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India : Toll Free No. 1800 103 5555 **Other Countries : +91-7292 410500**

SHAKTI PUMPS (INDIA) LIMITED

Plot No. 401, 402, & 413, Industrial Area, Sector - 3, Pithampur - 454774,
Dist. - Dhar, (M.P.) - INDIA, Fax: +91-7292 410645, E-mail: info@shaktipumps.com,
sales@shaktipumps.com, Visit us at : www.shaktipumps.com

SHAKTI®
PUMPING LIFE

INSTALLATION & OPERATING INSTRUCTIONS

6 INCH, 8 INCH & 10 INCH SUBMERSIBLE MOTORS

CE

SHAKTI
PUMPING LIFE

EC DECLARATION OF CONFORMITY

IN ACCORDANCE WITH LV & RoHS DIRECTIVES UNDER SELF DECLARATION

Product Designation : SUBMERSIBLE MOTORS 6 INCH, 8 INCH & 10 INCH BORE DIAMETER

Model Reference : PREMIUM, MCIP, SML, MTSF, MTSF NG, SOLAR MOTOR (0.5 TO 252 HP)

Intended End Use: for submersible Motor to be used for Clean water lifting application.

Conforming to the requirement of the following European Directive:

a) Low Voltage Directive -2006/95/EC

a) RoHS Directive -2011/65/EU

Conforming with the requirement of these Directives is testified under self-declaration by complete adherence to the following harmonised standards:

- EN 60034-1-2010

We hereby declare that Motors is intended to be incorporated into OR assembled with other machinery to constitute relevant machinery to comply with the Essential Health and Safety requirement of the above-mentioned directives.

This machinery, its components and sub-assemblies shall not be put in to service until the machinery into which it is to be incorporated has been declared in conformity with the provision of the applicable Directives.

The criteria for selection, safety requirement of other associated equipment and installation guidelines are detailed in the instruction manual.

Date of Manufacturer & First CE marking : 10-Dec-2007.

Place of Manufacturer : Shakti Pumps India Ltd, Pithampur.

Issued at : SHAKTI PUMPS (I) LTD.
Pithampur

Marking : CE

The above Motor must not be put into service/usage for other than specified in the instruction Manual.On Date : 10-Dec-2007.

Deo Kumar Thakur
(Manager-QA)

CONTENTS PAGE NO.

1 INTRODUCTION

The assembly and operating instructions form an integral part of the rewindable submersible motor and Describe its safe, intended use in all operating phases.

Document Retention

⇨ Keep the assembly and operating instructions in the immediate vicinity of the motor

⇨ Hand the assembly and operating instructions over to every subsequent user of the motor

Application

- The assembly and operating instructions only apply to the motors described in this booklet

1.1 WARNING SYMBOLS

∅ Forbidden actions

⇒ Measure to avoid the danger

1.2 INSTRUCTIONS AND HIGHLIGHTS

In the assembly and operating instructions we use the following symbols and highlights, for improved Legibility and uniform identification.

Insulation measuring unit
(this indicates a listing)

☑ Instructions observed
(this indicates a condition)

⇒ Switch off the motor
(This indicates an instruction to take action)

Motor has stopped
(This indicates the result of the action)

Immediately switch off the Motor
(You can see a highlight in bold here)

⚠ **NOTE**

Specifically important information is given here. You should observe this information to ensure correct and safe operation of the motor.

2 SAFETY

This section describes the safety rules which must be observed for the safe use of submersible motors.

Possible sources of danger and the relevant safety measures are listed here.

2.1 INTENDED USE

Shakti Pumps submersible motors are only intended for integration with a submersible pump in order to drive the relevant pump under water. They must only be put into use if the machine fulfils the provisions of the applicable directives and statutory provisions.

→ Installation Positions

The submersible motors must only be used in clean, highly fluid media, such as drinking or process water.

The following media are not allowed: air, highly flammable, explosive media and wastewater.

Loss of guarantee and exclusion of liability:-

Shakti Pumps shall not be liable for the damage resulting from any further, non-intended use. The risk of such use rests solely with the user.

2.2 TARGET GROUP

The electrical system must only be installed by professional staff (qualified electrical engineers or electrical machine technicians).

2.3 GENERAL SAFETY INSTRUCTIONS

The following safety measures must be observed prior to putting the motor into use.

