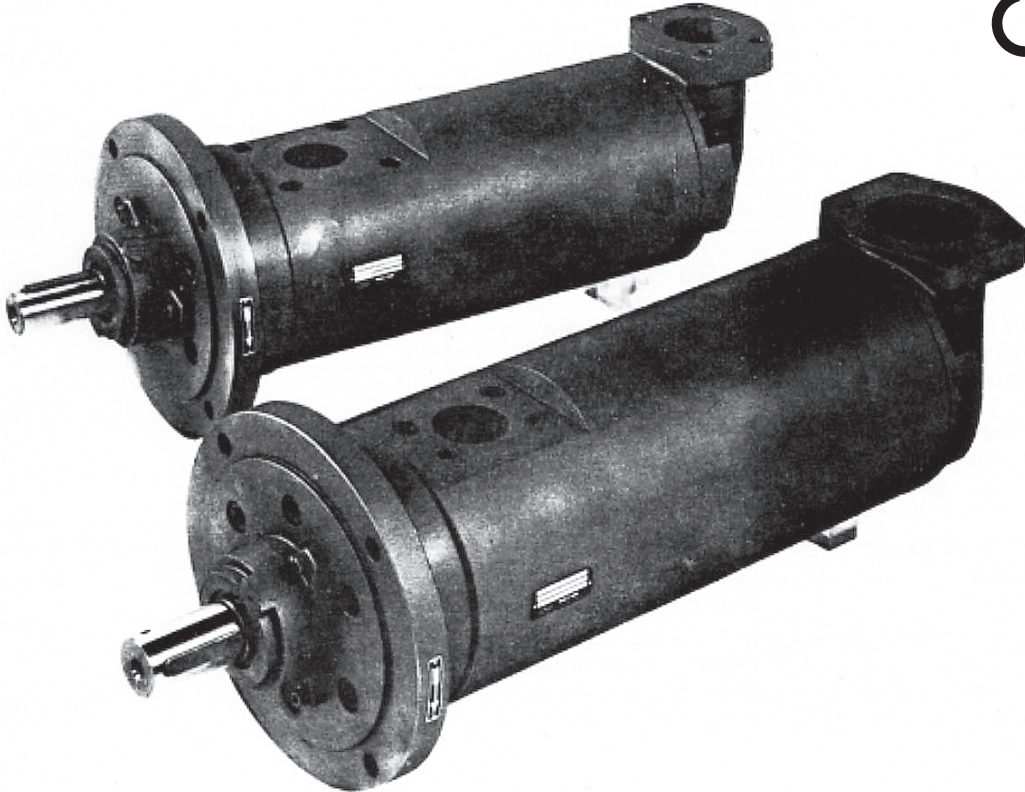


## HIGH PRESSURE PUMP



The IMO D6 pump is a positive constant displacement rotary three screw pump designed for high pressure and high flow in applications for lubricating oils, hydraulic fluids, fuel oils and fluids with similar lubricating properties.

The IMO pump has only three moving parts - three intermeshing screws. It has no gears, valves or vanes. It is the simplicity of the design that makes it so reliable and efficient. The exactly calculated curve of the screw thread eliminates pulsation and ensures quiet running.

The IMO pump is self-priming even under high suction lift conditions.

### D6 Features

- High discharge pressure up to 25 MPa (250 bar)
- Flow range 100-900 l/min
- Wide viscosity range
- Low noise level
- Flange- or foot mounting
- Available in 10 displacement steps
- Designed for as well lubricating and hydraulic oils as fuel oils
- High suction lift capacity
- Pulsation free flow

# SERIES D6 PUMP

## Applications

For lubricating oils, hydraulic fluids, fuel oils and fluids with similar lubricating properties.

