LENNOX®

ENGINEERING DATA

COOLING & GAS HEAT

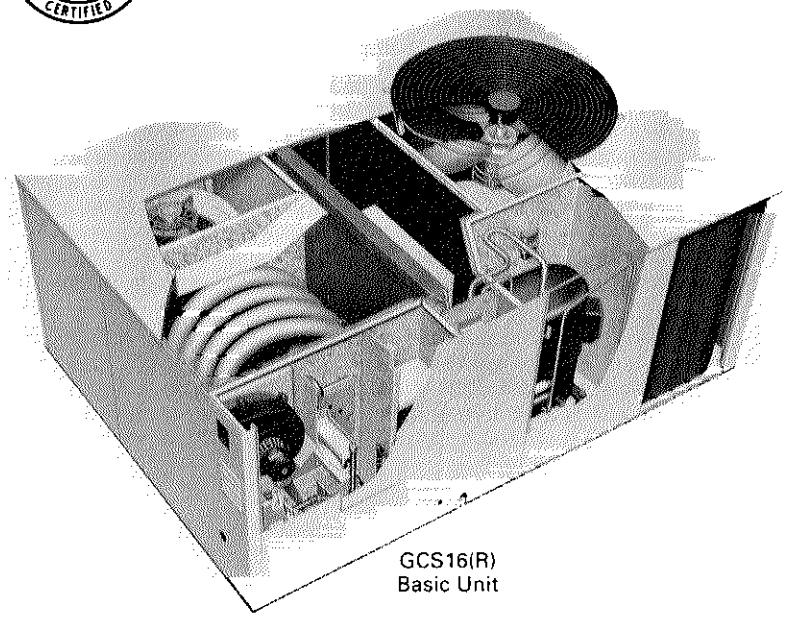
GCS16-261-311 & GCS16(R)(X)-410-510-650 PACKAGED UNITS — COOLING & GAS HEAT

GCS16(R)(X) (2 to 5 Ton)

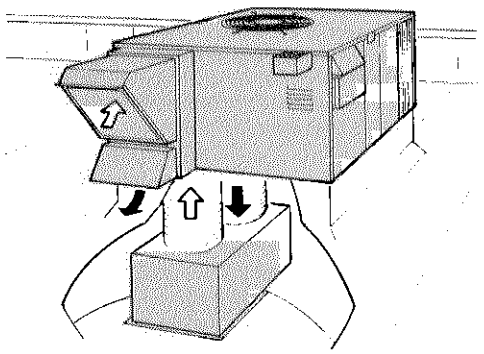
23,200 to 58,500 Btuh Cooling Capacity
50,000 to 125,000 Btuh Input Heating Capacity

*ARI Standard 210/240 Ratings

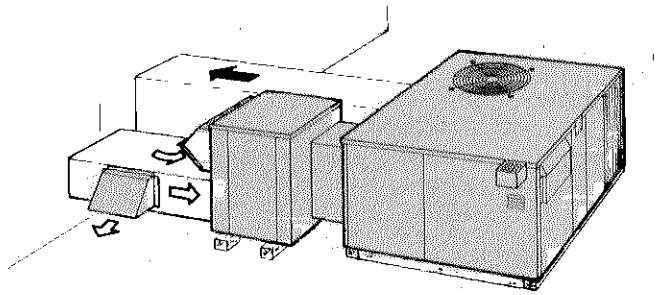
Bulletin #480023
February 1993
Supersedes July 1991



GCS16(R)
Basic Unit



GCS16 Rooftop Installation With Combination Supply and Return Air System



GCS16 Rooftop Installation
With Horizontal Economizer

Application — Lennox GCS16(R)(X) DX cooled and gas fired all season units are designed for outdoor rooftop or ground level installations in residential or light commercial applications. Units are capable of delivering bottom (down-flo) or side (horizontal) handling of supply and return air. GCS16(R) models are available in five models, single and three phase voltage with 50,000 to 125,000 Btuh input heating capacity and 23,200 to 58,500 Btuh cooling capacity.

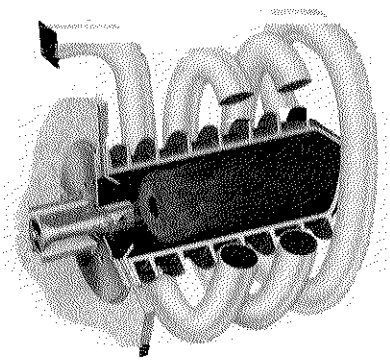
The GCS16-261-311-410-510-650 single and three phase voltage models are available with a choice of thermostat and related controls which include: electro-mechanical, W973, T7300, W7400 and Prostat. In addition a factory installed commercial controls platform consisting of: control system and economizer wiring harness is furnished as standard. The commercial controls platform and related control systems are not available on the GCS16R models.

Optional accessories include: LPG conversion kits (non "X" models), lifting lug kit (GCS16R), condenser coil guards, down-flo filter adaptor kit (GCS16R), roof mounting frames, stand-off mounting kit, down-flo or horizontal economizer dampers with modulating or 3 position damper motor, step-down or flush ceiling supply and return air diffusers, and manual outdoor air dampers. See Specification tables.

Approvals — Units are design certified by A.G.A. and ratings are certified by GAMA. Heating ratings are according to Department of Energy (DOE) test procedures and Federal Trade Commission (FTC) labeling regulations. Complies with ANSI safety codes. Cooling system has been rated in the Lennox environmental test room according to DOE test procedures and in accordance with ARI Standard 210/240-89. In addition, units have been sound rated in the Lennox reverberant sound test room in accordance with ARI Standard 270-84. All -50 & -75 input and all "X" models meet California Nitrogen Oxides (NO_x) standards. Units meet California Seasonal Efficiency requirements. Blower data is according to actual unit tests conducted in the Lennox air test chamber. In addition, each unit is test operated at the factory before shipment to ensure dependable field performance.

Equipment Warranty — Heat exchangers have a limited warranty for a full fifteen years. Compressors have a limited warranty for a full five years. All other covered components have a limited warranty for five years (single phase units only) in residential installations and one year (all single and three phase units) in non-residential installations. Refer to the Lennox Equipment Limited Warranty certificate included with the unit for additional details.

Durable and Compact Heat Exchanger — Lennox designed heat exchanger has a ductile cast iron cylindrical primary and a helical aluminized steel tube secondary. Finned and cast iron primary provides excellent heat radiation with total air coverage of entire surface area. Precisely sized and shaped tubular secondary is constructed of aluminized steel for superior resistance to corrosion and oxidation. Helical tube design allows complete exposure to air stream resulting in maximum heat transfer with minimum resistance. Compact overall design of heat exchanger reduces valuable space requirement in the cabinet resulting in a trim and space efficient unit. Removable cabinet access panel allows service access. Laboratory life cycle testing proves long life of heat exchanger.



NOTE — Specifications, Ratings and Dimensions subject to change without notice.

FEATURES

Heating System — Aluminized steel inshot burner provides efficient, trouble free operation, unaffected by adverse wind or atmospheric conditions. Burner venturi mixes air and gas in correct proportion for proper combustion. Burner may be removed for service. Stainless steel flame spreader fits flame to combustion chamber resulting in uniform heat distribution. 24 volt redundant combination control gas valve combines a manual main shut-off valve, pressure regulation and automatic electric valve (dual) into one compact control. Solid-state electronic direct spark ignition system provides positive and safe main burner ignition. Spark is intermittent and occurs only when required. Electronic flame sensor controls assure safe and reliable operation. Should loss of flame occur, flame sensor controls will initiate 3 to 5 attempts at re-ignition before locking out unit operation. Induced draft blower prepurges heat exchanger and safely vents flue products. Centrifugal switch proves blower operation before allowing gas valve to open. Induced draft blower operates only during heating cycle. Flame rollout switch protects against loss of combus tion air due to flue vent or intake air blockage. Peep hole with cover is furnished in cabinet access panel for flame viewing.

Fan and Limit Controls — Factory installed and accurately located. Fan control has adjustable temperature setting. Limit control has fixed temperature setting and protects heating system from abnormal operating conditions.

Weather Resistant Cabinet — Rugged cabinet is constructed of heavy gauge galvanized steel. Cabinet is subject to a five station metal wash process resulting in a perfect bonding surface for the paint finish of powder enamel, electrostatically bonded to the metal. Large removable cabinet panels allow service access. Base section and cabinet panels exposed to conditioned air are lined with thick fiberglass insulation. Supply and return air openings have flanges for ease of duct connection. Control box with factory installed controls is conveniently located for service access. A low voltage terminal strip is furnished and factory installed with GCS16-261-311-410-510-650 models. Electrical and gas line inlets are furnished for entry into the cabinet. Field installed flue outlet is constructed of durable aluminized steel. Evaporator coil drain pan is constructed of corrosion resistant galvalume and is equipped with a galvanized pipe (mpt) drain outlet.

Refrigeration System — Complete factory sealed refrigeration system consists of: compressor, condenser coil and fan, evaporator coil and blower, liquid line strainer, suction and liquid line service gauge ports and full operating charge of refrigerant. GCS16(R)-510 and -650 models have an expansion valve and thermometer well. GCS16-261-311-410-510-650 models have factory installed high pressure switch, loss of charge switch and compressor crankcase heater.

Dependable and Quiet Compressor — Rugged and reliable compressor is hermetically sealed, suction cooled, overload protected and equipped with internal pressure relief valve. Built-in protection devices assure protection from excessive current and temperature. The entire running gear is spring mounted within the sealed housing. In addition, the compressor is installed in the unit on resilient rubber mounts assuring quiet and vibration free operation. GCS16 non "R" model compressors have a immersible self-regulating type crankcase heater. Heater is temperature actuated to operate only when required and ensures proper lubrication at all times.

Copper Tube/Enhanced Fin Evaporator and Condenser Coils — Extra large surface area and circuiting of Lennox designed coils provide maximum cooling efficiency, excellent heat transfer and low air resis tance. Coils are constructed of precisely spaced ripple-edged aluminum fins fitted to durable copper tubes. Fins are equipped with collars that grip tubing for maximum contact area. Lanced fins provide maximum exposure of fin surface to air stream. Flared shoulder tubing connections and silver soldering provide tight, leakproof joints. Long life copper tubing is easy to field service. Coil is thoroughly factory tested under high pressure to insure leakproof construction. Evaporator coils feature rifled copper tubing for superior refrigerant flow resulting in maximum heat transfer.

