



# PUMPKVERTER VFD CONTROLLER



# Installation & Operating Manual

# INDEX

<b>1. CONTROLLER SPECIFICATIONS</b> .....	1
<b>2. SYMBOLS &amp; WARNINGS</b> .....	2
<b>3. WIRING</b> .....	3
<b>3.1 Main Circuit Terminals Wiring</b> .....	3
<b>3.2 Main Circuit Wiring</b> .....	4
<b>3.3 Controls Terminals Connection</b> .....	5
<b>3.4 Wiring Main Circuit Installation Accessories</b> .....	5
<b>4. OPERATION</b> .....	6
<b>4.1 Keypad Description</b> .....	6
<b>4.2 Operational Procedure</b> .....	7
<b>5. INVERTER PARAMETER DESCRIPTION</b> .....	9
<b>6. APPLICATION GUIDANCE</b> .....	18
<b>6.1 System First Startup/ Troubleshooting Procedure</b> ..	18
<b>6.2 Single Pump Constant Pressure Control</b> .....	19
<b>6.3 Multi-pump Constant Pressure Control</b> .....	20
<b>6.4 Parameter Setting for Master and Auxiliary</b> .....	21
<b>6.5 Day Part Water Supply Application Setting</b> .....	26
<b>6.6 Terminal Start/Stop Control Wiring and Setting</b> .....	28
<b>6.7 Manual/ Auto Control Wiring and Setting</b> .....	28
<b>6.8 Water Supply Control Using Pressure Switch</b> .....	29
<b>6.9 Pumping Application</b> .....	31
<b>7. FAULTY AND TROUBLE SHOOTING</b> .....	32
<b>8. TERMS OF WARRANTY</b> .....	37

**Congratulations on selecting a Dayliff Pumpverter. It is manufactured to the highest standards and if installed and operated correctly will give many years of efficient and trouble free service. Careful reading of this Installation Manual is therefore important, though should there be any queries they should be referred to the equipment supplier.**

## **1. CONTROLLER SPECIFICATIONS**



DAYLIFF Pumpverter drives are high specification VSD's suitable for use in residential and industrial applications. They are compact and versatile and can be installed in either motor or wall mounted configuration. The inverter varies pump motor speed with demand thus regulating pump output to a preset outlet pressure. Particular features include:

- Maintains constant system pressure when water demand changes by use of pressure transducers
- Can work simultaneously with other units and control up to 6 pumps in cascade sequence.
- Sleep mode when there is no water consumption for increased energy savings
- Provides complete pump protection against pump overload, low voltage, high voltage, phase failure, electronics overheating and dry running (when using float switch).
- Enclosure class: IP54

Pumpverter range of inverters are proven and dependable designs using the latest technology to give exceptional levels of performance, economy and reliability.

### **OPERATIONAL CONDITIONS**

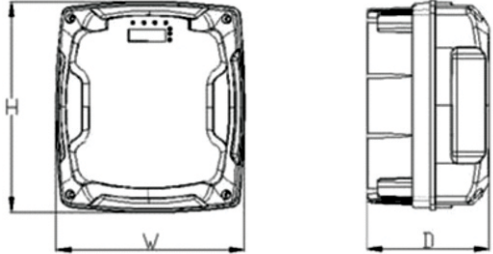
**Frequency:** 50-60Hz

**Supply Voltage Tolerances:** -15% ~ +10%

**Max Ambient Temperature:** 40°C

# SPECIFICATIONS

Model	Power			Max Current (A)	Dimensions (mm)			Weight (Kg)
	Motor (kW)	Supply Voltage (V)	Output Voltage		H	W	D	
PVm015	1.5	1x240	1x240	9.6	216	195	154	3
PVm022	2.2		3x240					
PVm075	7.5	3x415	3x415	17	282	255	165	5
PVm150	15			32	370	350	221	14



## 2. SYMBOLS AND WARNINGS



***Do not dismantle the product as it may cause electric shock, fire hazard or personal injury.***



***Do not open the cover during operation.***



***Do not put wire, bar of metal, filaments etc. into the controller as it may cause a short circuit and/or electric shock.***



***Do not splash water or other liquids on the controller.***



***Never connect AC power to the output terminals.***



***Do not touch internal components of the control if they have been exposed to static electricity.***



**The motor, controller and power specifications should be properly matched, otherwise it may cause abnormal operation and even burn the device;**



**If the controller appears to have vibration, noise, heat or peculiar smell during initial operation, cut off power immediately and contact authorised Dayliff retailer.**



**Do not install the controller under direct sunlight or rain.**



**When moving the controller lift it by its base and not by the panel, may cause the main unit to fall off which may resulting in personal injury.**



**Install the controller on fireproof material (such as metal) to avoid fire.**



**When powering off, ensure indicator light is completely extinguished, so as to ensure the device is discharged completely.**

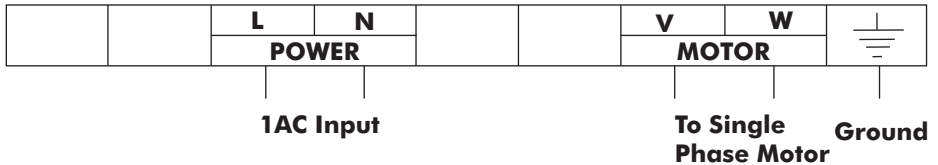


**Before opening the controller, ensure that all power lines are disconnected. Wait at least 5 minutes until DC Bus capacitors discharge.**

### 3. WIRING

#### 3.1 Main Circuit Terminals Wiring

Mains circuits terminals wiring diagram for PVm15



Mains circuits terminals wiring diagram for PVm22



Mains circuit wiring for PVm40, PVm75

(+) (-)	PB	R	S	T	PE	U	V	W	PE
		POWER				MOTOR			

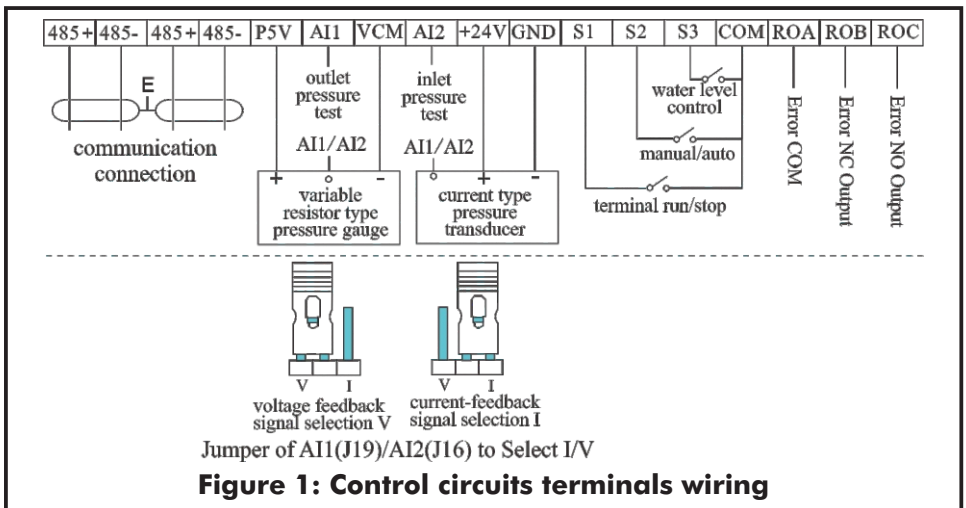
Mains circuit wiring for PVm 11-15kW

PE	(+) (-)	PB	(-)	POWER	U	V	W	PE
					MOTOR			

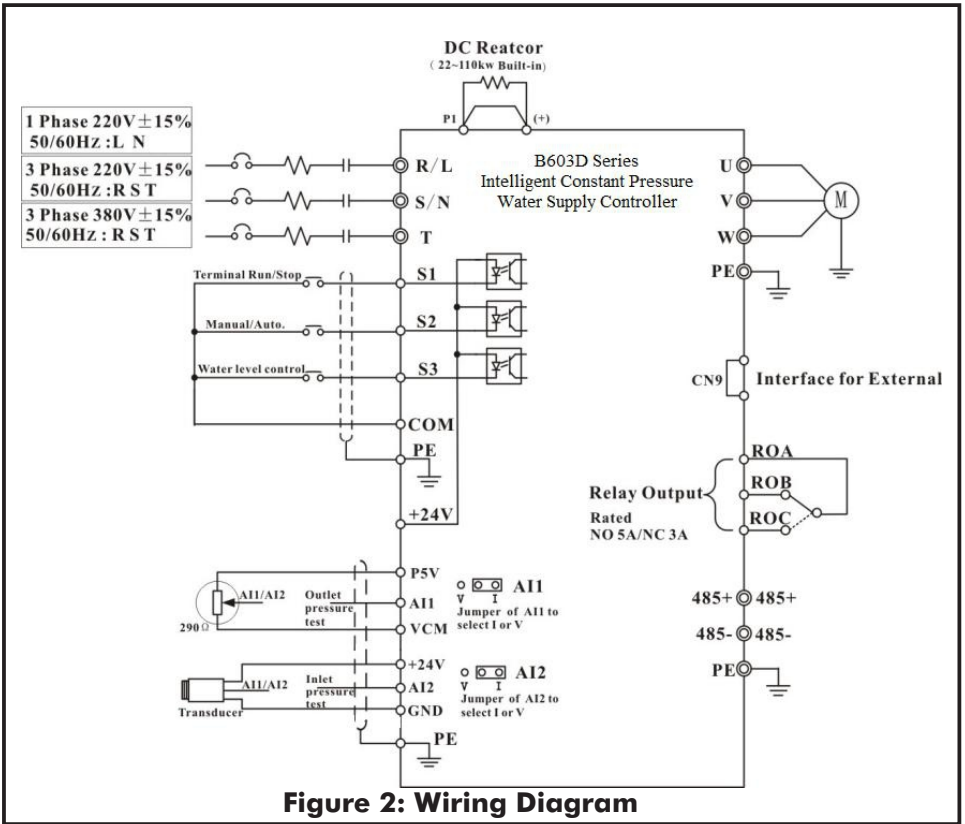
Terminal Symbol	Function Description
<b>L,N</b>	Terminals of single phase AC input
<b>U, V, W</b>	Motor wiring terminal. Note: V, W for PVm15
<b>PE/⊕</b>	Terminals for ground
<b>R, S, T</b>	Terminals of 3 phase AC input
<b>(+), (-)</b>	Reserved external terminals for braking units
<b>(+), PB</b>	Reserved external terminals for braking resistance
<b>P1, (+)</b>	Reserved external terminals for braking DC reactors
<b>(-)</b>	Output terminals for negative DC bus voltage

In order to maintain safety and prevent electric shock and fire, PE must be well grounded.

