

### Nomenclature

#### Electric Duct Heater

**D F C I 0 0 H**

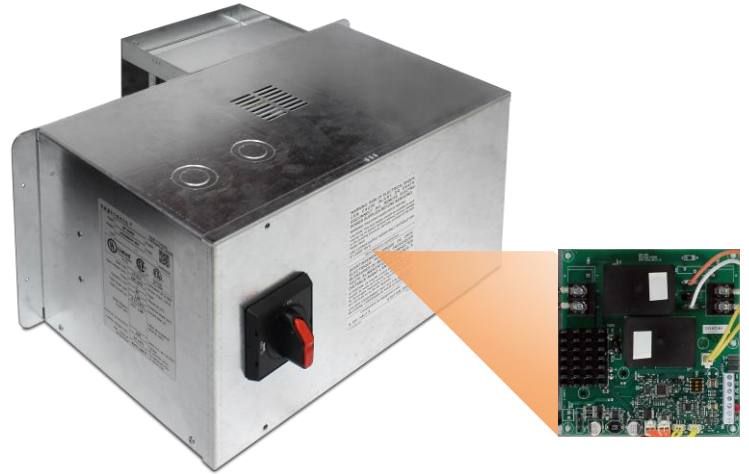
C: Open coil element

I: Slip in type  
F: Flange type

0: No screen left of the heater  
1: Screen left of the heater

0: No screen right of the heater  
1: Screen right of the heater

H: Horizontal air flow  
V: Vertical air flow



#### Intelligent Controller

- **HECH1A0:** Heater Controller, 7A Max (N, L1)
- **HECH1B0:** Heater Controller, 18A Max (N, L1)
- **HECH2A0:** Heater Controller, 7A Max (L1, L2)
- **HECH2B0:** Heater Controller, 18A Max (L1, L2)

### Electric Duct Heater

- Custom design with online heater selection software
- Horizontal or vertical air flow
- Slip-in, flanged or round corner installation
- Integrated HECH controller
- Control panel door with removable hinges
- **Open Coil**
  - Excellent heat dissipation
  - Minimal pressure drop
  - Fast response time
  - Up to 24kW per sq. ft.
  - Quick delivery

### Applications

- HVAC systems with VAV boxes
- Make-up air
- Fan coil units

### HECH Controller

- Accepts any industry standard input signal
- Quick and simple input signal selection via DIP switches
- Modulating, 1 stage on/off
- Provides feedback of actual measured output capacity
- Zero voltage crossing SSR
- Patented EASH Electronic Air Flow Sensors (US 7,012,223)
  - Accurate air flow readings without using air flow switches
  - Intelligently lowers output if velocity is insufficient as opposed to air flow switches that shut down the heater
  - Operates as low as 50FPM (ideal for VAV applications)
  - Additional heater element overheat protection
  - Eliminates need to define air flow orientation

### Electric Duct Heater Specifications

Technical data	Model C Open Coil Elements
Maximum inlet air temperature	95°F (35°C)
Maximum outlet air temperature	200°F (93°C)
Clearance from obstacle or obstruction in duct	3x duct diameter upstream and downstream of electric heater
Inlet bushing	2 knock out 7/8" (22.2mm) or 1 3/8" (34.9mm)
Control signal	Electric - On/Off, modulating, or Neptronic Signal (see Control Signals on page 6)
Air flow direction	Horizontal or Vertical (refer to name plate)
Voltage, Current, Power and Control Voltage	See name plate
Minimum air velocity	Ensure minimum air flow – as marked on name plate.

### HECH Input Signals

Input Type	Input Signal	Details
Electric	0-10Vdc, 2-10Vdc, or 4-20mA	-
	24Vac digital	
Neptronic signal	External setpoint (analog): STS3-11	User accessible setpoint.

### Warnings



**Caution, Risk of malfunction,** In case of alteration (drilling holes or other) to the electrical compartment, ensure proper protection of all electrical components installed. Chips may cause short circuit or affect operation of electrical components.

