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TECHNICAL DATASHEET  
ASME DESIGN  
(Imperial Version)

**Krombach® KFO 9136  
Metal Seated Ball Valves**



Crane ChemPharma & Energy

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# Krombach® KFO 9136 Features and Benefits

## Krombach® KFO 9136 Metal Seated Ball Valves with one Seat

Extreme Temperature and Wear Resistant Metal Seated Ball Valve for Use in Coal Gasification, Refining, Petrochemical and Pulp Slurry Severe Service.

### STANDARD FEATURES INCLUDE:

- Hard facing on ball and seat
- High wear resistance
- Unique lapping procedure for high quality seat / ball roundness of hard-faced surface
- Stem-ball connection uses a polygon profile to ensure the most effective torque transmission
- Optimized trunnion ball valve design permits smaller actuators due to lower torque
- Uni-Directional single seat design

### OPTIONAL FEATURES INCLUDE:



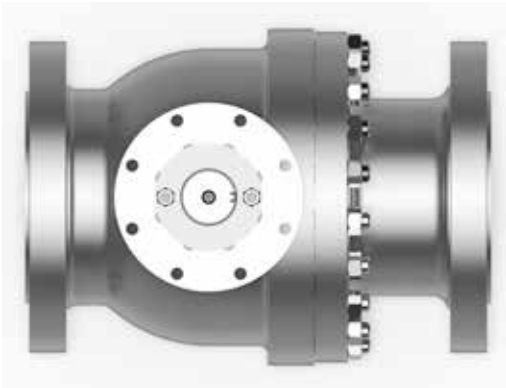
- Optional design with two seats and bi-directional sealing for demanding applications
- Stem extensions
- Emission monitoring ports
- Heating jacket
- Cladding on flow through body parts passage
- Single seat with Bi-Directional sealing



