

Installation & Operation Manual

L932/B

Ver.1.1



Conventions used in this manual

In the manual the following symbols will be used:



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



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

WARNINGS

Read this manual carefully before any operation.
Please keep this manual for future use.



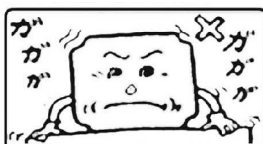
WARNING!!

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



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, controller and power specifications matching;
- Don't install the controller in the following condition;



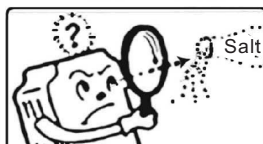
mechanical shock



corrosive gas or
corrosive liquid



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



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 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.

1 INTRODUCTION

Thank you for choosing our products, we will supply you with cordial and well-around service as well as ever.

Intelligent Pump Controller model L932-B is an easy to use, programmable controlling & protection device for duplex booster pump with direct start, three phase, 0.75KW-15KW(1HP-20HP)

1.1 Applications

Model L932-B is specially designed for pressure booster pumping system, by adopting pressure transmitter (0.5-4.5V), pump user can easily set the different pressure value and observe the dynamic pressure value in the pipeline.

Typical usage scenarios include:

- Houses
- Holidays houses
- Water supply from wells
- Construction site
- Flats
- Farms
- Industrial plants

1.2 Technical parameter & features

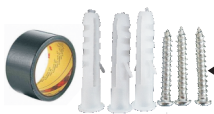
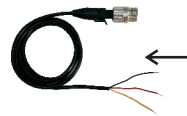
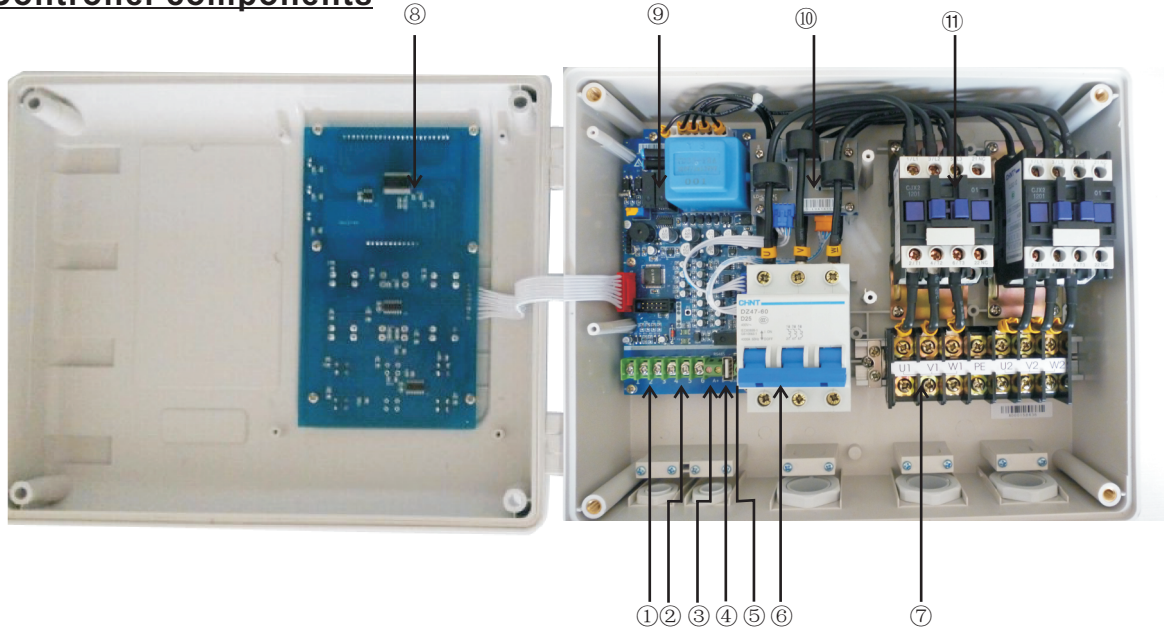
Main features:

- Double pumps control
 - main pump / standby pump automatically alternate
 - main pump / standby pump automatically switch against malfunctions
 - standby pump participate running if required
- Present pressure transmitter with 0.5-4.5V analog signal
- Easily setting the different pressure value and observing the dynamic pressure value
- Eliminates the pressure switches: pressure setting for two pumps; pressure setting for one pump
- Automatic stops the pump in the case of water shortage, protecting it from dry running without installing float switch or liquid probe in the well
- Auto / Manual switch
- Protect the pump against many faults
- Dynamic LCD displaying the real pressure value
- Dynamic LCD displaying pump running information
- Pump accumulative running time displaying
- Pump last five fault record displaying
- Pump shaft anti rust
- Present remote monitor
- Present one dry contact point

The following chart shows main technical parameters of Model L932/B

Main technical characteristic													
Control characteristic	pressure control												
Control method	Manual / Auto												
Pressure control characteristic	Pressure transmitter with 0.5-4.5V analog signal												
Main technical data													
Rated output power	0.75-15KW (1HP-20HP) refer to the nameplate												
Rated input voltage	AC220V-AC415V /50HZ Three Phase refer to the nameplate												
Trip response time of over load	5sec-5min												
Trip response time of open phase	<2sec												
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												
Trip voltage of over voltage	115% of the rated input voltage												
Trip voltage of under voltage	80% of the rated input voltage												
Liquid level transfer distance	≤1000m												
Protection function	<table border="0"> <tr> <td>Dry run</td> <td>Pump stalled</td> </tr> <tr> <td>Over load</td> <td>Short circuit</td> </tr> <tr> <td>Transient surge</td> <td>Three phase unbalance</td> </tr> <tr> <td>Under voltage</td> <td>Phase reversal</td> </tr> <tr> <td>Over voltage</td> <td>Repeated start</td> </tr> <tr> <td>Pump shaft rust protection</td> <td>Open phase</td> </tr> </table>	Dry run	Pump stalled	Over load	Short circuit	Transient surge	Three phase unbalance	Under voltage	Phase reversal	Over voltage	Repeated start	Pump shaft rust protection	Open phase
Dry run	Pump stalled												
Over load	Short circuit												
Transient surge	Three phase unbalance												
Under voltage	Phase reversal												
Over voltage	Repeated start												
Pump shaft rust protection	Open phase												
Main installation data													
Working temperature	-25℃ -- +55℃												
Working humidity	20% - 90%RH												
Degree of protection	IP54												
Install position	Horizontal												
Unit dimensions (L x W x H)	31 x 22x 12cm												
Unit weight (net)	3.6kg												
RS485 technical data													
Physics Interface	RS485 Bus Interface: asynchronism semiduplex												
Baud rate	1200 bps、 2400 bps、 4800 bps、 9600bps Default: 9600bps												
Protocol type	MODBUS Protocol (RTU)												

