TORAFLEX TYPE S10-S15-S20

TORAFLEX Rubber Joints are devised for piping works, consisting of a flexible main shell made of synthetic rubber with inner reinforcements to provide consistency, and pipe connections by means of loose flanges or threaded unions. Noise and vibrations caused by equipment such as pumps are absorbed by Rubber Joints. Rubber Joints balance thermal movements in rigid systems due to temperature changes, provide a great assistance to the plant commissioning team by balancing slight pipe works misalignments and can even be used as telescopic mounting kits.
Rubber joints can withstand surge pressures and mitigate the effects caused by water hammers thanks to their relatively high tensile strength. Its non-conductive feature avoids the electrolysis problem that appears when putting two different metals in contact.
A correct pipe system arrangement and installation according to our Installation Operating and Maintenance Manual is essential to ensure a safe performance.

Light and easy to install, little installation space required, easy maintenance of replaceable bellows

4 different allowable movements: axial compression and expansion, lateral and angular deflection

Loose flanges for easy assembly, specially machined to accept the full turned rubber, with standard execution in zinc plated steel

Full turned rubber design, self-sealing, no additional gaskets are required; it prevents electrolytic corrosion

Precision injection molded of synthetic rubber and nylon

Outer layer protects the bellows surface form eventual ozone attack, strikes and other environmental aggressions

Rugged design with high burst pressure, to absorb noise and vibration and withstand water hammers to a certain extent by:
-Inner Reinforcement placed in between the outer and inner layers, made of braided nylon fabrics as standard
-End Bellows reinforcement

Lot number punched for full traceability purpose

Rubber material identification and maximum service pressure & temperature

S10/15
Spherical design for better strength and efficiency

S20
Double sphere design allows greater axial, lateral and angular movements subject to less effort and material wearing down during movements. With optional root ring

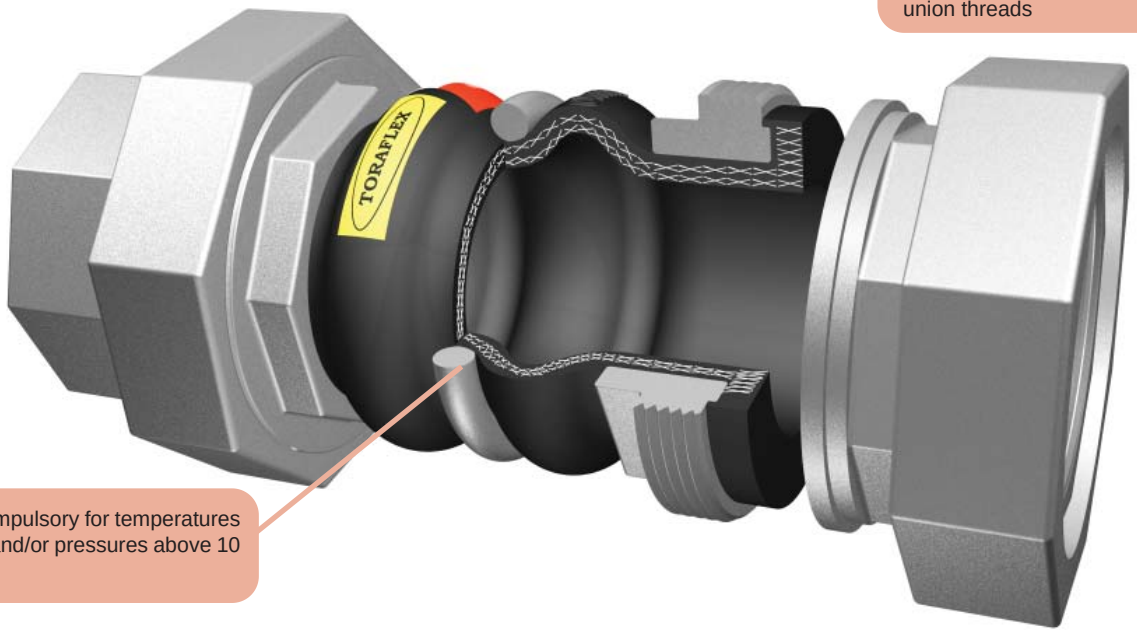
Main Features

Nominal Pressure: PN10 / PN16
Valve end connections: Loose flanges drilled to EN1092-1 PN10, PN16, or ASME B16.5 ASA150
Marking: EN 19
Pressure Tests: EN 12266-1
Rubber Joints are excluded from the Pressure Equipment Directive PED 97/23/CE, according to its article 1.3-15.

TYPE S30

S30
Double Sphere design for better strength and efficiency allow greater axial, lateral and angular movements subject to less effort and material wearing down during movements

Precision injection moulded of synthetic rubber inserted into union threads



Root ring, compulsory for temperatures above 50ºC and/or pressures above 10 bar

Outer layer protects the bellows surface form eventual ozone attack, strikes and other environmental aggressions

Rugged design with high burst pressure, to absorb noise and vibration and withstand water hammers to a certain extent

Light and easy to install, little installation space required, easy maintenance of replaceable bellows

Lot number punched for full traceability purpose

Rubber material identification and maximum service pressure & temperature

Main Features

Nominal Pressure: PN10 / PN16
Valve end connections: Threaded unions to EN 10266-1, with parallel female threads GAS-Rp-BSPP
Marking: EN 19
Pressure Tests: EN 12266-1
Rubber Joints are excluded from the Pressure Equipment Directive PED 97/23/CE, according to its article 1.3-15.

Codification

S	1	0	E	1	0	0	0	0	0	0	0	5	0

DESIGN	
S10	Single sphere Rubber Joints with flanges
S15	Single sphere Rubber Joints with flanges
S20	Double sphere Rubber Joints with flanges
S30	Double sphere Rubber Joints with Threaded Unions

MATERIAL OF RUBBER	
E	EPDM
N	NBR
H	Hypalon
V	Viton
C	Neoprene
T	PTFE

CONNECTIONS	
10	Flanges drilled to EN 1092-1 DIN PN10
16	Flanges drilled to EN 1092-1 DIN PN16
AS	Flanges drilled to B16.5 Class 150
00	Female Threaded unions, BSPP
NP	Female Threaded unions, NPT

CONNECTIONS MATERIAL	
0	Standard
G	Hot Dip Galvanized
I	Stainless Steel 316
J	Stainless Steel 304

ADDING PERFORMANCE	
0	None
R	Root Ring Reinforcement (For S20/S30 only)
V	Vulcanized Vacuum Reinforcement Ring
T	External Vacuum Reinforcement Ring

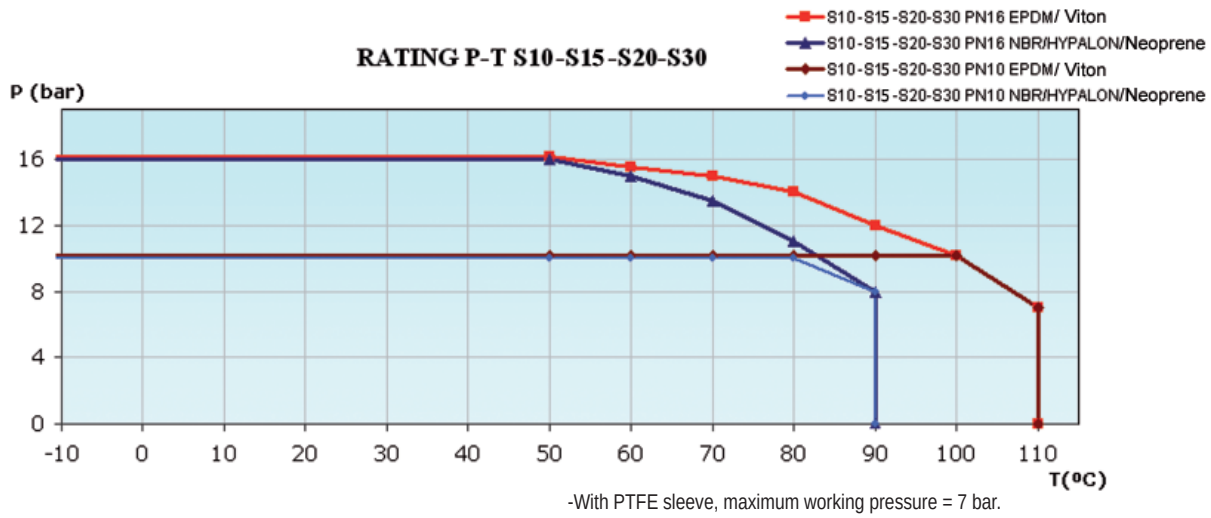
LIMITERS	
0	None
T	Carbon Steel Tie Rods

OTHER SPECIAL OPTIONS	
0	Standard

VALVE SIZE	
050	DN50
100	DN100
912	DN1200

Main Duties / Limits of use

Liquids and gases compatible with materials of construction.
Questions referring to chemical resistance, please consult us



-With PTFE sleeve, maximum working pressure = 7 bar.
-Check also medium-rubber compatibility / resistance / limits of use

JOINT	BURST PRESSURE
S10-S15-S20 DN32-200 (1.1/4"-8")	60 bar
S10-S15-S20 DN200-600 (10"-24")	40 bar
S30 DN15-80 (1/2"-3")	30 bar

