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INSTALLATION & OPERATING INSTRUCTIONS

ELITE SOFT STARTER



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Preface

Thank you for choosing Shakti's Elite Soft Starter. We are pleased to provide you a product that incorporates the latest technology and exceptional services to the customers.

This manual includes information for installation, maintenance, and safety of the soft starter. Please read the instructions of this manual carefully to ensure personal safety and equipment's proper functioning.

In this manual 'company' refers to Shakti Pumps (India) Ltd. Our contact details are given on the last page.

Please check the latest version at www.shaktipumps.com



CHAPTER 1 : SAFETY INSTRUCTIONS

WARNING! Ignoring the following instructions can cause physical injury or damage to the equipment or death.

1.1 Safety during Pre-Installation

1. Store the starter at an appropriate place. Storage instructions are given in chapter 2 "Introduction".
2. Before installation, kindly lift the starter carefully as the gross weight is close to 16 Kg. The product can be supported by bottom for easy handlings.
3. Don't use damaged or incomplete starter.
4. Make sure to use correct motor type (AC-IM & LSPMSM/S4RM).
5. Make sure that the starter and motor ratings comply with each other.
6. Customers are NOT authorized to open the starter or to do any kind of modification or repair. It may cause loss of warranty.

1.2 Safety during Installation

1. Only licensed person, who has been trained on design, installation, commission and operation of soft starter, is permitted to operate this equipment.
2. Installation person should wear proper safety equipments during installation.
3. Tighten the nuts and bolts properly and make sure that starter has been physically installed appropriately.
4. Ensure that power supply is switched off before making any connection.
5. Make proper connections. None of the connection should be loose. Please make sure that supply connector RYB wires are only connected to input RYB of the starter.
6. Earth the starter. This is very important. The gauge of the grounding cable must not be less than that of power supply cable.
7. If motor starts rotating in the other direction then kindly switch off the power and wait for at least five minutes and then correct the phase sequence of wire.
8. Use 63 A Circuit breaker for Soft starter input.

1.3 Safety during Operation

1. Untrained person should not work on any part/system of the Soft starter.
2. Don't put your hand near the fan of starter ,it may cause injury.
3. Please don't touch the device if earth connection got break.
4. Even if the Soft starter is not in operating situation, the following terminals still have dangerously high voltages:
 - a. Power terminals: R, Y, B.
 - b. Motor connection terminals: U, V, W.
5. Don't do any kind of repair during operation.
6. Don't stand by taking support of the starter.
7. Don't put your belongings on the starter.
8. Don't touch any naked wire.
9. If device is given power but output is not connected then please pay attention that you don't touch input/ output connection of the starter. For connecting the output, please switch off the power supply.

Attention

1. There are no user serviceable parts inside, contact customer care for any service requirement.
2. The parts inside the unit may contain high voltage even after removal of power. Wait for at least 5 minutes after the power is switched off to install/ service the Soft starter.
3. Do not connect switch gears or capacitors in the Soft starter output.
4. UVW refers to RYB sequence and accordingly connection should be made to motor so that it runs in the desired direction.
5. Ensure appropriate insulation of all the cables (Class B or above). There must not be naked copper wires.
6. Ensure proper ventilation (see Installation chapter).
7. Surface of starter may be at relatively higher temperature than ambient during operation or just after that.

CHAPTER 2 : INTRODUCTION

2.1 Product Overview

Shakti's unique ADA based Elite Soft Starter increases motor's lifetime by protecting it from electrical, mechanical and thermal stress. It uses advanced digital and power electronics control leading to stress free operation of motor. It has several inbuilt motor protection features and therefore it keeps the motor safe. It incorporates a novel technology (several patents) which is outcome of years of experience and research. It is easy to install with graphical display and inbuilt GPRS connectivity which cut installation and user efforts. With everything that you need in one unit, from bypass mechanism to overload protection, a single product is there for complete and compact start to stop solution. Furthermore with many application specific features, motor can really enjoy its ride with Shakti's Elite Soft Starter.

