60	565	—
517-0842	PP	EPDM	PP pipe DN 20	3	655	60	565	—
517-0851	PVDF	Viton	PVDF pipe DN 20	3	655	60	565	—
517-0852	PVDF	EPDM	PVDF pipe DN 20	3	655	60	565	—
517-0911	PVC	Viton	PVC tube/pipe DN20	5	841	70	750	—
517-0912	PVC	EPDM	PVC tube/pipe DN20	5	841	70	750	—
517-0923	1.4301	—	1.4571 pipe R 3/4"	5	345	100	—	170 190
517-0941	PP	Viton	PP pipe DN 20	5	700	70	608	—
517-0942	PP	EPDM	PP pipe DN 20	5	700	70	608	—
517-0951	PVDF	Viton	PVDF pipe DN 20	5	700	70	608	—
517-0952	PVDF	EPDM	PVDF pipe DN 20	5	700	70	608	—
517-1011	PVC	Viton	PVC flange DN 32	10	829	95	610	—
517-1012	PVC	EPDM	PVC flange DN 32	10	829	95	610	—
517-1024	1.4301	—	1.4571 flange DN 32	10	633	100	—	170 460
517-1041	PP	Viton	PP flange DN 32	10	829	95	605	—
517-1042	PP	EPDM	PP flange DN 32	10	829	95	605	—
517-1051	PVDF	Viton	PVDF flange DN 32	10	829	95	605	—
517-1052	PVDF	EPDM	PVDF flange DN 32	10	829	95	610	—
517-1124	1.4301	—	1.4571 flange DN 50	20	525	150	—	270 310
517-1141	PP	Viton	PP flange DN 50	20	1056	108	812	—
517-1142	PP	EPDM	PP flange DN 50	20	1056	108	812	—
517-1324	1.4301	—	1.4571 flange DN 65	20	525	150	—	254 310
517-1341	PP	Viton	PP flange DN 65	20	1056	108	812	—
517-1342	PP	EPDM	PP flange DN 65	20	1056	108	812	—
517-1424	1.4301	—	1.4571 flange DN 50	40	935	150	—	254 720
517-1441	PP	Viton	PP flange DN 50	40	896	166	662	—
517-1442	PP	EPDM	PP flange DN 50	40	896	166	662	—

Dimensions in mm

3.3.1 Pressure gauge for pressure side pulsation damper 517 without separating diaphragm (option)



Material	Gaskets	Pressure rating
PVC*	Viton	PN 10
PVC*	EPDM	PN 10
1.4571	PTFE	PN 16
1.4571	PTFE	PN 40
PP*	Viton	PN 10
PP*	EPDM	PN 10
PVDF*	Viton	PN 10
PVDF*	EPDM	PN 10

* Pressure gauges for plastic pulsation dampers are equipped with diaphragm pressure transducers.

3.4 Accessories

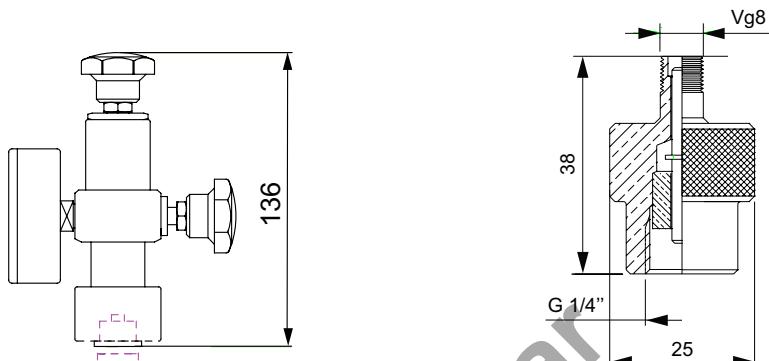
3.4.1 Manual vacuum pump as suction aid

Accessories for suction side pulsation damper 516

Order No.	Description
523-018	Suction aid (manual vacuum pump with tube and 3-way ball valve)

