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TECHNICAL DATASHEET  
ASME Design  
(Metric 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:



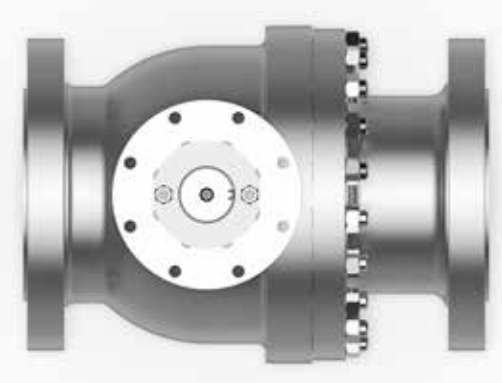
- Optional design with two seats and bi-directional sealing for demanding applications
- Stem extensions
- Emission monitoring ports
- Heating jacket
- Cladding on flow through body parts passage
- Single seat with Bi-Directional sealing



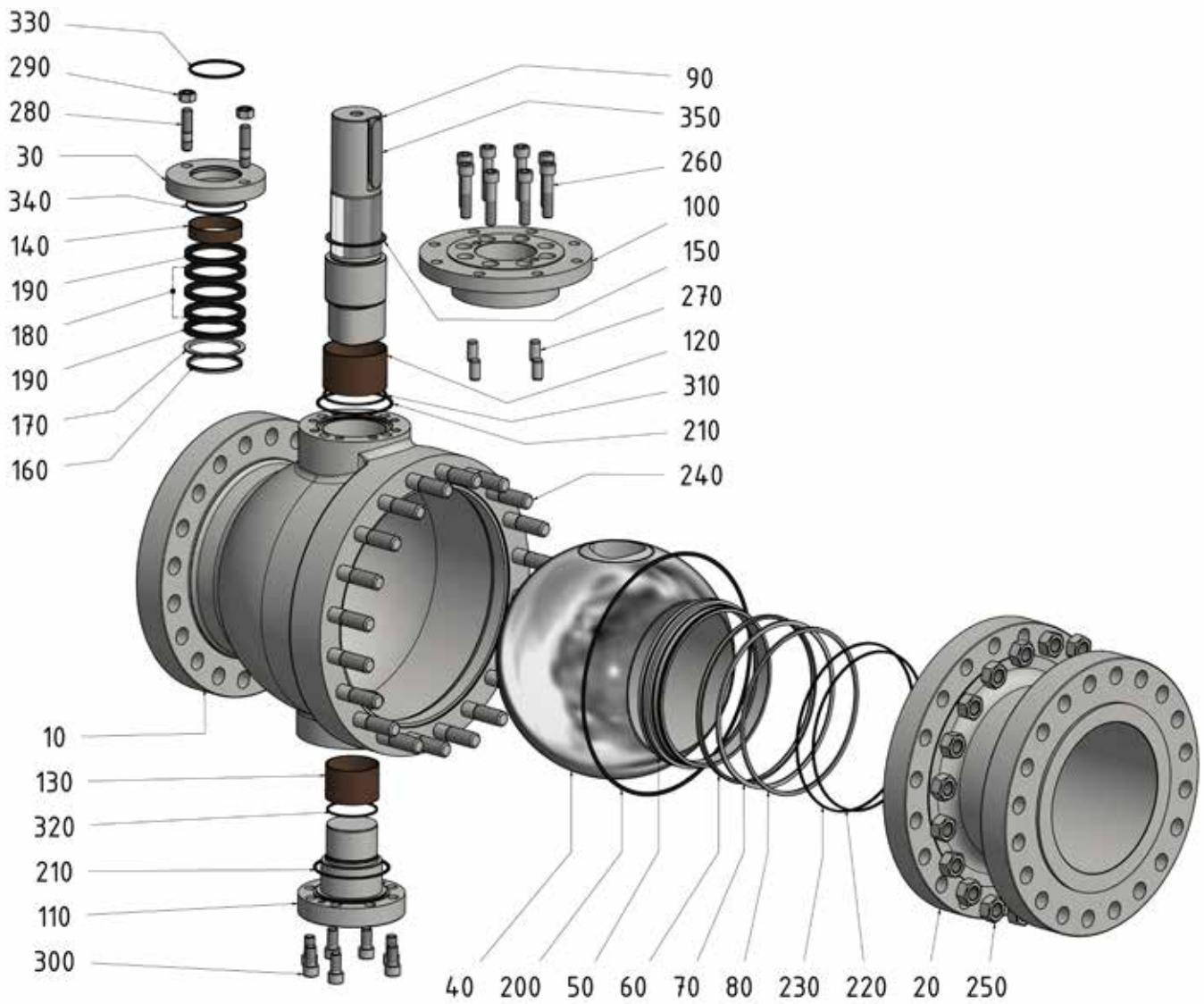
