

# Pipe Hangers & Supports



ASME STAMP



KEPIC MN STAMP



ISO 9001

ISO 14001

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**variable spring hangers**



light duty  
spring hanger  
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variable  
spring hanger  
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variable  
spring hanger  
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**constant supports**



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structural attachments



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saddle**



pipe covering  
protection saddle  
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**insulation  
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insulation protection  
shield  
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**pipe rolls**



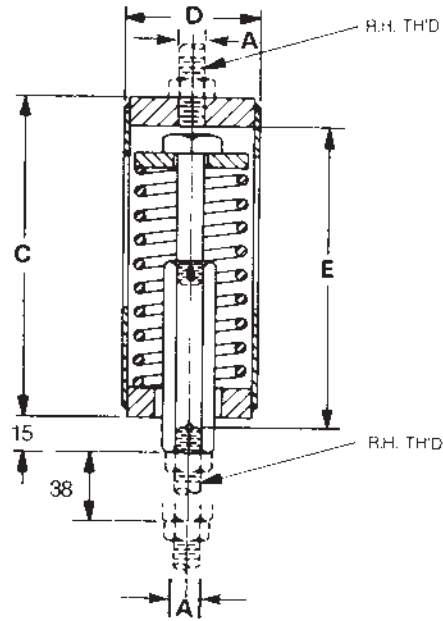
single pipe roll  
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pipe roll stand  
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light - duty spring hanger (standard)  
corrosion resistant type

model : LVS  
C-LVS



**FEATURES :**

- All welded construction.
- Neat, sturdy appearance.
- Incorporates a convenient load coupling to facilitate proper adjustment during erection.

**INSTALLATION :** Designed for attachment to its supporting member by screwing a rod into the top cap of the hanger the full depth of the cap.

**SERVICE :** Recommended for light loads where vertical movement does not exceed 32mm.

**ORDERING :** Specify size of hanger, model name. If corrosion-resistant hanger is required, specify "Galvanized with neoprene coated spring" (for protection against severe weather conditions or moderate corrosive conditions) or "Completely neoprene coated" (for highly corrosive conditions).  
ex) LVS-2.

**loads • weights • dimensions(mm)**

size no. max	■ max recom deflection	load, kg at max. recom deflection	deflection rate of hanger kg per mm	weight approx. kg each	A	C	D	rod take-out E
1	32	21.76	0.68	0.64	M10	105	48.6	105
2	32	38.72	1.21	0.73	M10	130	48.6	125
3	32	68.48	2.14	1.41	M12	132	60.5	122
4	32	122.24	3.82	2.04	M12	170	60.5	170

■ At maximum recommended deflection, spring can be compressed an additional 6 mm before becoming solid.

## variable spring hanger



**VSM**



**C-VSM**

### DESIGN FEATURES

- **Precompression**  
Precompressing the spring into the hanger casing provides the following advantages :
  - (1) Saves up 50% in headroom by reducing the length of the hanger.
  - (2) Reduces then installed height of the overall hanger assembly.
  - (3) Prevents the spring supporting force from exceeding the normal safe limits of variation.
  - (4) Saves valuable erection time because spring is precompressed to within 13mm of the working range.
- **Calibration** : All UNISON spring hangers and supports are calibrated for accurate loading conditions.
- Load indicator is clearly seen in the slot, simplifying reading of the scale plate.
- Cold set at the factory upon request.
- Spring and casing are fabricated of steel and are rugged and compact.
- Piston cap serves as a centering device or guide maintaining spring alignment.
- Casing protects the spring from damage and weather conditions.

### CORROSION RESISTANT

UNISON offers corrosion-resistant and weather resistant pre-engineered variable spring hangers to fill vital needs in the chemical and refinery industries as well as in modern outdoor power plant construction.

UNISON offers a choice :

- (1) For protection against severe weather conditions or moderate corrosive conditions, the parts of the hanger are Hot-Dip galvanized, except the spring which is neoprene coated and the load column for Type F which is electro-galvanized.
- (2) For highly corrosive conditions, all parts of the hanger, including the spring, are neoprene coated except the load column for Type F which is stainless steel.

### ADVANTAGES OF NEOPRENE COATING

- Protects from a wide range of corrosives.
- Does not affect the flex life of the spring.
- Recommended for ambient temperatures up to 110°C.

### SIZE RANGE

The UNISON pre-engineered Variable Spring Hanger in three series and seven types is offered in twenty-three sizes.

The hanger can be furnished to take loads from 23 Kg to 22,476 Kg.

### RECOMMENDED SERVICE

Pipe hangers located at points that are subject to vertical thermal movement and for which a constant support hanger is not required (see "recommended service" for constant support hanger, page 39).

### INSTALLATION

Securely attach hanger to the building.

Attach lower hanger rod and turn the load coupling until the load indicator is positioned at the desired setting indicated on the load scale plate.

### ADJUSTMENT OF HANGER

Once installed in the line : the hanger should be adjusted until the load indicator moves to the blue sticker marked "C" (cold position). On inspection of the system, after a reasonable period of operation, the load indicator should be at the red sticker marked "H" (hot position).

If it is not, the hanger should be readjusted to the hot position. No other adjustment is necessary.

## variable spring hanger

### HOW TO DETERMINE SERIES

In choosing between the VSS, VSM and VSL variable spring hangers, it must first be determined that the calculated movement will fall within the working load range of the hanger.

The model VSS hanger has a maximum variation in supporting force per 12.7mm spring deflection of 21 percent of its rated capacity.

The model VSM hanger has a maximum variation of 10.5 percent, while the model VSL hanger has a maximum variation of only 5.25 percent.

It is clear, then, that the longer spring causes the least transfer of load, and that sheer ability to get the known movement within the spring hanger's working range is not the complete answer to the problem.

Rather, good engineering sense, combined with available space and reasonable economic considerations should ultimately determine which series of variable spring hangers should be used. Special series of variable spring hangers can be fabricated for unusual conditions such as Triple or Quadruple type series hangers.

### HOW TO DETERMINE TYPE

The type of variable spring hanger to be used depend upon the physical characteristics required by the suspension problem; i.e., amount of head room, whether pipe is to be supported above the spring or below the spring, etc.

Consideration should be given to the seven standard types offered (see line cuts of types "A" through "G").

Special variable spring hangers can be fabricated for unusual conditions.

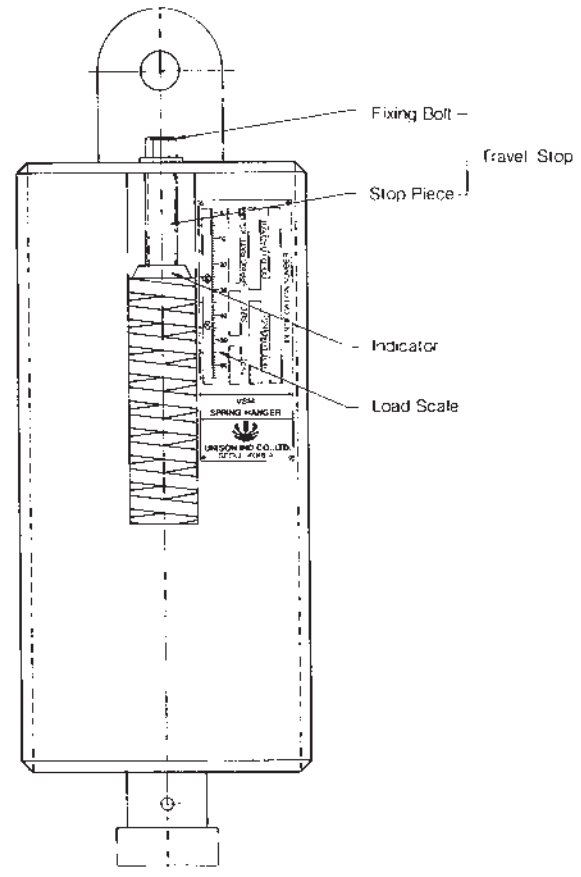
### HOW TO DETERMINE SIZE

Complete sizing information is given above the hanger selection chart on page 10 and 11.

This information is applicable to sizing hangers of all series.

It will be noted on the hanger selection charts that the total spring deflection in the casing leaves a reserve above and below the recommended working load range.

### TRAVEL STOP



The functional design of the pre-compressed variable spring hanger permits the incorporation of a two-piece travel stop that locks the hanger spring against upward or downward movement for temporary conditions of underload or overload.

The complete travel stop, the travel stop piece for cold set purpose and which may be employed during erection, hydrostatic test or chemical clean out.

The travel stop is painted as the same color with hanger body and is installed at the factory with a "red" caution tag attached calling attention that the device must be removed before the pipe line is put in service.

## variable spring hanger

### UNIVERSAL LOCKING DEVICES

It is not easy to reset a preset piece once removed.

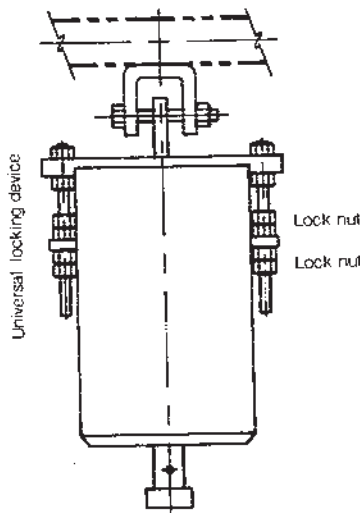
When it is required to be set and removed repeatedly, a Universal Locking Devices shown in below can be used.

By fastening its lock nuts, the hanger is locked at any travel position easily.

The devices are preset to the specified load same as preset pieces before they are shipped from the factory.

Lock nuts should not be unfastened until the hydrostatic proof test is completed.

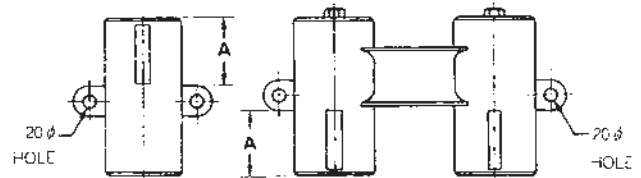
Universal Locking Devices are furnished by purchaser's special order.



### ORDERING

- (1) Hanger model name.
- (2) Hanger type and size.
- (3) Desired supporting force in operating position.
- (4) Calculated amount and direction of pipe movement from installed to operating position.
- (5) Customer's identification number (if any).
- (6) When ordering Type "G", specify total load and load per spring plus center to center rod dimensions.
- (7) If required, specify with Universal Locking Devices.
- (8) Specify with lifting lug, if required.
- (9) When ordering corrosion resistant hanger, specify C-VSS, C-VSM or C-VSL "completely galvanized except neoprene coated spring" or "completely neoprene coated."

### LIFTING LUGS



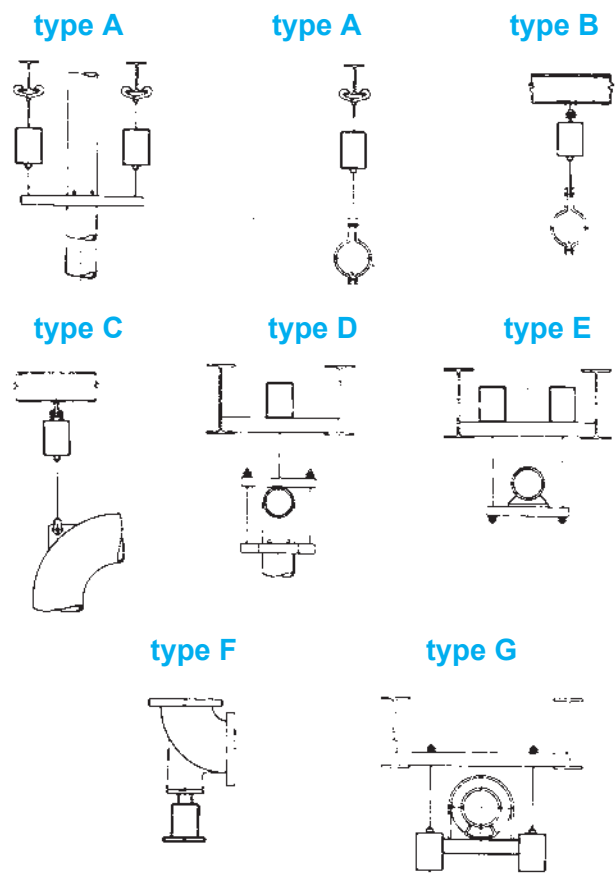
To help alleviate the problem of lifting large size spring hangers into position for installation, this product is available with lifting lugs (if requested) on sizes weighing 45kg or more.

### dimension "A"(mm)

hanger size	model name		
	VSS	VSM	VSL
9 thru 11	115 <sup>●</sup>	150 <sup>●</sup>	235 <sup>◆</sup>
12 thru 14	115 <sup>●</sup>	150 <sup>●</sup>	235
15 thru 17	125 <sup>●</sup>	155	240
18 thru 20	135	170	255
21 thru 22	150	180	265

- Lifting lugs required on Type G only.
- ◆ Lifting lugs required on Types F and G only.

### TYPICAL APPLICATIONS





variable spring hanger

HOW TO USE HANGER SELECTION TABLE

In order to choose a proper size hanger, it is necessary to know the actual load which the spring is to support and the amount and direction of the pipe line movement from the cold to the hot position. Find the actual load of the pipe in the load table. As it is desirable to support the actual weight of the pipe when the line is hot, the actual load is the hot load. To determine the cold load, read the spring scale, up or down, for the amount of expected movement. The chart must be read opposite from the direction of the pipe's movement.

The load arrived at is the cold load. If the cold load falls outside of the working load range of the hanger selected, relocate the actual or hot load in the adjacent column and find the cold load. When the hot and cold loads are both within the working range of a hanger, the size number of that hanger will be found at the top of the column. Should it be impossible to select a hanger in a particular series such that both loads occur within the working range, consideration should be given to a variable spring hanger with a wider working range or a constant support hanger.

LOAD TABLE in Kg : for selection of hanger size

working range (mm)			Hanger Size											deflection (mm)		
VSL	VSM	VSS	0	1	2	3	4	5	6	7	8	9	10	VSS	VSM	VSL
			20.4	28.5	36.6	48	64	86	114	152	204	271	353	0	0	0
			21.0	29.4	37.8	49	66	88	118	157	210	280	365			
			21.7	30.4	39.0	51	68	91	122	162	217	289	376		5	10
			22.4	31.3	40.3	52	70	94	125	167	224	298	388			
0	0	0	23.0	32.3	41.5	54	72	97	129	172	231	307	399	5	10	20
			23.7	33.2	42.7	55	74	100	133	177	237	316	411			
10	5		24.4	34.1	43.9	57	76	102	137	182	244	325	423		15	30
			25.1	35.1	45.1	58	78	105	140	187	251	334	434			
20	10	5	25.7	36.0	46.3	60	81	108	144	192	257	343	446	10	20	40
			26.4	36.9	47.5	62	83	111	148	197	264	352	458			
30	15		27.1	37.9	48.7	63	85	114	152	202	271	361	469		25	50
			27.7	38.8	49.9	65	87	116	155	207	277	370	481			
40	20	10	28.4	39.8	51.1	66	89	119	159	212	284	378	492	15	30	60
			29.1	40.7	52.3	68	91	122	163	217	291	387	504			
50	25		29.7	41.6	53.5	69	93	125	167	222	298	396	516		35	70
			30.4	42.6	54.7	71	95	128	170	227	304	405	527			
60	30	15	31.1	43.5	55.9	73	97	131	174	232	311	414	539	20	40	80
			31.8	44.4	57.1	74	99	133	178	237	318	423	550			
70	35		32.4	45.4	58.3	76	102	136	182	242	324	432	562		45	90
			33.1	46.3	59.5	77	104	139	185	247	331	441	574			
80	40	20	33.8	47.3	60.7	79	106	142	189	252	338	450	585	25	50	100
			34.4	48.2	61.9	80	108	145	193	257	344	459	597			
90	45		35.1	49.1	63.1	82	110	147	197	262	351	468	608		55	110
			35.8	50.1	64.4	83	112	150	200	267	358	477	620			
100	50	25	36.4	51.0	65.6	85	114	153	204	272	365	486	632	30	60	120
			37.1	51.9	66.8	87	116	156	208	277	371	495	643			
110	55		37.8	52.9	68.0	88	118	159	212	282	378	503	655		65	130
			38.5	53.8	69.2	90	120	161	215	287	385	512	667			
120	60	30	39.1	54.8	70.4	91	123	164	219	292	391	521	678	35	70	140
			39.8	55.7	71.6	93	125	167	223	297	398	530	690			
130	65		40.5	56.6	72.8	94	127	170	227	302	405	539	701		75	150
			41.1	57.6	74.0	96	129	173	230	307	411	548	713			
			41.8	58.5	75.2	98	131	176	234	312	418	557	725	40	80	160
			42.5	59.4	76.4	99	133	178	238	317	425	566	736			
			43.2	60.4	77.6	101	135	181	242	322	432	575	748		85	170
			spring rate (kg/mm)													
			0.536	0.750	0.964	1.250	1.679	2.250	3.00	4.00	5.36	7.14	9.29			
			0.268	0.375	0.482	0.625	0.839	1.125	1.50	2.00	2.68	3.57	4.64			
			0.134	0.188	0.241	0.313	0.420	0.563	0.75	1.00	1.34	1.79	2.32			

**ORDER TO SIZE A SPRING, then:**

1. Calculate the maximum allowable spring rate from the formula.

$$\text{SPRING RATE} = \frac{\text{VARIABILITY} \times \text{HOT LOAD}}{\text{MOVEMENT}}$$

2. Determine the size by finding the hot load in the hanger selection table.

3. Stay in that size column and choose the series with a spring rate equal or less then the value calculated above.

4. Calculate the cold load and check that both hot and cold loads fall within the working range.

$$\text{COLD LOAD} = \text{HOT LOAD} \pm \text{SPRING RATE} \times \text{MOVEMENT}$$

(+ : Moving Up, - : Moving Down)

5. Check the variability of selected spring is equal or less than the requirement.

A key criteria in selecting the size and series of a variable spring hanger is a factor known as variability. This is a measurement of the percentage change in supporting force between the hot and cold positions of a spring and is calculated from the formula :

$$\text{VARIABILITY} = \frac{\text{MOVEMENT} \times \text{SPRING RATE}}{\text{HOT LOAD}}$$

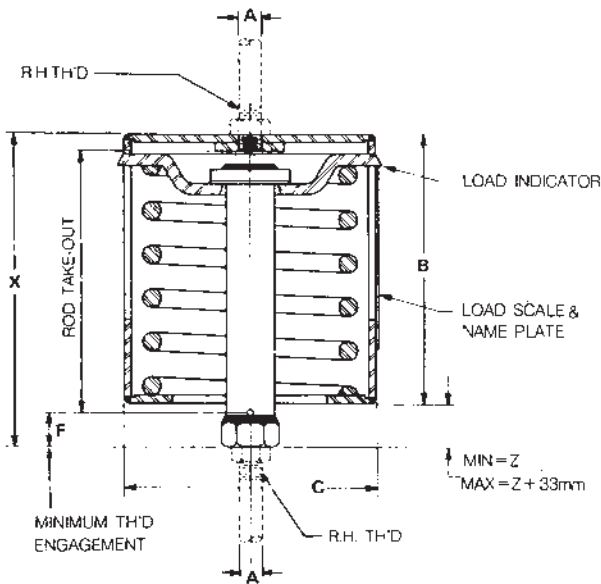
If an allowable variability is not specified, good practice would be to use 25% as specified by MSS-SP58.

6. If this condition is not met, move to adjacent size and rework. If load, movement, variability or available space prohibit the use of a variable spring hanger, the use of a constant support should be considered.

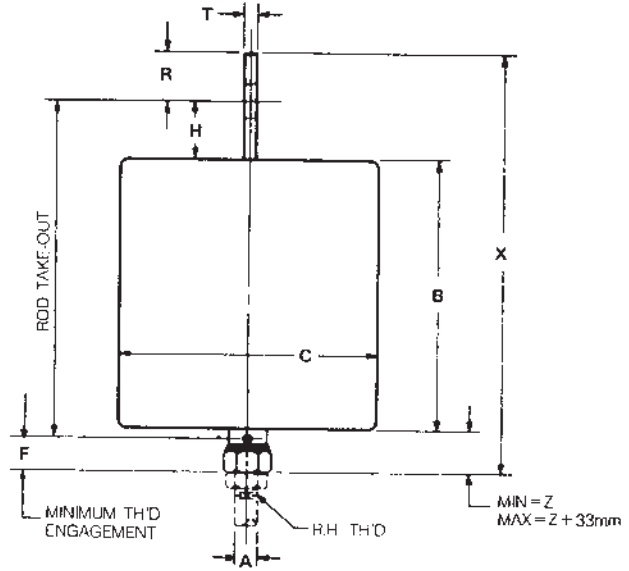
working range (mm)			Hanger Size											deflection (mm)			
			11	12	13	14	15	16	17	18	19	20	21				22
VSL	VSM	VSS												VSS	VSM	VSL	
			462	611	816	1085	1465	2035	2715	3610	4805	6379	8483	11313	0	0	0
			477	631	841	1121	1514	2102	2804	3729	4963	6589	8782	11685			
			492	651	867	1157	1562	2169	2893	3848	5121	6799	9041	12057		5	10
			507	671	895	1193	1610	2236	2982	3967	5279	7009	9320	12429			
0	0	0	522	691	922	1229	1659	2303	3072	4085	5437	7219	9599	12801	5	10	20
			537	711	948	1264	1707	2370	3161	4204	5595	7428	9878	13173			
10	5		552	731	975	1300	1755	2437	3250	4323	5753	7638	10157	13545	15	30	
			568	751	1002	1336	1803	2504	3339	4442	5911	7848	10436	13917			
20	10	5	583	771	1029	1371	1851	2571	3429	4560	6069	8058	10715	14290	10	20	40
			598	792	1055	1407	1899	2638	3518	4679	6227	8268	10994	14662			
30	15		613	812	1082	1443	1948	2705	3607	4798	6385	8478	11273	15034	25	50	
			628	832	1109	1478	1996	2772	3697	4917	6543	8687	11552	15406			
40	20	10	644	852	1136	1514	2044	2839	3786	5036	6701	8897	11831	15778	15	30	60
			659	872	1163	1550	2092	2906	3875	5154	6859	9107	12110	16150			
50	25		674	892	1189	1586	2141	2973	3964	5273	7017	9317	12389	16522	35	70	
			689	912	1216	1621	2189	3040	4054	5392	7176	9527	12668	16894			
60	30	15	704	932	1243	1657	2237	3107	4143	5511	7334	9737	12947	17267	20	40	80
			720	952	1270	1693	2285	3174	4232	5629	7492	9946	13226	17639			
70	35		735	972	1297	1728	2333	3241	4322	5748	7650	10156	13505	18011	45	90	
			750	992	1323	1764	2382	3308	4411	5867	7808	10366	13784	18383			
80	40	20	765	1013	1350	1800	2430	3375	4500	5986	7966	10576	14063	18755	25	50	100
			780	1033	1377	1836	2478	3442	4589	6104	8124	10786	14343	19127			
90	45		795	1053	1404	1871	2526	3509	4679	6223	8282	10996	14622	19499	55	110	
			810	1073	1431	1907	2574	3576	4768	6342	8440	11205	14901	19871			
100	50	25	826	1093	1457	1943	2623	3643	4857	6461	8598	11415	15180	20244	30	60	120
			841	1113	1484	1978	2671	3710	4947	6579	8756	11625	15459	20616			
110	55		856	1133	1511	2014	2719	3777	5036	6698	8914	11835	15738	20988	65	130	
			871	1153	1538	2050	2767	3844	5125	6817	9072	12045	16017	21360			
120	60	30	886	1173	1565	2086	2815	3911	5214	6936	9230	12255	16296	21732	35	70	140
			901	1193	1591	2121	2864	3978	5304	7054	9388	12464	16575	22104			
130	65		917	1213	1618	2157	2912	4045	5393	7173	9546	12674	16854	22476	75	150	
			932	1233	1645	2193	2960	4111	5482	7292	9704	12884	17133	22848			
			947	1254	1672	2228	3008	4178	5572	7411	9862	13094	17412	23221	40	80	160
			962	1274	1698	2264	3057	4245	5661	7530	10020	13304	17691	23593			
			977	1294	1725	2300	3105	4313	5750	7648	10178	13514	17970	23965	85	170	
<b>spring rate (kg/mm)</b>																	
			12.14	16.07	21.43	28.57	38.57	53.57	71.43	95.01	126.44	167.87	223.23	297.70			
			6.07	8.04	10.71	14.29	19.29	26.79	35.72	47.50	63.22	83.93	111.61	148.85			
			3.04	4.02	5.36	7.14	9.64	13.39	17.86	23.75	31.61	41.97	55.81	74.42			

spring hanger (short)  
type-A and type-B

model : VSS-A  
VSS-B



VSS-A



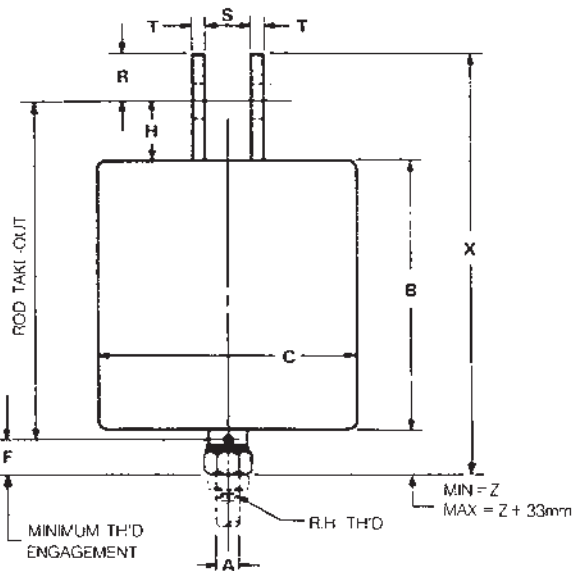
VSS-B

weights • dimensions(mm)

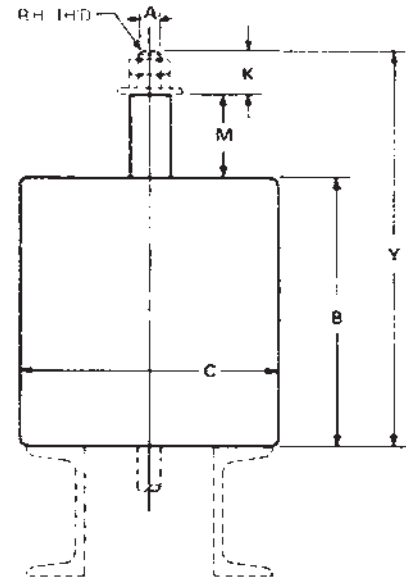
hanger size	A	recom. R.H. thread length	C	F	B	rod take-out		type B, C				
						type A	type B, C	lug hole size	H	R	S	T
0	M12	75	102	30	108	107	158	18	40	32	22	6
1	M12	75	102	30	113	112	163	18	40	32	22	6
2	M12	75	102	30	118	117	168	18	40	32	22	6
3	M12	75	140	30	118	117	168	18	40	32	22	6
4	M12	75	140	30	118	117	168	18	40	32	22	6
5	M12	75	140	30	118	117	168	18	40	32	22	6
6	M16	75	165	35	137	133	187	22	40	32	28	6
7	M16	75	165	35	137	133	187	22	40	32	28	6
8	M16	75	165	35	162	158	212	22	40	32	28	6
9	M20	100	216	45	162	160	217	26	40	32	32	9
10	M20	100	216	45	162	160	217	26	40	32	32	9
11	M20	100	216	45	177	175	237	26	40	32	32	9
12	M24	100	216	50	184	178	254	33	50	40	42	12
13	M24	100	216	50	200	194	270	33	50	40	42	12
14	M30	100	216	55	227	221	322	39	75	52	50	16
15	M30	125	216	55	245	235	340	39	75	52	50	16
16	M36	125	216	65	275	265	370	46	75	65	60	20
17	M42	150	216	70	310	296	405	52	75	65	68	20
18	M48	180	324	85	327	313	447	62	100	75	72	20
19	M56	180	324	85	367	347	502	70	115	75	80	20
20	M64	205	324	85	412	390	547	78	115	102	86	24
21	M72	230	324	95	438	412	573	86	115	102	92	24
22	M80	255	324	95	552	522	697	91	125	102	100	24

spring hanger (short)  
type -C and type -D

model : VSS-C  
VSS-D



VSS-C



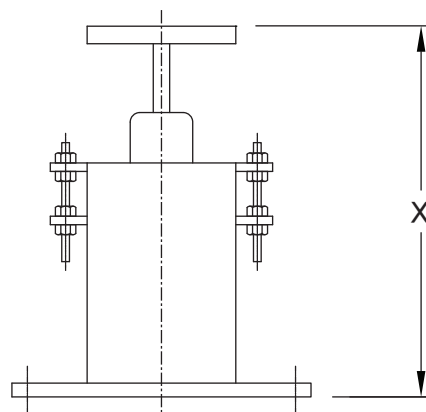
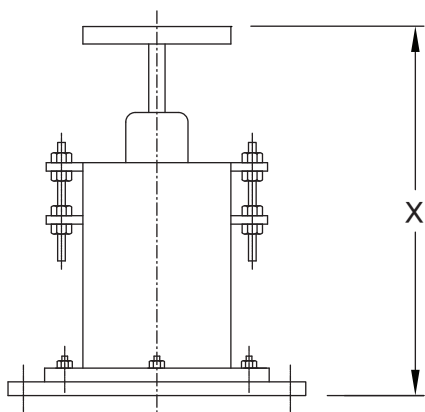
VSS-D

weights • dimensions(mm)

hanger size	weight(approx)kg each		type D			loaded length X			
	type A, B, C	type D	Y	K	M	type A		type B, C	
						min	max	min	max
0	2.27	1.81	188	35	45	148	181	220	253
1	2.72	2.27	193	35	45	153	186	225	258
2	3.18	2.72	198	35	45	158	191	230	263
3	4.08	3.63	198	35	45	158	191	230	263
4	4.54	4.08	198	35	45	158	191	230	263
5	4.99	4.54	198	35	45	158	191	230	263
6	7.71	7.26	222	40	45	182	215	254	287
7	9.07	8.62	222	40	45	182	215	254	287
8	9.53	9.07	247	40	45	207	240	279	312
9	20.87	19.05	252	45	45	222	255	294	327
10	23.59	21.77	252	45	45	222	255	294	327
11	20.41	18.60	267	45	45	237	270	309	342
12	21.77	19.50	285	60	45	249	282	339	372
13	26.76	24.04	301	60	45	265	298	355	388
14	28.12	24.95	340	75	45	297	330	424	457
15	33.57	29.48	361	75	45	315	348	442	475
16	39.92	34.93	406	90	45	355	388	495	528
17	48.08	41.28	452	105	45	395	428	535	568
18	103.87	88.91	483	115	45	427	460	602	635
19	116.12	97.98	532	130	45	467	500	657	690
20	145.15	123.38	586	140	45	512	545	729	762
21	168.29	140.16	631	160	45	548	581	765	798
22	208.66	181.89	751	170	45	662	695	889	922

spring hanger (universal locking device)  
type-F

model : UC-VSS, U-VSS  
UC-VSM, U-VSM  
UC-VSL, U-VSL



(universal-corrosion type)

(universal-standard type)

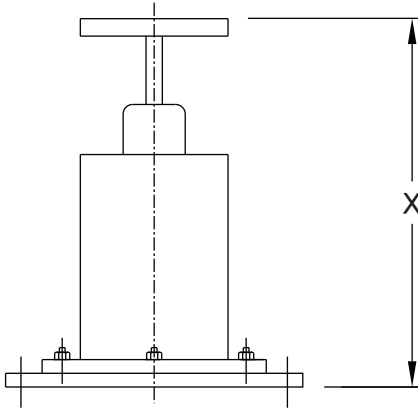
install length. dimensions (mm)

HANGER SIZE	UC-VSS & U-VSS load length X		UC-VSM & U-VSM load length X		UC-VSL & U-VSL load length X	
	Min.	Max.	Min.	Max.	Min.	Max.
0	212	242	277	337	446	566
1	217	247	277	337	446	566
2	217	247	297	357	486	606
3	222	252	297	357	486	606
4	222	252	307	367	506	626
5	222	252	307	367	506	626
6	257	287	347	407	563	683
7	257	287	347	407	563	683
8	282	312	387	447	643	763
9	301	331	402	462	648	768
10	301	331	406	466	656	776
11	326	356	417	477	668	788
12	332	362	437	497	705	825
13	354	384	482	542	786	906
14	374	404	509	569	840	960
15	384	414	515	575	852	972
16	436	466	581	641	966	1086
17	463	493	641	701	1086	1206
18	510	540	660	720	1077	1197
19	555	585	740	800	1222	1342
20	608	638	813	873	1352	1472
21	634	664	886	946	1484	1604
22	754	784	1092	1152	1884	2004

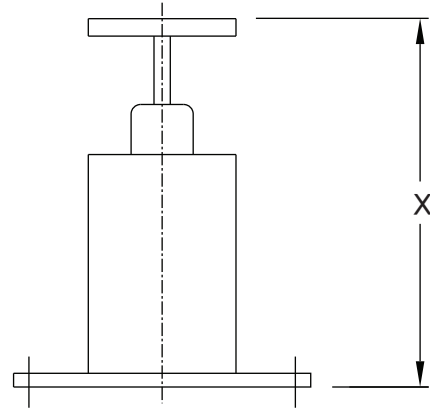


spring hanger (standard type)  
type-F

model : C-VSS, VSS  
C-VSM, VSM  
C-VSL, VSL



(corrosion type)



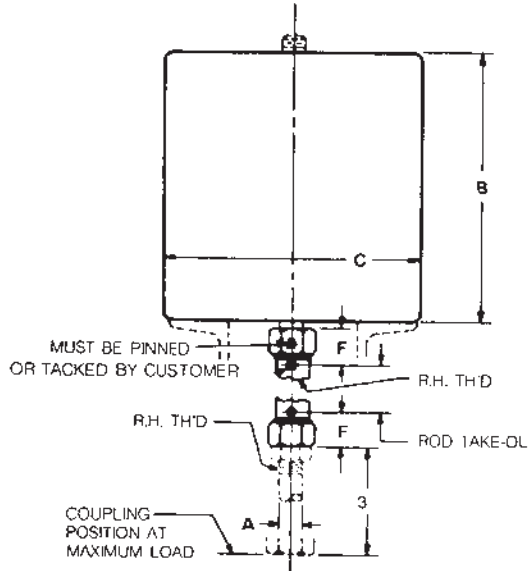
(standard type)

install length, dimensions (mm)

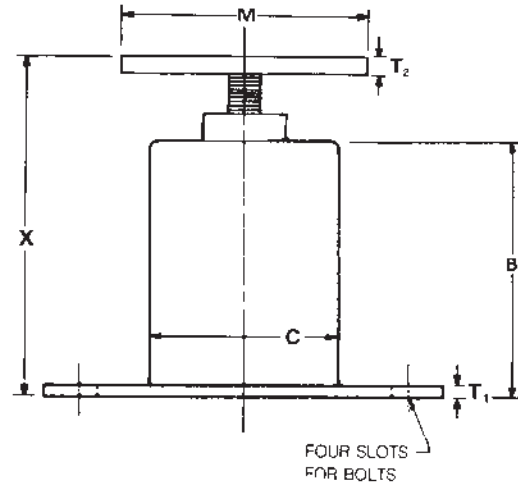
HANGER SIZE	C-VSS & VSS load length X		C-VSM & VSM load length X		C-VSL & VSL load length X	
	Min.	Max.	Min.	Max.	Min.	Max.
0	177	207	242	302	411	531
1	182	212	242	302	411	531
2	182	212	262	322	451	571
3	187	217	262	322	451	571
4	187	217	272	332	471	591
5	187	217	272	332	471	591
6	213	243	303	363	519	639
7	213	243	303	363	519	639
8	238	268	343	403	599	719
9	257	287	358	418	604	724
10	257	287	362	422	612	732
11	272	302	363	423	614	734
12	278	308	383	443	651	771
13	291	321	419	479	723	843
14	311	341	446	506	777	897
15	321	351	452	512	789	909
16	357	387	502	562	887	1007
17	384	414	562	622	1007	1127
18	431	461	581	641	998	1118
19	461	491	646	706	1128	1248
20	498	528	703	763	1242	1362
21	524	554	776	836	1374	1494
22	632	662	970	1030	1762	1882

spring hanger (short)  
type -E and type -F

model : VSS-E  
VSS-F



VSS-E



VSS-F

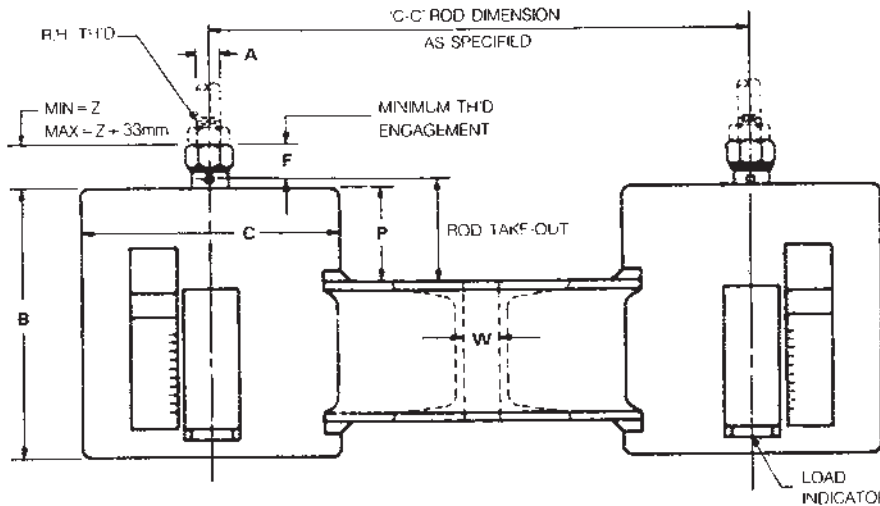
weights • dimensions(mm)

hanger size	A	recom. R.H. thread length	C	F	B		rod take-out	
					type E, G	type F	type E	type G
0	M12	75	102	25	108	108	75	30
1	M12	75	102	25	113	113	75	30
2	M12	75	102	25	118	113	75	30
3	M12	75	140	20	118	118	75	30
4	M12	75	140	20	118	118	75	30
5	M12	75	140	20	118	118	75	30
6	M16	75	165	25	137	134	75	55
7	M16	75	165	25	137	134	75	55
8	M16	75	165	25	162	159	75	55
9	M20	100	216	30	165	162	75	60
10	M20	100	216	30	165	162	75	60
11	M20	100	216	30	180	177	75	60
12	M24	100	216	30	183	183	75	50
13	M24	100	216	30	196	196	75	85
14	M30	100	216	30	220	220	75	85
15	M30	125	216	50	237	230	75	35
16	M36	125	216	50	267	262	75	35
17	M42	150	216	50	295	289	75	60
18	M48	180	324	80	319	319	300	25
19	M56	180	324	85	349	349	300	35
20	M64	205	324	85	386	386	300	35
21	M72	230	324	90	408	408	300	35
22	M80	255	324	95	516	516	300	85

spring hanger (short)  
type -G

model : VSS -G

※ Based on use of model UB-SD U-Bolt in conjunction with type G support.



※type "G" variable spring maximum allowable 'C-C'

spring size	max 'c-c'(mm)	max pipe size
0- 2	610	300A (12B)
3- 5	760	400A (16B)
6- 8	915	500A (20B)
9-11	915	500A (20B)
12-13	915	500A (20B)
14	840	400A (16B)
15	915	500A (20B)
16-17	915	500A (20B)
18-19	1065	500A (20B)
20	1015	500A (20B)
21-22	1220	600A (24B)

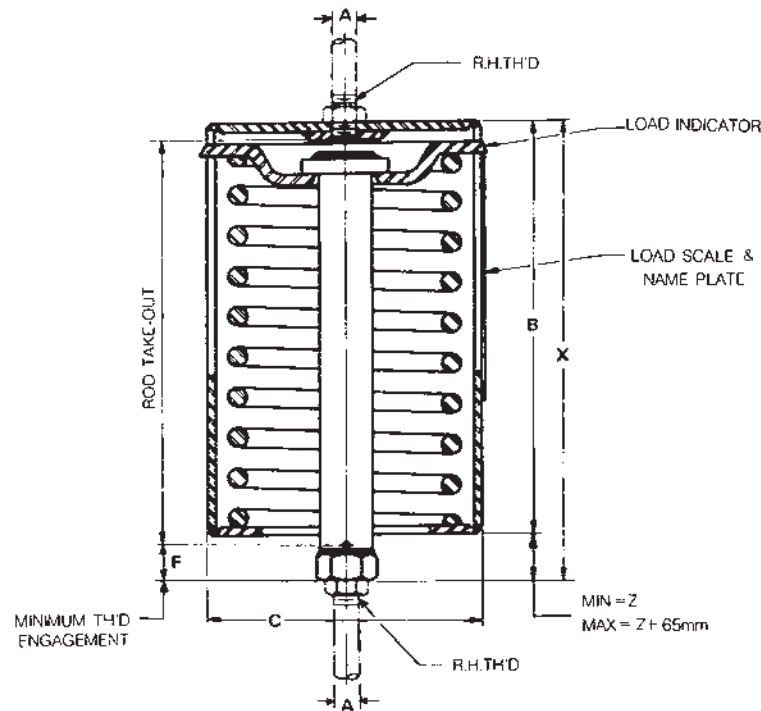
VSS-G

weights • dimensions(mm)

hanger size	weight(approx)kg. each			type F								type G		
	type E	type F	type G	bottom flange square	bottom flange bolt circle		bottom flange bolts	T <sub>1</sub>	M	T <sub>2</sub>	loaded length X		space between channel W	P
					min	max					min	max		
0	1.81	4.08	11.34	190	170	220	M16	6	90	6	177	207	15	25
1	2.27	4.08	11.34	190	170	220	M16	6	90	6	182	212	15	25
2	2.72	4.54	12.25	190	170	220	M16	6	90	6	182	212	15	25
3	3.63	5.44	13.15	190	170	220	M16	6	125	6	187	217	20	25
4	4.08	5.44	14.16	190	170	220	M16	6	125	6	187	217	20	25
5	4.54	5.98	14.52	190	170	220	M16	6	125	6	187	217	20	25
6	7.26	11.80	20.41	230	200	265	M20	9	155	9	213	243	25	50
7	8.62	12.70	23.13	230	200	265	M20	9	155	9	213	243	25	50
8	9.07	13.61	24.11	230	200	265	M20	9	155	9	238	268	25	50
9	19.50	28.12	47.62	305	305	370	M20	12	200	12	257	287	30	50
10	21.77	29.48	53.17	305	305	370	M20	12	200	12	257	287	30	50
11	18.60	27.67	45.84	305	305	370	M20	12	200	12	272	302	30	50
12	19.05	33.57	50.84	305	305	370	M20	12	200	12	278	308	40	40
13	24.04	31.75	60.78	305	305	370	M20	12	200	12	291	321	40	75
14	24.95	32.21	63.05	305	305	370	M20	12	200	12	311	341	40	75
15	29.48	34.93	77.11	305	305	370	M20	12	200	12	321	351	55	25
16	34.93	39.92	91.63	305	305	370	M20	12	200	16	357	387	55	25
17	41.28	45.81	107.76	305	305	370	M20	12	200	16	384	414	55	50
18	88.91	97.98	221.35	430	480	545	M20	16	250	24	431	461	60	15
19	97.98	100.25	244.41	430	480	545	M20	16	250	24	461	491	65	25
20	123.38	128.37	303.42	430	480	545	M20	16	250	24	498	528	75	25
21	140.16	129.73	375.13	430	480	545	M20	16	250	32	524	554	80	25
22	181.89	168.74	456.20	430	480	545	M20	16	250	32	632	662	85	75

spring hanger (medium)  
type -A

model : VSM -A



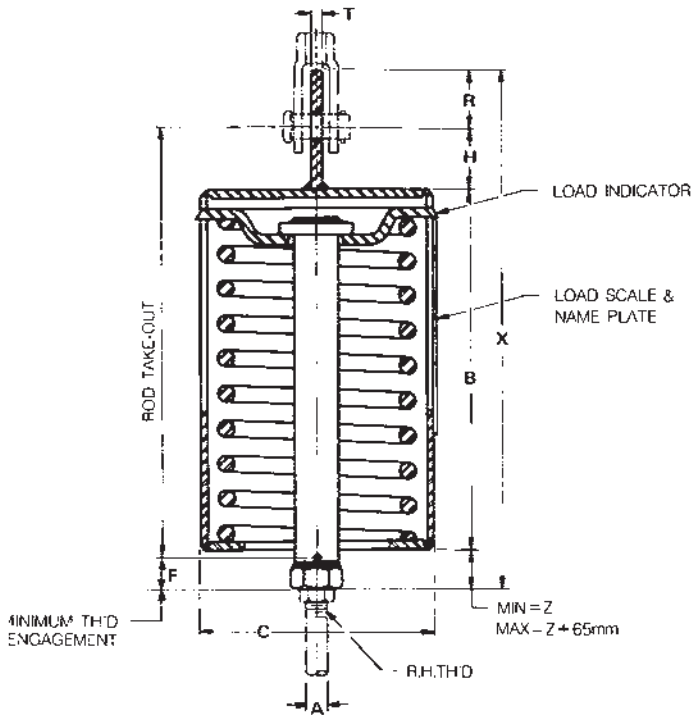
VSM-A

weights • dimensions(mm)

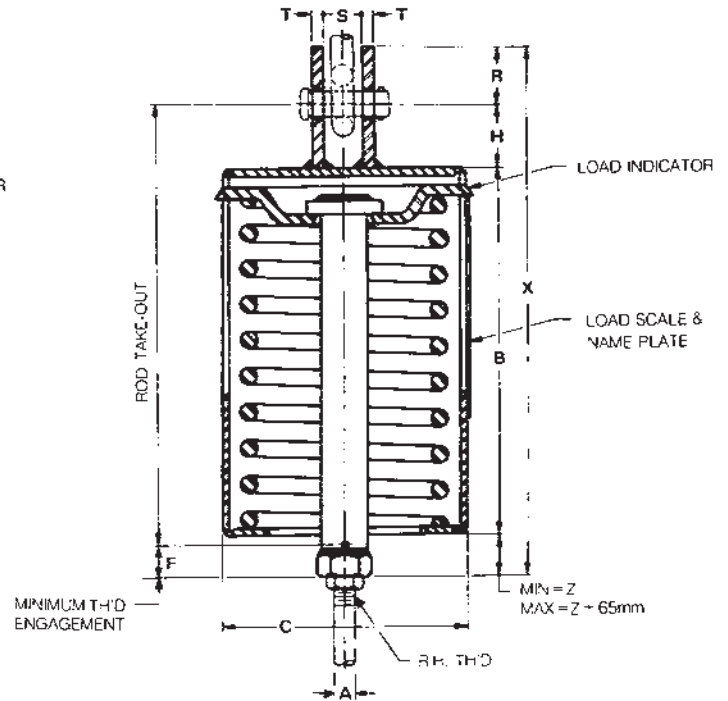
hanger size	weight (approx) each, kg	A	recom. R.H. thread length	B	C	rod take-out	F	loaded length X	
								min	max
0	3.18	M12	125	158	102	163	30	203	268
1	3.18	M12	125	158	102	163	30	203	268
2	3.63	M12	125	178	102	183	30	223	288
3	5.44	M12	125	178	140	183	30	223	288
4	5.90	M12	125	188	140	193	30	233	298
5	6.35	M12	125	188	140	193	30	233	298
6	10.43	M16	125	212	165	217	35	262	327
7	11.79	M16	125	212	165	217	35	262	327
8	12.70	M16	125	252	165	257	35	302	367
9	24.95	M20	150	248	216	268	45	313	378
10	27.67	M20	150	252	216	262	45	317	382
11	24.95	M20	150	253	216	263	45	318	383
12	27.67	M24	150	274	216	284	50	344	409
13	35.83	M24	180	313	216	323	50	383	448
14	37.65	M30	180	347	216	357	55	422	487
15	43.99	M30	180	361	216	371	55	436	501
16	53.97	M36	205	407	216	417	65	492	557
17	67.13	M42	205	475	216	485	70	565	630
18	136.00	M48	230	462	324	472	85	567	632
19	156.95	M56	230	537	324	547	85	642	707
20	204.12	M64	255	602	324	612	85	707	772
21	238.59	M72	255	675	324	685	95	790	865
22	306.18	M80	280	835	324	845	95	950	1015

spring hanger (medium)  
type -B and type -C

model : VSM-B  
VSM-C



VSM-B



VSM-C

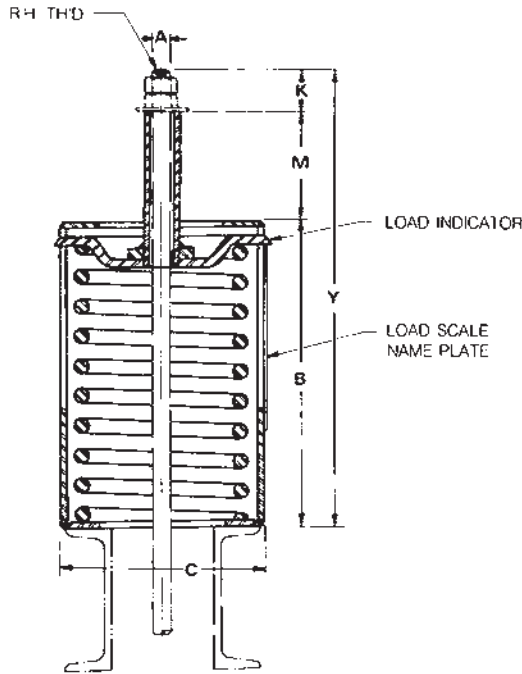
weights • dimensions(mm)

hanger size	weight (approx) each kg	A	R.H. thread length	lug hole size	B	C	F	H	rod take-out	R	S	T	loaded length X	
													min	max
0	3.18	M12	125	18	158	102	30	40	203	32	22	6	275	340
1	3.63	M12	125	18	158	102	30	40	203	32	22	6	275	340
2	4.08	M12	125	18	178	102	30	40	223	32	22	6	295	360
3	5.44	M12	125	18	178	140	30	40	223	32	22	6	295	360
4	6.35	M12	125	18	188	140	30	40	233	32	22	6	305	370
5	6.80	M12	125	18	188	140	30	40	233	32	22	6	305	370
6	10.89	M16	125	22	212	165	35	40	257	32	28	6	334	399
7	12.25	M16	125	22	212	165	35	40	257	32	28	6	334	399
8	13.15	M16	125	22	252	165	35	40	297	32	28	6	374	439
9	25.40	M20	150	26	248	216	45	40	298	32	32	9	385	450
10	28.12	M20	150	26	252	216	45	40	302	32	32	9	389	454
11	25.40	M20	150	26	253	216	45	40	303	32	32	9	390	455
12	27.67	M24	150	33	274	216	50	50	334	40	42	12	434	499
13	35.83	M24	180	33	313	216	50	50	373	40	42	12	473	538
14	38.10	M30	180	39	347	216	55	75	432	52	50	16	549	614
15	45.36	M30	180	39	361	216	55	75	446	52	50	16	563	628
16	56.25	M36	205	46	407	216	65	75	492	65	60	20	632	697
17	69.85	M42	205	52	475	216	70	75	560	65	68	20	705	770
18	136.53	M48	230	62	462	324	85	100	572	75	72	20	742	807
19	157.85	M56	230	70	537	324	85	115	662	75	80	20	832	897
20	206.84	M64	255	78	602	324	85	115	727	102	86	24	924	989
21	239.50	M72	255	86	675	324	95	115	800	102	92	24	1007	1072
22	310.26	M80	280	91	835	324	95	125	970	102	100	24	1177	1242

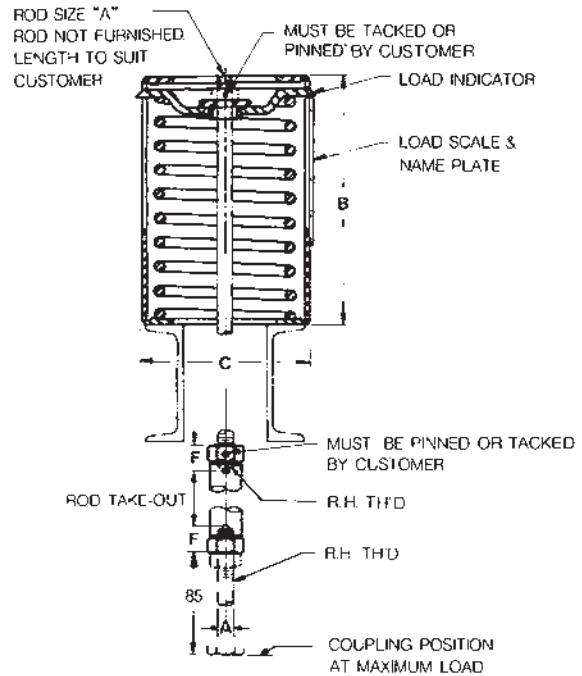


spring hanger (medium)  
type-D and type-E

model : VSM-D  
VSM-E



VSM-D



VSM-E

weights • dimensions(mm)

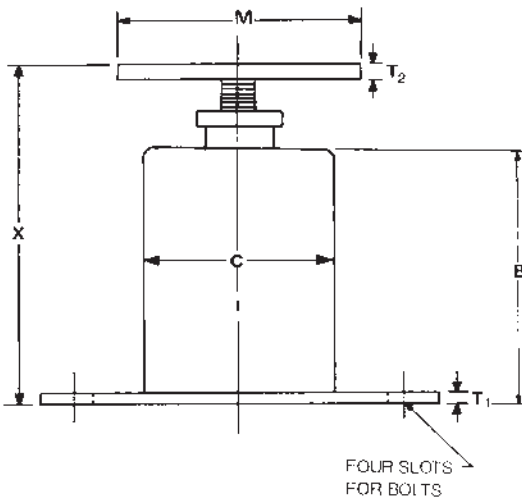
hanger size	A	recomm. R.H. thread length	casing diam C	F	B		rod take-out		type D		
					type D, E, G	type F	type E	type G	Y	K	M
0	M12	125	102	25	158	158	75	45	273	35	80
1	M12	125	102	25	158	158	75	45	273	35	80
2	M12	125	102	25	178	178	75	45	293	35	80
3	M12	125	140	25	178	178	75	55	293	35	80
4	M12	125	140	25	188	188	75	55	303	35	80
5	M12	125	140	25	188	188	75	55	303	35	80
6	M16	125	165	25	212	209	75	55	327	40	75
7	M16	125	165	25	212	209	75	55	327	40	75
8	M16	125	165	25	252	249	75	55	367	40	75
9	M20	150	216	30	248	248	75	85	368	45	75
10	M20	150	216	30	252	252	75	85	372	45	75
11	M20	150	216	30	253	253	75	85	373	45	75
12	M24	150	216	30	270	273	75	110	405	60	75
13	M24	180	216	30	309	309	75	110	444	60	75
14	M30	180	216	30	340	340	75	110	490	75	75
15	M30	180	216	50	357	346	75	110	507	75	75
16	M36	205	216	50	403	394	75	110	568	90	75
17	M42	205	216	50	467	454	75	110	647	105	75
18	M48	230	324	80	458	454	300	110	648	115	75
19	M56	230	324	85	527	519	300	110	732	130	75
20	M64	255	324	85	590	576	300	110	805	140	75
21	M72	255	324	90	663	645	300	110	898	160	75
22	M80	280	324	95	819	799	300	110	1064	170	75

spring hanger (medium)  
type-F and type-G

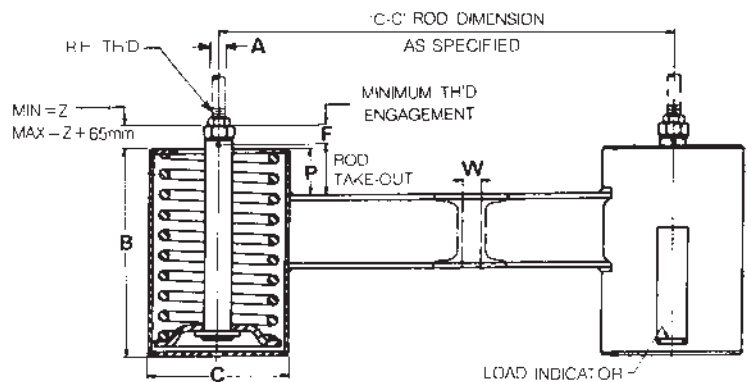
model : VSM-F  
VSM-G

spring size	max 'c-c'(mm)	max pipe size
0-2	610	300A (12B)
3-5	760	400A (16B)
6-8	915	500A (20B)
9-11	915	500A (20B)
12-13	915	500A (20B)
14	840	400A (16B)
15	915	500A (20B)
16-17	915	500A (20B)
18-19	1065	500A (20B)
20	1015	500A (20B)
21-22	1220	600A (24B)

\*type "G" variable spring maximum allowable 'C-C'



VSM-F



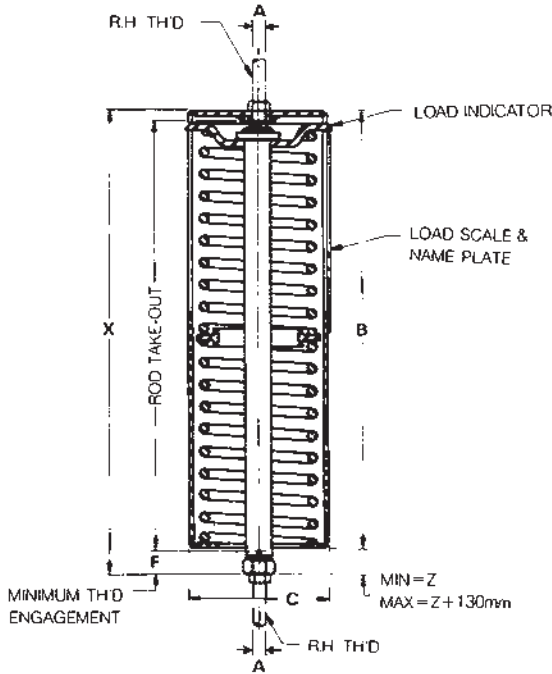
VSM-G

weights • dimensions(mm)

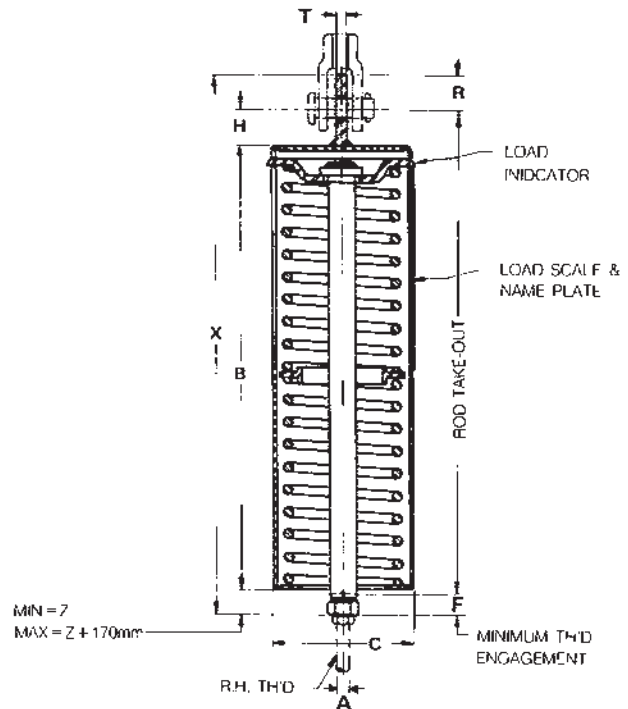
hanger size	weight(approx)kg. each			type F										type G	
	type D, E	type F	type G	bottom flange square	bottom flange bolt circle		bottom flange bolts	T <sub>1</sub>	diam M	T <sub>2</sub>	loaded length X		space between channel W	P	
					min	min					min	max			
0	2.72	5.90	12.70	190	170	220	M16	6	90	6	242	302	15	40	
1	3.18	5.90	13.15	190	170	220	M16	6	90	6	242	302	15	40	
2	3.63	6.35	13.61	190	170	220	M16	6	90	6	262	322	15	40	
3	4.99	9.53	16.78	190	170	220	M16	6	125	6	262	322	20	50	
4	5.44	10.43	17.24	190	170	220	M16	6	125	6	272	332	20	50	
5	6.35	10.89	17.69	190	170	220	M16	6	125	6	272	332	20	50	
6	9.98	16.78	25.86	230	200	265	M20	9	155	9	303	363	25	50	
7	11.34	19.50	28.58	230	200	265	M20	9	155	9	303	363	25	50	
8	11.79	19.96	30.39	230	200	265	M20	9	155	9	343	403	25	50	
9	23.13	36.74	55.79	305	305	370	M20	12	200	12	358	418	30	75	
10	26.31	39.92	62.14	305	305	370	M20	12	200	12	362	422	30	75	
11	23.13	36.29	56.70	305	305	370	M20	12	200	12	363	423	30	75	
12	25.40	38.56	62.14	305	305	370	M20	12	200	12	383	443	40	100	
13	33.11	47.63	79.38	305	305	370	M20	12	200	12	419	479	40	100	
14	34.93	49.44	83.00	305	305	370	M20	12	200	12	446	506	40	100	
15	39.92	52.62	100.70	305	305	370	M20	12	200	12	452	512	55	100	
16	48.54	61.69	122.47	305	305	370	M20	12	200	16	502	562	55	100	
17	60.33	72.12	147.87	305	305	370	M20	12	200	16	562	622	55	100	
18	118.84	141.98	285.77	430	480	545	M20	16	250	24	581	641	60	100	
19	136.08	158.76	327.95	430	480	545	M20	16	250	24	646	706	65	100	
20	167.83	200.04	423.21	430	480	545	M20	16	250	24	703	763	75	100	
21	206.39	211.38	515.74	430	480	545	M20	16	250	32	776	836	80	100	
22	229.07	283.05	651.37	430	480	545	M20	16	250	32	970	1030	85	100	

spring hanger (double)  
type -A and type -B

model : VSL - A  
VSL - B



VSL-A



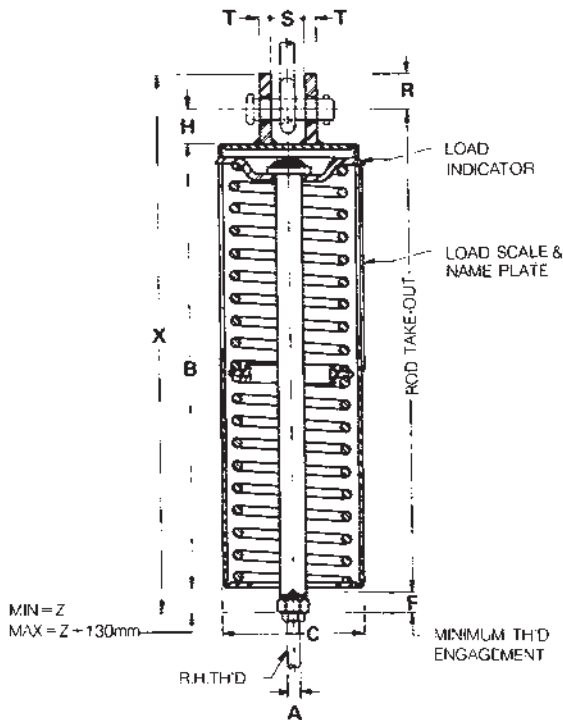
VSL-B

weights • dimensions(mm)

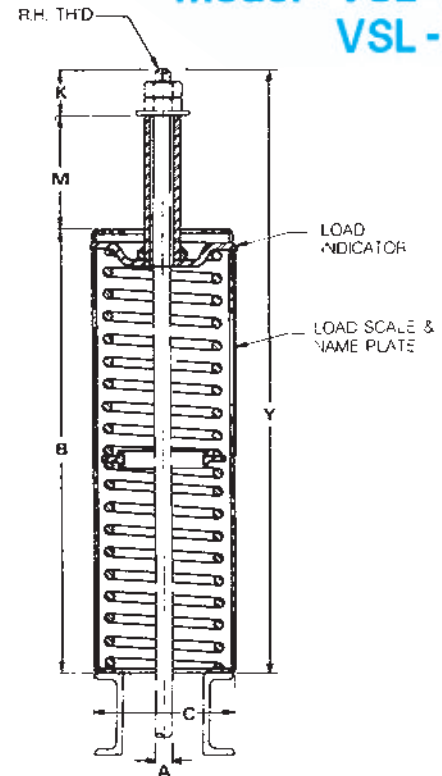
hanger size	A	recom. R.H. thread length	C	F	B	rod take-out		type B, C				
						type A	type B, C	lug hole size	H	R	S	T
0	M12	230	102	30	304	303	349	18	40	32	22	6
1	M12	230	102	30	304	303	349	18	40	32	22	6
2	M12	230	102	30	344	343	389	18	40	32	22	6
3	M12	230	140	30	344	343	389	18	40	32	22	6
4	M12	230	140	30	364	363	409	18	40	32	22	6
5	M12	230	140	30	364	363	409	18	40	32	22	6
6	M16	230	165	35	403	399	448	22	40	32	28	6
7	M16	230	165	35	403	399	448	22	40	32	28	6
8	M16	230	165	35	483	479	528	22	40	32	28	6
9	M20	230	216	45	469	467	519	26	40	32	32	9
10	M20	230	216	45	477	475	527	26	40	32	32	9
11	M20	255	216	45	479	477	529	26	40	32	32	9
12	M24	255	216	50	517	511	577	33	50	40	42	12
13	M24	255	216	50	592	586	652	33	50	40	42	12
14	M30	255	216	55	653	647	735	39	75	52	50	16
15	M30	255	216	55	673	663	758	39	75	52	50	16
16	M36	280	216	65	765	755	850	46	75	65	60	20
17	M42	305	216	70	893	879	978	52	75	65	68	20
18	M48	305	324	85	854	840	964	62	100	75	72	20
19	M56	330	324	85	994	1059	1119	70	115	75	80	20
20	M64	355	324	85	1116	1094	1241	78	115	102	86	24
21	M72	355	324	95	1248	1222	1373	86	115	102	92	24
22	M80	380	324	95	1562	1532	1697	91	125	102	100	24

spring hanger (double)  
type -C and type -D

model : VSL -C  
VSL -D



VSL-C



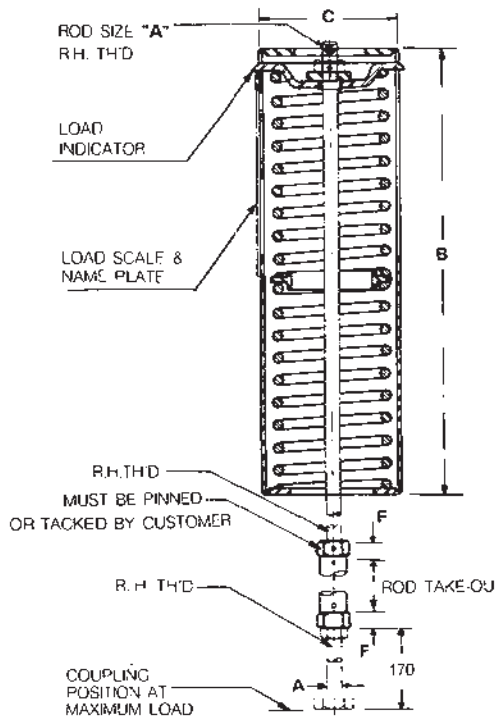
VSL-D

weights • dimensions(mm)

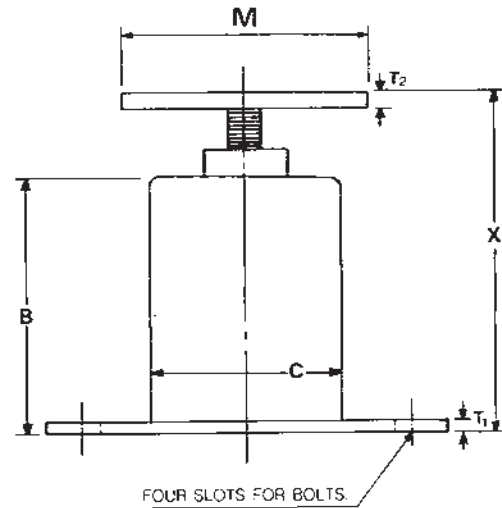
hanger size	weight(approx) kg. each		type D			loaded length X			
	type A, B, C	type D	Y	K	M	type A		type B, C	
						min	max	min	max
0	4.99	4.99	479	35	140	359	489	431	561
1	5.90	5.90	479	35	140	359	489	431	561
2	6.80	6.80	519	35	140	399	529	471	601
3	9.07	8.62	519	35	140	399	529	471	601
4	10.43	9.98	539	35	140	419	549	491	621
5	11.34	10.89	539	35	140	419	549	491	621
6	17.24	16.78	583	40	140	463	593	535	665
7	20.87	20.41	583	40	140	463	593	535	665
8	26.31	22.23	663	40	140	543	673	615	745
9	39.46	38.10	654	45	140	544	674	616	746
10	47.17	44.45	662	45	140	552	682	624	754
11	39.92	38.56	664	45	140	554	684	626	756
12	44.45	42.64	717	60	140	597	727	687	817
13	60.78	58.51	792	60	140	672	802	762	892
14	64.86	62.14	868	75	140	738	868	862	992
15	71.67	67.59	888	75	140	758	888	885	1015
16	92.53	85.28	995	90	140	860	990	1000	1130
17	117.48	105.69	1138	105	140	993	1123	1133	1263
18	218.64	202.76	1109	115	140	969	1099	1144	1274
19	258.55	234.96	1264	130	140	1109	1239	1299	1429
20	350.18	314.30	1396	140	140	1231	1361	1448	1578
21	412.78	369.68	1548	160	140	1373	1503	1590	1720
22	548.86	503.50	1872	170	140	1687	1817	1914	2044

spring hanger (double)  
type -E and type -F

model : VSL-E  
VSL-F



VSL-E



VSL-F

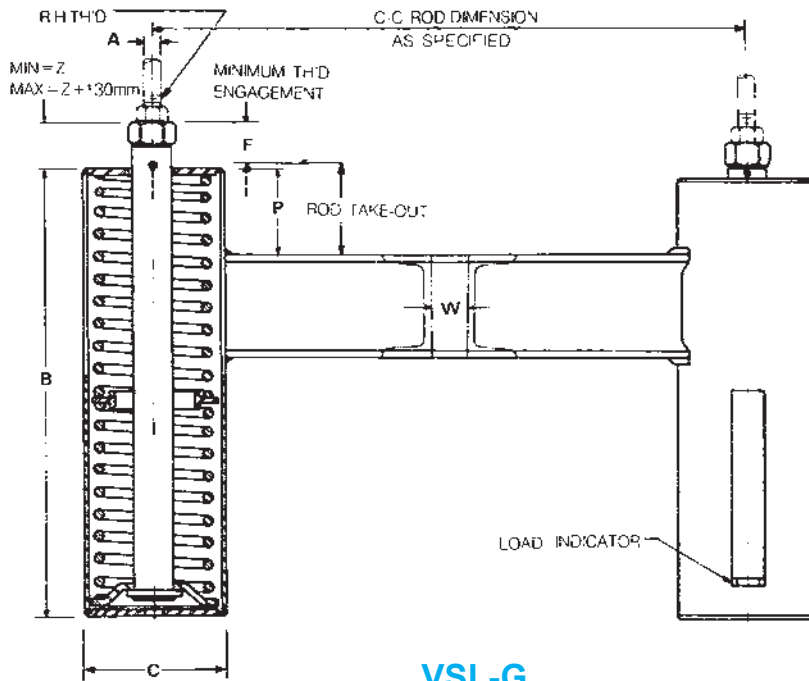
weights • dimensions(mm)

hanger size	A	recom. R.H. thread length	C	F	B		rod take-out	
					type E, G	type F	type E	type G
0	M12	230	102	25	304	302	75	45
1	M12	230	102	25	304	302	75	45
2	M12	230	102	25	344	342	75	45
3	M12	230	140	25	344	342	75	55
4	M12	230	140	25	364	362	75	55
5	M12	230	140	25	364	362	75	55
6	M16	230	165	25	403	400	75	55
7	M16	230	165	25	403	400	75	55
8	M16	230	165	25	483	480	75	55
9	M20	230	216	30	472	469	75	85
10	M20	230	216	30	480	477	75	85
11	M20	255	216	30	482	479	75	85
12	M24	255	216	30	516	516	75	110
13	M24	255	216	30	588	588	75	110
14	M30	255	216	30	646	646	75	110
15	M30	255	216	50	665	658	75	110
16	M36	280	216	50	757	752	75	110
17	M42	305	216	50	877	872	75	110
18	M48	305	324	80	846	846	300	110
19	M56	330	324	85	976	976	300	110
20	M64	355	324	85	1090	1090	300	110
21	M72	355	324	90	1218	1218	300	110
22	M80	380	324	95	1526	1526	300	110



spring hanger (double)  
type -G

model : VSL -G



\*type "G" variable spring maximum allowable 'C - C'

spring size	max 'c-c'(mm)	max pipe size
0-2	610	300A (12B)
3-5	760	400A (16B)
6-8	915	500A (20B)
9-11	915	500A (20B)
12-13	915	500A (20B)
14	840	400A (16B)
15	915	500A (20B)
16-17	915	500A (20B)
18-19	1065	500A (20B)
20	1015	500A (20B)
21-22	1220	600A (24B)

