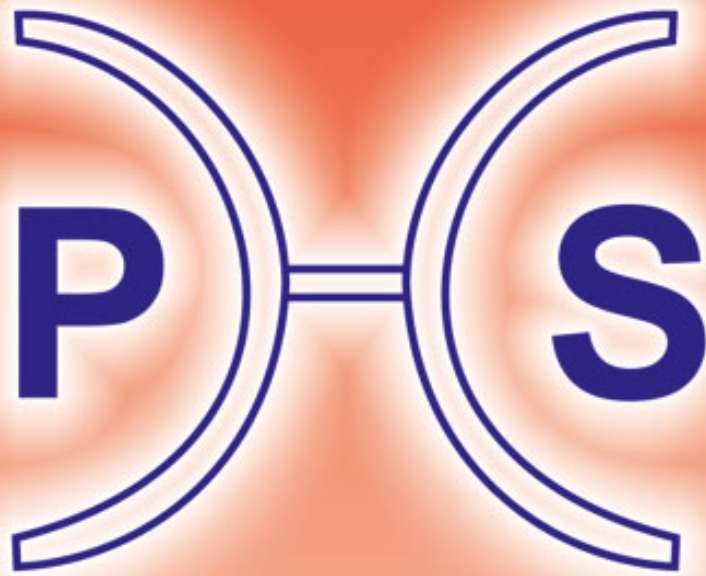


Pipe Hangers & Supports



Over 25 years of serving Power generation, Petroleum, Nuclear, Process, Oil & gas, Offshore, Water & HVAC industries worldwide.



History

We were Incorporated in the year 1984 under the name and style of Myricks Piping Systems (P) Ltd to manufacture state of the art Pipe Hanger & supports equipment in India with technology from Support Technology & Products UK.

In the year 2000, we signed a joint venture agreement with Pipe Supports Group UK to manufacture the "Pipe Supports" range of hangers & supports and upgraded to the latest technology. The company was renamed Pipe Supports India (P) Ltd.

The joint venture came to an end in Jan 2010 having completed its stipulated 10 year term and the technology was fully absorbed.

Present

The renamed company, 'Pipe Hangers & Supports (P) Ltd - PHSPL' was incorporated in January 2010 with its unique brand identity. We are enhancing the technology and introducing new products in the near future.

We use state of the art technology, modern manufacturing methods, latest software, computer systems, CNC machines etc. to deliver a competitive, cost effective high quality product. We are highly focused on timely delivery and on time response to client requirements. We provide after sales support including responding to site emergencies during erection and commissioning.

VARIABLE EFFORT SUPPORTS

The current expanded range of variable effort supports are designed keeping in mind the space constraints imposed by modern industrial complexes generating power, refining petroleum products and off shore rigs. The design lends itself to application of high performance paints which are being increasingly specified by clients who are conscious of degradation & corrosion due to process and environmental conditions.

APPLICATION

Pipe lines constructed of steel will expand along its axis by an amount equal to its co-eff of thermal expansion when carrying hot or cold fluids. The pipe lines when suspended from Variable effort supports will allow this thermal expansion or contraction relative to structure and at the same time support the weight of the pipe to prevent sagging.

The variable effort support is a simple device such that a helical coil compression spring is pre-compressed (to reduce head room) in a casing. The spring will compress or expand by an amount equal to the thermal movement of pipe. Hence the load on the pipe will vary with movement and hence the name variable effort support as the supporting effort varies with movement.

RANGE

Pipe Hanger & Supports offer a wide range of Variable effort supports right from 3.43 Kgs to 39120 Kgs spread across several travel, load & support configuration types

Available in the following variation

WORKING RANGES

VS1- 35mm

VS2-70mm

VS3-140mm

VS4-210mm

VS5-280mm

With 29 spring sizes (Size 1 to Size 29) within each travel range. Newly introduced High load variable series to cater for large loads using multi-coil configuration:

VS1- 35mm

VS2-70mm

VS3-140mm

With 7 spring sizes (Size H1 to H7) within each travel range.

SUPPORT TYPES

A, B, C	Top Supported
D	Top Adjustable
E	Extended Support
F	Base mounted
G	Trapeze type double

RELATED SPECIFICATIONS

The Pipe Hangers & Supports range of Variable Effort Supports are designed and manufactured to meet the requirements of the following Specifications:

BS3974	ANSI / ASME B31.1
ANSI / ASME B31.3	ANSI / MSS SP-58
ANSI / MSS SP69	

INSTALLATION AND ERECTION

Please refer the exhaustive Erection / Commissioning manual for details. This is supplied free of cost along with every dispatch. This manual is also available as a free download from our web site www.pipehangers.in.

MAINTENANCE

The supports are engineered and designed to be maintenance free. Refrain from making any attempt whatsoever to open the canister to remove spring coil since the spring coil is pre-compressed and assembled in the can.

General guidelines for periodic inspection at site:

- Look for rusting on spring coil / locking rods as these are load carrying members.
- Check for visual damage which may impede free movement of spring coil.
- Inspect for fallen construction debris inside can which can cause the spring to deform during operation.
- Check whether the piston plate pointer is near about the "Hot" & "Cold" position marked on the name plate and that it is not at the extremities.
- If the hanger rod is loose or the pipe shoe has lifted, it means that the support is not taking load.
- If the spring is fully compressed to its home length or solid, it means excessive movement / load and needs the attention of Pipe line designer to sort out the issue.

A more detailed erection and maintenance procedure is available upon request.



VARIABLE EFFORT SUPPORTS

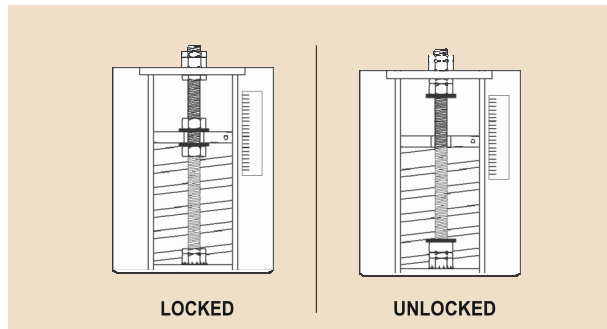
Type G



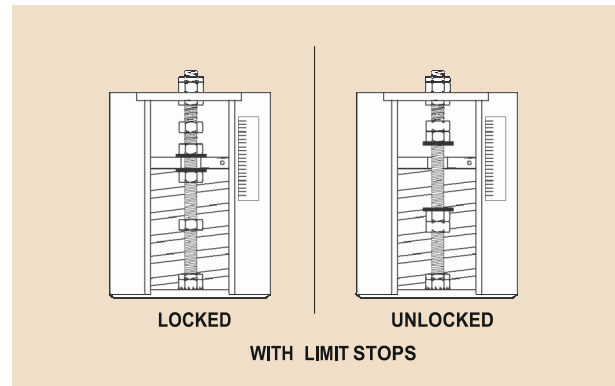
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STANDARD FEATURES



OPTIONAL FEATURES



- Occupies minimum head room, are compact with low installed heights.
 - Over travel provided at both ends of the travel range as follows:
VS1=5mm
VS2=10mm
VS3=20mm
VS4=30mm
VS5=40mm
 - Supports fitted with Stainless / Aluminum name and scale plates punched / engraved with details pertaining to support like Loads, Tag No, Size, S/r Constant, unique serial number for co-relation to test certificate etc.
 - The supports are fitted with a Universal preset locking device using fully threaded rods and nuts such that the piston plate can be locked at any position of its travel range. During installation, the locking nuts are unwound to allow free movement of the piston plate. The locking device stays on the support as an integral part of the support. In order to carry out any maintenance activity on the pipe line during plant shut down / outages the nuts can be wound back to lock the piston plate in position.
 - The construction of the support (bolted) is of particular benefit when specialty high performance paints are used or the support is hot dip galvanized, after compressing the spring and locking it, the top plate is locked in position by nuts and there is no welding, hence the paint / HDG does not get damaged.
- Limit stops can be incorporated when thermal movement has to be limited beyond a certain point. This simply means providing additional nuts welded in place on the side preset locking bars such that the piston plate cannot move beyond that. (see Fig 2).
 - For foot mounted supports, the load flange can be equipped with PTFE slider or graphite pads to reduce friction when large axial / transverse movements are envisaged.
 - Special supports can be designed to suit special operating conditions, please consult our design department for details.

VARIABLE EFFORT SUPPORTS

SELECTION

Variable Effort Supports can be selected manually with the help of the catalogue as shown below or can be selected by using our propriety software that is available as a free issue from our sales department.

SELECTION FROM THE CATALOGUE

Refer the load charts for variable effort supports, open out the table pertaining to the units i.e Newtons or Kilograms. Selection of VS1, VS2, VS3, VS4, VS5 will depend on the Thermal movement i.e. movement of pipe from cold position to hot position and the allowable load variation in percentage.

Since the pipe is slung or supported directly from the helical coil any vertical movement will represent a certain amount of compression or de-compression of spring coil, in turn manifesting itself as a change in supporting effort.

Thus when the pipe moves from the cold position to hot position the load will vary, the change in load or effort = movement x Spring Constant.

The change is normally expressed as a percentage of the operating load, provided the initial stress analysis is based on the hot load basis and client provide hot load and movement in their specification.

$$\text{Variation is Effort} = \frac{\text{Movement} \times \text{Spring Constant}}{\text{Operating Load}} \times 100 \%$$

Most Standards like MSS-SP58 limit this percentage variation, also called Load Variation to 25%, though depending on the criticality of application lower or higher Load variations are allowed by pipe work designers.

For the sake of guidance or rule of thumb basis, for movements upto 10 mm use VS1, for 10 to 25 mm use VS2, for 25 to 55mm movement use VS3.

SUPPORT SIZE

Selection of the support size is done by using the selection charts. Use procedure detailed below for selection.

SELECTION PROCEDURE

1. Determine the operating load or hot load and the thermal movement i.e movement of pipe from installed (cold or preset position) to hot or operating load. If there are attachments to pipe like heavy clamps or trapeze beams, the weight of these may be added to operating load.
2. Based on guide line above arrive at travel range required.
3. Refer selection chart & select smallest spring size which has the operating load in the working range shown.
4. Ensure that the spring size selected can accommodate the travel within economic range (not in over travel). If the movement is up then go down the chart from operating load and if movement is down, go up the chart by an amount equal to travel from the operating load.
5. Make sure that both operating load and preset load are in the same selected size.
6. If the movement cannot be accommodated by the selected spring try a next higher size or the next travel range.
7. If the travel cannot be accommodated by a VS5 range then select a constant effort support.
8. Calculate the percentage load variation by using formula shown above.

9. If the percentage variation exceeds the limit set by client or 25% (in the absence of any limit set by client) select the spring constant of the next travel range.
10. If the variation is less than half of the max allowed variation then a smaller travel range may do the job i.e from a VS3, you may select a VS2.
11. If the Load variation exceeds 25 % or the limit set by client then select a constant.
12. The process of selection is an iterative one.

TYPE

Determine the configuration and geometry of support or hanger required based on site conditions and available space and availability of steel work near the support location. The various types are A, B, C, D, E, F, E Once the Size, travel range etc. are selected, the support can be described as VS3-12-C.

CALCULATION OF INSTALLED DIMENSIONS

The Rod Take Out Dimension or "RTO" as it is popularly called for type A, B, C, G and "J" Dimn for D, E & F type supports tabulated in the tables are at min working load i.e dimensions at minimum load.

a) Installed Load =
Operating Load + (Movement x Spring Rate)
for 'installed to operating' movement up.

b) Installed Load =
Operating Load - (Movement x Spring Rate)
for 'installed to operating' movement down.

Spring Displacement at Installed Load =
Installed Load - Minimum Load (mm)

$$\text{Spring Rate}$$

Installed Dimension =
R.T.O. + Spring Displacement at Installed Load
(A, B, C and G

units). Installed Dimension =
J - Spring Displacement at Installed Load
(D, E and F units).