2.2 Storage Instructions

The Elite Soft Starter should be kept in the shipping carton or crate before installation. The starter should be stored properly when not in use especially for extended period, in order to retain warranty.

Caution

Store the starter in a place

- Which is clean, dry and free from direct sunlight or corrosive fumes.
- Has an ambient temperature range of -20 °C to 60 °C.
- Has a relative humidity range of 0% to 90% and non-condensing environment.
- Has an air pressure range of 85kPA to 107kPA.

DO NOT store

- In an area with rapid changes in temperature (condensation and frost may be caused).
- In a place with lots of water leakage.
- In a place which has high risk of fire ignition.

2.3 Receiving and Inspection

The Soft Starter has gone through rigorous quality control tests before shipment. After receiving the unit, please check if the part no. indicated on the name plate corresponds with part no. of your order.

● Serial Number Explanation from Left to Right

Model Number	29
Serial Number & Barcode	29-0004-0-24-08-19-0  29-0004-0-24-08-19-0
Software Version	CV RAMAN X.XX

Digits	Description
29	Model number
0004	Serial number for the batch
0	Batch number
24	Date of manufacturing
08	Month of manufacturing
19	Year of manufacturing
0	Reserved digits

CHAPTER 3 : PACKAGE CONTENTS

Inspection

Never install or operate any Soft starter which is damaged or has missing components. Doing so can result in injury. Check the following items when unpacking the Soft starter:

- Inspect the entire exterior of the Soft starter to see if there are any scratches or other damage resulting from shipping.
- Ensure there is operation manual and warranty card in the packing box.
- Ensure the nameplate is correct as ordered.
- Ensure the optional parts are as per order, if ordered.
- Contact the customer care if there is any damage to the Soft starter or the optional parts.

Following are the Items inside the starter box

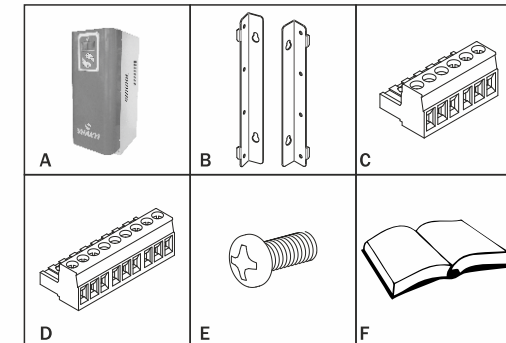


Figure 3.1

Table 3.1

Sr.	Items	Quantity
A	Elite Soft Starter	1
B	Wall Mount brackets	2
C	6 pin input connector	1
D	9 pin output connector	1
E	Pan head screws	8
F	User Manual	1

CHAPTER 4 : SPECIFICATIONS

Temperature	Operation: -10°C to 60°C Storage: -25°C to 70°C
Humidity	Relative air humidity. 90% without dew fall.
Altitude	< 1000 m for normal operation Note: Derate above 1000 m altitude.
Protection class	IP20
Input configurations	3 phase 3 wire, E
Input voltage range	415 V $\pm$ 10%, 440 V $\pm$ 10%
Input frequency	50/60 Hz $\pm$ 2.5 Hz
Rated current	28/35/45/55 A
Overload current	150% for 1 minute in bypass mode
Output voltage range	415 V $\pm$ 10%, 440 V $\pm$ 10%
Output power	15/20/25/30 HP
Maximum soft start time	1 minute
Maximum soft stop time	1 minute
Motor type supported	3 phase AC-IM/Shakti's S4RM
Startup mode	V/F with current limit
Stop mode	Soft stop or free stop; user selectable
Protection	• Over temperature • Dry run • Over Voltage • Under Voltage • Electronic thermal overload • Phase unbalance
Efficiency start	> 95%
Efficiency run	> 99%
Dimensions	180 mm x 235 mm x 460 mm
Display	Graphical LCD
Keyboard	Inbuilt in display
Display content	• Motor parameters while running • Fault data in case of malfunction
GSM/GPRS	Enabled

CHAPTER 5 : INSTALLATION

WARNING

Kindly go through safety chapter before installation and operation. Violation of the given messages may cause severe injury or property damage.

