16. Warranty

- The warranty period commences on the date of original purchase of the equipment. Evidence of this date of original purchase must be provided when claiming repairs under warranty. It is recommended you retain all receipts in a safe place.
- Shah Pneumatics products are warranted to the original user only to be free of defects in material and workmanship for a period of 12 months from date of manufacture. Shah Pneumatics' liability under this warranty shall be limited to repairing or replacing at Shah Pneumatics' option, without material charge however we may levy service charges, FOB Shah Pneumatics' Mumbai distribution center or authorized service agent. Shah Pneumatics will not be liable for any costs of removal, installation, transport or any other charges that may arise in connection with the warranty claim.
- This warranty is subject to due compliance by the original purchaser with all directions and conditions set out in the Installation and Operating Instructions. Failure to comply with these Instructions, damage or breakdown caused by fair wear and tear, negligence, misuse, incorrect installation, inappropriate chemicals or additives in the water, inadequate protection against freezing, rain or other adverse weather conditions, corrosive or abrasive water, lightning or high voltage spikes or through unauthorized persons attempting repairs are not covered under warranty.
- Shah Pneumatics shall not be liable for any loss of profits or any consequential, indirect or special loss, damage or injury of any kind whatsoever arising directly or indirectly from the product or any defect, and the purchaser shall indemnify Shah Pneumatics against any claim by any other person whatsoever in respect of any such loss, damage or injury.
- This warranty applies to all states and territories of India only.

Shah Pneumatics has a continuous policy of product development and although the Company reserves the right to change specifications, it attempts to keep customers informed of any alterations. This publication is for general information only and customers are requested to contact our Sales Department for detailed specifications and advice on a product's suitability for specific applications. All products are sold subject to the Company's standard conditions of sale.

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

Regd. Office: 28-30 Navketan Indl. Estate, Mahakali Caves Road, Andheri (East), Mumbai- 400 093. INDIA.
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Website: www.shah-pneumatics.com

FOR DISTRIBUTOR STAMP

IOM HORIZONTAL BOOSTER PUMP SYSTEMS- INVERTER WITH PID CONTROL- PP-YS-PP-YM

Flowmatics™

WATER MANAGEMENT SYSTEMS

PP - YS

PP - YM

P - PACK

SERIES

HORIZONTAL BOOSTER PUMP SYSTEMS

INVERTER WITH PID CONTROL

INSTALLATION OPERATION & MAINTENANCE MANUAL

DEALER: This manual must be given to the user of the pump

USER: Before using this pump, read this entire manual and save for future reference

energy saving

For more information regarding Flowmatics products, parts & services, please visit www.shah-pneumatics.com

WARNING:
1. Periodic inspection and maintenance of pumps is essential
2. Transfer of toxic, dangerous, flammable or explosive substances using Flowmatics products is at user's risk
3. Inspection, maintenance & installation of pumps must be made only by experienced, trained & qualified personnel
4. Use of strainer in the suction of the pump is a must for ensuring longer life of pump

Preface

Congratulations for your purchase of Flowmatics products.
We appreciate your trust while opening/unpacking the product, and make sure that there is no transit damage, if any, you must report to the dealer immediately.

We take no responsibilities in the case of accidents or damages on the basis of carelessness or disregard to the instructions and reject every responsibilities for the damages which originate from the improper use of the pumps/inverters.

PP-YS / PP-YM Series, which is embarked with PID control function, contains both Inverter and Booster Pump function.
The purchaser must correctly fill in a Maintenance Record, which would be provided by us, and mail/e-mail it to us, within 10 days from the date of purchase.
(Provide invoice no. / date / dealer's name & address with stamp & signature on last page)

Symbols used in this manual

In this user's manual, there are three distinguishable symbols indicating "Danger", "Warning" and "Caution."
These indicators are for the possibilities of mis-usage of the product.

In order to fully understand the security process indicators, you need to read this manual thoroughly before operating the system.

⚠ Danger	This indicates immediate danger situations and if not prevented in advance, serious error or damage may occur.
⚠ Warning	This indicates subconscious danger situations and if not prevented in advance, serious error or damage may occur.
⚠ Caution	This indicates subconscious danger situations and if not prevented in advance, danger and property damage may occur to some extent.

15. Guidance for Fallacy and Damage Treatment.

Fallacy and Damage Treatment

This system has many alarm and error diagnosis system.
When an error is detected, the correspondent protection function immediately operates and stops or re-operates the Inverter.

* Over Voltage
* Over Heat
* Over Load
* Over Current
* Motor stall occur
* Communication Error
* Sensor Open, Short
* High Pressure
* Low Pressure
* Level Alarm

Errors are like the followings

1) Three of the most current errors are saved in the un-flammable memory and you are able to check by operating the keyboard.

2) This page provides matters to help understanding the other error conditions and its usual repair process for the user's understanding.
Many different kinds of error descriptions and details are provided as well as the solution. Descriptions of the process of normal error repair are also provided.

3) There are some types of errors that re-operate the system without a complete stop even without diminishing the cause of the error.
However, if these kinds of error occur more than 5 times in a day, the system will stop operating and wait for user's repair.
(The number of times is changeable according to the selection of the automatic repair function. Refer to PR-22) When in these kinds of situation, please determine the causes and get rid of it before operating.

4) The two most distinguishable types of error are Hardware and Software.
As one of the Hardware error, High Pressure Warning and Low pressure Warning does not stop the system, but it causes errors.
Other Hardware errors will immediately stop the system and wait for User’s repair.

5) Errors of the Software will re-operate after 10 seconds except ER-BC (Bad Cable Connection) However, if the error is repeated more than three times in a day, the system will stop operating and wait for user's repair.

6) If the High Pressure or Low Pressure Warning occurs, the system will pause for 30seconds and re-operate after 10 seconds.

Inverter Error

Display	Error Name	Explanation	Solution
ER-OV	OVER VOLTAGE	The inverter is able to detect when the DC bus voltage surpluses the maximum permitted limit.	Inspect if the input voltage is within the rated current of the inverter and the possibilities of over voltage. It may be a fundamental cause for backward flow of the Motor. Increase the deceleration time or add resistance of the exterior option. Check if the required damping power is within the permitted limit.
ER-OT	OVER TEMP	The temperature sensor of the inverter detects over temperature.	Check if the indoor temperature is within the regulated temperature. Check whether the ventilating opening is closed or not. Get rid of the exterior obstacle on the heat-sink and check if the wing of the heat-sink is dirty or not. Provide enough space for suitable ventilation.

Indicators about the design of the System	
Caution	Do not tie the power cable which supplies the Input-Output control cable with the similar High-Voltage current cable.

