Hot Water Circulating System

OPERATION & MAINTENANCE MANUAL

CONTENTS

1.0 SAFETY PRECAUTIONS

Before installation, operation or maintenance of the pump system, read instructions and equipment manufacturer's specific instructions carefully.

System operation may cause injury. Take all necessary precautions. Wear necessary protective equipment. Refer to the engineers' department. Any maintenance of pump systems must be carried out by authorised qualified personnel only.

WARNING - PUMP MAY START AT ANY TIME

In normal automatic mode, pumps may start automatically at any time. Before maintenance or any work is carried out on pumps or motors, ensure proper isolation of motors at the relevant controller.

WARNING - SYSTEM IS PRESSURISED

Under normal operating conditions, the piper, pumps and components or water supply and pressure systems are pressurised. Before unbolting or dismantling any pipework or equipment, ensure water supply to the areas of maintenance is isolated and water pressure relieved.

WARNING – HOT WATER

Under normal operating conditions, the pump, pumps and components of water supply and pressure systems are pressurized. Before unbolting or dismantling any pipework or equipment, ensure water supply to the areas of maintenance is isolated and water pressure is relieved.

DANGER - HIGH VOLTAGE

Control boxes contain high voltage live wiring and terminals. Entry of control boxes is not permitted except by authorised service personnel only. Ensure controller is correctly isolated before entering.

CAUTION - EXPOSED MOVING PARTS

Keep clear of all moving parts on pumps, motors and couplings and keep the area around pump system clear at all times.

Finally take care and use common sense when working on or near Pumpset and report all faults to the Maintenance Manager.

2.0 PRODUCT OVERVIEW

Allied Pumps Packaged Hot Water Circulation System

are a range of automated twin pump packages designed to reduce energy consumption and ensure consistent hot water supply. Significant reduction in overall costs is achieved by simplifying site installation and eliminating the need to coordinate various trades.

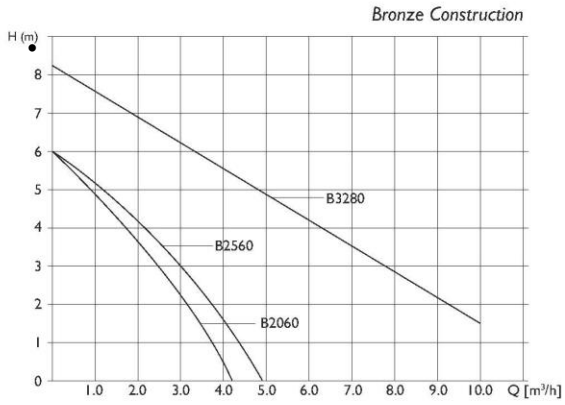
Complete package incorporates pumps on a base with all inter-connecting pipework, valves, supports and associated components. The pre-tested package ensures component compatibility and eliminates the possibility of incorrect installation.

In instances where site limitations preclude the use of a complete package, Allied Pumps offers a pump system compromising dual pumps with unions, cord and plug and Thermakos Controller.

Options available for Package System as described above, having all components, including pumps, valves and controls located inside a heavy duty lockable metal weatherproof enclosure.

KEY FEATURES:

- Increased system efficiency
- Reduced installation time
- Increased pump life
- Temperature or timer control
- Dual bronze or stainless steel pumps
- Automatic pump alternation
- Duty override selector
- Multi speed pumps
- Plug in electrics



CONTROL SYSTEM

Thermakos Controller is designed to provide advanced control management for the Allied Pumps Hot Water Circulation Pump System. The answer to every circulation pump application, the Thermakos smart technology ensures precise temperature control, user-friendly function and an overall cost saving.

THERMAKOS

THERMAKOS KEY FEATURES:

- Auto/Manual operation
- Alternating pump control
- Temperature or timer based control
- Digital temperature readout
- Programmable 7 day 24 hour cycle timer
- Pump current monitor
- Pump and temperature alarm output
- Building management system interface
- Plug in socket for each pump
- Separate circuit protection for each pump
- Easy to install
- Simplified maintenance

Model No.	Watts (Max)	Connection Size (mm)	Port to Port Diameter(mm)	Amps(Max)	Speed
APHWP	90	20	180	0.37	3
	90	25	180	0.40	3
	245	32	180	1.05	3

