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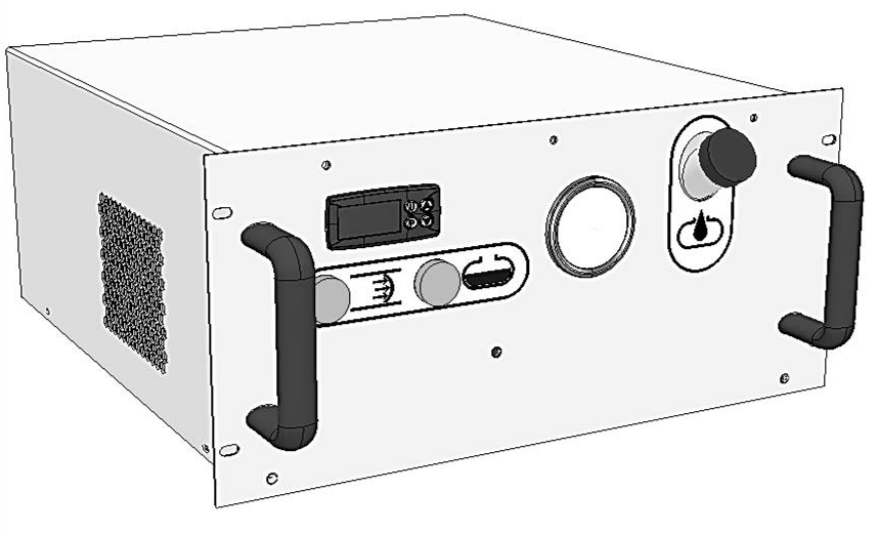
Installation, Operation & Service Manual

XR-Series

DOCUMENT DETAILS

Date	7/OCT/2020	Author(s)	MJH	Page	1 / 5	Revision	1



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DOCUMENT DETAILS

Date	7/OCT/2020	Author(s)	MJH	Page	2 / 5	Revision	1

CHANGE LOG

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7/OCT/2020	1	ALL	First release

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DOCUMENT DETAILS

Date	7/OCT/2020	Author(s)	MJH	Page	3 / 5	Revision	1

PRODUCT SPECIFICATIONS

Attribute	XR04059	XR08109	XR15179
Weight	30kg	30kg	30kg
	66lbs	66lbs	66lbs
Rack form factor	Standard 19”	Standard 19”	Standard 19”
‘U’ height	5U	5U	5U
Depth	500mm	500mm	500mm
	19.7”	19.7”	19.7”
Heat transfer fluid volume	2.3L	2.3L	2.3L
	0.6USGallons	0.6USGallons	0.6USGallons
Cooling capacity (delivery temperature at 10°K above house water supply at nominal flowrate)	4kW	8kW	15kW
	13,649BTU/h	27,297BTU/h	51,182BTU/h
	1.137TR	2.275TR	4.265TR
Temperature stability	0.1±°C	0.1±°C	0.1±°C
Temperature resolution	0.1±°C	0.1±°C	0.1±°C
Standard temp. range	+4°C to +55°C	+4°C to +55°C	+4°C to +55°C
Standard max return temp.	+65°C	+65°C	+65°C
Optional temp. range	+90°C	+90°C	+90°C
Control method	House water modulation	House water modulation	House water modulation
Temperature sensor	PT100	PT100	PT100
Stability achieved by	PID controller	PID controller	PID controller
Power supply requirement	208-230Vac	208-230Vac	208-230Vac
	50/60Hz	50/60Hz	50/60Hz
	1~ / 2~	1~ / 2~	1~ / 2~
	3A@230Vac	3A@230Vac	4A@230Vac
Design flowrate	5L/min	10L/min	17L/min
Pressure relief valve	Internal, 1-10bar (20-150psi)		
Fluid fittings	1/2" BSPPF		
Sound pressure level	45dBA@1m		
Tool-less access	No		
Anti-backfill protection	Yes		
Overtemperature protection	Yes		
Out of temperature range	Yes, visual, on controller		
Low fluid level alarm	Yes, visual, lamp		
Run-dry protection	Yes		
Low flow warning	Yes, visual, lamp		
Overcurrent protection	Fused, 2* T6.3A H250V		
Rated duty cycle	Continuous		
Compatible heat transfer fluids	DI water, propylene glycol mixes, Hexid A4 & A6		

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DOCUMENT DETAILS

Date	7/OCT/2020	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. 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.