3.4.2 Filling devices

Accessories for pressure side pulsation damper 517 with separating diaphragm



Filling device 523-030, -031, -032, -033

Adapter for filling valve 523-013

Type	Description
523-013	Adapter for filling valve (tyre valve) for pulsation damper up to 8 bar, for use in conjunction with filling device 523-016, 523-017 or pressure gauge.
523-016	Compressed air filling device for pulsation damper made of plastic , for an existing compressed air plant, control lever, pressure gauge and tube with filling valve, for use in conjunction with adapter 523-013.
523-017	Compressed air filling device for pulsation damper made of plastic , with 6 litre compressed air cylinder, control lever, pressure gauge and tube with filling valve, for use in conjunction with adapter 523-013.
523-030	Filling device for pulsation damper made of plastic or stainless steel , with pressure gauge, up to 25 bar, compressed air filled via G 1/4" connection
523-031	Filling device for pulsation damper made of stainless steel , with pressure gauge, up to 60 bar, compressed air filled via G 1/4" connection
523-032	Filling device for pulsation damper made of stainless steel , with pressure gauge, up to 160 bar, compressed air filled via G 1/4" connection
523-033	Filling device for pulsation damper made of stainless steel , with pressure gauge, up to 250 bar, compressed air filled via G 1/4" connection

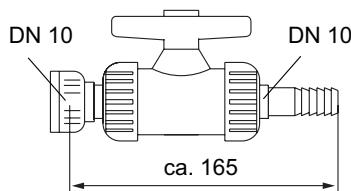
3.4.3 Counterflange sets

Accessories for pulsation damper 516 and 517 without separating diaphragm

Type	Materials		Nominal diameter	Note
	Body	Gaskets		
529-62	PVC	Viton	DN 32	_____
529-621	PVC	EPDM	DN 32	_____
529-80	1.4571	soft PVC	DN 32	Welding neck flange
529-93	PP	Viton	DN 32	_____
529-931	PP	EPDM	DN 32	_____
529-94	PVDF	Viton	DN 32	_____
529-941	PVDF	EPDM	DN 32	_____
529-95	PP	Viton	DN 50	_____
529-951	PP	EPDM	DN 50	_____
529-82	1.4571	soft PVC	DN 50	Welding neck flange
529-443	PVC	_____	DN 65	_____
529-444	PP	_____	DN 65	_____
529-445	1.4571	_____	DN 65	_____

3.4.4 Aeration and drain valves

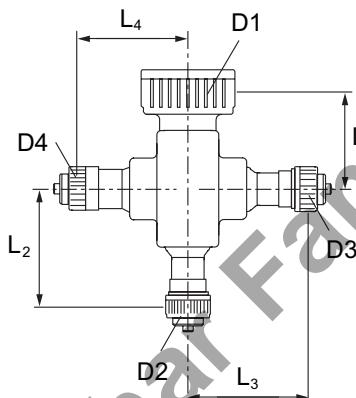
Accessories for suction side pulsation damper 516



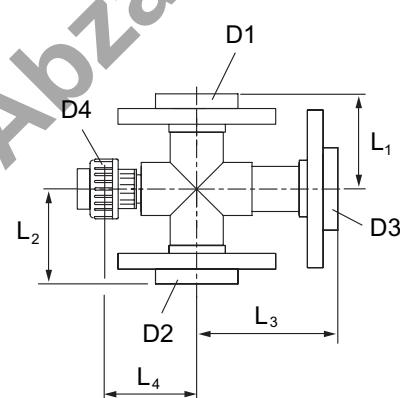
Type	Description	Connections	Materials	
			Body	Gaskets
523-020	Aeration and drain valve	DN 10	PVC	Viton
523-021	Aeration and drain valve	DN 10	PVC	EPDM
523-022	Aeration and drain valve	DN 10	PP	Viton
523-023	Aeration and drain valve	DN 10	PVC	EPDM
523-024	Aeration and drain valve	DN 10	PVDF	Viton

3.4.5 Cross pieces

Accessories for pulsation damper 517, for use in piped installations.



DN8, DN10 and DN20 cross pieces



DN32 and DN50 cross pieces

The choice of cross pieces listed in the table is limited to the cross pieces most frequently used. Other cross pieces are available on request.

