FAMCO
هایپرصنعت

Thermal Oil Centrifugal Pumps

KYP SERIES

TECHNICAL MANUAL

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Mas Grup

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تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبروی پالایشگاه نفت پارس، پلاک ۱۲

Fields of Application

- Chemical and refinery plants.
- Paper and sugar industry.
- Food and drug industry.
- Leather industry.
- Plastic and synthetic fibre industry.
- Rubber industry.
- Baking and heating applications
- Textile industry.
- Laundries.
- Heat transfer applications with a medium over 100 ˚C temperature.

Pumped Liquids

All organic and synthetic oils used for transferring heat.

Design

- Single-stage, end suction, centrifugal volute pump.
- Main dimensions according to DIN 24256 (ISO 2858).
- Single entry, closed impeller is hydraulically thrust compensated and dynamically balanced.
- To drop the pressure on the sealing and to balance axial trust, the impellers have back radial blades.
- Pump and motor are separate components, connected to each other via a flexible coupling and mounted on a common base plate.
- Maintenance is very much easier, the impeller shaft and other rotating parts being removable with no need to disconnect the suction and delivery pipes.
- Maximum interchangeability of components, identical parts can be used with various sizes of a pump, which greatly simplifies and reduces stock of spare parts.
- No need to cool the pump externally. Thanks to mechanical design, the temperature drops from casing to the bearing rapidly with the help of natural convection

Shaft and Bearings

- The shaft is designed according to the minimum heat transfer criteria.
- Bearing housing is made of spherical cast iron and mounted to the casing keeping minimum heat transfer from the casing to the bearing housing.
- On the bearing housing, there are fins for natural convection. There are two roller bearings and mechanical seal in the bearing housing.

Shaft Seal

- The mechanical seal stands between two roller bearings and close to the roller bearing on the coupling side. This gives the mechanical seal longer working life since it is on a lower temperature region.
- First bearing is on the impeller side and lubricated with working medium.
- There is a thermal resistant soft packing seal behind the impeller. It slows down the leakage and prevents the pumping to be stopped if there is mechanical seal damage.
- Second bearing is on the coupling side and lubricated with grease.

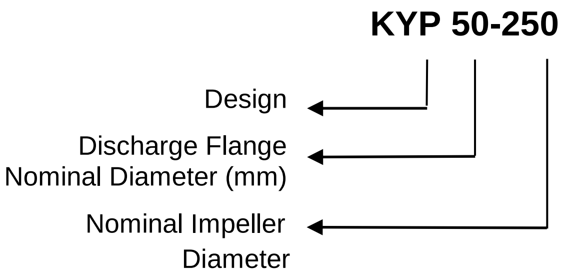
Technical Data

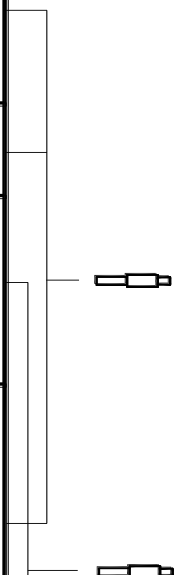
Suction Nozzle	: DN 32…DN 100
Discharge Nozzle	: DN 32…DN 100
Operating Pressure	: 16 Bar
Speed Range	: 1500 – 3000 RPM
Capacity Range	: 10 – 400 m^3 / h
Head Range	: 5 – 90 m

