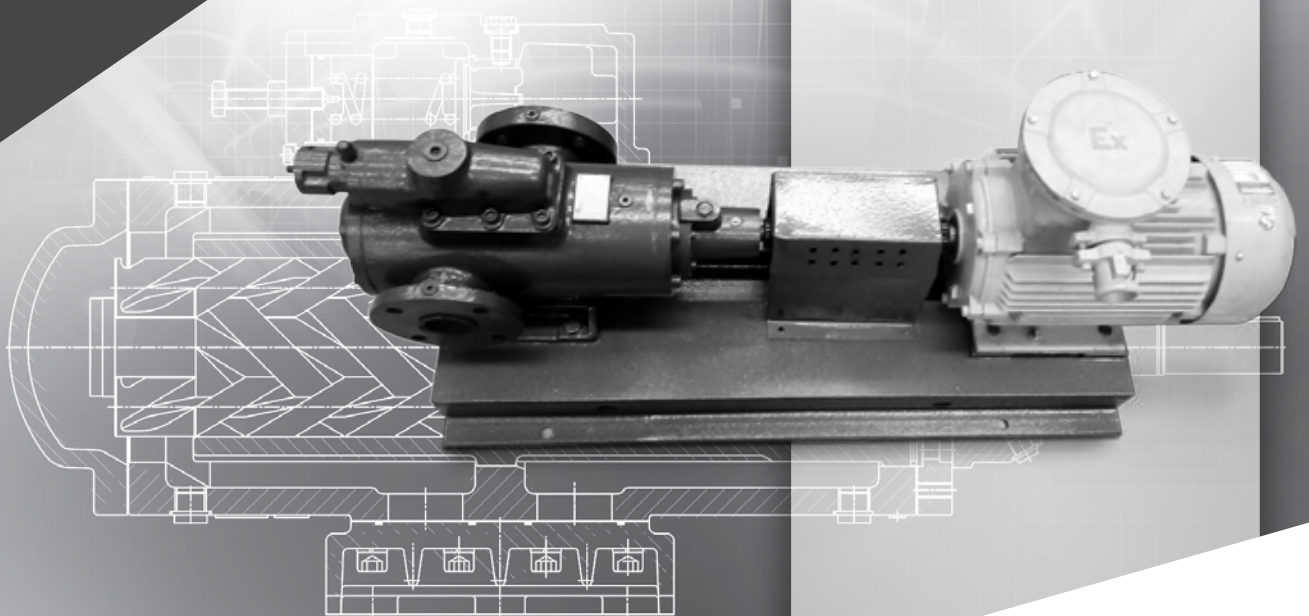


Blackmer®

Design Manual

3M Series
Triple-Screw Pumps



Where Innovation Flows

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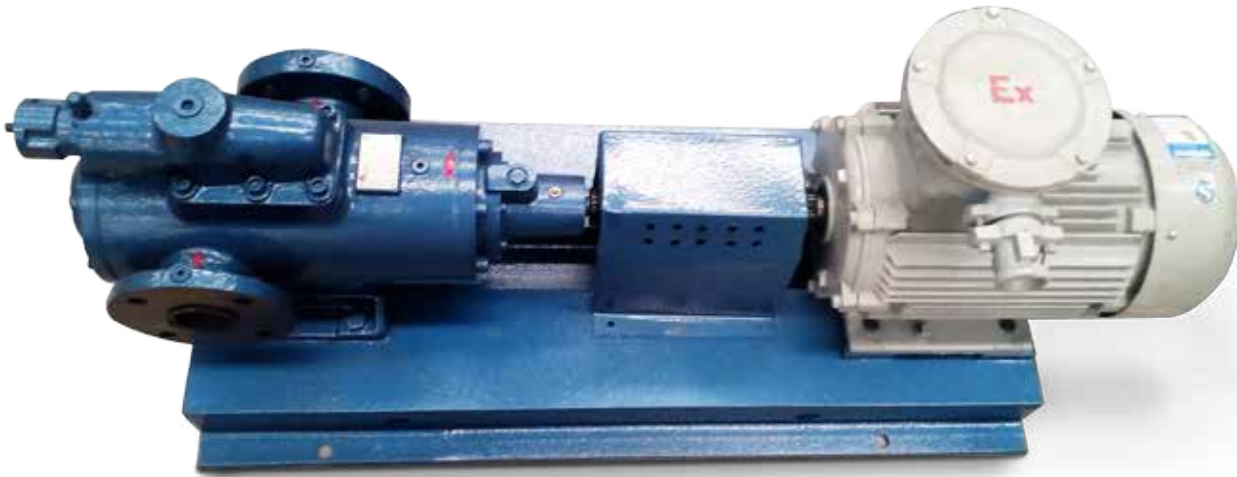
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3M Series Triple-Screw Pumps are used to handle various media/fluid without solid contents or lubricating liquids.

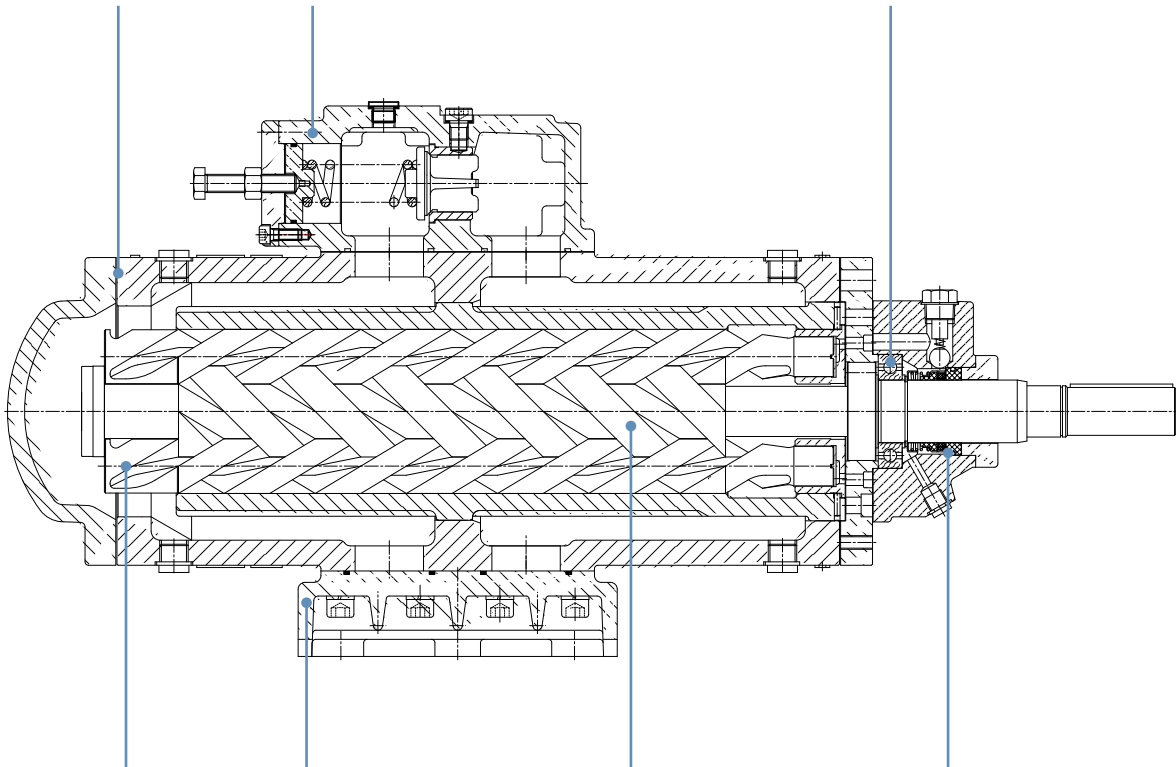
Flow rate: 10 - 1,900 l/min (2.6 - 500 gpm)	Temperature: ≤ 120°C (250°F)
Pressure: ≤ 100 bar (1,450 psi)	Viscosity: 3 - 5,000 mm ² /s

SECTION 2

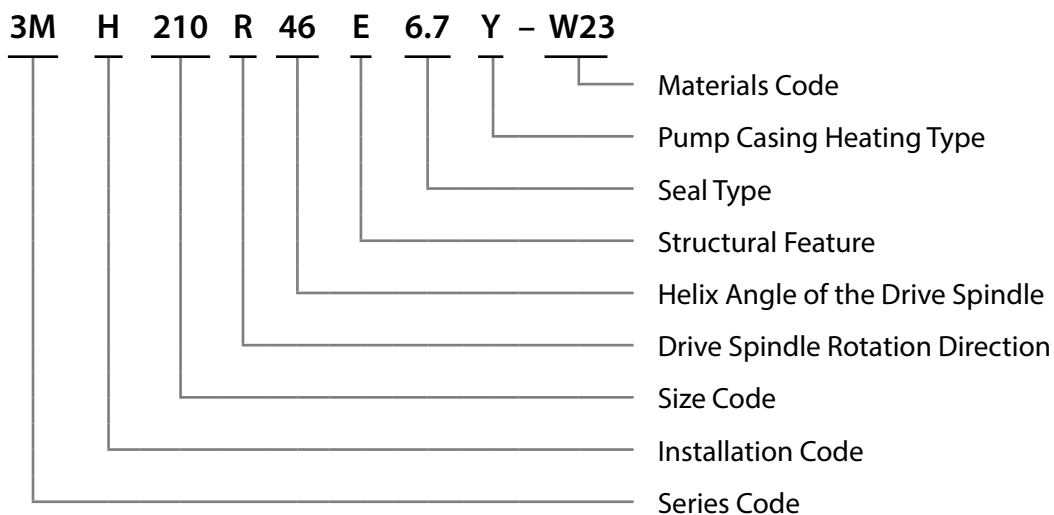
APPLICATIONS

- Loading, transporting and liquid supply in the petrochemical industry
- Hydraulic, lubricating process in machinery applications
- Transporting, boosting, fuel injection and hydraulic supply in the ship building industry
- Fuel injection, in heating systems

1. Jacketed pump body is available for various temperature and media needs.
2. Uniquely constructed pressure relief valve on the pump body. In instances where the discharge pressure is higher than the working pressure, part of the media may flow back to the inlet of the pump for overload protection. Meanwhile, the pump can be started at full pressure, thereby reducing the startup torque.
3. The axial force of the drive is equalized by the balance piston; minimal residue axial force is placed on the rollers (secondary shafts) allowing for a maximized shaft life. Internal bearing structure or external bearing structure can be chosen per working conditions.



4. Secondary screws are driven by hydraulic forces. Torque from the friction of the media is transferred and applied on the surface of secondary screws; therefore, no wearing occurs on the surface. The axial forces on the secondary screws are balanced by the low-tension from the balance sleeves.
5. Multiple installation modes are available, including horizontal, flanged, vertical, submerged, hang-up, etc.
6. A constant sealed chamber is formed between the teeth of the drive and secondary screws to move the liquid to the discharge port with consistent speed. Therefore, there is no pulsation during transportation and no propulsion since the sealed chamber remains volumetrically constant.
7. Multiple shaft seals are available for different media.



Series Code

Code	Key features	Max. flow (l/min)	Size range	Max. discharge pressure bar
3M	High pressure, single-suction, axial hydraulic balance	1,900	40-940	100

Installation Mode

Installation mode	H	F	S
Description	Foot installation	Flange installation	Vertical installation
Illustration			

*Flanged connections can be provided upon request; applicable for small pumps only.

Size and Helix Angle

There are 8 size codes for 3M pumps in total. The pump specification code is determined based on the pump running at 1,450 r/min, with helix angle of 46 degrees.

Size Code	40	80	120	210	280	440	660	940
Helix Angle (degrees)	38	36	42	40	43	40	40	42
	46	42	46	46	46	46	46	46
		46						

Drive Spindle Rotation Direction

View from the drive end: R stands for clockwise; L stands for counter clockwise.

Structural Feature

Code	Description	Applications
U	Internal bearing, multiple seal types	Media with good lubricity, working temperature below 150°C (302°F)
K	External bearing, packing seal	Media with poor lubricity, high viscosity, working temperature below 250°C (482°F)
E	External bearing, mechanical seal, with greaser on bearing	Media with poor lubricity, working temperature below 150°C (302°F)
D	External bearing, mechanical seal, without greaser port on bearing	Media with poor lubricity, working temperature below 80°C (176°F)

Seal Type

Code	Description	Application
2	Packing seal	U and K structures
3	Double oil seal	U structure
4	Triple oil seal	U and D structures
6.7	Mechanical seal	E structure
12.1	Mechanical seal	U structure

Pump Casing Heating Type

Code	Structure
[blank]	Standard pump body for handling liquids with good fluidity and lubricity
Y	Double layer, welded pump body with steam or other hot fluid as heating media
E	Electrical heating

Materials

Code	Casing			Liner			Application
	GB	DIN	ANSI	GB	DIN	ANSI	
W2	HT250	GG25	Class 35B	ZL109	-	A03360/ A03361	Transportation of liquids with good lubricity and medial viscosity at low pressure.
W3	QT400-18	GGG-40	60-40-18 F32800	ZL109	-	A03360/ A03361	In special applications (e.g., marine), for transportation of liquids with good lubricity and medial viscosity at low pressure.
W21	HT250	GG25	Class 35B	ZQSn5-5-5	G-CuSn5ZnPb 2.1096.01	C83600	Transportation of liquids with poor lubricity and low viscosity at high pressure.
W23	QT400-18	GGG-40	60-40-18 F32800	ZQSn5-5-5	G-CuSn5ZnPb 2.1096.01	C83600	In special applications (e.g., marine), for transportation of liquids with poor lubricity and low viscosity at high pressure.

1. User-Provided Parameters

- Working temperature of the media, T
- Viscosity at working temperature, ν
- Suction pressure (or vacuum), P1
- Discharge pressure, P2
- Working flow, Q
- Installation mode
- Any other supporting requirements

2. Notes for Model Selection

- Select proper structure based on the features of the media being pumped.
- Select proper speed based on the viscosity of the media. If media viscosity is $> 760 \text{ mm}^2/\text{s}$, please contact company for assistance.
- Select the model based on the flow and pressure from the 3M Series Triple-Screw Pump performance data sheet.
- Check and identify the NPSHr value from the cavitation redundancy sheet based on the pump specification, speed and viscosity. It should be ensured that the $\text{NPSHr} < \text{NPSHa}$ (cavitation redundancy of the inlet piping). Otherwise, a pump with one size larger or lower speed should be selected.
- After selecting the pump, find the shaft power from the performance chart. The drive power shall be higher than the absorbed power N (kW) with the safety factor K which is depends on the N value. See table below.

