



Auto Restart, Triple Mode, Pump Controller  
for Single or Dual Pumps

**iCON NXT PRO PLUS User Manual**

**808036 / BIA-NXTPROPLUS**



# 1. Introduction

The **iCON NXT Pro Plus** is a TRIPLE MODE, digital pump controller for directly controlling either one or two, single phase pumps up to a maximum of 16 amps each.

## **Mode 1: pressure controller with dry run protection operating a single pump.**

Pump starts by registering water pressure fall and stops the pump when flow through the controller falls sufficiently. The pump start pressure is able to be set by the user.

Connect a second pump to achieve duty/standby operation. Only one pump will operate at a time. Pump alternation options can be programmed

## **Mode 2: electronic pressure switch with dry run protection operating a single pump.**

Pump starts when water pressure falls below the starting pressure and stops when the upper pressure setting is reached. Both the start and stop pressure can be selected by the user.

Connect a second pump to achieve duty/standby operation. Only one pump will operate at a time. Pump alternation options can be programmed

## **Mode 3: electronic pressure switch with dry run protection for dual pumps operating as a duty/assist pair.**

When water pressure falls below the starting pressure the first pump will start. If demand exceeds the ability of a single pump to maintain the user preset pressure, the second pump will start. Pump start and stop settings are user configurable and can be set independently.

When pumps of equal or equivalent performance are used the controller can be set to alternate which pump runs each time the pump-set starts. Alternately pumps of different performance can be used in systems with a wide range of flow requirements with alternation function disabled.

The **iCon NXT Pro Plus** offers a number of other protection and control options to ensure the durability of your pumping system.






# 2. Key Features

- Electrical components are completely isolated from the water flow.
- The digital display provides real time information of the pressure, the pump current draw and can also indicate visually whether there is flow or no flow.
- Built in pump protections:
  - Dry run sensing and auto restart function when water supply is available
  - Prevents the pump from starting and stopping too often.
  - Over pressure protection
  - User programmable overload protection
  - User programmable Dry Run underload protection
  - Anti-seize function if pump has not operated for the last 24 hours.
  - User programmable maximum pump run time setting.
- Tested to 150 lpm through 1" ports and up to 300 lpm with the 1 ¼" ports

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### 4. ISO 7010 Symbols used in this manual

	Warning - Electrical safety
	Warning – Potential consequences of use outside of intended application(s). Includes environmental condition warnings.
	Mandatory warning
	Warning to disconnect power
	Read carefully

## 5. Technical specifications

	NXT PRO PLUS
<b>Function</b>	On/Off + Configuration
<b>Modes</b>	<p><b>Mode 1</b> Pressure Controller. Single or Dual pump (duty/standby)</p> <p><b>Mode 2</b> Pressure Switch. Single or Dual pump (duty/standby)</p> <p><b>Mode 3</b> Pressure switch. Dual pump (duty/assist)</p>
<b>Pump size</b>	Single or Dual Pumps up to 2.2kW ea - 240V 1Ph
<b>Input power</b>	80 - 240V 1ph 50Hz Generator compatible
<b>Max Amperage</b>	2 x 16 amp
<b>Connection Size</b>	1" BSP Male
<b>Pressure Tank</b>	<p>0.3l spring controlled diaphragm tank (removable) Removing the OEM tank exposes an internal 1" BSPF thread which enables connection to an external pressure vessel</p> <p>Running in <b>Mode 2</b> or <b>Mode 3</b>, a pressure vessel must be selected and fitted to reduce pump starts to less than <math>\leq 30</math> starts/hr</p>
<b>Pump Start pressure</b>	Default start pressure 2.2 bar in all modes User adjustable 0.5 - 6.0 bar
<b>Pump stop</b>	Flow less than 0.9 lpm in <b>Mode 1</b> User adjustable 1.8 - 9.0 bar for <b>Mode 2</b> and <b>Mode 3</b>
<b>Maximum pressure</b>	10 bar. Pressure differential range 0.5 – 9 bar
<b>Max ambient air temp</b>	3 - 50°C
<b>Max water temp</b>	3 - 60°C
<b>Maximum flow</b>	150 lpm / 9m <sup>3</sup> /hr - 1" outlet (as supplied) 300 lpm / 18m <sup>3</sup> /hr - 1 ¼" outlet (optional)
<b>Cable to Pump</b>	<i>Supplied without cables User to fit appropriately rated cables</i>
<b>Power Cable</b>	
<b>IP Rating</b>	IP54
<b>Accessories (Sold Separately)</b>	1-1/4 "Union kit

## 6. Warnings

	Read the manual carefully before starting and retain for future reference.
	Prior to starting installation or maintenance the controller must be disconnected from the power supply and pressure relieved from the system including controller, pump and associated pipework.
	Any changes or modification to the wiring must be carried out by suitably qualified personnel.
	A qualified electrician should correctly size and install circuit breakers to protect the power supply. The fitment of additional surge protection is recommended.
	Never open the cover while controller is connected to electrical supply.
	This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
	Never connect AC power to the output terminals. This will cause damage to the controller not covered under warranty.

## nXt Pro Plus

	Single Pump	OR	Dual Pump	Pressure Accumulator
<b>Mode 1</b> Pressure controller	Yes		Duty/Standby	0.3l standard
<i>Removal of the OEM tank allows fitment of larger tanks via a 1" BSPF Thread</i>				
<b>Mode 2</b> Pressure switch	Yes		Duty / Standby	Essential
<b>Mode 3</b> Pressure switch	N/A		Duty/ Assist	Essential

## 6.1 Cautions

- 6.1.1 Ensure the controller is suitable for the pump with respect to voltage, current draw and expected flow rates (see Section 5. Technical Data).
- 6.1.2 The controller is designed for use with clean water. Contamination including sand or mineral deposits may affect the operation of the controller.
- 6.1.3 Remove any shipping plugs from the suction and discharge ports.
- 6.1.4 There are no serviceable parts in the NXT Pro Plus controller. It should not be dismantled.
- 6.1.5 No regular maintenance of the NXT Pro Plus controller is required.
- 6.1.6 Fitment and replacement must be carried out by competent, skilled and qualified personnel.
- 6.1.7 Avoid installing the NXT Pro Plus controller where it could experience the following conditions:
- Where there is significant vibration and/or mechanical shock.
  - Where it could be exposed to corrosive liquids or gasses, or to flammable materials, solvents etc.
  - Extreme heat and cold. Operating range 3°C - 50°C.
  - Protect the controller from rain and moisture.

## 7. Electrical Connections

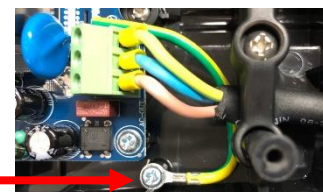
Always use an electrical outlet that is protected by Residual Current Device (RCD) Safety Switch with a trip current of 30mA or less. A Safety switch is required by Australian/New Zealand Standard AU/NZS 60335.1-2011.



