



Line Shaft Turbine Pumps VT series

5"-20"

Flow range: up to 1,500 m³/h

Including
VT Series Gearbox & Motors



www.sterlingpumps.com.au

VT series

5" through to 18" Line Shaft Turbine Pumps

The Sterling VT series of Vertical Line Shaft Vertical Turbine Pumps are a broad family of engineered pumps offering reliable and efficient pumping of large volume liquids used for irrigation, agriculture, Oil & Gas, chemicals, fuels, sea water, fire protection and industrial pumping applications moving liquid from wells, tanks or natural basins.



- 5" up to 55 m³/h
- 6" up to 95 m³/h
- 7" up to 160 m³/h
- 8" up to 280 m³/h
- 10" up to 500 m³/h
- 12" up to 850 m³/h
- 14" up to 1,150 m³/h
- 16" up to 1,000 m³/h
- 18" up to 1,450 m³/h

Material options

- Cast Iron
- 316 Stainless Steel
- Zinc Free Bronze
- Carbon Steel
- Nickel Aluminium Bronze
- Duplex Stainless Steel
- Super Duplex Stainless Steel
- Inconel 625
- Zeron 100

Nomenclature-Ordering

- VT = Series
- 18 = Nominal pump bowl diameter
- CA =...Impeller trims combination
- 1750 =...Nominal speed
- 3 = Number of stages



Applications



- Fire Pumps according to AS2041 and NFPA20
- Irrigation
 - From rivers
 - Dams
 - Sumps/pits
- Agricultural
 - Flood control
 - Lift irrigation
- Condensate Pumps
- Chemical Pumps
- Aviation Fuels
- Mine dewatering
- Mineral processing
- Processing water
- Sea Water Lift Pumps
- Power station cooling water
- Drainage and Sewage pump stations

Features

- All Sterling Pumps are 100% factory tested
- Stainless Steel 431 shafts
- Fluted phenolic resin coated NBR bearings for efficient water lubrication and sand handling capabilities
- Due to the diverse range of liquids being pumped, operating temperatures and site specifications, many materials such as elastomers, bearings, impellers and shafts are matched to suit your pumping application
- Can be supplied fitted with:
 - Electric motors: 2, 4 or 8 pole
 - Diesel driven pump sets via right angle gearboxes or drive shaft
 - Solar power with hybrid inverters
- Fabricated head works and discharge pipework available
 - Mild steel, stainless steel or other to suit
- Mixed flow (MX series) available
- Axial flow (AX series) available
- Water lubricated column design (Generally clean water applications)
- Oil lubricated column design with oil drip feeder tank (Usually for sandy or aggressive water applications)
- Non Reverse Ratchet assembly fitted and high capacity thrust bearings
- Optional inlet screen-strainer in various style



Larger Vertical Line Shaft Turbines, 20" up to 90"

The models shown in this brochure represent a general offering of the broad range of Line Shaft Turbine Pumps that Sterling Pumps manufacture regularly.

Our Vertical Line Shaft Turbine range is also available up to 90" diameter with flows up to 40,000 m³/h

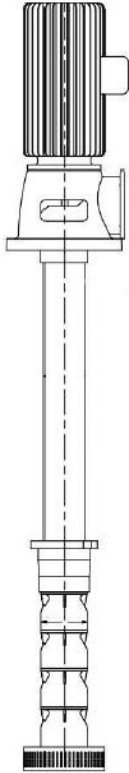


Line Shaft Column

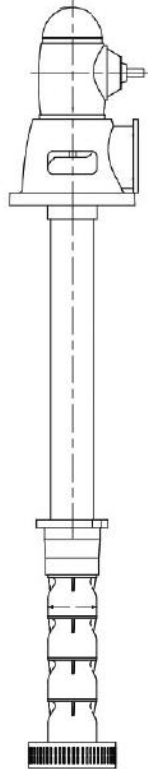
- Water lubricated
- Oil lubricated
- Carbon steel
- 304 Stainless Steel
- Special materials
- Threaded connections
- Flanged connections
- 3 metre lengths
- 3 metre or 1.5 metre length bearing centres
- 431 SS shafts
- Bronze bearing retainers
- Fluted NBR bearings
- Rubber centraliser for oil tube



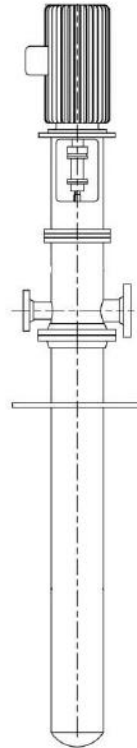
Electric Motor Drive Turbine



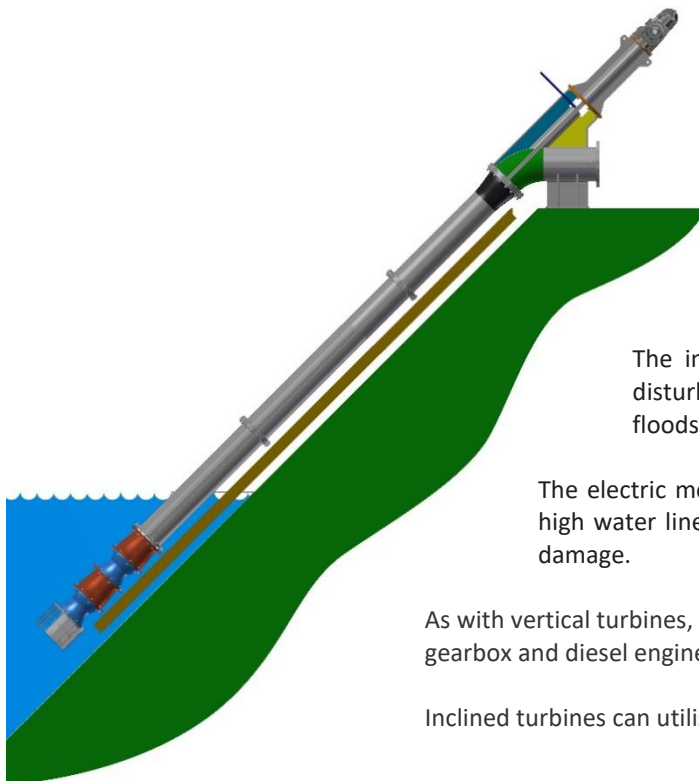
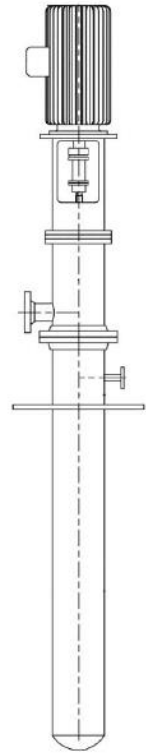
RA Gearbox Drive Turbine



Canned Turbine



Booster Turbine



Inclined Turbine

Sterling Line Shaft Turbines can be installed to obtain water from rivers, dams, and large pond applications. Mounted on fixed foundations, or a channel or rail type frame to enable the pump to be raised or lowered into the most efficient water drawing position.

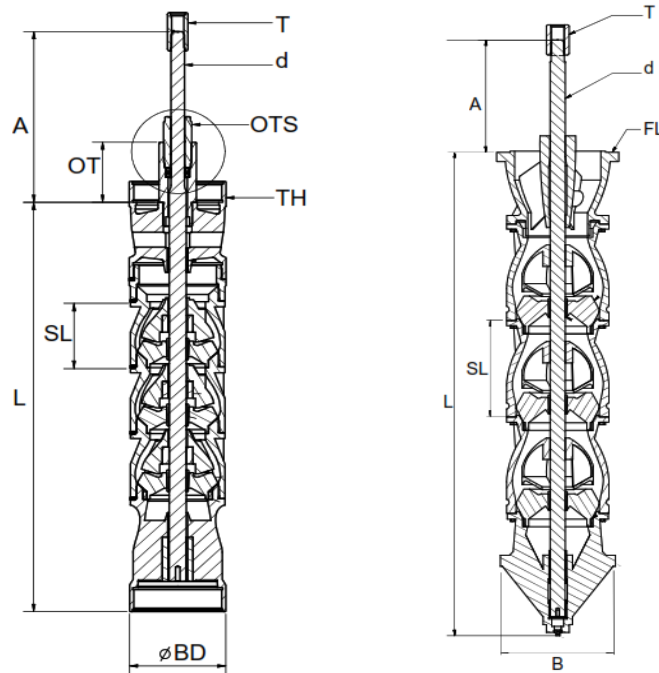
The inclined design allows for minimal bank and ground disturbance. The turbine can also be easily removed during floods or for servicing.

The electric motor or diesel engine can also be mounted above the high water line or flood levels to maximize usage and minimize any damage.

As with vertical turbines, an inclined turbine can be electrically driven, or via a gearbox and diesel engine.

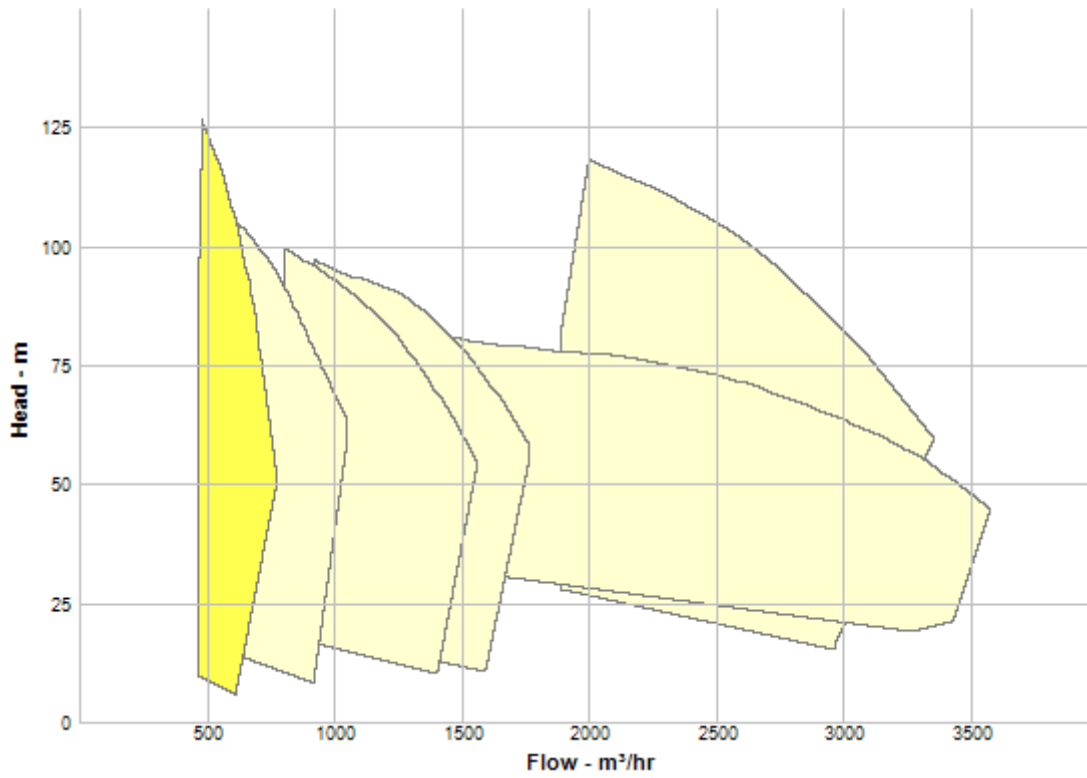
Inclined turbines can utilise either water lube or oil lube column assemblies.

