

Inline Heater Skid- 30 kW

OPERATION'S & MAINTENANCE MANUAL



INDUSTRIAL VACUUM EQUIPMENT CORP.

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REVIEW THIS MANUAL PRIOR TO OPERATING EQUIPMENT

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SECTION 1: GENERAL INFORMATION AND INSTALLATION INSTRUCTIONS

1.1 SAFETY GUIDELINES

Important Safety Precautions and Warnings:

When using The Portable Inline Heater, always follow basic safety precautions, including but not limited to the following:

WARNING! This symbol appears when a potentially hazardous safety condition exists that could cause personal injury or death. These hazards are not always apparent to trained mechanics.

WARNING! It is recommended that ALL Owners/Operators and personnel working around or with The Portable Inline Heater read and understand this manual PRIOR to operating the equipment.



WARNING! ONLY authorized and trained personnel should operate this equipment.

WARNING! This manual should be kept near The Portable Inline Heater for future referencing.

WARNING! ALWAYS use Proper Protective Equipment (PPE) when operating or working near The Portable Inline Heater Equipment. Protective footwear, hearing protection, and safety glasses are recommended, but not limited to, during operations.



*** ALWAYS following OSHA's State and Federal Guidelines.

WARNING! Read and follow all safety decals located on the equipment. Keep in good condition. Replace damaged or missing decals accordingly. Replacements are available from manufacturer.

WARNING! ALWAYS be prepared for Emergencies! Have phone numbers and first aid items readily available and know your companies designated Emergency Action Plan.

WARNING! NEVER start or operate this equipment without the proper safety guards or protective parts in place. Failure to do so could cause serious personal injury, death, and/or property damage.

WARNING! ALWAYS disconnect and lockout-tagout power PRIOR to servicing or performing any and all maintenance on The Portable Inline Heater Equipment. Failure to do so could result in serious personal injury, death and/or property damage.



WARNING! NEVER operate this equipment with unguarded inlet(s) or outlet(s). Failure to do so could cause serious personal injury, death, and/or property damage.

WARNING! Use caution while transporting equipment, make sure equipment and its components are secured properly. Electrical cord is considered a Trip Hazard if not wound up and secured.

WARNING! When lifting The Portable Inline Heater, use proper Safe Lifting Techniques. It is recommended that two people work together in lifting/moving the equipment to and from desired work area.

Safe Lifting Recommendations

- Bend at your knees, not at the waist.
- Keep your Back Straight.
- Keep object close to body and while maintaining a good grip.
- Don't lift and twist: always turn your feet, never twist you back.
- Ask for, or get help if the load is too large and/or heavy.



WARNING! Use caution while setting lifted unit down at desired work area. Go slow, keeping hand and feet clear. The Portable Inline Heater is considered a Crushing Hazard, if dropped or set down quickly.

WARNING! When setting up for operations, make sure the unit is set-up on a solid level surface. If surface conditions are not level or solid, take proper precautions with planks or plywood for a more secure and safe work area.

WARNING! ONLY authorized and trained personnel should open the electrical enclosure. Use caution, electric shock can cause serious personal injury, death and/or property damage.



WARNING! Portable Inline Heaters are designed to heat ambient air by allowing the airflow to pass over multiple stages of heating elements. **NEVER** stand directly in front of the inlet(s) and/or outlet(s) while unit is on and operating.

- **Inlet-** Is an opening or entrance for intake of airflow from a fan.
- **Outlet-** Is an opening, or exit through which something is let out. Personnel in close proximity or objects can come into contact with hot air temperature that are being exhausted out.

WARNING! NEVER operate, service, perform maintenance, or attempt to touch heating elements with guards removed. Heating elements can burn or cause serious personal injury, death and/or property damage.

WARNING! NEVER operate the Portable Inline Heater without airflow from a Portable Ventilator or Exhauster connected to inlet and/or outlet. **NEVER** run dirty air through the inline heater.

WARNING! NEVER operate the Portable Inline Heater too close to objects that could potentially cause a fire hazard. **NEVER** operate the Portable Inline Heater in or around an area with combustible material.

SAVE THESE INSTRUCTIONS!!!

1.2 EQUIPMENT VIEW AND IDENTIFICATION

Special Information about the Portable Inline Heater System

Each Portable Inline Heater System (ILH) is manufactured with basic standard equipment options, however, many ILH Systems have been built with requested specific customized features. Therefore, some of the information described in this manual may not apply to your particular equipment.