- Do not carry out any other work on the motor other than described in these instructions
- Only use the motor under water (the motor and the short motor cable must be fully submersed)
- Do not implement any changes or conversions to the motor or its electrical connections
- Never open the motor
- Never use the motor in combination with damaged pump units or parts

- Only work on the motor when it is switched off. No work or checks require the motor to be running
- Switch off the power supply to the motor before carrying out any work on it
- Make sure that nobody can switch on the voltage unexpectedly while work is being carried out on the motor
- Never work on electrical systems during a thunderstorm
- Make sure immediately after ending the work that all protective and safety devices have been fitted again & are operational

  Before switching on the motor, make sure that all electrical connections and safety devices have been checked and that all fuses and safeties have been set correctly
- Make sure that no danger zones are freely accessible (e.g. rotating parts, suction locations, pressure output locations, electrical connections)
- Observe the pump manufacturer's commissioning instructions.
- If motors or pump units have been used in contaminated media they must be marked as such before handing them over to a third party (e.g. when submitting them for repair). Pay attention to possible residues in "dead spaces" (diaphragm cover)
- Contaminated motors or pump units must be marked as such before handing them over to a third party (e.g. when submitting them for repair)
- Repairs must only be carried out by authorized professional workshops. Use only original Shakti Electric spare parts

3 STORAGE, TRANSPORT, UNPACKING DISPOSAL

Storage

⇨ Store the motor in its original packaging until the time of installing it

⇨ If the motor is stored standing up, make sure that it cannot topple over (shaft always pointing up!)

⇨ Do not store the motor in direct sunlight or within the reach of other heat sources

⇨ Observe the storage temperature (–15 +60 °C, see technical specifications).

Transport

⚠ **DANGER**

Falling loads may cause lethal injuries or may crush parts of the body!

⊘ Nobody is allowed to be located under suspended loads

⇨ Only use approved hoisting gear

⇨ Select the hoisting gear on the basis of the total weight to be transported

Unpacking

⇨ After unpacking the motor check it for possible damage, e.g. damage to the

⚠ diaphragm cover, housing, end bell, connection and motor cable

⇨ Immediately inform the supplier of any damage found

⊘ **DANGER**

⇨ Danger to life due to electrocution if the motor cable is damaged

Do not install the motor and do not put it into operation

Disposal

In order to avoid environmental damage :

- Avoid contamination by lubricants, detergents etc
- Dispose of the motor and the packaging material in a proper, environmentally sound manner
- Observe local regulations

INSTALLATION AND OPERATING INSTRUCTIONS

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4 TECHNICAL SPECIFICATIONS

DESCRIPTION	VALUE
Performance/model number	6 Inch: 4.0 - 37 kW 8 Inch: 30 - 93 kW / 7.5 - 37 kW 10 Inch: 85 - 185 kW ,
	SML 150, MTSF 150, MTSF NG, MTSF C200 / SML 200, MTSF C 250
Winding insulation	Optional PE 2/ PA (Standard - PVC)
Voltage range	220 V ... 460V, 3~ 50/60 Hz
Voltage tolerance (on the motor terminals)	50Hz { -10 to +6 % of UN, i.e. at a nominal voltage of 380/415 V 380 V –10 % = 342 V, 415 V + 6 % = 440 V
	60Hz = ±10% of UN
Frequency Tolerance	± 2%
Speed Start alternatives Starting .60 sequence	Approx. 3500 RPM at 60 Hz / 2900 RPM at 50 Hz Direct starting, delta-starting Max. number of Starts per hour with a minimum off time of 90 seconds 6 Inch : 20 Starts 8 Inch, 10 Inch : 10 Starts
Protection	IP 68 according to IEC 60529
Submersion depth	Max. 350 m
Installation location	Vertical (shaft up) to horizontal (only allowed if the pump size is identical to the motor size, e.g. 6 INCH motor with 6 Inch pump). The pump unit structure has to be able to withstand a sufficient axial motor load
Operating temperature	≥–3 °C
Sound pressure level	≤70 dB(A)
Maximum axial thrust towards the motor (8 Inch and 10 Inch motors : for clockwise rotation please consult Shakti Pumps)	6 Inch: 4 - 15 KW 15.5 kN 18.5 - 37 KW 27.5 kN 8 Inch: all motors 45.0 kN 10 Inch: all motors 60.0 kN
Maximum axial thrust away from the motor (only for a short-time load of max. 3 minutes; independent of performance rating)	6 Inch: 2.0 KN 8 Inch: 3.0 KN 10 Inch: 4.4 KN
Material	The person placing the order is responsible for selecting the correct material, specifically as regards its resistance in the medium to be transported. SS AISI 304: Stator 304, powder-coated castings SS AISI 316: Stator and castings
Motor fluid	GLYCOL (water-based emulsion) Filling fluid replacement on request
Weight	Technical data sheets (see appendix)
Storage temperature	-15 °C to +60 °C
Motor cable	Short motor cables are included in the deliver 6 inch SML = 3m, 6 inch & 8 inch MTSF = 4m 8 inch SML = 4m, 10 inch MTSF = 6m
Connection flange	6 Inch, 8 Inch: NEMA flange (see appendix) 10 Inch: Standard flange (see appendix)
Temperature monitoring	PT 100 temp. sensor for retrofiling separate orders

MOTOR COOLING

MOTOR SIZE (Inch)	PERFORMANCE RATING (KW)	COOLANT FLOW SPEED (M/S)	MAX. MEDIUM TEMPERATURE FOR WINDING (°C)	
			PVC	PE-2/PA
6	4 – 15	0.2	30	50
	18.5 - 30	0.5	30	50
	37	0.5	30	45
8	30 – 52	0.2	30	50
	55 - 93	0.5	30	50
10	85 - 185	0.5	25	45

The coolant flow speed is the speed of the medium flowing along the motor casing during normal operation.