VT Technical Data

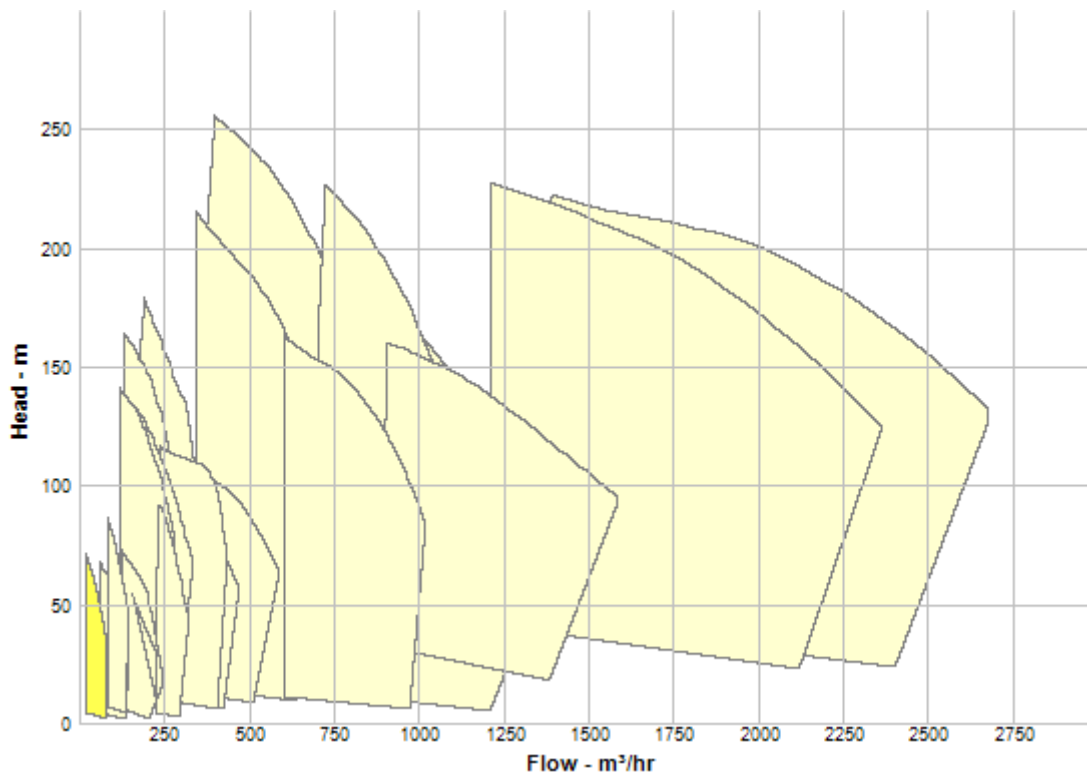


Model	Pump series	Shaft extension A	Shaft Size d	Shaft Thread T	Discharge thread size TH	Discharge Flange Size FL	Bowl Diameter BD	Bell diameter B	Oil tube extension OT	Oil tube size OTS	First stage length L	additional stage length SL	weight first stage	weight additional stage
VT-5	125	355mm	1"	1"	4"	4"	125mm	-	-	-	337mm	91mm	22kg	6kg
VT-6	150	355mm	1"	1"	4"	4"	136mm	-	125mm	1½"	414.4mm	105.3mm	24kg	7kg
VT-7	180	355mm	1¼"	1¼"	4"	4"	180mm	-	125mm	2"	444.0mm	133.6mm	54kg	16kg
VT-8	190	355mm	1¼"	1¼"	6"	6"	190mm	-	125mm	2"	500mm	200mm	62kg	19kg
VT-8	200	355mm	1¼"	1¼"	4", 6"	4", 6"	190mm	-	125mm	2"	456.5mm	152.5mm	59kg	18.2kg
VT-10	240	355mm	1½"	1½"	6", 8"	6", 8"	238mm	-	125mm	2½"	490mm	165.3mm	73kg	34kg
VT-10	250	355mm	1½"	1½"	8"	8"	248mm	-	125mm	3"	902mm	222mm	81kg	38kg
VT-12	300R/H	355mm	1¾"	1¾"	8", 10"	8", 10"	295mm	330mm	125mm	3"	923mm	298.5mm	125kg	46kg
VT-12	300GM	355mm	2¾"	1½"- 2¾"	8", 10"	8", 10"	295mm	355mm	125mm	2½"	686mm	268mm	148kg	59kg
VT-14	340	355mm	1 ¹⁵ / ₁₆ "	-	10"	10"	338mm	406mm	125mm	3"	700mm	228.6mm	227kg	73kg
VT-14	350	355mm	2"	-	10", 12"	10", 12"	344mm	..	125mm	3½"	738mm	313mm	270kg	110kg
VT-16	400	355mm	2¼"	-	-	10", 12", 14"	394mm	457mm	125mm	3¾"	932mm	354mm	295kg	127kg
VT-18	450TM	355mm	1 ¹⁵ / ₁₆ "	-	-	12", 14"	451mm	531mm	125mm	3¾"	498mm	368mm	296kg	139kg
VT-18	450NKL	355mm	2"	-	-	12", 14"	435mm	435mm	125mm	3¾"	1040mm	418mm	380kg	180kg
VT-18	450D	355mm	2¼"	-	-	12", 14"	440mm	508mm	125mm	3¾"	948mm	318mm	318kg	136kg
VT-20	500	355mm	2¾"	-	-	14", 16"	501mm	563mm	125mm	3¾"	1068mm	365.5mm	454kg	193kg

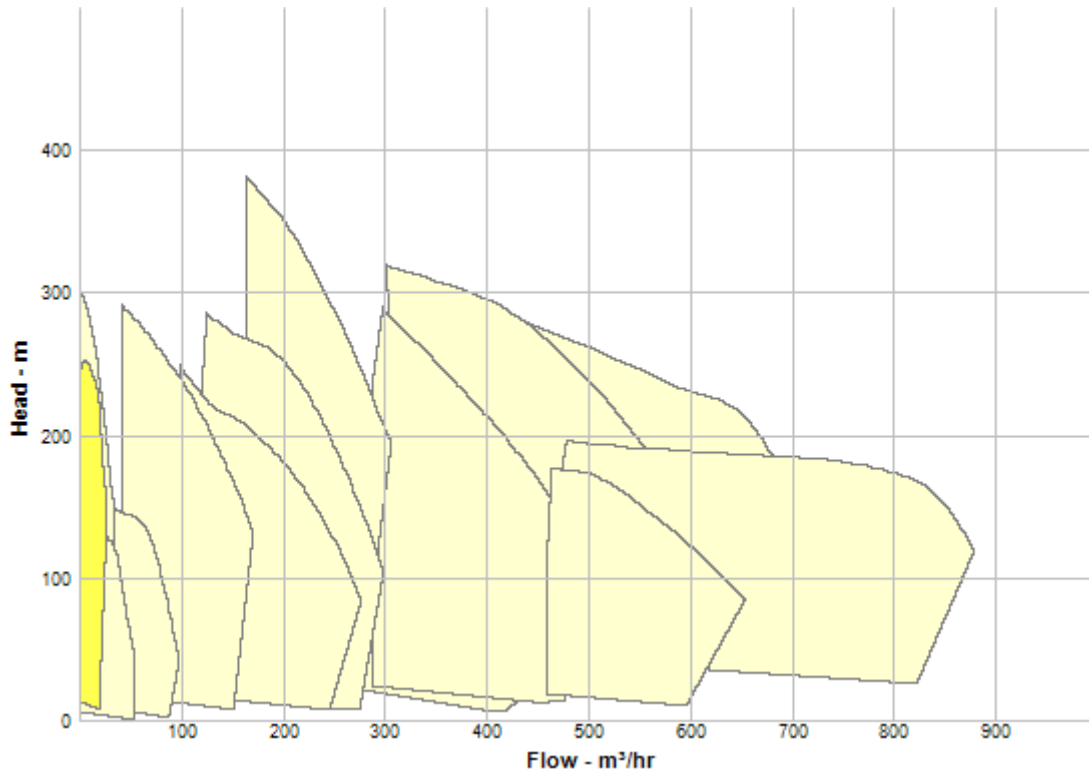
Performance Coverage Chart 1000RPM



Performance Coverage Chart 1500RPM

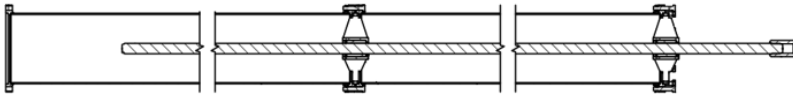


Performance Coverage Chart 3000RPM

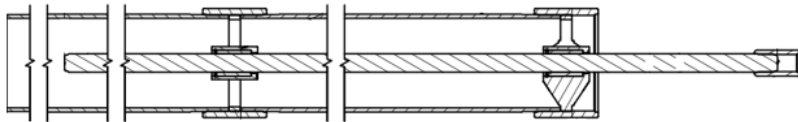


Water Lube Column

Water Lube Column Flanged



Water Lube Column Threaded



Line Shaft Size (inches)	Column Nominal Size Diameter	Column Length (metres)	Bearing Centres (metres) (refer to speed node)		Flanged		Threaded		
					Carbon Steel or 304SS		Carbon Steel or 304SS		
					Pipe	Flange OD (mm)	Pipe	Collar OD (mm)	Thread
1"	4"	3m	3m	1.5m	Sch 40 CS Sch 10 SS	160	Sch 40	127	8 TPI
	6"					235		188	
	8"					270		250	
1-1/4"	4"	3m	3m	1.5m	Sch 40 CS Sch 10 SS	160	Sch 40	127	8 TPI
	6"					235		188	
	8"					270		250	
	10"					336		295	
	12"					412		360	
1-1/2"	6"	3m	3m	1.5m	Sch 40 CS Sch 10 SS	235	Sch 40	188	8 TPI
	8"					270		250	
	10"					336		295	
	12"					412		360	
	14"					440		n/a	
	16"					580		n/a	
1-1 3/4"	6"	3m	3m	1.5m	Sch 40 CS Sch 10 SS	235	Sch 40	188	8 TPI
	8"					270		250	
	10"					336		295	
	12"					412		360	
	14"					440		n/a	
	16"					580		n/a	
	18"					640		n/a	

Notes for all column:

Shaft couplings are bronze or 431SS
 Bearing retainers are 316SS
 Shaft material is 431SS

Carbon steel threaded column collar is carbon steel
 304SS threaded column collar is 316SS
 TPI =- Threads Per Inch

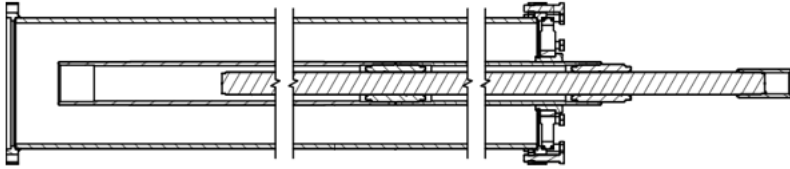
Pumps above 2,200 rpm may use 3 metre or 1.5 metre bearing centre column (flanged from February 2019, threaded from July 2020)

Pumps below 2,200 rpm may use 3 metre bearing centre column

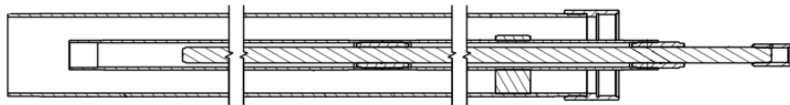
Carbon steel external surfaces are painted in bituminous black paint for corrosion resistance. Threaded columns use industry standard thread pitch, right hand. Left hand available as an option

Oil Lube Column

Oil Lube Column Flanged



Oil Lube Column Threaded



Line Shaft Size (inches)	Oil Lube Tube (inches)	Column Nominal Size Diameter	Column Length (metres)	Bearing Centres (metres)
1"	2"	4"	3m	1.5m
		6"		
		8"		

Flanged Carbon Steel or 304SS	
Pipe	Flange OD (mm)
Sch 40 CS Sch 10 SS	160
	235
	270

Threaded Carbon Steel or 304SS		
Pipe	Collar OD (mm)	Thread
Sch 40	127	8 TPI
	188	
	250	

1-1¼"	2"	4"	3m	1.5m
		6"		
		8"		
		10"		
		12"		

Sch 40 CS Sch 10 SS	160
	235
	270
	336
	412

Sch 40	127	8 TPI
	188	
	250	
	295	
	360	

1-1½"	2-2½"	6"	3m	1.5m
		8"		
		10"		
		12"		
		14"		
		16"		

Sch 40 CS Sch 10 SS	235
	270
	336
	412
	440
	580

Sch 40	188	8 TPI
	250	
	295	
	360	
	n/a	
	n/a	

1-1¾"	3"	6"	3m	1.5m
		8"		
		10"		
		12"		
		14"		
		16"		
		18"		

Sch 40 CS Sch 10 SS	235
	270
	336
	412
	440
	580
	640

Sch 40	188	8 TPI
	250	
	295	
	360	
	n/a	
	n/a	
	n/a	

Notes for all column:

Shaft couplings are steel or 431SS
 Bearing are bronze
 Shaft material is 431SS

Carbon steel threaded column collar is carbon steel
 304SS threaded column collar is 316SS/bronze
 TPI = Threads Per Inch

For vertical installations, install Oil Tube Stabiliser (centraliser) at least one (1) every 12 metres.

For inclined/angled installations, install Oil Tube Stabiliser (centraliser) every 3 metres

Carbon steel column and Oil Tube external surfaces are painted in bituminous black paint for corrosion resistance.

Threaded columns use industry standard thread pitch, right hand. Left hand available as an option

Conversion Charts

Multiplier	Unit	Volume Flow Rate - Capacity									
1	m ³ /h	5	10	20	30	40	50	60	70	80	90
24	m ³ /day	120	240	480	720	960	1,120	1,440	1,680	1,920	2,160
0.277778	L/S	1.4	2.8	5.6	803	11.1	13.9	16.7	19.4	22.2	25.0
16.6667	LPM	83	167	333	500	667	833	1,000	1,167	1,333	1,500
3.66615	IGPM	18	37	73	110	147	183	220	257	293	330
4.40287	USGPM	22	44	88	132	176	220	264	308	352	396
0.001	ML/hr	0.005	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.024	ML/day	0.12	0.24	0.48	0.72	0.96	1.2	1.44	1.68	1.92	2.16

Multiplier	Unit	Volume Flow Rate - Capacity									
1	m ³ /h	100	200	300	400	500	600	700	800	900	1,000
24	m ³ /day	2,400	4,800	7,200	9,600	12,000	14,400	16,800	19,200	21,600	24,000
0.277778	L/S	27.8	55.6	83.3	111.1	138.9	166.7	194.4	222.2	250.0	277.8
16.6667	LPM	1,667	3,333	5,000	6,667	8,333	10,000	11,667	13,333	15,000	16,667
3.66615	IGPM	367	733	1,100	1,466	1,833	2,200	2,566	2,933	3,300	3,666
4.40287	USGPM	440	881	1,321	1,761	2,201	2,642	3,082	3,522	3,963	4,403
0.001	ML/hr	0.1	0.2	0.32	0.4	0.5	0.6	0.7	0.8	0.9	1
0.024	ML/day	2.4	4.8	7.2	9.6	12	14.4	16.8	19.2	21.6	24

Multiplier	Unit	Volume Flow Rate - Capacity									
1	m ³ /h	1,100	1,200	1,400	1,600	1,800	2,000	2,500	3,000	3,500	4,000
24	m ³ /day	26,400	28,800	33,600	38,400	43,200	48,000	60,000	72,000	84,000	96,000
0.277778	L/S	306	333	389	444	500	556	694	833	972	1,111
16.6667	LPM	18,333	20,000	23,333	26,667	30,000	33,333	41,667	50,000	58,333	66,667
3.66615	IGPM	4,033	4,399	5,133	5,866	6,599	7,332	9,165	10,998	12,832	14,665
4.40287	USGPM	4,843	5,283	6,164	7,045	7,925	8,806	11,007	13,209	15,410	17,611
0.001	ML/hr	1.1	1.2	1.4	1.6	1.8	2	2.5	3	3.5	4
0.024	ML/day	26.4	28.8	33.6	38.4	43.2	48	60	72	84	96

Multiplier	Unit	Pressure									
1	PSI	10	20	30	40	50	75	100	125	150	200
6.89476	kPa	69	138	207	276	345	517	689	862	1,034	1,379
0.0689476	Bar	0.7	1.4	2.1	2.8	3.4	5.2	6.9	8.6	10.3	13.8
7.032496	m Head	70	141	211	281	352	527	703	879	1,055	1,406
23.066587	Ft Head	231	461	692	923	1,153	1,730	2,307	2,883	3,460	4,613

Multiplier	Unit	Pressure									
1	PSI	250	300	350	400	450	550	600	650	700	750
6.89476	kPa	1,724	2,068	2,413	2,758	3,103	3,792	4,137	4,482	4,826	5,171
0.0689476	Bar	17.2	20.7	24.1	27.6	31.0	37.9	41.4	44.8	48.3	51.7
7.032496	m Head	1,758	2,110	2,461	2,813	3,165	3,868	4,219	4,571	4,923	5,274
23.066587	Ft Head	5,767	6,920	8,073	9,227	10,380	12,687	13,840	14,993	16,147	17,300

Minimum Submergence

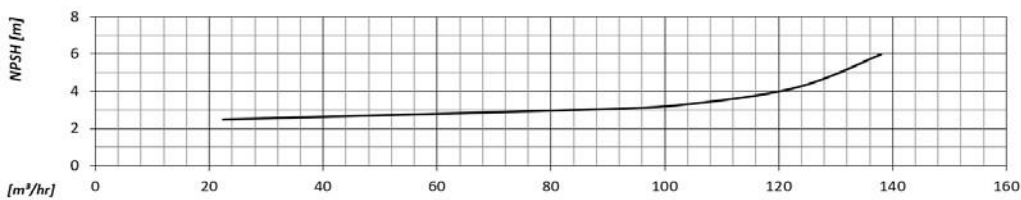
A submersible borehole/well pump must be submerged at all times.

