

INSTALLATION INSTRUCTIONS FOR ETA AND ETH SERIES ELECTRIC HEATERS IN T OR S SERIES UNITS

NOTE TO INSTALLER

The words "SHALL" and "MUST" indicate a requirement which is essential to satisfactory and safe product performance. The words "SHOULD" and "MAY" indicate a recommendation or advice which is not essential and not required but which may be useful or helpful.

These instructions are for the use of qualified individuals, trained and experienced in installation of this type of equipment and related system components.

Installation and service personnel are required by some states to be licensed. Persons not qualified shall not install this equipment nor interpret these instructions.

The installation manual is provided to ensure the proper installation and satisfactory performance of your equipment. The instructions contained herein SHALL NOT be deemed to extend, modify, alter, or expand any of the representations contained in the LIMITED WARRANTY.



DANGER: BEFORE PERFORMING ANY WORK ON THIS EQUIPMENT, POWER SUPPLY MUST BE TURNED OFF AT THE SERVICE BOX TO AVOID THE POSSIBILITY OF SHOCK, INJURY, DEATH, OR DAMAGE TO THE EQUIPMENT.



WARNING: IMPROPER INSTALLATION MAY DAMAGE EQUIPMENT, CAN CREATE A HAZARD, AND WILL VOID THE WARRANTY.

INSPECTION AND UNPACKING

A thorough inspection of the shipping container should be made immediately upon receiving our heater. Look for any punctures or openings, and if it appears damage has occurred, it should be noted on the freight bill before signing it. The delivering carrier should be contacted immediately and asked to inspect damage, and no installation work should begin until this inspection is completed.

After carefully checking the heater for loose wires or any damage due to shipping, you are now ready to install the heater.

LOCAL CODES

The installer shall comply with all local codes and/or regulations pertaining to this type of equipment and its installation. Such codes and/or regulations should take precedence over any recommendations contained herein. In lieu of local codes, installation should be made in accordance with the National Electrical Code and recommendations made by the National Board of Fire Underwriters.

DESCRIPTION

The ETA and ETH heaters are approved for field installation in the T and S series only. If your installation involves an heat pump unit, pay special attention to the staging requirements in these instructions.

CLEARANCES

The T or S series unit with the ETA and ETH series heaters installed requires a ¼" clearance for the first 3 feet of supply duct. Clearance to the cabinet is 0" on all sides including the unit back panel.

Refer to the unit installation instructions for required service clearances.

Refer to the table below to confirm that the heater model to be installed does not exceed the maximum KW allowed for the unit model.

Unit Model	Maximum Allowed KW	Heater Model
T/S V30-36	15	ETA
T/S V48-60	20	ETA
T/S H36-60	10	ETH

INSTALLATION (ALL UNITS)

1. THE POWER TO THE UNIT MUST BE DISCONNECTED!
 - a. Make sure the electrical power source matches the unit name plate and that constant voltage can be maintained to the unit.
 - b. Please place crack-and-peel heater model number label under unit label for future reference.
2. Remove the Upper Front Panel. Remove the Electrical Box Cover and slightly unscrew the blower keyhole screws (Fig. 1). Unplug the blower from the blower plug and remove the two screws securing the blower motor module.
3. Remove the four screws securing the double blower assembly, being careful to allow the blower to rest on the two keyhole screws.
4. Lift the blower assembly over the screws and remove.
5. Remove the black hole covering and attach the heater assembly to the blowers using three screws. (Fig. 2&3) Ensure that the heat kit is securely fastened.
6. Press the included snap bushing into the center hole to protect the wiring. Insert the electrical wiring through the bushing such that the wires will hang underneath the motor.
7. Hang the blower assembly on the two keyhole screws and fasten the blowers with the four screws, as mentioned in step 3. Reattach the blower motor module. The installation should reflect the picture in Fig. 4.
8. Route the wires from the heater underneath the blower motor and along the top of the control box. Secure the heater wires to the existing wires across the control box with ties provided. Route these wires through the hole in the control box above the breaker assembly. Connect these wires to the corresponding terminals shown in the wiring diagram. Each wire is numbered and color-coded. For the heater wire connections to the breaker and heat contactor locations see the appropriate diagram on page 8 -12.
9. Attach the crack and peel wire diagram to the inside of the electrical box cover for future reference.

