



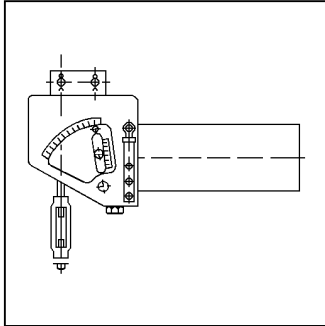
CONSTANT HANGERS



WITZENMANN

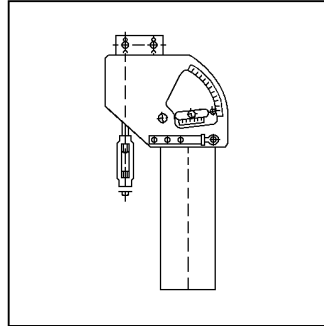


KHD



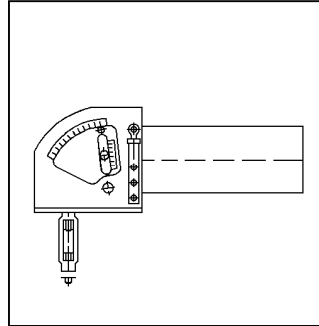
Horizontal constant hangers with bolts and turnbuckle included, are only suitable for direct connection to the hanging pension. Connection is performed by weld or clamp lugs. The main bolts is suitable for absorption of load including the weight of the hanger. The secondary bolt fixes the hanger in its position.

KVD



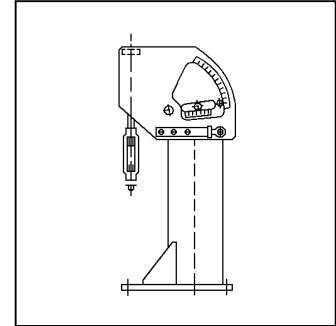
The vertical constant hanger with double lugs, bolts and turnbuckle included, is suitable only for direct connection to the superior suspension. This type will be selected in case of limited space.

KHS



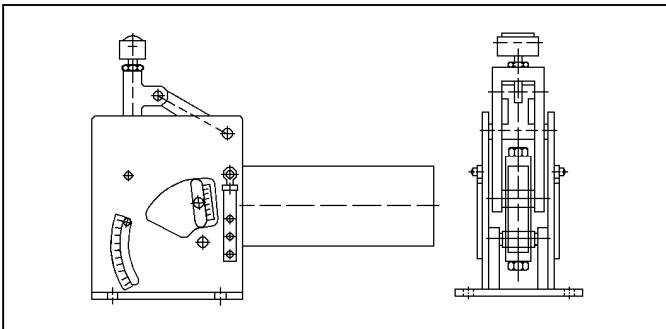
The horizontal constant hanger, set-on type, turnbuckle included, is suitable for screwed connection to the supporting steel, structure if the turnbuckle is to be located below the steel structure. The hanger is fixed with the spring housing parallel to the girders.

KVS



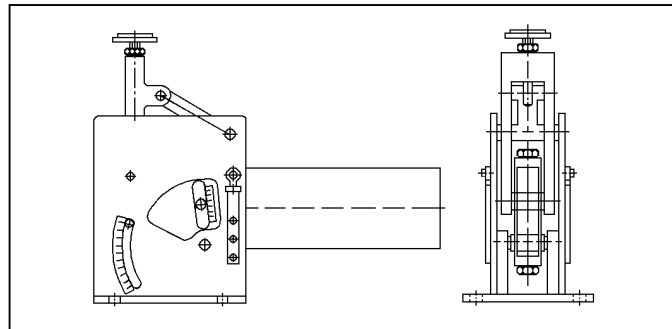
The vertical constant hanger, set-on type, turnbuckle included, is suitable for screwed connection to the supporting steel structure and the turnbuckle, placed in an easily accessible position above the steel structure. For large hangers, the overall height is reduced by placing the transmission housing between the spring columns.

KSR



The constant support with roll is suitable for screwed connection to the supporting structure. The load is carried by the top roller. For this purpose, the carrier component is equipped with a flat slide shoe acting as load-bearing part. The roll reduces the lateral force in rolling direction to approx. 3% of the load. This, however, requires exact positioning of the support into direction of the horizontal movement. There will be no influence on the load deviation of the support.

KSP



The constant support with supporting plate is suitable for screwed connection to the supporting structure. The load is carried by the PTFE-covered supporting plate. For this purpose, the supported component is equipped with a flat slide shoe acting as load-bearing part. The sliding surface of the shoe must be plated with stainless steel. This version allows universal relative movements at lateral forces of 6-10% of the load. The higher lateral force causes slight increase in friction ratio of the constant support.



Selection of constant hangers

The following table shows maximum required loads F_s -max. based on the nominal travel S_n for each CH-size. The required load allows load adjustment of +/-15% before the nominal load F_N will be reached. The most suitable hanger is selected on the basis of required nominal travel F_s by looking for the next CH-size having a maximum load F_s max higher than the required one. In this respect, a nominal travel s_n higher than required may be selected as long as the required load is obtained. If a subsequent load adjustment is dispensed with (e.g. with boiler hangers) the nominal load F_n may be chosen as the required load. The required load F_s required is factory-adjusted. For practical reasons, a possible hanger travel (nominal travel s_n) somewhat higher than the required travel value S_s will be selected. The required travel is usually positioned in the medium range of the nominal value, m i.e. it will be arranged symmetrically around the center of the nominal travel. The intended travel reserves S_r will then be equally available at both ends of the hanger travel. They should both amount to at least 10% of S_s , but to not less than 10 mm. The resulting locking position and installation dimension E depending on the direction of movement from cold position to hot position are: $E = E^* + 0.5 (S_n \pm S_s)$ for upwards(+) or downwards(-) movement. The installation dimension will be reduced for the type range KVS.

Example of requirement

Horizontal constant hanger with double lug required load: $F_s = 22$ kN. Required travel: $S_s = 148$ mm, upwards.
 Selection: F_s max 22kN, S_n $S_s + 2S_r = S_s \times 1.2 = 177.6$ mm

Result: Nominal travel 180 mm, CH-size 11, Load group LGV 24. **KHD 11.180.24**, with F_s max = 26.1 kN (adjusted to $F_s = 22$ kN), $S_n = 180$ mm (travel reserves $2 \times 11\%$), connection thread M24, installation dimension E , $E = E^* + 0.5 (S_n + S_s) = 740 + 0.5 (180 + 148) = 904$ mm. (see page 3.4.2.5).

Please indicate differing required locking positions!