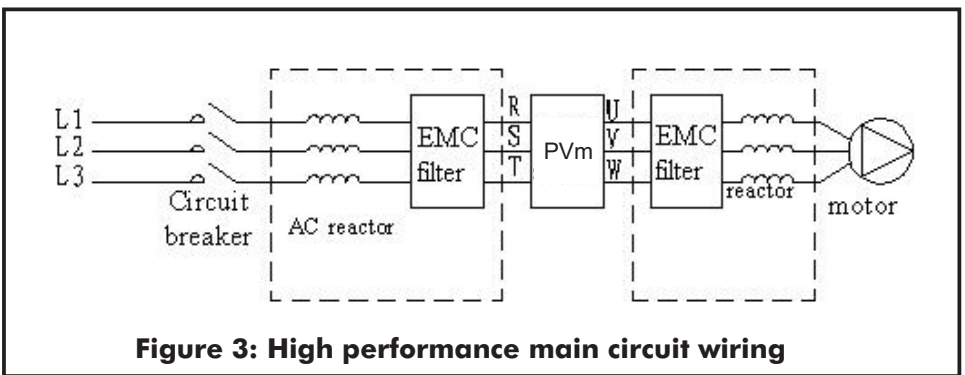
### 3.2 Main Circuit Wiring



### 3.3 Control Terminals Connection



### 3.4 Wiring Main Circuit Installation Accessories



## Circuit Breaker

It is necessary to connect a suitable circuit breaker between AC power supply and the Pumpverter. The capacity of breaker should be 1.5~2 times the rated current of controller.

## AC Reactor (Optional)

In order to prevent the rectifier damage resulted from the large current, AC reactor should be installed at the input side. It can also prevent rectifier from sudden variation of power voltage or harmonic generated by phase-control load.

## Input EMC Filter (Optional)

EMC filter can minimize the interference of the surrounding device which may be disturbed by the cables when the controller is working.

## Output EMC Filter (Optional)

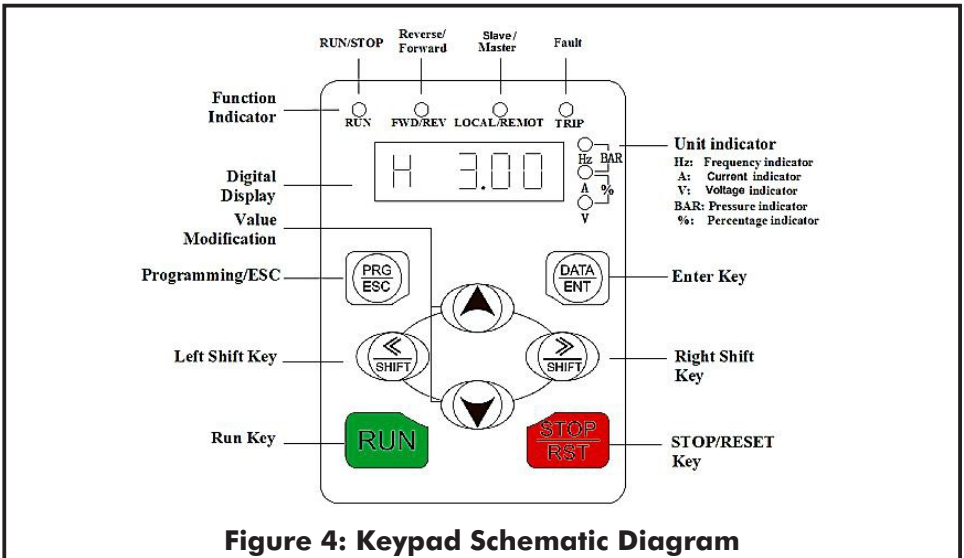
EMC filter should be installed to minimize the current leakage caused by the cable and minimize the radio noise caused by the cables between the controller and motor.

## Output Reactor (for long motor cables)

When the distance between the Pumpverter and motor is more than 50m, the controller may be tripped by over-current protection frequently because of the large current leakage resulting from the parasitic capacitance with ground. In order to avoid the damage of motor insulation, the output reactor should therefore be installed.

# 4. OPERATION

## 4.1 Keypad Description





- H:** Operating Frequency
- P:** The Actual Pressure of Pump Outlet
- L:** The Set Pressure of Pump Outlet
- A:** Output current
- D:** DC Bus Voltage
- U:** Output Voltage

## 4.2 Operation Procedure

### Power-on Initialization

When power is switched on the system initializes and LED displays controller model. After the initialization is completed, the controller switches to stand-by mode.

### Parameter Setting

Three levels of menu are available as below:

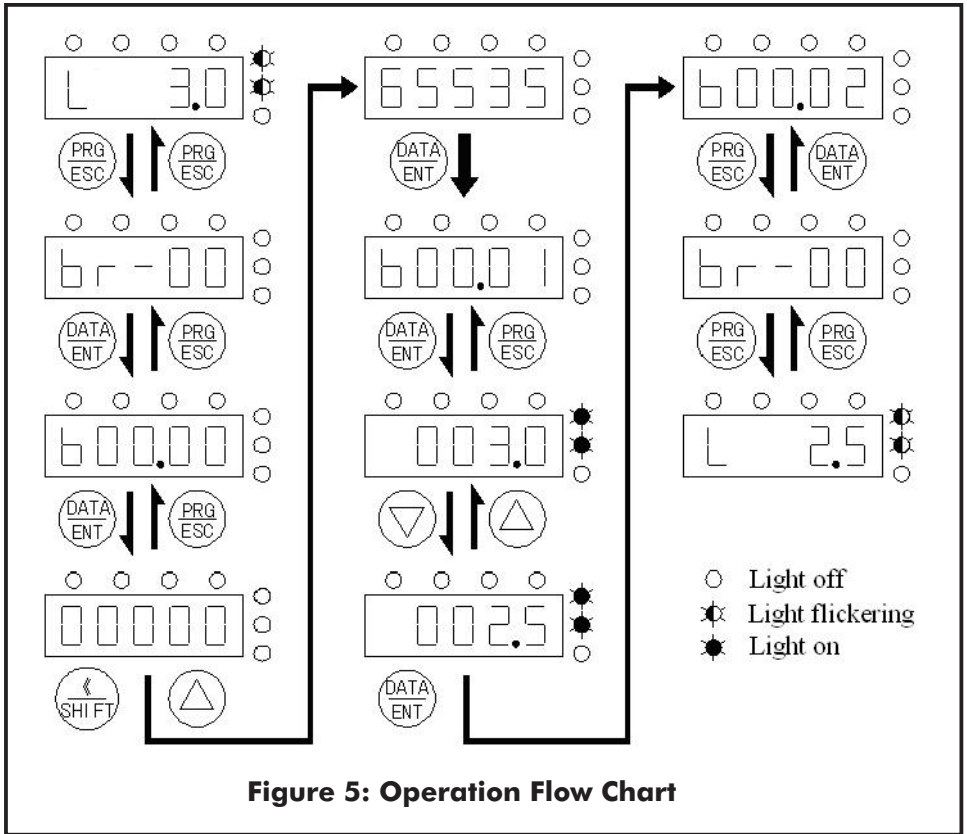
1. Primary Interface first-level function code
2. Second-level function code
3. Function code setting value third-level function code setting value

- Press **<</SHIFT** or **>>/SHIFT** to switch to display running/stop status monitoring parameters.
- At the primary interface, press **PRG/ESC** to enter the first-level menu then press **PRG/ESC** to return to the primary interface.
- At the first-level menu, press **DATA/ENT** to enter the second-level menu. Second-level menu press **PRG/ESC** and **DATA/ENT** to return to first-level menu or enter third-level menu.
- At third-level menu, press both **PRG/ESC** and **DATA/ENT** to return to the second-level menu the difference being by:
  - Pressing **DATA/ENT** the controller save the parameters in the controller and returns to the second-level menu with shifting to the next function code automatically.
  - Pressing **PRG/ESC** will return immediately to the second-level menu without saving the parameters; and stay at the current function code.

Example 1: Change factory pressure setting 3.0 bar to 2.5 bar

**Method 1:** Enter parameter setting

## Operation flow chart:



**Figure 5: Operation Flow Chart**

### Method 2: Direct setting at the primary interface

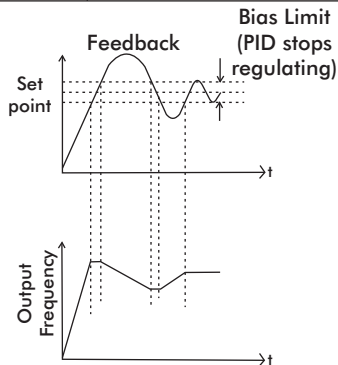
1. Press ▲ or ▼ at primary interface, the system will switch-over to display set pressure
2. Press ▲ or ▼ again, to increase or decrease set pressure.
3. After completing the pressure setting, press **DATA/ENT** to save the value.
4. During operation press <</SHIFT or >>/SHIFT to scroll through the parameters in left or right order until there are only two upper lights on.
5. Read out the pressure value.