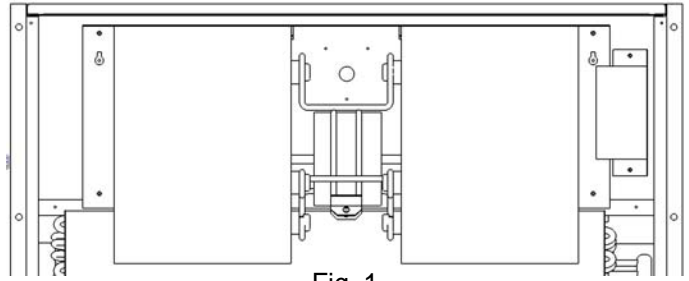


Fig. 1

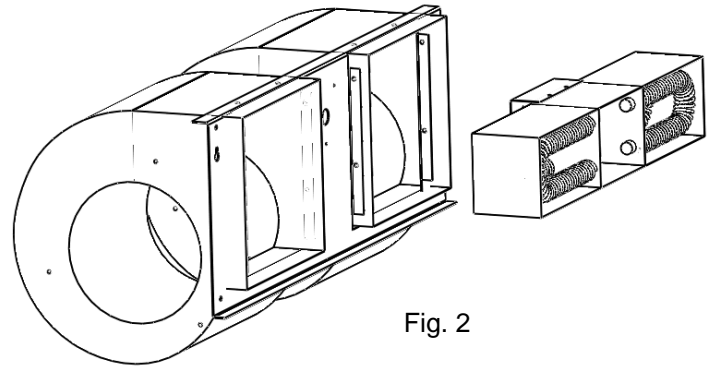


Fig. 2

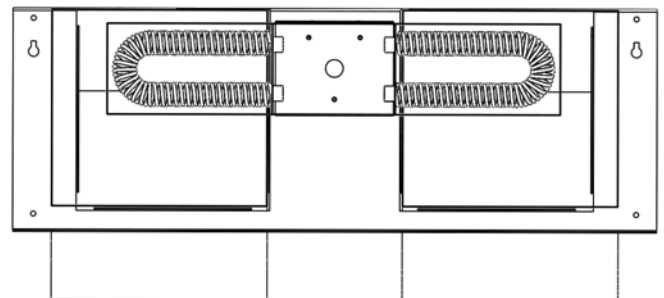


Fig. 3

Electric Heat

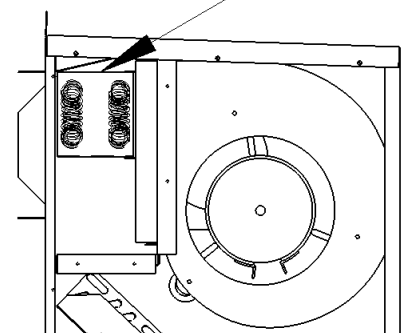


Fig. 4

ELECTRICAL HOOK UP

All heater assemblies have single-point line-voltage connection terminals. All 1-phase models above 10 KW have the option of single or dual point line voltage connections. If dual point connection is to be made, remove the single point wiring terminals.

NOTE: If separate over current devices are used on the dual circuits, they **MUST** be marked to show that both devices **MUST** be turned off to completely shut off power to the unit.

The line voltage electrical service can be routed through the right side panel, the left or right side of the back panel, and the right side panel. Each area is supplied with two line voltage knockouts (1/2" – 3/4" and 1" – 1-1/4" conduit) Low voltage can be routed through the right side panel, facing the unit from the outside.

NOTE: When routing line voltage through the return air compartment, conduit **MUST** be used (even though this is a dry area) to comply with the N.E.C.. Flexible conduit is recommended.

Be sure to install a ground wire of the proper size to the units equipment ground lug.

LOW – VOLTAGE WIRING

230 volt, single and three phase, units are equipped with dual primary voltage transformers for 208/240-volt operation. These models are factory wired to the 240-volt tap. For 208-volt operation, reconnect the factory-installed wire from the 240-volt tap to the 208-volt tap. The acceptable range for the voltage tap is:

<u>Tap</u>	<u>Voltage Range</u>
240 Volt	253 – 216
208 Volt	220 – 187

Four or five color-coded conductors should be run from the thermostat location to the unit for V series units. H series units may require 7 wires.