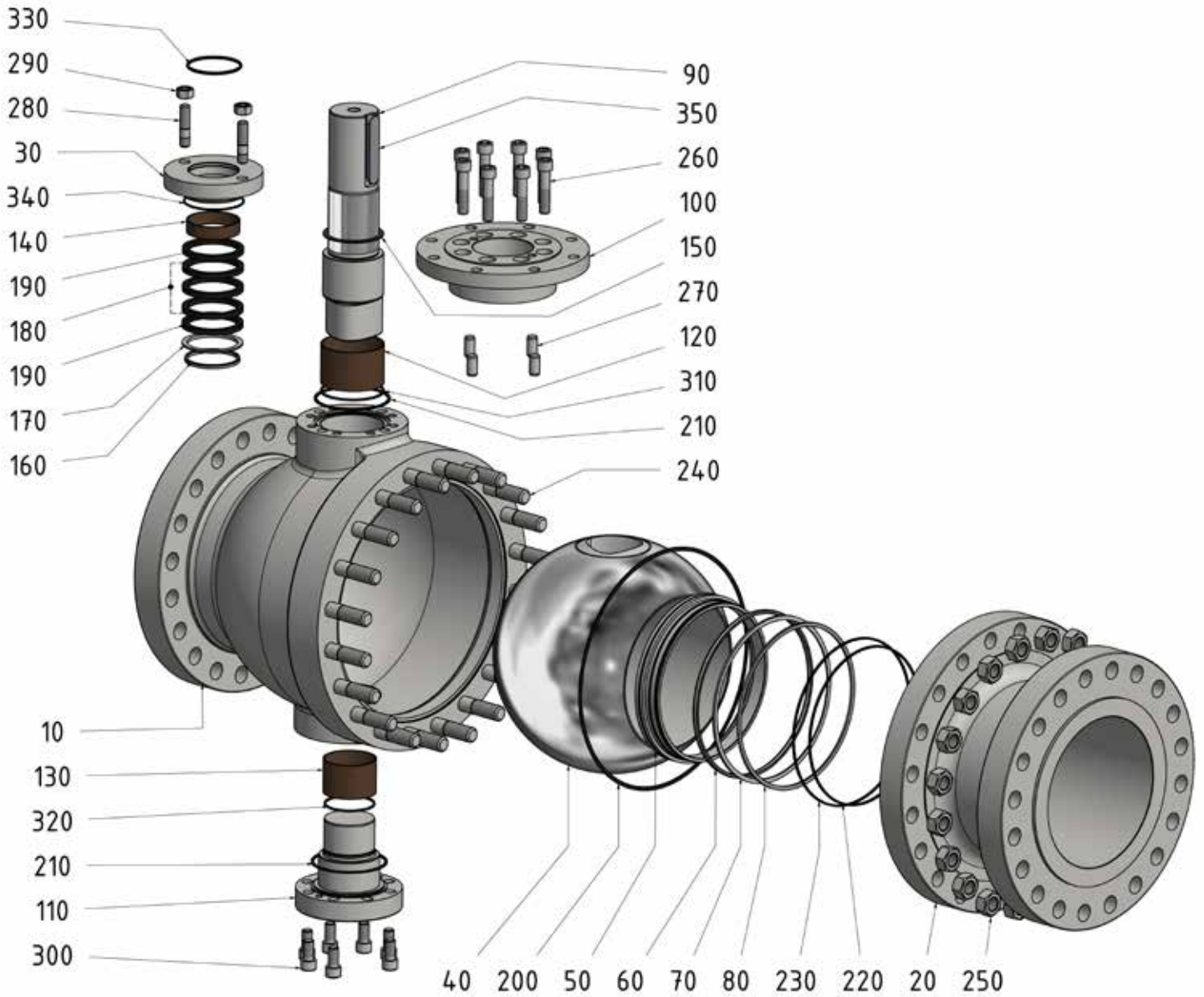
## Product Range

Size	Class	Body Design	Face-to-face Dimension	Body Material
2"-16" DN 200-600	Class 300-600	2-piece design Flanged Trunnion mounted Cast body	ASME B16.10	WCB / 1.0619 CF8M / 1.4408

## Krombach® KFO 9136 Body Designs

	Flange Design
Front View - Shaft side	
Side View	
Top View	

# Exploded View Standard Design



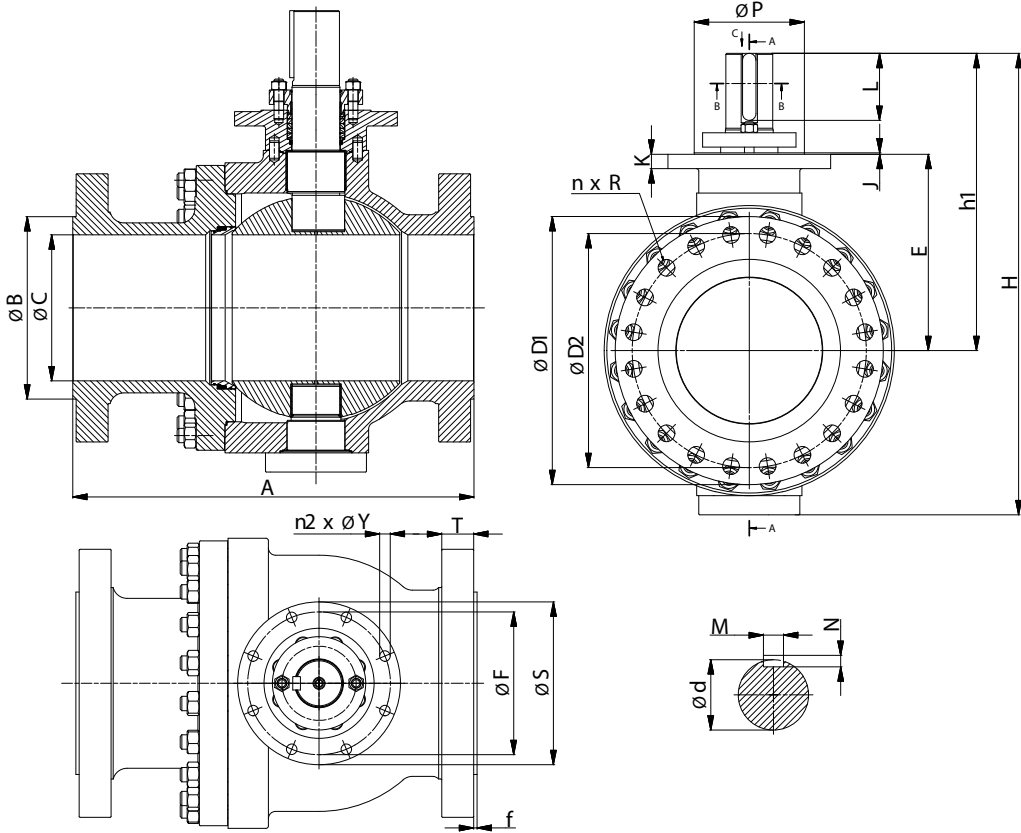
# Krombach® KFO 9136 Materials of Construction

