



THERMOLEC

ELECTRIC PLENUM HEATER

The Latest In Technology for

DUAL-ENERGY HEATING

**An Easy Conversion to Clean, Convenient
and Affordable Electric Heat**



Model TU Electric Heaters Offer

Lower air flow requirements

- 40 CFM per kW

Easy to baffle for various size plenums

- Baffles are included with heater

Automatic switching to fossil fuel backup

- Dual fuel control included

Built in circuit breaker for easy isolation

- Ensure additional safety for service contractor

Center coil baffle included

- Allows for easy installation over "A" coil

Modulating units available

- Ideal for heat pumps

Thermolec Plenum Heater Features

Center coil baffle

- Easy installation over A coil

High-grade nickel-chrome open coil elements

- Only 40 cfm per kW minimum air flow

Includes baffles that attach to coil frame

- Easier to baffle for larger plenums

Automatic and manual high-limit protection

- Prevents unit from overheating

Isolation and operating relays

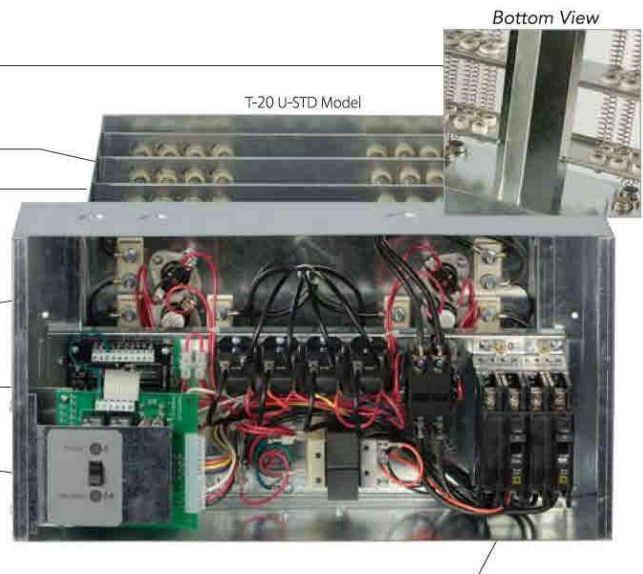
- A/C-ready, built-in interface control module

Built-in dual fuel control

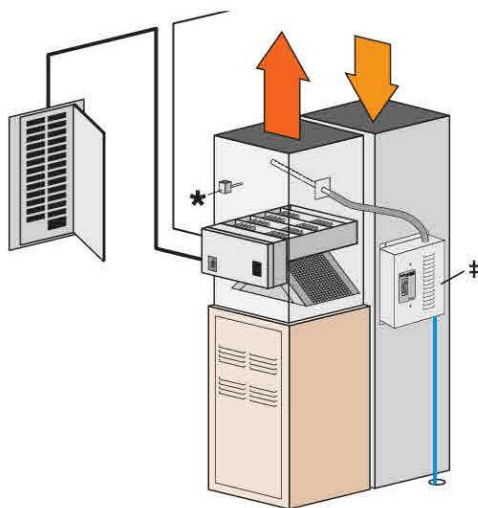
- Automatically switches to fossil fuel back-up with utility load control or can be switched manually

Circuit breakers included

- Provides safe electrical isolation for maintenance



Typical Installation



Applications

Standard Plenum Heater:

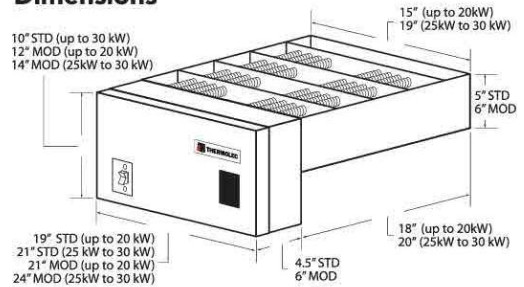
Fossil fuel furnace with or without A/C

Modulating Plenum Heater:

Fossil fuel furnace with heat pump or zoned system

For homes with 100 amp service panels, ask about our Retro models

Dimensions



Modulating Plenum Heater - Additional Features

* Plenum-mounted sensor and adjustable temperature setting on board

- Full modulation of elements to maintain plenum temperature – saves energy

All elements switched with solid state electronic relays

- Silent operation and long life

Built-in multi-purpose control module

- No additional interface or fossil fuel kit required



MODELS		KW @ 240V	BTU OUTPUT	HEATING SEQUENCES	TOTAL AMPERAGE	BREAKER (A)	
STANDARD	MODULATING					STD	MOD
T-5 U-STD	T-5 U-MOD	5	17,060	1	20.8	30	30
T-10 U-STD	T-10 U-MOD	10	34,120	2	41.6	60	60
T-15 U-STD	T-15 U-MOD	15	51,180	4 STD / 3 MOD	62.5	2 x 40	1 x 60 1 x 30
T-18 U-STD	T-18 U-MOD	18	61,416	4	75.0	2 x 50	2 x 50
T-20 U-STD	T-20 U-MOD	20	68,240	4	83.3	2 x 60	2 x 60
T-25 U-STD**	T-25 U-MOD**	25	85,300	4 STD / 5 MOD	104.0	3 x 50	2 x 60 1 x 30
T-30 U-STD**	T-30 U-MOD**	30	102,360	4 STD / 5 MOD	124.0	3 x 60	2 x 60 1 x 40

** Larger frame size required for 25/30 kW

‡ For optimum comfort, THERMOLEC recommends Acu-Steam Humidifiers.

Distributed By:



2060 Lucien-Thimens
Montreal, Quebec, Canada
H4R 1L1

Tel.: 514-336-9130 Fax.: 514-336-3270

Web Site: www.thermolec.com

HPX MODULATING PLENUM HEATER

**ADVANCED
TECHNOLOGY IN
ELECTRIC HEAT**



- *Ideal for all residential forced air heat pump applications*
- *Maximizes energy savings offered by utility's dual fuel programs*
- *Significantly increases heat pump BTU contribution during heating season*
- *Self-adjusting BTU output for maximum heating efficiency*
- *Reduces dependence on expensive LP gas and fuel oil*

The Next Generation of Dual Fuel Heating Systems

The HPX Modulating Plenum Heater (PH) from Thermolec is advanced technology ideal for dual-fuel/hybrid HVAC systems. Hybrid systems with a HPX PH provide up to a 50% savings on annual heating costs compared to conventional forced air heating systems.

HPX PHs maximize an air source heat pump's (HP) efficiency and savings by utilizing the HP's low cost BTU output. The HPX PH works with any air source HP and/or any brand/type of fossil fuel back-up forced air furnace.

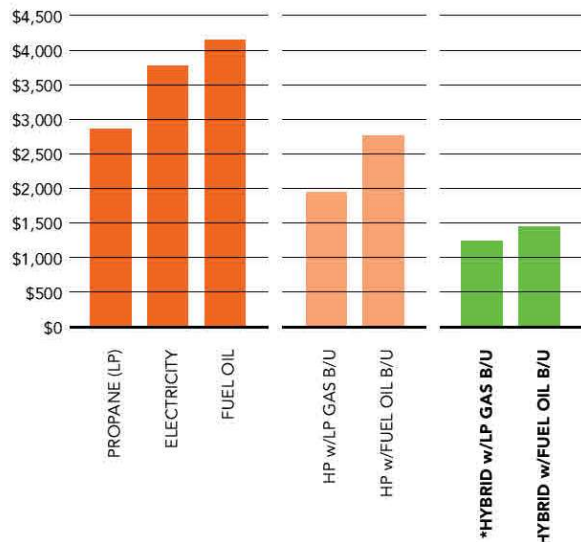


HPX Modulating Plenum Heater

Maximizes Savings

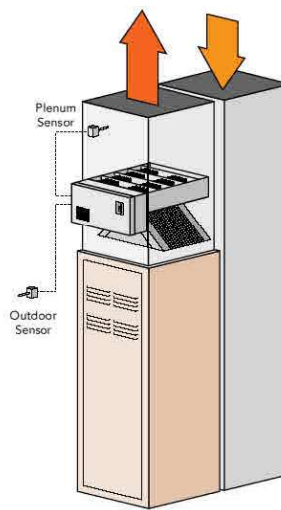
Hybrid HVAC systems can save over 50% in annual heating costs compared to high-efficiency LP or fuel oil furnaces. In a hybrid system, the HPX modulating plenum heater supplements the heat pump BTUs to provide low cost heat at outdoor temperatures down to 0°F and colder.

ANNUAL HEATING COST COMPARISON



* HYBRID = HPX Modulating Plenum Heater + Air Source Heat Pump + Backup Fossil Fuel Furnace

Typical Installation

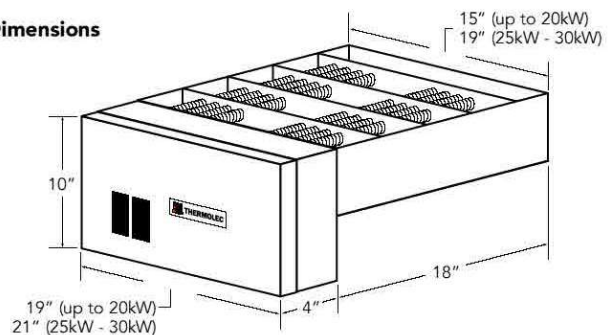


Precise Comfort/Efficiency Adjustment

The Thermolec System Controller allows you to manage the comfort and efficiency of your dual fuel heating system. Higher comfort levels are maintained by increasing the BTU output levels from the HPX modulating plenum heater in conjunction with the HP.



Dimensions



One Model for All Applications

- Multi-purpose control module requires no additional interface or fossil fuel kits
- Works with all brands/types of thermostats including 4-wire models with HP
- Works with all brands/models of HP's and gas/oil furnaces
- Same model for up-flow and down-flow applications
- Standard models in 5 through 30 kW with custom sizes available

HPX Modulating Plenum Heater Applications

- Dual Fuel / Hybrid
- Air Source Heat Pump
- Geothermal Heat Pump
- Zoned Forced Air Systems

MODEL	kW @ 240v	BTU OUTPUT	HEATING SEQUENCES	TOTAL AMPERAGE	BREAKER (AMP)
T-5 U-MOD-HPX	5	17,060	1	20.8	30
T-10 U-MOD-HPX	10	34,120	2	41.6	60
T-15 U-MOD-HPX	15	51,180	3	62.5	1 x 60 1 x 30
T-18 U-MOD-HPX	18	61,416	4	75.0	2 x 50
T-20 U-MOD-HPX	20	68,240	4	83.3	2 x 60
* T-25 U-MOD-HPX	25	85,300	5	104.0	2 x 60 1 x 30
* T-30 U-MOD-HPX	30	102,360	5	124.0	2 x 60 1 x 40

* Larger frame size. Note: custom sizes and voltages available.

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Web Site: www.thermolec.com
Email: sales@thermolec.com





THERMOLEC Retro Plenum Heater

Easy, low cost retrofit of gas to electric dual-fuel heat



Current Sensor included

- 34,000 btu heating capacity
- Uses low electric heat rate for majority of heating season
- Can be added to most existing 100 amp services
- Low (400 cfm) minimum airflow requirement
- Easy installation for various sized plenums

Unique features include:

- Designed for both single and variable speed blowers
- Current Sensor or utility load control compatible
- Automatically switches to fossil fuel back-up when electric cannot satisfy heat call due to ambient temperature conditions

Thermolec Plenum Heater Features

Center coil baffle

- Easy installation over A coil

High-grade nickel-chrome open coil elements

- Only 40 cfm per kW minimum air flow

Includes baffles that attach to coil frame

- Easier to baffle for larger plenums

Automatic and manual high-limit protection

- Prevents unit from overheating

Isolation and operating relays

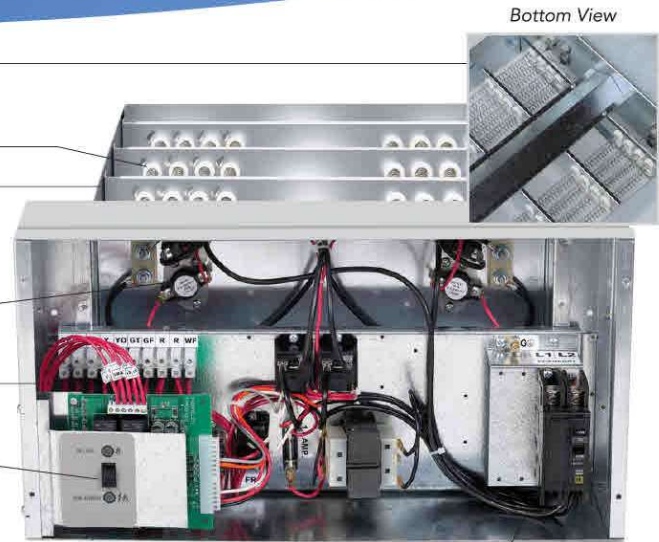
- A/C-ready, built-in interface control module

Built-in dual fuel control

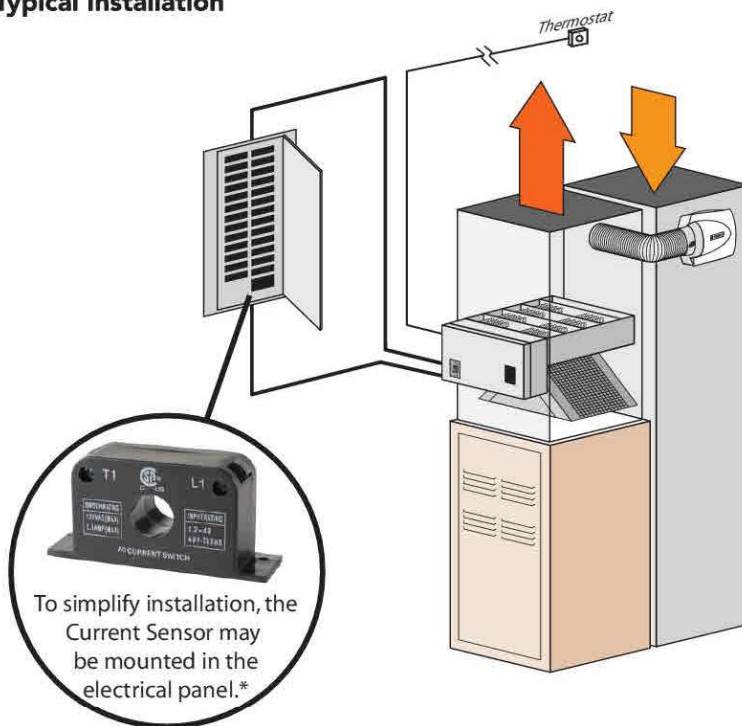
- Automatically switches to fossil fuel back-up with utility load control or can be switched manually

Circuit breakers included

- Provides safe electrical isolation for maintenance



Typical Installation

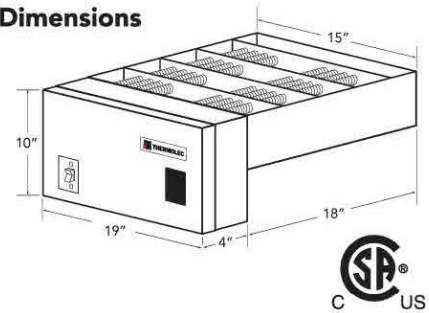


Applications

Easy and cost effective way to add electric heat to fossil fuel furnaces with or without A/C.

Can be safely installed with most 100 amp service entrances* thanks to a Current Sensor which monitors the use of a large electrical appliance such as a water heater or dryer. If the appliance is in use the plenum heater is automatically put into standby mode and will wait as long as the appliance is in use. If heat is required and the plenum heater is in standby or if it cannot satisfy the heating demand, it will automatically switch to the fossil fuel furnace for auxiliary heat.

Dimensions



MODELS	kW @ 240v	HEATING SEQUENCES	CURRENT (AMPS) PLENUM HEATER	BREAKER
T-10 U-DFCT	10	2	41.6	60

* Check with local codes before installing.

