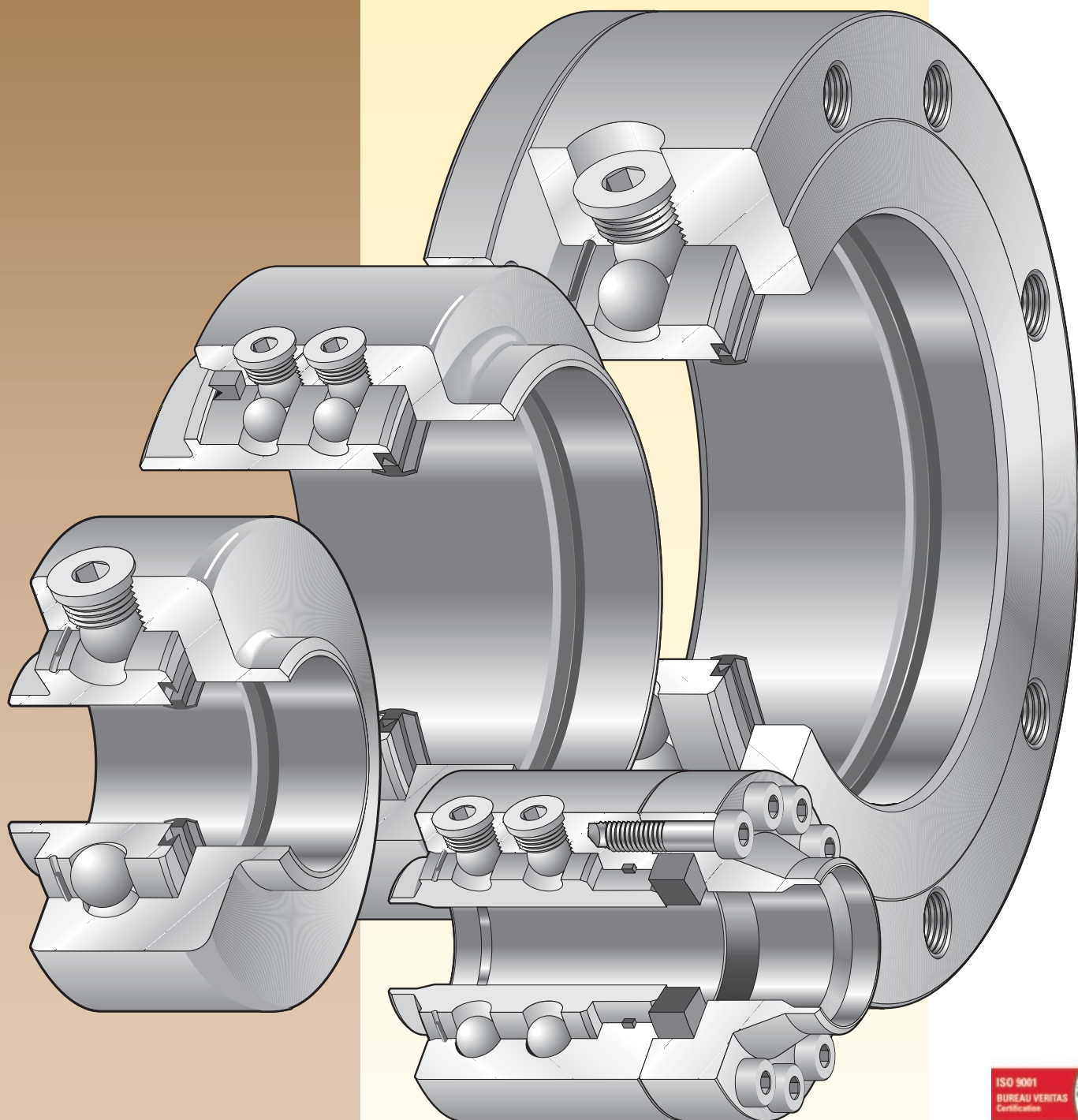




KLAAS

Maschinenbau GmbH & Co. KG

Swivel Joints Rotary Unions



...since 1970

Knowledge and experience



General Information

We about us ...

Klaas Maschinenbau GmbH & Co. KG was founded in the year 1970 and is an independent family business with approximately 35 employees.

Its business activity comprises the construction, the development, the internal manufacturing and the distribution of approved swivel joints, rotary pipe joint shears, multi-channel rotary unions and complete loading arms made of carbon steels and stainless steels. A quality management system certified according to DIN EN ISO 9001:2000 ensures a high quality standard. As a result of the experience which we gained during the last 40 years KLAAS swivel joints are particularly characterised by a high level of industrial safety and reliability. Well-known national and international companies engaged in various industrial sectors have been trusting in the KLAAS swivel joint technology for decades.

Assembly / Application

The KLAAS swivel joints are rotary units built in ball races. Therefore, they can be used anywhere to transport fluid or gaseous media between two relatively movable points. KLAAS swivel joints have a turning capacity of up to 360°.

Swivel Joint Types / Models / Connections

The KLAAS swivel joint head types RD1, RD2L, RD2S and VGC can be supplied in eight different models. As a result of the modular conception, the connections as flanges, welding ends, internal and external threads can be chosen optionally. The KLAAS swivel joint head types DL, DS and DH are equipped with integrated threads, and they can be combined with double-ended nipple or male stud couplings. Other connections can be provided on request.

Loads / Forces

In addition to loads through internal pressure, KLAAS swivel joints absorb external radial-axial forces and bending moments. The maximum permissible load of a joint depends on many operational factors. In this context, especially the interdependency of bending moment and pressure load has to be paid attention to (please see schedule on page 5).

Sealing / Maintenance

KLAAS swivel joints are equipped with an axial working medium seal made of PTFE compound and with an external radial working seal or an external stripper to protect the swivel joint from incoming dirt. All these parts are also available as spare parts (sealing kits). For special applications (e.g. food industry) appropriate seals are used. Should the medium contain any abrasive parts, an internal stripper will be used additionally to protect the axial working medium seal from premature wear-out. KLAAS swivel joints are greased with special synthetic greases suiting the operational conditions. Up to the exchange of seals KLAAS swivel joints are virtually maintenance-free. Therefore grease nipples are not included, but they can be provided on request.

Materials

KLAAS swivel joint heads are made of the materials 1.7225 (42CrMo4), 1.0570 (St52-3) and 1.4571 (X6CrNiMoTi 17-12-2) as standard, and they are available in nominal diameters from ND08 to ND700. Connections used for swivel joint heads which are made of (1.7225 or 1.0570) as e.g. welding connections, pipe bends, flanges etc. are normally made of the material ST 35.8 or C22.8.

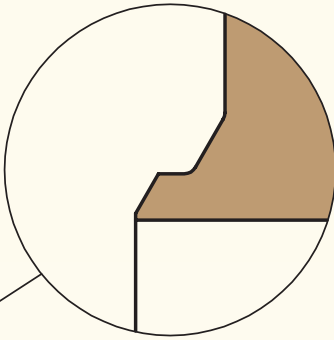
Printing errors, stated measurements and design modifications with reservations.
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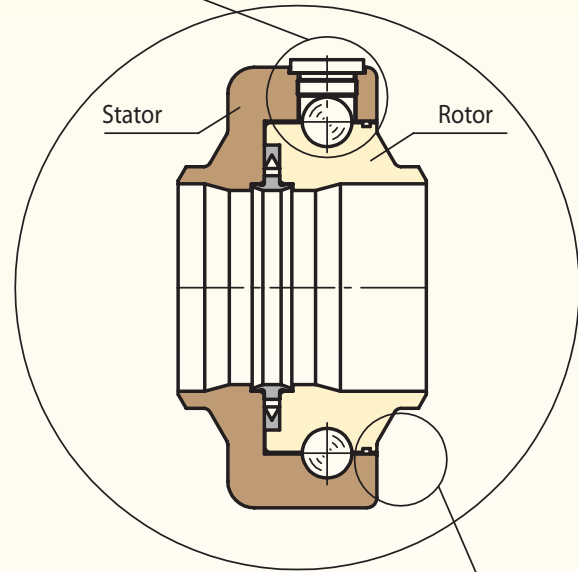
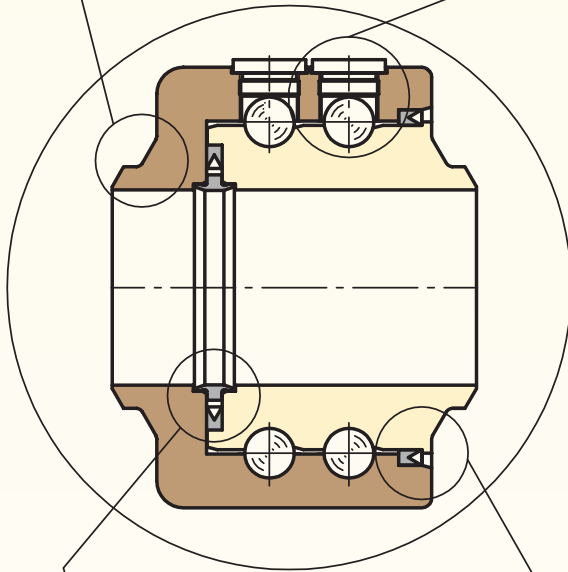
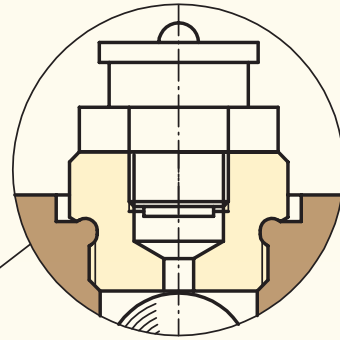
Swivel Joint Heads (Basic Unit)