Type	Material	PN **) (bar)	D1	D2	D3	D4	L ₁	L ₂	L ₃	appro x. L ₄
523-6001	PVC	10	DN20 (G1 1/4")	DN8 *) (G5/8")	DN8 (G5/8")	DN10 (G3/4")	55	73	73	77
523-6002	PVC	10	DN20 (G1 1/4")	DN20 (G1 1/4")	DN20 (G1 1/4")	DN10 (G3/4")	55	55	55	77
523-6003	PP	10	DN20 (G1 1/4")	DN20 (G1 1/4")	DN20 (G1 1/4")	DN10 (G3/4")	62	62	55	77
523-6004	PP	10	DN20 (G1 1/4")	DN10 (G3/4")	DN10 (G3/4")	DN10 (G3/4")	62	62	61	55
523-6005	PVDF	10	DN20 (G1 1/4")	DN10 (G3/4")	DN10 (G3/4")	DN10 (G3/4")	62	62	55	55
523-6006	PVDF	10	DN20 (G1 1/4")	DN20 (G1 1/4")	DN20 (G1 1/4")	DN10 (G3/4")	62	62	61	55
523-6007	PVC	10	Flange DN32	Flange DN32	Flange DN32	DN20 (G1 1/4")	85	85	125	83
523-6008	PVC	10	Flange DN50	Flange DN50	Flange DN50	DN20 (G1 1/4")	113	113	115	139
523-6063	PVC	10	DN4 (G5/8")	DN4 (G5/8")	DN4 (G5/8")	DN10 (G3/4")	66	73	73	77
523-6064	PP	10	DN4 (G5/8")	DN4 (G5/8")	DN4 (G5/8")	DN10 (G3/4")	73	66	45	53

The pulsation damper is attached to connection D1.

*) use the DN8 reducing piece supplied.

**) at T= 20°C

4 Installation

4.1 Transport and Storage

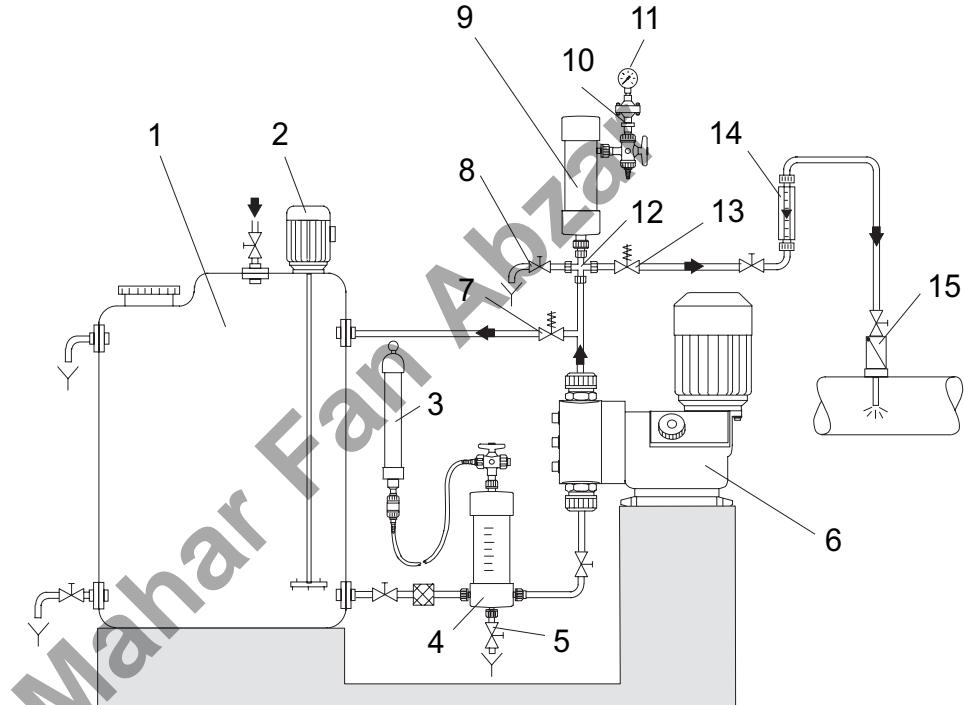
- Transport the unit carefully. Never throw it!
- Store in a cool, dry location.

4.2 Unpacking

- Do not allow foreign bodies to get inside the unit during unpacking.
- Check the delivery to ensure that no parts are missing.
- Assemble as soon as possible following unpacking.