Portable Inline Heater System:

Model: IHS-30KW-460-3P

Serial: I HS-30 KW-0012 THRU 0021

This Unit has the following Customized Features:

- Standard Equipment Options
- 30 kW Coiled Heating Elements, 460 VAC, 3 Phase, 50/60 Hz, 36.1 Amps
- 102,390 BTU output
- 40 Amp Rated Across The Line Starter, NEMA 4, Lockable Disconnect
- Air Flow Switch with LED indicator light
- Three Stage Heating with On/Off Switches and LED indicator light
- Steel Construction base
- 11-3/4" O.D. Slip-On Inlet and Outlet Hose Connections with protective screen
- Automatic thermal shutdown, 160° F

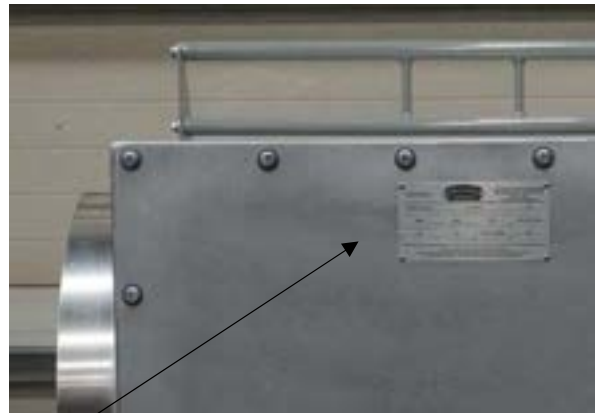
1.2 EQUIPMENT VIEW AND IDENTIFICATION

REVIEW THIS MANUAL BEFORE OPERATING THE
PORTABLE INLINE HEATER EQUIPMENT

MODEL #: 1 HS-30KW-460-3P SERIES

SERIAL#: 1 HS-30KW-0012 THRU 0021

DATE PURCHASED: _____



IDENTIFICATION LABEL LOCATION

WARNING!

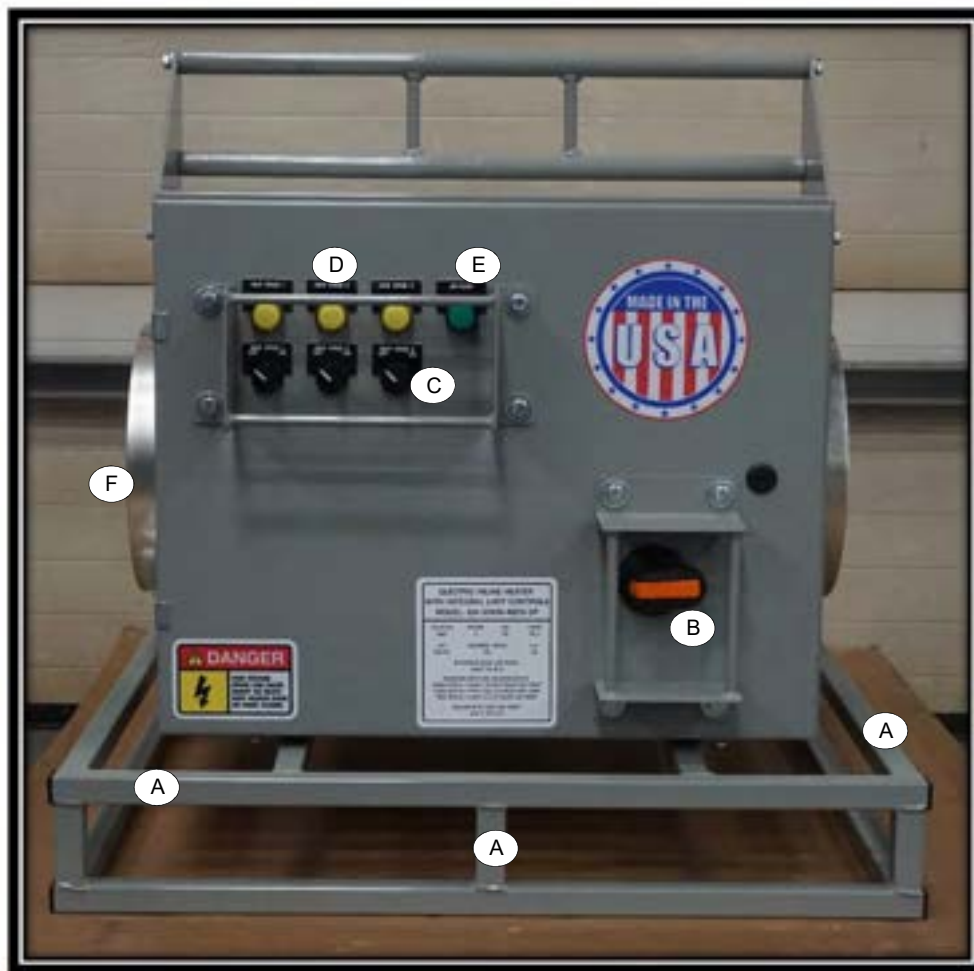
This manual contains important materials for the Owner(s) and/or Operator(s) to know and understand. The information in this manual relates to Protective Personal Safety and The Prevention of Potential Equipment Problems.

