



INSTALLATION AND OPERATING INSTRUCTIONS

DIGITAL STARTER WITH AUTO SWITCH



SCU200 (Single Phase)

SAP NO. 2900000721

VC :

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INSTALLATION AND OPERATING INSTRUCTIONS

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CONVENTIONS USED IN THIS MANUAL

In the manual the following symbols will be used:



Generic danger Failure to comply with the safety regulations that can irreparably damage the controller or equipment.



Electric shock risk Failure to comply with the safety regulations that can cause death or serious personal injury.

WARNINGS

Read this manual carefully before any operation.

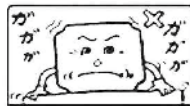
Please keep this manual for future use.

WARNING

- Before carrying out any installation or maintenance operation, protector must be disconnected from the power supply;
- Don't open the cover during running the protector;
- Don't put wire, metal bar filaments etc into the protector;
- Don't splash water or other liquid over the protector;

CAUTION

- The electrical and hydraulic connections must be carried out by competent, skilled, qualified personnel;
- Never connect AC power to output uvw terminals;
- Ensure the motor, protector and power specifications matching;
- Don't install the protector in the following condition;



mechanical shock



corrosive gas or
corrosive liquid



Extreme heat and cold,
acceptable temperature
range: -25°C +55°C



Salt mist corrosion



Rain and Moisture



flammable material:
solvent

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RESPONSIBILITY

The manufacturer is not liable for malfunctioning if the product has not correctly been installed, damaged, modified, and /or run outside the recommended work range or in contrast with other indications given in this manual.

The manufacturer declines all responsibility for possible errors in this operation manual, if due to misprints or errors in copying.

The manufacturer reserves the right to make any modifications to products that it may consider necessary or useful, without affecting the essential characteristics.

INTRODUCTION

Model SCU200 is an easy to use, programmable controlling and protection device for direct start, **single phase** submersible pumps and motors, self priming pumps, openwell, monoblock pumps etc. with output power from 0.37KW-3.7KW (0.5HP - 5HP) Model SCU200 has an important feature that makes the difference between model SCU200 and common On/Off pump control box that is, the float switch that makes it a very reliable and sensitive protection against pump dry run without installation float switch in the well.

APPLICATIONS

Model SCU200 is useful in all cases we need to protect single pump managing its turn-on and turn off.

Typical usage scenarios include:

- Domestic water supply
- Agricultural usage
- Industrial Application
- Waste water management
- Heating & cooling application
- Ground water supply
- Irrigation in horticulture & agriculture
- Ground water lowering

FEATURES

- Built In function switch
 - applied for water supply by liquid level control through float switch
 - applied for water supply by pressure control through pressure switch and pressure tank
 - applied for drainage by liquid level control through float switch
- Automatic stops the pump in the case of water shortage, protecting it from dry running without installing float switch in the well
- Auto / Manual switch
- Dynamic LCD displaying pump running state
- Push Button Calibration
- Starts and stops the pump in accordance with the different liquid level or pressure setting
- Reserved space for installing internal start capacitor of pump motor
- Protect the pump against many faults
- Starter with Auto Switch is a Single Phase Preventer
- Low voltage, High voltage cut off
- Water level controller
- Over ampere and Under ampere controllers
- Provides protection from Dry run, Over load, Under voltage, Over voltage, Pump stalled, Short circuit

