

Description

Design Principle

The variable spring unit as manufactured by QPS is designed to support pipework which is subject to vertical movements due to temperature changes or subsidence. It is recommended that a variable spring support be used only when the load variation is less than 25% as calculated between the pre-set (cold) load and the operating (hot) load. The spring units should only be used where the pipework is subject to minor vertical displacements up to approximately 75mm.

Where the vertical movements are greater than 75mm and the load variation exceed 25%, then consideration should be given to using a QPS constant support unit; practical and technical advice is always available from QPS to assist with choosing the correct type of support.

Construction

All our variable spring units are substantially constructed with a wide range of top fixing arrangements available for attachment to supporting steelwork. All materials have been selected to provide a high safety factor, and the helical coil is housed in a casing which prevents the ingress of construction debris, thus reducing the danger of damage or restriction to the function of the unit. All variable units are principally manufactured from carbon steel as standard, but stainless steel units are available for extreme corrosive conditions. Stainless steel scale plates are fitted to each unit and include operating (Red) and pre-set (Blue) load button indicators.

Model Range

The variable support units are available in eight top suspension type arrangements, and one floor mounted pedestal type unit.

Four model ranges are available; these are QV1, QV2, QV3, and QV4, and respectively have a working range of 35mm, 70mm, 140mm and 210mm.

The variable units range in size from 0 to 22, with a maximum load of 24,000kg; all units incorporate a low maintenance design and are supplied with two pre-set travel blocks as standard.

In addition to our standard variable spring supports, we manufacture a range of small compact spring supports for travels up to 150mm and loads up to 270.N (27Kg). See page 76 for details and selection table.

Specials

Our standard range of variable supports will cater for most design conditions, but we can provide special units for higher operating loads than shown in our standard selection table; please contact our technical department for advice.

Pre-setting

The variable spring units are supplied to site in the pre-set load condition by the use of two locking stops, each located either side of the spring casing. These locking stops should only be removed once the complete spring assembly has been attached between the pipework and the supporting steelwork.

Hydrostatic Test Loads

Every variable spring unit is capable of withstanding a hydrostatic test load of up to two times the maximum load shown in the selection table for a particular size.

Surface Protection

Standard finish for spring supports is hot dip galvanised. Multi-coat protective finishes are available if required to suit client specifications.

Description

Ordering

The following information is required when ordering a variable spring unit

- Support / tag number
- Variable type (e.g. Fig QV1)
- Size (0-22)
- Mounting type (e.g. A, B, C, etc.)
- Operating load (Kg or kN)
- Pre-set load (QPS can calculate this if required)
- Hydrostatic test load (if known)
- Vertical movement (mm)
- Direction of movement (up / down)
- Quantity required
- Surface finish specification (standard is hot dip galvanised)
- If hydrostatic test stops are required
- Distance between rod centres and total operating load (for model 'G' only)

Selection Procedure

How to select the appropriate Variable Spring Unit

Initial Information required:

- Operating load at support point
- Load calculated when pipe is in the operating (hot) position including pipe weight, insulation, contents, and ancillary equipment
- Pipe movement (mm)
- Direction of movement (up / down)

Method of Selection

Once the above information has been defined, select the actual spring type attachment that will suit the complete assembly (e.g. Type A, B, C, etc.).

Pre-set Load

The pre-set (cold) load is calculated by adding (up movement) or subtracting (down movement) the resultant figure of 'spring rate' x 'movement' to the operating (hot) load.

Pre-set load for movement up = operating load + (movement x spring rate)

Pre-set load for movement down = operating load – (movement x spring rate)

Example

QV1 size 8

Supported load = 366 kg

Movement up 3mm x spring rate 5.4kg/mm = 16.2 kg

Pre-set load = 366 kg + 16.2kg = 382.2 kg

Selection Procedure

1. Select the operating load in the variable spring selection table
2. Check that the movement can be accommodated within the recommended working range of the spring unit selected
3. If the movement can be accommodated, then check the model type required by using 25% as the maximum load change variability figure (pre-set to operating)

Example where first selection is CORRECT

- Operating load 366kg
- Movement 3mm
- Direction of movement: up

From the selection table it can be seen that model QV1 size 8 will theoretically accommodate the operating load and movement.

Check variability:

$$\frac{\text{Movement x Spring Rate}}{\text{Operating Load}} \times 100 = \text{Variability}$$

From the selection table, model QV1 size 8 has been selected (spring rate = 5.4)

$$\frac{3 \times 5.4}{366} \times 100 = 4.42\%$$

4.42 % (this is acceptable) pre-set load will be 366 kg + (3 x 5.4) = 382.2 kg

Selection Procedure

Example where first selection is INCORRECT

- Operating load 366kg
- Movement 50mm
- Direction of movement: up

From the selection table it can be seen that model QV1 size 8 will theoretically accommodate the operating load and movement.

Check variability for QV1 (spring rate 5.4kg / mm)

$$\frac{\text{Movement} \times \text{Spring Rate}}{\text{Operating Load}} \times 100 = \text{Variability}$$

$$\frac{50 \times 5.4}{366} \times 100 = 73\% \text{ (This is not acceptable)}$$

Check variability for QV2 (spring rate 2.7kg / mm)

$$\frac{50 \times 2.7}{366} \times 100 = 36.8\% \text{ (This is also not acceptable)}$$

Check variability for QV3 (spring rate 1.4kg / mm)

$$\frac{50 \times 1.4}{366} \times 100 = 19.12\% \text{ (This is acceptable)}$$

Acceptable spring unit will be QV3 size 8. Preset load will be $366 + (50 \times 1.4) = 436 \text{ kg}$

NOTE: The pre-set load above is within the 'over travel', which is acceptable in this case. Spring units should not be selected when the operating load lies within the over travel. All variable units have been designed to perform within the working range.

To Calculate Rod Take Out:

- Locate the minimum rod take out in the table for model size and type selected, this is the dimension in the "minimum load position".
- Then determine on working range scale where the preset load is positioned or add to dimension shown in tables, using the above as an example.

QV3 say type A, size 8 look up table	=	463mm
Preset load at 431 read on scale	=	141mm
Rod take out	=	604mm

To Calculate Loaded Length of Model F:

- Look up maximum loaded length in table for model, size and type selected.
- Then determine on working range scale where preset load is positioned and subtract from dimension shown.

Example QV2 size 16 Pre-set load	=	3506.5 Kg
Maximum dimension from table	=	543mm
Pre-set load read on scale at	=	42
Loaded length	=	501mm

Installation Instructions

Variable spring units are pre-set to a specific load in our works that takes into account the operating load and movement at each specific support point.