Nom. travel S_n mm	CH-size																				Load group LGV	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20		
	Maximum required load F_{smax} in kN																					
50	0.47	0.94	1.85	3.72	6.48																Required loads can be reduced by up to 40 in our own factory (down to the next smaller CH-size. Load adjustment of up to +/-15% on installation by the	
60	0.39	0.78	1.54	3.10	5.40	9.30	15.4	22.8	37.7													
70	0.33	0.67	1.32	2.56	4.63	7.97	13.2	19.6	32.3	44.3	61.0											
80	0.29	0.59	1.16	2.33	4.05	6.98	11.5	17.1	28.2	38.8	58.8											
90	0.26	0.52	1.03	2.07	3.60	6.20	10.3	15.2	25.1	34.5	52.3	73.3	105									
100	0.23	0.47	0.92	1.86	3.24	5.58	9.24	13.7	22.6	31.0	47.0	66.0	94.1	140								
110	0.21	0.43	0.84	1.69	2.95	5.07	8.40	12.5	20.5	28.2	42.8	60.0	85.5	128							90	
120	0.20	0.39	0.77	1.55	2.70	4.65	7.70	11.4	18.8	25.9	39.2	55.0	78.4	117	154							
130	0.18	0.36	0.71	1.43	2.49	4.29	7.10	10.5	17.4	23.9	36.2	50.8	72.4	108	142	209						
140	0.17	0.33	0.66	1.33	2.31	3.99	6.60	9.78	16.1	22.2	33.6	47.1	67.2	100	132	200						
150	0.16	0.31	0.62	1.24	2.16	3.72	6.16	9.13	15.1	20.7	31.4	44.0	62.7	93.5	123	187	261					
160	0.15	0.29	0.58	1.16	2.03	3.49	5.77	8.56	14.1	19.4	29.4	41.2	58.8	87.7	116	175	246	348				80
170	0.14	0.28	0.54	1.09	1.91	3.28	5.43	8.06	13.3	18.3	27.7	38.8	55.3	82.5	109	165	232	330				
180	0.13	0.26	0.51	1.03	1.80	3.10	5.13	7.61	12.6	17.2	26.1	36.7	52.3	77.9	103	156	219	312	435			
190	0.12	0.25	0.49	0.98	1.71	2.94	4.86	7.21	11.9	16.3	24.8	34.7	49.5	73.8	97.4	147	207	295	414			
200	0.12	0.23	0.46	0.93	1.62	2.79	4.62	6.85	11.3	15.5	23.5	33.0	47.0	70.1	92.5	140	197	281	394			
225	0.10	0.21	0.41	0.83	1.44	2.48	4.10	6.09	10.0	13.8	20.9	29.3	41.8	62.3	82.2	124	175	249	350		90	
250	0.09	0.19	0.37	0.74	1.30	2.23	3.69	5.48	9.04	12.4	18.8	26.4	37.6	56.1	74.0	112	157	224	315	435		
275	0.09	0.17	0.34	0.68	1.18	2.03	3.36	4.98	8.21	11.3	17.1	24.0	34.2	51.0	67.3	102	143	204	286	408		
300	0.09	0.16	0.31	0.62	1.08	1.86	3.08	4.57	7.53	10.3	15.7	22.0	31.4	46.8	61.7	93.4	131	187	262	374		
325						1.72	2.84	4.21	6.95	9.55	14.5	20.3	28.9	43.2	56.9	86.2	121	173	242	345	80	
350						1.59	2.64	3.91	6.45	8.87	13.4	18.9	26.9	40.1	52.9	80.0	112	160	225	321		
375								3.65	6.02	8.28	12.5	17.6	25.1	37.4	49.3	74.7	105	150	210	299		
400								3.42	5.65	7.76	11.8	16.5	23.5	35.1	46.3	70.0	98.4	140	197	281		
425									3.22	5.32	7.30	11.1	15.5	22.1	33.0	43.5	65.9	92.6	132	185	264	72
450									3.04	5.02	6.90	10.5	14.7	20.9	31.2	41.1	62.2	87.5	125	175	249	
475									2.88	4.76	6.53	9.90	13.9	19.8	29.5	39.0	59.0	82.9	118	166	236	
500									2.74	4.52	6.21	9.41	13.2	18.8	28.1	37.0	56.0	78.7	112	157	224	
Load group LGV									12	16	16	20	24	24	30	36	42	48	56	64		
Load group LGV				12	16	20	24	30	36	42	48	56	64	72	80	90						
Connection thread (DIN ISC)		M12	M16	M20	M24	M30	M36	M42	M48	M56	M64	M72	M80	M90								
(inch)		1/2	5/8	3/4	1	1 1/8	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/2								
Nominal load in kN		7	12	20	33	50	70	100	132	180	240	300	400	500								
Max. required load in kN, ca.		6	10	17	29	43	61	87	115	157	209	261	348	435								



Description

Constant hangers and constant supports have constant load-bearing properties independent of travel.

Main features

Suitable for use in industrial plants as well as for interior and exterior application, on vessels and off-shore platforms (select appropriate corrosion protection).

Features for use especially in power plants have been certified by type approval acc. To VGB-R 510 L and KTA 3205.3.

Minimum adjustability of load after installation +/- 15% without negative influence on hanger travel. Maximum deviation from constant required load (load deviation) at straight pull 5% (friction percent-age lower than 3%).