### Product Range

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

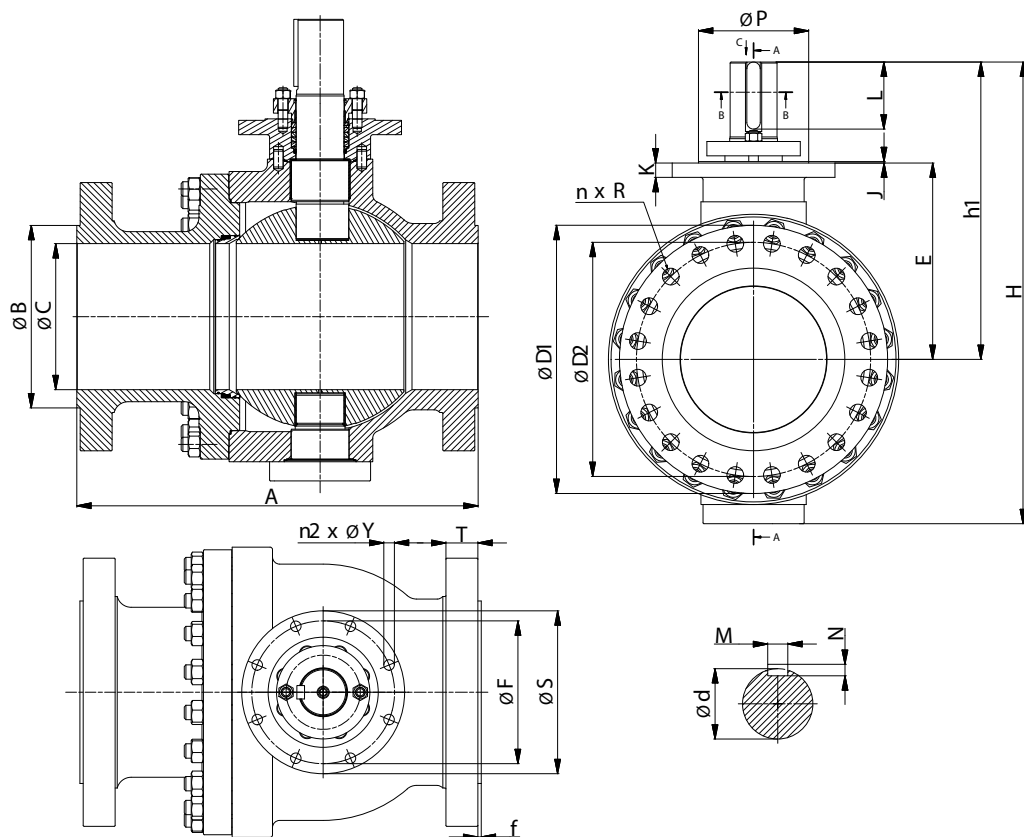


## Krombach® KFO 9136 Materials of Construction

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

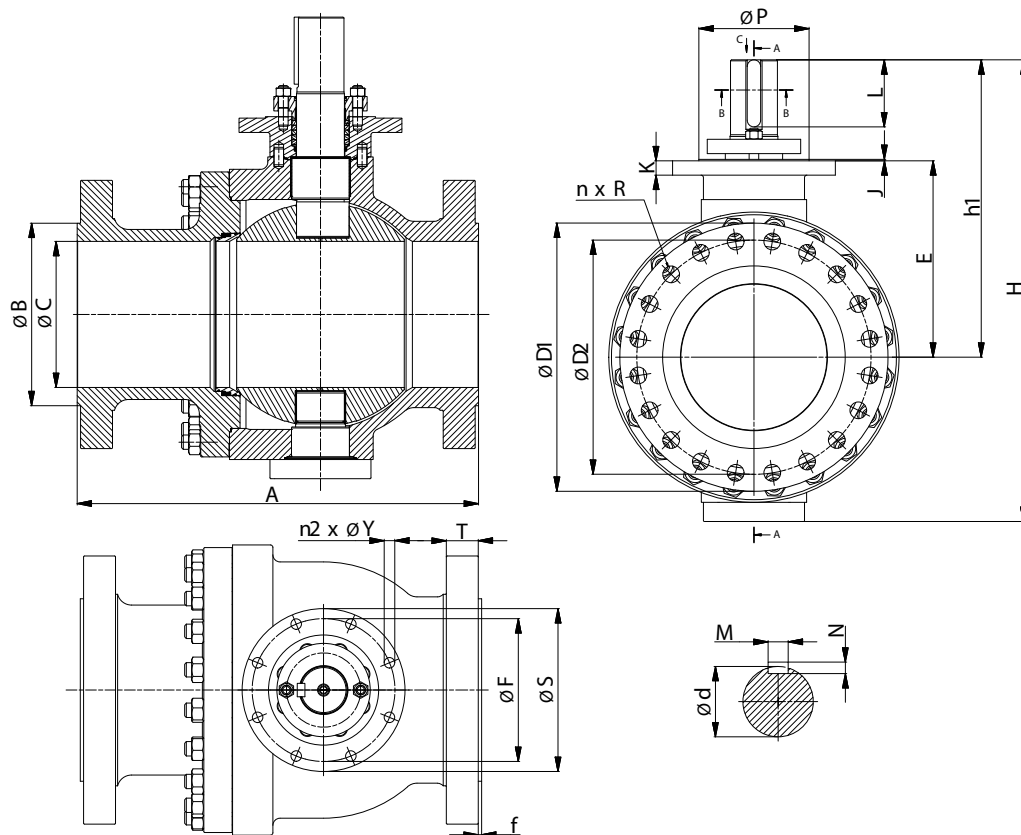
# KFO 9136 Dimensions and Weights Class 300



DN	NPS	Dimensions (mm)											Weight (kg)	
		A	$\varnothing C$	H	$h_1$	E	$\varnothing D1$	$\varnothing D2$	n	R	$\varnothing B$	T		f
50	2"	216	49	318	220	131	165	127	8	19	92	21	2	25
80	3"	283	76	365	241	152	210	168	8	22	127	27	2	46
100	4"	305	100	411	264	170	255	200	8	22	157	30	2	65
150	6"	403	150	586,8	382	254	320	270	12	22	216	35	2	155
200	8"	502	203	751	491	320	380	330	12	25	270	40	2	290
250	10"	568	252	826	531	350	445	387	16	29	324	46	2	425
300	12"	648	305	964	621	410	520	451	16	32	381	49	2	635
350	14"	762	336	1030	661	430	585	514	20	32	413	52	2	795
400	16"	838	385	1148	736	465	650	572	20	35	470	56	2	1095

