

NEVER LEAVE THE HEATER UNATTENDED WHILE BURNING!



OPERATING INSTRUCTIONS AND OWNER'S MANUAL

Model #

HSP40E

READ INSTRUCTIONS CAREFULLY: Read and follow all instructions. Place instructions in a safe place for future reference. Do not allow anyone who has not read these instructions to assemble, light, adjust or operate the heater.

Electric Construction HEATER



Languages included

- English

**For Indoor Use Only
Not For Use Outdoors**

⚠ WARNING: If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- This heater has hot or arcing parts inside. Do not use it in areas where gasoline, paint or other flammable liquids are used or stored.
- Service must be performed by a qualified service agency.

Definitions: Safety Guidelines IMPORTANT INSTRUCTIONS.

The definitions below describe the level of severity for each signal word. Please read the manual and pay attention to these symbols.

⚠ Danger: Indicates an imminently hazardous situation which, if not avoided, **will** result in **death or serious injury**.

⚠ Warning: Indicates a potentially hazardous situation which, if not avoided, **could** result in **death or serious injury**.

⚠ Caution: Indicates a potentially hazardous situation which, if not avoided, **may** result in **minor or moderate injury**.

NOTICE: Indicates a practice not related to personal injury which, if not avoided, **may** result in **property damage**.

⚠WARNING: DO NOT OPERATE THIS HEATER UNTIL YOU READ AND UNDERSTAND THIS INSTRUCTION MANUAL FOR SAFETY, OPERATION, AND MAINTENANCE INSTRUCTIONS.

⚠CAUTION: Use of this heater in any means not described in this manual may cause fire, electric shock, personal injury and/or property damage.

⚠CAUTION: This heater is hot when in use. To avoid burns, do not let bare skin touch hot surfaces. Use handle when moving this heater. Keep combustible materials, such as furniture, pillows, bedding, papers, clothes, and curtains at least 6 feet (2m) from the front of the heater and keep them away from sides and rear.

⚠CAUTION: In order to avoid unintended cycling of the heater, always unplug or unit from power source when not in use.

⚠CAUTION: TO DISCONNECT HEATER, reduce ambient thermostat to zero. Fan will continue to run until unit cools and shuts down automatically, turn switches off, disconnect power.

⚠CAUTION: Do not cover the power supply wiring or run the wiring under any carpet or rugs. Arrange cord and connections away from traffic patterns so it is not a tripping hazard.

⚠CAUTION: Connect unit to only properly grounded outlets and adequately sized and grounded electrical systems. Always plug heaters directly into a wall outlet/receptacle. Never use with an extension cord or relocatable power tap (outlet/power strip)

⚠CAUTION: Do not use this unit with unapproved or under sized electrical connections or wiring. They may overheat and cause a risk of fire.

⚠WARNING: UNIT NOT INTENDED FOR US IN INDOOR AREAS WHERE HEATER MAY BE EXPOSED TO WATER. AVOID USE IN BATHROOMS, LAUNDRY ROOMS OR ANY OTHER AREAS WHERE THE UNIT MAY COME IN CONTACT WITH WATER. NEVER LOCATE THE HEATER WHERE IT MAY FALL INTO A BATHTUB OR OTHER LIQUID CONTAINER.

⚠WARNING: Do not operate any heater with a damaged cord or plug or after the heater malfunctions, has been dropped or damaged in any manner. Return heater to authorized service facility for examination, electrical or mechanical adjustment or repair.

⚠WARNING: Do not point at flammable materials.

⚠WARNING: Do not insert or allow any foreign objects to enter the unit via the intake or exhaust vents on the unit. Failure to observe this warning may result in electric shock, fire or damage to the unit.

⚠WARNING: To prevent fire do not block either the air intake or exhaust in any manner. Do not use on soft surfaces like a bed, where openings may get blocked.

⚠WARNING: Unit is equipped with internal active electrical components that spark during use. Do not use in areas where fumes from gasoline, paint or other flammable liquids may be present.

⚠WARNING: Extreme caution must be used when any heater is used by or near children or invalids and whenever the heater is left operating and unattended.

⚠WARNING: Do not use outdoors.

⚠WARNING: Use this heater only as described in this manual. Any other use not recommended by the manufacturer may cause fire, electric shock, or injury to persons.