Item*	Description	Carbon Steel		Stainless Steel	
		ASTM	DIN	ASTM	DIN
10	Body	A216 WCB	1.0619	A351 CF8M	1.4408
20	Body Cover	A216 WCB	1.0619	A351 CF8M	1.4408
30	Gland	A105	1.0460	A276 Gr. 316Ti	1.4571
40	Ball	A182 Gr. 316Ti + H4	1.4571 + H4	A182 Gr. 316Ti + H4	1.4571 + H4
50	Seat Ring	A182 Gr. 316Ti + H4	1.4571 + H4	A182 Gr. 316Ti + H4	1.4571 + H4
60	Seal Element (Seat)	PTFE-Compound / Graphite	PTFE-Compound / Graphite	PTFE-Compound / Graphite	PTFE-Compound / Graphite
70	Pressure Ring	A276 Gr. 316Ti	1.4571	A276 Gr. 316Ti	1.4571
80	Cup Spring	Inconel X718	2.4668	Inconel X718	2.4668
90	Stem	A276 Gr.420	1.4021	A182 F51	1.4462
100	Bonnet	A105	1.0460	A276 Gr. 316Ti	1.4571
110	Trunnion	A105	1.0460	A276 Gr. 316Ti	1.4571
120	Bearing	Carbon Steel +PTFE	Carbon Steel +PTFE	Stainless Steel +PTFE	Stainless Steel +PTFE
130	Bearing	Carbon Steel +PTFE	Carbon Steel +PTFE	Stainless Steel +PTFE	Stainless Steel +PTFE
140	Bearing	Carbon Steel +PTFE	Carbon Steel +PTFE	Stainless Steel +PTFE	Stainless Steel +PTFE
150	Axial Bearing	Carbon Steel +PTFE	Carbon Steel +PTFE	Stainless Steel +PTFE	Stainless Steel +PTFE
160	Sealing Ring (Stem)	PTFE-Compound / Elgiloy Spring	PTFE-Compound / Elgiloy Spring	PTFE-Compound / Elgiloy Spring	PTFE-Compound / Elgiloy Spring
170	Supporting Ring	A276 Gr. 316Ti	1.4571	A276 Gr. 316Ti	1.4571
180	Packing Ring	Graphite	Graphite	Graphite	Graphite
190	Supporting Ring	Graphite	Graphite	Graphite	Graphite
200	Gasket	Graphite	Graphite	Graphite	Graphite
210	Gasket	Graphite	Graphite	Graphite	Graphite
220	Wiper Ring	Graphite	Graphite	Graphite	Graphite
230	Wiper Ring	Graphite	Graphite	Graphite	Graphite
240	Stud Bolt	A193 Gr. B7 Zinc plated	1.7709 Zinc plated	A193 Gr. B7 Zinc plated	1.7709 Zinc plated
250	Hex. Nut	A194 Gr. 2H Zinc plated	1.7258 Zinc plated	A194 Gr. 2H Zinc plated	1.7258 Zinc plated
260	Cyl. Screw	A193 Gr. B7 Zinc plated	1.7709 Zinc plated	A193 Gr. B7 Zinc plated	1.7709 Zinc plated
270	Pin	Carbon Steel	Carbon Steel	Stainless Steel	Stainless Steel
280	Stud Bolt	A193 Gr. B7 Zinc plated	1.7709 Zinc plated	A193 Gr. B7 Zinc plated	1.7709 Zinc plated
290	Hex. Nut	A194 Gr. 2H Zinc plated	1.7258 Zinc plated	A194 Gr. 2H Zinc plated	1.7258 Zinc plated
300	Cyl. Screw	A193 Gr. B7 Zinc plated	1.7709 Zinc plated	A193 Gr. B7 Zinc plated	1.7709 Zinc plated
310	Bearing Protector	Graphite	Graphite	Graphite	Graphite
320	Bearing Protector	Graphite	Graphite	Graphite	Graphite
330	O-Ring	FKM	FKM	FKM	FKM
340	O-Ring	FKM	FKM	FKM	FKM
350	Parallel Key	A29 (1045)	1.0060	A29 (1045)	1.0060