Powerful Blower — Units are equipped with direct drive centrifugal blower precisely matched to the unit for maximum efficiency and minimum noise level. Blower is statically and dynamically balanced as an assembly before being installed in the unit. Multiple speed permanent split capacitor (PSC) motor is resiliently mounted. A choice of blower speeds is available, see blower performance tables. Change in blower speed is easily accomplished by a simple field change in wiring.

Efficient Condenser Fan — Direct drive fan draws air through the condenser coil and discharges it vertically, up and away from the building. Fan orifice design and low fan tip speed keeps operating sound level at a minimum. Uniform air movement through the coil results in high refrigerant cooling capacity. Permanently lubricated, inherently protected, PSC motor is totally enclosed for maximum protection from rain, dust and corrosion. All models are equipped with a corrosion resistant PVC coated steel wire fan guard.

Air Filters (Furnished on GCS16 non "R" Models Only) — Cleanable polyurethane one inch thick filter and filter rack is furnished for field installation in GCS16 non "R" models for down-flo applications. Filter rack will accept up to two inch thick filter. For horizontal applications without economizer, filter must be field installed in return air duct. DF16 Down-flo Filter Adaptor is available for GCS16R models and must be ordered extra.

Commercial Controls Platform (GCS16 non "R" Models) — A commercial controls platform is furnished and factory installed on the GCS16-261-311-410-510-650 single and three phase voltage models. This control platform consists of: control system and economizer wiring harness with jack plug connections. The wiring harness facilitates installation of the control system and economizer dampers. A choice of several systems are available, see page 4.

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

Thermostat (Optional) — Thermostat is not furnished with the GCS16R models and must be ordered extra. See thermostat bulletin in Accessories section and Lennox Price Book. For thermostat and related controls for the GCS16-261-311-410-510-650 single and three phase voltage models see page 4.

LPG Conversion Kits (Optional) — For LPG field models a conversion kit is required for field changeover from natural gas. Kit is not furnished and must be ordered extra. See Specifications tables. Not available for "X" models.

Low Ambient Kit (Optional for -510 & -650 Models Only) — Units will operate satisfactorily in the cooling mode down to 45°F outdoor air temperature without any additional controls. For cases where operation of the unit in the cooling mode is required at low ambients, a Low Ambient Control Kit LB-57113BC **(24H77)** can be added in the field, enabling it to operate properly down to 30°F. Kit must be ordered extra.

Timed-Off Control (Optional) — Timed-off control LB-50709BA **(32F21)** is available for field installation. Prevents compressor short-cycling and also allows time for suction and discharge pressure to equalize on GCS16-261-311 & GCS16(R)-410 models, permitting the compressor to start in an unloaded condition. Automatic reset control provides a time delay between compressor shutoff and start-up.

Condenser Coil Guards (Optional) — PVC coated steel wire coil guards are available and must be ordered extra. GCS16-261-311 & GCS16(R)(X)-410 models require 2 per unit, LB-82199CB **(24H16)**. GCS16(R)-510-650 models require 3 per unit, LB-82199CC **(24H17)**. Correct number of guards are furnished per order number.

Compressor Crankcase Heater (Optional for GCS16R Models Only) — Heater P-8-8852 **(68887)** field installs on GCS16R models and must be ordered extra. Prevents migration of liquid refrigerant into the compressor and assures proper compressor lubrication. Heater is furnished as standard in compressor on the GCS16-261-311-410-510-650 single and three phase models.

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

RMF16 Roof Mounting Frame (Optional) — Roof mounting frame mates to the unit and provides a weather sealed rooftop installation. Shipped knocked down for ease of shipping and handling, it is easily field assembled. A wood nailer strip is secured to the frame sides to facilitate flashing. Design is approved by the National Roofing Contractor's Association. RMF16-41 may be used with all sizes of GCS16 models with slight unit overhang on the -510 and -650 models. RMF16-65 frame exactly matches the GCS16-510 & 650 models.

REMD16 Economizer (Optional for GCS16 non "R" Models Only) — Economizer field installs directly in GCS16 unit cabinets. See dimension drawings. Economizer consists of: cabinet constructed of heavy gauge steel with a baked-on enamel paint finish, outdoor air intake hood, combination outdoor air and recirculated air dampers with pressure operated gravity exhaust air damper. Formed damper blades rotate smoothly in nylon bearings and are gasketed for a tight seal. The economizer dampers and controls are shipped factory assembled, adjusted and cycled and only require plug-in connection. The positioning of the outdoor and recirculated air dampers is accomplished by a 24 volt three position spring return damper motor with adjustable minimum position switch and controlled by the room thermostat, electronic discharge air sensor and solid-state adjustable outdoor air enthalpy control. The enthalpy control allows 0 to 100% outdoor air to be used for "free cooling" when outdoor temperature and humidity are acceptable. Indoor filter is not furnished with economizer. REMD16 utilizes filter furnished with GCS16 units. Filter rack will accept up to two-inch thick filter. See Air Resistance table, page 17 for resistance data of two-inch thick pleated non-woven cotton fabric filter or two-inch thick fiberglass media filter. Removable exhaust air hood allows access to filter. Outdoor air intake hood is field installed. A cleanable aluminum mesh frame filter in the outdoor air hood provides extra air filtering and bird screen protection.

REMD16M Economizer (Optional) — The REMD16M economizer damper section is identical to the REMD16 model except it is equipped with a fully modulating spring return damper motor. See Specifications table.

EMDH16 Horizontal Economizer (Optional for GCS16 non "R" Models Only) — The horizontal economizer section is shipped factory assembled, adjusted and cycled. Field installs on the unit and only requires plug-in connection. The economizer section consists of: heavy gauge steel cabinet with baked-on enamel paint finish, fully insulated with thick fiberglass insulation and recirculated air and outdoor air dampers. Formed damper blades rotate smoothly in nylon bearings and are gasketed for tight seal. The positioning of the outdoor and recirculated air dampers is accomplished by a 24 volt three position spring return damper motor with adjustable minimum position switch and controlled by the room thermostat, electronic discharge air sensor and solid-state adjustable outdoor air enthalpy control. The enthalpy controls allows 0 to 100% outdoor air to be used for "free cooling" when outdoor humidity and temperature are acceptable. A one-inch thick frame type disposable filter is furnished. Filter rack will accept up to two-inch thick filter. Removable panel allows easy access to filter. A cleanable aluminum mesh frame filter in the outdoor air hood provides extra air filtering and bird screen protection.

EMDH16M Economizer (Optional) — The EMDH16M horizontal economizer damper section is identical to the EMDH16 model except it is equipped with a fully modulating spring return damper motor. See Specifications table.

GEDH16-65 Gravity Exhaust Dampers (Optional) — Available for use with EMDH16 horizontal economizer assembly. Pressure operated assembly field installs in the return air duct adjacent to the economizer assembly. Exhaust dampers also have bird screen.

Differential Enthalpy Control (Optional) — A solid-state return air enthalpy sensor is available to be used in conjunction with the outdoor air enthalpy control to determine which air has the lowest enthalpy. The air with the lowest enthalpy will be selected. Return air enthalpy sensor **(54G44)** field installs in the REMD16 or EMDH16 economizer damper section and must be ordered extra.

OAD16 Manual Minimum Fresh Air Damper (Optional) — Built-in damper assembly is furnished in cabinet panel that field interchanges with existing blower access panel. Manually operated sliding damper allows entry of a fixed amount (0-25%) of outdoor air into the system. See dimension drawing. An outdoor air hood with cleanable filter media is also provided.

DF16 Down-Flo Filter Adaptor Kit (Optional for GCS16R Models Only) — Heavy gauge steel filter rails field install on down-flo return air opening. One-inch thick cleanable frame type filter is furnished as standard. Filter rails are designed to accept up to two-inch thick filter. See Air Resistance table, page 17 for resistance data of two-inch thick pleated non-woven cotton fabric filter or two-inch thick fiberglass media filter. Filter access is accomplished by removing unit blower access panel. See Specifications table for filter size.

Roof Curb Power Entry Kit (Optional) — Field installed kit is available for power entry to the unit through the roof mounting frame. Kit contains 40-inch length of armored conduit and necessary installing hardware. Knockouts in side of roof mounting frame are provided for ease of installation. See dimension drawing. Two kits are required, one for low voltage and one for high voltage. Kits must be ordered extra. Order kit no. **(18H70)** 1/2 inch.

Lifting Lug Kit (Optional for GCS16R Models Only) — Field installed kit LB-62125DB **(44H92)** facilitates handling and rigging of units. Reusable heavy gauge steel lifting lugs (4) are easily and quickly secured to units by means of a sliding steel pin. See dimension drawing for locations. Must be ordered extra. Lifting brackets are furnished with GCS16-261-311-410 models for field installation. Lifting brackets are factory installed on GCS16-510-650 models.

Unit Stand-Off Mounting Kit (Optional) — Field installed kit **(38H18)** elevates horizontal application units above the mounting surface away from damaging moisture. Includes six high impact polystyrene stand-off mounts. Stand-offs are easily attached to unit and mounting surface. See dimension drawings. Kit must be ordered extra.

RTD9-65 Combination Ceiling Supply and Return Diffuser (Optional) — RTD9-65 step-down mount diffuser extends slightly below ceiling level when installed and discharges conditioned air out through grilles on all four sides. Aluminum grilles are fitted with double deflection louvers for precise directional control of air flow. Return air enters through the large center grille. Assembly also includes insulated diffuser box with connection collars for round duct connection, hanging rings for suspending and molded fiberglass interior transition to insure low static and even air flow on all four sides. Transition is sealed internally to prevent recirculation. Diffuser assembly is completely factory assembled. Diffuser readily adapts to T-bar ceiling grids and plaster ceilings. Must be ordered extra. See Specifications table.

FD9-65 Combination Ceiling Supply and Return Diffuser (Optional) — FD9-65 flush mount diffuser installs almost flush with the ceiling level and discharges conditioned air out through fixed blade louvers on all four sides. Fixed blade louvers insure that air flow will be evenly distributed. Return air enters through large center grille. Assembly also includes insulated diffuser box with connection collars for round duct connection, support hanger eyelets at the top corners for secure installation and molded fiberglass interior transition to insure low static and even air flow on all four sides. Transition is sealed internally to prevent recirculation. Diffuser assembly is completely factory assembled. Diffuser readily adapts to T-bar ceiling grids and plaster ceilings. Must be ordered extra. See Specifications table.

