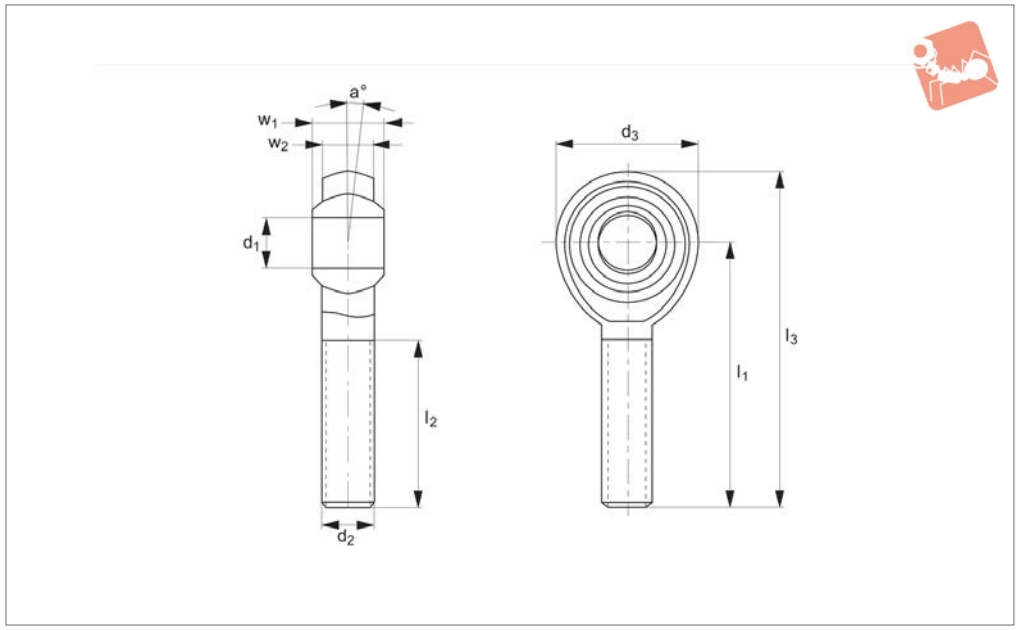
Low Cost Rod End - Male
with teflon bearing race



65704

Material
Ball: low carbon steel, surface hardened. Silver zinc plated.
Housing: low carbon steel, zinc plated for corrosion resistance.
Bearing race: teflon.
Brass bearing with PTFE composite lining.

Technical Notes
Standard thread is right hand thread.

Order No.	Thread hand	d_1 tol. H7	l_1	d_2	d_3	l_2	a °	l_3	w_1	w_2	Static load C_0 kN max.
65704.W0005	Right	5	33	M5	18	19	13	42	8	6.00	4.8
65704.W0006	Right	6	36	M6	20	21	13	46	9	6.75	6.2
65704.W0008	Right	8	42	M8	24	25	14	54	12	9.00	10.3
65704.W0010	Right	10	48	M10	28	28	13	62	14	10.50	14.4
65704.W0012	Right	12	54	M12	32	32	13	70	16	12.00	19.2
65704.W0016	Right	16	66	M16	42	37	15	87	21	15.00	31.2
65704.W0505	Left	5	33	M5	18	19	13	42	8	6.00	3.9
65704.W0506	Left	6	36	M6	20	21	13	46	9	6.75	6.0
65704.W0508	Left	8	42	M8	24	25	14	54	12	9.00	10.0
65704.W0510	Left	10	48	M10	28	28	13	62	14	10.50	16.0
65704.W0512	Left	12	54	M12	32	32	13	70	16	12.00	23.0
65704.W0516	Left	16	66	M16	42	37	15	87	21	15.00	44.0

Parts overview

Heavy Duty Rod Ends: integral spherical plain bearings - series K and series E

Male and female rod ends, maintenance free. These are our most popular range of heavy duty rod ends. Bore diameters 5mm up to 30mm.

Spherical Plain Bearings: steel and stainless steel

65974 is our lowest cost, most popular option spherical bearing. Stainless steel version 65976 requires maintenance. 65974 is maintenance free. Bore diameters 5mm up to 30mm.

Heavy Duty Rod Ends: integral ball bearings - series K and series E

Male and female rod ends. Different bore sizes in relation to the thread size. All require maintenance. Bore diameters 6mm up to 30mm.

Stainless Steel Heavy Duty Rod Ends: integral spherical plain bearings

Male and female rod ends maintenance free.

Low Cost Rod Ends: with spherical plain bearing

These are our most popular male and female rod ends. Maintenance free. Female-bore diameters 5mm up to 12mm. Male-bore diameters 5mm up to 16mm.

Rod Ends with Studs

Steel and Stainless steel, male and female, maintenance free. Sizes M6 up to M16.

see our website for our full range: wixroyd.com

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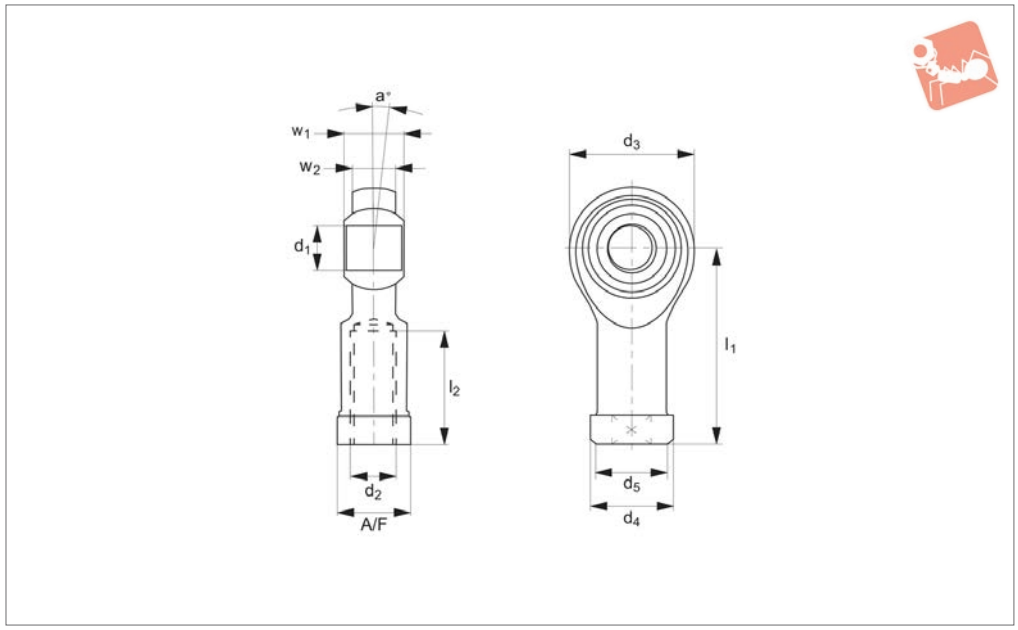
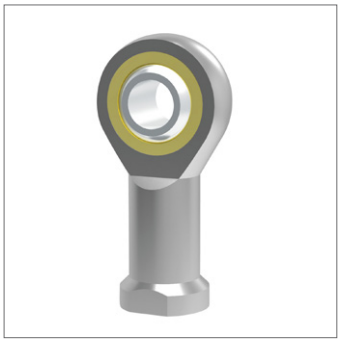
Low Cost Rod End - Female
with teflon bearing race





65724

Material
Ball: low carbon steel, surface hardened. Silver zinc plated.
Housing: low carbon steel, zinc plated for corrosion resistance.
Bearing race: teflon.
Brass bearing with PTFE composite lining.

Technical Notes
Standard thread is right hand thread.

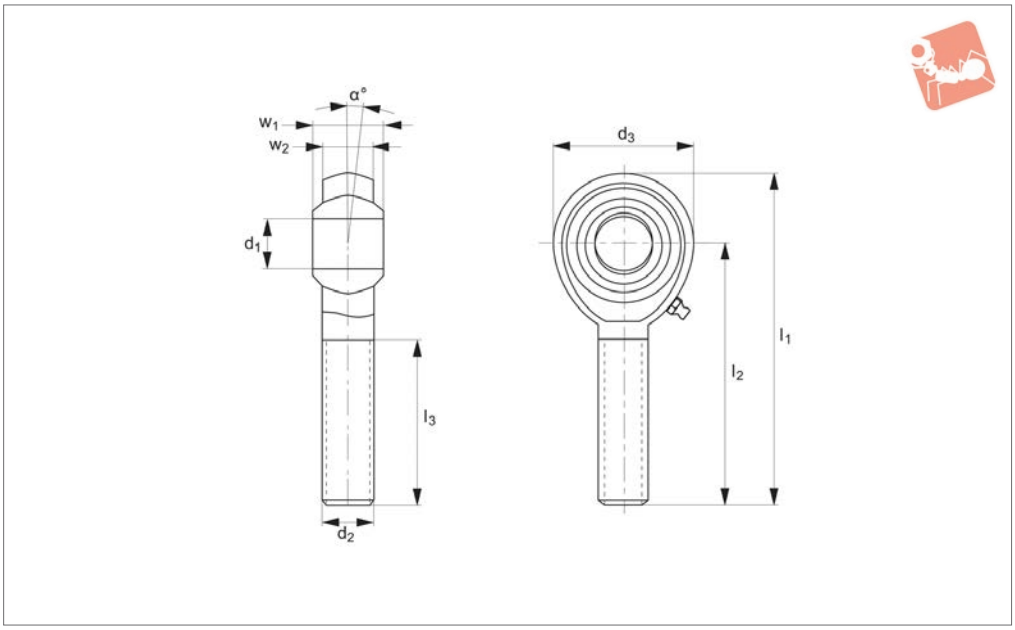
Important Notes
Housing styles are subject to change.

Order No.	Thread hand	d_1 tol. H7	l_1	d_2	d_3	d_4	d_5	l_2	w_1	w_2	A/F	a °	Static load C_0 kN max.
65724.W0005	Right	5	27	M5	18	11	9	10	8	6	9	13	4.8
65724.W0006	Right	6	30	M6	20	13	10	12	9	6.75	11	13	6.2
65724.W0008	Right	8	36	M8	24	16	12.5	16	12	9	13	14	10.3
65724.W0010	Right	10	43	M10	28	19	15	20	14	10.5	17	13	14.4
65724.W0012	Right	12	50	M12	34	22	17.5	22	16	12	19	13	19.2
65724.W0016	Right	16	64	M16	42	27	22	28	21	15	22	15	31.2
65724.W0505	Left	5	27	M5	18	11	9	10	8	6	9	13	4.8
65724.W0506	Left	6	30	M6	20	13	10	12	9	6.75	11	13	6.2
65724.W0508	Left	8	36	M8	24	16	12.5	16	12	9	13	14	10.3
65724.W0510	Left	10	43	M10	28	19	15	20	14	10.5	17	13	14.4
65724.W0512	Left	12	50	M12	34	22	17.5	22	16	12	19	13	19.2
65724.W0516	Left	16	64	M16	42	27	22	28	21	15	22	15	31.2

Stainless Low Cost Rod Ends

Male

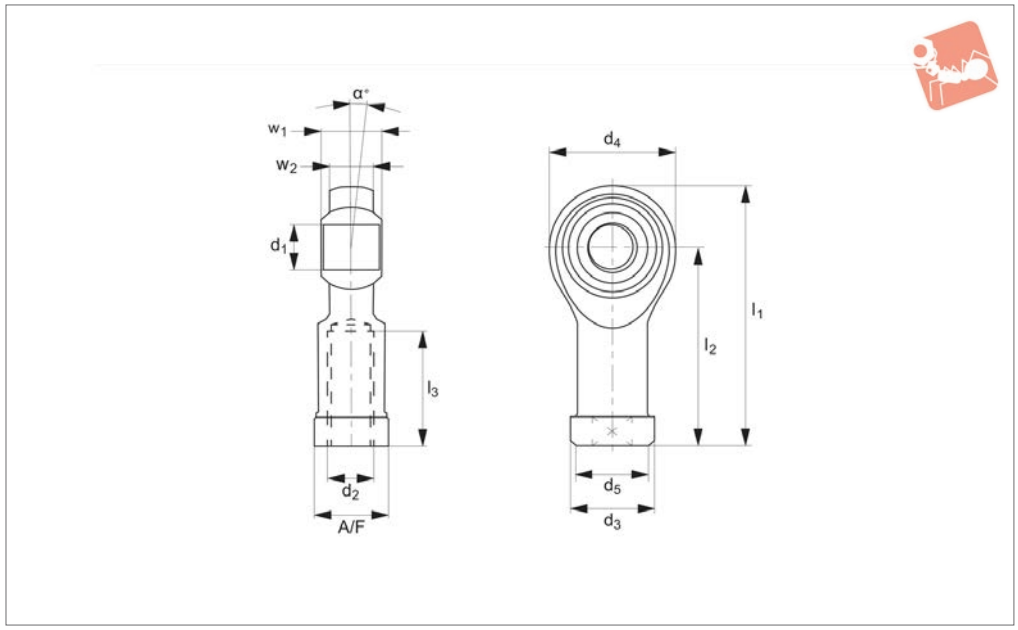
65706

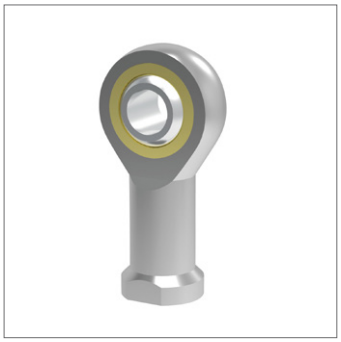


Material
Housing: stainless steel (AISI 303)
Ball: stainless steel, hardened, ground and polished.
Race: teflon or PTFE liner.
Stainless steel bearing ring lined with bronze and PTFE Composite

Technical Notes
Standard thread is right hand thread.

Order No.	Thread hand	d_1 tol. H7	l_1	d_2	d_3	l_2	a °	l_3	w_1	w_2	Static load kN max.	Weight g
65706.W0005	Right	5	42	M5	18	33	13	19	8	6	4.8	13
65706.W0006	Right	6	46	M6	20	36	13	21	9	6.75	6.2	20
65706.W0008	Right	8	54	M8	24	42	14	25	12	9	10.3	38
65706.W0010	Right	10	62	M10	28	48	13	28	14	10.50	14.4	55
65706.W0012	Right	12	70	M12	32	54	13	32	16	12	19.2	85
65706.W0505	Left	5	42	M5	18	33	13	19	8	6	4.8	13
65706.W0506	Left	6	46	M6	20	36	13	21	9	6.75	5.2	20
65706.W0508	Left	8	54	M8	24	42	14	25	12	9	7.0	38
65706.W0510	Left	10	62	M10	28	48	13	28	14	10.50	10.4	55
65706.W0512	Left	12	70	M12	32	54	13	32	16	12	13.0	85





65726

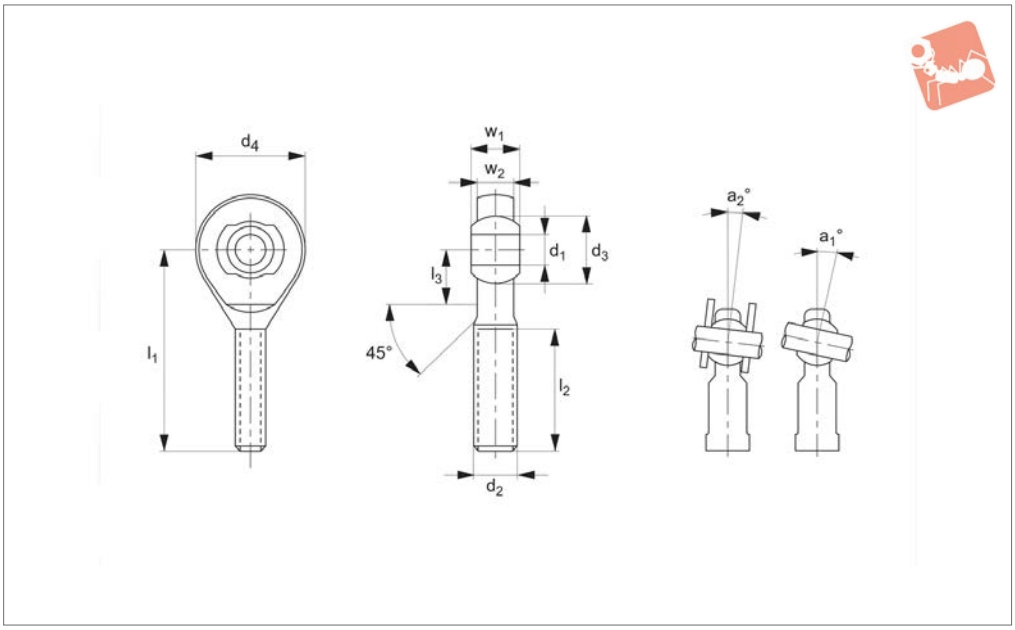
Material
Housing: stainless steel (AISI 303)
Ball: Stainless steel, hardened ground and polished stainless steel bearing rings

Technical Notes
Standard thread is right hand thread, series K, maintenance free.

Order No.	Thread hand	d_1 tol. H7	l_1	d_2	d_3	d_4	d_5	l_2	l_3	w_1	w_2	A/F	a °	Static load C_0 kN max.	Weight g
65726.W0005	Right	5	36	M 5	18	11	8.5	27	10	8	6.00	9	13	4.8	16
65726.W0006	Right	6	40	M 6	20	13	10	30	12	9	6.75	11	13	6.2	22
65726.W0008	Right	8	48	M 8	16	24	12.5	36	16	12	9.00	14	14	10.3	47
65726.W0010	Right	10	57	M10	28	19	15	43	20	14	10.50	17	13	14.4	77
65726.W0012	Right	12	66	M12	32	22	17.5	50	22	16	12.00	19	13	19.2	100
65726.W0016	Right	16	85	M16	42	27	22	64	28	21	15.00	22	15	31.2	220
65726.W0505	Left	5	36	M 5	18	11	8.5	27	10	8	6.00	9	13	4.8	16
65726.W0506	Left	6	40	M 6	20	13	10	30	12	9	6.75	11	13	6.2	22
65726.W0508	Left	8	48	M 8	16	24	12.5	36	16	12	9.00	14	14	10.3	47
65726.W0510	Left	10	57	M10	28	19	15	43	20	14	10.50	17	13	14.4	77
65726.W0512	Left	12	66	M12	32	22	17.5	50	22	16	12.00	19	13	19.2	100
65726.W0516	Left	16	85	M16	42	27	22	64	28	21	15.00	22	15	31.2	220

Heavy-Duty Rod Ends - Male
with integral spherical plain bearing

65700



Material
Housing - forged steel, tempered, rolled thread, surface galvanized.
Joint ball - ball bearing steel, hardened and ground.
Race - nylon/teflon/glass compound.

Technical Notes
Maintenance free, sizes according to DIN ISO 12240-4, series K, for tolerances see technical pages.

Tips
Standard thread is right hand thread.

Important Notes
*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a_1 °	Weight g
65700.W0005	Right	5	33	M5	11.11	20	18	13.0	14
65700.W0006	Right	6	36	M6	12.70	22	20	13.0	20
65700.W0008	Right	8	42	M8	15.87	25	24	14.5	38
65700.W0010	Right	10	48	M10	19.05	29	28	13.5	60
65700.W0012	Right	12	54	M12	22.22	33	32	13.0	92
65700.W0014	Right	14	60	M14	25.40	36	36	16.0	127
65700.W0016	Right	16	66	M16	28.57	40	42	15.5	202
65700.W0018	Right	18	72	M18x1,5*	31.75	44	46	15.0	250
65700.W0020	Right	20	78	M20x1,5*	34.92	47	50	14.5	327
65700.W0022	Right	22	84	M22x1,5*	38.10	51	54	15.5	440
65700.W0025	Right	25	94	M24x2*	42.85	57	60	15.0	630
65700.W0030	Right	30	110	M30x2*	50.75	66	70	17.0	1015
65700.W0505	Left	5	33	M5	11.11	20	18	13.0	14
65700.W0506	Left	6	36	M6	12.70	22	20	13.0	20
65700.W0508	Left	8	42	M8	15.87	25	24	14.5	38
65700.W0510	Left	10	48	M10	19.05	29	28	13.5	60
65700.W0512	Left	12	54	M12	22.22	33	32	13.0	92
65700.W0514	Left	14	60	M14	25.40	36	36	16.0	127
65700.W0516	Left	16	66	M16	28.57	40	42	15.5	202
65700.W0518	Left	18	72	M18x1,5*	31.75	44	46	15.0	250
65700.W0520	Left	20	78	M20x1,5*	34.92	47	50	14.5	327
65700.W0522	Left	22	84	M22x1,5*	38.10	51	54	15.5	440
65700.W0525	Left	25	94	M24x2*	42.85	57	60	15.0	630
65700.W0530	Left	30	110	M30x2*	50.80	66	70	17.0	1015

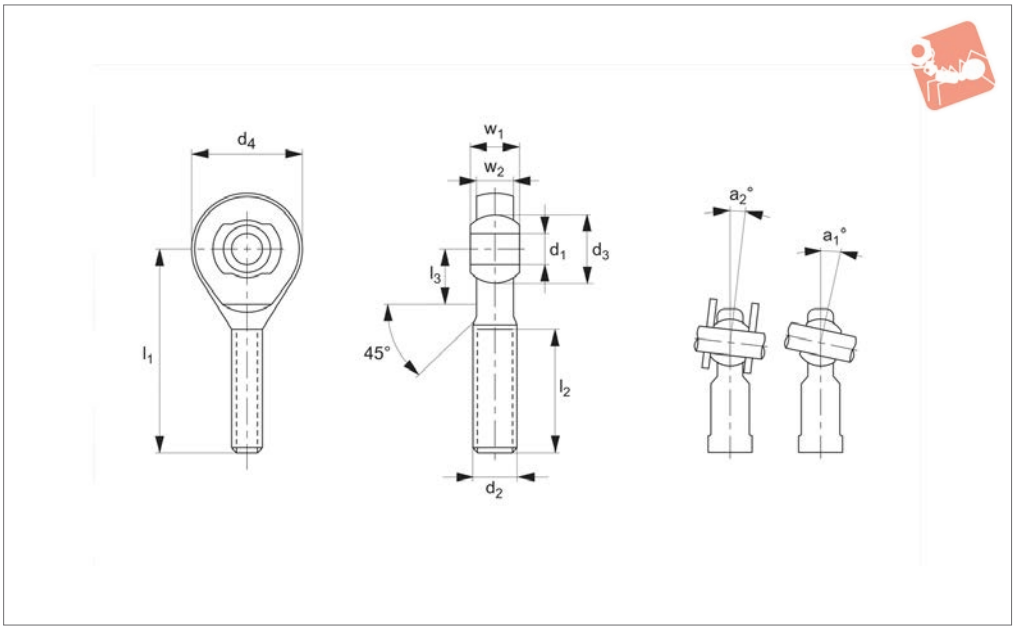
Order No.	a_2 °	l_3	w_1	w_2	Dyn. load C kN max.	Static load C_0 kN max.
65700.W0005	7.5	9	8	6.00	3.9	5.6
65700.W0006	6.5	12	9	6.75	4.6	7.8
65700.W0008	7.5	15	12	9.00	7.0	14.3
65700.W0010	8.0	15	14	10.50	10.4	22.6

Order No.	a_2 °	l_3	w_1	w_2	Dyn. load C kN max.	Static load C_0 kN max.
65700.W0012	8.0	19	16	12.00	12.4	32.8
65700.W0014	9.5	20	19	13.50	15.4	41.3
65700.W0016	8.5	22	21	15.00	22.4	56.6
65700.W0018	9.5	25	23	16.50	26.3	69.7
65700.W0020	9.0	28	25	18.00	30.8	82.2
65700.W0022	10.0	26	28	20.00	38.2	95.6
65700.W0025	10.0	30	31	22.00	45.3	118.6
65700.W0030	10.5	35	37	25.00	55.0	145.6
65700.W0505	7.5	9	8	6.00	3.9	5.6
65700.W0506	6.5	12	9	6.75	4.6	7.8
65700.W0508	7.5	15	12	9.00	7.0	14.3
65700.W0510	8.0	15	14	10.50	10.4	22.6
65700.W0512	8.0	19	16	12.00	12.4	32.8
65700.W0514	9.5	20	19	13.50	15.4	41.3
65700.W0516	8.5	22	21	15.00	22.4	56.6
65700.W0518	9.5	25	23	16.50	26.325	69.700
65700.W0520	9.0	28	25	18.00	30.805	82.200
65700.W0522	10.0	26	28	20.00	38.2	95.6
65700.W0525	10.0	30	31	22.00	45.3	118.6
65700.W0530	10.5	35	37	25.00	55.0	145.6

Stainless Heavy-Duty Rod Ends - Male

with integral spherical plain bearing

65702



Material

Rod end housing: Stainless steel DIN 1.4301 (AISI 304), forged, rolled thread
Joint ball: Stainless steel 1.4412, hardened and ground, surface polished.
Race: Nylon/Teflon/glass compound.

Technical Notes

Maintenance free, for tolerances see technical page 123, standard thread is right hand thread.

Tips

A2 stainless steel provides good corrosion resistance to a wide range of atmospheric conditions and corrosive media.
It is considered resistant to potable water.

Important Notes

*Denotes fine pitch thread.

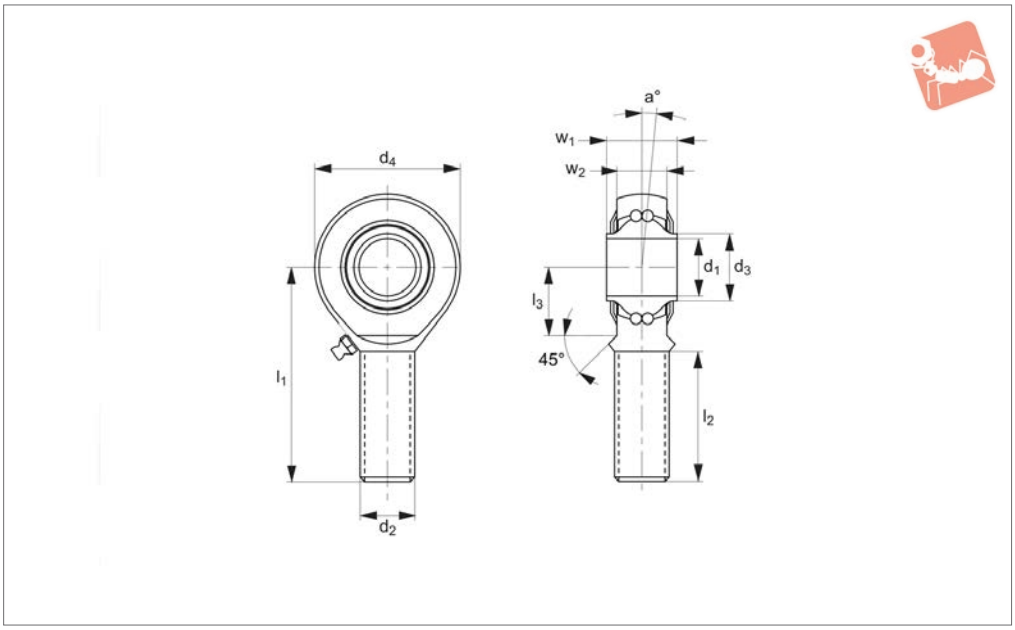
Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a_1 °	Weight g
65702.W0005	Right	5	33	M5	11.11	20	18	13.0	14
65702.W0006	Right	6	36	M6	12.70	22	20	13.0	20
65702.W0008	Right	8	42	M8	15.87	25	24	14.5	38
65702.W0010	Right	10	48	M10	19.05	29	28	13.5	60
65702.W0012	Right	12	54	M12	22.22	33	32	13.0	92
65702.W0014	Right	14	60	M14	25.40	36	36	16.0	127
65702.W0016	Right	16	66	M16	28.57	40	42	15.5	202
65702.W0018	Right	18	72	M18x1,5*	31.75	44	46	15.0	250
65702.W0020	Right	20	78	M20x1,5*	34.92	47	50	14.5	327
65702.W0022	Right	22	84	M22x1,5*	38.10	51	54	15.5	440
65702.W0025	Right	25	94	M24x2*	42.85	57	60	15.0	630
65702.W0030	Right	30	110	M30x2*	50.80	66	70	17.0	1015
65702.W0505	Left	5	33	M5	11.11	20	18	13.0	14
65702.W0506	Left	6	36	M6	12.70	22	20	13.0	20
65702.W0508	Left	8	42	M8	15.87	25	24	14.5	38
65702.W0510	Left	10	48	M10	19.05	29	28	13.5	60
65702.W0512	Left	12	54	M12	22.22	33	32	13.0	92
65702.W0514	Left	14	60	M14	25.40	36	36	16.0	127
65702.W0516	Left	16	66	M16	28.57	40	42	15.5	202
65702.W0518	Left	18	72	M18x1,5*	31.75	44	46	15.0	250
65702.W0522	Left	22	84	M22x1,5*	38.10	51	54	15.5	440
65702.W0525	Left	25	94	M24x2*	42.85	57	60	15.0	630
65702.W0530	Left	30	110	M30x2*	50.80	66	70	17.0	1015

Order No.	a_2 °	l_3	w_1	w_2	Dyn. load C kN max.	Static load C_0 kN max.
65702.W0005	7.5	9	8	6.00	3.9	3.9
65702.W0006	6.5	12	9	6.75	4.6	5.4

Order No.	a_2 °	l_3	w_1	w_2	Dyn. load C kN max.	Static load C_0 kN max.
65702.W0008	7.5	15	12	9.00	7.0	9.7
65702.W0010	8.0	15	14	10.50	10.4	15.4
65702.W0012	8.0	19	16	12.00	12.4	22.3
65702.W0014	9.5	20	19	13.50	15.4	30.4
65702.W0016	8.5	22	21	15.00	22.4	41.5
65702.W0018	9.5	25	23	16.50	26.3	51.2
65702.W0020	9.0	28	25	18.00	30.8	60.3
65702.W0022	10.0	26	28	20.00	38.2	70.0
65702.W0025	10.0	30	31	22.00	45.4	87.0
65702.W0030	10.5	35	37	25.00	55.0	106.8
65702.W0505	7.5	9	8	6.00	3.9	3.9
65702.W0506	6.5	12	9	6.75	4.6	5.4
65702.W0508	7.5	15	12	9.00	7.0	9.7
65702.W0510	8.0	15	14	10.50	10.4	15.4
65702.W0512	8.0	19	16	12.00	12.4	22.3
65702.W0514	9.5	20	19	13.50	15.4	30.4
65702.W0516	8.5	22	21	15.00	22.4	41.5
65702.W0518	9.5	25	23	16.50	26.3	51.2
65702.W0522	10.0	26	28	20.00	38.2	70.0
65702.W0525	10.0	30	31	22.00	45.4	87.0
65702.W0530	10.5	35	37	25.00	55.0	106.8

Heavy-Duty Rod Ends - Male
with integral ball bearing

65740



Material
Housing - forged steel, tempered, case hardened bearing race, ground and lapped, rolled thread, surface galvanized. Inner ring - ball bearing steel, hardened, superfine ground, lubrication - calcium-complex-soap-grease, temp range -20°C to +120°C.

Lubrication nipple - DIN 3405 D1/A (sizes 6 to 10) DIN 71412 H1 (sizes 12 to 30).

Technical Notes
Low maintenance. Sizes according to DIN ISO 12240-4 series K, for tolerances see technical pages.

Tips
Standard thread is right hand thread.

Important Notes
*Denotes fine pitch thread.

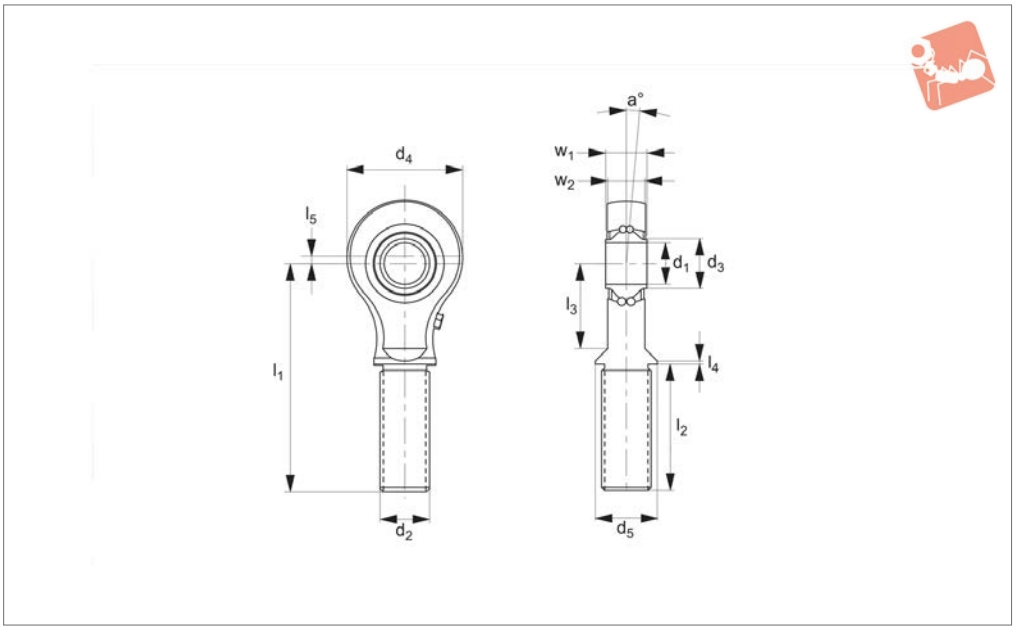
Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a °	l_3	w_1	Weight g
65740.W0106	Right	6	36	M6	9.0	22	20	8.0	12	9	19
65740.W0108	Right	8	42	M8	10.5	25	24	8.5	15	12	36
65740.W0110	Right	10	48	M10	12.0	29	28	8.0	15	14	60
65740.W0112	Right	12	54	M12	14.5	33	32	7.5	19	16	87
65740.W0114	Right	14	60	M14	17.0	36	36	6.0	20	19	135
65740.W0116	Right	16	66	M16	19.0	40	42	8.0	22	21	190
65740.W0118	Right	18	72	M18x1,5*	21.5	44	46	8.5	25	23	270
65740.W0120	Right	20	78	M20x1,5*	24.5	47	50	7.0	28	25	338
65740.W0122	Right	22	84	M22x1,5*	26.0	51	54	8.0	26	28	450
65740.W0125	Right	25	94	M24x2*	29.5	57	64	5.0	30	31	602
65740.W0130	Right	30	110	M30x2*	34.5	66	70	7.5	35	37	922
65740.W0206	Left	6	36	M6	9.0	22	20	8.0	12	9	19
65740.W0208	Left	8	42	M8	10.5	25	24	8.5	15	12	36
65740.W0210	Left	10	48	M10	12.0	29	28	8.0	15	14	60
65740.W0212	Left	12	54	M12	14.5	33	32	7.5	19	16	87
65740.W0214	Left	14	60	M14	17.0	36	36	6.0	20	19	135
65740.W0216	Left	16	66	M16	19.0	40	42	8.0	22	21	190
65740.W0218	Left	18	72	M18x1,5*	21.5	44	46	8.5	25	23	270
65740.W0220	Left	20	78	M20x1,5*	24.5	47	50	7.0	28	25	338
65740.W0222	Left	22	84	M22x1,5*	26.0	51	54	8.0	26	28	450
65740.W0225	Left	25	94	M24x2*	29.5	57	64	5.0	30	31	602
65740.W0230	Left	30	110	M30x2*	34.5	66	70	7.5	35	37	922

Order No.	w_2	Calc. factor Y	Calc. factor Y_0	Dyn. load C kN max.	Speed rpm max.	Static load C_0 kN max.
65740.W0106	6.75	2.19	2.09	2.75	1350	0.65
65740.W0108	9.00	1.89	1.80	4.00	1300	1.00
65740.W0110	10.50	1.81	1.90	4.45	1225	1.45

Order No.	w_2	Calc. factor Y	Calc. factor Y_0	Dyn. load C kN max.	Speed rpm max.	Static load C_0 kN max.
65740.W0112	12.00	1.82	1.74	4.95	1125	1.80
65740.W0114	13.50	2.48	2.36	5.60	1025	2.00
65740.W0116	15.00	2.35	2.24	6.25	975	2.35
65740.W0118	16.50	2.31	2.21	7.10	900	2.90
65740.W0120	18.00	2.58	2.46	7.90	825	3.45
65740.W0122	20.00	2.24	2.35	9.30	725	3.98
65740.W0125	22.00	2.12	2.02	11.03	600	5.68
65740.W0130	25.00	2.35	2.24	14.15	450	7.45
65740.W0206	6.75	2.19	2.09	2.75	1350	0.65
65740.W0208	9.00	1.89	1.80	4.00	1300	1.00
65740.W0210	10.50	1.81	1.90	4.45	1225	1.45
65740.W0212	12.00	1.82	1.74	4.95	1125	1.80
65740.W0214	13.50	2.48	2.36	5.60	1025	2.00
65740.W0216	15.00	2.35	2.24	6.25	975	2.35
65740.W0218	16.50	2.31	2.21	7.10	900	2.90
65740.W0220	18.00	2.58	2.46	7.90	825	3.45
65740.W0222	20.00	2.24	2.35	9.30	725	3.98
65740.W0225	22.00	2.12	2.02	11.03	600	5.68
65740.W0230	25.00	2.35	2.24	14.15	450	7.45

Heavy-Duty Rod Ends - Male
with integral ball bearing

65820



Material
Housing - forged steel, tempered, case hardened bearing race, ground and lapped, surface galvanized.
Inner ring - ball bearing steel, hardened, superfine ground.
Lubrication - calcium-complex-soap-grease, temp range -20°C to +120°C, lubrication nipple - DIN 3405 D1/A.

Technical Notes
Low maintenance, for tolerances see technical pages.

Tips
Standard thread is right hand thread.

Important Notes
*Denotes fine pitch thread.

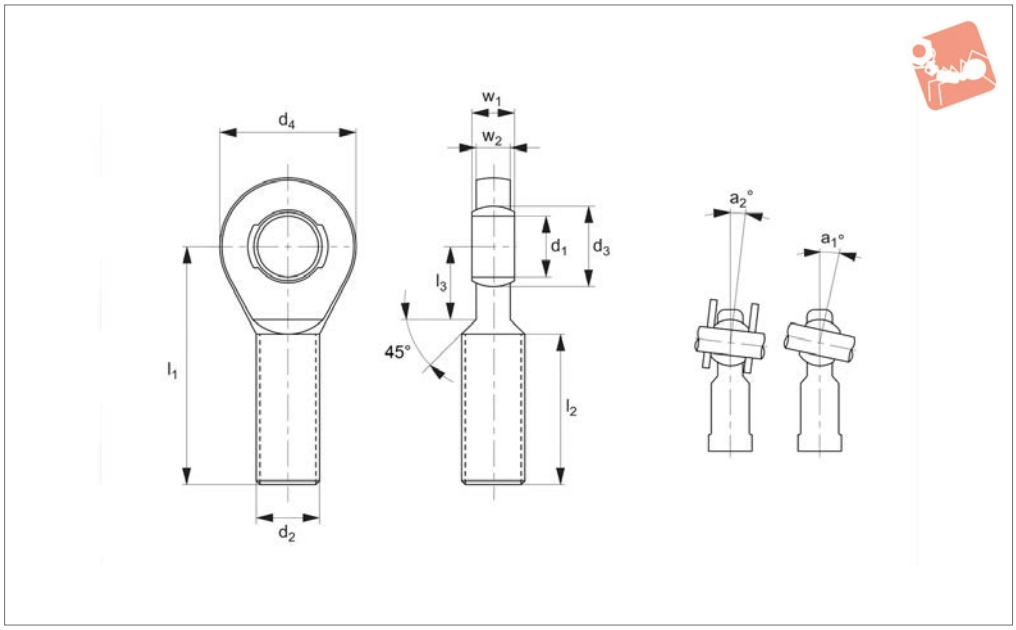
Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	d_5	a °	l_3	Weight g
65820.W0006	Right	6	64.0	M10x1	8.5	42.5	24	14	10.5	17	62
65820.W0007	Right	6	40.5	M10x1	8.5	19	24	14	10.5	17	57
65820.W0008	Right	8	72.0	M12x1,5	11.0	46.5	30	17	8.5	20	97
65820.W0009	Right	8	48.5	M12x1,5	11.0	23	30	17	8.5	20	88
65820.W0010	Right	10	82.0	M14x1,5	13.5	49.5	36	19	9.5	28	168
65820.W0011	Right	10	58.5	M14x1,5	13.5	26	36	19	9.5	28	154
65820.W0012	Right	12	90.0	M16x1,5	15.0	53.5	40	21	7.5	31	226
65820.W0013	Right	12	65.5	M16x1,5	15.0	29	40	21	7.5	31	204
65820.W0015	Right	15	100.0	M20x1,5	18.5	62.5	42	26	6.5	30	310
65820.W0016	Right	15	73.5	M20x1,5	18.5	36	42	26	6.5	30	273
65820.W0017	Right	17	105.0	M20x1,5	21.0	62.5	48	26	7.0	36	401
65820.W0018	Right	17	78.5	M20x1,5	21.0	36	48	26	7.0	36	354
65820.W0020	Right	20	117.0	M24x1,5	24.0	68.5	56	30	5.5	41	587
65820.W0021	Right	20	89.5	M24x1,5	24.0	41	56	30	5.5	41	519
65820.W0506	Left	6	64.0	M10x1	8.5	42.5	24	14	10.5	17	62
65820.W0507	Left	6	40.5	M10x1	8.5	19	24	14	10.5	17	57
65820.W0508	Left	8	72.0	M12x1,5	11.0	46.5	30	17	8.5	20	97
65820.W0509	Left	8	48.5	M12x1,5	11.0	23	30	17	8.5	20	88
65820.W0510	Left	10	82.0	M14x1,5	13.5	49.5	36	19	9.5	28	168
65820.W0511	Left	10	58.5	M14x1,5	13.5	26	36	19	9.5	28	154
65820.W0512	Left	12	90.0	M16x1,5	15.0	53.5	40	21	7.5	31	226
65820.W0513	Left	12	65.5	M16x1,5	15.0	29	40	21	7.5	31	204
65820.W0515	Left	15	100.0	M20x1,5	18.5	62.5	42	26	6.5	30	310
65820.W0516	Left	15	73.5	M20x1,5	18.5	36	42	26	6.5	30	273
65820.W0517	Left	17	105.0	M20x1,5	21.0	62.5	48	26	7.0	36	401
65820.W0518	Left	17	78.5	M20x1,5	21.0	36	48	26	7.0	36	354
65820.W0520	Left	20	117.0	M24x1,5	24.0	68.5	56	30	5.5	41	587
65820.W0521	Left	20	89.5	M24x1,5	24.0	41	56	30	5.5	41	519

Order No.	l_4	l_5	w_1	w_2	Calc. factor Y	Calc. factor Y_0	Dyn. load C kN max.	Speed rpm max.	Static load C_0 kN max.
65820.W0006	2.5	1.5	14	10	1.28	1.34	2.44	1300	0.76
65820.W0007	2.5	1.5	14	10	1.28	1.34	2.44	1300	0.76
65820.W0008	2.5	2.0	15	10	1.9	1.81	2.60	1225	0.98
65820.W0009	2.5	2.0	15	10	1.9	1.81	2.60	1225	0.98
65820.W0010	2.5	2.5	20	14	1.69	1.77	5.12	1100	1.90
65820.W0011	2.5	2.5	20	14	1.69	1.77	5.12	1100	1.90
65820.W0012	2.5	3.0	20	14	1.81	1.90	5.34	1050	2.06
65820.W0013	2.5	3.0	20	14	1.81	1.90	5.34	1050	2.06
65820.W0015	2.5	3.0	20	14	2.07	2.17	5.48	975	3.27
65820.W0016	2.5	3.0	20	14	2.07	2.17	5.48	975	3.27
65820.W0017	2.5	3.5	22	16	2.35	2.46	5.57	875	2.68
65820.W0018	2.5	3.5	22	16	2.35	2.46	5.57	875	2.68
65820.W0020	3.0	3.5	24	18	2.76	2.90	6.16	775	3.14
65820.W0021	3.0	3.5	24	18	2.76	2.90	6.16	775	3.14
65820.W0506	2.5	1.5	14	10	1.28	1.34	2.44	1300	0.76
65820.W0507	2.5	1.5	14	10	1.28	1.34	2.44	1300	0.76
65820.W0508	2.5	2.0	15	10	1.9	1.81	2.60	1225	0.98
65820.W0509	2.5	2.0	15	10	1.9	1.81	2.60	1225	0.98
65820.W0510	2.5	2.5	20	14	1.69	1.77	5.12	1100	1.90
65820.W0511	2.5	2.5	20	14	1.69	1.77	5.12	1100	1.90
65820.W0512	2.5	3.0	20	14	1.81	1.90	5.34	1050	2.06
65820.W0513	2.5	3.0	20	14	1.81	1.90	5.34	1050	2.06
65820.W0515	2.5	3.0	20	14	2.07	2.17	5.48	975	3.27
65820.W0516	2.5	3.0	20	14	2.07	2.17	5.48	975	2.68
65820.W0517	2.5	3.5	22	16	2.35	2.46	5.57	875	2.68
65820.W0518	2.5	3.5	22	16	2.35	2.46	5.57	875	2.68
65820.W0520	3.0	3.5	24	18	2.76	2.90	6.16	775	3.14
65820.W0521	3.0	3.5	24	18	2.76	2.90	6.16	775	3.14

Heavy-Duty Rod Ends - Male

with integral spherical plain bearing

65860



Material

Housing - forged steel, tempered, rolled thread, surface galvanized.
Joint ball - ball bearing steel, hardened and ground, surface superfinished and chromium plated.
Race - nylon/teflon/glass compound.

Technical Notes

Maintenance free, sizes according to DIN ISO 12240-4, series E, for tolerances technical pages.

Tips

Standard thread is right hand thread.

Important Notes

*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a_1 °	Weight g
65860.W0006	Right	6	36	M6	10.0	22	20	13.0	14
65860.W0008	Right	8	42	M8	13.0	25	23	15.0	24
65860.W0010	Right	10	48	M10	16.0	29	28	12.0	41
65860.W0012	Right	12	54	M12	18.0	33	32	10.5	67
65860.W0015	Right	15	63	M14	22.0	33	38	8.5	110
65860.W0017	Right	17	69	M16	25.0	40	44	10.0	163
65860.W0020	Right	20	78	M20x1,5*	29.0	47	51	9.0	270
65860.W0025	Right	25	94	M24x2*	35.5	57	62	7.5	508
65860.W0030	Right	30	110	M30x2*	40.7	66	70	6.0	785
65860.W0035	Right	35	140	M36x3*	47.0	92	82	6.5	1330
65860.W0040	Right	40	145	M42x3*	53.0	94	92	7.0	1890
65860.W0041	Right	40	150	M39x3*	53.0	99	92	7.0	1785
65860.W0045	Right	45	165	M45x3*	60.0	100	102	7.5	2620
65860.W0046	Right	45	163	M42x3*	60.0	98	102	7.5	2430
65860.W0050	Right	50	195	M52x3*	66.0	120	112	6.5	3865
65860.W0051	Right	50	185	M45x3*	66.0	110	112	6.5	3225
65860.W0060	Right	60	225	M60x4*	80.0	140	135	6.5	6400
65860.W0061	Right	60	210	M60x4*	80.0	125	-	6.5	5430
65860.W0506	Left	6	36	M6	10.0	22	20	13.0	14
65860.W0508	Left	8	42	M8	13.0	25	23	15.0	24
65860.W0510	Left	10	48	M10	16.0	29	28	12.0	41
65860.W0512	Left	12	54	M12	18.0	33	32	10.5	67
65860.W0515	Left	15	63	M14	22.0	33	38	8.5	110
65860.W0517	Left	17	69	M16	25.0	40	44	10.0	163
65860.W0520	Left	20	78	M20x1,5*	29.0	47	51	9.0	270
65860.W0525	Left	25	94	M24x2*	35.5	57	62	7.5	508
65860.W0530	Left	30	110	M30x2*	40.7	66	70	6.0	785
65860.W0535	Left	35	140	M36x3*	47.0	92	82	6.5	1330
65860.W0540	Left	40	145	M42x3*	53.0	94	92	7.0	1890
65860.W0541	Left	40	150	M39x3*	53.0	99	92	7.0	1785
65860.W0545	Left	45	165	M45x3*	60.0	100	102	7.5	2620
65860.W0546	Left	45	163	M42x3*	60.0	98	102	7.5	2430

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a_1 °	Weight g
65860.W0550	Left	50	195	M52x3,0*	66.0	120	112	6.5	3865
65860.W0551	Left	50	185	M45x3,0*	66.0	110	112	6.5	3225
65860.W0560	Left	60	225	M60x4,0*	80.0	140	135	6.5	6400
65860.W0561	Left	60	210	M52x3,0*	80.0	125	135	6.5	5430

Order No.	a_2 °	l_3	w_1	w_2	Dyn. load C kN max.	Static load C_0 kN max.
65860.W0006	6.5	11	6	4	2.5	6.4
65860.W0008	8.0	12	8	5	4.2	11.0
65860.W0010	6.0	15	9	6	6.4	16.8
65860.W0012	5.0	15	10	7	9.2	23.0
65860.W0015	4.5	18	12	9	13.4	39.6
65860.W0017	5.5	23	14	10	19.2	54.1
65860.W0020	4.5	25	16	12	25.2	76.7
65860.W0025	3.5	32	20	16	42.4	119.1
65860.W0030	3.0	35	22	18	54.0	141.8
65860.W0035	3.5	38	25	20	70.4	180.8
65860.W0040	3.5	42	28	22	86.0	222.6
65860.W0041	3.5	42	28	22	86.0	222.6
65860.W0045	4.0	50	32	25	107.0	276.2
65860.W0046	4.0	50	32	25	107.0	276.2
65860.W0050	3.0	60	35	28	132.0	339.2
65860.W0051	3.0	60	35	28	132.0	339.2
65860.W0060	3.5	70	44	36	208.0	532.1
65860.W0061	3.5	70	44	36	208.0	532.1
65860.W0506	6.5	11	6	4	2.5	6.4
65860.W0508	8.0	12	8	5	4.2	11.0
65860.W0510	6.0	15	9	6	6.4	16.8
65860.W0512	5.0	15	10	7	9.2	23.0
65860.W0515	4.5	18	12	9	13.4	39.6
65860.W0517	5.5	23	14	10	19.2	54.1
65860.W0520	4.5	25	16	12	25.2	76.7
65860.W0525	3.5	32	20	16	42.4	119.1
65860.W0530	3.0	35	22	18	54.0	141.8
65860.W0535	3.5	38	25	20	70.4	180.8
65860.W0540	3.5	42	28	22	86.0	222.6
65860.W0541	3.5	42	28	22	86.0	222.6
65860.W0545	4.0	50	32	25	107.0	276.2
65860.W0546	4.0	50	32	25	107.0	276.2
65860.W0550	3.0	60	35	28	132.0	339.2
65860.W0551	3.0	60	35	28	132.0	339.2
65860.W0560	3.5	70	44	36	208.0	532.1
65860.W0561	3.5	70	44	36	208.0	532.1

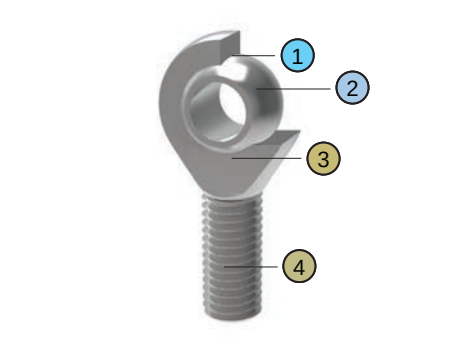
Rod Ends

introduction

All of our rod ends incorporate either a plain spherical bearing, ball bearing, or roller bearing. Below is an overview of each type.

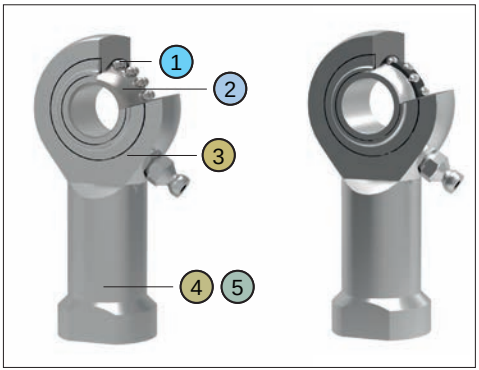
Plain spherical bearings

1. Thin coating made from Polyamid-PTFE-fibreglass - compound, maintenance free, absorbs any foreign particles.
2. Ball made of bearing steel, hardened, ground, polished and hard chromium plated, ensures reliable corrosion protection.
3. No clearance - radial clearance 0-10µm.
4. All rod end housings made of forged steel, tempered, extremely high load resistances.



Ball and roller bearings

1. Radial clearance: 10-30µm, low friction.
2. Inner ring made of bearing steel, hardened ball grooves polished.
3. Shields on both sides protect against rough dirt penetration.
4. All rod ends housings are made of forged steel, case hardened bearing race.
5. Low maintenance due to long-term greasing, especially suitable for high speed large swiveling angles or rotating movements.



Rod ends and water

Stainless steel versions

Most of our rod ends are available in stainless steel as standard.

High grade AISI 316 stainless steel available on request.

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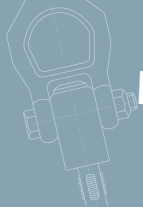


Rod ends with integral maintenance-free spherical plain bearings

In many cases heavy-duty rod ends with integral spherical plain bearings are most often used. They are above all used for small swivelling or tilting movements at low speeds. They stand out for their high load capacity and can also be used for shock-like loads. The rod end ball slides on a plastic bearing shell consisting of a glass fibre-filled nylon/teflon compound. This design assures a maintenance-free rod end. Heavy-duty plain bearing rod ends have slight initial movement friction and virtually no clearance. The plastic material used has another advantage in that it can absorb many foreign particles so that no damage can occur. The balls of heavy-duty rod ends with integral spherical plain bearings are hard chrome plated. This reliable corrosion protection ensures that the function of the rod end will not be affected by a corroded ball surface under humid operating conditions.

Rod ends with integral ball bearings

This design is especially suitable for high speeds, large swivelling angles or rotating movements with relatively low or medium loads. Prominent technical features are the low bearing friction, long-time greasing as well as the sealing against some dirt pentration (by means of shields on both sides). Under normal operating conditions the rod ends are maintenance-free. Greasing nipples are provided for lubrication in case of rough operations and maximum loads. To avoid incompatibility with the production lubrication, we recommend lubrication with a calcium-complex-soap-grease. A special heat treatment procedure gives the rod end housing a raceway hardness adapted to the antifriction bearing, ensuring at the same time high stability with changing loads.

Rod ends with integral roller bearings

This design, based on the structure of a self-aligning roller bearing is preferably used for high speed, large tilting angles or rotating movements under high loads. Compared to rod ends with ball bearings, rod ends with self-aligning roller bearings essentially have higher basic load ratings. This design is equipped with a cage to minimise the rolling friction and heat build-up. These rod ends, with long-time lubrication are under normal operating conditions maintenance-free. Greasing nipples are provided for lubrication in case of rough operations and maximum loads. To avoid incompatibility with the production lubrication, we recommend lubricating with a calcium-complex-soap-grease. Shields on both sides limit dirt particles from penetrating into the bearing. The rod ends with roller bearings are subjected to a special heat treatment to obtain a raceway hardness adapted to the antifriction bearings, ensuring at the same time a high stability with changing loads.

Rod end bearings load capacity explained

Static load capacity C_0 (plain bearings)

The static load capacity C_0 is the radially acting static load which does not cause any permanent deformation of the components when the spherical bearing or rod end is stationary, (i.e. the load condition without pivoting, swivelling or tilting movements). It is also a precondition here that the operating temperature must be at normal room temperature and the surrounding components must possess sufficient stability.

The values specified in the tables are determined by static tension tests on a representative number of series components at 20°C normal room temperature. The static load capacity may vary with lower or higher temperature depending on the material. In the case of all rod ends with plain bearings, the static load rating refers to the maximum permissible static load of the rod end housing in a tensile direction up to which no permanent deformation occurs at the weakest housing cross-section. The value in the product tables has a safety factor of 1.2 times the tensile strength of the rod ends housing material.

Static load capacity C_0 (roller and ball bearings)

For our rod ends with roller and ball bearings, the static load rating is the load at which the bearing can operate at room temperature without its performance being impaired as a result of deformations, fracture, or damage to the sliding contact surfaces (max 1/10,000th of the ball diameter).

Dynamic load capacity C (plain bearings)

Dynamic load ratings serve as values for calculation of the service life of dynamically-loaded spherical bearings and rod ends. The values themselves do not provide any information about the effective dynamic load capacity of the spherical bearing or rod end. To obtain this information, it is necessary to take into account the additional influencing factors such as load type, swivel or tilt angle, speed characteristic, max. permitted bearing clearance, max. permitted bearing friction, lubrication conditions and temperature, etc.

Dynamic load capacities depend on the definition used to calculate them. Comparison of values is not always possible owing to the different definitions used by various manufacturers, and because the load capacities are often determined under completely different test conditions.

Dynamic load capacity C (roller and ball bearings)

For our rod ends with roller and ball bearings, the dynamic load capacity is the load at which 90% of a large quantity of identical rod ends reach 1 million revolutions before they fail (due to fatigue of the rolling surfaces.)

Operating temperatures

Heavy-duty ball and roller bearing rod ends can be used for operating temperatures between -20°C and +120°C. The temperature range of heavy-duty rod ends with integral spherical plain bearing is between -30°C and +60°C, without affecting the load capacity. Higher temperatures will reduce the load capacity taken into account for the calculation of the 'working life' under the temperature factor C_2 on page 451.

Loads

The decisive parameters for the selection and calculation of heavy-duty rod ends are size, direction and type of load.

Radial or combined loads

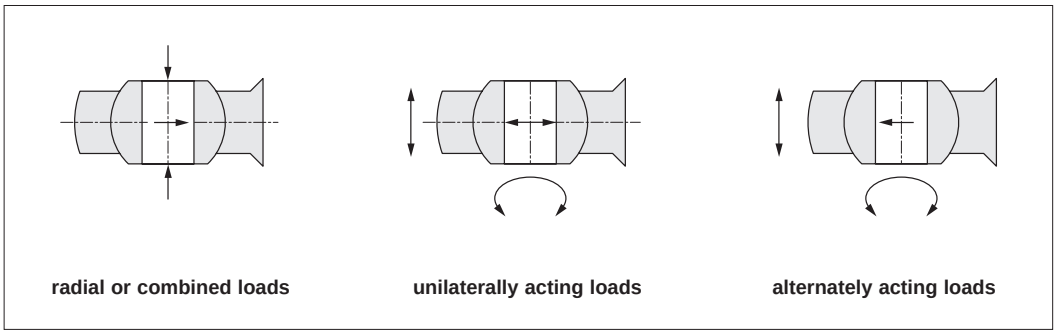
The heavy-duty rod ends have been especially designed to cope with high radial loads. They can be used for combined loads, the axial load share of which does not exceed 20% of the corresponding radial load.

Unilaterally acting load

In this case the load acts only in the same direction, which means that the load area is always in the same bearing section.

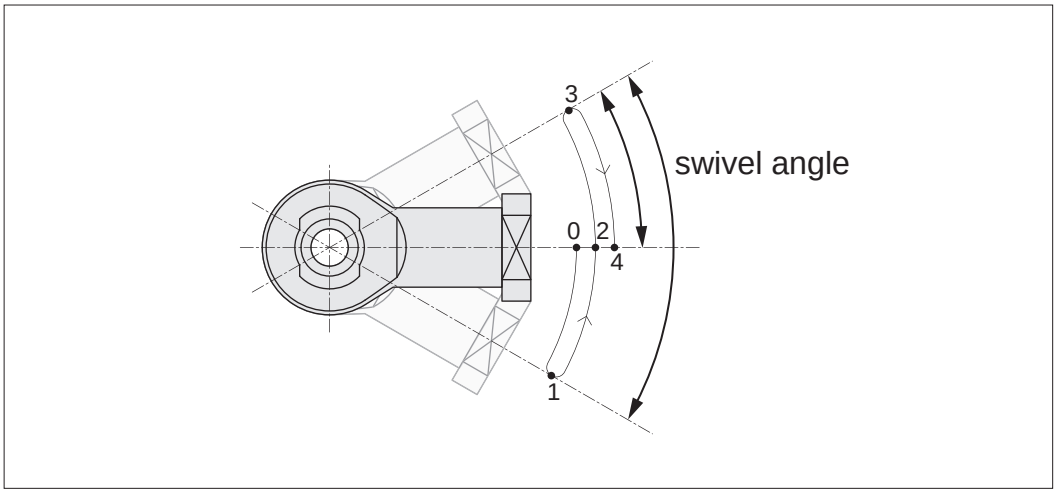
Alternately acting load

In case of alternating loads, the load areas facing each other are alternately loaded and/or relieved, which means that the load changes its direction constantly by approximately 180°.



Swivelling angle

The swivelling angle is the movement of the rod end from one final position to the other. Half the swivelling angle a° is used to calculate the service or 'working life'.

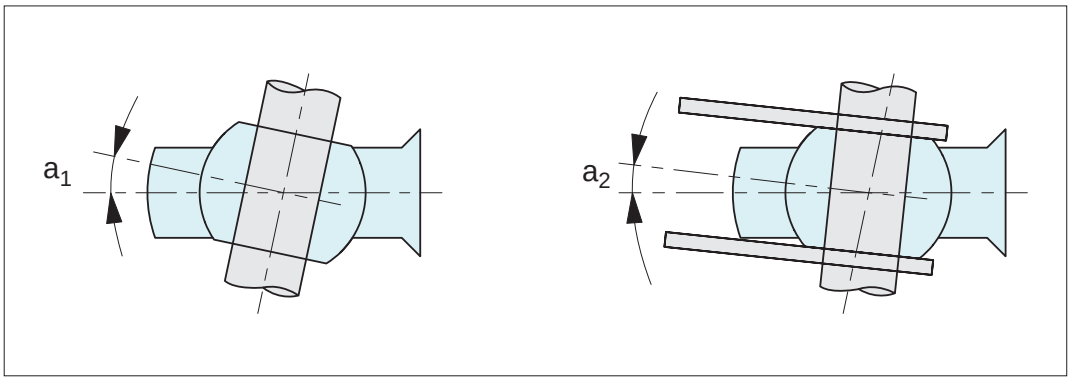


Angle of tilt

The angle of tilt, also called setting angle, refers to the movement of the joint ball and/ or the inner ring to the rod end axis (in degrees). The tilting angle (a) indicated in the table for the heavy-duty ball and roller bearing rod ends corresponds to the maximum possible movement being limited by the shields on both sides.

It is important that this tilting angle is not exceeded either during installation or operation, as otherwise the shields may be damaged. For heavy-duty plain bearing rod ends a distinction is made between the tilting angles (a1 and a2).

If the movement is not limited by adjacent components, then angle a1 can fully be used without affecting the rod end capacity. Tilting angle a2 is the movement limit when connecting a forked component.



Nominal service life

The term 'nominal service life' is used for heavy-duty ball and roller bearing rod ends and represents the number of swivelling motions or rotations and/or the number of service hours the rod end performs before showing the first signs of material fatigue on the raceway or roller bodies. In view of many factors that are difficult or impossible to assess, the service life of several apparently identical bearings differ under the same operating conditions.

For this reason, the following method for the service life determination of heavy-duty ball and roller rod ends results in a nominal service life being achieved or exceeded by at least 90% of a large quantity of identical rod ends.

Working life

The term 'working life' is used with heavy-duty plain bearing rod ends. It represents the number of swivelling motions or rotations and/ or the number of service hours the heavy duty plain bearing rod end performs before becoming unserviceable due to material fatigue, wear, increased bearing clearance or increase of the bearing friction moment.

The 'working life' is not only influenced by the size and the type of load, it is also affected by a number of factors, which are difficult to assess. A calculation of the exact service life is therefore impossible. Field-experienced standard values for the approximate 'working life' can nevertheless be determined by using the following calculation procedure which is based on numerous results from endurance test runs and values from decades of experience. The values determined by this formula are achieved, if not exceeded, by the majority of the heavy-duty rod ends.

ov-W65700-AR3550-T-W65970-AR3630-T-e-rnh- Updated -31-10-2022

Heavy-duty rod ends

65700, 65720, 65740, 65742, 65760, 65780, 65800

d_1		d_{1mp} Tolerance limit		V_{d1p}	V_{d1mp}	b_{1s} Tolerance limit		h_s, h_{1s}, h_{2s} Tolerance limit	
Over	Incl.	Upper	Lower	Max.	Max.	Upper	Lower	Upper	Lower
	6	+0,012	0	0,012	0,009	0	-0,12	+0,8	-1,2
6	10	+0,015	0	0,015	0,011	0	-0,12	+0,8	-1,2
10	18	+0,018	0	0,018	0,014	0	-0,12	+1,0	-1,7
18	30	+0,021	0	0,021	0,016	0	-0,12	+1,4	-2,1
30	50	+0,025	0	0,025	0,019	0	-0,12	+1,8	-2,7

Dimensions and tolerance symbols

d_1 = nominal bore diameter of the inner ring or joint ball.

d_{1mp} = mean bore diameter deviation in one plane, arithmetical mean of the largest and smallest bore diameter.

V_{d1p} = bore diameter variation in one plane, difference between the largest and smallest bore diameter.

V_{d1mp} = mean bore diameter variation, difference between the largest and smallest bore diameter of one inner ring or joint ball.

b_{1s} = single inner ring or joint ball width deviation.

h, h_1, h_2 = single length from inner ring or ball bore centre to shank end.

h_s, h_{1s}, h_{s2} = single length variation of a single rod end.

ov-W65700-AR3550-T-W65970-AR3630-T-f-Inh- Updated -31-10-2022

Permissible load

The maximum load is defined by the static basic load rating C_0. If static loads are a combination of radial and axial loads, the equivalent static load will have to be calculated.

$$P_0 \leq C_0 \text{ (N)}$$

P_0 = Static equivalent load

Self-aligning ball bearing $= P_0 = F_r + Y_0 \cdot F_a$

Self-aligning roller bearing $= P_0 = F_r + 5 \cdot F_a$

F_a = Axial load

F_r = Radial load

Y_0 = Axial factor, static, see individual product pages

Y_0 = Basic static load rating (kN), see individual product pages

Nominal service life

For Rod Ends with integral self-aligning ball bearing **65740, 65742, 65760, 65820, 65840.**

Rotating

$$G_{h\,rot.} = 10^6 \frac{\left(\frac{C}{P}\right)^3}{60 \cdot n} \text{ (h)}$$

Oscillating

$$G_{h\,osc.} = 10^6 \frac{\left(\frac{C}{P \sqrt[3]{\frac{ß}{90}}}\right)^3}{60 \cdot f} \text{ (h)}$$

P = Dynamic equivalent load (kN)

Self-aligning ball bearing $= P = F_r + Y \cdot F_a$

Self-aligning roller bearing $= P = F_r + 9.5 \cdot F_a$

C = Basic dynamic load (kN), see individual product pages

Y = axial factor, dynamic, see individual product pages

$Gh_{rot.}$ = nominal service life for rotation (hours of operation)

$Gh_{osc.}$ = nominal service life for rotation (hours of operation)

ß = half of swivelling angle (degree), ß = 90 should be used for rotation.
Condition: Swivelling angle ß “ 3°. For swivelling angles ß<3° we recommend the use of heavy-duty spherical plain bearing rod ends

n = rotation speed (rpm)

f = frequency of oscillation (rpm)

h = hours

For Rod ends with integral self-aligning roller bearing **65780, 65800.**

Rotating

$$G_{h\,rot.} = 10^6 \frac{\left(\frac{C}{P}\right)^{3{,}333}}{60 \cdot n} \text{ (h)}$$

Oscillating

$$G_{h\,osc.} = 10^6 \frac{\left(\frac{C}{P \sqrt[3]{\frac{ß}{90}}}\right)^{3{,}333}}{60 \cdot f} \text{ (h)}$$

Calculation example

At the rotating side of a crank mechanism a ball or roller bearing rod end should be installed. The expected service life amounts to at least 5000 hours.