\* Master BOM includes all items for the standard design



# KFO 9136 Dimensions and Weights Class 300



DN	NPS	Dimensions (inch)											
		A	Ø C	H	h1	E	Ø D1	Ø D2	n	R	Ø B	T	f
50	2"	8,50	1,93	12,51	8,65	5,16	6,50	5,00	8	0,75	3,63	0,81	0,08
80	3"	11,14	2,99	14,38	9,50	5,98	8,27	6,63	8	0,87	5,00	1,06	0,08
100	4"	12,01	3,94	16,17	10,41	6,69	10,04	7,87	8	0,87	6,19	1,19	0,08
150	6"	15,87	5,91	23,10	15,05	10,00	12,60	10,63	12	0,87	8,50	1,38	0,08
200	8"	19,76	7,99	29,58	19,32	12,60	14,96	13,00	12	0,98	10,63	1,56	0,08
250	10"	22,36	9,92	32,53	20,90	13,78	17,52	15,25	16	1,14	12,75	1,81	0,08
300	12"	25,51	12,01	37,94	24,44	16,14	20,47	17,75	16	1,26	15,00	1,94	0,08
350	14"	30,00	13,23	40,56	26,02	16,93	23,03	20,25	20	1,26	16,25	2,06	0,08
400	16"	32,99	15,16	45,19	28,97	18,31	25,59	22,50	20	1,38	18,50	2,19	0,08

DN	NPS	Dimensions (inch)												Weights (lb)
		ISO 5211	S(sq.)	Ø P	Ø F	n2	Ø Y	K	J	Ø d	L	M	N	
50	2"	F12	5,91	3,35	4,92	4	0,53	0,63	0,16	1,02	1,57	0,31	0,28	55,1
80	3"	F14	6,89	3,94	5,51	4	0,69	0,63	0,20	1,42	1,57	0,39	0,31	101,4
100	4"	F14	6,89	3,94	5,51	4	0,69	0,63	0,20	1,50	1,77	0,39	0,31	143,3
150	6"	F25	11,42	7,87	10,00	8	0,69	0,98	0,24	2,17	2,48	0,63	0,39	341,7
200	8"	F25	11,42	7,87	10,00	8	0,69	0,98	0,12	2,68	3,94	0,79	0,47	639,3
250	10"	F30	13,39	9,06	11,73	8	0,87	1,18	0,12	3,07	4,33	0,87	0,55	937,0
300	12"	F30	13,39	9,06	11,73	8	0,87	1,18	0,12	3,86	5,51	1,10	0,63	1399,9
350	14"	F35	15,94	10,24	14,02	8	1,30	1,38	0,12	3,86	6,30	1,10	0,63	1752,7
400	16"	F35	15,94	10,24	14,02	8	1,30	1,38	0,12	4,13	7,87	1,10	0,63	2414,1





# Krombach® KFO 9136

## Pressure/Temperature Ratings

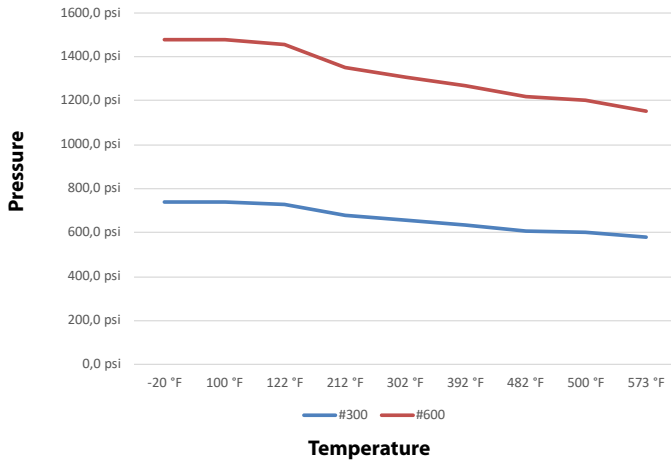
Temperature	Max working pressure ASME class 300	Max working pressure ASME class 600
	ASTM A216 Gr. WCB*	
°F	psi	
-20	741,2	1480,9
100	741,2	1480,9
122	726,7	1453,3
212	675,9	1351,8
302	654,1	1308,3
392	635,3	1270,6
482	607,7	1216,9
500	600,5	1203,8

