

# Torishima Pump Global Network



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# CAL (Cast Iron)

# CAR (Stainless Steel)

End-Suction Volute Pump



CAR



CAL



PT TORISHIMA GUNA INDONESIA

■ Manufacturing ■ Service Center



# The Torishima "Eco Pumps" lead the World!

## End-Suction Volute Pump (10 bar type)

CAL is of Cast Iron construction. CAR is of Stainless Steel construction.

CA series pumps are eco-friendly high-efficiency pumps based on technology from our engineered pumps.

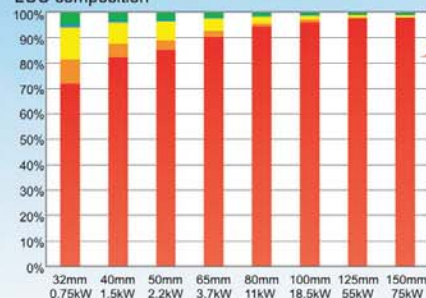
### Energy Saving & Cost Reduction

Eco pumps significantly reduce the life cycle costs of pumps and CO<sub>2</sub> emissions because of their design (3D impeller, casing), motor (Torishima ultra high efficiency motor) and optimized specification (impeller cut).

#### Reduction of LCC (Life Cycle Cost)

About 90% of the pump LCC is generated from electricity cost. Increased efficiency leads to big reduction of LCC.

LCC composition



About 90% of pump LCC is electricity cost.

LCC is calculated on the basis of:  
CAL size 32 to 150mm;  
24hours day, 365days, 15years operation;  
Operating at 60Hz-4P with normal temperature clean water;  
Electricity cost of JPY10 per kWh.

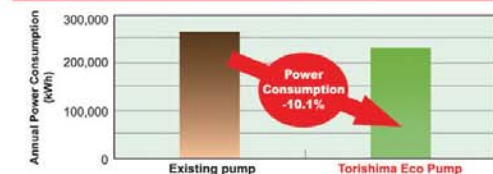
Operating cost  
■ Electricity  
■ Installation work  
■ Maintenance  
■ Unit price  
■ Spare parts

#### Energy Saving with Eco Pumps

Cooling water pump

Annual operating hours: 8,760hours

	Existing pump spec	Torishima pump CAL125-250	Difference
Motor capacity	30kW	30kW	
Facility spec	Operating point	Operating point	
Capacity(m <sup>3</sup> /min)	4.7	4.7	0%
Head(m)	29.5	29.5	-1.2m
Pump efficiency(%)	78	81	+3.0%
Shaft power(kW)	27.2	25.1	-2.1kW
Motor efficiency(%)	91.9	94.5	+2.6%
Power consumption(kW)	29.6	26.6	-3.0kW (-10.1%)
Annual Power Consumption(kWh)	259,296	233,016	-26,280kWh



Annual Saving  
USD\$2,628  
(= 26,280 kWh x  
USD 0.1)

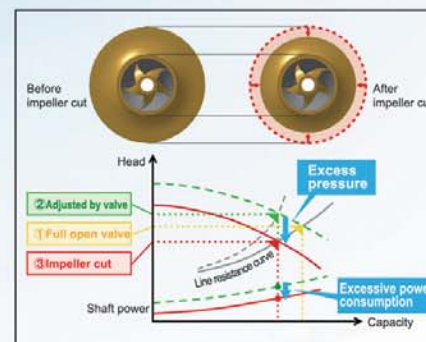
Electricity cost per kWh : USD 0.1

Annual  
CO<sub>2</sub> Reduction  
11.8t-CO<sub>2</sub>  
(=26,280kWh x 0.00045t-CO<sub>2</sub>/kWh)

Conversion factor of CO<sub>2</sub> emission: 0.00045 (t-CO<sub>2</sub>/kWh)  
referred from Tokyo Electric Power Co., Inc. 2011

#### Meeting Customer's Specification (Impeller cut)

The impeller diameter can be cut to meet the customer's specification to reduce unnecessary power consumption.



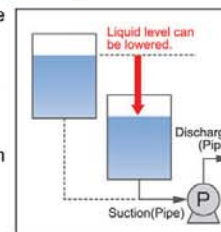
#### High Speed and Simplified Design

CAL/CAR are simplified with high speed and compact design, which enable to reduce the installation space.

#### Low NPSH and a Wide Application Range

Low NPSH performance enables lower suction level which reduces plant construction cost.

CAL/CAR can handle liquid temperatures from -40 to +350°C (heat medium) and various liquid types.



### Maintenance & Operation

#### Mechanical Seal as Standard Part

Maintenance free.

No leakage from seal parts allows cleanliness around pumps.

Standard mechanical seal (rubber bellows seal) is easy to install and does not damage shaft, thus does not require shaft sleeve.



	Mechanical seal	Gland packing
Leakage	0 cc/min	15 cc/min
5-year leakage	0 L	39,420 L
Cost amount	USD\$ 0	USD\$ 138*

\* In case of using tap water  
- Industrial Water : USD\$ 17.74 (USD\$ 0.45/m<sup>3</sup>)  
- Tap Water : USD\$ 138 (USD\$ 3.5/m<sup>3</sup>)  
- Pure Water : USD\$ 391,000(USD\$ 15t)

39,420L leakage from using gland packing for 5 years equals to about 197 bathtubs (200L home bathtub)



#### Safe Operation with Precision Bearing Design

#### Stable Operation

The stable pump performance facilitates valve control and parallel operation.



## Coupling Guard

### CAL/CAR are covered with and enclosed type coupling guard as an optional

An enclosed coupling guard improves safety and maintenance compared to an existing coupling guard due to the wide area of coverage



Standard Coupling Guard



Enclosed Coupling Guard  
(as optional)



TU Motor : 2P-55kW or less, 4P-110kW or less  
Coupling Diameter : 280 mm or less  
Motors have different size and frame by manufacturers

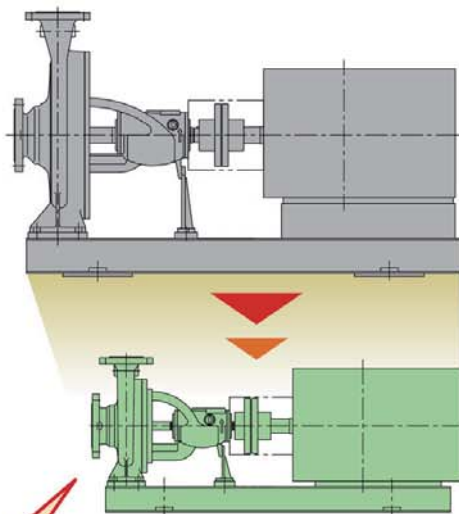
## Downsizing to 2P Design

### Increasing the pump speed by using a 2 pole motor reduces the pump size and weight.

Conditions: total head of 50m, capacity of 1m<sup>3</sup>/min, and 60Hz

Pole number: 4P  
Pump size: CAL80-400  
Motor output: 18.5kW  
Weight: 400kg

Pole number: 2P  
Pump size: CAL50-200  
Motor output: 15kW  
Weight: 209kg



Weight reduced by 47%  
compared to 4P  
= (400-209) ÷ 400 × 100



The above diagram describes characteristics of 2P. We can provide the design for 4P as well.  
Weight includes pump, base plate, motor and coupling.  
Motor weight differs depending on manufacturers.