Vacuum aplication

- Rubber Joints are resistant to negative pressures to a certain extent. They can become wrinkled depending on vacuum suction degree; herewith the guidelines for vacuum applications:

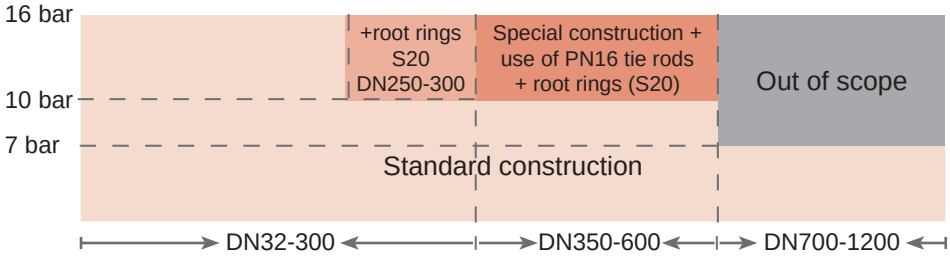
JOINT	VACUUM LIMIT
S10 up to DN100 S10 DN125-600	-0,85 bar-g (0,15 bar-abs) * -0,50 bar-g (0,50 bar-abs) *
S15 up to DN300	Full vacuum
S20 up to DN600	-0,40 bar-g (0,60 bar-abs) **
S30 up to DN80	-0,50 bar-g (0,50 bar-abs)

* For full vacuum, use embedded special vacuum ring version

** -0,85 bar-g (0,15 bar-abs) with not embedded vacuum ring

PTFE joint is not suitable for vacuum service

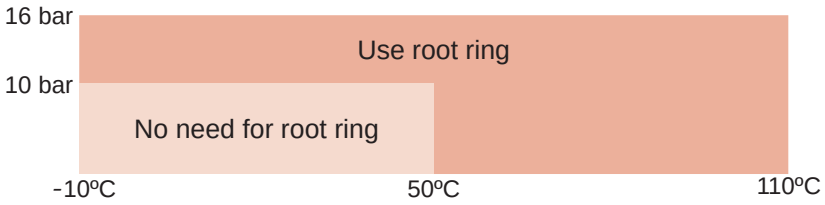
Maximum working pressure for S10/15/20



- With PTFE sleeve maximum working pressure = 7 bar.

- For PN16 construction it is particularly important to ensure that pipeline and counterflange are 90º and perpendicular to each other.

Maximum working pressure for S30



Options

Other designs and approvals, please consult us

Main Duties / Limits of use

Temperature and Chemical Resistance of Bellows

NBR Butadiene Acrylonitrile (-20ºC) -10ºC ... 75ºC (90ºC)
Lubricating oil, cutting oils, fuel oils, animal and vegetable oils, aviation kerosen, LPG, oily air, natural gas.
Generally resistant to oils and solvents. Not suitable for steam or hot water. Limited resistance to ozone and wheather.

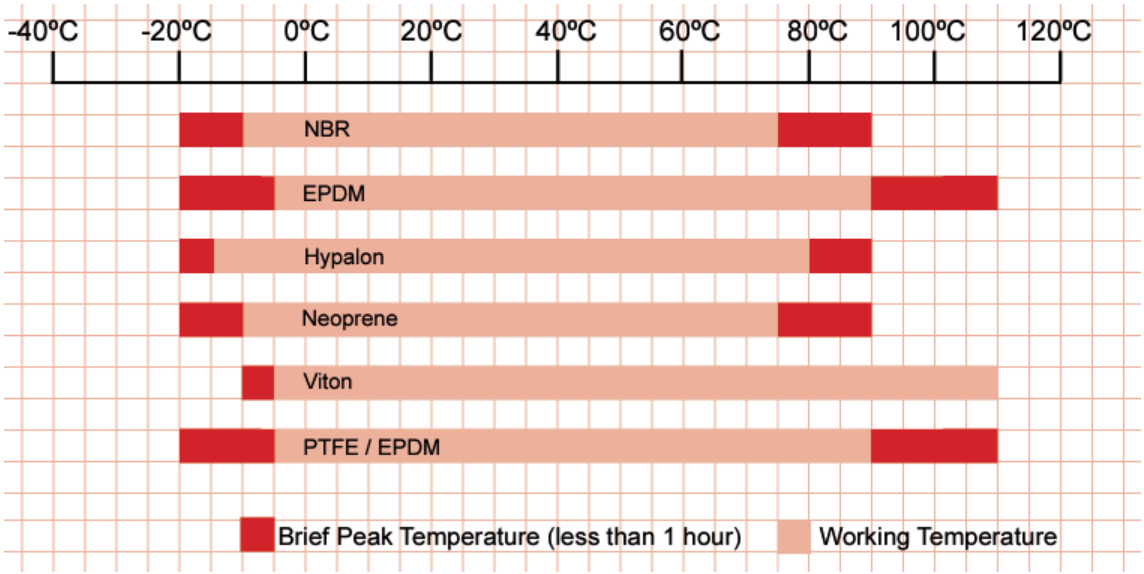
EPDM Ethylene Propylene Diene (-20ºC) -5ºC ... 90ºC (110ºC)
Salts in water, diluted acids, alkaline solutions, ester, ketones, alcohols, glycols, hot water, intermittent steam, sterilisation.
Good resistance to ozone and wheather.
It is attacked by hydrocarbon solutions, chlorinated hydrocarbons and other petroleum based oils.

Hypalon (CSM) Chlorosulfonated polyethylene (-20ºC) -10ºC ... 80ºC (90ºC)
Good chlorine and weather resistance. Resistant to diluted acids and bases. Low resistance to oil and fats.

Neoprene (CR) Chloroprene rubber (-20ºC) -10ºC ... 75ºC (90ºC)
Good behaviour with water and many oils, and generally with many inorganic and organic products. Nearly tight with hydrocarbon gases. Good resistance to weather.

Viton (FPM) Vinylidenefluoride-hexafluoro-propyleneco-polymer (-10ºC) -5ºC ... 110ºC
Strong and weak mineral acids, aliphatic hydrocarbons, chlorine gas, oils, aliphatic acids, phosporic acids, ozone, certain aromatic solvents. Not suitable for hot water, steam and dry heat. Not suitable for ketones and chlorine.

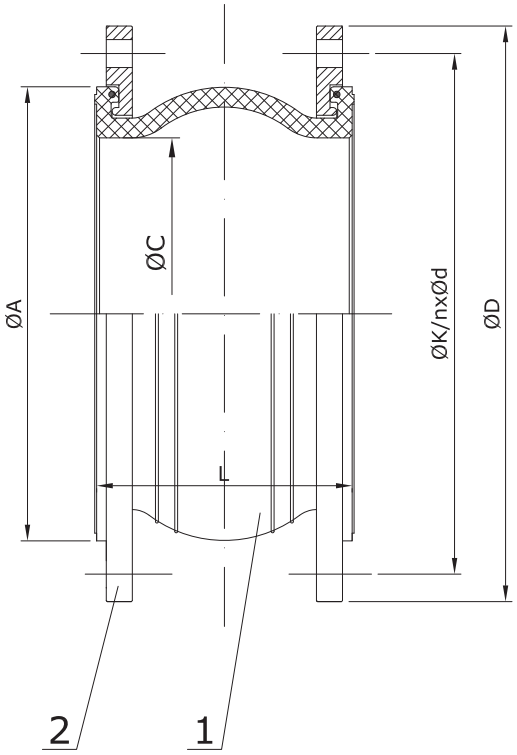
PTFE/EPDM Virgin PTFE + EPDM (-20ºC) -5ºC ... 90ºC (110ºC)
Excellent resistance to chemicals or biopharmaceuticals, strong acids and solvents, alkalies and salts in water.
Excellent resistance to weather.



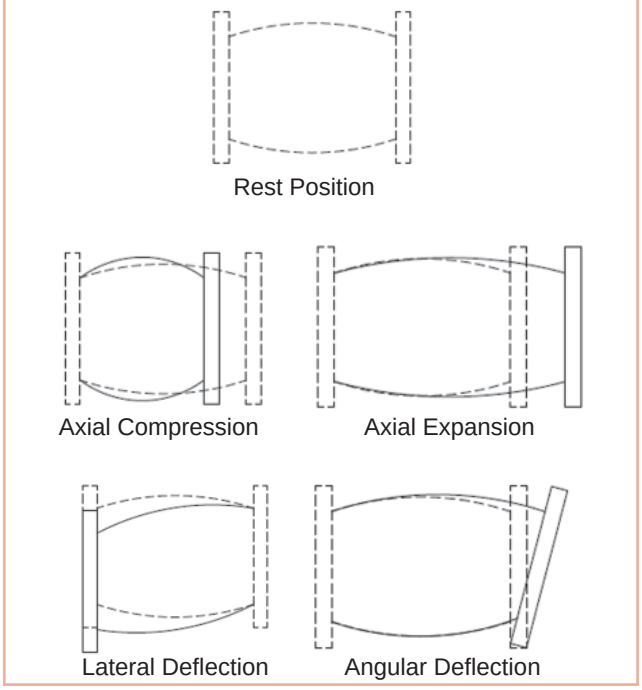
Temperature ranges given just for reference.
Pressure-temperature rating, material compatibility and other parameters also to be considered for rubber selection.
Please consult our Technical Department for a particular application.