1.3 Controller components



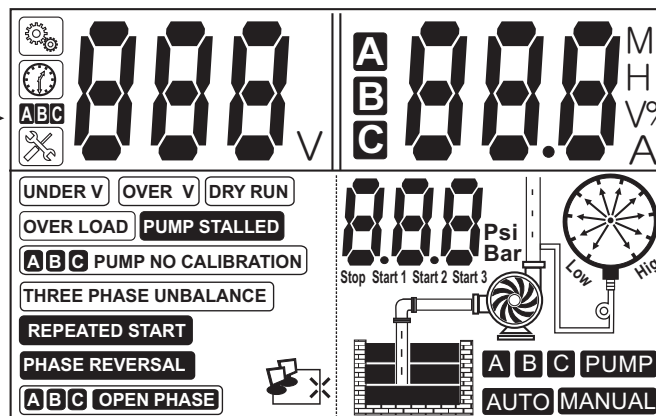
- 1. Control terminals for electrical connection to float switch/probe
- 2. The terminals for pressure transmitter
- 3. RS 485 terminals for communication link (remote monitor)
- 4. USB port
- 5. Passive dry contacting point
- 6. MCB for electrical connection to the power supply
- 7. Terminals to electrical pump
- 8. Displaying board
- 9. Main board
- 10. Transformer board
- 11. AC contactor
- 12. Remote monitor
- 13. Adaptor+cable for remote monitor(SC2)
- 14. Pressure transmitter
- 15. Wall-mounting spares+ waterproof tape for the cable of pressure transmitter

voltage displaying area →










→ ampere displaying area

fault displaying area →

→ pump running status displaying area



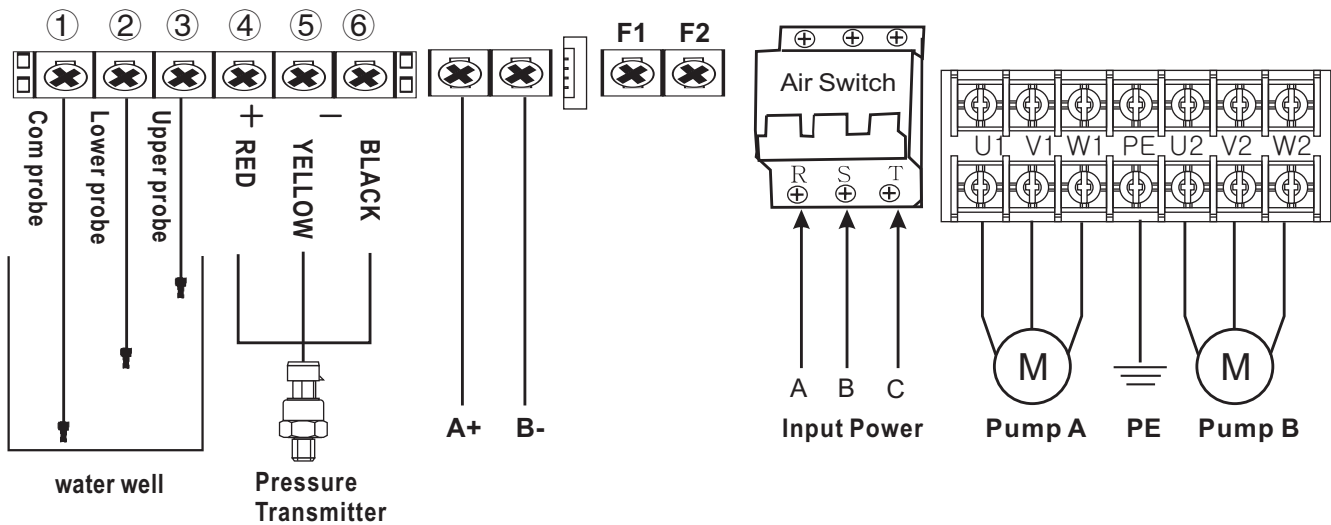
Meaning of the icons shown on the LCD

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 accumulative running time (unit: hour); counting down etc
	pump fault icon, when this icon appears, it means pump control box is displaying some fault information;
 ON LINE	network connection error icon, when this icon appears, it means there is no network connections or network connection error between pump control box and SC(slave controller) or computer;
 ON LINE	network normal connection icon, when this icon appears, it means the network connection between pump control box and SC (slave controller) or computer is normal;
V	voltage
M	minute
S	second
H	hour
%	percent
A	ampere
	pump running
	pump stops running
	low pressure or lack of pressure in the pipeline or pressure tank
	high pressure or full of pressure in the pipeline or pressure tank
A	pump A
B	pump B
C	pump C

Icon	Meaning/Description
Stop	pressure value for cut off setting
Start 1	pressure value for 1 st pump cut in setting
Start 2	pressure value for 2 nd pump cut in setting
Start 3	pressure value for 3 rd pump cut in setting
Psi	pressure unit
Bar	pressure unit
Low	low pressure or lack of pressure in the pipeline or pressure tank
Hig	high pressure or full of pressure in the pipeline or pressure tank

2 INSTALLATION

2.1 Electrical connection to the power supply line and electrical pump



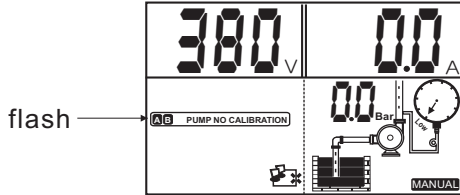
- ⚠ DANGER Electric shock risk**
Before carrying out any installation or maintenance operation, the L932/B should be disconnected from the power supply and one should wait at least 2 minutes before opening the appliance.
- ⚠** Never connect AC power to output U1 V1 W 1 U2 V2 W2 terminals.
- ⚠** Don't put wire, metal bar filaments etc into the controller.
- ⚠** Ensure the motor, controller and power specifications matching.
- ⚠** The electrical and hydraulic connections must be carried out by competent, skilled, qualified personnel.

