

3.1 Beams

These are used for supporting of horizontal pipes in double-rod hanger assemblies, e.g. RH2, RH4-6, SH4-7, variable support assemblies VS2 and rigid struts RS2. For basic division of beam types according to application see Table 3.1. Beams are differentiated according to the type of attachment to pipe and rods. Usual beam type selected enable attachment to pipe using a welding

or clamp support, which serves to determine position of pipe provided with heat insulation and restriction of heat transmission. The local contact temperature of beam under support will not exceed 150–200 °C. Direct placement of support onto beam can be selected for pipe without insulation or in justified cases only. Protection against burning must be ensured, as these beams conduct heat directly from pipe surface.

Table 3.1 – Summary of Beam Types

Type	Description	Attachment to pipe	Attachment to rod
311	For tube suspension (steel and plastic) DN10-DN50	Circular clamps	Directly via nut
321	For suspension of pipes up to DN50 and temperature up to 150°C	Support	Eye for clevis with pin
334	For assemblies of hanger types RH and SH	Support	Eye for clevis with pin
341	For attachment of spring blocks type 1 × 4	Support	Bolted to spring cage
351	Beam for linkage of rods	-	Directly via nut
371	Beam for assemblies RH2, RH5, SH4-6	Directly on beam	Eye for clevis with pin
372	Beam for support assemblies VS2	Directly on beam	Surface for support head
381	Beam for assemblies RH2, RH5, SH4-6	Directly on beam	Eye for clevis with pin
382	Beam for double-spring supports VS/CS5 or for rigid strut assemblies RS2	Directly on beam	Clevis type 440

3.2 Application

Type selection depends is based on assessment of the function required with respect to recommendations below:

- regular hanger assemblies should be used with beam type 334 with support,
- spring hangers with short construction length should be used with beam type 341,
- beams type 371 and 381 are selected in case of collision risk in the space under suspension node,
- beams may be used with shortened supports types, e.g. type 615A and 615.

All supports must be welded on beam to secure their position. Thermal or other displacements of pipe must result in deflection

of hanger rods, not in displacement of pipe on the beam. The support base is fixed onto beam by means of field weld.

3.3 Beam Design Temperature

Design temperature ratings of beams differ depending on their types and piping temperature, as defined in Table 3.3. Determining the design temperature is necessary for determination of load correction factor, as defined in Table 3.2. Beams made of material grade S235JR are used for minimum ambient temperature of -20°C, steel grade S355J0 is installed in applications for up to -40°C. For details of lowest temperature threshold for other materials refer to Table A.7 – A.10.

Table 3.2 – Design Temperature of Beams t_d

Beam type	Tube attachment	Pipe temperature TS (°C)						
		< 80	< 150	< 350	< 450	< 500	< 550	< 600
311, 321	Directly on beam	80 °C	150 °C	-	-	-	-	-
311, 321	Via support	80 °C	80 °C	150 °C	-	-	-	-
334, 341	Via support	80 °C	80 °C	150 °C	200 °C	225 °C	250 °C	(300 °C)
351	-	80 °C						
371, 372	Directly on beam	$t_d = TS, t_d = 250$			-			
381, 382	Directly on beam	80 °C	$t_d = TS$					

3.4 Beam Load Capacity

Permissible loads F_p stated in dimension tables for particular types has been determined for material group 1 and the temperature corresponding with the design temperature t_d stated in Table 3.2. Load capacities for values given in brackets need to be checked with the manufacturer.

Beams type 381 and 382 make an exception, as the values in table refer to their permissible loads for temperature of 80 °C and material group 1. For higher temperatures and other materials, the value of F_p in table shall be multiplied by the material-temperature coefficient $k_{T,M}$. The values of correction factors $k_{T,M}$ stated in Table 3.3 have been defined for sustained loads in category G and the service life of 200,000 hours. Values in brackets relate to occasional loads of category Q.

Table 3.3 – Permissible Load Correction Factor at Temperature – $k_{T,M}$ (-) for Beams 371, 372, 373, 374

Temperature t_d (°C)	80	100	150	200	250	300	350	400	450	500	520	540	560
Material													
S235	1	0.97	0.92	0.87	0.78	0.64	0.55	-	-	-	-	-	-
P265GH	1.16	1.13	1.05	0.96	0.88	0.81	0.75	0.65	0.32	-	-	-	-
16Mo3	1.26	1.24	1.18	1.09	1	0.91	0.82	0.75	0.69	0.47 (0.66)	-	-	-
10CrMo910	-	-	-	-	-	-	-	1	0.93	0.68 (0.87)	0.51 (0.73)	0.38 (0.57)	0.28 (0.45)
1.4301	0.95	0.89	0.81	0.74	0.68	0.64	0.61	0.59	0.57	-	-	-	-
1.4541	1.02	0.98	0.92	0.88	0.83	0.79	0.76	0.73	0.72	0.7	-	-	-
1.4948	-	-	-	-	-	-	-	-	-	0.56	0.55	0.54	0.53
P275NL1	1.21	1.17	1.09	1	0.92	0.84	0.78	0.65	-	-	-	-	-

Beam sections are designed pursuant to conditions applicable for permissible strain and buckling (skew) of beams.

Hanger beams must be further designed in the same load capacity class as hanger rods.

To ensure stability of beams against skew the maximum pitch E specified in particular catalogue data sheets shall not be exceeded. Other cases need to be consulted with the manufacturer.