Pump Flanges

Discharge Flanges	: DIN 2533 – PN 16
Suction Flanges	: DIN 2533 – PN 16

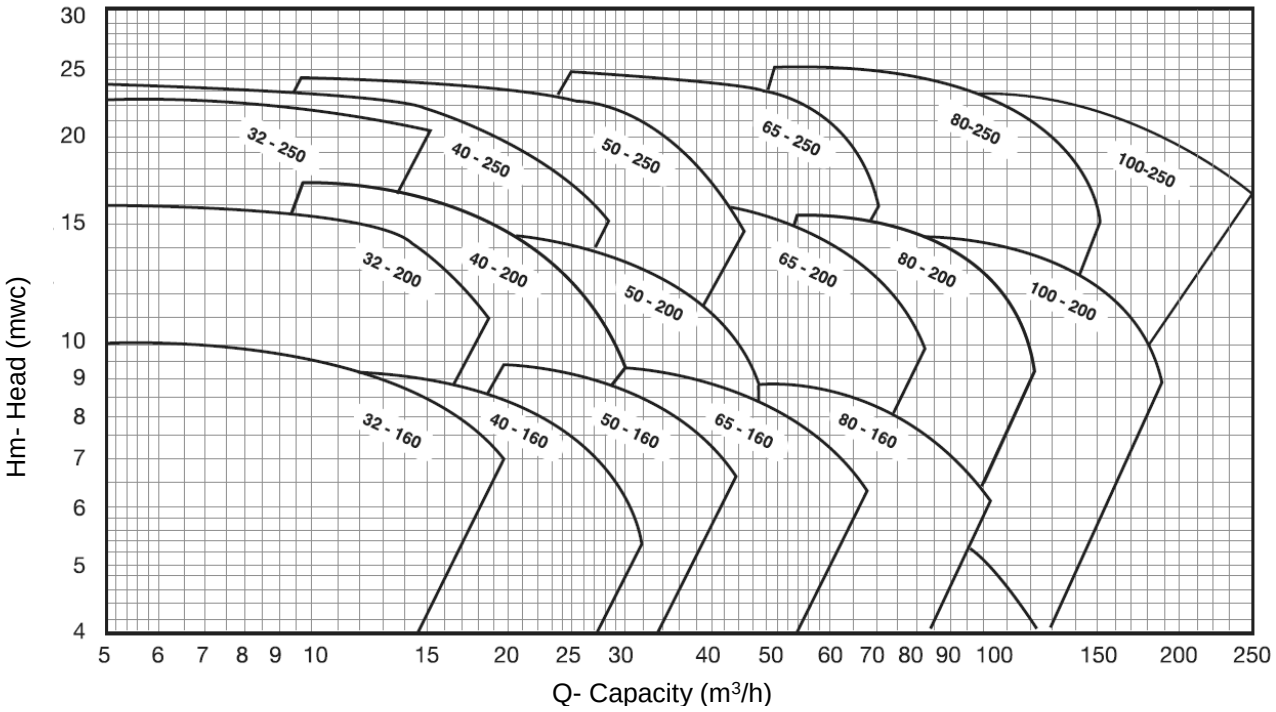
Identification Code



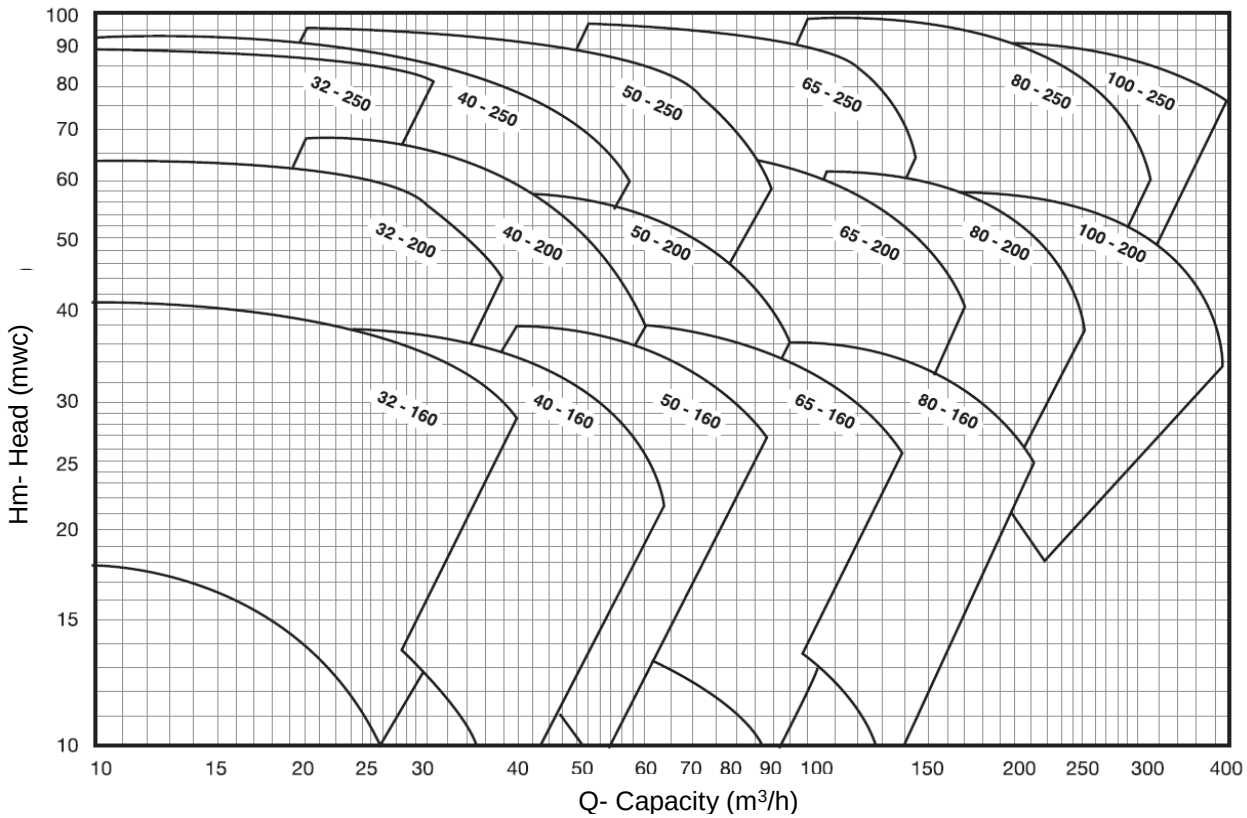
GROUP		PUMP TYPE	CASING	IMPELLER	ADAPTER	SHAFT	BEARING HOUSING	MECH. SEAL	ROLLER BEARING
A	A1	KYP 32-160							
		KYP 40-160							
		KYP 50-160							
	A2	KYP 32-200							
		KYP 40-200							
		KYP 50-200							
B	B1	KYP 65-160							
		KYP 80-160							
	B2	KYP 65-200							
		KYP 80-200							
		KYP 100-200							
	B3	KYP 32-250							
		KYP 40-250							
		KYP 50-250							
		KYP 65-250							
		KYP 80-250							
		KYP 100-250							

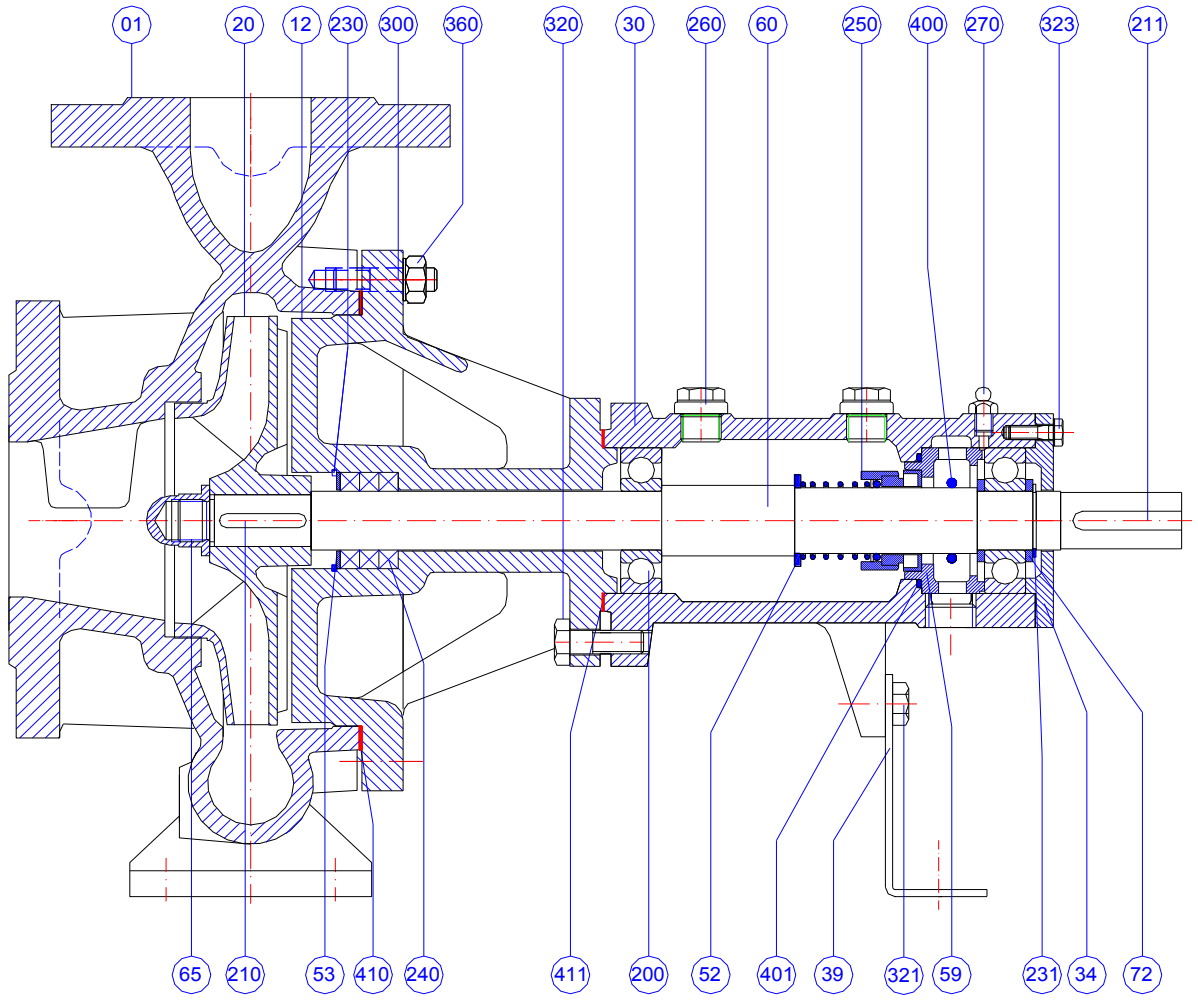
General Performance Curves 1450 RPM – 2900 RPM