## 5. INVERTER PARAMETERS DESCRIPTION

Function Code	Name	Setting Range	Factory Setting	Description
<b>b00.00</b>	Debugging Password	0~65535	65535	Set at b06.09, default is 65535
<b>b00.01</b>	Pressure Setting Valve	0.0~100bar	3.0bar	Set according to the actual requirements
<b>b00.02</b>	Motor Rotating Direction	0~1	0	0: Forward 1: Reverse Ensure pump motor is running correctly
<b>b00.04</b>	Anti-clogging	0~1	0	Prevention measures 0: Invalid 1: Valid
<b>b00.05</b>	Anti-clogging Rotating Cycle	1~300s	20.0s	Set the forward/reverse rotating direction cycle and corresponding output frequency of anti-clogging (should not be higher than the rated frequency of the pump).
<b>b00.06</b>	Anti-clogging Output Frequency	0~600 Hz	15.0Hz	
<b>b01.00</b>	High Water Pressure/Level Alarm Value	0.0~100.0 bar	8.0bar	When pressure is higher than the preset value, the controller will stop show alarms and display HP
<b>b01.01</b>	Low Water Pressure/Level Alarm Value	0.0~100.0 bar	0.5bar	When the pressure is lower than the preset value for the low pressure running time, the controller will stop, show alarms and displays LP
<b>b01.02</b>	Low Pressure/Level Alarm Running Time	0~300s	20s	
<b>b01.03</b>	Minimum Freeze Proofing Frequency	1.00-30.00 Hz	5.00Hz	Be valid when b00.03 was set to 1, whenever sleeps, running with the setting frequency in case of freezing
<b>b01.04</b>	Anti-clogging FWD/REV Dead Time	0.0~3600s	1.0s	When anti clogging is valid, b01.04 sets the FWD/REV transition time
<b>b01.05</b>	Maximum Transducer Setting Range	0.0~100.0 bar	10.0bar	E.g. If the rated max. range of transducer is 10bar, b01.05 should be set to 10.0

Function Code	Name	Setting Range	Factory Setting	Description	
<b>b01.06</b>	All Lower Limit	0.00~10.00V	1.00V	<ul style="list-style-type: none"> <li>• Lower limit use to transducer zero setting</li> <li>• Higher limit use to accordant display and transducer pressure</li> <li>• When display smaller than gauge increase higher limit. When display is greater than gauge, decrease higher limit.</li> <li>• When analog input is interfered, prolong filtering time so as to increase the ability of anti-interference but decreases the sensitivity.</li> <li>• Corresponding relationship of transducer parameter setting:</li> </ul> <div style="text-align: center;"> <p><b>Figure 5.1.1 Transducer Parameters</b></p> </div>	
<b>b01.07</b>	Corresponding Setting of All Lower Limit	-100~100%	0.0%		
<b>b01.08</b>	All Higher	0.0~10.0V	5.00V		
<b>b01.09</b>	Corresponding Setting of All Higher Limit	-100~100%	100%		
<b>b01.10</b>	All Filtering Time	0.00-10.00s	0.10s		
<b>b01.11</b>	All Lower Limit	0.00-10.00V	1.00V		
<b>b01.12</b>	Corresponding Setting of All Lower Limit	-100~100%	0.0%		
<b>b01.13</b>	All Lower Limit	0.00-10.00V	5.00V		
<b>b01.14</b>	Corresponding Setting of All Higher Limit	-100~100%	100%		
<b>b01.15</b>	All Filtering Time	0.00~10.00s	0.10s		
<b>b01.16</b>	Restart After Power-on	0~1	0		0:Invalid    1:Valid
<b>b01.17</b>	Control Mode	0~1	1		0:Synchronous    1:Master-Slave
<b>b02.00</b>	PID Source Selection	0~1	0		0:Keypad    1:Reserved
<b>b02.01</b>	PID Feedback Source Selection	0~1	0		0:All    1:Reserved

Function Code	Name	Setting Range	Factory Setting	Description
<b>b02.02</b>	PID Output Characteristics	0~1	0	0:Water Supply 1:Pumping
<b>b02.03</b>	Proportional Gain (KP)	0.00~100.00	2.50	Determining the strength of PID regulation, KP is bigger, regulation is stronger but fluctuates easily
<b>b02.04</b>	Integral Coefficient (KI)	0.00~10.00	1.00	Bias between the feedback and the given, determining the speed of regulation. If KI is bigger, regulation is stronger
<b>b02.05</b>	Derivative Coefficient (KD)	0.00~10.00	0.00	Variable ratio between the feedback and the given, KD is bigger, regulation is stronger. Be cautious use, for differential regulation amplifies interference of system
<b>b02.06</b>	Sampling cycle (T)	0.01~100s	0.10s	Calculating time of regulator, when increased response sluggishly
<b>b02.07</b>	PID Control Bias Limit	0.0~100%	0.0%	Max. bias of PID output value corresponding to closed loop given value



**Figure 5.2 PID control curve Corresponding System Diagram of Max. Limit and Output Frequency.**

**Properly set the value so as to regulate the accuracy and stability of PID system.**

Function Code	Name	Setting Range	Factory Setting	Description
<b>b02.08</b>	AI1 Feedback Lost Detecting Value	0.0~100.0%	1.0%	Transducer fault detecting setting value, corresponding to full range (100%), when the detecting time exceeds feedback lost time, it is deemed as malfunction by transducer, the system will report E022 as transducer fault code.
<b>b02.09</b>	AI2 Feedback Lost Detecting Value	0.0~100%	0.0%	
<b>b02.10</b>	Feedback Lost Detecting Time	0.0~3600s	1.0s	
<b>b03.00</b>	Communication Address	0~31	02	00: Master Controller 01~05: Auxiliary Controller 06~31: Reserved
<b>b03.01</b>	Band Rate Selection	0~5	3	Data of master and slave comes into the rate 0: 1200BPS      1: 2400BPS 2: 4800BPS     3: 9600BPS 4: 19200BPS    5: 38400BPS
<b>b03.02</b>	Data Format	0~5	0	Data Format (parity check)
<b>b03.03</b>	Communication Delay Time	0~200ms	15ms	Interval of data responding
<b>b03.04</b>	Communication Timeout Delay 0.0: invalid	0~100s	0.0s	If the interval time exceeds the setting value, the system will report E018 as fault
<b>b03.05</b>	Communication Error Action	0~1	0	0: Halt and display alarm 1: Do not display alarm, continue
<b>b03.06</b>	Communication Response Action	0~1	0	0: Responding to write operation 1: Un-responding to writer operation
<b>b03.07</b>	Data Transmission Time Interval	0.05~2.00s	0.10s	Ensure the effects of data transmission, long-time setting will slow down data transmission and short-time setting will easily make mistakes

Function Code	Name	Setting Range	Factory Setting	Description
<b>b03.08</b>	Slave Quantity	0~5	0	0: None
<b>b03.09</b>	Fault Shift/ Standby Master	0~2	2	Fault Master Shift <ul style="list-style-type: none"> <li>Invalid: Factory Setting: 2</li> <li>Valid: Master set as 0; Slave1 set as 1</li> </ul> Remarks: Fault shift requires connection of backup transducer to Slave 1. Slave 1 acts as standby master.
<b>b04.00</b>	Sleeping Function	0~1	1	No consuming auto stop 0:Invalid 1: Valid
<b>b04.01</b>	Sleeping Waiting Time	0.0~300.0s	5.0s	Delay time
<b>b04.02</b>	Sleeping Test	0.0~10.0%	4.0%	Water consuming test frequency rate
<b>b04.03</b>	Wake up Pressure Bias	0.0~20.0bar	0.5bar	During sleep the wake-up pressure bias e.g. the setting value (L)=3.0bar, bias (b04.03)=0.5bar, practical pressure (P)<L-0.5=2.5bar, the pump will restart again.
<b>b04.04</b>	Sleeping Bias	0.0~1.0bar	0.0bar	The pressure fluctuation which allows sleeping
<b>b05.00</b>	Water Level Control	0~2	2	Water level switch style 0: Invalid 1: NC 2: NO
<b>b05.01</b>	Low Level Restart Delay Time	0~300min	1 min	Delay time of restart after water level recover
<b>b05.02</b>	Terminal S1S2 Control	0~3	2	0: Invalid 1: Electric Contact Control S1-COM on: Frequency rise S2-COM on: Frequency drop 2. Manual/Auto Control S2-COM off: Auto Control S2-COM on: Manual Control 3. Terminal run/stop S1-COM on: Run S1-COM off: Stop S2-COM off: Auto Control S2-COM on: Manual Control

<b>Function Code</b>	<b>Name</b>	<b>Setting Range</b>	<b>Factory Setting</b>	<b>Description</b>
<b>b05.03</b>	Acceleration	0.1~3600s	Model	Setting time from zero to max
	<b>Time</b>		<b>Set</b>	<b>Frequency</b>
<b>b05.04</b>	Deceleration Time	0.1~3600s	Model Set	The setting time from max. frequency to zero
<b>b05.05</b>	Maximum Output Frequency	10-600Hz	50Hz	Determine the Acc./Dec. rate
<b>b05.06</b>	Up limit of Output Frequency	b05.07~ b05.05 (Maximum Frequency)	50Hz	Maximum running frequency
<b>b05.07</b>	Lower limit of Output Frequency	0Hz~b05.07	20Hz	The minimum running frequency of pump
<b>b05.08</b>	Carrier Frequency	1~15kHz	Model Set	Use to check the noise of motor and controller's interference to the surroundings. A high carrier makes a low motor noise, but leads to a big temperature rise and interference. Should not be altered if unnecessary.
<b>b05.09</b>	Low Pressure (LP) Restart Delay Time	0~60min	10min	In case of low pressure, b05.09≠0, the controller restarts according to the setting time automatically, without artificial restart. b05.09=0, restart invalid
<b>b05.10</b>	Alternating Time	0~300h	8h	In order to balance and prolong the pump service life to set the parameter, unit: hour. When the parameter is set to 0.0, it means no alteration. Operational time of master and auxiliary pump switches over according to the setting alternating time



