PENTAIR
ONGA

INTELLIMASTER
VARIABLE SPEED CONTROLLER

USER MANUAL

CAUTION

Should the installer or owner be unfamiliar with the correct installation and/or operation of this type of equipment, please contact the distributor or manufacturer for the correct advice before proceeding with the installation or operation of this product.

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IMPORTANT Please read the **SAFETY INSTRUCTIONS** below.

	Danger：Indicates a risk of electric shock, which, if not avoided, could result in damage to the equipment and possible injury or death.		Danger：Indicates a potentially hazardous situation other than electrical, which if not avoided, could result in damage to property.

	Intellimaster series is intended for professional incorporation into complete equipment or systems as part of a fixed installation. If installed incorrectly it may present a safety hazard. The Intellimaster series uses high voltages and currents, carries a high level of stored electrical energy, and is used to control mechanical plant that may cause injury. Close attention is required to system design and electrical installation to avoid hazards in either normal operation or in the event of equipment malfunction. Only qualified electricians are allowed to install and maintain this product.
	System design, installation, commissioning and maintenance must be carried out only by personnel who have the necessary training and experience. They must carefully read this safety information and the instructions in this Guide and follow all information regarding transport, storage, installation and use of the Intellimaster series, including the specified environmental limitations.
	Do not perform any flash test or voltage withstand test on the Intellimaster series. Any electrical measurements required should be carried out with the Intellimaster series disconnected.
	Electric shock hazard! Disconnect and ISOLATE the Intellimaster series before attempting any work on it. High voltages are present at the terminals and within the drive for up to 10 minutes after disconnection of the electrical supply. Always ensure by using a suitable multimeter that no voltage is present on any drive power terminals prior to commencing any work.
	Where supply to the drive is through a plug and socket connector, do not disconnect until 10 minutes have elapsed after turning off the supply.
	The driven motor can start at power up if the enable input signal is present.
	The STOP function does not remove potentially lethal high voltages. ISOLATE the drive and wait 10 minutes before starting any work on it. Never carry out any work on the Drive, Motor or Motor cable whilst the input power is still applied.
	The entry of conductive or flammable foreign bodies should be prevented. Flammable material should not be placed close to the drive Relative humidity must be less than 95% (non-condensing).
	Ensure that the supply voltage, frequency and single phase input correspond to the rating of the Intellimaster as delivered.
	Never connect the mains power supply to the Output terminals U, V, W.
	Do not install any type of automatic switchgear between the drive and the motor.

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GENERAL SPECIFICATIONS	
Operation Method	Individual Inverter Operation (Parallel up to 3 pumps)
Display	2.42" OLED with keypad
Language	English
Input Voltage	230V AC Single Phase, 50Hz
Temperature & Humidity	-10~40°C / 90%
Run History	Run-time record and display
Alarm History	Records and display's up to 20 alarms
Other Fuctions	Auto Reset, High and Low Pressure Alarms, Dry Run Protection, etc.

CONTROL KEY DESCRIPTION

STOP MODE	System Stop/ Mode (Entering the paramters)
RUN	System Run
▸	Moving the digit locations from left to right
▲ ▼	Changing the values and navigating through the parameters
↵	To confirm the settings

QUICK SETTINGS

ACTION	INSTRUCTIONS
Parameter Setting	Firmly press STOP MODE button for 2 - 3 seconds
Auto/Manual mode	Press and Hold both ▲ + ▼ for 2 - 3 seconds
Alarm History	Firmly press ▸ button for 2 -3 seconds
Operation History	Firmly press ↵ button for 2 -3 seconds
Deleting the Alarm History	After entering the **Alarm History** menu, press and hold ▲ + ▼ for 2 - 3 seconds
Deleting the Operation History	After entering the **Operation History** menu, press and hold ▲ + ▼ for 2 - 3 seconds

