

Dynaline
An ACS Brand

Dynaline[™] 3

**A Combination Gas Heating/Electric Cooling System
Designed to Serve an Individual Room or Zone**

ARCHITECT'S AND ENGINEER'S MANUAL



- Three BTU/h Capacities
- 12 - 20 MBTU Gas Heat
- Low Heating Amp Draw
- R-454B Refrigerant

*Ideal for Hotels/Motels,
Apartments and Senior Housing*



INTRODUCTION

The Dynaline Difference

Dynaline developed the first gas-fired package terminal air conditioner (PTAC) in 1985. Now in its third generation design, Dynaline is a leading supplier to the senior housing industry as well as other small commercial markets.

Dynaline™ 3 Packaged Terminal Air Conditioner (PTAC) combines the conventional features of compact zone control systems with the benefits of economical gas heating. It provides year-round comfort control for hotels, motels, apartments, dormitories, shops, nursing homes, assisted living centers, satellite offices, room additions and other applications that require economical heating and cooling. Specify Dynaline 3 for new construction, or as the best replacement for electric resistance or heat pump units.

Each Dynaline 3 chassis has individual controls – ideal for rooms not occupied during vacancies, holidays, weekends or nights. Built-in, digital, touch pad heating & cooling thermostat and fan controls are standard, plus all units have the flexibility to convert to a wall thermostat control, or interface into an energy management system.

The greater the number of annual heating degree days for a particular locale, the more money Dynaline 3 can save in operating costs.

Match Heating and Cooling Capacity to Your Project with These Three Dynaline™ 3 Models:

Model DYNH09, with 9500 BTU/h cooling and 12,000 BTU/h gas heating input, is ideal for hotels, motels, schools and nursing homes, or other applications requiring zone comfort control.

Model DYNH12 is for areas, such as, apartments and offices, with 11,500 BTU/h cooling and 18,000 BTU/h heating input.

Model DYNH16 is for larger areas, such as, multi-family housing units, with 15,000 BTU/h cooling and 20,000 BTU/h heating input.

Economical Gas Heat

The unique Dynaline 3 provides high-efficiency gas heat in a zone control heating and cooling unit. Clean gas heat is without equal for economy and comfort. There is none of the “indoor wind chill” that a heat pump creates. Compressor noise during the heating cycle is eliminated, too. And, because Dynaline 3’s air discharge is much warmer than a heat pump’s discharge, indoor temperatures reach a comfort level much faster. The compressor operates only during the cooling cycle unlike noisy heat pumps, thus extending the life of the compressor.

Savings for Builders

Dynaline 3’s space-saving, self-contained design eliminates most needs for ductwork, water pipes, water towers, high-capacity standby generators and rooftop equipment rooms. Dynaline 3 also frees architects and engineers from the design constraints of central systems.

Safe

Dynaline 3’s sealed combustion furnace draws outside air through the heat exchanger under negative pressure, and vents the products of combustion directly to the outside atmosphere. Solid-state, electronic, hot surface ignition (HSI) with no open flame is the modern alternative to pilot lights. HSI increases energy conservation while ensuring safety.

Easy to Install and Service

Gas (LP or Natural) connections may be inside or outside the room. Dynaline 3’s standard 42" x 16" wall sleeve makes it the right choice for new construction or replacement applications. There is no need to redesign an existing wall opening – just remove the old unit/sleeve and replace with Dynaline 3.

Dynaline 3 combines a self-diagnostic control system, with a slide-out chassis and removable electrostatic air filter (constructed of washable media) for enhanced serviceability and easy maintenance.

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This manual provides architects and engineers with information to select and design a zone comfort control system using Dynaline™ 3 Gas PTAC units. Proper application of the equipment will ensure satisfactory performance over a wide range of operating conditions. Gas PTACs are designed for through-the-wall installations in nursing homes, schools, apartments, hotels/motels and add-on rooms, or retrofit zone control.

APPLICATION CONSIDERATIONS

Hotels/Motels

Individual room control.
Energy management interface.

Nursing, Assisted Living Retirement Homes

Low heating amp draw enables downsizing of standby generator. Warm gas heat improves tenant comfort.

Apartments/Modular Housing

Gas heat/electric cooling in one package. Air discharge kit available for conditioning two zones.

Classrooms/Offices

Easy to install. Two units can be staged for economical operation.

OPERATING COST ANALYSIS

The Dynaline 3 provides lower annualized operating costs, in most locales in the United States and Canada, compared to packaged terminal heat pumps and electric heat PTAC's. The projected savings are dependent on the cost of natural gas and the cost of electricity for each specific locale.

Utilizing BIN Hour temperature data*, the following table provides representative examples of costs to operate one PTAC for one year.

| Location: | Northeast | Midwest | Mountain West | Canada |
|-------------------|------------|----------|---------------|------------|
| Dynaline 3 | \$327.04 | \$338.81 | \$347.88 | \$151.40 |
| Heat Pump | \$1,154.17 | \$389.63 | \$510.82 | \$896.94 |
| Electric Heat | \$2,026.40 | \$731.48 | \$1,003.63 | \$1,455.60 |

*BIN Hours are the number of hours of operation per year at the mid-point temperature specific to a geographical location. The BIN Hours are derived from historical weather data.

Dynaline will gladly prepare a BIN Hour Cost Analysis for your location. For more information, please contact the Dynaline Sales/Marketing Department at 229-273-3636, or contact your local Dynaline Representative. To find your local Dynaline Representative, simply go to our website at www.DynalineHVAC.com and click "Where to Buy".



Figure 1

The Dynaline™3 Difference

Dynaline Gas Heating and Electric Cooling will save money in the long run.

The Dynaline™3 is a Packaged Terminal Air Conditioner (PTAC) that combines economical gas heating and high-efficiency electric cooling in one compact unit for zone temperature room-by-room control. By comparing the operating costs of Dynaline 3 to heat pumps or electric resistance heat, a savings of hundreds of dollars per room every year can be achieved.

For example, at a location with 7,023 heating BIN hours, such as Syracuse, NY, with a 2° design temperature, the cost to heat with **Dynaline 3** can **save 80%** in utility costs compared to electric resistance. When compared to heat pumps, **Dynaline 3** can **save 66%**. For a building with 60 PTACs, **Dynaline 3** can **save over \$77,000** in utility costs in one year!

| | |
|----------------------------|-----------------------|
| Location Example | Syracuse, NY |
| Heating BIN hours | 7,023 |
| Heat load | 13,000 |
| Outside design temperature | 2° |
| Inside design temperature | 70° |
| Number of rooms | 60 |
| Heating correction factor | 0.66 |
| Cost of electricity | \$0.1516/ kW hours |
| Cost of gas | \$0.5637/ THERMS |

| System | Annual Cost of | Dynaline saves |
|---------------|----------------|----------------|
| ELECTRIC HEAT | \$1,600 | 80% |
| HEAT PUMP | \$896 | 66% |
| DYNALINE 3 | \$307 | |

| | Kw Hours | Annual heating cost per room | Annual heating cost for 60 rooms |
|----------------------|-----------------|-------------------------------------|---|
| Electric Heat | 10,555 | \$1,600.23 | \$96,013.80 |
| Heat Pump | 5,912 | \$896.23 | \$53,773.80 |
| | Therms | | |
| Gas Heat | 455 | \$306.90 | \$18,414.00 |

* Bin Hours are the number of hours of operation per year at the mid-point temperature specific to a geographical location. The BIN hours are derived from historical weather data.

Average unit cost of energy for residential energy sources 2013

| TYPE | COST |
|----------------|------------------|
| Electricity | 12.1¢ / kwh |
| Nat. gas | \$0.987 / therm |
| No. 2 heat oil | \$3.969 / gallon |
| Propane | \$2.69 / gallon |

| | | |
|---------------------------|---|-------------|
| 1 kwh | = | 3,412 BTU |
| 1 therm | = | 100,000 BTU |
| 1 gallon oil | = | 138,690 BTU |
| 1 gallon propane | = | 91,333 BTU |
| Energy Information Agency | | |

Table 2

DYNALINE™ 3 FEATURES

TOP VIEW

Electrical components:

Located on the indoor side of the wall, they are protected from the weather and easily accessed for service.

Attractive stamped aluminum or architectural-style exterior grilles:

Custom finished architectural grilles are available to match your building's decor.

Condensate removal:

Condenser fan vaporizes condensate from chassis bottom and expels vapor on the condenser coil. This accelerates the evaporation process. Positive drain kit is also available.

Air vent:

The manually-operated lever allows entry of 70 CFM of outside air into the conditioned space.

Rotary compressor:

Reliable, efficient and quiet-running design has a longer life expectancy than heat pump compressors. The Dynaline™ 3 gas PTAC does not use the compressor during heating cycles.

High Pressure Switch:

Protects the compressor in unlikely event of condenser fan failure.

Weather seals:

Seals the chassis to the wall case, preventing infiltration of air, water and contaminants into the conditioned area.

Control functions:

Top mounted for easy access. Include digital touch pad-type heating/cooling thermostat, and digital touch pad-type control for selecting heating, cooling and manual fan settings.

Sealed

combustion furnace:

Uses only outside air for combustion. Hot exhaust routes through unit for maximum heat exchange before exiting outside.

Tangential blower wheel:

Spans the length of the heating chamber and evaporator coil. Air flow is uniform over system components, enhancing air distribution and system efficiency.

High limit:

Protect appliance by turning gas off if, for any reason, the heating section approaches an unsafe temperature level.

Ignition:

An electronically controlled Hot Surface Ignitor, lights the burner without standing pilot lights. Gas is conserved and safety is ensured.

Gas connections:

Can be made inside or outside, to suit design or code requirements. Available for Natural gas or Propane. A 2-PSIG regulator accessory is available (Natural gas only).

Figure 2

De-ice control:

Low temperature cut-out control protects compressor by sensing freeze-up conditions on the evaporator coil.

Electrical connections:

Pigtail with leakage current detector interruptor (supplied), or field direct wire, to suit design or code requirements.

END VIEW (LH)

Room air discharge:

Attractive, durable grille constructed of extruded aluminum, 52° off vertical air discharge pattern.

Return air filter:

No tools are needed to install or remove the permanent electrostatic filter constructed of washable media.

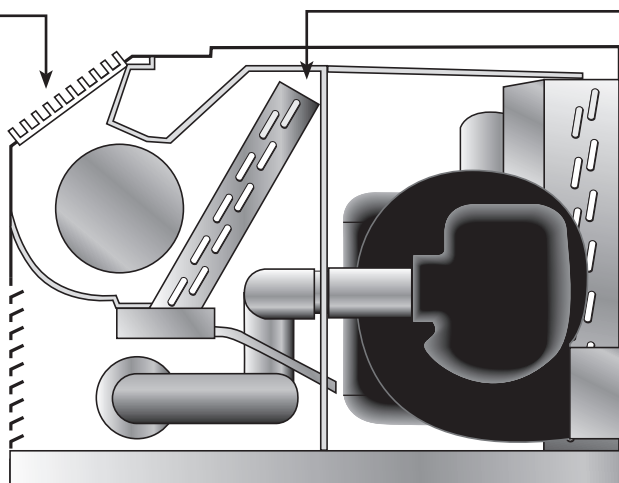


Figure 3

Copper and aluminum evaporator and condenser coils:

For extended life and ease of repair. Coils use seamless copper tubing, mechanically expanded into aluminum plate fins.

Compressor lock-out:

Standard design provides means of locking out A/C compressor when standby power generator is operating. Electronic control board has 24V input terminals to receive lock-out signal.

NEW STANDARD FEATURES

Freeze Protection:

Forces heating operation in standby, cooling and fan-only mode when the interior temperature drops below 45°F to help protect pipes, plumbing fixtures and sprinkler systems from freeze damage. Freeze Protection is enabled by default, but can be disabled. If a remote wall-mount thermostat is used, be sure to select one that is compatible with this feature.

Carbon Monoxide Detector

An integrated carbon monoxide (CO) detector is standard on all Dynaline 3 models. It has been verified to perform in the detection of carbon monoxide up to 12,000 ft above sea level and will alarm within the time specified by ANSI/UL 2034 for carbon monoxide concentrations of 70, 150 and 400 parts per million (ppm).

UNIT WALL SLEEVE DIMENSIONS

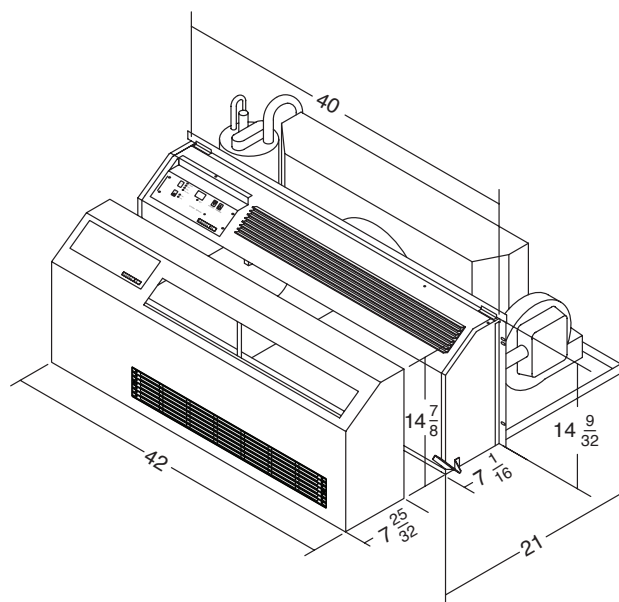
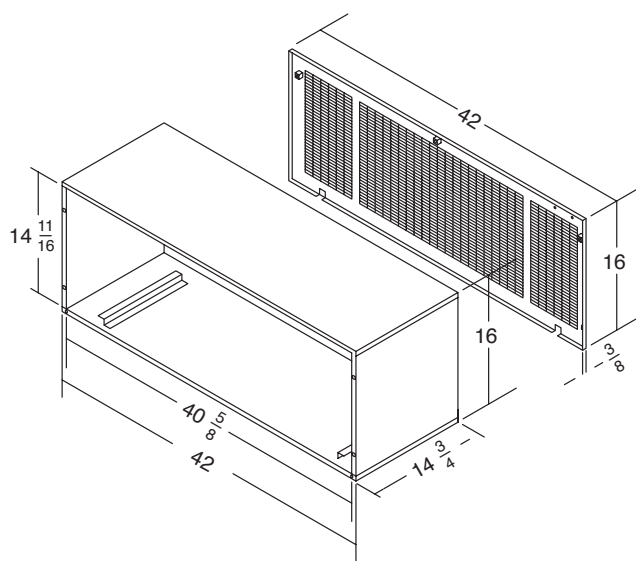


Figure 4



Specifications subject to change without notice.

SPECIFICATIONS

DYNALINE™ 3 SERIES

Dynaline™ 3 Model Identification And Specifications

| Example | D | Y | N | H | 0 | 9 | A | C | A | 0 | 1 | 2 | L | F | 2 | 0 | 1 | 0 | 0 |
|----------|-------------------------------|---|---|---|---|---|---|---|-------------------------------|----|----|----|----|----|----|----|----|----|----|
| Position | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 1 | | | | | | | | | | | | | | | | | | | |
| 2 | Unit Designation | | | | | | | | Dynaline 3™ | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | |
| 4 | Refrigerant Type | | | | | | | | H = R-454B | | | | | | | | | | |
| 5 | Nominal Cooling Capacity | | | | | | | | 09 = 9,500 | | | | | | | | | | |
| 6 | | | | | | | | | 12 = 11,500 | | | | | | | | | | |
| 7 | | | | | | | | | 16 = 15,000 | | | | | | | | | | |
| 8 | System Type | | | | | | | | AC = Air Conditioner | | | | | | | | | | |
| 9 | Power Supply (Volts-Phase-Hz) | | | | | | | | A = 208/230-1-60 | | | | | | | | | | |
| | | | | | | | | | V = 277-1-60 | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| 10 | Nominal Heat Input | | | | | | | | 012 = 12,000 | | | | | | | | | | |
| 11 | | | | | | | | | 020 = 18,000 | | | | | | | | | | |
| 12 | | | | | | | | | 022 = 20,000 | | | | | | | | | | |
| 13 | Fuel Type | | | | | | | | N = Natural Gas L = LP Gas | | | | | | | | | | |
| 14 | Gas Connection | | | | | | | | F = Front | | | | | | | | | | |
| 15 | Revision Code | | | | | | | | 20 | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | | |
| 17 | Cabinet Color | | | | | | | | 100 = Pebble Gray | | | | | | | | | | |
| 18 | | | | | | | | | 416 = White | | | | | | | | | | |
| 19 | | | | | | | | | 200 = Gray | | | | | | | | | | |

General Data

| Model | DYNH09AC | DYNH12AC | DYNH16AC |
|--------------------------------|----------|----------|----------|
| Rated Heating Input (BTU/h) | 12,000 | 18,000 | 20,000 |
| Rated Heating Output (BTU/h) | 9,840 | 14,580 | 16,000 |
| Thermal Efficiency (TE) | 82% | 82% | 82% |
| Rated Cooling Capacity (BTU/h) | 9,500 | 11,500 | 15,000 |
| Sensible/Latent Cooling | 69/31 | 65/35 | 65/35 |
| EER | 11.20 | 10.40 | 9.50 |
| Rated air flow: fan only (CFM) | 260 | 300 | 340 |
| Hi cool/low cool (CFM) | 300/250 | 390/300 | 400/330 |
| Hi heat/low heat (CFM) | 320/260 | 410/300 | 420/340 |
| Weight lbs (kg) | 180 (82) | 180 (82) | 185 (84) |

Minimum Installation Clearances

| | | | |
|--|--------|--------|--------|
| Outside: | | | |
| Rear to nearest obstruction | 3 feet | 3 feet | 3 feet |
| Top, sides to nearest obstruction | 0 | 0 | 0 |
| Centerline vent to window | 9" | 9" | 9" |
| Inside: | | | |
| Cabinet front to nearest obstruction | 12" | 12" | 12" |
| Cabinet sides to nearest obstruction | 1" | 1" | 1" |
| Cabinet bottom to floor (for return air) | 0 | 0 | 0 |
| Cabinet top to ceiling | 12" | 12" | 12" |

*Obstruction must be removed for service of unit.