It is the responsibility of the Owner(s)/Operator(s) to inform anyone working in the area of this equipment about the provided Portable Inline Heater information and safety guidelines.

Please read this manual paying attention to each section. To help distinguish the information, use the pictures and definitions throughout.

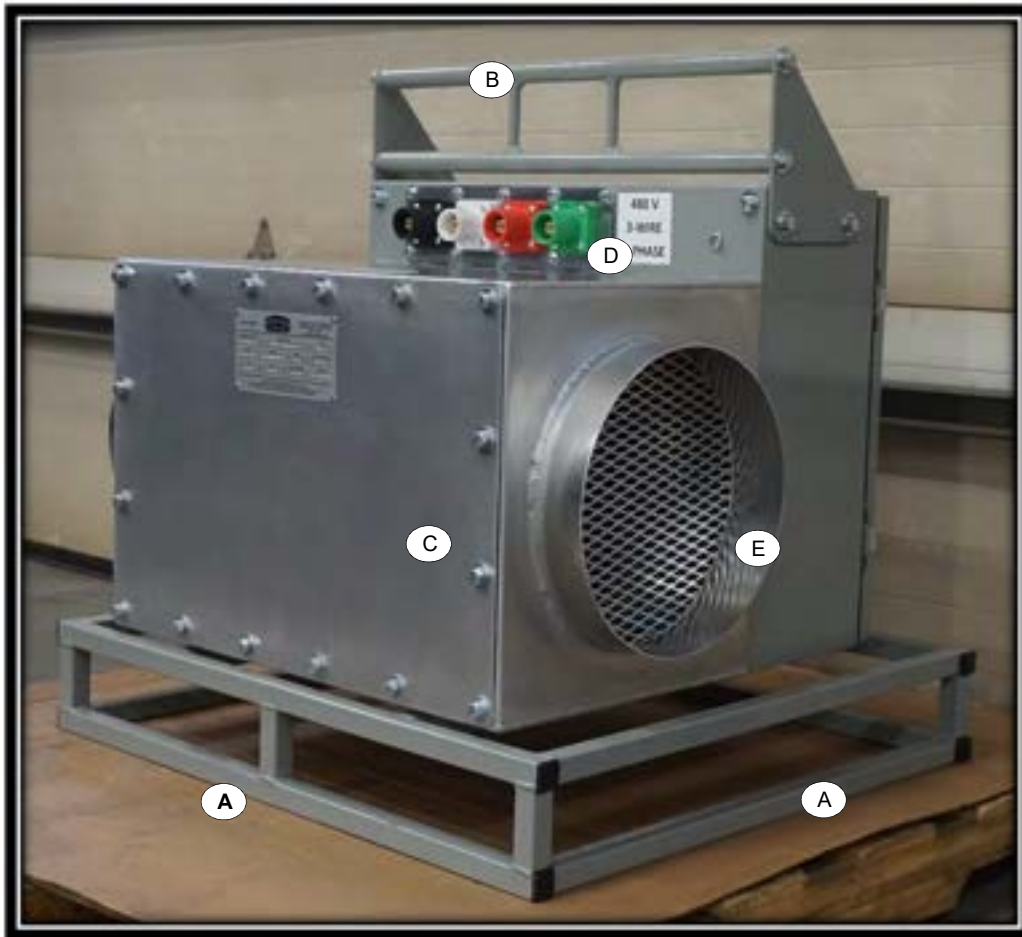
Failure to read this manual and the safety instructions is considered misuse of the equipment and could result in serious injuries, death and/or major equipment damage.

1.2 EQUIPMENT VIEW AND IDENTIFICATION



Key	Identification	Remarks
A	Structural Steel Base	
B	Power Disconnect Switch	
C	Heat Stage Switches	(3)
D	Heat Stage "ON" Indicators	(3)
E	Air Flow Indicator	
F	11-3/4" Ducting Connections w/ Protective Screens	

1.2 EQUIPMENT VIEW AND IDENTIFICATION



Key	Identification	Remarks
A	Structural Steel Base	
B	Lifting Handle	
C	Removable Access Panel	
D	Cam lock Connectors, Female, E-1016 Series	
E	11-3/4" Duct Connections w/ Protective Screens (2)	

1.2 EQUIPMENT VIEW AND IDENTIFICATION



(Close up of Control Panel)



(Picture of the Back View)

1.3 INSPECTION OF EQUIPMENT

Please inspect the equipment for proper parts, orientation, size, and condition prior to accepting shipment.