DN	NPS	Dimensions (mm)											
		ISO 5211	S (sq.)	$\varnothing P$	$\varnothing F$	n2	$\varnothing Y$	K	J	$\varnothing d$	L	M	N
50	2"	12	150	85	125	4	13,5	16	4	26	40	8	7
80	3"	14	175	100	140	4	17,5	16	5	36	40	10	8
100	4"	14	175	100	140	4	17,5	16	5	38	45	10	8
150	6"	25	290	200	254	8	17,5	25	6	55	63	16	10
200	8"	F25	290	200	254	8	18	25	3	68	100	20	12
250	10"	F30	340	230	298	8	22	30	3	78	110	22	14
300	12"	F30	340	230	298	8	22	30	3	98	140	28	16
350	14"	F35	405	260	356	8	33	35	3	98	160	28	16
400	16"	F35	405	260	356	8	33	35	3	105	200	28	16

# KFO 9136 Dimensions and Weights Class 600



DN	NPS	Dimensions (mm)												Weight (kg)
		A	Ø C	H	h1	E	Ø D1	Ø D2	n	R	Ø B	T	f	
50	2"	292	49	318	220	131	165	127	8	19	92	25	7	28
80	3"	356	76	365	241	152	210	168	8	22	127	32	7	54
100	4"	432	100	411	264	170	275	216	8	25	157	38	7	88
150	6"	559	150	586,8	382	254	355	292	12	29	216	48	7	215
200	8"	660	203	751	491	320	420	349	12	32	270	56	7	375
250	10"	787	252	826	531	350	510	432	16	35	324	64	7	575
300	12"	838	305	964	621	410	560	489	20	35	381	67	7	825
350	14"	889	336	1030	661	430	605	527	20	38	413	70	7	1025
400	16"	991	385	1148	736	465	685	603	20	41	470	76	7	1440

DN	NPS	Dimensions (mm)												
		ISO 5211	S (sq.)	Ø P	Ø F	n2	Ø Y	K	J	Ø d	L	M	N	
50	2"	12	150	85	125	4	13,5	16	4	26	40	8	7	
80	3"	14	175	100	140	4	17,5	16	5	36	40	10	8	
100	4"	14	175	100	140	4	17,5	16	5	38	45	10	8	
150	6"	25	290	200	254	8	17,5	25	6	55	63	16	10	
200	8"	F25	290	200	254	8	18	25	3	68	100	20	12	
250	10"	F30	340	230	298	8	22	30	3	78	110	22	14	
300	12"	F30	340	230	298	8	22	30	3	98	140	28	16	
350	14"	F35	405	260	356	8	33	35	3	98	160	28	16	
400	16"	F35	405	260	356	8	33	35	3	105	200	28	16	



# Krombach® KFO 9136

## Pressure/Temperature Ratings

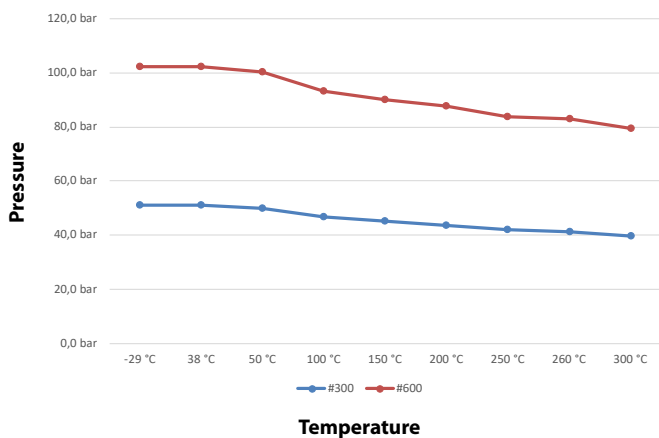
Temperature	Max working pressure ASME class 300	Max working pressure ASME class 600
	ASTM A216 Gr. WCB*	
°C	bar	
-29	51,1	102,1
38	51,1	102,1
50	50,1	100,2
100	46,6	93,2
150	45,1	90,2
200	43,8	87,6
250	41,9	83,9
260	41,4	83,0