SAVE THESE INSTRUCTIONS.

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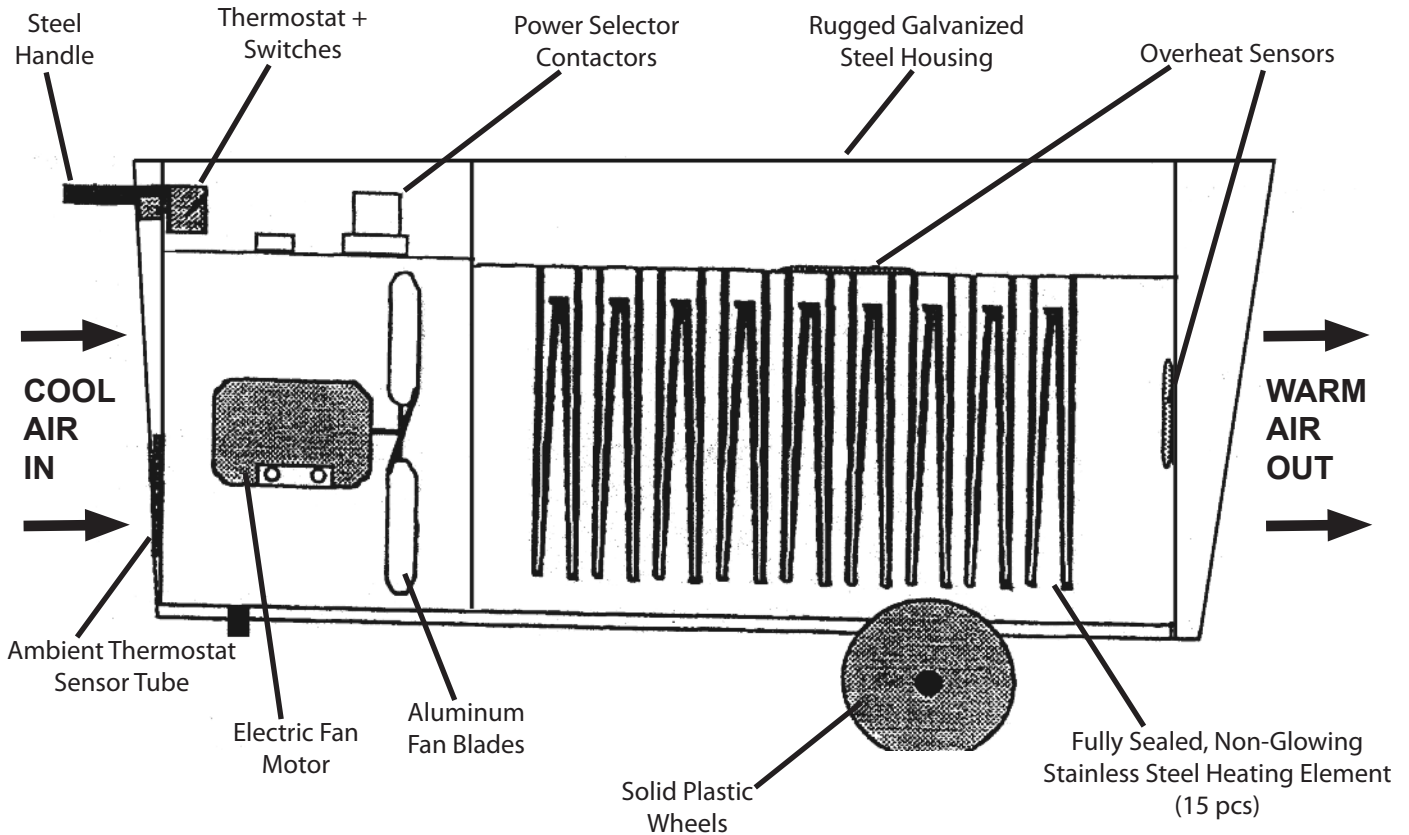
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SPECIFICATIONS

Heat Output (Max BTU's)	136,000
(First Stage)	51,200
(Second Stage)	102,400
(Third Stage)	136,500
Watts (Max)	40,000
(First Stage)	16,000
(Second Stage)	32,000
(Third Stage)	40,000
Electrical Rating	480V 60Hz 3Ø
Min. Voltage at Heater	440
Amp Draw (Max)	50
(First Stage)	20
(Second Stage)	40
(Third Stage)	50
Air Flow	1,800 CFM (3,000 Cu. m/hr)

