WALRUS PUMP

TPH-IC Series

Instruction Manual

Inverter Control Pump



Model : 2T / 4T / 8T / 12T / 25T / 50T

To ensure safe and proper use, please read this instruction before operation.

ISO 9001 Certified **WALRUS PUMP CO., LTD.** CE

Congratulations on your purchase of Walrus IC Series Inverter Control System. Please read all instructions carefully before installing your new system. The system has been designed and manufactured to give trouble free, reliable operation. Upon receiving, please check the following:

a. No shipping damage.

b. Product specs match name plate data (such as pressure, voltage, HP, etc).

1. Functions and Features

a. The system provides constant pressure despite varying consumption.

b. Pump will automatically shut off when it is in dry run.

c. The pump will compensate the pressure loss due to the leak in the system.

d. Available for Simplex and Duplex.

e. Pump will start when the tap is open and shut off when the water flow is stopped .

2. Installation

2.1 Installation site.

a. Choose a site dry and with good ventilation. The ambient temperature is at 4°C-40°C.

b. Recommend to install inside. If you have to install outside, please provide a pump house with water proof and frost free to protect from weather

c. No vibration and unusual electrical surge.

d. Easy access for maintenance.

2.2 Cautions of installation

a. Avoid sucking in any solid particles; especially bounding glue or chips from pipe work.

b. Make sure the power supply is correctly connected at 1-phase 220V, 3-phase 220V or 3-phase 380V.

c. Never run pump dry; and keep the pumped liquid below 75°C. Make sure your system is always connected to an adequate, reliable source of clean water.

d. For your safety, be sure the GFCI (Ground Fault Circuit Interrupter) is in your system and grounding is properly connected to prevent from electric shock.



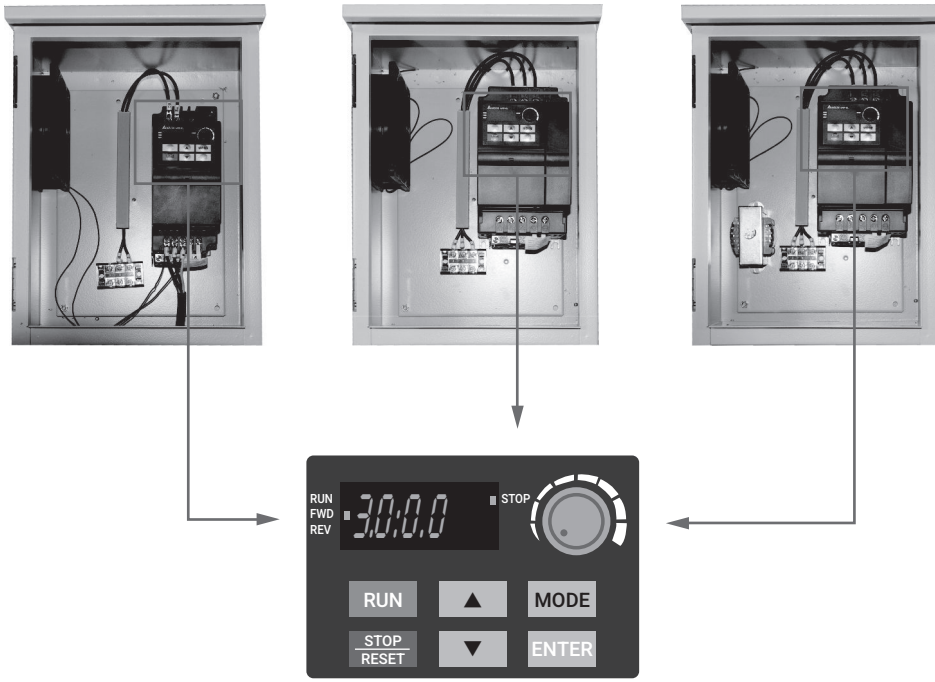
When using a regular GFCI (Ground Fault Circuit Interrupter), please select a current sensor with sensitivity of 200mA, and not less than 0.1-second detection time to avoid nuisance tripping. When using a designated GFCI for AC motor drive, please select a current sensor with sensitivity of 30mA or above.

e. Pumps without self-priming capability are prone to damage to parts when pumping water under negative pressure, Especially Pumps with larger water volumes are more sensitive to negative pressure water inflow, Please refer to the piping recommendations for land-based models.