Main Parts and Materials

TYPE S10 DN32-600



Permissible Movements



Nº	PART	MATERIAL			
1	VULCANISED RUBBER BELLOW With nylon tire cord and hard steel wire reinforcement	S10E_	EPDM	S10C_	Neoprene
		S10N_	NBR	S10V_	Viton
		S10H_	Hypalon		
2	LOOSE FLANGES	Carbon Steel Zinc Plated S235JR (EN10025)			

Main Valve Parameters

SIZE	NPS	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	5"	6"
	DN	32	40	50	65	80	100	125	150
	L	95	95	105	115	130	135	170	180
	Tolerance Installed (min-max)	89-97	89-97	99-107	107-118	122-133	122-138	156-173	167-183
MAX. MOVEMENTS*	AXIAL COMPRES.	8	8	8	12	12	18	18	18
	AXIAL EXPANS.	4	5	6	6	10	10	10	10
	LATERAL DEFL.	8	8	8	10	10	12	12	12
	ANGULAR DEFL.	15°	15°	15°	15°	15°	15°	15°	15°
	ØA	68	68	86	106	118	152	182	213
	ØC	35	37	50	65	72	98	122	146
FLANGES PN10	ØD	140	150	165	185	200	220	250	285
	ØK	100	110	125	145	160	180	210	240
	nxØd	4x18	4x18	4x18	4x18	8x18	8x18	8x18	8x22
	Approx. Weight	3,5	4	5	6	8	9	11	13
FLANGES PN16	ØD	140	150	165	185	200	220	250	285
	ØK	100	110	125	145	160	180	210	240
	nxØd	4x18	4x18	4x18	4x18	8x18	8x18	8x18	8x22
	Approx. Weight	3,5	4	5	6	8	9	11	13
FLANGES ANSI150	ØD	118	127	153	178	191	229	254	279
	ØK	89	98	121	140	152	191	216	241
	nxØd	4x16	4x16	4x19	4x19	4x19	8x19	8x22	8x22
	Approx. Weight	3,5	4	5	6	8	9	11	13

Dimensions in mm subject to manufacturing tolerance / Weights in kg

* The maximum movements allowed are considered from rest position.
The stated movements are solely valid with the joint subject to a single movement direction. Values are proportionally reduced along with the movement combination. Given tolerance installed and movements allowed are valid for rubber bellows.
Increasing temperatures reduce the permissible movements capacity and number of cycles.
Information / restriction of technical rules need to be observed!
Installation, Operating and Maintenance Manual can be downloaded at www.comeval.es

The engineer, designing a system or a plant, is responsable for the selection of the correct valve
Product suitability must be verified, contact manufacturer for information

Main Valve Parameters

TYPE S10 DN32-600

SIZE	NPS	8”	10”	12”	14”	16”	18”	20”	24”
	DN	200	250	300	350	400	450	500	600
	L	205	240	260	265	265	265	265	265
	Tolerance Installed (min-max)	186-208	221-243	241-263	246-268	246-268	246-268	246-268	246-268
MAX. MOVEMENTS*	AXIAL COMPRES.	25	25	25	25	25	25	25	25
	AXIAL EXPANS.	14	14	14	14	14	14	14	14
	LATERAL DEFL.	22	22	22	22	22	22	22	22
	ANGULAR DEFL.	15°	15°	15°	15°	15°	15°	15°	15°
	ØA	262	323	372	409	471	520	572	690
	ØC	194	245	295	320	365	420	480	585
FLANGES PN10	ØD	340	395	445	505	565	615	670	780
	ØK	295	350	400	460	515	565	620	725
	nxØd	8x22	12x22	12x22	16x22	16x22	20x26	20x26	20x30
	Approx. Weight	19	24	29	39	48	56	69	71
FLANGES PN16	ØD	340	405	460	520	580	640	715	840
	ØK	295	355	410	470	525	585	650	770
	nxØd	12x22	12x26	12x26	16x26	16x30	20x30	20x33	20x36
	Approx. Weight	19	27	33	48	62	73	111	138
FLANGES ANSI150	ØD	343	406	483	533	597	635	699	813
	ØK	298	362	432	476	540	578	635	479
	nxØd	8x22	12x25	12x25	12x29	16x29	16x32	20x32	20x32
	Approx. Weight	19	27	33	48	62	73	111	138

Dimensions in mm subject to manufacturing tolerance / Weights in kg

* The maximum movements allowed are considered from rest position.
The stated movements are solely valid with the joint subject to a single movement direction. Values are proportionally reduced along with the movement combination. Given tolerance installed and movements allowed are valid for rubber bellows.
Increasing temperatures reduce the permissible movements capacity and number of cycles.

TYPE S10 DN700-1200

Nº	PART	MATERIAL	
1	VULCANISED RUBBER BELLOW With nylon tire cord and hard steel wire reinforcement	S10E_	EPDM
		S10N_	NBR
2	LOOSE FLANGES	Carbon Steel Zinc Plated S235JR (EN10025)	

Main Valve Parameters

SIZE	NPS	28”	32”	36”	40”	48”
	DN	700	800	900	1000	1200
	L	265	265	265	265	265
	Tolerance Installed (min-max)	246-268	246-268	246-268	246-268	246-268
MAX. MOVEMENTS*	AXIAL COMPRES.	25	25	25	25	25
	AXIAL EXPANS.	14	14	14	14	14
	LATERAL DEFL.	22	22	22	22	22
	ANGULAR DEFL.	8°	4°	4°	2°	2°
	ØA	776	878	984	1078	1285
	ØC	686	786	886	986	1180
	Approx. Weight					
FLANGES PN10	ØD	895	1015	1115	1230	1455
	ØK	840	950	1050	1160	380
	nxØd	30x30	24x33	28x33	28x36	32x39
FLANGES PN16	ØD	910	1025	115	1230	1485
	ØK	840	950	1050	1170	1390
	nxØd	24x36	24x39	28x39	28x42	32x48

Dimensions in mm subject to manufacturing tolerance / Weights in kg

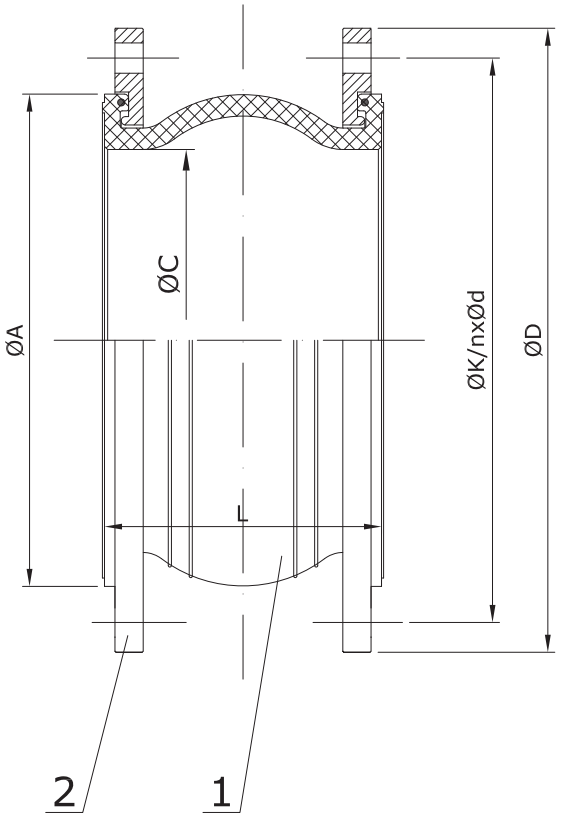
* The maximum movements allowed are considered from rest position.
The stated movements are solely valid with the joint subject to a single movement direction. Values are proportionally reduced along with the movement combination. Given tolerance installed and movements allowed are valid for rubber bellows.
Increasing temperatures reduce the permissible movements capacity and number of cycles.

Information / restriction of technical rules need to be observed!
Installation, Operating and Maintenance Manual can be downloaded at www.comeval.es

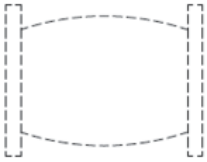
The engineer, designing a system or a plant, is responsable for the selection of the correct valve
Product suitability must be verified, contact manufacturer for information

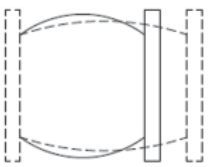
Main Parts and Materials

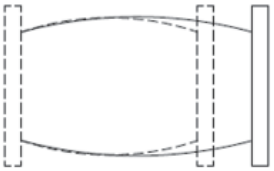
TYPE S10T DN25-500

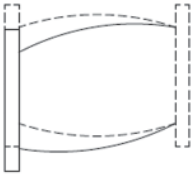


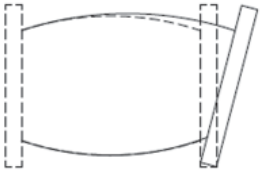
Permissible Movements


Rest Position


Axial Compression


Axial Expansion


Lateral Deflection


Angular Deflection

Nº	PART		MATERIAL
1	VULCANISED RUBBER BELLOW With nylon tire cord and hard steel wire reinforcement	S10T_	EPDM + PTFE inner sleeve
2	LOOSE FLANGES		Carbon Steel Zinc Plated S235JR (EN10025)