PUMPING TREATMENT STORAGE
PACKAGED WATER SOLUTIONS
Allied Pumps
MINING COMMERCIAL MUNICIPAL

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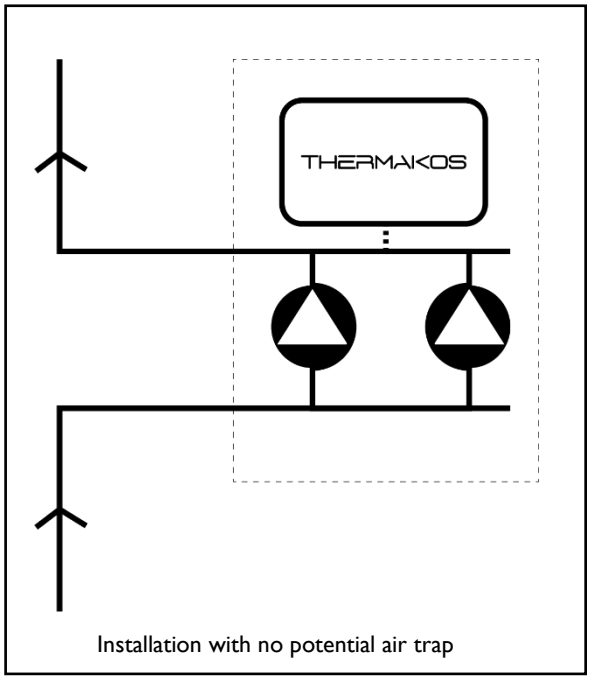
3.0 INSTALLATION NOTES

1. Hot Water Circulation Packages must be mounted on a wall or vertical surface so that the shaft of the circulation pump is in the horizontal position (see pages 6-11).

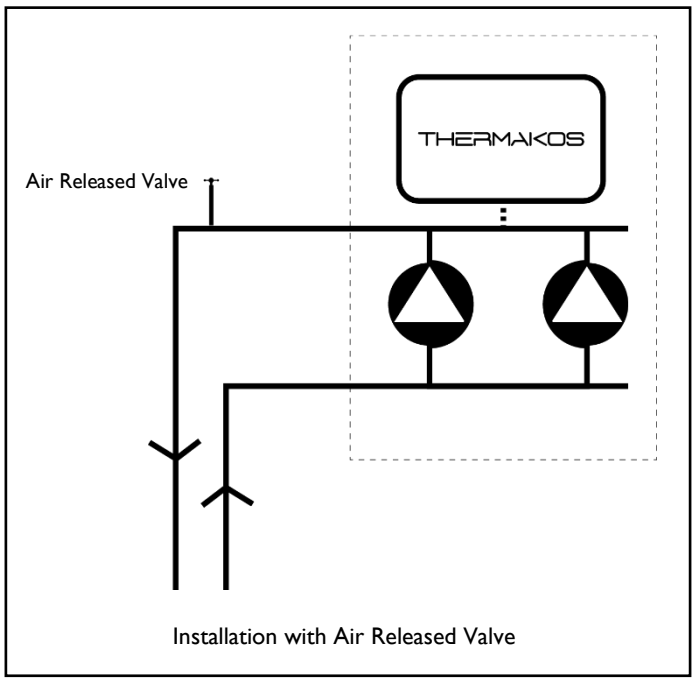
2. Packages/Systems are not weatherproof and must be mounted in a sheltered area.

3. Debris and shavings in Hot Water System piping can clog pump impeller and valves. All pipework must be flushed before pumps are installed.

4. Packages must be installed in a way such that there is no air lock. If an air lock situation is unavoidable, a suitable automatic air release valve must be fitted at the highest point e.g.