Optional SRT16 Supply and Return Transitions — Transitions field install in the roof mounting frame and provide segregated and simple duct connections to supply and return diffuser. Completely insulated galvanized steel transitions have collars for round duct connection. Round duct from the transitions to the diffuser is not furnished and must be provided by the installer. Transitions are completely factory assembled and easily field install in the roof mounting frame with minimum costs and labor requirement. Must be ordered extra. See Specifications table.

OPTIONAL TEMPERATURE CONTROL SELECTION (Non "R" Models Only)

Down-Flo Unit Commercial Controls Box (Optional) — Box is provided for housing control system components in bottom air handling applications. Field installs external to the unit, over the side return air opening in place of the opening cover panel furnished with the unit. Hinged cover with quarter turn latches allows complete access. Spacious weathertight box is constructed of heavy gauge steel with a durable paint finish and is fully insulated. Controls require field installation. See dimension drawing, page 20. Box is not furnished and must be ordered extra. See Control Flow Charts for usage.

Horizontal Unit Optional Commercial Controls Placement — Commercial controls for horizontal (side) air handling applications field install on bottom return air cover panel internal to the unit. Cabinet panel removal allows access for field placement and securing of controls. See dimension drawing, page 21.

Electro-Mechanical Thermostat and Control System (Optional) — The thermostat and related controls of this system must be ordered extra for field installation. Two stage heat and two stage cool thermostat **(13F06)** with dual temperature selector levers. Uses subbase **(13F17)** with manual system switch (Off-Heat-Auto-Cool) and fan switch (Auto-On) or non-switching subbase **(13F16)**. SP11 Remote Status Panel **(12F83)** or SSP11 Remote Switching Status Panel **(12F84)** is available for observing and controlling unit operation from the conditioned area. A SSP11 Relay Kit **(41G39)** is required for switching functions of the Switching Status Panel. Kit must be ordered extra and field installed. For nite operation the following are available. Single stage heating thermostat **(13F12)** and non-switching subbase **(13F16)**. For applications without the economizer a Nite Kit **(39G74)**, containing a plug-in relay, is required to override the operation of day thermostat. Two time clocks are available for the system. Automatic 7 day time clock **(43G98)** programs a weekly schedule. Any day or days can be omitted. Each day of the week is clearly separated from every other day. Day and nite periods are distinctly marked. When the settings have been made the clock will turn the system on and off. Spaced in 2 hour increments and equipped with battery back-up in case of power outage. 24 hour nite setback time clock **(43G99)** automatically programs the system to keep conditioned area at a more conservative temperature level (nite setback thermostat setting) during a period of vacancy. Spaced in 15 minute increments and equipped with battery back-up in case of power outage. Also available is a Warm Up Kit **(39G77)** which holds the economizer outdoor air dampers closed during nite heat operation and morning warm up. See Flow Chart on Page 5.

PRO-STAT Thermostat and Control System (Optional) — The thermostat and related controls of this system must be ordered extra and field installed. Pro-stat Thermostat **(36G67)** has touch sensitive keyboard, automatic switching from heat to cool, no anticipator, zero droop, indicator lights, hour/day programming, override capabilities, time readout, stage status indicators, operational mode symbols and battery back-up. A Remote Temperature Sensor **(36G68)** can be adapted to thermostat for applications where it is desirable to locate the thermostat out of the conditioned area. SP11 Remote Status Panel **(12F83)** is available for checking unit operation from within the conditioned area. Also available is a Warm Up Kit **(39G77)** which holds the economizer outside air dampers closed during nite heat operation and morning warm up. See Flow Chart on page 6.

W7400 Control System (Optional) — Control system must be ordered extra for field installation. Control Module **(74G11)** controls the operation of the economizer dampers and the stages of heating and cooling. Controlling input signals are setpoint, space temperature sensor and time-of-day scheduling from the thermostat. The control module balances the space temperature signal against the number of stages operating for system output. System output is measured and updated by monitoring the actual space temperature deviation from set point, and the rate of change of the space temperature. The control module field installs in the unit or in a remote panel located within the conditioned area. Two thermostats are available for the system. A room thermostat **(36G62)** with integral sensor that installs in the conditioned space or a remote thermostat **(36G64)** that installs outside the conditioned space with a Room Temperature Sensor **(58C92)** in the conditioned area or a Return Air Temperature Sensor **(27C40)** in the return air duct of the unit. Both thermostats are equipped with touch sensitive keyboard, automatic switching from heat to cool, no anticipator, zero droop, indicator lites, hour/day programming, override capabilities, time readout, stage status indicators, battery back-up and wiring wallplate. W7400 Plug-In Relay (furnished with the control module) provides separate set points for the economizer dampers and DX cooling. SP11 Remote Status Panel **(12F83)** is available for checking unit operation within the conditioned area. See Flow Chart on page 6.

W973 Control System (Optional) — Control system must be ordered extra for field installation. Logic Panel **(39G76)** controls the operation of the economizer dampers and the stages of cooling and heating in response to a signal from the thermostat. To maintain stable temperatures the logic panel balances the conditioned space thermostat demand against the system output. System output is measured by a discharge sensor (furnished with the logic panel) located in the discharge air duct of the unit. The combined demand and output signals from the sensor determines economizer damper position and number of cooling or heating stages energized. The logic panel field installs in the unit or in a remote panel located within the conditioned space. W973 Plug-In Relay (furnished with the logic panel) is required to adapt the control system to the unit. Two thermostats are available for the system. Dual set point room thermostat **(25C52)** or transmitter **(25C51)** with a choice of remote sensors. Both have separate heating-cooling locking set points concealed under the cover and do not have indicating thermometer. The room thermostat has integral sensor and installs in the conditioned space. The transmitter installs outside the conditioned space with a Room Temperature Sensor **(58C92)** in the conditioned area or a Return Air Temperature Sensor **(27C40)** in the return air duct of the unit. Thermostat and transmitter are furnished with a wiring wallplate. Also available is a switching subbase **(58C93)** with system selector switch (Heat-Auto-Cool-Off) and fan switch (Auto-On). SP11 Remote Status Panel **(12F83)** or SSP11 Remote Switching Status Panel **(12F84)** is available for observing and controlling unit operation from the conditioned area. Two time clocks are available for the system. Automatic 7 day time clock **(43G98)** programs a weekly schedule. Any day or days can be omitted. Each day of the week is clearly separated from every other day. Day and nite periods are distinctly marked. When the settings have been made the clock will turn the system on and off. Spaced in 2 hour increments and equipped with battery back-up in case of power outage. 24 hour nite setback time clock **(43G99)** automatically programs the system to keep the conditioned area at a more conservative temperature level (nite set back thermostat setting) during a period of vacancy. Spaced in 15 minute increments and equipped with battery back-up in case of power outage. Also available is a Warm Up Kit **(39G77)** which holds the economizer outdoor air dampers closed during nite heat operation and warm up. See Flow Chart on page 5.

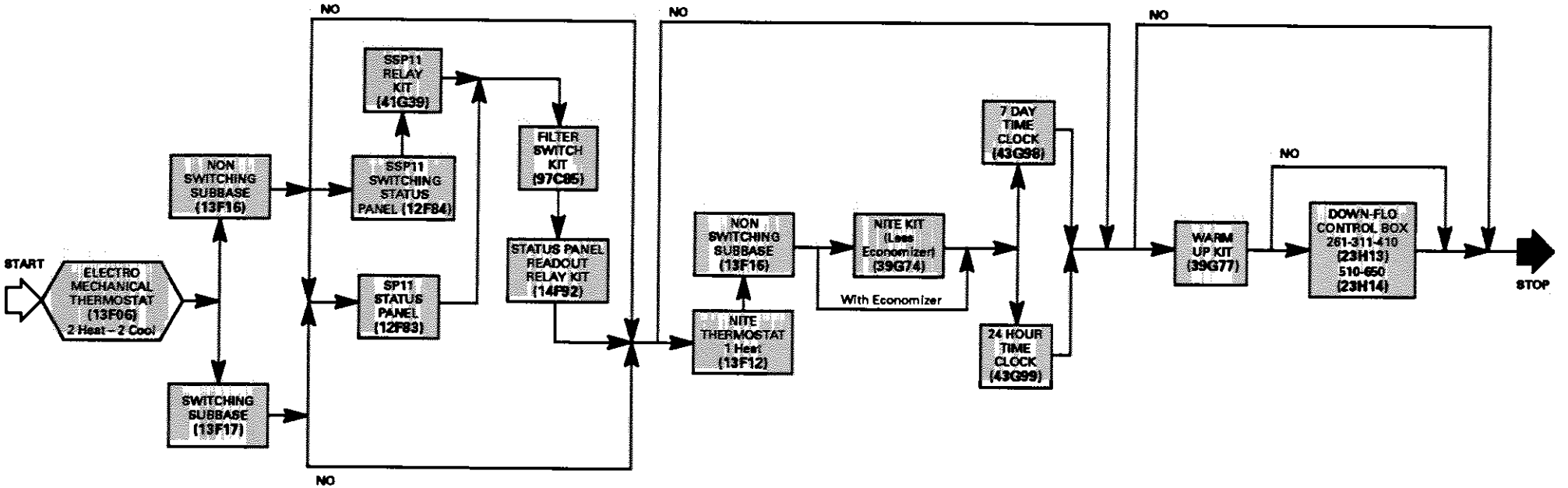
T7300 Thermostat and Control System (Optional) — The thermostat and related controls of this system must be ordered extra for field installation. T7300 programmable thermostat **(81G59)** has internal or optional remote temperature sensing, touch sensitive keyboard, automatic switching from heat to cool, °F or °C temperature readout, no anticipator, droop/no droop selection, indicator LED's, hour/day programming, override capabilities, time readout, stage status indicators, operational mode readout and battery back-up. T7300 thermostat has a choice of subbases. Switching subbase **(81G60)** has selectable output staging up to two heat and two cool, manual system switch (Heat-Off-Auto-Cool), fan switch (Auto-On) and two status LED's for monitoring various equipment operation. Switching subbase **(13H76)** features selectable output staging up to three heat and two cool, indicator LED's, manual system switch (Auto-Cool-Off-Heat-Emergency Heat) (Heat Pump only) and fan switch (Auto-On). Both subbases also features an auxiliary relay output which controls economizer operation during occupied and unoccupied periods. Also available is a Room Temperature Sensor **(58C92)** or Room Temperature Sensor with 3-hour override and setpoint adjustment **(86G67)** for installation in the conditioned area and a Return Air Temperature Sensor **(27C40)** for installation in the return air duct of the unit. SP11 Status Panel **(12F83)** is available for checking unit operation from within the conditioned area. See Flow Chart on page 6.