1450 RPM



2900 RPM





PART NO	PART NAME	PART NO	PART NAME
01	Pump Casing	230	Ring
20	Impeller	231	Ring
12	Adapter	240	Gland Packing
34	Bearing Housing Cover	260	Plug
30	Bearing Housing	270	Greaser
39	Support Foot	300	Stud
52	Mech. Seal Front Ring	320	Hexagonal Bolt
53	Packing Retaining Ring	321	Hexagonal Bolt
59	Mechanical Seal Housing	323	Hexagonal Bolt
60	Pump Shaft	250	Mechanical Seal
65	Impeller Nut	360	Hexagonal Nut
72	Retaining Ring	400	O-Ring
200	Ball Bearing	401	O-Ring
210	Key, Impeller	410	Gasket
211	Key, Coupling	411	Gasket

Material Options

Parts / Material No	0.6025	0.7040	2.1050.01	1.4021	1.4301	1.4401
Pump Casing		●	o		o	o
Adapter		●	o		o	o
Impeller	●	o	o		o	o
Bearing Housing		●	o		o	o
Pump Shaft				●	o	o

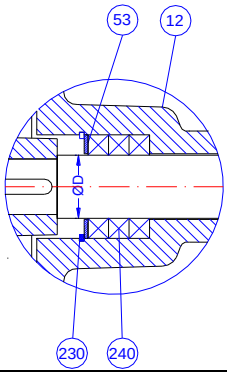
● – Standard Manufacturing
o – Options

Material Equivalent

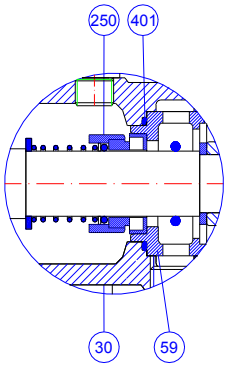
Description	DIN 17007	EN-DIN	ASTM
Cast Iron	0.6025	GJL-250 (GG25)	A 48 Class 40-B
Nodular Cast Iron	0.7040	GJS-400-15 (GGG40)	A 536 Gr.60-40-18
Cast Bronze	2.1050.01	G-Cu Sn 10	B 584 C 90700
Chrome Steel	1.4021	X20 Cr 13	A 276 Type 420
Chrome Nickel Steel	1.4301	X5 Cr Ni 18.9	A 276 Type 304
Chrome Nickel Molybdenum Steel	1.4401	X5 Cr Ni Mo 18.10	A 276 Type 316

Bearings, Soft Packing, Mechanical Seal

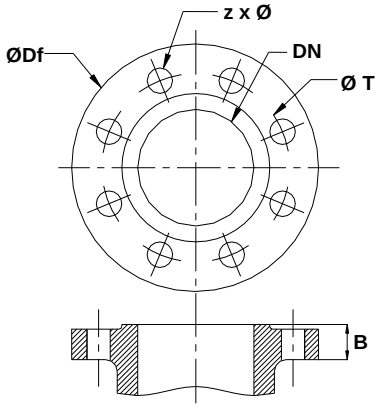
Group	Bearing System	Soft Packing (Rotatherm)		Mechanical Seal	Pump Size
	Type of Bearing	Packing Ring Size ØD	Qnty.		
A	2 x 6305 C4 / F	Ø25	3 x Soft Packing 8x8	Ø28 M32N69	32–160, 40–160,50–160, 32–200, 40–200, 50–200
B	2 x 6307 C4 / F	Ø35	3 x Soft Packing 10x10	Ø38 M32N69	65–160, 80–160, 65–200, 80–200,100–200, 32–250,40–250, 50–250, 65–250, 80–250, 100–250



Gland Packing Detail	
Part No	Part Name
12	Adapter
53	Packing Retaining Ring
230	Ring



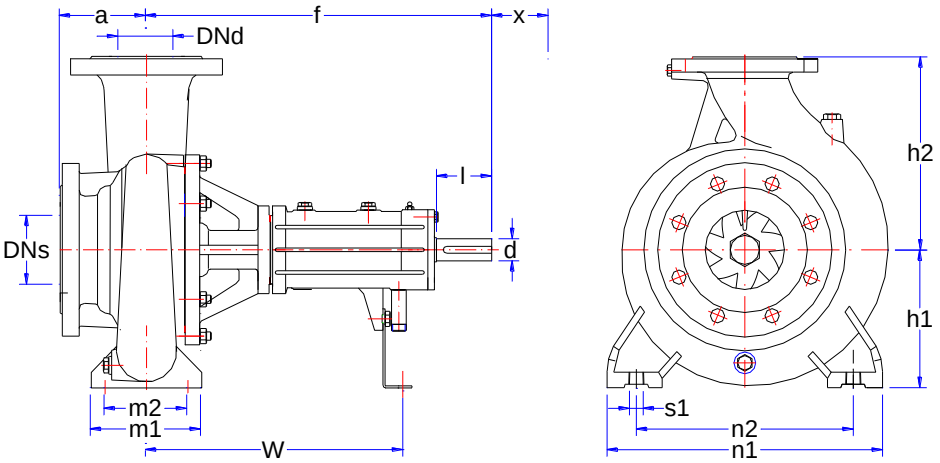
Mechanical Seal Detail	
Part No	Part Name
30	Bearing Housing
59	Mech. Seal Housing
250	Mechanical Seal



Pump Suction and Discharge Flange Dimensions								
DNs / DNd	PN	ØD	Øk	Ød4	Ød2	b	f	Hole Number
32	16	140	100	78	18	18	2	4
40		150	110	88	18	18	3	4
50		165	125	102	18	20	3	4
65		185	45	122	18	20	3	4
80		200	160	138	18	22	3	8
100		220	180	158	18	24	3	8
125		250	210	188	18	26	3	8