Installation with no potential air trap



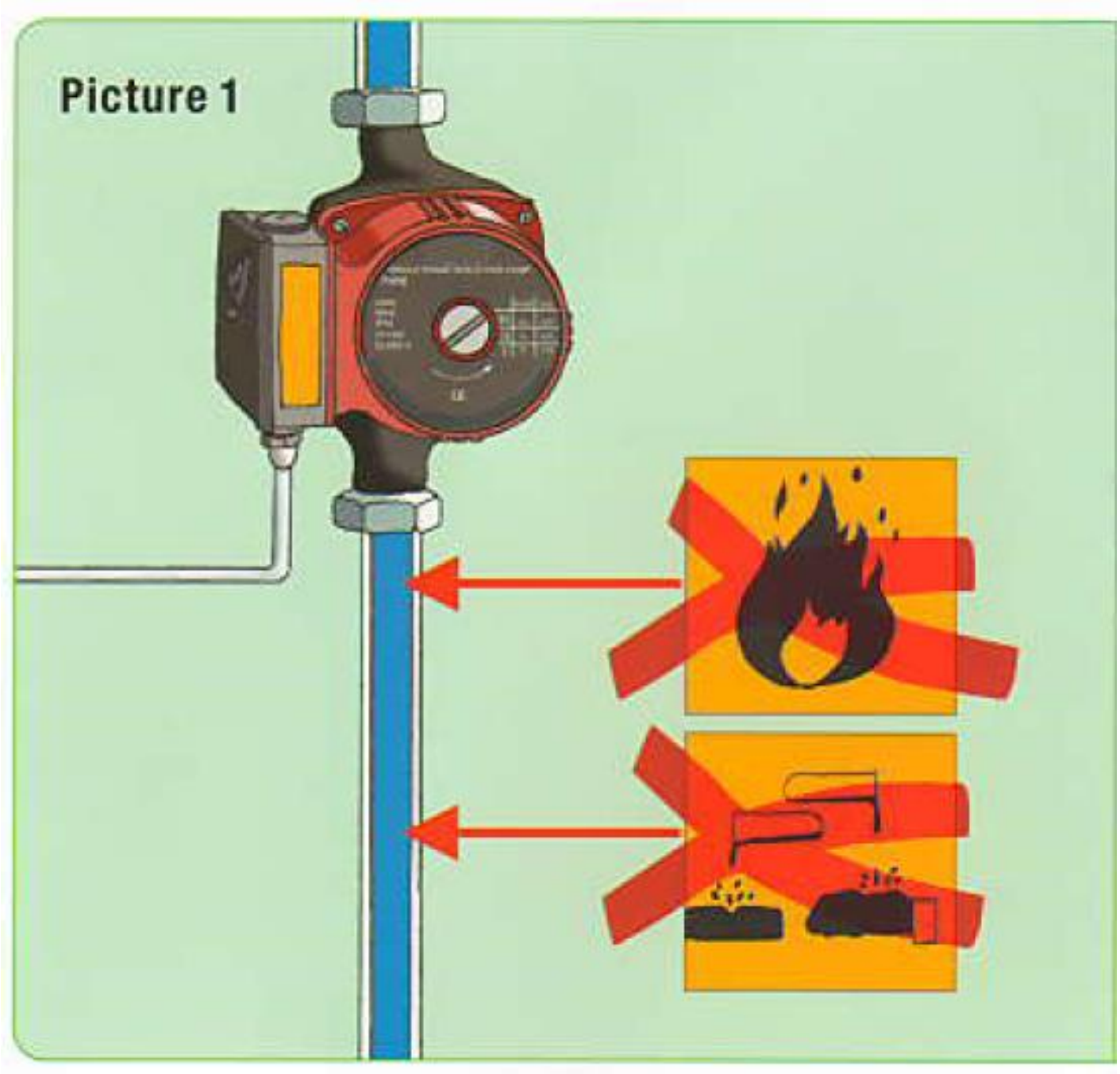
Installation with Air Released Valve

5. Bleed air from pressure system prior to start up.

6. Bleed air from air release screw or front pump prior to start up.

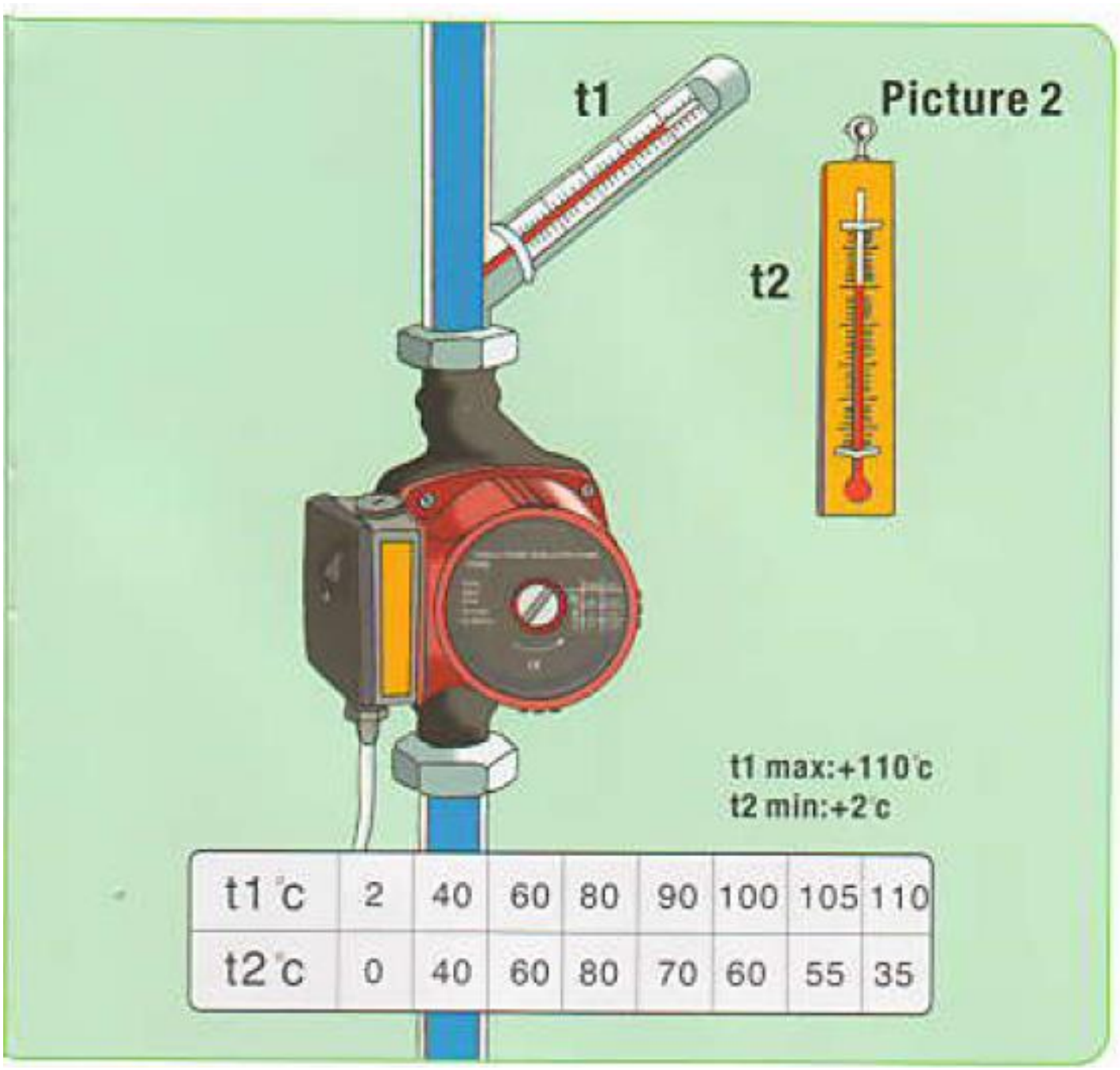
***Caution:** Hot air/gasses can escape whilst conducting this. Use face and body personal protection gear. Open slowly and do not fully release screw.*