Selected: **65760.W0108** = 4,0 kN

$$G_{h\,rot.} = 10^6 \frac{\left(\frac{C}{P}\right)^3}{60 \cdot n} \text{ (h)}$$

$$= 10^6 \frac{\left(\frac{4{,}0}{0{,}75}\right)^3}{60 \cdot 300} = 8428 \text{ h} > 5000 \text{ h} \quad ☑$$

Permissible load

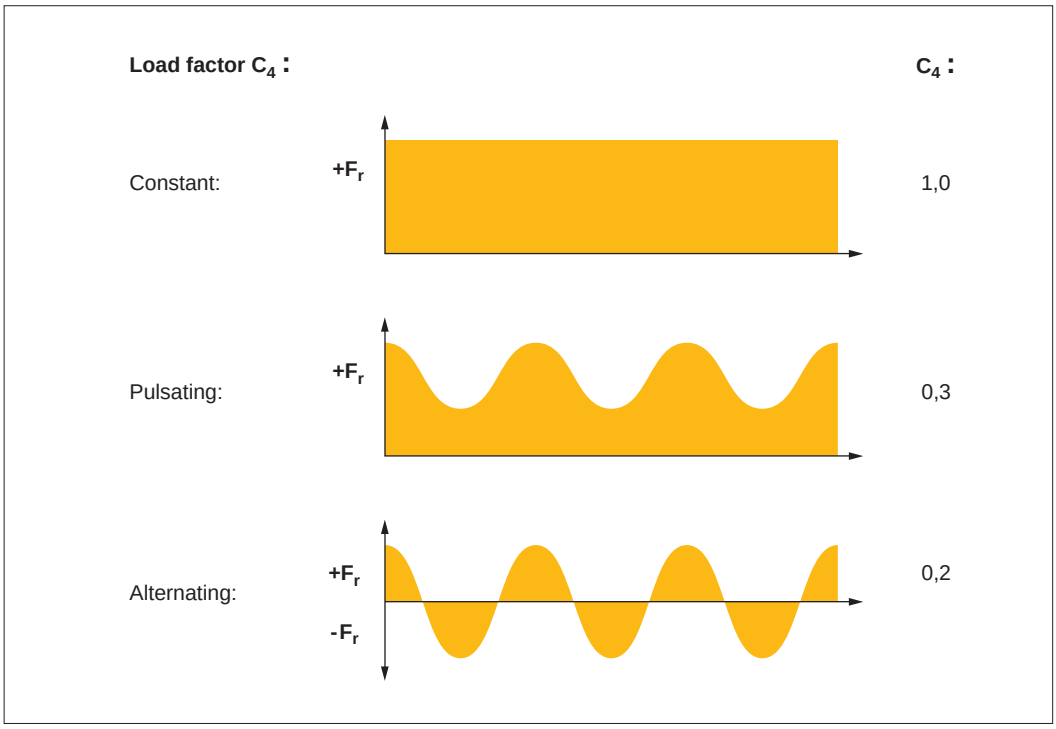
The maximum permissible load is calculated by using equation **1.** If static loads are a combination of radial and axial loads, the equivalent static load will have to be calculated using equation **2.**

Permissible load

Equation 1 $P_{max} = C_0 \cdot C_2 \cdot C_4$

Equation 2 $P = F_r + F_a \leq P_{max}$

P_{max} = Maximum permissible load (kN)
C_0 = Static basic load (kN), see individual product pages
C_2 = Temperature factor, see below
C_4 = Factor for type of load, see below
P = Equivalent dynamic load (kN)
F_r = Radial load
F_a = Axial load (kN)
Condition: $F_a \leq 0.2 \cdot F_r$



Temperature factor C_2

Up to 60°C	1,0.
60°C to 80°C	0,8.
80°C to 100°C	0,7.
100°C to 120°C	0,8.

ov-W65700-AR3550-T-W65970-AR3630-T-h-Inh- Updated -31-10-2022

Permissible sliding velocity

The permissible sliding velocity of heavy-duty rod ends mainly depends on the load and temperature conditions. Heat generated by friction in the rod end housing is the main limitation on sliding velocity. When selecting the rod end size, it is necessary to determine the sliding velocity and the pv-value, which is a product of the specific bearing load p (N/mm²) and the sliding velocity v (m/s).

Specific bearing load

$$p = k \cdot \frac{P}{C}$$

Known: Permissible pv-value = 0,5 N/mm² • m/s

P = Specific bearing load (N/mm²)
C = Basic dynamic load rating (N), see individual product pages
k = Specific load factor (N/mm²) for tribological pairing
k = 50 N/mm²

Mean sliding velocity

$$V_m = 5{,}82 \cdot 10^{-7} \cdot d_3 \cdot ß \cdot f$$

Known: Permissible sliding velocity v_{max} = 0,15 m/s

V_m = Mean sliding velocity (m/s)
d_3 = Pivot ball diameter (mm), see individual product pages
ß = Half swivelling angle (degree), for swivelling angle > 180°
ß = 90° to be used
f = Frequency of oscillation (rpm)

Nominal service life

$$G = C_1 \cdot C_2 \cdot C_3 \cdot \frac{3}{d_3 \cdot ß} \cdot \frac{C}{P} \cdot 10^8$$

$$G_h = C_1 \cdot C_2 \cdot C_3 \cdot \frac{5}{d_3 \cdot ß \cdot f} \cdot \frac{C}{P} \cdot 10^6$$

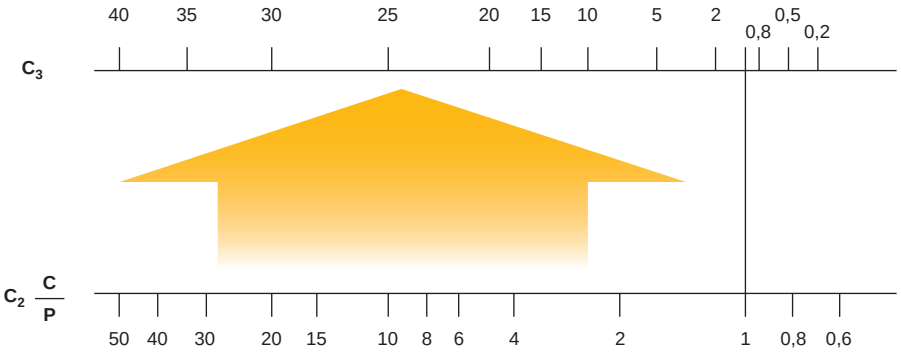
G = Nominal service life (number of oscillations or revolutions)
G_h = Nominal service life (hours)
C_2 = Temperature factor, see previous pages
C_3 = Material factor, see alignment chart on next page
C_1 = Load direction factor
C_1 = 1,0 = Single load direction

Alternating load direction at f < 30 rpm: C_1 = 0,250
Alternating load direction at f > 30 rpm: C_1 = 0,125

Alignment

To find C_3 calculate $C_2 \cdot \frac{C}{P}$ and on the chart below, read across to C_3

C_2 = Temperature factor
C = Basic dynamic load rating (N) see individual product pages
P = Specific bearing load (N/mm²)



Calculation example

The rod end assembly of conveyor equipment calls for heavy-duty rod end with a service life of 7000 hours in conjunction with an alternating acting load of 5 kN. 25 swivelling moments with a swivelling angle of 20° take place per minute. The operating temperature amounts to approx. 60° C. The choice is a heavy-duty rod end **65880.W0115** with: C = 13,4 kN, d_3 = 22mm.

Checking the permissible load of the rod end

$$P_{max} = C_0 \cdot C_2 \cdot C_4$$

$$P_{max} = 41 \cdot 0{,}2 \cdot 1{,}0 = 8{,}2 \text{ kN} > 5{,}0 \text{ kN}$$

C_0 = 41 kN
C_2 = 1,0 (temperature 60°C)
C_4 = 0,2 (alternating load)

Checking the permissible sliding velocity

$$V_m = 5{,}82 \cdot 10^{-7} \cdot d_3 \cdot ß \cdot f = 5{,}82 \cdot 10^{-7} \cdot 22 \cdot 10 \cdot 25$$

$$= 0{,}0032 \text{ m/s} < 0{,}15 \text{ m/s} \ \boxtimes$$

Checking the p · V -value

$$pV = p \cdot V_m$$

$$pV = 18{,}66 \cdot 0{,}0032$$

$$= 0{,}06 \text{ N/mm}^2 \cdot \text{m/s} < 0{,}5 \text{ N/mm}^2 \cdot \text{m/s} \ \boxtimes$$

$$p = k \cdot \frac{P}{C} = 50 \cdot \frac{5000}{13400} \text{ x } 18{,}66 \text{ N/mm}^2$$

Nominal service life

$$G_h = C_1 \cdot C_2 \cdot C_3 \cdot \frac{5}{d_3 \cdot ß \cdot f} \cdot \frac{C}{P} \cdot 10^6$$

$$G_h = 0{,}25 \cdot 1{,}0 \cdot 12 \cdot \frac{5}{22 \cdot 10 \cdot 25} \cdot \frac{13{,}4}{5{,}0} \cdot 10^6$$

$$= 7308 \text{ h} > 7000 \text{ h} \ \boxtimes$$

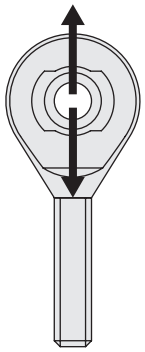
Known: C_1 = 0,25 (alternating load direction, f = 25 rpm < 30 rpm)

$$C_3 = C_2 \cdot \frac{C}{P} = 1{,}0 \cdot \frac{13{,}4}{5{,}0} = 2{,}68$$

See alignment chart C_3 = 12

d_3 = 22
f = 25 rpm

Radial static load



The ultimate radial static load rating is measured as the failure point when a load is increasingly applied to a pin through the rod end's bore and pulled straight up while the rod end is held in place. Note that the actual rating is determined by calculating the lowest of the following three values:

1. Raceway material comprehensive strength (R value)

$$R = E \times T \times X$$

2. Rod end head strength (H value, cartridge type construction)

$$H = \left[\left(\frac{T}{2}\sqrt{D^2 - T^2}\right) + \left(\frac{D}{2} \times \text{SIN}^{-1}\frac{T}{2}\right) - (\text{O.D. of Bearing} \times T)\right] \times X$$

$$\text{Angle of } \frac{T}{2} \text{ expressed in radians}$$

3. Shank strength (S value)

Male Threaded Rod End

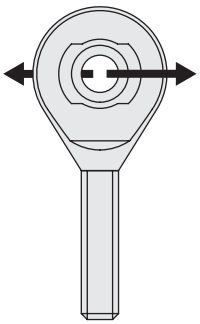
$$S = [(\text{root diameter of thread}^2 \times .78) - (N^2 \times .78)] \times X$$

Female Threaded Rod End

$$S_2 = [(J^2 \times .78) + (\text{major diameter of thread} \times .78)] \times X$$

E	=	Ball diameter
T	=	Housing width
X	=	Allowable stress
D	=	Head diameter
N	=	Diameter of drilled hole in shank of male rod end
J	=	Shank diameter of female rod end

Axial static load



The axial static load capacity is measured as the force required to cause failure via a load parallel to the axis of the bore. Depending on the material types and construction methods, the ultimate axial load is generally 10-20% of the ultimate radial static load. The formula does not account for the bending of the shank due to a moment of force, nor the strength of the stake in cartridge-type construction.

Axial strength (A value)

$$A = .78\,[(E + .176T)^2 - E2\,] \times X$$

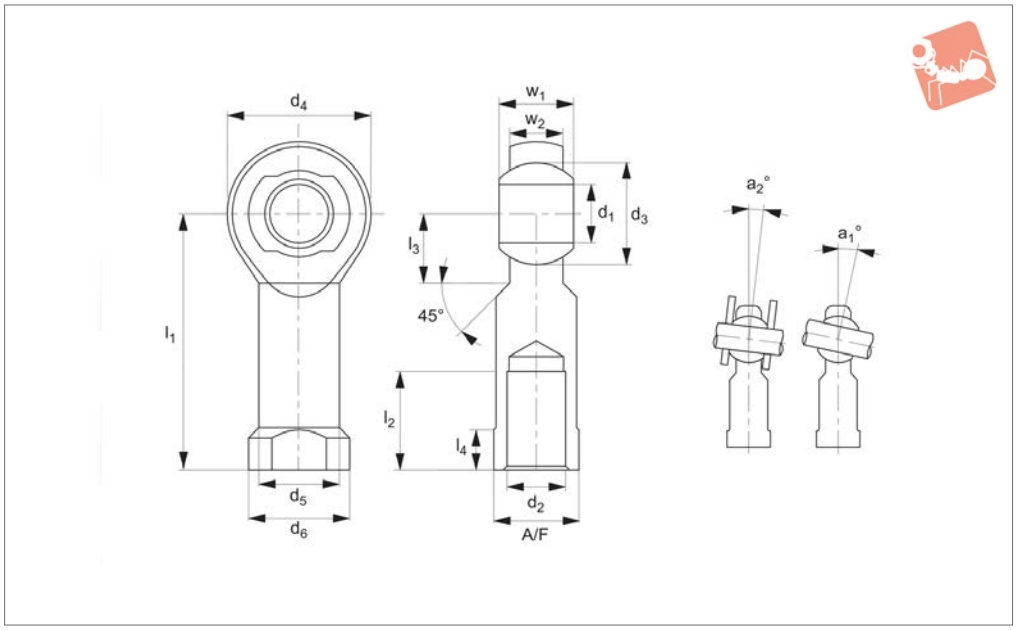
X	=	Allowable Stress (see table)
E	=	Ball diameter
T	=	Housing width

Material	Allowable stress (PSI)
300 Series stainless steel	35,000
Low carbon steel	52,000

Heavy-Duty Rod Ends - Female

with integral spherical plain bearing

65720



Material
Rod end housing - forged steel, tempered, surface galvanized.
Joint ball - ball bearing steel, hardened and ground, polished and chromium plated.

Race - nylon/teflon/glass compound.

Technical Notes
Maintenance free, sizes according to DIN ISO 12240-4, series K, thread according to Cetop RP 103 P.

For tolerances see technical pages.

Tips
Standard thread is right hand thread.

Important Notes
* Denotes fine pitch thread.

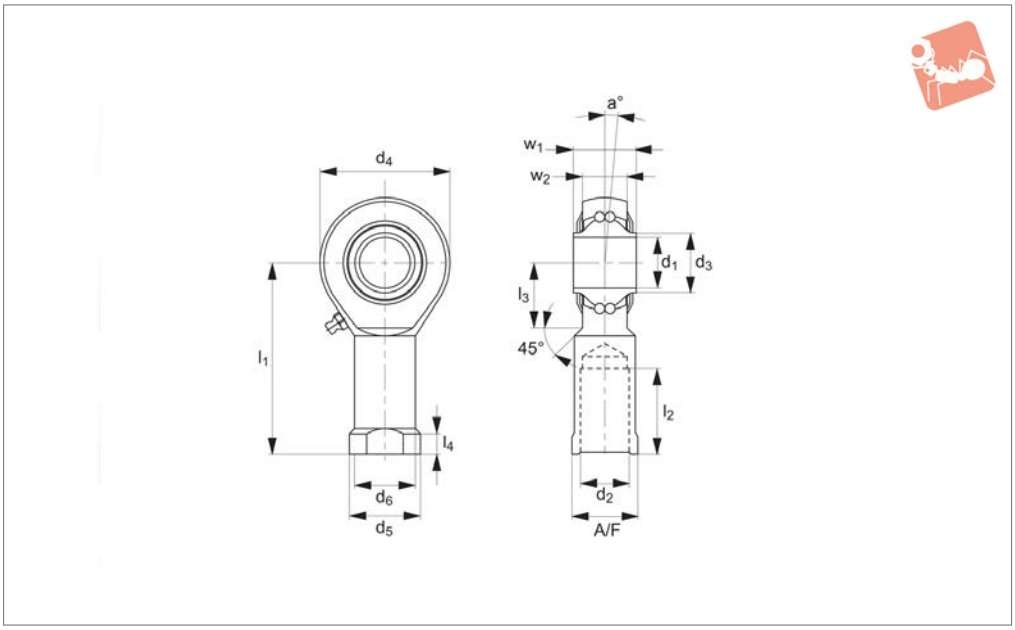
Order No.	Thread hand	d_1	l_1	d_2	d_3	d_4	d_5	d_6	l_2	Weight g
65720.W0004	Right	5	27	M4	11.11	18	9.0	11	10	18
65720.W0005	Right	5	27	M5	11.11	18	9.0	11	10	18
65720.W0006	Right	6	30	M6	12.70	20	10.0	13	12	24
65720.W0008	Right	8	36	M8	15.87	24	12.5	16	16	45
65720.W0010	Right	10	43	M10	19.05	28	15.0	19	20	74
65720.W0011	Right	10	43	M10x1,25*	19.05	28	15.0	19	20	74
65720.W0012	Right	12	50	M12	22.22	32	17.5	22	22	109
65720.W0013	Right	12	50	M12x1,25*	22.22	32	17.5	22	22	109
65720.W0014	Right	14	57	M14	25.40	36	20.0	25	25	155
65720.W0016	Right	16	64	M16	28.57	42	22.0	27	28	233
65720.W0017	Right	16	64	M16x1,5*	28.57	42	22.0	27	28	233
65720.W0018	Right	18	71	M18x1,5*	31.75	46	25.0	31	32	310
65720.W0020	Right	20	77	M20x1,5*	34.92	50	27.5	34	33	386
65720.W0022	Right	22	84	M22x1,5*	38.10	54	30.0	38	37	520
65720.W0025	Right	25	94	M24x2*	42.85	60	33.5	42	42	705
65720.W0030	Right	30	110	M30x2*	50.80	70	40.0	50	51	1084
65720.W0031	Right	30	110	M27x2*	50.80	70	40.0	50	51	1084
65720.W0504	Left	5	27	M4	11.11	18	9.0	11	10	18
65720.W0505	Left	5	27	M5	11.11	18	9.0	11	10	18
65720.W0506	Left	6	30	M6	12.70	20	10.0	13	12	24
65720.W0508	Left	8	36	M8	15.87	24	12.5	16	16	45
65720.W0510	Left	10	43	M10	19.05	28	15.0	19	20	74
65720.W0511	Left	10	43	M10x1,25*	19.05	28	15.0	19	20	74
65720.W0512	Left	12	50	M12	22.22	32	17.5	22	22	109
65720.W0513	Left	12	50	M12x1,25*	22.22	32	17.5	22	22	109
65720.W0514	Left	14	57	M14	25.40	36	20.0	25	25	155
65720.W0516	Left	16	64	M16	28.57	42	22.0	27	28	233
65720.W0517	Left	16	64	M16x1,5*	28.57	42	22.0	27	28	233
65720.W0518	Left	18	71	M18x1,5*	31.75	46	25.0	31	32	310
65720.W0520	Left	20	77	M20x1,5*	34.92	50	27.5	34	33	386
65720.W0522	Left	22	84	M22x1,5*	38.10	54	30.0	38	37	520
65720.W0525	Left	25	94	M24x2*	42.85	60	33.5	42	42	705

Order No.	Thread hand	d_1	l_1	d_2	d_3	d_4	d_5	d_6	l_2	Weight g
65720.W0530	Left	30	110	M30x2*	50.80	70	40.0	50	51	1084
65720.W0531	Left	30	110	M27x2*	50.80	70	40.0	50	51	1084

Order No.	l_3	l_4	w_1	w_2	A/F	a_1 °	a_2 °	Dyn. load C kN max.	Static load C_0 kN max.
65720.W0004	10	4.0	8	6.00	9	13.0	7.5	3.91	10.8
65720.W0005	10	4.0	8	6.00	9	13.0	7.5	3.91	10.8
65720.W0006	12	5.0	9	6.75	11	13.0	6.5	4.59	12.8
65720.W0008	12	5.0	12	9.00	14	14.5	7.5	6.965	19.2
65720.W0010	15	6.5	14	10.50	17	13.5	8.0	10.42	27.4
65720.W0011	15	6.5	14	10.50	17	13.5	8.0	10.42	27.4
65720.W0012	16	6.5	16	12.00	19	13.0	8.0	12.42	33.4
65720.W0013	16	6.5	16	12.00	19	13.0	8.0	12.42	33.4
65720.W0014	20	8.0	19	13.50	22	16.0	9.5	15.44	41.3
65720.W0016	22	8.0	21	15.00	22	15.5	8.5	22.41	59.6
65720.W0017	22	8.0	21	15.00	22	15.5	8.5	22.41	59.6
65720.W0018	24	10.0	23	16.50	27	15.0	9.5	26.32	69.7
65720.W0020	26	10.0	25	18.00	30	14.5	9.0	30.80	82.2
65720.W0022	26	12.0	28	20.00	32	15.5	10.0	38.23	95.60
65720.W0025	30	12.0	31	22.00	36	15.0	10.0	45.35	118.6
65720.W0030	35	15.0	37	25.00	41	17.0	10.5	55.01	145.6
65720.W0031	35	15.0	37	25.0	41	17.0	10.5	55.01	145.6
65720.W0504	10	4.0	8	6.00	9	13.0	7.5	3.91	10.8
65720.W0505	10	4.0	8	6.00	9	13.0	7.5	3.91	10.8
65720.W0506	12	5.0	9	6.75	11	13.0	6.5	4.59	12.8
65720.W0508	12	5.0	12	9.00	14	14.5	7.5	6.965	19.2
65720.W0510	15	6.5	14	10.50	17	13.5	8.0	10.42	27.4
65720.W0511	15	6.5	14	10.50	17	13.5	8.0	10.42	27.4
65720.W0512	16	6.5	16	12.00	19	13.0	8.0	12.42	33.4
65720.W0513	16	6.5	16	12.00	19	13.0	8.0	12.42	33.4
65720.W0514	20	8.0	19	13.50	22	16.0	9.5	15.44	41.3
65720.W0516	22	8.0	21	15.00	22	15.5	8.5	22.41	59.6
65720.W0517	22	8.0	21	15.00	22	15.5	8.5	22.41	59.6
65720.W0518	24	10.0	23	16.50	27	15.0	9.5	26.32	69.7
65720.W0520	26	10.0	25	18.00	30	14.5	9.0	30.80	82.2
65720.W0522	26	12.0	28	20.00	32	15.5	10.0	38.23	95.6
65720.W0525	30	12.0	31	22.00	36	15.0	10.0	45.35	118.6
65720.W0530	35	15.0	37	25.00	41	17.0	10.5	55.01	145.6
65720.W0531	35	15.0	37	25.00	41	17.0	10.5	55.01	145.6

Heavy-Duty Rod Ends - Female
with integral ball bearing

65760



Material
Rod end housing - forged steel, tempered, case hardened bearing race, ground and lapped, surface galvanized.
Inner ring - ball bearing steel, hardened, superfine ground.
Lubrication - calcium-complex-soap-grease, temp range -20°C to +120°C.
Lubrication nipple - DIN 3405 D1/A (sizes 6 to 10) DIN 71412 H1 (sizes 12 to 30).

Technical Notes
Low maintenance. Sizes according to DIN ISO 12240-4 series K, for tolerances see technical pages.

Tips
Standard thread is right hand thread.

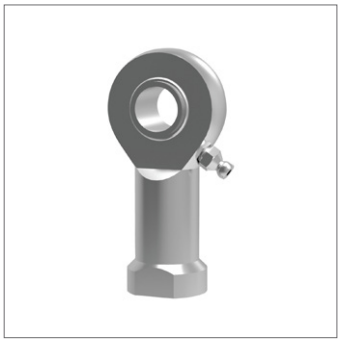
Important Notes
*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	d_4	d_5	d_6	l_2	l_3	l_4	Weight g
65760.W0106	Right	6	30	M6	9.0	20	10.0	13	12	10	5.0	24
65760.W0108	Right	8	36	M8	10.5	24	12.5	16	16	12	5.0	44
65760.W0110	Right	10	43	M10	12.0	28	15.0	19	20	15	6.5	72
65760.W0112	Right	12	50	M12	14.5	32	17.5	22	22	16	6.5	107
65760.W0114	Right	14	57	M14	17.0	36	20.0	25	25	20	8.0	160
65760.W0116	Right	16	64	M16	19.0	42	22.0	27	28	22	8.0	224
65760.W0118	Right	18	71	M18X1,5*	21.5	46	25.0	31	32	24	10.0	293
65760.W0120	Right	20	77	M20X1,5*	24.5	50	27.5	34	33	26	10.0	367
65760.W0122	Right	22	84	M22X1,5*	26.0	54	30.0	38	37	26	12.0	480
65760.W0125	Right	25	94	M24X2*	29.5	64	30.0	35	42	32	10.0	572
65760.W0130	Right	30	110	M30X2*	34.5	70	40.0	50	51	35	15.0	978
65760.W0206	Left	6	30	M6	9.0	20	10.0	13	12	10	5.0	24
65760.W0208	Left	8	36	M8	10.5	24	12.5	16	16	12	5.0	44
65760.W0210	Left	10	43	M10	12.0	28	15.0	19	20	15	6.5	72
65760.W0212	Left	12	50	M12	14.5	32	17.5	22	22	16	6.5	107
65760.W0216	Left	16	64	M16	19.0	42	22.0	27	28	22	8.0	224
65760.W0214	Left	14	57	M14	17.0	36	20.0	25	25	20	8.0	160
65760.W0218	Left	18	71	M18X1,5*	21.5	46	25.0	31	32	24	10.0	293
65760.W0220	Left	20	77	M20X1,5*	24.5	50	27.5	34	33	26	10.0	367
65760.W0222	Left	22	84	M22X1,5*	26.0	54	30.0	38	37	26	12.0	480
65760.W0225	Left	25	94	M24X2*	29.5	64	30.0	35	42	32	10.0	572
65760.W0230	Left	30	110	M30X2*	34.5	70	40.0	50	51	35	15.0	978

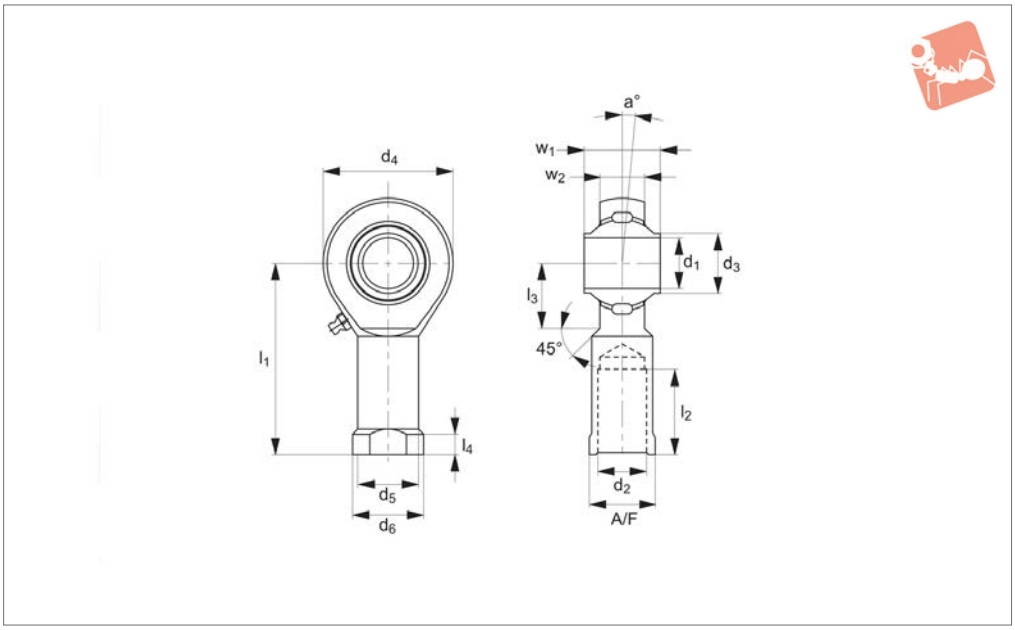
Order No.	w_1	w_2	A/F	a °	Calc. factor Y	Dyn. load C kN max.	Calc. factor Y_0	Speed rpm max.	Static load C_0 kN max.
65760.W0106	9	6.75	11	8.0	2.09	2.8	2.19	1350	0.7
65760.W0108	12	9.00	14	8.5	1.80	4.0	1.89	1300	1.0
65760.W0110	14	10.50	17	8.0	1.90	4.5	1.81	1225	1.5
65760.W0112	16	12.00	19	7.5	1.74	5.6	1.82	1125	2.0

Order No.	w_1	w_2	A/F	a °	Calc. factor Y	Dyn. load C kN max.	Calc. factor Y_0	Speed rpm max.	Static load C_0 kN max.
65760.W0114	19	13.50	22	6.0	2.36	7.1	2.48	1025	2.9
65760.W0116	21	15.00	22	8.0	2.24	7.9	2.35	975	3.5
65760.W0118	23	16.50	27	8.5	2.21	11.0	2.31	900	5.7
65760.W0120	25	18.00	30	7.0	2.46	14.2	2.58	825	7.5
65760.W0122	28	20.00	32	8.0	2.35	14.2	2.24	725	7.5
65760.W0125	31	22.00	30	5.0	2.02	14.2	2.12	600	7.5
65760.W0130	37	25.00	41	7.5	2.24	14.2	2.35	450	7.5
65760.W0206	9	6.75	11	8.0	2.09	2.8	2.19	1350	0.7
65760.W0208	12	9.00	14	8.5	1.80	4.0	1.89	1300	1.0
65760.W0210	14	10.50	17	8.0	1.90	4.5	1.81	1225	1.5
65760.W0212	16	12.00	19	7.5	1.74	5.6	1.82	1125	2.0
65760.W0216	21	15.00	22	8.0	2.24	7.9	2.35	1025	3.5
65760.W0214	19	13.50	22	6.0	2.36	7.1	2.48	975	2.9
65760.W0218	23	16.50	27	8.5	2.21	11.0	2.31	900	5.7
65760.W0220	25	18.00	30	7.0	2.46	14.2	2.58	825	7.5
65760.W0222	28	20.00	32	8.0	2.35	14.2	2.24	725	7.5
65760.W0225	31	22.00	30	5.0	2.02	14.2	2.12	600	7.5
65760.W0230	37	25.00	41	7.5	2.24	14.2	2.35	425	7.5

Heavy-Duty Rod Ends - Female
with integral roller bearing



65800



Material
Rod end housing - forged steel, tempered, case hardened bearing race, ground and lapped, surface galvanized.
Inner ring - ball bearing steel, hardened, superfine ground.
Lubrication - calcium-complex-soap-grease, temp. range -20°C to +120°C, lubrication nipple - DIN 71412 HZ.

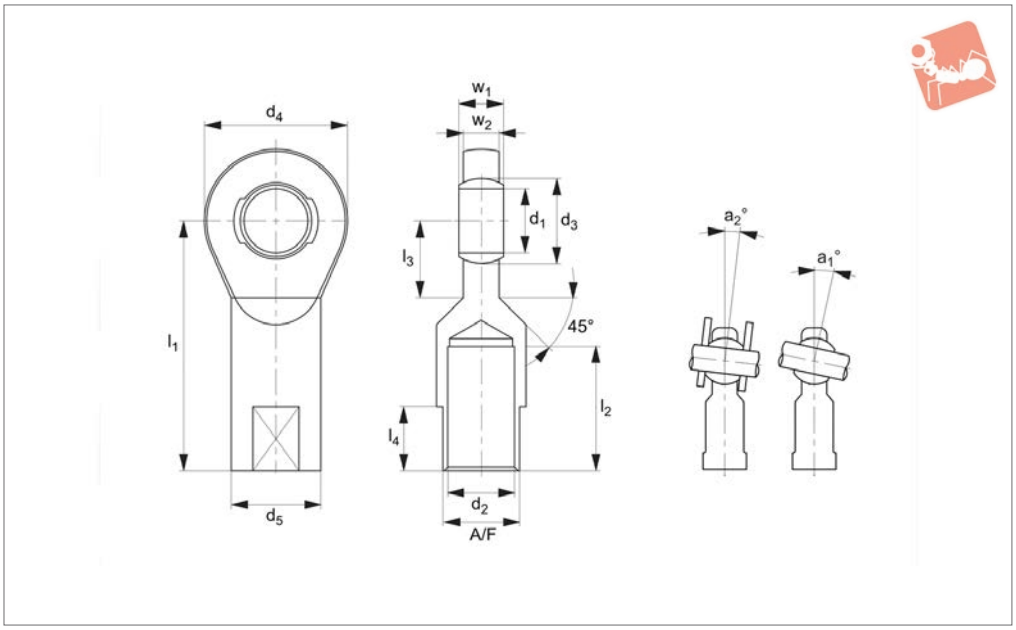
Technical Notes
Low maintenance. Sizes according to DIN ISO 12240-4, series K, for tolerances see technical pages.

Tips
Standard thread is right hand thread.

Important Notes
*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	d_4	d_5	d_6	l_2	Weight g
65800.W0112	Right	12	50.0	M12	14.5	32	17.5	22	22.0	109
65800.W0116	Right	16	64.0	M16	19.0	42	22.0	27	28.0	220
65800.W0120	Right	20	77.0	M20x1,5*	24.5	50	27.5	34	33.0	361
65800.W0125	Right	25	94.0	M24x2*	29.5	64	30.0	35	42.0	565
65800.W0130	Right	30	110.0	M30x2*	34.5	70	40.0	50	51.0	1000
65800.W0212	Left	12	50.0	M12	14.5	32	17.5	22	22.0	109
65800.W0216	Left	16	64.0	M16	19.0	42	22.0	27	28.0	220
65800.W0220	Left	20	77.0	M20x1,5*	24.5	50	27.5	34	33.0	361
65800.W0225	Left	25	94.0	M24x2*	29.5	64	30.0	35	42.0	565
65800.W0230	Left	30	110.0	M30x2*	34.5	70	40.0	50	51.0	1000

Order No.	l_3	l_4	w_1	w_2	A/F	a °	Dyn. load C kN max.	Speed rpm max.	Static load C_0 kN max.
65800.W0112	16	6.5	16	12	19	7.5	10.3	1125	6.6
65800.W0116	22	8.0	21	15	22	7.0	13.3	975	8.9
65800.W0120	26	10.0	25	18	30	7.0	17.0	825	11.7
65800.W0125	32	10.0	31	22	30	5.0	24.9	600	18.5
65800.W0130	35	15.0	37	25	41	7.5	32.5	450	24.9
65800.W0212	16	6.5	16	12	19	7.5	10.3	1125	6.6
65800.W0216	22	8.0	21	15	22	7.0	13.3	975	8.9
65800.W0220	26	10.0	25	18	30	7.0	17.0	825	11.7
65800.W0225	32	10.0	31	22	30	5.0	24.9	600	18.5
65800.W0230	35	15.0	37	25	41	7.5	32.5	450	24.9



65880

Material
Rod end housing - forged steel, tempered, surface galvanized.
Joint ball - ball bearing steel, hardened and ground, polished and chromium plated.

Race - nylon/teflon/glass compound.

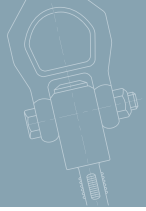
Technical Notes
Female thread maintenance free adapter sizes according to DIN ISO 12240-4, series E.

For tolerances see technical pages.

Tips
Standard thread is right hand thread.

Important Notes
*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	d_4	d_5	l_2	l_3	Weight g
65880.W0106	Right	6	30	M6	10.0	20	10	12	11	17
65880.W0108	Right	8	36	M8	13.0	23	13	16	12	31
65880.W0110	Right	10	43	M10	16.0	28	16	20	13	54
65880.W0111	Right	10	43	M10x1,25*	16.0	28	16	20	13	54
65880.W0112	Right	12	50	M12	18.0	32	19	22	15	86
65880.W0113	Right	12	50	M12x1,25*	18.0	32	19	22	15	86
65880.W0115	Right	15	61	M14	22.0	38	22	25	18	142
65880.W0117	Right	17	67	M16	25.0	44	25	28	20	208
65880.W0120	Right	20	77	M20x1,5*	29.0	51	28	33	23	290
65880.W0125	Right	25	94	M24x2*	35.5	62	35	42	30	573
65880.W0130	Right	30	110	M30x2*	40.7	70	42	51	32	908
65880.W0135	Right	35	125	M36x3*	47.0	82	50	61	38	1230
65880.W0136	Right	35	130	M36x2*	47.0	82	50	66	38	1230
65880.W0140	Right	40	145	M42x3*	53.0	92	58	71	42	2075
65880.W0141	Right	40	142	M39x3*	53.0	92	52	66	42	1880
65880.W0145	Right	45	165	M45x3*	60.0	102	67	76	50	3085
65880.W0146	Right	45	145	M42x3*	60.0	102	58	66	50	2500
65880.W0150	Right	50	195	M52x3*	66.0	112	70	89	60	3975
65880.W0151	Right	50	160	M45x3*	66.0	112	62	69	60	3200
65880.W0160	Right	60	225	M60x4*	80.0	135	82	103	70	7300
65880.W0161	Right	60	175	M52x3*	80.0	135	71	71	70	5900
65880.W0206	Left	6	30	M6	10.0	20	10	12	11	17
65880.W0208	Left	8	36	M8	13.0	23	13	16	12	31
65880.W0210	Left	10	43	M10	16.0	28	16	20	13	54
65880.W0211	Left	10	43	M10x1,25*	16.0	28	16	20	13	54
65880.W0212	Left	12	50	M12	18.0	32	19	22	15	86
65880.W0213	Left	12	50	M12x1,25*	18.0	32	19	22	15	86
65880.W0215	Left	15	61	M14	22.0	38	22	25	18	142
65880.W0217	Left	17	67	M16	25.0	44	25	28	20	208
65880.W0220	Left	20	77	M20x1,5*	29.0	51	28	33	23	290
65880.W0225	Left	25	94	M24x2*	35.5	62	35	42	30	573
65880.W0230	Left	30	110	M30x2*	40.7	70	42	51	32	908



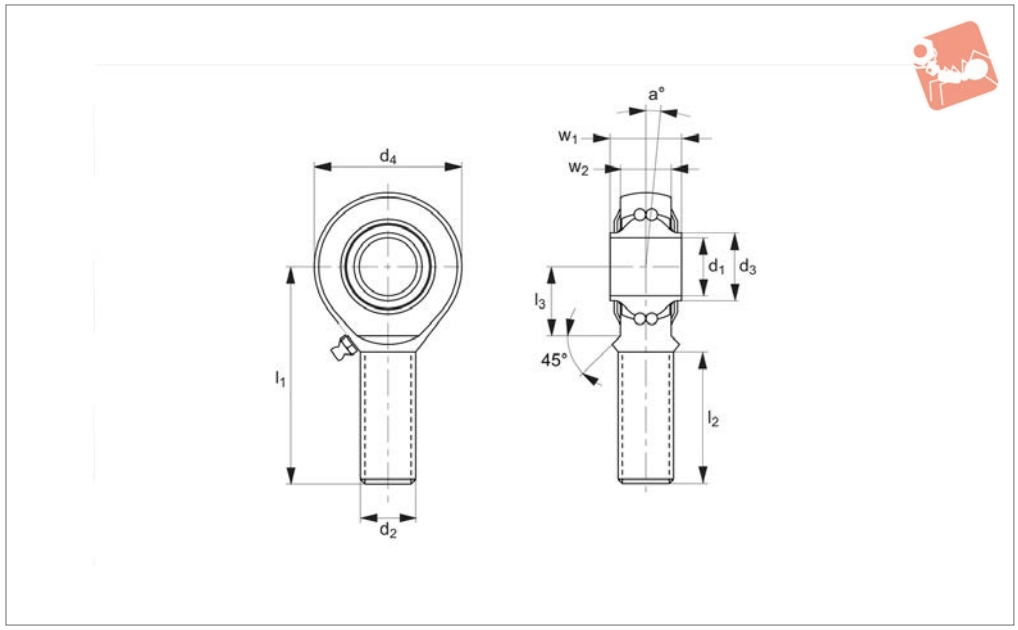
Heavy-Duty Rod Ends - Female

with integral spherical plain bearing

Order No.	Thread hand	d_1	l_1	d_2	d_3	d_4	d_5	l_2	l_3	Weight g
65880.W0235	Left	35	125	M36x3*	47.0	82	50	61	38	1230
65880.W0236	Left	35	130	M36x2*	47.0	82	50	66	38	1230
65880.W0240	Left	40	145	M42x3*	53.0	92	58	71	42	2075
65880.W0241	Left	40	142	M39x3*	53.0	92	52	66	42	1880
65880.W0245	Left	45	165	M45x3*	60.0	102	67	76	50	3085
65880.W0246	Left	45	145	M42x3*	60.0	102	58	66	50	2500
65880.W0250	Left	50	195	M52x3*	66.0	112	70	89	60	3975
65880.W0251	Left	50	160	M45x3*	66.0	112	62	69	60	3200
65880.W0260	Left	60	225	M60x4*	80.0	135	82	103	70	7300
65880.W0261	Left	60	175	M52x3*	80.0	135	71	71	70	5900

Order No.	l_4	w_1	w_2	A/F	a_1 °	a_2 °	Dyn. load C kN max.	Static load C_0 kN max.
65880.W0106	-	6	4	9	13.0	6.5	2.5	10.6
65880.W0108	-	8	5	11	15.0	8.0	4.2	13.1
65880.W0110	-	9	6	14	12.0	6.0	6.4	18.8
65880.W0111	-	9	6	14	12.0	6.0	6.4	18.8
65880.W0112	-	10	7	17	10.5	5.0	9.2	28.0
65880.W0113	-	10	7	17	10.5	5.0	9.2	28.0
65880.W0115	-	12	9	19	8.5	4.5	13.4	41.0
65880.W0117	-	14	10	22	10.0	5.5	19.2	57.9
65880.W0120	-	16	12	24	9.0	4.5	25.2	76.7
65880.W0125	-	20	16	30	7.5	3.5	42.4	119.1
65880.W0130	-	22	18	36	6.0	3.0	54.0	141.8
65880.W0135	36	25	20	41	6.5	3.5	70.4	180.8
65880.W0136	41	25	20	41	6.5	3.5	70.4	180.8
65880.W0140	42	28	22	50	7.0	3.5	86.0	222.6
65880.W0141	39	28	22	46	7.0	3.5	86.0	222.6
65880.W0145	45	32	25	55	7.5	4.0	107.0	276.2
65880.W0146	42	32	25	50	7.5	4.0	107.0	276.2
65880.W0150	52	35	28	60	6.5	3.0	132.0	339.2
65880.W0151	45	35	28	55	6.5	3.0	132.0	339.2
65880.W0160	60	44	36	70	6.5	3.5	208.0	532.1
65880.W0161	52	44	36	60	6.5	3.5	208.0	532.1
65880.W0206	-	6	4	9	13.0	6.5	2.5	10.6
65880.W0208	-	8	5	11	15.0	8.0	4.2	13.1
65880.W0210	-	9	6	14	12.0	6.0	6.4	18.8
65880.W0211	-	9	6	14	12.0	6.0	6.4	18.8
65880.W0212	-	10	7	17	10.5	5.0	9.2	28.0
65880.W0213	-	10	7	17	10.5	5.0	9.2	28.0
65880.W0215	-	12	9	19	8.5	4.5	13.4	41.0
65880.W0217	-	14	10	22	10.0	5.5	19.2	57.9
65880.W0220	-	16	12	24	9.0	4.5	25.2	76.7
65880.W0225	-	20	16	30	7.5	3.5	42.4	119.1
65880.W0230	-	22	18	36	6.0	3.0	54.0	141.8
65880.W0235	36	25	20	41	6.5	3.5	70.4	180.8
65880.W0236	41	25	20	41	6.5	3.5	70.4	180.8
65880.W0240	42	28	22	50	7.0	3.5	86.0	222.6
65880.W0241	39	28	22	46	7.0	3.5	86.0	222.6
65880.W0245	45	32	25	55	7.5	4.0	107.0	276.2
65880.W0246	42	32	25	50	7.5	4.0	107.0	276.2
65880.W0250	52	35	28	60	6.5	3.0	132.0	339.2
65880.W0251	45	35	28	55	6.5	3.0	132.0	339.2
65880.W0260	60	44	36	70	6.5	3.5	208.0	532.1
65880.W0261	52	44	36	60	6.5	3.5	208.0	532.1

Stainless Heavy-Duty Rod Ends - Male
with integral ball bearing



65742

Material
Housing - stainless steel (AISI 304), forged, hardened bearing race, superfinished, rolled thread.
Inner ring - stainless steel (AISI 304), hardened, superfine finish.
Lubrication - aluminium-complex-soap-grease, temp range -45°C to +120°C.

Lubrication nipple - DIN 3405 D1/A (until size 10) DIN 71412 H1 (from size 12).

Technical Notes
Low maintenance, sizes according to DIN ISO 12240-4 series K, for tolerances see technical pages.

Tips
Standard thread is right hand thread.

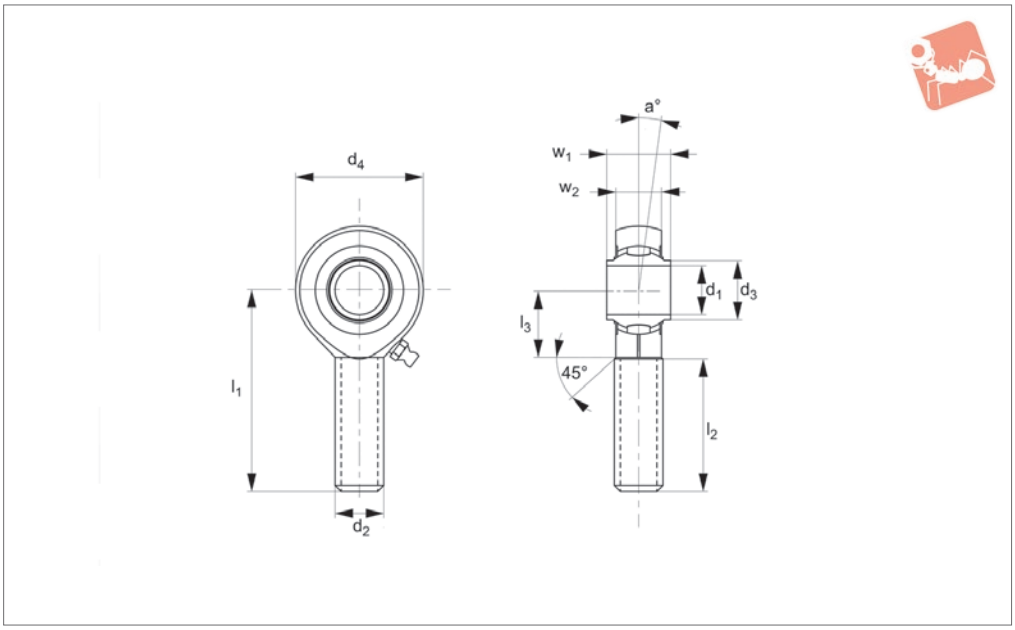
Important Notes
*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a °	l_3	w_1	Weight g
65742.W0008	Right	8	42	M8	10.5	25	24	8.5	15	12	36
65742.W0010	Right	10	48	M10	12.0	29	28	8.0	15	14	60
65742.W0012	Right	12	54	M12	14.5	33	32	7.5	19	16	87
65742.W0016	Right	16	66	M16	19.0	40	42	8.0	22	21	190
65742.W0020	Right	20	78	M20x1,5*	24.5	47	50	7.0	28	25	338
65742.W0508	Left	8	42	M8	10.5	25	24	8.5	15	12	36
65742.W0510	Left	10	48	M10	12.0	29	28	8.0	15	14	60
65742.W0512	Left	12	54	M12	14.5	33	32	7.5	19	16	87
65742.W0516	Left	16	66	M16	19.0	40	42	8.0	22	21	190
65742.W0520	Left	20	78	M20x1,5*	24.5	47	50	7.0	28	25	338

Order No.	w_2	Calc. factor Y	Calc. factor Y_0	Dyn. load C kN max.	Speed rpm max.	Static load C_0 kN max.
65742.W0008	9.00	1.89	1.80	0.7	1300	2.8
65742.W0010	10.50	1.81	1.90	1.0	1225	3.1
65742.W0012	12.00	1.82	1.74	1.3	1125	3.5
65742.W0016	15.00	2.35	2.24	1.6	975	4.3
65742.W0020	18.00	2.58	2.46	2.3	825	5.4
65742.W0508	9.00	1.89	1.80	0.7	1300	2.8
65742.W0510	10.50	1.81	1.90	1.0	1225	3.1
65742.W0512	12.00	1.82	1.74	1.3	1125	3.5
65742.W0516	15.00	2.35	2.24	1.6	975	4.3
65742.W0520	18.00	2.58	2.46	2.3	825	5.4

Heavy-Duty Rod Ends - Male
with integral roller bearing

65780



Material
Rod end housing - forged steel, tempered, case hardened bearing race, ground and lapped, surface galvanized.
Inner ring - ball bearing steel, hardened, superfine ground.
Lubrication - calcium-complex-soap-grease, temp. range -20°C to +120°C, lubrication nipple - DIN 71412 HZ.

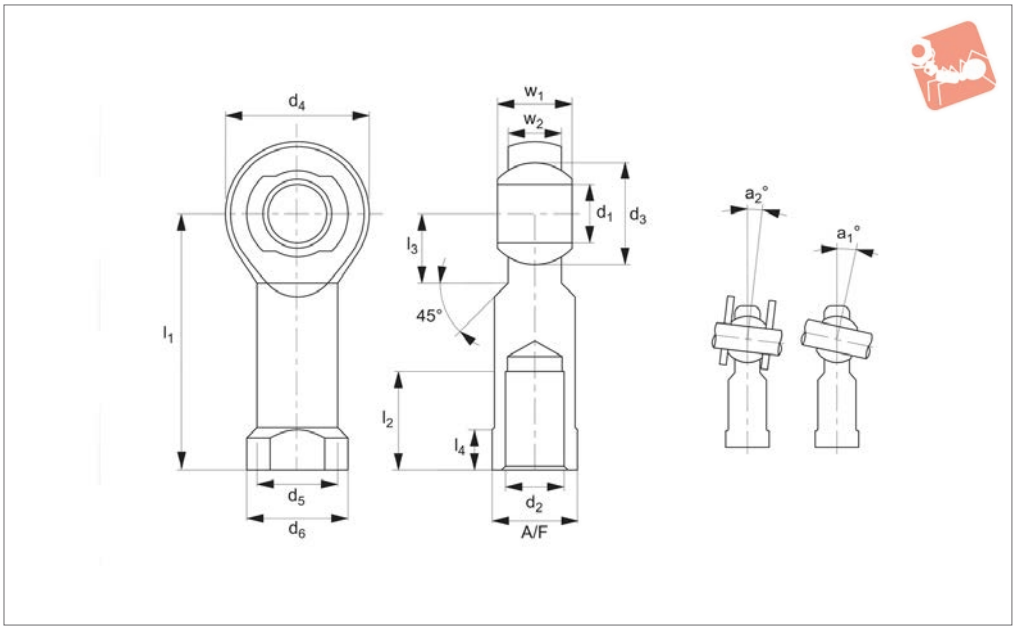
Technical Notes
Low maintenance. Sizes according to DIN ISO 12240-4, series K, for tolerances see technical pages.

Tips
Standard thread is right hand thread.

Important Notes
*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a °	Weight g
65780.W0112	Right	12	54	M12	14.5	33	32	7.5	88
65780.W0116	Right	16	66	M16	19.0	40	42	7.0	185
65780.W0120	Right	20	78	M20x1,5*	24.5	47	50	7.0	340
65780.W0125	Right	25	94	M24x2*	29.5	57	64	5.0	596
65780.W0130	Right	30	110	M30x2*	34.5	66	70	7.5	912
65780.W0512	Left	12	54	M12	14.5	33	32	7.5	88
65780.W0516	Left	16	66	M16	19.0	40	42	7.0	185
65780.W0520	Left	20	78	M20x1,5*	24.5	47	50	7.0	340
65780.W0525	Left	25	94	M24x2*	29.5	57	64	5.0	596
65780.W0530	Left	30	110	M30x2*	34.5	66	70	7.5	912

Order No.	l_3	w_1	w_2	Dyn. load C kN max.	Speed rpm max.	Static load C_0 kN max.
65780.W0112	19	16	12	10.25	1125	6.6
65780.W0116	22	21	15	13.3	975	8.9
65780.W0120	28	25	18	17.0	825	11.7
65780.W0125	30	31	22	24.90	600	18.5
65780.W0130	35	37	25	32.5	450	24.8
65780.W0512	19	16	12	10.25	1125	6.6
65780.W0516	22	21	15	13.3	975	8.9
65780.W0520	28	25	18	17.0	825	11.7
65780.W0525	30	31	22	24.9	600	18.5
65780.W0530	35	37	25	32.5	450	24.8



65722

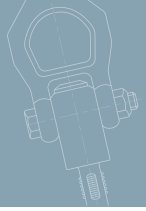
Material
Rod end housing: Stainless steel DIN 12240-4 (AISI 304).
Joint Ball: Stainless steel 1.4412, hardened and ground, surface polished.
Race: nylon/teflon/glass compound.

Technical Notes
Maintenance free, for tolerances see technical page 123, standard thread is right hand thread.

Tips
A2 stainless steel provides good corrosion resistance to a wide range of atmospheric conditions and corrosive media.
It is considered resistant to potable water.

Important Notes
*Denotes fine pitch thread.

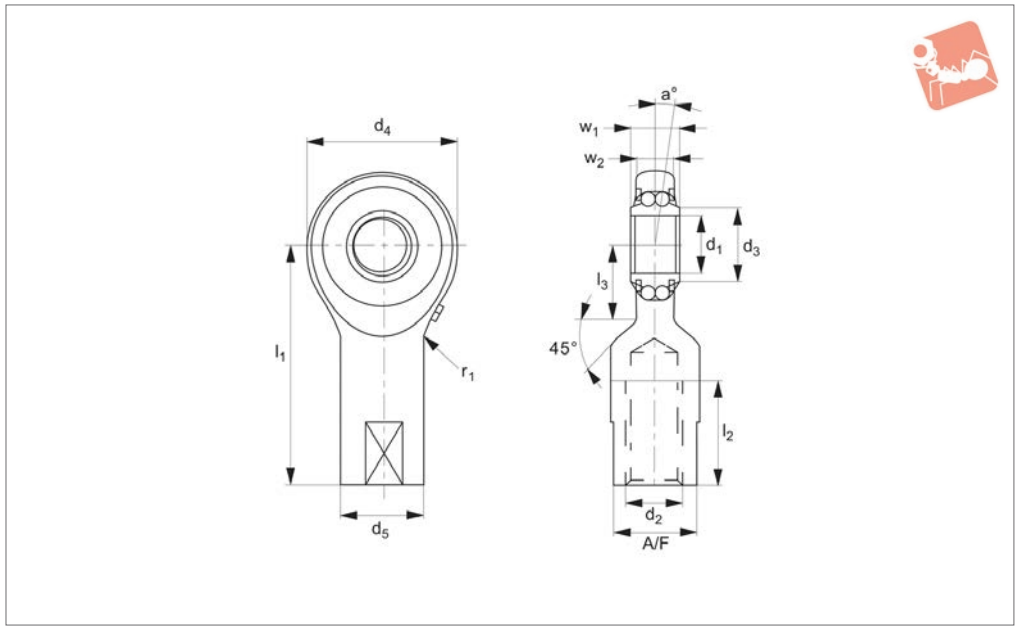
Order No.	Thread hand	d_1	l_1	d_2	d_3	d_4	d_5	d_6	l_2	Weight g
65722.W0104	Right	5	36	M4	11.11	18	9.0	11	10	18
65722.W0105	Right	5	36	M5	11.11	18	9.0	11	10	18
65722.W0106	Right	6	40	M6	12.70	20	10.0	13	12	24
65722.W0108	Right	8	48	M8	15.87	24	12.5	16	16	45
65722.W0110	Right	10	57	M10	19.05	28	15.0	19	20	74
65722.W0111	Right	10	57	M10x1,25*	19.05	28	15.0	19	20	74
65722.W0112	Right	12	66	M12	22.22	32	17.5	22	22	109
65722.W0113	Right	12	66	M12x1,25*	22.22	32	17.5	22	22	109
65722.W0114	Right	14	75	M14	25.40	36	20.0	25	25	155
65722.W0116	Right	16	85	M16	28.57	42	22.0	27	28	233
65722.W0117	Right	16	85	M16x1,5*	28.57	42	22.0	27	28	233
65722.W0118	Right	18	94	M18x1,5*	31.75	46	25.0	31	32	310
65722.W0120	Right	20	102	M20x1,5*	34.92	50	27.5	34	33	386
65722.W0122	Right	22	111	M22x1,5*	38.10	54	30.0	38	37	520
65722.W0125	Right	25	124	M24x2*	42.85	60	33.5	42	42	705
65722.W0130	Right	30	145	M30x2*	50.80	70	40.0	50	51	1084
65722.W0131	Right	30	145	M27x2*	50.80	70	40.0	50	51	1084
65722.W0504	Left	5	36	M4	11.11	18	9.0	11	10	18
65722.W0505	Left	5	36	M5	11.11	18	9.0	11	10	18
65722.W0506	Left	6	40	M6	12.70	20	10.0	13	12	24
65722.W0508	Left	8	48	M8	15.87	24	12.5	16	16	45
65722.W0510	Left	10	57	M10	19.05	28	15.0	19	20	74
65722.W0511	Left	10	57	M10x1,25*	19.05	28	15.0	19	20	74
65722.W0512	Left	12	66	M12	22.22	32	17.5	22	22	109
65722.W0513	Left	12	66	M12x1,25*	22.22	32	17.5	22	22	109
65722.W0514	Left	14	75	M14	25.40	36	20.0	25	25	155
65722.W0516	Left	16	85	M16	28.57	42	22.0	27	28	233
65722.W0517	Left	16	85	M16x1,5*	28.57	42	22.0	27	28	233
65722.W0518	Left	18	94	M18x1,5*	31.75	46	25.0	31	32	310

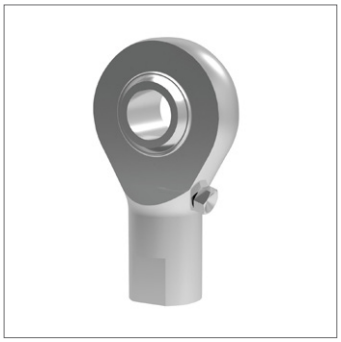


Stainless Heavy-Duty Rod Ends -
with integral spherical plain bearing

Order No.	Thread hand	d_1	l_1	d_2	d_3	d_4	d_5	d_6	l_2	Weight g
65722.W0520	Left	20	102	M20x1,5*	34.92	50	27.5	34	33	386
65722.W0522	Left	22	111	M22x1,5*	38.10	54	30.0	38	37	520
65722.W0525	Left	25	124	M24x2*	42.85	60	33.5	42	42	705
65722.W0530	Left	30	145	M30x2*	50.80	70	40.0	50	51	1084
65722.W0531	Left	30	145	M27x2*	50.80	70	40.0	50	51	1084

Order No.	l_3	l_4	w_1	w_2	A/F	a_1 °	a_2 °	Dyn. load C kN max.	Static load C_0 kN max.
65722.W0104	10	4.0	8	6.00	9	13.0	7.5	3.9	7.9
65722.W0105	10	4.0	8	6.00	9	13.0	7.5	3.9	7.9
65722.W0106	12	5.0	9	6.75	11	13.0	6.5	4.6	9.4
65722.W0108	12	5.0	12	9.00	14	14.5	7.5	7.0	14.1
65722.W0110	15	6.5	14	10.50	17	13.5	8.0	10.4	20.1
65722.W0111	15	6.5	14	10.50	17	13.5	8.0	10.4	20.1
65722.W0112	16	6.5	16	12.00	19	13.0	8.0	12.4	24.5
65722.W0113	16	6.5	16	12.00	19	13.0	8.0	12.4	24.5
65722.W0114	20	8.0	19	13.50	22	16.0	9.5	15.4	30.4
65722.W0116	22	8.0	21	15.00	22	15.5	8.5	22.4	43.7
65722.W0117	22	8.0	21	15.00	22	15.5	8.5	22.4	43.7
65722.W0118	24	10.0	23	16.50	27	15.0	9.5	26.3	51.2
65722.W0120	26	10.0	25	18.00	30	14.5	9.0	30.8	60.3
65722.W0122	26	12.0	28	20.00	32	15.5	10.0	38.2	70.0
65722.W0125	30	12.0	31	22.00	36	15.0	10.0	45.4	87.0
65722.W0130	35	15.0	37	25.00	41	17.0	10.5	55.0	106.8
65722.W0131	35	15.0	37	25.0	41	17.0	10.5	55.0	106.8
65722.W0504	10	4.0	8	6.00	9	13.0	7.5	3.9	7.9
65722.W0505	10	4.0	8	6.00	9	13.0	7.5	3.9	7.9
65722.W0506	12	5.0	9	6.75	11	13.0	6.5	4.6	9.4
65722.W0508	12	5.0	12	9.00	14	14.5	7.5	7.0	14.1
65722.W0510	15	6.5	14	10.50	17	13.5	8.0	10.4	20.1
65722.W0511	15	6.5	14	10.50	17	13.5	8.0	10.4	20.1
65722.W0512	16	6.5	16	12.00	19	13.0	8.0	12.4	24.5
65722.W0513	16	6.5	16	12.00	19	13.0	8.0	12.4	24.5
65722.W0514	20	8.0	19	13.50	22	16.0	9.5	15.4	30.4
65722.W0516	22	8.0	21	15.00	22	15.5	8.5	22.4	43.7
65722.W0517	22	8.0	21	15.00	22	15.5	8.5	22.4	43.7
65722.W0518	24	10.0	23	16.50	27	15.0	9.5	26.3	51.2
65722.W0520	26	10.0	25	18.00	30	14.5	9.0	30.8	60.3
65722.W0522	26	12.0	28	20.00	32	15.5	10.0	38.2	70.0
65722.W0525	30	12.0	31	22.00	36	15.0	10.0	45.4	87.0
65722.W0530	35	15.0	37	25.00	41	17.0	10.5	55.0	106.8
65722.W0531	35	15.0	37	25.00	41	17.0	10.5	55.0	106.8





65840

Material
Rod end housing - forged steel, tempered, case hardened bearing race, ground and lapped, surface galvanized.
Inner ring - ball bearing steel, hardened, superfine ground.

Lubrication - calcium-complex-soap-grease, temp range -20°C to +120°C, lubrication nipple - DIN 3405 D1/A.

Technical Notes
Low maintenance, for tolerances see technical pages.

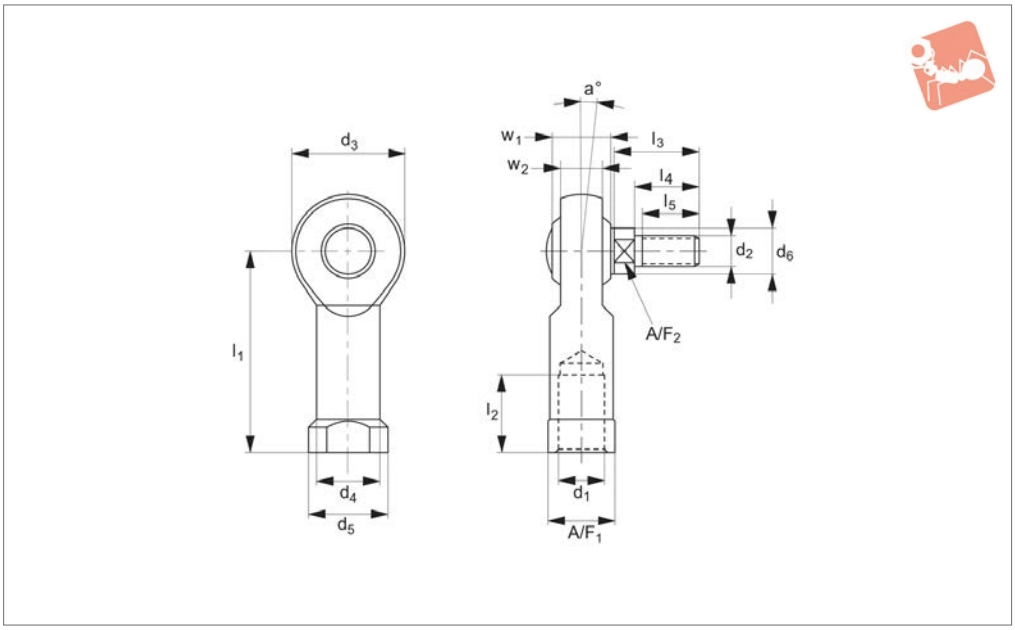
Tips
Standard thread is right hand thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	d_4	d_5	l_2	l_3	w_1	w_2	R	Weight g
65840.W0010	Right	10	38	M8	13.0	30	15	17	14.5	13.0	9	10	63
65840.W0015	Right	15	51	M12	17.5	40	19	24	20.0	16.5	12	15	140
65840.W0020	Right	20	65	M16	24.0	48	22	32	22.0	20.5	15	20	223
65840.W0510	Left	10	38	M8	13.0	30	15	917	14.5	13.0	9	10	63
65840.W0515	Left	15	51	M12	17.5	40	19	24	20.0	16.5	12	15	140
65840.W0520	Left	20	65	M16	24.0	48	22	32	22.0	20.5	15	20	223

Order No.	A/F	a °	Calc. factor Y	Dyn. load C kN max.	Calc. factor Y_0	Speed rpm max.	Static load C_0 kN max.
65840.W0010	13	7.0	1.90	2.6	1.81	1225	1.0
65840.W0015	17	7.0	2.30	5.0	2.41	1025	1.9
65840.W0020	19	6.5	2.34	6.1	2.45	850	3.0
65840.W0510	13	7.0	1.90	2.6	1.81	1225	1.0
65840.W0515	17	7.0	2.30	5.0	2.41	1025	1.9
65840.W0520	19	6.5	2.34	6.1	2.45	850	3.0

Rod End with Stud - Female

65990



Material
Body: surface zinc plated
Race: steel/ bronze - PTFE composite.
Inner ring: bearing steel, hardened ground and spherical surface chromium plates.
Outer ring: brass body pressed around, outer race lined with bronze - PTFE composite.