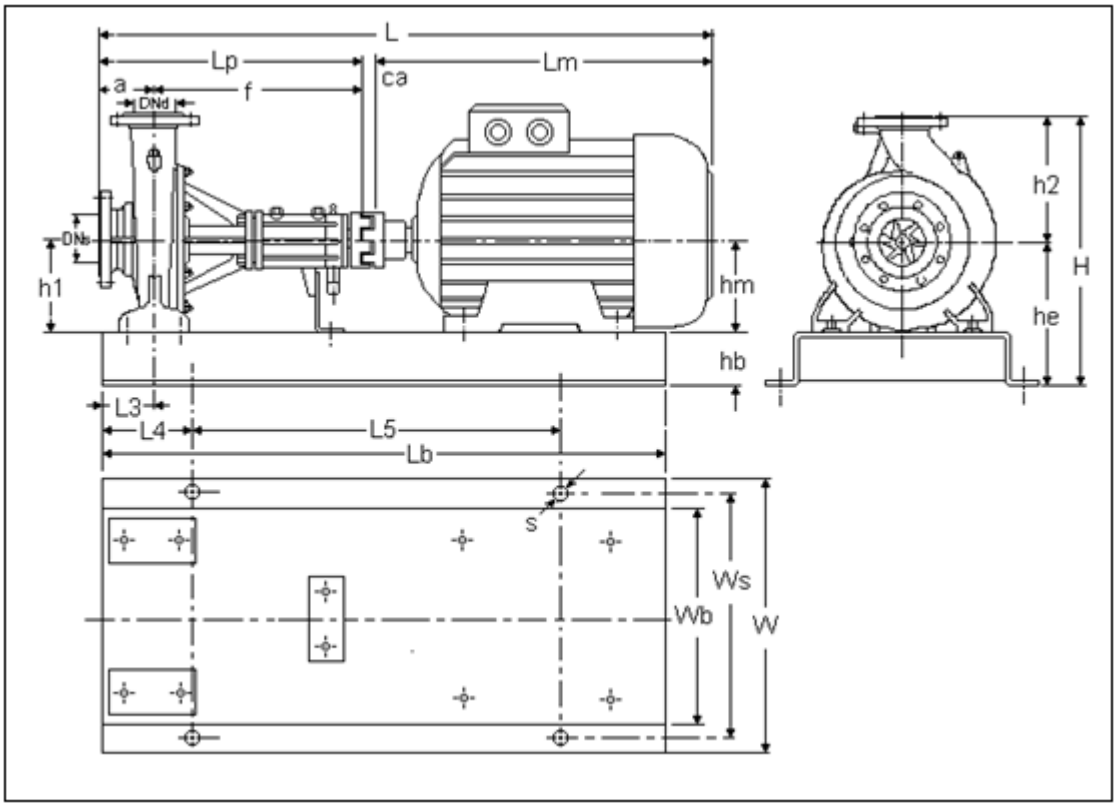
No	Pump Type	Flanges			
		DNs (mm) Suction		DNd (mm) Discharge	
1	32–160	50	PN 16	32	PN 16
2	32–200				
3	32–250				
4	40–160	65		40	
5	40–200				
6	40–250				
7	50–160	65		50	
8	50–200				
9	50–250				
10	50–315				
11	65–160	80		65	
12	65–200				
13	65–250				
14	65–315				
15	65–400				
16	80–160	100		80	
17	80–200				
18	80–250				
19	80–315				
20	80–400				
21	100–200	125		100	
22	100–250				

Overall Dimensions



No	Pump	Flanges (PN16)		Length		Height		Pump Feet		Fixing Details					Shaft End		(*)
	Size	DN Suc.	DN Del.	a	f	h1	h2	b	m1	m2	n1	n2	s1	W	d	l	X
1	32–160	50	32	80	385	132	160	50	100	70	240	190	M12	285	24	50	65
2	32–200	50	32	80	385	160	180	50	100	70	240	190	M12	285	24	50	65
3	32–250	50	32	100	500	180	225	65	125	95	320	250	M12	370	32	80	80
4	40–160	65	40	80	385	132	160	50	100	70	240	190	M12	285	24	50	75
5	40–200	65	40	100	385	160	180	50	100	70	265	212	M12	285	24	50	75
6	40–250	65	40	100	500	180	225	65	125	95	320	250	M12	370	32	80	75
7	50–160	65	50	100	385	160	180	50	100	70	265	212	M12	285	24	50	80
8	50–200	65	50	100	385	160	200	50	100	70	265	212	M12	285	24	50	85
9	50–250	65	50	100	500	180	225	65	125	95	320	250	M12	370	32	80	85
10	65–160	80	65	100	500	160	200	65	125	95	280	212	M12	370	32	80	100
11	65–200	80	65	100	500	180	225	65	125	95	320	250	M12	370	32	80	100
12	65–250	80	65	100	500	200	250	80	160	120	360	280	M16	370	32	80	100
13	80–160	100	80	125	500	180	225	65	125	95	320	250	M12	370	32	80	110
14	80–200	100	80	125	500	180	250	65	125	95	345	280	M12	370	32	80	110
15	80–250	100	80	125	500	200	280	80	160	120	400	315	M16	370	32	80	115
16	100–200	125	100	125	500	200	280	80	160	120	360	280	M16	370	32	80	120
17	100–250	125	100	140	500	225	280	80	160	120	400	315	M18	370	32	80	120

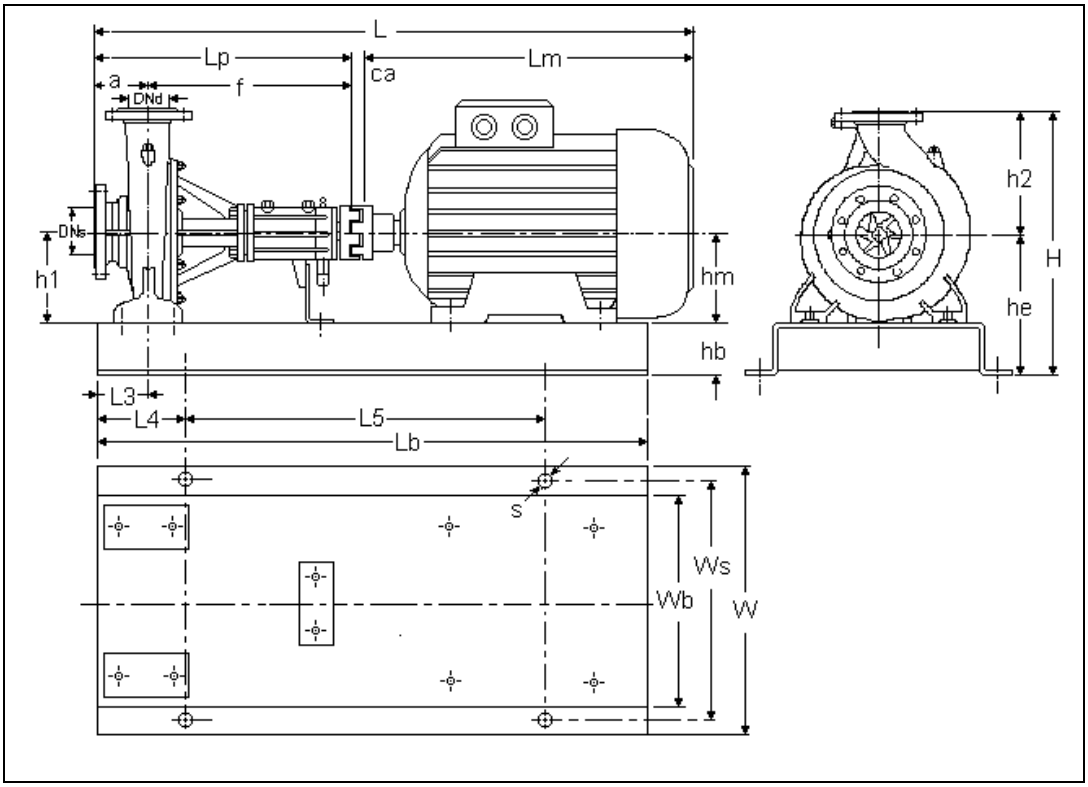
Overall Dimensions with Electric Motor 1450 RPM