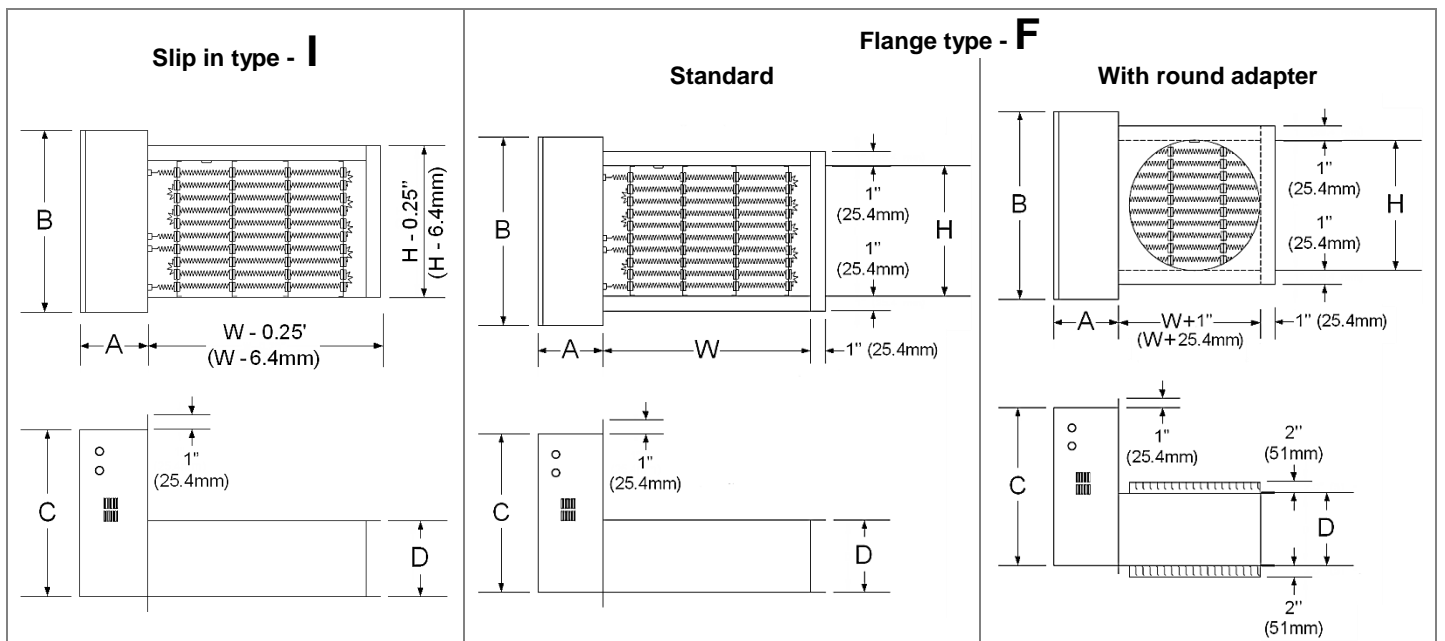
**Caution, Risk of damage and malfunction,** Ensure minimum air flow, insufficient airflow will lead to opening of mechanical air flow switch (PDN or PDA) or electronic air flow sensors (EASH) and automatic thermal cut-out. This may damage heating elements and controls.



**Important,** direction of installation (refer to arrow on name plate) must be respected. Failure to do so will impair proper operation of thermal cut-out and/or cause overheating of solid state relay(s),

**Caution, Risk of malfunction,** Do not proceed with modification or alteration to internal electric connections or components of the electric heater. Any non-authorized modification will void the warranty.

### Dimensions



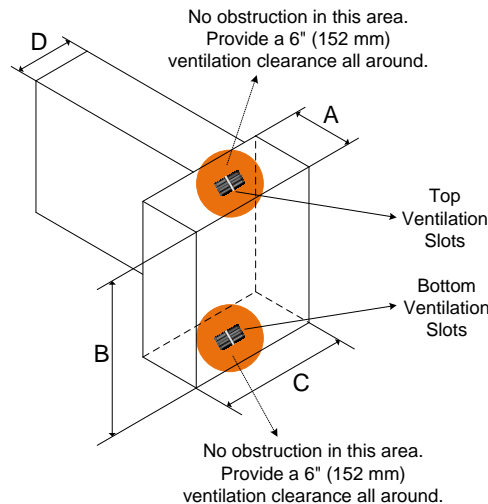
### Ventilation Slots



**Warning, Risk of failure or malfunction.** Respect minimum ventilation clearance heights to prevent blockage of the ventilation slots.