For a summary of attachment dimensions and load capacity classes see the Table 3.3.

Table 3.4 – Summary of Rod Attachments

Rod diameter d (mm)	Pin diameter d_c (mm)	Hole diameter d_1 (mm)	Band width T (mm)	Load capacity class	Permissible connection load (kN)
12	12	14	8	1	8.8
16	16	18	10	2	18
20	20	22	12	3	27.1
24	24	26	15	4	40.6
30	33	35	20	5	74.4
36	40	42	25	6	95
42	45	48	30	7	142
48	50	55	30	8	166
56	60	65	35	9	228
64	70	75	40	10	266
72	80	85	40	11	333
80	90	95	50	12	471

3.5 Surface Treatment

Beams are delivered with primer coating as standard. Beams for smaller piping are galvanized or hot-dipped.

3.6 Insulation

Beams type 311-351 may not pass through insulation. The height of selected pipe support must ensure clearance of at least 30 mm between the insulation surface and beam flange.

3.7 Welding

Supports laid on beam must be secured against movement by means of welded seam. Tack welding from the support base bottom side is usually sufficient, 4 tacks of 3-5 mm in length each. Longer welds would cause damage to the surface treatment under support, i.e. at places preventing application of corrective coating.

3 Beams

Beam Type 311 a 321

Beam Type 311

Application

Beam for suspension of bare tubing sized DN10 to DN33 using circular clamps type 701 or insulated and insulated tubing using supports type 602. Attachment to rods – direct to thread rods size M10.

Material

Carbon steel, galvanized by A3K method.

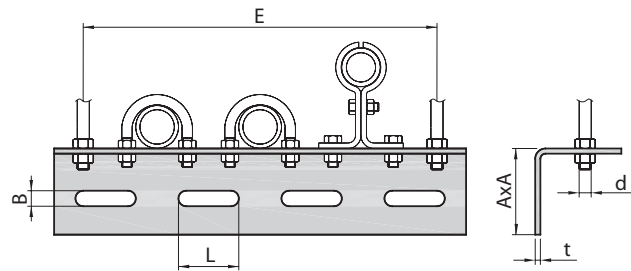
Marking

Type Pitch

311 E

Dimensions (mm)

d	A	B	L	t	E	m (kg) / 100 (mm)	Frd (kN)
10	52	9	35	3	200–1 000 by increments of 60	0.21	0.3



Beam Type 321

Application

Application of beam for double rod hangers for suspension of piping up to DN80, supported by means of support. Attachment to rods – thread rods size M12. The beam is not designed for piping with horizontal displacement exceeding 30 mm. Optional placement of multiple supports.

Material

Steel S235JR or S355J0.

Surface treatment

Galvanized using A3K method or with primer coating.

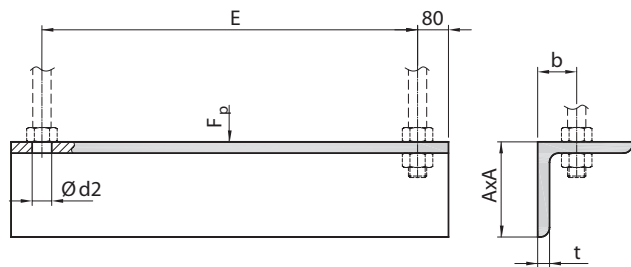
Marking

Type Size Pitch

321 A E

Dimensions (mm)

d2	A	b	t	F_p (kN)						m (kg) / 100 (mm)
				E = 250	E = 350	E = 500	E = 600	E = 800	E = 1 000	
14	60	25	6	1	1	0.8	0.7	0.5	-	0.5
14	80	32	8	1.5	1.5	1.2	1	0.8	0.6	1



3 Beams

Beam Type 334

Beam Type 334

Application

Beam for double-rod hangers for suspension of piping of any diameter. Attachment to rods – clevis with pin type 842. Piping is attached to the beam using supports type 5 or 6. Use of shortened supports is also possible.

Material

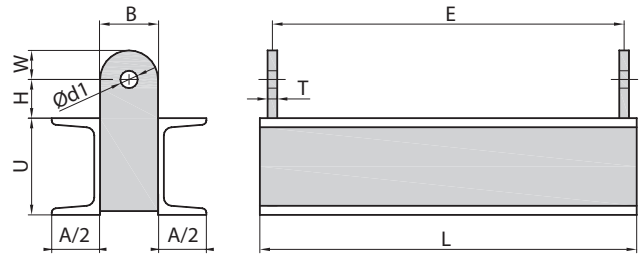
Steel S235JR or S353J0.

Surface treatment

Primer or top coating.

Marking

Type	Size	Pitch	TU
334	U	E	TU



Main beam dimensions (mm)

U	E _{min}	E _{max}	A	m1 (kg)
65	500	1 200	84	1.7
80	500	1 500	90	2.0
100	500	1 500	100	2.6
120	500	1 700	110	3.1
140	500	1 700	120	4.0
160	500	2 000	130	5.1
200	700	2 500	150	7.5
220	700	2 500	160	8.3
240	800	2 500	170	10.2
260	900	2 500	180	11.4
280	1 000	2 500	190	12.4
300	1 000	2 500	200	13.1

Main beam dimensions (mm)

M	d1	T	B	H	W
12	14	8	40	40	25
16	18	10	50	40	30
20	22	12	60	50	35
24	26	15	80	60	40
30	35	20	100	70	55
36	42	25	110	80	65
42	48	30	120	90	75
48	55	30	140	100	85
56	65	35	170	110	100
64	75	40	190	120	115
72	85	40	220	130	130

Remarks

The table of connections uses M to designate the rod diameter (which may differ from pin diameter). Permissible load is determined for the temperature of 250 °C and applies to all support design temperatures. Permissible load for pressure test level may be

set equal to $1.5 \times F_p$. Selected connective eye must comply with the rod load capacity class (see Table 3.3). The total length of beam $L = E + 2 \times T$. Beam weight has been specified for approximately 100 mm of length.