\*according ASME B16.34 - Material Group 1.1

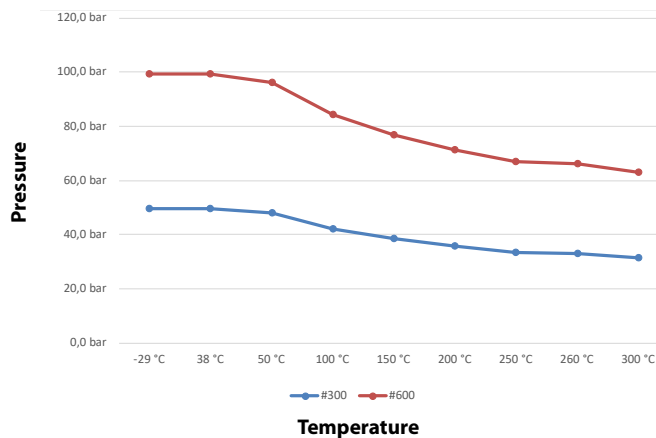
Temperature	Max working pressure ASME class 300	Max working pressure ASME class 600
	ASTM A351 Gr. CF8M*	
°C	bar	
-29	49,6	99,3
38	49,6	99,3
50	48,1	96,2
100	42,2	84,4
150	38,5	77,0
200	35,7	71,3
250	33,4	66,8
260	33,0	66,0

\*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 Nm	
		1,4021 A276 Gr. 420	1,4462 A182 Gr. F51
		50	2"
80	3"	1263	1419
100	4"	1524	1778
150	6"	4352	4352
200	8"	11934	11934
250	10"	18206	18206
300	12"	28894	28894
350	14"	38067	38067
400	16"	50614	50614

# Krombach® KFO 9136 Torques

## Class 300-600

DN	NPS	Δp [bar]	Torque (Nm)					
			BTO	RUN	ETO	BTC	RUN	ETC
50	2"	0	29	26	30	33	26	26
		15	51	30	32	35	30	37
		20	59	32	32	36	32	41
		50	103	42	36	39	42	64
		100	176	58	41	46	58	103
80	3"	0	52	46	55	60	46	47
		15	104	57	58	63	57	73
		20	121	60	59	64	60	82
		50	223	82	65	71	82	135
		100	394	117	75	82	117	224
100	4"	0	60	51	63	70	51	52
		15	145	68	66	73	68	96
		20	174	73	67	74	73	111
		50	345	106	73	81	106	198
		100	631	161	83	92	161	344
150	6"	0	185	162	193	213	162	164
		15	395	204	203	224	204	272
		20	466	218	207	227	218	308
		50	887	303	227	250	303	525
		100	1589	444	261	287	444	886
200	8"	0	281	245	302	332	245	249
		15	755	334	317	349	334	489
		20	913	364	322	355	364	569
		50	1860	543	353	389	543	1051
		100	3438	841	404	445	841	1853
250	10"	0	429	375	458	504	375	380
		15	1180	516	481	529	516	761
		20	1430	562	488	537	562	888
		50	2931	843	534	587	843	1649
		100	5433	1312	609	670	1312	2918
300	12"	0	674	589	721	793	589	597
		15	1897	823	765	841	823	1220
		20	2304	901	780	858	901	1428
		50	4748	1370	868	955	1370	2674
		100	8822	2151	1016	1118	2151	4750
350	14"	0	694	605	747	822	605	614
		15	2192	885	792	871	885	1373
		20	2691	978	806	887	978	1626
		50	5686	1538	895	985	1538	3145
		100	10678	2470	1043	1147	2470	5676
400	16"	0	823	719	883	972	719	729
		15	2888	1103	942	1036	1103	1775
		20	3577	1231	961	1058	1231	2124
		50	7708	1999	1079	1187	1999	4216
		100	14593	3279	1274	1402	3279	7704

*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"	32
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	7,2	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"	40
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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