Indicators about Cable Connection	
Warning	You must turn the power off when establishing system or connecting the cables. Otherwise, the equipment may be damaged or a man may be electric shocked.
Warning	When connecting power, you must establish the circuit breaker and the cable must be accurately connected to the right terminal plate with the right voltage and current. Over voltage, over current or wrong cable connection may cause physical or systematical damage or fire.
Warning	You must be sure that any conductive particle does not enter the inner part of the controller. Any conductive particle may cause fire or damage to the product.

Indicators for conveyance	
Caution	Because the inverter is attached to this Pump, it should not fall down or it should not be shocked in any way when conveying.

Indicators for operation	
Caution	It should be operated according to the Manual. Inject water to the inner casing area and when the water is filled, check the rotation direction and operate. When the product is operated without water, the mechanical seal may be damaged, so it must not rotate without water. You must check the voltage indicated on the motor label before operating.

Indicators for custody	
⚠ Caution	The product must be kept safe in the package box before setting up the product. Please be extra cautious so that the following matters are maintained when keeping. - It must be kept in a place where it is dry and without dregs or dust. - The suitable custody temperature is sub-zero 20 degrees and above-zero 65 degrees Celsius. - The relative humidity should be kept 0~95% and it should be at a state where the vapor does not form water drops. - It must be situated in the condition where there are no corrosive caustic gas or liquid is prevented. - It is recommended to lay the product inside the package on the shelf as it was delivered.

Indicators for installation	
⚠ Danger	Please observe the following matters in order to prevent fire or damage. - Be careful so that corrosive caustic gas, flammable gas or abrasive liquid does not touch the product. - Be careful so that the product is not exposed to high temperature, high humidity and other exterior climate condition. - Be careful so that the product is not exposed to great amount of dust, salinity, and metal powders. - Be careful so that the product is protected from extreme travail or shock. - The caliber of the suction head pipe should be the same or more than that of the pump and the valve and the strainer should be set up. - Make sure that both of the induction points do not go over 5M and seeing the pipe perfectly so that the air cannot be inhaled. - Confirm the direction of the suction and discharge before pip working. - It is recommended to establish valve on the suction and discharge pipe of the pump.

Indications for maintenance and repair	
⚠ Danger	Do not repair any machine while the power is on. Otherwise, there are consequences of being electric shocked.
⚠ Warning	The manufacturer will not be responsible for damage or breakdown caused by dismantle, repair and reconstruction of the product by any person or party without license.

14. Explanations of the Indication Error.

Booster Error

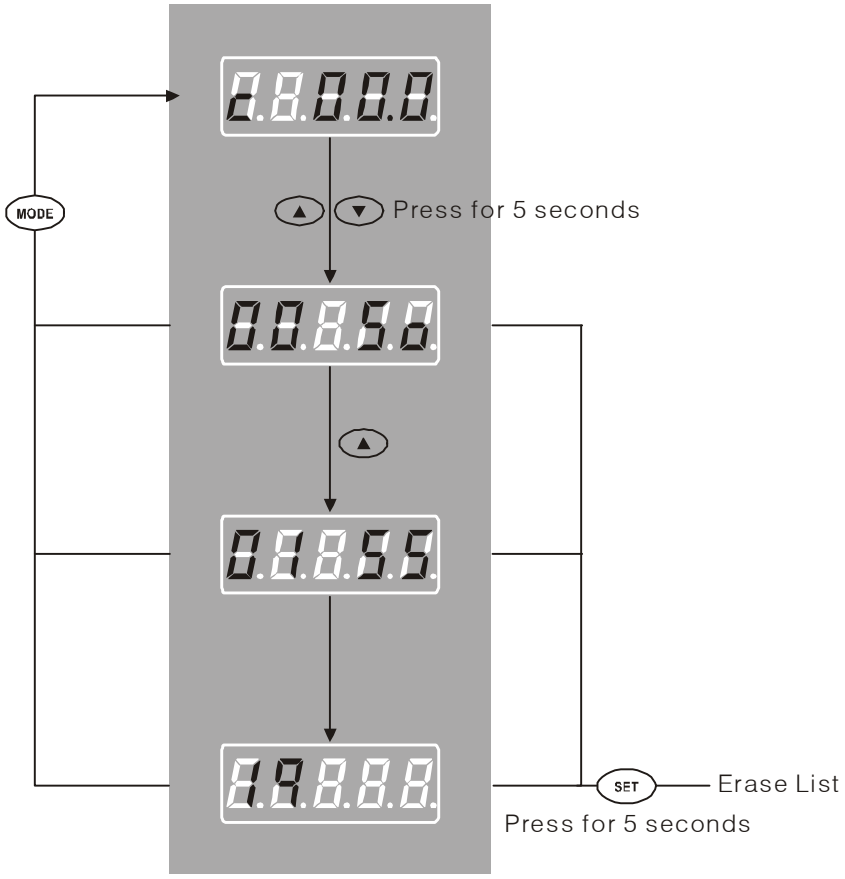
Display	Error Name	Explanation	Solution
ER-SO	SENSOR OPEN	The sensor is not connected.	Confirm the sensor connection.
ER-SS	SENSOR SHORT	It is a short sensor circuit.	The sensor is not operating normally. Please exchange the sensor.
ER-HP	HIGH PRESSURE	High Pressure Warning has been detected.	Please inspect the system.
ER-LP	LOW PRESSURE	Low Pressure Warning has been detected.	Please inspect the system.
ER-LL	LEVEL ALARM	Low water level warning.	Please inspect the water way.
ER-CE	COMMUNICATION ERROR	A problem has occurred on the communication cable.	Please inspect the communication cable connection condition. Please check the setting parameter for the communication operate .

Inverter Error

Display	Error Name	Explanation	Solution
ER-OC	OVER CURRENT	The over current Trip circuit is detecting unusual increase of the current.	Please inspect if the motor output matches the Inverter output. Please inspect the power line If there is any short line between the Inverter and the Motor. Rise the accelerating time. Please inspect if the motor has over load.
ER-OL	OVER LOAD	Inverter detects over output current. Inverter is able to bear unto 150% of the rated current for 60 seconds.	Please inspect the over load of the motor. Select the load torque repair from the parameter. Increase the output capacity of the Inverter.