Design Configuration

Weld edge preparation
according to DIN 2559 or ANSI B16.25

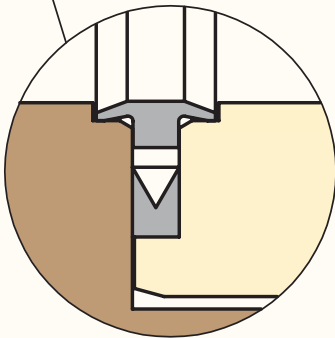


Grease nipple/ ball
Lifetime greasing
Grease nipple only on request

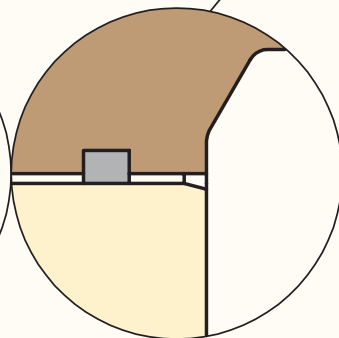
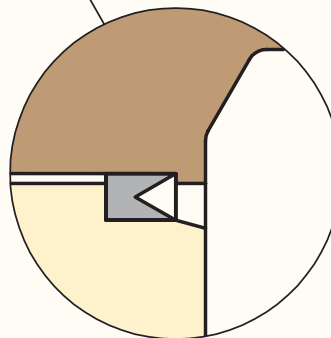


Stator

Rotor



Internal axial medium seal
Inside stripper (optional) in existence of
abrasive parts



External stripper resp. O-ring to protect the swivel joint from incoming dirt or
external radial working seal in case of application in the medium (optional)

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Production Schedule Overview

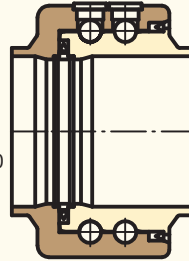
Swivel Joint Heads for Welded Structures

Swivel Joint Heads for the models 01 to 08

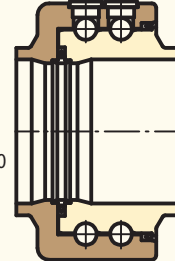
Design light*
RD1
ND20 to ND100



Design heavy*
RD2L
ND125 to ND700



Design heavy*
RD2S
ND20 to ND300

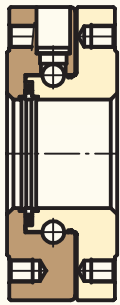


*) Design light for lower pressure stages and bending moments
*) Design heavy for high pressure stages and bending moments

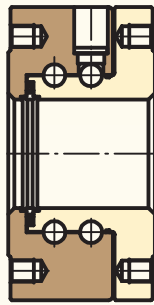
Dimensions (page 5)
Connections (page 7)

With integrated flange (hole pattern according to customers specification)
Overview (page 10)

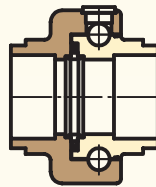
Design light
RDF1
ND50 to DN700



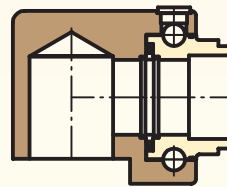
Design heavy
RDF2
ND50 to ND700



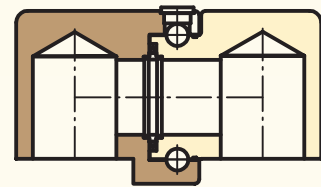
Design light
DL



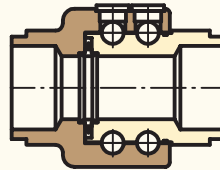
With internal thread on both sides



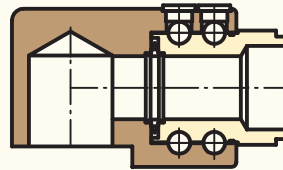
Overview (page 8)



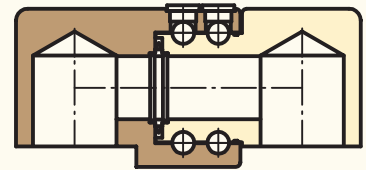
Design heavy
DS



With internal thread on both sides

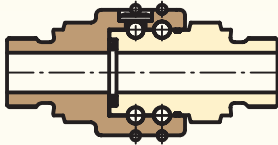


Overview (page 8)



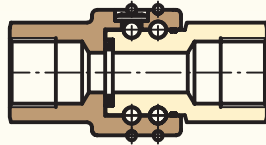
Swivel Joint with integrated connections – type **DH**, Overview (page 9)

AG-AG



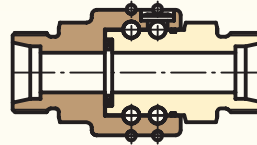
With internal or external thread

IG-IG



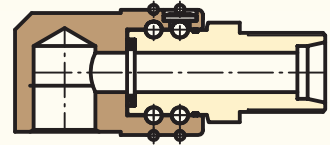
With cutting ring connection

AD-AD



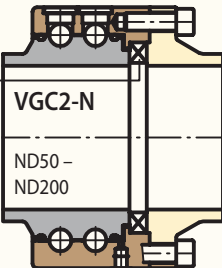
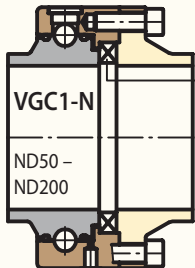
With bulkhead-type end connection

IG-ADS

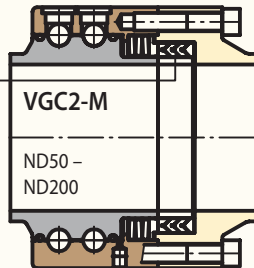


Swivel Joints for Loading Technology – type **VGC**

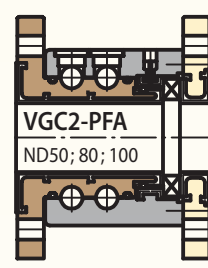
grooved ring sealing



lip seal

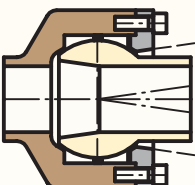


Overview (page 11)
with PFA lining

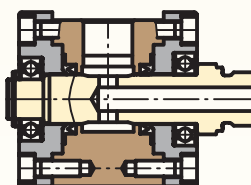


Construction and manufacturing according to customers specification (overview page 13)

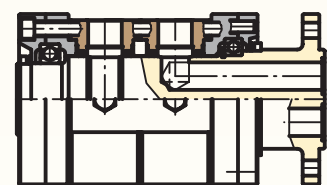
Ball-type rotary pipe joint – type **KG**



High-pressure rotary joint – type **HDV**



Multi-channel rotary unions – type **DF**



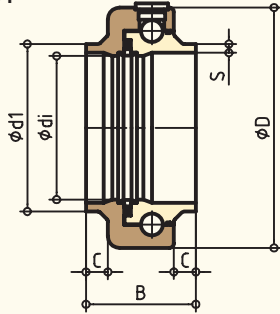
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Swivel Joint Heads RD1 – RD2L – RD2S

(Connections for welded constructions page 7)

RD1



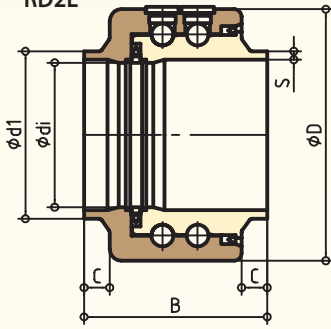
Dimensions and weights

ND	$\phi d1$	S	ϕdi	ϕD	B	C	kg
20	26,9	2,9	17,0	72	55	9	1,10
25	33,7	3,4	23,0	78			1,35
32	42,4	3,6	31,2	88	60	10	1,70
40	48,3	3,7	36,9	96			1,80
50	60,3	3,9	48,5	118	70	12	3,10
65	73,0	5,2	58,6	133			3,70
80	88,9	5,5	73,9	139	75	15	3,70
100	114,3	6,0	98,0	164			4,70

