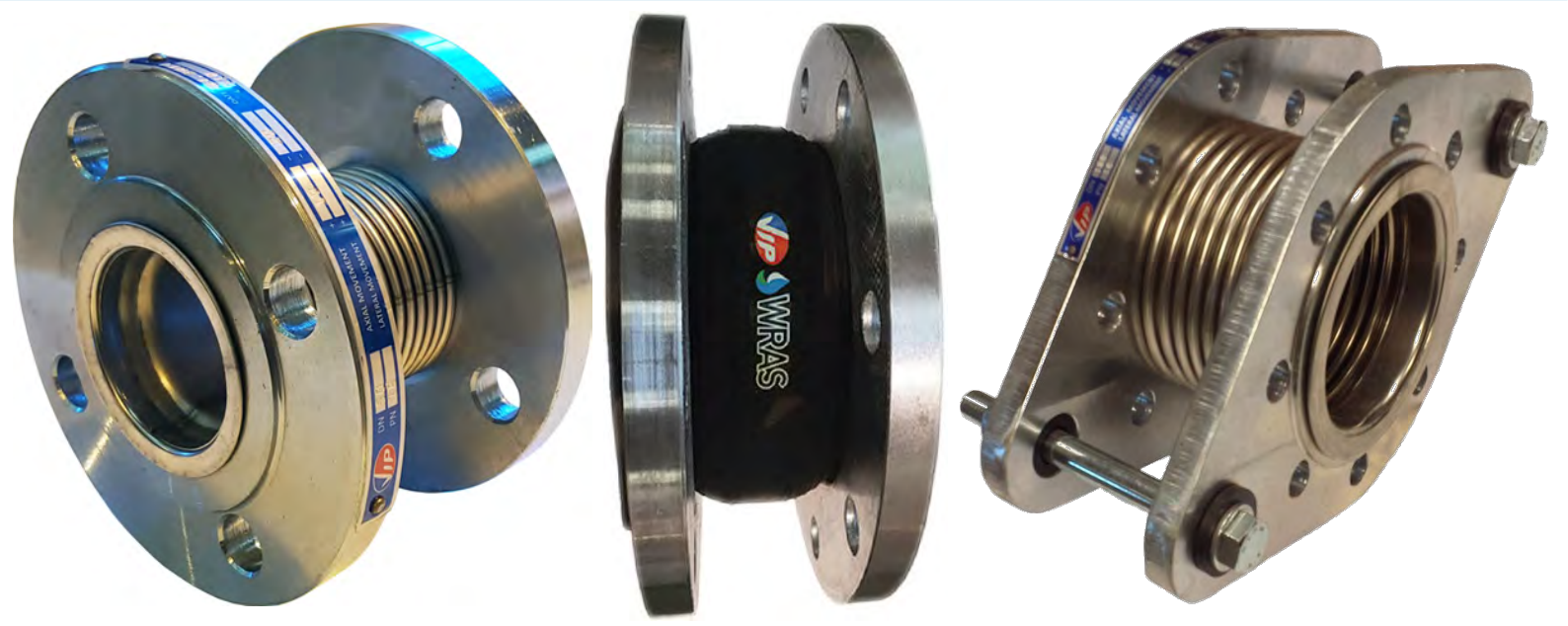
Valves Instruments Plus Ltd

Incorporating F. Ashton (ES) Ltd



Flexible Connections & Expansion Joints

Issue 1

In order to offer the most suitable product we will require the following minimum information:

- Pipe diameter
- Connection details
- Flow medium
- Pressure
- Temperature
- Required movement (if known, if not drawings are required)

As well as the products listed in this catalogue, VIP also offer:

- Facility to take off drawings
- Technical backup
- After sales support
- Site surveys

Our aim is to ensure efficiency and quality at all stages and levels of our business.

Formed in 1985, we have earned a reputation for setting standards in quality, service and reliability.

Our policy is to consistently provide you with a high level of quality products and service. Our ISO 9001 accreditation ensures that our standards are always maintained as we are assessed every 6 months.

We also hold the Investors In People award which ensures we are consistently training and developing our staff. This guarantees that we always offer a reliable service.

Our Customer Service team are always on hand to help you with any problems you may have, whether it be a need for a quick delivery or a product that is difficult to find.

Our service is based on a proactive modern approach - we are customer focused and our team will advise based on your requirements only. If you are unsure of what you need we are always happy to help.

We pride ourselves on technical expertise and experience, and have excellent relationships with a variety of manufacturers. Our choice of manufacturers is not taken lightly - they are constantly reviewed to make sure they are meeting your requirements.

Valves Instruments Plus will provide high quality yet affordable products that meet our customer's requirements, whilst offering excellent after sales service.

We will also strive to continually improve our products and service in order to maintain our high level of customer satisfaction.

This catalogue provides a sample of our product range. If you require further technical information or an item that is not featured then please contact us - we will be happy to help.

T: 01942 885700
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PN16 EPDM Flanged Rubber Flexible Connectors

PN6 also available (00/0599) 00/0600

VIP rubber pump flexible connectors are designed for installation onto vibrating equipment to reduce the transmission of noise and vibration to the attached pipeline system. They are suitable for use with potable water, warm water, sea water, air and weak acid.

VIP rubber pump flexible connectors should not be used at both their maximum working temperature and pressure simultaneously.

SPECIFICATION

Max. Working Temp: -10 to 90°C
Max. Working Pressure: 16 Bar at Ambient
Vacuum Rating: 700mm HG
Test Pressure: 1.5 x Working Pressure (24 Bar Max.)

Operating Temperature Against Operating Pressure						
Operating Temp °C	**Ambient**	**50**	**60**	**70**	**80**	**90**
Max Operating Pressure (Bar)	16	12.4	10	7.5	6.5	5.2

VIP Part No	NB (mm)	Neutral Length (mm)	Axial Compression (mm)	Axial Elongation (mm)	Lateral Deflection (+ or - mm)	Angular Deflection (+ or - °)
00/0600/032	32	130	12	10	12	15
00/0600/040	40	130	12	10	12	15
00/0600/050	50	130	12	10	12	15
00/0600/065	65	130	12	10	12	15
00/0600/080	80	130	12	10	12	15
00/0600/100	100	130	12	10	12	15
00/0600/125	125	130	12	10	12	15
00/0600/150	150	130	12	10	12	15
00/0600/200	200	130	12	10	12	15
00/0600/250	250	130	12	10	12	15
00/0600/300	300	130	12	10	12	15

Note: Larger sizes available on request

PN16 EPDM Flanged Tied Rubber Flexible Connectors

PN6 also available (00/0596) 00/0601

SPECIFICATION

Max. Working Temperature: -10 to 90°C
Max. Working Pressure: 16 Bar at Ambient (see chart above)
10 Bar rated 350mm and 400mm ND
(contact us for larger sizes and ratings)
Vacuum Rating: 700mm HG
Test Pressure: 1.5 x Working Pressure (24 Bar Max)

VIP Part No	NB (mm)	Neutral Length (mm)	Axial Compression (mm)	Axial Elongation (mm)	Lateral Deflection (+ or - mm)	Angular Deflection (+ or - °)
00/0601/032	32	130	12	10	12	15
00/0601/040	40	130	12	10	12	15
00/0601/050	50	130	12	10	12	15
00/0601/065	65	130	12	10	12	15
00/0601/080	80	130	12	10	12	15
00/0601/100	100	130	12	10	12	15
00/0601/125	125	130	12	10	12	15
00/0601/150	150	130	12	10	12	15
00/0601/200	200	130	12	10	12	15
00/0601/250	250	130	12	10	12	15
00/0601/300	300	130	12	10	12	15
00/0601/350	350	266	12	10	12	15
00/0601/400	400	266	12	10	12	15

Note: Larger sizes available on request

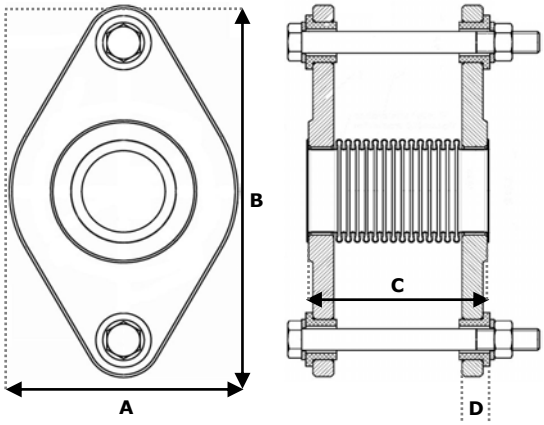
PN16 Flanged Stainless Steel Tied Pump Flexible Connectors

33/0595

VIP stainless steel pump flexible connectors are designed for installation onto vibrating equipment to reduce the transmission of noise and vibration to the attached pipeline system. They are designed for use when the system pressure, temperature or flow media is unsuitable for the use of rubber pump flexible connectors. All stainless steel to wetted parts with loose swivel plated carbon steel PN16 flanges.

SPECIFICATION

Max. Working Pressure: 16 Bar
Max. Working Temp: 120°C with Rubber Washers (standard supply)
300°C with Steel Washers (non-standard POA)
Test Pressure: 1.5x Working Pressure (24 Bar Max)



Dimensions (mm)					
VIP Part No	NB (mm)	A	B	C	D
33/0595/032	32	140	260	130	16
33/0595/040	40	150	270	130	16
33/0595/050	50	165	275	130	18
33/0595/065	65	185	305	130	18
33/0595/080	80	200	332	130	20
33/0595/100	100	220	352	130	20
33/0595/125	125	250	410	130	22
33/0595/150	150	285	445	130	22
33/0595/200	200	340	500	200	24

PN25 Flanged Stainless Steel Tied Pump Flexible Connectors

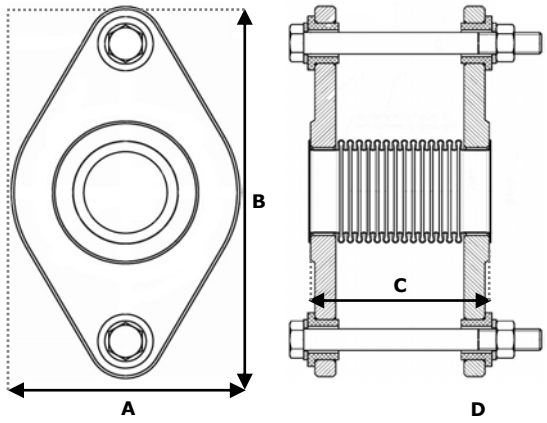
33/0592

VIP stainless steel pump flexible connectors are designed for installation onto vibrating equipment to reduce the transmission of noise and vibration to the attached pipeline system.

They are designed for use when the system pressure, temperature or flow media is unsuitable for the use of rubber pump flexible connectors. All stainless steel to wetted parts with loose swivel plated carbon steel PN25 flanges.

SPECIFICATION

Max. Working Pressure: 25 Bar
Max. Working Temp: 120°C with Rubber Washers (standard supply)
300°C with Steel Washers (non-standard POA)
Test Pressure: 1.5x Working Pressure (37.5 Bar Max)



Dimensions (mm)					
VIP Part No	NB (mm)	A	B	C	D
33/0592/032	32	140	260	130	20
33/0592/040	40	150	270	130	20
33/0592/050	50	165	275	130	20
33/0592/065	65	185	305	130	24
33/0592/080	80	200	332	130	32
33/0592/100	100	220	352	130	26
33/0592/125	125	250	410	130	34
33/0592/150	150	285	445	130	34
33/0592/200	200	340	500	200	34

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PN16 High Temp Flanged Rubber Flexible Connectors

00/0627

VIP high temperature rubber pump flexible connectors are designed for installation onto vibrating equipment to reduce the transmission of noise and vibration to the attached pipeline system. They are **TUV approved** to DIN 4809 with a minimum design life of 10 years.