2.2 Parameter Calibration setting & erasing

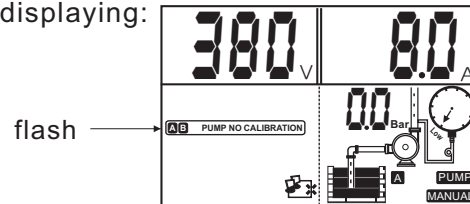
To achieve best level of protection of the pump, it is essential that parameter calibration must be done immediately after successful pump installation or pump maintenance.

Setting the parameter calibration(Pump A)

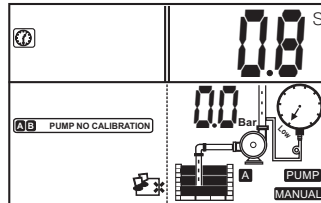
- Press the **MODE** key to switch to manual state, make sure the pump not running and LCD screen displaying:



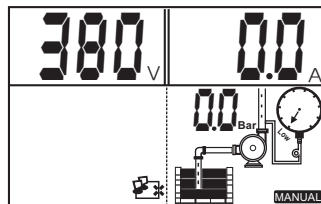
- Press the **A START** key to run pump, confirm the pump and all pipe network in normal working state (including voltage, running ampere et); LCD screen displaying:



- Press the **STORE SET** button; The L932/B makes a "Di" sound and starts countdown, LCDscreen displaying:



- Pump A stops running and parameter calibration completed, LCD screen displaying:



Note:Parameter calibration of pump B is same as pump A,just by pressing **B START button instead of **A START****

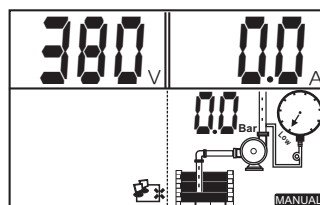
Pump A is ready for running

Erasing former parameter calibration

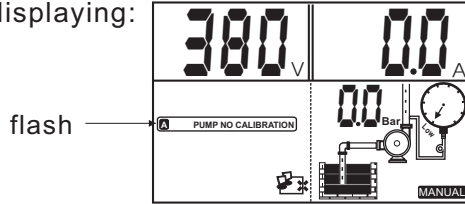
When pump is reinstalled after maintenance or new pump is installed, user must erase the former parameter calibration and a new calibration must be done.

Erasing the parameter calibration(Pump A)

- Press the **MODE** key to switch to manual state, make sure the pump not running and LCD screen displaying:



- Press the **A STOP** key and release till L932/B makes a "Di" sound, L932/B recover the default factory setting and LCD screen displaying:

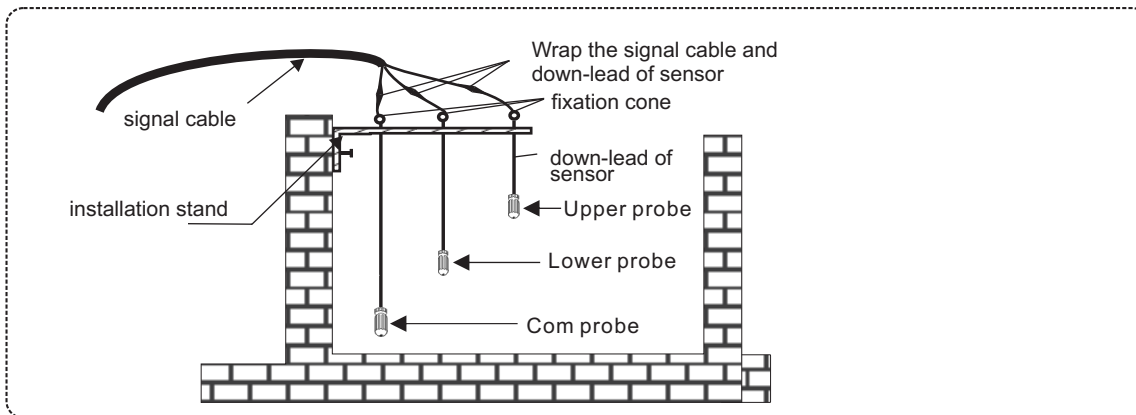


Note:Erasing the Parameter calibration of pump B is same as pump A, just by pressing **B STOP** button instead of **A STOP**

3 ELECTRICAL CONNECTION

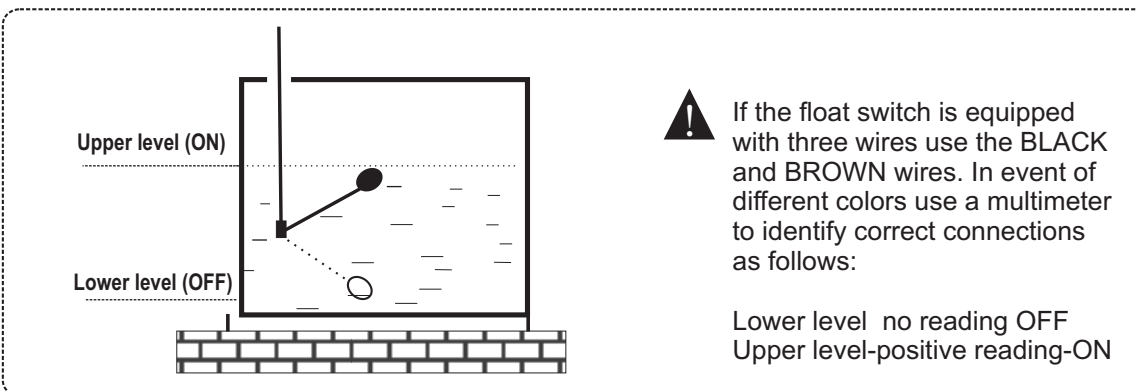
3.1 Installing liquid probe or float switch in the water well

Liquid probe installation



! In event of high risk of electric storms (lightning) or when liquid medium in well or tank or sump is very dirty it is recommended float switch is used.

Float switch installation



! DO NOT ENCASE SENSOR LEADS, FLOAT SWITCH WIRE OR SIGNAL CABLES IN METAL PIPES. USE PVC OR PE TUBING.