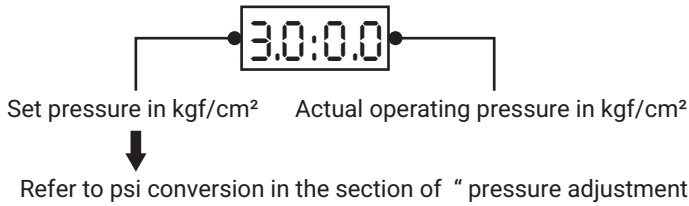
3. Control Panel

a. 1~5HP: The system status is displayed on Inverter Digital Keypad.

• 1Ø 220V (1~3HP) • 3Ø 220V • 3Ø 380V



Function of the Digital Keypad:



MODE	Press each time to display the different data (i.e pressure, frequency and current, etc.) The system allows user to change the pressure only.
▲	Press to increase the pressure
▼	Press to reduce the pressure

RUN Press to turn on the pump

STOP / RESET Press to force the pump to stop.

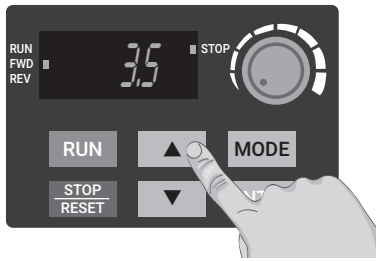
ENTER This key is for parameters programming only. Do not manipulate with this key unless you are familiar with the programming procedures.

Adjustment of Preset Pressure

1. Press “MODE” to scroll the display to the “preset pressure” with the right digit flashing (the picture is using the preset pressure of 3.0 kgf/cm² for example)



2. Press the “ ▲ Up” or the “ ▼ Down” key to change the value to the desired value, e.g. 3.5 kgf/cm².



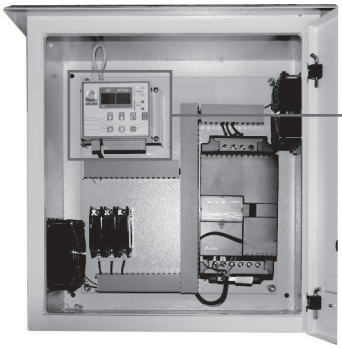
3. Press the “MODE” key to scroll the display back to the “preset:actual” screen.



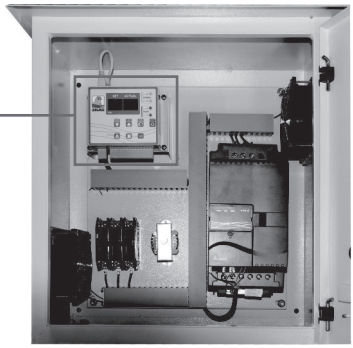
Caution :
The pressure value can only be adjusted higher than the “preset pressure” provided the incoming water source pressure is positive. (e.g. from city main), otherwise, pump will not perform properly.

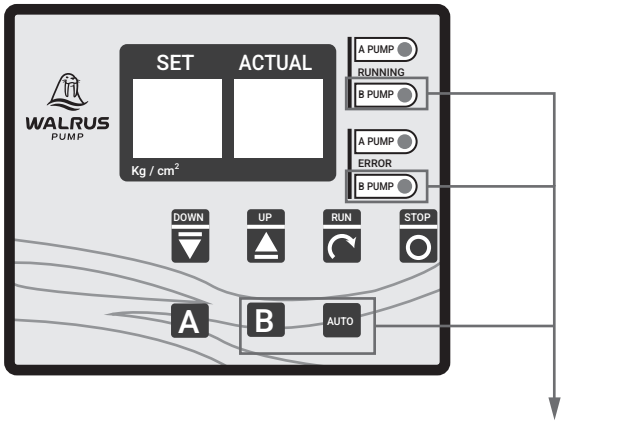
b. 7.5~15HP: The system status is displayed on the built-in “controller”.