Technical Notes
Maintenance free. Sizes according to DIN ISO 12240-4 series K.

Tips
Standard thread is right hand thread.
Rod end studs are all right hand threads.

Important Notes
*Denotes fine pitch threads.

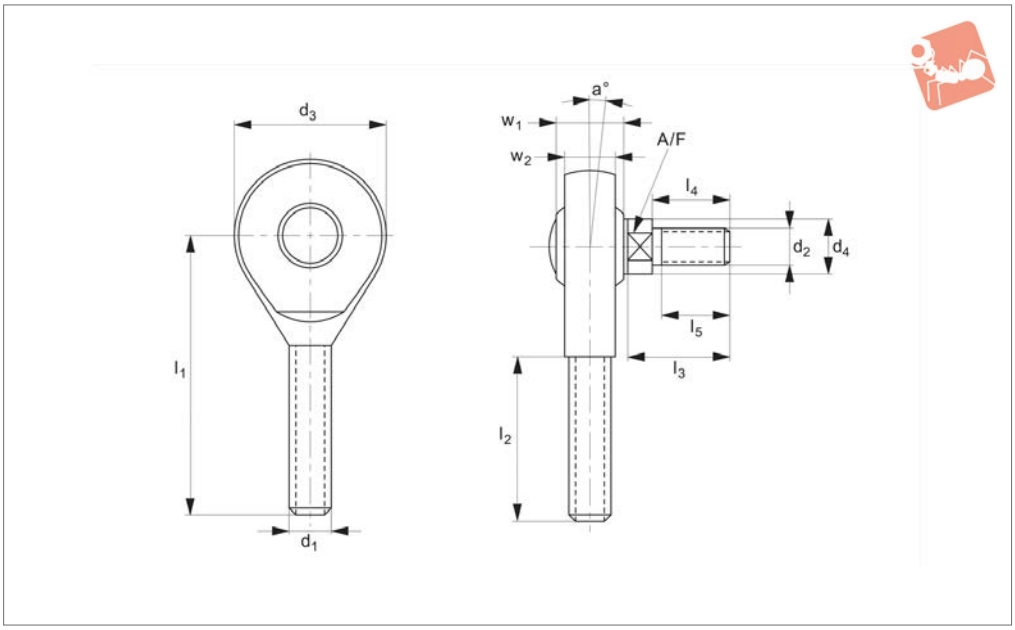
Order No.	Thread hand	d_1	d_2	l_1	w_1	d_3	d_4	d_5	d_6	l_2	Weight g
65990.W0106	Right	M6	M6	30	9	20	10.0	13	9.0	12	22
65990.W0108	Right	M8	M8	36	12	24	12.5	16	10.5	16	47
65990.W0110	Right	M10	M10	43	14	28	15.0	19	13.0	20	77
65990.W0111	Right	M10 x 1,25*	M10	43	14	28	15.0	19	13.0	20	77
65990.W0112	Right	M12	M12	50	16	32	17.5	22	15.0	22	100
65990.W0113	Right	M12 x 1,25*	M12	50	16	32	17.5	22	15.0	22	100
65990.W0114	Right	M14	M14	57	19	36	20.0	25	17.0	25	160
65990.W0115	Right	M14 x 1,5*	M14	57	19	36	20.0	25	17.0	25	160
65990.W0116	Right	M16	M16	64	21	42	22.0	27	19.0	28	220
65990.W0117	Right	M16 x 1,5*	M16	64	21	42	22.0	27	19.0	28	220
65990.W0506	Left	M6	M6	30	9	20	10.0	13	9.0	12	22
65990.W0508	Left	M8	M8	36	12	24	12.5	16	10.5	16	47
65990.W0510	Left	M10	M10	43	14	28	15.0	19	13.0	20	77
65990.W0511	Left	M10 x 1,25*	M10	43	14	28	15.0	19	13.0	20	77
65990.W0512	Left	M12	M12	50	16	32	17.5	22	15.0	22	100
65990.W0513	Left	M12 x 1,25*	M12	50	16	32	17.5	22	15.0	22	100
65990.W0514	Left	M14	M14	57	19	36	20.0	25	17.0	25	160
65990.W0515	Left	M14 x 1,50*	M14	57	19	36	20.0	25	17.0	25	160
65990.W0516	Left	M16	M16	64	21	42	22.0	27	19.0	28	220
65990.W0517	Left	M16 x 1,50*	M16	64	21	42	22.0	27	19.0	28	220

Order No.	l_3	l_4	l_5	w_2	A/F_1	A/F_2	a °	Static load C_0 kN max.
65990.W0106	18.5	13	10	6.75	11	8	13	7.7
65990.W0108	23.5	17	13	9.00	14	8	14	12.9
65990.W0110	28.0	21	17	10.50	17	12	13	18.0
65990.W0111	28.0	21	17	10.50	17	12	13	18.0
65990.W0112	32.5	25	20	12.00	19	14	13	24.0
65990.W0113	32.5	25	20	12.00	19	14	13	24.0
65990.W0114	37.5	29	22	13.50	22	14	16	31.0
65990.W0115	37.5	29	22	13.50	22	14	16	31.0

Order No.	l_3	l_4	l_5	w_2	A/F_1	A/F_2	a °	Static load C_0 kN max.
65990.W0116	42.5	33	24	15.00	22	17	15	39.0
65990.W0117	42.5	33	24	15.00	22	17	15	39.0
65990.W0506	18.5	13	10	6.75	11	8	13	7.7
65990.W0508	23.5	17	13	9.00	14	8	14	12.9
65990.W0510	28.0	21	17	10.50	17	12	13	18.0
65990.W0511	28.0	21	17	10.50	17	12	13	18.0
65990.W0512	32.5	25	20	12.00	19	14	13	24.0
65990.W0513	32.5	25	20	12.00	19	14	13	24.0
65990.W0514	37.5	29	22	13.50	22	14	16	31.0
65990.W0515	37.5	29	22	13.50	22	14	16	31.0
65990.W0516	42.5	33	24	15.00	22	17	15	39.0
65990.W0517	42.5	33	24	15.00	22	17	15	39.0

Rod End with Stud - Male

65992



Material

Body: surface zinc plated.
Race: steel/ bronze - PTFE composite.
Inner ring: bearing steel, hardened ground and spherical surface chromium plates.
Outer ring: brass body pressed around, outer race lined with bronze - PTFE composite.

Technical Notes

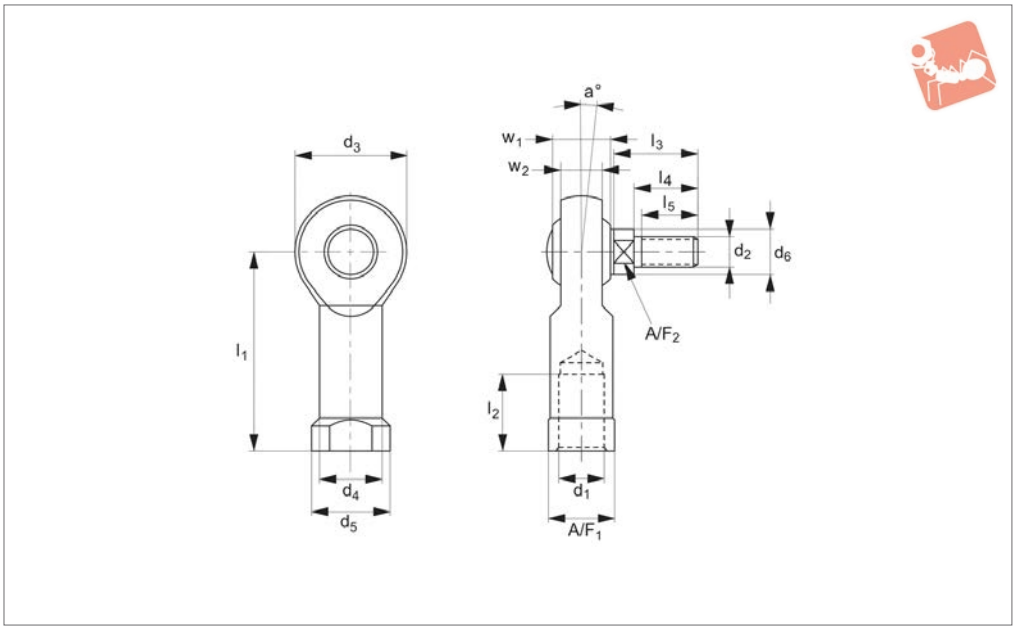
Maintenance free, sizes according to DIN ISO 12230-4 series K.

Tips

Standard thread is right hand thread.
Rod end studs are all right hand threads.

Order No.	Thread hand	d_1	d_2	l_1	w_1	d_3	d_4	l_2	l_3	Weight g
65992.W0106	Right	M6	M6	36	9	20	9.0	21	18.5	20
65992.W0108	Right	M8	M8	42	12	24	10.5	25	23.5	38
65992.W0110	Right	M10	M10	48	14	28	13.0	28	28.5	55
65992.W0112	Right	M12	M12	54	16	32	15.0	32	32.5	85
65992.W0114	Right	M14	M14	60	19	36	17.0	36	37.5	140
65992.W0116	Right	M16	M16	66	21	42	19.0	37	42.5	210
65992.W0506	Left	M6	M6	36	9	20	9.0	21	18.5	20
65992.W0508	Left	M8	M8	42	12	24	10.5	25	23.5	38
65992.W0510	Left	M10	M10	48	14	28	13.0	28	28.5	55
65992.W0512	Left	M12	M12	54	16	32	15.0	32	32.5	85
65992.W0514	Left	M14	M14	60	19	36	17.0	36	37.5	140
65992.W0516	Left	M16	M16	66	21	42	19.0	37	42.5	210

Order No.	l_4	l_5	w_2	A/F	a °	Static load C_0 kN max.
65992.W0106	13	10	6.75	8	13	7.7
65992.W0108	17	13	9.00	8	14	12.9
65992.W0110	21	17	10.50	12	13	18.0
65992.W0112	25	20	12.00	14	13	24.0
65992.W0114	29	22	13.50	14	16	31.0
65992.W0116	33	24	15.00	17	15	39.0
65992.W0506	13	10	6.75	8	13	7.7
65992.W0508	17	13	9.00	8	14	12.9
65992.W0510	21	17	10.50	12	13	18.0
65992.W0512	25	20	12.00	14	13	24.0
65992.W0514	29	22	13.50	14	16	31.0
65992.W0516	33	24	15.00	17	15	39.0



65994

Material
Body: stainless steel (AISI 304)
Race: steel/ bronze - PTFE composite.
Inner ring: stainless steel, hardened and ground (AISI 304).
Outer ring: brass body pressed around, outer race lined with bronze - PTFE composite.
Joint ball: stainless steel (AISI 440C)

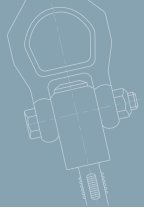
Technical Notes
Maintenance free. Sizes according to DIN ISO 12740-4, series K

Tips
Standard thread is right hand thread.
Rod end studs are all right hand threads.

Important Notes
*denotes fine pitch threads.

Order No.	Thread hand	d_1	d_2	l_1	w_1	d_3	d_4	d_5	d_6	l_2	Weight g
65994.W0106	Right	M6	M6	30	9	20	10.0	13	9.0	12	22
65994.W0108	Right	M8	M8	36	12	24	12.5	16	10.5	16	47
65994.W0110	Right	M10	M10	43	14	28	15.0	19	13.0	20	77
65994.W0111	Right	M10 x 1,25*	M10	43	14	28	15.0	19	13.0	20	100
65994.W0112	Right	M12	M12	50	16	32	17.5	22	15.0	22	100
65994.W0113	Right	M12 x 1,25*	M12	50	16	32	17.5	22	15.0	22	100
65994.W0114	Right	M14	M14	57	19	36	20.0	25	17.0	25	160
65994.W0115	Right	M14 x 1,5*	M14	57	19	36	20.0	25	17.0	25	160
65994.W0116	Right	M16	M16	64	21	42	22.0	27	19.0	28	220
65994.W0117	Right	M16 x 1,5*	M16	64	21	42	22.0	27	19.0	28	220
65994.W0506	Left	M6	M6	30	9	20	10.0	13	9.0	12	22
65994.W0508	Left	M8	M8	36	12	24	12.5	16	10.5	16	47
65994.W0510	Left	M10	M10	43	14	28	15.0	19	13.0	20	77
65994.W0511	Left	M10 x 1,25*	M10	43	14	28	15.0	19	13.0	20	100
65994.W0512	Left	M12	M12	50	16	32	17.5	22	15.0	22	100
65994.W0513	Left	M12 x 1,25*	M12	50	16	32	17.5	22	15.0	22	100
65994.W0514	Left	M14	M14	57	19	36	20.0	25	17.0	25	160
65994.W0515	Left	M14 x 1,50*	M14	57	19	36	20.0	25	17.0	25	160
65994.W0516	Left	M16	M16	64	21	42	22.0	27	19.0	28	220
65994.W0517	Left	M16 x 1,50*	M16	64	21	42	22.0	27	19.0	28	220

Order No.	l_3	l_4	l_5	w_2	A/F_1	A/F_2	a °	Static load C_0 kN max.
65994.W0106	18.5	13	10	6.75	11	8	13	7.7
65994.W0108	23.5	17	13	9.00	14	8	14	12.9
65994.W0110	28.0	21	17	10.50	17	12	13	18.0
65994.W0111	28.0	21	17	10.50	17	12	13	18.0
65994.W0112	32.5	25	20	12.00	19	14	13	24.0
65994.W0113	32.5	25	20	12.00	19	14	13	24.0

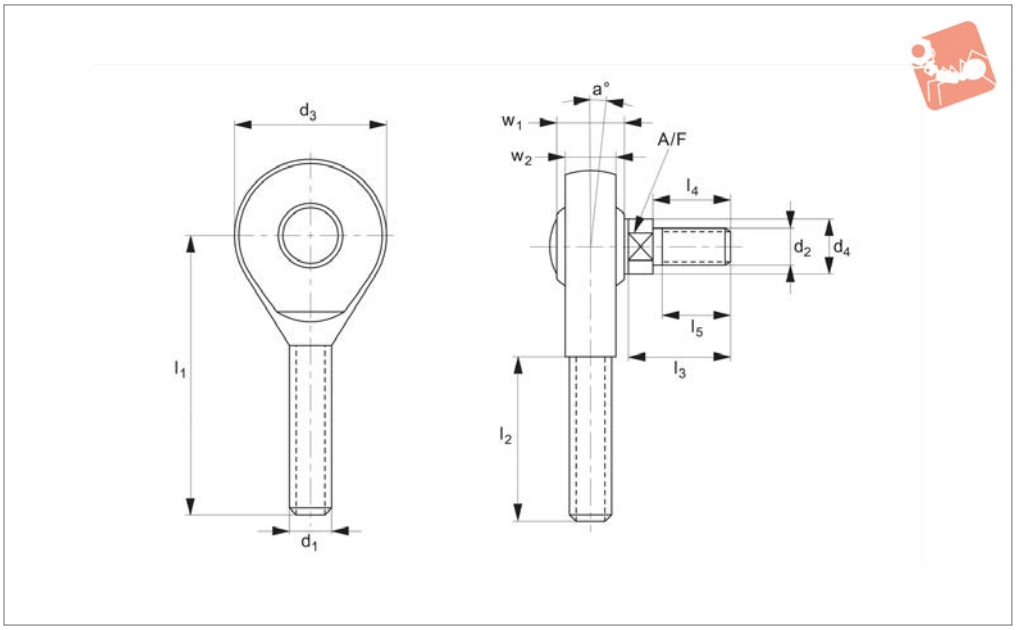


Stainless Rod End with Stud

Female

Order No.	l_3	l_4	l_5	w_2	A/F_1	A/F_2	a °	Static load C_0 kN max.
65994.W0114	37.5	29	22	13.50	22	14	16	31.0
65994.W0115	37.5	29	22	13.50	22	14	16	31.0
65994.W0116	42.5	33	24	15.00	22	17	15	39.0
65994.W0117	42.5	33	24	15.00	22	17	15	39.0
65994.W0506	18.5	13	10	6.75	11	8	13	7.7
65994.W0508	23.5	17	13	9.00	14	8	14	12.9
65994.W0510	28.0	21	17	10.50	17	12	13	18.0
65994.W0511	28.0	21	17	10.50	17	12	13	18.0
65994.W0512	32.5	25	20	12.00	19	14	13	24.0
65994.W0513	32.5	25	20	12.00	19	14	13	24.0
65994.W0514	37.5	29	22	13.50	22	14	16	31.0
65994.W0515	37.5	29	22	13.50	22	14	16	31.0
65994.W0516	42.5	33	24	15.00	22	17	15	39.0
65994.W0517	42.5	33	24	15.00	22	17	15	39.0

Stainless Rod End with stud
Male



65996

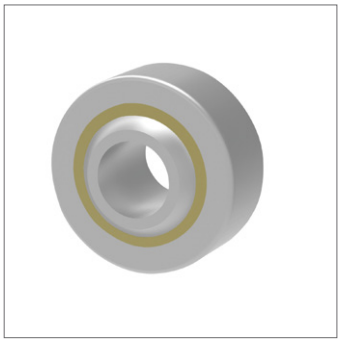
Material
Body: stainless steel (AISI 304)
Race: steel/ bronze - PTFE composite.
Inner ring: stainless steel, hardened and ground (AISI 304)
Outer ring: brass body pressed around, outer race lined with bronze - PTFE composite.
Joint ball: stainless steel (AISI 440C)

Technical Notes
Maintenance free, sizes according to DIN ISO 12240-4 series K.

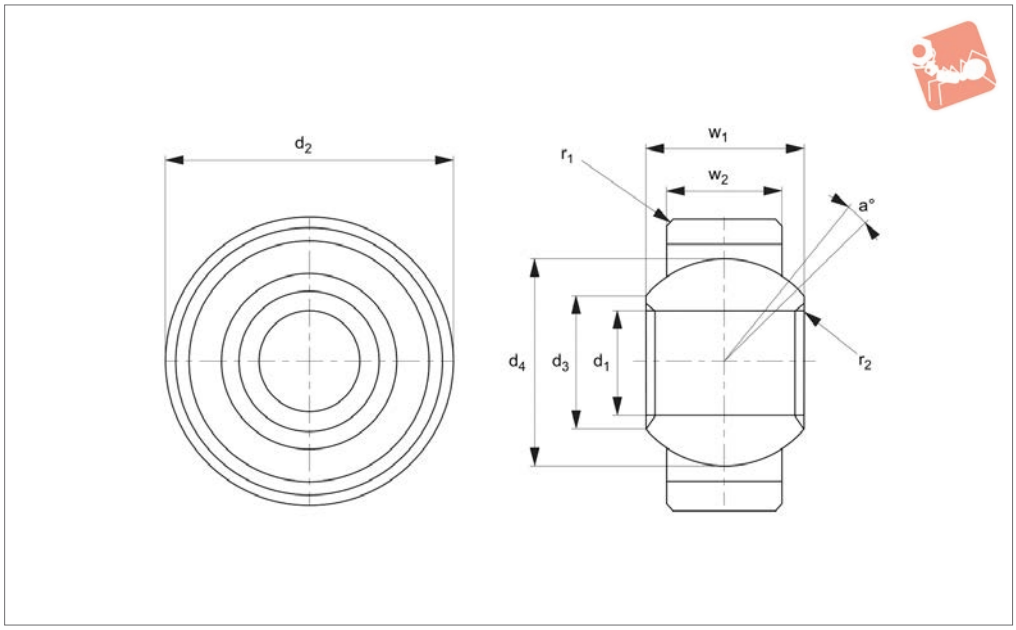
Tips
Standard thread is right hand thread.
Rod end studs are all right hand threads.

Order No.	Thread hand	d_1	d_2	l_1	w_1	d_3	d_4	Weight g
65996.W0106	Right	M6	M6	36	9	20	9.0	20
65996.W0108	Right	M8	M8	42	12	24	10.5	38
65996.W0110	Right	M10	M10	48	14	28	13.0	55
65996.W0112	Right	M12	M12	54	16	32	15.0	85
65996.W0116	Right	M16	M16	66	21	42	19.0	210
65996.W0506	Left	M6	M6	36	9	20	9.0	20
65996.W0508	Left	M8	M8	42	12	24	10.5	38
65996.W0510	Left	M10	M10	48	14	28	13.0	55
65996.W0512	Left	M12	M12	54	16	32	15.0	85
65996.W0516	Left	M16	M16	66	21	42	19.0	210

Order No.	l_2	l_3	l_4	l_5	w_2	A/F	a °	Static load C_0 kN max.
65996.W0106	21	18.5	13	10	6.75	8	13	7.7
65996.W0108	25	23.5	17	13	9.00	8	14	12.9
65996.W0110	28	28.5	21	17	10.50	12	13	18.0
65996.W0112	32	32.5	25	20	12.00	14	13	24.0
65996.W0116	37	42.5	33	24	15.00	17	15	39.0
65996.W0506	21	18.5	13	10	6.75	8	13	7.7
65996.W0508	25	23.5	17	13	9.00	8	14	12.9
65996.W0510	28	28.5	21	17	10.50	12	13	18.0
65996.W0512	32	32.5	25	20	12.00	14	13	24.0
65996.W0516	37	42.5	33	24	15.00	17	15	39.0



65974

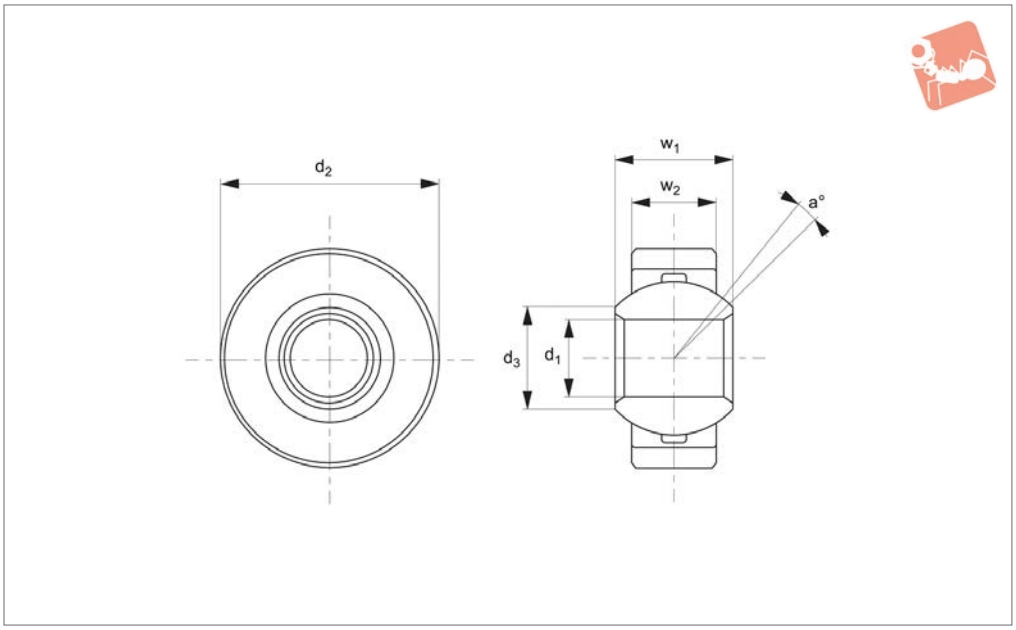


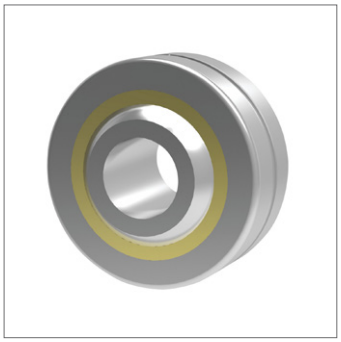
Material
Housing: undercut steel 11SMnPb30K (1.0718) turned silver zinc plated.
Ball: ball bearing steel 100Cr6 hardened, surface condition polished.
Race: teflon.

Technical Notes
To DIN 12240-1

Tips
For stainless steel version see R3641

Order No.	a °	d_1 tol. H7	d_2	d_3	d_4	r_1	r_2	w_1	w_2	Static load C_0 kN max.	Weight g
65974.W0005	13	5	16	7.7	11.10	0.3	1.2	8	6	17	9
65974.W0006	13	6	18	8.9	12.70	0.3	1.2	9	6.75	22	13
65974.W0008	13	8	22	10.3	15.88	0.3	1.2	12	9	36	24
65974.W0010	13	10	26	12.9	19.05	0.3	1.2	14	10.5	50	40
65974.W0012	13	12	30	15.4	22.23	0.4	1.2	16	12	67	80
65974.W0016	15	16	38	19.3	28.58	0.4	1.5	21	15	107	130





65976

Material
Housing: stainless steel (1.4305) turned.
Bearing shell: special brass CuSn8 surface coated with a PTFE foil.
Ball: ball bearing steel 100Cr6 hardened, surface condition polished, hard chrome plated.
Upon request: stainless steel (1.4034) hardened, surface condition polished.

Stainless steel (1.4401) not hardened, surface condition polished.

Technical Notes
Suitable for low speeds and high dynamic loads.

Maintenance free, series K similar to DIN 12240-1 (DIN 648)

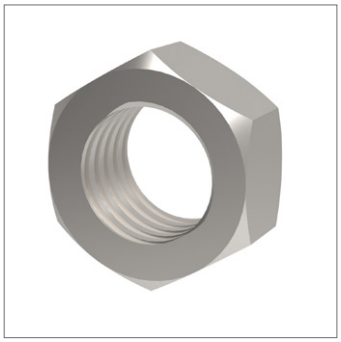
Important Notes
Working range -50°C to +200°C
Recommended shaft tolerance: g6

External diameter of pivoting bearing: h6

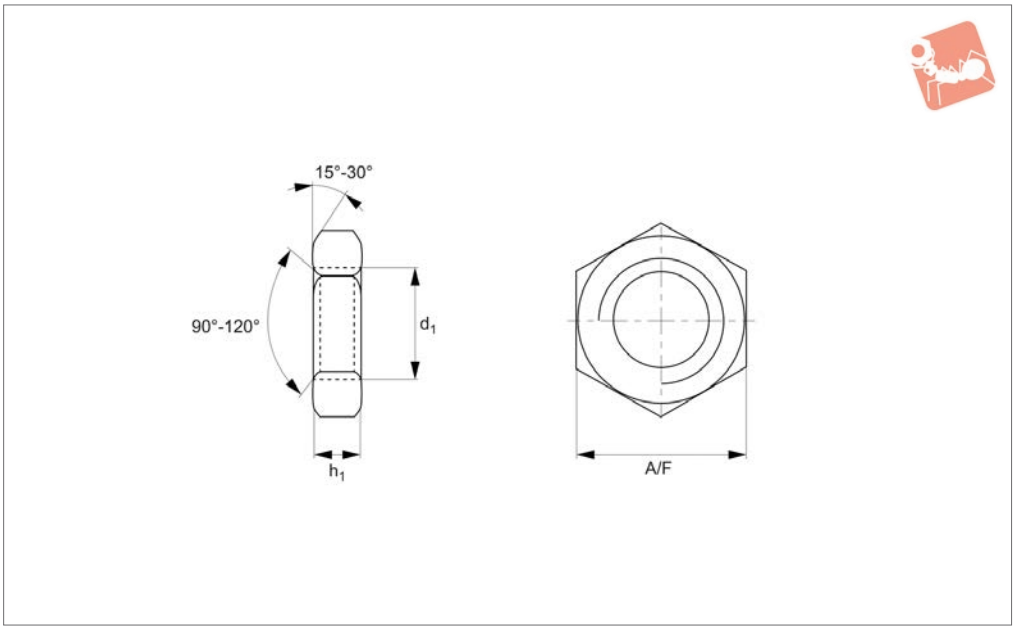
Recommended housing tolerance: J7

Order No.	a °	d_1 tol. H7	d_2	d_3	w_1	w_2	Admissible rpm min.	Static load C_0 kN max.	Weight g
65976.W0005	13	5	16	7.7	8	6	600	12.5	8
65976.W0006	13	6	18	8.9	9	6.75	530	15.5	12
65976.W0008	14	8	22	10.4	12	9	420	27.8	23
65976.W0010	13	10	26	12.9	14	10.5	350	39	38
65976.W0012	13	12	30	15.4	16	12	300	53.5	58
65976.W0016	15	16	38	19.3	21	15	230	88	115

Lock Nuts Coarse Thread
A2 stainless



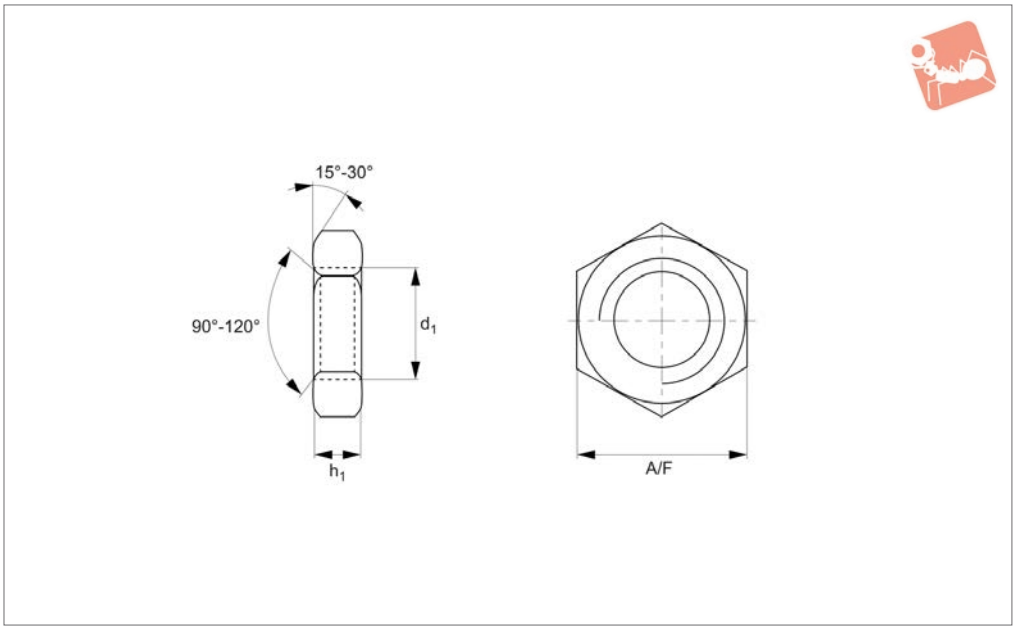
65690.A2

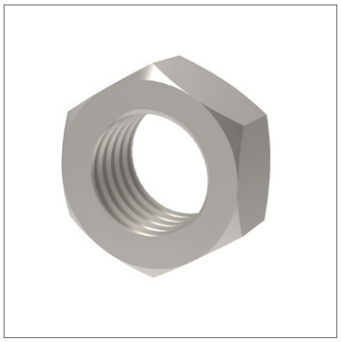


Material
Stainless steel (A2).

Technical Notes
To DIN 439. Standard metric coarse pitch threads.

Order No.	d_1	h_1	A/F	Material
65690.016-A2	M1,6	0.75	3.2	A2 s/s
65690.017-A2	M1,7	0.75	3.5	A2 s/s
65690.020-A2	M 2	0.95	4	A2 s/s
65690.023-A2	M2,3	0.95	4.5	A2 s/s
65690.025-A2	M2,5	1.35	5	A2 s/s
65690.026-A2	M2,6	1.35	5	A2 s/s
65690.030-A2	M 3	1.55	5.5	A2 s/s
65690.040-A2	M 4	1.95	7	A2 s/s
65690.050-A2	M 5	2.45	8	A2 s/s
65690.060-A2	M 6	2.9	10	A2 s/s
65690.080-A2	M 8	3.7	13	A2 s/s
65690.100-A2	M10	4.7	17	A2 s/s
65690.120-A2	M12	5.7	19	A2 s/s
65690.140-A2	M14	6.42	22	A2 s/s
65690.160-A2	M16	7.42	24	A2 s/s
65690.180-A2	M18	8.42	27	A2 s/s
65690.200-A2	M20	9.1	30	A2 s/s
65690.220-A2	M22	9.9	34	A2 s/s
65690.240-A2	M24	10.9	36	A2 s/s
65690.270-A2	M27	12.4	41	A2 s/s
65690.300-A2	M30	13.9	46	A2 s/s
65690.330-A2	M33	15.4	50	A2 s/s
65690.360-A2	M36	16.9	55	A2 s/s
65690.420-A2	M42	19.7	65	A2 s/s
65690.480-A2	M48	22.7	75	A2 s/s





65690.A4

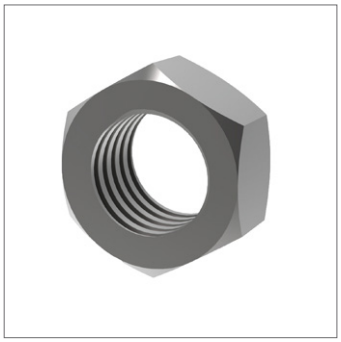
Material
Stainless steel (A4).

Technical Notes
To DIN 439. Standard metric coarse pitch threads.
For fine thread lock nuts see P0306.

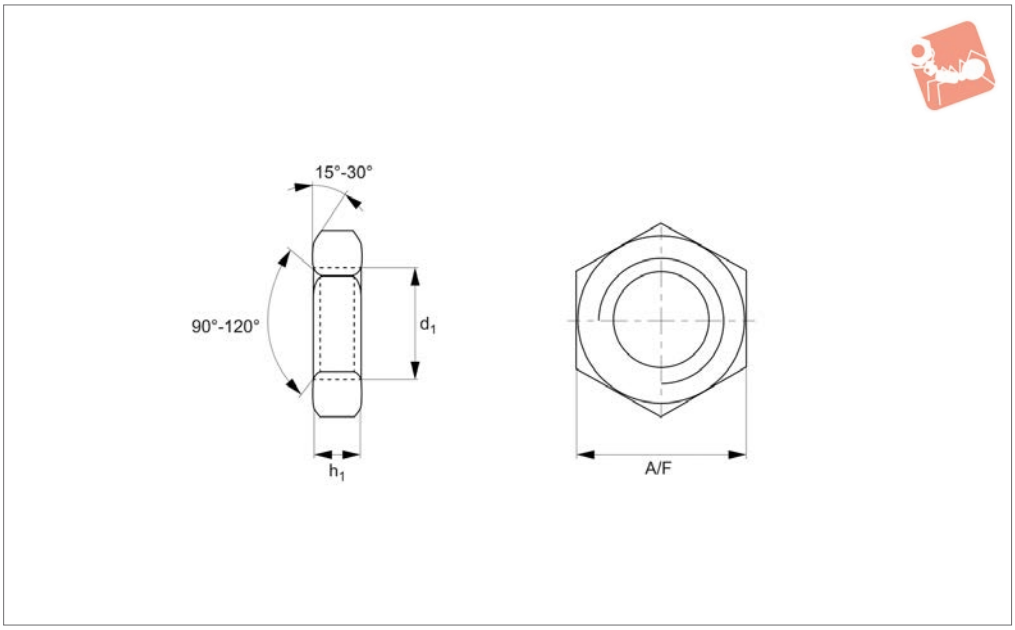
Order No.	d_1	h_1	A/F	Material
65690.016-A4	M1,6	0.75	3.2	A4 s/s
65690.017-A4	M1,7	0.75	3.5	A4 s/s
65690.020-A4	M 2	0.95	4	A4 s/s
65690.023-A4	M2,3	0.95	4.5	A4 s/s
65690.025-A4	M2,5	1.35	5	A4 s/s
65690.026-A4	M2,6	1.35	5	A4 s/s
65690.030-A4	M 3	1.55	5.5	A4 s/s
65690.040-A4	M 4	1.95	7	A4 s/s
65690.050-A4	M 5	2.45	8	A4 s/s
65690.060-A4	M 6	2.9	10	A4 s/s
65690.080-A4	M 8	3.7	13	A4 s/s
65690.100-A4	M10	4.7	17	A4 s/s
65690.120-A4	M12	5.7	19	A4 s/s
65690.140-A4	M14	6.42	22	A4 s/s
65690.160-A4	M16	7.42	24	A4 s/s
65690.180-A4	M18	8.42	27	A4 s/s
65690.200-A4	M20	9.1	30	A4 s/s
65690.220-A4	M22	9.9	34	A4 s/s
65690.240-A4	M24	10.9	36	A4 s/s
65690.270-A4	M27	12.4	41	A4 s/s
65690.300-A4	M30	13.9	46	A4 s/s
65690.330-A4	M33	15.4	50	A4 s/s
65690.360-A4	M36	16.9	55	A4 s/s
65690.420-A4	M42	19.7	65	A4 s/s
65690.480-A4	M48	22.7	75	A4 s/s

Lock Nuts Coarse Thread

Steel, self-colour



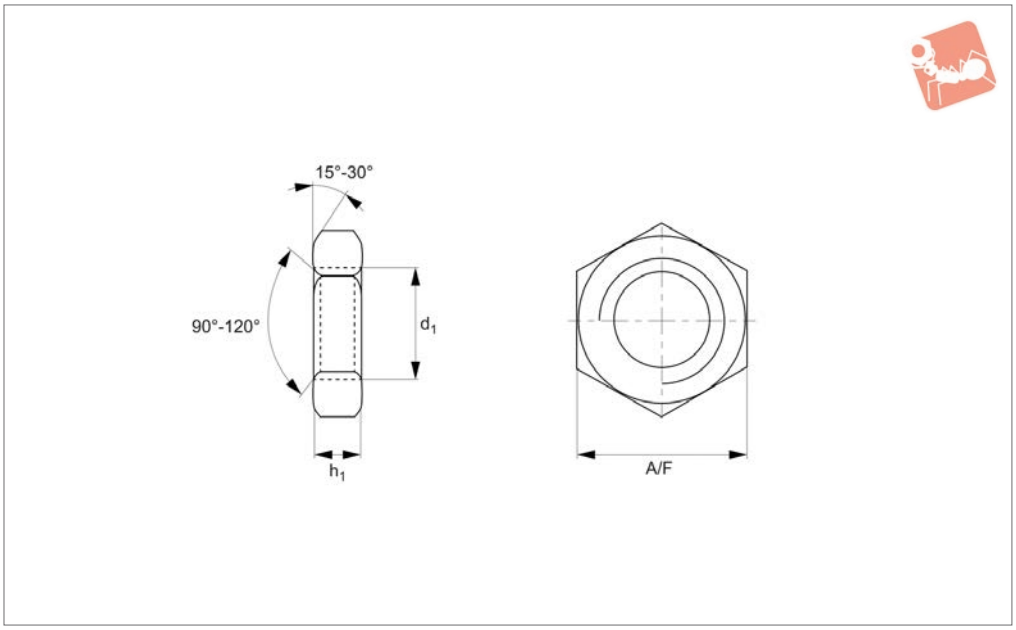
65690.SC

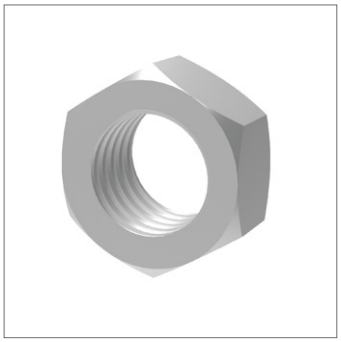


Material
Steel (class 4), self-colour.

Technical Notes
To DIN 439. Standard metric coarse pitch threads.
For fine thread lock nuts see P0306.

Order No.	d_1	h_1	A/F	Material
65690.020-SC	M 2	0.95	4	Steel SC
65690.025-SC	M2,6	1.35	5	Steel SC
65690.030-SC	M 3	1.55	5.5	Steel SC
65690.040-SC	M 4	1.95	7	Steel SC
65690.050-SC	M 5	2.45	8	Steel SC
65690.060-SC	M 6	2.9	10	Steel SC
65690.080-SC	M 8	3.7	13	Steel SC
65690.100-SC	M10	4.7	17	Steel SC
65690.120-SC	M12	5.7	19	Steel SC
65690.140-SC	M14	6.42	22	Steel SC
65690.160-SC	M16	7.42	24	Steel SC
65690.180-SC	M18	8.42	27	Steel SC
65690.200-SC	M20	9.1	30	Steel SC
65690.220-SC	M22	9.9	34	Steel SC
65690.240-SC	M24	10.9	36	Steel SC
65690.270-SC	M27	12.4	41	Steel SC
65690.300-SC	M30	13.9	46	Steel SC
65690.330-SC	M33	15.4	50	Steel SC
65690.360-SC	M36	16.9	55	Steel SC





65690.ZP

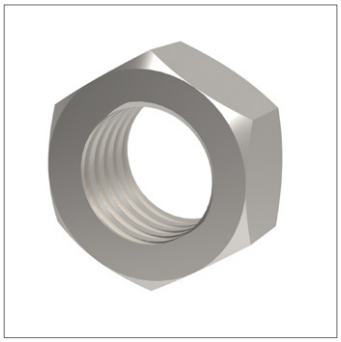
Material
Steel (class 4), zinc-plated.

Technical Notes
To DIN 439. Standard metric coarse pitch threads.
For fine thread lock nuts see P0306.

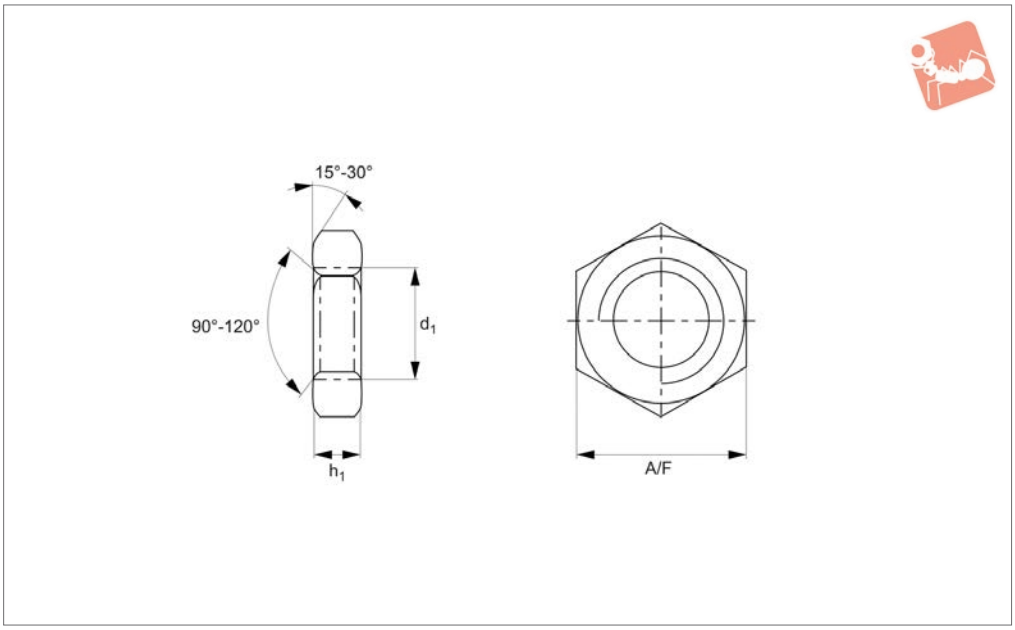
Order No.	d_1	h_1 min.	A/F	Material
65690.020-ZP	M 2	0.95	4	Steel ZP
65690.025-ZP	M2,5	1.35	5	Steel ZP
65690.030-ZP	M 3	1.55	5.5	Steel ZP
65690.040-ZP	M 4	1.95	7	Steel ZP
65690.050-ZP	M 5	2.45	8	Steel ZP
65690.060-ZP	M 6	2.9	10	Steel ZP
65690.080-ZP	M 8	3.7	13	Steel ZP
65690.100-ZP	M10	4.7	17	Steel ZP
65690.120-ZP	M12	5.7	19	Steel ZP
65690.140-ZP	M14	6.42	22	Steel ZP
65690.160-ZP	M16	7.42	24	Steel ZP
65690.180-ZP	M18	8.42	27	Steel ZP
65690.200-ZP	M20	9.1	30	Steel ZP
65690.220-ZP	M22	9.9	34	Steel ZP
65690.240-ZP	M24	10.9	36	Steel ZP
65690.270-ZP	M27	12.4	41	Steel ZP
65690.300-ZP	M30	13.9	46	Steel ZP
65690.330-ZP	M33	15.4	50	Steel ZP
65690.360-ZP	M36	16.9	55	Steel ZP

Lock Nuts Left Hand Thread

303 series stainless



65691.A2

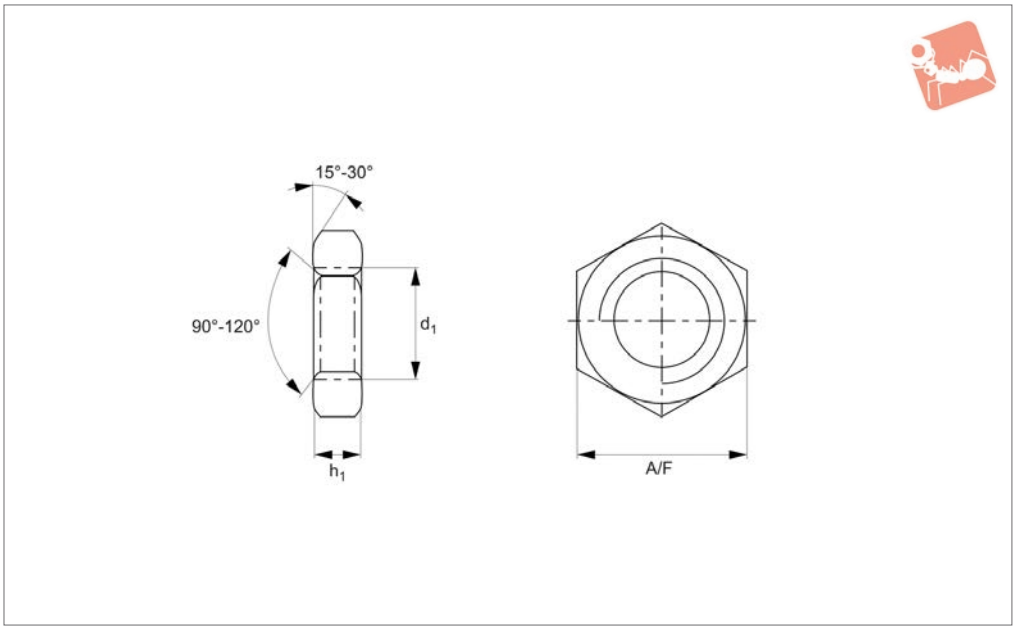


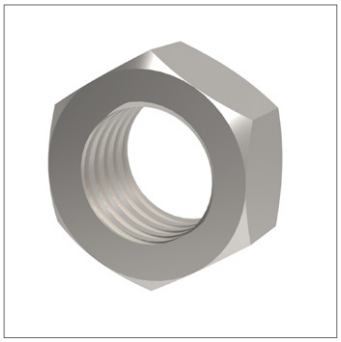
Material
Stainless steel (AISI 303, 1.4305).

Technical Notes
To DIN 439. Left hand threads.

Standard threads are coarse pitch.
Fine threads are indicated by an A & B suffix.

Order No.	d_1	h_1 min.	A/F	Material
65691.060-A2	M 6	2.9	10	A2 s/s
65691.080-A2	M 8	3.7	13	A2 s/s
65691.100-A2	M10	4.7	17	A2 s/s
65691.100-100-A2	M10x1,0	4.7	17	A2 s/s
65691.100-125-A2	M10x1,25	4.7	17	A2 s/s
65691.120-A2	M12	5.7	19	A2 s/s
65691.120-100-A2	M12x1,0	5.7	19	A2 s/s
65691.120-125-A2	M12x1,25	5.7	19	A2 s/s
65691.120-150-A2	M12x1,5	5.7	19	A2 s/s
65691.140-A2	M14	7	22	A2 s/s
65691.160-A2	M16	7.42	24	A2 s/s
65691.160-150-A2	M16x1,5	7.42	24	A2 s/s
65691.180-A2	M18	9	27	A2 s/s
65691.200-A2	M20	9.1	30	A2 s/s
65691.200-150-A2	M20x1,5	9.1	30	A2 s/s
65691.220-150-A2	M22x1,5	9.1	32	A2 s/s
65691.240-A2	M24	10.9	36	A2 s/s
65691.240-150-A2	M24x1,5	10.9	36	A2 s/s
65691.240-200-A2	M24x2,0	10.9	36	A2 s/s
65691.270-A2	M27	13.5	41	A2 s/s
65691.270-150-A2	M27x1,5	13.5	41	A2 s/s
65691.300-A2	M30	13.9	46	A2 s/s
65691.300-150-A2	M30x1,5	13.9	46	A2 s/s
65691.360-A2	M36	16.9	55	A2 s/s





65691.A4

Material
Stainless steel (A4).

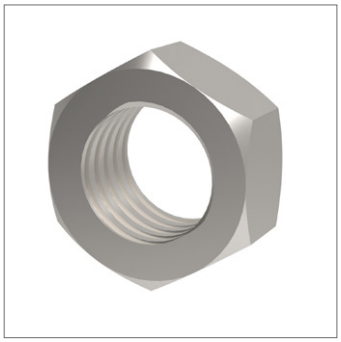
Technical Notes
To DIN 439. Left hand threads.

Standard threads are coarse pitch.
Fine threads are indicated by an A & B suffix.

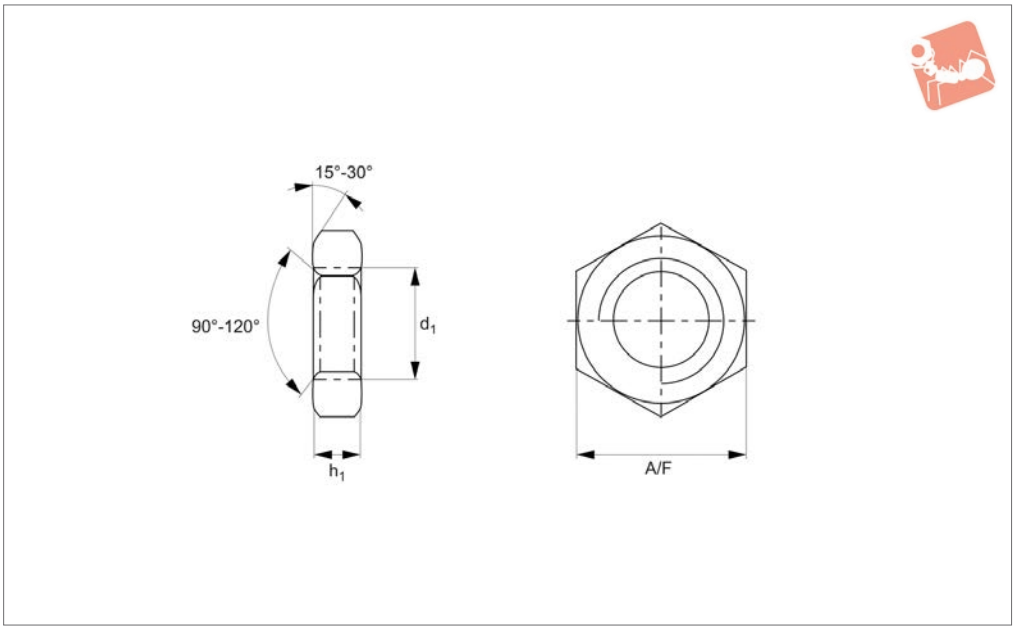
Order No.	d_1	h_1	A/F	Material
65691.060-A4	M 6	2.9	10	A4 s/s
65691.080-A4	M 8	3.7	13	A4 s/s
65691.100-A4	M10	4.7	17	A4 s/s
65691.120-A4	M12	5.7	19	A4 s/s
65691.160-A4	M16	7.42	24	A4 s/s
65691.200-A4	M20	9.1	30	A4 s/s
65691.240-A4	M24	10.9	36	A4 s/s
65691.300-A4	M30	13.9	46	A4 s/s
65691.360-A4	M36	16.9	55	A4 s/s

Lock Nuts Left Hand Thread

Steel, zinc-plated



65691.ZP

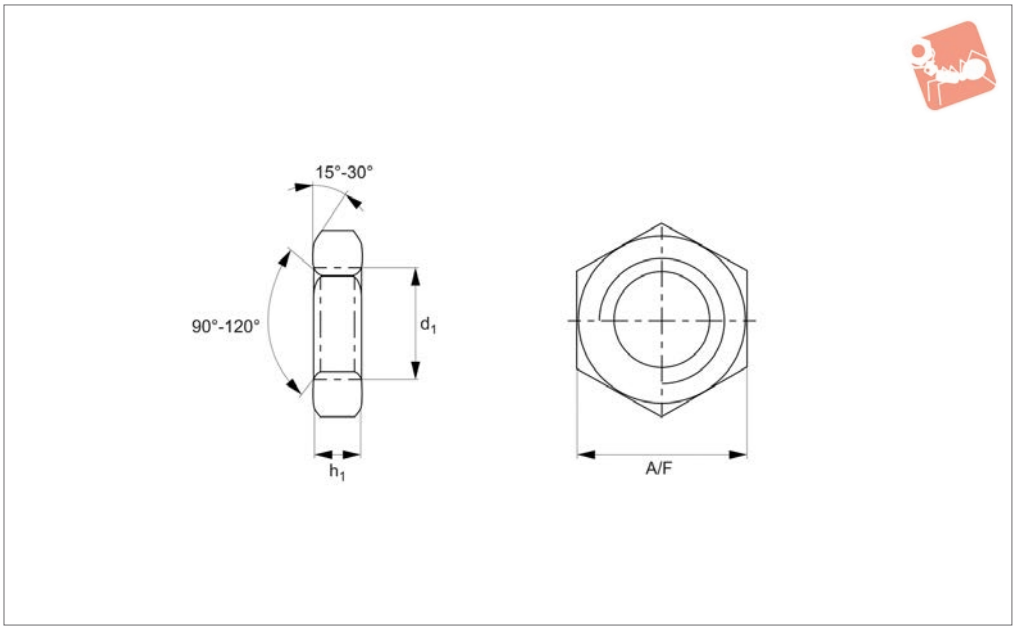


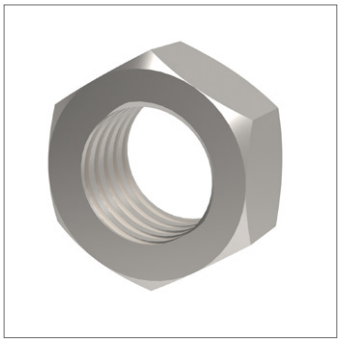
Material
Steel (class 4), zinc-plated.

Technical Notes
To DIN 439. Left hand threads.

Standard threads are coarse pitch.
Fine threads are indicated by an A & B suffix.

Order No.	d_1	h_1	A/F	Material
65691.050-ZP	M 5	2.7	8	Steel ZP
65691.060-ZP	M 6	2.9	10	Steel ZP
65691.080-ZP	M 8	3.7	13	Steel ZP
65691.100-ZP	M10	4.7	17	Steel ZP
65691.100-100-ZP	M10x1,0	4.7	17	Steel ZP
65691.100-125-ZP	M10x1,25	4.7	17	Steel ZP
65691.120-ZP	M12	5.7	19	Steel ZP
65691.120-125-ZP	M12x1,25	5.7	19	Steel ZP
65691.120-150-ZP	M12x1,5	5.7	19	Steel ZP
65691.160-ZP	M16	7.42	24	Steel ZP
65691.160-150-ZP	M16x1,5	7.42	24	Steel ZP
65691.200-ZP	M20	9.1	30	Steel ZP
65691.200-150-ZP	M20x1,5	9.1	30	Steel ZP
65691.220-150-ZP	M22x1,5	9.1	32	Steel ZP
65691.240-ZP	M24	10.9	36	Steel ZP
65691.240-200-ZP	M24x2,0	10.9	36	Steel ZP
65691.300-ZP	M30	13.9	46	Steel ZP
65691.300-200-ZP	M30x2,0	13.9	46	Steel ZP





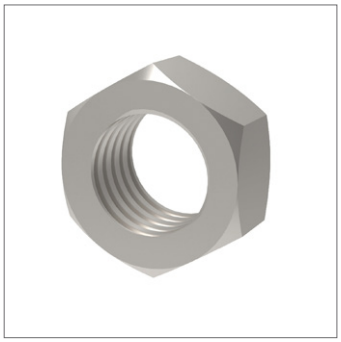
65692.A2

Material
Stainless steel (AISI 303, 1.4305).

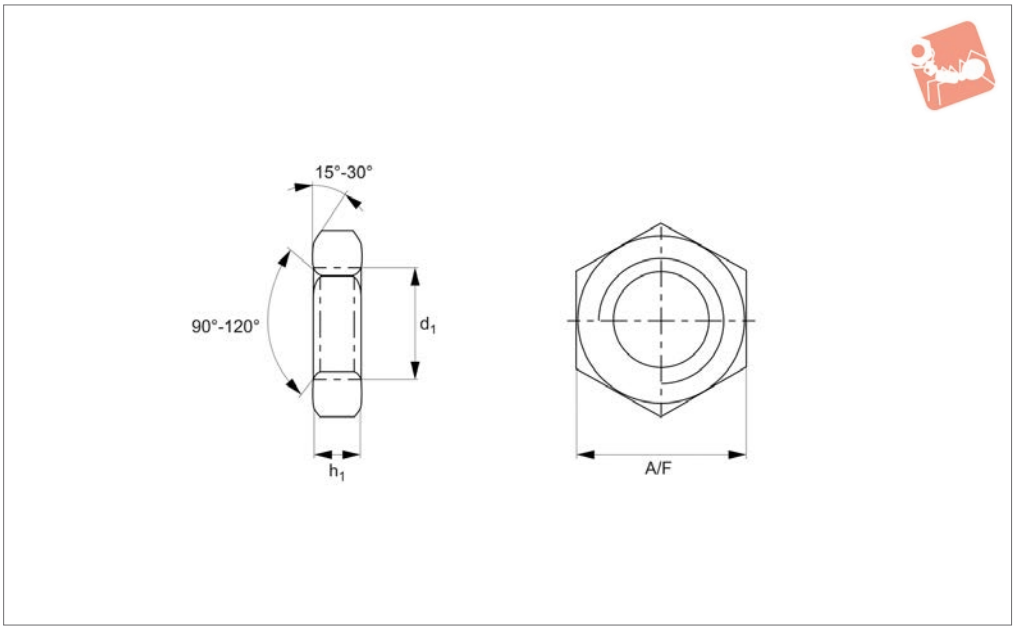
Technical Notes
To DIN 439. Fine pitch threads.
For coarse thread lock nuts see P0305.

Order No.	d_1	h_1 min.	A/F	Material
65692.080-100-A2	M 8x1,0	3.7	13	A2 s/s
32700.W0515	M10x1,0	4.7	17	A2 s/s
65692.100-125-A2	M10x1,25	4.7	17	A2 s/s
65692.120-125-A2	M12x1,25	5.7	19	A2 s/s
65692.120-150-A2	M12x1,5	5.7	19	A2 s/s
65692.140-150-A2	M14x1,5	6.42	22	A2 s/s
65692.160-150-A2	M16x1,5	7.42	24	A2 s/s
65692.180-150-A2	M18x1,5	8.42	27	A2 s/s
65692.200-150-A2	M20x1,5	9.1	30	A2 s/s
65692.220-150-A2	M22x1,5	9.9	34	A2 s/s
65692.240-150-A2	M24x1,5	10.9	36	A2 s/s
65692.240-200-A2	M24x2,0	10.9	36	A2 s/s
65692.270-150-A2	M27x1,5	12.4	41	A2 s/s
65692.270-200-A2	M27x2,0	12.4	41	A2 s/s
65692.300-150-A2	M30x1,5	13.9	46	A2 s/s
65692.300-200-A2	M30x2,0	13.9	46	A2 s/s
65692.330-200-A2	M33x2,0	15.4	49	A2 s/s
65692.360-150-A2	M36x1,5	16.9	55	A2 s/s

Lock Nuts Fine Thread
A4 stainless



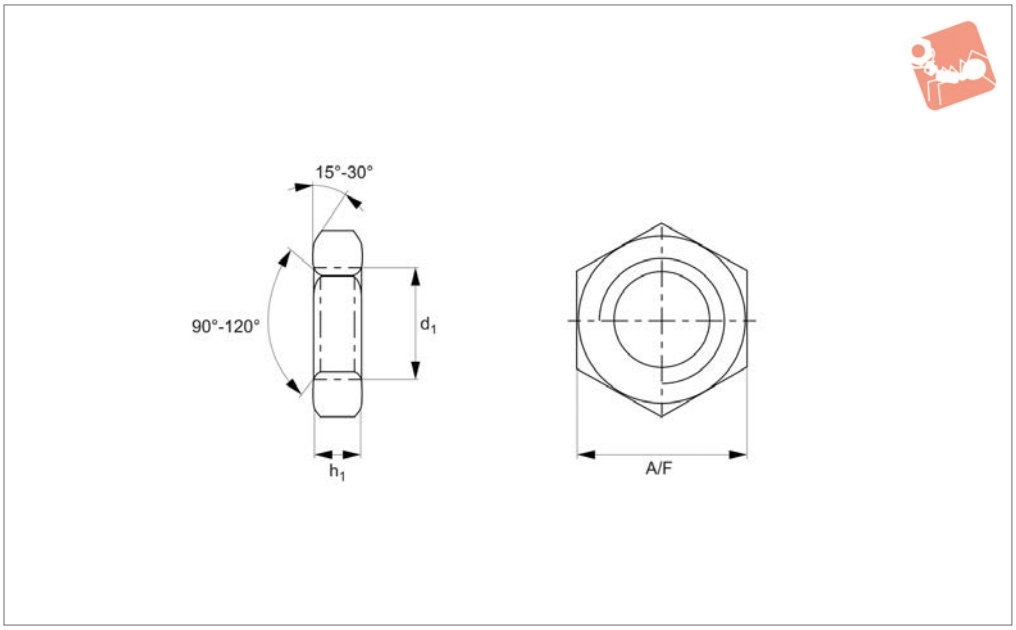
65692.A4

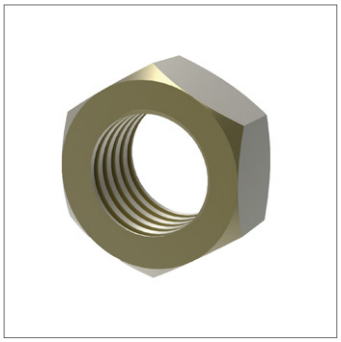


Material
Stainless steel (A4).

Technical Notes
To DIN 439. Fine pitch threads.
For coarse thread lock nuts see P0305.

Order No.	d_1	h_1	A/F	Material
65692.080-100-A4	M 8x1,0	3.7	13	A4 s/s
65692.100-100-A4	M10x1,0	4.7	17	A4 s/s
65692.100-125-A4	M10x1,25	4.7	17	A4 s/s
65692.120-125-A4	M12x1,25	5.7	19	A4 s/s
65692.120-150-A4	M12x1,5	5.7	19	A4 s/s
65692.140-150-A4	M14x1,5	6.42	22	A4 s/s
65692.160-150-A4	M16x1,5	7.42	24	A4 s/s
65692.180-150-A4	M18x1,5	8.42	27	A4 s/s
65692.200-150-A4	M20x1,5	9.1	30	A4 s/s
65692.220-150-A4	M22x1,5	9.9	34	A4 s/s
65692.240-150-A4	M24x1,5	10.9	36	A4 s/s
65692.240-200-A4	M24x2,0	10.9	36	A4 s/s
65692.270-150-A4	M27x1,5	12.4	41	A4 s/s
65692.270-200-A4	M27x2,0	12.4	41	A4 s/s
65692.300-150-A4	M30x1,5	13.9	46	A4 s/s
65692.300-200-A4	M30x2,0	13.9	46	A4 s/s
65692.330-200-A4	M33x2,0	15.4	49	A4 s/s
65692.360-150-A4	M36x1,5	16.9	55	A4 s/s





65692.BR

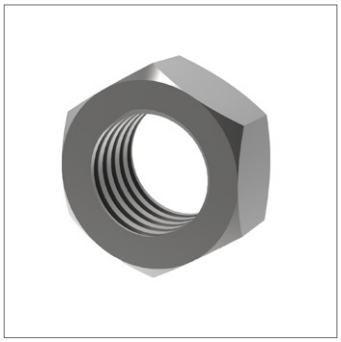
Material
Brass.

Technical Notes
To DIN 439. Fine pitch threads.
For coarse thread lock nuts see P0305.

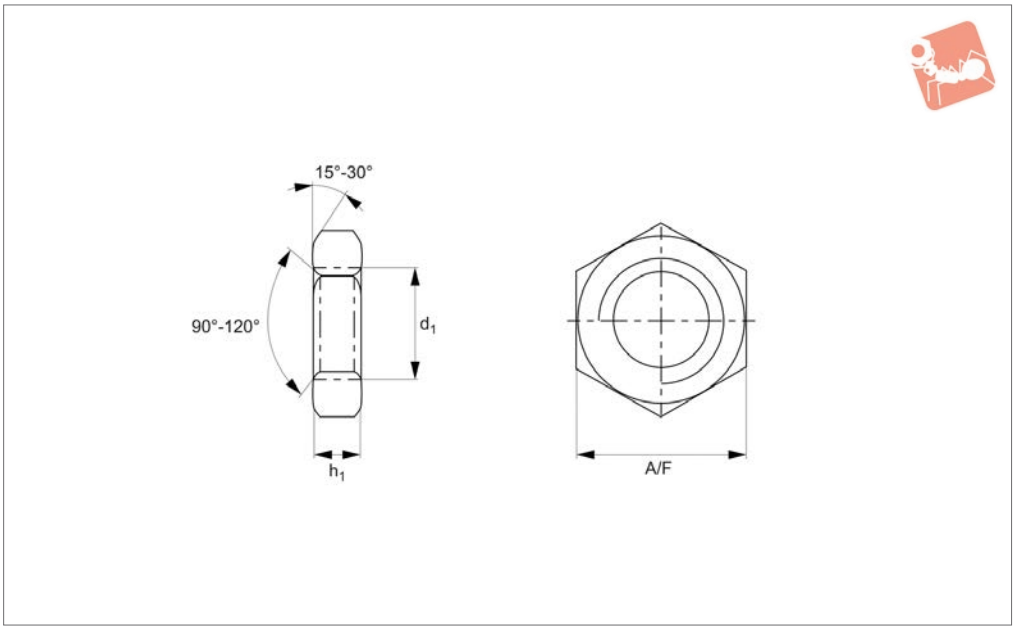
Order No.	d	h	A/F	Material
65692.300-150-BR	M30x1,5	13.9	46	Brass

Lock Nuts Fine Thread

Steel, self-colour



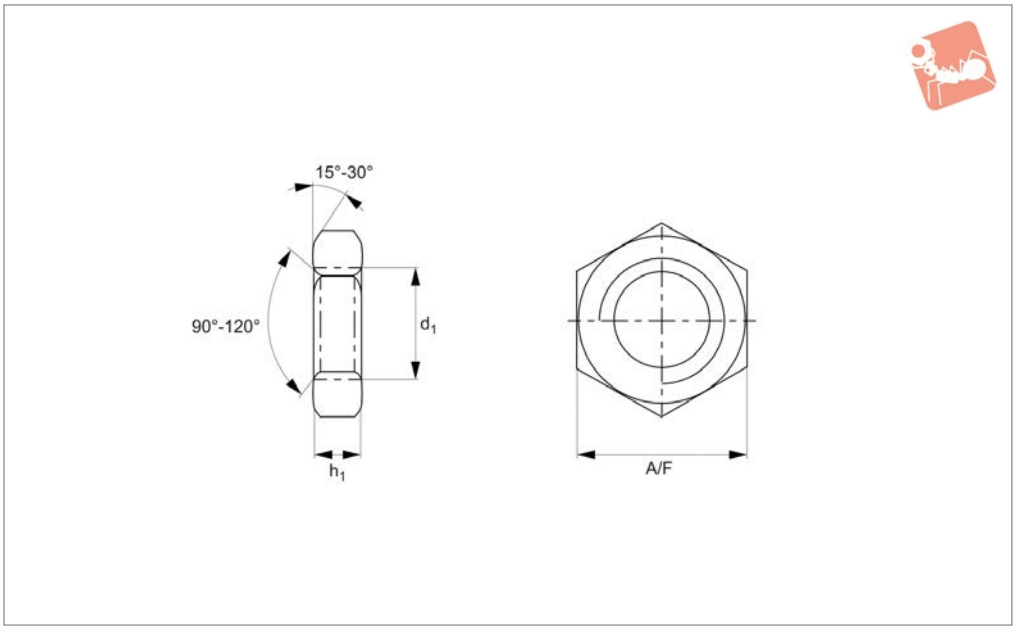
65692.SC

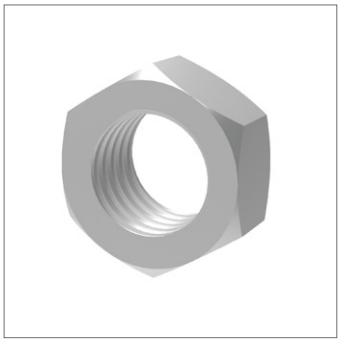


Material
Steel (class 4), self-colour.