SP11 Remote Status Panel (Optional) — The operation of the unit can be checked on the Remote Status Panel **(12F83)** located within the conditioned area. Signal lights on the panel indicate "Cool Mode," "Heat Mode," "Compressor 1," "Compressor 2," "No Heat" and "Filter." The Cool Mode signal light is green when lit and indicates cooling operation. Heat Mode light is green and reflects heating operation. Compressor 1 light is green when operating and will turn red if there is an operational malfunction. Compressor 2 light is not required and should be disregarded. The No Heat and Filter lights will show red and indicate a requirement for service. Additional controls are required for use with the Status Panel must be specified when ordering. Filter Switch Kit **(97C85)** is used with the Filter light. Status Panel Readout Relay Kit **(14F92)** is required to interface status panel with unit operation.

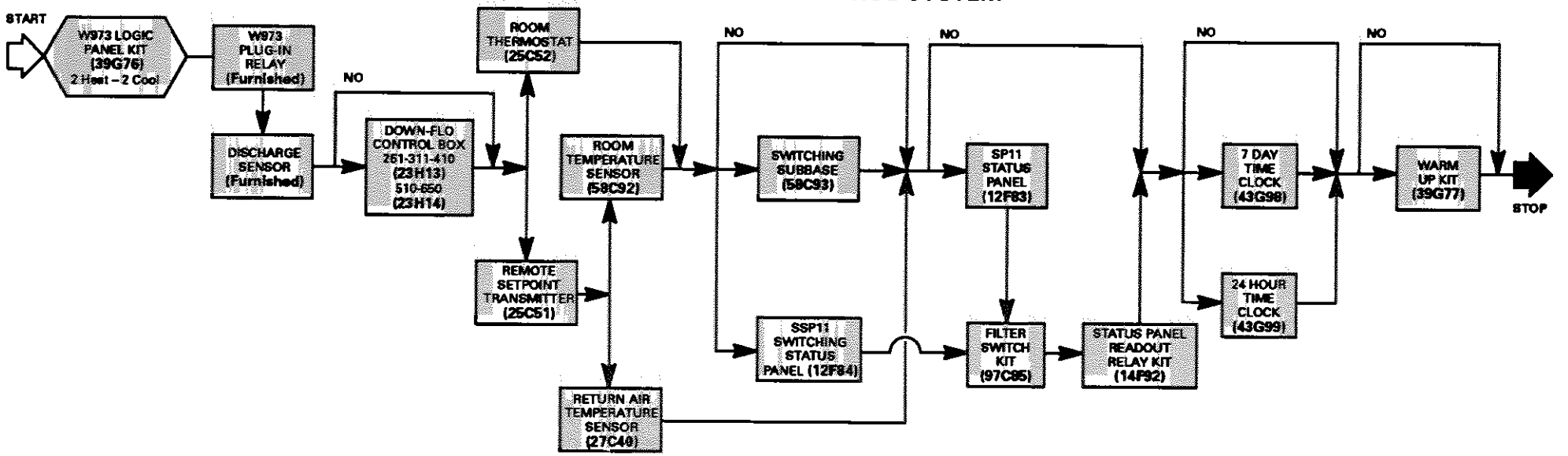
SSP11 Remote Switching Status Panel (Optional) — The operation of the unit can be controlled and observed on the Switching Status Panel **(12F84)** conveniently located within the conditioned area. Signal lights on the panel indicate "Cool Mode," "Heat Mode," "Compressor 1," "Compressor 2," "No Heat" and "Filter." The Cool Mode signal light is green when lit and indicates economizer damper operation or DX cooling operation for units without the economizer. Heat Mode light is green and reflects heating operation. Compressor 1 light is green when operating and will turn red if there is an operational malfunction. Compressor 2 light is not required and should be disregarded. The No Heat and Filter lights will show red and indicates a requirement for service. Additionally, panel is equipped with a system selector switch (Off — Heat — Auto — Cool — Emergency Heat) (Heat Pump Only), fan switch (Auto — On) and after hours timer. Fan switch provides a choice of intermittent (Auto) or continuous (On) blower operation. Manually operated after hours timer (0 to 12 hours) overrides night setback controls providing normal operation for time period set. A momentary push button switch is used to initiate the timer period. The following field installed controls are required for use with the status panel and must be ordered extra. Filter Switch Kit **(97C85)** is required for operation of the filter light. Status Panel Readout Relay Kit **(14F92)** is required to interface status panel with unit operation.