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Cost Per Million Btu

Electricity	3412 BTU / kWh																								
	\$ / kWh	0.038	0.040	0.042	0.044	0.046	0.048	0.050	0.052	0.054	0.056	0.058	0.060	0.062	0.064	0.066	0.068	0.070	0.072	0.074	0.076	0.078	0.080	0.090	0.100
	100%	11.14	11.72	12.31	12.90	13.48	14.07	14.65	15.24	15.83	16.41	17.00	17.58	18.17	18.76	19.34	19.93	20.52	21.10	21.69	22.27	22.86	23.45	26.38	29.31
	150%	7.42	7.82	8.21	8.60	8.99	9.38	9.77	10.16	10.55	10.94	11.33	11.72	12.11	12.50	12.90	13.29	13.68	14.07	14.46	14.85	15.24	15.63	17.58	19.54
	200%	5.57	5.86	6.15	6.45	6.74	7.03	7.33	7.62	7.91	8.21	8.50	8.79	9.09	9.38	9.67	9.96	10.26	10.55	10.84	11.14	11.43	11.72	13.19	14.65
	250%	4.45	4.69	4.92	5.16	5.39	5.63	5.86	6.10	6.33	6.57	6.80	7.03	7.27	7.50	7.74	7.97	8.21	8.44	8.68	8.91	9.14	9.38	10.55	11.72
	275%	4.05	4.26	4.48	4.69	4.90	5.12	5.33	5.54	5.76	5.97	6.18	6.39	6.61	6.82	7.03	7.25	7.46	7.67	7.89	8.10	8.31	8.53	9.59	10.66
	300%	3.71	3.91	4.10	4.30	4.49	4.69	4.88	5.08	5.28	5.47	5.67	5.86	6.06	6.25	6.45	6.64	6.84	7.03	7.23	7.42	7.62	7.82	8.79	9.77
	325%	3.43	3.61	3.79	3.97	4.15	4.33	4.51	4.69	4.87	5.05	5.23	5.41	5.59	5.77	5.95	6.13	6.31	6.49	6.67	6.85	7.03	7.21	8.12	9.02
	350%	3.18	3.35	3.52	3.68	3.85	4.02	4.19	4.35	4.52	4.69	4.86	5.02	5.19	5.36	5.53	5.69	5.86	6.03	6.20	6.36	6.53	6.70	7.54	8.37
	400%	2.78	2.93	3.08	3.22	3.37	3.52	3.66	3.81	3.96	4.10	4.25	4.40	4.54	4.69	4.84	4.98	5.13	5.28	5.42	5.57	5.72	5.86	6.59	7.33

System Efficiency
(C.O.P. or EF)

Natural Gas 100,000 BTU / therm

	\$ / ccf	0.90	0.95	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	1.75	1.80	1.85	1.90	1.95	2.00	2.05
	75%	12.00	12.67	13.33	14.00	14.67	15.33	16.00	16.67	17.33	18.00	18.67	19.33	20.00	20.67	21.33	22.00	22.67	23.33	24.00	24.67	25.33	26.00	26.67	27.33
	80%	11.25	11.88	12.50	13.13	13.75	14.38	15.00	15.63	16.25	16.88	17.50	18.13	18.75	19.38	20.00	20.63	21.25	21.88	22.50	23.13	23.75	24.38	25.00	25.63
	82%	10.98	11.59	12.20	12.80	13.41	14.02	14.63	15.24	15.85	16.46	17.07	17.68	18.29	18.90	19.51	20.12	20.73	21.34	21.95	22.56	23.17	23.78	24.39	25.00
	85%	10.59	11.18	11.76	12.35	12.94	13.53	14.12	14.71	15.29	15.88	16.47	17.06	17.65	18.24	18.82	19.41	20.00	20.59	21.18	21.76	22.35	22.94	23.53	24.12
	90%	10.00	10.56	11.11	11.67	12.22	12.78	13.33	13.89	14.44	15.00	15.56	16.11	16.67	17.22	17.78	18.33	18.89	19.44	20.00	20.56	21.11	21.67	22.22	22.78
	92%	9.78	10.33	10.87	11.41	11.96	12.50	13.04	13.59	14.13	14.67	15.22	15.76	16.30	16.85	17.39	17.93	18.48	19.02	19.57	20.11	20.65	21.20	21.74	22.28
	95%	9.47	10.00	10.53	11.05	11.58	12.11	12.63	13.16	13.68	14.21	14.74	15.26	15.79	16.32	16.84	17.37	17.89	18.42	18.95	19.47	20.00	20.53	21.05	21.58

System Efficiency

Propane 95,500 BTU / gallon

	\$ / gal	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00	2.10	2.20	2.30	2.40	2.50	2.60	2.70	2.80	2.90	2.95	3.00	3.05	3.10
	75%	13.96	15.36	16.75	18.15	19.55	20.94	22.34	23.73	25.13	26.53	27.92	29.32	30.72	32.11	33.51	34.90	36.30	37.70	39.09	40.49	41.19	41.88	42.58	43.28
	80%	13.09	14.40	15.71	17.02	18.32	19.63	20.94	22.25	23.56	24.87	26.18	27.49	28.80	30.10	31.41	32.72	34.03	35.34	36.65	37.96	38.61	39.27	39.92	40.58
	82%	12.77	14.05	15.32	16.60	17.88	19.15	20.43	21.71	22.99	24.26	25.54	26.82	28.09	29.37	30.65	31.92	33.20	34.48	35.76	37.03	37.67	38.31	38.95	39.59
	85%	12.32	13.55	14.78	16.01	17.25	18.48	19.71	20.94	22.17	23.41	24.64	25.87	27.10	28.33	29.57	30.80	32.03	33.26	34.49	35.73	36.34	36.96	37.57	38.19
	90%	11.63	12.80	13.96	15.13	16.29	17.45	18.62	19.78	20.94	22.11	23.27	24.43	25.60	26.76	27.92	29.09	30.25	31.41	32.58	33.74	34.32	34.90	35.49	36.07
	92%	11.38	12.52	13.66	14.80	15.93	17.07	18.21	19.35	20.49	21.63	22.76	23.90	25.04	26.18	27.32	28.45	29.59	30.73	31.87	33.01	33.58	34.15	34.71	35.28
	95%	11.02	12.12	13.23	14.33	15.43	16.53	17.64	18.74	19.84	20.94	22.04	23.15	24.25	25.35	26.45	27.56	28.66	29.76	30.86	31.96	32.52	33.07	33.62	34.17

System Efficiency

Fuel Oil 138,900 BTU / gallon

	\$ / gal	3.20	3.25	3.30	3.35	3.40	3.45	3.50	3.55	3.60	3.65	3.70	3.80	3.90	4.00	4.10	4.20	4.30	4.40	4.50	4.60	4.70	4.80	4.90	5.00
	75%	30.72	31.20	31.68	32.16	32.64	33.12	33.60	34.08	34.56	35.04	35.52	36.48	37.44	38.40	39.36	40.32	41.28	42.24	43.20	44.16	45.12	46.08	47.04	48.00
	80%	28.80	29.25	29.70	30.15	30.60	31.05	31.50	31.95	32.40	32.85	33.30	34.20	35.10	36.00	36.90	37.80	38.70	39.60	40.50	41.40	42.30	43.20	44.10	45.00
	82%	28.10	28.53	28.97	29.41	29.85	30.29	30.73	31.17	31.61	32.05	32.49	33.36	34.24	35.12	36.00	36.88	37.75	38.63	39.51	40.39	41.26	42.14	43.02	43.90
	85%	27.10	27.53	27.95	28.37	28.80	29.22	29.64	30.07	30.49	30.92	31.34	32.19	33.03	33.88	34.73	35.57	36.42	37.27	38.11	38.96	39.81	40.66	41.50	42.35
	90%	25.60	26.00	26.40	26.80	27.20	27.60	28.00	28.40	28.80	29.20	29.60	30.40	31.20	32.00	32.80	33.60	34.40	35.20	36.00	36.80	37.60	38.40	39.20	40.00
	92%	25.04	25.43	25.82	26.22	26.61	27.00	27.39	27.78	28.17	28.56	28.95	29.74	30.52	31.30	32.08	32.87	33.65	34.43	35.21	36.00	36.78	37.56	38.34	39.13
	95%	24.25	24.63	25.01	25.39	25.77	26.15	26.52	26.90	27.28	27.66	28.04	28.80	29.56	30.31	31.07	31.83	32.59	33.34	34.10	34.86	35.62	36.38	37.13	37.89

System Efficiency

Energy Efficiency Terms

Annual Fuel Utilization Efficiency (AFUE) - The measure of annual efficiency of a residential heating furnace or boiler. Accounts for operation energy losses of the heating unit
 Co-efficient of Performance (C.O.P.) - The same as the efficiency stated as a ratio of work or useful energy output of a system vs. the amount of energy inputted into the system.
 Energy Factor (EF) - The efficiency or measure of overall efficiency of a variety of appliances. Water heater efficiencies are rated by EF.



***Installation
instructions
for
Plenum-mounted
add-on
electric heaters***

MODEL TU

September 2016
Version 7

THERMOLEC PLENUM HEATER MODEL TU

BEFORE YOU START -GENERAL SAFETY AND INSTALLATION PRECAUTIONS

Please read and understand these instructions fully before you begin this installation and save them for future reference. The manufacturer will assume no responsibility and the warranty will be void if the user does not adhere to the following precautions.

1 - LIMITED WARRANTY

1.1 **THERMOLEC LTD.**, warrants the elements of its plenum heaters against all defects in material and workmanship for ten (10) years, and all other components for two (2) years after date of shipment from its factory.

1.2 **THERMOLEC LTD.**, will repair or replace, in their factory or on site, at their sole discretion, the plenum or any part thereof, which, in their opinion, is defective. Any misuse of this heater or any repair done by people other than authorized Thermolec personnel, without Thermolec's written consent, will void this warranty.

1.3 **THERMOLEC LTD.**, will not be held responsible for any accidental or consequential damage or delay, nor will Thermolec be held responsible for damages caused by the replacement of the plenum heater.

This limited warranty is granted by

Thermolec LTD., 2060 Lucien-Thimens Street, Montreal, Canada, H4R 1L1.

2 - INSTALLATION PRECAUTIONS AND SAFETY WARNINGS

2.1 This unit is designed to be used only in a **up-flow or down-flow installations** and it should be installed **only on oil or gas furnaces**. (No wood or solid fuel). For other applications, please contact the factory. **Custom units** are available for **horizontal installations**.

2.2 This unit is **not** designed to be installed side by side.

2.3 This unit must be installed by a qualified installer and Thermolec will not be held responsible for the quality of the installation.

2.4 Always check that you are not about to cut or drill into any air conditioning or electrical accessory during installation.

2.5 The installation and wiring must comply with national and local electrical, plumbing and building codes.

2.6 Electrical wiring must not come into contact with sharp edges or hot surfaces.

2.7 Please use common sense and normal safety precautions during the installation.

2.8 Please beware of sharp edges when you cut into a metal duct.

2.9 Always shut the power off before working on such installation. An electric shock could cause serious injury.

3 - DISCLAIMER

This warranty only applies if the unit is properly installed and operated according to the manufacturer's instructions provided with this product.

This limited warranty **does not** cover normal maintenance :

- replacement of fuses or breakers, filters, refrigerant, etc.,
- transportation and installation charges for the replacement part or component,
- any other service call or repair labor.

Replacement of a part or component under this limited warranty does not extend the warranty term or period.

This limited warranty does not apply to any part or component that is damaged in transit or handling; has been subject to abuse, neglect or accident; has not been installed, operated and serviced according to Thermolec's instruction booklet; has been operated beyond factory rated capacity; altered in any such way that its performance is affected. There is no warranty due to neglect, alteration, or ordinary wear and tear. Thermolec's liability is limited to replacement of defective parts or components and does not include payment of the cost of shipping charges and/or labor charges to remove or replace such defective components or parts.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the limitation of exclusion in the warranty may not apply to you.

We do not warranty this product suitable for the specific installation or application. It is the owner's (or installer's) responsibility for proper application. There are no other express warranties. Specification sheets and descriptions of this product are only to identify it, and are not a warranty claim that the unit fits the description. Thermolec is not bound by representatives, installers, warranties, or promises made by others beyond the terms of this express warranty. In no event shall Thermolec be responsible for any installation incidental or consequential damages.

Thermolec reserves the right to make changes in the design and material of its products without incurring any obligation to incorporate such changes in the units completed on the effective date of such changes.

THESE INSTALLATION INSTRUCTIONS COVER:

MODEL TU
T-5 U to T-30 U
T-5 U-DFC to T-30 U-DFC
(5 Kw to 30 Kw)
T-10 U-MOD-HPX to T-30 U-MOD-HPX
(10Kw to 30 Kw)

GENERAL NOTES

-The installation of this unit should be in accordance with the regulations of the authorities having jurisdiction.

CAUTIONS

1. Before installation, ensure that the local electrical inspection authority will accept connection of this equipment to the existing panel.
2. This equipment may only be installed and tested by qualified personnel.
3. The electrical power supply should be checked for adequacy for the proposed additional load.
4. Ensure that the heat output capacity of the installed electrical Add-on Heaters does not exceed the rated output capacity of the furnace burner.
5. This heater is for use with an in-line (hi-boy) or up-flow (lo-boy) oil or gas fired furnace.

OPERATING INSTRUCTIONS

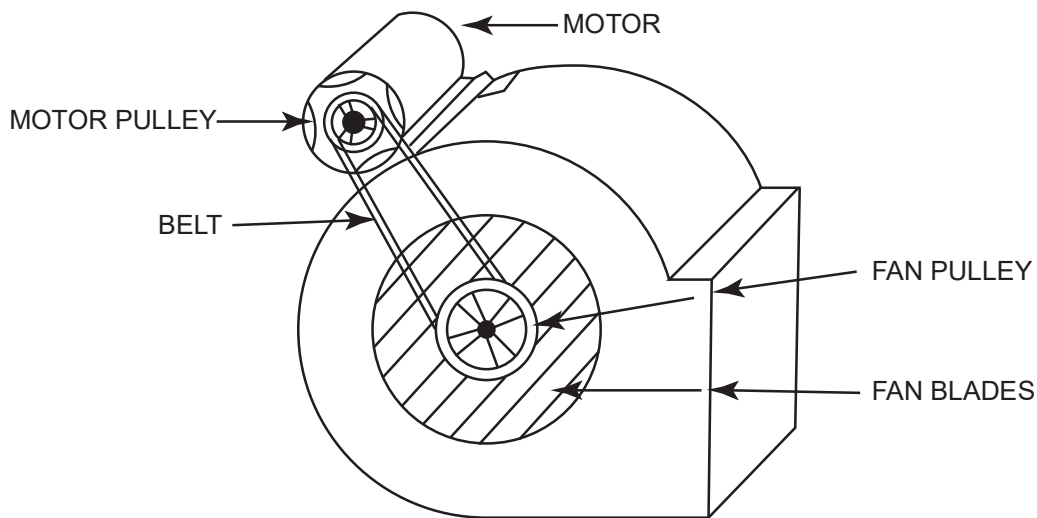
The controls provided with this unit prevent simultaneous operation of the add-on heater and the fossil fuel burner. In the case of malfunction, shut down the equipment and call a qualified electrician.

FIELD TESTS:

A. Before Installation of the Add-on Heater:

1. Ensure that the burner does not cycle due to repeated operation of the furnace's high limit control.
2. Determine whether stabilized outlet air temperature during burner operation is below 150°F (66°C) in the main outlet duct. If it does exceed 150°F (66°C) make the following adjustments to the Ventilation System in progressive steps:

Note: In most cases, only steps a) & b) will be necessary.



- a) Check if filters are clogged;
- b) Check if fan blades are clean. If not, remove the blower from its compartment and clean with a brush;
- c) Adjust the motor pulley to increase its diameter;
- d) Change the fan pulley for a smaller size;
- e) Change the motor pulley for a larger size;
- f) Change the motor and make sure that the fan control and wiring are adequate.

Note: If steps c), d) & e) are necessary, make sure that the existing motor is adequate: The current drawn must not exceed the nameplate specifications.

Important: The blower *must not* be changed. If the system cannot provide sufficient airflow after changing the motor, do not install the add-on heater in that furnace.

B. After Installation of the Add-on Heater:

1. Ensure that the burner does not cycle due to repeating operation of the furnace's high limit control.
2. Ensure that stabilized outlet air temperature during burner operation does not exceed 160°F (72°C) in the main outlet duct.
3. Run burner to ensure that the blower starts soon enough to prevent the manually resettable temperature limiting control on the Add-on Heater from tripping.
4. Operate the Add-on Heater to ensure satisfactory operation without overheating.

Note: Where a cooling coil is present, additional checks should be made to ensure adequate airflow exists for cooling system operation.

MECHANICAL SECTION

A. Product Inspection

- 1) Inspect the carton and heater and report any damage at once.

NEVER INSTALL A DAMAGED HEATER

- 2) Content of carton:

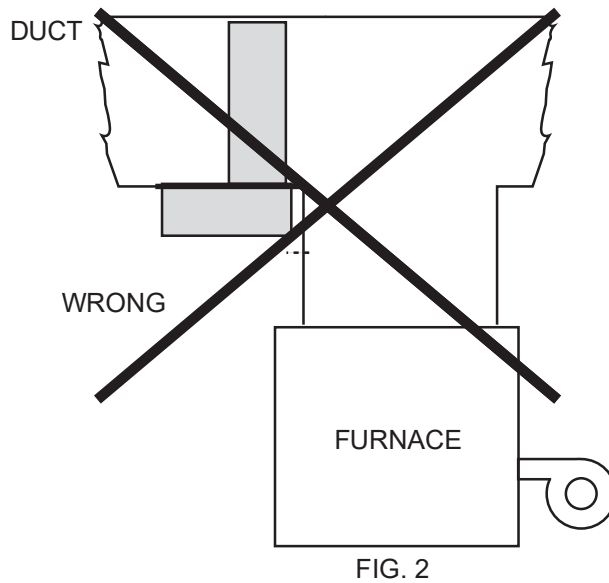
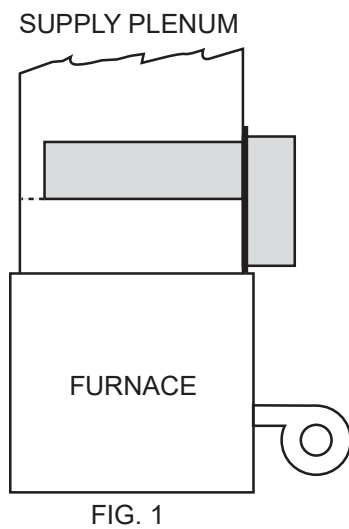
One plenum heater and baffles. Modulating models include a plenum temperature sensor and outdoor sensor.