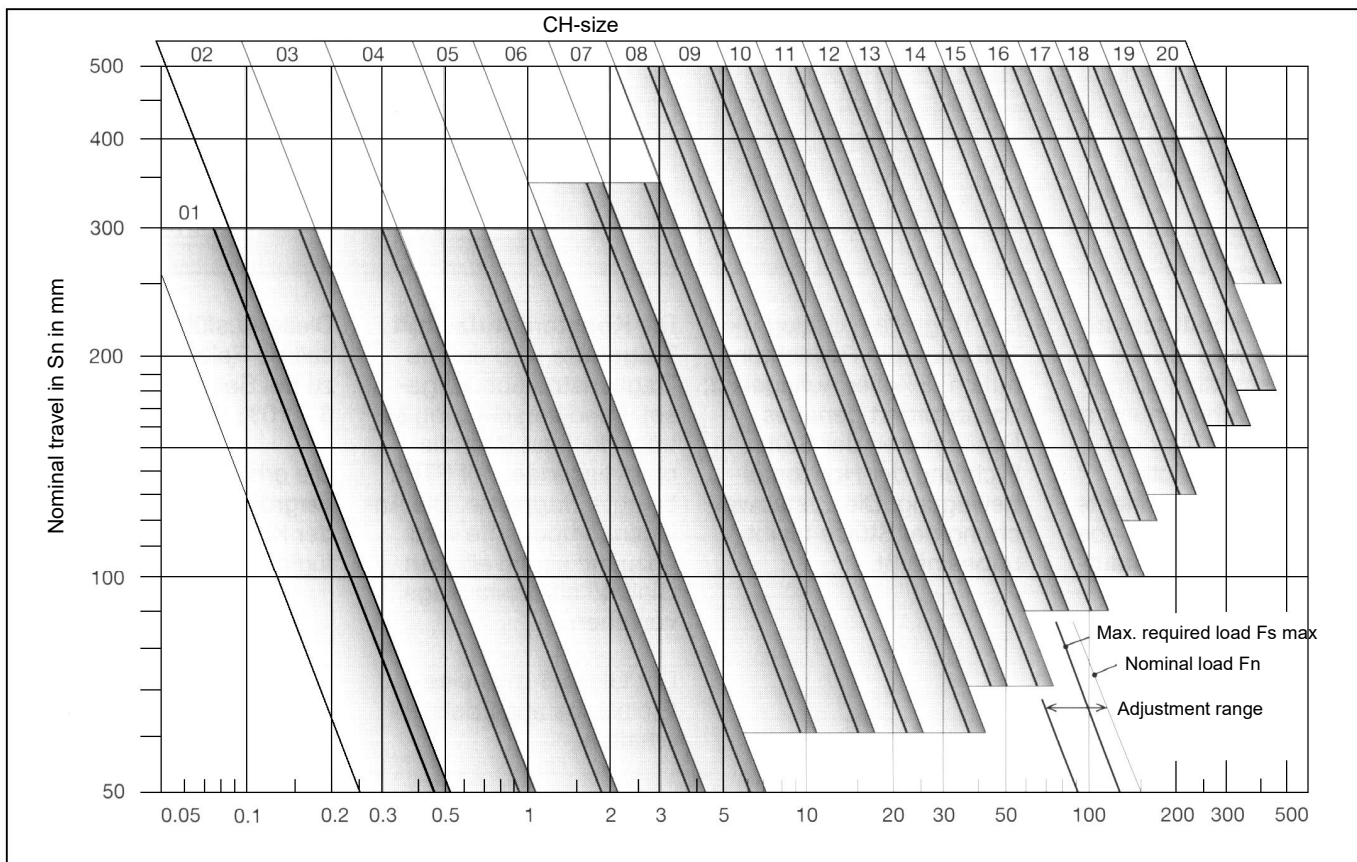
Acceptable angularity range of the tie rods in hangers 4° (except constant support). A load of 2.5 times the nominal load F_n can be sustained in extreme cases (e.g. hydraulic pressure test) without permanent deformation. In such cases, the not preset hangers travel downward to the lower support. The infinitely-variable locking device remains in connection with the housing for further use.

Maintenance-free

No wear and tear and no spare parts!

Load gradation

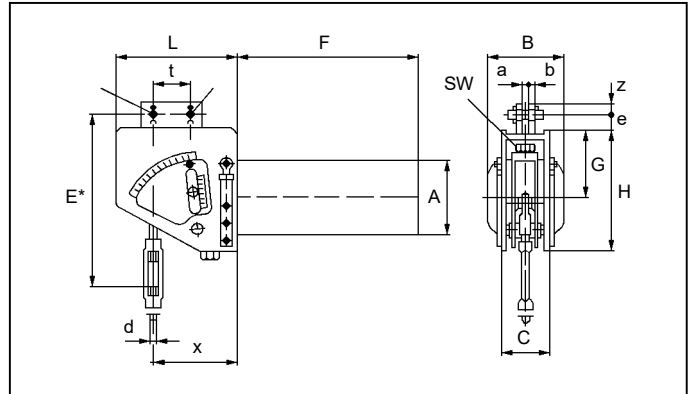
The total load range from 0.04 to 500 kN is covered by only twenty CH-sizes. An economical and technically suitable gradation has been achieved. Nominal travels from 50 to 500 mm in small determined steps may be selected. Higher travels upon request. Five versions/type ranges are available for each CH-size, thus ensuring easy selection of suitable hangers for each requirement.





**Horizontal Constant Hangers with double lugs
Type KHD**

Order example: KHD 11.180.24
(Standard)



CH-size Installation dimension E*/Load line position X Nominal travel Sn	01-05		06-07		08-09		10-11		12-13		14-15		16-17		18-20	
	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm
50	390	105														
60	385	115	545	115	650	155										
70	380	125	540	125	645	165	795	190								
80	375	135	535	135	640	175	790	200								
90	370	145	530	145	635	185	785	210	870	210						
100	365	155	525	155	630	195	780	220	865	220	1155	290				
110	360	165	520	165	625	205	775	230	860	230	1150	300				
120	355	170	515	170	620	210	770	235	855	235	1145	305				
130	350	180	510	180	615	220	765	245	850	245	1140	315	1295	315		
140	345	190	505	190	610	230	760	255	845	255	1135	325	1290	325		
150	340	200	500	200	605	240	755	265	840	265	1130	335	1285	335		
160	335	210	495	210	600	250	750	275	835	275	1125	345	1280	345	1565	400
170	330	220	490	220	595	260	745	285	830	285	1120	355	1275	355	1560	410
180	325	230	485	230	590	270	740	295	825	295	1115	365	1270	365	1555	420
190	320	235	480	235	585	275	735	300	820	300	1110	370	1265	370	1550	425
200	315	245	475	245	580	285	730	310	815	310	1105	380	1260	380	1545	435
225	305	270	460	270	570	310	720	335	805	335	1095	405	1250	405	1535	460
250	290	295	450	295	555	335	705	360	790	360	1080	430	1235	430	1520	485
275	280	315	435	315	545	355	695	380	780	380	1070	450	1225	450	1510	505
300	265	340	425	340	530	380	680	405	765	405	1055	475	1210	475	1495	530
325			410	365	520	405	670	430	755	430	1045	500	1200	500	1485	555
350			400	385	505	425	655	450	740	450	1030	520	1185	520	1470	575
375					495	450	645	475	730	475	1020	545	1175	545	1460	600
400					480	475	630	500	715	500	1005	570	1160	570	1445	625
425					470	495	620	520	705	520	995	590	1150	590	1435	645
450					455	520	605	545	690	545	980	615	1135	615	1420	670
475					445	545	595	570	680	570	970	640	1125	640	1410	695
500					430	565	580	590	665	590	955	660	1110	660	1395	715

Length of gear housing L								
Travel range Sn	50-130	60-150	60-225					
Length L	220	250	360					
Travel range Sn	140-225	170-250	250-325	70-250	90-275			
Length L	305	340	450	410	450			
Travel range Sn	250-300	275-350	350-425	275-375	300-400	100-275		
Length L	380	440	550	525	560	450		
Travel range Sn			450-500	400-500	400-500	300-500	130-500	160-500
Length L			630	650	660	740	770	900



Horizontal Constant Hangers with double lugs Type KHD

Standard version:

Hanger preset.