Main Valve Parameters

SIZE	NPS	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	5"
	DN	25	32	40	50	65	80	100	125
	L	102	102	102	112	122	137	142	177
	Tolerance Installed (min-max)	99-103	99-103	99-103	109-113	118-123	133-138	136-144	170-179
MAX. MOVEMENTS*	AXIAL COMPRES.	4	4	4	6	6	9	9	9
	AXIAL EXPANS.	2	2	3	3	5	5	5	5
	LATERAL DEFL.	4	4	4	5	5	6	6	6
	ANGULAR DEFL.	7°	7°	7°	7°	7°	7°	7°	7°
	ØA	60	63	68	86	106	118	152	182
	ØC	18	23	30	43	58	70	91	115
FLANGES PN10	ØD	115	140	150	165	185	200	220	250
	ØK	85	100	110	125	145	160	180	210
	nxØd	4x14	4x18	4x18	4x18	4x18	8x18	8x18	8x18
	Approx. Weight	3,5	4	4,5	5,5	6,5	8,5	9,5	12
FLANGES PN16	ØD	115	140	150	165	185	200	220	250
	ØK	85	100	110	125	145	160	180	210
	nxØd	4x14	4x18	4x18	4x18	8x18	8x18	8x18	8x18
	Approx. Weight	3,5	4	4,5	5,5	6,5	8,5	9,5	12

Dimensions in mm subject to manufacturing tolerance / Weights in kg

* The maximum movements allowed are considered from rest position.
The stated movements are solely valid with the joint subject to a single movement direction. Values are proportionally reduced along with the movement combination.
Increasing temperatures reduce the permissible movements capacity and number of cycles.

Information / restriction of technical rules need to be observed!
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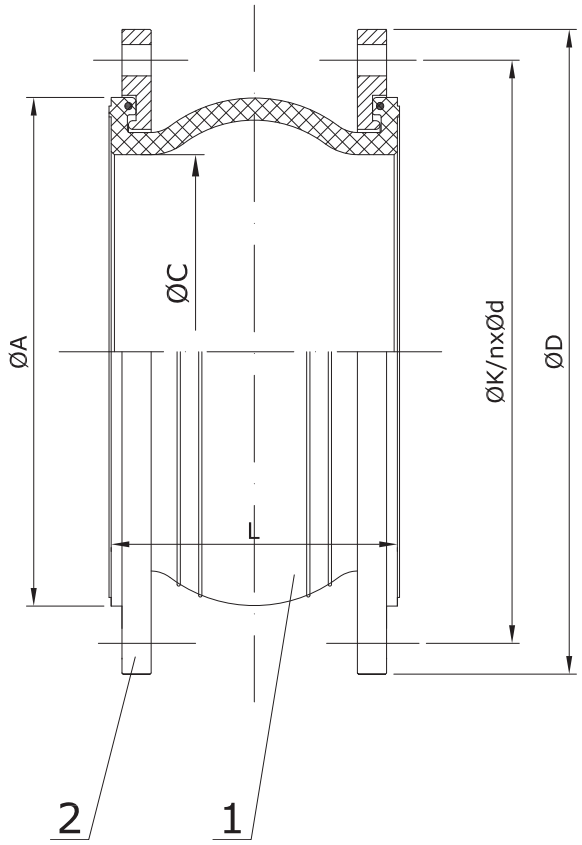
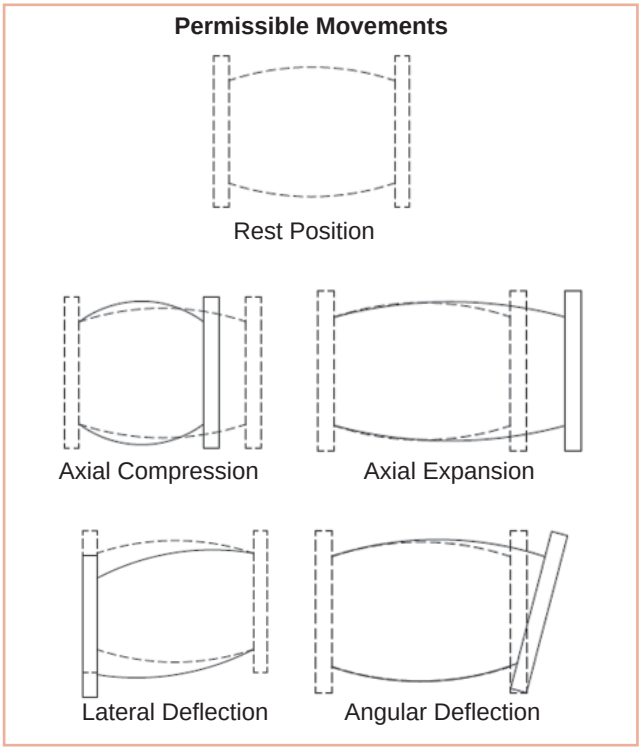
The engineer, designing a system or a plant, is responsable for the selection of the correct valve
Product suitability must be verified, contact manufacturer for information

TYPE S10T DN25-500





Main Valve Parameters

SIZE	NPS	6"	8"	10"	12"	14"	16"	18"	20"
	DN	150	200	250	300	350	400	450	500
L		187	212	247	267	272	272	272	272
Tolerance Installed (min-max)		181-189	203-215	238-250	258-270	264-276	264-276	264-276	264-276
MAX. MOVEMENTS*	AXIAL COMPRES.	12	12	12	12	12	12	12	12
	AXIAL EXPANS.	7	7	7	7	7	7	7	7
	LATERAL DEFL.	11	11	11	11	11	11	11	11
	ANGULAR DEFL.	7°	7°	7°	7°	7°	7°	7°	7°
ØA		213	262	323	372	410	473	520	572
ØC		139	187	238	288	323	373	421	473
FLANGES PN10	ØD	285	340	395	445	505	565	615	670
	ØK	240	295	350	400	460	515	565	620
	nxØd	8x22	8x22	12x22	12x22	16x22	16x26	20x26	20x26
	Approx. Weight	14	20	25	30	41	50	58	71
FLANGES PN16	ØD	285	340	405	560	520	580	640	715
	ØK	240	295	355	410	470	525	585	650
	nxØd	8x22	12x22	12x26	12x26	16x26	16x30	20x30	20x33
	Approx. Weight	14	20	25	30	41	50	58	71

Dimensions in mm subject to manufacturing tolerance / Weights in kg

* The maximum movements allowed are considered from rest position.
The stated movements are solely valid with the joint subject to a single movement direction. Values are proportionally reduced along with the movement combination.
Increasing temperatures reduce the permissible movements capacity and number of cycles.

Information / restriction of technical rules need to be observed!
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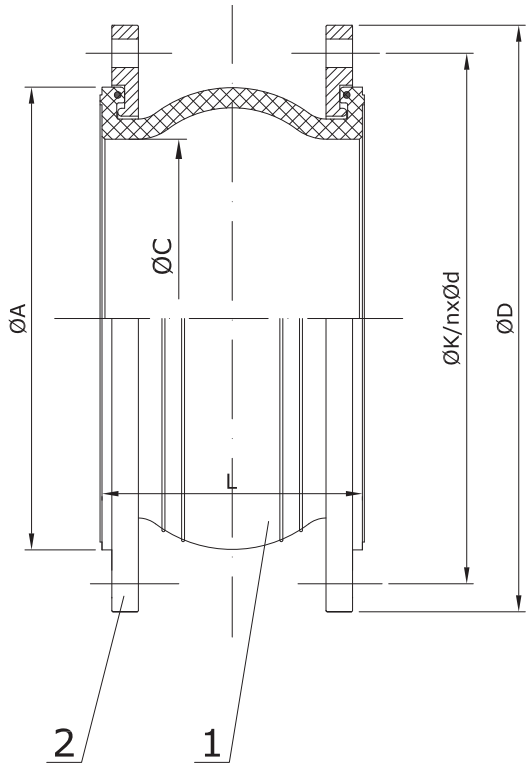
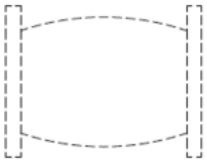
The engineer, designing a system or a plant, is responsable for the selection of the correct valve
Product suitability must be verified, contact manufacturer for information

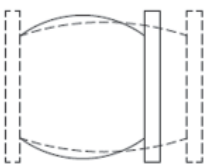
Main Parts and Materials

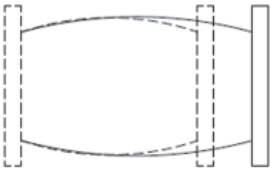
TYPE S15

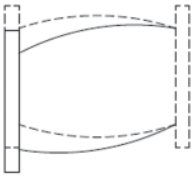


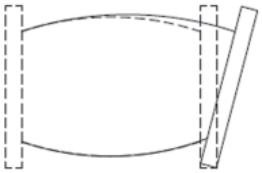
Permissible Movements


Rest Position


Axial Compression


Axial Expansion


Lateral Deflection


Angular Deflection

Nº	PART	MATERIAL			
1	VULCANISED RUBBER BELLOW With nylon tire cord and hard steel wire reinforcement	S15E_	EPDM	S15C_	Neoprene
		S15N_	NBR	S15V_	Viton
		S15H_	Hypalon		
2	LOOSE FLANGES	Carbon Steel Zinc Plated S235JR (EN10025)			