The **iCON NXT PRO PLUS** is supplied as a CONTROLLER ONLY. It is intended to be hard-wired to the power supply via fused, suitably rated wiring by a qualified electrical technician.

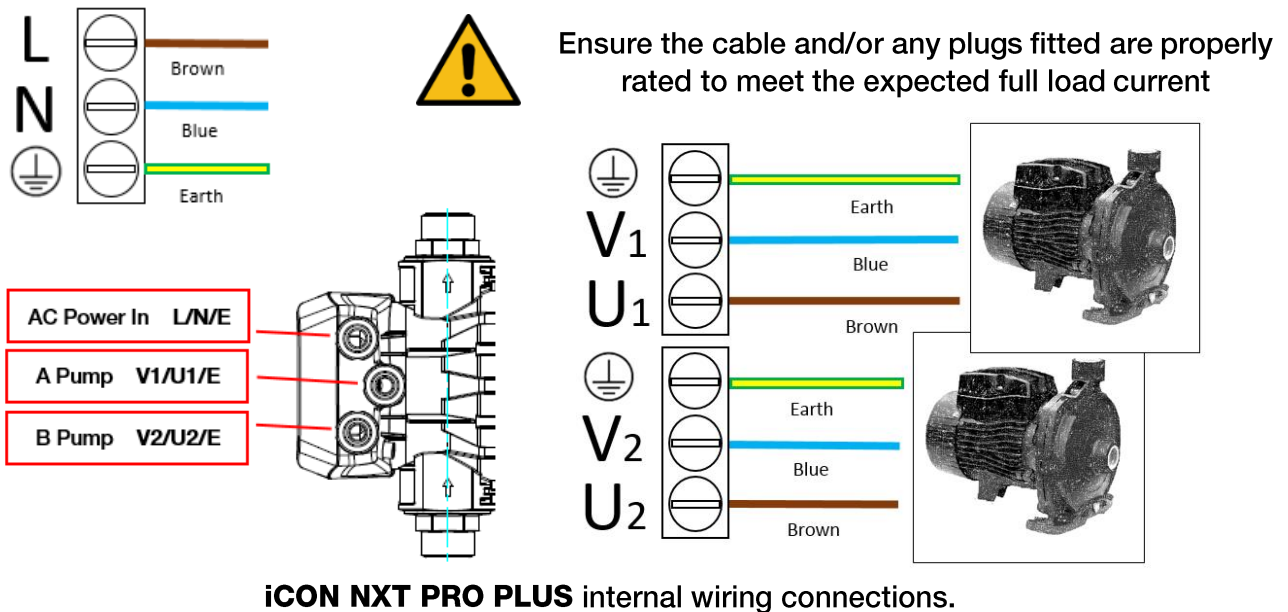
There is an additional earth wire inside the controller which provides protection in the event of flooding.

*Additional Earth Connection*

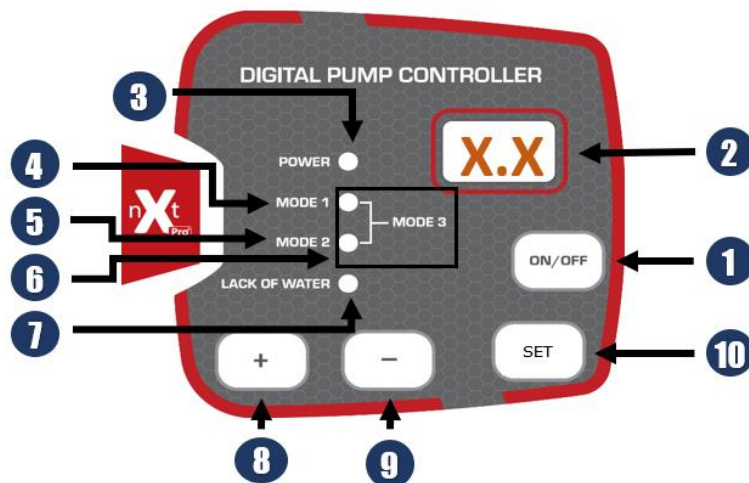


**When the controller is used to control 3 phase pumps via a relay, set F07/F08 to 001 which enables the pump(s) WITHOUT internal current monitoring function.**





## 8. Display



No.	Name	Function
1	ON/OFF	Press button to turn the pump controller on Press and HOLD button for <b>3 seconds</b> to turn the pump controller off Press and Hold ON/OFF to clear error messages or faults
2	DIGITAL DISPLAY (RUNNING)	Quick press of SET button 10 changes display modes <b>PX.X</b> : Real time pressure in Bar <b>CX.X</b> : Real time current in amps <b>Symbol moving clockwise</b> = Flow - - - <b>Symbol stationary</b> = No Flow  <b>OP</b> displayed: Over pressure protection activated <b>FS</b> displayed: Frequent start protection activated <b>OL</b> displayed: Overload protection activated <b>UL</b> displayed: Underload protection activated <b>Pr</b> displayed = Max run time protection activated <b>PE</b> displayed = Critical Hardware fault <b>P1F</b> or <b>P2F</b> displayed = Pump Fault