Permissible load on beam depending on pitch E for various beam sizes

U	F _p (kN) Loads corresponding to beam pitch E (mm)												
	500	600	700	800	900	1 000	1 200	1 500	1 700	2 000	2 200	2 500	
mm													
65	19.0	15.7	13.3	11.6	10.2	9.1	7.5						
80	28.4	23.4	19.9	17.2	15.2	13.6	11.1	8.7					
100	43.2	35.6	30.3	26.2	23.1	20.6	16.9	13.1					
120	64.2	53.0	45.1	39.1	34.5	30.7	25.2	19.6	17.0				
140	91.5	75.6	64.2	55.7	49.1	43.9	35.9	28.0	24.3				
160	121.4	101.7	86.4	75.0	66.2	59.1	48.4	37.8	32.8	27.1			
200		132.4	112.6	97.7	86.2	77.0	63.2	49.4	42.9	35.5	31.7		
220		169.1	144.0	125.0	110.3	98.5	80.9	63.3	55.0	45.6	40.7	34.8	
240		198.5	185.0	160.8	141.9	126.8	104.2	81.6	71.0	59.0	52.7	45.2	
260		228.4	227.4	197.7	174.6	156.1	128.3	100.6	87.6	72.8	65.2	56.0	
280			261.1	244.8	216.3	193.4	159.1	124.9	108.8	90.6	81.2	69.9	
300				282.3	261.2	233.7	192.4	151.1	131.7	109.8	98.5	84.9	

3 Beams

Beam Type 334

Recommended nominal diameters of rods of attached hanger depending on beam size

U mm	Recommended nominal diameter of rod (mm)												
	500	600	700	800	900	1 000	1 200	1 500	1 700	2 000	2 200	2 500	
65	16-20	16-20	16	12-16	12-16	12-16	12-16						
80	20-24	16-20	16-20	16-20	16-20	16	12-16	12-16					
100	20-30	20-24	20-24	16-24	16-20	16-20	16-20	16					
120	24-30	24-30	20-30	20-24	20-24	20-24	16-24	16-20	16-20				
140	30-36	30-36	24-30	24-30	24-30	20-30	20-24	20-24	16-24				
160	36	30-36	30-36	30-36	30	24-30	24-30	20-24	20-24	16-24			
200		36-42	30-36	30-36	30-36	30-36	24-30	24-30	20-30	20-24	20-24		
220		42-48	36-42	30-36	30-36	30-36	30-36	24-30	24-30	24-30	24	24	
240		48-56	48-56	42-56	42-56	36-42	30-42	30-36	30	24-30	24-30	24-30	
260		56-72	56-72	48-56	48-56	42-48	36-42	30-36	30-36	30-36	30-36	24-30	
280			56-72	56-72	48-56	48-56	42-48	36-42	36-42	30-36	30-36	30	
300				56-72	56-72	56-72	48-56	42-48	42-48	36-42	30-36	30-36	

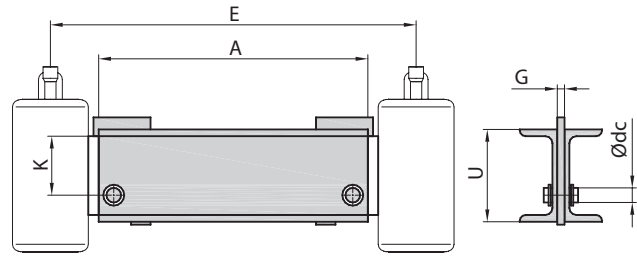
3 Beams

Beam Type 341

Beam Type 341

Application

Attachment to spring block type 1 × 4 using a sectional joint and pins. The beam is provided with a welded backstop leaning against the eye attached to the spring. Piping is attached to the beam via supports type series 5 or 6. Each supports must lie in the centre of beam span. Beam size U is selected depending on required load under operating conditions and the test condition, depending on pitch E. Values of permissible loads and applicable dimensional combinations are defined in the relevant table.



Material

Steel S235JR or S355J0.

Surface treatment

Primer or top coating.