Technical Notes
To DIN 439. Fine pitch threads.
For coarse thread lock nuts see P0305.

Order No.	d_1	h_1	A/F	Material
65692.100-100-SC	M10x1,0	4.7	17	Steel SC
65692.100-125-SC	M10x1,25	4.7	17	Steel SC
65692.120-125-SC	M12x1,25	5.7	19	Steel SC
65692.140-150-SC	M14x1,5	6.42	22	Steel SC
65692.160-150-SC	M16x1,5	7.42	24	Steel SC
65692.180-150-SC	M18x1,5	8.42	27	Steel SC
65692.200-150-SC	M20x1,5	9.1	30	Steel SC
65692.220-150-SC	M22x1,5	9.9	34	Steel SC
65692.240-150-SC	M24x1,5	10.9	36	Steel SC
65692.240-200-SC	M24x2,0	10.9	36	Steel SC
65692.270-150-SC	M27x1,5	12.4	41	Steel SC
65692.270-200-SC	M27x2,0	12.4	41	Steel SC
65692.300-150-SC	M30x1,5	13.9	46	Steel SC
65692.300-200-SC	M30x2,0	13.9	46	Steel SC
65692.330-200-SC	M33x2,0	15.4	49	Steel SC
65692.360-300-SC	M36x1,5	16.9	55	Steel SC
65692.420-150-SC	M42x1,5	21	65	Steel SC
65692.450-300-SC	M45x3,0	22.5	70	Steel SC
65692.560-200-SC	M56x2,0	28	85	Steel SC





65692.ZP

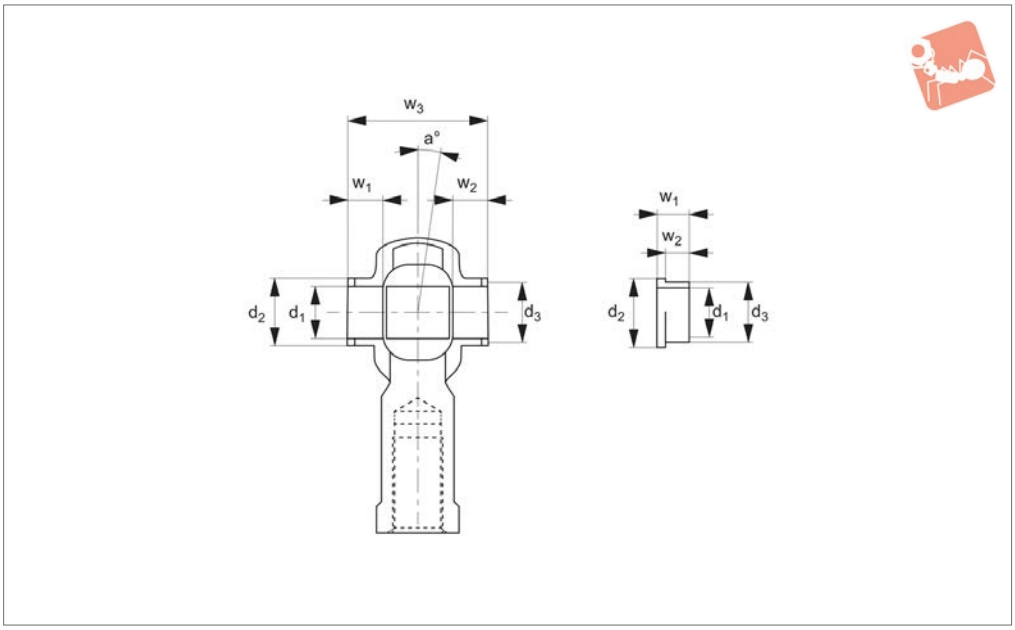
Material
Steel (class 4), zinc-plated.

Technical Notes
To DIN 439. Fine pitch threads.
For coarse thread lock nuts see P0305.

Order No.	d_1	h_1	A/F	Material
65692.080-100-ZP	M 8x1,0	3.7	13	Steel ZP
65692.100-100-ZP	M10x1,0	4.7	17	Steel ZP
65692.100-125-ZP	M10x1,25	4.7	17	Steel ZP
65692.120-125-ZP	M12x1,25	5.7	19	Steel ZP
65692.120-150-ZP	M12x1,5	5.7	19	Steel ZP
65692.140-150-ZP	M14x1,5	6.42	22	Steel ZP
65692.160-150-ZP	M16x1,5	7.42	24	Steel ZP
65692.180-150-ZP	M18x1,5	8.42	27	Steel ZP
65692.200-150-ZP	M20x1,5	9.1	30	Steel ZP
65692.220-150-ZP	M22x1,5	9.9	34	Steel ZP
65692.240-150-ZP	M24x1,5	10.9	36	Steel ZP
65692.240-200-ZP	M24x2,0	10.9	36	Steel ZP
65692.270-150-ZP	M27x1,5	12.4	41	Steel ZP
65692.270-200-ZP	M27x2,0	12.4	41	Steel ZP
65692.300-150-ZP	M30x1,5	13.9	46	Steel ZP
65692.300-200-ZP	M30x2,0	13.9	46	Steel ZP
65692.330-200-ZP	M33x2,0	15.4	49	Steel ZP
65692.360-200-ZP	M36x2,0	16.9	55	Steel ZP
65692.360-300-ZP	M36x3,0	16.9	55	Steel ZP

Rubber Protector Cap

65970



Material
Rubber

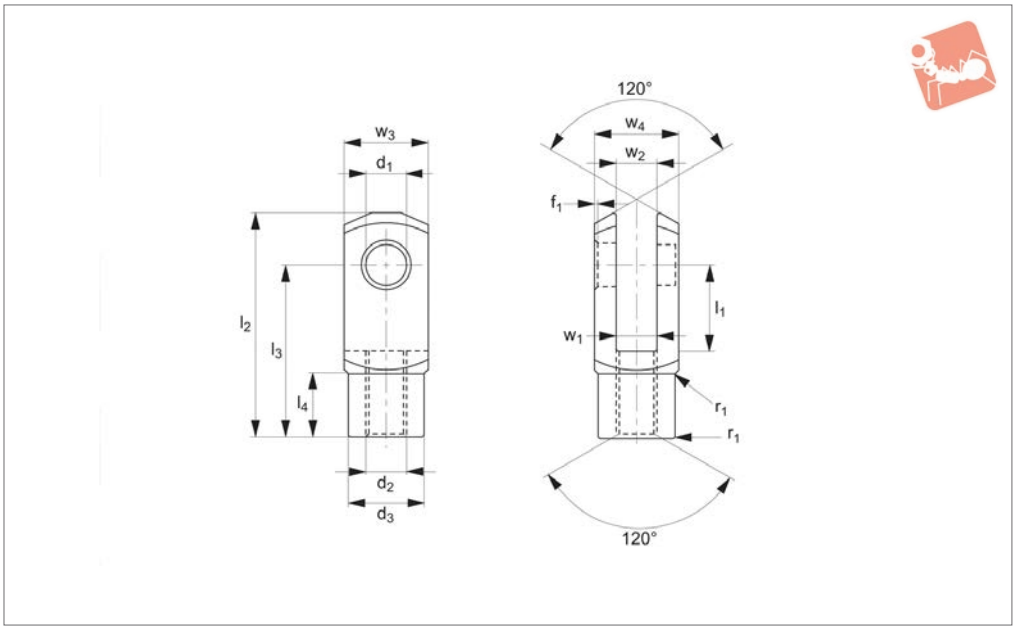
Technical Notes
Rubber protector caps for additional protection of rod ends. For use with maintenance free series K rod ends.
Brass spacer bush available on request.
Temperature range: -20°C to + 110°C.

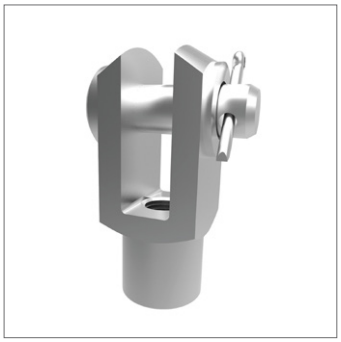
Tips
Mounted easily with retaining pliers.

Order No.	Suitable for steel rod ends	Suitable for stainless steel rod ends	d_1	d_2	d_3	w_1	w_2	w_3	a °	Weight g
65970.W0006	R3550/R3551.006	R3565/R3566.006	6	11	8.7	6	4	21	13	3
65970.W0008	R3550/R3551.008	R3565/R3566.008	8	12	10.3	6	4	24	14	3
65970.W0010	R3550/R3551.010	R3565/R3566.010	10	14	12.5	6	4	26	14	5
65970.W0012	R3550/R3551.012	R3565/R3566.012	12	17	15.0	8	6	32	13	5
65970.W0014	R3550/R3551.014	R3565/R3566.014	14	19	16.8	8	6	35	16	7
65970.W0016	R3550/R3551.016	R3565/R3566.016	16	21	19.0	8	6	37	15	7
65970.W0018	R3550/R3551.018	R3565/R3566.018	18	25	21.8	8	6	39	15	7
65970.W0020	R3550/R3551.020	R3565/R3566.020	20	28	24.3	10	8	45	15	40
65970.W0022	R3550/R3551.022	R3565/R3566.022	22	29	25.7	10	8	48	15	40
65970.W0025	R3550/R3551.025	R3565/R3566.025	25	33	29.7	10	8	51	15	40

Steel Clevis Joint with Pin

silver zinc plated





65600

Material
Steel 1.0718 (11SMnPb30k), silver zinc plated.

Technical Notes
M5-M16: DIN 71 752/DIN ISO 8140.
M18-M48: Similar to DIN 71 752/DIN ISO 8140 and according to CETOP standard.

Tips
Standard thread is right hand, (for left hand, see 65602).
Assembly is made up using 65630 clevis joint, 65660 clevis pin, P0330 washer, and 65674 split cotter pin.

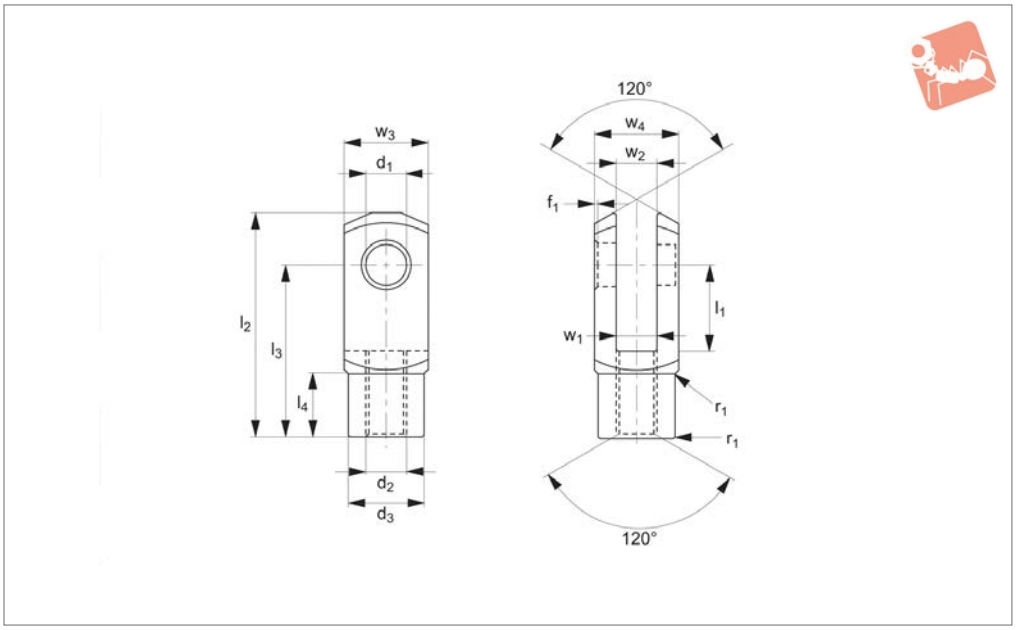
Important Notes
For sizes M4-M12, f_1 and r_1 =0,5, for sizes M14-M16, f_1 and r_1 =1
For sizes M18-M20, f_1=1, r_1 = 1,5, for M24 f_1 and r_1 = 1,5, for sizes M27-M30, f_1 = 1,5, r_1 = 2
For M36 f_1 = 2, r_1 = 3, for sizes M42-M48, f_1 = 3, r_1 = 5, for r_1, radius or 45° bevelling.
Other Tolerances:-
w_4: M4-M16 = +0,3 -0,16
M18-M48 = +0,5 -0,2
w_2: size 4x8-10x20 = B13
All others +0,7 +0,15
d_3: M4-M16 = ±0,3
l_2: size 4x8-6x12 = ±0,3
All others ±0,4
l_3: M4-M16 = ±0,2
M18-M48 = ±0,3
r_1: M18-M48 = ±0,5

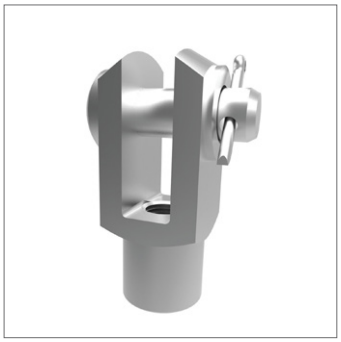
Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65600.W0051	5x10	Right	Coarse	5	10	M5	9	26	20	7.5	5	5	10	10	9
65600.W0052	5x20	Right	Coarse	5	20	M5	9	36	30	7.5	5	5	10	10	13
65600.W0061	6x12	Right	Coarse	6	12	M6	10	31	24	9.0	6	6	12	12	15
65600.W0062	6x24	Right	Coarse	6	24	M6	10	43	36	9.0	6	6	12	12	21
65600.W0081	8x16	Right	Coarse	8	16	M8	14	42	32	12.0	8	8	16	16	37
65600.W0082	8x16	Right	Fine	8	16	M8x1	14	42	32	12.0	8	8	16	16	37
65600.W0083	8x32	Right	Coarse	8	32	M8	14	58	48	12.0	8	8	16	16	54
65600.W0084	8x32	Right	Fine	8	32	M8x1	14	58	48	12.0	8	8	16	16	54
65600.W0102	10x20	Right	Coarse	10	20	M10	18	52	40	15.0	10	10	20	20	74
65600.W0103	10x20	Right	Fine	10	20	M10x1,25	18	52	40	15.0	10	10	20	20	74
65600.W0104	10x40	Right	Coarse	10	40	M10	18	72	60	15.0	10	10	20	20	116
65600.W0105	10x40	Right	Fine	10	40	M10x1,25	18	72	60	15.0	10	10	20	20	116
65600.W0122	12x24	Right	Coarse	12	24	M12	20	62	48	18.0	12	12	24	24	121
65600.W0123	12x24	Right	Fine	12	24	M12x1,25	20	62	48	18.0	12	12	24	24	121
65600.W0124	12x48	Right	Coarse	12	48	M12	20	86	72	18.0	12	12	24	24	175
65600.W0125	12x48	Right	Fine	12	48	M12x1,25	20	86	72	18.0	12	12	24	24	175
65600.W0142	14x28	Right	Coarse	14	28	M14	24	72	56	22.5	14	14	27	27	178
65600.W0143	14x28	Right	Fine	14	28	M14x1,5	24	72	56	22.5	14	14	27	27	178
65600.W0145	14x56	Right	Coarse	14	56	M14	24	101	85	22.5	14	14	27	27	258
65600.W0146	14x56	Right	Fine	14	56	M14x1,5	24	101	85	22.5	14	14	27	27	258
65600.W0163	16x32	Right	Coarse	16	32	M16	26	83	64	24.0	16	16	32	32	282
65600.W0164	16x32	Right	Fine	16	32	M16x1,5	26	83	64	24.0	16	16	32	32	282
65600.W0166	16x64	Right	Coarse	16	64	M16	26	115	96	24.0	16	16	32	32	411
65600.W0167	16x64	Right	Fine	16	64	M16x1,5	26	115	96	24.0	16	16	32	32	411
65600.W0183	18x36	Right	Coarse	18	36	M18	30	94	72	27.0	18	18	36	36	390

Steel Clevis Joint with Pin

silver zinc plated

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65600.W0184	18x36	Right	Fine	18	36	M18x1,5	30	94	72	27.0	18	18	36	36	390
65600.W0204	20x40	Right	Coarse	20	40	M20	34	105	80	30.0	20	20	40	40	550
65600.W0205	20x40	Right	Fine	20	40	M20x1,5	34	105	80	30.0	20	20	40	40	550
65600.W0208	20x80	Right	Coarse	20	80	M20	34	145	120	30.0	20	20	40	40	800
65600.W0209	20x80	Right	Fine	20	80	M20x1,5	34	145	120	30.0	20	20	40	40	800
65600.W0255	25x50	Right	Course	25	50	M24	42	132	100	36.0	25	25	50	50	1100
65600.W0256	25x50	Right	Fine	25	50	M24x2	42	132	100	36.0	25	25	50	50	1100
65600.W0285	28x56	Right	Coarse	28	56	M27	48	148	112	40.0	28	28	55	55	1500
65600.W0286	28x56	Right	Fine	28	56	M27x2	48	148	112	40.0	28	28	55	55	1500
65600.W0305	30x54	Right	Fine	30	54	M27x2	48	148	110	40.0	30	30	55	55	1440
65600.W0306	30x60	Right	Coarse	30	60	M30	52	160	120	42.0	30	30	60	60	1970
65600.W0307	30x60	Right	Fine	30	60	M30x2	52	160	120	42.0	30	30	60	60	1970
65600.W0355	35x54	Right	Fine	35	54	M36x2	60	188	144	54.0	35	35	70	70	2930
65600.W0357	35x72	Right	Coarse	35	72	M36	60	188	144	54.0	35	35	70	70	2930
65600.W0358	35x72	Right	Fine	35	72	M36x2	60	188	144	54.0	35	35	70	70	2930
65600.W0367	36x72	Right	Coarse	35	72	M36	60	188	144	54.0	36	36	70	70	2930
65600.W0368	36x72	Right	Fine	35	72	M36x2	60	188	144	54.0	36	36	70	70	2930
65600.W0408	40x84	Right	Fine	40	84	M42x2	70	232	168	63.5	40	40	85	85	5640
65600.W0428	42x84	Right	Coarse	42	84	M42	70	232	168	63.5	42	42	85	85	5340
65600.W0429	42x84	Right	Fine	42	84	M42x2	70	232	168	63.5	42	42	85	85	5340
65600.W0509	50x96	Right	Coarse	50	96	M48	82	265	192	73.0	50	50	96	96	7860
65600.W0510	50x96	Right	Fine	50	96	M48x2	82	265	192	73.0	50	50	96	96	7860





65602

Material
Steel 1.0718 (11SMnPb30k), silver zinc plated.

Technical Notes
M5-M16: DIN 71 752/DIN ISO 8140.
M18-M48: Similar to DIN 71 752/DIN ISO 8140 and according to CETOP standard.

Tips
Assembly is made up using the 65631 clevis joint, 65660 clevis pin, P0330 washer, and 65674 split cotter pin.

Important Notes
For sizes M4-M12, f_1 and r_1 =0,5, for sizes M14-M16, f_1 and r_1 =1
For sizes M18-M20, f_1=1, r_1 = 1,5, for M24 f_1 and r_1 = 1,5, for sizes M27-M30, f_1 = 1,5, r_1 = 2
For M36 f_1 = 2, r_1 = 3, for sizes M42-M48, f_1 = 3, r_1 = 5, for r_1, radius or 45° bevelling.

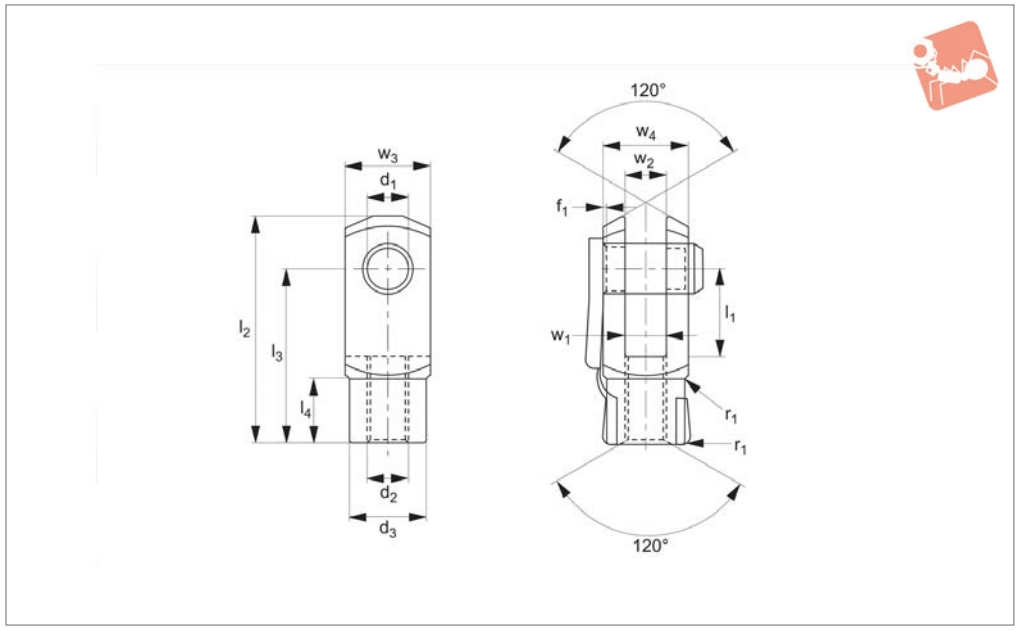
Other Tolerances:-
w_4: M4-M16 = +0,3 -0,16
M18-M48 = +0,5 -0,2
w_2: size 4x8-10x20 = B13
All others +0,7 +0,15
d_3: M4-M16 = ±0,3
l_2: size 4x8-6x12 = ±0,3
All others ±0,4
l_3: M4-M16 = ±0,2
M18-M48 = ±0,3
r_1: M18-M48 = ±0,5

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65602.W0051	5x10	Left	Coarse	5	10	M5	9	26	20	7.5	5	5	10	10	9
65602.W0052	5x20	Left	Coarse	5	20	M5	9	36	30	7.5	5	5	10	10	13
65602.W0061	6x12	Left	Coarse	6	12	M6	10	31	24	9.0	6	6	12	12	15
65602.W0062	6x24	Left	Coarse	6	24	M6	10	43	36	9.0	6	6	12	12	21
65602.W0081	8x16	Left	Coarse	8	16	M8	14	42	32	12.0	8	8	16	16	37
65602.W0082	8x16	Left	Fine	8	16	M8x1	14	42	32	12.0	8	8	16	16	37
65602.W0083	8x32	Left	Coarse	8	32	M8	14	58	48	12.0	8	8	16	16	54
65602.W0084	8x32	Left	Fine	8	32	M8x1	14	58	48	12.0	8	8	16	16	54
65602.W0102	10x20	Left	Coarse	10	20	M10	18	52	40	15.0	10	10	20	20	74
65602.W0103	10x20	Left	Fine	10	20	M10x1,25	18	52	40	15.0	10	10	20	20	74
65602.W0104	10x40	Left	Coarse	10	40	M10	18	72	60	15.0	10	10	20	20	116
65602.W0105	10x40	Left	Fine	10	40	M10x1,25	18	72	60	15.0	10	10	20	20	116
65602.W0122	12x24	Left	Coarse	12	24	M12	20	62	48	18.0	12	12	24	24	121
65602.W0123	12x24	Left	Fine	12	24	M12x1,25	20	62	48	18.0	12	12	24	24	121
65602.W0124	12x48	Left	Coarse	12	48	M12	20	86	72	18.0	12	12	24	24	175
65602.W0125	12x48	Left	Fine	12	48	M12x1,25	20	86	72	18.0	12	12	24	24	175
65602.W0142	14x28	Left	Coarse	14	28	M14	24	72	56	22.5	14	14	27	27	178
65602.W0143	14x28	Left	Fine	14	28	M14x1,5	24	72	56	22.5	14	14	27	27	178
65602.W0145	14x56	Left	Coarse	14	56	M14	24	101	85	22.5	14	14	27	27	258
65602.W0146	14x56	Left	Fine	14	56	M14x1,5	24	101	85	22.5	14	4	27	27	258
65602.W0163	16x32	Left	Coarse	16	32	M16	26	83	64	24.0	16	16	32	32	282
65602.W0164	16x32	Left	Fine	16	32	M16x1,5	26	83	64	24.0	16	16	32	32	282
65602.W0166	16x64	Left	Coarse	16	64	M16	26	115	96	24.0	16	16	32	32	411
65602.W0167	16x64	Left	Fine	16	64	M16x1,5	26	115	96	24.0	16	16	32	32	411
65602.W0183	18x36	Left	Coarse	18	36	M18	30	94	72	27.0	18	18	36	36	390
65602.W0184	18x36	Left	Fine	18	36	M18x1,5	30	94	72	27.0	18	18	36	36	390

Steel Clevis Joints with Pin

left hand thread - silver zinc plated

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65602.W0204	20x40	Left	Coarse	20	40	M20	34	105	80	30.0	20	20	40	40	550
65602.W0205	20x40	Left	Fine	20	40	M20x1,5	34	105	80	30.0	20	20	40	40	550
65602.W0208	20x80	Left	Coarse	20	80	M20	34	145	120	30.0	20	20	40	40	800
65602.W0209	20x80	Left	Fine	20	80	M20x1,5	34	145	120	30.0	20	20	40	40	800
65602.W0255	25x50	Left	Coarse	25	50	M24	42	132	100	36.0	25	25	50	50	1100
65602.W0256	25x50	Left	Fine	25	50	M24x2	42	132	100	36.0	25	25	50	50	1100
65602.W0285	28x56	Left	Coarse	28	56	M27	48	148	112	40.0	28	28	55	55	1500
65602.W0286	28x56	Left	Fine	28	56	M27x2	48	148	112	40.0	28	28	55	55	1500
65602.W0305	30x54	Left	Fine	30	54	M27x2	48	148	110	40.0	30	30	55	55	1440
65602.W0306	30x60	Left	Coarse	30	60	M30	52	160	120	42.0	30	30	60	60	1970
65602.W0307	30x60	Left	Fine	30	60	M30x2	52	160	120	42.0	30	30	60	60	1970
65602.W0355	35x54	Left	Fine	35	54	M36x2	60	188	144	54.0	35	35	70	70	2930
65602.W0357	35x72	Left	Course	35	72	M36	60	188	144	54.0	35	35	70	70	2930
65602.W0358	35x72	Left	Fine	35	72	M36x2	60	188	144	54.0	35	35	70	70	2930
65602.W0367	36x72	Left	Course	35	72	M36	60	188	144	54.0	36	36	70	70	2930
65602.W0368	36x72	Left	Fine	35	72	M36x2	60	188	144	54.0	36	36	70	70	2930
65602.W0408	40x84	Left	Fine	40	84	M42x2	70	232	168	63.5	40	40	85	85	5640
65602.W0428	42x84	Left	Coarse	42	84	M42	70	232	168	63.5	42	42	85	85	5340
65602.W0429	42x84	Left	Fine	42	84	M42x2	70	232	168	63.5	42	42	85	85	5340
65602.W0509	50x96	Left	Coarse	50	96	M48	82	265	192	73.0	50	50	96	96	7860
65602.W0510	50x96	Left	Fine	50	96	M48x2	82	265	192	73.0	50	50	96	96	7860



65618

Material
Steel 1.0718 (11SMnPb30k), silver zinc plated.

Technical Notes
M4-M16: DIN 71 752/DIN ISO 8140.
M20: Similar to DIN 71 752/DIN ISO 8140 and according to CETOP standard.

Tips
For yellow zinc plated version see R3398, standard thread is right hand, (for left hand, see 65620).

Assembly made up using 65630 clevis joint and 65684 clevis retention clip.

Important Notes
For sizes M4-M12, f_1 and r_1 =0,5, for sizes M14-M16, f_1 and r_1 =1
For sizes M18-M20, f_1=1, r_1 = 1,5, for M24 f_1 and r_1 = 1,5, for sizes M27-M30, f_1 = 1,5, r_1 = 2
For M36 f_1 = 2, r_1 = 3, for sizes M42-M48, f_1 = 3, r_1 = 5, for r_1, radius or 45° bevelling.
Other Tolerances:-

w_4: M4-M16 = +0,3 -0,16
M18-M48 = +0,5 -0,2
w_2: size 4x8-10x20 = B13
All others +0,7 +0,15
d_3: M4-M16 = ±0,3
l_2: size 4x8-6x12 = ±0,3
All others ±0,4
l_3: M4-M16 = ±0,2
M18-M48 = ±0,3
r_1: M18-M48 = ±0,5

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65618.W0040	4x8	Right	Coarse	4	8	M4	8	21	16	6.0	4	4	8	8	5
65618.W0051	5x10	Right	Coarse	5	10	M5	9	26	20	7.5	5	5	10	10	9
65618.W0052	5x20	Right	Coarse	5	20	M5	9	36	30	7.5	5	5	10	10	13
65618.W0061	6x12	Right	Coarse	6	12	M6	10	31	24	9.0	6	6	12	12	15
65618.W0062	6x24	Right	Coarse	6	24	M6	10	43	36	9.0	6	6	12	12	21
65618.W0081	8x16	Right	Coarse	8	16	M8	14	42	32	12.0	8	8	16	16	37
65618.W0082	8x16	Right	Fine	8	16	M8x1	14	42	32	12.0	8	8	16	16	37
65618.W0083	8x32	Right	Coarse	8	32	M8	14	58	48	12.0	8	8	16	16	54
65618.W0084	8x32	Right	Fine	8	32	M8x1	14	58	48	12.0	8	8	16	16	54
65618.W0102	10x20	Right	Coarse	10	20	M10	18	52	40	15.0	10	10	20	20	74
65618.W0103	10x20	Right	Fine	10	20	M10x1,25	18	52	40	15.0	10	10	20	20	74
65618.W0104	10x40	Right	Coarse	10	40	M10	18	72	60	15.0	10	10	20	20	116
65618.W0105	10x40	Right	Fine	10	40	M10x1,25	18	72	60	15.0	10	10	20	20	116
65618.W0122	12x24	Right	Coarse	12	24	M12	20	62	48	18.0	12	12	24	24	121
65618.W0123	12x24	Right	Fine	12	24	M12x1,25	20	62	48	18.0	12	12	24	24	121
65618.W0124	12x48	Right	Coarse	12	48	M12	20	86	72	18.0	12	12	24	24	175
65618.W0125	12x48	Right	Fine	12	48	M12x1,25	20	86	72	18.0	12	12	24	24	175
65618.W0142	14x28	Right	Coarse	14	28	M14	24	72	56	22.5	14	14	27	27	178
65618.W0143	14x28	Right	Fine	14	28	M14x1,5	24	72	56	22.5	14	14	27	27	178
65618.W0145	14x56	Right	Coarse	14	56	M14	24	101	85	22.5	14	14	27	27	258
65618.W0146	14x56	Right	Fine	14	56	M14x1,5	24	101	85	22.5	14	14	27	27	258
65618.W0163	16x32	Right	Coarse	16	32	M16	26	83	64	24.0	16	16	32	32	282
65618.W0164	16x32	Right	Fine	16	32	M16x1,5	26	83	64	24.0	16	16	32	32	282
65618.W0166	16x64	Right	Coarse	16	64	M16	26	115	96	24.0	16	16	32	32	411
65618.W0167	16x64	Right	Fine	16	64	M16x1,5	26	115	96	24.0	16	16	32	32	411

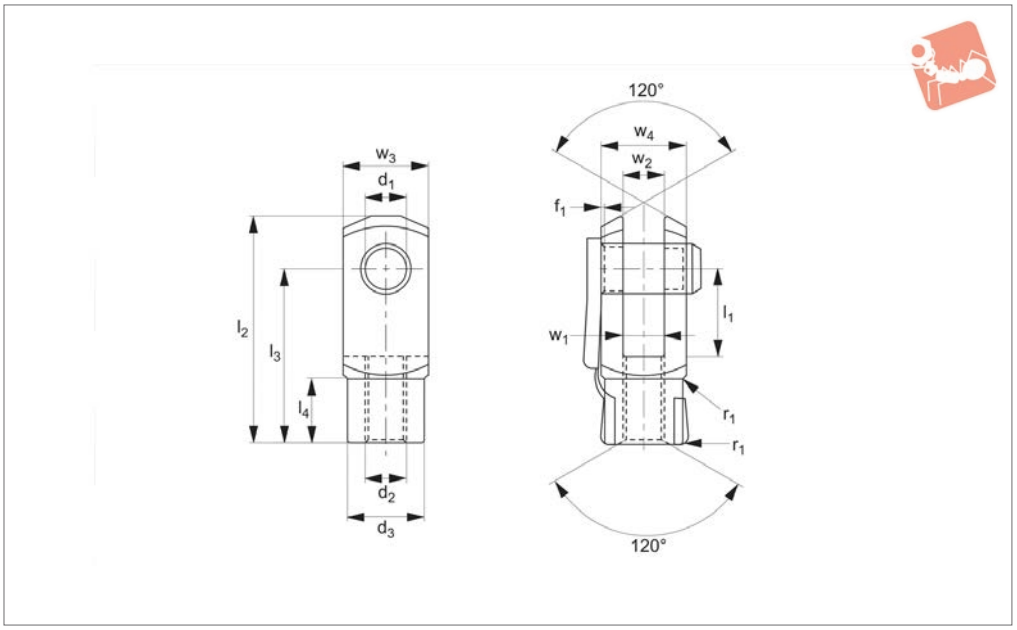
Steel Clevis Joints with Retention

silver zinc plated

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65618.W0204	20x40	Right	Coarse	20	40	M20	34	105	80	30.0	20	20	40	40	550
65618.W0205	20x40	Right	Fine	20	40	M20x1,5	34	105	80	30.0	20	20	40	40	550

Steel Clevis Joints with Retention

left hand thread - silver zinc plated



65620

Material
Steel 1.0718 (11SMnPb30k), silver zinc plated.

Technical Notes
M4-M16: DIN 71 752/DIN ISO 8140.
M20: Similar to DIN 71 752/DIN ISO 8140 and according to CETOP standard.

Tips
For yellow zinc plated version see R3399, assembly made up using 65631 clevis joint and 65684 clevis retention clip.

Important Notes
For sizes M4-M12, f_1 and r_1 =0,5
For sizes M4-M16, f_1 and r_1 =1
For sizes M20, f_1=1, r_1 = 1,5
For r_1, radius or 45° bevelling.

Other Tolerances:-

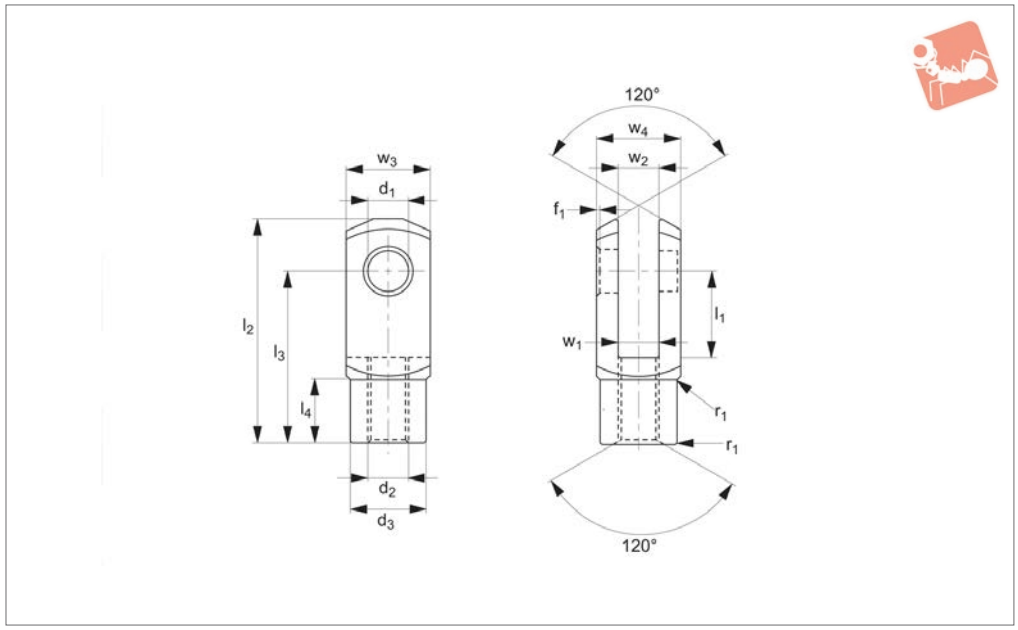
w_4: M4-M16 = +0,3 -0,16
M20 = +0,5 -0,2
w_2: size 4x8-10x20 = B13
All others +0,7 +0,15
d_3: M4-M16 = ±0,3
l_2: size 4x8-6x12 = ±0,3
All others ±0,4
l_3: M4-M16 = ±0,2
M20 = ±0,3
r_1: M20 = ±0,5

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65620.W0040	4x8	Left	Coarse	4	8	M4	8	21	16	6.0	4	4	8	8	5
65620.W0051	5x10	Left	Coarse	5	10	M5	9	26	20	7.5	5	5	10	10	9
65620.W0052	5x20	Left	Coarse	5	20	M5	9	36	30	7.5	5	5	10	10	13
65620.W0061	6x12	Left	Coarse	6	12	M6	10	31	24	9.0	6	6	12	12	15
65620.W0062	6x24	Left	Coarse	6	24	M6	10	43	36	9.0	6	6	12	12	21
65620.W0081	8x16	Left	Coarse	8	16	M8	14	42	32	12.0	8	8	16	16	37
65620.W0082	8x16	Left	Fine	8	16	M8x1	14	42	32	12.0	8	8	16	16	37
65620.W0083	8x32	Left	Coarse	8	32	M8	14	58	48	12.0	8	8	16	16	54
65620.W0084	8x32	Left	Fine	8	32	M8x1	14	58	48	12.0	8	8	16	16	54
65620.W0102	10x20	Left	Coarse	10	20	M10	18	52	40	15.0	10	10	20	20	74
65620.W0103	10x20	Left	Fine	10	20	M10x1,25	18	52	40	15.0	10	10	20	20	74
65620.W0104	10x40	Left	Coarse	10	40	M10	18	72	60	15.0	10	10	20	20	116
65620.W0105	10x40	Left	Fine	10	40	M10x1,25	18	72	60	15.0	10	10	20	20	116
65620.W0122	12x24	Left	Coarse	12	24	M12	20	62	48	18.0	12	12	24	24	121
65620.W0123	12x24	Left	Fine	12	24	M12x1,25	20	62	48	18.0	12	12	24	24	121
65620.W0124	12x48	Left	Course	12	48	M12	20	86	72	18.0	12	12	24	24	175
65620.W0125	12x48	Left	Fine	12	48	M12x1,25	20	86	72	18.0	12	12	24	24	175
65620.W0142	14x28	Left	Course	14	28	M14	24	72	56	22.5	14	14	27	27	178
65620.W0143	14x28	Left	Fine	14	28	M14x1,5	24	72	56	22.5	14	14	27	27	178
65620.W0145	14x56	Left	Coarse	14	56	M14	24	101	85	22.5	14	14	27	27	258
65620.W0146	14x56	Left	Fine	14	56	M14x1,5	24	101	85	22.5	14	14	27	27	258
65620.W0163	16x32	Left	Course	16	32	M16	26	83	64	24.0	16	16	32	32	282
65620.W0164	16x32	Left	Fine	16	32	M16x1,5	26	83	64	24.0	16	16	32	32	282
65620.W0166	16x64	Left	Coarse	16	64	M16	26	115	96	24.0	16	16	32	32	411
65620.W0167	16x64	Left	Fine	16	64	M16x1,5	26	115	96	24.0	16	16	32	32	411
65620.W0204	20x40	Left	Coarse	20	40	M20	34	105	80	30.0	20	20	40	40	550

Steel Clevis Joints with Retention

left hand thread - silver zinc plated

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65620.W0205	20x40	Left	Fine	20	40	M20x1,5	34	105	80	30.0	20	20	40	40	550



65630

Material
Steel 1.0718 (11SMnPb30k), silver zinc plated.

Technical Notes
M4-M16: DIN 71 752/DIN ISO 8140.
M18-M48: Similar to DIN 71 752/DIN ISO 8140 and according to CETOP standard.

Tips
For yellow zinc plated version see R3393, standard thread is right hand, (for left hand, see 65631).

Important Notes
For sizes M4-M12, f_1 and r_1 =0,5, for sizes M14-M16, f_1 and r_1 =1
For sizes M18-M20, f_1=1, r_1 = 1,5, for M24 f_1 and r_1 = 1,5, for sizes M27-M30, f_1 = 1,5, r_1 = 2
For M36 f_1 = 2, r_1 = 3, for sizes M42-M48, f_1 = 3, r_1 = 5, for r_1, radius or 45° bevelling.
Other Tolerances:-

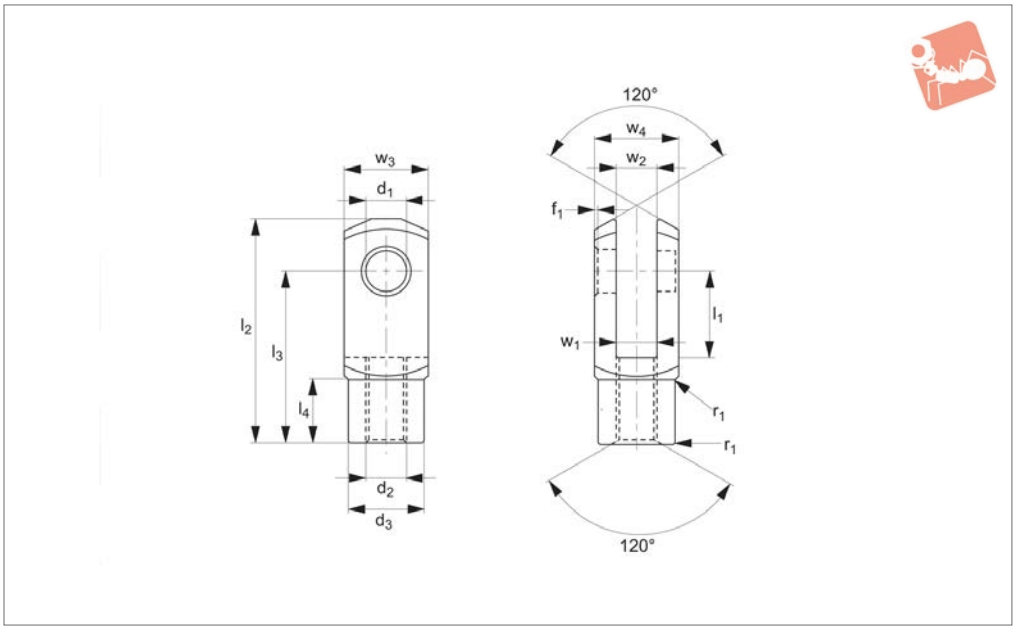
w_4: M4-M16 = +0,3 -0,16
M18-M48 = +0,5 -0,2
w_2: size 4x8-10x20 = B13
All others +0,7 +0,15
d_3: M4-M16 = ±0,3
l_2: size 4x8-6x12 = ±0,3
All others ±0,4
l_3: M4-M16 = ±0,2
M18-M48 = ±0,3
r_1: M18-M48 = ±0,5

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65630.W0040	4x8	Right	Coarse	4	8	M4	8	21	16	6.0	4	4	8	8	5
65630.W0041	4x16	Right	Coarse	4	16	M4	8	29	24	6.0	4	4	8	8	7
65630.W0051	5x10	Right	Coarse	5	10	M5	9	26	20	7.5	5	5	10	10	9
65630.W0052	5x20	Right	Coarse	5	20	M5	9	36	30	7.5	5	5	10	10	13
65630.W0061	6x12	Right	Coarse	6	12	M6	10	31	24	9.0	6	6	12	12	15
65630.W0062	6x24	Right	Coarse	6	24	M6	10	43	36	9.0	6	6	12	12	21
65630.W0081	8x16	Right	Coarse	8	16	M8	14	42	32	12.0	8	8	16	16	37
65630.W0082	8x16	Right	Fine	8	16	M8x1	14	42	32	12.0	8	8	16	16	37
65630.W0083	8x32	Right	Coarse	8	32	M8	14	58	48	12.0	8	8	16	16	54
65630.W0084	8x32	Right	Fine	8	32	M8x1	14	58	48	12.0	8	8	16	16	54
65630.W0102	10x20	Right	Coarse	10	20	M10	18	52	40	15.0	10	10	20	20	74
65630.W0103	10x20	Right	Fine	10	20	M10x1,25	18	52	40	15.0	10	10	20	20	74
65630.W0104	10x40	Right	Coarse	10	40	M10	18	72	60	15.0	10	10	20	20	116
65630.W0105	10x40	Right	Fine	10	40	M10x1,25	18	72	60	15.0	10	10	20	20	116
65630.W0122	12x24	Right	Coarse	12	24	M12	20	62	48	18.0	12	12	24	24	121
65630.W0123	12x24	Right	Fine	12	24	M12x1,25	20	62	48	18.0	12	12	24	24	121
65630.W0124	12x48	Right	Coarse	12	48	M12	20	86	72	18.0	12	12	24	24	175
65630.W0125	12x48	Right	Fine	12	48	M12x1,25	20	86	72	18.0	12	12	24	24	175
65630.W0142	14x28	Right	Coarse	14	28	M14	24	72	56	22.5	14	14	27	27	178
65630.W0143	14x28	Right	Fine	14	28	M14x1,5	24	72	56	22.5	14	14	27	27	178
65630.W0145	14x56	Right	Coarse	14	56	M14	24	101	85	22.5	14	14	27	27	258
65630.W0146	14x56	Right	Fine	14	56	M14x1,5	24	101	85	22.5	14	14	27	27	258
65630.W0163	16x32	Right	Coarse	16	32	M16	26	83	64	24.0	16	16	32	32	282
65630.W0164	16x32	Right	Fine	16	32	M16x1,5	26	83	64	24.0	16	16	32	32	282
65630.W0166	16x64	Right	Coarse	16	64	M16	26	115	96	24.0	16	16	32	32	411
65630.W0167	16x64	Right	Fine	16	64	M16x1,5	26	115	96	24.0	16	16	32	32	411

Steel Clevis Joints

silver zinc plated

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65630.W0183	18x36	Right	Coarse	18	36	M18	30	94	72	27.0	18	18	36	36	390
65630.W0184	18x36	Right	Fine	18	36	M18x1,5	30	94	72	27.0	18	18	36	36	390
65630.W0204	20x40	Right	Coarse	20	40	M20	34	105	80	30.0	20	20	40	40	550
65630.W0205	20x40	Right	Fine	20	40	M20x1,5	34	105	80	30.0	20	20	40	40	550
65630.W0208	20x80	Right	Coarse	20	80	M20	34	145	120	30.0	20	20	40	40	800
65630.W0209	20x80	Right	Fine	20	80	M20x1,5	34	145	120	30.0	20	20	40	40	800
65630.W0255	25x50	Right	Coarse	25	50	M24	42	132	100	36.0	25	25	50	50	1100
65630.W0256	25x50	Right	Fine	25	50	M24x2	42	132	100	36.0	25	25	50	50	1100
65630.W0285	28x56	Right	Coarse	28	56	M27	48	148	112	40.0	28	28	55	55	1500
65630.W0286	28x56	Right	Fine	28	56	M27x2	48	148	112	40.0	28	28	55	55	1500
65630.W0305	30x54	Right	Fine	30	54	M27x2	48	148	110	40.0	30	30	55	55	1440
65630.W0306	30x60	Right	Coarse	30	60	M30	52	160	120	42.0	30	30	60	60	1970
65630.W0307	30x60	Right	Fine	30	60	M30x2	52	160	120	42.0	30	30	60	60	1970
65630.W0355	35x54	Right	Fine	35	54	M36x2	60	188	144	54.0	35	35	70	70	2930
65630.W0357	35x72	Right	Coarse	35	72	M36	60	188	144	54.0	35	35	70	70	2930
65630.W0358	35x72	Right	Fine	35	72	M36x2	60	188	144	54.0	35	35	70	70	2930
65630.W0367	36x72	Right	Coarse	35	72	M36	60	188	144	54.0	36	36	70	70	2930
65630.W0368	36x72	Right	Fine	35	72	M36x2	60	188	144	54.0	36	36	70	70	2930
65630.W0408	40x84	Right	Fine	40	84	M42x2	70	232	168	63.5	40	40	85	85	5640
65630.W0428	42x84	Right	Coarse	42	84	M42	70	232	168	63.5	42	42	85	85	5340
65630.W0429	42x84	Right	Fine	42	84	M42x2	70	232	168	63.5	42	42	85	85	5340
65630.W0509	50x96	Right	Coarse	50	96	M48	82	265	192	73.0	50	50	96	96	7860
65630.W0510	50x96	Right	Fine	50	96	M48x2	82	265	192	73.0	50	50	96	96	7860



65631

Material
Steel 1.0718 (11SMnPb30k), silver zinc plated.

Technical Notes
M4-M16: DIN 71 752/DIN ISO 8140.
M18-M48: Similar to DIN 71 752/DIN ISO 8140 and according to CETOP standard.

Tips
For yellow zinc plated version see R3394.

Important Notes
For sizes M4-M12, f_1 and r_1 =0,5, for sizes M14-M16, f_1 and r_1 =1
For sizes M18-M20, f_1=1, r_1 = 1,5, for M24 f_1 and r_1 = 1,5, for sizes M27-M30, f_1 = 1,5, r_1 = 2
For M36 f_1 = 2, r_1 = 3, for sizes M42-M48, f_1 = 3, r_1 = 5, for r_1, radius or 45° bevelling.
Other Tolerances:-
w_4: M4-M16 = +0,3 -0,16
M18-M48 = +0,5 -0,2
w_2: size 4x8-10x20 = B13
All others +0,7 +0,15
d_3: M4-M16 = ±0,3
l_2: size 4x8-6x12 = ±0,3
All others ±0,4
l_3: M4-M16 = ±0,2
M18-M48 = ±0,3
r_1: M18-M48 = ±0,5

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65631.W0040	4x8	Left	Coarse	4	8	M4	8	21	16	6.0	4	4	8	8	5
65631.W0041	4x16	Left	Coarse	4	16	M4	8	29	24	6.0	4	4	8	8	7
65631.W0051	5x10	Left	Coarse	5	10	M5	9	26	20	7.5	5	5	10	10	9
65631.W0052	5x20	Left	Coarse	5	20	M5	9	36	30	7.5	5	5	10	10	13
65631.W0061	6x12	Left	Coarse	6	12	M6	10	31	24	9.0	6	6	12	12	15
65631.W0062	6x24	Left	Coarse	6	24	M6	10	43	36	9.0	6	6	12	12	21
65631.W0081	8x16	Left	Coarse	8	16	M8	14	42	32	12.0	8	8	16	16	37
65631.W0082	8x16	Left	Fine	8	16	M8x1	14	42	32	12.0	8	8	16	16	37
65631.W0083	8x32	Left	Coarse	8	32	M8	14	58	48	12.0	8	8	16	16	54
65631.W0084	8x32	Left	Fine	8	32	M8x1	14	58	48	12.0	8	8	16	16	54
65631.W0102	10x20	Left	Coarse	10	20	M10	18	52	40	15.0	10	10	20	20	74
65631.W0103	10x20	Left	Fine	10	20	M10x1,25	18	52	40	15.0	10	10	20	20	74
65631.W0104	10x40	Left	Coarse	10	40	M10	18	72	60	15.0	10	10	20	20	116
65631.W0105	10x40	Left	Fine	10	40	M10x1,25	18	72	60	15.0	10	10	20	20	116
65631.W0122	12x24	Left	Coarse	12	24	M12	20	62	48	18.0	12	12	24	24	121
65631.W0123	12x24	Left	Fine	12	24	M12x1,25	20	62	48	18.0	12	12	24	24	121
65631.W0124	12x48	Left	Coarse	12	48	M12	20	86	72	18.0	12	12	24	24	175
65631.W0125	12x48	Left	Fine	12	48	M12x1,25	20	86	72	18.0	12	12	24	24	175
65631.W0142	14x28	Left	Coarse	14	28	M14	24	72	56	22.5	14	14	27	27	178
65631.W0143	14x28	Left	Fine	14	28	M14x1,5	24	72	56	22.5	14	14	27	27	178
65631.W0145	14x56	Left	Coarse	14	56	M14	24	101	85	22.5	14	14	27	27	258
65631.W0146	14x56	Left	Fine	14	56	M14x1,5	24	101	85	22.5	14	14	27	27	258
65631.W0163	16x32	Left	Coarse	16	32	M16	26	83	64	24.0	16	16	32	32	282
65631.W0164	16x32	Left	Fine	16	32	M16x1,5	26	83	64	24.0	16	16	32	32	282
65631.W0166	16x64	Left	Coarse	16	64	M16	26	115	96	24.0	16	16	32	32	411
65631.W0167	16x64	Left	Fine	16	64	M16x1,5	26	115	96	24.0	16	16	32	32	411

Steel Clevis Joints

left hand - silver zinc plated

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65631.W0183	18x36	Left	Coarse	18	36	M18	30	94	72	27.0	18	18	36	36	390
65631.W0184	18x36	Left	Fine	18	36	M18x1,5	30	94	72	27.0	18	18	36	36	390
65631.W0204	20x40	Left	Coarse	20	40	M20	34	105	80	30.0	20	20	40	40	550
65631.W0205	20x40	Left	Fine	20	40	M20x1,5	34	105	80	30.0	20	20	40	40	550
65631.W0208	20x80	Left	Coarse	20	80	M20	34	145	120	30.0	20	20	40	40	800
65631.W0209	20x80	Left	Fine	20	80	M20x1,5	34	145	120	30.0	20	20	40	40	800
65631.W0255	25x50	Left	Coarse	25	50	M24	42	132	100	36.0	25	25	50	50	1100
65631.W0256	25x50	Left	Fine	25	50	M24x2	42	132	100	36.0	25	25	50	50	1100
65631.W0285	28x56	Left	Coarse	28	56	M27	48	148	112	40.0	28	28	55	55	1500
65631.W0286	28x56	Left	Fine	28	56	M27x2	48	148	112	40.0	28	28	55	55	1500
65631.W0305	30x54	Left	Fine	30	54	M27x2	48	148	110	40.0	30	30	55	55	1440
65631.W0306	30x60	Left	Coarse	30	60	M30	52	160	120	42.0	30	30	60	60	1970
65631.W0307	30x60	Left	Fine	30	60	M30x2	52	160	120	42.0	30	30	60	60	1970
65631.W0355	35x54	Left	Fine	35	54	M36x2	60	188	144	54.0	35	35	70	70	2930
65631.W0357	35x72	Left	Coarse	35	72	M36	60	188	144	54.0	35	35	70	70	2930
65631.W0358	35x72	Left	Fine	35	72	M36x2	60	188	144	54.0	35	35	70	70	2930
65631.W0367	36x72	Left	Coarse	35	72	M36	60	188	144	54.0	36	36	70	70	2930
65631.W0368	36x72	Left	Fine	35	72	M36x2	60	188	144	54.0	36	36	70	70	2930
65631.W0408	40x84	Left	Fine	40	84	M42x2	70	232	168	63.5	40	40	85	85	5640
65631.W0428	42x84	Left	Coarse	42	84	M42	70	232	168	63.5	42	42	85	85	5340
65631.W0429	42x84	Left	Fine	42	84	M42x2	70	232	168	63.5	42	42	85	85	5340
65631.W0509	50x96	Left	Coarse	50	96	M48	82	265	192	73.0	50	50	96	96	7860
65631.W0510	50x96	Left	Fine	50	96	M48x2	82	265	192	73.0	50	50	96	96	7860

Parts overview

Clevis Joints

Stocked to DIN 71752 in steel and stainless steel. Plain clevis joints available in right and left hand threads zinc plated steel and stainless steel. Steel sizes from M4 up to M48. Stainless sizes from M4 up to M27.

Clevis Mating Pieces

These are designed to fit in between our clevis joints to create a linkage where an angular offset is required. Available in zinc plated steel and stainless steel. Sizes M4 up to M20.

Clevis Pins and Clips

Various styles of pins and clips to suit clevis joints in zinc plated steel and stainless steel. Sizes available to suit all sizes of clevis joints that we offer.

Male Clevis Joints

Stocked in zinc plated steel and stainless steel, right and left hand threads. Sizes M6 up to M20.

Clevis Retention Clips

These are the most popular type of clip used with our clevis joints. They create a neat compact assembly, only available in zinc plated steel. Size available for clevis joints from 4mm up to 20mm.

ov-W65630-AR3385-T-W65684-AR3435-T-a-rnh- Updated -31-10-2022

Zinc plated steel

Clevis with retention clip 65630 and 65684

Clevis with clevis pin 65664
Safety fastener 65680

Clevis with clevis pin, washer and cotter pin 65660 and 65674

Stainless steel

Clevis with clevis pin and circlips 65666 and 65678

Clevis with clevis pin, washer and cotter pin 65661 and 65675

Assembly options

Clevis with 65652 mating piece and 65684 clevis retention clip

Clevis with 65880 rod end and 65684 clevis retention clip

Tensile tests, statistically to failure (break)

Clevises M6 - M42

Clevis joints axially loaded.

Material

Leaded low carbon steel (AISI 12L14, 1.0718).

Important note: values in this table are indicative only and should only be used as a rough guide. The Company cannot foresee the intended applications of their products and we accept no liability for any actions taken by third parties. Customers are advised to use their own safety factors and/or perform their own testing on the clevis joint to ensure it meets requirements for their application.

Clevis size	F min (kN)	F max (kN)	F average value (kN)	Avg. force when clevis starts to deform (kN)
6 x 24 M 6	16,0	19,5	17,6	15,3
8 x 32 M 8	33,2	35,6	34,6	29,3
10 x 40 M10	42,0	52,0	47,5	41,3
12 x 48 M12	53,0	68,5	61,1	50,2
14 x 56 M14	60,5	64,5	63,0	48,8
16 x 64 M16	133,5	146,0	140,2	115
20 x 40 M20	194,5	234,0	213,5	176
25 x 50 M25	311,0	336,0	328,0	260
30 x 60 M30	428,0	450,0	440,6	343
36 x 72 M36	566,0	573,0	569,5	300
35 x 72 M36	561,2	567,9	564,6	370
42 x 84 M42	904,6	904,6	904,6	420

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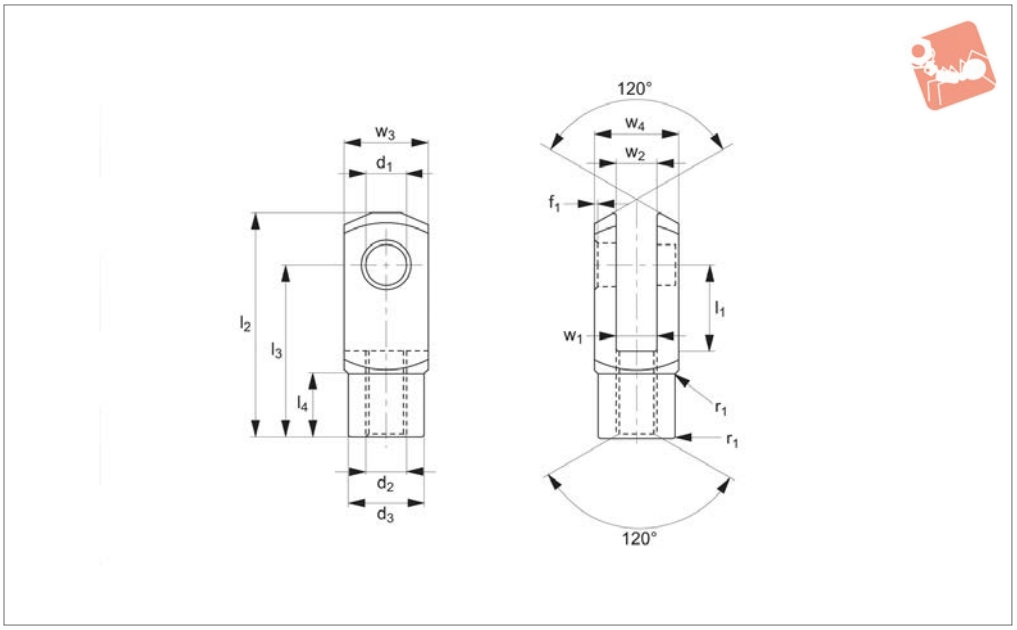


65610

Material
Stainless steel (1.4305 AISI 303 X8CrNiS18-9)

Technical Notes
M5-M16: DIN 71 752/DIN ISO 8140.
M20-M24: Similar to DIN 71 752 and according to CETOP standard.

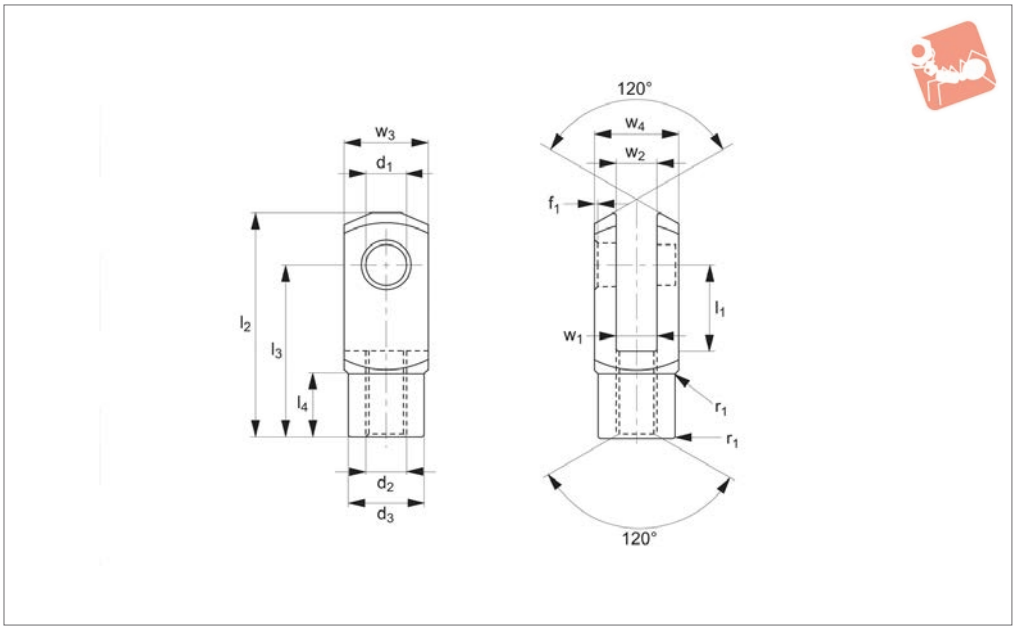
Tips
Standard thread is right hand (for left hand, see 65612).
Assembly is made up using 65635 clevis joint, 65661 pin, P0330 washer, and 65675 split cotter pin.