4.3 Typical installations

4.3.1 Suction/pressure side pulsation damper without separating diaphragm



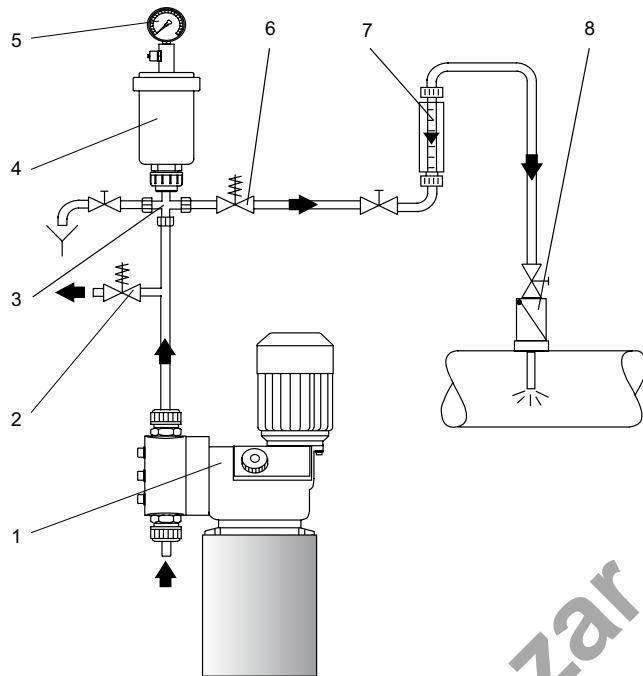
Suction side

- 1 Dosing tank
- 2 Agitator
- 3 Suction aid vacuum pump or aeration valve
- 4 Suction side pulsation damper without separating diaphragm (516)
- 5 Drain valve
- 6 Dosing pump

Pressure side

- 7 Overflow valve
- 8 Drain valve
- 9 Pressure side pulsation damper without separating diaphragm (517)
- 10 Diaphragm pressure transducer
- 11 Pressure gauge
- 12 Cross piece
- 13 Pressure retention valve
- 14 Flowmeter
- 15 Injection unit

4.3.2 Pressure side pulsation damper 517 with separating diaphragm



- 1 Dosing pump
- 2 Overflow valve
- 3 Cross piece
- 4 Pressure side pulsation damper (517) with separating diaphragm
- 5 Pressure gauge
- 6 Pressure retention valve
- 7 Flowmeter
- 8 Injection unit

4.4 Installation



Caution

*Pulsation damper 516 must only be used as a suction side pulsation damper.
Pulsation damper 517 must only be used as a pressure side pulsation damper.*

Observe the correct mounting position. For correct operation and to prevent the accumulation of dirt, install the pulsation damper vertically with the connection pointing downwards.

- Install the pulsation damper in the pressure line or suction line according to the specified installation method.
 - Dosing lines must be free from strain.
 - Pulsation dampers with a tube connection or very heavy pulsation dampers must be fixed separately using the fixing materials supplied.

To avoid flow deflection losses and frictional losses:

- Make sure the dosing lines are as straight as possible.
- Use dosing lines with the same nominal diameter as the pulsation damper.



Note

Mount suction side pulsation damper 516 as close as possible to the suction valve (intake) of the dosing pump.

Mount pressure side pulsation damper 517 as close as possible to the pressure valve (outlet) of the dosing pump.

5 Commissioning

5.1 Pulsation dampers without separating diaphragm

- Check that all components of the dosing system are mounted and connected correctly.
- Degaerate the pulsation damper.
- Switch on the dosing system.

5.2 Pulsation dampers with separating diaphragm

- Check that all components of the dosing system are mounted and connected correctly.



Warning

Danger of explosion!

**Do not introduce oxygen into a pulsation damper with separating diaphragm.
Use only compressed air or nitrogen.**



Caution

Depressurise the pressure line before checking and adjusting the preload pressure.

- Check the preload pressure and adjust if necessary:
 - Read the pressure at the pressure gauge, if present.
 - If there is no pressure gauge, connect the filling device and read the pressure.
 - Set the recommended preload pressure (0.8 x average operating pressure of the system).
- Switch on the dosing system.