## General Description

Positive constant displacement, rotary, three screw pump.  
Flow rate per revolution 9.8 - 307 cm<sup>3</sup> in 10 steps.  
The three screws, the central driven screw – the power rotor - which meshes with the two sealing screws – the idler rotors - are the only rotating components of the pump. The axial pressure and friction loads on the pump rotors are hydraulically balanced. The power rotor is positioned axially by the selfcompensated thrust washer arrangement, being part of the hydraulic balancing system of the power rotor. The pump accommodates mechanical shaft seals complying with the DIN 24960 Standard.

The D6 pump is available in the following models:

- **D6 SRBZ** flange mounting pump with radial inlet for horizontal or vertical mounting for lube and hydraulic oils.
- **D6 SVBY** same as SRBZ but intended for fuel oils.
- **D6 SRTZ** flange mounting pump with built-on inlet strainer for tank top mounting for shallow tank operation
- **D6 SRJZ** as SRTZ with extended inlet pipe for deep tank operation.
- **D6 STFZ** designed to meet the API (American Petroleum institute) requirements for lube and hydraulic oils.

## Use in potentially explosive areas

The pump fulfils the requirements according to EU explosion-protection directive 2014/34/EU (ATEX 100a) for devices in device class II, category 2G.

Classification into temperature classes according to DIN EN 80079-36 depends on the temperature of the pumped liquid. Refer to the proposal or order documentation for the maximum permissible liquid temperature for the respective temperature classes.

Note: When operating the pump in category 2, suitable measures must be provided to prevent impermissible warming of the pump surfaces in the event of disturbance.

## Duties

### Max Discharge Pressure:

25 MPa      D6 xxxZ  
12 MPa      D6 xxxY

Reduced pressure limits apply due to fluid viscosity, rotor lead and pump speed. Consult the Performance Data Sheet for the individual pump size. The Performance Data Sheet or the corresponding information is available from your local IMO AB representative.

### Flow Rate:

1,7 - 15 dm<sup>3</sup>/s (100 - 900 l/min)

## Model Code

<b>Series</b>	D	6					3	S					A			
<b>Size:</b> (Power rotor outer diameter)																
	038-045-052-060-070															
<b>Rotor lead:</b>																
K = Low lead																
N = Normal lead																
<b>Generation:</b>																
3 = Current generation																
<b>Material in pump casing:</b>																
S = Steel casing with bronze lining																
<b>Shaft seal design</b>																
R = Carbon/Ni-resist; Rubber parts in Nitrile																
V = Carbon/Ni-resist; Rubber parts in Viton																
T = Tungsten carbide / Tungsten carbide; Rubber parts in viton																
<b>Mounting</b>																
B = Flange mounting																
F = Foot mounting																
J = Vertical mounting in tank with suction pipe																
T = Vertical mounting in tank with strainer																
<b>Other characteristics:</b>																
Z = Internal ball bearing (Lub.oil)																
Y = External ball bearing (Fuel oil)																
<b>Special design:</b>																

# Material Specification

**Pump rotors** - hardened alloy steel.

**Rotor housing** - steel, bronze-lined.

**”O”-rings** - Nitrile rubber (standard) or Viton.

**Shaft seal** - mechanical seal with nitrile (standard) or viton rubber, carbon seal ring, seat in NiResist. Optional choice of materials with seals according to DIN 24960 Standard.

For handling of fire resistant hydraulic fluids on phosphate ester base and fluids which may be aggressive to above material – consult IMO AB.