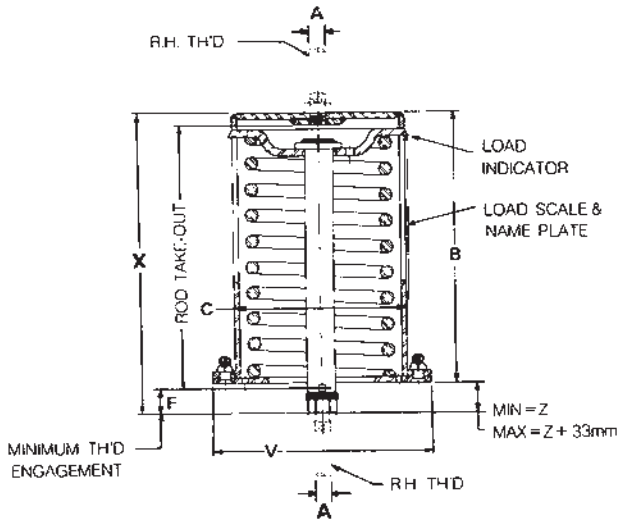
VSL-G

weights · dimensions(mm)

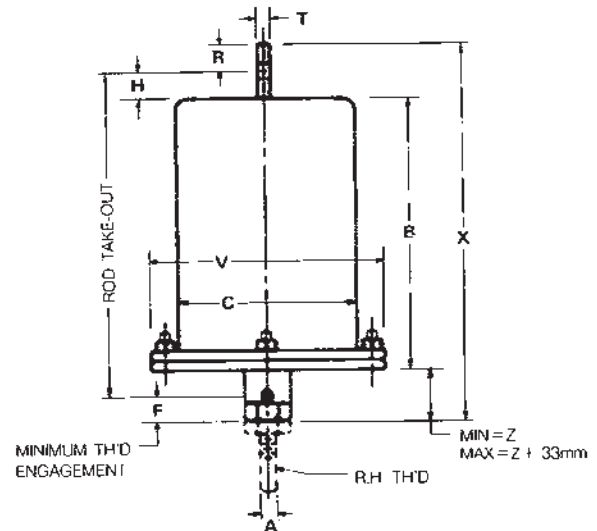
hanger size	weight(approx) each			type F										type G	
	type E	type F	type G	bottom flange square	bottom flange bolt circle		bottom flange bolts	T <sub>1</sub>	diam M	T <sub>2</sub>	loaded length X		space between channels W	P	
					min	max					min	max			
0	4.99	8.62	15.88	190	170	220	M16	6	90	6	411	531	15	40	
1	5.90	9.07	17.69	190	170	220	M16	6	90	6	411	531	15	40	
2	6.80	9.98	19.50	190	170	220	M16	6	90	6	451	571	15	40	
3	8.62	14.97	23.13	190	170	220	M16	6	125	6	451	571	20	50	
4	9.98	16.78	25.86	190	170	220	M16	6	125	6	471	591	20	50	
5	10.89	17.69	27.67	190	170	220	M16	6	125	6	471	591	20	50	
6	16.78	26.76	39.46	230	200	265	M20	9	155	9	519	639	25	50	
7	20.41	31.30	46.72	230	200	265	M20	9	155	9	519	639	25	50	
8	22.23	32.66	57.61	230	200	265	M20	9	155	9	599	719	25	50	
9	38.10	57.15	84.82	305	305	370	M20	12	200	12	604	724	30	75	
10	44.45	63.50	100.35	305	305	370	M20	12	200	12	612	732	30	75	
11	38.56	56.25	85.73	305	305	370	M20	12	200	12	614	734	30	75	
12	42.64	60.78	96.61	305	305	370	M20	12	200	12	651	771	40	100	
13	58.51	77.57	129.28	305	305	370	M20	12	200	12	723	843	40	100	
14	62.14	80.74	137.44	305	305	370	M20	12	200	12	777	901	40	100	
15	67.59	84.82	154.22	305	305	370	M20	12	200	12	789	897	55	100	
16	85.28	102.97	196.86	305	305	370	M20	12	200	16	887	1007	55	100	
17	105.69	123.83	246.76	305	305	370	M20	12	200	16	1007	1127	55	100	
18	202.76	235.87	451.79	430	480	545	M20	16	250	24	998	1118	60	100	
19	234.98	269.44	531.17	430	480	545	M20	16	250	24	1128	1248	65	100	
20	314.34	352.45	913.51	430	480	545	M20	16	250	24	1242	1362	75	100	
21	369.68	381.93	864.11	430	480	545	M20	16	250	32	1374	1494	80	100	
22	503.50	523.45	1131.72	430	480	545	M20	16	250	32	1762	1882	85	100	

spring hanger (corrosion-resistant)  
short type - A and type - B

model : C-VSS-A  
C-VSS-B



C-VSS-A



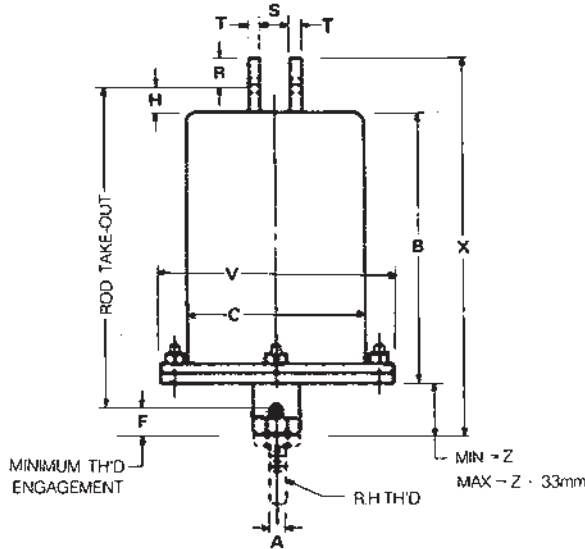
C-VSS-B

weights • dimensions(mm)

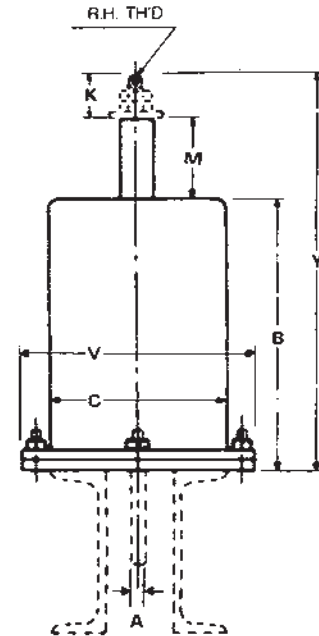
hanger size	A	recom. R.H. thread length	C	diam V	F	B	rod take-out		type B, C				
							type A	type B, C	lug hole size	H	R	S	T
0	M12	75	102	130	30	108	107	158	18	40	32	22	6
1	M12	75	102	130	30	113	112	163	18	40	32	22	6
2	M12	75	102	130	30	118	117	168	18	40	32	22	6
3	M12	75	140	175	30	118	117	168	18	40	32	22	6
4	M12	75	140	175	30	118	117	168	18	40	32	22	6
5	M12	75	140	175	30	118	117	168	18	40	32	22	6
6	M16	75	165	215	35	137	133	187	22	40	32	28	6
7	M16	75	165	215	35	137	133	187	22	40	32	28	6
8	M16	75	165	215	35	162	158	212	22	40	32	28	6
9	M20	100	216	275	45	162	160	217	26	40	32	32	9
10	M20	100	216	275	45	162	160	217	26	40	32	32	9
11	M20	100	216	275	45	177	175	237	26	40	32	32	9
12	M24	100	216	275	50	184	178	254	33	50	40	42	12
13	M24	100	216	275	50	200	194	270	33	50	40	42	12
14	M30	100	216	275	55	227	221	322	39	75	52	50	16
15	M30	125	216	290	55	245	235	340	39	75	52	50	16
16	M36	125	216	290	65	275	265	370	46	75	65	60	20
17	M42	150	216	290	70	310	296	405	52	75	65	68	20
18	M48	180	324	405	85	327	313	447	62	100	75	72	20
19	M56	180	324	405	85	367	347	502	70	115	75	80	20
20	M64	205	324	405	85	412	390	547	78	115	102	86	24
21	M72	230	324	405	95	438	412	573	86	115	102	92	24
22	M80	255	324	405	95	552	522	697	91	125	102	100	24

spring hanger (corrosion-resistant)  
short type-C and type-D

model : C-VSS-C  
C-VSS-D



C-VSS-C



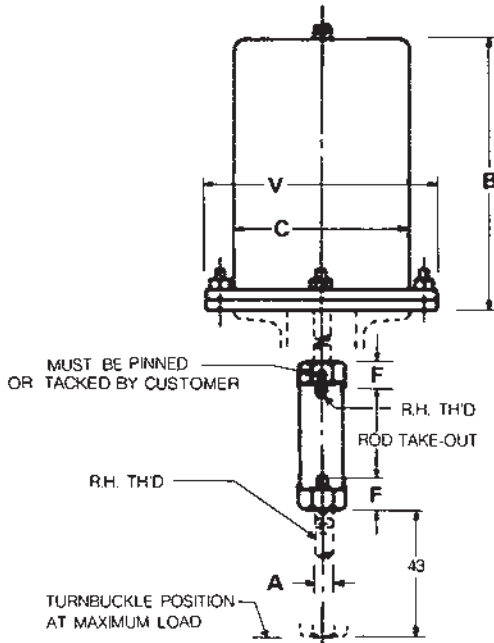
C-VSS-D

weights • dimensions(mm)

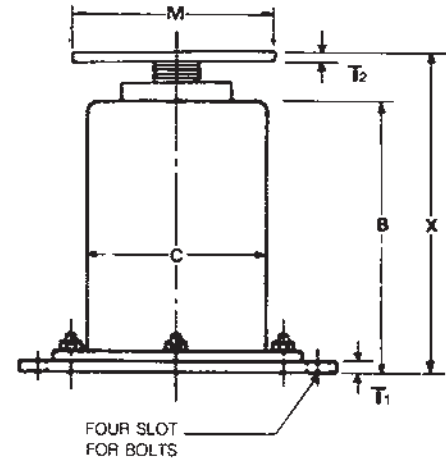
hanger size	weight(approx)kg each		type D			loaded length X			
	type A, B, C	type D	Y	K	M	type A		type B, C	
						min	max	min	max
0	2.72	2.27	188	35	45	148	181	220	253
1	3.18	2.72	193	35	45	153	186	225	258
2	3.63	3.18	198	35	45	158	191	230	263
3	4.99	4.54	198	35	45	158	191	230	263
4	5.44	4.99	198	35	45	158	191	230	263
5	5.90	5.44	198	35	45	158	191	230	263
6	9.07	8.62	222	40	45	182	215	254	287
7	10.43	9.98	222	40	45	182	215	254	287
8	10.89	10.43	247	40	45	207	240	279	312
9	25.40	23.59	252	45	45	222	255	294	327
10	28.12	26.31	252	45	45	222	255	294	327
11	24.95	23.13	267	45	45	237	270	309	342
12	26.31	24.04	285	60	45	249	282	339	372
13	31.30	28.58	301	60	45	265	298	355	388
14	32.66	24.95	340	75	45	297	330	424	457
15	39.92	35.83	361	75	45	315	348	442	475
16	46.27	41.28	406	90	45	355	388	495	528
17	54.43	47.63	452	105	45	395	428	535	568
18	117.48	102.51	483	115	45	427	460	602	635
19	129.73	111.59	532	130	45	467	500	657	690
20	158.76	136.99	586	140	45	512	545	729	762
21	181.89	153.77	631	160	45	548	581	765	798
22	222.26	195.50	751	170	45	662	695	889	922

spring hanger (corrosion-resistant)  
short type-E and type-F

model : C-VSS-E  
C-VSS-F



C-VSS-E



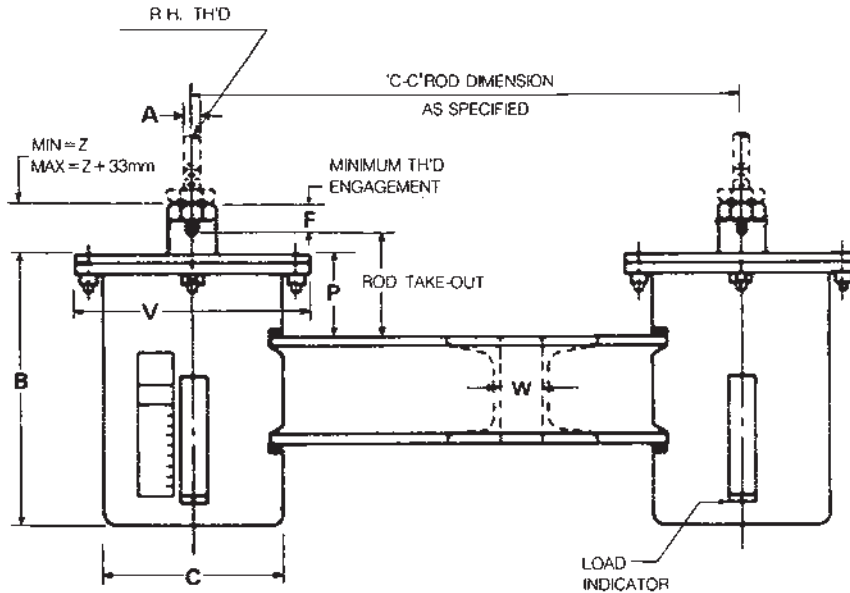
C-VSS-F

weights • dimensions(mm)

hanger size	A	recom. R.H. thread length	C	diam V	F	B		rod take-out	
						type E, G	type F	type E	type G
0	M12	75	102	130	30	108	108	75	30
1	M12	75	102	130	30	113	113	75	30
2	M12	75	102	130	30	118	113	75	30
3	M12	75	140	175	30	118	118	75	30
4	M12	75	140	175	30	118	118	75	30
5	M12	75	140	175	30	118	118	75	30
6	M16	75	165	215	35	137	134	75	55
7	M16	75	165	215	35	137	134	75	55
8	M16	75	165	215	35	162	159	75	55
9	M20	100	216	275	45	165	162	75	60
10	M20	100	216	275	45	165	162	75	60
11	M20	100	216	275	45	180	177	75	60
12	M24	100	216	275	50	183	183	75	50
13	M24	100	216	275	50	196	196	75	85
14	M30	100	216	275	55	220	220	75	85
15	M30	125	216	290	55	237	230	75	35
16	M36	125	216	290	65	267	262	75	35
17	M42	150	216	290	70	295	289	75	60
18	M48	180	324	405	120	319	319	300	25
19	M56	180	324	405	120	349	349	300	35
20	M64	205	324	405	120	386	386	300	35
21	M72	230	324	405	142	408	408	300	35
22	M80	255	324	405	142	516	516	300	85

spring hanger (corrosion-resistant)  
short type-G

model : C-VSS-G



\*type "G" variable spring maximum allowable 'C-C'

spring size	max 'c-c'(mm)	max pipe size
0-2	610	300A (12B)
3-5	760	400A (16B)
6-8	915	500A (20B)
9-11	915	500A (20B)
12-13	915	500A (20B)
14	840	400A (16B)
15	915	500A (20B)
16-17	915	500A (20B)
18-19	1065	500A (20B)
20	1015	500A (20B)
21-22	1220	600A (24B)

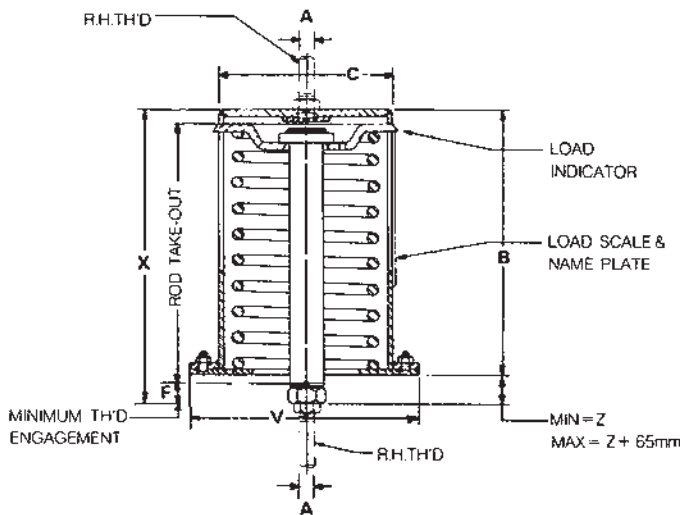
C-VSS-G

weights · dimensions(mm)

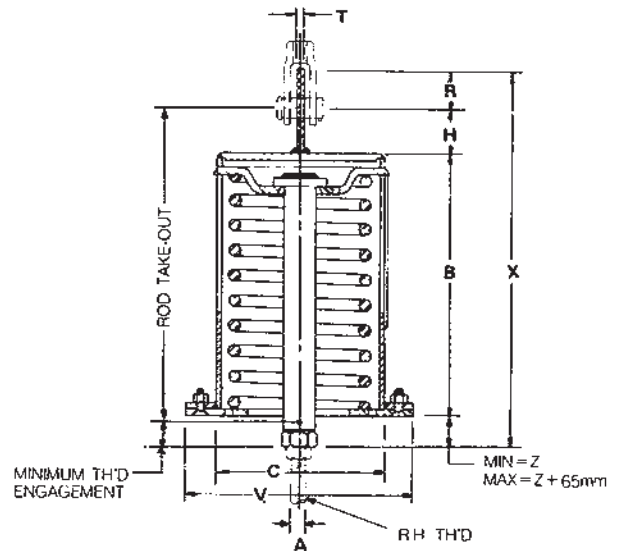
hanger size	weight(approx)kg each			type F								type G		
	type E	type F	type G	bottom flange square	bottom flange bolt circle		bottom flange bolt	T <sub>1</sub>	load flange diam M	T <sub>2</sub>	loaded length X		space between channel W	P
					min	max					min	max		
0	2.27	4.99	12.25	217	205	260	M16	6	90	6	177	207	15	25
1	2.72	4.99	13.15	217	205	260	M16	6	90	6	182	212	15	25
2	3.18	5.44	13.15	217	205	260	M16	6	90	6	182	212	15	25
3	4.54	8.62	14.97	244	245	300	M16	6	125	6	187	217	20	25
4	4.99	9.07	15.88	244	245	300	M16	6	125	6	187	217	20	25
5	5.44	9.53	16.33	244	245	300	M16	6	125	6	187	217	20	25
6	8.62	14.97	23.13	282	270	335	M20	9	155	9	213	243	25	50
7	9.98	15.88	25.86	282	270	335	M20	9	155	9	213	243	25	50
8	10.43	16.33	26.76	282	270	335	M20	9	155	9	238	268	25	50
9	23.59	35.38	56.70	327	322	385	M20	12	200	12	257	287	30	50
10	26.31	38.10	62.14	327	322	385	M20	12	200	12	257	287	30	50
11	23.13	34.47	54.89	327	322	385	M20	12	200	12	272	302	30	50
12	24.04	35.38	59.88	327	322	385	M20	12	200	12	278	308	40	40
13	28.58	36.74	69.85	327	328	395	M20	12	200	12	291	321	40	75
14	24.95	41.28	72.12	327	328	395	M20	12	200	12	311	341	40	75
15	35.83	45.36	89.81	327	335	400	M20	12	200	12	321	351	55	25
16	41.28	50.80	104.33	327	335	400	M20	12	200	16	357	387	55	25
17	47.63	57.15	120.66	327	335	400	M20	12	200	16	384	414	55	50
18	102.51	122.47	248.57	430	480	545	M20	16	250	24	431	461	60	15
19	111.59	124.74	271.71	430	480	545	M20	16	250	24	461	491	65	30
20	136.99	156.04	330.67	430	480	545	M20	16	250	24	498	528	75	30
21	153.77	157.85	402.34	450	494	560	M20	16	250	32	524	554	80	35
22	195.50	200.94	483.54	450	510	575	M20	16	250	32	632	662	85	85

spring hanger (corrosion-resistant)  
medium type -A and type -B

model : C-VSM-A  
C-VSM-B



C-VSM-A



C-VSM-B

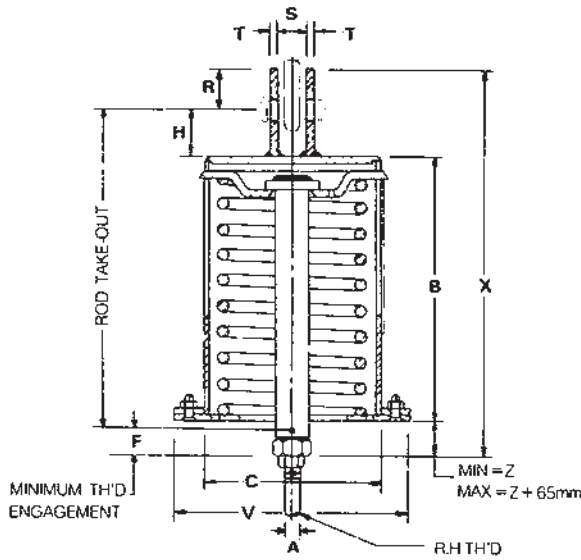
weights · dimensions(mm)

hanger size	A	recom. thread length	C	diam V	F	B	rod take-out		type B, C				
							type A	type B, C	lug hole size	H	R	S	thickness T
0	M12	125	102	130	30	158	163	203	18	40	32	22	6
1	M12	125	102	130	30	158	163	203	18	40	32	22	6
2	M12	125	102	130	30	178	183	223	18	40	32	22	6
3	M12	125	140	175	30	178	183	223	18	40	32	22	6
4	M12	125	140	175	30	188	193	233	18	40	32	22	6
5	M12	125	140	175	30	188	193	233	18	40	32	22	6
6	M16	125	165	215	35	212	217	257	22	40	32	28	6
7	M16	125	165	215	35	212	217	257	22	40	32	28	6
8	M16	125	165	215	35	252	257	297	22	40	32	28	6
9	M20	150	216	275	45	248	258	298	26	40	32	32	9
10	M20	150	216	275	45	252	262	302	26	40	32	32	9
11	M20	150	216	275	45	253	263	303	26	40	32	32	9
12	M24	150	216	275	50	274	284	334	33	50	40	42	12
13	M24	180	216	275	50	313	323	373	33	50	40	42	12
14	M30	180	216	275	55	347	357	432	39	75	52	50	16
15	M30	180	216	290	55	361	371	446	39	75	52	50	16
16	M36	205	216	290	65	407	417	492	46	75	65	60	20
17	M42	205	216	290	70	475	485	560	52	75	65	68	20
18	M48	230	324	405	85	462	472	572	62	100	75	72	20
19	M56	230	324	405	85	537	547	662	70	115	75	80	20
20	M64	255	324	405	85	602	612	727	78	115	102	86	24
21	M72	255	324	405	95	675	685	800	86	115	102	92	24
22	M80	280	324	405	95	835	845	970	91	125	102	100	24

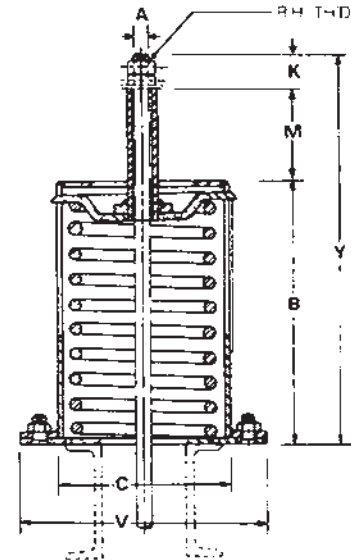


spring hanger (corrosion-resistant)  
medium type - C and type - D

model : C-VSM-C  
C-VSM-D



C-VSM-C



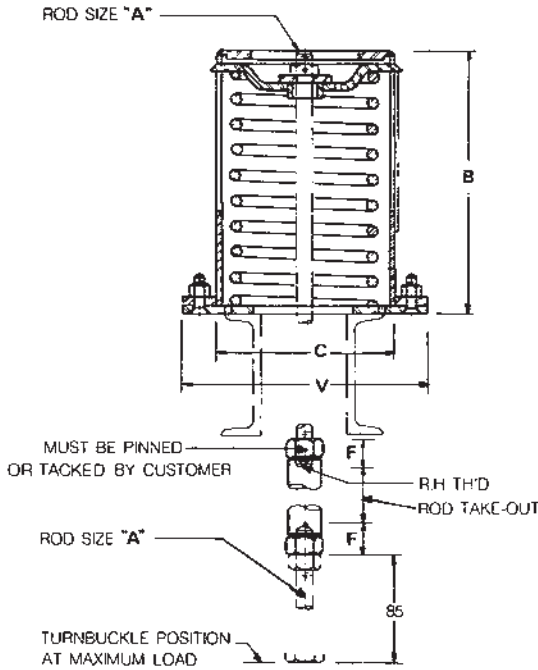
C-VSM-D

weights • dimensions(mm)

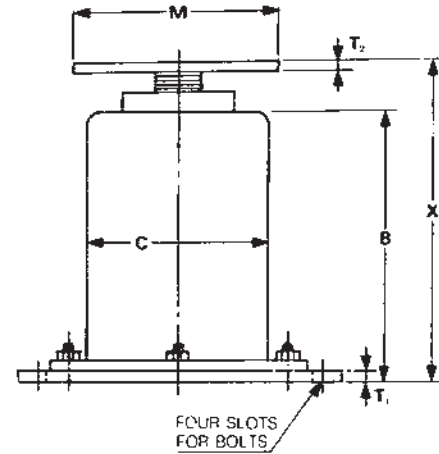
hanger size	weight (approx) kg each			type D			loaded length X			
	type A	type B, C	type D	Y	K	M	type A		type B, C	
							min	max	min	max
0	3.63	3.63	2.72	273	35	80	203	268	275	340
1	3.63	4.08	3.18	273	35	80	203	268	275	340
2	4.08	4.54	3.63	293	35	80	223	288	295	360
3	6.35	6.35	4.99	293	35	80	223	288	295	360
4	6.80	7.26	5.44	303	35	80	233	298	305	370
5	7.26	7.71	6.35	303	35	80	233	298	305	370
6	11.79	12.25	9.98	327	40	75	262	327	334	399
7	13.15	13.61	11.34	327	40	75	262	327	334	399
8	14.06	14.52	11.79	367	40	75	302	367	374	439
9	29.48	29.94	23.13	368	45	75	313	378	385	450
10	32.21	32.66	26.31	372	45	75	317	382	389	454
11	29.48	29.94	23.13	373	45	75	318	383	390	455
12	32.21	32.21	25.40	405	60	75	344	409	434	499
13	40.37	40.37	33.11	444	60	75	383	448	473	538
14	42.18	42.64	34.93	490	75	75	422	487	549	614
15	50.35	51.71	39.92	507	75	75	436	501	563	628
16	60.33	62.60	48.54	568	90	75	492	557	632	697
17	73.48	76.20	60.33	647	105	75	565	630	705	770
18	149.69	150.14	118.80	648	115	75	567	632	742	807
19	170.55	171.46	136.10	732	130	75	642	707	832	897
20	217.73	220.45	167.80	805	140	75	707	772	924	989
21	252.20	257.64	206.40	898	160	75	790	855	1007	1072
22	319.79	323.87	229.10	1064	170	75	950	1015	1177	1242

spring hanger (corrosion-resistant)  
medium type -E and type -F

model : C-VSM-E  
C-VSM-F



C-VSM-E



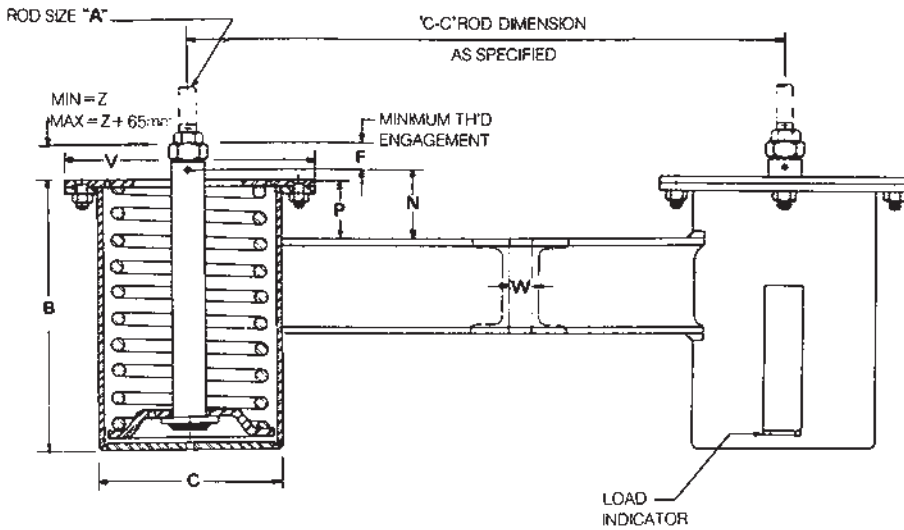
C-VSM-F

weights • dimensions(mm)

hanger size	A	recom. R.H. thread length	casing diam C	diam V	F	B		rod take-out	
						type E, G	type F	type E	type G
0	M12	125	102	130	25	158	158	75	45
1	M12	125	102	130	25	158	158	75	45
2	M12	125	102	130	25	178	178	75	45
3	M12	125	140	175	20	178	178	75	55
4	M12	125	140	175	20	188	188	75	55
5	M12	125	140	175	20	188	188	75	55
6	M16	125	165	215	25	212	209	75	55
7	M16	125	165	215	25	212	209	75	55
8	M16	125	165	215	25	252	249	75	55
9	M20	150	216	275	30	248	248	75	85
10	M20	150	216	275	30	252	252	75	85
11	M20	150	216	275	30	253	253	75	85
12	M24	150	216	275	30	270	273	75	110
13	M24	180	216	275	30	309	309	75	110
14	M30	180	216	275	30	340	340	75	110
15	M30	180	216	290	50	357	346	75	110
16	M36	205	216	290	50	403	394	75	110
17	M42	205	216	290	50	467	454	75	110
18	M48	230	324	405	80	458	454	300	110
19	M56	230	324	405	85	527	519	300	110
20	M64	255	324	405	85	590	576	300	110
21	M72	255	324	405	90	663	645	300	110
22	M80	280	324	405	95	819	799	300	110

spring hanger (corrosion-resistant)  
medium type-G

model : C-VSM-G



\*type "G" variable spring maximum allowable 'C-C'

spring size	max 'c-c'(mm)	max pipe size
0-2	610	300A (12B)
3-5	760	400A (16B)
6-8	915	500A (20B)
9-11	915	500A (20B)
12-13	915	500A (20B)
14	840	400A (16B)
15	915	500A (20B)
16-17	915	500A (20B)
18-19	1065	500A (20B)
20	1015	500A (20B)
21-22	1220	600A (24B)

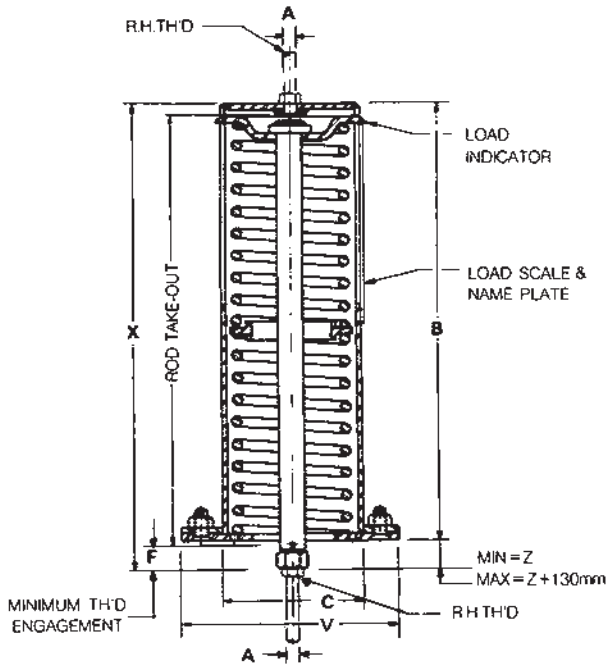
C-VSM-G

weights • dimensions(mm)

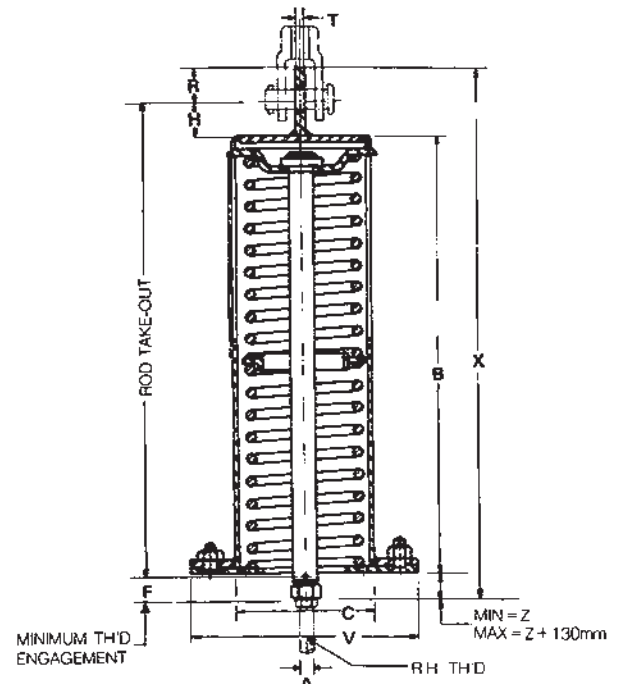
hanger size	weight (approx)kgs each			type F								type G		
	type E	type F	type G	bottom flange square	bottom flange bolts circle		bottom flange bolts	T <sub>1</sub>	diam M	T <sub>2</sub>	loaded length X		space between channels W	P
					min	max					min	max		
0	2.72	6.36	13.61	217	205	260	M16	6	90	6	242	302	15	40
1	3.18	6.36	14.06	217	205	260	M16	6	90	6	242	302	15	40
2	3.63	6.80	14.52	217	205	260	M16	6	90	6	262	322	15	40
3	4.99	10.43	18.60	244	245	300	M16	6	125	6	262	322	20	50
4	5.44	11.34	19.05	244	245	300	M16	6	125	6	272	332	20	50
5	6.35	11.79	19.50	244	245	300	M16	6	125	6	272	332	20	50
6	9.98	18.14	28.58	282	270	335	M20	9	155	9	303	363	25	50
7	11.34	20.87	31.30	282	270	335	M20	9	155	9	303	363	25	50
8	11.79	21.32	33.11	282	270	335	M20	9	155	9	343	403	25	50
9	23.13	41.28	64.86	327	322	385	M20	12	200	12	358	418	30	75
10	26.31	44.45	71.22	327	322	385	M20	12	200	12	362	422	30	75
11	23.13	40.82	65.77	327	322	385	M20	12	200	12	363	423	30	75
12	25.40	43.09	71.22	327	322	385	M20	12	200	12	383	443	40	100
13	33.11	52.16	88.45	327	328	395	M20	12	200	12	419	479	40	100
14	34.93	53.98	92.08	327	328	395	M20	12	200	12	446	506	40	100
15	39.92	58.97	113.40	327	335	400	M20	12	200	12	452	512	55	100
16	48.54	68.04	135.17	327	335	400	M20	12	200	16	502	562	55	100
17	60.33	78.47	160.57	327	335	400	M20	12	200	16	562	622	55	100
18	118.80	155.58	312.98	430	480	545	M20	16	250	24	581	641	60	110
19	131.10	172.37	355.17	430	480	545	M20	16	250	24	646	706	65	110
20	167.80	213.65	450.43	430	480	545	M20	16	250	24	703	763	75	110
21	206.40	224.99	542.96	450	494	560	M20	16	250	32	776	836	80	110
22	229.10	296.65	678.59	450	510	575	M20	16	250	32	970	1030	85	110

spring hanger (corrosion-resistant)  
double type-A and type-B

model : C-VSL-A  
C-VSL-B



C-VSL-A



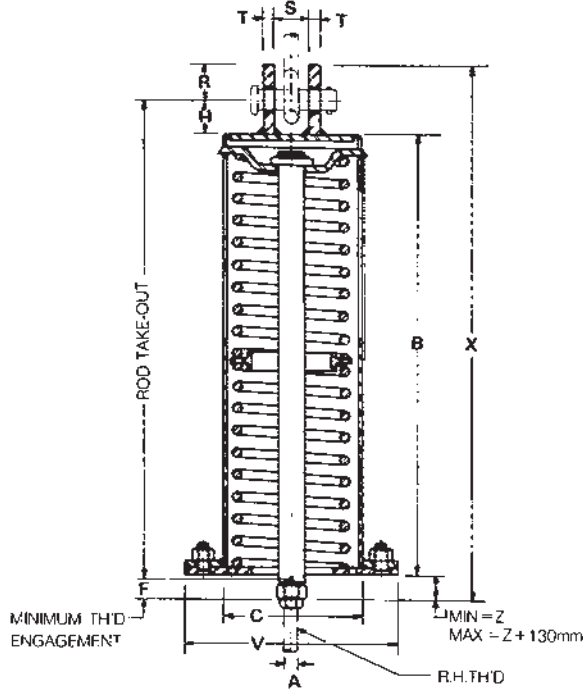
C-VSL-B

weights · dimensions(mm)

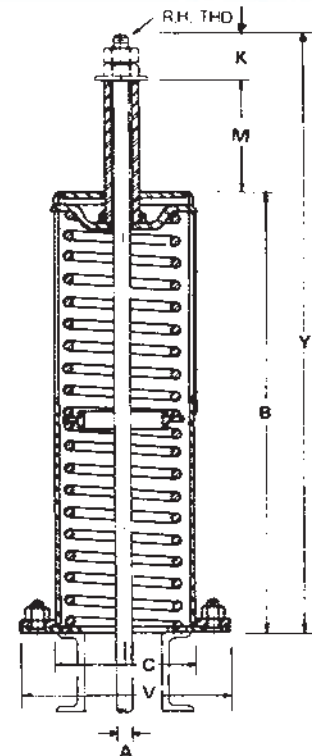
hanger size	A	recom thread length	C	diam V	F	B	rod take-out		type B, C				
							type A	type B, C	lug hole size	H	R	S	thickness T
0	M12	230	102	130	30	304	303	349	18	40	32	22	6
1	M12	230	102	130	30	304	303	349	18	40	32	22	6
2	M12	230	102	130	30	344	343	389	18	40	32	22	6
3	M12	230	140	175	30	344	343	389	18	40	32	22	6
4	M12	230	140	175	30	364	363	409	18	40	32	22	6
5	M12	230	140	175	30	364	363	409	18	40	32	22	6
6	M16	230	165	215	35	403	399	448	22	40	32	27	6
7	M16	230	165	215	35	403	399	448	22	40	32	27	6
8	M16	230	165	215	35	483	479	528	22	40	32	27	6
9	M20	230	216	275	45	469	467	519	26	40	32	32	9
10	M20	230	216	275	45	477	475	527	26	40	32	32	9
11	M20	255	216	275	45	479	477	529	26	40	32	32	9
12	M24	255	216	275	50	517	511	577	33	50	40	40	12
13	M24	255	216	275	50	592	586	652	33	50	40	40	12
14	M30	255	216	275	55	653	647	735	39	75	52	50	16
15	M30	255	216	290	55	673	663	758	39	75	52	50	16
16	M36	280	216	290	65	765	755	850	46	75	65	60	20
17	M42	305	216	290	70	893	879	978	52	75	65	67	20
18	M48	305	324	405	85	854	840	964	62	100	75	73	20
19	M56	330	324	405	85	994	1059	1119	70	115	75	80	20
20	M64	355	324	405	85	1116	1094	1241	78	115	102	85	24
21	M72	355	324	405	95	1248	1222	1373	86	115	102	92	24
22	M80	380	324	405	95	1562	1632	1697	91	125	102	98	24

spring hanger (corrosion-resistant)  
double type -C and type -D

model : C-VSL-C  
C-VSL-D



C-VSL-C



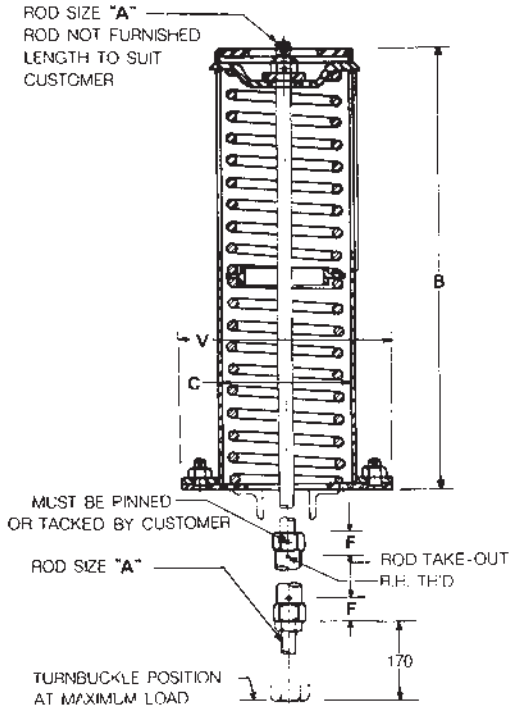
C-VSL-D

weights · dimensions(mm)

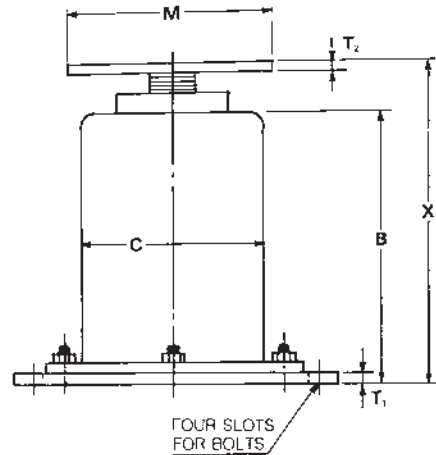
hanger size	weight(approx) kg		type D			loaded length X			
	type A, B, C	type D	Y	K	M	type A		type B, C	
						min	max	min	max
0	5.44	5.44	479	35	140	359	489	431	561
1	6.35	6.35	479	35	140	359	489	431	561
2	7.26	7.26	519	35	140	399	529	471	601
3	9.98	9.53	519	35	140	399	529	471	601
4	11.34	10.89	539	35	140	419	549	491	621
5	12.25	11.79	539	35	140	419	549	491	621
6	18.60	18.14	583	40	140	463	593	535	665
7	22.23	21.77	583	40	140	463	593	535	665
8	27.67	23.59	663	40	140	543	673	615	745
9	44.00	42.64	654	45	140	544	674	616	746
10	51.71	48.99	662	45	140	552	682	624	754
11	44.45	53.09	664	45	140	554	684	626	756
12	48.99	47.17	717	60	140	597	727	687	817
13	65.32	63.05	792	60	140	672	802	762	892
14	69.40	66.68	868	75	140	738	868	862	992
15	78.02	73.94	888	75	140	758	888	885	1015
16	98.88	91.63	995	90	140	860	990	1000	1130
17	123.83	112.04	1138	105	140	993	1123	1133	1263
18	232.24	216.37	1109	115	140	969	1099	1144	1274
19	272.16	248.57	1264	130	140	1109	1239	1299	1429
20	363.79	327.95	1396	140	140	1231	1361	1448	1578
21	426.38	383.29	1548	160	140	1373	1503	1590	1720
22	532.46	517.10	1872	170	140	1687	1817	1914	2044

spring hanger (corrosion-resistant)  
double type-E and type-F

model : C-VSL-E  
C-VSL-F



C-VSL-E



C-VSL-F

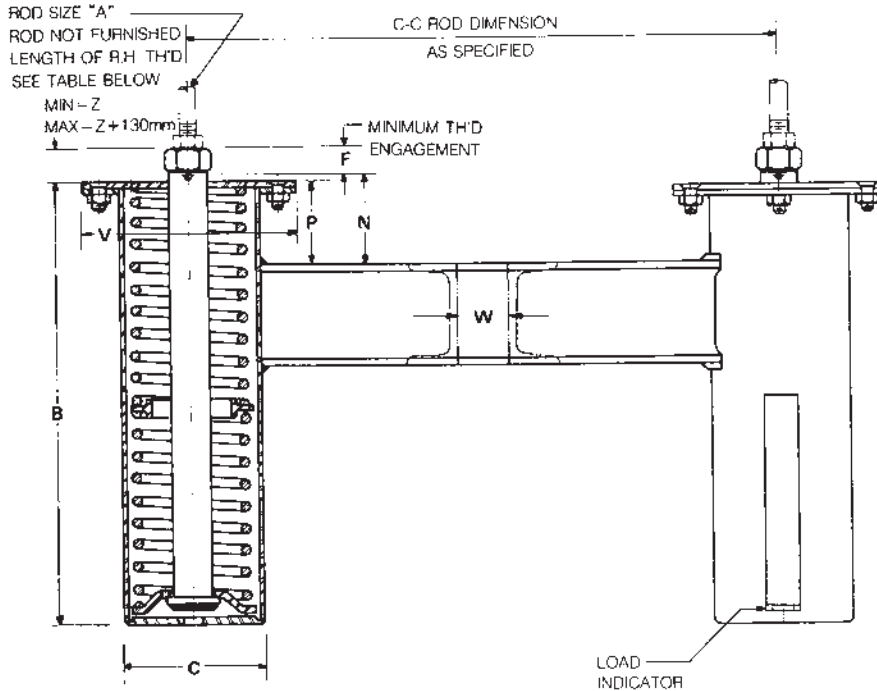
weights • dimensions(mm)

hanger size	A	recom. R.H. thread length	C	diam V	F	B		rod take-out	
						type E, G	type F	type E	type G
0	M12	230	102	130	25	304	302	75	45
1	M12	230	102	130	25	304	302	75	45
2	M12	230	102	130	25	344	342	75	45
3	M12	230	140	175	25	344	342	75	55
4	M12	230	140	175	25	364	362	75	55
5	M12	230	140	175	25	364	362	75	55
6	M16	230	165	215	25	403	400	75	55
7	M16	230	165	215	25	403	400	75	55
8	M16	230	165	215	25	483	480	75	55
9	M20	230	216	275	30	472	469	75	85
10	M20	230	216	275	30	480	477	75	85
11	M20	255	216	275	30	482	479	75	85
12	M24	255	216	275	30	516	516	75	110
13	M24	255	216	275	30	588	588	75	110
14	M30	255	216	275	30	646	646	75	110
15	M30	255	216	290	50	665	658	75	110
16	M36	280	216	290	50	757	752	75	110
17	M42	305	216	290	50	877	872	75	110
18	M48	305	324	405	80	846	846	300	110
19	M56	330	324	405	85	976	976	300	110
20	M64	355	324	405	85	1090	1090	300	110
21	M72	355	324	405	90	1218	1218	300	110
22	M80	380	324	405	95	1526	1526	300	110



spring hanger (corrosion-resistant)  
double type-G

model : C-VSL-G



\*type "G" variable spring maximum allowable 'C-C'

spring size	max 'c-c'(mm)	max pipe size
0-2	610	300A (12B)
3-5	760	400A (16B)
6-8	915	500A (20B)
9-11	915	500A (20B)
12-13	915	500A (20B)
14	840	400A (16B)
15	915	500A (20B)
16-17	915	500A (20B)
18-19	1065	500A (20B)
20	1015	500A (20B)
21-22	1220	600A (24B)

C-VSL-G

weights • dimensions(mm)

hanger size	weight(approx) kg			type F										type G	
	type E	type F	type G	bottom flange square	bottom flange bolt circle		bottom flange bolts	T <sub>1</sub>	diam M	T <sub>2</sub>	loaded length X		space between channels W	P	
					min	max					min	max			
0	5.44	9.07	16.78	217	205	260	M16	6	90	6	411	531	15	40	
1	6.35	9.53	18.60	217	205	260	M16	6	90	6	411	531	15	40	
2	7.26	10.43	20.41	217	205	260	M16	6	90	6	451	571	15	40	
3	9.53	15.88	24.95	244	245	300	M16	6	125	6	451	571	20	50	
4	10.89	17.69	27.67	244	245	300	M16	6	125	6	471	591	20	50	
5	11.79	18.60	29.48	244	245	300	M16	6	125	6	471	591	20	50	
6	18.14	28.12	42.18	282	270	335	M20	9	155	9	519	639	25	50	
7	21.77	32.66	49.44	282	270	335	M20	9	155	9	519	639	25	50	
8	23.59	34.02	60.33	282	270	335	M20	9	155	9	599	719	25	50	
9	42.64	61.69	93.90	327	322	385	M20	12	200	12	604	724	30	75	
10	48.99	68.04	109.32	327	322	385	M20	12	200	12	612	732	30	75	
11	43.09	60.78	94.80	327	322	385	M20	12	200	12	614	734	30	75	
12	47.17	65.32	101.15	327	322	385	M20	12	200	12	651	771	40	100	
13	63.05	82.10	138.35	327	328	395	M20	12	200	12	723	843	40	100	
14	66.68	85.28	146.51	327	328	395	M20	12	200	12	777	897	40	100	
15	73.94	91.17	166.92	327	335	400	M20	12	200	12	789	909	55	100	
16	91.63	109.32	209.56	327	335	400	M20	12	200	16	887	1007	55	100	
17	112.04	130.18	259.46	327	335	400	M20	12	200	16	1007	1127	55	100	
18	216.37	249.48	479.00	430	480	545	M20	16	250	24	998	1118	60	110	
19	248.57	283.05	558.38	430	480	545	M20	16	250	24	1128	1248	65	110	
20	327.95	366.06	740.73	430	480	545	M20	16	250	24	1242	1362	75	110	
21	383.29	395.53	891.30	450	494	560	M20	16	250	32	1374	1494	80	110	
22	517.10	537.06	1163.94	450	510	575	M20	16	250	32	1762	1882	85	110	

constant support

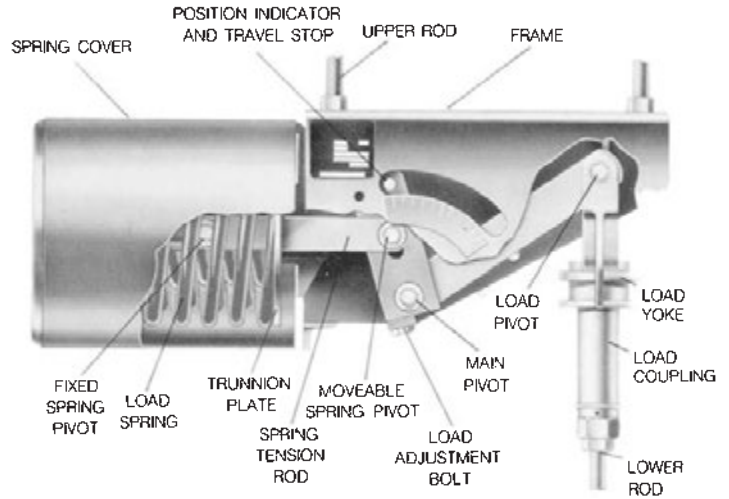
mathematically perfect pipe support

The exclusive geometric design of Unison Model Constant Support hanger assures perfectly constant support through the entire deflection of the pipe load.

This counter-balancing of the load and spring moments about the main pivot is obtained by the use of carefully designed compression type load springs, lever and spring tension rods.

As the lever moves from the high to the low position, the load spring is compressed and the resulting increasing force acting on the decreasing spring moment arm creates a turning moment about the main pivot which is exactly equal and opposite to the turning moment of the load and load moment arm.

As the lever moves from the low to the high position, the load spring is increasing in length and the resulting decreasing force acting on the increasing spring moment arm creates a turning moment about the main pivot which is exactly equal and opposite to the turning moment of the load and load moment arm.

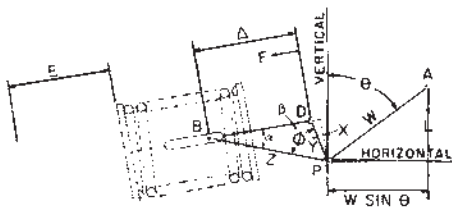


$$(5) \text{ Spring moment} = F \left( \frac{YZ \sin \phi}{\Delta} \right), \text{ where } \frac{YZ \sin \phi}{\Delta}$$

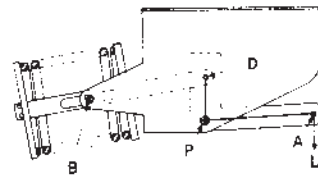
is the spring moment arm.

The spring force "F" is equal to the spring constant "K" times the spring deflection "E"; thus:

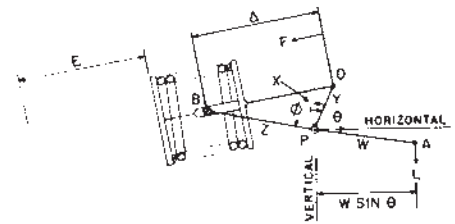
(6) F=KE; therefore equation #5 may be written:



high position



mid position



low position

$$(1) \frac{\sin \alpha}{Y} = \frac{\sin \phi}{\Delta}, \quad \frac{\sin \alpha}{Y} = \frac{\sin \beta}{Z}, \quad \sin \alpha = \frac{YZ \sin \beta}{Z}$$

$$\text{and } Y \sin \beta = X, \quad \sin \alpha = \frac{X}{Z}$$

Substituting in (1):

$$(2) \frac{X}{YZ} = \frac{\sin \phi}{\Delta} \quad (3) X = \frac{YZ \sin \phi}{\Delta}$$

The load "L" is suspended from the lever at point "A" and at any point within the load travel range the moment of the load about the main lever-pivot "P" is equal to the load times its moment arm; thus:

(4) Load moment=L(W sin theta), where W sin theta is the load moment arm.

The spring is attached at one of its ends to the fixed pivot "B". The spring's free end is attached by means of a rod to the lever-pivot "D". This spring arrangement provides a spring moment about the main lever-pivot "P" which opposes the load moment and is equal to the spring force "F" times its moment arm; thus:

$$(7) \text{ Spring moment} = KE \left( \frac{YZ \sin \phi}{\Delta} \right)$$

To obtain perfect constant support the load moment must always equal the spring moment.

$$(8) LW \sin \theta = \frac{KEYZ \sin \phi}{\Delta}$$

By proper design "phi" and "theta" are made equal. Therefore, equation #8 may be written.

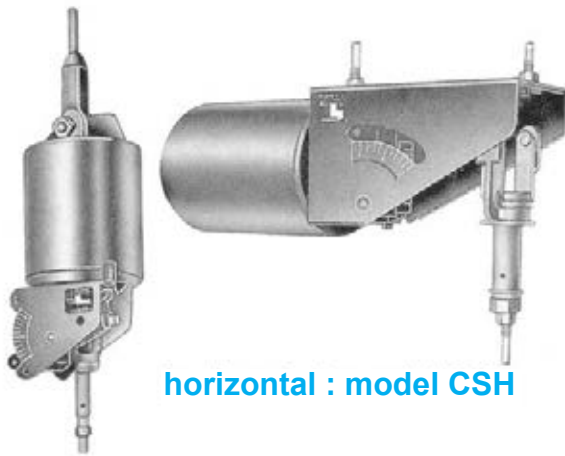
$$(9) LW = \frac{KEYZ}{\Delta}$$

The spring and the rod are so arranged that the spring deflection "E" always equals the distance "Delta" between pivots "B" and "D". Therefore, equation #9 may be written.

$$(10) LW=KEYZ \quad \text{or} \quad (11) L = \frac{KEYZ}{W}$$

Since equation #11 holds true for all positions of the load within its travel range and "K", "Y", "Z" and "W" remain constant it is therefore true that perfect constant support is obtained.

## constant support



horizontal : model CSH

## vertical : model CSV

**RECOMMENDED SERVICE :** When piping stress is critical and pipe is subject to vertical movement in excess of 13mm due to thermal expansion, and also at locations where it is necessary to avoid any transfer of stress from support to support or onto critical terminals or connecting equipment.

**FEATURES :**

- Because of exclusive geometric design, mathematically perfect constancy of support is maintained throughout the full range of load adjustment.
- Compactness—new design provides smaller and more versatile units.
- Increased load and travel capacity.
- Each hanger is individually calibrated before shipment to support the exact load specified.
- All models of Constant Supports have a wide range of load adjustability. No less than 10% of this adjustability is provided either side of the calibrated load for plus or minus field load adjustment.
- Blue button marked "C" denotes cold setting of hanger; red button marked "H" denotes hot or operating setting.
- Field load adjustment is made by turning the single load adjustment bolt.
- Covered spring provides protection and good appearance.
- J-rod swings at least 4° from vertical.
- Non-resonant to all vertical vibrations.

**SIZE RANGE :** Unison Constant Support Hangers are made in two basic designs—the CSV (vertical design) and the CSH (horizontal design). Combined, the CSV and CSH Constant Supports are made in nine different frame sizes and one hundred and ten spring sizes to accommodate travels from 40mm to 510mm and loads from 12kg to 40,325kg.

**SINGLE ROD SUSPENSION :** Available in types A, B and C of model CSV and model CSH.

**HOW TO SELECT HANGER SIZE :** Determine the total load to be supported by the hanger as well as the actual travel—that is, the actual vertical movement of the pipe at the point of hanger location. Refer to the Load-Travel table for Constant Support hangers (page 42 to 45) and select a size hanger which will accommodate the known load and actual travel. It must be noted that the travel shown in the table is a total travel—that is, the maximum vertical movement which the hanger will accommodate. The total travel of the hanger should always be greater than the calculated travel of the pipe line to allow for some discrepancy between calculated travel and actual travel. It is suggested that the total travel for Constant Supports should be equal to "actual travel" plus 20% and in no case less than 25mm.

**HOW TO DETERMINE DESIGN :** After the size of the Constant support is determined, consideration of available room for suspending the pipe and hanger will indicate whether a vertical CSV series or horizontal CSH series hanger is desirable.

**HOW TO DETERMINE TYPE :** After the hanger size and design are determined, the type of constant support to be used depends upon the physical installation required by the suspension problem, i.e., whether the hanger is to be installed above, between or below steel members (see line cuts referring to Types A, B, C etc.). It will be noted that the Types F and G are made in the vertical design only. Special Constant Support Hangers can be fabricated for unusual conditions.

**J-ROD AND K-HOLE DIAMETER :** Tapping or drilling for standard rod size will be furnished as shown in the J-rod and K-hole selection charts unless otherwise specified. Upper attachments, turnbuckles and clamps should be tapped to agree with the rod as shown in the selection chart. Standard rod diameters are based on the load to be carried by the upper rod which includes the weight of the hanger assembly as well as the pipe line.

**ORDERING :** Specify hanger size number, model name, loads to be supported (kg), total travel (mm), actual travel (mm) also direction "cold" to "hot", customer's hanger mark. When ordering Type G, specify C-C rod dimension as well as load per spring and total load. For Types A, B, C, model CSH when required, specify "for single rod suspension." Constant Support Hangers are also available corrosion-resistant as model C-CSV and C-CSH."

## constant support

### INSTALLATION

- (1) Securely attach the hanger to the building structure at a point where the load coupling is directly over the desired point of attachment to the pipe in the operating position.
- (2) Make certain that the moving parts of the hanger will be unobstructed.
- (3) Attach the lower J-rod between the pipe attachment and the load coupling. Make certain that the lower J-rod has enough thread engagement before taking up the load. A sight hole is provided for this.
- (4) Turn the load coupling, as you would a turn-buckle, until the travel indicator rotates to the desired cold setting (blue sticker) marked "C" indicated on the position scale. If the Constant Support incorporates a travel stop see below.
- (5) After the line is in operation, check hanger for indicated hot setting. If necessary, make adjustment by turning the load coupling to bring the indicator to the hot position (red sticker) marked "H". No other adjustment is normally required since the load as calibrated at the factory is equal to the load specified to be supported.

**ADJUSTMENT:** When the hanger is installed, its supporting force should be in balance with the portion of the piping weight assigned to it. Each hanger is individually calibrated before shipment to support the exact load specified. All models of Constant Supports have a wide range of load adjustability. Special instructions for this field recalibration of individual hangers may be obtained from Unison. No less than 10% of this adjustability is provided either side of the calibrated load for plus or minus field load adjustment.

The percentage increase or decrease from the factory calibrated load should be carefully calculated. The calibrated load setting of each hanger is indicated by an arrow, die-stamped on the load adjustment scale. Load adjustments should be made from this reference point, with each division on the patented scale equal to 2% except sizes 84 - 110 where each division is valued at 1%. The load adjustment is made by turn-



Load adjustment scale shown applies to size 1 through 83 only. For information relative to load adjustment scale for sizes 84 through 110, contact with Unison.

ing the single load adjustment bolt. For example, calibrated load - 1,361kg; revised load - 1,252kg. Load is decreased 109kg or 109/1,361 equals 8%.

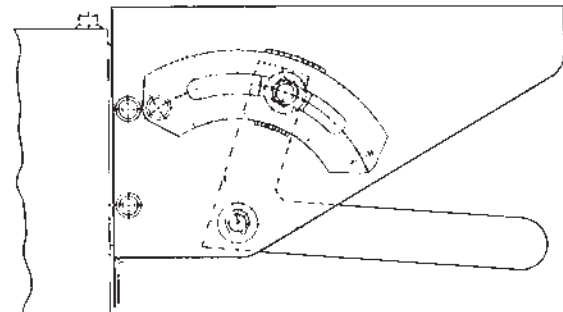
Turn load adjustment bolt until arrow moves in the "decrease" direction four divisions.

**TRAVEL STOP:** The functional design of the Constant Support Hanger permits the incorporation of a travel stop that will lock the hanger against upward or downward movement for temporary conditions of underload or overload, such as may exist during erection, hydrostatic test or chemical clean-out.

The travel stop consists of two plates, with matched serrations, attached to the hanger frame with two or more cap screws and with a socketed piece which engages the position indicator.

It is installed at the factory to hold the hanger in the "cold" position. A series of serrations can be engaged to lock the hanger at any position along the total travel range.

The travel stop, which is furnished only when specified, is painted red. The stop must be removed before the piping system is put into operation, but not before the hanger is installed



and fully loaded. The travel stop is released by removing the cap screws.

A red tag marked "Caution" and containing instructions for removal of the travel stop is attached to the hanger.

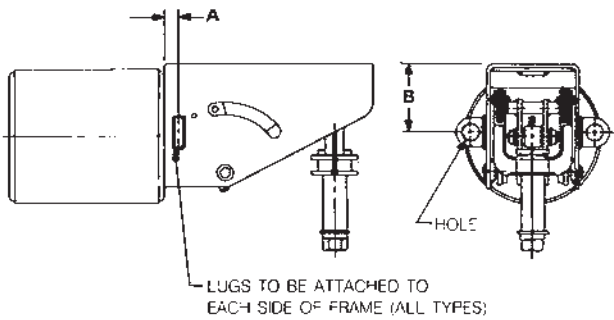


constant support

lifting lugs :

To help alleviate the problem of lifting large size Constant Supports into position for installation, this product is available with lifting lugs (if requested) on sizes ten and larger.