- Orientation and clearance space

Installation of the Soft Starter should be done with following spacing/clearance from panel doors/walls or other modules. This is required to maintain enough air circulation and ease of identification and wiring.



Figure 5.1

- Wall mount dimensions

Use the dimension given in the image to wall mount the Soft Starter.

Note: The dimensions are in mm and are not to scale.

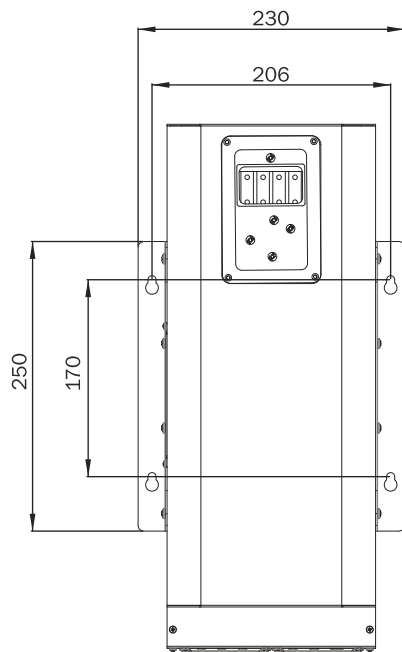


Figure 5.2

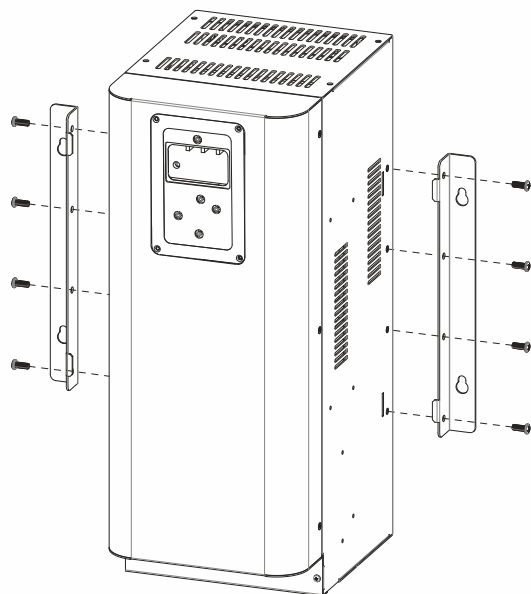


Figure 5.3

Secure the wall mount brackets to the Soft Starter with 8 numbers of pan head screws

CHAPTER 6 : CONNECTIONS & CONNECTING PROCEDURE

6.1 Remove TB cover

- Remove 2 numbers of pan head screws.
- Remove TB cover

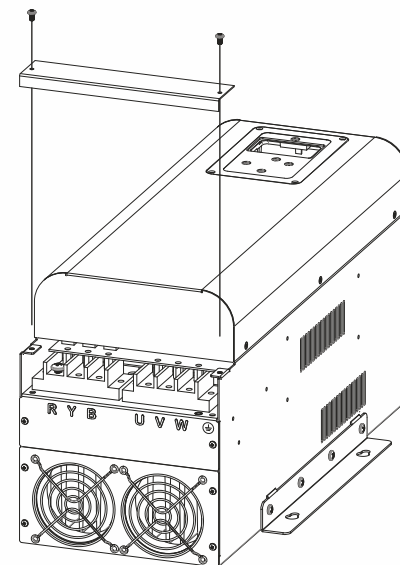


Figure 6.1

- Power input/output connections

Type	Number of wires	Wire size
Power input terminals: RYB	3	16 mm ²
Motor output terminals: UVW		