INSTALLATION AND OPERATING INSTRUCTIONS

TECHNICAL PARAMETERS

The following chart shows main technical parameters of Model SCU200

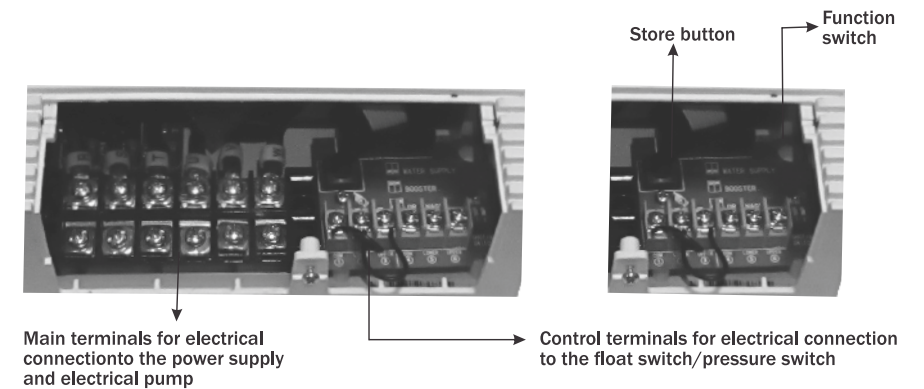
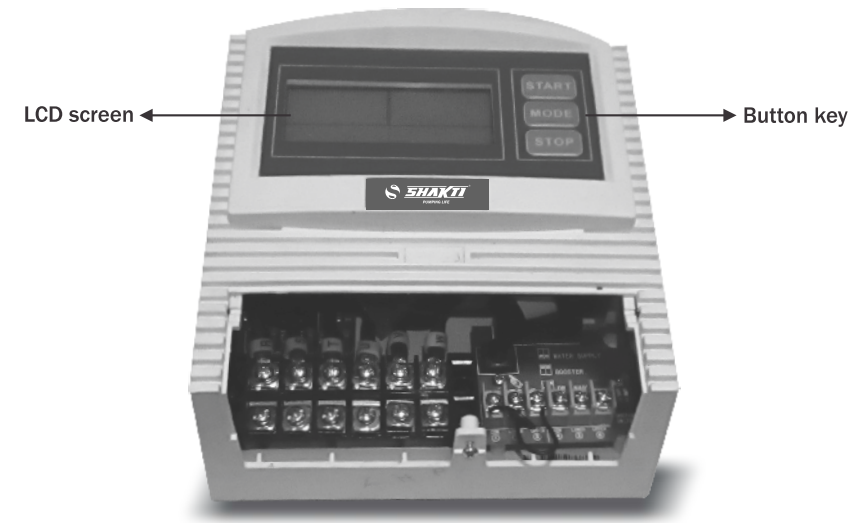
Main technical characteristic	
Control characteristic	double liquid level control pressure control
Control method	Manual / Auto
Liquid level control characteristic	float switch
Pressure control characteristic	pressure switch (n/c) & pressure tank

Main technical data	
Rated output power	0.37KW-3.7KW (0.5HP - 5HP)
Rated input voltage	AC220V/50Hz Single Phase
Trip response time of over load	5sec-5min
Trip response time of short circuit	0.1sec
Trip response time of under / over voltage	5sec
Trip response time of dry run	6sec
Recovery time of over load	30min
Recovery time of under / over voltage	5min
Recovery time of dry run	30min
Tripping over voltage	253V
Tripping under voltage	135V

Main installation data	
Working temperature	-25°C +55°C
Working humidity	20% - 90%RH, no drips concentered
Degree of protection	IP22
Install position	Vertical
Unit dimensions (L x W x H)	17 x 15.5 x 8.5cm
Gross weight	800gm

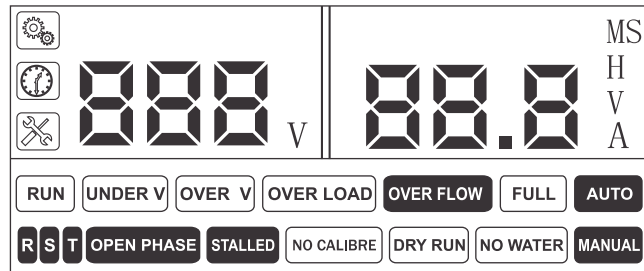
INSTALLATION AND OPERATING INSTRUCTIONS

CONTROLLER COMPONENTS



INSTALLATION AND OPERATING INSTRUCTIONS

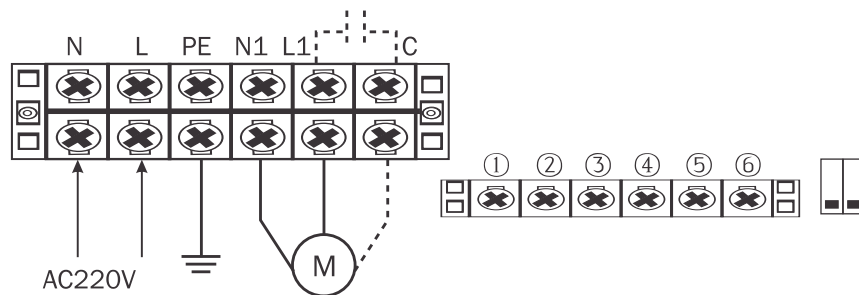
LCD SCREEN



ICON	MEANING/DESCRIPTION
	pump parameter configuration icon, when this icon appears, pump control box is in parameter adjusting manual;
	time displaying icon, when this icon appears, it means pump control box is displaying some parameter of time, eg: pump dry run trip time (unit:second);
	pump fault icon, when this icon appears, it means pump control box is displaying some fault information;
V	voltage
M	minute
S	second
H	hour
A	ampere