Housing hot-dip galvanized and connection parts galvanized.

Alkyd-painted spring.

Options:

Hanger not preset, terrosone coating of the spring, inch. thread.

CH-size	Main dimensions						Weight ca. kg
	A/B mm	C mm	F mm	G mm	H mm	SW mm	
01	Ø120	85	245	125	210	24	14
02	Ø120	85	245	125	210	24	14
03	Ø120	85	245	125	210	24	15
04	Ø120	85	245	125	210	24	15
05	Ø150	85	310	125	210	24	22
06	Ø150	95	310	170	255	30	32
07	Ø180	95	350	170	255	30	41
08	Ø230	120	580	215	350	36	74
09	Ø230	120	680	215	350	36	91
10	Ø230	140	680	240	400	46	110
11	Ø255	140	810	240	400	46	142
12	Ø255	160	810	280	450	55	206
13	Ø275	160	880	280	450	55	233
14	Ø510	210	870	365	610	55	470
15	500/420	210	960	365	610	55	530
16	620/510	225	1290	455	720	75	855
17	620/510	225	1290	455	720	75	945
18	1140/510	265	1610	630	1000	75	1700
19	1140/510	265	1610	630	1000	75	2500
20	1250/560	265	1830	630	1000	75	3000

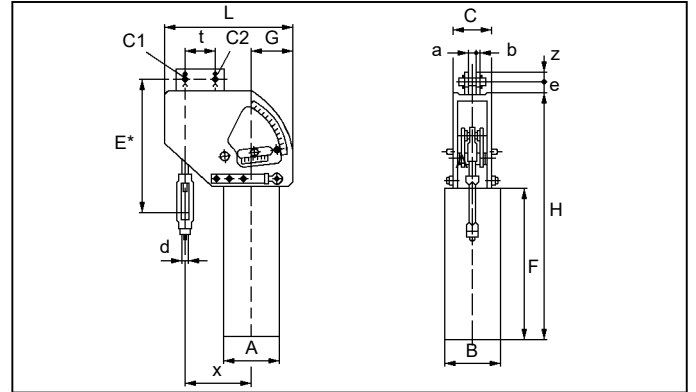
Load group LGV	Thread connection			Connecting dimensions				
	d mm	a mm	b mm	c1 mm	c2 mm	e mm	t mm	z mm
12	M12	14	6	12	12	25	70	20
16	M16	14	6	16	12	30	85	25
20	M20	16	6	20	16	35	95	30
24	M24	20	8	24	20	45	120	35
30	M30	25	10	33	24	55	120	45
36	M36	35	10	40	30	70	150	55
42	M42	35	15	45	33	80	160	60
48	M48	42	15	50	33	90	160	70
56	M56	42	20	60	40	105	230	85
64	M64	50	20	70	45	130	240	100
73	M72	50	20	80	45	140	270	110
80	M80	60	25	90	45	150	300	120
90	M90	60	25	100	45	160	300	130

The load group - of connecting parts LGV - based on CH-sizes and nominal travel - can be taken from the load/travel table.



**Vertical Constant Hangers with double lugs
Type KVD**

Order example: KVD 11.180.24
(Standard)



CH-size Installation dimension E*/Load line position X Nominal travel Sn	01-05		06-07		08-09		10-11		12-13		14-15		16-17	
	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm
50	400	100												
60	395	110	580	155	710	190								
70	390	120	575	160	705	200	860	215						
80	385	130	570	170	700	210	855	225						
90	380	140	565	180	695	220	850	235	935	245				
100	375	145	560	190	690	230	845	245	930	255	1220	365		
110	370	155	520	155	635	195	840	255	925	265	1215	375		
120	365	165	515	165	630	205	765	220	920	275	1210	385		
130	360	175	510	175	625	215	760	230	915	280	1205	395	1390	425
140	355	185	505	185	620	225	755	240	910	290	1200	405	1385	435
150	350	195	500	195	615	235	750	250	905	295	1195	415	1380	445
160	345	205	495	205	610	240	745	260	900	300	1190	420	1375	450
170	340	215	490	215	605	250	740	270	895	305	1185	430	1370	460
180	335	220	485	220	600	260	735	275	890	310	1180	440	1365	470
190	330	230	480	230	595	270	730	285	885	315	1175	450	1360	480
200	325	240	475	240	590	280	725	295	880	320	1170	460	1355	490
225	315	265	460	265	580	305	715	320	870	340	1160	485	1345	515
250	300	285	450	285	565	325	700	340	860	360	1150	510	1330	535
275	290	310	435	310	555	350	690	365	850	380	1140	535	1320	560
300	275	335	425	335	540	375	675	390	840	400	1130	560	1305	586
325			410	355	530	395	665	410	830	420	1120	590	1290	615
350			400	380	515	420	650	435	820	440	1110	615	1275	645
375					505	445	640	460	810	460	1100	640	1260	675
400					490	465	625	480	800	480	1090	665	1245	705
425					480	490	615	505	790	500	1080	690	1230	735
450					465	515	600	530	780	520	1070	715	1215	765
475					455	535	590	550	770	540	1060	740	1200	795
500					440	560	575	575	760	560	1050	765	1185	825

Length of gear housing L							
Travel range Sn	50-100	60-160	60-220				
Length L	310	390	505				
Travel range Sn	110-200	170-250	225-300	70-200	90-250		
Length L	400	470	600	550	630		
Travel range Sn	225-300	275-350	325-400	225-350	275-375	100-400	
Length L	490	570	700	690	750	940	
Travel range Sn			425-500	375-500	400-500	425-500	130-500
Length L			800	840	870	1030	1135



Vertical Constant Hangers with double lugs Type KVD

Standard version:

Hanger preset.
Housing hot-dip galvanized and connection parts galvanized.
Alkyd-painted spring.

Options:

Hanger not preset, terrosone coating of the spring, inch. thread.

