Hazloc Heaters™

Safe heat when you need it!

AEU1

Electric Forced-Air Explosion-Proof Heater

Owner's Manual, Version: AEU1-OM-G-A4

This manual covers installation, maintenance, repair, and replacement parts.

Forced-Air Heater for Hazardous Locations

CE 2813 Ex II 2G Ex db h IIB T4 Gb IP55 (ATEX)
Ex db h IIB T4 Gb IP55 (IECEx)
Ex II 2G Ex db h IIB T4 Gb IP55 (UKEX)
(Suitable for ATEX / IECEx / UKEX Zone 1 and 2)

WARNING!

Please adhere to all instructions published in this manual.
Failure to do so may be dangerous and may void your warranty.

Note: ***AEU1 heaters must not be exposed to rain or snow. This applies to installed & stored heaters.***
The AEU1 heater should not be modified in any way.

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Printed in Canada

Part No. AEU1-OM-G-A4

AEU1 Model Coding

Heater Model Code & Option Codes

Model Code														Option Codes
AEU	1	-	G	-	12	-	100	-	400	3	50	-	B	-	Y	-	B	T1, D1, etc.

(stamped on separate field of data plate)

Model Series

Generation
For major revisions

Flammable Substance	
Gas	G

Fan Size	
12" (305 mm)	12
16" (406 mm)	16
20" (508 mm)	20

Power Output		
3 kW	030	12" (305 mm) fan size
5 kW	050	12" (305 mm) fan size
7.5 kW	075	12" (305 mm) fan size
10 kW	100	12" (305 mm) fan size
15 kW	150	16" (406 mm) fan size
20 kW	200	16" (406 mm) fan size
25 kW	250	20" (508 mm) fan size
30 kW	300	20" (508 mm) fan size

Heater Line Voltage		
230 Volts[1]	230	@ 50Hz only
400 Volts[2]	400	@ 50Hz only
480 Volts[3]	480	@ 60Hz only

Product Revision No.
For minor revisions

Factory Built-in Options	
N	No options selected
Y	Yes, options selected

Option Codes (stamped on separate field of data plate)	
T1	Thermostat, Bi-metal (**BTX1-E-A**)
T2	Thermostat, Electronic (**XET1-1-E-A**)
D2	Disconnect switch, **20A**
D4	Disconnect switch, **40A**
F	Continuous fan
H1	Heresite Core
H2	Heresite Cabinet
H3	Heresite Core/Cabinet

Control Voltage	
B	24VAC

Frequency		
@230 & 400 Volts only	50	50Hz
@480 Volts only	60	60Hz

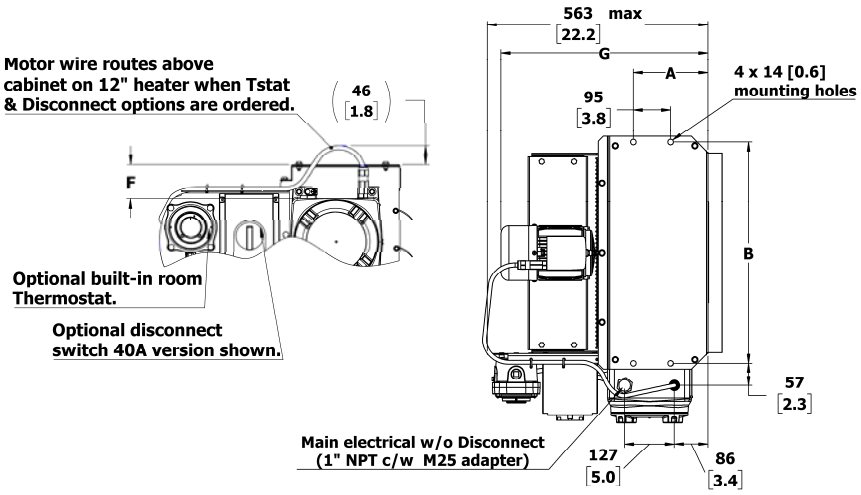
Phase	
3	3 Phase

[1] Line voltage is 230VAC +/- 5% @ 50Hz.

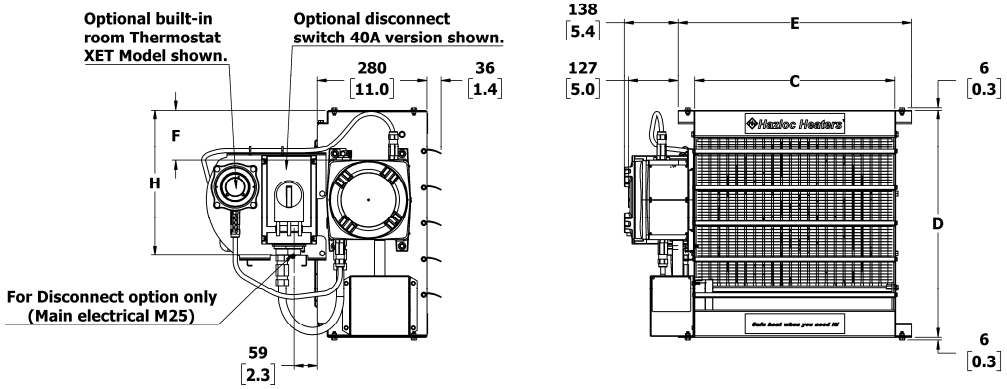
[2] Line voltage is 400VAC +/- 5% @ 50Hz.

[3] Line voltage is 480VAC Max @ 60Hz. Motor has a rated voltage of 460VAC +/- 5%

AEU1 Physical Dimensions



Heater Size	12 (3-10kW)	16 (15-20kW)	20 (25-30kW)
Dim.	mm (Inches)	mm (Inches)	mm (Inches)
A	191 (7.5)	191 (7.5)	191 (7.5)
B	462 (18.2)	566 (22.3)	667 (26.3)
C	414 (16.3)	515 (20.3)	617 (24.3)
D	482 (19.0)	583 (23.0)	686 (27.0)
E	494 (19.5)	596 (23.5)	697 (27.4)
F	79 (3.1)	130 (5.1)	181 (7.1)
G	528 (20.8)	528 (20.8)	528 (20.8)
H	322 (12.7)	373 (14.7)	424 (16.7)



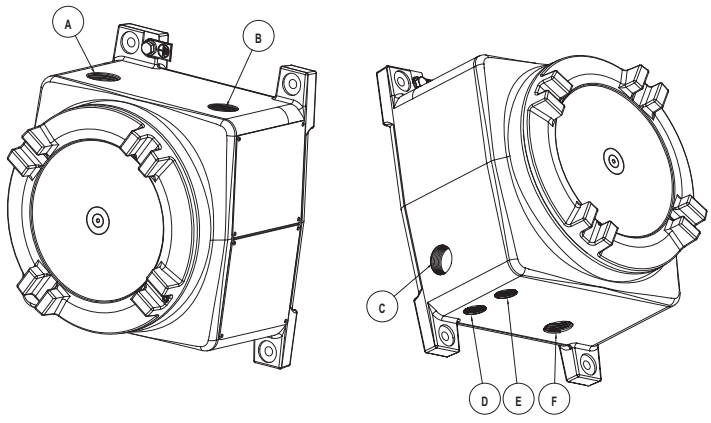
AEU1 Specifications for all 50 Hz Models by Size