Function Code	Name	Setting Range	Factory Setting	Description
<b>b06.00</b>	Running Status Display Selection	0~0x1FF	0x01F	bit0: Operational frequency bit1: The actual pressure of pump outlet bit2: The setting pressure of pump outlet bit3: Output current bit4: DC bus voltage bit5: Output voltage bit6: Present time bit7: The actual pressure of pump inlet bit8: Input terminal status
<b>b06.01</b>	Stop Status Display Selection	0~0x1FF	0x001F	bit0: The setting pressure of pump outlet bit1: The actual pressure of pump outlet bit2: Giver frequency bit3: DC bus voltage bit4: Input terminal status bit5: Output terminal status bit6: All input voltage bit7: The actual pressure of pump inlet Bit8: Present time
<b>b06.02</b>	Keypad Display Selection	0~3	3	0: External keypad prior enable 1: Both display enable, only external keypad control 2: Both display enable, only on board keypad control 3: Both display enable and keypad control.
<b>b06.03</b>	Relay Output Selection	0~5	0	0: Error or external fault 1: Forward running 2: Frequency reaching 3: Stop status 4: Lower limit of output frequency reaching 5: The frequency is not equal to zero

Function Code	Name	Setting Range	Factory Setting	Description
<b>b06.04</b>	Third Latest Fault Type		Read Only	E000~E022 Refer to chapter 9
<b>b06.05</b>	Second Latest Fault Type			
<b>b06.06</b>	Latest Fault Type			
<b>b06.07</b>	Parameters Storage Condition	0~2	0	0: Power off storage 1: Power off default storage 2: Invalid
<b>b06.08</b>	Accumulated Running Time	0~65535h	Read Only	Display accumulated running time
<b>b06.09</b>	Set the password of b00.00	0~65535	65535	Password set prevent user from modifying the parameters randomly, avoiding abnormal running and damages.
<b>b07.00</b>	Day part Function Selection	0~3	0	0: Invalid 1: Day part A 2: Day part A and B 3: Day part A, B, C
<b>b07.01</b>	Day part A Starting Time	00:00~24:00	00~00	<ul style="list-style-type: none"> <li>Setting starting time and finishing time to 0 is invalid.</li> <li>Pressure setting determines the steady state value of outlet pressure</li> <li>Once actual pressure from inlet pipe network lower than inlet pressure lower limit, the pump stops.</li> </ul>
<b>b07.02</b>	Day part A Pressure Setting	0.0~20bar	3.0bar	
<b>b07.03</b>	Day part A Finishing Time	00:00~24:00	00~00	
<b>b07.04</b>	AI2 Lower	0.0~20bar	2.0bar	

Function Code	Name	Setting Range	Factory Setting	Description	
	Limit of Day part A			<ul style="list-style-type: none"> <li>When regardless of the inlet water pressure, just set the lower limit as 0.</li> </ul>	
<b>b07.05</b>	Day part B Starting Time	00:00~24:00	00-00		
<b>b07.06</b>	Day part B Pressure Setting	0~20.0bar	3.0Bar		
<b>b07.07</b>	Day part B Finishing Time	00:00~24:00	00-00		
<b>b07.08</b>	AI2 Lower Limit Day part B	0~20.0bar	3.0Bar		
<b>b07.09</b>	Day part C Starting Time	00:00~24:00	00-00		
<b>b07.10</b>	Day part C Pressure Setting	0~20.0bar	3.0Bar		
<b>b07.11</b>	Day part C Finishing Time	00:00~24:00	00-00		
<b>b07.12</b>	AI2 Lower Limit of Day part C	0~20.0bar	2.0Bar		
<b>b07.13</b>	Lower Limit of Inlet Pressure	0~100.0bar	0.0Bar		Valid all day, especially when taking into account the inlet water pressure. When not needed, set as 0.
<b>b07.14</b>	Restore Defaults	0~2	0		0: No action 1: Set to default 2: Clear error records
<b>b07.15</b>	Password of Group Br08	0~65535	65535		
<b>b08.00</b>	G/P Option	0~1	1	0: G model 1:P model	
<b>b08.01</b>	Motor Rated Power	0.4~350kW	Model Set	Depending on model, setting parameters according to nameplate of motor	
<b>b08.02</b>	Motor Rated Frequency	0~600Hz	50Hz		

Function Code	Name	Setting Range	Factory Setting	Description
<b>b08.03</b>	Motor Rated Speed	0~36000 RPM	Model Set	
<b>b08.04</b>	Motor Rated Voltage	0~460V		
<b>b08.05</b>	Motor Rated Current	0.0~2000A		
<b>b08.06</b>	Reserved	0~65535	00000	
<b>b08.07</b>	Set the Password of b07.15	0~65535	65535	Modify password of b07.15
<b>b08.08</b>	Password of Factory Parameters	0~65535	xxxxx	Don't try to enter or will cause abnormal operations and damages

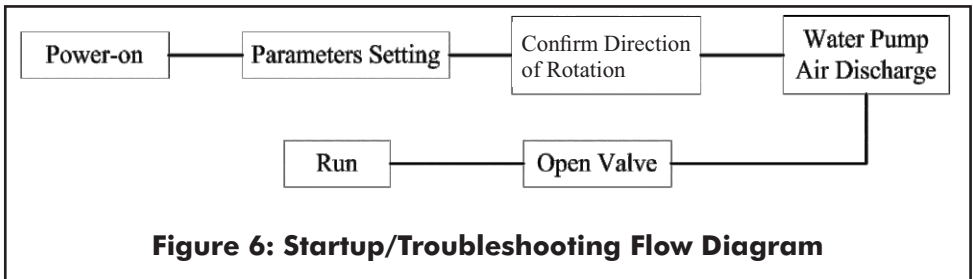
In order to ensure the pumps running safety, carefully enter rated value from motor nameplate.

## 6. APPLICATION GUIDANCE

Pumpverter has functions to handle various use cases. This section introduces typical use cases with relevant parameter settings.

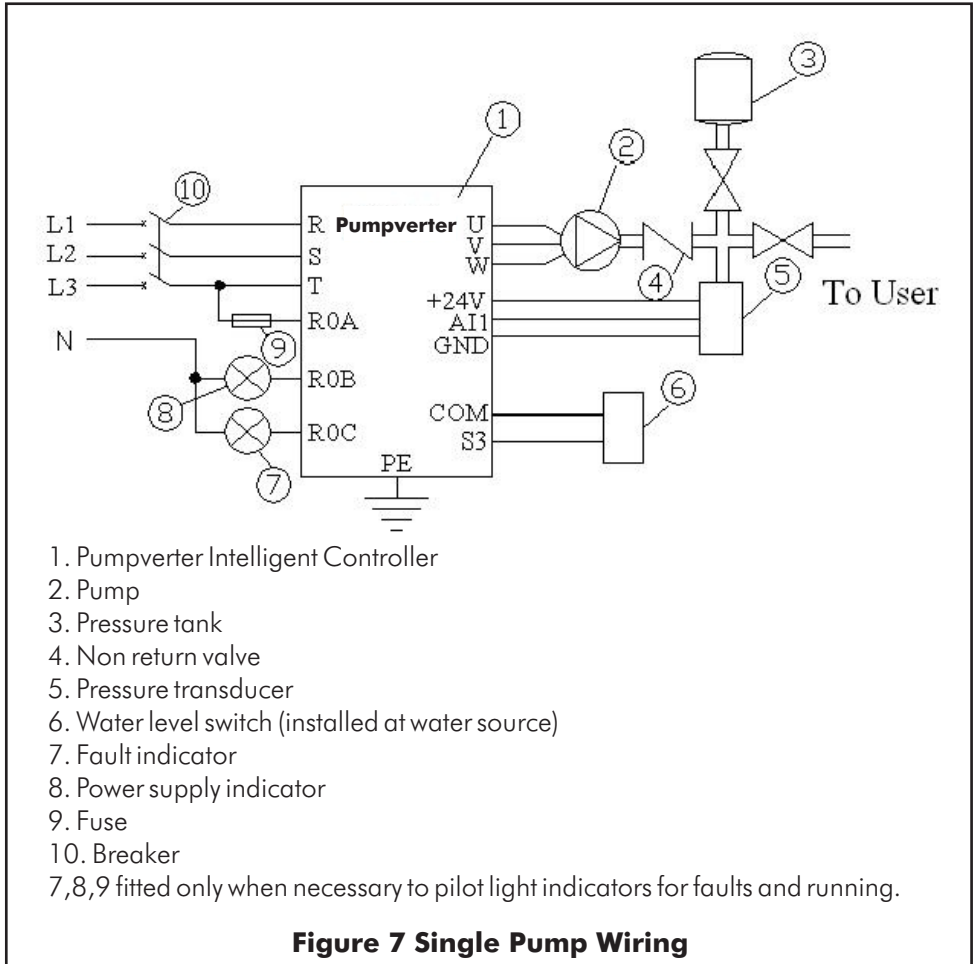
### 6.1 System First Startup/ Troubleshooting Procedure