CH-size	Main dimensions						Weight ca. kg
	A/B mm	C mm	F mm	G mm	H mm	SW mm	
01	Ø120	85	245	115	500	24	14
02	Ø120	85	245	115	500	24	14
03	Ø120	85	245	115	500	24	15
04	Ø120	85	245	115	500	24	15
05	Ø150	85	310	115	560	24	22
06	Ø150	95	310	140	600	30	32
07	Ø180	95	350	140	630	30	41
08	Ø230	120	580	180	1000	36	74
09	Ø230	120	680	180	1100	36	91
10	Ø230	140	680	200	1150	46	110
11	Ø255	140	810	200	1290	46	142
12	Ø255	160	810	230	1310	55	206
13	Ø275	160	880	230	1370	55	233
14	Ø510	210	870	330	1610	55	470
15	420/500	210	960	330	1700	55	530
16	510/620	225	1290	410	2140	75	855
17	510/620	225	1290	410	2140	75	945

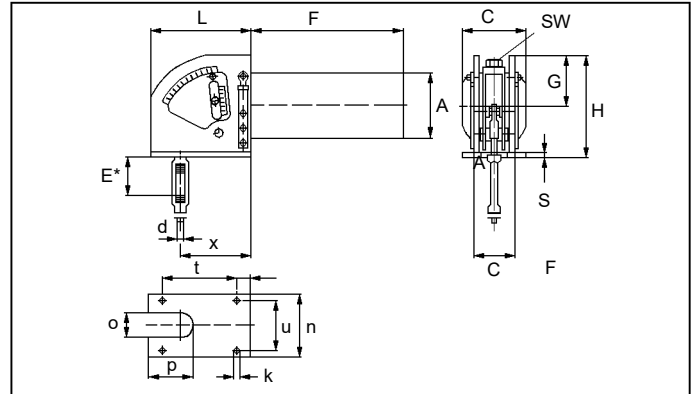
Load group LGV	Thread connection			Connecting dimensions				
	d mm	a mm	b mm	c1 mm	c2 mm	e mm	t mm	z mm
12	M12	14	6	12	12	25	70	20
16	M16	14	6	16	12	30	85	25
20	M20	16	6	20	16	35	95	30
24	M24	20	8	24	20	45	120	35
30	M30	25	10	33	24	55	120	45
36	M36	35	10	40	30	70	150	55
42	M42	35	15	45	33	80	160	60
48	M48	42	15	50	33	90	160	70
56	M56	42	20	60	40	105	230	85
64	M64	50	20	70	45	130	240	100
73	M72	50	20	80	45	140	270	110
80	M80	60	25	90	45	150	300	120
90	M90	60	25	100	45	160	300	130

The load group - of connecting parts LGV - based on CH-sizes and nominal travel - can be taken from the load/travel table.



**Horizontal Constant Hangers set-on type
Type KHS**

Order example: KHS 11.180.24
(Standard)



CH-size Installation dimensions E*/Load line position X Nominal travel Sn	01-05		06-07		08-09		10-11		12-13		14-15		16-17		18-20	
	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm
50	135	105														
60	135	115	185	115	200	155										
70	135	125	185	125	200	165	235	190								
80	135	135	185	135	200	175	235	200								
90	135	145	185	145	200	185	235	210	250	210						
100	135	155	185	155	200	195	235	220	250	220	330	290				
110	135	165	185	165	200	205	235	230	250	230	330	300				
120	135	170	185	170	200	210	235	235	250	235	330	305				
130	135	180	185	180	200	220	235	245	250	245	330	315	320	315		
140	135	190	185	190	200	230	235	255	250	255	330	325	320	325		
150	135	200	185	200	200	240	235	265	250	265	330	335	320	335		
160	135	210	185	210	200	250	235	275	250	275	330	345	320	345	325	400
170	135	220	185	220	200	260	235	285	250	285	330	355	320	355	325	410
180	135	230	185	230	200	270	235	295	250	295	330	365	320	365	325	420
190	135	235	185	235	200	275	235	300	250	300	330	370	320	370	325	425
200	135	245	185	245	200	285	235	310	250	310	330	380	320	380	325	435
225	135	270	185	270	200	310	235	335	250	335	330	405	320	405	325	460
250	135	295	185	295	200	335	235	360	250	360	330	430	320	430	325	485
275	135	315	185	315	200	355	235	380	250	380	330	450	320	450	325	505
300	135	340	185	340	200	380	235	405	250	405	330	475	320	475	325	530
325			185	365	200	405	235	430	250	430	330	500	320	500	325	555
350			185	385	200	425	235	450	250	450	330	520	320	520	325	575
375					200	450	235	475	250	475	330	545	320	545	325	600
400					200	475	235	500	250	500	330	570	320	570	325	625
425					200	495	235	520	250	520	330	590	320	590	325	645
450					200	520	235	545	250	545	330	615	320	615	325	670
475					200	545	235	570	250	570	330	640	320	640	325	695
500					200	565	235	590		590	330	660	320	660	325	715

Length of gear housing L								
Travel range Sn	50-130	60-160	60-225					
Length L	220	240	375					
Height H	265	295	435					
Bore pitch t	170	160	275					
Travel range Sn	140-225	170-250	250-325	70-250	90-275			
Length L	320	340	460	425	455			
Height H	320	340	480	480	545			
Bore pitch t	270	260	360	265	255			
Travel range Sn	250-300	275-350	350-425	275-375	300-400	100-275	130-350	
Length L	390	440	560	525	560	635	680	
Height H	355	390	535	530	595	685	775	
Bore pitch t	340	360	460	365	360	435	440	
Travel range Sn			450-500	400-500	425-500	300-500	375-500	160-500
Length L			630	620	625	700	750	900
Height H			575	600	635	775	835	1125
Bore pitch t			530	460	420	500	510	600



**Horizontal Constant Hangers set-on type
Type KHS**

Standard version:

Hanger preset.
Housing hot-dip galvanized and connection parts galvanized.
Alkyd-painted spring.

Options:

Hanger not preset, terrosone coating of the spring, inch. thread.