	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 8 bar during operation.
	Warning; Water and electricity in close proximity to one another. Always ensure the unit is isolated before service. The product is protected from overcurrent by mains fusing. Never bypass this component.
	Warning; 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.

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DOCUMENT DETAILS

Date	7/OCT/2020	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 191122 Unpacking - Weighing over 18kg
Annex B-3 200810 XR-Series site and environmental requirements
Annex C-2 201007 Installation - XR-Series
Annex D-3 201007 Fluid handling procedures - Generic
Annex D-4 201007 Fluid handling procedures - Anti-backfill mechanism
Annex E-5 200207 KR3 Basic programming guide
Annex F-3 201007 PD pump using discrete PRV
Annex G-7 201008 XR-Series, generic initial troubleshooting
Annex H-2 200909 End-user maintenance - water-cooled units with water as fluid
I Annex I-5 201008 Maintenance for technicians - X-series units
Annex J-3 200120 X-series EU DoC
Annex J-5 200706 Conflict Minerals compliance statement
Annex J-7 200715 REACH compliance statement
Annex J-8 200827 POPs compliance statement
Annex K-1 200623 Standard warranty terms of ATC
Annex M-4 201008 Recommended spares, XR-Series
Annex R-3 200203 SDS Hexid A4 v6.3

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Annex A-1

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UNPACKING

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.

As the unit is >18kg, ATC must recommend that 2 persons are used to lift by hand, or a crane. 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.

Please retain all packaging in the unlikely event that the chiller needs to be returned to our local representatives.

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Annex B-3

DOCUMENT DETAILS

Doc. Date	7/OCT/2020	Author(s)	LW, MJH	Page	1 / 1	Revision	2

XR-SERIES SITE & ENVIRONMENTAL REQUIREMENTS

a) **Rack mounting** – Secure the XR-Series product in the rack unit. Ensure that all fixings are secured and torqued to the correct level. 4 x M6 bolts are enough to secure the unit to the rack, however, it is advisable to install additional support to carry the weight of the product at the rear of the rack. This may be the 'left-to-right' type, taking the weight across the back-lower edge, or the 'front-to-back' type, taking the weight along both bottom-left and bottom-right edges.

b) **Clean, dust-free environment** – the XR-Series units use an internal axial frame fan to provide airflow for cooling the pump motor. Do not block these vents. The system will shut down in the event the motor overtemperature trip is triggered.

c) **Non-condensing ambient temperature** – +5°C to +40°C (+39°F to +104°F). This prevents build-up of moisture on internal components.

d) **Humidity** - 80% for ambient temperatures up to +31°C (+88°F), decreasing linearly to 50% relative humidity at +40°C (+104°F) ambient temperature.

e) **Electrical supply** – The XR-Series can accept;
   a. Voltage fluctuations of ±10% of the nominal voltage range.
   b. Frequency of 50Hz or 60Hz.
   c. Maximum current draw of 4.5A@230VAC; mains fusing is rated 6.3A, accessible from rear.
      i. See product rating label for fuse specification.
      ii. Two modes of supply are acceptable; **L1 / N / E** or **L1 / L2 / E**
      iii. The inlet module itself is rated 10A 250V.
      iv. Protective earth must be provided by user at IEC type C14 appliance inlet.

f) **Clearance** – the rack form factor limits clearance considerations to the rear face of the unit. Ensure there is sufficient room at the rear of the product to remove the power cable without obstruction. Ensure bend radius of your chosen hose/tube/pipework is not compromised. The front face has no vents. Left and right side clearance is dictated by the rack cabinet.

g) **Plumbing** – tubing, piping or hose must be clean and compatible with the fluid to be used. The chiller is compatible with deionized water and water-glycol mixtures such as Hexid fluid.

h) **Indoor use only** – altitude up to 2000m.

i) **Installation category** – transient overvoltage category II; Pollution degree 2. Temporary overvoltages occurring on mains supply are acceptable within limits defined in the aforementioned categories.

Caution; Always use ATC recommended fluids in your chiller – many other anti-freeze mixtures have the potential to corrode your application and to damage seals in the chiller.

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Annex C-2

DOCUMENT DETAILS

Date	7/OCT/2020	Author(s)	LW, MJH	Page	1 / 1	Revision	1

INSTALLATION

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;

a) **Short in length** – this reduces friction-based pressure drop and addition ambient heat load

b) **Large diameter bore** – at least 12mm (1/2”).

c) **Free from 90° bends** – 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.

d) **Clean** – 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.

e) **Opaque, ideally black** – to inhibit light passing through the tube and algae building up. Alternatively, solid ABS or copper pipe can be used where application chemistry allows.