Important Notes
For sizes M5-M12, f_1 and r_1 = 0,5, for sizes M14-M16, f_1 and r_1 = 1
For size M20, f_1=1, r_1 = 1,5, for M24, f_1 and r_1 = 1,5, for r_1, radius or 45° bevelling.
Other Tolerances:-
w_4: M4-M16 = +0,3 -0,16
M20-M24 = +0,5 - 0,2
w_2: Size 4x8-10x20 = B13
Size 10x40-25x50 = +0,7 +0,15
l_3: up to size 6x12 = ±0,3
From size 6x24 = ±0,4

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 ±0.5	w_2	w_3 tol. h11	w_4	Weight g
65610.W0051	5x10	Right	Coarse	5	10	M5	9	26	20	7.5	5	5	10	10	9
65610.W0052	5x20	Right	Coarse	5	20	M5	9	36	30	7.5	5	5	10	10	13
65610.W0061	6x12	Right	Coarse	6	12	M6	10	31	24	9.0	6	6	12	12	15
65610.W0062	6x24	Right	Coarse	6	24	M6	10	43	36	9.0	6	6	12	12	21
65610.W0081	8x16	Right	Coarse	8	16	M8	14	42	32	12.0	8	8	16	16	37
65610.W0082	8x16	Right	Fine	8	16	M8x1	14	42	32	12.0	8	8	16	16	37
65610.W0083	8x32	Right	Coarse	8	32	M8	14	58	48	12.0	8	8	16	16	54
65610.W0084	8x32	Right	Fine	8	32	M8x1	14	58	48	12.0	8	8	16	16	54
65610.W0102	10x20	Right	Coarse	10	20	M10	18	52	40	15.0	10	10	20	20	74
65610.W0103	10x20	Right	Fine	10	20	M10x1,25	18	52	40	15.0	10	10	20	20	74
65610.W0104	10x40	Right	Coarse	10	40	M10	18	72	60	15.0	10	10	20	20	116
65610.W0105	10x40	Right	Fine	10	40	M10x1,25	18	72	60	15.0	10	10	20	20	116
65610.W0122	12x24	Right	Coarse	12	24	M12	20	62	48	18.0	12	12	24	24	121
65610.W0123	12x24	Right	Fine	12	24	M12x1,25	20	62	48	18.0	12	12	24	24	121
65610.W0124	12x48	Right	Coarse	12	48	M12	20	86	72	18.0	12	12	24	24	175
65610.W0125	12x48	Right	Fine	12	48	M12x1,25	20	86	72	18.0	12	12	24	24	175
65610.W0142	14x28	Right	Coarse	14	28	M14	24	72	56	22.5	14	14	27	27	178
65610.W0143	14x28	Right	Fine	14	28	M14x1,5	24	72	56	22.5	14	14	27	27	178
65610.W0145	14x56	Right	Coarse	14	56	M14	24	101	85	22.5	14	14	27	27	258
65610.W0146	14x56	Right	Fine	14	56	M14x1,5	24	101	85	22.5	14	14	27	27	258
65610.W0163	16x32	Right	Coarse	16	32	M16	26	83	64	24.0	16	16	32	32	282
65610.W0164	16x32	Right	Fine	16	32	M16x1,5	26	83	64	24.0	16	16	32	32	282
65610.W0166	16x64	Right	Coarse	16	64	M16	26	115	96	24.0	16	16	32	32	411
65610.W0167	16x64	Right	Fine	16	64	M16x1,5	26	115	96	24.0	16	16	32	32	411
65610.W0204	20x40	Right	Coarse	20	40	M20	34	105	80	30.0	20	20	40	40	550
65610.W0205	20x40	Right	Fine	20	40	M20x1,5	34	105	80	30.0	20	20	40	40	550
65610.W0255	25x50	Right	Coarse	25	50	M24	42	132	100	36.0	25	25	50	50	1100

Stainless Clevis Joint with Pin

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 ±0.5	w_2	w_3 tol. h11	w_4	Weight g
65610.W0256	25x50	Right	Fine	25	50	M24x2	42	132	100	36.0	25	25	50	50	1100



65612

Material
Stainless steel (1.4305 AISI 303 X8CrNiS18-9)

Technical Notes
M5-M16: DIN 71 752/DIN ISO 8140.
M20-M24: Similar to DIN 71 752 and according to CETOP standard.

Tips
Assembly is made up using 65636 clevis joint, 65661 pin, P0330 washer, and 65675 split cotter pin.

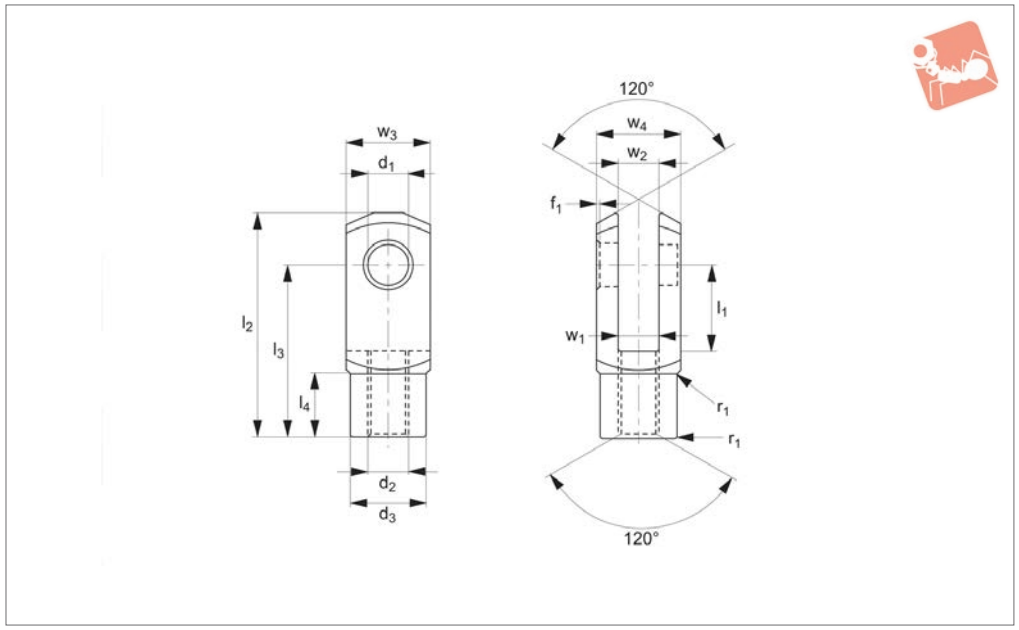
Important Notes
For sizes M5-M12, f_1 and r_1 = 0,5, for sizes M14-M16, f_1 and r_1 = 1
For size M20, f_1=1, r_1 = 1,5, for M24, f_1 and r_1 = 1,5, for r_1, radius or 45° bevelling.
Other Tolerances:-
w_4: M4-M16 = +0,3 -0,16
M20-M27 = +0,5 - 0,2
w_2: Size 4x8-10x20 = B13
Size 10x40-30x54 = +0,7 +0,15
l_3: up to size 6x12 = ±0,3
From size 6x24 = ±0,4

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65612.W0051	5x10	Left	Coarse	5	10	M5	9	26	20	7.5	5	5	10	10	9
65612.W0052	5x20	Left	Coarse	5	20	M5	9	36	30	7.5	5	5	10	10	13
65612.W0061	6x12	Left	Coarse	6	12	M6	10	31	24	9.0	6	6	12	12	15
65612.W0062	6x24	Left	Coarse	6	24	M6	10	43	36	9.0	6	6	12	12	21
65612.W0081	8x16	Left	Coarse	8	16	M8	14	42	32	12.0	8	8	16	16	37
65612.W0082	8x16	Left	Fine	8	16	M8x1	14	42	32	12.0	8	8	16	16	37
65612.W0083	8x32	Left	Coarse	8	32	M8	14	58	48	12.0	8	8	16	16	54
65612.W0084	8x32	Left	Fine	8	32	M8x1	14	58	48	12.0	8	8	16	16	54
65612.W0102	10x20	Left	Coarse	10	20	M10	18	52	40	15.0	10	10	20	20	74
65612.W0103	10x20	Left	Fine	10	20	M10x1,25	18	52	40	15.0	10	10	20	20	74
65612.W0104	10x40	Left	Coarse	10	40	M10	18	72	60	15.0	10	10	20	20	116
65612.W0105	10x40	Left	Fine	10	40	M10x1,25	18	72	60	15.0	10	10	20	20	116
65612.W0122	12x24	Left	Coarse	12	24	M12	20	62	48	18.0	12	12	24	24	121
65612.W0123	12x24	Left	Fine	12	24	M12x1,25	20	62	48	18.0	12	12	24	24	121
65612.W0124	12x48	Left	Coarse	12	48	M12	20	86	72	18.0	12	12	24	24	175
65612.W0125	12x48	Left	Fine	12	48	M12x1,25	20	86	72	18.0	12	12	24	24	175
65612.W0142	14x28	Left	Coarse	14	28	M14	24	72	56	22.5	14	14	27	27	178
65612.W0143	14x28	Left	Fine	14	28	M14x1,5	24	72	56	22.5	14	14	27	27	178
65612.W0145	14x56	Left	Coarse	14	56	M14	24	101	85	22.5	14	14	27	27	258
65612.W0146	14x56	Left	Fine	14	56	M14x1,5	24	101	85	22.5	14	14	27	27	258
65612.W0163	16x32	Left	Coarse	16	32	M16	26	83	64	24.0	16	16	32	32	282
65612.W0164	16x32	Left	Fine	16	32	M16x1,5	26	83	64	24.0	16	16	32	32	282
65612.W0166	16x64	Left	Coarse	16	64	M16	26	115	96	24.0	16	16	32	32	411
65612.W0167	16x64	Left	Fine	16	64	M16x1,5	26	115	96	24.0	16	16	32	32	411
65612.W0204	20x40	Left	Coarse	20	40	M20	34	105	80	30.0	20	20	40	40	550
65612.W0205	20x40	Left	Fine	20	40	M20x1,5	34	105	80	30.0	20	20	40	40	550
65612.W0255	25x50	Left	Coarse	25	50	M24	42	132	100	36.0	25	25	50	50	1100

Stainless Clevis Joints with Pin

left hand thread

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65612.W0256	25x50	Left	Fine	25	50	M24x2	42	132	100	36.0	25	25	50	50	1100



65614

Material
Stainless steel (1.4305 AISI 303 X8CrNiS18-9)

Technical Notes
M5-M16: DIN 71 752/DIN ISO 8140.
M20: Similar to DIN 71 752 and according to CETOP standard.

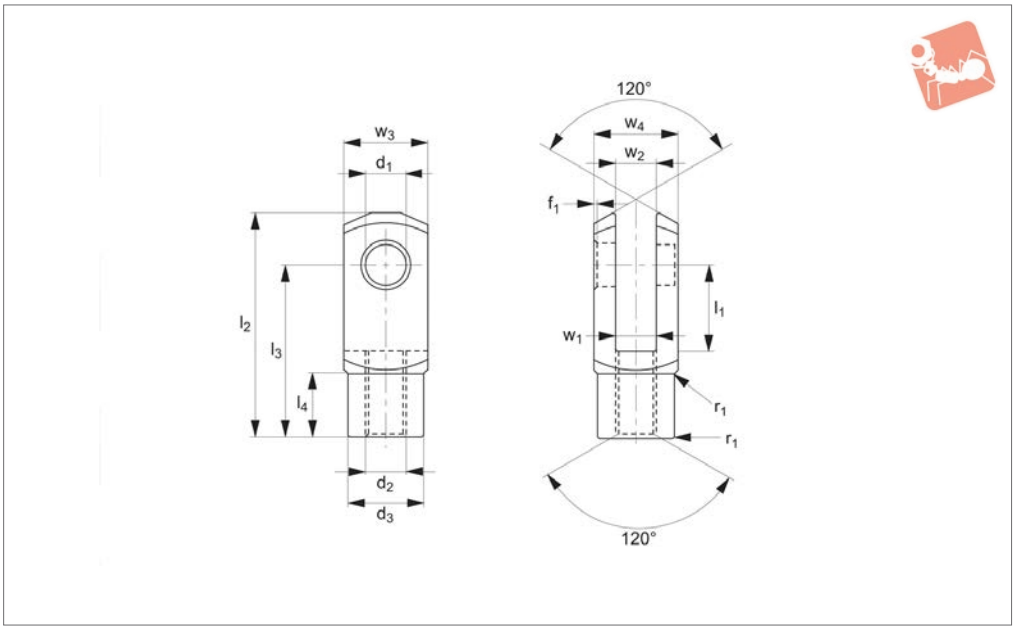
Tips
Standard thread is right hand, (for left hand, see 65616).
Assembly is made up using 65635 clevis joint, 65666 pin, and 2 off 65678 circlips.

Important Notes
For sizes M5-M12, f_1 and r_1 = 0,5, for sizes M16, f_1 and r_1 = 1
For size M20, f_1=1, r_1 = 1,5, for r_1, radius or 45° bevelling.
Other Tolerances:-
w_4: M4-M16 = +0,3 -0,16
M20 = +0,5 - 0,2
w_2: Size 4x8-10x20 = B13
Size 10x40-20x40 = +0,7 +0,15
l_3: up to size 6x12 = ±0,3
From size 6x24 = ±0,4

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 ±0.5	w_2	w_3 tol. h11	w_4	Weight g
65614.W0051	5x10	Right	Coarse	5	10	M5	9	26	20	7.5	5	5	10	10	9
65614.W0052	5x20	Right	Coarse	5	20	M5	9	36	30	7.5	5	5	10	10	13
65614.W0061	6x12	Right	Coarse	6	12	M6	10	31	24	9.0	6	6	12	12	15
65614.W0062	6x24	Right	Coarse	6	24	M6	10	43	36	9.0	6	6	12	12	21
65614.W0081	8x16	Right	Coarse	8	16	M8	14	42	32	12.0	8	8	16	16	37
65614.W0082	8x16	Right	Fine	8	16	M8x1	14	42	32	12.0	8	8	16	16	37
65614.W0083	8x32	Right	Coarse	8	32	M8	14	58	48	12.0	8	8	16	16	54
65614.W0084	8x32	Right	Fine	8	32	M8x1	14	58	48	12.0	8	8	16	16	54
65614.W0102	10x20	Right	Coarse	10	20	M10	18	52	40	15.0	10	10	20	20	74
65614.W0103	10x20	Right	Fine	10	20	M10x1,25	18	52	40	15.0	10	10	20	20	74
65614.W0104	10x40	Right	Coarse	10	40	M10	18	72	60	15.0	10	10	20	20	116
65614.W0105	10x40	Right	Fine	10	40	M10x1,25	18	72	60	15.0	10	10	20	20	116
65614.W0122	12x24	Right	Coarse	12	24	M12	20	62	48	18.0	12	12	24	24	121
65614.W0123	12x24	Right	Fine	12	24	M12x1,25	20	62	48	18.0	12	12	24	24	121
65614.W0124	12x48	Right	Coarse	12	48	M12	20	86	72	18.0	12	12	24	24	175
65614.W0125	12x48	Right	Fine	12	48	M12x1,25	20	86	72	18.0	12	12	24	24	175
65614.W0163	16x32	Right	Coarse	16	32	M16	26	83	64	24.0	16	16	32	32	282
65614.W0164	16x32	Right	Fine	16	32	M16x1,5	26	83	64	24.0	16	16	32	32	282
65614.W0166	16x64	Right	Coarse	16	64	M16	26	115	96	24.0	16	16	32	32	411
65614.W0167	16x64	Right	Fine	16	64	M16x1,5	26	115	96	24.0	16	16	32	32	411
65614.W0204	20x40	Right	Coarse	20	40	M20	34	105	80	30.0	20	20	40	40	550
65614.W0205	20x40	Right	Fine	20	40	M20x1,5	34	105	80	30.0	20	20	40	40	550

Stainless Clevis Joints with Pin
left hand thread

65616



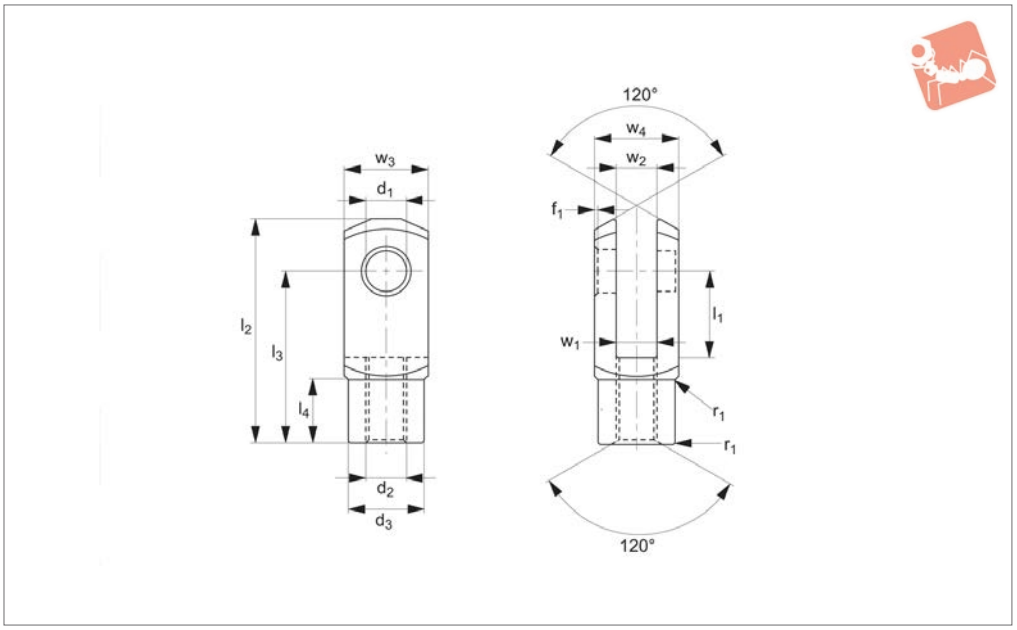
Material
Stainless steel (1.4305 AISI 303 X8CrNiS18-9)

Technical Notes
M5-M16: DIN 71 752/DIN ISO 8140.
M20: Similar to DIN 71 752 and according to CETOP standard.

Tips
Assembly is made up using 65636 clevis joint, 65666 pin, and 2 off 65678 circlips.

Important Notes
For sizes M5-M12, f_1 and r_1 = 0,5, for sizes M16, f_1 and r_1 = 1
For size M20, f_1=1, r_1 = 1,5, for r_1, radius or 45° bevelling.
Other Tolerances:-
w_4: M4-M16 = +0,3 -0,16
M20 = +0,5 - 0,2
w_2: Size 4x8-10x20 = B13
Size 10x40-20x40 = +0,7 +0,15
l_3: up to size 6x12 = ±0,3
From size 6x24 = ±0,4

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65616.W0051	5x10	Left	Coarse	5	10	M5	9	26	20	7.5	5	5	10	10	9
65616.W0052	5x20	Left	Coarse	5	20	M5	9	36	30	7.5	5	5	10	10	13
65616.W0061	6x12	Left	Coarse	6	12	M6	10	31	24	9.0	6	6	12	12	15
65616.W0062	6x24	Left	Coarse	6	24	M6	10	43	36	9.0	6	6	12	12	21
65616.W0081	8x16	Left	Coarse	8	16	M8	14	42	32	12.0	8	8	16	16	37
65616.W0082	8x16	Left	Fine	8	16	M8x1	14	42	32	12.0	8	8	16	16	37
65616.W0083	8x32	Left	Coarse	8	32	M8	14	58	48	12.0	8	8	16	16	54
65616.W0084	8x32	Left	Fine	8	32	M8x1	14	58	48	12.0	8	8	16	16	54
65616.W0102	10x20	Left	Coarse	10	20	M10	18	52	40	15.0	10	10	20	20	74
65616.W0103	10x20	Left	Fine	10	20	M10x1,25	18	52	40	15.0	10	10	20	20	74
65616.W0104	10x40	Left	Coarse	10	40	M10	18	72	60	15.0	10	10	20	20	116
65616.W0105	10x40	Left	Fine	10	40	M10x1,25	18	72	60	15.0	10	10	20	20	116
65616.W0122	12x24	Left	Coarse	12	24	M12	20	62	48	18.0	12	12	24	24	121
65616.W0123	12x24	Left	Fine	12	24	M12x1,25	20	62	48	18.0	12	12	24	24	121
65616.W0124	12x48	Left	Coarse	12	48	M12	20	86	72	18.0	12	12	24	24	175
65616.W0125	12x48	Left	Fine	12	48	M12x1,25	20	86	72	18.0	12	12	24	24	175
65616.W0163	16x32	Left	Coarse	16	32	M16	26	83	64	24.0	16	16	32	32	282
65616.W0164	16x32	Left	Fine	16	32	M16x1,5	26	83	64	24.0	16	16	32	32	282
65616.W0166	16x64	Left	Coarse	16	64	M16	26	115	96	24.0	16	16	32	32	411
65616.W0167	16x64	Left	Fine	16	64	M16x1,5	26	115	96	24.0	16	16	32	32	411
65616.W0204	20x40	Left	Coarse	20	40	M20	34	105	80	30.0	20	20	40	40	550
65616.W0205	20x40	Left	Fine	20	40	M20x1,5	34	105	80	30.0	20	20	40	40	550



65635

Material
Stainless steel (1.4305 AISI 303 X8CrNiS18-9).

Technical Notes
M4-M16: DIN 71 752/DIN ISO 8140.
M20-M27: Similar to DIN 71 752 and according to CETOP standard.

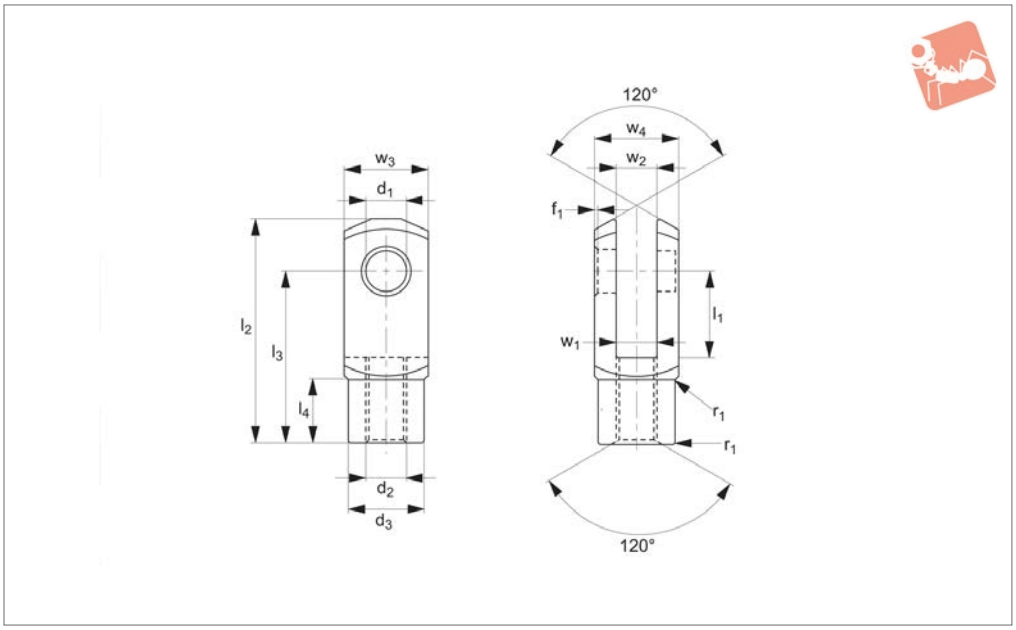
Tips
Standard thread is right hand, (for left hand, see 65636).

Important Notes
For sizes M4-M12, f_1 and r_1 = 0,5, for sizes M14-M16, f_1 and r_1 = 1, for size M20, f_1=1, r_1 = 1,5
For M24, f_1 and r_1 = 1,5, for M27, f_1 = 1,5, r_1 = 2, for r_1, radius or 45° bevelling.
Other Tolerances:-
w_4: M4-M16 = +0,3 -0,16
M20-M27 = +0,5 - 0,2
w_2: Size 4x8-10x20 = B13
Size 10x40-30x54 = +0,7 +0,15
l_3: up to size 6x12 = ±0,3
From size 6x24 = ±0,4

Order No.	Size	Thread hand	Thread type	d_1 tol. h9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 ±0.5	w_2	w_3 tol. h11	w_4	Weight g
65635.W0040	4x8	Right	Coarse	4	8	M 4	8	21	16	6.0	4	4	8	8	5
65635.W0041	4x16	Right	Coarse	4	16	M 4	8	29	24	6.0	4	4	8	8	7
65635.W0051	5x10	Right	Coarse	5	10	M 5	9	26	20	7.5	5	5	10	10	9
65635.W0052	5x20	Right	Coarse	5	20	M 5	9	36	30	7.5	5	5	10	10	13
65635.W0061	6x12	Right	Coarse	6	12	M 6	10	31	24	9.0	6	6	12	12	15
65635.W0062	6x24	Right	Coarse	6	24	M 6	10	43	36	9.0	6	6	12	12	21
65635.W0081	8x16	Right	Coarse	8	16	M 8	14	42	32	12.0	8	8	16	16	37
65635.W0082	8x16	Right	Fine	8	16	M 8x1	14	42	32	12.0	8	8	16	16	37
65635.W0083	8x32	Right	Coarse	8	32	M 8	14	58	48	12.0	8	8	16	16	54
65635.W0084	8x32	Right	Fine	8	32	M 8x1	14	58	48	12.0	8	8	16	16	54
65635.W0102	10x20	Right	Coarse	10	20	M10	18	52	40	15.0	10	10	20	20	74
65635.W0103	10x20	Right	Fine	10	20	M10x1,25	18	52	40	15.0	10	10	20	20	74
65635.W0104	10x40	Right	Coarse	10	40	M10	18	72	60	15.0	10	10	20	20	116
65635.W0105	10x40	Right	Fine	10	40	M10x1,25	18	72	60	15.0	10	10	20	20	116
65635.W0122	12x24	Right	Coarse	12	24	M12	20	62	48	18.0	12	12	24	24	121
65635.W0123	12x24	Right	Fine	12	24	M12x1,25	20	62	48	18.0	12	12	24	24	121
65635.W0124	12x48	Right	Coarse	12	48	M12	20	86	72	18.0	12	12	24	24	175
65635.W0125	12x48	Right	Fine	12	48	M12x1,25	20	86	72	18.0	12	12	24	24	175
65635.W0142	14x28	Right	Coarse	14	28	M14	24	72	56	22.5	14	14	27	27	178
65635.W0143	14x28	Right	Fine	14	28	M14x1,5	24	72	56	22.5	14	14	27	27	178
65635.W0145	14x56	Right	Coarse	14	56	M14	24	101	85	22.5	14	14	27	27	258
65635.W0146	14x56	Right	Fine	14	56	M14x1,5	24	101	85	22.5	14	14	27	27	258
65635.W0163	16x32	Right	Coarse	16	32	M16	26	83	64	24.0	16	16	32	32	282
65635.W0164	16x32	Right	Fine	16	32	M16x1,5	26	83	64	24.0	16	16	32	32	282
65635.W0166	16x64	Right	Coarse	16	64	M16	26	115	96	24.0	16	16	32	32	411
65635.W0167	16x64	Right	Fine	16	64	M16x1,5	26	115	96	24.0	16	16	32	32	411
65635.W0204	20x40	Right	Coarse	20	40	M20	34	105	80	30.0	20	20	40	40	550

Stainless Clevis Joint

Order No.	Size	Thread hand	Thread type	d_1 tol. h9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 ±0.5	w_2	w_3 tol. h11	w_4	Weight g
65635.W0205	20x40	Right	Fine	20	40	M20x1,5	34	105	80	30.0	20	20	40	40	550
65635.W0255	25x50	Right	Coarse	25	50	M24	42	132	100	36.0	25	25	50	50	1100
65635.W0256	25x50	Right	Fine	25	50	M24x2	42	132	100	36.0	25	25	50	50	1100
65635.W0305	30x54	Right	Fine	30	54	M27x2	48	148	110	40.0	30	30	55	55	1440



65636

Material
Stainless steel (1.4305 AISI 303 X8CrNiS18-9)

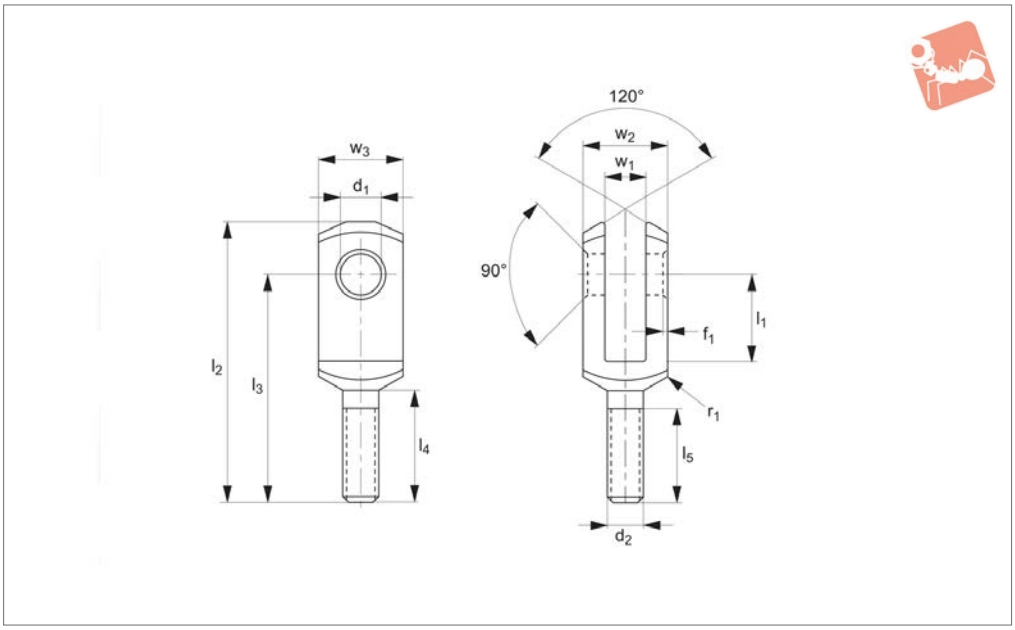
Technical Notes
M4-M16: DIN 71 752/DIN ISO 8140.
M20-M27: Similar to DIN 71 752 and according to CETOP standard.

Important Notes
For sizes M4-M12, f_1 and r_1 = 0,5, for sizes M14-M16, f_1 and r_1 = 1, for size M20, f_1=1, r_1 = 1,5
For M24, f_1 and r_1 = 1,5, for M27, f_1=1,5, r_1 = 2, for r_1, radius or 45° bevelling.
Other Tolerances:-
w_4: M4-M16 = +0,3 -0,16
M20-M27 = +0,5 - 0,2
w_2: Size 4x8-10x20 = B13
Size 10x40-30x54 = +0,7 +0,15
l_3: up to size 6x12 = ±0,3
From size 6x24 = ±0,4

Order No.	Size	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	d_3	l_2 ±0.5	l_3	l_4	w_1 tol. B13	w_2	w_3 tol. h11	w_4	Weight g
65636.W0040	4x8	Left	Coarse	4	8	M4	8	21	16	6.0	4	4	8	8	5
65636.W0041	4x16	Left	Coarse	4	16	M4	8	29	24	6.0	4	4	8	8	7
65636.W0051	5x10	Left	Coarse	5	10	M5	9	26	20	7.5	5	5	10	10	9
65636.W0052	5x20	Left	Coarse	5	20	M5	9	36	30	7.5	5	5	10	10	13
65636.W0061	6x12	Left	Coarse	6	12	M6	10	31	24	9.0	6	6	12	12	15
65636.W0062	6x24	Left	Coarse	6	24	M6	10	43	36	9.0	6	6	12	12	21
65636.W0081	8x16	Left	Coarse	8	16	M8	14	42	32	12.0	8	8	16	16	37
65636.W0082	8x16	Left	Fine	8	16	M8x1	14	42	32	12.0	8	8	16	16	37
65636.W0083	8x32	Left	Coarse	8	32	M8	14	58	48	12.0	8	8	16	16	54
65636.W0102	10x20	Left	Coarse	10	20	M10	18	52	40	15.0	10	10	20	20	74
65636.W0103	10x20	Left	Fine	10	20	M10x1,25	18	52	40	15.0	10	10	20	20	74
65636.W0104	10x40	Left	Coarse	10	40	M10	18	72	60	15.0	10	10	20	20	116
65636.W0105	10x40	Left	Fine	10	40	M10x1,25	18	72	60	15.0	10	10	20	20	116
65636.W0122	12x24	Left	Coarse	12	24	M12	20	62	48	18.0	12	12	24	24	121
65636.W0123	12x24	Left	Fine	12	24	M12x1,25	20	62	48	18.0	12	12	24	24	121
65636.W0124	12x48	Left	Coarse	12	48	M12	20	86	72	18.0	12	12	24	24	175
65636.W0125	12x48	Left	Fine	12	48	M12x1,25	20	86	72	18.0	12	12	24	24	175
65636.W0142	14x28	Left	Coarse	14	28	M14	24	72	56	22.5	14	14	27	27	178
65636.W0143	14x28	Left	Fine	14	28	M14x1,5	24	72	56	22.5	14	14	27	27	178
65636.W0145	14x56	Left	Coarse	14	56	M14	24	101	85	22.5	14	14	27	27	258
65636.W0146	14x56	Left	Fine	14	56	M14x1,5	24	101	85	22.5	14	4	27	27	258
65636.W0163	16x32	Left	Coarse	16	32	M16	26	83	64	24.0	16	16	32	32	282
65636.W0164	16x32	Left	Fine	16	32	M16x1,5	26	83	64	24.0	16	16	32	32	282
65636.W0166	16x64	Left	Coarse	16	64	M16	26	115	96	24.0	16	16	32	32	411
65636.W0167	16x64	Left	Fine	16	64	M16x1,5	26	115	96	24.0	16	16	32	32	411
65636.W0204	20x40	Left	Coarse	20	40	M20	34	105	80	30.0	20	20	40	40	550
65636.W0205	20x40	Left	Fine	20	40	M20x1,5	34	105	80	30.0	20	20	40	40	550
65636.W0255	25x50	Left	Coarse	25	50	M24	42	132	100	36.0	25	25	50	50	1100
65636.W0256	25x50	Left	Fine	25	50	M24x2	42	132	100	36.0	25	25	50	50	1100
65636.W0305	30x54	Left	Fine	30	54	M27x2	48	148	110	40.0	30	30	55	55	1440

Male Clevis Joints
silver zinc plated

65640



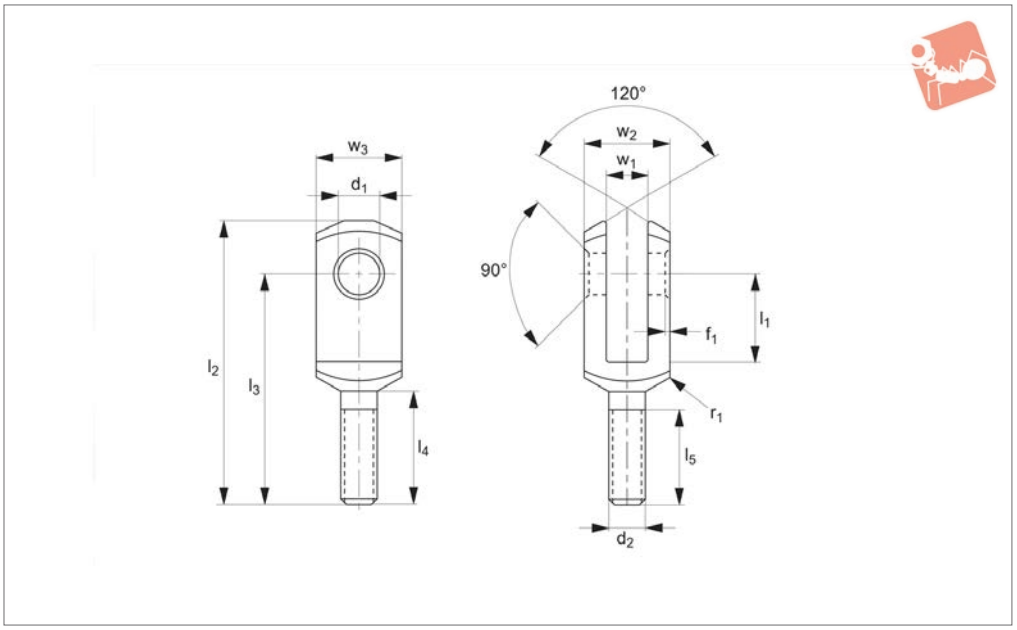
Material
Steel (1.0718) silver zinc plated.

Technical Notes
Similar to DIN 71 752/DIN ISO 8140/CETOP standard.

Tips
Standard thread is right hand, (for left hand, see 65641).

Other Tolerances: for r_1, radius or 45° bevelling.

Order No.	Size	Thread hand	d_1 tol. H9	l_1 ±0.5	d_2	l_2 ±0.2	l_3 ±0.4	l_4 ±0.2	l_5	w_1 +0.7|+0.15	w_2 +0.5|+0.2	w_3 tol. h11	f_1 ±0.2	r_1	Weight g
65640.W0006	6x12	Right	6	12	M6	44	37	20	15	6	12	12	0.5	0.8	15
65640.W0008	8x16	Right	8	16	M8	57	47	25	20	8	16	16	0.5	0.8	36
65640.W0010	10x20	Right	10	20	M10	69	57	30	25	10	20	20	0.5	0.8	68
65640.W0012	12x24	Right	12	24	M12	82	68	35	30	12	24	24	0.5	0.8	112
65640.W0014	14x28	Right	14	28	M14	94	78	40	35	14	27	27	1.0	1.2	171
65640.W0016	16x32	Right	16	32	M16	108	89	45	40	16	32	32	1.0	1.2	288
65640.W0020	20x40	Right	20	40	M20	134	109	55	50	20	40	40	1.0	1.5	550



65641

Material
Steel (1.0718) silver zinc plated.

Technical Notes
Similar to DIN 71 752/DIN ISO 8140/CETOP standard.

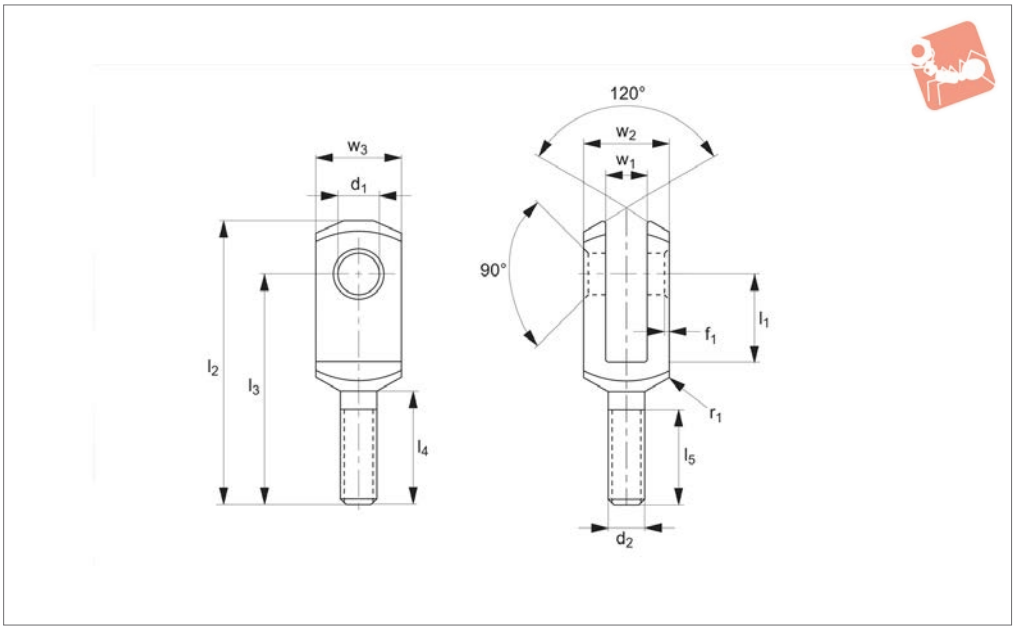
Tips
Standard thread is right hand, (for left hand, see 65641).

Other Tolerances: for r_1, radius or 45° bevelling.

Order No.	Size	Thread hand	d_1 tol. H9	l_1 ±0.5	d_2	l_2 ±0.2	l_3 ±0.4	l_4 ±0.2	l_5	w_1 +0.7|-0.15	w_2 +0.5|+0.2	w_3 tol. h11	f_1 ±0.2	r_1	Weight g
65641.W0006	6x12	Left	6	12	M6	44	37	20	15	6	12	12	0.5	0.8	15
65641.W0008	8x16	Left	8	16	M8	57	47	25	20	8	16	16	0.5	0.8	36
65641.W0010	10x20	Left	10	20	M10	69	57	30	25	10	20	20	0.5	0.8	68
65641.W0012	12x24	Left	12	24	M12	82	68	35	30	12	24	24	0.5	0.8	112
65641.W0014	14x28	Left	14	28	M14	94	78	40	35	14	27	27	1.0	1.2	171
65641.W0016	16x32	Left	16	32	M16	108	89	45	40	16	32	32	1.0	1.2	288
65641.W0020	20x40	Left	20	40	M20	134	109	55	50	20	40	40	1.0	1.5	550

Stainless Male Clevis Joints

65645



Material
Stainless steel (1,4305 AISI 303).

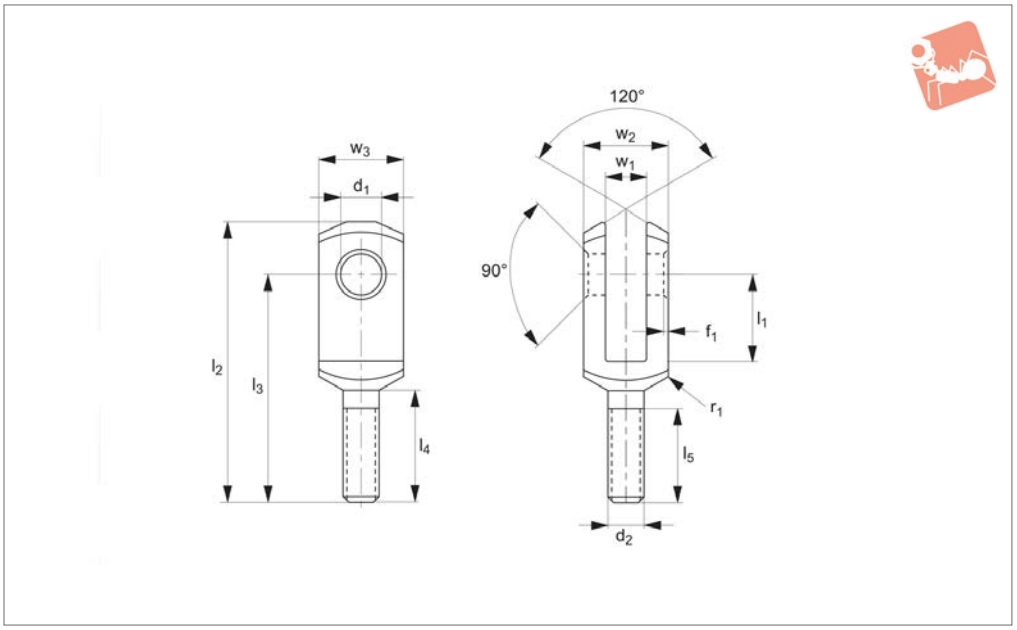
Technical Notes
Similar to DIN 71 752/DIN ISO 8140/CETOP standard.

Tips
Standard is right hand thread, (For left hand see 65646).

Other Tolerances: For r_1, radius or 45° bevelling.

Order No.	Size	Thread hand	d_1 tol. H9	l_1 ±0.5	d_2	l_2 ±0.2	l_3 ±0.4	l_4 ±0.2	l_5	w_1 +0.7|-0.15	w_2 +0.5|+0.2	w_3 tol. h11	f_1 ±0.2	r_1	Weight g
65645.W0006	6x12	Right	6	12	M 6	44	37	20	15	6	12	12	0.5	0.8	15
65645.W0008	8x16	Right	8	16	M 8	57	47	25	20	8	16	16	0.5	0.8	36
65645.W0010	10x20	Right	10	20	M10	69	57	30	25	10	20	20	0.5	0.8	68
65645.W0012	12x24	Right	12	24	M12	82	68	35	30	12	24	24	0.5	0.8	112
65645.W0014	14x28	Right	14	28	M14	94	78	40	35	14	27	27	1.0	1.2	171
65645.W0016	16x32	Right	16	32	M16	108	89	45	40	16	32	32	1.0	1.2	288
65645.W0020	20x40	Right	20	40	M20	134	109	55	50	20	40	40	1.0	1.5	550

Stainless Male Clevis Joints
left hand thread



65646

Material
Stainless steel (1,4305 AISI 303).

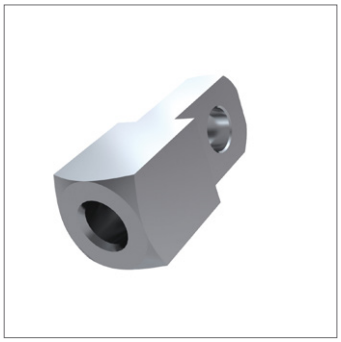
Technical Notes
Similar to DIN 71 752/DIN ISO 8140/CETOP standard.

Tips
Other Tolerances: For r_1, radius or 45° bevelling.

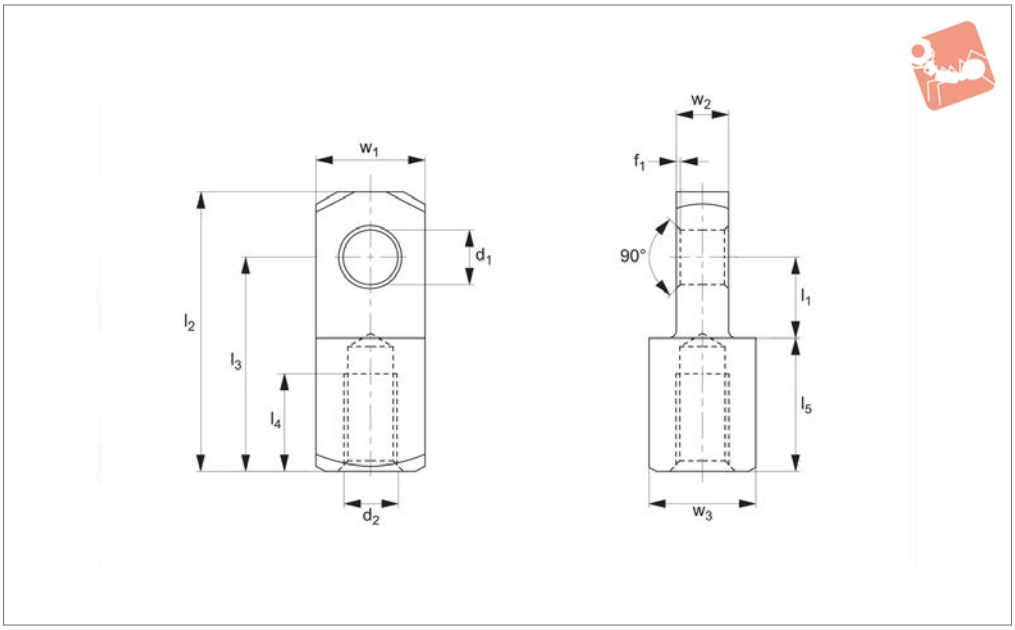
Order No.	Size	Thread hand	d_1 tol. H9	l_1 ±0.5	d_2	l_2 ±0.2	l_3 ±0.4	l_4 ±0.2	l_5	w_1 +0.7|-0.15	w_2 +0.5|+0.2	w_3 tol. h11	f_1 ±0.2	r_1	Weight g
65646.W0006	6x12	Left	6	12	M6	44	37	20	15	6	12	12	0.5	0.8	15
65646.W0008	8x16	Left	8	16	M8	57	47	25	20	8	16	16	0.5	0.8	36
65646.W0010	10x20	Left	10	20	M10	69	57	30	25	10	20	20	0.5	0.8	68
65646.W0012	12x24	Left	12	24	M12	82	68	35	30	12	24	24	0.5	0.8	112
65646.W0014	14x28	Left	14	28	M14	94	78	40	35	14	27	27	1.0	1.2	171
65646.W0016	16x32	Left	16	32	M16	108	89	45	40	16	32	32	1.0	1.2	288
65646.W0020	20x40	Left	20	40	M20	134	109	55	50	20	40	40	1.0	1.5	550

Mating Piece for Clevis Joints

silver zinc plated



65652



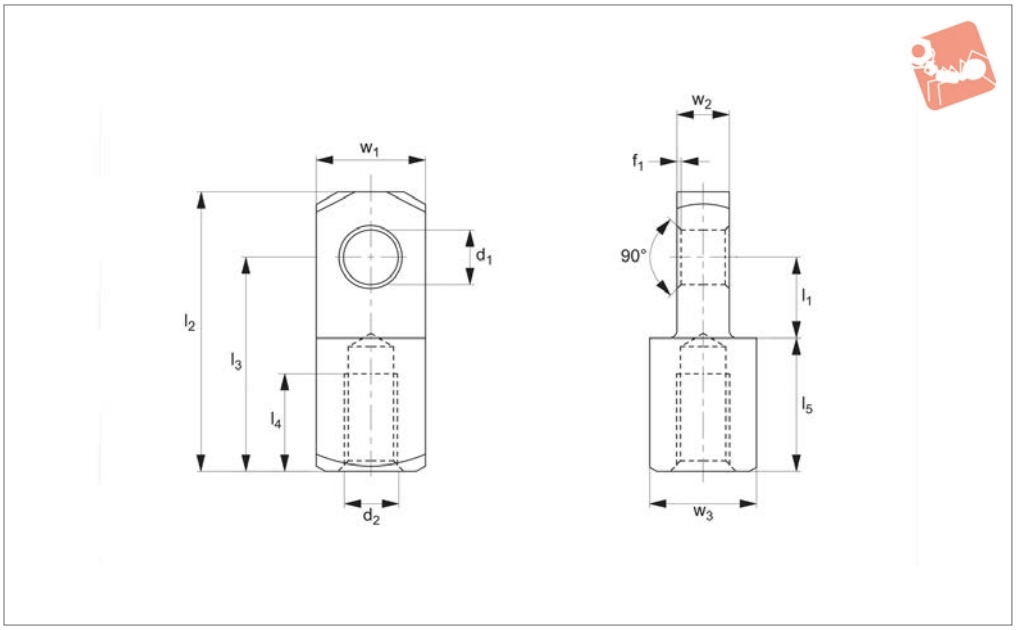
Material
Steel (1.0718), silver zinc plated.

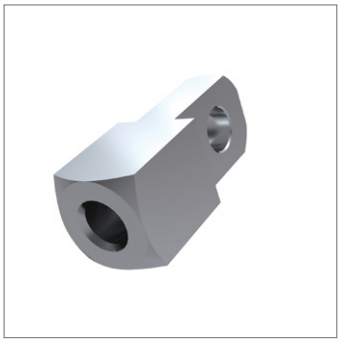
Tips
Standard thread is right hand, (for left hand thread, see 65653).
Thin end of mating piece is designed to fit in between forks of clevis joint.
Designed so thread size matches clevis joint, (e.g. M5 mating piece will fit on M5 clevis joint).

Order No.	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	l_2 ±0.5	l_3 ±0.5	l_4	l_5 ±0.2	w_1 tol. h11	w_2 -0,2	w_3 tol. h11	f_1 ±0.2	Weight g
65652.W0004	Right	Coarse	4	6.0	M4	21	16	6	10	8	4	8	0.5	6
65652.W0005	Right	Coarse	5	7.5	M5	26	20	8	12.5	10	5	10	0.5	12
65652.W0006	Right	Coarse	6	9.0	M6	31	24	11	15	12	6	12	0.5	21
65652.W0008	Right	Coarse	8	12.0	M8	42	32	14	20	16	8	16	0.5	51
65652.W0009	Right	Fine	8	12.0	M8x1	42	32	14	20	16	8	16	0.5	51
65652.W0010	Right	Coarse	10	15.0	M10	52	40	18	25	20	10	20	0.5	98
65652.W0011	Right	Fine	10	15.0	M10x1,25	52	40	18	25	20	10	20	0.5	98
65652.W0012	Right	Coarse	12	18.0	M12	62	48	22	30	24	12	24	0.5	168
65652.W0013	Right	Fine	12	18.0	M12x1,25	62	48	22	30	24	12	24	0.5	167
65652.W0014	Right	Coarse	14	21.0	M14	72	56	25	35	27	14	27	1.0	247
65652.W0015	Right	Fine	14	21.0	M14x1,5	72	56	25	35	27	14	27	1.0	245
65652.W0016	Right	Coarse	16	24.0	M16	83	64	30	40	32	16	32	1.0	397
65652.W0017	Right	Fine	16	24.0	M16x1,5	83	64	30	40	32	16	32	1.0	395
65652.W0020	Right	Coarse	20	30.0	M20	105	80	38	50	40	20	40	1.0	783
65652.W0021	Right	Fine	20	30.0	M20X1,5	105	80	38	50	40	20	40	1.0	776

Mating Piece for Clevis Joints

left hand thread - silver zinc plated





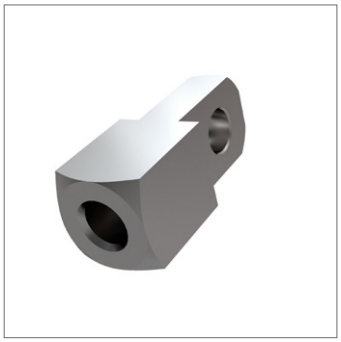
65653

Material
Steel (1.0718), silver zinc plated.

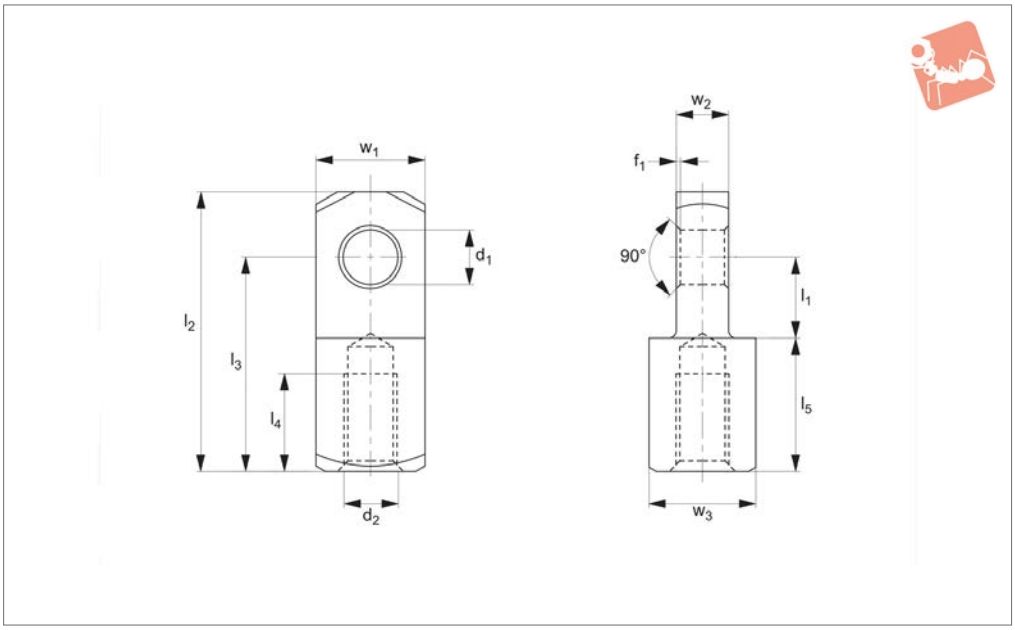
Tips
Thin end of mating piece is designed to fit in between forks of clevis joint.
Designed so thread size matches clevis joint, (e.g. M5 mating piece will fit on M5 clevis joint).

Order No.	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	l_2 ±0.5	l_3 ±0.5	l_4	l_5 ±0.2	w_1 tol. h11	w_2 -0,2	w_3 tol. h11	f_1 ±0.2	Weight g
65653.W1004	Left	Coarse	4	6	M4	21	16	6	10.0	8	4	8	0.5	6
65653.W1005	Left	Coarse	5	7.5	M5	26	20	8	12.5	10	5	10	0.5	12
65653.W1006	Left	Coarse	6	9	M6	31	24	11	15.0	12	6	12	0.5	21
65653.W1008	Left	Coarse	8	12	M8	42	32	14	20.0	16	8	16	0.5	51
65653.W1009	Left	Fine	8	12	M8x1	42	32	14	20.0	16	8	16	0.5	51
65653.W1010	Left	Coarse	10	15	M10	52	40	18	25.0	20	10	20	0.5	98
65653.W1011	Left	Fine	10	15	M10x1,25	52	40	18	25.0	20	10	20	0.5	98
65653.W1012	Left	Coarse	12	18	M12	62	48	22	30.0	24	12	24	0.5	168
65653.W1013	Left	Fine	12	18	M12x1,25	62	48	22	30.0	24	12	24	0.5	167
65653.W1014	Left	Coarse	14	21	M14	72	56	25	35.0	27	14	27	1.0	247
65653.W1015	Left	Fine	14	21	M14x1,5	72	56	25	35.0	27	14	27	1.0	245
65653.W1016	Left	Coarse	16	24	M16	83	64	30	40.0	32	16	32	1.0	397
65653.W1017	Left	Fine	16	24	M16x1,5	83	64	30	40.0	32	16	32	1.0	395
65653.W1020	Left	Coarse	20	30	M20	105	80	38	50.0	40	20	40	1.0	783
65653.W1021	Left	Fine	20	30	M20X1,5	105	80	38	50.0	40	20	40	1.0	776

Stainless Mating Piece for Clevis



65656

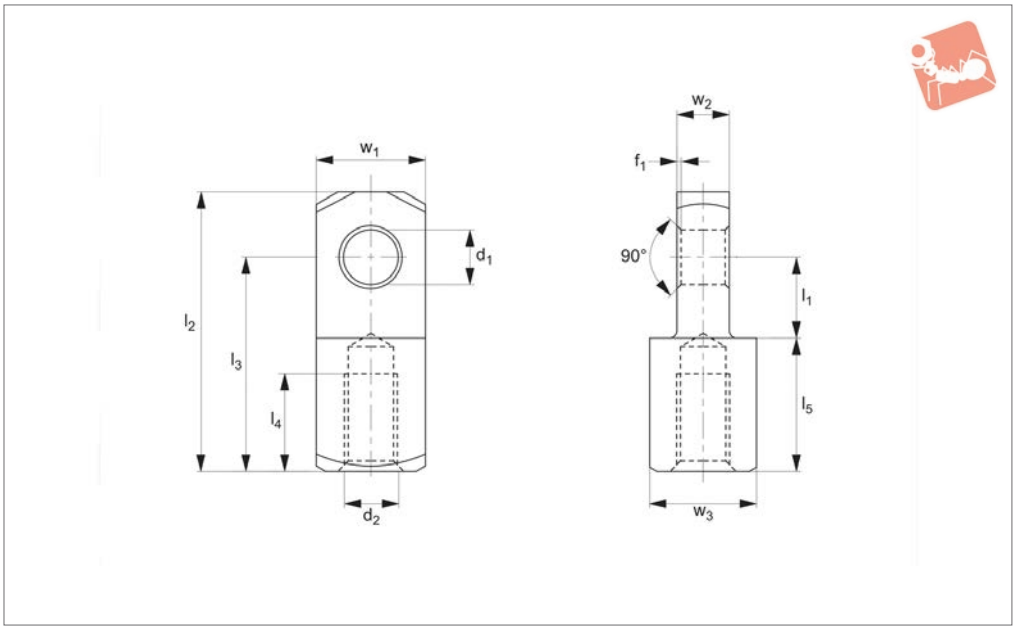


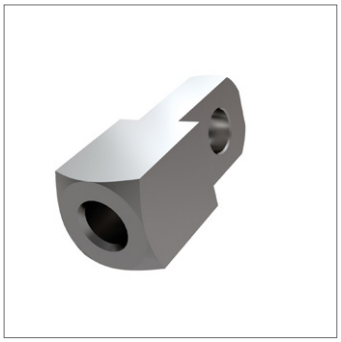
Material
Stainless steel (AISI 303 1.4305).

Tips
Standard thread is right hand, (for left hand thread see 65657).
Thin end of mating piece is designed to fit in between forks of clevis joint.
Designed so thread size matches clevis joint, (e.g. M5 mating piece will fit on M5 clevis joint).

Order No.	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	l_2 ±0.5	l_3 ±0.5	l_4	l_5 ±0.2	w_1 tol. h11	w_2 -0,2	w_3 tol. h11	f_1 ±0.2	Weight g
65656.W0004	Right	Coarse	4	6	M4	21	16	6	10.0	8	4	8	0.5	6
65656.W0005	Right	Coarse	5	7.5	M5	26	20	8	12.5	10	5	10	0.5	12
65656.W0006	Right	Coarse	6	9	M6	31	24	11	15.0	12	6	12	0.5	21
65656.W0008	Right	Coarse	8	12	M8	42	32	14	20.0	16	8	16	0.5	51
65656.W0009	Right	Fine	8	12	M8x1	42	32	14	20.0	16	8	16	0.5	51
65656.W0010	Right	Coarse	10	15	M10	52	40	18	25.0	20	10	20	0.5	98
65656.W0011	Right	Fine	10	15	M10x1,25	52	40	18	25.0	20	10	20	0.5	98
65656.W0012	Right	Coarse	12	18	M12	62	48	22	30.0	24	12	24	0.5	168
65656.W0013	Right	Fine	12	18	M12x1,25	62	48	22	30.0	24	12	24	0.5	167
65656.W0014	Right	Coarse	14	21	M14	72	56	25	35.0	27	14	27	1.0	247
65656.W0015	Right	Fine	14	21	M14x1,5	72	56	25	35.0	27	14	27	1.0	245
65656.W0016	Right	Coarse	16	24	M16	83	64	30	40.0	32	16	32	1.0	397
65656.W0017	Right	Fine	16	24	M16x1,5	83	64	30	40.0	32	16	32	1.0	395
65656.W0020	Right	Coarse	20	30	M20	105	80	38	50.0	40	20	40	1.0	783
65656.W0021	Right	Fine	20	30	M20X1,5	105	80	38	50.0	40	20	40	1.0	776

Stainless Mating Piece for Clevis
left hand thread





65657

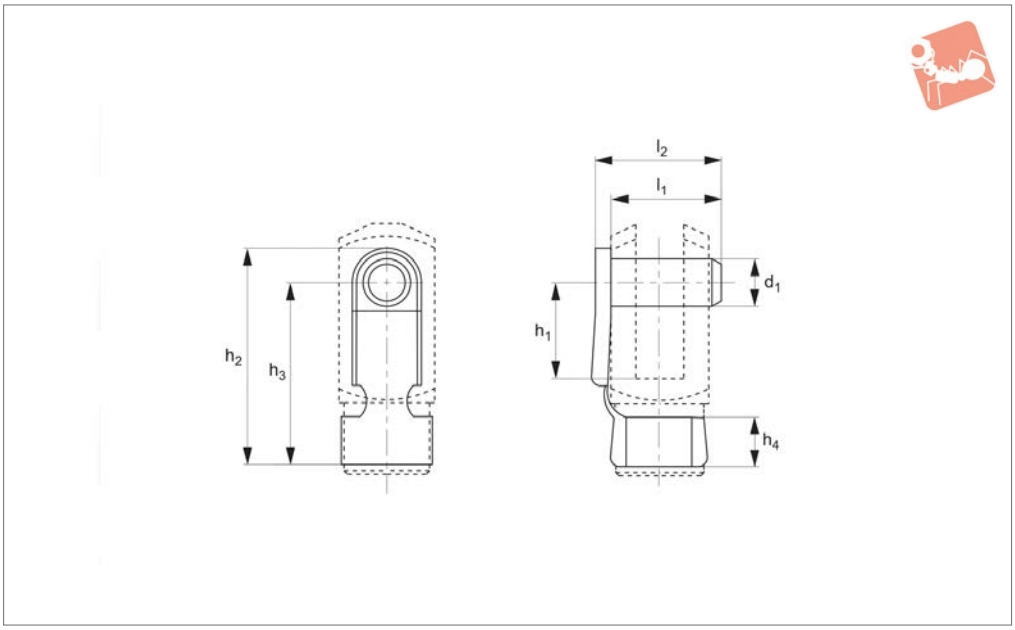
Material
Stainless steel (AISI 303 1.4305).

Tips
Thin end of mating piece is designed to fit in between forks of clevis joint. Designed so thread size matches clevis joint, (e.g. M5 mating piece will fit on M5 clevis joint).

Order No.	Thread hand	Thread type	d_1 tol. H9	l_1 ±0.5	d_2	l_2 ±0.5	l_3 ±0.5	l_4	l_5 ±0.2	w_1 tol. h11	w_2 -0,2	w_3 tol. h11	f_1 ±0.2	Weight g
65657.W0004	Left	Coarse	4	6	M4	21	16	6	10.0	8	4	8	0.5	6
65657.W0005	Left	Coarse	5	7.5	M5	26	20	8	12.5	10	5	10	0.5	12
65657.W0006	Left	Coarse	6	9	M6	31	24	11	15.0	12	6	12	0.5	21
65657.W0008	Left	Coarse	8	12	M8	42	32	14	20.0	16	8	16	0.5	51
65657.W0009	Left	Fine	8	12	M8x1	42	32	14	20.0	16	8	16	0.5	51
65657.W0010	Left	Coarse	10	15	M10	52	40	18	25.0	20	10	20	0.5	98
65657.W0011	Left	Fine	10	15	M10x1,25	52	40	18	25.0	20	10	20	0.5	98
65657.W0012	Left	Coarse	12	18	M12	62	48	22	30.0	24	12	24	0.5	168
65657.W0013	Left	Fine	12	18	M12x1,25	62	48	22	30.0	24	12	24	0.5	167
65657.W0014	Left	Coarse	14	21	M14	72	56	25	35.0	27	14	27	1.0	247
65657.W0015	Left	Fine	14	21	M14x1,5	72	56	25	35.0	27	14	27	1.0	245
65657.W0016	Left	Coarse	16	24	M16	83	64	30	40.0	32	16	32	1.0	397
65657.W0017	Left	Fine	16	24	M16x1,5	83	64	30	40.0	32	16	32	1.0	395
65657.W0020	Left	Coarse	20	30	M20	105	80	38	50.0	40	20	40	1.0	783
65657.W0021	Left	Fine	20	30	M20X1,5	105	80	38	50.0	40	20	40	1.0	776

Clevis Retention Clips
silver zinc plated

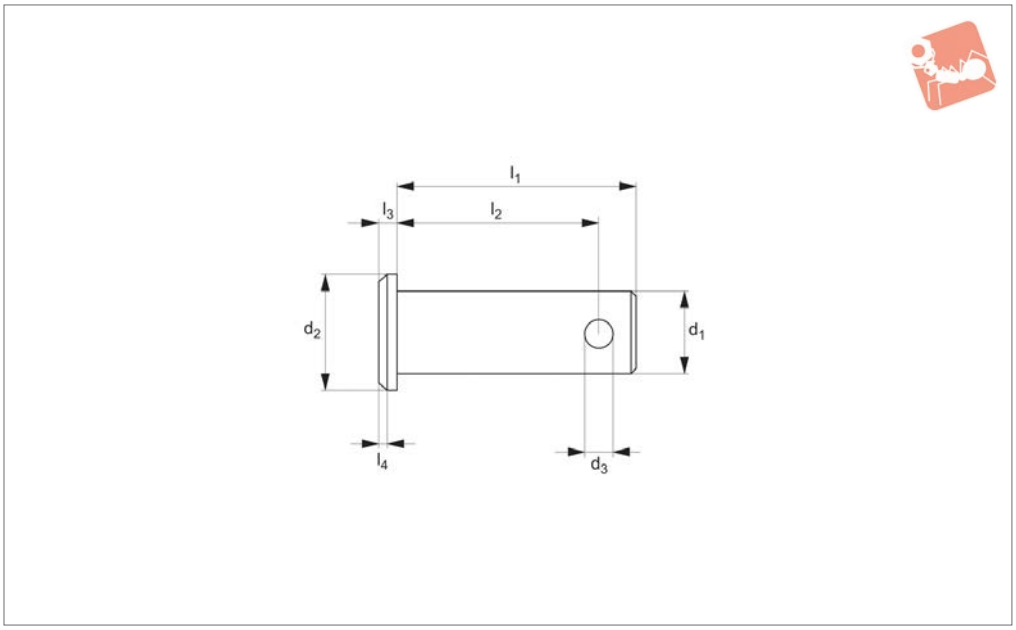
65684



Material
Pin - steel (9SMnPb28), spring - carbon steel C70, silver zinc plated.

Tips
Clips on to base of clevis joint, for clevis joint see part numbers 65630 and 65631.