# Design Details

Pump size		038	045	052	060	070	
Max discharge pressure (duty dependent, please contact your IMO AB rep.)		25 MPa (250 bar) Type D6 xxxZ 12 MPa (120 bar) Type D6 xxxY					
Max. inlet pressure		1.0 MPa (10 bar)					
Pumping temperature	SRxx - 20 °C - + 90 °C	-10°C to + 90°C O-ring and shaft seal in nitrile					
	SVxx - 20 °C - + 130 °C STxx - 20 °C - + 155 °C	-10°C to + 150°C O-ring and shaft seal in viton					
Viscosity		1.6-400 mm <sup>2</sup> /s. Viscosities up to 5000 mm <sup>2</sup> /s after approval					
Max speed rpm		3 660 With heavy fuel oil max 1600 rpm is recommended					
	Speed selected must take into account the pump inlet pressure conditions.						
Displacement flow per revolution, cm <sup>3</sup>	K-lead	38.8	65.2	103	159	251	
	N-lead	49.1	81.6	126	193	307	
Sound level dB(A) at 2 975 rpm	K-lead	10 Mpa	59	63	66	69	74
		20 Mpa	62	66	69	72	77
	N-lead	10 Mpa	61	65	68	71	76
		20 Mpa	64	68	71	74	79
Moment of inertia, Kgm <sup>2</sup>		0.00038	0.00087	0.0016	0.0033	0.0065	

## Filtration

In order to protect the D6 pump from foreign matter, such as weld slag, weld beads, pipe scale and rust, nuts, bolts, rags, etc a strainer should be installed in the pump inlet pipe near the pump. Recommended strainer-open-meshwidth for the D6 pump is:

max 800 µm

Max. pressure difference over clean strainer: 10 kPa att full flow rate

## Rotation:

Clockwise facing pump shaft.

## Drive

Direct drive over flexible shaft coupling which must allow an axial pump shaft movement of min. 0.3 mm. Axial or transverse loads on pump shaft are not allowed.

In this leaflet following units are used:

Quantity	SI-Unit	Other unit	Conversion
Pressure	MPa, kPa	-	1 MPa = 10 bar
Speed	r/s	rpm	-
Viscosity	mm <sup>2</sup> /s	-	1 mm <sup>2</sup> /s = 1 cSt
Temperature	°C	-	-
Length	m, mm, µm	-	-
Volume	cm <sup>3</sup>	-	-
Flow rate	dm <sup>3</sup> /s	l/min	-

The built-on strainer of pumps D6 xxTx and D6 xxJx has an open meshwidth of 500 µm (40 mesh straining cloth). When the D6 pump is used in power hydraulic systems or is used as lube oil or seal oil pump, no extra filtering precautions are required other than those prescribed for the remaining components in the system.

If no other filtration is prescribed it is recommended that the hydraulic fluid of a power hydraulic system is pumped through a filter – in the return line to the fluid reservoir or in a separate fluid reconditioning circuit – with an open meshwidth of 25 µm.