The pump suction intake must be sufficiently submerged to prevent cavitation and avoid the formation of vortices being created on the liquid being pumped.

When a vortex forms, this can cause air to mix with the water being pumped, causing possible cavitation and reduce the pump capacity and can lead to internal damage of the impellers and bowls.

To avoid free surface vortex formation, you would use the minimum submergence figure recommended by the manufacturer in their charts.

An approximate way to determine the submergence value for a submersible turbine pumps can be based from the NPSH curve;



Identify the flow rate you require and go up the graph to the NPSH curve/line.

Examples:

At the nominal flow rate of 80 m³/h the NPSH is 3 metres.

Now use the 3 metres and subtract atmospheric pressure of 9.81 metres. The result is a negative figure which is not acceptable for a pump intake.

$NPSH(M) - G(M) + 1M = \text{minimum submergence}$

NPSHr = Net Positive Suction Head required. G = head of atmospheric pressure. M = metre

If the value calculated is less than zero metres, for our submersible pumps we would recommend a minimum submergence 'Y' of 1 metre.

If the value calculated is above zero, use that figure and add 1 metre

Example: If the NPSH curve shows 12 metres, subtract 9.81 metres which equals 2.2 metres, so the recommended minimum submergence 'Y' would be 3.2 metres. In our charts we would likely state 'Y' as being 3.5 or even 4 metres.

Note:

Minimum submergence is considered from the bottom of the suction strainer for submersible pumps and from the bottom of the suction bell for vertical line shaft turbine pumps.

Friction Loss Chart for Standard Pipe Column

Loss of Head in Meters per 30 Metres of Column

Column Size	76mm 3"			100mm 4"			125mm 5"			150mm 6"			200mm 8"			250mm 10"				300mm 12"				
Tube Size mm	32	32	38	50	32	38	50	32	38	50	38	50	64	38	50	64	50	64	76	89	50	64	76	89
Shaft Size mm	19	19	25	32	19	25	32	25	32	38	25	32	38	25	32	38	32	38	45	50	32	38	45	50
1	0.22																							
2	0.63			0.23																				
3	1.3	0.17	0.24	0.48																				
4	2.25	0.29	0.40	0.8			0.11																	
5	3.25	0.43	0.4	1.2			0.12	0.17																
6	4.75	0.62	0.85	1.7	0.15	0.18	0.25																	
7	6.3	0.82	1.12	2.3	0.2	0.24	0.34					0.14												
8		1.04	1.44	2.9	0.25	0.31	0.43				0.13	0.18												
9		1.28	1.75	3.6	0.31	0.38	0.52	0.12	0.13	0.23														
10		1.52	2.1	4.3	0.37	0.45	0.63	0.145	0.19	0.27														
12		2.2	3	5.9	0.53	0.64	0.88	0.19	0.27	0.38														
14		2.8	3.8		0.67	0.81	1.13	0.27	0.35	0.49														
16		3.5	4.8		0.85	1.04	1.45	0.34	0.44	0.62														
18		4.4			1.1	1.3	1.8	0.42	0.55	0.77				0.12										
20		5.5			1.3	1.6	2.3	0.53	0.67	0.96				0.15										
22					1.6	1.9	2.7	0.63	0.8	1.03				0.15	0.18									
24					1.8	2.3	3.2	0.73	0.95	1.33				0.17	0.21									
26					2.1	2.6	3.6	0.83	1.08	1.52	0.11	0.2	0.24											
28					2.4	2.9	4	0.94	1.2	1.73	0.13	0.23	0.28											
30					2.7	3.25	4.6	1.05	1.37	1.95	0.14	0.26	0.32									0.11		
35					3.5	4.25	6	1.4	1.8	2.6	0.19	0.34	0.41								0.12	0.15		
40					4.6	5.5		1.8	2.35	3.3	0.25	0.43	0.54								0.12	0.15	0.19	
45					5.6			2.2	2.85	4.1	0.31	0.53	0.65	0.13	0.15	0.19	0.23							
50								2.7	3.4	4.8	0.37	0.64	0.78	0.16	0.19	0.23	0.29							0.09
60								3.7	4.75		0.51	0.86	1.07	0.23	0.26	0.32	0.39						0.11	0.13
70								4.8			0.66	1.14	1.4	0.3	0.35	0.42	0.52	0.12	0.13	0.16	0.18			
80											0.88	1.5	1.88	0.39	0.41	0.55	0.68	0.15	0.17	0.2	0.23			
90											1.08	1.84	2.3	0.48	0.55	0.67	0.83	0.19	0.21	0.25	0.28			
100											1.28	2.24	2.7	0.58	0.65	0.79	1	0.23	0.25	0.3	0.35			
120											1.77	3.1	3.7	0.79	0.89	1.1	1.4	0.32	0.35	0.4	0.47			
140											2.4	4.1	5	1.05	1.2	1.46	1.8	0.42	0.46	0.54	0.63			
160											3	5.1		1.32	1.5	1.86	2.3	0.53	0.59	0.68	0.78			
180											3.7	6.2		1.64	1.8	2.3	2.8	0.65	0.71	0.83	0.96			
200											4.4			1.95	2.2	2.7	3.4	0.77	0.85	1	1.1			
225											5.4			2.4	2.8	3.4	4.2	0.95	1.1	1.2	1.4			
250														3	3.4	4.1	5.1	1.2	1.3	1.5	1.8			
300															4.2	4.7	5.8		1.7	1.8	2.2	2.5		
350															5.6	6.2			2.3	2.5	2.9	3.3		
400															7.3				2.9	3.2	3.7	4.3		

Notes: For open line shaft column friction losses use above figures corresponding to the tube size used for enclosed shaft.
For data on column sizes over 300mm diameter, refer to Sterling Pumps

To convert: Multiply
l/s 60 lpm
l/s 3.6 m³/h

Shaft Rating Curves

Before using the charts, you need to calculate the total down thrust. This includes hydraulic thrust, line shaft weight and the weight of the bowls, shaft and impellers. Weight of bowls, shaft and impeller values can be negligible.

Having calculated the total thrust, the maximum shaft loading can be taken from the chart, using the applicable RPM chart.

An example:

Speed = 2900 rpm

Thrust = 3000kg

Shaft = 38mm diameter

Using the chart, the maximum load would be 205 kW

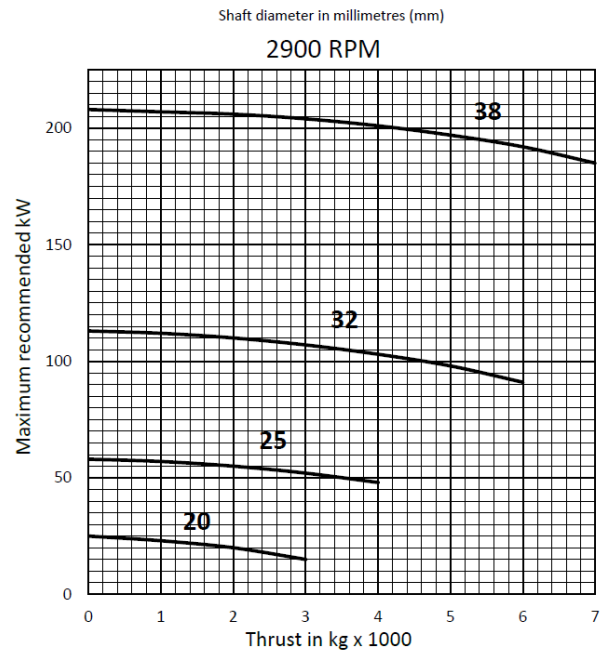
An example:

Speed = 2900 rpm

Thrust 2000kg

kW required = 55 kW at bowls

Using the chart, the correct shaft size will be 25mm as the loading exceeds the allowable for the 20mm shaft but is less than the allowable for the 25mm shaft.



For different shaft materials, apply the following multipliers:

Material	Multiplier
AISI C1045 HTS	1.0
431 Stainless Steel	1.0
416 Stainless Steel	0.9
316 Stainless Steel	0.8

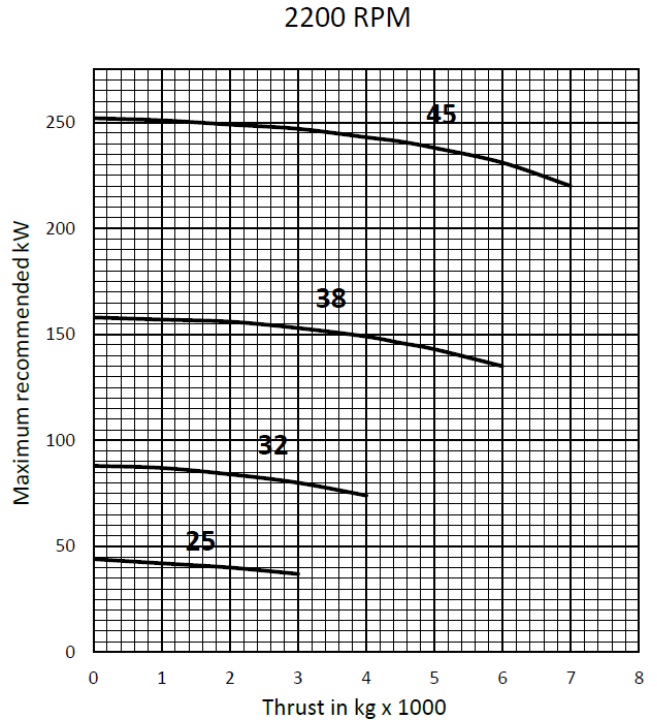
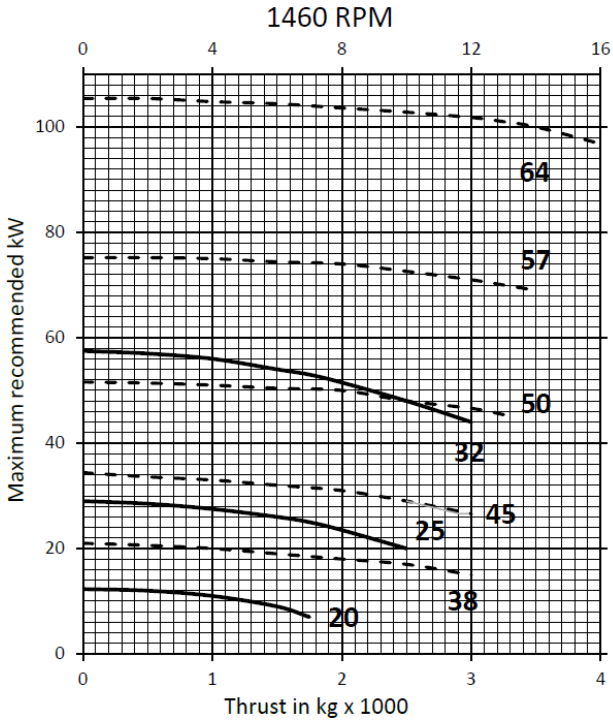
Shaft Friction Loss in kW												
RPM	Shaft Size (mm)											
	20	25	32	38	45	50	57	64	70	76	82	
1460	0.19	0.32	0.48	0.75	0.93	1.3	1.6	1.9	2.2	2.7	3.1	
1770	0.24	0.4	0.56	0.93	1.1	1.5	1.8	2.2	2.6	3.2		
2200	0.30	0.5	0.75	1.1	1.4	1.8	2.2	2.6				
2900	0.39	0.66	0.95	1.4	1.8							
3500	0.46	0.82	1.1									

Shafting and Tubing Weights – kg per linear metre (m)												
Shaft Diam. (mm)	20	25	32	38	45	50	57	64	70	76	82	
kg/m	2.23	3.97	6.21	8.94	12.2	15.9	20.1	23.6	30.1	34.3	42	