\*according ASME B16.34 - Material Group 1.1

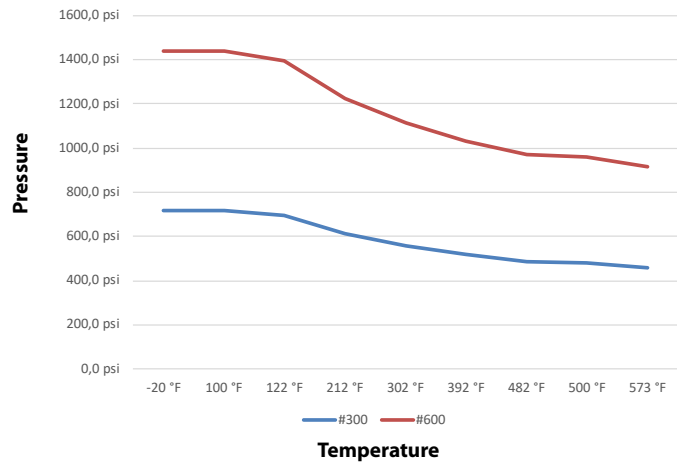
Temperature	Max working pressure ASME class 300	Max working pressure ASME class 600
	ASTM A351 Gr. CF8M*	
°F	psi	
-20	719,4	1440,2
100	719,4	1440,2
122	697,6	1395,3
212	612,1	1224,1
302	558,4	1116,8
392	517,8	1034,1
482	484,4	968,9
500	478,6	957,3

\*according ASME B16.34 - Material Group 2.2

**Pressure & Temperature  
ASTM A216 Gr. WCB**



**Pressure & Temperature  
ASTM A351 Gr. CF8M**





# Krombach® KFO 9136 Kv / Cv Values and MAST

## Kv / Cv Values Class 300

DN	NPS	Opening Angle															
		90°		80°		70°		60°		50°		40°		30°		20°	
		Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv
50	2"	350	406	301	349	224	260	133	154	88	102	56	65	35	41	21	24
80	3"	970	1125	834	967	621	720	369	428	243	282	155	180	97	113	58	67
100	4"	1900	2204	1634	1895	1216	1411	722	838	475	551	304	353	190	220	114	132
150	6"	4750	5510	4085	4739	3040	3526	1805	2094	1188	1378	760	882	475	551	285	331
200	8"	9300	10788	7998	9278	5952	6904	3534	4099	2325	2697	1488	1726	930	1079	558	647
250	10"	15200	17632	13072	15164	9728	11284	5776	6700	3800	4408	2432	2821	1520	1763	912	1058
300	12"	23700	27492	20382	23643	15168	17595	9006	10447	5925	6873	3792	4399	2370	2749	1422	1650
350	14"	28100	32596	24166	28033	17984	20861	10678	12386	7025	8149	4496	5215	2810	3260	1686	1956
400	16"	38000	44080	32680	37909	24320	28211	14440	16750	9500	11020	6080	7053	3800	4408	2280	2645

## Kv / Cv Values Class 600

DN	NPS	Opening Angle															
		90°		80°		70°		60°		50°		40°		30°		20°	
		Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv
50	2"	305	354	262	304	195	226	116	135	76	88	49	57	31	36	18	21
80	3"	860	998	740	858	550	638	327	379	215	249	138	160	86	100	52	60
100	4"	1590	1844	1367	1586	1018	1181	604	701	398	462	254	295	159	184	95	110
150	6"	4030	4675	3466	4021	2579	2992	1531	1776	1008	1169	645	748	403	467	242	281
200	8"	8150	9454	7009	8130	5216	6051	3097	3593	2038	2364	1304	1513	815	945	489	567
250	10"	13000	15080	11180	12969	8320	9651	4940	5730	3250	3770	2080	2413	1300	1508	780	905
300	12"	20600	23896	17716	20551	13184	15293	7828	9080	5150	5974	3296	3823	2060	2390	1236	1434
350	14"	26000	30160	22360	25938	16640	19302	9880	11461	6500	7540	4160	4826	2600	3016	1560	1810
400	16"	35000	40600	30100	34916	22400	25984	13300	15428	8750	10150	5600	6496	3500	4060	2100	2436

## Maximum Allowable Stem Torque Class 300-600

DN	NPS	MAST [ft lb(f)]	
		1.4021 A276 Gr. 420	1.4462 A182 Gr. F51
50	2"	333	471
80	3"	932	1047
100	4"	1124	1311
150	6"	3210	3210
400	16"	6927	8802
250	10"	10276	13428
300	12"	19152	21311
350	14"	18334	28077
400	16"	23590	37331