Static load

p max bar	Material: 1.7225		Material: 1.4571		Frictional Torque M_f (Nm) at p=0	
	Mb (Nm) at p=1 bar	Mb (Nm) at p=40bar	p max bar	Mb (Nm) at p=1 bar		Mb (Nm) at p=25bar
100	300	250	40	95	70	3,0
	400	350		130	80	5,0
	600	500		185	110	10,0
	750	600		235	125	15,0
	1500	1200		460	270	20,0
	2000	1500		650	280	25,0
	2350	1650		725	285	30,0
	3500	2300		1000	300	35,0

RD2L



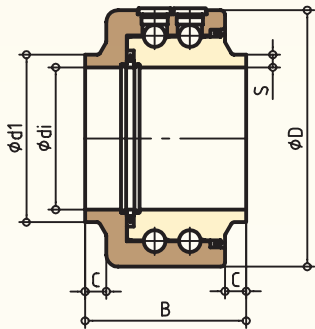
Dimensions and weights

ND	$\phi d1$	S	ϕdi	ϕD	B	C	kg
125	141,3	6,6	124	197	125	17,5	12,1
150	168,3	7,1	150	223			13,5
200	219,1	8,2	198,7	277	135	22,5	19,8
250	273,0	9,3	250,4	325			23,1
300	323,9	11,5	301	390			33,4
350	355,6	8,0	335	420	140	25	34,5
400	406,4	8,8	384,8	470			39,8
500	508,0	9,5	485	590			58,0

Static load

p max bar	Material: 1.7225		Material: 1.4571		Frictional Torque M_f (Nm) at p=0	
	Mb (Nm) at p=1 bar	Mb (Nm) at p=40bar	p max bar	Mb (Nm) at p=1 bar		Mb (Nm) at p=25bar
40	10000	9000	16	3000	2700	30,0
	13000	11750		4000	3500	85,0
	22000	18500		6500	5500	250,0
	32000	25500		9500	7500	350,0
	44000	34000		13000	10000	400,0
16	52000	40000	6	15500	11250	475,0
	67000	47500		20000	13500	525,0
	100000	67000		30000	18000	750,0

RD2S



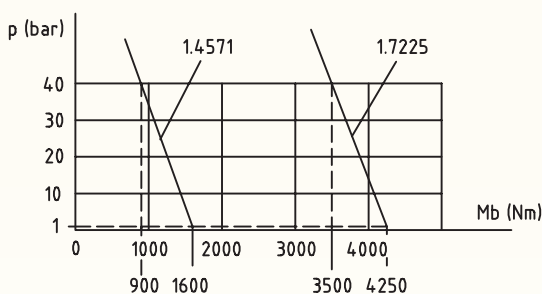
Dimensions and weights

ND	$\phi d1$	S	ϕdi	ϕD	B	C	kg
20	26,9	3,9	18	72	90	12,5	1,70
25	33,7	4,6	23	78			2,20
32	42,4	4,9	31,2	88			2,70
40	48,3	5,1	36,9	104			3,20
50	60,3	5,5	48,5	118	100		4,70
65	73,0	7,0	59	133	110	13,5	6,6
80	88,9	7,6	73,7	139			6,9
100	114,3	8,6	97,1	175			14,5
125	141,3	9,5	122,3	218	140	17,5	19,8
150	168,3	7,1	150	250	155		25,6
200	219,1	8,2	198,7	330	180	22,5	55,0
250	273,0	9,3	250,4	375	185		63,0
300	323,9	9,5	301	455	195	25,0	99,0

Static load

p max bar	Material: 1.7225		Material: 1.4571		Frictional Torque M_f (Nm) at p=0	
	Mb (Nm) at p=1 bar	Mb (Nm) at p=40bar	p max bar	Mb (Nm) at p=1 bar		Mb (Nm) at p=40bar
350	550	500	100	200	160	3,0
	750	675		275	200	5,0
	1000	950		400	300	10,0
	1500	1250		550	360	15,0
	2700	2400		1000	700	20,0
	3750	3250		1400	850	25,0
	4250	3500		1600	900	30,0
	7250	6000		2750	1250	35,0
250	15000	12500	40	5750	3000	50,0
	20000	15750		7500	3250	85,0
	47500	37500		17500	7750	250,0
	75000	57500		27750	11000	350,0
115000	85000	42500	12500	400,0		

Example of static load: RD2S-DN80



IMPORTANT INFORMATION!

When ordering swivel joint heads made of 1.7225 (42CrMo4) without connections, the customer has to ensure that the welding instruction is followed in detail!

(The welding instruction has to be ordered by the customer separately!)

On the basis of our long-time experience and to avoid crack formation, we recommend to order complete swivel joints with connections.

The loads given are a static values. Factors like pressure fluctuations, additional axial resp. radial forces influence the load of the swivel joints. The frictional torques given are to be regarded as standard values only. Deviations may occur.

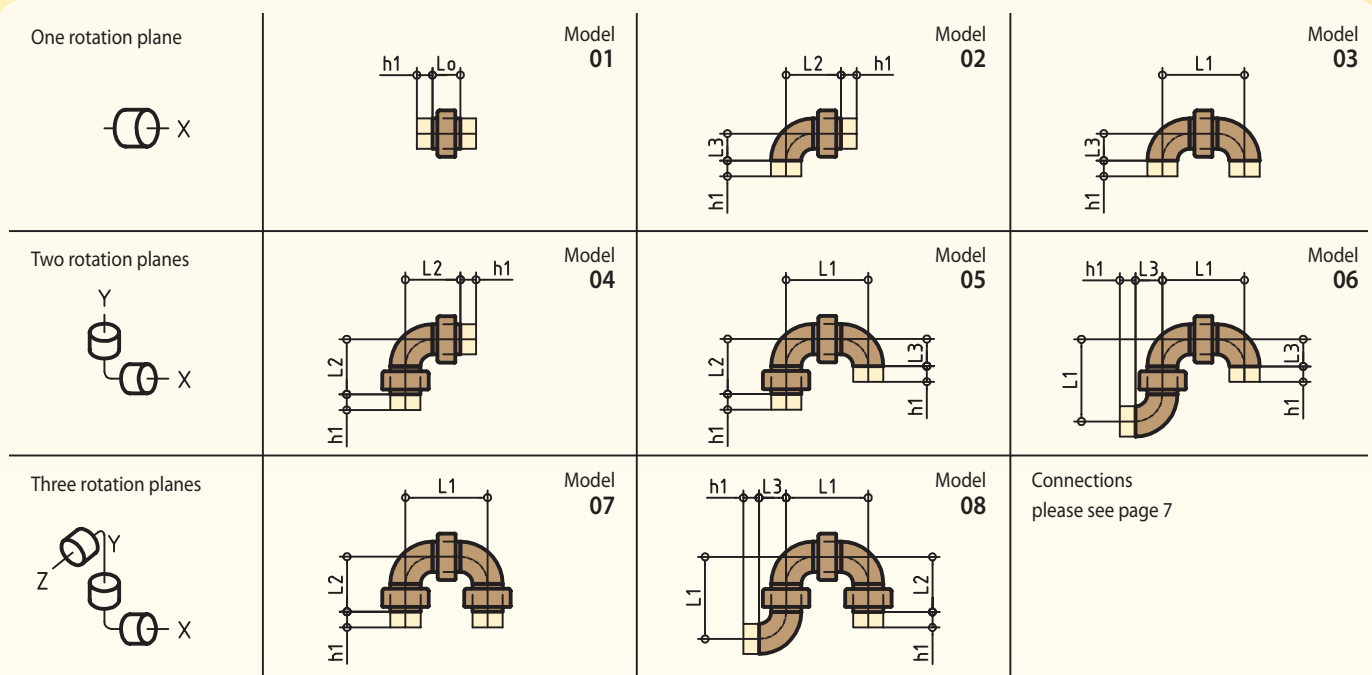
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Overview: Basic Models

Standard Materials of Swivel Joint Heads

1.7225 (42CrMo4) 1.4571 (X6CrNiMoTi17-12-2)



Dimensions

Weights (kg)