GCS16-261-311, GCS16-411-413, GCS16-511-513, GCS16-651-653 MODELS ONLY
TEMPERATURE SELECTION FLOW CHARTS

OPTIONAL ELECTRO-MECHANICAL THERMOSTAT CONTROL SYSTEM

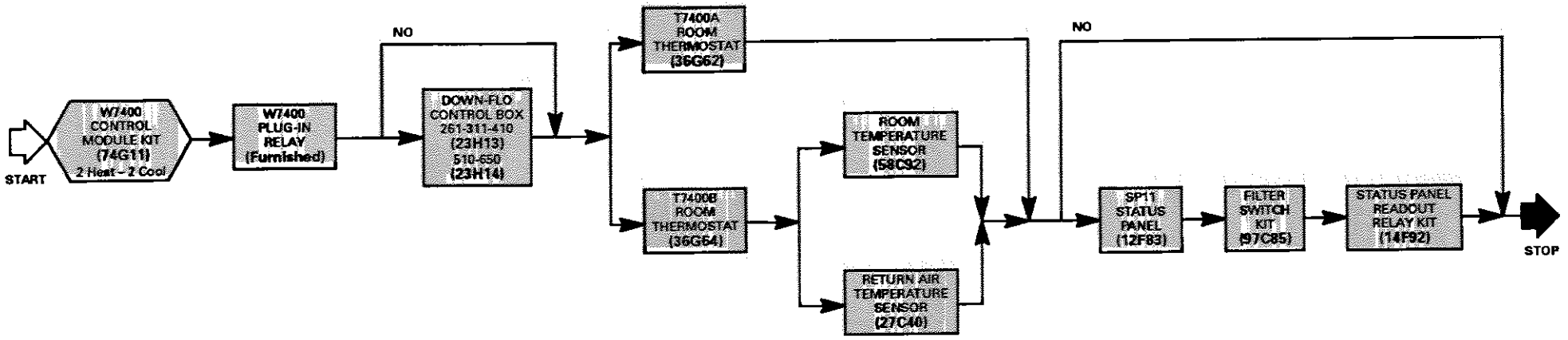


OPTIONAL W973 CONTROL SYSTEM

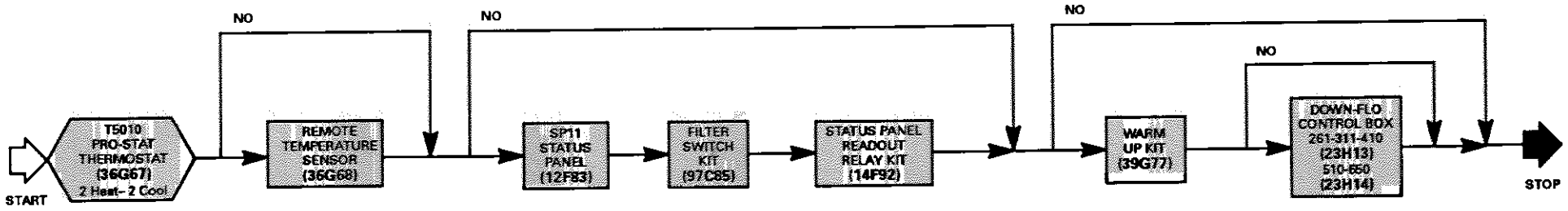


GCS16-261-311, GCS16-411-413, GCS16-511-513, GCS16-651-653 MODELS ONLY
TEMPERATURE SELECTION FLOW CHARTS

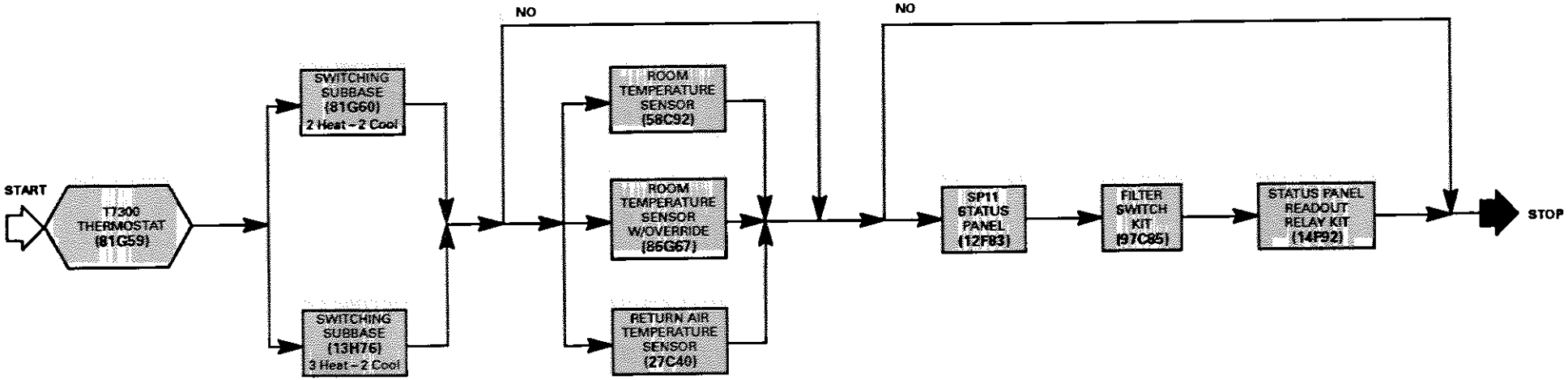
OPTIONAL W7400 CONTROL SYSTEM



OPTIONAL PRO-STAT THERMOSTAT CONTROL SYSTEM



OPTIONAL T7300 THERMOSTAT CONTROL SYSTEM



SPECIFICATIONS — GCS16R(X)-411 Models

Model No.			GCS16R-411-50	GCS16R-411-75	GCS16R-411-100	GCS16RX-411-100
Heating capacity input (Btuh) — Natural Gas			50,000	75,000	100,000	92,000
Heating capacity output (Btuh) — Natural Gas			37,000	57,000	78,000	74,000
Heating capacity input (Btuh) — **LPG			50,000	67,500	90,000	- - -
Heating capacity output (Btuh) — **LPG			37,000	52,000	70,000	- - -
†A.F.U.E.		Natural Gas	78.0%	79.5%	80.5%	80.5%
		**LPG	78.0%	79.9%	81.0%	- - -
California Seasonal Efficiency		Natural Gas	73.3%	75.2%	77.1%	75.4%
		**LPG	73.5%	75.2%	77.1%	- - -
★ARI Standard 270 SRN (bels)			8.0			
*ARI Standard 210/240 Ratings	Total cooling capacity (Btuh)		35,400			
	Total unit watts		3850			
	SEER (Btuh/Watts)		10.10			
	EER (Btuh/Watts)		9.20			
Refrigerant (R-22) charge			4 lbs. 14 oz.			
Evaporator Blower	Blower wheel nominal diameter x width (in.)		10 x 8			
	Motor horsepower		1/2			
Evaporator Coil	Net face area (sq. ft.)		4.1			
	Tube diameter (in.) & No. of rows		3/8 — 2			
	Fins per inch		15			
Condenser Coil	Net face area (sq. ft.)	Outer coil	8.7			
		Inner coil	8.4			
	Tube diameter (in.) & No. of rows		3/8 — 2			
	Fins per inch		20			
Condenser Fan	Diameter (in.) & Number of blades		20 — 4			
	Air volume (cfm)		2200			
	Motor horsepower		1/6			
	Motor watts		240			
Gas Supply Connections fpt (in.)		Natural	1/2			
		**LPG	1/2			- - -
Recommended Gas Supply Pressure (wc in.)		Natural	7			
		**LPG	11			- - -
Condensate drain size mpt (in.)			3/4			
Net weight of basic unit (lbs.)			404	404	422	422
Shipping weight of basic unit (lbs)			484	484	505	505
Electrical characteristics			208/230v — 60hz — 1 ph			
** Optional LPG Conversion Kit			LB-62090DA	LB-62090DB	LB-62090DC	- - -
Optional Down-Flo Filter Adaptor Kit		Model No.	DF16-41			
		No. & size of filters (in.)	(1) 16 x 25 x 1 (polyurethane)			
Optional Lifting Lug Kit			LB-62125DB			
Optional Condenser Coil Guards			LB-82199CB			
Optional Roof Curb Power Entry Kit (conduit size)			**18H70** (1/2")			
Optional Roof Mounting Frame — (Net Weight)			RMF16-41 (75 lbs.)			
Optional Ceiling Supply and Return Air Diffusers (Net Weight)		Step-Down	RTD9-65 (67 lbs.)			
		Flush	FD9-65 (37 lbs.)			
		Transition	SRT16-65 (20 lbs.)			
Optional Outdoor Air Dampers (Manual)—(Net Wt.) filter media size (in.)			OAD16-41 (12 lbs.) 5 x 17 x 1			

†Annual Fuel Utilization Efficiency based on DOE test procedures and FTC labeling regulations.
★Sound rating Number in accordance with ARI Standard 270.
*Rated in accordance with ARI standard 210/240 and DOE; 95°F outdoor air temperature and 80°F db/67°F wb entering wet evaporator air.
**For LPG units, a field changeover kit is required and must be ordered extra. Non "X" models only.

HIGH ALTITUDE DERATE

Units are certified for operation at altitudes of 0 to 4500 feet above sea level. If unit is installed at an altitude higher than 4500 feet, the unit must be derated 4% for every 1000 feet above 4500 feet. Thus, at an altitude of 8500 feet, the unit would require a 16% derate.

SPECIFICATIONS — GCS16R-511-651 Models

Model No.			GCS16R-511-75	GCS16R-511-125	GCS16R-651-75	GCS16R-651-125
Heating capacity input (Btuh) — Natural Gas			75,000	125,000	75,000	125,000
Heating capacity output (Btuh) — Natural Gas			58,000	95,000	58,000	95,000
Heating capacity input (Btuh) — **LPG			67,500	112,500	67,500	112,500
Heating capacity output (Btuh) — **LPG			52,000	85,000	52,000	85,000
†A.F.U.E.		Natural Gas	78.4%	78.3%	78.4%	78.3%
		**LPG	79.9%	78.5%	78.4%	78.5%
California Seasonal Efficiency		Natural Gas	72.7%	75.0%	72.7%	75.0%
		**LPG	73.7%	75.0%	72.3%	75.0%
★ARI Standard 270 SRN (bels)			8.2		8.2	
*ARI Standard 210/240 Ratings	Total cooling capacity (Btuh)		46,500		58,500	
	Total unit watts		4890		6570	
	SEER (Btuh/Watts)		10.35		10.00	
	EER (Btuh/Watts)		9.5		8.90	
Refrigerant (R-22) charge			6 lbs. 0 oz.		7 lbs. 0 oz.	
Evaporator Blower	Blower wheel nominal diameter x width (in.)		11-1/2 x 9		11-1/2 x 9	
	Motor horsepower		3/4		3/4	
Evaporator Coil	Net face area (sq. ft.)		5.3		6.2	
	Tube diameter (in.) & number of rows		3/8 — 2		3/8 — 2	
	Fins per inch		15		15	
Condenser Coil	Net face area (sq. ft.)	Outer coil	14.3		14.3	
		Inner coil	5.9		13.7	
	Tube diameter (in.) & number of rows		3/8 — 1.4		3/8 — 2	
	Fins per inch		20		20	
Condenser Fan	Diameter (in.) & number of blades		24 — 4		24 — 4	
	Air volume (cfm)		3880		3770	
	Motor horsepower		1/4		1/4	
	Motor watts		340		360	
Gas Supply Connections fpt (in.)		Natural	1/2		1/2	
		**LPG	1/2		1/2	
Recommended Gas Supply Pressure (wc. in.)		Natural	7		7	
		**LPG	11		11	
Condensate drain size mpt (in.)			3/4		3/4	
Net weight of basic unit (lbs.)			550	590	530	560
Shipping weight of basic unit (lbs.) 1 package			660	710	590	620
Electrical characteristics			208/230v — 60 hz — 1 phase			
**Optional LPG Conversion Kit			LB-62090DB	LB-62090DD	LB-62090DB	LB-62090DD
Optional Down-flo Filter Adaptor Kit		Model Number	DF16-65			
		Number and size of filters (in.)	(1) 20 x 25 x 1 (polyurethane)			
Optional Lifting Lug Kit			LB-62125DB			
Optional Roof Curb Power Entry Kit (conduit size)			18H70 (1/2")			
Optional Roof Mounting Frame — (Net Weight)			RMF16-41 (75 lbs.) or RMF16-65 (86 lbs.)			
Optional Ceiling Supply and Return Air Diffusers (Net Weight)		Step-down	RTD9-65 (67 lbs.)			
		Flush	FD9-65 (37 lbs.)			
		Transition	SRT16-65 (20 lbs.)			
Optional Condenser Coil Guards			LB-82199CC			
Optional Outdoor Air Dampers (Manual) — (Net Weight) filter media size (in.)			OAD16-65 (12 lbs.) 8 x 17 x 1			

†Annual Fuel Utilization Efficiency based on DOE test procedures and FTC labeling regulations.
★Sound Rating Number in accordance with ARI Standard 270.
*Rated in accordance with ARI Standard 210/240 and DOE; 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air.
**For LPG units a field changeover kit is required and must be ordered extra.

SPECIFICATIONS — GCS16-261-311-411-413 Models

Model No.			GCS16-261-50	GCS16-311-50	GCS16-311-75	GCS16-411-50 413-50	GCS16-411-75 413-75	GCS16-411-100 413-100	GCS16X-411-100 413-100
Heating capacity input (Btuh) — Natural Gas			50,000	50,000	75,000	50,000	75,000	100,000	92,000
Heating capacity output (Btuh) — Natural Gas			38,000	38,000	56,000	37,000	57,000	78,000	74,000
Heating capacity input (Btuh) — **LPG			50,000	50,000	67,500	50,000	67,500	90,000	- - - -
Heating capacity output (Btuh) — **LPG			38,000	38,000	51,000	37,000	52,000	70,000	- - - -
†A.F.U.E.		Natural Gas	79.0%	79.0%	78.1%	78.0%	79.5%	80.5%	80.5%
		**LPG	79.0%	79.0%	78.9%	78.0%	79.9%	81.0%	- - - -
California Seasonal Efficiency		Natural Gas	75.0%	75.0%	75.1%	73.3%	75.2%	77.1%	75.4%
		**LPG	75.0%	75.0%	75.7%	73.5%	75.2%	77.1%	- - - -
★ARI Standard 270 SRN (bels)			8.0	8.0		8.0			
*ARI Standard 210/240 Ratings	Total cooling capacity (Btuh)		23,200	29,200		35,900			
	Total unit watts		2670	3320		3850			
	SEER (Btuh/Watts)		10.00	10.00		10.10			
	EER (Btuh/Watts)		8.70	8.80		9.20			
Refrigerant (R-22) charge			3 lbs. 1 oz.	4 lbs. 12 oz.		4 lbs. 14 oz.			
Evaporator Blower	Blower wheel nominal diameter x width (in.)		9 x 8	10 x 8		10 x 8			
	Motor horsepower		1/3	1/3		1/2			
Evaporator Coil	Net face area (sq. ft.)		3.2	3.2		4.1			
	Tube diameter (in.) & No. of rows		3/8 — 2	3/8 — 2		3/8 — 2			
	Fins per inch		15	17		15			
Condenser Coil	Net face area (sq. ft.)	Outer coil	8.7	8.7		8.7			
		Inner coil	- - - -	8.4		8.4			
	Tube diameter (in.) & No. of rows		3/8 — 1	3/8 — 2		3/8 — 2			
	Fins per inch		20	20		20			
Condenser Fan	Diameter (in.) & Number of blades		20 — 4	20 — 4		20 — 4			
	Air volume (cfm)		2450	2200		2200			
	Motor horsepower		1/6	1/6		1/6			
	Motor watts		220	240		240			
Gas Supply Connections fpt (in.)		Natural	1/2	1/2		1/2			
		**LPG	1/2	1/2		1/2		- - - -	
Recommended Gas Supply Pressure (wc in.)		Natural	7	7		7			
		**LPG	11	11		11		- - - -	
Condensate drain size mpt (in.)			3/4						
Net weight of basic unit (lbs.)			375	412		404		422	
Shipping weight of basic unit (lbs)			433	463		484		505	
Electrical characteristics			208/230v 60hz 1 ph			208/230v 60hz 1 or 3ph or 460v 60hz 3 ph			
** Optional LPG Conversion Kit			LB-62090DA	LB-62090DB	LB-62090DA	LB-62090DB	LB-62090DC	- - - -	
Optional Condenser Coil Guards			LB-82199CB						
Optional Outdoor Air Dampers (Manual)—(Net Wt.) filter media size (in.)			OAD16-41 (12 lbs.) 5 x 17 x 1						
Optional Roof Curb Power Entry Kit (conduit size)			**18H70** (1/2")						
Optional Roof Mounting Frame — (Net Weight)			RMF16-41 (75 lbs.)						
Optional Economizer Dampers With Gravity Exhaust	Model No.	3 Position (Net Weight)	REMD16-41 (48 lbs.)						
		Modulating (Net Weight)	REMD16M-41 (48 lbs.)						
	Number and size of filters (in.)	Indoor	•(1) 16 x 25 x 1						
		Outdoor	(1) 14 x 25 x 1 (aluminum mesh)						
Optional Horizontal Economizer Dampers	Model No.	3 Position (Net Weight)	EMDH16-41 (110 lbs.)						
		Modulating (Net Weight)	EMDH16M-41 (110 lbs.)						
	Number and size of filters (in.)	Indoor	(1) 20 24 x 1 (fiberglass)						
		Outdoor	(1) 8 x 24 x 1 (aluminum mesh)						
Optional Gravity Exhaust dampers — (Net Weight)			GEDH16-65 (4 lbs.) Use with EMDH16						
Optional Ceiling Supply and Return Air Diffusers (Net Weight)	Step-Down		RTD9-65 (67 lbs.)						
	Flush		FD9-65 (37 lbs.)						
	Transition		SRT16-65 (20 lbs.)						
Optional Controls Selection			Electro-mechanical, W973, W7400, Pro-stat, T7300 Control Systems						
Optional Down-Flo Units Commercial Controls Box			**23H13**						
††Commercial Controls Platform			Furnished and factory installed						