Model		AEU1-12				AEU1-16		AEU1-20	
Fan Diameter	in (mm)	12 (305)				16 (406)		20 (508)	
Nominal kW		3	5	7.5	10	15	20	25	30
Air Delivery	m^3/hr	595	680	1019	1359	2039	2888	3568	5097
Approx. Air Velocity	m/s	2.1	2.4	3.6	4.9	4.1	5.8	4.6	6.6
Approx. Horizontal Air Throw	m	3.9	4.6	6.7	9.1	10.1	14.0	12.5	18.6
Motor Power	kW (HP)	0.37 (½)							
Max. Mounting Height (to underside of heater)	m	2.1	2.1	2.3	2.9	3.0	3.4	3.6	4.6
Approx. Net Weight (no built-in options)	kg (lbs)	65.4 (144)			67.2 (148)	79.8 (176)		91.5 (201)	
(with thermostat)		68.5 (151)			70.3 (155)	83.0 (183)		94.3 (208)	
(with disconnect		70.3 (155)			72.1 (159)	81.8 (187)		96.1 (212)	N/A
(with thermostat & disconnect)		73.0 (161)			74.8 (165)	87.5 (193)		98.8 (218)	N/A
Approx. Max. Shipping Weight (no built-in options)	kg (lbs)	92.0 (203)			93.9 (207)	108.4 (239)		122.5 (270)	
(with thermostat)		95.7 (211)			97.0 (214)	111.6 (246)		126.0 (278)	
(with disconnect		97.0 (214)			98.9 (218)	113.4 (250)		127.5 (281)	N/A
(with thermostat & disconnect)		99.8 (220)			101.6 (224)	116.1 (256)		130.2 (287)	N/A

AEU1 Specifications for all 60 Hz Models by Size

Model		AEU1-12				AEU1-16		AEU1-20	
Fan Diameter	in (mm)	12 (305)				16 (406)		20 (508)	
Nominal kW		3	5	7.5	10	15	20	25	30
Air Delivery	m^3/hr	714	815	1225	1630	2445	3465	4280	6115
Approx. Air Velocity	m/s	2.2	2.9	4.3	5.9	4.9	7.0	5.5	7.9
Approx. Horizontal Air Throw	m	4.7	5.5	8.0	11.0	12.1	16.8	15.0	22.3
Motor Power	kW (HP)	0.37 (½)							
Max. Mounting Height (to underside of heater)	m	2.1	2.1	2.3	2.9	3.0	3.4	3.6	4.6
Approx. Net Weight (no built-in options)	kg (lbs)	65.4 (144)			67.2 (148)	79.8 (176)		91.5 (201)	
(with thermostat)		68.5 (151)			70.3 (155)	83.0 (183)		94.3 (208)	
(with disconnect		70.3 (155)			72.1 (159)	81.8 (187)		96.1 (212)	
(with thermostat & disconnect)		73.0 (161)			74.8 (165)	87.5 (193)		98.8 (218)	
Approx. Max. Shipping Weight (no built-in options)	kg (lbs) (no	92.0 (203)			93.9 (207)	108.4 (239)		122.5 (270)	
(with thermostat)		95.7 (211)			97.0 (214)	111.6 (246)		126.0 (278)	
(with disconnect		97.0 (214)			98.9 (218)	113.4 (250)		127.5 (281)	
(with thermostat & disconnect)		99.8 (220)			101.6 (224)	116.1 (256)		130.2 (287)	

Enclosure Entries



Entry	Entry Type	Entry Detail
A	Threaded: 1” NPT (Shipped with an M25 adapter installed)	main power
B	Threaded: 3/4" NPT	Accessories
C	Threaded: 3/4" NPT	Accessories
D	Threaded: 1/2" NPT	Accessories
E	Threaded: 1/2" NPT	Accessories
F	Threaded: 3/4" NPT	Element wires (vertical conduit)

AEU1 General Specifications

Hazardous Location Approvals	**ATEX**	SIRA 13 ATEX 1240X CE 2813 Ex II 2G Ex db h IIB T4 Gb IP55 -40°C ≤ Tamb ≤ +40°C (Suitable for Zone 1 and 2)
	IECEx	IECEX CSA 13.0034X Ex db h IIB T4 Gb IP55 -40°C ≤ Tamb ≤ +40°C (Suitable for Zone 1 and 2)
	UKEX	CSAE 22UKEX1147X Ex II 2G Ex db h IIB T4 Gb IP55 -40°C ≤ Tamb ≤ +40°C (Suitable for Zone 1 and 2)
Cabinet	Cabinet Material	2 mm (14-gauge) steel. Epoxy/polyester powder coated with five-stage pretreatment, including iron phosphate.
	Fan Guard	Split design with close wire spacing. A 9.5 mm diameter probe will not enter. Black polyester powder coated.
	Louver Blades	Anodized extruded aluminum.
	Fasteners	Zinc plated steel for corrosion resistance.
	Enclosures	Flame proof (Ex db) cast aluminum with O-ring.
	Mounting Holes	14mm diameter holes – Four located on the top face of heater.
Motor/Fan	Motor Type	Flameproof (Ex d), thermally protected, 1500 RPM (nominal) @ 50Hz or 1800 RPM (nominal) @ 60Hz permanently lubricated ball bearing type with 71 frame and “easy-off” fan blade replacement feature.
	Fan	Three-blade non sparking aluminum, steel spider and hub with 14 mm bore.
Heat Exchanger	Heating Elements	Long-life, low watt-density, high grade metal-sheathed.
	Heat Transfer Fluid	Ethylene glycol and water including corrosion inhibitors.
	ExCaliber™ Core	Carbon steel headers and element housing with O-ring. Fin tubes are carbon steel tubes with copper-free, roll-formed aluminum fins @ 2.5 mm pitch. Vacuum sealed. Coated with black, high-heat enamel.
Protection	Temperature High Limits	One automatic reset rated for 100,000 cycles, and one manual reset. Both are snap-action bimetal type, open on temperature rise.
	Pressure Relief	High quality stainless steel pressure relief device.
Controls	Control Circuit	Built in 24V control. (1.04 amps, 25 VA, grounded)
	Control Contactor	40 FLA (50 A resistive per pole) Definite Purpose. Rated for 500,000 mechanical operations.
	Control Transformer	Multitap primary, 24VAC secondary.
	Fuse Protection	Thermal delay fuse with spare, .25” x 1.25” , 24VAC = 1A.
	Room thermostat with lockable temperature dial (option code T1 or T2)	Built-in, **BTX1** (T1) bi-metal or **XET1** (T2) electronic explosion-proof thermostat, 5°C to 25°C (40°F to 80°F). Marine-grade armoured cable and cable glands between enclosures. Wall mount thermostats also available.
Load Isolation	Disconnect switch with lockable handle (option code D2 or D4)	Built-in, CEAG 20 Amp (D2) or 40 Amp (D4) disconnect switch, with lockout feature. Prebuilt marine-grade armoured cable / gland assembly.
Additional Options	Continuous fan (option code F)	Continuous fan operation. Circulates air and prevents gas pockets from forming.
	Heresite Coating (option code H1, H2, H3)	H1 = Heresite Core; or H2 = Heresite Cabinet; or H3 = Heresite Core and Cabinet. Note: Contact factory for Heresite delivery lead time.
Operating Limits	Ambient Temperature	Operation: -40°C to 40°C. Storage: -50°C to 60°C.
	Maximum Altitude	3000 m above sea level.

AEU1 Conditions For Safe Use

1. Remove any dirt / dust from heater cabinet using a damp cloth to mitigate electrostatic charge build up.
2. Do not install the heater in an environment which could potentially cause an electrostatic charge build up on the cabinet (i.e. exposure to high pressure steam).
3. The motor is NOT field repairable. All defective motors must be replaced with a factory supplied or factory approved unit.
4. Flameproof joints are NOT field repairable. Any damaged enclosures/fittings will have to be replaced with factory approved units.
5. For any field repairs use only original factory installed fasteners or factory supplied replacement fasteners.

— WARNING! —

Read and follow the instructions in this manual. Failure to do so may result in severe or fatal injury.