CH-size	Main dimensions							Connecting dimensions				SW mm	Weight ca. kg
	A/B mm	C mm	F mm	G mm	e mm	k mm	n mm	o mm	p mm	s mm	u mm		
01	Ø120	85	245	115	25	14	160	65	170	8	130	24	18
02	Ø120	85	245	115	25	14	160	65	170	8	130	24	18
03	Ø120	85	245	115	25	14	160	65	170	8	130	24	19
04	Ø120	85	245	115	25	14	160	65	170	8	130	24	19
05	Ø150	85	310	115	25	14	160	65	170	8	130	24	23
06	Ø150	95	310	125	40	18	190	70	180	10	150	30	32
07	Ø180	95	350	125	40	18	190	70	180	10	150	30	43
08	Ø230	120	580	180	50	23	220	85	285	12	170	36	76
09	Ø230	120	680	180	50	23	220	85	285	12	170	36	84
10	Ø230	140	680	190	80	23	260	105	310	12	200	46	118
11	Ø250	140	810	190	80	23	260	105	310	12	200	46	150
12	Ø250	160	810	220	100	23	300	120	340	15	240	55	230
13	Ø275	160	880	220	100	23	300	120	340	15	240	55	250
14	Ø510	210	870	280	100	27	380	165	445	20	300	55	455
15	510/420	210	960	280	100	27	380	165	445	20	300	55	550
16	620/510	225	1290	320	120	27	380	180	475	20	300	75	830
17	620/510	225	1290	320	120	27	380	180	475	20	300	75	1130
18	1140/510	265	1610	430	150	33	480	225	530	25	380	75	1800
19	1140/510	265	1610	430	150	33	480	225	530	25	380	75	2500
20	1250/560	265	1610	430	150	33	480	225	530	25	380	75	3000

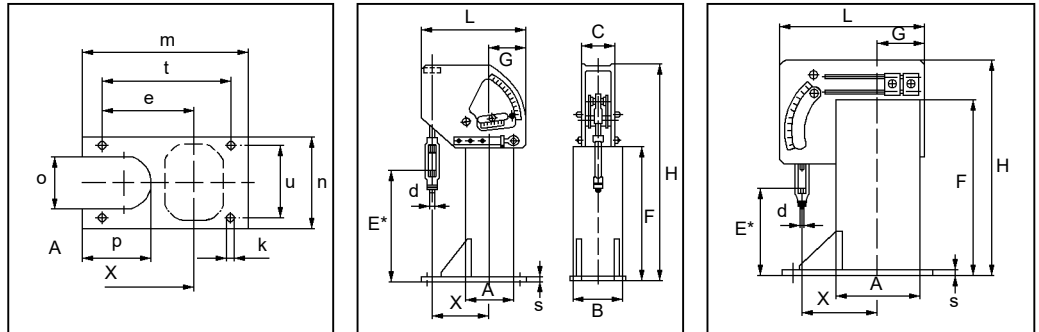
Load group LGV	Thread connection d mm
12	M12
16	M16
20	M20
24	M24
30	M30
36	M36
42	M42
48	M48
56	M56
64	M64
72	M72
80	M80
90	M90

The load group - of connecting parts LGV - based on CH-size and nominal travel - can be taken from the load/travel table.



**Vertical Constant Hangers set-on type
Type KVS**

**Order example:
KVS 11.180.24
(Standard)**



CH-size Installation dimension E*/Load Nominal travel Sn	01-05		06-07		08-09		10-11		12-13		14-15		16-17		18-20	
	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm
50	159	100														
60	200	110	85	155	430	190										
70	205	120	90	160	435	200	445	215								
80	210	130	95	170	440	210	450	225								
90	215	140	100	180	445	220	455	235	545	245						
100	220	145	105	190	450	230	460	245	550	255	595	365				
110	225	155	145	155	505	195	465	255	555	265	600	375				
120	230	165	150	165	510	205	540	220	560	275	605	385				
130	235	175	155	175	515	215	545	230	565	280	610	395	905	425		
140	240	185	160	185	520	225	550	240	570	290	615	405	910	435		
150	245	195	165	195	525	235	555	250	665	250	620	415	915	445		
160	250	205	170	205	530	240	560	260	670	260	625	420	920	450	740	365
170	255	215	175	215	535	250	565	270	675	270	630	430	925	460	745	375
180	260	220	180	220	540	260	570	275	680	275	635	440	930	470	750	385
190	265	230	185	230	545	270	575	285	685	285	640	450	935	480	755	395
200	270	240	190	240	550	280	580	295	690	295	645	460	940	490	760	405
225	285	265	205	265	565	305	595	320	700	320	660	485	950	515	775	425
250	295	285	215	285	575	325	605	340	715	340	720	395	965	535	785	450
275	310	310	230	310	590	350	620	365	725	365	735	420	975	560	800	475
300	320	335	240	335	600	375	630	390	740	390	745	445	990	585	810	495
325			255	355	615	395	645	410	750	410	760	465	1060	465	825	520
350			265	380	625	420	655	435	765	435	770	490	1075	490	835	545
375					640	445	670	460	775	460	785	515	1085	515	850	565
400					650	465	680	480	790	480	795	535	1100	535	860	590
425					665	490	695	505	800	505	810	560	1110	560	875	615
450					675	515	705	530	815	530	820	585	1125	585	885	635
475					690	535	720	550	825	550	835	605	1135	605	900	660
500					700	560	730	575	840	575	845	630	1150	630	910	685

Length of gear housing L								
Travel range Sn	50-100	60-165	60-200					
Length L	310	390	505					
Bore to center E	170	225	290					
Length of shoe m	285	375	455					
Bore pitch t	235	325	385					
Travel range Sn	110-200	170-250	225-300	70-200	90-250			
Length L	400	470	600	550	630			
Bore to center E	255	305	385	690	360			
Length of shoe m	370	455	550	455	570			
Bore pitch t	320	405	480	630	490			
Travel range Sn	225-300	275-350	325-400	225-350	275-350			
Length L	490	570	700	690	750			
Bore to center E	350	405	485	455	480			
Length of shoe m	465	555	650	630	690			
Bore pitch t	415	505	580	560	610			
Travel range Sn			425-500	375-500	400-500	100-500	130-500	160-500
Length L			800	840	870	940	1135	1250
Bore to center E			585	615	600	655	680	750
Length of shoe m			750	790	810	985	1050	1300
Bore pitch t			680	720	730	885	950	1200



**Vertical Constant Hangers set-on type
Type KVS**

Standard version:

Hanger preset.
Housing hot-dip galvanized and connection parts galvanized.
Alkyd-painted spring.

Options:

Hanger not preset, terrosone coating of the spring, inch. thread.