Conductors should be sized as shown:

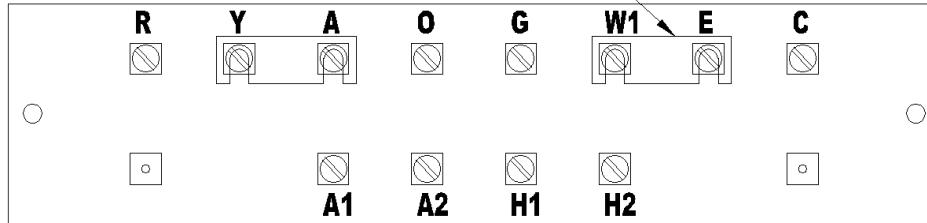
Wire Gauge	Maximum Length
20	45'
18	60'
16	100'
14	160'
12	250'

STAGING OF ELECTRIC HEAT (TV & SV SERIES)

ETA and ETH model heaters installed in TV & SV series units may be wired for single or two-stage operation. A jumper bar is supplied with each heat assembly for single stage operation. For two-stage electric heat operation disconnect the jumper bar between the W1 (first stage) and E (second stage) terminals of the unit low voltage board.

NOTE: The following applies only to ETH15B1 and ETH20B1 heat installations.

Remove Jumper Bar for Staging of Electric Heat



JUMPER BAR BETWEEN W1 AND E MUST BE REMOVED ON ALL HEAT PUMP MODELS

DUCTWORK

A section of steel duct or duct board with a length of at least 24" MUST be installed on the unit supply opening to serve as a heat sink. Any type of ductwork listed for this application may be used from there on.

Refer to the units' installation instructions for the recommended duct static and motor speed selection for our unit and heater combination.

MAINTENANCE

Always install filters and keep them clean. Check filters every ten days to two weeks. Clean or replace as necessary. Keep the return air grille clean and clear of any obstructions. Do not place any type of furniture over or in front of the grille, as it will restrict airflow. If a supply grille is used do not place any obstructions that will restrict air flow.



SERVICE WARNING:

WHILE SERVICING THE HEATER, BE SURE TO DE-ENERGIZE BOTH THE HEATER CIRCUIT AND THE AIR-CONDITIONER CIRCUIT, AS A HAZARD OF SHOCK MAY EXIST.

THERE MAY BE MORE THAN ONE DISCONNECT REQUIRED TO DE-ENERGIZE THE HEATER AND AIR CONDITIONER.

TV SERIES AIR CONDITIONER ELECTRIC DATA

Model No. & Electric Heater Kw [1]	Volt / Phase	No. of Field Power Ckts	SINGLE FIELD CIRCUIT				DUAL FIELD CIRCUIT													
			MINIMUM CIRCUIT AMPACITY	MAX OVER CURRENT PROTECTION [2]	FIELD POWER WIRE SIZE [3],[4],[5]	GROUND WIRE SIZE	MIM WIRE AMPACITY		MAX OVER CURRENT PROTECTION [2]		FIELD POWER WIRE SIZE [3],[4],[5]		GROUND WIRE SIZE							
							CKT1	CKT2	CKT1	CKT2	CKT1	CKT2	CKT1	CKT2						
TV36S00 5 10 15	208-230/1	1 1 1 1 OR 2	24 28 54 80	30 30 60 90	12 10 6 4	12 10 10 8														
TV36T00 6 9 15	208-230/3	1 1 1 1	16 20 29 47	30 30 30 60	14 12 10 8	14 12 10 10														
TV36D00 6 9 15	460/3	1 1 1 1	9 11 15 24	15 15 30 30	14 14 14 12	14 14 14 12														
TV48S00 5 10 15 20	208-230/1	1 1 1 1 OR 2 1 OR 2	33 33 56 82 108	60 60 60 90 125	10 10 6 4 2	10 10 10 8 6														
TV48T00 6 9 15 18	208-230/3	1 1 1 1 1	23 23 31 49 58	30 30 60 60 60	12 12 10 8 6	12 12 10 10 10														
TV48D00 6 9 15	460/3	1 1 1 1	12 12 17 26	15 15 30 30	14 14 14 10	14 14 14 10														
TV60S00 5 10 15 20	208-230/1	1 1 1 1 OR 2 1 OR 2	39 39 56 82 108	60 60 60 90 125	8 8 6 4 2	10 10 10 8 6														
TV60T00 6 9 15 18	208-230/3	1 1 1 1 1	26 26 31 49 58	30 30 60 60 60	10 10 10 8 6	10 10 10 10 10														
TV60D00 6 9 15	460/3	1 1 1 1	14 14 17 26	15 15 30 30	14 14 14 10	14 14 14 10														

[1] Heater data were based on 240V or 480V AC respectively.
 [2] Maximum recommended size for "Time Delay" fuse or HACR circuit breaker.
 [3] Power supply wire size and ground wire sizes were based on AWG 75C rise, NEC Article 310 and Table 310.15(B)(16).
 [4] For single power conductor, sized per NEC Table 310.15(B)(17).
 [5] Power supply wire 75C rated COPPER CONDUCTOR ONLY.