	ND	Lo	L1		L2		L3		ND	01		02		03		04		05		06		07		08	
			1.7225	1.4571	1.7225	1.4571	1.7225	1.4571		1.7225	1.4571	1.7225	1.4571	1.7225	1.4571	1.7225	1.4571	1.7225	1.4571	1.7225	1.4571	1.7225	1.4571	1.7225	1.4571
RD1	20	55	117	115	86	85	29	29	20	1,1	1,2	1,2	1,3	1,2	2,3	2,3	2,4	2,3	2,4	2,4	3,5	3,4	3,5	3,5	
	25	60	114	138	87	99	25	38	25	1,4	1,5	1,5	1,6	1,6	2,8	2,8	2,9	2,9	3,0	3,1	4,3	4,3	4,4	4,4	
	32	60	128	158	94	109	32	48	32	1,7	1,9	1,9	2,0	2,1	3,6	3,6	3,7	3,8	3,9	4,0	5,4	5,5	5,6	5,7	
	40	60	140	176	100	118	38	57	40	1,8	2,1	2,1	2,3	2,3	3,9	3,9	4,1	4,1	4,4	4,4	5,9	5,9	6,2	6,2	
	50	70	176	224	123	147	51	76	50	3,1	3,5	3,6	4,0	4,1	6,6	6,7	7,1	7,2	7,5	7,7	10,2	10,3	10,6	10,8	
	65	75	207	267	141	171	64	95	65	3,7	4,6	4,5	5,4	5,3	8,3	8,2	9,1	9,0	10,0	9,7	12,8	12,7	13,7	13,4	
	80	75	231	305	153	190	76	114	80	3,7	5,1	4,9	6,4	6,1	8,8	8,6	10,1	9,8	11,5	11,1	13,8	13,5	15,2	14,8	
100	75	283	381	179	228	102	152	100	4,7	7,3	7,1	9,8	9,4	12,0	11,8	14,5	14,1	17,1	16,5	19,2	18,8	21,8	21,2		
RD2L	125	125	383	507	254	316	127	190	125	11,9	16,3	15,9	20,6	19,9	28,2	27,8	32,5	31,8	36,9	35,8	44,4	43,7	48,8	47,7	
	150	135	443	595	289	365	152	229	150	13,5	20,3	20,1	27,1	26,6	33,8	33,6	40,6	40,1	47,4	46,7	54,1	53,6	60,9	60,2	
	200	135	545	747	340	441	203	305	200	19,8	33,4	34,7	47,0	49,6											
	250	135	647	899	391	517	254	381	250	23,1	47,2	47,9	71,3	72,7											
	300	140	754	1056	447	598	305	457	300	33,4	68,8	73,2	104,2	113,0											
	350	140	856	1208	498	674	356	533	350	34,5	79,9	92,0	125,3	149,5											
	400	140	956	1362	548	751	406	610	400	39,8	99,3	122,4	158,8	205,0											
500	140	1160	1666	650	903	508	762	500	58,0	151,5	219,0	245,0	380,0												
RD2S	20	90	152	150	121	120	29	29	20	1,7	1,8	1,8	1,9	1,8	3,5	3,5	3,6	3,5	3,6	3,6	5,3	5,2	5,3	5,3	
	25	90	144	168	117	129	25	38	25	2,2	2,3	2,3	2,4	2,4	4,5	4,5	4,6	4,6	4,7	4,8	6,8	6,8	6,9	7,0	
	32	90	158	188	124	139	32	48	32	2,7	2,9	2,9	3,0	3,1	5,6	5,6	5,7	5,8	5,9	6,0	8,4	8,5	8,6	8,7	
	40	90	170	206	130	148	38	57	40	3,2	3,5	3,5	3,7	3,7	6,7	6,7	6,9	6,9	7,2	7,2	10,1	10,1	10,4	10,4	
	50	100	206	254	153	177	51	76	50	4,7	5,1	5,2	5,6	5,7	9,8	9,9	10,3	10,4	10,7	10,9	15,0	15,1	15,4	15,5	
	65	110	242	302	176	206	64	95	65	6,6	7,5	7,4	8,3	8,2	14,1	14,0	14,9	14,8	15,8	15,5	21,5	21,4	22,4	22,1	
	80	110	266	340	188	225	76	114	80	6,9	8,3	8,1	9,6	9,3	15,2	15,0	16,5	16,2	17,9	17,5	23,4	23,1	24,8	24,4	
	100	110	318	416	214	263	102	152	100	10,5	13,1	12,9	15,6	15,2	23,6	23,4	26,1	25,7	28,7	28,1	36,6	36,2	39,2	38,6	
	125	140	398	522	269	331	127	190	125	19,8	24,2	23,8	28,5	27,8	44,0	43,6	48,3	47,6	52,7	51,6	68,1	67,4	72,5	71,4	
	150	155	463	615	309	385	152	229	150	25,6	32,4	32,2	39,2	38,7											
	200	180	590	792	385	486	203	305	200	55,0	68,6	69,9	82,8	84,8											
	250	185	697	949	441	567	254	381	250	63,0	87,1	87,8	111,2	112,6											
	300	195	805	1111	502	653	305	457	300	99,0	134,4	138,8	169,8	178,6											

Complete models are produced modularly. Therefore optional connections are welded on to the ends of the swivel joint heads respectively to the pipe bends which have been welded on to the swivel joint heads before. Except for the standard connections (page 7), also custom-made connections can be welded on.

The total overall dimensions result from the dimensions L0 to L3 of the single modules plus the dimension h1 (page 7) of the respective connections. The tolerances for L1, L2 and L3 are equal to the sum of tolerances for the single components.

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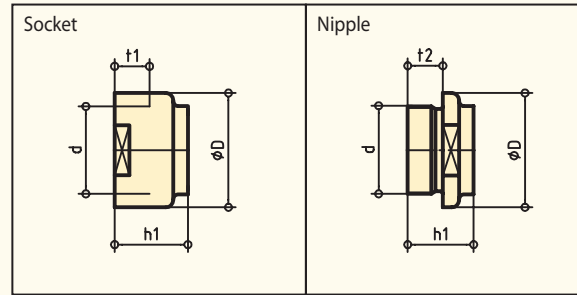


Connections (standard)

Other connections on request

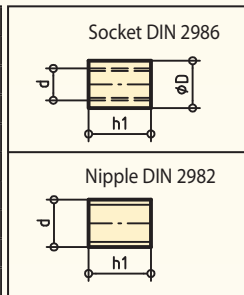
KLAAS socket and nipple

DN	d	øD	SW	Socket			Nipple		
				t1	h1	w. (kg)	t2	h1	w. (kg)
20	G3/4	36	32	22	32	0,10	16	27	0,10
25	G1	46	41	26	37	0,20	18	32	0,15
32	G1 1/4	56	50	28	40	0,30	20	35	0,20
40	G1 1/2	68	60	30	45	0,60	22	40	0,30
50	G2	78	70	32	50	0,70	24	45	0,45
65	G2 1/2	95	85	42	60	1,20	34	55	0,65
80	G3	110	100	48	70	1,80	40	65	1,30
100	G4	140	125	58	80	3,20	50	75	2,20



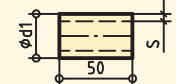
DIN socket and nipple (on request)

DN	d	Socket DIN 2986		Nipple DIN 2982	
		D	h1 w.(kg)	h1	w. (kg)
20	G3/4	31,8	36 0,10	30	0,05
25	G1	39,5	43 0,20	35	0,10
32	G1 1/4	48,3	48 0,25	38	0,15
40	G1 1/2	54,5	48 0,30	38	0,20
50	G2	66,3	56 0,40	45	0,25
65	G2 1/2	82,0	65 0,60	55	0,35
80	G3	95,0	71 0,80	60	0,50
100	G4	122,0	83 1,50	70	0,85



Welding ends (pipe end)

DN	RD1			RD2S			RD2L			
	ød1	s	w.(kg)	ød1	s	w.(kg)	DN	ød1	s	w.(kg)
20	26,9	2,3	0,1	26,9	3,9	0,1	125	139,7	4,0	0,7
25	33,7	2,6	0,1	33,7	4,6	0,1	150	168,3	4,5	0,9
32	42,4	2,6	0,1	42,4	4,8	0,2	200	219,1	6,3	2,1
40	48,3	2,6	0,2	48,3	5,1	0,2	250	273,0	6,3	2,1
50	60,3	2,9	0,2	60,3	5,5	0,3	300	323,9	7,1	2,8
65	76,1	2,9	0,3	76,1	7,0	0,4				
80	88,9	3,2	0,3	88,9	7,6	0,6				
100	114,3	3,6	0,5	114,3	8,6	0,8				



DIN flanges

ND	DIN 2632		DIN 2633		DIN 2635	
	h1	w.(kg)	h1	w. (kg)	h1	w. (kg)
20			38	1,0	40	1,1
25			38	1,1	40	1,3
32			40	1,7	42	1,9
40			42	1,9	45	2,3
50			45	2,5	48	2,8
65			45	3,1	52	3,7
80			50	3,7	58	4,8
100			52	4,6	65	6,5
125			55	6,3	68	9,1
150			55	7,8	75	11,8
200	62	11,3	62	11,0	88	21,5
250	68	14,7	70	15,6	105	34,9
300	68	17,4	78	22,0	115	49,7
350	68	23,6	82	31,2	125	68,1
400	72	28,6	85	39,3	135	96,5
500	75	38,1	90	61,0	140	117,0