Marking

Type	Size	Pitch	Spring size
341	U	E	S

Main dimensions (mm) and permissible loads

Spring size	U	TU	G	K	dc	A	m (kg) / 0.1 m	F _p (kN) for pitch E (mm)						
								600	700	800	1 000	1 200	1 500	2 000
1-3	80	1	8	50	12	E-130	1.7	53.4	45.4	39.4	30.9	25.3		
4-5	100	2	10	65	16	E-155	2.1	53.0	45.1	39.1	30.7	25.2		
4-5	120	2	10	65	16	E-155	2.7				43.9	35.9	28.0	20.1
6	120	3	12	80	16	E-160	2.7	75.6	64.2	55.7	43.9	35.9		
6	140	3	12	80	16	E-160	3.2				59.1	48.4	37.8	
6	160	3	12	80	16	E-160	3.8						49.4	35.5
7	140	4	15	90	20	E-180	3.2	101.7	86.4	75.0	59.1			
7	160	4	15	90	20	E-180	3.8			97.7	77.0	63.2		
7	200	4	15	90	20	E-200	5.1					80.9	63.3	45.6
8	160	5	20	110	24	E-200	3.8	132.4	112.6	97.7	77.0			
8	200	5	20	110	24	E-200	5.1			125.0	98.5	80.9		
8	240	5	20	110	24	E-200	5.1				156.1	128.3	100.6	72.8
9, 10	200	6	25	130	33	E-280	5.1	169.1	144.0	125.0	98.5			
9, 10	240	6	25	130	33	E-280	6.6			197.7	156.1	128.3	100.6	
9, 10	300	6	25	130	33	E-280	7.6				278.5	229.5	180.3	131.3
11	260	7	50	190	45	E-340	7.6			244.8	193.4	159.1	124.9	
11	300	7	50	190	45	E-340	9.2				278.5	229.5	180.3	131.3
12	260	8	50	200	50	E-350	7.6			244.8	193.4	159.1	124.9	
12	300	8	50	200	50	E-350	9.2				278.5	229.5	180.3	131.3

Load capacity classes and the relevant diameters or pins and rods are specified on page A.11 of the catalogue. The load for piping pressure test equals to 1.5 times the permissible operating load F_p. Beams for any loads exceeding the maximum permissible thresh-

old are supplied on request. Assemblies for spring blocks up to size 6 inclusive are delivered fully assembled with beams. Beams for spring blocks exceeding size 7 need to be assembled on the installation only.

3 Beams

Beam Type 351

Beam Type 351

Application

The beam is used for joining two rods into one in hanger assemblies RH 4-6 and SH/CH 11-19. Attachment of rod pair to clevises with pins on the hanger edge, attachment of centre rod to the spherical pad, which forms a part of beam, via a pair of nuts. The load capacity class of rod pair is usually one level below values for a single centrally located rod only. Turn the beam eyes up or down is allowed.

Material

Steel S235JR or S355J0.

Surface treatment

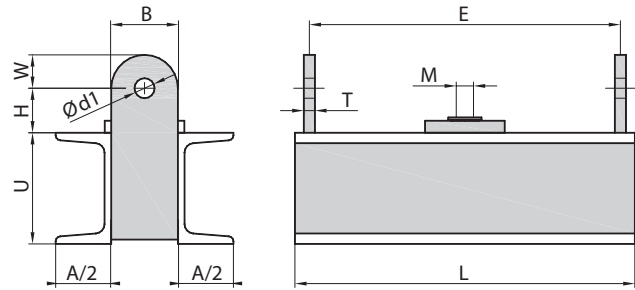
Primer or top coating.

Marking

Type	Size	Pitch	TU1	TU2
351	U	E	TU1	TU2

TU1 = load capacity class for single rod

TU2 = load capacity class for a pair of rods



Main beam dimensions (mm)

U	E _{min}	E _{max}	A	m1 (kg)
65	500	1 200	84	1.7
80	500	1 500	90	2.0
100	500	1 500	100	2.6
120	500	1 700	110	3.1
140	500	1 700	120	4.0
160	500	2 000	130	5.1
200	700	2 500	150	7.5
220	700	2 500	160	8.3
240	800	2 500	170	10.2
260	900	2 500	180	11.4
280	1 000	2 500	190	12.4
300	1 000	2 500	200	13.1

Main connection dimensions (mm)

M	d1	T	B	H	W
12	14	8	40	40	25
16	18	10	50	40	30
20	22	12	60	50	35
24	26	15	80	60	40
30	35	20	100	70	55
36	42	25	110	80	65
42	48	30	120	90	75
48	55	30	140	100	85
56	65	35	170	110	100
64	75	40	190	120	115
72	85	40	220	130	130

Remarks

The table of connections uses M to designate nominal rod diameter, d1 refers to the diameter of hole for connection of pins for a pair of rods. Permissible load has been defined for temperature of 80 °C and it relates to load of a single rod by means of central con-

centrated force. Permissible load of $1.5 \times F_p$ can be considered for pressure test condition. The total length of beam is $L = E + 2 \times T$. Beam weight has been specified for approximately 100 mm of length.

Permissible load on beam depending on pitch E for various beam sizes

U	F _p (kN) Loads corresponding to beam pitch E (mm)												
	500	600	700	800	900	1 000	1 200	1 500	1 700	2 000	2 200	2 500	
65	24.9	20.6	17.5	15.2	13.4	11.9	9.8						
80	37.1	30.7	26.0	22.6	19.9	17.8	14.5	11.3					
100	56.5	46.7	39.6	34.4	30.3	27.0	22.1	17.2					
120	84.1	69.4	59.0	51.2	45.1	40.3	33.0	25.7	22.3				
140	119.9	99.0	84.1	73.0	64.3	57.4	47.1	36.7	31.8				
160	159.0	133.2	113.2	98.2	86.6	77.3	63.4	49.5	42.9	35.5			
200		173.4	147.5	128.0	112.9	100.8	82.8	64.7	56.1	46.5	41.5		
220		221.5	188.5	163.7	144.4	129.0	106.0	82.9	72.0	59.7	53.3	45.6	
240		259.9	242.2	210.5	185.8	166.0	136.4	106.9	93.0	77.2	69.1	59.2	
260		299.0	297.8	258.9	228.6	204.4	168.0	131.7	114.7	95.4	85.4	73.3	
280			341.9	320.6	283.2	253.3	208.3	163.6	142.5	118.7	106.3	91.5	
300				369.7	342.0	306.0	251.9	197.8	172.4	143.8	129.0	111.1	