- 3) File claim with shipping company if shipment is damaged.

B. Installation Instructions:

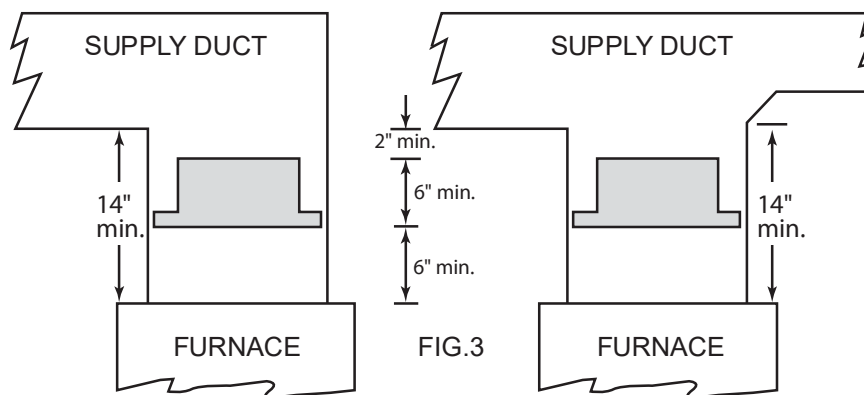
«Cautions» -The installation, location, position and orientation of the add-on heater must conform with the following:

- 1) This heater must be installed downstream of the furnace in the warm air plenum.
- 2) This heater must be installed downstream of the furnace safety limit control.
- 3) No deformation, removal or displacement of any part of the furnace is permitted.
- 4) The position of the add-on heater must be as indicated on the front of the heater control box (Please see Fig. 1).
- 5) The heater axis must be in line with the plenum axis.
- 6) Do not install heater from top or bottom of duct. (Please see Fig. 2).
- 7) Always check that you are not about to cut or drill into any air conditioning or electrical accessory during installation.



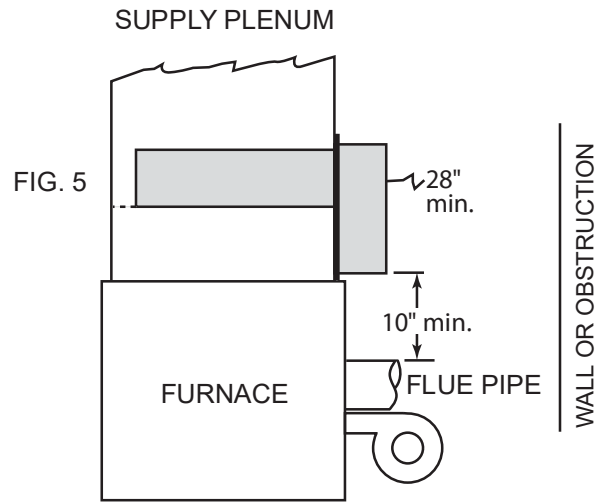
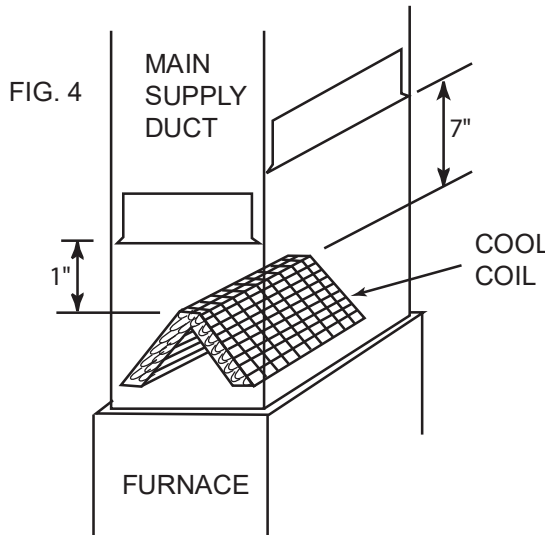
STANDARD INSTALLATION CLEARANCE

The heater must be installed in the warm air plenum. A minimum distance of 14 inches is required from the furnace to the elbow, Tee or plenum end take-off of the main supply duct (Please see Fig. 3).



If a cooling coil is installed in the warm air plenum a minimum distance of 1" or 7" is required between the top of the cooling coil and the add-on heater (depending from which side of the plenum the add-on heater is inserted). (Please see Fig. 4) d). In both cases, a minimum distance of 2" must be kept between the top of the add-on heater and the elbow, Tee or plenum-end take off of the main supply

duct. If 'N' or 'W' coils are used, a minimum of 7" is required from the top of coil to bottom of heater.



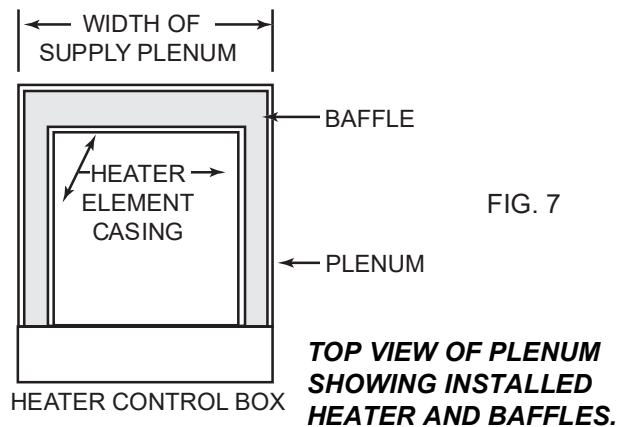
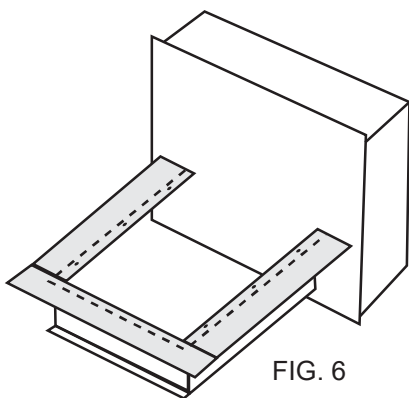
SERVICE CLEARANCE AND CLEARANCE FROM FLUE PIPE

The heater may be installed on any available side of the plenum. An installation and service clearance of 28 inches is required from the heater control box to a wall, partition or any other obstruction. If the heater is installed on the same side as the flue pipe a minimum clearance of 10 inches must be maintained between the flue pipe and the heater control box. (Please see Fig. 5) Select the plenum side, which offers the most space for installation and service.

VERY IMPORTANT

BAFFLES MUST ASSURE MAXIMUM AIR FLOW OVER THE HEATING ELEMENTS.

- Screw the baffles to bottom flanges of casing, as shown in Fig. 6.
- Cut baffles to size allowing **only** 1/8" clearance for insertion of heater.



AIR FLOW

All the air from the furnace must pass through the heater element. If the heater element casing is smaller than the plenum the space between the plenum and the element casing must be blocked off with baffles. (Please see Fig. 7)

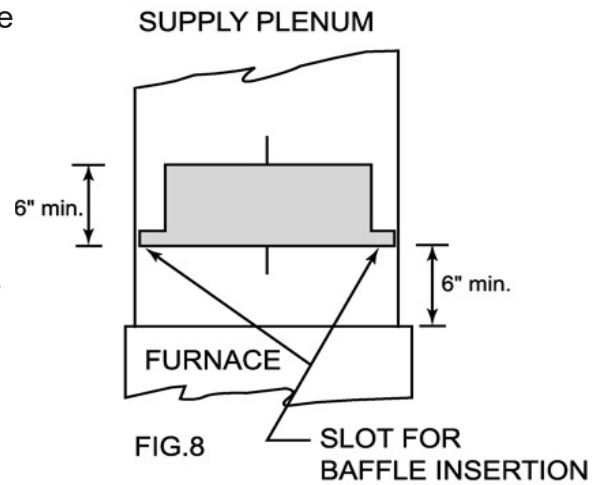
HEATER UP FLOW MOUNTING

Cut out heater opening at a minimum distance of 6 inches

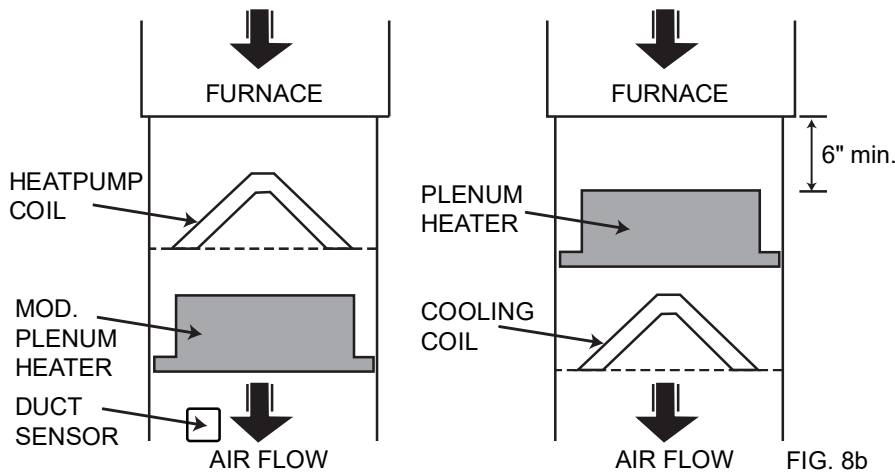
from the furnace. Center the opening on the plenum. Provide slots for insertion if baffles are installed. (Please see Fig. 8).

Note: The 6 inch dimension from the top of the furnace to the heater opening in the plenum may be increased. If increased, 14 inch minimum dimensions in Fig. 3 must be increased accordingly.

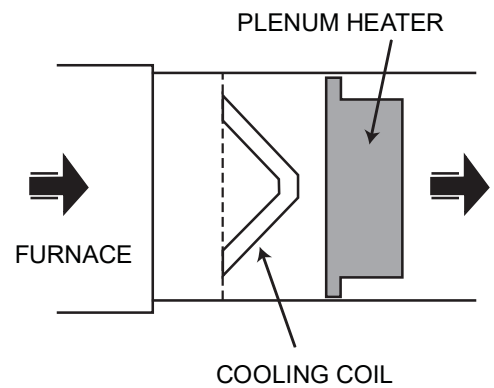
Slip the heater element into the opening. Make sure that the opening and slots are entirely covered by the heater mounting flanges. Secure the heater to the plenum by means of metal screws through the pre-drilled holes. For modulating models use angle bracket supplied.



DOWN FLOW MOUNTING



HORIZONTAL MOUNTING

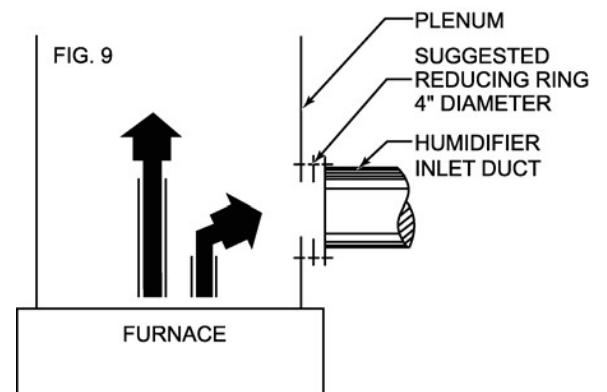


HUMIDIFIER

DO NOT USE PAN & PLATE TYPE HUMIDIFIERS WITH THE WATER RESERVOIR INSIDE THE WARM AIR SUPPLY PLENUM.

Only «Pressure Differential» type humidifiers (preferably a power or Steam humidifier) should be used. If the round inlet duct of the humidifier is connected on the hot side of the heater, it is strongly recommended to insert a reducing ring between the round inlet duct of the humidifier and the opening in the plenum such that the effective opening for the humidifier will

approximate 4" in diameter. This will reduce the volume of short-circuited air through the humidifier connection (Please see Fig. 9).



ELECTRICAL INSTALLATION INSTRUCTIONS and REQUIREMENTS for Model TU

- 1-Disconnect all power sources before opening electrical boxes and working within.
- 2-Read the nameplate and markings carefully and consult the wiring diagram before you start wiring.
- 3-Wires and protective equipment should be sized according to the National Electrical Code requirements.
- 4-Use only wires suitable for at least 75°C. Consult the table "Characteristics" to find the number of feeders required.
- 5a-Connect Thermostat wires to terminals on heater as shown on wiring diagram. Select proper wiring diagram for the application.
- 5b-Connect thermostat wires to furnace terminals per wiring diagram. Select wiring diagram based on type of furnace and fan motor.
- 6-Wire heater to furnace as shown on the wiring diagram. For two stage control and standard plenum heater, remove jumper from terminals 1 and 2 on heater and wire with isolation relay to W2 (second stage) on furnace.
- 7-Connect load management control to terminals OP and R on heater.

START-UP for Model TU

- 1-Do required fields tests after installation of the Add-on Heater as detailed on page 4.
- 2-Set the thermostat 1° above the room temperature.
- 3-Stages will sequence ON as required based on the demand for heat.
- 4-Measure the amperage drawn by the heater and compare it with the one shown on the nameplate. When the thermostat is satisfied, the stages will sequence OFF at 5 seconds interval.
- 5-Make sure the fan is ON when the heater is energized. The heater requires a minimum of 40 cfm per kW.
- 6-Set the room thermostat to the desired set point.
- 7-Your heater is now ready and functional.

OPERATING MODE SELECTION for Model TU

1-The heater is provided with a three-position mode selector switch, the middle position is disabled and should **not** be selected for US models. In the "gas / oil" mode the room thermostat will call upon the furnace to maintain the house temperature at the level desired by the user. The "Dual-Energy" mode gives automatic control to the load management control relay, outdoor thermostat or other switching signal for dual-energy control. When the contacts are closed, the electric mode is selected. When the load management contacts are open or when power is disconnected to the plenum heater, the "gas / oil" mode is selected. A green pilot light indicates the mode in operation.

OPERATING MODE TEST for Model TU

- 1-Do required fields tests after installation of the Add-on Heater as detailed on page 4.
- 2-The heater is supplied with a built-in 2 position mode selector switch.
 - (🔥) position - Heating by means of original furnace.
 - (⚡🔥) position - Dual-energy mode.
- 3-Simulate a heating demand by setting the room thermostat 1° above the room temperature.
- 4-Switch the mode selector to position (🔥) and check if the burner responds to thermostat demand.

5-Switch the mode selector to the dual-energy position (⚡). If you jump terminals OP and R the electric mode is selected. The fan will start and the heating elements will come on in sequence at 5 seconds interval. Measure the amperage drawn by the heater and compare it with the one shown on the nameplate. If you disconnect the load management control wires the “gas / oil” mode should be selected.

6-Switch the mode selector to the desired position and set the room thermostat to the desired set point.

7-Your heater is now ready and functional.

Characteristics

Models	kW @ 240V	Heating Sequences	Current (Amps)	
			Plenum Heater	Breaker
Staged Dual-energy				
T-5 U-DFC	5	1	20.8	30
T-10 U-DFC	10	2	41.6	60
T-15 U-DFC	15	4	62.5	2 x 40
T-18 U-DFC	18	4	75.0	2 x 50
T-20 U-DFC	20	4	83.3	2 x 60
T-25 U-DFC	25	4	104.0	3 x 50
T-30 U-DFC	30	4	124.0	3 x 60

Modulating Dual-energy				
T-10 U-MOD-HPX	10	3	41.6	60
T-15 U-MOD-HPX	15	4	62.5	2 x 40
T-18 U-MOD-HPX	18	4	75.0	2 x 50
T-20 U-MOD-HPX	20	4	83.3	2 x 60
T-25 U-MOD-HPX	25	4	104.17	2 x 60 1 x 30
T-30 U-MOD-HPX	30	4	125.0	2 x 60 1 x 40

Three Phase Models with Staged Dual-energy	kW	Voltage	Heating Sequences	Plenum Heater Amperage	Recommended Circuit Protection (Amps)
T-15 U	15	460V / 3Ø	1	18.85	25
T-20 U	20	480V / 3Ø	1	24.06	30
T-25 U	25	480V / 3Ø	1	30.07	40

Three Phase Models with Modulating Dual-energy	kW	Voltage	Heating Sequences	Plenum Heater Amperage	Recommended Circuit Protection (Amps)
T-15 U-MOD-HPX	15	460V / 3Ø	1	18.85	25

ELECTRICAL INSTALLATION INSTRUCTIONS and REQUIREMENTS for Model TU-DFC-MOD

- Disconnect all power sources before opening electrical boxes and working within.
- Read the nameplate and markings carefully and consult the wiring diagram before you start wiring.
- Wires and protective equipment should be sized according to the National Code requirements.
- Use only wires suitable for at least 75°C consult the table “characteristics” to find the number of feeders required.
 - *** If the heat pump thermostat that was selected has a switch over Valve Selector Switch or B & O terminal, it must be placed in the cool position. Wire according to wiring diagram.
 - ** If the O output of the heat pump is active in the heating mode, move the white jumpers on the relay board to the normally open position.
- Select a wiring diagram based on the type of stat, furnace and heat pump. Connect control wiring between equipment and stat as shown on wiring diagram.
- Connect terminals OP & R to the contacts of the load management relay, outdoor thermostat or other switching signals for dual-energy control.