Condenser Fan

| | | | |
|-------------------------|-------|-------|-------|
| Fan Blade Diameter | 12" | 12" | 12" |
| Number of Blades | 4 | 4 | 4 |
| Pitch | 25° | 25° | 25° |
| Condenser Fan Motor RPM | 1,500 | 1,500 | 1,500 |
| Full Load Amps | 0.5 | 0.5 | 0.5 |

Condenser Coil

| | | | |
|---------------|-----------------|----|----|
| Type | Copper/Aluminum | | |
| Coil Area | 364 sq. inches | | |
| Rows | 3 | 3 | 3 |
| Fins per Inch | 12 | 13 | 13 |

Evaporator Coil

| | | | |
|----------------------|-----------------|-------------|-------------|
| Type | Copper/Aluminum | | |
| Coil Area | 234 sq. in. | 260 sq. in. | 260 sq. in. |
| Rows | 3 | 3 | 3 |
| Fins per Inch | 11 | 11 | 11 |
| Refrigerant Metering | Capillary | | |



Room Air Fan Motor

| | | | |
|-----------------------------|-----------|-----------|-----------|
| Speed | 2 | 2 | 2 |
| RPM High/Low | 1260/1130 | 1520/1400 | 1520/1400 |
| Full Load Amps | 0.3 | 0.5 | 0.7 |
| Min. Wire Size (60° Copper) | #18 AWG | #18 AWG | #18 AWG |

Electrical Data

| Model | Compressor | | | | Outdoor Fan Motor | Indoor Blower Motor | Exhaust Blower |
|-----------|------------|--------------|------------------|------------------|-------------------|---------------------|------------------|
| | Type | Volts-Hz-Ph | RLA ¹ | LRA ² | FLA ³ | FLA ³ | FLA ³ |
| DYNH09ACA | ROTARY | 208/230-60-1 | 4.0 | 22 | 0.2 | 0.4 | 0.6 |
| DYNH12ACA | | 208/230-60-1 | 4.6 | 25 | 0.5 | 0.4 | 0.6 |
| DYNH12ACV | | 277-1-60 | 3.9 | 21 | 0.4 | 0.4 | 0.6 |
| DYNH16ACA | | 208/230-60-1 | 6.7 | 34 | 0.7 | 0.4 | 0.6 |

¹RLA = Rated Load Amps ²LRA = Locked Rotor Amps ³FLA = Full Load Amps 4HP = Horsepower

| | DYNH09ACA | DYNH12ACA | DYNH12ACV | DYNH16ACA |
|--|--|----------------------------|----------------------------|----------------------------|
| Min. Wire Size (Copper) | #14 AWG | #14 AWG | #14 AWG | #14 AWG |
| Protection-Fused | 2-15 amp | 2-15 amp | 2-15 amp | 2-15 amp |
| Protection-Circuit (HACR type) | Dual-15 amp | Dual-15 amp | Dual-15 amp | Dual-15 amp |
| Unit Plug: Amps NEMA Rating |  15 amp 6-15 P | 15 amp 6-15 P | 15 amp 6-15 P | 15 amp 6-15 P |
| Receptacle: Type Amps NEMA Rating |  Tandem 15 amp 6-15 R | Tandem 15 amp 6-15 R | Tandem 15 amp 6-15 R | Tandem 15 amp 6-15 R |

Summary Electrical Ratings

| No Electric Heat | | 0 kW | 0 kW |
|------------------|--------------|------------------|------------------|
| Model | Volts-Hz-Ph | CKT#1 | |
| | | MCA ¹ | MFS ² |
| DYNH09ACA | 208/230-60-1 | 5.6 | 10 |
| DYNH12ACA | 208/230-60-1 | 6.7 | 10 |
| DYNH12ACV | 277-1-60 | 5.7 | 10 |
| DYNH16ACA | 208/230-60-1 | 9.4 | 15 |

¹MCA = Minimum Circuit Ampacity (Wiring Size Amps) ²MFS = Maximum Fuse or HACR Breaker Size*

Gas Controls and Additional Data

| Model | DYNH09AC | DYNH12AC | DYNH16AC |
|------------------------------|--------------------|----------|----------|
| Gas (specify) | Natural or LP | | |
| Burners | 1 | | |
| Ignition System: Solid-State | Hot Surface | | |
| High Limit (Fixed) | 190° | | |
| Blocked Flue Switch | 200° | 200° | 205° |
| Gas Connection Size | 3/8"IPS | 3/8"IPS | 3/8"IPS |
| Gas Connection | (LH) Front or Rear | | |

Blower/Evaporator

| Model | DYNH09AC | DYNH12AC | DYNH16AC |
|--------------------------|------------------------------|------------|----------------|
| Wheel Diameter | 4.375" | 4.530" | 4.530" |
| Wheel Width | 26" | 26" | 26" |
| Air Vent-Manual | 70 CFM | 70 CFM | 70 CFM |
| Required Filter (1 Each) | 6"x30-3/4" | 6"x30-3/4" | 8-1/4"x30-3/4" |
| Filter Type | Electrostatic/Washable Media | | |

Dynaline 3



Specifications subject to change without notice. Installation must be in accordance with local codes and regulations.

SUGGESTED BID SPECIFICATIONS

The supplier will provide packaged terminal gas heat/electric air conditioner of the sizes and capacities shown on the schedule and listed in the specifications. Each unit shall consist of a chassis, wall case/sleeve, outside grille and room cabinet. Units shall be UL listed and/or ETL design certified and shall be Dynalene Manufacturing Company DYNALINE™ 3 models, or equivalents. The units shall be located as shown on the drawings.

Unit's steady state efficiency shall be rated at 80% nominal and the EER of the air conditioner shall not be less than ASHRAE 90.1 - 2010 standards.

Units shall be designed to operate on 208/230 volts, 60 Hz, single phase power.

Unit dimensions shall not exceed 42" wide and 16" high without optional air discharge package in place, and not more than 22-29/32" from face of room cabinet to face of standard exterior grille.

Units shall be designed to operate on Natural or LP gas for the heating cycle.

CHASSIS:

Unit chassis shall be a standard product of the manufacturer and shall be packed to prevent damages when reasonable care is exercised during shipment. Warnings on packaging shall alert handlers to the hazards of improper handling or stacking.

Chassis shall slide into a standard-sized wall case and, after installation and testing, be ready to operate. Each chassis shall consist of the following system and components:

- Refrigeration system constructed to isolate the hermetically sealed rotary-type compressor from external vibration. The system shall include copper/aluminum condenser and evaporator coils with capillary refrigerant control.
- Air flow system consists of a two-speed room air motor (for Hi & Low A/C and Hi & Low heat speeds) and a fan cycle switch to permit continuous indoor fan operation. A separate condenser fan operates in the A/C cycle only. The condenser fan, not operating in the heating mode, eliminates the potential for exhaust gases to be drawn back and freezing in the chassis compartment. The room air system incorporates a tangential blower wheel for reduced noise and increased efficiency.
- Condenser coils, with not less than 13 fins per inch, and evaporator coils, with not less than 11 fins per inch. Coils shall be constructed of copper/aluminum and fins shall be bonded to tubes to prevent electrolytic action.
- Indoor and outdoor airflow which match the coil capacity for efficient transfer of heat. Design of the unit shall prevent water blow-off on the indoor evaporator coil. Indoor supply air grille, constructed of extruded aluminum, shall discharge air at 52 degrees off vertical pattern.
- Electrostatic return air filter, constructed of washable media, that installs and removes without tools.
- Factory-installed, gas-fired heat exchanger with electronic controlled, pilotless ignition system and a "draw-through" negative draft combustion air system. Gas ignition shall occur by energizing hot surface ignitor, which lights the burner on each thermostatically controlled heating cycle. Heat exchanger shall be located in indoor air stream so as not to be visible or accessible through indoor supply air grille.

FOR PRODUCT AND APPLICATION

Dynalene 3 Fits any Decor

The Dynalene 3 PTAC features a modern, compact, and sleek design. Four standard colors, stainless steel and custom options to match any decor. Small and snug against the wall, it complements any room without commanding attention.

Standard Color Options

100 = Pebble Gray
416 = White
200 = Gray

Stainless Steel and custom powder coating are also available¹.

¹Minimum order quantities required.



1. *MFS (Maximum Fuses Size) value listed is the maximum value as per UL 60335-2-40 calculations for MOCP (branch-circuit conductor sizes in this chart are based on this MOCP). The actual factory installed Overcurrent Protective Device (Circuit Breaker) in the models may be lower than the maximum UL 60335-2-40 allowable MOCP value, but still above the UL 60335-2-40 minimum calculated value or Minimum Circuit Ampacity (MCA) listed.
2. The end user shall size conductors based on the Single Point Power Entry (SPPE) - Minimum Circuit Ampacity. The service circuit breaker shall not be sized less than the minimum circuit ampacity associated to Single Point Power Entry value provided. The service circuit breaker shall also not be sized greater than the Maximum Fuse size associated to the Single Point Power Entry Value Provided.
3. While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes

SUGGESTED BID SPECIFICATIONS

FOR PRODUCT AND APPLICATION

- Touch pad-type digital control for selecting temperature set point, heating, cooling and manual fan operation. Control system to incorporate computerized self-diagnostics to facilitate troubleshooting.
- Positive closing fresh air damper, located within the chassis. An accessible manual control shall operate the damper.
- Compressor “lock-out” interface with standby emergency power generator.

WALL CASE:

Wall case shall be constructed of 18-gauge galvanized and shall have a protective baked-on enamel finish. Base pan shall be 18-gauge galvanized. Cases shall be installed through exterior walls where shown on the plans and shall be level from side to side and slope 1/4" from front to rear to ensure proper operation of condensate system. Case shall be secured to the wall at both sides as shown in installation instructions. In no instance shall fasteners be used through the base pan so as to protect the water integrity of the base pan.

OUTSIDE GRILLE:

Special grilles to be supplied by others must be submitted to the PTAC manufacturer for feasibility and air flow characteristics.

ROOM CABINET:

Each room chassis shall be equipped with a removable, wrap-around room cabinet constructed of 20-gauge galvanized steel with a protective baked-on enamel finish similar to the wall case.

GAS TYPE:

Natural gas units shall be equipped with a gas valve having a built-in regulator set to operate at the gas inlet supply pressure, minimum 5" W.C., maximum 7" W.C. Units burning LP gas shall be equipped with a gas valve having a built-in regulator set to operate at gas inlet supply pressures of 11" W.C. minimum and 13" W.C. maximum.

SERVICE:

Bidders shall submit complete information regarding service availability, including address(es) and phone number(s), along with complete information of manufacturer address and phone number to cover service information pertinent to installed equipment.

RESPONSIBILITY FOR INSTALLATION, START-UP, TESTING, DEMONSTRATION:

Units shall be installed in full accordance to the manufacturer's recommendation. The manufacturer shall not be liable for unit failure resulting from improper installation, which invalidates the warranty. Bidders shall specify their responsibilities for the initial starting of units, performing necessary tests and adjustments to place units in proper operating condition and demonstrating heating and cooling operations to the owner or the owner's representative.

WARRANTY:

There shall be a two-year limited warranty on parts and a five-year limited warranty on the compressor and heat exchanger.

INSTALLING DYNALINE™ 3

Dynaline™ 3 PTAC units are self-contained gas heating/electric cooling systems for through-the-wall installations in hotels, motels, hospitals, nursing homes, assisted living centers, add-on rooms, apartments, shops, small offices and other applications. Dynaline 3 models offer:

- Energy-efficient operation
- Reliable, durable construction
- Ease of service and maintenance
- Application flexibility
- Ease of installation
- Quiet operation

Dynaline 3 models are certified by ETL as gas-fired packaged terminal air conditioners. Dynaline 3 complies with the latest edition of American National Standard Z21.86/ETL 2.32 and UL 484. Dynaline 3 is designed for use with Natural gas or Propane gas only.

Each Dynaline 3 unit is carefully packed in a container to withstand the load conditions encountered in normal transit and handling. If inspection reveals any damages, do not install the unit. Notify the transportation company immediately, and file a damage claim.

Dynaline units are designed to be installed in residential homes and commercial buildings with a minimum wall thickness of 1" and a maximum wall thickness of 14-1/2" when using the standard wall sleeve. (Maximum wall thickness cannot exceed 12-5/8" if rear gas hook-up is to be used.) Units must be installed so that the rear portion is vented to the outside atmosphere. Venting systems of the units must not be altered.

In addition to being located along the outside wall of a room, the unit should be installed where it can effectively circulate air into the room. Generally, the best location is midway along the wall and away from a stairwell, or other opening. Unit must not be located behind a door or any location where a door could obstruct air circulation. Also, avoid installing the unit in an alcove or recess that does not allow good air circulation.

Note: Unit must not be used as a construction heater!

To ensure adequate service accessibility and proper operation, maintain the minimum clearances shown in **Table 3**:

GENERAL INFORMATION

LOCATION CONSIDERATION

| Minimum Operational Clearances | Minimum Clearance to Combustible Construction |
|--|---|
| <p>The following minimum outside clearance from rear grille must be maintained:</p> <ul style="list-style-type: none">• Rear of unit to nearest obstruction - 36"• Top, Sides to nearest obstruction - 0" <p>Bottom of unit to obstruction and/or ground: This requirement is determined by local climate and environmental conditions. The unit must be above ground high enough to prevent snow, water, leaves or other obstruction from blocking the rear of the unit.</p> <p>The following minimum inside clearances from cabinet front must be maintained:</p> <ul style="list-style-type: none">• The flow of discharge air must not be obstructed for a minimum of 12"• Side of cabinet to nearest obstruction - 1"• Top of unit to ceiling - 12"• Cabinet front to nearest obstruction - 12"*• Bottom of wall sleeve front to finished floor - 0" <p>* Obstruction must be removable for service, otherwise minimum 36" required.</p> | <p>Units are approved for 0" clearance to combustible construction top, sides, and bottom. Front and rear clearances not applicable as there can be no construction combustible or non-combustible to the front or rear of the opening.</p> |

