



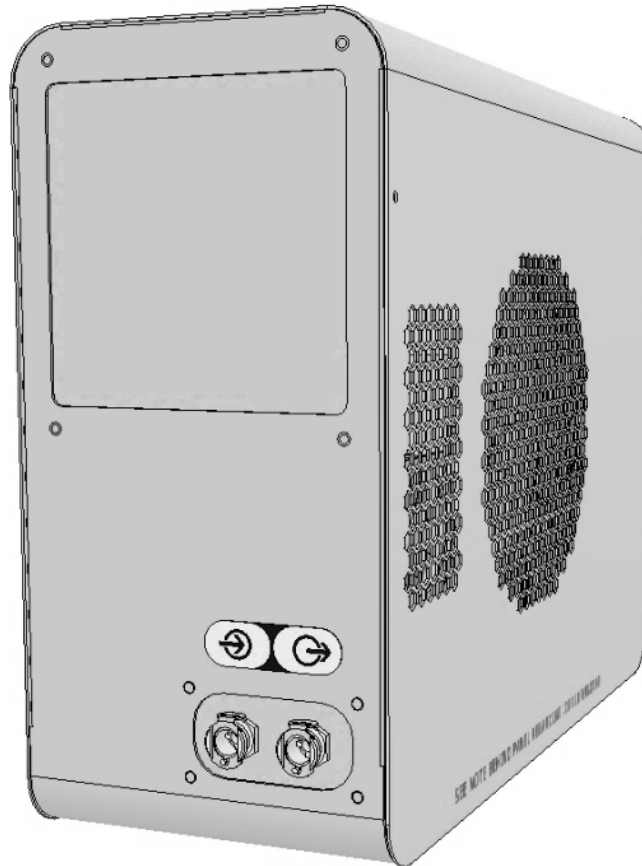
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# Installation, Operation & Service Manual

# A01

## DOCUMENT DETAILS

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Date	11/MAR/2022	Author(s)	MJH	Page	2 / 5	Revision	1
------	-------------	-----------	-----	------	-------	----------	---

## CHANGE LOG

Date	Revision	Page ref	Change
11/MAR/2022	1	ALL	First release



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------	-------------	-----------	-----	------	-------	----------	---

## PRODUCT SPECIFICATIONS

A01	
CAD assembly dwg no.	MA485
Physical dimensions	W180 x D435 x H380mm
Construction	Sheet steel gauge 1.5mm Epoxy polyester powder coat
Mounting type	Rubber feet
Acceptable environment	Indoors
Weight (kg)	10kg
Noise level (dB(A) @ 1m)	≤54
Toolless access	No
Technology	Air blast
Control method	None, continuous fan Optional PID of fan
Temperature stability	Load & ambient dependent
Cooling capacity with 'setpoint' 5°K above ambient	0.5kW
Cooling capacity with 'setpoint' 10°K above ambient	1kW
Cooling capacity with 'setpoint' 20°K above ambient	2kW
Maximum ambient	+40°C
Design flowrate	1.3L/min
Maximum THR (Total Heat Rejection)	Applied load, plus power in
Maximum permissible return line temperature	+60°C
System volume	1L
Pump options	PC3, PC6 (032, 061)
Pressure relief	Optional
Standard fittings	Pushfit 12mm
Standard chemical compatibility	Tap water, water-glycol mix
1st party approvals	CE, UKCA
3rd party approvals	UL-ready
Empty fluid reservoir alarm	Standard, process stop
Low fluid flow alarm	Optional
Temperature display	Optional
Temperature out of range alarm	Optional
Motor thermal overload	Not present
Cooling system	Single 172mm axial frame fan. PED-compliant coil.
Water system	Fluid level switch. UL-approved fuse protected pump motor.
Overcurrent protection	Standard, via L1/L2 fuses
Overcurrent fault-cleared restart mode	Fuse replacement
Interlock-restored restart mode	Automatic
Emergency off	Not present
Warranty options	2 year parts, 1 year labour Enhanced warranty options



DOCUMENT DETAILS

Date	11/MAR/2022	Author(s)	MJH	Page	4 / 5	Revision	1
------	-------------	-----------	-----	------	-------	----------	---

SAFETY NOTICES

For your safety, we draw your attention to the following warning and caution marks throughout the manual. Warning symbols can be found on the unit. Ensure you have read through all warnings before starting the unit. The safe operation of ATC products always remains the responsibility of the operator. This equipment is intended to be used as a liquid temperature conditioning device – it requires no external pump, nor any further manipulation of temperature. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired. Failure to comply with a ‘warning’ may result in personal injury or death. ATC does not accept any liability for injury caused through use of this equipment.



Caution; Failure to comply with a caution will invalidate product warranty and absolve ATC from any liability, howsoever caused, and could result in permanent damage to equipment.



Caution; Filling/topping up of the tank should only be undertaken with the unit switched off, to prevent back-filling of the fluid.



Caution; This product contains no user-serviceable parts. Repair and service requires specialized knowledge and tools to be provided by ATC or its local agent. Any unauthorized tampering with the heat exchanger system automatically invalidates warranty.



Warning; Hot and cold surfaces are present during operation. Take caution and care when touching pump during operation.



Warning; Water pressures of up to 10 bar during operation.



Warning; Water and electricity near one another. Always ensure the unit is isolated before service. The product is protected from overcurrent by fuses. Never bypass this component.



During fault diagnostics and maintenance, it may be necessary to remove panels, which expose the operator to the dangers of pressurized systems, hot or cold pipes and electrical circuits. Only qualified personnel who are aware and equipped to deal with these systems should only carry out such work.



Any temporary electrical supply to the chiller should be correctly earthed and connected through an earth leakage trip.



In case of unexpected coolant leakage, safety glasses should always be worn when the chiller is operated with the covers removed.



Under no circumstances leave the cooler unattended with the side panels removed.



Never alter settings of pressure switches, overloads, circuit breakers or any safety device without first consulting Applied Thermal Control.



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Date	11/MAR/2022	Author(s)	MJH	Page	5 / 5	Revision	1
------	-------------	-----------	-----	------	-------	----------	---

## INCLUDED ANNEXES

Specific technical product information is provided in the following series of annexes.

- Annex A-1 220310 Shipping & Unpacking - Crane or forklift not typically necessary
- Annex B-2 220311 Site & Environmental Requirements for A01,03,08,12-Series
- Annex C-1 220311 Installation - Generic air-cooled with Pushfit or CPC adapters
- Annex D-3 201007 Fluid Handling & Startup Procedures - Generic
- Annex E-0 211203 No controller
- Annex E-15 210301 KR1 - how to use (for coolers with setpoint control)
- Annex F-5 220311 Centrif or turbine pump without relief
- Annex G-10 220309 Troubleshooting - Initial help for A-Series
- Annex H-1 191121 End-user maintenance - air-cooled units with water as fluid
- Annex I-7 220310 Maintenance for technicians - Generic airblast
- Annex J-5 200706 EU Compliance Statement - Conflict Minerals
- Annex J-6 210212 EU DoC A-series
- Annex J-7 200715 EU Compliance Statement - REACH
- Annex J-8 200827 EU Compliance Statement - POPs
- Annex J-10 201111 EU Compliance Statement - RoHS
- Annex J-17 220310 UKCA DoC - A-Series
- Annex K-1 200623 Standard warranty terms of ATC
- Annex M-7 220311 Recommended spares, A Series
- Annex R-3 200203 SDS Hexid A4 v6.4



# Annex A-1

## DOCUMENT DETAILS

Date	11/MAR/2022	Author(s)	MJH	Page	1 / 1	Revision	1
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## CRANE OR FORKLIFT NOT TYPICALLY NECESSARY

This guide applies to products that can conceivably be lifted/positioned by one or more persons without the aid of machinery. Upon reviewing recommendations below, you may opt to use machinery. This is at your discretion. ATC are not responsible for injury or death sustained through improper handling procedures.