IMPORTANT SAFETY INFORMATION

1. Heater is to be connected and serviced only by a qualified electrician experienced with hazardous location equipment. It is the responsibility of the installer to verify the safety and suitability of the installation.
2. Installation and wiring of the heater must adhere to all applicable codes. Heater must be effectively grounded to eliminate shock hazard. Internal and external earthing terminations are provided.
3. Heater is to be used only in gas atmospheres that are compliant with the hazardous area gas atmosphere certification of the heater. Hazardous area certification information for the heater is located on the main heater data plate and in this manual (page 4).
4. Do not operate heater in ambient temperatures above 40°C (104°F).
5. Do not plug heater outlet with gloves, clothing, etc. or operate heater with louvers fully closed.
6. **Explosion/Electric Shock Hazard**. Disconnect heater from power supply before opening enclosures or servicing heater. Do not open if an explosive atmosphere is present.
7. Operate the heater only while it is permanently mounted in an upright position. Failure to comply will cause overheating of the heat exchanger and shutting down of the unit. Refer to the mounting instructions located on the heater data plate and in this manual (page 6).
8. **This heater is equipped with two bimetal thermal high-limit cutouts**, one automatic reset type and one manual reset type. The heater is not to be operated with the high-limit cutouts disabled or disconnected from the control circuit.
9. Keep all electrical enclosure covers tightly closed and secured using the set screws. Cover joints must be clean before replacing covers. Keep away from rain or snow. Heater is for dry indoor use only.
10. All unused threaded openings must be fitted with threaded plugs approved for use in hazardous locations.
11. The heat exchanger has been air evacuated, fluid filled, and sealed at factory and is not field repairable. Replacement heat exchangers are available from the factory and are inspected and electrically tested for correct heat output and proper operation of the high-limits.
12. The heat exchanger is filled with a mixture of water and inhibited **ethylene glycol** which **is poisonous**. Contact with the fluid at operating temperatures may produce a burn hazard. Suggested first aid consists of flushing eyes with plenty of water and to wash off skin in flowing water or shower. If any fluid leakage occurs from the heater, disconnect it from the power supply and have the heat exchanger replaced with a factory supplied unit.
13. Heater must be kept clean. When operating in a dirty / dusty environment, regularly clean the fin tubes, fan, fan guard, motor, cabinet, and any other areas where dirt / dust have accumulated. Refer to recommended maintenance procedures (page 14).
14. Do not operate or store heater in atmospheres which are corrosive to aluminum or steel.
15. See applicable electrical codes for gland / cable installation and for seal requirements for field installed conduits. Factory installed conduits require no further sealing.
16. **Crackling or pinging noises within the heat exchanger during start up may occur. This is normal.**
17. Air discharge at the bottom of the heater may be warmer than at the top. This is normal.
18. Do not attempt to install a Remote Fan Only Switch. **Do not modify the heater in any way**.
19. Flameproof joints are not to be repaired in the field.
20. Use factory approved replacement parts only.
21. Contact factory for any questions or concerns.

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— INSTALLATION —
Mechanical

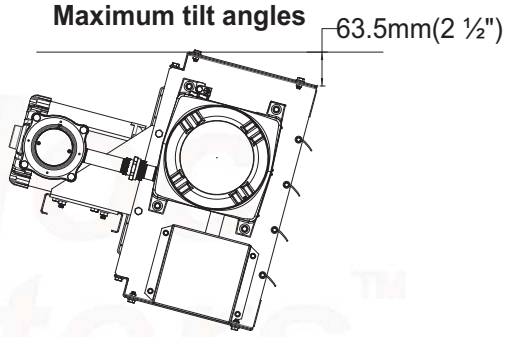
Location

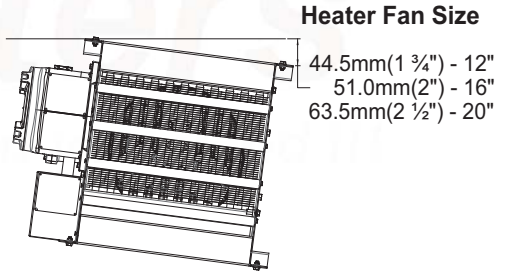
Please follow guidelines below for optimum heating results:

1. Do not install heaters such that airflow is blocked or impeded by equipment or walls.
2. For occupant comfort, position heaters so that air discharge is directed across areas of highest heat loss, such as doors, windows, and outside walls.
3. For large areas, arrange heaters such that the air discharge of one heater is directed towards the inlet of the next heater. This sets up a rotational airflow with air circulation in the central area of the building.
4. For equipment freeze protection, direct air discharge at equipment.
5. For large workshops or warehouses it may be acceptable to use fewer, larger heaters.
6. Locate remote mount room thermostat on interior partition walls or posts away from cold drafts, internal heat sources, and away from heater discharge air streams.

Mounting

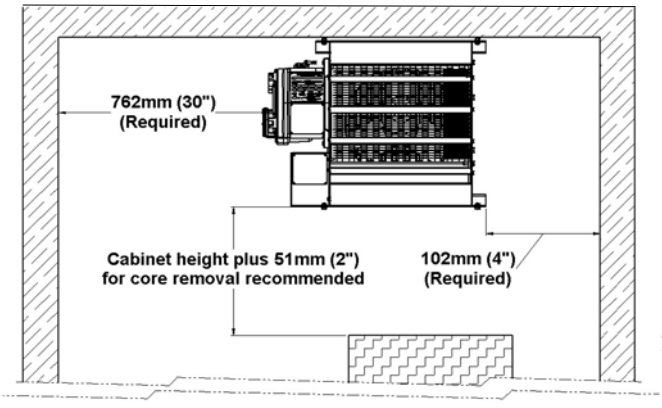
1. A variety of mounting brackets are available from the factory to aid in installation.
2. If using mounting hardware or a supporting structure not supplied by the factory, the unit should be suspended through the four 14mm (9/16") mounting holes on top of the unit with M12 (1/2") fasteners. Lock washers should be used on all mounting nuts and bolts to ensure they don't vibrate or work loose due to fan vibration or other vibration transmitted to the heater. If in doubt consult factory.
3. It is essential that adequate structural support be provided for installation. **The mounting structure must be strong enough to support the heaters weight**, provide sufficient stiffness to prevent excessive vibration, and withstand all probable abusive situations such as transportable installations where truck off-loading impacts, etc. may occur. Refer to table on Page 3, AEU1 Specifications by Model Size, for heater net weights.

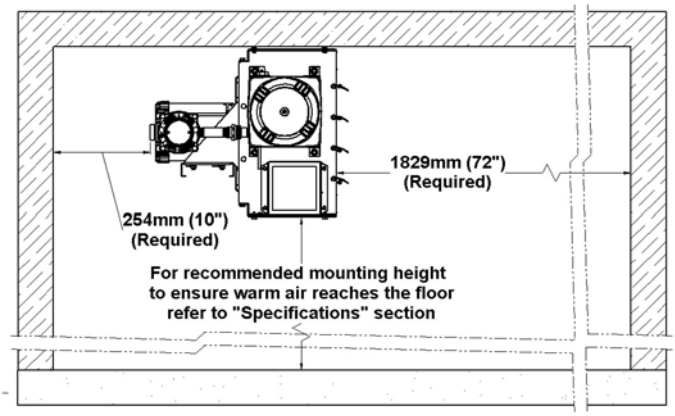




Mounting Heights and Clearances

1. To ensure that warm air reaches the floor observe the recommended maximum mounting heights in table on Page 3, AEU1 Specifications by Model Size. Heaters may be mounted at higher elevations and still provide warm air at floor level however, the maximum mounting elevation at which this occurs depends on location and operational conditions.
2. Louvers may be adjusted to provide greater downward deflection of the discharge air. However, louvers must not be set less than 30 degrees of the closed position.





— WARNING! —

Read and follow the instructions in this manual. Failure to do so may result in severe or fatal injury.

— INSTALLATION —
Electrical

1. Heater is to be connected and serviced only by qualified electrician experienced with hazardous location equipment. It is the responsibility of the installer to verify the safety and suitability of the installation.
2. **Explosion/Electric Shock Hazard**. Disconnect heater from power supply before opening enclosures or servicing heater. Do not open if an explosive atmosphere is present.
3. Use copper conductors only for supply wires and approved explosion-proof means of wiring during installation. Use minimum 90°C rated wire. Refer to "Supply Wire Requirements" table and heater data plate for conductor wire rating.
4. Installation must include appropriate over-current protection devices (fusing or circuit breakers) as required by the applicable electrical code. Refer to "Supply Wire Requirements" table and heater data plate for current ratings. For 50 Hz heaters the supply voltage is to be within 5% of the data plate voltage. For 60Hz heaters the supply voltage is 480VAC Max. (motor has a rated voltage of 460VAC +/- 5%).
5. Confirm that the electrical power supply matches the nameplate voltage, phase, amperage and frequency rating of the heater to be connected.
6. Supply conductors and ground conductor pass through the 1" NPT conduit entry (with an M25 adapter installed) on the control enclosure. Refer to the wiring diagrams on page 10.
7. The heater requires that an adequate grounding conductor be connected to the ground terminal. Internal and external earthing terminations are provided.
8. Heater may be supplied with a factory installed integral room thermostat with lockable temperature dial. If a **remote explosion-proof room thermostat** is used, connection is to be made via the 3/4" NPT entry (entry "B" listed in the "Enclosure Entries" table on page 3). Refer to the thermostat installation manual and the wiring diagrams on page 10 to connect the remote thermostat.