Main Valve Parameters

SIZE	NPS	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
	DN	25	32	40	50	65	80
	L	130	130	130	130	130	130
	Tolerance Installed (min-max)	122-133	122-133	122-133	122-133	122-133	122-133
MAX. MOVEMENTS*	AXIAL COMPRES.	30	30	30	30	30	30
	AXIAL EXPANS.	20	20	20	20	20	20
	LATERAL DEFL.	30	30	30	30	30	30
	ANGULAR DEFL.	35°	35°	35°	35°	30°	30°
	ØA	60	68	68	86	106	118
	ØC	25	35	37	50	65	72
FLANGES PN10	ØD	115	140	150	165	185	200
	ØK	85	100	110	125	145	160
	nxØd	4x14	4x18	4x18	4x18	4x18	8x18
	Approx. Weight	4	4	4,5	5,5	7	8
FLANGES PN16	ØD	115	140	150	165	185	200
	ØK	85	100	110	125	145	160
	nxØd	4x14	4x18	4x18	4x18	4x18	8x18
	Approx. Weight	4	4	4,5	5,5	7	8
FLANGES ANSI150	ØD	108	118	127	153	178	191
	ØK	79	89	98	121	140	152
	nxØd	4x16	4x16	4x16	4x19	4x19	4x19
	Approx. Weight	4	4	4,5	5,5	7	8

Dimensions in mm subject to manufacturing tolerance / Weights in kg

* The maximum movements allowed are considered from rest position.
The stated movements are solely valid with the joint subject to a single movement direction. Values are proportionally reduced along with the movement combination. Given tolerance installed and movements allowed are valid for rubber bellows.
Increasing temperatures reduce the permissible movements capacity and number of cycles.
Information / restriction of technical rules need to be observed!
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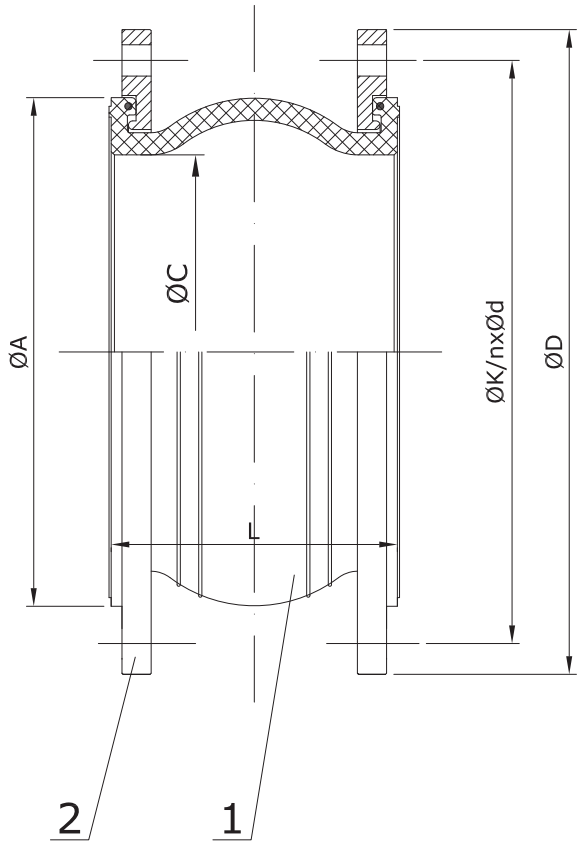
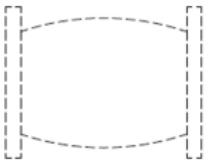
The engineer, designing a system or a plant, is responsable for the selection of the correct valve
Product suitability must be verified, contact manufacturer for information

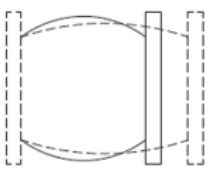
TYPE S15



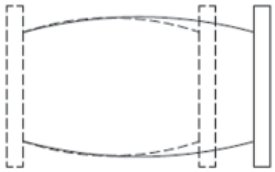
Permissible Movements



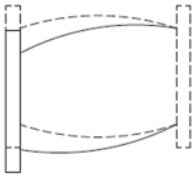
Rest Position



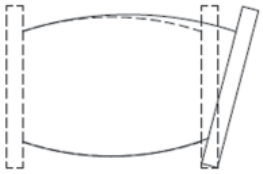
Axial Compression



Axial Expansion



Lateral Deflection



Angular Deflection

Main Valve Parameters

SIZE	NPS	4”	5”	6”	8”	10”	12”
	DN	100	125	150	200	250	300
L		130	130	130	130	130	130
Tolerance Installed (min-max)		122-133	122-133	122-133	122-133	122-133	122-133
MAX. MOVEMENTS*	AXIAL COMPRES.	30	30	30	30	30	30
	AXIAL EXPANS.	20	20	20	20	20	20
	LATERAL DEFL.	30	30	30	30	30	30
	ANGULAR DEFL.	25°	25°	15°	15°	10°	10°
ØA		152	182	213	262	323	372
ØC		98	122	146	194	245	295
FLANGES PN10	ØD	220	250	285	340	395	445
	ØK	180	210	240	295	350	400
	nxØd	8x18	8x18	8x22	8x22	12x22	12x22
	Approx. Weight	9	11	13	19	24	29
FLANGES PN16	ØD	220	250	285	340	405	460
	ØK	180	210	240	295	355	410
	nxØd	8x18	8x18	8x22	12x22	12x26	12x26
	Approx. Weight	9	11	13	19	27	33
FLANGES ANSI150	ØD	229	254	279	343	406	483
	ØK	191	216	241	298	362	432
	nxØd	8x19	8x22	8x22	8x22	12x25	12x25
	Approx. Weight	9	11	13	19	27	33

Dimensions in mm subject to manufacturing tolerance / Weights in kg

* The maximum movements allowed are considered from rest position.
The stated movements are solely valid with the joint subject to a single movement direction. Values are proportionally reduced along with the movement combination. Given tolerance installed and movements allowed are valid for rubber bellows.
Increasing temperatures reduce the permissible movements capacity and number of cycles.

Information / restriction of technical rules need to be observed!
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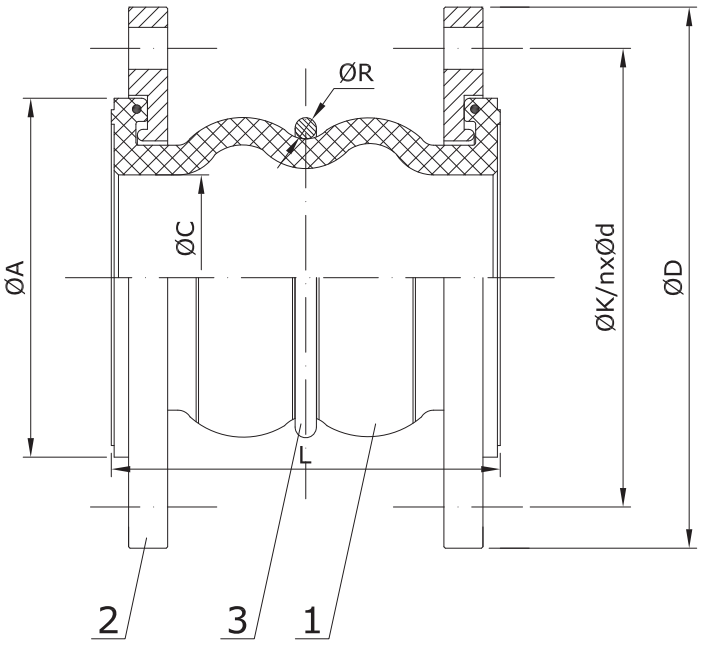
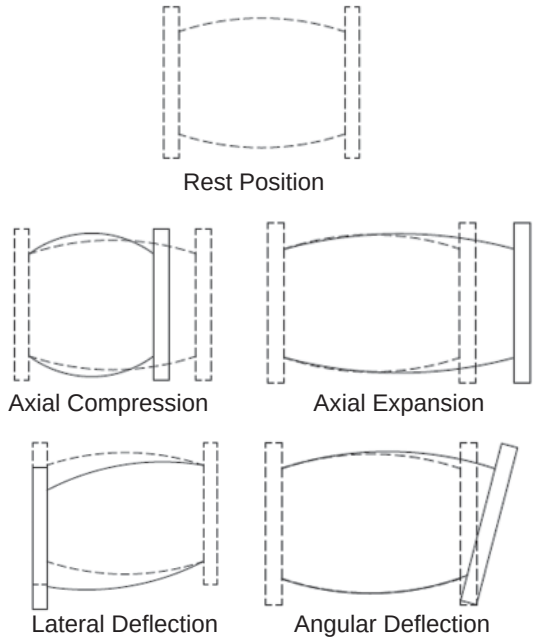
The engineer, designing a system or a plant, is responsable for the selection of the correct valve
Product suitability must be verified, contact manufacturer for information

Main Parts and Materials

TYPE S20



Permissible Movements



Nº	PART	MATERIAL			
1	VULCANISED RUBBER BELLOW With nylon tire cord and hard steel wire reinforcement	S20E_	EPDM	S20C_	Neoprene
		S20N_	NBR	S20V_	Viton
		S20H_	Hypalon		
2	LOOSE FLANGES	Carbon Steel Zinc Plated S235JR (EN10025)			
3	ROOT RING (Optional)	Malleable Iron Zinc Plated EN-GJMB-350-10 (EN1562)			