Notify the manufacturer immediately if there are any concerns in the equipment that you are receiving.

1.4 SETTING UP THE PORTABLE INLINE HEATER SYSTEM.

The Portable Inline Heater is designed to be used in either indoor or outdoor applications. The equipment should be set up in an area where the ground is solid and level. If necessary, make appropriate accommodations so the work area will be safe and secure. Using planks and/or plywood can help with creating a sturdy and level work area

- Use caution while moving equipment, make sure equipment and its components are secured properly. Electrical cord is considered a Trip Hazard if not wound up and secured.
- When lifting The Portable Inline Heater, use proper Safe Lifting Techniques. It is recommended that two people work together in lifting/moving the equipment to and from desired work area.

Safe Lifting Recommendations

- Bend at your knees, not at the waist.
- Keep your Back Straight.
- Keep object close to body while maintaining a good grip.
- Don't lift and twist: always turn your feet, never twist you back.
- Ask for, or get help if the load is too large and/or heavy.



- Use caution while setting lifted unit down at desired work area. Go slow, keeping hand and feet clear. The Portable Inline Heater is considered a Crushing Hazard, if dropped or set down quickly.



- Remove shipping cover on outlet.
- Attach the appropriate size duct fittings and hose to the inlet and outlet connections.

****Always use proper protective equipment when operating equipment. Hearing protection, safety glasses, gloves, and respirator are recommended. Follow OSHA, State and Federal guidelines.**



1.5 CONNECTING ELECTRICAL SERVICE

- Consult certified electrician for installation hook-up. Follow the proper electrical codes and laws that apply.
- Customer will need to supply a 460-Volt, 40AMP Rated, Three Phase Power Service.



WARNING! ONLY authorized personnel should open the Electrical Enclosure.

WARNING! ALWAYS disconnect and lockout the power source PRIOR to servicing or performing any and all maintenance on The Portable Inline Heater System. Failure to do so could result in serious personal injury, death and/or property damage.

SECTION 2: OPERATION AND SHUTDOWN INSTRUCTIONS

2.1 INITIAL START-UP PROCEDURES

The following procedures need to be followed prior to operating The Portable Inline Heater. Refer to these Sections:

- SECTION 1.4 SETTING UP THE PORTABLE INLINE HEATER
- SECTION 1.5 CONNECTING ELECTRICAL SUPPLY

Initial set-up

The operation of the system needs to be checked. Make sure the electrical service that will run The Portable Inline Heater has power. The following steps will need to be verified:

- Check to see that Inlet/Outlet Hose Connections are securely attached.
- Be sure there is nothing that could block or obstruct the inlet/outlet hoses.
- Once equipment is plugged into an electrical service, turn the main disconnect switch to the “ON” position.
- Make sure airflow is present from fan source and flowing into inline heater. Verify LED airflow indicator light is on.
- **The Portable Inline Heater is now set-up and ready for operation.** The heat stages can be turned on. Turn Heat Stage #1 switch to the “ON” position. The Heat Stage #1 LED indicator light will come on. If more heat is needed Heat Stage #2 switch can be turned to the “ON” position. The Heat Stage #2 LED light will come on. Also can turn on Heat Stage #3 switch to the “ON” position. The Heat Stage #3 LED light will come on. These stages will have to be turned on in order of #1 then #2 then #3.

2.2 OPERATING THE PORTABLE INLINE HEATER

This equipment can be used in applications to heat ambient air in a containment or confined space with the use of a fan or blower.

The Portable Inline Heater Systems are designed with a durable, rugged and compact size, that allows this portable equipment access in hard to reach areas, for either indoor or outdoor applications.

During equipment operations, the Fan works by creating suction and air pressure; pulling air into the Inlet, and pushing or exhausting air out at the Outlet.

WARNING! Portable Inline Heaters are designed to heat ambient air by allowing the airflow to pass over multiple stages of heating elements. NEVER stand directly in front of the inlet(s) and/or outlet(s) while unit is on and operating.

- **Inlet-** Is an opening or entrance for intake of airflow from a fan.
- **Outlet-** Is an opening, or exit through which something is let out. Personnel in close proximity or objects can come into contact with hot air temperature that are being exhausted out.