## UNPACKING

- 1 Please check that both the packaging and the unit are undamaged. If there is any doubt, it is vital that you inform both ATC and the carrier. There are no hidden shipping bolts or other fixings. You should inspect the packaging for signs of transit damage before signing for the unit, and if possible, unpack the unit before signing. Once you have signed for the goods, ATC cannot be held responsible for any transit damage subsequently found.
- 2 Remove the unit from its original packaging and ensure that there is no packaging left around the cooling ducts. There is no internal product packaging that requires the chiller to be opened.
- 3 Please retain all packaging in the unlikely event that the chiller needs to be returned to our local representatives.

## MANUAL HANDLING RECOMMENDATIONS

- 4 For UL compliance, ATC must make the statement; "as the unit is >18kg, ATC must recommend that 2 persons are used to lift by hand, or a crane".

Your region's workplace safety regulations may differ. The below information is provided as a guideline only in the absence of any other regulations. It is based on the United Kingdom's 'Manual Handling Operations Regulations (1992)'.  
 Lifting items of any weight can cause injury if handled incorrectly, depending on what the load is and the physicality of the person handling it. Manual handling guidelines suggest that the maximum safe lifting weight for a woman is 16kg and the maximum safe lifting weight for men is 25kg. These recommendations change depending on the height the object is lifted to and how the object is carried, outlined in the tables below.

### Recommendations for Men

Height Object is Lifted	Max Weight Held Close to Body	Max Weight at Arm's Length
Head Height	10kg	5kg
Shoulder Height	20kg	10kg
Elbow Height	25kg	15kg
Knuckle Height	20kg	10kg
Mid-Lower Leg Height	10kg	5kg

### Recommendations for Women

Height Object is Lifted	Max Weight Held Close to Body	Max Weight at Arm's Length
Head Height	7kg	3kg
Shoulder Height	13kg	7kg
Elbow Height	16kg	10kg
Knuckle Height	13kg	7kg
Mid-Lower Leg Height	7kg	3kg

When two people are lifting an item, the approximate rule is that you should not exceed 2/3rds of the sum of both individual's lifting limits. If two men who can carry a maximum of 25kg each are lifting an object together, then the object should not weigh more than around 33kg. If three people are lifting an object, the maximum weight of this object should not exceed half the sum of all individual's lifting limits.



# Annex B-2

## DOCUMENT DETAILS





Doc. Date	11/MAR/2022	Author(s)	MJH	Page	1 / 1	Revision	3
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## SITE & ENVIRONMENTAL REQUIREMENTS FOR A01, A03, A08 & A12-SERIES

This guide applies to certain A-Series products only. Please find below the requirements for all services and conditions necessary for years of trouble-free running. If you require more detail, please contact ATC for support on sales@app-therm.com or using the contact information at the top of this page.

## GUIDANCE

- 1 **Storage temperature range.** Without process fluids, -20°C to +70°C.
  - 2 **Storage humidity range.** Non-condensing, relative humidity 5% to 95%. Before starting product, allow product to acclimate for 24h in location of use when storing outside *operating* humidity range.
  - 3 **Operating temperature range.** With appropriate process fluids, -20°C to +65°C.
  - 4 **Operating humidity range.** 80% for ambient temperatures up to +31°C (+88°F), decreasing linearly to 50% relative humidity at +40°C (+104°F) ambient temperature.
  - 5 **Hard, level surface.** A level surface is important for ensuring proper filling and allowing air to escape.
- |   | Model | Electrical | Voltage range | Voltage tolerance | Current      | Frequency | Supply           |
|---|-------|------------|---------------|-------------------|--------------|-----------|------------------|
| 6 | A01   | -Uspec     | 100-240Vac    | ±10%              | 1-0.5A (L-N) | 50/60Hz   | L/N/E or L1/L2/E |
|   | A03   | -9spec     | 208-230Vac    | ±10%              | 4A (L-N)     | 50/60Hz   | L/N/E or L1/L2/E |
|   | A08   | -3spec     | 400Vac        | ±5%               | 5.2A (L-L)   | 50/60Hz   | L1/L2/L3/N/E     |
|   | A08   | -8spec     | 208Vac        | ±5%               | TBC          | 60Hz      | L1/L2/L3/E       |
|   | A08   | -9spec     | 208-230Vac    | ±10%              | 5A (L-N)     | 50/60Hz   | L/N/E or L1/L2/E |
|   | A12   | -3spec     | 400Vac        | ±5%               | 6.9A (L-L)   | 50/60Hz   | L1/L2/L3/N/E     |
|   | A12   | -8spec     | 208Vac        | ±5%               | TBC          | 60Hz      | L1/L2/L3/E       |
|   | A12   | -9spec     | 208-230Vac    | ±10%              | TBC          | 50/60Hz   | L/N/E or L1/L2/E |
- 7 **Clearance.** Clearance is required to;
    - a) Ensure the on/off switch on the front face is unobstructed to allow access in case of emergency.
    - b) Fit hoses and electrical supply to the rear of the unit allowing recommended bending radii.
    - c) Allow maintenance access points on top and side panels to be removed.
    - d) Allow process to take place – A01/A03 air-on face is the front of unit – 0.5m is recommended – the coolest, cleanest air that can be provided will improve performance. A08/A12 air-on face is the right-hand side. Air-off faces are every other vented face – 0.5m clearance is recommended on at least 1, preferably 2 of the rear, left and right sides.
  - 8 **Plumbing.** Tubing, piping or hose must be clean and compatible with the fluid to be used. The product is compatible with deionized water, tap water and water-glycol mixtures such as Hexid A4 and A6. Ensure the connected pipework is suitable for handling up to 20L/min at system pressure ≥6bar.
  - 9 **Indoor use only.** Altitude up to 2000m above sea level. Ensure the unit has adequate ventilation.
  - 10 **Installation category.** Transient overvoltage category II; Pollution degree 2. Temporary overvoltages occurring on mains supply are acceptable within limits defined in the categories.

-  Caution; Always use ATC recommended fluids in our products – many sealing compounds and materials are present and unapproved fluids have the potential to corrode your application and damage seals.
-  Caution; Do not use inadequately rated wiring. Consult an electrician if you are unsure.
-  Caution; The safety of any system incorporating the equipment is the responsibility of the assembler of the system.
-  Caution; Do not replace detachable mains cords with inadequately rated cords. Contact ATC for appropriately rated products.



**DOCUMENT DETAILS**

Date	11/MAR/2022	Author(s)	MJH	Page	1 / 2	Revision	2
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**INSTALLATION FOR AIR-COOLED UNITS WITH PUSHFIT OR QUICK-RELEASE ADAPTERS**

This guide applies to the following product groups;

- M-Series refrigerated units, in the MA485 chassis, with or without an SA00016 options pack.
- A-Series airblast units, in the MA485 chassis, with or without an SA00016 options pack.

**HOSE RECOMMENDATIONS**

Having ensured that your installation meets all site requirements, it is best practice that the fluid lines between your application and the chiller have the following characteristics.

1	<b>Short in length</b> – this reduces friction-based pressure drop and addition ambient heat load.
2	<b>Large diameter bore</b> – at least 12mm (1/2").
3	<b>Free from 90° bends</b> – to limit the effects of water hammer. If this cannot be avoided, sharp changes of direction should be minimized so far as possible. Doing this correctly can yield higher pump performance and extend time between maintenance intervals. It will also reduce electrical energy consumption.
4	<b>Clean</b> – If your installation is to existing pipe work, it is good practice to flush the system with either a commercially available central heating cleaner or 5% acetic acid solution. The system should be flushed clean with tap water to remove all traces of cleaner prior to filling the system. Failing this, it is recommended to use a domestic bleach in solution with tap water, diluted to the point where the bleach can longer be smelled by human nose.
5	<b>Opaque, ideally black</b> – to inhibit light passing through the tube and algae building up. Alternatively, solid ABS or copper pipe can be used where application chemistry allows.
6	<b>Insulation, where low temperature process is planned</b> – the process line from chiller to application contains the feed of low temperature fluid. Insulation prevents heat from entering this line and can promote better stability. Uninsulated return lines are helpful where free cooling can be obtained by allowing heat to transfer to air – likewise, insulating the return line is helpful if the fluid temperature is below ambient.