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

The XR-Series is supplied with 1/2” British Standard Pipe Parallel Female (BSPPF) threads (also known as G threads (ISO228)) by default, for both application/process and house/primary water supply. These fittings are not valved and will ‘drop’ the volume of the system if left open to atmosphere.

Ensure the appropriate thread sealants are used in the fitting of adapters to hose. For metallic mating parts, we recommend Loctite 577. For plastic adaptors such as those supplied with the product, we recommend using ~8-12mm wide PTFE tape, wrapped around the male thread before tightening.

Ensure that the system is correctly connected. The ‘donut’ labels around the ports are clearly marked with inlet and outlet symbols and the function in both English and French languages. Ports marked as outlets mean fluid leaves the product and must be connected to the process inlet or house water return line. Check all joints are tight and leak free.

Where this product is incorporated into other equipment, it is the responsibility of the assembler to ensure safety.

Caution; Do not replace detachable mains cords with inadequately rated cords. Contact ATC for appropriately rated products.

Preventing Backfilling – 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. The weakest seal is normally the tank lid, and this is typically where fluid will escape the unit. Ideally the XR-Series 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. Please raise any questions with the sales team on sales@app-therm.com.

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Annex D-3

DOCUMENT DETAILS

Date	7/OCT/2020	Author(s)	LW, MJH	Page	1 / 1	Revision	1

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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Annex D-4

DOCUMENT DETAILS

Date	7/OCT/2020	Author(s)	MJH	Page	1 / 1	Revision	1

LIMITATION OF SINGLE SWITCHING POINT

In a system with a single level switch, there is only one point the water level must be above in order to have the unit run. As the tank level drains through natural losses, connections/disconnections, etc., the level gets ever closer to the switching point. In a system where the application and hosing are more flexible, poorly bled of air, or a small elevation difference exists, it's not uncommon to see some liquid return to the tank after the unit is turned off (whether by hand or by interlock). This liquid return (sometimes called drainback) can be enough to re-satisfy the level switch and re-start the product, thus emptying the tank again and shutting down once more. The product then enters a cycle of stopping and starting, detrimental to pump health and the electrics that drive it.

ANTI-BACKFILL LEVEL SWITCH ARRANGEMENT

Products with an anti-backfill level switch system are designed to prevent the product from stopping and starting continuously. A pair of level switches are present in the tank. The first is in the same position as in a single switching point system. Upon filling, this first lower switch becomes satisfied. Upon continued filling, a second switch (the upper, or anti-backfill switch) becomes satisfied. As the unit runs, the level slowly reduces – the upper switch becomes dissatisfied, but the unit doesn't stop, it keeps going until the lower switch is dissatisfied also preventing the pump from running dry as it shuts down. As fluid reenters the tank from sources outside the product, the bottom level switch is re-made, but fluid volume is insufficient to satisfy the upper level switch. Electrically, the system requires the upper level switch to be re-made before starting again.

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Annex E-5

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Date	07/FEB/2020	Author(s)	LW, MJH	Page	1 / 3	Revision	1

BASIC PROGRAMMING GUIDE KR3T-HCIRRD-Q-UK

*This guide should be used alongside the full engineering manual, appropriate to the instrument being used, where more detailed information can be found (download manual from **www.t-uk.co.uk**).*

Programming the Instrument

Tecnologic controllers are supplied with default programmable settings that may be suitable for your application. However we recommend that you go through the programming process, as incorrect programming could compromise its performance.

There are four possible ways of programming the KR range of controllers:

1. **Quick setting** - using 8 numbers derived from a parameter option list shown later in this document. ***If the options you require are not shown you will need to use either the basic or full menu options.***
2. **Basic menu** – Most standard options can be programmed here in a simple sequential parameter list.
3. **Full menu** - All programming options are here, split into sub-menus.
4. **Via software or memory KEY015-E** – Key plugs into controller and PC via USB.

Programming level pass numbers

300 - Quick setting using a 2 x 4 digit code.

81 - Basic menu with 10 second time out function.