3 Beams

Beam Type 351

Recommended nominal diameters of rods M depending on beam size

U	Recommended nominal rod diameter (mm)												
	mm	500	600	700	800	900	1 000	1 200	1 500	1 700	2 000	2 200	2 500
65		12	12	12	12	12	12	12					
80		16	16	16	16	16	16	12	12				
100		20	20	20	20	20	20	16	16				
120		24	24	24	24	24	24	20	20	20			
140		30	30	30	30	30	30	24	24	24			
160		36	36	36	36	36	36	30	30	30	24		
200			42	42	42	42	42	36	36	36	30	30	
220			48	48	48	48	48	36	36	36	36	36	30
240			56	56	56	56	56	48	48	48	42	42	36
260			64	64	56	56	56	56	56	56	48	48	42
280				72	72	64	64	56	56	56	48	48	48
300				72	72	72	72	64	64	64	56	56	48

3 Beams

Beam Type 371

Beam Type 371

Application

Beam formed by a pair of rolled U-sections for double-rod hangers for horizontal pipes, hanger assemblies RH2, RH5 and SH 4-6. Attachments to rods – clevis with pin type 842. Only for temperatures up to 250 °C (limited by heat transmission). Two different size versions of beam sections for lower and higher load capacity.

Material designs

S235JR/J2 – group No. 1

1.4301 – group No. 6*

* Remark: Material group No. 6 – the beam is made of carbon steel, the clamp and cradle are of stainless steel.

Marking

Type	Version	DN	Material	Pitch	TU
371	1/2	D	MS	E	TU

Example of beam marking: size, version 2, DN250 ($D_o = 245$), stainless material (group No. 6), rod pitch 800 mm, attachment load capacity class 3 (M20): **3712-245-6-800-3**.

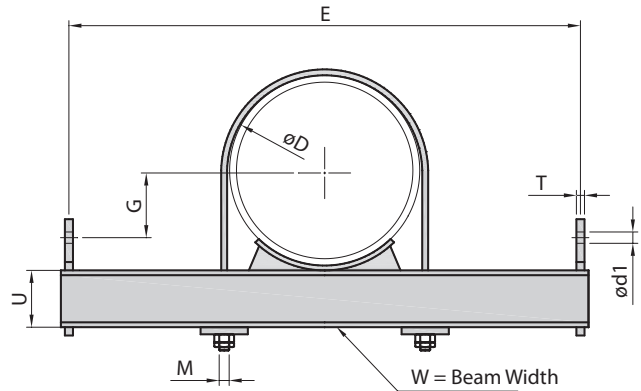
Versions

Normal load capacity – Version 1

Higher load capacity – Version 2

Dimensions (mm)

DN	D	Version	U	G	W	d1	T	M	E
150	168.3	1	80	43	150	14	10	12	400–800
		2	100	33	160	18	12	16	400–1 000
200	219.1	1	80	69	150	14	10	12	400–800
		2	100	59	160	18	12	16	400–1 000
250	245	1	80	82	150	14	10	16	400–800
		2	100	72	160	18	12	20	400–1 000
250	273	1	80	98	150	14	10	16	400–800
		2	100	88	160	18	12	20	400–1 000
300	323.9	1	100	113	160	18	10	16	500–1 000
		2	140	103	190	22	12	20	500–1 200
350	355.6	1	100	129	160	18	10	16	500–1 000
		2	140	119	190	22	12	20	500–1 200
400	406.4	1	120	144	190	22	12	20	600–1 000
		2	160	144	200	22	12	24	600–1 200
450	457	1	120	170	190	22	12	20	600–1 000
		2	160	170	200	22	12	24	600–1 200
500	508	1	140	197	200	22	12	20	700–1 200
		2	180	187	230	26	15	24	700–1 400
550	559	1	140	223	200	22	12	24	700–1 200
		2	180	213	230	26	15	30	700–1 400
600	610	1	160	238	230	26	15	24	800–1 200
		2	200	238	240	35	20	30	800–1 500
650	660	1	160	266	230	26	15	24	800–1 200
		2	200	266	240	35	20	30	800–1 500
700	711	1	180	292	240	26	15	30	900–1 400
		2	220	292	260	35	20	36	900–1 800
750	762	1	180	317	240	26	15	30	900–1 400
		2	220	317	260	35	20	36	900–1 800
800	813	1	200	343	260	35	20	30	1 000–1 500
		2	240	323	310	42	25	36	1 000–2 000
900	914	1	200	393	260	35	20	30	1 000–1 500
		2	240	373	310	42	25	36	1 000–2 000



3 Beams

Beam Type 371

Permissible beam load depending on pitch E for various beam sizes

U mm	F _p (kN) Loads corresponding to beam pitch E (mm)									
	500	600	700	800	900	1 000	1 200	1 500	1 700	2 000
80	37.1	30.7	26.0	22.6	19.9	17.8	14.5	11.3		
100	56.5	46.7	39.6	34.4	30.3	27.0	22.1	17.2		
120	84.1	69.4	59.0	51.2	45.1	40.3	33.0	25.7	22.3	
140	119.9	99.0	84.1	73.0	64.3	57.4	47.1	36.7	31.8	
160	159.0	133.2	113.2	98.2	86.6	77.3	63.4	49.5	42.9	35.5
200		173.4	147.5	128.0	112.9	100.8	82.8	64.7	56.1	46.5
220		221.5	188.5	163.7	144.4	129.0	106.0	82.9	72.0	59.7
240		259.9	242.2	210.5	185.8	166.0	136.4	106.9	93.0	77.2

Permissible load

Values F_p and dimensions of connections have been determined for t_d = 250 °C. No correction is applied to permissible load for lower temperatures.