## 8. Display con't

<p><b>2</b></p>	<p>DIGITAL DISPLAY (PROGRAMMING)</p>	<p><b>PX.X</b> = Start and Stop Pressure (Bar)  <b>CX.X</b> = Current (Amperage)  <b>XXX</b> = Numerical Value</p> <p><u>Parameters:</u>  <b>F00</b> – Select Mode <b>000 = Mode 1</b> <b>001 = Mode 2</b> <b>002 = Mode 3</b></p> <p><b>F01</b> - <b>Mode 1</b> only. Pump start pressure - Note: Mode One is the factory default  <i>Default cut in 2.2 bar.</i> Range 0.5 – 6.0 bar</p> <p><b>F02</b> - <b>Mode 2</b> and <b>Mode 3</b> Start pressure for Duty pump  <i>Default cut in 2.2 bar.</i> Range 0.5 – 6.0 bar</p> <p><b>F03</b> - <b>Mode 2</b> and <b>Mode 3</b> Stop pressure for Duty pump  <i>Default 5.0 bar.</i> Range 1.8 – 9.0 bar</p> <p><b>F04</b> - <b>Mode 3</b> only. Start pressure for Assist pump  <i>Default 1.5 bar.</i> Range 0.5 – 5.0 bar</p> <p><b>F05</b> - <b>Mode 3</b> only. Stop pressure for Assist pump  <i>Default 3.5 bar.</i> Range 0.5 – 5.0 bar</p> <p><b>F06</b> - Exchange time for pump A and B in hours  <i>000 = Never alternate Default 00A – alternate each start.</i> Range 01 – 98 hrs</p> <p><b>F07</b> – Enable/Disable Pump 1 <i>Default 002 = enabled,</i> 000 = disabled  <b>F08</b> – Enable/Disable Pump 2 <i>Default 002 = enabled,</i> 000 = disabled</p> <p><b>OL</b> - Overcurrent setting (combined) <i>Default setting C0.0</i> 50A max  <b>UL</b> - Underload (dry run) protection setting  <i>Default setting C0.0</i> Range 0.0 – 12.0</p> <p><b>PF</b> - Flow protection setting <i>Default setting 001</i> (Enabled)  <b>Pr</b> - Maximum run time setting <i>Default setting 000</i> (Inactive)  <b>FS</b> – Anti cycle protection setting <i>Default setting 001</i> (Enabled)</p>
<p><b>3</b></p>	<p>POWER</p>	<p><b>GREEN LED POWER constant</b> – Power connected</p>
<p><b>4</b></p>	<p><b>MODE 1</b></p>	<p><b>Orange LED MODE 1 constant</b> – control <b>Mode 1</b>          Pressure controller. Single pump OR dual pump duty/standby</p>
<p><b>5</b></p>	<p><b>MODE 2</b></p>	<p><b>Orange LED MODE 2 constant</b> – control <b>Mode 2</b>          Pressure switch. Single pump OR dual pump duty/standby</p>
<p><b>6</b></p>	<p><b>MODE 3</b></p>	<p><b>Orange LED MODE 1 and MODE 2 constant</b> – control <b>Mode 3</b>          Pressure switch. Dual pump duty/assist</p>
<p><b>7</b></p>	<p>LACK OF WATER</p>	<p><b>RED LED flashing</b> - pump short of water  <b>RED LED constant</b> - pump awaiting 24 hour restart</p>
<p><b>8</b></p>	<p>PLUS</p>	<p>To increase value of parameter (Located bottom left, marked +)</p>
<p><b>9</b></p>	<p>MINUS</p>	<p>To decrease value of parameter (Located bottom centre, marked -)</p>
<p><b>10</b></p>	<p>SET</p>	<p>To set and save a parameter (Located bottom right, marked SET)</p>



## 9. Installation



Review **SECTION 6 and 6.1 (Warnings and Cautions)** prior to Installing

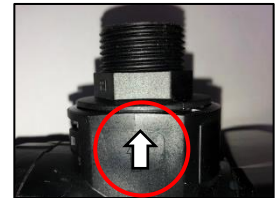
Direction of flow is indicated by an arrow on the inlet and outlet.

Note that the controller has been designed to work with clean water.

Avoid any debris in the pipeline and controller to prevent failure.

The controller can be installed **in any orientation** so long as the direction of flow is observed.

The maximum static head (pressure) of water above the controller must be less than the starting (cut in) pressure, otherwise the pump will not start. See table below.



The controller is to be installed on the discharge of the pump prior to any outlets/taps.

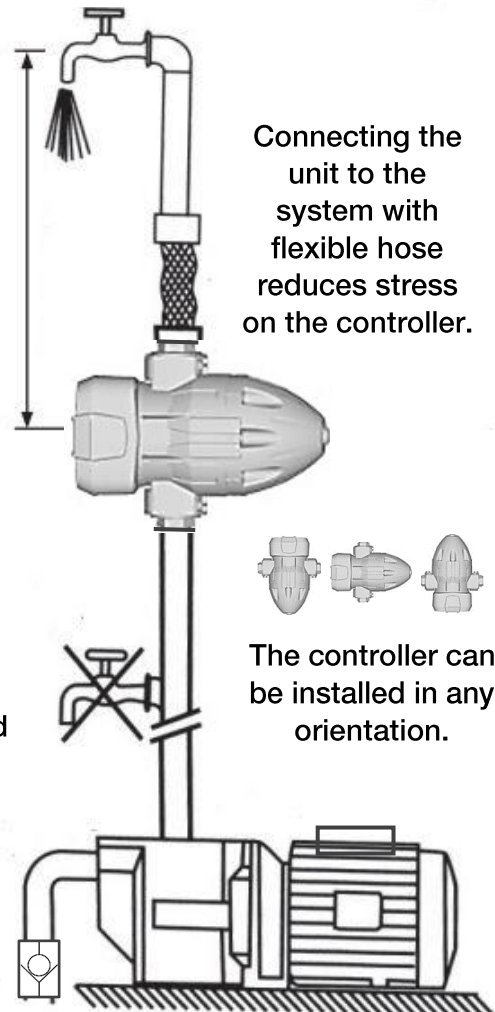
*Installation of the controller must be performed by a suitably qualified technician.*

The maximum pressure (static head) of water above the controller must be less than the starting (cut in) pressure selected, otherwise the pump will not start.

Cut in Pressure	Maximum static head
1.0 bar	Less than 5m
2.0 bar	Less than 15m
3.0 bar	Less than 25m
4.0 bar	Less than 35m
5.0 bar	Less than 45m
6.0 bar	Less than 55m

NO water can be drawn off between the pump outlet and the control unit.

Fit a non-return valve on the inlet line to prevent pressure loss back through the intake.



# 10. Programming

*Important Note: The controller allows for a maximum of 10 seconds between button presses when programming. If no button press is detected, after 10 seconds the controller will exit the adjustment state*



POWER ●

The following is a visual overview of the entire programming menu  
Included on pgs 18 - 21 are specific programming guides for each of the 3 modes of operation

**SET** Hold for 3 seconds to enter parameter menu

After completing a parameter menu the controller returns to the start of the programming options

**F00**

SET **XXX** + or - SET

F00 - Select Mode

000 = Mode 1: Pressure Control. Single Pump OR Dual Pump - Duty / Standby  
001 = Mode 2: Pressure switch. Single Pump OR Dual Pump - Duty / Standby  
002 = Mode 3: Pressure switch. Dual Pump - Duty / Assist

+

**F01**

SET **PX.X** + or - SET

F01 Mode 1 only. Duty Pump start pressure. Default cut in 2.2 bar. Range 0.5 - 6.0 bar  
Pump turns off when flow falls below 0.9 lpm

+

**F02**

SET **PX.X** + or - SET

F02 Mode 2 and Mode 3.  
Duty Pump start pressure. Default cut in 2.2 bar. Range 0.5 - 6.0 bar

+

**F03**

SET **PX.X** + or - SET

F03 Mode 2 and Mode 3.  
Duty Pump stop pressure. Default cut out 5.0 bar. Range 1.8 - 9.0 bar

+

**F04**

SET **PX.X** + or - SET

F04 Mode 3 only.  
Assist Pump start pressure. Default cut in 1.5 bar. Range 0.5 - 5.0 bar

+

**F05**

SET **PX.X** + or - SET

F05 Mode 3 only.  
Assist Pump stop pressure. Default cut out 3.5 bar. Range 1.8 - 5.0 bar