Order No.	Size	d_1 tol. H11	h_1	h_2	h_3	h_4	l_1	l_2	Weight g
65684.W0048	4x8	4	8	19	15	4	9	11	2
65684.W0051	5x10	5	10	23	19	4.5	12	14	3
65684.W0052	5x20	5	20	33	29	4.5	12	14	3
65684.W0061	6x12	6	12	28	23	6	14	16	5
65684.W0062	6x24	6	24	40	35	6	14	16	5
65684.W0081	8x16	8	16	37	31	8	19	23	11
65684.W0083	8x32	8	32	53	47	8	19	23	12
65684.W0102	10x20	10	20	46	39	10	23	27	19
65684.W0104	10x40	10	40	66	59	10	23	27	20
65684.W0122	12x24	12	24	55	46	12	28	32	32
65684.W0124	12x48	12	48	79	71	12	28	32	34
65684.W0142	14x28	14	28	62	52	14	31	34	47
65684.W0145	14x56	14	56	92	82	14	31	34	50
65684.W0163	16x32	16	32	72	62	16	36	41	67
65684.W0166	16x64	16	64	103	92	16	36	39	74
65684.W0204	20x40	20	40	88	72	16	44	49	130



65660

Material
Sizes 5-14 steel 1,0214 (QST 36-3).
Sizes 16-50 steel (1,0718 11SMnPb30+C).
Zinc-plated.

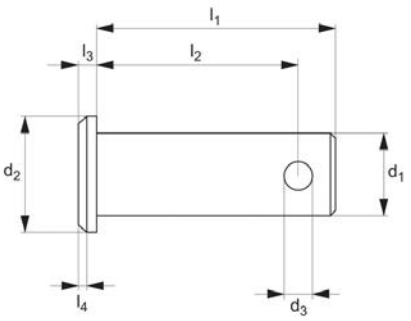
Technical Notes
Designed for use with clevis joints.

Tips
For use with clevis joints 65630 and 65631, for split cotter pins to suit see part number 65674.
For washers see part number P0330-ZP.

Order No.	d_1 tol. h11	d_2 tol. h14	d_3 tol. h14	l_1 tol. js15	l_2 +0.5	l_3 tol. js14	l_4	Weight g
65660.W0105	5	8	1.0	15	12.3	1.5	0.5	2.6
65660.W0106	6	9	1.6	18	15.3	1.5	0.5	4.6
65660.W0108	8	12	2.0	23	19.5	2.0	1.0	10.0
65660.W0110	10	14	3.2	29	24.5	2.0	1.0	19.0
65660.W0112	12	17	4.0	35	29.5	3.0	1.5	34.0
65660.W0114	14	19	4.0	40	32.5	3.0	1.5	53.0
65660.W0116	16	20	4.0	45	38.2	3.5	1.5	72.0
65660.W0118	18	25	5.0	50	43.5	3.5	1.5	104.0
65660.W0120	20	28	5.0	53	47.0	4.0	1.5	139.0
65660.W0125	25	34	6.3	67	59.0	5.5	1.5	266.0
65660.W0128	28	34	6.3	72	63.2	5.5	2.0	361.0
65660.W0130	30	36	6.3	77	68.2	5.5	2.0	428.0
65660.W0135	35	45	8.0	87	76.5	7.0	2.0	677.0
65660.W0140	40	48	8.0	100	90.0	6.0	5.0	1035.0
65660.W0142	42	48	8.0	100	90.0	7.0	5.0	1151.0
65660.W0150	50	58	10.0	115	103.0	7.0	6.0	1846.0

Stainless Clevis Pin With Hole

65661

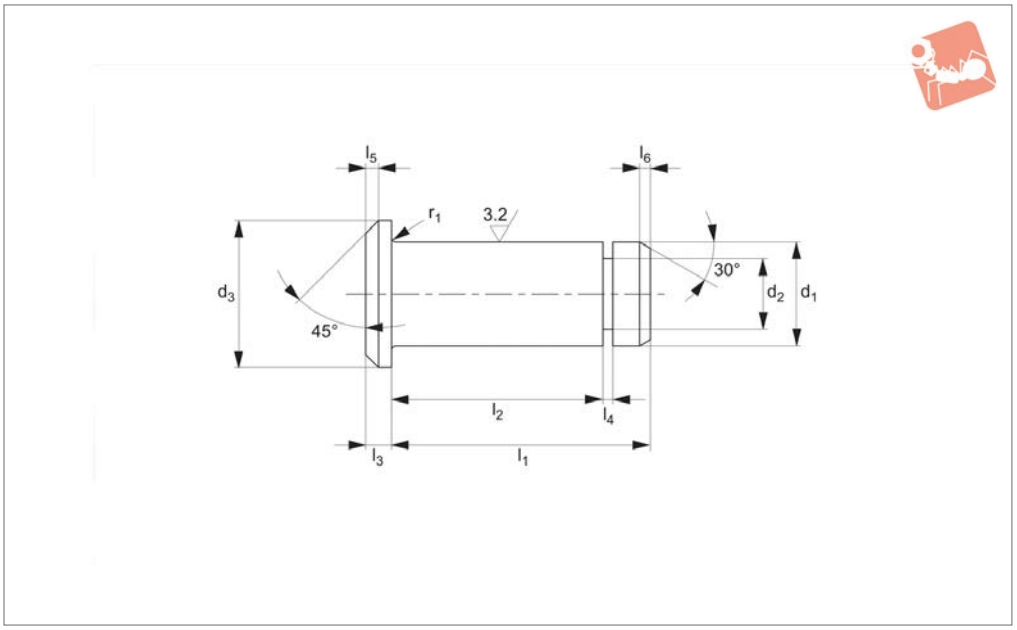


Material
Stainless steel (1.4305, X8CrNiS18-9), for sizes 6-8: stainless steel (1.4567, X3CrNiCu18-9-4).

Technical Notes
Designed for use with clevis joints.

Tips
For use with clevis joints 65635 and 65636, for split cotter pins to suit see part number 65675.
For washers see part number 65671.

Order No.	d_1 tol. h11	d_2 tol. h14	d_3 tol. h14	l_1 tol. js15	l_2 +0.5	l_3 tol. js14	l_4	Weight g
65661.W0005	5	8	1.2	15	12.3	1.5	0.5	2.6
65661.W0006	6	9	1.6	18	15.3	1.5	0.5	4.6
65661.W0008	8	12	2.0	23	19.5	2.0	1.0	10.0
65661.W0010	10	14	3.2	29	24.5	2.0	1.0	19.0
65661.W0012	12	17	4.0	35	29.5	3.0	1.5	34.0
65661.W0014	14	19	4.0	40	32.5	3.0	1.5	53.0
65661.W0016	16	21	4.0	45	38.2	3.0	-	73.0
65661.W0020	20	28	5.0	53	47.0	4.0	-	139.0
65661.W0025	25	34	6.3	67	59.0	5.5	-	266.0



65664

Material
Steel (9SMnPb28), silver zinc plated.

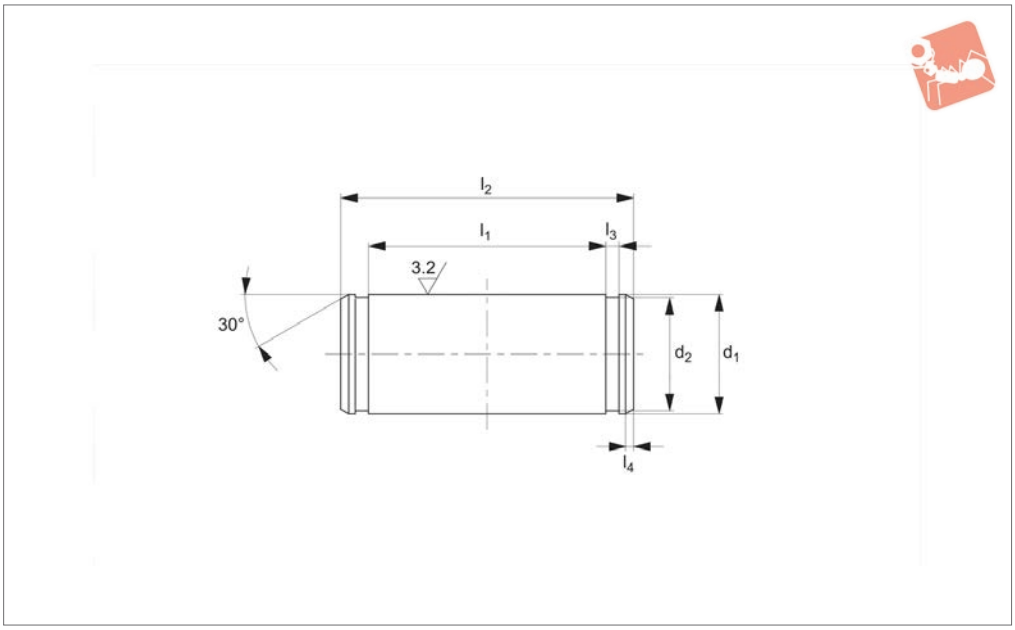
Tips
For safety fasteners, see 65680-.

Technical Notes
Designed for use with clevis joints.

Order No.	d_1 tol. h11	d_2 tol. h11	d_3 tol. h12	l_1	l_2 +0.30	l_3 tol. js14	l_4 +0.10	l_5	l_6	R	Weight g
65664.W0104	4	3.2	6	10.5	8.5	1.0	0.64	0.5	0.5	0.3	2
65664.W0105	5	4.0	8	13.0	10.5	1.5	0.74	0.5	0.5	0.5	3
65664.W0106	6	5.0	9	15.5	12.5	1.5	0.74	0.5	0.75	0.5	4
65664.W0108	8	6.0	12	20.0	16.5	2.0	0.94	1.0	1.0	0.5	9
65664.W0110	10	8.0	14	25.0	20.5	2.0	1.05	1.0	1.0	0.5	17
65664.W0112	12	9.0	17	30.0	24.5	3.0	1.15	1.25	1.25	0.5	30
65664.W0114	14	10.0	19	33.0	27.5	3.0	1.25	1.5	1.5	1.0	48
65664.W0116	16	12.0	20	38.5	32.5	3.0	1.35	1.5	1.5	1.0	67
65664.W0120	20	17.5	26	46.0	40.5	4.0	1.8	2.0	1.5	1.0	125
65664.W0125	25	18.0	32	57.0	50.5	5.0	1.8	2.0	1.5	1.0	260

Stainless Clevis Pin

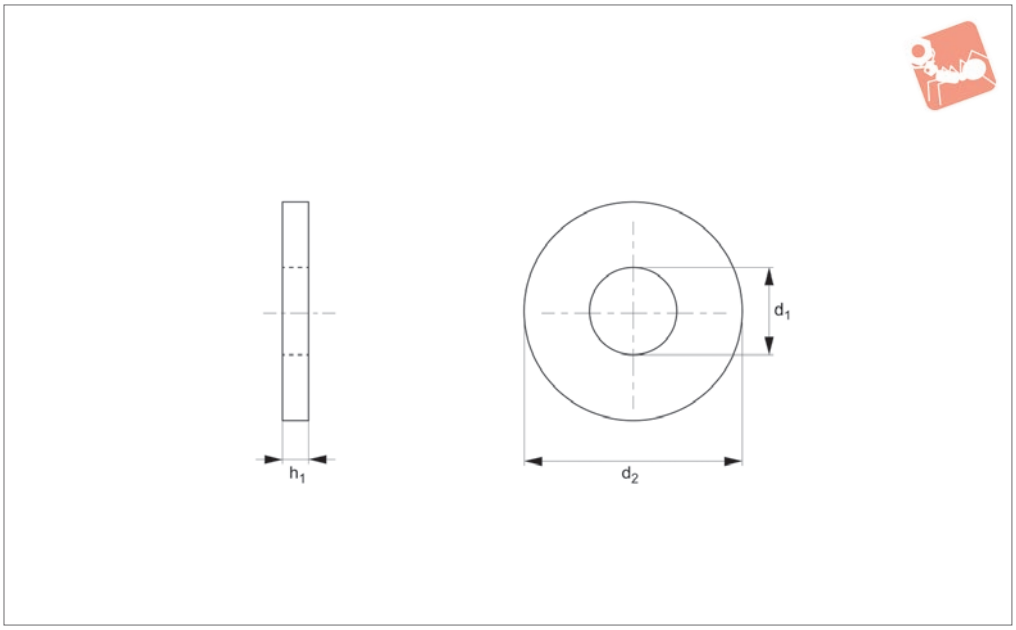
65666



Material
Stainless steel (AISI 303).

Technical Notes
For use with 65635-65636 clevis joints and 65678 circlips.

Order No.	d_1 tol. h11	d_2 tol. h11	l_1 +0.30	l_2 +0.40	l_3 tol. h13	l_4	Weight g
65666.W0005	5	4.8	10.5	15	0.7	1	3
65666.W0006	6	5.7	12.2	17	0.8	1	5
65666.W0008	8	7.6	16.5	20	0.9	1	8
65666.W0010	10	9.6	20.5	25	1.1	1	15
65666.W0012	12	11.5	24.5	30	1.1	1	26
65666.W0016	16	15.2	32.5	39	1.1	1	61
65666.W0020	20	19.0	40.5	48	1.3	1	118



65670

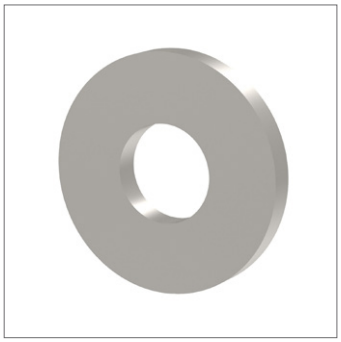
Material
Steel, zinc-plated.

Technical Notes
To DIN 125 A.

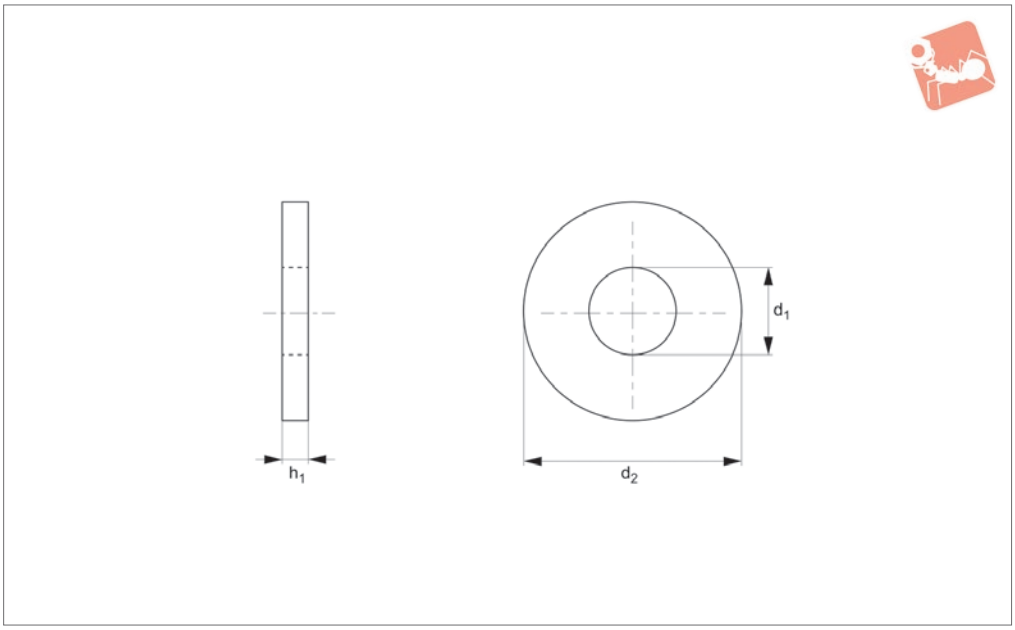
Order No.	For thread	d_1	d_2	h_1	Material
65670.W0004	M 4	4.3	9	0.8	Steel ZP
65670.W0005	M 5	5.3	10	1.0	Steel ZP
65670.W0006	M 6	6.4	12	1.6	Steel ZP
65670.W0007	M 7	7.4	14	1.6	Steel ZP
65670.W0008	M 8	8.4	16	1.6	Steel ZP
65670.W0010	M10	10.5	20	2.0	Steel ZP
65670.W0012	M12	13.0	24	2.5	Steel ZP
65670.W0014	M14	15.0	28	2.5	Steel ZP
65670.W0016	M16	17.0	30	3.0	Steel ZP
65670.W0018	M18	19.0	34	3.0	Steel ZP
65670.W0020	M20	21.0	37	3.0	Steel ZP
65670.W0022	M22	23.0	39	3.0	Steel ZP
65670.W0025	M24	25.0	44	4.0	Steel ZP
65670.W0028	M27	28.0	50	4.0	Steel ZP
65670.W0030	M30	31.0	56	4.0	Steel ZP

Flat Washers Form A

A2 stainless



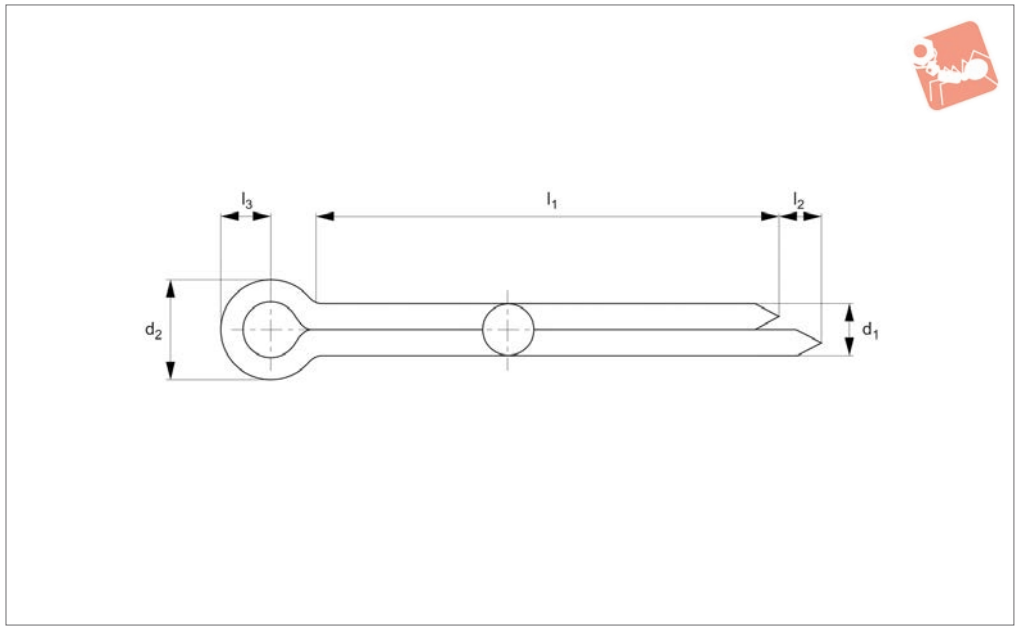
65671



Material
Stainless steel (A2).

Technical Notes
To DIN 125 A.

Order No.	For thread	d_1	d_2	h_1	Material
65671.W0004	M 4	4.3	9	0.8	A2 s/s
65671.W0005	M 5	5.3	10	1.0	A2 s/s
65671.W0006	M 6	6.4	12	1.6	A2 s/s
65671.W0007	M 7	7.4	14	1.6	A2 s/s
65671.W0008	M 8	8.4	16	1.6	A2 s/s
65671.W0010	M10	10.5	20	2.0	A2 s/s
65671.W0012	M12	13.0	24	2.5	A2 s/s
65671.W0014	M14	15.0	28	2.5	A2 s/s
65671.W0016	M16	17.0	30	3.0	A2 s/s
65671.W0020	M20	21.0	37	3.0	A2 s/s
65671.W0025	M24	25.0	44	4.0	A2 s/s



65674

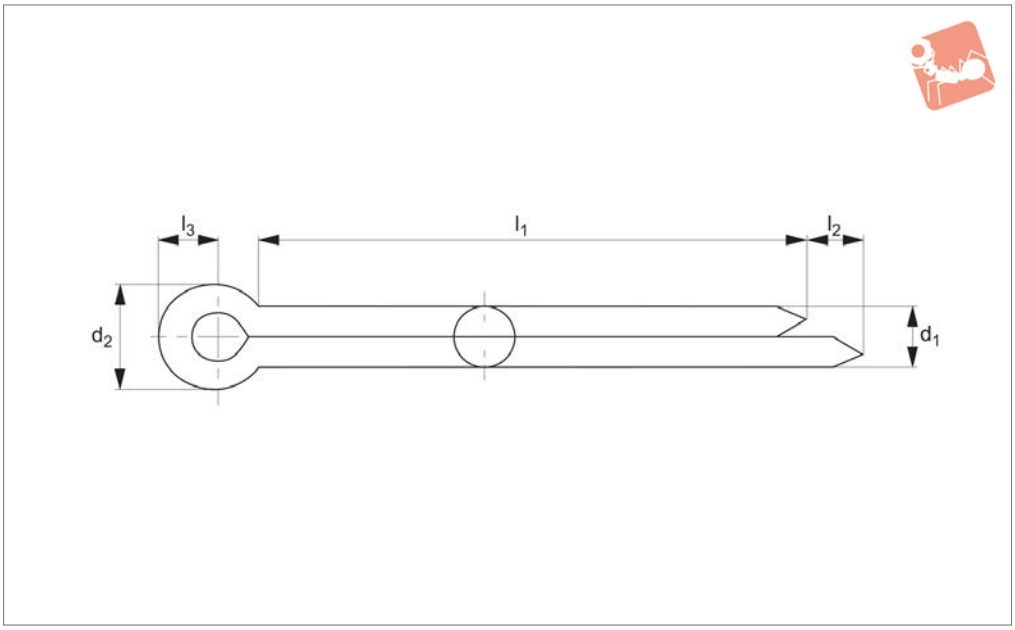
Material
Mild steel (zinc-plated).

Technical Notes
To DIN 94 (equivalent to ISO 1234). Cotter pins require a loose fit, and as a result the metric versions can also be for inch sizes.
Recommended hole tolerance for d_1 1,6 is H14 (under this diameter recommended tolerance is H13).

Order No.	d_1 nom.	d_1 min.	d_1 max.	d_2 max.	l_1	l_2 max.	l_3 ≈
65674.W0010	1	0.8	0.9	1.8	10	1.6	3
65674.W0016	1.6	1.3	1.4	2.8	18	2.5	3.2
65674.W0020	2	1.7	1.8	3.6	18	2.5	4.0
65674.W0032	3.2	2.7	2.9	5.8	22	3.2	6.4
65674.W0040	4	3.5	3.7	7.4	28	4.0	8.0
65674.W0050	5	4.4	4.6	9.2	50	4.0	10.0
65674.W0060	6	5.7	5.9	11.8	71	4.0	12.6
65674.W0080	8	7.3	7.5	15	112	4.0	16.0
65674.W0100	10	9.3	9.5	19	112	6.3	20.0

Stainless Cotter Pins

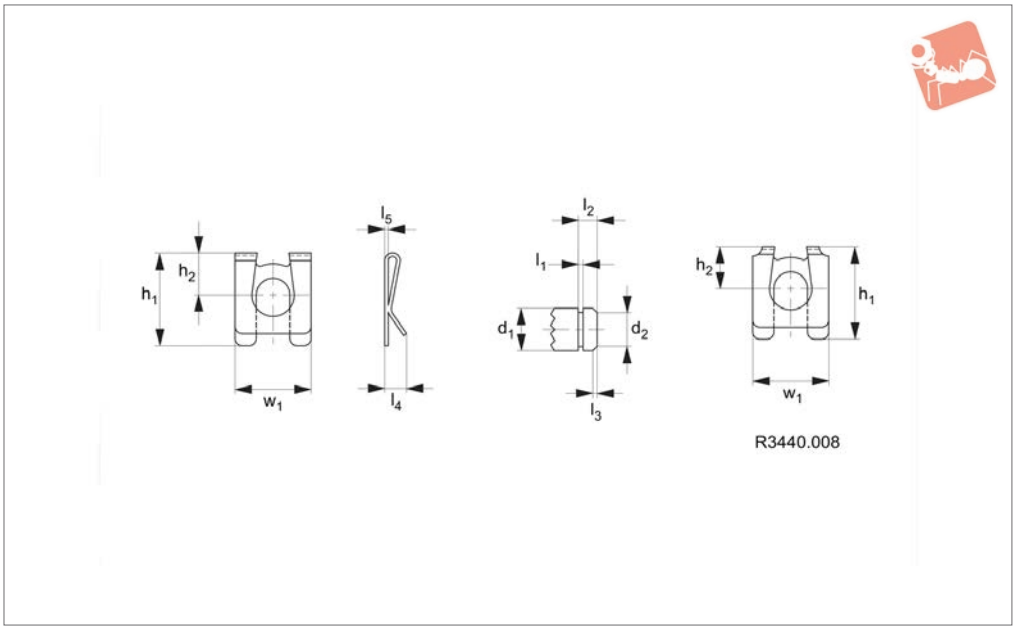
65675



Material
Stainless steel (A2, AISI 303).

Technical Notes
To DIN 94 (equivalent to ISO 1234). Cotter pins require a loose fit, and as a result the metric versions can also be for inch sizes.

Order No.	d_1 nom.	d_2 max.	l_1	l_2 max.	l_3 ≈
65675.W1010	1	1.8	10	1.6	3.0
65675.W1018	1.6	2.8	18	2.5	3.2
65675.W2018	2	3.6	18	2.5	4.0
65675.W3022	3.2	5.8	22	3.2	6.4
65675.W4028	4	7.4	28	4.0	8.0
65675.W5050	5	9.2	50	4.0	10
65675.W6071	6.3	11.8	71	4.0	12.6



65680

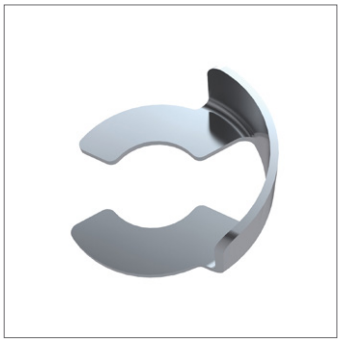
Material
Spring steel, silver zinc plated, hardened and annealed 1450 to 1600°C N/mm².

Tips
Easily assembled and removed by hand without special tools, compatible with clevis pins.
Safety lip prevents accidental removal.
Assembly ‚rattle' is eliminated by the fasteners concave back holding the clevis pin under tension.

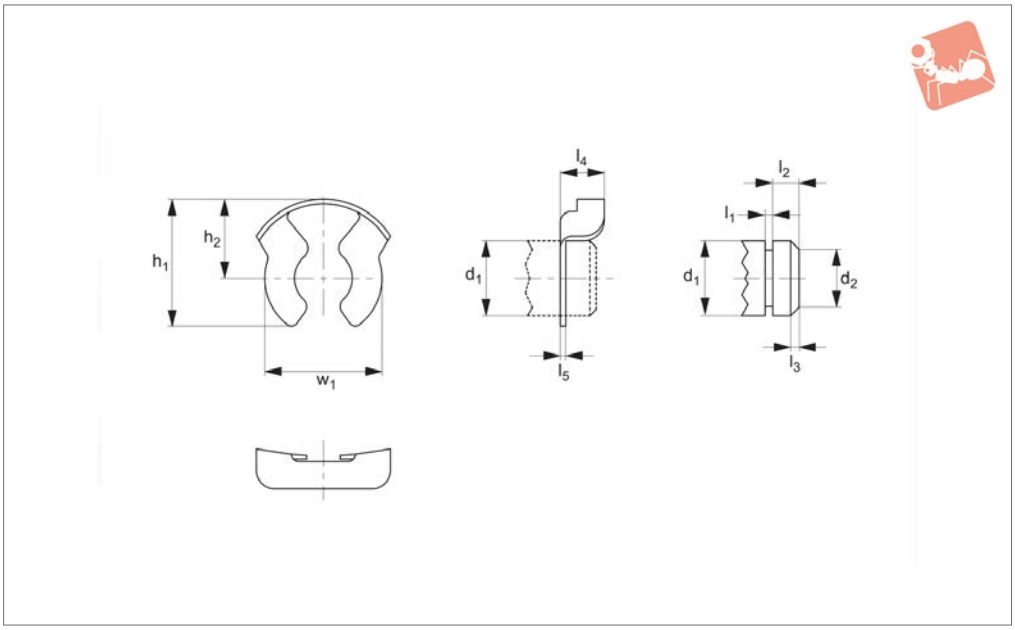
Order No.	d_1 tol. h11	d_2 tol. h11	h_1	h_2	l_1 +0.1	l_2	l_3	l_4	l_5	w_1	Axial thrust kN max.	Weight g
65680.W0004	4	3.2	8.5	4.0	0.64	2.0	0.5	2.3	0.3	7	1.00	0.19
65680.W0005	5	4.0	10.7	5.0	0.74	2.5	0.5	3.3	0.4	9	1.30	0.34
65680.W0006	6	5.0	14.1	6.0	0.74	3.0	0.75	3.8	0.4	11	1.50	0.63
65680.W0008	8	6.0	17.5	8.0	0.94	3.5	1.0	4.0	0.5	14	3.60	1.10
65680.W0010	10	8.0	22.1	10.0	1.05	4.5	1.0	5.0	0.5	18	6.40	2.11
65680.W0012	12	9.0	26.0	12.0	1.15	5.0	1.25	5.0	0.5	22	9.60	2.80
65680.W0014	14	10.0	30.0	13.5	1.25	5.5	1.5	6.0	0.6	25	11.32	4.74
65680.W0016	16	12.0	34.0	16.0	1.35	6.0	1.5	6.0	0.6	28	13.50	5.63

Safety Fastener (KLM)

silver zinc plated



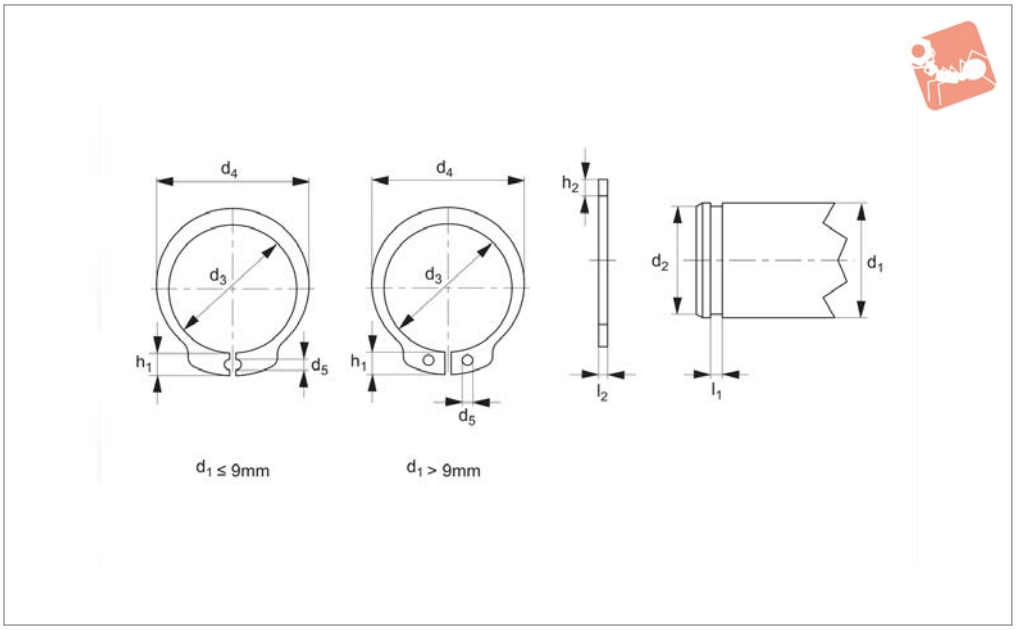
65682



Material
Steel, silver zinc plated.

Tips
Easily assembled and removed by hand without special tools.

Order No.	d_1 tol. h11	d_2 tol. h11	h_1	h_2	l_1 +0.10	l_2	l_3	l_4	l_5	w	Axial force kN max.
65682.W0004	4	3.2	7.2	4.3	0.64	2.0	0.5	2.8	0.4	6.6	1.50
65682.W0005	5	4.0	8.4	5.2	0.74	2.5	0.5	2.8	0.5	7.5	3.00
65682.W0006	6	5.0	11.25	6.8	0.74	3.0	0.75	3.5	0.5	10.6	4.85
65682.W0008	8	6.0	11.9	7.4	0.94	3.5	1.0	4.5	0.5	11.5	5.50
65682.W0010	10	8.0	16.3	9.5	1.05	4.5	1.0	5.9	0.6	15.5	9.50
65682.W0012	12	9.0	18.0	10.5	1.15	5.5	1.25	6.2	0.6	16.8	10.70
65682.W0014	14	10.0	20.0	12.2	1.25	5.5	1.5	6.8	0.7	19.2	12.70
65682.W0016	16-18	12.0	24.0	14.3	1.35	5,5-6,0	1.5	7.6	0.8	22.7	14.00



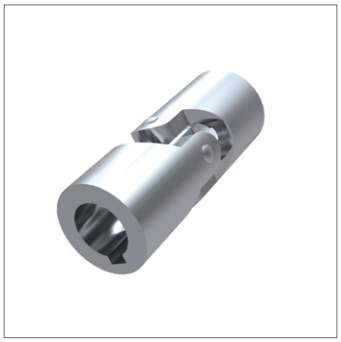
65678

Material
Stainless steel (AISI 303).

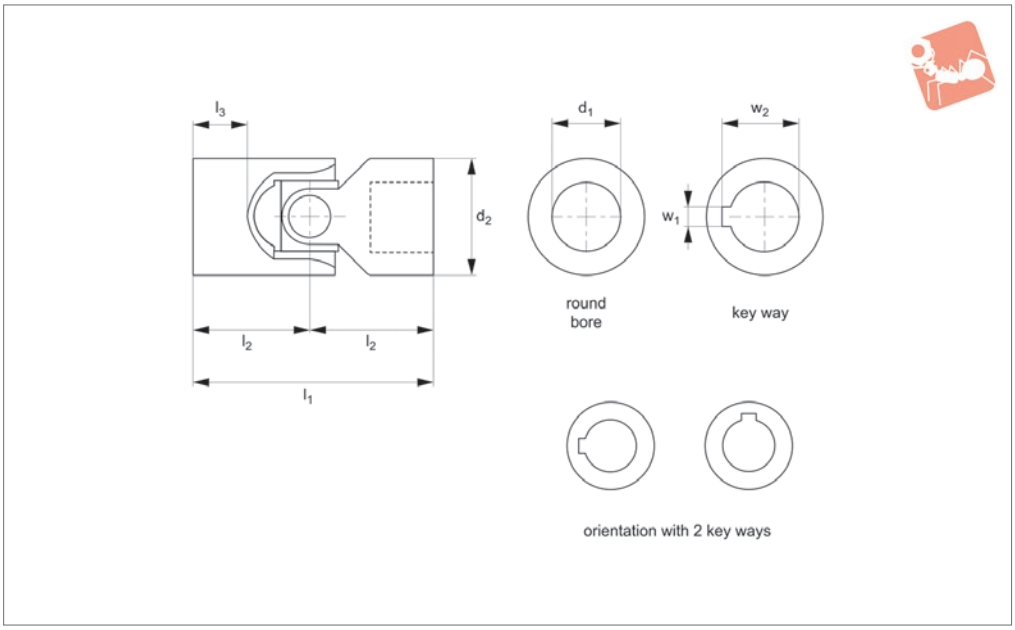
Technical Notes
To DIN 471, for use with 65666 clevis pins and 65635-65636 clevis joints.

Order No.	d_1	d_2	d_3	d_4	d_5 min.	h_1	h_2	l_1	l_2
65678.W0005	5	4.8	3.7	6.2	1.0	2.5	1.1	0.7	0.6
65678.W0006	6	5.7	5.6	7.5	1.15	2.7	1.3	0.8	0.7
65678.W0010	10	9.6	9.3	12.7	1.7	3.3	1.8	1.1	1.0
65678.W0012	12	11.5	11.0	7.7	1.7	3.3	1.8	1.1	1.0
65678.W0016	16	15.2	14.7	12.2	1.7	3.7	2.2	1.1	1.0
65678.W0020	20	19.0	18.5	16.2	2.0	4.0	2.6	1.3	1.2

Single Universal Joint
Steel



65170



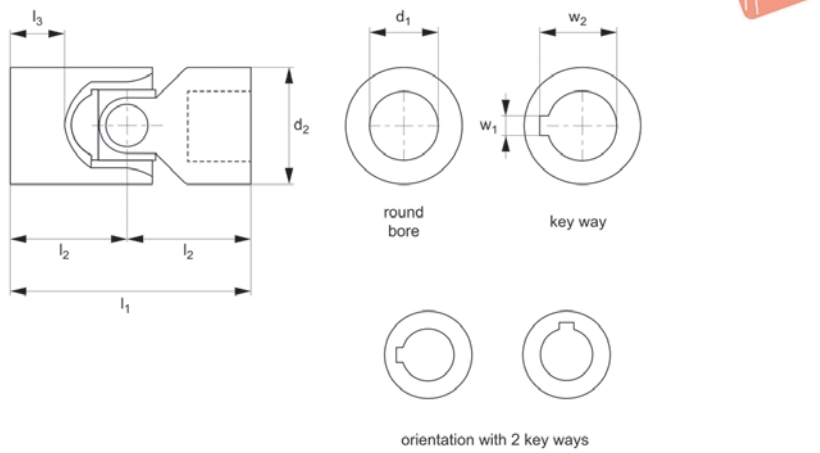
Material
Steel (9SMnPb28k, no. 10718).
Bearing type: plain bearing.

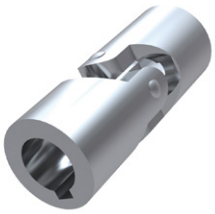
Technical Notes
To DIN 808/7551.
Maximum bending angle 45° per joint, Max. drive speed of 1000 rpm.

Tips
Single universal joints are used where shafts are off-set towards each other.
Product variations available on request, for square bores change the suffix to SQ for square bores or HX for hex bores.
For stainless steel see 65186

For needle roller bearings see part number .

Order No.	Bore dia.	d_1 tol. H7	d_2	l_1	l_2	l_3	w_1 tol. JS9	w_2	Weight g
65170.W0010	Round bore	10	16	52	26	15	-	-	50
65170.W0012	Round Bore	12	22	62	31	18	-	-	120
65170.W0016	Round Bore	16	25	74	37	21	-	-	200
65170.W0020	Round Bore	20	32	86	43	24	-	-	350
65170.W0025	Round Bore	25	42	108	54	31	-	-	800
65170.W0030	Round Bore	30	50	132	66	38	-	-	1200
65170.W0040	Round Bore	40	70	166	83	47	-	-	2900
65170.W0210	With keyway	10	16	52	26	15	3	11.4	50
65170.W0212	With keyway	12	22	62	31	18	4	13.8	120
65170.W0216	With keyway	16	25	74	37	21	5	18.3	200
65170.W0220	With keyway	20	32	86	43	24	6	22.8	350
65170.W0225	With keyway	25	42	108	54	31	8	28.3	800
65170.W0230	With keyway	30	50	132	66	38	8	33.3	1200
65170.W0240	With keyway	40	70	166	83	47	12	43.3	2900





65172

Material
Steel (9SMnPb28k, no. 10718).
Bearing type: plain bearing.

Technical Notes
To DIN 808.

Maximum bending angle 45° per joint.
Max. drive speed of 1000 rpm.

Tips
Single universal joints are used where shafts are off-set towards each other.

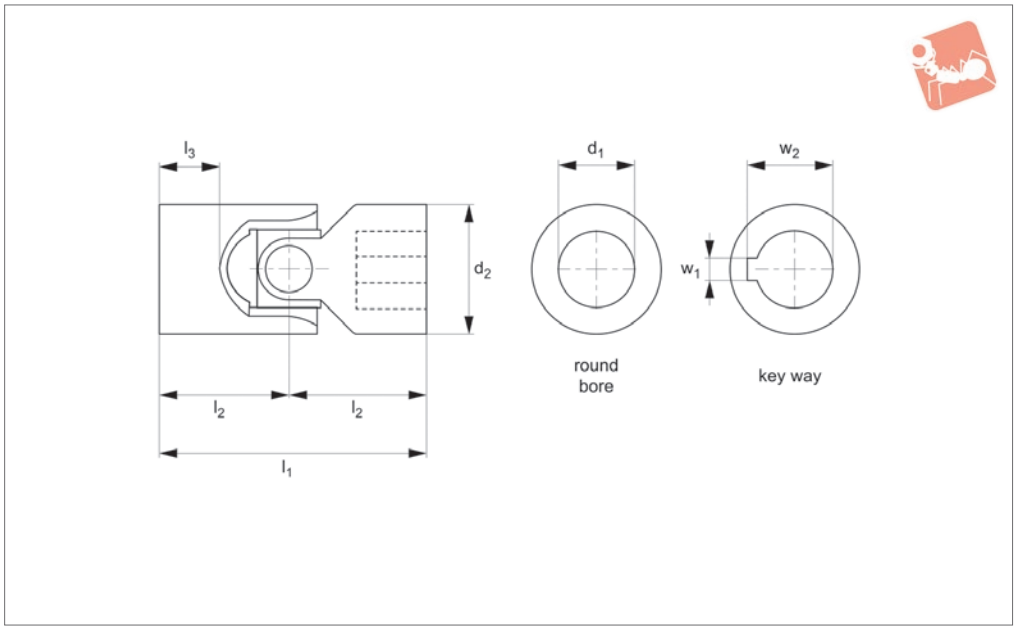
Product variations available on request, for square bores change the suffix to SQ for square bores or HX for hex bores.
For stainless steel see 65186.

Order No.	Bore dia.	d_1 tol. H7	d_2	l_1	l_2	l_3	w_1 tol. JS9	w_2	Weight g
65172.W0006	Round bore	6	16	34	17	8	-	-	50
65172.W0008	Round bore	8	16	40	20	11	-	-	50
65172.W0010	Round bore	10	22	48	24	12	-	-	100
65172.W0012	Round bore	12	25	56	28	13	-	-	160
65172.W0014	Round bore	14	28	60	30	14	-	-	200
65172.W0016	Round bore	16	32	68	34	16	-	-	300
65172.W0018	Round bore	18	36	74	37	17	-	-	450
65172.W0020	Round bore	20	42	82	41	18	-	-	600
65172.W0022	Round bore	22	45	95	47.5	22	-	-	950
65172.W0025	Round bore	25	50	108	54	26	-	-	1200
65172.W0030	Round bore	30	58	122	61	29	-	-	1850
65172.W0032	Round bore	32	58	130	65	33	-	-	2000
65172.W0035	Round bore	35	70	140	70	35	-	-	3150
65172.W0040	Round bore	40	80	160	80	39	-	-	4600
65172.W0050	Round bore	50	95	190	95	46	-	-	7600
65172.W0206	With Keyway	6	16	34	17	8	2	7.0	50
65172.W0208	With Keyway	8	16	40	20	11	2	9.0	50
65172.W0210	With Keyway	10	22	48	24	12	3	11.4	100
65172.W0212	With Keyway	12	25	56	28	13	4	13.8	160
65172.W0214	With Keyway	14	28	60	30	14	5	16.3	200
65172.W0216	With Keyway	16	32	68	34	16	5	18.3	300
65172.W0218	With Keyway	18	36	74	37	17	6	20.8	450
65172.W0220	With Keyway	20	42	82	41	18	6	22.8	600
65172.W0222	With Keyway	22	45	95	47.5	22	6	24.8	950
65172.W0225	With Keyway	25	50	108	54	26	8	28.3	1200
65172.W0230	With Keyway	30	58	122	61	29	8	33.3	1850
65172.W0232	With Keyway	32	58	130	65	33	10	35.3	2000
65172.W0235	With Keyway	35	70	140	70	35	10	38.3	3150
65172.W0240	With Keyway	40	80	160	80	39	12	43.3	4600
65172.W0250	With Keyway	50	95	190	95	46	14	53.8	7600

Stainless Single Universal Joint

Stainless

65186



Material

Stainless steel (AISI 304)

Technical Notes

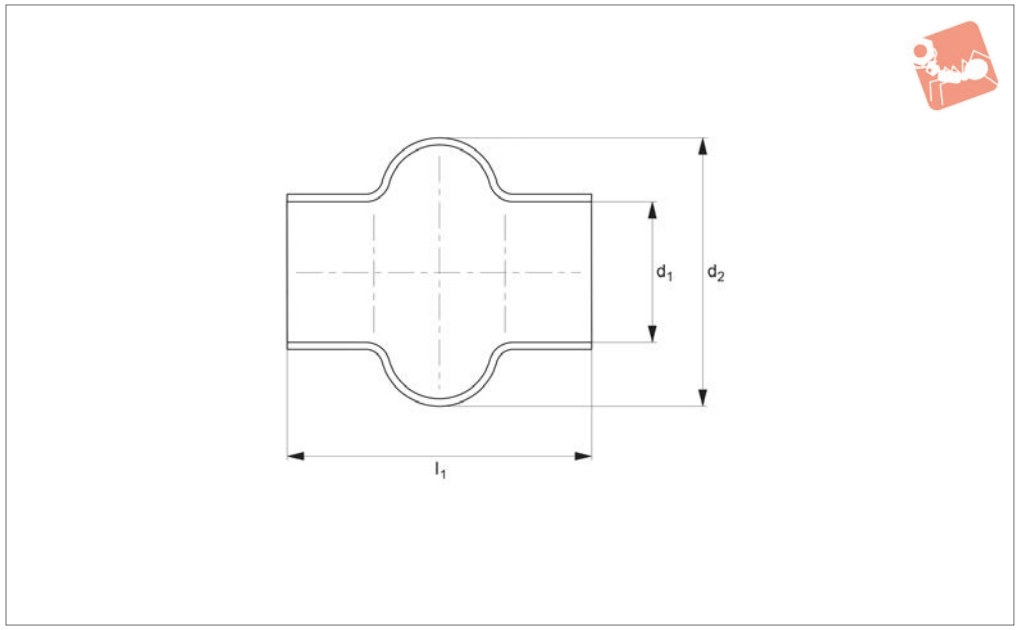
To DIN 808, maximum bending angle 45° per joint.

Tips

Single universal joints are used where shafts are off-set towards each other.

Product variations available on request, for square bores change the suffix to SQ for square bores or HX for hex bores.

Order No.	Bore dia.	d_1 tol. H7	d_2	l_1	l_2	l_3	w_1 tol. JS9	w_2	Weight g
65186.W0006	Round bore	6	16	34	17	8	-	-	50
65186.W0008	Round Bore	8	16	40	20	11	-	-	50
65186.W0010	Round Bore	10	22	48	24	12	-	-	100
65186.W0012	Round Bore	12	25	56	28	13	-	-	160
65186.W0016	Round Bore	16	32	68	34	16	-	-	300
65186.W0020	Round Bore	20	42	82	41	18	-	-	600
65186.W0025	Round Bore	25	50	108	54	26	-	-	1200
65186.W0030	Round Bore	30	58	122	61	29	-	-	1850



65280

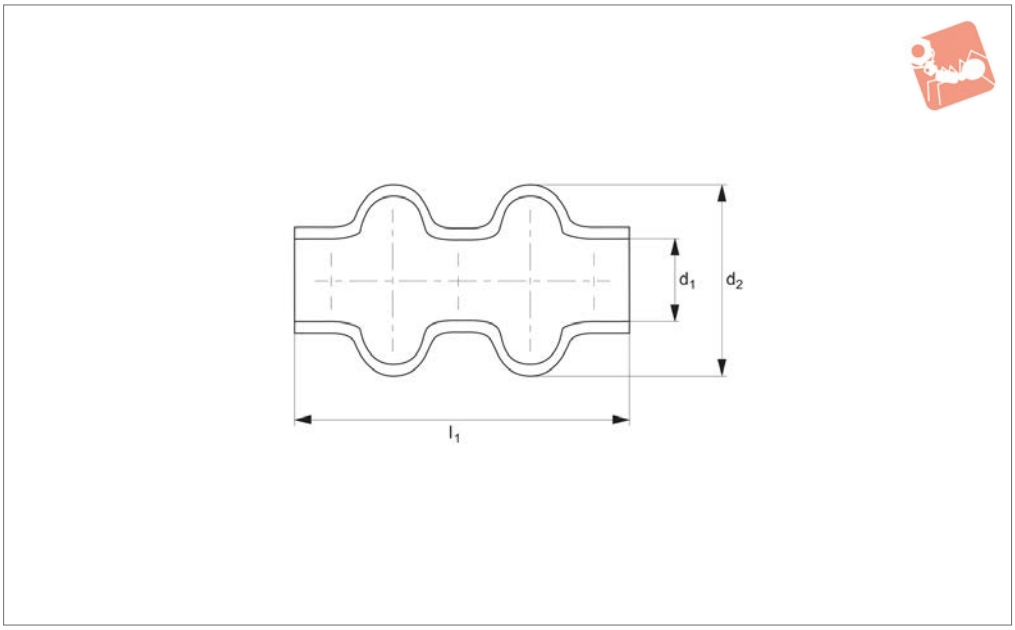
Material
Rubber.

Tips
Bellows give universal joints full protection against ingress of dirt.
They can be filled with grease which gives long term lubrication for friction bearings.
Bellows should be secured at each end with two cable ties (not supplied).

Order No.	To suit joint of o.d	d_1	d_2	l_1
65280.W0016	16	15.0	28	34
65280.W0018	18	16.5	32	40
65280.W0022	22	20.5	40	45
65280.W0025	25/26	24.5	48	50
65280.W0028	28/29	27.5	52	56
65280.W0032	32	30.5	56	65
65280.W0036	36/37	35.5	66	72
65280.W0042	42	40.0	75	82
65280.W0045	45/47	45.0	84	95
65280.W0050	50/52	50.0	92	108
65280.W0058	58	56.0	100	122

Bellows
for double universal joints

65282



Material
Black elastomer plastic (smooth PVC)

Tips
Bellows give universal joints full protection against ingress of dirt.
They can be filled with grease which gives long term lubrication for friction bearings.
Bellows should be secured at each end with two cable ties (not supplied).

Order No.	To suit joint of o.d	d_1	d_2	l_1
65282.W0016	16	16	35	55
65282.W0022	22	20	36	65
65282.W0025	25	24	44	70
65282.W0028	28	28	51	80
65282.W0032	32	32	62	90
65282.W0050	50	50	90	155

Parts overview

Single Universal Joints

Available with plain bearings or needle roller bearings. Plain bore and keyed bores stocked as standard, hex or square shaped bores on request. Bore diameters 6mm up to 50mm.

Double Universal Joints

Available with plain bearings or needle roller bearings. Plain bore and keyed bores stocked as standard, hex or square shaped bores on request. Bore diameters 6mm up to 50mm.

Stainless Steel Universal Joints

Single and double universal joints with plain bearings and plain bores. Keyed, hex or square shaped bores available on request. Bore diameters 6mm up to 30mm.

Quick Release Universal Joints

Quick change mechanism one end of the joint to allow rapid connection and release of the shaft, ideal when time is critical. Bore diameters 8mm up to 30mm.

Universal Joint Bellows

Available for both single and double universal joints, bellows are used to cover and protect the joints. Available to protect joints up to 58mm outside diameter.

Telescopic Universal Joints

Two universal joints connected by a sliding splined shaft with the ability to extend, allowing adjustments in length during installation. Bore diameters 10mm up to 30mm.

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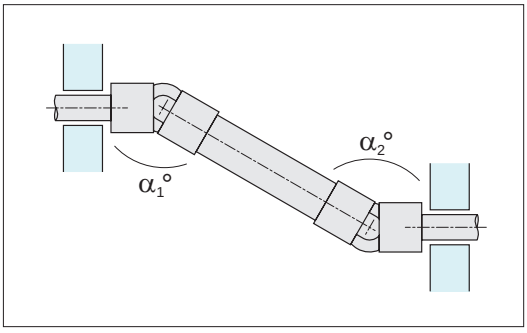
When one single joint is coupled with two shafts (of which the driving one is rotating at a constant speed) forming an angle, a periodic variation of the driven shaft is caused with exactly four fluctuations per revolution.

The difference between the maximum and the minimum speed of the driven shaft depends on the angle formed by the two shafts. The difference grows with the an increase of the angle a°. To have a homokinetic transmission, either two opposite single joints (ensuing that that the two central yokes lie on the same plane and the angles are equal) or a double joint need to be fitted. The irregularity caused by the former articulation is cancelled by the latter. The overall length resulting from the coupling of the two single joints can be reduced by using a double joint. In other words, the double joint is to be considered as the shortest homokinetic transmission.

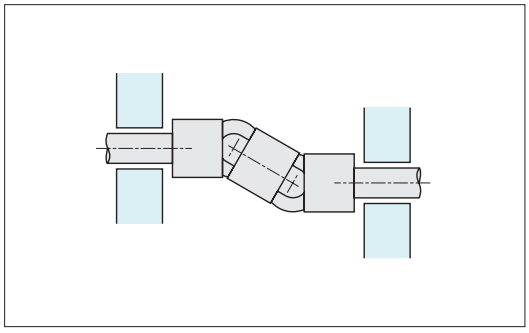
For low speed applications (Max. 1000 rpm), joints with plain bearings (rubbing bearings) are suggested. They are able to support shock loads, motion reversals, irregular runnings and relatively high torques. The working angles must be be restricted when using at speeds between 500 - 1000 rpm. Please consult our technical department if you have such an application.

For high rotation speeds, relatively low torques or wide angles, joints with needle roller bearings are preferred. They can reach 4000 RPM dependent on the angle.

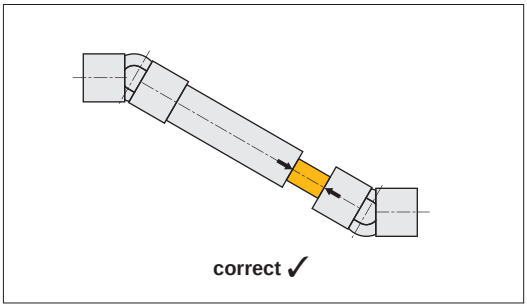
Dynamic basic load ratings of plain bearing rod ends



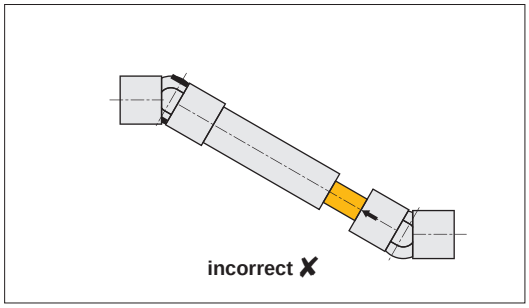
To obtain a uniform rotary motion always use either two opposite single joints or one double joints. $\alpha_1 = \alpha_2$.



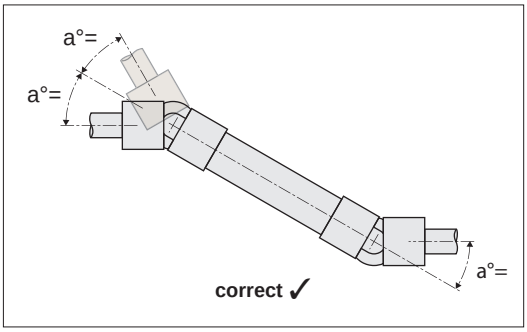
The pillow block supports should be positioned as close as possible to the joints.



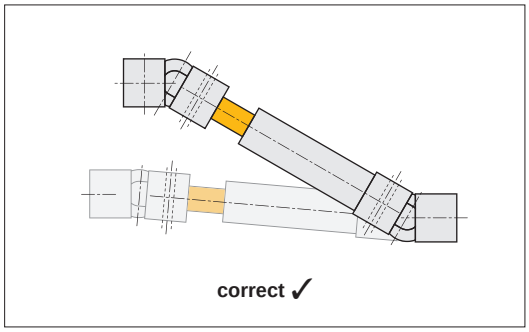
When using two opposite single joints ensure the alignment of the inside yokes.



In extensible transmissions make sure that the arrows are perfectly aligned.



It is essential that the two bending angles a° are equal.



How to read diagrams

The joint capacity to transmit a regular torque at a constant load with no shocks, for a long period, mainly depends on the number of revolutions per minute and the inclination angle a° of the two axes. The diagrams on the following pages are based on this. Each curve corresponds to the joint size (outside diameter "D") and represents the torque that the joint can transmit depending on speed and working angle a°.

The diagrams can be directly read if angle (a°) is 10°. For wider angles, torques are reduced, therefore these are to be corrected using the correction vales (F) relating to the angle shown in the table.

Important Note: Diagrams' values are merely indicative and refer to the single joints only. When choosing a double joint, you have to consider that they can transmit a torque about 10% lower than the same sized single joints. Each application has its own particular motion characteristics, such as: shock loads, motion reversals, connected masses, kind of starting, presence of elastic joints, stops and starts, etc., that have to be considered when choosing the joint.

Working angle a°	Correction value F
5°	1,25
10°	1,00
15°	0,80
20°	0,65
25°	0,55
30°	0,45
35°	0,38
40°	0,30
45°	0,25

Example

Known: Power = 0,65 kW
RPM = 230

With working angle a 10°, F = 1, we get point P. Torque = 27 Nm
corresponding to joint size "D" = 25/26mm = Types **65170.W0016** and **65172.W0012**

With working angle a 30°, F = 0,45 (kW 0,65: 0,45 = 1,44 kW) we get point
P1 Torque = 60 Nm corresponding to joint size "D" = 32mm = Types **65170.W0020**
and **65172.W0016**

Consider that:

$$\text{Torque in Nm} = 9550 \times \frac{\text{Power (kW)}}{\text{RPM}}$$

$$\text{Torque in Nm} = 7020 \times \frac{\text{Power (HP)}}{\text{RPM}}$$

1 kW = 1,35 HP
1 HP = 0,736 kW
1 Kgm = 9,81 Nm
1 Nm = 0,102 Kgm

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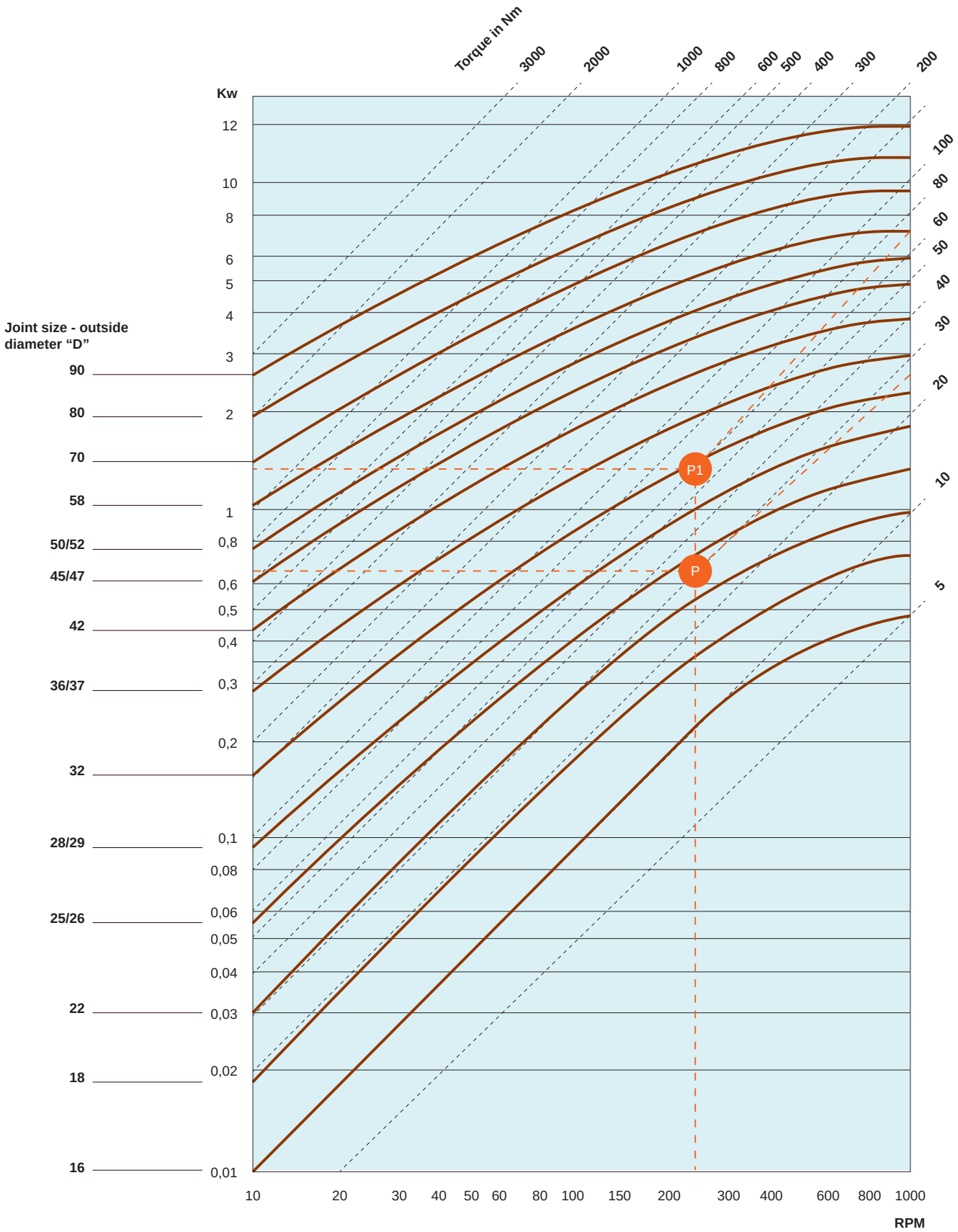
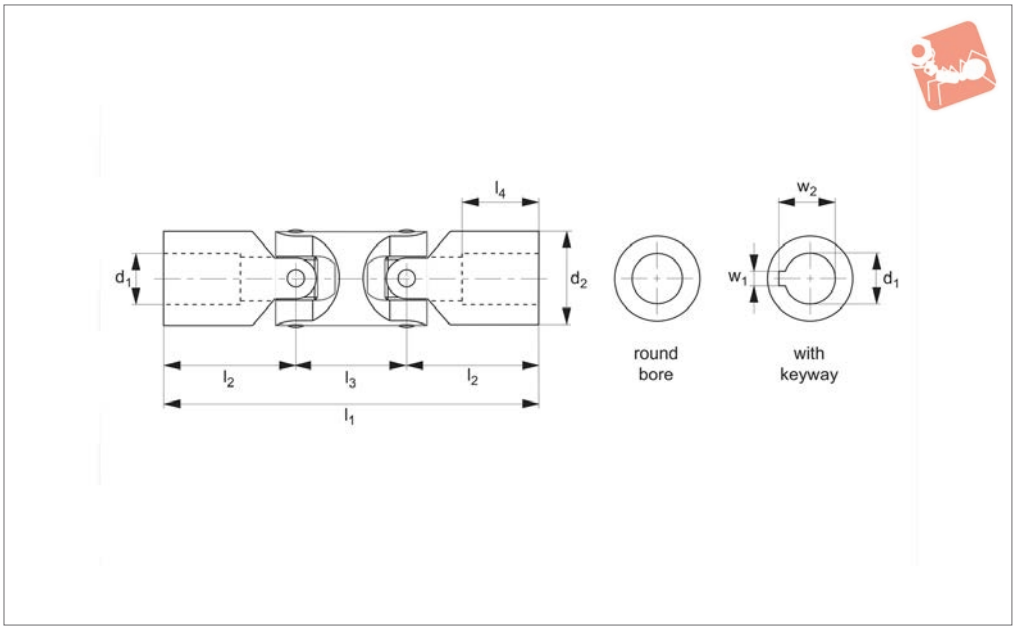
Torque Ratings for Plain Bearing Universal Joints



Double Universal Joint
Steel



65160

Material
Steel (9 SMnPb28k, no. 10718).
Bearing type: Plain bearing.

Technical Notes
To DIN 808/7551, keyways aligned.

Maximum bending angle 45° per joint.
Max. drive speed of 1000 rpm.

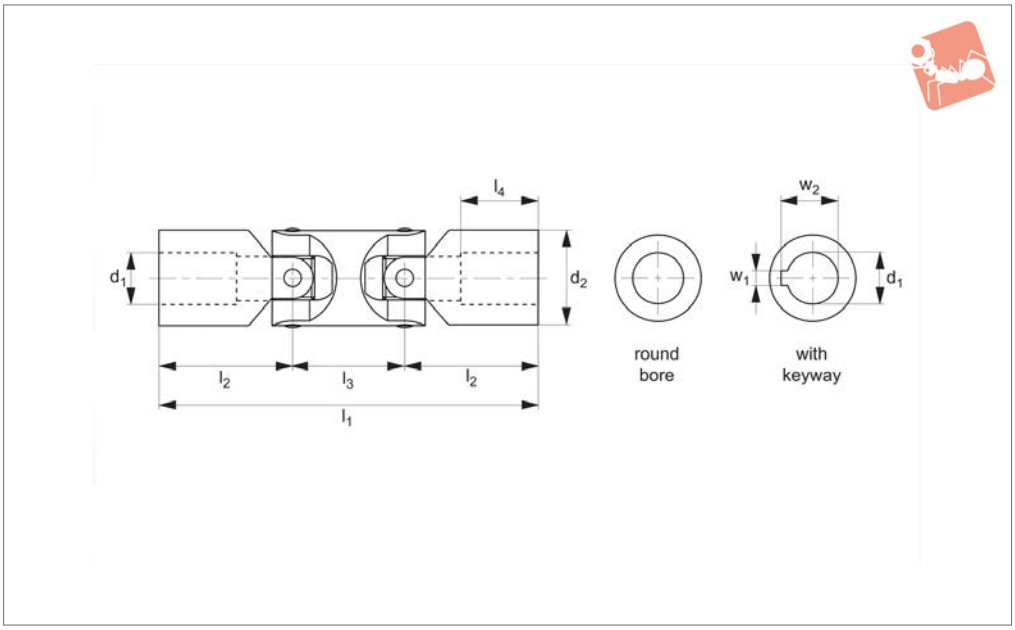
Tips
Double universal joints are used where large bending angles are required or where two shafts offset in relation to each other.
Product variations available on request, for square bores change the suffix to SQ for square bores or HX for hex bores.
For stainless steel see 65166.

Order No.	Bore dia.	d_1 tol. H7	d_2	l_1	l_2	l_3	l_4	w_1 tol. JS9	w_2	Weight g
65160.W0010	Round bore	10	16	74	26	22	15	-	-	80
65160.W0012	Round Bore	12	22	88	31	26	18	-	-	200
65160.W0016	Round Bore	16	25	104	37	30	21	-	-	300
65160.W0020	Round Bore	20	32	124	43	38	24	-	-	500
65160.W0025	Round Bore	25	42	156	54	48	31	-	-	1200
65160.W0030	Round Bore	30	50	188	66	56	38	-	-	1700
65160.W0040	Round Bore	40	70	238	83	72	47	-	-	4300
65160.W0210	with keyway	10	16	74	26	22	15	3	11.4	80
65160.W0212	with keyway	12	22	88	31	26	18	4	13.8	200
65160.W0216	with keyway	16	25	104	37	30	21	5	18.3	300
65160.W0220	with keyway	20	32	124	43	38	24	6	22.8	500
65160.W0225	with keyway	25	42	156	54	48	31	8	28.3	1200
65160.W0230	with keyway	30	50	188	66	56	38	8	33.3	1700
65160.W0240	with keyway	40	70	238	83	72	47	12	43.3	4300

Double Universal Joint

Steel

65162



Material

Steel (9SMnPb28k, no. 10718).
Bearing type: Plain bearing.