Pump Type	Motor [kW]	Pump DNs	Pump DNd	Pump a	Pump f	Outer Dimensions L	Outer Dimensions W	Outer Dimensions H	Motor L_m	Motor h_m	Baseplate L_b	Baseplate W_b	Baseplate h_b	Baseplate h_e	Baseplate L3	Baseplate L4	Baseplate L5	Baseplate W_s	Baseplate s3
KYP 32–160	0.25	50	32	80	385	723	330	357	242	71	710	240	65	197	60	115	480	290	19
	0.37																		
	0.55					754			273	80									
	0.75																		
KYP 32–200	0.55					754	330	405	273	80	710	240	65	197	60	115	480	290	19
	0.75																		
	1.1					785			300	90				225					
	1.5					810			325		800					130	540		
KYP 32–250				100	500	893	450	485	273	80	800	340	80	260	72	150	540	320	24
	1.1					920			300	90	900								
	1.5					945			325										
	2.2					985			365	100							600	400	
KYP 40–160	0.55	65	40	80	385	754	330	357	273	80	710	240	65	197	60	115	480	290	19
	0.75																		
	1.1					785			300	90									
KYP 40–200	0.55			100	385	774	360	405	273	80	710	270	65	225	60	115	480	320	19
	0.75																		
	1.1					805	350		300	90									
	1.5					830	360		325		800					130	540		
KYP 40–250	1.1			100	500	920	450	485	300	90	900	340	80	260	72	150	600	400	24
	1.5					945			325										
	2.2					985			365	100									
	3								385										

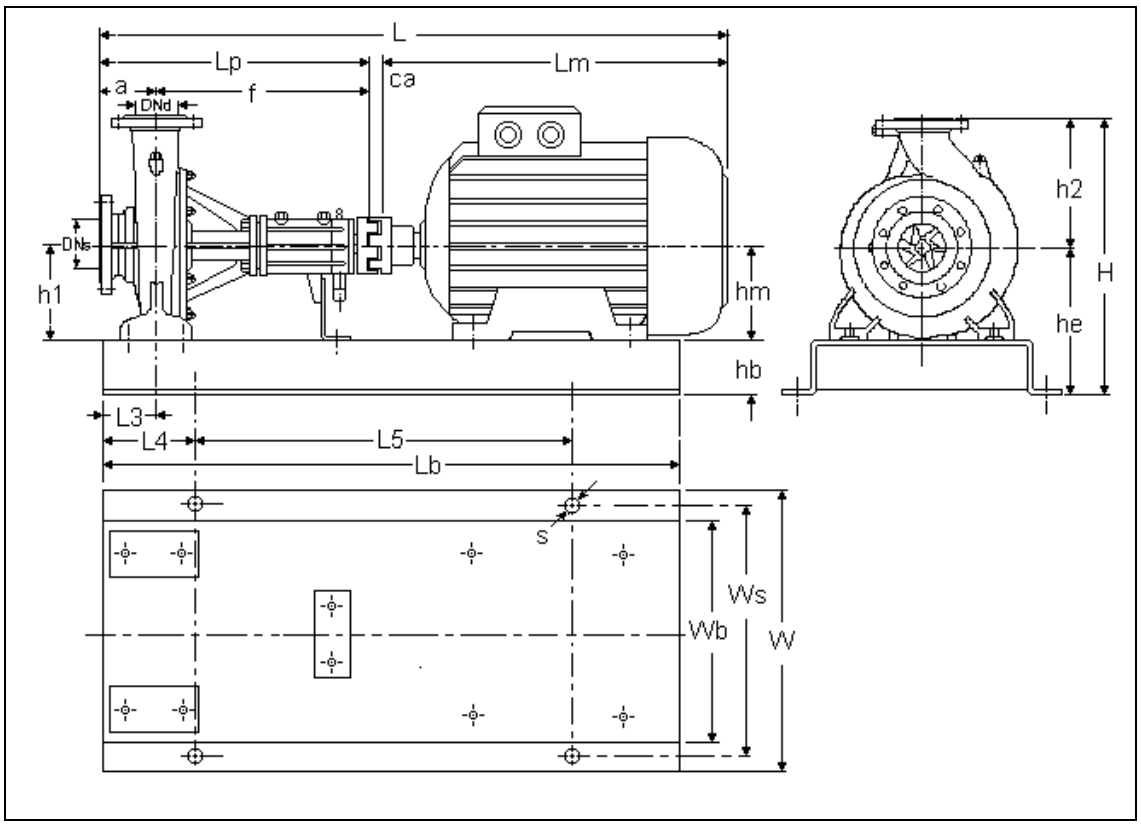
Thermal Oil Centrifugal Pumps

Overall Dimensions with Electric Motor 1450 RPM



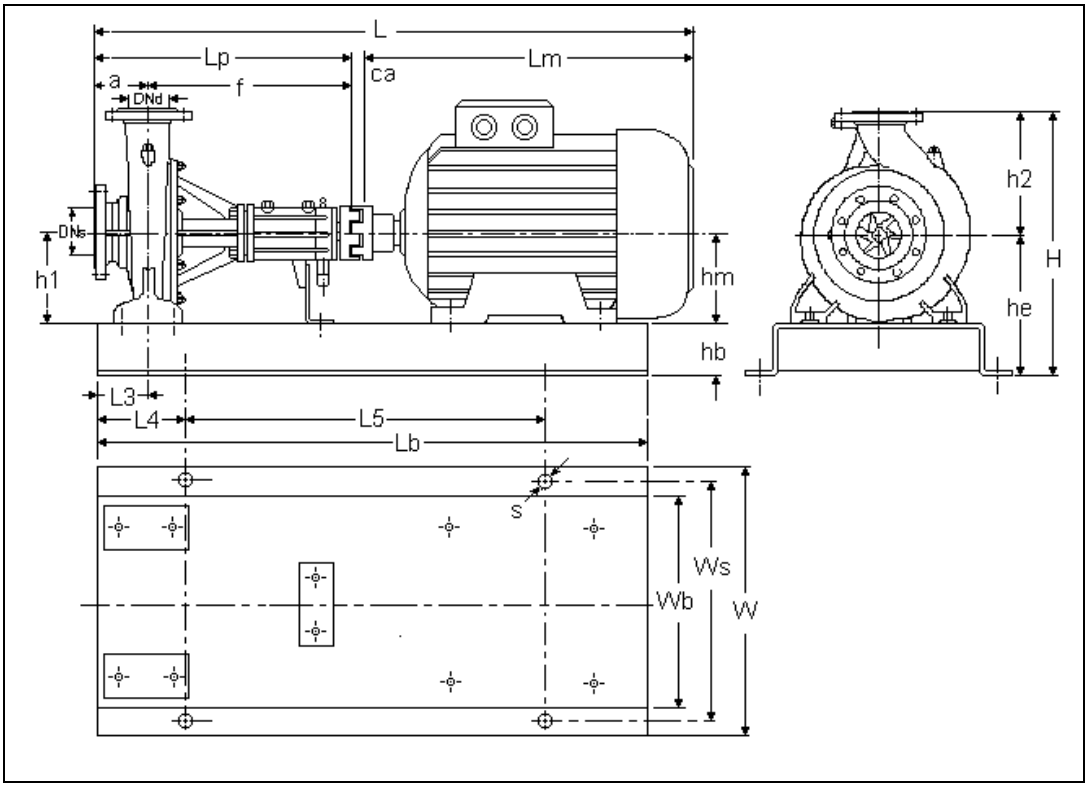
Pump Type	Motor [kW]	Pump DNs	Pump DNd	Pump a	Pump f	Outer Dimensions L	Outer Dimensions W	Outer Dimensions H	Motor L_m	Motor h_m	Baseplate L_b	Baseplate W_b	Baseplate h_b	Baseplate h_e	Baseplate L3	Baseplate L4	Baseplate L5	Baseplate W_s	Baseplate s3
KYP 50–160	0.55	65	50	100	385	774	360	405	273	80	710	270	65	225	60	115	480	320	19
	0.75																		
	1.1					805			300	90									
	1.5					830			325		800					130	540		
KYP 50–200	1.1					805	360	425	300	90	710	270	65	225	60	115	480	320	19
	1.5					830			325		800					130	540		
	2.2					870			365	100									
KYP 50–250	2.2			100	500	985	450	485	365	100	900	340	80	260	72	150	600	400	24
	3																		
	4					1005			384	112									
	5.5					1081			455	132	1000					170			
KYP 65–160	0.75	80	65	100	500	889	390	425	273	80	800	300	65	225	72	130	540	350	19
	1.1					920			300	90	900					150	600		
	1.5					945			365	100									
	2.2					985													
KYP 65–200	1.5					945	450	485	325	90	900	340	80	260	72	150	600	400	24
	2.2					985			365	100									
	3																		
	4					1005			384	112									
KYP 65–250	3					985	490	530	365	100	900	380	80	280	90	150	600	440	24
	4					1005			384	112	1000					170	660		
	5.5					1081			455	132									
	7.5					1119			493										