TH SERIES HEAT PUMP ELECTRIC DATA

Model No. & Electric Heater Kw [1]	Volt / Phase	No. of Field Power Ckts	SINGLE FIELD CIRCUIT				DUAL FIELD CIRCUIT								
			MINIMUM CIRCUIT AMPACITY	MAX OVER CURRENT PROTECTION [2]	FIELD POWER WIRE SIZE [3],[4],[5]	GROUND WIRE SIZE	MIM WIRE AMPACITY		MAX OVER CURRENT PROTECTION [2]		FIELD POWER WIRE SIZE [3],[4],[5]		GROUND WIRE SIZE		
							CKT1	CKT2	CKT1	CKT2	CKT1	CKT2	CKT1	CKT2	
TH36S00 5 10	208-230/1	1 1 1 OR 2	24 50 76	30 60 90	12 8 4	12 10 8									
TH36T00 6 9	208-230/3	1 1 1	16 34 43	30 60 60	14 10 8	14 10 10									
TH36D00 6 9	460/3	1 1 1	9 18 23	15 30 30	14 14 12	14 14 12									
TH48S00 5 10	208-230/1	1 1 1 OR 2	33 59 85	60 60 90	10 6 3	10 10 8									
TH48T00 6 9	208-230/3	1 1 1	23 41 50	30 60 60	12 8 6	12 10 10									
TH48D00 6 9	460/3	1 1 1	12 21 25	15 30 30	14 12 10	14 12 10									
TH60S00 5 10	208-230/1	1 1 OR 2 1 OR 2	39 65 91	60 90 100	8 4 3	10 8 8									
TH60T00 6 9	208-230/3	1 1 1	26 44 53	30 60 60	10 8 6	10 10 10									
TH60D00 6 9	460/3	1 1 1	14 23 27	15 30 30	14 12 10	14 12 10									

[1] Heater data were based on 240V or 480V AC respectively.
 [2] Maximum recommended size for "Time Delay" fuse or HACR circuit breaker.
 [3] Power supply wire size and ground wire sizes were based on AWG 75C rise, NEC Article 310 and Table 310.15(B)(16).
 [4] For single power conductor, sized per NEC Table 310.15(B)(17).
 [5] Power supply wire 75C rated COPPER CONDUCTOR ONLY.

SV SERIES AIR CONDITIONER ELECTRIC DATA

Model No. & Electric Heater Kw [1]	Volt / Phase	No. of Field Power Ckts	SINGLE FIELD CIRCUIT				DUAL FIELD CIRCUIT									
			MINIMUM CIRCUIT AMPACITY	MAX OVER CURRENT PROTECTION [2]	FIELD POWER WIRE SIZE [3],[4],[5]	GROUND WIRE SIZE	MIM WIRE AMPACITY		MAX OVER CURRENT PROTECTION [2]		FIELD POWER WIRE SIZE [3],[4],[5]		GROUND WIRE SIZE			
							CKT1	CKT2	CKT1	CKT2	CKT1	CKT2	CKT1	CKT2		
SV36S00	208-230/1	1	23	30	12	12										
5		1	30	30	10	10										
10		1	56	60	6	10										
15		1 OR 2	82	90	4	8	30	52	30	60	10	6	10	10		
SV36T00	208-230/3	1	18	30	14	14										
6		1	22	30	12	12										
9		1	31	60	10	10										
15		1	49	60	8	10										
SV36D00	460/3	1	11	15	14	14										
6		1	12	15	14	14										
9		1	17	30	14	14										
15		1	26	30	10	10										
SV48S00	208-230/1	1	34	60	10	10										
5		1	34	60	10	10										
10		1	57	60	6	10										
15		1 OR 2	84	90	4	8	31	52	60	60	10	6	10	10		
20		1 OR 2	110	125	2	6	57	52	60	60	6	6	10	10		
SV48T00	208-230/3	1	25	30	12	12										
6		1	25	30	12	12										
9		1	32	60	10	10										
15		1	50	60	6	10										
18		1	60	60	6	10										
SV48D00	460/3	1	14	15	14	14										
6		1	14	15	14	14										
9		1	19	30	14	14										
15		1	28	30	10	10										
SV60S00	208-230/1	1	41	60	8	10										
5		1	41	60	8	10										
10		1	57	60	6	10										
15		1 OR 2	84	90	4	8	31	52	60	60	10	6	10	10		
20		1 OR 2	110	125	2	6	57	52	60	60	6	6	10	10		
SV60T00	208-230/3	1	28	30	10	10										
6		1	28	30	10	10										
9		1	32	60	10	10										
15		1	50	60	6	10										
18		1	60	60	6	10										
SV60D00	460/3	1	15	15	14	14										
6		1	15	15	14	14										
9		1	19	30	14	14										
15		1	28	30	10	10										