AEU1 Supply Wire Requirements

Model	kW	Volts	Hz	Ø	Max Total Current Amps	Minimum Circuit Ampacity	Max Fuse Amps	* Supply Wire mm^2 (AWG)
AEU1-G-12-030-230350-B	3	230	50	3	9.3	11.6	15	2.08 (14)
AEU1-G-12-030-400350-B	3	400	50	3	5.4	6.7	15	2.08 (14)
AEU1-G-12-030-480360-B	3	480	60	3	4.7	5.8	15	2.08 (14)
AEU1-G-12-050-230350-B	5	230	50	3	14.3	17.8	20	3.31 (12)
AEU1-G-12-050-400350-B	5	400	50	3	8.3	10.3	15	2.08 (14)
AEU1-G-12-050-480360-B	5	480	60	3	7.1	8.8	15	2.08 (14)
AEU1-G-12-075-230350-B	7.5	230	50	3	20.5	25.6	30	5.26 (10)
AEU1-G-12-075-400350-B	7.5	400	50	3	11.9	14.8	15	2.08 (14)
AEU1-G-12-075-480360-B	7.5	480	60	3	10.1	12.6	15	2.08 (14)
AEU1-G-12-100-230350-B	10	230	50	3	26.7	33.4	35	8.36 (8)
AEU1-G-12-100-400350-B	10	400	50	3	15.5	19.3	20	3.31 (12)
AEU1-G-12-100-480360-B	10	480	60	3	13.1	16.3	20	3.31 (12)
AEU1-G-16-150-230350-B	15	230	50	3	39.2	49.0	50	8.36 (8)
AEU1-G-16-150-400350-B	15	400	50	3	22.7	28.4	30	5.26 (10)
AEU1-G-16-150-480360-B	15	480	60	3	19.1	23.9	25	5.26 (10)
AEU1-G-16-200-400350-B	20	400	50	3	29.9	37.4	40	8.36 (8)
AEU1-G-16-200-480360-B	20	480	60	3	25.1	31.4	35	8.36 (8)
AEU1-G-20-250-400350-B	25	400	50	3	37.1	46.4	50	8.36 (8)
AEU1-G-20-250-480360-B	25	480	60	3	31.1	38.9	40	8.36 (8)
AEU1-G-20-300-400350-B	30	400	50	3	44.3	55.4	60	13.3 (6)
AEU1-G-20-300-480360-B	30	480	60	3	37.1	46.4	50	8.36 (8)

* Supply wire sizes are a recommended minimum. Ensure all applicable electrical code requirements are met. The minimum recommended supply wire size is rated for a 30^0C ambient temperature.

9. Heater may be supplied with a integral disconnect switch. If a remote explosion proof disconnect is used, connection is to be made via the 1" NPT conduit entry (with an M25 adapter installed) entry "A" listed in the "Enclosure Entries" table on page 3. Connect the remote disconnect as per the wiring diagrams on page 10. The ratings for the remote disconnect must be appropriate for the heater that it is installed on.
10. **All** unused threaded openings in enclosures must be fitted with threaded plugs approved for use in hazardous locations. Factory installed conduits require no additional sealing.
11. If a rigid conduit field wiring system is used then the installer must seal each conduit at the enclosure. This seal must be suitable for the hazardous location. Ensure that any liquids used in the sealing process do not enter into any of the electrical enclosures.
12. Ensure that input conductors and conduit have adequate strain relief at installation.
13. If a cable gland and cable field wiring system is used then appropriate glands and cable are required for the hazardous location.
14. Before application of electrical power check all connections to ensure compliance with the wiring diagram and any code requirements. Remove any foreign objects from the control box and heater. Ensure all wire terminals are tight and not pinching the wire insulation. Reinstall cover tight and secure.
15. **On all three-phase heaters, it is necessary to verify that the fan rotation is correct** (counter clockwise when facing the rear of the heater). If air delivery is not from the front of the heater, reverse any two supply leads at the main power contactor located in the control enclosure.
16. The explosion-proof control enclosure and element enclosures are designed with O-rings, threaded joints and metal-to-metal contact at the lid or cover joint to prevent an explosion. Do not attempt to install gasket material of any type at these joints. A light coating of anti-seize compound may be applied to the threads to prevent seizing.

— WARNING! —

Heater is to be serviced only by qualified electrician experienced with hazardous location equipment.

Explosion/Electric Shock Hazard. Disconnect heater from power supply before opening enclosures or servicing heater. **Do not open if an explosive atmosphere is present.**

— Repair and Replacement —

Heat Exchanger Replacement (See Page 11 for assembly diagram)

The heat exchanger core assembly has been fluid filled and vacuum sealed at factory and is not field repairable. Replacement heat exchanger core assemblies are available from the factory and are inspected and electrically tested for correct heat output and proper operation of the high-limits.

1. **Explosion/Electric Shock Hazard**. Disconnect heater from power supply before opening enclosures or servicing heater. Do not open if an explosive atmosphere is present.
2. To prevent burn hazard, be sure heat exchanger and fluid has been allowed to cool before proceeding.
3. Remove the four 1/4-20 UNC bolts (7/16" wrench) on the cabinet bottom panel, set aside bottom panel. Remove the four 10-32 UNF self threading screws (5/16" wrench) on the element housing cover, set aside housing cover. Loosen (do not remove) the M4x0.7 set screw (2mm hex key) on the element enclosure cover, remove the element enclosure cover. Loosen (do not remove) the M6x1.0 set screw (4mm hex key) on the control enclosure cover, remove the control enclosure cover. *Do not damage flameproof threads as these cannot be repaired in the field*.
4. From the control enclosure, disconnect two high-limit wires from printed circuit board terminal block marked 3 & 4 and disconnect three output heating element wires from contactor terminals marked T1, T2, & T3.
5. Slightly loosen the 1/4-20 UNC cabinet bolts (7/16" wrench) and the 10-24 UNC louver self threading screws (5/16" wrench) on one side of the heater to prevent the heat exchanger from binding.
6. The heat exchanger is secured by three 1/4-20 UNC bolts on the right-side cabinet panel (when facing front of heater) and one 1/4-20 UNC bolt located on the left side cabinet panel of the heater. On 3 - 10kW models the left-side cabinet panel bolt is located at the top right-hand foot of control enclosure. On 15 - 30kW models the left-side cabinet panel bolt is located above the control enclosure. With an assistant supporting the weight of the heat exchanger remove these 4 bolts (7/16" wrench). Use a rubber mallet to separate the heater core from the vertical conduit. Carefully lower the heat exchanger from the cabinet. *Do not damage the machined cylindrical surface on the vertical conduit*.
7. Reverse the above procedure when installing a new heat exchanger. **NOTE:** Ensure there is a continuous film of sealing compound on the cylinder joint when installing the vertical conduit into the element housing.

Temperature High-Limit Replacement (See Page 12 for assembly diagram)

<u>This heat-exchanger includes one automatic reset & one manual reset temperature high-limit that are wired in series</u>. The automatic reset high-limit is rated for 100,000 cycles and is for a temporary failure condition. Continuous nuisance tripping of the automatic reset is generally not the fault of the high-limit but is usually caused by incorrect operating voltage, blocked air inlet or outlet, fan/motor malfunction, high ambient temperatures, excessively dirty heat exchanger or leaking heat exchanger. **Care should be taken to determine the exact reason that the automatic reset high-limit control tripped so the problem can be resolved immediately**. The automatic reset high-limit normally fails in the open position, however, it can also fail closed.