- Do not install the electric duct heater in locations which may restrict air flow from the ventilation slots.
- Do not add any insulation around the electric duct heater cabinet.

The electric duct heater has a NEMA type 1 enclosure with top and bottom air ventilation slots, which require a clearance of at least 6" (152 mm) for proper ventilation. If insulation is used, ensure that the insulation does not cover the ventilation slots.



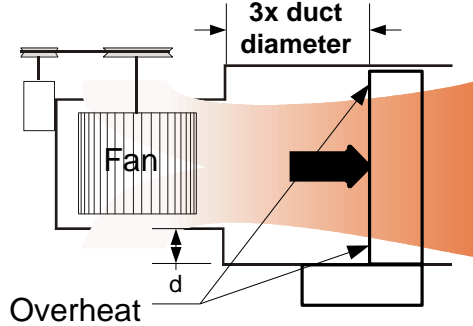
### Installation Tips

#### Air flow condition to avoid:

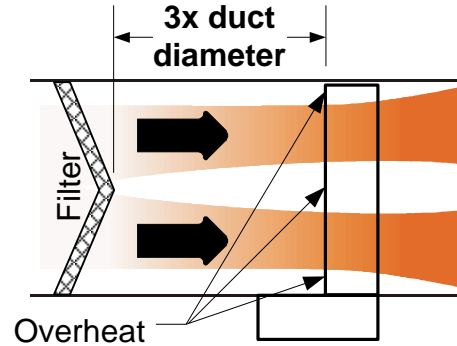
Minimum distance for the conditions below is **3 times the duct diameter**.

*Electric heater too close to Fan.*

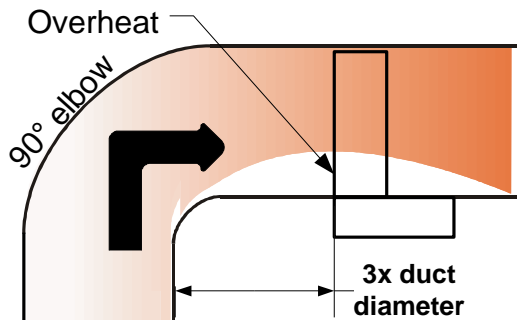
*Avoid any abrupt transition after a fan*