## Applications

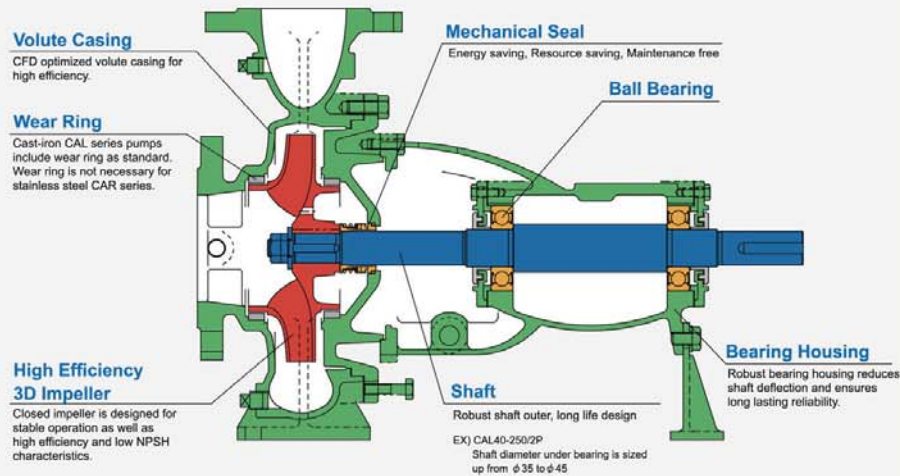
Utility	Co-generation	Cooling water pump, Hot water (circulation) pump	CAL
	Air conditioning	Cold water pump, Cooling water pump, Hot water pump	
	Drainage treatment	Raw water pump, Filtrate pump, Back wash pump, Transfer pump	CAR
	Pure water facility	Raw water pump, RO wash pump, Recovering back wash pump, Filtrate water pump	
Iron & Metal	Power generation	Deaerator feed water pump	CAL
	Hot rolling	Transfer pump, Hot water pump, Water pumping pump, Filtrate pump, Back wash pump,	
	Flue gas desulfurization	Cooling water pump, Industrial water pump	CAR
	Roll coolant	Spray pump	
	Plating	Wash pump (Rinse pump)	
Food & Beverage	Manufacturing process	Cold water pump, Cooling water pump (Circulation / Boost), Recycle water pump, Filtrate pump, Sprinkling pump	CAL
	Refrigerator	Chilled pump, Defrost pump	CAR
	CIP system	CIP supply / return pump	
Automobile (Painting Plant)	Degreasing process	Degreasing pump, Hot / Cold water wash pump, Spray pump	CAR
	Transformation process	Chemical pump, Hot / Cold water wash pump, Pure water pump	
	Electrodeposition process	Electrodeposition liquid circulation pump, Wash pump, Pure water pump	
Garbage Incinerating Plant	Power generation	Deaerator feed water pump, Condensate pump,	CAL
	Heat decrease tower	Heat decrease pump, Spray pump for heat decrease tower	
	Drainage	Reuse water pump (pumping, transferring, feeding)	
Other Liquid Handled	Brain, Acetone, Calcium chloride, Kalium chloride, Alkaline solution, Ethylene glycol, Agua fortis, Sulfate, Sodium hydroxide, Ammonia liquor, Caustic soda, etc.		CAR

Please ask about special fluid.

## Specification

		CAL(Cast Iron) 	CAR(Stainless Steel) 
Handled liquid	Kinds	Clean water, Warm water, Oil, Chemical medicine, Alkaline solution, Brine, Heat transfer media, Abrasive slurry liquid under 3wt%, etc.	Pure water, Hot water, Sea water, Salted water, Refrigerant, Electrodeposition paint, Abrasive slurry liquid under 3wt%, etc.
	Temperature	Standard: -10°C < T ≤ 100°C Option: 100°C < T ≤ 350°C	Standard: -10°C to +80°C Option: -40°C to +140°C
Max. discharge pressure		Standard: 1MPa (10kgf/cm <sup>2</sup> G) Option: 1.4MPa (14kgf/cm <sup>2</sup> G)	1MPa (10kgf/cm <sup>2</sup> G)
Max. suction pressure		0.8MPa (8kgf/cm <sup>2</sup> G)	0.8MPa (8kgf/cm <sup>2</sup> G)
Design	Impeller	Closed	Closed
	Shaft seals	Standard: Single mechanical seal (Rubber bellows) Option: Double mechanical seal, Gland packing	Standard: Single mechanical seal (Rubber bellows) Option: Double mechanical seal, Gland packing
	Water injection for shaft seal	Standard: Internal injection Option: Quenching, Flushing	Standard: Internal injection Option: Quenching, Flushing
	Lubricated bearing	Standard: Grease lubrication Option: Oil lubrication	Standard: Grease lubrication Option: Oil lubrication
Flange standard, Suction / Discharge direction		JIS 10KRF Shaft direction suction / Vertical top discharge	JIS 10KRF Shaft direction suction / Vertical top discharge
Pump material	Casing	Standard: FC250 Option: FCD400	Standard: SCS13 Option: SCS14
	Impeller	Standard: FC200 Option: SCS13, SCS14, BC6	Standard: SCS13 Option: SCS14
	Shaft	Standard: SUS420J2 Option: SUS329J1, SUS304	Standard: SUS304 Option: SUS316, SUS329J1
	Case wear ring	Standard: FC200	—

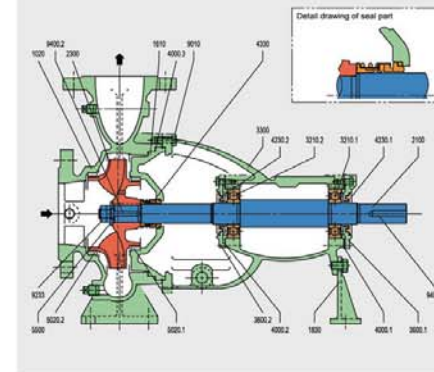
## Design Features



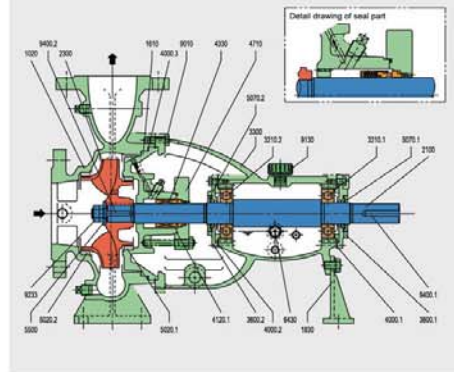
## Pump Sectional Drawing

The basic structure is same between CAL and CAR for parts interchangeability. CAR, which is made from stainless, does not require case wear ring. Due to adopting build to order method, various combination with pump material, seal and bearing is available according to liquids kinds and temperature.

**Standard** Seal: Mechanical seal  
Bearing: Grease lubrication



**Option** Seal: Mechanical seal + Water cooling  
Bearing: Oil lubrication



## Parts Interchangeability

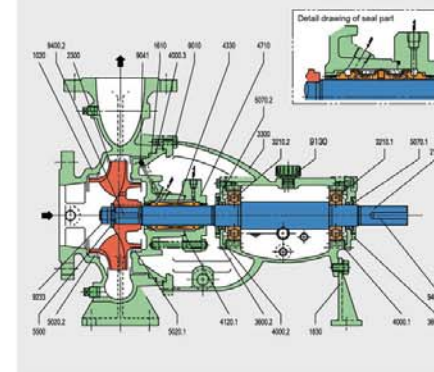
**2P type** Same color and number in the same parts indicate interchangeability.

Parts Pump type	Casing	Casing Cover	Bearing Housing	Shaft	Mechanical Seal
32-125	1				
40-125	2	1			
65-125	3				
32-160	4				
40-160	5	2	1	1	1
50-160	6				
32-200	7				
40-200	8	3			
50-200	9				
80-160	10	4	2	2	
80-200	11	5			
32-250	12				2
40-250	13	6	3	3	
50-250	14				
80-250	15	7			

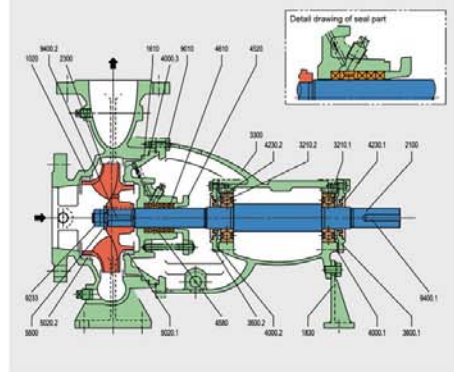
**4P type** Same color and number in the same parts indicate interchangeability.