Overall Dimensions with Electric Motor 1450 RPM



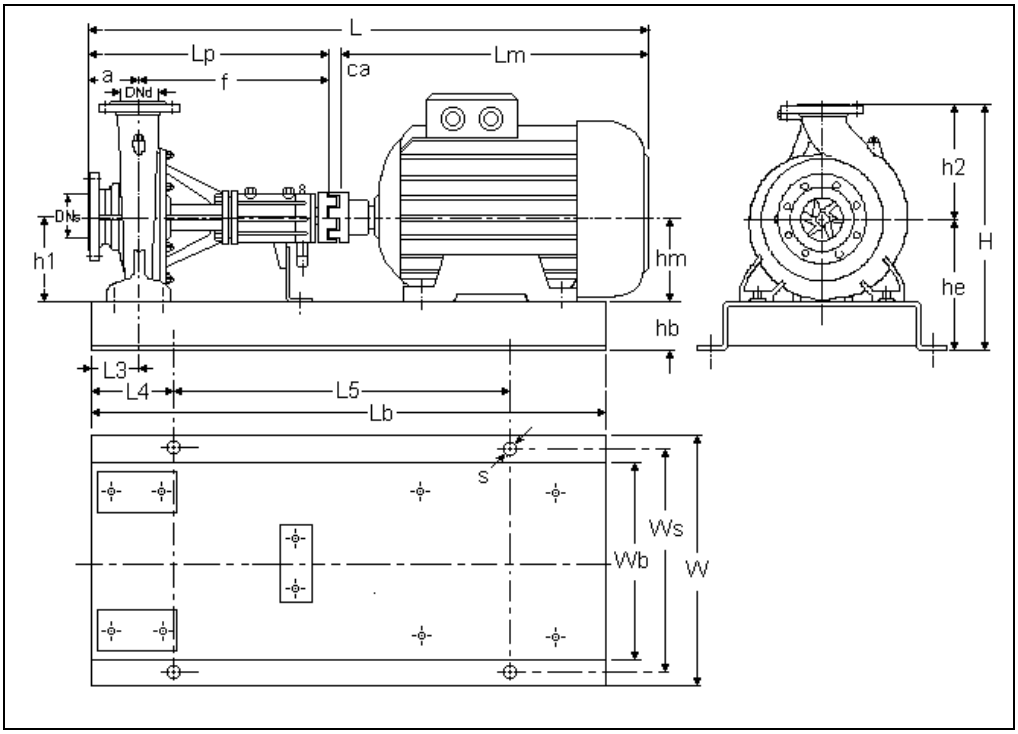
Pump Type	Motor [kW]	Pump DNs	Pump DNd	Pump a	Pump f	Outer Dimensions L	Outer Dimensions W	Outer Dimensions H	Motor L_m	Motor h_m	Baseplate L_b	Baseplate W_b	Baseplate h_b	Baseplate h_e	Baseplate L3	Baseplate L4	Baseplate L5	Baseplate W_s	Baseplate s3
KYP 80–160	1.5	100	80	125	500	970	450	485	325	90	900	340	80	260	72	150	600	400	24
	2.2					1010			365	100									
	3																		
KYP 80–200	3					1010	490	510	365	100	900	380	80	260	72	150	600	440	24
	4					1030			384	112									
	5.5					1106			455	132	1000					170	660		
	7.5					1144			493										
KYP 80–250	5.5					1106	540	560	455	132	1000	430	80	280	90	170	660	490	24
	7.5					1144			493										
	11					1249			594	160	1120					190	740		
	15					1293			638		1250					205	840		
KYP 100–200	3	125	100	125	500	1010	490	560	365	100	900	380	80	280	90	150	600	440	24
	4					1030			384	112	1000					170	660		
	5.5					1106			455	132									
	7.5					1144			493										
KYP 100–250	11			140	500	1308	540	585	638	160	1120	430	80	305	90	190	740	490	24
	15					1308													
	18.5					1327			654										