## Accessories

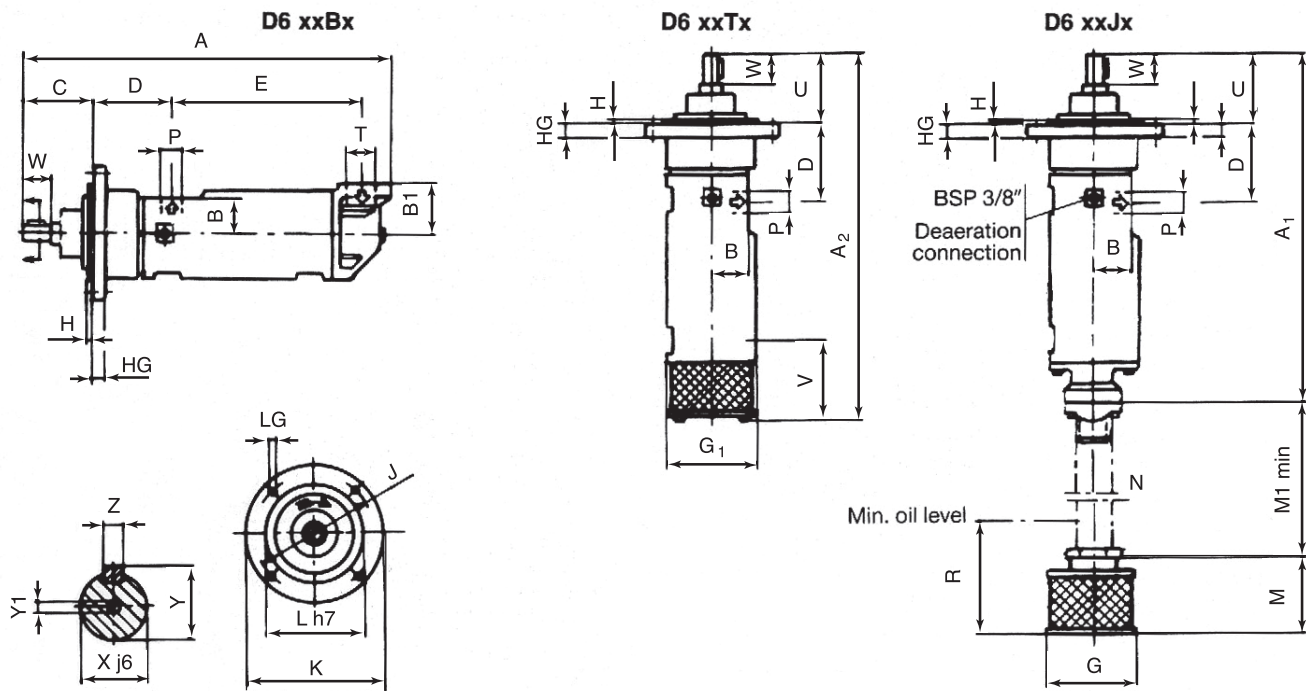
For the D6 xxBx pumps following standard accessories are available:

- Circular frame for connecting the pump to flange/foot mount IM2001 IEC Standard electric motors with or without supporting foot. (D6 xxBx).
- Circular frame for vertical tank mounting to flange mount IM-3011 IEC Standard electric motor (D6 xxJxx xxTx).
- Flexible shaft coupling.
- Inlet outlet counter flange set for pipe weld connection or pipe thread connection.
- Totally enclosed fan cooled squirrel-cage electric motors according to IEC, mounting form IM 2001 and IM 3011.

# Dimensions

## Pump Series D6 xxBx, xxJx and xxTx

Dimensions in mm



Sizes		038	045	052	060	070
Main dimensions	A	579	680	743	860	955
	A <sub>1</sub>	573	678	717	814	901
	A <sub>2</sub>	586	673	741	850	967
	B	65	65	77	90	97
	B <sub>1</sub>	85	85	100	125	125
	C	117	145	145	180	180
	D	146	151	158	171	188
	E	274	334	385	442	511
	G	142	167	185	205	225
Flange dimensions	G <sub>1</sub>	150	150	185	210	230
	H	5	5	5	5	5
	HG	20	25	25	30	30
	J	215	240	240	265	265
	K	250	275	275	300	300
	L h7	180	205	205	230	230
Outlet	Number Diameter	LG	4	4	4	4
			18	18	18	18
Inlet	P	32	32	40	50	50
Shaft	T	40	50	60	75	100
	W	42	58	58	82	82
	X j6	28	32	38	42	48
	Y	31	35	41	45	51.5
	Y1	M8	M8	M8	M12	M12
Strainer	Z	8	10	10	12	14
	M	93	120	147	177	188
	M 1 min.	80	85	105	120	135
Min. oil level	N	BSP 1 1/2"	BSP 2"	BSP 2 1/2"	BSP 3"	-
	R	125	160	190	225	240
Weight kg	V	125	125	140	160	200
		≈55	≈75	≈115	≈165	≈210

Subject to change without notice. Not binding unless certified.