• 3Ø 220V



• 3Ø 380V





(For duplex system only)

Function of the Keypad:

SET



The number in the screen indicates the set pressure in kg/cm^2.

ACTUAL



The number in the screen indicates the actual operating pressure in kg/cm^2.



Press to reduce pressure (00-99).



Press to increase pressure (00-99).



Press to turn on the pump



Press to force the pump to stop. Under normal operation, the pump will stop automatically when the tap is closed.
It is also the function memory key.

Adjustment of Preset Pressure

1. When you start up the pump, the SET pressure indicates the factory default pressure. It is also the max. constant pressure the pump will work. It can be set lower by pressing 

until the SET screen shows the number you desire, and then press 

to memorize the new setting.
2. You can not increase the SET pressure unless you have positive incoming pressure from your water source. For example, you have 0.7 kg/cm^2 incoming pressure and the default pressure is 3.5 kg/cm^2, you can adjust the SET pressure up to 4.1 kg/cm^2 as max. Make sure your positive incoming pressure is very stable because the pump performance will be affected once your incoming pressure is fluctuated.
3. To increase SET pressure, please press 

to the number you desire, and then press 

to memorize the new setting.
4. For other adjustment, please contact us for more information.

Remarks:

- After finishing any adjustment of the above, please be sure to press 

to default the new setting. If you do not press 

, the pump will resume the previous setting when the power turns off.
- When the indicator display "▯", the pump is in dry run and it will be shut off automatically.

The default is set to stop for 1 hour and the pump will attempt to run 1 minutes and stop for 1 hour. The stop-and-run cycle will be continued until the water supply is normal. It is highly recommended to shut off the pump when the water supply has problem as continue to run the pump dry will cause serious damage.

4. Start Up the Pump

4.1 Connect the power.

4.2 Check if the voltage and wiring are correct before you switch on the pump. The voltage should be kept at ±10% of the rated voltage on the nameplate.

4.3 Priming

Do not start the pump until it has been primed. Follow the following priming instruction:

4.3.1 Booster systems and systems where the liquid level on the suction side is above the pump inlet:

4.3.1.1 Close the isolating valves either side of the pump.

4.3.1.2 Remove the priming plug, fig. 1.

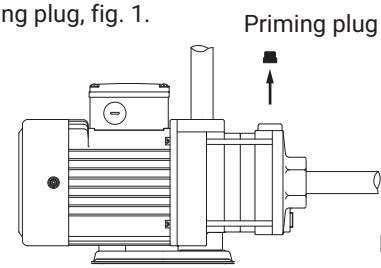


Fig. 1

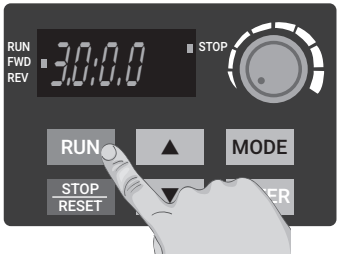
4.3.1.3 Slowly open the suction valve and keep it open until a steady stream of liquid runs out the priming port.

4.3.1.4 Close the valve, replace the priming plug and tighten it.

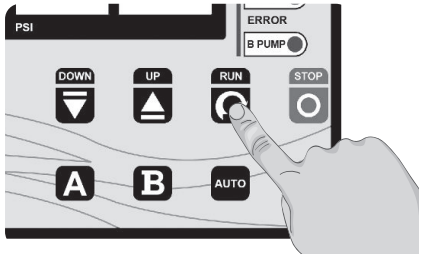
4.3.1.5 Open the suction valve.