CH-size	Main dimensions							Connecting dimensions				SW mm	Weight ca. kg
	A/B mm	C mm	F mm	G mm	H mm	k mm	n mm	o mm	p mm	s mm	u mm		
01	Ø120	85	310	115	560	14	180	80	140	8	130	24	18
02	Ø120	85	310	115	560	14	180	80	140	8	130	24	18
03	Ø120	85	310	115	560	14	180	80	140	8	130	24	19
04	Ø120	85	310	115	560	14	180	80	140	8	130	24	19
05	Ø150	85	310	115	560	14	180	80	140	8	130	24	21
06	Ø150	95	345	140	630	18	230	100	170	10	180	30	30
07	Ø180	95	345	140	630	18	230	100	170	10	180	30	52
08	Ø230	120	670	180	1090	23	300	160	225	12	230	36	80
09	Ø230	120	670	180	1090	23	300	160	225	12	230	36	96
10	Ø230	140	770	200	1240	23	320	180	240	12	250	46	114
11	Ø250	140	770	200	1240	23	320	180	240	12	250	46	145
12	Ø250	160	900	230	1400	23	360	200	250	15	280	55	225
13	Ø275	160	900	230	1400	23	360	200	250	15	280	55	275
14	Ø510	210	980	330	1720	27	580	260	450	20	480	55	480
15	510/420	210	980	330	1720	27	580	260	490	20	480	55	530
16	620/510	225	1310	410	2160	27	700	340	470	20	600	75	830
17	620/510	225	1310	410	2160	27	700	340	470	20	600	75	1130
18	1140/510	305	1660	390	1950	33	950	300	550	25	850	75	1800
19	1140/510	305	1660	390	1950	33	950	300	550	25	850	75	2500
20	1250/560	305	1850	430	1950	33	950	300	550	25	850	75	3000

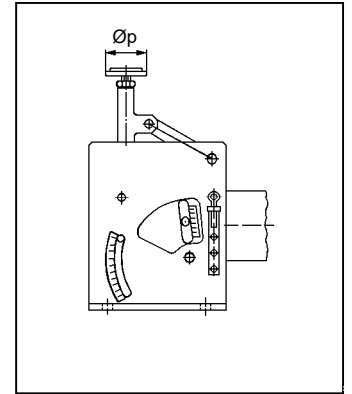
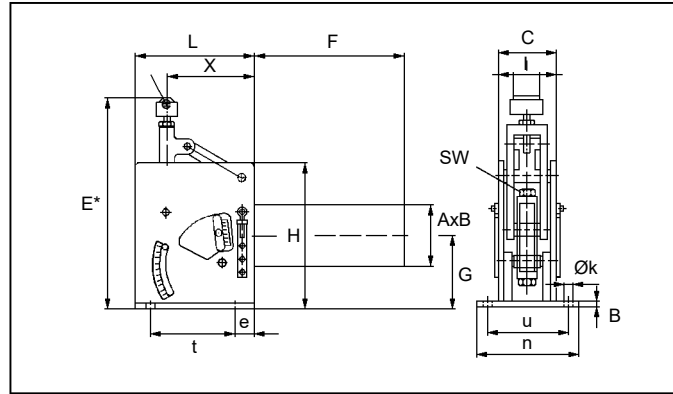
Load group LGV	Thread connection d mm
12	M12
16	M16
20	M20
24	M24
30	M30
36	M36
42	M42
48	M48
56	M56
64	M64
72	M72
80	M80
90	M90

The load group - of connecting parts LGV - based on CH-size and nominal travel - can be taken from the load/travel table.



Constant Support with supporting roll
Type KSR
Type KSP

Order example:
KSR 12.190.00
(Standard)



CH-size	Main dimensions						Connecting dimensions										SW	Weight
	A/B mm	C mm	F mm	G mm	H mm	L mm	d mm	e mm	k mm	l mm	n mm	p mm	s mm	t mm	u mm	ca. kg		
01	Ø120	145	245	170	315	230	50	40	14	65	210	50	6	150	180	24	23	
02	Ø120	145	245	170	315	230	50	40	14	65	210	50	6	150	180	24	23	
03	Ø120	145	245	170	315	230	50	40	14	65	210	50	6	150	180	24	23	
04	Ø120	145	245	170	315	230	50	40	14	65	210	50	6	150	180	24	23	
05	Ø150	145	310	175	315	230	50	40	14	65	210	50	8	150	180	24	28	
06	Ø150	175	310	195	355	250	60	50	18	90	260	60	10	150	220	30	32	
07	Ø180	175	350	195	355	250	60	50	18	90	260	60	10	150	220	30	52	
08	Ø230	195	580	295	500	350	60	50	23	90	300	100	12	250	250	36	91	
09	Ø230	195	680	295	500	350	60	50	23	90	300	100	12	250	250	36	100	
10	Ø230	240	680	340	580	420	90	60	23	120	360	120	12	300	300	46	142	
11	Ø250	240	810	340	580	420	90	60	23	120	360	120	12	300	300	46	180	
12	Ø250	250	810	350	625	450	90	60	23	120	400	140	15	330	320	55	276	
13	Ø275	250	880	350	625	450	90	60	23	120	400	140	15	330	320	55	300	
14	Ø510	350	870	485	835	610	110	100	27	150	500	180	20	410	440	55	546	
15	510/420	350	960	485	835	610	110	100	27	150	500	180	20	410	440	55	660	
16	620/510	365	1290	535	960	680	140	120	27	190	520	220	20	440	440	75	996	
17	620/510	365	1290	535	960	680	140	120	27	190	520	220	20	440	440	75	1130	

CH-size	01-05		06-07		08-09		10-11		12-13		14-15		16-17	
Installation dimension E*/Load line position X														
Nominal travel Sn	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm	E* mm	X mm
50	480	105												
60	485	115	545	115	685	155								
70	490	125	550	125	690	165								
80	495	135	555	135	695	175	825	200						
90	500	145	560	145	700	185	830	210	870	210				
100	505	155	565	155	705	195	835	220	875	220				
110	510	165	570	165	710	205	840	230	880	230	1165	300		
120	515	170	575	170	715	210	845	235	885	235	1170	305		
130	520	180	580	180	720	220	850	245	890	245	1175	315		
140			585	190	725	230	855	255	895	255	1180	325	1305	325
150			590	200	730	240	860	265	900	265	1185	335	1310	335
160			595	210	735	250	865	275	905	275	1190	345	1315	345
170					740	260	870	285	910	285	1195	355	1320	355
180					745	270	875	295	915	295	1200	365	1325	365
190					750	275	880	300	920	300	1205	370	1330	370
200					755	285	885	310	925	310	1210	380	1335	380
225							900	335	940	335	1225	405	1350	405
250							910	360	950	360	1235	430	1360	430
275									965	380	1250	450	1375	450
300											1260	475	1385	475
325											1275	500	1400	500
350													1410	520



Constant Hangers

The constant support is mounted on the supporting structure and bears the load by means of a roll or a supporting plate covered with PTFE. Both versions must be equipped with a flat sliding shoe. For the version with supporting roll, type range KSR, one of the advantages is that the load remains constant since the lateral force in rolling direction is less than 3% of the load, but this support must be aligned to the horizontal movement of the supported component. The advantage of the version with supporting plate, type range KSP, is that it, unlike the version with supporting roll, allows universal relative movements, but it has a higher lateral friction force (6-10% of the load) which leads to a slightly higher load deviation in the constant support. The sliding shoe must have a sliding surface of stainless steel.