6 Operation

6.1 Function

Pressure fluctuations in pipe networks often cause undue stress and damage, especially with rigid pipe work. Danger exists in particular where the pulsation frequency is close to the resonant frequency of the pipe network, in which case unforeseeable damage can occur.

Diaphragm and piston-diaphragm dosing pumps have a built-in tendency to experience pressure pulsations, which may need to be reduced by pulsation dampers.

As liquids are not compressible, a gas cushion (air or nitrogen) is used to store part of the dosing medium when the pressure rises and release it into the pipe network when the pressure falls again.

On the suction side of a dosing pump, the medium is often subject to high acceleration. If the acceleration is too great, the liquid column may break (due to cavitation). **Suction side pulsation dampers** ensure an even flow of the dosing medium, even under these conditions.

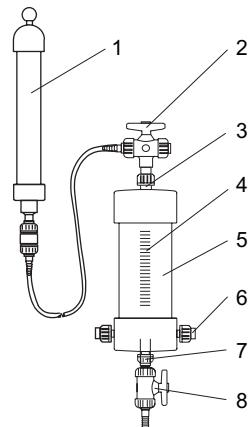
In the case of **pulsation dampers without a separating diaphragm**, the dosing medium is in direct contact with the air cushion. At start-up, the cushion is compressed by the pressure of the dosing medium. Over time, the air dissolves in the dosing medium, so that the pulsation damper has to be degassed on a regular basis.



In the case of **pulsation dampers with a separating diaphragm**, the air or nitrogen cushion is separated from the dosing medium by an elastic diaphragm. As a result the cushion cannot dissolve in the dosing medium. Furthermore the cushion can be preloaded, making it also suitable for high pressures.

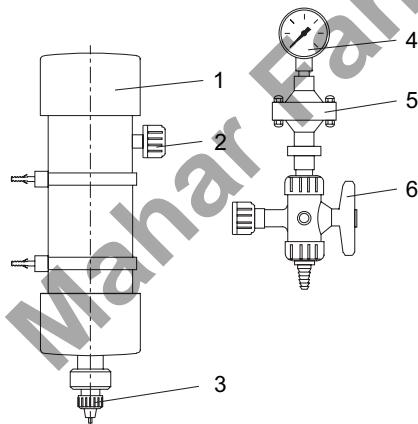
6.2 Unit description

6.2.1 Suction side pulsation damper 516



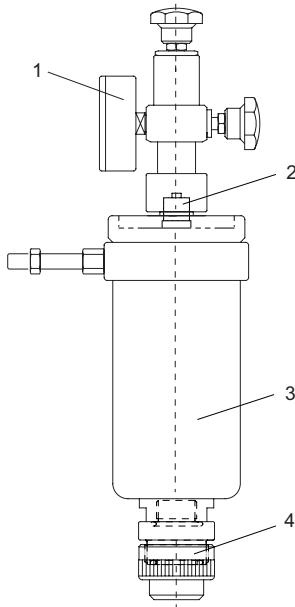
- 1 Suction aid (manual pump)
- 2 Aeration valve
- 3 Connection for aeration valve
- 4 Calibration scale (only on versions in transparent PVC)
- 5 Body
- 6 Connections for dosing medium
- 7 Connection for aeration valve
- 8 Drain valve

6.2.2 Pressure side pulsation damper 517 without separating diaphragm



- 1 Body
- 2 Connection for aeration valve
- 3 Connection for dosing medium
- 4 Pressure gauge
- 5 Pressure gauge or diaphragm pressure transducer
- 6 Aeration valve

6.2.3 Pressure side pulsation damper 517 with separating diaphragm



- 1 Filling device with pressure gauge
- 2 Connection for filling device
- 3 Body
- 4 Connection for dosing medium

6.3 Operation



Note

*Before the system is put into operation, the preload pressure must be adjusted according to the system pressure.
Recommended preload pressure = 0.8 x average operating pressure of the system.
All further settings must be carried out on the plant components.*

6.4 Possible faults

Fault	Cause	Remedy
Pulsation damping effect too small or diminishing.	For pulsation dampers without separating diaphragm: The air cushion has been absorbed by the dosing medium.	Deaerate the pulsation damper.
	For pulsation dampers with separating diaphragm: Preload pressure is too high or too low.	Set the correct preload pressure.
After start-up, the pulsation damper does not produce the desired effect.	Pulsation damper is the wrong size.	Use a pulsation damper of the correct size.
	For pulsation dampers with separating diaphragm: Preload pressure is too high or too low.	Set the correct preload pressure.