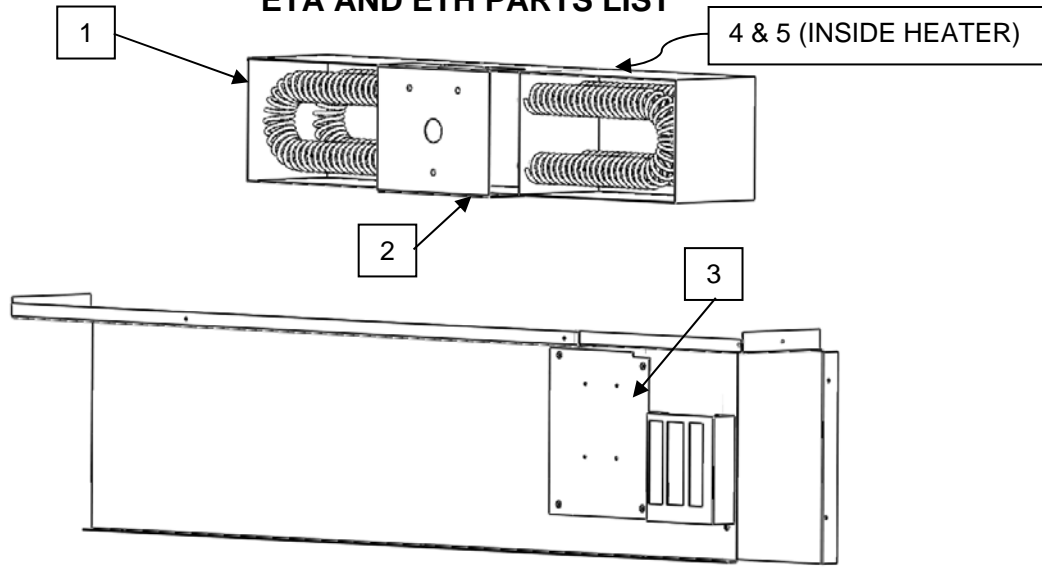
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 [3] Power supply wire size and ground wire sizes were based on AWG 75C rise, NEC Article 310 and Table 310.15(B)(16).
 [4] For single power conductor, sized per NEC Table 310.15(B)(17).
 [5] Power supply wire 75C rated COPPER CONDUCTOR ONLY.

SH SERIES HEAT PUMP ELECTRIC DATA

Model No. & Electric Heater Kw [1]	Volt / Phase	No. of Field Power Ckts	SINGLE FIELD CIRCUIT				DUAL FIELD CIRCUIT								
			MINIMUM CIRCUIT AMPACITY	MAX OVER CURRENT PROTECTION [2]	FIELD POWER WIRE SIZE [3],[4],[5]	GROUND WIRE SIZE	MIN WIRE AMPACITY		MAX OVER CURRENT PROTECTION [2]		FIELD POWER WIRE SIZE [3],[4],[5]		GROUND WIRE SIZE		
							CKT1	CKT2	CKT1	CKT2	CKT1	CKT2	CKT1	CKT2	
SH36S00 5 10	208-230/1	1	22	30	12	12									
		1	48	60	8	10									
		1 OR 2	74	90	4	8	22	52	30	60	12	6	12	10	
SH36T00 6 9	208-230/3	1	17	30	14	14									
		1	35	60	8	10									
		1	44	60	8	10									
SH36D00 6 9	460/3	1	9	15	14	14									
		1	18	30	14	14									
		1	23	30	12	12									
SH48S00 5 10	208-230/1	1	33	60	10	10									
		1	59	60	6	10									
		1 OR 2	85	90	4	8	33	52	60	60	10	6	10	10	
SH48T00 6 9	208-230/3	1	24	30	12	12									
		1	42	60	8	10									
		1	51	60	6	10									
SH48D00 6 9	460/3	1	12	15	14	14									
		1	21	30	12	12									
		1	26	30	10	10									
SH60S00 5 10	208-230/1	1	40	60	8	10									
		1 OR 2	66	90	4	8	40	26	60	30	8	10	10	10	
		1 OR 2	92	100	3	8	40	52	60	60	8	6	10	10	
SH60T00 6 9	208-230/3	1	27	30	10	10									
		1	45	60	8	10									
		1	54	60	6	10									
SH60D00 6 9	460/3	1	13	15	14	14									
		1	22	30	12	12									
		1	27	30	10	10									