In the event that the pipework system is subject to hydraulic testing prior to normal service, then the spring units should be ordered with down travel hydrostatic test stops. These should remain in position until after the hydraulic test has been carried out.

In the event that the pipework service is not subject to hydrostatic testing then the standard pre-set stops supplied with the variable units will be sufficient.

Once removed, the pre-set stops on all units should be retained in case of a requirement for future use. If it becomes obvious that an incorrect load is being applied to any supports in the system, it is advisable to contact our technical support team who would be pleased to give you advice.

Adjustment

Once installed the variable spring units should be adjusted until the load indicators point to the installed load position. The units should be checked following a reasonable period of operation. The load indicator should be indicating the operating load. If minor differences are apparent then the units should be adjusted to the correct operating position. No further adjustments should be necessary.

If major differences are noted then either consult the designer or QPS for further advice, prior to making any adjustments.

Range of site adjustment:

Hanging type's $\pm 75\text{mm}$

Base mounted type's $\pm 25\text{mm}$

Installation of Spring Units Type A, B & C

The spring unit is fitted between the pipe/duct/bracket to be supported and the steelwork above the unit. The hanger rod coming up from the pipe/duct/bracket is connected with a turnbuckle which is fitted to all three types of spring units.

Rotation of the turnbuckle transfers the operating load of the pipe to the spring unit, thus allowing withdrawal of the pre-set stops. No further adjustment should be required unless it becomes obvious that incorrect loads are being applied to adjacent supports in the system.

Installation of Spring Units Type D & E

Both of these units are mounted on top of the steelwork.

Installation of Spring Units Type D

The hanger rod passes through the unit and is secured to the spring unit at the top of the load tube by two nuts. The hanger rod should be of adequate length and threaded sufficiently to take into account any deviation in the pipe or duct elevation since these units are not supplied with a turnbuckle. Adjustment of the two nuts transfers the load to the spring unit, thus allowing withdrawal of the pre-set stops.

Installation of Spring Units Type E

The hanger rod passes through the unit and is secured by two nuts which prevent it passing through the spring pressure plate. Adjustment in length is provided by a turnbuckle at a convenient situation in the hanger assembly. Rotation of the turnbuckle transfers the load to the spring unit allowing withdrawal of the pre-set stops.

Installation Instructions

Installation of Spring Units Type F, H & K

These units are base mounted and should be aligned directly below the point of support. The height of the load flange is adjusted to contact the lower surface of the support point by rotation of the adjustment nut on the load column. Further rotation of this nut will transfer the load onto the spring unit and the pre-set stops can then be withdrawn.

Installation of Spring Units Type G

These units are fitted with turnbuckles so that hanger rods which have been previously connected to the steelwork above can be inserted into them. The rotation of the turnbuckle transfers the load to the spring unit. When the load is correctly supported the pre-set stops can be withdrawn.

Inspection During Operation

Following commissioning, the variable support should be examined to ensure the correct movement has been achieved in the operating (hot) position. If the internal load plate is shown to be against the stop at either end of the scale, an investigation should be made at once.

Subsequently the spring support should be examined at regular intervals to ensure that no change has occurred either in application or condition. The frequency of examination intervals will depend on the environmental and operating conditions and will range from annual examinations for land based, dry atmospheres, to monthly examinations for hostile offshore conditions with the possibility of salt corrosion.

Maintenance

If an excessive build-up of foreign matter or corrosion is observed it is important that the spring support is cleaned either by hand or with a pressure washer to ensure uninhibited operation.







Variable Spring Supports

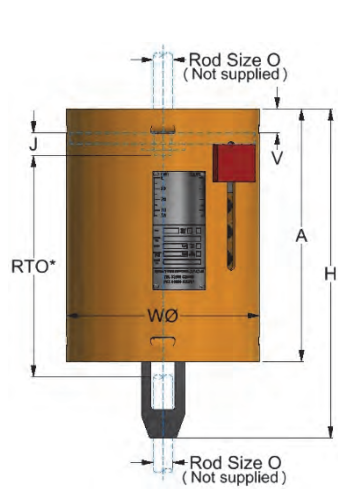
Variable Spring Supports – Selection Table in kg. Travel in mm