SPECIFICATION

Max. Working Temp: 110°C
Max. Working Pressure: 16 Bar at ambient
Body (Outer Layer): EPDMT
Body (Inner Layer): EPDMT
Reinforcing: Aramid reinforced
Flanges: Plated carbon steel drilled to PN16

Operating Temperature Against Operating Pressure			
Working Temp	90°C	100°C	110°C
Working Pressure	12.4	10	7.5

VIP Part No	NB (mm)	Neutral Length (mm)	Axial Compression (mm)	Axial Extension (mm)	Angular (+ or - mm)
00/0627/040	40	130	25	10	20
00/0627/050	50	130	25	10	20
00/0627/065	65	130	25	10	17
00/0627/080	80	130	25	10	14
00/0627/100	100	130	25	10	14
00/0627/125	125	130	25	15	10
00/0627/150	150	130	20	15	10
00/0627/200	200	130	20	15	8
00/0627/250	250	130	15	15	8
00/0627/300	300	130	15	15	8

PN16 High Temp Flanged Tied Rubber Flexible Connectors

00/0628

VIP high temperature rubber pump flexible connectors are designed for installation onto vibrating equipment to reduce the transmission of noise and vibration to the attached pipeline system. They are **TUV approved** to DIN 4809 with a minimum design life of 10 years.

SPECIFICATION

Max. Working Temp: 110°C
Max. Working Pressure: 16 Bar at ambient
Body (Outer Layer): EPDMT
Body (Inner Layer): EPDMT
Reinforcing: Aramid reinforced
Oval Flanges: Plated carbon steel drilled to PN16

Operating Temperature Against Operating Pressure			
Working Temp	90°C	100°C	110°C
Working Pressure	12.4	10	7.5

VIP Part No	NB (mm)	Neutral Length (mm)	Axial Compression (mm)	Axial Extension (mm)	Lateral (+ or - mm)	Angular (+ or - mm)
00/0628/040	40	130	25	10	15	20
00/0628/050	50	130	25	10	15	20
00/0628/065	65	130	25	10	15	17
00/0628/080	80	130	25	10	15	14
00/0628/100	100	130	25	10	15	14
00/0628/125	125	130	25	15	15	10
00/0628/150	150	130	20	15	15	10
00/0628/200	200	130	20	15	15	8
00/0628/250	250	130	15	15	15	8
00/0628/300	300	130	15	15	15	8

BSP Female EPDM Rubber Flexible Connectors

00/0597

VIP rubber pump flexible connectors are designed for installation onto vibrating equipment to reduce the transmission of noise and vibration to the attached pipeline system. WRAS Approved - they are suitable for use with water, warm water, sea water, air and weak acid.

SPECIFICATION

Max. Working Temperature: -10°C to 90°C
Max. Working Pressure: 16 Bar at Ambient Temperature
Vacuum Rating: 500mm HG
Test Pressure: 1.5 x Working Pressure (24 Bar Max)

VIP rubber pump flexible connectors should not be used at both their maximum working temperature and pressure simultaneously.

Operating Temperature Against Operating Pressure					
Operating Temp °C	Ambient	50	60	70	80
Max Operating Pressure (Bar)	16	9.6	7.5	6.2	5

VIP Part No	NB (mm)	Neutral Length (mm)	Axial Compression (mm)	Axial Extension (mm)	Lateral Deflection (+ or - mm)	Angular Deflection (+ or - mm)
00/0597/015	15	165	22	6	22	20
00/0597/020	20	165	22	6	22	20
00/0597/025	25	175	22	6	22	20
00/0597/032	32	186	22	6	22	20
00/0597/040	40	186	22	6	22	20
00/0597/050	50	200	22	6	22	20

PN16 Nitrile Rubber Untied Single Sphere Bellows

00/0623

VIP rubber pump flexible connectors are designed for installation onto vibrating equipment to reduce the transmission of noise and vibration to the attached pipeline system. They are suitable for use with gas, oil, water, warm water, sea water, air and weak acid.

SPECIFICATION

Max. Working Temperature: -10 to 80°C
Max. Working Pressure: 16 Bar
Vacuum Rating: 700mm HG
Flanges Standard: PN16 EN1092-1

VIP rubber pump flexible connectors should not be used at both their maximum working temperature and pressure simultaneously.

VIP Part No	NB (mm)	Neutral Length (mm)	Axial Compression (mm)	Axial Elongation (mm)	Lateral Deflection (+ or - mm)	Angular Deflection (+ or - °)
00/0623/040	40	130	12	10	12	15
00/0623/050	50	130	12	10	12	15
00/0623/065	65	130	12	10	12	15
00/0623/080	80	130	12	10	12	15
00/0623/100	100	130	12	10	12	15
00/0623/125	125	130	12	10	12	15
00/0623/150	150	130	12	10	12	15
00/0623/200	200	130	12	10	12	15

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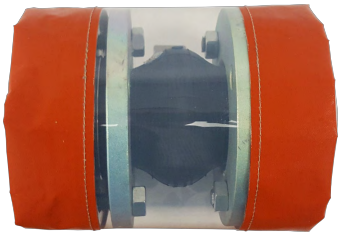


Rubber Bellows With PTFE Protective Cover

Metal Bellows With PTFE Protective Cover

Lagging Jacket

Rubber Bellows Installation Instructions

STORAGE

We recommend VIP Bellows be kept away from potential damage by other equipment or plant items, and stored in a cool, dry and clean place.

INSPECTION

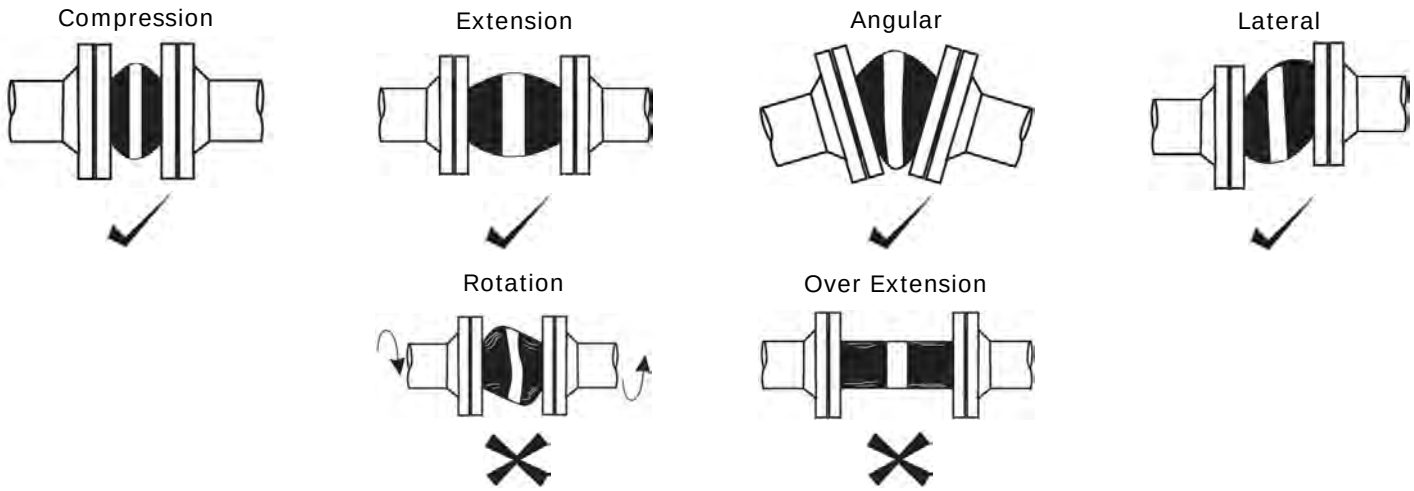
Prior to installation the bellows sealing surface must be clean and free of debris, as this can damage the bellows and / or prevent a seal. Bellows must be inspected for any internal or external damage prior to installation.

SELECTION

It is important that the operating conditions of the bellow match requirements in terms of temperature, movement and pressure. System failure can result if an incorrect selection is made. If vacuum conditions exist, please check whether a vacuum support ring is required and / or has been installed.

INSTALLATION

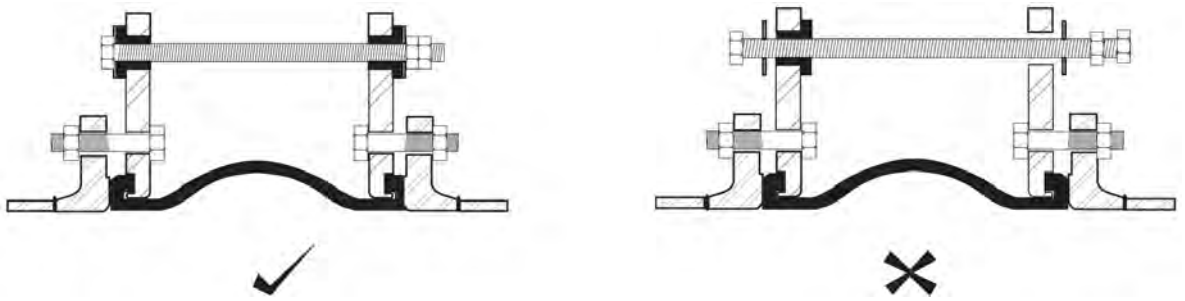
VIP rubber bellows should be installed at their neutral / supplied length - this can be found on the datasheet(s) provided. Ensure this neutral / supplied length corresponds exactly to the length of the gap left between mating flanges in the pipework. The pipework must be straight - any adjustments should be made to the pipework before the bellows are installed.



Please use only mating flanges with same size, drilling and sealing face as that of the rubber bellows. To prevent damage to the bellows, ensure faces are clear of sharp edges, debris and dirt. A composite gasket should be used to prevent sharp edges damaging the rubber sealing face in the case of different sealing face diameters.

Flange bolts should be tightened gradually, evenly and in a crosswise manner to avoid over-tightening. To prevent damage, bolts must be positioned so the bolt head is nearest the bellows.

Install the bellows in their neutral / supplied length, and double check movement capabilities and length before installing. Rubber hat top washers and steel washers must be checked. Bolts should be re-checked a week after installation. Tie bar assemblies must be uniformly tightened.

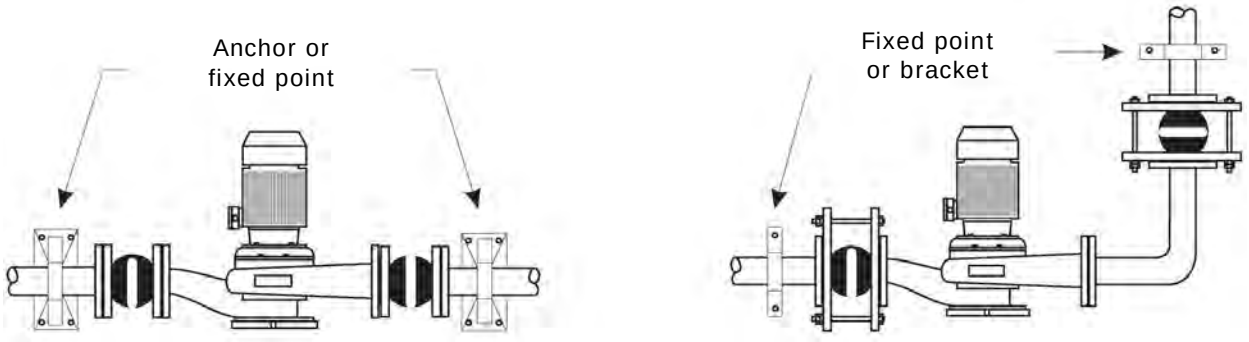


PRESSURE TEST

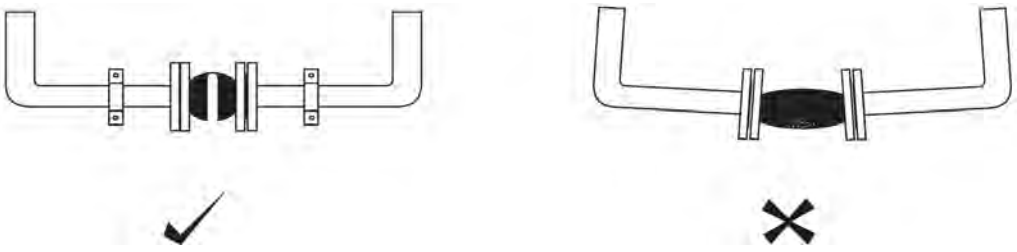
When performing hydraulic pressure testing please ensure before hand that all anchors are correctly fitted. The test pressure, usually 1.5x working, should not exceed the rubber bellow's test pressure.

ANCHORING

Anchoring is important to guarantee correct performance. For pressures above 3 bar or sizes above 80mm, tied rubber bellows should be used.



To protect adjacent equipment and pipework, rubber bellows must be anchored - this is because they will exert a pressure thrust in service. Anchoring will also prevent the bellows from extending under pressure.