WARNING! NEVER operate, service, perform maintenance, or attempt to touch heating elements with guards removed. Heating elements can burn or cause serious personal injury, death and/or property damage.

WARNING! NEVER operate the fan with a non-ducted inlet and/or outlet. If the blower inlet and/or outlet is non-ducted, it is the user's responsibility to install an inlet and/or outlet guard.

WARNING! NEVER operate the Portable Inline Heater without airflow from a Portable Ventilator or Exhauster connected to inlet and/or outlet. NEVER run dirty air through the inline heater.

WARNING! NEVER operate the Portable Inline Heater too close to objects that could potentially cause a fire hazard. NEVER operate the Portable Inline Heater in or around an area with combustible material.

WARNING! ALWAYS use proper protective equipment (PPE) when operating equipment. Hearing protection, safety glasses, gloves and respirator are recommended.



ALWAYS following OSHA, State and Federal guidelines.

2.3 STANDARD SHUTDOWN PROCEDURE

- Turn off heat stages in reverse order. Turn Heat Stage #3 to the “OFF” position. The Heat Stage #3 LED indicator light will turn off. Turn Heat Stage #2 to the “OFF” position. The Heat Stage #2 LED indicator light will turn off. Turn Heat Stage #1 to the “OFF” position. The Heat Stage #1 LED indicator light will turn off.
- Turn off fan or blower to remove air source from inline heater. The airflow LED indicator light will turn off.
- Move the main disconnect lever, located on the panel, to the “OFF” position.
- Disconnect electrical, air and duct hose connections before moving or transporting.
- Once these procedures are done The Portable Inline Heater will be ready for moving or transporting.

WARNING! When lifting The Portable Inline Heater, use proper Safe Lifting Techniques. It is recommended that two people work together in lifting/moving the equipment to and from desired work area.

Safe Lifting Recommendations

- Bend at your knees, not at the waist.
- Keep your Back Straight.
- Keep object close to body and while maintaining a good grip.
- Don't lift and twist: always turn your feet, never twist you back.
- Ask for, or get help if the load is too large and/or heavy.



*****Always use proper protective equipment when operating equipment. Hearing protection, safety glasses, gloves, and respirator are recommended. Follow OSHA, State and Federal guidelines.***



SECTION 3: MAINTENANCE AND TROUBLESHOOTING INSTRUCTIONS

Portable Inline Heaters are easy to maintain and keep operational because of the simplistic design and aluminum construction.

3.1 Routine Maintenance

Look over Portable Inline Heater prior to start-up, watching for anything that may indicate equipment issues. It is recommended, however; to carefully continue observing the equipment during operations and if an issue arises to discontinue operations immediately.

- Prior to actual operation, operators must be familiar with starting and stopping the Portable Inline Heater System.
- Visually inspect the general appearance of the heating elements. Watch for build-up of foreign material or objects inside the aluminum duct heater compartment. Determine if the equipment can safely operate without causing damage.
- Pay attention to equipment, watching for any unusual vibrations, noise or any operating temperatures exceeding the maximum specs for your equipment.
- Make sure all hardware and connections are securely fastened.
- Make sure there are no obstructions around inlet and outlet connections and safety screens.
- Electric Cords and Plug should be tightly fitted to each other.

WARNING! Prior to performing any maintenance or servicing to The Portable Inline Heater, lockout and tagout any and all power to the equipment. Failure to do so could result in serious personal injury, death, or property damage.



3.2 Maintenance References

Portable Inline Heater's critical component informational references:

- Motor Information (**refer to WORLDWIDE ELECTRIC MAINTENANCE AND TROUBLESHOOTING MANUAL**).
- Motor Disconnect Information (**refer to ITECH MANUAL STARTER MAINTENANCE AND TROUBLESHOOTING MANUAL**).

WARNING! NEVER start or operate this equipment without the proper safety guards or protective parts in place. Failure to do so could cause serious personal injury, death, and/or property damage.

WARNING! ALWAYS disconnect and lockout-tagout power **PRIOR** to servicing or performing any and all maintenance on The Portable Ventilator Exhauster Equipment. Failure to do so could result in serious personal injury, death and/or property damage.

WARNING! ONLY authorized and trained personnel should open the electrical enclosure. Use caution, electric shock can cause serious personal injury, death and/or property damage.



3.3 TROUBLESHOOTING

EXCESSIVE VIBRATION OF EQUIPMENT

- Check for loose or missing vibration mounts. Tighten or replace if needed.
- Check for loose or missing hardware. Tighten or replace if needed.
- Check for loose or excessive wear on heating element rack. Tighten or replace if needed.