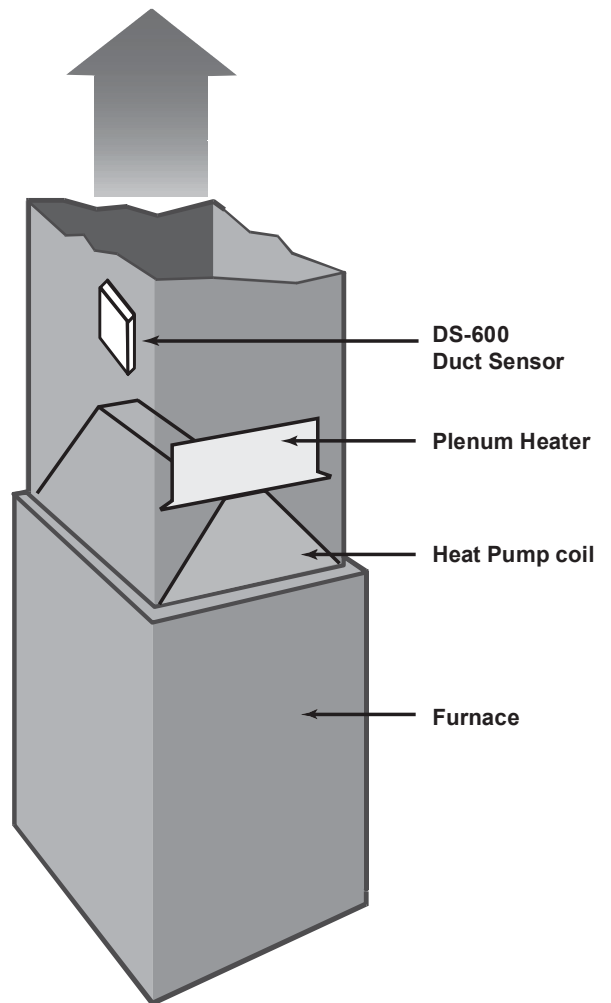
S-15 OUTDOOR SENSOR

- Install the S-15 on an exterior North wall and connect it with 18/2 wire to "OT/OT" on the TH600-HPX board.
- The S-15 automatically controls the duct air temperature based on the outdoor temperature. Please see table on next page.



MECHANICAL INSTALLATION INSTRUCTIONS and REQUIREMENTS for Model TU-DFC-MOD

- The modulating plenum heater is installed per instructions and in an upflow application as shown in the diagram.
- Duct sensor is installed a minimum 8” above the modulating plenum heater in a position where it can measure true plenum temperature.



OPERATING and SETUP INSTRUCTIONS

- The modulating plenum heater minimum plenum discharge temperature is selected on the COMFORT LEVEL dial on the TH600-HPX control board.



TH600-HPX Comfort Level Temperature Set Point

	1	2	3	4	5	6	7	8
°C	32.0	33.0	34.0	35.0	36.0	37.0	38.0	39.0
°F	90	91	93	95	97	99	100	102

-When the plenum temperature falls below the comfort level setting, the plenum heater elements will modulate to maintain the selected discharge temperature, using the minimum amount of energy required.

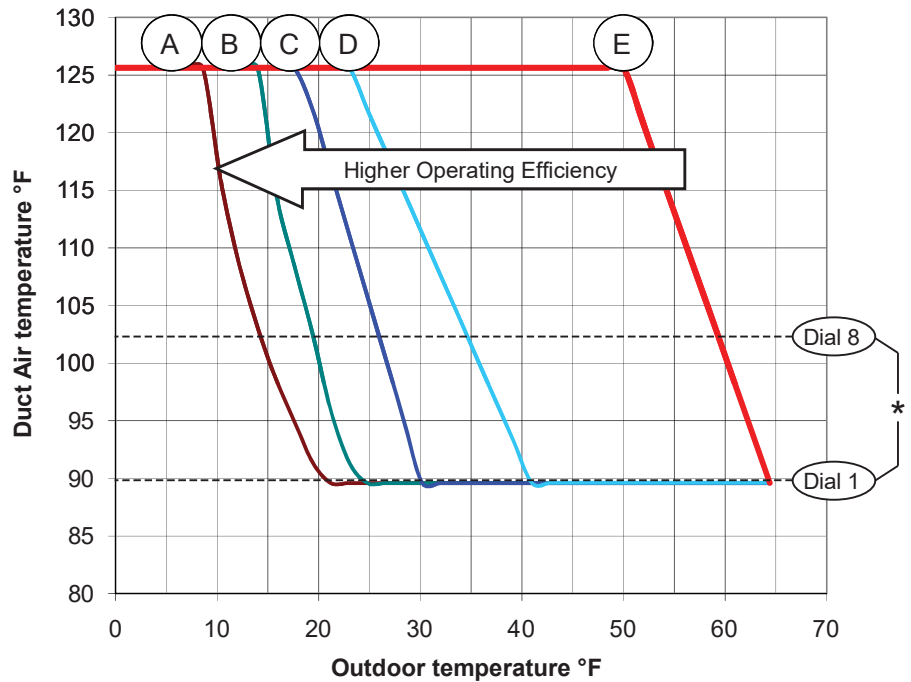
-When the plenum temperature is above the comfort level setting, the plenum heater will allow the heat pump to be the primary source of heat.

HEAT PUMP EFFICIENCY

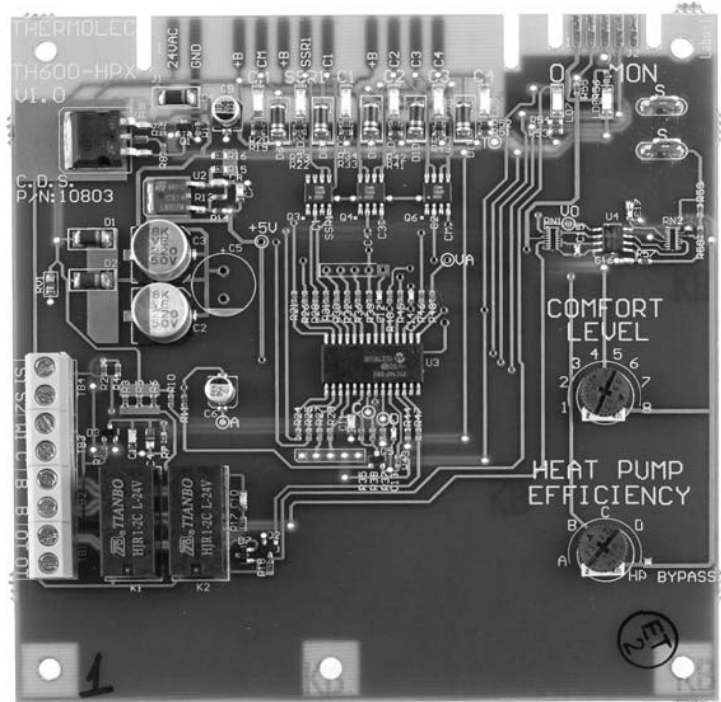
The Heat Pump Efficiency dial is used to better match the plenum heater to a heat pump based on its operating efficiency. This allows the heat pump to operate as much as possible, using the minimum amount of electricity for the plenum heater. Select 'A' on the dial for a more efficient Heatpump and 'D' for a less efficient one. In case of an emergency such as a heat pump failure, set the dial to position 'E' (* HP BYPASS) and the Thermolec plenum heater will be the main source of heat.

TH600-HPX Duct Air Temperature vs. Outdoor Temperature table					
Outdoor temp.	A	B	C	D	E
°F	°F	°F	°F	°F	°F
0	126	126	126	126	126
1	126	126	126	126	126
3	126	126	126	126	126
5	126	126	126	126	126
7	126	126	126	126	126
9	126	126	126	126	126
10	116	126	126	126	126
12	109	126	126	126	126
14	103	126	126	126	126
16	99	115	126	126	126
18	95	109	126	126	126
19	91	103	122	126	126
21	90	96	117	126	126
23	90	91	111	126	126
25	90	90	106	122	126
27	90	90	100	118	126
28	90	90	95	115	126
30	90	90	90	111	126
32	90	90	90	108	126
34	90	90	90	104	126
36	90	90	90	100	126
37	90	90	90	97	126
39	90	90	90	93	126
41	90	90	90	90	126
43	90	90	90	90	126
45	90	90	90	90	126
46	90	90	90	90	126
48	90	90	90	90	126
50	90	90	90	90	126
52	90	90	90	90	121
54	90	90	90	90	117
55	90	90	90	90	112
57	90	90	90	90	108
59	90	90	90	90	103
61	90	90	90	90	99
63	90	90	90	90	94
64	90	90	90	90	90

TH600-HPX Duct Air Temperature vs. Outdoor temperature



* The duct air temp. will never go below the 90-102 °F temperature range. This minimum temperature is selected by the Comfort Level Dial knob.



Modulating Plenum Heater Instructions

Sequence of operation, modulating plenum heater with heat pump

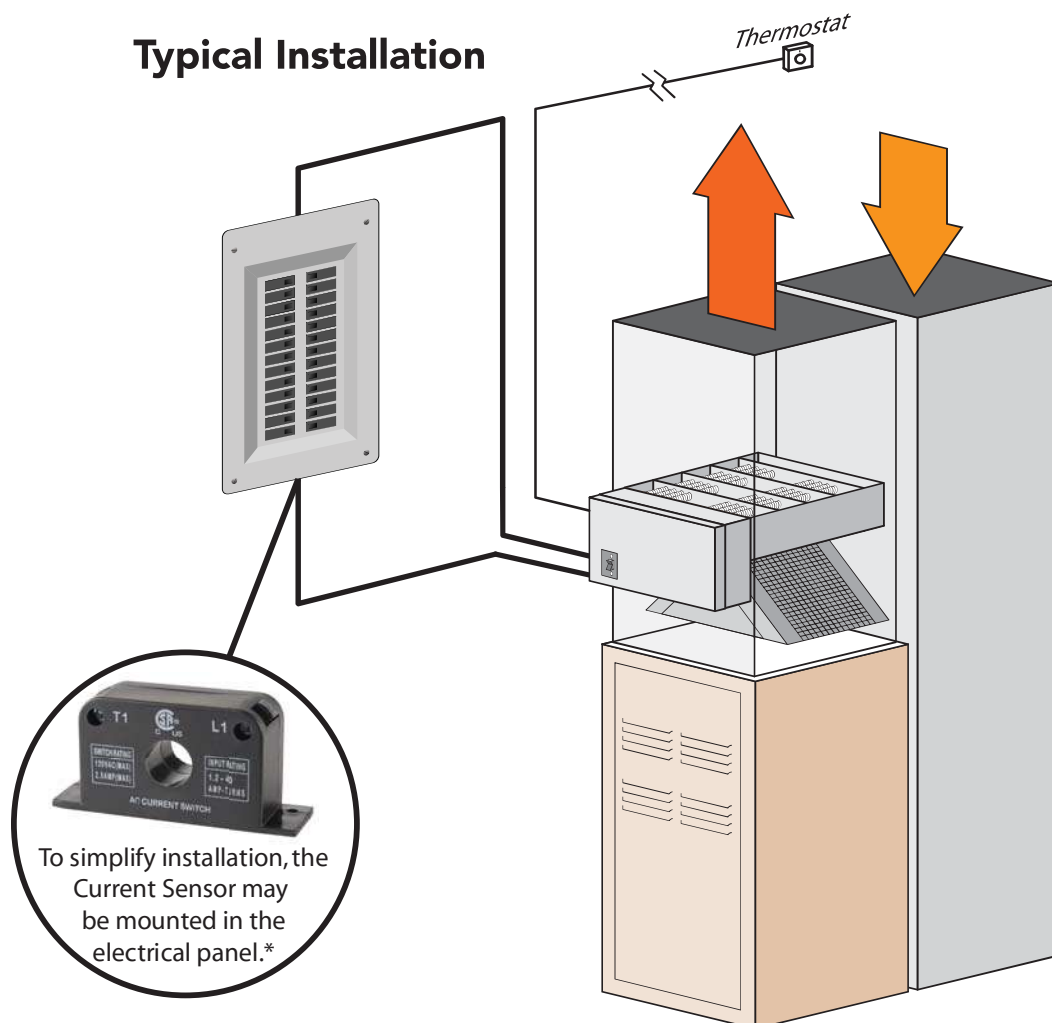
1. When the utility load management control is closed and outdoor temperature is above the set point of the heat pump lockout, heat pump / electric heat is selected as first stage. With a call for heat, the heat pump will start and provide heat. If the DS-600 temperature sensor senses plenum temperature below the comfort level set point of the dial on the plenum heater control board, the plenum heater elements will energize, supplementing the heat provided by the heat pump and modulate to maintain the desired plenum temperature. If the utility load management control is opened, the fossil fuel back up will be selected.
2. When the utility load management control is closed and outdoor temperature is below the heat pump lockout set point, the heat pump will be locked out. With a call for heat, the plenum heater will provide the full heat load and modulate the elements to maintain the desired plenum temperature. If the utility load management control is opened, the fossil fuel back up will be selected.
3. Heat pump lockout setpoint is determined by the "Heat Pump Efficiency" dial setting, A = 0 °F, B = 10 °F, C = 15 °F, D = 20 °F. If an alternative lockout temperature is desired, use an adjustable outdoor thermostat wired in series from YS on plenum heater and Y on heat pump.
4. When the heat pump switches to defrost, the fossil fuel back up will be selected and the plenum heater will be locked out. After defrost, the system will switch back to heat pump / electric heat mode.
5. When the utility load management control is open, with a call for heat, the fossil fuel back up will be selected.
6. To manually select fossil fuel mode, switch heat pump thermostat to emergency or switch plenum heater circuit breakers to off position.

Sequence of operation, modulating plenum heater with standard heating/cooling system

1. When the utility load management control is closed, with a call for heat, the plenum heater will provide the full heat load and modulate the elements to maintain the desired plenum temperature. If the utility load management control is opened, the fossil fuel back up will be selected.
2. When the utility load management control is open, with a call for heat, the fossil fuel back up will be selected.

RETRO PLENUM APPLICATION NOTES

This version of Thermolec Plenum Heater is designed specifically for installations with 100 amp service entrances*. It allows a 10kW (34,000 BTU) electric plenum heater to be added to a fossil fuel furnace without the need of upgrading the service entrance. The National Electric Code (NEC) allows up to 7 kW electric heating with typical large appliances such as a clothes dryer or hot water tank. To allow a full 10 kW of heating, Thermolec's advanced electronic controller combined with a current sensor will shut down the electric plenum heater when a large electrical appliance is in use. As soon as the current sensor detects a load, the electric plenum heater is automatically put into standby mode and will switch to the fossil fuel furnace if there is a demand for heat. When the major appliance is no longer in use and there is a demand for heat, the plenum heater will start heating again. The electrician must determine which major appliance is best suited to be used with the current sensor. If the plenum heater has been heating for more that 30 minutes and there is still a demand for heat, the electronic controller will switch to the fossil fuel furnace for auxiliary heat. This is the safest approach to ensure that the plenum heater will not overload the service entrance. For safety reasons, the electric plenum heater will not function if the current sensor is not connected or if the wire breaks by accident. For convenience there are LEDs on the front panel to indicate whether the plenum heater is in electric or fossil fuel mode. Please check the wiring diagram for proper connections.



*check with local codes before installing

Thermolec Standard Plenum Heater Troubleshooting Guide

Step	Issue	What to Check	Possible Cause/Problem
1	No Heat-No Fan	On Relay Board Terminal Strip Check for 24 VAC to: OP,R,WT If Not (See Possible Cause) If Yes: Continue to step 2	Furnace Transformer, Wiring to Thermostat, Off Peak Relay
2	No Heat-No Fan	On the TH400 Board: Check for continuity between C and W1, S1 and S2 If Not (See Possible Causes) If Yes Continue to step 3	Bad Relay Board
3	No Heat-No Fan	Check for 24 VAC at Plenum Heater Transformer and Fuse If No: See Cause (A) If Yes: See Cause (B)	(A): Check for Voltage at Breakers, Transformer (B): TH-400 Board Faulty
4	No Heat- Blower is on	Check for Continuity on Auto High Limits, Manual High Limits and Back Up Contactor	Air flow issues, Low CFM, not wired for variable speed blower, baffles not installed correctly, faulty back up contactor or bad high limits.
5	No Electric Heat or No A/C	Check for 24 VAC at OP terminal on Relay Board	Wired Improperly, Bad Off Peak Relay, Bad Load Control box at house or Utility is currently in a control period.
6	Insufficient Heat	Check Amp draw: If Drawing full amps: heater is operating at design spec (C). If not: Continue to step 7	(C): Airflow or Unit is Undersized
7	Insufficient Heat	Check for 24 VDC to Operating Contactor C1-C4 If No: See cause (D) If Yes: Continue to step 8	(D): Faulty TH-400 Board
8	Insufficient Heat	Are the Operating Contactor(s) closing? If Not: Cause (E) If Yes: Continue to step 9	(E) Bad Operating Contactor
9	Insufficient Heat	Measure Element Resistance and Amp Draw If full open: Cause (F) If Amp Draw is incorrect: Cause (F)	(F) Bad Element

Modulating Plenum Heater Trouble Shooting Guide

1. **Before you start;** Identify your system, make sure that you are using the appropriate wiring diagram that matches the system components:

- A. Furnace (Single Stage or Two Stage, Variable Speed or Standard Drive)
- B. Cooling (Heat Pump or A/C, 1 stage or 2 stage)
- C. Thermostat (With or Without outdoor sensor?)