7 Maintenance



Warning

The whole system must be turned off before carrying out any cleaning or maintenance work.
Observe the safety precautions for the dosing medium used. Use safety gear where appropriate.

7.1 Aeration - only for pulsation dampers without separating diaphragm

If the damping effect has diminished, the pulsation damper must be deaerated:

1. Switch off the dosing system.
2. Place a basin under the drain valve.
3. Open the aeration valve and the drain valve.
4. Wait until the dosing medium has flowed out of the pulsation damper.
5. Close the aeration valve and the drain valve.
6. Switch on the dosing system.

7.2 Setting the preload pressure - only for pulsation dampers with a separating diaphragm



Warning

Danger of explosion!
Do not introduce oxygen into a pulsation damper with a separating diaphragm.
Use only compressed air or nitrogen.



Caution

Depressurise the pressure line before checking and adjusting the preload pressure.



Note

Recommended preload pressure: $0.8 \times$ average operating pressure of the system.

7.2.1 Checking interval

Check the preload pressure and readjust it if necessary:

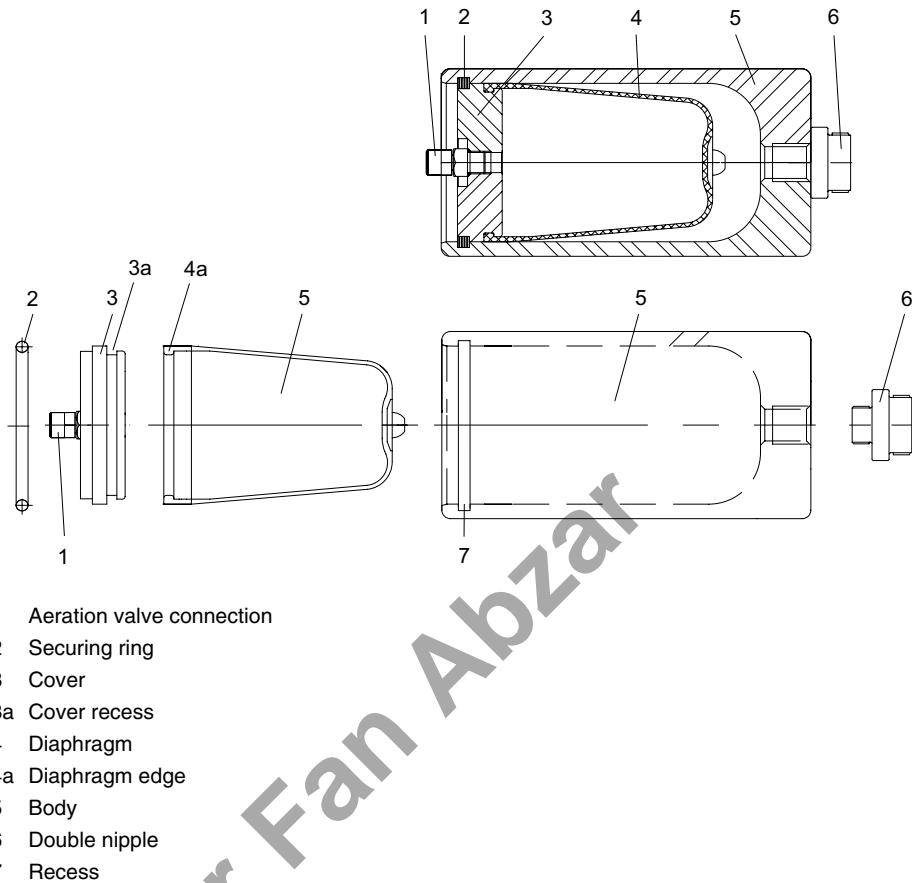
- one week after initial commissioning
- every three months

7.2.2 Setting the preload pressure

1. Switch off the dosing system.
2. Close the shut-off valves (if present) before and after the pulsation damper.
3. Depressurise the pressure line.
4. Connect the filling device.
5. Read the pressure at the pressure gauge.
6. Fill the pulsation damper with compressed air or nitrogen (or reduce the pressure) until the correct preload pressure ($0.8 \times$ average operating pressure of the system) is reached.
7. Remove the filling device.
8. Open the shut-off valves (if present) before and after the pulsation damper.
9. Switch on the dosing system.