Main Valve Parameters

SIZE	NPS	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	5"	6"
	DN	32	40	50	65	80	100	125	150
	L	175	175	175	175	175	225	225	225
	Tolerance Installed (min-max)	168-178	168-178	168-178	168-178	168-178	218-228	218-228	218-228
MAX. MOVEMENTS*	AXIAL COMPRES.	50	50	50	50	50	57	57	57
	AXIAL EXPANS.	30	30	30	30	30	35	35	35
	LATERAL DEFL.	35	35	35	35	35	40	40	40
	ANGULAR DEFL.	40°	40°	40°	40°	40°	35°	35°	35°
	ØA	68	68	86	106	118	152	182	213
	ØC	35	37	50	65	77	98	122	146
	ØR	26	26	26	26	26	26	26	26
FLANGES PN10	ØD	140	150	165	185	200	220	250	285
	ØK	100	110	125	145	160	180	210	240
	nxØd	4x18	4x18	4x18	4x18	8x18	8x18	8x18	8x22
	Approx. Weight	3,5	4	5,5	6	8	9	12	14
FLANGES PN16	ØD	140	150	165	185	200	220	250	285
	ØK	100	110	125	145	160	180	210	240
	nxØd	4x18	4x18	4x18	4x18	8x18	8x18	8x18	8x22
	Approx. Weight	3,5	4	5,5	6	8,0	9	12	14
FLANGES ANSI150	ØD	118	127	153	178	191	229	254	279
	ØK	89	98	121	140	152	191	216	241
	nxØd	4x16	4x16	4x19	4x19	4x19	8x19	8x22	8x22
	Approx. Weight	3,5	4	5,5	6	8	9	12	14

Dimensions in mm subject to manufacturing tolerance / Weights in kg

* The maximum movements allowed are considered from rest position.

The stated movements are solely valid with the joint subject to a single movement direction. Values are proportionally reduced along with the movement combination. Given tolerance installed and movements allowed are valid for rubber bellows.

Increasing temperatures reduce the permissible movements capacity and number of cycles.

Information / restriction of technical rules need to be observed!

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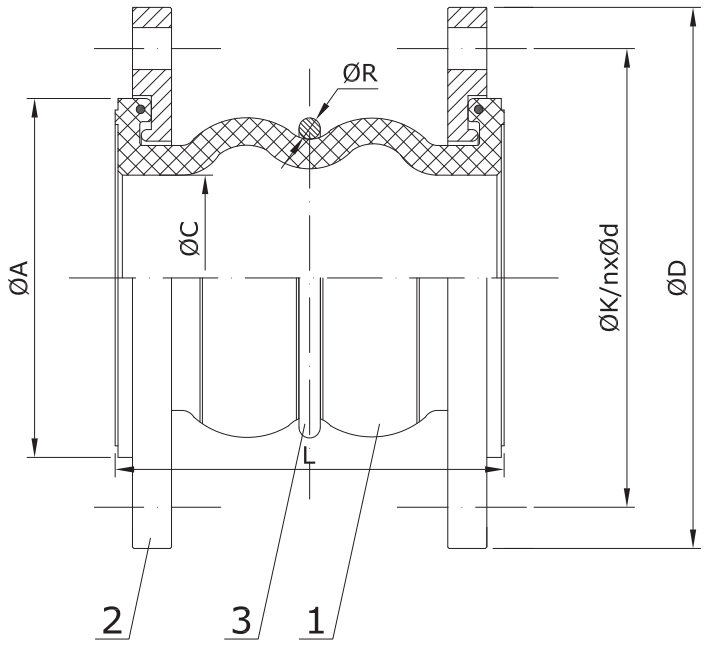
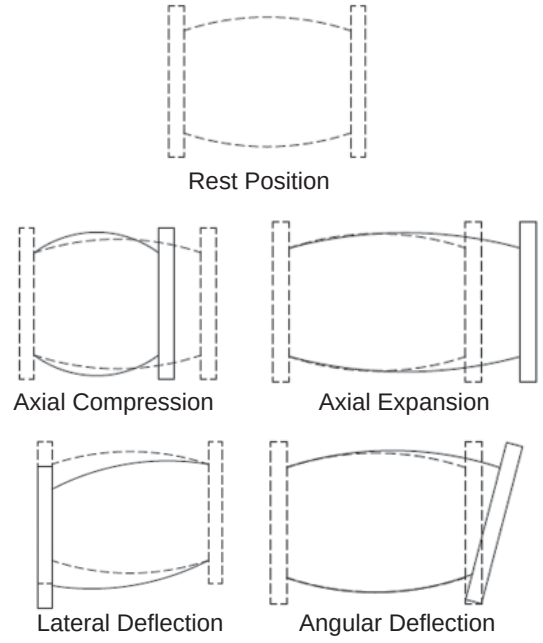
Product suitability must be verified, contact manufacturer for information

TYPE S20



Permissible Movements



Main Valve Parameters

SIZE	NPS	8"	10"	12"	14"	16"	18"	20"	24"
	DN	200	250	300	350	400	450	500	600
L		325	325	325	350	350	350	350	350
Tolerance Installed (min-max)		318-328	318-328	318-328	344-353	344-353	344-353	344-353	344-353
MAX. MOVEMENTS*	AXIAL COMPRES.	63	63	63	40	40	40	40	40
	AXIAL EXPANS.	35	35	35	30	30	30	30	30
	LATERAL DEFL.	45	45	45	30	30	30	30	30
	ANGULAR DEFL.	30°	30°	30°	20°	20°	20°	20°	20°
	ØA	262	323	372	410	473	522	570	690
	ØC	194	245	295	330	380	428	476	596
	ØR	26	26	26	40	40	40	40	40
FLANGES PN10	ØD	340	395	445	505	565	615	670	780
	ØK	295	350	400	460	515	565	620	725
	nxØd	8x22	12x22	12x22	16x22	16x22	20x26	20x26	20x30
	Approx. Weight	20	26	32	42	54	62	77	82
FLANGES PN16	ØD	340	405	460	520	580	640	715	840
	ØK	295	355	410	470	525	585	650	770
	nxØd	12x22	12x26	12x26	16x26	16x30	20x30	20x33	20x36
	Approx. Weight	21	29	35	50	67	77	119	147
FLANGES ANSI150	ØD	343	406	483	533	597	635	699	813
	ØK	298	362	432	476	540	578	635	479
	nxØd	8x22	12x25	12x25	12x29	16x29	16x32	20x32	20x32
	Approx. Weight	21	29	35	50	67	77	119	147

Dimensions in mm subject to manufacturing tolerance / Weights in kg

* The maximum movements allowed are considered from rest position.
The stated movements are solely valid with the joint subject to a single movement direction. Values are proportionally reduced along with the movement combination. Given tolerance installed and movements allowed are valid for rubber bellows.
Increasing temperatures reduce the permissible movements capacity and number of cycles.

Information / restriction of technical rules need to be observed!
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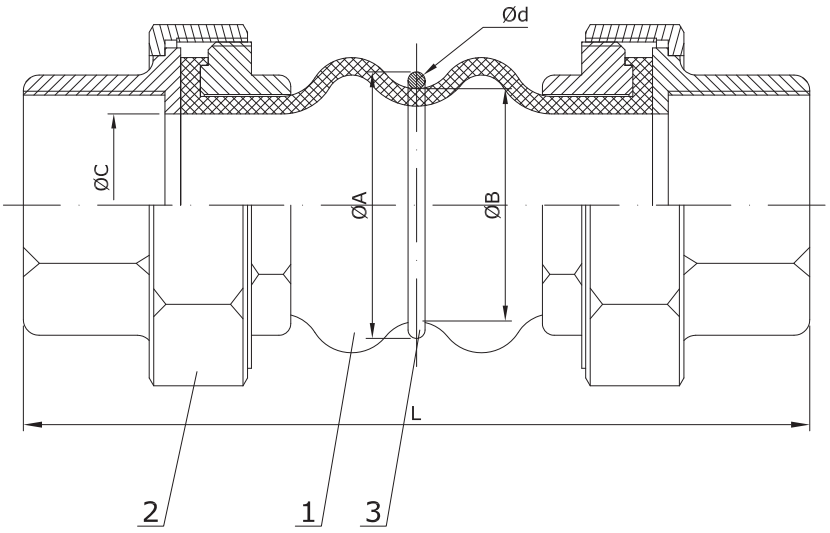
The engineer, designing a system or a plant, is responsable for the selection of the correct valve
Product suitability must be verified, contact manufacturer for information

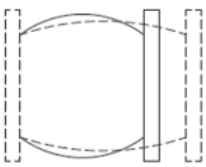
Main Parts and Materials

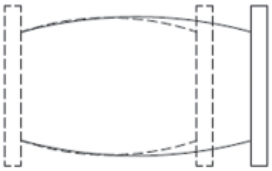
TYPE S30

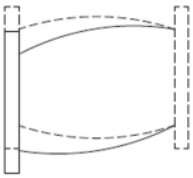


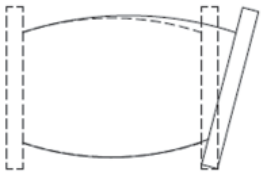
Permissible Movements


Rest Position


Axial Compression


Axial Expansion


Lateral Deflection


Angular Deflection

Nº	PART		MATERIAL
1	VULCANISED RUBBER BELLOW With nylon tire cord and hard steel wire reinforcement	S30E_	EPDM
		S30N_	NBR
		S30H_	Hypalon
		S30C_	Neoprene
		S30V_	Viton
2	UNIONS WITH THREADED ENDS	Malleable Iron Zinc Plated EN-GJMB-350-10 (EN1562)	
3	ROOT RING (Optional)	Malleable Iron Zinc Plated EN-GJMB-350-10 (EN1562)	