Overall Dimensions with Electric Motor 2900 RPM



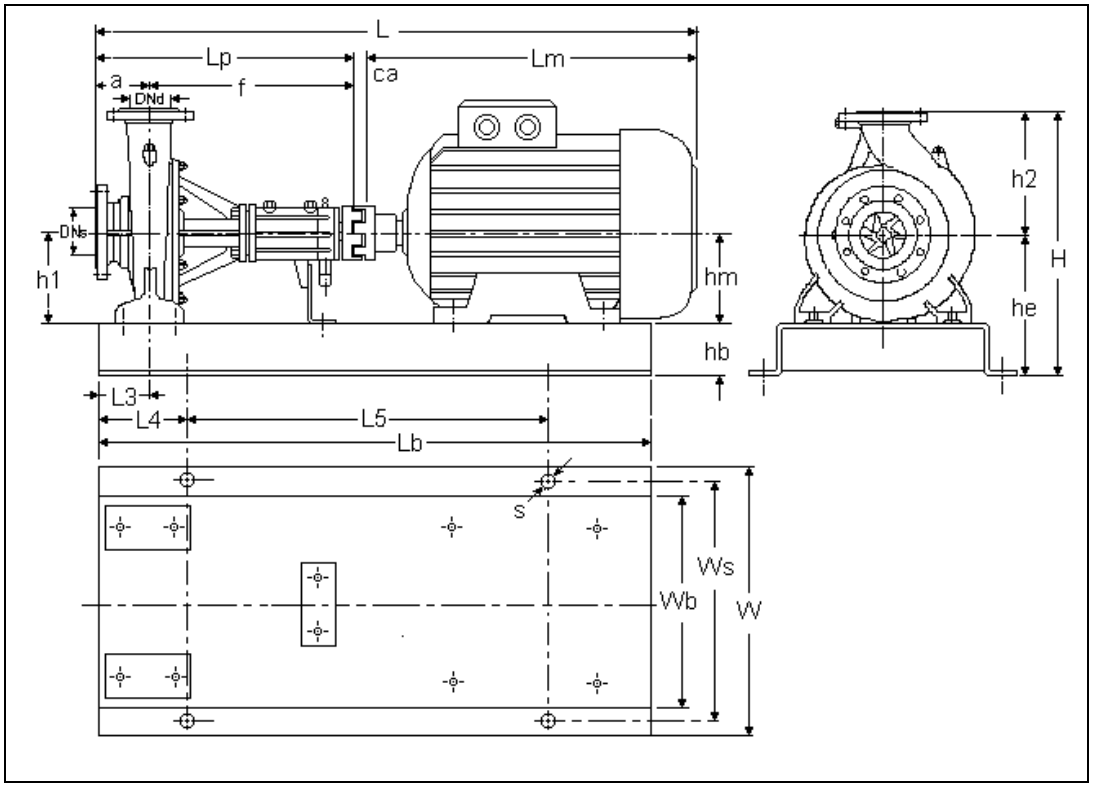
Pump Type	Motor [kW]	Pump				Outer Dimensions			Motor		Baseplate								
		DNs	DNd	a	f	L	W	H	L_m	h_m	L_b	W_b	h_b	h_e	L3	L4	L5	W_s	s3
KYP 32–160	1.5	50	32	80	385	775	330	358	300	90	710	240	65	197	60	115	480	290	19
	2.2					800			325										
	3					840			365	100	800					130	540		
	4					859			384	112									
KYP 32–200	4					859	330	405	384	112	800	240	65	225	60	130	540	290	19
	5.5					930	360		455	132		270						320	
	7.5					930													
	11					1069	450	420	594	160	900	340	80	240		150	600	400	24
KYP 32–250	7.5			100	500	1065	450	485	455	132	1000	340	80	260	73	170	660	400	24
	11					1204			594	160	1120					190	740		
	15					1204													
	18.5					1248			638										
KYP 40–160	3	65	40	80	385	840	330	357	365	100	800	240	65	197	60	130	540	290	19
	4					859			384	112									
	5.5					930	360		455	132		270						320	
	7.5					930													
KYP 40–200	5.5			100	385	950	360	405	455	132	800	270	65	225	60	130	540	320	19
	7.5					950													
	11					1089	450	420	594	160	900	340	80	240		150	600	400	24
	15					1089													
KYP 40–250	15			100	500	1204	450	485	594	160	1120	340	80	260	73	190	740	400	24
	18.5					1248			638										
	22					1264	490		654	180		380						440	
	30					1357	540	505	747	200	1250	430		280		205	840	490	

Overall Dimensions with Electric Motor 2900 RPM



Pump Type	Motor [kW]	Pump				Outer Dimensions			Motor		Baseplate								
		DNs	DNd	a	f	L	W	H	L_m	h_m	L_b	W_b	h_b	h_e	L3	L4	L5	W_s	s3
KYP 50–160	4	65	50	100	385	879	360	405	384	112	800	270	65	225	60	130	540	320	19
	5.5					950			455	132									
	7.5					950													
	11					1089	450		594	160	900	340				150	600	400	24
KYP 50–200	7.5					950	360	425	455	132	800	270	65	225		130	540	320	19
	11					1089	450	440	594	160	900	340	80	240	60	150	600	400	24
	15					1089													
	18.5					1133			638		1000					170	660		
KYP 50–250	22			100	500	1264	490	485	654	180	1120	380	80	260	73	190	740	440	24
	30					1357	540	505	747	200	1250	430		280		205	840	490	
	37					1357													
	45					1400	610	550	790	225		480	100	325				550	28
KYP 65–160	5.5	80	65	100	500	1065	390	425	455	132	900	300	65	225	73	150	600	350	19
	7.5					1065													
	11					1204	450	450	594	160	1120	340	80	240		190	740	400	24
	15					1204													
	18.5					1248			638										
KYP 65–200	18.5					1248	450	485	638	160	1120	340	80	260	73	190	740	400	24
	22					1264	490		654	180		380						440	
	30					1357	540	505	747	200	1250	430		280		205	840	490	
	37					1357													
KYP 65–250	22					1264	490	530	654	180	1120	380	80	280	90	190	740	440	24
	30					1357	540		747	200	1250	430				205	840	490	
	37					1357													
	45					1400	610	575	790	225		480	100	325				550	28
	55					1500	660	600	890	250	1400	530		350		230	940	600	

Overall Dimensions with Electric Motor 2900 RPM



Pump Type	Motor [kW]	Pump				Outer Dimensions			Motor		Baseplate								
		DNs	DNd	a	f	L	W	H	L_m	h_m	L_b	W_b	h_b	h_e	L3	L4	L5	W_s	s3
KYP 80–160	7.5	100	80	125	500	1090	450	485	455	132	900	340	80	380	73	150	600	400	24
	11					1229			594	160	1120					190	740		
	15					1229													
	18.5					1273			638										
	22					1289	490		654	180		380						440	
KYP 80–200	30					1382	540	530	747	200	1250	430	80	280	73	205	840	490	24
	37					1382													
	45					1425	610	575	790	225		480	100	325				550	28
	55					1525	660	600	890	250	1400	530		350		230	940	600	
KYP 80–250	45					1425	610	605	790	225	1250	480	100	325	90	205	840	550	28
	55					1525	660	630	890	250	1400	530		350		230	940	600	
	75					1593	730	660	958	280		600		380				670	
	90					1645			1010										
KYP 100–200	30	125	100	125	500	1382	540	540	747	200	1250	430	80	280	90	205	840	490	24
	37					1382													
	45					1425	610	605	790	225		480	100	325				550	28
	55					1525	660	630	890	250	1400	530		350		230	940	600	
	75					1593	730	660	958	280		600		380				670	
KYP 100–250	55			140	500	1570	610	630	890	250	1400	480	100	350	125	230	940	550	28
	75					1640	730	660	958	280	1600	600		380	140	270	1060	670	
	90					1690			1010										
	110					1758	830	715	1078	315		680	120	415				760	33

Permissible Loads and Torques on Pump Flanges

Load and torque components on discharge flanges : F_{xD}, F_{yD}, F_{zD} , M_{xD}, M_{yD}, M_{zD}
Load and torque components on suction flanges : F_{xS}, F_{yS}, F_{zS} , M_{xS}, M_{yS}, M_{zS}
Dimension for force and torque : N, Nm