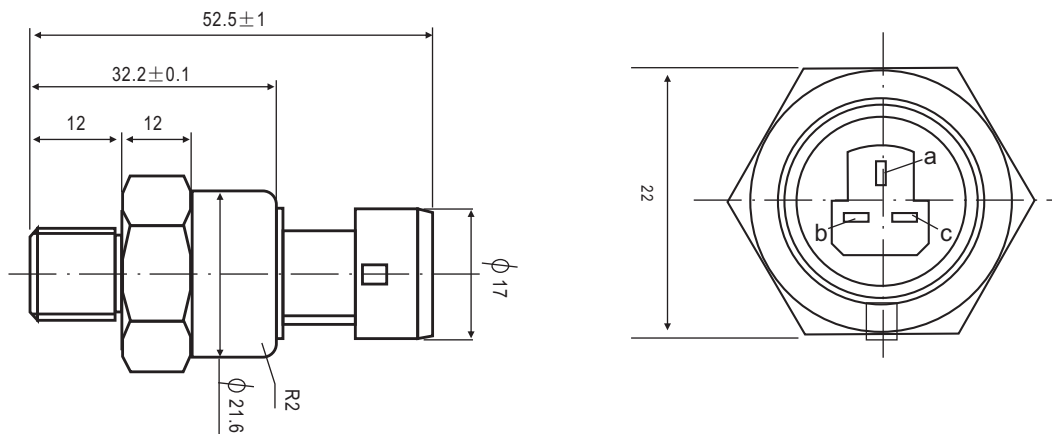
3.2 Installing pressure transmitter

Technical parameter

The following chart shows the main the technical parameters of pressure transmitter

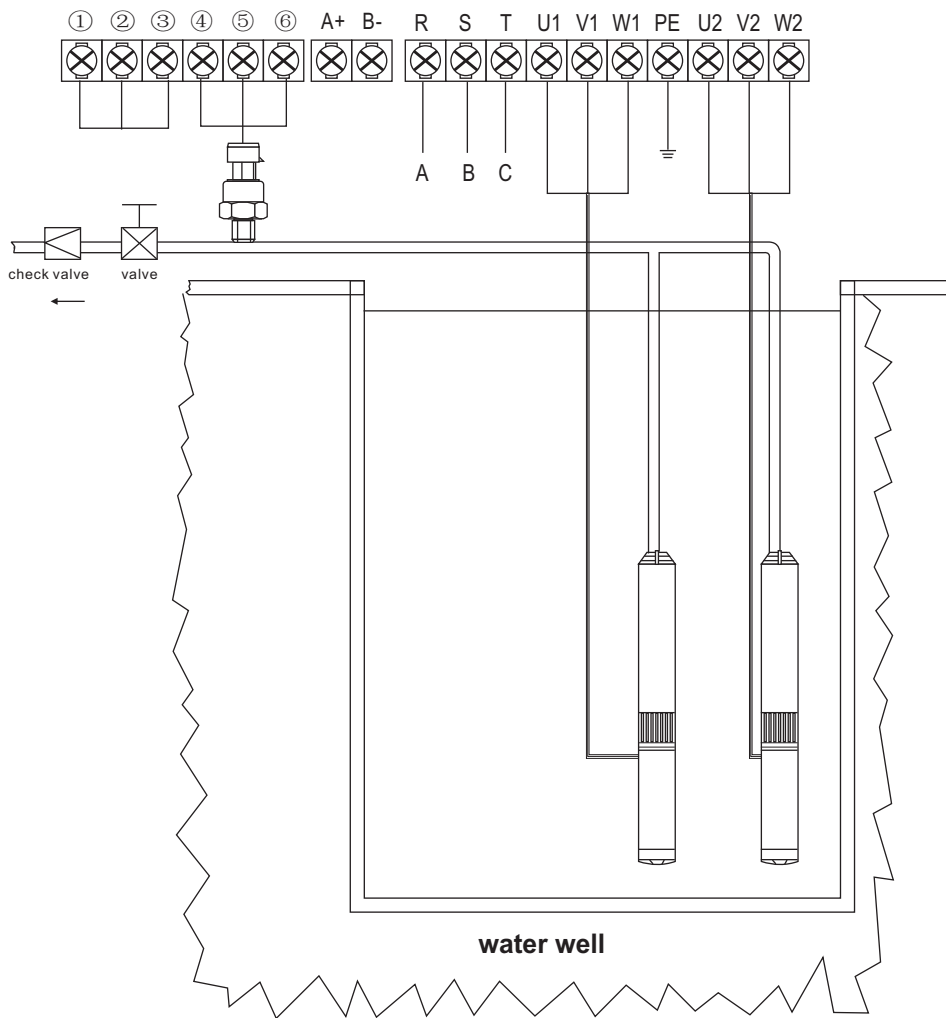
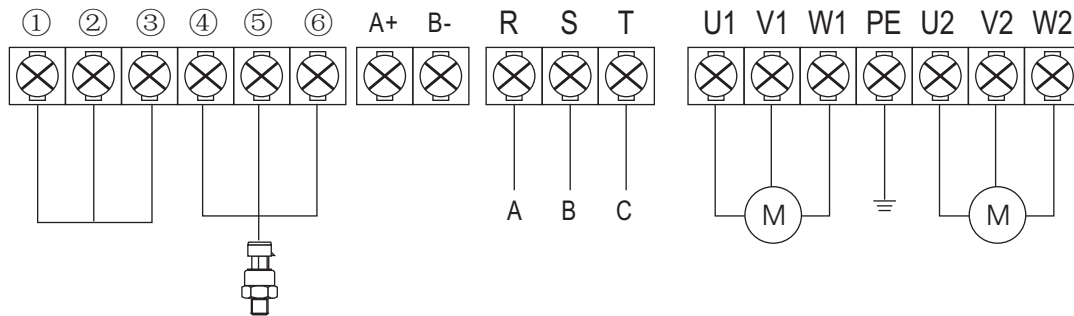
Main technical data	Value
Measure Range	0-2. 5Mpa
Power Supply	5±0. 5VDC
Output Signal	0. 5-4. 5V
Accuracy	±2%FS (-10℃100℃)
Overload Pressure	2×RP (rated pressure)
Broken Pressure	3×RP (rated pressure)
Insulation	≥10MΩ@50V
Response Time	<10ms
Wires	Three-wire
Elec. connector	Packard
Pressure Port	G1/2
Shell Protection	IP65