40 – Full menu

Note: To reset instrument to factory default settings, press **P** for 5 seconds and dial in **-481.** Press **P** to confirm

Key

U	U button is used for navigation between menus. Holding down for 1 second will take you back one step. Holding down for 2 seconds will take you out of configuration.
P	P button used for entering or moving to the next parameter.
△ ▽	Up & down buttons used for increasing or decreasing values.

Quick Setting Configuration Codes

The controller configuration (Input type, Control mode Alarms and Auxiliary functions) can be made by entering two 4-digit codes. You can work out the 2 relevant configuration codes using the tables below.

To work out code 1

Cod1

L	M	N	O

Input Type & Range		L	M
TC J	-50...+1000°C	0	0
TC K	-50...+1370°C	0	1
TC S	-50...+1760°C	0	2
TC R	-50...+1760°C	0	3
TC T	-70...+400°C	0	4
Infrared J	-50...+785°C	0	5
Infrared K	-50...+785°C	0	6
PT100 / PTC KTY81-121	-200... +850°C/ -55...+150°C	0	7
PT1000 / NTC 103-AT2	-200... +850°C/ -55...+110°C	0	8
Linear 0...60mV		0	9
Liner 12...60mV		1	0
Linear 0...20mA (this selection forces out 4=TX)		1	1
Linear 4...20mA (this selection forces Out 4=TX)		1	2
Linear 0...5V		1	3
Linear 1...5V		1	4
Linear 0...10V		1	5
Linear 2...10V		1	6
TC J	-58...+1832°F	1	7
TC K	-58...+2498°F	1	8
TC S	-58...3200°F	1	9
TC R	-58..+3200°F	2	0
TC T	-94..+752°F	2	1
Infrared J	-58..+1445°F	2	2
Infrared K	-58..+1445°F	2	3
PT100 / PTC KTY81-121	-328...+1562°F/ -67...+302°F	2	4
PT1000 / NTC 103-AT2	-328...+1562°F/ -58...+230°F	2	5

Control Mode	OP1	OP 2	OP 3	OP 4	N	O
ON/OFF heating = H	H	AL1	AL2	AL3	0	0
	NU	AL1	AL2	H	0	1
ON/OFF cooling = C	C	AL1	AL2	AL3	0	2
	NU	AL1	AL2	C	0	3
ON/OFF with neutral zone (H/C)	H	C	AL2	AL3	0	4
	H	AL1	AL2	C	0	5
	C	H	AL2	AL3	0	6
	NU	H	AL2	C	0	7
	C	AL1	AL2	H	0	8
	NU	C	AL2	H	0	9
PID heating =H	H	AL1	AL2	AL3	1	0
	NU	AL1	AL2	H	1	1
PID cooling =C	C	AL1	AL2	AL3	1	2
	NU	AL1	AL2	C	1	3
PID double action (H/C)	H	C	AL2	AL3	1	4
	H	AL1	AL2	C	1	5
	C	H	AL2	AL3	1	6
	NU	H	AL2	C	1	7
	C	AL1	AL2	H	1	8
	NU	C	AL2	H	1	9

Entering the codes

Press 'P' and then enter the pass code, 300.
Press 'P' again. You can now enter in code 1.
Press 'P' and enter code 2 in.
The screen will then flash is code is accepted or not.