Parts Pump type	Casing	Casing Cover	Bearing Housing	Shaft	Mechanical Seal
32-125	1				
40-125	2	1			
65-125	3				
32-160	4				
40-160	5	2	1	1	1
50-160	6				
32-200	7				
40-200	8				
50-200	9				
65-190	10	3			
80-150	11				
80-190	12	4			
100-190	13	5			
32-250	14				
40-250	15	6			
50-250	16				
65-240	17				
80-240	18	7	2	2	2
100-240	19				
100-245	20				
100-250	21				
50-315	22				
65-310	23	8			
80-320	24				
100-320	25				
150-190	26	9	3	3	3
150-230	27	10			
125-230	28				
125-280	29	11	4	4	
200-240	30	12			
200-280	31	13	3	3	
125-310	32	14	4	4	
125-315	33	15			
80-400	34	16	5	5	4
100-400					
125-400					
150-310					
150-315					
150-350					
150-400					

**Option** Seal: Double mechanical seal  
Bearing: Oil lubrication



**Option** Seal: Gland packing  
Bearing: Grease lubrication



Parts number	Parts name	Parts number	Parts name	Parts number	Parts name	Parts number	Parts name
1020	Volute casing	3600.2	Bearing cover	4580	Lantern ring	9010	Hex. bolt
1610	Casing cover	4000.1	Flat gasket	4610	Gland packing	9041	Nock
1830	Support foot	4000.2	Flat gasket	4710	Seal cover	9130	Plug
2100	Shaft	4000.3	Flat gasket	5020.1	Casing wear ring	9233	Lock nut
2300	Impeller	4120.1	O-ring	5020.2	Casing wear ring	9400.1	Key
3210.1	Deep groove ball bearing	4230.1	Labyrinth ring	5070.1	Deflector	9400.2	Key
3210.2	Deep groove ball bearing	4230.2	Mechanical seal	5070.2	Deflector		
3300	Bearing housing	4330	Shaft box gland	5500	Washer		
3600.1	Bearing cover	4520		6430	Oil gauge		



6P is also available. Please ask our sales representative for details.

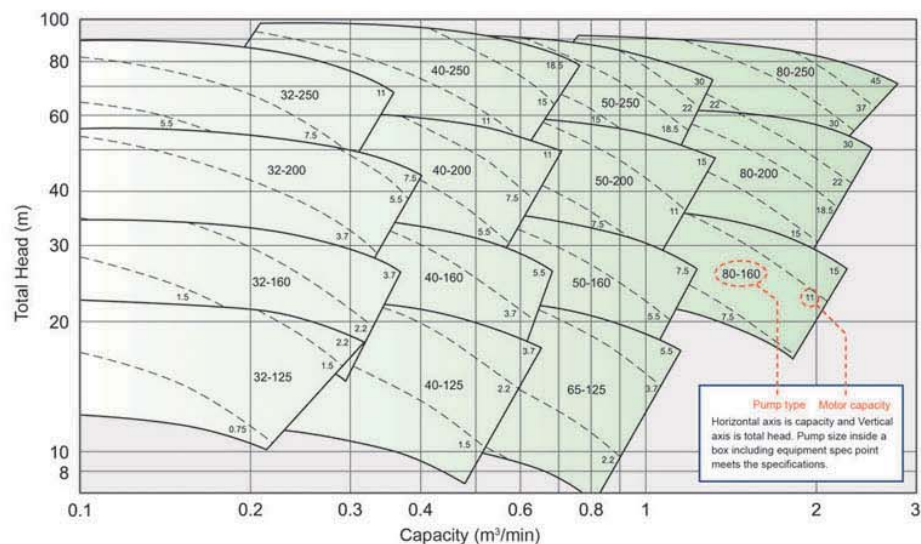


# CAR (Stainless Steel) Selection Range Charts

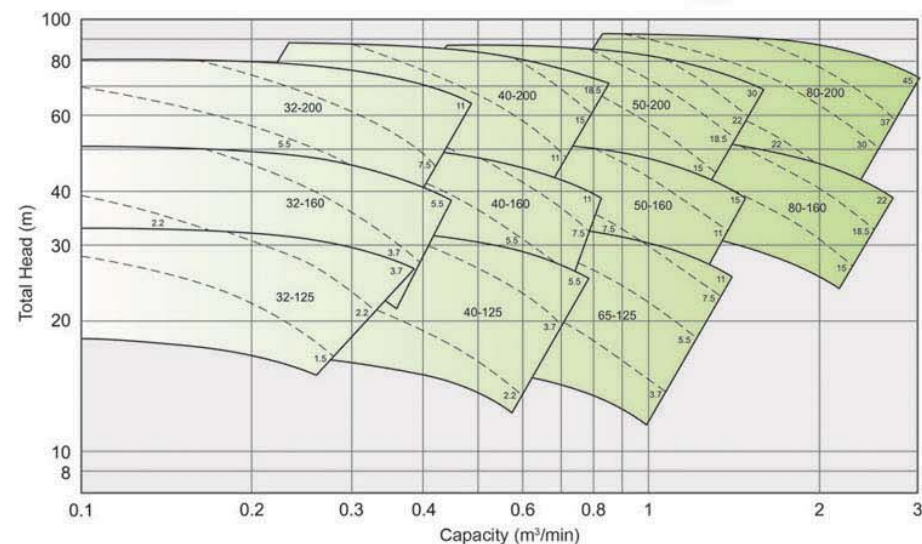
6P is also available. Please ask our sales representative for details.



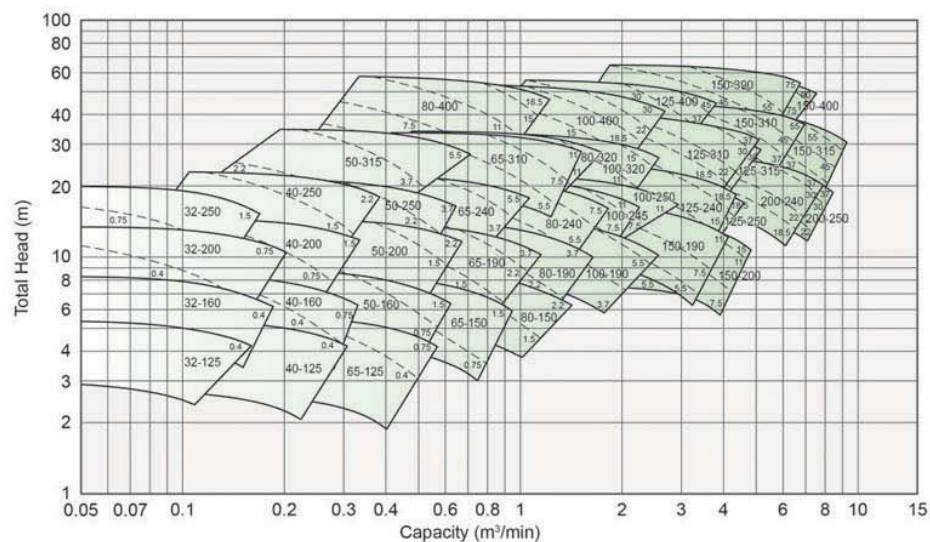
■ 50Hz-2P (3000min<sup>-1</sup>)