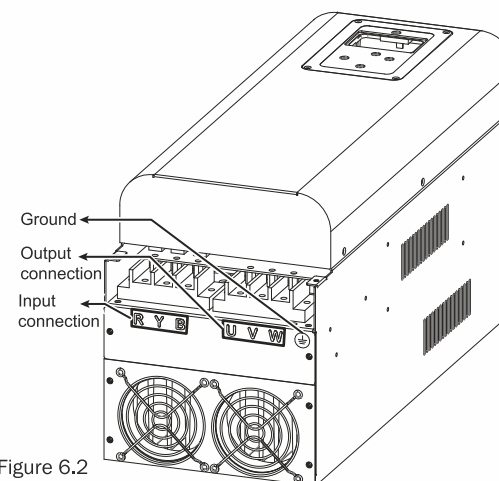


Figure 6.2

6.2 Dry Contacts

- Remove side cover

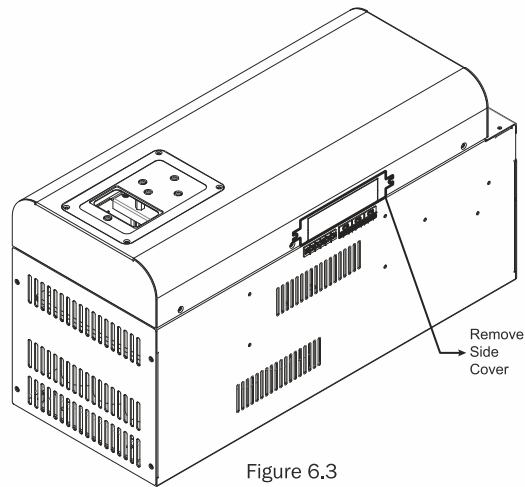


Figure 6.3

Connect Input output connectors

*This is very important otherwise starter will not work

Type	Number of pins	Wire size
Input connector	6	0.5 - 1.5 mm ²
Output connector	9	

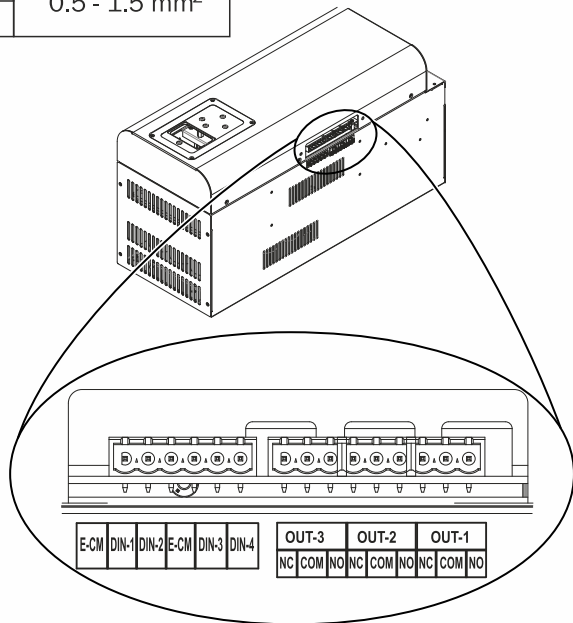


Figure 6.4

● Digital input details

Digital inputs are 24 V, 5 mA rated.

	Name	Description
E-CM	External input common terminal	24 V supply for digital inputs
DIN-1	Digital input 1	Safety input must be connected to ECM for starting (if connected to timer or float switch with E-CM: motor runs when connected to E-CM and stops when not connected)
DIN-2	Digital input 2	Fault reset input for normal faults. Connect to E-CM to reset fault.
E-CM	External input common terminal	24 V supply for digital inputs
DIN-3	Digital input 3	Normally not connected (if connected to timer or float switch with E-CM: motor stops when connected to E-CM and runs when not connected)
DIN-4	Digital input 4	For future use