N (kW)	$N \leq 5$	$5 < N \leq 10$	$10 < N \leq 50$	$N > 50$
K	1.25	1.2	1.15	1.1

50Hz																			U.S. STANDARD			
Size	Speed = 950 rpm							Speed = 1450 rpm							Speed = 2900 rpm							
	Viscosity (mm ² /s)																					
	3-12	20	40	75	150	380	760	3-12	20	40	75	150	380	760	3-12	20	40	75	150	380	760	
	NPSHr (ft)																					
40-38	6.6	6.6	6.9	7.2	7.9	8.9	10.2	6.9	7.2	7.2	7.9	8.2	9.5	10.8	6.6	6.9	7.2	7.9	8.5	10.2	12.1	
40-46	6.9	6.9	7.2	7.5	8.2	9.2	10.8	7.2	7.5	7.9	8.2	8.9	10.2	11.8	7.9	8.2	8.5	9.2	10.2	12.5	15.1	
80-36	6.6	6.9	7.2	7.5	7.9	9.2	10.5	7.2	7.2	7.5	7.9	8.5	9.8	11.5	7.2	7.5	7.9	8.5	9.2	11.2	13.4	
80-42	6.9	6.9	7.2	7.5	8.2	9.5	10.8	7.5	7.5	7.9	8.2	8.9	10.5	12.1	8.2	8.5	9.2	9.5	10.8	13.1	15.7	
80-46	6.9	7.2	7.5	7.9	8.5	9.5	11.2	7.9	7.9	8.2	8.9	9.5	10.8	12.8	9.5	9.8	10.5	11.2	12.5	15.1	18.7	
120-42	6.9	7.2	7.5	7.9	8.2	9.5	11.2	7.5	7.9	8.2	8.5	9.2	10.8	12.5	9.2	9.2	9.8	10.5	11.8	14.4	17.7	
120-46	7.2	7.2	7.5	8.2	8.5	9.8	11.5	8.2	8.2	8.5	9.2	9.8	11.5	13.4	10.5	10.8	11.5	12.5	14.1	17.1	21.6	
210-40	7.2	7.2	7.5	7.9	8.5	9.8	11.5	7.9	8.2	8.5	8.9	9.8	11.2	13.1	10.2	10.5	11.2	11.8	13.1	16.4	20.3	
210-46	7.5	7.9	7.9	8.5	9.2	10.5	12.1	8.9	8.9	9.5	9.8	10.8	12.5	14.8	13.1	13.4	14.4	15.7	17.4	22.0		
280-43	7.5	7.5	7.9	8.5	9.2	10.5	12.1	8.9	8.9	9.2	9.8	10.5	12.5	14.8	12.8	13.1	14.1	15.1	17.1	21.3		
280-46	7.9	7.9	8.2	8.9	9.5	10.8	12.8	9.2	9.5	9.8	10.5	11.5	13.4	16.1	15.1	15.7	16.7	18.4	20.7			
440-40	7.5	7.9	8.2	8.5	9.2	10.5	12.1	8.9	9.2	9.5	9.8	10.8	12.8	15.1	13.4	14.1	14.8	16.1	18.0	22.6		
440-46	8.2	8.5	8.9	9.2	9.8	11.5	13.4	10.2	10.5	10.8	11.5	12.5	15.1	18.0	19.7	20.3	21.6					
660-40	7.9	8.2	8.5	8.9	9.5	11.2	13.1	9.5	9.8	10.5	10.8	11.8	14.1	17.1	17.4	17.7	19.0	20.7				
660-46	8.5	8.9	9.2	9.8	10.5	12.5	14.8	11.2	11.5	12.1	12.8	14.1	16.7	20.3								
940-42	8.5	8.5	8.9	9.5	10.2	12.1	14.1	10.5	10.8	11.5	12.1	13.1	15.7	19.0	22.3	23.0						
940-46	9.2	9.5	9.8	10.5	11.2	13.1	15.7	12.1	12.5	13.1	14.1	15.7	18.7									

The NPSHr values in the table are only applicable to media without gas. As a rule of thumb, 0.4 – 0.8 m is added to the NPSHr value identified from the table to indicate the NPSHr value for the pump.

The data in the table is subject to revision without prior notice.

60Hz																			U.S. STANDARD			
Size	Speed = 1150 rpm							Speed = 1750 rpm							Speed = 3500 rpm							
	Viscosity (mm ² /s)																					
	3-12	20	40	75	150	380	760	3-12	20	40	75	150	380	760	3-12	20	40	75	150	380	760	
	NPSHr (ft)																					
40-38	6.6	6.9	7.2	7.5	7.9	9.2	10.5	7.2	7.2	7.5	7.9	8.5	9.8	11.5	7.5	7.5	8.2	8.5	9.5	11.5	13.8	
40-46	6.9	7.2	7.5	7.9	8.5	9.5	11.2	7.9	7.9	8.2	8.5	9.2	10.8	12.5	9.2	9.5	10.2	10.8	11.8	14.4	18.0	
80-36	6.9	6.9	7.2	7.5	8.2	9.5	10.8	7.5	7.5	7.9	8.2	8.9	10.5	12.1	8.2	8.5	8.9	9.5	10.5	12.8	15.7	
80-42	7.2	7.2	7.5	7.9	8.5	9.8	11.2	7.9	8.2	8.5	8.9	9.5	11.2	12.8	9.8	10.2	10.5	11.5	12.8	15.4	19.4	
80-46	7.2	7.5	7.9	8.2	8.9	10.2	11.8	8.2	8.5	8.9	9.5	10.2	11.8	14.1	11.5	11.8	12.5	13.5	15.1	18.7		
120-42	7.2	7.5	7.5	8.2	8.9	10.2	11.5	8.2	8.5	8.9	9.2	9.8	11.5	13.5	10.8	11.2	11.8	12.8	14.1	17.7	22.0	
120-46	7.5	7.9	8.2	8.5	9.2	10.5	12.1	8.9	8.9	9.5	9.8	10.8	12.5	15.1	13.1	13.8	14.4	15.7	17.7	22.3		
210-40	7.5	7.5	7.9	8.2	8.9	10.5	12.1	8.5	8.9	9.2	9.8	10.5	12.5	14.4	12.5	12.8	13.8	14.8	16.7			
210-46	7.9	8.2	8.5	8.9	9.8	11.2	13.1	9.5	9.8	10.5	11.2	12.1	14.1	17.1	17.4	18.0	19.0	20.7				
280-43	7.9	8.2	8.5	8.9	9.5	11.2	13.1	9.5	9.8	10.2	10.8	11.8	14.1	16.7	16.7	17.4	18.7	20.0	23.0			
280-46	8.2	8.5	8.9	9.5	10.2	11.8	13.8	10.5	10.5	11.2	11.8	12.8	15.4	18.4	20.7	21.7	23.0					
440-40	8.2	8.2	8.5	9.2	9.8	11.5	13.5	9.8	10.2	10.5	11.2	12.1	14.4	17.1	17.7	18.4	19.7	21.3				
440-46	8.9	9.2	9.5	10.2	10.8	12.8	15.1	11.5	11.8	12.5	13.5	14.8	17.7	21.7								
660-40	8.5	8.9	9.2	9.8	10.5	12.1	14.4	10.8	11.2	11.8	12.5	13.8	16.4	20.0								
660-46	9.5	9.8	10.2	10.8	11.8	13.8	16.7	13.1	13.5	14.1	15.1	16.7	20.3									
940-42	9.2	9.5	9.8	10.5	11.5	13.5	15.7	12.5	12.8	13.5	14.1	15.7	19.0									
940-46	10.2	10.5	11.2	11.8	12.8	15.1	18.4	14.8	15.4	16.1	17.4	19.4										

Size	50Hz																				METRIC	
	Speed = 950 rpm							Speed = 1450 rpm							Speed = 2900 rpm							
	Viscosity (mm ² /s)																					
	3-12	20	40	75	150	380	760	3-12	20	40	75	150	380	760	3-12	20	40	75	150	380	760	
NPSHr (m)																						
40-38	2.0	2.0	2.1	2.2	2.4	2.7	3.1	2.1	2.2	2.2	2.4	2.5	2.9	3.3	2.0	2.1	2.2	2.4	2.6	3.1	3.7	
40-46	2.1	2.1	2.2	2.3	2.5	2.8	3.3	2.2	2.3	2.4	2.5	2.7	3.1	3.6	2.4	2.5	2.6	2.8	3.1	3.8	4.6	
80-36	2.0	2.1	2.2	2.3	2.4	2.8	3.2	2.2	2.2	2.3	2.4	2.6	3.0	3.5	2.2	2.3	2.4	2.6	2.8	3.4	4.1	
80-42	2.1	2.1	2.2	2.3	2.5	2.9	3.3	2.3	2.3	2.4	2.5	2.7	3.2	3.7	2.5	2.6	2.8	2.9	3.3	4.0	4.8	
80-46	2.1	2.2	2.3	2.4	2.6	2.9	3.4	2.4	2.4	2.5	2.7	2.9	3.3	3.9	2.9	3.0	3.2	3.4	3.8	4.6	5.7	
120-42	2.1	2.2	2.3	2.4	2.5	2.9	3.4	2.3	2.4	2.5	2.6	2.8	3.3	3.8	2.8	2.8	3.0	3.2	3.6	4.4	5.4	
120-46	2.2	2.2	2.3	2.5	2.6	3.0	3.5	2.5	2.5	2.6	2.8	3.0	3.5	4.1	3.2	3.3	3.5	3.8	4.3	5.2	6.6	
210-40	2.2	2.2	2.3	2.4	2.6	3.0	3.5	2.4	2.5	2.6	2.7	3.0	3.4	4.0	3.1	3.2	3.4	3.6	4.0	5.0	6.2	
210-46	2.3	2.4	2.4	2.6	2.8	3.2	3.7	2.7	2.7	2.9	3.0	3.3	3.8	4.5	4.0	4.1	4.4	4.8	5.3	6.7		
280-43	2.3	2.3	2.4	2.6	2.8	3.2	3.7	2.7	2.7	2.8	3.0	3.2	3.8	4.5	3.9	4.0	4.3	4.6	5.2	6.5		
280-46	2.4	2.4	2.5	2.7	2.9	3.3	3.9	2.8	2.9	3.0	3.2	3.5	4.1	4.9	4.6	4.8	5.1	5.6	6.3			
440-40	2.3	2.4	2.5	2.6	2.8	3.2	3.7	2.7	2.8	2.9	3.0	3.3	3.9	4.6	4.1	4.3	4.5	4.9	5.5	6.9		
440-46	2.5	2.6	2.7	2.8	3.0	3.5	4.1	3.1	3.2	3.3	3.5	3.8	4.6	5.5	6.0	6.2	6.6					
660-40	2.4	2.5	2.6	2.7	2.9	3.4	4.0	2.9	3.0	3.2	3.3	3.6	4.3	5.2	5.3	5.4	5.8	6.3				
660-46	2.6	2.7	2.8	3.0	3.2	3.8	4.5	3.4	3.5	3.7	3.9	4.3	5.1	6.2								
940-42	2.6	2.6	2.7	2.9	3.1	3.7	4.3	3.2	3.3	3.5	3.7	4.0	4.8	5.8	6.8	7.0						
940-46	2.8	2.9	3.0	3.2	3.4	4.0	4.8	3.7	3.8	4.0	4.3	4.8	5.7									

		60Hz																		METRIC			
Size	Speed = 1150 rpm							Speed = 1750 rpm							Speed = 3500 rpm								
	Viscosity (mm ² /s)																						
	3-12	20	40	75	150	380	760	3-12	20	40	75	150	380	760	3-12	20	40	75	150	380	760		
	NPSHr (m)																						
40-38	2.0	2.1	2.2	2.3	2.4	2.8	3.2	2.2	2.2	2.3	2.4	2.6	3.0	3.5	2.3	2.3	2.5	2.6	2.9	3.5	4.2		
40-46	2.1	2.2	2.3	2.4	2.6	2.9	3.4	2.4	2.4	2.5	2.6	2.8	3.3	3.8	2.8	2.9	3.1	3.3	3.6	4.4	5.5		
80-36	2.1	2.1	2.2	2.3	2.5	2.9	3.3	2.3	2.3	2.4	2.5	2.7	3.2	3.7	2.5	2.6	2.7	2.9	3.2	3.9	4.8		
80-42	2.2	2.2	2.3	2.4	2.6	3.0	3.4	2.4	2.5	2.6	2.7	2.9	3.4	3.9	3.0	3.1	3.2	3.5	3.9	4.7	5.9		
80-46	2.2	2.3	2.4	2.5	2.7	3.1	3.6	2.5	2.6	2.7	2.9	3.1	3.6	4.3	3.5	3.6	3.8	4.1	4.6	5.7	7.2		
120-42	2.2	2.3	2.3	2.5	2.7	3.1	3.5	2.5	2.6	2.7	2.8	3.0	3.5	4.1	3.3	3.4	3.6	3.9	4.3	5.4	6.7		
120-46	2.3	2.4	2.5	2.6	2.8	3.2	3.7	2.7	2.7	2.9	3.0	3.3	3.8	4.6	4.0	4.2	4.4	4.8	5.4	6.8			
210-40	2.3	2.3	2.4	2.5	2.7	3.2	3.7	2.6	2.7	2.8	3.0	3.2	3.8	4.4	3.8	3.9	4.2	4.5	5.1	6.3			
210-46	2.4	2.5	2.6	2.7	3.0	3.4	4.0	2.9	3.0	3.2	3.4	3.7	4.3	5.2	5.3	5.5	5.8	6.3	7.2				
280-43	2.4	2.5	2.6	2.7	2.9	3.4	4.0	2.9	3.0	3.1	3.3	3.6	4.3	5.1	5.1	5.3	5.7	6.1	7.0				
280-46	2.5	2.6	2.7	2.9	3.1	3.6	4.2	3.2	3.2	3.4	3.6	3.9	4.7	5.6	6.3	6.6	7.0	7.7					
440-40	2.5	2.5	2.6	2.8	3.0	3.5	4.1	3.0	3.1	3.2	3.4	3.7	4.4	5.2	5.4	5.6	6.0	6.5	7.4				
440-46	2.7	2.8	2.9	3.1	3.3	3.9	4.6	3.5	3.6	3.8	4.1	4.5	5.4	6.6	8.7	9.0							
660-40	2.6	2.7	2.8	3.0	3.2	3.7	4.4	3.3	3.4	3.6	3.8	4.2	5.0	6.1	7.4	7.7							
660-46	2.9	3.0	3.1	3.3	3.6	4.2	5.1	4.0	4.1	4.3	4.6	5.1	6.2	7.7									
940-42	2.8	2.9	3.0	3.2	3.5	4.1	4.8	3.8	3.9	4.1	4.3	4.8	5.8	7.1									
940-46	3.1	3.2	3.4	3.6	3.9	4.6	5.6	4.5	4.7	4.9	5.3	5.9	7.3										