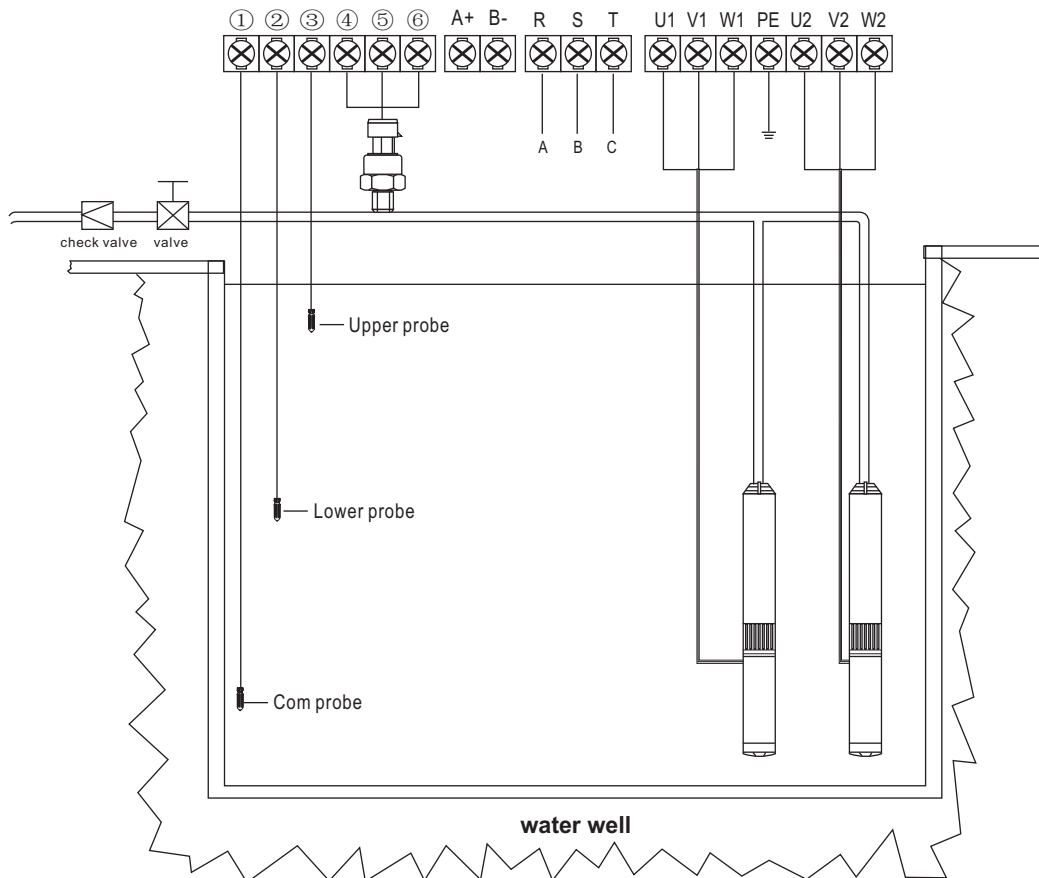
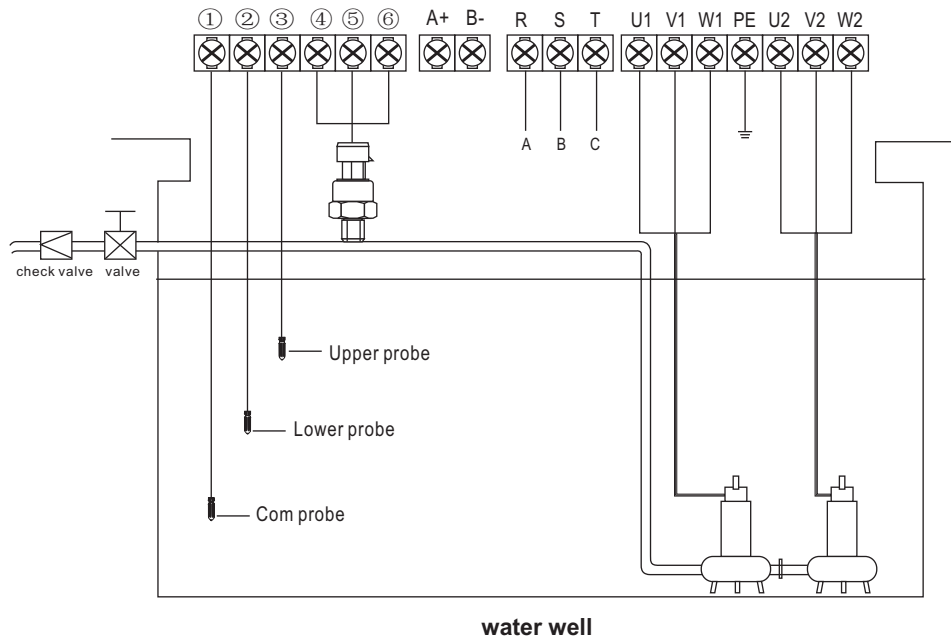
Dimension & Pin definition