2. **If Heat Pump;** does O/B energize in heating or cooling mode? Jumpers on the Relay Board are in the normally closed position, Jumpers must be put to the normally open position if you energize O/B for heating. Same at your Thermostat.

	Step	Issue	What to Check	Possible Cause/Problem
1	No Heat	On Relay Board Terminal Strip Check for 24 VAC to: OP,Y,R If No 24 VAC (See Possible Causes) If Yes: Continue to step 2	Off Peak Relay, Thermostat, Wiring and/or Transformer at Furnace	
2	No Heat	On the TH600 Control Board: Check for continuity between C and W1, S1 and S2. If None (See Possible Causes) If Yes Continue to step 3	Bad Relay Board. O/B not correct as in "Before you Start" section.	
3	No Heat	Double check main power to Plenum Heater transformer. Check HI Limits manual and auto (Ohm or 24VAC). Reset Manual Limits (listen for click). Make sure back up contactor is pulled in. Check transformer fuse. If Yes (Continue to step 4) If Not (see possible causes)	Tripped Breaker, Bad High Limits; Auto/Manual, Bad Contactor, Blown Fuse	
4	No Heat	Remove wires from duct temperature sensor at the TH-600 board. Does unit start? If yes; see possible causes (A). If no; see possible causes (B)	(A): Bad duct temperature sensor (B) Faulty TH-600 Board	
5	Insufficient Heat	Turn Dial on TH-600 board higher, check for green led lights on TH-600 board. If no lights; see possible causes. If yes; continue	Heat Pump is putting out enough bTu's to satisfy heat load on its own.	
6	Insufficient Heat	Perform an amp draw; if amperage is correct in reference to name plate on unit; see possible causes. If not; continue	Did you use the proper diagram (variable speed?), Is kW load properly sized, Dial on the TH-600 board not in the correct setting for discharge temp. needed	
7	Insufficient Heat	Check for 24 Volts DC to SSR relays If no: see possible causes If yes; continue	TH-600 Board not functioning properly	
8	Insufficient Heat	Check the high voltage side of SSR relay contacts (Should be 0 VAC) If not; see possible causes	SSR Relay is faulty, Broken/Bad element (Ohm out to make sure)	



Electric Boiler and Modulating Plenum Heater SSR Relay Troubleshooting

Call for heat, circuit board lights come on but no heat or insufficient heat. Try the following:

1. Check amp draw at circuit breakers. If amp draw is less than rating on label, continue to step 2. If amp draw is correct on boiler check pump operation, confirm system design, heat loss, boiler sizing, system water level, etc. On plenum heater check air flow, confirm system design, heat loss, etc.
2. Set volt meter to DC, check for control voltage from circuit board to solid state relays. Make sure + probe on meter to + terminal (A1) on SSR and – probe on meter to – terminal (A2) on SSR. If no DC voltage to solid state relays, check wiring harness connection to circuit board. If 24 volts DC at solid state relay, check line voltage at solid state relays. Set meter to volts AC and put one probe on L1 and one probe on T1. If meter reads zero voltage, continue to step 3. If meter reads 240 VAC, SSR is not closing. If SSR is 25 amp marked RS1A48D25S48, change all solid state relays in boiler.
3. Turn OFF circuit breakers. Check for continuity at boiler or plenum heater elements. If no continuity, change element.





Fahrenheit

Temperature
Resistance

Temperature
Resistance

Temperature
Resistance

Temperature
Resistance

Temperature
Resistance

-40	336095	19	47612	78	9760	137	2642	196	885
-39	323934	20	46222	79	9526	138	2589	197	870
-38	312255	21	44878	80	9298	139	2538	198	856
-37	301040	22	43576	81	9077	140	2487	199	841
-36	290264	23	42316	82	8861	141	2438	200	827
-35	279921	24	41098	83	8652	142	2390	201	814
-34	269982	25	39919	84	8448	143	2343	202	800
-33	260429	26	38777	85	8249	144	2297	203	787
-32	251250	27	37673	86	8056	145	2252	204	774
-31	242426	28	36602	87	7868	146	2208	205	761
-30	233942	29	35566	88	7685	147	2165	206	749
-29	225794	30	34563	89	7506	148	2123	207	736
-28	217954	31	33592	90	7333	149	2082	208	724
-27	210413	32	32651	91	7164	150	2042	209	713
-26	203161	33	31739	92	6999	151	2003	210	701
-25	196184	34	30856	93	6839	152	1965	211	690
-24	189473	35	30001	94	6682	153	1927	212	678
-23	183017	36	29172	95	6530	154	1891	213	668
-22	176801	37	28369	96	6382	155	1855	214	657
-21	170821	38	27591	97	6238	156	1820	215	646
-20	165062	39	26836	98	6097	157	1785	216	636
-19	159520	40	26104	99	5960	158	1752	217	626
-18	154185	41	25395	100	5826	159	1719	218	616
-17	149045	42	24707	101	5696	160	1687	219	606
-16	144094	43	24041	102	5569	161	1655	220	597
-15	139324	44	23394	103	5446	162	1624	221	587
-14	134734	45	22767	104	5325	163	1594	222	578
-13	130307	46	22159	105	5208	164	1565	223	569
-12	126041	47	21569	106	5093	165	1536	224	560
-11	121932	48	20997	107	4981	166	1508	225	551
-10	117968	49	20442	108	4872	167	1480	226	543
-9	114152	50	19903	109	4766	168	1453	227	534
-8	110468	51	19380	110	4663	169	1427	228	526
-7	106917	52	18873	111	4562	170	1401	229	518
-6	103492	53	18381	112	4463	171	1375	230	510
-5	100192	54	17903	113	4367	172	1350	231	502
-4	97007	55	17439	114	4273	173	1326	232	494
-3	93932	56	16989	115	4182	174	1302	233	487
-2	90968	57	16551	116	4093	175	1279	234	479
-1	88106	58	16126	117	4006	176	1256	235	472
0	85346	59	15714	118	3921	177	1234	236	465
1	82680	60	15313	119	3838	178	1212	237	458
2	80109	61	14924	120	3757	179	1190	238	451
3	77624	62	14546	121	3678	180	1169	239	444
4	75226	63	14179	122	3601	181	1149	240	438
5	72910	64	13822	123	3526	182	1129	241	431
6	70675	65	13476	124	3453	183	1109	242	425
7	68515	66	13139	125	3381	184	1089	243	418
8	66428	67	12812	126	3311	185	1070	244	412
9	64411	68	12493	127	3243	186	1052	245	406
10	62464	69	12184	128	3176	187	1034	246	400
11	60581	70	11884	129	3111	188	1016	247	394
12	58762	71	11591	130	3047	189	998	248	388
13	57003	72	11307	131	2985	190	981	249	383
14	55303	73	11031	132	2925	191	964	250	377
15	53660	74	10762	133	2865	192	948		
16	52072	75	10501	134	2807	193	932		
17	50535	76	10247	135	2751	194	916		
18	49049	77	10000	136	2696	195	901		



Plenum Heater Parts

9/1/19

10-02-003	Automatic Reset Cut-out
10-02-999	PH Manual Hi Limit Reset Cut-out
10-02-005	Back-up Contactor to Manual Cut-out
10-02-0055	Back-up Contactor to Manual Cut-out
10-02-006	Pump Relay/HTR Relay/Opr Contactor
10-02-0105	Fan Relay/HPX Heat Pump Lock-out Relay
17-02-111	Circuit Breaker 30A, T-15UMOD, T-25UMOD
17-02-112	Circuit Breaker 40A, T-15U
17-02-113	Circuit Breaker 50A, T-25U
17-02-114	Circuit Breaker 60A, T-10U, T-20U, T-30U
17-02-115	SSR Relay - 50 Amp
17-02-116	Control Transformer
17-02-117	Control Fuse - 2 Amp
10-00-008	Control Board - TH400, STD PH used after SN #375820 (molex)
10-02-011	Control Board - TH400 STD PH, used b/f SN #375820 (wire harness)
17-02-109	Control board - TH600D, Mod PH temp dial b/f #369107 (wire harness)
10-01-019	Control Board - TH-600 HPX PH
17-00-100	Control Board - TH-600D, Mod PH with temp dial after #369107 (molex)
10-02-014	Heating Element, T-10U, T-20U, T-30U
10-02-015	Heating Element, T-15U
10-02-016	Heating Element, T-25U
10-02-017	BIR,HIR,OPR Isolation Relays
10-02-019	Plenum Temperature Sensor - Mod and HPX PH
10-02-026	OPR/ST2 Iso Relay - MOD only
17-02-119	Outdoor Sensor - HPX PH
10-02-031	Relay Board - I4 Standard PH - replaces part# 10-02-028
10-02-032	Relay Board - I6 Mod & HPX PH - replaces part# 10-02-029
10-01-015	Control Board - Retro PH
10-01-016	Relay Board - Retro PH
10-01-018	AC Current Sensing Relay
10-02-031	Relay Board - I4-2 Standard PH
10-02-032	Relay Borad - I6-2 Mod & HPX PH

(Parts Breakdown is on reverse side)



Plenum Heater Parts Breakdown

Quantity per Model Number

Part Number	T-10U	T-15U	T-20U	T-25U	T-30U	T-10U DFCT (Retro)
10-02-003	2	2	2	2	2	2
10-02-999	2	2	2	2	2	2
10-02-005	1	1	1			1
10-02-0055				1	1	
10-02-006	2	4	4	6	6	2
17-02-116	1	1	1	1	1	1
17-02-111		1*		1*		
17-02-112		2				
17-02-113				3		
17-02-114	1		2		3	1
17-02-115	*2	*3	*4	*5	*5	
10-02-011	1	1	1	1	1	
17-02-109	*1	*1	*1	*1	*1	
10-01-019	**1	**1	**1	**1	**1	
10-02-031	1	1	1	1	1	
10-02-032	*1	*1	*1	*1	*1	
10-02-014	2		4		6	2
10-02-015		4				
10-02-016				6		
17-02-117	1	1	1	1	1	1
10-02-0105	1	1	1	1	1	1
10-02-017	3	3	3	3	3	3
10-02-019	*1	*1	*1	*1	*1	
10-02-026	*2	*2	*2	*2	*2	
17-02-119	**1	**1	**1	**1	**1	
10-01-015						1
10-01-016						1
10-01-018						1
10-02-031	∞ 1	∞ 1	∞ 1	∞ 1	∞ 1	
10-02-032	∞ 1	∞ 1	∞ 1	∞ 1	∞ 1	

* Modulating Units - discontinued model

9/1/19

** Modulating HPX Only

∞ Compatible with all models with relay boards

NOTE:

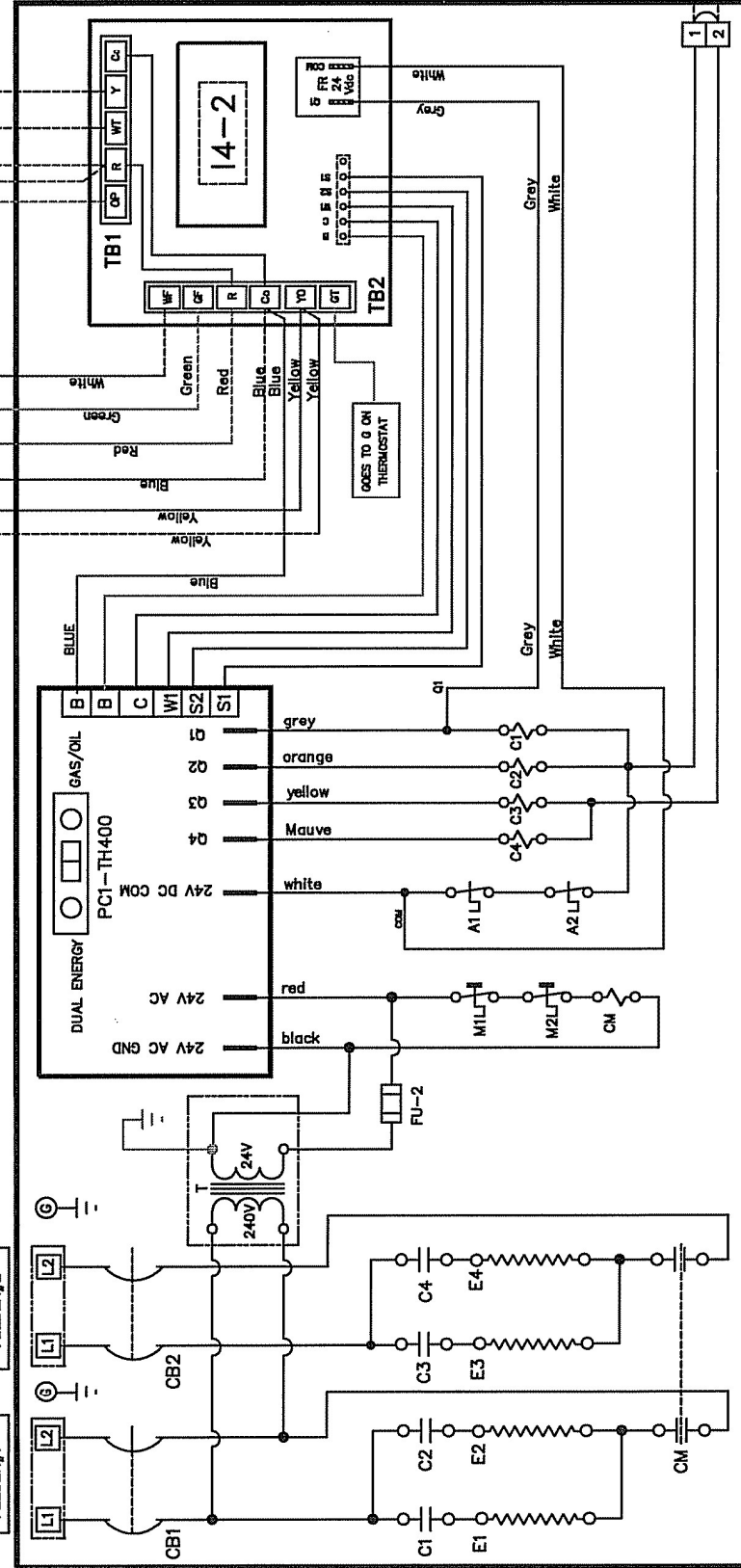
1. The 24V source that supplies the thermostat must be grounded (terminal Co)

2. If panel disconnect load control, must be grounded (terminal Co)

CONNECT TO PANELBOARD

FEEDER#1

FEEDER#2



IMPORTANT:

WIRE IN ACCORDANCE TO LOCAL ELECTRIC CODES. READ CAREFULLY THE INSTALLATION INSTRUCTIONS BEFORE WIRING AND OPERATING.