Speed n=950 r/min

METRIC

Size	Pressure ΔP bar	Viscosity (mm ² /s)																		
		3		6		12		20		40		75		150		380		760		
		Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	
440-46	10.0	218	5.5	262	5.5	271	5.5	275	5.5	280	5.5	283	5.7	286	6.1	288	6.8	289	7.7	
	20.0	189	10.4	238	10.4	254	10.4	262	10.4	271	10.4	276	10.6	281	11	285	11.7	287	12.5	
	30.0	162	15.2	216	15.2	238	15.2	250	15.2	262	15.2	270	15.5	276	15.8	282	16.6	285	17.4	
	40.0					223	20.1	239	20.1	254	20.1	264	20.3	272	20.7	279	21.4	283	22.3	
	50.0							228	24.9	246	24.9	259	25.2	268	25.6	277	26.3	281	27.1	
	60.0									239	29.8	253	30	264	30.4	274	31.1	279	32	
	70.0									231	34.7	248	34.9	260	35.3	272	36	278	36.8	
	80.0												242	39.8	257	40.1	270	40.9	276	41.7
	90.0														253	45	267	45.7	274	46.6
	100.0														249	49.9	265	50.6	273	51.4
660-40	10.0	273	6.8	324	6.8	333	6.8	338	6.8	342	6.8	345	7.2	348	7.7	350	8.8	351	9.9	
	20.0	245	12.7	301	12.7	316	12.7	325	12.7	333	12.7	339	13.1	343	13.6	347	14.6	349	15.8	
	30.0	218	18.6	280	18.6	301	18.6	313	18.6	325	18.6	333	19	339	19.5	344	20.5	347	21.7	
	40.0			259	24.5	287	24.5	302	24.5	317	24.5	327	24.9	335	25.4	342	26.4	345	27.6	
	50.0					273	30.4	291	30.4	309	30.4	321	30.7	331	31.3	339	32.3	343	33.5	
	60.0							281	36.3	302	36.3	316	36.6	327	37.2	337	38.2	342	39.4	
	70.0									295	42.2	311	42.5	323	43.1	334	44.1	340	45.3	
	80.0											306	48.4	319	49	332	50	338	51.2	
	90.0											330	54.3	316	54.9	330	55.9	337	57.1	
	100.0													312	60.7	328	61.8	335	63	
660-46	10.0	332	8.2	395	8.2	407	8.2	413	8.2	420	8.2	424	8.5	427	9.1	430	10.1	432	11.3	
	20.0	292	15.4	364	15.4	384	15.4	396	15.4	407	15.4	415	15.8	421	16.3	426	17.4	429	18.6	
	30.0	256	22.7	334	22.7	364	22.7	380	22.7	396	22.7	407	23	415	23.6	422	24.6	426	25.8	
	40.0					344	30	364	30	385	30	399	30.3	409	30.8	419	31.9	424	33.1	
	50.0							350	37.2	375	37.2	391	37.5	404	38.1	416	39.1	421	40.3	
	60.0									365	44.5	384	44.8	399	45.3	412	46.4	419	47.6	
	70.0											376	52.1	394	52.6	409	53.6	417	54.8	
	80.0											369	59.3	389	59.8	406	60.9	414	62.1	
	90.0													384	67.1	403	68.2	412	69.3	
	100.0													379	74.4	400	75.4	410	76.6	
940-42	10.0	388	9.9	465	9.9	480	9.9	488	9.9	496	9.9	502	10.4	506	11.2	510	12.7	512	14.4	
	20.0	337	18.5	424	18.5	451	18.5	466	18.5	480	18.5	490	19	498	19.8	505	21.3	508	23	
	30.0	290	27.2	386	27.2	424	27.2	445	27.2	466	27.2	479	27.6	490	28.4	500	29.9	505	31.6	
	40.0			350	35.8	398	35.8	425	35.8	452	35.8	469	36.3	483	37	495	38.5	501	40.2	
	50.0					374	44.4	406	44.4	438	44.4	459	44.9	476	45.6	491	47.1	498	48.8	
	60.0							387	53	425	53	450	53.5	469	54.2	487	55.8	495	57.4	
	70.0							369	61.2	412	61.6	440	62.1	463	62.8	483	64.4	492	66.1	
	80.0									400	70.2	431	70.7	456	71.4	478	73	490	74.7	
	90.0									388	78.8	422	79.3	450	80.1	474	81.6	487	83.3	
	100.0													414	87.9	444	88.7	471	90.2	91.9
940-46	10.0	479	11.7	568	11.7	583	11.7	591	11.7	600	11.7	605	12.2	609	12.9	613	14.4	615	16.1	
	20.0	428	22	527	22	554	22	569	22	584	22	593	22.5	601	23.2	608	24.8	611	26.5	
	30.0	381	32.3	489	32.3	527	32.3	548	32.3	569	32.3	583	32.8	593	33.6	603	35.1	608	36.8	
	40.0					502	42.7	528	42.7	555	42.7	572	43.1	586	43.9	599	45.4	605	47.1	
	50.0					477	53	509	53	541	53	563	53.5	579	54.2	594	55.8	602	57.4	
	60.0							491	63.3	528	63.3	553	63.8	572	64.6	590	66.1	599	67.8	
	70.0							473	73.6	516	73.6	544	74.1	566	74.9	586	76.4	596	78.1	
	80.0									503	84	535	84.5	559	85.2	582	86.7	593	88.4	
	90.0											526	94.8	553	95.6	578	97.1	590	98.8	
	100.0													517	105	547	106	574	107	587

Speed n=1150 r/min
METRIC

Size	Pressure ΔP bar	Viscosity (mm ² /s)																	
		3		6		12		20		40		75		150		380		760	
		Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW
40-38	10.0	19.7	0.50	21.3	0.50	22.5	0.50	23.1	0.50	23.8	0.50	24.2	0.60	24.5	0.60	24.8	0.80	24.9	0.90
	20.0	4.01	1.34	18.2	1	20.2	1	21.4	1	22.5	1	23.3	1	23.9	1.1	24.4	1.2	24.7	1.3
	30.0	2.9	1.88	15.2	1.4	18.2	1.4	19.8	1.4	21.4	1.4	22.4	1.4	23.3	1.5	24	1.6	24.4	1.8
	40.0			12.4	1.8	16.2	1.8	18.2	1.8	20.3	1.8	21.7	1.8	22.7	1.9	23.7	2	24.2	2.2
	50.0					14.3	2.2	16.8	2.2	19.3	2.2	20.9	2.3	22.2	2.3	23.3	2.5	23.9	2.6
	60.0							15.4	2.6	18.3	2.6	20.2	2.7	21.7	2.7	23	2.9	23.7	3
	70.0									17.3	3.1	19.4	3.1	21.2	3.2	22.7	3.3	23.5	3.4
	80.0									16.3	3.5	18.7	3.5	20.7	3.6	22.4	3.7	23.2	3.9
	90.0											18	3.9	20.2	4	22.1	4.1	23	4.3
	100.0											17.4	4.4	19.7	4.4	21.8	4.6	22.8	4.7
40-46	10.0	6.89	0.94	28.4	0.7	29.9	0.7	30.8	0.7	31.6	0.7	32.2	0.7	32.7	0.8	33.1	0.9	33.3	1.1
	20.0	5.28	1.61	24	1.2	26.9	1.2	28.4	1.2	30	1.2	31	1.3	31.8	1.3	32.5	1.5	32.9	1.6
	30.0	3.8	2.41	20.1	1.8	24.1	1.8	26.2	1.8	28.4	1.8	29.9	1.8	31	1.9	32	2	32.5	2.2
	40.0					21.4	2.4	24.2	2.4	27	2.4	28.8	2.4	30.2	2.5	31.5	2.6	32.2	2.7
	50.0							22.2	2.9	25.6	2.9	27.8	3	29.5	3	31.1	3.2	31.9	3.3
	60.0									24.2	3.5	26.8	3.5	28.8	3.6	30.6	3.7	31.5	3.9
	70.0									22.8	4	25.8	4.1	28.1	4.2	30.2	4.3	31.2	4.4
	80.0											24.8	4.7	27.4	4.7	29.8	4.8	30.9	5
	90.0													26.8	5.3	29.4	5.4	30.6	5.6
	100.0													26.1	5.8	28.9	6	30.3	6.1
80-36	10.0	9.79	1.21	39.7	0.9	41.6	0.9	42.6	0.9	43.6	0.9	44.3	1	44.8	1.1	45.3	1.3	45.5	1.5
	20.0	7.87	2.28	34.6	1.7	38	1.7	39.8	1.7	41.7	1.7	42.9	1.8	43.8	1.8	44.7	2	45.1	2.2
	30.0	6.10	3.35	29.9	2.5	34.6	2.5	37.2	2.5	39.8	2.5	41.5	2.5	42.9	2.6	44.1	2.8	44.7	3
	40.0			25.3	3.2	31.4	3.2	34.7	3.2	38.1	3.2	40.2	3.3	42	3.4	43.5	3.6	44.3	3.8
	50.0					28.4	4	32.4	4	36.4	4	39	4.1	41.1	4.1	43	4.3	43.9	4.5
	60.0							30.1	4.8	34.8	4.8	37.8	4.8	40.3	4.9	42.4	5.1	43.5	5.3
	70.0							27.8	5.5	33.2	5.5	36.7	5.6	39.4	5.7	41.9	5.9	43.1	6.1
	80.0									31.6	6.3	35.5	6.4	38.6	6.5	41.4	6.6	42.8	6.8
	90.0											34.4	7.1	37.8	7.2	40.9	7.4	42.4	7.6
	100.0											33.3	7.9	37.1	8	40.4	8.2	42.1	8.4
80-42	10.0	11.51	1.48	47.2	1.1	49.8	1.1	51.2	1.1	52.6	1.1	53.5	1.2	54.2	1.2	54.9	1.4	55.2	1.6
	20.0	8.87	2.68	40.2	2	44.8	2	47.3	2	49.9	2	51.5	2.1	52.8	2.2	54	2.4	54.6	2.6
	30.0	6.44	4.02	33.7	3	40.2	3	43.8	3	47.4	3	49.7	3	51.5	3.1	53.2	3.3	54	3.5
	40.0			27.5	3.9	35.9	3.9	40.4	3.9	45	3.9	47.9	4	50.3	4	52.4	4.2	53.5	4.4
	50.0					31.6	4.8	37.1	4.8	42.7	4.8	46.3	4.9	49.1	5	51.7	5.2	52.9	5.4
	60.0							34	5.8	40.4	5.8	44.6	5.8	48	5.9	50.9	6.1	52.4	6.3
	70.0									38.2	6.7	43	6.7	46.8	6.8	50.2	7	51.9	7.2
	80.0									36.1	7.6	41.5	7.7	45.7	7.8	49.5	8	51.4	8.2
	90.0											39.9	8.6	44.6	8.7	48.9	8.9	51	9.1
	100.0											38.4	9.5	43.6	9.6	48.2	9.8	50.5	10
80-46	10.0	14.12	1.74	57.1	1.3	59.7	1.3	61.1	1.3	62.5	1.3	63.4	1.3	64.1	1.4	64.8	1.6	65.1	1.8
	20.0	11.48	3.22	50.1	2.4	54.7	2.4	57.2	2.4	59.8	2.4	61.4	2.4	62.7	2.5	63.9	2.7	64.5	2.9
	30.0	9.06	4.69	43.6	3.5	50.1	3.5	53.7	3.5	57.2	3.5	59.6	3.5	61.4	3.6	63.1	3.8	63.9	4
	40.0					45.7	4.6	50.3	4.6	54.8	4.6	57.8	4.6	60.2	4.7	62.3	4.9	63.3	5.1
	50.0							47	5.6	52.5	5.6	56.1	5.7	59	5.8	61.5	6	62.8	6.2
	60.0									50.3	6.7	54.5	6.8	57.8	6.9	60.8	7.1	62.3	7.3
	70.0									48.1	7.8	52.9	7.9	56.7	8	60.1	8.2	61.8	8.4
	80.0											51.4	9	55.6	9.1	59.4	9.3	61.3	9.5
	90.0													54.5	10.2	58.7	10.4	60.8	10.6
	100.0													53.5	11.3	58.1	11.5	60.4	11.7
120-42	10.0	16.68	2.15	67.9	1.6	71.2	1.6	73	1.6	74.8	1.6	76	1.7	76.8	1.8	77.7	2.2	78.1	2.5
	20.0	13.31	3.89	58.8	2.9	64.8	2.9	68	2.9	71.3	2.9	73.4	3	75.1	3.2	76.6	3.5	77.3	3.8
	30.0	10.16	5.63	50.4	4.2	58.9	4.2	63.4	4.2	68.1	4.2	71.1	4.3	73.4	4.5	75.6	4.8	76.6	5.1
	40.0			42.4	5.6	53.2	5.6	59.1	5.6	65	5.6	68.8	5.7	71.9	5.8	74.6	6.1	75.9	6.5
	50.0					47.8	6.9	54.9	6.9	62	6.9	66.6	7	70.3	7.1	73.6	7.4	75.3	7.8
	60.0							50.8	8.2	59.1	8.2	64.5	8.3	68.8	8.4	72.7	8.8	74.6	9.1
	70.0									56.3	9.5	62.5	9.6	67.4	9.8	71.8	10.1	74	10.4
	80.0									53.5	10.8	60.5	10.9	66	11.1	70.9	11.4	73.3	11.7
	90.0													58.5	12.3	64.6	12.4	70	12.7
	100.0													56.6	13.6	63.2	13.7	69.1	14.4