#### System Wiring



**Figure 6: Startup/Troubleshooting Flow Diagram**

## 6.2 Single Pump Constant Pressure Control



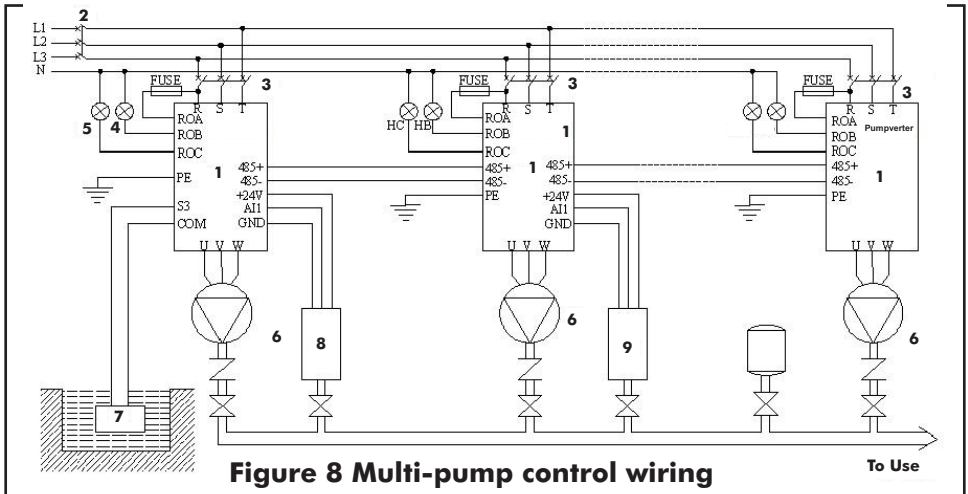
1. Transducer used is 4-20mA current type. Jumper for AI1 (J19) set to current feedback signal selection I, refer to figure 1
2. Water level control switch installed in source water tank. For pipeline boosting application, connection of water level switch is not necessary.
3. Parameter settings as per section 6.4

## 6.3 Multi-pump Constant Pressure Control

### Typical System Wiring

Diagram:

- (1) Pumpverter Controller
- (2) Main Breaker
- (3) Breaker
- (4) Power Light
- (5) Fault Light
- (6) Motor and Pump
- (7) Water Level Switch
- (8) Outlet Transducer on master pump controller
- (9) Backup Transducer on slave pump controller, that is set as standby master



**Figure 8 Multi-pump control wiring**

To Use

1. Transducer used is 4-20mA current type. Jumper for AI1 (J19) set to current feedback signal selection I, refer to figure 1
2. At least one transducer necessary; to be connected to master pump controller.
3. Two transducers required if one slave pump controller is to be set as standby master controller.
4. Parameter settings as per section 6.4.

## 6.4 Parameter Settings for Single and Multi-Pump constraint Pressure Control

### Single pump constant pressure control

- Set all parameters in table below on controller except b03.00-b03.09, b05.10

### Multi-pump constant pressure control: One master Pump, all other pumps slaves

- Master controller should have pressure transducer connected
- Set all parameters in table below for master pump controller
- Set following parameters for slave pump controllers: b00.00, b00.02, b02.08=0, b03.00, b03.08, b03.09, b08.01-b08.05

### Multi-pump constant pressure control: One master, all other pumps slaves with one slave set as standby master

- Both master and standby master controllers should have pressure transmitters connected.
- Set all parameters in table below for master pump controller
- Set all parameters in table below for slave pump controller that used as standby master
- Set following parameters for slave pump controllers: b00.00, b00.02, b02.08=0, b03.00, b03.08, b03.09, b08.01-b08.05

Code	Name	Setting Range	Factory Setting	Recommended Setting	Description
b00.00	Debugging Password	0-65535	65535	65535	Retain as per the Factory default. Can be modified by b06.09
b00.01	Pressure setting value	0-100 bar	3 bar	4 bar	Set according to the actual requirements of the user e.g. 4 bar
b00.02	Motor rotation	0-1	0	0	0- Forward 1- Reverse Ensure pump motor is running in correct direction
b01.00	High water pressure/ Level alarm value	0-100 bar	8 bar	8 bar	When the pressure is higher than this preset value, the controller halts, alarms and displays HP.

Code	Name	Setting Range	Factory Setting	Recommended Setting	Description
<b>b01.05</b>	Maximum Transducer setting range	0-100 bar	10 bar	10 bar	For example, if the rated range of transducer is 0-10 bar, b01.05 should be set to 10.0
<b>b01.06</b>	All lower limit	0-10V	1.0V	1.0V	Lower limit settings should not be changed unless transducer is not 4-20mA Current Type nor 0-10V Voltage Type.
<b>b01.07</b>	All lower limit%	-100 to 100	0%	0%	
<b>b01.08</b>	All higher limit	0-10V	5V	5V	4-20mA pressure transducer requires setting of b01.06=1V and b01.08=5V. When the displayed pressure is less than the pressure gauge reading, increase b01.08 and when the displayed pressure is greater than pressure gauge reading, decrease b01.08.
<b>b01.09</b>	All higher limit%	-100 to 100	100%	100%	
<b>b01.16</b>	Restart after power on	0-1	1	1	0: Invalid      1: Valid Allows unattended management
<b>b01.17</b>	Control Mode	0-1	1	1	0: Synchronous 1: Master Slave
<b>b02.00</b>	PID source selection	0-1	0	0	0: Keypad      1: Reserved
<b>b02.01</b>	PID feedback source selection	0-1	0	0	0: All      1: Reserved
<b>b02.02</b>	PID Output Characteristic	0-1	0	0	0: Water supply      1: Pumping

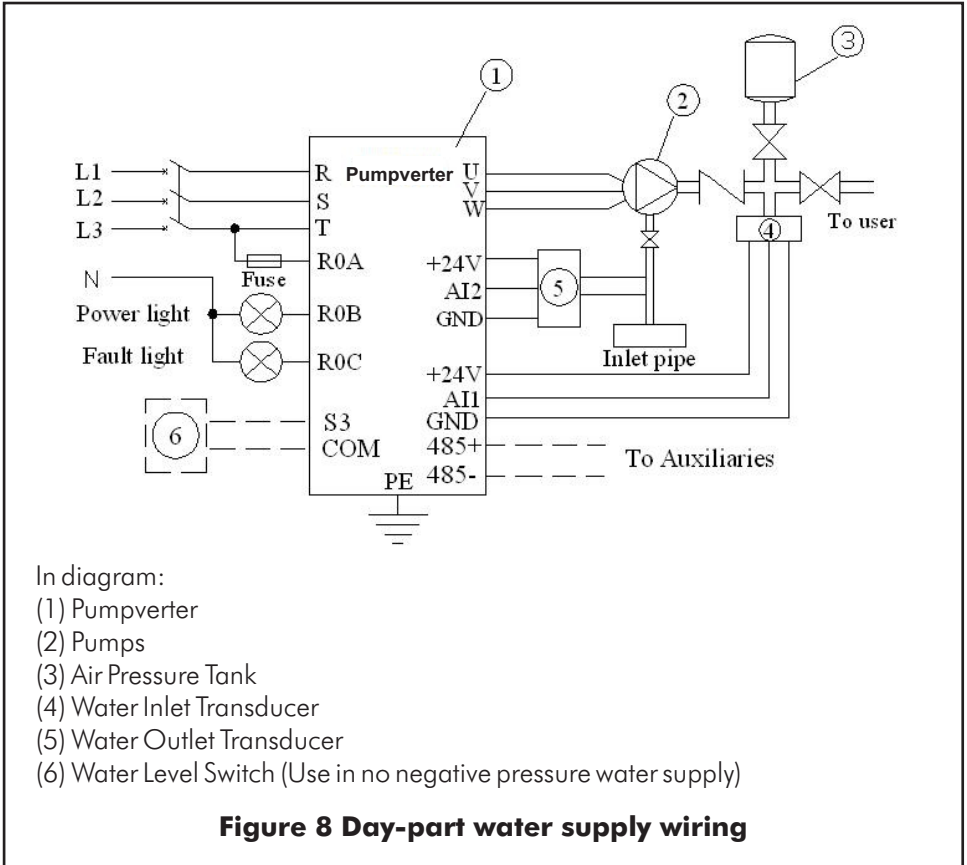


Code	Name	Setting Range	Factory Setting	Recommended Setting	Description
<b>b03.00</b>	Communication Address	0-31	2	00-0N	00: Master Controller 01-05: Auxiliary controller (slaves) 06-31: Reserved Auxiliaries should be set as 01-on 0N on order assuming N auxiliary controllers
<b>b03.08</b>	Slave Quantity	0-5	0	N	0: None Slave number, assume 1 master N slaves, set as N
<b>b03.09</b>	Fault Shift/ Standby master	0-2	2	0-1	Fault Master Shift. If invalid, Set 2. If valid, Set Master as 0 and Slave 1 as 1; slave 1 to act as standby master With Fault shift, connect a redundant transducer to the slave 1. No need to modify other slaves.
<b>b04.00</b>	Sleeping function	0-1	1	1	0: Invalid 1: Valid Automatically Stop when there is no water consumption
<b>b04.01</b>	Sleeping time	0-300s	5s	10s	Delay time in seconds
<b>b04.03</b>	Wake up pressure bias	0-20 bar	0.5bar	0.5bar	Determines how low the pressure falls before pump restarts during sleep mode e.g. if setting (L)=3.0 bar, bias b04.03=0.5bar, the pump will restart again when pressure falls to 3.0-0.5=2.5bar.
<b>b04.04</b>	Sleeping Bias	0-1bar	0bar	0.5bar	The pressure fluctuation that allows sleeping. If pressure rises by this set value b04.04 for time b04.01, it enters sleep mode.
<b>b05.00</b>	Water level control	0-2	2	1	Water level switch connection style; 0: Invalid 1: NC 2: NO

Code	Name	Setting Range	Factory Setting	Recommended Setting	Description
<b>b05.01</b>	Low level restart delay	0-300min	1 min	1 min	Delay time in minutes for restart after water level switch recover
<b>b05.02</b>	Terminal S1 & S2 control	0-3	2	2	0: Invalid 1: Electric contact control <b>S1&amp;COM</b> -ON: Frequency rise <b>S2&amp;COM</b> -ON: Frequency drop 2: Manual/Auto control <b>S2&amp;COM</b> -OFF: Auto control <b>S2&amp;COM</b> -ON: Manual control 3: Terminal run/stop <b>S1&amp;COM</b> -ON: Run <b>S1&amp;COM</b> -OFF: Stop <b>S2&amp;COM</b> -ON: Manual control <b>S2&amp;COM</b> -OFF: Auto control
<b>b05.03</b>	Acceleration time	0.1-3600s	Depends on model	10s	Ramp up frequency
<b>b05.04</b>	Deceleration time	0.1-3600s	Depends on model	10s	Ramp up frequency
<b>b05.05</b>	Maximum output frequency	10-600 Hz	50Hz	50Hz	Maximum frequency
<b>b05.06</b>	Frequency upper limit	b05.07-b05.05	50Hz	50Hz	Maximum running frequency
<b>b05.07</b>	Frequency lower limit	10Hz-b05.07Hz	20Hz	30Hz	Minimum running frequency