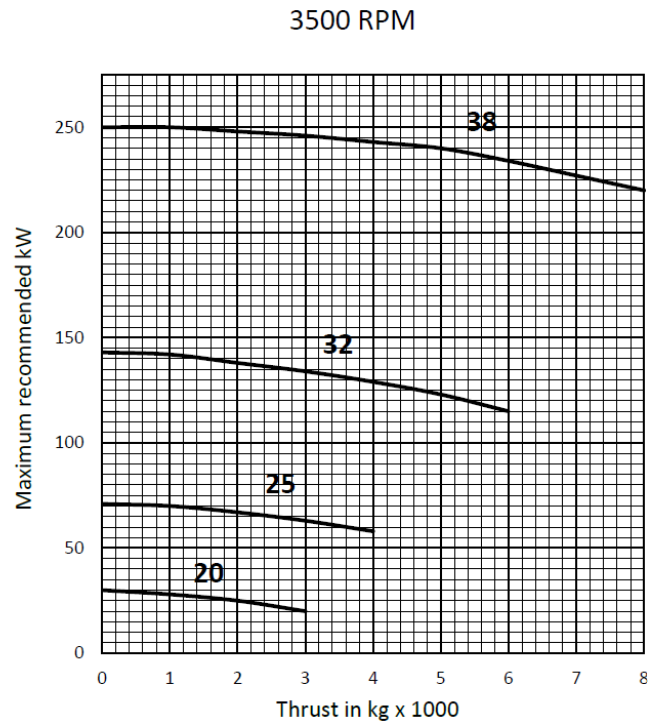
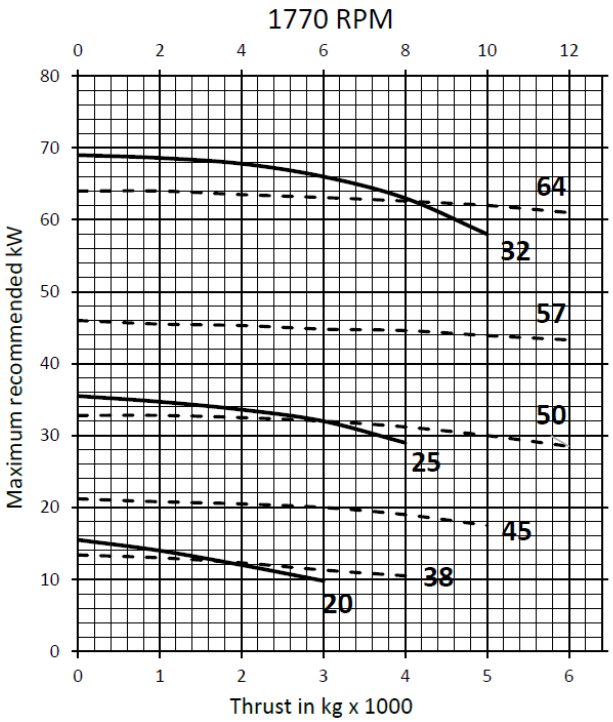
Tube Diam. (mm)	32	38	50	64	76	76	89	102	125	125	125
kg/m	4.45	5.4	7.47	11.4	15.3	15.3	18.6	22.3	30.9	30.9	30.9

Shaft Rating Curves

Shaft diameters in millimetres (mm)



Solid line curves: bottom and left scale
 Dash line curves: top and right scale



Solid line curves: bottom and left scale
 Dash line curves: top and right scale

Column & Tube Elongation Chart

Millimetres (mm) elongation per 30 metres of column

Hydraulic Thrust kg	Column Diameter millimetres (inches)						
	80mm 3"	100mm 4"	125mm 5"	150mm 6"	200mm 8"	250mm 10"	300mm 12"
100	0.07	0.05	0.04	0.03			
200	0.15	0.11	0.09	0.06			
300	0.22	0.16	0.13	0.09	0.06		
400	0.29	0.21	0.17	0.13	0.09		
500	0.36	0.27	0.21	0.16	0.12	0.06	
600	0.44	0.32	0.25	0.19	0.13	0.08	
700	0.51	0.37	0.30	0.23	0.15	0.09	0.09
800	0.58	0.43	0.34	0.26	0.17	0.11	0.10
900	0.66	0.48	0.38	0.29	0.19	0.12	0.11
1,000	0.73	0.53	0.42	0.32	0.21	0.14	0.12
1,200	0.88	0.64	0.51	0.39	0.26	0.18	0.15
1,400	1.02	0.75	0.59	0.45	0.30	0.21	0.18
1,600	1.17	0.86	0.65	0.52	0.34	0.24	0.20
1,800	1.31	0.96	0.76	0.58	0.38	0.27	0.23
2,000	1.46	1.07	0.85	0.64	0.43	0.31	0.25
2,250		1.20	0.95	0.72	0.48	0.34	0.28
2,500		1.34	1.06	0.81	0.53	0.38	0.31
2,750		1.47	1.16	0.89	0.59	0.42	0.34
3,000		1.60	1.27	0.97	0.64	0.46	0.37
3,250			1.38	1.05	0.70	0.50	0.41
3,500			1.48	1.13	0.75	0.53	0.44
3,750			1.59	1.21	0.80	0.57	0.47
4,000			1.69	1.29	0.86	0.61	0.50
4,500			1.90	1.45	0.96	0.69	0.56
5,000				1.61	1.07	0.76	0.62
5,500				1.77	1.18	0.84	0.69
6,000				1.93	1.28	0.91	0.75
6,500				2.09	1.39	0.99	0.81
7,000				2.25	1.50	1.07	0.87
8,000					1.71	1.22	1.00
9,000					1.92	1.37	1.12
10,000					2.14	1.52	1.25
11,000					2.35	1.68	1.37
12,000					2.56	1.83	1.50
13,000						1.98	1.62
14,000						2.13	1.75
15,000						2.29	1.87
16,000						2.44	2.00
18,000						2.74	2.25
20,000							2.50
	32	38	38	50	64	76	90
	Enclosing Tube Diameter (mm)						

Figures are shown based on standard pipe column and enclosing tube with nominal ID.
For open line shaft column multiply value by 1.3

Downthrust due to the hydraulic thrust of the pump causes the shaft and column to stretch after the pump is in operation.

Unless the impellers can be and are raised off the bottom of the bowls enough to allow for this stretch plus some running clearances, the impellers will rub, causing the pump to wear and increase kW power required.

With the total hydraulic downthrust known and the Column Elongation determined from this chart, the total stretch of the column shaft for the setting in question can be determined.

To find the net elongation subtract from shaft elongation the column elongation

$$e = \frac{L \times 1000 \times HT \times 9.8}{E \times CSA}$$

e = Elongation (mm)
 L = Shaft Length (m)
 E = Modulus of Elast. (200 x 10³ Mpa)
 HT = Hydraulic Thrust (kg)
 CSA = Cross Section Area (mm)

Shaft Elongation Chart

Millimetres (mm) elongation per 30 metres of shaft

Hydraulic Thrust kg	Shaft Diameter millimetres (inches)											
	20mm ¾"	25mm 1"	32mm 1¼"	38mm 1½"	45mm 1¾"	50mm 2"	57mm 2¼"	64mm 2½"	70mm 2¾"	76mm 3"	82mm 3¼"	
100	0.52	0.29	0.19	0.13	0.09	0.07	0.06					
200	1.02	0.58	0.38	0.26	0.19	0.15	0.12	0.09				
300	1.55	0.87	0.57	0.39	0.28	0.22	0.17	0.14	0.12			
400	2.07	1.16	0.75	0.52	0.38	0.29	0.23	0.19	0.15	0.13		
500	2.58	1.45	0.94	0.55	0.47	0.36	0.29	0.23	0.19	0.16	0.14	
600	3.1	1.74	1.13	0.77	0.57	0.44	0.34	0.29	0.23	0.19	0.17	
700	3.61	2.04	1.32	0.90	0.66	0.51	0.40	0.33	0.27	0.23	0.19	
800	4.13	2.33	1.51	1.03	0.76	0.58	0.46	0.37	0.31	0.26	0.22	
900	4.65	2.62	1.70	1.16	0.85	0.65	0.52	0.42	0.35	0.29	0.25	
1,000	5.16	2.91	1.89	1.29	0.95	0.73	0.57	0.47	0.38	0.32	0.28	
1,200	6.42	3.49	2.26	1.55	1.14	0.87	0.69	0.56	0.46	0.39	0.33	
1,400		4.07	2.64	1.81	1.32	1.02	0.80	0.65	0.54	0.45	0.39	
1,600		4.65	3.02	2.07	1.52	1.16	0.92	0.74	0.61	0.52	0.44	
1,800		5.23	3.40	2.32	1.71	1.31	1.03	0.84	0.69	0.58	0.50	
2,000		5.82	3.77	2.58	1.90	1.45	1.15	0.93	0.77	0.65	0.55	
2,250		6.54	4.24	2.90	2.13	1.63	1.29	1.05	0.86	0.73	0.62	
2,500			4.72	3.22	2.37	1.81	1.43	1.16	0.96	0.81	0.69	
2,750			5.19	3.55	2.61	2.00	1.58	1.28	1.06	0.89	0.76	
3,000			5.66	3.87	2.84	2.18	1.72	1.39	1.15	0.97	0.83	
3,250			6.13	4.20	3.08	2.36	1.86	1.51	1.25	1.05	0.89	
3,500			6.60	4.51	3.32	2.54	2.01	1.63	1.34	1.13	0.96	
3,750				4.84	3.56	2.72	2.15	1.74	1.44	1.21	1.03	
4,000				5.16	3.79	2.90	2.29	1.86	1.54	1.29	1.10	
4,500				5.81	4.27	3.27	2.58	2.09	1.73	1.45	1.24	
5,000				6.45	4.74	3.63	2.67	2.32	1.92	1.61	1.38	
5,500					5.21	4.00	3.16	2.56	2.11	1.78	1.51	
6,000					5.69	4.36	3.44	2.79	2.30	1.94	1.65	
6,500					6.16	4.72	3.73	3.02	2.50	2.10	1.79	
7,000					6.64	5.08	4.02	3.25	2.69	2.26	1.93	
8,000						5.81	4.59	3.71	3.07	2.59	2.20	
9,000						6.53	5.16	4.18	3.46	2.90	2.48	
10,000							5.74	4.65	3.84	3.23	2.75	
11,000							6.31	5.11	4.22	3.55	3.02	
12,000								5.58	4.61	3.87	3.30	
13,000								6.04	5.00	4.20	3.57	
14,000								6.51	5.38	4.52	3.85	
15,000									5.76	4.84	4.12	
16,000									6.14	5.16	4.40	
18,000										5.81	4.95	
20,000										6.45	5.50	

Figures are shown based on grade CS 1040 carbon steel.
For grades of 300 series stainless steel multiply value by 1.3

Downthrust due to the hydraulic thrust of the pump causes the shaft and column to stretch after the pump is in operation.

Unless the impellers can be and are raised off the bottom of the bowls enough to allow for this stretch plus some running clearances, the impellers will rub, causing the pump to wear and increase kW power required.

With the total hydraulic downthrust known and the shaft elongation determined from this chart, the total stretch of the column shaft for the setting in question can be determined.

To find the net elongation subtract from shaft elongation the column elongation

$$e = \frac{L \times 1000 \times HT \times 9.8}{E \times CSA}$$

e = Elongation (mm)
 L = Shaft Length (m)
 E = Modulus of Elast. (200 x 10³ Mpa)
 HT = Hydraulic Thrust (kg)
 CSA = Cross Section Area (mm)

For Performance Curves – please visit:
www.sterlingpumps.com.au

Right Angle Pump Drive

Model Designation:

The model number designates the basic horsepower rating at 1760 RPM pump speed.

The number is preceded by one of the following letter designations to define the type of drive:

- SL Standard Hollow Shaft Drive with Opposed Thrust Capacity
- S Standard Hollow Shaft Drive with Standard Thrust Capacity
- SH Standard Hollow Shaft Drive with Heavy Thrust Capacity



Efficiency:

Through the use of high quality gears and bearings, transmission efficiency ranges from 94% to 98% varying with speed, horsepower and thrust. Actual efficiency values will be furnished upon request.

Gears:

All drives are furnished with spiral bevel gears, designed in accordance with AGMA (American Gear Manufacturers Association) standards for both strength and surface durability, employing a minimum service factor of 1.50 at rated horsepower.

Ratio Selection

Refer to Sterling Pumps for Ratio Availability

(speeds shown are for nominal ratios. Actual ratios may vary by up to 3%)

Vertical Shaft RPM	Speed Increaseers – Ratio & Input Speed								
	1:1	10:11	5:6	4:5	3:4	2:3	4:7	1:2	1:3
720	720	655	600	576	540	480	411	360	240
870	870	791	725	696	653	580	497	435	290
960	960	873	800	768	720	640	549	480	320
1160	1160	1055	967	928	870	773	663	580	387
1460	1460	1327	1217	1168	1095	973	834	730	487
1760	1760	1600	1467	1408	1320	1173	1006	880	587
3460	3460	3145	2883	2768	2595	2307	1977	1730	1153

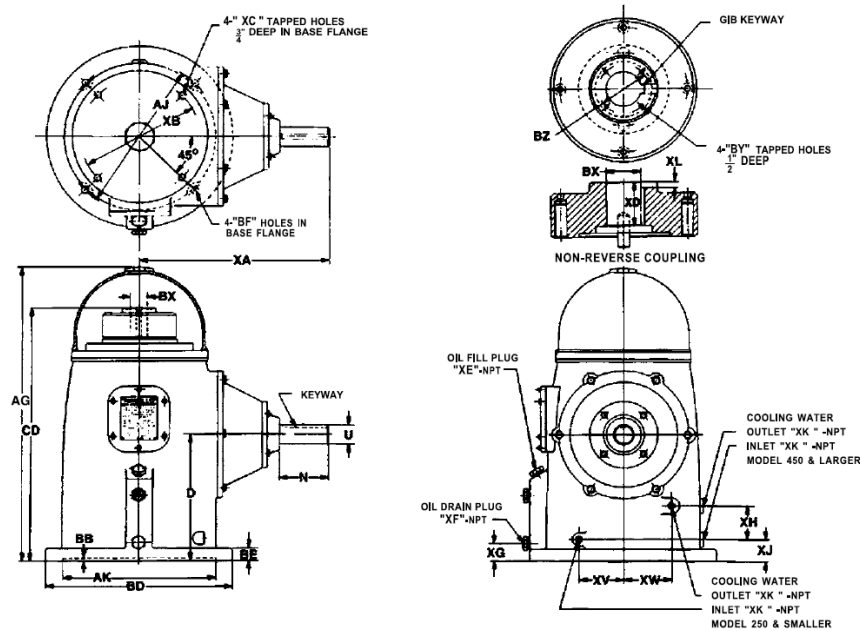
Vertical Shaft RPM	Speed Decreasers – Ratio & Input Speed								
	11:1	6:5	5:4	4:3	3:2	7:4	2:1	5:2	3:1
720	792	864	900	960	1080	1260	1440	1800	2160
870	957	1044	1088	1160	1305	1523	1740	2175	2610
960	1056	1152	1200	1280	1440	1680	1920	2400	2880
1160	1276	1392	1450	1547	1740	2030	2320	2900	3480
1460	1606	1752	1825	1947	2190	2555	2920	3650	-
1760	1936	2112	2200	2347	2640	3080	3520	-	-