The Pump bearing are water lubricated. Dry running of pumps should never exceed 10 seconds.



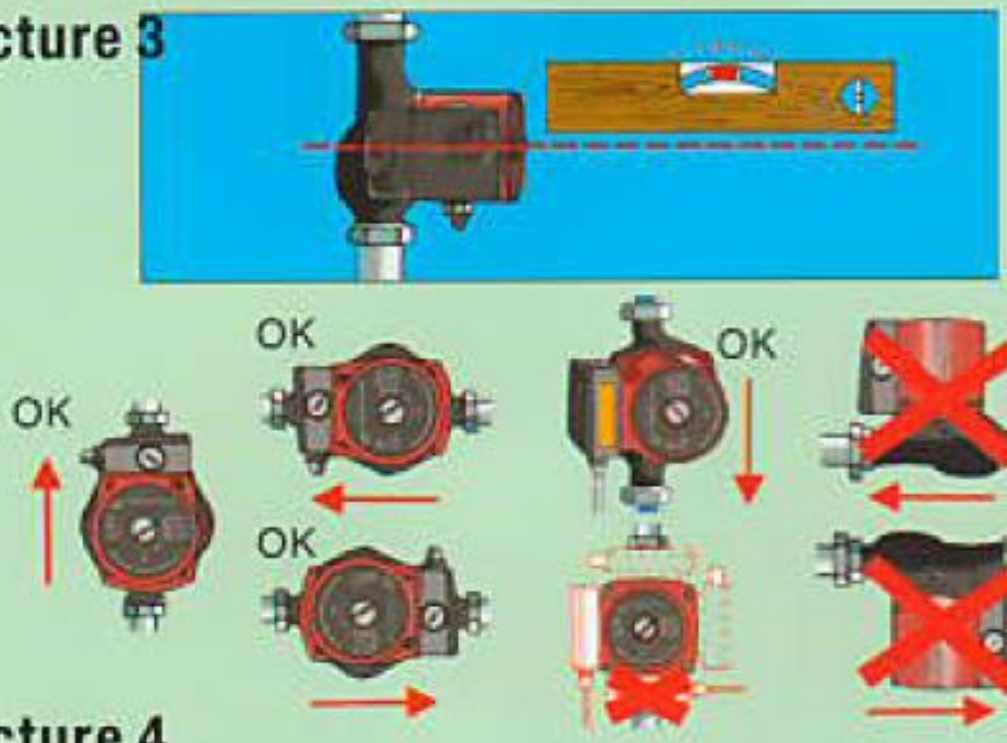
Ensure the room and water temperature do not exceed the temperature shown in the following table