In the event of higher media temperatures, operation is only allowed if you

- Use a special winding PE2/PA
- Reduce the performance (De-Rating, See Product Information Service)
- Increase the coolant flow speed

5 PRE-OPERATION CHECKS

5.1 CHECK THE MOTOR PRIOR TO INSTALLATION

If a leak is visible or if the motor is more than one year old (e.g. in the event of re-use or after long storage):

⇨ Check the fluid level in the motor prior to installing it (See 5.1.2 to 5.1.4).

⇨ Check insulation resistance prior to installation (See 5.4)

TOOLS

You need the following tools for assembly and inspection work :

Insulation measuring unit : As Per testing

Filling Kit

⇨ Determine the age of the motor by checking the type plate (See Fig. 5.1).

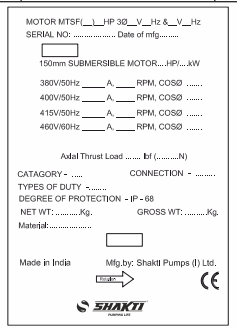

Figure 5.1 Name Plate

5.1.1 CHECKING THE MOTOR FLUID

⚠ CAUTION

Motor damage due to being insufficiently filled!

⇨ Fill the motor with sufficient motor fluid

⇨ Wear safety goggles and gloves when filling and draining the motor.

⇨ Top up using original motor fluid from Shakti Pumps 5-liter container or clean drinking water

Never use distilled water!

Filling volumes

- 6 Inch: approx. 5 liters
- 8 Inch: approx. 12 liters
- 10 Inch: approx. 20 liters

5.1.2 VENTING THE MOTOR

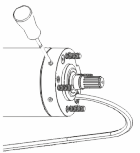

Figure 5.1.2 : 6 Inch, 8 Inch, 10 Inch MTSF - 150, SML - 150, MTSF C 200, MTSF C 250

⇨ Place the motor horizontally so that the filling valve is located at the highest position

⇨ Remove the PRV Cap from the filling valve

⇨ Carefully push the test pin into the filling valve until air and some fluid escape from it.

5.1.3 CHECKING THE MOTOR

⇨ Feed the test pin (A) through the opening in the diaphragm housing (B)

⇨ Measure the actual diaphragm distance to the side of the opening in the diaphragm cover

If the measured result is not identical to the target value :

44 mm±2 mm (6 Inch/8 Inch motor) MTSF 150/C 200

46 mm±2 (6 Inch) NG MTSF

64 mm±2 mm (10 Inch motor) or MTSF C 250

59 mm±2 mm (6 Inch motor): SML 150

⇨ Top up or drain motor fluid.

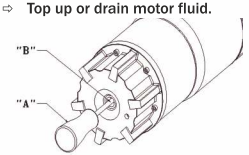

Figure 5.1.3: Checking the motor fluid

5.1.4 TOPPING UP THE MOTOR

⇨ Apply the filling syringe (C) to the filling valve (Green Colour) (D). See Figure (5-4)

⇨ Top up the motor filling fluid until the value of the diaphragm position is lower than the target value.

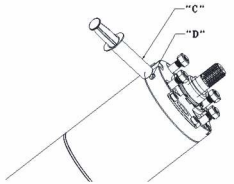

Figure 5.1.4: Topping up the motor fluid

5.1.5 ADJUSTING THE MOTOR

⇨ Adjust the diaphragm position by draining (see Venting) or topping up motor fluid until the target value is reached.

⇨ Fit the PRV Cap again.

⚠ CAUTION

⇒ Risk of injury from pre-tensioned 8 Inch /10 Inch diaphragm cover during disassembly!

⇒ Secure the diaphragm cover : screw the M8 threaded rod through the central cover opening in the diaphragm insert cover

Lock it from the outside using an M8 locknut

5.2 ASSEMBLING THE MOTOR & PUMP

⚠ NOTE

These assembly & operating instructions only describe action steps related to the motor. You should also observe the pump unit manufacturer's instructions in all events.

HOW TO COUPLE MOTOR WITH PUMP

STEP - 1
REMOVE THE SHAFT PROTECTOR, NUT & WASHER (REF FIG-A)
Surfaces of parts to be connected are free from dust & dirt.

