

WARNING! Read all instructions before installing or using the heater. Please adhere to instructions published in this manual. Failure to do so may be dangerous and may void certain provisions of your warranty.



Corrosion-Resistant Washdown Unit Heaters
(European Market)

CRE1 Triton Series™

Owner's Manual

For installation, operation, maintenance, repair, and replacement parts



Model Coding

CRE1	-	400	3	50	-	200	-	T
Model Series		Heater Voltage 220, 240V, 380V, 400V, 415V, 690V	Phase 1, 3	Hertz 50		Heater Kilowatts 2.5 kW - 40 kW		T – Built-in room thermostat P – Built-in pilot light F – Built-in 3-position fan switch ("ON", "OFF", "FAN ONLY") D – Built-in door interlocking disconnect switch M – Built-in manual reset temperature high-limit E – Monel® elements
1st Generation								

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A. HEATER MAINTENANCE CHECKLIST



WARNING. Heater should only be serviced by qualified personnel with heating equipment experience. Lock the switch in the **"OFF"** (open) position and/or tag the switch to prevent unexpected power application.

Heater Model _____ Date of Maintenance _____

Serial Number _____ Maintenance Done By _____

Comments _____

A.1 Period

- | | |
|---|--|
| <p>1. Clean (before and as required during heating season)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Finned Elements <input type="checkbox"/> Fan <input type="checkbox"/> Fan Guard <input type="checkbox"/> Motor <input type="checkbox"/> Louvers | <p>2. Check</p> <ul style="list-style-type: none"> <input type="checkbox"/> Motor for smooth, quiet operation <input type="checkbox"/> Electrical junction box cover for tightness |
|---|--|

Wash with water pressure less than 70 psi.

A.2 Annual

- | | |
|---|---|
| <p>1. Electrical (before heating season)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Check all terminal connections and conductors. Tighten loose connections. Conductors with damaged insulation must be replaced. <p>2. Mechanical</p> <ul style="list-style-type: none"> <input type="checkbox"/> Electrical junction box. Inside of enclosure must be clean, dry, and free of foreign materials. Cover must be completely on and tight. <input type="checkbox"/> Check motor shaft bearing play. Replace motor if play is excessive or if motor does not run quietly and smoothly. Motor bearings are permanently lubricated. <input type="checkbox"/> Check fan. Replace immediately if cracked or damaged. <input type="checkbox"/> Check louvers. Louver screws should be tight. Louvers are not to be closed more than 75° from horizontal. | <ul style="list-style-type: none"> <input type="checkbox"/> Check the tightness of all hardware. All nuts and bolts, including mounting hardware, must be tight. <input type="checkbox"/> TURN HEATER MOTOR ON FOR A MINIMUM OF 15 MINUTES. Check for air exiting heater through louvers and smooth running of fan motor. |
|---|---|



For assistance, please call
Toll Free: 1-800-661-8529
U.S. & Canada

B. IMPORTANT NOTICES



WARNING. Read and adhere to the following. Failure to do so may result in severe or fatal injury.



WARNING. Heater is not to be used in hazardous atmospheres where flammable vapors, gases, liquids or other combustible atmospheres are present. Failure to do so can result in equipment explosion that can cause property damage, fatal personal injury, or death. Failure to follow this instruction manual, including but not limited to installation procedure, operation procedure, and maintenance requirement may results in equipment explosion, fire, and/or bodily harm.

1. Read and follow all instructions in this manual.
2. Heater is to be connected and serviced only by a qualified electrician.
3. Installation and wiring of the heater must adhere to all applicable codes.
4. Before opening any enclosures, disconnect the heater from the power supply. Lock the switch in the "OFF" position and/or tag the switch to prevent unexpected power application.



WARNING. Appropriate protection against ground faults, such as a ground-fault circuit interrupter or GFCI, is required for this equipment, as well as compliance with all applicable electrical codes and standards.

5. The heater does not operate with the high-limit disconnected from the control circuit.



WARNING. Elements get hot during operation. Contact can cause burns.



WARNING. To prevent risk of fire, install heater according to minimum clearances stated in Figure 1.

6. The heater does not to be operate if the bulb or capillary of the high-limit is damaged.
7. Do not operate the heater in atmosphere corrosive to type 304 stainless steel.
8. Use factory replacement parts only.
9. Maximum ambient operating temperature is 40°C (104°F).
10. Type 4X conduits must be used for field connection in order to maintain watertightness of the enclosure.
11. Do not operate the heater with the louvers deformed from their factory preset positions.
12. Wash with water pressure less than 70 psi.
13. Complies with U.S. Coast Guard regulations only when indicated on heater data plate and when the discharge grille directs airflow downward.
14. If there are any questions or concerns regarding the heater, please refer to contact info on page 14.

C. INSTALLATION GENERAL GUIDE FOR INSTALLATION AND WIRING

All applicable codes must be adhered to. For optimum performance, the heater should be installed as follows:

C.1 Location

1. Ensure there are no obstructions that may impede the heater's air inlet or discharge (see Figure 1 for minimum clearances).
2. Ensure the air discharge is not directed at a thermostat.
3. Ensure the air discharge is not directed towards areas of heat loss, such as windows.
4. Ensure the air discharge is directed along and at a slight angle toward exterior walls.
5. If equipment freeze protection is important, direct air discharge at equipment while maintaining minimum clearances.