If the automatic reset fails in the open position the heater will not function and the high-limit should be replaced. **The occurrence of the manual reset high-limit control to trip is an abnormal condition and indicates that the automatic reset high-limit has failed in the closed position. If this occurs remove the heater from service immediately and replace the automatic reset high-limit. Determine the exact reason that the automatic reset high-limit control tripped so the problem can be resolved immediately.** If the manual reset high-limit shuts down the heater it will have to be reset by pressing on the small reset button protruding from the center of the high-limit device.

1. De-energize the heater electrical supply circuit. Ensure an explosive atmosphere is NOT present.
2. Remove the four 10-32 UNF self threading screws (5/16" wrench) on the element housing cover, set aside housing cover. Loosen (do not remove) the M4x0.7 set screw (2mm hex key) on the element enclosure cover, remove the element enclosure cover. *Do not damage flameproof threads as these cannot be repaired in the field*.
3. Remove the wires from the spade connectors on the automatic reset high limit.
4. Remove automatic reset high-limit assembly by unscrewing, and clean the inside of the thermowell. A clean thermowell ensures good thermal contact.
5. Replace high-limit with a factory supplied unit only. Apply a continuous bead of heat sink conductive cement around the base of the high-limit, but not on the threads, and screw into thermowell. Reattach the wires to the high limit.
6. Replace element housing cover, and element enclosure cover.
7. Energize the heater electrical supply circuit and let run for 15 minutes to reach a stable operating temperature.
8. If heater operation appears to be normal, place unit into service.

— WARNING! —

Heater is to be serviced only by qualified electrician experienced with hazardous location equipment.

Explosion/Electric Shock Hazard. Disconnect heater from power supply before opening enclosures or servicing heater. Do not open if an explosive atmosphere is present.

— Repair and Replacement, Continued —

Fan, Fan Guard or Motor Replacement (See Page 11 for assembly diagram)

The motor is a sealed unit that requires no lubrication. If the motor is defective, it must be replaced with an original factory supplied motor (or factory approved replacement) and factory supplied motor mounting fasteners.

If Replacing Fan Blade Only:

1. Remove the four 5/16-18 UNC nuts (1/2" wrench) holding the motor to the motor mount.
2. Detach and remove the two-piece fan guard assembly by removing the eight 1/4-20 UNC screws (3/8" wrench) that attach the fan guard to the cabinet.
3. Loosen the M8x1.25 fan blade set screw (4mm allen key) and remove fan blade from end of motor shaft.
4. To reassemble, place fan blade inside fan panel opening. Slip fan blade onto motor shaft and ensure fan hub meets the shoulder on the motor shaft. Apply medium strength (blue) Loctite thread locker to the M8 set screw, torque to 17 N-m.
5. Fasten the two-piece fan guards to the cabinet. Center fan in fan-panel opening, verify all fan blade tips have equal clearance to the fan shroud (approx. 5mm - 8mm depending on heater size). Leave approximately 2mm to 5mm gap between motor face and fan guard.
6. Bolt motor to motor mount, tighten nuts to 28 N-m torque. Manually spin the fan blade to ensure it rotates freely before reconnecting heater to power supply.
7. Run test the heater, check for smooth, balanced operation of the motor / fan assembly. Fan must rotate counterclockwise when viewed from rear of heater.

If Replacing Motor or Motor & Fan:

1. Perform steps 1 - 3 detailed in the above section “If Replacing Fan Blade Only”.
2. Note wire connections for future reference. Remove the cable gland and cable from the motor.
3. Remove the motor (and fan if applicable).
4. To reassemble, ensure fan blade is inside fan panel opening and then place motor onto motor mount. Slip fan blade onto motor shaft and ensure fan hub meets the shoulder on the motor shaft. Apply medium strength (blue) Loctite thread locker to the M8 set screw, tighten to 17 N-m torque.
5. Fasten the two-piece fan guards to the cabinet.
6. Reinstall cable gland and wire connections on the motor. Center fan in fan-panel opening verify all fan blade tips have equal clearance to the fan shroud (approx. 5mm - 8mm depending on heater size). Leave approximately 2mm to 5mm gap between motor face and fan guard.
7. Bolt motor to motor mount, tighten to 28 N-m torque. Manually spin the fan blade to ensure it rotates freely before reconnecting heater to power supply.
8. Run test the heater, check for smooth, balanced operation of the motor / fan assembly. Fan must rotate counterclockwise when viewed from rear of heater.

Contactor (See Page 11 for assembly diagram)

1. Note wire connections for future reference. Remove all wires.
2. Loosen (do not remove) mounting screws. Slide contactor off mounting screws.
3. Replace with a factory supplied contactor of the same rating. Tighten mounting screws. Reconnect all wires.
4. Fan must rotate counterclockwise when viewed from rear of heater.

Transformer (See Page 11 for assembly diagram)

1. Replace with a factory supplied transformer of the same rating.
2. On the new transformer, select primary wires to match heater voltage. Ensure that the correct transformer secondary lead is grounded (see Page 10 wiring diagram). Individually terminate all unused wires using closed end connections.

Torque Settings

Item	Torque (N - m)	Wrench Size
M8x1.25 fan blade set screw	17	4mm Hex
5/16-18 UNC motor nuts	28	1/2"
5/16-18 UNC motor mount bolts	28	1/2"
1/4-20 UNC fan panel bolts	11	7/16"
1/4-20 UNC fan guard self tapping screws	11	3/8"
#10-24 UNC louver blade screws	3	5/16"

Printed Circuit Board (See Page 11 for assembly diagram)

1. Note wire connections for future reference. Replace with a factory supplied printed circuit board.

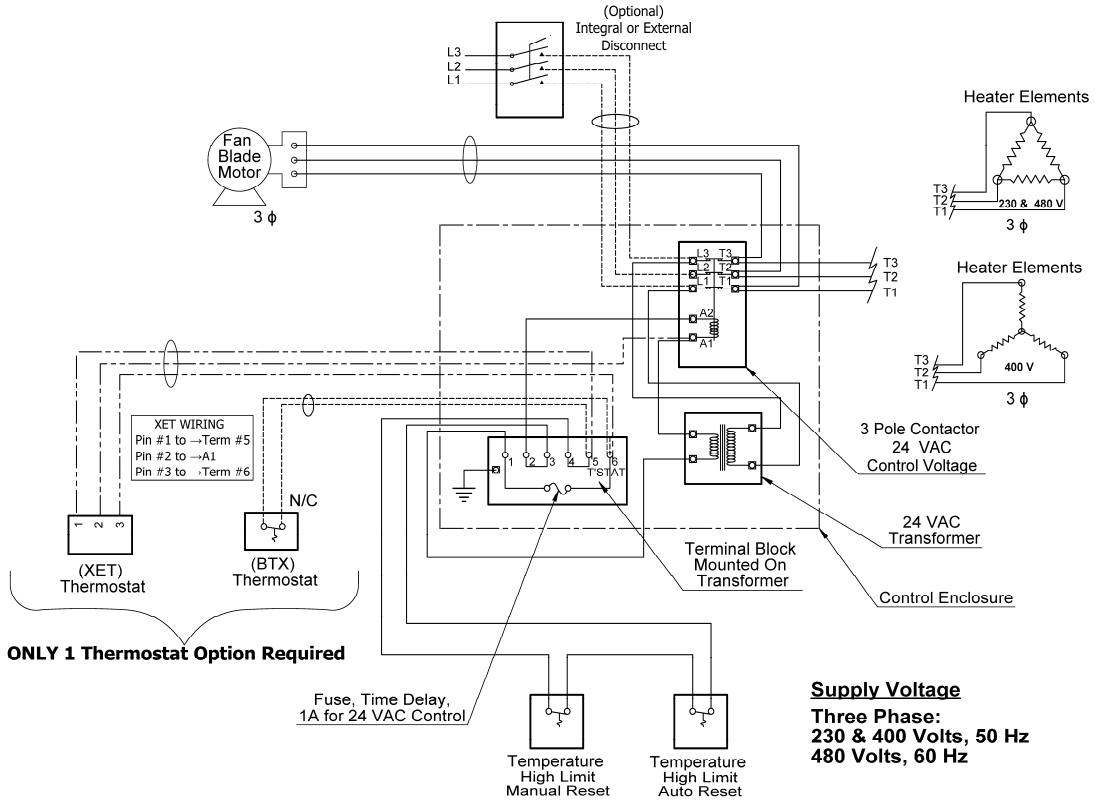
Thermal Delay Fuse (See Page 11 for assembly diagram)

1. Replace fuse with one of the same type and rating as indicated on printed circuit board or refer to parts list. An extra fuse should be stored in the clips marked “SPARE”.