13. Method to check the Alarm List.

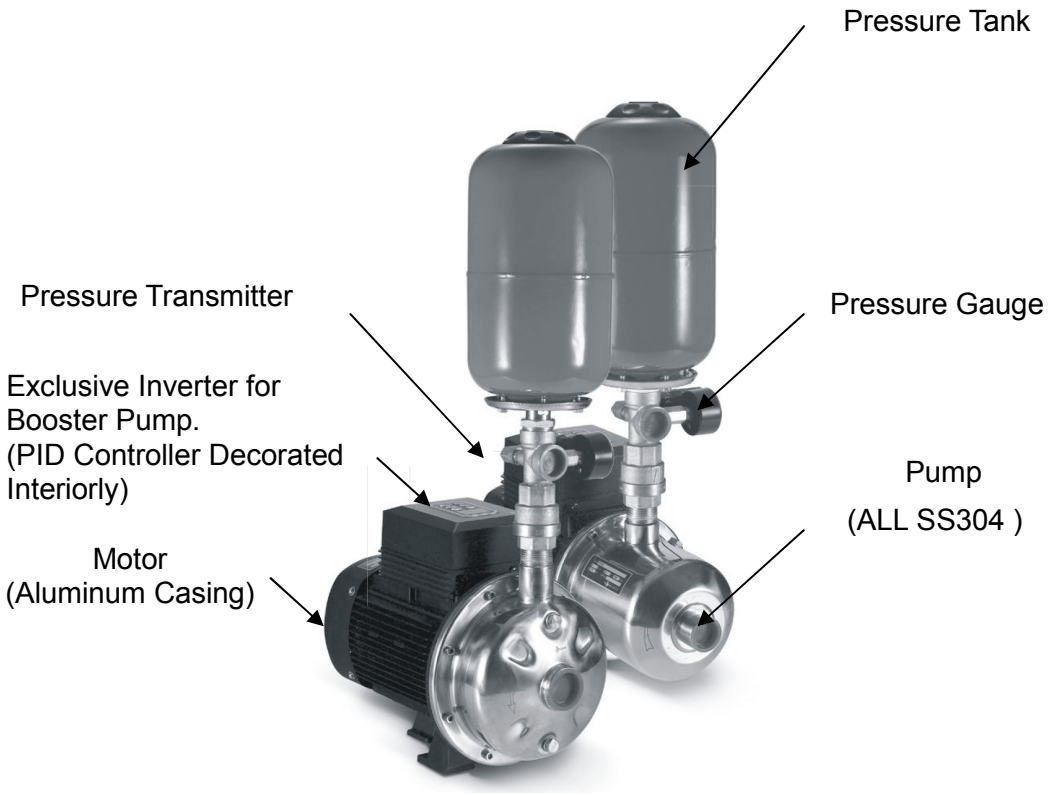
Method to check the Alarm List



Contents

1. Exterior Explanation

PP-YS Series



Number	PR-16
Name	PWM Frequency.
Range	1-9
Default	7(10 KHz)
Contents	Decided the Carrier frequency current for the PWM output. 1: 2.5 KHz 2: 3.2 KHz 3: 4.0 KHz 4: 5.0 KHz 5: 6.4 KHz 6: 8.0 KHz 7: 10.0 KHz 8: 12.5 KHz 9: 16.0 KHz

Number	PR-17,18,19,23
Name	Preparation/Test
Contents	It is for the interior Testing so do not set it at one's pleasure

Number	PR-20
Name	Init
Range	0-10
Default	0
Contents	Change all the set value of the PR parameter to the defult value as it was when shipped. When it is set to "10"

Number	PR-21
Name	Horse Power (HP)
Range	1-3
Default	3
Contents	Set the most suitable rated current of the Motor. 1.0 : 1HP, 1.5 : 1.5HP, 2.0 : 2HP, 3.0 : 3HP

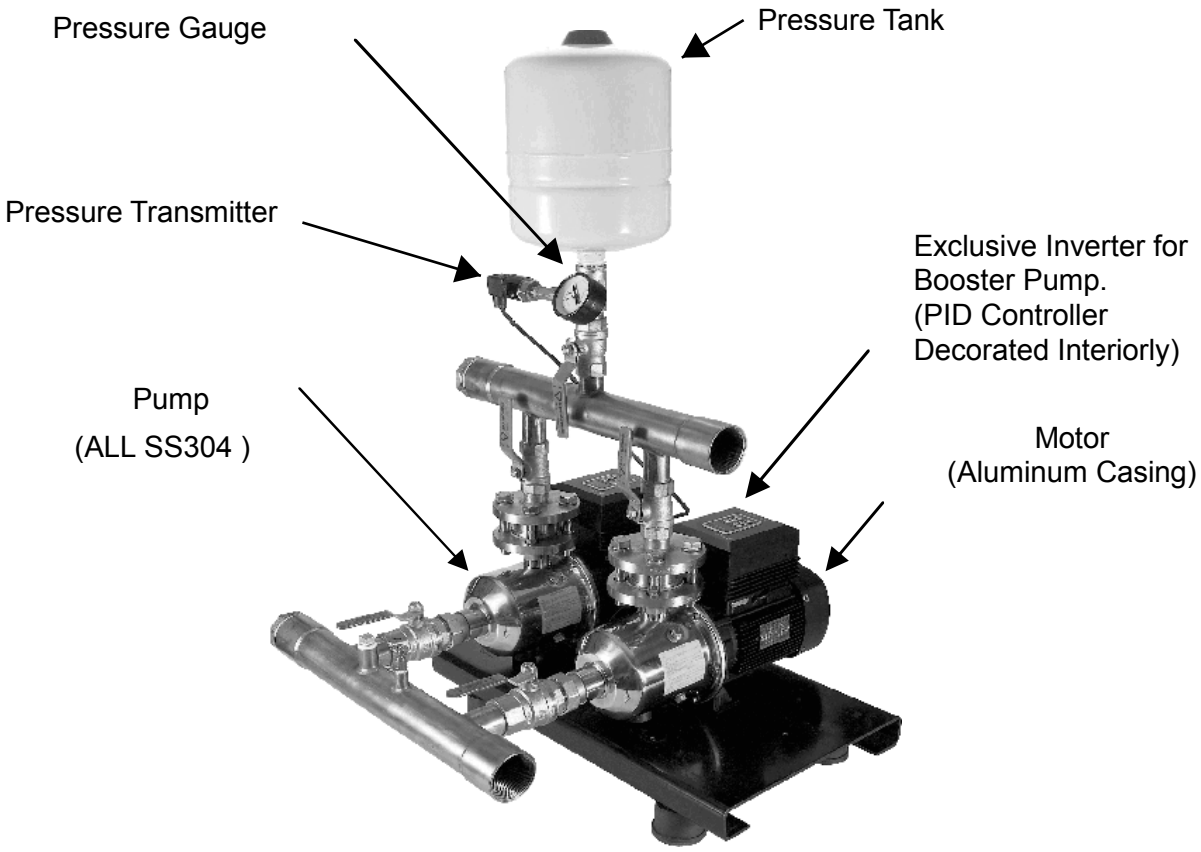
Number	PR-22
Name	Auto Reset
Range	0-20
Default	5
Contents	It will re-operate after automatically reset when Alarm occurs during Booster Pump Operation.