+

**F06**

SET **XX** + or - SET

F06 Exchange time between pumps in hours. Default 00A alternate EACH START  
Exchange setting F06 will alternate the running pump after a set period of continuous operation  
Set to 000 the pumps will NOT alternate Continuous running range 1 - 99hrs

+

**F07**

SET **XX** + or - SET

F07 Enable / Disable pump A (Middle gland V1, U1) Default = 002, enabled with OL, UL option  
000 = Disabled 001 = Pump enabled with pump failure detection disabled  
(OL, UL option will not function correctly if set on 3 phase pumps)

+

**F08**

SET **XX** + or - SET

F08 Enable / Disable pump A (Bottom gland V2, U2) Default = 002, enabled with OL, UL option  
000 = Disabled 001 = Pump enabled with pump failure detection disabled  
(OL, UL option will not function correctly if set on 3 phase pumps)

+

Continue to next page

## 10. Programming cont



**+** Overload Current (Combined) - Range C15 - C50 (15 - 50 amps) Default = 0.0 (inactive)



**+** Underload (Dry run) Current - Range C0.0 - C12 (0.0 - 12 amps) Default = 0.0 (inactive)



**+** Flow Protection. Default 001 = Enabled 002 = Disabled - Setting cannot be altered in Mode 1  
With flow protection disabled the unit ignores the internal flow sensor



**+** Maximum run time. Default 000 = Disabled Select 30,60,90,120,150,180,210,240 minutes  
If Pr maximum run time is active, the pump(s) will stop should they exceed the set maximum.  
A software restart is required to resume normal operation. Pr has priority over F06 ExchangeTime.



Anti Cycling Protection. Default 001 = Enabled 002 = Disabled

To clear an error code and resume normal operation

ON/OFF

3"



or cycle power

### ERROR MESSAGES

**OP** Over Pressure  
Pressure on the control has exceeded 9.9 bar for more than 5 seconds Pump will attempt restart in 30 minutes.

**FS** Frequent Start  
Pump has started for less than 30 seconds for the last 15 starts. Pump will attempt restart in 30 minutes.

**OL** Over Load  
Overload condition active. Pump will shut down and prevent operation until a manual reset is performed.

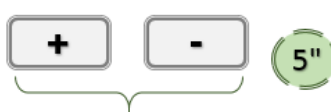
**UL** Underload (Dry run) Pump will enter an AUTO RESTART CYCLE - See page 16  
The RED LACK OF WATER LED will FLASH   
The RED LACK OF WATER LED is STEADY   
The controller will attempt re-prime and start every 24 hrs

**Pr** Maximum run time exceeded. Controller has stopped the pump. Cycle power to resume normal operation

**Pr** Critical Controller error. Sensor or hardware issue. Return to service center if problem persists

**P1F** **P2F** Pump Fault. Should a pump fault occur, the controller locks the affected pump(s) out.  
After rectifying the fault, re-enable the pump(s) via parameter F07 or F08

Re-set controller completely to factory default settings



Pushing the SET button rotates the display indication.

Flow

No Flow



## 11. Priming the system




The **iCON NXT Pro Plus** is supplied with two 1" BSPT male swivel unions. 1 1/4" unions are available as an accessory for flows up to 300 lpm

The controller can be removed from the pump by removing the stainless steel retaining clip. Once the clip is removed the connection fitting will slide from the controller body.



Due to the non-return mechanism inside the controller, the pump should be primed before fitting the controller OR filled through the pump priming port.

## 12. Standards and Approvals

	<p><b>SAA Approvals</b> is accredited by the Joint Accreditation Service of Australia and New Zealand (JAS-ANZ) as a third party certification body to issue of Certificates of Approval for declared and non-declared electrical equipment that has proven to comply with the safety requirements of the applicable Australian Standard.</p>
	<p>Pumps that carry the <b>AS/NZ4020 Drinking Water Approval</b> demonstrate compliance with requirements of Australia &amp; New Zealand Standards of products that come into contact with water intended for human consumption. This approval also ensures that the water coming from the pump will not be contaminated by toxic materials or metals. It also means the water will not support the growth of micro-organisms and will not cause a change in taste or appearance.</p>
	<p><b>CE marking</b> is a certification mark that indicates conformity with health, safety and environment. The CE marketing represents a manufacturer's declaration that products comply with the EU's New Approach Directives. These directives not only apply to products within the EU but also for products that are manufactured in or designed to be sold in the EEA.</p>

## 13. Operation

Note that the **iCon NXT PRO PLUS** factory default setting is:

Dual pumps connected, single pump operation in **Mode 1**, Cut in pressure of 2.2 bar.

When the unit is connected to a power supply the **GREEN** LED “**Power On**” lights up.

- Press ON/OFF button and the pump will attempt to run
- **Press and Hold the ON/OFF button for 3 seconds to switch the controller off**

On initial priming the controller may time out on 'dry run' and the **RED** LED "**LACK OF WATER**" will illuminate. Press and Hold the "ON/OFF" button for 5 sec to clear.

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### **Mode 1 – Electronic Pressure Controller**

The **iCon NXT Pro Plus** controller will start the pump automatically when the pressure falls under the Cut In pressure. See Programming sequence: [Section 10, Page 10](#)

**Mode 1** = default Cut In pressure = 2.2 bar (Adjustable range 0.5 – 6.0 bar)

Set to **Mode 1**, the **iCon NXT Pro Plus** controller will stop the pump for 4 reasons:

- Once FLOW stops (less than 0.9 lpm).
- In the event that the pump has run out of water
- If the control is subject to over-pressure or frequent starts
- If the controller should operate outside of any user programmed parameters

When 2 pumps are connected and enabled, they operate as **Duty/Standby**.

- Only one pump will operate at a time.
- Each pump uses the same Cut In pressure.
- Default setting (F06 - 00A) pumps start alternately each time there is a demand.

Single pump operation requires the F07 or F08 parameter altered. [Section 10, Pg 11](#)

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### **Mode 2 and Mode 3 – Electronic Pressure switch**

The **iCON NXT Pro Plus** controller will start the pump automatically when the pressure falls under the Cut In pressure. See Programming sequence: [Section 10, Page 10](#)

Set to **Mode 2** or **Mode 3**, the **iCON NXT Pro Plus** controller will stop the pump for 4 reasons:

- Once the Cut Out PRESSURE has been reached due to a tap being closed
- In the event that the pump has run out of water
- If the control is subject to over-pressure or frequent starts
- If the controller should operate outside of any user programmed parameters.

## 13. Operation con't

**Mode 2** - when 2 pumps are connected and enabled, they operate as **Duty/Standby**

- Only one pump will operate at a time.
- Each pump uses the same Cut In and Cut Out pressure.
- Default setting (F06 -00A) pumps start alternately each time there is a demand.