To work out code 2

Cod2

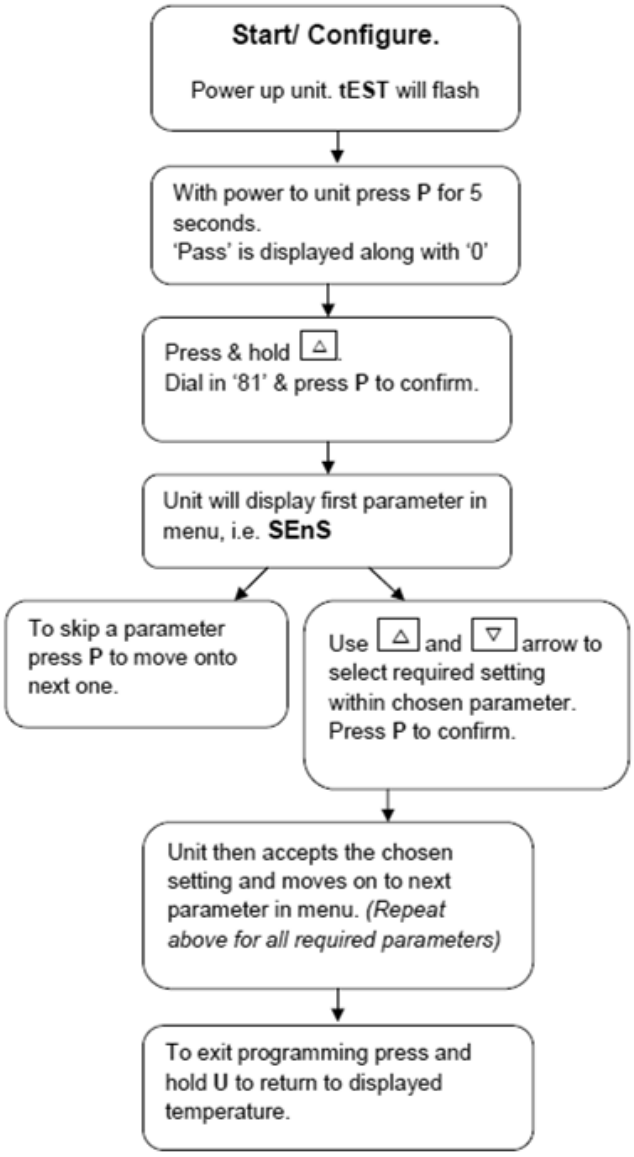
P	Q	R	S

Alarm 3				R
Alarm 2			Q	
Alarm 1		P		
Not used		0	0	0
Sensor break		1	1	1
Absolute	High	2	2	2
	Low	3	3	3
Absolute High/Low	External High/Low	4	4	4
	Internal High/ Low	5	5	5
Deviation	Deviation High	6	6	6
	Deviation Low	7	7	7
Band	External Band	8	8	8
	Internal Band	9	9	9

Auxiliary functions activation	S
None	0
Wattmeter (instantaneous power expressed in W)	1
Wattmeter (energy expressed in Wh)	2
Absolute worked time (expressed in days)	3
Absolute worked time (expressed in hrs)	4

Navigating the basic level programming guide

This is a blueprint guide for changing all the parameter settings on the instrument within the 81 basic menu.



81 Basic parameter menu

Display	Parameter name/ description	Manual ref.
SEnS	Sensor/ input type	[1]
dP	Decimal point position	[2]
unit	Engineering Unit	[5]
o1F	Output function 1	[13]
o2F	Output function 2	[18]
o3F	Output function 3	[21]
o4F	Output function 4	[24]
cont	Control type	[55]
Auto	Auto tuning for PID parameters	[56]
Pb	Proportional band value (°C)	[61]
ti	Integral time	[62]
td	Derivative time	[63]
Fuoc	Fuzzy overshoot control	[64]
tcH	Heating output cycle time	[65]
SPLL	Min. adjustable set point value	[76]
SPHL	Max. adjustable set point value	[77]
SP	Control set point	[78]
AL1t	Alarm 1 type/function	[27]
AL2t	Alarm 2 type/function	[35]
AL3t	Alarm 3 type/function	[43]
di.cL	Display colour	[122]
io4.F	Input/ Output 4 function	[9]

Note: *Some parameters will disappear and/or additional parameters will appear depending on settings selected. If the advanced menu is required use the 40 pass code & select appropriate menu using the 'U' key. Please refer to the main manual.*

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Operating Manual; Pressure & Flow Adjustment