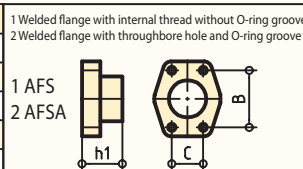


ANSI flanges

ND		150 lb/sq.in		300 lb/sq.in		600 lb/sq.in	
		h1	w. (kg)	h1	w. (kg)	h1	w. (kg)
20	3/4"	52,3	0,71	57,1	1,26	57,2	1,45
25	1"	55,6	1,01	62,0	1,52	62,0	1,76
32	1 1/4"	57,2	1,33	65,0	2,03	66,5	2,49
40	1 1/2"	62,0	1,72	68,3	2,89	69,9	3,49
50	2"	63,5	2,58	69,8	3,40	73,2	4,36
65	2 1/2"	69,9	4,11	76,2	5,15	79,2	6,43
80	3"	69,9	4,92	79,2	6,93	82,6	8,53
100	4"	76,2	6,84	85,8	11,20	101,6	17,4
125	5"	88,9	8,56	98,5	15,10	114,3	29,2
150	6"	88,9	10,6	98,5	19,10	117,3	34,9
200	8"	101,6	17,6	111,2	29,90	133,4	53,9
250	10"	101,6	24,0	117,3	42,70	152,4	86,5
300	12"	114,3	36,5	130,0	61,80	155,4	103,0
350	14"	127,0	48,4	142,7	85,8	165,1	122,0
400	16"	127,0	60,6	146,0	106,0	177,8	170,0
500	20"	144,5	84,5	162,0	158,0	190,5	254,0

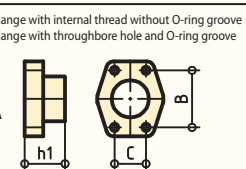
SAE welded flanges / companion flanges 3000 psi

ND	h1	B	C	w.(kg)
20	3/4"	36	47,6	22,2 0,40
25	1"	38	52,4	26,2 0,45
32	1 1/4"	41	58,7	30,2 0,65
40	1 1/2"	44	69,9	35,7 1,0
50	2"	45	77,8	42,9 1,3



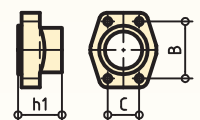
SAE welded flanges / companion flanges 6000 psi

ND	h1	B	C	w.(kg)
20	3/4"	36	50,8	23,8 0,50
25	1"	44	57,1	27,8 0,80
32	1 1/4"	44	66,7	31,8 1,10
40	1 1/2"	51	79,4	36,5 1,70
50	2"	65	96,8	44,4 3,75



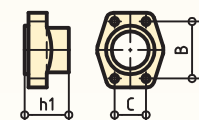
SAE stub end flange connectors 3000 psi with full flange or split flange halves

ND	h1	B	C	w.(kg)
20	3/4"	35	47,6	22,2 0,40
25	1"	40	52,4	26,2 0,50
32	1 1/4"	45	58,7	30,2 0,75
40	1 1/2"	50	69,9	35,7 1,00
50	2"	60	77,8	42,9 1,50



SAE stub end flange connectors 6000 psi with full flange or split flange halves

ND	h1	B	C	w.(kg)
20	3/4"	45	50,8	23,8 0,65
25	1"	50	57,1	27,8 1,10
32	1 1/4"	55	66,7	31,8 1,55
40	1 1/2"	60	79,4	36,5 2,50
50	2"	70	96,8	44,4 4,20



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Swivel Joints Type DL – DS

Various connections e.g. double-ended nipple or male adaptors

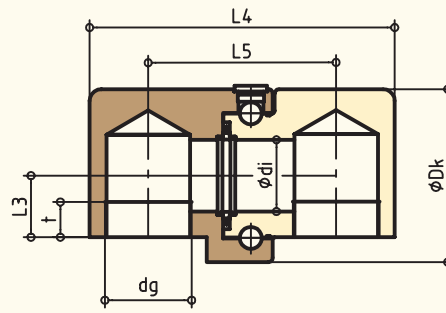
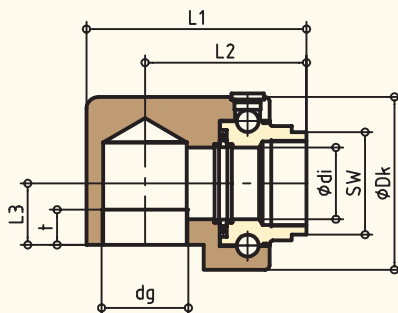
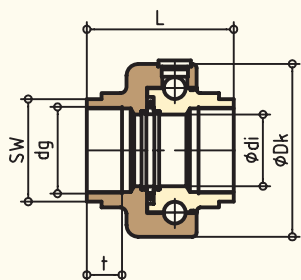
Type DL

Model 01

Model 02

Model 03

Design light



Dimensions

ND	dg		phi di	t	phi Dk	SW	L	L1	L2	L3	L4	L5	Weights in kg		
													01	02	03
8	G1/4	NPT1/4"	17	12	72	32	78	92	75	30	110	75	1,3	2,3	3,3
10	G3/8	NPT3/8"		14										2,3	3,3
15	G1/2	NPT1/2"		16										2,25	3,25
20	G3/4	NPT3/4"		16										1,95	2,7
25	G1	NPT1"	23	18	78	41	85	107	85	32	130	85	1,5	2,7	4,0
32	G1 1/4	NPT1 1/4"	31	20	88	55		115	90	33	152	100	2,4	3,6	5,3
40	G1 1/2	NPT1 1/2"	37	22	96	60	90	132	100	35	175	110	2,5	4,7	6,6
50	G2	NPT2"	48,5	24	118	70	100	150	110	42	208	128	4,1	7,7	11,4

Static load, please see swivel joint heads RD1 (page 5)

Materials: 1.7225 (42CrMo4), 1.4571 (X6CrNiMoTi17-12-2)

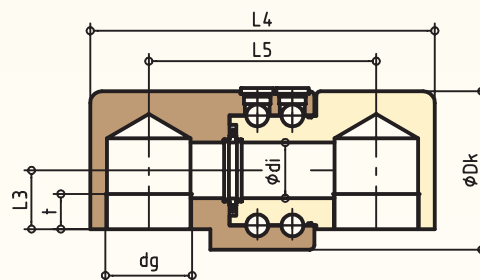
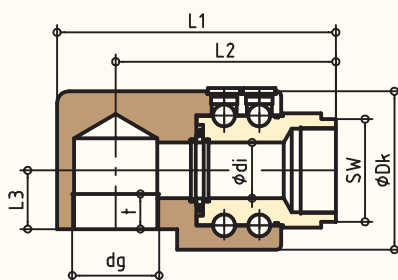
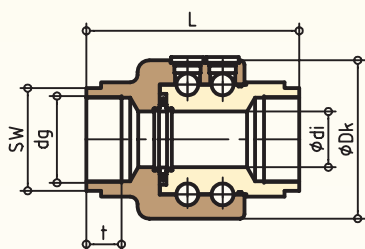
Type DS

Model 01

Model 02

Model 03

Design heavy



Dimensions

ND	dg		phi di	t	phi Dk	SW	L	L1	L2	L3	L4	L5	Weights in kg					
													01	02	03			
8	G1/4	NPT1/4"	17	12	72	32	110	132	110	30	154	110	2,8	3,9	5,0			
10	G3/8	NPT3/8"		14												2,7	3,8	4,8
15	G1/2	NPT1/2"		16												2,5	3,6	4,7
20	G3/4	NPT3/4"		16												2,5	3,6	4,7
25	G1	NPT1"	23	18	78	41	120	158	125	33	200	132	3,5	5,2	7,2			
32	G1 1/4	NPT1 1/4"	31	20	88	55										33	200	132
40	G1 1/2	NPT1 1/2"	37	22	104	60	145	190	150	40	235	155	4,1	7,0	9,9			
50	G2	NPT2"	48,5	24	118	70										40	235	155

Static load, please see swivel joint heads RD2S (page 5)

Materials: 1.7225 (42CrMo4), 1.4571 (X6CrNiMoTi17-12-2)