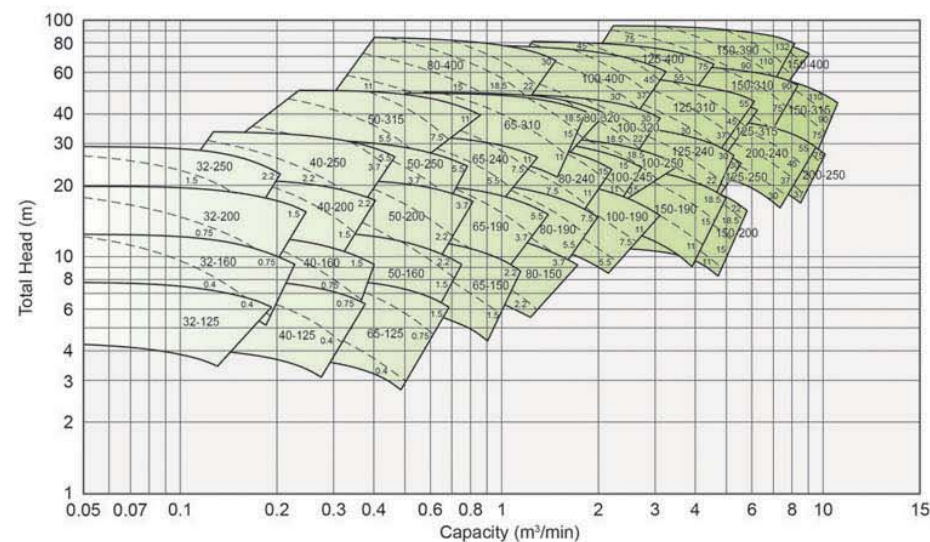
■ 60Hz-2P (3600min<sup>-1</sup>)



■ 50Hz-4P (1500min<sup>-1</sup>)




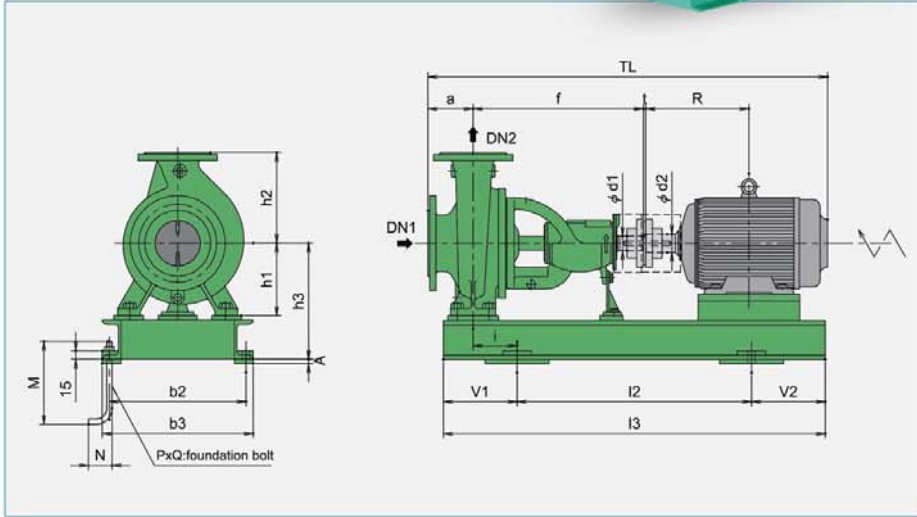
■ 60Hz-4P (1800min<sup>-1</sup>)





## Dimension Chart

- Flange standard CAL : JIS10K RF / CAR : JIS10K RF
  - Below dimension is based on totally enclosed fan-cooled motor.
  - Motors have different size and frame depending on manufacturers.
- 



### Dimension Chart for 2P Motor Drive

Pump Sizes	Pump									Motor		Base Plate				Foundation Dimensions												Coupling		Refer.		
	Bore		Dimension				Axle	Weight		Dimension																						
	DN1	DN2	a	f	h1	h2	d1	Grade L	Grade R	Frame	R	d2	b3	I3	A	Wt.	h3	i	b2	I2	M	N	P	Q	V1	V2	I	Wt.	TL			
	mm	mm	mm	mm	mm	mm	mm	kg	kg	mm	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		mm	
	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		---	
32-125 40-125										71M	120	14	320	670	0	27	202	45	290	420	200	50	4	MB2	105	145	3	1.1	681			
										80	140	19	320	670	0	27	202	45	290	420	200	50	4	MB2	105	145	3	1.1	725			
										80M	140	19	320	670	0	27	202	45	290	420	200	50	4	MB2	105	145	3	1.1	705			
										90S	156	24	320	750	0	28	202	55	290	480	200	50	4	MB2	115	155	3	1.1	750			
										90L	168	3	24	320	750	0	28	202	55	290	480	200	50	4	MB2	115	155	3	1.1	775		
										100L	193	28	320	750	0	28	202	55	290	480	200	50	4	MB2	115	155	3	1.6	809			
										112M	200	28	320	750	0	27	202	55	290	480	200	50	4	MB2	115	155	3	1.6	834			
										132S	239	38	350	870	0	32	219	90	320	600	200	50	4	MB2	150	120	3	3.2	897			
										80M	140	19	320	670	0	28	222	45	290	420	200	50	4	MB2	105	145	3	1.1	745			
										90S	156	24	320	750	0	28	222	55	290	480	200	50	4	MB2	105	145	3	1.1	725			
										90L	168	3	24	320	750	0	30	222	55	290	480	200	50	4	MB2	115	155	3	1.1	795		
										90L	168	3	24	320	750	0	30	222	55	290	480	200	50	4	MB2	115	155	3	1.1	795		
32-160 40-160 65-125										100L	193	28	320	750	0	29	222	55	290	480	200	50	4	MB2	115	155	3	1.6	829			
										112M	200	28	320	750	0	28	222	55	290	480	200	50	4	MB2	115	155	3	1.6	854			
										132S	239	38	350	870	0	31	222	90	320	600	200	50	4	MB2	150	120	3	3.2	917			
										160M <sup>1</sup>	323	42	430	1000	0	41	250	110	400	660	200	50	4	MB2	170	170	3	6.7	1017			
										160M <sup>2</sup>	323	42	430	1000	0	41	250	110	400	660	200	50	4	MB2	170	170	3	6.7	786			
										160L	345	42	430	1000	0	41	250	110	400	660	200	50	4	MB2	170	170	3	6.7	1175			

\*Motor frame is the same but shaft axle diameter (d2) is different.