Code	Name	Setting Range	Factory Setting	Recommended Setting	Description
<b>b05.10</b>	Alternating time	0-300h	8.00h	8.00h	When set to 0:0, there will be no pump alternation. Used in multi-pump systems to balance and prolong pump service life. Master and auxiliary pump(s) changeover according to this setting.
<b>b06.03</b>	Relay output selection	0-5	0	0	0: Error on external fault 1: Forward running 2: Frequency reaching 3: Stop status 4: Lower limit of output frequency reaching 5: The frequency is not equal to zero
<b>b07.15</b>	Password for Br08 access	0-65535	65535	65535	Use this to be able to access <b>Br08</b> parameter settings.
<b>b08.00</b>	G/P option	0-1	1	1	0: G model      1: P model
<b>b08.01</b>	Motor rated power	0.4-350 kW	As per the pump model	4kW	Set as per the pump model provided on the motor nameplate e.g. 4kW/400V/8.7A
<b>b08.02</b>	Motor rated frequency	0-600Hz	50Hz	50Hz	
<b>b08.03</b>	Motor rated speed	0-3600 rpm	As per the pump model	2900rpm	
<b>b08.04</b>	Motor rated voltage	0-460V		400V	
<b>b08.05</b>	Motor rated current	0-2000A		8.7A	

## 6.5 Day-Part Water Supply Application Setting System Wiring



### Typical Application

Use in pipe pressure boosting for positive suction water supply with different pressurisation requirements at different times of the day.

#### For example

First part running 2.5bar from 00:00 to 06:00, stop running as water inlet pressure below 2.0bar.

Second part running 3.2bar from 06:00 to 13:30, stop running when inlet pressure below 2.3bar.

Third part running 3.5bar from 17:00 to 23:00, stop running when inlet pressure below 2.2bar.

The undefined day part running 3.0bar, stop running when inlet pressure below 1.8bar

## Relevant Parameter Setting

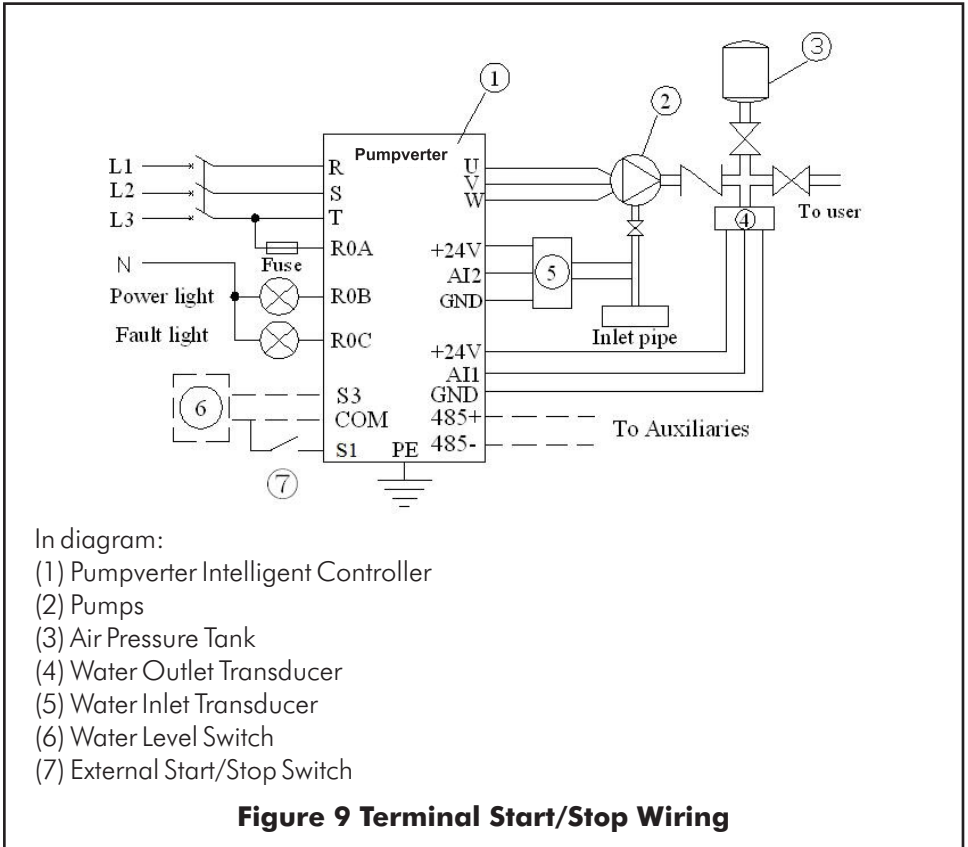
Follow section 6.4 to set other parameters first and then refer to this application to set day part control parameters.

Code	Factory Setting	Recommended	Description
<b>b01.11</b>			Inlet transducer calibration (b01.11,b01.13), if need not detect inlet pressure, do not install inlet transducer but the inlet pressure lower limit of every day-part must be set as 0 is needed.
<b>b01.13</b>			
<b>b07.00</b>	0	3	Day-part number setting, 0 means day-part control invalid, proceed to choose 3 day part
<b>b07.01</b>	00-00	00-00	Set 00:00~06:00 running with 2.5bar stop when inlet pressure
<b>b07.02</b>	3.0	2.5	Below 2.0bar (It recovers running when inlet pressure return to 2.0bar again)
<b>b07.03</b>	00-00	06-00	
<b>b07.04</b>	2.0	2.0	
<b>b07.05</b>	00-00	06-00	Set 06:00~13:30 running with 3.2bar, stop when inlet pressure below 2.3bar
<b>b07.06</b>	3.0	3.2	
<b>b07.07</b>	00-00	13-30	
<b>b07.08</b>	2.0	2.3	
<b>b07.09</b>	00-00	17-00	Set 17:00~23:00 running with 3.5bar, stop when inlet pressure below 2.2bar
<b>b07.10</b>	3.0	3.5	
<b>b07.11</b>	00-00	23-00	
<b>b07.12</b>	2.0	2.2	
<b>b07.13</b>	0.0	1.8	
<b>b00.01</b>	3.0	3.0	Set running with 3.0bar at the undefined time, stop when inlet pressure below 1.8bar

## 6.6 Terminal Start/ Stop Control Wiring and Setting

### System Wiring

Base on above applications, connect a switch to S1 -COM refers to section 4.3



### Operation

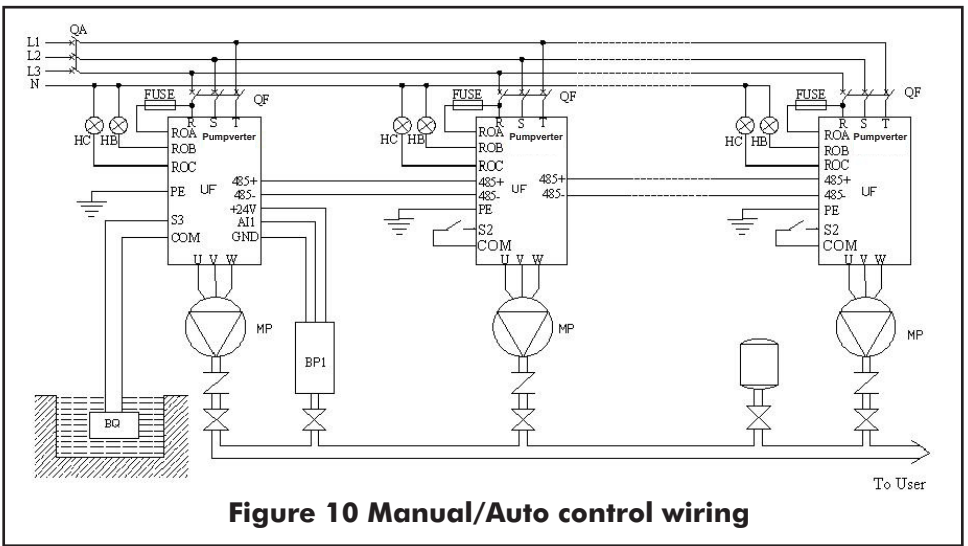
Use case where there is a remote start/stop switch. It's recommended to use a shielded twisted pair cable to wire the external switch. Pump runs only when external switch S1 -COM is turned on.

### Relevant Parameter Setting

According to the application use section 6.4 to set other parameters first, and then set master b05.02=3. Auxiliaries should be put on standby by pressing run after parameters have been set.