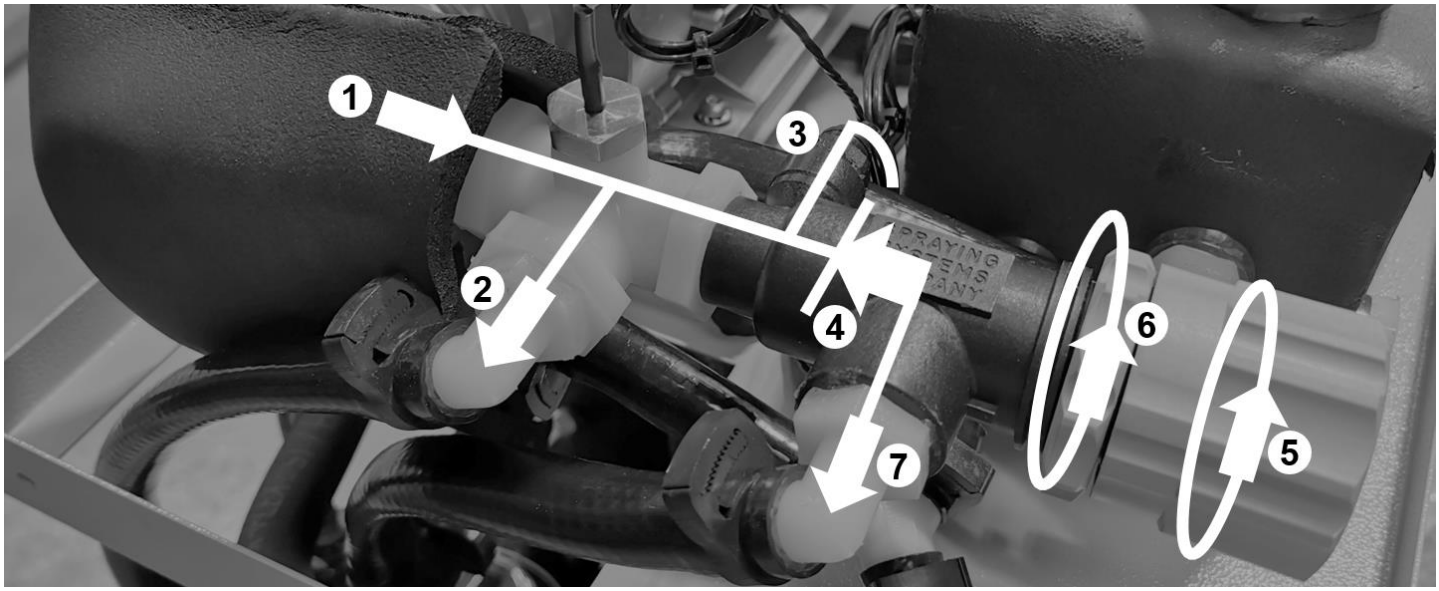
Annex F-3

DOCUMENT DETAILS

Date	7/OCT/2020	Author(s)	MJH	Page	1 / 2	Revision	1

POSITIVE DISPLACEMENT PUMPS & DISCRETE PRESSURE RELIEF VALVE

This arrangement comprises a positive displacement pump (most commonly a rotary vane type) with a spring-loaded pressure relief valve to provide better overpressure setting control with minimal flow losses compared to fixed orifice bypasses/reliefs. This annex describes ATC's default settings and how to adjust the system.



It is important to understand the basic principle that all else being equal, higher flow results in a higher demand for pressure. The motor generates the power required to turn the pump head and create that pressure. The more restrictive a water circuit is, the higher the pressure required to maintain flowrate. Positive displacement pumps are designed to generate high pressure and are mechanically tight - their RPM dictates flowrate. See image;

1) **Pump discharge** – fluid leaves the pump head and enters the gauge-tee assembly. It passes the temperature sensor at the tee, and when the pressure relief is inactive, fluid heads towards no. 2.

2) **Outlet to process** – fluid heads out of the product to the application. Whatever restrictions lie downstream, fluid leaving this point has not passed through the pressure relief valve.

3) **Pressure gauge connection** – connection to a pressure gauge on the front panel of the product. This displays the pressure in the water circuit, *at the pump outlet, not the application which will be lower.*

4) **Pressure Relief Valve (PRV)** – spring tension in the body of the PRV determines whether fluid travels through point 2 or passes through to point 7.

5) **PRV adjustment knob** – rotate clockwise to increase maximum delivery pressure. Rotate anti-clockwise to limit maximum delivery pressure.

6) **PRV adjustment locknut** – release this locknut to adjust no.5. Ensure it is tightened once adjustments are made. If it is not, vibration may cause the adjustment knob to move on itself.

7) **Bypass flow outlet** – where the pressure requirement to overcome restrictions downstream of no.2 rises to be higher than the setting at no.5, the spring inside no.4 will compress and allow liquid to start bleeding through to no.7. It is important to understand that the nature of the spring means there can be no black and white point for pressure relief setting – the spring will slowly compress and bleed flow until all flow passes through no.7. When fully bypassing, all flow stays inside the chiller to protect the application.

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Annex F-3

DOCUMENT DETAILS

Date	7/OCT/2020	Author(s)	MJH	Page	2 / 2	Revision	1

SETTING THE PRESSURE RELIEF VALVE (BYPASS)

Unless otherwise agreed at point of sale, the default setting for this type of pump and PRV arrangement is 3.33bar (50psi). In the absence of external calibrated pressure gauges, it's possible to use the chiller itself to set this value;

8) **Isolate the chiller** – always isolate before performing work.