FIG - A

STEP - 2
PUMP FITTED ON MOTOR BY ADJUSTING SPLINE (REF FIG-B)
Apply water resistant, acid free grease to the inner part of coupling

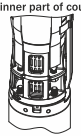

FIG - B

STEP - 3
PLACE SPRING WASHER INSIDE MOTOR STUD (REF FIG-C)

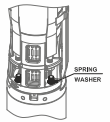

FIG - C

STEP - 4 PUT NUT OVER SPRING WASHER & TIGHT CROSSWISE AS PER TABLE, TORQUE STATED IN TABLE-1 (REF FIG-D)

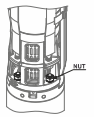

FIG - D

⚠ NOTE

Only use fixing screws of the relevant grade & dimensions approved by the pump unit manufacturer

When Assembling the motor and pump, the nuts must be tightened diagonally to the torques stated in the following table:

TABLE 1

PUMP/MOTOR STAY BOLT SIZE	TORQUE [Nm]
M8	18
M12	100
M16	150
M20	300

⚠ CAUTION

Make sure that the pump chambers are aligned when assembly has been completed.

5.3 CONNECTING THE DROP CABLE

⚠ CAUTION

Motor damage due to damaged motor cable

⇨ Make sure that the motor cable is not in contact with any sharp edges

⇨ Protect the cable against damage using the cable guard

☑ The unit manufacturer's instructions regarding the cable connection have been observed

☑ Only extension cable and insulating material used with are suitable for the specific use (specifically drinking water) and witch are approved for the temperatures occurring in the relevant medium

☑ Cable cross-sections: The table in the appendix only save as recommended suggestions. The fitter is responsible for the correct selection & dimensioning of the cable

⇨ Lay the cable along the pump

⇨ Connect the ground conductor correctly (motors or integrated ground conductors are prepared for external grounding)

⇨ Protect the cable connection location against water penetration (shrink hoses, compounds or ready cable sets)

⇨ Make sure that the short motor cable is always fully surrounded by transport medium for proper cooling during operation

5.4 MEASURING THE INSULATION RESISTANCE

This measurement is to be carried out using an insulation measuring unit (500 VDC) before and while submersing the fully assembled unit at the place of use.

⇨ Before submersing the unit, connect a measuring cable to the ground conductor

⇨ Make sure that the contact points are clean Connect the other measuring cable to every core of the connected motor cable in succession

The insulation resistance is shown on the insulation measuring unit.

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Minimum insulation resistance
(Ambient temp. 20°C) with extension cable :

- For a new motor > 4 MΩ
- For a used motor > 1 MΩ

For Your Information

Minimum insulation resistance without extension cable :

- For a new motor > 400 MΩ
- For a used motor > 20 MΩ

5.5 POWERING THE MOTOR

⚠ DANGER

Danger to Life Due to Electrocution

⇨ Prior to making the electrical motor connection make sure that there is no more voltage on the entire plant and that nobody can accidentally switch on the voltage again while the work is being carried out.

⇨ Observe the instructions on the motor type plate and dimension the electrical system accordingly. The connection examples in this chapter concern the actual motor and do not serve as recommendation for the upstream control elements.

☑ All action steps of the previous chapter have been carried out properly

Energy supply by generator

⚠ NOTE

We urgently recommend that you discuss the plant dimensions with the generator manufacturer.

The voltage tolerance –10 % to +6 % (on the motor terminals) and the deviation of a motor current from the mean value of all three currents must not be more than 5 %.

- Generator selected on the basis of the motor start behavior, i.e. starting current with a mean cos of 0.5
- Sufficient continuous generator power available
- Starting voltage at least 55 % of the nominal voltage

⇨ You must follow the following switch-on sequences unconditionally:

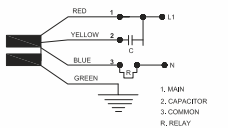
First switch on the generator and then the motor.

First switch off the motor and then the generator.

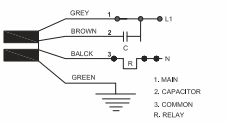
Single Phase Connection

Connect motor so that its direction of rotation corresponds to that of the unit.
The connection features the usual circuit with a clockwise rotating field and an counter clockwise rotation for the motor shaft.

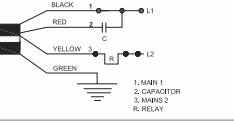
WIRING DIAGRAM FOR INDIA



WIRING DIAGRAM FOR EUROPE



WIRING DIAGRAM FOR USA/KOREA



Fusing and Motor Protection

Provide an external mains switch (1) enabling the voltage to be removed from the system
Provide fuses (2) for every single phase on siteProvide a motor starting & protection switch (3) (see connection alternatives)
Provide an emergency stop system, if required for your specific application
Ground the motor (4) (exterior grounding possible with all motors)

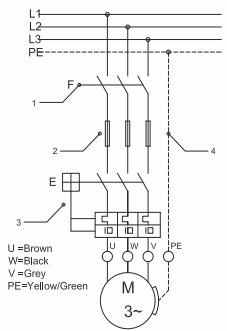


Figure 5-10: Fusing & Motor Protection

Overload Protector

⇨ Integrate an overload protector in accordance with IEC 60099 in the power supply (lightning safety (5).