Pump Sizes	Pump										Weight		Motor		Base Plate		Foundation Dimensions										Coupling			Refer.			
	Bore		Dimension				Axle																										
	DN1	DN2	a	f	h	h1	h2	d1	Grade L	Grade R	Frame	R	d2	b3	I3	A	Wt.	h3	i	b2	I2	M	N	P	Q	V1	V2	I	Wt.	Tl.			
	mm	mm	mm	mm	mm	mm	mm	mm	kg	kg	---	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
32-200 40-200 50-160	60	40	32	80	360	160	180	24	36	37	38	39	90L	168	5	24	320	750	0	33	250	55	290	480	200	50	4	M2	115	155	3	1.6	795.5
													100L	193	28	320	750	0	33	250	55	290	480	200	50	4	M2	115	155	3	1.6	829	
													112M	200	28	320	750	0	32	250	55	290	480	200	50	4	M2	115	155	3	1.6	854.5	
													132S	239	38	350	870	0	34	250	90	320	600	200	50	4	M2	150	120	3	3.2	917	
													160M*	323	42	430	1000	0	39	250	110	400	660	200	50	4	M2	170	170	3	6.7	1071	
													160M**	323	42	430	1000	0	39	250	110	400	660	200	50	4	M2	170	170	3	6.7	786	
													160L	345	42	430	1000	0	39	250	110	400	660	200	50	4	M2	170	170	3	6.7	1115	
													180M	351.5	48	430	1000	0	42	270	110	400	660	200	50	4	M2	170	170	3	9.0	1107	
													50-200	80	50	100	360	160	200	24	37	39	112M	200	28	320	750	0	32	250	55	290	480
132S	239	38	350	870	0	34	250	90	320	600	200	50											4	M2	150	120	3	3.2	917				
160M*	323	42	430	1000	0	39	250	110	400	660	200	50											4	M2	170	170	3	6.7	1071				
160M**	323	42	430	1000	0	39	250	110	400	660	200	50											4	M2	170	170	3	6.7	786				
160L*	345	42	430	1000	0	39	250	110	400	660	200	50											4	M2	170	170	3	6.7	1115				
160L**	345	48	430	1000	0	39	250	110	400	660	200	50											4	M2	170	170	3	9.0	1033.5				
180MA	351.5	48	430	1000	0	42	270	110	400	660	200	50											4	M2	170	170	3	9.0	1135				
180M*	351.5	48	430	1000	0	42	270	110	400	660	200	50											4	M2	170	170	3	9.0	1107				
180M**	351.5	55	430	1000	0	42	270	110	400	660	200	50											4	M2	170	170	3	13.9	1040				
80-160	100	80	125	470	160	225	32	50	52	180L	370.5	55	430	1000	0	42	270	110	400	660	200	50	4	M2	170	170	3	13.9	1145				
										200LA	395.5	55	470	1120	0	53	292	130	440	740	200	50	4	M2	190	190	3	13.9	1233				
										200L	395.5	55	470	1120	0	53	292	130	440	740	200	50	4	M2	190	190	3	13.9	1213.5				
										225S	402	55	530	1250	10	71	342	145	490	840	250	63	4	M6	205	205	3	13.9	1230				
										132S	239	38	350	1000	0	33	250	110	320	660	200	50	4	M2	170	170	3	3.2	1052				
										160M*	323	42	430	1120	0	36	250	130	400	740	300	50	4	M2	190	190	3	6.7	1206				
										160M**	323	42	430	1120	0	36	250	130	400	740	300	50	4	M2	190	190	3	6.7	921				
										160L*	345	42	430	1120	0	36	250	130	400	740	300	50	4	M2	190	190	3	6.7	1250				
										160L**	345	48	430	1120	0	36	250	130	400	740	300	50	4	M2	190	190	3	9.0	1168.5				
32-250 40-250 50-250 80-200	60	40	32	100	470	180	225	32	54	55	58	62	180MA	351.5	48	430	1120	0	44	270	130	400	740	300	50	4	M2	190	190	3	9.0	1270	
													180M*	351.5	48	430	1120	0	44	270	130	400	740	300	50	4	M2	190	190	3	9.0	1242	
													180M**	351.5	55	430	1120	0	44	270	130	400	740	300	50	4	M2	190	190	3	13.9	1175	
													180L	370.5	55	430	1120	0	44	270	130	400	740	300	50	4	M2	190	190	3	13.9	1280	
													200LA	395.5	55	470	1250	10	63	317	145	430	840	250	63	4	M6	205	205	3	13.9	1368	
													200L	395.5	55	470	1250	10	63	317	145	430	840	250	63	4	M6	205	205	3	13.9	1348.5	
													225S	402	55	530	1250	10	65	342	145	490	840	250	63	4	M6	205	205	3	13.9	1365	
													112M	200	28	380	870	0	38	270	75	350	600	200	50	4	M2	150	120	3	3.2	989.5	
													132S	239	38	430	1000	0	42	270	95	400	660	200	50	4	M2	170	170	3	3.2	1052	
80-250	100	80	125	470	225	32	67	70	160M*	323	42	470	1120	0	45	270	115	440	740	300	50	4	M2	190	190	3	6.7	1206					
									160M**	323	42	470	1120	0	45	270	115	440	740	300	50	4	M2	190	190	3	6.7	921					
									160L*	345	42	470	1120	0	45	270	115	440	740	300	50	4	M2	190	190	3	6.7	1250					
									160L**	345	48	470	1120	0	45	270	115	440	740	300	50	4	M2	190	190	3	9.0	1168.5					
									180MA	351.5	48	470	1120	0	43	270	115	440	740	300	50	4	M2	190	190	3	9.0	1270					
									180M*	351.5	48	470	1120	0	43	270	115	440	740	300	50	4	M2	190	190	3	9.0	1242					
									180M**	351.5	55	470	1120	0	43	270	115	440	740	300	50	4	M2	190	190	3	13.9	1175					
									180L	370.5	55	470	1120	0	43	270	115	440	740	300	50	4	M2	190	190	3	13.9	1280					
									200LA	395.5	55	530	1250	10	67	317	130	490	840	250	63	4	M6	205	205	3	13.9	1368					
200L	395.5	55	530	1250	10	67	317	130	490	840	250	63	4	M6	205	205	3	13.9	1348.5														
225S	402	55	530	1250	10	69	342	130	490	840	250	63	4	M6	205	205	3	13.9	1365														
225MA	414.5	55	530	1250	10	69	342	130	490	840	250	63	4	M6	205	205	3	13.9	1409														
225M	414.5	55	530	1250	10	69	342	130	490	840	250	63	4	M6	205	205	3	13.9	1462.5														
250SA	463.5	60	530	1250	10	76	370	130	490	840	250	63	4	M6	205	205	4	21.0	1481.5														
250M	452.5	55	530	1250	10	76	370	130	490	840	250	63	4	M6	205	205	3	13.9	1526														
160M*	323	42	470	1120	0	52	317	100	440	740	300	50	4	M2	190	190	3	6.7	1206														
160M**	323	42	470	1120	0	52	317	100	440	740	300	50	4	M2	190	190	3	6.7	921														
160L*	345	42	470	1120	0	52	317	100	440	740	300	50	4	M2	190	190	3	6.7	1250														
160L**	345	48	470	1120	0	52	317	100	440	740	300	50	4	M2	190	190	3	9.0	1168.5														
180MA	351.5	48	470	1120	0	53	317	100	440	740	300	50	4	M2	190	190	3	9.0	1270														
180M*	351.5	48	470	1120	0	53	317	100	440	740	300	50	4	M2	190	190	3	9.0	1242														
180M**	351.5	55	470	1120	0	53	317	100	440	740	300	50	4	M2	190	190	3	13.9	1175														
180L	370.5	55	470	1120	0	53	317	100	440	740	300	50	4	M2	190	190	3	13.9	1280														
200LA	395.5	55	530	1250	10	74	342	115	490	840	250	63	4	M6	205	205	3	13.9	1368														
200L	395.5	55	530	1250	10	74	342	115	490	840	250	63	4	M6	205	205	3	13.9	1348.5														
225S	402	55	530	1250	10	65	342	115	490	840	250	63	4	M6	205	205	3	13.9	1365														
225MA	414.5	55	530	1250	10	65	342	115	490	840	250	63	4	M6	205	205	3	13.9	1409														
225M	414.5	55	530	1250	10	65	342	115	490	840	250	63	4	M6	205	205	3	13.9	1462.5														
250SA	463.5	60	530	1250	10	74	370	115	490	840	250	63	4	M6	205	205	4	21.0	1481.5														
250M	452.5	55	530	1250	10	74	370	115	490	840	250	63	4	M6	205	205	3	13.9	1526														

\*Motor frame is the same but shaft axle diameter (d2) is different.