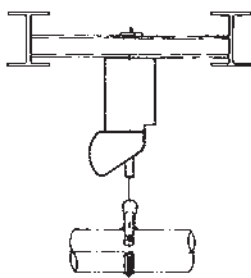
model : CSH



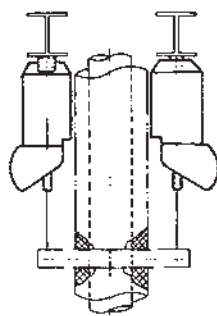
sizes	A	B	hole size
10- 18	30	125	22
19- 34	40	180	
35- 49	50	190	
50- 63	50	240	
64- 74	50	355	
75- 83	75	430	33
84-110	75	485	

typical applications

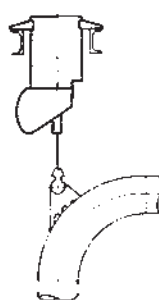
model : CSV(vertical)



type A



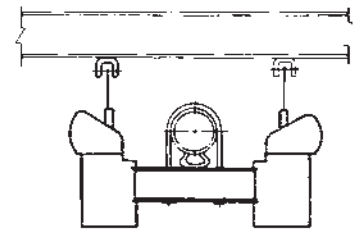
type B and type C



type D

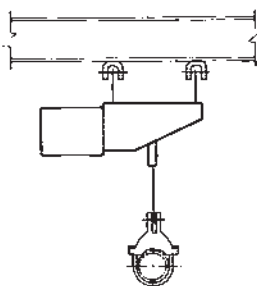


type E

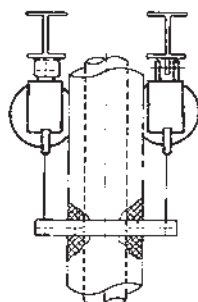


type G

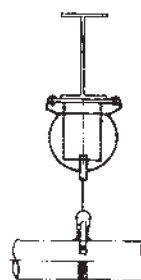
model : CSH(horizontal)



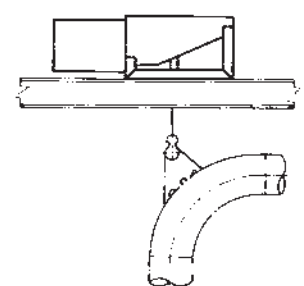
type A



type B and type C



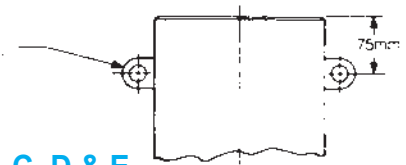
type D



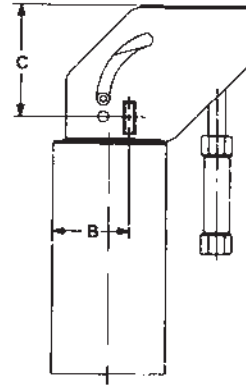
type E

model : CSV

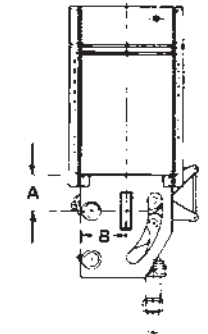
LUGS TO BE 90° FROM CHANNEL ON TYPE D



CSV types A, B, C, D & E sizes 10 thru 63



sizes 84 through 110.



sizes 64 thru 83

Lugs to be attached to each side of frame and will need stabilizing rigging when being lifted.

sizes	A	B	C
64- 74	200	255	-
75- 83	200	280	
84-110	-	405	610

constant support model CSV and CSH

load travel table(load in kgs for total travel in mm)

hanger size no.	total travel in mm														
	40	50	65	75	90	100	115	125	140	150	165	180	190	205	215
1	62	50	38	33	28	25	22	20	18	17	15	14	13	12	
	75	60	46	40	33	30	26	24	21	20	18	17	16	15	
2	88	70	54	47	39	35	31	28	25	23	21	20	19	17	
3	101	81	62	54	45	40	35	32	29	27	24	22	21	20	
4	121	97	74	65	54	48	42	39	35	32	29	27	25	24	
5	141	113	87	75	63	56	49	45	40	38	34	31	30	28	
6	161	129	99	86	72	64	56	52	46	43	39	36	34	31	
7	195	156	120	104	87	78	68	62	56	52	47	43	41	38	
8	228	182	140	122	101	91	79	73	65	61	55	51	48	44	
9	259	207	159	138	115	104	90	83	74	69	63	58	55	51	
10	314	251	193	167	140	126	109	100	90	84	76	70	66	61	
11	368	294	226	196	164	147	128	118	105	98	89	82	77	72	
12	422	338	260	225	188	169	147	135	121	113	102	94	89	82	
13	509	407	313	271	226	204	177	163	145	136	123	113	107	99	
14	593	474	365	316	264	237	206	190	169	158	144	132	125	116	
15	680	544	418	363	302	272	237	218	194	181	165	151	143	133	
16	818	654	503	436	364	327	285	262	234	218	198	182	172	160	
17	958	766	590	511	426	383	333	307	274	255	232	213	202	187	
18	1097	878	675	585	488	439	382	351	313	293	266	244	231	214	
19															204
		933	718	622	518	467	406	373	333	311	283	259	246	228	217
20		989	761	659	549	495	430	396	353	330	300	275	260	241	230
21		1076	828	717	598	538	468	430	384	359	326	299	283	262	250
22		1164	895	776	647	582	506	466	416	388	353	323	306	284	271
23		1249	961	833	694	625	543	500	446	416	378	347	329	305	290
24		1341	1032	894	745	671	583	536	479	447	406	373	353	327	312
25		1433	1102	955	796	717	623	573	512	478	434	398	377	350	333
26		1525	1173	1017	847	763	663	610	545	508	462	424	401	372	355
27		1673	1287	1115	929	837	727	669	598	558	507	465	440	408	389
28		1820	1400	1213	1011	910	791	728	650	607	552	506	479	444	423
29		1968	1514	1312	1093	984	856	787	703	656	596	547	518	480	458
30		2090	1608	1393	1161	1045	909	836	746	697	633	581	550	510	486
31		2210	1700	1473	1228	1105	961	884	789	737	670	614	582	539	514
32		2332	1794	1555	1296	1166	1014	933	833	777	707	648	614	569	542
33		2440	1877	1627	1356	1220	1061	976	871	813	739	678	642	595	567
34		2546	1958	1697	1414	1273	1107	1018	909	849	772	707	670	621	592
35			2081	1804	1503	1353	1176	1082	966	902	820	751	712	660	629
36			2201	1908	1590	1431	1244	1145	1022	954	867	795	753	698	665
37			2322	2012	1677	1509	1312	1207	1078	1006	915	839	794	736	702
38			2489	2157	1798	1618	1407	1294	1156	1079	981	899	852	789	752
39			2653	2299	1916	1724	1500	1380	1232	1150	1045	958	908	841	802
40			2818	2442	2035	1832	1593	1465	1308	1221	1110	1018	964	894	852
41			3091	2679	2232	2009	1747	1607	1435	1339	1218	1116	1057	980	934
42			3362	2914	2428	2185	1900	1748	1561	1457	1324	1214	1150	1066	1016
43			3634	3149	2625	2362	2054	1890	1687	1575	1432	1312	1243	1152	1099
44			3866	3351	2792	2513	2185	2010	1795	1675	1523	1396	1323	1226	1169
45			4114	3565	2971	2674	2325	2139	1910	1783	1621	1486	1407	1304	1244
46			4325	3748	3124	2811	2445	2249	2008	1874	1704	1562	1480	1371	1308
47			4598	3985	3321	2989	2599	2391	2135	1992	1811	1660	1573	1458	1390
48			4869	4220	3517	3165	2752	2532	2261	2110	1918	1758	1666	1544	1472
49			5140	4455	3712	3341	2905	2673	2386	2227	2025	1856	1758	1630	1554
50				4778	3982	3584	3116	2867	2560	2389	2172	1991	1886	1748	1667
51				5100	4250	3825	3326	3060	2732	2550	2318	2125	2013	1866	1779
52				5460	4550	4095	3561	3276	2925	2730	2482	2275	2155	1998	1905
53				5817	4848	4363	3794	3490	3116	2909	2644	2424	2296	2128	2029
54				6175	5146	4631	4027	3705	3308	3088	2807	2573	2438	2259	2154
55				6781	5651	5086	4422	4069	3633	3391	3082	2825	2677	2481	2365
56				7384	6153	5538	4816	4430	3956	3692	3356	3077	2915	2701	2576
57				7988	6657	5991	5210	4793	4279	3994	3631	3328	3153	2922	2787
58				8490	7075	6368	5537	5094	4548	4245	3859	3538	3351	3106	2962
59				8991	7493	6743	5864	5395	4817	4496	4087	3746	3549	3289	3136
60				9494	7912	7121	6192	5696	5086	4747	4315	3956	3748	3473	3312
61				10088	8407	7566	6579	6053	5404	5044	4585	4203	3982	3691	3519
62				10681	8901	8011	6966	6409	5722	5341	4855	4450	4216	3908	3726
63				11274	9395	8456	7353	6764	6040	5637	5125	4698	4450	4125	3933
<b>'B' average mm</b>	<b>37</b>	<b>46</b>	<b>60</b>	<b>69</b>	<b>83</b>	<b>92</b>	<b>106</b>	<b>115</b>	<b>129</b>	<b>138</b>	<b>152</b>	<b>166</b>	<b>175</b>	<b>189</b>	<b>198</b>



constant support model CSV and CSH

load travel table(load in kgs for total travel in mm)

hanger size no.	total travel in mm														
	230	240	255	265	280	290	305	320	330	345	355	370	380	395	405
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19	191	183	172												
20	203	194	183												
21	215	206	194												
22	234	224	211												
23	253	243	228												
24	272	260	245												
25	292	279	263												
26	312	299	281												
27	332	318	299												
28	364	349	328												
29	396	379	357												
30	428	410	386												
31	454	435	410												
32	480	460	433												
33	507	486	457												
34	530	508	478												
35	553	530	499												
36				480	455	439	417	398	386	369	359				
37	588	564	530	510	483	466	443	423	410	392	381				
38	622	596	561	540	511	493	469	447	434	415	403				
39	656	629	592	570	539	520	495	472	457	437	425				
40	703	674	634	611	578	558	530	506	490	469	456				
41	750	719	676	651	616	595	565	539	523	500	486				
42	796	763	718	691	654	632	601	572	555	531	516				
43	874	837	788	758	718	693	659	628	609	582	566				
44	950	911	857	825	780	754	716	683	662	633	616				
45	1027	984	926	891	844	815	774	738	716	685	665				
46	1093	1047	985	948	897	867	824	785	761	728	708				
47	1163	1114	1049	1009	955	922	877	836	810	775	753				
48	1222	1171	1102	1061	1004	969	922	879	852	815	792				
49	1299	1245	1172	1128	1067	1031	980	934	906	866	842				
50	1376	1319	1241	1194	1130	1091	1038	989	959	917	892				
51	1453	1392	1310	1261	1193	1152	1095	1044	1012	968	941				
52												903	879	846	825
53	1558	1493	1405	1352	1280	1236	1175	1120	1086	1039	1009	969	943	907	885
54	1663	1594	1500	1443	1366	1319	1254	1195	1159	1109	1077	1034	1007	968	944
55	1780	1706	1606	1545	1463	1412	1343	1280	1241	1187	1154	1107	1078	1037	1011
56	1897	1818	1711	1646	1558	1504	1430	1363	1322	1265	1229	1179	1148	1104	1077
57	2014	1930	1816	1748	1654	1597	1518	1447	1403	1342	1305	1252	1219	1172	1144
58	2211	2119	1994	1919	1816	1754	1667	1589	1541	1474	1433	1375	1338	1288	1256
59	2408	2308	2172	2090	1978	1910	1816	1731	1678	1605	1560	1497	1457	1402	1367
60	2605	2496	2349	2261	2140	2066	1964	1872	1815	1737	1688	1619	1577	1517	1479
61	2768	2653	2497	2403	2274	2196	2088	1990	1930	1846	1794	1721	1676	1612	1572
62	2932	2810	2644	2545	2408	2325	2211	2107	2043	1955	1900	1823	1775	1707	1665
63	3096	2967	2792	2687	2543	2455	2335	2225	2158	2064	2006	1924	1874	1803	1758
64	3290	3153	2967	2855	2702	2609	2481	2364	2293	2193	2131	2045	1991	1915	1868
65	3483	3338	3141	3023	2861	2762	2626	2503	2428	2322	2257	2165	2108	2028	1978
66	3676	3523	3316	3191	3020	2916	2772	2642	2562	2451	2382	2285	2225	2141	2088
<b>B' average mm</b>	212	221	235	244	258	267	281	290	304	317	327	341	350	364	373

constant support model CSV and CSH

load travel table(load in kgs total travel in mm)

hanger size no.	total travel in mm																
	100	115	125	140	150	165	180	190	205	215	230	240	255	265	280	290	305
64	8860	7704	7088	6329	5907	5370	4922	4663	4322	4121	3852	3692	3475	3343	3164	3055	2905
65	9263	8055	7410	6616	6175	5614	5146	4875	4519	4308	4027	3860	3633	3495	3308	3194	3037
66	10170	8843	8136	7264	6780	6164	5650	5353	4961	4730	4422	4238	3988	3838	3632	3507	3334
67	11076	9631	8861	7911	7384	6713	6153	5829	5403	5152	4816	4615	4344	4180	3956	3819	3631
68	11982	10419	9586	8559	7988	7262	6657	6306	5845	5573	5210	4993	4699	4522	4279	4132	3929
69	12736	11075	10189	9097	8491	7719	7076	6703	6213	5924	5537	5307	4995	4806	4549	4392	4176
70	13488	11729	10790	9634	8992	8175	7493	7099	6580	6273	5864	5620	5289	5090	4817	4651	4422
71	14240	12383	11392	10171	9493	8630	7911	7495	6946	6623	6191	5933	5584	5374	5086	4910	4669
72	15132	13158	12106	10809	10088	9171	8407	7964	7381	7038	6579	6305	5934	5710	5404	5218	4961
73	16023	13933	12818	11445	10682	9711	8902	8433	7816	7453	6967	6676	6284	6046	5723	5525	5253
74	16913	14707	13530	12081	11275	10250	9396	8902	8250	7867	7353	7047	6633	6382	6040	5832	5545
75	17881	15549	14305	12772	11921	10837	9934	9411	8722	8317	7774	7450	7012	6748	6386	6166	5863
76	18849	16390	15079	13464	12566	11424	10472	9921	9195	8767	8195	7854	7392	7113	6732	6500	6180
77	19817	17232	15854	14155	13211	12010	11009	10430	9667	9217	8616	8257	7771	7478	7078	6833	6497
78	20893	18168	16714	14924	13929	12662	11607	10996	10192	9718	9084	8705	8193	7884	7462	7204	6850
79	21968	19103	17574	15691	14645	13314	12204	11562	10716	10218	9551	9153	8615	8290	7846	7575	7203
80	23043	20037	18434	16459	15362	13965	12802	12128	11240	10718	10019	9601	9036	8695	8230	7946	7555
81	24195	21039	19356	17282	16130	14664	13442	12734	11802	11253	10520	10081	9488	9130	8641	8343	7933
82	25347	22041	20278	18105	16898	15362	14082	13341	12364	11789	11020	10561	9940	9565	9053	8740	8310
83	26499	23043	21199	18928	17666	16060	14722	13947	12926	12325	11521	11041	10392	10000	9464	9138	8688
84			22674	20245	18895	17177	15746	14917	13826	13183	12323	11809	11115	10695	10122	9773	9293
85			24149	21562	20124	18295	16770	15888	14725	14040	13124	12578	11838	11391	10781	10409	9897
86			25532	22796	21277	19342	17731	16797	15568	14844	13876	13298	12516	12043	11398	11005	10464
87			26914	24030	22428	20389	18690	17707	16411	15648	14627	14018	13193	12695	12015	11601	11030
88			28297	25265	23581	21437	19651	18616	17254	16452	15379	14738	13871	13348	12633	12197	11597
89			30417	27158	25348	23043	21123	20011	18547	17684	16531	15842	14910	14348	13579	13111	12466
90					28265	25695	23554	22314	20682	19720	18434	17666	16626	15999	15142	14620	13901
91					30953	28139	25794	24437	22649	21595	20187	19346	18208	17521	16582	16010	15223
92					33873	30794	28228	26742	24785	23632	22091	21171	19925	19173	18146	17521	16659
93					37251	33865	31043	29409	27257	25989	24294	23282	21912	21085	19956	19268	18320
94					40325	36659	33604	31836	29506	28134	26299	25203	23721	22825	21603	20858	19832
95							35365	33504	31052	29608	27677	26524	24964	24022	22735	21951	20871
96							36806	34869	32317	30814	28805	27605	25981	25000	23661	22845	21722
97							38246	36233	33582	32020	29932	28685	26997	25978	24587	23739	22571
98							39205	37142	34424	32823	30682	29404	27674	26630	25203	24334	23137
99								39111	36249	34563	32309	30963	29142	28042	26540	25624	24364
100								39794	36882	35167	32873	31504	29650	28532	27003	26072	24790
101									39060	37243	34814	33364	31401	30216	28598	27611	26253
102									39342	37512	35066	33605	31628	30434	28804	27811	26443
103										39856	37257	35704	33604	32336	30604	29548	28095
104											39323	37685	35468	34129	32301	31187	29653
105											39448	37804	35581	34238	32404	31286	29748
106												39905	37558	36140	34204	33025	31401
107													39534	38042	36004	34763	33053
108														39945	37805	36501	34706
109															39581	38216	36337
110															39605	38239	36359
B'dim. sizes 64-83	92	106	115	129	138	152	166	175	189	198	212	221	235	244	258	267	281
B'dim. sizes 84-110	-	-	105	117	126	138	150	159	172	180	193	201	214	222	235	243	256

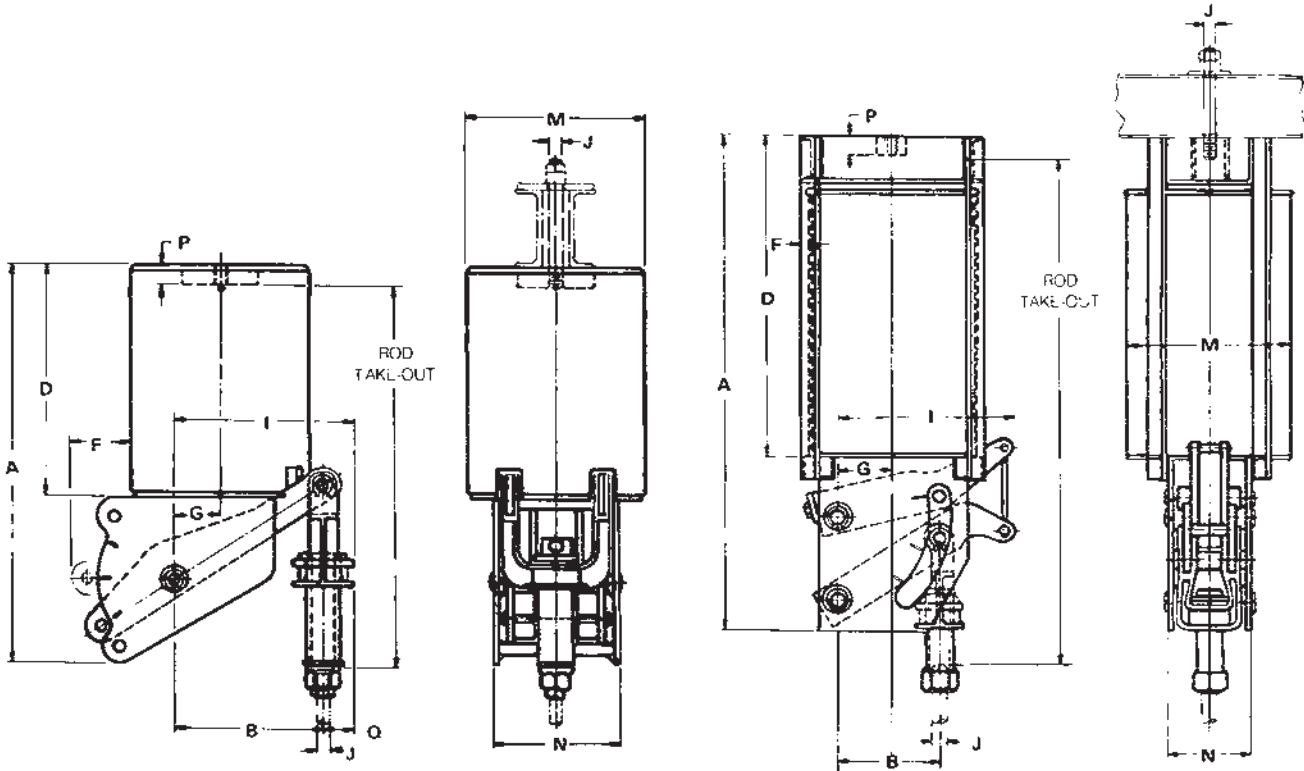
## constant support model CSV and CSH

load travel table(load in kgs for total travel in mm)

hanger size no.	total travel in mm															
	320	330	345	355	370	380	395	405	420	430	445	455	470	485	495	510
64	2769	2685	2568	2496	2395	2332	2243	2188								
65	2895	2807	2685	2609	2504	2438	2345	2287								
66	3178	3082	2948	2865	2749	2676	2575	2511								
67	3461	3356	3210	3120	2994	2915	2804	2735								
68	3744	3631	3473	3375	3238	3153	3033	2959								
69	3980	3859	3692	3588	3442	3352	3224	3145								
70	4215	4087	3910	3799	3645	3549	3415	3330								
71	4450	4315	4128	4011	3849	3747	3605	3516								
72	4729	4585	4386	4263	4090	3982	3831	3736								
73	5007	4855	4644	4514	4331	4217	4056	3956								
74	5285	5125	4902	4764	4571	4451	4282	4176								
75	5588	5418	5183	5037	4833	4706	4527	4415								
76	5890	5712	5463	5310	5094	4960	4772	4654								
77	6193	6005	5744	5582	5356	5215	5017	4893								
78	6529	6331	6056	5885	5647	5498	5289	5159								
79	6865	6657	6368	6188	5937	5781	5562	5424								
80	7201	6983	6679	6491	6228	6064	5834	5690								
81	7561	7332	7013	6815	6539	6367	6125	5974								
82	7921	7681	7347	7140	6851	6670	6417	6259								
83	8281	8030	7681	7465	7162	6973	6709	6543								
84	8857	8589	8215	7984	7660	7459	7175	6998								
85	9433	9147	8750	8503	8158	7944	7642	7453								
86	9973	9671	9251	8990	8626	8399	8080	7880								
87	10513	10195	9751	9477	9093	8853	8517	8307								
88	11054	10719	10253	9964	9560	9308	8955	8734								
89	11882	11522	11021	10710	10276	10006	9626	9388								
90	13249	12848	12289	11943	11459	11157	10734	10469								
91	14509	14070	13458	13079	12549	12218	11754	11464								
92	15878	15397	14727	14313	13732	13371	12863	12546								
93	17461	16932	16196	15740	15102	14704	14146	13797								
94	18902	18330	17533	17039	16348	15918	15313	14935								
95	19893	19290	18451	17932	17025	16752	16116	15718	14402	14067	13593	13294	12870	12472	12220	11860
96	20703	20076	19203	18662	17906	17434	16772	16358	15156	14804	14305	13991	13544	13125	12860	12482
97	21513	20861	19954	19392	18606	18117	17429	16998	15774	15407	14888	14561	14096	13660	13384	12990
98	22053	21385	20455	19879	19073	18571	17866	17424	16391	16010	15470	15130	14647	14194	13908	13499
99	23222	22518	21539	20933	20084	19556	18813	18348	17693	17282	16699	16332	15811	15322	15012	14571
100	23628	22912	21916	21298	20435	19897	19141	18669	18002	17583	16991	16617	16087	15589	15274	14825
101	25023	24265	23210	22556	21641	21072	20272	19771	19065	18622	17994	17598	17037	16510	16176	15701
102	25203	24440	23377	22719	21798	21224	20418	19914	19203	18756	18124	17726	17160	16629	16293	15814
103	26778	25967	24838	24138	23160	22550	21694	21158	20402	19928	19256	18833	18232	17668	17311	16802
104	28263	27407	26215	25477	24444	23801	22897	22332	21534	21033	20324	19878	19243	18648	18271	17734
105	28353	27494	26299	25558	24522	23876	22970	22403	21602	21100	20389	19941	19304	18707	18329	17790
106	29929	29022	27760	26978	25884	25203	24246	23647	22803	22273	21522	21049	20377	19747	19348	18779
107	31504	30549	29221	28398	27246	26529	25522	24892	24003	23445	22654	22156	21449	20786	20366	19767
108	33079	32077	30682	29818	28609	27856	26799	26137	25203	24617	23787	23265	22522	21826	21385	20756
109	34633	33584	32124	31219	29953	29165	28057	27365	26387	25774	24905	24358	23580	22851	22389	21731
110	34654	33604	32143	31238	29971	29183	28074	27381	26403	25789	24920	24372	23594	22865	22403	21744
'B' dim. sizes 64-83	290	304	317	327	341	350	364	373	-	-	-	-	-	-	-	-
'B' dim. sizes 84-110	268	276	289	297	310	318	331	339	351	360	373	381	394	406	418	427

constant support vertical type - A

model : CSV - A



sizes 10-63

sizes 64-83

NOTES : See load travel tables on pages 42-45 for "B" dimension. For weights see page 62.

dimensions(mm)

hanger size	A	D	F	G	I	diam M	N	P	Q	total travel	factor <sup>■</sup>	J-rod		
												min thread length	min rod diam	max. rod diam
1- 9	available in model CSH only.													
10- 18	418	225	50	38	●	216	160	22	90	90 or less 100 or more	430 490	45*TT	M12	M20
19- 34	667	405	55	67	●	319	213	30	102	125 or less 140 or more	710 765	60*TT	M12	M30
35- 49	795	465	120	95	●	356	252	38	140	150 or less 165 or more	822 940	85*TT	M12	M42
50- 63	1190	715	210	150	●	457	285	50	165	280 or less 290 or more	1180 1315	110*TT	M20	M56
64- 74	1715	1125	30	190	●	645	565	280	65	265 or less 280 or more	1972 1975	145*TT	M30	M72
75- 83	1765	1175	38	190	●	645	690	280	75	265 or less 280 or more	1985 1990	145*TT	M36	M85
84-110	see page 51													

■ Rod take - out = (factor) ± (Actual Travel / 2) ● "I" dimension for sizes 10 through 63 equals "B" plus "Q"  
 (+ : Moving Up, - : Moving Down)

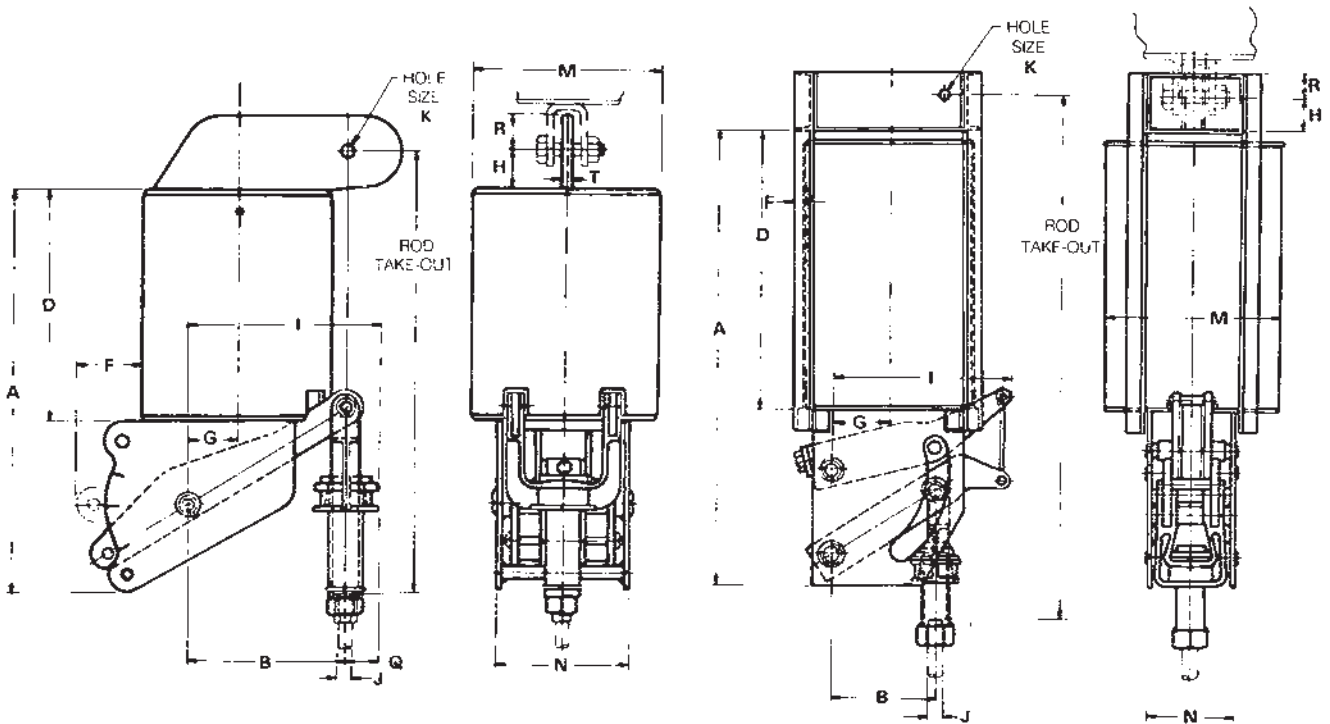
J-rod selection chart

load kg	0	363	681	1153	1815	2768	4264	6079	8301	11204	14062	17691	21773
	362	680	1152	1814	2767	4263	6078	8300	11203	14061	17690	21772	26308
rod diam	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M72	M80	M85



constant support vertical type -B

model : CSV -B



! sizes 10-63

sizes 64-83

NOTES : See load travel tables on pages 42-45 for "B" dimension. For weights see page 62.

dimensions(mm)

hanger size	A	D	F	G	H	I	diam M	N	Q	R	T	total travel	factor <sup>■</sup>	J-rod		
														min thread length	min rod diam	max rod diam
1- 9	available in model CSH only.															
10- 18	418	225	50	38	38	●	216	160	90	38	9	90 or less 100 or more	490 550	45+TT	M12	M20
19- 34	667	405	55	67	50	●	319	213	102	38	16	125 or less 140 or more	790 843	60+TT	M12	M30
35- 49	795	465	120	95	75	●	356	252	140	33K-hole and smaller 38 33K-hole and larger 50	19	150 or less 165 or more	937 1055	85+TT	M12	M42
50- 63	1190	715	210	150	100	●	457	285	165	33K-hole 38, 33K-hole 50 48K-hole and larger 76	24	280 or less 290 or more	1335 1467	110+TT	M20	M56
64- 74	1537	945	30	190	115	●	565	280	-	76	24	265 or less 280 or more	1962 1965	145+TT	M30	M72
75- 83	1556	965	38	190	92	●	690	280	-	95	24	265 or less 280 or more	1980 1983	145+TT	M36	M85
84-110	see page 51															

■ Rod take - out = (factor) ± (Actual Travel / 2) ● "I" dimension for sizes 10 through 63 equals "B" plus "Q"  
 (+: Moving Up, - : Moving Down)

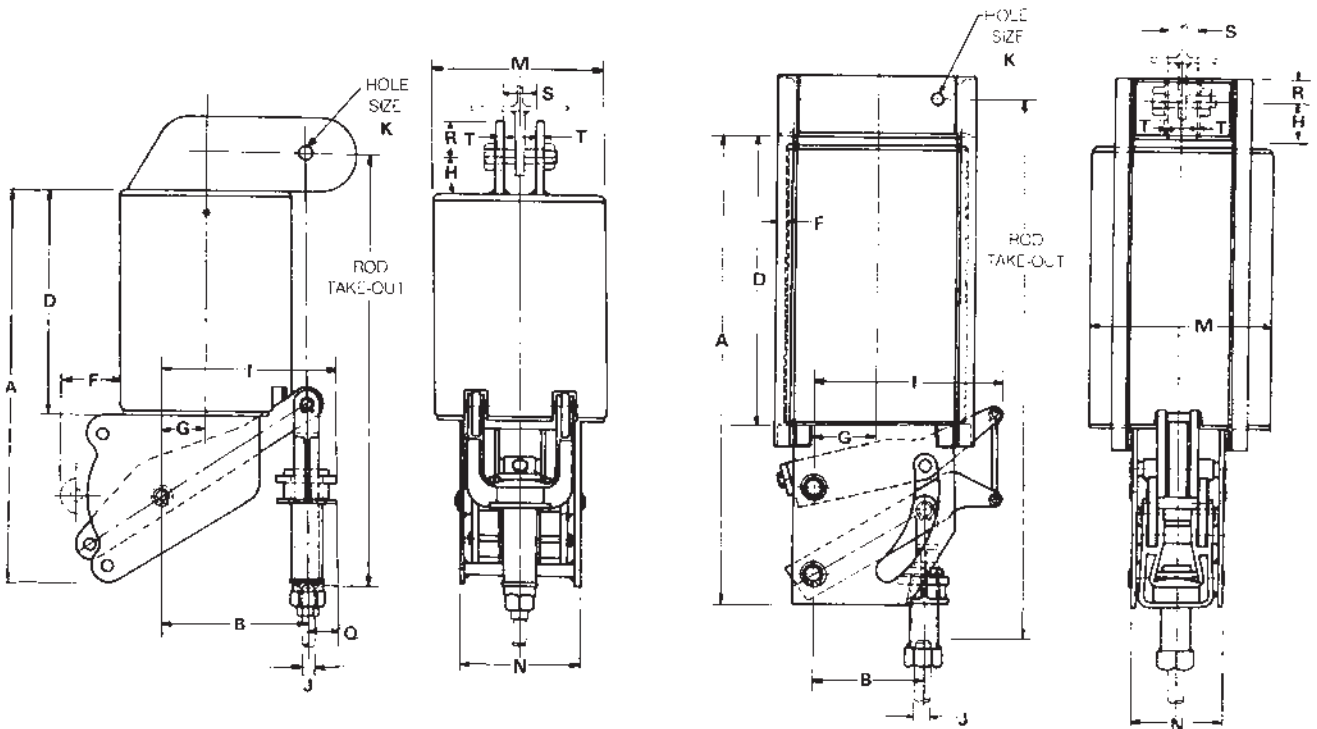
J-rod, K-hole selection chart

load kg	0 362	363 680	681 1152	1153 1814	1815 2767	2768 4263	4264 6078	6079 8300	8301 11203	11204 14061	14062 17690	17691 21772	21773 26308
J-rod size	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M72	M80	M85
K-hole size	18	22	26	33	39	46	52	62	70	78	86	91	96

For constant support sizes 50-63 and 64-74 where M30 rod is required, check the "R" dimensions versus the Model "WBA" welded beam attachment dimensions for compatibility.

constant support vertical type - C

model : CSV - C



sizes 10-63

sizes 64-83

NOTES : See load travel tables on pages 42-45 for "B" dimension. For weights see page 62.

dimensions(mm)

hanger size	A	D	F	G	H	I	diam M	N	Q	R	T	total travel	factor <sup>■</sup>	J-rod			
														min thread length	min rod diam	max rod diam	
1- 9	available in model CSH only.																
10- 18	418	225	50	38	38	●	216	160	90	38	9	90 or less 100 or more	490 550	45+TT	M12	M20	
19- 34	667	405	55	67	50	●	319	213	102	38	16	125 or less 140 or more	790 843	60+TT	M12	M30	
35- 49	795	465	120	75	75	●	356	252	140	33K-hole and smaller, 38 38K-hole and larger, 52	19	150 or less 165 or more	937 1055	85+TT	M12	M42	
50- 63	1190	715	210	150	100	●	457	285	165	28K-hole, 38 33K-hole, 50 48K-hole and larger, 76	24	280 or less 290 or more	1335 1467	110+TT	M20	M56	
64- 74	1525	933	30	190	127	645	565	280	-	76	24	265 or less 280 or more	1962 1965	145+TT	M30	M72	
75- 83	1537	945	38	190	108	645	690	280	-	95	24	265 or less 280 or more	1980 1983	145+TT	M36	M85	
84-110	see page 51																

■ Rod take - out = (factor) ± (Actual Travel / 2) ● "I" dimension for sizes 10 through 63 equals "B" plus "Q"  
 (+ : Moving Up, - : Moving Down)

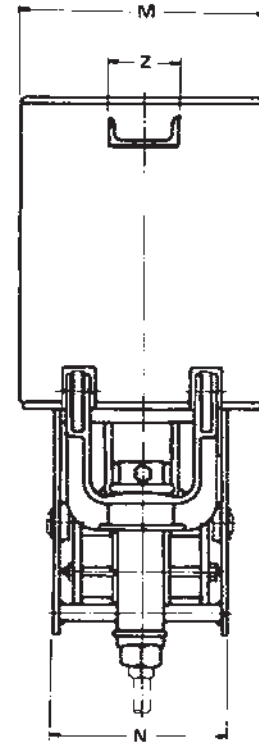
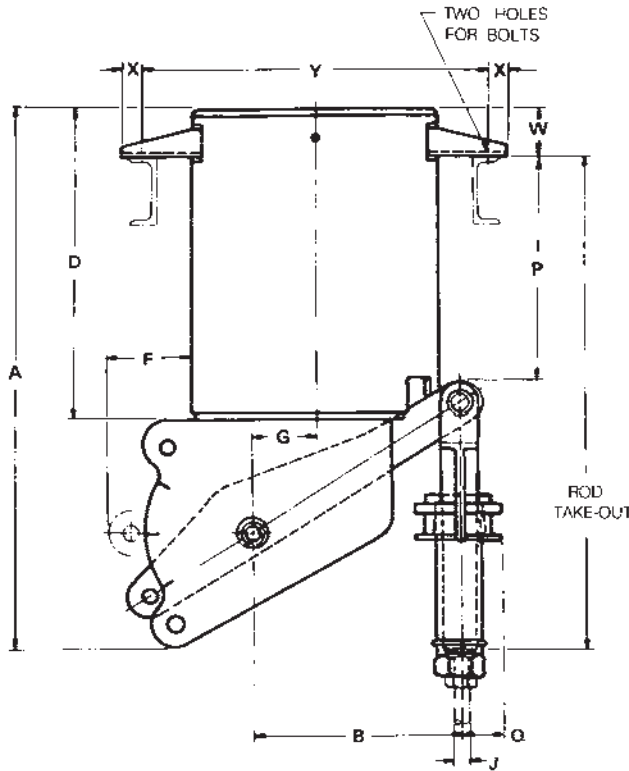
J-rod, K-hole selection chart

load kg	0	363	681	1153	1815	2768	4264	6079	8301	11204	14062	17691	21773
	362	680	1152	1814	2767	4263	6078	8300	11203	14061	17690	21772	26308
J-rod size	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M72	M80	M85
K-hole size	18	22	26	33	39	46	52	62	70	78	86	91	96
S	22	27	32	40	50	60	67	73	80	86	92	98	105



constant support vertical type -D

model : CSV -D



NOTES : See load travel tables on pages 42-45 for "B" dimension. For weights see page 62.

dimensions(mm)

hanger size	A	D	F	G	diam M	N	Q	P	W	X	Y	Z	bracket hole diam	total travel	factor <sup>■</sup>	J-rod		
																min thread length	min rod diam	max rod diam
1- 9	available in model CSH only.																	
10- 18	418	225	50	38	216	160	90	125	60	38	273	75	18	90 or less 100 or more	395 452	45+TT	M12	M20
19- 34	667	405	55	67	319	213	102	318	60	38	378	75	22	125 or less 140 or more	678 732	60+TT	M12	M30
35- 49	795	465	120	95	356	252	140	337	67	50	425	100	26	150 or less 165 or more	795 910	85+TT	M12	M42
50- 63	1190	715	210	150	457	285	165	622	73	75	533	150	33	280 or less 290 or more	1157 1292	110+TT	M20	M56
64- 83	available in model CSH only																	
84-110	not available																	

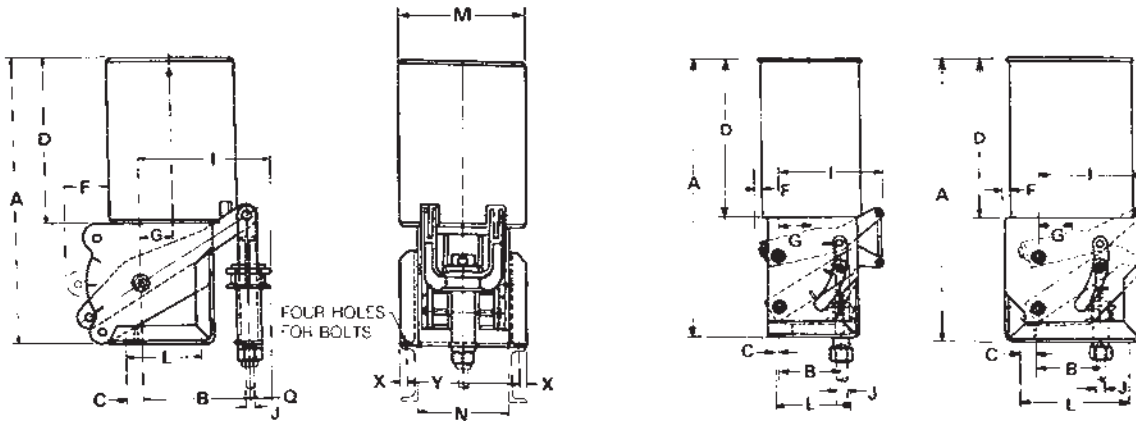
$\blacksquare$  Rod take - out = (factor)  $\pm$   $\left( \frac{\text{Actual Travel}}{2} \right)$   
 (+ : Moving Up, - : Moving Down)

J-rod selection chart

load kg	0	363	681	1153	1815	2768	4264	6079	8301
	362	680	1152	1814	2767	4263	6078	8300	11203
rod diam	M12	M16	M20	M24	M30	M36	M42	M48	M56

constant support vertical type - E

model : CSV - E



sizes 10-63

sizes 64-74

sizes 75-83

NOTES : See load travel tables on pages 42-45 for "B" dimension. For weights see page 62.

dimensions(mm)

hanger size	A	C	D	F	G	I	L	diam M	N	Q	X	Y	bracket hole diam	total travel	factor	J-rod		
																min thread length	min rod diam	max rod diam
1- 9	available in model CSH only.																	
10- 18	418	38	225	50	38	●	110	216	160	90	16	205	18	90 or less 100 or more	37 95	45+TT	M12	M20
19- 34	667	46	405	55	67	●	170	319	213	102	16	260	18	125 or less 140 or more	70 125	60+TT	M12	M30
35- 49	795	48	465	120	95	●	210	356	252	140	20	315	22	150 or less 165 or more	65 180	85+TT	M12	M42
50- 63	1190	95	715	210	150	●	325	457	285	165	33	373	33	280 or less 290 or more	40 178	110+TT	M20	M56
64- 74	1575	10	908	10	190	645	400	565	280	-	40	380	39	256 or less 280 or more	232 235	145+TT	M30	M72
75- 83	1588	133	908	38	190	645	650	690	280	-	44	395	39	265 or less 280 or more	222 225	145+TT	M36	M85
84-110	not available																	

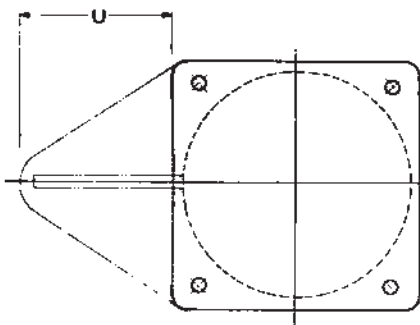
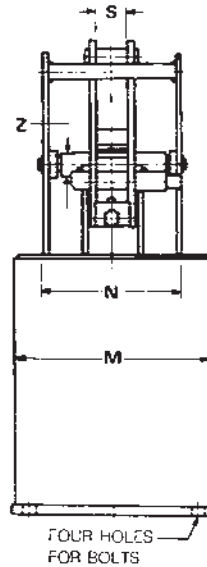
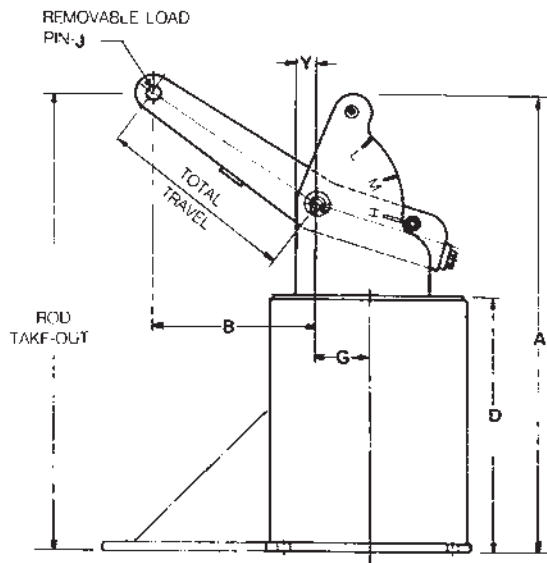
■ Rod take - out =  $(\text{factor}) \pm \left( \frac{\text{Actual Travel}}{2} \right)$  ● "I" dimension for sizes 10 through 63 equals "B" plus "Q"  
 (+ : Moving Up, - : Moving Down)

J-rod selection chart

load kg	0	363	681	1153	1815	2768	4264	6079	8301	11204	14062	17691	21773
	362	680	1152	1814	2767	4263	6078	8300	11203	14061	17690	21772	26308
rod diam	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M72	M80	M85

constant support vertical type-F

model : CSV-F



**BOTTOM VIEW**

hanger size	total travel(mm)	U (mm)
10 to 18	125 thru 205	125
19 to 34	180 thru 255	185
35 to 49	165 thru 230 240 thru 355	180 290
50 to 63	180 thru 255 265 thru 405	215 355

**NOTES :** See load travel tables on pages 42–45 for “B” dimension. For weights see page 62.

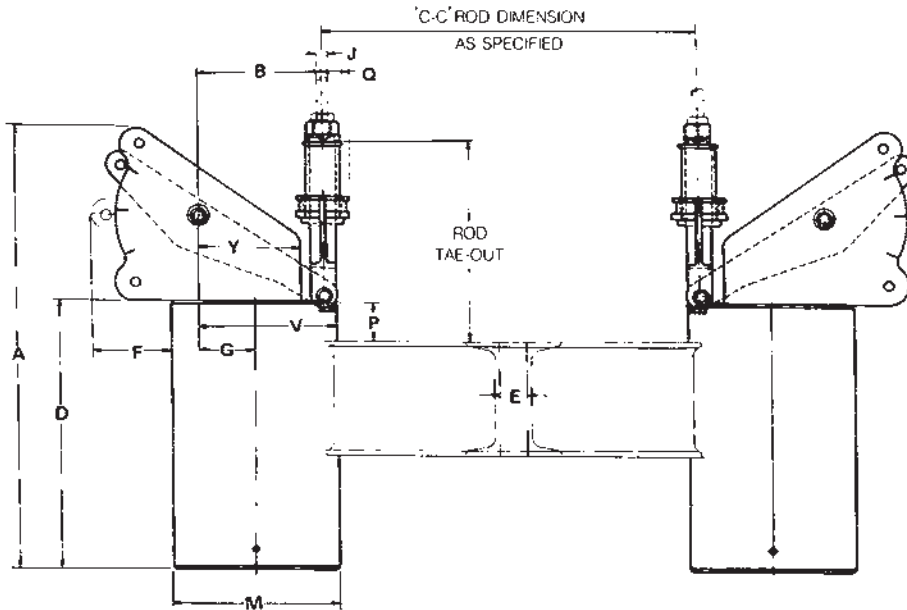
**dimensions(mm)**

hanger size	A	D	G	M	N	S	Y	Z	bottom flange square	flange bolt circle	flange hole diam	flange thick-ness	factor <sup>■</sup>	total travel	J-diam
1- 9	not available														
10- 18	422	222	38	216	160	25	25	20	230	255	10	6	320	140 or less 150 or more	M20 M12
19- 34	645	373	67	319	213	33	25	32	330	380	16	9	510	100 or less 115 or more	M30 M24
35- 49	830	470	95	356	252	57	38	40	368	432	22	16	648	180 or less 190 or more	M36 M30
50- 63	1238	727	150	457	285	57	40	50	470	533	26	19	978	200 or less 215 or more	M48 M36
64-110	not available														

$$\blacksquare \text{ Rod take-out} = (\text{factor}) \pm \left( \frac{\text{Actual Travel}}{2} \right)$$
 (- : Moving Up, . : Moving Down)

constant support vertical type - G

model : CSV - G



**NOTES :** See load travel tables on pages 42–45 for “B” dimension. For weights see page 62.

In sizing a Type G hanger, it must be remembered that each standard spring unit carries one-half of the total pipe load. Furthermore, the weight of the hanger itself must be considered as part of the overall load. Therefore, using one-half the total pipe load, select the required hanger size from the Load-Travel table and add one-half the weight of the size hanger selected to one-half the total pipe load. If the load now exceeds the maximum load at the required total travel for the hanger size selected, it is necessary to go to the next larger hanger. If the pipe line is designed so as not to be centered on the channel, one spring of the trapeze will carry a

heavier load than the other and care must be taken in sizing the individual hanger units. The center-to-center rod dimension must be specified when ordering. The minimum C-C dimension can be determined as follows:

B plus Q greater than Y:O.D. of pipe covering plus 2Q.

B plus Q less than Y:O.D. of pipe covering plus 2(Y minus B).

**NOTES :** If U-bolt is used to fasten pipe to channels, C-C of U-bolt tangents plus one washer plate width cannot be greater than C-C of the hanger rods minus 2(V minus B).

**dimensions(mm)**

hanger sizes	A	D	E	F	G	diam M	N	P	Q	V	Y	total travel	factor <sup>a</sup>	J-rod		
														min thread length	min rod diam	max rod diam
1- 9	not available															
10- 18	418	225	25	50	38	216	see type A	65	90	148	100	90 or less 100 or more	297 355	45+TT	M12	M20
19- 34	667	405	32	55	67	319		90	102	230	155	125 or less 140 or more	427 475	60+TT	M12	M30
35- 49	795	465	38	120	95	356		85	140	273	203	150 or less 165 or more	490 605	85+TT	M12	M42
50- 63	1190	715	55	210	150	457		100	165	375	278	280 or less 290 or more	625 762	110+TT	M20	M56
64-110	not available															

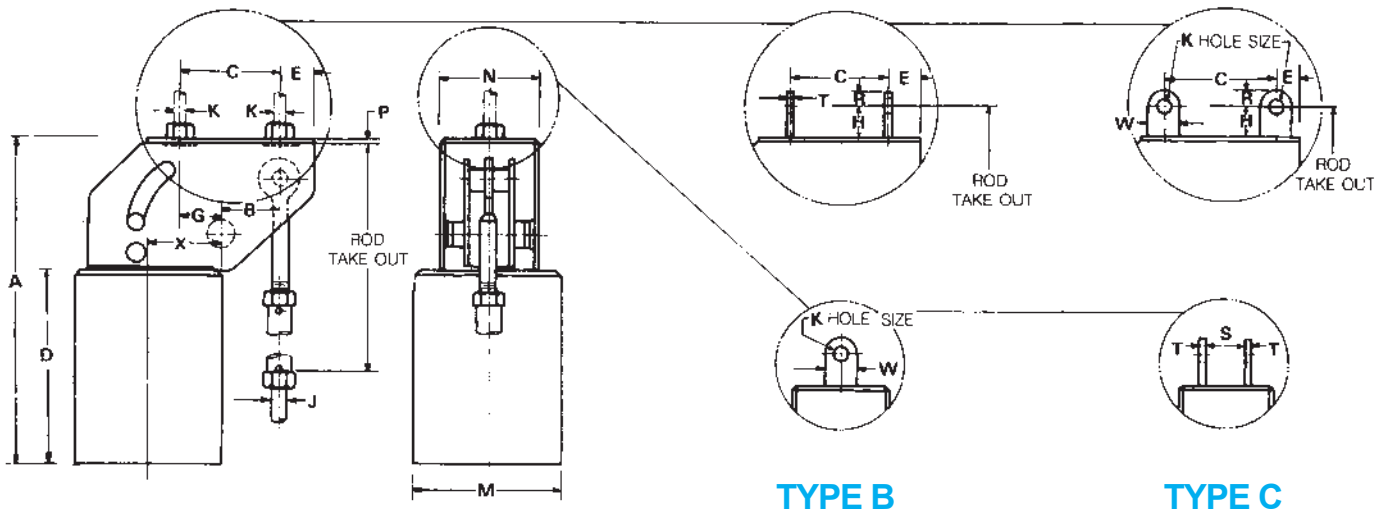
■ Rod take out = (factor) ± (  $\frac{\text{Actual Travel}}{2}$  ) ( : Moving Up, - : Moving Down)

**J-rod selection chart**

load, kg	0 362	363 680	681 1152	1153 1814	1815 2767	2768 4263	4264 6078	6079 8300	8301 11203
rod diam	M12	M16	M20	M24	M30	M36	M42	M48	M56

constant support  
vertical type - A, B and C for size 84 to 110

model : CSV - A  
CSV - B  
CSV - C



**NOTES :** "B" Dimension is a function of total travel ("G" plus "B" should not be assumed as equal to "C" dimension).

Types A, B and C sizes 84 to 110, for large loads and long travels, provide for basically the same methods of upper attachment as sizes 10 to 83 shown on pages 46-48.

**NOTES :** See load travel table on pages 42-45 for "B" dimension. For weights see page 62.

**dimensions(mm)**

hanger sizes	total travel	A	C		D	E		G		H	M	N	P	X	factor <sup>a</sup>		J-rod		
			types A&B	type C		types A&B	type C	types A&B	type C						type A	types B&C	min thread length	min	max
84- 94	240 or less 255 or more	2000	405	380	1265	102	115	38	25	150	610	267	76	305	1162 1410	1390 1638	255 330	M48	M95
95-110	355 or less 370 or more	2540	610	585	1625	102	115	190	178	150	610	292	90	343	1435 1660	1675 1902	305 380	M64	M95

■ Rod take-out = (factor) minus (0.75 x Actual Travel)

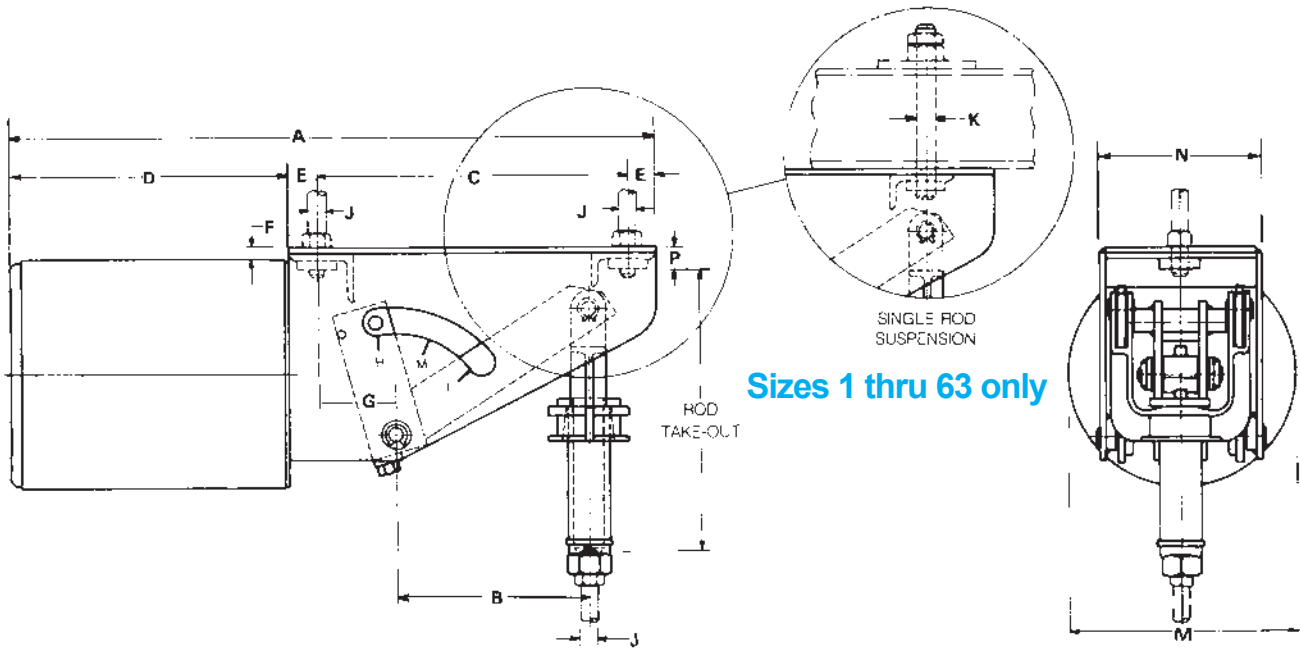
**J-rod, K-rod, K-hole selection chart**

load kg	6521 8301	8302 11204	11205 14061	14062 17690	17691 21772	21773 26308	26309 31299	31300 39689
J & K-Rods	M48	M56	M64	M72	M80	M85	M90	M95
K-Hole	62	70	76	81	91	96	101	106
R	75	75	102	102	105	118	116	118
S	73	80	85	92	98	105	111	117
T(Type B)	19	19	24	24	24	24	38	45
T(Type C)	19	19	24	24	24	24	32	32
W	150	150	204	204	210	236	236	236



constant support horizontal type - A

model : CSH - A



**NOTES:** Also available for single rod suspension as indicated above. When ordering specify "for single rod suspension."

See load travel tables on pages 42-45 for "B" dimension. For weights see page 62.

dimensions(mm)

hanger sizes	total travel	A	C	D	E	F	G	M	N	P	factor <sup>■</sup>	J-rod		
												min thread length	min rod diam	max rod diam
1- 9	100 or less 115 or more	352 455	152 255	150	25	22	50	155	105	20	325 390	45+TT	M12	M12
10- 18	90 or less 100 to 125 140 or more	468 468 545	203 203 280	215	25	13	65	210	160	17	275 337 337	45+TT	M12	M20
19- 34	125 or less 140 or more	686 791	255 360	367	32	15	98	315	213	30	415 470	60+TT	M12	M30
35- 49	150 or less 165 or more	803 1006	280 483	433	45	17	120	350	252	35	485 602	85+TT	M12	M42
50- 63	205 or less 215 to 280 290 or more	1156 1361 1361	405 610 610	665	43	25	195	450	285	45	633 633 768	110+TT	M20	M56
64- 74	265 or less 280 or more	1458 1598	400 540	908	75	83	133	565	280	87	875 878	145+TT	M30	M72
75- 83	265 or less 280 or more	1461 1601	367 527	908	83	92	127	690	280	108	927 930	145+TT	M36	M85
84-110	see page 57													

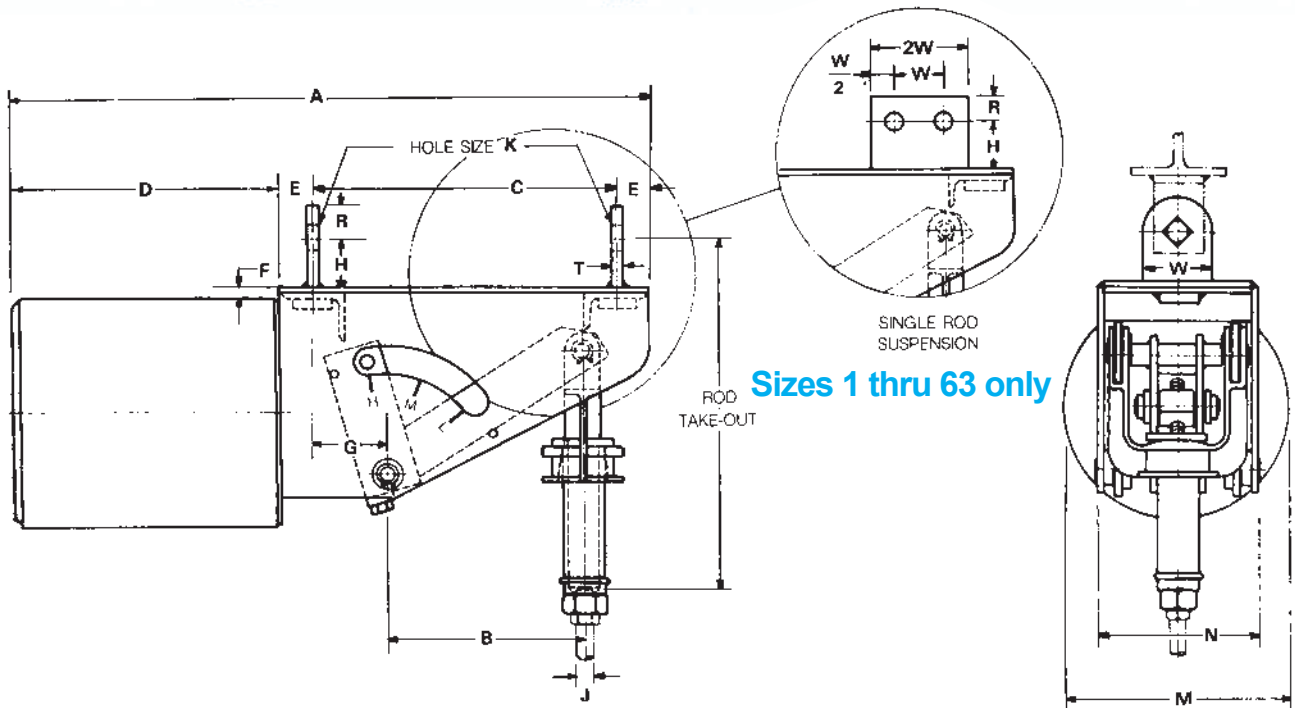
■ Rod take - out = (factor) ×  $\left(\frac{\text{Actual Travel}}{2}\right)$  ( : : Moving Up, - : Moving Down)

J-rod, K-rod selection chart

load kg	0	363	681	1153	1815	2768	4264	6079	8301	11204	14062	17691	21773
	362	680	1152	1814	2767	4263	6078	8300	11203	14061	17690	21772	26308
J-rod diam.	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M72	M80	M85
K-rod diam.	M16	M20	M24	M30	M36	M42	M48	M56	M64	M72	M80	M85	M90

constant support horizontal type - B

model : CSH-B



Sizes 1 thru 63 only

**NOTES :** Also available for single rod suspension as indicated above. When ordering specify "for single rod suspension."

See load travel tables on pages 42-45 for "B" dimension. For weights see page 62.

dimensions(mm)

hanger sizes	total travel	A	C	D	E	F	G	H	M	N	factor <sup>■</sup>	J-rod		
												min thread length	min rod diam	max rod diam
1- 9	100 or less 115 or more	354 454	140 240	150	32	22	45	40	155	105	370 437	45+TT	M12	M12
10- 18	90 or less 100 to 125 140 or more	469 469 546	190 190 267	215	32	13	60	40	210	160	332 392 392	45+TT	M12	M20
19- 34	125 or less 140 or more	685 789	248 352	367	35	15	95	50	315	213	495 550	60+TT	M12	M30
35-49	150 or less 165 or more	800 1003	267 470	433	50	17	115	75	350	252	595 713	85+TT	M12	M42
50- 63	205 or less 215 to 280 290 or more	1155 1358 1358	340 543 543	665	75	25	162	100	450	285	780 780 915	110+TT	M20	M56
64- 74	265 or less 280 or more	1461 1801	387 527	908	83	83	127	115	565	280	1075 1080	145+TT	M30	M72
75- 83	265 or less 280 or more	1463 1803	375 515	908	90	92	120	125	690	280	1162 1165	145+TT	M36	M85
84-110	see page 57													

■ Rod take-out = (factor) ± (Actual Travel / 2) (+ : Moving Up, - : Moving Down)

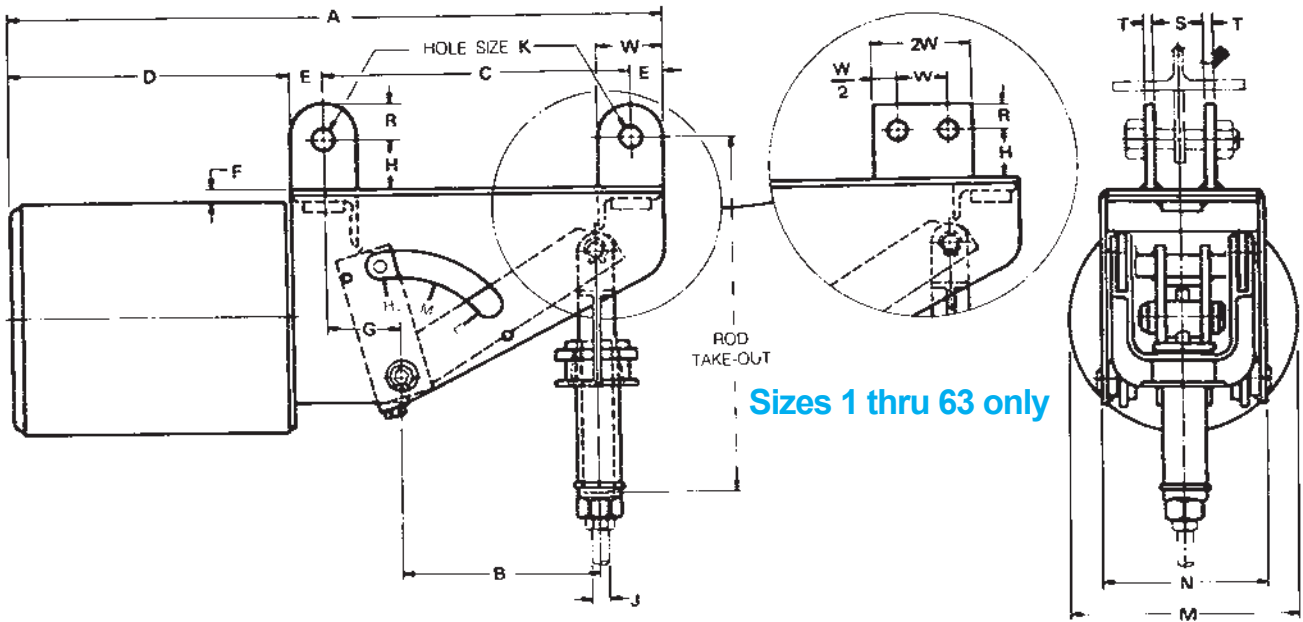
J-rod, K-hole selection chart

load, kg	0 362	363 680	681 1152	1153 1814	1815 2767	2768 4263	4264 6078	6079 8300	8301 11203	11204 14061	14062 17690	17691 21772	21773 26308
J-rod	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M72	M80	M85
K-hole size	18	22	26	33	39	46	52	62	70	78	86	91	96
R	32	32	32	40	52	65	65	75	75	102	102	102	115
T	*6	*6	9	12	16	19	19	19	19	24	24	24	24
W	64	64	64	80	104	130	130	150	150	204	204	204	230

◆ 9mm thickness for single rod suspension.

constant support horizontal type-C

model : CSH-C



**NOTES :** Also available for single rod suspension as indicated above. When ordering specify "for single rod suspension."