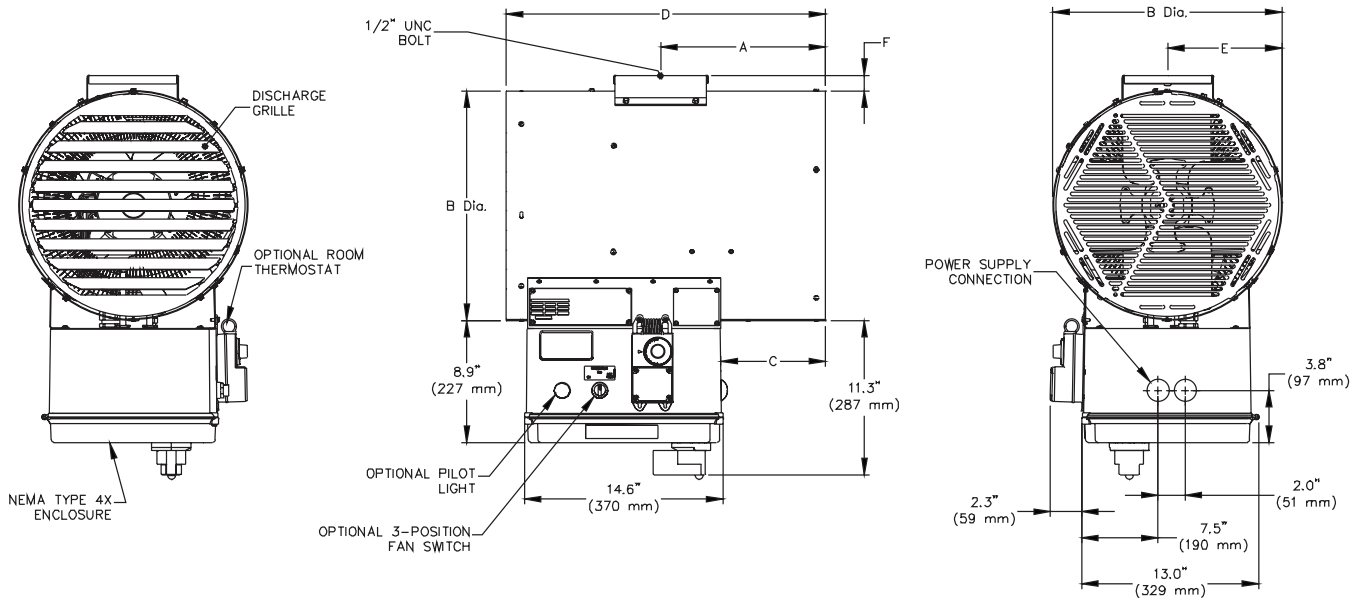


Figure 1

Table 1 – Heater Dimensions

DIMENSIONS	A	B	C	D	E	F
2.5 to 10 kW	318 mm (12.5")	325 mm (12.8")	216 mm (8.5")	620 mm (24.4")	162.5 mm (6.4")	23 mm (1")
11 to 20 kW	307 mm (12.1")	425 mm (16.7")	190 mm (7.5")	595 mm (23.4")	212.5 mm (8.4")	30 mm (1.1")
21 to 40 kW	307 mm (12.1")	526 mm (20.7")	190 mm (7.5")	595 mm (23.4")	262.5 mm (10.3")	33 mm (1.3")

Table 2 – Installation Minimum Clearances

Minimum clearances for service and airflow:	
Front	1829 mm (72")
Back	152 mm (6")
Right Side	254 mm (10")
Left Side	25 mm (1")
Top	203 mm (8")
Bottom	1829 mm (72")

C.2 Mounting

1. The heater must be permanently mounted with the control box at the bottom.
2. The mounting surface must be strong enough to:
 - a. Support the heater's weight.
 - b. Provide sufficient stiffness to prevent excessive vibration.
 - c. Withstand harsh situations such as transportable installations.
 - d. The single bolt mounting is not designed in contemplation of high dynamic loads that can occur during transportation. For heaters that are to be installed prior to transportation it is recommended that temporary blocking or strapping be used to limit movement of the heater with respect to the mounting structure. Inspection of the mounting bolt for correct tensioning is also recommended after arrival at site to ensure no loosening has occurred in transportation.
3. Install the heater at least 1.8 m (6 ft) from the floor.
4. Install the bracket (see Figure 2 - 5 for installation instructions).
 - a. Orient the heater to its final position before tightening all hardware.
 - b. In higher vibration installations use of a removable thread locking compound such as Loctite® 243 Blue Threadlocker is recommended.
 - c. Correct tensioning of the mounting bolt will include full compression of the split lock washer and inspection for correct thread engagement. The mounting bolt/nut should be torqued to 88 to 102 N·m (65 - 75 ft-lbs.)
 - d. Ensure that all safety pins are installed in the bolt(s) and clevis pin(s).
5. Louvered discharge grille can be rotated in 45° increments. Heater only complies with U.S. Coast Guard regulations when the grille is installed such that the airflow is directed downward.
6. For maximum tilt angles, see Figure 2. For maximum mounting height, see general specifications table on page 11.