Caution; Never use transparent tubing. UV light will pass through, prompting growth of organic contamination.

**CONNECTING ADAPTERS TO PRODUCT**

1	Standard units are supplied with 12mm pushfit female connections. These fittings are not valved and will 'drop' the volume of the system if left open to atmosphere.
2	Ensure the tube selected to connect to the product has been cut square to the centerline of the tube. Cutting at an angle increases the chances that only a partial seal will be achieved. Pushfit fittings can sometimes feel as though they're pushed fully-home into the connector, but only be halfway in – ensure the tube is pressed in.
3	Pushfit connectors supplied are natively 12mm – while you may be able to find 1/2" tube and operate successfully, other metric to imperial conversions are more difficult. Try to source metric tube.
4	Tube selected must be relatively stiff. Polyurethane and Nylon are good choices. Silicon can often be too soft and alignment/support is critical for harder materials like copper. If using Polyurethane tube, ensure you have selected ether-based. Ester-based is not suitable for water.
5	Ensure that the system is correctly connected. The labels at the ports are clearly marked with ISO7000 standard inlet and outlet symbols. Ports marked as outlet means fluid leaves the product and must be connected to the process inlet. Check all joints are tight and leak free.
6	If your product has the optional SA00016 pack applied, you will have a valved connection. Disconnecting the fittings will retain system volume in the chiller and in the connected tube/hose.
7	Where this product is incorporated into other equipment, it is the responsibility of the assembler to ensure safety.





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## Operating Manual; Installation

# Annex C-1

### DOCUMENT DETAILS

Date	11/MAR/2022	Author(s)	MJH	Page	2 / 2	Revision	2
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### BACKFILLING

- 1 In situations where the chiller is situated physically lower than the application being cooled, fluid will apply pressure to the water circuit of the product.
- 2 The weakest seal is normally the tank lid, and this is typically where fluid will escape the unit.
- 3 Ideally, the product will be located higher or level with the product water-line. If this is not possible, a non-return solenoid valve kit can be installed as an optional standard assembly.
- 4 Please raise any questions with the sales team on sales@app-therm.com.



# Annex D-3

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## FILLING A SYSTEM

- a) **Check all application valves are open, including solenoid valves and variable position valves.**
  - i) The product will require an open water circuit to pump into.
  - ii) Any obstructions can increase the time, or entirely prevent the bleeding of air from the system.
- b) **Remove the cap from the tank lid on the top of the product.**
  - i) Fill the tank to just underneath the bottom of the filling port.
- c) **Turn your attention to the main power switch.**
  - i) Immediately after toggling this switch assuming that the power cord is connected and turned on at the wall the product will begin to pump water.
  - ii) Leave the product to run until it cuts out on the level switch interlock.
  - iii) Turn the unit off at the mains switch.
  - iv) Fill the tank again to lift the level switches.
  - v) Start the product again until the unit cuts out again.



Caution; Do not run the pump dry. Do not deadhead the pump.

- d) **Repeat steps at c) until the chiller tank water level (if visible) doesn't drop, and the chiller doesn't cut-out on its level switches.**
- e) **With the unit now running;**
  - i) Leave the cap off the tank for >30mins to allow air to escape, or very loosely screwed on to prevent water splashing out of the tank if the unit has a 'flow through' design.
- f) **Check the application and tubing for signs of leaks whilst the chiller is running.**
  - i) Replace the tank lid fully when satisfied the system is full and bled of air.

## DRAINING A SYSTEM

- a) **Isolate the unit. Have a suitable bucket or drain on-hand.**
  - i) Remove the tank lid to allow air into the system.
  - ii) Disconnect hoses individually. Be aware hoses as well as the unit are filled with fluid.
  - iii) Consider using the red transport plugs to block product ports to give yourself time to empty hoses before continuing to empty the product.
- b) **Local rules affect where fluid can be disposed of.**
  - i) Ensure hazardous products do not enter the water course and are reclaimed from the unit for professional disposal.



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## Operating Manual; Controller Operation

# Annex E-0

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### PRODUCTS WITHOUT TEMPERATURE CONTROLLERS / DISPLAYS

This guide may apply to your product if it is designed for continuous cooling or heating without any form of regulation, i.e., basic airblast products and KTR.

### WHY IS THERE NO CONTROLLER ON MY PRODUCT?

- 1 Some cooling technologies, such as airblast, are inherently safe when left to run without regulation. The worst an airblast can do to a process fluid is bring it down to ambient temperature. Naturally, a lot depends on where the airblast cooler is placed. The same is feasible with an unregulated water-to-water product, although at time of writing, ATC do not make unregulated water-to-water heat exchangers.
- 2 In a refrigerated system, such as ATC's KTR family, there is a valve that limits the lowest temperature the chiller can reach. These valves are robust and maintain their regulating ability over the lifetime of the product. They can be adjusted to allow sub zero operation; the operator must ensure appropriate process fluids are used to avoid freezing.



## DOCUMENT DETAILS

Date	1/MAR/2021	Author(s)	MJH	Page	1 / 1	Revision	1
------	------------	-----------	-----	------	-------	----------	---

## BASIC PROGRAMMING GUIDE KR1 (ALL MODELS)

This guide may apply to your product if you require general navigation advice and help accessing settings. If you are planning to change the settings in any way, you may need a copy of the existing settings which are model dependent, signified by a letter on the end of Annex E-15, i.e. Annex E-15A.

## DISPLAY CONTENTS DURING NORMAL OPERATION

- 1 Physical navigation buttons, up, down, return and enter.
- 2 8888.8 is the actual read value on input sensor.
- 3 888.8 is the setpoint value.
- 4 Rectangles bottom left 1-4 display when output is active.
- 5 MAN LED shows in manual mode (fixed output value).
- 6 °C or °F shows units as settable in the 'inP' group.
- 7 AL LED appears when output is beyond a set alarm point.



## ACCESS TO SETTINGS

- 8 Push the return button for more than 5 seconds. The upper display will show PASS while the lower display will show 0.
- 9 Using up and down buttons set the programmed password – full access is granted by entering '40'. ATC are not responsible for damage either to the chiller or the connected equipment as a result of changing parameters without ATC's oversight.
- 10 During parameter modification the instrument continues to perform process control. In certain conditions, when a configuration change can produce a significant change to the process, it is advisable to temporarily stop the controller from controlling during the programming procedure (control outputs will be OFF). A password equal to 2000 + the programmed value (i.e. 2000 + 40 = 2040). The control will restart automatically when the configuration procedure will be manually closed.
- 11 Push the return button. If the password is correct the display will show the acronym of the first parameter group 'inP'. Push button for more than 5 seconds, the instrument will come back to the "standard display".
- 12 The configuration parameters are collected in various groups. Every group defines all parameters related with a specific function (control, alarms, output functions).
- 13 Push return button for more than 5 seconds, the instrument will come back to the "standard display". For specific settings and guidance, review the controller datasheets provided by ATC. If you are not in receipt of these, please contact ATC using the information in the header of this document.

## GENERAL NAVIGATION

- 14 Return button; A short press allows to exit from the current parameter group and select a new parameter group. A long press allows you to close the configuration parameter procedure (the instrument will come back to the "standard display").
- 15 Enter button; When the upper display is showing a group and the lower display is blank, this key allows to enter in the selected group. When the upper display is showing a parameter and the lower display is showing its value, this key allows to store the selected value for the current parameter and access the next parameter within the same group.
- 16 Up button; Allows to increase the value of the selected parameter.
- 17 Down button; Allows to decrease the value of the selected parameter.
- 18 Pushing both Return and Enter buttons moves back to the previous group. Press return first to start. The selection of the group is cyclic (on a carousel), so it is possible to move back around to the group you require.