4.3.1.6 Press RUN to start the pump. The pump will operate at the auto mode.

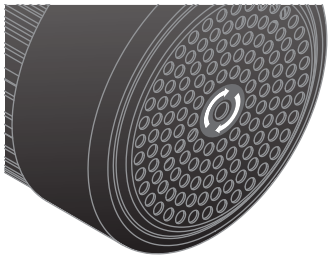
Inverter (1-5HP)



Controller (7.5-15HP)



4.3.1.7 Make sure the motor runs the same direction as the rotating direction sticker (on the motor fan cover).



4.3.1.8 Slowly open the discharge valve until it is fully open.

4.3.2 Pumping from tanks and wells where the liquid level on the suction side is below the pump inlet:

4.3.2.1 Close the discharge isolating valve.

4.3.2.2 Remove the priming plug, fig. 2.

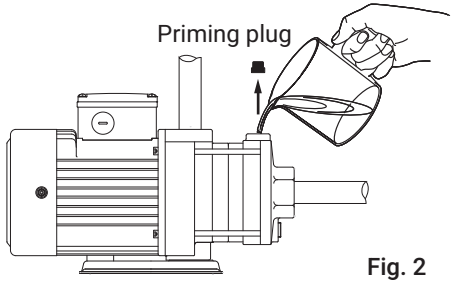


Fig. 2

4.3.2.3 Pour water through the priming port. Make sure that the suction pipe and pump are completely filled with liquid and vented.

4.3.2.4 Replace the priming plug and tighten it.

4.3.2.5 Press RUN to start the pump. The pump will operate at the auto mode.

4.3.2.6 Make sure the motor runs the same direction as the rotating direction sticker (on the motor fan cover).

4.3.2.7 Slowly open the discharge valve until it is fully open.

4.4 If there is no discharge flow after a few minutes, please turn off the pump and repeat the Process of 4.3 Turn the pump on and off several times until it is working normally.

5. Trouble Shooting

5.1 For pump and motor: (Before proceeding any action, please switch off the power.)

Cause	Remedy
1. Motor does not run.	a. Check if voltage is correct. b. Check if water supply is adequate. c. Check if rotor spins freely. d. If the problem is unsolved, please contact our distributor or us.
2. Motor keeps running when water flow is stopped	a. Check if faucet is completely shut off. b. Check if there is any leak in the system. c. Check if check valve function normally. d. Check if water supply is adequate.

5.2 For Inverter digital keypad:

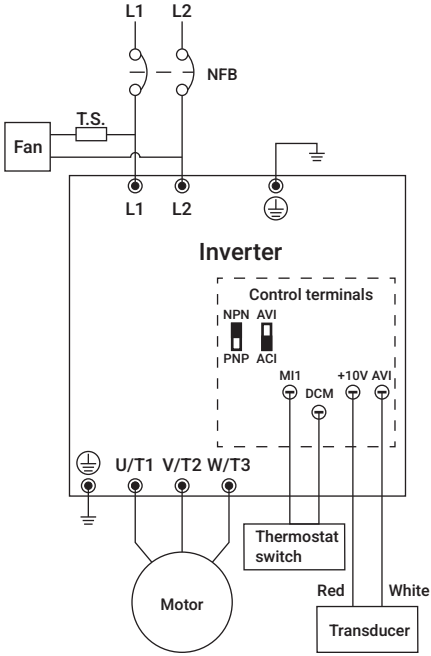
Cause	Remedy
■ Over Current (OC)	■ Check if there is any short circuits and grounding between the U, V, W and motor ■ Stop power supply, and manually check if fan is spinning Check the load condition
■ Over Voltage (OV)	■ Check if supply voltage is within ± 10%
■ Low Voltage (Lv)	■ Check if supply voltage is within ± 10%
■ Over Heat (OH1)	■ Check if cooling fan is jammed ■ Check if surrounding temperature
■ Overload (oL)	■ Stop power supply, and manually check if fan is spinning Check the load condition
■ Keypad Display is Abnormal	■ Cut off the power supply, Re-connect power
■ Phase Loss (PHL)	■ Check if the input voltage of R, S, T is unbalanced
■ Ground Fault (GFF)	■ Check if motor winding contains moisture or the surrounding humidity is too high