Table 3

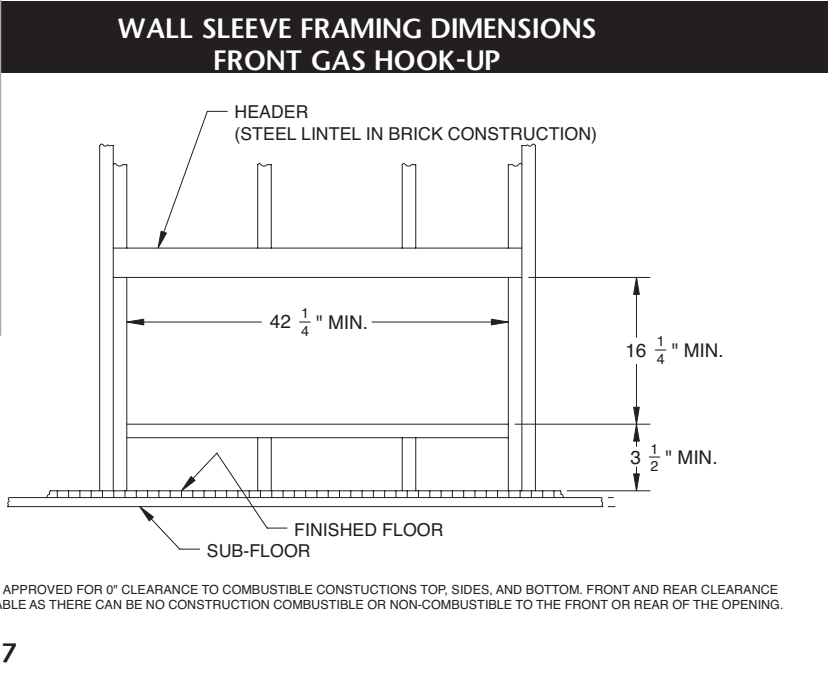
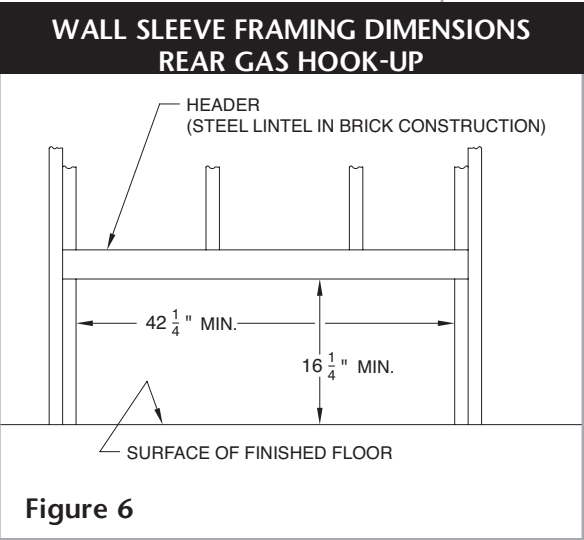
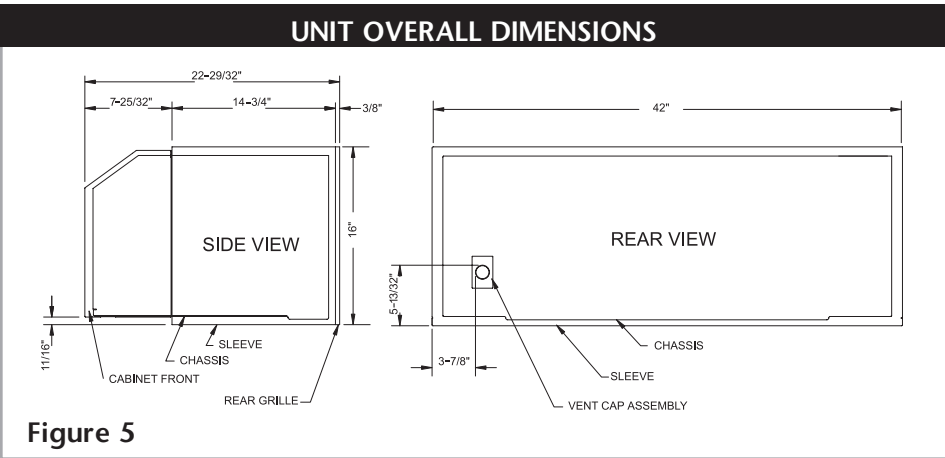
FRAMING

In the United States and Canada, the installation must conform with local codes. In the absence of local codes, US installations must conform with the current National Fuel Gas Code ANSI Z223.1 and with the National Electrical Code ANSI/NFPA No. 70, and Canadian installations must conform with the current CANI-B149 installation code.

After selecting a location, inspect the wall and floor areas to determine that there are no hidden electrical wires, piping, tubing, ducts, girders, wall studs, etc., that might interfere with the proper installation and safe operation of the unit and gas supply.

Dynaline™ 3 is designed to be installed through an exterior wall from 1" to 14-1/2" thick. To accommodate the unit's dimensions (see Figure 5), the wall opening must be framed as shown in Figures 6 & 7. For walls thicker than 14-1/2", consult factory regarding available extended length wall sleeves. The maximum wall thickness for rear gas hook-up is 12-5/8".

NOTE: Use conventional construction methods to frame the opening. Do not use the wall sleeve as a lintel.



KNOCKDOWN WALL SLEEVE

1. Unfold the sides of the wall sleeve and assemble the top, so that the sides wedge between the top flange and the retaining angle. (See **Figure 8**.) Apply 4 screws provided to secure top to the sides.
2. Cut an opening in the outside wall and frame to minimum opening. (See **Figures 6 & 7**.)
3. Install wall sleeve into framed opening. Be sure that the bottom of wall sleeve is resting firmly on the bottom framing member since the weight of the unit rests solely on the bottom of the wall sleeve. Failure to support the bottom of the wall sleeve could pull the sides away and result in water leakage on the floor.
4. Secure the wall sleeve to the wall as shown in **Figures 9 & 10**. Be sure wall sleeve has a 1/4" slope to the outside. Do not slope toward front! To avoid water damage to the wall, do not put holes through the bottom of the wall sleeve.

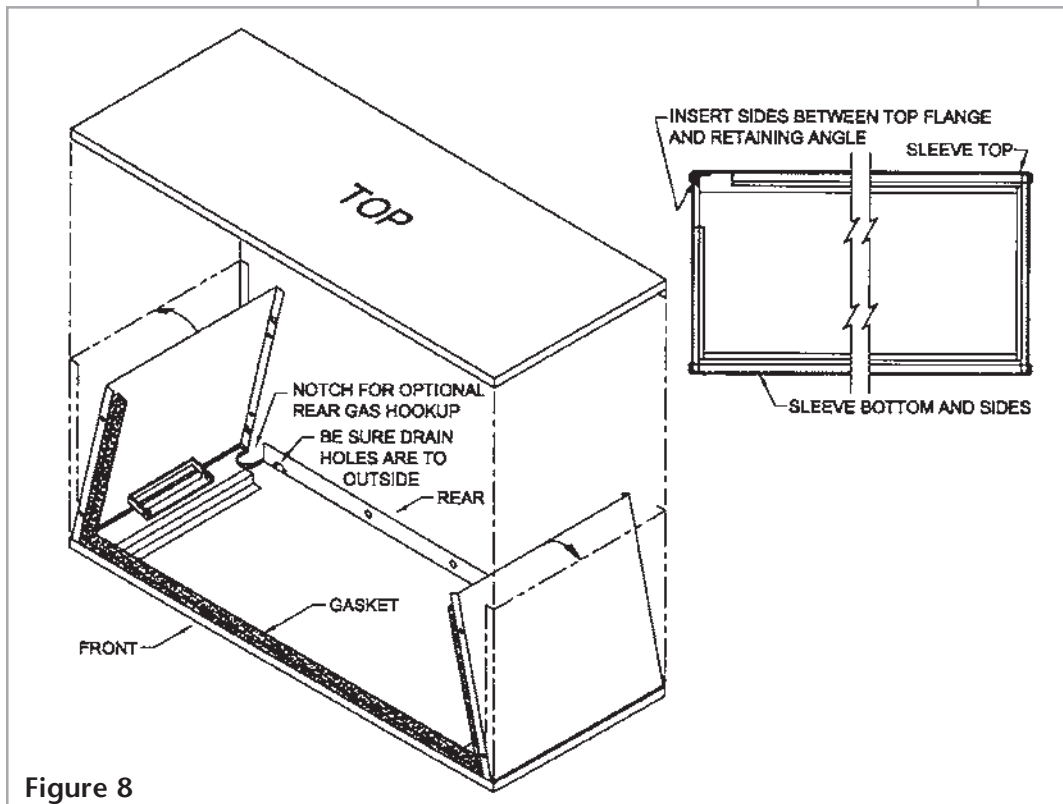
NOTE: If the unit is to be mounted flush with the exterior wall, wall sleeve must protrude beyond the finished exterior wall a minimum of 1/4". If rear gas connection, sleeve must extend beyond the finished exterior wall surface 1-5/8". (See **Figures 9, 10, & 11**.)

5. Trim around the wall sleeve with moulding or other suitable material. (See **Figures 9, 10, & 11**.)
6. Install the grille with louvers angled in the downward position, as shown in **Figures 9, 10 & 11**.

NOTE: Outside rear grille must be installed prior to installing chassis.

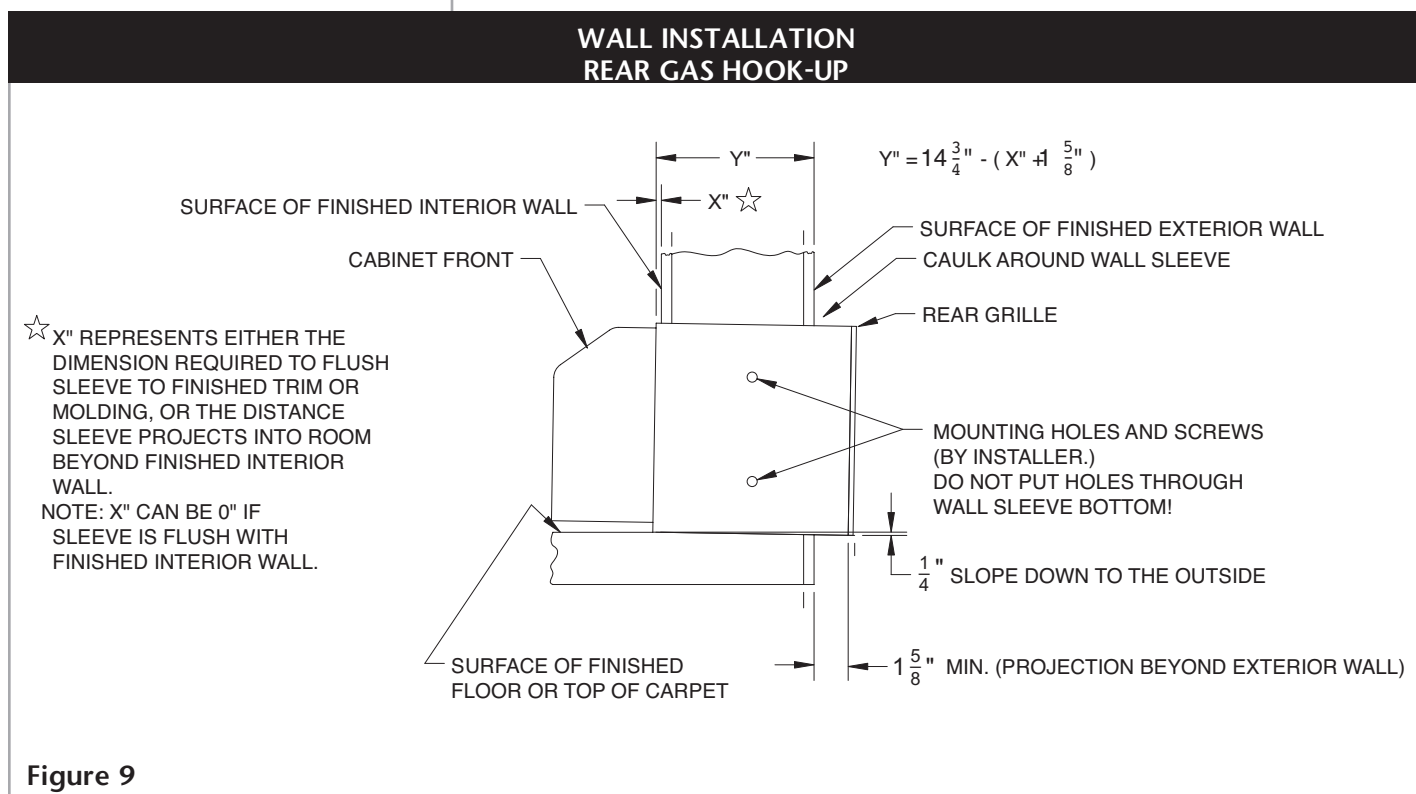
NOTE: Do not discard packing inside carton. It may be used as a temporary cover for weather and construction protection. To cover the wall sleeve opening, cut cardboard insert along the perforated line, fold and place in rear of sleeve.

INSTALLING THE WALL SLEEVE



INSTALLING THE CHASSIS

1. Slide chassis squarely into wall sleeve from inside and secure with four (4) screws into flange on wall sleeve to ensure proper security.
 2. Connect gas and electrical supply. (See pages 13, 14 and 20.)
 3. Remote thermostat: Dynalene™ 3 chassis are supplied for standard built-in control. To convert the standard chassis to function with remote thermostat, connect the thermostat wiring (according to thermostat manufacturer's instructions) to the terminal block located on the module board. Move the dip switch #1 on the module board to the "ON" position. (See **Figure 13.**) Unit is capable of operating set-back (5-wire) thermostat.
- NOTE:** Connecting remote thermostat overrides the built-in thermostat and no digital read out will be displayed on the control panel. There is no need to disconnect the chassis' built-in thermostat.
4. To lock out the A/C compressor when the chassis is powered by an emergency standby power generator, 24-volt lead wires from the transformer (NOTE: Field supplied transformer to be powered by the standby generator) must be connected to the 1/4" spade terminals on the module board. (See **Figure 28** for ladder diagram of typical standby generator electric service.)
 5. Install cabinet front.



WALL INSTALLATION REAR GAS HOOK-UP

MODIFICATIONS TO THE WALL SLEEVE ARE THE
RESPONSIBILITY OF THE INSTALLER
MANUFACTURES RECOMMENDATIONS MAY NOT
BE SUFFICIENT
THE INSTALLER IS RESPONSIBLE TO TAKE MEASURES TO
INSURE INSTALL AGAINST LEAKS

- STEP 1 DRILL .812 HOLE PER DRAWING
STEP 2 INSTALL WALL SLEEVE
STEP 3 ADD REAR GAS HOOKUP KIT TO UNIT
STEP 4 ATTACH GAS LINE TO UNIT
STEP 5 CAULK AROUND THE GAS LINE ENTERING THE WALL SLEEVE TO PREVENT WATER FROM LEAKING AROUND THE PIPE
STEP 6 INSTALL GRILL