LEGEND

- A AUTOMATIC RESET CUT-OUT
- CR...C4 OPERATING CONTACTORS (ELEMENTS)
- FR FAN RELAY, ELECTRIC MODE
- E1...E4 HEATING ELEMENTS
- FU-2 FUSE 1.5 AMP 24V
- PC1 PRINTED CIRCUIT BOARD
- PL1 PILOT LIGHTS & 3 POSITION SWITCH
- T TRANSFORMER, CLASS 2
- L LINEAR MANUAL RESET CUT-OUT
- CM BACK-UP CONTACTOR TO MANUAL
- CB CIRCUIT BREAKER
- HIR HEAT ISOLATING RELAY
- BIR BURNER ISOLATING RELAY
- OPR OFF PEAK RELAY

REMOVED JUMPER TO CONNECT 2ND. STAGE THERMOSTAT IF REQUIRED

TITLE

Standard Plenum Heater - Standard Furnace



MONTREAL - CANADA

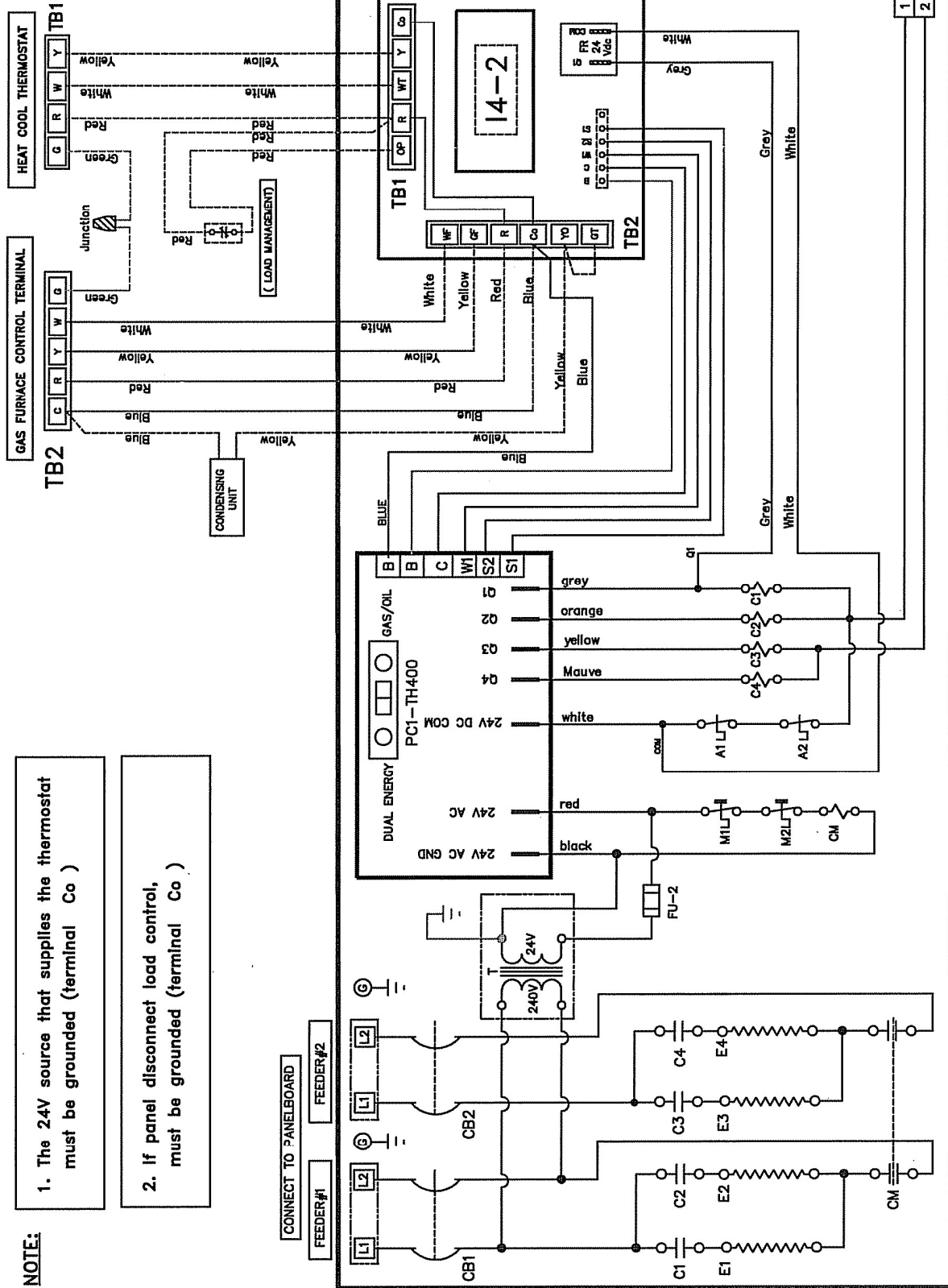
DRAWING NO. BI-ENERGIE TH400-T15-T18-T20-US(OPR) 14-2

DATE 03-12-2015

PER

NOTE:

1. The 24V source that supplies the thermostat must be grounded (terminal Co)
2. If panel disconnect load control, must be grounded (terminal Co)



IMPORTANT:
WIRE IN ACCORDANCE TO LOCAL ELECTRIC CODES. READ CAREFULLY THE INSTALLATION INSTRUCTIONS BEFORE WIRING AND OPERATING.

- LEGEND**
- A - AUTOMATIC RESET CUT-OUT
 - CL...CB - FAN RELAY, ELECTRIC MODE
 - EL...EB - HEATING ELEMENTS
 - EL...E2 - FUSED CUT-OUT 24V
 - PC1 - PILOT LIGHTS # 3 POSITION SWITCH
 - PL1 - TRANSFORMER, CLASS 2
 - T - MANUAL RESET CUT-OUT
 - M - BACK-UP CONTACTOR TO MANUAL
 - CM - CIRCUIT BREAKER
 - CB - HEAT ISOLATING RELAY
 - BIR - BURNER ISOLATING RELAY
 - OFR - OFF PEAK RELAY

REMOVED JUMPER TO CONNECT 2ND. STAGE THERMOSTAT IF REQUIRED

TITLE

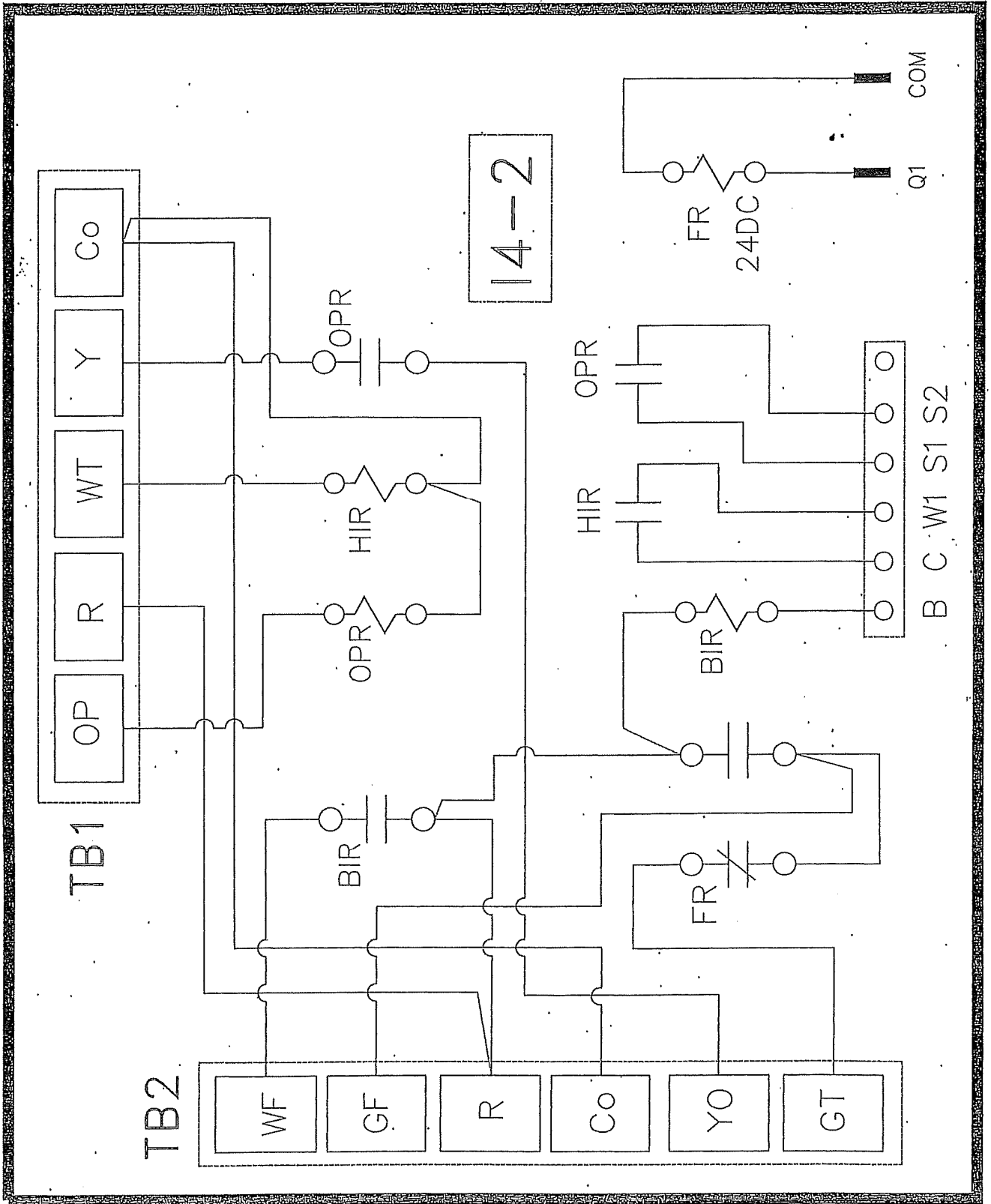
Standard Plenum Heater - Vari SPEED Furnace



DRAWING NO: ENER-GIE TH400-T15-T18-T20-US(OFR) VARI 14-2

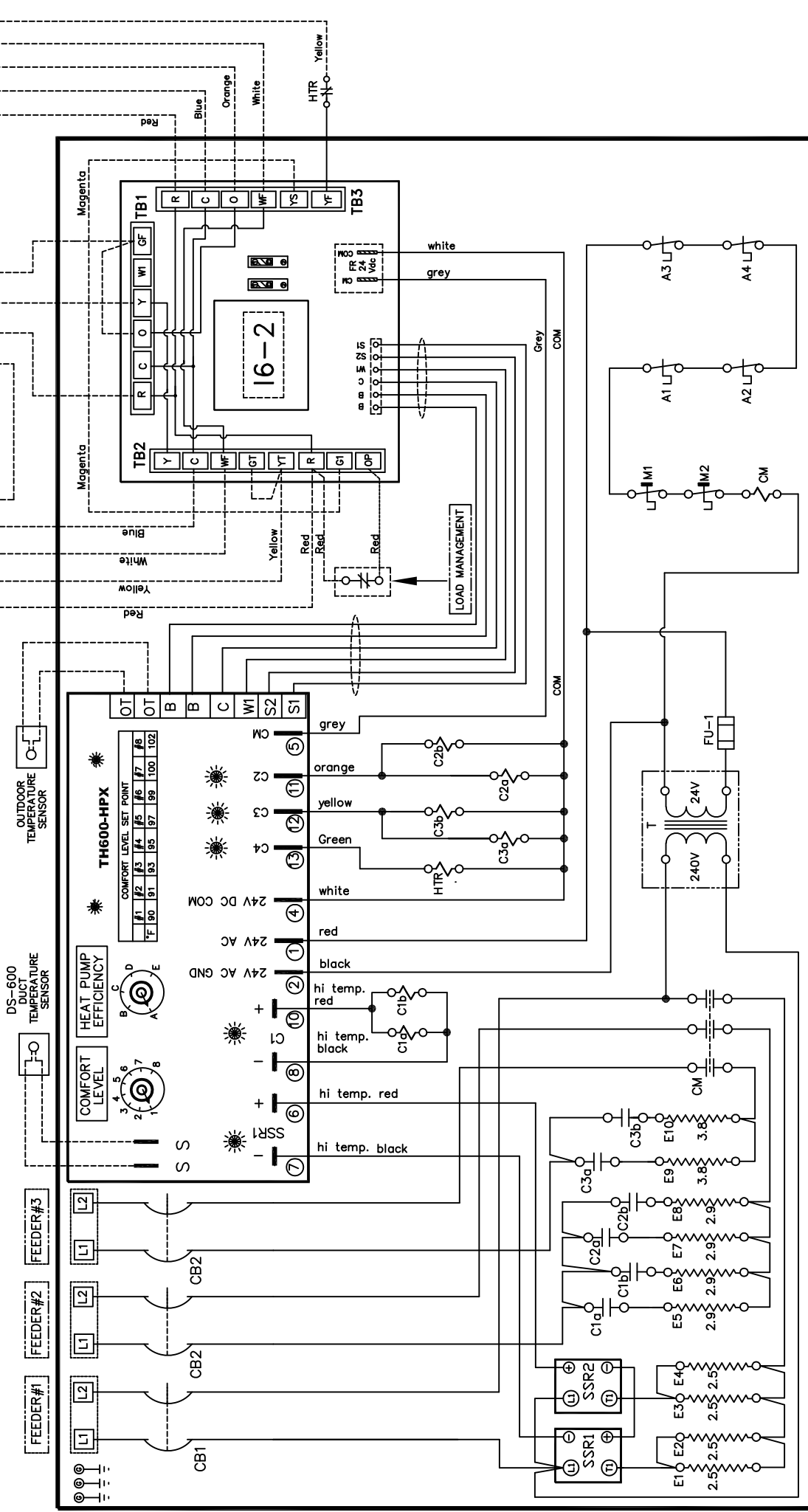
DATE 10-12-15
PER

14-2 INTERNAL DRAWING



IMPORTANT:
WIRE IN ACCORDANCE TO LOCAL & NATIONAL ELECTRIC CODES. READ CAREFULLY INSTALLATION INSTRUCTION BEFORE WIRING AND OPERATING.

- LEGEND**
- A - AUTOMATIC RESET CUT-OUT
 - C1...C4 - OPERATING CONTACTORS (ELEMENTS)
 - E1...E4 - HEATING ELEMENTS
 - F1...F1 - FUSES
 - PC1 - POINTED CIRCUIT BOARD TH600-HPX
 - T - TRANSFORMER, CLASS 2
 - SSR - SOLID STATE RELAY
 - M - MANUAL RESET CUT-OUT
 - CM - BACK-UP CONTACTOR TO MANUAL
 - CB - CIRCUIT BREAKER
 - HTR - HEAT PUMP LOCKOUT RELAY
 - I6 - ELECTRONIC RELAY BOARD



THERMOLEC LTD
MONTREAL - CANADA

HPX Modulating Plenum Heater with HEAT PUMP 4 WIRE THERMOSTAT

TITLE

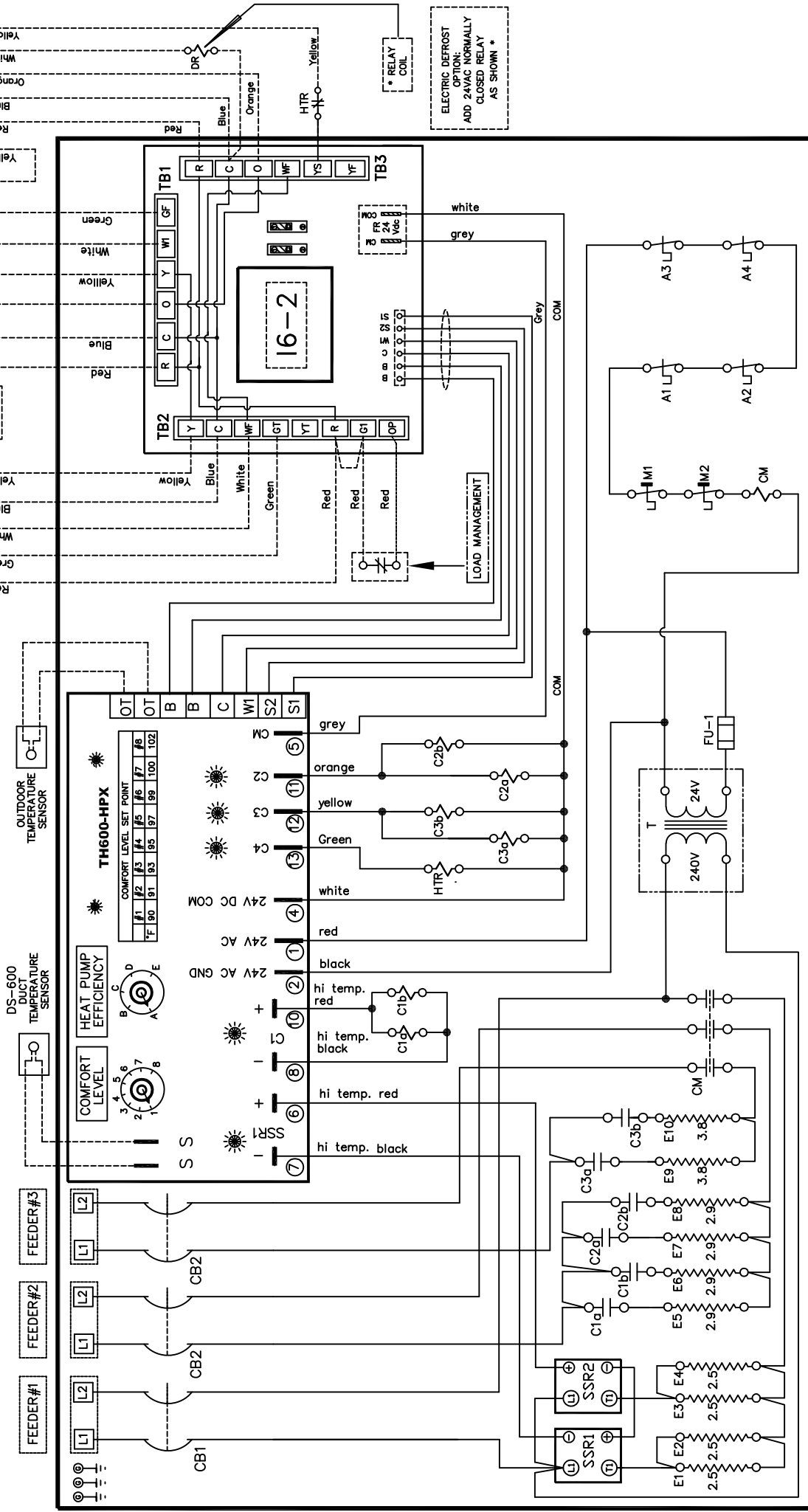
DRAWING NO. TH600-HPX T30 -1SCR MOD USA DFC 16 4RLY

DATE 08-12-15

PER

IMPORTANT:
WIRE IN ACCORDANCE TO LOCAL & NATIONAL ELECTRIC CODES. READ CAREFULLY INSTALLATION INSTRUCTION BEFORE WIRING AND OPERATING.