Speed n=1150 r/min

METRIC

Size	Pressure ΔP bar	Viscosity (mm ² /s)																		
		3		6		12		20		40		75		150		380		760		
		Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	
120-46	10.0	20.54	2.41	82.4	1.8	85.7	1.8	87.5	1.8	89.3	1.8	90.5	1.9	91.4	2.1	92.3	2.4	92.7	2.7	
	20.0	17.16	4.56	73.4	3.4	79.3	3.4	82.5	3.4	85.8	3.4	87.9	3.5	89.6	3.7	91.1	4	91.9	4.3	
	30.0	14.02	6.71	65	5	73.4	5	77.9	5	82.5	5	85.6	5.1	87.9	5.2	90.1	5.5	91.1	5.9	
	40.0					67.8	6.5	73.7	6.5	79.5	6.5	83.3	6.6	86.3	6.8	89.1	7.1	90.4	7.4	
	50.0							69.5	8.1	76.6	8.1	81.1	8.2	84.8	8.3	88.1	8.7	89.7	9	
	60.0									73.7	9.7	79	9.8	83.3	9.9	87.2	10.2	89.1	10.6	
	70.0									70.9	11.2	77	11.3	81.9	11.5	86.3	11.8	88.4	12.1	
	80.0												75.1	12.9	80.4	13	85.4	13.3	87.8	13.7
	90.0														79	14.6	84.5	14.9	87.2	15.3
	100.0														77.7	16.2	83.6	16.5	86.6	16.8
210-40	10.0	30.54	3.62	121	2.7	125	2.7	127	2.7	129	2.7	130	2.8	131	3.1	132	3.5	133	4.1	
	20.0	26.72	6.57	111	4.9	117	4.9	121	4.9	125	4.9	127	5	129	5.3	131	5.8	132	6.3	
	30.0	23.15	9.52	101	7.1	111	7.1	116	7.1	121	7.1	125	7.3	127	7.5	130	8	131	8.5	
	40.0			92.1	9.3	104	9.3	111	9.3	118	9.3	122	9.5	125	9.7	129	10.2	130	10.8	
	50.0					98.1	11.6	106	11.6	114	11.6	120	11.7	124	12	128	12.5	129	13	
	60.0							102	13.8	111	13.8	117	14	122	14.2	126	14.7	129	15.2	
	70.0							97	16	108	16	115	16.2	120	16.4	125	16.9	128	17.5	
	80.0									105	18.3	113	18.4	119	18.7	124	19.2	127	19.7	
	90.0											110	20.7	117	20.9	123	21.4	126	21.9	
	100.0												108	22.9	116	23.1	122	23.6	126	24.2
210-46	10.0	37.83	4.29	151	3.2	156	3.2	158	3.2	161	3.2	163	3.4	164	3.6	166	4.1	166	4.6	
	20.0	32.58	8.05	136	6	146	6	151	6	156	6	159	6.2	162	6.4	164	6.9	165	7.4	
	30.0	27.72	11.80	123	8.8	137	8.8	144	8.8	151	8.8	155	9	159	9.2	162	9.7	164	10.2	
	40.0					128	11.6	137	11.6	146	11.6	152	11.8	157	12	161	12.5	163	13.1	
	50.0							130	14.4	141	14.4	149	14.6	154	14.8	159	15.3	162	15.9	
	60.0									137	17.2	145	17.4	152	17.6	158	18.1	161	18.7	
	70.0									133	20	142	20.2	150	20.4	156	20.9	160	21.5	
	80.0											139	23	148	23.2	155	23.7	159	24.3	
	90.0													145	26	154	26.5	158	27.1	
	100.0														143	28.8	152	29.3	157	29.9
280-43	10.0	43.93	5.23	175	3.9	181	3.9	185	3.9	188	3.9	190	4.2	192	4.5	194	5.3	194	6.1	
	20.0	37.57	9.66	158	7.2	169	7.2	175	7.2	181	7.2	185	7.4	189	7.8	191	8.5	193	9.3	
	30.0	31.71	14.08	142	10.5	158	10.5	167	10.5	175	10.5	181	10.7	185	11.1	189	11.8	191	12.6	
	40.0			127	13.7	148	13.7	158	13.7	170	13.7	177	14	182	14.3	188	15.1	190	15.9	
	50.0					137	17	151	17	164	17	173	17.2	180	17.6	186	18.3	189	19.2	
	60.0							143	20.3	159	20.3	169	20.5	177	20.9	184	21.6	188	22.4	
	70.0									153	23.6	165	23.8	174	24.2	182	24.9	186	25.7	
	80.0											161	27.1	171	27.4	181	28.2	185	29	
	90.0											157	30.3	169	30.7	179	31.4	184	32.3	
	100.0													166	34	177	34.7	183	35.5	
280-46	10.0	50.77	5.77	201	4.3	207	4.3	211	4.3	214	4.3	216	4.6	218	4.9	220	5.7	220	6.5	
	20.0	44.43	10.86	184	8.1	195	8.1	201	8.1	207	8.1	211	8.3	215	8.7	217	9.4	219	10.2	
	30.0	38.54	15.82	168	11.8	184	11.8	193	11.8	201	11.8	207	12	211	12.4	215	13.1	217	13.9	
	40.0					173	15.5	184	15.5	195	15.5	203	15.7	208	16.1	214	16.8	216	17.6	
	50.0							177	19.2	190	19.2	199	19.4	206	19.8	212	20.5	215	21.3	
	60.0									185	22.9	195	23.1	203	23.5	210	24.2	214	25	
	70.0									179	26.6	191	26.8	200	27.2	208	27.9	212	28.7	
	80.0											187	30.5	197	30.9	207	31.6	211	32.4	
	90.0													195	34.6	205	35.3	210	36.1	
	100.0														192	38.3	203	39	209	39.9
440-40	10.0	65.13	7.51	256	5.6	262	5.6	265	5.6	269	5.6	271	5.9	273	6.5	275	7.5	275	8.7	
	20.0	58.61	13.68	238	10.2	250	10.2	256	10.2	262	10.2	266	10.5	269	11.1	272	12.2	274	13.4	
	30.0	52.59	19.85	222	14.8	238	14.8	247	14.8	256	14.8	262	15.2	266	15.7	270	16.8	272	18	
	40.0			207	19.4	227	19.4	239	19.4	250	19.4	257	19.8	263	20.3	268	21.4	271	22.6	
	50.0					217	24.1	231	24.1	244	24.1	253	24.4	260	24.9	267	26	270	27.2	
	60.0							223	28.7	239	28.7	249	29	257	29.6	265	30.6	268	31.9	
	70.0							215	33.3	233	33.3	245	33.7	255	34.2	263	35.3	267	36.5	
	80.0									228	37.9	241	38.3	252	38.8	261	39.9	266	41.1	
	90.0												237	42.9	249	43.4	260	44.5	265	45.7
	100.0												234	47.5	246	48.1	258	49.1	264	50.3

U.S. STANDARD

Speed n=1150 r/min

Size	Pressure PSI	Viscosity (mm ² /s)																		
		3		6		12		20		40		75		150		380		760		
		Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	
440-46	145	82.13	9.12	85.38	9.12	87.67	9.12	88.92	9.12	90.18	9.12	91.00	9.66	91.63	10.33	92.22	11.80	92.51	13.41	
	290	73.21	17.03	79.07	17.03	83.21	17.03	85.46	17.03	87.73	17.03	89.21	17.57	90.37	18.24	91.42	19.71	91.95	21.32	
	435	65.00	24.94	73.26	24.94	79.09	24.94	82.29	24.94	85.48	24.94	87.57	25.34	89.21	26.15	90.71	27.62	91.42	29.23	
	580					75.19	32.85	79.25	32.85	83.34	32.85	86.01	33.26	88.12	34.06	90.00	35.40	90.95	37.01	
	725							76.35	40.77	81.29	40.77	84.51	41.17	87.04	41.84	89.34	43.31	90.47	44.92	
	870									79.28	48.54	83.03	49.08	86.01	49.75	88.68	51.23	90.02	52.84	
	1015									77.33	56.46	81.60	56.99	85.01	57.66	88.04	59.14	89.58	60.75	
	1160												80.23	64.90	84.03	65.57	87.44	67.05	89.13	68.66
	1305														83.05	73.49	86.83	74.96	88.70	76.57
	1450														82.10	81.40	86.22	82.87	88.28	84.48
660-40	145	102.22	11.40	105.39	11.40	107.63	11.40	108.85	11.40	110.09	11.40	110.88	12.07	111.51	13.14	112.07	15.15	112.36	17.57	
	290	93.51	20.92	99.24	20.92	103.28	20.92	105.47	20.92	107.69	20.92	109.14	21.59	110.27	22.66	111.30	24.81	111.80	27.09	
	435	85.48	30.57	93.56	30.57	99.26	30.57	102.38	30.57	105.49	30.57	107.53	31.25	109.14	32.18	110.59	34.33	111.30	36.61	
	580			88.15	40.10	95.44	40.10	99.42	40.10	103.41	40.10	106.00	40.77	108.06	41.84	109.90	43.85	110.83	46.26	
	725					91.77	49.62	96.57	49.62	101.40	49.62	104.54	50.29	107.03	51.36	109.27	53.51	110.38	55.79	
	870							93.80	59.27	99.45	59.27	103.12	59.94	106.02	61.02	108.64	63.03	109.93	65.31	
	1015											97.52	68.79	101.72	69.46	105.05	70.54	108.00	72.55	
	1160													100.35	79.12	104.07	80.06	107.40	82.20	
	1305													99.03	88.64	103.12	89.71	106.81	91.72	
	1450														102.19	99.23	106.23	101.38	108.21	103.66
660-46	145	124.29	13.54	128.65	13.54	131.71	13.54	133.40	13.54	135.06	13.54	136.17	14.21	137.04	15.29	137.81	17.43	138.20	19.71	
	290	112.41	25.34	120.23	25.34	125.77	25.34	128.78	25.34	131.82	25.34	133.80	26.02	135.35	27.09	136.75	29.23	137.44	31.51	
	435	101.40	37.15	112.46	37.15	120.28	37.15	124.53	37.15	128.81	37.15	131.58	37.82	133.80	38.89	135.78	40.90	136.75	43.31	
	580					115.05	48.95	120.46	48.95	125.93	48.95	129.49	49.62	132.32	50.69	134.85	52.70	136.09	55.12	
	725							116.58	60.75	123.18	60.75	127.49	61.42	130.89	62.36	133.95	64.50	135.48	66.78	
	870									120.52	72.55	125.53	73.22	129.52	74.16	133.08	76.30	134.85	78.58	
	1015													123.63	84.89	128.17	85.96	132.24	88.10	
	1160													121.76	96.69	126.85	97.76	131.42	99.90	
	1305														125.56	109.56	130.60	111.57	133.11	
	1450														124.29	121.36	129.81	123.37	132.53	125.79
940-42	145	145.91	16.63	151.54	16.63	155.50	16.63	157.66	16.63	159.83	16.63	161.25	17.57	162.36	19.04	163.39	21.99	163.86	25.34	
	290	130.55	30.57	140.66	30.57	147.81	30.57	151.72	30.57	155.63	30.57	158.19	31.51	160.20	32.99	162.02	35.94	162.91	39.29	
	435	116.34	44.52	130.63	44.52	140.71	44.52	146.20	44.52	151.75	44.52	155.34	45.46	158.19	46.94	160.75	50.02	162.02	53.37	
	580			121.07	58.47	133.95	58.47	140.98	58.47	148.02	58.47	152.64	59.54	156.29	61.02	159.56	63.97	161.17	67.32	
	725					127.46	72.55	135.93	72.55	144.49	72.55	150.03	73.49	154.44	74.96	158.40	77.91	160.35	81.26	
	870							131.05	86.49	141.03	86.49	147.52	87.43	152.64	88.91	157.26	91.86	159.56	95.21	
	1015							126.30	100.44	137.65	100.44	145.04	101.38	150.93	102.85	156.18	105.94	158.80	109.16	
	1160									134.35	114.39	142.64	115.33	149.21	116.80	155.13	119.89	158.03	123.24	
	1305									131.13	128.33	140.29	129.41	147.55	130.88	154.07	133.83	157.29	137.18	
	1450											137.97	143.35	145.91	144.83	153.04	147.78	156.55	151.13	
940-46	145	178.94	19.44	184.56	19.44	188.52	19.44	190.69	19.44	192.85	19.44	194.28	20.38	195.39	21.86	196.39	24.81	196.89	28.16	
	290	163.57	36.21	173.69	36.21	180.84	36.21	184.72	36.21	188.65	36.21	191.19	37.15	193.22	38.62	195.02	41.57	195.94	44.92	
	435	149.37	52.97	163.63	52.97	173.74	52.97	179.23	52.97	184.75	52.97	188.34	53.91	191.22	55.38	193.78	58.33	195.04	61.69	
	580					166.98	69.73	174.00	69.73	181.05	69.73	185.64	70.67	189.29	72.15	192.56	75.10	194.20	78.45	
	725					160.49	86.49	168.96	86.49	177.49	86.49	183.06	87.43	187.47	88.91	191.40	91.86	193.38	95.21	
	870							164.08	103.26	174.03	103.26	180.52	104.20	185.67	105.67	190.29	108.62	192.59	111.97	
	1015							159.32	120.02	170.68	120.02	178.07	120.96	183.93	122.43	189.21	125.38	191.80	128.74	
	1160									167.38	136.78	175.67	137.72	182.24	139.20	188.13	142.28	191.06	145.50	
	1305											173.29	154.48	180.55	155.96	187.07	159.04	190.32	162.26	
	1450												170.97	171.25	178.91	172.72	186.04	175.81	189.58	179.16

Speed n=1150 r/min

METRIC

Size	Pressure ΔP bar	Viscosity (mm ² /s)																	
		3		6		12		20		40		75		150		380		760	
		Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW
440-46	10.0	82.13	9.12	323	6.8	332	6.8	337	6.8	341	6.8	344	7.2	347	7.7	349	8.8	350	10
	20.0	73.21	17.03	299	12.7	315	12.7	323	12.7	332	12.7	338	13.1	342	13.6	346	14.7	348	15.9
	30.0	65.00	24.94	277	18.6	299	18.6	311	18.6	324	18.6	331	18.9	338	19.5	343	20.6	346	21.8
	40.0					285	24.5	300	24.5	315	24.5	326	24.8	334	25.4	341	26.4	344	27.6
	50.0							289	30.4	308	30.4	320	30.7	329	31.2	338	32.3	342	33.5
	60.0									300	36.2	314	36.6	326	37.1	336	38.2	341	39.4
	70.0									293	42.1	309	42.5	322	43	333	44.1	339	45.3
	80.0											304	48.4	318	48.9	331	50	337	51.2
	90.0													314	54.8	329	55.9	336	57.1
	100.0													311	60.7	326	61.8	334	63
660-40	10.0	102.22	11.40	399	8.5	407	8.5	412	8.5	417	8.5	420	9	422	9.8	424	11.3	425	13.1
	20.0	93.51	20.92	376	15.6	391	15.6	399	15.6	408	15.6	413	16.1	417	16.9	421	18.5	423	20.2
	30.0	85.48	30.57	354	22.8	376	22.8	388	22.8	399	22.8	407	23.3	413	24	419	25.6	421	27.3
	40.0			334	29.9	361	29.9	376	29.9	391	29.9	401	30.4	409	31.2	416	32.7	420	34.5
	50.0					347	37	366	37	384	37	396	37.5	405	38.3	414	39.9	418	41.6
	60.0							355	44.2	376	44.2	390	44.7	401	45.5	411	47	416	48.7
	70.0									369	51.3	385	51.8	398	52.6	409	54.1	414	55.9
	80.0											380	59	394	59.7	407	61.3	413	63
	90.0											375	66.1	390	66.9	404	68.4	411	70.2
	100.0													387	74	402	75.6	410	77.3
660-46	10.0	124.29	13.54	487	10.1	499	10.1	505	10.1	511	10.1	515	10.6	519	11.4	522	13	523	14.7
	20.0	112.41	25.34	455	18.9	476	18.9	487	18.9	499	18.9	506	19.4	512	20.2	518	21.8	520	23.5
	30.0	101.40	37.15	426	27.7	455	27.7	471	27.7	488	27.7	498	28.2	506	29	514	30.5	518	32.3
	40.0					436	36.5	456	36.5	477	36.5	490	37	501	37.8	510	39.3	515	41.1
	50.0							441	45.3	466	45.3	483	45.8	495	46.5	507	48.1	513	49.8
	60.0									456	54.1	475	54.6	490	55.3	504	56.9	510	58.6
	70.0											468	63.3	485	64.1	501	65.7	508	67.4
	80.0											461	72.1	480	72.9	497	74.5	506	76.2
	90.0													475	81.7	494	83.2	504	85
	100.0													470	90.5	491	92	502	93.8
940-42	10.0	145.91	16.63	574	12.4	589	12.4	597	12.4	605	12.4	610	13.1	615	14.2	618	16.4	620	18.9
	20.0	130.55	30.57	532	22.8	560	22.8	574	22.8	589	22.8	599	23.5	606	24.6	613	26.8	617	29.3
	30.0	116.34	44.52	494	33.2	533	33.2	553	33.2	574	33.2	588	33.9	599	35	609	37.3	613	39.8
	40.0			458	43.6	507	43.6	534	43.6	560	43.6	578	44.4	592	45.5	604	47.7	610	50.2
	50.0					482	54.1	515	54.1	547	54.1	568	54.8	585	55.9	600	58.1	607	60.6
	60.0							496	64.5	534	64.5	558	65.2	578	66.3	595	68.5	604	71
	70.0							478	74.9	521	74.9	549	75.6	571	76.7	591	79	601	81.4
	80.0									509	85.3	540	86	565	87.1	587	89.4	598	91.9
	90.0									496	95.7	531	96.5	559	97.6	583	99.8	595	102
	100.0													522	107	552	108	579	110
940-46	10.0	178.94	19.44	699	14.5	714	14.5	722	14.5	730	14.5	735	15.2	740	16.3	743	18.5	745	21
	20.0	163.57	36.21	657	27	685	27	699	27	714	27	724	27.7	731	28.8	738	31	742	33.5
	30.0	149.37	52.97	619	39.5	658	39.5	678	39.5	699	39.5	713	40.2	724	41.3	734	43.5	738	46
	40.0					632	52	659	52	685	52	703	52.7	717	53.8	729	56	735	58.5
	50.0					608	64.5	640	64.5	672	64.5	693	65.2	710	66.3	725	68.5	732	71
	60.0							621	77	659	77	683	77.7	703	78.8	720	81	729	83.5
	70.0							603	89.5	646	89.5	674	90.2	696	91.3	716	93.5	726	96
	80.0									634	102	665	103	690	104	712	106	723	108
	90.0											656	115	683	116	708	119	720	121
	100.0											647	128	677	129	704	131	718	134