**Mode 2** = default Cut In pressure = 2.2 bar, default Cut Out pressure = 5.0 bar

User adjustable range,      0.5 – 6.0 bar Cut In pressure  
   1.8 – 9.0 bar Cut Out pressure

**Mode 3** - with 2 pumps connected, they operate as **Duty/Assist**

- The Duty pump has a higher Cut in and Cut Out pressure than the Assist Pump.
- Should water demand exceed the ability of the Duty pump to maintain a pressure greater than the Assist pump Cut In, the second (Assist) pump will start up to increase supply.
- F06 (alternating start or no) depends whether pumps are identical or not.

**Mode 3** defaults

Duty Pump = Cut In pressure = 2.2 bar, default Cut Out pressure = 5.0 bar

Assist Pump = Cut In pressure = 1.5 bar, default Cut Out pressure = 3.5 bar

User adjustable range,      0.5 – 6.0 bar Cut In pressure  
   1.8 – 9.0 bar Cut Out pressure

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The Cut In and Cut Out pressures must be set prior to operation



Setting F06 offers 000= Never Alternate, 00A = Alternate each start, Continuous run time setting 01 – 99 hrs

Setting F07 and F08 should reflect the number of pumps connected and in operation. See Programming sequence: Section 10, Page 11



Ensure the Cut Out pressure is set 0.3 – 0.5 bar less than the pump maximum pressure to enable the pump to turn off properly.



If the **PF Pump Flow protection** is disabled and the Cut Out pressure is set higher than the pump can deliver the controller will not switch off at all.



It is essential that a pressure vessel is included in the system for operation in **Mode 2** and **Mode 3** (pressure switch) to manage pump starts per hour.

**Pressure Tank pre-charge recommendation = 66% of the cut out pressure.**

### **Software reset**

By pressing and holding the + and - buttons together for 5 seconds the controller will revert to factory default settings.

**Re-set to  
factory  
default  
settings**



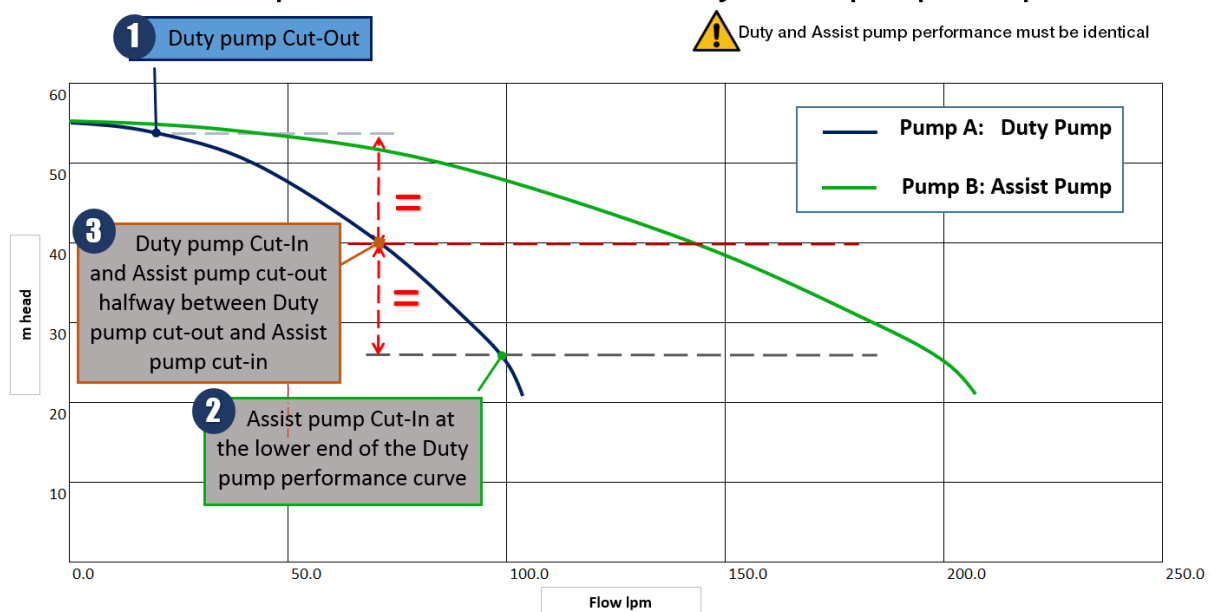
## 13. Operation con't

**Mode 3:** When using pumps of dissimilar performance set F06 to 000 (Never alternate)

**Mode 3:** Selecting the Cut in and Cut out pressures for 2 identical pumps:

1. Pump A (Duty pump) Set the Cut-Out pressure. **F03** Ensure it doesn't exceed the pump maximum head.
2. Pump B (Assist pump) Set the Cut-In Pressure toward the lower end of the Duty pump performance. **F04** Ensure there is no risk of Duty pump cavitation.
3. Set the Pump A (Duty pump) Cut-In **F02** and the Pump B (Assist pump) Cut-Out **F05** halfway between the maximum and minimum settings.

Example: nXt Pro Plus **Mode 3** Duty/Assist pump set up



In this example Pump A (Duty pump) will start when the system pressure drops below 4.0 bar.

If Pump A (Duty pump) cannot keep up with the demand flow and pressure drops to below 2.5 bar, Pump B (Assist pump) will start.

As demand flow reduces, the system pressure will increase. Pump B (Assist pump) is set to switch off when system pressure reaches 4.0 bar leaving Pump A (Duty pump) to supply demand.

When demand flow further decreases Pump A will turn off when system pressure reaches 5.5 bar.

- The default setting **F06** (00A) has the pumps alternating each time the system starts
- Setting **F06** (pump exchange time) can be used to initiate a swap between pump A and B after an elapsed time to prevent excessive operation of a single pump.
- In systems where the performance of the two pumps is different, Set **F06** to (000) to prevent pump alternation
- Note that when setting **Pr** (maximum run time), is enabled it has precedence over **F06** (exchange time)
- A suitably sized pressure vessel should be incorporated in the system to ensure pump starts don't exceed 30 starts/hour or the manufacturers recommendation.

## 13. Operation con't

<b><u>Display of OP</u></b>	Occurs when pressure on the control exceeds 9.9 bar for more than 5 seconds. Pump will attempt restart in 30 minutes.
<b><u>Display of FS</u></b>	Occurs when Pump has cut in and cut out in intervals less than 30 seconds for the last 15 starts. Pump will attempt restart in 30 minutes.
<b><u>Display of OL</u></b>	The controller has sensed a current overload condition exceeding the programmed value. The pump will shut down until a manual system reset occurs.  Press and Hold ON/OFF for 3 seconds. Then press ON/OFF.
<b><u>Display of UL</u></b>	An underload (dry run) condition outside of the programmed value has occurred. The Auto Restart Cycle will commence and the <b>RED LED</b> LACK OF WATER will flash.
<b><u>Display of Pr</u></b>	The controller has shut down because the maximum run time has been exceeded
<b><u>Display of PE</u></b>	The controller has suffered a critical fault
<b><u>Display of P1F/P2F</u></b>	Pump Fault indication P1F relates to middle gland V1/U1 P2F relates to bottom gland V2/U2



In the event of a P1F or P2F fault occurring with one or both of the pumps, the controller program will lock out affected pump(s) completely. After rectifying the cause of the fault it is necessary to re-enable the pump(s) via the F07/F08 parameter

**Underload / Dry Run condition** – assumes the Pipe Flow parameter **PF** is enabled.

The following applies to all Modes See Programming sequence: [Section 10, Page 11](#)

If there is no water in the tank or a closed supply/suction pipe issue, the **iCon NXT Pro Plus** controller will allow the pump to run for 20 seconds with no flow detected before shutting down.