See load travel tables on pages 42-45 for "B" dimension.  
For weights see page 62.

dimensions(mm)

hanger size	total travel	A	C	D	E	F	G	H	M	N	factor <sup>■</sup>	J-rod		
												min thread length	min rod diam	max rod diam
1- 9	100 or less 115 or more	354 454	140 240	150	32	22	45	40	155	105	370 437	45+TT	M12	M12
10- 18	90 or less 100 to 125 140 or more	469 469 546	190 190 267	215	32	13	60	40	210	160	332 392 392	45+TT	M12	M20
19- 34	125 or less 140 or more	686 791	215 320	367	52	15	80	50	315	213	495 550	60+TT	M12	M30
35- 49	150 or less 165 or more	803 1008	240 445	433	65	17	102	75	350	252	695 713	85+TT	M12	M42
50- 63	205 or less 215 to 280 290 or more	1155 1358 1358	340 543 543	665	75	25	162	100	450	285	780 780 915	110+TT	M20	M56
64- 74	265 or less 280 or more	1462 1602	350 490	908	102	83	108	115	565	280	1075 1080	145+TT	M30	M72
75- 83	265 or less 280 or more	1463 1603	325 465	908	115	92	95	125	690	280	1162 1165	145+TT	M36	M85
84-110	see page 57													

■ Rod take-out = (factor) ± (Actual Travel / 2)

(+ : Moving Up, - : Moving Down)

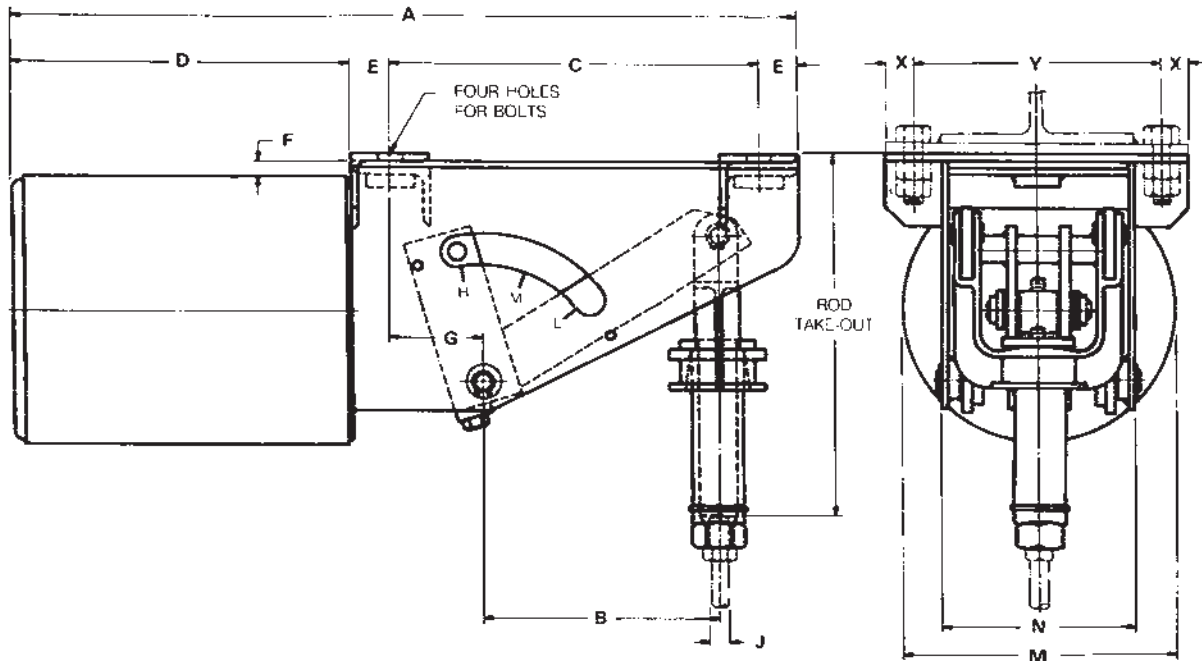
J-rod, K-hole selection chart

load, kg	0 362	363 680	681 1152	1153 1814	1815 2767	2768 4263	4264 6078	6079 8300	8301 11203	11204 14061	14062 17690	17691 21772	21773 26308
J-rod	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M72	M80	M85
K-hole size	18	22	26	33	39	46	52	62	70	78	86	91	96
R	32	32	32	40	52	65	65	75	75	102	102	102	115
S	22	27	32	40	50	60	67	73	80	86	92	98	105
T	*6	*6	9	12	16	19	19	19	19	24	24	24	24
W	64	64	64	80	104	130	130	150	150	204	204	204	230

◆ 9mm thickness for single rod suspension.

constant support horizontal type-D

model : CSH-D



NOTES : See load travel tables on pages 42–45 for “B” dimension. For weights see page 62.

dimensions(mm)

hanger size	total travel	A	C	D	E	F	G	M	N	X	Y	bracket hole diam	factor <sup>■</sup>	J-rod		
														min thread length	min rod diam	max rod diam
1- 9	100 or less 115 or more	352 455	152 255	150	25	22	50	155	105	20	143	14	340 405	45+TT	M12	M12
10- 18	90 or less 100 to 125 140 or more	468 468 545	203 203 280	215	25	13	65	210	160	22	203	18	300 360 360	45+TT	M12	M20
19- 34	125 or less 140 or more	683 788	240 345	367	38	15	92	315	213	30	273	18	450 505	60+TT	M12	M30
35- 49	150 or less 165 or more	800 1003	267 470	433	50	17	115	350	252	35	320	22	530 645	85+TT	M12	M42
50- 63	205 or less 215 to 280 290 or more	1155 1360 1360	390 595 595	665	50	25	187	450	285	40	370	33	687 687 822	110+TT	M20	M56
64- 74	265 or less 280 or more	1458 1598	400 540	908	75	83	133	565	280	50	380	39	975 978	145+TT	M30	M72
75- 83	265 or less 280 or more	1458 1598	400 540	908	75	92	120	690	280	50	380	39	1048 1050	145+TT	M36	M85
84-110	not available															

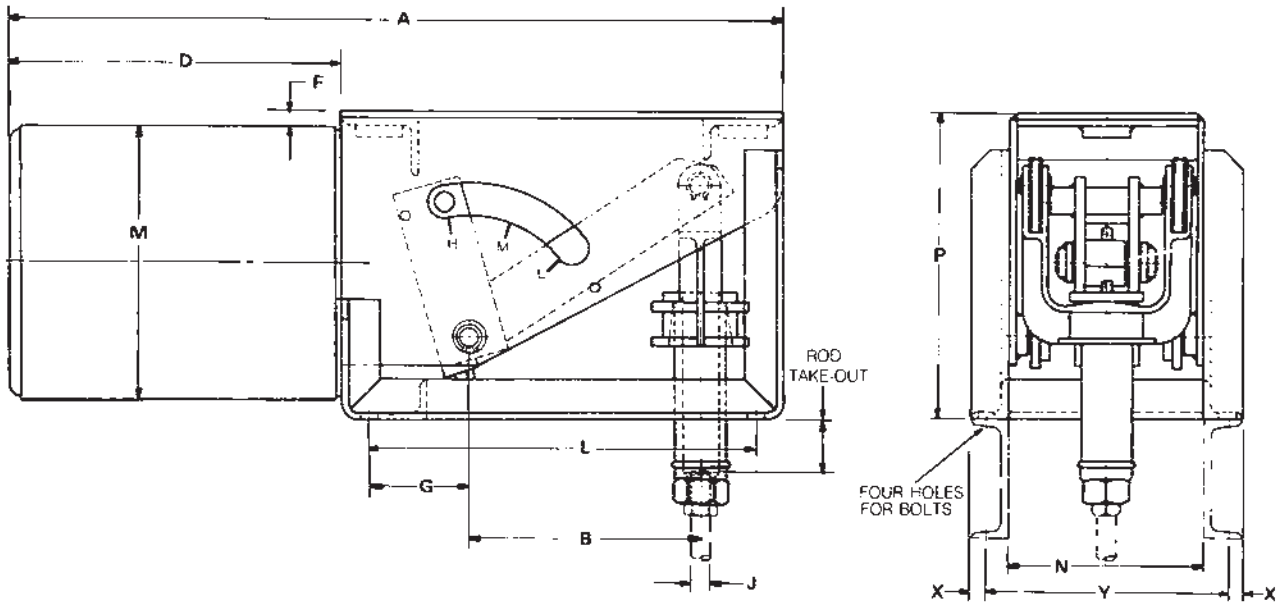
■ Rod take - out = (factor) ±  $\left( \frac{\text{Actual Travel}}{2} \right)$  ( - : Moving Up, + : Moving Down)

J-rod selection chart

load kg	0	363	681	1153	1815	2768	4264	6079	8301	11204	14062	17691	21773
rod diam.	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M72	M80	M85

constant support horizontal type-E

model : CSH-E



NOTES : See load travel tables on pages 42-45 for "B" dimension. For weights see page 62.

dimensions(mm)

hanger size	total travel	A	D	F	G	L	M	N	P	X	Y	bracket hole diam	factor <sup>■</sup>	J-rod		
														min thread length	min rod diam	max rod diam
1- 9	100 or less 115 or more	354 455	150	24	50	152 255	155	105	205	17	151	14	130 195	45+TT	M12	M12
10- 18	90 or less 100 to 125 140 or more	468 468 545	215	14	60	190 190 267	210	160	250	17	206	18	45 103 103	45+TT	M12	M20
19- 34	125 or less 140 or more	684 789	367	17	98	255 360	315	213	360	17	259	18	85 140	60+TT	M12	M30
35- 49	150 or less 165 or more	800 1003	433	19	130	295 498	350	252	395	20	312	22	125 240	85+TT	M12	M42
50- 63	205 or less 215 to 280 290 or more	1155 1360 1360	665	25	187	390 595 595	450	285	502	32	371	33	175 175 310	110+TT	M20	M56
64- 74	265 or less 280 or more	1481 1600	908	84	155	445 585	565	280	683	40	380	39	283 285	145+TT	M30	M72
75- 83	265 or less 280 or more	1461 1600	908	94	155	445 585	690	280	810	40	380	39	230 232	145+TT	M36	M85
84-110	see page 57															

■ Rod take-out = (factor) ± (Actual Travel / 2) (±: Moving Up, -: Moving Down)

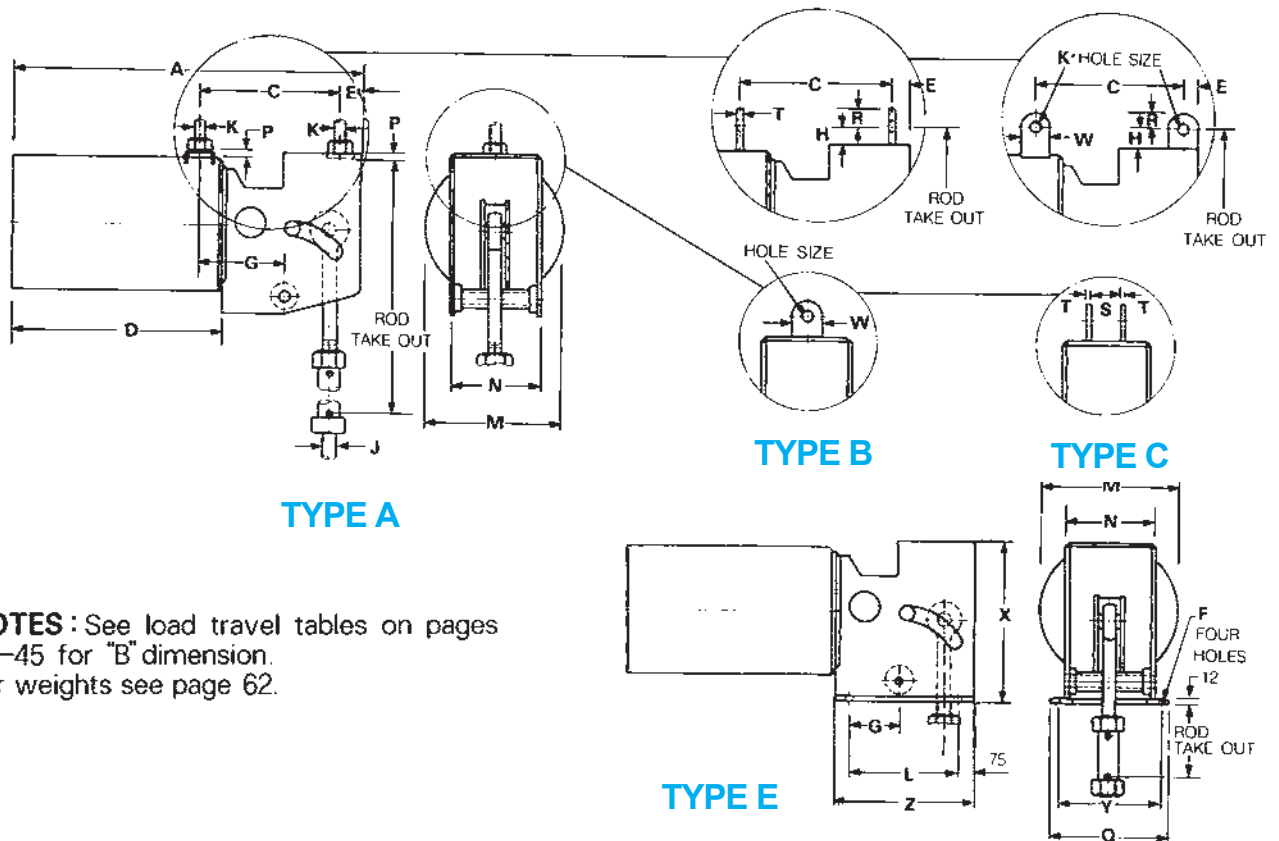
J-rod selection chart

load kg	0	363	681	1153	1815	2768	4264	6079	8301	11204	14062	17691	21773
	362	680	1152	1814	2767	4263	6078	8300	11203	14061	17690	21772	26308
rod diam.	M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M72	M80	M85



constant support horizontal type - A, B, C and E model : CSH - A  
for sizes 84 to 110

CSH - B  
CSH - C  
CSH - E



NOTES : See load travel tables on pages 42-45 for "B" dimension. For weights see page 62.

dimensions(mm)

hanger size	total travel	A	C		D	E		F	G		H	L	M	N	P	Q	X	Y	Z	factor*			J-rod		
			types A&B	type C		types A B&C	type C		types A, B&C	type E										type A	types B&C	type E	min thread length	rod diam	min
84- 94	240 or less 255 or more	1950	710	700	1265	102	115	26	355	152	150	533	610	267	75	405	885	330	686	1337 1585	1565 1813	550 797	255 330	M48	M95
95-110	355 or less 370 or more	2540	1245	1232	1625	102	115	33	730	222	150	762	610	292	90	432	940	368	915	1300 1527	1540 1768	448 675	305 380	M64	M95

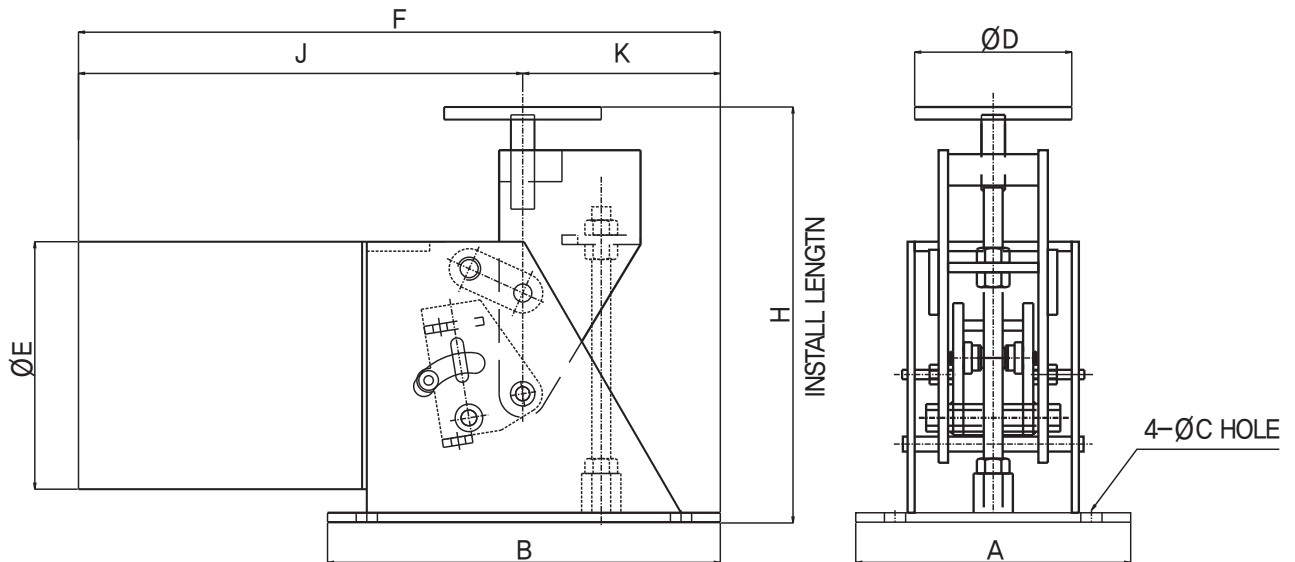
■ Rod take-out = (factor) minus (0.75 × total travel)

J-rod, K-rod, K-hole selection chart

load kg	6521	8301	11204	14062	17691	21773	26309	31299
	8300	11203	14061	17690	21772	26308	31298	39690
J & K-rods	M48	M56	M64	M72	M80	M85	M90	M95
K-Hole	62	70	78	86	91	96	101	106
R	78	78	105	105	105	118	118	118
S	73	80	85	92	98	105	110	117
T(Type B)	19	19	24	24	24	24	38	45
T(Type C)	19	19	24	24	24	24	32	32
W	156	156	210	210	210	236	236	236

## constant support horizontal type-F

model : CSH-F



## install length. Dimensions (mm)

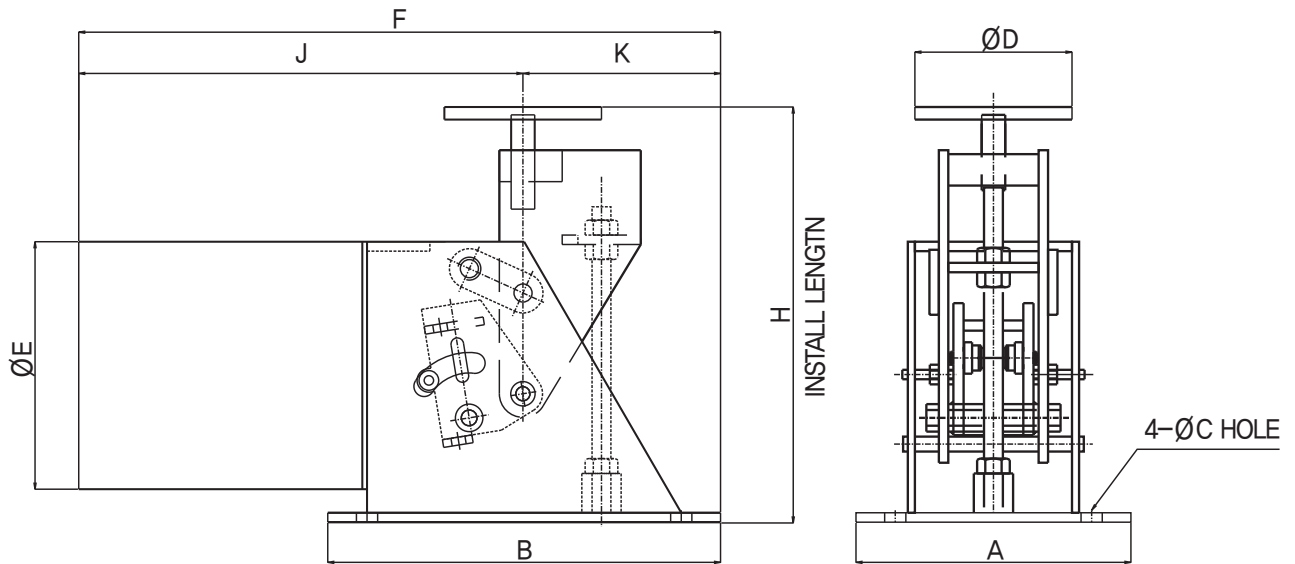
No.	hanger size	Total Travel	Bottom Plate (TxAxB)				Load Flange D	Casing $\Phi$ ExF	factor
			T	A	B	Hole C			
1	1~9	140 or less	6	200	300	15	9Tx $\Phi$ 125	$\Phi$ 156 x 461	317
2	1~9	200 or less	6	200	350	15	9Tx $\Phi$ 125	$\Phi$ 156 x 511	367
3	10~18	140 or less	9	250	450	23	9Tx $\Phi$ 125	$\Phi$ 210 x 615	460
4	10~18	205 or less	9	250	450	23	9Tx $\Phi$ 125	$\Phi$ 210 x 615	500
5	10~18	230 or less	9	250	450	23	9Tx $\Phi$ 125	$\Phi$ 210 x 615	550
6	19~34	150 or less	12	350	500	23	12Tx $\Phi$ 200	$\Phi$ 315 x 817	505
7	19~34	240 or less	12	350	550	23	12Tx $\Phi$ 200	$\Phi$ 315 x 867	560
8	19~34	290 or less	12	350	600	23	12Tx $\Phi$ 200	$\Phi$ 315 x 917	610
9	35~49	165 or less	16	400	600	23	16Tx $\Phi$ 200	$\Phi$ 350 x 958	668
10	50~63	165 or less	16	400	700	23	19Tx $\Phi$ 260	$\Phi$ 450 x 1315	734
11	50~63	205 or less	16	400	700	23	19Tx $\Phi$ 260	$\Phi$ 450 x 1315	764
12	64~74		19	550	850	23	25Tx $\Phi$ 300	$\Phi$ 565x 1664	950

$$\text{Install length(H)} = (\text{factor}) \pm \frac{\text{Actual Travel}}{2}$$

( + : Moving down, - : Moving up )

constant support horizontal type-F

model : CSH-F



"J" Dimensions (mm)

Size	TOTAL TRAVEL													
	75	90	100	115	125	140	150	165	180	190	205	215	230	240
1~9	295	309	318	332	341	355	364	378	392	401	415	424	438	447
10~18	374	388	397	411	420	434	443	457	471	480	494	503	517	526
19~34	566	580	589	603	612	626	635	649	663	672	686	695	709	718
35~49	667	381	690	704	713	727	736	750	764	773	787	796	810	819
50~63	972	986	995	1009	1018	1032	1041	1055	1069	1078	1092	1101	1115	1124
64~83	1187	1201	1210	1224	1233	1247	1256	1270	1284	1293	1307	1316	1330	1339

NOTE :  $K = F - J$

## constant support

## weight (approx) kg

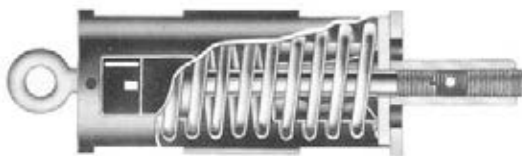
hanger size	CSV						CSH				Hanger size	CSV						CSH						
	type A	B	C	D	E	F	type G	type A	B	C		D	E	type F	type A	B	C	D	E	type F				
1	-	-	-	-	-	-	-	8					12	56	302				638	261				392
2	-	-	-	-	-	-	-	8					12	57	302				638	279				419
3	-	-	-	-	-	-	-	8					12	58	320				675	279				419
4	-	-	-	-	-	-	-	10					15	59	320				675	279				419
5	-	-	-	-	-	-	-	10					15	60	320				675	279				419
6	-	-	-	-	-	-	-	10					15	61	338				710	297				446
7	-	-	-	-	-	-	-	10					15	62	338				710	297				446
8	-	-	-	-	-	-	-	10					15	63	338				710	297				446
9	-	-	-	-	-	-	-	10					15	64	666				-	556				834
10	28						73	24					36	65	666				-	556				834
11	28						73	24					36	66	711				-	601				902
12	28						73	24					36	67	711				-	601				902
13	29						75	25					38	68	711				-	601				902
14	29						75	25					38	69	750				-	640				960
15	29						75	25					38	70	750				-	640				960
16	32						80	27					41	71	750				-	640				960
17	32						80	27					41	72	795				-	689				1034
18	32						80	27					41	73	795				-	689				1034
19	74						168	68					102	74	795				-	689				1034
20	74						168	68					102	75	1070				-	894				-
21	75						170	69					104	76	1070				-	894				-
22	75						170	69					104	77	1070				-	894				-
23	75						170	69					104	78	1102				-	916				-
24	78						176	72					108	79	1102				-	916				-
25	78						176	72					108	80	1102				-	916				-
26	82						176	72					108	81	1166				-	989				-
27	82						184	76					114	82	1166				-	989				-
28	82						184	76					114	83	1166				-	989				-
29	82						184	76					114	84	1236				-	1048				-
30	85						190	79					119	85	1236				-	1048				-
31	85						190	79					119	86	1302				-	1114				-
32	85						190	79					119	87	1302				-	1114				-
33	88						197	83					125	88	1302				-	1114				-
34	88						197	83					125	89	1393				-	1204				-
35	136						307	127					191	90	1393				-	1204				-
36	136						307	127					191	91	1431				-	1243				-
37	136						307	127					191	92	1431				-	1243				-
38	143						320	134					201	93	1476				-	1288				-
39	143						320	134					201	94	1476				-	1288				-
40	143						320	134					201	95	1973				-	1780				-
41	151						336	142					213	96	1973				-	1780				-
42	151						336	142					213	97	1973				-	1780				-
43	151						336	142					213	98	1973				-	1780				-
44	156						346	147					221	99	2121				-	1928				-
45	156						346	147					221	100	2121				-	1928				-
46	156						346	147					221	101	2121				-	1928				-
47	163						361	154					231	102	2121				-	1928				-
48	163						361	154					231	103	2404				-	2211				-
49	163						361	154					231	104	2404				-	2211				-
50	273						590	232					348	105	2404				-	2211				-
51	273						590	232					348	106	2404				-	2211				-
52	284						602	243					365	107	2631				-	2427				-
53	284						602	243					365	108	2631				-	2427				-
54	284						602	243					365	109	2631				-	2427				-
55	302						638	261					392	55	2631				-	2427				-

■ Based on 915mm 'C-C' dimension and 205mm total travel.

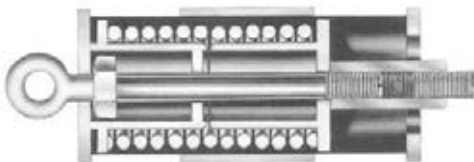
## sway brace

model : SBS - A  
SBS - B

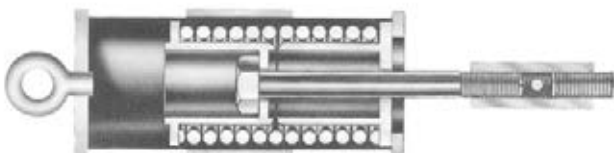
The Unison vibration control and sway brace presents a neat, compact appearance.



Cut-away section shows simplicity of exclusive single spring design.



Deflection of single spring occurs when thrust exceeds pre-compression.



Tension causes deflection of single spring in posite direction.

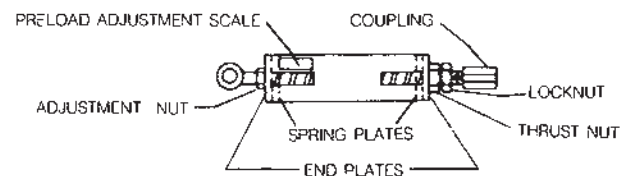
above exhibits are model SBS-A

**SERVICE** : Recommended for controlling vibration; absorbing shock loading; guiding or restraining the movement of pipe resulting from thermal expansion; bracing a pipe line against sway.

**ADJUSTMENT** : The sway brace should be in the neutral position when the system is hot and operating, at which time both spring plates should be in contact with the end plates. If they are not, the sway brace should be adjusted to the neutral position by use of the load coupling.

**PRELOAD ADJUSTMENT - model SBS - B**

Turn the preload adjustment nut until desired preload is indicated. Turn thrust nut until it is in contact with the spring plate. Lock in position. Indicated deflection must be greater than thermal movement.

**FEATURES :**

- Vibration is opposed with an instantaneous counter force bringing the pipe back to normal position.
- A single energy-absorbing pre-loaded spring provides two way action.
- One spring saves space and simplifies design.
- Spring has 75mm travel in either direction.
- Accurate neutral adjustment assured.

**ADDITIONAL FEATURE - model SBS - B**

- The model SBS-B sway brace is adjustable from the initial preload to the maximum capacity of the unit selected. It is equipped with a load-deflection scale to facilitate preload adjustment.

**ORDERING** : Specify model name and sway brace size. The Unison model SBS-A and SBS-B consist of the vibration control and sway brace only. Available corrosion resistant as C-SBS-A and C-SBS-B.

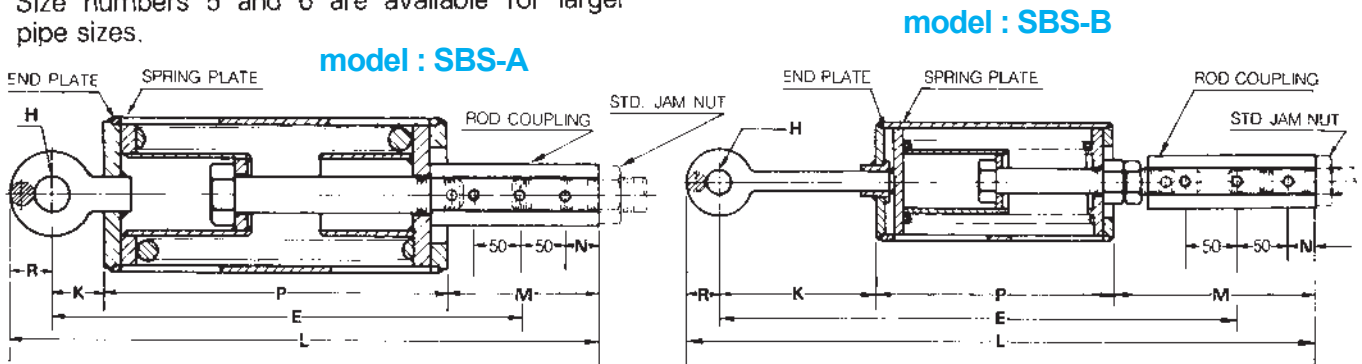


**SIZE SELECTION :** The Unison vibration control and sway brace gives full deflection forces from 90 to 3265kg and has initial precompressed spring forces from 23 to 815kg to dampen vibrations, oppose pipe sway and absorb shock forces.

The exact amount of energy needed to control piping should be in proportion to the mass, amplitude of movement, and nature of disturbing forces acting on the pipe. When it is possible to calculate the exact restraining force required, the size of the vibration control and sway brace capable of providing this force should be selected. To simplify the selection of size, Unison engineers have designed the vibration and control and sway brace in six sizes that are readily related to nominal pipe size. For pipe sizes 90A(3 1/2B) and smaller, the size no.1 is recommended; for 100A to 200A (4B to 8B), the size no.2; for 250A to 400A(10B to 16B), the size no.3; and for 450A to 600A(18B to 24B) the size no.4. Size numbers 5 and 6 are available for larger pipe sizes.

**INSTALLATION :** (1) Attach rear bracket to structure and pipe attachment to piping or equipment. (2) Connect coupling to pipe attachment and turn coupling so that spring is compressed in direction opposite to and by approximate amount of piping thermal movement.

**IMPORTANT :** Final adjustment should be made with the pipe in its hot or operating position. Turn the coupling until both spring plates are in contact with the end plates of the sway brace. When correct tension adjustments are completed, the brace exerts no force on the pipe in its operating position. Under shutdown conditions, the brace allows the pipe to assume its cold position. It exerts a nominal cold strain force equal to the pre-load force plus the amount of travel from the hot to cold position, times the spring scale of the particular size of the vibration control and sway brace.



model : SBS-A

sway brace size	for pipe size	preload and spring scale, kg	max force kg	weight (approx) each, kg	rod size model SBS-C	pipe size model SBS-D	eye, H diam hole	D	rod take-out E	K	L	M	N	P	R
1	50A (2B) to 90A (3 1/2B)	23	90	10.0	M20	40A(1 1/2B)	26	114	350	45	458	155	25	225	33
2	100A (4B) to 200A (8B)	68	272	11.3	M24	50A( 2B)	26	114	370	45	478	155	25	245	33
3	250A (10B) to 400A (16B)	205	816	16.3	M24	50A( 2B)	26	114	455	45	563	155	25	330	33
4	450A (18B) to 600A (24B)	408	1633	29.0	M30	50A( 2B)	40	168	435	60	569	170	38	293	46
5	▲	612	2450	35.8	M36	65A(2 1/2B)	40	168	472	60	606	170	38	330	46
6	▲	815	3265	43.0	M36	65A(2 1/2B)	40	168	522	60	656	170	38	380	46

model : SBS-B

sway brace size	for pipe size	preload and spring scale, kg	max force kg	weight (approx) each, kg	rod size model SBS-E	pipe size model SBS-F	eye, H diam hole	D	rod take-out E	K max	L	M min	N	P	R
1	50A to 90A	23	90	10.4	M20	40A(1 1/2B)	26	114	508	150	616	200	25	233	33
2	100A to 200A	68	272	11.8	M24	50A( 2B)	26	114	527	150	635	200	25	252	33
3	250A to 400A	205	816	17.2	M24	50A( 2B)	26	114	613	150	721	200	25	338	33
4	450A to 600A	408	1633	30.4	M30	50A( 2B)	40	168	619	167	753	235	38	305	46
5	▲	612	2450	37.2	M36	65A(2 1/2B)	40	168	657	167	791	235	38	343	46
6	▲	815	3265	44.5	M36	65A(2 1/2B)	40	168	708	167	842	235	38	394	46

▲ As specified by customer.

sway brace

model : SBS-C, SBS-D  
SBS-E, SBS-F

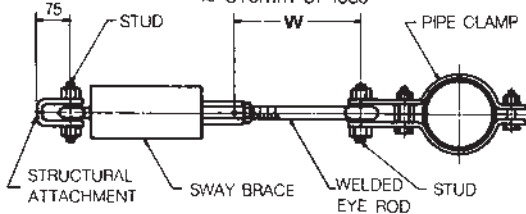
The model SBS-C and model SBS-E consist of a structural attachment, two studs, the sway brace, rod up to 610mm in length as required, and a modified model PCDB pipe clamp. The model SBS-D and model SBS-F consist of a structural attachment, two studs, the sway brace, steel pipe 635mm in length or over as required, an adapter and a modified model PCDB pipe clamp.

**HOW TO SIZE ASSEMBLIES :** When using a sway brace as sized for pipe in the table below the "W" dimension, required for ordering, can be obtained as follows: Subtract from the overall dimension (wall to the center of the pipe) the "X" dimension given below. The resultant figure is the "W" dimension. "X" is not shown as a dimension on the line cuts.

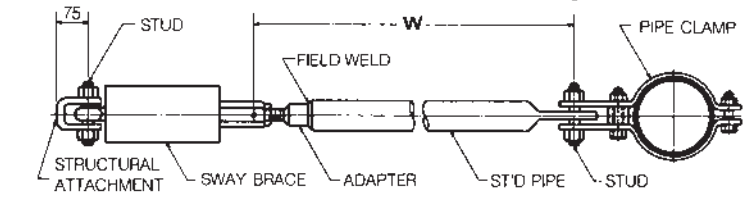
In specifying sway brace assemblies where the "W" dimension exceeds 610mm in length, the model SBS-D assembly is recommended.

**ORDERING ASSEMBLIES :** Specify model name sway brace size, pipe size, "W" dimension. Available corrosion resistant as C-SBS-C, C-SBS-D, C-SBS-E and C-SBS-F.

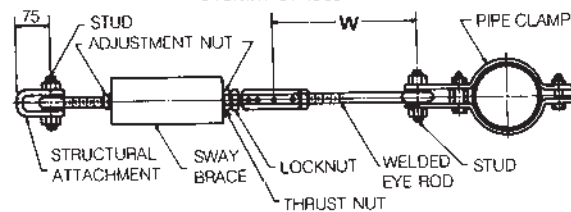
**model SBS-C** recommended when W dimension is 610mm or less



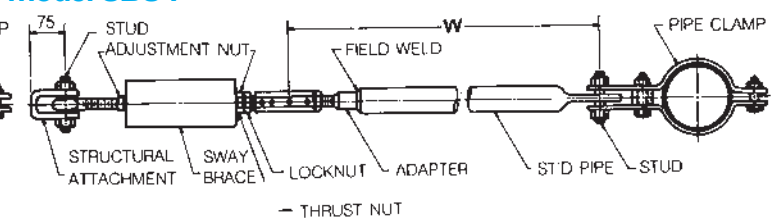
**model SBS-D** recommended when W dimension is greater than 610mm.



**model SBS-E** recommended when W dimension is 610mm or less



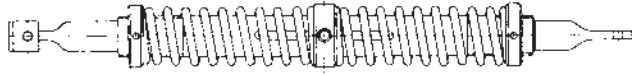
**model SBS-F** recommended when W dimension is greater than 610mm.



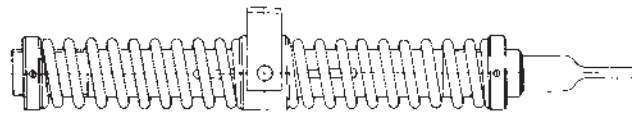
nominal pipe size	sway brace size	distance center of pipe to outside stud of pipe clamp	X		W			
			model SBS-C SBS-D	model SBS-E SBS-F	model SBS-C, SBS-E		model SBS-D, SBS-F	
					min	max	min	max
50A( 2B)	1	130	555	713	200	610	635	2290
65A(2 1/2 B)		135	560	718				
80A( 3B)		150	575	733				
90A(3 1/2 B)		155	580	738				
100A( 4B)	2	165	610	767	215	610	635	2200
125A( 5B)		195	640	797				
150A( 6B)		215	660	817				
200A( 8B)		240	685	842				
250A(10B)	3	265	795	953	215	610	635	2010
300A(12B)		300	830	988				
350A(14B)		320	850	1008				
400A(16B)		345	875	1033				
450A(18B)	4	370	880	1064	245	610	635	1900
500A(20B)		400	910	1094				
600A(24B)		460	970	1154				

sway brace

model : SBD-A  
SBD-B



model : SBD-A



model : SBD-B

SBD-type units are constructed with 2 equivalent springs initially compressed facing each other and are identical in their functions. When external force does not act on them, the forces of springs on both sides are balanced.

$$L_{f1} - L_1 = L_{f2} - L_2$$

$L_{f1}$  : free length of spring #1

$L_{f2}$  : free length of spring #2

$L_1$  : compressed length by adjustable nut of spring #1

$L_2$  : compressed length by adjust ring of spring #2

Both Springs are identical, hence,

$$L_{f1} = L_{f2} = L_f \quad L_1 = L_2 = L \quad K_1 = K_2 = K$$

Force on spring #1 will be  $(L_f - (L - \delta_B)) \times K$  and force on spring #2 will be  $(L_f - (L + \delta_B)) \times K$  in the case of (b) in Fig. 1.

Different force between spring #1 and #2 will be  $(L_f - (L - \delta_B)) \times K - (L_f - (L + \delta_B)) \times K = 2K\delta_B$ .

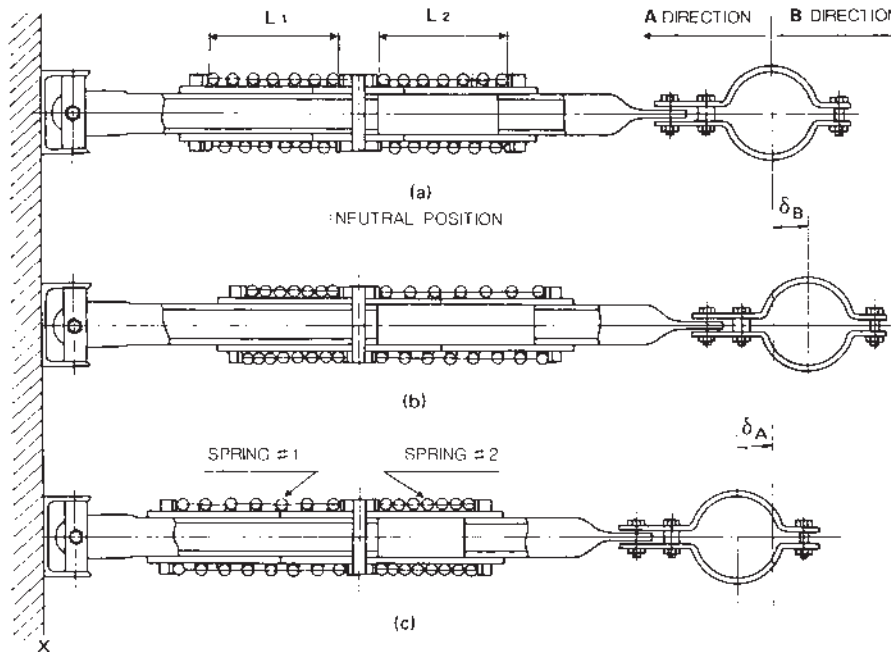


Fig 1. Operation of model SBD type

As above, sway brace of types SBD exhibit the antivibration force of  $2K\delta_B$  when the pipe line moves by an amplitude  $\delta_B$ ; in other words, it is unavoidable with them that the relevant pipe line moves slightly.

The load characteristic concerned then results as shown in Fig. 3.

On the contrary, with sway braces type SBS, the pipe line is not displaced when the origin of load characteristic is set as shown in Fig.2 during operation unless a vibrating force greater than the initial compressive force is produced. It can be installed in cold condition when thermal travel is very limited, but otherwise it should be

installed in hot condition. When it is not easy to install the unit during operation, the installation in cold condition may be performed. However, an adjustment by means of turnbuckle will be required in order to eliminate the spring reaction force in hot condition.

As in general term, displacement due to thermal expansion is greater than vibrating amplitude, it may be recommendable to minimize the initial deflection within a range not lower than piping amplitude in order to reduce the resistance force of a sway brace in cold condition and to increase its restricting force with respect to the vibration.

sway brace

model : SBD - A  
SBD - B

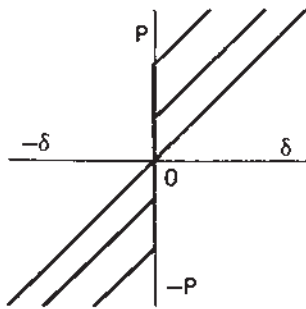


Fig 2. type SBS

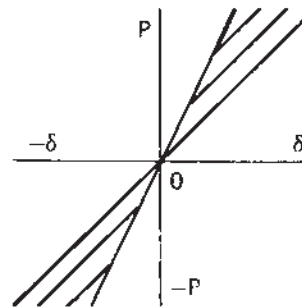


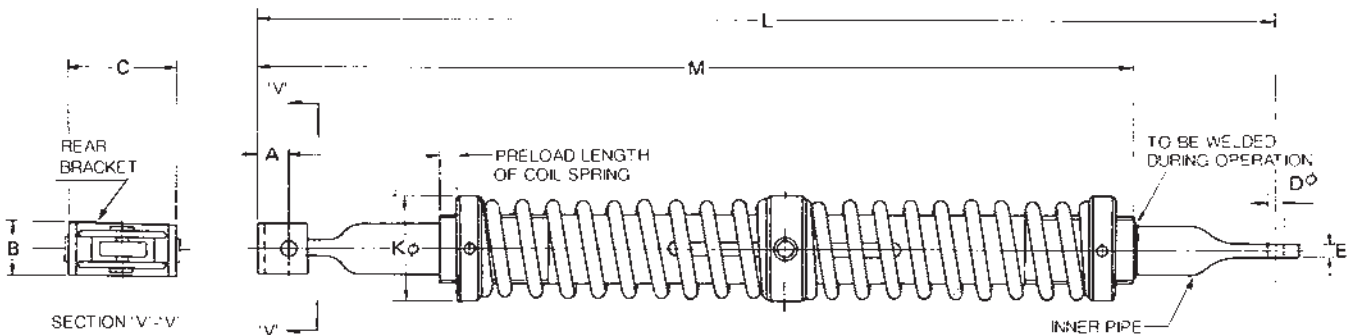
Fig 3. type SBD

FEATURES :

- Piping is free from extra load by springs when there is no vibration in the piping.
- Control force will be equal to twice as much as the single spring constant.

- Preload can be adjusted by means of adjusting nuts.
- Swivel joint is adaptable three-dimensional movements of piping.
- Available where installation space is limited.

model : SBD-A



weights · dimensions (mm)

dim \ size	3	4	6	10	3A	4A	6A	10A
A	50	65	65	70	50	65	65	70
B	40	60	60	70	40	60	60	70
C	150	180	180	200	150	180	180	200
D	As specified							
D (MAX)	20	30	30	30	20	30	30	30
E	7	10	10	10	7	10	10	10
K	80	110	110	125	80	110	110	125
M	825	865	900	965	1165	1185	1205	1295
L	As specified, but limitation below.							
L (MIN)	950	1000	1050	1150	1300	1320	1350	1450
L (MAX)	4000	4500	3500	3500	4000	4500	3500	3500
weight, kg	10.5	20	23	30	13.5	25	35	40
spring rate, kg/mm	3.4	6.5	15.9	20.6	2.2	4.3	10.3	13.2
max. deflection, mm	110	100	90	100	170	150	135	140
anti-vibration force, kg	374	650	1431	2060	374	645	1390	1850

sway brace

model : SBD - A  
SBD - B

HOW TO SIZE :

It is so far more desirable with this setting if it has been verified by calculation that there is no causable by a statical force that will be generated to the pipe line in cold condition.

Approximate force F (Kg) required for damping the vibration of a pipe line can be given by the following formula when the weight of the pipe line to which the sway brace is attached between restraints on both sides is assumed to be W (Kg) :

$$F = a\beta W$$

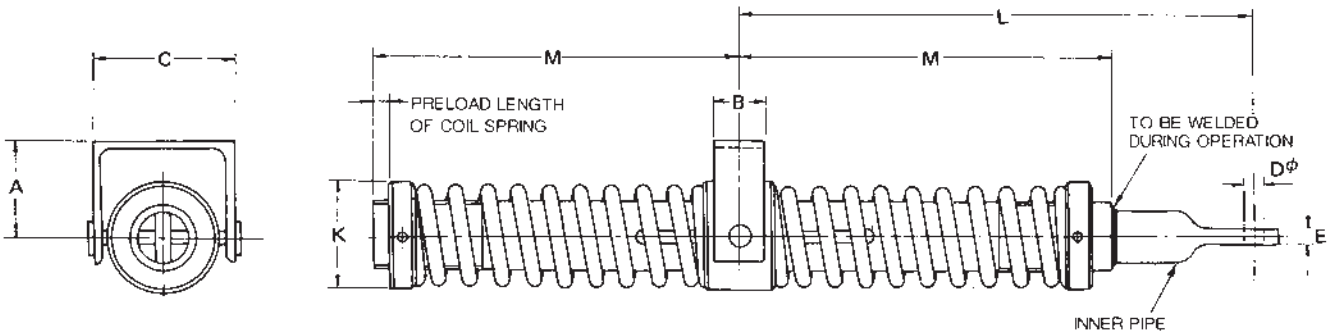
Where, *a* stands for the ratio between vibration acceleration at fitting point and gravitational acceleration, and *β* for the conversion factor from vibrating pipe weight to equivalent concentrated mass.

A general suggestion is :  $a=0.5$  and  $\beta=0.5$ , then, it results,

$$F = 0.25W$$

To select the proper size of sway brace, above formula can give the inertia force of vibrating mass, however, for this purpose, it is necessary to get values regarding vibration frequency, amplitude and mass beforehand. Unison has defined applicable pipe sizes for various types of sway braces and prepared a Size Table backed up by our long past experience so that the customers may select required sizes easily.

model : SBD-B



weights • dimensions (mm)

dim \ size	3	4	6	10	3A	4A	6A	10A
A	70	100	100	115	75	100	100	115
B	50	65	65	75	50	65	65	75
C	110	150	150	180	110	150	150	180
D	As specified							
D (MAX)	20	30	30	30	20	30	30	30
E	7	10	10	10	7	10	10	10
K	80	110	110	125	80	110	110	125
M	300	320	355	380	440	470	490	530
L	As specified, but limitation below.							
L (MIN)	420	450	500	550	560	600	620	700
L (MAX)	3500	4000	3000	3000	3500	4000	3000	3000
weight	10	19.5	23	30	13.5	25	35	38
spring rate	3.4	6.5	15.9	20.6	2.2	4.3	10.3	13.2
max. deflection	110	100	90	100	170	150	135	140
anti-vibration force	374	650	1431	2060	374	645	1390	1850



sway brace

model : SBD - A  
SBD - B

**INSTALLATION:** (1) Attach rear bracket to structure and pipe attachment to piping or equipment. (2) Fit the sway brace body to the bracket on pipe clamp side (only for model SBD-B). (3) Connect rear bracket with inner pipe for model SBD-B or with the sway brace body for model SBD-A. (4) Match sway brace body with inner pipe and cut off inner pipe partially so that it may be inserted into sway brace body for about 50-100mm.

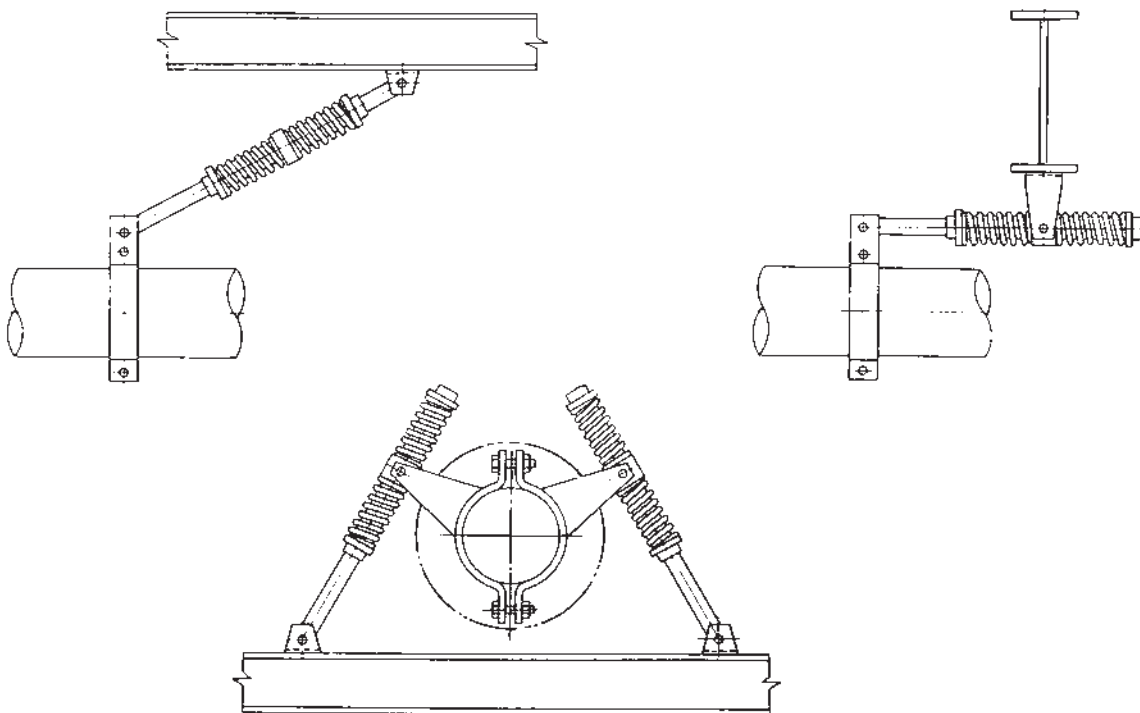
An inner pipe inserted longer than this length may affect functions of sway brace. (5) Insert inner pipe into the sway brace body and fasten bolts and nuts of the pipe clamp. (6) Weld inner pipe to the specified position of the sway brace body, during operation.

**ORDERING:** Specify model name, pipe size, sway brace size, overall length between pipe center line and wall or structure and anti-vibration on force if available.

general application:

model	size	application	pipe size
SBD-A	3		3B and less
	4		4B~5B
	6		6B~8B
	10		10B and over
	3A	large travel pipe	3B and less
	4A		4B~5B
	6A		6B~8B
SBD-B	10A		10B and over
	3	narrow spaced pipe	3B and less
	4		4B~5B
	6		6B~8B
	10		10B and over
	3A	large travel and narrow spaced pipe	3B and less
	4A		4B~5B
	6A		6B~8B
10A	10B and over		

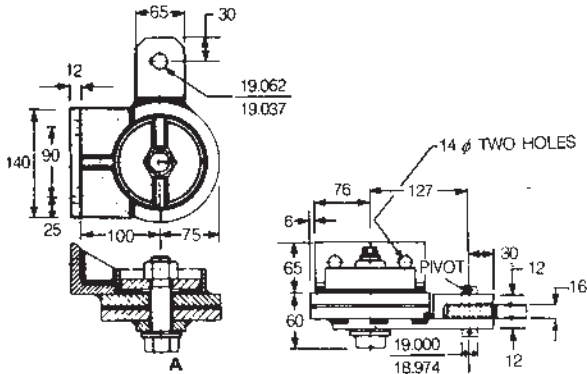
Various application of SBD type



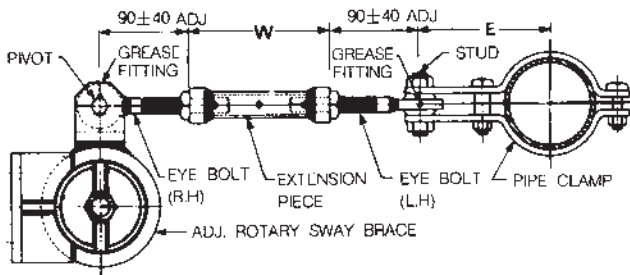
sway brace

model : SBG  
SBH

model : SBG



model : SBH



The model SBG Adjustable Rotary Sway brace consists of a stationary shoe, a movable disc with a radial arm, a friction material, and a means of adjusting and maintaining the friction force at a desired value. An adjustable strut is required to connect the radial arm of the device to the piping or equipment in which vibrations are to be dampened

dimensions(mm)

nominal pipe size	"E"	"X"
50A( 2B)	130	422
65A(2 1/2B)	135	427
80A( 3B)	150	442
90A(3 1/2B)	155	447
100A( 4B)	165	457
125A( 5B)	195	487
150A( 6B)	215	507
200A( 8B)	240	532
250A( 10B)	265	557
300A( 12B)	300	592
350A( 14B)	320	612
400A( 16B)	345	637
450A( 18B)	370	662
500A( 20B)	400	692
600A( 24B)	460	752

**SIZE RANGE:** Available in two sizes, 0-225kg and 0-635kg fully adjustable over entire range.

**SERVICE:** Recommended for controlling vibration, absorbing shock, restraining pipe movement as a result of thermal expansion, and bracing a pipe against sway.

**INSTALLATION:** Can be welded or bolted to wall or bulkhead.

Installation must be made so that the strut is positioned at 90° to and in the plane of the radial arm. Securely fasten the stationary shoe to a rigid base by two M12 bolts. Loosen bolt "A" so that the radial arm can be rotated by hand and positioned at a 90° angle to the strut which connects it to the piping or equipment. Adjust the strut to the proper length and tighten lock nuts. Tighten bolt "A" so that the indicator is at the proper setting (1 to 10) to obtain the desired resisting force.

**NOTE:** When used as a vibration dampener, it should be located at a point where thermal movement is at a minimum, since the setting required for vibration control may be great enough to inhibit normal thermal movement.

**ADJUSTMENT:** One nut adjustment with graduated indicator. Each graduation is 10% of total range.

**FEATURES:**

- Uniform loading throughout travel.
- One spring-simple adjustment.

**ORDERING:** Model SBG Adjustable Rotary Sway Brace only:

Specify model name, size number. Specify load setting if required to be set at factory.

Model SBH Adjustable Sway Brace Assembly:

Specify model name, size number, pipe size and "W" dimension (maximum "W" is 610mm). Specify load setting if required to be set at factory. The "W" dimension is calculated by subtracting from the overall dimension (wall to center of pipe) the "X" dimension shown. The "X" dimension is not shown as a dimension on the line cut.

**loads • weights**

size no.	load range-kg	weight(approx) kg each
1	0-225	11
2	0-635	11

## sway strut

model : SSA  
SSB  
C-SSA

sway strut assembly : model SSA  
corrosion resistant : C-SSA  
field alterable strut : model SSB



**SERVICE :** Used to restrain movement of piping in one direction while providing for movement due to thermal expansion or contraction in another direction.

**HOW TO SIZE :**

1. Select size consistent with max. load to be restrained.
2. Determine distance from structural steel to center of pipe and subtract from it, pipe clamp take out (dim. E) for pipe size being restrained and rear bracket (dim. A) for size selected. This will give required C to C dimension. Check to be within limits of min. and max. C-C dimension listed for size selected.
3. Determine W dimension by subtracting (2 times dimension F) from C-C dimension.

**INSTALLATION :** Shipped assembled. Securely fasten bracket to structure, make necessary adjustment in overall length and fasten clamp to pipe.

**FEATURES :**

- Effective under either tensile or compressive force.
- Provides 90mm (model SSA) or 50mm (model SSB) of field adjustment in either direction.
- Self-aligning bushings permit  $\pm 5^\circ$  misalignment or angular motion. Bushings are coated with a dry lubricant.

**ORDERING :** Specify model name, assembly size, option number if other than standard configuration is required or nominal pipe size or special O.D, and "W" dimension. Alloy pipe clamps are available as a special order. The rear bracket assembly may be ordered separately.

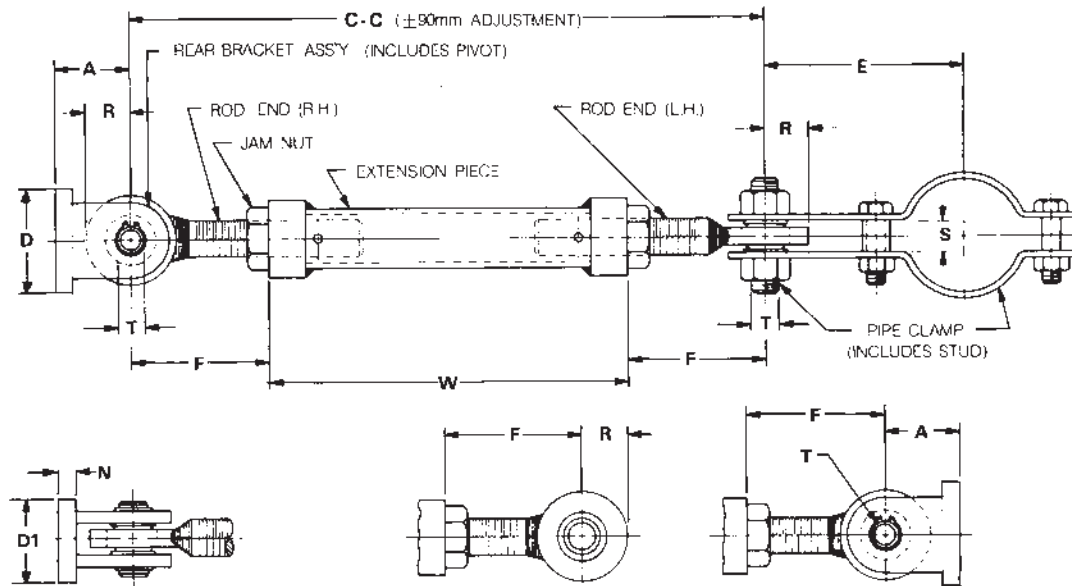
For restraint parallel to the pipe axis using two sway strut assemblies, a riser clamp is available. If a riser clamp is required, consult with **Unison** for information about this clamp.

**E-TAKE OUT**

pipe size	M20 rod end size	M24 rod end size	M30 & M36 rod end size	M42 & M48 rod end size	M56 rod end size	M64 rod end size	M80 rod end size	M100 rod end size
	size A	size B & C	size 1 & 2	size 3 & 4	size 5	size 6	size 7	size 8
20A( 3/4B)	60	180	-	-	-	-	-	-
25A( 1B)	65	180	-	-	-	-	-	-
32A(1 1/2B)	70	180	-	-	-	-	-	-
40A(1 1/2B)	105	180	-	-	-	-	-	-
50A( 2B)	130	180	180	205	255	-	-	-
65A(2 1/2B)	135	180	180	205	255	-	-	-
80A( 3B)	150	180	180	205	255	-	-	-
90A(3 1/2B)	155	180	180	205	255	-	-	-
100A( 4B)	165	185	185	215	255	-	-	-
125A( 5B)	195	195	195	230	255	-	-	-
150A( 6B)	215	215	215	255	255	300	-	-
200A( 8B)	240	240	240	285	285	320	-	-
250A(10B)	265	265	265	325	325	360	360	415
300A(12B)	-	300	300	350	350	390	390	440
350A(14B)	-	320	320	370	370	405	415	455
400A(16B)	-	345	345	385	385	435	445	485
450A(18B)	-	370	370	415	415	465	470	515
500A(20B)	-	400	400	450	450	490	500	545
600A(24B)	-	460	460	505	505	550	550	610
750A(30B)	-	540	540	585	585	635	635	710
900A(36B)	-	610	610	675	675	715	715	795

sway strut

model : SSA



OPTION 1

OPTION 2

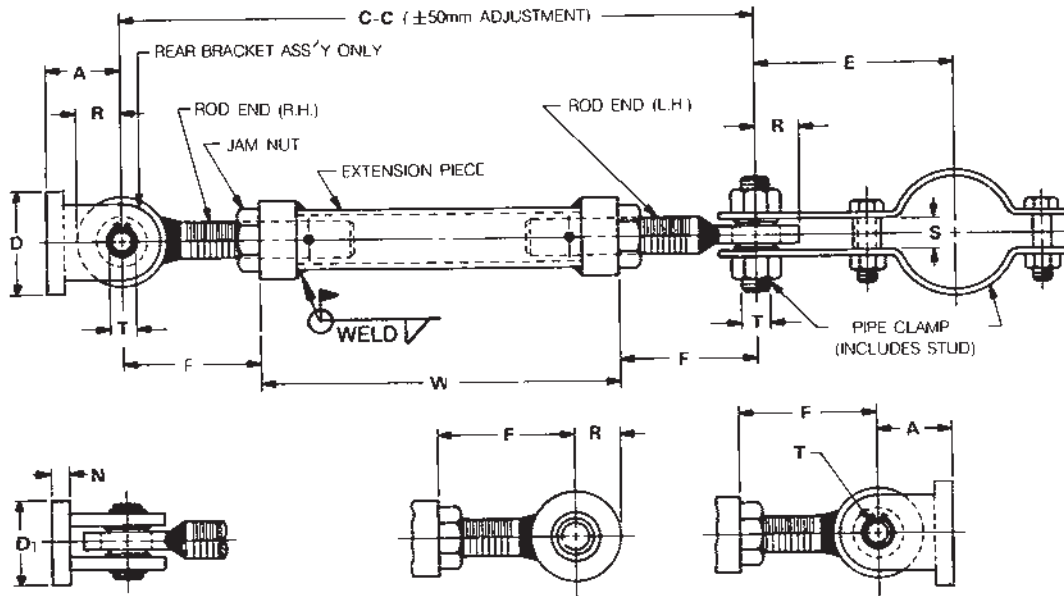
loads • dimensions (mm)

size	load <sup>■</sup> kg	rod end	extension piece	A	C-C		W		F	D	D <sub>1</sub>	N	R	S	T <sub>nom.</sub>
					max	min	max	min							
A	295	M 20	25A( 1B)	25	1525	425	1335	235	95	73	38	6	15	15	10
B	680	M 24	40A(1½B)	55	2745	500	2495	250	125	127	92	12	35	35	20
C	2040	M 24	50A( 2B)	55	3055	500	2805	250	125	127	92	12	35	35	20
1	3630	M 30	50A( 2B)	65	3050	540	2790	280	130	114	77	19	40	35	25
2	5275	M 36	65A(2½B)	65	3050	560	2770	280	140	114	77	19	40	35	25
3	7120	M 42	65A(2½B)	85	3050	610	2720	280	165	137	90	24	50	45	30
4	9390	M 48	80A( 3B)	85	3050	675	2700	325	175	137	90	24	50	45	30
5	12340	M 56	80A( 3B)	100	3050	715	2660	325	195	155	108	32	65	50	40
6	15195	M 64	100A( 4B)	125	3050	765	2610	325	220	200	137	45	75	60	45
7	30935	M 80	100A( 4B)	145	3050	885	2540	375	255	232	160	50	90	75	50
8	54430	M100	150A( 6B)	185	3050	1080	2400	430	325	355	222	60	120	90	60

■ Loads must not be applied outside a 10° included angle cone of action to the pipe clamp axis without special authorization.

sway strut

model : SSB



OPTION 1

OPTION 2

loads • dimensions (mm)

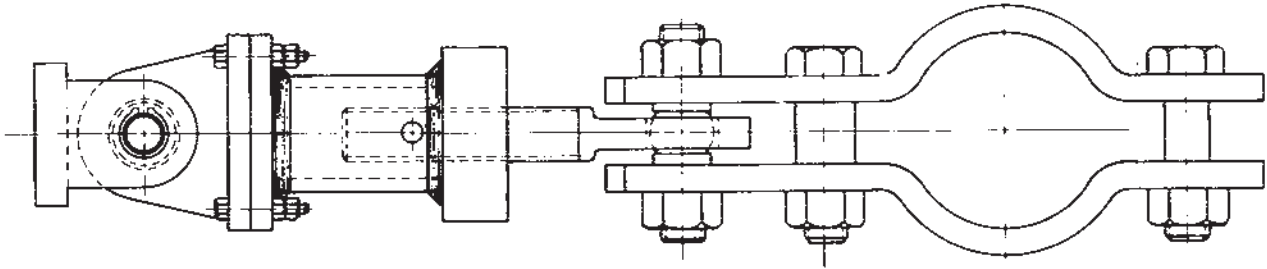
size	load <sup>■</sup> kg	rod end	extension piece	A	C-C		F	D	D <sub>1</sub>	N	R	S	T <sub>nom.</sub>	Weld
					max	min								
A	295	M 20	25A( 1B)	25	1525	335	75	73	38	6	15	15	10	5
B	680	M 24	40A(1½B)	55	2440	415	110	127	92	12	35	35	20	5
C	2040	M 24	50A( 2B)	55	2440	415	110	127	92	12	35	35	20	5
1	3630	M 30	50A( 2B)	65	2440	460	115	114	77	19	40	35	25	8
2	5275	M 36	65A(2½B)	65	2440	475	120	114	77	19	40	35	25	8
3	7120	M 42	65A(2½B)	85	2440	520	145	137	90	24	50	45	30	8
4	9390	M 48	80A( 3B)	85	2440	580	155	137	90	24	50	45	30	10
5	12340	M 56	80A( 3B)	100	2440	620	180	155	108	32	65	50	40	10
6	15195	M 64	100A( 4B)	125	2440	665	200	200	137	45	75	60	45	10
7	30935	M 80	100A( 4B)	145	2440	785	235	232	160	50	90	75	50	16
8	54430	M100	150A( 6B)	185	2440	985	305	355	222	60	120	90	60	19

■ Loads must not be applied outside a 10° included angle cone of action to the pipe clamp axis without special authorization.



mini-sway strut assembly

model : SSC



(see next page for dimensions)

E - TAKE OUT

pipe size	M20 rod end size	M24 rod end size	M30 & M36 rod end size
	size A	size B & C	size 1 & 2
20A( 3/4B)	60	180	-
25A( 1B)	65	180	-
32A(1 1/2B)	70	180	-
40A(1 1/2B)	105	180	-
50A( 2B)	130	180	180
65A(2 1/2B)	135	180	180
80A( 3B)	150	180	180
90A(3 1/2B)	155	180	180
100A( 4B)	165	185	185
125A( 5B)	195	195	195
150A( 6B)	215	215	215
200A( 8B)	240	240	240
250A( 10B)	265	265	265
300A( 12B)	-	300	300
350A( 14B)	-	320	320
400A( 16B)	-	345	345
450A( 18B)	-	370	370
500A( 20B)	-	400	400
600A( 24B)	-	460	460
750A( 30B)	-	540	540
900A( 36B)	-	610	610

**MAXIMUM RECOMMENDED LOAD :** 3630 Kg

**SERVICE :** Used to restrain movement of piping in one direction while providing for movement due to thermal expansion or contraction in another direction.

**HOW TO SIZE :**

1. Select size consistent with max. load to be restrained.
2. Determine distance from structural steel to center of pipe and subtract from it, pipe clamp take out (dim. E) for pipe size being restrained and rear bracket (dim. A) for size selected. This will give required C to C dimension. Check to be within limits of min. and max. C-C dimension listed for size selected.

**INSTALLATION :** Shipped assembled. Securely fasten bracket to structure, make necessary adjustment in overall length, and fasten clamp to pipe.

**FEATURES :**

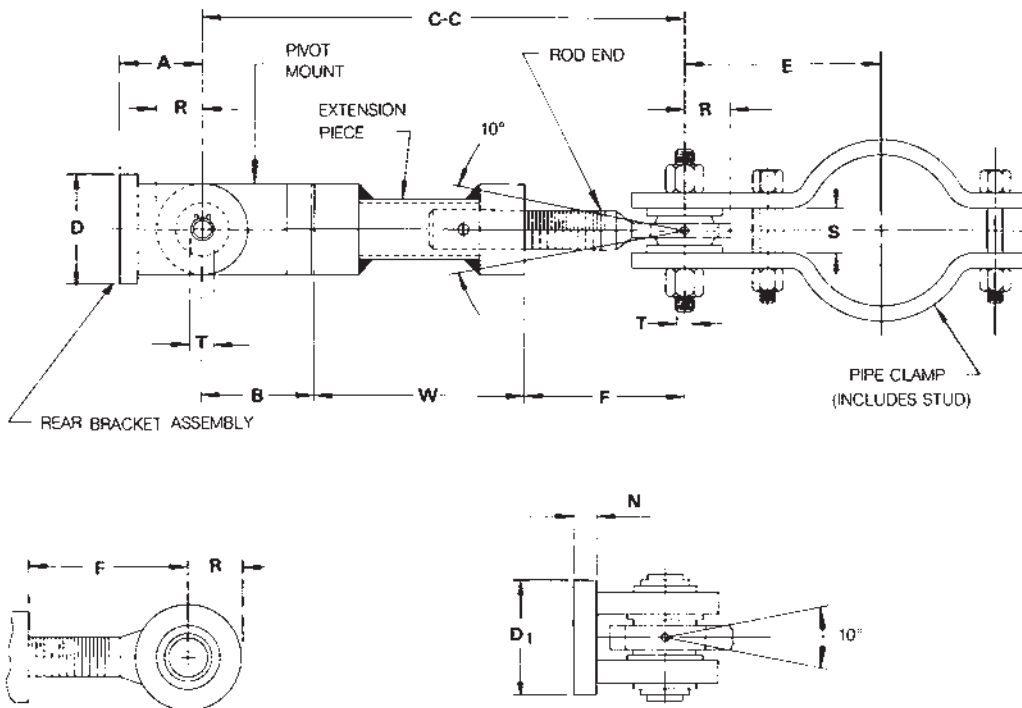
- Assembly provides a shorter C to C dimension.
- Effective under either tensile or compressive force.
- Self-aligning bushings permit  $\pm 5^\circ$  misalignment or angular motion. Bushings are coated with a dry lubricant.

**ORDERING :** Specify assembly size no, model name, pipe O.D. or option no. if other than standard, and load. Alloy pipe clamps are available as a special order.  
ex) SSC-A-2, 273mm O.D pipe, C-C=185mm

For restraint parallel to the pipe axis using two sway strut assemblies, a riser clamp is available. If a riser clamp is required, consult with **UNISON** for information about this clamp.

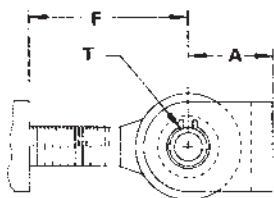
mini-sway strut assembly

model : SSC



OPTION 1

dimensions(mm)



OPTION 2

assembly size no.	C-C		F		W	
	max	min	max	min		
A	A-1	165	135	70	40	65
	A-2	220	165	110	55	80
	A-3	340	220	160	40	150
B & C	C-1	170	155	75	60	40
	C-2	200	170	90	60	55
	C-3	220	195	95	70	70
	C-4	280	225	125	70	100
	C-5	395	280	185	70	155
	C-6	500	395	235	130	210
1	1-1	230	205	95	70	55
	1-2	270	225	115	70	75
	1-3	300	260	120	80	100
	1-4	390	305	165	80	145
	1-5	550	385	245	80	225

size	rod end	A	D	D <sub>1</sub>	N	R	S	T nom.	B
A	M20	25	73	32	6	15	15	10	30
B	M24	55	127	92	12	35	35	20	55
C	M24	55	127	92	12	35	35	20	55
1	M30	65	115	75	19	40	35	25	80

On these sizes the extension piece consists of round bar stock that is drilled and tapped. Loads must not be applied outside a 10° included angle cone of action to the pipe clamp axis without special authorization.

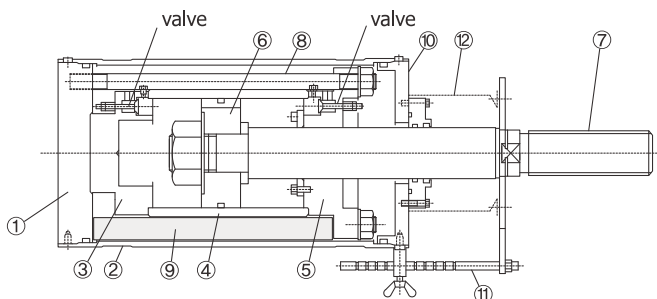
**NOTE :** The rear bracket assembly may be ordered separately.



Configuration

### HYDRAULIC SNUBBER

Hydraulic Snubber is a device developed to protect high pressure/temperature piping system in power generating plants and various types of industrial plants. They function to restrain undesirable displacement of piping system or components when they are about to oscillate due to seismic or other types of dynamic loading, while, to allow their free movement during the thermal displacement mode. Our hydraulic snubber is designed to provide such essential two-way functions by means of a sophisticated combination of hydraulic cylinder with a valve mechanism. A built-in flexible reservoir is also a dominant design feature. As an important step among entire development works, comprehensive design verifications and thorough testing were conducted to assure the highest reliability. Since they were put into service decades ago, they have been proving perfect trouble-free performance and excellent maintainability, and thus assuring maximum safeness for operation of various piping systems when they were subjected to occasional dynamic events.



1	Holder	5	Rod Cover	9	Accumulator
2	Casing	6	Piston	10	Casing Cover
3	Cylinder Cover	7	Piston Rod	11	Travel Indicator
4	Cylinder Tube	8	Tie-Rod	12	Canvas Cover

Design principle of our hydraulic snubber is a hydraulic system controlled by a valve mechanism. The magnitude of generated resistance force is a function of input velocity. Namely,  $CV^n = F$  ( C = constant, V = piston velocity, n = valve property, F = force generated)

- ① Hydraulic cylinder is fully enclosed in the outer casing and they are filled with hydraulic fluid. A piston divides the cylinder into two pressure chambers. They are hydraulically linked each other through a fluid path formed by a pair of popet valves and outer casing.
- ② A popet valve, being loaded by a built-in coil spring, stays open so far as the pressure in a fluid chamber is lower than the pre-determined threshold, and thus allowing reciprocal free movement of the piston during the thermal displacement mode of piping.
- ③ The cubic volume of lateral piston rod, penetrating one of the chambers, causes a difference in fluid volume in each chamber. An elastic accumulator, inserted between the cylinder wall and outer casing, functions as the self-adjustment means for offsetting the difference. For this design advantage, Model SNA snubber has no projection on the cylindrical body unlike conventional snubbers having outside oil reservoirs.
- ④ Dynamic input displacement gives a quick driving force to the piston. and then causes a rapid pressure increase inside the compressed chamber. The valve on the compressed chamber side closes and the fluid path is shut off on the spot. Complete stop of fluid flow generates the resistant force inside the cylinder to restrain the displacement.
- ⑤ The entire process takes place against a reverse loading, and completely suppress the dynamic loading.
- ⑥ The popet valve, having a fine slit on its head, keeps a minimum fluid flow even when it is in shut off position. For this design feature, the snubber unit is capable of allowing thermal displacement of the piping even during a dynamic oscillation of the piping system. This ability is defined by so-called release rate or bleed rate.

## Advantages :

- ① Reliable hydraulic system including precise valve mechanism assures stable and symmetrical performance in both loading directions.
- ② Self-contained oil reservoir eliminates fluid leakage from sealed connections.
- ③ High durability of sealing materials assures longer service duration without frequent maintenance works.
- ④ Well-engineered construction simplifies disassembling and re-assembling of the unit, assuring easier maintenance works.
- ⑤ Installable in a limited space because of a plain cylindrical contour.
- ⑥ Filled with thoroughly verified genuine hydraulic fluid.
- ⑦ Easy-to-read stroke indicator.

## Major Design Specifications :

### 1. Applicable Code and Standard

- ① JIS (Japanese Industrial Standard) Code
- ② MITI (Ministry of Trade and Industry) Code 501
- ③ ASTM (American Iron and Steel Institute) Standard
- ④ SSPC (Steel Structure Painting Council) Standard

### 2. Rated Load (Kgf)

Size No.	Rated Load	Size No.	Rated Load
SNA 03	300	SNA 16	16,000
SNA 06	600	SNA 25	25,000
SNA 1	1,000	SNA 40	40,000
SNA 3	3,000	SNA 60	60,000
SNA 6	6,000	SNA 100	100,000
SNA 10	10,000		

### 3. Standard Strokes (mm)

100mm	160mm	250mm	Extra strokes available on request
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### 4. Minimum Spring Rate (Kgf/mm)

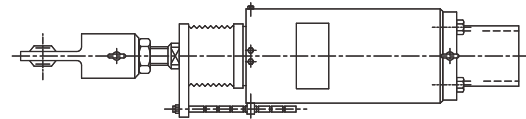
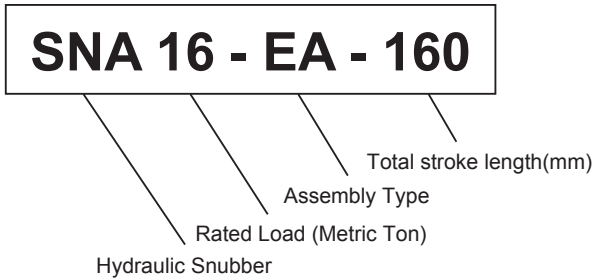
Stroke mm	100	160/250	Stroke mm	100	160/250
SNA-03	250	150	SNA-6	3,000	2,000
SNA-06	450	300	SNA-10	5,000	3,000
SNA-1	650	450	SNA-16	7,000	4,500
SNA-3	1,500	1,000	SNA-25	8,000	6,500

### 5. Design Parameters

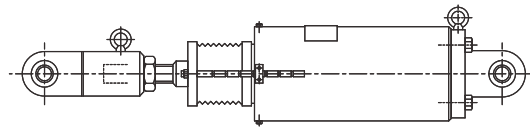
Design Parameters	Criteria
Drag Force (Frictional Resistance)	2% of the rated load, or 50Kgf. Whichever is greater.
Bleed Rate (Release Capacity)	0.5mm/Sec.
Lock-up Rate	0.1 ~ 0.4cm/sec.
Frequency Range	1 Hz ~ 33 Hz
Pressure Capacity	1.5 times of the rated load.
Loading Capacity (under rated load)	20,000 loading cycles.
Temperature Capacity Radiation Limit	-15°C ~ 60°C
Recommended	1 x 10 <sup>8</sup> (TEKOHR 200 Fluid)
Maintenance	Once every 10 years.
Angular Offset	Max. 15 °

## Ordering

### ■ Designation of Size No.



Type EA



Type FA

### ■ Size Selection Guideline

Selection of the proper snubber assembly shall be made based on the following design elements :

- (1) Design dynamic load.
- (2) Amount of thermal displacement (actual travel) and its direction.
- (3) Overall installation length allotted for the snubber assembly.
- (4) Details of end conditions (Bracket or pipe clamp).
- (5) Radiation level to select the type of fluid.