Speed n=1450 r/min

METRIC

Size	Pressure ΔP bar	Viscosity (mm ² /s)																	
		3		6		12		20		40		75		150		380		760	
		Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW
440-46	10.0	403	8.9	415	8.9	424	8.9	429	8.9	433	8.9	437	9.5	439	10.3	441	12	442	14
	20.0	369	16.3	391	16.3	407	16.3	416	16.3	424	16.3	430	16.9	434	17.7	438	19.5	440	21.4
	30.0	338	23.8	369	23.8	391	23.8	404	23.8	416	23.8	424	24.3	430	25.2	435	26.9	438	28.8
	40.0					377	31.2	392	31.2	408	31.2	418	31.7	426	32.6	433	34.3	436	36.2
	50.0					362	38.6	381	38.6	400	38.6	412	39.2	422	40	430	41.7	435	43.6
	60.0							370	46	392	46	406	46.6	418	47.4	428	49.1	433	51.1
	70.0							360	53.4	385	53.4	401	54	414	54.8	425	56.6	431	58.5
	80.0									378	60.9	396	61.4	410	62.3	423	64	429	65.9
	90.0											391	68.8	406	69.7	421	71.4	428	73.3
	100.0											385	76.2	403	77.1	418	78.8	426	80.7
660-40	10.0	499	11.2	511	11.2	519	11.2	524	11.2	528	11.2	531	12	534	13.2	536	15.7	537	18.4
	20.0	466	20.2	487	20.2	503	20.2	511	20.2	519	20.2	525	21	529	22.2	533	24.7	535	27.4
	30.0	435	29.2	466	29.2	487	29.2	499	29.2	511	29.2	519	30	525	31.2	530	33.7	533	36.4
	40.0					473	38.2	488	38.2	503	38.2	513	39	521	40.2	528	42.7	531	45.4
	50.0					459	47.2	477	47.2	495	47.2	507	47.9	517	49.2	525	51.6	529	54.4
	60.0							467	56.1	488	56.1	502	56.9	513	58.2	523	60.6	528	63.4
	70.0									481	65.1	497	65.9	509	67.2	520	69.6	526	72.4
	80.0									474	74.1	491	74.9	506	76.2	518	78.6	524	81.4
	90.0											486	83.9	502	85.2	516	87.6	523	90.4
	100.0													498	94.2	514	96.6	521	99.4
660-46	10.0	608	13.2	624	13.2	636	13.2	642	13.2	649	13.2	653	14	656	15.3	659	17.7	661	20.5
	20.0	563	24.3	593	24.3	614	24.3	625	24.3	636	24.3	644	25.1	650	26.3	655	28.8	658	31.6
	30.0	521	35.4	563	35.4	593	35.4	609	35.4	625	35.4	635	36.2	644	37.4	651	39.9	655	42.6
	40.0					573	46.5	593	46.5	614	46.5	628	47.3	638	48.5	648	51	653	53.7
	50.0					554	57.5	579	57.5	604	57.5	620	58.3	633	59.6	644	62	650	64.8
	60.0							564	68.6	594	68.6	613	69.4	628	70.6	641	73.1	648	75.9
	70.0									584	79.7	605	80.5	623	81.7	638	84.2	646	86.9
	80.0											598	91.6	618	92.8	635	95.3	643	98
	90.0											591	103	613	104	632	106	641	109
	100.0													608	115	629	117	639	120
940-42	10.0	715	16.2	737	16.2	752	16.2	760	16.2	768	16.2	773	17.4	778	19.1	781	22.7	783	26.6
	20.0	657	29.4	696	29.4	723	29.4	737	29.4	752	29.4	762	30.5	769	32.3	776	35.8	780	39.8
	30.0	603	42.5	657	42.5	696	42.5	716	42.5	737	42.5	751	43.7	762	45.4	771	49	776	52.9
	40.0					670	55.7	697	55.7	723	55.7	741	56.8	755	58.6	767	62.1	773	66.1
	50.0					645	68.8	678	68.8	710	68.8	731	69.9	748	71.7	763	75.2	770	79.2
	60.0					622	81.9	659	81.9	697	81.9	721	83.1	741	84.8	758	88.4	767	92.3
	70.0					598	95.1	641	95.1	684	95.1	712	96.2	734	98	754	101	764	105
	80.0							623	108	672	108	703	109	728	111	750	115	761	119
	90.0									659	121	694	122	722	124	746	128	758	132
	100.0											685	136	715	137	742	141	756	145
940-46	10.0	873	18.9	894	18.9	909	18.9	917	18.9	926	18.9	931	20	935	21.8	939	25.3	941	29.3
	20.0	815	34.6	853	34.6	880	34.6	895	34.6	910	34.6	919	35.8	927	37.5	934	41.1	937	45
	30.0	761	50.4	815	50.4	853	50.4	874	50.4	895	50.4	909	51.5	919	53.3	929	56.8	934	60.8
	40.0					828	66.2	854	66.2	881	66.2	898	67.3	912	69.1	925	72.6	931	76.6
	50.0					803	81.9	835	81.9	868	81.9	889	83.1	905	84.8	920	88.4	928	92.3
	60.0							817	97.7	854	97.7	879	98.9	899	101	916	104	925	108
	70.0									842	113	870	115	892	116	912	120	922	124
	80.0											861	130	885	132	908	136	919	140
	90.0											852	146	879	148	904	151	916	155
	100.0													873	164	900	167	913	171

Speed n=1750 r/min

METRIC

Size	Pressure ΔP bar	Viscosity (mm ² /s)																	
		3		6		12		20		40		75		150		380		760	
		Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW
440-46	10.0	495	11.1	507	11.1	516	11.1	521	11.1	525	11.1	529	11.9	531	13.2	533	15.7	534	18.5
	20.0	461	20.1	483	20.1	499	20.1	508	20.1	516	20.1	522	20.9	526	22.1	530	24.6	532	27.4
	30.0	430	29	461	29	483	29	496	29	508	29	516	29.9	522	31.1	527	33.6	530	36.4
	40.0					469	38	484	38	500	38	510	38.8	518	40	525	42.6	528	45.3
	50.0					455	47	473	47	492	47	504	47.8	514	49	522	51.5	527	54.3
	60.0							462	55.9	484	55.9	498	56.7	510	58	520	60.5	525	63.2
	70.0							452	64.9	477	64.9	493	65.7	506	66.9	517	69.4	523	72.2
	80.0									470	73.8	488	74.6	502	75.9	515	78.4	521	81.2
	90.0											483	83.6	498	84.8	513	87.3	520	90.1
	100.0											477	92.5	495	93.8	510	96.3	518	99.1
660-40	10.0	610	14	622	14	631	14	635	14	640	14	643	15.2	645	17	648	20.6	649	24.6
	20.0	577	24.9	599	24.9	614	24.9	623	24.9	631	24.9	636	26	641	27.8	645	31.4	647	35.4
	30.0	547	35.7	577	35.7	599	35.7	611	35.7	623	35.7	630	36.9	636	38.7	642	42.3	645	46.3
	40.0					585	46.6	600	46.6	615	46.6	624	47.7	632	49.5	639	53.1	643	57.2
	50.0					571	57.4	589	57.4	607	57.4	619	58.6	628	60.4	637	64	641	68
	60.0							578	68.3	600	68.3	614	69.5	625	71.3	634	74.9	639	78.9
	70.0									592	79.2	608	80.3	621	82.1	632	85.7	638	89.7
	80.0									585	90	603	91.2	617	93	630	96.6	636	101
	90.0											598	102	614	104	628	107	634	111
	100.0													610	115	625	118	633	122
660-46	10.0	745	16.5	762	16.5	773	16.5	780	16.5	786	16.5	790	17.7	793	19.5	796	23.1	798	27.1
	20.0	700	29.9	730	29.9	751	29.9	762	29.9	774	29.9	781	31	787	32.8	792	36.4	795	40.4
	30.0	659	43.2	700	43.2	730	43.2	746	43.2	762	43.2	773	44.4	781	46.2	789	49.8	792	53.8
	40.0					710	56.6	731	56.6	752	56.6	765	57.8	776	59.6	785	63.2	790	67.2
	50.0					691	70	716	70	741	70	757	71.1	770	72.9	782	76.5	788	80.5
	60.0							702	83.3	731	83.3	750	84.5	765	86.3	779	89.9	785	93.9
	70.0									721	96.7	743	97.9	760	99.7	775	103	783	107
	80.0											736	111	755	113	772	117	781	121
	90.0											729	125	750	126	769	130	779	134
	100.0													745	140	766	143	776	147
940-42	10.0	878	20.4	900	20.4	915	20.4	923	20.4	931	20.4	936	22	941	24.6	944	29.8	946	35.5
	20.0	820	36.2	859	36.2	886	36.2	900	36.2	915	36.2	925	37.9	932	40.5	939	45.6	943	51.4
	30.0	766	52.1	820	52.1	859	52.1	880	52.1	900	52.1	914	53.8	925	56.3	935	61.5	939	67.2
	40.0					833	67.9	860	67.9	886	67.9	904	69.6	918	72.2	930	77.3	936	83.1
	50.0					809	83.8	841	83.8	873	83.8	894	85.5	911	88	926	93.2	933	99
	60.0					785	99.7	822	99.7	860	99.7	884	101	904	104	921	109	930	115
	70.0					761	115	804	115	847	115	875	117	897	120	917	125	927	131
	80.0							786	131	835	131	866	133	891	136	913	141	924	146
	90.0									822	147	857	149	885	151	909	157	921	162
	100.0											848	165	878	167	905	172	919	178
940-46	10.0	1069	23.5	1090	23.5	1105	23.5	1113	23.5	1121	23.5	1127	25.2	1131	27.8	1135	32.9	1137	38.7
	20.0	1010	42.6	1049	42.6	1076	42.6	1090	42.6	1105	42.6	1115	44.2	1123	46.8	1129	52	1133	57.7
	30.0	957	61.6	1011	61.6	1049	61.6	1070	61.6	1091	61.6	1104	63.3	1115	65.8	1125	71	1130	76.8
	40.0					1023	80.6	1050	80.6	1077	80.6	1094	82.3	1108	84.9	1120	90	1126	95.8
	50.0					999	99.7	1031	99.7	1063	99.7	1084	101	1101	104	1116	109	1123	115
	60.0							1012	119	1050	119	1075	120	1094	123	1112	128	1120	134
	70.0									1037	138	1065	139	1087	142	1107	147	1117	153
	80.0											1056	158	1081	161	1103	166	1114	172
	90.0											1047	177	1075	180	1099	185	1112	191
	100.0													1069	199	1095	204	1109	210