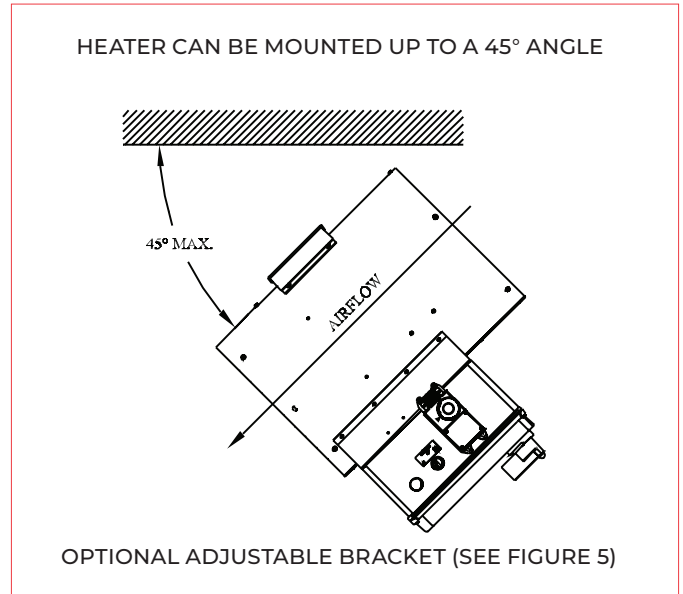


Figure 2

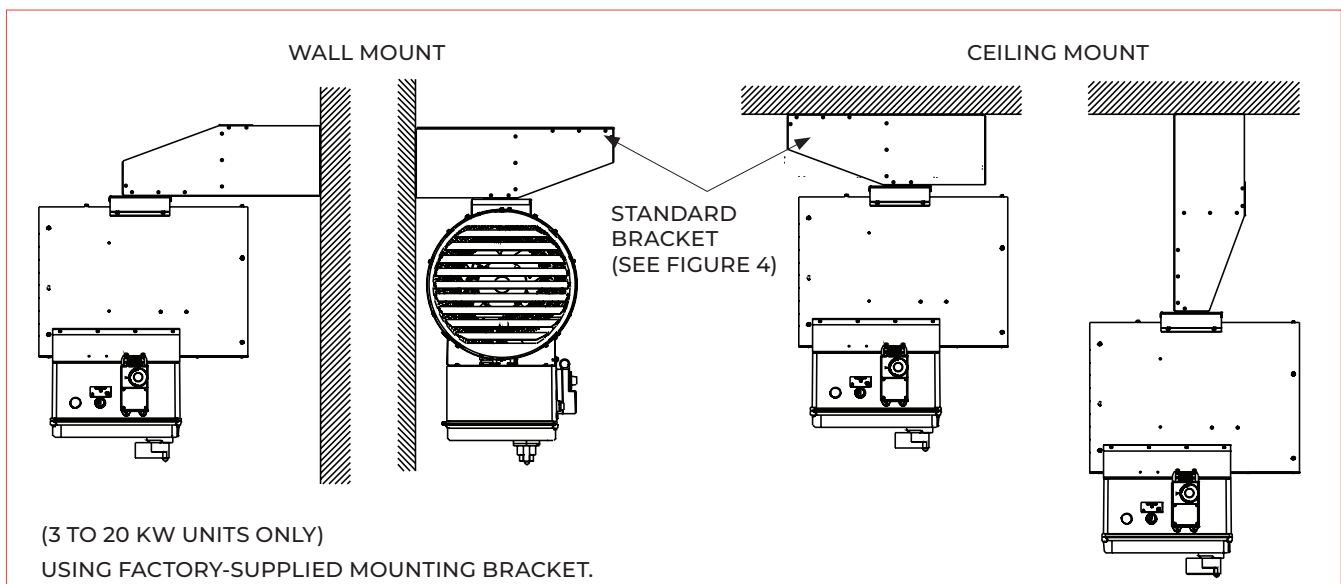


Figure 3

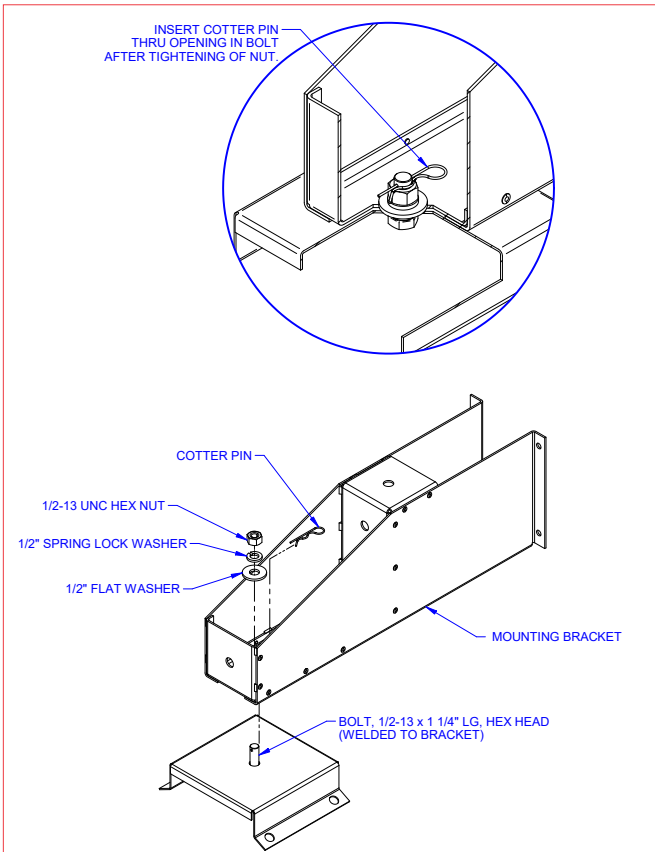


Figure 4

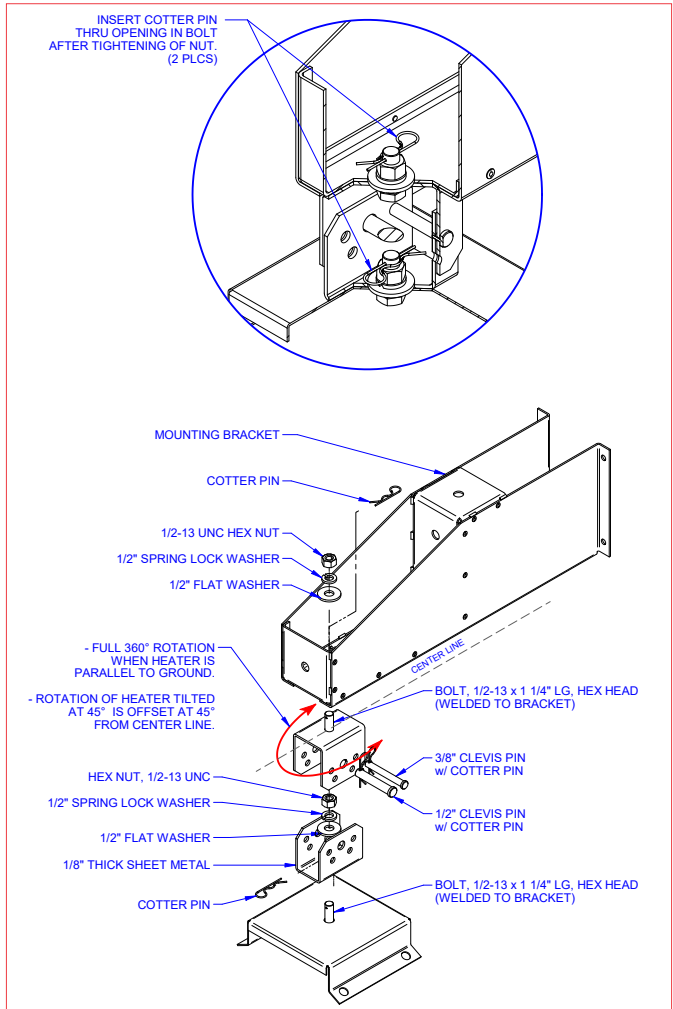


Figure 5

C.3 Electrical



WARNING. Disconnect heater from power supply before installation of the heater. Lock the switch in the "OFF" (open) position and/or tag the switch to prevent unexpected power application. Installation and wiring of the heater must adhere to all application codes.