MAINTENANCE

VIP rubber bellows should periodically be inspected to check for signs of deterioration. Any insulation used should be removable to allow these inspections to take place. Check all flange bolts and re-tighten if needed. Do not paint the bellows as this can reduce service life.

Bellows should be replaced if fine hairline cracks are evident, as these are indications the bellows are nearing their end of life. We recommend keeping a stock of spare bellows due to their importance in chilled water or heating systems - this will ensure continuous performance.

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BSP Male Stainless Steel Braided Hose Assembly

33/0594

VIP stainless steel braided flexible hose connectors are designed for installation on to vibrating equipment to reduce the transmission of noise and vibration to the attached pipeline system. They are designed for use when the system pressure, temperature or flow media is unsuitable for the use of rubber pump flexible connectors.

WRAS APPROVED PRODUCT

SPECIFICATION

Max. Working Temperature: 300°C
Max. Working Pressure: 16 Bar at 120°C
Test Pressure: 1.5x Working Pressure (24 Bar Max)

VIP stainless steel pump flexible connectors should not be used at both their maximum working pressure and temperature simultaneously.

VIP Part No	NB (mm)	Size (inches)	Installed Length (mm)	Movement +/- (mm)
33/0594/015	15	1/2″	250	2
33/0594/020	20	3/4″	250	2
33/0594/025	25	1″	250	2
33/0594/032	32	1 1/4″	350	2
33/0594/040	40	1 1/2″	350	2
33/0594/050	50	2″	350	2

PN16 Flanged Stainless Steel Hose Assembly

33/0624

VIP stainless steel braided flexible hose connectors are designed to reduce noise and vibration from pumps and reciprocating machinery. They are suitable for use on chilled water, LTHW, MTHW and steam.

SPECIFICATION

Max. Working Temperature: 300°C
Max. Working Pressure: 16 Bar at 120°C
Test Pressure: 1.5x Working Pressure or 1.5x flange rating, whichever the lower.

VIP stainless steel pump flexible connectors should not be used at both their maximum working temperature and pressure simultaneously.

VIP Part No	N.B (mm)	Installed Length (mm)	Movement +/- (mm)	Max Working Pressure (Bar) At 120°C	Test Pressure (bar)
33/0624/015	15	220	2	16	24
33/0624/020	20	220	2	16	24
33/0624/025	25	250	2	16	24
33/0624/032	32	300	2	16	24
33/0624/040	40	300	2	16	24
33/0624/050	50	300	2	16	24
33/0624/065	65	300	2	16	24
33/0624/080	80	300	2	16	24
33/0624/100	100	300	2	10	15
33/0624/125	125	300	2	10	15
33/0624/150	150	350	2	6	9

STORAGE

Stainless steel pump connectors should be stored in a cool, dark, clean area and be protected from damage caused by other items of plant and equipment.

INSPECTION

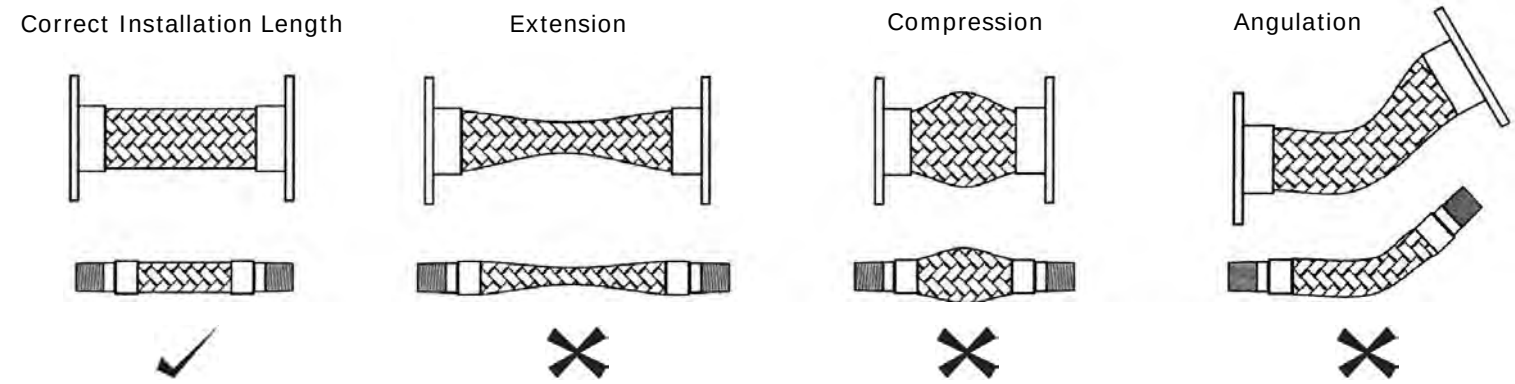
VIP Stainless steel pump connectors should be inspected for external damage to the stainless steel overbraiding and hose convolutions.

SELECTION

Check that the correct stainless steel hose has been selected for the operating conditions that exist. Temperature, pressure and movement should all be confirmed, as the wrong selection may result in failure of the system. If the pump connector is being used on potable or domestic hot water services, ensure the unit is WRAS Approved and has been supplied with stainless steel end connections.

INSTALLATION

VIP stainless steel pump connectors should be installed at their correct installation length. They should not be compressed or extended. Pipework should be true and straight and adjustments made if dimensions exceed movement capabilities of the pump connectors being used.

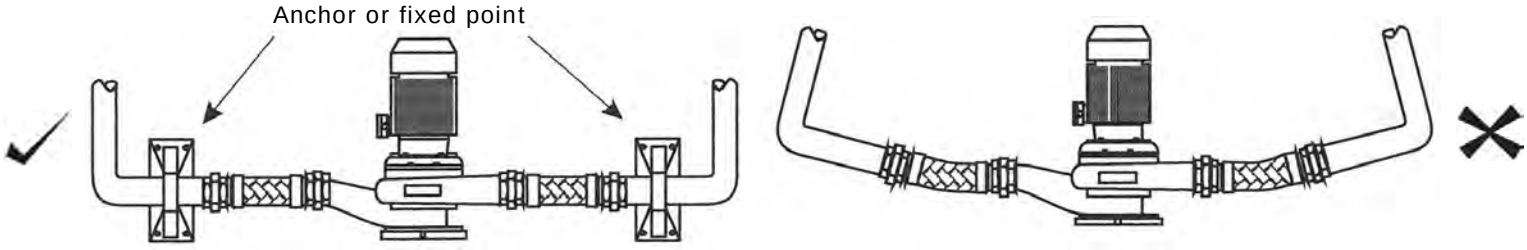


TEST PRESSURE

If a hydraulic pressure test is to be carried out on a system containing pump connectors, ensure that the anchors are correctly fitted before the test is carried out. Also ensure that the test pressure (usually 1.5x working) does not exceed the maximum test pressure on the hose connector.

ANCHORING

Stainless steel pump connectors must be anchored to ensure their correct performance.



VIP stainless steel pump connectors will exert a small pressure thrust in service and must be anchored to protect adjacent pipework and equipment.

MAINTENANCE

When properly installed and used at their correct operating temperature and pressure, stainless steel pump connectors will give many years of trouble free service. However they should be inspected periodically for signs of deterioration. End connections and flange bolts should be checked and re-tightened if required. If insulation is to be used this should be removable to allow an inspection to be carried out.

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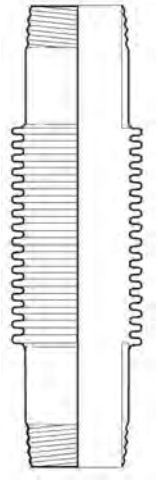
Stainless Steel BSP Male Axial Expansion Joints

33/0612



VIP stainless steel expansion joints are designed to absorb thermal expansion within straight pipelines.

They are suitable for use with drinking water, HWS, DHWS, LTHW, MTHW, Steam and other hot liquids and gases.

SPECIFICATION

Max. Working Temp: 300°C
Max. Working Pressure: 10 Bar at 120°C
Test Pressure: 1.5x Working Pressure (15 Bar Max)

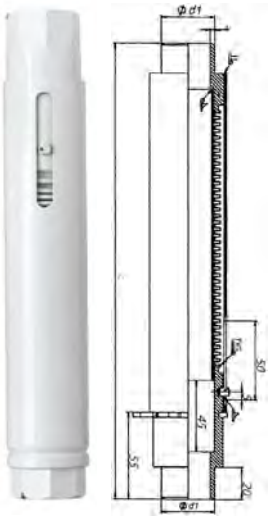
Designed to, and complies with, the EJMA design standard. Require full guiding and only one expansion joint should be located between two main anchors.

VIP Part No	NB (mm)	Overall Length (mm)	Axial Compression (mm)	Spring Rate (N/mm)	Effective Area (sq. cm)
33/0612/015	15	182	25	30	7
33/0612/020	20	182	25	30	7
33/0612/025	25	185	30	60	10
33/0612/032	32	200	30	60	15
33/0612/040	40	215	30	70	22
33/0612/050	50	247	50	85	35

VIP axial expansion joints should not be used at maximum working temperature and pressure simultaneously.

BSP Female Axial Expansion Joints With External Sleeve

33/0613



VIP expansion joints are designed to absorb thermal expansion within straight pipelines.

They are suitable for use with LTHW, MTHW, Steam and other hot liquids and gases.

SPECIFICATION

Max. Working Temperature: 250°C
Max. Working Pressure: 10 Bar at 200°C
Test Pressure: 1.5x Working Pressure (15 Bar Max)

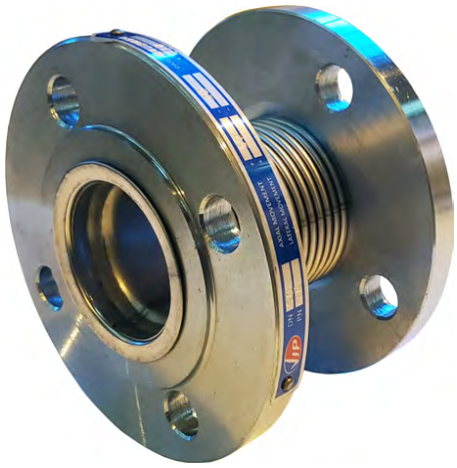
VIP Axial Expansion Joints should not be used at both their maximum working temperature and pressure simultaneously.

Designed to, and comply with, the EJMA design standard. Require full guiding and only one expansion joint should be located between two main anchors.

VIP Part No	NB (mm)	Ød1	S (mm)	L (mm)	Axial Spring Rate (N/mm)	Life Cycles
33/0613/015	15	21	3	300	51 N/mm	1227
33/0613/020	20	27	3	300	51 N/mm	1227
33/0613/025	25	34	4	300	44 N/mm	1254
33/0613/032	32	42	4	350	38 N/mm	2917
33/0613/040	40	48	4	350	37 N/mm	3849
33/0613/050	50	60	4	350	37 N/mm	3849

PN16 Flanged S/S Axial Expansion Joints With Van-Stone Ends

33/0616



VIP stainless steel expansion joints are designed to absorb thermal expansion within straight pipelines. They are suitable for use with drinking water, HWS, DHWS, LTHW, MTHW, Steam and other hot liquids and gasses. All stainless steel to wetted parts with loose swivel plated carbon steel PN16 flanges.

SPECIFICATION

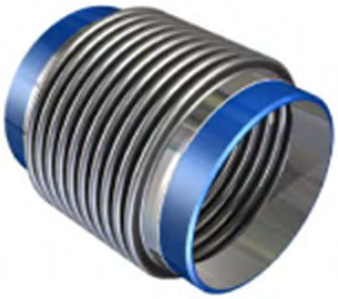
Max. Working Temp: 300°C
Max. Working Pressure: 16 Bar at 200°C
Test Pressure: 1.5x Working Pressure (24 Bar Max)

Designed to, and complies with, the EJMA design standard. Larger sizes and other Flange Drillings available on request. Requires full guiding and work between two main anchors.

VIP Part No	NB (mm)	Overall Length (mm)	Total Movement (mm)	Spring Rate (N/mm)	Effective Area (sq. cm)
33/0616/050	50	110	+ 10 - 20	118	37
33/0616/065	65	195	+ 20 - 40	42	58
33/0616/080	80	190	+ 20 - 40	88	79
33/0616/100	100	200	+ 20 - 40	125	128
33/0616/125	125	210	+ 20 - 40	160	183
33/0616/150	150	225	+ 20 - 40	240	268
33/0616/200	200	245	+ 20 - 40	345	437
33/0616/250	250	235	+ 20 - 40	295	705

PN16 Stainless Steel Axial Expansion Joint, C/S Weld Ends

33/0633



Axial expansion joint consisting of stainless steel grade 321 bellows assembly fitted with carbon steel weld pipe ends. (Stainless steel weld end expansion joints, available on request. Can also be manufactured with ends for Victaulic connectors.)