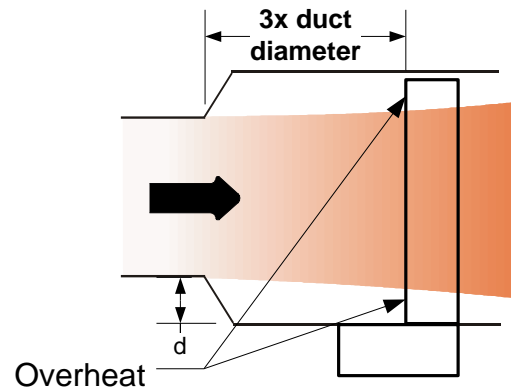
*Electric heater too close to filter.*



*Electric heater too close to elbow.*



*Electric heater too close to transition.*

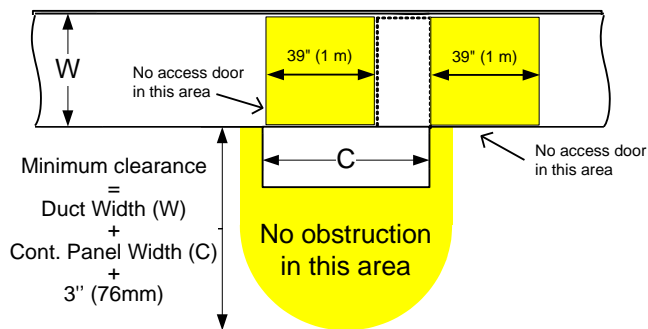


### Minimum clearance to access control panel



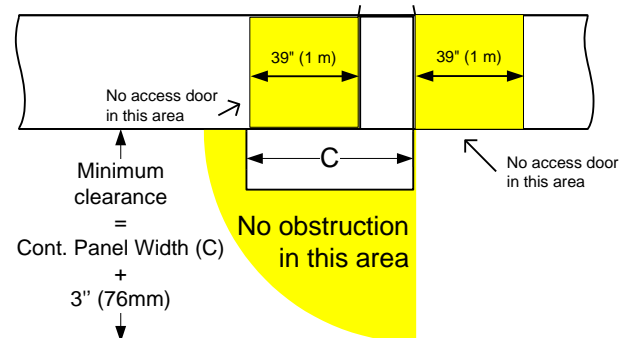
**Caution**, for safety reasons, minimum clearance to the access control panel should respect local electric codes.

#### Slip-in type electric heater - Type I



Provide a minimum clearance equal to  $W + C + 3"$  (76mm).

#### Flange type electric heater - Type F (with or without round adapter)



Provide a minimum clearance equal to  $C + 3"$  (76mm).



**Caution, Risk of electric shock and burns.** A minimum distance of 39" (1 m) must be maintained between heating section and any opening or access door in the duct. This applies to all types of heaters. If such distance cannot be maintained, a protective guard (**C22.2 No.155 section 4.1.8**) must be installed to protect personnel from contact to heating elements and bare live parts.

## Handling



**Warning, Risk of failure or malfunction.** Do not operate electric heater if heating elements have been damaged during transport or handling.

- Protective packaging should be kept until installation.
- Electric heater should be handled with care, particularly Open Coil electric heaters.

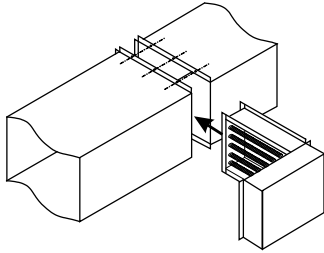
## Mechanical Installation



**Caution, Risk of damage and malfunction.** Do not block air flow to heating elements, insufficient airflow may damage heating elements and controls.

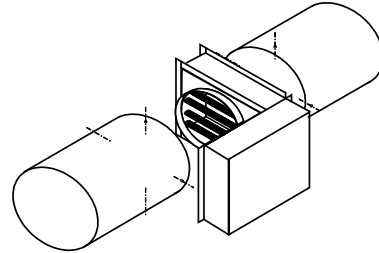
**Important,** direction of installation (refer to arrow on name plate) must be respected. Failure to do so will impair proper operation of thermal cut-out and/or cause overheating of solid state relay(s).

### Flange type electric heater - Type F



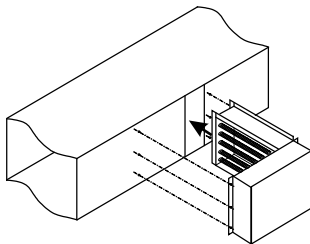
- 1) Position electric heater in front of the duct flange.
- 2) Secure electric heater to the duct by using metal screws or bolts through the duct flanges.
- 3) If necessary, install supports to hold the electric heater.

### With round adapter option



- 1) Insert electric heater between the two sections of the round duct.
- 2) Secure electric heater by using metal screws through round flanges.
- 3) If necessary, install supports to hold the electric heater.

### Slip-in type electric heater - Type I



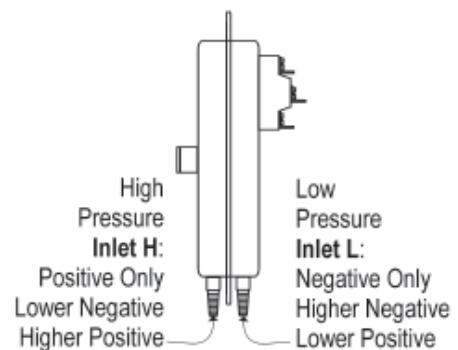
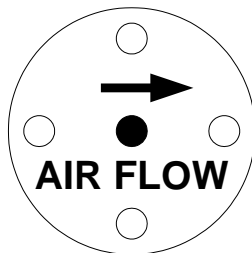
- 1) Cut an opening in the duct. Allow  $\frac{1}{4}$ " (6.3mm) more than the frame width "D".
- 2) Insert electric heater through the opening.
- 3) Secure electric heater onto the duct using metal screws. Two flanges of 1" (25.4mm) are provided on each side of control panel.
- 4) If necessary, reinforce the duct by installing appropriate support(s).