[1] Heater data were based on 240V or 480V AC respectively.
 [2] Maximum recommended size for "Time Delay" fuse or HACR circuit breaker.
 [3] Power supply wire size and ground wire sizes were based on AWG 75C rise, NEC Article 310 and Table 310.15(B)(16).
 [4] For single power conductor, sized per NEC Table 310.15(B)(17).
 [5] Power supply wire 75C rated COPPER CONDUCTOR ONLY.

ETA AND ETH PARTS LIST



ITEM #	PART #	DESCRIPTION	A05B1	H05B1	A10B1	H10B1	H15B1	H20B1	A06B3	A09B3	A15B3	A18B3	A06B4	A09B4	A15B4	A18B4
1	3010002	HTR ELEMENT 5KW 1PH	1	1												
1	3010003	HTR ELEMENT 10KW 1PH			1	1										
1	3010004	HTR ELEMENT 15KW 1PH					1									
1	3010005	HTR ELEMENT 20KW 1PH						1								
1	3010006	HTR ELEMENT 6KW 3PH							1							
1	3010007	HTR ELEMENT 9KW 3PH								1						
1	3010008	HTR ELEMENT 15KW 3PH									1					
1	3010009	HTR ELEMENT 18KW 3PH										1				
1	3010010	HTR ELEMENT 6KW 460V											1			
1	3010011	HTR ELEMENT 9KW 460V												1		
1	3010012	HTR ELEMENT 15KW 460V													1	
1	3010013	HTR ELEMENT 18KW 460V														1
2	T36-0136	HEATER MOUNTING PLATE	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	T36-0031	CIRCUIT BREAKER STAND	1		1	1	1	1	1	1	1	1				
4	45-4323	LIMIT SWITCH 160-30F W/FUSE														
4	043-0086	LIMIT SWITCH 160-30F WO/FUSE	2	2	2	2	4	4	4	4	4	4				
4	45-8020	LIMIT SWITCH 160-30F 460V											4	4	4	4
5	45-4332	LIMIT SWITCH 245 DEG 24V 1 SHOT	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6	45-3151	HEAT CONTACTOR 30 AMP RES	1	1	1	1	2	2								
6		HEAT CONTACTOR 3 PHASE							1	1	1	1	1	1	1	1
7	45-3151	CIRCUIT BREAKER 2P 60 AMP	1	1	1	1	2	2								
7	O42019	CIRCUIT BREAKER 3P 60 AMP							1	1	1	1				
7	45-1955	DISCONNECT SWITCH 460V											1	1	1	1