T1 = Water Temperature
T2 = Room Temperature



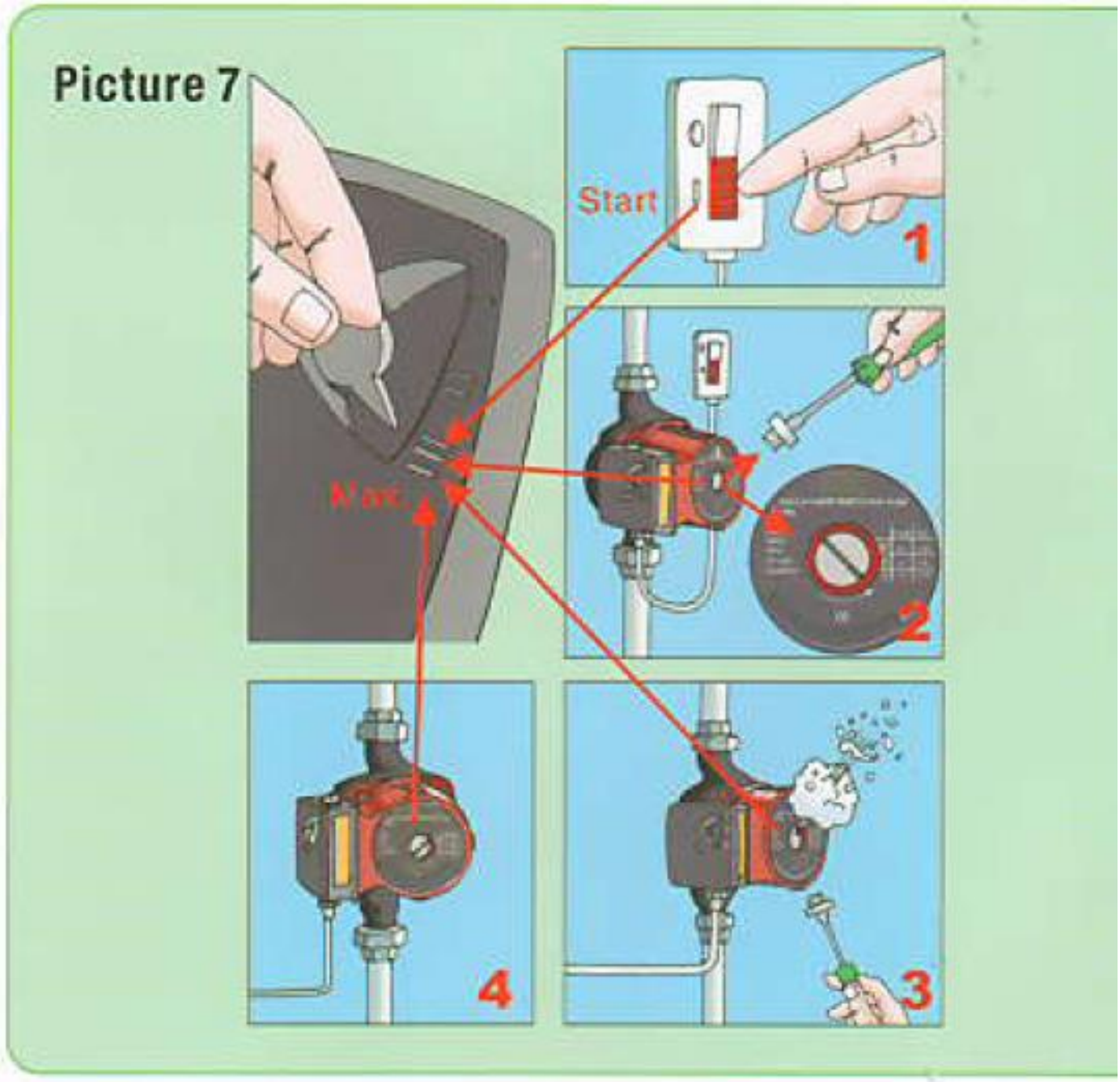
Pump must be installed with shaft horizontal. Shaft position is shown in red in the diagram below.