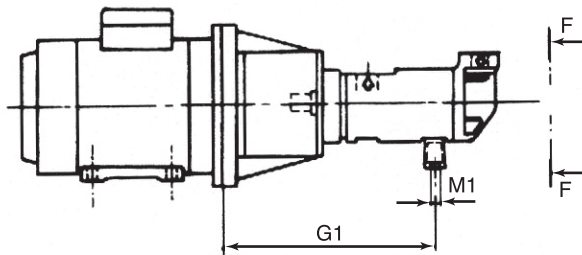
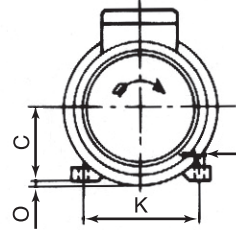
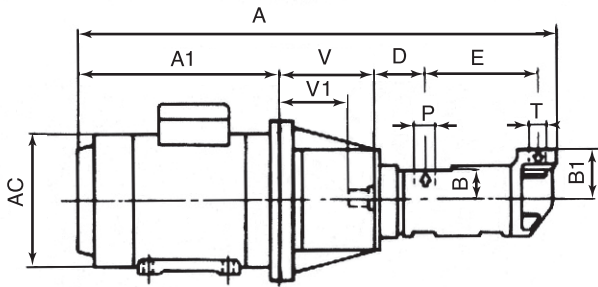
# Dimensions

## Pump Unit Type D6 xxBx

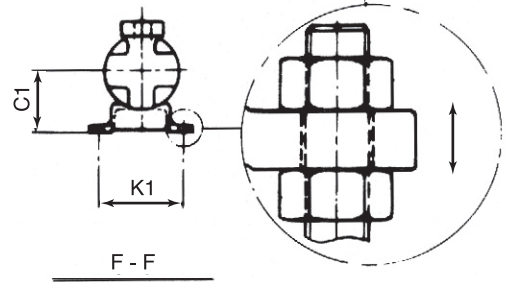
with flange mounted IEC Standard electric motors.

For complete pump unit dimensions, consult the Dimensions Prints for the individual unit mount.

Dimensions in mm.



Alternative with supporting foot



F - F

Pump Sizes	Connecting frame type	Motor poles	A	A1	ACAC	B	B1	D	E	P	T	V	V1	G1	M1	C1	K1
038	F300	2 - 4	1287	585	375	65	85	146	274	32	38	240	123	558	14	140	210
	F350		1341	639	392							240	123	558			
	F400	2	1396	694	460							240	123	558			
	F400-140	4	1392	655	275							158	593				
	F500	2-4	1667	930	557							275	158	593			
045	F300	2-4	1385	585	375	65	85	151	334	32	48	265	120	630	14	140	210
	F350		1439	639	392							265	120	630			
	F400	2	1494	694	460							265	120	630			
	F400-140	4	1490	655	300							155	665				
	F500	2-4	1765	930	557							300	155	665			
	F600	2	1660	1045	630							300	155	665			
052	F350	2-4	1502	639	392	77	100	158	385	40	58	265	120	685	14	155	210
	F400	2	1557	694	265							120	685				
	F400-140	4	1553	655	460							300	155	720			
	F500	2 - 4	1828	930	557							300	155	720			
	F600	2	1943	1045	630							300	155	720			
060	F500	2-4	1945	930	557	90	125	171	442	50	73	335	155	790	18	170	260
	F600	2	2060	1045	630							335	155	790			
	F600-170	4	2097	372	192							827					
	F740	2	2282	1260	728							342	162	797			
070	F500	2-4	2040	930	557	97	125	188	511	50	98	335	155	865	18	180	260
	F600	2	2155	1045	630							335	155	865			
	F600-170	4	2192	372	192							902					
	F740	2	2377	1260	728							342	162	872			

### Remarks

- Dimensions A and A1 may vary with make of electric motor.
- For certain motor sizes the motor mounting flange projects (max 25 mm) below the motor foot.