#### ① Rated Load

Snubber unit having a rated load nearest to but greater than the design load(calculated dynamic load).

For example, when the calculated design load is 4500 Kgf, size SNA 6 (rated load = 6000 Kgf) is the proper size to be selected.

#### ② Assembly Type

**Type EA :** With extension attachments, for a longer installation length.

**Type FA :** With the shortest attachments, for a limited installation length.

#### ③ Stroke

(1) The rated stroke of the snubber unit selected must be sufficiently greater than the calculated travel so as to provide a safety margin for the extra movement not counted in at the designing stage of the piping system.

Combination of total (rated) stroke and design displacement

Design Stroke(mm) (Displacement)	Total(Rated) Stroke(mm)		
	100	160	250
50 and less	○	△	△
51 - 110	X	○	△
111 - 200	X	X	○

○ Optimum  
△ Usable  
X Not usable

(2) Each snubber unit is pre-set its stroke position at factory to provide the ready-to-install length of the assembly based on the designated amount and direction of the stroke



### ■ Special Design

In addition to the standard size series, for non-standard, rated load, stroke length and/or installation length, special design of snubber assemblies are available on request. Testing facilities having loading capacity of Max. 500,000 Kgf is available at our factory. For details, contact our Engineering Department.

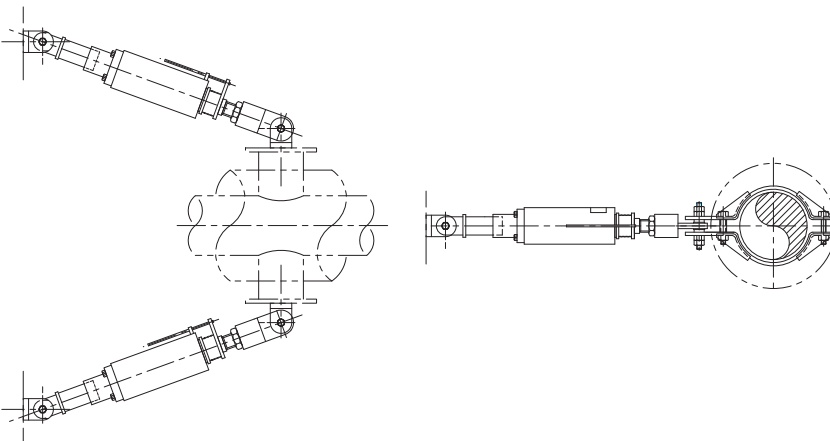
### ■ Storage Guide

(1) For lifting the snubber unit, use the sling bolt provided, and do not drag it on the ground or floor or smash to hard objects.

(2) Place the components in a space covered with a roof, and keep them away from dust, sunbeam, moisture and high humidity.

(3) Cover them with proper protective sheet when welding spatters may fall down on them.

### ■ Typical Installation Plan



### ■ Installation Guide

(1) Installation works at site must be carried out in close reference to the relevant installation drawing to be provided for each individual snubber location.

(2) Exact alignment of the entire snubber assembly is critically important for the snubber assembly to assure the required performance, and the alignment must be carefully observed throughout the installation works, especially when welding the connecting tube with the adapter of the main unit.

(3) When connecting the assembly to the bracket(s), it is required to confirm that the name plate affixed on the cylindrical snubber unit comes to the upward surface.

(4) When the required installation works have been completed in exact compliance with the installation manual and the relevant installation drawing, the pre-set pin must be completely removed as the final step.

### ■ Mobile Type Snubber Operability Test Equipment

To meet the needs for periodic or on-demand checking at site of snubber operability, a compact mobile type testing equipment is available. For details, please contact our Engineering Department.

### ■ Quality Assurance

Supply of our Hydraulic Snubber products, including sales activities, designing, manufacturing, testing, inspection and after-sale services, is performed in strict compliance with our ISO-9001 quality system.



## Configuration

### MECHANICAL SNUBBER

■ In general, snubbers are required to restrain undesirable displacement of piping systems or components when they are about to oscillate due to seismic or other types of dynamic loading, while, to allow their free movement during the thermal displacement mode. Our mechanical snubber is designed to provide such essential two-way functions by means of a rotary inertia mass, which inherently generates a resistance force against a quick input movement, in combination with a ball screw assembly, which transforms reciprocal linear motions to rotary motions. This simple yet sophisticated design was developed by us as the first invention in the world and patented in many countries including Japan, USA, Canada and U. K. The quality and reliability of our Mechanical Snubbers has been proved and established by comprehensive and thorough testing, and by achievements of completely trouble-free service through the decades with various safety-related piping systems in the world.

■ Design principle of our Mechanical Snubber is a utilization of an inertia mass which generates different magnitude of resistance force against the input load in proportion to its acceleration level.

Namely,  $M \alpha = F$  (where :  $M$  = Mass,  $\alpha$  = acceleration,  $F$  = force generated)

Low input acceleration generates a negligible level of resistance force allowing the free movement of piping, while high acceleration assumes sufficient resistance force to completely restrain the vibration of piping.

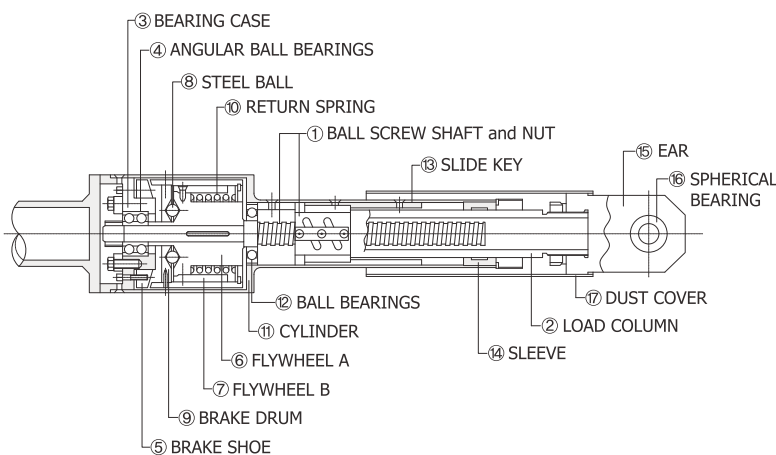
■ The one end of Mechanical Snubber is connected with a structural member through extension attachments, and the other end is pin-connected to the piping or component. It is also a dominant design feature in our Mechanical Snubber that an efficient built-in braking mechanism enhances the function of the inertia mass reducing its size, while developing a clear acceleration threshold in its performance.

① When dynamic (vibration) or gradual (thermal) displacements are developed in the piping system or component, they are instantaneously transferred to the snubber unit, and give telescoping motions to the ball nut.

② The nut, when pushed or pulled, causes rotary motions of the ball screw shaft.

③ The rotary motions of ball screw shaft give integral motions to the inertia mass as it is solidly assembled with the shaft. So far as the input displacement is relatively slow, the inertia mass rotates without assuming any significant inertial force, thus allows the displacement as if the snubber does not exist.

④ On the contrary, when a quick displacement takes place, the mass functions to prevent the screw shaft from rotation because of its inherent inertial force, thus suppressing the dynamic displacement of the system.



## Advantages :

- ① Acceleration-sensitive type.
- ② Durability guaranteed for 40 years without routine maintenance service.
- ③ Identical performance against tension and compression displacements.
- ④ Compact contour with adequate side-load capacity.
- ⑤ Easy observation of stroke position.
- ⑥ Factory preset to ready-to-install length.
- ⑦ Operability can be verified with In-service testing equipment.
- ⑧ Lubricated with 40-year-life radiation-proof grease.

## Major Design Specifications :

### 1. Applicable Code and Standard

- ① JIS (Japanese Industrial Standard) Code
- ② MITI (Ministry of Trade and Industry) Code 501
- ③ ASME (American Society of Mechanical Engineers) Boiler and Pressure Vessel Code, Section III Subsection NF
- ④ ASTM (American Iron and Steel Institute) Standard
- ⑤ SSPC (Steel Structure Painting Council) Standard

### 2. Rated Load (Kgf)

Size No.	Rated Load	Size No.	Rated Load
SMS 005	50	SMS 10	10,000
SMS 01	100	SMS 16	16,000
SMS 03	300	SMS 25	25,000
SMS 06	600	SMS 40	40,000
SMS 1	1,000	SMS 60	60,000
SMS 3	3,000	SMS 100	100,000
SMS 6	6,000		

- ① Service Level A and B ratings defined in ASME Code shall be as same as Design rated Load. Service Level C and D ratings shall be 1.33 and 1.5 times the Design rated Load, respectively

### 3. Standard Strokes (mm)

100	160	250	Special for extra length
-----	-----	-----	--------------------------

### 4. Minimum Spring Rate (Kgf/mm)

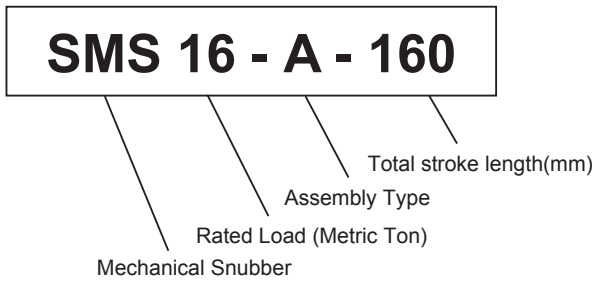
Size/Stroke	100mm	160mm	250mm
SMS 005	100	100	50
SMS 01	200	200	100
SMS 03	300	300	200
SMS 06	300	300	200
SMS 1	500	500	300
SMS 3	1,500	1,500	1,000
SMS 6	3,000	3,000	2,000
SMS 10	5,000	5,000	3,000
SMS 16	8,000	8,000	4,500
SMS 25	10,000	10,000	6,500
SMS 40	12,000	12,000	8,000
SMS 60	14,000	14,000	9,000
SMS 100	23,500	23,500	15,000

### 5. Design Parameters

Design Parameters	Specifications
Breakaway / Drag Force Limit at the velocity of 0.1cm/sec.	less than 2% of the rated load or 15Kg, whichever is greater.
Operational Frequency Range	3 ~ 33 Hz
Limit of Angular Offset	±6 ° (Spherical Bearing)
Side-load Capacity	6.5g with the Max. pin-to-pin length
Temperature Limit	21℃ - 93℃ in normal operation
Relative Humidity Limit	0% - 100%
Radiation Dosage	1 x 10 <sup>9</sup> Rad.
Resonance prevention of overall snubber assembly	Lateral Natural Frequency, not between 3 Hz - 33 Hz

## Ordering

### ■ Designation of Size No.



### ■ Size Selection Guideline

Selection of the proper size shall be made on the basis of following design elements :

- (1) Calculated load to be developed during the dynamic event of piping system.
- (2) Amount of thermal displacement (travel) and its direction.
- (3) Overall installation length allotted for the snubber assembly.

#### ① Rated Load

The snubber's rated load must be nearest to but greater than the calculated load. For example, when the calculated load is 4500Kg, size SMS 6(rated load = 6000Kg) will be the proper size to select.

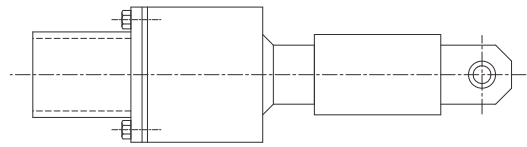
Based on the diameter of the piping to which the snubber assembly is installed, the smallest usable snubber size is designated in this table

Pipe Dia.	Rated Load
5B	03
6B - 10B	06
12B - 16B	1
18B - 24B	3
25B and over	6

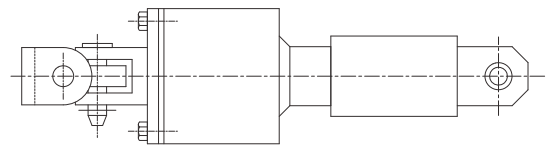
#### ② Assembly Type

Type A : For the longer installation length the snubber unit installed with the extension attachment.

Type B : For the limited installation length, the shortest assembly is employed.



Type A



Type B

#### ③ Stroke

(1) The rated stroke of the snubber unit selected must be sufficiently greater than the calculated travel so as to provide a safety margin for the extra movement not counted in at the designing stage of the piping system.

Combination of total (rated) stroke and design displacement

Design Stroke(mm) (Displacement)	Total(Rated) Stroke(mm)		
	100	160	260
50 and less	○	△	△
51 - 110	X	○	△
111 - 200	X	X	○

○ Optimum  
△ Usable  
X Not usable

(2) Each snubber unit is pre-set its stroke position at factory to provide the ready-to-install length of the assembly based on the designated amount and direction of the stroke (displacement of the piping system).

## polyurethane cradle

model : UCHR  
UCRS  
UCAR



Configuration

**GENERAL :**

UNISON has complete capability to mold high density rigid urethane cradle in pipe size from 15A through 1500A.

We are able to vary our basic chemical formulas to produce the broadest range of urethane molded products specifically designed for the exacting requirements for cryogenic service.

Our customers are guaranteed rigid urethane cradle molded to the highest quality control standards and assembled into an insulated pipe support unit.

High density rigid urethane cradle possesses a unique cellular structure.

Due to the roundness of the cells as well as the heavy cell wall thickness, the compaction typical of some cellular foams under cryogenic temperatures are eliminated. Under cryogenic conditions the gas within the cells contracts, liquifies or solidifies while the cell walls maintain the integrity of support.

At cryogenic temperatures each cell develops a partial vacuum resulting in excellent insulating properties.

**APPLICATION :**

Nowadays, the highest degree of reliability is required in the field of pipe supporting system design for petrochemical plants including low and ultra-low temperature liquefied natural gas (LNG), liquefied petroleum gas (LPG), liquefied ethylene gas (LEG), liquefied nitrogen(LN<sub>2</sub>) and liquefied oxygen(LO<sub>2</sub>) are getting larger scale.

And we have developed high quality urethane cradle made of high density polyurethane foam which has low thermal conductivity.

Our products are already been used and well received in various LNG, LPG and other petrochemical plants.

Any types of pipe supporting urethane cradle to be used following customer's requirements, please contact UNISON.

**PHYSICAL PROPERTIES :**

- Density : 500 kg/m<sup>3</sup>
- Compressive strength : higher than 170 kg/m<sup>2</sup>
- Bending strength : higher than 200 kg/cm<sup>2</sup>
- Thermal conductivity : less than 0.084 kcal/Mhr °C
- Coefficient of thermal contraction :  $50 \times 10^{-6}$
- Flame spread : less than 25
- Closed cell content by volume : more than 90%
- Water absorption : less than 1 g/100cm<sup>2</sup>
- Working temperature range : -190 ~ +80°C

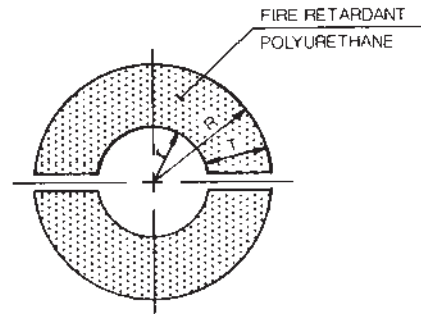
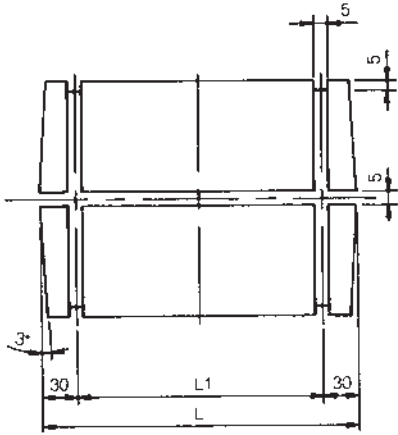
**FEATURES :**

1. The density of polyurethane cradles can be depending on where they are to be used, thereby enabling you to obtain the cradle with strength most appropriate for your purpose.
2. Polyurethane cradle supports are light-weight compared with oakmade or FRP support.
3. Being highly reliable in water and resistant to oil and corrosion, they do not need any preservative treatment such as creosote impregnation.
4. Having high weather-tightness, they resist weathering and corrosion in long-term outdoor use.
5. they exceed in physical strength against compression, bending and shearing.
6. Polyurethane cradle supports are suitable for mass production as they are molded.
7. Forming incorporated with other material is possible.
8. Free of grains, homogenous and standard quality cradles can be obtained in large quantity at the same time.
9. Because of their low water absorption, they do not incur cracks from icing during storage or operation.
10. Polyurethane cradle supports are standardized in a variety of sizes and dimensions, thereby facilitating various pipe support designs and installation methods.
11. Also available from UNISON are special series products with enhanced heat and flame resistance.

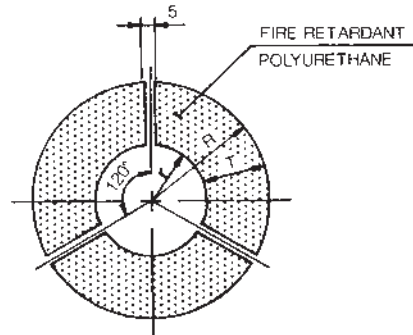
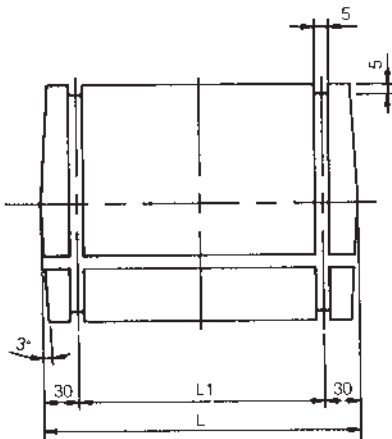


polyurethane cradle  
hanger type

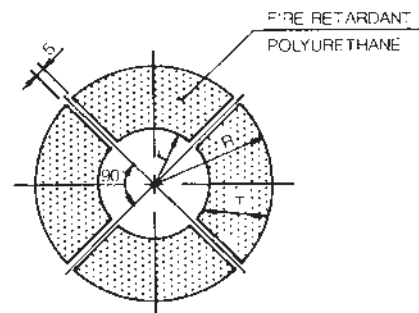
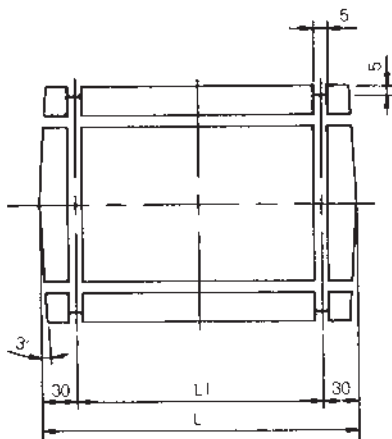
model : UCHR



4" & UNDER



5" - 24"



26" - 60"

polyurethane cradle  
hanger type

model : UCHR

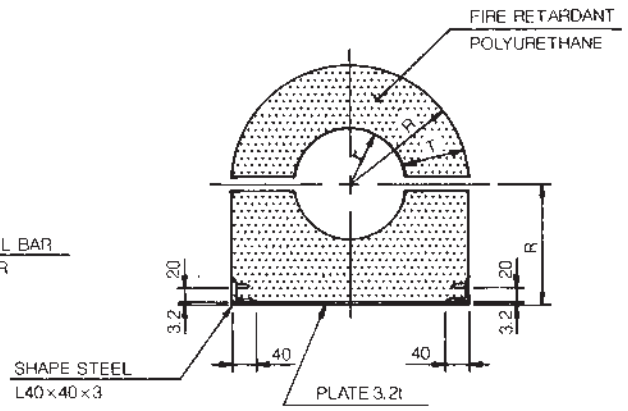
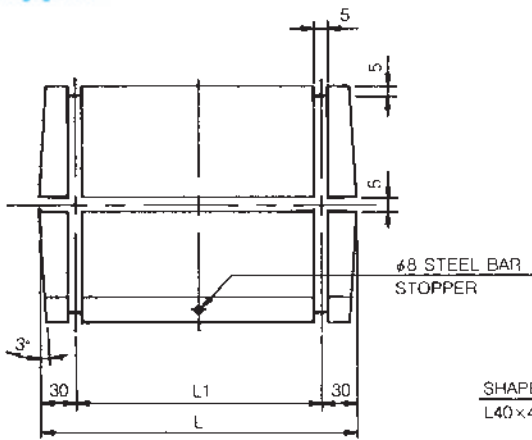
**MATERIAL** : High density polyurethane**ORDERING** : Specify model name, insulation thickness and nominal pipe size.  
ex) UCHR-250A-100**SERVICE TEMPERATURE** : -190 ~ +80℃

## dimensions(mm)

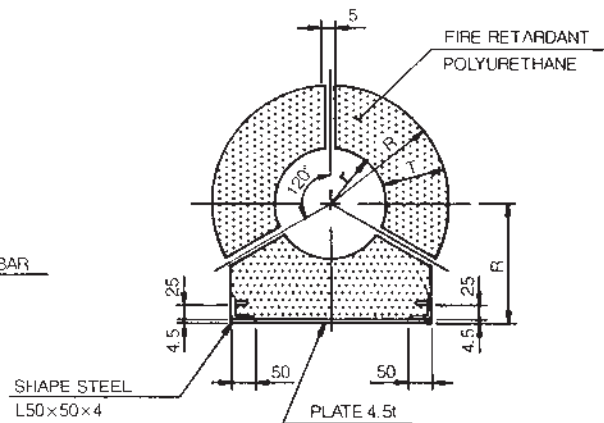
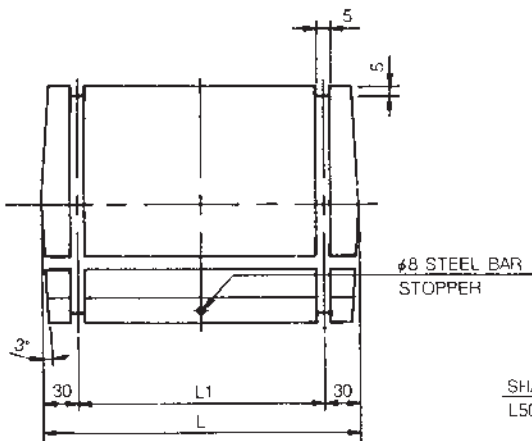
COLD INSULATION THICKNESS CRADLE THICKNESS				25~50	51~100	101~150	151~200	201~250	251~300
				T=50	T=100	T=150	T=200	T=250	T=300
pipe size	t	L	L1	R	R	R	R	R	R
15A( 1/2B)	11	370	310	61	111	161	-	-	-
20A( 3/4B)	14	370	310	64	114	164	-	-	-
25A( 1B)	17	370	310	67	117	167	-	-	-
40A(1 1/2B)	25	370	310	75	125	175	225	-	-
50A( 2B)	31	370	310	81	131	181	231	-	-
65A(2 1/2B)	37	370	310	87	137	187	237	-	-
80A( 3B)	45	420	360	95	145	195	245	-	-
100A( 4B)	58	420	360	108	158	208	258	-	-
125A( 5B)	72	420	360	122	172	222	272	-	-
150A( 6B)	85	420	360	135	185	235	285	-	-
200A( 8B)	110	420	360	160	210	260	310	360	-
250A( 10B)	137	420	360	187	237	287	337	387	-
300A( 12B)	162	420	360	212	262	312	362	412	-
350A( 14B)	178	420	360	228	278	328	378	428	-
400A( 16B)	204	420	360	254	304	354	404	454	-
450A( 18B)	229	420	360	279	329	379	429	479	-
500A( 20B)	254	420	360	304	354	404	454	504	554
550A( 22B)	280	420	360	330	380	430	480	530	580
600A( 24B)	305	420	360	355	405	455	505	555	605
650A( 26B)	331	420	360	381	431	481	531	581	631
700A( 28B)	356	420	360	406	456	506	556	606	656
750A( 30B)	381	420	360	431	481	531	581	631	681
800A( 32B)	407	420	360	457	507	557	607	657	707
850A( 34B)	432	420	360	482	532	582	632	682	732
900A( 36B)	458	420	360	508	558	608	658	708	758
1000A( 40B)	508	420	360	558	608	658	708	758	808
1050A( 42B)	534	420	360	584	634	684	734	784	834
1100A( 44B)	559	520	460	609	659	709	759	809	859
1200A( 48B)	610	520	460	660	710	760	810	860	910
1300A( 52B)	661	520	460	711	761	811	861	911	961
1350A( 54B)	686	520	460	736	786	836	886	939	986
1500A( 60B)	782	520	460	812	862	912	962	1012	1062

polyurethane cradle  
resting type

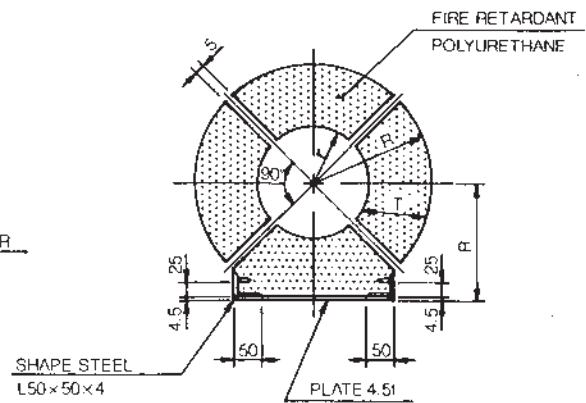
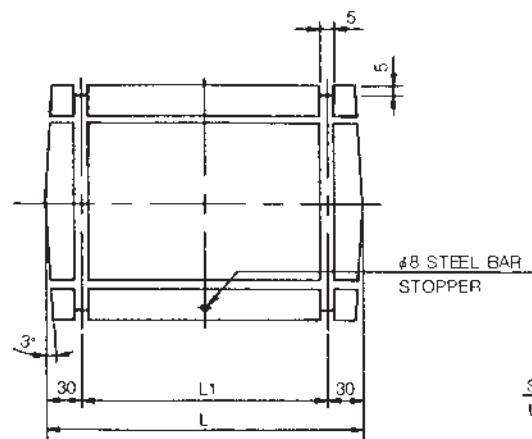
model : UCRS



4" & UNDER



5" - 24"



26" - 60"

polyurethane cradle  
resting type

model : UCRS

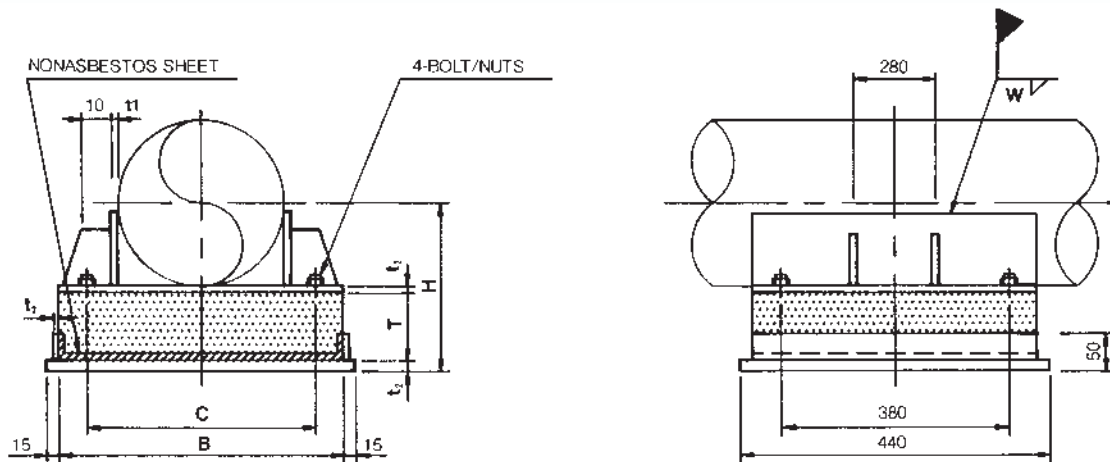
**MATERIAL** : High density polyurethane.**ORDERING** : Specify model name, insulation thickness and nominal pipe size.  
ex) UCRS-250A-100**SERVICE TEMPERATURE** : -190 ~ +80℃

## dimensions(mm)

COLD INSULATION THICKNESS				25~50	51~100	101~150	151~200	201~250	251~300
CRADLE THICKNESS				T=50	T=100	T=150	T=200	T=250	T=300
pipe size	t	L	L1	R	R	R	R	R	R
15A( 1/2B)	11	370	310	61	111	161	-	-	-
20A( 3/4B)	14	370	310	64	114	164	-	-	-
25A( 1B)	17	370	310	67	117	167	-	-	-
40A(1 1/2B)	25	370	310	75	125	175	225	-	-
50A( 2B)	31	370	310	81	131	181	231	-	-
65A(2 1/2B)	37	370	310	87	137	187	237	-	-
80A( 3B)	45	420	360	95	145	195	245	-	-
100A( 4B)	58	420	360	108	158	208	258	-	-
125A( 5B)	72	420	360	122	172	222	272	-	-
150A( 6B)	85	420	360	135	185	235	285	-	-
200A( 8B)	110	420	360	160	210	260	310	360	-
250A( 10B)	137	420	360	187	237	287	337	387	-
300A( 12B)	162	420	360	212	262	312	312	412	-
350A( 14B)	178	420	360	228	278	328	378	428	-
400A( 16B)	204	420	360	254	304	354	404	454	-
450A( 18B)	229	420	360	279	329	379	429	479	-
500A( 20B)	254	420	360	304	354	404	454	504	554
550A( 22B)	280	420	360	330	380	430	480	530	580
600A( 24B)	305	420	360	355	405	455	505	555	605
650A( 26B)	331	420	360	381	431	481	531	581	631
700A( 28B)	356	420	360	406	456	506	556	606	656
750A( 30B)	381	420	360	431	481	531	581	631	681
800A( 32B)	407	420	360	457	507	557	607	657	707
850A( 34B)	432	420	360	482	532	582	632	682	732
900A( 36B)	458	420	360	508	558	608	658	708	758
1000A( 40B)	508	420	360	558	608	658	708	758	808
1050A( 42B)	534	420	360	584	634	684	734	784	834
1100A( 44B)	559	520	460	609	659	709	759	809	859
1200A( 48B)	610	520	460	660	710	760	810	860	910
1300A( 52B)	661	520	460	711	761	811	861	911	961
1350A( 54B)	686	520	460	736	786	836	886	939	986
1500A( 60B)	762	520	460	812	862	912	962	1012	1062

## polyurethane cradle anchor type

model : UCAR



**MATERIAL** : High density polyurethane.

**SERVICE TEMPERATURE** : -190 ~ +80°C

**ORDERING** : Specify model name, insulation thickness and nominal pipe size.

ex) UCAR-250A-100

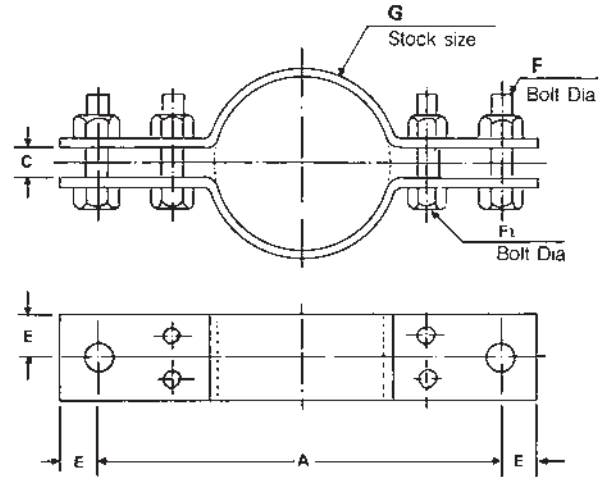
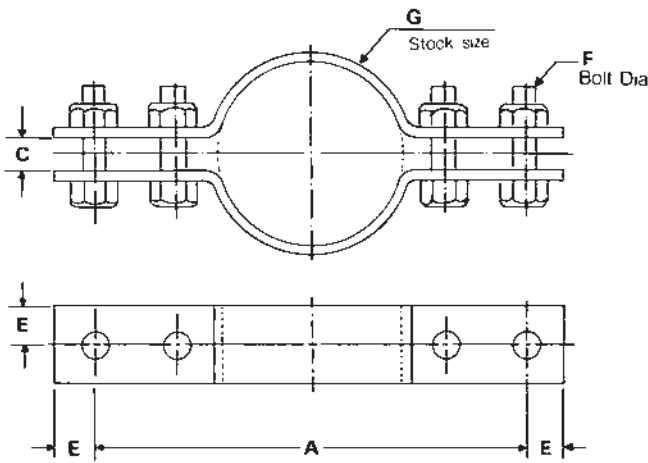
### dimensions(mm)

pipe size	B	C	t1	t2	W	H					
						T=50	T=100	T=150	T=200	T=250	T=300
15A( 1/2B)	100	65	4.5	6	4.5	61	111	161	-	-	-
20A( 3/4B)	110	70	4.5	6	4.5	64	114	164	-	-	-
25A( 1B)	115	75	4.5	6	4.5	67	117	167	-	-	-
40A(1 1/2B)	130	90	4.5	6	4.5	75	125	175	225	-	-
50A( 2B)	140	100	4.5	6	4.5	81	131	181	231	-	-
65A(2 1/2B)	160	120	4.5	6	4.5	87	137	187	237	-	-
80A( 3B)	190	140	4.5	6	4.5	95	145	195	245	-	-
100A( 4B)	210	145	4.5	6	4.5	108	158	208	258	-	-
125A( 5B)	240	190	4.5	6	4.5	122	172	222	272	-	-
150A( 6B)	270	215	4.5	6	4.5	135	185	235	285	-	-
200A( 8B)	320	265	6	9	4.5	160	210	260	310	360	-
250A( 10B)	370	315	6	9	4.5	187	237	287	337	387	-
300A( 12B)	425	370	6	9	4.5	212	262	312	362	412	-
350A( 14B)	480	405	6	9	4.5	228	278	328	378	428	-
400A( 16B)	530	455	6	9	4.5	254	304	354	404	454	-
450A( 18B)	570	505	6	9	4.5	279	329	379	429	479	-
500A( 20B)	630	555	6	9	4.5	304	354	404	454	504	554
550A( 22B)	680	610	6	9	4.5	330	380	430	480	530	580
600A( 24B)	740	660	6	9	4.5	355	405	455	505	555	605
650A( 26B)	810	725	9	12	6	381	431	481	531	581	631
700A( 28B)	860	775	9	12	6	406	456	506	556	606	656
750A( 30B)	940	815	9	12	6	431	481	531	581	631	681
800A( 32B)	970	880	9	12	6	457	507	557	607	657	707
850A( 34B)	1020	930	9	12	6	482	532	582	632	682	732
900A( 36B)	1070	980	9	12	6	508	558	608	658	708	758
1000A( 40B)	1180	1090	9	12	6	558	608	658	708	758	808
1050A( 42B)	1220	1150	9	12	6	584	634	684	734	784	834
1100A( 44B)	1295	1200	9	12	6	609	659	709	759	809	859
1200A( 48B)	1390	1250	9	12	6	660	710	760	810	860	910
1300A( 52B)	1470	1300	9	12	6	711	761	811	861	911	961
1350A( 54B)	1560	1455	9	12	6	736	786	836	886	936	986
1500A( 60B)	1720	1605	9	12	6	812	862	912	962	1012	1062



riser clamp - standard

model : PCRS



**MATERIAL :** Carbon steel

**MAXIMUM TEMPERATURE :** 345°C

**SERVICE :** Riser Clamps are used for the support of vertical piping. Load is carried by stopper lugs which are welded to the pipe. Dimension "E" is not always on the centerline of the clamp.

**ORDERING :** Specify model name, nominal pipe size and required A dimension.  
ex) PCRS - 150A x 455L.

loads • weights • dimensions(mm)

pipe size	wgt at max A dim. kg, each	max. load @ A dim. at 345°C									min A	C	E	F	F <sub>1</sub>	stock size G
		300	455	610	760	915	1065	1220	1370	1525						
25A( 1B)	4.1	180	120	85	-	-	-	-	-	-	205	20	15	M10	M 8	6× 50
32A(1½B)	4.1	175	110	75	-	-	-	-	-	-	230	20	15	M10	M 8	6× 50
40A(1½B)	4.1	170	105	75	-	-	-	-	-	-	255	20	15	M10	M 8	6× 50
50A( 2B)	9.1	565	350	255	-	-	-	-	-	-	255	20	20	M12	M10	9× 75
65A(2½B)	9.1	575	345	250	-	-	-	-	-	-	305	20	20	M12	M10	9× 75
80A( 3B)	10.0	605	350	250	-	-	-	-	-	-	305	20	20	M12	M10	9× 75
100A( 4B)	24.5	-	1365	940	-	-	-	-	-	-	355	25	30	M20	M16	16× 100
125A( 5B)	34.0	-	1445	970	730	585	-	-	-	-	380	25	30	M20	M16	16× 100
150A( 6B)	35.0	-	1565	1015	755	600	-	-	-	-	405	25	30	M20	M16	16× 100
200A( 8B)	63.5	-	-	2575	1840	1430	-	-	-	-	510	30	40	M24	M20	20× 150
250A( 10B)	90.7	-	-	4500	3485	2640	-	-	-	-	545	30	40	M24	M20	24× 150
300A( 12B)	107.1	-	-	-	3870	2855	2260	-	-	-	585	30	40	M24	M20	24× 150
350A( 14B)	120.7	-	-	-	4160	3005	2350	1935	-	-	685	30	40	M24	M20	24× 150
400A( 16B)	126.1	-	-	-	4500	3305	2525	2045	-	-	710	30	40	M24	M20	24× 150
450A( 18B)	136.1	-	-	-	4500	3665	2735	2180	-	-	760	30	40	M24	M20	24× 150
500A( 20B)	269.9	-	-	-	-	-	6345	4960	4070	3450	865	40	45	M30	M24	30× 205
600A( 24B)	290.3	-	-	-	-	-	7260	5780	4605	3830	965	40	45	M30	M24	30× 205

riser clamp -heavy duty

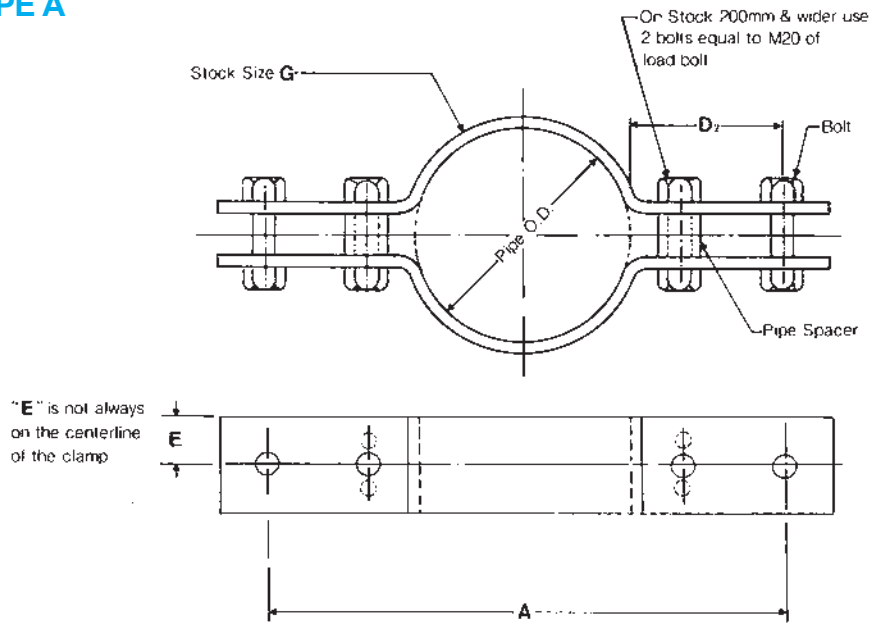
model : PCRH

**MATERIAL :** Specify.

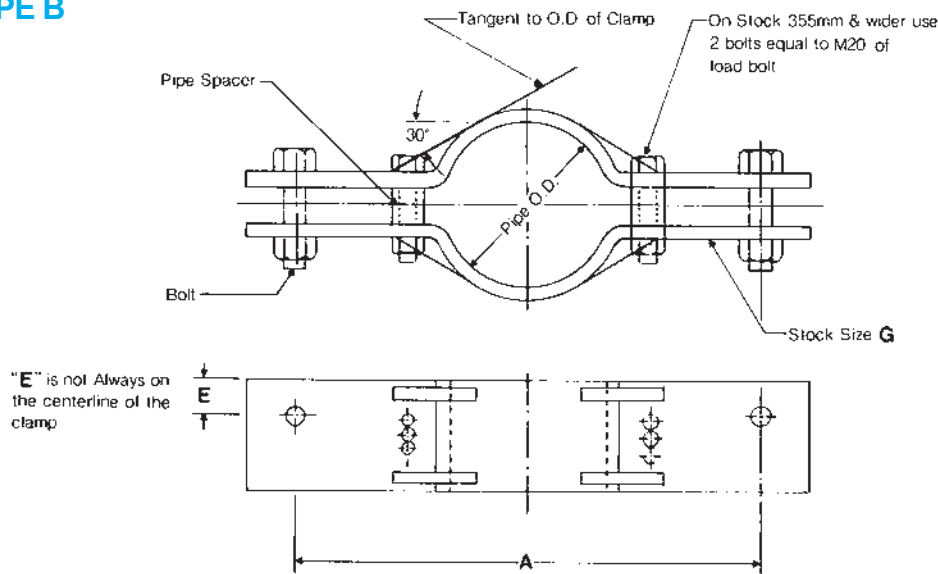
**SERVICE :** Riser Clamps are used for the support of vertical piping. Load is carried by stopper lugs which are welded to the pipe.

**ORDERING :** Specify model name, exact pipe outdia, total pipe load, maximum temperature, pipe material and required A dimension. The stock size G will be determined by Unsiom unless specified by coustomer.

**TYPE A**



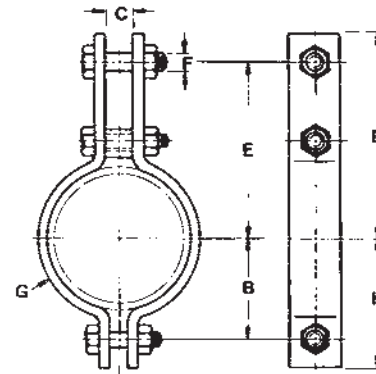
**TYPE B**



\*NOTE : 1) Type B available only on stock 200mm wide and up.  
 2) Gusset plate to extend to centerline of inner bolt or 175mm past O.D. of pipe, whichever is greater.

## double bolt pipe clamp

model : PCDB-L



**SERVICE** : Recommended for suspension of pipe requiring up to 100mm of insulation and where flexibility of the clamp is desirable within the limitation of temperature and loads shown below.

**MATERIAL** : Carbon steel

**MAXIMUM TEMPERATURE** : 400°C

**ORDERING** : Specify model name and nominal pipe size.

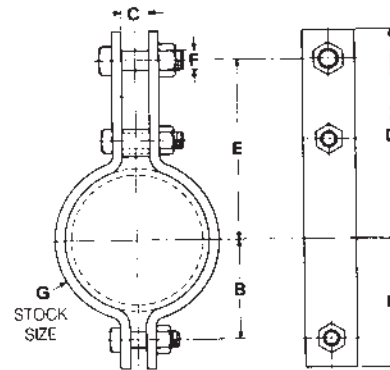
ex) PCDB-L - 250A

## loads • weights • dimensions(mm)

pipe size	max. recomm. load (Kg)		weight (approx) Kg. each	G	E	B	D	H	C	F
	345°C	400°C								
20A( 3/4B)	430	385	0.32	4.5 × 25	65	25	80	40	15	M10
25A( 1B)	430	385	0.34	4.5 × 25	65	25	80	40	15	M10
32A(1 1/4B)	430	385	0.37	4.5 × 25	70	30	85	45	15	M10
40A(1 1/2B)	700	625	1.04	6 × 32	105	45	125	60	25	M16
50A( 2B)	700	625	1.18	6 × 32	130	55	150	70	25	M16
65A(2 1/2B)	700	625	1.22	6 × 32	135	60	155	75	25	M16
80A( 3B)	700	625	1.36	6 × 32	150	70	170	90	25	M16
90A(3 1/2B)	730	635	1.50	6 × 32	160	82	180	105	25	M16
100A( 4B)	1135	1010	3.04	9 × 50	165	85	195	115	25	M20
125A( 5B)	1135	1010	3.18	9 × 50	180	100	210	130	25	M20
150A( 6B)	1300	1160	5.22	9 × 65	220	120	250	155	35	M24
200A( 8B)	1300	1160	6.00	9 × 65	245	145	280	180	35	M24
250A( 10B)	1470	1310	8.98	12 × 65	270	180	305	215	35	M24
300A( 12B)	1470	1310	10.12	12 × 65	295	205	330	240	35	M24
350A( 14B)	1950	1740	17.10	16 × 75	320	230	365	275	50	M30
400A( 16B)	1950	1740	18.78	16 × 75	350	255	395	300	50	M30
450A( 18B)	1950	1740	20.37	16 × 75	375	280	420	325	50	M30
500A( 20B)	2490	2225	26.00	19 × 75	405	315	450	360	50	M36
600A( 24B)	2040	1820	29.90	19 × 75	455	365	500	415	50	M36
700A( 28B)	2720	-	50.94	19 × 100	550	445	615	510	55	M36
750A( 30B)	3400	-	68.04	19 × 125	595	470	665	540	65	M36
800A( 32B)	3740	-	87.68	19 × 150	635	500	710	575	65	M36
850A( 34B)	4450	-	112.86	24 × 125	705	545	795	635	75	M42
900A( 36B)	4765	-	116.80	24 × 125	730	570	820	660	75	M42

## double bolt pipe clamp

## model : PCDB - M



**SERVICE** : Recommended for suspension of pipe requiring up to 100mm of insulation and where flexibility of the clamp is desirable within the limitation of temperature and loads shown below.

**MATERIAL** : Carbon Steel.

**MAXIMUM TEMPERATURE** : 400°C

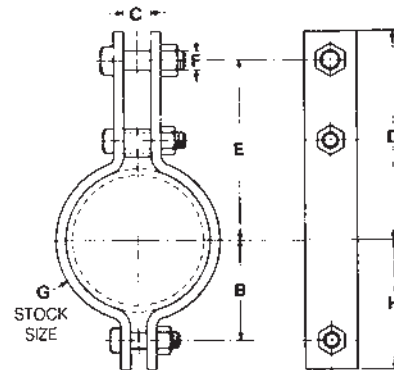
**ORDERING** : Specify model name and nominal pipe size.  
ex) PCDB-M-200A

## loads • weights • dimensions(mm)

pipe size	max. recomm. load (Kg)		weight (approx) Kg. each	G	E	B	D	H	C	F
	345°C	400°C								
150A( 6B)	1900	1653	6.7	12 × 65	215	130	245	160	38	M24
200A( 8B)	1900	1653	8.0	12 × 65	255	165	285	195	38	M24
250A(10B)	2082	1811	15.0	19 × 75	280	195	315	230	38	M24
300A(12B)	3969	3453	21.3	19 × 75	305	230	345	270	38	M30
350A(14B)	4173	3630	32.4	19 × 100	345	255	395	305	45	M36
400A(16B)	4173	3630	34.7	19 × 100	380	280	430	330	45	M36
450A(18B)	4173	3630	38.1	19 × 100	405	305	455	355	45	M36
500A(20B)	4173	3630	56.7	19 × 150	430	330	480	380	45	M36
550A(22B)	4173	3630	60.3	19 × 150	455	355	505	405	45	M36
600A(24B)	4173	3630	64.0	19 × 150	485	380	535	430	45	M36
650A(26B)	5761	5012	96.2	24 × 150	530	425	580	480	54	M42
700A(28B)	5761	5012	100.7	24 × 150	555	450	605	505	54	M42
750A(30B)	7348	6392	147.0	24 × 200	610	485	675	555	60	M48
800A(32B)	7348	6392	153.3	24 × 200	635	505	700	575	60	M48
850A(34B)	7348	6392	159.7	24 × 200	660	535	725	605	60	M48
900A(36B)	7307	6357	166.0	24 × 200	685	560	750	630	60	M48
950A(38B)	9344	8129	224.1	30 × 200	745	605	815	680	67	M56
1000A(40B)	8990	7821	232.2	30 × 230	770	630	845	705	67	M56
1050A(42B)	9344	8129	266.7	30 × 230	795	655	870	735	67	M56

## double bolt pipe clamp

## model : PCDB-H



**MATERIAL :** Carbon steel

**SERVICE :** Recommended for suspension of heavy loads pipe requiring up to 100mm of insulation.

**MAXIMUM TEMPERATURE :** 400°C

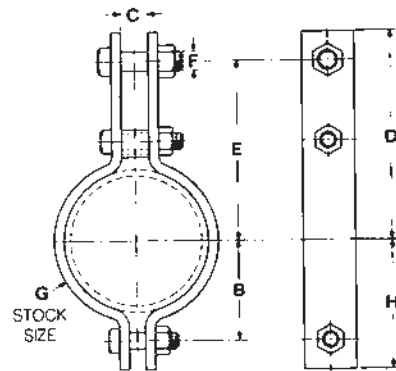
**ORDERING :** Specify model name and nominal pipe size.  
ex) PCDB-H-250A

## loads • weights • dimensions(mm)

pipe size	max. recomm. load (Kg)		weight (approx) Kg. each	G	E	B	D	H	C	F
	345°C	400°C								
150A( 6B)	2810	2505	11.3	12× 75	220	140	260	180	45	M30
200A( 8B)	3965	3540	23.1	16× 100	280	180	330	230	50	M36
250A(10B)	4535	4050	29.0	19× 100	310	210	360	260	55	M36
300A(12B)	4535	4050	31.3	19× 100	335	235	385	285	65	M36
350A(14B)	4535	4050	34.5	19× 120	355	255	405	305	65	M36
400A(16B)	4535	4050	36.3	19× 120	380	275	435	335	75	M42
450A(18B)	6260	5590	52.2	24× 100	415	315	470	370	90	M48
500A(20B)	6940	6200	63.5	24× 125	440	345	500	410	90	M48
600A(24B)	7395	6600	86.2	24× 155	490	395	565	470	90	M48
700A(28B)	8165	-	160.6	24× 180	690	480	800	595	100	M56
750A(30B)	9300	-	184.2	24× 210	720	505	830	620	110	M56
800A(32B)	10775	-	251.8	32× 205	785	550	915	680	110	M64
850A(34B)	11340	-	274.0	38× 200	825	595	955	725	110	M64
900A(36B)	12700	-	307.5	38× 205	885	625	1020	765	115	M72

## alloy double bolt pipe clamp

model : PCDB-LA



**SERVICE** : Recommended for suspension of high temperature pipe requiring up to 100mm of insulation.

**MAXIMUM TEMPERATURE** : 570℃

**MATERIAL** : Chrome molybdenum steel.

**ORDERING** : Specify model name and nominal pipe size.

ex) PCDB-LA-250A

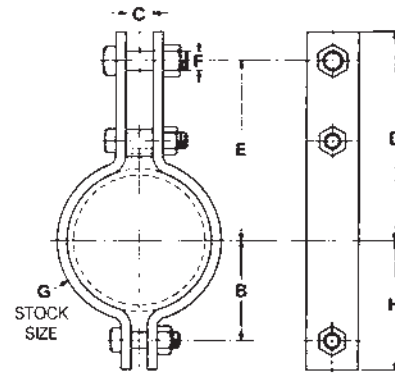
## loads • weights • dimensions(mm)

pipe size	max. recomm. load (Kg)		weight (approx) Kg. each	G	E	B	D	H	C	F
	540℃	570℃								
40A( 1 1/2 B)	455	340	1.04	6×32	105	45	125	60	25	M16
50A( 2B)	455	340	1.18	6×32	130	55	150	70	25	M16
65A(2 1/2 B)	455	340	1.22	6×32	135	60	155	75	25	M16
80A( 3B)	455	340	1.36	6×32	150	70	170	90	25	M16
100A( 4B)	740	545	3.04	9×50	165	85	195	115	25	M20
125A( 5B)	740	545	3.18	9×50	180	100	210	130	25	M20
150A( 6B)	845	625	5.22	9×65	220	120	250	155	35	M24
200A( 8B)	845	625	6.00	9×65	245	145	280	180	35	M24
250A( 10B)	955	710	8.98	12×65	270	180	305	215	35	M24
300A( 12B)	950	705	10.12	12×65	295	205	330	240	35	M24
350A( 14B)	1270	935	17.10	16×75	320	230	365	275	50	M30
400A( 16B)	1270	935	18.78	16×75	350	255	390	300	50	M30
450A( 18B)	1260	935	20.37	16×75	375	280	415	325	50	M30
500A( 20B)	1610	1195	26.00	19×75	405	315	445	360	50	M36
600A( 24B)	1320	980	29.90	19×75	455	365	495	415	50	M36



## alloy double bolt pipe clamp

## model : PCDB-MA



**SERVICE :** Recommended for suspension of high temperature pipe requiring up to 100mm of insulation.

**MAXIMUM TEMPERATURE :** 570℃

**MATERIAL :** Chrome molybdenum steel.

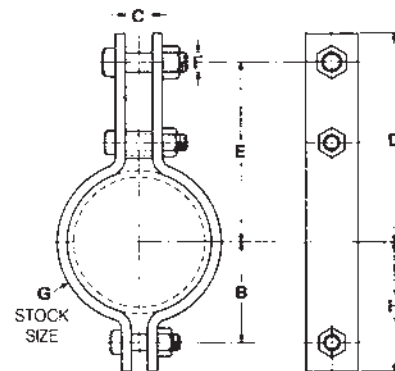
**ORDERING :** Specify model name and nominal pipe size.  
ex) PCDB-MA-200A

## loads • weights • dimensions(mm)

pipe size	max. recomm. load (Kg)		weight (approx) Kg, each	G	E	B	D	H	C	F
	540℃	570℃								
50A( 2B)	1230	890	3.3	9 × 50	160	75	190	105	25	M20
65A(2 1/2B)	1230	890	3.5	9 × 50	165	95	195	125	25	M20
80A( 3B)	1230	890	3.6	9 × 50	175	105	205	135	25	M20
100A( 4B)	1230	955	4.5	9 × 65	200	115	230	145	25	M20
125A( 5B)	1066	770	4.7	9 × 65	210	125	240	155	25	M20
150A( 6B)	1746	1250	9.0	12 × 65	235	145	275	185	30	M24
200A( 8B)	1384	1000	10.1	12 × 65	260	170	300	210	30	M24
250A( 10B)	2041	1455	16.3	16 × 75	305	205	345	245	30	M24
300A( 12B)	1678	1205	17.8	16 × 75	330	230	370	270	30	M24
350A( 14B)	2790	2000	31.9	19 × 100	360	260	405	305	40	M30
400A( 16B)	2450	1750	34.3	19 × 100	390	285	435	330	40	M30
450A( 18B)	2155	1545	36.7	19 × 100	410	310	460	360	40	M30
500A( 20B)	3130	2245	59.7	19 × 150	440	340	495	395	45	M36
600A( 24B)	2608	1885	63.6	19 × 150	490	390	545	445	45	M36
700A( 28B)	4082	2950	103.9	25 × 150	560	465	615	520	55	M42
750A( 30B)	3856	2770	105.2	25 × 150	585	490	640	545	55	M42

## alloy double bolt pipe clamp

model : PCDB-HA



**SERVICE** : Recommended for suspension of high temperature pipe with heavy loads requiring up to 100mm of insulation.

**MAXIMUM TEMPERATURE** : 570℃

**MATERIAL** : Chrome molybdenum steel.

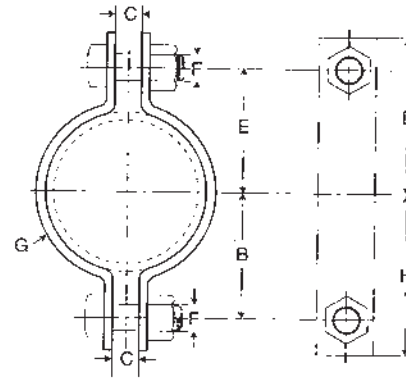
**ORDERING** : Specify model name and nominal pipe size.  
ex) PCDB-HA-250A

## loads • weights • dimensions(mm)

pipe size	max. recomm. load (Kg)		weight (approx) Kg, each	G	E	B	D	H	C	F
	540℃	570℃								
125A( 5B)	2360	1680	9.0	12× 75	195	115	250	165	40	M30
150A( 6B)	2360	1680	14.8	12× 100	230	145	285	200	45	M36
200A( 8B)	2360	1680	16.3	12× 100	255	170	310	225	45	M36
250A( 10B)	3265	2270	29.3	19× 100	305	215	365	275	50	M42
300A( 12B)	3265	2270	31.6	19× 100	330	240	390	300	50	M42
350A( 14B)	3765	2720	43.1	22× 115	355	260	430	335	55	M48
400A( 16B)	3765	2720	46.1	22× 115	380	285	455	360	55	M48
450A( 18B)	3765	2720	49.3	22× 115	405	310	480	385	55	M48
500A( 20B)	4810	3400	69.5	24× 130	455	350	535	430	55	M48
600A( 24B)	5895	4080	100.6	28× 155	510	405	590	485	55	M48
750A( 30B)	5895	4080	132.9	32× 155	635	485	725	575	55	M48
900A( 36B)	5895	4080	150.1	32× 155	710	560	800	650	55	M48

## single bolt pipe clamp

model : PCSB-L

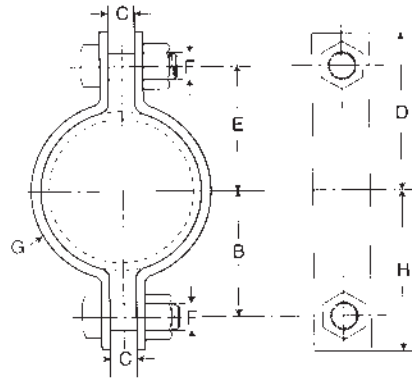
**MATERIAL** : Carbon steel**MAXIMUM TEMPERATURE** : 400℃**SERVICE** : Recommended for suspension of cold pipe lines or hot lines where little or no insulation is required.**ORDERING** : Specify model name and nominal pipe size.  
ex) PCSB-L - 250A

## loads • weights • dimensions(mm)

pipe size	max. recomm. load (Kg)		weight (approx) Kg, each	G	E	B	D	H	C	F
	345℃	400℃								
15A( 1/2B)	225	200	0.13	3.2× 25	30	30	45	45	15	M 8
20A( 3/4B)	225	200	0.15	3.2× 25	35	35	50	50	15	M 8
25A( 1B)	225	200	0.16	3.2× 25	40	40	55	55	15	M 8
32A(1 1/4B)	225	200	0.17	3.2× 25	40	40	55	55	15	M 8
40A(1 1/2B)	365	325	0.20	3.2× 25	45	45	60	60	15	M 8
50A( 2B)	470	420	0.50	6× 25	55	55	70	70	15	M12
65A(2 1/2B)	470	420	0.54	6× 25	65	65	85	85	15	M12
80A( 3B)	470	420	0.64	6× 25	75	75	95	95	15	M12
90A(3 1/2B)	470	420	0.68	6× 25	80	80	100	100	15	M12
100A( 4B)	470	420	1.04	6× 38	90	90	110	110	20	M16
125A( 5B)	470	420	1.18	6× 38	105	105	125	125	20	M16
150A( 6B)	735	655	2.45	9× 40	130	130	155	155	20	M20
200A( 8B)	735	655	2.95	9× 40	155	155	180	180	25	M20
250A( 10B)	1130	1005	6.17	12× 50	190	190	220	220	25	M24
300A( 12B)	1130	1005	6.89	12× 50	215	215	245	245	25	M24
350A( 14B)	1130	1005	9.30	12× 65	235	235	270	270	30	M24
400A( 16B)	1130	1005	10.12	12× 65	260	260	295	295	30	M24
450A( 18B)	1390	1240	14.33	16× 65	295	295	330	330	30	M24
500A( 20B)	1390	1240	16.24	16× 65	325	325	360	360	35	M30
600A( 24B)	1390	1240	24.09	16× 75	390	390	435	435	40	M30
750A( 30B)	1590	1525	51.67	19× 100	480	480	540	540	50	M42

## single bolt pipe clamp

model : PCSB-M

**MATERIAL** : Carbon steel**MAXIMUM TEMPERATURE** : 400℃

**SERVICE** : Recommended for suspension of cold pipe lines or hot lines where little or no insulation is required.

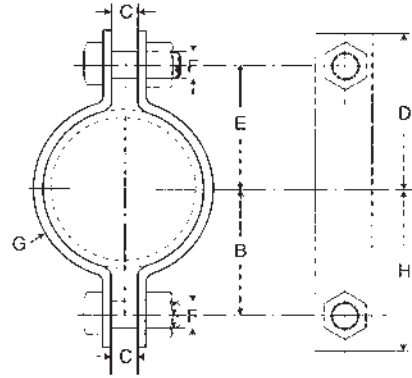
**ORDERING** : Specify model name and nominal pipe size.  
ex) PCSB-M-200A

## loads • weights • dimensions(mm)

pipe size	max. recomm. load (Kg)		weight (approx) Kg. each	G	E	B	D	H	C	F
	345℃	400℃								
20A( 3/4B)	460	400	0.4	4.5×25	35	35	50	50	16	M12
25A( 1B)	460	400	0.4	4.5×25	40	40	55	55	16	M12
32A(1 1/2B)	460	400	0.4	4.5×25	45	45	60	60	16	M12
40A(1 1/2B)	740	644	0.8	6×32	55	55	75	75	25	M16
50A( 2B)	740	644	0.8	6×32	60	60	80	80	25	M16
65A(2 1/2B)	720	626	0.9	6×32	65	65	85	85	25	M16
80A( 3B)	690	600	1.0	6×32	75	75	95	95	25	M16
90A(3 1/2B)	1220	1061	2.4	9×50	90	90	115	115	32	M20
100A( 4B)	1220	1061	2.5	9×50	95	95	120	120	32	M20
125A( 5B)	1220	1061	2.8	9×50	110	110	135	135	32	M20
150A( 6B)	1300	1131	3.9	9×65	125	125	150	150	32	M20
200A( 8B)	1300	1131	4.6	9×65	150	150	175	175	32	M20
250A( 10B)	1580	1375	7.8	12×65	200	200	230	230	40	M24
300A( 12B)	1603	1395	8.8	12×65	225	225	255	255	40	M24
350A( 14B)	1700	1480	9.5	12×75	245	245	275	275	40	M24
400A( 16B)	2290	1992	16.8	16×75	280	280	315	315	50	M30
450A( 18B)	2310	2010	18.4	16×75	310	310	345	345	50	M30
500A( 20B)	3100	2697	29.7	19×90	350	350	390	390	50	M36
600A( 24B)	2590	2253	33.9	19×90	400	400	440	440	50	M36
650A( 26B)	3560	3097	47.9	22×100	430	430	480	480	50	M42
700A( 28B)	3310	2880	50.2	22×100	450	450	500	500	50	M42
750A( 30B)	3090	2688	53.3	22×100	480	480	530	530	50	M42
800A( 32B)	3630	3158	68.9	22×125	505	505	555	555	50	M42
850A( 34B)	4400	3828	88.0	25×125	545	545	610	610	60	M48
900A( 36B)	5000	4350	107.8	25×150	565	565	630	630	60	M48
1000A( 40B)	4500	3915	117.6	25×150	620	620	685	685	60	M48
1100A( 44B)	5450	4742	166.3	25×200	670	670	735	735	60	M48

## single bolt pipe clamp

model : PCSB - H

**MATERIAL :** Carbon steel**MAXIMUM TEMPERATURE :** 400°C

**SERVICE :** Recommended for suspension of heavy loads where little or no insulation is required

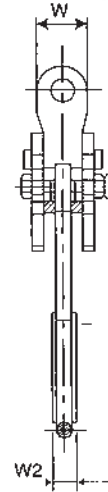
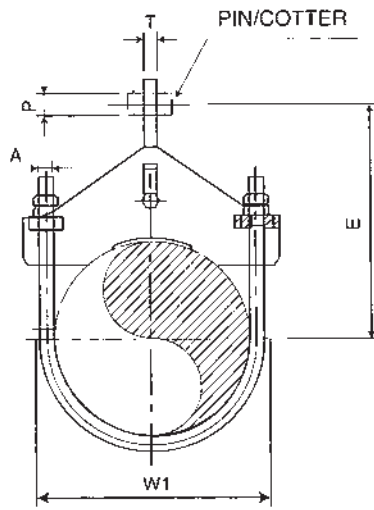
**ORDERING :** Specify model name and nominal pipe size.  
ex) PCSB-H-250A

## loads • weights • dimensions(mm)

pipe size	max. recomm. load (Kg)		weight (approx) Kg. each	G	E	B	D	H	C	F
	345°C	400°C								
80A( 3B)	1530	1365	1.63	9× 50	80	75	105	100	25	M20
100A( 4B)	1595	1420	3.24	9× 65	95	90	125	120	25	M24
125A( 5B)	1595	1420	3.72	9× 65	110	105	140	135	25	M24
150A( 6B)	2210	1970	5.31	12× 65	135	125	170	160	30	M24
200A( 8B)	2210	1970	6.31	12× 65	160	155	195	190	30	M24
250A( 10B)	2725	2430	10.12	16× 65	195	190	230	225	30	M30
300A( 12B)	3935	2510	17.28	19× 75	235	230	280	275	40	M36
350A( 14B)	4135	3690	21.23	19× 90	255	250	300	295	40	M36
400A( 16B)	4135	3690	23.32	19× 90	280	275	330	325	40	M36
450A( 18B)	6260	-	59.01	19×150	370	370	440	440	75	M48
500A( 20B)	6940	-	74.21	24×125	405	405	475	475	75	M48
600A( 24B)	7395	-	97.61	24×150	470	470	545	545	85	M56
700A( 28B)	8165	-	137.35	24×205	520	520	595	595	85	M56
750A( 30B)	9300	-	165.75	32×180	570	570	660	660	90	M64
800A( 32B)	10775	-	195.82	32×205	595	595	685	685	90	M64
850A( 34B)	11340	-	242.13	38×205	635	635	725	725	90	M64
900A( 36B)	12700	-	260.87	38×205	675	675	770	770	90	M72
950A( 38B)	14651	-	279.40	38×205	700	700	800	800	90	M72
1000A( 40B)	14651	-	289.30	38×205	725	725	825	825	90	M72
1050A( 42B)	15875	-	415.36	45×255	760	760	855	855	90	M72

yoke pipe clamp(alloy)

model : PCY - A(standard)  
PCY - HA(heavy)



**MATERIAL** : Chrome molybdenum steel, except U-bolt which is stainless steel.

**MAXIMUM TEMPERATURE** : 595°C

**SERVICE** : Recommended for suspension of high temperature pipe line.

**ORDERING** : Specify model name and exact O.D.  
ex) PCY - A - 300A  
PCY - HA - 300A

loads • weights • dimensions(mm)

model : PCY-A

nom pipe size	used on O.D pipe size	max. recom. load, kg			A	C	D	E	P	W	W1	wgt (approx) kg, each
		570°C	580°C	595°C								
250A(10B)	220-275	4310	4130	3990	M24	50	240	350	M36	110	370	22.23
300A(12B)	276-326	4310	4130	3990	M24	50	265	375	M36	110	420	24.49
350A(14B)	327-359	4310	4130	3990	M24	50	285	395	M36	110	460	26.76
400A(16B)	360-410	5670	5445	5215	M24	55	330	425	M42	130	535	47.17
450A(18B)	411-460	5670	5445	5215	M24	55	355	450	M42	130	585	51.26
500A(20B)	461-515	5670	5445	5215	M24	55	380	475	M42	130	635	56.70
550A(22B)	516-565	7030	6805	6575	M30	60	420	510	M48	150	715	73.48
600A(24B)	566-615	7030	6805	6575	M30	60	445	535	M48	150	765	79.83
650A(26B)	616-665	7030	6805	6575	M30	60	470	560	M48	150	815	87.54
700A(28B)	666-715	9070	8710	8390	M30	65	510	605	M56	170	880	124.29
750A(30B)	716-768	9070	8710	8390	M30	65	535	630	M56	170	930	135.17

model : PCY-HA

nom pipe size	used on O.D pipe size	max. recom. load, kg			A	C	D	E	P	W	W1	wgt (approx) kg, each
		570°C	580°C	595°C								
250A(10B)	220-275	5670	5445	5215	M24	60	260	355	M42	130	390	32.66
300A(12B)	276-326	7030	6805	6575	M30	60	300	390	M48	150	455	46.72
350A(14B)	327-359	7030	6805	6575	M30	60	320	405	M48	150	490	49.90
400A(16B)	360-410	9070	8710	8390	M30	65	350	445	M56	170	560	75.75
450A(18B)	411-460	9070	8710	8390	M30	65	375	470	M56	170	610	81.65
500A(20B)	461-515	10750	10295	9935	M36	70	405	510	M64	190	675	103.42
550A(22B)	516-565	10750	10295	9935	M36	70	430	535	M64	190	725	111.59
600A(24B)	566-615	13155	12700	12245	M36	75	470	580	M72	215	785	147.42
650A(26B)	616-665	13155	12700	12245	M36	75	495	605	M72	215	835	154.22
700A(28B)	666-715	13155	12700	12245	M36	75	520	630	M72	215	885	161.03
750A(30B)	716-768	13155	12700	12245	M36	75	545	655	M72	215	935	167.38



## extension pipe clamp

## model : PCR



**MATERIAL** : Carbon steel.

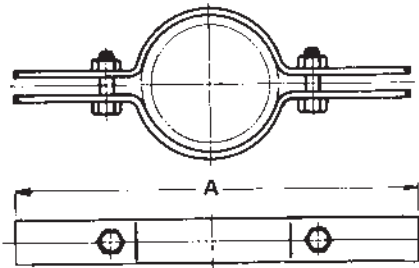
**SERVICE** : For support and steadying of steel pipe risers either insulated or bare, cast iron pipe or conduit. Also supports pipe covering or insulation.