EQUIPMENT WILL NOT OPERATE

- Check for 460 Volt power at outlet, tripped breaker or GFCI circuit.
- Check electrical plug terminal connections. Tighten or replace if needed.
- Check power cable wires for continuity. Replace if needed.
- Check power connections or disconnect switch. Tighten or replace if needed.
- Check internal fuses for main power. Replace if needed.
- Check internal fuses for control power. Replace if needed.

EQUIPMENT WILL NOT HEAT

- Check fan or blower power source for airflow.
- Check air flow switch is operating. Check air flow LED light.
- Check manual thermal resets have not been tripped.
- Check automatic thermal reset is not stuck from high heat condition
- Check inlet screen for foreign material or blockage.
- Check outlet screen for foreign material or blockage.
- Make sure inlet and outlet duct hoses are clear. Check for foreign material or blockage.

** If experiencing other problems, please contact the manufacturer for further assistance.

3.4 TECHNICAL SUPPORT AND CONTACT INFORMATION



INDUSTRIAL VACUUM EQUIPMENT CORP.
N8150 MAPLE ST
IXONIA, WI 53036
800-331-4832
www.industrialvacuum.com

SECTION 4: SPECIFICATIONS AND OPTIONAL EQUIPMENT

4.1 EQUIPMENT DATA

Standard Equipment Options

- 30 kW Coiled Heating Elements, 460 VAC, 3 Phase, 50/60 Hz, 36.1 Amps
- 102,390 BTU output
- 40 Amp Rated Across The Line Starter, NEMA 4, Lockable Disconnect
- Air Flow Switch with LED indicator light
- Three Stage Heating with On/Off Switches and LED indicator light
- Steel Construction base
- 11-3/4" O.D. Slip-On Inlet and Outlet Hose Connections with protective screen
- Automatic thermal shutdown, 160° F

4.2 OPTIONAL ACCESSORIES

- Pre-wired power cable (specify length)
- Camlock Electrical panel connections
- NEMA 4X Stainless Steel Enclosure
- Wired 230 volt, 3 phase
- Remote thermostat interface, 2-10 VDC
- Remote thermostat interface, 4-20 mA
- Lifting skid with fork pockets
- Ducting and Hose Accessories