C.3.1 General

1. Use only copper conductors and approved Type 4X wiring methods during installation. Refer to the "Technical Data" table and heater data plate for conductor rating.
2. External overcurrent protection is required. Refer to the "Technical Data" table and heater data plate for voltage, amperage, and frequency. Supply voltage is to be within 10% of the data plate voltage.

C.3.2 Field Wiring

1. Heater is supplied with an enclosure that has 2 standard 3/4" trade size conduit openings to accommodate the line conductors or external thermostat connection.

2. Heater may be supplied with a factory-installed built-in room thermostat. On heaters not supplied with this option, a remote thermostat is required. Connect the remote thermostat conductors to the terminal block marked T1, T2 and Ground. Any thermostat used with this heater must be:
 - a. Listed or Approved
 - b. Type 4X rated*, and
 - c. Rated at 120 volt minimum and 5 amp minimum.
 - d. *An appropriate Type 4X rated room thermostat is available from the factory.

C.3.3 Final Inspection

1. Before application of electrical power:
 - a. Check that all connections are secured and comply with the applicable code requirements.
 - b. Confirm that the supply voltage is compatible with the data plate specifications.
 - c. Remove any foreign objects from the heater.
 - d. Ensure all external fittings and enclosure covers are secured.
 - e. Ensure that the fan rotates freely.
 - f. If equipped, ensure manual reset high-limit has been reset.

Wiring Schematics

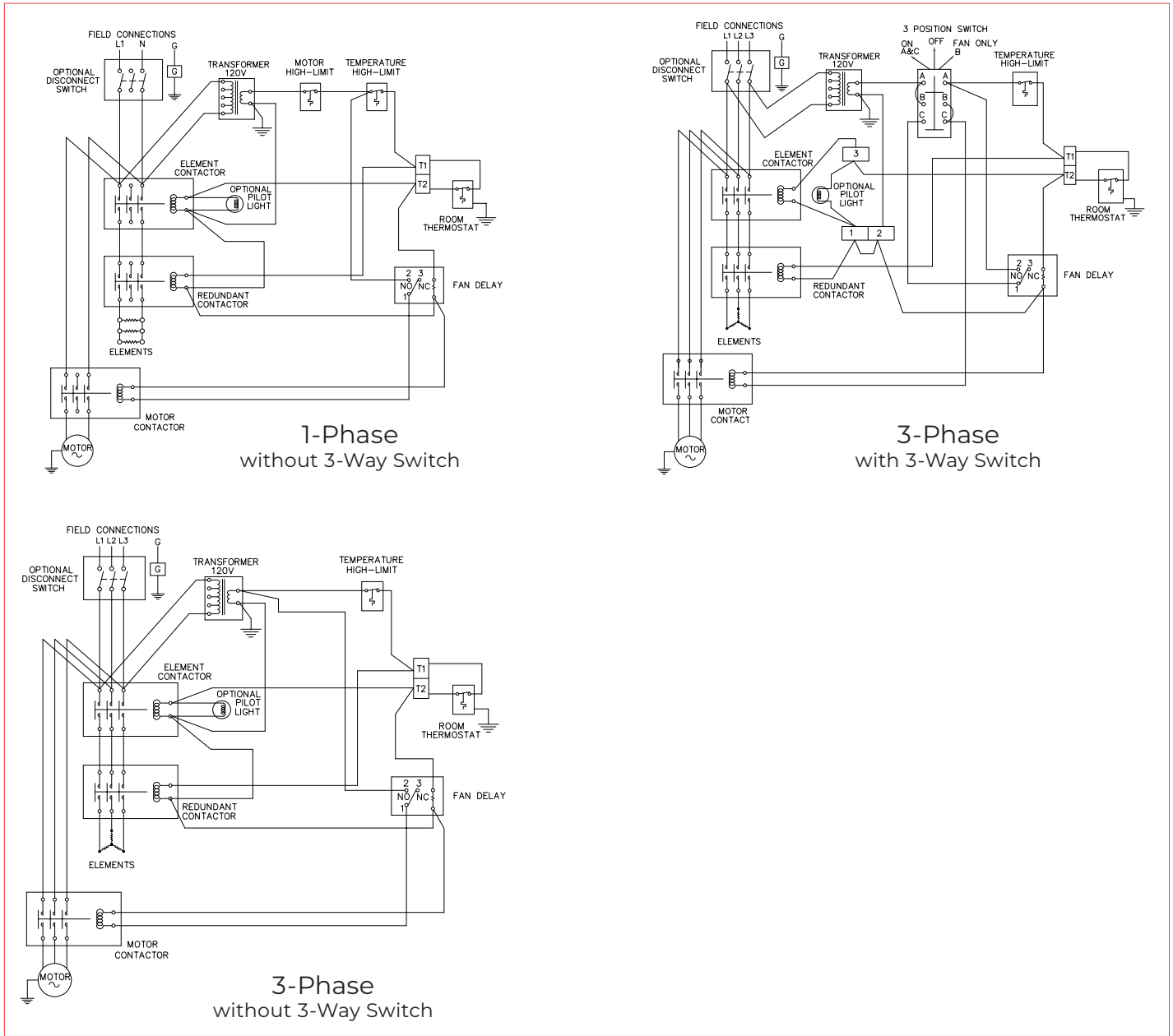


Figure 6

D. OPERATION

D.1 General

1. To operate heater, ensure power supply is properly connected as specified in the wiring schematic (see figure 6 on page 6).
2. Ensure the thermostat controlling the heater is set above the ambient temperature.
3. If the heater is provided with the optional door interlocking disconnect switch, ensure the switch is in the "ON" position.
4. If the heater is provided with the optional 3-position fan switch, ensure the switch is in the "ON" position. Note: If the switch is in the "FAN ONLY" position, only the fan will energize, not the elements.
5. If the heater is provided with the optional pilot light, the light will illuminate only when the elements are energized.
6. The heater is provided with a fan delay relay. The fan will energize approximately 20 seconds after the elements are energized. The fan will remain in operation for approximately 2 minutes after the thermostat de-energizes the elements. If the 3-position fan switch is turned to the "OFF" position, the fan will de-energize immediately.
7. During normal operation, the high-limit control should not cycle the heater ON and OFF. If cycling occurs, check to see if there is an airflow blockage. If there are no obstructions, the heater must be examined by qualified personnel to determine the cause of the high-limit cycling.
8. The heater is moisture resistant and can be externally washed down with low pressure water. High pressure washing or direct internal pressure washing of the heater may result in damage or failure. (Refer to Important Notices Section - 14).