## Mechanical Air Flow Switch Installation (Optional)

Installation of a mechanical air flow switch is not required with Neptronic's EASH (Electronic Air Flow Sensors), which is available/installed for heaters with less than 18A and dimensions less than 48"x40" (some restrictions may apply).

Upon application of 0.05"w.c. (12Pa) minimum pressure, the mechanical air flow switch (PDN or PDA) will activate internal normally open and normally closed contacts.

Install pitot tube into the air duct "up flow" of the electric heater. Ensure that the arrow is in the direction of air flow.



### Electrical Installation



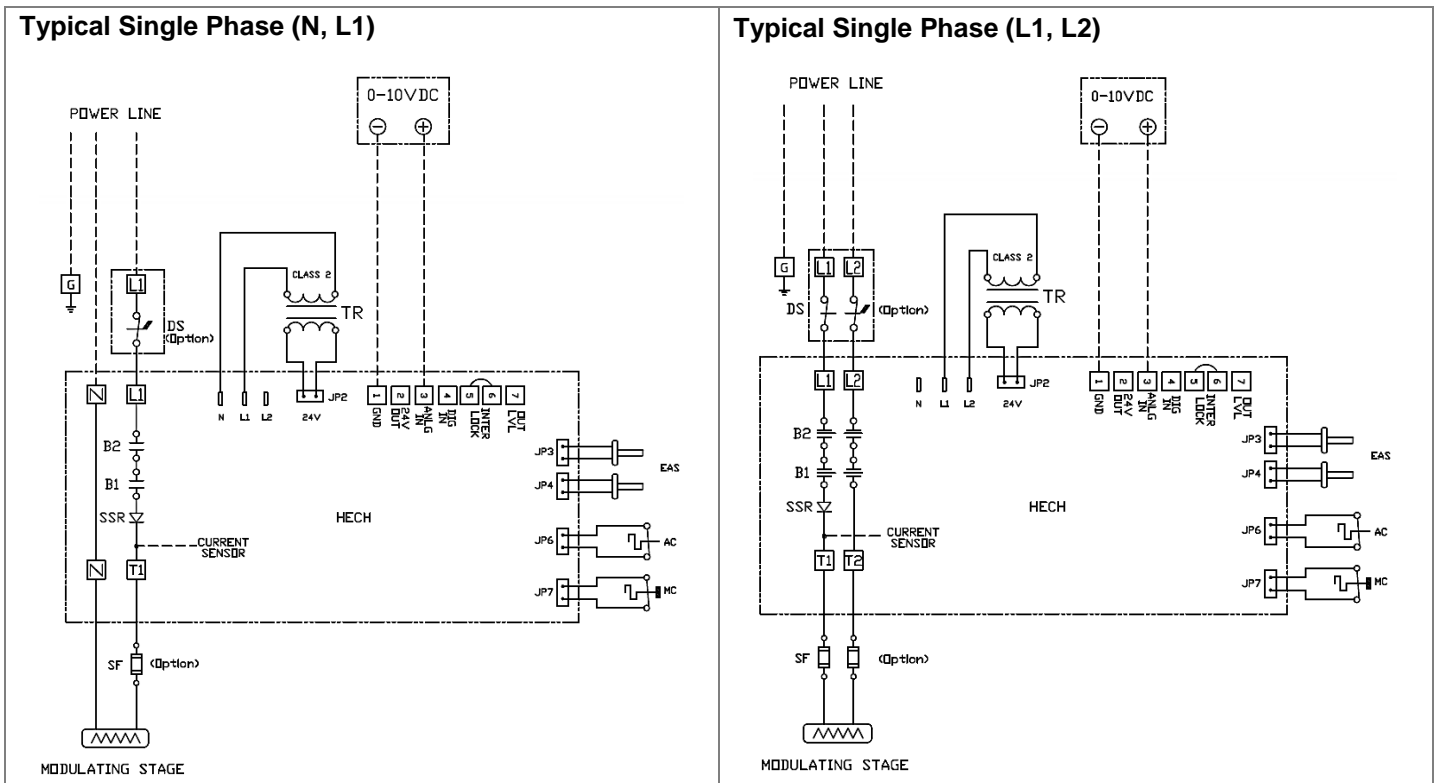
- **DANGER: Risk of electric shock.** Disconnect all electrical supplies before working on any circuit.
- **CAUTION: Risk of malfunction.** Use only copper wires suitable for 105°C (221°F).
- **CAUTION:** Electric installation should be done by qualified electrician and should conform to local electrical code.
- **CAUTION:** If a disconnect switch and/or fuses have not been supplied with control panel of electric heater, disconnect switch and/or fuses should be installed on supply.
- **CAUTION:** Gauge of electric supply wires should be of appropriate section, function of line current, as per local electrical code.