● Relay output details

Relay outputs are potential free NO/NC contacts of 24 V, 1 A

OUT3	NC	FAULT output normally closed contact
	COM	FAULT output common terminal
	NO	FAULT output normally open contact
OUT2	NC	IN BYPASS mode output normally closed contact
	COM	IN BYPASS mode output common terminal
	NO	IN BYPASS mode output normally open contact
OUT1	NC	RUN mode output normally closed contact
	COM	RUN mode output common terminal
	NO	RUN mode output normally open contact

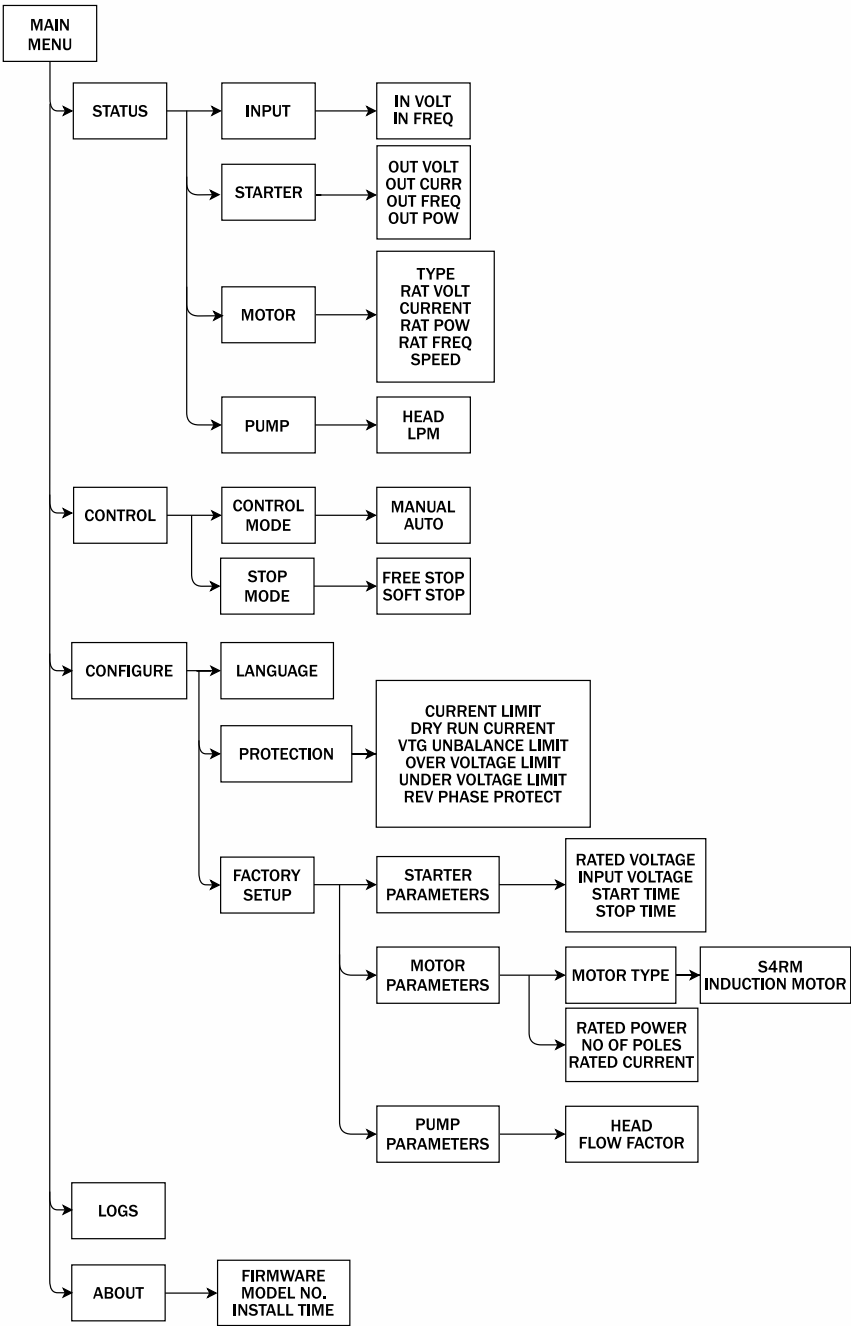
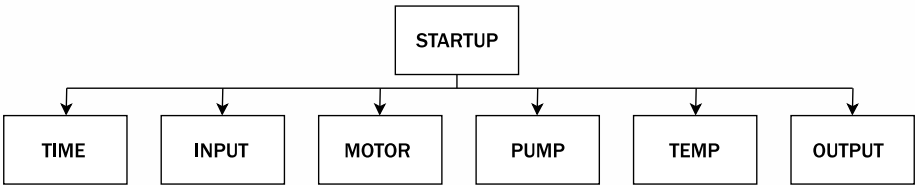
CHAPTER 7 : OPERATION OF UNIT