E. REPAIR & REPLACEMENT



WARNING. Disconnect heater from power supply before installation of the heater. Lock the switch in the "OFF" (open) position and/or tag the switch to prevent unexpected power application. The heater should only be serviced by qualified personnel with electrical heating equipment experience.

NOTE: ONLY USE FACTORY SUPPLIED REPLACEMENT PARTS OF THE SAME SPECIFICATION. FOLLOW STEP BY STEP INSTRUCTIONS SUPPLIED IN HEATING ELEMENT REPLACEMENT PARTS PACKAGE.

E.1 Heating Elements

1. Disconnect all wires connected to the element terminals and remove all bus bars. Remove discharge grille from heater. If equipped, remove element brackets from heater.
2. Remove elements, noting their proper placement.
3. Install factory-supplied replacement elements such that the smallest loop of the spiral element is closest to the discharge end of the heater (see Figure 7).
 - a. Ensure that the element gaskets are in place and in good condition.
 - b. Tighten the element bushing nuts until the gaskets are snug between the bushing shoulders and enclosure.
 - c. Compress the gaskets by turning the nuts 1 to 1-1/4 additional turns.

- d. Check that the elements are not in contact with the cabinet or each other.
4. Reinstall all bus bars, wires, brackets, and discharge grille.

E.2 Fan

1. Remove inlet grille from heater. Remove the three screws securing the fan to the fan hub attached to the motor.
2. Replace fan with factory-supplied fan. Install the fan such that the "spider" of the fan (see Figure 8) faces the outside of the heater (i.e., facing away from the motor). The spider should be visible from the rear of the heater (as shown in Figure 8).

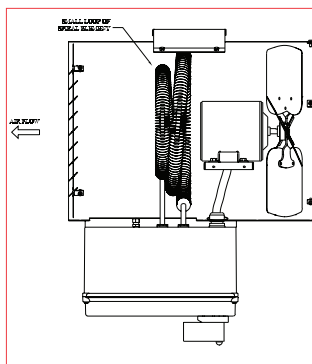


Figure 7

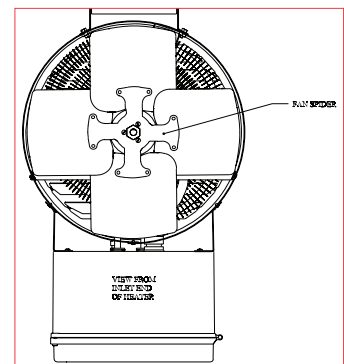


Figure 8

E.3 Temperature High-Limit

1. Remove discharge grille from heater. Remove clips securing bulb and capillary to cabinet.
2. Inside electrical enclosure, remove lock nut from high-limit compression fitting and remove fitting from enclosure.
3. Remove compression nut from the fitting (see Figure 9). Remove seal from fitting. Remove fitting from capillary.
4. Remove high-limit switch from the enclosure.
5. Replace high-limit with factory-supplied replacement high-limit.
6. Reinstall high-limit switch to bracket in the control enclosure.
7. Slip capillary sleeve over capillary. Note: For 25 to 39 kW heaters, the sleeve must be cut to 210 mm (8.25 in.). For 15 and 20 kW heaters, the sleeve must be cut to 360 mm (14.125 in.). For 3 to 10 kW heaters, sleeve does not have to be cut to length.
8. Slide lock nut over bulb and capillary. Insert bulb and capillary through the enclosure opening.
9. Place compression fitting body over capillary. Install seal on capillary and insert seal into body of fitting (see Figure 9).
10. Loosely install top nut onto compression seal body. Secure fitting to enclosure with lock nut on the inside of the enclosure. Tighten lock nut to ensure watertight seal.
11. Reinstall the bulb and capillary using the original clips. Ensure the bulb is in the same position as the previous high-limit. The bulb tip should be 100 mm (3.94 in.) from the discharge edge of the cabinet.
12. Tighten top nut on compression seal.