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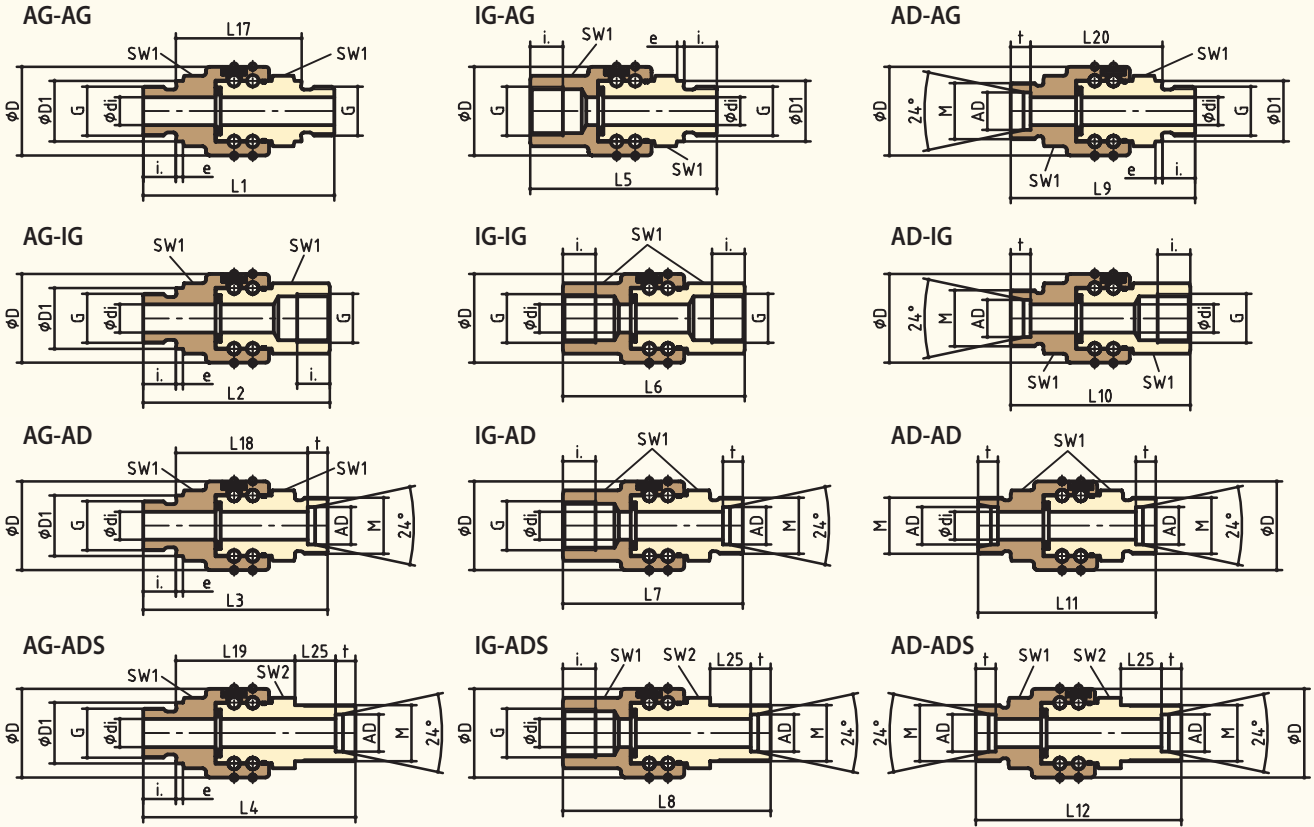


Swivel Joint with integrated connections – type DH

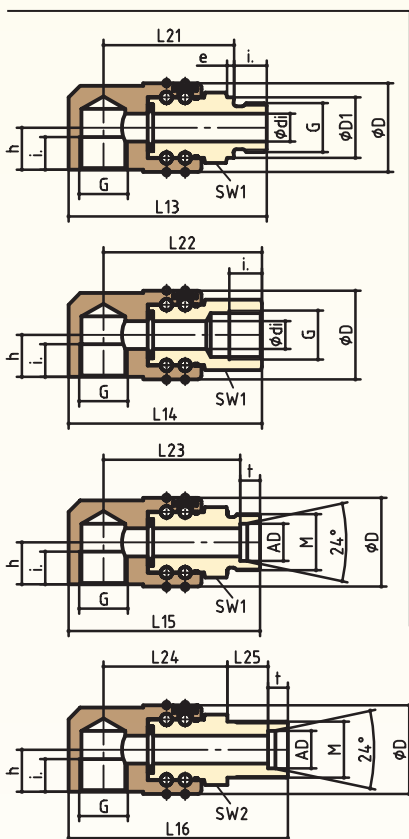
Internal – external thread, cutting ring connection (AD)

Various connections e.g. double-ended nipple or male stud couplings

Model - 01



Model- 02



AD	G	M	ødi	i	t	e	øD	øD1	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	
8		M16x1,5	7	12	7	2			19	68	66	77	66	64	75	66	64	75	70			
10	G1/4	M18x1,5	7	12	7,5		32															
12		M20x1,5	9	12	7,5	2,5					66,5	77,5		66	77	66,5						
14	G3/8	M22x1,5	9	12	8		22		69		71	80,5	69	70	80	70,5			72	80	75	
16	G1/2	M24x1,5	12	14	8,5		38	26	80	79	91	80	78	77	89	79	77	76	88	85		
20	G3/4	M30x2	14	16	10,5		50	32	98	90	95	118	90	82	87	110	95	87	92	115	105	
25	G1	M36x2	20	18	12	3	55	39	107	104	128	107	104	128	104	101	125	120				
30	G1 1/4	M42x2	25	20	13,5		60	49	111	108	132	110	107	131	108	105	129	134				
38	G1 1/2	M52x2	32	22	16		70	55	121	116	143	118	113	115	140	118	113	115	140	145		

AD	L14	L15	L16	L17	L18	L19	L20	L21	L22	L23	L24	L25	B	H	h	SW1	SW2	w. (kg)	
																		01	02
8	70	68	79	44	47	42	47	47	59	50	45	16	22	29	15			0,30	0,35
10					46,5	42	46,5	47		49,5		15,5				22			
12	75	72,5	83,5	45	47	42,5	47	50	62	52	47,5							0,35	0,40
14		76,5	86,5		50,5	44,5	50,5			55,5	49,5	16	27						
16	83	82	94	54	56,5	51	56,5	56	68	58,5	53	17,5		36	18	27		0,45	0,55
20	97	102	125	66	68,5	63	68,5	70	78	72,5	67	28,5	41	46	24	32		0,80	1,10
25	120	117	141	71	74	68	74	78	96	81	75	30	46	52	28	41		1,00	1,40
30	134	131	155		74,5	68	75,5	84	104	81,5	81	30,5	55	59	31	50		1,50	1,80
38	140	142	167	77	80	74	80	91	108	94	88	31	60	70	35	55	60	2,10	2,60

Max. pressure	Material	
	1.7225	1.4571
	AD8 - AD25 AD30 - AD38	p max. = 350 bar p max. = 315 bar
		p max. = 160 bar p max. = 100 bar

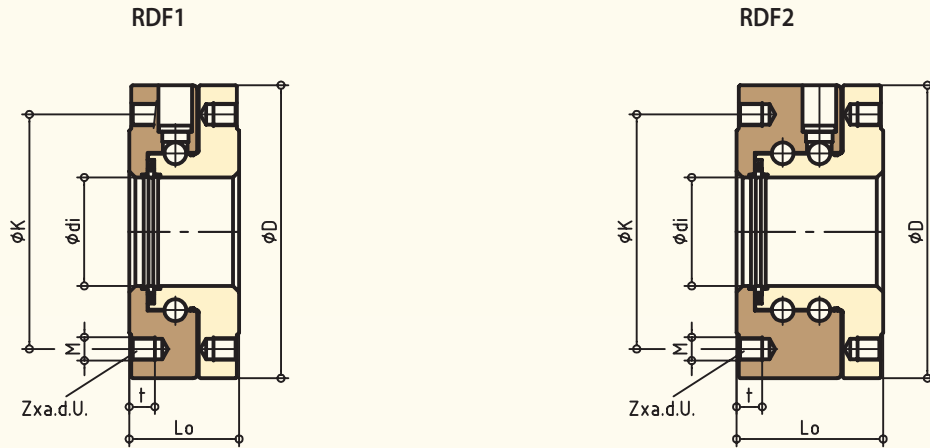
Swivel joints of the series DH can be used as connection for hose lines to prevent moved hoses from torsion. Range of application: For slow turning and swivel motions and filtered clean media. The sealing kits can be replaced.

Example for orders: DH-01-AG1/4-AD8 (model 01)
DH-02-IG1/4-AG1/4 (model 02)



Swivel Joints RDF1 – RDF2

Swivel Joints with integrated flange connection according to DIN or ANSI



Materials: 1.7225, 1.4571

Allowable loads and bending moments – please see RD1, RD2S, RD2L (page 5)

Flange connection according to DIN

2632 – PN10 / 2633 – PN16 / 2635 – PN40

ND	bar	ϕD	ϕdi	t	ϕK	M	Z	RDF1		RDF2	
								Lo	w. (kg)	Lo	w. (kg)
50	16	165	48,5	23	125	16	4	95	13,0	120	16,3
	40										
65	16	185	58,6	24	145	16	4	95	16,9	120	20,9
	40										
80	16	200	73,9	24	160	16	8	100	19,0	125	23,4
	40										
100	16	220	98	24	180	16	8	100	22,2	125	27,7
	40										
125	10	250	124	23	210	16	8			130	35,2
	16										
150	10	285	150	26	240	20	8			140	46,3
	16										
200	10	340	198,7	27	295	20	8			140	59,7
	16										
250	10	395	250,4	31	350	20	12			145	76,0
	16				355	24					
300	10	445	301	31	400	20	12			145	89,6
	16				410	24					

Nominal diameter ND350 – 700 on request

Flange connection

according to ANSI B16.5

ND	lbs	ϕD	ϕdi	t	ϕK	M	Z	RDF1		RDF2	
								Lo	w. (kg)	Lo	w. (kg)
2"	150	152	52,6	23	120,6	16	4	95	10,6	120	13,6
	600										
2½"	150	178	62,7	23	139,7	16	4	95	16,5	120	20,1
	600										
3"	150	190	78	23	152,4	16	4	100	16,7	120	23,4
	600										
4"	150	228	102,4	23	190,5	16	8	100	24,4	125	30,4
	600										
5"	150	254	128,3	27	215,9	20	8			135	38,3
	300										
6"	150	279	154,2	27	241,3	20	8			140	43,5
	300										
8"	150	342	202,7	27	298,4	20	8			140	59,7
	300										
10"	150	406	254,5	31	361,9	24	12			145	82,4
	300										
12"	150	482	304,8	31	431,8	24	12			145	119,0
	300										

Nominal diameter ND350 – 700 on request

IMPORTANT INFORMATION:

The advantages of RDF swivel joints are their short overall length and their integrated flange connection.