DIAGRAM FOR ETA05B1 OR ETA10B1

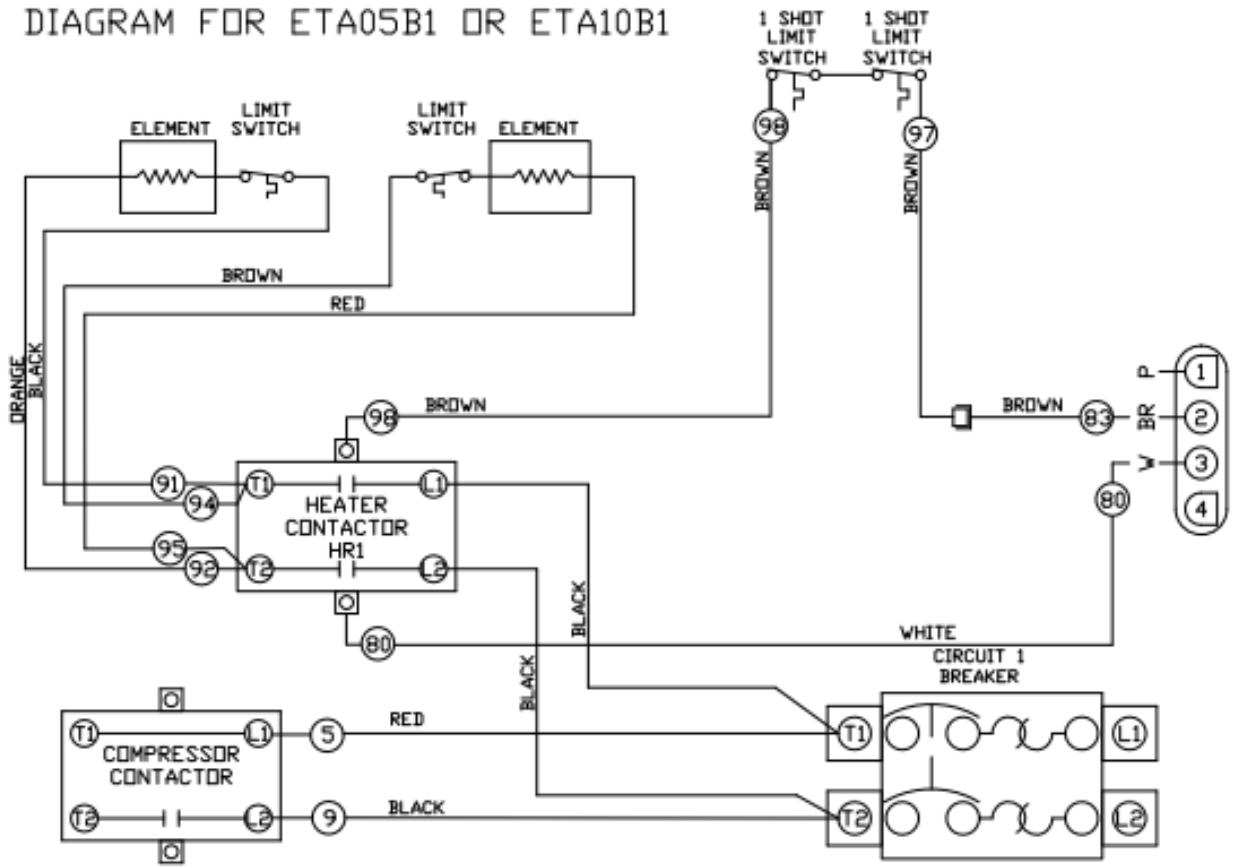


DIAGRAM FOR ETH05B1 OR ETH10B1

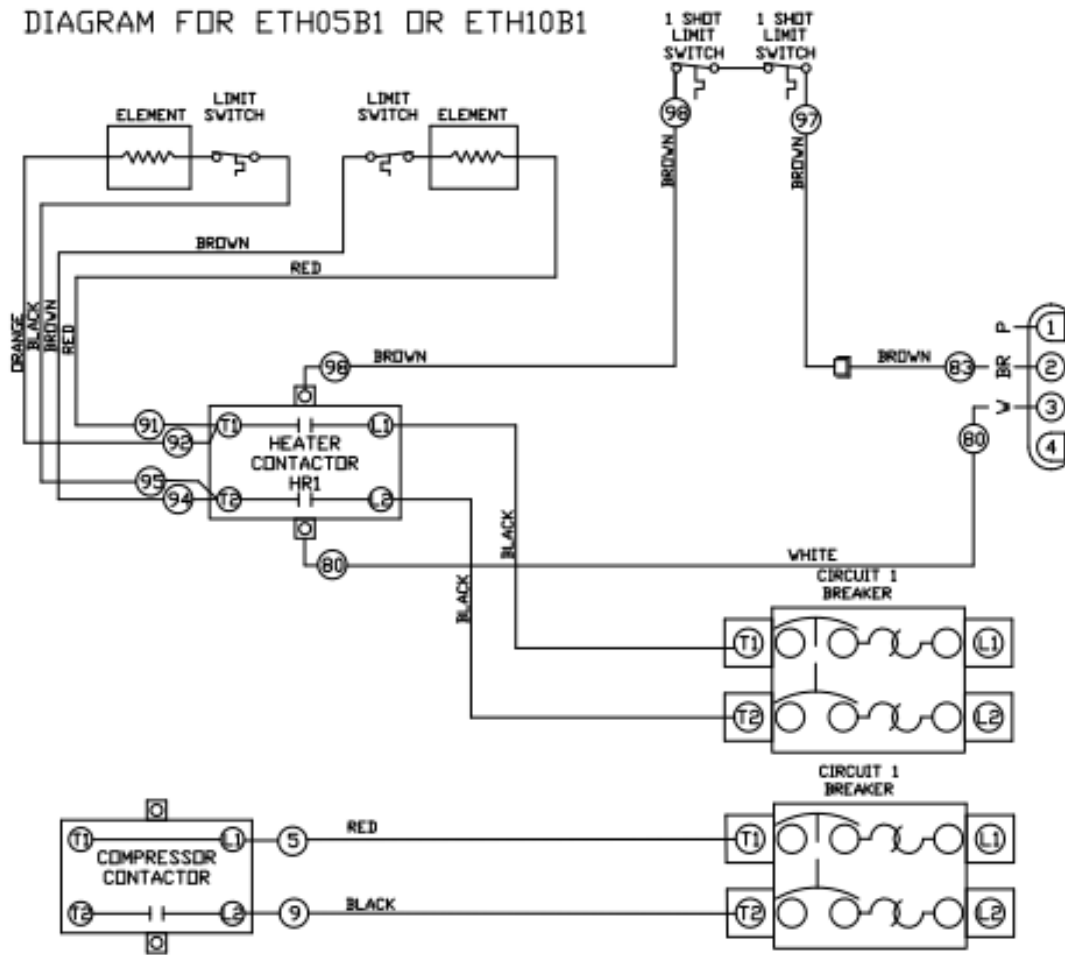
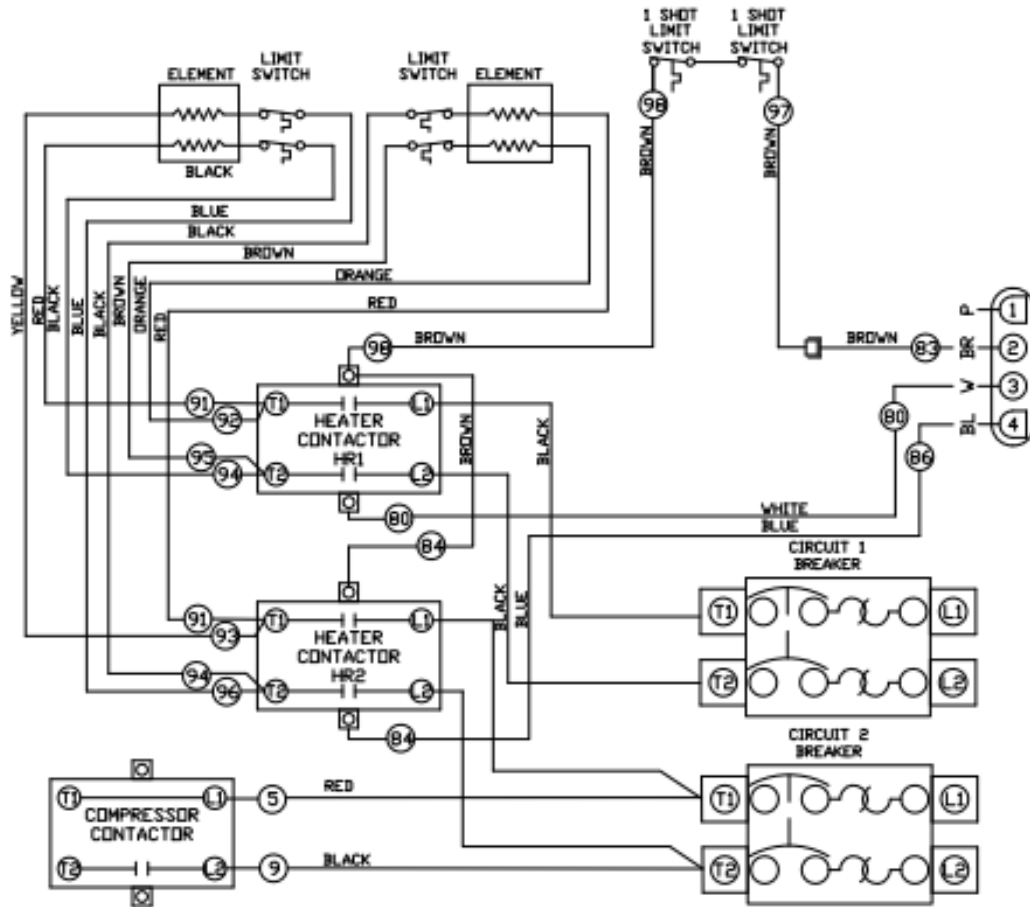


DIAGRAM FOR ETH15B1 OR ETH20B1



The information in this manual supersedes and replaces the previous instruction/operation manual 3090015 with regards to T Series wallmount products. Illustrations, part numbers and others cover the general appearance of the units at the time of publication and the Manufacturer reserves the right to make changes in design and construction at any time without notice.

For replacement parts contact:

National Coil Company
1998 FM 2011
Longview, TX 75603
Phone: 903-643-2261
Fax: 903-643-2222
www.EubankNCC.com