5.3 For controller:

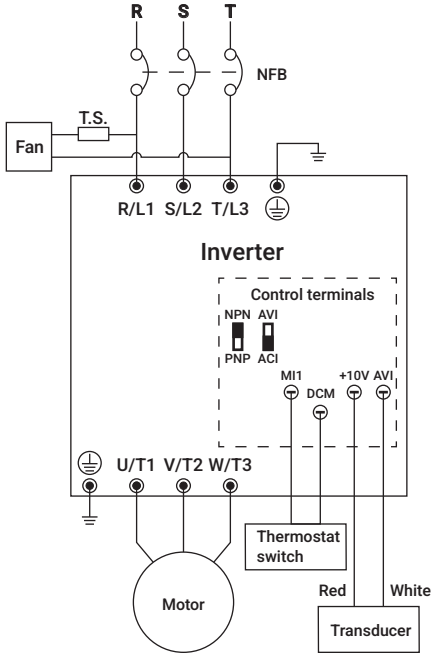
Display	Description	Remedy
AF	Error signal of inverter	Check if connection from controller to inverter is good.
o	Error of dry run or power being shut off	1. Check if the water supply is adequate; otherwise, please switch off the power. 2. Check if connection of the transducer is good. 3. Check if the pump is in dry run protection mode. The default is to stop for 1 hour and the pump will attempt to run 1 minutes and stop for 1 hour. The stop-and-run cycle will continue until the water supply is normal. When the pump is for sure in dry run, it is required to STOP it and turn off the power.