### Power supply wiring

See the name plate for information for voltage and current.

- Connect all wires to appropriate terminals as per **electrical diagram** affixed inside the control panel door.
- Correct connection and proper tightening should be verified before start up, and after a short period of operation (typically after 2 weeks).

### Typical electrical diagram and legend



### Typical Legend



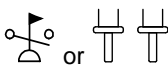
Thermal cut-out automatic reset



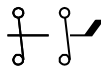
Thermal cut-out Manual reset



Transformer



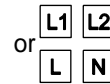
Air flow switch  
or EASH\*\*



Disconnect switch



Heating element



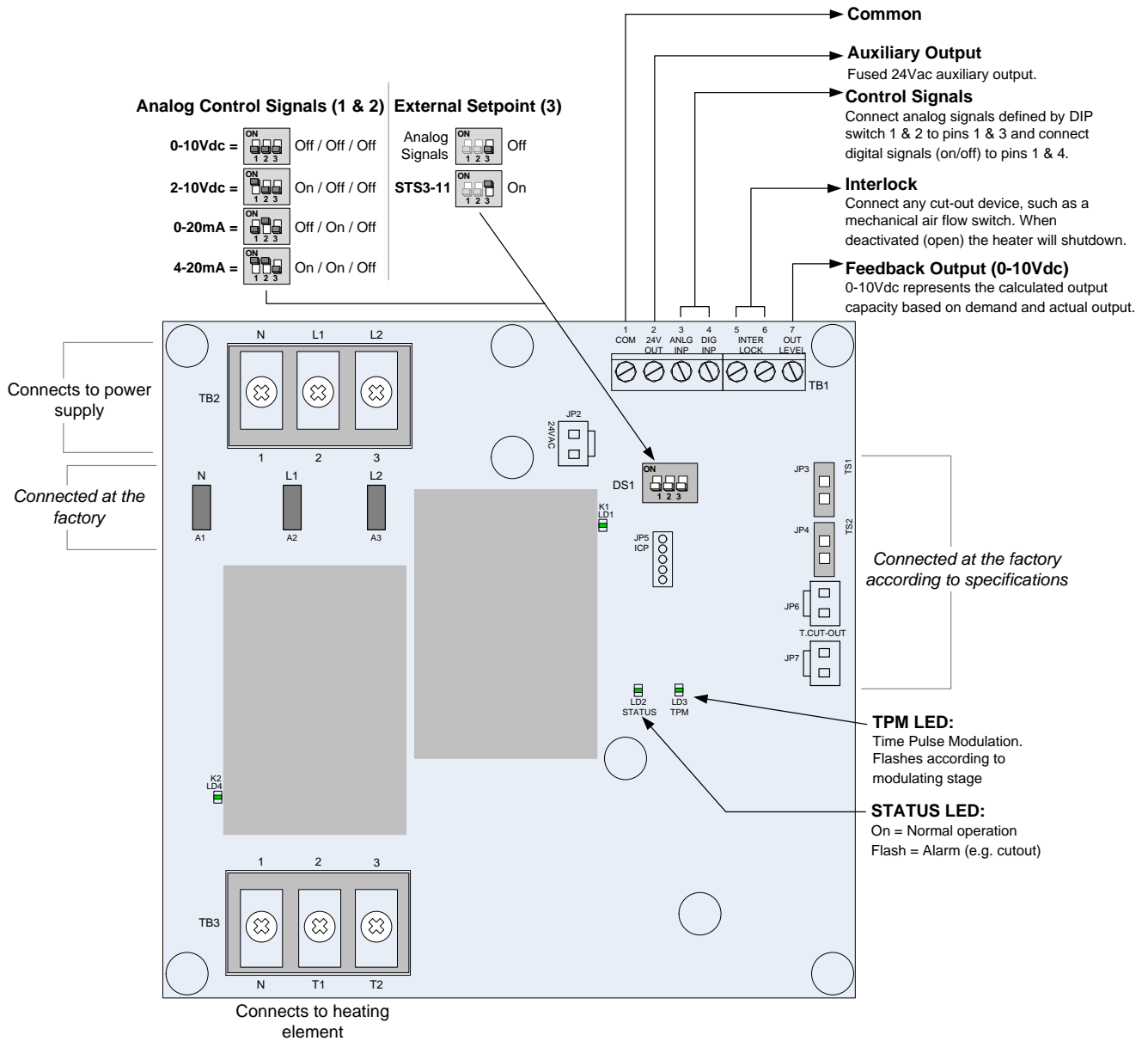
Single phase power supply terminals