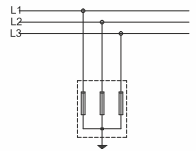


Figure 5-12: Overload protector

Connection Alternatives

The motors can be used for clockwise and anti clockwise rotation. When using 8 Inch/10 Inch motors with anticlockwise rotation, please first consult Shakti Pumps.

The connection example shows the usual circuit with a right-hand field and an anti-clockwise direction of rotation:

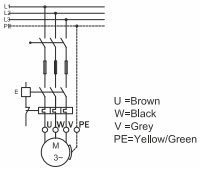


Figure 5-13: Direct starting

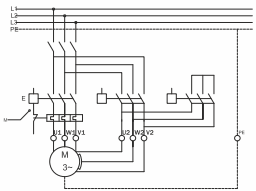


Figure 5-14: Delta-starting

Motor Safety Switch

A motor safety switch (overload relay) is absolutely necessary only use thermal trips of tripping categories 10A or 10, with

⇨ Tripping time <10 s at 500 % I_N (nominal current)

⇨ Phase sensitivity

⇨ Temperature compensation

⇨ Set the motor protection unit to the value of the operating current measured without exceeding the rated motor current I_N (as indicated on the type plate) recommendation: 90 % of the nominal motor current.

6 MOTOR OPERATION

6.1 PROPER MOTOR COOLING

⚠ **CAUTION**

Damage to the motor and the motor cable due to overheating

⇨ Make sure that the coolant flow speed along the motor is sufficient

⇨ Make sure that the short motor cable is always fully surrounded by transport medium for proper cooling

Figure 6-1: Cooling tube

If the required minimum coolant flow speed cannot be reached (e.g. if the inlet opening of the well is located above the motor or if using large-diameter wells):

⇨ Fit a cooling tube (see figure 6-1)

⇨ Make sure that the cooling tube encases the entire motor and the pump water inlet opening. The motor is force-cooled

6.2 PROVIDING A CHECK VALVE & LEVEL SENSOR

⇨ Provide at least one spring-loaded check valve in the production tube in case no such check valve has been fitted in the pump

⇨ Ensure that the first check valve is no further than 7 meters away from the pump

⇨ Further install check valves at mutual distances of 50 meters

⇨ Install a level sensor for wells with a highly varying water inflow

6.3 SWITCHING ON THE MOTOR

☑ All action steps of the previous chapter have been carried out properly

⇨ Switch on the motor using the mains switch in the control cabinet.

⇒ Measure the following values after switching on:

⇨ Motor operating current in every phase

- Mains voltage when motor is running
- Level of the medium to be transported

⇨ Immediately switch off the motor if:

- The nominal current as specified on the type plate is exceeded
- Voltage tolerances of more than –10 %/+6% relative to the nominal voltage are measured on the motor
- There is a risk of the motor running dry
- Motor current deviates from the mean value of all three currents by more than 5 %

6.4 MOTOR OPERATION WITH FREQUENCY CONVERTER

⚠ **NOTE**

When operating a motor with a frequency converter, the relevant operating manual must be observed!

⇨ Make sure that the motor current in all operating levels of the regulating range does not exceed the nominal motor current indicated on the type plate

⇨ Adjust the frequency converter so that the limit values for the nominal motor frequency of min. 30 Hz and max. the value of the nominal motor frequency (50 or 60 Hz) are observed

⇨ Limit any voltage peaks on the motor when using a frequency converter to the following values : max. voltage rise 500 V/µs, max. voltage peak 1000 V

⇨ Make sure that the running up time from 0 to 30 Hz and the deceleration time from 30 to 0 Hz is maximum one second

⇨ Dimension the cable such that power loss due to additional filters is taken into consideration

⇨ Make sure that the required coolant flow speed along the motor is also observed with frequency converter operation

6.5 MOTOR OPERATION WITH SOFT STARTER

⚠ **NOTE**

When operating a motor with a soft starter, the relevant operating manual must be observed!

⇒ Set the starting voltage of the soft starter to 55% of the nominal voltage and set the running up and delay times to max. three seconds.

⇒ Bridge the soft starter after running up, using a contractor.

7 MAINTENANCE AND SERVICE

The motor is maintenance-free, no maintenance or service activities are necessary.