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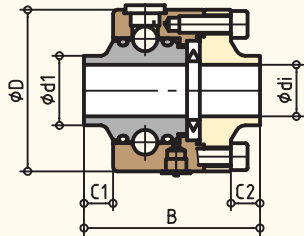


Swivel Joint Heads for Loading Technology

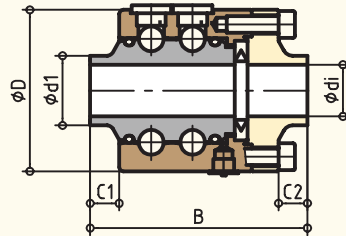
For the construction of complete loading systems

Combinable connections (page 7)

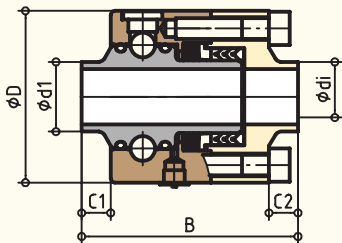
VGC1-N
(PTFE grooved ring sealing)



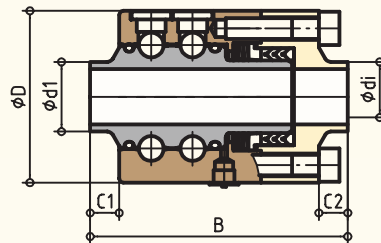
VGC2-N
(PTFE grooved ring sealing)



VGC1-M
(Lip seal)

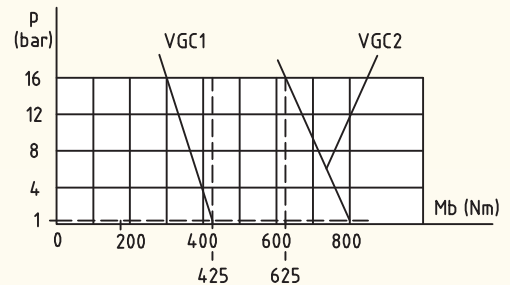


VGC2-M
(Lip seal)



$p_{max} = 16 \text{ bar}$
Allowable bending moments (please see schedule)
Material: 1.4571 (others on request)

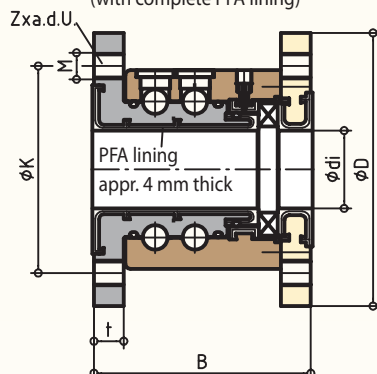
Example of bending moment:
VGC-DN50-Material: 1.4571



ND	$\phi d1$	ϕdi	ϕD	C1	C2	VGC1				VGC2							
						VGC1-N		VGC1-M		Allowable bending moment		VGC2-N		VGC2-M		Allowable bending moment	
						B	w. (kg)	B	w. (kg)	Mb (Nm) at p=1 bar	Mb (Nm) at p=16 bar	B	w. (kg)	B	w. (kg)	Mb (Nm) at p=1 bar	Mb (Nm) at p=16 bar
25	33,7	25,0	83	14	14												
50	60,3	48,0	120	15	23												
80	88,9	78	155	15	28	85	2,0	104,5	2,4	125,0	100,0	105	3,0	125	3,2	230	200
100	114,3	98,0	178	20	32	110	5,0	146	7,6	425,0	300,0	135	6,6	160	9,0	800	625
150	168,3	154	256	17,5	17,5	116	10,0	156	12,4	850	500	140	12,5	170	14,8	1600	1200
200	219,1	198	338	20	24	125	12,0	147,5	14,0	1225	625	150	15,3	171,5	16,6	2250	1600

VGC2-PFA

(PTFE grooved ring sealing)
(with complete PFA lining)



ND	ϕD	ϕdi	t	ϕK	M	Z	B	w. (kg)
50	165	47	18	125	16	4	133	12,6
80	200	74	20	160	16	8	137	16,2
100	220	94	20	180	16	8	137	18,5

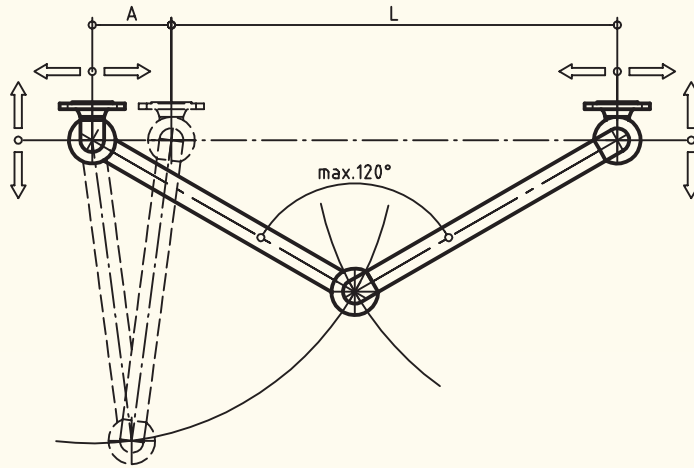
$p_{max} = 16 \text{ bar}$
Allowable bending moments (please see VGC2)
Material: 1.4571 (others on request)



Rotary pipe joint shears

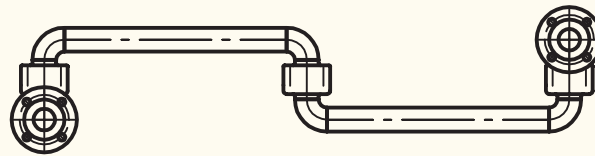
Examples of application

Examples of application 1

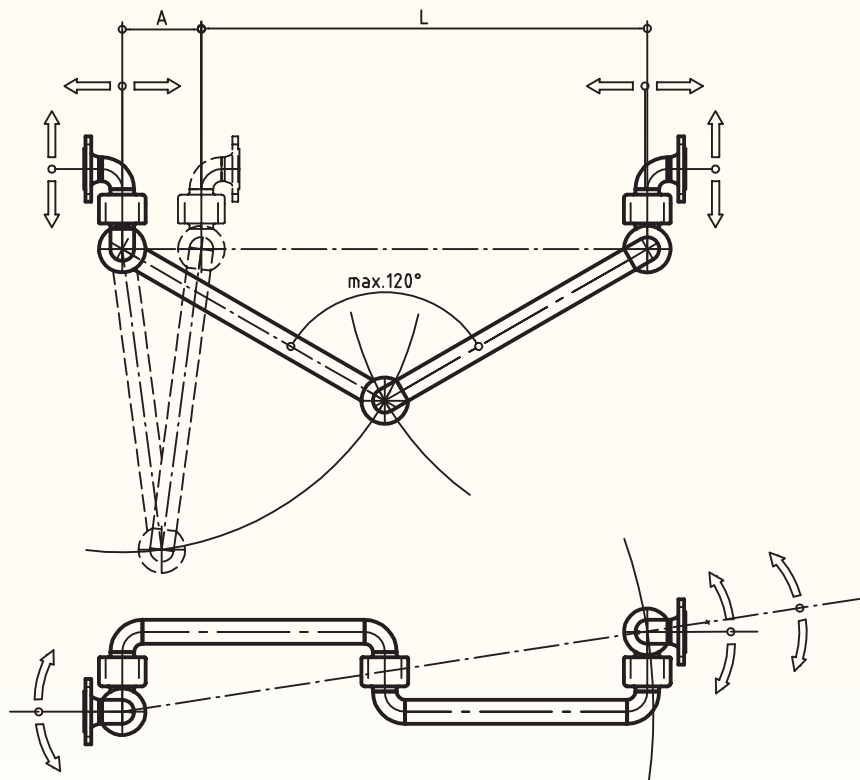


Rotary pipe joint shears are movable pipe systems with which greater distances can be bridged. For applications, where hoses are not considered suitable, the use of rotary pipe joints is an ideal alternative.

Rotary pipe joint shears are manufactured on customers specification only. In case of fire prevention (water based fire extinguishing systems) KLAAS rotary pipe joint shears can be proved with VdS approval if demanded.