TECHNICAL CHARACTERISTICS

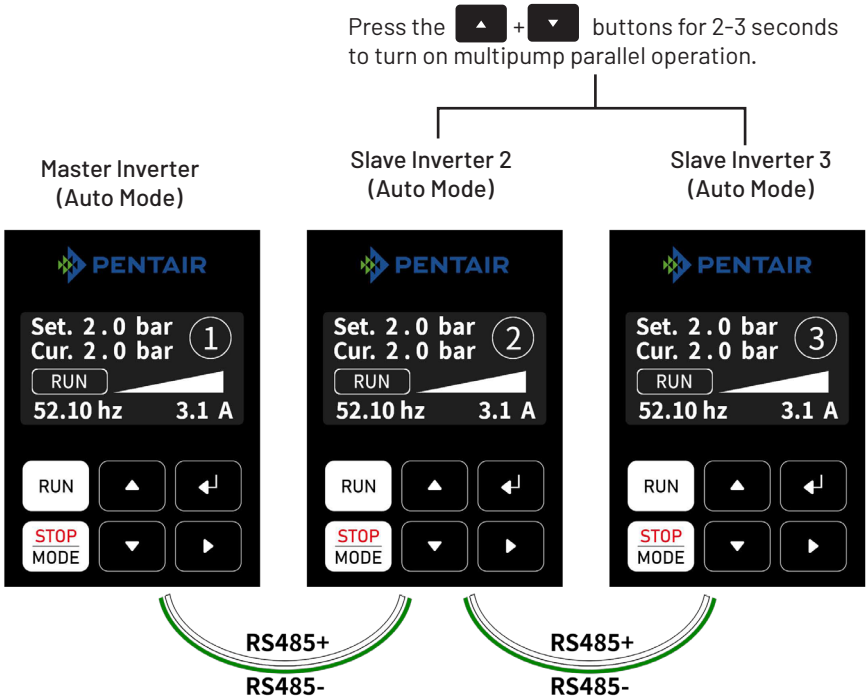
Pump Model	Controller Model	Input Voltage [V]	Output Voltage [V]	Output Current [A]	Motor [kW]
IMH750K	PVFD0750S (810960)	230V AC 1PH +/- 10%	3 X 220/240	2.4A	0.75
IMH1100K	PVFD1500S (810961)	230V AC 1PH +/- 10%	3 X 220/240	4.7A	1.5
IMH2200K	PVFD2200S (810962)	230V AC 1PH +/- 10%	3 X 220/240	7.1A	2.2

Protection Class IP55
Output Frequency 50 Hz (+/-5%)
Ambient Temperature -10°C ~ 40°C

Pump Model	IMH750K	IMH1100K	IMH2200K
Protection Class	IP55	IP55	IP55
Motor [kW]	0.75	1.5	2.2
Rated Input AC Voltage	1Phase 220V/240V (+/-15%)	1Phase 220V/240V (+/-15%)	1Phase 220V/240V (+/-15%)
Rated Output Voltage [V]	3Phase 220V/240V	3Phase 220V/240V	3Phase 220V/240V
Rated Output Current [A]	2.4	4.7	7.1
Output Frequency Range [Hz]	0-50 Hz	0-50 Hz	0-50 Hz
Voltage/Frequency Characteristic	V/F control	V/F control	V/F control
Overload Rated Current	150% of rated current	150% of rated current	150% of rated current
Protections	Auto Reset, Dry Run Protection, etc		

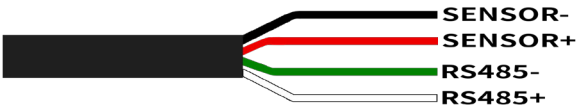
PARALLEL OPERATION

To set parallel operation, change the operation method to the auto operation mode.
NOTE: Up to 3 pumps can be linked and operated in parallel.