8 TROUBLESHOOTING

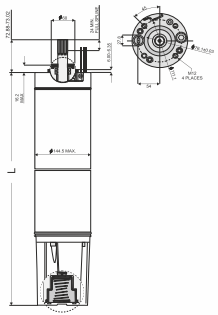
FAULT	REMEDY
Unusual noises, problems with the proper running of the pump or the pump switching on and off too frequently.	⇨ Try to find the cause of the fault on the pump unit.
The pump repeatedly switches off	⇨ Have the insulation resistance checked by a professional Service Personal ⇨ If no cause can be found in the motor or the motor cable: Have the electrical system checked.

9 SERVICE

Repairs must only be carried out by authorised professional workshops (only use original Shakti Pumps spare parts). If you have any questions or problems, please contact your dealer or contact Shakti Pumps mail to info@shaktipumps.com

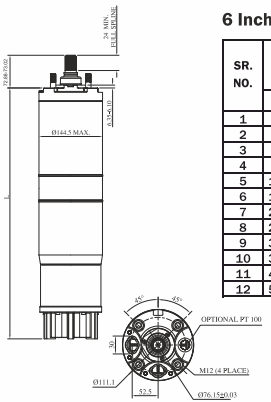
10 APPENDIX

6 Inch - REWINDABLE SML 150



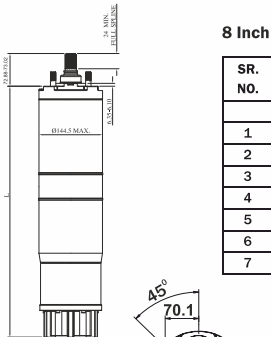
SR. NO.	P_N	L	PACKING SIZE	MOTOR WEIGHT
	[HP/Kw]	MM	LXWXH	KG
1	3.0/2.2	550	900x165x165	35
2	5.5/4.0	590	900x165x165	38
3	7.5/5.5	665	900x165x165	43
4	10.0/7.5	680	1000x165x165	48
5	12.5/9.3	700	1000x165x165	49
6	15.0/11.0	740	1000x165x165	54
7	17.5/13.0	820	1130x165x165	62
8	20.0/15.0	910	1250x165x165	72

SHAKTI PUMPING LIFE



6 Inch - REWINDABLE MTSF C 150

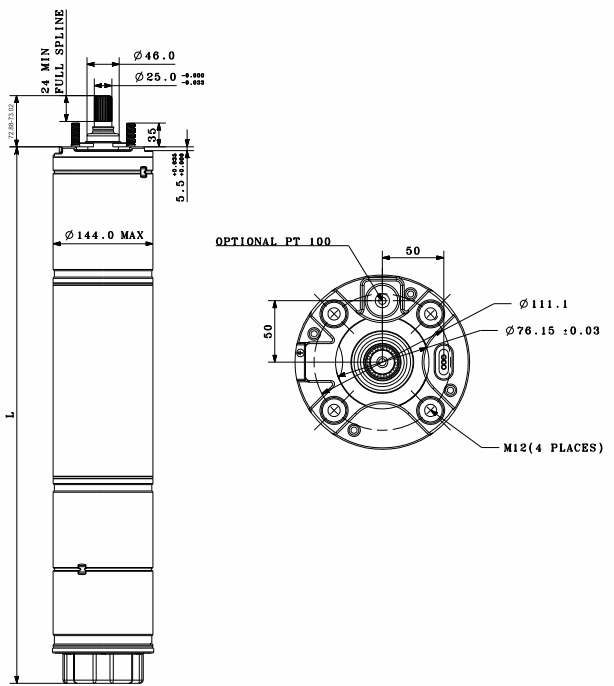
SR. NO.	P_N	L CI FG - 260	L 304SS	L 316SS	SIZE	MOTOR WEIGHT
	[HP/Kw]	MM	MM	MM	LXWXH	KG
1	5.5/4.0	768	772	785	1000x165x165	51
2	7.5/5.5	768	772	785	1000x165x165	51
3	10.0/7.5	788	792	805	1000x165x165	54
4	12.5/9.3	818	822	835	1000x165x165	57
5	15.0/11.0	848	852	865	1130x165x165	59
6	17.5/13.0	898	902	915	1130x165x165	64
7	20.0/15.0	943	947	960	1250x165x165	70
8	25.0/18.5	988	992	1005	1250x165x165	74
9	30.0/22.0	1078	1082	1095	1350x165x165	81.7
10	35.0/26.0	1183	1187	1200	1200x160x190	98
11	40.0/30.0	1283	1287	1300	1310x160x190	107
12	50.0/37.0	1363	1367	1380	1420x160x190	115