SPECIFICATION

Max. Working Temperature: 300°C
Max. Working Pressure: 16 Bar at 120°C
Max. Test Pressure: 1.5x Working Pressure (24 Bar)

Designed to accommodate pipe movements in an axial plane (straight runs) due to thermal expansion. Suitable for use on LTHW, MTHW, HTHW, steam and other hot liquids and gases. Axial expansion joints should not be used at both their maximum working temperature and pressure respectively.

VIP Part No	NB (mm)	Overall Length (mm)	Total Movement (mm)	Force To Compress (N/mm)	Effective Area (sq. cm)	Working Pressure at 120°C (bar)	Cold Test Pressure (bar)
33/0633/025	25	210	+ 10 - 20	50	16	16	24
33/0633/032	32	215	+ 10 - 20	50	18	16	24
33/0633/040	40	240	+ 10 - 20	60	23	16	24
33/0633/050	50	210	+ 10 - 20	104	37	16	24
33/0633/065	65	210	+ 20 - 40	44	58	16	24
33/0633/080	80	210	+ 20 - 40	89	79	16	24
33/0633/100	100	220	+ 20 - 40	126	128	16	24
33/0633/125	125	230	+ 20 - 40	160	183	16	24
33/0633/150	150	245	+ 20 - 40	217	268	16	24
33/0633/200	200	240	+ 20 - 40	347	437	16	24
33/0633/250	250	250	+ 20 - 40	295	705	16	24
33/0633/300	300	260	+ 20 - 40	248	984	16	24

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Copper Axial Expansion Joints

33/0617

Small bore copper ended axial expansion joints are made from stainless steel convoluted bellows for use in heating circuits. Designed to EJMA (Expansion Joint Manufacturer's Association).

Small bore copper ended expansion joints are used in small bore pipework systems to absorb thermal movement in the axial direction.

Movements and pressure ratings apply for temperatures up to 90°C. Copper pipe ended units should not be used above this temperature.

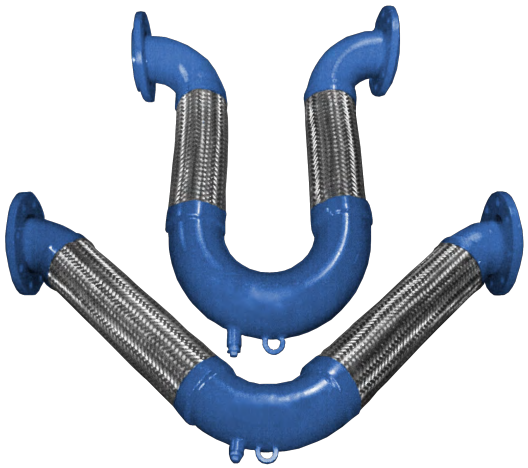
Max. Working Temp: 90°C
Max. Working Pressure: 6 Bar
Max. Test Pressure: 9 Bar

Bellows: 316 S/S
Ends: Copper Table x BS EN 1057

DN (mm)	Supplied Length (mm)	Axial Movement (Comp) (mm)	Spring Rate (N/mm)	Effective Area (sq. cm)	Force To Compress (KgF)	Pressure Rating (Bar g)	Pressure Thrust (6 Bar) (KgF)
15	220	25	19.1	5.2	49	6	31
20	230	25	19.1	5.2	49	6	31
25	235	25	26.2	8.2	67	6	50
32	245	25	28.5	13.7	73	6	82
40	250	25	35.2	20.4	90	6	123
50	250	25	59.8	32.1	153	6	193

'U' Shaped & 'V' Shaped Flanged Pipe Loops

33/0648 & 33/0649



For use when anchoring and guiding pipe systems (usually at high level) proves difficult. VIP's V Shaped & U Shaped Flanged Pipe Loops can absorb large movements in the X, Y and Z directions.

They also provide protection against seismic movement. They remove the need for large solid pipe loops due to their short overall lengths.

Application: LTHW, cold water and fire protection pipelines.

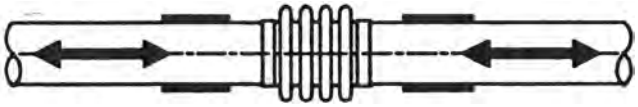
Hose: Stainless steel
Braiding: Stainless steel, AISI 304
Fittings: Carbon steel (stainless steel available on request)
Connections: Flanged (welded ended, grooved also available)
Sizes: DN15 (1/2") to DN200 (8")

'U' Shaped, Flanged (33/0648)		
X = 100mm (-50 / +50)	X = 200mm (-100 / +100)	X = 400mm (-200 / +200)
Y = 100mm (-50 / +50)	Y = 200mm (-100 / +100)	Y = 400mm (-200 / +200)
Z = 100mm (-50 / +50)	Z = 200mm (-100 / +100)	Z = 400mm (-200 / +200)

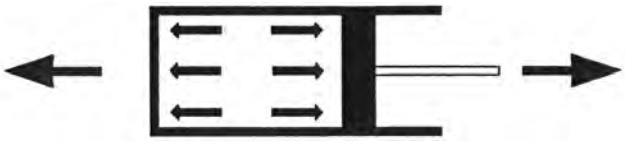
'V' Shaped, Flanged (33/0649)		
X = 100mm (-50 / +50)	X = 200mm (-100 / +100)	X = 400mm (-200 / +200)
Y = 100mm (-50 / +50)	Y = 200mm (-100 / +100)	Y = 400mm (-200 / +200)
Z = 100mm (-50 / +50)	Z = 200mm (-100 / +100)	Z = 400mm (-200 / +200)

Unrestrained Expansion Joints Explained

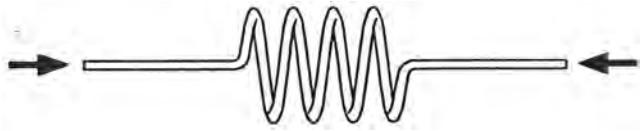
The application of an axial expansion joint is very simple with few variants possible, offering little room for engineering initiative. The only limitations on an axial solution are the movement capacity of the expansion joint and the ability to support, guide and anchor the pipe.



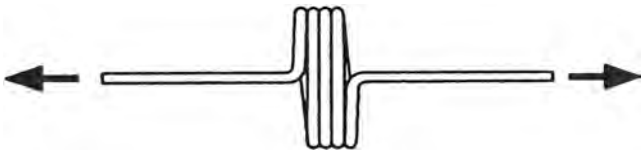
Axial expansion joints exert a pressure thrust on the pipe due to pressure attempting to open out the bellows lengthwise. This is similar to the force generated by a hydraulic piston.



Force is also required to compress or extend the bellows due to the stiffness of the convolutions. A good analogy is the force required to compress and extend a spring.



Pull from extended spring

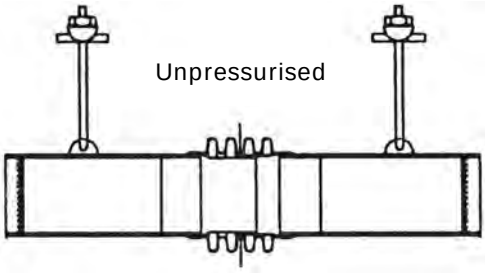


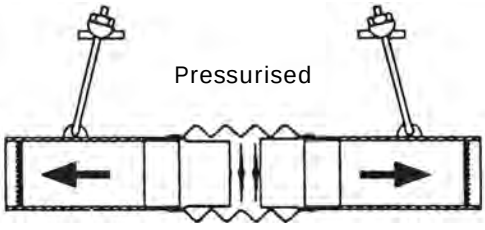
Push from compressed spring

Rules For Unrestrained Expansion Joints

The use or application of unrestrained expansion joints is rigid and therefore best expressed as a set of rules.

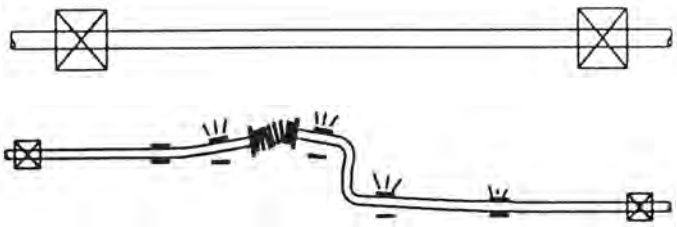
1. Unrestrained expansion joints can only be used in anchored pipe lines.





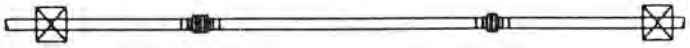
Warning: Omitting anchors **will** result in failure of unrestrained expansion joints.

2. The pipe must be straight in plan and elevation.



Warning: Offsets can result in excessive forces and moments being applied to guides.

3. Only one axial bellows may be placed between any two anchors.



Warning: If more than one bellows were fitted, variations in spring rate and friction would cause one to work harder than the other and therefore fail prematurely.

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STORAGE

Stainless steel axial expansion joints should be stored in a clean dry area and be protected from damage caused by other items of plant and equipment.

INSPECTION

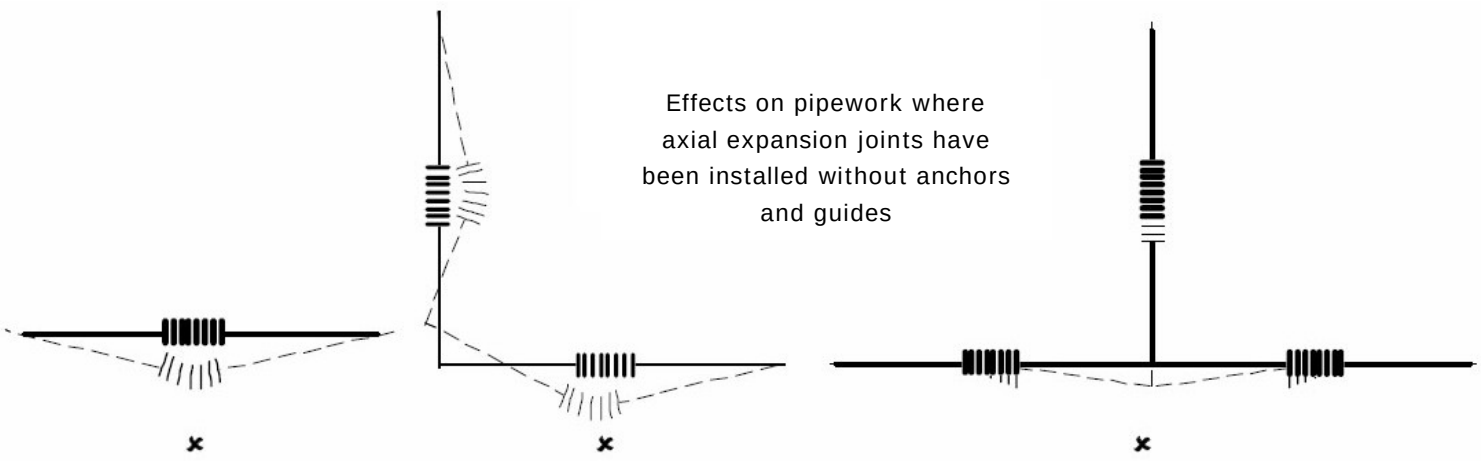
Stainless steel axial expansion joints should be inspected for any internal or external damage to the bellows convolutions.