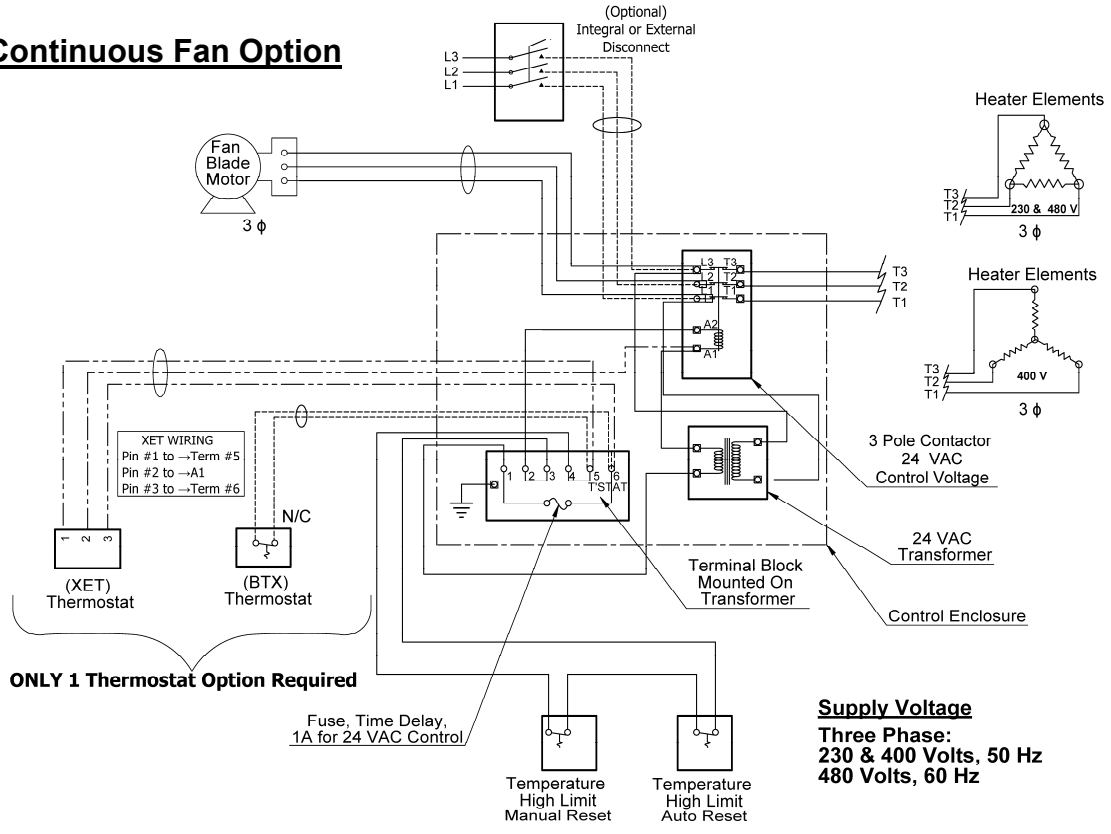
— Warning —

Heater is to be serviced only by qualified electrician experienced with hazardous location equipment.