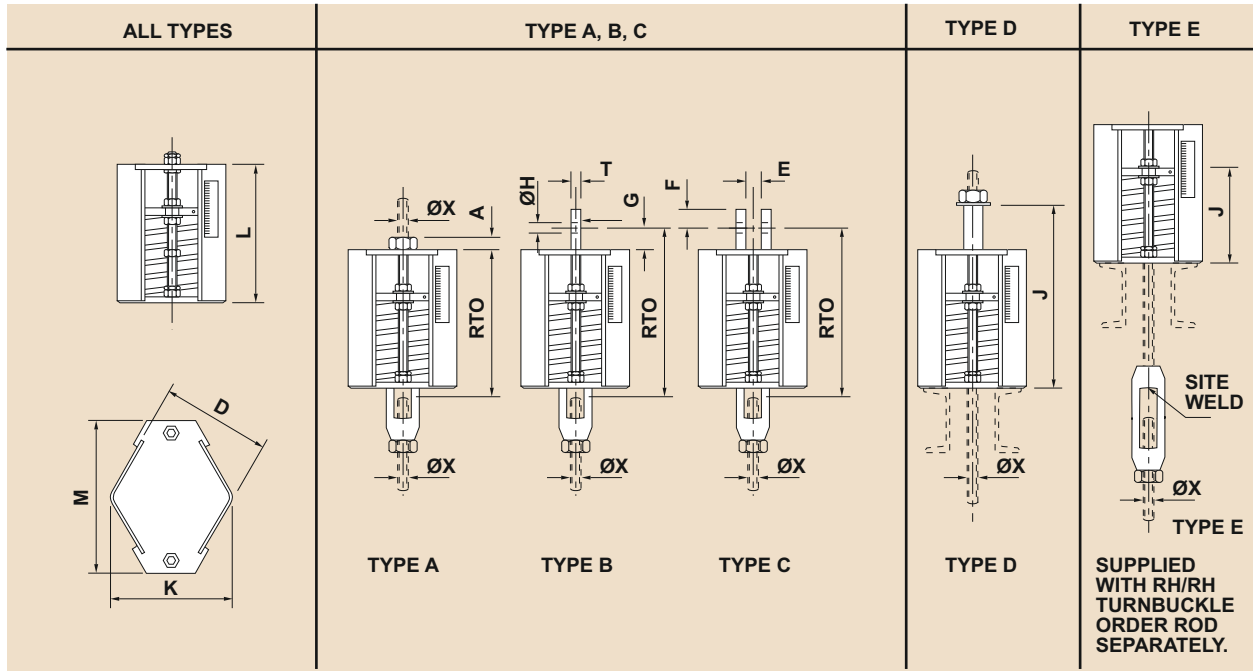
ORDERING

For information on ordering a support or hanger please refer to Page no - 221

VARIABLE EFFORT SUPPORTS

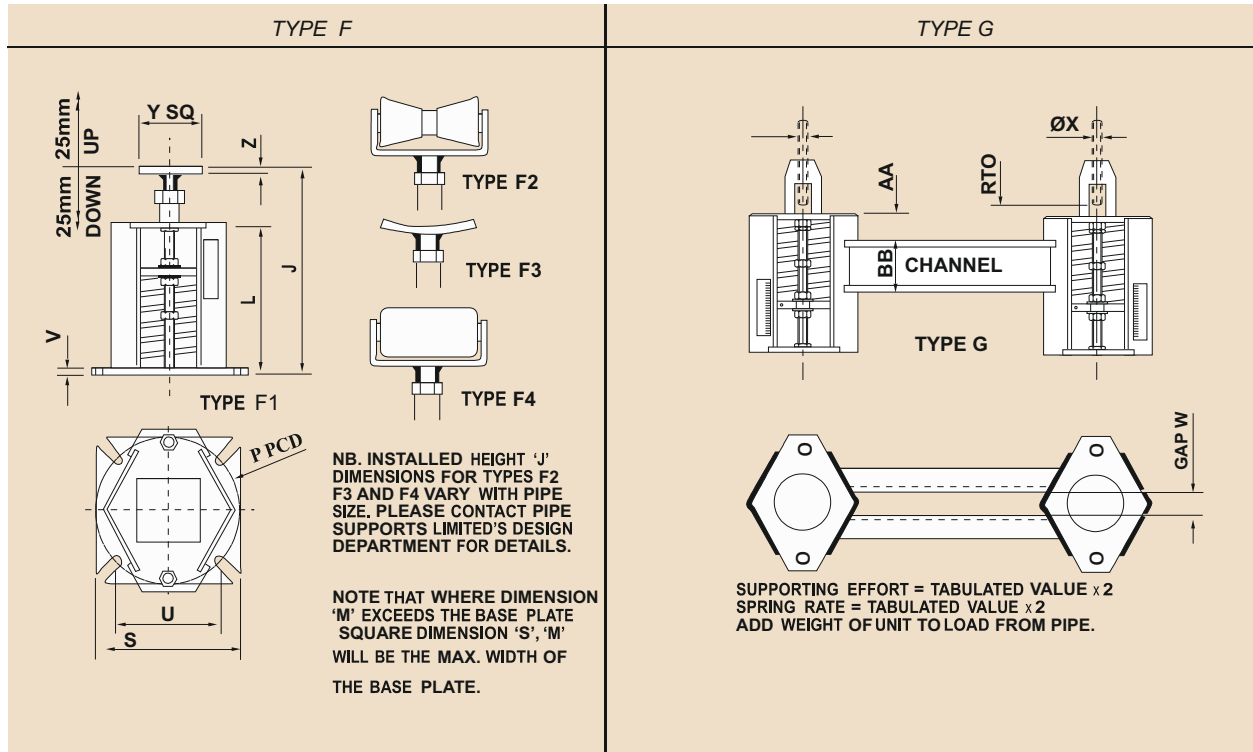


RANGE VS1



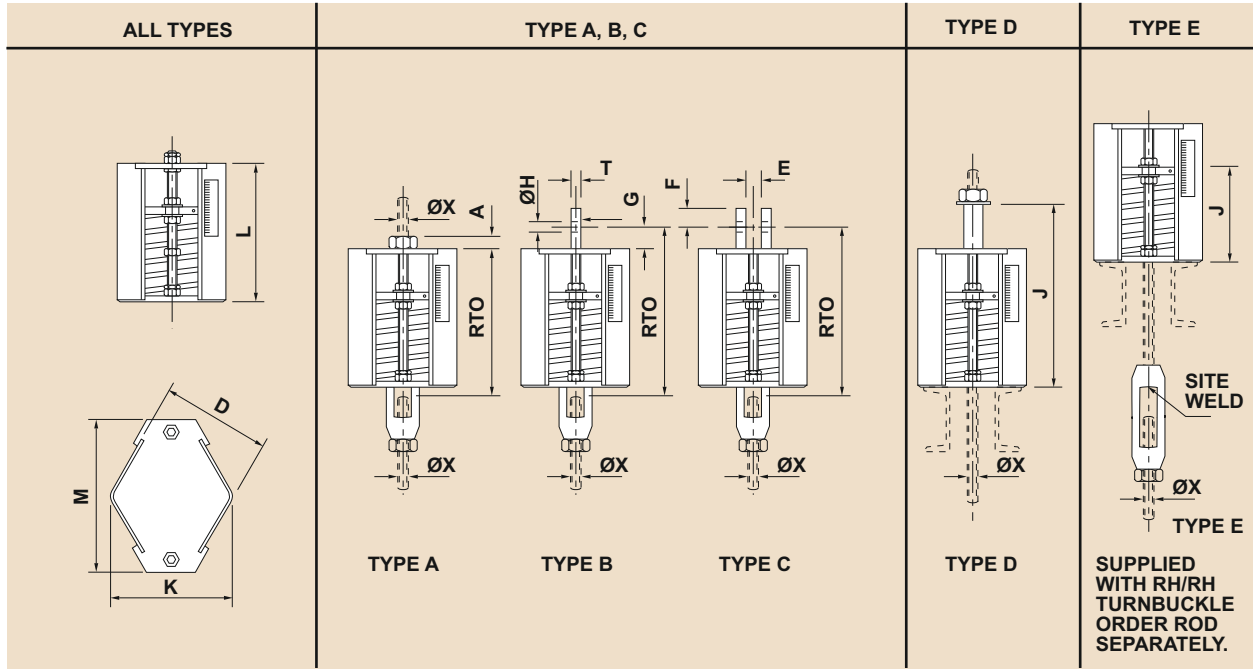
SUPPORT SIZE	ROD DIA	BODY DIMENSIONS					RTO AT MIN LOAD (mm)			DEPTH OF THRD	LUG DIMENSIONS TYPES B & C						WEIGHTS kgf			J AT MIN LOAD mm	WEIGHT kgf	J AT MIN LOAD mm	WEIGHT kgf
		X mm	D mm	K mm	M mm	L mm (not BM)	A	B	C		A mm	E mm	F mm	G mm	H mm	T mm	A	B	C				
VS1-1	M12	108	122	155	133	150	182	182	12	20	20	30	14	6	4.0	4.1	4.2	153	3.2	84	3.4		
VS1-2	M12	108	122	155	117	150	182	182	12	20	20	30	14	6	4.1	4.2	4.3	157	3.2	88	3.5		
VS1-3	M12	108	122	155	123	150	182	182	12	20	20	30	14	6	4.1	4.2	4.3	163	3.3	93	3.5		
VS1-4	M12	108	122	155	124	150	182	182	12	20	20	30	14	6	4.2	4.3	4.4	164	3.3	94	3.6		
VS1-5	M12	108	122	155	123	150	182	182	12	20	20	30	14	6	4.2	4.3	4.4	163	3.3	93	3.6		
VS1-6	M12	108	122	155	126	150	182	182	12	20	20	30	14	6	4.2	4.3	4.4	166	3.3	96	3.6		
VS1-7	M12	108	122	155	127	150	182	182	12	20	20	30	14	6	4.3	4.4	4.5	167	3.4	97	3.7		
VS1-8	M12	108	122	155	133	150	182	182	12	20	20	30	14	6	4.4	4.5	4.6	173	3.5	103	3.8		
VS1-9	M12	108	122	155	136	150	182	182	12	20	20	30	14	6	4.4	4.5	4.6	176	3.6	106	3.8		
VS1-10	M12	108	122	155	134	150	182	182	12	20	20	30	14	6	4.5	4.6	4.7	174	3.6	105	3.9		
VS1-11	M12	108	122	155	139	150	182	182	12	20	20	30	14	6	4.6	4.7	4.8	179	3.7	109	4.0		
VS1-12	M12	108	122	155	139	150	182	182	12	20	20	30	14	6	4.7	4.8	4.9	179	3.8	110	4.1		
VS1-13	M12	108	122	155	160	158	196	196	12	25	30	36	18	6	5.0	5.1	5.3	200	4.1	130	4.4		
VS1-14	M12	108	122	155	173	171	209	209	12	25	30	36	18	6	5.4	5.6	5.7	213	4.6	143	4.8		
VS1-15	M12	108	122	155	194	192	230	230	12	25	30	36	18	6	6.0	6.2	6.3	234	5.1	165	5.4		
VS1-16	M16	145	164	200	210	207	260	260	16	30	35	50	22	10	12.3	12.6	13.0	250	10.4	172	10.8		
VS1-17	M16	145	164	200	184	181	234	234	16	30	35	50	22	10	11.5	11.9	12.2	224	9.6	146	10.1		
VS1-18	M16	145	164	200	197	194	247	247	16	30	35	50	22	10	12.2	12.5	12.9	237	10.3	159	10.7		
VS1-19	M20	175	198	250	209	205	269	269	20	35	45	60	26	10	20.8	21.4	22.0	249	16.7	163	17.3		
VS1-20	M24	175	198	250	231	226	301	301	24	40	55	70	33	12	23.0	24.0	25.1	271	18.3	181	19.3		
VS1-21	M30	175	198	250	259	253	339	339	30	45	55	80	40	15	26.4	27.8	29.4	299	20.5	204	22.2		
VS1-22	M30	220	250	330	268	262	348	348	30	45	55	80	40	15	45.3	46.6	48.2	308	35.8	208	37.5		
VS1-23	M36	220	250	330	313	306	403	403	36	60	75	90	46	15	57.2	59.2	61.5	353	44.6	242	46.6		
VS1-24	M42	220	250	330	360	352	465	465	42	70	85	105	52	20	72.1	75.6	79.8	400	55.4	277	58.3		
VS1-25	M48	330	376	500	366	356	486	486	48	75	100	120	60	20	137	142	148	406	112	283	116		
VS1-26	M56	330	376	500	398	387	538	538	56	80	115	140	68	20	161	167	175	438	132	307	139		
VS1-27	M64	330	376	520	425	412	580	580	64	90	130	155	76	25	184	194	205	465	148	328	158		
VS1-28	M72	330	376	530	488	474	643	643	72	90	130	155	76	25	233	241	253	528	185	378	198		
VS1-29	M80	330	376	540	571	555	746	746	80	100	150	175	85	25	293	304	318	611	228	448	247		