Setting the MASTER PUMP : Press the ▲ + ▼ for a duration 2-3 seconds.
The Master pump should state "**1**"

Setting the SLAVE PUMP : Press the ▲ + ▼ for a duration 2-3 seconds.
The Slave pump should state "**2**"



RS485 connection guide

CONTROL PARAMETER SETTING

Parameters	Input Range	Unit	Default
Set Pressure	0.1 ~ 20.0	bar	3.5
	10 ~ 300	psi	30
Run Deviation	-3.0 ~ -0.2	bar	-0.3
	-50 ~ -3	psi	-5
Stop Delay	3.0 ~ 999.9	sec	5.0
Restart Delay	0 ~ 9999	sec	0
Shift Time	0 ~ 9999	Min	60
Maximum Runtime	0 ~ 999	Min	0
P	1 ~ 200	-	25
I	1 ~ 200	-	40
D	1 ~ 200	-	40
Low Pressure Alarm	[Used][Not Used]		[Used]
Low Pressure Value	0.1 ~ 10.0	bar	0.3
	1 ~ 140	psi	5
Low Pressure Stop	0 ~ 999	sec	10
Low Pressure Restart	0 ~ 999	sec	10
Low Pressure Restart Time	0 ~ 20	Cyle	3
Pressure Unit	[bar][psi]		[bar]

CONTROL PARAMETER SETTING

Set Pressure	Refers to the operating set pressure.
Run Deviation	Refers to the run deviation in which the operating of the system starts.
Stop Delay	Refers to the stop delay time of the system.
Restart Delay	Refers to the start delay time of the system.
Shift Time	Refers to the time when the lead pump alternates.
Maximum Runtime	Maximum time in minutes the pump is allow to operate continuously, this feature is disabled if value is set to 0.
P	It is relevant to 'P' (Propotional Constant) out of the PID controls.
I	It is relevant to 'I' (Integral Constant) out of the PID controls.
D	It is relevant to 'D' (Differential Constant) out of the PID controls.
Low Pressure Alarm	If the operation pressure is lower than the set pressure, alarm will occur.
Low Pressure Value	Setting the low pressure limit.
Low Pressure Stop	Once the low pressure alarm occurs, the system will operate duration of the set delay time and afterwards the system will stop.
Low Pressure Restart	Setting the low pressure restart time. The system will restart after the set value.
Low Pressure Restart Time	Setting the low pressure restart cycle. The system will stop ater the set cycle.
Pressure Unit	Setting the Pressure unit.

FUNCTION PARAMETER SETTING

Content	Input Range	Unit	Default
Sensor Range	0.2 ~ 20.0	bar	16.0
	10 ~ 300	psi	230
Sensor Offset	-9.9 ~ 9.9	bar	0.0
	-99 ~ -99	psi	0
Auto Reset	0 ~ 20	cycle	5
Min. Out Rate	30.00 ~ 70.00	%	50.00
Stop Rate	30.00 ~ 95.00	%	65.00
Motor Direction	[Foward][Backward]	-	Forward
Low Current Alarm	[Used][Not Used]	-	Not Used
Low Current Value	0.0 ~ 99.9	A	Depended on VSD Model
Low Current Stop	1 ~ 999	sec	10

FUNCTION PARAMETER SETTING

Sensor Range	To set-up the rated capacity of the pressure sensor utilized.
Sensor Offset	To correct the variation between the value of the pressure sensor and acutual pressure value.
Auto Reset	Refers to the number of times the system will reset once an alarm occurs.
Min. Op. Rate	Refers to the minimum output.
Stop Rate	Refers to the stop output.
Motor Direction	Direction of the motor.
Low Curr. Alarm	Refers to the Stop output.
Low Curr. Value	Refers to the set point [Amp.] where the low current alarm occurs.
Low Curr. Stop	Refers to the set time the system will stop once the low current occurs.

VFD CONTROL PARAMETER SETTING

Parameters	Input Range	Unit	Default
Max.Output Frequency	5.0 ~ 70	Hz	50.0
Max. Voltage Frequency	5.0 ~ 70	Hz	50.0
Max. Voltage	50 ~ 250	VAC	240
Mid-Point Frequency	5.0 ~ 70	Hz	25
Mid-Point Voltage	0 ~ 250	VAC	120
Min. Output Frequency	0.10 ~ 20.00	Hz	1.50
Min. Output Voltage	3.0 ~ 200	VAC	15
Acceleration Time	1.0 ~ 120	Sec.	3.0
Deceleration Time	1.0 ~ 120	Sec.	3.0
Stop Mode	0: Ramp to Stop/ 1: Coast to Stop	-	1
Motor HP	IDM-1007M	[0.5HP][0.75HP][1.0HP]	
	IDM-1015M	[0.5HP][0.75HP][1.0HP] [1.5HP][2.0HP]	
	IDM-1022M	[0.5HP][0.75HP][1.0HP] [1.5HP][2.0HP][2.5HP] [3.0HP]	
Overload Rate	50 ~ 200	%	150
Overload Time	2.0 ~ 999	Sec	10.0
Over-Voltage Rate	100 ~ 200	%	120
Low-Voltage Rate	70 ~ 90	%	80
Carrier Frequency	3.0 ~ 15.0	KHz	8.0