7.3 Changing the separating diaphragm - only for pulsation dampers with a separating diaphragm

Pulsation damper (cross-section)



Note

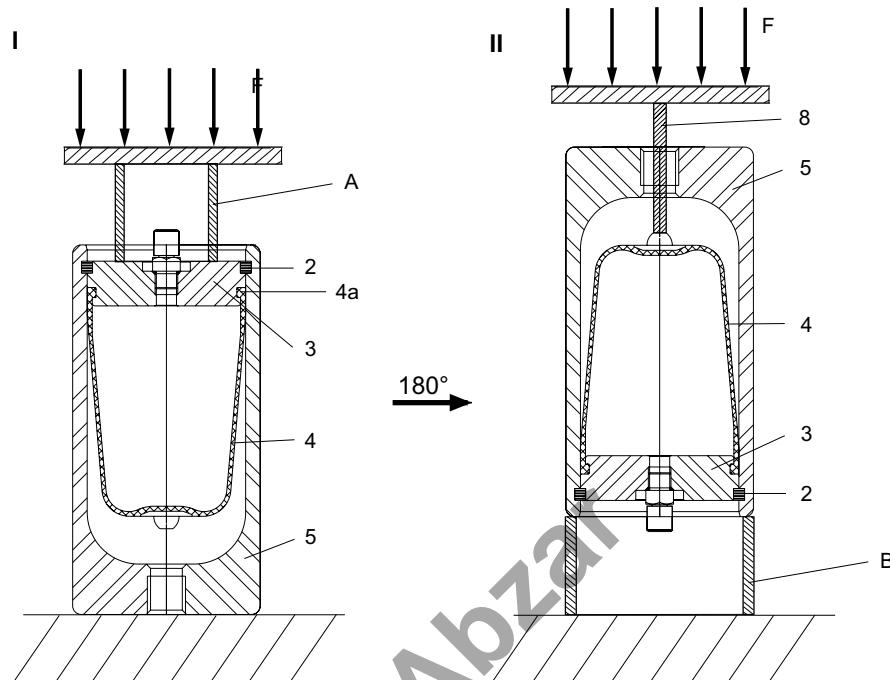
To change the diaphragm you need a manual press. If this is not available, the diaphragm must be changed in the factory.

To change the diaphragm:

1. Switch off the dosing system.
2. Close the shut-off valves (if present) before and after the pulsation damper.
3. Depressurise the pressure line.
4. Depressurise the pulsation damper and open the aeration valve (1).
5. Detach the pulsation damper from the pressure line.
6. Unscrew the double nipple (6) from the body (5).

Removing the diaphragm

1. Place the pulsation damper (5) upright (see diagram I), and press on the cover with a hollow object (A) such as a pipe (using a manual press) until the diaphragm is pushed down by approx. 5mm..



2. Remove the securing ring (2).
3. Turn the pulsation damper through 180° and place it with the body (5) standing on a pipe (B) as shown in diagram II.



Note

The inner edge of the body and the cover (2) must be unobstructed.

4. Using a mandrel (8) the same size as the hole in the bottom of the damper, carefully push out the diaphragm (4) and cover (3) assembly.
5. Lift the diaphragm (4) from the cover (3).
6. Clean the inside of the body (5).

Inserting the new diaphragm

1. Place the edge of the new diaphragm (4a) in the recess in the cover (3a).
2. Insert the assembly (cover and diaphragm) in the body (5), see diagram (note the direction: cover above, diaphragm below).



Note

To facilitate pressing, the interior of the damper or the diaphragm may be wetted, or greased if the dosing medium is grease-tolerant.

3. Place the body with cover and diaphragm under the press.
4. Using a hollow object (A) such as a pipe, press the cover assembly down as far as the recess (7).
5. Fit the securing ring (2).
6. Screw in the double nipple (6) with O-ring.
7. Re-install the pulsation damper in the pressure line.
8. Open the shut-off valves (if present) before and after the pulsation damper.