# Dimension Chart

## Dimension Chart for 4P Motor Drive

Pump Sizes	Pump										Motor		Base Plate				Foundation Dimensions										Coupling				Refer.
	Bore		Dimension				Axle	Weight		Dimension																					
	DN1	DN2	a	f	h1	h2	d1	Grade L	Grade R	Frame	R	d2	b3	I3	A	Wt	h3	I	b2	I2	M	N	P	Q	V1	V2	I	Wt	TL		
	mm	mm	mm	mm	mm	mm	mm			---	mm	mm	mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
32-125 40-125	50	32	80	360	112	140	24	27	28	28	71M	120	14	320	670	0	27	202	45	290	420	200	50	4	M12	105	145	3	1.1	681	
	65	40	80	360	112	140	24	28	29		80M	140	19	320	670	0	27	202	45	290	420	200	50	4	M12	105	145	3	1.1	726	
											80M	140	19	320	670	0	27	202	45	290	420	200	50	4	M12	105	145	3	1.1	705	
32-160 40-160 65-125	50	32	80	360	132	160	24	28	30	31	71M	120	14	320	670	0	28	222	45	290	420	200	50	4	M12	105	145	3	1.1	681	
	65	40	80	360	132	160	24	30	31		80M	140	19	320	670	0	28	222	45	290	420	200	50	4	M12	105	145	3	1.1	726	
	80	65	100	360	132	180	24	31	33		90L	168.5	24	320	750	0	30	222	55	290	480	200	50	4	M12	115	155	3	1.1	776	
32-300 40-300 50-160 65-150	50	32	80	360	160	180	24	36	38		71M	120	14	320	670	0	30	250	45	290	420	200	50	4	M12	105	145	3	1.1	701	
	65	40	80	360	160	180	24	37	39		80M	140	19	320	670	0	30	250	45	290	420	200	50	4	M12	105	145	3	1.1	725	
	80	50	100	360	160	180	24	32	33		90L	168.5	24	320	750	0	33	250	55	290	480	200	50	4	M12	115	155	3	1.1	796	
50-200 65-190	80	50	100	360	160	200	24	34	36		100L	193	28	320	750	0	33	250	55	290	480	200	50	4	M12	115	155	3	1.6	838	
											123M	200	28	320	750	0	32	250	55	290	480	200	50	4	M12	115	155	3	1.9	855	
											80M	140	19	320	670	0	30	250	45	290	420	200	50	4	M12	105	145	3	1.1	725	
80-150	80	50	100	360	160	200	24	37	39		90L	168.5	24	320	750	0	33	250	55	290	480	200	50	4	M12	115	155	3	1.1	796	
											100L	193	28	320	750	0	33	250	55	290	480	200	50	4	M12	115	155	3	1.6	838	
											123M	200	28	320	750	0	32	250	55	290	480	200	50	4	M12	115	155	3	1.9	855	
80-150	100	80	100	470	160	200	32	47	49		123S	239	38	350	870	0	34	250	90	320	600	200	50	4	M12	150	120	3	3.2	917	
											90L	168.5	24	320	870	0	30	250	90	290	600	200	50	4	M12	150	120	3	3.2	906	
											100L	193	28	320	870	0	30	250	90	290	600	200	50	4	M12	150	120	3	3.2	948	
32-250 40-250 50-250 65-240 80-190	100	80	100	470	160	200	32	47	49		123M	200	28	320	870	0	29	250	90	290	600	200	50	4	M12	150	120	3	3.2	965	
											123S	239	38	350	1000	0	33	250	110	320	660	200	50	4	M12	170	170	3	3.2	1027	
											80M	140	19	380	870	0	38	270	75	350	600	200	50	4	M12	150	120	3	3.2	881	
32-250 40-250 50-250 65-240 80-190	50	32	100	470	180	225	32	49	51		80M	140	19	380	870	0	38	270	75	350	600	200	50	4	M12	150	120	3	3.2	931	
	65	40	100	470	180	225	32	50	53		100L	193	28	380	870	0	38	270	75	350	600	200	50	4	M12	150	120	3	3.2	973	
	80	50	100	470	180	225	32	52	54		123M	200	28	380	870	0	38	270	75	350	600	200	50	4	M12	150	120	3	3.2	990	
80-240 100-190	100	80	100	470	180	225	32	52	56		123S	239	38	430	1000	0	42	270	95	400	660	200	50	4	M12	170	170	3	3.2	1052	
											132M	258	38	430	1000	0	42	270	95	400	660	200	50	4	M12	170	170	3	3.2	1090	
											160M	323	42	470	1120	0	45	270	115	440	740	200	50	4	M12	190	190	3	6.7	1206	
80-240 100-190	100	80	100	470	200	250	32	63	62		100L	193	28	380	870	0	41	292	60	350	600	200	50	4	M12	150	120	3	3.2	973	
											123M	200	28	380	870	0	41	292	60	350	600	200	50	4	M12	150	120	3	3.2	990	
											123S	239	38	430	1000	0	46	292	80	400	660	200	50	4	M12	170	170	3	3.2	1052	
50-315	100	80	100	470	200	280	32	64	67		123M	258	38	430	1000	0	46	292	80	400	660	200	50	4	M12	170	170	3	3.2	1090	
											160M	323	42	470	1120	0	49	292	100	440	740	200	50	4	M12	190	190	3	6.7	1206	
											160L	345	42	470	1120	0	49	292	100	440	740	200	50	4	M12	190	190	3	6.7	1250	
50-315	80	50	100	470	225	280	32	70	71		100L	193	28	380	870	0	38	315	75	350	600	200	50	4	M12	150	120	3	3.2	948	
											123M	200	28	380	870	0	42	315	75	350	600	200	50	4	M12	150	120	3	3.2	965	
											123S	239	38	430	1000	0	46	315	95	400	660	200	50	4	M12	170	170	3	3.2	1027	
100-245 100-250 65-310 80-320	125	100	125	470	225	280	32	72	75		123M	258	38	430	1000	0	46	315	95	400	660	200	50	4	M12	170	170	3	3.2	1065	
	65	40	80	470	225	280	32	76	72		160M	323	42	470	1120	0	51	315	115	440	740	200	50	4	M12	190	190	3	6.7	1181	
	80	50	100	470	225	280	32	70	71		160L	345	42	470	1120	0	51	315	115	440	740	200	50	4	M12	190	190	3	6.7	1225	
100-245 100-250 65-310 80-320	125	100	125	470	225	280	32	71	75		123M	258	38	430	1000	0	49	317	60	400	660	200	50	4	M12	150	120	3	3.2	990	
											123S	239	38	430	1000	0	49	317	80	400	660	200	50	4	M12	150	120	3	3.2	1052	
											132M	258	38	430	1000	0	49	317	80	400	660	200	50	4	M12	170	170	3	3.2	1090	
100-245 100-250 65-310 80-320	125	100	125	470	225	280	32	71	75		160M	323	42	470	1120	0	52	317	100	440	740	200	50	4	M12	190	190	3	6.7	1206	
											160L	345	42	470	1120	0	52	317	100	440	740	200	50	4	M12	190	190	3	6.7	1250	
											100L	193	28	380	870	0	38	315	75	350	600	200	50	4	M12	150	120	3	3.2	948	
100-245 100-250 65-310 80-320	125	100	125	470	225	280	32	72	76		123M	258	38	430	1000	0	46	315	95	400	660	200	50	4	M12	170	170	3	3.2	1027	
											123S	239	38	430	1000	0	46	315	95	400	660	200	50	4	M12	170	170	3	3.2	1065	
											160M	323	42	470	1120	0	51	315	115	440	740	200	50	4	M12	190	190	3	6.7	1181	
100-245 100-250 65-310 80-320	125	100	125	470	225	280	32	72	76		160L	345	42	470	1120	0	51	315	115	440	740	200	50	4	M12	190	190	3	6.7	1225	
											123M	258	38	430	1000	0	49	317	60	400	660	200	50	4	M12	150	120	3	3.2	990	
											123S	239	38	430	1000	0	49	317	80	400	660	200	50	4	M12	150	120	3	3.2	1052	
100-245 100-250 65-310 80-320	125	100	125	470	225	280	32	71	75		132M	258	38	430	1000	0	49	317	80	400	660	200	50	4	M12	170	170	3	3.2	1090	
											160M	323	42	470	1120	0	52	317	100	440	740	200	50	4	M12	190	190	3	6.7	1206	
											160L	345	42	470	1120	0	52	317	100	440	740	200	50	4							

\*Motor frame is the same but shaft axle diameter (d2) is different.