6. Wiring Diagram

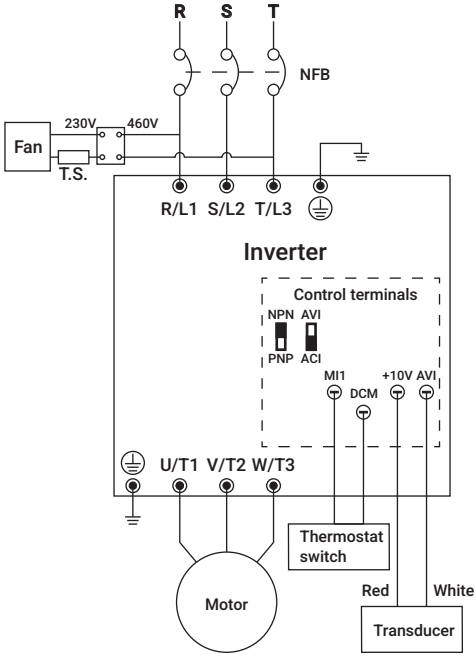
Single-phase 220V inverter



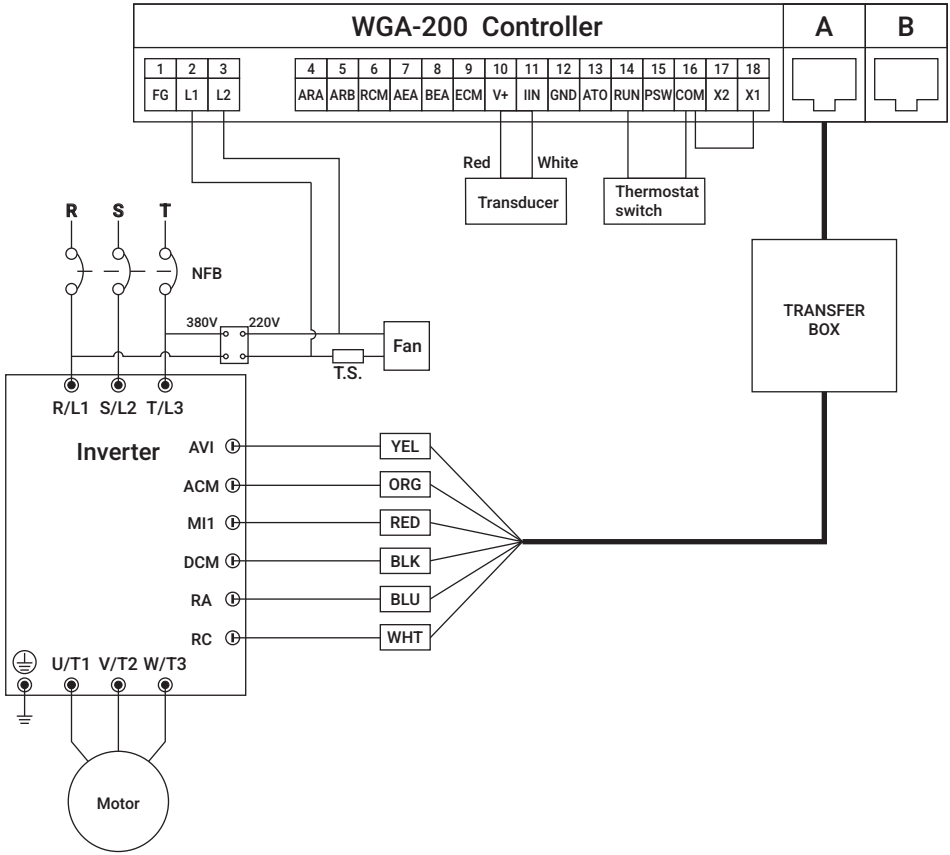
3-phase 220V inverter



3-phase 380V inverter



7.5HP~15HP inverter



7 Parameter Settings

7.1 Inverter parameter settings (1-5HP)

Parameter	Explanation	Settings	Factory Setting
00.02	Parameter Reset	9: All parameters are reset to factory settings (50Hz, 230V/400V or 220V/380V depends on Pr.00.12) 10: All parameters are reset to factory settings (60Hz, 220V/440V)	10
00.14	Position of Decimal Point of Userdefined Value 1	0 to 3	1
00.03	Start-up Display Selection	3: Multifunction display	3
00.04	Content of Multi-function Display	8: Display PID setting and feedback signal	8
01.07	Output Frequency Upper Limit	0.1 to 120.0%	100.0
01.09	Accel Time 1	0.1 to 600.0 sec	5.0
01.10	Decel Time 1	0.1 to 600.0 sec	5.0
02.01	Source of First Operation Command	0: Digital keypad 1: External terminals. Keypad STOP/RESET enabled. 2: External terminals. Keypad STOP/RESET disabled.	1
02.05	Line Start Lockout	0: Disable. Operation status is not changed even if operation command source Pr.02.01 is changed. 1: Enable. Operation status is not changed even if operation command source Pr.02.01 is changed.	0
03.08	Fan Control	0: Fan always ON 3: Fan ON when preliminary heatsink temperature attained	3
08.04	Momentary Power Loss Operation Selection	0: Operation stops after momentary power loss 1: Operation continues after momentary power loss, speed search starts with the Master Frequency reference value	1
08.05	Maximum Allowable Power Loss Time	0.1 to 5.0 sec	2.0
08.15	Auto Restart After Fault	0 to 10 (0=disable)	3
10.00	PID Set Point Selection	1: Keypad (based on Pr.02.00)	1
10.01	Input Terminal for PID Feedback	3: Negative PID feedback from external terminal ACI (4 ~ 20mA)	3

10.02	Proportional Gain (P)	0.0 to 10.0	3.0
10.03	Integral Time (I)	0.00 to 100.0 sec (0.00=disable)	0.48
10.12	PID Feedback Level	1.0 to 50.0%	3
10.13	Detection Time of PID Feedback	0.1 to 300.0 sec	60.0
10.19	PID Calculation Mode Selection	0: Series mode 1: Parallel mode	1
10.20	Treatment of the Erroneous PID Feedback Level	3: Ramp to stop and restart after time set in Pr.10.21	3
10.21	Restart Delay Time after Erroneous PID Deviation Level	1 to 9999 sec	3600
10.22	Set Point Deviation Level	0 to 100%	5
10.23	Detection Time of Set Point Deviation Level	0 to 9999 sec	15
10.24	Offset Level of Liquid Leakage	0 to 50%	15
10.25	Liquid Leakage Change Detection	0 to 100% (0: disable)	15
10.26	Time Setting for Liquid Leakage Change	0.1 to 10.0 sec (0: disable)	3.0
10.49			1