SECTION 5: MAJOR COMPONENTS AND REFERENCE INFORMATION

5.1 HEATING ELEMENTS

DESCRIPTION: 30 kW Coiled Heating Elements
MANUFACTURER: Tutco

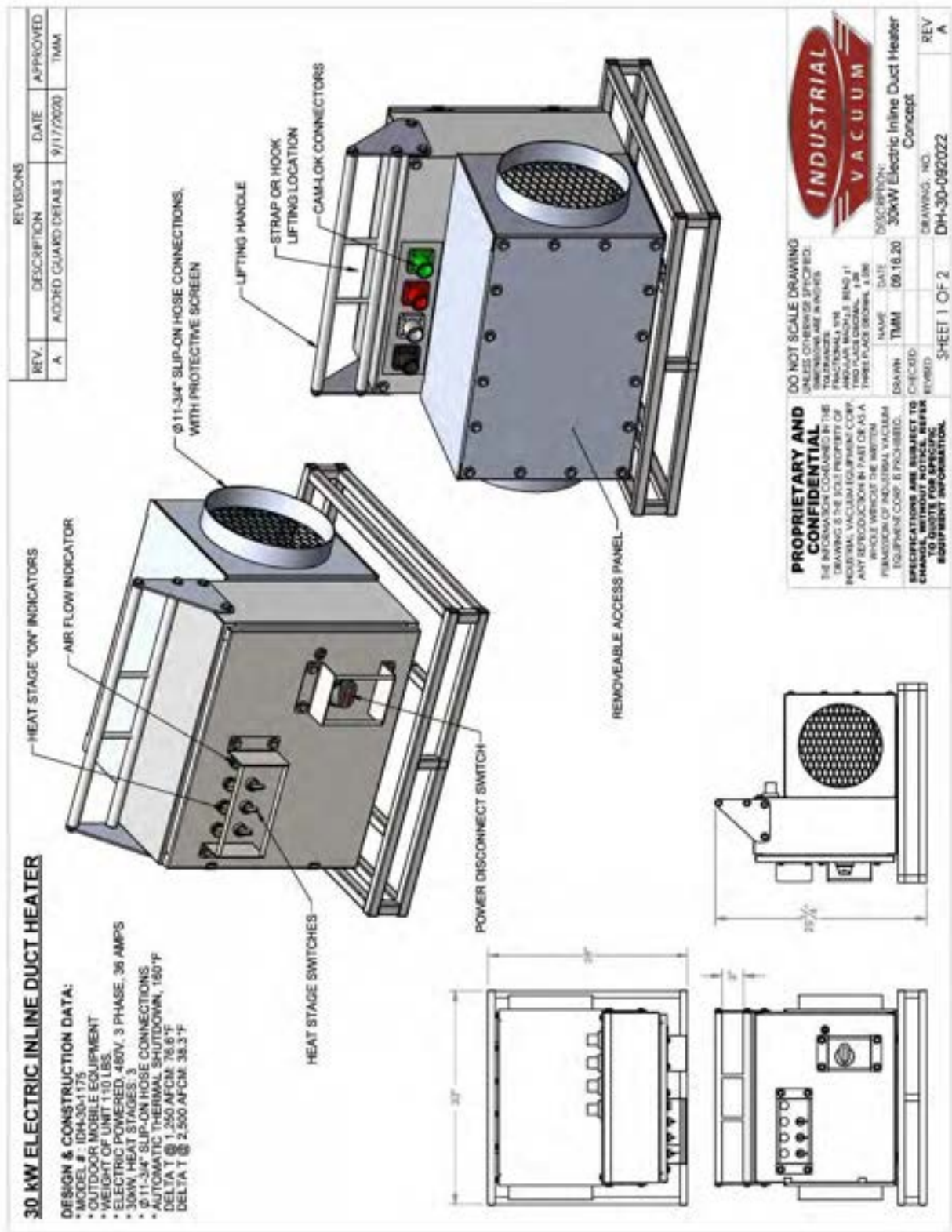
5.2 ELECTRICAL ENCLOSURE

DESCRIPTION: NEMA 4 Hinged Enclosure
MANUFACTURER: Saginaw Controls

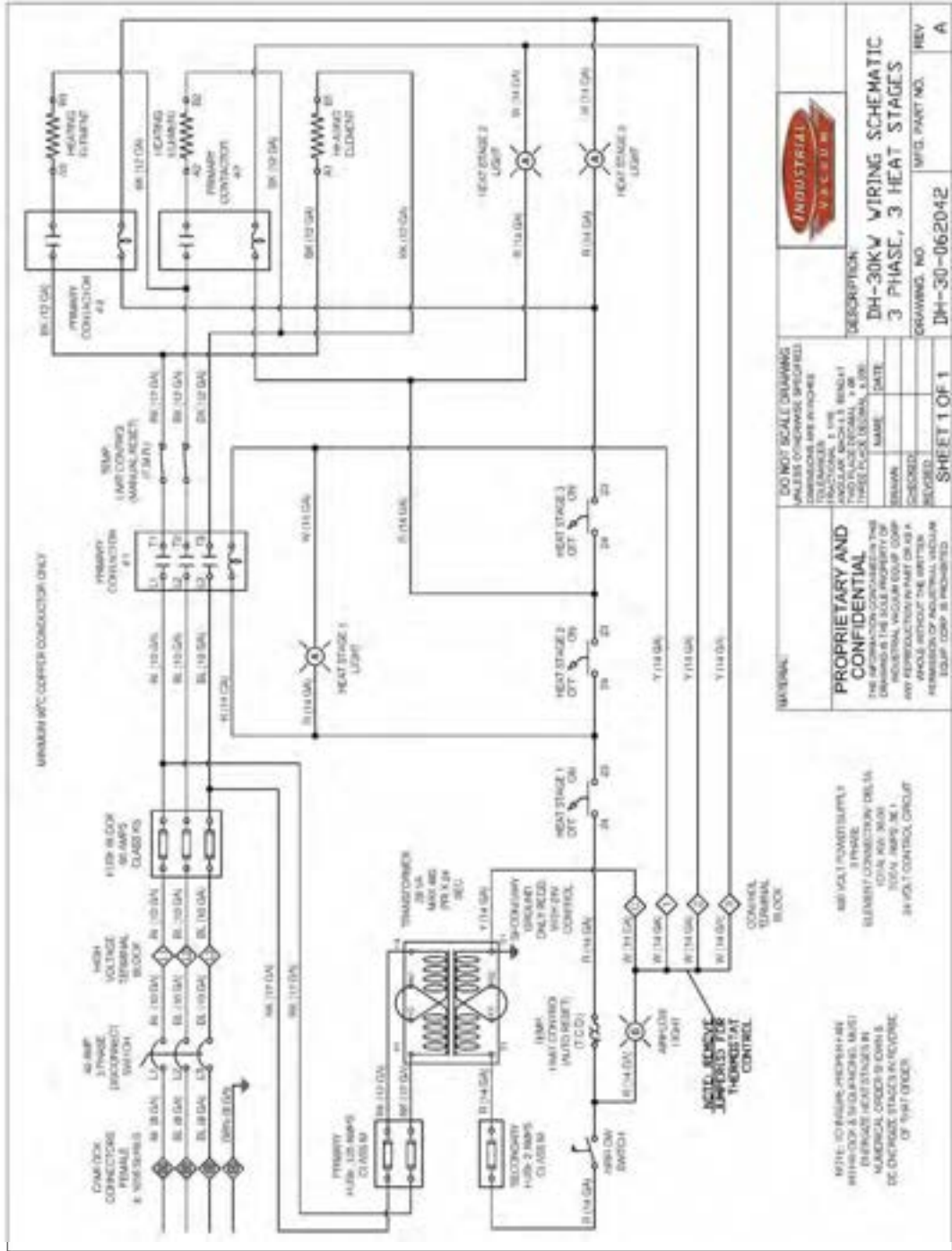
5.3 ELECTRICAL COMPONENTS

DESCRIPTION: 40 Amp Rated Across the Line Starter with Disconnect
MANUFACTURER: Mersen

CONCEPT DRAWING (DH-30-092022)



WIRING SCHEMATIC (DH-30-062042)



		DESCRIPTION: DH-30KW WIRING SCHEMATIC 3 PHASE, 3 HEAT STAGES		DRAWING NO. DH-30-062042	MFG. PART NO. HEV
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480VOLT POWER SUPPLY 3 PHASE ELEMENT CONNECTION DELTA 30VA, 30VA, 30VA 30VA, 30VA, 30VA 3 PHASE CONTROL CIRCUIT		480VOLT POWER SUPPLY 3 PHASE ELEMENT CONNECTION DELTA 30VA, 30VA, 30VA 30VA, 30VA, 30VA 3 PHASE CONTROL CIRCUIT		480VOLT POWER SUPPLY 3 PHASE ELEMENT CONNECTION DELTA 30VA, 30VA, 30VA 30VA, 30VA, 30VA 3 PHASE CONTROL CIRCUIT	

OPERATING REQUIREMENTS:

**ELECTRIC INLINE HEATER
WITH INTEGRAL LIMIT CONTROLS
MODEL: ILH-30KW-480V-3P**

VOLTS AC	PHASE	KW	AMPS
480	3	30	36.1
HZ	CONTROL VOLTS		V.A.
50/60	24		26

**MAXIMUM INLET AIR TEMP:
100 F (37.8 C)**

**MINIMUM AIR FLOW REQUIREMENTS:
2100 CFM @ \leq 100 F (37.8 C) INLET AIR TEMP
1200 CFM @ \leq 70 F (21.1 C) INLET AIR TEMP
900 CFM @ \leq 40 F (4.4 C) INLET AIR TEMP**

**MAXIMUM OUTLET AIR TEMP:
200 F (93.3 C)**

**SECTION 6:
WARRANTY AND SERVICE NOTES**

INDUSTRIAL VACUUM EQUIPMENT CORPORATION
LIMITED WARRANTY