	QV4	QV3	QV2	QV1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22																								
					Spring Rate - Kg per Millimetre																																														
Over Travel	30	20	10	5	20	29	38	49	66	88	118	158	211	282	366	479	634	845	1127	1521	2113	2818	3752	4983	6625	8806	11744	0.53	0.75	0.96	1.25	1.6	2.2	3	4	5.4	7.1	9.2	12.1	16	21.4	28.6	38.6	53.6	71.4	95	126.4	168	223.2	297.6	
					20.5	30.5	39	51	68	91	121	162	216	289	376	491	650	867	1155	1560	2167	2889	3847	5109	6793	9029	12042	0.26	0.37	0.48	0.62	0.8	1.1	1.5	2	2.7	3.6	4.6	6	8	10.7	14.3	19.3	26.8	35.7	47.5	63.2	84	111.6	148.8	
					21	31	40	52	70	93	124	166	222	296	385	503	666	888	1184	1599	2221	2960	3942	5236	6961	9252	12340	0.13	0.18	0.24	0.31	0.4	0.5	0.7	1	1.3	1.8	2.3	3	4	5.3	7.1	9.6	13.4	17.8	23.7	31.6	42	55.8	74.4	
					21.5	32	41	53	71	95	127	170	227	303	394	515	682	909	1213	1637	2274	3032	4037	5362	7129	9475	12637	0.09	0.12	0.16	0.21	0.27	0.37	0.5	0.67	0.9	1.2	1.53	2	2.67	3.57	4.77	6.43	8.93	11.9	15.83	21.07	28	37.2	49.6	
Minimum Working Load	0	0	0	0	22	32.5	42	54	73	97	130	174	232	310	403	528	698	931	1241	1676	2328	3103	4132	5489	7297	9699	12935	Figure QV1	0.53	0.75	0.96	1.25	1.6	2.2	3	4	5.4	7.1	9.2	12.1	16	21.4	28.6	38.6	53.6	71.4	95	126.4	168	223.2	297.6
					22.5	33.5	43	56	75	100	133	178	238	317	413	540	714	952	1270	1714	2381	3175	4227	5615	7465	9922	13233	Figure QV2	0.26	0.37	0.48	0.62	0.8	1.1	1.5	2	2.7	3.6	4.6	6	8	10.7	14.3	19.3	26.8	35.7	47.5	63.2	84	111.6	148.8
					23	34.5	44	57	76	102	136	182	243	324	422	552	730	974	1298	1753	2435	3246	4322	5742	7633	10146	13531	Figure QV3	0.13	0.18	0.24	0.31	0.4	0.5	0.7	1	1.3	1.8	2.3	3	4	5.3	7.1	9.6	13.4	17.8	23.7	31.6	42	55.8	74.4
					23.5	35	45	58	78	104	139	186	248	332	431	564	746	995	1327	1791	2488	3318	4417	5868	7801	10368	13828	Figure QV4	0.09	0.12	0.16	0.21	0.27	0.37	0.5	0.67	0.9	1.2	1.53	2	2.67	3.57	4.77	6.43	8.93	11.9	15.83	21.07	28	37.2	49.6
Recommended Working Range of Spring	30	20	10	5	24	36	46	59	80	107	142	190	254	339	441	576	762	1017	1355	1830	2542	3389	4512	5995	7968	10592	14126	Figure QV1	0.53	0.75	0.96	1.25	1.6	2.2	3	4	5.4	7.1	9.2	12.1	16	21.4	28.6	38.6	53.6	71.4	95	126.4	168	223.2	297.6
					24.5	36.5	47	61	81	109	145	194	259	346	450	588	779	1038	1384	1869	2596	3461	4607	6121	8136	10815	14424	Figure QV2	0.26	0.37	0.48	0.62	0.8	1.1	1.5	2	2.7	3.6	4.6	6	8	10.7	14.3	19.3	26.8	35.7	47.5	63.2	84	111.6	148.8
					25	37.5	48	62	83	111	148	198	265	353	459	600	795	1059	1413	1907	2649	3532	4702	6247	8304	11038	14721	Figure QV3	0.13	0.18	0.24	0.31	0.4	0.5	0.7	1	1.3	1.8	2.3	3	4	5.3	7.1	9.6	13.4	17.8	23.7	31.6	42	55.8	74.4
					25.5	38	49	63	85	113	151	202	270	360	468	613	811	1081	1441	1946	2703	3603	4797	6374	8472	11261	15019	Figure QV4	0.09	0.12	0.16	0.21	0.27	0.37	0.5	0.67	0.9	1.2	1.53	2	2.67	3.57	4.77	6.43	8.93	11.9	15.83	21.07	28	37.2	49.6
Maximum Working Load	60	40	20	10	26	39	50	64	87	116	154	206	275	367	478	625	827	1102	1470	1984	2756	3675	4892	6500	8640	11485	15317	Figure QV1	0.53	0.75	0.96	1.25	1.6	2.2	3	4	5.4	7.1	9.2	12.1	16	21.4	28.6	38.6	53.6	71.4	95	126.4	168	223.2	297.6
					27	39.5	50.5	66	88	118	157	210	281	374	487	637	843	1124	1498	2023	2810	3746	4987	6627	8808	11708	15614	Figure QV2	0.26	0.37	0.48	0.62	0.8	1.1	1.5	2	2.7	3.6	4.6	6	8	10.7	14.3	19.3	26.8	35.7	47.5	63.2	84	111.6	148.8
					27.5	40.5	51.5	67	90	120	160	214	286	382	496	649	859	1145	1527	2061	2863	3818	5082	6753	8976	11931	15912	Figure QV3	0.13	0.18	0.24	0.31	0.4	0.5	0.7	1	1.3	1.8	2.3	3	4	5.3	7.1	9.6	13.4	17.8	23.7	31.6	42	55.8	74.4
					28	41	52.5	68	92	122	163	218	291	389	506	661	875	1167	1556	2100	2917	3889	5177	6880	9144	12154	16210	Figure QV4	0.09	0.12	0.16	0.21	0.27	0.37	0.5	0.67	0.9	1.2	1.53	2	2.67	3.57	4.77	6.43	8.93	11.9	15.83	21.07	28	37.2	49.6
Over Travel	30	20	10	5	28.5	42	53.5	69	93	125	166	222	297	396	515	673	891	1188	1584	2139	2971	3961	5272	7006	9311	12378	16508	Figure QV1	0.53	0.75	0.96	1.25	1.6	2.2	3	4	5.4	7.1	9.2	12.1	16	21.4	28.6	38.6	53.6	71.4	95	126.4	168	223.2	297.6
					29	42.5	54.5	71	95	127	169	226	302	403	524	685	907	1209	1613	2177	3024	4032	5367	7133	9479	12601	16805	Figure QV2	0.26	0.37	0.48	0.62	0.8	1.1	1.5	2	2.7	3.6	4.6	6	8	10.7	14.3	19.3	26.8	35.7	47.5	63.2	84	111.6	148.8
					29.5	43.5	55.5	72	97	129	172	230	307	410	533	698	923	1231	1641	2216	3078	4103	5462	7259	9647	12824	17103	Figure QV3	0.13	0.18	0.24	0.31	0.4	0.5	0.7	1	1.3	1.8	2.3	3	4	5.3	7.1	9.6	13.4	17.8	23.7	31.6	42	55.8	74.4
					30	44	56.5	73	98	131	175	234	313	417	543	710	939	1252	1670	2254	3131	4175	5557	7386	9815	13047	17400	Figure QV4	0.09	0.12	0.16	0.21	0.27	0.37	0.5	0.67	0.9	1.2	1.53	2	2.67	3.57	4.77	6.43	8.93	11.9	15.83	21.07	28	37.2	49.6