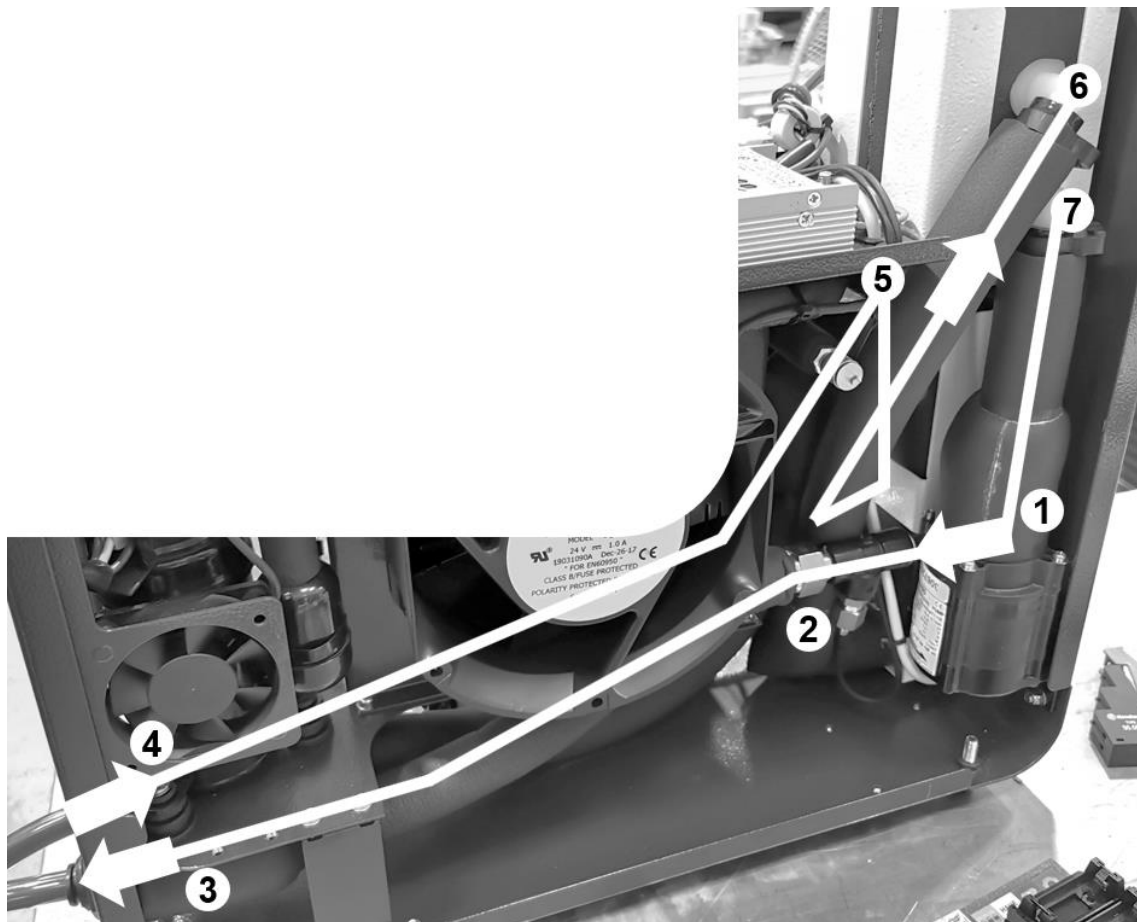
### DOCUMENT DETAILS

Date	11/MAR/2022	Author(s)	MJH	Page	1 / 1	Revision	1
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### CENTRIFUGAL OR TURBINE PUMP WITHOUT RELIEF

This arrangement comprises a centrifugal or turbine type pump without any form of flowrate control or pressure relief downstream of the pump discharge. Without any relief, it is critical to ensure the pump is not deadheaded. In systems with low-pressure pumps and no control valves in the connected application, this approach provides a simple and cost-effective water circuit, albeit one more prone to failure through lack of safety devices. This annex describes ATC's default settings and how to adjust the system.

### REPRESENTATIVE COMPONENT LAYOUT & FUNCTIONS



- |          |   |
|----------|---|
| <b>A</b> | It is important to understand the basic principle that all else being equal, higher flow results in a higher demand for pressure to overcome forces of friction and viscosity. The pump motor generates the motive force required to turn the pump head and create that pressure. |
| <b>B</b> | The more restrictive a water circuit is, the higher the pressure required to maintain flowrate. Centrifugal and turbine-type pumps are designed to generate lower pressure and higher flowrates. They are mechanically loose which usually leads to a longer lifetime in service. |
| <b>1</b> | <b>Pump discharge</b> – centrifugal is gravity fed and discharges at 90deg to the inlet.  |
| <b>2</b> | <b>Temperature sensor</b> – may or may not be present on your unit, but temperature is governed at the outlet.  |
| <b>3</b> | <b>Front outlet bulkhead fitting</b> – see Annex C for specific information about connecting to the unit.   |
| <b>4</b> | <b>Front inlet bulkhead fitting (hidden)</b> – as above.  |
| <b>5</b> | <b>Return to Plate Heat Exchanger (hidden)</b> – layouts vary, but in this unit, we return to the PHE. Other layouts may see a return to tank or return to airblast coil.   |
| <b>6</b> | <b>Tank return</b> – the ‘no relief’ system pictured has returned to tank. Some systems will go straight to pump.   |
| <b>7</b> | <b>Tank suction</b> – the feed to the pump to begin the path again.   |



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Operating Manual; Troubleshooting

# Annex G-10

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Date	9/MAR/2022	Author(s)	MJH	Page	1 / 1	Revision	1
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**A-SERIES GENERIC INITIAL TROUBLESHOOTING**

SYMPTOM	POSSIBLE CAUSE
Unit not running	Check the tank is filled past the level switch to ensure it can run.
	Check temperature of fluid and pump motor. In the case of these reaching temperatures that could cause damage, the unit will switch off.
	Check overload state and ensure internal fuses have continuity.
	Check pump motor interlock chain.
	Check supply is at correct voltage.
Noisy operation	Air in the system the has not purged causing pump vanes to rattle (where fitted).
	Bearing failure in fan or pump motor causes grinding / intermittent knocking noise.
	Fan blade is running off center and grinding against coil housing.
Fluid lines becoming fouled / containing biological matter	Not using opaque tubing can lead to UV light passing through the tubing, prompting growth of organisms.
	Not following maintenance schedule for cleaning/flushing.
Fluid seen leaking from system	Fluid may be incompatible with the materials used in chiller construction. Contact ATC to ensure the fluid is compatible.
	Rapid changes in system temperature can cause some materials to change shape at a faster rate than others and open leak paths. Contact ATC to discuss alternative materials and parts in water circuit construction if your temperature range goes beyond the standard for this product range.
	In case of centrifugal pump being fitted, minimum head of 2bar has not been observed.
Poor cooling capacity (undercooling)	Excess application thermal heat load. See Annex G-2 for a description on how to calculate this.
	Ambient air temperature has increased from nominal requirement, or flow has reduced from cooling fan.
	Process fluid pump high flowrate can yield a low delta T, i.e. outlet temperature to application will be higher than desired and return temperature will be lower than nominal. Cooling capacity will be the same.
Excess cooling capacity (overcooling)	Reduction in flowrate in an airblast system without process temperature control can yield outlet temperature much closer to ambient (lower) than system design nominals. For nominals, please contact sales@app-therm.com.
	One or more component in failure mode generating heat beyond that which the cooler can reject.
	Cooler oversized at point of design or thermal load overestimated – this can be remedied by blocking part of the cooling coil.