9) **Disconnect from the application if already connected** – review the draining procedure in Annex D.

10) **Connect the chiller's process inlet to process outlet** – a short run of hose around 1-2m (3-6ft) will be adequate.

11) **Start the chiller and follow the fill process from Annex D** – fluid will now be running through a short loop with very low pressure required to overcome the restriction.

12) **With the chiller running, very slowly kink the short run of hose fitted above** – this simulates a blocked application – this is known as 'deadheading' the pump. Without PRV, the pump motor would stall or hoses might blow off. Watch the pressure gauge climb as you apply the kink.

13) **The pressure gauge will eventually stop climbing with the hose fully kinked** – note the value; this is the setting of the PRV where all flow is bypassed.

14) **Refer to points 5) and 6) above to adjust if required** – contact ATC if you're unsure over whether your desired setting is reasonable for the product you have.

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Annex G-7

DOCUMENT DETAILS

Date	8/OCT/2020	Author(s)	LW, MJH	Page	1 / 1	Revision	1

XR-SERIES GENERIC INITIAL TROUBLSHOOTING	
Unit not running	Check the tank is filled past the level of the top-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 the fuses to ensure excessive current in-rush has not blown a fuse in the unit. There are two internal fuses for controller and pump motor in addition to the external fuses mounted on the power inlet.
Noisy operation	Air in the system the has not purged can cause load pump operation. Usually bearing failure in rotating machinery causes noise – this might be the pump. Pay attention to specific components to identify the source of noise.
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	Your 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.
Poor cooling capacity (undercooling)	Excess application thermal heat load. See Annex G-2 for a description on how to calculate this.
	House/primary water temperature has increased from nominal requirement, or flow has reduced.
	Water regulating valve is not opening correctly or blocked by debris restricting water flow.
Excess cooling capacity (overcooling)	A reduction in flow of application water can lead to overcooling. Check for constrictions in the application lines. Review pressure gauge position for values typically seen in normal satisfactory operation.
	Check value that controller presents for outlet liquid temperature. A value reported that is higher than actual will force the controller to cool without need.
	Water regulating valve could be stuck open, not restricting water flow to prevent over cooling.

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Annex H-2

DOCUMENT DETAILS

Date	8/SEP/2020	Author(s)	MJH, AMI, LW	Page	1 / 1	Revision	2

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.				

Annually	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**
Drain process fluid and replace with fresh fluid.								
Check for fluid leaks throughout product and application.								
Check filters for accumlation of particulate matter.								
Clear any dust and debris from inside the product.								

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 wiring becomes damaged, contact ATC or a qualified electrician who will be able to supply a replacement of the correct specification.

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Annex I-5

DOCUMENT DETAILS

Date	3/DEC/2019	Author(s)	LW	Page	1 / 1	Revision	1

MAINTENANCE FOR TECHNICIANS; X-SERIES UNITS

⚠	Warning; during operation component temperatures can exceed +70°C, take care when opening unit.
⚠	Warning; After switching off, the cooling fan blades continue to rotate. Do not attempt servicing whilst the blades are rotating.
⚠	Warning; All products contain water and electricity in close proximity. Ensure the unit is isolated before service. Never bypass overcurrent protection on the mains supply. Never bypass fuses or circuit breakers.

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-3

DOCUMENT DETAILS

Date	7/OCT/2020	Author(s)	LW, MJH	Page	1 / 1	Revision	2

EU DECLARATION OF CONFORMITY

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

REGISTERED BUSINESS ADDRESS

39 Hayhill Industrial Estate, Barrow Upon Soar, Leicestershire, LE12 8LD, UK

AUTHORISATION TO COMPILE THE TECHNICAL FILE

Mitchell Howard, 39 Hayhill Industrial Estate, Barrow Upon Soar, Leicestershire, LE12 8LD, UK

DESCRIPTION & IDENTIFICATION OF MACHINERY

Generic denomination	X-Series
Function	Water Heat Exchanger
Model	All with ‘XR’ and ‘XF’ prefix.
Type	Water 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 Coalville, UK, date 14/DEC/2018

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Annex J-5

DOCUMENT DETAILS

Date	6/JUL/2020	Author(s)	MJH	Page	1 / 1	Revision	1

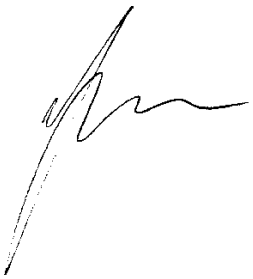
CONFLICT MINERALS COMPLIANCE STATEMENT

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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Annex J-7

DOCUMENT DETAILS

Date	15/JUL/2020	Author(s)	MJH	Page	1 / 1	Revision	1

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.