### 6.7 Manual/Auto Control Wiring and Setting

Base on above applications, connect a switch to **S2-COM** (refer to Figure 4.3.1) Normally apply this function on auxiliaries



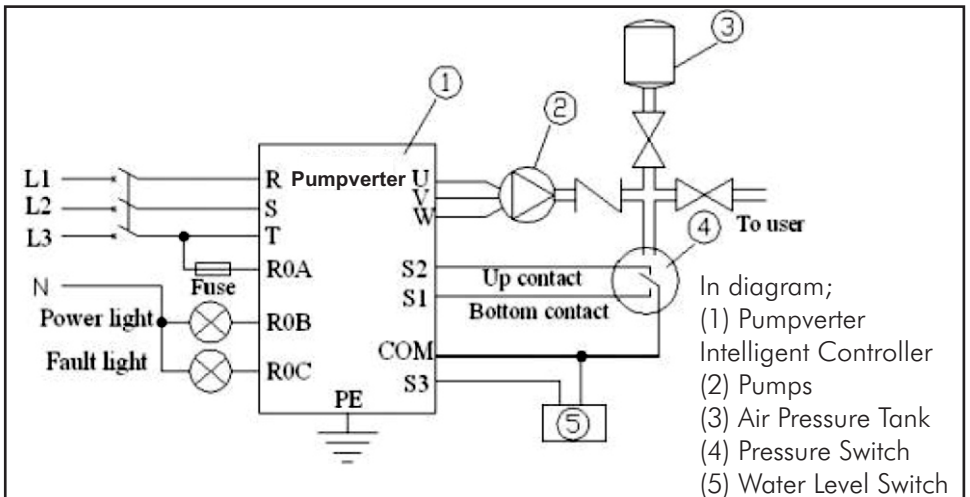
### Operation

Use in building site for manual control water supply where empty pipes require quick fill up which is achieved by running pumps at full speed. After parameters set, when **S2-COM** switch is turned on, pump runs at maximum set frequency (full speed).

### Relevant Parameter Setting

According to the application use section 6.4 to set other parameters first and then set auxiliaries b05.02=2.

## 6.8 Water Supply Control Using Pressure Switch System Wiring



## Relevant Parameter Setting

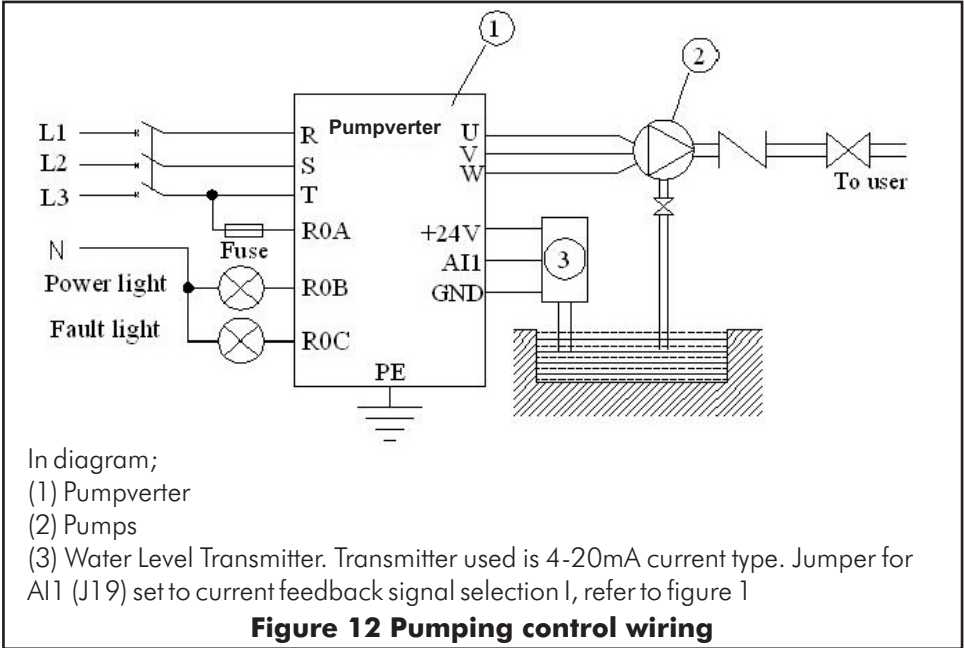
This example uses the pressure switch for control instead of the transducer (Wiring refer to figure 1). Adjustment of the pressure switch cut-in and cut-out pressures should be done before running. For example for 3bar water supply, then up contact adjust above 3bar (such as at 3bar), bottom electric contact below 3bar (such as at 2.8bar).

Code	Factory Setting	Recommended	Description
<b>b00.00</b>	65535	65535	Password of entering parameter groups. Factory set is 65535, it can be modified by b06.09
<b>b02.08</b>	1.0%	0.0%	All feedback lost detecting value, this application need not pressure detect, set the parameter 0
<b>b08.01</b> ~ <b>b08.05</b>			Ensure normal operation must input parameter according to nameplate of motor
<b>b00.02</b>	0	x	Motor rotating direction, set according to the actual motor wiring of spot. Make sure the motor is running in forward direction
<b>b01.02</b>	20	xx	Low pressure running time should be increased for use-cases where water pressure rises slowly. The LP running time b01.02 determines the maximum time that pressure is below cut-in pressure. Controller stops and alarms when the pressure below cut-in pressure lasts for a duration three times of the setting b01.02.
<b>b05.02</b>	2	1	Terminal S1 S2 control set for pressure switch control
<b>b01.16</b>	0	x	Restart after power on considering unattended management, set parameter to 1
<b>b05.00</b>	2	x	Water level (terminal S3) switch type according to the switch type in use 1. NC Valid                      2: NO Valid
<b>b05.01</b>	001	xxx	S3 action delay time, In case slow incoming water leads to short run time durations
<b>b05.03</b>			Acc. and Dec. time. It is recommended to set equal or above 20s, a short acc./dec. time leads to rapid pump cycling
<b>b05.04</b>			



## 6.9 Pumping Application

### System Wiring



Used in environmentally friendly sewage treatment, water level control, drainage and irrigation etc. Water level above 40%, Pumping in full frequency; below 40%, slow pumping; below 10% stop pumping

### Relevant Parameter Setting

Code	Factory Setting	Recommended	Description
<b>b00.00</b>	65535	65535	Password of entering parameter groups. Factory set is 65535, it can be modified by b06.09
<b>b08.01</b> ~ <b>b08.05</b>			To ensure normal operation, must input parameter according to motor nameplate
<b>b00.02</b>	0	x	Motor rotating direction, set according to the actual motor wiring. Make sure the motor is running in forward direction

Code	Factory Setting	Recommended	Description
<b>b02.02</b>	0	1	PID output Characteristics, set as pumping characteristics
<b>b01.05</b>	10.0	100.0	Set as the range of water level transmitter
<b>b01.00</b>	8.0	100.0	High water pressure/level alarm value, set as the alarm water level
<b>b01.01</b>	0.5	10.0	Low water pressure/level alarm value, water level below this value stop pumping
<b>b00.01</b>	3.0	40.0	The full frequency pumping water level, above this value full frequency pumping, below b00.01 and above b01.01 pumping with the setting frequency of b05.07. (the minimum allowed running frequency of the pump)
<b>Below need to set based on working conditioning and user requirement</b>			
<b>b01.06</b>			Water level transmitter calibration, b01.06 use to adjust transducer zero bias; b01.08 use to calibrate the displayed pressure. When displayed value is smaller than gauge, decrease b01.08. When displayed value is bigger than gauge, increase b01.08
<b>b01.08</b>			
<b>b01.02</b>	20	xx	Low pressure running time, set according to actual condition. Determine appropriate LP low pressure alarm detection time and adjust the factory setting if necessary
<b>b05.09</b>	10	30	Low water level automatic restart delay time. Manual restart after low water level not affected by this parameter

## 7. FAULT AND TROUBLE SHOOTING

Fault	Reason	Solution
<b>Can't Sleep</b>	<ol style="list-style-type: none"> <li>1. Outlet pipe leakage</li> <li>2. Check valve leakage</li> <li>3. Pressure tank damage</li> <li>4. EMI</li> <li>5. Wrong parameters set</li> </ol>	<ul style="list-style-type: none"> <li>• Check outlet pipe</li> <li>• Inspect check valve</li> <li>• Change pressure tank</li> <li>• Ensure b04.00=1 and setb04.04</li> </ul>

<b>Fault</b>	<b>Reason</b>	<b>Solution</b>
<b>Display Pressure Error</b>	<ol style="list-style-type: none"> <li>1. Detector error</li> <li>2. Wrong parameter</li> <li>3. Transducer wires too long</li> </ol>	<ul style="list-style-type: none"> <li>• Adopt standard detector</li> <li>• Calibration parameter b01.05, b01.08</li> <li>• Shorten wire</li> </ul>
<b>Full Frequency Running</b>	<ol style="list-style-type: none"> <li>1. Loss of pressure</li> <li>2. Wrong parameter</li> <li>3. Pump under power</li> </ol>	<ul style="list-style-type: none"> <li>• Check transducer</li> <li>• b05.02 should not be set as 1</li> <li>• <b>S2-COM</b> should be open</li> <li>• Set B07.14=1, or factory reset</li> </ul>
<b>Pressure Fluctuation Stabilizes Slowly</b>	<ol style="list-style-type: none"> <li>1. PID value incorrect</li> <li>2. Acc./Dec time too fast</li> <li>3. Big delay on pressure feedback</li> </ol>	<ul style="list-style-type: none"> <li>• Tune P1 value b02.03, b02.04</li> <li>• Tune Acc./Dec. time b05.03, b05.04</li> <li>• Shorten wires</li> </ul>
<b>Motor Noise</b>	<ol style="list-style-type: none"> <li>1. Motor running abnormally</li> <li>2. Motor Installation not stable</li> <li>3. Low carrier frequency</li> </ol>	<ul style="list-style-type: none"> <li>• Check motor</li> <li>• Properly set frequency B05.08</li> </ul>

<b>Fault Code</b>	<b>Fault Type</b>	<b>Reason</b>	<b>Solution</b>
<b>LP</b>	Low Water Pressure	<ol style="list-style-type: none"> <li>1. Abnormal sensor.</li> <li>2. Motor rotates in reverse direction</li> <li>3. Insufficient water inflow</li> <li>4. There is air inside the pump</li> </ol>	<ul style="list-style-type: none"> <li>• Check the installation of pressure transmitter</li> <li>• Check the motor's direction of rotation is correct</li> <li>• Check the parameter B01.01 (setting value too big)</li> <li>• Check the pump whether is free of air</li> </ul>
<b>HP</b>	High Water Pressure	<ol style="list-style-type: none"> <li>1. Abnormal sensor.</li> <li>2. The parameter B01.00 setting value is too small</li> </ol>	<ul style="list-style-type: none"> <li>• Check the installation of pressure transmitter</li> <li>• Check the parameter b01.00 (setting value too small)</li> </ul>
<b>LL</b>	Low Water Level	<ol style="list-style-type: none"> <li>1. Water level is too low.</li> <li>2. Abnormal water level switch.</li> <li>3. Wrong setting of water level switch style parameter</li> </ol>	<ul style="list-style-type: none"> <li>• Check the water system</li> <li>• Check condition of the control terminal S3</li> <li>• Check the parameter B05.00 and correct</li> </ul>