Number	PR-13
Name	Over Voltage Stall Mode.
Range	0-5
Default	0
Contents	The Motor DC bus voltage may surplus the maximum permitted value during deceleration because of Motor generation. When this function is used, the inverter will stop the deceleration function and will maintain stable output voltage current. It will start decelerating again when the voltage drops below the set value. When the inertia electrical load soothes out, the over voltage stall function will not operate. It is recommended to increase the deceleration time during application of the high inertia electrical load. 0: Over voltage stall function stop. 1: Action will stop when over load is detected while operating at a stable speed. 2: When over load is detected while operating at a stable Speed, continue after detecting. 3: Stop operating when over load is detected while operating. 4: When over load is detected while operating, continue after detecting.

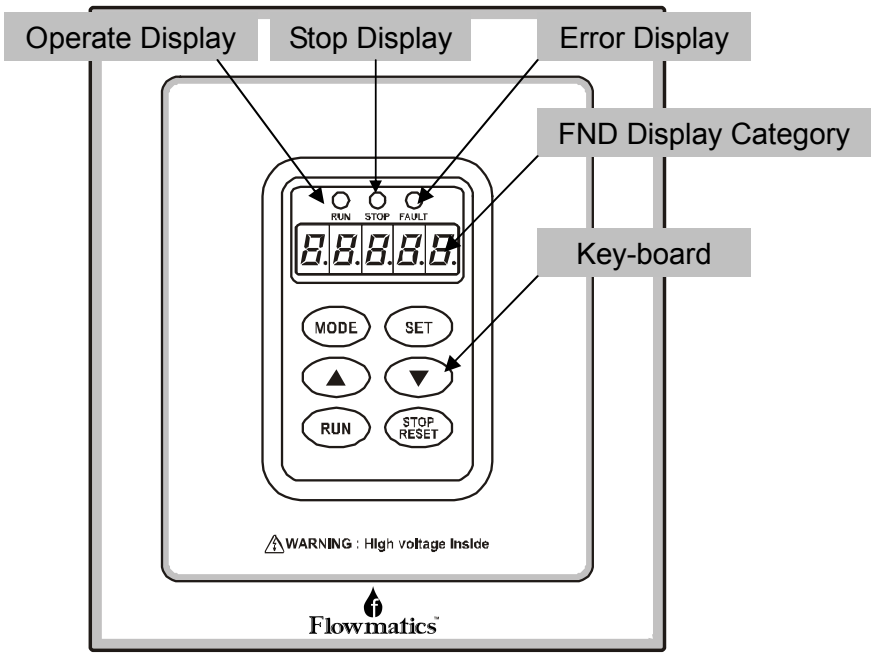
Number	PR-14
Name	Over Load Level
Range	30-200
Default	130%
Contents	Set the over load detection to 1% unit. Regard the inverter the most voltage current to 100% unit.

Number	PR-15
Name	Over Load Time
Range	0.1-120
Default	5
Contents	Set the over load detection time to 0.1sec unit.

PP-YM Series


Pressure Gauge
Pressure Tank
Pressure Transmitter
Exclusive Inverter for
Booster Pump.
(PID Controller
Decorated Interiorly)
Pump
(ALL SS304)
Motor
(Aluminum Casing)

Surface Category



LED Category

1) Operate Signal LED: Indicates that it is operating
2) Stop Signal LED: Indicates that the system is stop function.
3) Error Signal LED: Indicates several errors detected from the system.
   Refer to guidance for fallacy and damage treatment.

FND Category

Indicates Conditions and Information what User Needs.

Key-board Category

Input the Set-Value for System Operation.

Number	PR-11
Name	Prevent Over-Current during acceleration.
Range	50-200
Default	150%
Contents	The 100% set is the same as the most suitable output voltage current of DRIVE. The output voltage current of the inverter may be abruptly increased because of the over electrical load and sudden acceleration which is applied to the motor during acceleration. If this function is performances, the acceleration will stop and will maintain stable output frequency during the situation such as mentioned above. When the output current drops below the set value, it will restart the acceleration.

Number	PR-12
Name	Prevent Over-Current during operation.
Range	50-200
Default	150%
Contents	The output current of the inverter may surplus the set range when the electrical load of the motor increases greatly and if it is performing normal operation. When this situation occurs, the output voltage current will decrease maintaining stable motor velocity. It will accelerate with the output voltage current only if it is below the set range. It will be decided proportionately to 100% condition of the most suitable inverter rated current.

Number	PR-08
Name	Acceleration Time
Range	1-600
Default	1.5
Contents	This parameter sets the required time to reach from 0Hz to the maximum action frequency (PR-02). If the S curve is not given as a "possibility," the sector transformation will occur.

Number	PR-09
Name	Deceleration Time.
Range	1-600
Default	1.5
Contents	This parameter sets the required time to drop the maximum frequency (PR-02) to 0Hz. If the S curve is not given as a "possibility," the sector transformation will occur.

Number	PR-10
Name	Stall Prevent Mode
Range	0-1
Default	0
Contents	This parameter sets whether or not the usage of the stall prevention function. 0: Do not use the function. 1: Use the function.

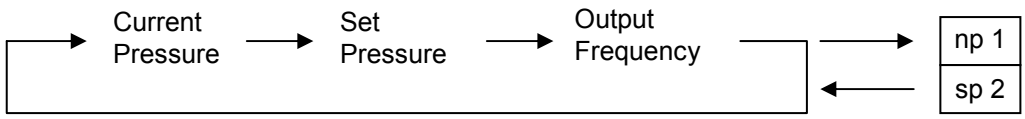
1) MODE Key

Used when converting from Normal Mode to Parameter mode.

2) SET Key

Used to Input Set Pressure Value.

Also used to Parameter set.



3) ▲ ▼ Key

Used to modify the Set-Value of the Parameter or set Pressure Value.

Also used to the Current System Value Display.

4) RUN Key

Used to the System operate as the Set Mode.