RANGE VS1



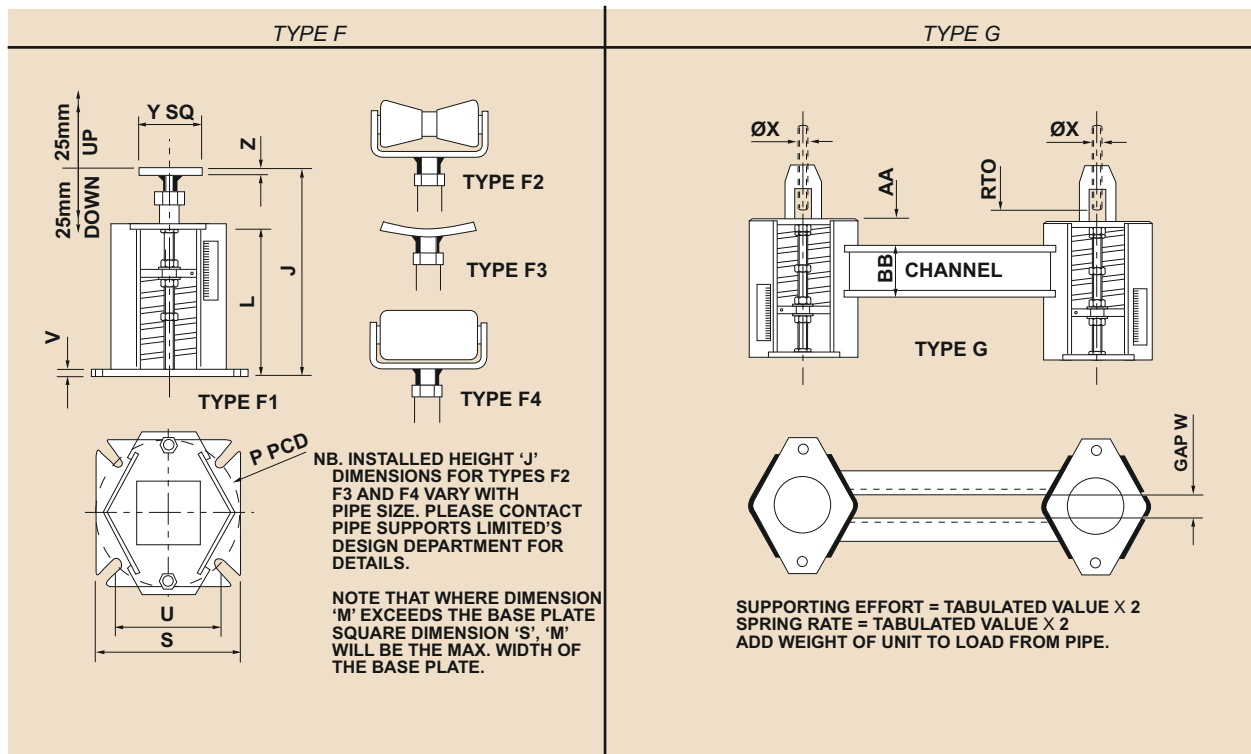
SUPPORT SIZE	J AT MIN. LOAD TYPE F mm	BODY L'TH L mm	BASE PLATE SQ. S mm	BASE PLATE PCD P mm	BASE BOLT CRS. SQ. U mm	BASE BOLT SIZE	BASE PLATE THK V mm	LOAD PAD SQ. Y mm	LOAD PAD THK Z mm	WEIGHT kgf F	RTO AT MIN LOAD mm	DIM. AA mm	GAP W mm	BEAM DEPTH BB (mm)			WEIGHT kgf		
														800 MAX CENTRES	1200 MAX CENTRES	1600 MAX CENTRES	@ 800 CRS	@ 1200 CRS	@ 1600 CRS
VS1-1	184	104	150	160	113	M16	6	75	6	3.5	63	25	18	50	50	50	14	18	21
VS1-2	188	108	150	160	113	M16	6	75	6	3.5	59	25	18	50	50	50	14	18	21
VS1-3	193	113	150	160	113	M16	6	75	6	3.5	54	25	18	50	50	50	14	18	21
VS1-4	194	114	150	160	113	M16	6	75	6	3.6	53	25	18	50	50	50	15	18	22
VS1-5	193	113	150	160	113	M16	6	75	6	3.6	54	25	18	50	50	50	15	18	22
VS1-6	196	116	150	160	113	M16	6	75	6	3.6	51	25	18	50	50	50	15	18	22
VS1-7	197	117	150	160	113	M16	6	75	6	3.6	50	25	18	50	50	50	15	18	22
VS1-8	203	123	150	160	113	M16	6	75	6	3.7	44	25	18	50	50	50	15	18	22
VS1-9	206	126	150	160	113	M16	6	75	6	3.8	41	25	18	50	50	50	15	18	22
VS1-10	210	127	185	177	125	M20	8	75	6	5.4	42	25	22	75	75	75	19	24	30
VS1-11	214	131	185	177	125	M20	8	75	6	5.5	38	25	22	75	75	75	19	25	30
VS1-12	215	132	185	177	125	M20	8	75	6	5.6	37	25	22	75	75	75	19	25	31
VS1-13	241	152	200	197	139	M20	8	75	10	6.8	25	25	26	75	75	75	20	25	31
VS1-14	254	165	200	197	139	M20	8	75	10	7.2	25	25	26	75	75	75	21	26	32
VS1-15	276	187	200	197	139	M20	8	75	10	7.6	25	25	26	75	75	75	22	27	33
VS1-16	292	204	270	240	170	M20	10	100	12	15.1	25	25	33	100	100	125	38	46	64
VS1-17	266	178	270	240	170	M20	10	100	12	14.7	25	25	33	100	100	125	36	44	63
VS1-18	279	191	270	240	170	M20	10	100	12	15.2	25	25	33	100	100	125	37	45	64
VS1-19	289	199	270	240	170	M20	12	120	12	22.5	25	25	40	125	150	150	59	82	97
VS1-20	307	217	270	240	170	M20	12	120	12	23.6	25	25	40	125	150	150	63	86	102
VS1-21	330	240	270	240	170	M20	12	120	12	25.4	25	25	40	125	150	150	70	93	109
VS1-22	337	246	270	268	190	M20	12	150	15	38.6	25	25	52	200	200	250	119	138	158
VS1-23	361	270	270	268	190	M20	12	150	15	44	25	25	52	200	200	250	143	162	182
VS1-24	401	308	270	268	190	M20	20	150	15	57	25	25	52	200	200	250	172	192	212
VS1-25	422	320	400	400	283	M24	20	200	20	117	25	25	60	250	300	390	296	342	411
VS1-26	446	339	400	400	283	M24	20	200	20	132	25	25	70	250	300	390	345	391	459
VS1-27	473	363	400	400	283	M24	20	200	20	150	25	25	80	250	300	390	391	437	506
VS1-28	536	416	400	400	283	M24	25	200	25	189	25	25	80	390	390	430	517	560	629
VS1-29	626	495	400	400	283	M24	30	200	30	237	25	25	90	390	390	430	637	681	750

RANGE VS2



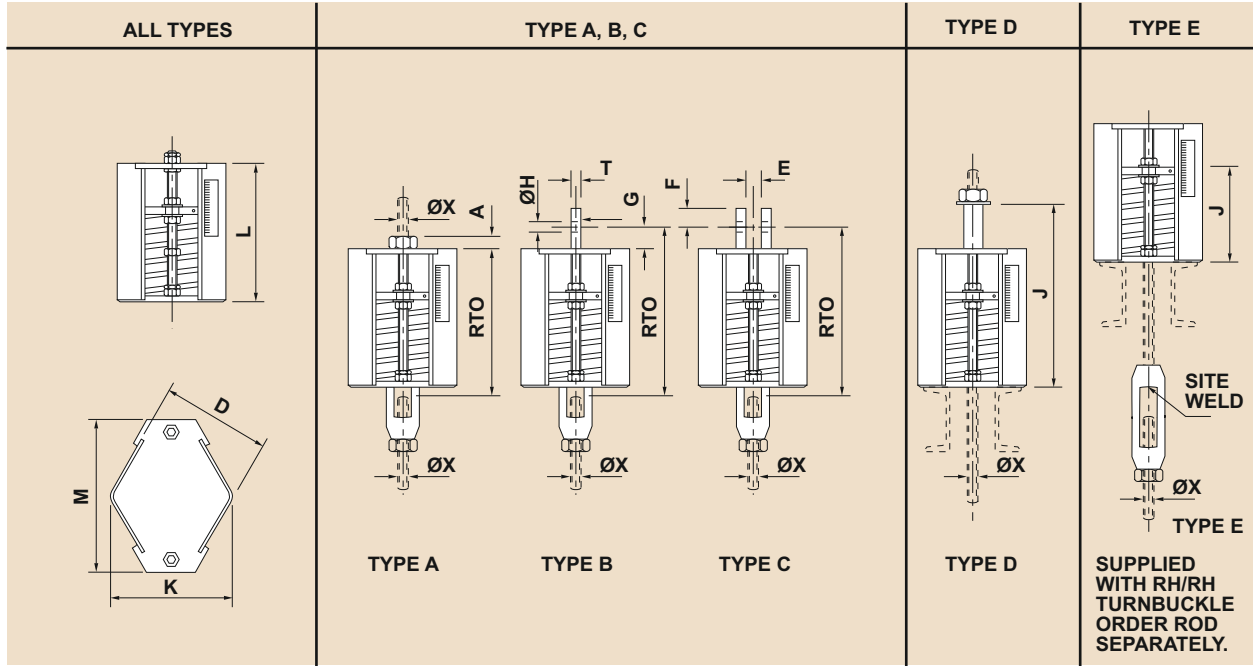
SUPPORT SIZE	ROD DIA	BODY DIMENSIONS				RTO AT MIN LOAD (mm)			DEPTH OF THRD	LUG DIMENSIONS TYPES B & C						WEIGHTS kgf			J AT MIN LOAD mm	WEIGHT kgf	J AT MIN LOAD mm	WEIGHT kgf
		X mm	D mm	K mm	M mm	L mm (not BM)	A	B		C	A mm	E mm	F mm	G mm	H mm	T mm	A	B				
VS2-1	M12	108	122	155	169	167	199	199	12	20	20	30	14	6	4.4	4.5	4.6	249	3.6	133	3.8	
VS2-2	M12	108	122	155	176	174	206	206	12	20	20	30	14	6	4.5	4.6	4.7	256	3.7	140	3.9	
VS2-3	M12	108	122	155	185	183	215	215	12	20	20	30	14	6	4.7	4.8	4.9	265	3.8	148	4.1	
VS2-4	M12	108	122	155	191	189	221	221	12	20	20	30	14	6	4.8	4.9	5.0	271	3.9	155	4.2	
VS2-5	M12	108	122	155	187	185	217	217	12	20	20	30	14	6	4.7	4.8	4.9	267	3.9	151	4.1	
VS2-6	M12	108	122	155	197	195	227	227	12	20	20	30	14	6	4.8	4.9	5.0	277	4.0	161	4.2	
VS2-7	M12	108	122	155	190	188	220	220	12	20	20	30	14	6	4.8	4.9	5.0	270	4.0	154	4.2	
VS2-8	M12	108	122	155	206	204	236	236	12	20	20	30	14	6	5.1	5.1	5.3	286	4.2	170	4.4	
VS2-9	M12	108	122	155	208	206	238	238	12	20	20	30	14	6	5.0	5.1	5.2	288	4.2	171	4.4	
VS2-10	M12	145	164	200	206	204	236	236	12	20	20	30	14	6	9.5	9.6	9.7	286	8.4	167	8.6	
VS2-11	M12	145	164	200	209	207	239	239	12	20	20	30	14	6	9.7	9.8	9.9	289	8.6	171	8.8	
VS2-12	M12	145	164	200	213	211	243	243	12	20	20	30	14	6	9.9	10.0	10.1	293	8.8	175	9.0	
VS2-13	M12	145	164	200	222	220	258	258	12	25	30	36	18	6	10.2	10.3	10.5	302	9.1	183	9.3	
VS2-14	M12	145	164	200	235	233	271	271	12	25	30	36	18	6	10.9	11.0	11.1	315	9.7	197	9.9	
VS2-15	M12	145	164	200	261	259	297	297	12	25	30	36	18	6	12.2	12.4	12.5	341	11.1	223	11.3	
VS2-16	M16	175	198	250	244	241	294	294	16	30	35	50	22	10	17.7	18.0	18.4	324	15.2	199	15.5	
VS2-17	M16	175	198	250	264	261	314	314	16	30	35	50	22	10	18.8	19.2	19.6	344	16.3	219	16.7	
VS2-18	M16	175	198	250	284	281	334	334	16	30	35	50	22	10	20.4	20.8	21.1	364	17.9	239	18.2	
VS2-19	M20	220	250	320	285	281	345	345	20	35	45	60	26	10	34.0	34.6	35.2	365	28.5	232	29.0	
VS2-20	M24	220	250	320	311	306	381	381	24	40	55	70	33	12	37.7	38.7	39.8	391	31.7	254	32.4	
VS2-21	M30	220	250	320	348	342	428	428	30	45	55	80	40	15	45.5	46.9	48.5	428	36.1	281	37.5	
VS2-22	M30	220	250	330	389	383	469	469	30	45	55	80	40	15	55.2	56.5	58.2	469	45.4	322	46.9	
VS2-23	M36	220	250	330	454	447	544	544	36	60	75	90	46	15	71.2	73.1	75.5	534	58.3	376	59.6	
VS2-24	M42	220	250	330	526	518	631	631	42	70	85	105	52	20	89.9	93.4	97.6	606	72.4	436	74.6	
VS2-25	M48	330	376	500	467	457	587	587	48	75	100	120	60	20	165	170	176	547	139	377	143	
VS2-26	M56	330	376	500	541	530	681	681	56	80	115	140	68	20	193	199	206	621	162	443	168	
VS2-27	M64	330	376	520	611	598	766	766	64	90	130	155	76	25	234	243	255	691	195	507	204	
VS2-28	M72	330	376	530	728	714	883	883	72	90	130	155	76	25	303	312	323	808	250	611	262	
VS2-29	M80	330	376	540	845	829	1020	1020	80	100	150	175	85	25	382	393	407	925	309	715	328	