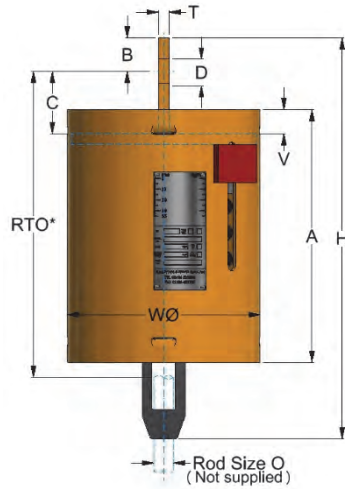


Variable Spring Supports

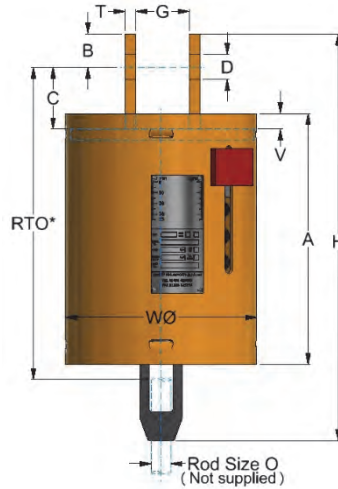
Variable Spring Supports – QV1



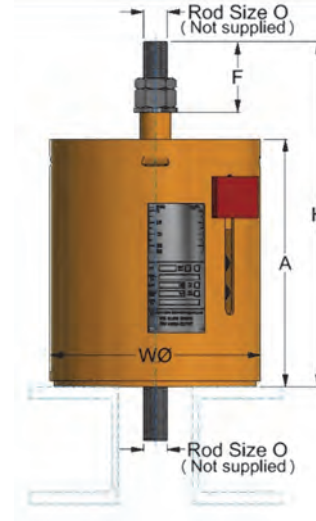
Type A



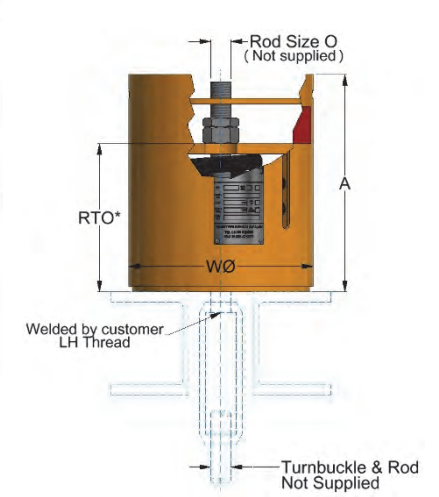
Type B



Type C



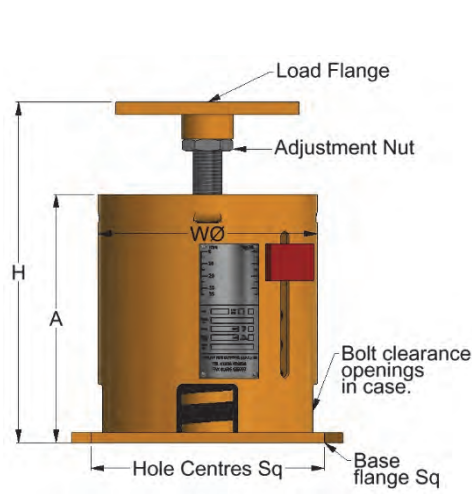
Type D



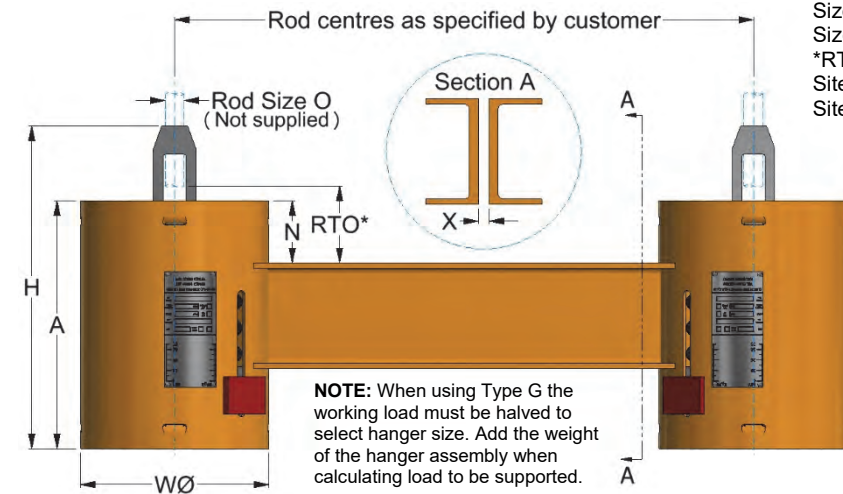
Type E

General Notes:

Sizes 0 – 17 are manufactured using the dimpled casing construction.
 Sizes 18 – 22 are manufactured as a totally welded unit.
 *RTO – At minimum load position.
 Site Adjustments Types A, B, C & G $\pm 75\text{mm}$
 Site Adjustments Types F, H & K $\pm 25\text{mm}$

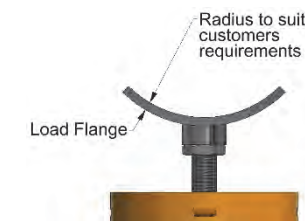


Type F

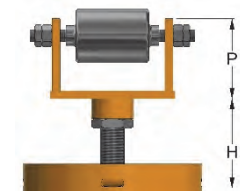


Type G

NOTE: When using Type G the working load must be halved to select hanger size. Add the weight of the hanger assembly when calculating load to be supported.