Main Valve Parameters

SIZE	NPS	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
	DN	20	25	32	40	50	65	80
L		200	200	200	200	200	240	240
Tolerance Installed (min-max)		194-203	194-203	194-203	194-203	194-203	234-243	234-243
MAX. MOVEMENTS*	AXIAL COMPRES.	22	22	22	22	22	22	22
	AXIAL EXPANS.	6	6	6	6	6	6	6
	LATERAL DEFL.	22	22	22	22	22	22	22
	ANGULAR DEFL.	45°	45°	45°	45°	45°	45°	45°
ØC		17	25	32	39	47	60	70
ØA		46	55	65	72	84	100	112
ØB		30	39	45	52	64	80	92
Ød			8	10	10	10	10	10
Approx. Weight		1	1,5	1,5	2	3	4	5,5

Dimensions in mm subject to manufacturing tolerance / Weights in kg

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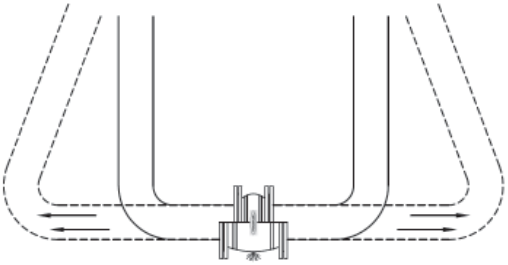
Reaction Forces

Rubber Joints are flexible components which break the pipe system rigidity. A Rubber Joint acts as a piston by the forces arising from the internal pressure of the pipe. To prevent the pipes from damage they have to be properly anchored in order to absorb these reaction forces (Fr).

The reaction force caused by internal pressure in a Rubber Joint is calculated by the following formula:

$$Fr\ (N) = P\ (kg/cm^2) \times A\ (cm^2) \times 10$$

Fr =Reaction Force
P = Pressure (Maximum Working Pressure and Testing Pressure must be considered)
A = Effective cross sectional area



Joint under pressure acts as a piston.
Results shown when working without anchoring.

Effective Area Values

In rest position

SIZE	TYPE		
	S10/S15	S20	S30
DN	Effective Area (cm^2)		
20	-	-	7
25	-	-	13
32	21	21	17
40	21	21	25
50	42	42	35
65	59	59	49
80	77	85	71
100	129	129	-
125	193	193	-
150	277	277	-
200	437	437	-
250	692	692	-
300	934	934	-
350	1086	1110	-
400	1445	1492	-
450	1847	1839	-
500	2306	2222	-
600	3286	3337	-

After compressed

SIZE	TYPE		
	S10/S15	S20	S30
DN	Effective Area (cm^2)		
20	-	-	20
25	-	-	31
32	28	82	37
40	28	82	48
50	52	119	62
65	77	147	80
80	97	186	107
100	167	269	-
125	240	360	-
150	333	471	-
200	535	702	-
250	814	1017	-
300	1075	1307	-
350	1237	1358	-
400	1618	1779	-
450	2042	2155	-
500	2524	2568	-
600	3545	3759	-

Other Reaction Forces:

- Reaction forces caused by the innate joint resistance to move, calculated through the joint stiffness, normally given in N/mm (linear) and Nm (torsion).

- Reaction forces caused by the friction of the guides.

- Apart from reaction forces caused by the joint installation itself, pipe system weight and centrifugal forces on bends caused by velocity of the fluid must also be considered for anchoring.

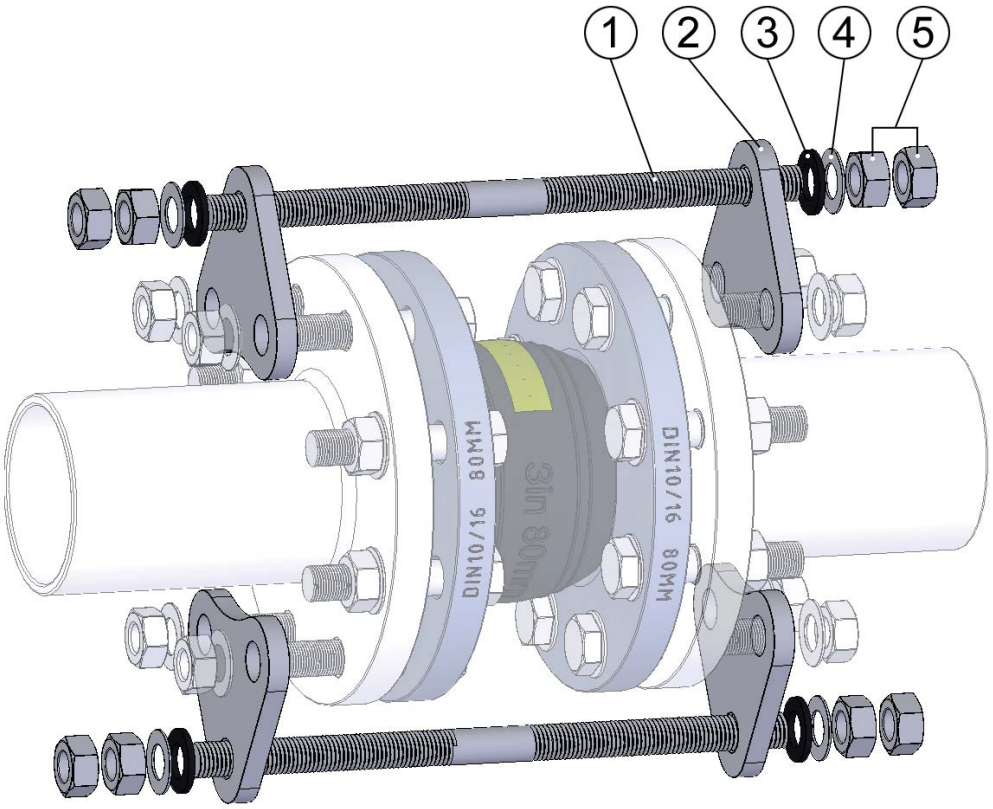
TYPE S10-S15-S20

Guidelines to Application - Limit Rods

The main purpose of Limit Rods is to absorb the force caused by internal pressure, and avoid reaction force over Fix Points. Fix Points will be released but they are still necessary. A Joint with limit rods will work only with axial movements. They are normally used with high pressures and large DNs, that may require very strong anchoring. They also relieve pump frames.

Limit rods can control Joint bellow over-extension and/or over-compression.

Limit rods can be used to avoid or correct mounting mistakes by over expansion.



Limit Rods Parts:	1 Rod
	2 Plate
	3 Rubber Gasket
	4 Washer
	5 Nut

Standard Material: Carbon Steel Zinc Plated S235JR to EN10025 (old St 37-2 to DIN 17100)

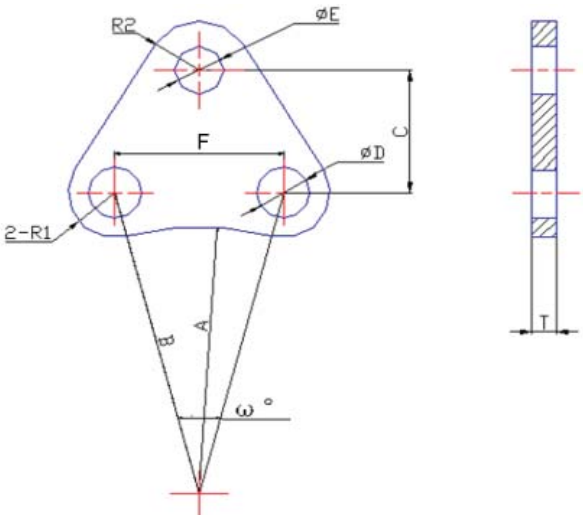
Material Options: Stainless Steel AISI 304, AISI 316, etc.