The **RED** LED, LACK OF WATER will **FLASH** and the following sequence will run:

- i. Stop for 10 seconds,
- ii. Run for 40 seconds, Stop for 10 seconds
- iii. Run for 40 seconds, Stop for 10 seconds.

LACK OF WATER 

After this sequence, the controller will go into auto restart mode and the **RED** LED, LACK OF WATER will stay **ON AND STEADY**

LACK OF WATER 

The controller will repeat this sequence every 24 hours until flow is detected.



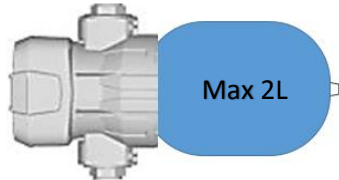
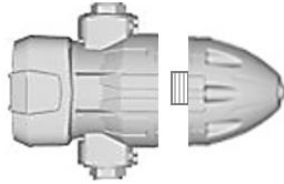
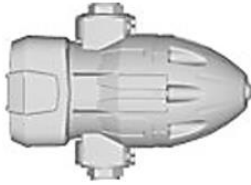
Caution: False dry run errors can occur should the following situation occur;

- a. The UL (under-current) setting has been programmed  
AND
- b. a pump is enabled in the programming menu (F07, F08) but is not connected.



## 14. nXt Pro Plus and Pressure tank fitment

The nXt Pro controller behaves as a pressure controller in Mode 1 and as a pressure switch in Mode 2

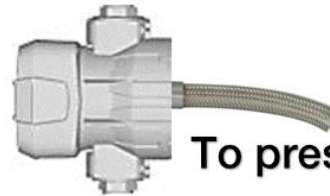


As supplied, the controller has a 0.3 litre pressure accumulator threaded onto the rear of the unit. Removing the OEM tank exposes an internal 1" BSPF thread which allows the user to thread a 2l pressure directly to the controller or to connect larger pressure vessels via a flexible hose.

Maximum size for direct fitment – 2 litre



or



To pressure tank

### Mode 1

A pressure controller minimises pump cycling by keeping the pump running until the flow drops below 0.9lpm so it cannot be said that a pressure vessel is essential.

Most systems suffer from small water losses (dripping taps, leaking cisterns, feeding low demand items such as ice makers or Reverse Osmosis filtration units) **the addition of a 2, 8 or 18 litre tank is strongly encouraged**

Fitting a pressure tank will reduce the number of pump starts giving a number of benefits:

- Power saving (reduced power bill!)
- Longer pump life
- Reduced noise

### Mode 2 and Mode 3

As with all pressure switches, a **suitably sized pressure vessel MUST be added to the system to prevent the pump from cycling.**

Typically surface mounted pumps up to 2.2kW should start less than 30 times per hour.

Pressure tanks should never hold more than 1/3 of their total volume as water.

Manufacturer's recommend the gas pressure in the tank to be 66% of the maximum system pressure

		CUT IN PRESSURE								
		1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	
CUT OUT PRESSURE	2.5	1.30	1.80	Green cells - precharge is 20kpa below cut in pressure						
	3.0	1.66	1.80	2.30	Blue cells - precharge is 66.6% of cut out pressure					
	3.5	2	1.80	2.30	2.80					
	4.0	2.33	2.33	2.33	2.80	3.30				
	4.5	2.66	2.66	2.66	2.80	3.30	3.80			
	5.0	3	3	3	2.80	3.30	3.80	4.30		
	5.5	3.33	3.33	3.33	3.33	3.30	3.80	4.30	4.80	
	6.0				3.66	3.66	3.66	3.80	4.30	4.80
	6.5				4	4	4	4	4.30	4.80
	7.0				4.33	4.33	4.33	4.33	4.33	4.80
	8.0				4.99	4.99	4.99	4.99	4.99	4.99
	9.0					5.66	5.66	5.66	5.66	5.66



POWER

## Mode 1: Pressure Control Single Pump OR Dual Pump - Duty / Standby

Default configuration is Mode 1

Pump A enabled, Pump B enabled

For single pump operation only, alter F07 or F08 to  
disable one of the pump outputs

**SET** Hold for 3 seconds to  
enter parameter menu

**F00** **SET** **XX** + or - **000** **SET** **MODE 1**

F00 Set to 000 = Mode 1, Pressure Control. Single Pump OR Dual Pump - Duty / Standby

**+**

Dual Pump Operation

- i. Both pumps must be of equal or near equivalent performance.
- ii. Ensure settings F07 and F08 (Enable/Disable pump) are set correctly.

**F01** **SET** **PX.X** + or - **SET**

F01 (Mode 1 only). Pump start pressure. Default cut in 2.2 bar. Range 0.5 - 6.0 bar  
Pump turns off when flow falls below 0.9 lpm

**+**

**F06** **SET** **XX** + or - **SET**

F06 Exchange time between pumps in hours. Range 1 - 99hrs Default 00A  
Exchange setting F06 will alternate the running pump after the set period of continuous operation  
Set to 00A the pumps will alternate EACH START. Set to 000, the pumps will not alternate

**+**

**F07** **SET** **XX** + or - **SET**

F07 Enable / Disable pump A (Middle gland V1, U1) Default = 002, enabled with OL, UL option  
000 = Disable 001 = enabled without OL, UL option (when controlling 3~ pumps)

**+**

**F08** **SET** **XX** + or - **SET**

F08 Enable / Disable pump A (Bottom gland V2, U2) Default = 002, enabled with OL, UL option  
000 = Disable 001 = enabled without OL, UL option (when controlling 3~ pumps)

**+**

### Optional Settings

**OL** **SET** **CXX** + or - **SET**

Overload Current (Combined) - Range C15 - C50 (15 - 50 amps)

**+**

**UL** **SET** **CX.X** + or - **SET**

Underload (Dry run) Current - Range C0.0 - C12 (0.0 - 12 amps) Default = 0.0 (inactive)

**+**

**PF** **SET** **001**

Flow Protection. Default 001 = Enabled. Setting cannot be altered in Mode 1

**+**

**Pr** **SET** **000** + or - **XXX** **SET**

Maximum run time. Default 000 = Disabled Select 30,60,90,120,150,180,210,240 minutes

If Pr maximum run time is active, the pump(s) will stop should they exceed the set maximum.  
A software restart is required to resume normal operation. Pr has priority over F06 Exchange Time.