$F_{VD}=|F_{yD}|$: Amount of vertical load on discharge flange
$F_{VS}=|F_{yS}|$: Amount of vertical load on suction flange
$F_{HD}=(F_{xD}^2+F_{zD}^2)^{1/2}$: Amount of horizontal load on discharge flange
$F_{HS}=(F_{xS}^2+F_{zS}^2)^{1/2}$: Amount of horizontal load on suction flange
$M_D=(M_{xD}^2+M_{yD}^2+M_{zD}^2)^{1/2}$: Amount of torque on discharge flange
$M_S=(M_{xS}^2+M_{yS}^2+M_{zS}^2)^{1/2}$: Amount of torque on suction flange

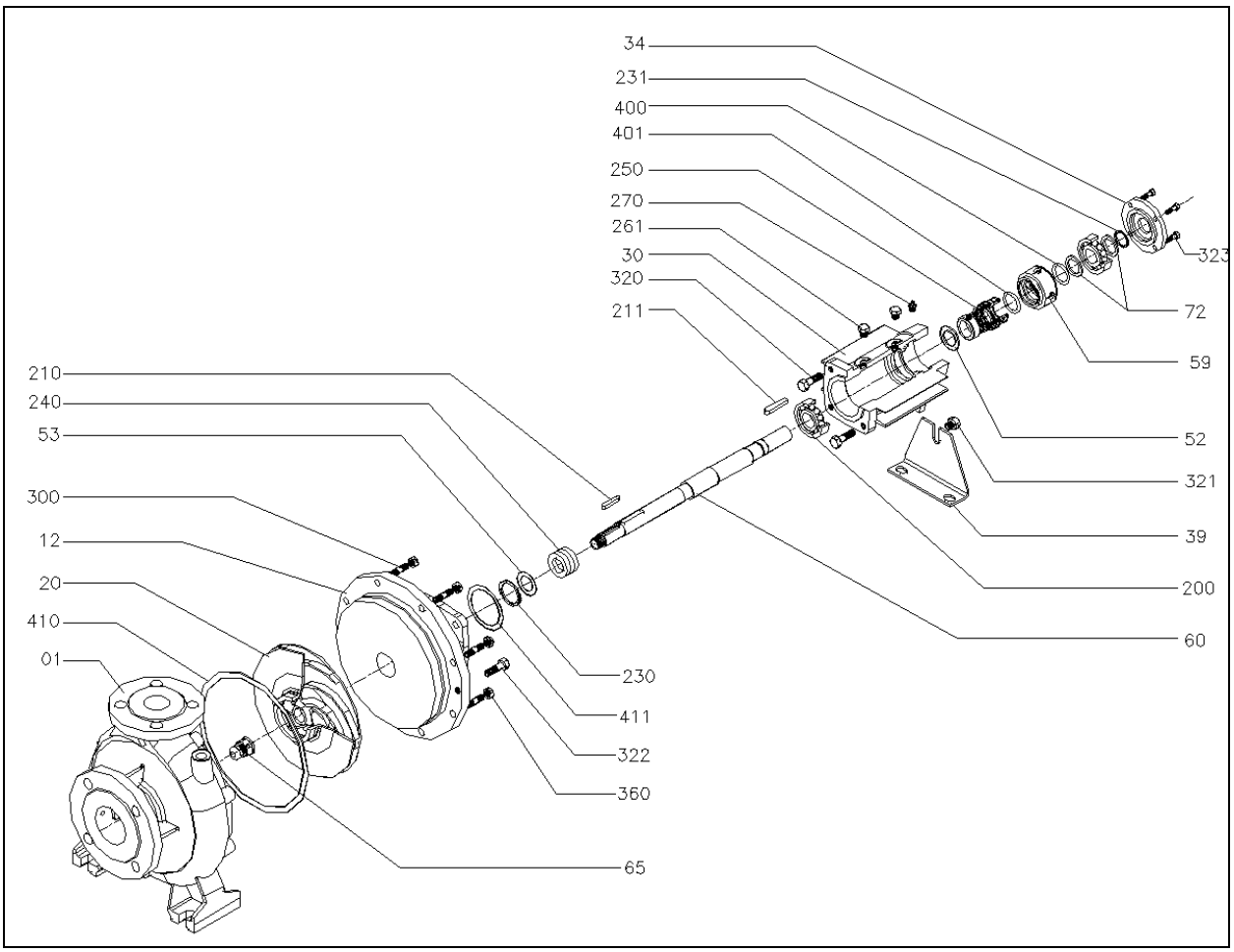
$\Sigma F_V=2/3 \times F_{VD}+F_{VS}$: Sum of vertical loads
$\Sigma F_H=F_{HD}+F_{HS}$: Sum of horizontal loads
$\Sigma M=M_D+M_S$: Sum of torques

The load on the flange is permissible if the following condition is fulfilled.

$$(\Sigma F_V/\Sigma F_{Vmax})^2+(\Sigma F_H/\Sigma F_{Hmax})^2+(\Sigma M/\Sigma M_{max})^2 \leq 1$$

PUMP TYPE	t = 20 °C			t = 300 °C		
	F_{Vmax} [kN]	F_{Hmax} [kN]	M_{max} [kNm]	F_{Vmax} [kN]	F_{Hmax} [kN]	M_{max} [kNm]
KYP 32-160	3.56	2.61	0.51	3.08	2.17	0.44
KYP 32-200	3.60	2.43	0.51	3.11	2.10	0.44
KYP 32-250	3.65	2.43	0.51	3.11	2.10	0.44
KYP 40-160	3.81	2.67	0.81	3.29	2.31	0.70
KYP 40-200	3.81	2.67	0.81	3.29	2.31	0.70
KYP 40-250	4.21	2.92	0.58	3.64	2.52	0.50
KYP 50-160	3.97	2.67	1.11	3.43	2.31	0.96
KYP 50-200	4.21	2.92	1.11	3.64	2.52	0.96
KYP 50-250	4.58	3.32	0.87	3.96	2.87	0.75
KYP 65-160	4.42	3.04	1.16	3.82	2.63	1.00
KYP 65-200	5.27	3.89	1.79	4.55	3.36	1.55
KYP 65-250	5.27	3.89	1.79	4.55	3.36	1.55
KYP 80-160	5.43	4.05	1.91	4.69	3.50	1.65
KYP 80-200	6.08	4.74	2.44	5.25	4.10	2.10
KYP 80-250	6.16	4.78	2.44	5.32	4.13	2.10
KYP 100-200	7.70	6.28	3.60	6.65	5.43	3.10
KYP 100-250	7.86	6.48	3.47	6.79	5.60	3.00

Note: Pump casing material is GGG 40.



PART NO	PART NAME	PART NO	PART NAME
01	Pump Casing	230	Ring
20	Impeller	231	Ring
12	Adapter	240	Gland Packing
34	Bearing Housing Cover	261	Plug
30	Bearing Housing	270	Greaser
39	Support Foot	300	Stud
52	Mech. Seal Front Ring	320	Hexagonal Bolt
53	Packing Retaining Ring	321	Hexagonal Bolt
59	Mechanical Seal Housing	323	Hexagonal Bolt
60	Pump Shaft	250	Mechanical Seal
65	Impeller Nut	360	Hexagonal Nut
72	Retaining Ring	400	O-Ring
200	Ball Bearing	401	O-Ring
210	Key, Impeller	410	Gasket
211	Key, Coupling	411	Gasket

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