INSTALLATION

Electrical connection to the power supply line and electrical pump



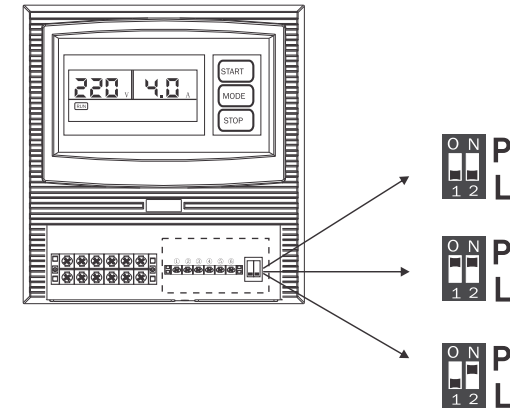
DANGER ELECTRIC SHOCK RISK

- Before carrying out any installation or maintenance operation, the SCU200 should be disconnected from the power supply and one should wait at least 2 minutes before opening the appliance.
- Never connect AC power to output N1 L1 C terminals.
- Don't put wire, metal bar filaments etc into the controller.
- Ensure the motor, protector and power specifications matching.
- The electrical and hydraulic connections must be carried out by competent, skilled, qualified personnel.

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FUNCTION SWITCH SETTING

Pump users can set the function switch to meet different application requirement, before setting the function switch, the SCU200 should be disconnected from the power supply, after completing the setting, apply power to SCU200 and observe the application sign displayed on the LCD conforming to the following list.



Item	Switch position	Messages & voltage displaying area	Application
1		000	Applied for water supply by liquid level control through float switch
2		222	Applied for water supply by pressure control through pressure switch & pressure tank
3		111	Applied for drainage by liquid level control through float switch

INSTALLATION AND OPERATING INSTRUCTIONS

PARAMETER CALIBRATION SETTING & ERASING

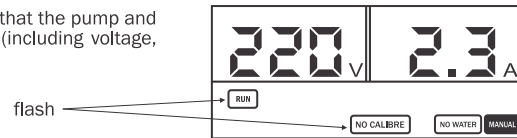
To achieve best level of protection of the motor, it is essential that parameter calibration must be done immediately after successful pump installation or pump maintenance.

SETTING THE PARAMETER CALIBRATION

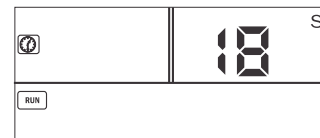
- Press the **MODE** Key to switch to manual state, make sure that the pump is not running and LCD screen displays:



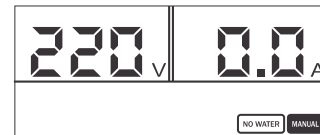
- Press the **START** key to run the pump, confirm that the pump and all pipe network are in normal working state (including voltage, running ampere etc); LCD screen displays:



- Hold pressing the **START** key and release, the SCU200 makes a "Di" sound and starts 20 seconds countdown, LCD screen displays:



- Pump stops running and parameter calibration is completed, LCD screen displays:



- SCU200 is now ready for running.

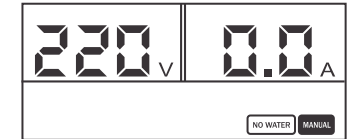
ERASING FORMER PARAMETER CALIBRATION

When pump is reinstated after maintenance or new pump is installed, user must erase the former parameter calibration and a new calibration must be done.

INSTALLATION AND OPERATING INSTRUCTIONS

ERASING THE PARAMETER CALIBRATION

- Press the **MODE** Key to switch to manual state, make sure that the pump is not running and LCD screen displays:

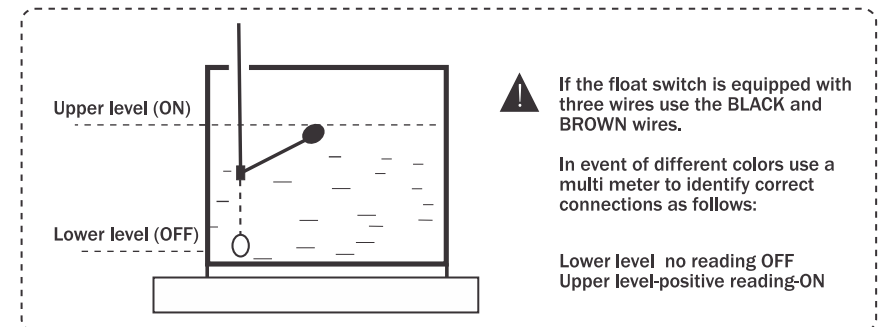


- Hold press the **STOP** key and release till SCU200 makes a "Di" sound, SCU200 recovers the default factory settings and the LCD screen displays:



ELECTRICAL CONNECTION

Float Switch Installation

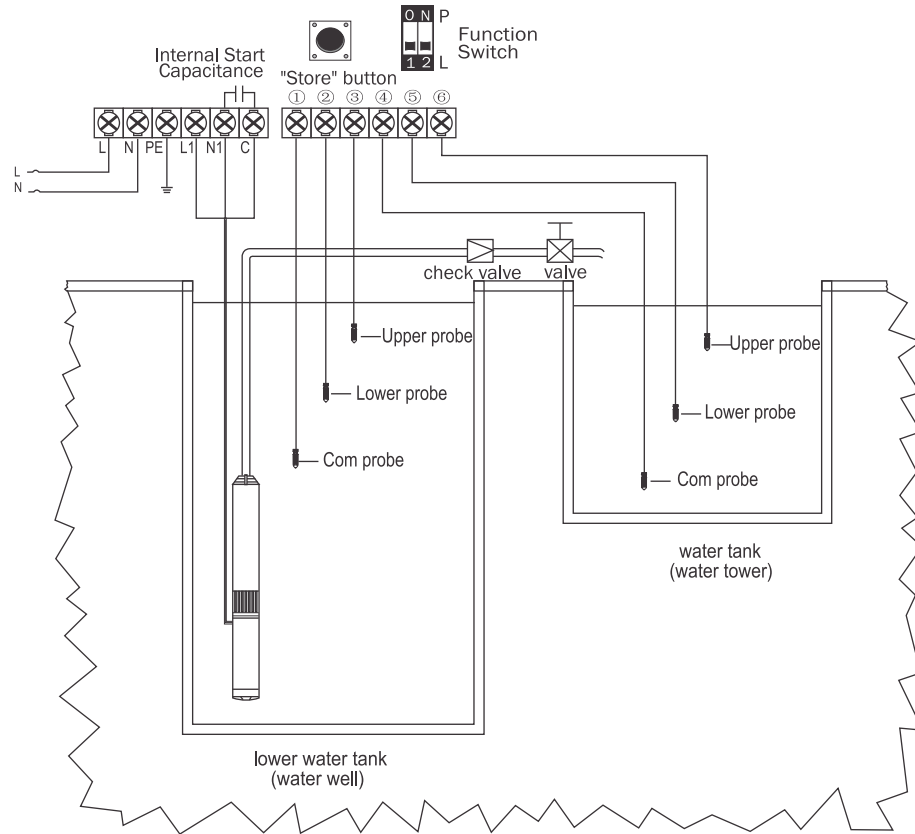


- !** Do Not Encase Float Switch Wire or Signal Cables in Metal Pipes. Use PVC or PE Tubing.

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ELECTRICAL CONNECTION FOR DIFFERENT APPLICATION

Water supply by liquid level control through float switch or liquid probe



INSTALLATION AND OPERATING INSTRUCTIONS

1. Starting condition

Liquid level in the water tank is below Lower probe (float switch: Down level) and liquid level in the water well is above Lower probe (float switch: Up level), the SCU200 will run pump;

2. Stop condition

Liquid level in the water tank reaches Upper probe (float switch: Up level) or liquid level in the water well is below Lower probe (float switch: Down level); the SCU200 will stop pump running;

3. The probe / sensor free in the water well

As the SCU200 has reliable and automatic stop function against pump dry-run (dewatering), if it is used in submersible pump for deep well, pipeline pump or other situations when it is inconvenient to install lower liquid probe in the well, pump users can put terminals ①, ②, ③ in short circuit, which minimize the troubles and costs.

4. Meaning of the messages & graphic shown on the LCD screen

Message	Description
FULL	Liquid level in the upper water tank / water tower reaches Upper probe (Float Switch: Up level), pump stops running;
DRY RUN	Liquid level in the well is below the pump intake, pump stops running;
NO WATER	liquid level in the lower water tank / water well is below Lower sensor/probe (float switch: Down level)

INSTALLATION AND OPERATING INSTRUCTIONS

BASIC OPERATION

Switching to MANUAL mode

Press the **MODE** key to switch to manual state, SCU200 is under the manual control state; Under manual state, press the **START** key to run pump; press the **STOP** key to stop pump running;

Note: Under manual state, the SCU200 can not receive the signal from float switch or pressure switch.

Switching to AUTO mode

Press the **MODE** key to switch to auto state, SCU200 is under the auto control state; under auto state, SCU200 will run or stop the pump according to the signal from float switch probe or pressure switch.