Standard version:

- support preset
- galvanized housing and connecting parts (large housings hot-dip galvanized)
- alkyd-painted spring

Variants:

- support not preset
- hot-dip galvanized housing and coating of the spring

Load/travel table (see page 3.4.2.3)

Nom. travel Sn mm	CH-size																
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
	Max required load Fs max in kN																
50	0.47	0.94	1.85	3.72													
60	0.39	0.78	1.54	3.10	5.40	9.30	15.4	22.8	37.7								
70	0.33	0.67	1.32	2.56	4.63	7.97	13.2	19.6	32.3								
80	0.29	0.59	1.16	2.33	4.05	6.98	11.5	17.1	28.2	38.8	58.8						
90	0.26	0.52	1.03	2.07	3.60	6.20	10.3	15.2	25.1	34.5	52.3	73.3	105				
100	0.23	0.47	0.92	1.86	3.24	5.58	9.24	13.7	22.6	31.0	47.0	66.0	94.1				
110	0.21	0.43	0.84	1.69	2.95	5.07	8.40	12.5	20.5	28.2	42.8	60.0	85.5	128	168		
120	0.20	0.39	0.77	1.55	2.70	4.65	7.70	11.4	18.8	25.9	39.2	55.0	78.4	117	154		
130	0.18	0.36	0.71	1.43	2.49	4.29	7.10	10.5	17.4	23.9	36.2	50.8	72.4	108	142		
140						3.99	6.60	9.78	16.1	22.2	33.6	47.1	67.2	100	132	200	281
150						3.72	6.16	9.13	15.1	20.7	31.4	44.0	62.7	93.5	123	187	261
160						3.49	5.77	8.56	14.1	19.4	29.4	41.2	58.8	87.7	116	175	246
170								8.06	13.3	18.3	27.7	38.8	55.3	82.5	109	165	232
180								7.61	12.6	17.2	26.1	36.7	52.3	77.9	103	156	219
190								7.21	11.9	16.3	24.8	34.7	49.5	73.8	97.4	147	207
200								6.85	11.3	15.5	23.5	33.0	47.0	70.1	92.5	140	197
225										13.8	20.9	29.3	41.8	62.3	82.2	124	175
250										12.4	18.8	26.4	37.6	56.1	74.0	112	157
275												24.0	34.2	51.0	67.3	102	143
300														46.8	61.7	93.4	131
325														43.2	56.9	86.2	121
350																80.0	112

Marking, corrosion and package

Marking

Hangers and supports have name plates stenciled with type and adjustment values. Nuts and bolts are marked with producer's material specifications. The marking of forged threaded parts such as clevis, eye nuts, turnbuckles up to M48 consists of trademark, load group and material. Other connecting parts are marked respectively with punching figures if expressly agreed upon.

Additional marking e.g. indicating installation position is carried out upon agreement.

Corrosion protection

The suitable corrosion protection depends on the product type and the respective application. We deliver each product of this catalogue with a standard corrosion protection. Further corrsions are available as options and must be selected by the customers. In all cases, the surface protection is applied according to technical standards or to respective specifications.

Packing

Delivery of products is carried out of wooden pallets, in skeleton boxes or cardboard boxes, depending on type, size and weight. Other packing only upon request.



Manufacture, inspection and testing

Manufacture and production

Almost our whole product range is manufactured at our own plant where all facilities required are at our disposal.

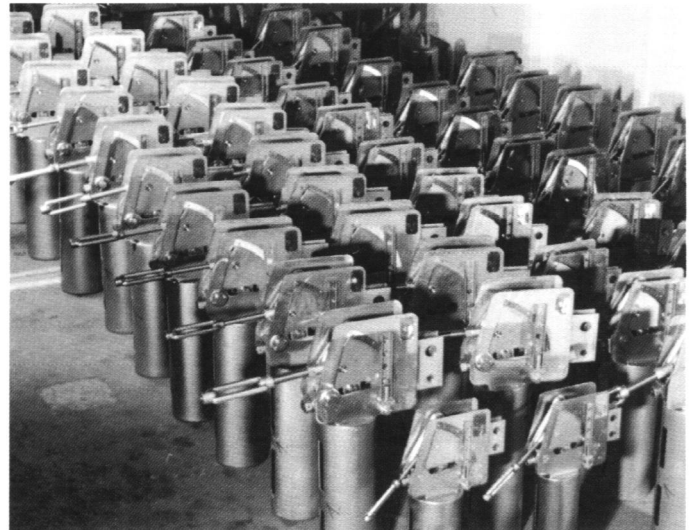
Existing production facilities

- Saw-cuttings and flame-cutting machines
- Chamfering, punching and forming presses of different sizes
- Clamp production lines for a rational clamp production
- Annealing furnace
- Machines for metal-cutting
- Welding robots, automatic welding machines, manual welding sets
- Shot-blasting and spraying machines for surface treatment
- Testing devices

Only materials according to DIN EN with certified chemical and physical properties will be processed. An abundant stock ensures short delivery periods.

Testing

In addition to over-all receiving inspections of the supplied materials, in-process tests such as dimensional inspections, visual inspections and surface crack detection will be carried out. Final inspections of the finished products ensure that only faultless products will leave our factory. Function inspections on calibrated test stands with electronic measuring of load and travel are standard inspections for hangers and supports.

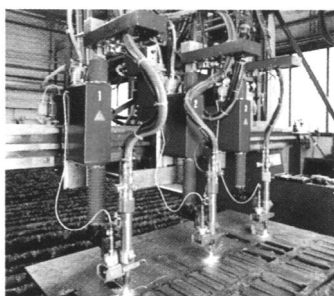


Inspection

These inspections certify the specified load/travel behaviour and the compliance with acceptable tolerances. Upon agreement, we enclose diagrams and functional behaviour records.

Approval

The company has been given the "Grosser Befähigungsnachweis" (welding capability certificate) according to DIN EN 18800 and the HPO license. We only employ qualified welders according to DIN EN 1418 who are permanently supervised by the supervising department and the welding engineer.



03-17-242

Technical modifications reserved