Ambient Thermostat	32 to 100° F
Weight	130 lbs.
Ducting (Max)	14" x 50' (straight) Duct PN-WD 1425 14" x 25' Long
Temp Rise (from 0° F ambient)	100° F
dB Noise	82 dB(A) 1m
UL Listed	Yes
Dimensions	46"L x 20"W x 25"H
Clearance to Combustibles	
Outlet	6' (1.8M)
Sides	1' (.3M)
Rear	2' (.6M)
Top	2' (.6M)
Floor	Combustible

PRINCIPAL OF OPERATION



Assembly

- Remove the heater and all of the packaging material from the box.
- Check all of the packing material for loose parts and set aside.
- Thoroughly inspect the heater for damage. If any is found do not contact the place of purchase. Please call the Manufacturer at 866-447-2194.

Starting Instructions

IMPORTANT: Review and understand all warnings in this manual. They are essential for safe use of the heater. Follow all local codes.

1. Place the heater on a stable and level surface. Make sure that no explosive or combustible fumes or dust are present. See that the heater is not exposed to water spray, rain, or dripping water. Insure clearance to combustibles are observed (See clearances in the specification table).

2. Connect heater to a 480V, 60 Hz three phase, 50 Amp power source.

IMPORTANT: ALL POWER SOURCES NEED TO BE EQUIPPED WITH A CIRCUIT BREAKER!

NOTE: When power is first applied to unit, the heater fan may blow air out of heater INLET. If this condition occurs, (after first removing power from cord) reverse the first two hot wires at heater terminal inlet block. (3 Phase Models Only)

3. Set the remote thermostat to a temperature above the ambient room temperature by turning the knob.
NOTE: The heater will start only if the thermostat "calls for heat", meaning that it is set to higher than prevailing ambient temperature.
4. Set the selector switch to the desired heating setting. The switches are labeled S1 with a heat output of 16Kw (54,600 Btu's), S1 and S2 with a heat output of 32Kw (109,200 Btu's) or S1, S2 and S3 with a heat output of 40Kw (136,000 Btu's).

The heater will now operate automatically, controlled by the thermostat.

To Stop Heating

1. Turn all switches to "Off".
2. Allow fan to run until unit stops automatically, controlled by unit cooldown thermostat (fan switch). Heater may cycle more than once.
3. Unplug the power supply cable after the fan has stopped cooling down the heater completely.

NOTE: This heater is equipped with an overheat limit switch which may cause the heater to stop. Check and remove the cause of the overheating before restarting.

IMPORTANT: Never disconnect supply plug to stop the heater while in operation!!

Maintenance

⚠WARNING:

Never attempt to service the heater while the unit is hot, in use, or plugged in. Severe bodily injury or electric shock may occur. Only qualified service technicians should service these units.

1. Keep heater clean (ex. dry wall dust). Use pressurized air to blow fan blades clean.
NOTE: Use moderate pressure to avoid damage to fan blades.
2. Inspect heater before and after each use.
3. The bearings of the fan motor are permanently lubricated and sealed. No additional lubrication is needed.

Storage

When not in use, the heater must be disconnected from power source, dusted off and the cord should be loosely wound around the handle.

For service :

Please call Toll-Free 866-447-2194 or visit www.heatstarbyenerco.com.

Our office hours are 8:00 AM – 5:00 PM, EST, Monday through Friday. Please include the model number, date of purchase, and description of problem in all communication.

General Electric Heater Sizing Issues

When running HEATSTAR electric heaters from a generator, it is extremely important to make sure that the generator selected for your heater is not undersized. The single largest service issue with HEATSTAR electric heaters is improper set up relating to inadequate voltage due to too small of an electric source and/or too small of a power cord.

The HSP40E heater would require a minimum 40,000 Watt (40KW), 480 volt three phase generator that can provide 50 amps of continuous power.

NOTE: This heater's Heating Coil Ohm Reading is 85.