Ground terminal

\*\*Note: Patented EASH (Electronic Air Flow Sensors) is available/installed for heaters with less than 18A and dimensions less than 48" x40". Some restrictions may apply.

### PCB Overview

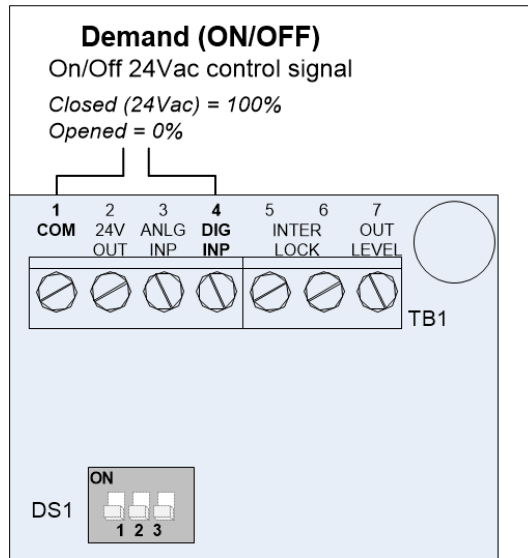


### Control Signals

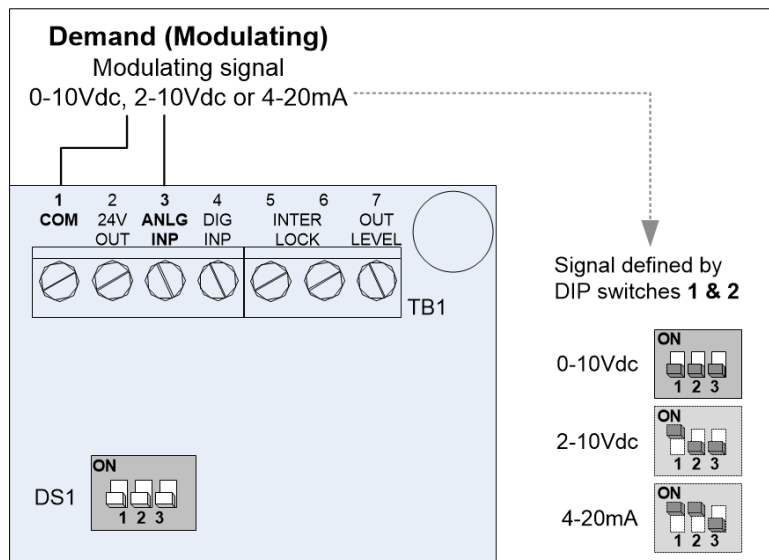
The HECH Intelligent Controller accepts most input signals used in the HVAC industry and converts it to a modulating and/or ON/OFF control signal to a solid state relay(s) and contactor(s). If the Intelligent Controller has a maximum amperage capacity of 7A, the part number is HECH1A0 (N, L1) or HECH2A0 (L1, L2); and if it has a maximum amperage capacity of 18A, the part number is HECH1B0 (N, L1) or HECH2B0 (L1, L2).