SELECTION

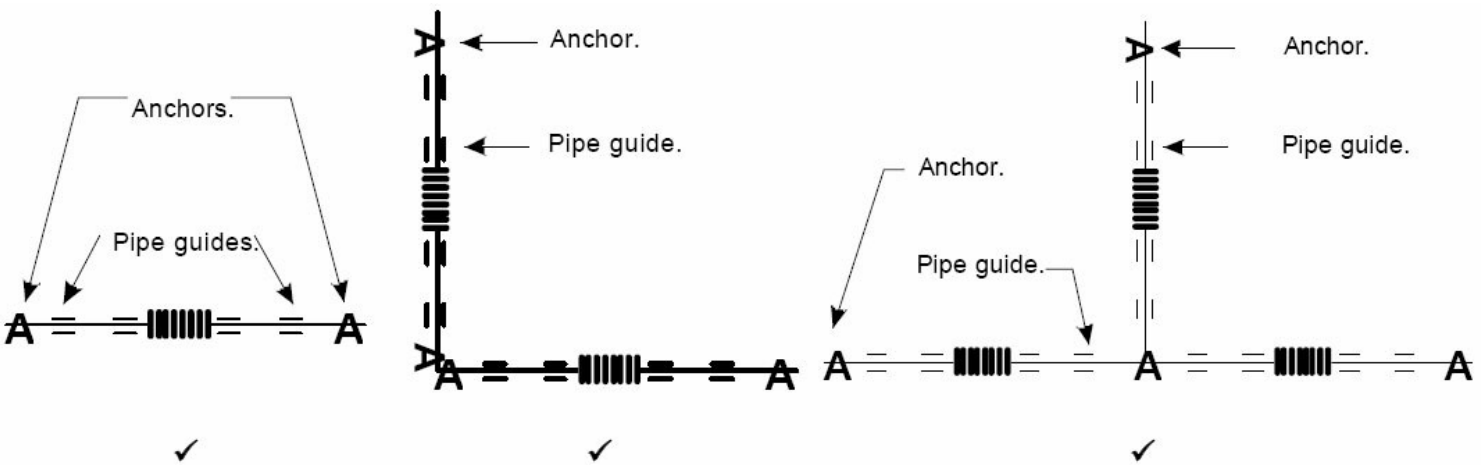
The VIP range of stainless steel axial expansion joints are designed to be used on a wide range of Building Services and Industrial applications. Check that the correct axial expansion joint has been selected for the operating conditions that exist. Temperature, pressure and movement should all be confirmed as the wrong selection may result in failure of the system. Check that the correct number of axial expansion joints are being installed to accommodate the total amount of expansion in a pipework system.

INSTALLATION

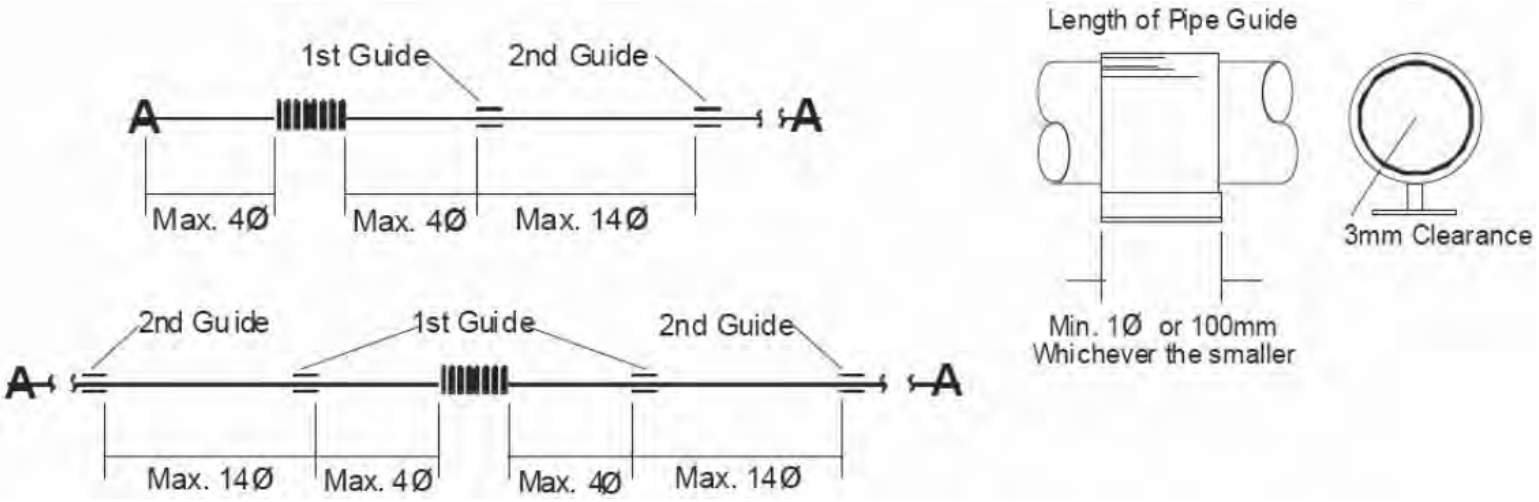
Stainless steel axial expansion joints requiring Cold Draw will be supplied at their neutral length and should be extended on installation by up to 50% of their movement capability. If an expansion joint has been supplied with internal flow sleeve it should be installed with the arrow in the correct flow direction. Bellows convolutions should be protected from damage during installation due to rotation or weld spatter etc. Stainless steel axial expansion joints should only be installed in straight pipework runs. Stainless steel axial expansion joints require anchors and guides to ensure their correct performance.



Anchors and pipe guides are essential to ensure the correct performance of the axial expansion joints. Ensure that only one axial expansion joint is installed between anchors.



Pipework should be correctly aligned with guides being installed to prevent buckling whilst allowing movement to be directed into the axial expansion joint. Details are given below for 1st and 2nd guide spacing. Remaining pipe guides should be installed as per specification or details given in guidance notes.



TEST PRESSURE

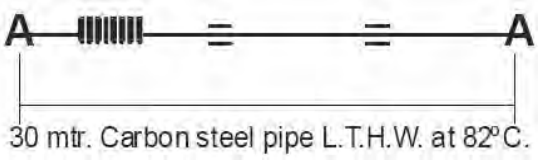
If a hydraulic pressure test is to be carried out on a system containing axial expansion joints ensure that anchors and guides have been correctly fitted before the test is carried out. Ensure that the test pressure (usually 1.5 x working pressure) does not exceed the test pressure of the axial expansion joint being installed.

ANCHORING

Axial expansion joints must be securely anchored and adequately guided to ensure their correct performance. Anchors must have sufficient strength to withstand the forces created by internal pressure, total pipe weight, thermal expansion and spring rate of the bellows. See guidance notes for details and calculations on anchoring of pipework.

Anchors are used to divide the system into manageable sections. Anchors must be spaced to suit the axial expansion joints being installed.

EXAMPLE



Carbon steel pipework run 30 meters between anchors.
Nominal bore 65mm.
LTHW. system at 82°C .
Installed at 0°C.
Maximum 29mm thermal expansion.

Thermal Expansion = 29mm

For this application a 65mm nominal bore VIP axial expansion joint should be selected.
Movement capability +20/-40mm axial.

MAINTENANCE

When properly installed and used at their correct operating temperature and pressure, stainless steel axial expansion joints will give many years of trouble free service. However the expansion joints should be periodically inspected for signs of deterioration.

Anchors and pipe alignment should also be examined. Anchor failure can result in a breakdown of the system. If insulation is to be used it should be removable to allow inspection to be carried out.

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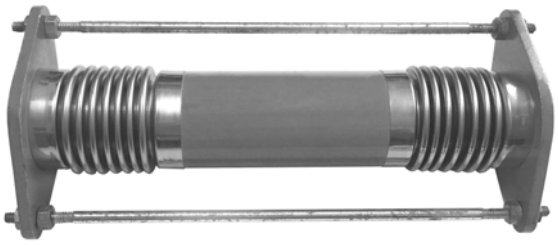
PN16 Stainless Steel Double Tied Lateral Expansion Joint, Flanged

33/0638



Double tied lateral expansion joint consisting of two stainless steel grade 321 bellows, centre tube and mating surfaces (stainless steel wetted parts) fitted with zinc plated carbon steel van stone oval flanges and tie bar assembly, drilled to EN1092-1 PN16.

For installation in changes in pipework direction and will accommodate lateral movement in one or two planes.

SPECIFICATION

Max. Working Temperature: 300°C
Max. Working Pressure: 16 Bar at 120°C
Max. Test Pressure: 1.5x Working Pressure or 1.5x flange rating, whichever lower

VIP Part No	NB (mm)	Overall Length (mm)	Total Movement (mm)	Lateral Spring Rate (N/mm)	Working Pressure at 120°C (bar)	Cold Test Pressure (bar)
33/0638/040	40	350	50	3	16	24
33/0638/050	50	450	50	4	16	24
33/0638/065	65	450	50	7	16	24
33/0638/080	80	500	50	9	16	24
33/0638/100	100	500	50	18	16	24
33/0638/125	125	650	50	23	16	24
33/0638/150	150	650	50	36	16	24
33/0638/200	200	700	50	47	16	24
33/0638/250	250	800	50	79	16	24
33/0638/300	300	950	50	128	16	24

PN16 Single Hinged Expansion Joint, Flanged

33/0641

VIP expansion joints are designed to absorb thermal expansion within straight pipelines. They are suitable for use with LTHW, MTHW, Steam and other hot liquids and gases.

SPECIFICATION

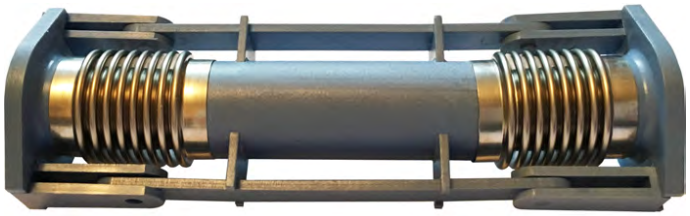
Max. Working Temperature: 300°C
Max. Working Pressure: 16 Bar at 120°C
Test Pressure: 1.5x Working Pressure (24 Bar Max)

VIP single hinged angular expansion joints are used in sets of two or three and are generally installed in changes in pipework direction. They will accommodate lateral movement in only one plane. This movement occurs due to thermal expansion or contraction or building settlement.

VIP Part No	NB (mm)	Angulation (degrees)	Overall Length (mm)	Force To Angulate (N/deg)	Working Pressure at 120°C (bar)	Cold Test Pressure (bar)
33/0641/050	50	5	130	10	16	24
33/0641/065	65	5	130	13	16	24
33/0641/080	80	5	130	46	16	24
33/0641/100	100	5	130	75	16	24
33/0641/125	125	6.5	200	80	16	24
33/0641/150	150	6.5	200	94	16	24
33/0641/200	200	7	210	135	16	24
33/0641/250	250	7	210	240	16	24
33/0641/300	300	7	210	375	16	24

PN16 Stainless Steel Double Hinged Articulated Expansion Joint, Flanged

33/0644



VIP double hinged articulated expansion joints are generally installed in changes in pipework direction and will accommodate lateral movement in only one plane due to thermal expansion or contraction or building settlement.

Comprising two sets of bellows convolutions, manufactured in 321 stainless steel with carbon steel connecting pipe, flanges and bracketry.

Suitable for LTHW, MTHW, HTHW, steam and other hot liquids and gases.

SPECIFICATION

Max. Working Temperature: 300°C
Max. Working Pressure: 16 Bar at 120°C
Max. Test Pressure: 1.5x Working Pressure or 1.5x flange rating, whichever the lower

VIP Part No	NB (mm)	Total Movement (+/-mm)	Overall Length (mm)	Lateral Spring Rate (N/mm)	Working Pressure at 120°C (bar)	Cold Test Pressure (bar)
33/0644/050	50	50	750	3	16	24
33/0644/065	65	50	750	4.5	16	24
33/0644/080	80	50	750	16	16	24
33/0644/100	100	50	750	27	16	24
33/0644/125	125	50	1000	10	16	24
33/0644/150	150	50	1000	18	16	24
33/0644/200	200	50	1000	17	16	24
33/0644/250	250	50	1000	32	16	24
33/0644/300	300	50	1000	94	16	24

PN16 Single Gimbal Expansion Joint, Flanged

33/0646

Gimbal expansion bellows consisting of stainless steel grade 321 bellows fitted with carbon steel oval flanges drilled to EN1092-1 PN16. Complete with carbon steel gimbal ring assembly.

They are suitable for use on LTHW, MTHW, HTHW, steam and other hot liquids and gases. Used in sets of two with angular expansion joints to accommodate complex lateral movements in pipework installations. This occurs due to thermal expansion or contraction or building settlement.