5) STOP/RESET Key

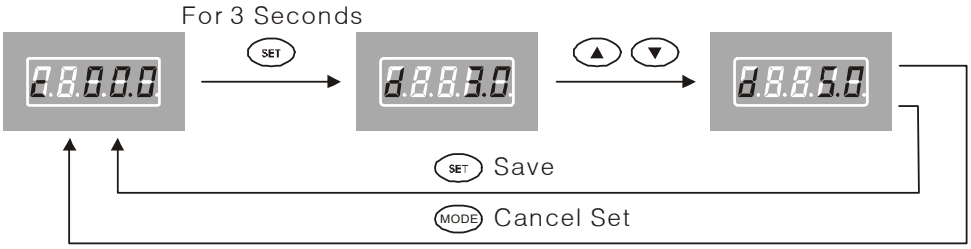
Used to Operate or Stop the System.

Also, when pressed for 10 seconds, it resets the System.

2. Ways to select pressure and convert screen.

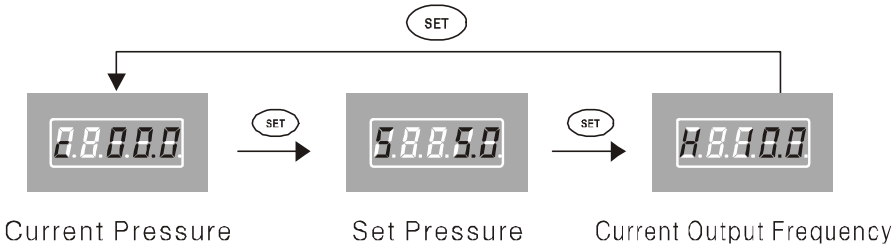
<Ways to Set Pressure >

Ways to convert pressure from 3.0Bar to 5.0Bar.



If the Key is not pressed for several seconds it will return to the main screen.

< Ways to Convert Screen >



Number	PR-04
Name	Middle Point Frequency
Range	0.1-400
Default	25
Contents	This parameter will set the middle point frequency of the V/F curve. With this, the V/F ratio between minimum frequency (PR-06) and the middle point frequency may be decided. Minimum output frequency < middle point frequency < Maximum output frequency.

Number	PR-05
Name	Middle Point Voltage.
Range	2.0-220
Default	50
Contents	Set the middle point voltage when in V/F curve. With this, the V/F ratio between the minimum voltage (PR-07) and the middle point voltage may be decided. Minimum output voltage < Middle Point voltage

Number	PR-06
Name	Minimum output frequency.
Range	0.1-20
Default	1.5
Contents	Set the minimum output frequency. It should be set as same as or smaller than Middle Point frequency (PR-04).

Number	PR-07
Name	Minimum output voltage.
Range	2-50
Default	10
Contents	Set the minimum output voltage. It should be set as same as or smaller of value than the middle point voltage (PR-05).

12. Specific Explanation of the Function of Inverter.

Number	PR-00
Name	Method of Operation (Operation Mode)
Range	0-1
Default	1
Contents	Set the Method of Operation 0: When used as Inverter / 1: When used as Booster

Number	PR-01
Name	Method of stop
Range	0-1
Default	0
Contents	This parameter sets the method of stop when the effective stop order is received. 0: After stopping the motor by the minimum frequency (PR-06), it will reach the complete stop according to the deceleration time which is set at PR-09. 1: The output will immediately stop by the stop order, and the motor will operate freely until complete stop.

Number	PR-02
Name	Maximum Frequency
Range	50-400
Default	60
Contents	Set the Maximum output frequency of the Inverter.

Number	PR-03
Name	Basis Frequency
Range	10-400
Default	60
Contents	This value should be set according to the most suitable frequency of the motor which is indicated on the motor label, and the maximum voltage frequency is decided according to the Hz.

3. How to operate.

How to Operate.

< Before Operating >

1. Is the Water Tank filled with Water?
2. Are the Pipes and Lines connected?
3. Did you look through the way to make emergency stop thoroughly?
4. Is the Earth-Ground Connection Accurate?

< Operation >

1. Confirm if the water tank is filled with water.
2. Confirm if the Electric Power Line is connected to the Motor and Management Equipment.
   (Caution: One Phase, Three Phase, Voltage 220Vac, Earth-Ground Connection & Etc.)
3. Please open both Suction and Discharge Valve.
4. To remove the air inside the pump, open the air cork until water comes out.
5. Please close the cork.
6. Please input the Main-Power.
7. Confirm the direction of the Motor using Run and Stop Key.
   (Confirm the direction of the Motor and Pump. If the direction is incorrect, please change the rotation direction from the parameter Br-06)
8. Please input the pressure when the rotation direction is confirmed.
9. Please input the Set Pressure referring to the performance curve of the Pump.
   (Warning: The Pump will not stop if the pressure is set above the most suitable pressure)
10. Please confirm if operation pressure reached the set pressure and if the pump stopped after slowly closing the Discharge pipe.
    If it does not reach to the complete stop, there may be possibilities of backward flow of the check valve, so please confirm.

4. Control and Power Requirement.

Frequency Control

Item	HRP-M
Inverter Control Method	HRP-M
Input Supply Power	One Phase 220V Power : 220±15%, 50~60Hz
Rated Frequency	0.10 ~ 400.00Hz
Output Resolution	0.1Hz
Method to set operation	Mode, Set, ▲, ▼ Set using Key
Method to set inverter analog	4~20mA
Other functions	Frequency maximum/ minimum value stopping the moving frequency

General management

Item	HRP-M
Acceleration/deceleration time	1.0~600sec
V/F Curve	Preventing stall while operating
Preventing Stall	Preventing stall while accelerating
Digital Operating Monitor	Command Frequency, Output Frequency, Output Current, Bus Voltage, communication operating condition
Method to operate Booster	4~20mA current Type censor
Method for communication	RS485
Used temperature	sub-zero 10 degrees ~ above-zero 40 degrees Celsius
Humidity	0-95% relative humidity
Vibration	0.5G or below

Protection function

Item	HRP-M
Instant over-voltage current	200% of the Rated voltage current
Over Load	150% of the Rated voltage current(For 2minutes)
Over voltage	440V over the DC-Bus Voltage
Low voltage	300V below DC-Bus Voltage
Instant electricity failure	re-operate after instant electricity failure
Over-heat	protected by the thermistor of the interior IPM