Picture 3



Picture 4

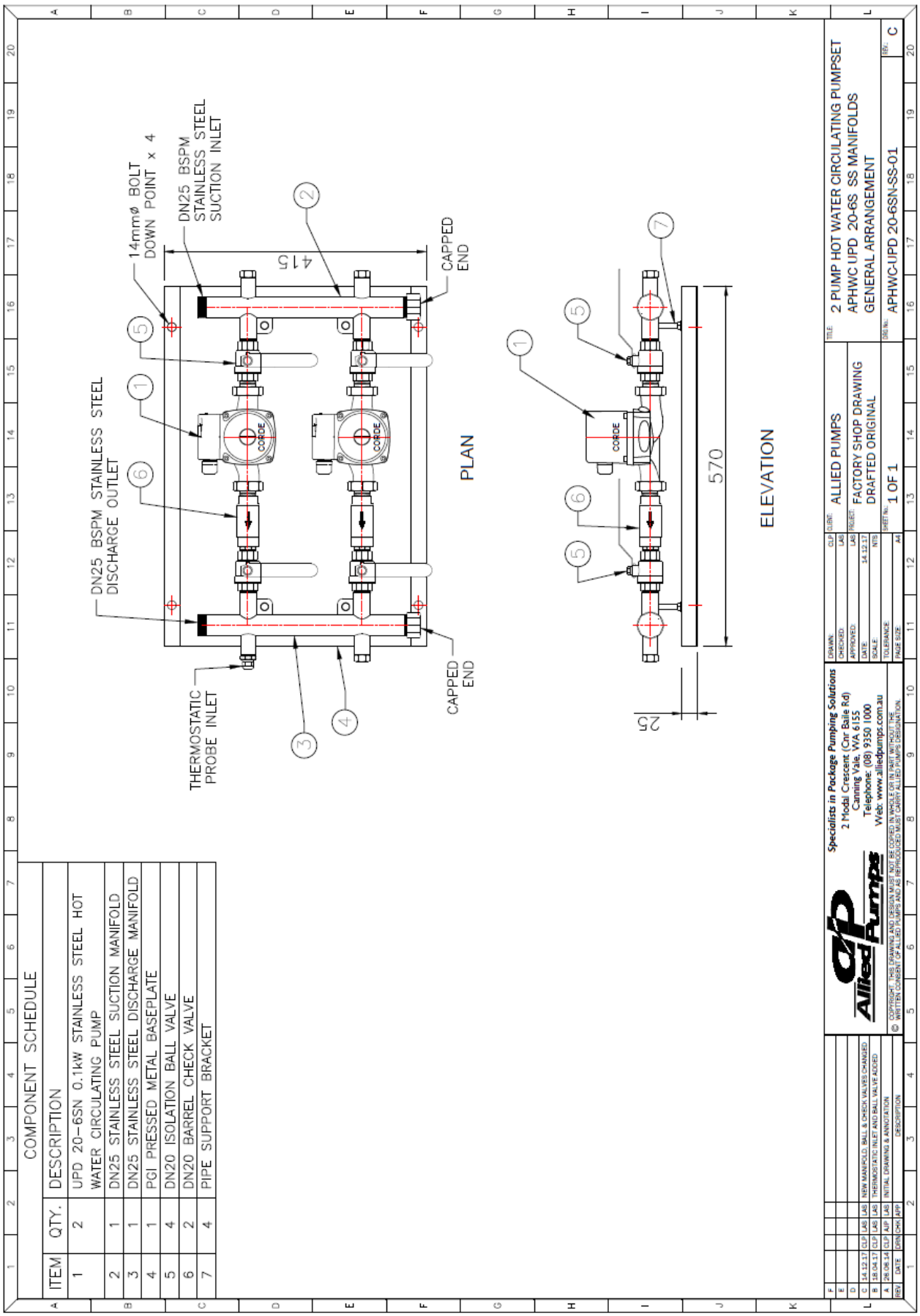
After installation the pump must be primed with water before switching on for the first time.



4.0 TROUBLESHOOTING

FAULT FINDING CHART		
Fault	**Cause**	**Remedy**
Pump fails to start	Supply failure	Check fuses and possible loose electrical connections.
	Capacitor is defective.	Replace the capacitor.
	Pump blocked due to furred bearings.	Change over to maximum speed for a short period or free the rotor with a screwdriver inserted in the slot of the shaft end.
	Impurities in the pump	Dismantle and clean the pump.
Noise in the system	Pump flow is too high.	Change over to lower speed.
	Air in the system	Vent the system.
Noise in the pump.	Air in the pump	Vent the pump.
	Inlet pressure too low	Increase the inlet pressure or check the air volume in the expansion tank (if installed).

5.0 TYPICAL DRAWING



A

APPENDIX A
Thermakos Controller Manual

Hot Water Circulation Pump Control System
Operation & Maintenance Manual

The Definition of Temperature Control

THERMAKOS

SAFETY PRECAUTIONS

THERMAKOS

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WARNING – SYSTEM IS PRESSURIZED

Under normal operating conditions, the pipe, pumps and components of water supply and pressure systems are pressurized. Before unbolting or dismantling any pipework or equipment, ensure water supply to the areas of maintenance is isolated and water pressure relieved.

WARNING – HOT WATER

Under normal operating conditions, the pipe, pumps and components of HWC contain hot water. Before unbolting or dismantling any pipework or equipment, ensure hot water supply to the areas of maintenance is isolated and allow time for the water in the immediate area to work on, to cool.

DANGER – HIGH VOLTAGE

Control boxes contain high voltage live wiring and terminals. Entry of control boxes is not permitted except by authorised service personnel only. Ensure controller is correctly isolated before entering.

CAUTION – EXPOSED MOVING PARTS

Keep clear of all moving parts on pumps, motors and couplings and keep area around the pump system clear at all times.

Finally take care and use common sense when working on or near the Pumpset and report all faults to the Maintenance Manager.

OVERVIEW

The controller consists of an IP55 plastic housing with a backlit display, buttons and sounder that connects to the following items.

- Mains power supply (via a GPO)
- 1 or 2 pumps (via GPO sockets on the controller)
- Building management, alarm or SCADA system
- 2 line x 16 character display and 6 buttons to show status and allow programming and manual operation,

One or two pumps are used to circulate hot water through the plumbing of some buildings so that hot water is available as soon as the tap is turned on. The pumps are only operated as needed based on:

1. The temperature of the water returning from the distribution system loop
2. The time of day and the day of the week.

CONFIGURATION MENU

The configuration menu is accessed by pressing the "UP", "OK" and "DOWN" buttons together and holding them down continuously for 3 seconds.