8 Inch - REWINDABLE SML 200 Drawing Required

SR. NO.	P_N	L	SIZE	MOTOR WEIGHT
	[HP/Kw]	MM	LXWXH	KG
1	10/7.5	749	1200X200X290	65
2	15/11.0	799	1200X200X290	77
3	20/15.0	849	1200X200X290	90
4	25/18.5	899	1200X200X290	102
5	30/22.0	959	1300X200X290	115
6	35/40-26/30	999	1300X200X290	130
7	50/37.0	1059	1550X200X290	145

6 Inch - REWINDABLE MTSF - NG



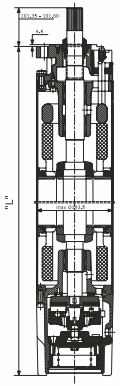
SHAKTI PUMPING LIFE

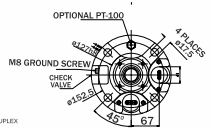
50 Hz

	P_N	P_N	LENGTH	MOTOR WEIGHT(NET)	PACKING SIZE
Sr. No.	[HP]	[kW]	304 SS/316 SS	KG	LXWXH
1	5.5	4	635	42	1000x165x165
2	7.5	5.5	675	45	1000x165x165
3	10	7.5	765	50	1000x165x165
4	12.5	9.3	765	52	1130x165x165
5	15	11	884	61	1130x165x165
6	17.5	13	900	68	1250x165x165
7	20	15	990	68	1250x165x165
8	25	18.5	990	78	1350x165x165
9	30	22	1115	93	1200x160x190
10	35	26	1235	101	1310x160x190
11	40	30	1235	105	1420x160x190

60 Hz

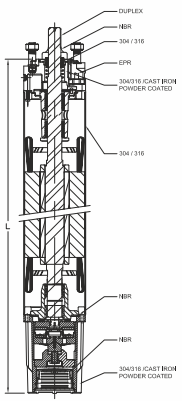
Sr. No.	P_N	P_N	LENGTH	MOTOR WEIGHT(NET)	PACKING SIZE
	[HP]	[kW]	304 SS/316 SS	KG	LXWXH
1	5.5	4	635	42	1000x165x165
2	7.5	5.5	675	46	1000x165x165
3	10	7.5	725	54	1000x165x165
4	12.5	9.3	725	48	1130x165x165
5	15	11	765	52	1130x165x165
6	17.5	13	830	58	1250x165x165
7	20	15	900	68	1250x165x165
8	25	18.5	990	78	1350x165x165
9	30	22	990	78	1200x160x190
10	35	26	1235	101	1310x160x190
11	40	30	1235	101	1420x160x190

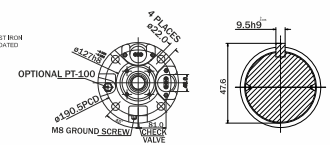




8 Inch - REWINDABLE MTSF C 200

SR. NO.	P_N	L	SIZE	MOTOR WEIGHT
	[HP/Kw]	MM	LXWXH	KG
1	30/22	1140.6	1550X200X290	146
2	40/50-30/37	1240.6	1550X200X290	146
3	60/45	1330.6	1550X200X290	168
4	70/75-52/55	1440.6	1650X200X290	181
5	80/90-60/67	1570.6	1850X200X290	228
6	100/75	1660.6	2000X200X290	228
7	110/125-83/93	1840.6	2100X200X290	260





10 Inch - REWINDABLE MTSF C 250

SR. NO.	P_N	L	SIZE	MOTOR WEIGHT
	[HP/Kw]	MM	LXWXH	KG
1	116/85	1520	2000X250X350	310
2	150/110	1630	2000X250X350	310
3	177/130	1760	2250X250X350	320
4	204/150	1870	2250X250X350	320
5	252/185	2020	2400X250X350	430