Type H



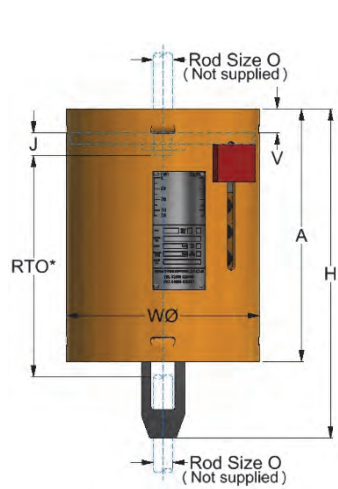
Type K

Size	Dim. 'P'
0 – 5	54
6 – 14	54
15 – 17	70
18 – 20	84
21	115
22	131

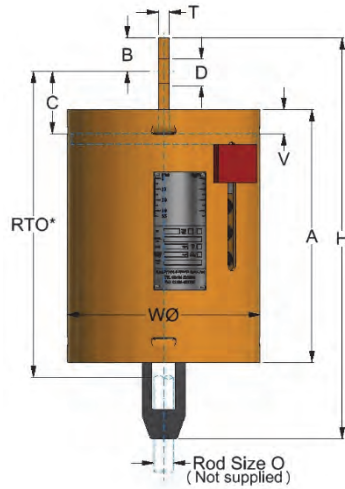


Variable Spring Supports

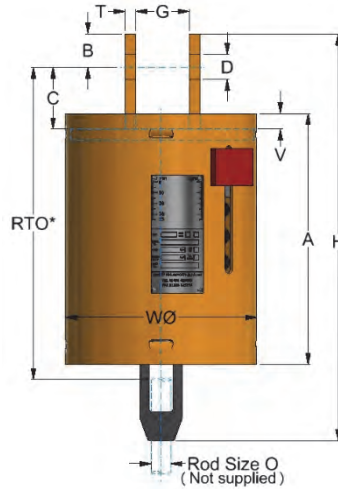
Variable Spring Supports – QV2



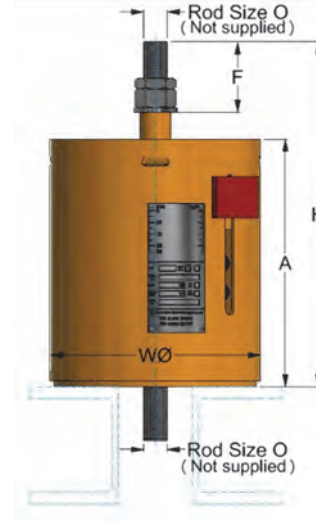
Type A



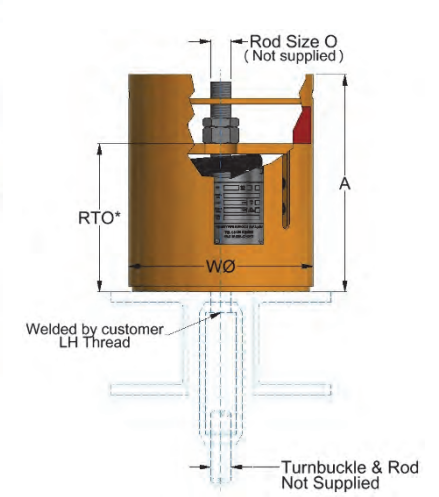
Type B



Type C



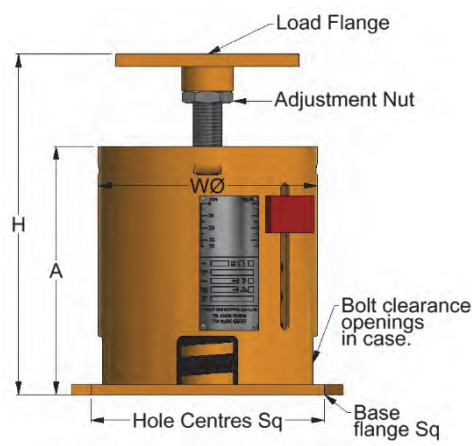
Type D



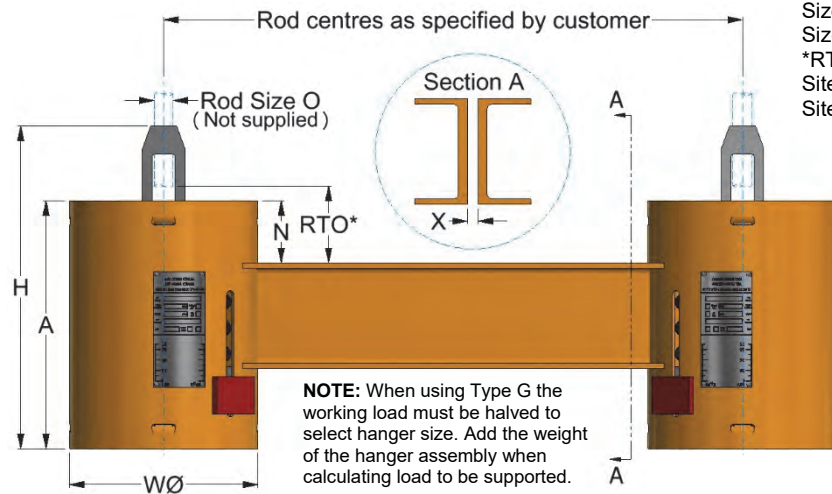
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 Site Adjustments Types F, H & K $\pm 25\text{mm}$

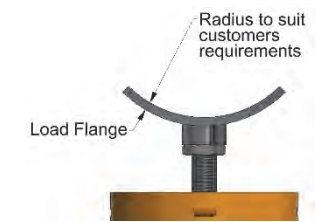


Type F

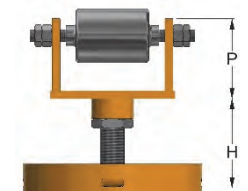


Type G

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Type H



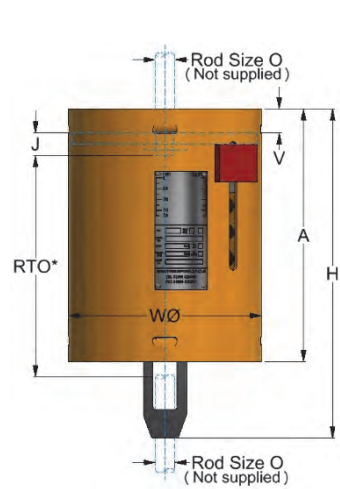
Type K

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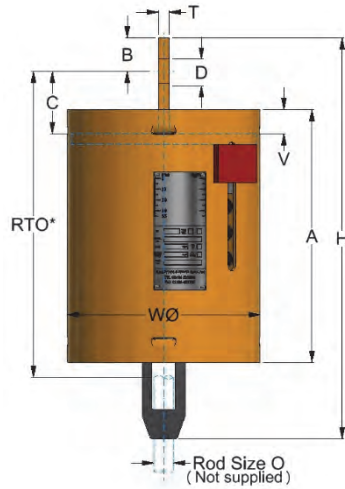