Within the menus the OK button will accept the current selection/value while the ESC (escape) button will cancel and/or exit from the current selection. The UP and DOWN buttons are used to select different items from a list (e.g. sub-menu selection) or modify a value.

While an UP or DOWN button is held down the opposite button can also be pressed to cause the parameter to change by a larger step value i.e. while adjusting a value with the UP button held down, simultaneously pressing the DOWN button will increase the value by a step of 10 rather than just 1, and vice versa while adjusting a value down with the DOWN button.

CONFIGURATION MENU STRUCTURE

The configuration menu has the following structure:

1. Setup Parameters
2. Setup Schedules
3. Setup Clock
4. Reset Run Hours
5. Restore Defaults
6. Manual Operation

1. Setup Parameters Menu Structure

- Number of Pumps (Default Setting: 2)
- Continuous Pump: (Default Setting:
- Heating/Cooling (Default Setting: Heat)
- Cut in Temp (Default Setting: 55)
- Dead Band Temp (Default Setting: 2.5)
- Pump Fault Delay (Default Setting: 45)
- Water Temp Alarm (Default Setting: NO)
- VFC 1 Function (Default Setting: Fail)
- VFC 2 Function (Default Setting: Fault)
- VFC 3 Function (Default Setting: Pump On)
- VFC 4 Function (Default Setting: Power On)
- VFC 5 Function (Default Setting: Temp Fault 1)
- VFC 6 Function (Default Setting: Temp Fault 2)
- Pump Swap Init (Default Setting: 60)
- Pump Swap After (Default Setting: 30)
- Temp Sensor. (Default Setting: Sensor 1 Only)
- USE MCB Inputs (Default Setting: No)

2. Setup Schedules Menu Structure

- Edit Schedules (Default Setting: All Cleared)
- Clear/Set Daily1 (Default Setting: All Cleared)
- Clear/Set Weekly (Default Setting: All Cleared)
- Clear Schedules (Default Setting: Ok)

3. Setup Clock

- Set the day of the week and the time of the day (Default Setting: As per Time)

4. Reset Run Hours

- Reset Pump 1 Hours (Default Setting: NO)
- Reset Pump 2 Hours (Default Setting: NO)

5. Restore Defaults

6. Manual Operation

OTHER OPERATOR FUNCTIONS

1. Mute Alarm

When the alarm sounder is active it will turn on and off approximately once per second – about ½ second on and ½ second off – and pressing any button will mute the alarm. The alarm sound will remain muted until a new fault condition occurs.

2. Clear Faults

Pressing and holding the ESC button for 2 seconds will clear all non-permanent faults that The Controller has registered. Note that the RTC battery fault can only be cleared by setting the clock time.

3. Cancel Pump Swap Delay

When both pumps exhibit fault conditions in succession the Pump Swap Delay is invoked – i.e. a 30 minute delay before the pumps are swapped. When this delay is in effect pressing any button will cancel the delay and The Controller will immediately swap pumps.

4. Timed Manual Pump Run

- A pump can be run manually for 3 minutes by pressing and holding either the Left button (for Pump 1) or the Right Button (for Pump 2) while The Controller is in Running (including Continuous) or Stopped mode. In Tines Manual Pump Run mode the display will appear as follows:
  Mo 01:23 >PUMPS
  P1 02:59 T:55.5
  The bottom row displays which pump is running (P1 or P2), the remaining run time as minutes; seconds and the water temperature.

5. Pump Hour Meters

The Controller maintains a separate run-time hour meter for each pump. The hour meters can be viewed by pressing and holding down the DOWN button for 4.5 seconds. The hour meter display appears as follows:

Pump 1: 01234.5h

Pump 2: 32767.0h

The hour meter for Pump2 will only be displayed if The Controller is configured for 2 pumps.

Upon installation of The Controller or whenever a pump is changed the corresponding hour meter(s) should be reset to zero via the Configuration menu.

FAULTS & ALARMS

An alarm is indicated by flashing the LCD backlight and a sounder. One of the buttons doubles as a mute switch when the sounder is operating. The backlight will continue to flash until the fault is cleared. It is also possible to manually clear all faults by holding down a button.

Fault	Cleared By
Pump Fault	Manually or automatically if pump operates with current consumption above the threshold.
Invalid Step	Setup corrected
Temperature Fault	User or temperature reaches Cut In + Dead Band temperature
Time Lost	Time set
Feed Temp Fault	User or automatically when temperature probe 2 reaches feed temperature

SPECIFICATION

Description	Parameter
Dedicated Power Outlets	2
Dimensions	170W x 145H x 85D (mm)
Cut In Temperature	40 to 99.5 °C
Pump Fault Delay	1-120 °C
Dead Band	1-20 °C
Volt Free Outputs	6
Mains Input Voltage 1	190V to 260V AC. 49 to 62Hz. Suitable for 220VAC and 240VAC supplies.
Mains Input Voltage 2	90 to 130VAC. 49 to 62Hx. Suitable for 110VAC supplies.
Power Rating	840W Max, (300W recommended @ 3.15A fuse). Including one pump operating
Internal Fuse Rating	3.1 5A semi delay
Pump Current Threshold	40mA
IP Rating	IP55

VOLT FREE CONTACTS OUTPUT

The controller provides six volt free contacts on 8 screw terminals. The function of each line is described in the table below. All outputs can be set to have an alternate function.