Horsepower & Thrust Ratings

Model	Vertical Shaft Speed (RPM)	H.P. Rating	Downdruth Capacity in kg					
			Type SL		Type S		Type SH	
			Min	Max	Min	Max	Min	Max
30	1160	22	0	445	362	1072	362	1673
	1460	26	0	410	345	988	345	1542
	1760	30	0	386	318	932	318	1455
40	1160	30	0	680	517	2091	517	3136
	1460	35	0	626	480	1927	480	2891
	1760	40	0	591	455	1818	455	2727
60A	960	39	0	943	677	2828	677	3882
	1160	45	0	889	646	2666	646	3659
	1460	53	0	819	605	2457	605	3373
	1760	60	0	773	568	2318	568	3182
80A	960	52	0	1775	948	3438	948	5102
	1160	60	0	1673	905	3241	905	4809
	1460	70	0	1542	839	2987	839	4433
100A	960	65	0	1775	948	3438	948	5102
	1160	75	0	1673	905	3241	905	4809
	1460	88	0	1542	844	2987	844	4433
125A	960	82	0	2274	1215	3715	1215	5767
	1160	93	0	2143	1167	3502	1167	5436
	1460	115	0	1975	1085	3228	1085	5011
	1760	125	0	1864	1023	3045	1023	4727
150A	720	80	0	3068	1620	5032	1620	7732
	960	98	0	2773	1470	4547	1470	6987
	1160	112	0	2614	1403	4286	1403	6586
	1460	132	0	2409	1302	3951	1302	6071
	1760	150	0	2273	1227	3727	1227	5727
200A	720	108	0	3068	1620	5523	1620	8284
	960	130	0	2773	1463	4991	1463	7486
	1160	150	0	2614	1396	4705	1396	7057
	1460	176	0	2409	1302	4336	1302	6505
250	720	134			0	7955	0	10125
	960	165			0	7209	0	9150
	1160	187			0	6795	0	8625
	1460	219			0	6264	0	7950
	1760	250			0	5909	0	7500

Model	Vertical Shaft Speed (RPM)	HP Rating	Downdruth Capacity in kg					
			Type SL		Type S		Type SH	
			Min	Max	Min	Max	Min	Max
300	720	162			0	7977	0	10125
	960	195			0	7209	0	9150
	1160	225			0	6795	0	8625
	1460	264			0	6264	0	7950
350	720	187			0	7977	0	10125
	960	229			0	7209	0	9150
	1160	261			0	6795	0	8625
	1460	307			0	6264	0	7950
450A	720	241	0	3682	2105	11659	2105	15341
	960	294	0	3327	1898	10536	1898	13864
	1160	336	0	3136	1809	9932	1809	13068
	1460	395	0	2891	1688	9155	1688	12045
500A	720	267	0	3682	2520	12886	2520	16568
	960	327	0	3327	2275	11645	2275	14973
	1160	373	0	3136	2172	10977	2172	14114
	1460	439	0	2891	2025	10118	2025	13009
600A	720	321	0	4909	2700	16568	2700	19636
	960	393	0	4436	2438	14973	2438	17745
	1160	448	0	4182	2328	14114	2328	16727
	1460	526	0	3855	2170	13009	2170	15418
750A	720	401	0	4909	3000	16568	3000	20557
	870	458	0	4582	2808	15464	2808	19186
	960	491	0	4436	2711	14973	2711	18577
	1160	560	0	4182	2589	14114	2589	17511
1000G	720	658	0	3855	2411	13009	2411	16141
	1760	750	0	3636	2273	12273	2273	15227
	720	535	0	4909	3000	16568	3000	20557
	870	811	0	4582	2808	15464	2808	19186
	960	654	0	4436	2711	14973	2711	18577
	1160	747	0	4182	2589	14114	2589	17511
	1460	877	0	3855	2411	13009	2411	16141

Table of Dimensions Standard Drive (inches)



Standard Coupling Dimensions (inches)

Nominal	Actual	GIB Keyway	BY	BZ	XL
3/4	0.751	3/16 X 3/32	1/4 - 20	1 3/8	9/32
7/8	0.876	1/4 X 1/8	1/4 - 20	1 3/8	9/32
1	1.001	1/4 X 1/8	1/4 - 20	1 3/8	9/32
1 1/16	1.188	1/4 X 1/8	1/4 - 20	1 3/4	9/32
1 1/4	1.251	1/4 Keyway by special request	1/4 - 20	1 3/4	9/32
1 1/2	1.251	3/8 X 3/16	1/4 - 20	1 3/4	9/32
1 7/16	1.438	3/8 X 3/16	1/4 - 20	2 1/8	9/32
1 1/2	1.501	3/8 X 3/16	1/4 - 20	2 1/8	9/32
1 11/16	1.688	3/8 X 3/16	1/4 - 20	2 1/2	9/32
1 3/4	1.751	3/8 X 3/16	1/4 - 20	2 1/2	9/32
1 15/16	1.938	1/2 X 1/4	1/4 - 20	2 1/2	9/32
2	2.001	1/2 X 1/4	1/4 - 20	2 1/2	9/32
2 3/16	2.188	1/2 X 1/4	3/8 - 16	3 1/4	9/32
2 1/4	2.251	1/2 X 1/4	3/8 - 16	3 1/4	9/32
2 7/16	2.438	5/8 X 5/16	3/8 - 16	3 1/4	9/32
2 1/2	2.501	5/8 X 5/16	3/8 - 16	3 1/4	9/32
2 11/16	2.688	5/8 X 5/16	3/8 - 16	3 3/4	9/32
2 3/4	2.751	5/8 X 5/16	3/8 - 16	3 3/4	9/32
2 15/16	2.938	3/4 X 3/8	3/8 - 16	3 3/4	7/16

Table of Dimensions Standard Drive (inches)

Model	D	N	Horizontal Shaft U			Type SL		Type S		Type SH		AJ	AK	BB
			Nominal	Actual	Keyway	AG	CD	AG	CD	AG	CD			
30	6 $\frac{3}{4}$	2 $\frac{5}{8}$	1 $\frac{1}{4}$	1.249	5/16 X 5/32	16 $\frac{1}{4}$	13 $\frac{3}{4}$	16 $\frac{1}{4}$	13 $\frac{3}{4}$	17 $\frac{1}{4}$	14 $\frac{3}{4}$	9 $\frac{1}{8}$	8.250	3/16
40A	8 $\frac{1}{2}$	4 $\frac{3}{8}$	1 $\frac{1}{2}$	1.499	3/8 X 3/16	21 $\frac{3}{4}$	18	21 $\frac{3}{4}$	18	23	19 $\frac{1}{4}$	9 $\frac{1}{8}$	8.250	1/4
40B	8 $\frac{1}{2}$	4 $\frac{3}{8}$	1 $\frac{1}{2}$	1.499	3/8 X 3/16	21 $\frac{3}{4}$	18	21 $\frac{3}{4}$	18	23	19 $\frac{1}{4}$	14 $\frac{3}{4}$	13.500	1/4
60A	11 $\frac{1}{2}$	4 $\frac{1}{4}$	1 $\frac{1}{2}$	1.499	3/8 X 3/16	28	23 $\frac{5}{16}$	28	23 $\frac{5}{16}$	29 $\frac{1}{4}$	24 $\frac{9}{16}$	14 $\frac{3}{4}$	13.500	1/4
80A	11 $\frac{1}{2}$	4 $\frac{1}{4}$	1 $\frac{7}{8}$	1.874	3/8 X 3/16	29 $\frac{1}{4}$	24 $\frac{9}{16}$	28	23 $\frac{5}{16}$	29 $\frac{3}{8}$	24 $\frac{11}{16}$	14 $\frac{3}{4}$	13.500	1/4
100A	11 $\frac{1}{2}$	4 $\frac{1}{4}$	1 $\frac{7}{8}$	1.874	3/8 X 3/16	29 $\frac{1}{4}$	24 $\frac{9}{16}$	28	23 $\frac{5}{16}$	29 $\frac{3}{8}$	24 $\frac{11}{16}$	14 $\frac{3}{4}$	13.500	1/4
125A	11 $\frac{1}{2}$	4 $\frac{1}{4}$	1 $\frac{7}{8}$	1.874	3/8 X 3/16	29 $\frac{1}{4}$	24 $\frac{9}{16}$	29 $\frac{3}{4}$	24 $\frac{9}{16}$	29 $\frac{3}{8}$	24 $\frac{11}{16}$	14 $\frac{3}{4}$	13.500	1/4
150A	11 $\frac{1}{2}$	4 $\frac{1}{2}$	2 $\frac{7}{16}$	2.436	5/8 X 5/16	29 $\frac{3}{8}$	25 $\frac{1}{8}$	29 $\frac{3}{8}$	25 $\frac{1}{8}$	31 $\frac{1}{8}$	26	14 $\frac{3}{4}$	13.500	1/4
200A	13 $\frac{3}{4}$	5 $\frac{1}{4}$	2 $\frac{7}{16}$	2.436	5/8 X 5/16	34 $\frac{11}{16}$	30 $\frac{3}{16}$	34 $\frac{11}{16}$	30 $\frac{3}{16}$	35 $\frac{5}{16}$	30 $\frac{13}{16}$	18 $\frac{1}{4}$	13.500	1/4
250	13 $\frac{3}{4}$	5 $\frac{1}{4}$	2 $\frac{15}{16}$	2.936	3/4 X 3/8	-	-	34 $\frac{11}{16}$	30 $\frac{3}{16}$	36 $\frac{5}{16}$	31 $\frac{13}{16}$	18 $\frac{1}{4}$	13.500	1/4
*300	13 $\frac{3}{4}$	5 $\frac{1}{4}$	2 $\frac{15}{16}$	2.936	3/4 X 3/8	-	-	34 $\frac{11}{16}$	30 $\frac{3}{16}$	36 $\frac{5}{16}$	31 $\frac{13}{16}$	18 $\frac{1}{4}$	13.500	1/4
*350	13 $\frac{3}{4}$	5 $\frac{1}{4}$	2 $\frac{15}{16}$	2.936	3/4 X 3/8	-	-	34 $\frac{11}{16}$	30 $\frac{3}{16}$	36 $\frac{5}{16}$	31 $\frac{13}{16}$	18 $\frac{1}{4}$	13.500	1/4
450A	16	6	2 $\frac{15}{16}$	2.936	3/4 X 3/8	42 $\frac{7}{8}$	36 $\frac{7}{8}$	43 $\frac{3}{4}$	38	45 $\frac{3}{4}$	38 $\frac{3}{4}$	23	13.500	1/4
500A	16	6	3 $\frac{1}{8}$	3.124	3/4 X 3/8	42 $\frac{7}{8}$	36 $\frac{7}{8}$	43 $\frac{3}{4}$	38	45 $\frac{3}{4}$	38 $\frac{3}{4}$	23	13.500	1/4
600A	16	6	3 $\frac{3}{4}$	3.749	7/8 X 7/16	42 $\frac{7}{8}$	36 $\frac{7}{8}$	43 $\frac{3}{4}$	38	45 $\frac{3}{4}$	38 $\frac{3}{4}$	23	13.500	1/4
750A	18	6	3 $\frac{3}{4}$	3.749	7/8 X 7/16	48	41 $\frac{3}{8}$	50	42	50	42 $\frac{9}{16}$	23	13.500	1/4
1000G	21	8	4	3.998	1 X 1 $\frac{1}{2}$	62 $\frac{1}{4}$	50 $\frac{1}{4}$	62 $\frac{1}{4}$	50 $\frac{1}{4}$	62 $\frac{1}{4}$	50 $\frac{1}{4}$	28 $\frac{3}{4}$	22.000	1/4