Variable Spring Supports

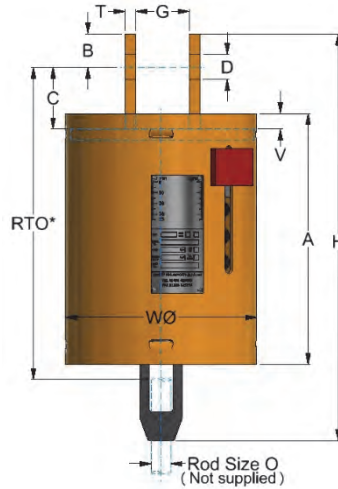
Variable Spring Supports – QV3



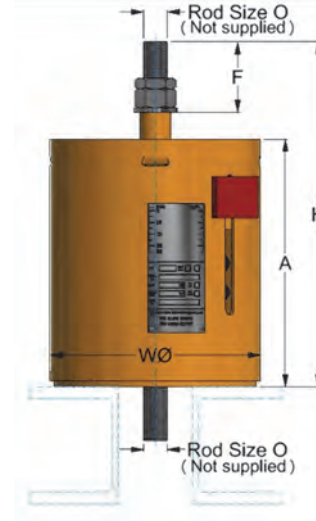
Type A



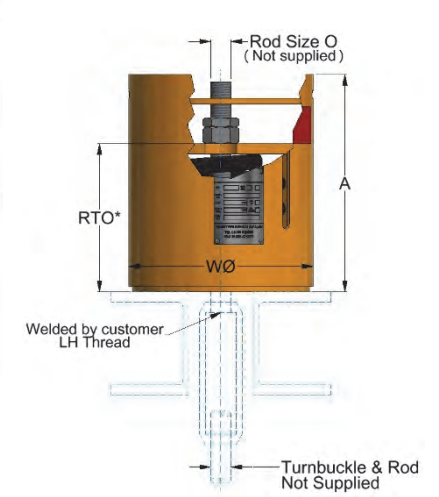
Type B



Type C



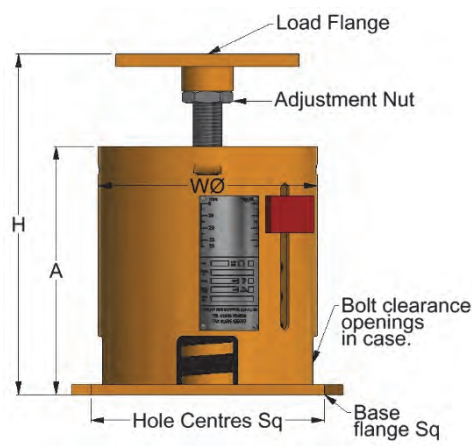
Type D



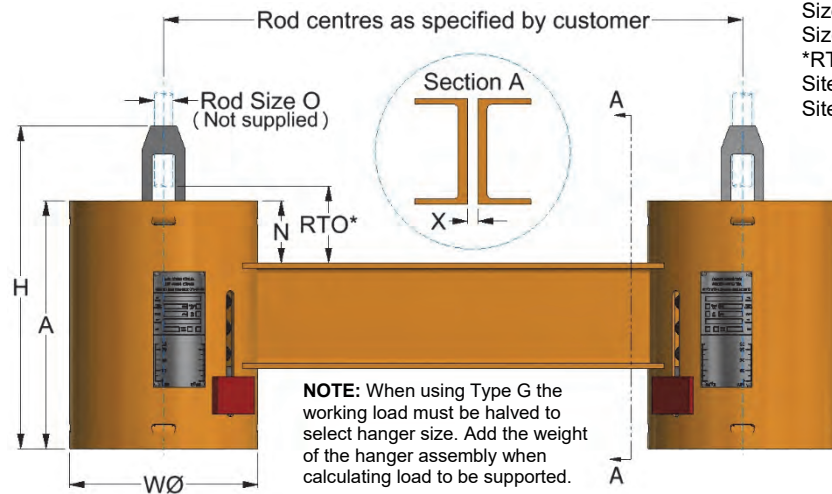
Type E

General Notes:

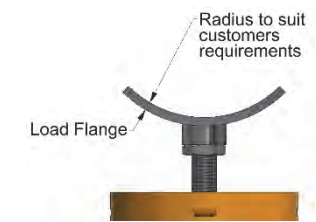
Sizes 0 – 17 are manufactured using the dimpled casing construction.
 Sizes 18 – 22 are manufactured as a totally welded unit.
 *RTO – At minimum load position.
 Site Adjustments Types A, B, C & G $\pm 75\text{mm}$
 Site Adjustments Types F, H & K $\pm 25\text{mm}$