Pump Sizes	Pump										Motor		Base Plate						Foundation Dimensions										Coupling			Refer.	
	Bore		Dimension				Axle		Weight		Frame	Dimension		Base Plate						Foundation Dimensions										Coupling			
	DN1	DN2	a	f	h1	h2	d1	Grade L	Grade R	R		d2	b3	I3	A	Wt	h3	I	b2	I2	M	N	P	Q	V1	V2	I	Wt	TL				
	mm	mm	mm	mm	mm	mm	mm			mm		mm	mm	mm	mm	kg	mm	mm	mm	mm	mm	mm	mm			mm	mm	mm	kg	mm			
100-320	125	100	125	470	250	315	32	81	91	180LC	370.5	48	470	1120	0	56	342	100	440	740	200	50	4	M12	190	190	3	9.0	1308				
										180L*	370.5	55	470	1120	0	56	342	100	440	740	200	50	4	M12	190	190	3	13.9	1280				
										180L**	400.5	60	470	1250	10	66	367	115	430	840	250	63	4	M16	205	205	4	21.0	1272				
										200LC	395.5	55	530	1250	10	75	367	115	490	840	250	63	4	M16	205	205	3	13.9	1368				
										200L*	395.5	55	530	1250	10	75	367	115	490	840	250	63	4	M16	205	205	3	13.9	1394				
										200L**	425.5	60	530	1250	10	75	367	115	490	840	250	63	4	M16	205	205	4	21.0	1380				
										225SC	432	60	530	1250	10	75	367	115	490	840	250	63	4	M16	205	205	4	21.0	1415				
										225S*	432	60	530	1250	10	75	367	115	490	840	250	63	4	M16	205	205	4	21.0	1417				
										225S**	432	65	530	1250	10	75	367	115	490	840	250	63	4	M16	205	205	4	21.0	1397				
										112M	200	28	430	870	0	46	342	60	400	660	200	50	4	M12	150	120	3	5.4	1004.5				
										132S	239	38	430	1000	0	51	342	80	400	660	200	50	4	M12	170	170	3	5.4	1067				
										132M	258	38	430	1000	0	51	342	80	400	660	200	50	4	M12	170	170	3	5.4	1105				
160M	323	42	470	1120	0	56	342	100	440	740	200	50	4	M12	190	190	3	6.7	1221														
160L*	345	42	470	1120	0	56	342	100	440	740	200	50	4	M12	190	190	3	6.7	1265														
160L**	345	48	470	1120	0	56	342	100	440	740	200	50	4	M12	190	190	3	9.0	1183.5														
180MC	351.5	48	470	1120	0	56	342	100	440	740	200	50	4	M12	190	190	3	9.0	1285														
180M*	351.5	48	470	1120	0	56	342	100	440	740	200	50	4	M12	190	190	3	9.0	1287														
180M**	351.5	55	470	1120	0	56	342	100	440	740	200	50	4	M12	190	190	3	13.9	1198														
180L*	370.5	48	470	1120	0	56	342	100	440	740	200	50	4	M12	190	190	3	9.0	1322														
180L**	370.5	55	470	1120	0	56	342	100	440	740	200	50	4	M12	190	190	3	13.9	1295														
180L**	400.5	60	470	1250	10	66	367	115	430	840	250	63	4	M16	205	205	4	21.0	1287														
200LC	395.5	55	530	1250	10	75	367	115	490	840	250	63	4	M16	205	205	3	13.9	1383														
200L*	396	55	530	1250	10	75	367	115	490	840	250	63	4	M16	205	205	3	13.9	1408.5														
200L**	425.5	60	530	1250	10	75	367	115	490	840	250	63	4	M16	205	205	4	21.0	1394.5														
225SC	432	60	530	1250	10	75	367	115	490	840	250	63	4	M16	205	205	4	21.0	1430														
225S*	432	60	530	1250	10	75	367	115	490	840	250	63	4	M16	205	205	4	21.0	1486														
225S**	432	65	530	1250	10	75	367	115	490	840	250	63	4	M16	205	205	4	21.0	1411														
80-400	100	80	125	470	280	355	42	128	128	132S	239	38	510	1000	0	60	372	80	480	660	200	50	4	M12	170	170	3	5.4	1052				
										132M	258	38	510	1000	0	60	372	80	480	660	200	50	4	M12	170	170	3	5.4	1090				
										160M	323	42	530	1250	10	77	397	115	490	840	250	63	4	M16	205	205	3	6.7	1206				
										160L*	345	42	530	1250	10	77	397	115	490	840	250	63	4	M16	205	205	3	6.7	1250				
										160L**	345	48	530	1250	10	77	397	115	490	840	250	63	4	M16	205	205	3	9.0	1168.5				
										180MC	351.5	48	530	1250	10	77	397	115	490	840	250	63	4	M16	205	205	3	9.0	1270				
										180M*	351.5	48	530	1250	10	77	397	115	490	840	250	63	4	M16	205	205	3	9.0	1242				
										180M**	351.5	55	530	1250	10	77	397	115	490	840	250	63	4	M16	205	205	3	13.9	1183				
										180L*	370.5	48	530	1250	10	77	397	115	490	840	250	63	4	M16	205	205	3	9.0	1308				
										180L**	370.5	55	530	1250	10	77	397	115	490	840	250	63	4	M16	205	205	3	13.9	1280				
										180L**	400.5	60	530	1250	10	77	397	115	490	840	250	63	4	M16	205	205	4	21.0	1272				
										200LC	395.5	55	590	1400	10	89	397	140	550	940	250	63	4	M16	230	230	3	13.9	1368				
200L*	395.5	55	590	1400	10	89	397	140	550	940	250	63	4	M16	230	230	3	13.9	1393.5														
200L**	425.5	60	590	1400	10	89	397	140	550	940	250	63	4	M16	230	230	4	21.0	1379.5														
225SC	432	60	590	1400	10	92	397	140	550	940	250	63	4	M16	230	230	4	21.0	1411														
225S*	432	60	590	1400	10	92	397	140	550	940	250	63	4	M16	230	230	4	21.0	1471														
225S**	432	65	590	1400	10	92	397	140	550	940	250	63	4	M16	230	230	4	21.0	1396														
160L*	345	42	530	1250	10	81	400	95	490	840	250	63	4	M16	205	205	3	6.7	1325														
160L**	345	48	530	1250	10	81	400	95	490	840	250	63	4	M16	205	205	3	9.0	1243.5														
180MC	351.5	48	530	1250	10	80	400	95	490	840	250	63	4	M16	205	205	3	9.0	1345														
180M*	351.5	48	530	1250	10	80	400	95	490	840	250	63	4	M16	205	205	3	9.0	1317														
180M**	351.5	55	530	1250	10	80	400	95	490	840	250	63	4	M16	205	205	3	13.9	1258														
180LC	370.5	48	530	1250	10	80	400	95	490	840	250	63	4	M16	205	205	3	9.0	1383														
180L*	370.5	55	530	1250	10	80	400	95	490	840	250	63	4	M16	205	205	3	13.9	1355														
180L**	400.5	60	530	1250	10	80	400	95	490	840	250	63	4	M16	205	205	4	21.0	1347														
200M	406.5	65	590	1400	10	91	400	120	550	940	250	63	4	M16	230	230	4	21.0	1381.5														
200LC	395.5	55	590	1400	10	91	400	120	550	940	250	63	4	M16	230	230	3	13.9	1443.5														
200L*	395.5	55	590	1400	10	91	400	120	550	940	250	63	4	M16	230	230	3	13.9	1468														
200L**	425.5	60	590	1400	10	91	400	120	550	940	250	63	4	M16	230	230	4	21.0	1454.5														
225SC	432	60	590	1400	10	87	400	120	550	940	250	63	4	M16	230	230	4	21.0	1490														
225S*	432	60	590	1400	10	87	400	120	550	940	250	63	4	M16	230	230	4	21.0	1546														
225S**	432	65	590	1400	10	87	400	120	550	940	250	63	4	M16	230	230	4	21.0	1471														
225MC	444.5	60	590	1400	10	87	400	120	550	940	250	63	4	M16	230	230	4	21.0	1515														
225M	444.5	60	590	1400	10	87	400	120	550	940	250	63	4	M16	230	230	4	21.0	1568.5														
250SC	463.5	70	590	1400	10	87	400	120	550	940	250	63	4	M16	230	230	4	31.0	1556.5														
250M*	482.5	65	590	1400	10	87	400	120	550	940	250	63	4	M16	230	230	4	21.0	1607.5														
250M**	482.5	75	590	1400	10	87	400	120	550	940	250	63	4	M16	230	230	4	31.0	1635														