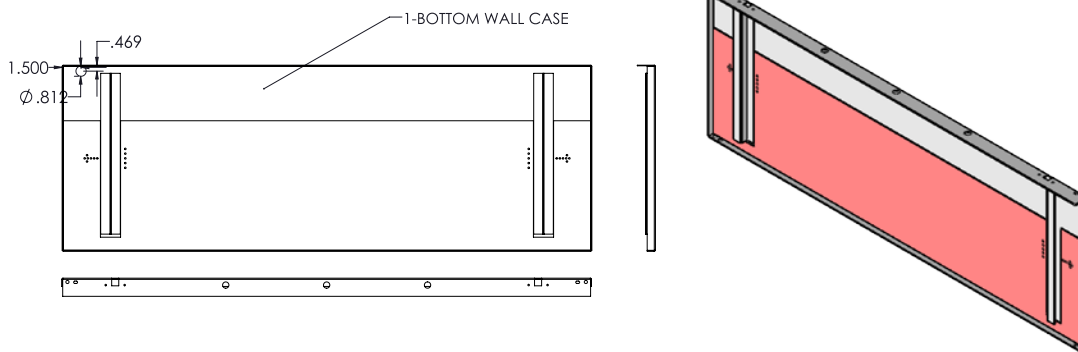


Figure 10

WALL INSTALLATION FRONT GAS HOOK-UP

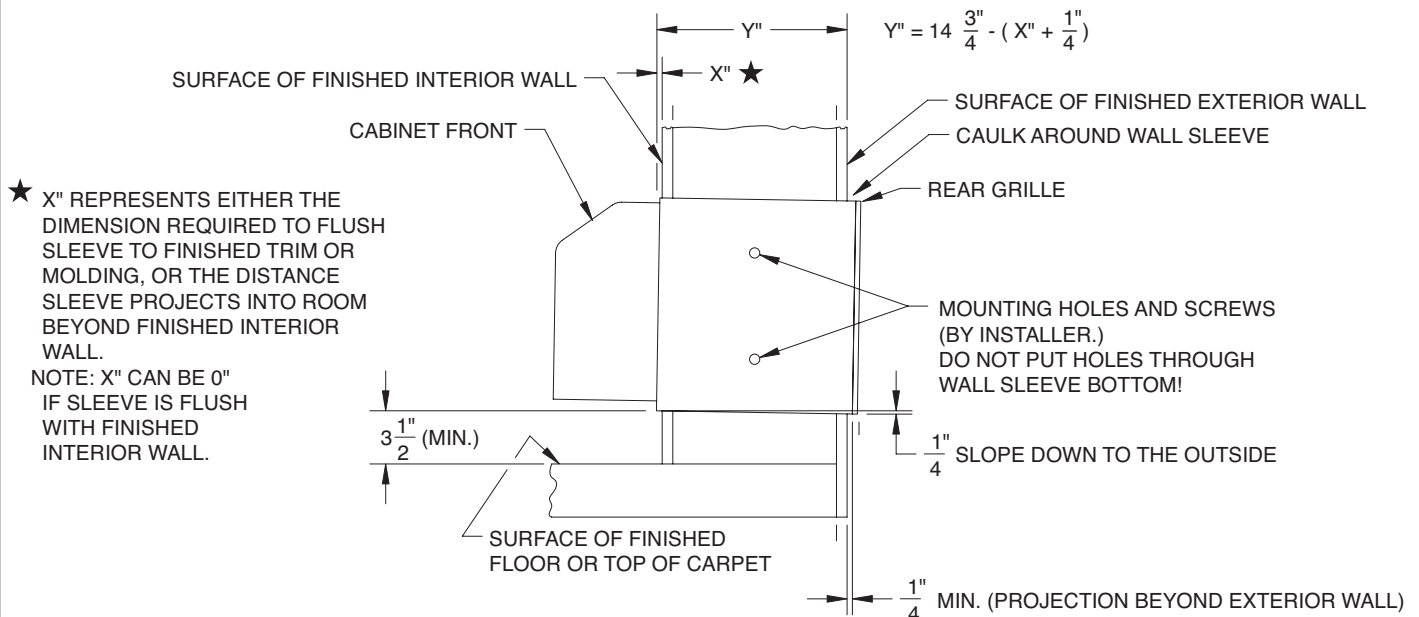


Figure 11

WINDOW, CURTAIN WALL, OR WALL PANEL INSTALLATION

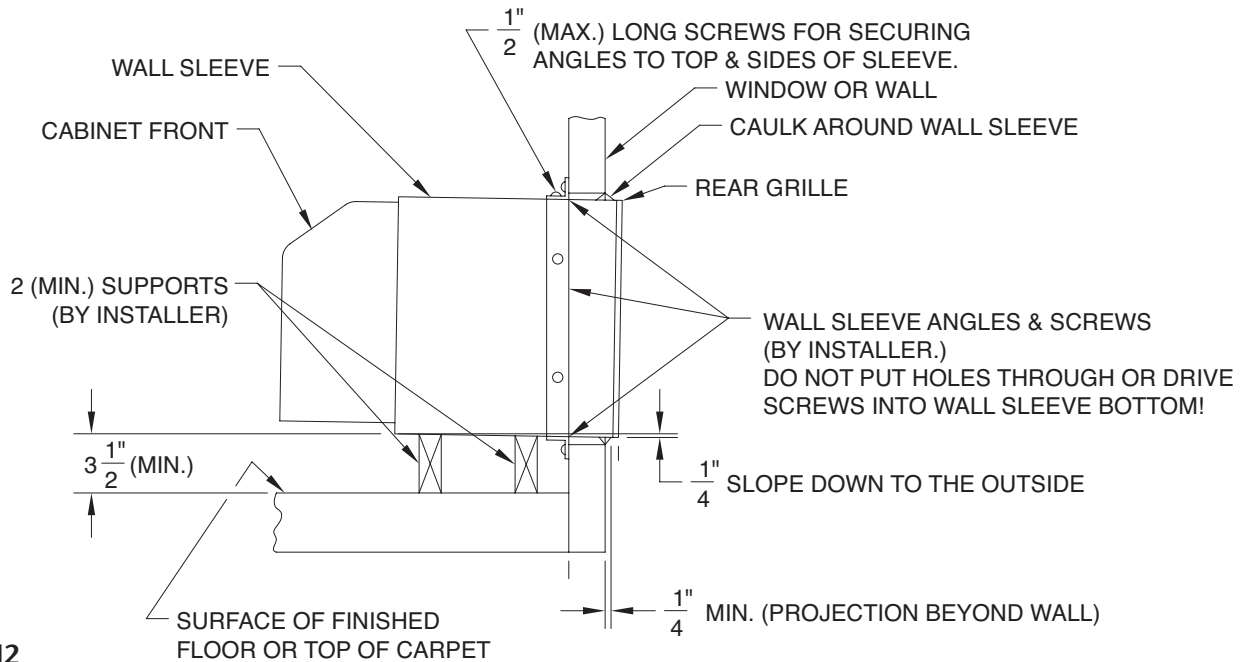
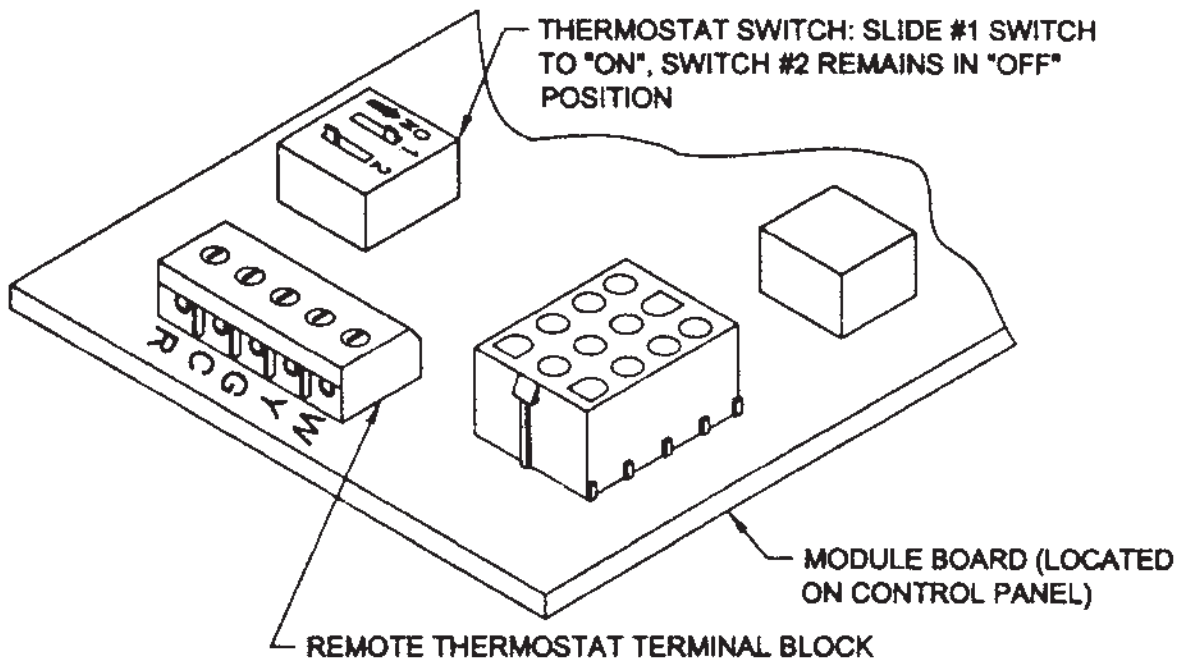


Figure 12



NOTE: THERE IS A 5/8" HOLE IN THE BASE NEAR THE JUNCTION BOX FOR ROUTING THE WIRING FOR REMOTE THERMOSTAT. THE 5/8" STRAIN RELIEF BUSHING PROVIDED IN THE PACK-OUT BAG SUPPLIED WITH THE UNIT MUST BE USED TO SECURE THE THERMOSTAT WIRING FOR REMOTE THERMOSTAT.

Figure 13

INSTALLATION DATA

Dynaline™ 3 chassis are factory equipped with a 3/8" NPT gas connection located at the bottom left front corner. Gas piping used to make the gas connection to the unit must be purchased locally. The size of the pipe should be computed according to type of gas and length of run. (See Table 5.) See Figure 14 for location of gas connection on the chassis when installed into the wall sleeve.

Table 5 gives a reasonably accurate size for the gas service line. The quantities in the table are for cubic feet per hour. To convert BTU capacity to cubic feet, divide total BTU load by the BTU value of the gas being used. The table is for Natural gas only. To convert to Propane gas, multiply by .633.

The pressure drop caused by other gas appliances being served must be considered. If the new line is a take-off from an existing line to another appliance, pressure drop computation with the table must include the demand of the other appliance.

| Gas supply pressure for purposes of input adjustment | | |
|--|------------------|------------------|
| | Minimum | Maximum |
| Natural Gas | 5" Water Column | 7" Water Column |
| Propane Gas | 11" Water Column | 13" Water Column |

Table 4

Operating Pressure

All units are equipped with a valve having a built-in regulator. For units burning Natural gas, the regulator is preset at 3.5" W.C. pressure. For units burning LP gas, the regulator is preset at 10.5" W.C. pressure.

It is recommended that a shut-off valve be installed in the gas line to the unit, and that a ground joint union also be installed.

NOTE: Manual shut-off valve to be supplied by installer.

A condensate trap should also be installed in the gas supply line as close to the unit as possible.

To occasionally monitor the gas supply pressure to the unit, install a 1/8" NPT plug tap for test gauge connection immediately upstream of the gas supply connection to the unit. The unit must be disconnected from the gas supply piping system during any pressure testing of the gas supply system at test pressures equal to or greater than 1/2 PSIG.

MAKING GAS CONNECTIONS

Capacity of pipe of different diameters and lengths in cubic feet per hour with pressure drop of 0.3 inches and specific gravity of 0.60 inches.

Iron Pipe Sizes (IPS) Inches

| Pipe Length (feet) | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 |
|--------------------|-----|-----|-----|-------|-------|
| 10 | 132 | 278 | 520 | 1,050 | 1,600 |
| 20 | 92 | 190 | 350 | 730 | 1,100 |
| 30 | 73 | 152 | 285 | 590 | 890 |
| 40 | 63 | 130 | 245 | 500 | 760 |
| 50 | 56 | 115 | 215 | 440 | 670 |
| 60 | 50 | 105 | 195 | 400 | 610 |
| 70 | 46 | 96 | 180 | 370 | 560 |
| 80 | 43 | 90 | 170 | 350 | 530 |
| 90 | 40 | 84 | 160 | 320 | 490 |
| 100 | 38 | 79 | 150 | 305 | 460 |
| 125 | 34 | 72 | 130 | 275 | 410 |
| 150 | 31 | 64 | 120 | 250 | 380 |
| 175 | 28 | 59 | 110 | 225 | 350 |
| 200 | 26 | 55 | 100 | 210 | 320 |

Table 5

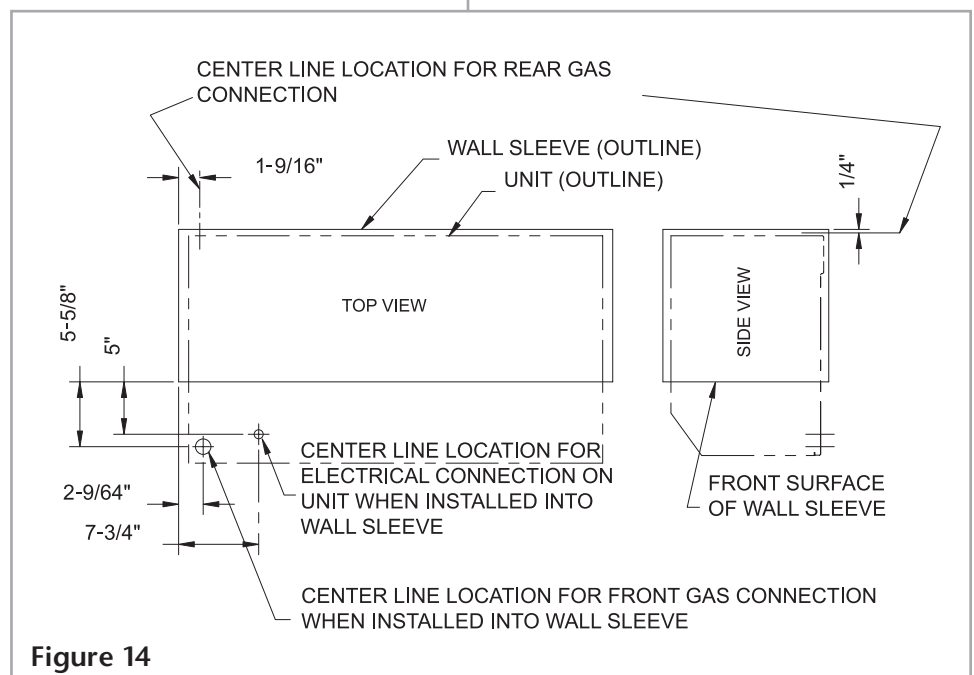


Figure 14

INSTALLING REAR GAS CONNECTION WITH REAR GAS HOOK-UP KIT

Dynaline™ 3 chassis are manufactured for front gas hook-up. The optional rear gas hook-up kit can be used for field conversion of the chassis to a rear gas hook-up at the RH side (facing back of the unit).

1. Remove cabinet front.
2. Remove brass street elbow from valve and replace it with the 3/8" NPT x 3/8" flare elbow provided. Be sure to apply a thread compound resistant to the action of liquefied petroleum (LP) gas and Natural gas to the threads. NOTE: Flared portion of elbow must be pointing up. Do not discard the elbow that was removed. It will be used later. (See A, **Figure 15**.)
3. Remove the 1-1/8" plug from the firewall and replace it with the 1-1/8" universal bushing provided. (See B, **Figure 15**.)
4. Using the two (2) 8-32 x 1/2 self tapping screws provided, secure hi-ear elbow as illustrated. (See C, **Figure 15**.)
5. Insert gas inlet tube assembly. (See D, **Figure 15**) through bushing in firewall. NOTE: The shortest end of the tube connects to main gas valve.
6. Secure tube assembly to elbows as illustrated. (See **Figure 15**.) Do not apply thread compound to flare fittings.
7. Using silicone caulking, seal gas inlet tube assembly where it passes through bushing. (See E, **Figure 15**.)
8. Install street elbow removed from valve in Step #2. Clean threads, and apply new thread compound sealant. Secure street elbow to the 90° hi-ear elbow that was attached to chassis in Step #4. Female threads must be pointing down.
9. Install chassis into wall sleeve.
10. Chassis installation into wall case can now be completed by installing nipple, union and shutoff valve (field supplied) in accordance with local code.
11. Check all joints for gas leaks.

NOTE: Wall sleeve must extend beyond the finished exterior wall surface 1-5/8" minimum.

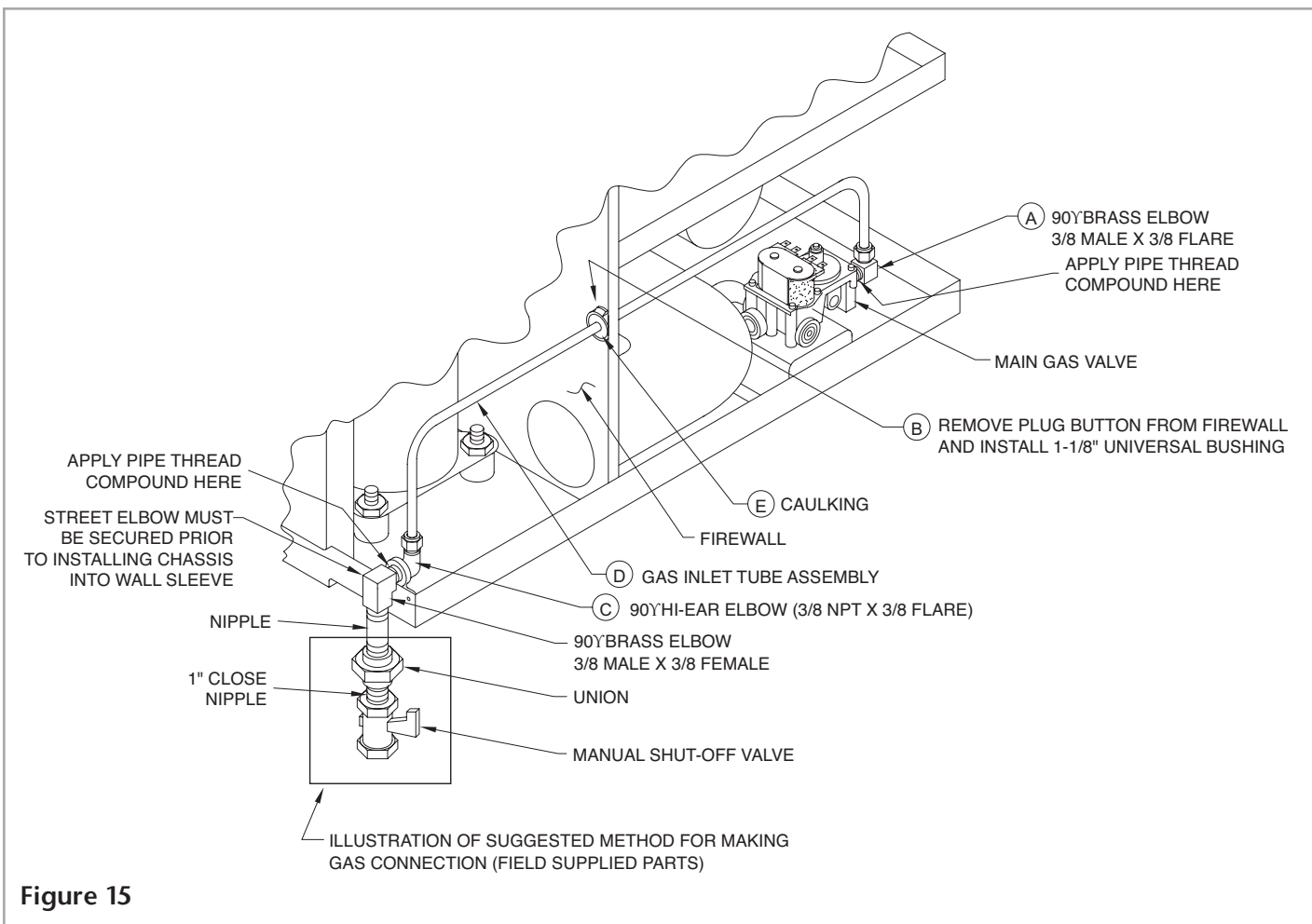


Figure 15

The optional air discharge package allows heating and cooling of an adjoining room. The adaptor is preassembled for air discharge to the right but can easily be converted for discharge to the left. The adaptor is 43-1/4" long with female connection. The extension is 43-1/4" long with 1" male tapered flange. If you wish to discharge the air to the left, remove the end cover from the left end of the adaptor and secure it to the right end. Next, turn it around so the flow of air will be directed toward the front. The grille on the adaptor need not be removed. Air apportionment can range from 30% to 70% for the primary room and 70% to 30% for the secondary room. (See **Table 6.**)

Discharge air is dependent on Dynalene 3 model selected, mode of operation (heat or cool), and length of total air discharge application.