Beam Type 372

Application

Beam formed by a pair of rolled U-sections for double-spring supports for horizontal piping in assemblies VS2. The head of spring support is located under a plate sized of $A \times A$ dimension. For temperatures up to 250 °C only (limited by heat transmission). Horizontal displacements exceeding 10 mm require application of a pair of antifrictional sliding surfaces. Attention is required with respect to displacement reserves of the support head – thrust plate dimensional pair. The beam can be also used for rigid struts type 1.6, where the clevis is welded to thrust plate.

Material designs

S235JR/J2 – group No. 1

1.4301 – group No. 6*

* Remark: Material group No. 6 – the beam is made of carbon steel, the clamp and cradle are of stainless steel.

Marking

Type	Version	DN	Material	Pitch
372	1/2	D	MS	E

Example of beam marking: size, version 2, DN400, steel material (group No. 1), rod pitch 1000 mm: **3721-400-1-1000**.

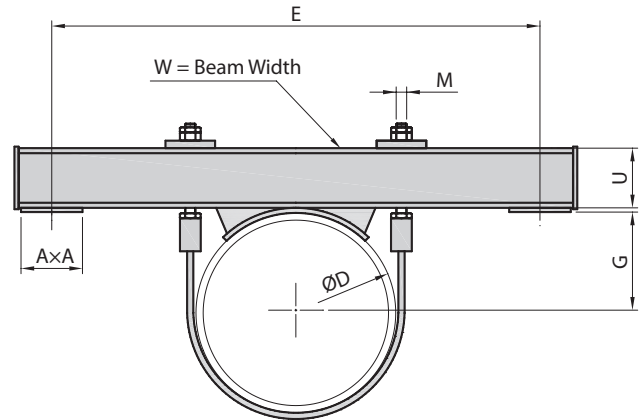
Versions

Normal load capacity – Version 1

Higher load capacity – Version 2

Dimensions (mm)

DN	D	Version	U	G	W	A	M	E
150	168.3	1	80	103	150	120	16	400–800
		2	100	103	160	140	16	400–1 000
200	219.1	1	80	129	150	120	16	400–800
		2	100	129	160	140	16	400–1 000
250	245	1	80	142	150	120	16	400–800
		2	100	142	160	140	16	400–1 000
250	273	1	80	160	150	120	16	400–800
		2	100	160	160	140	16	400–1 000
300	323.9	1	100	185	160	140	16	500–1 000
		2	140	185	190	160	24	500–1 200
350	355.6	1	100	201	160	140	16	500–1 000
		2	140	201	190	160	24	500–1 200
400	406.4	1	120	226	190	160	20	600–1 000
		2	160	226	200	180	30	600–1 200
450	457	1	120	252	190	160	20	600–1 000
		2	160	252	200	180	30	600–1 200
500	508	1	140	281	200	180	24	700–1 200
		2	180	281	230	200	30	700–1 400
550	559	1	140	307	200	180	24	700–1 200
		2	180	307	230	200	30	700–1 400
600	610	1	160	332	230	200	30	800–1 200
		2	200	332	240	220	36	800–1 500
650	660	1	160	363	230	200	30	800–1 200
		2	200	363	240	220	36	800–1 500
700	711	1	180	389	240	220	30	900–1 400
		2	220	389	260	240	42	900–1 800
750	762	1	180	414	240	220	30	900–1 400
		2	220	414	260	240	42	900–1 800
800	813	1	200	440	260	240	36	1 000–1 500
		2	240	440	310	280	42	1 000–2 000
900	914	1	200	490	260	220	36	1 000–1 500
		2	240	490	310	280	42	1 000–2 000



3 Beams

Beam Type 372

Permissible beam load depending on pitch E for various beam sizes

U mm	F _p (kN) Loads corresponding to beam pitch E (mm)									
	500	600	700	800	900	1 000	1 200	1 500	1 700	2 000
80	22.3	22.3	19.9	17.2	15.2	13.6	11.1	8.7		
100	22.3	22.3	22.3	22.3	22.3	20.6	16.9	13.1		
120	34.8	34.8	34.8	34.8	34.5	30.7	25.2	19.6	17.0	
140	50.2	50.2	50.2	50.2	49.1	43.9	35.9	28.0	24.3	
160	79.8	79.8	79.8	75.0	66.2	59.1	48.4	37.8	32.8	27.1
200		116.2	116.2	116.2	110.3	98.5	80.9	63.3	55.0	45.6
220		159.4	159.4	159.4	141.9	126.8	104.2	81.6	71.0	59.0
240		159.4	159.4	159.4	159.4	156.1	128.3	100.6	87.6	72.8

Permissible load

Values F_p and dimensions of connections have been determined for t_d = 250°C. No correction is applied to permissible load for lower temperatures.

3 Beams

Beam Type 381

Beam Type 381

Application

Beam comprising a welded H-section for double-rod hangers for horizontal piping. Temperature range up to 500 °C. Parts protruding outside insulation may reach contact temperature exceeding 60 °C! Two different sizes of beam sections. The bottom edge of beam is located right below the pipe, the assembly is suitable for space with low clearance heights.