<b>Fault Code</b>	<b>Fault Type</b>	<b>Reason</b>	<b>Solution</b>
<b>HL</b>	High Water Pressure and Low Water Level (HP+LL)	<ol style="list-style-type: none"> <li>1. Abnormal sensor</li> <li>2. The parameter B01.00 setting value is too small</li> <li>3. Water level is too low</li> <li>4. Abnormal water level switch</li> <li>5. Wrong setting of water level switch style parameter</li> </ol>	<ul style="list-style-type: none"> <li>• Check the installation of pressure transmitter</li> <li>• Check the parameter b01.00 (setting value is too small)</li> <li>• Check the water system</li> <li>• Check the condition of the control terminal S3</li> <li>• Check the parameter B05.00 and correct</li> </ul>
<b>E022</b>	Sensor Fault	<ol style="list-style-type: none"> <li>1. Pressure transmitter disconnected</li> <li>2. Wrong pressure transmitter wiring</li> <li>3. Pressure transmitter short circuit</li> <li>4. Pressure transmitter breakdown</li> </ol>	<ul style="list-style-type: none"> <li>• Check the cable between pressure transmitter and controller</li> <li>• Check the sensor whether normal</li> </ul>
<b>E001</b>	IGBT Ph-U Fault (OUT1)	<ol style="list-style-type: none"> <li>1. Acc/Dec time is too short</li> <li>2. IGBT module fault</li> <li>3. Malfunction caused by interference</li> <li>4. Grounding not properly done</li> </ol>	<ul style="list-style-type: none"> <li>• Increase Acc/Dec time</li> <li>• Check external equipment and eliminate interference</li> <li>• Check earth wiring</li> <li>• Contact Dayliff retailer</li> </ul>
<b>E002</b>	IGBT Ph-V Fault (OUT2)		
<b>E003</b>	IGBT Ph-W Fault (OUT3)		
<b>E004</b>	Over current When Acceleration (OC1)	<ol style="list-style-type: none"> <li>1. Acc time is too short</li> <li>2. Low input voltage</li> <li>3. Low power of controller</li> </ol>	<ul style="list-style-type: none"> <li>• Prolong Acc time</li> <li>• Check the power supply</li> <li>• Select bigger power controller</li> </ul>
<b>E005</b>	Over current during Deceleration (OC2)	<ol style="list-style-type: none"> <li>1. Dec time is too short</li> <li>2. Load is too big</li> <li>3. Controller undersized</li> </ol>	<ul style="list-style-type: none"> <li>• Prolong Dec time</li> <li>• Increase braking time</li> <li>• Select bigger power controller</li> </ul>
<b>E006</b>	Over current When running at Constant speed (OC3)	<ol style="list-style-type: none"> <li>1. Sudden change of load</li> <li>2. Low input voltage</li> <li>3. The power of controller is small</li> </ol>	<ul style="list-style-type: none"> <li>• Check the load</li> <li>• Check the power supply</li> <li>• Select bigger capacity controller</li> </ul>

<b>Fault Code</b>	<b>Fault Type</b>	<b>Reason</b>	<b>Solution</b>
<b>E007</b>	Over current When Acceleration (OVI)	<ol style="list-style-type: none"> <li>1. High input voltage</li> <li>2. Regenerative energy from the motor is too large</li> </ol>	<ul style="list-style-type: none"> <li>• Check the power supply</li> <li>• Avoid restarting the motor until it stops completely</li> </ul>
<b>E008</b>	Over current during Deceleration (OV2)	<ol style="list-style-type: none"> <li>1. Dec time is too short</li> <li>2. Load is too big</li> <li>3. High input voltage</li> </ol>	<ul style="list-style-type: none"> <li>• Increase Dec. time</li> <li>• Reduce load or use higher power controller</li> <li>• Check the power supply</li> </ul>
<b>E009</b>	Over voltage When running at Constant Speed (OV3)	<ol style="list-style-type: none"> <li>1. High input voltage</li> <li>2. Load is too big</li> </ol>	<ul style="list-style-type: none"> <li>• Install input reactor</li> <li>• Increase braking</li> </ul>
<b>E010</b>	DC Bus Under Voltage (UV)	<ol style="list-style-type: none"> <li>1. Low input voltage</li> </ol>	<ul style="list-style-type: none"> <li>• Check the power supply</li> </ul>
<b>E011</b>	Motor Overload (OL1)	<ol style="list-style-type: none"> <li>1. Low input voltage</li> <li>2. Wrong setting of motor parameter</li> <li>3. Motor locked rotor or sudden big change of load to small load</li> <li>4. The power of motor is too small</li> </ol>	<ul style="list-style-type: none"> <li>• Check the power supply</li> <li>• Set the rated current of motor properly</li> <li>• Check the load, adjust the value of torque boost</li> <li>• Select proper power motor</li> </ul>
<b>E012</b>	Controller Overload (OL2)	<ol style="list-style-type: none"> <li>1. Acc time is too short</li> <li>2. Restart the motor when it is decelerating</li> <li>3. Low input voltage</li> <li>4. Load is too big</li> </ol>	<ul style="list-style-type: none"> <li>• Prolong Acc time</li> <li>• Avoid restarting the motor until it stops completely</li> <li>• Check the power supply</li> <li>• Select bigger capacity controller</li> </ul>
<b>E013</b>	Input Phase Failure (SP1)	<ol style="list-style-type: none"> <li>1. Loss of phase occurred in power supply</li> </ol>	<ul style="list-style-type: none"> <li>• Check the wiring, installation and the power supply</li> </ul>
<b>E014</b>	Output Phase Failure (SP0)	<ol style="list-style-type: none"> <li>1. Loss of phase occurred in output side of main</li> </ol>	<ul style="list-style-type: none"> <li>• Check the output wiring, cable and motor</li> </ul>

<b>Fault Code</b>	<b>Fault Type</b>	<b>Reason</b>	<b>Solution</b>
<b>E014</b>	Output Phase Failure (SP0)	1. Open phase occurred in output side of main circuit	<ul style="list-style-type: none"> <li>• Check the output wiring, cable and motor</li> </ul>
<b>E015</b>	Rectify Overheat (OH1)	1. Sudden over current 2. Input/Output side has short circuit 3. Cooling fans of controller damaged	<ul style="list-style-type: none"> <li>• Refer to solutions for over current</li> <li>• Check the wiring</li> <li>• Replace cooling fans</li> <li>• Find appropriate operating conditions</li> <li>• Check and reconnect</li> <li>• Contact Dayliff retailer</li> </ul>
<b>E016</b>	IGBT Overheat (OH2)	4. Ambient temperature is too high 5. Wires or connectors of control board are loose 6. Auxiliary power supply unit is damaged or low driving voltage for IGBT 7. Power module bridge is damaged 8. Control board is abnormal	
<b>E018</b>	<b>Reserve</b>		
<b>E019</b>	Current Detection Fault (ITE)	1. Wires or connectors of control board are loose 2. Auxiliary power supply unit is damaged 3. Current detector is damaged or amplifying circuit is abnormal	<ul style="list-style-type: none"> <li>• Check the wiring and connectors</li> <li>• Contact Dayliff retailer</li> </ul>
<b>E020</b>	<b>Reserve</b>		
<b>E021</b>	EEPROM Fault (EEP)	R/W fault of control parameters	<ul style="list-style-type: none"> <li>• Press <b>STOP/RST</b> to reset</li> <li>• Contact Dayliff Retailer</li> </ul>

## 8. TERMS OF WARRANTY

### i) General Liability

- In lieu of any warranty, condition or liability implied by law, the liability of Dayliff (hereafter called the Distributor) in respect of any defect or failure of equipment supplied **is limited to making good by replacement or repair** (at the Distributor's discretion) defects which under proper use appear therein and arise solely from faulty design, materials or workmanship within a specified period. This period commences **immediately after the equipment has been delivered to the customer** and at its termination all liability ceases. Also the warranty period will be assessed **on the basis of the date that the Distributor is informed of the failure.**
- This warranty applies solely to equipment supplied and **no claim for consequential damages**, however arising, will be entertained. Also the warranty specifically excludes defects caused by fair wear and tear, the effects of careless handling, lack of maintenance, faulty installation, incompetence on the part of the equipment user, Acts of God or any other cause beyond the Distributors's reasonable control. Also, any repair or attempt at repair carried out by any other party **invalidates all warranties.**

### ii) Standard Warranty

#### General Terms

If equipment failure occurs in the normal course of service having been competently installed and when operating within its specified duty limits warranty will be provided as follows:-

- **Up to one year - The item will be replaced or repaired at no charge.**
- **Over one year, less than two years - The item will be replaced or repaired at a cost to the customer of 50% of the Davis & Shirliff market price.**

The warranty on equipment supplied or installed by others is conditional upon the defective unit **being promptly returned free to a Davis & Shirliff office** and collected thereafter when repaired. No element of site repair is included in the warranty and any site attendance costs will be payable in full at standard chargeout rates.

**DAYLIFF** is a brand of **Davis & Shirliff**

for enquiries contact

**Davis & Shirliff, Ltd.**

P.O. Box 41762 - 00100, Nairobi, Kenya

Tel: 6968000/ 0711 079 000

or visit

**[www.davisandshirliff.com](http://www.davisandshirliff.com)**

for details of the nearest branch or stockist