9. Connect the filling device.
10. Read the pressure at the pressure gauge.
11. Fill the pulsation damper with compressed air or nitrogen until the correct preload pressure ($0.8 \times$ average operating pressure of the system) is reached.



Note

When filling the pulsation damper, increase the preload pressure slowly until the cover has reached the securing ring.

12. Switch on the dosing system.

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8 Spare Parts

Order No. Replacement diaphragm	For pulsation damper Type	Materials		Volume (l)	P _{max} (bar)
		Body	Diaphragm		
10.7714-01	517-2111	PVC	Viton	0,07	10
10.7714-11	517-2112	PVC	EPDM	0,07	10
10.7714-02	517-2121	1.4404	Viton	0,07	200
10.7714-12	517-2122	1.4404	EPDM	0,07	200
10.7714-04	517-2141	PP	Viton	0,07	10
10.7714-14	517-2142	PP	EPDM	0,07	10
10.7715-01	517-2211	PVC	Viton	0,15	10
10.7715-11	517-2212	PVC	EPDM	0,15	10
10.7715-02	517-2221	1.4404	Viton	0,15	180
10.7715-12	517-2222	1.4404	EPDM	0,15	180
10.7715-04	517-2241	PP	Viton	0,15	10
10.7715-14	517-2242	PP	EPDM	0,15	10
10.7715-25	517-2253	PVDF	PTFE	0,15	20
10.7716-01	517-2311	PVC	Viton	0,35	10
10.7716-11	517-2312	PVC	EPDM	0,35	10
10.7716-02	517-2321	1.4404	Viton	0,35	130
10.7716-12	517-2322	1.4404	EPDM	0,35	130
10.7716-04	517-2341	PP	Viton	0,35	10
10.7716-14	517-2342	PP	EPDM	0,35	10
10.7716-25	517-2353	PVDF	PTFE	0,3	20
10.7717-01	517-2411	PVC	Viton	0,65	10
10.7717-11	517-2412	PVC	EPDM	0,65	10
10.7717-02	517-2421	1.4404	Viton	0,65	50
10.7717-12	517-2422	1.4404	EPDM	0,65	50
10.7717-04	517-2441	PP	Viton	0,65	10
10.7717-14	517-2442	PP	EPDM	0,65	10
10.7717-25	517-2453	PVDF	PTFE	0,7	20
10.7718-01	517-2511	PVC	Viton	1,4	10
10.7718-11	517-2512	PVC	EPDM	1,4	10
10.7718-02	517-2521	1.4404	Viton	1,4	40
10.7718-12	517-2522	1.4404	EPDM	1,4	40
10.7718-04	517-2541	PP	Viton	1,4	10
10.7718-14	517-2542	PP	EPDM	1,4	10
10.7718-25	517-2553	PVDF	PTFE	1,4	20
10.7719-01	517-2611	PVC	Viton	2,6	10
10.7719-11	517-2612	PVC	EPDM	2,6	10
10.7719-02	517-2621	1.4404	Viton	2,6	30
10.7719-12	517-2622	1.4404	EPDM	2,6	30
10.7719-04	517-2641	PP	Viton	2,6	10
10.7719-14	517-2642	PP	EPDM	2,6	10
10.7719-25	517-2653	PVDF	PTFE	2,6	20
10.7720-01	517-2711	PVC	Viton	5,6	10
10.7720-11	517-2712	PVC	EPDM	5,6	10
10.7720-02	517-2721	1.4404	Viton	5,6	40
10.7720-12	517-2722	1.4404	EPDM	5,6	40
10.7720-04	517-2741	PP	Viton	5,6	10
10.7720-14	517-2742	PP	EPDM	5,6	10
10.7720-25	517-2753	PVDF	PTFE	5,6	20
10.7721-01	517-2811	PVC	Viton	9,5	10

10.7721-11	517-2812	PVC	EPDM	9,5	10
10.7721-02	517-2821	Stainless steel	Viton	9,5	30
10.7721-12	517-2822	Stainless steel	EPDM	9,5	30
10.7721-04	517-2841	PP	Viton	9,5	10
10.7721-14	517-2842	PP	EPDM	9,5	10
10.7721-25	517-2853	PVDF	PTFE	9,5	20

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