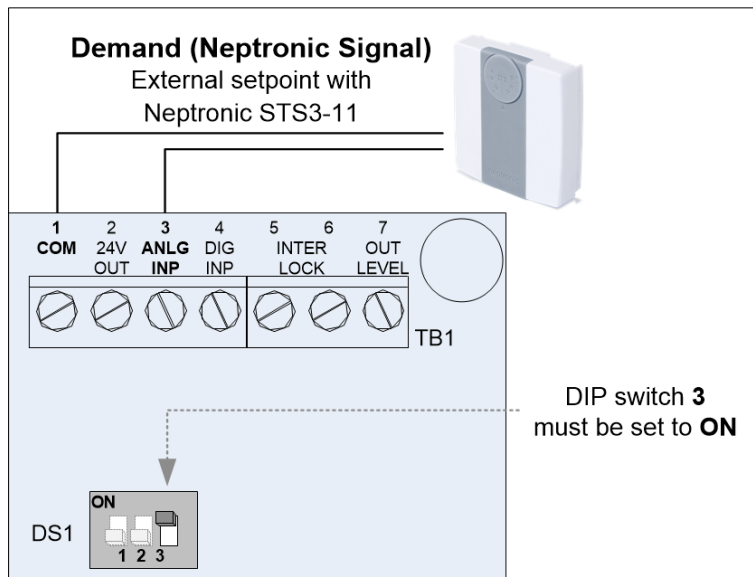
ON/OFF signal



Modulating signal (0-10Vdc, 2-10Vdc or 4-20mA)



Electric Neptronic® signal, resistive



## Operational Conditions

### Air Flow

- Air flow should not be lower than the minimum air flow indicated on name plate.
- Air flow going through the electric heater should be free of combustible particles, flammable vapour or gas.
- **Open Coil:** Air flow going through the electric heater should be free of dust.

### Zero Clearance Construction

- Neptronic electric heaters are designed and approved for zero clearance to combustible material. Insulation material may be installed directly onto electric heater surfaces or onto air duct. However control panel should be accessible for maintenance.



**Warning, Risk of fire and/or malfunction.** Do not install insulation directly on heating elements.

## Maintenance

Neptronic® electric heaters do not require specific maintenance; however we recommend a **yearly** inspection, typically before the winter season or after a long term shut down.

### Visual inspection



**Risk of electric shock.** Disconnect all supplies before any visual inspection.

- Verify condition of heating elements.
- Heating element should be clean and free of dust or lint.
- **Open Coil:** Carefully verify that there is no dust accumulation. Any dust or lint accumulation can lead to fire hazard.
- Verify any indication of overheating conditions (discoloration) as well as any trace of oxidation (rust).

### Electrical inspection



**Risk of electric shock.** Disconnect all supplies before any electrical inspection.

- Verify that electrical connections are correct and properly tightened.
- Verify the condition of fuses.
- Verify resistance of each circuit against ground.
- Verify correct operation of contactor(s).
- *If necessary, electrical components should be replaced only with identical origin components.*

## General Warranty

This product is subject to the terms and conditions described at <http://www.neptronic.com/Sales-Conditions.aspx>.

## Technical Support

For any questions or specific requests, please consult our web site: [www.neptronic.com](http://www.neptronic.com)  
Or call: **1 800 361-2308** or **(514) 333-1433**, and ask for the Electric Heater Department.



Recycling at end of life: please return this product to your Neptronic local distributor for recycling. If you need to find the nearest Neptronic authorized distributor, please consult [www.neptronic.com](http://www.neptronic.com).