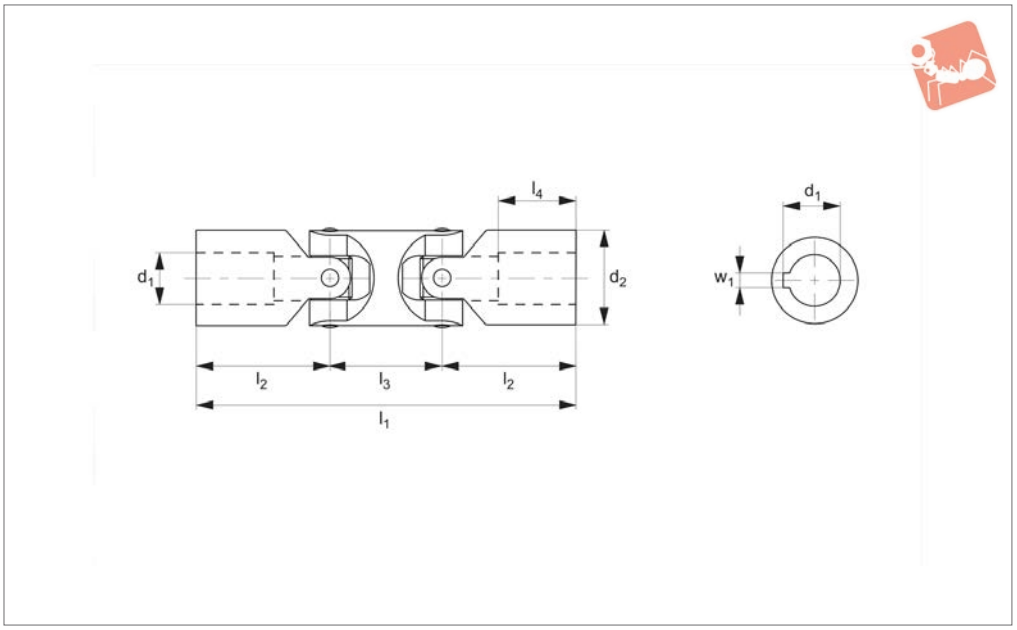
Technical Notes

To DIN 808, keyways aligned.
Maximum bending angle 45° per joint.
Max. drive speed of 1000 rpm.

Tips

Double universal joints are used where large bending angles are required or where two shafts offset in relation to each other.
Product variations available on request, for square bores change the suffix to SQ for square bores or HX for hex bores.
For stainless steel see part number 65166, for needle roller bearings see part number .

Order No.	Bore dia.	d_1 tol. H7	d_2	l_1	l_2	l_3	l_4	w_1 tol. JS9	w_2	Weight g
65162.W0006	Round bore	6	16	56	17.0	22	8	-	-	80
65162.W0008	Round Bore	8	16	62	20.0	22	11	-	-	80
65162.W0010	Round Bore	10	22	74	24.0	26	12	-	-	150
65162.W0012	Round Bore	12	25	86	28.0	30	13	-	-	250
65162.W0014	Round Bore	14	28	96	30.0	36	14	-	-	400
65162.W0016	Round Bore	16	32	104	34.0	36	16	-	-	450
65162.W0018	Round Bore	18	36	114	37.0	40	17	-	-	700
65162.W0020	Round Bore	20	42	128	41.0	46	18	-	-	1000
65162.W0022	Round Bore	22	45	145	47.5	50	22	-	-	1550
65162.W0025	Round Bore	25	50	163	54.0	55	26	-	-	2000
65162.W0030	Round Bore	30	58	190	61.0	68	29	-	-	2900
65162.W0032	Round Bore	32	58	198	65.0	68	33	-	-	3000
65162.W0035	Round Bore	35	70	212	70.0	72	35	-	-	4750
65162.W0040	Round Bore	40	80	245	80.0	85	39	-	-	7200
65162.W0050	Round Bore	50	95	290	95.0	100	46	-	-	12.000
65162.W0206	With keyway	6	16	56	17.0	22	8	2	7	80
65162.W0208	With Keyway	8	16	62	20.0	22	11	2	9	80
65162.W0210	With Keyway	10	22	74	24.0	26	12	3	11.4	150
65162.W0212	With Keyway	12	25	86	28.0	30	13	4	13.8	250
65162.W0214	With Keyway	14	28	96	30.0	36	14	5	16.3	400
65162.W0216	With Keyway	16	32	104	34.0	36	16	5	18.3	450
65162.W0218	With Keyway	18	36	114	37.0	40	17	6	20.8	700
65162.W0220	With Keyway	20	42	128	41.0	46	18	6	22.8	1000
65162.W0222	With Keyway	22	45	145	47.5	50	22	6	24.8	1550
65162.W0225	With Keyway	25	50	163	54.0	55	26	8	28.3	2000
65162.W0230	With Keyway	30	58	190	61.0	68	29	8	33.3	2900
65162.W0232	With Keyway	32	58	198	65.0	68	33	10	35.3	3000
65162.W0235	With Keyway	35	70	212	70.0	72	35	10	38.3	4750
65162.W0240	With Keyway	40	80	245	80.0	85	39	12	43.3	7200
65162.W0250	With Keyway	50	95	290	95.0	100	46	14	53.8	12.000



65166

Material
Stainless steel (AISI 304).

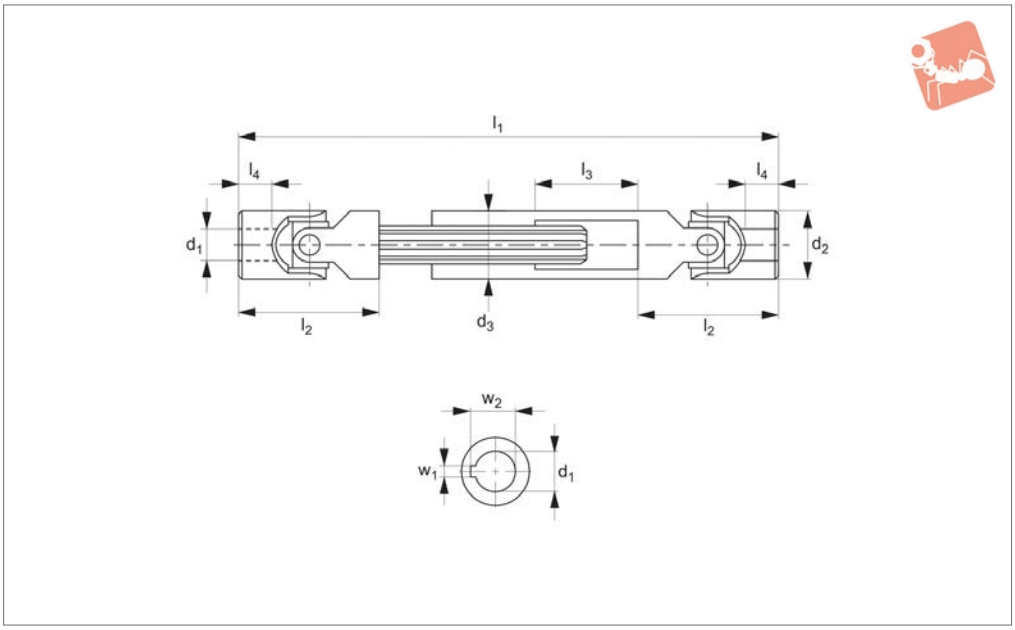
Technical Notes
To DIN 808, maximum bending angle 45° per joint.

Tips
Product variations available on request, for square bores change the suffix to SQ for square bores or HX for hex bores.

Order No.	Bore dia.	d_1 tol. H7	d_2	l_1	l_2	l_3	l_4	w_1	w_2	Weight g
65166.W0020	Round Bore	20	42	128	41	46	18	-	-	1000
65166.W0025	Round Bore	25	50	163	54	55	26	-	-	2000
65166.W0220	Keyway	20	42	128	41	46	18	6	22.8	1000

Telescopic Universal Joints

65142



Material
Steel (9SMnPb28k, no. 10718, greased).
Bearing type: plain bearing.

Technical Notes
To DIN 808.

Maximum bending angle 45° per joint. The drive speed of universal joints with journal bearings must not exceed 1000 rpm.

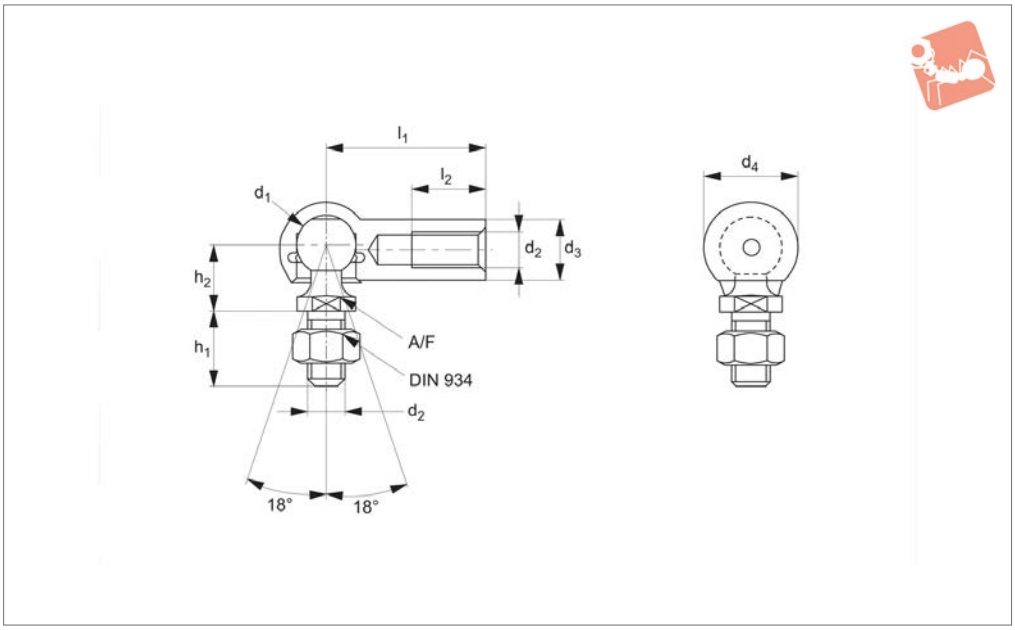
Tips
Double universal joints are used where large bending angles are required or where two shafts offset in relation to each other. Zinc plated available on request.

Order No.	d_1 tol. H7	d_2	d_3	l_1 min.	l_1 max.	l_2	l_3 stroke	l_4	w_1 tol. JS9	w_2	Shaft	Weight g
65142.W2100	10	22	22	140	170	48	30	12	3	11.4	11x14x6	310
65142.W2101	10	22	22	160	200	48	40	12	3	11.4	11x14x6	360
65142.W2102	10	22	22	180	240	48	60	12	3	11.4	11x14x6	380
65142.W2103	10	22	22	230	330	48	100	12	3	11.4	11x14x6	500
65142.W2120	12	25	26	160	190	56	30	13	4	13.8	13x16x6	500
65142.W2121	12	25	26	180	225	56	45	13	4	13.8	13x16x6	560
65142.W2122	12	25	26	200	270	56	70	13	4	13.8	13x16x6	620
65142.W2123	12	25	26	220	300	56	80	13	4	13.8	13x16x6	670
65142.W2124	12	25	26	250	355	56	105	13	4	13.8	13x16x6	760
65142.W2125	12	25	26	280	420	56	140	13	4	13.8	13x16x6	840
65142.W2126	12	25	26	300	450	56	150	13	4	13.8	13x16x6	900
65142.W2140	14	28	29	170	200	60	30	14	5	16.3	13x16x6	620
65142.W2141	14	28	29	180	220	60	40	14	5	16.3	13x16x6	640
65142.W2142	14	28	29	200	260	60	60	14	5	16.3	13x16x6	720
65142.W2143	14	28	29	220	300	60	80	14	5	16.3	13x16x6	780
65142.W2144	14	28	29	250	350	60	100	14	5	16.3	13x16x6	870
65142.W2145	14	28	29	280	420	60	140	14	5	16.3	13x16x6	960
65142.W2146	14	28	29	300	450	60	150	14	5	16.3	13x16x6	1030
65142.W2147	14	28	29	350	550	60	200	14	5	16.3	13x16x6	1170
65142.W2148	14	28	29	400	650	60	250	14	5	16.3	13x16x6	1330
65142.W2160	16	32	32	190	220	68	30	16	5	18.3	16x20x6	900
65142.W2161	16	32	32	210	250	68	40	16	5	18.3	16x20x6	980
65142.W2162	16	32	32	240	320	68	80	16	5	18.3	16x20x6	1100
65142.W2163	16	32	32	250	350	68	100	16	5	18.3	16x20x6	1140
65142.W2164	16	32	32	275	390	68	115	16	5	18.3	16x20x6	1240
65142.W2165	16	32	32	300	430	68	130	16	5	18.3	16x20x6	1330
65142.W2166	16	32	32	380	590	68	210	16	5	18.3	16x20x6	1600
65142.W2167	16	32	32	400	630	68	230	16	5	18.3	16x20x6	1730
65142.W2180	18	36	37	230	280	74	50	17	6	20.8	18x22x6	1350
65142.W2181	18	36	37	250	320	74	70	17	6	20.8	18x22x6	1460
65142.W2182	18	36	37	270	370	74	100	17	6	20.8	18x22x6	1550
65142.W2183	18	36	37	290	400	74	110	17	6	20.8	18x22x6	1660

Order No.	d_1 tol. H7	d_2	d_3	l_1 min.	l_1 max.	l_2	l_3 stroke	l_4	w_1 tol. JS9	w_2	Shaft	Weight g
65142.W2184	18	36	37	300	415	74	115	17	6	20.8	18x22x6	1710
65142.W2185	18	36	37	400	620	74	220	17	6	20.8	18x22x6	2230
65142.W2186	18	36	37	500	820	74	320	17	6	20.8	18x22x6	2750
65142.W2303	30	58	58	400	510	122	110	29	8	33.3	32x38x8	5850
65142.W2304	30	58	58	450	620	122	170	29	8	33.3	32x38x8	6480
65142.W2305	30	58	58	500	720	122	220	29	8	33.3	32x38x8	7140
65142.W2306	30	58	58	540	795	122	255	29	8	33.3	32x38x8	7690
65142.W2202	20	42	42	290	380	82	90	18	6	22.8	21x25x6	2250
65142.W2206	20	42	42	500	800	82	300	18	6	22.8	21x25x6	3660
65142.W2253	25	50	52	380	500	108	120	26	8	28.3	26x32x6	4200
65142.W2222	22	45	47	290	350	95	60	22	6	24.8	23x28x6	2670
65142.W2300	30	58	58	330	380	122	50	29	8	33.3	32x38x8	4900
65142.W2254	25	50	52	420	590	108	170	26	8	28.3	26x32x6	4590
65142.W2250	25	50	52	295	345	108	50	26	8	28.3	26x32x6	3390
65142.W2223	22	45	47	330	430	95	100	22	6	24.8	23x28x6	3000
65142.W2203	20	42	42	320	440	82	120	18	6	22.8	21x25x6	2460
65142.W2200	20	42	42	250	300	82	50	18	6	22.8	21x25x6	1990
65142.W2301	30	58	58	350	420	122	70	29	8	33.3	32x38x8	5170
65142.W2204	20	42	42	380	560	82	180	18	6	22.8	21x25x6	2860
65142.W2255	25	50	52	460	660	108	200	26	8	28.3	26x32x6	4980
65142.W2220	22	45	47	250	280	95	30	22	6	24.8	23x28x6	2350
65142.W2251	25	50	52	310	375	108	65	26	8	28.3	26x32x6	3520
65142.W2224	22	45	47	350	470	95	120	22	6	24.8	23x28x6	3160
65142.W2256	25	50	52	500	745	108	245	26	8	28.3	26x32x6	5370
65142.W2205	20	42	42	420	640	82	220	18	6	22.8	21x25x6	3130
65142.W2252	25	50	52	350	450	108	100	26	8	28.3	26x32x6	3920
65142.W2302	30	58	58	370	455	122	85	29	8	33.3	32x38x8	5420
65142.W2221	22	45	47	270	320	95	50	22	6	24.8	23x28x6	2510
65142.W2201	20	42	42	270	340	82	70	18	6	22.8	21x25x6	2120
65142.W2225	22	45	47	470	710	95	240	22	6	24.8	23x28x6	4130

Ball and Socket Joints

65500



Material
Steel, silver zinc plated, ball stud: minimum tensile strength Rm=600N/mm². Housing: minimum tensile strength Rm=500N/mm².

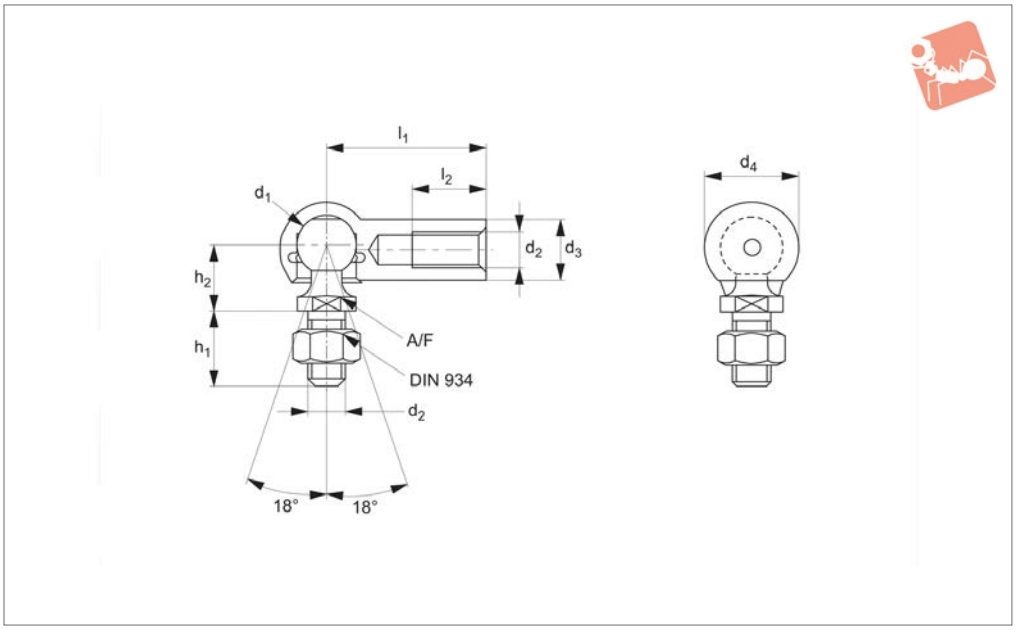
Technical Notes
To DIN 71802 form CS, supplied with hexagon nut.
Safety ring aids the retention of the ball stud in the housing.
*M14x1,5 is a fine pitch thread.

Tips
For sealing cap version, see .
Standard thread is right hand, (for left hand thread see 65502).

Important Notes
Thread is not full length. There is a min 1.5mm unthreaded shank. If using part without the supplied nut, then please consider a counterbore to accommodate the unthreaded shank.

Order No.	Thread hand	d_1	l_1 ±0.3	d_2	d_3	d_4	h_1 ±0.3	Weight g
65500.W0105	Right	8	22	M 5	8	12.8	10.2	15.2
65500.W0106	Right	10	25	M 6	10	14.8	12.5	25.2
65500.W0108	Right	13	30	M 8	13	19.3	16.5	53.1
65500.W0110	Right	16	35	M10	16	24.0	20.0	103.8
65500.W0112	Right	16	35	M12	16	24.0	20.0	103.8
65500.W0114	Right	19	45	M14x1,5*	22	30.0	28.0	220.9
65500.W0115	Right	19	45	M14	22	30.0	28.0	220.9
65500.W0116	Right	19	45	M16	22	30.0	28.0	220.9

Order No.	h_2 ±0.3	l_2 min.	A/F tol. h14	Extraction force kg min.	Static load kg max.	Dyn. load C kg max.	Force required for movement kg max.
65500.W0105	9	10.2	7	3	50	20	3
65500.W0106	11	11.5	8	4	100	40	4
65500.W0108	13	14.0	11	6	200	80	6
65500.W0110	16	15.5	13	8	400	160	8
65500.W0112	16	15.5	13	8	400	160	8
65500.W0114	22	21.5	16	10	800	320	10
65500.W0115	22	21.5	16	10	800	320	10
65500.W0116	22	21.5	16	10	800	320	10



65502

Material
Steel, silver zinc plated, ball stud: minimum tensile strength Rm=600N/mm².
Housing: minimum tensile strength Rm=500N/mm².

Technical Notes
To DIN 71802 form CS, supplied with hexagon nut.
Safety ring aids the retention of the ball stud in the housing.
*M14x1,5 is a fine pitch thread.

Tips
Stud: right hand thread.
Housing: left hand thread.
For sealing cap version, see .

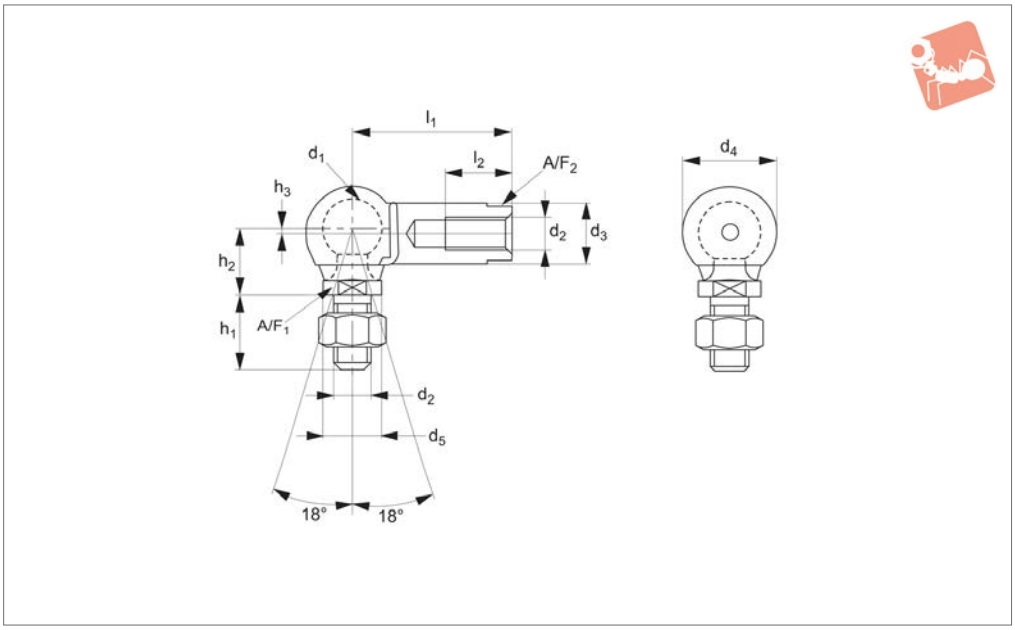
Important Notes
Thread is not full length. There is a min 1.5mm unthreaded shank. If using part without the supplied nut, then please consider a counterbore to accommodate the unthreaded shank.

Order No.	Thread hand	d_1	l_1 ±0.3	d_2	d_3	d_4	h_1 ±0.3	Weight g
65502.W0005	Left	8	22	M 5	8	12.8	10.2	15.2
65502.W0006	Left	10	25	M 6	10	14.8	12.5	25.2
65502.W0008	Left	13	30	M 8	13	19.3	16.5	53.1
65502.W0010	Left	16	35	M10	16	24.0	20.0	103.8
65502.W0012	Left	16	35	M12	16	24.0	20.0	103.8
65502.W0014	Left	19	45	M14x1,5*	22	30.0	28.0	220.9
65502.W0015	Left	19	45	M14	22	30.0	28.0	220.9
65502.W0016	Left	19	45	M16	22	30.0	28.0	220.9

Order No.	h_2 ±0.3	l_2 min.	A/F tol. h14	Extraction force kg min.	Static load kg max.	Dyn. load C kg max.	Force required for movement kg max.
65502.W0005	9	10.2	7	3	50	20	3
65502.W0006	11	11.5	8	4	100	40	4
65502.W0008	13	14.0	11	6	200	80	6
65502.W0010	16	15.5	13	8	400	160	8
65502.W0012	16	15.5	13	8	400	160	8
65502.W0014	22	21.5	16	10	800	320	10
65502.W0015	22	21.5	16	10	800	320	10
65502.W0016	22	21.5	16	10	800	320	10

Ball and Socket Joint
with flats on housing

65508



Material
Stud: carbon steel, sealing cap: neoprene. Housing: steel (9sMnPb28), silver zinc plated.

Technical Notes
To DIN 71802 form CS, supplied without hexagon nut.

Safety ring aids the retention of the ball stud in the housing.
*M14x1,5 is a fine pitch thread.

Tips
Standard thread is right hand, (for left hand thread see 65510).

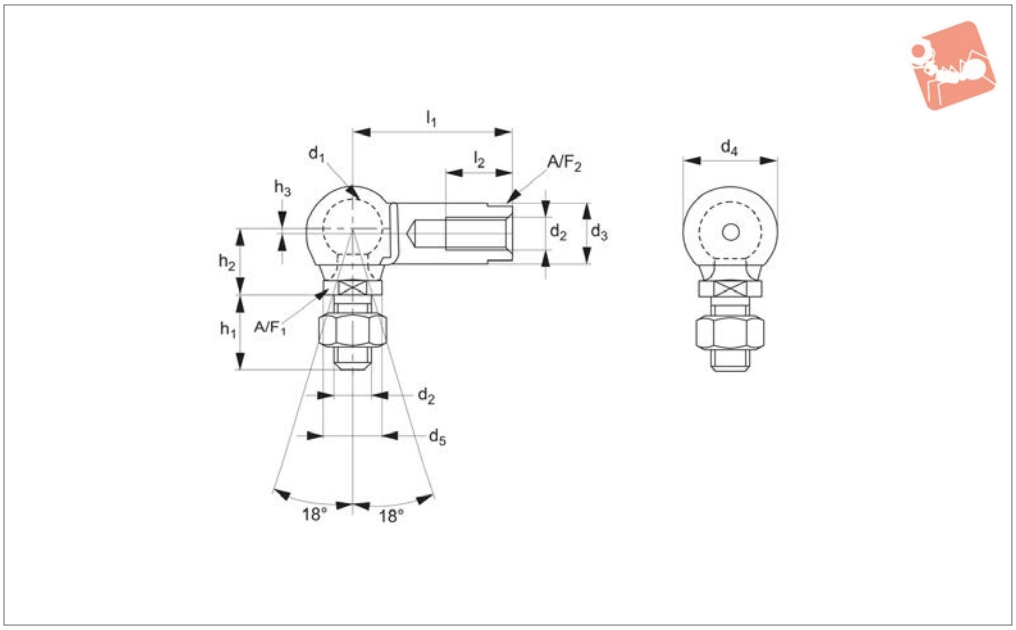
Important Notes
Thread is not full length. There is a min 1.5mm unthreaded shank. If using part without a nut, then please consider a counterbore to accommodate the unthreaded shank.

Order No.	Thread hand	d_1	l_1 ±0.3	d_2	d_3 ±0.5	d_4 ±0.5	d_5 ±0.5	Weight g
65508.W0105	Right	8	22	M 5	8	12.8	8	15.2
65508.W0106	Right	10	25	M 6	10	14.8	10	25.2
65508.W0108	Right	13	30	M 8	13	19.3	13	53.1
65508.W0110	Right	16	35	M10	16	24.0	16	103.8
65508.W0112	Right	16	35	M12	16	24.0	16	103.8
65508.W0114	Right	19	45	M14x1,5*	22	30.0	22	220.9
65508.W0115	Right	19	45	M14	22	30.0	22	220.9
65508.W0116	Right	19	45	M16	22	30.0	22	220.9

Order No.	h_1 ±0.3	h_2 ±0.3	h_3	l_2 min.	A/F_1	A/F_2	Extraction force kg min.	Static load kg max.	Dyn. load C kg max.	Force required for movement kg max.
65508.W0105	10.0	9	0.65	10.2	7	-	3	50	20	3
65508.W0106	12.5	11	0.70	11.5	8	-	4	100	40	4
65508.W0108	16.5	13	1.15	14.0	11	-	6	200	80	6
65508.W0110	20.0	16	1.15	15.5	13	-	8	400	160	8
65508.W0112	20.0	16	1.15	15.5	13	-	8	400	160	8
65508.W0114	28.0	20	0.50	21.5	16	19	10	800	320	10
65508.W0115	28.0	20	0.50	21.5	16	19	10	800	320	10
65508.W0116	28.0	20	0.50	21.5	16	19	10	800	320	10

Ball and Socket Joint

left hand thread- with flats on housing



65510

Material

Stud: carbon steel, sealing cap: neoprene.
Housing: steel (9sMnPb28), silver zinc plated.

Technical Notes

To DIN 71802 form CS, supplied with hexagon nut.

Safety ring aids the retention of the ball stud in the housing.
*M14x1,5 is a fine pitch thread.

Tips

Stud: right hand thread.
Housing: left hand thread

Important Notes

Thread is not full length. There is a min 1.5mm unthreaded shank. If using part without the supplied nut, then please consider a counterbore to accommodate the unthreaded shank.

Order No.	Thread hand	d_1	l_1 ±0.3	d_2	d_3 ±0.5	d_4 ±0.5	d_5 ±0.5	Weight g
65510.W0005	Left	8	22	M5	8	12.8	8	15.2
65510.W0006	Left	10	25	M6	10	14.8	10	25.2
65510.W0008	Left	13	30	M8	13	19.3	13	53.1
65510.W0010	Left	16	35	M10	16	24.0	16	103.8
65510.W0012	Left	16	35	M12	16	24.0	16	103.8
65510.W0014	Left	19	45	M14x1,5	22	30.0	22	220.9
65510.W0015	Left	19	45	M14	22	30.0	22	220.9
65510.W0016	Left	19	45	M16	22	30.0	22	220.9

Order No.	h_1 ±0.3	h_2 ±0.3	h_3	l_2 min.	A/F_1	A/F_2	Extraction force kg min.	Static load kg max.	Dyn. load C kg max.	Force required for movement kg max.
65510.W0005	10.0	9	0.65	10.2	7	-	3	50	20	3
65510.W0006	12.5	11	0.70	11.5	8	-	4	100	40	4
65510.W0008	16.5	13	1.15	14.0	11	-	6	200	80	6
65510.W0010	20.0	16	1.15	15.5	13	-	8	400	160	8
65510.W0012	20.0	16	1.15	15.5	13	-	8	400	160	8
65510.W0014	28.0	20	0.50	21.5	16	19	10	800	320	10
65510.W0015	28.0	20	0.50	21.5	16	19	10	800	320	10
65510.W0016	28.0	20	0.50	21.5	16	19	10	800	320	10

Parts overview

Ball and Socket Joints

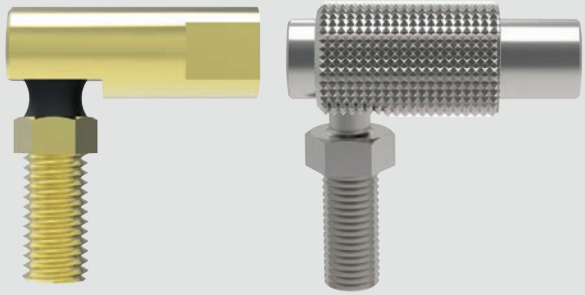
Ball and socket joints to DIN 71802 available in zinc plated steel and stainless steel. Right and left hand threads available. Sizes M5 up to M16.

Axial Ball and Socket Joints

In-line ball and socket joints to DIN 71802 available in zinc plated steel and stainless steel. Sizes M5 up to M14 x 1,5.

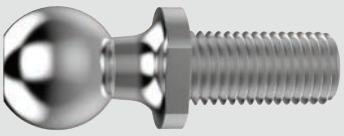
Ball and Socket Joints with sealing caps and spanner flats

Ball and socket joints to DIN 71802 available in zinc plated steel and stainless steel. Right and left hand threads available. Spanner flats on housing to aid installation. Sizes M5 up to M16.



Quick Release plus other ball and socket joints

Quick release ball joints allow rapid release and reconnection of ball stud for easy installation. DMG6 and male:male ball joints and lockable also available. Sizes M5 up to M10.



Threaded Ball Studs

Threaded ball studs to DIN71803 form C available in zinc plated steel. Sizes M5 up to M14.

see our website for our full range:
wixroyd.com

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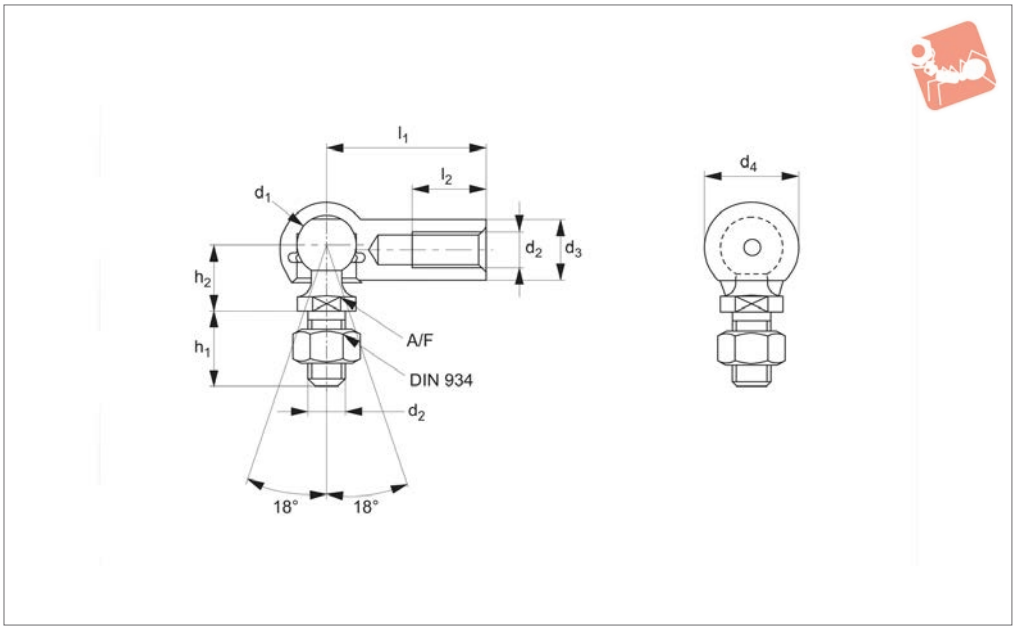


65504

Material
Stainless steel (A2, AISI 303).

Technical Notes
To DIN 71802 form CS, supplied with hexagon nut.
Safety ring aids the retention of the ball stud in the housing.
*M14x1,5 is a fine pitch thread.

Tips
For sealing cap version, see , standard thread is right hand, (for left hand thread see 65506).

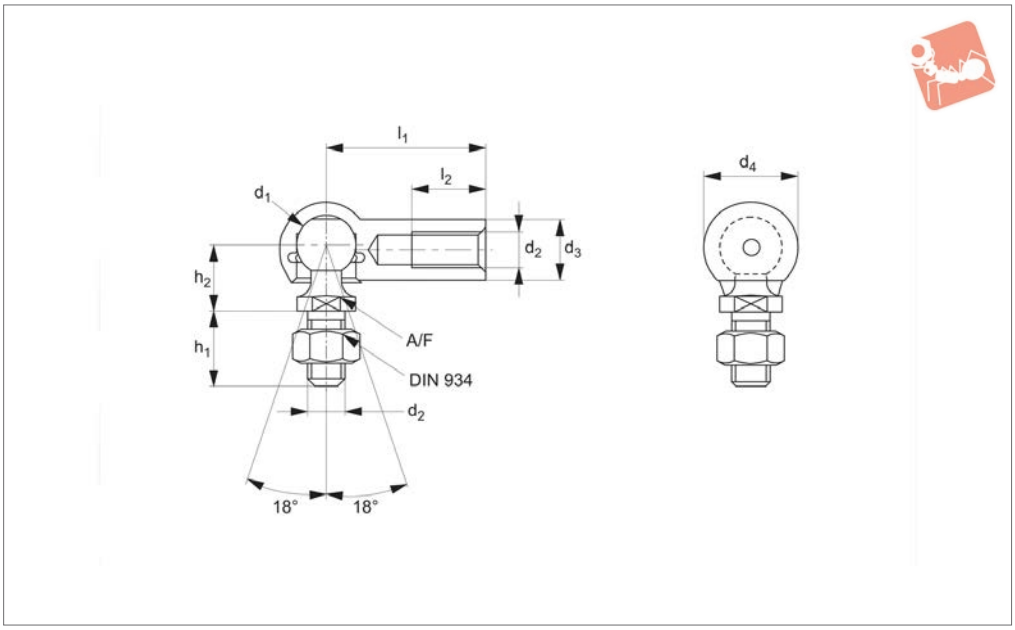
Important Notes
Thread is not full length. There is a min 1.5mm unthreaded shank. If using part without the supplied nut, then please consider a counterbore to accommodate the unthreaded shank.

Order No.	Thread hand	d_1	l_1 ±0.3	d_2	d_3	d_4	h_1 ±0.3	Weight g
65504.W0005	Right	8	22	M 5	8	12.8	10.2	15.2
65504.W0006	Right	10	25	M 6	10	14.8	12.5	25.2
65504.W0008	Right	13	30	M 8	13	19.3	16.5	53.1
65504.W0010	Right	16	35	M10	16	24.0	20.0	103.8
65504.W0012	Right	16	35	M12	16	24.0	20.0	103.8
65504.W0014	Right	19	45	M14x1,5*	22	30.0	28.0	220.9
65504.W0015	Right	19	45	M14	22	30.0	28.0	220.9
65504.W0016	Right	19	45	M16	22	30.0	28.0	220.9

Order No.	h_2 ±0.3	l_2 min.	A/F tol. h14	Extraction force kg min.	Static load kg max.	Dyn. load C kg max.	Force required for movement kg max.
65504.W0005	9	10.2	7	3	50	20	3
65504.W0006	11	11.5	8	4	100	40	4
65504.W0008	13	14.0	11	6	200	80	6
65504.W0010	16	15.5	13	8	400	160	8
65504.W0012	16	15.5	13	8	400	160	8
65504.W0014	22	21.5	16	10	800	320	10
65504.W0015	22	21.5	16	10	800	320	10
65504.W0016	22	21.5	16	10	800	320	10

Stainless Ball and Socket Joints
left hand thread

65506



Material
Stainless steel (A2, AISI 303).

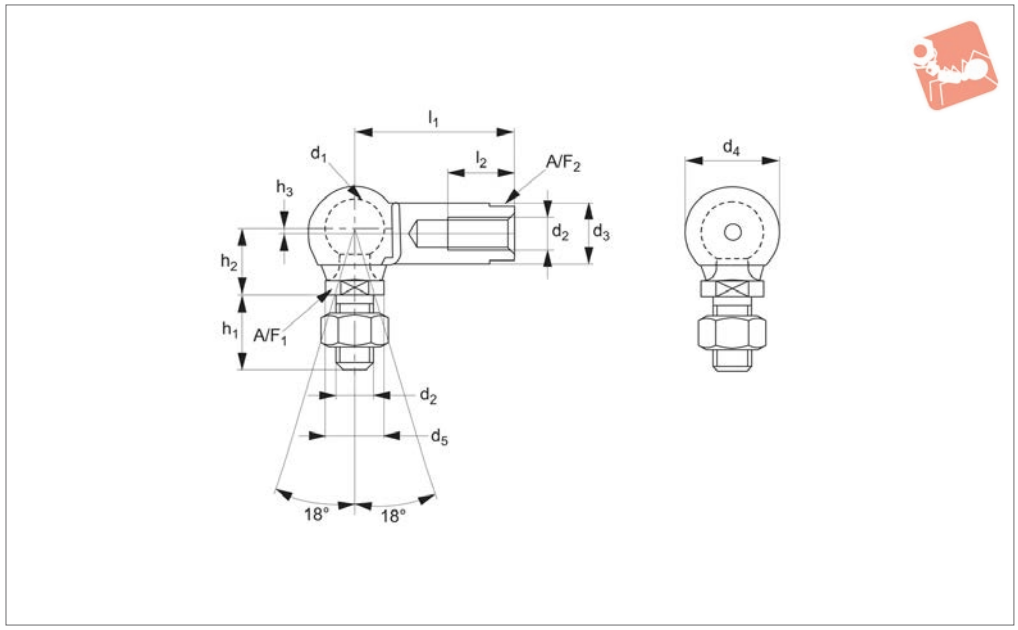
Technical Notes
To DIN 71802 form CS, supplied with hexagon nut.
Safety ring aids the retention of the ball stud in the housing.
*M14x1,5 is a fine pitch thread.

Tips
Stud: right hand thread.
Housing: left hand thread
For sealing cap version, see .

Important Notes
Thread is not full length. There is a min 1.5mm unthreaded shank. If using part without the supplied nut, then please consider a counterbore to accommodate the unthreaded shank.

Order No.	Thread hand	d_1	l_1 ±0.3	d_2	d_3	d_4	h_1 ±0.3	Weight g
65506.W0005	Left	8	22	M 5	8	12.8	10.2	15.2
65506.W0006	Left	10	25	M 6	10	14.8	12.5	25.2
65506.W0008	Left	13	30	M 8	13	19.3	16.5	53.1
65506.W0010	Left	16	35	M10	16	24.0	20.0	103.8
65506.W0012	Left	16	35	M12	16	24.0	20.0	103.8
65506.W0014	Left	19	45	M14x1,5*	22	30.0	28.0	220.9
65506.W0015	Left	19	45	M14	22	30.0	28.0	220.9
65506.W0016	Left	19	45	M16	22	30.0	28.0	220.9

Order No.	h_2 ±0.3	l_2 min.	A/F tol. h14	Extraction force kg min.	Static load kg max.	Dyn. load C kg max.	Force required for movement kg max.
65506.W0005	9	10.2	7	3	50	20	3
65506.W0006	11	11.5	8	4	100	40	4
65506.W0008	13	14.0	11	6	200	80	6
65506.W0010	16	15.5	13	8	400	160	8
65506.W0012	16	15.5	13	8	400	160	8
65506.W0014	22	21.5	16	10	800	320	10
65506.W0015	22	21.5	16	10	800	320	10
65506.W0016	22	21.5	16	10	800	320	10



65512

Material
Stainless steel (A2, AISI 303), sealing cap: neoprene.

Technical Notes
To DIN 71802 form CS, supplied with hexagon nut.
Safety ring aids the retention of the ball stud in the housing.
*M14x1,5 is a fine pitch thread.

Tips
Standard thread is right hand, (for left hand thread see 65514).

Important Notes
Thread is not full length. There is a min 1.5mm unthreaded shank. If using part without the supplied nut, then please consider a counterbore to accommodate the unthreaded shank.

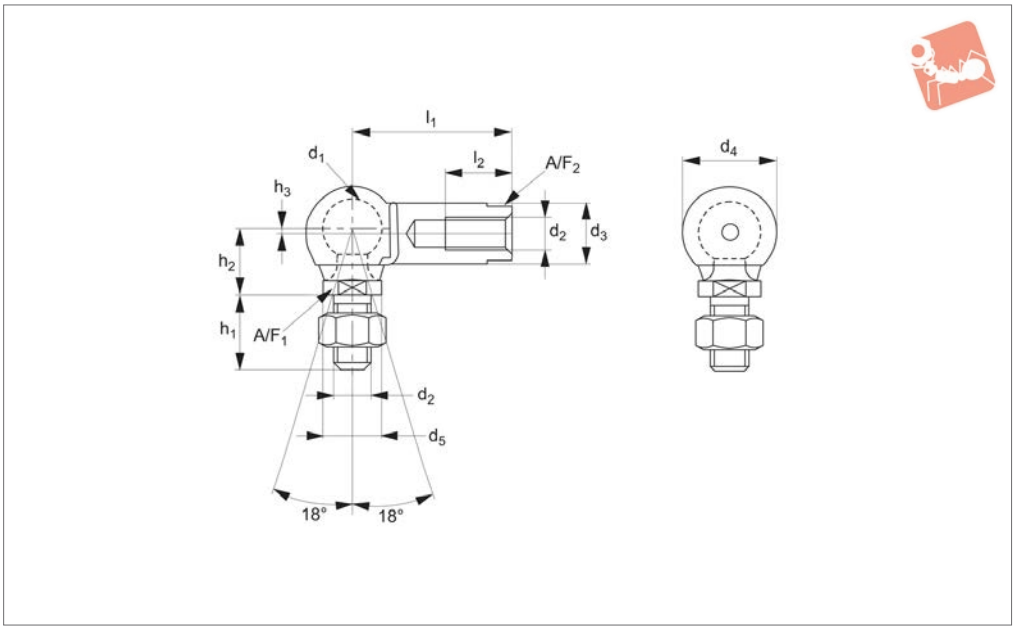
Order No.	Thread hand	d_1	l_1 ±0.3	d_2	d_3 ±0.5	d_4 ±0.5	d_5 ±0.5	h_1 ±0.3	h_2 ±0.3	h_3	Weight g
65512.W0105	Right	8	22	M5	8	12.8	8	10.0	9	0.65	15.2
65512.W0106	Right	10	25	M6	10	14.8	10	12.5	11	0.70	25.2
65512.W0108	Right	13	30	M8	13	19.3	13	16.5	13	1.15	53.1
65512.W0110	Right	16	35	M10	16	24.0	16	20.0	16	1.15	103.8
65512.W0112	Right	16	35	M12	16	24.0	16	20.0	16	1.15	103.8
65512.W0114	Right	19	45	M14x1,5*	22	30.0	22	28.0	20	0.50	220.9
65512.W0115	Right	19	45	M14	22	30.0	22	28.0	20	0.50	220.9
65512.W0116	Right	19	45	M16	22	30.0	22	28.0	20	0.50	220.9

Order No.	l_2 min.	A/F_1	A/F_2	Extraction force kg min.	Static load kg max.	Dyn. load C kg max.	Force required for movement kg max.
65512.W0105	10.2	7	-	3	50	20	3
65512.W0106	11.5	8	-	4	100	40	4
65512.W0108	14.0	11	-	6	200	80	6
65512.W0110	15.5	13	-	8	400	160	8
65512.W0112	15.5	13	-	8	400	160	8
65512.W0114	21.5	16	19	10	800	320	10
65512.W0115	21.5	16	19	10	800	320	10
65512.W0116	21.5	16	19	10	800	320	10

Stainless Ball and Socket Joint

left hand thread - with flats on housing

65514



Material
Stainless steel (A2, AISI 303), sealing cap: neoprene.

Technical Notes
To DIN 71802 form CS, supplied with hexagon nut.

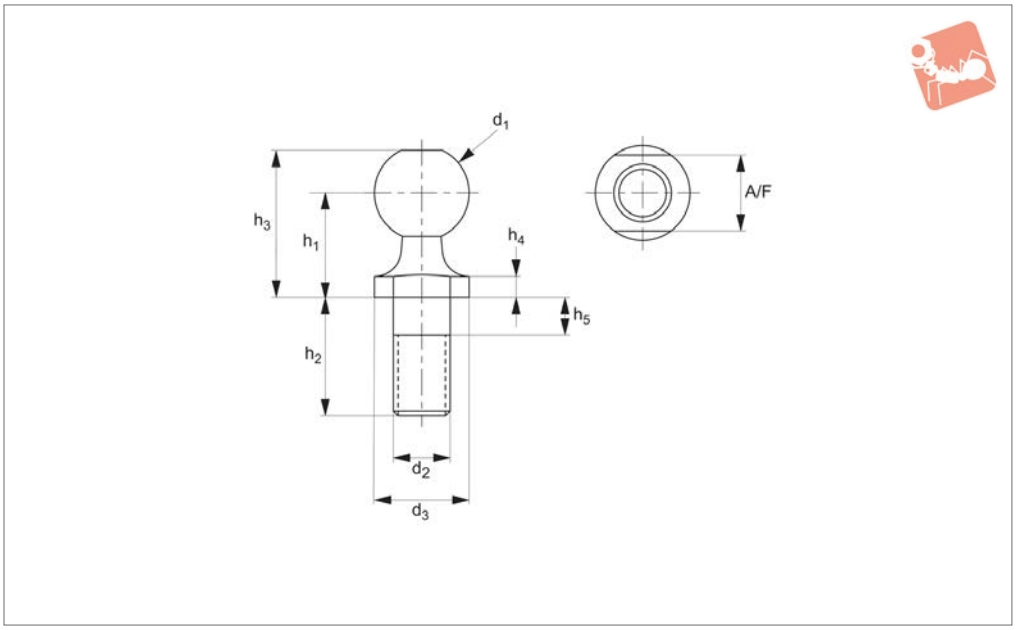
Safety ring aids the retention of the ball stud in the housing.
*M14x1,5 is a fine pitch thread.

Tips
Stud: right hand thread.
Housing: left hand thread

Important Notes
Thread is not full length. There is a min 1.5mm unthreaded shank. If using part without the supplied nut, then please consider a counterbore to accommodate the unthreaded shank.

Order No.	Thread hand	d_1	l_1 ±0.3	d_2	d_3 ±0.5	d_4 ±0.5	d_5 ±0.5	h_1 ±0.3	h_2 ±0.3	h_3	Weight g
65514.W0005	Left	8	22	M5	8	12.8	8	10.0	9	0.65	15.2
65514.W0006	Left	10	25	M6	10	14.8	10	12.5	11	0.70	25.2
65514.W0008	Left	13	30	M8	13	19.3	13	16.5	13	1.15	53.1
65514.W0010	Left	16	35	M10	16	24.0	16	20.0	16	1.15	103.8
65514.W0012	Left	16	35	M12	16	24.0	16	20.0	16	1.15	103.8
65514.W0014	Left	19	45	M14x1,5*	22	30.0	22	28.0	20	0.50	220.9
65514.W0015	Left	19	45	M14	22	30.0	22	28.0	20	0.50	220.9
65514.W0016	Left	19	45	M16	22	30.0	22	28.0	20	0.50	220.9

Order No.	l_2 min.	A/F_1	A/F_2	Extraction force kg min.	Static load kg max.	Dyn. load C kg max.	Force required for movement kg max.
65514.W0005	10.2	7	-	3	50	20	3
65514.W0006	11.5	8	-	4	100	40	4
65514.W0008	14.0	11	-	6	200	80	6
65514.W0010	15.5	13	-	8	400	160	8
65514.W0012	15.5	13	-	8	400	160	8
65514.W0014	21.5	16	19	10	800	320	10
65514.W0015	21.5	16	19	10	800	320	10
65514.W0016	21.5	16	19	10	800	320	10



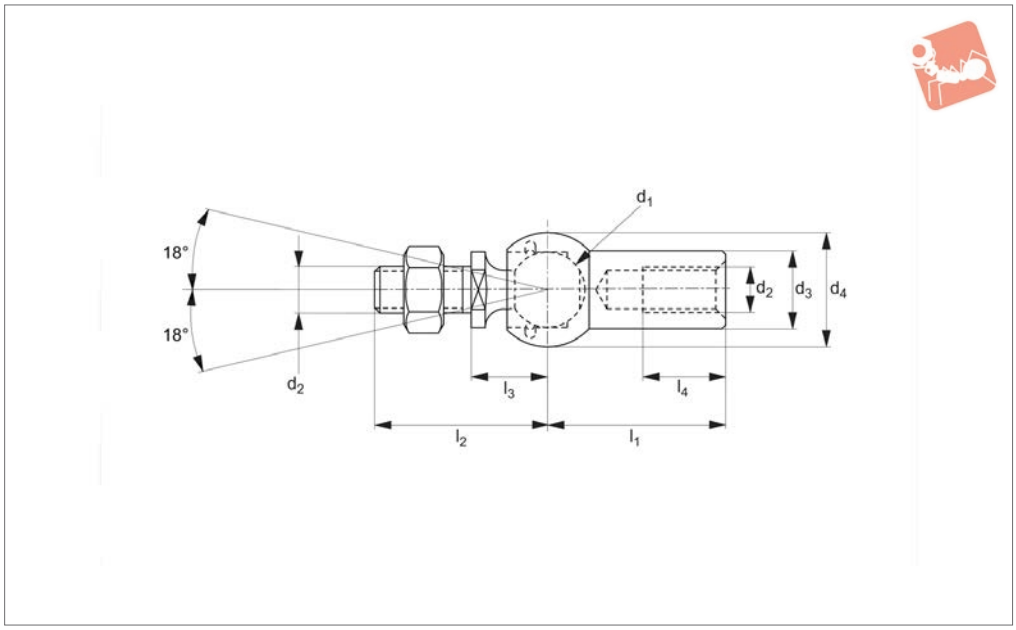
65550

Material
Low carbon steel (1018), silver zinc plated.

Technical Notes
To DIN 71803 Form C, *M14x1.5 is a fine pitch thread.

Order No.	d_1 tol. h9	d_2	d_3 +0.0|-0.2	h_1 ±0.3	h_2 ±0.3	h_3 ±0.3	h_4 +0.4|-0.0	h_5 max.	A/F	Weight g
65550.W0005	8.0	M5	8.0	9.0	10.2	12.5	2.0	4.0	7.0	4.5
65550.W0006	10.0	M6	10.0	11.0	12.5	15.5	2.2	4.0	8.0	8.5
65550.W0008	13.0	M8	13.0	13.0	16.5	18.5	2.4	5.3	11.0	17.7
65550.W0010	16.0	M10	16.0	16.0	20.0	23.0	2.7	7.3	13.0	35.0
65550.W0012	16.0	M12	16.0	16.0	20.0	23.0	2.7	7.3	13.0	35.0
65550.W0014	19.0	M14 x 1.5*	19.0	20.0	28.0	28.5	3.0	10.8	16.0	71.2
65550.W0015	19.0	M14	19.0	20.0	28.0	28.5	3.0	10.8	16.0	71.2
65550.W0016	19.0	M16	19.0	20.0	28.0	28.5	3.0	10.8	16.0	71.2

65520

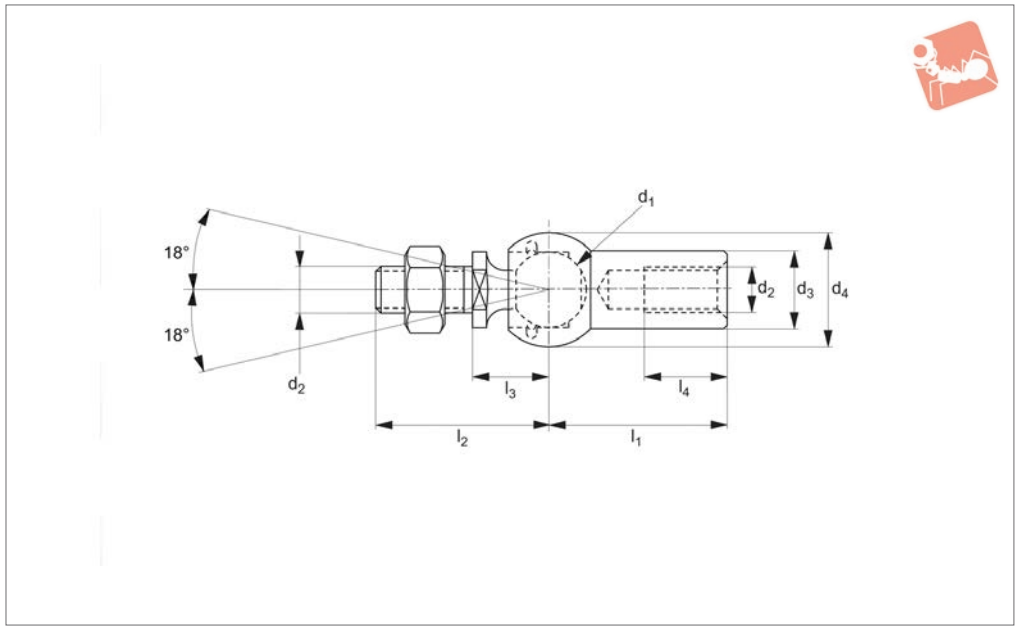


Material
Steel, silver zinc plated, ball stud: minimum tensile strength Rm=600N/mm².
Housing: minimum tensile strength Rm=500N/mm².

Technical Notes
Similar to DIN 71802, *M14x1,5 is a fine pitch thread.

Tips
Standard thread is right hand, (for left hand thread see 65522).
For stainless steel version see 65524.

Order No.	Thread hand	d_1 tol. h9	d_2	l_1	d_3 ±0.5	d_4 ±0.5	l_2	l_3	l_4	Extraction force N	Weight g
65520.W0005	Right	8	M 5	22	8	12.8	19.2	9	10.2	30	15.2
65520.W0006	Right	10	M 6	25	10	14.8	23.5	11	11.5	40	25.2
65520.W0008	Right	13	M 8	30	13	19.3	29.5	13	14.0	60	53.1
65520.W0010	Right	16	M10	35	16	24.0	36.0	16	15.5	80	103.8
65520.W0014	Right	19	M14x1,5*	45	22	30.0	48.0	20	21.5	100	220.9



65522

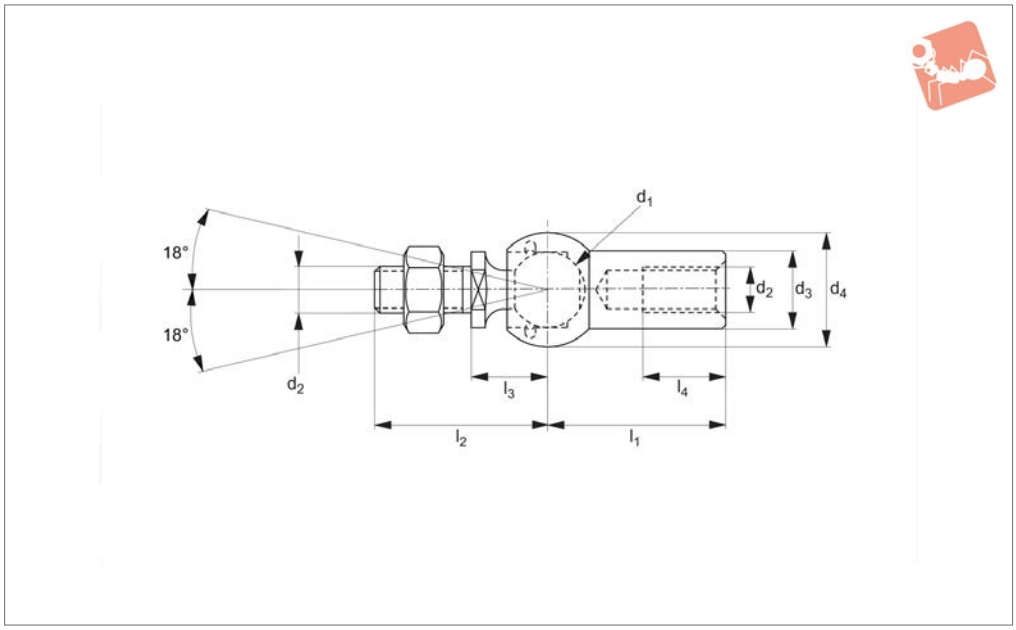
Material
Steel, silver zinc plated, ball stud: minimum tensile strength Rm=600N/mm². Housing: minimum tensile strength Rm=500N/mm².

Technical Notes
Similar to DIN 71802, *M14x1,5 is a fine pitch thread.

Tips
For stainless steel version see 65526.

Order No.	Thread hand	d_1 tol. h9	d_2	l_1	d_3 ±0.5	d_4 ±0.5	l_2	l_3	l_4	Extraction force N	Weight g
65522.W0005	Left	8	M5	22	8	12.8	19.2	9	10.2	30	15.2
65522.W0006	Left	10	M6	25	10	14.8	23.5	11	11.5	40	25.2
65522.W0008	Left	13	M8	30	13	19.3	29.5	13	14.0	60	53.1
65522.W0010	Left	16	M10	35	16	24.0	36.0	16	15.5	80	103.8
65522.W0014	Left	19	M14x1,5*	45	22	30.0	48.0	20	21.5	100	220.9

65524

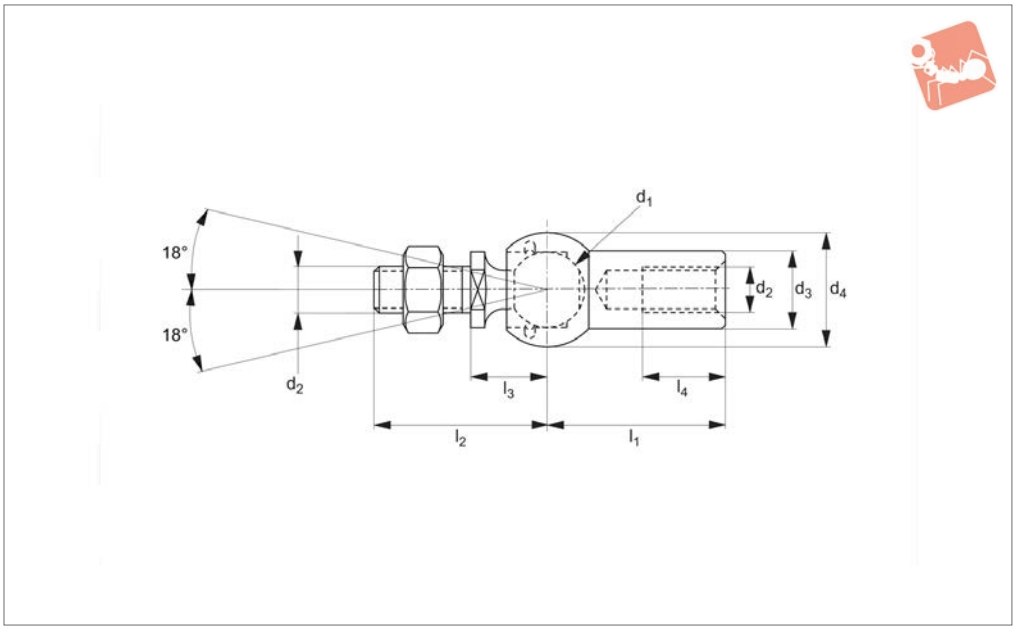


Material
Stainless steel (AISI 303).

Technical Notes
Similar to DIN 71802, *M14x1,5 is a fine pitch thread.

Tips
Standard thread is right hand, (for left hand thread see 65526).

Order No.	Thread hand	d_1 tol. h9	d_2	l_1	d_3 ±0.5	d_4 ±0.5	l_2	l_3	l_4	Extraction force N	Weight g
65524.W0005	Right	8	M5	22	8	12.8	19.2	9	10.2	30	15.2
65524.W0006	Right	10	M6	25	10	14.8	23.5	11	11.5	40	25.2
65524.W0008	Right	13	M8	30	13	19.3	29.5	13	14.0	60	53.1
65524.W0010	Right	16	M10	35	16	24.0	36.0	16	15.5	80	103.8
65524.W0014	Right	19	M14x1,5*	45	22	30.0	48.0	20	21.5	100	220.9



65526

Material
Stainless steel (AISI 303).

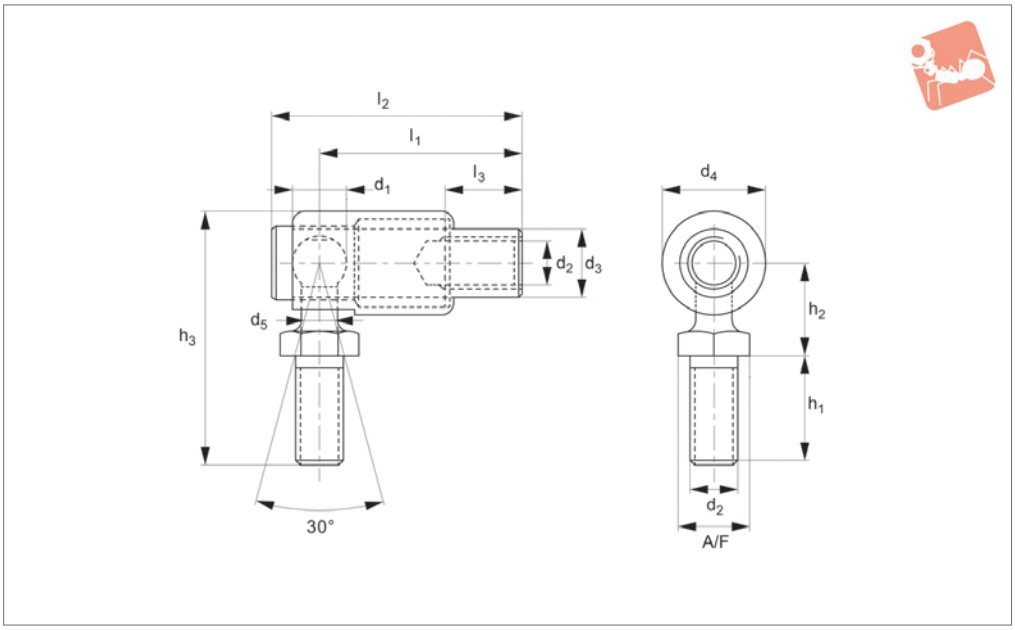
Technical Notes
Similar to DIN 71802, *M14x1,5 is a fine pitch thread.

Order No.	Thread hand	d_1 tol. h9	d_2	l_1	d_3 ±0.5	d_4 ±0.5	l_2	l_3	l_4	Extraction force N	Weight g
65526.W0005	Left	8	M5	22	8	12.8	19.2	9	10.2	30	15.2
65526.W0006	Left	10	M6	25	10	14.8	23.5	11	11.5	40	25.2
65526.W0008	Left	13	M8	30	13	19.3	29.5	13	14.0	60	53.1
65526.W0010	Left	16	M10	35	16	24.0	36.0	16	15.5	80	103.8
65526.W0014	Left	19	M14x1,5*	45	22	30.0	48.0	20	21.5	100	220.9

Quick Release Ball Joints

A2 stainless and steel, zinc-plated

65542



Material

Body: stainless steel (A2, AISI 303) or steel zinc-plated.
Shield and ball stud: carbon steel.
Body and ball stud: case hardened.
Spring: (302 S26) stainless steel or equivalent, zinc plated.

Technical Notes

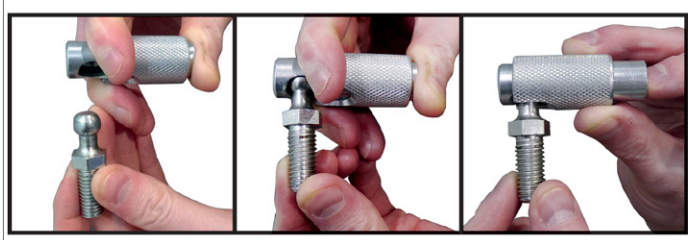
The spring loaded outer shield allows both rapid release and reconnection of the ball stud.
Linkage assemblies can be installed or removed without disturbing pre-set centres.