RANGE VS2



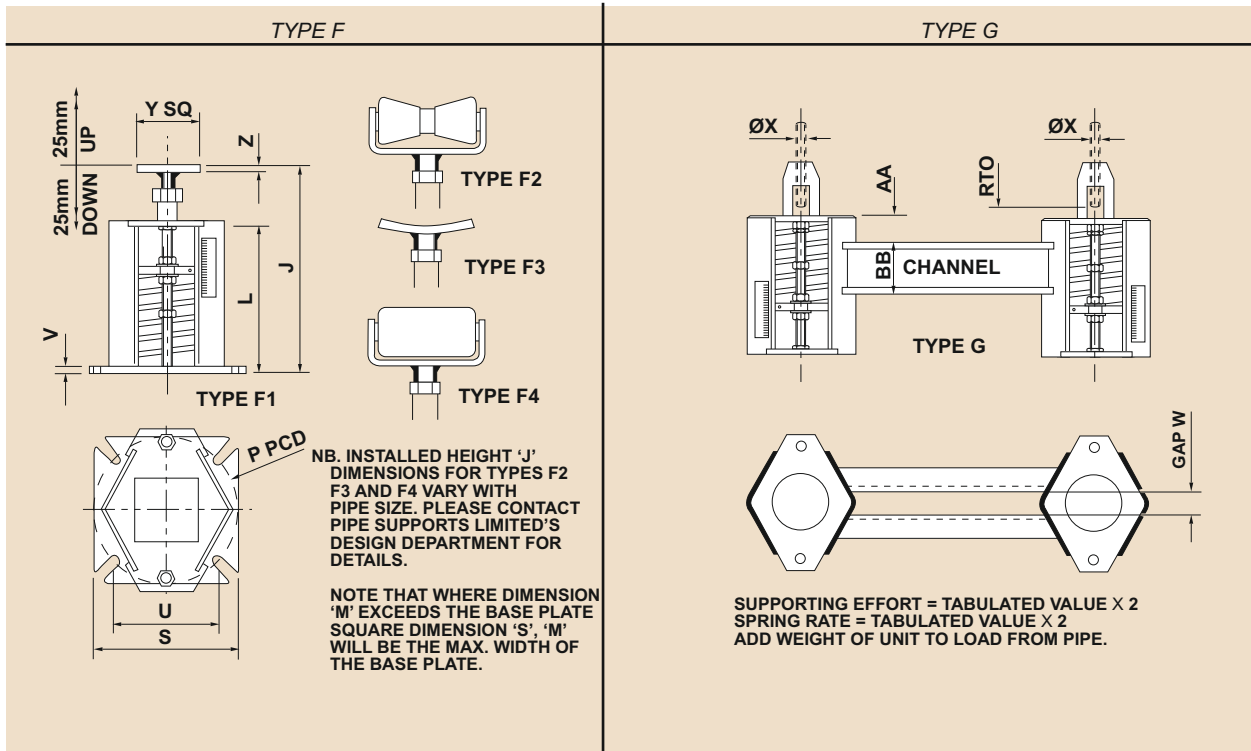
SUPPORT SIZE	J AT MIN. LOAD TYPE F mm	BODY L'TH L mm	BASE PLATE SQ. S mm	BASE PLATE PCD P mm	BASE BOLT CRS. SQ. U mm	BASE BOLT SIZE V mm	BASE PLATE THK Y mm	LOAD PAD SQ. Z mm	LOAD PAD THK F mm	WEIGHT kgf	RTO AT MIN LOAD mm	DIM. AA mm	GAP W mm	BEAM DEPTH BB (mm)			WEIGHT kgf		
														800 MAX CENTRES	1200 MAX CENTRES	1600 MAX CENTRES	@ 800 CRS	@ 1200 CRS	@ 1600 CRS
VS2-1	280	159	150	160	113	M16	6	75	6	3.7	25	25	18	50	50	50	15	18	22
VS2-2	287	166	150	160	113	M16	6	75	6	3.7	25	25	18	50	50	50	15	19	22
VS2-3	295	174	150	160	113	M16	6	75	6	3.8	25	25	18	50	50	50	16	19	23
VS2-4	302	181	150	160	113	M16	6	75	6	3.9	25	25	18	50	50	50	16	19	23
VS2-5	298	177	150	160	113	M16	6	75	6	3.8	25	25	18	50	50	50	16	19	23
VS2-6	308	187	150	160	113	M16	6	75	6	3.9	25	25	18	50	50	50	16	19	23
VS2-7	301	180	150	160	113	M16	6	75	6	3.9	25	25	18	50	50	50	16	19	23
VS2-8	317	196	150	160	113	M16	6	75	6	4.1	25	25	18	50	50	50	16	20	23
VS2-9	318	197	150	160	113	M16	6	75	6	4.0	25	25	18	50	50	50	16	20	23
VS2-10	325	205	200	197	139	M20	10	75	6	9.6	25	25	22	75	75	75	28	34	40
VS2-11	329	209	200	197	139	M20	10	75	6	9.7	25	25	22	75	75	75	29	34	40
VS2-12	333	213	200	197	139	M20	10	75	6	9.9	25	25	22	75	75	75	29	35	40
VS2-13	347	221	200	197	139	M20	10	75	10	10.8	25	25	26	75	75	75	30	35	41
VS2-14	361	235	200	197	139	M20	10	75	10	11.3	25	25	26	75	75	75	31	37	42
VS2-15	387	261	200	197	139	M20	10	75	10	12.4	25	25	26	75	75	75	34	39	45
VS2-16	368	239	270	240	170	M20	12	100	12	20.0	25	25	33	100	100	125	48	56	74
VS2-17	388	259	270	240	170	M20	12	100	12	20.9	25	25	33	100	100	125	50	58	76
VS2-18	408	279	270	240	170	M20	12	100	12	22.2	25	25	33	100	100	125	53	61	80
VS2-19	405	276	270	268	190	M20	12	120	12	31.7	25	25	40	125	150	150	84	106	122
VS2-20	427	298	270	268	190	M20	12	120	12	34.2	25	25	40	125	150	150	91	113	129
VS2-21	454	325	270	268	190	M20	12	120	12	37.8	25	25	40	125	150	150	107	129	145
VS2-22	498	366	270	268	190	M20	12	150	15	46.8	25	25	52	200	200	250	139	158	178
VS2-23	542	410	270	268	190	M20	12	150	15	55.5	25	25	52	200	200	250	171	190	210
VS2-24	607	473	270	268	190	M20	20	150	15	71.4	25	25	52	200	200	250	208	228	247
VS2-25	563	420	400	400	283	M24	20	200	20	141	25	25	60	250	300	390	352	398	467
VS2-26	629	481	400	400	283	M24	20	200	20	158	25	25	70	250	300	390	409	455	523
VS2-27	699	548	400	400	283	M24	20	200	20	192	25	25	80	250	300	390	491	537	606
VS2-28	816	655	400	400	283	M24	25	200	25	248	25	25	80	390	390	430	657	700	769
VS2-29	940	768	400	400	283	M24	30	200	30	312	25	25	90	390	390	430	815	859	928

RANGE VS3



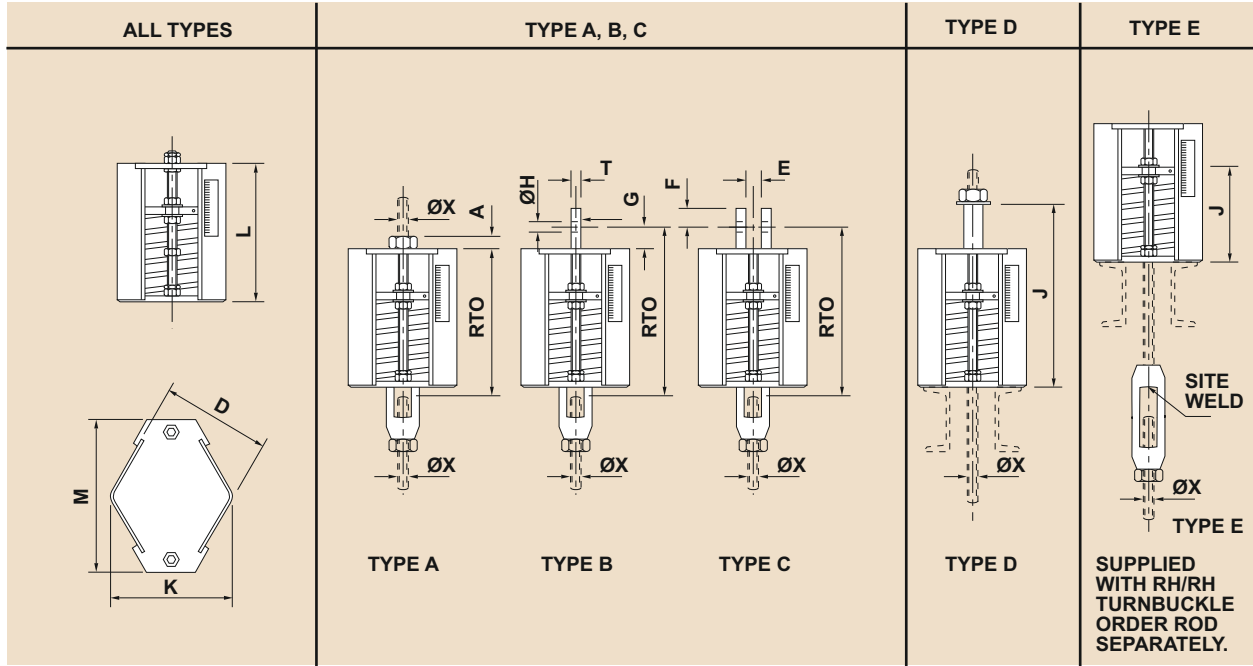
SUPPORT SIZE	ROD DIA	BODY DIMENSIONS					RTO AT MIN LOAD (mm)			DEPTH OF THRD	LUG DIMENSIONS TYPES B & C						WEIGHTS kgf			J AT MIN LOAD mm	WEIGHT kgf	J AT MIN LOAD mm	WEIGHT kgf
		X mm	D mm	K mm	M mm	L mm (not BM)	A	B	C		LUG DIMENSIONS TYPES B & C						A	B	C				
											A mm	E mm	F mm	G mm	H mm	T mm							
VS3-1	M12	108	122	155	294	292	324	324	12	20	20	30	14	6	5.4	5.5	5.6	454	4.7	243	4.8		
VS3-2	M12	108	122	155	315	313	345	345	12	20	20	30	14	6	5.8	5.8	6.0	475	5.0	264	5.1		
VS3-3	M12	108	122	155	329	327	359	359	12	20	20	30	14	6	5.9	6.0	6.1	489	5.1	278	5.2		
VS3-4	M12	108	122	155	330	328	360	360	12	20	20	30	14	6	6.0	6.1	6.2	490	5.2	279	5.3		
VS3-5	M12	108	122	155	323	321	353	353	12	20	20	30	14	6	6.0	6.1	6.2	483	5.2	272	5.3		
VS3-6	M12	108	122	155	328	326	358	358	12	20	20	30	14	6	6.0	6.1	6.2	488	5.2	277	5.3		
VS3-7	M12	108	122	155	336	334	366	366	12	20	20	30	14	6	6.2	6.3	6.4	496	5.4	286	5.5		
VS3-8	M12	108	122	155	356	354	386	386	12	20	20	30	14	6	6.6	6.7	6.8	516	5.7	306	5.9		
VS3-9	M12	108	122	155	370	368	400	400	12	20	20	30	14	6	7.0	7.1	7.2	530	6.1	319	6.2		
VS3-10	M12	145	164	200	351	349	381	381	12	20	20	30	14	6	12.0	12.0	12.2	511	10.9	299	11.0		
VS3-11	M12	145	164	200	357	355	387	387	12	20	20	30	14	6	12.3	12.4	12.5	517	11.2	305	11.4		
VS3-12	M12	145	164	200	364	362	394	394	12	20	20	30	14	6	12.7	12.8	12.9	524	11.6	312	11.7		
VS3-13	M12	145	164	200	380	378	416	416	12	25	30	36	18	6	13.2	13.3	13.5	540	12.1	328	12.2		
VS3-14	M12	145	164	200	406	404	442	442	12	25	30	36	18	6	14.4	14.5	14.7	566	13.3	353	13.4		
VS3-15	M12	145	164	200	455	453	491	491	12	25	30	36	18	6	16.9	17.1	17.2	615	15.8	403	15.9		
VS3-16	M16	220	250	320	374	371	424	424	16	30	35	50	22	10	30.0	30.3	30.7	534	27.0	315	27.2		
VS3-17	M16	220	250	320	409	406	459	459	16	30	35	50	22	10	33.6	33.9	34.3	569	30.5	350	30.7		
VS3-18	M16	220	250	320	430	427	480	480	16	30	35	50	22	10	36.0	36.4	36.7	590	32.9	371	33.1		
VS3-19	M20	220	250	320	473	469	533	533	20	35	45	60	26	10	43.8	44.4	45.0	633	38.2	406	38.4		
VS3-20	M24	220	250	320	519	514	589	589	24	40	55	70	33	12	50.0	51.0	52.1	679	43.8	448	44.2		
VS3-21	M30	220	250	320	578	572	658	658	30	45	55	80	40	15	61.6	63.0	64.6	738	51.6	497	52.6		
VS3-22	M30	220	250	330	649	643	729	729	30	45	55	80	40	15	76.1	77.5	79.1	809	65.7	568	66.7		
VS3-23	M36	220	250	330	759	752	849	849	36	60	75	90	46	15	101	103	105	919	87.0	667	87.2		
VS3-24	M42	220	250	330	929	921	1034	1034	42	70	85	105	52	20	136	140	144	1089	117	825	117		
VS3-25	M48	330	376	500	806	796	926	926	48	75	100	120	60	20	235	240	246	966	207	702	209		
VS3-26	M56	330	376	500	942	931	1082	1082	56	80	115	140	68	20	283	289	297	1102	248	830	251		
VS3-27	M64	330	376	520	1074	1061	1229	1229	64	90	130	155	76	25	358	367	379	1234	311	956	318		
VS3-28	M72	330	376	530	1285	1271	1440	1440	72	90	130	155	76	25	474	483	494	1445	408	1154	417		
VS3-29	M80	330	376	540	1503	1487	1678	1678	80	100	150	175	85	25	609	620	635	1663	517	1359	532		