Electrical Cord Selection for HEATSTAR Electric Heaters

Once you have established that you have enough power to properly run a HEATSTAR Electric Heater, you still need to deliver the power to the heater adequately. You will need to do a Voltage Drop Formula. The Voltage Drop Formula is amps (source), times resistance (cord's wire size) equals voltage drop. A cords wire size resistance chart is below:

Wire Size Resistance Chart	
#4	0.000308 Resistance per Foot
#6	0.000403 Resistance per Foot
#8	0.000641 Resistance per Foot
#10	0.00102 Resistance per Foot
#12	0.00162 Resistance per Foot
#14	0.00258 Resistance per Foot
#16	0.00409 Resistance per Foot
#18	0.00651 Resistance per Foot

A sample formula is listed below:

Minimum Voltage Required=440V
 150 ft. x 18 gauge wire (0.00651) = .98
 50 amps x .98 = 49.0 volt drop
 480v (at source) – 49v = 431 volts

Conclusion: Heater will not run, wire too small or cord too long.

Options to Correct the Situation:

1. Increase gauge of wire: If you increased your wire to a 12 gauge wire, then your formula would be as follows:

Minimum Voltage Required=440V
 150 ft. x 12 gauge wire (0.00162) = 0.24
 50 amps x 0.24 = 12 volt drop
 480 volts (at source) – 12 volts= 468 volts

Now, your heater will run properly.

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2. Run a shorter cord. If by chance you could use a 50ft cord instead of a 150ft cord, then your formula would be as follows:

Minimum Voltage Required=440V
 50ft. x 18 gauge wire (0.00651) = .33
 50 amps x .33 = 16.5 volt drop
 480 volts (at source) –16.5 volts= 463.5 volts

Now, your heater will run properly.

Troubleshooting

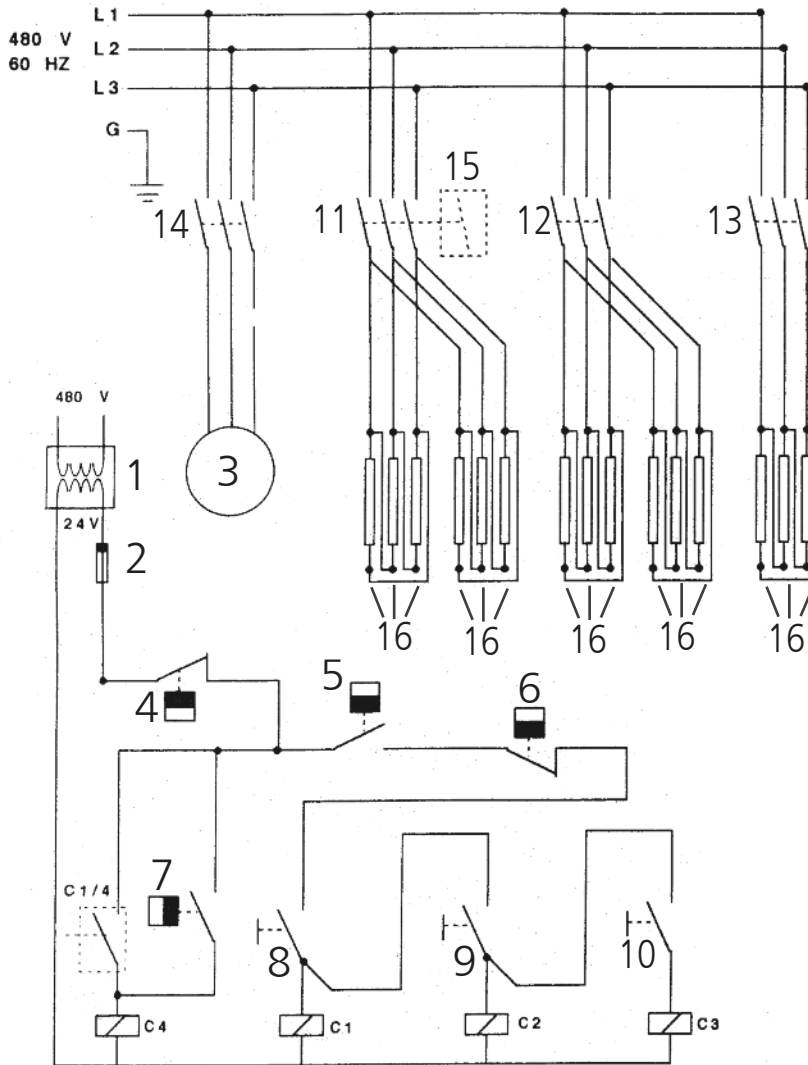
Before beginning the Troubleshooting section, please review the Set-up and Installation section of this manual. Most technical issues can be resolved with proper set-up and preventative maintenance.