SPECIFICATION

Max. Working Temperature: 300°C
Max. Working Pressure: 16 Bar at 120°C
Max. Test Pressure: 1.5x Working Pressure or 1.5x flange rating, whichever the lower

VIP Part No	NB (mm)	Angulation (degrees)	Overall Length (mm)	Angular Spring Rate (N/mm)	Working Pressure at 120°C (bar)	Cold Test Pressure (bar)
33/0646/050	50	5	133	10	16	24
33/0646/065	65	5	133	13.5	16	24
33/0646/080	80	5	133	46.5	16	24
33/0646/100	100	5	133	75	16	24
33/0646/125	125	6.5	199	80	16	24
33/0646/150	150	6.5	199	94	16	24
33/0646/200	200	7	212	135	16	24
33/0646/250	250	7	212	240	16	24
33/0646/300	300	7	212	376	16	24

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BENEFITS OF USING RESTRAINED EXPANSION JOINTS

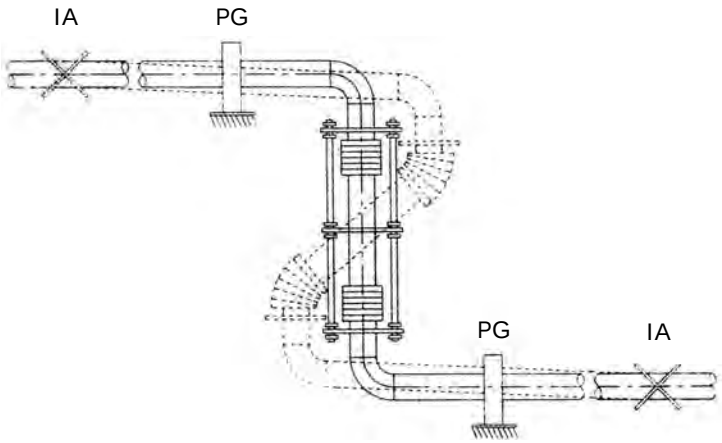
Although the initial outlay of restrained joints seems excessive compared to the cost of unrestrained expansion joints, primarily due to more complex design, savings can be seen with the reduced number of bellows, pipe guides and the strength of anchors required with restrained systems. Additionally, restrained systems are far safer by design and will allow installations at high level.

RESTRAINED EXPANSION JOINTS INSTRUCTIONS

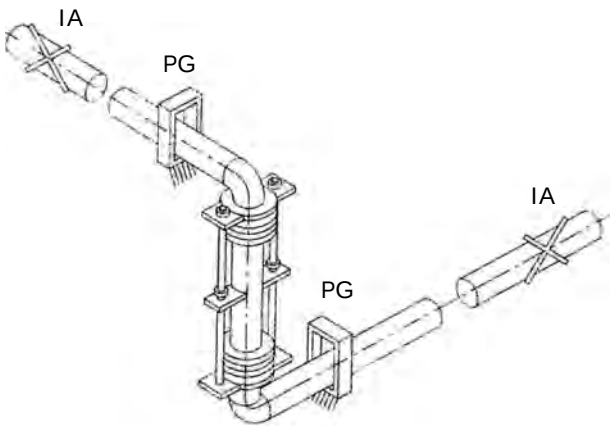
Restrained expansion joints are normally designed to contain the loadings due to the end thrust without any change in length by the means of tie bars or hinges. Therefore the loads imposed on system anchors are considerably lower than for unrestrained type expansion joints, as the internal pressure thrust produced by expansion joints is retained by the integral bracketry.

Consequently, most types of restrained expansion joints are unable to absorb axial movements imposed by the system. Flexibility must therefore be provided by means of angular or lateral deflection. In order to absorb these types of movements it is necessary to take advantage of any changes in direction in the pipe run to position restrained expansion joints at right angles to the direction of movement.

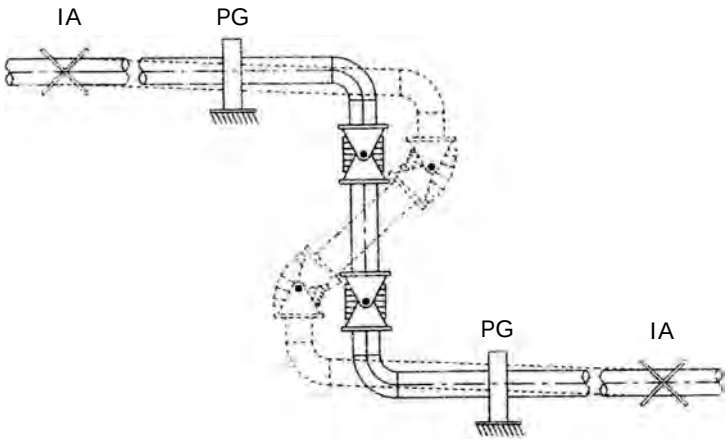
Shown below are typical examples of restrained expansion joint applications. **Please note the use of immediate anchors and planar guiding.** Please consult our engineers for application and installation support.



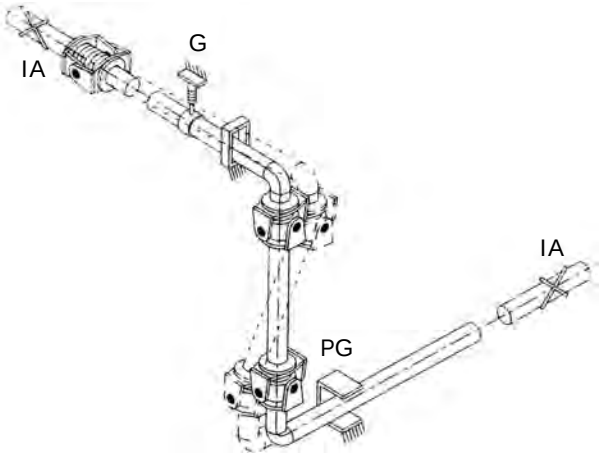
DTF type expansion joint in a single-plane "Z" bend



DTF type expansion joint in a three-plane "Z" bend



SHF type two hinge system in a single "Z" plane



SHF & SGF type 3 pin multi plane system

DEFINITION OF TERMS

Intermediate Anchor:	One that must withstand the bellows thrust due to flow, spring forces, and all other piping loads, but not the thrust due to pressure.
Planar Guide:	One that permits transverse movement and / or bending of the pipeline in one plane.
DTF:	Double Tied Flanged
SHF:	Single Hinged Flanged
SGF:	Single Gimbal Flanged

VIP Cleated Anchor Brackets

33/0656

VIP cleated anchor brackets, either manufactured in plated carbon steel or powder coated steel - generally BZP for steel pipes and powder coated for copper and stainless pipe.

Anchor brackets can be adjusted in height and fall, and come in banks of 2 or 3 split bands.

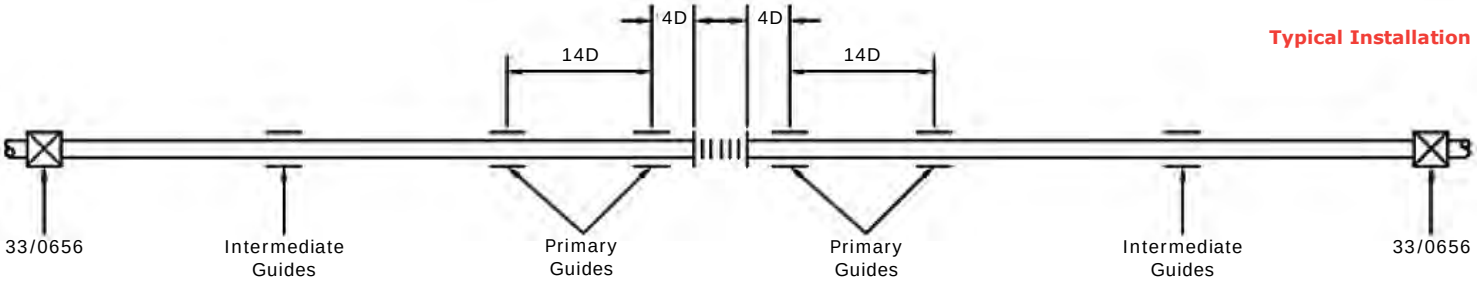
They are to be used predominantly in conjunction with our axial bellows and twin slide guide sets.

PC = Powder Coated **BZP =** Carbon Steel Plated

For use on Low Temperature Heating (LTHW), Medium Temperature Heating (MTHW), High Temperature Hot Water (HTHW) and Domestic Hot Water (DHWS) applications.

For Steam and Condensate applications please contact our sales team.

Typical Installation



Single Point Light Anchor - 1kN

33/0652

The VIP single point light anchor is suitable for loads up to 1kN and for maximum centre lines of pipe 100mm to 250mm.

An electro-galvanized carbon steel pipe anchor with a 2 point fixing clip. Used in M&E services. Also available in stainless steel.

The single point light anchor is designed to provide a fixing point necessary when expansion joints are fitted.

The pipe anchor can be floor, ceiling or wall mounted and is rated for loads of up to 1kN and pipe diameters up to 54mm.

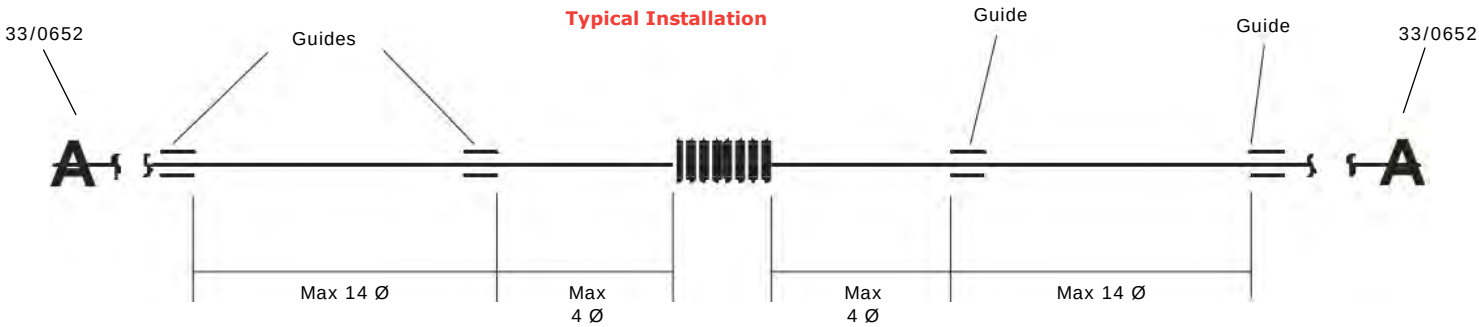
When fixing to the building structure use 2x M10 Anchors.

When anchor loads exceed 1kN please contact VIP for technical assistance.

Pipe clamps for copper, stainless steel, carbon steel, ABS and PVC are also available on request.

Black pipe clamps are finished with a RAL 9005 powder coat, suitable for Copper and HWS services.

Typical Installation



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Suspended Single Pipe Anchor - 2kN

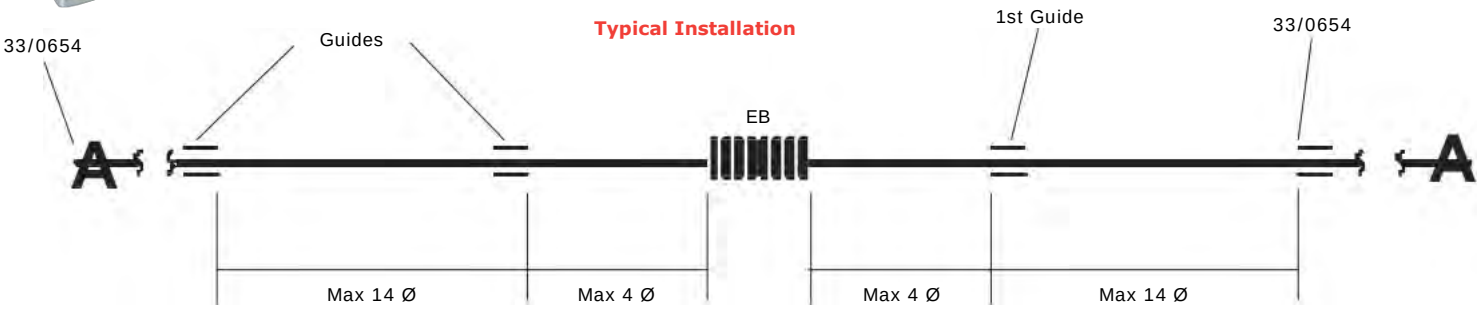
33/0654

The VIP suspended pipe anchor consists of an electro-galvanised carbon steel 2 part fixed point clamp, complete with 2x M16 angular braces and fixing kit.

For use on carbon steel pipe systems as standard, or with coated carbon steel anchor clamps. VIP anchors are designed to provide fixing points necessary when expansion joints are to be installed.