RANGE VS3



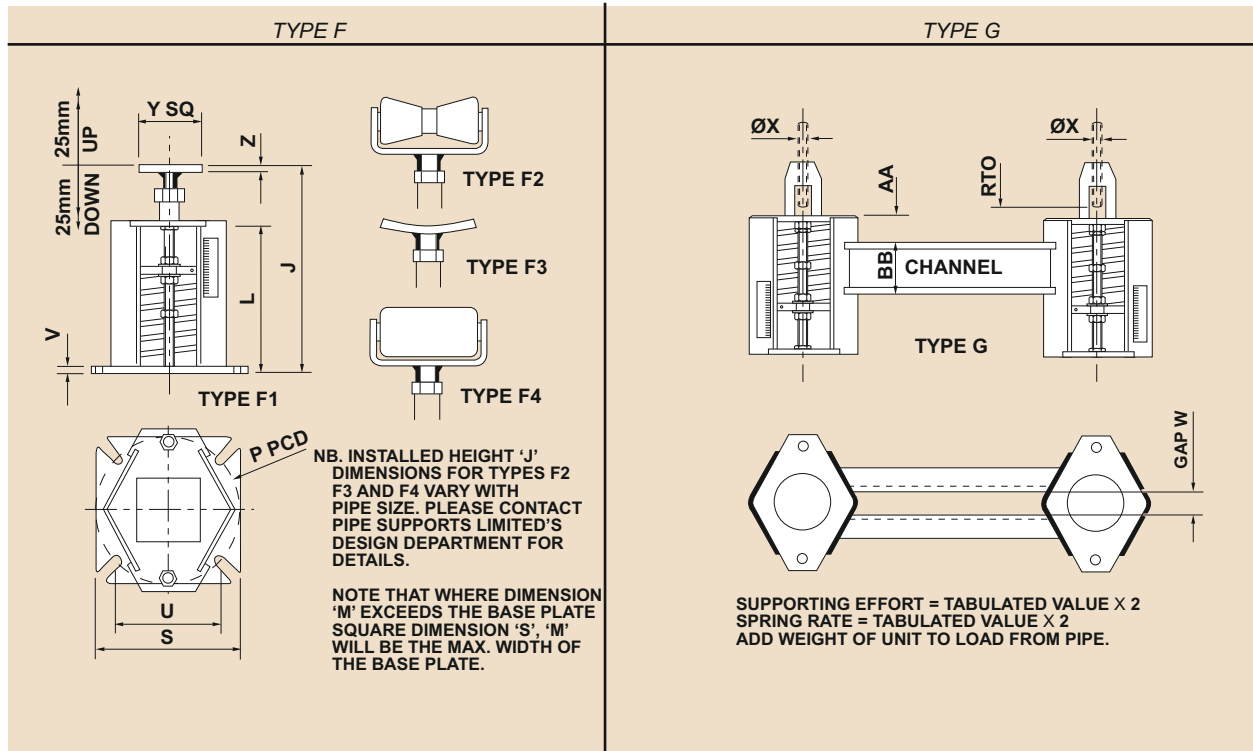
SUPPORT SIZE	J AT MIN. LOAD TYPE F mm	BODY L'TH L mm	BASE PLATE SQ. S mm	BASE PLATE PCD P mm	BASE BOLT CRS. SQ. U mm	BASE BOLT SIZE V mm	BASE PLATE THK Y mm	LOAD PAD SQ. Z mm	LOAD PAD THK mm	WEIGHT kgf	RTO AT MIN LOAD mm	DIM. AA mm	GAP W mm	BEAM DEPTH BB (mm)			WEIGHT kgf		
														800 MAX CENTRES	1200 MAX CENTRES	1600 MAX CENTRES	@ 800 CRS	@ 1200 CRS	@ 1600 CRS
VS3-1	484	281	150	160	113	M16	6	75	6	4.1	25	25	18	50	50	50	17	20	24
VS3-2	505	302	150	160	113	M16	6	75	6	4.3	25	25	18	50	50	50	18	21	25
VS3-3	519	316	150	160	113	M16	6	75	6	4.4	25	25	18	50	50	50	18	21	25
VS3-4	520	317	150	160	113	M16	6	75	6	4.4	25	25	18	50	50	50	18	22	25
VS3-5	513	310	150	160	113	M16	6	75	6	4.5	25	25	18	50	50	50	18	22	25
VS3-6	518	315	150	160	113	M16	6	75	6	4.5	25	25	18	50	50	50	18	22	25
VS3-7	527	324	150	160	113	M16	6	75	6	4.7	25	25	18	50	50	50	19	22	26
VS3-8	547	344	150	160	113	M16	6	75	6	4.9	25	25	18	50	50	50	19	23	26
VS3-9	560	357	150	160	113	M16	6	75	6	5.2	25	25	18	50	50	50	20	24	27
VS3-10	551	349	200	197	139	M20	10	75	6	10.9	25	25	22	75	75	75	33	39	45
VS3-11	557	355	200	197	139	M20	10	75	6	11.2	25	25	22	75	75	75	34	39	45
VS3-12	564	362	200	197	139	M20	10	75	6	11.5	25	25	22	75	75	75	35	40	46
VS3-13	586	378	200	197	139	M20	10	75	10	12.6	25	25	26	75	75	75	36	41	47
VS3-14	611	403	200	197	139	M20	10	75	10	13.6	25	25	26	75	75	75	38	44	49
VS3-15	661	453	200	197	139	M20	10	75	10	15.6	25	25	26	75	75	75	43	49	54
VS3-16	580	371	270	268	190	M20	12	100	12	28.4	25	25	33	100	100	125	71	79	97
VS3-17	615	406	270	268	190	M20	12	100	12	31.4	25	25	33	100	100	125	79	87	105
VS3-18	636	427	270	268	190	M20	12	100	12	33.5	25	25	33	100	100	125	83	91	109
VS3-19	673	462	270	268	190	M20	12	120	12	39.5	25	25	40	125	150	150	103	126	141
VS3-20	715	504	270	268	190	M20	12	120	12	43.9	25	25	40	125	150	150	116	138	154
VS3-21	764	553	270	268	190	M20	12	120	12	50.6	25	25	40	125	150	150	139	161	177
VS3-22	838	624	270	268	190	M20	12	150	15	63.7	25	25	52	200	200	250	180	200	220
VS3-23	927	713	270	268	190	M20	12	150	15	79.5	25	25	52	200	200	250	230	250	269
VS3-24	1090	874	270	268	190	M20	20	150	15	109	25	25	52	200	200	250	300	320	339
VS3-25	982	757	400	400	283	M24	20	200	20	200	25	25	60	250	300	390	492	538	607
VS3-26	1109	880	400	400	283	M24	20	200	20	232	25	25	70	250	300	390	589	635	703
VS3-27	1242	1009	400	400	283	M24	20	200	20	295	25	25	80	250	300	390	739	785	854
VS3-28	1453	1210	400	400	283	M24	25	200	25	390	25	25	80	390	390	430	999	1042	1111
VS3-29	1678	1424	400	400	283	M24	30	200	30	501	25	25	90	390	390	430	1269	1313	1382

RANGE VS4



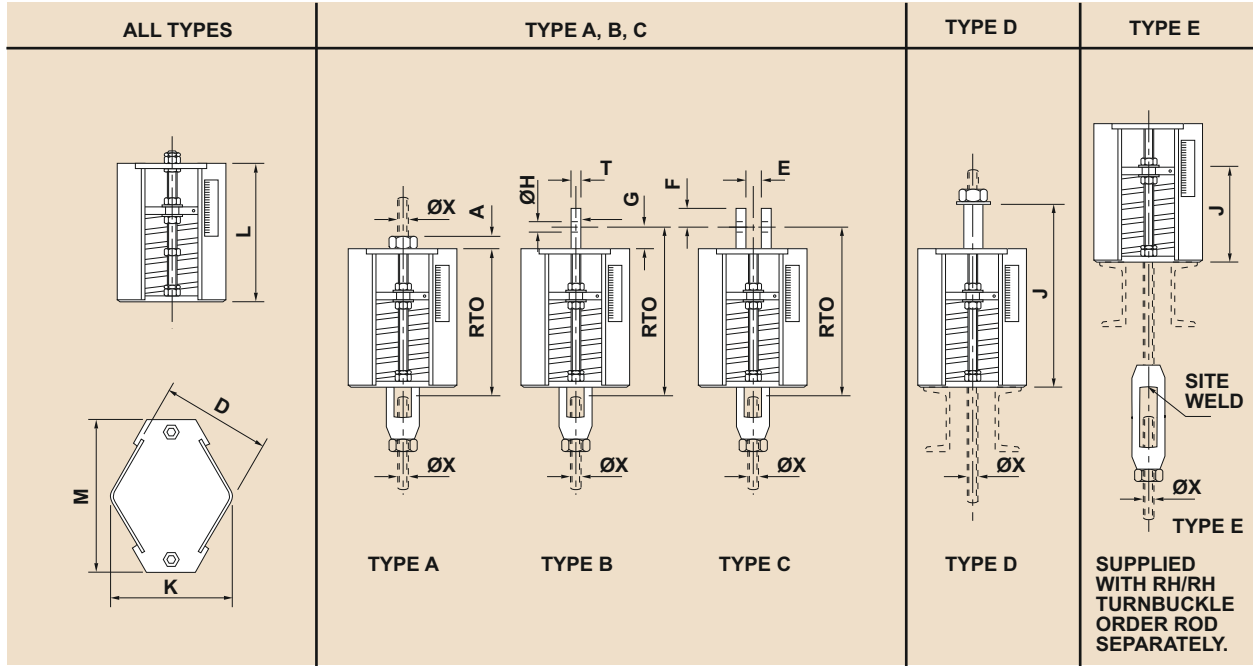
SUPPORT SIZE	ROD DIA	BODY DIMENSIONS				RTO AT MIN LOAD (mm)			DEPTH OF THRD	LUG DIMENSIONS TYPES B & C					WEIGHTS kgf			J AT MIN LOAD mm	WEIGHT kgf	J AT MIN LOAD mm	WEIGHT kgf
		X mm	D mm	K mm	M mm	L mm (not BM)	A	B		C	A mm	E mm	F mm	G mm	H mm	T mm	A				
VS4-1	M12	149.2	156.2	155	429	427	459	459	12	20	20	30	14	6	7.6	7.7	7.8	669	6.6	378	6.7
VS4-2	M12	149.2	156.2	155	457	455	487	487	12	20	20	30	14	6	8.1	8.1	8.4	697	7.0	406	7.1
VS4-3	M12	149.2	156.2	155	480	478	510	510	12	20	20	30	14	6	8.3	8.4	8.5	720	7.1	429	7.3
VS4-4	M12	149.2	156.2	155	487	485	517	517	12	20	20	30	14	6	8.4	8.5	8.7	727	7.3	436	7.4
VS4-5	M12	149.2	156.2	155	476	474	506	506	12	20	20	30	14	6	8.4	8.5	8.7	716	7.3	425	7.4
VS4-6	M12	149.2	156.2	155	486	484	516	516	12	20	20	30	14	6	8.4	8.5	8.7	726	7.3	435	7.4
VS4-7	M12	149.2	156.2	155	492	490	522	522	12	20	20	30	14	6	8.7	8.8	9.0	732	7.6	442	7.7
VS4-8	M12	149.2	156.2	155	528	526	558	558	12	20	20	30	14	6	9.2	9.4	9.5	768	8.0	478	8.3
VS4-9	M12	149.2	156.2	155	544	542	574	574	12	20	20	30	14	6	9.8	9.9	10.1	784	8.5	493	8.7
VS4-10	M12	177.6	188.9	200	523	521	553	553	12	20	20	30	14	6	16.8	16.8	17.1	763	15.3	471	15.4
VS4-11	M12	177.6	188.9	200	532	530	562	562	12	20	20	30	14	6	17.2	17.4	17.5	772	15.7	480	16.0
VS4-12	M12	177.6	188.9	200	543	541	573	573	12	20	20	30	14	6	17.8	17.9	18.1	783	16.2	491	16.4
VS4-13	M12	177.6	188.9	200	568	566	604	604	12	25	30	36	18	6	18.5	18.6	18.9	808	16.9	516	17.1
VS4-14	M12	177.6	188.9	200	607	605	643	643	12	25	30	36	18	6	20.2	20.3	20.6	847	18.6	554	18.8
VS4-15	M12	177.6	188.9	200	682	680	718	718	12	25	30	36	18	6	23.7	23.9	24.1	922	22.1	630	22.3
VS4-16	M16	246.2	263.5	320	578	575	628	628	16	30	35	50	22	10	42.0	42.4	43.0	818	37.8	517	38.1
VS4-17	M16	246.2	263.5	320	633	630	683	683	16	30	35	50	22	10	47.0	47.5	48.0	873	42.7	572	43.0
VS4-18	M16	246.2	263.5	320	675	672	725	725	16	30	35	50	22	10	50.4	51.0	51.4	915	46.1	614	46.3
VS4-19	M20	246.2	263.5	320	709	705	769	769	20	35	45	60	26	10	61.3	62.2	63.0	949	53.5	639	53.8
VS4-20	M24	246.2	263.5	320	778	773	848	848	24	40	55	70	33	12	70.0	71.4	72.9	1018	61.3	704	61.9
VS4-21	M30	246.2	263.5	320	863	857	943	943	30	45	55	80	40	15	86.2	88.2	90.4	1103	72.2	779	73.6
VS4-22	M30	248.2	263.5	330	970	964	1050	1050	30	45	55	80	40	15	107	109	111	1210	92.0	884	93.4
VS4-23	M36	248.2	263.5	330	1129	1122	1219	1219	36	60	75	90	46	15	141	144	147	1369	122	1032	122
VS4-24	M42	248.2	263.5	330	1343	1335	1448	1448	42	70	85	105	52	20	190	196	202	1583	164	1239	164
VS4-25	M48	375.8	408.5	500	1165	1155	1285	1285	48	75	100	120	60	20	329	336	344	1405	290	1056	293
VS4-26	M56	375.8	408.5	500	1367	1356	1507	1507	56	80	115	140	68	20	396	405	416	1607	347	1245	351
VS4-27	M64	379.2	412.5	520	1572	1559	1727	1727	64	90	130	155	76	25	501	514	531	1812	435	1434	445
VS4-28	M72	379.2	412.5	530	1882	1868	2037	2037	72	90	130	155	76	25	664	676	692	2122	571	1726	584
VS4-29	M80	379.2	412.5	540	2200	2184	2375	2375	80	100	150	175	85	25	853	868	889	2440	724	2031	745