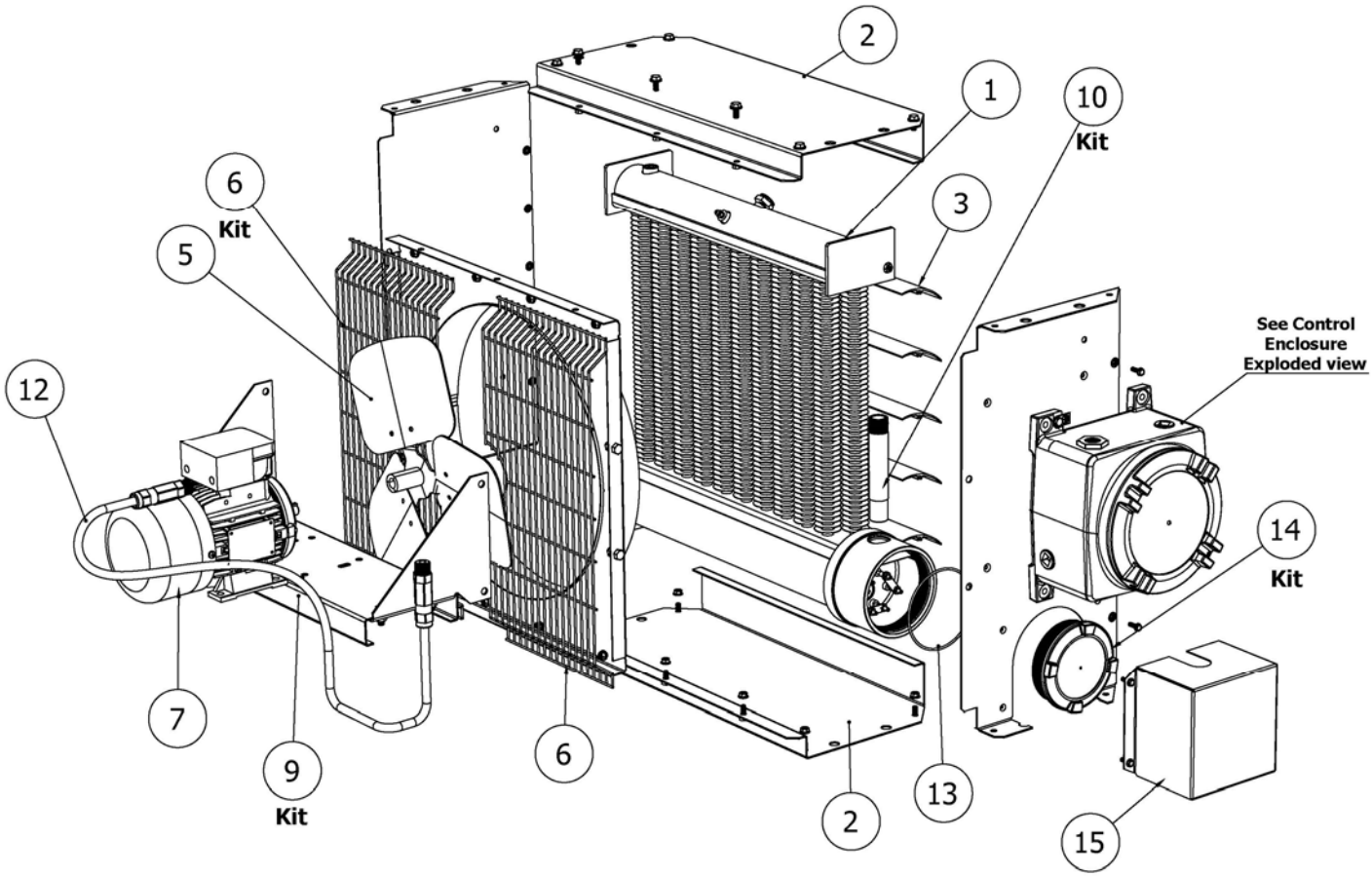
— Electrical Wiring —

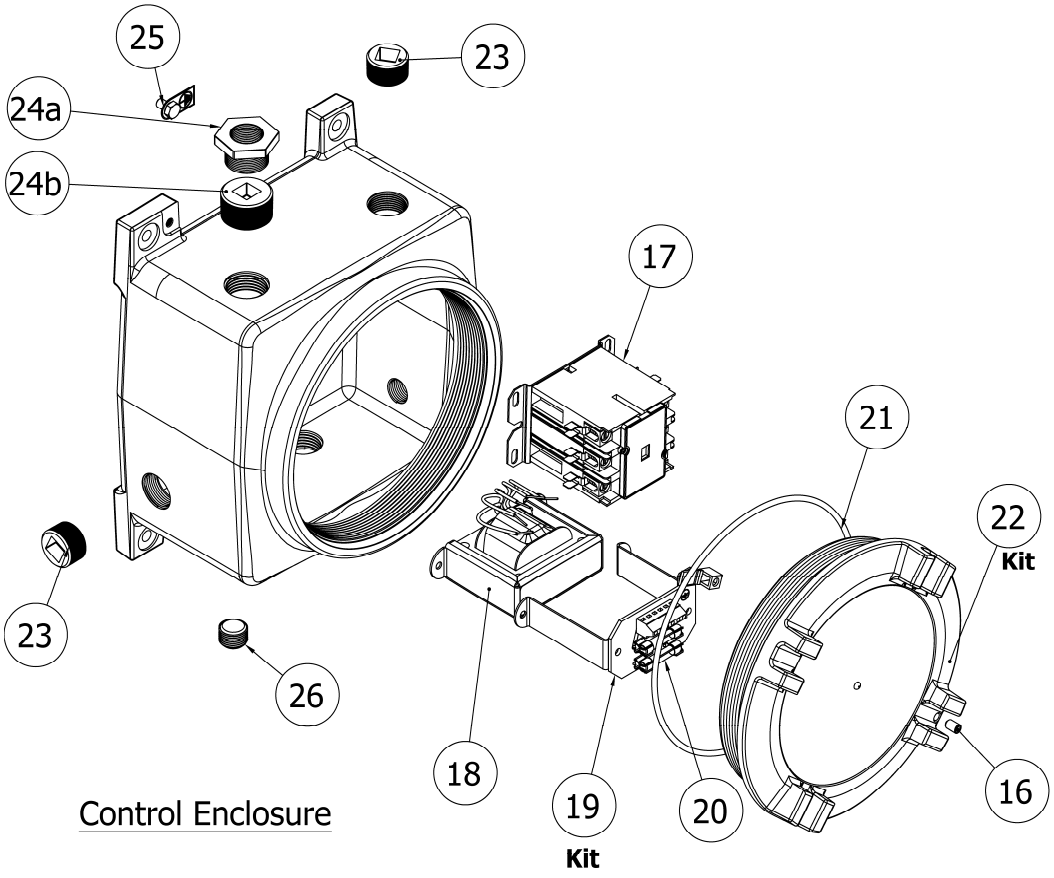


Continuous Fan Option



— Assembly Diagram —

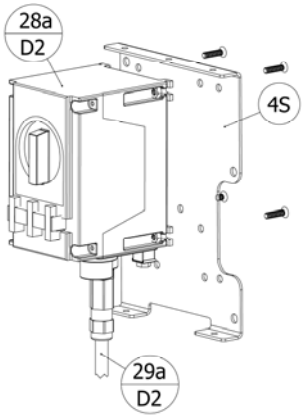




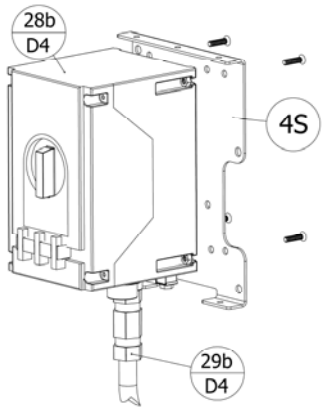
— Assembly Diagram —

Thermostat or Disconnect Factory Built-in Options

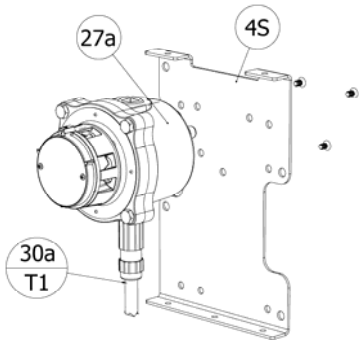
20 Amp Disconnect



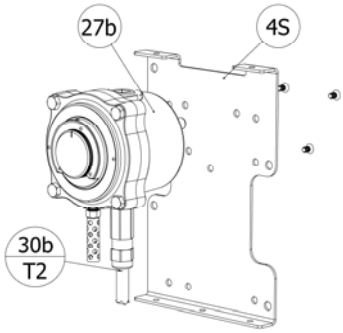
40 Amp Disconnect



Bi-metal Thermostat

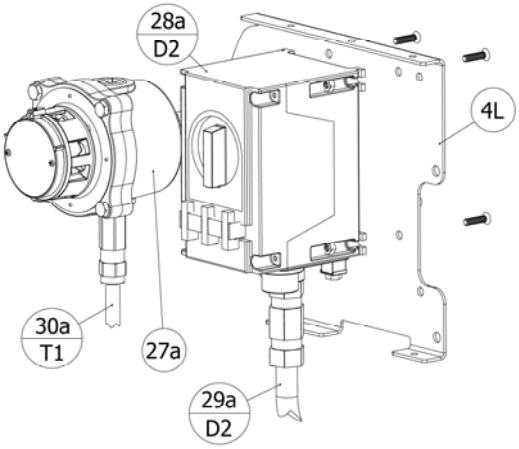


Electronic Thermostat

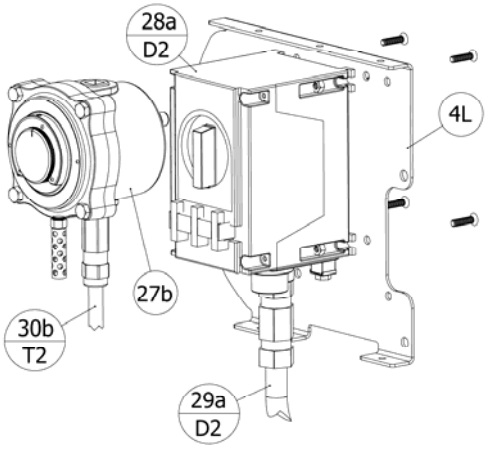


Thermostat and Disconnect Factory Built-in Options

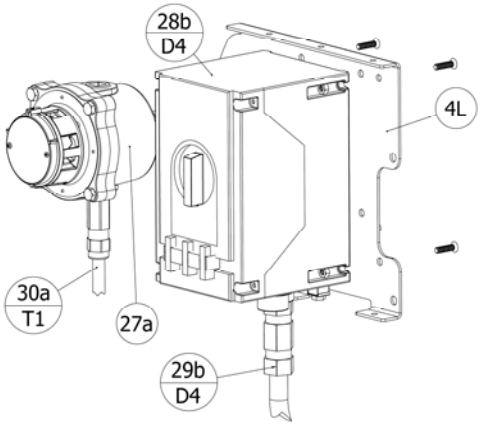
Bi-metal Thermostat and 20 Amp Disconnect



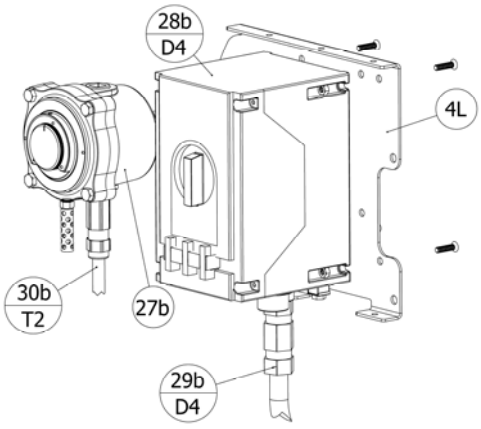
Electronic Thermostat and 20 Amp Disconnect



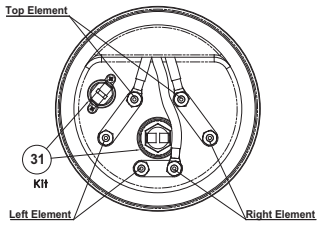
Bi-metal Thermostat and 40 Amp Disconnect



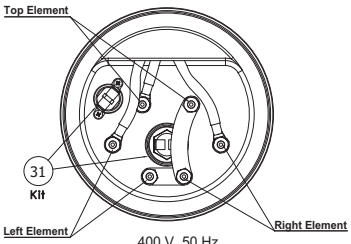
Electronic Thermostat and 40 Amp Disconnect