Symptom	Cause	Check	Remedy
Turn thermostat up and motor does not come on	<ul style="list-style-type: none"> • No power on any phase • Overheat Limit (TO) • Main Switch assembly • Motor • Motor Relay • Control Transformer 	<ul style="list-style-type: none"> • Check for 240V between L1 and L2 (for single phase models). Check for power between L1 and L2, L2 and L3, and between L1 and L3 (for 3 phase models). Overheat Limit (TO) • Check for continuity. The switch should be closed. • Check for continuity • Check for proper voltage to motor • Check for 24 volts to contactor • Check for 24 volts out from Control Transformer 	<ul style="list-style-type: none"> • Refer to Setup and Operation section • Replace • Replace • Replace • Make sure contactor pulls in. If not, replace. • Replace
Motor Starts but air comes out the inlet	<ul style="list-style-type: none"> • Reversed power (hot) wires 	<ul style="list-style-type: none"> • Check power at terminal block 	<ul style="list-style-type: none"> • Switch first two power wires at terminal block
Motor starts but no heat	<ul style="list-style-type: none"> • Ambient Thermostat • Overheat limit(s) • Contactors • Heating Elements 	<ul style="list-style-type: none"> • Turn thermostat above ambient temperature • Check for continuity. It is a closed switch • Make sure they are clean, tight, and that they pull in when voltage is applied • Visual check for burns. Check resistance of each individual element 	<ul style="list-style-type: none"> • Replace • Replace • Replace • 85K Ohms
Heater operates, fan doesn't cool the unit after thermostat is satisfied	<ul style="list-style-type: none"> • Fan Cooldown Thermostat 	<ul style="list-style-type: none"> • Check for resistance • Check for proper wiring 	<ul style="list-style-type: none"> • Replace • Rewire
High limit tripping	<ul style="list-style-type: none"> • Low Volume of Air 	<ul style="list-style-type: none"> • Duct restrictions • Dust buildup on inlet grill 	<ul style="list-style-type: none"> • Straighten duct • Clean fan area