Each Rod Set is comprehensive of:
1 rod + 2 plates + 2 rubber gaskets + 2 washers + 4 nuts

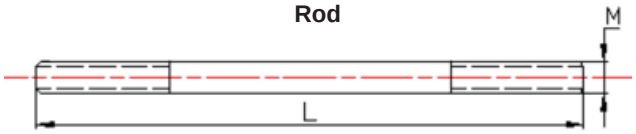
Limit Rods - Dimensions

TYPE S10

Plate



Rod



Rod Sets - S10 for flanges PN10 (Maximum Working Pressure: 10 bar)

SIZE NPS	SIZE DN	M	L	A	B	W°	ØD	ØE	R1	R2	F	C	T	Number of Rod Sets per Joint
1-1/2”	40	16	240	37	55	90	18	18	18	20	78	60	10	2
2”	50	16	250	45	62,5	90	18	18	18	20	88	65	10	2
2-1/2”	65	16	260	33	72,5	90	18	18	20	20	103	65	10	2
3”	80	16	280	60	80	45	18	18	20	20	61	50	10	2
4”	100	16	290	70	90	45	18	18	20	20	69	50	10	2
5”	125	16	325	85	105	45	18	18	20	20	80	55	10	2
6”	150	16	340	94	120	45	23	18	22	20	92	60	12	2
8”	200	20	370	125	147,5	45	23	23	22	24	113	65	12	2
10”	250	20	440	153	175	30	23	23	22	24	91	65	18	3
12”	300	20	460	178	200	30	23	23	22	24	104	65	18	3
14”	350	20	460	208	230	22,5	23	23	22	24	90	60	20	4
16”	400	20	470	233	257,5	22,5	27	23	25	24	100	60	20	4
18”	450	20	480	258	282,5	18	27	23	25	24	88	60	20	4
20”	500	20	480	285	310	18	27	23	25	24	97	60	20	4
24”	600	24	495	333	362,5	18	30	27	30	28	113	70	20	4

Rod Sets - S10 for flanges PN16 (Maximum Working Pressure: 16 bar (DN40-300); 10 bar (DN350-600))

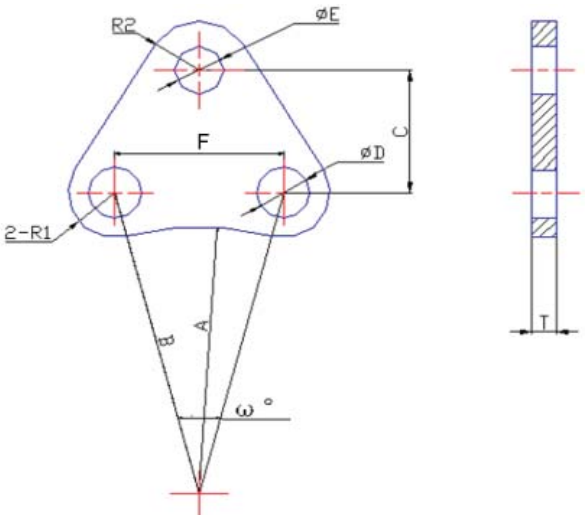
SIZE NPS	SIZE DN	M	L	A	B	W°	ØD	ØE	R1	R2	F	C	T	Number of Rod Sets per Joint
1-1/2”	40	16	240	37	55	90	18	18	18	20	78	60	10	2
2”	50	16	250	45	62,5	90	18	18	18	20	88	65	10	2
2-1/2”	65	16	260	53	72,5	90	18	18	20	20	103	65	10	2
3”	80	16	280	60	80	45	18	18	20	20	61	50	10	2
4”	100	16	290	70	90	45	18	18	20	20	69	50	10	2
5”	125	16	325	85	105	45	18	18	20	20	80	55	10	2
6”	150	16	340	98	120	45	23	18	22	20	92	60	12	2
8”	200	20	370	125	147,5	30	23	23	22	24	76	65	12	3
10”	250	20	440	153	177,5	30	27	23	25	24	92	65	18	3
12”	300	20	460	180	205	30	27	23	25	24	106	65	18	3
14”	350	20	460	210	235	22,5	27	23	25	24	92	65	20	4
16”	400	20	470	233	262,5	22,5	30	23	30	24	102	65	20	4
18”	450	20	480	263	292,5	18	30	23	30	24	92	65	20	4
20”	500	20	480	292	325	18	33	23	33	24	102	70	20	4
24”	600	24	495	348	385	18	37	27	37	28	120	80	22	4

Dimensions in mm., subject to manufacturing tolerances
For higher maximum working pressures please consult us

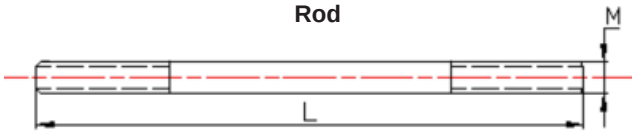
Limit Rods - Dimensions

TYPE S15

Plate



Rod



Rod Sets - S15 for flanges PN16 (Maximum Working Pressure: 16 bar)

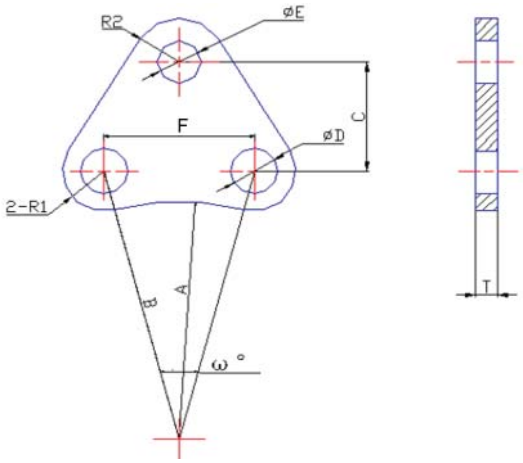
SIZE NPS	SIZE DN	M	L	A	B	W°	ØD	ØE	R1	R2	F	C	T	Number of Rod Sets per Joint
1-1/2”	40	16	300	37	55	90	18	18	18	20	78	60	10	2
2”	50	16	300	45	62,5	90	18	18	18	20	88	65	10	2
2-1/2”	65	16	300	53	72,5	90	18	18	20	20	103	65	10	2
3”	80	16	300	60	80	45	18	18	20	20	61	50	10	2
4”	100	16	300	70	90	45	18	18	20	20	69	50	10	2
5”	125	16	300	85	105	45	18	18	20	20	80	55	10	2
6”	150	16	300	98	120	45	23	18	22	20	92	60	12	2
8”	200	20	300	125	147,5	30	23	23	22	24	76	65	12	3
10”	250	20	300	153	177,5	30	27	23	25	24	92	65	18	3
12”	300	20	300	180	205	30	27	23	25	24	106	65	18	3

Dimensions in mm., subject to manufacturing tolerances
For higher maximum working pressures please consult us

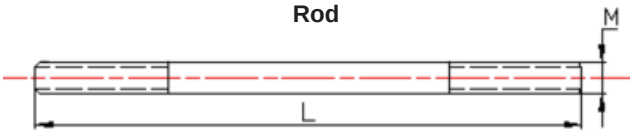
Limit Rods - Dimensions

TYPE S20

Plate



Rod



Rod Sets - S20 for flanges PN10 (Maximum Working Pressure: 10 bar)

SIZE NPS	SIZE DN	M	L	A	B	W°	ØD	ØE	R1	R2	F	C	T	Number of Rod Sets per Joint
1-1/2”	40	16	320	37	55	90	18	18	18	20	78	60	10	2
2”	50	16	320	45	62,5	90	18	18	18	20	88	65	10	2
2-1/2”	65	16	320	33	72,5	90	18	18	20	20	103	65	10	2
3”	80	16	320	60	80	45	18	18	20	20	61	50	10	2
4”	100	16	380	70	90	45	18	18	20	20	69	50	10	2
5”	125	16	380	85	105	45	18	18	20	20	80	55	10	2
6”	150	16	380	94	120	45	23	18	22	20	92	60	12	2
8”	200	20	515	125	147,5	45	23	23	22	24	113	65	12	2
10”	250	20	515	153	175	30	23	23	22	24	91	65	18	3
12”	300	20	515	178	200	30	23	23	22	24	104	65	18	3
14”	350	20	515	208	230	22,5	23	23	22	24	90	60	20	4
16”	400	20	560	233	257,5	22,5	27	23	25	24	100	60	20	4
18”	450	20	560	258	282,5	18	27	23	25	24	88	60	20	4
20”	500	20	560	285	310	18	27	23	25	24	97	60	20	4
24”	600	24	600	333	362,5	18	30	27	30	28	113	70	20	4

Rod Sets - S20 for flanges PN16 (Maximum Working Pressure: 16 bar (DN40-300); 10 bar (DN350-600))

SIZE NPS	SIZE DN	M	L	A	B	W°	ØD	ØE	R1	R2	F	C	T	Number of Rod Sets per Joint
1-1/2”	40	16	320	37	55	90	18	18	18	20	78	60	10	2
2”	50	16	320	45	62,5	90	18	18	18	20	88	65	10	2
2-1/2”	65	16	320	53	72,5	90	18	18	20	20	103	65	10	2
3”	80	16	320	60	80	45	18	18	20	20	61	50	10	2
4”	100	16	380	70	90	45	18	18	20	20	69	50	10	2
5”	125	16	380	85	105	45	18	18	20	20	80	55	10	2
6”	150	16	380	98	120	45	23	18	22	20	92	60	12	2
8”	200	20	515	125	147,5	30	23	23	22	24	76	65	12	3
10”	250	20	515	153	177,5	30	27	23	25	24	92	65	18	3
12”	300	20	515	180	205	30	27	23	25	24	106	65	18	3
14”	350	20	515	210	235	22,5	27	23	25	24	92	65	20	4
16”	400	20	560	233	262,5	22,5	30	23	30	24	102	65	20	4
18”	450	20	560	263	292,5	18	30	23	30	24	92	65	20	4
20”	500	20	560	292	325	18	33	23	33	24	102	70	20	4
24”	600	24	600	348	385	18	37	27	37	28	120	80	22	4

Dimensions in mm., subject to manufacturing tolerances
For higher maximum working pressures please consult us