The anchor can be supplied fully assembled or in kit form. These pipe anchors are suitable for floor, ceiling or wall mounting and are a readily available alternative to fabricating and welding anchors on site. The pipe anchor is rated for loads up to 2kN and for pipe diameters up to 67mm.

Typical Installation



Suspended Single Pipe Anchor - 5kN to 35kN

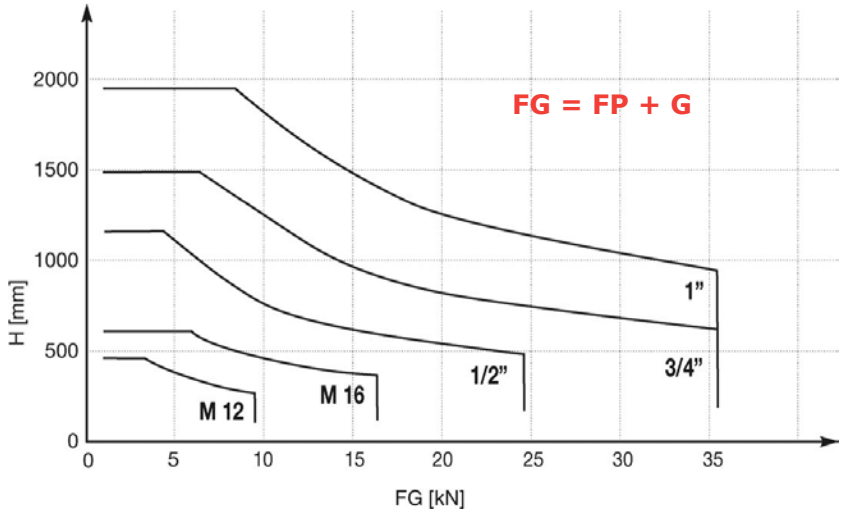
33/0655

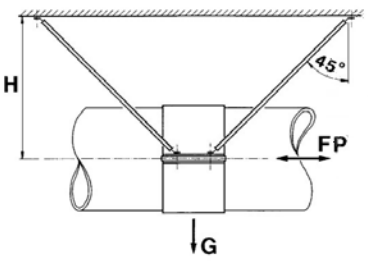
The VIP suspended pipe anchor consists of an electro-galvanised carbon steel 2 part fixed point clamp, complete with 4x angular braces and fixing kit.

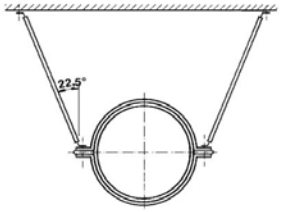
VIP anchors are designed to provide fixing points necessary when expansion joints are to be installed. The anchor can be supplied fully assembled or in kit form. These pipe anchors are suitable for floor, ceiling or wall mounting and are a readily available alternative to fabricating and welding anchors on site. The pipe anchor is rated for loads of between 5kN and 35kN, and for varying height pipework centre distances.

TYPE A

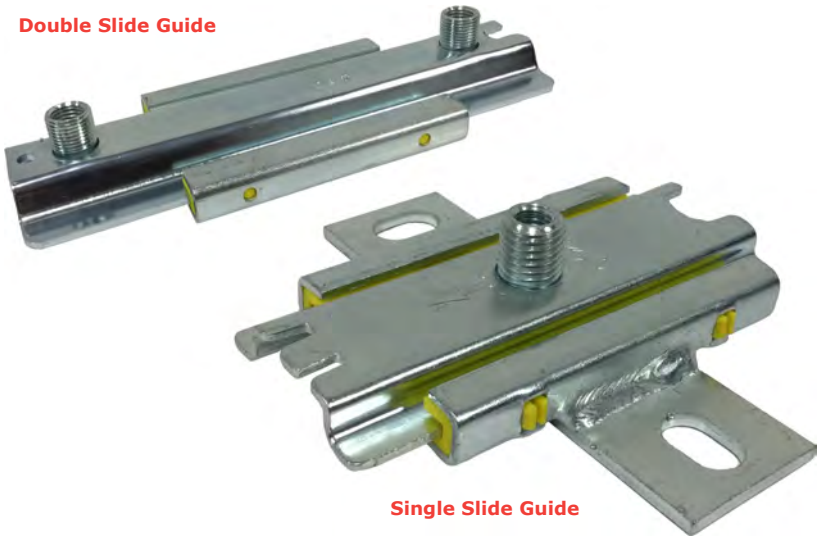
45°C for higher fixed point forces







Double Slide Guide



Single Slide Guide

The VIP expansion joint guide consists of an electro-galvanised carbon steel guide assembly with one or two multi-threaded fixings.

Connections External M16 - Internal M10, M12.

The low friction slide rails are manufactured in glass fibre reinforced (silicon free) Polyphenylene Sulphide.

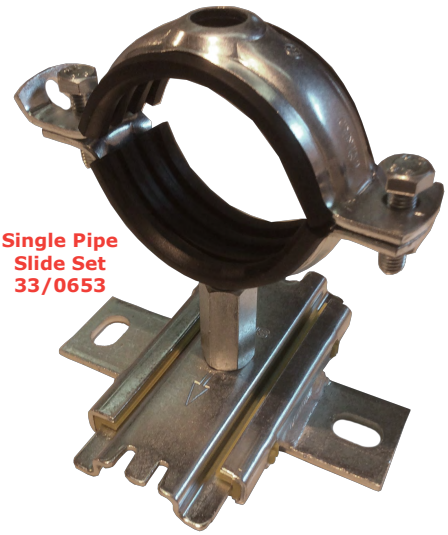
They are fixed to the building structure using M10 or M12 anchors.

VIP slide guides are designed for wall, ceiling or floor mounting.

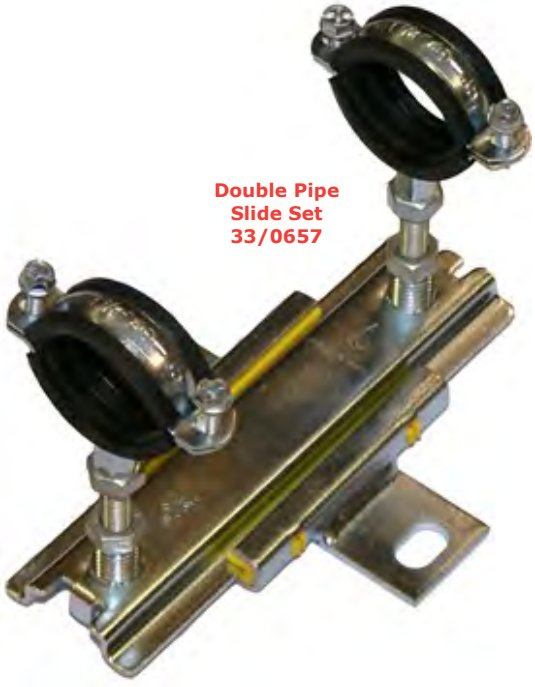
They are designed to accommodate axial movement in pipework and provide a solution that prevents squirming or buckling of pipe due to the forces created when using expansion joints.

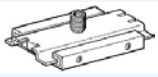
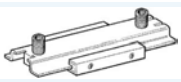
VIP slide guides are suitable for all pipework systems up to a maximum permanent external temperature of 130°C (unlined clamps) - 110°C (rubber lined clamps).

Single Pipe Slide Set 33/0653



Double Pipe Slide Set 33/0657



Dimensions		Movement (mm)	Pipework Ø mm	Maximum Loads			
Width (mm)	Length (mm)			Floor (kN)	Ceiling (kN)	Wall (kN)	
67	130	85	15-65	1.2	0.6	110	
67	200	140	15-65	1.2	0.6	110	
135	130	85	15-65	1.2	0.6	110	
135	200	140	15-65	1.2	0.6	110	
102	150	100	80-300	9	5	350	
102	275	135	80-300	9	5	350	
190	150	100	80-300	9	5	350	
190	275	135	80-300	9	5	350	

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Stainless Steel Braided EPDM Hoses

For Fan Coil, Heating Systems & Chilled Water Applications

Length Tolerances: + / - 10mm
Operating Temp: 0°C to 85°C
Inner Liner: EPDM Elastomer

External Braid: Multi Strand Stainless Steel AISI 304 EN 10204 3.1
WRAS Approved also available on request

VIP offer a variety of types and sizes including:

Male x Compression

Compression x Compression

Brass Push-Fit x Brass Push-Fit

BSP Male x Standpipe

Compression x Standpipe

Standard lengths available:

- 300mm
- 450mm

Insulated Flexible Hoses Also Available:

- Pre-insulated Armaflex Class 0
- Compression Nut
- Male BSPT
- Male x Female Adapter
- Copper Standpipe
- Female Flat Swivel
- Male x Male Adapter

Stainless Steel Convoluted Hose With Stainless Steel Over-Braid

VIP offer a range of stainless steel convoluted hose assemblies to meet customer requirements:

- Manufactured to BS6501 Part 1, 1991, Type B flexibility
- Suitable for elevated temperatures up to 650°C or in cryogenic application down to -200°C
- Available with no braid, single braid or double braid, depending on pressure requirements
- Each unit is manufactured to your requirements. We offer a varying range of end connections in mild or stainless steel

Male x Male

Male x Female

Female x Compression

Compression x Compression

Standard lengths available:

- 300mm
- 450mm
- 500mm

Also available:

- BSPT hexagon male
- BSPT barrel male
- BSP flat faced swivel female
- BSP cone seated swivel female
- Compression
- OD stand pipe connection

Insulated Flexible Hoses Also Available:

- Pre-insulated Armaflex Class 0
- Compression Nut
- Male BSPT
- Male x Female Adapter
- Copper Standpipe
- Female Flat Swivel
- Male x Male Adapter

PREFERRED GEOMETRY AND MINIMUM BEND RADIUS

Good and bad installation geometry

CORRECT

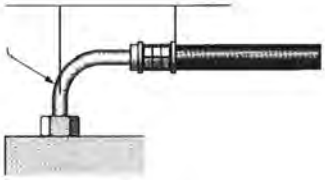
INCORRECT

Slack is present on straight lengths, ends are aligned.

CORRECT

INCORRECT

Avoid the bending radius becoming too small by using elbow fittings



CORRECT

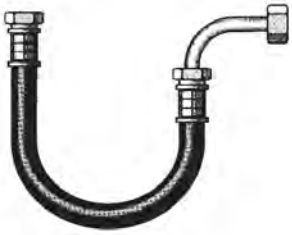
INCORRECT

Hose is long enough to allow smooth curve

CORRECT

INCORRECT

Hose is long enough to allow smooth curve



CORRECT

INCORRECT

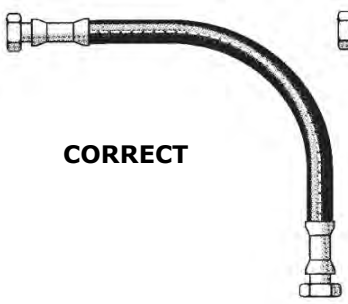
Observe minimum bend radii

CORRECT

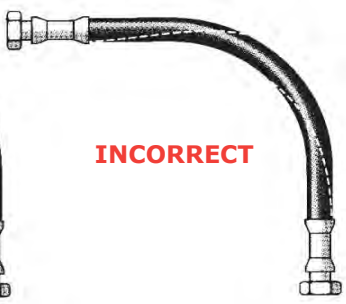
INCORRECT

AVOIDANCE OF TWIST AND STRETCH

Make sure hose is under no strain.
Do not twist hose as this will shorten its life.