11. Function Summary of the Inverter Parameter.

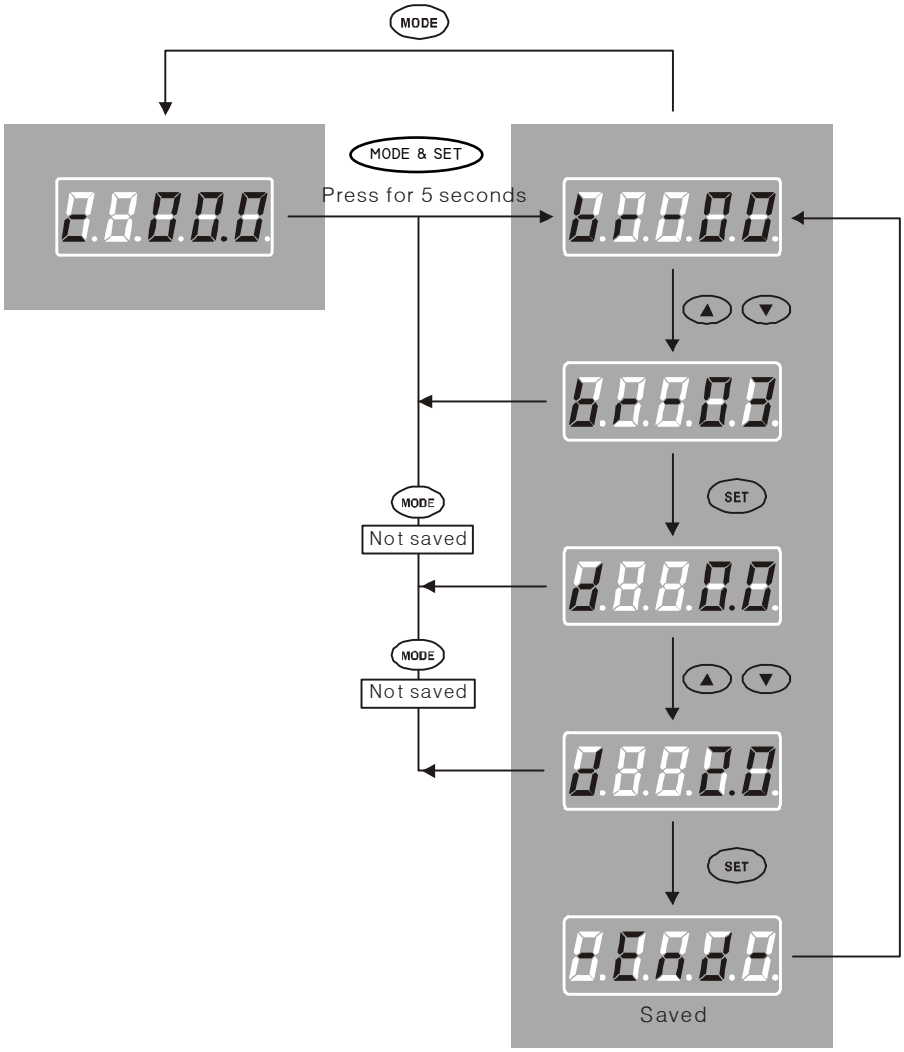
Function summary

No	Contents	Min. Value	Max Value	Default Value	Enable to set in operating	Other
Pr - 00	Method of operation	0	1	1	X	0: Inverter operation 1: Booster operation
Pr - 01	Method of stop	0	1	0	X	0: deceleration stop 1: immediately stop
Pr - 02	Maximum Frequency	50	400	60	X	Unit : Hz
Pr - 03	Basis Frequency	10	400	60	X	Unit : Hz
Pr - 04	Middle Point Frequency	0.1	400	25	X	Unit : Hz
Pr - 05	Middle Point Voltage	2	220	50	X	Unit : Voltage
Pr - 06	Minimum Frequency	0.1	20	1.5	X	Unit : Hz
Pr - 07	Minimum Voltage	2	50	10	X	Unit : Voltage
Pr - 08	Acceleration time	1	600	1.5	O	Unit : Second
Pr - 09	Deceleration Time	1	600	1.5	O	Unit : Second
Pr - 10	Method to prevent Stall	0	1	0	X	0:Don’s use / 1:Use
Pr - 11	Preventing Stall while Accelerating	50	200	150	X	Unit : %
Pr - 12	Preventing Stall while operating	50	200	150	X	Unit : %
Pr - 13	Overload Mode	0	4	0	X	0:Don’s use / 1~4:Use
Pr - 14	Overload Level	30	200	130	O	Unit : %
Pr - 15	Overload Time	0.1	120	5	O	Unit : Second
Pr - 16	PWM frequency	1	10	7	X	7:10khz
Pr - 17	Preparation 1	-	-	-	-	
Pr - 18	Preparation 2	-	-	-	-	
Pr - 19	Preparation 3	-	-	-	-	
Pr - 20	Reset	0	10	0	X	0~9:Don’t use / 10:Use
Pr - 21	Horse-Power	1	3	3	X	Unit : HP
Pr - 22	Auto Reset	0	20	5	O	Unit : Times
Pr - 23	Preparation 4	-	-	-	-	

10. Ways to convert the Inverter Parameter

PR Mode Parameter changing method

Ex) Method to change Pr-03 from 0.0 to 2.0



* If you do not press the Key for 10 seconds, it will return to the main screen.

5. Explanations of Connecting Terminal Plate and Connector.

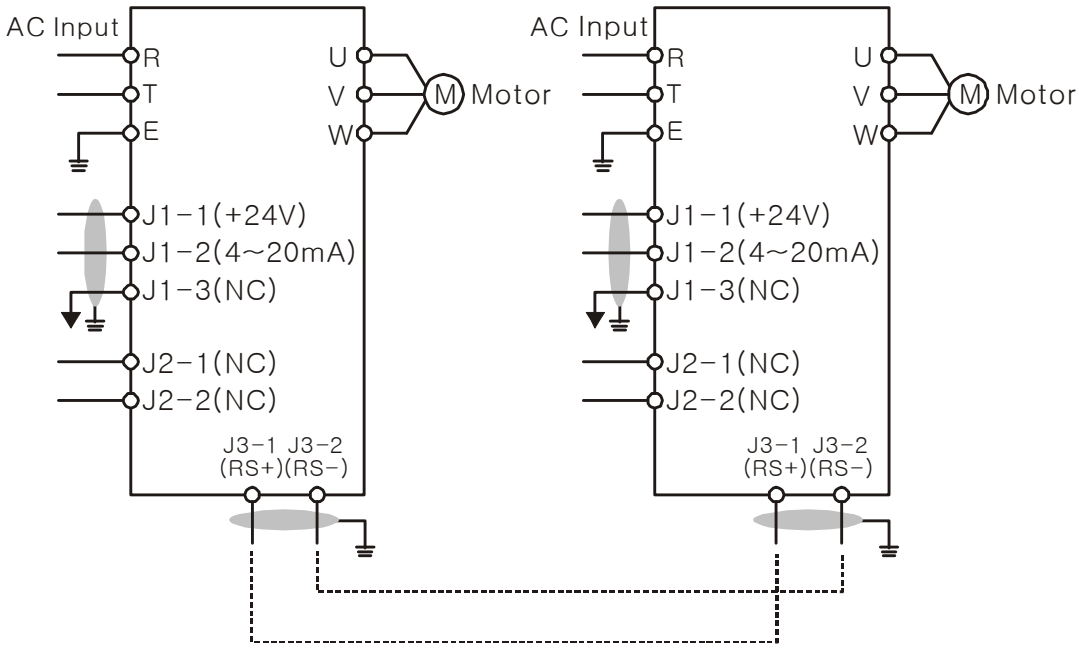
Explanation of the connecting terminal plate