# Krombach® KFO 9136 Torques

## Class 300-600

DN	NPS	Δp [psi]	Torque [ft lb(f)]					
			BTO	RUN	ETO	BTC	RUN	ETC
50	2"	0	21	19	22	24	19	19
		218	38	22	24	26	22	27
		290	44	24	24	27	24	30
		725	76	31	27	29	31	47
		1450	130	43	30	34	43	76
80	3"	0	38	34	41	44	34	35
		218	77	42	43	46	42	54
		290	89	44	44	47	44	60
		725	164	60	48	52	60	100
		1450	291	86	55	60	86	165
100	4"	0	44	38	46	52	38	38
		218	107	50	49	54	50	71
		290	128	54	49	55	54	82
		725	254	78	54	60	78	146
		1450	465	119	61	68	119	254
150	6"	0	136	119	142	157	119	121
		218	291	150	150	165	150	201
		290	344	161	153	167	161	227
		725	654	223	167	184	223	387
		1450	1172	327	193	212	327	653
200	8"	0	207	181	223	245	181	184
		218	557	246	234	258	246	361
		290	674	269	238	262	269	420
		725	1373	401	261	287	401	776
		1450	2537	621	298	328	621	1368
250	10"	0	317	277	338	372	277	280
		218	871	381	355	390	381	562
		290	1055	415	360	396	415	655
		725	2163	622	394	433	622	1217
		1450	4010	968	449	494	968	2153
300	12"	0	497	435	532	585	435	441
		218	1400	607	565	621	607	900
		290	1700	665	576	633	665	1054
		725	3504	1011	641	705	1011	1973
		1450	6511	1587	750	825	1587	3506
350	14"	0	512	446	551	607	446	453
		218	1618	653	584	643	653	1013
		290	1986	722	595	655	722	1200
		725	4196	1135	661	727	1135	2321
		1450	7880	1823	770	846	1823	4189
400	16"	0	607	531	652	717	531	538
		218	2131	814	695	765	814	1310
		290	2640	908	709	781	908	1568
		725	5689	1475	796	876	1475	3111
		1450	10770	2420	940	1035	2420	5686

*The torques shown in the chart are for reference only. For application-specific torque, please consult the factory.*

# Krombach® KFO 9136 Flange Bolting & Bolt Torques

## Flange Bolting Class 300

DN	NPS	Thread Size	Through Hole		
			Quantity Bolts	Length L	Quantity Nuts
50	2"	5/8-11 UNC	8	3,5"	16
80	3"	3/4-10 UNC	8	4,5"	16
100	4"	3/4-10 UNC	8	4,5"	16
150	6"	3/4-10 UNC	12	5"	24
200	8"	7/8-9 UNC	12	5,5"	24
250	10"	1-8 UNC	16	6,5"	32
300	12"	1 1/8-8 UN	16	7"	40
350	14"	1 1/8-8 UN	20	7,5"	40
400	16"	1 1/4-8 UN	20	8"	40

## Flange Bolting Class 600

DN	NPS	Thread Size	Through Hole		
			Quantity Bolts	Length L	Quantity Nuts
50	2"	5/8-11 UNC	8	4,5"	16
80	3"	3/4-10 UNC	8	5"	16
100	4"	7/8-9 UNC	8	6"	16
150	6"	1-8 UNC	12	7"	24
200	8"	1 1/8-8 UN	12	8"	24
250	10"	1 1/4-8 UN	16	9"	32
300	12"	1 1/4-8 UN	20	9"	32
350	14"	1 3/8-8 UN	20	9,5"	40
400	16"	1 1/2-8 UN	20	10,5"	40

## Trunnion joint bolt torques Class 300-600

DN	NPS	Bolt ø	Nm
50	2"	10	18
80	3"	10	18
100	4"	10	18
150	6"	16	122
200	8"	M20	139
250	10"	M20	159
300	12"	M20	205
350	14"	M20	205
400	16"	M20	229

## Gland nut torques Class 300-600

DN	NPS	Thread ø	Nm
50	2"	10	7
80	3"	10	8
100	4"	10	8
150	6"	16	32
200	8"	M20	59
250	10"	M20	66
300	12"	M20	81
350	14"	M20	81
400	16"	M20	88

## Body joint nut torques Class 300

DN	NPS	Thread ø	Nm
50	2"	M10	34
80	3"	M12	58
100	4"	M16	141
150	6"	M16	141
200	8"	M20	276
250	10"	M24	478
300	12"	M24	478
350	14"	M24	478
400	16"	M27	705

## Body joint nut torques Class 600

DN	NPS	Thread ø	Nm
50	2"	M12	58
80	3"	M16	141
100	4"	M20	276
150	6"	M24	478
200	8"	M27	705
250	10"	M27	705
300	12"	M30	958
350	14"	M33	1302
400	16"	M36	1675



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