7.1 LCD Display Features



Button	Functionality
POWER	To turn On/Off the motor.
LCD MONITOR	To display the system related information like starter parameters, motor parameters, pump parameters, signal strength, date and time etc.
ENTER	To open menu or select menu.
ESC	To go to previous screen.
UP	To scroll up in screen.
DOWN	To scroll down in screen.

7.2 Menu Overview



7.3 LCD Operation

● Soft Start

Two modes of operation (Configurable from LCD)

- ▶ Auto: The unit starts after 10 seconds from supplying three phase healthy power.
- ▶ Manual: The unit does not accept any command for 10 seconds after supplying three phase healthy power. After 10 seconds, the power switch need to be pressed for soft start operation

● Soft Stop

Press the Power switch on the display unit for Soft stop operation.

● Remote Start/Stop

- ▶ Soft Starter can be started or stopped remotely by Shakti Remote Monitoring app.
- ▶ The Soft Starter comes with a SIM card.
- ▶ Give the command to the starter from the app to start.
- ▶ The motor/pump starts running if the input is healthy and if there are no faults present in the system.
- ▶ The app will show the status of the starter whether it is ON/OFF.
- ▶ Give the command to the starter from the app to stop.

CHAPTER 8 : TROUBLESHOOTING

Fault message will pop up every 30 seconds if the Soft Starter is in fault mode.

Displayed Fault	Description	Clear Fault	Fault Reset
Thyristor fail	No control on output voltage	Restart the Soft Starter. If fault is not cleared, contact customer care	Manual*
Soft start fail	Soft start not possible due to input power fluctuation or internal component malfunction	Restart the Soft Starter. If input power supply is correct and the fault is not cleared after restart, contact customer care	Manual*
Short circuit fault	Soft Starter output has a short circuit	Contact customer care	Restart the Soft Starter
Over temp fault	Heat sink temperature is out of range	Contact customer care	Automatic
Unbalance current	Output 3 phase motor current is not balanced	Contact customer care	Restart the Soft Starter
Dry run	Pump dry run	Wait for 30 min to 1 hour for the water to recharge in case of pump system. If false trip, contact customer care	Automatic/Manual*
Sync error fault	Input line frequency is out of range	Wait for the input line frequency to stabilize	Restart the Soft Starter
Line voltage not OK	Mains 3 phase voltages are not within the range	Wait for 3 phase voltage to come within the range. If false trip, contact customer care	Automatic with sufficient stabilization delay

*Reset the fault either by pressing Escape button or enabling the digital input 2 [DIN-2]