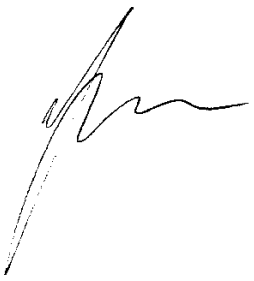
Applied Thermal Control has contacted all our suppliers and to the best of our knowledge, none of the articles that we sell intentionally contain any of the Annex XVII substances currently on the candidate list in concentrations of >0.1% by weight.

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	27/AUG/2020	Author(s)	MJH	Page	1 / 1	Revision	1

WHAT IS THE POPs REGULATION 2019/1021?

POPs stands for persistent organic pollutants. In Europe, the global Stockholm Convention is implemented through POPs legislation. POPs 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.

POPs 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.

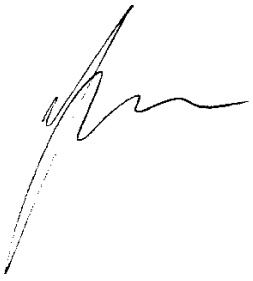
POPs LISTED UNDER AMENDMENT 2020/784

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

POPs 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 POPs 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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Annex K-1

DOCUMENT DETAILS

Date	23/JUN/2020	Author(s)	RW, MJH	Page	1 / 1	Revision	2

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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Annex M-4

DOCUMENT DETAILS

Date	8/OCT/2020	Author(s)	MJH	Page	1 / 1	Revision	1

RECOMMENDED SPARES FOR XR-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.

COMMON TO ALL XR04, XR08 & XR15

PN	Description	QTY
EA512	FUSE – T6.3A H250V UL-OK (FS1+2)	2
EA507	FUSE – T5A H250V UL-OK (FS3)	1
EA513	FUSE – T0.5A L250V UL-OK (FS4)	1
EA517	MOTOR – Pump motor 370W	1
EA781	SWITCH – level switch threaded	2
EA425	RELAY – 230Vac coil, DPCO 8A contacts	1
EA143	FAN – 120mm axial frame fan 230Vac	1
EA092	SWITCH – flow switch	1
EA798	CONTROLLER – Ascon Tecnologic KR3	1
EA586	SENSOR – PT100	1
EA794	ACTUATOR – Valve driver for flow control	1
WA679	COUPLING – bronze double flat male-to-male pump-to-motor	1

COMMON TO XR04 ONLY

PN	Description	QTY
WA334	PUMP – P5	1
RA016	PHE – Micro Plate Heat Exchanger 10plates	1

COMMON TO XR08 ONLY

PN	Description	QTY
WA319	PUMP – P10	1
RA027	PHE – Micro Plate Heat Exchanger 16plates	1

COMMON TO XR15 ONLY

PN	Description	QTY
WA318	PUMP – P17	1
RA003	PHE – Micro Plate Heat Exchanger 26plates	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

1.1.	**Product Name**	Hexid A4
1.2.	**Supplier**	Applied Thermal Control Limited 39 Hayhill Industrial Estate, Barrow upon Soar, Leicestershire, LE12 8LD. United Kingdom. www.app-therm.com
1.3.	**Telephone Number**	+44(0)1530 839998
1.4.	**Email**	sales@app-therm.com
1.5.	**Emergency Telephone Number**	+44(0)1530 839998
1.6.	**Intended/Recommended Use**	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 CO2. 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 (CO2) 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/m3
EH40 WEL, Time Weighted Average (TWA):, Particulate.10 mg/m3
ELV (IE), Time Weighted Average (TWA):, Total vapour and particulates.150 ppm, 470 mg/m3
ELV (IE), Time Weighted Average (TWA):, Particulate.10 mg/m3

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^3
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
9.10	Specific Heat Capacity	3.78kJ/kg °K
9.11	Viscosity, Kinetic, at 25°C	3.51mPa.s

SAFETY DATA SHEET
HEXID A4 HEAT TRANSFER FLUID

Conforming to Directive 1907/2006/EC

SECTION 10: STABILITY AND REACTIVITY

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.

SECTION 11: TOXICOLOGICAL INFORMATION

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.