Model	BD	BE	BF	XA	XB	XC	XD	XE	XF	XG	XH	XJ	XK	XV	XW	** BX Max.
30	10	5/8	7/16	10 $\frac{7}{8}$	-	0	1 $\frac{5}{16}$	3/8	3/8	5/16	-	-	-	-	-	1
40A	12	13/16	7/16	15 $\frac{5}{8}$	-	0	1 $\frac{1}{4}$	1/2	1/2	1 $\frac{1}{4}$	2	2 $\frac{1}{4}$	3/8	0	6 $\frac{3}{8}$	1 $\frac{1}{4}$
40B	16 $\frac{1}{2}$	13/16	11/16	15 $\frac{5}{8}$	-	0	1 $\frac{1}{4}$	1/2	1/2	1 $\frac{1}{4}$	2	2 $\frac{1}{4}$	3/8	0	6 $\frac{3}{8}$	1 $\frac{1}{4}$
60A	16 $\frac{1}{2}$	3/4	11/16	16 $\frac{3}{4}$	-	0	2	3/4	3/4	1 $\frac{5}{8}$	3	2	3/8	3 $\frac{7}{8}$	4 $\frac{1}{4}$	1 $\frac{1}{2}$
80A	16 $\frac{1}{2}$	3/4	11/16	16 $\frac{3}{4}$	-	0	2	3/4	3/4	1 $\frac{5}{8}$	3	2	3/8	3 $\frac{7}{8}$	4 $\frac{1}{4}$	1 $\frac{1}{2}$
100A	16 $\frac{1}{2}$	3/4	11/16	16 $\frac{3}{4}$	-	0	2	3/4	3/4	1 $\frac{5}{8}$	3	2	3/8	3 $\frac{7}{8}$	4 $\frac{1}{4}$	1 $\frac{1}{2}$
125A	16 $\frac{1}{2}$	3/4	11/16	16 $\frac{3}{4}$	-	0	2	3/4	3/4	1 $\frac{5}{8}$	3	2	3/8	3 $\frac{7}{8}$	4 $\frac{1}{4}$	1 $\frac{1}{2}$
150A	16 $\frac{1}{2}$	3/4	11/16	18 $\frac{3}{4}$	-	0	2 $\frac{1}{4}$	3/4	3/4	1 $\frac{5}{8}$	3	2	3/8	3 $\frac{7}{8}$	4 $\frac{1}{4}$	1 $\frac{11}{16}$
200A	20	1 $\frac{1}{8}$	11/16	20 $\frac{3}{4}$	14 $\frac{3}{4}$	5/8-11-NC	3	3/4	3/4	2 $\frac{1}{8}$	4 $\frac{1}{2}$	2 $\frac{5}{8}$	1/2	5	5	2
250	20	1 $\frac{1}{8}$	11/16	22 $\frac{3}{8}$	14 $\frac{3}{4}$	5/8-11-NC	3	3/4	3/4	2 $\frac{1}{8}$	4 $\frac{1}{2}$	2 $\frac{5}{8}$	1/2	5	5	2 $\frac{3}{16}$
*300	20	1 $\frac{1}{8}$	11/16	22 $\frac{3}{8}$	14 $\frac{3}{4}$	5/8-11-NC	3	3/4	3/4	2 $\frac{1}{8}$	4 $\frac{1}{2}$	2 $\frac{5}{8}$	*	*	*	2 $\frac{3}{16}$
*350	20	1 $\frac{1}{8}$	11/16	22 $\frac{3}{8}$	14 $\frac{3}{4}$	5/8-11-NC	3	3/4	3/4	2 $\frac{1}{8}$	4 $\frac{1}{2}$	2 $\frac{5}{8}$	*	*	*	2 $\frac{3}{16}$
450A	24 $\frac{1}{2}$	1 $\frac{1}{8}$	13/16	+25 $\frac{1}{2}$	14 $\frac{3}{4}$	5/8-11-NC	3	3/4	3/4	1 $\frac{13}{16}$	4 $\frac{1}{2}$	2 $\frac{3}{4}$	3/4	7 $\frac{3}{4}$	7 $\frac{3}{4}$	2 $\frac{7}{16}$
500A	24 $\frac{1}{2}$	1 $\frac{1}{8}$	13/16	+25 $\frac{1}{2}$	14 $\frac{3}{4}$	5/8-11-NC	3	3/4	3/4	1 $\frac{13}{16}$	4 $\frac{1}{2}$	2 $\frac{3}{4}$	3/4	7 $\frac{3}{4}$	7 $\frac{3}{4}$	2 $\frac{7}{16}$
600A	24 $\frac{1}{2}$	1 $\frac{1}{8}$	13/16	+25 $\frac{1}{2}$	14 $\frac{3}{4}$	5/8-11-NC	3	3/4	3/4	1 $\frac{13}{16}$	4 $\frac{1}{2}$	2 $\frac{3}{4}$	3/4	7 $\frac{3}{4}$	7 $\frac{3}{4}$	2 $\frac{7}{16}$
750A	24 $\frac{1}{2}$	1 $\frac{1}{8}$	13/16	+26 $\frac{3}{4}$	14 $\frac{3}{4}$	5/8-11-NC	3	1	1	1 $\frac{13}{16}$	6	2 $\frac{7}{8}$	3/4	8 $\frac{1}{4}$	8 $\frac{1}{4}$	2 $\frac{7}{16}$
1000G	30 $\frac{1}{2}$	1 $\frac{1}{4}$	13/16	+36 $\frac{7}{8}$	26	3/4-11-NC	3 $\frac{3}{4}$	3/4	3/4	2 $\frac{5}{16}$	6 $\frac{1}{4}$	3 $\frac{3}{8}$	3/4	8	8 $\frac{1}{2}$	2 $\frac{15}{16}$

Note:

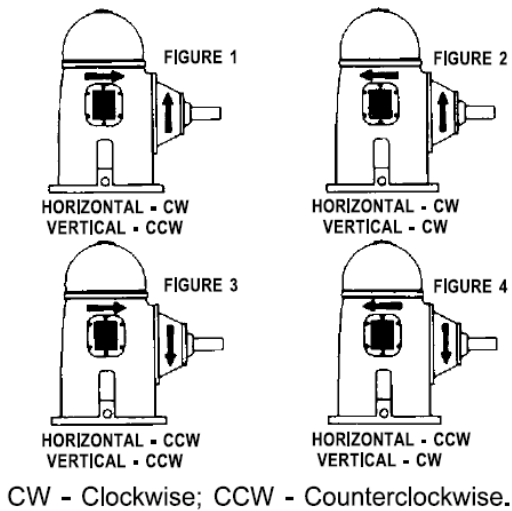
+“XA” dimensions shown apply to 1:1 and speed increasing ratios only. Request certified drawings for others.

*Models 300 and 350 furnished with heat exchanger.

** Contact factory for maximum coupling bore for Fig. 2 or Fig. 3 rotation with 1:2 or 1:3 ratio.

RATIOS AND ROATATIONS: The ratio of a drive is defined as the ratio of the horizontal input speed to vertical output speed. For example, a 2:1 ratio would have a horizontal speed of twice the vertical speed. There are four rotational schemes available as shown in figures 1, 2, 3 and 4. Figure 1 is donated a standard rotation.

Figures 2, 3, and 4 are special rotation being manufactured only on order and are not subject to cancellation without charge for completed parts.



Horsepower and Thrust Bearing Rating

Vertical Shaft RPM	Percent of Rated Horsepower	Percent of Thrust Capacity
430	37%	160%
580	46%	145%
690	52%	137%
720	53%	135%
870	61%	126%
960	65%	122%
1160	75%	115%
1460	88%	106%
1760	100%	100%
*2000	107%	96%
*220	112%	93%
*2400	117%	90%
*2600	122%	88%
*2800	128%	86%
*3000	134%	84%
*3460	146%	80%
*3600	150%	79%

* Cooling coils should be specified for models 40, 60A and 80A operating at speeds above 1760 rpm. Consult with the factory on all applications when the vertical speeds exceed 1760 rpm. Maximum allowable cooling water pressure for cooling coils is 100 psi and heat exchanger is 150 psi

Features:

Cooling coils are available on models 40, 60A, and 80A, at additional cost and are standard on Model 100A and above. Non-reverse clutches are standard on all drives. Marine options are available upon request.

Our rigid castings are designed to insure correct alignment. Gears are case hardened alloy steel, lapped in pairs. All drives have positive pressure oil distribution systems, and bearing life exceeds AGMA recommendations. All standard hollow shaft gear drives through Model 1200 are approved by Factory Mutual for use with vertical fire pumps

Special Drives:

Drives listed in this catalogue may also be available with additional options. For applications that require power ratings larger than listed in this catalogue. Please contact Sterling Pumps for further information.

Weights and Box Dimensions

Model	Net Weight (kg)	Domestic Skid (kg)	Export Box kg	Export Box Dimensions			Volume: Cubic Metres
				Length (mm)	Width (mm)	Height (mm)	
30	42	50	57	559	356	533	0.11
40A	100	109	125	686	381	686	0.17
40B	105	118	141	737	457	686	0.23
60A	148	159	177	737	483	864	0.31
80A	157	168	186	737	483	864	0.31
100A	166	177	195	737	483	864	0.31
125A	166	177	195	737	483	864	0.31
150A	195	205	230	787	483	914	0.34
200A	286	307	368	889	610	1067	0.57
250	345	366	409	965	610	1016	0.59
*300	345	366	409	965	610	1016	0.59
*350	345	366	409	965	610	1016	0.59
450A	609	645	736	1118	813	1321	1.19
500A	623	659	750	1118	813	1321	1.19
600A	630	666	757	1118	813	1321	1.19
750A	818	859	984	1143	813	1448	1.36
1000G	1205	1389	1505	1473	940	1880	2.61

TCI/TCP Series Motors – Cast Iron Three Phase

0.75kW to 315kW - Frame 80 to 355

The three phase cast iron motors combine superior electrical characteristics, high quality design and the robust strength of cast iron, making this series ideal for all industrial applications.



Operating Parameters

Standard TCI/TCP series motors are designed with the following parameters:

- 380V to 415V, 50Hz & 440V to 480V, 60Hz supply
- Continuous (S1) duty
- Ambient temperatures up to 40°C
- Installation up to 1000 MASL

Connection

- 230V Delta / 400V Star (3kW & below)
- 400V Delta / 690V Star (4kW & above)

Standards

Dimensions and rated outputs for the TCI/TCP series conform to Australian Standard AS/NZS 1359 and International Standard IEC 60034 and IEC 60072

Standard and High Efficiency

The TCI range complies with MEPS2 requirements of AS/NZS 1359.5:2004 Table A2 (Standard Efficiency). The TCP range complies with MEPS2 requirements of AS/NZS 1359.2:2004 Table A3 (High Efficiency). Motors are tested in accordance with Test Method A of AS/NZS 1359.102.3 as per IEC 60034-2-1.

Insulation Class

TCI/TCP motors are insulated with Class F materials and limited to Class B temperature rise. The windings are spike resistant making them suitable for use with VVVF drives.

Thermistors

As standard all TCI/TCP series motors from 160 frame and above are fitted with one set of PTC thermistors. The thermistor termination is located in the main terminal box and has a trip temperature of 150°C as standard. Additional 130°C thermistors can be fitted as an option for alarm connection. Thermistors are available as an option for smaller frame sizes.

IP Protection

The standard degree of enclosure protection is IP 55 (increased with IP protection is available). Shafts are fitted with an oil seal as standard.

Multi-mount Design

TCI/TCP series motors from frame size 80-280 are fitted with detachable feet. The multi-mount design allows for the motor feet to be removed and repositioned to either side to produce a side mounted terminal box.

Terminal Box.

The terminal box is manufactured from cast iron and is mounted on top of the motor as standard. Terminal box is separate to the motor body and can be rotated in 90° increments.

Surface Finish

As standard TCI/TCP motors are painted with high quality alkyd enamel with the final colour being RAL 9005 Jet Black. Other colours are available upon request.

Bearings

Bearings fitted are high quality NSK bearings with C3 diametrical clearances. As standard, frame sizes 80 to 132 have sealed for life deep groove ball bearings. Frame sizes 160 to 355 have re-greaseable bearings with facilities to replenish the grease during operation. Grease nipples are fitted to the top of the end shields with a grease relief fitted at the bottom.

Frame Size Cast Iron	Bearing	
	D.E.	N.D.E
80	6204 ZZ C3	
90	6205 ZZ C3	
100	6206 ZZ C3	
112	6306 ZZ C3	
132	6308 ZZ C3	
160	6309 C3	
180	6311 C3	
200	6312 C3	
225	6313 C3	
250	6314 C3	
280	6316 C3	
315 (2P)	6317 C3	
315 (4/6/8)	NU319 C3	6319C3
355 (2P)	6319 C3	
355 (4/6/8)	NU322 C3	6322 C3

Vibration

Vibration levels are within Level N (normal) limits of vibration severity as per IEC 60034 – 14:2007 which are listed below:

Vibration Grade	Frame Size	56 – 132	160 – 280	315 - 355
	Mounting Type	(mm/s)	(mm/s)	(mm/s)
A	Suspension	1.5	2.2	2.8
	Rigid Mount	1.3	1.8	2.3

Conduit Entries

Frame Size	Entry Size	Number of Entries
80	M20 X 1.5	2
90	M20 X 1.5	2
100	M20 X 1.5	2
112	M25 X 1.5	2
132	M25 X 1.5	2
160*	M32 X 1.5	2
180*	M32 X 1.5	2
200*	M50 X 1.5	2
225*	M50 X 1.5	2
250*	M50 X 1.5	2
280*	M50 X 1.5	2
315*	M63 X 1.5	2
355*	M63 X 1.5	2

*Frames fitted with 1 x M20 cable gland for thermistor termination.

Noise Level

Noise levels comply with the limits shown in IEC 60034.9 and AS1359.109 standards

Output kW	Sound pressure dB(A) @ 1 metre no load			
	2 Pole	4 Pole	6 Pole	8 Pole
0.75	64	60	58	55
1.1	64	60	59	55
1.5	68	6+0	59	55
2.2	68	62	59	55
3	71	62	63	58
4	71	66	63	58
5.5	75	67	67	64
7.5	75	70	67	64
11	79	71	69	64
15	79	73	69	66
18.5	79	73	69	66
22	84	73	69	67
30	86	75	72	69
37	86	75	72	69
45	88	75	75	69
55	88	77	75	73
75	90	80	77	75
90	90	80	77	75
110	91	83	78	75
132	91	85	79	76
160	91	86	84	81
200	92	88	84	81
250	94	91	87	-
315	94	91	-	-

TCI Series

Grease

TCI bearings are lubricated with polyurea (Mobil Polyrex EM) based bearing grease suitable for operation in ambient temperatures from -20°C to +55°C. Bearings are prepacked with grease but it is recommended to lubricate the bearings one hour after commissioning.