**+**

**FS** **SET** **001** + or - **002** **SET**

Anti Cycling Protection. Default 001 = Enabled 002 = Disabled



POWER ●

## Mode 2: Pressure Switch Single Pump OR Dual Pump - Duty / Standby

*Default setup: Pump A and B enabled*

*For single pump operation only, alter F07 or F08 to  
disable one of the pump outputs*

**SET** Hold for 3 seconds to enter parameter menu

**F00** **SET** **XX** + or - **001** **SET** **MODE 2**

F00 Set to 001 = Mode 2, Pressure Switch. Single Pump OR Dual Pump - Duty / Standby

**+**

### Dual Pump Operation

- i. Both pumps must be of equal or near equivalent performance.
- ii. Ensure settings F07 and F08 (Enable/Disable pump) are set correctly.

**F02** **SET** **PX.X** + or - **SET**

F02 Mode 2

Pump start pressure. *Default cut in 2.2 bar. Range 0.5 - 6.0 bar*

**+**

**F03** **SET** **PX.X** + or - **SET**

F03 Mode 2

If F03 is set higher than the pump can deliver it will not shut down  
Pump stop pressure. *Default cut out 5.0 bar. Range 1.8 - 9.0 bar*

**+**

**F06** **SET** **XX** + or - **SET**

F06 Exchange time between pumps in hours. *Range 1 - 99hrs Default = 00A*

Exchange setting F06 will alternate the running pump after a set period of continuous operation  
Set to 00A the pumps will alternate EACH START. Set to 000, pumps will not alternate

**+**

**F07** **SET** **XX** + or - **SET**

F07 Enable / Disable pump A (Middle gland V1, U1) *Default = 002, enabled with OL, UL option*  
000 = Disable 001 = enabled without OL, UL option (when controlling 3~ pumps)

**+**

**F08** **SET** **XX** + or - **SET**

F08 Enable / Disable pump B (Bottom gland V2, U2) *Default = 002, enabled with OL, UL option*  
000 = Disable 001 = enabled without OL, UL option (when controlling 3~ pumps)

**+**

### Optional Settings

**OL** **SET** **CXX** + or - **SET**

Overload Current (Combined) - Range C15 - C50 (15 - 50 amps)

**+**

**UL** **SET** **CX.X** + or - **SET**

Underload (Dry run) Current - Range C0.0 - C12 (0.0 - 12 amps) *Default = 0.0 (inactive)*

**+**

**PF** **SET** **001** + or - **002** **SET**

Flow Protection. *Default 001 = Enabled 002 = Disabled*  
With flow protection disabled the unit ignores the internal flow sensor

**+**

**Pr** **SET** **000** + or - **XXX** **SET**

Maximum run time. *Default 0 = Disabled Select 30,60,90,120,150,180,210,240 minutes*

If Pr maximum run time is active, the pump(s) will stop should they exceed the set maximum.  
A software restart is required to resume normal operation. Pr has priority over F06 Exchange Time.

**+**

**FS** **SET** **001** + or - **002** **SET**

Anti Cycling Protection. *Default 001 = Enabled 002 = Disabled*



POWER

## Mode 3: Pressure Switch Dual Pump - Duty / Assist

SET

Hold for 3 seconds to enter parameter menu

Note: Mode 3 must be used with dual pumps

**F00** SET **XX** + or - **002** SET MODE 1  MODE 2  MODE 3

F00 - Set to 002 = Mode 3: Pressure switch. Dual Pump - Duty / Assist

+

**F02** SET **PX.X** + or - SET

F02 Mode 3. Duty Pump start pressure. Default cut in 2.2 bar. Range 0.5 - 6.0 bar

+

**F03** SET **PX.X** + or - SET

F03 Mode 3. If F03 is set higher than the pump can deliver it will not shut down  
Duty Pump stop pressure. Default cut out 5.0 bar. Range 1.8 - 9.0 bar

+

**F04** SET **PX.X** + or - SET

F04 (Mode 3 only) F04 MUST be lower than F02  
Assist Pump start pressure. Default cut in 1.5 bar. Range 0.5 - 5.0 bar

+

**F05** SET **PX.X** + or - SET

F05 (Mode 3 only) F05 MUST be lower than F03  
Assist Pump stop pressure. Default cut out 3.5 bar. Range 1.8 - 5.0 bar

+

**F06** SET **XX** + or - SET

F06 Exchange time between pumps in hours. Default 00A. Range 1 - 99hrs  
Exchange setting F06 will alternate the running pump after a set period of continuous operation

+

Set to 000 alternation is disabled  
Set to 00A the pumps will alternate EACH START

When the system comprises of two pumps with dissimilar performance i.e. a jacking pump and a main pump OR a domestic house supply and a larger pump for irrigation etc. the system must be configured so that the pumps do not alternate. **Set F06 to 000**

When the pump set comprises of two pumps with equal or equivalent performance, the user can elect to have the pumps alternating every start by programming **F06 to 00A**  
OR

Program a continuous run time (1 - 99hrs)

- Pump A will always start / run for its time duration according to setting of F06, alternating with Pump B by time.
- Pump B will always start / run for its time duration according to setting of F06, alternating with Pump A by time.

To prevent interrupted duty cycling, once the timer expires, the pump will alternate at the next start. i.e. if set to 1 hr the controller will operate the first pump continually for an hour. Beyond that, at next cycle it will alternate and the second pump will run for the hour.

**F07**      SET **XX** + or - SET

**+** F07 Enable / Disable pump A (Middle gland V2, U2) *Default = 002, enabled with OL, UL option*  
 001 = enabled without OL, UL option (when controlling 3~ pumps)

**F08**      SET **XX** + or - SET

**+** F08 Enable / Disable pump A (Bottom gland V2, U2) *Default = 002, enabled with OL, UL option*  
 001 = enabled without OL, UL option (when controlling 3~ pumps)

### Optional Settings

**OL**      SET **CXX** + or - SET

**+** Overload Current (Combined) - Range C15 - C50 (15 - 50 amps)

**UL**      SET **CX.X** + or - SET

**+** Underload (Dry run) Current - Range C0.0 - C12 (0.0 - 12 amps) *Default = 0.0 (inactive)*

**PF**      SET **001** + or - **002** SET

**+** Flow Protection. *Default 001 = Enabled    002 = Disabled*  
*With flow protection disabled the unit ignores the internal flow sensor*

**Pr**      SET **000** + or - **XXX** SET

**+** Maximum run time. *Default 0 = Disabled Select 30,60,90,120,150,180,210,240 minutes*  
*If Pr maximum run time is active, the pump(s) will stop should they exceed the set maximum.*  
*A software restart is required to resume normal operation. Pr has priority over F06 ExchangeTime.*

**FS**      SET **001** + or - **002** SET

Anti Cycling Protection. *Default 001 = Enabled    002 = Disabled*

Dual pumps of equal or quivelent output have the the option of alternating at each start (F06 00A) or of selecting a continuous operating time (F06 1 – 99hrs) before alternating.