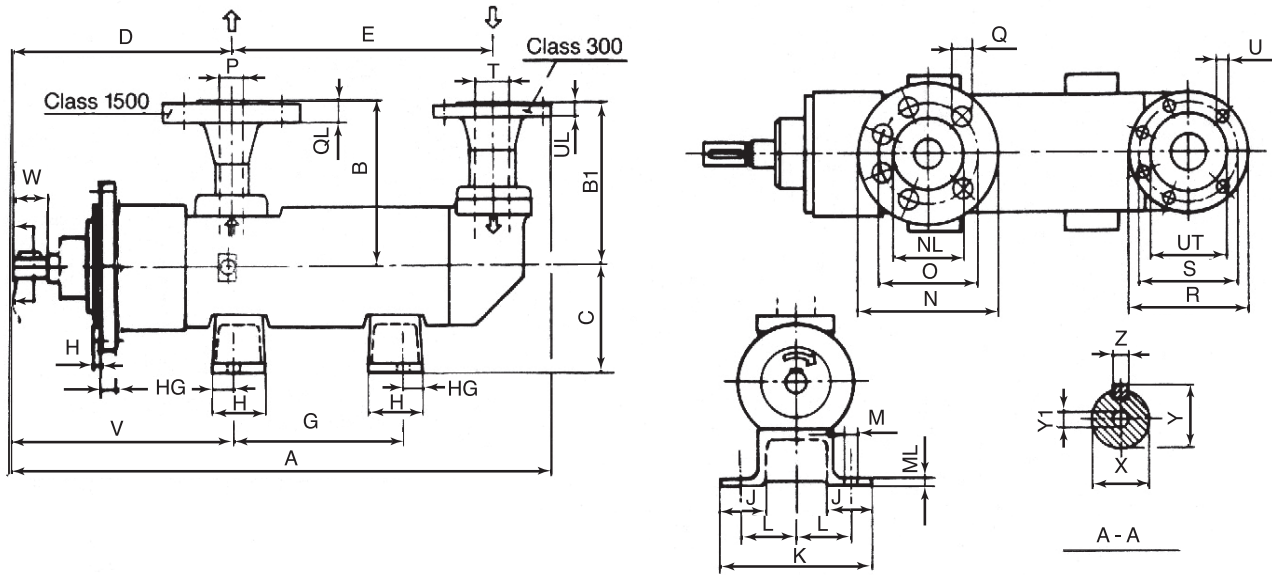
# Dimensions Pump D6 xxFx

Designed to meet the requirements as per API 676-standards norms.

For complete pump unit dimensions consult the Dimensional Prints for the individual unit mount.

Flange according to ANSI (ASA) B 16.5.

Dimensions in mm



Sizes		038	045	052	060	070	
Main Dimensions	A	615	713	783	898	1006	
	B	225	225	260	300	307	
	B1	225	225	260	300	307	
	C	140	140	155	175	180	
	D	263	296	303	351	368	
Foot Dimensions	E	274	334	385	442	511	
	V	265	300	305	355	360	
	G	170	210	260	280	350	
	H	75	75	75	85	85	
	HG	27	27	27	32	32	
	K	245	245	245	310	310	
	L	105	105	105	130	130	
	J	65	65	65	80	80	
	ML	12	12	12	15	15	
Outlet	M	Number Diameter	4	4	4	4	4
	14		14	14	18	18	
	P	31,8	31,8	38,1	50,8	50,8	
	QL	35	35	38	44,5	44,5	
	NL	63,5	63,5	73	92,1	92,1	
	O	111,1	111,1	123,8	165,1	165,1	
Inlet	N	158,7	158,7	177,8	215,9	215,9	
	Q	Number Diameter	4	4	4	8	8
	25,4		25,4	28,6	25,4	25,4	
	T	40,9	52,6	62,7	78	102,4	
	UL	20,6	22,2	25,4	28,6	31,7	
	UT	73	92,1	104,8	127	157,2	
	S	114,3	127	149,2	168,3	200	
R	155,6	165,1	190,5	209,5	254		
Shaft	U	Number Diameter	4	8	8	8	8
	22,2		19	22,2	22,2	22,2	
	W	42	58	58	82	82	
	X 150 J6	28	32	38	42	48	
	Y	31	35	41	45	51,5	
Weight	Y1	M8	M8	M8	M12	M12	
	Z	8	10	10	12	14	
	Kg	≈ 73	≈ 93	≈ 136	≈ 195	≈ 245	
Lbs	≈ 160	≈ 205	≈ 300	≈ 430	≈ 540		