Recommended Bearing Maintenance

Frame	Bearing	Grease Qty (g)	Interval Hours			
			2P	4P	6P	8P
160	6309 C3	15	6,600	11,000	14,000	16,200
180	6311 C3	18	6,100	10,600	14,000	15,250
200	6312 C3	20	5,200	10,200	14,100	15,000
225	6313 C3	25	4,900	9,600	13,600	15,000
250	6314 C3	38	2,600	9,200	13,200	14,600
280	6316 C3	42	2,100	9,000	12,800	14,000
315 (2P)	6317 C3	44	2,000	-	-	-
315 (4/6/8)	NU/6319 C3	48	-	6,400	9,300	12,000
355 (2P)	6319 C3	48	1,900	-	-	-
355 (4/6/8)	NU/6322 C3	68	-	4,400	8,300	11,000

Radial & Axial Loads

The table below details the permissible force that can be applied to the motor shaft and are applicable for horizontal mounting only. The values shown are calculated on a basic bearing life of L_{10} or 40,000 hours

Frame Size	Permissible Radial Load (N)				Permissible Axial Load (N)			
	2 Pole	4 Pole	6 Pole	8 Pole	2 Pole	4 Pole	6 Pole	8 Pole
80	470	595	690	750	395	540	655	635
90	485	625	720	785	420	570	685	690
100	710	890	1,035	1,150	570	780	940	1,075
112	950	1,240	1,420	1,580	790	1,085	1,310	1,520
132	1,420	1,820	2,100	2,325	1,160	1,590	1,915	2,210
160	1,800	2,350	2,720	3,040	1,480	2,035	2,450	2,810
180	2,490	3,200	3,780	4,215	1,990	2,710	3,270	3,760
200	2,915	3,750	4,350	4,835	2,225	3,065	3,710	4,235
225	3,270	4,000	4,700	5,210	2,460	3,390	4,130	4,750
250	3,590	4,650	5,400	5,980	2,725	3,780	4,575	5,225
280	3,700	8,100	9,375	10,300	3,280	4,560	5,590	6,375
315 (2P)	4,500	-	-	-	3,825	-	-	-
315 (4/6/8)	-	15,800	17,950	19,750	-	4,855	5,895	6,780
355 (2P)	4,560	-	-	-	3,980	-	-	-
355 (4/6/8)	-	22,145	25,360	27,890	-	6,135	7,395	8,555

TCIM Series – High Specification

0.75kW to 315kW – Frame 80 to 355

Sterling Pump's TCIM high specification cast iron series motors are designed for severe duty applications and harsh environments

Based on the TCI series, our TCIM High Specification motor has the identical electrical performance to the TCI series with additional mechanical features as detailed below:

- IP66 protection
- Class H insulation with Class B rise
- Oil seals fitted at both ends
- Rotating slinger at both ends
- Cast iron fan
- Cast iron fan cowl
- Sintered bronze porous drain plugs
- Stainless steel name plate
- Epoxy paint finish



Please refer to the TCI performance data as detailed on pages 66 and 67 of this catalogue.

Surface Finish

TCIM motors are subject to a two pack epoxy coating system with the final colour being RAL 2008 Bright Red Orange.

Operating Parameters

- High specification TCIM series motors are designed with the following parameters:
- 380V to 415V, 50Hz & 440V to 480V 60Hz supply
- Continuous (S1) duty
- Ambient temperatures up to 50°C
- Installation up to 1000 MASL
- Service factors up to 1.25

Available options

- Insulated bearing & earth brush
- Winding RTD's
- Bearing RTD's
- Force ventilation
- Auxiliary terminal box

Dimensions

Please refer to page 29 of this catalogue.

TCI/TCIM Series Performance Data

Output kW	Full Load Speed (RPM)	Frame Size	Shaft Diameter (mm)	Current @ 400V		Efficiency		Power Factor		Torque				Noise Level dB (A)	Weight Foot Mount (kg)
				Full Load (A)	Locked Rotor (%)	Full Load (%)	% Load (%)	Full Load (%)	% Load (%)	Full Load (Nm)	Locked Rotor (% FLT)	Pull Up (%FLT)	Break Down (%FLT)		
0.75	2880	80A	19	1.76	687	80.1	80.2	0.79	0.71	2.5	292	196	302	64	16
	1420	80B	19	1.94	550	81.1	81.5	0.69	0.60	5	303	270	310	60	18
	940	90S	24	2.22	444	76.3	75.7	0.65	0.54	7.6	225	196	252	58	20
	690	100LA	28	2.21	363	72.3	73.3	0.68	0.58	10.4	177	175	213	55	34
1.1	2880	80A	19	2.39	758	81.2	81.3	0.82	0.74	3.6	283	186	285	64	17
	1420	90S	24	2.57	618	82.8	83.8	0.75	0.67	7.4	296	247	297	60	22
	940	90L	24	2.98	487	78.4	78.7	0.69	0.60	11	207	180	245	59	29
	690	100LA	28	3.17	390	74.8	75.2	0.67	0.57	15.1	198	192	230	55	35
1.5	2880	90S	24	3.19	690	83.1	83.5	0.83	0.75	5.0	276	187	308	68	21
	1440	90L	24	3.44	713	85.5	86.1	0.76	0.68	9.9	316	240	313	60	26
	945	100LA	28	3.71	472	80.1	82	0.74	0.66	15.1	172	161	225	59	34
	700	112M	28	4.18	403	78.4	79.3	0.68	0.59	20.4	182	180	212	55	42
2.2	2890	90L	24	4.61	811	84	84.4	0.83	0.75	7.2	300	222	318	68	22
	1440	100La	28	4.55	726	85.8	86.6	0.82	0.76	14.6	260	218	305	62	36
	950	112M	28	5.36	547	82.8	83.9	0.73	0.64	22	220	181	271	59	40
	710	132S	38	5.95	420	80.0	80.6	0.67	0.58	29.4	186	174	233	55	68
3	2900	100L	28	5.59	920	87.0	87.6	0.90	0.87	9.9	309	249	351	71	35
	1445	100LB	28	6.27	760	86.0	86.6	0.80	0.73	19.8	239	244	325	62	37
	960	132S	38	6.42	601	85.5	86.6	0.76	0.70	29.6	188	157	258	63	65
	715	132M	38	7.8	529	82.7	83.1	0.70	0.61	39.9	231	203	274	58	77
4	2915	112M	28	7.56	960	87.4	87.7	0.89	0.84	13.1	332	208	365	71	47
	1440	112M	28	8.17	781	87.5	88.2	0.82	0.75	26.4	257	231	335	66	51
	960	132MA	38	9.21	583	84.7	85.6	0.74	0.68	39.6	200	165	257	63	67
	720	160MA	42	9.56	556	85.5	86.0	0.71	0.63	53.0	232	169	254	58	116
5.5	2910	132SA	38	10.3	823	87.8	88.3	0.89	0.85	18.0	244	195	343	75	61
	1460	132SA	38	11.0	856	88.1	88.5	0.83	0.77	35.9	217	193	350	67	65
	960	132MB	38	12.4	654	86.3	87.5	0.75	0.69	54.5	240	184	261	67	68
	720	160MB	42	14.9	600	85.8	84.7	0.63	0.61	74.0	230	190	260	64	147
7.5	2920	132SA	38	13.9	1029	89.2	89.6	0.89	0.86	24.5	314	202	366	75	66
	1450	132M	38	14.3	823	89.5	90.4	0.85	0.82	49.4	299	117	295	70	77
	980	160M	42	17.5	855	89.7	89.4	0.71	0.63	73.0	331	194	336	67	120
	720	160L	42	18.6	600	87.2	86.9	0.67	0.64	100.1	240	190	270	64	147
11	2950	160MA	42	19.5	858	89.9	90.2	0.91	0.89	35.6	260	93	302	79	113
	1470	160M	42	20.4	838	91.7	91.7	0.86	0.81	71.3	287	203	329	71	125
	975	160L	42	23.8	818	89.4	89.7	0.75	0.68	107.5	309	140	152	70	135
	730	180L	48	23.8	660	88.8	88.7	0.75	0.69	145.9	230	200	280	64	183
15	2950	160MB	42	25.8	901	91.8	92.1	0.92	0.90	48.4	257	132	316	79	132
	1470	160L	42	27.4	881	91.1	91.5	0.88	0.84	97.4	253	177	316	73	140
	980	180L	48	31.4	882	89.6	88.9	0.77	0.70	145.7	267	153	322	69	183
	730	200L	55	30.6	660	90.0	90.1	0.78	0.76	198.9	220	200	290	66	240
18.5	2950	160L	42	32.0	976	92.1	92.6	0.92	0.91	59.8	302	140	332	79	146
	1470	180M	48	33.2	786	91.8	92	0.88	0.84	120.1	254	194	311	73	158
	980	200LA	55	36.9	853	91.2	91.2	0.81	0.74	179.4	207	139	320	69	232
	730	225S	60	38.7	660	90.7	90.4	0.76	0.72	243.7	220	200	320	66	315
22	2950	180M	48	39.1	843	91.2	91	0.90	0.88	71.2	266	163	330	84	177
	1465	180L	48	38.9	767	91.9	92.5	0.89	0.86	143.1	225	155	269	73	183
	980	200LB	55	42.6	1031	91.9	92.1	0.83	0.78	213.5	313	156	342	69	250
	740	225M	60	43.5	660	91.2	91.4	0.80	0.78	289.7	210	190	310	67	348

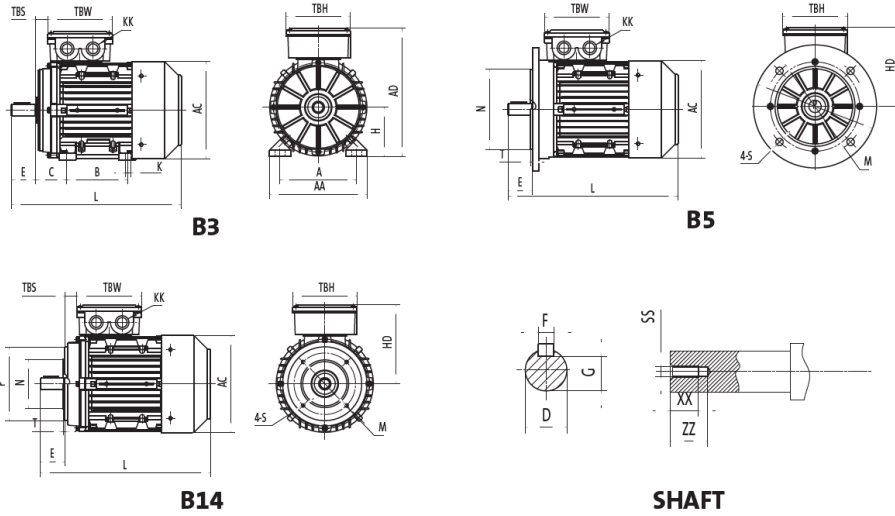
TCI/TCIM Series Performance Data Continued

Output kW	Full Load Speed (RPM)	Frame Size	Shaft Diameter (mm)	Current @ 400V		Efficiency		Power Factor		Torque				Noise Level dB (A)	Weight Foot Mount (kg)
				Full Load (A)	Locked Rotor (%)	Full Load (%)	¾ Load (%)	Full Load (%)	¾ Load (%)	Full Load (Nm)	Locked Rotor (% FLT)	Pull Up (%FLT)	Break Down (%FLT)		
30	2955	200LA	55	52.9	703	92.0	92.3	0.90	0.88	96.9	205	104	254	86	233
	1480	200L	55	57.2	814	92.5	92.7	0.82	0.76	193.5	237	191	295	75	242
	985	225M	60	54.9	815	91.9	92.4	0.86	0.83	290.5	264	151	257	72	335
	740	250M	65	61.5	660	92.1	91.6	0.76	0.71	392.4	210	190	270	69	397
37	2955	200LB	55	64.9	759	92.7	93.1	0.90	0.88	119.6	244	144	260	86	246
	1475	225S	60	65.4	743	91.2	90.7	0.85	0.82	239.1	222	147	243	75	315
	980	250M	65	68.7	646	93.2	93.3	0.85	0.82	359.2	186	135	232	72	398
	740	280S	75	73.5	660	92.7	92.5	0.78	0.74	484.0	210	180	250	69	500
45	2955	225M	55	77.6	744	93.2	93.4	0.91	0.89	145.2	273	113	251	88	322
	1475	225M	60	85.1	695	93.1	92.9	0.83	0.78	290.5	207	187	333	75	352
	985	280S	75	81.5	850	92.7	93.0	0.86	0.82	434.7	284	156	272	75	505
	740	280M	75	88.9	660	93.2	93.1	0.78	0.77	584.7	200	180	250	69	594
55	2970	250M	60	93.3	892	94.5	94.3	0.91	0.90	176.8	302	142	299	88	420
	1480	250M	65	98.7	805	93.6	93.9	0.86	0.83	354.4	264	167	268	77	420
	985	280M	75	99.0	897	93.5	93.6	0.87	0.83	531.3	321	181	311	75	596
	740	315S	80	107.2	750	93.7	93.1	0.79	0.76	709.8	200	180	240	73	1025
75	2970	250MB	60	126.3	970	94.3	94.2	0.93	0.91	241.0	291	153	339	88	475
	2970	280S	65	125.3	898	93.9	93.9	0.93	0.93	241.0	256	105	281	90	572
	1480	250MB	65	131.4	755	94.0	93.8	0.89	0.85	485.6	258	149	230	79	448
	1480	280S	75	127.7	756	94.9	95.2	0.90	0.89	482.5	254	211	237	80	570
	980	315S	80	128.9	790	94.4	94.1	0.89	0.86	730.8	210	190	250	77	809
	740	315M	80	145.2	770	94.4	94.0	0.79	0.75	967.8	200	180	230	75	1108
90	2970	280M	65	148.3	1009	94.5	94.3	0.93	0.92	289.1	294	123	302	90	637
	1485	280M	75	152.9	860	94.4	94.8	0.92	0.90	578.7	297	229	260	80	658
	980	315M	80	152.3	800	94.8	94.2	0.90	0.88	877.0	200	180	230	77	962
	740	315LA	80	171.5	780	94.7	94.5	0.80	0.78	1161.4	200	180	220	75	1155
110	2980	315S	65	185.5	770	95.1	95.2	0.90	0.88	357.3	190	170	225	91	1008
	1480	280MB	75	188.4	773	94.7	94.6	0.89	0.88	709.8	246	172	308	81	658
	1485	315S	80	185.1	780	95.3	95.1	0.91	0.89	709.8	210	180	230	83	1049
	980	315LA	80	185.5	770	95.1	95.3	0.90	0.87	1071.9	200	180	235	78	989
132	2980	315M	65	219.5	760	95.4	95.2	0.91	0.89	428.7	190	160	220	91	1062
	1485	315M	80	222.8	700	95.0	94.2	0.90	0.87	848.9	248	164	323	85	1049
	980	315LB	80	224.4	800	95.4	95.1	0.89	0.87	1286.2	200	175	230	79	1082
160	2980	315LA	65	268.7	780	95.5	95.4	0.90	0.90	518.8	205	180	240	91	1222
	1485	315LA	80	265.2	790	95.7	95.5	0.91	0.91	1032.4	200	180	230	86	1222
	985	355MA	100	265.5	760	95.6	95.3	0.91	0.89	1559.0	220	195	238	84	1580
	745	355MB	100	287.3	780	95.7	95.4	0.84	0.82	2050.9	200	180	235	81	1740
200	2985	315LB	65	339.7	790	95.5	95.2	0.89	0.88	648.5	215	170	240	91	1240
	1490	315LB	80	335.2	770	95.7	95.6	0.90	0.90	1290.5	200	180	235	88	1190
	985	355MB	100	336.0	760	95.6	95.7	0.90	0.88	1948.8	210	190	245	84	1760
	745	355LB	100	350.8	770	95.7	95.5	0.86	0.85	2563.6	205	185	235	81	1990
250	2985	355M	75	419.8	780	95.5	95.2	0.90	0.89	810.6	200	180	240	94	1780
	1490	355M	100	423.7	790	95.7	95.4	0.89	0.87	1613.0	230	190	260	91	1820
	985	355LB	100	424.1	780	95.6	95.2	0.89	0.86	2436.0	210	190	250	87	1990
315	2985	355LB	75	531.8	740	95.0	95.6	0.90	0.86	1021.4	225	195	240	94	1780
	1490	355LB	100	532.3	758	95.8	96.1	0.89	0.89	2020.3	275	185	255	91	1700