	VFC 1/2/3/4/5/6
Alternate Function 1	**Power On** (VFC 4 Default)
Alternate Function 2	**Fail** (VFC 1 Default)
Alternate Function 3	**Normal**
Alternate Function 4	**Fault or Fail**
Alternate Function 5	**Fault** (VFC 2 Default)
Alternate Function 6	**Pump Fault**
Alternate Function 7	**Pump 1 On**
Alternate Function 8	**Pump 1 Fault**
Alternate Function 9	**Pump On** (VFC 3 Default)
Alternate Function 10	**Pump 2 On**
Alternate Function 11	**Pump 2 Fault**
Alternate Function 12	**Temp Fault 1&2**
Alternate Function 13	**Temp Fault 1or2**
Alternate Function 14	**Temp Fault 1** (VFC 5 Default)
Alternate Function 15	**Temp Fault 2** (VFC 6 Default)
Alternate Function 16	**Feed Temp Fault**
Alternate Function 17	**Feed Water On**

When there is no power to the controller or the controller is not configured (or lost its settings) the outputs will remain off. If the first output is set to the alternate function so it is "On" when the status is "Normal" then monitoring system can identify faults such as power failure to the controller.

B

APPENDIX B
Warranty and Service Information

WARRANTY

Warranty is subject to Allied Pumps Pty Ltd terms and conditions of sale and limited to replacement or repair, at Manufacturer's discretion, of any parts or equipment, excluding and travel, site, removal or reinstallation costs, for a period of twelve months from date of invoice, provided such part of equipment that is deemed by the respective manufacturer to be faulty. Any work done on site to inspect or remedy faults that are subsequently not accepted as being under warranty by the manufacturer, or are caused by misuse, fair wear or operating procedures, will be charged at parts and labour and travelling time rates applicable at the time.

Warranty does not provide for circumstances outside Allied Pumps control including (but not limited to); seismic activity, base or ground movement, mechanical impact, abuse or negligence, or general wear and tear.

Warranty does not cover equipment that is not installed, continuously monitored and maintained in accordance with the manufacturer's requirements, including, but not limited to, regular servicing, and/or regulatory requirements and applicable Australian Standards. Warranty does not cover damage caused by dry running the pumps.

If Buyer requires our services in respect of site inspection or service outside of what is covered by Manufacturers' warranties, then Buyer should enter into a separate agreement with ALLIED PUMPS in respect to the same. In the event of no such separate agreement, all operations, calibrating, cleaning and maintenance of plant is the responsibility of the buyer.

ALLIED PUMPS have not acted as a consultant nor charged design fees on this project, and are in no way responsible for, nor guarantee any particular level or performance of the treatment plant supplied or effluent quality unless such guarantee is specially given in writing.

Under no circumstances is ALLIED PUMPS liable for any direct or consequential loss or business interruption or damage to persons or properties of any nature due to any cause whatsoever.

Application of warranties is conditional on ALLIED PUMPS having received in cash the total contract price. Furthermore, ALLIED PUMPS reserves the right to withdraw any code compliance, Australian Standard compliance or selection compliance, should the contract not be paid in full.

SCHEDULE SERVICE INFORMATION REQUEST

Allied Pumps recommends regular scheduled servicing for all systems & packages to ensure acceptable service life and reduce the potential for emergency service requirement.

ROUTINE SERVICING

This equipment must be serviced on a regular basis in accordance with the manufacturer's requirements. Failure to do so may void warranty.

As a minimum, this equipment must be serviced on a six monthly basis. More arduous applications will require more regular servicing. Schedule service is in addition to any statutory/standards requirements which should be addressed independently as applicable.

Service should be carried out by experienced service technicians and we recommend this is done by Allied Pumps or an Authorised Dedicated Service Team.

◯ Yes, please send more information on your preventative maintenance program for the following, including a quotation to service our system.

APPLICATION AND WARRANTY REGISTRATION – Please complete the following:

Company Name: _____ **Contact Name:** _____

Site Address: _____

Postal Address: _____

Phone: _____ **Fax:** _____

Email: _____ **Mobile:** _____

System: _____

Model No.: _____ **Serial No.:** _____

If you have other systems on-site that you wish to have maintained to our high standards please fill in as many details as you can below.

Application: _____ **Approx. Age:** _____

Make: _____ **Model:** _____

Location: _____

Comment: _____

Please fax back to: 08 9356 5255 or
Email to: service@alliedpumps.com.au

C-D/105

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