U.S. STANDARD

Speed n=2900 r/min

Size	Pressure PSI	Viscosity (mm ² /s)																	
		3		6		12		20		40		75		150		380		760	
		Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP	Flow GPM	Power HP
440-46	145	223.95	27.89	227.20	27.89	229.50	27.89	230.74	27.89	232.00	27.89	232.82	30.98	233.48	35.54	234.06	44.66	234.35	54.98
	290	215.05	47.87	220.92	47.87	225.06	47.87	227.30	47.87	229.57	47.87	231.05	50.82	232.21	55.38	233.27	64.64	233.80	74.83
	435	206.84	67.72	215.11	67.72	220.94	67.72	224.11	67.72	227.30	67.72	229.39	70.67	231.05	75.23	232.53	84.48	233.27	94.81
	580	199.03	87.70	209.56	87.70	217.03	87.70	221.10	87.70	225.17	87.70	227.83	90.65	229.94	95.21	231.84	104.33	232.77	114.66
	725			204.26	107.55	213.26	107.55	218.17	107.55	223.11	107.55	226.33	110.50	228.89	115.06	231.18	124.31	232.29	134.50
	870					209.62	127.40	215.34	127.40	221.13	127.40	224.88	130.35	227.86	135.04	230.52	144.16	231.84	154.48
	1015					206.05	147.38	212.60	147.38	219.17	147.38	223.45	150.33	226.86	154.89	229.89	164.14	231.40	174.33
	1160							209.88	167.22	217.27	167.22	222.05	170.17	225.85	174.73	229.28	183.99	230.97	194.31
	1305							207.24	187.07	215.40	187.07	220.68	190.15	224.90	194.71	228.68	203.83	230.52	214.16
	1450									213.55	207.05	219.33	210.00	223.95	214.56	228.07	223.81	230.10	234.00
660-40	145	274.24	35.67	277.41	35.67	279.66	35.67	280.87	35.67	282.11	35.67	282.90	39.96	283.54	46.53	284.09	59.81	284.38	74.69
	290	265.53	59.81	271.26	59.81	275.30	59.81	277.49	59.81	279.71	59.81	281.16	64.10	282.30	70.67	283.32	83.95	283.83	98.83
	435	257.51	83.95	265.58	83.95	271.29	83.95	274.40	83.95	277.52	83.95	279.55	88.24	281.16	94.81	282.61	108.08	283.32	122.97
	580	249.88	108.08	260.17	108.08	267.46	108.08	271.44	108.08	275.43	108.08	278.02	112.38	280.08	118.95	281.93	132.22	282.85	146.97
	725	242.51	132.22	254.97	132.22	263.79	132.22	268.59	132.22	273.42	132.22	276.57	136.51	279.05	143.08	281.29	156.36	282.40	171.11
	870			249.93	156.36	260.22	156.36	265.82	156.36	271.47	156.36	275.14	160.65	278.04	167.22	280.66	180.50	281.95	195.25
	1015					256.74	180.50	263.13	180.50	269.54	180.50	273.74	184.79	277.07	191.36	280.02	204.64	281.50	219.39
	1160					253.33	204.64	260.49	204.64	267.70	204.64	272.37	208.93	276.09	215.50	279.42	228.77	281.08	243.53
	1305							257.90	228.77	265.85	228.77	271.05	233.07	275.14	239.64	278.84	252.91	280.66	267.66
	1450									264.05	252.91	269.73	257.20	274.22	263.77	278.26	277.05	280.24	291.80
660-46	145	336.02	41.30	340.38	41.30	343.44	41.30	345.10	41.30	346.79	41.30	347.87	45.59	348.74	52.16	349.54	65.44	349.93	80.19
	290	324.14	70.94	331.95	70.94	337.50	70.94	340.51	70.94	343.54	70.94	345.50	75.23	347.08	81.80	348.48	95.08	349.17	109.96
	435	313.13	100.71	324.17	100.71	331.98	100.71	336.23	100.71	340.51	100.71	343.31	105.00	345.52	111.57	347.50	124.85	348.48	139.60
	580	302.68	130.35	316.80	130.35	326.75	130.35	332.19	130.35	337.66	130.35	341.22	134.64	344.04	141.21	346.58	154.48	347.82	169.37
	725			309.67	160.12	321.74	160.12	328.31	160.12	334.91	160.12	339.21	164.41	342.62	170.98	345.68	184.25	347.19	199.00
	870					316.85	189.75	324.51	189.75	332.22	189.75	337.26	194.04	341.25	200.61	344.81	213.89	346.58	228.77
	1015					312.10	219.52	320.84	219.52	329.63	219.52	335.36	223.81	339.90	230.38	343.97	243.66	345.97	258.41
	1160							317.22	249.16	327.07	249.16	333.48	253.45	338.58	260.02	343.15	273.30	345.39	288.18
	1305							313.68	278.93	324.56	278.93	331.66	283.22	337.29	289.79	342.33	303.07	344.81	317.82
	1450									322.11	308.56	329.87	312.86	336.02	319.43	341.54	332.70	344.26	347.59
940-42	145	397.14	51.90	402.76	51.90	406.72	51.90	408.88	51.90	411.05	51.90	412.47	57.93	413.58	67.45	414.59	86.49	415.09	107.68
	290	381.77	87.03	391.88	87.03	399.04	87.03	402.92	87.03	406.82	87.03	409.38	93.20	411.42	102.59	413.21	121.63	414.11	142.82
	435	367.57	122.30	381.82	122.30	391.93	122.30	397.43	122.30	402.94	122.30	406.53	128.47	409.41	137.85	411.97	156.90	413.24	178.08
	580	354.05	157.57	372.29	157.57	385.18	157.57	392.20	157.57	399.25	157.57	403.84	163.74	407.48	173.12	410.76	192.17	412.39	213.35
	725	341.06	192.84	363.11	192.84	378.68	192.84	387.16	192.84	395.68	192.84	401.25	199.00	405.66	208.39	409.60	227.43	411.58	248.62
	870			354.18	228.10	372.37	228.10	382.27	228.10	392.22	228.10	398.72	234.14	403.87	243.66	408.49	262.70	410.78	283.89
	1015					366.22	263.37	377.49	263.37	388.87	263.37	396.26	269.41	402.12	278.79	407.40	297.84	409.99	319.02
	1160					360.20	298.51	372.85	298.51	385.57	298.51	393.86	304.68	400.44	314.06	406.32	333.10	409.25	354.29
	1305							368.28	333.77	382.32	333.77	391.49	339.94	398.75	349.33	405.27	368.37	408.51	389.56
	1450							363.77	369.04	379.16	369.04	379.16	389.16	375.21	397.11	384.60	404.24	403.64	407.77

Speed n=2900 r/min

METRIC

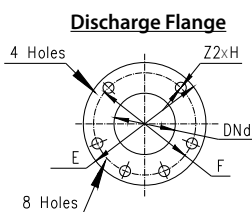
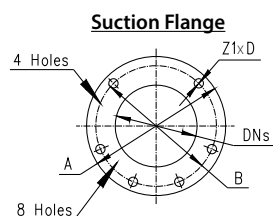
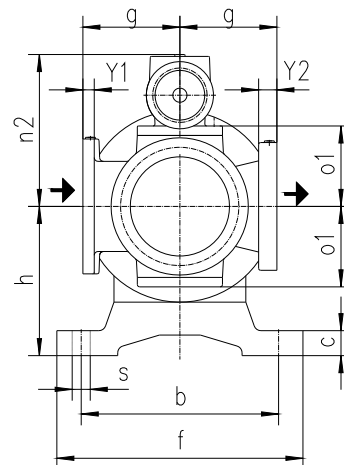
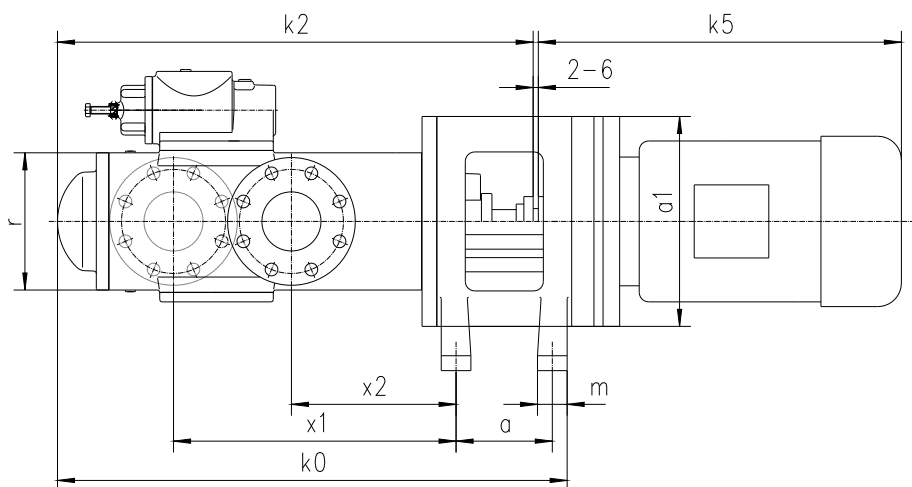
Size	Pressure ΔP bar	Viscosity (mm ² /s)																	
		3		6		12		20		40		75		150		380		760	
		Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW
440-46	10.0	848	20.8	860	20.8	869	20.8	873	20.8	878	20.8	881	23.1	884	26.5	886	33.3	887	41
	20.0	814	35.7	836	35.7	852	35.7	860	35.7	869	35.7	875	37.9	879	41.3	883	48.2	885	55.8
	30.0	783	50.5	814	50.5	836	50.5	848	50.5	860	50.5	868	52.7	875	56.1	880	63	883	70.7
	40.0	753	65.4	793	65.4	822	65.4	837	65.4	852	65.4	862	67.6	870	71	878	77.8	881	85.5
	50.0			773	80.2	807	80.2	826	80.2	845	80.2	857	82.4	866	85.8	875	92.7	879	100
	60.0					793	95	815	95	837	95	851	97.2	863	101	873	107	878	115
	70.0					780	110	805	110	830	110	846	112	859	115	870	122	876	130
	80.0							794	125	822	125	841	127	855	130	868	137	874	145
	90.0							784	139	815	139	835	142	851	145	866	152	873	160
	100.0									808	154	830	157	848	160	863	167	871	174
660-40	10.0	1038	26.6	1050	26.6	1059	26.6	1063	26.6	1068	26.6	1071	29.8	1073	34.7	1075	44.6	1076	55.7
	20.0	1005	44.6	1027	44.6	1042	44.6	1050	44.6	1059	44.6	1064	47.8	1069	52.7	1073	62.6	1074	73.7
	30.0	975	62.6	1005	62.6	1027	62.6	1039	62.6	1051	62.6	1058	65.8	1064	70.7	1070	80.6	1073	91.7
	40.0	946	80.6	985	80.6	1012	80.6	1028	80.6	1043	80.6	1052	83.8	1060	88.7	1067	98.6	1071	110
	50.0	918	98.6	965	98.6	999	98.6	1017	98.6	1035	98.6	1047	102	1056	107	1065	117	1069	128
	60.0			946	117	985	117	1006	117	1028	117	1042	120	1053	125	1062	135	1067	146
	70.0					972	135	996	135	1020	135	1036	138	1049	143	1060	153	1066	164
	80.0					959	153	986	153	1013	153	1031	156	1045	161	1058	171	1064	182
	90.0							976	171	1006	171	1026	174	1042	179	1056	189	1062	200
	100.0									1000	189	1021	192	1038	197	1053	207	1061	218
660-46	10.0	1272	30.8	1288	30.8	1300	30.8	1306	30.8	1313	30.8	1317	34	1320	38.9	1323	48.8	1325	59.8
	20.0	1227	52.9	1257	52.9	1278	52.9	1289	52.9	1300	52.9	1308	56.1	1314	61	1319	70.9	1322	82
	30.0	1185	75.1	1227	75.1	1257	75.1	1273	75.1	1289	75.1	1300	78.3	1308	83.2	1315	93.1	1319	104
	40.0	1146	97.2	1199	97.2	1237	97.2	1257	97.2	1278	97.2	1292	100	1302	105	1312	115	1317	126
	50.0			1172	119	1218	119	1243	119	1268	119	1284	123	1297	127	1309	137	1314	148
	60.0					1199	141	1228	141	1258	141	1277	145	1292	150	1305	159	1312	171
	70.0					1181	164	1215	164	1248	164	1269	167	1287	172	1302	182	1310	193
	80.0							1201	186	1238	186	1262	189	1282	194	1299	204	1307	215
	90.0							1187	208	1229	208	1255	211	1277	216	1296	226	1305	237
	100.0									1219	230	1249	233	1272	238	1293	248	1303	259
940-42	10.0	1503	38.7	1525	38.7	1540	38.7	1548	38.7	1556	38.7	1561	43.2	1566	50.3	1569	64.5	1571	80.3
	20.0	1445	64.9	1483	64.9	1511	64.9	1525	64.9	1540	64.9	1550	69.5	1557	76.5	1564	90.7	1568	106
	30.0	1391	91.2	1445	91.2	1484	91.2	1504	91.2	1525	91.2	1539	95.8	1550	103	1559	117	1564	133
	40.0	1340	117	1409	117	1458	117	1485	117	1511	117	1529	122	1542	129	1555	143	1561	159
	50.0	1291	144	1375	144	1433	144	1466	144	1498	144	1519	148	1536	155	1550	170	1558	185
	60.0			1341	170	1410	170	1447	170	1485	170	1509	175	1529	182	1546	196	1555	212
	70.0					1386	196	1429	196	1472	196	1500	201	1522	208	1542	222	1552	238
	80.0					1364	223	1411	223	1460	223	1491	227	1516	234	1538	248	1549	264
	90.0							1394	249	1447	249	1482	253	1509	260	1534	275	1546	290
	100.0							1377	275	1435	275	1473	280	1503	287	1530	301	1544	317

Speed n=3500 r/min

METRIC

Size	Pressure ΔP bar	Viscosity (mm ² /s)																	
		3		6		12		20		40		75		150		380		760	
		Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW	Flow l/min	Power kW
440-46	10.0	1032	26.6	1044	26.6	1053	26.6	1058	26.6	1062	26.6	1065	29.9	1068	34.8	1070	44.8	1071	56
	20.0	998	44.6	1020	44.6	1036	44.6	1045	44.6	1053	44.6	1059	47.8	1063	52.7	1067	62.8	1069	73.9
	30.0	967	62.5	998	62.5	1020	62.5	1032	62.5	1045	62.5	1052	65.7	1059	70.6	1064	80.7	1067	91.8
	40.0	937	80.4	977	80.4	1006	80.4	1021	80.4	1036	80.4	1047	83.6	1055	88.6	1062	98.6	1065	110
	50.0			957	98.3	991	98.3	1010	98.3	1029	98.3	1041	101	1051	106	1059	116	1064	128
	60.0					978	116	999	116	1021	116	1035	119	1047	124	1057	134	1062	145
	70.0					964	134	989	134	1014	134	1030	137	1043	142	1054	152	1060	163
	80.0							979	152	1007	152	1025	155	1039	160	1052	170	1058	181
	90.0							969	170	999	170	1019	173	1035	178	1050	188	1057	199
	100.0									992	188	1014	191	1032	196	1047	206	1055	217
660-40	10.0	1261	34.3	1273	34.3	1282	34.3	1286	34.3	1291	34.3	1294	39	1297	46.1	1299	60.5	1300	76.6
	20.0	1228	56	1250	56	1265	56	1274	56	1282	56	1288	60.7	1292	67.8	1296	82.2	1298	98.3
	30.0	1198	77.7	1229	77.7	1250	77.7	1262	77.7	1274	77.7	1281	82.4	1288	89.5	1293	104	1296	120
	40.0	1169	99.5	1208	99.5	1236	99.5	1251	99.5	1266	99.5	1276	104	1283	111	1291	126	1294	142
	50.0	1141	121	1188	121	1222	121	1240	121	1258	121	1270	126	1280	133	1288	147	1292	163
	60.0			1169	143	1208	143	1229	143	1251	143	1265	148	1276	155	1286	169	1291	185
	70.0			1151	165	1195	165	1219	165	1244	165	1259	169	1272	176	1283	191	1289	207
	80.0					1182	186	1209	186	1237	186	1254	191	1268	198	1281	212	1287	229
	90.0					1170	208	1200	208	1230	208	1249	213	1265	220	1279	234	1286	250
	100.0							1190	230	1223	230	1244	234	1261	242	1277	256	1284	272
660-46	10.0	1547	39.3	1563	39.3	1575	39.3	1581	39.3	1588	39.3	1592	44	1595	51.1	1598	65.5	1599	81.6
	20.0	1502	66	1531	66	1552	66	1564	66	1575	66	1583	70.7	1589	77.8	1594	92.3	1597	108
	30.0	1460	92.8	1502	92.8	1532	92.8	1548	92.8	1564	92.8	1574	97.4	1583	105	1590	119	1594	135
	40.0	1421	119	1474	119	1512	119	1532	119	1553	119	1566	124	1577	131	1587	146	1591	162
	50.0			1447	146	1493	146	1518	146	1542	146	1559	151	1572	158	1583	172	1589	188
	60.0					1474	173	1503	173	1532	173	1551	178	1566	185	1580	199	1587	215
	70.0					1456	200	1489	200	1523	200	1544	204	1561	211	1577	226	1584	242
	80.0							1476	226	1513	226	1537	231	1556	238	1574	253	1582	269
	90.0							1462	253	1503	253	1530	258	1551	265	1571	279	1580	295
	100.0									1494	280	1523	285	1547	292	1568	306	1578	322
940-42	10.0	1829	49.8	1851	49.8	1866	49.8	1874	49.8	1882	49.8	1887	56.4	1892	66.6	1895	87.3	1897	110
	20.0	1771	81.5	1809	81.5	1837	81.5	1851	81.5	1866	81.5	1876	88.1	1883	98.4	1890	119	1894	142
	30.0	1717	113	1771	113	1810	113	1830	113	1851	113	1865	120	1876	130	1885	151	1890	174
	40.0	1666	145	1735	145	1784	145	1811	145	1837	145	1855	152	1869	162	1881	182	1887	205
	50.0	1617	177	1700	177	1759	177	1792	177	1824	177	1845	183	1862	193	1877	214	1884	237
	60.0			1667	208	1736	208	1773	208	1811	208	1835	215	1855	225	1872	246	1881	269
	70.0					1712	240	1755	240	1798	240	1826	247	1848	257	1868	278	1878	301
	80.0					1689	272	1737	272	1786	272	1817	278	1842	289	1864	309	1875	332
	90.0							1720	303	1773	303	1808	310	1836	320	1860	341	1872	364
	100.0							1703	335	1761	335	1799	342	1829	352	1856	373	1870	396

Blackmer reserves the right to change the data in the table without prior notice.