INVERTER CONTROL PARAMETER

Max. Output Frequency	This parameter determines the inverters max. output frequency.
Max. Voltage Frequency	This value should be set according to the rated frequency of the motor.
Mid-Point Frequency	Refers to the mid-point frequency of the V/F curve. The V/F ratio between the min. frequency and mid-point frequency can be determined.
Mid-Point Voltage	Refers to the mid-point voltage of any V/F curve. The V/F ratio between the min. frequency and mid-point frequency can be determined.
Min.Output Frequency	Refers to the min. output frequency of the inverter.
Min. Output Voltage	Refers to the min. output voltage of the inverter.
Acceleration Time	Refers to the time required for the inverter to accelerate from 0 Hz to its max. output frequency.
Deceleration Time	Refers to the time required for the inveter to decelerate from the max. output frequency down to 0 Hz.
Stop Mode	1. Ramp: the inverter decelerates the motor to min. output frequency then stops according to the set deceleration time.
	2. Coast: the inverter stops output instantly upon command, and the motor free runs until it comes to a complete stop.
Motor HP	Displays the inverter HP that is currently being utilized.
Overload Rate	Refers to the trip current level against the rated current of the motor.
Overload Time	Refers to the maintaining time of the overload trip level to generate the overload trip.
Over-Voltage Rate	Refers to over-voltage protection.
Low-Voltage Rate	Refers to the low-voltage protection.
Carrier Frequency	Refers to the trip current level against the rated current of the motor.

SYSTEM PARAMETER SETTING

Parameters	Input Range	Default
Power Outage Restart	[System Stop] [System Run] [Backup State]	Backup State
Language	[Korean][English]	English
Password (0000: Not Used)	0000 ~ 9999	0000
Test Code	0000 ~ 9999	0000

IMPORTANT

Please attach your sales invoice/docket here as proof of purchase should warranty service be required. Please do not return warranty form to Pentair Australia. Retain for your records.

PURCHASED FROM:
PURCHASE DATE:
SERIAL NO:
MODEL NO:

ALARM

Display	Alarm Type	Corrective Action
Comm Fail	Communication Fail	Check the connection status between the master and slave pumps.
Sensor Open	Sensor Open	Check if the sensor connection has been properly performed. Replace the sensor if the error still occurs after checking the connection.
Sen.Short	Sensor Short	Check if the sensor connection has been properly performed. Replace the sensor if the error still occurs after checking the connection.
High Pres.	High Pressure	Check the set pressure and high pressure setting values within the parameters.
Low Pres.	Low Pressure	Check if the suction pipeline is filled with water and also release air from the air vent on the pump if neccessary.
L-Pre. Stop	Low Pressure Stop	Check if the suction pipeline is filled with water and also release air from the air vent on the pump if neccessary.
Low Current	Low Current	Check if the suction pipeline is filled with water and also release air from the air vent on the pump if neccessary.
L-Cur. Stop	Low Current Stop	Check if the suction pipeline is filled with water and also release air from the air vent on the pump if neccessary.
Overload	Overload	Check the rated current of the motor and the rated current setting on the inverter
Over Cur.	Over Current	Check the Acc./Dec time. Also, check if the inverter capacity is suitable for the motor that is being installed.
Low Volt.	Low Voltage	Check the input voltage and power capacity.
Over Heat	Over Heat	Contact your local supplier.
Over Volt.	Over Voltage	Check the supply voltage and increase the deceleration time.

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