Displayed Fault	Description	Clear Fault	Fault Reset
Input freq not OK	Line frequency is not within the range	Wait for line frequency to come within the range If false trip, contact customer care	Automatic With Sufficient Stabilization delay
DCBUS under voltage	Soft Starter DC bus voltage is less than "DCUV Lim" set	Wait for 3 phase voltage to come within range If false trip, contact customer care	Automatic
DCBUS overvoltage	Soft Starter DC bus voltage is above "DCOV Lim" set	Wait for 3 phase voltage to come within the range If false trip, contact customer care	Automatic
Bypass overload	Output current is more than overload percentage in bypass mode	Contact customer care	Manual*
Unbalance voltage	Mains 3 phase voltages are not balanced	Wait for 3 phase voltage to come within the range If false trip, contact customer care	Automatic with sufficient stabilization delay
Soft start overload	Output current is greater than Soft Starter over load percentage in Soft Starter mode	Contact customer care	Manual*
Current FB error	Soft Starter malfunction	Restart the Soft Starter If fault is not cleared, Contact customer care	Manual*

*Reset the fault either by pressing Escape button or enabling the digital input 2 [DIN-2]
T: Installation time (hour: minute)

CHAPTER 9 : RECYCLING & DISPOSAL

Electrical & electronic waste should not be thrown out in open or buried or fired. They must never be treated as residential waste. A Soft Starter which was reached end of its life or is not needed any more should be returned to the dealer or to the company. A user may also act as per the government norms prevailing in the area.

WARRANTY CERTIFICATE

Shakti Pumps provides the warranty on this product as per Shakti Warranty Policy.

Warranty Conditions

If product gets fault and requires troubleshooting or for any kind of repair, kindly contact your dealer or company. To claim warranty kindly supply us the following:

1. Model and serial number of product.
 2. Copy of invoice and warranty card.
 3. Copy of installation report.
 4. Message appearing on LCD display or any kind of information, which could be helpful to resolve the fault.
 5. Detailed information of the whole system.
 6. Documents related to previous claims or exchanges.
- Upon receiving such information Shakti Pumps will decide about the repair/exchange.
- A. Company may send person from its factory
 - B. Or from its service centre.
 - C. Or offer an equivalent exchange as per the model and age.

In case of exchange, the remaining portion of the original warranty period will be transferred to the exchanged product and it is to be noted that customer will not get any new warranty card/certificate. All such exchanges and repair will be documented.

In case of exchange, Shakti Pumps will send the replacement unit as soon as possible and the defective unit should be sent back to the nearest service centre or to the dealer or to the company if possible in its original packing conditions. Service after warranty expiration will be as per Shakti Warranty policy.

Exclusion from warranty/liability

Kindly note the following conditions which cause exclusion from warranty/liability.

1. Customer has not sent warranty card to the dealer or to the company.
2. Customer has done any unauthorized modification or replacement or repair or maintenance.
3. Any attempt to change or erase, model or serial number or seals of the product other than authorized.
4. Failure to follow the safety instructions given in this manual.
5. Failure to properly store the product as per instructions stated in this manual.
6. Incorrect installation and commissioning.
7. Transportation damage (this includes scratch due to movement inside the package during transportation). A Claim can be made directly to shipping company/insurance Company as soon as such damage is identified.
8. Failure to follow any kind of instructions given in this manual.
9. Improper use or misuse of the product.
10. Insufficient ventilation of the product.
11. Influence of foreign objects and force majeure
12. This warranty excludes every condition whether statutory or otherwise, whatsoever not herein expressly set out.
13. For any further information please visit our website www.shaktipumps.com

WARRANTY CARD

Customer to fill following details

Name :
 Address :
 City/Village :
 District :
 State :
 Country :
 Pin Code :
 Mobile no. :
 Email id :

Information on Device:

Model no :
 Serial no. :
 Invoice no. :
 Commissioning date :
 Fault date and time :
 Message related to fault on display :
 Brief fault description and photo of display :
 Sign :
 Date :
 Place :

Installer to fill following details

Modules Used :
 Modules per string :
 Number of strings :
 Dealer license Number :
 Company :
 City/Village :
 State :
 Country :
 Pin Code :
 Mobile no. :
 Email id :
 Sign :
 Date :
 Place: :

INSTALLATION & OPERATING INSTRUCTIONS

BOOK-POST

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Stamp