Material designs

S235JR – group No. 1
 P265GH – group No. 2
 16Mo3 – group No. 3
 P275NL – group No. 5
 1.4301 – group No. 6

Marking

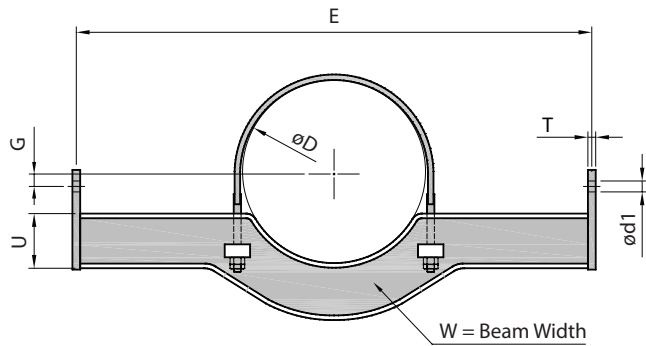
Typ	Version	DN	Material	Pitch
381	1/2	D	MS	E

Versions

Normal load capacity – Version 1
 Higher load capacity – Version 2

Dimensions (mm)

DN	D	Version	U	G	W	d1	T	M	E
150	168.3	1	80	43	150	14	10	12	500–1200
		2	100	33	160	18	12	16	500–1200
200	219.1	1	80	69	150	14	10	12	500–1200
		2	100	59	160	18	12	16	500–1200
250	245	1	80	82	150	14	10	16	500–1400
		2	100	72	160	18	12	20	500–1400
250	273	1	80	98	150	14	10	16	500–1500
		2	100	88	160	18	12	20	500–1500
300	323.9	1	100	113	160	18	10	16	500–1500
		2	140	103	190	22	12	20	500–1500
350	355.6	1	100	129	160	18	10	16	500–1500
		2	140	119	190	22	12	20	500–1500
400	406.4	1	120	144	190	22	12	20	600–1500
		2	160	144	200	22	12	24	600–1500
450	457	1	120	170	190	22	12	20	600–1500
		2	160	170	200	22	12	24	600–1500
500	508	1	140	197	200	22	12	20	700–1800
		2	180	187	230	26	15	24	700–1800
550	559	1	140	223	200	22	12	24	700–1800
		2	180	213	230	26	15	30	700–1800
600	610	1	160	238	230	26	15	24	800–2000
		2	200	238	240	35	20	30	800–2000
650	660	1	160	266	230	26	15	24	800–2000
		2	200	266	240	35	20	30	800–2000
700	711	1	180	292	240	26	15	30	900–2000
		2	220	292	260	35	20	36	900–2000
750	762	1	180	317	240	26	15	30	900–2000
		2	220	317	260	35	20	36	900–2000
800	813	1	200	343	260	35	20	30	900–2000
		2	240	323	310	42	25	36	900–2000
900	914	1	200	393	260	35	20	30	1 000–1 500
		2	240	373	310	42	25	36	1 000–2 000



3 Beams

Beam Type 381

Permissible beam load depending on pitch E for various beam sizes

DN	U mm	Version	Loads F_p corresponding to beam pitch E										
			500	600	700	800	900	1000	1200	1500	1800	2000	
150	168,3	1	68	57	49	43	38	34	29				
		2	121	101	87	76	67	61	51				
200	219,1	1	74	62	53	46	41	37	31				
		2	122	102	87	76	68	61	51				
250	245	1	104	86	74	65	58	52	43				
		2	146	122	105	91	81	73	61				
250	273	1	105	88	75	66	58	53	44				
		2	149	124	106	93	83	74	62				
300	323,9	1	129	107	92	80	71	64	54	43			
		2	227	189	162	142	126	113	94	76			
350	355,6	1	198	165	141	124	110	99	82	66			
		2	325	270	232	203	180	162	135	108			
400	406,4	1		194	167	146	130	117	97	78			
		2		422	362	317	282	253	211	169			
450	457	1		217	186	163	145	130	108	87			
		2		429	368	322	286	258	215	172			
500	508	1			260	228	202	182	152	121	101		
		2			351	308	273	246	205	164	137		
550	559	1			217	190	169	152	127	101	84		
		2			465	407	361	325	271	217	181		
600	610	1				217	193	173	144	116	96	87	
		2				452	402	362	302	241	201	181	
650	660	1				337	299	269	224	180	150	135	
		2				456	406	365	304	243	203	183	
700	711	1						302	271	226	181	151	136
		2						448	403	336	269	224	202
750	762	1						304	273	228	182	152	137
		2						452	406	339	271	226	203
800	813	1							275	229	183	153	137
		2							409	341	273	227	205

Permissible load

Values F_p have been determined for $t_d = 80^\circ\text{C}$. Higher design temperatures t_d will be subject to temperature correction factor $k_{T,M}$ from Table 3.2.

The beam is recommended for applications up to 450–500°C due to heat transmission into ambient environment. Parts protruding outside insulation may reach contact temperature exceeding 60 °C!

The beam can be also used inverted, as the clamp has been rated for load values included in the relevant tables. However, such non-standard design must be specified in detail.