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WIRING DIAGRAM HSP40E

480 Volt 60 Hz 3 PH



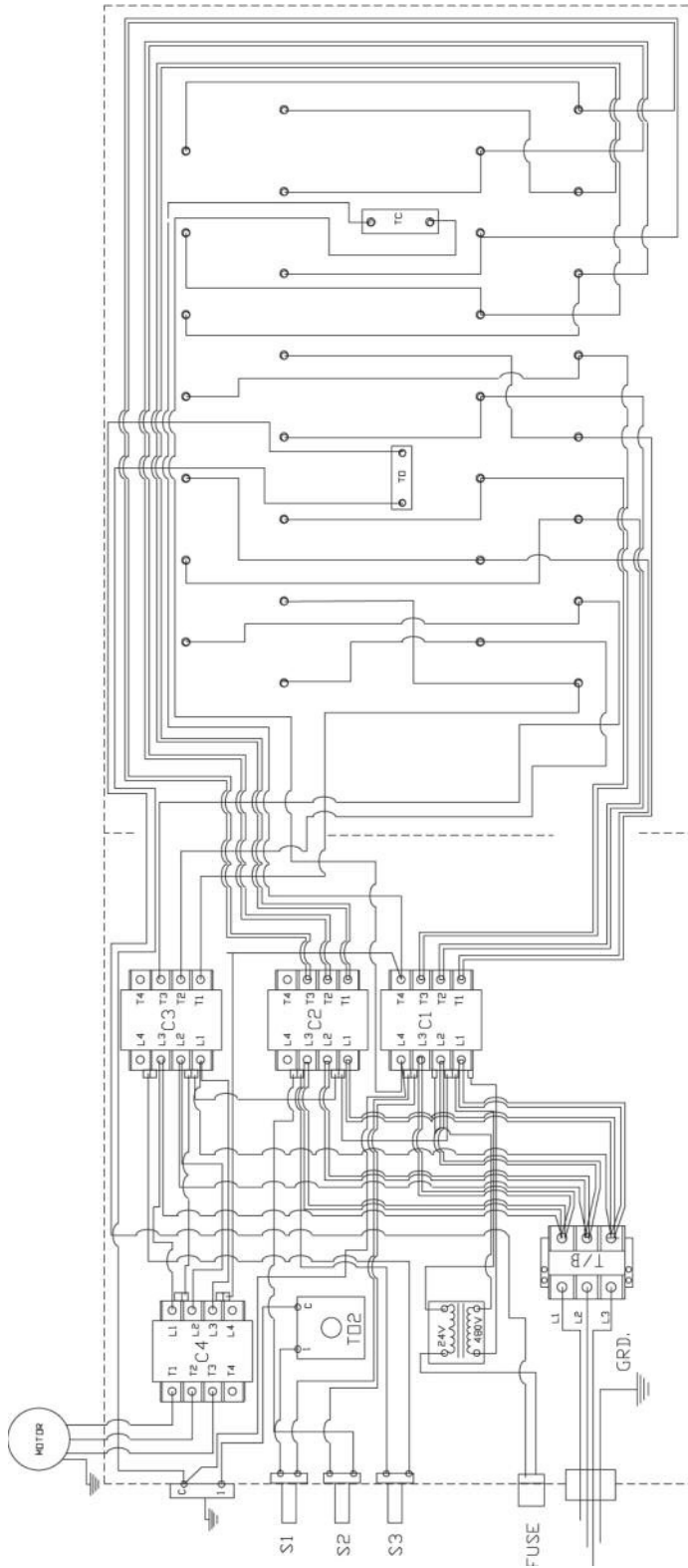
#	P/N	DESCRIPTION
1	41158	Transformer
2	41156	Fuse
3	41165	Fan Motor
4	41135	Overheat Limit Switch
5	41170	Ambient Thermostat
6	41137	Overheat Limit Switch - Air Outlet
7	41136	Unit Cooldown Thermostat
8	41154	Toggle Switch (for output 16KW)

#	P/N	DESCRIPTION
9	41154	Toggle Switch (for output + 16KW)
10	41154	Toggle Switch (for output 8KW)
11	41152	Contactors & Coils (for output 16KW)
12	41151	Contactors & Coils (for output + 16KW)
13	41151	Contactors & Coils (for output + 16KW)
14	41151	Fan Contactor
15	41152	Pole 4 of Contactor C1
16	41142	Heating Elements, 2.7KW each