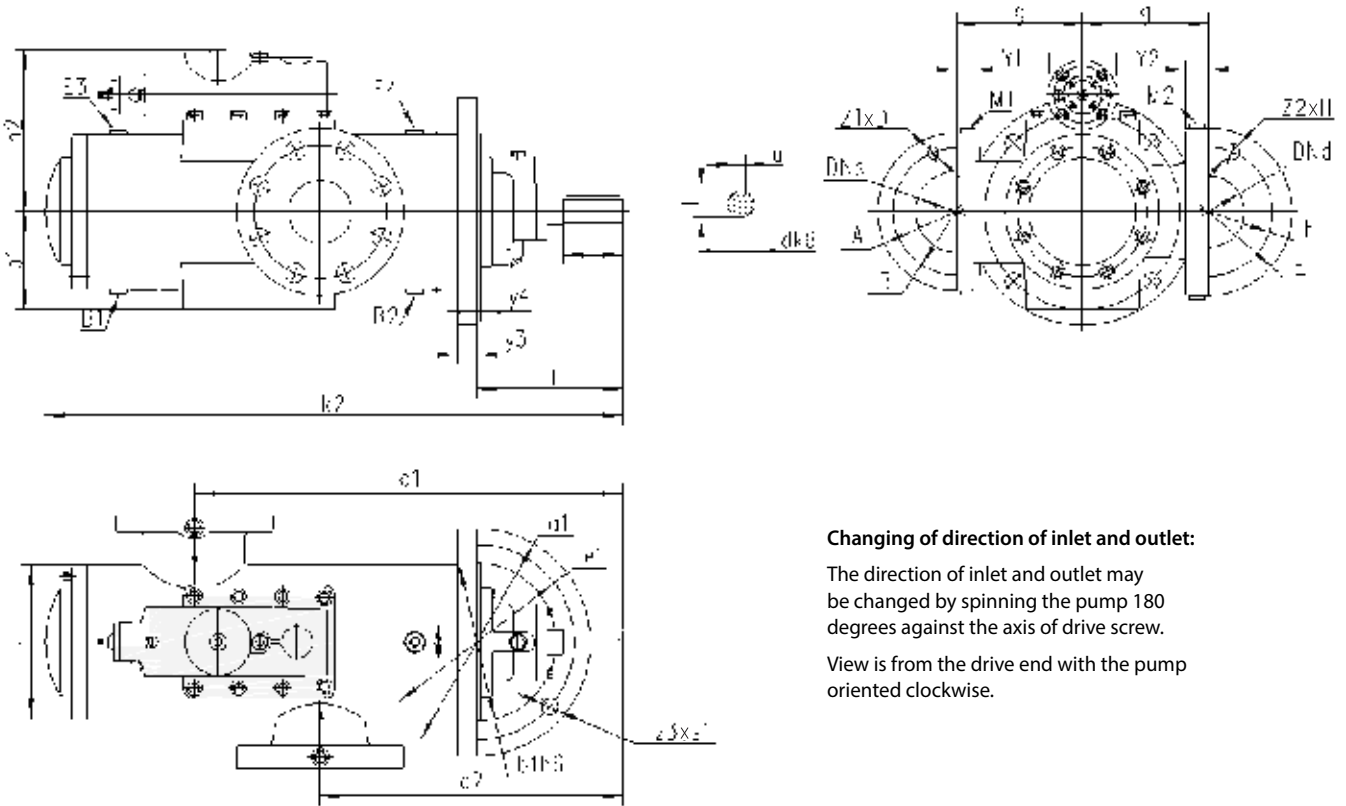
Changing of direction of inlet and outlet:

The direction of inlet and outlet may be changed by spinning the pump 180 degrees against the axis of drive screw.

View is from the drive end with the pump oriented clockwise.

Size	Pump Unit Installation Dimensions															
	a1	h	k0	k2	n2	o1	r	x1	x2	a	b	c	f	g	m	s
40	190	180	530.5	464	175	87	130	213.0	148.0	140	170	33	207	110	57	11
80	230	180	611.0	548	192	108	156	312.0	182.0	140	250	40	315	125	60	18
120	260	195	668.0	613	202	118	185	325.0	225.0	160	250	40	315	140	60	18
210	290	210	777.0	724	212	128	205	351.0	231.0	180	250	40	315	155	60	18
280	310	280	862.0	777	247	144	220	397.0	247.0	180	355	40	410	195	80	23
440	360	280	955.5	893	256	154	245	489.5	289.5	190	355	40	410	200	80	23
660	380	290	1090.0	1025	307	169	270	525.0	355.0	220	355	40	410	200	80	23
940	400	310	1221.0	1154	317	179	294	553.0	323.0	235	355	40	410	220	80	23

Size	Suction Flange						Discharge Flange						Motor K5		Motor K5	
	DN _s	A	B	D	Y1	Z1	DN _d	E	F	H	Y2	Z2				
40	32	140	100	18	18	4	25	140	100	18	24	4	90S	360	180L	850
80	65	185	145	18	20	4	40	170	125	23	26	4	90L	385	200L	875
120	65	185	145	18	20	4	50	195	145	27	28	4	100L	440	225S	935
210	80	200	160	18	22	8	65	220	170	27	30	8	112M	460	225	960
280	100	220	180	18	24	8	80	230	180	27	32	8	132S	510	250	1035
440	125	250	210	18	26	8	100	265	210	30	36	8	132M	550	280S	1110
660	125	250	210	18	26	8	100	265	210	30	36	8	160M	655	280M	1150
940	150	285	240	23	26	8	125	315	250	33	40	8	160L	695	315S	1370



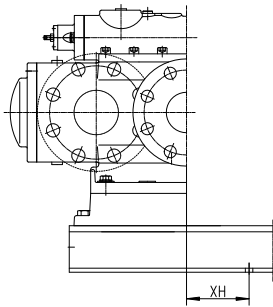
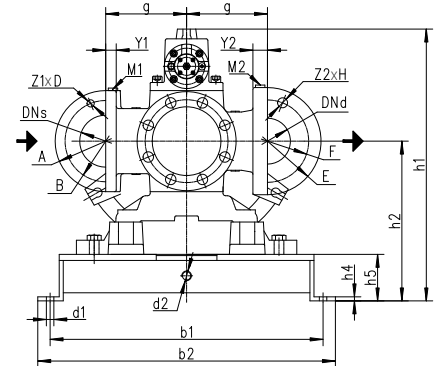
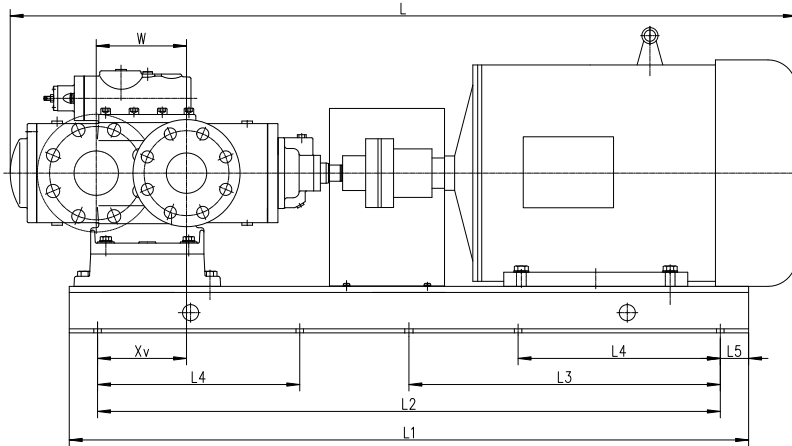
Changing of direction of inlet and outlet:

The direction of inlet and outlet may be changed by spinning the pump 180 degrees against the axis of drive screw.

View is from the drive end with the pump oriented clockwise.

Size	Pump Size															Shaft Head Size			
	a1	b1	e1	g	i1	k2	n2	o1	q1	q2	r	s1	y3	y4	z3	d	l	u	t
40	190	130	160	110	130	464	175	87	315	250	130	14	20	4.5	4	19	34	6	21.5
80	230	155	190	125	138	548	192	108	419	289	156	18	20	6.0	4	19	45	6	21.5
120	260	185	220	140	168	613	202	118	460	360	185	18	22	6.0	4	24	54	8	27.0
210	290	205	250	155	181	724	212	128	508	388	205	18	24	7.0	4	28	60	8	31.0
280	310	220	260	195	195	777	247	144	552	402	220	22	27	6.0	4	32	60	10	35.0
440	360	250	310	200	209	893	256	154	657	457	245	26	30	6.0	4	38	72	10	41.0
660	380	270	320	200	239	1025	307	169	720	550	270	26	30	6.0	4	42	95	12	45.0
940	400	290	350	220	251	1154	317	179	761	531	294	22	30	6.0	8	48	105	14	51.5

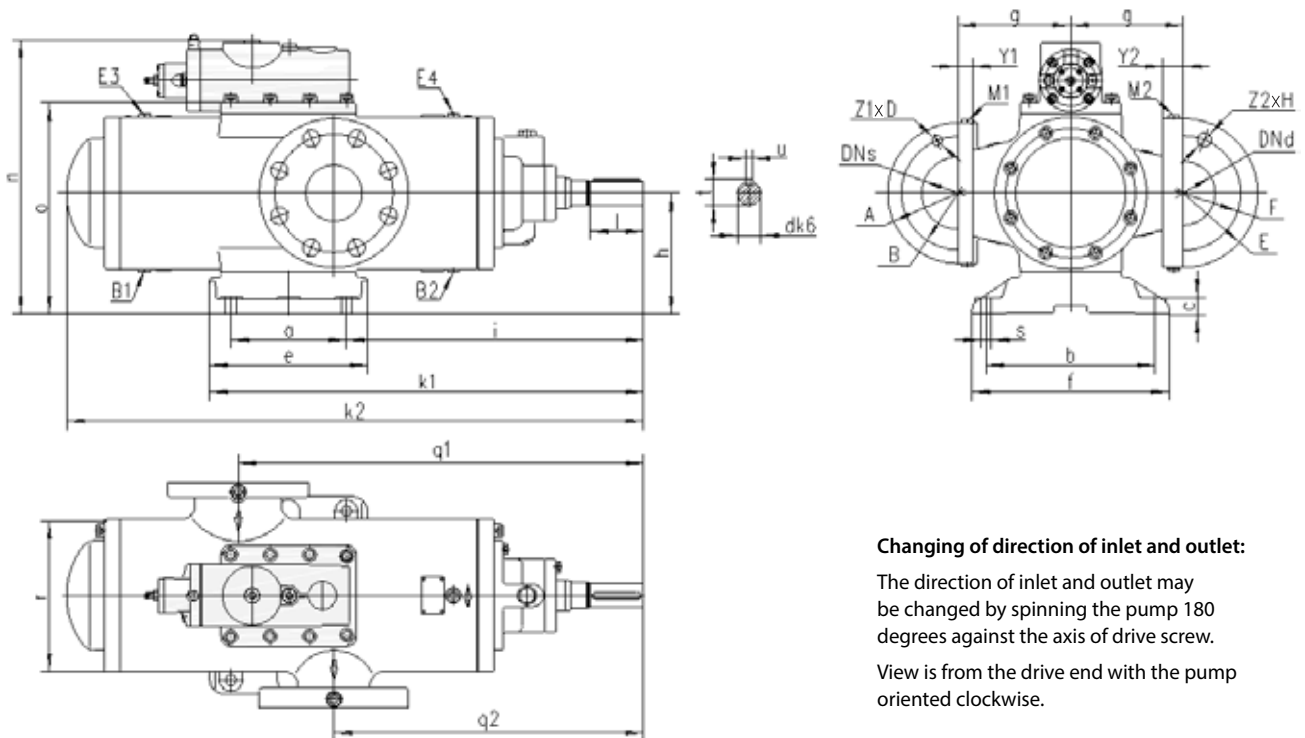
Size	Suction Flange						Discharge Flange						Drainage	Vent	Pressure Gauge
	DNs	A	B	D	Y1	Z1	DNd	E	F	H	Y2	Z2	B1/B2	E3/E4	M1/M2
40	32	140	100	18	18	4	25	140	100	18	24	4	G1/4	G1/4	G1/4
80	65	185	145	18	20	4	40	170	125	23	26	4	G1/4	G1/4	G1/4
120	65	185	145	18	20	4	50	195	145	27	28	4	G3/8	G3/8	G1/4
210	80	200	160	18	22	8	65	220	170	27	30	8	G1/2	G1/2	G1/4
280	100	220	180	18	24	8	80	230	180	27	32	8	G3/4	G3/4	G1/2
440	125	250	210	18	26	8	100	265	210	30	36	8	G3/4	G3/4	G1/2
660	125	250	210	18	26	8	125	265	210	30	36	8	G3/4	G3/4	G1/2
940	150	285	240	23	26	8	125	315	250	33	40	8	G3/4	G3/4	G3/4



Size	Motor	Pump Unit Installation Dimensions																	Suction and Discharge Flange														
		Base	L	L1	L2	L3	L4	L5	b1	b2	d1	d2	h1	h2	h4	h5	g	XV	XH	W	DNs	A	B	D	Y1	Z1	DNd	E	F	H	Y2	Z2	
40	90L	5	853	725	500	--	--	112	335	379	19	G3/8	343	168	30	50	110	25	--	65	32	140	100	18	18	4	25	140	100	18	24	4	
	100L	5	908	725	500	--	--	112	335	379	19	G3/8	343	168	30	50	110	25	--	65													
	112M	5	928	725	500	--	--	112	335	379	19	G3/8	343	168	30	50	110	25	--	65													
	132S/M	6	978	825	560	--	--	132	375	419	19	G3/8	357	182	30	50	110	10	--	65													
	160M	8.1	1123	980	630	--	--	195	400	460	20	G1/2	410	235	35	75	110	5	--	65													
160L	9.1	1163	1090	710	--	--	215	445	505	25	G1/2	422	247	35	87	110	20	--	65														
80	100L	7.1	1004	940	630	--	--	155	320	380	20	G1/2	405	213	35	73	125	30	--	130	65	185	145	18	20	4	40	170	125	23	26	4	
	112M	7.1	1024	940	630	--	--	155	320	380	20	G1/2	405	213	35	73	125	30	--	130													
	132S/M	7.1	1074	940	630	--	--	155	320	380	20	G1/2	405	213	35	73	125	30	--	130													
	160M/L	9.1	1114	1090	710	--	--	215	445	505	25	G1/2	439	247	35	87	125	20	--	130													
	180M	9.1	1294	1090	710	--	--	215	445	505	25	G1/2	459	267	35	87	125	25	--	130													
180L	10.1	1314	1190	900	450	--	--	160	470	530	25	G1/2	459	267	35	87	125	100	--	130													
120	112M	7.1	1077	940	630	--	--	155	320	380	20	G1/2	425	223	35	73	140	--	10	100	65	185	145	18	20	4	40	170	125	23	26	4	
	132S/M	8.1	1167	980	630	--	--	195	400	460	20	G1/2	425	223	35	75	140	--	10	100													
	160M	9.1	1272	1090	710	--	--	215	445	505	25	G1/2	449	247	35	87	140	--	20	100													
	160L	10.1	1312	1190	900	450	--	--	160	470	530	25	G1/2	449	247	35	87	140	20	--													100
	180M/L	10.1	1367	1190	900	450	--	--	160	470	530	25	G1/2	469	267	35	87	140	20	--													100
200L	10.1	1422	1190	900	450	--	--	160	470	530	25	G1/2	489	287	35	87	140	50	--	100													
210	132S	8.1	1230	980	630	--	--	195	400	460	20	G1/2	447	235	35	75	155	--	5	120	80	200	160	18	22	8	65	195	145	27	28	8	
	132M	9.1	1270	1090	710	--	--	215	445	505	25	G1/2	459	247	35	87	155	--	10	120													
	160M/L	10.1	1415	1190	900	450	--	--	160	470	530	25	G1/2	459	247	35	87	155	30	--													120
	180M/L	10.1	1470	1190	900	450	--	--	160	470	530	25	G1/2	479	267	35	87	155	30	--													120
	200L	11.1	1525	1390	1190	595	--	--	120	520	580		G1/2	522	290	35	90	155	140	--													120
225S/M	11.1	1610	1390	1190	595	--	--	120	520	580		G1/2	527	315	35	90	155	120	--	120													