Symbol	Explanation of function
R.T	Input terminal plate of the AC power
U.V.W	Output power terminal plate of the motor
E	Terminal plate of the Earth-Ground connection

Explanation of function with the connector

Symbol	Explanation of function
ISP1	Program downloading
J1	Use current type pressure censor
J2	Use temperature censor
J3	Use communication
CN1/CN2	For control signal and monitor signal

Connection diagram



(Use when communication operates)

* It is possible to use the censor connector in any system during communication operate.

Number	BR-14, BR-18, BR-18, BR-21
Name	Preparation) / Test
Contents	Please do not voluntarily change it because it may be used as System Test.

Number	BR-20
Name	Reset
Range	0~10
Default	0
Contents	It will chance the value of all the parameters to Default value. If it is set to 10, all the BR parameter will be changed to the initial value. But, the error records will not be changed. *Warning: This parameter cannot be changed while operating.

Number	BR-21
Name	Program Version
Range	
Default	1.84
Contents	This indicates the version of the System

Number	BR-13
Name	Minimum output ratio
Range	0~100%
Default	80%
Contents	Set the minimum value of the PID output. Set it according to the condition of the pump. It is important to set the most suitable value for the harmonious control of the pressure *Warning: This parameter cannot be changed while operating.

Number	BR-15
Name	Baud rate ratio
Range	0~3
Default	0
Contents	Set the RS-485 communication velocity 0 : 4800, 1 : 9600, 2 : 19200, 3 : 38400

Number	BR-16
Name	Communication Address
Range	0~31
Default	0
Contents	It will be communicated only when it is set to 0 If it is set between 1~31, the address of the exterior interface will be used.

Number	BR-17
Name	Operation-shift time (when Communication operate)
Range	0~99(hour)
Default	0
Contents	The operation time of the initial moving pump elapses, the initial moving pump will shift. It will immediately shift after the stop of the main pump when it is set to 0.If it is set to 99, it will operate according to the shifting time.

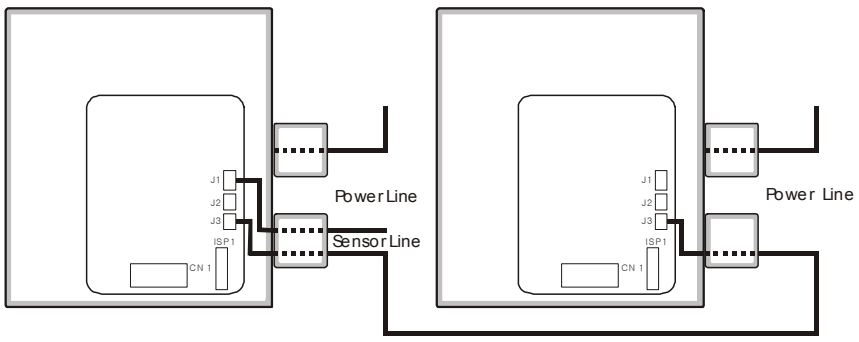
6. Ways to Operate the Booster System Communication.

Method to operate the Communication

1) Confirm if the Booster Parameter is set as same as BR-15.
2) Set the Booster Parameter BR-16 as same as 0.
3) Confirm the communication condition by pressing the Set Key on the Pressure Label Screen. If NOT ON appears on the screen, it means that it is abnormal so confirm the Parameter and pipes. If normal, it will be indicated by n P1, S P2.
4) You are able to set pressure on any controller when communication operates. This will set same pressure for both of the controllers. (Refer to the booster mode pressure set method)
5) Press each Run Button to begin operating.

* During the Communication operate; it will operate exchanging data of High Pressure Warning, Low Pressure Warning, Set Pressure and Shifting Time.

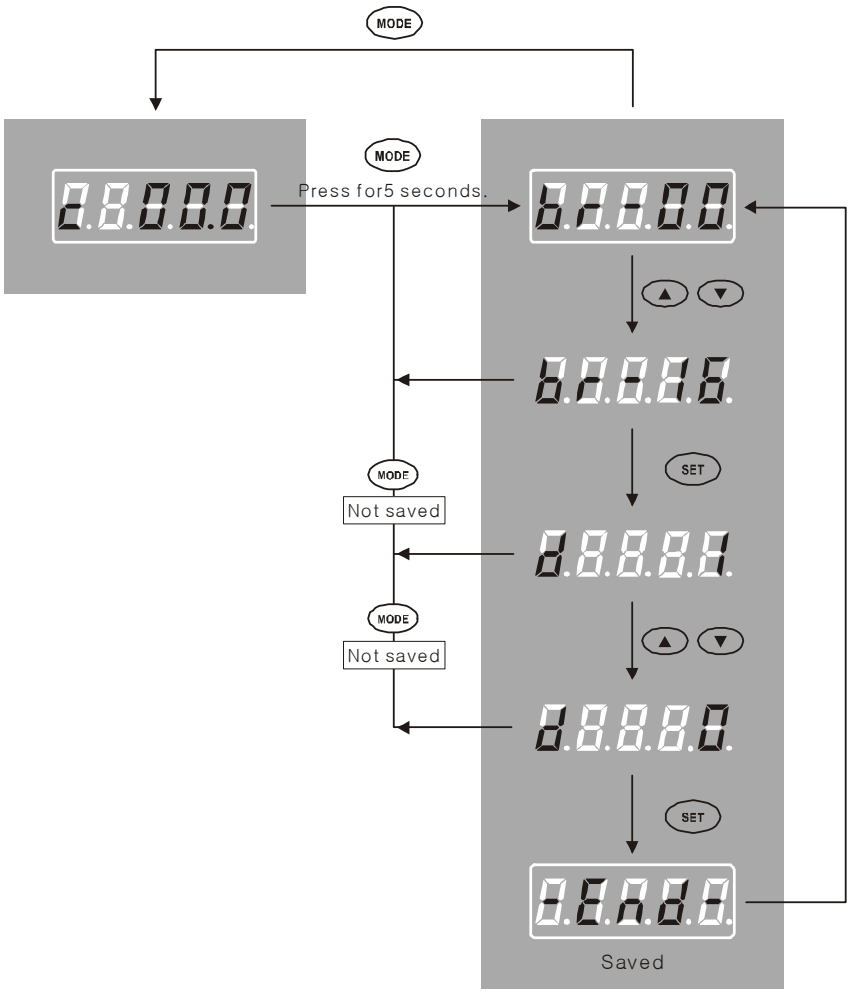
Construction Diagram



7. Ways to convert the Booster Parameter.

BR Parameter changing method

Ex) Method to change Br-16 to 0



* If you do not press the Key for 10 seconds, it will return to the main screen.