TCP Series Performance Data

Output kW	Full Load Speed (RPM)	Frame Size	Shaft Diameter (mm)	Current @ 400V		Efficiency		Power Factor		Torque				Noise Level dB (A)	Weight Foot Mount (kg)
				Full Load (A)	Locked Rotor (%)	Full Load (%)	% Load (%)	Full Load (%)	% Load (%)	Full Load (Nm)	Locked Rotor (% FLT)	Pull Up (%FLT)	Break Down (%FLT)		
0.75	2890	80A	19	1.64	735	81.6	81.3	0.81	0.72	2.5	315	235	324	64	15.2
	1435	80B	19	1.81	618	83.1	83.4	0.72	0.64	5.0	288	241	296	60	18.2
	945	90S	24	2.01	469	80.0	80.3	0.67	0.58	7.5	231	211	267	58	21.5
1.1	2900	80B	19	2.38	809	83.1	82.6	0.80	0.72	3.6	341	262	351	64	17.1
	1440	90S	24	2.58	674	84.9	85.4	0.72	0.64	7.3	308	248	312	60	23.0
	950	90L	24	2.94	519	81.0	81.1	0.67	0.57	11.1	278	250	298	59	25.5
1.5	2895	90S	24	3.11	825	84.9	85.0	0.82	0.74	4.9	351	210	373	68	21.5
	1440	90L	24	3.60	722	85.7	86.0	0.70	0.61	9.9	385	294	367	60	26.3
	945	100LA	28	3.55	504	82.4	83.8	0.74	0.66	15.1	214	209	262	59	33.5
2.2	2895	90L	24	4.49	808	86.5	86.9	0.82	0.74	7.2	312	226	360	68	24.6
	1450	100LA	28	4.45	793	87.2	87.8	0.82	0.75	14.5	296	248	355	62	35.5
	950	112M	28	5.54	543	84.6	85.3	0.68	0.60	22	208	188	254	59	40.0
3	2915	100L	28	5.60	933	87.4	87.9	0.89	0.84	9.8	318	262	360	71	35.5
	1450	100LB	28	6.20	829	88.2	88.7	0.79	0.71	19.7	339	291	378	62	38.5
	965	132S	38	6.80	593	85.9	86.9	0.74	0.67	29.6	200	175	271	63	59.0
4	2925	112M	28	7.22	1051	88.1	88.5	0.91	0.87	13.1	347	249	398	71	44.5
	1450	112M	28	7.93	854	88.8	89.4	0.82	0.75	26.3	309	266	374	66	47.0
	970	132MA	38	8.88	678	87.4	88.1	0.74	0.67	39.3	237	183	304	63	75.5
5.5	2930	132SA	38	9.98	991	89.5	89.7	0.89	0.85	17.9	318	249	402	75	63.2
	1460	132S	38	10.5	898	89.8	90.5	0.84	0.79	35.9	231	198	350	67	68.3
	970	132MB	38	12.6	738	88.3	88.7	0.71	0.63	53.9	289	220	348	67	76.3
7.5	2925	132SB	38	13.0	1005	90.6	91.4	0.92	0.90	24.5	265	191	362	75	70.0
	1460	132M	38	13.9	889	90.5	91.3	0.86	0.81	49.4	288	175	350	70	79.0
	960	160M	42	16.2	750	89.1	90.3	0.75	0.70	74.6	230	187	280	67	120
11	2960	160MA	42	19.3	932	91.3	91.8	0.90	0.87	35.5	225	100	341	79	121
	1470	160M	42	19.8	846	91.8	92.3	0.87	0.83	71.4	300	60	301	71	128
	960	160L	42	22.3	730	91.2	90.8	0.75	0.78	109.4	250	200	280	70	134
15	2955	160MB	42	26.2	1038	92.1	92.1	0.90	0.87	48.4	331	175	356	79	123
	1470	160L	42	26.5	945	92.6	92.9	0.88	0.85	97.2	263	115	317	73	140
	960	180L	48	30.1	800	91.2	92.0	0.79	0.77	149.2	250	140	280	69	184
18.5	2955	160L	42	31.1	950	92.7	93.2	0.93	0.91	59.8	279	117	331	79	160
	1475	180M	48	33.3	875	92.9	93.2	0.86	0.81	119.7	263	203	339	73	160
	980	200LA	55	36.2	928	91.7	92.0	0.8	0.74	179.5	289	60	321	69	188
22	2960	180M	48	37.9	956	93.0	93.3	0.90	0.88	71.0	246	180	345	84	183
	1475	180L	48	38.9	978	93.8	94.0	0.87	0.83	142.3	305	194	341	73	186
	980	200LB	55	42.1	1021	92.7	92.8	0.81	0.76	213.4	277	167	348	69	250
30	2965	200LA	55	51.6	889	94.0	94.2	0.89	0.86	96.5	289	183	332	86	247
	1480	200LA	55	58.4	852	93.6	93.5	0.79	0.72	193.3	287	267	370	75	245
	980	225M	60	53.0	661	92.8	93.6	0.88	0.86	291.8	193	201	221	72	252
37	2965	200LB	55	63.2	793	93.8	94.2	0.9	0.88	119.3	273	152	288	86	268
	1480	225S	60	65.0	919	94.3	94.5	0.87	0.84	238.3	271	142	286	75	320
	975	250M	65	67.3	700	93.3	94.0	0.85	0.83	362.4	180	130	200	72	399
45	2965	225M	55	74.9	638	94.4	94.7	0.92	0.91	144.9	176	66	262	88	322
	1480	225M	60	79.1	898	94.8	94.9	0.87	0.83	290.0	275	170	291	75	350
	990	280S	75	80.1	1028	93.9	93.9	0.86	0.82	433.9	361	242	347	75	410
55	2970	250M	60	92.4	1004	94.9	94.8	0.91	0.88	176.6	293	183	351	88	420
	1485	250M	65	98.0	884	95.1	95.2	0.85	0.81	353.8	291	192	310	77	460
	990	280M	75	98.3	1001	94.5	94.3	0.85	0.81	530.2	350	192	341	75	520
75	2975	280S	65	125.2	1057	95.2	95.0	0.91	0.89	240.4	298	164	360	90	630
	1490	280S	75	130.6	1046	95.0	95.3	0.87	0.83	480.6	358	208	340	80	620
90	2975	280M	65	149.7	1100	95.1	94.9	0.91	0.90	288.5	320	285	351	90	650
	1490	280M	75	158.6	1074	95.9	95.8	0.85	0.81	576.7	355	220	361	80	673
110	1490	315S	80	190.0	866	95.8	95.6	0.87	0.84	704.8	333	231	383	83	1030
132	1490	315M	80	224.3	906	95.8	95.9	0.89	0.86	845.8	366	103	383	85	1070

TCI/TCP/TCIM Series Motor Outline Dimensions



TCI/TCP/TCIM Series Dimensional Data

Frame Size	Foot Mounting				Shaft						General							
	H	A	B	C	D	E	F	G	K	AA	AD	HD	AC	L	TBS	TBW	TBH	
80	80	125	100	50	19	40	6	15.5	9	154	209	129	158	290	48	105	105	
90s/l	90	140	100/125	56	24	50	8	20	10	178	231	150	176	320/345	49	114	114	
100	100	160	140	63	28	60	8	24	12	203	251	151	199	385	76	114	114	
112	112	190	140	70	28	60	8	24	12	231	292	180	220	405	73	134	134	
132S/M	132	216	140/178	89	38	80	10	33	12	264	330	198	259	457/505	62	134	134	
160M/L	160	254	210/254	108	42	110	12	37	15	316	404	244	313	605/650	91	162	162	
180M/L	180	279	241/279	121	48	110	14	42.5	15	361	442	262	360	687/725	160/180	162	187	
200L	200	318	305	133	55	110	16	49	19	392	500	300	399	769	193	186	233	
225S	4, 8	225	356	286	149	60	140	18	53	19	438	557	332	465	810	199	186	233
	2	225	356	311	149	55	110	16	49	19	438	557	332	465	805	212	186	233
225M	4, 6, 8	225	356	311	149	60	140	18	53	19	438	557	332	465	835	212	186	233
	2	250	406	349	168	60	140	18	53	24	484	616	366	506	915	234	218	260
250M	4, 6, 8	250	406	349	168	65	140	18	58	24	484	616	366	506	915	234	218	260
	2	280	457	368/419	190	65	140	18	58	24	557	673/690	393/410	559	984/1035	265/277	218/245	260/280
280S/M	4, 6, 8	280	457	368/419	190	75	140	20	67.5	24	557	673/690	393/410	559	984/1035	265/277	218/245	260/280
	2	315	508	406	216	65	140	18	58	28	628	825	510	682	1205	200	290	350
315S	4, 6, 8	315	508	406	216	80	170	22	71	28	628	825	510	682	1235	200	290	350
	2	315	508	457/508	216	65	140	18	58	28	628	825	510	682	1355	200	290	350
315M/L	4, 6, 8	315	508	457/508	216	80	170	22	71	28	628	825	510	682	1385	200	290	350
	2	355	610	560/630	254	75	140	20	67.5	28	740	1010	655	820	1500	140	330	380
355M/L	4, 6, 8	355	610	560/630	254	100	210	28	90	28	740	1010	655	820	1570	140	330	380

Frame Size	B5				
	N	M	P	S	T
80-90	130	165	198	4-12	3.5
100-112	180	215	250	4-15	4
132	230	265	300	4-15	4
160-180	250	300	350	4-19	5
200	300	350	400	4-19	5
225	350	400	450	8-19	5
250-280	450	500	550	8-19	5
315	550	600	660	8-24	6
355	680	740	800	8-24	6

Frame Size	B14A				
	N	M	P	D	T
80	80	100	118	M6	3
90	95	115	138	M8	3
100-112	110	130	158	M8	3.5
132	130	165	198	M10	3.5

Mounting Arrangements

Frame Size	B3	B5	B3/B5	V1	V3	V5	V6	B6	B7	B8	V1/V5	V3/V6
56-200	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
225-250	✓	✓	✓	✓	-	-	-	-	-	-	-	-
380-355	✓	-	✓	✓	-	-	-	-	-	-	-	-

Frame Size	B14	B3/B14	V18	V19	V5/V18	V6/V19
56-160	✓	✓	✓	✓	✓	✓

Maximum Starting Time

Frame	Method	2 Pole	4 Pole	6 Pole	8 Pole
56-71	D.O.L	20	28	44	-
80	D.O.L	15	26	40	40
90	D.O.L	10	15	25	30
100	D.O.L	12	14	18	40
112	D.O.L	10	10	18	35
132	D.O.L	14	12	12	25
160-315	D.O.L	15	15	20	22
315	Star-Delta	45	45	60	65

Starts Per Hour

Frame	2 Pole	4 Pole	6 Pole	8 Pole
56-71	22	40	40	-
80-90	18	35	40	40
100-132	12	22	25	25
160-180	10	18	22	22
200	6	12	12	12
225	5	10	10	10
250	4	8	8	8
280	3	6	6	8
315	3	4	6	6
355	2	3	3	3

IP Rating Chart

Protection against solid objects		Protection against liquids	
First Number	Definition	Second Number	Definition
0	No Protection	0	No Protection
1	Protected against solid objects over 50mm	1	Protected against vertically falling drops of water
2	Protected against solid objects over 12mm	2	Protected against direct sprays up to 15° from the vertical
3	Protected against solid objects over 2.5mm	3	Protected against direct sprays up to 60° from the vertical
4	Protected against solid objects over 1mm	4	Protected against sprays from all directions – limited ingress permitted
5	Protected against dust – limited ingress (no harmful deposit)	5	Protected against low pressure jets of water from all directions – limited ingress permitted
6	Totally protected against dust	6	Protected against strong jets of water from all directions
		7	Protected against the effects of temporary immersion up to 1 metre
		8	Protected against long periods of immersion under pressure.



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