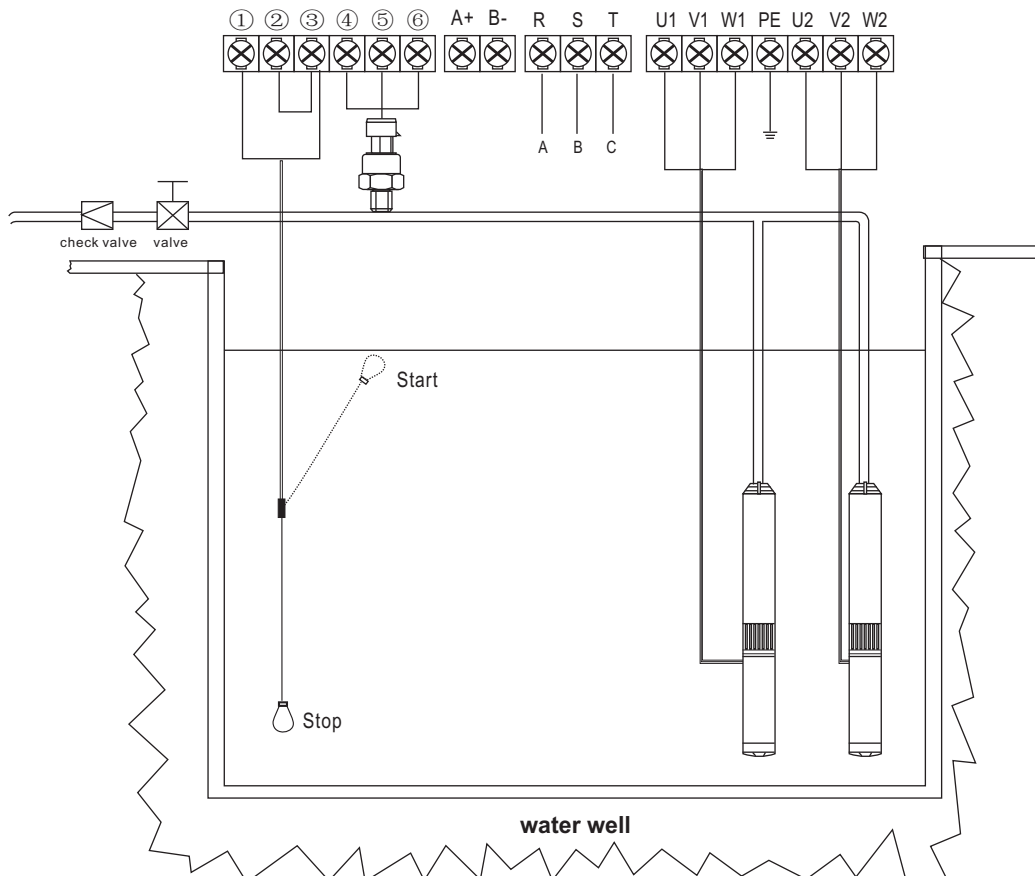
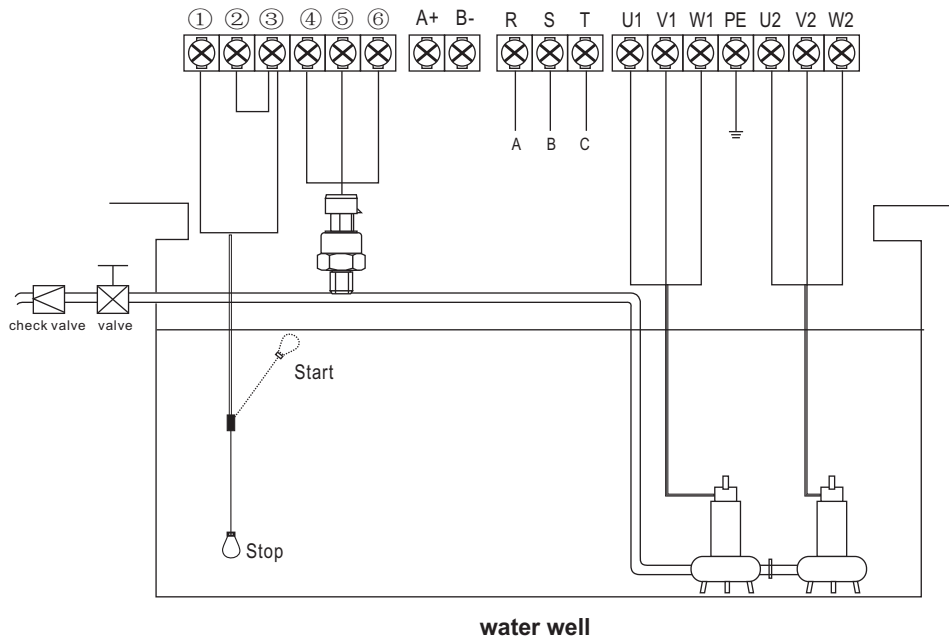


Pin definition		
a	VOUT	Yellow color wire
b	VCC	Red color wire
c	GND	Black color wire

3.3 Electrical connection for pressure booster pumping system







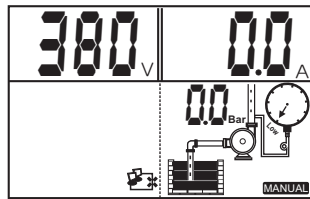
4 SET DIFFERENT WORKING PRESSURE VALUE

Note: the pressure value degree is CUT OFF SETTING > 1ST PUMP CUT IN SETING > 2ND PUMP CUT IN SETTING

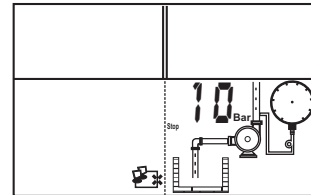
Note: suppose pump user sets the cut off pressure value: 10bar;
 1st pump cut in pressure: 6bar;
 2nd pump cut in pressure value: 3bar;

4.1 Cut off pressure value setting

-press the **MODE** key to switch to manual state, make sure the pump not running and LCD screen displaying:



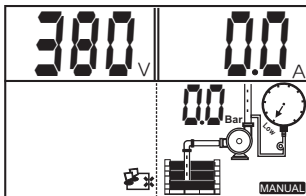
-hold pressing **STORE SET** key and click **CUT OFF SETTING** to add or decrease the cut off pressure value;



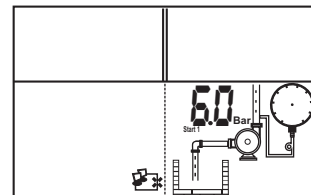
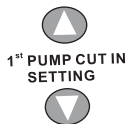
-loosen **STORE SET** key, controller makes a DI sound, cut off pressure value setting complete;

4.2 1ST Pump cut in pressure value setting

-press the **MODE** key to switch to manual state, make sure the pump not running and LCD screen displaying:



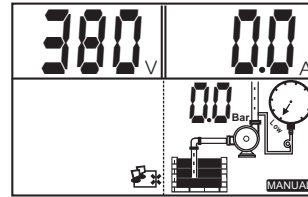
-hold pressing **STORE SET** key and click **1ST PUMP CUT IN SETTING** to add or decrease the 1st pump cut in pressure value;



-loosen **STORE SET** key, controller makes a DI sound, cut off pressure value setting complete;

4.3 2nd Pump cut in pressure value setting

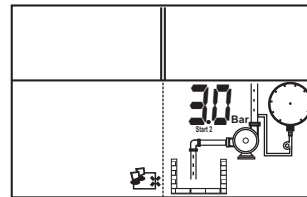
- press the **MODE** key to switch to manual state, make sure the pump not running and LCD screen displaying:



hold pressing **STORE SET** key and click **2nd PUMP CUT IN SETTING** to add or decrease the 2nd pump cut in pressure value;