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Operating Manual; Maintenance for End-Users

# Annex H-1

**DOCUMENT DETAILS**

Date November 2019

Compiled by MJH

Revision 1

**PERIODIC MAINTENANCE REQUIREMENTS BY END USER**



Caution; Failure to carry out service at the specified intervals may permanently damage your equipment.

Print this sheet out and display close to the chiller to maximize the visibility of maintenance requirements.

Weekly	Week 1	Week 2	Week 3	Week 4
Check fluid level – top up as required.				

Monthly	J	F	M	A	M	J	J	A	S	O	N	D
Check the condenser is free from dust or accumulation of debris.												

Annually	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8
Drain process fluid and replace with fresh fluid.								
Check for fluid leaks throughout chiller and application.								
Clear any debris from inside the chiller.								

A vacuum cleaner is recommended for cleaning out the condenser, while soft cloths and IPA are recommended for cleaning metallic surfaces. If any spillages have occurred, best practice is to allow the water to evaporate off and wipe up remaining glycol residue with a cloth. Always clean with power supply isolated.



Caution; Never blow out the condenser with compressed air.



Caution; If the mains lead is lost or damaged, contact ATC who will be able to supply a replacement of the correct specification.



# Annex I-7

## DOCUMENT DETAILS

Date	10/MAR/2022	Author(s)	MJH	Page	1 / 1	Revision	1
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## GENERIC MAINTENANCE FOR TECHNICIANS



Warning; Water pressures of up to 10 bar during operation.



Warning; After switching off, the condenser cooling fan blades continue to rotate. Do not attempt servicing whilst the blades are rotating.



Warning; All chillers contain water and electricity in close proximity. Ensure the unit is isolated before service. This product is protected from overcurrent by fuses (or MCB) on the mains inlet. Never bypass the overcurrent protection.

Following service or repair by a trained technician;

- a) Ensure any electrical connections that may have been disturbed are given the 'tug-test'
- b) Ensure earth bonding conductors are re-attached.
- c) Ensure the correct fuses are in place.
- d) Ensure the mains cord being used is to specification, and is free from damage
- e) Subject the unit to a PAT test to ensure the unit is safe before running.
- f) Ensure there are no leaks inside or outside the unit.
- g) Using the wiring schematic for guidance, simulate faults to check each interlock's function.





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# Annex J-5

## DOCUMENT DETAILS

Date	03/FEB/2021	Author(s)	MJH	Page	1 / 1	Revision	01
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## CONFLICT MINERALS COMPLIANCE STATEMENT

Applied Thermal Control (ATC) adheres to and embraces the ethical values that support our everyday activities. As an expression of these principles and ethical values, ATC adheres to the principle of responsible sourcing of components containing precious and non-precious metals and metal salts in compliance with applicable laws and regulations.

The metals considered are Tantalum (Ta), Tungsten (W), Tin (Sn) and Gold (Au). ATC actively sources components from suppliers known to be reputable and could demonstrate compliance upon request with the Conflict Minerals acts and guidelines.

ATC uses Gold and Tin in electrical components, on PCBs and in rotating machinery, as governed by technical requirements of products. These metals could potentially originate from conflict mineral sites. As many of our suppliers do not purchase these metals direct from smelters, both they and ATC must rely heavily on information that will be provided by their suppliers to determine the source and chain of the metals in those products.

ATC is committed to working with its customers and supply chain to meet the customer's specification and requirements with regards to traceability, sourcing requirements and restrictions. ATC commits that, to the best of our knowledge, our suppliers are complying with the conflict minerals act as stated in their documentation. These statements are reviewed, and updates obtained as required.

Mitchell Howard, Technical Manager  
Signed in Coalville, UK, date 6/JUL/2020



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## Operating Manual; Declarations & Approvals

# Annex J-6

### DOCUMENT DETAILS

Date	12/FEB/2021	Author(s)	MJH	Page	1 / 1	Revision	2
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### EU DECLARATION OF CONFORMITY

Document layout; Governed by Machinery Directive 2006/42/EC, Annex II.

### REGISTERED BUSINESS ADDRESS

Applied Thermal Control Ltd, 39 Hayhill Industrial Estate, Barrow-upon-Soar, Loughborough, LE12 8LD, UK.

### AUTHORISATION TO COMPILE THE TECHNICAL FILE

Mitchell Howard, Applied Thermal Control Ltd, 39 Hayhill Industrial Estate, Barrow-upon-Soar, Loughborough, LE12 8LD, UK.

### DESCRIPTION & IDENTIFICATION OF MACHINERY

Generic denomination;	A-Series
Function;	Recirculating Cooler
Model;	All with 'A' prefix.
Type;	Air-cooled heat exchanger
Serial number;	
Commercial name;	As above.

### NOTIFIED BODY

Not applicable

### QUALITY ASSURANCE SYSTEM

QMS International Ltd, Muspole Court, Muspole Street, Norwich, NR3 1DJ, United Kingdom.  
ASCB Registered; 201409-2

### DECLARATION

The manufacturer declares that the machinery described above fulfils all the relevant provisions of the;

- Machinery Directive 2006/42/EC.
- EMC Directive 2014/30/EU, via harmonised standards;
  - IEC 61000-6-2:2005 (Immunity for industrial environments).
  - IEC 61000-6-4:2006 +A1:2011 (Emission for industrial environments).
- Low Voltage Directive 2014/35/EU.
- RoHS Directive 2011/65/EU (*RoHS 2*);
  - The machinery above contains no Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent Chromium (Cr6+), Polybrominated Biphenyls (PBB) or Polybrominated Diphenyl Ether (PBDE).
- RoHS Directive (EU) 2015/863 (*RoHS 3*);
  - Bis(2-Ethylhexyl) phthalate (DEHP): < 1000 ppm
  - Benzyl butyl phthalate (BBP): < 1000 ppm
  - Dibutyl phthalate (DBP): < 1000 ppm
  - Diisobutyl phthalate (DIBP): < 1000 ppm

### PERSON EMPOWERED TO DRAW UP DECLARATION

Robert Poniatowski, CEO

Signed in Barrow-upon-Soar, UK, date 6/JAN/2020



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# Annex J-7

## DOCUMENT DETAILS

Date	03/FEB/2021	Author(s)	MJH	Page	1 / 1	Revision	01
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### WHAT IS THE REACH REGULATION 1907/2006?

REACH is a regulation of the European Union, adopted to improve the protection of human health and the environment from the risks that can be posed by chemicals, while enhancing the competitiveness of the EU chemicals industry. REACH places the burden of proof on companies. To comply with the regulation, companies must identify and manage the risks linked to the substances they manufacture and market in the EU. They have to demonstrate to ECHA how the substance can be safely used, and they must communicate the risk management measures to the users. If the risks cannot be managed, authorities can restrict the use of substances in different ways. In the long run, the most hazardous substances should be substituted with less dangerous ones. REACH stands for Registration, Evaluation, Authorization and Restriction of Chemicals. It entered into force on 1/JUN/2007.

### REACH 'ARTICLE' COMPLIANCE CONSIDERATIONS

#### REACH ANNEX XVII COMPLIANCE

Substances under Annex XVII are restricted either in full (not to be used at all) or for specific uses (can be used in some uses but cannot be used in identified uses).

Applied Thermal Control has contacted all our suppliers and to the best of our knowledge, none of the articles that we sell intentionally contain any of the Annex XVII substances currently on the candidate list in concentrations of >0.1% by weight.

#### REACH ANNEX XIV COMPLIANCE

Substances under Annex XIV require authorization to use in the EU after sunset date, require communication to downstream recipients when over threshold (0.1% w/w at article level) and require notification to ECHA when SVHC over threshold and imported over 1000kg annually and use not already registered.

Applied Thermal Control has contacted all our suppliers and to the best of our knowledge, none of the articles that we sell intentionally contain any of the Annex XVII substances currently on the candidate list in concentrations of >0.1% by weight.