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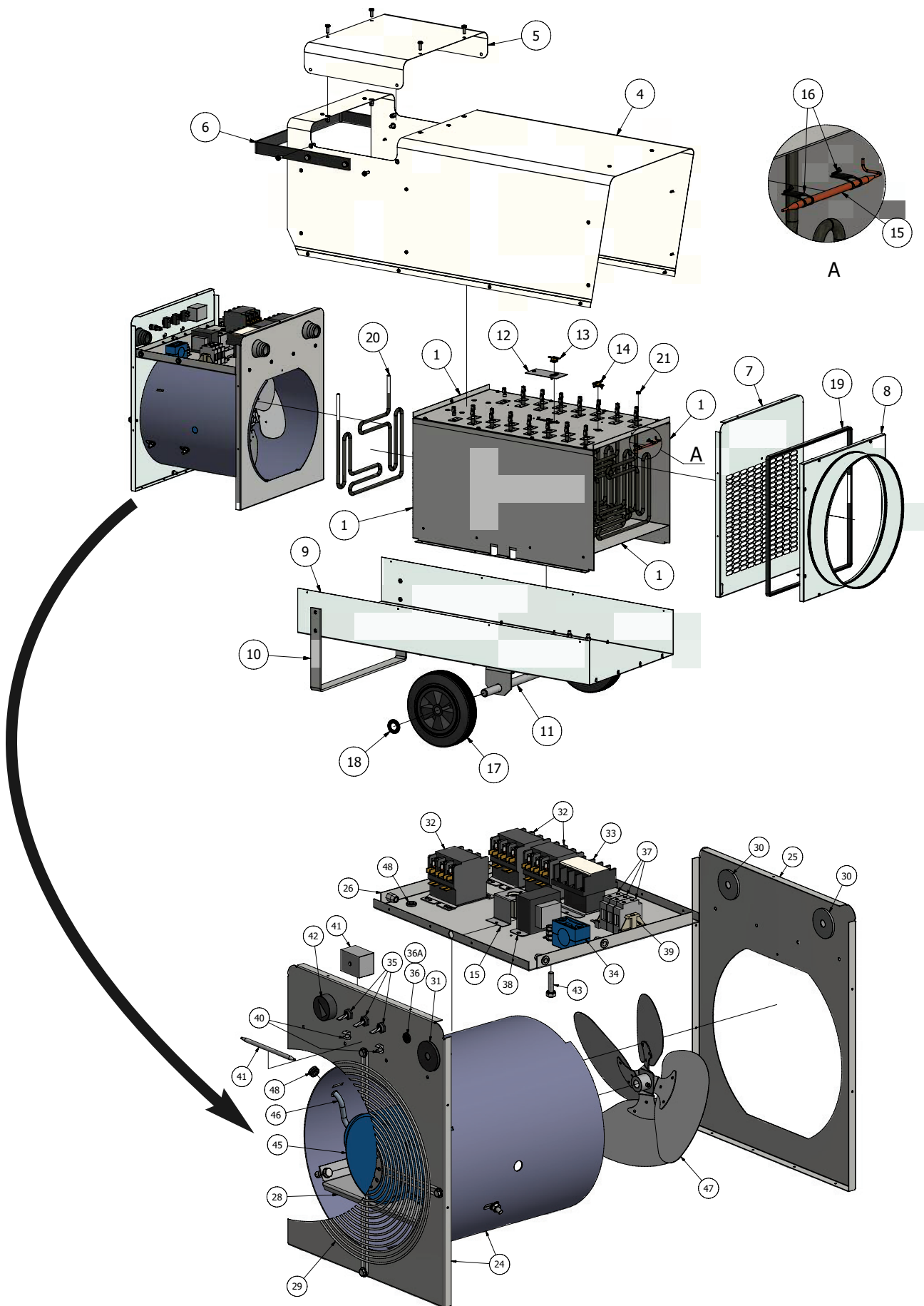
WIRING DIAGRAM HSP40E



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#	P/N	DESCRIPTION
1	41125	Heat Exchanger Chamber
4	41126	Hood (including Connection Hatch)
5	41127	Connection Hatch Only
6	41128	Handle
7	41129	Front Panel
8	41130	Duct Adapter
9	41131	Bottom Frame
10	41132	Support Leg
11	41133	Wheel Shaft
12	41134	Plate, Fan Thermostat
13	41135	Overheat Limit Switch (Inner)
14	41136	Cooldown Thermostat
15	41137	Overheat Limit Switch, Air Outlet (PETE)
16	41138	Metal Bracket, or Bulb
17	41139	Wheel
18	41140	Locking Washer
19	41141	Gasket, Rubber
20	41142	Heating Element (15 Per Heater)
21	41143	Guard Ring, Rubber
24	41144	Rear Panel
25	41145	Partition Panel/ Bracket
26	41146	Contactor Mounting Plate
28	41147	Mounting Plate, Fan Motor
29	41148	Fan Guard Grill