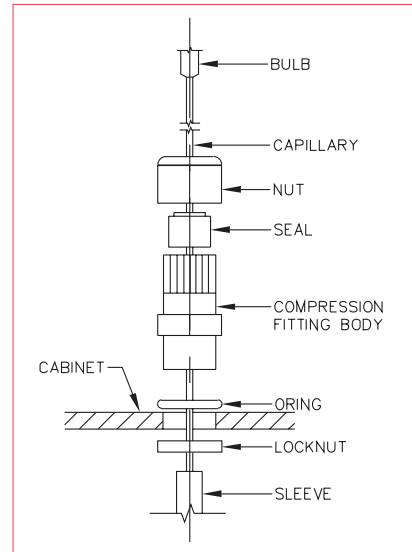
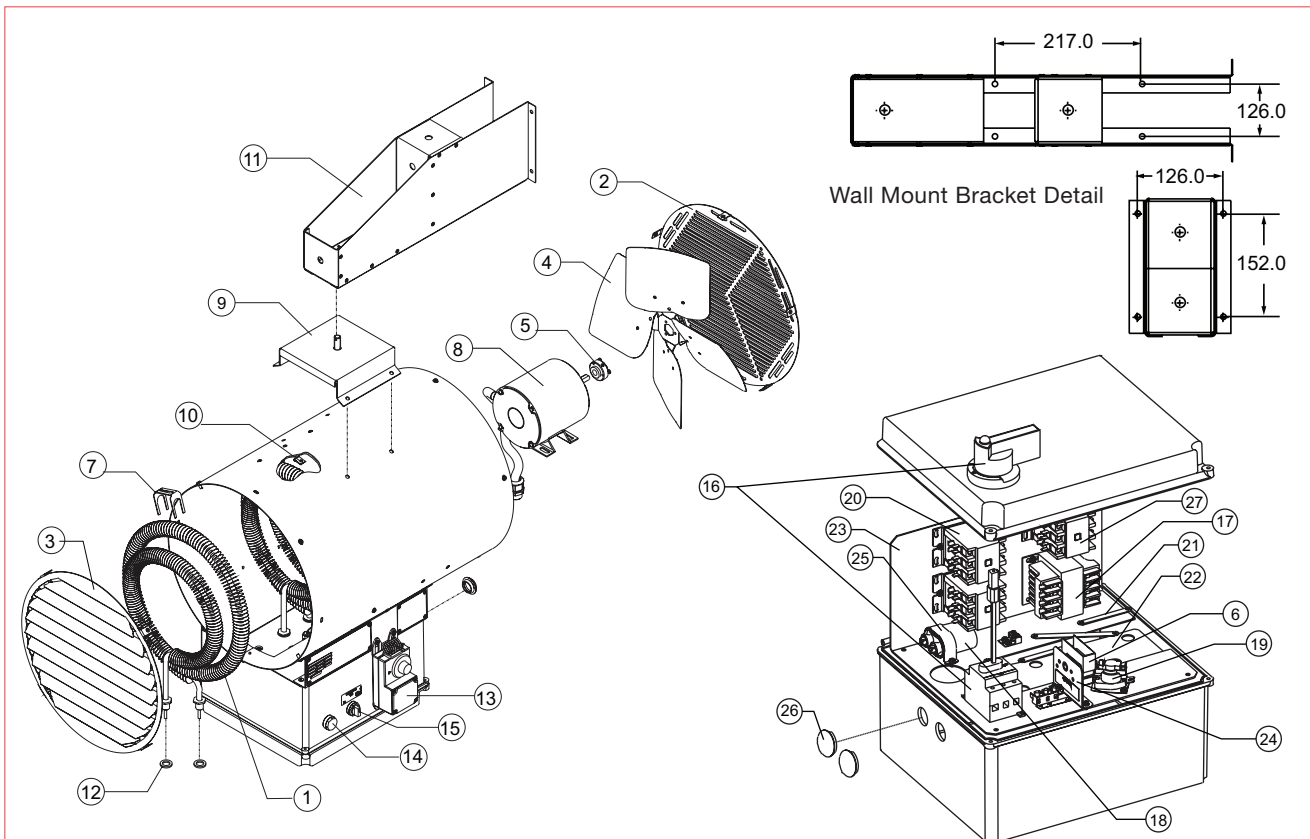


Figure 9

F. PARTS LIST



Item #	Description		2.52kW to 3kW	4.2kW to 5kW	6.3kW to 7.5kW	8.41kW to 10kW	12.62kW to 15kW	16.82kW to 20kW	"21.03kW to 25kW"	25.23kW to 30kW	35kW	40kW	
1	Elements	SS	220V	20-14071-01	20-14071-02	20-14071-03	-	-	-	-	-	-	
			240V				-	-	-	-	-		
			380V				-	-	-	-	-		
			400V				-	-	-	-	-		
			415V				-	-	-	-	-		
		690V	20-14071-05	20-14071-06	20-14071-07	20-14071-08	20-14072-03	20-14072-04	20-14073-03	20-14073-04	20-14073-05	20-14073-06	
		MoneI®	220V	20-14071-09	20-14071-10	20-14071-11	0-14071-12	-	-	-	-	-	-
			240V					-	-	-	-	-	
			380V					-	-	-	-	-	
			400V					20-14072-05	-	-	-	-	
			415V					-	-	-	-	-	
		690V	-	-	-	-	-	-	-	-	-		
2	Inlet Grill		7485			7484			8251				
3	Discharge Grill		7487			7486			8252				
4	Fan Blade		7522-01			7523-01			8304-01				
5	Fan Hub					7519							
6	High-Limit Kit	Auto Reset				7740							
		Manual Reset				7741							
7	Element Bracket		N/A						7589				
8	Motor Kit	220-240V				20-14075-01							
		380-690V				20-14075-02							
9	Attachment Bracket					7490							
10	High-Limit Clip					7656							
11	Mounting Bracket					7501							
12	Element Gasket					7579							
13	Built-in Thermostat Kit					7743							
14	Pilot Light Kit					7744							
15	3-Position Fan Switch					7745							
16	Disconnect Switch Kit					7577							
17	Transformer	220-240V				MO50A							
		380-690V				9062							
18	Motor Capacitor					N/A							
19	Fan Delay Relay					7470							
20	Contactors	40 Amp				3618							
		75 Amp				3619							
21	Bus Bars	1Ø				7475							
		3Ø Short				7476							
		3Ø Long				7477							
22	Element Plate					7488							
23	Controls Bracket					7493							
24	Hi-Limit Switch Bracket					7654							
25	Capacitor Bracket					N/A							
26	Knock-out Plugs					7639							
27	Contactor (Motor)					3618							