†Annual Fuel Utilization Efficiency based on DOE test procedures and FTC labeling regulations.
★Sound rating Number in accordance with ARI Standard 270.
*Rated in accordance with ARI standard 210/240 and DOE; 95°F outdoor air temperature and 80°F db/67°F wb entering wet evaporator air.
**For LPG units, a field changeover kit is required and must be ordered extra. Non "X" models only.
††Furnished as standard. Consists of: factory installed controls system and economizer wiring harness.
•Indoor filter is not furnished with economizer. REMD16 utilizes filter furnished with GCS16 unit.

SPECIFICATIONS — GCS16-510-650 Models

Model No.			GCS16-511-75 GCS16-513-75	GCS16-511-125 GCS16-513-125	GCS16-651-75 GCS16-653-75	GCS16-651-125 GCS16-653-125
Heating capacity input (Btuh) — Natural Gas			75,000	125,000	75,000	125,000
Heating capacity output (Btuh) — Natural Gas			58,000	95,000	58,000	95,000
Heating capacity input (Btuh) — **LPG			67,500	112,500	67,500	112,500
Heating capacity output (Btuh) — **LPG			52,000	85,000	52,000	85,000
†A.F.U.E.		Natural Gas	78.4%	78.3%	78.4%	78.3%
		**LPG	79.9%	78.5%	78.4%	78.5%
California Seasonal Efficiency		Natural Gas	72.7%	75.0%	72.7%	75.0%
		**LPG	73.7%	75.0%	72.3%	75.0%
★ARI Standard 270 SRN (bels)			8.2		8.2	
*ARI Standard 210/240 Ratings	Total cooling capacity (Btuh)		46,500		58,500	
	Total unit watts		4890		6570	
	SEER (Btuh/Watts)		10.35		10.00	
	EER (Btuh/Watts)		9.5		8.90	
Refrigerant (R-22) charge			6 lbs. 0 oz.		7 lbs. 0 oz.	
Evaporator Blower	Blower wheel nominal diameter x width (in.)		11-1/2 x 9		11-1/2 x 9	
	Motor horsepower		3/4		3/4	
Evaporator Coil	Net face area (sq. ft.)		5.3		6.2	
	Tube diam. (in.) & number of rows		3/8 — 2		3/8 — 2	
	Fins per inch		15		15	
Condenser Coil	Net face area (sq. ft.)	Outer coil	14.3		14.3	
		Inner coil	5.9		13.7	
	Tube diam. (in.) & number of rows		3/8 — 1.4		3/8 — 2	
	Fins per inch		20		20	
Condenser Fan	Diameter (in.) & number of blades		24 — 4		24 — 4	
	Air volume (cfm)		3880		3770	
	Motor horsepower		1/4		1/4	
	Motor watts		340		360	
Gas Supply Connection fpt (in.) — Natural & **LPG			1/2		1/2	
Recommended Gas Supply Pressure (wc. in.)		Natural	7		7	
		**LPG	11		11	
Condensate drain size mpt (in.)			3/4		3/4	
Number and size of filters (in.)			(1) 20 x 25 x 1 (polyurethane)			
Net weight of basic unit (lbs.)			550	590	530	560
Shipping weight of basic unit (lbs.) 1 package			660	710	590	620
Electrical characteristics (60 hz)			208/230v — 60 hz — 1 or 3 phase or 460v — 60 hz — 3 phase			
**Optional LPG conversion kit			LB-62090DB	LB-62090DD	LB-62090DB	LB-62090DD
Optional Condenser Coil Guards			LB-82199CC			
Optional Outdoor Air Dampers (Manual) — (Net Weight)			OAD16-65 (12 lbs.)			
filter media size (in.)			8 x 17 x 1			
Optional Roof Curb Power Entry Kit (conduit size)			18H70 (1/2")			
Optional Roof Mounting Frame — (Net Weight)			RMF16-41 (75 lbs.) or RMF16-65 (86 lbs.)			
Optional Economizer Dampers with Gravity Exhaust	Model No.	3 position (Net Weight)	REMD16-65 (66 lbs.)			
		Modulating (Net Weight)	REMD16M-65 (66 lbs.)			
	Number and size of filters (in.)	Indoor	•(1) 20 x 25 x 1			
		Outdoor	(1) 18 x 25 x 1 (aluminum mesh)			
Optional Horizontal Economizer Dampers	Model No.	3 position (Net Weight)	EMDH16-65 (130 lbs.)			
		Modulating (Net Weight)	EMDH16M-65 (130 lbs.)			
	Number and size of filters (in.)	Indoor	(1) 16 x 25 x 1 & (1) 14 x 25 x 1 (fiberglass)			
		Outdoor	(1) 8 x 28 x 1 (aluminum mesh)			
Optional Gravity Exhaust Dampers — (Net Weight)			GEDH16-65 (4 lbs.) Use with EMDH16			
Optional Ceiling Supply and Return Air Diffusers (Net Weight)		Step-down	RTD9-65 (67 lbs.)			
		Flush	FD9-65 (37 lbs.)			
		Transition	SRT16-65 (20 lbs.)			
Optional Controls Selection			Electro-Mechanical Thermostat Controls			
			W973 Controls			
			W7400 Controls			
			Pro-stat Thermostat Controls			
			T7300 Thermostat Controls			
Optional Down-flo Units Commercial Controls Box			23H14			
†††Commercial Controls Platform			Furnished and Factory Installed			

†Annual Fuel Utilization Efficiency based on DOE test procedures and FTC labeling regulations.

★Sound Rating Number in accordance with ARI Standard 270.

*Rated in accordance with ARI Standard 210/240 and DOE; 95°F outdoor air temperature and 80°F db/67°F wb entering evaporator air.

**For LPG units a field changeover kit is required and must be ordered extra.

†††Furnished as standard. Consists of: factory installed controls system and economizer wiring harness.

•Indoor filter is not furnished with economizer. REMD16 utilizes existing filter furnished with GCS16 unit.

ELECTRICAL DATA — GCS16-261-311 Models — Single Phase Voltage

Model No.		GCS16-261	GCS16-311
Line Voltage Data		60 hz — 1 ph 208/230v	60 hz - 1 ph 208/230v
Compressor	Rated load amps	11.5	13.5
	Locked rotor amps	56.0	71.0
Condenser Fan Motor	Full load amps	1.1	1.1
	Locked rotor amps	2.3	2.3
Evaporator Blower Motor	Full load amps	2.2	3.0
	Locked rotor amps	4.2	6.2
Induced Draft Blower Motor	Full load amps	.75	.75
•Recommended maximum fuse size (amps)		25	30
Unit power factor		.98	.98
*Minimum Circuit Ampacity		18.0	21.0

•Where current does not exceed 100 amps, HACR circuit breaker may be used in place of fuse.
NOTE — Extremes of operating range are plus and minus 10% of line voltage.
* Refer to National Electrical Code manual to determine wire, fuse and disconnect size requirements.

ELECTRICAL DATA — GCS16(R)-411-511-651 Models — Single Phase Voltage

Model No.		GCS16(R)-411	GCS16(R)-511	GCS16(R)-651
Line voltage data		60 hz — 1 ph 208/230v	60 hz - 1 ph 208/230v	60 hz - 1 ph 208/230v
Compressor	Rated load amps	17.3	23.1	27.6
	Locked rotor amps	94	105	135
Condenser Fan Motor	Full load amps	1.1	2.0	2.0
	Locked rotor amps	1.9	4.4	4.4
Evaporator Motor	Full load amps	3.9	4.6	4.6
	Locked rotor amps	8.3	10.0	10.0
Induced Draft Blower Motor	Full load amps	.75	.6	.6
•Recommended maximum fuse size (amps)		45	50	60
Unit power factor		.95	.93	.95
*Minimum Circuit Ampacity		28.8	36.0	42.0

•Where current does not exceed 100 amps, HACR circuit breaker may be used in place of fuse.
NOTE — Extremes of operating range are plus and minus 10% of line voltage.
* Refer to National Electrical Code manual to determine wire, fuse and disconnect size requirements.