SHAKTI PUMPING LIFE

SUBMERSIBLE CABLE SELECTION CHART FOR 400V, 50Hz AC POWER SUPPLY

CABLE DIMENSIONS AT 3X400 VOLT, 50 Hz

VOLTAGE DROP : 3%																		
kW	In [A]	Cos φ 100%	DIMENSIONS [mm²]															
			1.5	2.5	4	6	10	16	25	35	50	70	95	120	150	185	240	300
0.37	1.4	0.64	576	955														
0.55	2.2	0.64	366	608	966													
0.75	2.3	0.72	312	518	824													
1.1	3.4	0.72	211	350	558	830												
1.5	4.2	0.75	164	273	434	646												
2.2	5.5	0.82	115	191	304	453	748											
3	7.85	0.77	86	142	226	337	555	872										
4	9.6	0.8	67	112	178	266	438	689										
5.5	13	0.81	49	82	130	194	320	504	768									
7.5	18.8	078	49	59	93	139	229	360	548	745								
5.5	13.6	0.77	37	82	131	195	320	503	765									
7.5	17.6	0.8		61	97	145	239	376	573	781								
9.2	21.8	0.81		49	78	116	191	300	458	625	860							
11	24.8	0.83		42	67	99	164	258	395	540	744	995						
13	30	0.81			56	84	139	218	333	454	625	833						
15	34	0.82				73	121	191	291	397	547	731	938					
18.5	42	0.81				60	99	156	238	324	446	595	763	913				
22	48	0.84					84	132	202	273	382	511	659	792	935			
26	57	0.84					71	111	170	233	321	431	555	667	788	913		
30	66.5	0.83						96	147	201	277	371	477	573	676	782	925	
37	85.5	0.79							119	162	223	296	378	451	529	608	713	806
22	48	0.84					84	132	202	276	382	511	659	792	935			
26	56.5	0.85					70	111	170	233	322	432	557	671	794	922		
30	64	0.85						98	150	205	284	381	492	592	701	814	967	
37	78.5	0.85						80	122	168	232	311	401	483	572	664	789	903
45	96.5	0.82							10	140	193	257	330	396	466	539	635	723
55	114	0.85								115	159	214	276	333	394	457	543	622
63	132	0.83									140	187	240	289	340	394	466	531
75	152	0.86									119	160	206	249	295	343	409	469
92	186	0.86										130	169	203	241	281	334	383
110	224	0.87											140	169	200	233	279	321
75	156	0.34										157	203	244	288	334	395	452
92	194	0.82										128	164	197	232	268	316	360
110	228	0.84											139	167	197	228	271	309
132	270	0.84												141	166	193	228	261
147	315	0.81													143	165	194	221
170	365	0.81															168	190
190	425	0.79															143	162
147	305	0.83													147	170	202	230
170	345	0.85														151	179	205
190	390	0.84															158	181
220	445	0.85																159
250	505	0.85																
MAX. CURRENT FOR CABLE [A]*			18.5	25	34	43	60	80	101	126	153	196	38	276	319	364	430	497

*At Particularly Favorable Heat Dissipation Conditions. Maximum Cable Length in Meters from Motor Starter to Pump.

NOTE:- Table Showing maximum allowable length of submersible cable for the given full load current where site for other voltage, the cable size is to be selected for the length which is calculated as follows. Calculated length =(400/Actual Voltage) X actual length 7.5 HP and above are SD Motors. For these motors, the actual current is $1/\sqrt{3}$ times the FL Current. The Cable size and maximum allowable length are arrived at accordingly.

WARRANTY CERTIFICATE

Dear Customer,
Congratulation, for purchasing our product.

Pump and Motor are warranted against defects in workmanship and material under normal use, service & specified duty conditions. We provide one time warranty service for twelve months from the date of purchase by the first user.
Shakti Pumps (India) Limited warrants this product to be free from damage/ defects in material and workmanship under normal use and service for Twelve Months from the date of purchase by the first user. The user shall produce valid and original copy of invoice for availing warranty. The user shall carry defective pump set to nearest authorized service center

This warranty does not cover any loss or damage/ defect of any nature resulting from wrong product selection/ improper installation or installation by unauthorized/ untrained person/ sandy condition/ dry running and improper use of the pump sets.
The warranty also does not cover consequential losses/ damages arising due to failure of pump/ motor. **Warranty of motor will not be cover for 25 HP and above, if they are running without soft starter.**
Our obligation is limited t to recycling or repairing or replacing product/ parts ex-factory. Equipment for repairs should be returned free of cost to us.
The forgoing is subject to the provision that the user does not open the unit and make any change or repair without prior approval of authorized service center during the warranty period.
This warranty excludes every condition whether statutory or otherwise, whatsoever not herein expressly set out.

Customer name: .....Customer's phone:.....

Customer Address: .....

Invoice number: .....Invoice date:.....

Model Name: .....Model Serial Number:.....

Dealer's Name: .....Dealer's phone:.....

Dealer's Address:.....

APPROVED BY: DATE OF ISSUE

17 - 05 - 2016

SHAKTI PUMPING LIFE

INSTALLATION REPORT

Customer's Name: - _____

Customer's Address: - _____

Customer's Ph. No.: _____

Dealer's Name: - _____

Dealer's Address: _____

Dealer's Ph. No. _____

Pump Model:- _____ S.L.No: _____

Project/Application: _____

Pressure In Kg:- _____ Flow in m^3/hr: _____

Liquid:- _____ Temp.: _____

Voltage:- _____ Current: _____

Packing Condition:- _____

Remarks: _____

_____

_____

Date:- _____ _____

Customer's Signature

BOOK-POST

SHAKTI PUMPS (INDIA) LIMITED

Stamp

Plot No. 401, 402, & 413, Industrial Area,
Sector - 3, Pithampur - 454774, Dist. - Dhar, (M.P.) - INDIA,
E-mail: info@shaktipumps.com,
sales@shaktipumps.com, Visit us at : www.shaktipumps.com