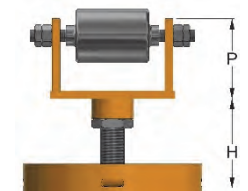
Type F



Type G



Type H



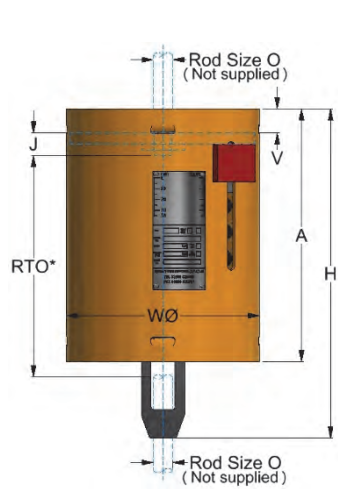
Type K

Size	Dim. 'P'
0 – 5	54
6 – 14	54
15 – 17	70
18 – 20	84
21	115
22	131

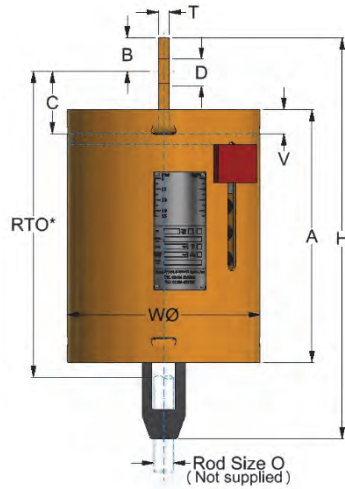


Variable Spring Supports

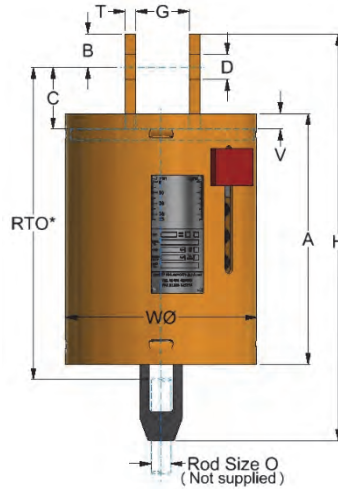
Variable Spring Supports – QV4



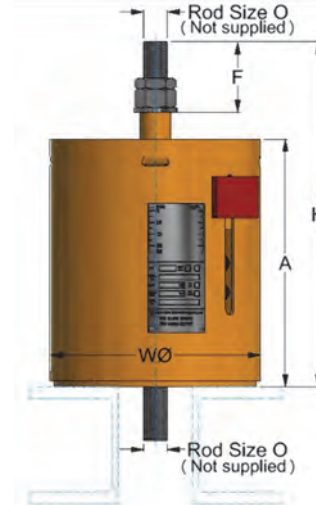
Type A



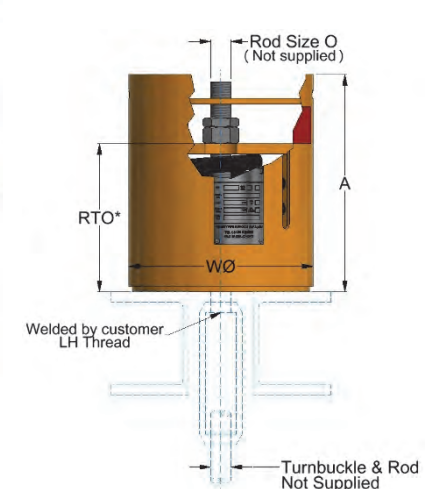
Type B



Type C



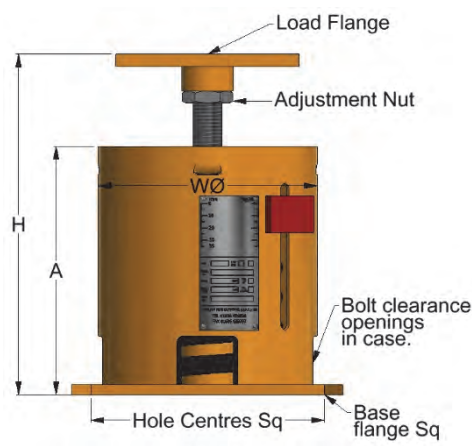
Type D



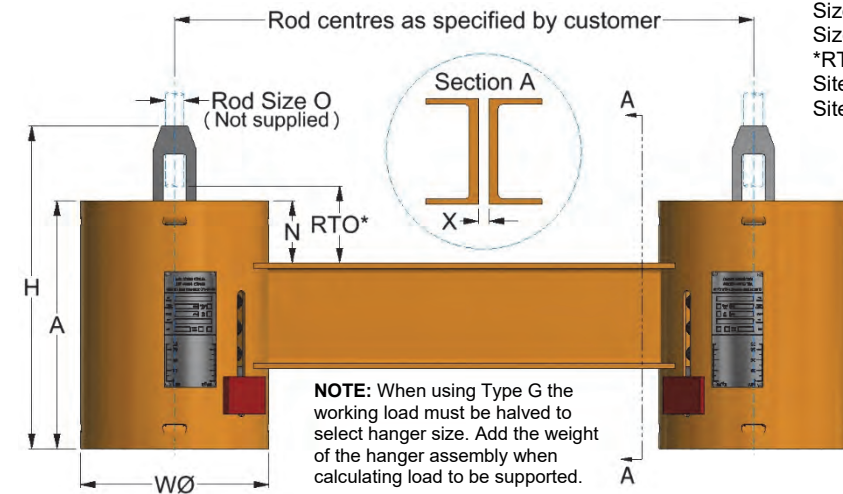
Type E

General Notes:

Sizes 0 – 17 are manufactured using the dimpled casing construction.
 Sizes 18 – 22 are manufactured as a totally welded unit.
 *RTO – At minimum load position.
 Site Adjustments Types A, B, C & G $\pm 75\text{mm}$
 Site Adjustments Types F, H & K $\pm 25\text{mm}$

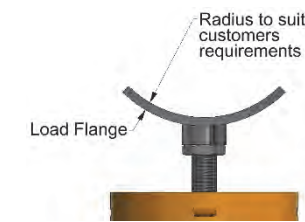


Type F

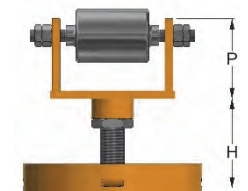


Type G

NOTE: When using Type G the working load must be halved to select hanger size. Add the weight of the hanger assembly when calculating load to be supported.