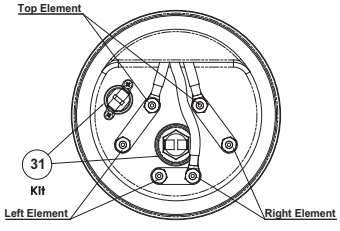
High Limits and Heater Element Configurations



230 V, 50 Hz,
Three Phase (delta)



400 V, 50 Hz,
Three Phase (wye)



480 V, 60 Hz,
Three Phase (delta)

— Parts List —

*** Please have model & serial number available before calling ***

Item No.	Description	12" fan size		16" fan size	20" fan size
		3, 5 & 7.5 kW	10 kW	15 & 20 kW	25 & 30 kW
1	Core assembly (includes bus bars)	Contact factory with the heater voltage, frequency, phase, and kilowatts (V-Hz-Ph-kW) Part #'s 1000 thru 1047			
2	Panel, Top or Bottom	1048		1049	1050
3	Louver Blade kit	1625		1626	1627
4S	Bracket, Disconnect or Thermostat	1054			
4L	Bracket, Disconnect and Thermostat	1055			
5	Fan Blade	3.0 kW = 1056 5.0 kW = 1057 7.5 kW = 1058	10.0 kW = 1059	15.0 kW = 1060 20.0 kW = 1061	25.0 kW = 1062 30.0 kW = 1063
6	Fan Guard Kit	1157		1158	1159
7a	Motor Replacement Kit, 230V, 50 Hz	1067 (230V, 50 Hz, 3Ø)			
7b	Motor Replacement Kit, 400V, 50 Hz and 480V, 60 Hz	1068 (400V, 50 Hz, 3Ø) or (480V, 60 Hz, 3Ø)			
9	Motor Mount Kit	1151		1152	1153
10	Vertical Conduit Kit	1072		1073	1074
12a	Motor Cable Kit	3177		3177	3177
12b	Motor Cable Kit **(only required if the heater has a built in thermostat and built in disconnect)**	3178		3178	3178
13	O-ring, Element Enclosure Cover	1080			
14	Element Enclosure Cover Kit (includes #13)	1081			
15	Guard, Element Enclosure	1082			
16	Set Screw, Control Enclosure	1083			
17	Contactor	1084			
18	Transformer	1085			
19	PCB Kit (includes 2x, #20)	1086			
20	Fuse	1087			
21	O-ring, Control Enclosure Cover	1088			
22	Control Enclosure Cover Kit	1089			
23	Plug, 3/4" NPT	1090			
24a	1" NPT to M25 adaptor	1091			
24b	Plug, 1" NPT	1092			
25	Ground Screw Kit, External	1093			
26	Plug, 1/2" NPT	1094			
27a	Thermostat, BTX1 (T1)	1095			
27b	Thermostat, XET1 (T2)	1096			
28a	Disconnect, 20 Amp (D2)	2356			
28b	Disconnect, 40 Amp (D4)	2357			
29a	Disconnect Cable Kit (D2)	1099			
29b	Disconnect Cable Kit (D4)	1118			
30a	Thermostat Cable Kit, BTX1 (T1)	3179			
30b	Thermostat Cable Kit, XET1 (T2)	3180			
31	High Limit Kit (includes Auto and Manual High Limits)	1102			

— WARNING! —

Heater is to be serviced only by qualified electrician experienced with hazardous location equipment.

Disconnect unit heater from power supply before starting any service or repair work. Do not open if an explosive atmosphere is present. Failure to follow these procedures may result in severe or fatal injury.

— Maintenance Program —

Regular inspection, based on a schedule determined by the amount of dirt / dust in the atmosphere, assures maximum safety, operating economy and heating capacity.

The Maximum allowable dust layer thickness for "dust protected, Ex tb" heaters is 5mm. Based on the environment the heater is installed in ensure the maintenance program is designed to meet this criteria.

Annual Inspection (before each heating season)

1. Check all terminal connections and electrical conductors for damage, looseness, defects, fraying, etc. and replace or tighten where applicable.
2. Inspect contactor contacts. If badly pitted, burned or welded shut, replace with factory supplied contactor. It is recommended that the contactor be replaced every two (2) years.
3. Inspect thermal delay fuses. Fuse rating and type are printed on circuit board. Correct fuse must be in the "ACTIVE" fuse clip. An extra fuse should be stored in the clips marked "SPARE".
4. Check for fluid leakage from heat-exchanger. The heat exchanger is filled with a mixture of water and inhibited **ethylene glycol, which is poisonous,** and is factory vacuum-sealed. In the unlikely event that fluid leakage occurs, remove heater from service and have the heat-exchanger replaced by a factory replacement unit. Refer to "Repair and Replacement" section for complete details. Do not attempt to loosen or tighten the vacuum plug or pressure relief device. A loss of vacuum could cause nuisance tripping of the thermal cutouts and uneven heat distribution across the core.
5. Check all explosion-proof fittings and cables. Replace damaged components with factory approved components. All threaded fittings must be wrench tight and have a minimum 5 turns of engagement. Inside of enclosures must be clean, dry, and free from any foreign materials. Enclosure covers must also be completely on, tight and secured.
6. Check the electrical resistance at the T1, T2, T3 connection points on the contactor. Measure the resistance across the three load points (T1 to T2, T1 to T3, and T2 to T3) . The minimum and maximum resistance readings should be within +/- 5% of the median reading (for three phase models only, consult factory for procedure to verify single phase models).
7. Check motor shaft bearing play. Replace motor if motor does not run quietly and smoothly. Motor bearings are permanently lubricated.
8. Check fan blade. Replace immediately if cracked or damaged.
9. Check fan blade tip clearance to the fan shroud, verify all fan blade tips have equal clearance to the fan shroud (approx. 5mm - 8mm depending on heater size).
10. Check louvers. Louver screws should be tight. Louvers must not be set less than 30 degrees of the closed position.
11. Check the tightness of all hardware. All nuts and bolts, including mounting hardware, must be tightened to correct torque settings on Page 9.
12. Turn heater motor on for a minimum of 10 minutes. Crackling or pinging noises within heater during start-up may occur. This is normal. Check for air exiting heater through louvers and smooth running of motor.

Periodic Maintenance (before and as required during heating season)

1. Clean the following (remove dirt / dust using compressed air):
   - Finned tubes
   - Fan / Fan Guard
   - Motor
   - Cabinet
   - Louvers

   ⇒ Wipe cabinet with a damp cloth to remove any remaining dirt / dust and to mitigate any electrostatic charge buildup
2. Check the following:
   - Motor for smooth and quiet operation
   - Louvers for proper angle and tightness
   - All explosion-proof covers and fittings are tight and secure
   - Contactor for signs of wear or pitting

HEATER MAINTENANCE RECORD

Heater Model: _____ Serial No.: _____

Date of Maintenance	Performed By	Maintenance Performed

Limited 36-Month Warranty

***Hazloc Heaters*™** warrants all **AEU1** series of explosion-proof electric heaters against defects in materials and workmanship under normal conditions of use for a period of thirty-six (36) months from date of purchase based on the following terms:

1. The heater must not be modified in any way.
2. The heater must be stored, installed and used only in accordance with the owner's manual and attached data plate information.
3. Replacement parts will be provided free of charge as necessary to restore any unit to normal operating condition, provided that the defective parts be returned to us freight prepaid and that the replacement parts be accepted freight collect.
4. The complete heater may be returned to our manufacturing plant for repair or replacement (at our discretion), freight charges prepaid.
5. Components damaged by contamination from water, dirt, dust, etc. or corrosion will not be considered as defects.
6. This warranty shall be limited to the actual equipment involved and, under no circumstances, shall include or extend to installation or removal costs, or to consequential damages or losses.

Hazloc Heaters™

Safe heat when you need it!

#1, 666 Goddard Ave. NE
Calgary, Alberta T2K 5X3
Canada
Tel.: +1-403-730-2488
Fax: +1-403-730-2482
Customer Toll Free (U.S. & Canada):
+1-866-701-Heat (4328)
www.HazlocHeaters.com

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