G. TECHNICAL DATA

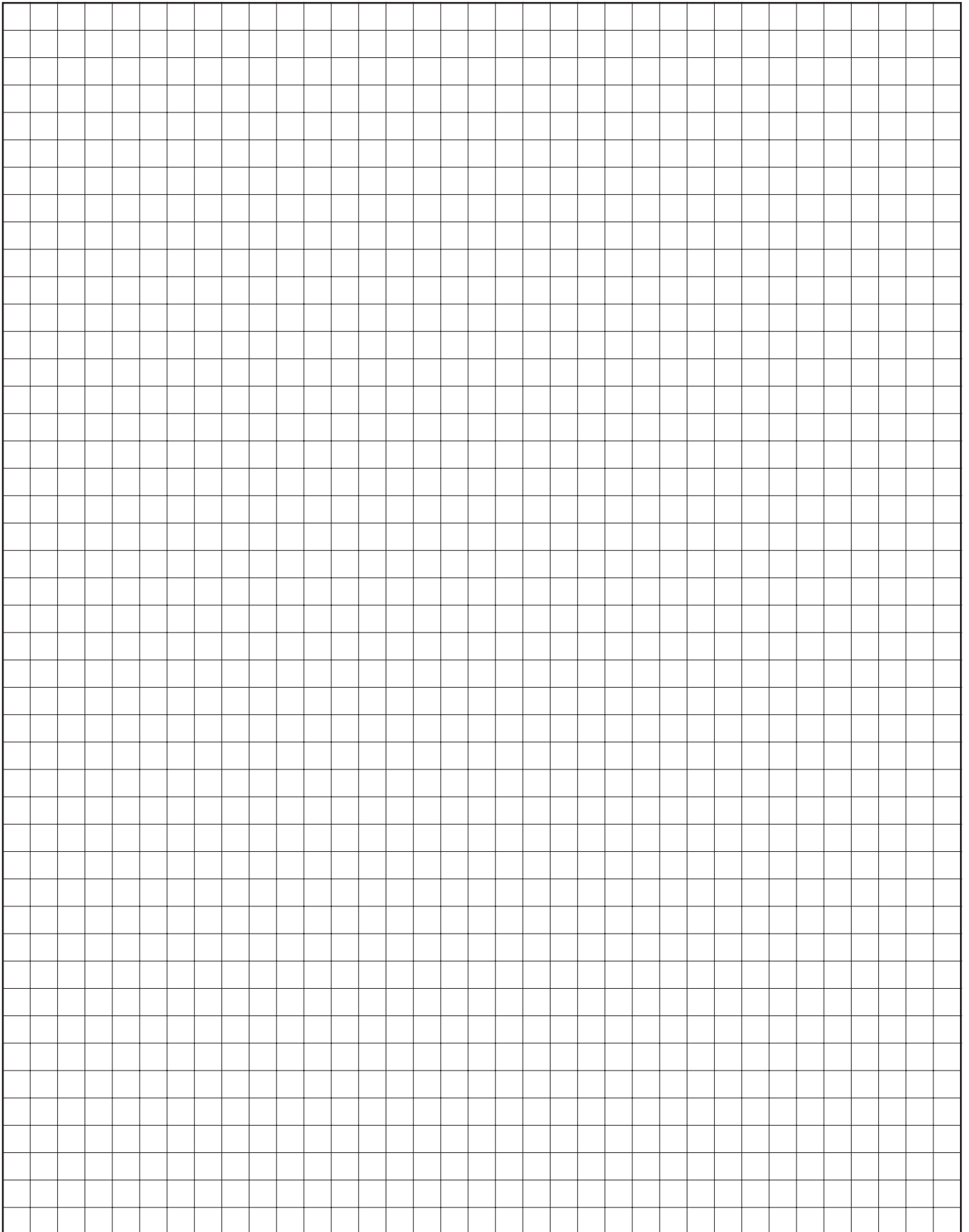
Model	Nominal Power (kW)	Unit Voltage (V)	Phase	Unit Current (A)	Cabinet Size
CRE1-220150-025	2.52	220	1	13.6	12
CRE1-220150-042	4.20	220	1	21.2	12
CRE1-220150-063	6.30	220	1	30.7	12
CRE1-240150-030	3.00	240	1	14.6	12
CRE1-240150-050	5.00	240	1	22.9	12
CRE1-240150-075	7.50	240	1	33.4	12
CRE1-240150-100	10.00	240	1	43.8	12
CRE1-380350-025	2.52	380	3	5.0	12
CRE1-380350-042	4.21	380	3	7.6	12
CRE1-380350-063	6.31	380	3	10.8	12
CRE1-380350-084	8.41	380	3	14.0	12
CRE1-380350-126	12.62	380	3	20.4	16
CRE1-380350-168	16.82	380	3	26.8	16
CRE1-380350-210	21.03	380	3	33.2	20
CRE1-380350-252	25.23	380	3	39.5	20
CRE1-400350-028	2.79	400	3	5.2	12
CRE1-400350-047	4.65	400	3	7.9	12
CRE1-400350-070	6.97	400	3	11.3	12
CRE1-400350-093	9.29	400	3	14.6	12
CRE1-400350-139	13.94	400	3	21.3	16
CRE1-400350-186	18.58	400	3	28.0	16
CRE1-400350-232	23.23	400	3	34.7	20
CRE1-400350-279	27.87	400	3	41.4	20
CRE1-415350-030	3.00	415	3	5.4	12
CRE1-415350-050	5.00	415	3	8.2	12
CRE1-415350-075	7.50	415	3	11.6	12
CRE1-415350-100	10.00	415	3	15.1	12
CRE1-415350-150	15.00	415	3	22.1	16
CRE1-415350-200	20.00	415	3	29.0	16
CRE1-415350-250	25.00	415	3	36.0	20
CRE1-415350-300	30.00	415	3	42.9	20
CRE1-690350-030	3.00	690	3	3.1	12
CRE1-690350-050	5.00	690	3	4.8	12
CRE1-690350-075	7.50	690	3	6.9	12
CRE1-690350-100	10.00	690	3	9.0	12
CRE1-690350-150	15.00	690	3	13.2	16
CRE1-690350-200	20.00	690	3	17.3	16
CRE1-690350-250	25.00	690	3	21.5	20
CRE1-690350-300	30.00	690	3	25.7	20
CRE1-690350-350	35.00	690	3	29.9	20
CRE1-690350-400	40.00	690	3	34.1	20