- LEGEND**
- A - AUTOMATIC RESET CUT-OUT
 - C1...C4 - OPERATING CONTACTORS (ELEMENTS)
 - E1...E4 - HEATING ELEMENTS
 - F1...F1 - FUSES
 - PC1 - POINTED CIRCUIT BOARD TH600-HPX
 - T - TRANSFORMER, CLASS 2
 - SSR - SOLID STATE RELAY
 - M - MANUAL RESET CUT-OUT
 - CM - BACK-UP CONTACTOR TO MANUAL
 - CB - CIRCUIT BREAKER
 - HTR - HEAT PUMP LOCKOUT RELAY
 - I6 - ELECTRONIC RELAY BOARD



TH600-HPX

COMFORT LEVEL SET POINT

#1	#2	#3	#4	#5	#6	#7	#8
90	91	93	95	97	99	100	102

COMFORT LEVEL: 3 4 5 6 7 8

HEAT PUMP EFFICIENCY: A B C D E

OUTDOOR TEMPERATURE SENSOR

DS-600 DUCT TEMPERATURE SENSOR

FEEDER #1 FEEDER #2 FEEDER #3

CB1 CB2 CB2

SSR1 SSR2

E10 2.5Ω 2.5V E9 3.8Ω 3.8V E8 2.9Ω 2.9V E7 2.9Ω 2.9V E6 2.9Ω 2.9V E5 2.9Ω 2.9V E4 2.5Ω 2.5V

C1a C1b C2a C2b C3a C3b C3c

HTR

24V AC 24V AC GND 24V DC COM

hi temp. black hi temp. red hi temp. black hi temp. red

grey orange yellow Green white red black

grey COM Grey COM

A1 L1 A2 L1 A3 L1 A4 L1

M1 M2 CM

FU-1

240V 24V

HEAT PUMP THERMOSTAT

R/H C O/B Y E/AUX G Y2

Red Blue Orange Yellow White Green Yellow

GAS FURNACE CONTROL TERMINAL

R G W C Y

Red Green White Blue Yellow

HEAT PUMP CONTROL TERMINAL

Y2 R C O W Y

Yellow Red Blue Orange White Yellow

DR

NC RELAY CONTACT

DR

* RELAY COIL

ELECTRIC DEFROST OPTION
ADD 24VAC NORMALLY CLOSED RELAY AS SHOWN *

THERMOLEC LTD

MONTREAL - CANADA

HPX Modulating Plenum Heater with Heat Pump, ELECTRIC DEFROST

TITLE

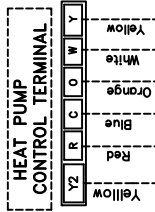
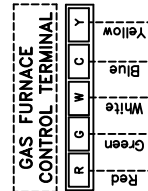
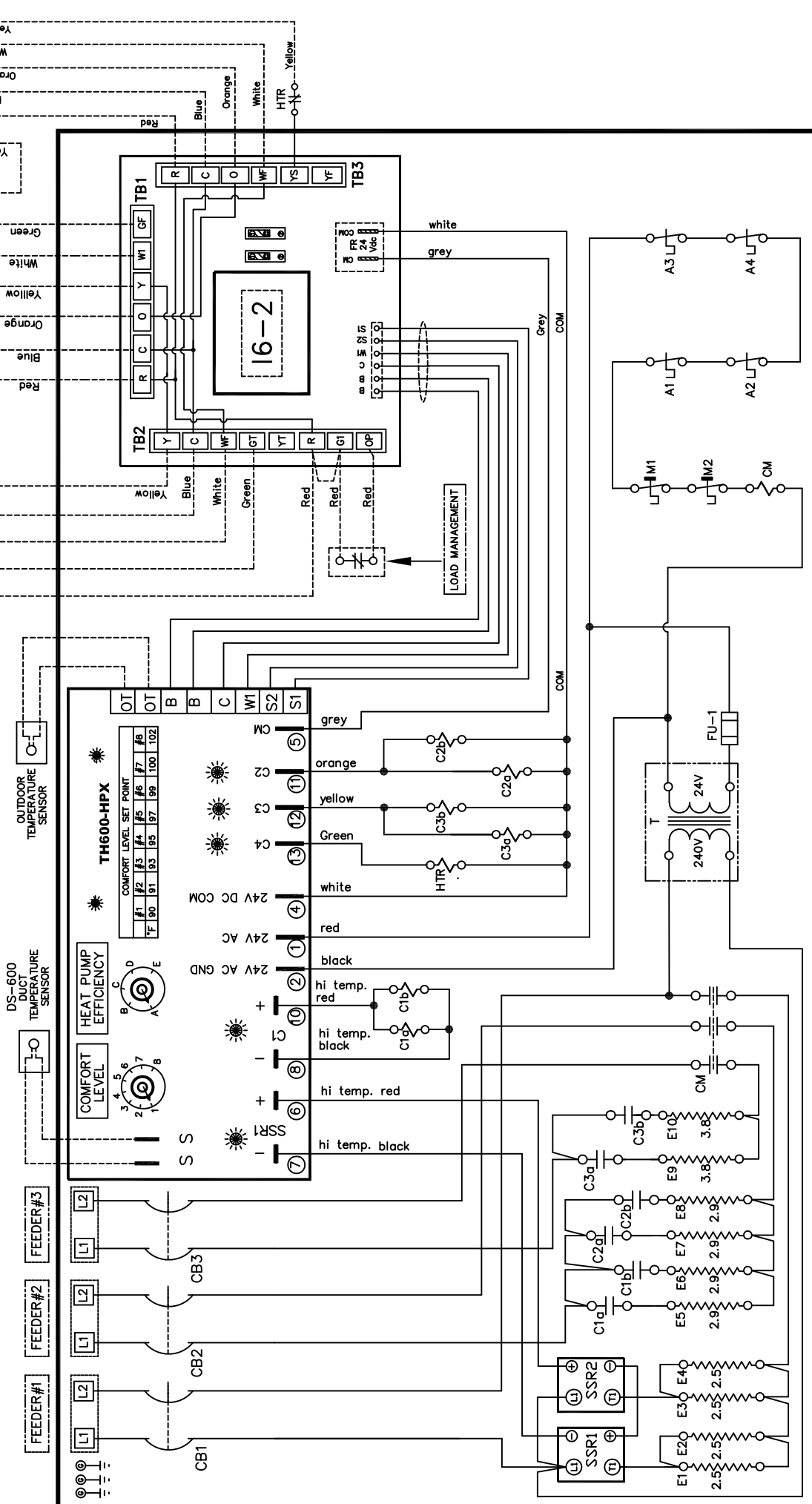
DRAWING NO. TH600-HPX T30 -1SCR MOD USA DFC 16 4RLY

DATE PER

08-12-15

IMPORTANT: WIRE IN ACCORDANCE TO LOCAL & NATIONAL ELECTRIC CODES. READ CAREFULLY INSTALLATION INSTRUCTION BEFORE WIRING AND OPERATING.

- LEGEND
- A - AUTOMATIC RESET CUT-OUT
 - C1...C4 - OPERATING CONTACTS (ELEMENTS)
 - E1...E4 - HEATING ELEMENTS
 - F1...F1 - FUSES
 - PC1 - POINTED CIRCUIT BOARD TH600-HPX
 - T - TRANSFORMER, CLASS 2
 - SSR - SOLID STATE RELAY
 - M - MANUAL RESET CUT-OUT
 - CM - BACK-UP CONTACTOR TO MANUAL
 - CB - CIRCUIT BREAKER
 - HTR - HEAT PUMP LOCKOUT RELAY
 - I6 - ELECTRONIC RELAY BOARD



NOTE: FOR 2 STAGE HEAT PUMP CONNECT (Y2 AT STAT TO Y2 AT HEAT PUMP)

DRAWING NO. TH600-HPX T30 -1SCR MOD USA DFC 16 4RLY

THERMOLEC LTD
MONTREAL - CANADA

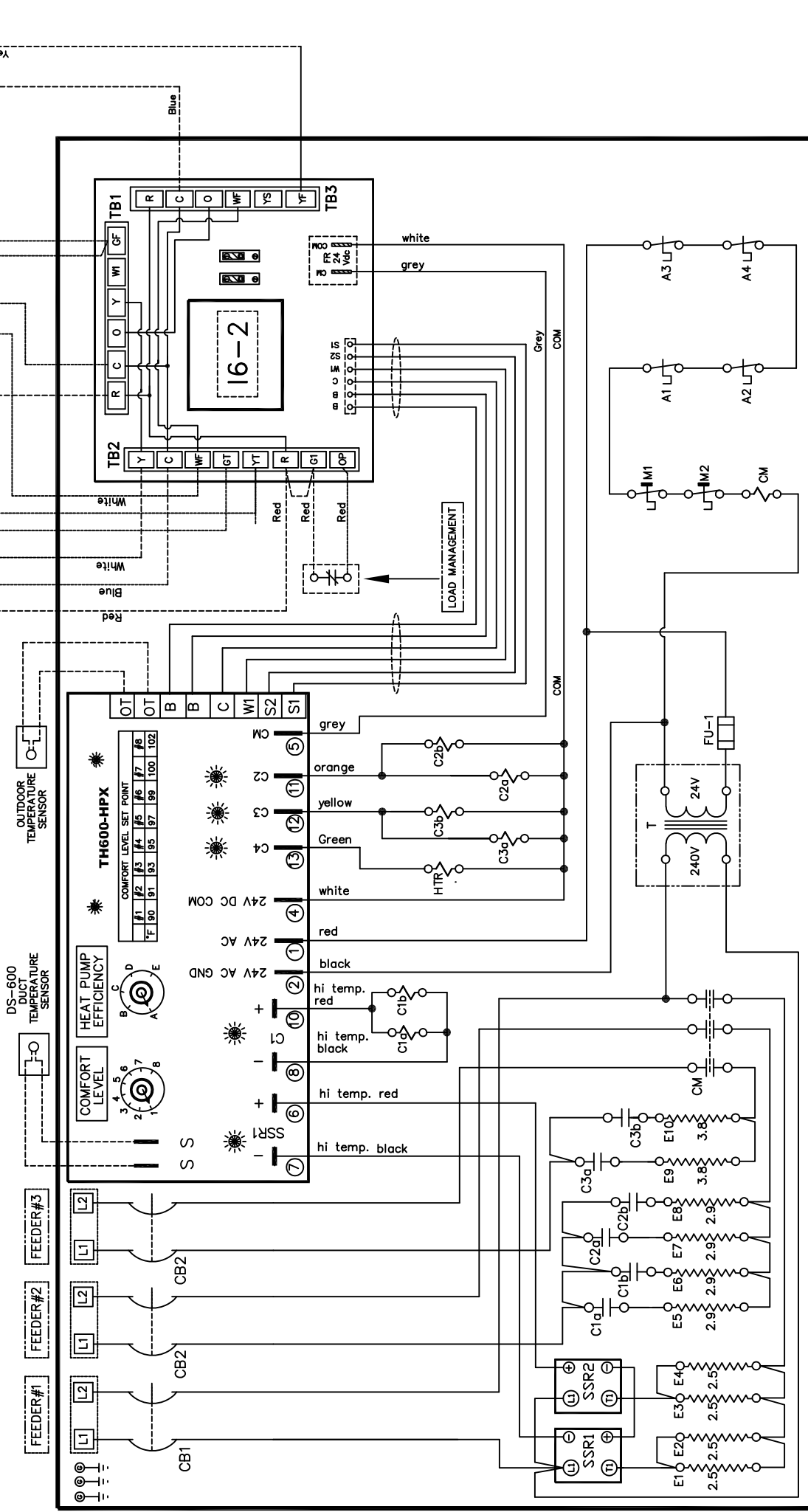
TITLE
THX Modulating Plenum Heater with Heat Pump, HEAT PUMP STAT,

DATE
08-12-15

PER

IMPORTANT:
WIRE IN ACCORDANCE TO LOCAL & NATIONAL ELECTRIC CODES. READ CAREFULLY INSTALLATION INSTRUCTION BEFORE WIRING AND OPERATING.

- LEGEND**
- A - AUTOMATIC RESET CUT-OUT
 - C1...C4 - OPERATING CONTACTORS (ELEMENTS)
 - E1...E4 - HEATING ELEMENTS
 - F1...F1 - FUSES
 - PC1 - POINTED CIRCUIT BOARD TH600-HPX
 - T - TRANSFORMER, CLASS 2
 - SSR - SOLID STATE RELAY
 - M - MANUAL RESET CUT-OUT
 - CM - BACK-UP CONTACTOR TO MANUAL
 - CB - CIRCUIT BREAKER
 - HTR - HEAT PUMP LOCKOUT RELAY
 - I6 - ELECTRONIC RELAY BOARD



THERMOLEC LTD

MONTREAL - CANADA

DRAWING NO. TH600-HPX T30 -1SCR MOD A/C USA DFC I6 4RLY

DATE: 08-12-15

PER: _____

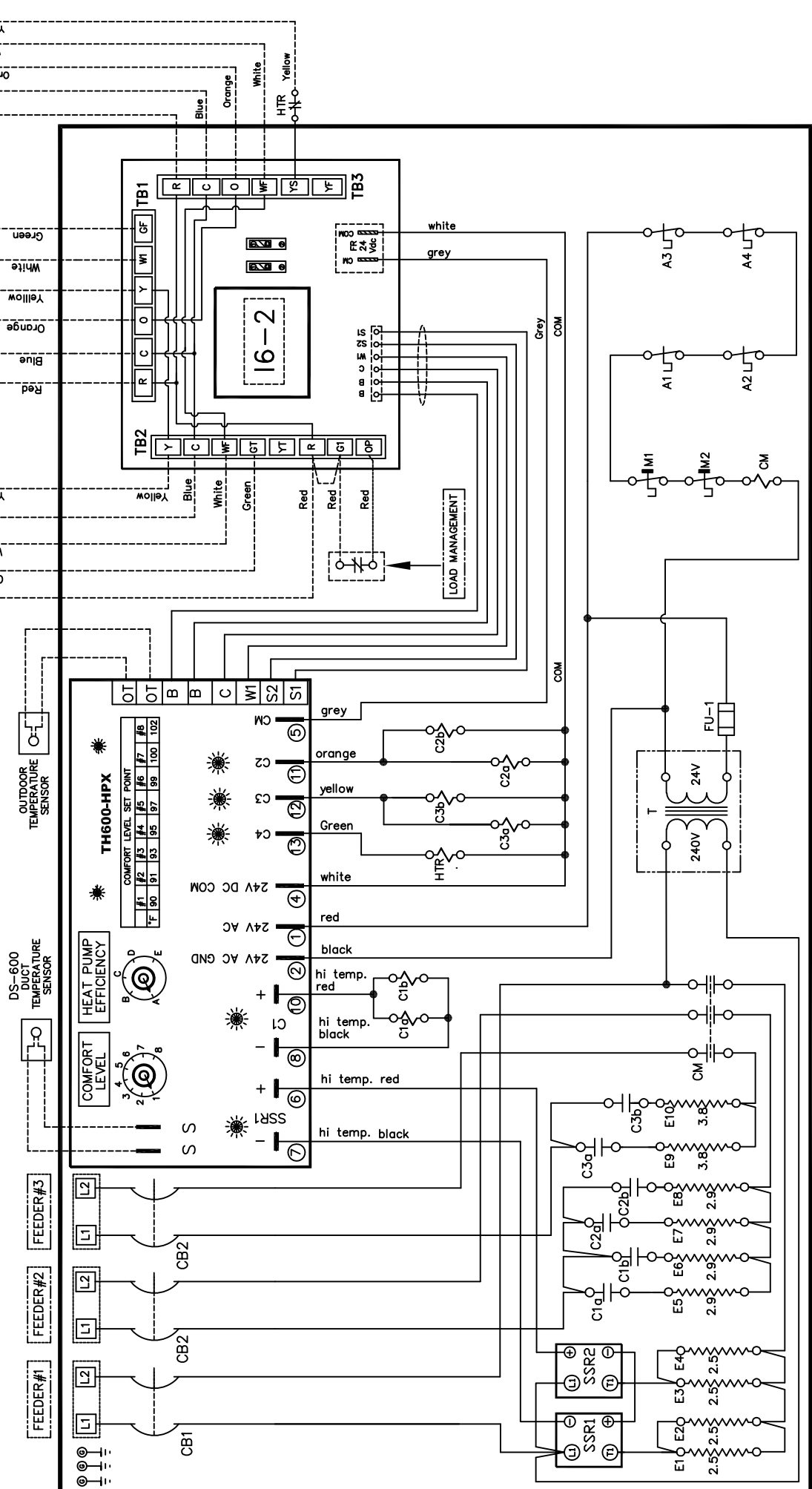
TITLE

HPX Modulating Plenum Heater with
A/C VARIABLE SPEED FURNACE

IMPORTANT: WIRE IN ACCORDANCE TO LOCAL & NATIONAL ELECTRIC CODES. READ CAREFULLY INSTALLATION INSTRUCTION BEFORE WIRING AND OPERATING.