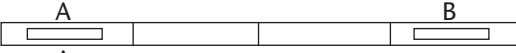
When additional length is required, a connector is used in conjunction with the air discharge package. Up to two connectors can be placed between the adaptor and the extension (DYNH12 or DYNH16 only). Dynalene recommends that chassis with air discharge packages be controlled via remote control thermostats.

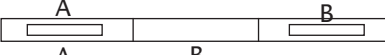
TWO OPTIONS OF SUPPLYING CONDITIONED AIR TO AN ADJOINING ROOM.

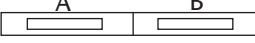
- Rectangular Front
- Air Discharge Package

CFM CHART (DRY COIL)

| DYNH12/DYNH16 | | | | | | | | | DYNH09** | | |
|---------------|---------|---------|-------|---------|---------|-------|---------|---------|----------|---------|--------|
| 1* | | | 2 | | | 3 | | | 3 | | |
| | HI | LOW | | HI | LOW | | HI | LOW | | HI | LOW |
| 50/50 | 143/121 | 127/108 | 50/50 | 144/122 | 128/108 | 50/50 | 145/123 | 129/109 | 50/50 | 123/104 | 109/93 |
| 60/40 | 159/102 | 142/91 | 60/40 | 160/103 | 143/91 | 60/40 | 161/103 | 143/92 | 60/40 | 137/88 | 122/78 |
| 70/30 | 173/85 | 154/76 | 70/30 | 174/84 | 155/76 | 70/30 | 175/86 | 156/77 | 70/30 | 149/73 | 132/65 |

1 

2 

3 

* Max. length = 130" from adaptor.

** DYNH09 - 1 and 2 are N/A. There is only one extension or connector allowed for DYNH09

Table 6

INSTALLING AIR DISCHARGE PACKAGE

Installation when adaptor support brackets are mounted to finished wall.

NOTE: Projection of wall sleeve into room cannot exceed 1-1/4".

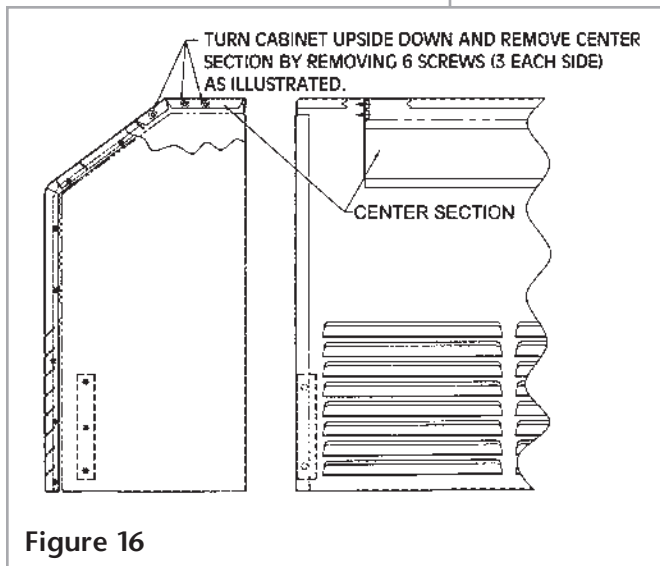


Figure 16

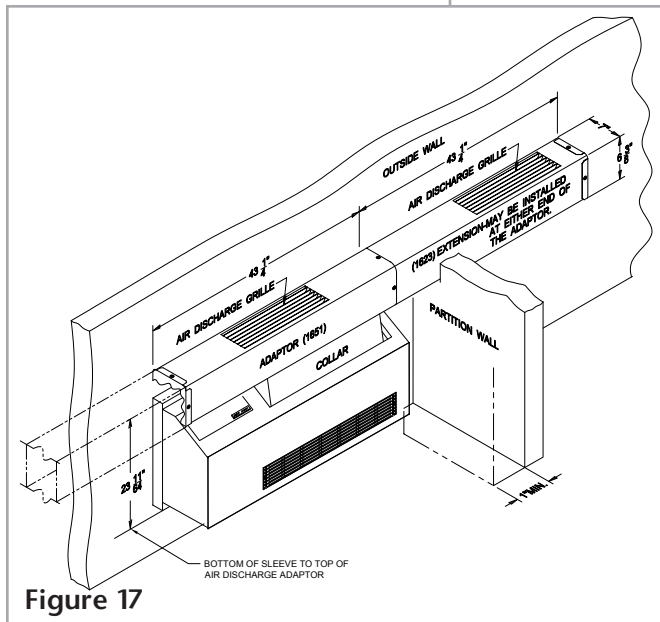


Figure 17

1. Mount adaptor brackets to the wall as illustrated. Installer to provide screws. (See **Figure 18**.)
2. Slide collar into position under the adaptor and secure with the two (2) screws provided. (See **Figure 17**.)
3. If the required air flow direction is to the left, remove the end cap and three (3) tinnermans from the left end of the adaptor. Reinstall end cap and tinnermans to the right end of the adaptor.
4. Remove the center section from the cabinet front assembly. (See **Figure 16**.) **If the center section is not removed, you will be unable to open the cabinet front once the collar and adaptor are installed. Discard center section.**
5. Remove the discharge air grille from the unit. **Retain the two (2) screws.**
6. Place the adaptor and collar assembly into position on the unit. Make sure the adaptor is resting on the adaptor brackets – adjust brackets as needed!
7. Locate the hole in the adaptor bracket and mark the underside of the adaptor at each end.
8. Remove adaptor and collar assembly from unit. At the two (2) locations marked on the adaptor in Step #7, drill a 7/64"-diameter hole (2 places).
9. Install adaptor and collar assembly on unit as illustrated and secure with the two (2) screws retained in **Step #5**. Also, secure the adaptor to the adaptor brackets with the screws provided.
10. Install the extension (DYNH09) or the connector(s) and extension (DYNH12 or DYNH16 only) as required. Installer must provide wall support brackets for the connectors and extension.
11. Air Delivery: The air delivery baffle, located under the discharge air grille in the adaptor, is factory positioned to provide a 50/50 distribution of air into each zone. By removing the baffle and cutting along the scored line, 60% of the conditioned air will flow in the primary zone. Removing the baffle results in a 70/30 split. (On model DYNH16 you **must** remove the baffle). For best results unit should be run on Hi only when using discharge package.

Installation when adaptor support brackets are mounted to the wall sleeve.

NOTE: Projection of the wall sleeve into room must exceed 1-1/4".

1. Assemble each adaptor bracket to the wall sleeve bracket with screws and nuts provided. (See **Figure 19**.)
2. Mark and drill two 7/64"-diameter holes in the wall sleeve as illustrated. Mount bracket assemblies to wall sleeve with screws and tinnermans provided.
3. Slide collar into position under the adaptor and secure with the two screws provided. (See **Figure 17**.)
4. If the required air flow direction is to the left, remove the end cap and three tinnermans from the left end of the adaptor. Reinstall end cap and tinnermans on the right end of the adaptor.
5. Remove the center section from the cabinet front assembly. (See **Figure 16**.) **If the center section is not removed, you will be unable to open the cabinet front once the collar and adaptor are installed. Discard center section.**
6. Remove the discharge grille from the unit. **Retain the two (2) screws.**
7. Place the adaptor and collar assembly into position on the unit. Make sure the adaptor is resting on the adaptor brackets – adjust brackets as needed.
8. Locate the hole in the adaptor bracket and mark the underside of the adaptor at each end.
9. Remove adaptor and collar assembly from the unit. At the two locations marked on the adaptor in Step #8, drill a 7/64"-diameter hole (2 places).
10. Install adaptor and collar assembly on unit as illustrated and secure with the two (2) screws retained in **Step #6**. Also, secure the adaptor to the adaptor brackets with the screws provided.
11. Install the extension (DYNH09) or the connector(s) and extension (DYNH12 or DYNH16 only) as required. Installer must provide wall support brackets for the connectors and extension.
12. Air Delivery: The air delivery baffle, located under the discharge air grille in the adaptor, is factory positioned to provide a 50/50 distribution of air into each zone. By removing the baffle and cutting along the scored line, 60% of the conditioned air will flow in the primary zone. Removing the baffle results in a 70/30 split. (On model DYNH16 you **must** remove the baffle.)

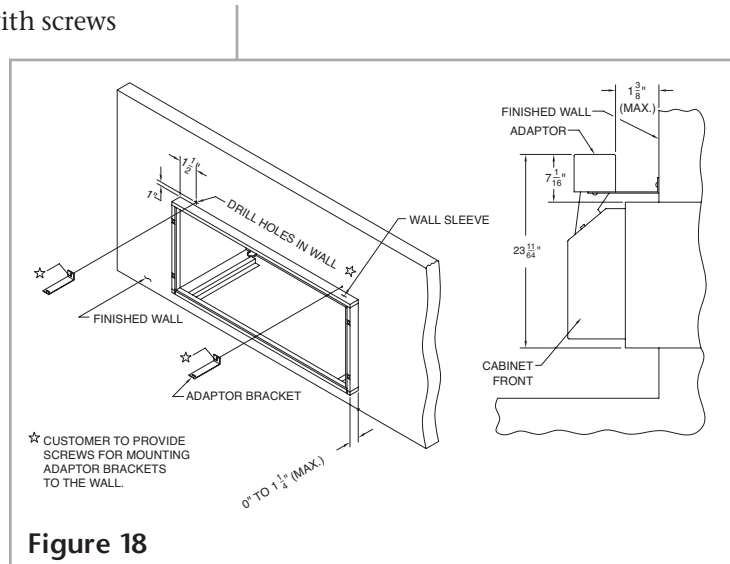


Figure 18

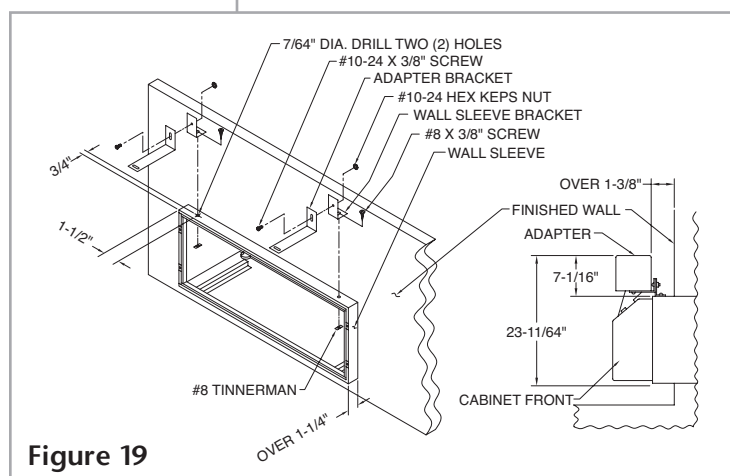


Figure 19

The 43" insulated connector plenum attaches to either side of the air discharge adaptor. It can be cut to the desired length. Ends have male/female collars.

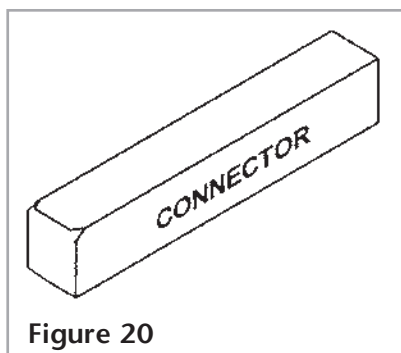


Figure 20

AIR DISCHARGE CONNECTOR

LEVELING LEGS PROVIDE ADDITIONAL SUPPORT

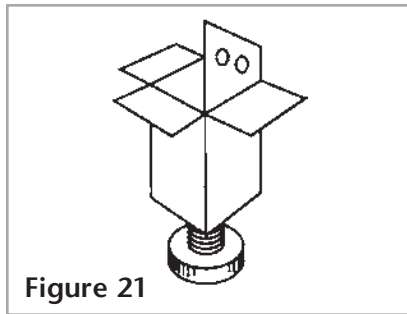


Figure 21

Leveling legs (optional; two each) are available to provide leveling and chassis support for installations that, because of wall thickness or chassis projection into the room, require additional support. The adjusting screw can be extended 2", with a maximum distance from the bottom of wall sleeve to screw base of 5" and a minimum distance of 3". (See Figures 11 & 21.)

DECORATIVE BASE CONCEALS ELECTRICAL AND GAS CONNECTIONS

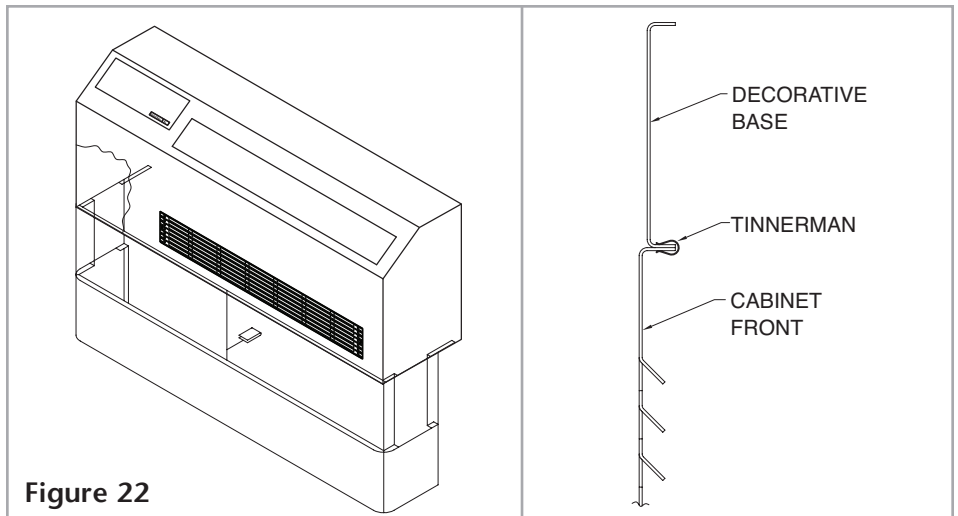


Figure 22

ENERGY MANAGEMENT SYSTEM

Dynaline 3 chassis may be wired to a central location, usually the front desk, where they may be controlled by a toggle switch or other means in a control panel (field supplied). The units remain de-energized until the room becomes occupied, at which time the desk attendant can energize them.

The standard design of Dynaline 3 chassis provides a means of locking out the A/C compressor when a stand-by generator is installed to provide emergency power. The electronic control board has 24V input terminals to receive the lock-out signal. (See Figure 30.)

A 5-wire terminal connection allows use of set-back temperature thermostats and other remote control devices. Infrared motion sensors must be sourced separately (by others). Dynaline remote heat/cool 24 VAC thermostat manual changeover can be ordered separately. High/Low fan speeds can be selected via the touch pad controls.

NOTE: Heating or cooling capacity is not reduced – only the blower speed and air movement are reduced.

Prior to installing the wall sleeve, condensate drainage from the wall sleeve must be considered. Two methods to drain condensate may be used:

Free Drain

A generally acceptable alternative where condensate drains from the wall sleeve through three exterior drain holes and drops to open ground. The chassis' condensate evaporation system is designed to vaporize normal condensate, and evaporate it through the warm condenser coil.

Drain Kit

A condensate drain kit is recommended for positive drainage when specified or code requires, or when condensate is heavy under conditions of extreme humidity for extended periods of time. We offer drain kit #K/04943 (See Figure 22). The condensate can be freely drained to ground level or routed in tubing to another location for disposal. The drain tube kit is designed for 1/2 O.D. copper tubing. It is field installed.