Note: Under auto state, if the pump is running and pump user wants to stop pump running compulsory, press the **MODE** key to switch to manual state and pump stops running;

Note: Under auto state, if the input power being cut off and recovery power again, the SCU200 will enter operation state after 10 seconds countdown;

Note: No matter the SCU200 is under auto or manual state, if the input power being cut off and recovery power again, the SCU200 will resume its operation state as the operation state before power being cut off;

PUMP PROTECTION

During pump running, if dry run, over load, under voltage, over voltage etc failures happened, the SCU200 will immediately shut down the pump running and automatically execute a check for restarting conditions after a built in time delay has elapsed. The SCU200 will not recover automatically until all the abnormal situation(s) have been cleared.

MEMORY FUNCTION WHEN POWER OFF AND POWER RECOVERY (AUTO SWITCH)

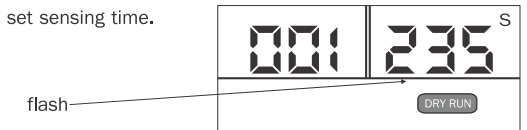
During the pump running, if the input power cut off and recover back, the SCU200 will start the pump running automatically, it will not stop pump running unless pressing stop button. If the pump does not run, the input power cut off and recover back, the SCU200 will not start the pump running, unless pump press start button to run the pump.

INSTALLATION AND OPERATING INSTRUCTIONS

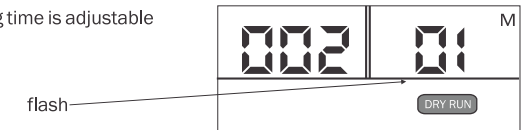
PROTECTION FUNCTION

DRY RUN

- Press the **MODE** key, hold for 5 to 10 sec. and set sensing time. Sensing time is adjustable from 0 to 255 Sec.



- Press the **MODE** Key. Set the reset time. Sensing time is adjustable from 0 to 255 Min.

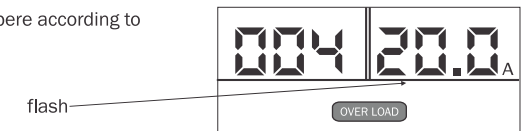


- Press the **MODE** Key. Set the ampere setting as indicated by starter. Dry run ampere is adjustable according to the HP.



OVER LOAD AMPERE

- Press the **MODE** Key. We can set Over load ampere according to the HP.



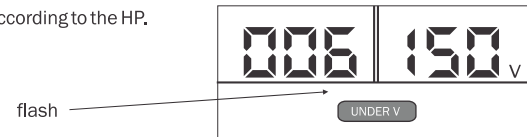
- Press the **MODE** Key.



INSTALLATION AND OPERATING INSTRUCTIONS

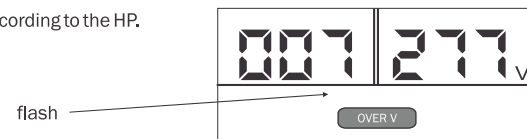
UNDER VOLTAGE

- Press the **MODE** Key. We can set Under Voltage according to the HP.



OVER VOLTAGE

- Press the **MODE** Key. We can set Over Voltage according to the HP.



- Again Press the **MODE** Key and hold for 5 to 10 sec.

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TROUBLE SHOOTING GUIDE

Fault Message	Possible Cause	Solutions
flashing of UNDER V	the real running voltage is lower than the calibrated voltage, pump is in under voltage protection state	report low line voltage to the power supply company
		SCU200 will attempt to restart the pump every 5 minutes until line voltage is restored to normal
flashing of OVER V	the real running voltage is higher than the calibrated voltage, pump is in over voltage protection state	report high line voltage to the power supply company
		SCU200 will attempt to restart the pump every 5 minutes until line voltage is restored to normal
flashing of OVER LOAD	the real running ampere is higher than the calibrated running ampere, pump is in over load protection state	SCU200 will attempt to restart the pump every 30 minutes until running ampere is restored to normal
	pump impeller is jammed / pump motor dragging / pump bearing broken	check pump impeller or bearing
flashing of NO CALIBRE	parameter calibration not completed	refer to parameter calibration setting
flashing of DRY RUN	liquid level in the well / pump is below the pump intake, pump stops running	SCU200 will attempt to restart the pump every 30 minutes until the liquid level becomes above the pump intake
flashing of STALLED	pump motor running ampere increasing was greater than the normal running ampere (calibrated ampere) by more than 200%	cut off power supply & repair or replace pump immediately