**MAXIMUM-TEMPERATURE** : 345°C

**ORDERING** : Specify model name and nominal pipe size.  
ex) PCR-100A

## plastic coated : extension pipe clamp

## model : PCRP



**MATERIAL** : Carbon steel with formed section plastic coated.

**SERVICE** : Recommended for suspension of glass, copper, brass and aluminum pipe.

**MAXIMUM TEMPERATURE** : 105°C

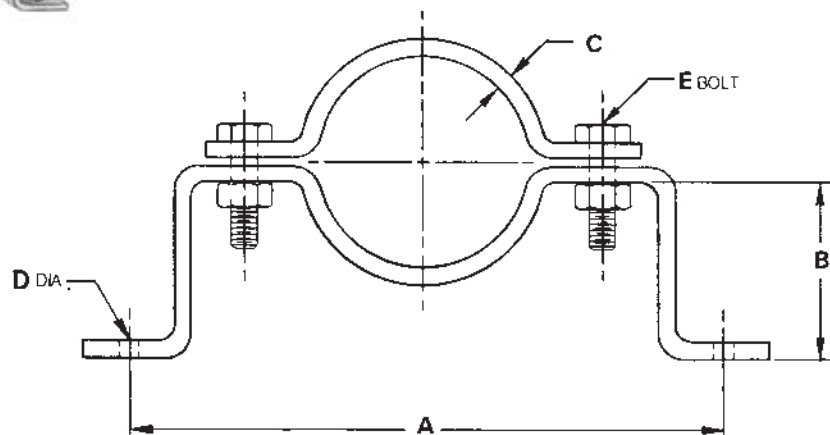
**ORDERING** : Specify model name and nominal pipe size.  
ex) PCRP-100A

## loads • weights • dimensions(mm)

pipe size	max.recom. load, kgs	wgt(approx) kgs each	A	stock size	bolt size
20A( 3/4B)	115	0.64	240	4.5×35	M10×40L
25A( 1B)	115	0.64	240	4.5×35	M10×40L
32A(1 1/4B)	115	0.91	255	6×35	M10×40L
40A(1 1/2B)	115	0.91	265	6×35	M10×40L
50A( 2B)	115	1.00	275	6×35	M10×40L
65A(2 1/2B)	175	1.04	285	6×35	M10×40L
80A( 3B)	240	1.13	305	6×35	M10×40L
90A(3 1/2B)	305	1.50	330	6×40	M12×50L
100A( 4B)	365	1.54	345	6×40	M12×50L
125A( 5B)	525	2.22	370	6×50	M12×50L
150A( 6B)	710	2.40	395	6×50	M12×50L
200A( 8B)	1135	4.49	470	9×50	M16×65L
250A( 10B)	1135	5.03	515	9×50	M16×65L
300A( 12B)	1225	7.53	580	12×50	M16×65L
350A( 14B)	1225	8.75	610	12×50	M16×65L
400A( 16B)	1315	14.70	660	16×65	M20×75L
450A( 18B)	1315	15.33	710	16×65	M20×75L
500A( 20B)	1315	15.88	760	16×65	M20×75L

## offset pipe clamp

model : PCOF



**MATERIAL** : Carbon steel.

**SERVICE** : For use in supporting general piping away from wall or floor.

**MAXIMUM TEMPERATURE** : 400°C

**ORDERING** : Specify model name and nominal pipe size.

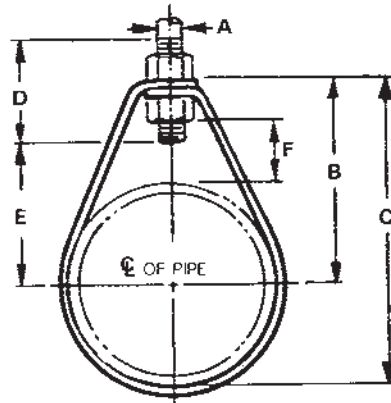
ex) PCOF-80A

## loads • weights • dimensions(mm)

pipe size	max.recom. load, kgs	wgt(approx) kg	A	B	E	C	D
15A( 1/2B)	85	0.50	210	60	M10×25L	4.5×25	12
20A( 3/4B)	85	0.61	220	65	M10×25L	4.5×35	12
25A( 1B)	85	0.66	240	65	M10×25L	4.5×35	12
32A(1 1/4B)	85	0.70	250	70	M10×25L	4.5×35	12
40A(1 1/2B)	85	0.73	260	75	M10×25L	4.5×35	12
50A( 2B)	190	1.27	290	80	M12×40L	6×35	14
65A(2 1/2B)	190	1.32	300	85	M12×40L	6×35	14
80A( 3B)	190	1.46	330	95	M12×40L	6×35	14
100A( 4B)	275	1.91	350	110	M12×40L	6×40	14
125A( 5B)	275	2.95	400	120	M16×40L	6×50	18
150A( 6B)	395	3.24	430	135	M16×40L	6×50	18
200A( 8B)	395	3.77	480	160	M16×40L	6×50	18
250A( 10B)	TBD	5.62	550	185	M20×50L	6×65	22
300A( 12B)	TBD	9.53	630	215	M20×50L	10×65	22

## adjustable ring

model : RGAN



**MATERIAL** : Carbon steel.

**SERVICE** : Recommended for suspension of noninsulated, stationary pipe lines or conduit.

**MAXIMUM TEMPERATURE** : 345°C

**ORDERING** : Specify model name and nominal pipe size.

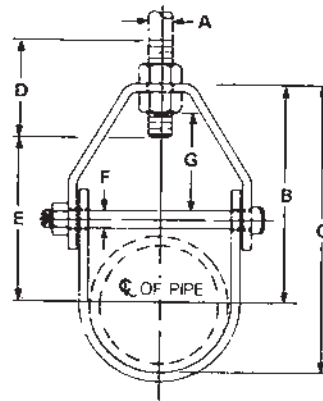
ex) RGAN-50A

## loads • weights • dimensions(mm)

pipe size	max recom load, kg	wgt (approx) kg each	A	B	C	D	rod take-out E	adjustment F
15A( 1/2B)	275	0.05	M10	45	56	65	30	25
20A( 3/4B)	275	0.06	M10	50	63	65	35	25
25A( 1B)	275	0.07	M10	55	72	65	35	25
32A(1 1/4B)	275	0.08	M10	65	86	65	45	30
40A(1 1/2B)	275	0.11	M10	70	94	65	50	30
50A( 2B)	275	0.13	M10	75	105	65	55	30
65A(2 1/2B)	440	0.17	M12	100	137	90	75	45
80A( 3B)	440	0.20	M12	110	155	90	85	45
90A(3 1/2B)	440	0.21	M12	115	166	90	90	45
100A( 4B)	565	0.41	M16	125	182	90	95	45
125A( 5B)	565	0.50	M16	145	216	100	115	50
150A( 6B)	725	0.68	M20	160	244	115	130	50
200A( 8B)	815	1.22	M24	190	300	120	155	50

## adjustable clevis - standard

model : CHA

**MATERIAL** : Carbon steel.**MAXIMUM TEMPERATURE** : 345°C**SERVICE** : Recommended for the suspension of noninsulated, stationary pipe lines.**ORDERING** : Specify model name and nominal pipe size.  
ex) CHA-50A

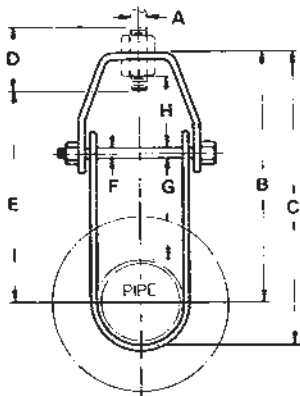
## loads • weights • dimensions(mm)

pipe size	max. recom. load, kg	wgt (approx) kg each	size of steel		A	B	C	D	E	F	adjustment G
			upper	lower							
15A( 1/2B)	280	0.15	3.2×25	3.2×25	M10	45	56	65	20	M 6	10
20A( 3/4B)	280	0.18	3.2×25	3.2×25	M10	50	63	65	25	M 6	13
25A( 1B)	280	0.20	3.2×25	3.2×25	M10	60	77	65	30	M 6	15
32A(1 1/4B)	280	0.20	3.2×25	3.2×25	M10	65	86	65	45	M 6	22
40A(1 1/2B)	280	0.25	4.5×25	3.2×25	M10	75	99	65	55	M 6	27
50A( 2B)	280	0.28	4.5×25	3.2×25	M10	95	125	65	75	M 6	40
65A(2 1/2B)	515	0.64	4.5×35	4.5×35	M12	120	157	75	95	M10	50
80A( 3B)	515	0.68	4.5×35	4.5×35	M12	120	165	75	100	M10	45
90A(3 1/2B)	515	0.77	4.5×35	4.5×35	M12	125	176	75	105	M10	45
100A( 4B)	650	0.95	6×35	4.5×35	M16	140	197	90	115	M10	50
125A( 5B)	650	1.09	6×35	4.5×35	M16	155	226	90	130	M12	45
150A( 6B)	880	1.63	6×40	4.5×40	M20	175	259	100	140	M12	47
200A( 8B)	910	2.27	6×45	4.5×45	M24	215	325	110	180	M16	55
250A( 10B)	1635	3.99	9×45	6×45	M24	250	387	115	215	M20	57
300A( 12B)	1725	5.17	9×50	6×50	M24	290	452	120	260	M20	77
350A( 14B)	1905	6.71	12×50	6×50	M24	315	493	135	275	M24	75
400A( 16B)	2085	9.53	12×65	6×65	M24	355	558	150	315	M24	67
450A( 18B)	2180	11.07	12×65	6×65	M24	395	624	165	355	M30	98
500A( 20B)	2180	19.32	16×75	9×75	M30	440	694	180	365	M30	102
600A( 24B)	2180	21.95	16×75	9×75	M30	500	805	190	445	M30	108
750A( 30B)	2720	31.53	19×75	9×75	M30	615	996	210	555	M30	127

■ Requires spacer to support max. load rating.

## adjustable clevis for insulated lines

model : **CHA - C** (Carbon)  
**CHA - A** (Alloy)  
**CHA - S** (Stainless)

**MATERIAL :**

model CHA - C : all carbon steel.

model CHA - A : yoke and bolt : carbon steel

U-strap : chrome molybdenum

model CHA - S : all stainless steel

**SERVICE :** Recommended for suspension of insulated, stationary pipe lines.

**MAXIMUM TEMPERATURE :**

model CHA - C : 345°C

model CHA - A : 570°C

**ORDERING :** Specify model name and nominal pipe size.

ex) CHA - C - 80A

CHA - A - 80A

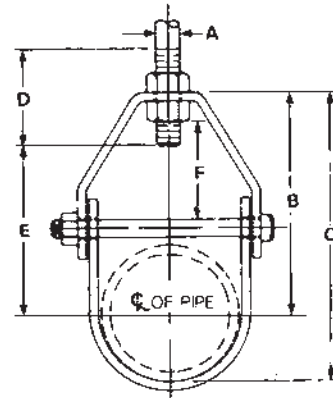
CHA - S - 80A

## loads • weights • dimensions(mm)

pipe size	max. recom. load, kg	wgt (approx) kgs each	size of steel		A	B	C	D	E	F	G	adjustment H
			upper	lower								
20A( 3/4B)	280	0.23	3.2×25	3.2×25	M10	90	103	65	75	M 6	50	13
25A( 1B)	280	0.26	3.2×25	3.2×25	M10	100	117	65	85	M 6	50	15
32A(1 1/2B)	280	0.29	3.2×25	3.2×25	M10	115	136	65	90	M 6	50	22
40A(1 1/2B)	280	0.34	4.5×25	3.2×25	M10	120	144	65	105	M 6	50	25
50A( 2B)	280	0.39	4.5×25	3.2×25	M10	190	220	65	165	M 6	100	40
65A(2 1/2B)	515	0.86	4.5×35	4.5×35	M12	215	252	75	190	M10	100	50
80A( 3B)	515	0.91	4.5×35	4.5×35	M12	220	265	75	190	M10	100	45
100A( 4B)	650	1.13	6×35	4.5×35	M16	240	297	90	210	M10	100	50
125A( 5B)	650	1.36	6×35	4.5×35	M16	250	321	90	220	M12	100	45
150A( 6B)	880	1.54	6×40	4.5×40	M20	270	354	100	240	M12	100	48
200A( 8B)	910	3.04	6×45	4.5×45	M24	315	425	100	280	M16	100	50
250A( 10B)	1635	4.99	9×45	6×45	M24	350	487	115	310	M20	100	55
300A( 12B)	1725	6.26	9×50	6×50	M24	385	547	115	345	M20	100	62

adjustable clevis for cast iron pipe

model : CHA - CI



**MATERIAL :** Carbon steel.

**SERVICE :** Recommended for the suspension of cast iron pipe.

**INSTALLATION :** Hanger rod nut above clevis must be tightened securely to assure proper hanger performance.

**ADJUSTMENT :** Vertical adjustment without removing pipe may be made from 30mm to 100mm, varying with the size of the clevis. Tighten upper nut after adjustment.

**ORDERING :** Specify model name and nominal pipe size.  
ex) CHA - CI - 100A

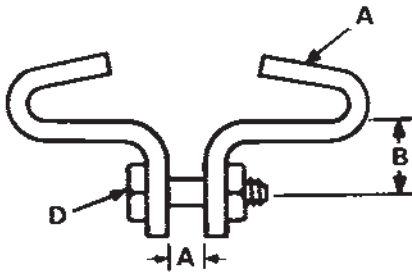
loads • weights • dimensions (mm)

pipe size	max. recom. load,kg	wgt (approx) kg each	size of steel		A	B	C	D	E	adjustment F
			upper	lower						
100A( 4B)	650	1.00	6×35	4.5×35	M16	145	210	90	120	40
150A( 6B)	880	1.63	6×40	4.5×40	M20	180	270	90	145	45
200A( 8B)	910	2.36	6×45	4.5×45	M24	215	332	100	180	45
250A(10B)	1635	3.67	9×45	4.5×45	M24	255	398	115	220	55
300A(12B)	1725	5.94	9×50	6×50	M24	265	437	125	230	30
350A(14B)	1905	7.98	12×50	6×50	M24	345	548	125	300	65
400A(16B)	2085	11.25	12×65	6×65	M24	390	620	150	345	85
450A(18B)	2180	13.52	12×65	6×65	M24	425	680	150	380	85
500A(20B)	2180	22.23	16×75	9×75	M30	470	756	180	415	95
600A(24B)	2180	25.67	16×75	9×75	M30	525	862	180	475	100



## beam clamp

model : BC



**MATERIAL** : Carbon steel.

**SERVICE** : For attachment on standard Beams under normal service conditions. Regularly furnished complete with bolt and nut as shown. Designed for use with Welded Eye Rods, Weldless Eye Nuts or similar applications. Clamps for wider flange widths are available to order. However, maximum recommended loads do not apply to flange widths in excess of 200mm and maximum loads must be decreased in accordance with flange widths.

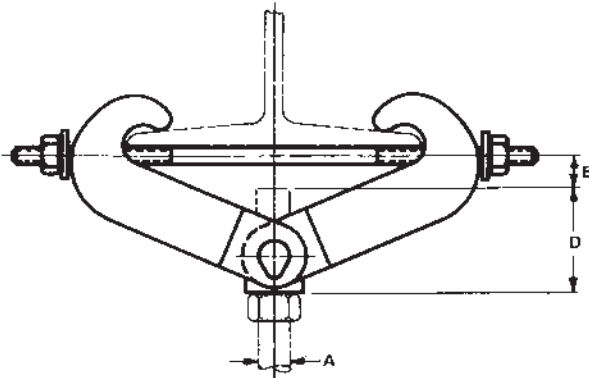
**ORDERING** : Specify model name, clamp number, Flange Width and where possible, give beam description.

## loads • weights • dimensions (mm)

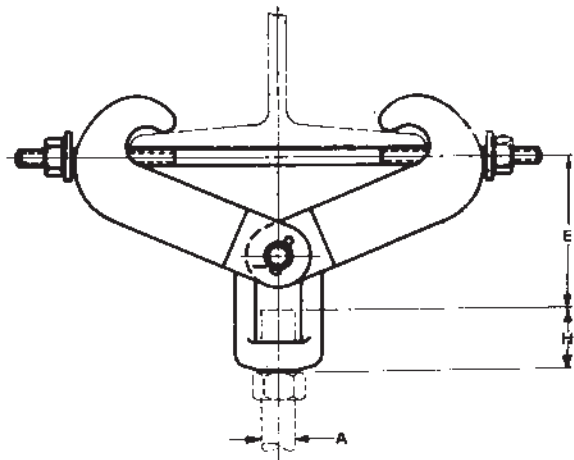
clamp no.	max. recom. load, kg	A	B	bolt size D	stock size G	weight per C dim. (approx), kg						
						beam flange width						
						50	75	100	125	150	175	200
1	455	12	30	M10×40L	6×30	34.0	38.6	47.6	51.3	54.9	58.5	63.5
2	565	12	35	M12×40L	6×40	-	52.2	61.2	66.7	70.3	75.3	83.0
3	680	15	35	M12×50L	9×40	-	83.9	90.7	99.8	113.4	122.5	131.5
4	1360	20	40	M16×65L	12×50	-	-	186.0	197.3	217.7	235.9	249.5
5	1475	20	50	M16×65L	12×65	-	-	247.2	263.1	288.0	313.0	328.9
6	1590	20	50	M20×75L	16×65	-	-	328.9	367.4	387.8	430.9	449.1

Steel beam clamp

model : SBC - S (with swivel nut)  
SBC - E (with weldless eye nut)



SBC-S



SBC-E

**MATERIAL :** Body - Formed carbon steel.  
Swivel Nut - Cast steel.  
Weldless Eye Nut - Forged steel.

**SERVICE :** For suspension of loads from standard beam and wide flange members without welding.

**NOTE :** Swivel Nut permits rod swing in one plane. Weldless Eye Nut allows multi-directional movement.

**WARNING :** Care must be exercised in the selection and use of beam clamps to insure application of clamps does not induce transfer stresses in the beam.

**ORDERING :** Specify model name, clamp number and rod size.  
ex) SBC - S - 3, ROD : M30

loads • weights • dimensions (mm)

clamp no.	weight (approx) kg each		max recom. load, kg	max rod size A	H	D	flange size	
	SBC-S	SBC-E					width	max. thick
1	163.3	177.0	820	M16	30	35	50-200	16
2	265.4	279.0	820	M16	30	35	150-250	16
3	249.5	294.8	2250	M24	40	65	50-200	16
4	453.6	499.0	2250	M24	40	65	150-250	16
5	875.5	1084.1	5275	M36	55	100	150-300	24

E dimensions (mm) : SBC-S

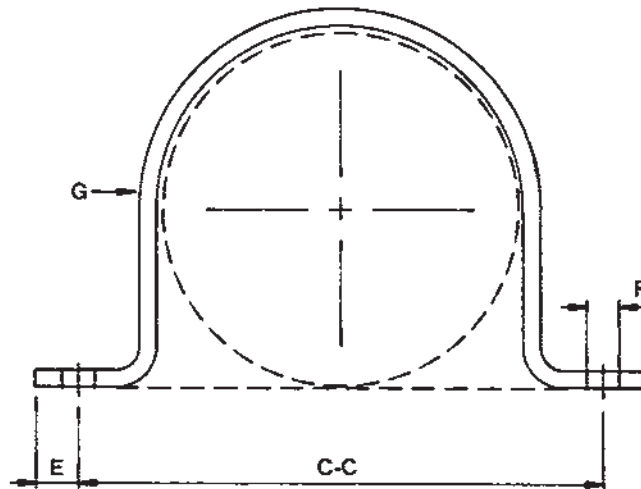
clamp no.	beam flange width								
	50	75	100	125	150	175	200	250	300
1	75	70	65	55	40	30	-	-	-
2	-	-	-	105	100	90	80	65	60
3	60	55	50	40	25	15	-	-	-
4	-	-	-	90	85	75	65	50	45
5	-	-	-	105	95	90	80	75	65

E dimensions (mm) : SBC-E

clamp no.	beam flange width								
	50	75	100	125	150	175	200	250	300
1	125	120	115	105	92	85	-	-	-
2	-	-	-	155	150	145	130	120	110
3	135	130	125	115	100	90	-	-	-
4	-	-	-	165	160	150	140	125	120
5	-	-	-	210	200	195	185	180	170

## pipe strap

model : PSR

**MATERIAL** : Carbon steel.**MAXIMUM TEMPERATURE** : 345℃**ORDERING** : Specify model name and nominal pipe size.

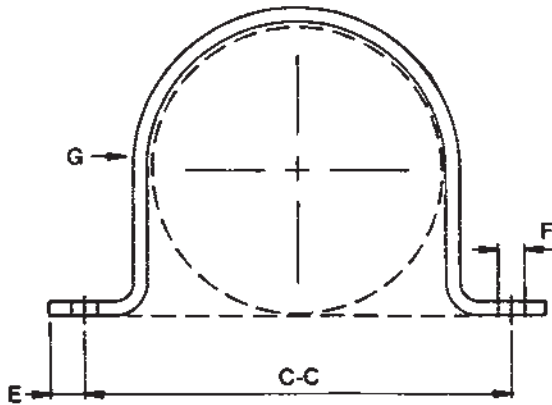
ex) PSR - 150A

## loads • weights • dimensions (mm)

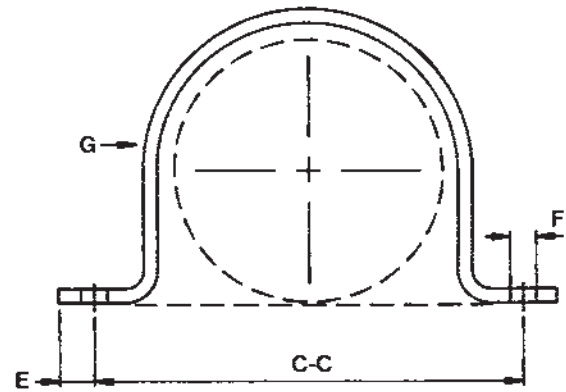
pipe size	weight (approx) Kg/100	G	E	F	C-C center to center
15A( 1/2B)	8.2	3×25	20	12	70
20A( 3/4B)	9.1	3×25	20	12	76
25A( 1B)	10.0	3×25	20	12	83
32A(1 1/4B)	11.3	3×25	20	12	94
40A(1 1/2B)	13.2	3×25	20	12	106
50A( 2B)	15.0	3×25	20	12	120
65A(2 1/2B)	39.0	4.5×38	25	18	133
80A( 3B)	45.4	4.5×38	25	18	150
90A(3 1/2B)	49.9	4.5×38	25	18	160
100A( 4B)	54.4	4.5×38	25	18	180
125A( 5B)	113.4	6×50	30	22	205
150A( 6B)	127.0	6×50	30	22	230
200A( 8B)	163.3	6×50	30	22	280
250A( 10B)	445.0	9×75	30	22	350
300A( 12B)	523.0	9×75	30	22	400

## bolted pipe strap bolted pipe guide

model : BPS  
model : BPG



STRAP



GUIDE

**MATERIAL** : Carbon steel.

**MAXIMUM TEMPERATURE** : 345°C

**ORDERING** : Specify model name and nominal pipe size.

ex) BPS - 100A

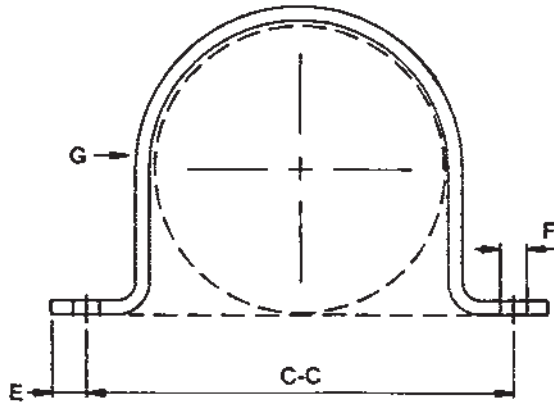
ex) BPG - 100A

### loads • weights • dimensions (mm)

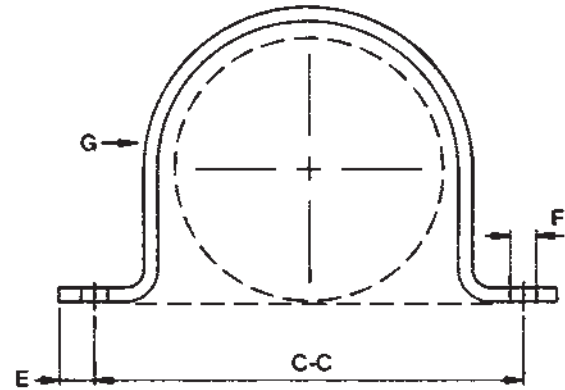
pipe size	max. recom. vertical load(Kg)	max. recom. lateral load(Kg)	weight (approx) Kg/100	G	E	F	C - C	
							BPS	BPG
15A( 1/2B)	272	115	22.2	6 × 32	14	15	86	90
20A( 3/4B)	272	115	24.5	6 × 32	14	15	90	94
25A( 1B)	272	115	26.8	6 × 32	14	15	97	100
32A(1 1/4B)	545	230	77.1	9 × 50	14	15	122	125
40A(1 1/2B)	545	230	83.0	9 × 50	14	15	130	148
50A( 2B)	545	230	93.9	9 × 50	14	15	140	143
65A(2 1/2B)	1090	455	340.2	16 × 75	18	20	190	194
80A( 3B)	1090	455	374.2	16 × 75	18	20	206	210
90A(3 1/2B)	1090	455	408.2	16 × 75	18	20	220	222
100A( 4B)	2180	455	1179.3	19 × 150	22	30	252	256
150A( 6B)	2180	455	1474.2	19 × 150	22	30	306	310
200A( 8B)	2180	455	1791.7	19 × 150	22	30	357	360

**bolted pipe strap heavy duty**  
**bolted pipe guide heavy duty**

**model : BPH**  
**model : BGH**



**STRAP**



**GUIDE**

**MATERIAL :** Carbon steel.

**MAXIMUM TEMPERATURE :** 345 °C

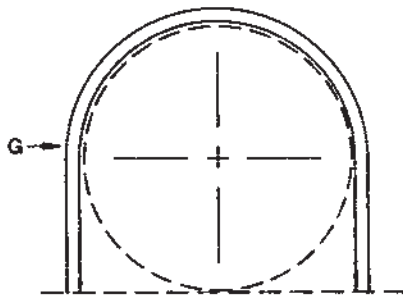
**ORDERING :** Specify model name and nominal pipe size.  
 ex) BPH-25A  
 ex) BGH-25A

**loads • weights • dimensions (mm)**

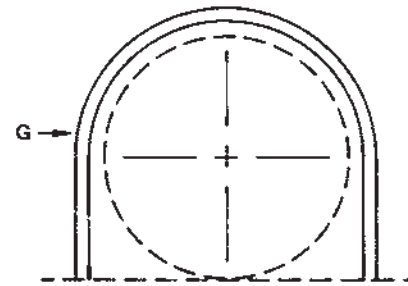
pipe size	max. recom. vertical load(Kg)	max. recom. lateral load(Kg)	weight (approx) Kg/100	G	E	F	C - C	
							BPH	BGH
15A( 1/2B)	545	230	59.0	9×50	15	14	102	105
20A( 3/4B)	545	230	68.0	9×50	15	14	106	110
25A( 1B)	545	230	72.6	9×50	15	14	113	116
32A(1 1/4B)	1090	455	136.1	12×65	20	18	145	148
40A(1 1/2B)	1090	455	145.1	12×65	20	18	150	154
50A( 2B)	1090	455	165.6	12×65	20	18	162	165

welded u-strap  
welded u-guide

model : USR  
model : UGR



STRAP



GUIDE

**MATERIAL** : Carbon steel.

**MAXIMUM TEMPERATURE** : 345°C

**ORDERING** : Specify model name and nominal pipe size.

ex) USR - 150A

ex) UGR - 150A

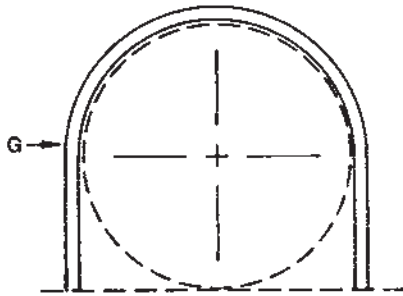
#### loads • weights • dimensions (mm)

pipe size	max. recom. vertical load(Kg)	max. recom. lateral load(Kg)	weight (approx) Kg/100	G stock size
15A( 1/2B)	272	115	11.3	6 × 32
20A( 3/4B)	272	115	13.6	6 × 32
25A( 1B)	272	115	15.9	6 × 32
32A(1 1/4B)	545	230	49.4	9 × 50
40A(1 1/2B)	545	230	56.2	9 × 50
50A( 2B)	545	230	67.1	9 × 50
65A(2 1/2B)	1090	455	204.1	16 × 75
80A( 3B)	1090	455	226.8	16 × 75
90A(3 1/2B)	1090	455	294.8	16 × 75
100A( 4B)	2180	455	725.7	19 × 150
150A( 6B)	2180	455	1088.6	19 × 150
200A( 8B)	2180	455	1428.8	19 × 150

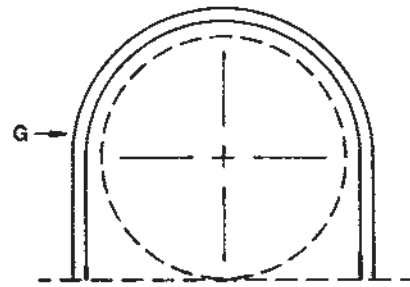


welded u-strap heavy duty  
welded u-guide heavy duty

model : USH  
model : UGH



STRAP



GUIDE

**MATERIAL** : Carbon steel.

**MAXIMUM TEMPERATURE** : 345°C

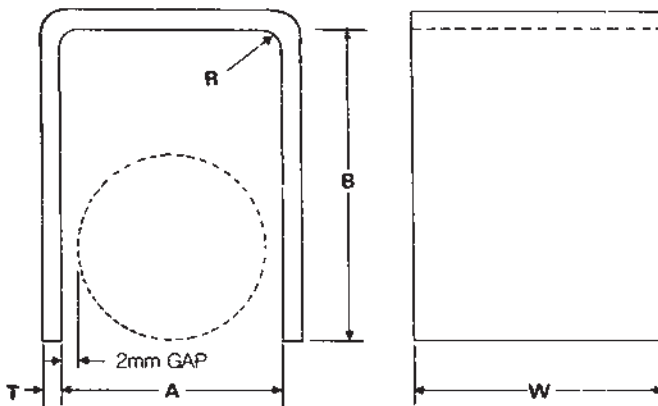
**ORDERING** : Specify model name and nominal pipe size.  
ex) USH-50A  
ex) UGH-50A

**loads • weights • dimensions (mm)**

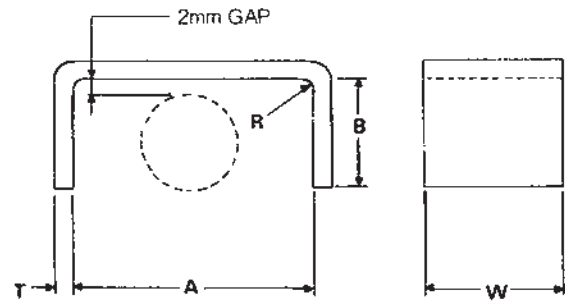
pipe size	max. recom. vertical load(Kg)	max. recom. lateral load(Kg)	weight (approx) Kg/100	G stock size
15A( 1/2B)	545	230	29.5	9×50
20A( 3/4B)	545	230	34.5	9×50
25A( 1B)	545	230	40.8	9×50
32A(1 1/4B)	1090	455	90.7	12×65
40A(1 1/2B)	1090	455	99.8	12×65
50A( 2B)	1090	455	117.9	12×65

pipe strap

model : PSD  
PSV



PSD



PSV

**MATERIAL** : Carbon steel.

**MAXIMUM TEMPERATURE** : 345°C

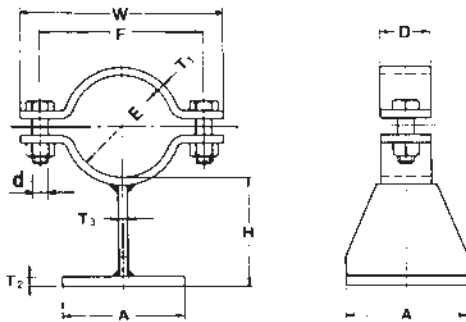
**ORDERING** : Specify model name and nominal pipe size.  
ex) PSD-80A  
ex) PSV-80A

loads • weights • dimensions (mm)

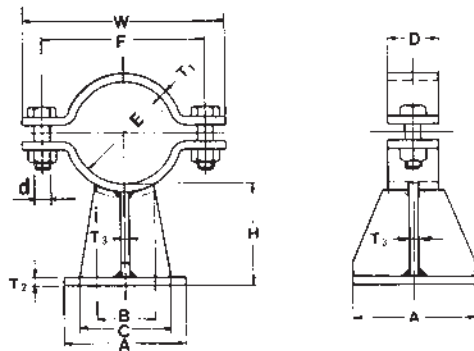
pipe size	R	T	W	model PSD				model PSV			
				max. recom. load	A	B	weight, kg. each	max. recom. load	A	B	weight, kg. each
15A( 1/2B)	10	6	50	195	25	75	0.44	410	75	23	0.30
20A( 3/4B)					30	75	0.45		90	28	0.35
25A( 1B)					37	85	0.49		285	100	35
32A(1 1/2B)	14	9	75	350	46	90	1.25	455	115	44	1.14
40A(1 1/2B)					52	100	1.43		125	50	1.28
50A( 2B)					65	115	1.65		140	63	1.50
65A(2 1/2B)	20	12	75	205	77	125	2.44	410	155	75	2.25
80A( 3B)			100		93	140	3.67		365	165	91
100A( 4B)	20	12	100	410	118	165	4.44	680	190	116	4.22
150A( 6B)			150		172	215	9.02		250	170	8.85

pipe clamp shoe

model : PCS - C (carbon)  
 PCS - A (alloy)  
 PCS - S (stainless)



40A and smaller



50A and larger

MATERIAL :

PCS - C : Carbon steel  
 PCS - A : Alloy steel and carbon steel (only base plate)  
 PCS - S : Stainless steel and carbon steel (only base plate)

SERVICE :

For the support of piping where a Sliding Shoe is required and where it is not desired to weld the Shoe to the piping system. Recommended for use on industrial piping systems where the pipe is subject to horizontal expansion. All sizes maintain a standard height clearance of 150mm between the structure and the bottom of the pipe. Heat loss is kept to a minimum as only the clamps are in contact with the piping system. Longer over-all length than shown may be furnished to order to accommodate larger horizontal pipe movements. Pipe Clamp Shoe fabricated to the customer's dimensions can be furnished to satisfy specific applications.

ORDERING :

Specify model name and nominal pipe size.  
 ex) PCS - C - 250A

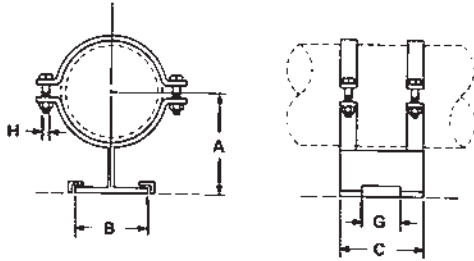
weights • dimensions (mm)

pipe size	weight approx (Kg)	A	B	C	D	E	F	W	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	d
20A( 3/4B)	3.8	200	-	-	25	28	60	100	3.2	6	6	8
25A( 1B)	3.8	200	-	-	25	35	65	110	3.2	6	6	8
32A(1 1/4B)	4.1	200	-	-	25	44	70	100	3.2	6	6	8
40A(1 1/2B)	4.5	200	-	-	25	50	80	120	3.2	6	6	8
50A( 2B)	4.9	200	50	150	25	63	110	140	6	9	6	12
65A(2 1/2B)	5.0	200	65	150	25	78	130	170	6	9	6	12
80A( 3B)	5.1	200	80	150	25	92	145	190	6	9	6	12
90A(3 1/2B)	8.1	200	90	150	25	104	160	200	6	9	9	12
100A( 4B)	8.2	200	90	150	35	117	175	220	6	9	9	16
125A( 5B)	8.6	200	110	150	35	144	205	250	6	9	9	16
150A( 6B)	12.3	250	130	200	40	170	255	310	9	12	9	20
175A( 7B)	12.8	250	150	200	40	194	280	340	9	12	9	20
200A( 8B)	13.1	250	180	200	40	222	305	360	9	12	9	20
225A( 9B)	22.7	300	200	250	50	274	370	380	12	16	12	24
250A( 10B)	23.3	300	200	250	50	276	375	440	12	16	12	24
300A( 12B)	24.2	300	200	250	50	326	425	400	12	16	12	24
350A( 14B)	29.1	350	250	300	65	359	465	540	12	16	12	24
400A( 16B)	36.1	350	250	300	65	410	515	590	12	16	12	24
450A( 18B)	37.7	350	250	300	65	460	585	660	16	19	12	24
500A( 20B)	52.7	350	250	300	65	512	645	720	16	19	16	30
550A( 22B)	53.5	350	400	300	75	562	700	810	16	19	16	30
600A( 24B)	55.7	350	400	300	75	614	770	870	16	19	16	30
650A( 26B)	76.0	350	400	300	100	665	830	920	19	22	19	36
700A( 28B)	78.2	350	400	300	100	715	900	970	19	22	19	36

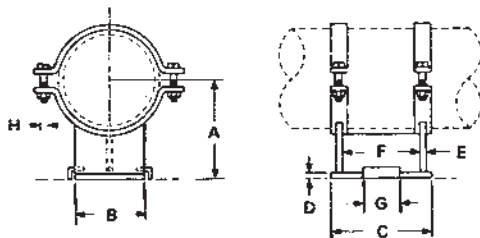
■ Weights are calculated for those which have 150mm of the height H.

pipe sliding guide

model : **PSG-C** (carbon)  
**PSG-A** (alloy)  
**PSG-S** (stainless)



150A and smaller



200A and larger

**MATERIAL :**

PSG-C : Carbon steel  
 PSG-A : Alloy steel and carbon steel (only base plate)  
 PSG-S : Stainless steel and carbon steel (only base plate)

**SERVICE :** For the support of piping where a Sliding Guide is required and where it is not desired to weld the Guide to the piping system.

The Pipe Sliding Guide is recommended for use on industrial piping systems where the pipe is subject to horizontal expansion. All sizes maintain a standard height clearance of 150mm between the structure and the bottom of the pipe. Heat loss is kept to a minimum as only the clamps are in contact with the piping system. The Slide Guide Lugs are welded to the supporting steel to retain the Guide in the desired position during movement of the piping system.

The Pipe Sliding Guide can be furnished without Slide Guide Lugs where it is desired to retain the piping at a specified location and the bottom plate of the Guide is then welded directly to the structure providing an anchor where required. Sliding Guides of a longer over-all length than shown may be furnished to order to accommodate larger horizontal pipe movements.

Sliding Guides fabricated to the customer's dimensions can be furnished to satisfy specific applications.

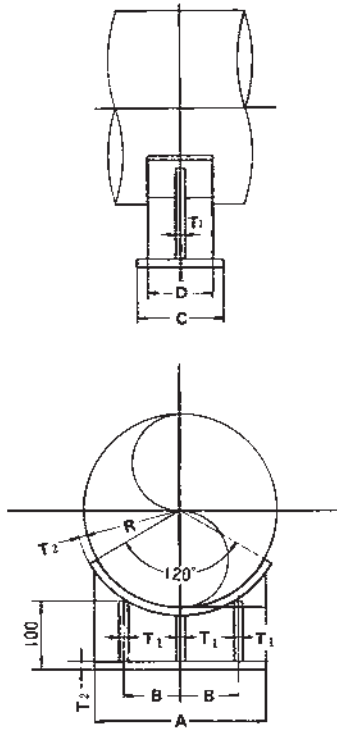
**ORDERING :** Specify model name and nominal pipe size.  
 ex) PSG-C-250A

loads • weights • dimensions (mm)

pipe size	max. recom load, kg	wgt (approx) kg each	max avail. mvmt.	A	B	C	D	E	F	G	H
20A( 3/4B)	545	1.33	100	120	60	150	6	4.5	-	50	M 8
25A( 1B)	545	1.34	100	120	60	150	6	4.5	-	50	M 8
32A(1 1/4B)	545	1.38	100	125	60	150	6	4.5	-	50	M 8
40A(1 1/2B)	545	1.41	100	130	60	150	6	4.5	-	50	M 8
50A( 2B)	545	1.79	100	140	60	150	9	6	-	50	M12
65A(2 1/2B)	545	2.60	100	145	100	150	9	6	-	50	M12
80A( 3B)	545	2.72	100	150	100	150	9	6	-	50	M12
90A(3 1/2B)	545	2.99	100	160	100	150	9	6	-	50	M12
100A( 4B)	815	3.09	90	165	100	150	9	6	-	65	M16
125A( 5B)	815	3.96	90	180	100	150	9	6	-	65	M16
150A( 6B)	815	6.15	90	195	100	150	12	9	-	65	M20
200A( 8B)	2270	11.53	100	210	150	200	12	9	175	75	M20
250A( 10B)	2270	16.29	100	240	150	200	16	9	175	75	M24
300A( 12B)	2270	21.13	100	265	200	200	16	12	175	75	M24
350A( 14B)	2270	25.43	150	280	200	250	16	12	220	75	M24
400A( 16B)	2270	26.98	150	305	200	250	16	12	220	75	M24
450A( 18B)	2270	41.04	145	330	250	250	16	12	220	75	M24
500A( 20B)	3175	49.78	185	355	300	300	16	12	260	90	M30
600A( 24B)	3175	57.90	185	405	300	300	16	12	260	90	M30

## pipe saddle slide

model : PSS

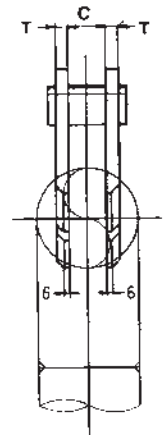
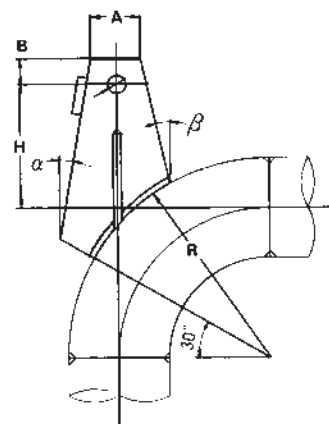
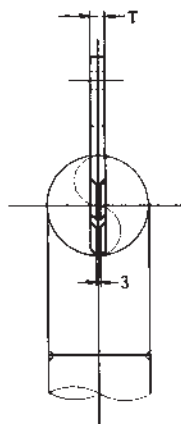
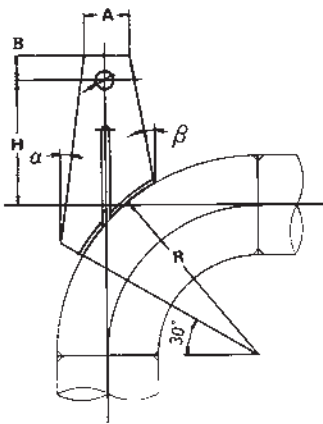
**MATERIAL** : Carbon steel**SERVICE** : Recommended for use of large diameter pipe line.**MAXIMUM TEMPERATURE** : 345℃**ORDERING** : Specify model name and nominal pipe size.  
ex) PSS-300A

## weights · dimensions (mm)

pipe size	wgt. approx. kg	pipe dia.	A	B	C	D	R	T <sub>1</sub>	T <sub>2</sub>
250A(10B)	7.8	267.4	230	75	125	100	137	6	12
300A(12B)	9.0	318.5	270	90	125	100	162	6	12
350A(14B)	9.9	355.6	300	100	125	100	181	6	12
400A(16B)	11.3	406.4	350	115	125	100	207	6	12
450A(18B)	14.1	457.2	390	130	125	100	232	9	12
500A(20B)	15.6	508.0	430	145	125	100	257	9	12
550A(22B)	17.3	558.8	480	160	125	100	283	9	12
600A(24B)	18.7	609.6	520	175	125	100	308	9	12
650A(26B)	30.5	660.4	560	190	175	125	334	9	16
700A(28B)	33.1	711.1	610	200	175	125	360	9	16
750A(30B)	35.4	762.0	650	220	175	125	385	9	16
800A(32B)	37.6	812.8	690	230	175	125	410	9	16
850A(34B)	40.3	863.6	740	250	175	125	436	9	16
900A(36B)	42.6	914.4	780	265	175	125	461	9	16
1000A(40B)	58.1	1016.0	860	290	200	175	512	9	16

elbow lug (for carbon steel)

model : ELC



225A and smaller

250A and larger

**MATERIAL** : Carbon steel

**SERVICE** : Recommended for suspension of long radius pipe elbow.  
Edge preparation of lug plate is made for groove weld.

**ORDERING** : Specify model name and nominal pipe size.

When special dimension for P and/or H other than standard is required, specify it.

ex) ELC-80A  
ELC-80A, P=28, H=180

**MAXIMUM TEMPERATURE** : 345°C

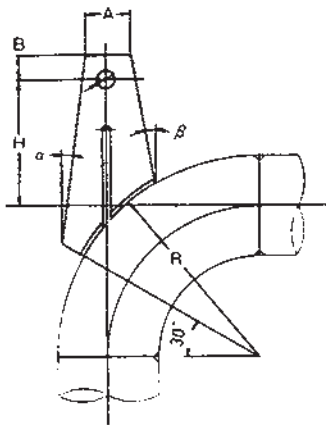
loads • weights • dimensions (mm)

pipe size	max. recom. load kg	wgt. approx. kg	A	B	C	H	α	β	diam P	R	T	pin dia.
80A( 3B)	1200	0.8	60	30	-	150	0	0	26	159	9	-
90A(3½B)	1200	0.8	60	30	-	150	0	0	26	185	9	-
100A( 4B)	1200	1.5	60	30	-	150	5	5	26	210	9	-
125A( 5B)	1730	3.5	80	30	-	200	5	10	33	260	12	-
150A( 6B)	1730	3.7	80	30	-	200	5	10	33	311	12	-
175A( 7B)	2760	4.1	80	45	-	200	5	15	39	363	12	-
200A( 8B)	2760	4.2	80	45	-	200	5	15	39	413	12	-
225A( 9B)	2760	4.4	80	45	-	200	5	15	39	464	12	-
250A( 10B)	4035	15.1	100	55	48	250	5	15	46	515	12	42
300A( 12B)	4035	15.7	100	55	48	250	5	15	46	616	12	42
350A( 14B)	4035	17.2	100	55	48	250	5	15	46	711	12	42
400A( 16B)	5545	42.1	120	55	48	300	10	20	52	813	12	48
450A( 18B)	5545	45.9	120	55	48	300	10	20	52	915	12	48
500A( 20B)	5545	49.7	120	55	48	300	10	20	52	1016	12	48
550A( 22B)	7295	80.6	150	60	60	300	10	20	62	1118	16	56
600A( 24B)	7295	86.6	150	60	60	300	10	20	62	1220	16	56

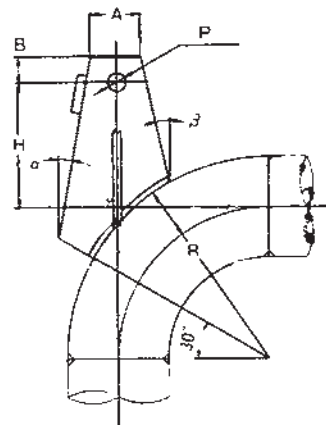
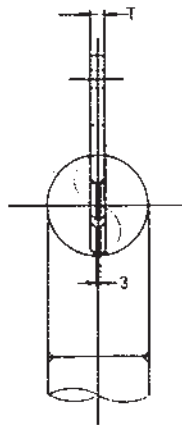


elbow lug (for alloy steel)

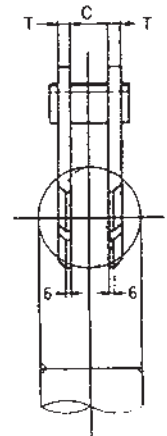
model : ELA



225A and smaller



250A and larger



**MATERIAL :** Chrome molybdenum steel

**SERVICE :** Recommended for suspension of long radius pipe elbow.  
Edge preparation of lug plate is made for groove weld.

**ORDERING :** Specify model name and nominal pipe size.

When special dimension for P and/or H other than standard is required, specify it.

ex) ELA-80A  
ELA-80A, P=28, H=180

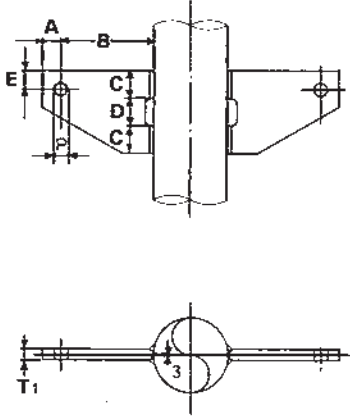
**MAXIMUM TEMPERATURE :** 570°C

loads • weights • dimensions (mm)

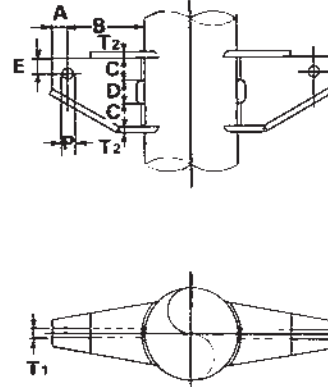
pipe size	max. recom. load, kg				wgt. approx. kg	A	B	C	H	α	β	diam P	R	T	pin dia.
	400°C	450°C	500°C	570°C											
80A( 3B)	1200	1175	940	520	1.9	80	30	-	175	0	5	26	159	12	-
90A(3 1/2 B)	1200	1175	940	520	2.1	80	30	-	200	0	5	26	185	12	-
100A( 4B)	1200	1175	940	520	3.2	80	30	-	200	5	5	26	210	12	-
125A( 5B)	1730	1695	1360	755	4.6	80	30	-	200	5	10	33	260	16	-
150A( 6B)	1730	1695	1360	755	5.9	80	30	-	250	5	10	33	311	16	-
175A( 7B)	2760	2700	2170	1205	7.3	90	45	-	250	5	15	39	363	16	-
200A( 8B)	2760	2700	2170	1205	7.5	90	45	-	250	5	15	39	413	16	-
225A( 9B)	2760	2700	2170	1205	7.8	90	45	-	250	5	15	39	463	16	-
250A( 10B)	4035	3950	3170	1760	17.4	100	55	48	300	5	15	46	515	12	42
300A( 12B)	4035	3950	3170	1760	18.0	100	55	48	300	5	15	46	616	12	42
350A( 14B)	4035	3950	3170	1760	19.7	100	55	48	300	5	15	46	711	12	42
400A( 16B)	5545	5430	4360	2420	56.1	120	55	48	300	10	20	52	813	16	48
450A( 18B)	5545	5430	4360	2420	60.7	120	55	48	300	10	20	52	915	16	48
500A( 20B)	5545	5430	4360	2420	65.8	120	55	48	300	10	20	52	1016	16	48
550A( 22B)	7295	7150	5730	3180	80.6	150	60	60	300	10	20	62	1118	16	56
600A( 24B)	7295	7150	5730	3180	86.6	150	60	60	300	10	20	62	1220	16	56

riser lug (for carbon steel)

model : RLH-C



150A and smaller



175A and larger

**MATERIAL** : Carbon steel

**SERVICE** : Recommended for suspension of riser pipe line with hanger type construction. Edge preparation of lug plate is made for groove weld.

**MAXIMUM TEMPERATURE** : 345°C

**ORDERING** : Specify model name and nominal pipe size.

When special dimension for P and/or B other than standard is required, specify it.

ex) RLH-C-80A

RLH-C-80A, P=28, B=250

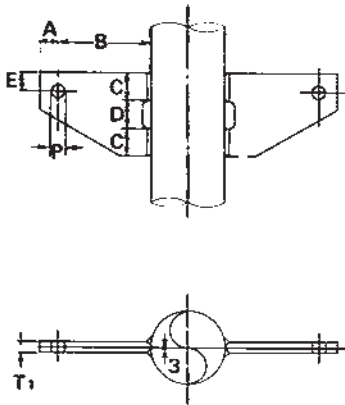
loads • weights • dimensions (mm)

pipe size	■ max. recom. load, kg	wgt. approx. kg	A	B	C	D	E	diam P	T <sub>1</sub>	T <sub>2</sub>
80A( 3B)	765	2.4	30	220	65	50	30	22	9	-
90A(3 1/2 B)	765	2.4	30	220	65	50	30	22	9	-
100A( 4B)	765	2.4	30	220	65	50	30	22	9	-
125A( 5B)	1200	3.4	30	240	65	55	30	26	12	-
150A( 6B)	1200	3.4	30	240	65	55	30	26	12	-
175A( 7B)	1730	10.3	45	300	75	70	45	33	12	9
200A( 8B)	1730	10.8	45	300	75	70	45	33	12	9
225A( 9B)	1730	11.1	45	300	75	70	45	33	12	9
250A( 10B)	2760	13.0	45	320	85	80	45	39	12	9
300A( 12B)	2760	13.8	45	320	85	80	45	39	12	9
350A( 14B)	2760	14.6	45	320	85	80	45	39	12	9
400A( 16B)	4035	26.8	55	375	100	100	55	46	16	12
450A( 18B)	4035	28.1	55	375	100	100	55	46	16	12
500A( 20B)	4035	29.4	55	375	100	100	55	46	16	12
550A( 22B)	5545	44.7	55	420	110	105	55	52	19	16
600A( 24B)	5545	46.6	55	420	110	105	55	52	19	16

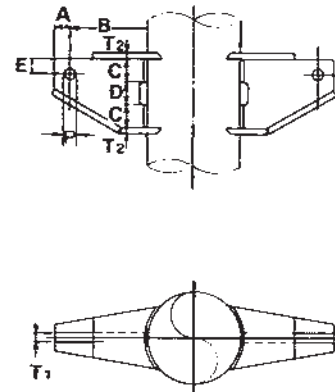
■ Calculated for one piece of lug.

## riser lug (for alloy steel)

## model : RLH-A



150A and smaller



175A and larger

**MATERIAL** : Chrome molybdenum steel

**SERVICE** : Recommended for suspension of riser pipe line with hanger type construction. Edge preparation of lug plate is made for groove weld.

**MAXIMUM TEMPERATURE** : 570°C

**ORDERING** : Specify model name and nominal pipe size.

When special dimension for P and/or B other than standard is required, specify it.

ex) RLH-A-80A

RLH-A-80A, P=28, B=300

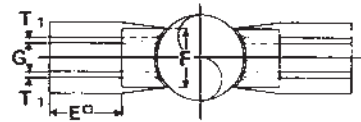
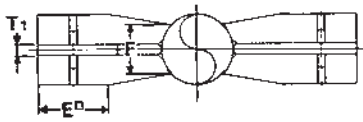
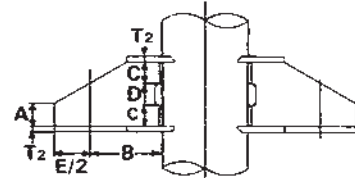
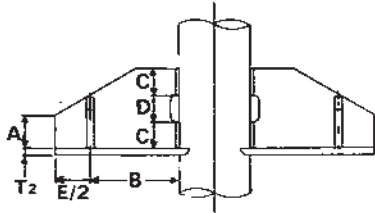
## loads • weights • dimensions (mm)

pipe size	max. recom. load, kg	wgt. approx. kg	A	B	C	D	E	diam P	T <sub>1</sub>	T <sub>2</sub>
80A( 3B)	765	3.6	30	250	70	50	30	22	12	-
90A(3½B)	765	3.6	30	250	70	50	30	22	12	-
100A( 4B)	765	3.6	30	250	70	50	30	22	12	-
125A( 5B)	1200	5.4	30	275	70	60	30	26	16	-
150A( 6B)	1200	5.4	30	275	70	60	30	26	16	-
175A( 7B)	1730	13.9	45	370	95	80	45	33	12	9
200A( 8B)	1730	14.4	45	370	95	80	45	33	12	9
225A( 9B)	1730	14.8	45	370	95	80	45	33	12	9
250A( 10B)	2760	22.5	45	390	100	90	45	39	16	12
300A( 12B)	2760	23.9	45	390	100	90	45	39	16	12
350A( 14B)	2760	24.9	45	390	100	90	45	39	16	12
400A( 16B)	4035	33.5	55	410	115	100	55	46	19	12
450A( 18B)	4035	34.9	55	410	115	100	55	46	19	12
500A( 20B)	4035	36.4	55	410	115	100	55	46	19	12
550A( 22B)	5545	49.8	55	450	125	100	55	52	19	16
600A( 24B)	5545	51.8	55	450	125	100	55	52	19	16

■ Calculated for one piece of lug.

riser lug (for carbon steel)

model : RLS-C



150A and smaller

175A and larger

**MATERIAL :** Carbon steel

**MAXIMUM TEMPERATURE :** 345℃

**SERVICE :** Recommended for support of riser pipe line with support type onstruction. Edge preparation of lug plate is made for groove weld.

**ORDERING :** Specify model name and nominal pipe size.

When special dimension for B other than standard is required, specify it.

ex) RLS-C-80A  
RLS-C-80A, B=250

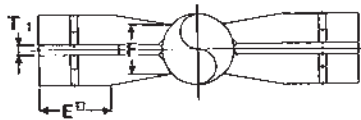
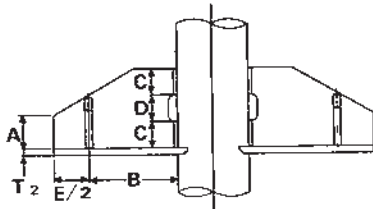
loads • weights • dimensions (mm)

pipe size	max.recom. load, kg	wgt. approx. kg	A	B	C	D	E	F	G	T <sub>1</sub>	T <sub>2</sub>
80A( 3B)	765	10.8	60	220	65	50	250	80	-	9	9
90A(3½B)	765	10.9	60	220	65	50	250	90	-	9	9
100A( 4B)	765	10.9	60	220	65	50	250	100	-	9	9
125A( 5B)	1200	15.5	60	240	65	55	250	125	-	12	12
150A( 6B)	1200	15.4	60	240	65	55	250	125	-	12	12
175A( 7B)	1730	24.3	90	300	75	70	250	155	110	9	12
200A( 8B)	1730	24.1	90	300	75	70	250	155	110	9	12
225A( 9B)	1730	24.0	90	300	75	70	250	155	110	9	12
250A( 10B)	2760	35.8	90	320	85	80	300	195	150	12	12
300A( 12B)	2760	35.5	90	320	85	80	300	195	150	12	12
350A( 14B)	2760	35.3	90	320	85	80	300	195	150	12	12
400A( 16B)	4035	58.9	110	1375	100	100	300	200	150	16	16
450A( 18B)	4035	58.7	110	1375	100	100	300	200	150	16	16
500A( 20B)	4035	58.6	110	1375	100	100	300	200	150	16	16
550A( 22B)	5545	76.5	110	1420	110	105	350	250	200	16	16
600A( 24B)	5545	76.3	110	1420	110	105	350	250	200	16	16

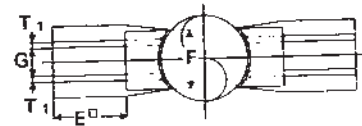
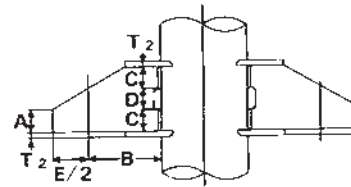
■ Calculated for one piece of lug.

## riser lug (for alloy steel)

## model : RLS - A



## 150A and smaller



## 175A and larger

**MATERIAL** : Chrome molybdenum steel

**SERVICE** : Recommended for support of riser pipe line with support type construction. Edge preparation of lug plate is made for groove weld.

**MAXIMUM TEMPERATURE** : 570℃

**ORDERING** : Specify model name and nominal pipe size.

When special dimension for B other than standard is required, specify it.

ex) RLS-A-80A  
RLS-A-80A, B=300

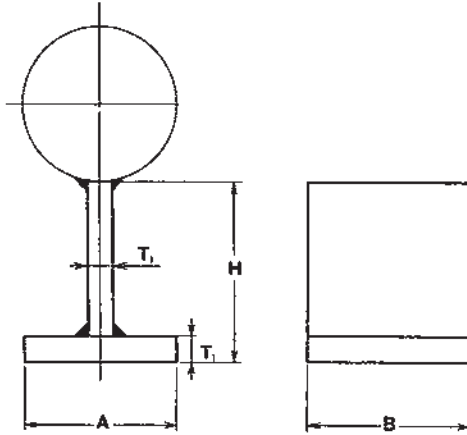
## loads • weights • dimensions (mm)

pipe size	■ max. recom. load, kg	wgt. approx. kg	A	B	C	D	E	F	G	T <sub>1</sub>	T <sub>2</sub>
80A( 3B)	765	11.8	60	250	70	50	250	80	-	9	9
90A(3½B)	765	11.9	60	250	70	50	250	90	-	9	9
100A( 4B)	765	11.9	60	250	70	50	250	100	-	9	9
125A( 5B)	1200	17.3	60	275	70	60	250	125	-	12	12
150A( 6B)	1200	17.2	60	275	70	60	250	125	-	12	12
175A( 7B)	1730	32.2	90	320	95	80	250	155	110	12	12
200A( 8B)	1730	32.0	90	320	95	80	250	155	110	12	12
225A( 9B)	1730	31.9	90	320	95	80	250	155	110	12	12
250A( 10B)	2760	44.5	90	390	100	90	300	195	150	12	12
300A( 12B)	2760	44.1	90	390	100	90	300	195	150	12	12
350A( 14B)	2760	43.9	90	390	100	90	300	195	150	12	12
400A( 16B)	4035	67.6	110	410	115	100	300	200	150	16	16
450A( 18B)	4035	67.4	110	410	115	100	300	200	150	16	16
500A( 20B)	4035	67.2	110	410	115	100	300	200	150	16	16
550A( 22B)	5545	82.3	110	450	125	100	350	250	200	16	16
600A( 24B)	5545	82.1	110	450	125	100	350	250	200	16	16

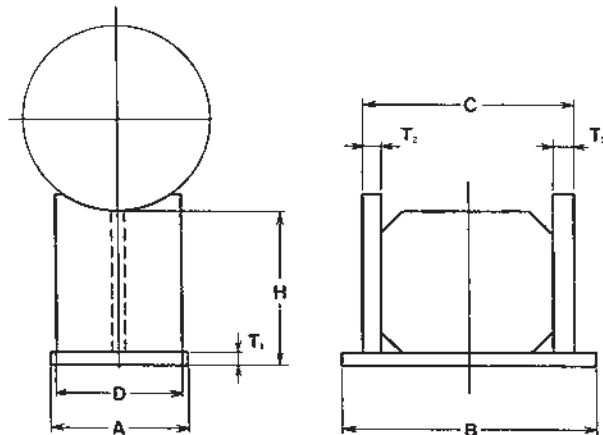
■ Calculated for one piece of lug.

pipe slide assembly (for carbon steel)

model : PSL - C



65A and smaller



80A and larger

**MATERIAL :** Carbon Steel

**SIZE RANGE :** 15A through 600A pipe outer diameter.

**SERVICE :** Used to support insulated carbon steel pipe at horizontal portion by welding to pipe.

**ORDERING :** Specify model name and nominal pipe size.  
ex) PSL - C - 100A

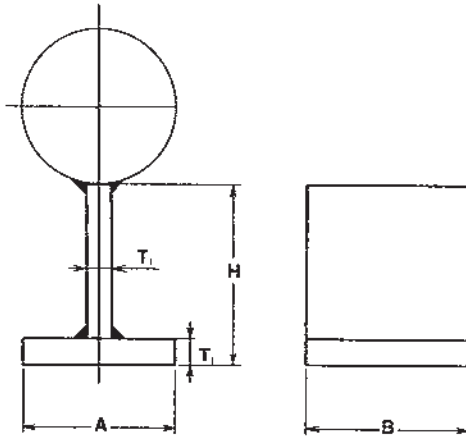
loads • weights • dimensions (mm)

pipe size	max. recom. load, kg (400°C)	wgt. (approx) Kg/100	A	B	C	D	H	T <sub>1</sub>	T <sub>2</sub>
15A( 1/2B)	100	12	20	32	-	-	69	6	6
20A( 3/4B)	100	12	20	32	-	-	67	6	6
25A( 1B)	100	20	30	32	-	-	68	9	9
32A(1 1/4B)	250	22	40	32	-	-	69	9	9
40A(1 1/2B)	250	39	40	50	-	-	81	9	9
50A( 2B)	250	55	50	50	-	-	80	12	12
65A(2 1/2B)	450	98	70	75	-	-	84	12	12
80A( 3B)	900	142	75	120	100	75	81	6	9
90A(3 1/2B)	1500	171	90	120	100	75	94	6	9
100A( 4B)	1500	161	90	120	100	75	93	6	9
125A( 5B)	2200	161	90	120	100	75	89	6	9
150A( 6B)	3100	373	125	220	200	100	91	9	9
200A( 8B)	5600	433	125	220	200	100	116	9	9
250A( 10B)	8700	949	175	225	200	150	119	12	12
300A( 12B)	13000	949	175	225	200	150	118	12	12
350A( 14B)	16000	1163	220	225	200	200	147	12	12
400A( 16B)	22000	1163	220	225	200	200	147	12	12
450A( 18B)	29000	1163	220	225	200	200	146	12	12
500A( 20B)	37000	2016	280	285	250	250	151	16	16
550A( 22B)	46000	1986	280	285	250	250	146	16	16
600A( 24B)	55000	1966	280	285	250	250	145	16	16

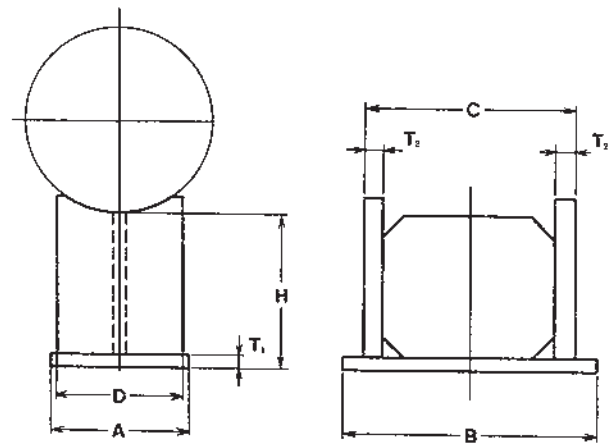


## pipe slide assembly (for alloy steel)

model : PSL - A



65A and smaller



80A and larger

**MATERIAL** : Chrome molybdenum steel**SERVICE** : Used to support insulated alloy steel pipe at horizontal portion by welding to pipe.**SIZE RANGE** : 15A through 600A pipe outer diameter.**ORDERING** : Specify model name and nominal pipe size.

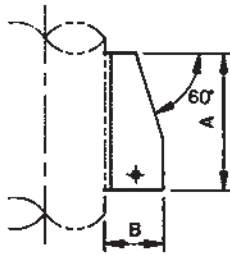
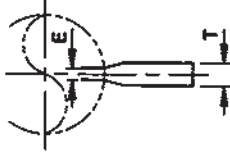
ex) PSL - A - 100A

## loads • weights • dimensions (mm)

pipe size	max. recom. load, kg (570°C)	wgt. (approx) Kg/100	A	B	C	D	H	T <sub>1</sub>	T <sub>2</sub>
15A( 1/2B)	31	13	20	32	-	-	84	6	6
20A( 3/4B)	31	14	20	32	-	-	82	6	6
25A( 1B)	31	26	30	32	-	-	93	9	9
32A(1 1/4B)	78	28	40	32	-	-	94	9	9
40A(1 1/2B)	78	43	40	50	-	-	91	9	9
50A( 2B)	78	60	50	50	-	-	90	12	12
65A(2 1/2B)	140	105	70	75	-	-	94	12	12
80A( 3B)	281	95	75	120	100	75	116	6	9
90A(3 1/2B)	469	106	90	120	100	75	119	6	9
100A( 4B)	469	105	90	120	100	75	118	6	9
125A( 5B)	688	103	90	120	100	75	114	6	9
150A( 6B)	970	300	125	220	200	100	116	9	9
200A( 8B)	1752	325	125	220	200	100	141	9	9
250A( 10B)	2723	574	175	225	200	150	144	12	12
300A( 12B)	4069	573	175	225	200	150	143	12	12
350A( 14B)	5008	802	220	225	200	200	222	12	12
400A( 16B)	6886	802	220	225	200	200	222	12	12
450A( 18B)	9077	801	220	225	200	200	221	12	12
500A( 20B)	11581	1452	280	285	250	250	226	16	16
550A( 22B)	14398	1441	280	285	250	250	221	16	16
600A( 24B)	17215	1439	280	285	250	250	220	16	16

## stopper lug

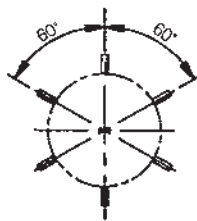
model : SLC (Carbon)  
SLA (Alloy)  
SLS (Stainless)



**MATERIAL** : SLC : Carbon steel  
SLA : Chrome molybdenum steel  
SLS : Stainless steel

**SERVICE** : Used mainly for anchor lug for riser clamp by welding to vertical portion of pipe.

**ORDERING** : Specify model name and pipe size.  
ex) SLC-100A



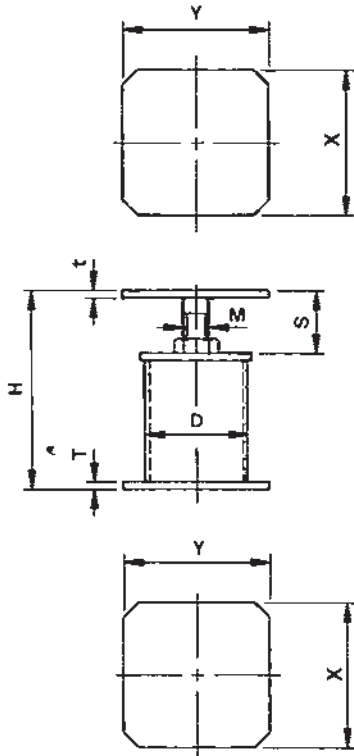
250A and smaller      300A and larger

## weights • dimensions (mm)

pipe size	wgt. approx. (kg/100)	A	B	T	E	required Q'ty
80A( 3B)	9	50	30	12	2	4
90A(3 1/2 B)	9	50	30	12	2	4
100A( 4B)	9	50	30	12	2	4
125A( 5B)	32	75	30	16	4	4
150A( 6B)	32	75	30	16	4	4
175A( 7B)	32	75	30	16	4	4
200A( 8B)	62	125	50	16	4	4
225A( 9B)	62	125	50	16	4	4
250A( 10B)	94	150	50	16	4	4
300A( 12B)	111	150	50	19	5	6
350A( 14B)	111	150	50	19	5	6
400A( 16B)	111	150	50	19	5	6
450A( 18B)	111	150	50	19	5	6
500A( 20B)	129	150	50	22	6	6
550A( 22B)	129	150	50	22	6	6
600A( 24B)	147	150	50	25	7	6
650A( 26B)	147	150	50	25	7	6
700A( 28B)	320	170	50	25	12	6
750A( 30B)	320	170	50	32	12	6

## adjustable support

## model : ATS



**MATERIAL :** Carbon steel

**SERVICE :** For the support of piping where a Adjustable Support is required and where it is not desired to weld the support to the piping system. The height can be adjusted from 80mm longer to 30mm shorter against specified H.