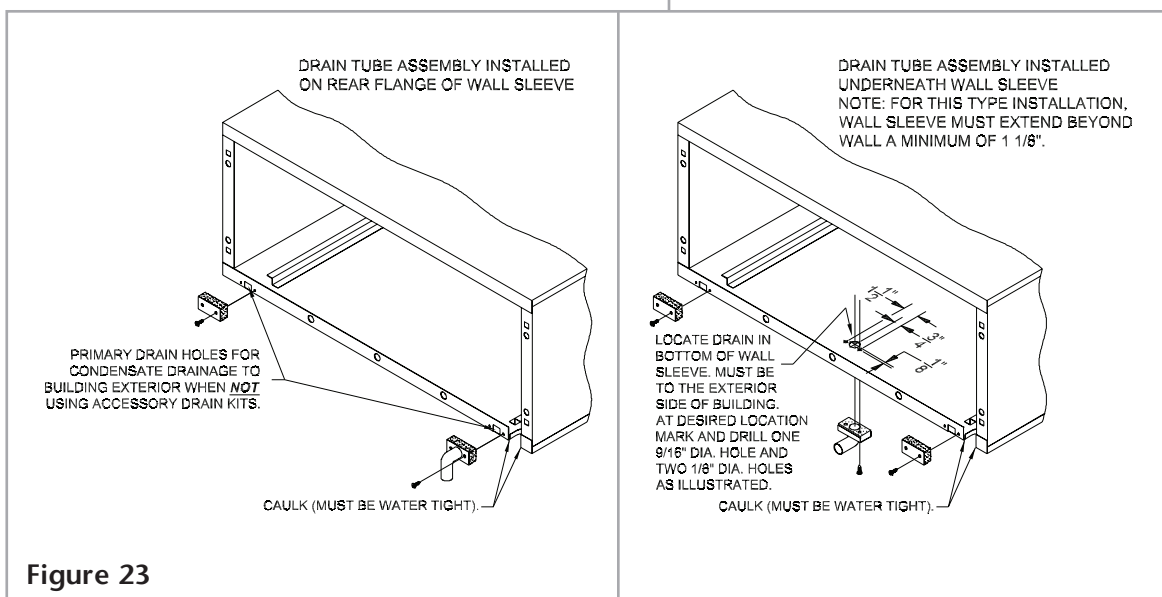


Figure 23

THREE EXTERIOR GRILLE STYLES OFFER AESTHETIC OPTIONS

Two styles of exterior grilles are available to complement building aesthetics:

Aluminum Grille (optional)

Bronze-finished, architectural style grille of one-piece extruded, anodized aluminum. Designed for optional rear gas hook-up.

Aluminum Grille (optional)

Aluminum-finished, architectural style grille of one-piece extruded, anodized aluminum. Designed for optional rear gas hook-up.

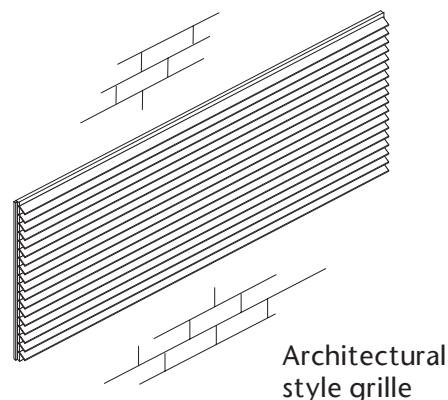
To install grille:

Secure grille to the wall sleeve from the inside with the grille angled downward. (See Figure 23.) Design limits “see through.” Do not attempt to bend or alter the grille, venting system or vent cap assembly.

All outdoor grilles must be installed prior to installing chassis.

NOTE: Consult with factory engineers before using any other outdoor grilles or special exterior treatment. Application of non-Dynalene products could severely affect the overall operating characteristics of the flue unit, causing hazardous or unsatisfactory performance.

OPTIONAL DRAIN KITS

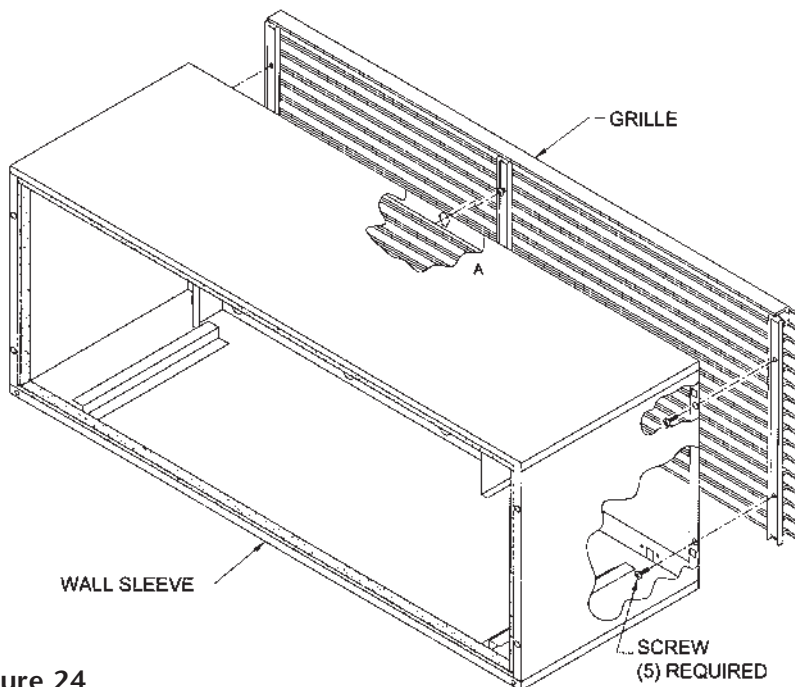


OPTIONAL 2-PSIG REGULATOR

| | |
|----------------------------|----------------|
| Maximum inlet pressures | 10 PSI |
| Emergency exposure limits | 65 PSI |
| Ambient temperature limits | -40° to 205° F |
| Venting | 1/8" NPT |
| Inlet/outlet gas | 3/8" NPT |
| Height | 3-1/2" |
| Length | 4-1/4" |
| Width | 3-7/8" |

Table 7

Figure 24



A pounds-to-inches regulator for use on residential, commercial and industrial applications is available. Features high leverage valve linkage to deliver positive dead-end lock-up and precise regulating control. Use only for Natural gas applications. (Consult factory about LP and other applications.) Front gas hook-up must have sufficient clearances for the field installed regulator. A high-pressure shut-off valve (supplied by installer) must be installed upstream of the regulator. Regulator provides no downstream overpressure protection. Housing is aluminum die cast, and internal parts are corrosion resistant. The regulator offers an automatic vent limiting device eliminating need to run vent piping as in the event of a diaphragm rupture. Gas escapement is limited within ANSI standard levels. Multipurpose mounting internal or external. For best performance and quick response, mount in upright position. Fixed orifice diameter 0.0087" equally limits inhalation and escapement. Mounts with gas flow direction as marked on bottom casting. (See Table 7 and Figure 26.)

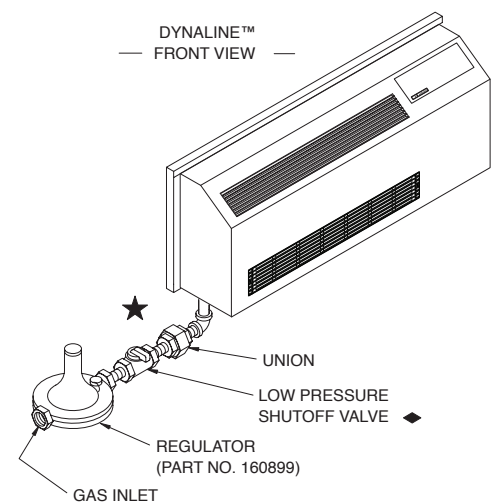
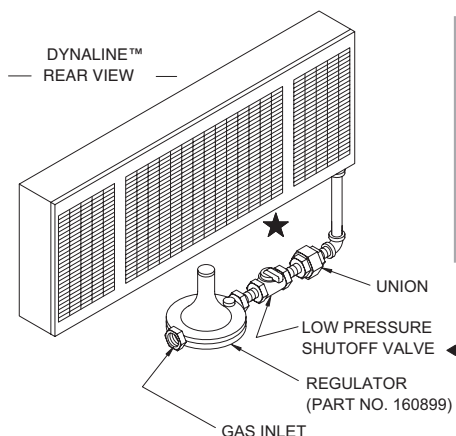


Figure 25



★ ILLUSTRATION OF BOXED IN AREAS: SUGGESTED METHOD FOR MAKING GAS CONNECTIONS (FIELD SUPPLIED PARTS).

◆ NOTE: LOW PRESSURE SHUTOFF VALVE MAY OR MAY NOT BE REQUIRED. CHECK LOCAL CODES.

ELECTRICAL CONNECTIONS AND WIRING

If local codes permit, the service cord supplied with the unit may be used for electrical connection. Otherwise, remove the cord and make electrical connections in the junction box.

All external wiring, including grounding, must comply with local codes or, in the absence of local codes, with the National Electrical Code ANSI/NFPA No. 70 (in Canada, with the latest edition of ETL C22.1 Canadian Electrical Code).

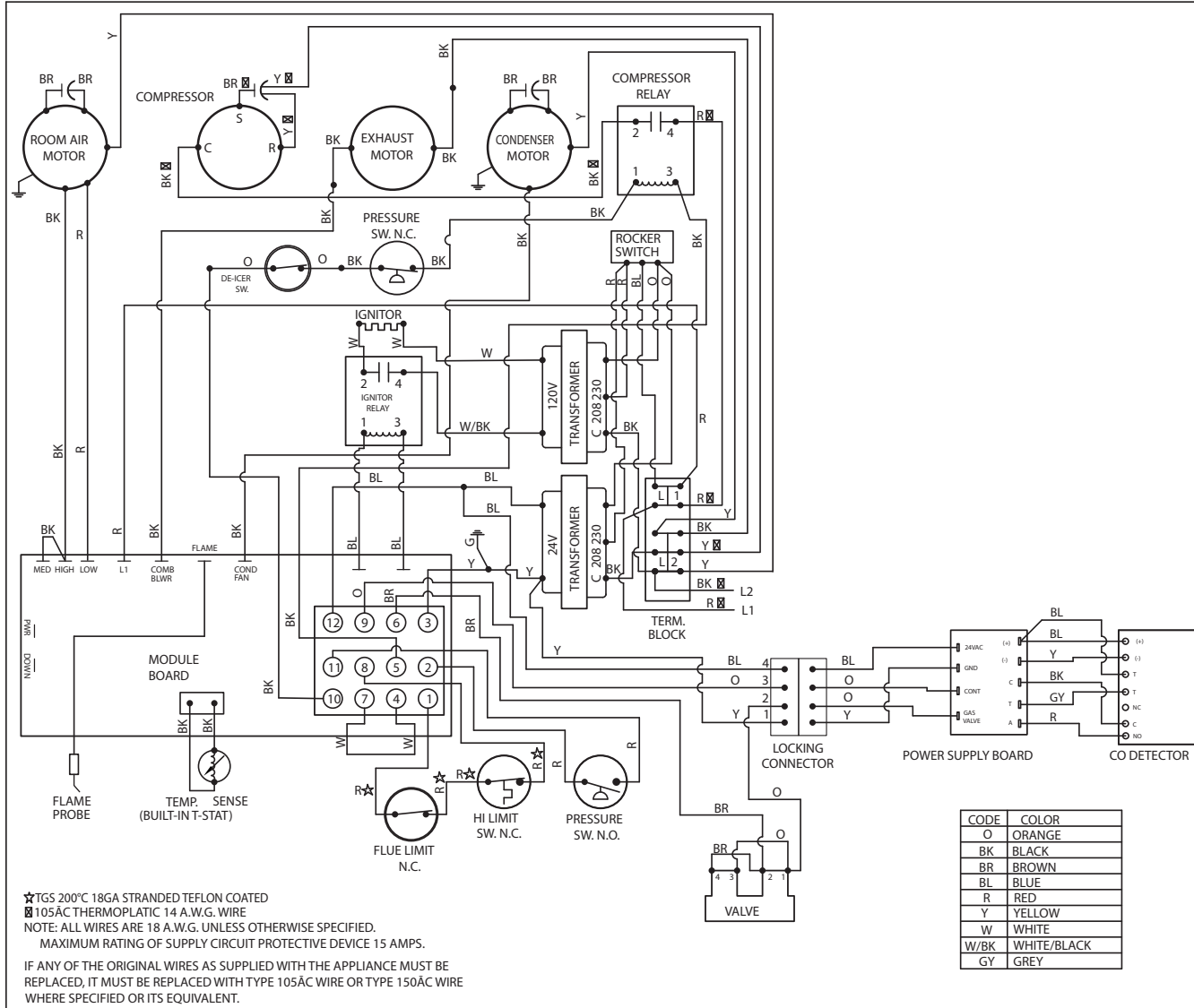
Wiring Diagrams

Schematic: 208/230 V.A.C.
Figure 26

Ladder Diagram: 208/230 V.A.C.
Figure 27

Schematic: 277 V.A.C.
Figure 28

Ladder Diagram: 277 V.A.C.
Figure 29



81872

Figure 26

Schematic:
208/230 V.A.C.

To convert the standard chassis to function with remote thermostat, connect the thermostat wiring (according to thermostat manufacturer's instructions) to the terminal block located on the module board. Move the dip switch #1 on the module board to the "ON" position. (See Figure 13.) Unit is capable of operating set-back (5-wire) thermostat.

NOTE: Connecting remote thermostat overrides the built-in thermostat and no digital read out will be displayed on the control panel. There is no need to disconnect the chassis' built-in thermostat.

Ladder Diagram:
208/230 V.A.C.