#### SVHC LIST COMPLIANCE

Substances of Very High Concern (SVHC) require communication to downstream recipients when over threshold (0.1% w/w at the article level), notification to the European Chemicals Agency (ECHA) when SVHC over threshold and when imported over 1000kg annually and use not already registered.

Applied Thermal Control has contacted all our suppliers and to the best of our knowledge, none of the articles that we sell intentionally contain any of the Annex XVII substances currently on the candidate list in concentrations of >0.1% by weight.

### DECLARATION

Mitchell Howard, Technical Manager  
Signed in Barrow-upon-Soar, UK, date 15/JUL/2020



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# Annex J-8

## DOCUMENT DETAILS

Date	03/FEB/2021	Author(s)	MJH	Page	1 / 1	Revision	01
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### WHAT IS THE POPs REGULATION 2019/1021?

POP<sub>s</sub> stands for persistent organic pollutants. In Europe, the global Stockholm Convention is implemented through POP<sub>s</sub> legislation. POP<sub>s</sub> are organic substances that persist in the environment, accumulate in living organisms and pose a risk to our health and the environment. They can be transported by air, water or migratory species across international borders, reaching regions where they have never been produced or used. International risk management is necessary as no region can manage the risks posed by these substances alone.

The European Parliament (and Council) issued regulation 2019/1021 on 20/JUN/2019, and further amended (regulation 2020/784) on 8/APR/2020.

### POP<sub>s</sub> LISTED UNDER INITIAL REGULATION 2019/1021

#### **Pesticides;**

Aldrin, Chlordane, DDT, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene, Mirex, Toxaphene.

#### **Industrial Chemicals;**

Hexachlorobenzene, Polychlorinated Biphenyls (PCBs).

#### **Industrial Chemical Byproducts;**

*Hexachlorobenzene byproducts;*

Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/PCDF), and PCBs.

### POP<sub>s</sub> LISTED UNDER AMENDMENT 2020/784

Perfluorooctanoic acid (PFOA), its salts and PFOA-related compounds.

### POP<sub>s</sub> COMPLIANCE STATEMENT

We certify that to the best of our knowledge, based upon up-to-date information from our suppliers, all products supplied by Applied Thermal Control are fully POP<sub>s</sub> compliant in accordance with regulations and amendments above mentioned.

### DECLARATION

Mitchell Howard, Technical Manager  
Signed in Barrow-upon-Soar, UK, date 27/AUG/2020



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## Operating Manual; Declarations & Approvals

# Annex J-10

### DOCUMENT DETAILS

Date	03/FEB/2021	Author(s)	MJH	Page	1 / 1	Revision	02
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### WHAT IS THE RoHS DIRECTIVE?

The RoHS Directive places restrictions on the use of certain hazardous substances in electrical and electronic equipment (EEE). RoHS compliance has been required for many years, however in 2014 it became a mandatory requirement under CE Marking. ATC products do not clearly fall within any of the existing categories of equipment, but as of 23/JUL/2019, all EEE not covered falls within scope of the directive. In contrast to RoHS 1, RoHS 2 is a CE marking Directive, and requires, for finished EEE, the use of the CE mark on the product to show compliance. The responsibility for affixing the CE mark resides with the manufacturer.

### RoHS 1 2002/95/EC

Adopted in February 2003 by the EU and taking effect on 1/JUL/2006, RoHS 1 restricted the use of 6 hazardous materials;

- 1) Lead (Pb)
- 2) Mercury (Hg)
- 3) Cadmium (Cd)
- 4) Hexavalent Chromium (Cr6+)
- 5) Polybrominated Biphenyls (PBB)
- 6) Polybrominated Diphenyl Ether (PBDE)

*We certify that to the best of our knowledge, based upon up-to-date information from our suppliers, all products supplied by Applied Thermal Control are fully RoHS 1 compliant.*

### RoHS 2 2011/65/EU

Adopted in July 2011 by the EU and taking effect on 2/JAN/2013, RoHS 2 expands the scope of RoHS 1 by adding new categories. RoHS 2 compliance is required to CE mark the product. Compliance with RoHS 2 is mandatory from 22/JUL/2019.

*We certify that to the best of our knowledge, based upon up-to-date information from our suppliers, all products supplied by Applied Thermal Control are fully RoHS 2 compliant.*

### RoHS 3 2015/863/EU

Adopted in 2015 by the EU and taking effect from 22/JUL/2019, RoHS 3 adds four additional substances to RoHS 1's list.

- 1) Bis(2-Ethylhexyl) phthalate (DEHP): < 1000 ppm
- 2) Benzyl butyl phthalate (BBP): < 1000 ppm
- 3) Dibutyl phthalate (DBP): < 1000 ppm
- 4) Di-isobutyl phthalate (DIBP): < 1000 ppm

*We certify that to the best of our knowledge, based upon up-to-date information from our suppliers, all products supplied by Applied Thermal Control are fully RoHS 3 compliant.*

### DECLARATION

Mitchell Howard, Technical Manager  
Signed in Barrow-upon-Soar, UK, date 11/NOV/2020



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Operating Manual; Declarations & Approvals

Annex J-17

DOCUMENT DETAILS

Date	10/MAR/2022	Author(s)	MJH	Page	1 / 1	Revision	1
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UKCA DECLARATION OF CONFORMITY (DoC)

Demand created by;	The Product Safety and Metrology etc. (Amendment etc.) (EU Exit) Regulations 2019
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REGISTERED BUSINESS ADDRESS

Applied Thermal Control Ltd, 39 Hayhill Industrial Estate, Barrow-upon-Soar, Loughborough, LE12 8LD, UK.

AUTHORISATION TO COMPILE THE TECHNICAL FILE

Mitchell Howard, Applied Thermal Control Ltd, 39 Hayhill Industrial Estate, Barrow-upon-Soar, Loughborough, LE12 8LD, UK.

DESCRIPTION & IDENTIFICATION OF MACHINERY

Generic denomination;	A-Series
Function;	Water cooler
Model;	All with 'A' prefix.
Type;	Airblast
Serial number;	
Commercial name;	As above.

NOTIFIED BODY

Not applicable

QUALITY ASSURANCE SYSTEM

QMS International Ltd, Muspole Court, Muspole Street, Norwich, NR3 1DJ, United Kingdom.  
 ASCB Registered; 201409-2

DECLARATION

The manufacturer declares that the machinery described above is in conformity with the relevant statutory requirements applicable to the specific product. The manufacturer takes full responsibility for the product's compliance.

- Supply of Machinery (Safety) Regulations 2008
- Electromagnetic Compatibility Regulations 2016
- Electrical Equipment (Safety) Regulations 2016
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

PERSON EMPOWERED TO DRAW UP DECLARATION

Robert Poniatowski, CEO  
 Signed in Barrow-upon-Soar, UK, date 10/MAR/2022



# Annex K-1

## DOCUMENT DETAILS

Date	03/FEB/2021	Author(s)	RW, MJH	Page	1 / 1	Revision	02
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## WARRANTY TERMS

Please visit the website warranty registration page to ensure ATC can offer you the best possible support;

**<https://www.app-therm.com/warranty-registration/>**

**a) For how long is my ATC product warrantied?**

ATC provides a comprehensive return to base 2-year parts, 1-year labor warranty from delivery as standard on all new equipment, provided it has been installed and operated in accordance with the manual.

**b) Where will ATC fulfill the product warranty?**

ATC's standard warranty terms are Return to Base (RTB) – issues with chillers are often easily solvable over the phone or email, or by reviewing ATC's technical guidance on the web and in the product manual. On occasion, at the discretion of ATC, goods may be serviced on site FOC or a service loan unit may be supplied. Warranty cover excludes the cost of travel by engineers and loan unit rental charges. Obtaining onsite service for a product, even in full warranty, is a chargeable service.