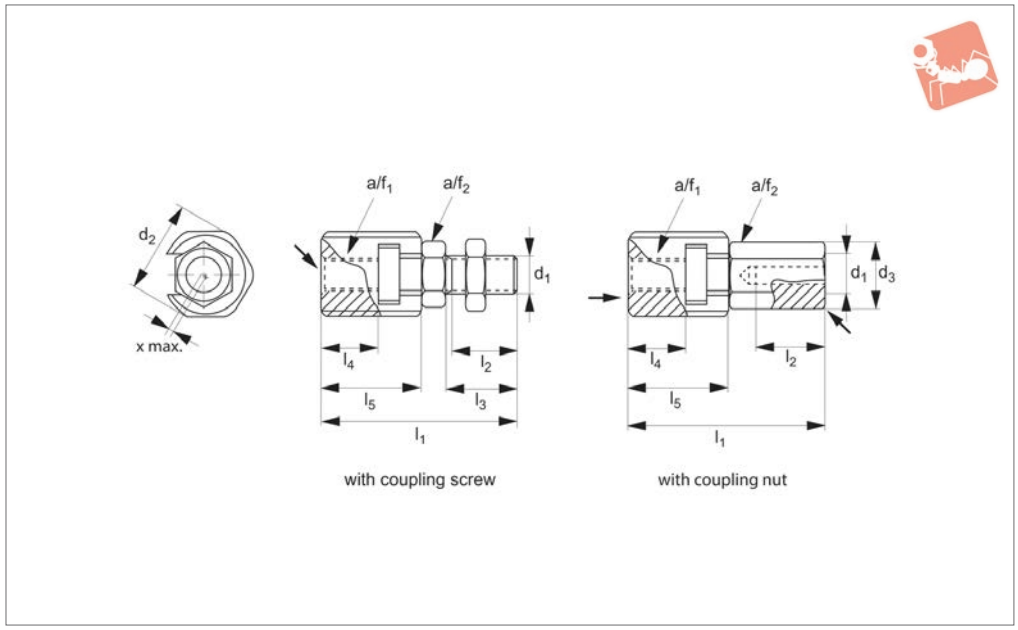
These are metric equivalents to SAE J 490 Style 1 quick release detachable ball joints.

Tips

Standard thread is a right hand thread.

Order No.	Thread hand	d_1	d_2	l_1	l_2	d_3	d_4	d_5	h_1	h_2	h_3	l_3	A/F	Weight g
65542.W0105	Right	6.35	M 5	23.0	28	7.9	11.1	4.35	11.1	11.9	28.6	11.1	8	17
65542.W0106	Right	7.9	M 6	24.6	30	9.4	13.0	4.95	12.6	12.6	33.4	13.0	10	25
65542.W0108	Right	8.6	M 8	31.7	40	11.1	16.0	5.8	15.2	15.2	40.6	14.3	11	48
65542.W0110	Right	10.7	M10	39.7	49	14.1	19.0	6.85	19.8	19.8	51.4	27.0	13	78





64500

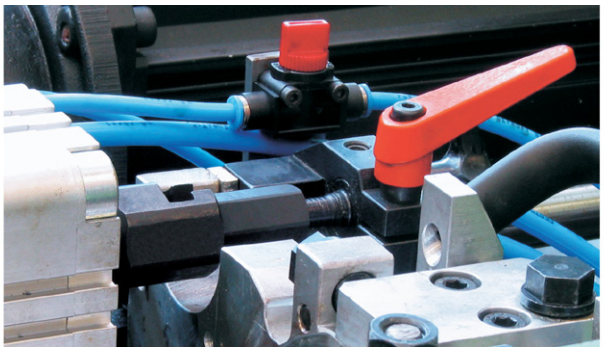
Material
Body: steel, heat-treated, phosphated.
Lock nut: steel, blackened (ISO 4035/ 8675).

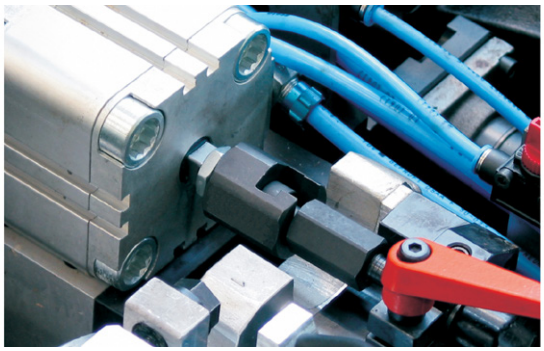
Technical Notes
For quick coupling/uncoupling of components within a linear movement application, with the additional advantage of compensating for radial off-set between the components. In built adjustment feature of the quick plug coupling means manual adjustment of the coupled units is unnecessary. Coupling via means of a t-slot channel within the coupling nut.

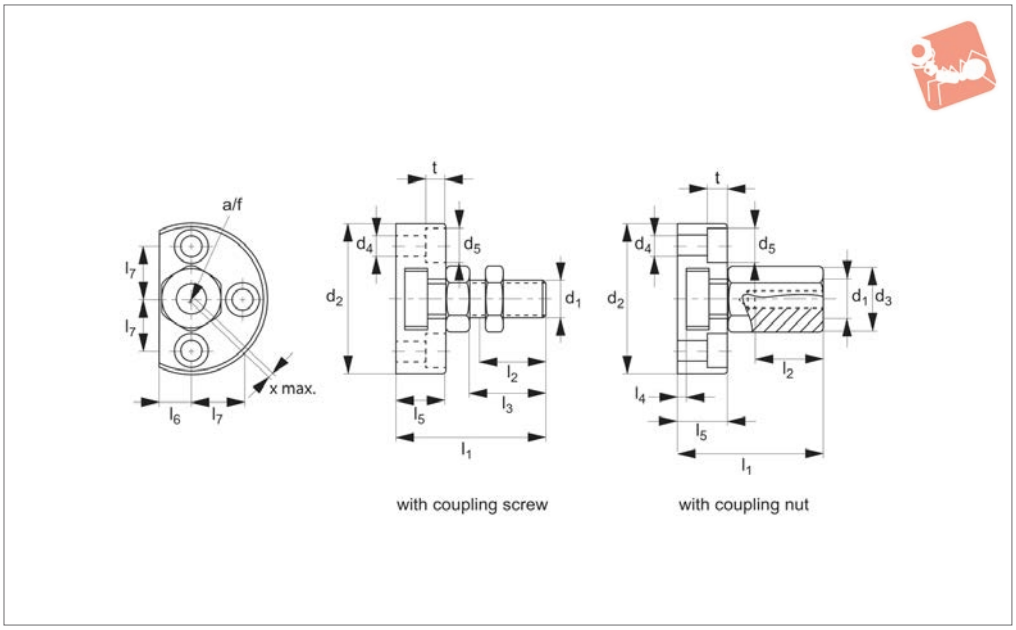
Tips
Can be linked to pneumatic and hydraulic lifting cylinders in many different applications.
Important note: suitable for linear movement applications, does not transmit any torque.

Order No.	Coupling Type	d_1	d_2	d_3	l_1 ≈	l_2 min.	l_3	l_4 min.	l_5	Tensile & compression load kN max.	A/F_1	A/F_2	Axial offset x max.	Weight g
64500.W0006	Screw	M_6	21,0		37,5	11,0	14	9,0	18,0	2,5	19	10	0,6	44
64500.W0008	Screw	M_8	26,0		45,0	13,5	17	11,5	22,5	4,5	24	13	0,7	86
64500.W0010	Screw	M10	30,0		56,2	16,0	20	16,0	29,0	6,5	27	17	0,7	147
64500.W0012	Screw	M12	32,5		66,7	21,0	25	17,0	34,0	10,0	30	19	0,8	208
64500.W0016	Screw	M16	39,0		83,0	25,0	30	23,0	42,0	18,0	36	24	1,0	383
64500.W0020	Screw	M20	44,0		93,5	29,0	35	23,5	45,5	30,0	41	30	1,0	571
64500.W0030	Screw	M10 x 1,25	30,0		56,2	16,0	20	16,0	29,0	6,5	27	17	0,7	147
64500.W0032	Screw	M12 x 1,25	32,5		66,7	21,0	25	17,0	34,0	10,0	30	19	0,8	207
64500.W0036	Screw	M16 x 1,50	39,0		83,0	25,0	30	23,0	42,0	18,0	36	24	1,0	384
64500.W0040	Screw	M20 x 1,50	44,0		93,5	29,0	35	23,5	45,5	30,0	41	30	1,0	576
64500.W0056	Nut	M_6	21,0	11,0	37,5	11,0		9,0	18,0	2,5	19	10	0,6	47
64500.W0058	Nut	M_8	26,0	14,4	45,0	13,5		11,5	22,5	4,0	24	13	0,7	91
64500.W0060	Nut	M10	30,0	19,0	56,2	15,0		16,0	29,0	6,5	27	17	0,7	160
64500.W0062	Nut	M12	32,5	21,2	66,7	17,5		17,0	34,0	10,0	30	19	0,8	223
64500.W0066	Nut	M16	39,0	27,0	83,0	22,0		23,0	42,0	18,0	36	24	1,0	401
64500.W0070	Nut	M20	44,0	34,0	93,5	25,0		23,5	45,5	30,0	41	30	1,0	606
64500.W0080	Nut	M10 x 1,25	30,0	19,0	56,2	15,0		16,0	29,0	6,5	27	17	0,7	159
64500.W0082	Nut	M12 x 1,25	32,5	21,2	66,7	17,5		17,0	34,0	10,0	30	19	0,8	221
64500.W0086	Nut	M16 x 1,50	39,0	27,0	83,0	22,0		23,0	42,0	18,0	36	24	1,0	400
64500.W0090	Nut	M20 x 1,50	44,0	34,0	93,5	25,0		23,5	45,5	30,0	41	30	1,0	601

Quick Plug Couplings
with radial offset compensation







64600

Material
Body: steel, heat-treated, tempered, phosphated.
Lock nut: steel, blackened (ISO 4035/8675).

Technical Notes
For quick coupling/uncoupling of components within a linear movement application, with the additional advantage of compensating for radial off-set between the components. In built adjustment feature of the quick plug coupling means manual adjustment of the coupled units is unnecessary. Coupling via means of a t-slot channel within the coupling nut.
*kN max is the maximum tensile and compression load.

Tips
Ideal quick coupler where space is limited. Can be linked to pneumatic and hydraulic lifting cylinders in many different applications.
Important note: suitable for linear movement applications, does not transmit any torque.

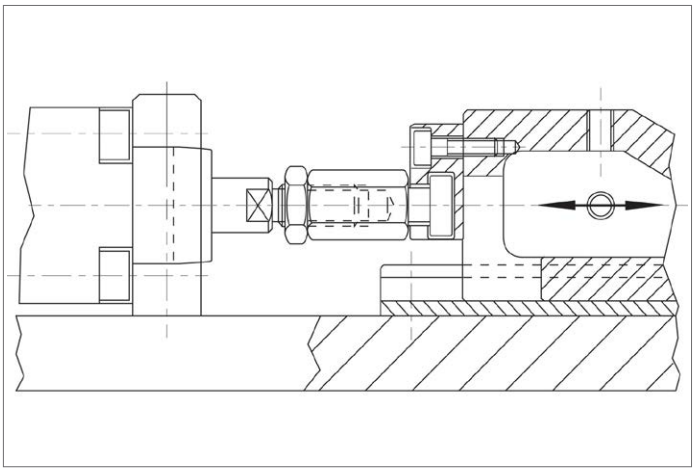
Order No.	Coupling Type	d_1	d_2	d_3	d_4	d_5	Weight g
64600.W0206	Screw	M_6	42	-	5.5	10	75
64600.W0208	Screw	M_8	48	-	6.6	11	116
64600.W0210	Screw	M10	50	-	6.6	11	175
64600.W0212	Screw	M12	55	-	6.6	11	281
64600.W0216	Screw	M16	65	-	9.0	15	458
64600.W0220	Screw	M20	80	-	11.0	18	817
64600.W0230	Screw	M10x1,25	50	-	6.6	11	176
64600.W0232	Screw	M12x1,25	55	-	6.6	11	280
64600.W0236	Screw	M16x1,50	65	-	9.0	15	454
64600.W0240	Screw	M20x1,50	80	-	11.0	18	850
64600.W0256	Nut	M_6	42	11.0	5.5	10	77
64600.W0258	Nut	M_8	48	14.4	6.6	11	123
64600.W0260	Nut	M10	50	19.0	6.6	11	187
64600.W0262	Nut	M12	55	21.2	6.6	11	295
64600.W0266	Nut	M16	65	27.0	9.0	15	472
64600.W0270	Nut	M20	80	34.0	11.0	18	849
64600.W0280	Nut	M10x1,25	50	19.0	6.6	11	187
64600.W0282	Nut	M12x1,25	55	21.2	6.6	11	298
64600.W0286	Nut	M16x1,50	65	27.0	9.0	15	477
64600.W0290	Nut	M20x1,50	80	34.0	11.0	18	852

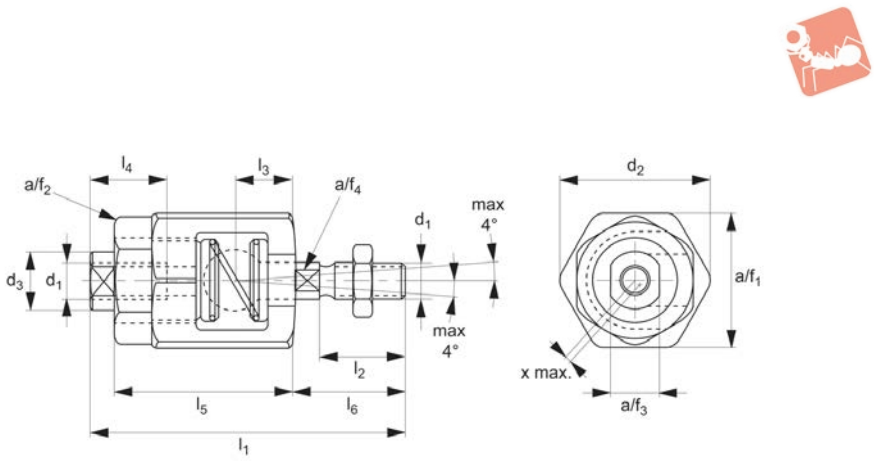
Order No.	l_1 ≈	l_2 min.	l_3	l_4	l_5	l_6	l_7	A/F	t	Axial offset x max.	kN kN max.
64600.W0206	30.5	11.0	14	3.0	11.0	7.0	14.0	10	5.4	0.6	2.5
64600.W0208	35.5	13.5	17	3.0	13.0	8.0	16.0	13	6.4	0.7	4.5
64600.W0210	43.2	16.0	20	4.2	16.0	9.0	17.0	17	6.4	0.7	6.5

Quick Plug Couplings

with radial offset compensation and screwed flange

Order No.	l_1 ≈	l_2 min.	l_3	l_4	l_5	l_6	l_7	A/F	t	Axial offset x max.	kN kN max.
64600.W0212	53.2	21.0	25	4.2	20.5	10.0	19.0	19	6.4	0.8	10.0
64600.W0216	64.0	25.0	30	5.0	23.0	12.5	22.5	24	8.5	1.0	18.0
64600.W0220	74.0	29.0	35	5.0	26.0	17.0	28.0	30	10.4	1.0	30.0
64600.W0230	43.2	16.0	20	4.2	16.0	9.0	17.0	17	6.4	0.7	6.5
64600.W0232	53.2	21.0	25	4.2	20.5	10.0	19.0	19	6.4	0.8	10.0
64600.W0236	64.0	25.0	30	5.0	23.0	12.5	22.5	24	8.5	1.0	18.0
64600.W0240	74.0	29.0	35	5.0	26.0	17.0	28.0	30	10.0	1.0	30.0
64600.W0256	30.5	11.0	-	3.0	11.0	7.0	14.0	10	5.4	0.6	2.5
64600.W0258	35.5	13.5	-	3.0	13.0	8.0	16.0	13	6.4	0.7	4.5
64600.W0260	43.2	15.0	-	4.2	16.0	9.0	17.0	17	6.4	0.7	6.5
64600.W0262	53.2	17.5	-	4.2	20.5	10.0	19.0	19	6.4	0.8	10.0
64600.W0266	64.0	22.0	-	5.0	23.0	12.5	22.5	24	8.5	1.0	18.0
64600.W0270	74.0	25.0	-	5.0	26.0	17.0	28.0	30	10.0	1.0	30.0
64600.W0280	43.2	15.0	-	4.2	16.0	9.0	17.0	17	6.4	0.7	6.5
64600.W0282	53.2	17.5	-	4.2	20.5	10.0	19.0	19	6.4	0.8	10.0
64600.W0286	64.0	22.0	-	5.0	23.0	12.5	22.5	24	8.5	1.0	18.0
64600.W0290	74.0	25.0	-	5.0	26.0	17.0	28.0	30	10.0	1.0	30.0





64700

Material
Body: steel, heat-treated, tempered, phosphated.
Nut: steel, heat-treated, phosphated.
Spring: stainless steel.
Coupling part: steel, heat-treated, nitrided, blackened.
Lock nut: steel, blackened (ISO 4035/8675).

Technical Notes
Compensates for both radial off-set and angular off-set between the components, making it ideal for applications with non-aligned linear components. Inbuilt adjustment feature of the quick plug coupling means manual adjustment of the coupled units is unnecessary. Coupling via means of a t-slot channel within the coupling nut.

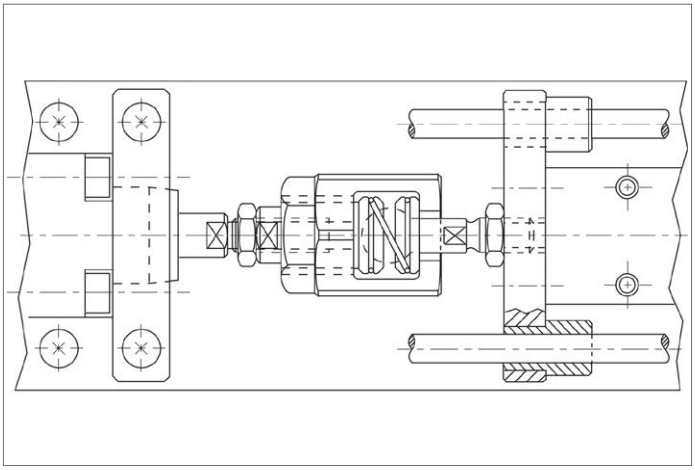
Tips
Solid and compact design, no loose elements. Can be linked to pneumatic and hydraulic lifting cylinders in many different applications.
Important note: suitable for linear movement applications, does not transmit any torque.

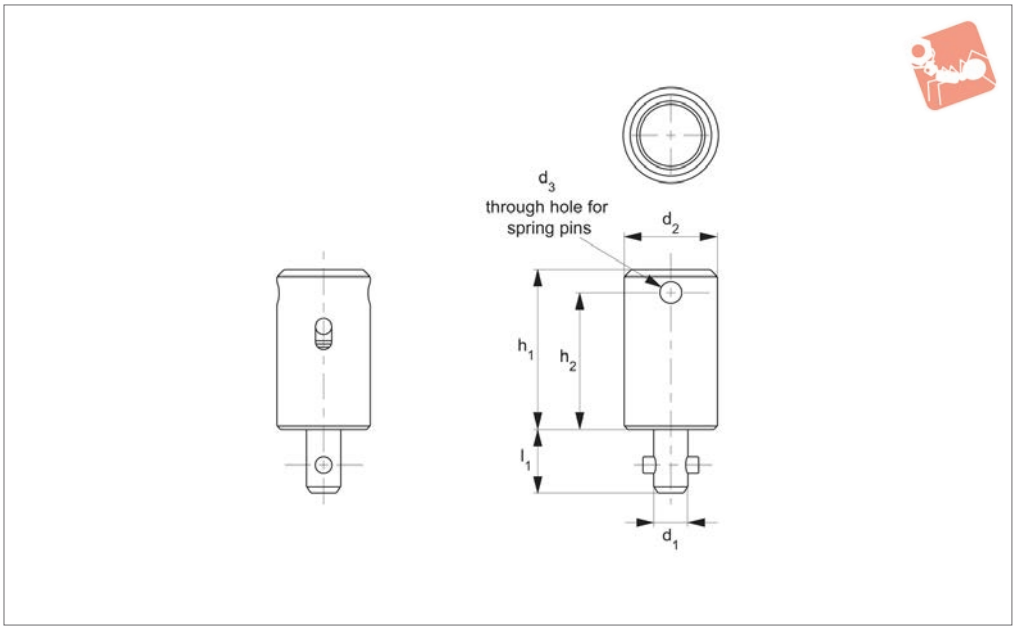
Order No.	d_1	d_2	d_3	l_1 ≈	l_2	l_3	Weight g
64700.W0406	M 6	24.5	9.6	52	14	9.5	75
64700.W0408	M 8	30.0	15.0	63	18	11.5	137
64700.W0410	M10	44.0	21.0	81	22	16.0	401
64700.W0412	M12	44.0	21.0	85	26	16.0	405
64700.W0416	M16	60.0	32.0	121	34	26.0	1127
64700.W0420	M20	60.0	32.0	129	42	26.0	1152
64700.W0430	M10x1,25	44.0	21.0	81	22	16.0	403
64700.W0432	M12x1,25	44.0	21.0	85	26	16.0	406
64700.W0436	M16x1,50	60.0	32.0	121	34	26.0	1128
64700.W0440	M20x1,50	60.0	32.0	129	42	26.0	1155

Order No.	l_4 min.	l_5	l_6	Radial offset compensation max.	Tensile load kN max.	A/F_1	A/F_2	A/F_3	A/F_4
64700.W0406	13	29	18.5	0.6	2.5	22	19	8	5
64700.W0408	16	33	23.5	0.6	4.5	27	24	13	7
64700.W0410	24	43	30.5	0.7	6.5	41	36	18	12
64700.W0412	24	43	34.5	0.7	10.0	41	36	18	12
64700.W0416	34	62	45.0	1.0	18.0	55	46	27	18
64700.W0420	34	62	53.0	1.0	30.0	55	46	27	18
64700.W0430	24	43	30.5	0.7	6.5	41	36	18	12
64700.W0432	24	43	34.5	0.7	10.0	41	36	18	12
64700.W0436	34	62	45.0	1.0	18.0	55	46	27	18
64700.W0440	34	62	53.0	1.0	30.0	55	46	27	18

Quick Plug Couplings

with angular radial offset compensation





64775

Material
Body: steel S45C, nickel plated.
Pin and Spring: stainless steel, SUS304

Technical Notes
For quick coupling/uncoupling of components within a linear movement application. Coupling via means of a 90°C turn of coupling into the cam locking receiver. Please order receivers separately, see part nos. 64780 and 64782.
Temperature resistant to 200 °C

Tips
Can be linked to pneumatic and hydraulic lifting cylinders in many different applications.

Important Notes
Suitable only for linear movement applications, does not transmit any torque.

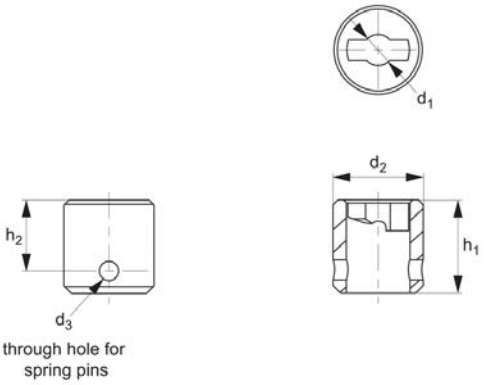
Actuation:
- Following installation dimensions for both coupling and receiver in introductory pages.
- Once coupling and receiver are correctly installed, align male coupling to female receiver, paying attention to correctly alight pins on the coupling's shaft to holes in receiver.
- Engage coupling and receiver, to lock turn shaft or block 90 degrees to clamp.
- When properly locked an audible „click" is heard.
- When properly installed, repeatability of upto +/- 0.08mm is achievable.
- To release, reverse steps described above.

Order No.	d_1 -0.04|-0.08	d_2 -0.04|-0.08	d_3	h_1	h_2	l_1	Shear strength N	Tensile strength N	Clamping force N max.	Weight g
64775.W0514	5	14	3	23.5	20	9.5	1800	1200	30	25

Receiver - Shaft Mount - Cam Locking

for Quick Plug Coupling no. 64775

64780



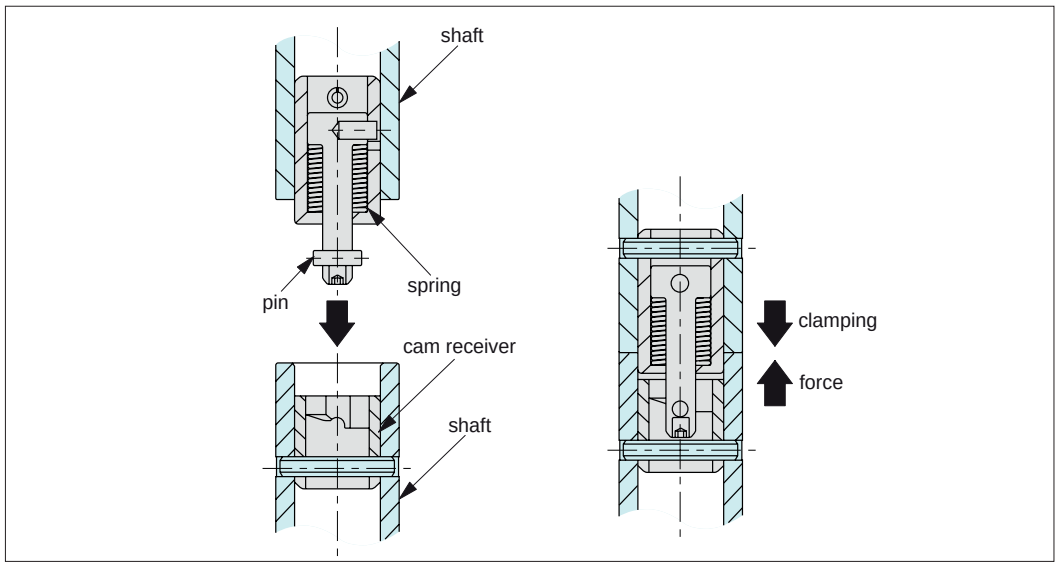
Material
Body: tempered steel SCM440, nickel plated.

Technical Notes
Receiver for use with quick plug coupling, cam locking no. 64775. Shaft mount version suited to installation on shafts; such as the end of pneumatic or hydraulic cylinders.
Temperature resistant to 200° C

Important Notes
Suitable only for linear movement applications, does not transmit any torque.

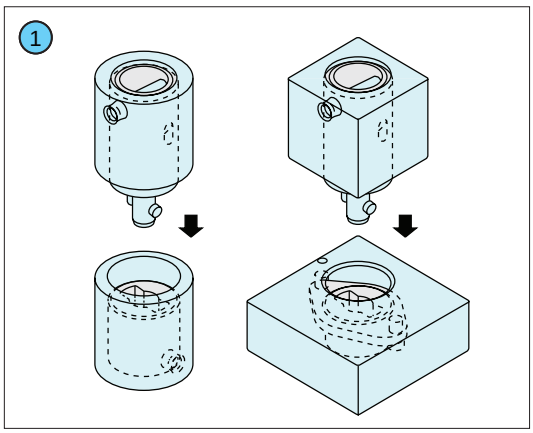
Order No.	d_1 +0.08|+0.04	d_2 tol. h9	d_3	h_1	h_2	Weight g
64780.W0514	5	14	3	14.5	11	10

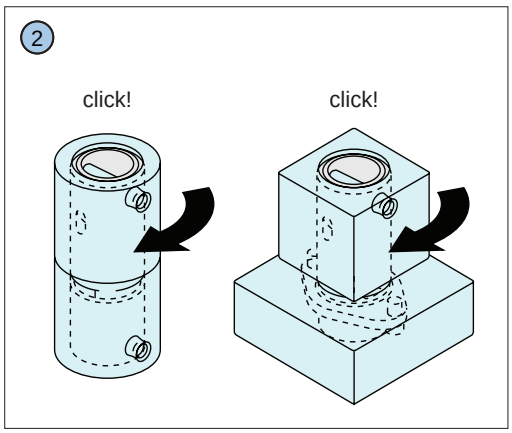
Operating Principle



When the male quick plug coupling is fully inserted into the receiver and actuated, the internal spring is compressed to clamp the shaft.

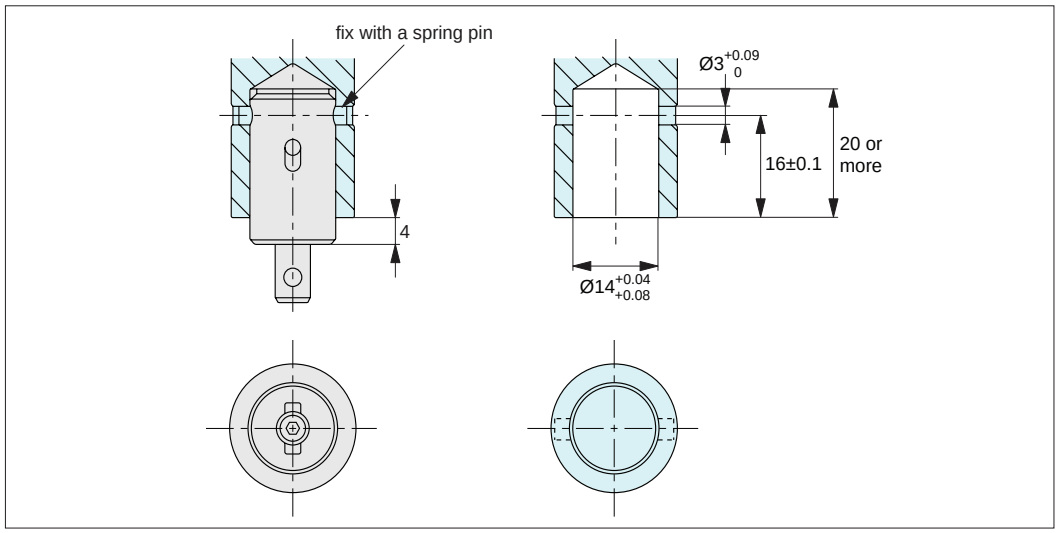
Operating Instructions





1. Insert the shaft into the keyway of cam receiver.
2. Rotate the shaft block 90° to clamp the element. An audible click can be heard when clamped. For unclamping, reverse these steps.

Operating Dimensions

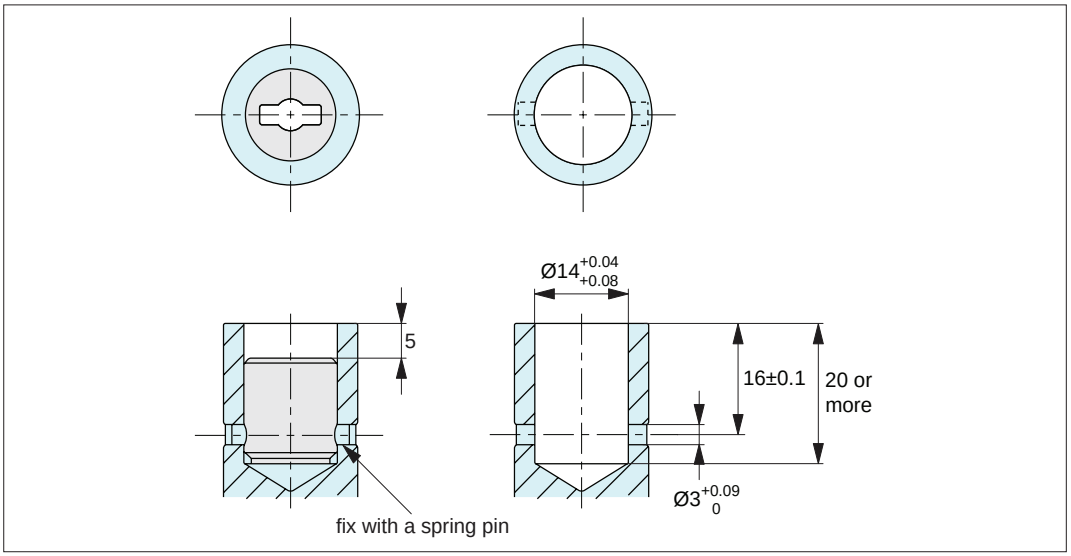


How to mount shaft coupling clamp

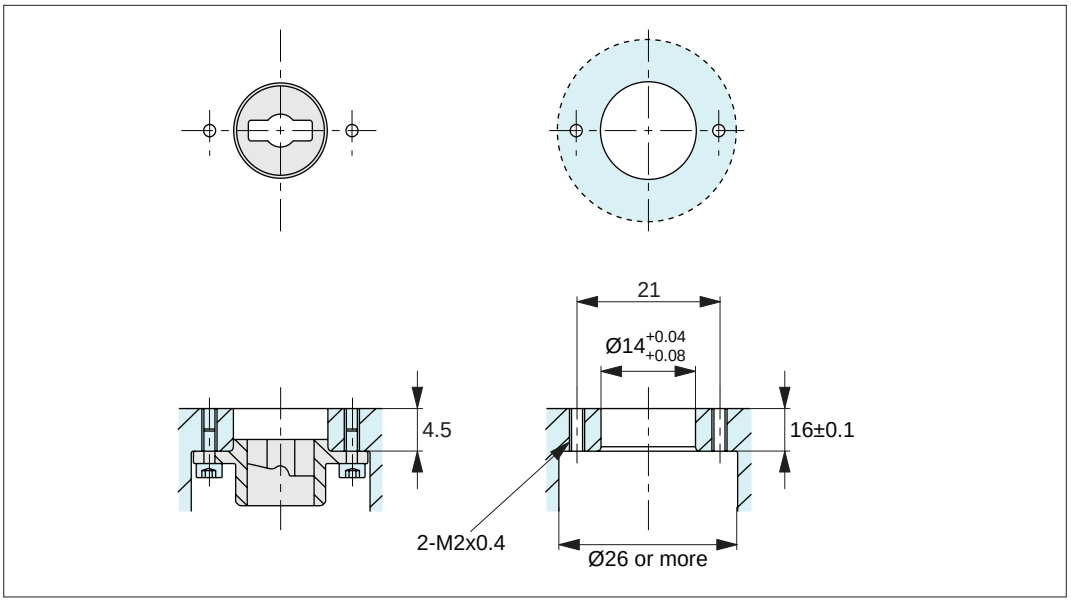
Quick Plug Coupling - Cam Locking

overview

How to mount receiver (shaft mount)

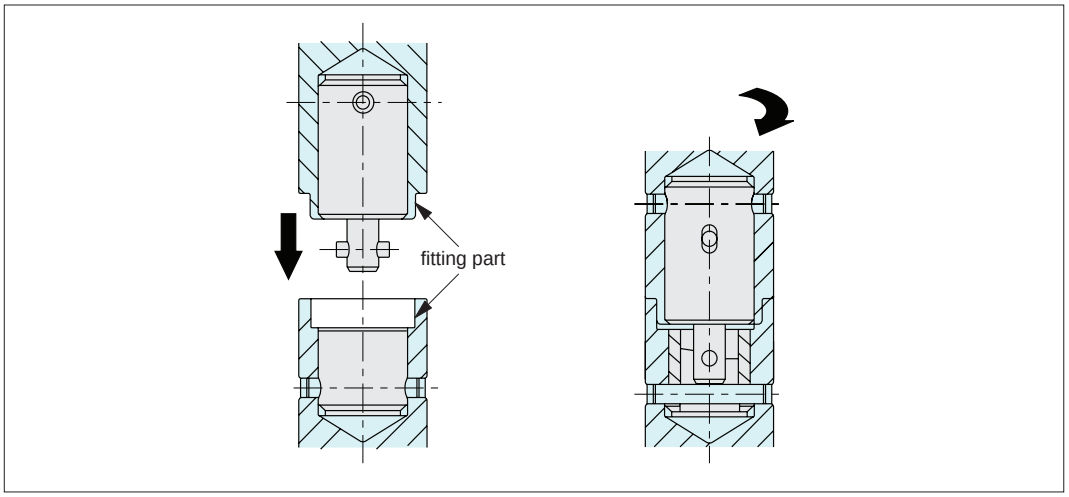


How to mount receiver (plate mount)

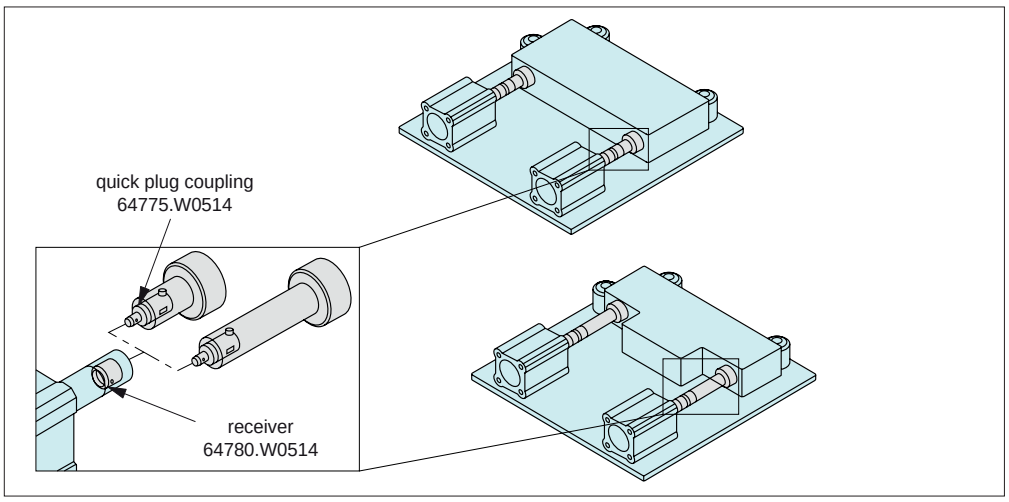


Repeatability

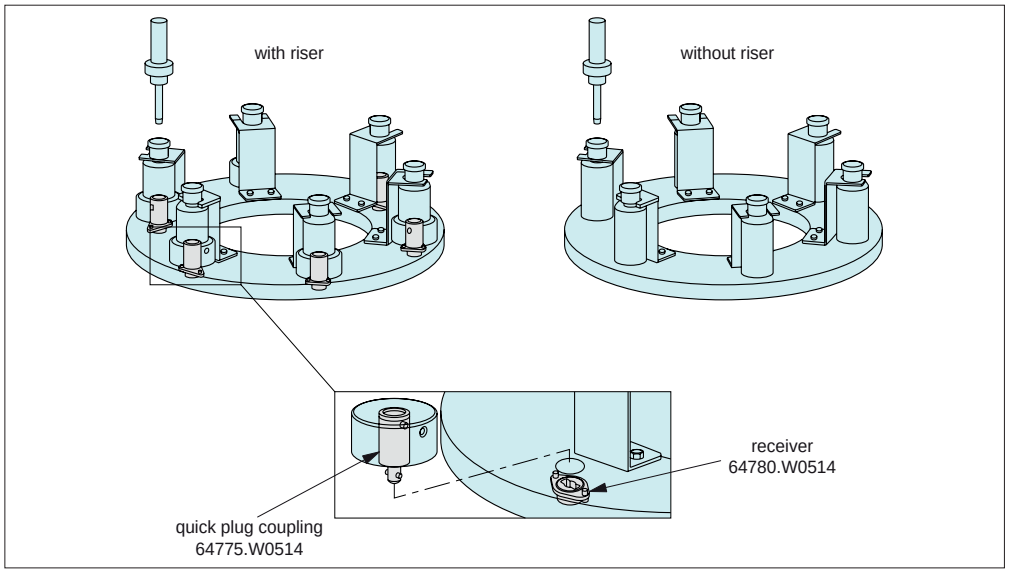
Prepare male and female fittings for highly accurate locating. Repeatability of ±0.08 is achievable.



Applications

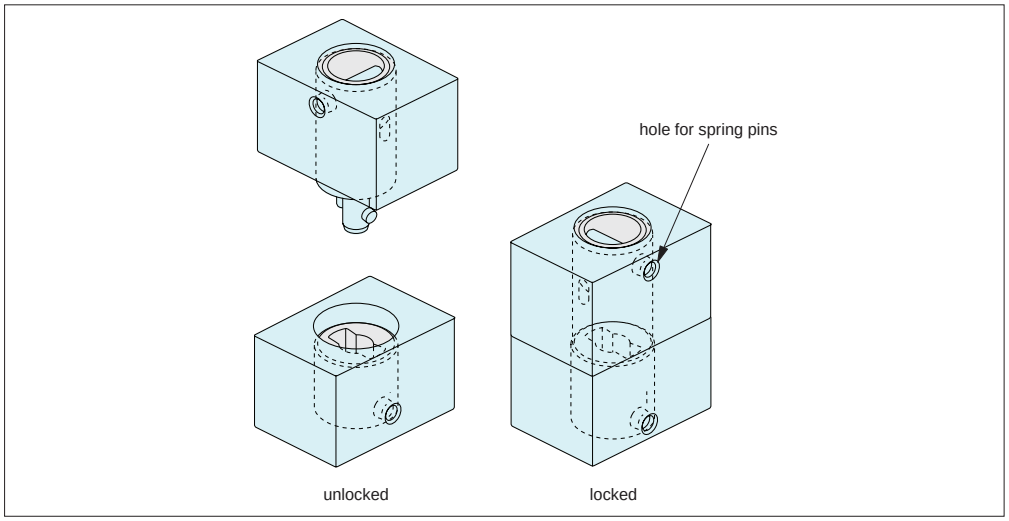


Changes of thrust pads



Changes of riser

Notes

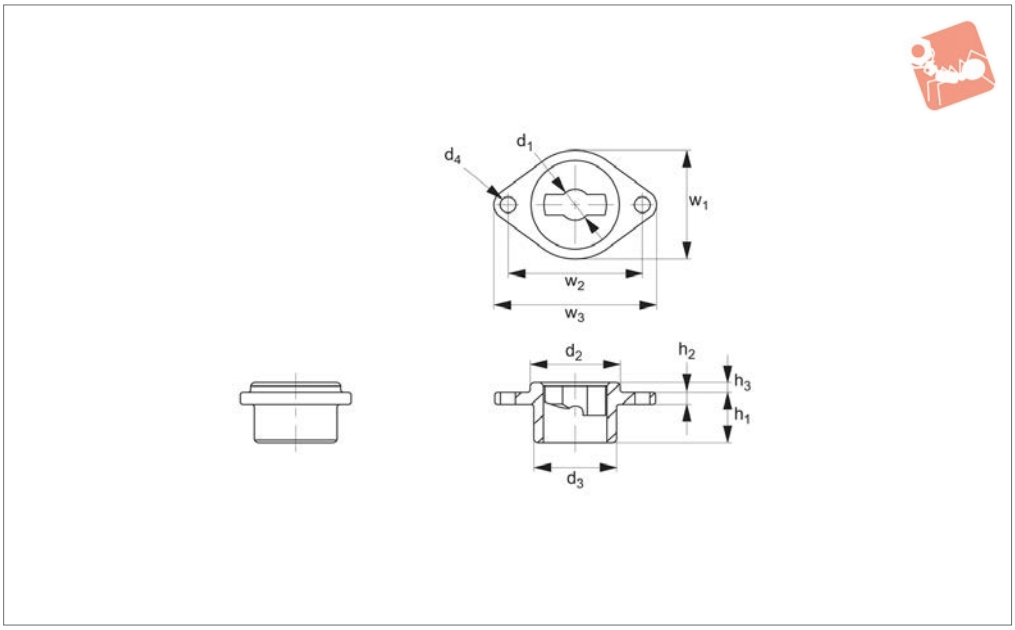


Pay attention to the direction of holes for spring pins.

Receiver - Plate Mount - Cam Locking

for Quick Plug Coupling no. 64775

64782

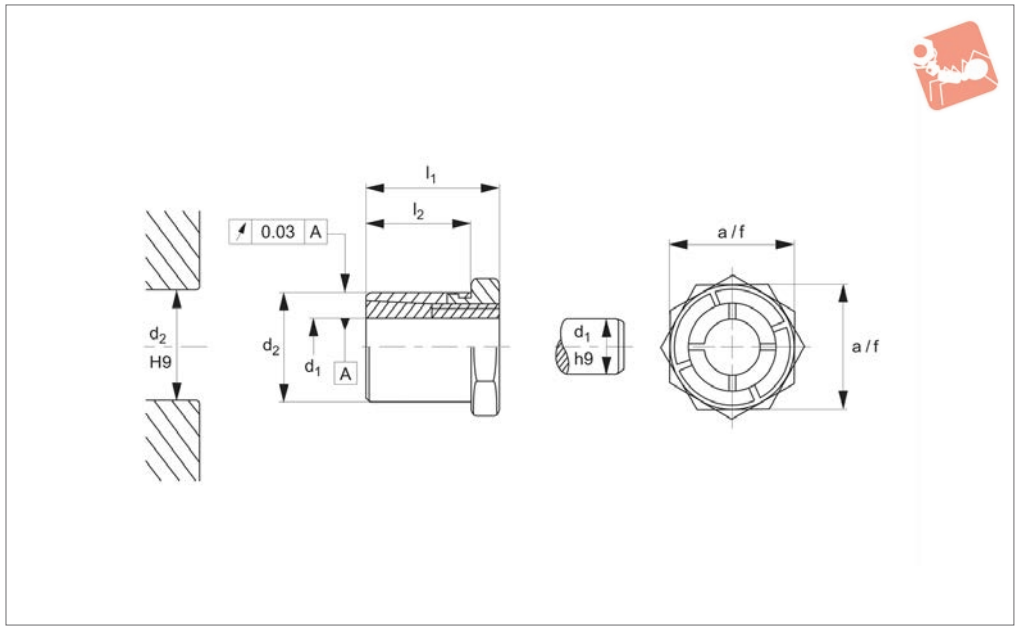


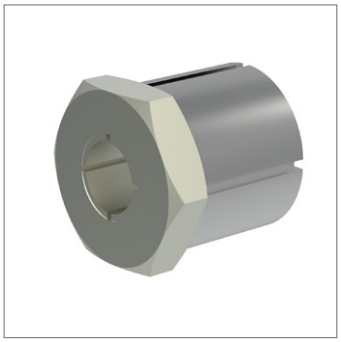
Material
Body: tempered steel SCM440, nickel plated.

Technical Notes
Receiver for use with quick plug coupling, cam locking no. 64775. Plate mount version suited to installation in thin walled parts, and sub-flush to the mounting surface.
Temperature resistant to 200° C

Suitable only for linear movement applications, does not transmit any torque.

Order No.	d_1 +0.08|+0.04	d_2 tol. h9	d_3	d_4	h_1	h_2	h_3	w_1	w_2	w_3	Weight g
64782.W0514	5	14	13	2.4	8	2	1.5	17	21	25	8





38400

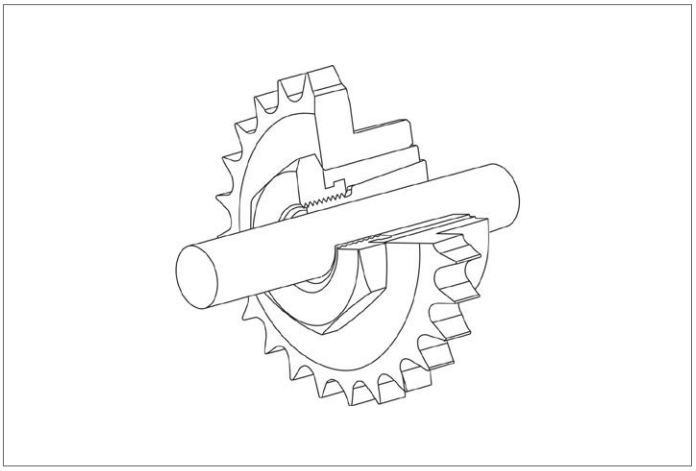
Material
Inner part: steel, blackened. Outer part: steel, galvanised. Nut: steel, nickel-plated.

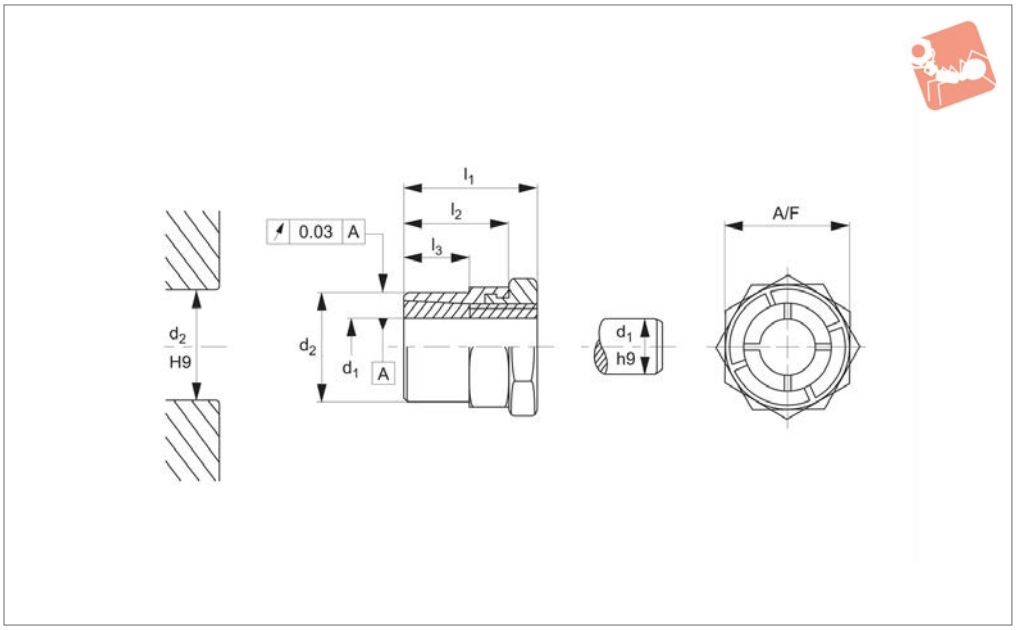
Technical Notes
Ta = tightening torque of nut.
M = transferable torque.
Fa = transferable thrust load.
pw = surface pressure of shaft.
pn = surface pressure of hub.
The rotational accuracy is 0,03mm.
Please refer to technical pages for mounting instructions.

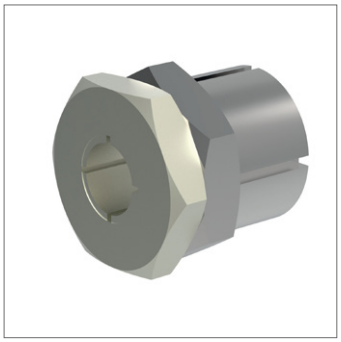
Tips
These self-centering and non-floating tapered shaft hubs are used to easily and effectively achieve shaft/hub joints of machine elements such as sprocket wheels, gear wheels, belt pulleys, cams, levers etc.
For special fork wrench see part 38420. W0814- .W0865.

Order No.	Finish	d_1	d_2	l_1	l_2	A/F	M Nm max.	pn N/mm² max.	pw N/mm² max.	Ta Nm max.	F_a kN max.	Weight g
38400.W0005	Without Lock Nut	5	14	19	15	14	10.1	96	264	9.9	4.0	20
38400.W0006	Without Lock Nut	6	14	19	15	14	12.1	96	220	9.9	4.0	19
38400.W0008	Without Lock Nut	8	16	22	17	16	23.4	91	179	16.9	5.8	26
38400.W0009	Without Lock Nut	9	20	24	19	22	43.7	115	245	34.9	9.7	47
38400.W0010	Without Lock Nut	10	20	24	19	22	48.6	115	221	34.9	9.7	46
38400.W0011	Without Lock Nut	11	22	24	19	22	59.9	117	225	43.8	10.9	51
38400.W0012	Without Lock Nut	12	22	24	19	22	65.3	117	206	43.8	10.9	49
38400.W0014	Without Lock Nut	14	26	28	22	27	93.0	99	178	65.0	13.3	83
38400.W0015	Without Lock Nut	15	26	28	22	27	99.0	99	166	65.0	13.3	78
38400.W0016	Without Lock Nut	16	26	28	22	27	106.0	99	156	65.0	13.3	73
38400.W0018	Without Lock Nut	18	35	36	27	36	223.0	125	224	161.0	24.8	201
38400.W0019	Without Lock Nut	19	35	36	27	36	235.0	125	212	161.0	24.8	189
38400.W0020	Without Lock Nut	20	35	36	27	36	248.0	125	201	161.0	24.8	186
38400.W0022	Without Lock Nut	22	42	41	30	46	349.0	110	197	250.0	31.8	346
38400.W0024	Without Lock Nut	24	42	41	30	46	381.0	110	180	250.0	31.8	326
38400.W0025	Without Lock Nut	25	42	41	30	46	397.0	110	173	250.0	31.8	315
38400.W0028	Without Lock Nut	28	47	44	33	50	565.0	110	174	355.0	40.4	403
38400.W0030	Without Lock Nut	30	47	44	33	50	605.0	110	162	355.0	40.4	378
38400.W0032	Without Lock Nut	32	55	51	38	55	764.0	102	166	490.0	47.8	632
38400.W0035	Without Lock Nut	35	55	51	38	55	836.0	102	151	490.0	47.8	571
38400.W0038	Without Lock Nut	38	62	58	43	65	1179.0	111	159	720.0	62.1	897
38400.W0040	Without Lock Nut	40	62	58	43	65	1241.0	111	151	720.0	62.1	842

Tapered Shaft Hubs
non-locking







38420

Material
Inner part: steel, nickel plated.
Outer part: steel, galvanised.
Nut: steel, nickel-plated.

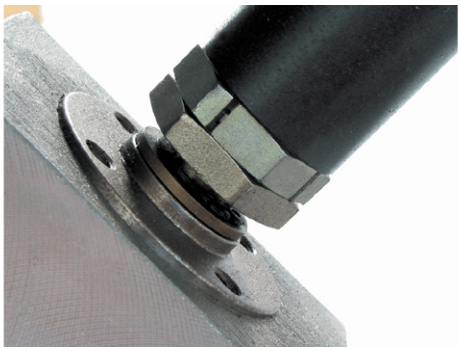
Technical Notes
Ta = tightening torque of nut.
M = transferable torque.
Fa = transferable thrust load.
pw = surface pressure of shaft.
pn = surface pressure of hub.
Rotational accuracy is 0,3mm.
Please note special fork wrench is required for mounting, wrench thickness is equal to l2 - l3.

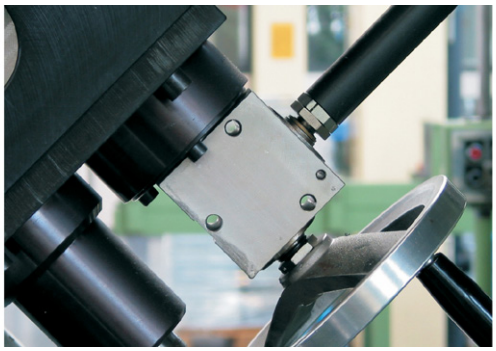
Tips
These self-centering and non-floating tapered shaft hubs are used to easily and effectively achieve shaft/hub joints of machine elements such as sprocket wheels, gear wheels, belt pulleys, cams, levers etc. The lock nut enables locking of the shaft-hub joint, where free rotating shafts are used.

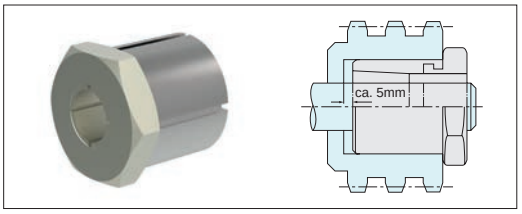
Order No.	Finish	d_1	d_2	l_1	l_2	l_3	A/F	M Nm max.	pn N/mm² max.	pw N/mm² max.	Ta Nm max.	F_a kN max.	Weight g
38420.W0105	With Lock Nut	5	12	19	15	9	14	10.1	119	264	9.9	4.0	18
38420.W0106	With Lock Nut	6	12	19	15	9	14	12.1	119	220	9.9	4.0	17
38420.W0108	With Lock Nut	8	14	22	17	11	16	23.4	121	179	16.9	5.8	23
38420.W0109	With Lock Nut	9	18	24	19	12	22	43.7	127	245	34.9	9.7	47
38420.W0110	With Lock Nut	10	18	24	19	12	22	48.6	127	221	34.9	9.7	46
38420.W0111	With Lock Nut	11	20	24	19	12	22	59.9	128	225	43.8	10.9	47
38420.W0112	With Lock Nut	12	20	24	19	12	22	65.3	128	206	43.8	10.9	45
38420.W0114	With Lock Nut	14	24	28	22	15	27	93.0	107	178	65.0	13.3	78
38420.W0115	With Lock Nut	15	24	28	22	15	27	99.0	107	166	65.0	13.3	75
38420.W0116	With Lock Nut	16	24	28	22	15	27	106.0	107	156	65.0	13.3	70
38420.W0118	With Lock Nut	18	30	36	27	17	36	223.0	145	224	161.0	24.8	179
38420.W0119	With Lock Nut	19	30	36	27	17	36	235.0	145	212	161.0	24.8	169
38420.W0120	With Lock Nut	20	30	36	27	17	36	248.0	145	201	161.0	24.8	213
38420.W0122	With Lock Nut	22	38	41	30	20	46	349.0	122	197	250.0	31.8	341
38420.W0124	With Lock Nut	24	38	41	30	20	46	381.0	122	180	250.0	31.8	320
38420.W0125	With Lock Nut	25	38	41	30	20	46	397.0	122	173	250.0	31.8	310
38420.W0128	With Lock Nut	28	42	44	33	23	50	565.0	123	174	355.0	40.4	370
38420.W0130	With Lock Nut	30	42	44	33	23	50	605.0	123	162	355.0	40.4	348
38420.W0132	With Lock Nut	32	50	51	38	28	55	764.0	112	166	490.0	47.8	555
38420.W0135	With Lock Nut	35	50	51	38	28	55	836.0	112	151	490.0	47.8	501
38420.W0814	Special Fork Wrench	-	-	-	-	-	14	-	-	-	-	-	45
38420.W0816	Special Fork Wrench	-	-	-	-	-	16	-	-	-	-	-	72
38420.W0822	Special Fork Wrench	-	-	-	-	-	22	-	-	-	-	-	195
38420.W0827	Special Fork Wrench	-	-	-	-	-	27	-	-	-	-	-	195
38420.W0836	Special Fork Wrench	-	-	-	-	-	36	-	-	-	-	-	428
38420.W0846	Special Fork Wrench	-	-	-	-	-	46	-	-	-	-	-	610
38420.W0850	Special Fork Wrench	-	-	-	-	-	50	-	-	-	-	-	870
38420.W0855	Special Fork Wrench	-	-	-	-	-	55	-	-	-	-	-	1125

Tapered Shaft Hubs
with lock nut

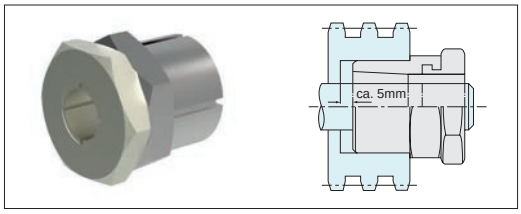
Order No.	Finish	d_1	d_2	l_1	l_2	l_3	A/F	M Nm max.	pn N/mm² max.	pw N/mm² max.	Ta Nm max.	F_a kN max.	Weight g
38420.W0865	Special Fork Wrench	-	-	-	-	-	65	-	-	-	-	-	1295



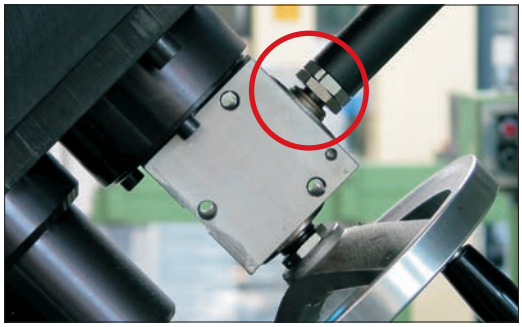


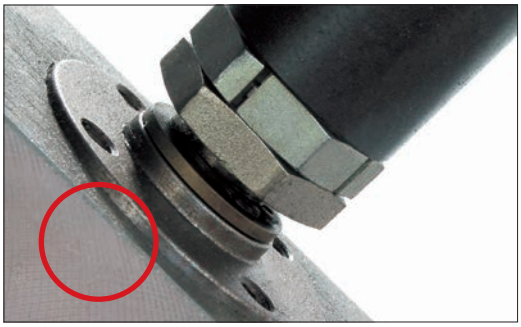


Tapered shaft hub with hexagon nut



Tapered shaft hub with hexagon nut and lock nut





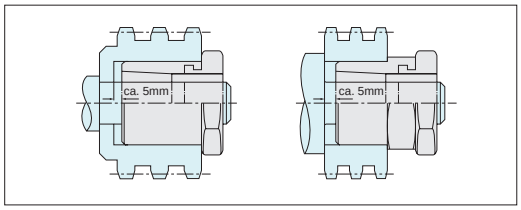
Applications

By using tapered shaft hubs, sprocket wheels, gear wheels, belt pulleys, cams, levers etc. can be easily and efficiently installed.

Tapered shaft hubs are available with or without lock nuts.

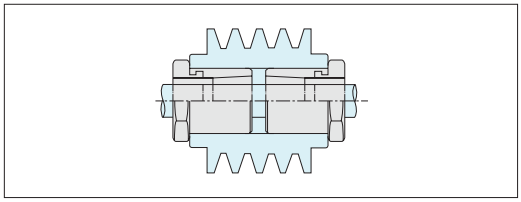
No Axial Shift

If, on mounting, the hub sits close to a collar, an axial offset is not possible. In this case, only 60% of the forces mentioned in the charts can be transmitted.

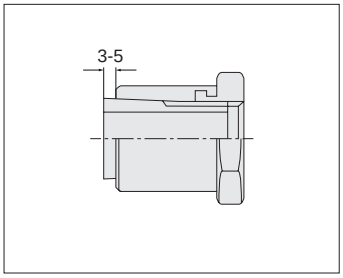


Two Tapered Shaft Hubs in One Hub

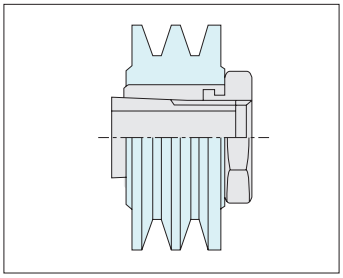
When using this method, the tapered shaft hub which is tightened first transmits 100% of the forces mentioned in the charts. When tightening the second tapered shaft hub, an axial offset of the hub is not possible. Therefore, this tapered shaft hub is able to transmit only 60% of the forces.



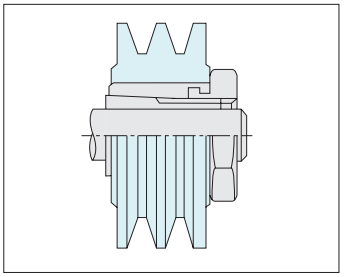
Assembly and Disassembly



1. Rotate nut to the left until the inner part protrudes approx. 3-5mm over the outer.



2. Install tapered shaft hub in the hub hole.



3. Slightly tighten the nut when located in the desired position. Compensate the axial offset thus produced with a soft-face mallet. Tighten the tapered shaft hub.

Assembly

The contact surface of the shaft and the hub must be free from oil and dirt.

Disassembly

1. Release tapered shaft hub by turning the nut to the left until the inner part protrudes approx. 3-5mm over the outer part.

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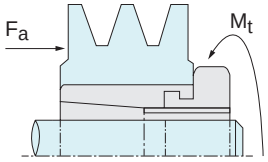
Simultaneous Exposure to Different Forces



If torque (M_t) and axial forces (F_a) are transmitted simultaneously, a resultant total torque (M_r) is obtained which must be less than or equal to the maximum torque (M_{max}) indicated in the charts. ($M_r \leq M_{max}$).

$$M_r = \sqrt{M_t^2 + (F_a \times 2 \times \frac{d_1}{1000})^2 \times \nu}$$

M_r = Resultant total torque
M_t = Torque
F_a = Axial force
d_1 = Shaft diameter
ν = Safety factor

Example:

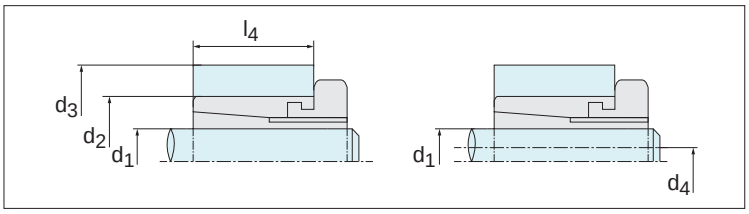
Shaft hub 38420.W0125

M_t = 150Nm
F_a = 5kN
d_1 = 25mm
ν = 2

$$M_r = \sqrt{150^2 Nm^2 + (5000N \times 2 \times \frac{25mm}{1000mm/m})^2 \times 2} = 325Nm$$

A maximum torque (M_{max}) of 520 Nm is transmitted by the tapered shaft hub 38420.W0125. The forces can be transmitted because M_r (325 Nm) is less than M_{max}.

Outside Diameter of Hub and Inside Diameter to Hollow Shaft



When fitting tapered shaft hubs, the outside diameter of the hub and the inside diameter of the hollow shaft have to be considered.

Smallest possible outside diameter of hub / largest possible inside diameter of hollow shaft

$$d_3 \geq d_2 \times \sqrt{\frac{R_e + P_N \times C_N}{R_e - P_N \times C_N}} \quad [mm]$$

$$d_4 \leq d_1 \times \sqrt{\frac{R_e - 2P_W}{R_e\ (R_p)}} \quad [mm]$$

d_1 = Shaft diameter
d_2 = Hub hole
d_3 = Outside diameter of hub
d_4 = Inside diameter of hollow shaft
R_e = Apparent yielding point
$R_{p0,2}$ $R_{p0,1}$ = Permanent elongation limit

P_N = Surface pressure hub
P_W = Surface pressure shaft
C_N = Factor [is "1", if the hub length is ≥ the fitting length of the tapered shaft hub ($L_N \geq L_2$)]

Example:

Tapered shaft hub 38400.W0025, hub material GG25;

$R_{p0,1}$ = 165Nmm²
C_N = 1

$$d_3 \geq = 42mm \times \sqrt{\frac{165Nmm^2 + 103Nmm^2 \times 1}{165Nmm^2 - 103Nmm^2 \times 1}} \geq 87{,}4mm$$

Tapered shaft hub 38400.W0025, hub material CK45;

R_e = 380Nmm²
C_N = 1

$$d_4 \leq 25mm \times \sqrt{\frac{380Nmm^2 - 2 \times 174Nmm^2}{380Nmm^2}} \leq 7{,}2mm$$

Material Chart

	Material									
	St 37-2 Ust 37-2	St 50-2	Ck 35	Ck 45	11 SMn 30 11SMn Pb 30	GG 15	GG 20	GG 25	GGG-40	AlMg 3 F 25
	Minimum strength values in N/mm²									
Diameter	**Re**	**Re**	**Re**	**Re**	**Re**	**Rp 0,1**	**Rp 0,1**	**Rp 0,1**	**Rp 0,2**	**Re**
16 < d_1 ≤ 40	225	285	320	380	375	90	130	165	250	180
40 < d_1 ≤ 100	205	265	260	300	245	90	130	165	250	180