RANGE VS4



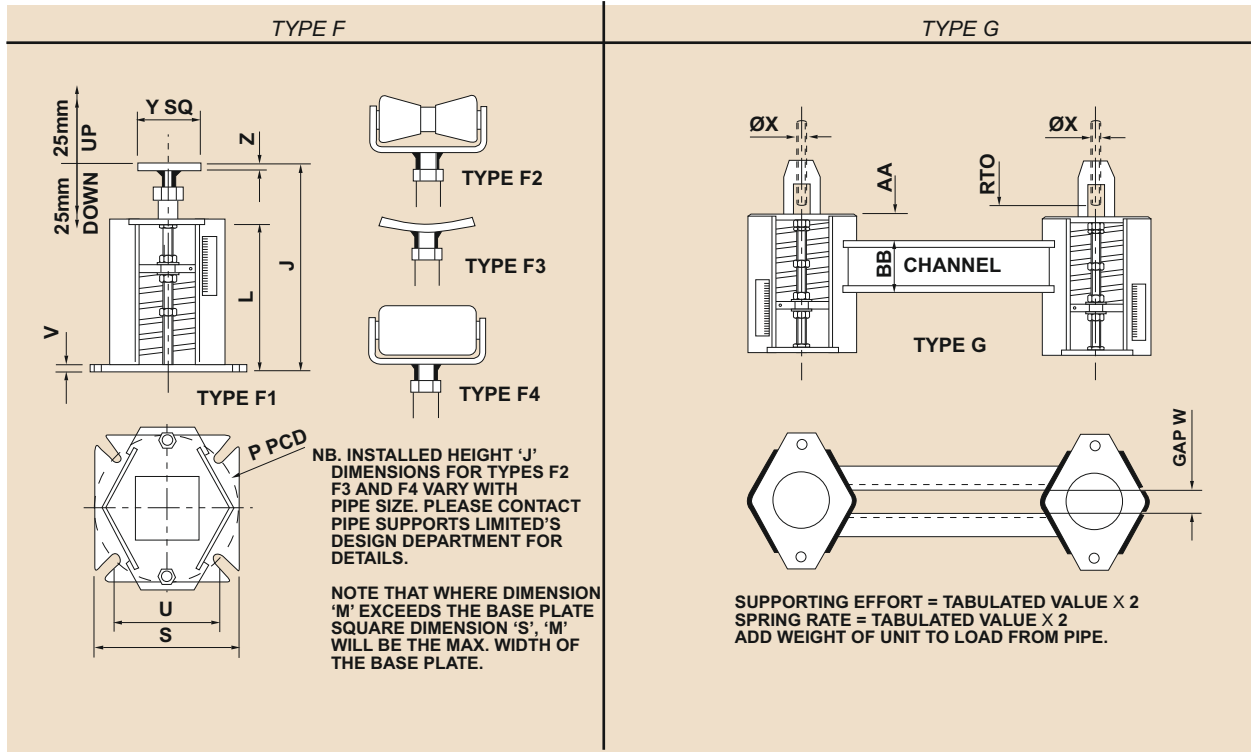
SUPPORT SIZE	J AT MIN. LOAD TYPE F mm	BODY L'TH L mm	BASE PLATE E SQ. S mm	BASE PLATE E PCD P mm	BASE BOLT CRS. SQ. U mm	BASE BOLT SIZE V mm	BASE PLATE E V mm	LOAD PAD SQ. Y mm	LOAD PAD THK Z mm	WEIGHT TYPE F kkgf	RTO AT MIN LOAD mm	DIM. M mm	GAP W mm	RSC SIZE			WEIGHT kgf		
														900 MAX CENTRES	1300 MAX CENTRES	1800 MAX CENTRES	@ 900 CRS	@ 1300 CRS	@ 1800 CRS
VS4-1	701	416	156	170	120	M16	6	75	6	5.7	25	25	18	51 x 25	51 x 25	51 x 25	20.6	23.3	26.7
VS4-2	729	444	156	170	120	M16	6	75	6	6.0	25	25	18	51 x 25	51 x 25	51 x 25	21.5	24.2	27.7
VS4-3	752	467	156	170	120	M16	6	75	6	6.2	25	25	18	51 x 25	51 x 25	51 x 25	21.9	24.7	28.1
VS4-4	759	474	156	170	120	M16	6	75	6	6.2	25	25	18	51 x 25	51 x 25	51 x 25	22.1	24.9	28.3
VS4-5	748	463	156	170	120	M16	6	75	6	6.3	25	25	18	51 x 25	51 x 25	51 x 25	22.1	24.8	28.3
VS4-6	758	473	156	170	120	M16	6	75	6	6.3	25	25	18	51 x 25	51 x 25	51 x 25	22.3	25.0	28.4
VS4-7	765	480	156	170	120	M16	6	75	6	6.6	25	25	18	51 x 25	51 x 25	51 x 25	22.8	25.6	29.0
VS4-8	801	516	156	170	120	M16	6	75	6	6.9	25	25	18	51 x 25	51 x 25	51 x 25	23.8	26.6	30.0
VS4-9	816	531	156	170	120	M16	6	75	6	7.3	25	25	18	51 x 25	51 x 25	51 x 25	24.9	27.7	31.1
VS4-10	805	521	200	205	145	M20	10	75	6	15.3	25	25	22	76 x 38	76 x 38	76 x 38	43.4	48.8	55.5
VS4-11	814	530	200	205	145	M20	10	75	6	15.7	25	25	22	76 x 38	76 x 38	76 x 38	44.4	49.8	56.5
VS4-12	825	541	200	205	145	M20	10	75	6	16.1	25	25	22	76 x 38	76 x 38	76 x 38	45.5	50.9	57.6
VS4-13	856	566	200	205	145	M20	10	75	10	17.6	25	25	26	76 x 38	76 x 38	76 x 38	47.0	52.3	59.0
VS4-14	894	604	200	205	145	M20	10	75	10	19.0	25	25	26	76 x 38	76 x 38	76 x 38	50.3	55.6	62.3
VS4-15	970	680	200	205	145	M20	10	75	10	21.8	25	25	26	76 x 38	76 x 38	76 x 38	57.4	62.7	69.4
VS4-16	864	573	270	280	198	M20	12	100	12	39.8	25	25	33	76 x 38	102 x 51	102 x 51	92.8	106	117
VS4-17	919	628	270	280	198	M20	12	100	12	44.0	25	25	33	76 x 38	102 x 51	102 x 51	103	116	127
VS4-18	961	670	270	280	198	M20	12	100	12	46.9	25	25	33	76 x 38	102 x 51	102 x 51	110	123	134
VS4-19	988	695	270	287	203	M20	12	120	12	55.3	25	25	40	102 x 51	127 x 64	127 x 64	136	154	169
VS4-20	1053	760	270	287	203	M20	12	120	12	61.5	25	25	40	102 x 51	127 x 64	127 x 64	154	172	187
VS4-21	1128	835	270	287	203	M20	12	120	12	70.8	25	25	40	102 x 51	127 x 64	127 x 64	186	204	218
VS4-22	1236	940	276	294	208	M20	12	150	15	89.2	25	25	52	152 x 76	203 x 76	203 x 76	237	264	288
VS4-23	1377	1081	300	308	218	M20	12	150	15	111.3	25	25	52	152 x 76	203 x 76	203 x 76	306	333	357
VS4-24	1586	1288	300	308	218	M20	20	150	15	152.6	25	25	52	152 x 76	203 x 76	203 x 76	405	431	455
VS4-25	1418	1111	430	453	320	M24	20	200	20	280.0	25	25	60	203 x 89	254 x 89	305 x 89	689	724	777
VS4-26	1606	1295	430	453	320	M24	20	200	20	324.8	25	25	70	203 x 89	254 x 89	305 x 89	823	858	911
VS4-27	1802	1487	440	467	330	M24	20	200	20	413.0	25	25	80	203 x 89	254 x 89	305 x 89	1031	1067	1120
VS4-28	2107	1782	460	481	340	M24	25	200	25	546.0	25	25	80	305 x 89	305 x 102	381 x 102	1369	1411	1483
VS4-29	2432	2096	480	495	350	M24	30	200	30	701.4	25	25	90	305 x 89	305 x 102	381 x 102	1746	1788	1861

RANGE VS5



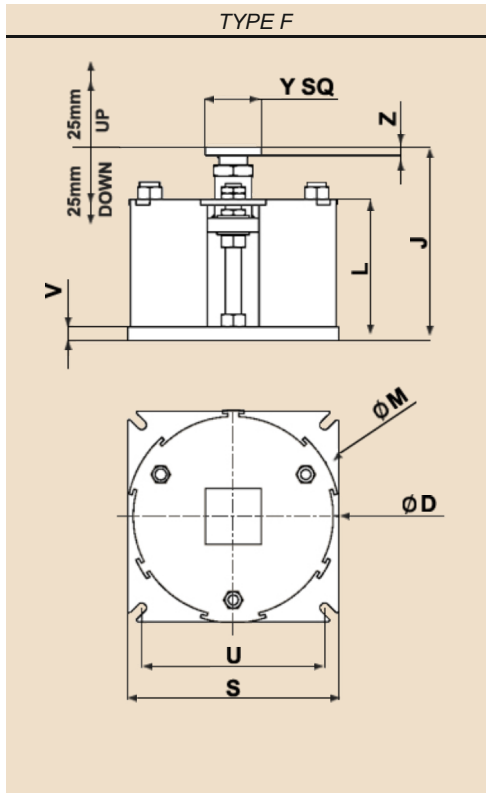
SUPPORT SIZE	ROD DIA	BODY DIMENSIONS				RTO AT MIN LOAD (mm)			DEPTH OF THRD	LUG DIMENSIONS TYPES B & C					WEIGHTS kgf			J AT MIN LOAD mm	WEIGHT kgf	J AT MIN LOAD mm	WEIGHT kgf
		X mm	D mm	K mm	M mm	L mm (not BM)	A	B		C	A mm	E mm	F mm	G mm	H mm	T mm	A				
VS5-1	M12	149.2	156.2	155	556	554	586	586	12	20	20	30	14	6	9.2	9.4	9.5	876	8.0	505	8.2
VS5-2	M12	149.2	156.2	155	598	596	628	628	12	20	20	30	14	6	9.9	9.9	10.2	918	8.5	547	8.7
VS5-3	M12	149.2	156.2	155	626	624	656	656	12	20	20	30	14	6	10.0	10.2	10.4	946	8.7	575	8.8
VS5-4	M12	149.2	156.2	155	628	626	658	658	12	20	20	30	14	6	10.2	10.4	10.5	948	8.8	577	9.0
VS5-5	M12	149.2	156.2	155	614	612	644	644	12	20	20	30	14	6	10.2	10.4	10.5	934	8.8	563	9.0
VS5-6	M12	149.2	156.2	155	624	622	654	654	12	20	20	30	14	6	10.2	10.4	10.5	944	8.8	573	9.0
VS5-7	M12	149.2	156.2	155	640	638	670	670	12	20	20	30	14	6	10.5	10.7	10.9	960	9.2	590	9.4
VS5-8	M12	149.2	156.2	155	680	678	710	710	12	20	20	30	14	6	11.2	11.4	11.6	1000	9.7	630	10.0
VS5-9	M12	149.2	156.2	155	708	706	738	738	12	20	20	30	14	6	11.9	12.1	12.2	1028	10.4	657	10.5
VS5-10	M12	177.6	188.9	200	670	668	700	700	12	20	20	30	14	6	20.4	20.4	20.7	990	18.5	618	18.7
VS5-11	M12	177.6	188.9	200	682	680	712	712	12	20	20	30	14	6	20.9	21.1	21.3	1002	19.0	630	19.4
VS5-12	M12	177.6	188.9	200	696	694	726	726	12	20	20	30	14	6	21.6	21.8	21.9	1016	19.7	644	19.9
VS5-13	M12	177.6	188.9	200	728	726	764	764	12	25	30	36	18	6	22.4	22.6	23.0	1048	20.6	676	20.7
VS5-14	M12	177.6	188.9	200	780	778	816	816	12	25	30	36	18	6	24.5	24.7	25.0	1100	22.6	727	22.8
VS5-15	M12	177.6	188.9	200	878	876	914	914	12	25	30	36	18	6	28.7	29.1	29.2	1198	26.9	826	27.0
VS5-16	M16	246.2	263.5	320	714	711	764	764	16	30	35	50	22	10	51.0	51.5	52.2	1034	45.9	653	46.2
VS5-17	M16	246.2	263.5	320	781	778	831	831	16	30	35	50	22	10	57.1	57.6	58.3	1101	51.9	720	52.2
VS5-18	M16	246.2	263.5	320	822	819	872	872	16	30	35	50	22	10	61.2	61.9	62.4	1142	55.9	761	56.3
VS5-19	M20	246.2	263.5	320	899	895	959	959	20	35	45	60	26	10	74.5	75.5	76.5	1219	64.9	829	65.3
VS5-20	M24	246.2	263.5	320	987	982	1057	1057	24	40	55	70	33	12	85.0	86.7	88.6	1307	74.5	913	75.1
VS5-21	M30	246.2	263.5	320	1095	1089	1175	1175	30	45	55	80	40	15	105	107	110	1415	87.7	1011	89.4
VS5-22	M30	248.2	263.5	330	1231	1225	1311	1311	30	45	55	80	40	15	129	132	134	1551	111.7	1145	113.4
VS5-23	M36	248.2	263.5	330	1436	1429	1526	1526	36	60	75	90	46	15	172	175	179	1756	147.9	1339	148.2
VS5-24	M42	248.2	263.5	330	1704	1696	1809	1809	42	70	85	105	52	20	231	238	245	2024	198.9	1600	198.9
VS5-25	M48	375.8	408.5	500	1449	1439	1569	1569	48	75	100	120	60	20	400	408	418	1769	351.9	1340	355.3
VS5-26	M56	375.8	408.5	500	1708	1697	1848	1848	56	80	115	140	68	20	481	491	505	2028	421.6	1586	426.7
VS5-27	M64	379.2	412.5	520	1970	1957	2125	2125	64	90	130	155	76	25	609	624	644	2290	528.7	1832	540.6
VS5-28	M72	379.2	412.5	530	2367	2353	2522	2522	72	90	130	155	76	25	806	821	840	2687	693.6	2211	708.9
VS5-29	M80	379.2	412.5	540	2778	2762	2953	2953	80	100	150	175	85	25	1035	1054	1080	3098	879	2609	904