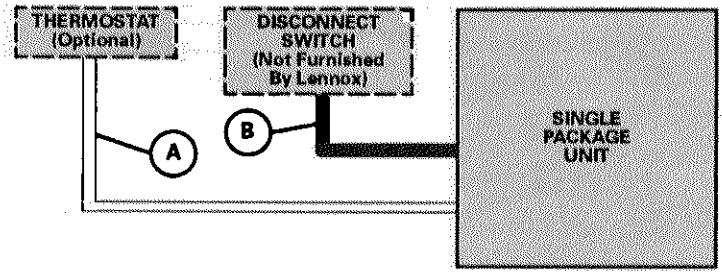
ELECTRICAL DATA — GCS16-413-513-653 Models — Three Phase Voltage

Model No.		GCS16-413		GCS16-513		GCS16-653	
Line voltage data		60 hz — 3 ph		60 hz — 3 ph		60 hz — 3 ph	
		208/230v	460v	208/230v	460v	208/230v	460v
Compressor	Rated load amps	10.9	5.8	14.7	7.7	17.6	9.4
	Locked rotor amps	78	40	130	64	105	55
Condenser Fan Motor (1 phase)	Full load amps	1.1	.75	2.0	1.1	2.0	1.1
	Locked rotor amps	1.9	1.3	4.4	2.2	4.4	2.2
Evaporator Blower Motor (1 phase)	Full load amps	3.9	1.8	4.6	1.8	4.6	1.8
	Locked rotor amps	8.3	4.4	10.0	3.8	10.0	3.8
†Induced Draft Blower Motor (1 phase)	Full load amps	.75	.75	.6	.6	.6	.6
•Recommended maximum fuse size (amps)		30	15	35	20	45	25
Unit power factor		.86	.86	.84	.87	.86	.88
*Minimum Circuit Ampacity		19.0	11.0	25.0	14.0	29.0	15.0

•Where current does not exceed 100 amps, HACR circuit breaker may be used in place of fuse.
NOTE — Extremes of operating range are plus and minus 10% of line voltage.
* Refer to National Electrical Code manual to determine wire, fuse and disconnect size requirements.
† Motor rated at 230 volts. Full load amps shown are for step-down transformer output.

FIELD WIRING — GCS16R Models

A — Four Wire Low Voltage (Electromechanical)
— Five Wire Low Voltage (Electronic)
B — Two Wire Power (See Electrical Data Table)
NOTE — All wiring must conform to NEC and local electrical codes.
— Field wiring not furnished —



GCS16-261-311, GCS16-411-413, GCS16-511-513, GCS16-651-653 MODELS ONLY

W973 CONTROL SYSTEM

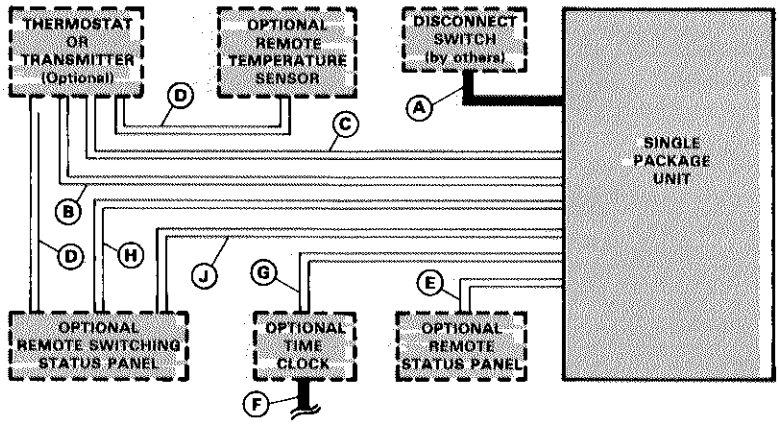
A – Two or Three wire power (See Electrical Data table)
B – Seven wire low voltage – DC only
– Five wire low voltage – DC only – with SSP11 Switching Status Panel
– Seven wire low voltage – DC only – with switching subbase
C – Two wire low voltage – AC only – with switching subbase
D – Two wire low voltage – DC only
E – Nine wire low voltage – AC only
F – Two wire low voltage – AC only
G – Two wire low voltage – AC only
H – Thirteen wire low voltage – AC only
J – Two wire low voltage – DC only

AC – Alternating current
DC – Direct current

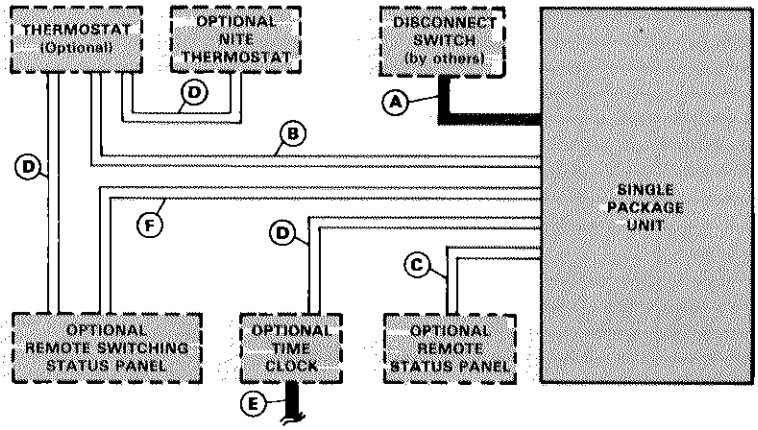
NOTE – Run separate harnesses for AC and DC. AC voltage interferes with DC signals.

– Field wiring not furnished –

NOTE – All wiring must conform to NEC and local electrical codes.



ELECTRO-MECHANICAL THERMOSTAT CONTROL SYSTEM



A – Two or Three wire power (See Electrical Data table)
B – Six wire low voltage
– Five wire low voltage (with SSP11 Switching Status Panel)
C – Nine wire low voltage
D – Two wire low voltage
E – Two wire low voltage
F – Fifteen wire low voltage

– Field wiring not furnished –

NOTE – All wiring must conform to NEC and local electrical codes.

W7400 CONTROL SYSTEM

A – Two or Three wire power (See Electrical Data table)

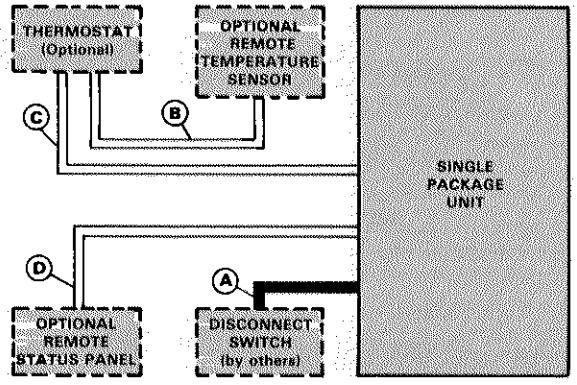
B – Two wire low voltage

C – Four wire low voltage

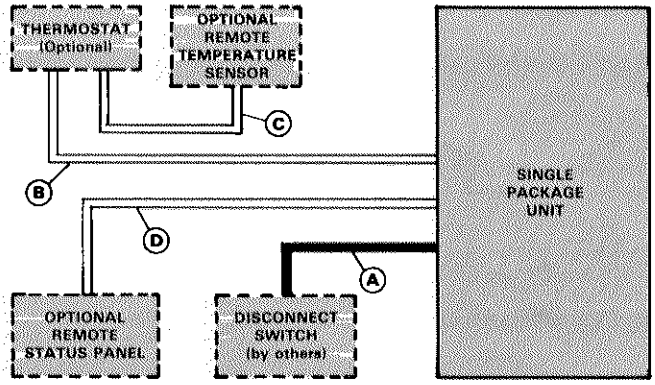
D – Nine wire low voltage

– Field wiring not furnished –

NOTE – All wiring must conform to NEC and local electrical codes.



PRO-STAT OR T7300 THERMOSTAT CONTROL SYSTEM



A – Two or Three wire power (See Electrical Data table)

B – Seven wire low voltage (Pro-Stat)

– Nine wire low voltage (T7300)

C – Two wire low voltage
Seven wire low voltage (T7300 with optional override sensor)

D – Nine wire low voltage

– Field wiring not furnished –

NOTE – All wiring must conform to NEC and local electrical codes.

RATINGS

NOTE — To determine Sensible Capacity, Leaving Wet and Dry Bulb temperatures not shown in the tables, see Miscellaneous Engineering Data section, page 9.

GCS16-261 COOLING CAPACITY

Enter. Wet Bulb (°F)	Total Air Vol. (cfm)	Outdoor Air Temperature Entering Condenser Coil (°F) 85					95					105					115				
		Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85
63	700	23,500	1940	.75	.88	1.00	22,300	2060	.76	.90	1.00	21,100	2190	.78	.93	1.00	19,800	2360	.80	.96	1.00
	800	24,300	1970	.77	.92	1.00	23,000	2080	.79	.94	1.00	21,700	2220	.81	.97	1.00	20,400	2400	.83	1.00	1.00
	900	24,900	1980	.80	.95	1.00	23,500	2100	.82	.98	1.00	22,300	2250	.84	1.00	1.00	20,900	2420	.86	1.00	1.00
67	700	24,700	1980	.59	.72	.85	23,500	2100	.60	.74	.87	22,200	2250	.61	.75	.89	20,900	2430	.62	.78	.92
	800	25,500	2010	.61	.75	.88	24,200	2130	.62	.76	.91	22,900	2280	.63	.78	.93	21,600	2460	.64	.81	.96
	900	26,200	2030	.62	.77	.92	24,800	2160	.63	.79	.94	23,500	2310	.65	.81	.97	22,100	2490	.66	.84	1.00
71	700	25,800	2020	.44	.57	.70	24,600	2150	.45	.58	.71	23,300	2300	.45	.60	.73	22,000	2490	.46	.61	.75
	800	26,700	2040	.45	.59	.72	25,400	2180	.46	.60	.74	24,000	2330	.46	.61	.76	22,600	2530	.47	.63	.78
	900	27,400	2070	.46	.61	.75	26,000	2200	.47	.62	.77	24,600	2360	.48	.63	.79	23,100	2560	.48	.65	.81

NOTE — All values are gross capacities and do not include evaporator coil blower motor heat deduction.