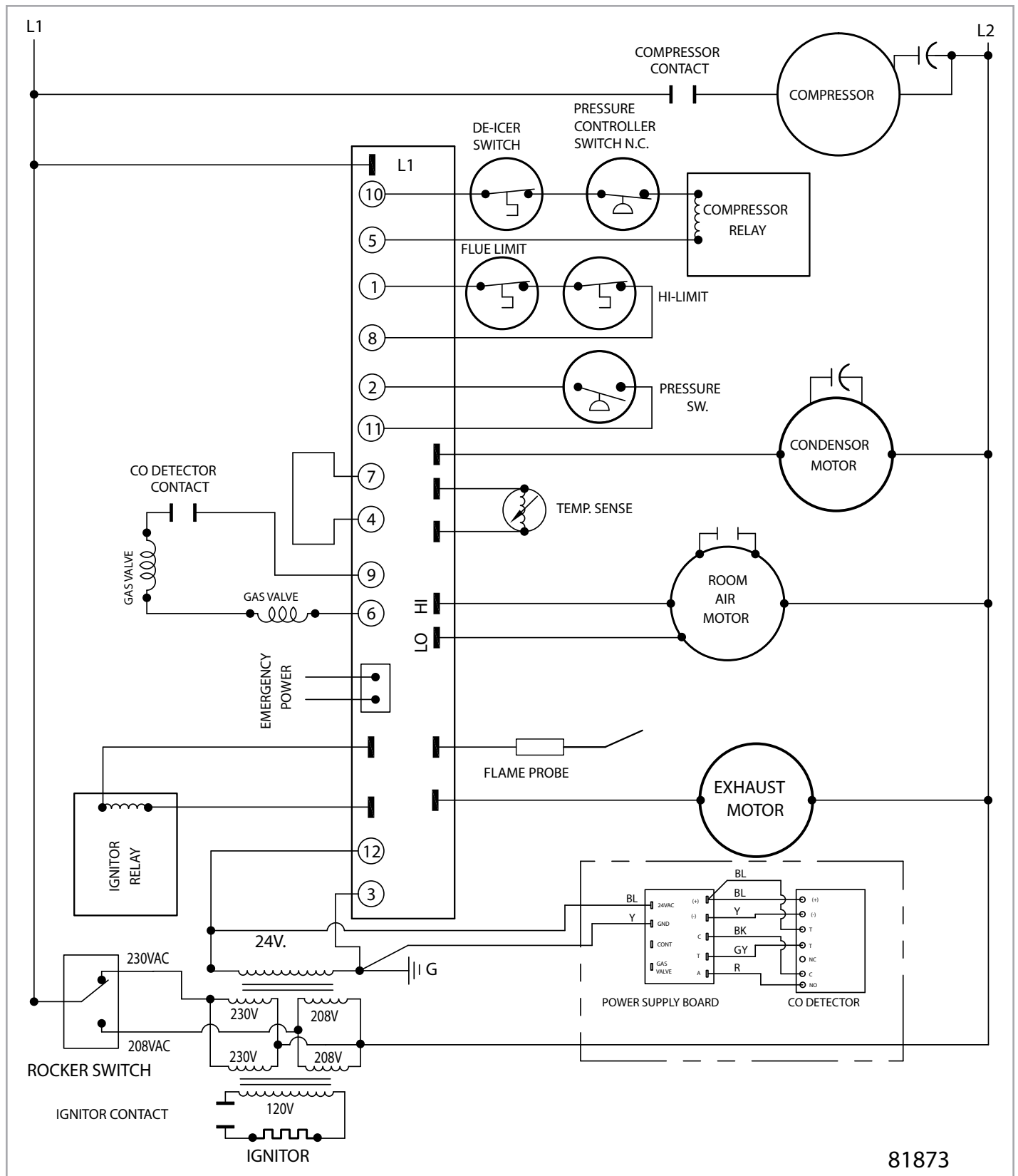


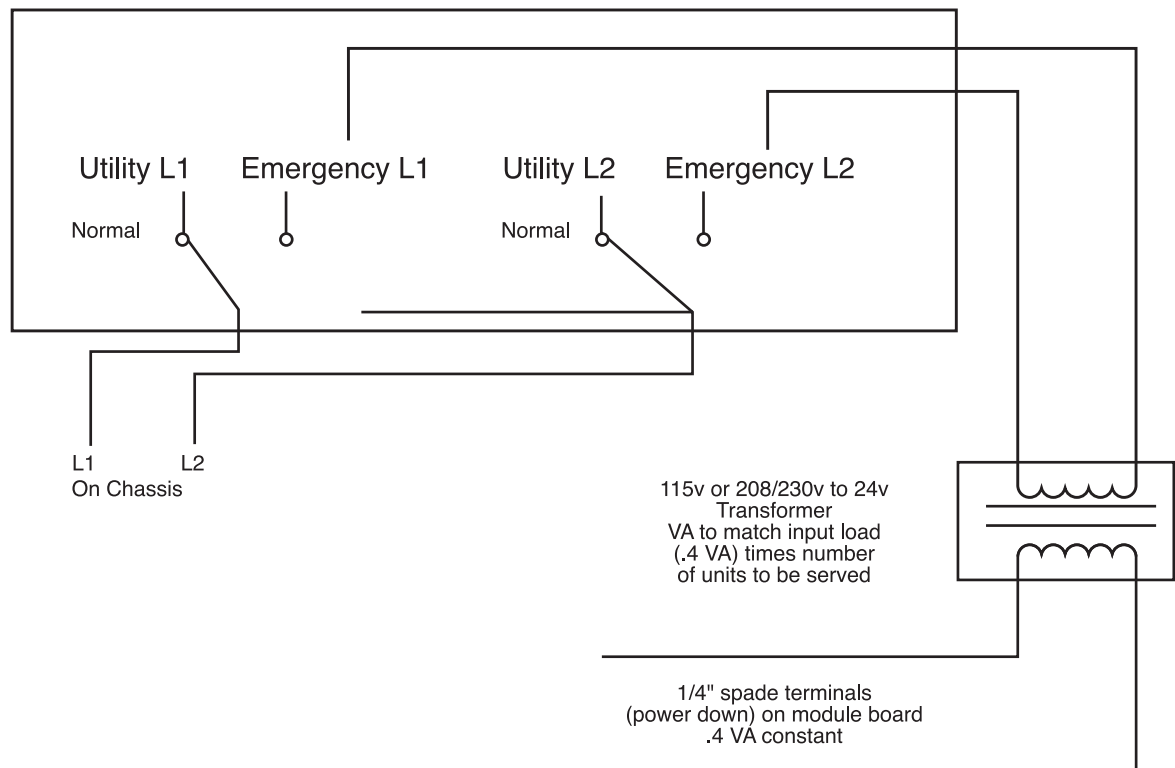
Figure 27

Connecting Dynaline™ 3 to a Standby Generator

A Dynaline™ 3 feature of particular importance to the nursing home/assisted living industry is its low amp draw in the heating cycle, made possible by its high efficiency gas heating. This creates an opportunity for the facility to install a smaller, less costly standby emergency power generator, without forfeiting zone temperature control on the heating cycle.

Dynaline 3 incorporates an A/C compressor lock-out capability. This feature allows the compressor circuit to be locked out when facility power is supplied by a standby emergency power generator. This is done by routing 24-volt lead wires from a 208/230/24 V.A.C. transformer (NOTE: Field supplied transformer to be powered by the standby generator.) to the 1/4" spade terminals on the module board. (See **Figure 30** for Ladder Diagram of typical standby generator electric service.)

LADDER DIAGRAM FOR SUGGESTED FIELD WIRING FOR THE COMPRESSOR CUT-OUT CIRCUIT



Utility circuit size for 6 amp per unit maximum load.
Emergency generator size for 1.1 amp per unit maximum load.

Figure 28

UNIT CONTROLS AND THEIR FUNCTIONS

High Limit Switch

This switch turns the gas to the main burner off if, for any reason, the heating section of the unit approaches an unsafe temperature level. Cycling on limit does not always indicate a defective limit switch. If the circulating air is blocked or only partially so, the limit control will function and cause the main burner to go off. Cycling on limit may not be undesirable, particularly if it happens only occasionally and on a warm day. If cycling happens too often or for an extended period, the circulating air system should be thoroughly cleaned.

If the limit switch is determined to be defective, it must be replaced. Never attempt to repair it, and never shunt the limit switch – even for only temporary operation.

Flue Block Limit Switch

This switch turns the gas to the main burner off if the flow of exhaust gases through the unit's vent system is obstructed creating an unsafe condition.

If the limit switch is determined to be defective, it must be replaced. Never attempt to repair it, and never shunt the limit switch – even for only temporary operation.

Pressure Switch

This switch senses the air pressure generated by the combustion air blower. When the pressure is adequate to support combustion, the contacts in the switch close, completing the circuit to the input of the module board. This activates the ignition sequence. If the pressure is not sufficient to support combustion, the switch will not operate. Possible causes: (1) slow combustion air motor, (2) restriction in the combustion air intake, (3) loose hose, or (4) blockage in connecting hose.

Fresh Air Vent

This introduces outside air into the living area during unit operation. The control rod is located in the lower left front corner of the chassis. To gain access to the control rod, the cabinet front must be removed. (See **Figure 30.**)

NOTE: Operating the unit with the vent open could reduce efficiency of the unit in both heating and cooling modes.

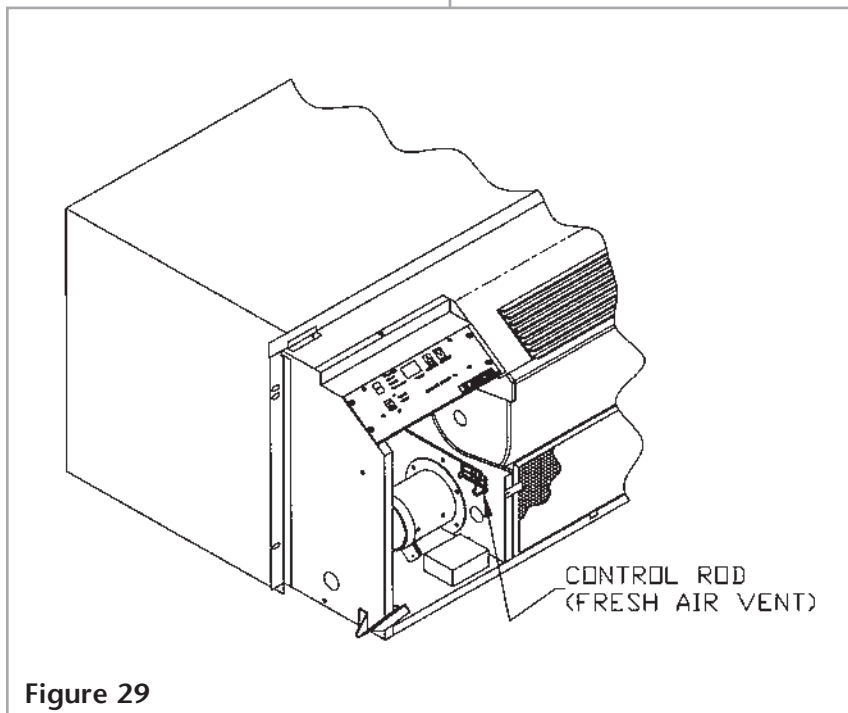


Figure 29

OPERATING INSTRUCTIONS

Built-in Thermostat Control - Heat Mode

Initial Lighting Instructions

1. Open the manual shut-off valve. The valve is fully open when the handle is level or parallel to the gas line. Never attempt to operate unit with manual valve partially closed.
2. Depress "System" key pad until heat lamp is illuminated. (See **Figure 32**.)
3. Depress "Fan" key pad until desired speed lamp is illuminated. (See **Figure 32**.)
4. Set thermostat to desired setting by depressing temperature-indicating arrows until desired temperature is displayed.
5. If the thermostat circuit is closed at the setting chosen in Step #4, the ignition sequence begins. After approximately 20-25 seconds, the main burner should be established.
6. After ignition, the operation of the unit will be controlled automatically by the thermostat.

To Shut Down for an Extended Period of Time

1. Depress "System" key pad until standby lamp is illuminated.
2. Close manual shutoff valve.

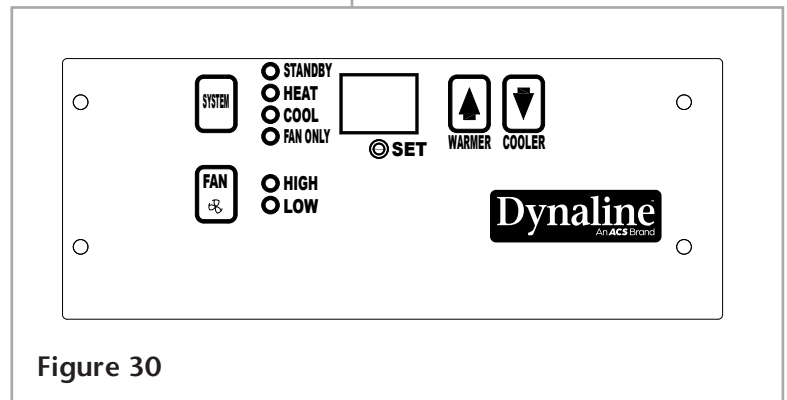
Sequence of Normal Operation - Heat Mode

1. When heat is required, the thermostat closes and energizes the combustion air motor and the supply air motor.
2. As the blower reaches approximately 90% of the normal RPM, the pressure created by the combustion air motor causes the diaphragm in the pressure switch to move, closing the contacts. This completes the electrical circuit to the input of the module board and a 10-second warm-up period for the glo-bar is established. During the warm-up period, the glo-bar comes on for 10 seconds, then the valve opens. The glo-bar remains on another 3 seconds after the valve opens and then goes off. When the valve opens, it will remain open for 6 seconds. Gas will flow to the burner and be ignited by the glo-bar.
3. If the main burner flame is sensed, the burner will remain on until the thermostat is satisfied. If the flame is not sensed, the gas valve closes and the ignition sequence is automatically repeated two (2) times. If the burner does not light during this trial for ignition period, the unit will lock out for one (1) hour and then re-set automatically.

NOTE: If lock-out should occur, the unit can be re-set manually by selecting Standby and then selecting Heat Mode. The ignition procedures can now be repeated. Should repeated lock-out occur, shut unit down and contact service agency.

4. When the thermostat is satisfied, the valve closes. The combustion air motor will remain on for a 30-second purge cycle, then goes off. The room air blower will continue to operate for approximately 90 seconds at which time the circuit is opened and the room air blower goes off.

DIGITAL KEY PAD CONTROL



Built-in Thermostat Control – Cooling Mode

1. Depress “System” key pad until cool lamp is illuminated. (See **Figure 32.**)
2. Depress “Fan” key pad until desired speed lamp is illuminated. (See **Figure 32.**)
3. Set thermostat to desired setting by depressing temperature-indicating arrows until desired temperature is displayed.
4. If the thermostat circuit is closed at the setting chosen in Step #3, the cooling cycle begins.

NOTE: On initial start-up, the compressor will not be energized for five (5) minutes even though the system functions have been properly selected. This is to protect the compressor. This feature can be overridden by pressing the “System” and “Cooler” pads at the same time.

NOTE: Whenever the outside temperature is below 65°F and the humidity is high, frost could form on the evaporator coil during extended cooling operation. To eliminate frost formation, a de-ice switch in the compressor circuit will sense a frost condition and open the compressor circuit. Upon temperature rise, the switch will close and the compressor will again come on provided that the thermostat is still calling for cooling.

NOTE: Dynaline™ 3 has a built-in 5-minute delay between compressor cycles. Anytime the compressor cycle is interrupted either manually, through the thermostat, a power interruption, etc., the compressor will not restart for 5 minutes. Also, the A/C compressor has a minimum one-minute run time.

Remote Thermostat Control – Heat Mode

Initial Lighting Instructions

1. Set wall thermostat to “Heat Mode.”
2. Open the manual shut-off valve. The valve is fully open when the handle is level or parallel to the gas line. Never attempt to operate unit with manual valve partially closed.
3. Set the wall thermostat at desired setting.
4. Select AUTO/FAN operation.
5. Using the “System” key pad, depress “Fan” key until desired speed lamp is illuminated.

NOTE: When Dynaline 3 is controlled by a wall thermostat, the sequence of operation is the same as with built-in thermostat control; however, the temperature setting and system functions are selected at the wall thermostat.

To Shut Down for an Extended Period of Time

1. Move selector on thermostat to “STOP” or “OFF” position.
2. Close manual shut-off valve.

Remote Thermostat Control – Cooling Mode

1. Set wall thermostat to “Cool Mode.”
2. Set wall thermostat at desired setting.
3. Select AUTO/FAN operation.
4. Using the “System” key pad, depress “Fan” key until desired speed lamp is illuminated.

NOTE: When Dynaline™ 3 is controlled by a wall thermostat, the sequence of operation is the same as with built-in thermostat control; however, the temperature setting and system functions are selected at the wall thermostat.

NOTE: On initial start-up, the compressor will not be energized for five (5) minutes even though the system functions have been properly selected. This is to protect the compressor. This feature can be overridden by pressing the “System” and “Cooler” pads at the same time.

NOTE: Whenever the outside temperature is below 65°F and the humidity is high, frost could form on the evaporator coil during extended cooling operation. To eliminate frost formation, a de-ice switch in the compressor circuit will sense a frost condition and open the compressor circuit. Upon temperature rise, the switch will close and the compressor will again come on provided that the thermostat is still calling for cooling.

NOTE: Dynaline 3 has a built-in 5-minute delay between compressor cycles. Anytime the compressor cycle is interrupted either manually, through the thermostat, a power interruption, etc., the compressor will not restart for 5 minutes. Also, the A/C compressor, once started, will run for 1 minute even if the cooling mode is switched off.

OPERATING TIPS

Heat Mode or Cooling Mode

1. At times it may be desirable to reduce the operating sound level. This is possible by selecting “Low” fan speed. (See **Figure 31.**)
2. Circulation of room air with no heat or cooling may be obtained if desired. To accomplish this, select the “Fan Only” position on the “System” key pad.
3. Operate unit with the fresh air vent in the closed position except when introduction of outside air into the room is desired.
4. Clean filter as part of regular maintenance.
5. Have regular professional maintenance to clean burners and ensure proper performance.
6. Keep windows and doors closed. Conditioned air escapes when they are open.
7. Operate at high fan speed during extremely hot or cold weather.
8. Keep outdoor condenser coil clean.
9. Turn the unit off during vacations or extended absences.