CORRECT



INCORRECT

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Automatic Air Vents

33/0679

Body: Brass

Connections: Screwed 1/2"

Max. Working Temp: 110°C

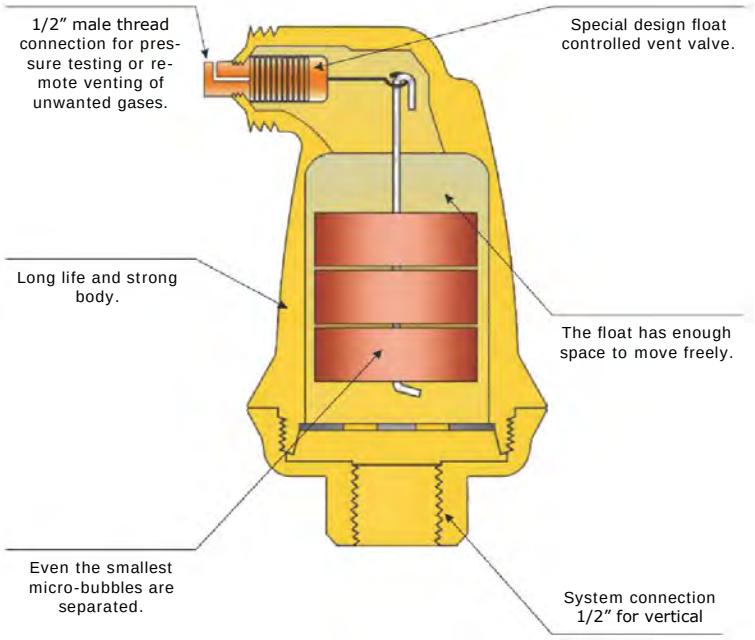
Max. Working Pressure: 10 Bar

Automatic air vents purge air micro-bubbles and other gases from the system quickly & reliably. Air that collects at high points or specially designated collection points within heating systems needs to be removed to enable efficient operation. This is achieved by installing a VIP float operated automatic air eliminator. There is a float-controlled vent valve within the unit which operates when the float level drops due to the accumulation of air. This then opens the valve allowing the air to escape.

The float chamber is large enough to ensure the float moves freely even if there are dirt deposits in the chamber and the water level ensures protection of the valve mechanism from dirt.

The discharge has a 1/2" BSP male thread for ease of piping away if required, otherwise it vents to atmosphere.

The VIP automatic air vent must be installed at high points or specifically designed collection points.



Air & Dirt Separators

33/0593

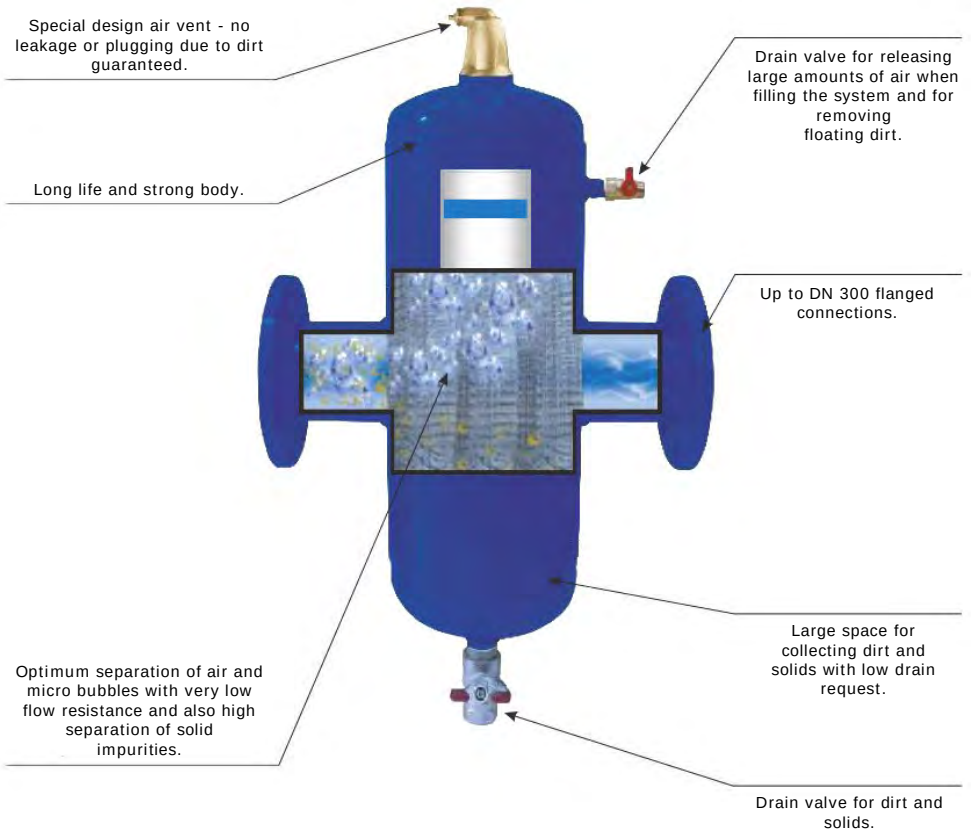
Body / Strainer Screen: Carbon steel - ST37

Connections: Flanged

Max. Working Temp: 110°C

Max. Working Pressure: 10 Bar

Air & Dirt Separators are for use in pipelines for the high efficiency removal of both dirt and air micro-bubbles from heating and cooling systems in buildings.



For heating...

Cal-Pro
For heating systems
(capacity 4 - 900ltr)

Easy-Pro
For water heaters and electric pumps
(capacity 4 - 24ltr)

OEM-Pro
For boilers
(capacity 6 - 24ltr)

For potable water...

Inox-Pro
For anti-hammer, use in coastal areas and in the presence of brackishness
(capacity 0.16 - 18ltr)

Ultra Inox-Pro
For potable water, pumps and booster sets
(capacity 24 - 100ltr)

Ultra-Pro Evo
For potable water, pumps and booster sets
(capacity 19 - 100ltr)

Ultra-Pro
For potable water, pumps, booster sets
(capacity 24 - 3000ltr)

For sanitary water...

Hydro-Pro
For electrical pumps, anti-water hammer and water heaters
(capacity 2 - 600ltr)

Hy-Pro
For water heaters and any type of pump
(capacity 2 - 24ltr)

Water-Pro
For electrical pumps and water heaters
(capacity 5 - 24ltr)

For solar systems...

SolarPlus
(capacity 12 - 1600ltr)

SolarPlus TM
(capacity 12 - 500ltr)

VSG Vessel
(capacity 5 - 400ltr)

SolarPlus Safe
(capacity 18 - 500ltr)

T: 01942 885700 **F:** 01942887213 **E:** sales@vip-ltd.co.uk **W:** www.vip-ltd.co.uk

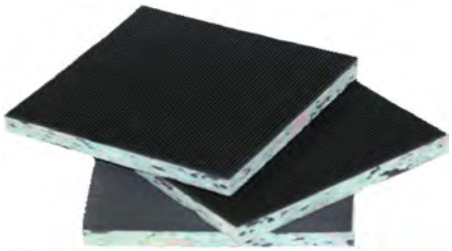
In addition to the products listed within this catalogue, VIP can source a wide range of products to your requirements, including (but not limited to) those listed below. Please consult our engineering team on 01942 885700 for product support, technical backup and assistance - all enquiries are welcome.

Inertia Bases & Mounts

Plant Frames & Roof Top Mounts

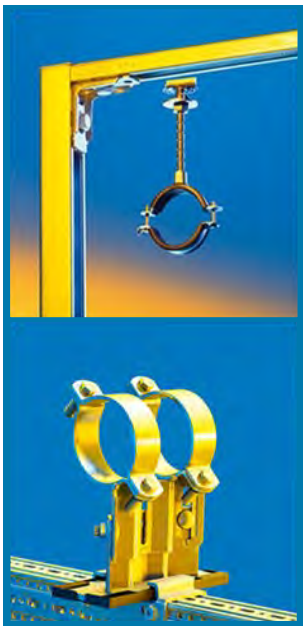
Spring Mounts

Anti-Vibration Matting

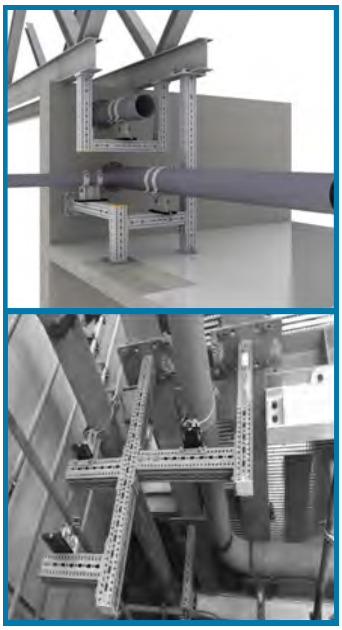


Rubber Mounts

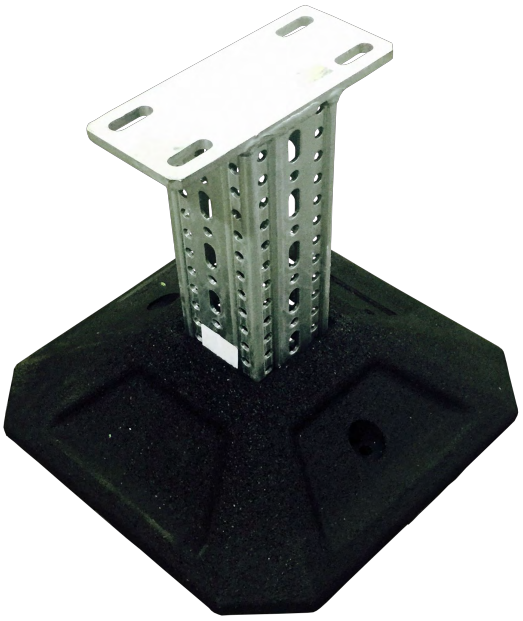
Spring Hangers



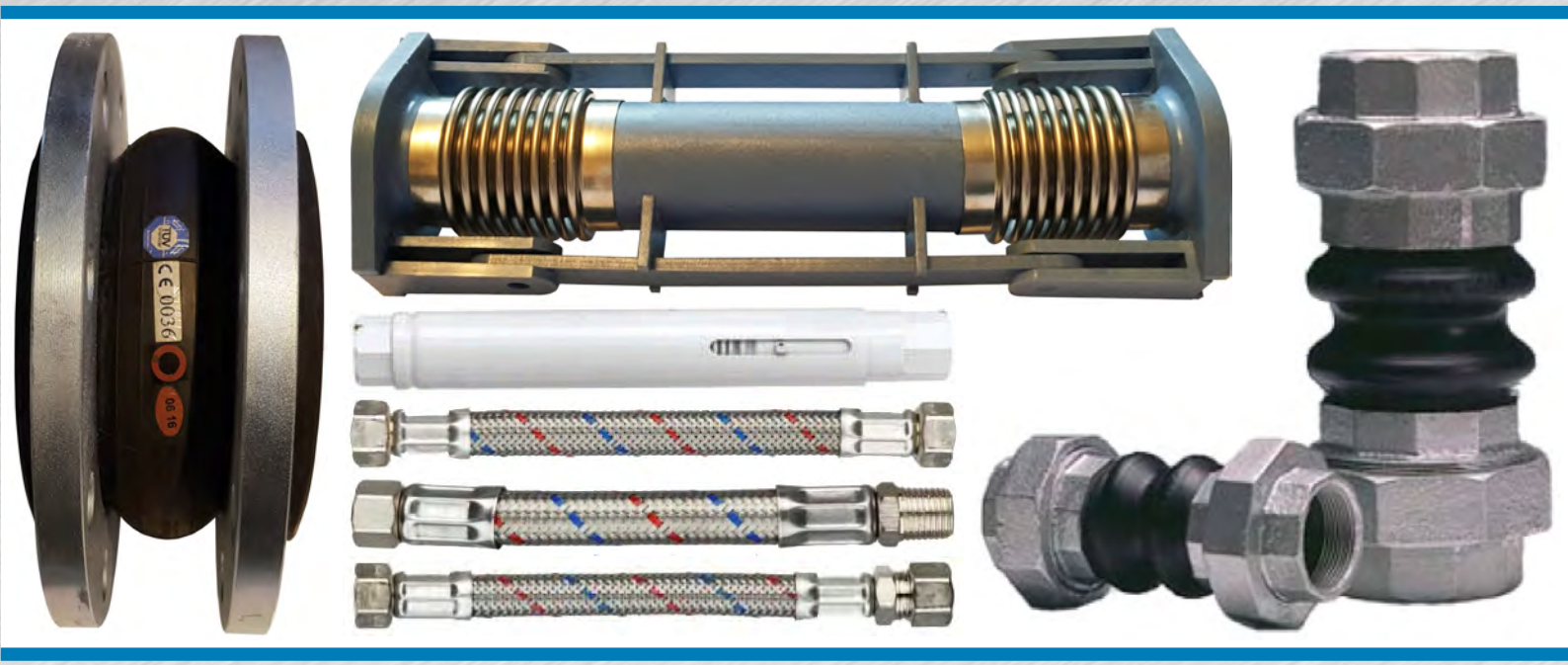
Pipe Clips & Sliders



Framo Steel Supports



Heavy Plant Support



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