Seller warrants each new product to be free from defects in material and workmanship under normal use and maintenance as herein described. This warranty does not apply to commercial items manufactured by others (Tutco, Saginaw Controls, Mersen, etc.), which are covered by existing warranties of the representative manufacturers thereof. Seller's sole obligation under this warranty shall be limited to repairing, replacing or allowing credit for, at Seller's option, any part which under normal and proper use and maintenance proves defective in material or workmanship within twelve (12) months after delivery to Buyer. In the event of defects developing within that period, the Seller will furnish, F.O.B. its plant, without charge, parts required to replace material found defective. Beyond this, the Seller assumes no responsibility.

This warranty is in lieu of all other warranties (except of title), expressed or implied, and there is not an implied warranty of merchantability or fitness for a particular purpose. In no event, shall Seller be liable for consequential or special damages.

Used products are sold on an "as is" basis and there is no implied warranty of merchantability or of fitness for a particular purpose, unless otherwise expressly stated on the face of this form.

**SECTION 7:
SPARE PARTS LIST**



**30 kW PORTABLE INLINE HEATER
RECOMMENDED SPARE PARTS LIST**

<u>Qty</u>	<u>Item #</u>	<u>Description</u>
3		Heat Stage On/Off Switch
3		Main Class K5 Fuses 50A
2		Primary Class M Fuses .125A
1		Secondary Class M Fuse 2A
3		Stage Heat LED Light
1		Air Flow LED Light

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