Pump combinations of different performance MUST have the alternation function **F06** disabled (000)

When using the nXt Pro Plus to control 3 Phase pumps via a relay, the internal programming requires the user to set **F07/F08** to 001.

Care must be taken if the PF or FS function(s) are disabled.

In Mode 3 with dual pumps, the UL (underload/dry run) protection setting must take into account the combined current of both pumps operating without sufficient water.

## 15. Warranties – Terms and Conditions

This warranty is given in addition to the consumer guarantees found within the Australian Competition and Consumer Act 2010 (Cth) for goods purchased in Australia and the Consumer Guarantees Act 1993 NZ for goods purchased in New Zealand:



1) White International Pty Ltd / White International NZ Ltd (White International) warrant that all products distributed are free from defects in workmanship and materials, for their provided warranty period as indicated on the top or opposite side of this document. Subject to the conditions of the warranty, White International will repair any defective products free of charge at the premises of our authorised service agents throughout Australia and New Zealand if a defect in the product appears during the warranty period. If you believe that you have purchased a defective product and wish to make a claim under this warranty, contact us on our Sales Hotline on 1300 783 601, or send your claim to our postal address or fax line below and we will advise you as to how next to proceed. You will be required to supply a copy of your proof of purchase to make a claim under this warranty.

2) This warranty excludes transportation costs to and from White International or its appointed service agents and excludes defects due to non-compliance with installation instructions, neglect or misuse, inadequate protection against the elements, low voltage or use or operation for purposes other than those for which they were designed. For further information regarding the suitability of your intended application contact us on our Sales Hotline on 1300 783 601. If you make an invalid claim under this warranty, the original product will be sent back to you unrepai red.

3) This warranty refers only to products sold after the 1st January 2012, and is not transferable to another product type and only applies to the original owner, purchaser or end user, and is in addition to the consumer guarantees found within the Competition and Consumer Act 2010 (Cth) for goods purchased in Australia and the Consumer Guarantees Act 1993 (NZ) for goods purchased in New Zealand.

4) Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. 2 YEAR WARRANTY

5) To the fullest extent permitted by law, White International excludes its liability for all other conditions or warranties which would or might otherwise be implied at law. To the fullest extent permitted by law, White International's liability under this warranty and any other conditions, guarantees or warranties at law that cannot be excluded, including those in the Competition and Consumer Act 2010 (Cth), is expressly limited to: (a) in the case of products, the replacement of the product or the supply of equivalent product, the payment of the cost of replacing the product or of acquiring an equivalent product or the repair of the product or payment of the cost of having the product repaired, is at the discretion of White International or a 3rd party tribunal elected under the Competition and Consumer Act 2010 (Cth) for goods purchased in Australia and the Consumer Guarantees Act 1993 (NZ) for goods purchased in New Zealand; and

6) To the fullest extent permitted by law, this warranty supersedes all other warranties attached to the product or its packaging.

7) In the case of services, supplying the services again or the payment of the cost of having the services supplied again, is at the discretion of White International or a 3rd party tribunal elected under the Competition and Consumer Act 2010 (Cth) for goods purchased in Australia and the Consumer Guarantees Act 1993 (NZ) for goods purchased in New Zealand. 8) Our warranty commences from the date of purchase of the above mentioned pumps. Proof of purchase is required before consideration under warranty is given.

*Record your date of purchase in the space below and retain this copy for your records.*

**Date of Purchase .....****Model Purchased .....**

## 16. Trouble Shooting Guide

	Causes unrelated to the controller	Unit related causes
The pump will not start	<ol style="list-style-type: none"> <li>1. Voltage Failure Is the <b>GREEN LED 'POWER'</b> illuminated?</li> <li>2. Pump no longer operational.</li> <li>3. Wiring inverted (line/motor)</li> </ol>	<ol style="list-style-type: none"> <li>1. Ensure the controller ON/OFF button is ON.</li> <li>2. Check the controller to pump wiring</li> <li>3. Is the pump operation enabled? (F07, F08)</li> <li>4. Check the controller isn't in error mode with the <b>RED LED 'LACK OF WATER'</b> illuminated or the display showing OP, FS, OL, UL or PF <i>Note: After a P1F or P2F fault the pump will require re-enabling (F07/F07) Refer to Pg 11 or 16</i></li> <li>5. Ensure the water column above the controller isn't greater than the cut in pressure. (F01, F02)</li> <li>6. Internal electronics may have failed due to a lightning strike or power surge</li> </ol>
The pump doesn't stop	<ol style="list-style-type: none"> <li>1. There may be leaks greater than the minimum flow requirement. (nominal 0.9 l/min) <i>Note: Check discharge and intake for losses</i></li> </ol>	<ol style="list-style-type: none"> <li>1. Inspect the internal check valve</li> <li>2. Excessive iron oxide disrupting operation</li> <li>3. Internal electronics may be damaged</li> <li>4. Flow protection PF may be disabled</li> <li>5. <b>Mode 2</b> and <b>Mode 3</b> – the pump cut out pressure setting(s) may be greater than the pump's ability to deliver</li> </ol>
Pump Failure P1F / P2F	<ol style="list-style-type: none"> <li>1. Water failure</li> <li>2. Suction problems</li> <li>3. Check pump wiring</li> </ol>	<p><i>Pump failure is not necessarily the fault of the controller.</i></p> <p>Refer to Pg 11 or 16 for more information</p>
<b>RED LED 'LACK OF WATER'</b> Flashing	<ol style="list-style-type: none"> <li>1. Pump not primed or has lost prime</li> <li>2. Water shortage. Valve on suction closed?</li> <li>3. Air pockets or leaks in the suction line</li> <li>4. Pump thermal protection activated</li> <li>5. Pump head less than cut in pressure.</li> </ol>	
Display OP	The actual pressure in the pipeline has been more than 9.9 Bar for longer than 5 seconds	<ol style="list-style-type: none"> <li>1. The controller may be damaged</li> <li>2. The pressure sensor may be damaged</li> </ol>
Display FS	Check for leaking taps, float valves, or non-return valves/foot valves	<b>For the last 15 starts the pump has run for less than 30 sec</b>
Display OL	Possible pump fault	Indicates Power Overload Check the OL set value is correct
Display UL	Lack of water (dry run)	Indicates Power Underload Check the UL set value is correctly
Display Pr	Maximum run time setting exceeded	Investigate why the pump is running continuously
Display PE	N/A	The controller has suffered a software or hardware issue. Return to dealer if issue persists



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**Please always refer to our website for further technical information & new product innovations**

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