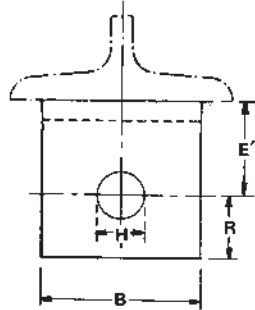
**ORDERING :** Specify model name, size and height H.  
ex) ATS-80A

## dimensions (mm)

pipe size	D	S	t	T	M	X	Y
40A(1½B)	60	85	6	6	12	150	150
50A( 2B)	60	85	6	6	12	150	150
65A(2½B)	60	85	6	6	12	150	150
80A( 3B)	60	85	6	6	12	150	150
90A(3½B)	89	95	6	6	12	150	150
100A( 4B)	89	95	6	9	16	150	150
125A( 5B)	114	95	6	9	16	160	160
150A( 6B)	114	95	6	9	16	160	160
200A( 8B)	140	115	9	12	16	190	190
250A( 10B)	165	115	6	12	20	210	210
300A( 12B)	165	115	9	12	20	210	210
350A( 14B)	216	115	12	16	20	260	260
400A( 16B)	216	115	12	16	24	260	260
450A( 18B)	267	115	12	16	24	320	320
500A( 20B)	267	115	12	16	24	320	320
550A( 22B)	318	115	16	19	24	350	350
600A( 24B)	355	115	16	19	24	400	400

welded beam attachment

model : WBA



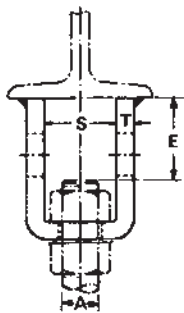
M64 rod dia. and smaller

**MATERIAL :** Carbon steel

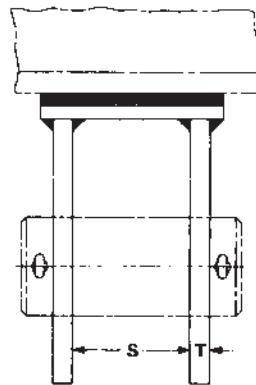
**SERVICE :** Recommended for attachment to bottom of beams, especially where loads are considerable and rod sizes are large.

**HOW TO SIZE :** Size of attachment is determined by size of rod.

**ORDERING :** Specify model name and rod size. Specify "with bolt and nut" if required for M24 rod size and smaller. Specify "with pin and cotter pins" if required for M30 rod size and larger.  
ex) WBA-M30



M64 rod dia. and smaller only



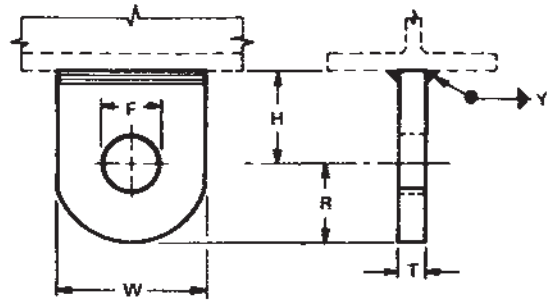
M72 rod dia. and larger.

loads • weights • dimensions (mm)

rod size A	bolt or pin size	maximum recom. load, kg		wgt (approx). kg each		rod take-out		B	H	R	S	T
		345°C	400°C	without bolt and nut	with bolt and nut	E	E'					
M10	M12 × 65	275	230	0.44	0.54	50	50	50	14	25	30	6
M12	M16 × 65	515	425	0.44	0.59	45	50	50	18	25	30	6
M16	M20 × 70	820	685	0.44	0.73	45	50	50	22	25	30	6
M20	M24 × 85	1230	1025	0.86	1.27	45	50	65	26	30	40	9
M24	M30 × 115	2250	1880	1.95	2.86	70	75	75	33	40	50	12
M30	φ36 × 135	3630	3020	3.67	4.63	75	75	100	39	50	65	16
M36	φ42 × 150	5275	4400	7.08	8.62	100	100	125	46	65	75	19
M42	φ48 × 180	7120	6350	8.48	10.98	125	125	125	52	70	95	19
M48	φ56 × 180	9390	8375	10.34	13.88	135	125	150	62	85	95	19
M56	φ64 × 195	12340	11005	11.98	16.69	160	150	150	70	90	110	19
M64	φ70 × 200	15195	13555	12.11	18.01	160	150	150	78	95	115	19
M72	φ80 × 180	18860	16815	12.16	18.51	-	145	150	86	100	95	19
M80	φ85 × 180	22945	20450	14.79	21.18	-	160	180	91	100	95	19
M85	φ90 × 195	27435	24450	20.46	28.17	-	180	180	96	115	110	19
M90	φ95 × 195	32335	28800	24.22	32.84	-	190	205	101	115	110	19

## structural welding lug

model : SWL



**MATERIAL** : Carbon steel

**SIZE RANGE** : Short lug is available for use with M12 through M90 rod; long lug may be used with M12 through M48 rod.

**SERVICE** : For attachment to structural steel in conjunction with model FSC forged steel clevis and with type B and C spring hanger.

**ORDERING** : Specify model name, rod size and whether short or long lug is required.  
ex) SWL - M30 - SHORT

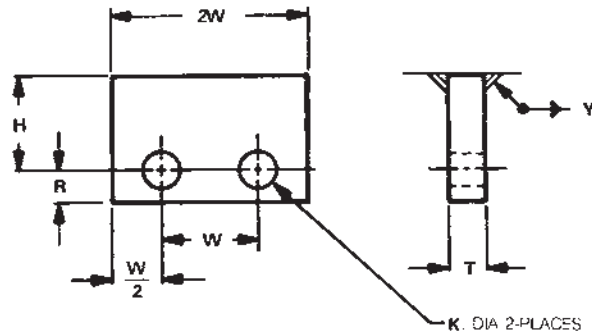
## loads • weights • dimensions (mm)

rod size	max. recom. load, kg		wgt(approx)kg each		pin or bolt	F	H		R	T	W	Y
	short	long	short	long			short	long				
M12	515	515	0.22	0.34	M 16	18	40	75	32	6	64	6
M16	820	820	0.19	0.31	M 20	22	40	75	32	6	64	6
M20	1230	1230	0.27	0.45	M 24	26	40	75	32	9	64	6
M24	2250	2250	0.54	0.73	M 30	33	50	75	40	12	80	6
M30	3630	3630	1.36	1.68	M 36	39	75	100	52	16	104	6
M36	5275	5275	2.18	2.90	M 42	46	75	115	65	19	130	10
M42	7120	7120	2.13	2.86	M 48	52	75	115	65	19	130	10
M48	9360	9360	3.27	3.99	M 56	62	100	115	75	19	150	10
M56	10435	-	3.45	-	M 64	70	115	-	75	19	150	13
M64	13860	-	7.03	-	M 72	78	115	-	102	24	204	13
M72	18870	-	6.85	-	M 80	86	115	-	102	24	204	13
M80	22905	-	7.26	-	M 85	91	125	-	102	24	204	16
M85	27445	-	8.57	-	M 90	96	125	-	115	24	230	16
M90	32340	-	14.20	-	M 95	101	150	-	115	■ 38	230	16
M95	37605	-	16.28	-	M100	106	150	-	130	■ 44	260	16

■ 32mm thickness when double lug is used; Weight, then, is 11.9kg for M90 size and 11.6kg for M95 size.

two hole welding beam lug

model : WBL



**MATERIAL :** Carbon steel

**ORDERING :** Specify model name, rod size and "H" dimension.

**SERVICE :** For single rod suspension of model CSH type B & C Constant Supports.

ex) WBL - M30 - 75

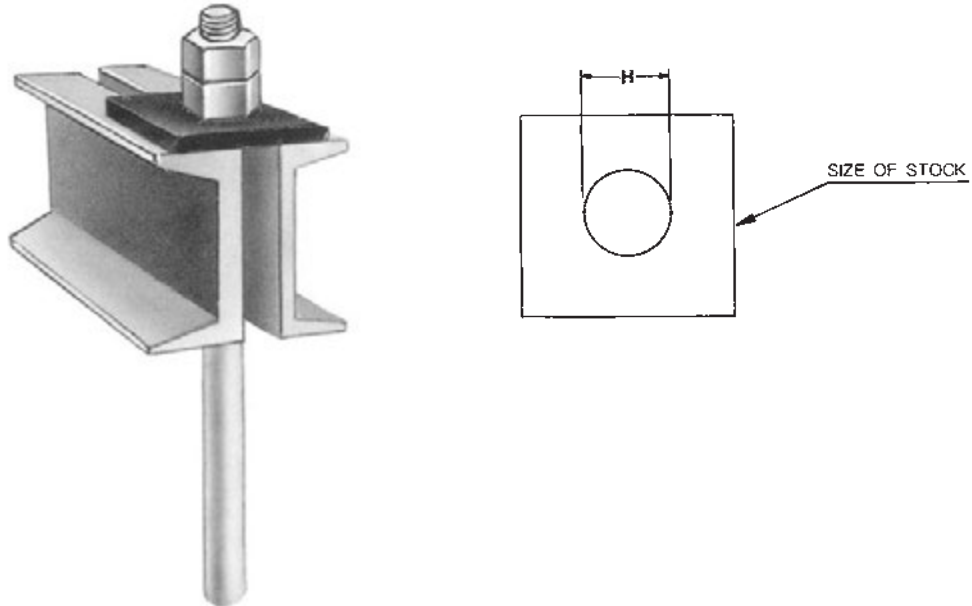
loads • weights • dimensions (mm)

rod size	max. load rating kg	weight(approx)kg/H dim.				H (constant support frame sizes)					pin or bolt	K hole	R	T	W	2W	W/2	Y
		40	50	75	100	1-9	10-18	19-34	35-49	50-63								
M12	515	0.64	0.77	1.00	-	40	40	50	75	-	M16	18	32	9	64	128	32	6
M16	820	0.64	0.73	1.00	-	40	40	50	75	-	M20	22	32	9	64	128	32	6
M20	1230	0.59	0.73	0.95	1.18	-	40	50	75	100	M24	26	32	9	64	128	32	6
M24	2250	-	1.18	1.59	1.95	-	-	50	75	100	M30	33	40	12	80	160	40	6
M30	3630	-	2.27	2.95	3.58	-	-	50	75	100	M36	39	52	16	104	208	52	6
M36	5275	-	-	4.85	5.81	-	-	-	75	100	M42	46	65	19	130	260	65	6
M42	7120	-	-	4.72	5.67	-	-	-	75	100	M48	52	65	19	130	260	65	6
M48	9360	-	-	-	7.26	-	-	-	-	100	M56	62	75	19	150	312	75	10
M56	10435	-	-	-	7.08	-	-	-	-	100	M64	70	75	19	150	312	75	10



## steel washer plate

model : SWP

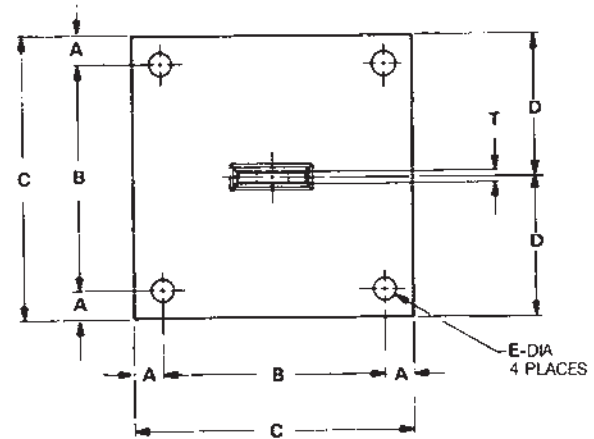
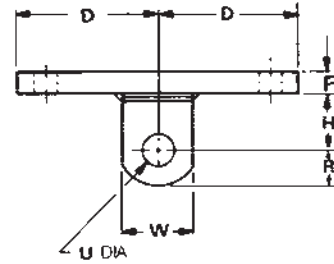
**MATERIAL** : Carbon steel**SERVICE** : A heavy duty washer plate used on top of channels or angles for supporting pipe with rods or U-bolts.**ORDERING** : Specify model name and rod size.  
ex) SWP-M30

## weights • dimensions (mm)

rod size	wgt(approx) kg each	size of stock	hole diameter H
M10	0.28	75 × 75 × 6	12
M12	0.27	75 × 75 × 6	14
M16	0.41	75 × 75 × 9	18
M20	0.73	100 × 100 × 9	22
M24	0.95	100 × 100 × 12	26
M30	1.50	125 × 125 × 12	33
M36	2.20	125 × 125 × 19	39
M42	2.13	125 × 125 × 19	46
M48	2.04	125 × 125 × 19	52
M56	2.99	150 × 150 × 19	62
M64	2.90	150 × 150 × 19	70
M72	2.81	150 × 150 × 19	78
M80	2.68	150 × 150 × 19	86
M85	2.54	150 × 150 × 19	91
M90	3.67	180 × 180 × 19	96
M95	3.54	180 × 180 × 19	101

concrete single lug plate

model : WLP



**MATERIAL :** Carbon steel

**SERVICE :** Structural attachment to concrete ceiling.  
Lug is used in conjunction with model FSC forged steel clevis.

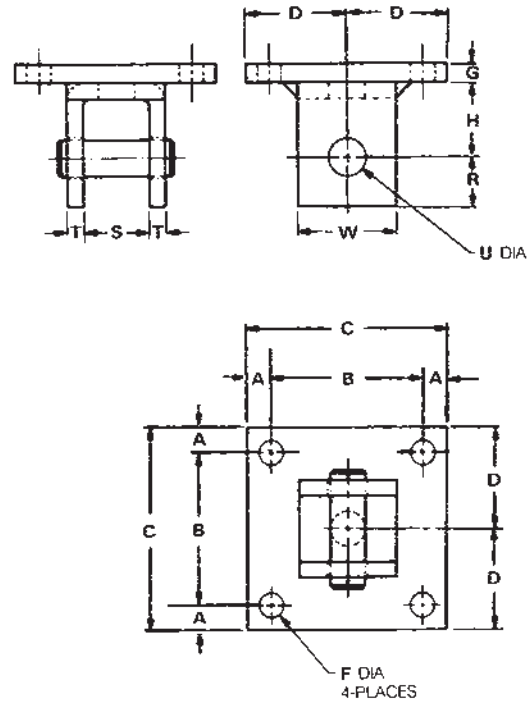
**ORDERING :** Specify model name and rod size.  
ex) WLP-M30

loads • weights • dimensions (mm)

rod size	maximum recom. load, kg	wgt (approx) kg, each	A	B	C	D	E	F	H	R	T	U	W
M12	515	5.03	25	200	250	125	14	9	40	32	6	18	64
M16	820	6.62	25	200	250	125	14	12	40	32	9	22	64
M20	1230	6.71	25	200	250	125	18	12	40	32	9	26	64
M24	2250	14.47	50	200	300	150	22	19	50	40	12	33	80
M30	3630	19.87	50	200	300	150	26	24	75	52	16	39	104
M36	5275	20.68	50	200	300	150	33	24	75	65	19	46	130
M42	7120	25.27	50	200	300	150	33	30	75	65	19	52	130
M48	9360	26.40	50	200	300	150	33	30	100	75	19	62	150

## concrete clevis plate

model : BAP

**MATERIAL** : Carbon steel

**SERVICE** : Structural attachment to concrete ceiling where flexibility is desired. Concrete clevis plate is normally used in conjunction with weldless eye nut or welded eye rod.

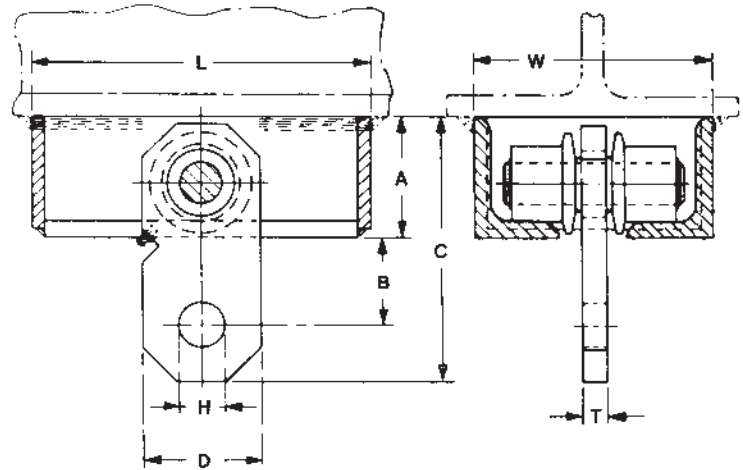
**ORDERING** : Specify model name and rod size.  
ex) BAP-M30

## loads • weights • dimensions (mm)

rod size	maximum recom. load, kg	wgt (approx) kg, each	A	B	C	D	F	G	H	R	S	T	U	W
M10	275	5.35	25	200	250	125	14	9	50	25	30	6	14	50
M12	515	5.40	25	200	250	125	14	9	50	25	30	6	18	50
M16	820	7.12	25	200	250	125	14	12	50	25	30	6	22	50
M20	1230	7.67	25	200	250	125	18	12	50	30	40	9	26	65
M24	2250	16.74	50	200	300	150	22	19	75	40	50	12	33	75
M30	3630	18.55	50	200	300	150	26	19	75	50	65	16	39	100
M36	5275	27.13	50	200	300	150	33	24	100	65	75	19	46	125
M42	7120	42.46	50	250	350	175	33	30	125	70	95	19	52	125
M48	9390	45.36	50	250	350	175	33	30	125	85	95	19	62	150

## horizontal traveler

model : HTR



The UNISON model HTR Horizontal Traveler facilitates the supporting of piping systems subject to linear horizontal movements where head room is limited. Designed for use with UNISON Pre-Engineered Variable Spring Hangers or Constant Supports it can also be used in conjunction with a rigid type hanger assembly.

**FEATURES**

- Highly economical
- Minimum friction
- Virtually dust proof
- Compact - designed for minimum head room
- Versatile

**SIZE RANGE :** Available in four sizes to take loads to 9,390 Kg. All sizes provide for 305 mm of horizontal travel.

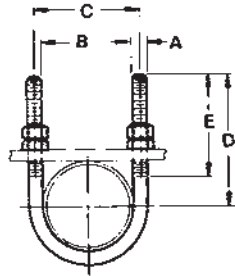
**INSTALLATION :** Shipped ready for installation. Attach to the supporting steel by welding around the frame. Spring hanger may be bolted or welded to the load plate.

**ORDERING :** Specify model name, size number and H dimension, if required.  
ex) HTR-1

**loads • weights • dimensions (mm)**

size no.	maximum recom. load, Kg	weight (approx) Kg, each	A	B	C	D	H max.	L	T	W
1	1710	6.8	65	42	136	64	29	384	19	160
2	2825	16.8	90	67	200	90	35	416	19	175
3	5275	31.3	130	76	266	127	45	454	24	214
4	9390	46.3	150	89	318	152	60	486	38	250

U-bolt



- model : UB-SD (standard)
- UB-SP (special)
- UB-AS (alloy steel)
- UB-SS (stainless steel)

**MATERIAL** : Carbon steel U-bolt and four finished hex nuts.

**SERVICE** : Recommended for support, anchor or guide of heavy loads: often employed in power, process plant and marine service.

**ORDERING UB-SD and UB-SS** : Specify model name and nominal pipe size.

**ORDERING UB-SP and UB-AS** : Specify model name, material spec., dimension A, B, C, D and E

plastic coated U-bolt



model : UB-PL

**MATERIAL** : Carbon steel U-bolt and four finished hex nuts. Formed portion of the U-bolt is plastic coated.

**SERVICE** : Recommended for support, anchor or guide for glass, copper, brass and aluminum pipe.

**MAXIMUM TEMPERATURE** : 100°C

**ORDERING** : Specify model name and nominal pipe size.

loads • weights • dimensions (mm)

pipe size	max. recom. Load, kg for vertical use									approx wgt (kg/100)	actual/approx rod dia		A	C	D	E
	UB-SD		UB-AS		UB-SS						actual	approx				
	345°C	400°C	500°C	570°C	400°C	500°C	550°C	600°C	650°C		φ	φ				
15A(½B)	690	560	285	75	195	180	170	155	130	6.7	10	8.8	M10	34	47	40
20A(¾B)	690	560	285	75	195	180	170	155	130	7.5	10	8.8	M10	40	50	40
25A(1B)	690	560	285	75	575	180	170	155	130	8.5	10	8.8	M10	46	53	40
32A(1¼B)	690	1620	825	225	575	530	510	460	400	9.9	10	8.8	M10	56	57	40
40A(1½B)	690	1620	825	225	575	530	510	460	400	10.9	10	8.8	M10	62	60	40
50A(2B)	690	1620	825	225	850	530	510	460	400	12.7	10	8.8	M10	74	65	40
65A(2½B)	1000	2380	1210	330	850	790	755	685	590	22.8	12	10.7	M12	92	75	50
80A(3B)	1000	2380	1210	330	850	790	755	685	590	25.9	12	10.7	M12	104	85	50
90A(3½B)	1000	2380	1210	330	850	790	755	685	590	28.8	12	10.7	M12	116	90	50
100A(4B)	1890	2380	1210	330	850	790	755	685	590	54.9	16	14.5	M16	134	100	65
125A(5B)	1890	2380	1210	330	850	790	755	685	590	65.3	16	14.5	M16	160	118	65
150A(6B)	1890	4520	2310	630	1610	1500	1430	1300	1130	75.8	16	14.5	M16	186	130	65
200A(8B)	2950	4520	2310	630	1610	1500	1430	1300	1130	153.4	20	18.2	M20	242	162	75
250A(10B)	2950	7000	3580	975	2510	2340	2230	2000	1750	186.2	20	18.2	M20	296	188	75
300A(12B)	4260	10000	5100	1390	3620	3370	3220	2900	2540	319.3	24	21.8	M24	350	220	85
350A(14B)	4260	10000	5100	1390	3620	3370	3220	2900	2540	351.9	24	21.8	M24	386	236	85
400A(16B)	4260	10000	5100	1390	3620	3370	3220	2900	2540	397.7	24	21.8	M24	438	261	85
450A(18B)	6790	10000	5100	1390	3620	3370	3220	2900	2540	702.5	30	27.5	M30	496	296	100
500A(20B)	6790	10000	5100	1390	3620	3370	3220	2900	2540	777.9	30	27.5	M30	548	322	100
550A(22B)	6790	10000	5100	1390	3620	3370	3220	2900	2540	850.1	30	27.5	M30	598	347	100
600A(24B)	9920	10000	5100	1390	3620	3370	3220	2900	2540	1337.6	36	33.2	M36	656	383	115
700A(28B)	9920	10000	5100	1390	3620	3370	3220	2900	2540	1544.5	36	33.2	M36	758	434	115
750A(30B)	9920	10000	5100	1390	3620	3370	3220	2900	2540	1654.8	36	33.2	M36	810	459	115
800A(32B)	12550	10000	5100	1390	3620	3370	3220	2900	2540	2408.9	42	38.5	M42	868	494	130
850A(34B)	12550	10000	5100	1390	3620	3370	3220	2900	2540	2250.4	42	38.5	M42	920	520	130
900A(36B)	12550	10000	5100	1390	3620	3370	3220	2900	2540	2692.8	42	38.5	M42	970	545	130

\* Above table does not apply for model UB-SP

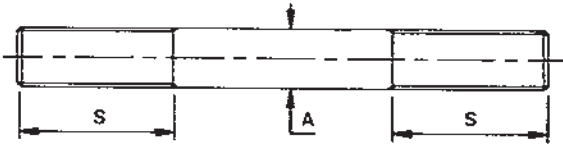
\* Actual rod dia.: rod dia size for nominal dia U-bolt

\* Approx rod dia.: rod dia size for pitch dia U-bolt

both ends threaded rod

model : RDBR (right-hand threads)

model : RDRL (right and left-hand threads)



loads • standard thread lengths(mm)

rod size A	maximum recom. load, kg		standard rod thread length $\diamond$ S(mm)
	345℃	400℃	
M10	275	245	100
M12	515	460	100
M16	820	730	100
M20	1230	1100	100
M24	2250	2005	100
M30	3630	3240	150
M36	5280	4705	150
M42	7120	6350	200
M48	9390	8375	200
M56	12350	11005	250
M64	15200	13555	250
M72	18890	16815	300
M80	22970	20450	300
M85	27460	24450	350
M90	32350	28800	350
M95	37640	33500	380

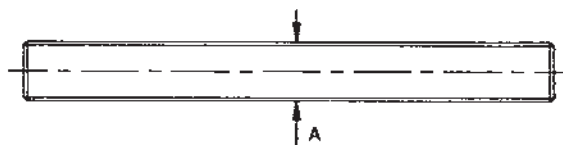
MATERIAL : Carbon steel.

ORDERING : Specify model name, rod size and rod length. Specify thread length if other than standard.  
ex) RDBR - M30 × 1200L × 150S

◆M10, M12 and M16 rod in lengths of 500 mm or shorter will be furnished as continuous thread rod unless order states that all thread rod is not acceptable.

full threaded rod

model : RDFT



loads • weights • dimensions (mm)

rod size A	maximum recom. load, kg		weight (approx) kgs/m
	345℃	400℃	
M 6	110	100	0.18
M10	275	245	0.45
M12	515	460	0.79
M16	820	730	1.25
M20	1230	1100	1.79
M24	2250	2000	3.42
M30	3630	3240	5.35
M36	5280	4700	7.60

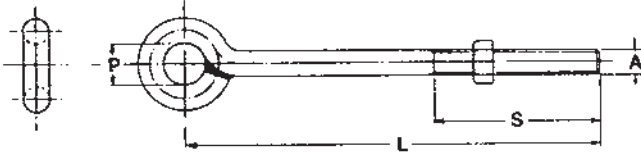
MATERIAL : Carbon steel: rod threaded complete length

ORDERING : Specify model name, rod size and rod length.  
ex) RDFT - M30 × 1200L

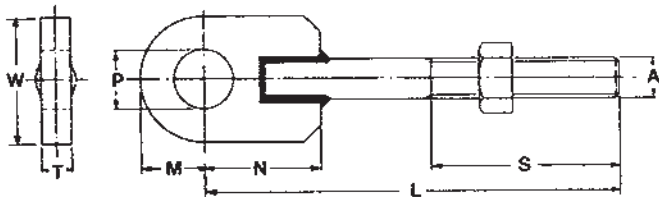


welded eye rod

model : ERDR (Right-hand threads)  
ERDL (right and left-hand threads)



M36 and smaller



M42 and larger

**MATERIAL :** Carbon steel

**SERVICE :** For use with Pre-engineered Variable spring and Constant spring hanger assembly. It can be also be used in conjunction with a rigid type hanger assembly.

**ORDERING :** Spccify model name, rod size, rod length and inside diameter of eye.  
ex) ERDR-M30 × 1200L × 150s - φ40

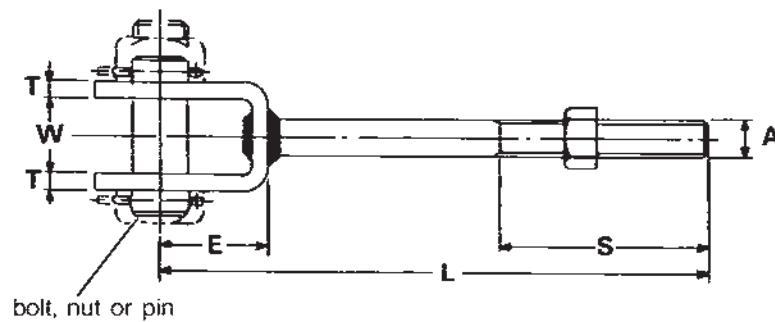
standard thread lengths • loads • dimensions(mm)

rod size A	standard rod thread length S(mm)	M	N	W	T	maximum recommended load,kg	
						ERDR and ERDL	
						345℃	400℃
M10	100	-	-	-	-	275	245
M12	100	-	-	-	-	515	460
M16	100	-	-	-	-	820	730
M20	100	-	-	-	-	1230	1100
M24	100	-	-	-	-	2250	2005
M30	150	-	-	-	-	3630	3240
M36	150	-	-	-	-	5280	4705
M42	200	60	120	120	22	7120	6350
M48	200	70	140	140	24	9390	8375
M56	250	75	160	150	28	12350	11005
M64	250	80	180	160	32	15200	13555
M72	300	95	200	190	38	18860	16820
M80	300	100	200	200	38	23970	21380

rod size A	standard inside diameter of eye, p,mm									
	18	22	28	34	-	-	-	-	-	-
M10	18	22	28	34	-	-	-	-	-	-
M12	18	22	28	34	-	-	-	-	-	-
M16	18	22	28	34	40	-	-	-	-	-
M20	-	22	28	34	40	46	-	-	-	-
M24	-	-	28	34	40	46	-	-	-	-
M30	-	-	-	-	40	46	-	-	-	-
M36	-	-	-	-	40	46	-	-	-	-
M42	-	-	-	-	-	46	52	-	-	-
M48	-	-	-	-	-	-	52	62	-	-
M56	-	-	-	-	-	-	-	62	70	-
M64	-	-	-	-	-	-	-	-	70	78
M72	-	-	-	-	-	-	-	-	82	90
M80	-	-	-	-	-	-	-	-	88	94

## clevis bolt

model : RDCS

**MATERIAL** : Carbon steel

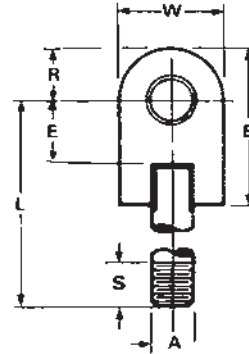
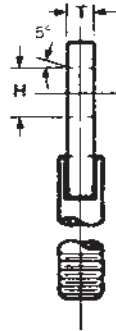
**ORDERING** : Specify model name and rod size with length L and R.H. thread or L.H. thread. Specify thread length if other than standard.  
ex) RDCS-M30×1200L×150S-R.H

## loads • dimensions (mm)

rod size A	max. recom. load kg	E	W	t	bolt, nut or pin	standard thread length, S
M10	300	50	30	6	M12	100
M12	500	50	30	6	M16	100
M16	880	50	30	6	M20	100
M20	1320	50	45	9	M24	100
M24	2130	75	50	12	M30	100
M30	3410	75	65	16	φ36	150
M36	4980	100	75	19	φ42	150
M42	6850	125	95	19	φ48	200
M48	9000	125	95	19	φ56	200
M56	12400	150	110	19	φ64	250
M64	15900	155	115	19	φ70	250

rod with eye end

model : RWE



**MATERIAL :** Carbon steel.

**SERVICE :** A large diameter rod with eye end for load ratings from 18860 to 69850 kg.

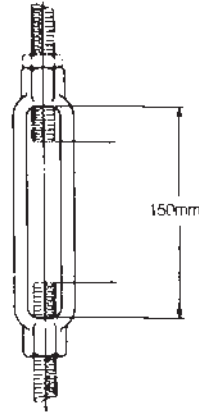
**ORDERING :** Specify model name, rod size and dimension "L".  
Specify thread length if other than standard.  
ex) RWE - M85 × 1200L × 200S

**loads • weights • dimensions(mm)**

rod size A	max. recom. load kg	wgt (approx) kgs each of min length	wgt (approx) kgs/m additional length	B	standard rod thread length S	E	H	min rod length with std thread L	R	T	W
M72	18860	17.38	30.86	245	300	95	86	485	95	38	170
M80	22945	21.59	37.81	280	300	100	91	510	100	38	180
M85	27435	25.73	42.60	310	380	100	96	535	110	38	190
M90	32335	33.04	51.62	320	380	120	101	610	115	50	200
M95	37600	39.08	57.85	355	380	125	106	635	125	50	210
M100	40885	46.27	66.26	385	380	125	116	660	130	50	230
M110	43190	57.61	71.43	415	460	135	121	760	140	50	240
M115	55795	66.65	87.59	405	460	145	126	760	146	65	250
M120	62595	74.24	93.68	430	460	145	131	785	155	65	260
M125	69850	82.86	103.19	455	460	160	136	815	160	65	270

turnbuckle - standard

model : TBS



**MATERIAL :** Forged steel.

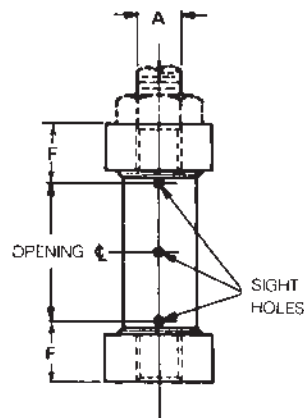
**ORDERING :** Specify model name and rod size.  
ex) TBS-M30

loads • weights(kg)

rod size	max recom load,kg		wgt(approx) kg each
	345℃	400℃	
M10	275	245	0.19
M12	515	460	0.29
M16	820	730	0.44
M20	1230	1100	0.68
M24	2250	2005	1.18
M30	3630	3240	2.04
M36	5275	4705	2.90
M42	7120	6350	4.99
M48	9390	8375	6.76
M56	12340	11005	8.89
M64	15195	13555	12.20

turnbuckle - type F

model : TBF



**MATERIAL :** Carbon steel.

**SERVICE :** Provides adjustments up to 610mm with loads from 3630 to 69850 kg.

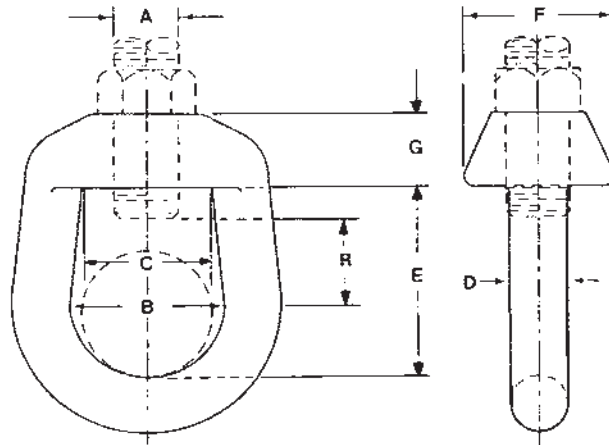
**ORDERING :** Specify model name, rod size and opening dimension.  
ex) TBF-M30-460

loads • weights • dimensions(mm)

rod size A	max.recom load, kg	weight(approx)kgs each opening				F
		150	300	460	610	
M30	3630	-	4	5	6	55
M36	5275	-	6	7	5	60
M42	7120	-	5	6	8	60
M48	9390	-	9	11	13	80
M56	12340	-	13	16	18	85
M64	15195	-	13	15	18	85
M72	18860	16	19	22	25	90
M80	22945	19	22	26	29	95
M85	27435	18	21	25	28	95
M90	32335	33	38	42	47	115
M95	37600	32	36	41	49	115
M100	43275	50	57	63	70	125
M110	49440	49	55	62	68	125
M115	55795	106	116	126	135	175
M120	62595	103	113	123	133	175
M125	69850	100	110	120	130	175

## weldless eye nut

model : ENR (Right-hand threads)  
ENL (Left-hand threads)



**MATERIAL** : Forged steel.

**ORDERING** : Specify model name and rod size.  
ex) ENR-M20

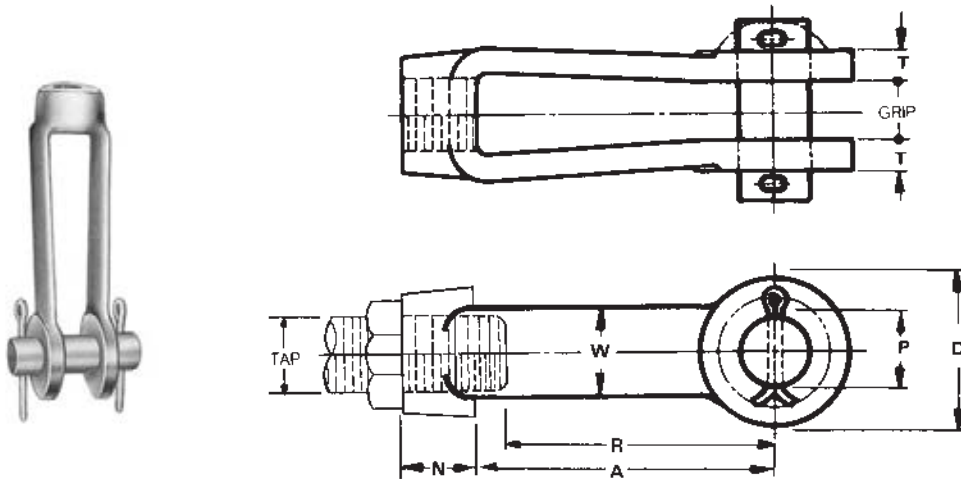
**SERVICE** : For use on high temperature piping installations.

## loads • weights • dimensions (mm)

rod size A	max. recomm. load (kg)		weight (approx) kg. each	B	C	R	D	E	F	G
	345℃	400℃								
M10	275	245	0.29	38	30	25	13	50	35	20
M12	515	460	0.29	38	30	25	13	50	35	20
M16	820	730	0.28	38	30	25	13	50	35	20
M20	1230	1100	0.27	38	30	25	13	50	35	20
M24	2250	2005	0.77	50	43	35	20	65	50	25
M30	3630	3240	1.63	65	46	40	26	85	60	32
M36	5275	4705	1.59	65	46	40	26	85	60	32
M42	7120	6350	7.44	100	100	80	40	160	100	57
M48	9390	8375	7.21	100	100	80	40	160	100	57
M56	12340	11005	6.99	100	100	80	40	160	100	57
M64	15195	13555	6.76	100	100	80	40	160	100	57

forged steel clevis

model : FSC



**MATERIAL :** Forged steel.

**SERVICE :** For use on high temperature piping installation.

**ORDERING :** Specify model name and rod (tap) size.

If pin and cotter pins are required, specify "with pin". If other than standard combination of clevis size and rod tapping size is required, specify clevis number, special rod tapping size, pin size, grip.

ex) FSC-M30 with pin.

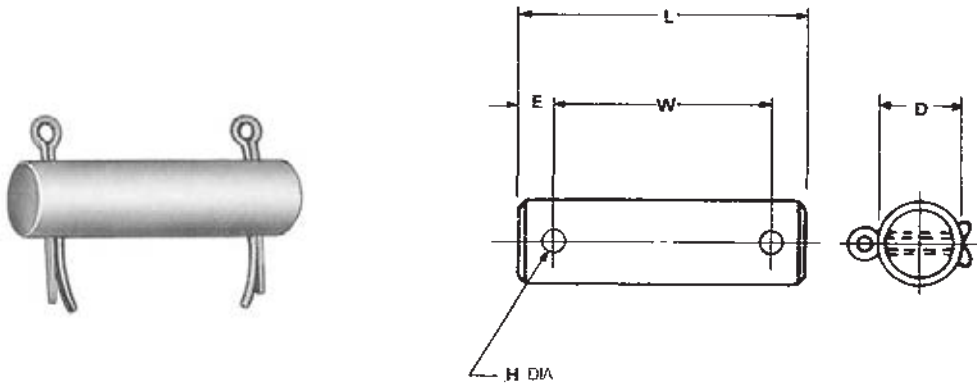
loads • weights • dimensions (mm)

tap size	max. recom. load, kg		weight (approx) kg each		A	D	N	pin size P	T	W	grip	R
	345°C	400°C	without pin	with pin								
M10	275	245	0.41	0.45	95	36	16	12	8	27	13	70
M12	515	460	0.32	0.41	95	36	16	16	8	27	13	70
M16	820	730	0.32	0.41	95	36	16	20	8	27	16	70
M20	1230	1100	1.13	1.36	125	50	22	22	10	32	19	90
M24	2250	2005	1.81	2.31	125	76	33	28	13	38	25	90
M30	3630	3240	1.72	2.49	125	76	33	36	13	38	32	90
M36	5275	4705	2.72	3.86	150	89	41	42	13	44	38	110
M42	7120	6350	3.63	5.85	150	102	44	48	13	50	38	110
M48	9390	8375	7.26	10.57	180	127	57	56	16	64	64	140
M56	12340	11005	11.79	15.92	205	152	70	64	19	76	64	150
M64	15195	13555	11.57	16.33	205	152	70	70	19	76	64	150
M72	18860	16815	16.33	22.68	230	178	76	75	22	89	64	170
M80	22945	20450	15.88	23.36	230	178	76	85	22	89	64	170
M85	27435	24450	40.82	52.62	255	203	102	90	38	102	102	180
M90	32335	28800	39.92	53.52	255	203	102	95	38	102	102	180
M95	37600	33500	39.01	54.43	255	203	102	100	38	102	102	180
M100	43275	38555	38.10	55.34	255	203	102	110	38	102	102	180



## clevis pin with cotters

model : PIN



**MATERIAL** : Carbon steel.

**SERVICE** : For use with type C variable spring hanger, CSH type C constant support and model WBA welded beam attachment.

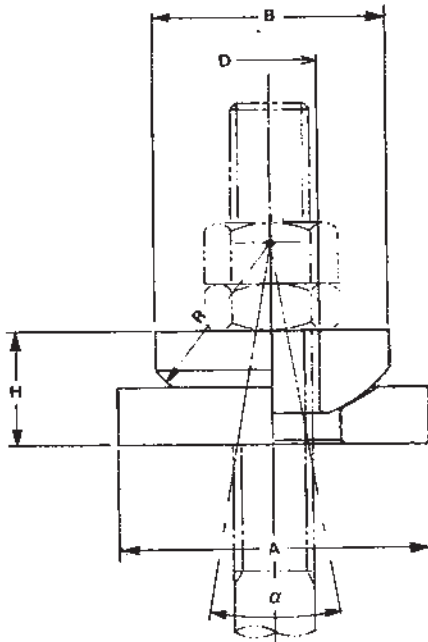
**ORDERING** : Specify model name and pin diameter.  
ex) PIN-20

## loads • weights • dimensions (mm)

pin diam. D	max recom load, kg	wgt(approx) kg each	L	W	E	H	cotter pin size
12	275	0.05	75	55	10	4	3.7 × 30
16	515	0.08	80	60	10	4	3.7 × 30
20	820	0.13	75	55	10	5	4.6 × 40
22	1230	0.21	100	80	10	5	4.6 × 40
24	1710	0.30	100	80	10	5	4.6 × 50
28	2250	0.45	110	90	10	6.3	5.9 × 50
36	3630	0.95	135	110	12.5	6.3	5.9 × 50
42	5275	1.50	150	125	12.5	8	7.5 × 50
48	7120	2.18	180	150	15	10	9.5 × 80
56	9390	3.27	180	150	15	10	9.5 × 80
64	12340	4.22	195	160	17.5	10	9.5 × 100
70	15195	5.67	200	170	15	10	9.5 × 100
75	18860	7.53	210	170	20	13	12.4 × 130
80	20900	8.29	210	175	17.5	13	12.4 × 130
85	22945	9.07	215	180	17.5	13	12.4 × 130
90	27435	10.84	225	185	20	13	12.4 × 130
95	32335	11.39	240	205	17.5	13	12.4 × 150
100	37600	15.79	250	210	20	13	12.4 × 150

## spherical washer

model : SPW

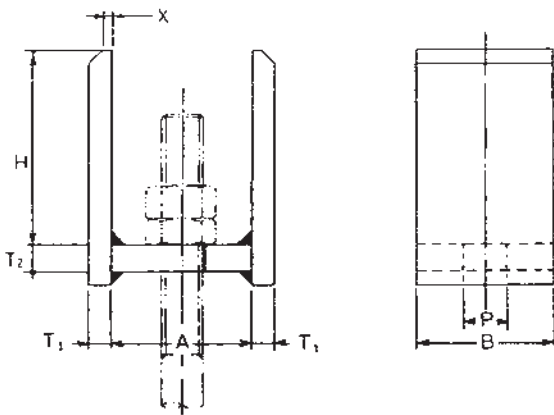
**MATERIAL** : Carbon steel**SERVICE** : For the support of piping where horizontal movement resulting from expansion and contraction takes place.**ORDERING** : Specify model name and rod size  
ex) SPW-M12

## loads • weights • dimensions (mm)

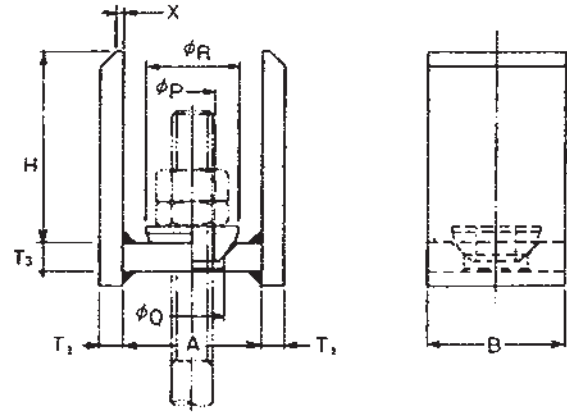
rod size	max. recom. load, kg	wgt (approx) kg each	diam. A	diam. B	diam. D	H	α	R
M12	500	0.6	80	40	14	20	15	25
M16	880	0.7	85	55	18	24	15	38
M20	1320	1.1	100	60	22	24	15	45
M24	2130	1.9	120	70	26	31	15	50
M30	3410	3.6	150	90	33	42	15	70
M36	4980	3.8	150	90	39	42	15	70
M42	6850	6.0	175	120	46	46	15	90
M48	9000	7.8	185	120	52	54	10	90
M56	12400	10.6	210	130	62	62	10	100
M64	15900	14.5	225	150	70	76	10	100

welded rod attachment

model : WRA  
WRS



WRA



WRS

**MATERIAL** : Carbon steel.

**ORDERING** : Specify model name and rod size.

ex) WRA - M24, WRS - M24

**SERVICE** : Recommended for attachment to bottom of beams where vertical adjustment is desired. Model WRS will be supplied with Spherical Washer, model SPW.

loads • weights • dimensions (mm)

rod size	max. recom. load(Kg)	wgt. approx. (Kg)		A	B	H	P	Q	R	X	T1	T2	T3
		WRA	WRS										
M12	500	1.2	1.4	80	60	135	14	20	40	6	6	9	12
M16	880	1.3	1.5	80	60	143	18	28	55	6	6	9	12
M20	1320	2.3	2.6	80	75	146	22	35	60	4	9	12	16
M24	2130	3.8	4.4	110	100	154	26	40	70	4	9	16	19
M30	3410	9.1	11.2	140	150	164	33	55	90	6	12	22	22
M36	4980	12.5	16.3	160	175	179	39	55	90	6	12	25	25
M42	6850	19.2	22.3	170	200	194	46	70	120	9	16	28	28
M48	9000	23.7	25.3	180	225	198	52	70	120	9	16	32	32

**rod coupling**  
**model : RCST (straight)**  
**RCRD (reducing)**

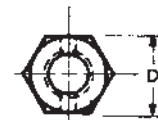
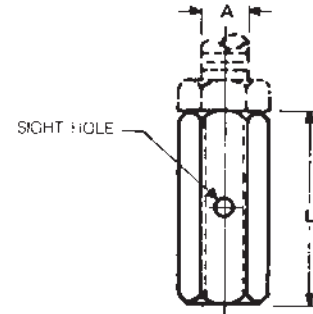


**MATERIAL :** Malleable iron.

**SERVICE :** For connecting rod lengths within limitation.

**ORDERING :** Specify model name and tap size.  
 ex) RCST - M12  
 RCRD - M20 × M16

**steel rod coupling**  
**model : SRC**



**MATERIAL :** Carbon steel.

**SERVICE :** For connecting rods to accommodate up to M125 and support up to 69850 kg.

**ORDERING :** Specify model name and rod size.  
 ex) SRC - M30

**loads • weights • dimensions (mm)**

**straight**

rod tapping	maximum recom. load, kg	weight (approx) kgs each	overall length
M6	105	0.03	35
M10	275	0.05	40
M12	515	0.09	55
M16	820	0.15	65
M20	1230	0.20	65
M24	2250	0.43	70

**reducing**

rod tapping	maximum recom. load, kg	weight (approx) kgs each	overall length
M10 × M6	105	0.05	40
M12 × M10	275	0.10	55
M16 × M12	515	0.16	65
M20 × M16	820	0.22	80

**loads • weights • dimensions (mm)**

rod size	maximum recom. load, kg	weight (approx) kgs each	D	L
M12	515	0.05	19	40
M16	820	0.11	24	50
M20	1230	0.19	29	55
M24	2250	0.45	38	75
M30	3630	0.86	48	95
M36	5275	1.50	57	115
M42	7120	2.81	70	135
M48	9390	4.08	79	150
M56	12340	5.76	89	170
M64	15195	7.80	98	190
M72	18860	10.30	108	210
M80	22945	13.25	118	230
M85	27435	16.74	127	250
M90	32335	20.77	137	265
M95	37600	25.40	146	285
M100	43275	30.71	156	305
M110	49440	36.65	165	325
M115	55795	43.36	175	345
M120	62595	50.85	184	360
M125	69850	59.15	194	380

## anchor bolt

## model : ARB



Anchor Bolt is a complete unit (nut, washer, stud or bolt). The correct size nut and washer means quick, simple, dependable installation. There is no inconvenience or time lost handling separate pieces.

There is less inventory, less loss.

**FINISH** : Galvanized unless otherwise specified.

**ORDERING** : Specify model name, size and length.

ex) ARB - M12 × 140L

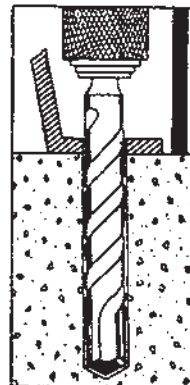
## loads • weights • dimensions (mm)

Anchor no.	size & length	weight (approx) Kg/100	allowable working load(Kg) (280 Kg/cm <sup>2</sup> concrete)		thread length	hole depth
			Tension	Shear		
061	M6 × 65	1.5	172	195	20	60
062	M6 × 70	1.6	172	195	20	60
063	M6 × 100	2.3	172	195	20	60
101	M10 × 80	4.9	340	340	28	70
102	M10 × 90	5.5	340	340	28	70
103	M10 × 120	7.4	340	340	28	70
121	M12 × 110	9.8	658	726	32	95
122	M12 × 140	12.4	658	726	32	95
123	M12 × 180	16.0	658	726	32	95
161	M16 × 145	22.9	966	1270	42	115
162	M16 × 220	34.7	966	1270	42	115
201	M20 × 170	41.9	1211	1574	43	135
202	M20 × 270	66.6	1211	1574	43	135

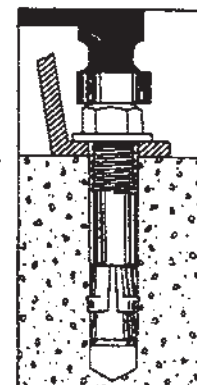
## INSTALLATION

- Simply drill a hole the same diameter as the ARB Anchor Bolt with or without the fixture in place. Don't worry about drilling too deep - ARB Anchor Bolt works in a "bottomless" hole.
- Drive the ARB Anchor Bolt far enough into the hole so that at least six threads are below the top surface of the fixture.
- Tighten to the recommended torque value or up to 4 turns from the finger tight position to achieve specified torque values.

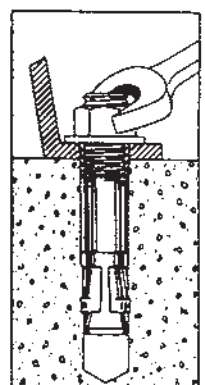
## 1. DRILL



## 2. INSERT

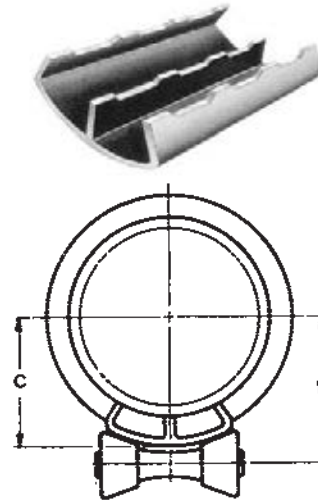
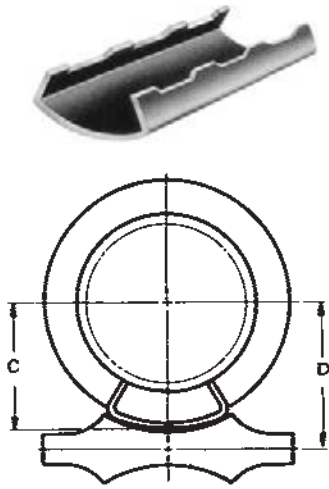


## 3. ANCHOR



pipe covering protection saddle

model : SAD



for nominal thickness of covering :

- 25mm : SAD - 25
- 40mm : SAD - 40
- 50mm : SAD - 50
- 65mm : SAD - 65
- 80mm : SAD - 80
- 100mm : SAD - 100
- 100mm (Alloy) : SAD - 100A
- 140mm (Alloy) : SAD - 140A

**MATERIAL :**

model SAD - 25 through SAD - 100 : Carbon steel.  
 model SAD - 100A, 140A : Chrome Molybdenum  
 Pipe size 300A and larger and all sizes of model  
 SAD - 100A/SAD - 140A have a welded-in  
 center plate.

All saddles are 300mm long with side edges  
 turned up.

**SERVICE :** Designed for high temperature or  
 where heat losses are to be kept at a minimum  
 protect insulation against damage.

**ORDERING :** Specify pipe size and model name  
 with nominal thickness of covering.

loads • weights • dimensions (mm)

pipe size	nom. thick. of covering (model)	max. recom. load, kg	wgt. (approx) kgs each	actual thickness of covering	size of pipe roll		center line of pipe to outside of saddle C	center line of pipe to center line of roll	
					model name			D	E
					PRS PRA PRCH	PRSD PRP PRSD-A		PRS PRA PRCH	
20A ( <sup>3</sup> / <sub>4</sub> B)	SAD-25	545	0.64	22	50	50 - 90	41	52	57
	SAD-40	545	0.95	37	80	50 - 90	56	70	73
	SAD-50	545	1.27	48	100	50 - 90	68	84	68
25A (1B)	SAD-25	545	0.64	27	65	50 - 90	46	59	62
	SAD-40	545	0.95	40	80	50 - 90	59	73	76
	SAD-50	545	1.27	54	100	50 - 90	73	89	89
32A (1 <sup>1</sup> / <sub>4</sub> B)	SAD-25	545	0.64	22	65	50 - 90	49	64	65
	SAD-40	545	0.95	41	90	50 - 90	65	78	81
	SAD-50	545	1.27	49	100	50 - 90	76	92	94
	SAD-65	545	1.63	62	125	100-150	95	111	111
40A (1 <sup>1</sup> / <sub>2</sub> B)	SAD-25	545	0.68	25	80	50 - 90	54	67	68
	SAD-40	545	0.95	38	90	50 - 90	67	83	84
	SAD-50	815	1.45	59	125	100-150	84	102	98
	SAD-65	815	1.63	71	150	100-150	98	114	114
50A (2B)	SAD-25	545	0.77	27	90	50 - 90	60	76	78
	SAD-40	545	1.04	40	100	50 - 90	73	89	91
	SAD-50	815	1.45	54	125	100-150	91	108	106
	SAD-65	815	1.63	67	150	100-150	103	121	121
	SAD-80	815	2.04	79	200	100-150	116	137	133

■ Maximum recommended loads are applicable only when saddle is used on flat bearing surface and tack weld to pipe. When saddle is used with a pipe roll, the maximum load given for the pipe roll applies to the saddle.



## loads • weights • dimensions (mm)

pipe size	nom. thick. of covering (model)	■max. recom. load, kg	wgt. (approx) kgs each	actual thickness of covering	size of pipe roll		center line of pipe to outside of saddle C	center line of pipe to center line of roll	
					model name			D	E
					PRS PRA PRCH	PRSD PRP PRSD-A		PRS PRA PRCH	
65A (2 1/2B)	SAD-25	545	0.77	27	90	50 - 90	68	83	84
	SAD-40	545	1.27	48	125	100-150	84	102	100
	SAD-50	815	1.45	59	150	100-150	98	114	114
	SAD-65	815	1.86	73	200	100-150	108	130	127
	SAD-80	815	2.04	86	200	100-150	124	143	140
80A (3B)	SAD-25	545	0.86	25	100	50 - 90	75	89	91
	SAD-40	815	1.27	40	125	100-150	92	110	108
	SAD-50	815	1.63	52	150	100-150	105	122	119
	SAD-65	815	1.86	65	200	100-150	119	138	135
	SAD-80	815	2.22	78	200	200-250	129	152	154
90A (3 1/2B)	SAD-25	545	1.04	32	125	100-150	84	102	100
	SAD-40	815	1.45	46	150	100-150	94	116	114
	SAD-50	815	1.63	57	200	100-150	110	130	127
	SAD-65	815	2.04	70	200	200-250	119	143	145
	SAD-80	815	2.22	84	250	200-250	137	160	162
100A (4B)	SAD-25	815	1.04	27	125	100-150	91	108	106
	SAD-40	815	1.45	40	150	100-150	103	124	121
	SAD-50	815	1.63	52	200	100-150	116	137	133
	SAD-65	815	2.04	65	200	200-250	127	151	152
	SAD-80	815	2.22	78	250	200-250	143	167	168
	SAD-100	815	2.77	103	250	300-350	165	194	192
	SAD-100A	2270	5.26	103	250	300-350	165	194	192
125A (5B)	SAD-25	815	1.04	25	150	100-150	105	122	121
	SAD-40	815	1.45	38	200	100-150	119	140	137
	SAD-50	815	1.63	51	200	200-250	132	152	156
	SAD-65	815	2.04	65	250	200-250	143	167	168
	SAD-80	815	2.22	78	250	200-250	157	181	184
	SAD-100	815	2.77	106	300	300-350	181	208	208
	SAD-100A	2270	5.26	106	300	300-350	181	206	208
	SAD-140A	2270	7.12	145	400	300-350	221	256	251
150A (6B)	SAD-25	815	1.72	25	200	100-150	114	137	133
	SAD-40	815	2.00	38	200	200-250	129	149	152
	SAD-50	815	2.59	51	250	200-250	140	164	165
	SAD-65	815	2.95	64	250	200-250	157	181	184
	SAD-80	815	3.49	76	300	200-250	167	194	194
	SAD-100	815	4.63	105	350	400-500	192	229	222
	SAD-100A	2270	5.85	105	350	400-500	194	232	224
200A (8B)	SAD-140A	2270	7.39	143	400	400-500	232	270	265
	SAD-40	815	2.63	38	250	200-250	152	179	179
	SAD-50	815	2.86	51	250	200-250	165	192	192
	SAD-65	815	3.27	68	300	200-250	184	211	211
	SAD-80	815	3.49	79	350	300-350	195	229	222
	SAD-100	815	4.63	106	400	300-350	221	257	251
SAD-100A	3265	7.67	106	400	300-350	221	256	251	
SAD-140A	3265	10.25	143	450	400-500	260	302	295	

■ Maximum recommended loads are applicable only when saddle is used on a flat bearing surface and tack weld to pipe. When saddle is used with a pipe roll, the maximum load given for the pipe roll applies to the saddle.

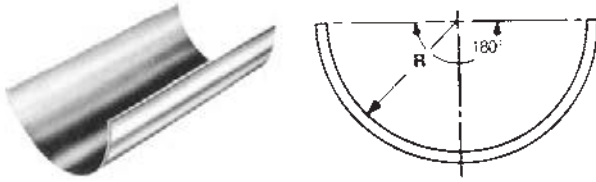
## loads • weights • dimensions (mm)

pipe size	nom. thick. of covering (model)	■ max. recom. load, kg	wgt. (approx) kgs each	actual thickness of covering	size of pipe roll		center line of pipe to outside of saddle C	center line of pipe to center line of pipe	
					model name			D	E
					PRS PRA PRCH	PRSD PRP PRSD-A		PRS PRA PRCH	
250A ( 10B)	SAD-40	815	2.63	40	300	200-250	184	211	211
	SAD-50	815	3.49	52	350	300-350	194	230	224
	SAD-65	815	3.72	65	350	300-350	206	243	237
	SAD-80	815	3.99	78	400	400-500	221	257	254
	SAD-100	815	4.90	103	450	400-500	248	286	283
	SAD-100A	3265	8.57	103	450	400-500	246	287	283
300A ( 12B)	SAD-40	2270	3.54	40	350	300-350	205	241	235
	SAD-50	2270	4.49	52	400	400-500	219	259	254
	SAD-65	2270	4.76	67	400	400-500	232	272	267
	SAD-80	2270	5.17	78	450	400-500	245	283	279
	SAD-100	2270	6.35	105	500	400-500	275	314	310
	SAD-100A	5055	12.70	105	500	400-500	279	318	314
350A ( 14B)	SAD-40	2270	3.54	38	400	300-350	222	259	256
	SAD-50	2270	4.49	51	400	400-500	236	276	272
	SAD-65	2270	4.76	64	450	400-500	251	287	284
	SAD-80	2270	5.17	76	450	400-500	262	299	295
	SAD-100	2270	6.35	102	500	550-600	287	327	321
	SAD-100A	5055	12.52	102	500	550-600	294	332	327
400A ( 16B)	SAD-40	2270	3.81	38	450	400-500	250	286	283
	SAD-50	2270	4.72	51	450	400-500	259	284	294
	SAD-65	3265	5.03	64	500	400-500	275	313	310
	SAD-80	3265	6.03	76	600	550-600	281	327	316
	SAD-100	3265	6.92	102	600	550-600	310	359	346
	SAD-100A	5055	13.65	102	600	550-600	316	364	352
450A ( 18B)	SAD-40	2270	4.13	38	500	400-500	275	313	310
	SAD-50	3265	4.72	51	500	550-600	287	327	322
	SAD-65	3265	5.62	64	600	550-600	295	345	332
	SAD-80	3265	6.03	76	600	550-600	311	360	346
	SAD-100	3265	6.94	102	600	550-600	338	387	375
	SAD-100A	6065	18.28	102	600	550-600	349	399	384
500A ( 20B)	SAD-40	3265	4.72	38	600	550-600	295	345	332
	SAD-50	3265	5.26	51	600	550-600	311	359	346
	SAD-65	3265	5.62	64	600	550-600	324	373	360
	SAD-80	3265	6.08	76	600	550-600	338	387	375
	SAD-100	3265	10.34	102	750	650-750	359	432	403
	SAD-100A	6065	20.32	102	750	650-750	365	437	410
SAD-140A	6065	23.63	140	750	650-750	410	482	454	

■ Maximum recommended loads are applicable only when saddle is used on a flat bearing surface and tack weld to pipe. When saddle is used with a pipe roll, the maximum load given for the pipe roll applies to the saddle.

## insulation protection shield

model : IPS



**MATERIAL :** Carbon steel.

**SERVICE :** Recommended for outside of foam or fiber glass insulation to preclude crushing of insulation without breaking the vapor barrier.

**HOW TO SIZE :** Refer to "Shield Size Selection Table"

**ORDERING :** Specify model name and shield size. Data applicable to shields for thicker insulation or larger pipe sizes is available upon request.

## weights • dimensions (mm)

shield size	wgt(approx) kgs each	thick size	shield length	R
1A	0.31	1.2	300	30
2A	0.38	1.2	300	37
3A	0.45	1.2	300	45
4A	0.50	1.2	300	50
5A	0.59	1.2	300	57
6A	0.64	1.2	300	65
7A	0.73	1.2	300	70
8A	0.86	1.6	300	85
9A	1.22	1.6	300	97
10A	1.41	1.6	300	110
9B	1.81	1.6	450	97
10B	2.09	1.6	450	110
11B	2.31	1.6	450	122
12B	2.54	1.6	450	137
13C	4.63	2.0	600	150
14C	5.03	2.0	600	162
15C	5.40	2.0	600	178
16C	5.76	2.0	600	190
17C	6.17	2.0	600	203
18C	6.58	2.0	600	215
19C	9.62	2.8	600	230
20C	10.16	2.8	600	240
21C	10.70	2.8	600	255
22C	11.25	2.8	600	268
23C	11.75	2.8	600	280
24C	12.29	2.8	600	292
25C	12.84	2.8	600	305
26C	14.06	2.8	600	330
27C	14.42	2.8	600	343
28C	14.97	2.8	600	355

## sizes of model CHA clevis for use with shields outside of insulation

pipe size	insulation thickness (mm)				
	12	20	25	40	50
15A( 1/2B)	50	50	-	-	-
20A( 3/4B)	50	50	65	90	125
25A( 1B)	50	65	80	100	125
32A(1 1/4B)	65	80	80	125	125
40A(1 1/2B)	65	80	90	125	125
50A( 2B)	80	90	100	125	150
65A(2 1/2B)	90	100	125	125	150
80A( 3B)	100	125	125	150	200
90A(3 1/2B)	-	-	150	200	200
100A( 4B)	-	-	150	200	200
125A( 5B)	-	-	200	200	250
150A( 6B)	-	-	200	250	250
200A( 8B)	-	-	-	300	300
250A( 10B)	-	-	300	350	400
300A( 12B)	-	-	400	400	450
350A( 14B)	-	-	400	450	450
400A( 16B)	-	-	450	500	500
450A( 18B)	-	-	500	-	-
500A( 20B)	-	-	-	600	600
600A( 24B)	-	-	-	-	-

As actual foam or fiber glass insulation thicknesses vary, verify that the radius of the selected shield is suitable for the required application. Shields are designed for a maximum span of 3m on 0.3kg/cm<sup>2</sup> compressive strength insulation.

For compressive strengths greater than 0.3kg/cm<sup>2</sup> spans may be increased proportionately up to maximum allowable for steel pipe.

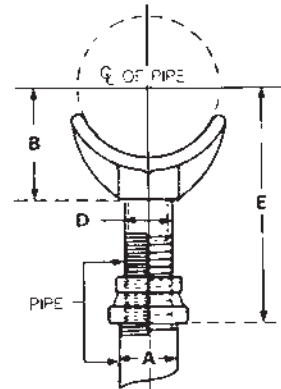
## shield size selection table

## weights • dimensions(mm)

pipe size	insulation thickness (mm)				
	12	20	25	40	50
15A( 1/2B)	1A	1A	-	-	-
20A( 3/4B)	1A	1A	2A	4A	6A
25A( 1B)	1A	2A	3A	5A	7A
32A(1 1/4B)	2A	3A	3A	6A	7A
40A(1 1/2B)	2A	3A	4A	6A	7A
50A( 2B)	3A	4A	5A	7A	8A
65A(2 1/2B)	4A	5A	6A	7A	8A
80A( 3B)	5A	6A	7A	8A	9A
90A(3 1/2B)	-	-	8A	9A	10A
100A( 4B)	-	-	8A	9A	10A
125A( 5B)	-	-	9B	10B	11B
150A( 6B)	-	-	10B	11B	12B
200A( 8B)	-	-	-	13C	14C
250A( 10B)	-	-	14C	15C	16C
300A( 12B)	-	-	16C	17C	18C
350A( 14B)	-	-	17C	18C	19C
400A( 16B)	-	-	19C	20C	21C
450A( 18B)	-	-	21C	22C	23C
500A( 20B)	-	-	23C	24C	25C
600A( 24B)	-	-	26C	27C	28C

## adjustable pipe saddle support

model : SADA



**MATERIAL :** Cast iron saddle, locknut nipple and special cast iron reducer, assembled.

**SERVICE :** Stanchion type support where vertical adjustment is required.

**INSTALLATION :** Adjustment is obtained by turning the locknut nipple. The lower end of the nipple is staked, upsetting the threads to prevent separation of nipple and coupling during adjustment.

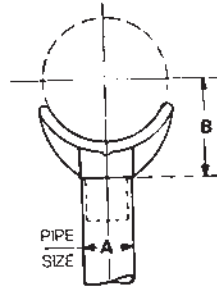
**ORDERING :** Specify model name and nominal pipe size to be supported.  
ex) SADA-200A

## weights • dimensions (mm)

pipe size	wgt(approx) kg. each	A	B	D	E	
					min	max
65A(2½B)	4.08	65A(2½B)	90	40A(1½B)	205	330
80A( 3B)	4.17	65A(2½B)	95	40A(1½B)	210	335
90A(3½B)	4.26	65A(2½B)	102	40A(1½B)	215	345
100A( 4B)	6.80	80A( 3B)	108	65A(2½B)	235	355
125A( 5B)	7.58	80A( 3B)	125	65A(2½B)	255	375
150A( 6B)	8.03	80A( 3B)	140	65A(2½B)	265	385
200A( 8B)	9.16	80A( 3B)	175	65A(2½B)	300	420
250A(10B)	11.43	80A( 3B)	215	65A(2½B)	345	465
300A(12B)	13.15	80A( 3B)	252	65A(2½B)	380	500
350A(14B)	18.23	100A( 4B)	278	80A( 3B)	415	525
400A(16B)	24.13	100A( 4B)	315	80A( 3B)	450	565
450A(18B)	32.11	150A( 6B)	352	90A(3½B)	495	610
500A(20B)	47.54	150A( 6B)	390	90A(3½B)	535	650
600A(24B)	62.14	150A( 6B)	455	100A( 4B)	605	720
750A(30B)	77.11	150A( 6B)	540	100A( 4B)	685	800
800A(32B)	82.10	150A( 6B)	572	100A( 4B)	720	830
900A(36B)	112.95	150A( 6B)	622	100A( 4B)	770	885

## pipe saddle support

model : SADS

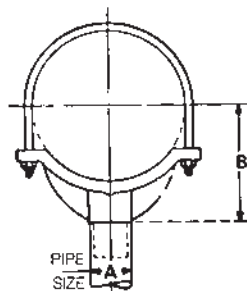
**MATERIAL** : Cast iron saddle.**INSTALLATION** : Slip saddle base into riser pipe.**ORDERING** : Specify model name and nominal pipe size to be supported.  
ex) SADS-200A

## weights • dimensions (mm)

pipe size	wgt(approx) kgs each	A	B
100A ( 4B)	4.13	80A (3B)	105
125A ( 5B)	4.90	80A (3B)	122
150A ( 6B)	5.35	80A (3B)	138
200A ( 8B)	6.49	80A (3B)	175
250A (10B)	8.75	80A (3B)	215
300A (12B)	10.48	80A (3B)	252

## pipe stanchion saddle

model : SADU

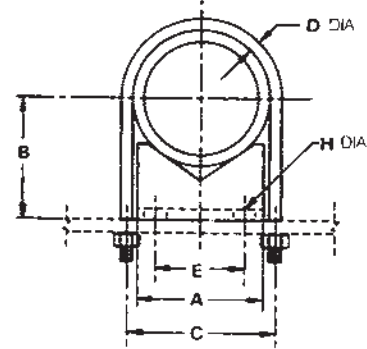
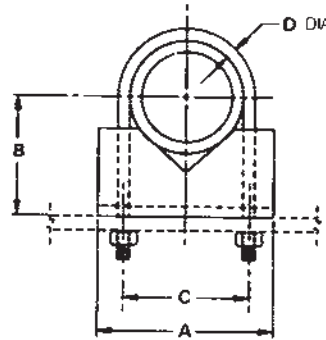
**MATERIAL** : Cast iron stanchion saddle with steel yoke and nuts.**INSTALLATION** : Same as pipe saddle support SADS except that yoke is attached to saddle after pipe is in place.**ORDERING** : Specify model name and nominal pipe size to be supported.  
ex) SADU-200A

## weights • dimensions (mm)

pipe size	wgt(approx) kgs each	A	B
100A ( 4B)	4.90	80A (3B)	105
125A ( 5B)	5.49	80A (3B)	122
150A ( 6B)	5.76	80A (3B)	138
200A ( 8B)	9.66	80A (3B)	175
250A (10B)	11.70	80A (3B)	215
300A (12B)	14.20	80A (3B)	252

## anchor chair

## model : ACH



**MATERIAL** : Carbon steel.

**MAXIMUM TEMPERATURE** : 400°C

**SERVICE** : For use in anchoring general piping to structural member.

**ORDERING** : Specify model name and nominal pipe size.  
ex) ACH-100A

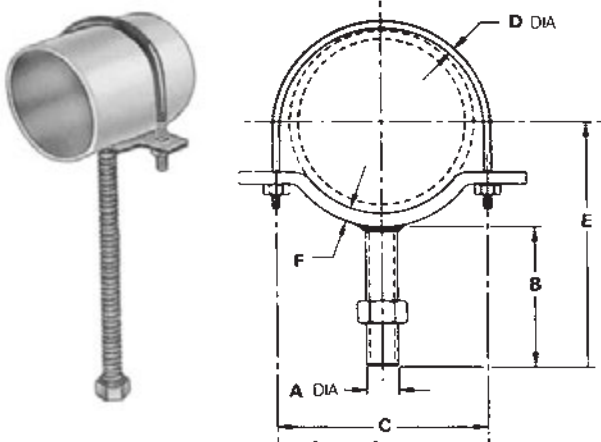
## weights • dimensions (mm)

pipe size	A	B	C	D	E	H	wgt approx kgs each
15A( 1/2B)	60	30	34	M10	-	-	0.45
20A( 3/4B)	65	35	38	M10	-	-	0.47
25A( 1B)	75	35	45	M10	-	-	0.50
32A(1 1/4B)	80	40	54	M10	-	-	0.64
40A(1 1/2B)	100	40	60	M10	-	-	0.73
50A( 2B)	110	45	73	M10	-	-	0.82
65A(2 1/2B)	70	55	91	M12	30	14	0.82
80A( 3B)	85	65	105	M12	45	14	0.86
90A(3 1/2B)	100	65	117	M12	55	22	0.90
100A( 4B)	110	70	130	M12	55	22	1.09
125A( 5B)	125	90	157	M12	55	22	1.22
150A( 6B)	150	100	186	M16	75	22	1.81
200A( 8B)	205	145	238	M16	115	22	4.72
250A( 10B)	215	170	296	M20	140	22	6.35
300A( 12B)	230	195	352	M24	150	22	8.30
350A( 14B)	255	210	385	M24	180	22	8.98
400A( 16B)	255	240	436	M24	180	22	9.39
450A( 18B)	280	260	486	M24	180	22	12.07
500A( 20B)	280	290	538	M24	180	22	12.56
600A( 24B)	305	390	640	M24	205	22	13.93



## adjustable pipe stanchion saddle w/U-bolt

model : SADN



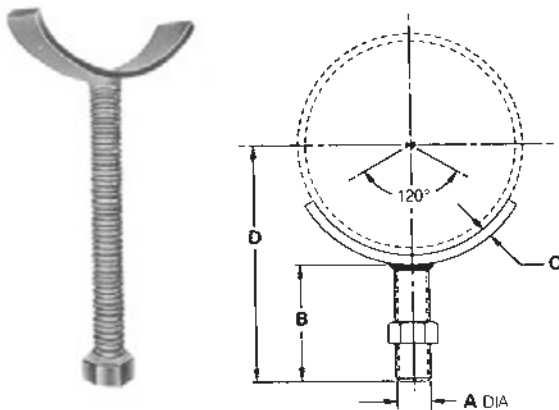
**MATERIAL** : Carbon steel

**SERVICE** : Stanchion type support where vertical adjustment is required, plus the additional stability provided by u-bolt attachment to pipe.