**c) Who is liable for shipping charges in the event of warranty failure?**

During the **first year** of the warranty period, freight costs for shipping to ATC are for the customer's account. Freight costs for shipping from ATC are for ATC's account.

During the **second year** of the warranty, freight costs to and from ATC are for the customer's account.

**d) I'm experiencing problems with my chiller. It's within warranty – what do I do next?**

Contact ATC to discuss the issue you are having. The contact details in the header of this document are an ideal place to start. Be sure to have your model number and serial number on-hand to aid those attempting to solve remotely.

**e) Telephone support couldn't fix my chiller – what do I do next?**

An RMA form must be completed. This allows both the end-user and ATC to clarify your details, to set the party responsible for shipping costs, and to set a different return address if desired. Shipping advice is provided, and the end-user must sign a declaration that states the unit is safe to handle. Return the form by email for fastest response.

**f) What happens if my chiller failed outside warranty or requires non-warranty repair work?**

A purchase order will be requested to cover an initial inspection – this will only be invoiced if the inspection shows there is no fault. If packaging is required, i.e. a crate, a separate charge will be levied. If the end user prefers ATC to arrange a collection, a shipping charge may be levied.

**g) Our process must continue running – can we have a loan unit whilst our chiller is in repair?**

ATC hold several standard air-cooled chillers at the factory for the sole purpose of offering for loan – these are available on a first-come, first-serve basis. Models up-to 3kW capacity are available.



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Operating Manual; Recommended Spares

# Annex M-7

**DOCUMENT DETAILS**

Date	11/MAR/2022	Author(s)	MJH	Page	1 / 2	Revision	3
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**RECOMMENDED SPARES FOR A-SERIES**

Recommended spares include all rotating machinery (i.e. motors, fans), all sacrificial elements (i.e. fuses) and parts that users interact with (dials, fittings). Pricing is available from sales@app-therm.com.

**A01 (MA485 CHASSIS)**

PN	Description	QTY
EA770	Appliance inlet module	1
EA044	CORDSET – UK BS1363 to C13, 2m, right angle head (to suit appliance C14)	1
EA507	FUSE – T5A H250V UL-OK (FS1+2)	2
EA769	FUSE – T4A H250V UL-OK (FS3)	1
EA506	FUSE – T2A H250V UL-OK (FS4)	1
EA815	PSU – universal input, 24VDC 350W output	1
EA781	Level switch	1
EA834	Relay	1
WA696	Pump – PC6 (A01061U)	1
WA697	Pump – PC3 (A01032U)	1
RA287	Fan – 172mm axial frame fan 24Vdc	1

**A03 (MA165 CHASSIS)**

PN	Description	QTY
EA513	FUSE - T0.5A L250V UL-OK	1
EA626	Circuit Breaker 2 pole 10	1
WA334	Pump head – P5	1
EA517	Pump motor 230V 1/2~ for PD pumps P5 P10 P15	1
RA320	FAN ASSY - 300mm 4pole fixed speed PSC motor (fixed speed models)	1
EA846	FAN ASSY - 300mm 1700RPM EC motor 0-10Vdc (variable speed models)	1
EA586	Sensor PT100B, 1/4" BSP	1
	Control – KR3 (variable speed models)	1
EA781	Level switch	1

**A08 & A12 STANDARD -0SPEC & -3SPEC MODELS**

PN	Description	QTY
EA643	Overload 4-6.3A	1
EA101	Auxiliary contact	1
EA252	No volt release (undervoltage trip)	1
EA781	Level switch	1
EA517	Pump motor 230V 1/2~ for PD pumps P5 P10 P17	1
EA617	Pump motor 400V 3~ for PD pumps P5 P10 P17	1
WA319	Pump head – P10	1
WA318	Pump head – P17	1
WA781	Pump – Turbine 17L/min@5bar 400V 3~ 50Hz	1
RA116	FAN – EC motor (fixed speed models)	4 / 6
EA779	Lamp 230Vac 1/2~	1
EA208	Fan – PSC motor, high flow 2pole.	4 / 6





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## Operating Manual; Recommended Spares

# Annex M-7

### DOCUMENT DETAILS

Date	11/MAR/2022	Author(s)	MJH	Page	2 / 2	Revision	3
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### A08NS420 ADDITIONAL PARTS

PN	Description	QTY
EA895	Fans – 3~ 400V	1
64-415	Low voltage PSU, input 180-550Vac 1/2~	1
EA816	Control – Z31 24Vdc (for on-off control, OR simple temperature display OR VFCs)	1
EA092	Flow switch	1
EA896	Supply lamp, white, 24Vdc	1
EA834	Relay	3
EA781	Level switch	1
EA812	Contactora 12A/phase 5.5kW 24Vdc coil	1

# SAFETY DATA SHEET

## HEXID A4 HEAT TRANSFER FLUID

Conforming to Directive 1907/2006/EC

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

<b>1.1. Product Name</b>	Hexid A4
<b>1.2. Supplier</b>	Applied Thermal Control Limited 39 Hayhill Industrial Estate, Barrow upon Soar, Leicestershire, LE12 8LD. United Kingdom. www.app-therm.com
<b>1.3. Telephone Number</b>	+44(0)1530 839998
<b>1.4. Email</b>	<a href="mailto:sales@app-therm.com">sales@app-therm.com</a>
<b>1.5. Emergency Telephone Number</b>	+44(0)1530 839998
<b>1.6. Intended/Recommended Use</b>	Heat Transfer Fluid

### SECTION 2: HAZARDS IDENTIFICATION

- 2.1. Classification of the substance or mixture**  
The product is not classified as dangerous according to Regulation (EC) No. 1272/2008.  
This mixture is not classified as dangerous according to Directive 1999/45/EC.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

- 3.1. Chemical Nature** Water (CAS 7732-18-5), not classified.  
Propylene glycol (CAS 57-55-6) (REACH 01-2119456809-23)  
(EINECS 200-338-0) not classified.  
Fluorescein (trace) and biocide (trace) not classified.
- 3.2. Food Grade**

### SECTION 4: FIRST AID MEASURES

- General advise** No special precautions required. Treat symptomatically.
- 4.1. Eye Contact** Rinse thoroughly with plenty of water, also under the eyelids. Remove contact lenses after a few minutes and continue rinsing. If symptoms persist, call a physician.
- 4.2. Skin Contact** Wash off immediately with plenty of water. If skin irritation persists, call a physician.
- 4.3. Inhalation** Remove to fresh air. If symptoms persist, call a physician.
- 4.4. Ingestion** Rinse mouth with water. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

### SECTION 5: FIREFIGHTING MEASURES

- 5.1. Extinguishing media**  
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Water spray, foam, dry powder or CO<sub>2</sub>. Alcohol-resistant foam
- 5.2. Unsuitable extinguishing Media**  
High volume water jet. Do not use a solid water stream as it may scatter and spread fire.
- 5.3. Specific hazards during firefighting**  
In fire conditions, toxic decomposition products may be formed (see also section 10). In combustion, emits fumes, smoke, carbon dioxide (CO<sub>2</sub>) and carbon monoxide (CO). Heating will cause a pressure rise - with severe risk of bursting and explosion, Violent steam generation or eruption may occur upon application of direct water to hot liquids.
- 5.4. Advice for firefighters**  
In the event of fire, wear self-contained breathing apparatus. Wear personal protective equipment. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. Keep containers cool by spraying with water if exposed to fire. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Burning fluids may be extinguished by dilution with water

# SAFETY DATA SHEET

## HEXID A4 HEAT TRANSFER FLUID

Conforming to Directive 1907/2006/EC

### SECTION 6: ACCIDENTAL RELEASE MEASURES

#### 6.1. Personal precautions

Use personal protective equipment. Avoid contact with skin and eyes. Keep unnecessary and unprotected personnel from entering the area.

#### 6.2. Precaution to protect the environment

Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.