Examples of application 2



The following details are necessary to enable us to offer the best possible construction:

- totality of motions which have to be realised
- distance between the connections (traverse path)
- kind of connection
- operational parameter

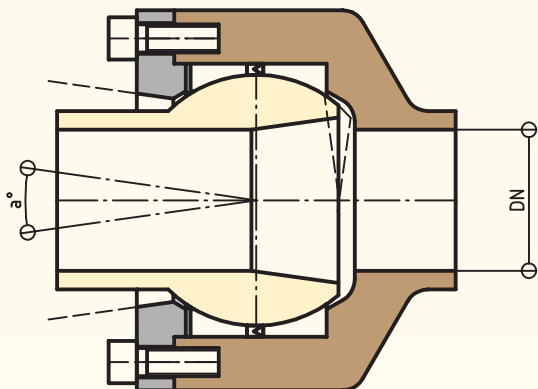


Special constructions (overview)

Construction and manufacturing according to customers specification

Ball-type rotary pipe joint – type KG

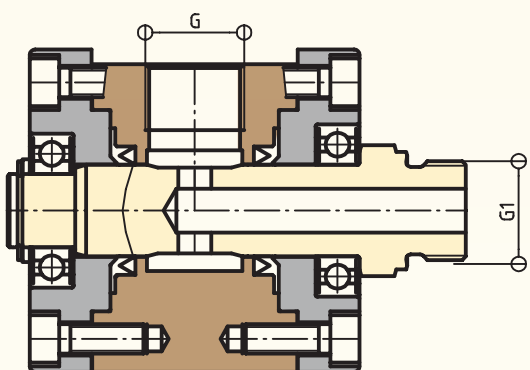
Combinable connections (page 7)



Apart from the rotation around its center axis by 360°, ball-type rotary pipe joints can also cope with lateral deflections by $\pm 7,5^\circ$. Ball-type rotary pipe joints are an approved solution for braced pipeline systems where a straightened movement is not possible.

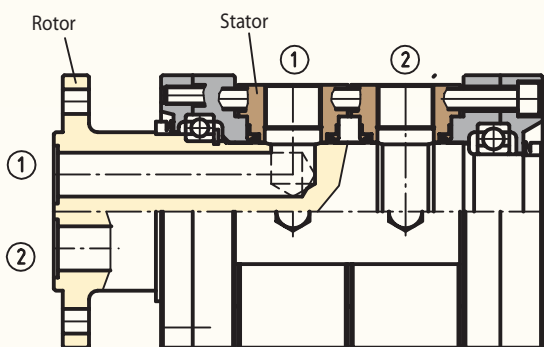
High-pressure rotary joint – type HDV

HDV rotary joints are an optimal solution in case of high pressure stages and high rotational speed



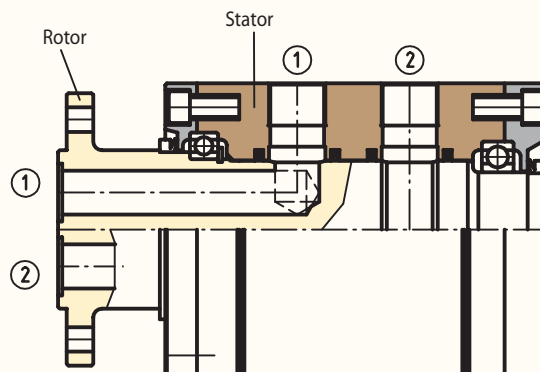
Threaded connection: up to 2" (G or NPT)
 Threaded connection: "G" internal thread only
 Threaded connection: "G" internal or external thread
 Pressure: up to 1500 bar
 Rotational speed: up to 3000/min (depending on pressure)

Multi-channel rotary unions – type DFS (segment design)



Number of channels: 2 to 12
 Connection with the rotor: drilled hole with O-ring sealing
 Connection with the stator: according to customers specification

Multi-channel rotary unions – type DFK (compact design)



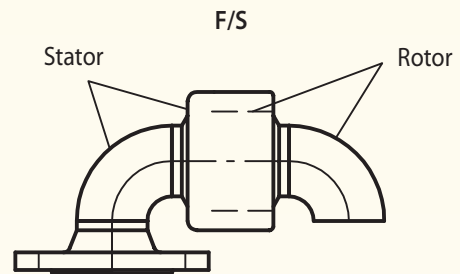
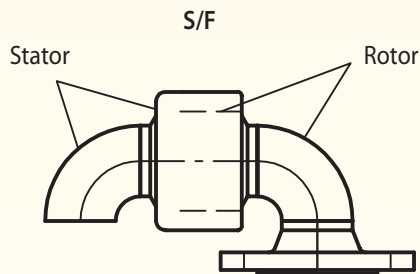
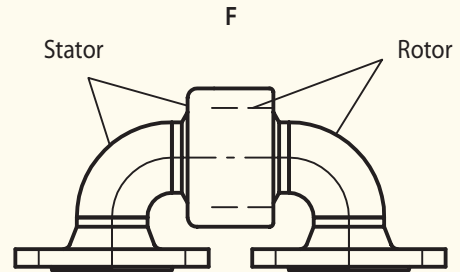
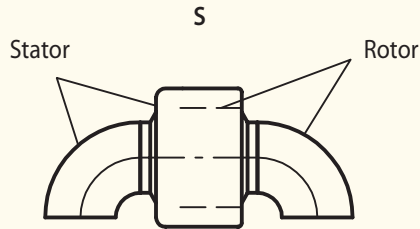
Nominal diameter: ND 6 to ND100
 Pressure stage: up to 1500 bar
 Rotational speed: up to 3000 rotations per minute (depending on pressure)

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Examples of orders

Different connections are combinable

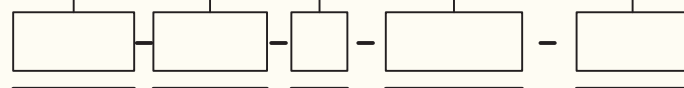


N - nipple
M -socket
F -flange DIN, ANSI, SAE
S - welding end

ect.
:
F/S
S/F

SAE6-AFAV
SAE3-AFS
600lbs
300lbs
150lbs
PN40
:
PN10

VGC
RD2S
RD2L
RD1 - S - 01 - DN20 -



Swivel Joint

Design / Type

Connection

Model

Nominal diameter (ND)

Pressure stage (bar; psi)

Examples of orders:

Swivel Joint RD2S-F-03-DN50-PN16
Swivel Joint RD2S-F-05-DN32-SAE6-AFAV
Swivel Joint RD2L-F-02-DN250-150lbs

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Technical questionnaire



Enquiry / Offer

Order

Please send us a filled in copy of our questionnaire by fax.

Fax: + 49 (0) 23 35 - 97 80 - 20

Field of application:
Flow medium / analysis:

Quantity					
Swivel joint type					
Nominal diameter (NW/ ND)					
Model					
Material					

Flange

DIN / ANSI / PN					
-----------------	--	--	--	--	--

Welding end

Pipe dimension $\varnothing \times s$ (mm)					
--	--	--	--	--	--

Thread

Dimension internal thread					
Dimension external thread					

Operational conditions

Movement type r.p.m.					
Operating temperature °C					
Working pressure bar					
Test pressure					

Certificates, approvals, documentation					
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Delivery time
Delivery address <small>(if different from company address)</small>

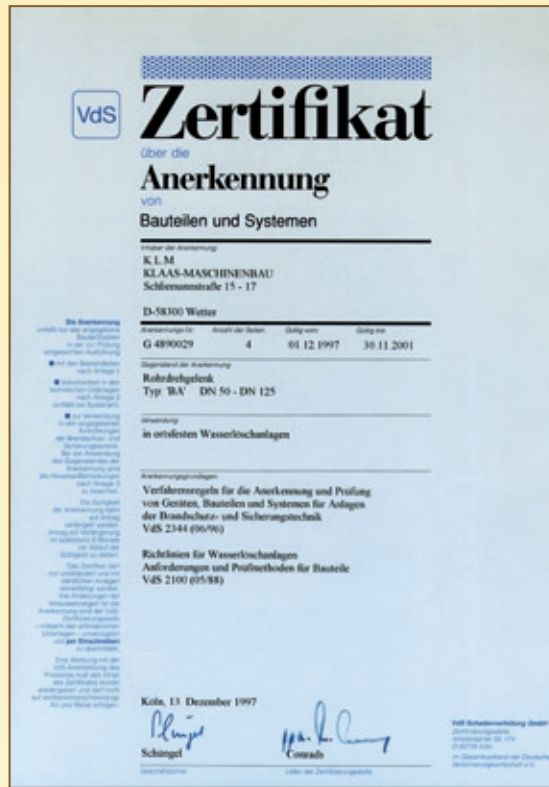
Enquiry / order no.
Reference / project

Company:	Name:
Street address:	Department:
Postcode / Place:	Telephone : Fax:
POB:	e-mail:

Date:	Signature:
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... since 1970

Quality directly from the manufacturer



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