RANGE VS5



SUPPORT SIZE	J AT MIN. LOAD TYPE F mm	BODY L'TH L mm	BASE PLATE SQ. S mm	BASE PLATE PCD P mm	BASE BOLT CRS. SQ. U mm	BASE BOLT SIZE V mm	LOAD PAD SQ. Y mm	LOAD PAD THK Z mm	WEIGHT TYPE F kgf	RTO AT MIN LOAD mm	DIM. M mm	GAP W mm	RSC SIZE			WEIGHT kgf			
													900 MAX CENTRES	1300 MAX CENTRES	1800 MAX CENTRES	@ 900 CRS	@ 1300 CRS	@ 1800 CRS	
													VS5-1	910	543	156	169.7	120	M16
VS5-2	952	585	156	169.7	120	M16	6	75	6	7.3	25	25	18	51 x 25	51 x 25	51 x 25	25.0	27.7	31.5
VS5-3	980	613	156	169.7	120	M16	6	75	6	7.5	25	25	18	51 x 25	51 x 25	51 x 25	25.5	28.4	31.9
VS5-4	982	615	156	169.7	120	M16	6	75	6	7.5	25	25	18	51 x 25	51 x 25	51 x 25	25.7	28.6	32.2
VS5-5	968	601	156	169.7	120	M16	6	75	6	7.7	25	25	18	51 x 25	51 x 25	51 x 25	25.7	28.5	32.2
VS5-6	978	611	156	169.7	120	M16	6	75	6	7.7	25	25	18	51 x 25	51 x 25	51 x 25	25.9	28.7	32.3
VS5-7	995	628	156	169.7	120	M16	6	75	6	8.0	25	25	18	51 x 25	51 x 25	51 x 25	26.5	29.4	33.0
VS5-8	1035	668	156	169.7	120	M16	6	75	6	8.3	25	25	18	51 x 25	51 x 25	51 x 25	27.7	30.7	34.2
VS5-9	1062	695	156	169.7	120	M16	6	75	6	8.8	25	25	18	51 x 25	51 x 25	51 x 25	29.1	32.0	35.6
VS5-10	1034	668	200	205.1	145	M20	10	75	6	18.5	25	25	22	76 x 38	76 x 38	76 x 38	50.6	56.0	63.0
VS5-11	1046	680	200	205.1	145	M20	10	75	6	19.0	25	25	22	76 x 38	76 x 38	76 x 38	51.8	57.4	64.2
VS5-12	1060	694	200	205.1	145	M20	10	75	6	19.6	25	25	22	76 x 38	76 x 38	76 x 38	53.1	58.6	65.5
VS5-13	1098	726	200	205.1	145	M20	10	75	10	21.4	25	25	26	76 x 38	76 x 38	76 x 38	54.9	60.3	67.3
VS5-14	1149	777	200	205.1	145	M20	10	75	10	23.1	25	25	26	76 x 38	76 x 38	76 x 38	59.0	64.4	71.4
VS5-15	1248	876	200	205.1	145	M20	10	75	10	26.5	25	25	26	76 x 38	76 x 38	76 x 38	67.6	73.1	80.0
VS5-16	1082	709	270	280	198	M20	12	100	12	48.3	25	25	33	76 x 38	102 x 51	102 x 51	110.8	124.5	135.5
VS5-17	1149	776	270	280	198	M20	12	100	12	53.4	25	25	33	76 x 38	102 x 51	102 x 51	122.9	136.7	147.7
VS5-18	1190	817	270	280	198	M20	12	100	12	57.0	25	25	33	76 x 38	102 x 51	102 x 51	131.3	145.2	156.4
VS5-19	1260	885	270	287.1	203	M20	12	120	12	67.2	25	25	40	102 x 51	127 x 64	127 x 64	162.3	181.2	197.0
VS5-20	1344	969	270	287.1	203	M20	12	120	12	74.6	25	25	40	102 x 51	127 x 64	127 x 64	184.0	203.4	219.9
VS5-21	1442	1067	270	287.1	203	M20	12	120	12	86.0	25	25	40	102 x 51	127 x 64	127 x 64	223.2	243.2	259.4
VS5-22	1579	1201	276	294.2	208	M20	12	150	15	108.3	25	25	52	152 x 76	203 x 76	203 x 76	282.5	311.5	337.7
VS5-23	1766	1388	300	308.3	218	M20	12	150	15	135.2	25	25	52	152 x 76	203 x 76	203 x 76	366.4	396.2	423.0
VS5-24	2029	1649	300	308.3	218	M20	20	150	15	185.3	25	25	52	152 x 76	203 x 76	203 x 76	486.4	518.0	547.6
VS5-25	1784	1395	430	452.5	320	M24	20	200	20	340.0	25	25	60	203 x 89	254 x 89	305 x 89	830	872	933
VS5-26	2029	1636	430	452.5	320	M24	20	200	20	394.4	25	25	70	203 x 89	254 x 89	305 x 89	993	1037	1101
VS5-27	2282	1885	440	466.7	330	M24	20	200	20	501.5	25	25	80	203 x 89	254 x 89	305 x 89	1246	1295	1365
VS5-28	2674	2267	460	480.8	340	M24	25	200	25	663.0	25	25	80	305 x 89	305 x 102	381 x 102	1654	1708	1796
VS5-29	3092	2674	480	495	350	M24	30	200	30	851.7	25	25	90	305 x 89	305 x 102	381 x 102	2112	2169	2263

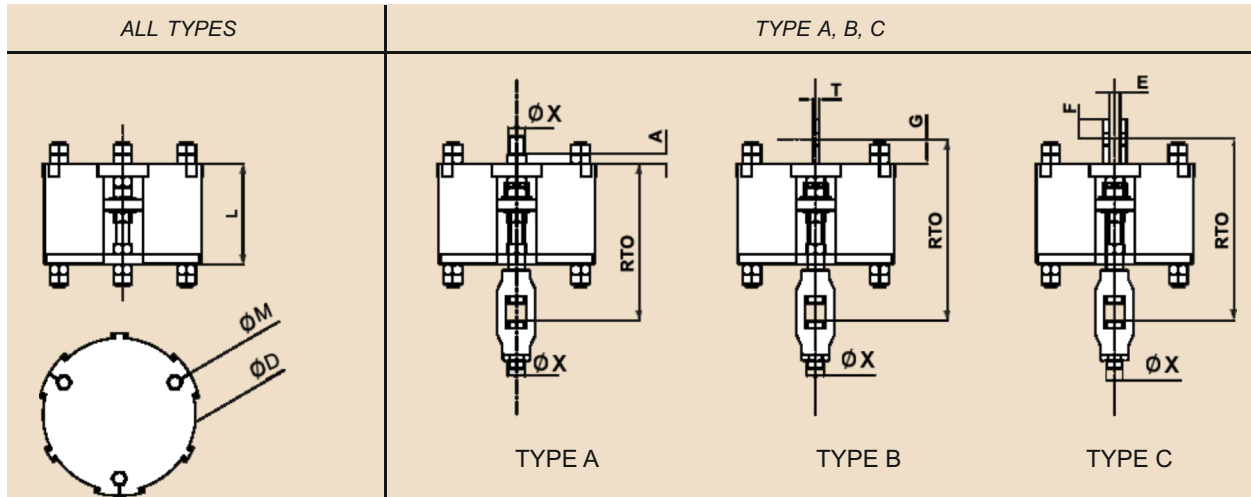
HIGH LOAD VARIABLES



High load variable with multi coil design

All TYPES		TYPE F									
SUPPORT SIZE	BODY DIMENSIONS		J AT MIN. LOAD TYPE F mm	BODY L'TH L mm	BASE PLATE SQ. S mm	BASE BOLT CRS. SQ. U mm	BASE BOLT SIZE	BASE PLATE THK V mm	LOAD PAD SQ. Y mm	LOAD PAD THK Z mm	WEIGHT TYPE F kcf
	ØD mm	ØM mm									
VS1-H1	630	657	408	276	650	550	M24	35	200	25	326.0
VS1-H2	630	657	449	313	650	550	M24	40	200	25	383.3
VS1-H3	730	757	460	313	750	650	M24	40	200	30	519.0
VS1-H4	730	757	508	361	750	650	M30	50	200	30	600.8
VS1-H5	730	757	558	371	750	650	M30	50	200	30	646.8
VS1-H6	730	757	595	396	750	650	M30	50	200	40	672.0
VS1-H7	780	807	608	409	800	700	M30	60	200	40	818.1
VS2-H1	730	757	526	354	750	650	M24	35	200	25	458.9
VS2-H2	730	757	574	398	750	650	M24	40	200	25	545.8
VS2-H3	730	757	622	435	750	650	M24	40	200	30	586.9
VS2-H4	730	757	690	503	750	650	M30	50	200	30	681.9
VS2-H5	730	757	740	513	750	650	M30	50	200	30	737.5
VS2-H6	730	757	802	563	750	650	M30	50	200	40	772.9
VS2-H7	780	807	815	576	800	700	M30	60	200	40	933.6
VS3-H1	730	757	809	557	750	650	M24	35	200	25	543.6
VS3-H2	730	757	886	630	750	650	M24	40	200	25	658.1
VS3-H3	730	757	964	697	750	650	M24	40	200	30	729.9
VS3-H4	730	757	1077	810	750	650	M30	50	200	30	853.4
VS3-H5	730	757	1127	820	750	650	M30	50	200	30	929.0
VS3-H6	730	757	1242	923	750	650	M30	50	200	40	996.7
VS3-H7	780	807	1255	936	800	700	M30	60	200	40	1190.2

HIGH LOAD VARIABLES



SUPPORT SIZE	ROD DIA X mm	BODY DIMENSIONS			RTO AT MIN LOAD (mm)			DEPTH OF THR'D A mm	LUG DIMENSIONS TYPES B & C					WEIGHTS kgf		
		ØD mm	ØM mm	L mm (not BM)	A	B	C		E mm	F mm	G mm	H mm	T mm	A	B	C
VS1-H1	M56	630	657	353	539	690	690	56	80	115	140	68	20	386	393	400
VS1-H2	M64	630	657	400	584	752	752	64	90	130	155	76	25	472	482	493
VS1-H3	M72	730	757	406	577	766	766	72	100	150	175	85	25	633	645	659
VS1-H4	M80	730	757	469	638	854	854	80	100	160	200	95	40	732	755	781
VS1-H5	M90	730	757	479	666	884	884	90	100	160	200	95	40	814	834	860
VS1-H6	M90	730	757	514	701	919	919	90	100	160	200	95	40	872	892	918
VS1-H7	M100	780	807	537	722	957	957	100	110	170	215	105	40	1044	1066	1096
VS2-H1	M56	730	757	431	622	773	773	56	80	115	140	68	20	532	538	546
VS2-H2	M64	730	757	485	674	842	842	64	90	130	155	76	25	654	664	675
VS2-H3	M72	730	757	528	704	893	893	72	100	150	175	85	25	702	714	728
VS2-H4	M80	730	757	611	785	1001	1001	80	100	160	200	95	40	816	839	865
VS2-H5	M90	730	757	621	813	1031	1031	90	100	160	200	95	40	909	929	955
VS2-H6	M90	730	757	681	873	1091	1091	90	100	160	200	95	40	978	998	1024
VS2-H7	M100	780	807	704	894	1129	1129	100	110	170	215	105	40	1167	1189	1219
VS3-H1	M56	730	757	634	835	986	986	56	80	115	140	68	20	619	625	633
VS3-H2	M64	730	757	717	916	1084	1084	64	90	130	155	76	25	767	777	788
VS3-H3	M72	730	757	790	976	1165	1165	72	100	150	175	85	25	848	860	875
VS3-H4	M80	730	757	918	1102	1318	1318	80	100	160	200	95	40	994	1018	1044
VS3-H5	M90	730	757	928	1130	1348	1348	90	100	160	200	95	40	1111	1131	1157
VS3-H6	M90	730	757	1041	1243	1461	1461	90	100	160	200	95	40	1215	1235	1261
VS3-H7	M100	780	807	1064	1264	1499	1499	100	110	170	215	105	40	1441	1463	1493

DESCRIPTION

Sway Braces are essentially a double-acting spring, housed in a canister. Unlike variable effort supports, Sway Braces are not intended to carry the weight of pipework; their purpose is to limit undesirable movement.