Type H



Type K

Size	Dim. 'P'
0 – 5	54
6 – 14	54
15 – 17	70
18 – 20	84
21	115
22	131



Variable Spring Supports

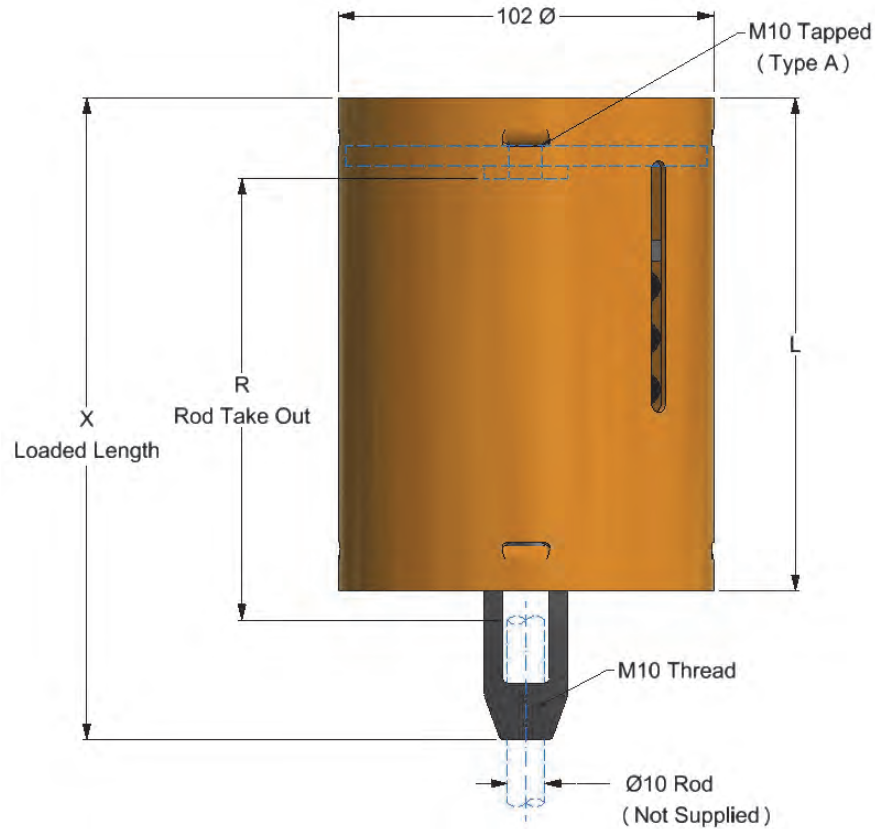
Variable Spring Supports – QV4

Size	Rod Size	Case Ø	Casing Length A			Rod Take Out				J - Thread Depth Type A	Type BC						Type F						Type G						Loaded Length H								Weight (approx.) Kgs								
	O	W	Types			Types					Dimensions						Base Plate Square	Base Plate Hole Centres Square	Base Plate Bolts	Base Plate Thickness	Load Pad Square	Load Pad Thickness	Gap Width X	N	Beam Sections						Type A		Type B & C		Type D		Type F		Type G		Types				
			A	B	C	D	E	F	A		B	C	E	G	D	C									B	G	T	V	900mm Rod Centres	1300mm Rod Centres	1800mm Rod Centres	Min	Max	Min	Max	Min	Max	F	Min	Max	Min	Max	A	B	C
0	M12	120	530	492	485	465	535	440	34	12	18	58	32	22	6	20	150	113	M16	6	130	6	16	40	50	12	50	12	50	12	592	802	662	872	550	760	54	560	770	571	781	7	7	12	19
1	M12	120	580	542	535	525	595	490	43	12	18	58	32	22	6	20	150	113	M16	6	130	6	16	40	50	12	50	12	50	12	652	862	722	932	605	815	54	620	830	640	850	9	9	12	23
2	M12	120	635	602	595	570	640	545	42	12	18	58	32	22	6	20	150	113	M16	6	130	6	16	40	50	12	50	12	50	12	697	907	767	977	660	870	54	680	890	699	909	10	10	13	26
3	M12	160	565	527	520	500	570	475	50	12	18	58	32	22	6	20	200	139	M20	6	130	6	20	50	76	38	76	38	76	38	627	837	697	907	590	800	54	610	820	622	832	12	13	20	29
4	M12	160	615	577	570	560	630	525	55	12	18	58	32	22	6	20	200	139	M20	6	130	6	20	50	76	38	76	38	76	38	687	897	757	967	640	850	54	655	865	677	887	16	13	23	35
5	M12	160	665	632	625	610	680	575	52	12	18	58	32	22	6	20	200	139	M20	6	130	6	20	50	76	38	76	38	76	38	737	947	807	1017	695	905	54	710	920	729	939	17	15	25	35
6	M16	180	670	635	625	605	680	575	47	16	22	58	32	27	10	20	220	144	M20	8	150	10	25	50	76	38	76	38	76	38	742	952	813	1023	690	900	54	710	920	733	943	25	22	37	54
7	M16	180	740	705	695	690	765	645	57	16	22	58	32	27	10	20	220	144	M20	8	150	10	25	50	76	38	76	38	76	38	827	1037	898	1108	760	970	54	785	995	813	1023	32	30	44	65
8	M16	180	775	740	730	710	785	680	43	16	22	58	32	27	10	20	220	144	M20	8	150	10	25	50	76	38	76	38	76	38	847	1057	918	1128	795	1005	54	820	1030	834	1044	41	32	46	85
9	M20	240	785	735	725	710	795	670	75	20	26	63	32	32	10	25	260	190	M20	8	180	12	32	75	76	38	100	50	100	50	862	1072	934	1144	810	1020	54	830	1040	842	1052	55	53	77	114
10	M20	240	880	835	825	805	890	770	78	20	26	63	32	32	10	25	260	190	M20	8	180	12	32	75	76	38	100	50	100	50	957	1167	1029	1239	910	1120	54	920	1130	945	1155	66	64	88	135
11	M20	240	710	665	655	645	740	600	85	20	26	75	35	37	10	25	260	190	M20	8	180	12	32	75	76	38	100	50	100	50	797	1007	882	1092	740	950	54	760	970	786	996	55	50	76	115
12	M24	240	775	725	715	690	795	650	112	30	32	75	35	41	12	25	260	190	M20	8	180	12	38	100	100	50	125	65	125	65	859	1069	944	1154	790	1000	54	805	1015	851	1061	62	61	83	132
13	M30	240	975	915	905	880	1010	845	122	30	38	101	49	46	12	25	260	190	M20	8	180	12	38	100	100	50	125	65	125	65	1063	1273	1187	1397	990	1200	54	1000	1210	1065	1275	86	85	108	180
14	M30	240	980	930	920	890	1020	855	125	30	38	101	49	46	12	25	260	190	M20	8	180	12	38	100	100	50	125	65	125	65	1073	1263	1197	1407	1000	1210	54	1010	1220	1083	1293	92	89	112	193
15	M30	250	990	945	930	900	1035	860	138	35	38	101	49	51	12	25	260	190	M20	10	200	15	54	100	150	75	200	75	200	75	1088	1298	1212	1422	1020	1230	70	1015	1225	1111	1321	100	96	119	208
16	M36	250	1175	1120	1105	1080	1215	1040	138	35	46	101	64	60	20	25	260	190	M20	10	200	15	54	100	150	75	200	75	200	75	1273	1483	1412	1622	1200	1410	70	1190	1400	1291	1501	132	129	144	311
17	M42	250	1335	1280	1265	1245	1390	1195	139	35	51	111	74	67	20	25	260	190	M20	10	200	15	54	100	150	75	200	75	200	75	1448	1658	1607	1817	1360	1570	70	1350	1560	1462	1672	169	152	176	346
18	M48	320	1230	1168	1160	1180	1330	1110	87	45	60	102	80	73	20	-	350	283	M24	12	250	20	60	100	200	90	260	90	300	90	1350	1560	1535	1745	1315	1525	84	1285	1495	1288	1498	302	287	336	618
19	M56	320	1395	1336	1330	1380	1550	1290	110	50	68	114	80	79	20	-	350	283	M24	12	250	20	67	100	200	90	260	90	300	90	1555	1765	1755	1965	1485	1695	84	1442	1652	1498	1708	361	334	385	734
20	M64	320	1660	1595	1590	1605	1775	1540	88	55	75	114	102	86	25	-	350	283	M24	15	250	20	73	100	200	90	260	90	300	90	1795	2005	2010	2220	1735	1945	84	1705	1915	1730	1940	498	462	510	1004
21	M72	320	1910	1835	1825	1760	1930	1780	3	65	84	114	102	92	25	-	350	283	M24	15	250	20	79	100	300	90	300	100	380	100	1975	2185	2182	2392	1985	2195	115	1905	2115	1900	2110	575	521	536	1185
22	M80	320	2395	2295	2285	2210	2400	2245	6	65	94	127	102	98	25	-	350	283	M24	15	250	20	86	100	300	90	300	100	380	100	2450	2660	2680	2890	2465	2675	131	2360	2570	2350	2560	775	766	752	1599



Variable Spring Supports

Variable Spring Supports – QV38, QV75 & QV150



Loads N		Loads Kg		Travels mm		
Size 01	Size 02	Size 01	Size 02	QV150	QV75	QV38
88.97	177.95	9.07	18.14	0	0	0
95.15	184.13	9.70	18.77	10	5	2.5
101.33	190.31	10.33	19.40	20	10	5
107.51	196.49	10.96	20.03	30	15	7.5
113.69	202.67	11.59	20.66	40	20	10
119.87	208.85	12.22	21.29	50	25	12.5
126.05	215.03	12.85	21.92	60	30	15
132.23	221.21	13.48	22.55	70	35	17.5
138.41	227.39	14.11	23.18	80	40	20
144.59	233.57	14.74	23.81	90	45	22.5
150.77	239.75	15.37	24.44	100	50	25
156.96	245.93	16.00	25.07	110	55	27.5
163.14	252.11	16.63	25.70	120	60	30
169.32	258.29	17.26	26.33	130	65	32.5
175.50	264.47	17.89	26.96	140	70	35
181.68	270.66	18.52	27.59	150	75	37.5
Spring Rate		Kg/mm		0.063	0.125	0.25
		N/mm		0.618	1.226	2.45

Fig No	QV150		QV75	QV38	
	mm		mm	mm	
	01	02			
Rod Takeout 'R'	416	416	202	120	
Can Length 'L'	450	450	270	200	
Loaded Length 'X'	Min	539	539	330	245
	Max	689	689	405	283

This range of spring supports is available for the following types:-
A, B, C, D, E & F.

These units are not pre-set unless required.