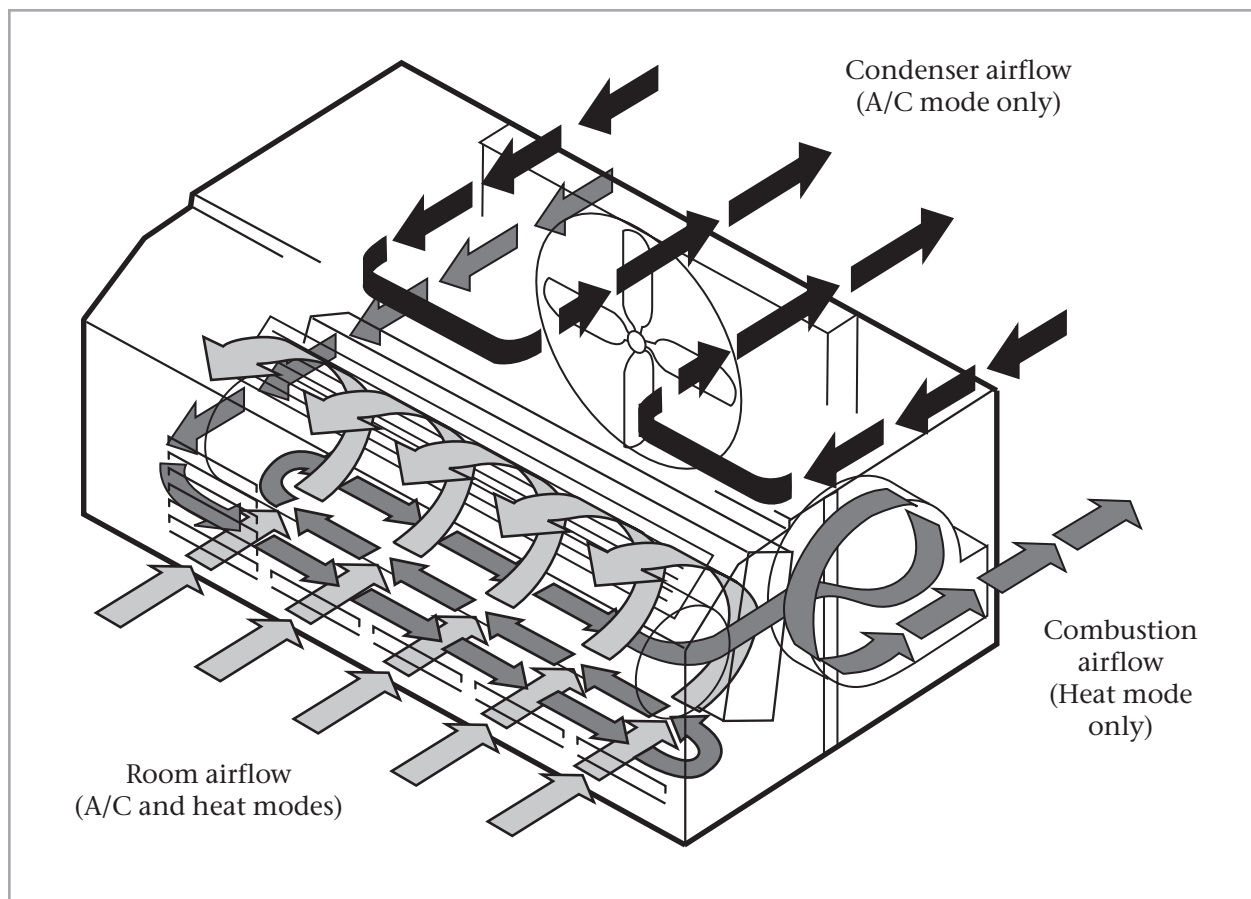
ACCESSORY DESCRIPTION REVIEW

All optional and field installed

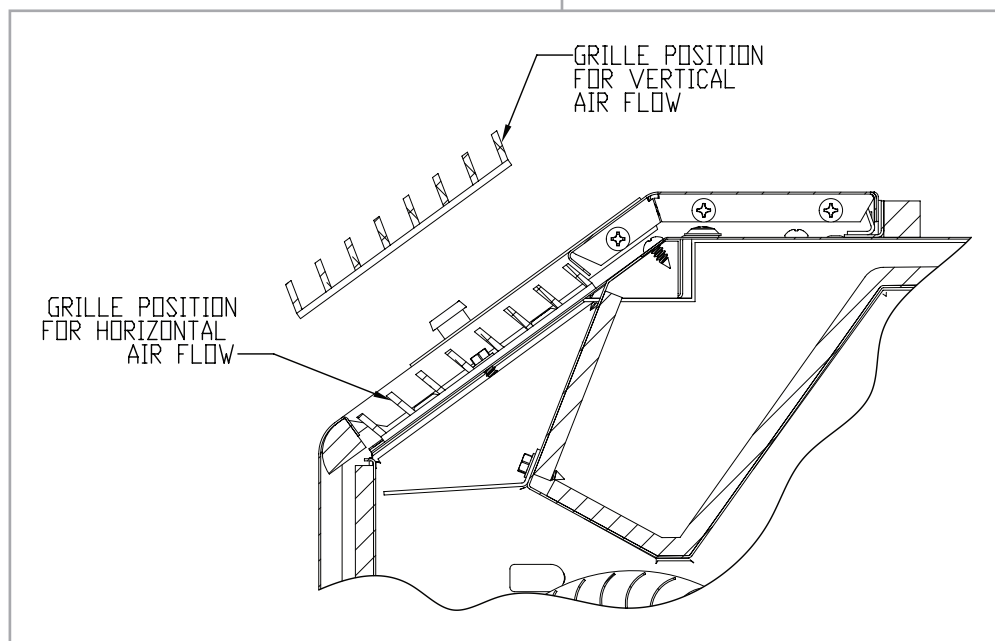
DESCRIPTION

- Wall Sleeve (knockdown)
- Rear Grille – Standard Aluminum Anodized
- Rear Grille – Dark Bronze Extruded Aluminum
- Rear Grille – Clear Anodized Extruded Aluminum
- Air Discharge Lateral Adaptor
- Air Discharge Lateral Connector – 43"
- Air Discharge Lateral Extension – 43"
- Rear Gas Connection Kit – Field Installed
- 2-PSIG Regulator
- Leveling Legs, Set of 2 each
- Decor Base Panel (conceals gas/electric connections)
- Condensate Drain Kit
- Wall Thermostat 24 VAC heat/cool
- 88" Line Cord Accessory (Use with Dynaline 3 chassis when replacing DL/DLII units in retrofit applications where the electrical receptacle is more than 20" right of wall opening.)

DYNALINE™ 3 AIRFLOW



The room air discharge grille can be installed to deliver room discharge air either horizontally or vertically. The grille is installed from the factory to deliver horizontal air flow. To change the airflow to vertical, simply remove the grille and reinstall in the opposite position.



DYNALINE LIMITED WARRANTY

Marvair Inc., warrants its Dynaline to be free from defects in materials and workmanship under normal use to the original purchaser for the period of time in the table below. If any part of your Dynaline product fails within 24 months from the date of the original start-up, Marvair will furnish without charge, EXW Cordele, Georgia, the required replacement part. The owner must provide proof of the date of the original start-up. The contractor's invoice, the certificate of occupancy, or similar documents are examples of acceptable proof of the date of the original start-up.

| Dynaline |
|--|
| 90 Days ¹ DOA (Dead on Arrival) labor coverage (<i>See Dynaline Flat Rate Labor Guidelines</i>) |
| 2 Year Parts ONLY Warranty on Entire Unit ^{2,3} |
| Additional 3 Years Parts Only coverage on the Compressor ³ |
| Additional 8 Years Parts Only Coverage on the Heat Exchanger ^{2,3} |

¹If any part of your Dynaline unit fails within 90 days of the commencement of the warranty, Marvair, Inc. will furnish without charge, EX Works, Cordele, Georgia, the required replacement part and pay for the labor to replace the part in accordance with the Dynaline Flat Rate Labor Guidelines.

²All OTR (over the road) applications that are moved from one location to another: Factory Warranty applies only up to the point of initial start-up and test at all OEM manufacturing locations or subsequent facility. Once it goes into OTR service, the warranty expires immediately for compressor and sealed system components. This OTR exemption does not apply to relocatable classrooms, construction or office trailers.

³All warranty replacement parts shall be shipped Ground only. Expedited shipping is available upon request for additional cost.

The responsibility of the equipment owner includes:

1. To operate the equipment in accordance with the manufacturer's instructions.
2. To provide easy accessibility for servicing.
3. To check and reset any circuit breaker(s) and/or disconnect(s) prior to calling for service.
4. To keep the unit clean and free of dirt and containment and replace filters as required.
5. To keep the outdoor coil clean and free of leaves, paper, or other debris.
6. To pay the charges incurred when any of the above have not been done.
7. To pay for repair or replacement of any material or part other than those within the Marvair, Inc. unit or controller.

Marvair, Inc., will not be responsible for labor after 90 days, transportation costs, delays or failures to complete repairs caused by events beyond our control (labor hours incurred due to required site-specific training, time waiting to gain access, or extended drive time for remote sites). This warranty does not cover:

1. Any transportation, related service labor, diagnosis calls, filter, driers, refrigerant, or any other material charges.
2. Damages caused by shipping, accident, abuse, negligence, misuse, fire, flood, or Acts of God.
3. Damages caused by operating or staging the unit in a corrosive environment.
4. Damages caused by improper application of the product.
5. Damages caused by failing to perform proper routine maintenance.
6. Expenses incurred for erecting, disconnecting or dismantling the product or installing the replacement part(s).
7. Products not installed or operated according to the included instructions, local codes, and good trade practices.
8. Products moved from the original installation site.
9. Products lost or stolen
10. Consequential damages or incidental expenses including losses to persons, property or business.
11. Modifications to original unit after it leaves the factory, such as breaking into any part of the sealed systems unless authorized in advance in writing by Marvair, Inc..
12. Damages as a result of operating as a construction site cooler / dehumidifier.

When service is required, it must be performed during normal working hours (8:00 AM - 5:00 PM) Monday - Friday and must be performed by Marvair Inc., personnel or a designated Service Representative.

The owner of the product may ship the allegedly defective or malfunctioning product or part to Marvair Inc., at such owner's expense, and Marvair Inc., will diagnose the defect and, if the defect is covered under this warranty, Marvair Inc. will honor its warranty and furnish the required replacement part. All costs for shipment and risk of loss during shipment of the product to Marvair Inc. and back to the owner shall be the responsibility and liability of the owner. Upon written request by an owner, Marvair Inc. may arrange for remote diagnosis of the allegedly defective or malfunctioning product or part but all costs for transportation, lodging and related expenses with regard to such diagnostic services shall be the responsibility and liability of the owner.

An owner requesting performance under this Warranty shall provide reasonable access to the allegedly defective or malfunctioning product or part to Marvair Inc. and its authorized agents and employees.

THIS WARRANTY CONSTITUTES THE EXCLUSIVE REMEDY OF ANY PURCHASER OF A MARVAIR HEAT PUMP OR AIR CONDITIONER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR USE, TO THE FULLEST EXTENT PERMITTED BY LAW. IN NO EVENT SHALL ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR USE EXCEED THE TERMS OF THE APPLICABLE WARRANTY STATED ABOVE AND MARVAIR SHALL HAVE NO OTHER OBLIGATION OR LIABILITY. IN NO EVENT SHALL MARVAIR BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OR MONETARY DAMAGES.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE-TO-STATE. Some states do not allow limitations or exclusions, so the above limitations and exclusions may not apply to you.

03/16/2020 New

IF YOU HAVE A PRODUCT PROBLEM

FIRST: Contact the installer of the equipment or the selling dealer for warranty service. You may find his name on the product or with your homeowners manual. If his name is not known, call your builder or general contractor if yours is a new structure.

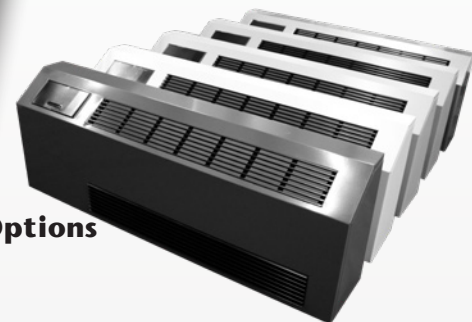
SECOND: Contact the Dynalene distributor who supplied the product to the installer/dealer.

THIRD: Contact:
Dynalene - Customer Service Department
156 Seedling Drive
Cordele, GA 31015
(229) 273-3636
Fax: (229) 273-5154
www.DynaleneHVAC.com



Dynaline™ 3 PTAC:

A Proven Payback In Utility Savings



Standard Color Options

1. Marvair Beige
2. Pebble Gray
3. White
4. Gray

*Stainless Steel and custom powder coating are also available¹.
¹Minimum order quantities required.*

High-Efficiency Rotary Compressor:

Reliable and quiet-running design. Dynaline's gas heat PTAC design does not use the compressor during heating cycles.

Copper and Aluminum Evaporator and Condenser Coils:

For longer life and ease of repair. Coils use seamless copper tubing mechanically expanded into aluminum plate fins.



Attractive Stamped Aluminum or Architectural-style Louvered Grilles:

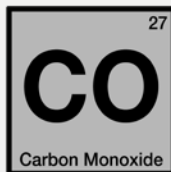
Custom-colored architectural grilles are available to match your building's decor.

Gas Heat Exchanger:

Provides economical gas heating backed by a 5-year limited warranty.

Standard Carbon Monoxide Detector:

An integrated carbon monoxide (CO) detector is standard on all Dynaline 3 models. It has been verified to perform in the detection of carbon monoxide up to 12,000 ft above sea level and will alarm within the time specified by ANSI/UL 2034 for carbon monoxide concentrations of 70, 150 and 400 parts per million (ppm).



Condensate Removal:

Condenser fan draws condensate from bottom. Warm condenser air, combined with coil temperature, accelerates the evaporation process. Positive drain kits are also available.

Weather Seals:

Sealing the chassis to the wall case, they prevent the infiltration of air, water and contaminants into the conditioned area.

Air Vent:

The manually-operated lever allows entry of 70 CFM of outside air into the comfort area.

Return Air Filter:

No tools are needed to install or remove the permanent electrostatic filter constructed of washable media.

Gas Connection (Front or Rear):

208/230V models available for Natural or LP gas (277V models are natural gas only), thus saving the cost of field conversion. Optional 2-lb. Natural gas regulator is available.

Room Air Discharge:

An attractive, durable grille constructed of extruded aluminum directs air laterally.

Tangential Blower Wheel:

Spans the length of the heating chamber and evaporator coil. Air flow is uniform over the system components, enhancing air distribution performance and system efficiency.

Digital Display:

Room ambient and set point temperatures are easy to read.

Unit Controls:

Each unit can be controlled by a built-in thermostat or reprogrammed to operate from an optional wall thermostat.

Electrical Components:

Located on the indoor side of the wall, they're protected from the weather.

Ignition:

The standard in gas heating, an electronically controlled, ceramic hot surface ignites the burner without standing pilot lights. Gas is conserved and safety is ensured.

Freeze Protection:

Forces heating operation in standby, cooling and fan-only mode when the interior temperature drops below 45°F to help protect pipes, plumbing fixtures and sprinkler systems from freeze damage. Enabled by default, but can be disabled. If a remote wall-mount thermostat is used, be sure to select one that is compatible with this feature.

Economical Gas Heat Provides Comfort to Those Who Need it the Most

For Senior Housing, Hotels/Motels, Apartments And Other Applications

Elderly senior housing and assisted living facility residents require controlled cool summers and warm winters. Because typical systems don't readily adapt to extremes in temperature, warmer, dry gas heat is preferred for its therapeutic effect on residents' respiratory systems. Electric cooling, in turn, is preferred for its rapid response to adjustments. Housing for seniors and the elderly remains expensive because of the necessity for near-hospital-quality security and facility extras not required in normal residential housing. Dynaline 3 adds the option of lowering utility expenses by using economical gas heating with electric cooling units.

Low Heating Amp Draw — The Dynaline 3 consumes about 1 amp during the heating cycle; while all-electric PTACs consume much more. In the event of a power failure, less power is used by the Dynaline 3 so the standby generator can be downsized, thus reducing construction costs.

Compressor Lock-Out — The standard design provides means of locking out the A/C compressor when the standby power generator is operating. The electronic control board has 24V input terminals to receive the lock-out signal.

Better Comfort for Residents — Faster increase in temperature than an all-electric unit.

The Dynaline³ Difference

The DynalineTM 3 is a Packaged Terminal Air Conditioner (PTAC) that combines economical gas heating and high-efficiency electric cooling in one compact unit for zone temperature room-by-room control. By comparing the operating costs of Dynaline 3 to heat pumps or electric resistance heat, a savings of hundreds of dollars per room every year can be achieved.

Dynaline 3 provides warm gas heat

In cooler climates, particularly, warm gas heat is preferred. The 11.2 EER provides high-efficiency air conditioning to cool areas economically.

Dynaline 3 is a versatile PTAC

Four BTU/h capacities are available, operating efficiently and economically in zone systems. All have individual controls, and operating costs can be controlled by setting the control at a maintained, desired comfort level, or interfacing into an energy management system.

Dynaline 3 is easy to install

Because of its compact size and standard 42" x 16" wall case, the Dynaline 3 can be specified in new construction or as replacement for obsolete electric resistance or heat pump units.

Dynaline 3 fits any decor

The Dynaline 3 PTAC features a modern, compact, and sleek design. Four standard colors, stainless steel and custom options to match any decor. Small and snug against the wall, it complements any room without commanding attention.



Please consult the Dynaline Manufacturing website at www.DynalineHVAC.com for the latest product literature. Detailed dimensional data is available upon request. A complete warranty statement can be found in each product's Installation/Operation Manual, on our website. As part of the Dynaline continuous improvement program, specifications are subject to change without notice.

Manufactured by:



Marvair
An ACS Brand

P.O. Box 400 • Cordele, GA 31010
156 Seedling Drive • Cordele, GA 31015
Ph: 229-273-3636 • Fax: 229-273-5154
Email: marvair@airxcs.com