LEGEND

- A - AUTOMATIC RESET CUT-OUT
- C1...C4 - OPERATING CONTACTORS (ELEMENTS)
- E1...E4 - HEATING ELEMENTS
- FU-1 - FUSE, 2 AMP, 24V
- PC1 - PRINTED CIRCUIT BOARD TH600-HPX
- T - TRANSFORMER, CLASS 2
- SSR - SOLID STATE RELAY
- M - MANUAL RESET CUT-OUT
- CB - BACK-UP CONTACTOR TO MANUAL CIRCUIT BREAKER
- HTR - HEAT PUMP LOCKOUT RELAY
- I6 - ELECTRONIC RELAY BOARD

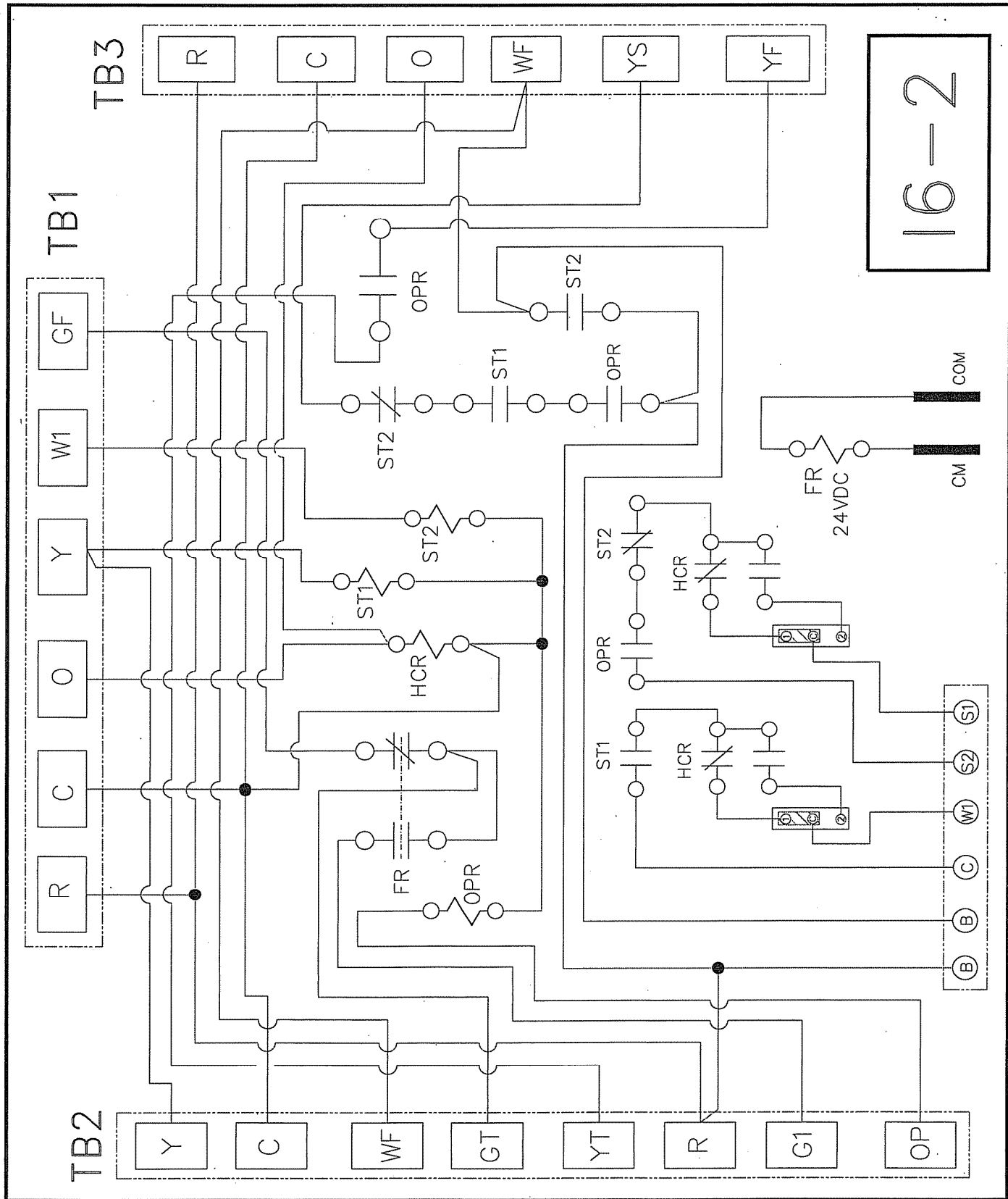


DRAWING NO. TH600-HPX T30 -1SCR MOD USA DFC 16 4RLY
 DATE 08-12-15
 PER



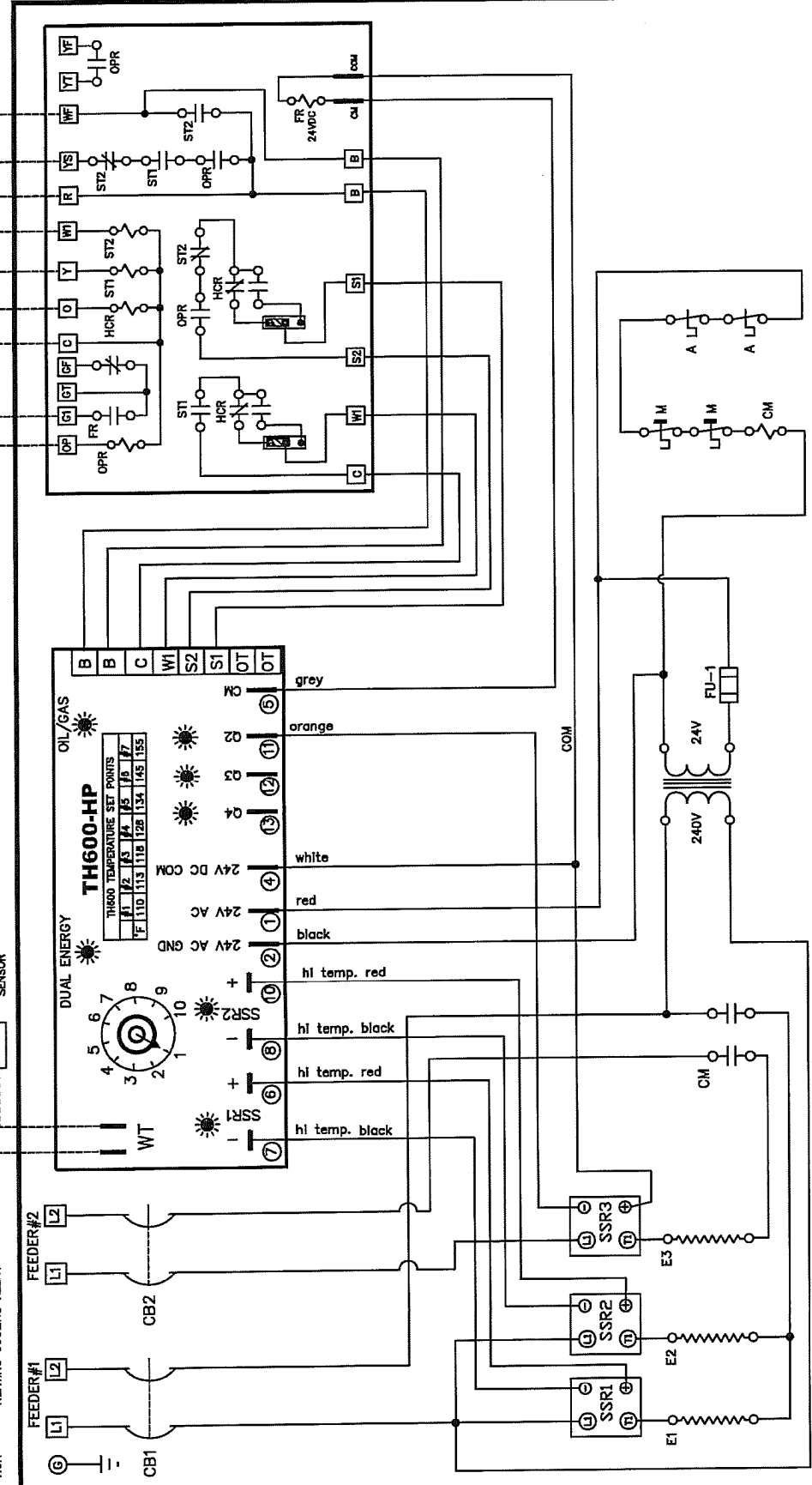
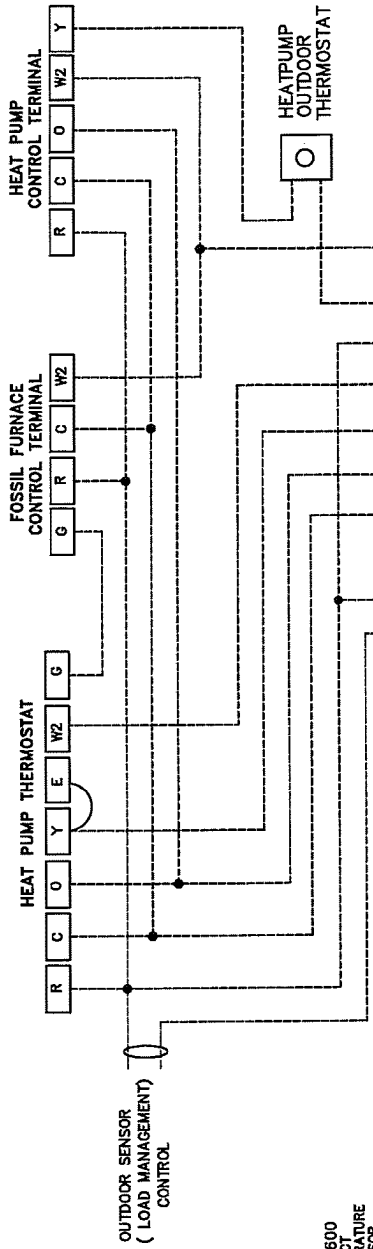
TITLE
 HPX Modulating Plenum Heater with Heat Pump, VARIABLE SPEED FURNACE

16-2 INTERNAL DRAWING



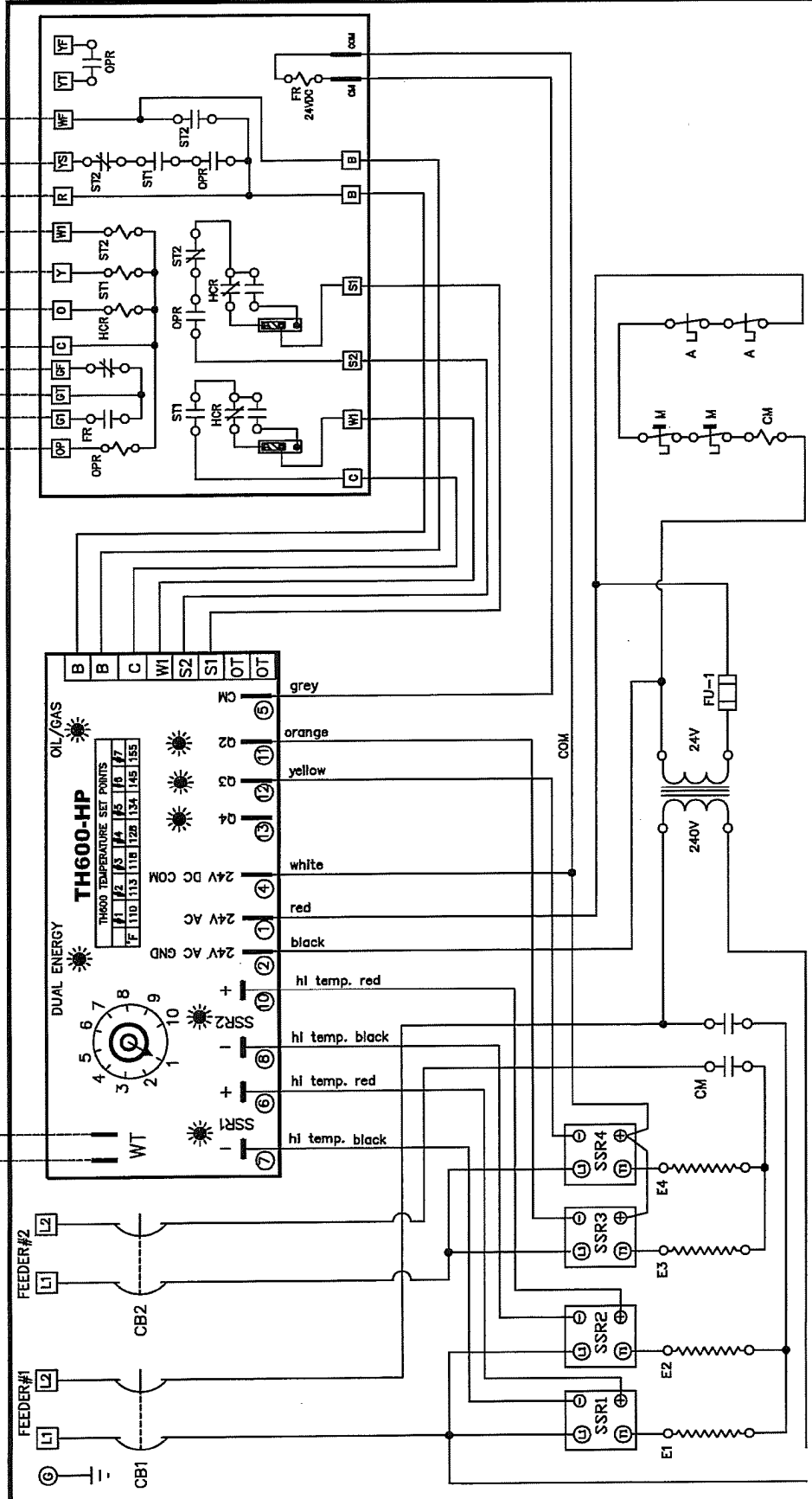
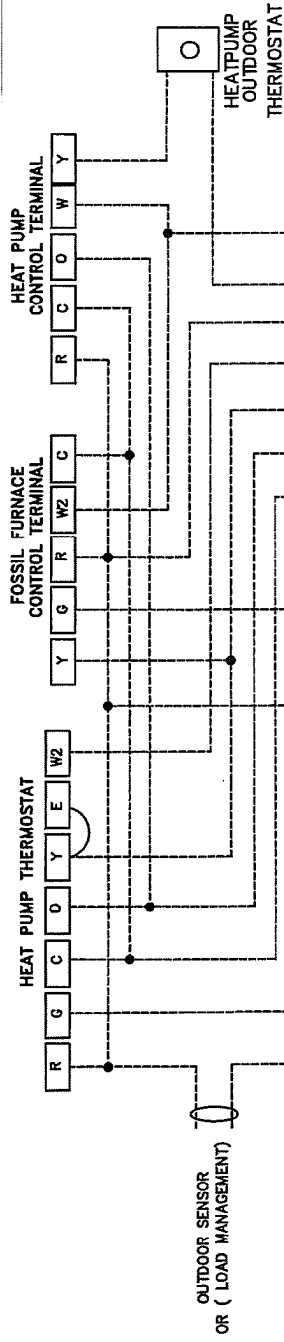
IMPORTANT: WIRE IN ACCORDANCE TO LOCAL & NATIONAL ELECTRIC CODES. READ CAREFULLY INSTALLATION INSTRUCTION BEFORE WIRING AND OPERATING.

- LEGEND
- - - AUTOMATIC RESET CUT-OUT OPERATING CONTACTS (ELEMENTS)
 - FR FAN RELAY CONTACT 10A
 - EL-E4 HEATING ELEMENTS
 - FU-2 2 AMP 24V FUSE
 - PL1 PRINTED CIRCUIT BOARD TH800
 - T TRANSFORMER, CLASS 2
 - SSR SOLID STATE RELAY
 - M MANUAL RESET CUT-OUT
 - CB BACK-UP CONTACTOR TO MANUAL CIRCUIT BREAKER
 - STAGE #1
 - STAGE #2
 - OFF PEAK RELAY
 - HEATING COOLING RELAY



IMPORTANT: WIRE IN ACCORDANCE TO LOCAL & NATIONAL ELECTRIC CODES. READ CAREFULLY INSTALLATION INSTRUCTION BEFORE WIRING AND OPERATING.

- LEGEND
- - - AUTOMATIC RESET CUT-OUT
 - - - OPERATING CONTACTS (ELEMENTS)
 - - - FAN RELAY CONTACTS
 - - - HEATING ELEMENTS
 - - - FUSE 2 AMP 24V
 - - - PRINTED CIRCUIT BOARD TH800
 - - - PILOT LIGHTS & 3 POSITION SWITCH
 - - - TRANSFORMER, CLASS 2
 - - - SOLID STATE RELAY
 - - - BACK-UP CONTACTOR TO MANUAL
 - - - CIRCUIT BREAKER
 - - - STAGE #1
 - - - STAGE #2
 - - - OFF PEAK RELAY
 - - - HEATING COOLING RELAY



TITLE/TITRE
Modulating Plenum Heater -- Heat Pump
Var: Speed Furnace

THERMOLEC LITEE LTD
MONTREAL - CANADA

DRAWING NO. TH-600 HP-T18-20-4SCR MODULATING US 1st DFC
DATE 23-10-07 PER #1

PLENUM HEATER WARRANTY REGISTRATION CARD

Name : _____

Address : _____

City : _____ State : _____ Zip : _____

MODEL NO. : _____ Date installed : _____

Oil furnace : Gaz furnace : Air conditioning : Heat pump :

Comments / Suggestions : _____

**Warranty Registration Card
c/o Thermolec Ltd.
2060 Lucien-Thimens St.
Ville St-Laurent, Montreal
Quebec, Canada
H4R 1L1**