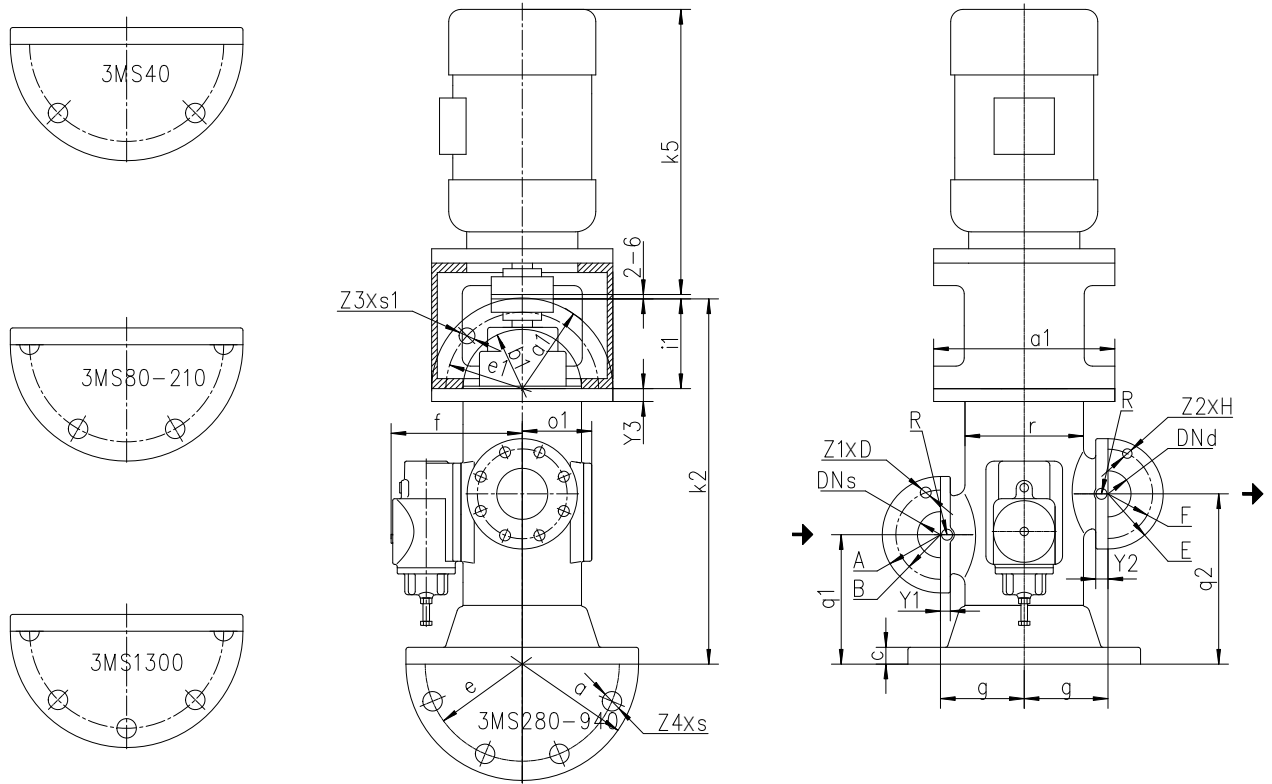
Size	Motor	Pump Unit Installation Dimensions																		Suction and Discharge Flanges												
		Base	L	L1	L2	L3	L4	L5	b1	b2	d1	d2	h1	h2	h4	h5	g	XV	XH	W	DNs	A	B	D	Y1	Z1	DNd	E	F	H	Y2	Z2
280	160M/L	10.1	1474	1190	900	450	--	160	470	530	25	G1/2	537	277	35	87	195	80	--	150	100	220	180	18	24	8	80	230	180	27	32	8
	180M/L	11.1	1529	1390	1190	595	--	120	520	580	--	G1/2	540	280	35	90	195	200	--	150												
	200L	11.1	1584	1390	1190	595	--	120	520	580	--	G1/2	550	290	35	90	195	150	--	150												
	225S/M	11.1	1669	1390	1190	595	--	120	520	580	--	G1/2	575	315	35	90	195	140	--	150												
	250M	12.1	1724	1570	1240	--	440	140	575	635	25	G3/4	625	365	35	115	195	225	--	150												
	280S	12.3	1789	1570	1340	--	440	140	645	705	25	G3/4	655	395	35	115	195	130	--	150												
	280M	14.1	1839	1720	1540	--	500	90	675	755	25	G3/4	655	395	35	115	195	230	--	150												
440	160M/L	11.1	1575	1390	1190	595	--	120	520	580	--	G1/2	560	290	35	90	200	190	--	200	125	250	210	18	26	8	100	265	210	30	36	8
	180M	11.1	1610	1390	1190	595	--	120	520	580	--	G1/2	560	290	35	90	200	190	--	200												
	180L	11.1	1630	1390	1190	595	--	120	520	580	--	G1/2	560	290	35	90	200	170	--	200												
	200L	12.1	1685	1570	1240	--	440	140	575	635	25	G3/4	585	290	35	115	200	220	--	200												
	225S/M	12.1	1770	1570	1240	--	440	140	575	635	25	G3/4	610	340	35	115	200	200	--	200												
250M	12.1	1825	1570	1240	--	440	140	575	635	25	G3/4	635	365	35	115	200	255	--	200													
660	180M	12.1	1741	1570	1240	--	440	140	575	635	25	G3/4	615	330	35	115	200	200	--	170	125	250	210	18	26	8	100	265	210	30	36	8
	180L	12.1	1761	1570	1240	--	440	140	575	635	25	G3/4	615	330	35	115	200	180	--	170												
	200L	12.1	1816	1570	1240	--	440	140	575	635	25	G3/4	615	330	35	115	200	160	--	170												
	225S	12.1	1876	1570	1240	--	440	140	575	635	25	G3/4	625	340	35	115	200	140	--	170												
	225M	12.1	1901	1570	1240	--	440	140	575	635	25	G3/4	625	340	35	115	200	130	--	170												
	250M	13.1	1956	1720	1540	--	500	90	575	635	25	G3/4	650	365	35	115	200	200	--	170												
	280S	14.1	2021	1720	1540	--	500	90	675	755	25	G3/4	680	395	35	115	200	170	--	170												
	280M	14.1	2071	1720	1540	--	500	90	675	755	25	G3/4	680	395	35	115	200	140	--	170												
315S	16.3	2291	1920	1740	--	500	90	675	736	18.5	G3/4	715	430	26	115	200	265	--	170													
940	180M	12.1	1859	1570	1240	--	440	140	575	635	25	G3/4	635	340	35	115	220	230	--	230	150	285	240	23	26	8	125	315	250	33	40	8
	180L	12.1	1879	1570	1240	--	440	140	575	635	25	G3/4	635	340	35	115	220	210	--	230												
	200L	12.1	1934	1570	1240	--	440	140	575	635	25	G3/4	635	340	35	115	220	190	--	230												
	225S	12.1	1994	1570	1240	--	440	140	575	635	25	G3/4	635	340	35	115	220	180	--	230												
	225M	13.1	2019	1720	1540	--	500	90	575	635	25	G3/4	635	340	35	115	220	270	--	230												
	250M	13.1	2074	1720	1540	--	500	90	575	635	25	G3/4	660	365	35	115	220	240	--	230												
	280S	14.1	2139	1720	1540	--	500	90	675	755	25	G3/4	690	395	35	115	220	210	--	230												
	280M	14.1	2189	1720	1540	--	500	90	675	755	25	G3/4	690	395	35	115	220	180	--	230												
	315S	16.3	2409	1920	1740	--	500	90	675	736	18.5	G3/4	725	430	26	115	220	300	--	230												
315M	16.3	2479	1920	1740	--	500	90	675	736	18.5	G3/4	725	430	26	115	220	275	--	230													

Blackmer reserves the right to change the data in the table without prior notice.



Size	Pump Size																Shaft Head Size				
	a	b	c	e	f	g	h	i	k1	k2	k3	n	o	q1	q2	r	s	d	l	u	t
40	140	180	15	190	210	110	118	215	380	464	172	293	204	315	250	130	14	19	40	6	21.5
80	140	190	18	210	225	125	140	286	461	560	278	332	248	431	301	156	18	19	55	6	21.5
120	140	190	18	210	225	140	150	325	500	613	278	352	268	460	360	185	18	24	60	8	26.9
210	140	190	18	210	225	155	160	355	530	716	278	372	288	500	380	205	18	28	60	8	30.9
280	205	300	30	280	350	195	190	368	610	775	413	437	334	550	400	220	18	32	70	10	35.3
440	205	300	30	280	350	200	200	435	677	876	413	456	354	640	440	245	18	38	70	10	41.3
660	205	300	30	280	350	200	215	508	750	1005	413	522	384	700	530	270	18	42	85	12	45.1
940	205	300	30	280	350	220	225	518	760	1123	413	542	404	730	500	294	18	48	90	14	51.5

Size	Suction Flange							Discharge Flange							Drainage	Vent	Pressure Gauge
	DNs	A	B	C	D	Y1	Z1	DNd	E	F	G	H	Y2	Z2	B1/B2	E3/E4	M1/M2
40	32	140	100		18	18	4	25	140	100	25	18	24	4	G1/4	G1/4	G1/4
80	65	185	145	65	18	20	4	40	170	125	40	23	26	4	G1/4	G1/4	G1/4
120	65	185	145	65	18	20	4	50	195	145	50	27	28	4	G3/8	G3/8	G1/4
210	82	200	160	80	18	22	8	65	220	170	65	27	30	8	G1/2	G1/2	G1/4
280	100	220	180	100	18	24	8	80	230	180	80	27	32	8	G3/4	G3/4	G1/2
440	125	250	210	125	18	26	8	100	265	210	100	30	36	8	G3/4	G3/4	G1/2
660	125	250	210	125	18	26	8	100	265	210	100	30	36	8	G3/4	G3/4	G1/2
940	150	285	240	150	23	26	8	125	315	250	125	33	40	8	G3/4	G3/4	G1/2



Size	Foot Flange					Drive End Flange						Pump Dimensions								
	a	c	e	s	z4	a1	b1	e1	y3	s1	z3	f	g	i1	k2	q1	q2	O1	r	R
40	250	22	220	14	4	190	130	160	20	14	4	175	110	130	486	171	236	86.5	130	G1/4"
80	280	23	240	18	6	230	155	190	20	18	1	192	125	138	576	157	287	108	156	G1/4"
120	320	25	280	18	6	260	185	220	22	18	4	202	140	168	632	172	272	118	185	G1/4"
210	340	25	300	18	6	290	205	250	24	18	1	212	155	181	727	218.5	338.5	128	205	G1/4"
280	400	300	360	18	1	310	220	260	27	22	4	247	195	195	887.5	335.5	485.5	144	220	G1/2"
440	420	35	380	18	8	360	250	310	30	269	4	256	200	209	967	31	510	154	245	G1/2"
660	480	35	440	18	8	380	270	320	30	26	4	307	200	239	1065	345	515	169	270	G1/2"
940	510	40	460	18	8	400	290	350	30	22	8	317	220	251	1193	432	662	179	294	G1/2"

Size	Suction Flange						Discharge Flange						Motor K5		Motor K5	
	DNs	A	B	D	Y1	Z1	DNd	E	F	H	Y2	Z2				
40	32	140	100	18	18	4	25	140	100	18	24	4	90S	360	180L	850
80	65	185	145	18	20	4	40	170	125	23	26	4	90L	385	200L	875
120	65	185	145	18	20	4	50	195	145	27	28	4	100L	440	225S	935
210	80	200	160	18	22	8	65	220	170	27	30	8	112M	460	225	960
280	100	220	180	18	24	8	80	230	180	27	32	8	132S	510	250	1035
440	125	250	210	18	26	8	100	265	210	30	36	8	132M	550	280S	1110
660	125	250	210	18	26	8	100	265	210	30	36	8	160M	655	280M	1150
940	150	285	240	23	26	8	125	315	250	33	40	8	160L	695	315S	1370



NOTES

TRIPLE-SCREW PUMP DESIGN MANUAL

Blackmer, part of PSG®, a Dover company, warrants its products free from defects in materials and workmanship under normal use and service for which its products were designed. This warranty is for a period of 12 months after installation or 18 months after shipment from the factory, whichever comes first. This standard warranty applies unless specific warranty conditions are granted in writing by Blackmer. If its products should fail through defect in workmanship or material within the stated warranty period, Blackmer must be notified in writing within the warranty period of such defects and shall have the option of requiring return of parts or product to its factory for verification of any claim. The warranty is in lieu of any other liability for defects.

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PLEASE PRINT OR TYPE AND FAX TO BLACKMER

PUMP INFORMATION			
Item # _____		Serial # _____	
Company Where Purchased _____			
YOUR INFORMATION			
Company Name _____			
Industry _____			
Name _____		Title _____	
Street Address _____			
City _____	State _____	Postal Code _____	Country _____
Telephone _____	Fax _____	Email _____	Web Address _____
Number of pumps in facility? _____		Number of Blackmer pumps? _____	
Types of pumps in facility (check all that apply): <input type="checkbox"/> Diaphragm <input type="checkbox"/> Centrifugal <input type="checkbox"/> Gear <input type="checkbox"/> Submersible <input type="checkbox"/> Lobe			
<input type="checkbox"/> Other _____			
Media being pumped? _____			
How did you hear of Blackmer pump? <input type="checkbox"/> Trade Journal <input type="checkbox"/> Trade Show <input type="checkbox"/> Internet/Email <input type="checkbox"/> Distributor			
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