Number	BR-10
Name	Low pressure operation period
Range	0~100
Default	30 seconds
Contents	Determine the operation tine after the low pressure warning has been put off. Determine the operation period of the pump after the low pressure warning had been put off. If the pressure does not ascend even after operating the pump for the set tine, the system will automatically stop. (It will automatically operate after 10 seconds of pause)

Number	BR-11
Name	Operating deflection pressure
Range	0.0~2.0
Default	0.3 Bar
Contents	Set the operating deflection pressure. If the current pressure reaches the set pressure, the pump will stop. If you wish to operate it because of the low pressure, it will re-operate when the current pressure and the set pressure has difference below the deflection pressure. It is to prevent frequent movement of the pump.

Number	BR-12
Name	PID stop time
Range	0~200
Default	3 seconds
Contents	Set the PID control stop tine. If the value of the PID output does not show any difference during the stop tine, stop the pump. Please do not change this clause if you are not the manager. The pump may make wrong movements.

Number	BR-07
Name	Function to prevent frozen burst
Range	0~1
Default	0
Contents	Set the function to prevent frozen burst 0 is used when you do not wish to used the function and 1 is used when you wish to set the function to prevent frozen burst. Function to prevent frozen burst (option): do not stop the pump when the temperature goes below sub-zero in winter but continue operating in a low velocity. Thus, it prevents the pipe of the pump to freeze.

Number	BR-08
Name	Setting sensor value
Range	0.0~25.0
Default	10.0Bar
Contents	Set the value of the sensor Set the value of the pressure sensor which is used. When exchanging the sensor, the value of the sensor must be set.

Number	BR-09
Name	Reforming the value of the sensor
Range	-0.5~0.5
Default	0.0Bar
Contents	Reform the value of the sensor. You may reform the value when an error occurred on the value which appeared on the screen.

8. Function Summary of the Booster Parameter.

Function summary

No	Contents	Min. Value	Max Value	Default Value	Enable to set in operating	Other
Br - 00	High pressure warning	0	10	7.5	O	Unit : Bar
Br - 01	Low pressure warning	0	10	0.3	O	Unit : Bar
Br - 02	A constant of Proportion	0	100	30	O	Unit : a positive number
Br - 03	A constant of Integration	0	100	80	O	Unit : a positive number
Br - 04	A constant Of Differentiation	0	100	70	O	Unit : a positive number
Br - 05	Control period	1	200	1	O	Unit : mSec
Br - 06	Rotation direction	0	1	0	X	0: forward direction 1: reverse direction
Br - 07	Function to prevent frozen burst	0	1	0	O	0: do not use 1 : use
Br - 08	Type of censors	0	25	10	O	Unit : Bar
Br - 09	Sensor reform	-5	5	0	O	Unit : Bar
Br - 10	Low pressure operation time	0	100	30	O	Unit : sec
Br - 11	Moving deflection	0	2	0.3	O	Unit : Bar
Br - 12	PID stop time	0	200	3	O	Unit : Sec
Br - 13	PID minimum output ratio	0	100	80	O	Unit : %
Br - 14	Preparation1	-	-	-	-	0:Auto do not use1: use
Br - 15	Baud rate ratio	0	3	0	X	0:4800,1:9600,2:19200, 3:38400
Br - 16	Communication address	0	32	0	X	0: communication operate 1~31 : external interface
Br - 17	Lead Pump Operation-shift time	0	99	0	O	Unit : Hour 0 : immediately shift 0~99 : shift according to the shifting time *Shift the main pump during communication operate
Br - 18	Preparation2	-	-	-	-	
Br - 19	Preparation3	-	-	-	-	
Br - 20	Reset Booster parameter	0	10	0	X	0~9:do not use/ 10: reset
Br - 21	Preparation4	-	-	-	-	
Br - 22	Software version			18.4	-	Software Version : 1.84

9. Specific Explanation of the function of Booster.

Number	BR-00
Name	High pressure warning
Range	0.0 ~ 10.0
Default	7.5Bar
Contents	Set the pressure to set off the high pressure warning. If the current pressure is higher than that of the pressure set to put off high pressure warning, the "ER-HP" will appear on the screen and the pump will not operate. When the current pressure falls below that of the pressure set to put off the high pressure warning, "ER-HP" message will automatically disappear.

Number	BR-01
Name	Low pressure warning
Range	0.0 ~ 10.0
Default	0.3Bar
Contents	Set the pressure to set off the low pressure warning. When the current pressure is lower than that of the low pressure warning, "ER-LP" will appear on the screen. The low pressure warning message will come off and if the warning is not canceled within 30seconds, the pump will automatically stop. 10 Seconds after the stop, it will automatically re-operate If this continues more than PR-22 (Auto reset), "ER-LL" will appear on the screen because it means that there is an error in the system and the system will fully stop. In this incident, the user should check the system and re-activate.

Number	BR-02
Name	A constant of proportion value
Range	0~100
Default	30
Contents	Set the P value on the PID control. If the P value is set too high, it may quickly react to error and it may cause high pressure. If it is set too low, the reaction velocity may decrease.

Number	BR-03
Name	A constant of integration value
Range	0~100
Default	80
Contents	Set the I value on the PID control.

Number	BR-04
Name	A constant of differentiation value
Range	0~100
Default	70
Contents	Set the D value on the PID management.

Number	BR-05
Name	Control period
Range	1~200
Default	1ms
Contents	Set the time for the PID control calculation. If the management period is set fast, the reaction velocity becomes fast. If the control period value is increased when the pump is moving too fast, the pump slows down.

Number	BR-06
Name	Rotation direction
Range	0~1
Default	0
Contents	Set the rotation direction of the pump. 0 operates the pump to the FOR direction and 1 to the opposite. If a mistake has been made while setting the direction, you are able to control the rotation direction without changing the direction of the motor. ● Warning: you are not able to change this while operating.