H. GENERAL SPECIFICATIONS

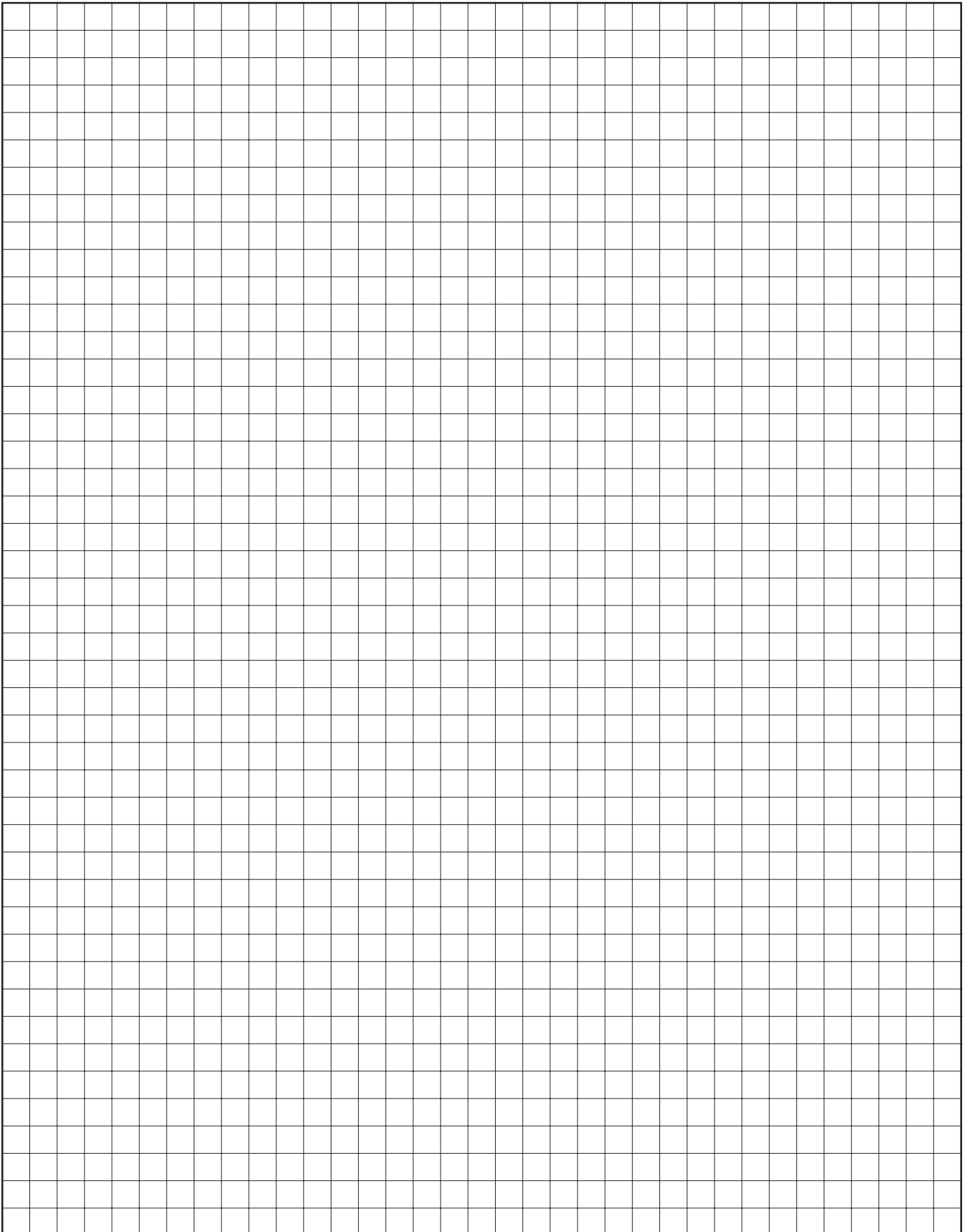
			Nominal kW		
			2.5 to 10	11 to 20	21 to 40
Air Delivery		m ³ /hr	1190	2465	3570
Approx. Air Velocity		m/s	4.0	4.8	4.6
Horizontal Throw		m	6.7	10.7	13.4
Max. Mounting Height	Horizontal (to underside)	m	2.6	3.5	3.7
	45° Decline (to underside)	m	3.9	5.5	5.7
Min. Mounting Height		m	1.8		
Fan Diameter		in	12	16	20
Net Weight		mm	305	406	508
Shipping Weight		kg	34.1	40.9	59.1
		kg	56.8	63.6	81.8

NOTE: Maximum mounting height to ensure warm air reaches the floor.

NOTES



NOTES





Ruffneck™

PLEASE ADHERE TO INSTRUCTIONS IN THIS MANUAL

Failure to do so may be dangerous and may void certain provisions of your warranty.

For further assistance, please call 24hr hotline: 1-800-661-8529 (U.S.A. and Canada)
Please have model and serial numbers available before calling.

WARRANTY: Under normal use the Company warrants to the purchaser that defects in material or workmanship will be repaired or replaced without charge for a period of 18 months from date of shipment, or 12 months from the start date of operation, whichever expires first. Any claim for warranty must be reported to the sales office where the product was purchased for authorized repair or replacement within the terms of this warranty.

Subject to State or Provincial law to the contrary, the Company will not be responsible for any expense for installation, removal from service, transportation, or damages of any type whatsoever, including damages arising from lack of use, business interruptions, or incidental or consequential damages.

The Company cannot anticipate or control the conditions of product usage and therefore accepts no responsibility for the safe application and suitability of its products when used alone or in combination with other products. Tests for the safe application and suitability of the products are the sole responsibility of the user.

This warranty will be void if, in the judgment of the Company, the damage, failure or defect is the result of:

- Vibration, radiation, erosion, corrosion, process contamination, abnormal process conditions, temperature and pressures, unusual surges or pulsation, fouling, ordinary wear and tear, lack of maintenance, incorrectly applied utilities such as voltage, air, gas, water, and others or any combination of the aforementioned causes not specifically allowed for in the design conditions or,
- Any act or omission by the Purchaser, its agents, servants or independent contractors which for greater certainty, but not so as to limit the generality of the foregoing, includes physical, chemical or mechanical abuse, accident, improper installation of the product, improper storage and handling of the product, improper application or the misalignment of parts.

No warranty applies to paint finishes except for manufacturing defects apparent within 30 days from the date of installation.

The Company neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with the product(s).

The Purchaser agrees that all warranty work required after the initial commissioning of the product will be provided only if the Company has been paid by the Purchaser in full accordance with the terms and conditions of the contract.

The Purchaser agrees that the Company makes no warranty or guarantee, express, implied or statutory, (including any warranty of merchantability or warranty of fitness for a particular purpose) written or oral, of the Article or incidental labour, except as is expressed or contained in the agreement herein.

LIABILITY: Technical data contained in the catalog or on the website is subject to change without notice. The Company reserves the right to make dimensional and other design changes as required. The Purchaser acknowledges the Company shall not be obligated to modify those articles manufactured before the formulation of the changes in design or improvements of the products by the Company.

The Company shall not be liable to compensate or indemnify the Purchaser, end user or any other party against any actions, claims, liabilities, injury, loss, loss of use, loss of business, damages, indirect or consequential damages, demands, penalties, fines, expenses (including legal expenses), costs, obligations and causes of action of any kind arising wholly or partly from negligence or omission of the user or the misuse, incorrect application, unsafe application, incorrect storage and handling, incorrect installation, lack of maintenance, improper maintenance or improper operation of products furnished by the Company.

Visit www.Thermon.com to contact a Thermon representative near you.

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