## Selection Guide

### Flow rate and Power Consumption

D6 Pump at 50 Hz and 60 Hz with 2-pole and 4-pole electric motors at 37 mm<sup>2</sup>/s viscosity and for pumping temperatures up to 60°C. Consult the Performance Data Sheet for the individual pump size for performance datas at other speeds, viscosities and pumping

temperatures, The Performance Data Sheet or the corresponding information is available from your local IMO AB representative.

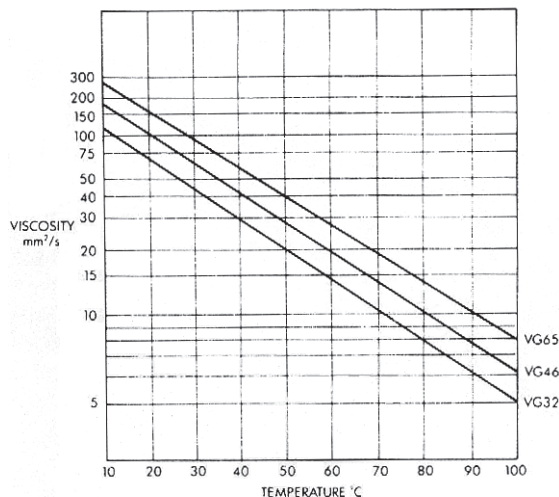
Electric motor power to be selected considering viscosity and discharge pressure at start-up conditions. Pump performance established according to VDMA 24284.

### Flow rate and power consumption

Flow rate (Q<sub>eff</sub>) l/m<sup>3</sup>/s, (O<sub>eff</sub>) l/min and Power Consumption (P<sub>e</sub>) kW at 37 mm<sup>2</sup>/s, < 60°C