#### 6.3. Clean-up procedures

Contain the spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal. Dike the area of spill to prevent spreading and pump liquid to salvage tank. Treat recovered material as described in section 13 Disposal considerations.

### SECTION 7: HANDLING AND STORAGE

#### 7.1. Precautions for safe handling

Keep container tightly closed. Handle in accordance with good industrial hygiene and safety practice. Spills of these organic materials on hot fibrous insulations may lead to lowering of the auto-ignition temperatures possibly resulting in spontaneous combustion.

#### 7.2. Conditions for safe storage

Keep only in the original container.

### SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

#### 8.1. Control parameters

Component: Propane-1,2-diol CAS-No. 57-55-6

Other Occupational Exposure Limit Values EH40 WEL, Time Weighted Average (TWA):, Total vapour and particulates.150 ppm, 474 mg/m<sup>3</sup>

EH40 WEL, Time Weighted Average (TWA):, Particulate.10 mg/m<sup>3</sup>

ELV (IE), Time Weighted Average (TWA):, Total vapour and particulates.150 ppm, 470 mg/m<sup>3</sup>

ELV (IE), Time Weighted Average (TWA):, Particulate.10 mg/m<sup>3</sup>

#### 8.2. Exposure controls/Appropriate engineering controls

Local exhaust. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

#### Personal protective equipment

Respiratory protection Suitable respiratory protective device Combination filter: A-P2

Filter Type Combined particulates and organic vapour type

Hand protection Category short time exposure Break through time > 10 min

Protective index Class 1 When prolonged exposure is expected: Break through time > 120 min

Protective index Class 4 Observe the information of the glove manufacturers on permeability.

Protective gloves should be chosen according to Workplace Safety Assessment.

Gloves recommended according to EN 374 (protection against chemicals).

Material Chemical resistant gloves made of butyl rubber or nitrile rubber category III according to EN 374.

### SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1	Appearance at 20°C	Fluorescent green clear liquid
9.2	Odour	Almost odourless
9.3	Flash point	Boils without flashing
9.4	Ignition temperature	Not Available
9.5	Flammability Limit	Not Available
9.6	Oxidizing Properties	Not Available
9.7	Auto flammability	450°C
9.8	Density at 25°C	~1.036g/cm <sup>3</sup>
9.9	pH (as is)	7
9.10	Boiling point	102°C
9.7	Auto flammability	450°C
9.8	Solubility in water	Miscible
9.9	Freezing point	-21°C

# SAFETY DATA SHEET

## HEXID A4 HEAT TRANSFER FLUID

Conforming to Directive 1907/2006/EC

9.10	Specific Heat Capacity	3.78kJ/kg °K
9.11	Viscosity, Kinetic, at 25°C	3.51mPa.s

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### SECTION 10: STABILITY AND REACTIVITY

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#### 10.1. Reactivity

Stable under recommended storage conditions. No dangerous reaction known under conditions of normal use.

#### 10.2. Chemical stability

No decomposition if stored and applied as directed. Stable under recommended storage conditions. Hygroscopic.

#### 10.3. Hazardous reactions

Hazardous polymerisation does not occur.

#### 10.4. Conditions to avoid

Generation of gas from decomposition causes pressure in closed systems. Keep away from direct sunlight. Avoid high temperatures. Avoid temperatures exceeding the decomposition temperature. Avoid UV light.

#### 10.5. Materials to avoid

Strong acids, Strong bases, Strong oxidizing agents.

#### 10.6. Hazardous decomposition products

Aldehydes, Alcohols, Ether, Organic acids.

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### SECTION 11: TOXICOLOGICAL INFORMATION

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#### 11.1. Toxicity Oral

LD50 : > 20000 mg/kg (rat) This product can present a small hazard if large quantities are swallowed.

#### 11.2. Inhalation

LC50 : 6.15 mg/l (rat; 4 h; vapour) At ambient temperature the exposure to vapours is minimal due to a low volatility rate. Inhalation may cause irritation to the nose, throat, upper respiratory tract and lungs. No deaths occurred

#### 11.3. Dermal

LD50 : > 20000 mg/kg (rabbit) Prolonged skin contact is unlikely to result in absorption of harmful amounts. Skin irritation by prolonged exposure is unlikely. Repeated contact may cause flaking and softening of skin.

#### 11.4. Eyes

Slight irritation is possible. Direct contact with eyes may cause temporary irritation. Corneal injury is unlikely.

#### 11.5. Sensitisation

Patch test on human volunteers did not demonstrate sensitisation properties.

#### 11.6. CMR Carcinogenicity

Animal testing did not show any carcinogenic effects. Information given is based on data obtained from similar substances.

#### 11.7. Mutagenicity

No data available.

#### 11.8. Reproductive toxicity

No data available.

#### 11.9. Specific Target Organ Toxicity

Single exposure no data available. Repeated exposure no data available.

#### 11.10. Other toxic properties

Repeated dose toxicity. In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system effects. Aspiration hazard Due to its physical properties, the substance does probably not pose any aspiration hazard.

#### 11.11. Other relevant toxicity information

Handle in accordance with good industrial hygiene and safety practice.

#### 11.12. Experience with human exposure

Health injuries are not known or expected under normal use.

# SAFETY DATA SHEET

## HEXID A4 HEAT TRANSFER FLUID

Conforming to Directive 1907/2006/EC

### SECTION 12: ECOLOGICAL INFORMATION

#### 12.1. Acute toxicity

Fish - LC50 : 40613 mg/l (Oncorhynchus mykiss; 96 h) (static test)

Daphnia and other aquatic invertebrates - LC50 : 18340 mg/l (Ceriodaphnia Dubia (water flea); 48 h) (static test)

Algae - ErC50 : 19000 mg/l (Pseudokirchneriella subcapitata (green algae); 96 h) (Growth inhibition)

Bacteria - NOEC : > 20000 mg/l (Pseudomonas putida; 18 h) Chronic toxicity

Aquatic invertebrates - NOEC : 13020 mg/l (Ceriodaphnia Dubia (water flea); 7 d) (semi-static test)

#### 12.2. Persistence and degradability

Biodegradability 81 % (anaerobic; Exposure Time: 28 d)(OECD 301 F)

Readily biodegradable 96 % (anaerobic; Exposure Time: 64 d)(OECD 306.)

#### 12.3. Bioaccumulative potential

BCF - 0.09 estimated Low bioaccumulative potential

#### 12.4. Mobility

Estimated Koc < 1, indicating very high soil mobility.

#### 12.5. PBT and vPvB assessment

Not a PBT or vPvB substance or mixture

#### 12.6. Other adverse effects

Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration. This substance is not in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

### SECTION 13: DISPOSAL CONSIDERATION

#### 13.1. Waste treatment methods

Disposal together with normal waste is not allowed. Special disposal required according to local regulations. Do not let product enter drains. Contact waste disposal services.

#### 13.2. Contaminated packaging

Empty contaminated packaging thoroughly. They can be recycled after thorough and proper cleaning. Packaging that cannot be cleaned are to be disposed of in the same manner as the product.

#### 13.3. European Waste Catalogue Number

No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

### SECTION 14: TRANSPORT INFORMATION

Not dangerous goods for ADR, RID, IMDG and IATA.

#### 14.1. EEC Regulations

**UNNO** None **Class** None **Packing Group** None

Road & Rail Transport (ADR & RID) None **IMDG** Not Applicable **ICOA** None

### SECTION 15: REGULATORY INFORMATION

**15.1** Classification Not classified as hazardous to users.

**15.2** CAS No. 57556

**15.3** Risk or Safety phrases None

**15.4** Labelling None

### SECTION 16: OTHER INFORMATION

Key literature references and sources for data taken from supplier information and data from the "Database of registered substances" of the European Chemicals Agency (ECHA) were used to create this safety data sheet. Other information - The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and does not constitute a legal relationship.

The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.