7.2 Controller parameter settings (7.5-15HP)

code	function	Description	Set	Unit
0	P gain	P gain adjustment	6	
1	I gain	I gain adjustment	4	
2		HOLD	12	
3	water leakage compensation pressure	when turn off , the pressure is lower to compensated value, controller would start to run	3	0.1kg/cm^2
4	turn off dectection	when inverter output frequency is lower than dectection , controller will stop output immediately.	153	
5	turn off dectection interval	can do turn off testing according to turn off dectection interval	100	0.1sec
6	turn off decresing speed	can do turn off testing according to turn off decresing speed	10	
7	pressure sensor spec	input use pressure sensor max. pressure vaule spec.	100	0.1kg/cm^2
8		HOLD	-	
9	parallel waitting time	after inverter full output , when the pressure difference is over than0.2 bar, it would stop parallel running after waitting setting time	100	0.1sec
A	remote parallel watting time	after inverter output to zero, when the feedback value is over than the setting vaule, it would stop parallel running after watting setting time	100	0.1sec
B	alternating time	alternating time setting	5	hour
C	no water pressure detection	when pressure is lower than the detection , then contorller will enter to the no water detection mode	5	0.1kg/cm^2
D	no water resting time	no water resting time setting	60	minute
E	no water detection time	no water detection time setting	60	second
F	pressure compensation adjust	pressure value compensation adjust setting		
H	power on option	0: terminal , 1 : key entering	1	
J	run option	0 : double pump(alternate) 1 : single pump(parallel)	0	
L	alternating option	0: alternate at once , 1: alternate after turn off	1	
N	breakdown connection type	0 : NC , 1 : ON	1	
O		HOLD	0	
P		HOLD	0	
R	Stop speed value	HOLD	15	0.1kg/cm^2

T	Positive negative Pressure value	A PUMP Do not check speed		A PUMP
U	Maxi Pressure value			kg/cm^2
Y	Positive negative Pressure value	B PUMP Do not check speed		B PUMP

7.2.1 Inverter parameter settings (7.5-15HP)

Parameter	Explanation	Settings	Factory Setting
00.02	Parameter Reset	9: All parameters are reset to factory settings (50Hz, 230V/400V or 220V/380V depends on Pr.00.12) 10: All parameters are reset to factory settings (60Hz, 220V/440V)	10
01.07	Output Frequency Upper Limit	0.1 to 120.0%	100.0
01.09	Accel Time 1	0.1 to 600.0 sec	3.0
01.10	Decel Time 1	0.1 to 600.0 sec	30.0
02.05	Line Start Lockout	0: Disable. Operation status is not changed even if operation command source Pr.02.01 is changed. 1: Enable. Operation status is not changed even if operation command source Pr.02.01 is changed.	0
04.13	Max AVI Voltage	0.0 to 10.0V	9.8

Limited Warranty

Products manufactured by Walrus Pumps Co (Walrus) are warranted to the first user only to be free of defects in material and quality for 12 months from the date of installation but no more than 24 months from the date of shipment. Walrus' liability under this Warranty shall be limited to repairing or replacing at our election, without charge, FOB Walrus' distribution center or authorized service agent. Walrus will not be liable for any cost of removal, installation, transportation, or any other charges that may arise in connection with the warranty claim.

The warranty period commences on the original purchase of the equipment. Proof of purchase and installation date, failure date, and supporting installation data must be provided when claiming repairs under warranty.

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.

Walrus will not be liable for any incidental or consequential damages, losses, or expenses, arising from installation, use, or other causes. There are no express or implied warranties, including merchantability or fitness for a particular purpose, extending beyond those described or referred to above.

This warranty sets forth specific legal rights and obligations. Certain states do not permit the exclusion or limitation of incidental or consequential damages or the placing of restrictions on the duration of an implied warranty. Therefore, the rules or exclusions herein may not apply. However, additional rights may exist, varying from state to state.

The above Warranty supersedes all previous publications.

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