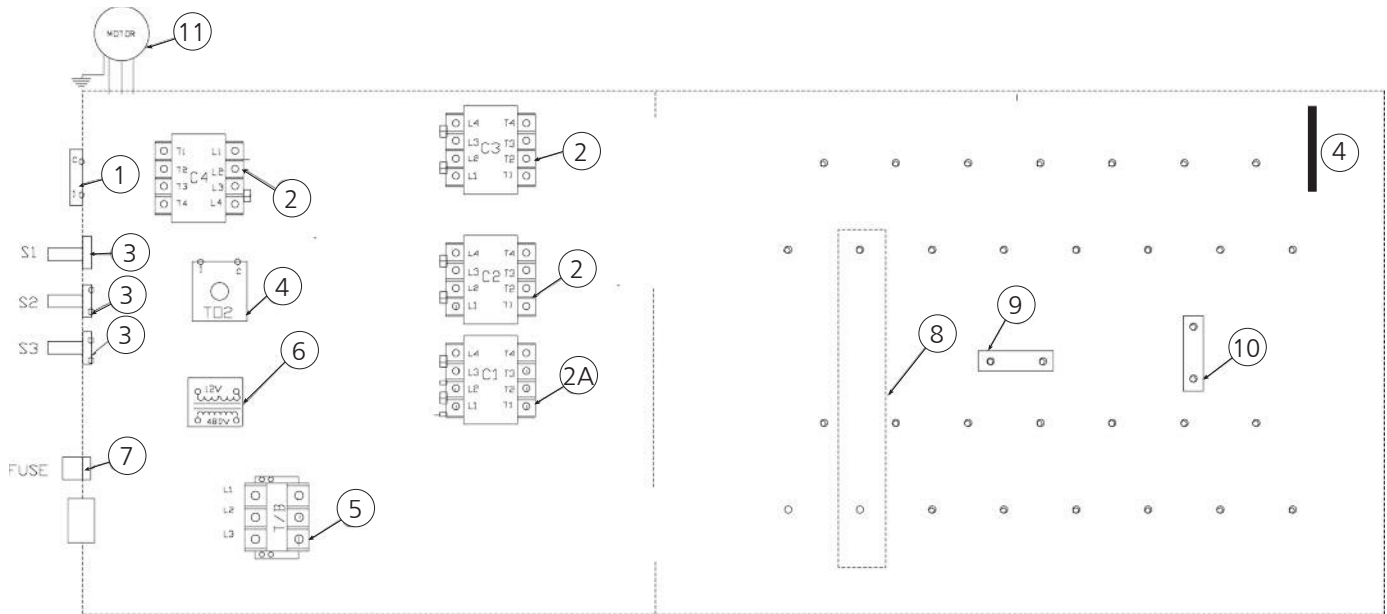
#	P/N	DESCRIPTION
30	41149	Bushing, Medium
31	41150	Bushing, Large
32	41151	Contactor (3 Per Heater) S/N prior to 2142 use 41152
33	41152	Contactor (1 Per Heater)
34	41153	Strain Reliever (Qty 2)
35	41154	Toggle Switch
36	41155	Fuse Holder
36A	41156	Fuse
37	41157	Terminal Block
38	41158	Transformer
39	41159	Locking Clamp + End Plate
40	41160	Plastic Bracket
41	41161	Ambient Thermostat (Knob Not Included) S/N 2022 & Beyond
42	41162	Thermostat Knob (For 180017)
	41163	Thermostat Knob (For 20220)
43	41164	Ground Bolt
45	41165	Fan Motor
47	41166	Fan Blade
48	41167	Bushing, Small
	41168†	Duct (14" x 25' long)
	41169†	Bracket for Terminal Block

† Not Shown

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CONTROL BOX HSP40E



#	P/N	DESCRIPTION
1	41161	Ambient Thermostat
2	41151	Contactor, 3-Pole (S/N prior to 2142 use 41152)
2A	41152	Contactor, 4-Pole
3	41154	Toggle Switch
4	41137	Overheat Limit Switch (PETE)
5	41157	Terminal Block

#	P/N	DESCRIPTION
6	41158	Transformer (PETR)
7	41156	Fuse
8	41142	Heating Element
9	41135	Overheat Limit Switch (Inner)
10	41136	Cooldown Thermostat
11	41165	Fan Motor

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PARTS ORDERING INFORMATION:

PURCHASING: Accessories may be purchased at any HEATSTAR by ENERCO local dealer or direct from the factory

FOR INFORMATION REGARDING SERVICE

Please call Toll-Free 866-447-2194
www.heatstarbyenerco.com

Our office hours are 8:00 AM – 5:00 PM, EST, Monday through Friday.

Please include the model number, date of purchase, and description of problem in all communication.

LIMITED WARRANTY

Enerco Technical Products, Inc. warrants its heaters and accessories to be free from defects in material and workmanship for a period of 1 year from date of purchase. Enerco Technical Products, Inc. will repair or replace this product free of charge if it has been proven to be defective within the 1-year period, and is returned at customer expense with proof of purchase to Enerco Technical Products, Inc. within the warranty period.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Heatstar Products, Inc. reserves the right to make changes at any time, without notice or obligation, in colors, specifications, accessories, materials and models.

PRODUCT REGISTRATION: Thank you for your purchase.
Please log in to <http://www.egiregistration.com> to register your product.