-



loosen **STORE SET** key, controller makes a DI sound, cut off pressure value setting complete;

5 BASIC OPERATION

5.1 Switching to MANUAL mode

Press the **MODE** key to switch to manual state, L932-B is under the manual control state; under manual state, press **A START** / **B START** key to run A/B pump; press **A STOP** / **B STOP** key to stop A/B pump;

Note: under manual state, the L932-B can not receive the signal from pressure transmitter;

5.2 Switching to AUTO mode

Press the **MODE** key to switch to auto state, L932-B is under the auto control state; L932-B will run or stop the pumps according to the pressure value setting;

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 L932/B will enter operation state after 10seconds countdown;

Note: no matter the L932/B is under auto or manual state, if the input power being cut off and recovery power again, the L932/B will resume its operation state same as the operation state before power being cut off;

5.2.1 AUTO mode working logic description

Note: suppose pump user sets the cut off pressure value: 10bar;
 1st pump cut in pressure: 6bar;
 2nd pump cut in pressure value: 3bar;

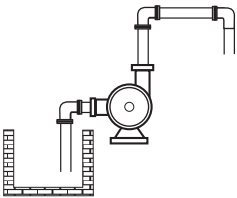
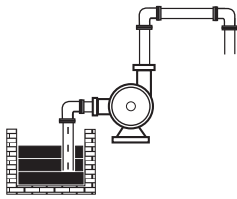
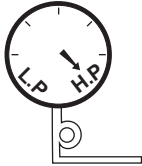
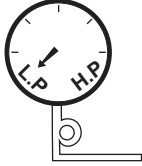
1). Normal pressure demanding

If pressure value in the pipeline is 6bar, controller will order single pump to run, when pressure value reaches 10bar, single pump stops running; controller will alternate dual pumps running automatically when pressure value varies from 6bar to 10bar;

2). Extra pressure demanding

single pump is running, pressure value in the pipeline still decrease to 3bar, controller will order another pump to run simultaneously, till the pressure in the pipeline reaches 10bar, double pump will not stop running;

3). Meaning of the messages & graphic shown on the LCD screen

Messages & Graphic	Description
	Lack of water in water well
	Full of water in water well
	Full of pressure in pipeline or pressure tank
	Lack of pressure in pipeline or pressure tank

5.3 Pump protection

During pump running, if dry run, over load, under voltage, etc failures happened, the L932/B will immediately shut down the pump running and automatically execute a check for restarting conditions after a built in time delay has elapsed. The L932/B will not recover automatically until all the abnormal situation(s) have been cleared.

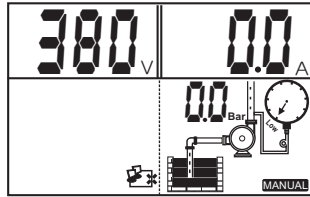
If pump stalled, open phase etc serious failures happened, pump user must check the pump and motor immediately and repair the pump.

5.4 Pump last five failure record displaying

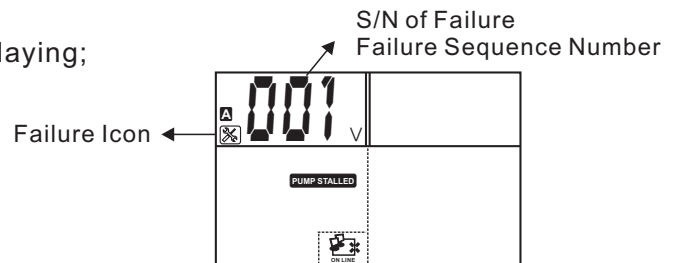
The L932/B can memorize the last five failures of pump, so it is very convenient for the pump users to analyse the pump running conditions.

Displaying the pump A last five failure record

- Press the **MODE** key to switch to manual state, make sure the pump not running and LCD screen displaying:



- Hold pressing **A STOP** key and press **MODE** key, the L932/B makes a "Di" sound, the L932/B displays pump failure record;
- Press **A STOP** key to quit the failure record displaying;



THE LATEST FAILURE OF PUMP A IS PUMP STALLED

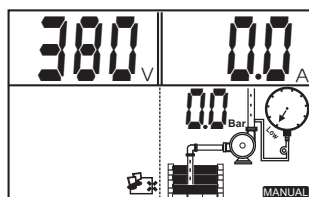
Note: displaying the pump B last five failure record is same as pump A, just by pressing **B STOP** button instead of **A STOP**

5.5 Pump accumulative running time displaying

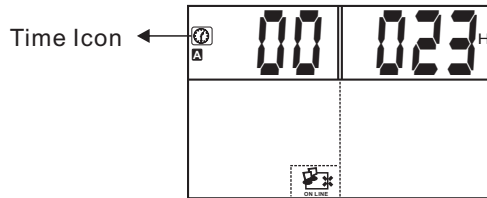
The L932/B can memorize how many hours of pump running, so it is very convenient for the pump users to analyse the pump running conditions and do maintenance

Displaying the pump accumulative running time

- Press the **MODE** key to switch to manual state, make sure the pump not running and LCD screen displaying:



- Hold pressing **MODE** button and press **A STOP** key, the L932/B makes a "Di" sound, the L932/B displays pump accumulative running time record;