Speed		50 Hz 48.3 r/s (2900 rpm)							60 Hz 58.3 r/s (3500 rpm)						
Size	Discharge pressure	10 Mpa	15 Mpa	17 Mpa	19 Mpa	21 Mpa	23 Mpa	25 Mpa	10 Mpa	15 Mpa	17 Mpa	19 Mpa	21 Mpa	23 Mpa	25 Mpa
038K	Q <sub>eff</sub>	1.67	1.58	1.55	1.52	1.47	1.43	1.40	2.05	1.97	1.93	1.90	1.87	1.83	1.78
	O <sub>eff</sub>	100	95	93	91	88	86	84	123	118	116	114	112	110	107
	P <sub>e</sub>	20.1	29.7	33.5	37.3	41.1	45.0	48.8	24.4	36.0	40.6	45.2	49.9	54.5	59.1
038N	Q <sub>eff</sub>	2.10	1.96	1.98	1.90	1.85	-	-	2.58	2.48	2.43	2.38	2.33	-	-
	O <sub>eff</sub>	126	119	116	114	111	-	-	155	149	146	143	140	-	-
	P <sub>e</sub>	25.4	37.5	42.4	47.2	52.1	-	-	30.9	45.5	51.4	57.2	63.1	-	-
045K	Q <sub>eff</sub>	2.88	2.77	2.73	2.68	2.63	2.60	2.55	3.53	3.43	3.38	3.33	3.30	3.25	3.20
	O <sub>eff</sub>	173	166	164	161	158	156	153	212	206	203	200	198	195	192
	P <sub>e</sub>	33.8	49.8	56.3	62.7	69.1	75.6	82.0	41.0	60.5	68.2	76.0	83.8	91.6	99.4
045N	Q <sub>eff</sub>	3.60	3.45	3.40	3.35	3.28	-	-	4.42	4.27	4.21	4.17	4.10	-	-
	O <sub>eff</sub>	216	207	204	201	197	-	-	-	265	256	253	250	246	-
	P <sub>e</sub>	42.2	62.4	70.4	78.5	86.5	-	-	51.3	75.7	85.4	95.1	105	-	-
052K	Q <sub>eff</sub>	4.63	4.50	4.45	4.38	4.33	4.28	4.21	5.67	5.53	5.47	5.42	5.37	5.30	5.25
	O <sub>eff</sub>	278	270	267	263	260	257	253	340	332	328	325	322	318	315
	P <sub>e</sub>	53.3	78.7	88.9	99.0	109	119	130	64.8	95.5	108	120	132	145	157
052N	Q <sub>eff</sub>	5.63	5.45	5.38	5.30	5.23	-	-	6.90	6.72	6.63	6.57	6.48	-	-
	O <sub>eff</sub>	338	327	323	318	314	-	-	414	403	398	394	389	-	-
	P <sub>e</sub>	65.2	96.3	109	121	134	-	-	79.3	117	132	147	162	-	-
060K	Q <sub>eff</sub>	7.23	7.05	6.97	6.90	6.82	6.75	6.68	8.82	8.63	8.57	8.48	8.42	8.33	8.27
	O <sub>eff</sub>	434	423	418	414	409	405	401	529	518	514	509	505	500	496
	P <sub>e</sub>	82.3	122	137	153	169	184	200	100	147	166	185	204	223	242
060N	Q <sub>eff</sub>	8.70	8.45	8.35	8.25	8.15	-	-	10.6	10.4	10.3	10.2	10.1	-	-
	O <sub>eff</sub>	522	507	501	495	489	-	-	638	623	617	611	605	-	-
	P <sub>e</sub>	99.9	148	167	186	205	-	-	121	179	202	225	248	-	-
070K	Q <sub>eff</sub>	11.5	11.2	11.1	11.0	10.9	10.8	10.7	14.0	13.7	13.6	13.5	13.4	13.3	13.2
	O <sub>eff</sub>	689	673	666	660	654	647	641	839	823	817	811	804	798	791
	P <sub>e</sub>	130	192	217	241	266	291	316	158	233	263	293	323	353	382
070N	Q <sub>eff</sub>	13.9	13.6	13.5	13.3	13.2	-	-	17.0	16.7	16.5	16.4	16.2	-	-
	O <sub>eff</sub>	837	816	807	798	789	-	-	1020	1000	991	982	974	-	-
	P <sub>e</sub>	159	235	265	295	325	-	-	193	285	321	358	395	-	-

### LUB. OIL VISCOSITIES



### CONVERSION TABLES

#### Capacity and flow rate

	m <sup>3</sup> /h	l/m	UK gal/ min	US gal/min
m <sup>3</sup> /h	1	16.67	3.667	4.4
l/m	0.06	1	0.2199	0.264
UK gal/min	0.272	4.546	1	1.2
US gal/min	0.227	3.785	0.833	1

#### Head and pressure

	Head		Pressure		
	m	ft	bar	lbf/in <sup>2</sup>	MPa
m	1	3.281	0.098	1.422	0.0098
ft	0.3048	1	0.0299	0.434	0.003
Bar	10.2	33.46	1	14.50	0.1
lbf/in <sup>2</sup>	0.703	2.307	0.069	1	0.0069
Mpa	102	335	10	145	1

#### Power

1 kW = 1.341 hp

1 hp = 0.7457 kW

#### Weight

1 kg = 2.2 lb

1 lb = 0.453 kg

#### Temperature

°F = (°C x 1.8) + 32

°C = (°F - 32) x 0.5555

Adress:

IMO AB  
PO Box 42090, 126 14 Stockholm  
Sweden