**ORDERING** : Specify model name and nominal pipe size to be supported.  
ex) SADN-200A

### weights • dimensions (mm)

pipe size	A	B	C	D	E	F	wgt approx kgs each
50A( 2B)	M16	200	73	M10	236	6×25	0.57
65A(2½B)	M16	200	91	M12	243	6×25	0.67
80A( 3B)	M16	200	105	M12	250	6×25	0.76
90A(3½B)	M16	200	117	M12	257	6×25	1.21
100A( 4B)	M24	200	130	M12	263	6×35	1.36
125A( 5B)	M24	200	157	M12	277	6×35	1.45
150A( 6B)	M24	200	186	M16	293	9×40	2.22
200A( 8B)	M24	200	238	M16	319	9×40	2.81
250A( 10B)	M30	200	296	M20	349	12×50	5.03
300A( 12B)	M30	200	352	M24	374	12×50	5.39



## adjustable pipe model : SADC saddle support

**MATERIAL** : Carbon Steel.

**SERVICE** : Stanchion type support where vertical adjustment is required.

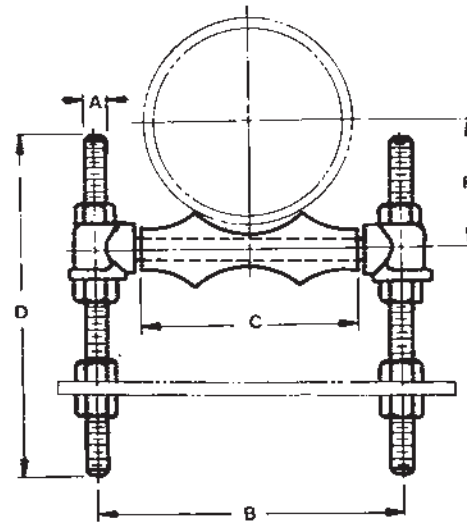
**ORDERING** : Specify model name and nominal pipe size to be supported.

### weights • dimensions (mm)

pipe size	A	B	C	D	wgt approx kgs each
50A( 2B)	M16	200	6×25	236	0.45
65A(2½B)	M16	200	6×25	243	0.50
80A( 3B)	M16	200	6×25	250	0.50
90A(3½B)	M16	200	6×25	257	0.73
100A( 4B)	M24	200	6×35	263	0.90
125A( 5B)	M24	200	6×35	277	0.95
150A( 6B)	M24	200	9×40	293	1.50
200A( 8B)	M24	200	9×40	319	1.63
250A( 10B)	M30	200	12×50	349	3.08
300A( 12B)	M30	200	12×50	374	3.36

## adjustable pipe roll support

model : PRA



**MATERIAL :** Cast iron roll and sockets, steel roll rod, continuous thread rods and hex nuts.

**SERVICE :** For support of pipe where horizontal movement due to expansion and contraction will occur and where vertical adjustment up to 150mm may be necessary.

**HOW TO SIZE :**

- (1) If roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- (2) If used with pipe covering protection saddle, see pages 148–150 for size of pipe saddle.
- (3) If roll is to support covered pipe, the O.D. of the covering should not be greater than the O.D. of the pipe for which the roll was designed.

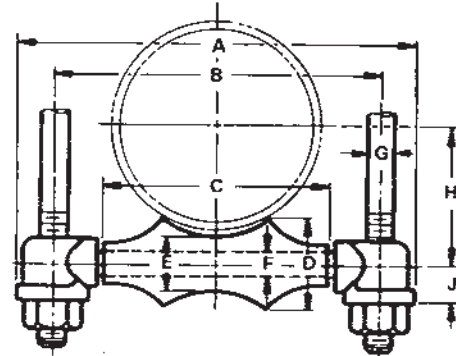
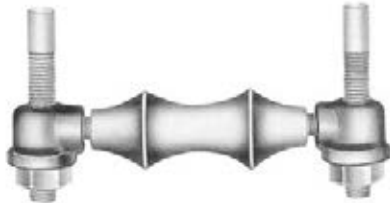
**ORDERING :** Specify model name and size of roll. Be certain to order oversized rolls where insulation makes this necessary.

**weights • dimensions (mm)**

pipe size	weight (approx) kgs each	A	B	C	D	H
25A( 1B)	0.50	M10	80	40	300	27
32A(1 1/4B)	0.54	M10	90	50	300	32
40A(1 1/2B)	0.54	M10	90	55	300	35
50A( 2B)	0.59	M10	110	65	300	40
65A(2 1/2B)	1.04	M12	120	80	300	50
80A( 3B)	1.09	M12	140	95	300	57
90A(3 1/2B)	1.22	M12	160	110	300	65
100A( 4B)	1.72	M16	170	120	300	70
125A( 5B)	2.13	M16	210	150	300	87
150A( 6B)	3.45	M20	240	175	300	102
200A( 8B)	4.99	M24	300	225	300	130
250A( 10B)	6.21	M24	360	280	300	162
300A( 12B)	8.80	M24	400	320	300	190
350A( 14B)	14.15	M24	450	360	300	213
400A( 16B)	19.28	M24	500	415	460	240
450A( 18B)	21.14	M24	560	465	460	267
500A( 20B)	30.03	M30	620	515	460	295
600A( 24B)	46.49	M36	730	615	610	355
750A( 30B)	84.73	M36	900	770	610	443

single pipe roll

model : PRS



**MATERIAL :** Cast iron roll and sockets ; steel roll rod

**SERVICE :** For suspension of pipe from two rods where longitudinal movement due to expansion and contraction may occur.

**HOW TO SIZE :**

(1) If the roll is to support non-insulated pipe, select the size directly from nominal pipe size(column 1) in table below.

- (2) If used with pipe covering protection saddle, see pages 148–150 for size of pipe saddle.
- (3) If roll is to support covered pipe, select the nominal pipe size (column 1) which corresponds to outside diameter of covering and saddle (column 2).

**ORDERING :** Specify model name and size of roll.

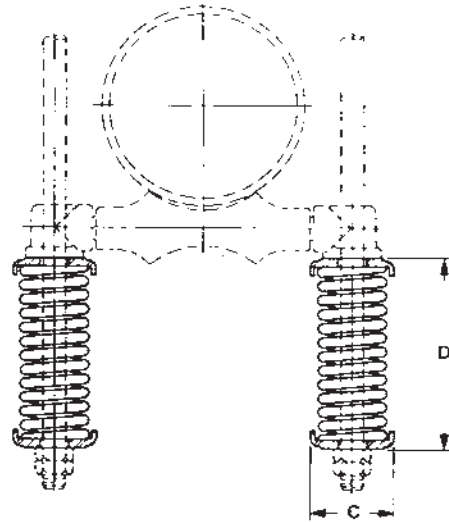
- Order should include model name, pipe size in all cases. Hanger rods/nuts and adjustable socket to be ordered separately.
- Be certain to order oversized rolls where insulation makes this necessary.

loads • weights • dimensions (mm)

nom pipe size	max O.D covering	hanger rod size,G	adj. socket no.	max recom safe load kg	weight (approx) kgs each	A	B	C	D	E	F	H	J
25A( 1B)	51	M10	1-10	270	0.20	105	80	40	25	19	M10	27	14
32A(1 1/4B)	64	M10	1-10	270	0.22	115	90	50	27	19	M10	32	14
40A(1 1/2B)	70	M10	1-10	270	0.23	120	90	55	29	19	M10	35	14
50A( 2B)	83	M10	1-10	270	0.26	135	110	65	30	19	M10	41	14
65A(2 1/2B)	95	M12	2-12	300	0.45	160	120	80	35	22	M12	49	18
80A( 3B)	114	M12	2-12	320	0.50	175	140	95	37	22	M12	57	18
90A(3 1/2B)	127	M12	2-12	340	0.64	190	160	110	41	25	M12	65	18
100A( 4B)	140	M16	3-12	340	0.77	210	170	120	45	25	M12	71	22
125A( 5B)	178	M16	3-16	340	1.18	250	210	150	51	29	M16	87	22
150A( 6B)	210	M20	4-20	485	2.04	290	240	175	59	32	M20	102	25
200A( 8B)	267	M24	5-24	610	3.27	360	300	225	71	38	M24	130	32
250A( 10B)	324	M24	5-24	785	4.31	415	360	280	86	45	M24	162	32
300A( 12B)	375	M24	5-24	1090	7.21	455	400	320	98	51	M24	189	32
350A( 14B)	413	M24	6-30	1420	11.02	510	450	360	118	64	M30	213	38
400A( 16B)	457	M24	6-30	1800	14.47	560	500	415	127	67	M30	240	38
450A( 18B)	514	M24	6-30	1905	16.14	625	560	465	138	70	M30	267	38
500A( 20B)	572	M30	8-30	2065	21.32	695	620	515	152	76	M30	295	41
600A( 24B)	673	M36	9-36	2795	34.61	820	730	615	183	92	M36	356	45
750A( 30B)	826	M36	9-42	3305	58.92	990	900	770	227	114	M42	443	62

spring cushion hanger

model : SCH



**MATERIAL :** Spring cushion hanger consists of a set of two springs and four retainers only.

**SERVICE :** Generally used with single pipe roll as shown in above photo. Recommended for installations where the vertical movement does not exceed 32mm. Maximum recommended load is 1360kg.

**ORDERING :** Specify model name, spring no. and rod size. If used with model PRS single pipe roll, pipe roll must be ordered separately. The retainers are cored to the dimensions as shown, but can be drilled or reamed larger to satisfy the hanger rod required.

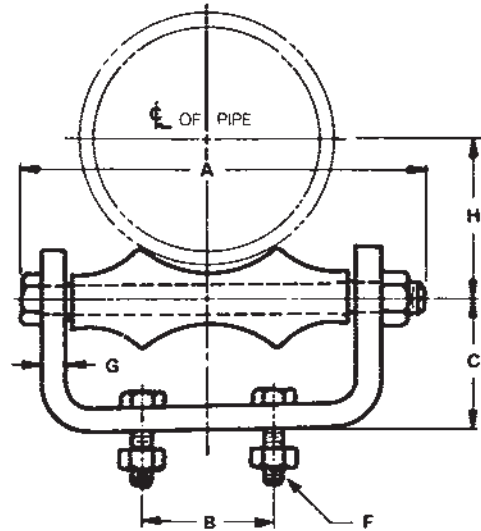
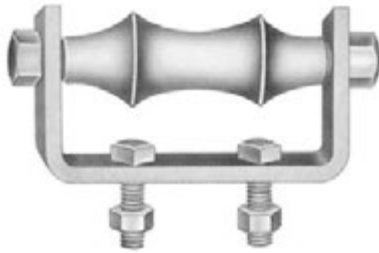
loads • weights • dimensions (mm)

spring no.	max.recom. deflection ♦	load kg at max.recom deflection ■	deflection rate of hanger kg per mm	weight (approx) kgs each	C	D	size of retainer core	for rod size
1	32	245	7.66	2.04	70	165	12	M10
2	32	680	21.25	6.35	105	155	14	M12
3	32	1360	42.50	9.98	105	230	26	M24

- ◆ At maximum recommended deflection, spring can be compressed on additional 6mm before becoming solid.
- Maximum capacity of double spring hanger.

## roller chair

model : PRCH



**MATERIAL :** Cast iron roll, steel chair, roll rod, bolts and hex nuts.

**SERVICE :** For support of pipe where horizontal movement due to expansion and contraction will occur but where no vertical adjustment is expected.

**ORDERING :** Specify model name and nominal pipe size. Be certain to order oversized rolls where insulation makes this necessary.

**HOW TO SIZE :**

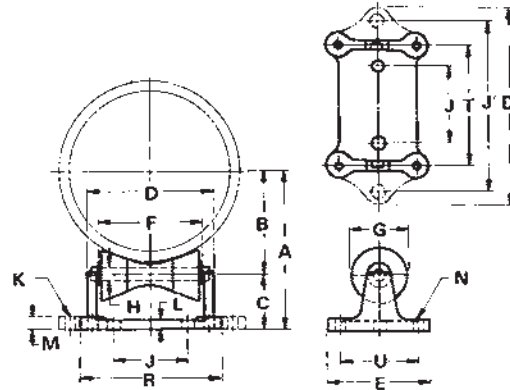
- (1) If the roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- (2) If used with pipe covering protection saddle, see page 148–150 for size of pipe saddle.
- (3) If roll is to support covered pipe, the O.D. of the covering should not be greater than the O.D. of the pipe for which the roll was designed.

**weights • dimensions (mm)**

pipe size	weight (approx) kgs each	A	B	C	F	G	H
50A( 2B)	0.50	105	30	40	M10×40	6×35	41
65A(2½B)	0.64	125	30	40	M10×40	6×35	49
80A( 3B)	0.73	140	50	45	M10×40	6×35	57
90A(3½B)	1.18	155	50	50	M10×40	9×40	65
100A( 4B)	1.32	170	50	60	M12×40	9×40	71
125A( 5B)	1.77	200	75	65	M12×40	9×40	87
150A( 6B)	2.72	235	80	70	M12×40	9×50	102
200A( 8B)	4.08	295	85	75	M16×40	9×50	130
250A( 10B)	6.26	360	135	90	M16×50	12×50	162
300A( 12B)	8.57	410	140	105	M16×50	12×50	189

pipe roll stand

model : PRSD



**MATERIAL :** Cast iron roll and stand.

**SERVICE :** For support of pipe where longitudinal movement resulting from expansion and contraction may take place but vertical adjustment is unnecessary.

**HOW TO SIZE :**

- (1) If roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- (2) If used with pipe covering protection saddle, see pages 148–150 for size of pipe saddle.

**ORDERING :** Specify model name and pipe roll size. Be certain to order oversized rolls where insulation makes this necessary.

**loads • weights(kg)**

pipe size	50A(2B) to 90A(3 1/2B)	100A(4B) to 150A(6B)	200A(8B) to 250A(10B)	300A(12B) to 350A(14B)	400A(16B) to 500A(20B)	600A(24B)	750A(30B)	900A(36B) to 1050A(42B)
max recom load,kg	175	430	955	1395	2260	2765	3400	5445
wgt(approx)kg	2.90	4.04	6.94	12.75	18.01	22.50	45.04	68.95

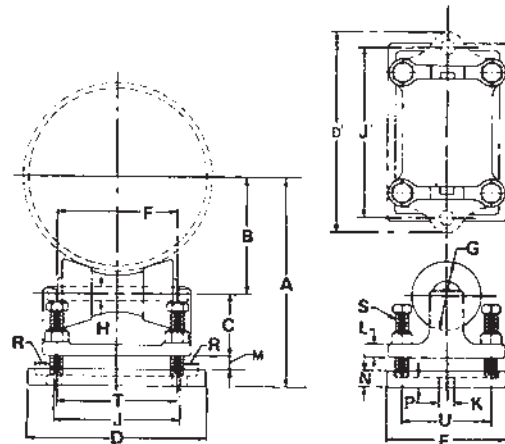
**dimensions (mm)**

pipe size	A	B	C	D	D'	E	F	G	H	J	J'	K	L	M	N	R	T	U
50A( 2B)	90	45	45	102	215	135	70	48	M12	-	160	26	15	18	12	-	87	100
65A(2 1/2B)	100	55	45	102	215	135	70	48	M12	-	160	26	15	18	12	-	87	100
80A( 3B)	105	60	45	102	215	135	70	48	M12	-	160	26	15	18	12	-	87	100
90A(3 1/2B)	112	67	45	102	215	135	70	48	M12	-	160	26	15	18	12	-	87	100
100A( 4B)	120	70	50	137	255	145	95	52	M12	-	200	26	20	22	12	-	120	110
125A( 5B)	136	86	50	137	255	145	95	52	M12	-	200	26	20	22	12	-	120	110
150A( 6B)	152	102	50	137	255	145	95	52	M12	-	200	26	20	22	12	-	120	110
200A( 8B)	218	133	85	200	255	170	150	83	M20	100	-	26	20	22	16	200	180	130
250A( 10B)	247	162	85	200	-	170	150	83	M20	100	-	26	20	22	16	200	180	130
300A( 12B)	291	191	100	253	-	200	205	102	M24	145	-	26	20	22	20	280	232	155
350A( 14B)	306	206	100	253	-	200	205	102	M24	145	-	26	20	22	20	280	232	155
400A( 16B)	348	238	110	287	-	220	230	114	M30	170	-	26	22	25	20	315	262	166
450A( 18B)	374	264	110	287	-	220	230	114	M30	170	-	26	22	25	20	315	262	166
500A( 20B)	400	290	110	287	-	220	230	114	M30	170	-	26	22	25	20	315	262	166
600A( 24B)	450	340	110	319	-	220	255	114	M30	190	-	26	25	30	20	345	290	166
750A( 30B)	556	426	130	403	-	275	320	140	M42	255	-	26	32	38	26	430	365	204
900A( 36B)	653	508	145	480	-	305	380	162	M48	305	-	26	38	45	33	510	431	230
1050A( 42B)	732	587	145	480	-	305	380	162	M48	305	-	26	38	45	33	510	431	230



adjustable pipe roll stand

model : PRSD - A



**MATERIAL :** Cast iron base plate, stand and roll steel adjusting screws.

**SERVICE :** To support pipe lines where vertical and lateral adjustment during installation may be required in addition to provision for expansion and contraction.

**HOW TO SIZE :**

- (1) If roll is to support bare pipe, select the size directly from nominal pipe size(see below).
- (2) If used with pipe covering protection saddle, see pages 148–150 for size of pipe saddle.

**ORDERING :** Specify model name and pipe roll size. Be certain to order oversized rolls where insulation makes this necessary.

**loads • weights(kg)**

pipe size	max recom load, kg	weight(approx), kgs
50A( 2B) to 90A(3 1/2B)	175	6.89
100A( 4B) to 150A( 5B)	430	8.75
200A( 8B) to 250A( 10B)	955	14.56
300A(12B) to 350A( 14B)	1395	23.22
400A(16B) to 500A( 20B)	2260	32.34
600A(24B)	2765	39.46
750A(30B)	3400	75.39

**dimensions (mm)**

pipe size	A		B	C	D	D'	E	F	G	H	J	J'	K	L	M max	N	P	R	S	T	U
	min	max																			
50A( 2B)	130	135	45	45	175	215	140	70	48	M12	100	160	26	18	20	25	20	25	M16	87	100
65A(2 1/2B)	135	145	55	45	175	215	140	70	48	M12	100	160	26	18	20	25	20	25	M16	87	100
80A( 3B)	145	150	60	45	175	215	140	70	48	M12	100	160	26	18	20	25	20	25	N16	87	100
90A(3 1/2B)	150	160	67	45	175	215	140	70	48	M12	100	160	26	18	23	25	20	25	M16	87	100
100A( 4B)	165	180	70	50	205	255	145	95	52	M12	130	200	26	22	35	25	20	25	M16	120	110
125A( 5B)	180	190	86	50	205	255	145	95	52	M12	130	200	26	22	29	25	20	25	M16	120	110
150A( 6B)	195	205	102	50	205	255	145	95	52	M12	130	200	26	22	28	25	20	25	M16	120	110
200A( 8B)	265	295	133	85	270	-	170	150	83	M20	185	-	26	22	47	30	20	25	M20	180	130
250A( 10B)	290	325	162	85	270	-	170	150	83	M20	185	-	26	22	48	30	20	25	M20	180	130
300A( 12B)	330	360	191	100	330	-	205	205	102	M24	240	-	26	22	39	30	20	25	M24	232	155
350A( 14B)	345	380	206	100	330	-	205	205	102	M24	240	-	26	22	44	30	20	25	M24	232	155
400A( 16B)	385	420	238	110	370	-	220	230	114	M30	284	-	26	25	40	32	22	30	M24	262	166
450A( 18B)	415	450	264	110	370	-	220	230	114	M30	284	-	26	25	44	32	22	30	M24	262	166
500A( 20B)	440	475	290	110	370	-	220	230	114	M30	284	-	26	25	43	32	22	30	M24	262	166
600A( 24B)	500	535	340	110	400	-	220	255	114	M30	310	-	26	30	50	35	25	30	M24	290	166
750A( 30B)	610	680	426	130	490	-	265	320	140	M42	400	-	26	38	82	42	32	35	M30	365	204

## distance to first rigid hanger

The table below is offered as a guide for placement of the first rigid hanger on piping where deflection at a given point is known. When the distance from the point of known deflection (left-hand column) to the first rigid hanger is equal to, or greater than, the value L read from the table for the appropriate pipe size, then the deflection will be absorbed without inducing stresses in excess of  $7\text{kg/mm}^2$  in the piping.

It should be noted that these figures are computed using standard wall pipe over an uninterrupted straight length. If the allowable stress is other than  $7\text{kg/mm}^2$ , multiply the minimum distance in meter (m) by the correction factor for the given bending stress.

$$L = \frac{\sqrt{\Delta \times \text{O.D. of Pipe} \times 101243.72}}{1.6S} = 94,868 \times \sqrt{\Delta \times \text{O.D of pipe}} \quad (\text{mm})$$

Unit : m

Deflection $\Delta$ (mm)	pipe size																
	25A (1B)	32A (1 $\frac{1}{2}$ B)	40A (1 $\frac{1}{2}$ B)	50A (2B)	65A (2 $\frac{1}{2}$ B)	80A (3B)	90A (3 $\frac{1}{2}$ B)	100A (4B)	125A (5B)	150A (6B)	200A (8B)	250A (10B)	300A (12B)	350A (14B)	400A (16B)	450A (18B)	500A (20B)
5	1.2	1.4	1.5	1.6	1.8	2.0	2.1	2.3	2.5	2.8	3.1	3.5	3.8	4.0	4.3	4.5	4.8
10	1.7	1.9	2.1	2.3	2.6	2.8	3.0	3.2	3.6	3.9	4.4	5.0	5.4	5.7	6.0	6.4	6.8
15	2.1	2.4	2.6	2.9	3.1	3.5	3.7	3.9	4.4	4.8	5.4	6.1	6.6	6.9	7.4	7.9	8.3
20	2.5	2.8	2.9	3.3	3.6	4.0	4.3	4.5	5.0	5.5	6.3	7.0	7.6	8.0	8.6	9.1	9.6
25	2.7	3.1	3.3	3.7	4.1	4.5	4.8	5.1	5.6	6.2	7.0	7.8	8.5	8.9	9.6	10.1	10.7
30	3.0	3.4	3.6	4.0	4.4	4.9	5.2	5.6	6.2	6.7	7.7	8.6	9.4	9.8	10.5	11.1	11.7
35	3.2	3.6	3.9	4.4	4.8	5.3	5.7	6.0	6.7	7.3	8.3	9.3	10.1	10.6	11.3	12.0	12.6
40	3.5	3.9	4.2	4.7	5.1	5.7	6.0	6.4	7.1	7.8	8.9	9.9	10.8	11.3	12.1	12.8	13.5
45	3.7	4.1	4.4	4.9	5.4	6.0	6.4	6.8	7.6	8.3	9.4	10.5	11.5	12.0	12.8	13.6	14.3
50	3.9	4.4	4.7	5.2	5.7	6.3	6.8	7.2	8.0	8.7	9.9	11.1	12.1	12.6	13.5	14.3	15.1
55	4.1	4.6	4.9	5.5	6.0	6.6	7.1	7.5	8.4	9.1	10.4	11.6	12.7	13.3	14.2	15.0	15.9
60	4.2	4.8	5.1	5.7	6.3	6.9	7.4	7.9	8.7	9.5	10.9	12.1	13.2	13.9	14.8	15.7	16.6
65	4.4	5.0	5.3	5.9	6.5	7.2	7.7	8.2	9.1	9.9	11.3	12.6	13.8	14.4	15.4	16.4	17.2
70	4.6	5.2	5.5	6.2	6.8	7.5	8.0	8.5	9.4	10.3	11.7	13.1	14.3	15.0	16.0	17.0	17.9
75	4.7	5.3	5.7	6.4	7.0	7.7	8.3	8.8	9.8	10.7	12.2	13.6	14.8	15.5	16.6	17.6	18.5
80	4.9	5.5	5.9	6.6	7.3	8.0	8.6	9.1	10.1	11.0	12.6	14.0	15.3	16.0	17.1	18.1	19.1
85	5.1	5.7	6.1	6.8	7.5	8.2	8.8	9.4	10.4	11.3	12.9	14.5	15.7	16.5	17.6	18.7	19.7
90	5.2	5.8	6.3	7.0	7.7	8.5	9.1	9.6	10.7	11.7	13.3	14.9	16.2	17.0	18.1	19.2	20.3

### CORRECTION FACTOR FOR STRESSES OTHER THAN $7\text{kg/mm}^2$

■ for bending stress of:	1.5	2.0	2.5	3.5	4.5	5.5	7.0	8.5	10.5	14.0
multiply min. distance by:	2.16	1.87	1.67	1.41	1.25	1.13	1.00	0.91	0.82	0.71

■ All stresses are  $\text{kg/mm}^2$

## spacing of pipe hangers

(unit : m)

### steel pipe

nom. pipe size		15A (1/2B)	20A (3/4B)	25A (1B)	32A (1 1/4B)	40A (1 1/2B)	50A (2B)	65A (2 1/2B)	80A (3B)	90A (3 1/2B)	100A (4B)	125A (5B)	150A (6B)	200A (8B)	250A (10B)	300A (12B)	350A (14B)	400A (16B)	450A (18B)	500A (20B)	600A (24B)	750A (30B)
max. span (m)	water service	2.1	2.1	2.1	2.1	2.7	3.0	3.3	3.6	3.9	4.2	4.8	5.1	5.8	6.1	7.0	7.6	8.2	8.5	9.1	9.7	10.0
	steam, gas, air service	2.4	2.7	2.7	2.7	3.6	3.9	4.2	4.5	4.9	5.2	5.8	6.4	7.3	7.9	9.1	9.7	10.6	11.3	11.9	12.8	13.4
hanger rod	recom dia	M10				M12				M16		M20		M24				M30		M36		
	max. rated load, kg	275				515				820		1230		2250				3630		5275		

\*Hanger rod diameters may be selected by pipe size only after a check that the supported load does not exceed the max rated load of that rod diameter, and that a particular rod diameter is not required by the component to which the rod is attached.

### copper tubing

tubing size	15A (1/2B)	20A (3/4B)	25A (1B)	32A (1 1/4B)	40A (1 1/2B)	50A (2B)	65A (2 1/2B)	80A (3B)	90A (3 1/2B)	100A (4B)	125A (5B)	150A (6B)	200A (8B)	250A (10B)	300A (12B)
span (m)	1.5	1.5	1.8	2.1	2.4	2.4	2.7	3.0	3.4	3.7	4.0	4.3	4.9	5.5	5.8

### PVC plastic pipe (MAX. 38°C)

pipe size	15A (1/2B)	20A (3/4B)	25A (1B)	32A (1 1/4B)	40A (1 1/2B)	50A (2B)	65A (2 1/2B)	80A (3B)	90A (3 1/2B)	100A (4B)	150A (6B)
span (m)	1.2	1.2	1.2	1.2	1.5	1.5	1.5	1.5	1.5	1.8	1.8

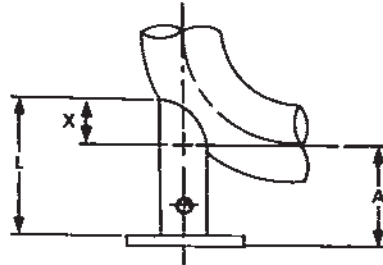
### cast iron pipe

Hanger spacing - 3.6m (at each joint)

### glass pipe

Hanger spacing - 2.4m

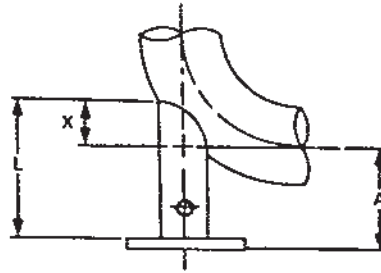
### decision of pipe stanchion size take-out for long radius elbows



$L = A - \text{BASE PLATE THICKNESS} + X$

stanchion size nominal pipe size	40A (1½B)	50A (2B)	60A (2½B)	80A (3B)	100A (4B)	125A (5B)	150A (6B)	200A (8B)	250A (10B)	300A (12B)	350A (14B)	400A (16B)	500A (20B)
65A(2½B)	36	55											
80A( 3B)	36	49	62										
100A( 4B)	40	49	62	81									
125A( 5B)	40	51	62	76	108								
150A( 6B)			63	76	100	138							
200A( 8B)				82	103	128	162						
250A( 10B)					106	128	154	214					
300A( 12B)						133	157	208	281				
350A( 14B)						159	181	229	295	382			
400A( 16B)						165	186	230	287	354	408		
450A( 18B)							194	235	286	343	386	471	
500A( 20B)								240	287	340	376	444	
550A( 22B)								246	290	340	373	432	600
600A( 24B)								252	295	341	360	427	565
650A( 26B)									303	346	375	425	549
700A( 28B)									308	351	378	425	540
750A( 30B)										355	381	429	533
800A( 32B)										362	387	432	532
850A( 34B)										368	394	437	532
900A( 36B)										376	400	443	533
1050A( 42B)											421	460	546
	"X" dimension (mm)												

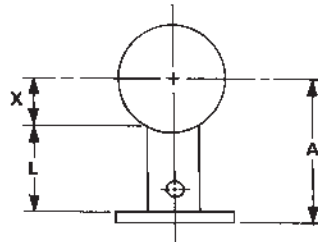
### take-out for short radius elbows



$$L = A - \text{BASE PLATE THICKNESS} + X$$

stanchion size nominal pipe size	40A (1½B)	50A (2B)	60A (2½B)	80A (3B)	100A (4B)	125A (5B)	150A (6B)	200A (8B)	250A (10B)	300A (12B)	350A (14B)	400A (16B)	500A (20B)
65A(2½B)	14	29											
80A( 3B)	10	19	33										
100A( 4B)	5	13	24	40									
125A( 5B)	2	8	16	29	25								
150A( 6B)			11	22	43	73							
200A( 8B)			6	13	30	52	79						
250A( 10B)					19	36	59	111					
300A( 12B)						36	48	98	152				
350A( 14B)						35	54	95	151	227			
400A( 16B)						27	44	83	129	183	232		
450A( 18B)							36	70	114	163	198	273	
500A( 20B)								62	102	144	176	245	
550A( 22B)								52	90	131	159	210	354
600A( 24B)								44	81	119	144	191	310
650A( 26B)									73	108	133	175	279
700A( 28B)									63	98	121	162	257
750A( 30B)										89	110	149	238
800A( 32B)										81	102	140	222
850A( 34B)										71	94	129	208
900A( 36B)										63	84	95	197
1050A( 42B)											62	94	163
	"X" dimension(mm)												

## take-out for horizontal pipe

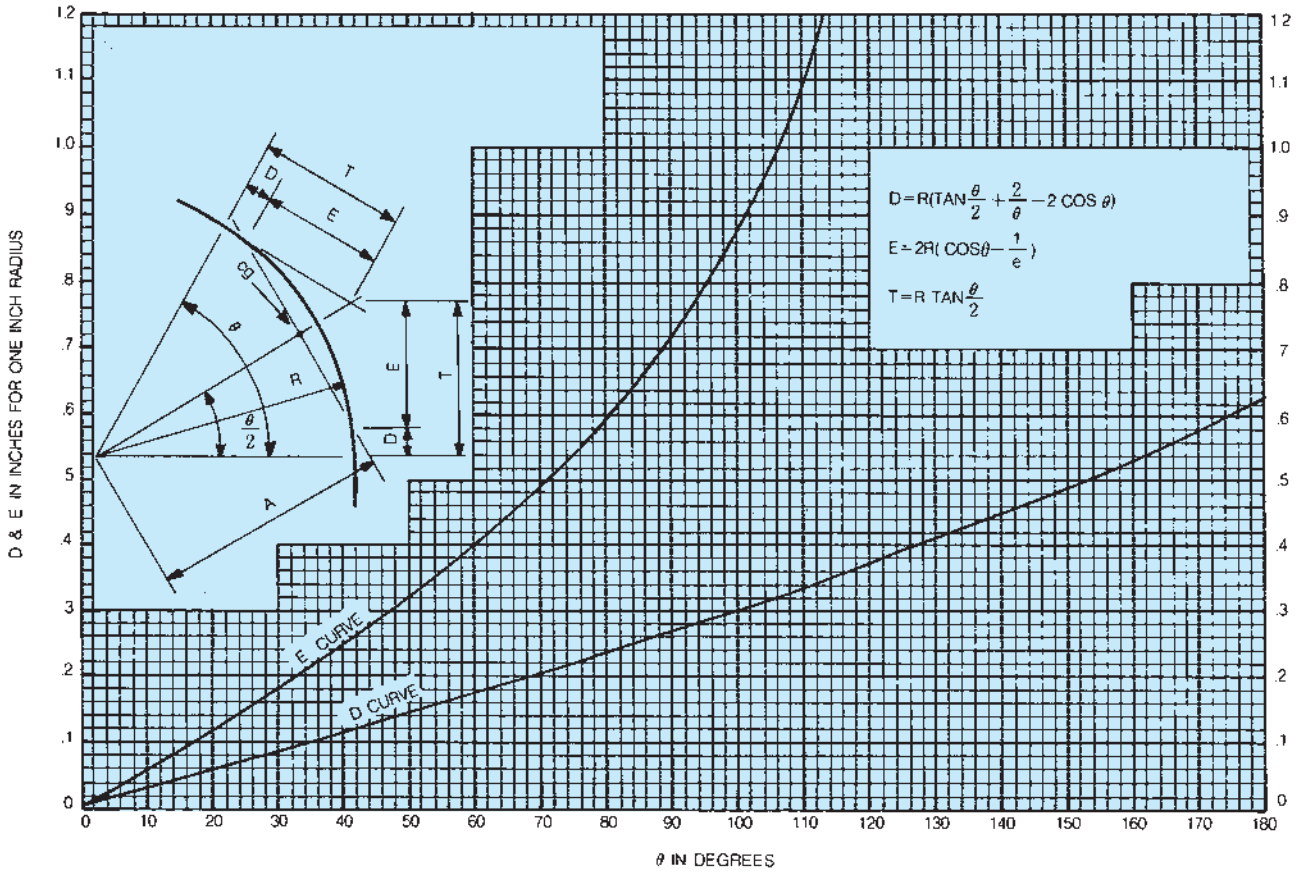


$$L = A - (\text{BASE PLATE THICKNESS} + X)$$

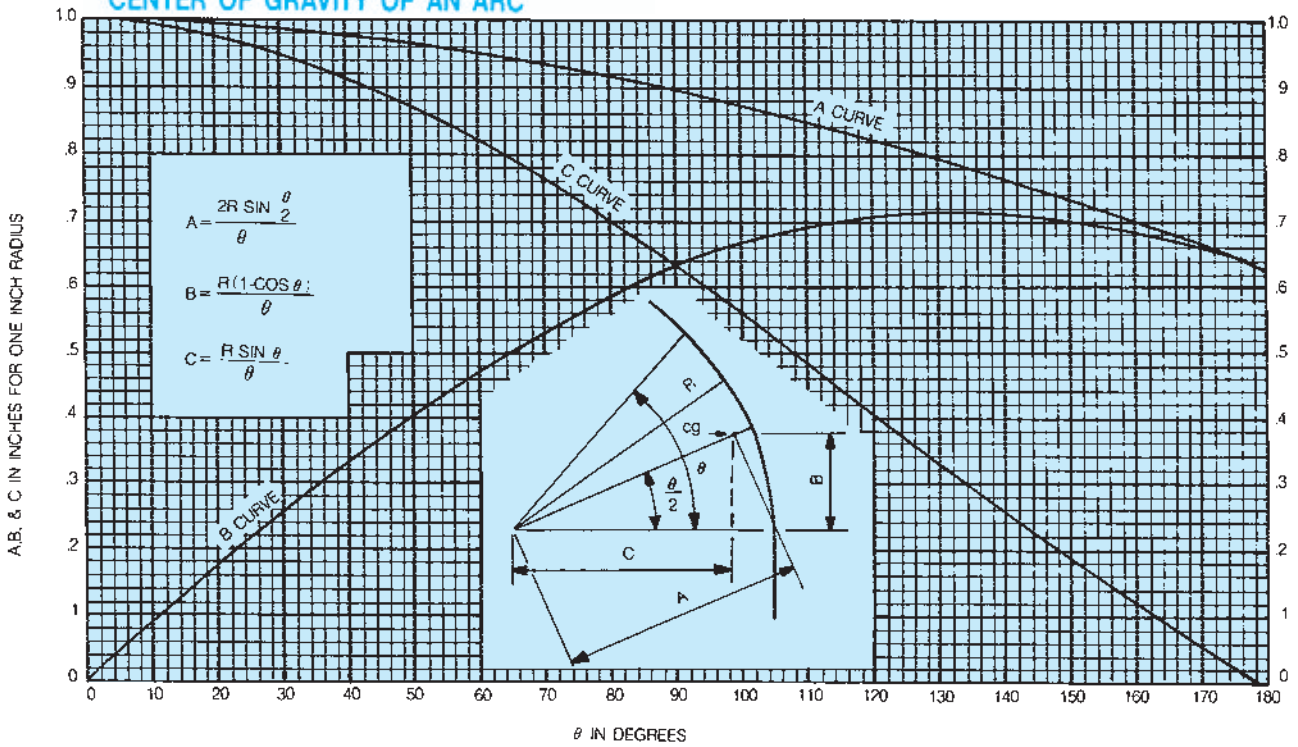
stanchion size moninal pipe size	40A (1½B)	50A (2B)	60A (2½B)	80A (3B)	100A (4B)	125A (5B)	150A (6B)	200A (8B)	250A (10B)	300A (12B)	350A (14B)	400A (16B)	500A (20B)
65A(2½B)	27	20											
80A( 3B)	36	33	32										
100A( 4B)	54	48	44	35									
125A( 5B)	67	63	60	55	41								
150A( 6B)			76	71	62	46							
200A( 8B)				100	92	84	70						
250A( 10B)					124	117	108	82					
300A( 12B)					149	146	138	119	87				
350A( 14B)						163	157	140	113	73			
400A( 16B)						190	184	171	151	122	98		
450A( 18B)							211	200	184	162	143	105	
500A( 20B)								229	214	195	181	152	
550A( 22B)								259	243	227	216	192	116
600A( 24B)								284	273	257	248	227	168
650A( 26B)									300	287	278	260	211
700A( 28B)									329	320	308	292	249
750A( 30B)										344	336	322	281
800A( 32B)										371	365	351	317
850A( 34B)										400	394	381	349
900A( 36B)										427	421	410	381
1050A( 42B)											503	494	470
	"X" dimension(mm)												



CALCULATED ARC DISTANCES FOR BENDS AND WELDING ELBOWS



CENTER OF GRAVITY OF AN ARC



thermal expansion of pipe materials—mm/m

temp. (°C)	carbon Cr-Mo (<3Cr)	Cr(5~9) 5-9cr	austenite stainless steel 18Cr-8Ni	chrome stainless steel 12Cr, 17Cr 27Cr	25Cr-20Ni	monel metal 67Ni-30Cu	monel metal 66Ni-23Cu-Al	Al	cast iron	bronze	brass	70Cu-30Ni	3'/Ni	nickel chrome iron
-190	-1.91	-1.79	-3.10	-1.64	-2.42	-2.13	-2.05	-3.80		-3.20	-3.12	-2.49	-1.79	
-180	-1.83	-1.72	-2.97	-1.57	-2.32	-2.05	-1.98	-3.65		-3.06	-2.97	-2.35	-1.72	
-170	-1.75	-1.64	-2.83	-1.49	-2.21	-1.98	-1.91	-3.49		-2.90	-2.82	-2.24	-1.64	
-160	-1.67	-1.57	-2.70	-1.42	-2.11	-1.91	-1.84	-3.35		-2.76	-2.68	-2.14	-1.57	
-150	-1.60	-1.50	-2.56	-1.36	-2.00	-1.83	-1.76	-3.20		-2.62	-2.54	-2.04	-1.50	
-140	-1.52	-1.43	-2.43	-1.29	-1.90	-1.76	-1.70	-3.04		-2.47	-2.40	-1.94	-1.43	
-130	-1.43	-1.36	-2.29	-1.22	-1.80	-1.69	-1.63	-2.88		-2.33	-2.26	-1.84	-1.36	
-120	-1.36	-1.29	-2.15	-1.16	-1.70	-1.62	-1.56	-2.72		-2.19	-2.13	-1.79	-1.29	
-110	-1.28	-1.21	-2.02	-1.09	-1.60	-1.55	-1.49	-2.55		-2.05	-1.99	-1.72	-1.21	
-100	-1.20	-1.13	-1.88	-1.03	-1.50	-1.48	-1.41	-2.38		-1.91	-1.85	-1.61	-1.14	
-90	-1.11	-1.05	-1.72	-0.95	-1.37	-1.36	-1.30	-2.20		-1.76	-1.71	-1.49	-1.05	
-80	-1.02	-0.96	-1.57	-0.87	-1.25	-1.24	-1.19	-2.02		-1.61	-1.57	-1.36	-0.96	
-70	-0.93	-0.88	-1.41	-0.79	-1.12	-1.11	-1.08	-1.84		-1.46	-1.42	-1.24	-0.87	
-60	-0.84	-0.79	-1.27	-0.72	-1.00	-1.00	-0.97	-1.66		-1.32	-1.28	-1.12	-0.78	
-50	-0.74	-0.70	-1.10	-0.63	-0.87	-0.87	-0.86	-1.47		-1.16	-1.13	-0.99	-0.69	
-40	-0.64	-0.60	-0.94	-0.55	-0.75	-0.74	-0.74	-1.27		-1.08	-0.98	-0.86	-0.59	
-30	-0.54	-0.50	-0.79	-0.46	-0.63	-0.62	-0.62	-1.06		-0.98	-0.82	-0.71	-0.50	
-20	-0.43	-0.40	-0.63	-0.37	-0.50	-0.50	-0.50	-0.85		-0.70	-0.66	-0.58	-0.40	
-10	-0.33	-0.31	-0.48	-0.28	-0.38	-0.38	-0.38	-0.65		-0.51	-0.50	-0.44	-0.31	
0	-0.22	-0.21	-0.32	-0.19	-0.26	-0.27	-0.26	-0.44		-0.34	-0.34	-0.30	-0.21	
10	-0.12	-0.11	-0.18	-0.10	-0.13	-0.17	-0.14	-0.23		-0.18	-0.18	-0.16	-0.12	
20	-0.01	-0.01	-0.02	-0.01	-0.01	-0.02	-0.01	-0.02		-0.02	-0.02	-0.02	-0.01	
30	0.10	0.10	0.15	0.09	0.12	0.12	0.12	0.20	0.09	0.16	0.15	0.14	0.10	0.11
40	0.21	0.20	0.32	0.19	0.26	0.26	0.26	0.43	0.20	0.34	0.33	0.29	0.20	0.24
50	0.33	0.31	0.48	0.28	0.40	0.40	0.39	0.66	0.30	0.51	0.50	0.44	0.31	0.37
60	0.44	0.42	0.65	0.38	0.53	0.54	0.53	0.89	0.40	0.69	0.68	0.59	0.42	0.50
70	0.56	0.53	0.82	0.48	0.68	0.69	0.66	1.13	0.50	0.86	0.86	0.75	0.53	0.64
80	0.68	0.64	1.00	0.58	0.83	0.84	0.80	1.37	0.62	1.07	1.04	0.91	0.64	0.78
90	0.79	0.75	1.17	0.69	0.97	0.98	0.93	1.60	0.72	1.25	1.21	1.06	0.75	0.92
100	0.92	0.87	1.34	0.78	1.11	1.12	1.07	1.84	0.82	1.42	1.40	1.22	0.86	1.05
110	1.04	0.98	1.51	0.89	1.25	1.26	1.21	2.08	0.93	1.61	1.58	1.37	0.98	1.19
120	1.15	1.10	1.68	1.00	1.40	1.41	1.36	2.33	1.05	1.79	1.76	1.53	1.09	1.33
130	1.28	1.21	1.85	1.10	1.54	1.56	1.50	2.58	1.15	1.97	1.95	1.69	1.20	1.47
140	1.40	1.32	2.02	1.20	1.69	1.71	1.64	2.83	1.26	2.16	2.13	1.86	1.30	1.61
150	1.54	1.44	2.19	1.31	1.83	1.86	1.78	3.08	1.38	2.34	2.32	2.02	1.42	1.76
160	1.66	1.55	2.36	1.42	1.98	1.99	1.93	3.33	1.49	2.53	2.51	2.18	1.53	1.89
170	1.79	1.67	2.54	1.53	2.13	2.13	2.09	3.59	1.61	2.72	2.70	2.35	1.65	2.03
180	1.92	1.79	2.72	1.64	2.29	2.27	2.24	3.84	1.73	2.91	2.90	2.52	1.77	2.18
190	2.05	1.90	2.90	1.75	2.43	2.41	2.39	4.10	1.84	3.10	3.09	2.68	1.88	2.33
200	2.19	2.03	3.09	1.87	2.60	2.62	2.54	4.38	1.96	3.30	3.29	2.86	2.01	2.48
210	2.33	2.16	3.27	1.99	2.76	2.80	2.70	4.65	2.09	3.49	3.49	3.09	2.14	2.63
220	2.47	2.29	3.45	2.11	2.91	2.97	2.86	4.91	2.21	3.68	3.69	3.29	2.27	2.77
230	2.61	2.42	3.64	2.22	3.07	3.13	3.01	5.18	2.33	3.87	3.89	3.49	2.40	2.91
240	2.74	2.54	3.82	2.34	3.22	3.29	3.16	5.44	2.45	4.06	4.09	3.68	2.53	3.06
250	2.88	2.67	4.00	2.45	3.38	3.45	3.32	5.71	2.58	4.25	4.30	3.86	2.66	3.20

260	3.02	2.79	4.17	2.57	3.53	3.61	3.47	5.97	2.70	4.44	4.50	2.78	3.35
270	3.16	2.93	4.35	2.69	3.69	3.78	3.64	6.25	2.83	4.63	4.71	2.92	3.50
280	3.31	3.06	4.54	2.81	3.86	3.95	3.81	6.53	2.96	4.83	4.92	3.06	3.65
290	3.45	3.19	4.72	2.93	4.02	4.12	3.97	6.80	3.08	5.02	5.13	3.19	3.80
300	3.60	3.32	4.90	3.05	4.18	4.28	4.14	7.08	3.22	5.22	5.33	3.33	3.94
310	3.74	3.45	5.09	3.18	4.34	4.45	4.30	7.36	3.35	5.42	5.54	3.47	4.09
320	3.90	3.59	5.28	3.30	4.51	4.62	4.47		3.48	5.62	5.76	3.62	4.25
330	4.06	3.74	5.48	3.43	4.68	4.81	4.64		5.63	5.82	5.99	3.77	4.40
340	4.21	3.87	5.67	3.55	4.85	4.99	4.82		3.77	6.02	6.21	3.92	4.56
350	4.37	4.00	5.85	3.68	5.02	5.16	4.99		3.90	6.21	6.42	4.06	4.72
360	4.52	4.14	6.04	3.80	5.18	5.34	5.17		4.04	6.41	6.64	4.20	4.88
370	4.68	4.27	6.23	3.93	5.35	5.52	5.34		4.18	6.60	6.86	4.35	5.02
380	4.84	4.41	6.42	4.05	5.52	5.69	5.52		4.31	6.80	7.09	4.51	5.18
390	4.99	4.55	6.61	4.18	5.69	5.88	5.69		4.45	7.00	7.31	4.66	5.33
400	5.15	4.70	6.81	4.31	5.87	6.06	5.87		4.60	7.20	7.54	4.82	5.49
410	5.31	4.84	7.00	4.44	6.04	6.24	6.05		4.74	7.41	7.77	4.97	5.65
420	5.47	4.98	7.20	4.57	6.21	6.42	6.22		4.88	7.61	7.99	5.12	5.81
430	5.63	5.13	7.39	4.71	6.39	6.60	6.41		5.03	7.81	8.22	5.27	
440	5.79	5.27	7.59	4.84	6.56	6.78	6.59		5.17	8.01	8.45	5.43	
450	5.97	5.43	7.80	4.98	6.75	6.98	6.78		5.33	8.24	8.71	5.61	
460	6.14	5.58	8.00	5.12	6.93	7.18	6.97		5.48	8.45	8.95	5.77	
470	6.31	5.72	8.20	5.25	7.10	7.37	7.16		5.63	8.65	9.18	5.93	
480	6.48	5.86	8.39	5.38	7.28	7.56	7.34		5.78	8.86	9.41	6.09	
490	6.64	6.01	8.59	5.51	7.45	7.75	7.54		5.93	9.06	9.65	6.30	
500	6.80	6.15	8.80	5.65	7.63	7.95	7.73		6.09	9.27	9.89	6.52	
510	6.96	6.30	9.00	5.78	7.81	8.14	7.92		6.25	9.48	10.13	6.74	
520	7.12	6.45	9.20	5.92	7.98	8.33	8.12		6.40	9.68	10.38	6.96	
530	7.29	6.60	9.40	6.06	8.15	8.53	8.31		6.56	9.88	10.62	7.18	
540	7.44	6.75	9.61	6.19	8.33	8.72	8.51			10.08	10.87	7.38	
550	7.61	6.89	9.81	6.32	8.50	8.92	8.71			10.29	11.11	7.47	
560	7.78	7.04	10.01	6.51	8.68	9.12	8.91			10.50	11.36	7.56	
570	7.96	7.19	10.22	6.68	8.86	9.33	9.11			10.72	11.62	7.66	
580	8.14	7.35	10.44	6.82	9.04	9.55	9.32			10.95	11.88	7.75	
590	8.31	7.50	10.64	6.90	9.21	9.75	9.52			11.16	12.13	7.85	
600	8.48	7.64	10.84	7.02	9.39	9.95	9.74			11.38	12.39	8.01	
610	8.64	7.78	11.04	7.15	9.56	10.16	9.96			11.59	12.65	8.21	
620	8.79	7.92	11.25	7.29	9.74	10.37	10.18			11.81	12.91	8.40	
630	8.95	8.06	11.45	7.42	9.92	10.57	10.41			12.02	13.16	8.60	
640	9.11	8.20	11.65	7.55	10.10	10.78	10.63			12.24	13.42	8.80	
650	9.27	8.35	11.85	7.68	10.28	10.98	10.85						
660	9.43	8.50	12.06	7.81	10.44	11.19	11.05						
670	9.60	8.66	12.26	7.95	10.61	11.40	11.25						
680	9.77	8.83	12.47	8.09	10.79	11.62	11.45						
690	9.95	8.99	12.68	8.23	10.97	11.85	11.65						
700	10.12	9.15	12.89	8.37	11.15	12.06	11.85						
710	10.28	9.30	13.09	8.50	11.32	12.29	12.06						
720	10.45	9.45	13.29	8.64	11.49	12.49	12.28						
730	10.62	9.59	13.49	8.77	11.67	12.71	12.50						
740	10.78	9.74	13.69	8.90	11.85	12.92	12.71						
750	10.95	9.89	13.90	9.04	12.03	13.14	12.93						
760	11.12	10.04	14.10	9.17	12.21	13.35	13.15						
770			14.33										
780			14.56										
790			14.79										
800			15.02										
810			15.25										

## pipe weight as per schedule

(based on ANSI pipe)

a: ANSI B36. 10 steel pipe schedule numbers  
 b: ANSI B36. 10 steel pipe nominal wall thickness designation  
 c: ANSI B36. 19 stainless steel pipe schedule numbers.

pipe size O.D.	schedule			wall thick. (mm)	weight (kg/m)	weight of water (kg/m)
	a	b	c			
6A ( $\frac{1}{8}$ "B) 10.29	-	-	10S	1.25	0.277	0.048
	40	Std	40S	1.73	0.365	0.037
	80	XS	80S	2.41	0.469	0.023
8A ( $\frac{1}{4}$ "B) 13.72	-	-	10S	1.65	0.491	0.085
	40	Std	40S	2.24	0.632	0.067
	80	XS	80S	3.02	0.796	0.046
10A ( $\frac{3}{8}$ "B) 17.15	-	-	8S	1.65	0.801	0.255
	-	-	10S	1.65	0.630	0.151
	40	Std	40S	2.31	0.845	0.123
	80	XS	80S	3.20	1.100	0.091
15A ( $\frac{1}{2}$ "B) 21.34	-	-	5S	1.65	0.801	0.254
	-	-	10S	2.11	1.000	0.230
	40	Std	40S	2.77	1.266	0.196
	80	XS	80S	3.73	1.619	0.151
	160	-	-	4.75	1.941	0.110
-	XXS	-	7.47	2.551	0.032	
20A ( $\frac{5}{8}$ "B) 26.67	-	-	5S	1.65	1.018	0.429
	-	-	10S	2.11	1.275	0.396
	40	Std	40S	2.87	1.683	0.342
	80	XS	80S	3.91	2.194	0.279
	160	-	-	5.54	2.883	0.191
-	XXS	-	7.82	3.633	0.095	
25A (1"B) 33.35	-	-	5S	1.65	1.292	0.711
	-	-	10S	2.77	2.089	0.609
	40	Std	40S	3.38	2.499	0.557
	80	XS	80S	4.55	3.232	0.463
	160	-	-	6.35	4.232	0.336
-	XXS	-	9.09	5.445	0.182	
32A ( $\frac{1\ 1}{8}$ "B) 42.16	-	-	5S	1.65	1.647	1.186
	-	-	10S	2.77	2.686	1.052
	40	Std	40S	3.56	3.383	0.954
	80	XS	80S	4.85	4.460	0.826
	160	-	-	6.35	5.603	0.682
-	XXS	-	9.70	7.759	0.407	
40A ( $\frac{1\ 1}{2}$ "B) 48.26	-	-	5S	1.65	0.740	0.689
	-	-	10S	2.77	0.740	0.655
	40	Std	40S	3.68	4.045	1.313
	80	XS	80S	5.08	5.404	1.139
	160	-	-	7.14	7.231	0.905
	-	XXS	-	10.16	9.536	0.613
	-	-	-	13.34	11.474	0.366
-	-	-	16.51	12.915	0.183	
50A (2"B) 60.33	-	-	5S	1.65	2.387	2.554
	-	-	10S	2.77	3.926	2.354
	40	Std	40S	3.91	5.436	2.165
	80	XS	80S	5.54	7.474	1.905
160	-	-	8.71	11.078	1.445	

pipe size O.D.	schedule			wall thick. (mm)	weight (kg/m)	weight of water (kg/m)
	a	b	c			
50A (2B) 60.33	-	XXS	-	11.07	13.437	1.144
	-	-	-	14.27	16.194	0.793
	-	-	-	17.45	18.431	0.507
65A ( $2\ \frac{1}{2}$ "B) 73.03	-	-	5S	2.11	3.683	3.719
	-	-	10S	3.05	5.255	3.514
	40	Std	40S	5.16	8.621	3.089
	80	XS	80S	7.01	11.401	2.734
	160	-	-	9.53	14.897	2.284
	-	XXS	-	14.02	20.388	1.588
	-	-	-	17.15	23.607	1.179
-	-	-	20.32	26.384	0.825	
80A (3B) 88.90	-	-	5S	2.11	4.509	5.625
	-	-	10S	3.05	6.444	5.372
	40	std	40S	5.49	11.280	4.762
	80	XS	80S	7.62	15.254	4.262
	160	-	-	11.10	21.311	3.494
	-	XXS	-	15.24	27.651	2.680
-	-	-	18.42	31.977	2.130	
-	-	-	21.59	35.801	1.641	
90A ( $3\ \frac{1}{2}$ "B) 101.60	-	-	5S	2.11	5.164	7.456
	-	-	10S	3.05	7.396	7.158
	40	Std	40S	5.74	13.557	6.369
	80	XS	80S	8.08	18.617	5.730
-	XXS	-	16.15	34.005	3.765	
100A (4B) 114.30	-	-	5S	2.11	5.834	9.524
	-	-	10S	3.05	8.349	9.182
	-	-	-	4.78	12.739	8.631
	40	Std	40S	6.02	16.058	8.200
	80	XS	80S	8.56	22.293	7.411
	120	-	-	11.10	28.216	6.667
	-	-	-	12.70	31.788	6.191
	160	-	-	13.49	33.499	5.983
	-	XXS	-	17.12	40.985	5.030
	-	-	-	20.32	47.046	4.262
-	-	-	23.50	52.560	3.558	
125A (5B) 141.30	-	-	5S	2.77	9.450	14.480
	-	-	10S	3.40	11.563	14.182
	40	Std	40S	6.55	21.757	12.888
	80	XS	80S	9.53	30.925	11.742
	120	-	-	12.70	40.241	10.551
	160	-	-	15.88	49.051	9.420
	-	XXS	-	19.05	57.370	8.364
-	-	-	22.23	65.198	7.368	
-	-	-	25.40	71.037	6.298	
150A (6B) 168.28	-	-	5S	2.77	7.992	20.805
	-	-	10S	3.40	13.825	20.448
	-	-	-	5.56	22.353	19.495
	40	Std	40S	7.11	28.231	18.617
80	XS	80S	10.97	42.518	16.802	

pipe size O.D.	schedule			wall thick. (mm)	weight (kg/m)	weight of water (kg/m)
	a	b	c			
150A (6B) 168.28	120	-	-	14.27	54.155	15.328
	160	-	-	18.24	67.415	13.632
	-	XXS	-	21.95	79.112	12.159
	-	-	-	25.40	89.404	10.840
	-	-	-	28.58	98.345	9.699
200A (8B) 219.08	-	-	5S	2.77	14.748	35.821
	-	-	10S	3.76	19.942	35.106
	-	-	-	5.56	29.228	34.080
	20	-	-	6.35	33.276	33.454
	30	-	-	7.04	36.758	33.008
	40	Std	40S	8.18	42.488	32.279
	60	-	-	10.31	53.039	30.939
	80	XS	80S	12.70	64.573	29.466
	100	-	-	15.06	75.704	28.037
	120	-	-	18.24	90.229	26.192
	140	-	-	20.62	100.840	24.838
	160	-	-	23.01	111.153	23.513
	-	-	-	25.40	121.194	22.241
	-	-	-	28.58	134.107	20.594
	250A (10B) 273.05	-	-	5S	3.40	22.546
-		-	10S	4.19	27.829	54.914
-		-	-	5.56	36.654	53.872
20		-	-	6.35	41.729	53.277
30		-	-	7.80	50.956	52.087
40		Std	40S	9.27	60.242	50.747
60		XS	80S	12.70	81.463	48.069
80		-	-	15.06	95.735	46.283
100		-	-	18.24	114.486	43.902
120		-	-	21.41	132.746	41.669
-		-	-	22.23	137.330	41.074
140		-	-	25.40	154.965	38.842
160		-	-	28.58	172.109	36.609
-		-	-	31.75	188.732	34.526
-		-	-	38.10	220.535	30.508
300A (12B) 323.85	-	-	5S	3.96	31.237	78.428
	-	-	10S	4.57	36.014	77.683
	20	-	-	6.35	49.676	76.046
	30	-	-	8.38	65.138	73.963
	-	Std	40S	9.53	73.755	72.921
	40	-	-	10.31	79.663	72.177
	-	XS	80S	12.70	97.357	69.945
	60	-	-	14.27	108.876	68.457
	80	-	-	17.45	131.720	65.480
	-	-	-	19.05	143.164	64.141
	100	-	-	21.41	159.534	61.909
	-	-	-	22.23	165.040	61.165
	120	-	-	25.40	186.753	58.486
	140	-	-	28.58	207.870	55.807
	-	-	-	31.75	228.586	53.277

pipe size O.D.	schedule			wall thick. (mm)	weight (kg/m)	weight of water (kg/m)
	a	b	c			
300A (12B) 323.85	160	-	-	33.32	238.512	51.938
	-	-	-	-	-	-
350A (14B) 355.60	-	-	5S	3.96	34.228	94.798
	-	-	10S	4.78	41.223	93.905
	-	-	-	5.33	45.985	93.458
	-	-	-	5.56	47.920	93.161
	10	-	-	6.35	54.631	92.417
	-	-	-	7.14	61.313	91.524
	20	-	-	7.92	67.980	90.631
	-	-	-	8.74	74.707	89.738
	30	Std	-	9.53	81.210	88.845
	40	-	-	11.10	94.307	87.357
	-	-	-	11.91	100.899	86.315
	-	XS	-	12.70	107.284	85.571
	60	-	-	15.06	126.362	83.190
	-	-	-	15.88	132.866	82.297
	80	-	-	19.05	157.941	79.172
100	-	-	23.80	194.551	74.409	
120	-	-	27.76	224.225	70.689	
140	-	-	31.75	253.320	66.969	
160	-	-	35.71	281.446	63.397	
400A (16B) 406.40	-	-	5S	4.19	41.669	124.264
	-	-	10S	4.78	47.622	123.520
	10	-	-	6.35	62.578	121.734
	20	-	-	7.92	77.922	119.799
	30	Std	-	9.53	93.131	117.716
	40	XS	-	12.70	123.177	113.846
	60	-	-	16.66	159.980	109.233
	80	-	-	21.41	203.078	103.727
	100	-	-	26.19	245.298	98.369
	120	-	-	30.94	286.164	93.161
450A (18B) 457.20	140	-	-	36.50	332.819	87.208
	160	-	-	40.46	364.770	83.190
	-	-	-	-	-	-
	-	-	5S	4.19	46.134	158.046
	-	-	10S	4.78	53.575	157.302
	10	-	-	6.35	70.525	155.218
	20	-	-	7.92	87.848	152.986
	-	Std	-	9.53	105.051	150.605
	30	-	-	11.10	122.121	148.670
	-	XS	-	12.70	139.071	146.438
500A (20B) 508.0	40	-	-	14.27	155.888	144.354
	60	-	-	19.05	205.623	137.955
	80	-	-	23.80	254.108	131.705
	100	-	-	29.36	309.484	124.561
	120	-	-	34.93	363.326	117.865
	140	-	-	39.67	408.106	112.060
	160	-	-	45.24	459.121	105.661
	-	-	-	-	-	-
	-	-	5S	4.78	59.528	194.953
	-	-	10S	5.54	68.457	193.762
10	-	-	6.35	78.472	192.720	
20	Std	-	9.53	116.972	187.512	



pipe size O.D.	schedule			wall thick. (mm)	weight (kg/m)	weight of water (kg/m)
	a	b	c			
500A (20B) 508.0	30	XS	-	12.70	154.965	182.750
	40	-	-	15.06	182.913	179.178
	60	-	-	20.62	247.635	171.142
	-	-	-	22.23	265.984	168.761
	80	-	-	26.19	310.838	162.808
	100	-	-	32.54	381.125	153.879
	120	-	-	38.10	441.055	146.289
	140	-	-	44.45	507.621	137.806
160	-	-	49.99	564.039	130.812	
550A (22B) 558.80	-	-	5S	4.78	65.480	236.771
	-	-	10S	5.54	75.898	235.431
	10	-	-	6.35	86.315	234.241
	20	Std	-	9.53	129.472	228.735
	30	XS	-	12.70	171.142	223.526
	-	-	-	15.88	212.811	218.169
	-	-	-	19.05	252.992	212.960
	60	-	-	22.23	293.173	207.751
	80	-	-	28.58	373.535	197.631
	100	-	-	34.93	450.921	187.809
	120	-	-	41.28	526.819	177.987
	140	-	-	47.63	599.740	168.612
160	-	-	53.98	671.173	159.534	
600A (24B) 609.60	10	-	-	6.35	94.366	279.780
	20	Std	-	9.53	140.812	273.529
	-	XS	-	12.70	186.753	268.023
	30	-	-	14.27	209.537	265.046
	-	-	-	15.88	232.202	262.219
	40	-	-	17.45	254.733	259.391
	-	-	-	19.05	277.160	256.564
	-	-	5S	5.54	81.850	281.119
	-	-	-	22.23	321.449	250.909
	60	-	-	24.59	354.353	246.742
	80	-	-	30.94	441.040	235.580
	100	-	-	38.89	546.761	222.187
	120	-	-	46.02	639.013	210.430
	140	-	-	52.37	718.990	200.161
	160	-	-	59.51	806.509	189.000
	-	-	-	6.35	99.709	329.485
	10	-	-	7.92	127.984	326.211
	-	Std	-	9.53	153.283	323.086
	20	XS	-	12.70	202.394	316.687
	-	-	-	15.88	251.504	310.436
-	-	-	19.05	300.614	304.186	
-	-	-	22.23	349.724	297.935	
-	-	-	25.40	397.346	291.834	
-	-	-	28.58	444.969	285.881	
700A (28B) 711.20	-	-	-	6.35	110.126	382.911
	10	-	-	7.92	136.913	379.488
	-	Std	-	9.53	165.189	375.917
	20	XS	-	12.70	218.764	369.071
	30	-	-	15.88	272.339	362.225

pipe size O.D.	schedule			wall thick. (mm)	weight (kg/m)	weight of water (kg/m)
	a	b	c			
700A (28B) 711.20	-	-	-	19.05	324.425	355.528
	-	-	-	22.23	376.512	348.831
	-	-	-	25.40	428.598	342.283
	-	-	-	28.58	480.685	335.735
750A (30B) 762.00	-	-	5S	6.35	117.567	440.950
	10	-	10S	7.92	147.331	437.081
	-	Std	-	9.53	177.094	433.361
	20	XS	-	12.70	235.134	425.920
	30	-	-	15.88	291.685	418.628
	40	-	-	19.05	348.236	411.633
	-	-	-	22.23	404.787	404.490
	-	-	-	25.40	461.339	397.346
-	-	-	28.58	516.402	390.203	
800A (32B) 812.80	-	-	-	6.35	126.496	502.710
	10	-	-	7.92	157.748	498.841
	-	Std	-	9.53	189.000	494.823
	20	XS	-	12.70	250.016	486.935
	30	-	-	15.88	311.031	479.048
	40	-	-	17.48	342.283	474.732
	-	-	-	19.05	372.047	471.309
	-	-	-	22.23	433.063	463.720
	-	-	-	25.40	492.591	455.981
	-	-	-	28.58	552.118	448.391
850A (34B) 863.60	-	-	-	6.35	133.937	568.488
	10	-	-	7.92	166.677	564.470
	-	Std	-	9.53	200.906	559.857
	20	XS	-	12.70	266.386	551.820
	30	-	-	15.88	331.866	543.189
	40	-	-	17.48	364.606	538.873
	-	-	-	19.05	395.858	535.004
	-	-	-	22.23	461.339	526.968
	-	-	-	25.40	525.331	518.783
	-	-	-	28.58	587.835	510.746
900A (36B) 914.40	-	-	-	6.35	142.866	638.582
	10	-	-	7.92	177.094	634.117
	-	Std	-	9.53	212.811	629.653
	20	XS	-	12.70	282.756	620.724
	30	-	-	15.88	351.213	611.794
	40	-	-	19.05	419.669	603.163
	-	-	-	22.23	488.126	594.383
	-	-	-	25.40	556.583	585.751
-	-	-	28.58	623.551	577.269	
1050A (42B) 1066.80	-	-	-	6.35	166.677	872.674
	-	Std	-	9.53	248.528	862.108
	20	XS	-	12.70	330.378	851.691
	30	-	-	15.88	410.740	841.422
	40	-	-	19.05	491.102	831.005
	-	-	-	25.40	651.827	810.765
-	-	-	31.75	809.575	790.526	
-	-	-	38.10	965.835	770.733	





# Pipe Hangers & Supports



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