Sway Braces act like a rigid strut until a small preload is reached, whereafter the restraining force increases in proportion to the applied deflection. Fig. 1

Undesirable movement can occur due to many phenomena, such as wind loading, sympathetic vibration, rapid valve closure, relief valves opening, two phase flow or earthquake. It may be necessary to limit this type of deflection to prevent the generation of unacceptable stresses and equipment loadings.

The Sway Brace is a cost-effective means of limiting pipework deflection. It should be noted however that it does provide some resistance to the thermal movement of the pipework and care should be taken when specifying to ensure that this is acceptable. Installation of Sway Braces will have the effect of raising the fundamental frequency of vibration of a pipework system; this is likely to reduce undesirable deflections.

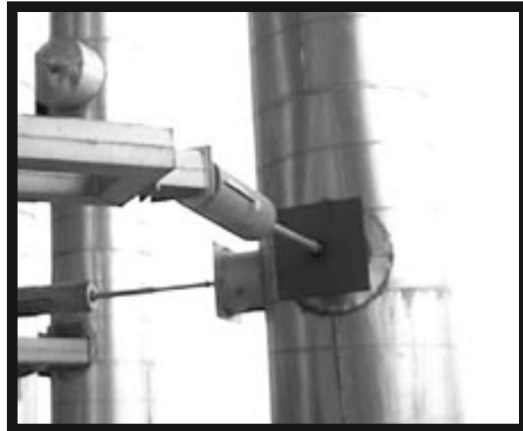
Sway Braces are often used to solve unforeseen problems of resonant vibration.

THE PHSPL RANGE OF SWAY BRACES

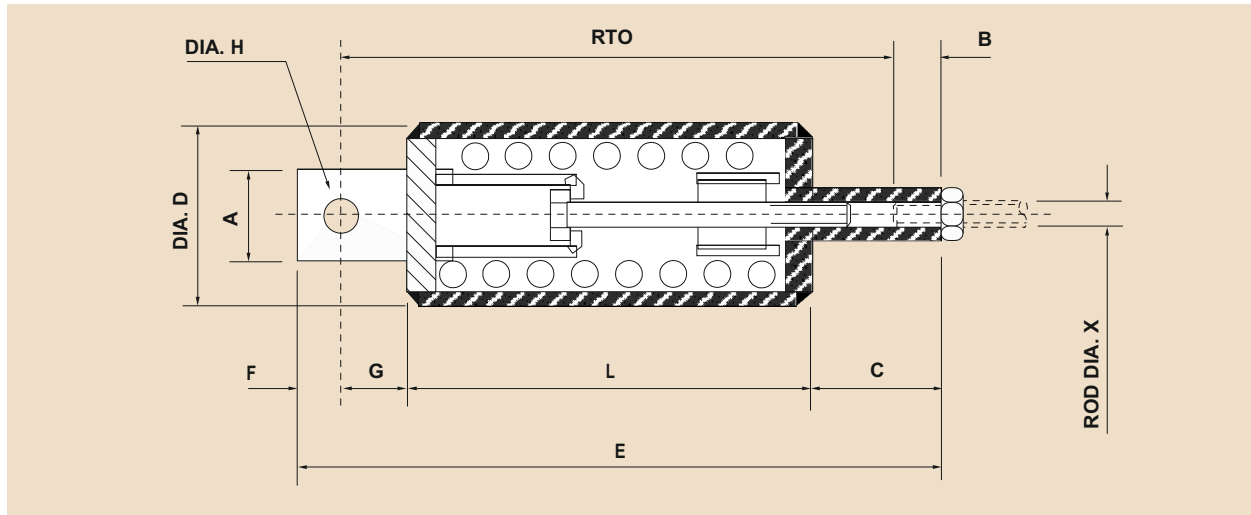
PHSPL offer a range of eight Sway Braces, all of which limit movement to a maximum of 70mm in either direction. Preloads range from 14 kgf to 1040 kgf and corresponding maximum loads from 85 to 6170 kgf.

SELECTION

Care should be taken when selecting to ensure the Sway Brace provides sufficient force to limit the deflection caused by the dynamic occurrence, but not so much as to unduly restrain the thermal movement of the piping. Ideally selections should be checked by analysis.



SWAY BRACES



SIZE	SWB1	SWB2	SWB3	SWB4	SWB5	SWB6	SWB7	SWB8
PRELOAD kgf	14	45	140	300	400	535	770	1040
MAX LOAD kgf	85	260	800	1860	2470	3340	4620	6170
RATE kgf/mm	1.0	3.1	9.5	22.3	29.6	40.1	55.1	73.2
PRELOAD N	137	441	1370	2940	3920	5250	7550	10200
MAX. LOAD N	834	2550	7850	18240	24220	32750	45310	60510
RATE N/mm	9.8	30.4	93.2	219	290	393	540	718
RTO mm	308	305	311	359	395	406	447	495
ROD SIZE X	M20	M24	M24	M30	M36	M36	M42	M48
A mm	80	80	80	100	100	100	110	130
B mm	25	30	30	38	45	45	53	60
C mm	80	80	78	75	95	90	100	105
DIA. D mm	102	102	152	168	168	219	219	219
E mm	378	380	386	462	505	516	575	640
F mm	45	45	45	65	65	65	75	85
G mm	60	60	60	80	80	80	90	105
DIA. H mm	26	26	26	39	39	39	45	52
L mm	193	195	203	242	265	281	310	345
WEIGHT kgf	6.8	7.6	16	27	31	51	60	73

STANDARD DESIGN FEATURES

1. Rugged construction.
2. Compact design.
3. Spring preloaded.
4. 70 mm of travel in both directions.
5. Painted finish as standard.

NON STANDARD DESIGN FEATURES

1. Sway Braces are available in all the corrosion-resistant materials and finishes which are applicable to our range of variable effort supports.
2. Special units to suit particular preload and spring rate requirements are available. Please contact our design department for details.

ORDERING INFORMATION

1. Size
2. Finish if other than PHSP standard.
3. Thread form if other than isometric coarse.
4. Mark No. (if known).

INSTALLATION AND ERECTION

Refer manual

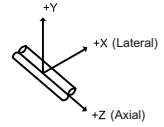
MAINTENANCE

Periodic inspection should be made at intervals to suit the operating environment. Check for visual damage, corrosion and wear.

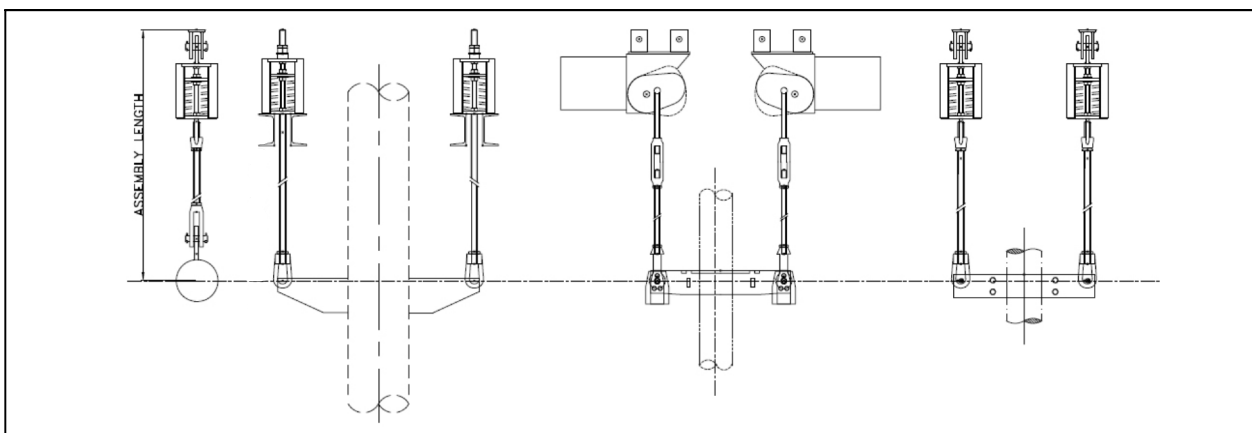


Pipe Hangers & Supports Private Limited

Ordering Information



- 1) Hot Load (Operating Load) in Kgs : _____
- 2) Thermal Movement / Travel (Direction + or -) in mm : UP (+) _____ mm
- 3) Type of Hanger Variable / Constant /Rigid : VariableEffort Support
- 4) For Constant Add Over Travel : Yes No
- 5) For Variable Springs Max Allowable % Load Variation : _____ %
- 6) Horizontal / Lateral Movement (If any) : 'X' Dir _____ mm / 'Z' Dir _____ mm
- 7) Hydro Load (If any) : _____ Kgs
- 8) Model & Type of Support : _____
- 9) Assembly Length (From BOS/TOS to Pipe CL) : _____ mm
- 10) Operating Temperature : _____ Deg C
- 11) Pipe Insulation Thk : _____ mm
- 12) Pipe Material : _____
- 13) Require Pipe Shoe for Foot Mounted Support : Yes No
- 14) For Foot Mounted Support Match Height : Yes No
- 15) Attachments like Lugs, Cleats Welded to Pipe in Scope : Yes No
- 16) Operating Load includes Wt of Accessories like Clamp, Tie Rods, Cleats, Lugs etc. : Yes No
- 17) Preferred Surface Protection / Painting : _____
- 18) For 'G' Type / Double / Trapeze type Hanger the Load Given above is for 1 assembly consisting of 2 Hangers / Individual Hanger : Yes No





Pipe Hangers & Supports Private Limited

Thanjavur



Chennai



Additional Services

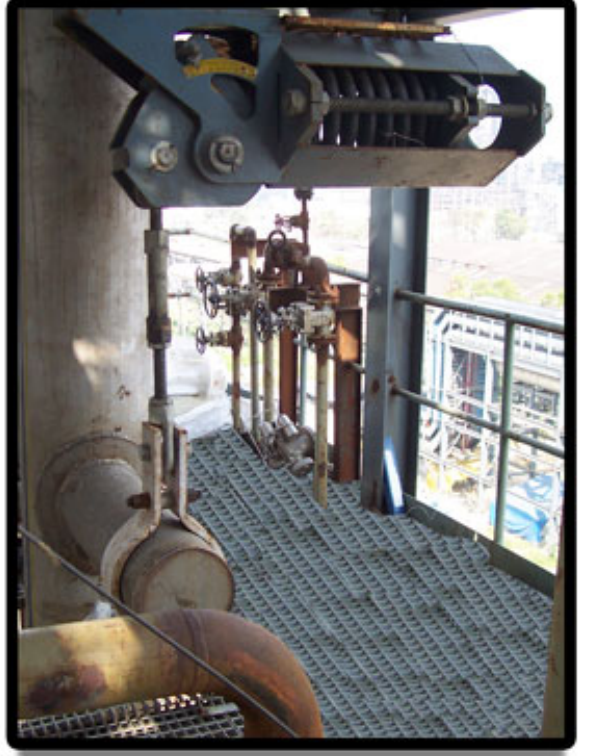


- Design and Detail of complete Pipe Support Systems
- Survey of existing pipe supports
- Inspection at site prior to commissioning
- Assist customers with innovative ideas to provide unique solutions

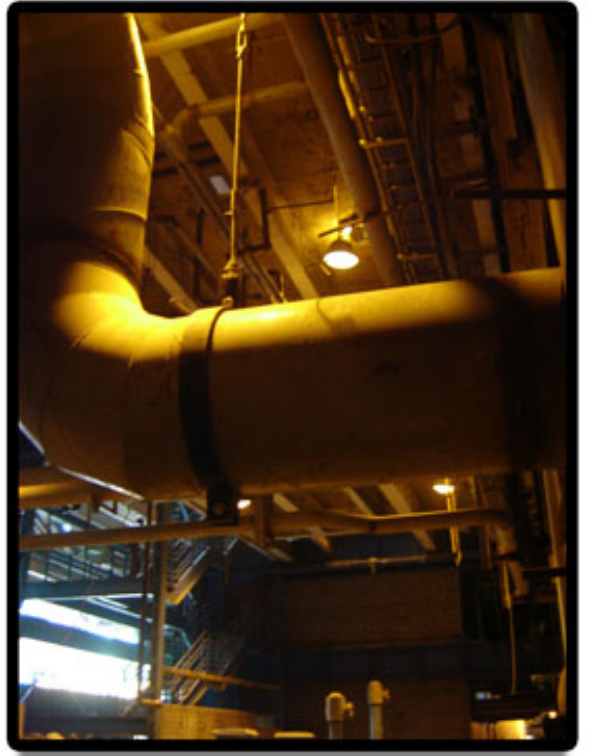


- Stress analysis & detail support engineering
- Conduct training programs on Hangers & Supports





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Pipe Hangers & Supports Private Limited

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Thanjavur

Chennai



Pipe Hangers & Supports is India's leading manufacturer of spring hangers, supports and accessories. Over the past 25 years we have supplied to major power plants, refineries, nuclear installations & process industries in India and several international projects.

www.pipehangers.in