3 Beams

Beam Type 382

Beam Type 382

Application

Beam comprising a welded H-section for double-spring supports for horizontal pipes in assemblies VS/CS5 or rigid struts for assemblies RS2. The beam can be used with piping located below or above beam. Temperature range up to 500 °C. Parts protruding outside insulation may reach contact temperature exceeding 60 °C! Two different sizes of beam sections. The bottom edge of beam is just under the pipe, the assembly is suitable for space with low clearance heights.

Material designs

- S235JR – group No. 1
- P265GH – group No. 2
- 16Mo3 – group No. 3
- P275NL – group No. 5
- 1.4301 – group No. 6

Marking

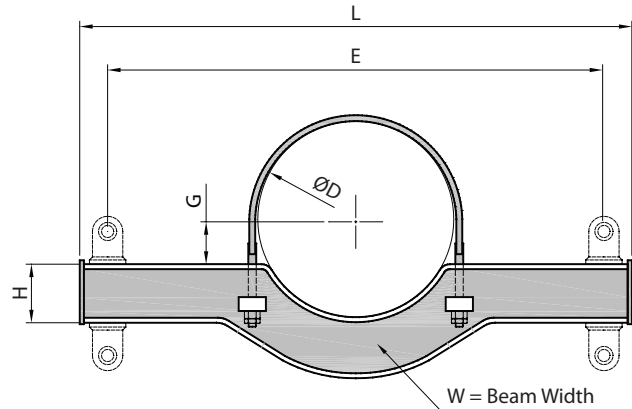
Type	Version	DN	Material	Pitch
382	1/2	D	MS	E2

Versions

- Normal load capacity – Version 1
- Higher load capacity – Version 2

Dimensions (mm)

DN	D	Version	U	G	W	E	L
150	168.3	1	90	60	110	500–1200	E + 100
		2	110	60	130	500–1200	E + 140
200	219.1	1	100	78	120	500–1200	E + 100
		2	120	78	140	500–1200	E + 140
250	273	1	110	97	130	500–1400	E + 120
		2	130	97	150	500–1400	E + 150
300	323.9	1	110	115	130	500–1500	E + 140
		2	130	115	150	500–1500	E + 160
350	355.6	1	120	126	140	500–1500	E + 140
		2	150	126	160	500–1500	E + 160
400	406.4	1	140	144	150	500–1500	E + 160
		2	180	144	180	500–1500	E + 180
450	457	1	150	162	160	600–1500	E + 160
		2	200	162	200	600–1500	E + 180
500	508	1	160	180	160	600–1500	E + 160
		2	200	180	200	600–1500	E + 180
600	610	1	160	216	160	700–1800	E + 160
		2	220	216	220	700–1800	E + 180
650	660	1	170	234	170	700–1800	E + 160
		2	220	234	220	700–1800	E + 180



3 Beams

Beam Type 382, Installation

Permissible beam load depending on pitch E for various beam sizes

DN	U mm	Version	Loads F_p corresponding to beam pitch E									
			500	600	700	800	900	1000	1200	1500	1800	2000
150	168,3	1	55	55	49	43	38	34	29			
		2	86	86	86	76	67	61	51			
200	219,1	1	55	55	53	46	41	37	31			
		2	86	86	86	76	68	61	51			
250	245	1	86	86	74	65	58	52	43			
		2	124	122	105	91	81	73	61			
250	273	1	86	86	75	66	58	53	44			
		2	124	124	106	93	83	74	62			
300	323,9	1	86	86	86	80	71	64	54	43		
		2	124	124	124	124	124	113	94	76		
350	355,6	1	124	124	124	124	110	99	82	66		
		2	198	198	198	198	180	162	135	108		
400	406,4	1		194	167	146	130	117	97	78		
		2		288	288	288	282	253	211	169		
450	457	1		194	186	163	145	130	108	87		
		2		288	288	288	286	258	215	172		
500	508	1			198	198	198	182	152	121	101	
		2			288	288	273	246	205	164	137	
550	559	1			198	190	169	152	127	101	84	
		2			288	288	288	288	271	217	181	
600	610	1				217	193	173	144	116	96	87
		2				395	395	362	302	241	201	181
650	660	1				288	288	269	224	180	150	135
		2				395	395	365	304	243	203	183
700	711	1					288	271	226	181	151	136
		2					395	395	336	269	224	202
750	762	1					288	273	228	182	152	137
		2					395	395	339	271	226	203
800	813	1						275	229	183	153	137
		2						395	341	273	227	205

Permissible load

Values F_p have been determined for $t_d = 80^\circ\text{C}$. Higher design temperatures t_d will be subject to temperature correction factor $k_{T,M}$ from Table 3.2.

The beam is recommended for applications up to $450\text{--}500^\circ\text{C}$ due to heat transmission into ambient environment. Parts protruding outside insulation may reach contact temperature exceeding 60°C !

Installation

Piping should be located as close to the beam centre as possible to prevent uneven load of rods. Each beam must be in horizontal position within tolerance of 1 %. Beams type 334 can be used for piping axially inclined up to 45° . We recommend to keep the support position within the range of $\pm 0.2 \times E$ from the beam centre, where E refers to pitch of hanger rods. Pipe support is field welded to the beam in accordance with assembly drawing. Galvanized beams for outdoor applications must be delivered with supports featuring beam stops (type G) to avoid site welding.

Hanger rods attached to the beam may not pass through insulation of piping above the beam!

Modification of beam by means of additional welded spherical pad type 932 is provided for hanger assemblies RH 4-6 and SH 11-19. Each pad must be right in the centre of beam span. The pad is attached to beam by means of field weld.