THE PUMPA HAS RUN FOR 23 HOURS

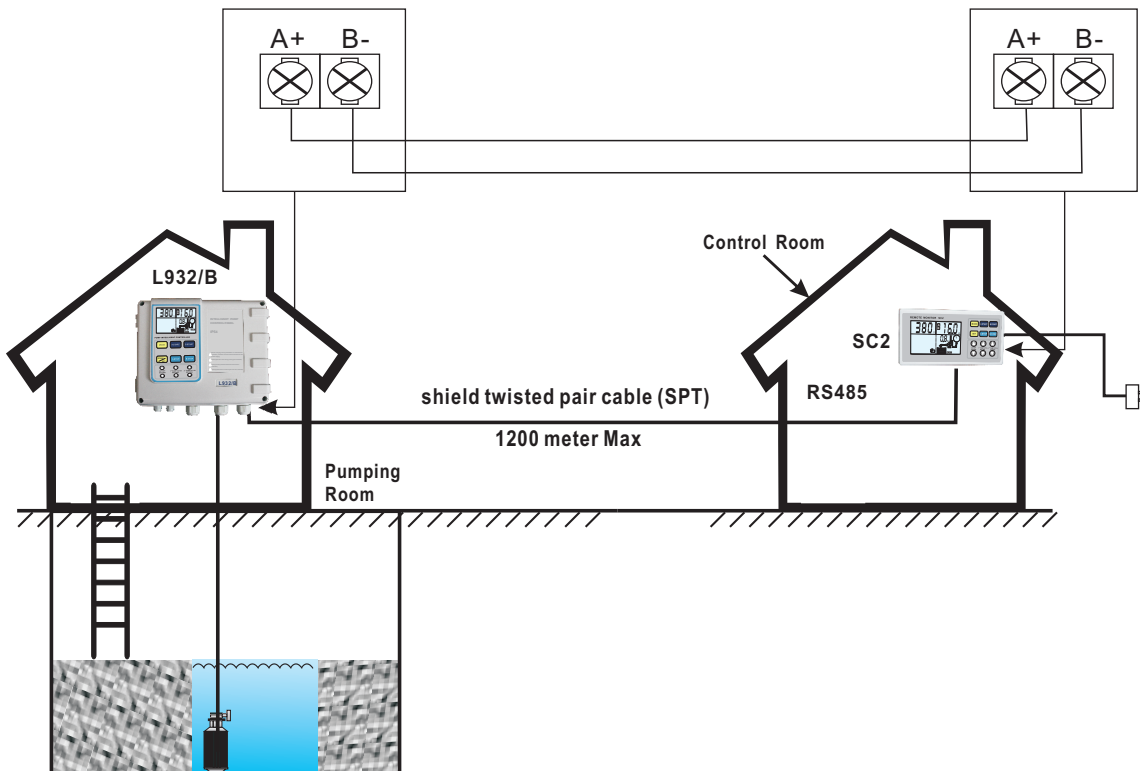
- Press **A STOP** key to quit the accumulative running time displaying;

Note: displaying the pump B accumulative running time is same as pump A, just by pressing **B STOP** button instead of **A STOP**

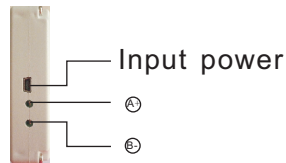
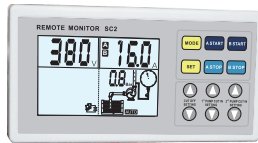
6 COMMUNICATION LINK

Model L932/B has communication interface, To adopting simple peripheral equipment (Slave Controller), pump users can realize long distance monitoring function.

This function is applied for L932/B installed in the basement, pumping room etc, but pump users require to monitor and control the pump on the ground or in the control room.



6.1 Basic Function



Slave Controller, model SC2 with communication interface can realize long distance monitoring function. In the control room, pump users can realize all functions of L932/B (Master Controller) through SC2 **without the parameter calibration and adjusting**.

6.2 Special Application

As adopting communication interface, the wire communication distance is less than 1200metres. For those installation environment which require long distance communication, say: mine, water tower, across railway, road and bridge etc, users can adopt RS485 extender, wireless communication or GSM system.

Please contact the manufacturer for more information.

6.3 Technical parameter

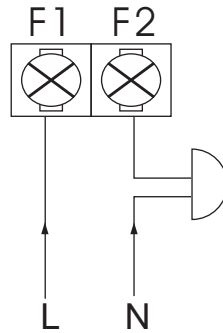
The following chart shows main technical parameters of communication link between L932/B & Slave Controller (SC)

Main technical data	
Physics Interface	RS485 Bus Interface: asynchronism semiduplex
Data format	1start bit 8data bit, 1stop bit, no verify 1start bit 8data bit, 2stop bit, no verify Default: 1start bit 8data bit, 1stop bit, no verify
Baud rate	1200 bps、2400 bps、4800 bps、9600bps Default: 9600bps
Communication address	Setting range of controller address: 1-126 127: broadcast address, Host computer broadcasting, Slave machine responion forbidden
Protocol type	MODBUS Protocol (RTU)
Rated input voltage for SC	AC220V/50Hz, single phase
Main installation data	
wire communication distance	1200meters max by shield twisted pair cable (STP) for RS485 & CAN 5000meters max by STP and RS485 extender
STP	STP-120 one pair 20AWG for RS485 & CAN
RS485 extender	5000meters (9600bps)

7 ELECTRICAL CONNECTON FOT PASSIVE DRY CONTACT POINT


Controller has one pair of passive dry contact point with N/O (normally open) contacting point, close (activated) for some critical situation: pump stalled, open phase, phase reversal, phase unbalance , over flow etc.

Rating: AC220V, 4Amp



8 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 powersupply company
		L932/B will attempt to restart the pump every 5minutes 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
		L932/B will attempt to restart the pump every 5minutes until line voltage is restored to normal
flashing of PUMP 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
flashing of OPEN PHASE	power supply lose phase	report to the power supply company
	controller inlet wire or pump cable broken	repair inlet wire or pump cable

Fault Message	Possible Cause	Solutions
flashing of OVER LOAD	the real running ampere is higher than the calibrated running ampere, pump is in over load protection state	L932/B will attempt to restart the pump every 30minutes until running ampere is restored to normal
	pump impeller is jammed / pump motor dragging / pump bearing broken	check pump impeller or bearing
flashing of PUMP NO CALIBRATION	parameter calibration not completed	refer to parameter calibration setting
flashing of DRY RUN	liquid level in the well / sump is below the pump intake, pump stops running	L932/B will attempt to restart the pump every 30minutes until liquid level above the pump intake
flashing of THREE PHASE UNBALANCE	the real voltage (ampere) between three phase (R/S/T) is not same and the difference is more than $\pm 15\%$	report to the power supply company L932/B will attempt to restart the pump every 5minutes until the voltage (ampere) between three phase s restored to normal
flashing of PHASE REVERSAL	sequence of the three phase input voltage (R/S/T) error	change the sequence of the three phase (R/S/T)
flashing of REPEATED START	pump starts more than 5times per minutes	The most common cause for the rapid cycle condition is a waterlogged tank. Check for a ruptured bladder in the water tank. Check the air volume control or snifter valve for proper operation. Check the setting on the pressure switch and examine for defects Cut off the power supply & repair the water tank, pressure switch or valve
	no communication link between SC / computer and L932/B	connecting the L932/B to SC / computer to realize long distance monitoring