# Dimension Chart

Dimension Chart for 4P Motor Drive (continuation)

Pump Sizes	Pump						Motor		Base Plate				Foundation Dimensions												Coupling		Refer		
	Bore		Dimension				Grade	Weight	Frame	Dimension			A	Wt.	h3	i	b2	I2	M	N	P	Q	V1	V2	I	Wt.	TL		
	DN1	DN2	a	f	h1	h2				d1	R	d2																b3	I3
	mm	mm	mm	mm	mm	mm	mm	kg	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
125-400 200-240 200-250	150 200 200	125 200 200	140 160 160	530 530 530	315 315 315	400 400 400	42 42 42	165 158 158	182 174 174	160L	345	48	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	3	9.0	1263.5
										180MC	351.5	48	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	3	9.0	1365
										180M*	351.5	48	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	3	9.0	1337
										180M**	351.5	55	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	3	13.9	1278
										180LC	370.5	48	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	3	9.0	1403
										180L*	370.5	55	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	3	13.9	1375
										180L**	400.5	60	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	4	21.0	1367
										200M	406.5	65	590	1400	10	99	435	120	550	940	250	63	4	M16	230	230	4	21.0	1401.5
										200LC	395.5	55	590	1400	10	99	435	120	550	940	250	63	4	M16	230	230	3	13.9	1463
										200L*	395.5	55	590	1400	10	99	435	120	550	940	250	63	4	M16	230	230	3	13.9	1488.5
										200L**	425.5	60	590	1400	10	99	435	120	550	940	250	63	4	M16	230	230	4	21.0	1474.5
										225SC	432	60	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	21.0	1510
										225S*	432	60	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	21.0	1566
										225S**	432	65	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	21.0	1491
										225M**	432	75	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	31.0	1551
										225MC	444.5	60	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	21.0	1535
										225M*	444.5	60	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	21.0	1588.5
										225M**	444.5	75	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	31.0	1551
										250SC	463.5	70	640	1400	10	99	435	120	600	940	250	63	4	M16	230	230	4	31.0	1576.5
										250S*	463.5	75	640	1400	10	99	435	120	600	940	250	63	4	M16	230	230	4	31.0	1574
										250M*	482.5	70	640	1400	10	99	435	120	600	940	250	63	4	M16	230	230	4	31.0	1614.5
										250M**	482.5	65	640	1400	10	99	435	120	600	940	250	63	4	M16	230	230	4	21.0	1627.5
										250M**	482.5	75	640	1400	10	99	435	120	600	940	250	63	4	M16	230	230	4	31.0	1632
										280SB	544	80	710	1600	10	109	435	160	670	1060	250	63	4	M16	270	270	4	45.0	1765.5
										280S*	514	75	710	1600	10	109	435	160	670	1060	250	63	4	M16	270	270	4	31.0	1718.5
										280M*	539.5	75	710	1600	10	109	435	160	670	1060	250	63	4	M16	270	270	4	31.0	1769.5
										280M**	569.5	85	710	1600	10	109	435	160	670	1060	250	63	4	M16	270	270	4	45.0	1777
150-310 150-315 150-330 150-400	200 200 200 200	150 160 160 160	530 530 530 530	315 315 315 315	400 400 400 450	48 48 48 48	188 188 204 204	198 198 217 217	180MC	351.5	48	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	3	9.0	1365	
									180M*	351.5	48	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	3	9.0	1337	
									180M**	351.5	55	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	3	13.9	1278	
									180LC	370.5	48	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	3	9.0	1403	
									180L*	370.5	55	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	3	13.9	1375	
									180L**	400.5	60	590	1250	10	90	435	95	550	840	250	63	4	M16	205	205	4	21.0	1367	
									200M	406.5	65	590	1400	10	99	435	120	550	940	250	63	4	M16	230	230	4	21.0	1401.5	
									200LC	395.5	55	590	1400	10	99	435	120	550	940	250	63	4	M16	230	230	3	13.9	1463	
									200L*	395.5	55	590	1400	10	99	435	120	550	940	250	63	4	M16	230	230	3	13.9	1488.5	
									200L**	425.5	60	590	1400	10	99	435	120	550	940	250	63	4	M16	230	230	4	21.0	1474.5	
									225SC	432	60	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	21.0	1510	
									225S*	432	60	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	21.0	1566	
									225S**	432	65	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	21.0	1491	
									225M**	432	75	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	31.0	1551	
									225MC	444.5	60	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	21.0	1535	
									225M*	444.5	60	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	21.0	1588.5	
									225M**	444.5	75	590	1400	10	95	435	120	550	940	250	63	4	M16	230	230	4	31.0	1551	
250SC	463.5	70	640	1400	10	99	435	120	600	940	250	63	4	M16	230	230	4	31.0	1576.5										
250S*	463.5	75	640	1400	10	99	435	120	600	940	250	63	4	M16	230	230	4	31.0	1574										
250M*	482.5	70	640	1400	10	99	435	120	600	940	250	63	4	M16	230	230	4	31.0	1614.5										
250M**	482.5	65	640	1400	10	99	435	120	600	940	250	63	4	M16	230	230	4	21.0	1627.5										
250M**	482.5	75	640	1400	10	99	435	120	600	940	250	63	4	M16	230	230	4	31.0	1632										
280SB	544	80	710	1600	10	109	435	160	670	1060	250	63	4	M16	270	270	4	45.0	1765.5										
280S*	514	75	710	1600	10	109	435	160	670	1060	250	63	4	M16	270	270	4	31.0	1718.5										
280M*	544	85	710	1600	10	109	435	160	670	1060	250	63	4	M16	270	270	4	45.0	1726										
280MB	569.5	80	710	1600	10	109	435	160	670	1060	250	63	4	M16	270	270	4	45.0	1816										
280M*	539.5	75	710	1600	10	109	435	160	670	1060	250	63	4	M16	270	270	4	31.0	1769.5										
280M**	569.5	85	710	1600	10	109	435	160	670	1060	250	63	4	M16	270	270	4	45.0	1777										
315SB	589	85	710	1600	10	109	445	160	670	1060	250	63	4	M16	270	270	4	61.0	1835										