GCS16-311 COOLING CAPACITY

Enter. Wet Bulb (°F)	Total Air Vol. (cfm)	Outdoor Air Temperature Entering Condenser Coil (°F) 85					95					105					115				
		Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85
63	875	29,500	2470	.76	.89	1.00	28,100	2640	.77	.91	1.00	26,600	2820	.79	.94	1.00	25,200	2970	.81	.97	1.00
	1000	30,400	2500	.78	.92	1.00	29,000	2680	.80	.95	1.00	27,500	2850	.82	.97	1.00	25,800	3010	.84	1.00	1.00
	1125	31,200	2530	.80	.96	1.00	29,600	2700	.82	.99	1.00	28,200	2880	.85	1.00	1.00	26,400	3040	.87	1.00	1.00
67	875	30,900	2520	.60	.73	.85	29,500	2700	.61	.75	.87	28,000	2880	.62	.76	.90	26,500	3050	.63	.78	.93
	1000	32,000	2550	.61	.75	.89	30,400	2740	.63	.77	.91	28,900	2920	.64	.79	.94	27,300	3090	.65	.82	.98
	1125	32,800	2580	.62	.78	.92	31,100	2770	.64	.80	.95	29,600	2950	.66	.82	.98	27,900	3130	.67	.85	1.00
71	875	32,300	2560	.45	.58	.70	30,800	2750	.46	.59	.72	29,300	2940	.46	.60	.74	27,800	3120	.46	.61	.76
	1000	33,400	2600	.45	.59	.73	31,800	2790	.46	.61	.75	30,200	2980	.47	.62	.77	28,600	3160	.47	.64	.79
	1125	34,200	2630	.46	.61	.75	32,600	2820	.47	.62	.77	31,000	3010	.47	.64	.79	29,300	3200	.49	.66	.82

NOTE — All values are gross capacities and do not include evaporator coil blower motor heat deduction.

GCS16(R)-411-413 COOLING CAPACITY

Enter. Wet Bulb (°F)	Total Air Vol. (cfm)	Outdoor Air Temperature Entering Condenser Coil (°F) 85					95					105					115				
		Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85
63	1050	34,800	2920	.77	.92	1.00	33,500	3090	.78	.94	1.00	32,000	3260	.79	.96	1.00	30,500	3410	.81	.99	1.00
	1200	35,800	2960	.80	.96	1.00	34,400	3130	.81	.98	1.00	32,900	3300	.83	1.00	1.00	31,300	3450	.84	1.00	1.00
	1350	36,700	2990	.83	1.00	1.00	35,100	3160	.84	1.00	1.00	33,700	3330	.86	1.00	1.00	31,900	3490	.88	1.00	1.00
67	1050	36,400	2990	.60	.75	.90	35,100	3160	.61	.77	.91	33,600	3340	.62	.78	.93	32,000	3500	.63	.80	.95
	1200	37,500	3030	.62	.78	.94	36,100	3210	.63	.80	.95	34,500	3380	.64	.81	.97	32,900	3540	.65	.83	1.00
	1350	38,400	3060	.64	.81	.98	36,800	3240	.65	.83	1.00	35,300	3420	.66	.85	1.00	33,600	3580	.67	.87	1.00
71	1050	38,000	3050	.45	.60	.75	36,500	3230	.45	.61	.77	35,000	3410	.46	.62	.78	33,400	3570	.46	.63	.79
	1200	39,100	3090	.46	.62	.78	37,600	3270	.46	.63	.80	36,000	3450	.47	.64	.81	34,300	3620	.47	.65	.83
	1350	39,900	3130	.47	.64	.81	38,400	3310	.47	.65	.83	36,700	3490	.47	.66	.84	35,000	3660	.48	.68	.86

NOTE — All values are gross capacities and do not include evaporator coil blower motor heat deduction.

GCS16(R)-511-513 COOLING CAPACITY

Enter. Wet Bulb (°F)	Total Air Vol. (cfm)	Outdoor Air Temperature Entering Condenser Coil (°F) 85					95					105					115				
		Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool. Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85
63	1400	46,700	3500	.72	.87	.99	44,700	3780	.74	.89	1.00	42,500	4050	.75	.92	1.00	40,300	4320	.77	.94	1.00
	1600	48,300	3530	.75	.91	1.00	46,200	3820	.77	.93	1.00	44,000	4100	.78	.95	1.00	41,300	4360	.80	.98	1.00
	1800	49,600	3570	.78	.94	1.00	47,000	3850	.80	.96	1.00	44,900	4130	.81	.98	1.00	42,100	4390	.83	1.00	1.00
67	1400	48,900	3550	.57	.71	.85	46,900	3840	.58	.73	.86	44,700	4130	.59	.74	.88	42,500	4410	.59	.76	.90
	1600	50,500	3590	.59	.74	.88	48,400	3880	.60	.75	.90	46,100	4180	.60	.77	.92	43,800	4470	.61	.79	.94
	1800	51,900	3620	.60	.76	.92	49,600	3920	.61	.78	.94	47,300	4220	.62	.80	.96	44,900	4510	.63	.82	.99
71	1400	51,100	3600	.43	.56	.71	48,900	3900	.43	.57	.72	46,800	4200	.43	.58	.74	44,500	4500	.44	.60	.75
	1600	52,700	3640	.43	.58	.74	50,500	3950	.44	.59	.75	48,200	4250	.44	.60	.77	45,900	4550	.44	.62	.78
	1800	54,100	3670	.44	.60	.77	51,800	3980	.44	.61	.78	49,400	4290	.45	.62	.80	47,000	4600	.45	.64	.81

NOTE — All values are gross capacities and do not include evaporator coil blower motor heat deduction.

RATINGS

NOTE — To determine Sensible Capacity, Leaving Wet and Dry Bulb temperatures not shown in the tables, see Miscellaneous Engineering Data section, page 9.

GCS16(R)-651-653 COOLING CAPACITY

Enter. Wet Bulb (°F)	Total Air Vol. (cfm)	Outdoor Air Temperature Entering Condenser Coil (°F) 85					95					105					115				
		Total Cool Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85	Total Cool Cap. (Btuh)	Comp. Motor Watts Input	Sensible To Total Ratio (S/T) Dry Bulb (°F) 75	80	85
63	1750	59,000	4910	.74	.88	1.00	56,300	5270	.76	.90	1.00	53,500	5640	.78	.92	1.00	50,700	6040	.80	.95	1.00
	2000	60,900	4980	.77	.91	1.00	58,000	5340	.78	.93	1.00	55,300	5720	.80	.96	1.00	51,900	6110	.83	.99	1.00
	2250	62,500	5030	.79	.94	1.00	59,500	5400	.81	.97	1.00	56,000	5790	.83	1.00	1.00	53,100	6180	.86	1.00	1.00
67	1750	62,000	5010	.58	.72	.84	59,300	5400	.59	.73	.86	56,500	5800	.61	.75	.88	53,700	6230	.62	.77	.91
	2000	64,100	5080	.60	.74	.87	61,200	5480	.61	.76	.90	58,300	5900	.62	.78	.92	55,400	6330	.64	.80	.95
	2250	65,800	5140	.61	.76	.90	62,800	5550	.62	.78	.93	59,800	5970	.64	.80	.96	56,800	6430	.65	.83	.99
71	1750	65,000	5120	.44	.57	.69	62,300	5520	.44	.58	.70	59,400	5950	.45	.59	.72	56,600	6420	.46	.60	.74
	2000	67,200	5190	.44	.58	.71	64,300	5610	.45	.59	.73	61,400	6060	.45	.60	.75	58,500	6550	.46	.62	.77
	2250	68,900	5250	.45	.60	.74	66,000	5690	.45	.61	.75	63,000	6160	.46	.62	.77	60,100	6660	.47	.64	.79

BLOWER DATA

GCS16-261-50 BLOWER PERFORMANCE @ 230 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds High	Med-High	Med-Low	Low
0	1335	1000	905	665
.05	1330	1010	915	680
.10	1315	1015	920	685
.15	1300	1015	925	690
.20	1280	1010	920	695
.25	1255	1005	915	695
.30	1225	990	900	690
.40	1160	945	865	665
.50	1075	885	815	630
.60	975	805	745	585
.70	860	705	655	520
.75	795	650	605	485

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16-261-50 BLOWER PERFORMANCE @ 230 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds High	Med-High	Med-Low	Low
0	1315	915	840	615
.05	1300	930	855	640
.10	1285	945	870	655
.15	1265	950	875	670
.20	1240	950	880	680
.25	1220	950	880	685
.30	1195	945	875	685
.40	1140	915	850	675
.50	1080	870	815	650
.60	1010	805	760	610
.70	935	725	690	550
.75	890	675	650	515

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16-311-50/75 BLOWER PERFORMANCE @ 230 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds High	Med-High	Med-Low	Low
0	1480	1360	1155	1015
.05	1465	1345	1145	1010
.10	1445	1335	1135	1000
.15	1425	1315	1120	985
.20	1400	1295	1105	970
.25	1375	1270	1085	955
.30	1345	1245	1060	930
.40	1275	1180	1005	875
.50	1190	1100	940	805
.60	1095	1010	865	720
.70	990	900	780	625
.75	930	845	730	570

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16-311-50/75 BLOWER PERFORMANCE @ 230 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds High	Med-High	Med-Low	Low
0	1365	1235	1050	910
.05	1365	1225	1050	905
.10	1360	1215	1045	900
.15	1350	1205	1040	890
.20	1335	1190	1030	880
.25	1320	1170	1020	865
.30	1300	1155	1005	850
.40	1250	1110	965	815
.50	1185	1060	915	770
.60	1105	1000	855	715
.70	1010	930	780	655
.75	960	895	740	620

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16(R)-411-413-50/75 BLOWER PERFORMANCE @ 230 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds High	Med-High	Med-Low	Low
0	1825	1705	1540	1380
.05	1810	1690	1525	1370
.10	1795	1670	1510	1360
.15	1775	1650	1495	1350
.20	1755	1630	1480	1340
.25	1735	1605	1460	1325
.30	1715	1585	1440	1310
.40	1660	1535	1390	1275
.50	1595	1465	1325	1225
.60	1505	1385	1235	1150
.70	1445	1345	1195	1100
.75	1400	1310	1160	1065

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16(R)-411-413-50/75 BLOWER PERFORMANCE @ 230 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds High	Med-High	Med-Low	Low
0	1830	1700	1555	1385
.05	1810	1680	1535	1375
.10	1790	1660	1515	1365
.15	1770	1640	1495	1350
.20	1745	1620	1475	1335
.25	1720	1600	1455	1320
.30	1695	1575	1430	1305
.40	1640	1525	1385	1270
.50	1580	1475	1330	1225
.60	1520	1415	1270	1175
.70	1450	1355	1230	1120
.75	1410	1325	1200	1090

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16-413-50/75 BLOWER PERFORMANCE @ 460 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds		
	High	Medium	Low
0	1790	1595	1095
.05	1770	1580	1095
.10	1750	1560	1095
.15	1725	1535	1095
.20	1700	1515	1090
.25	1675	1490	1080
.30	1645	1465	1070
.40	1575	1405	1045
.50	1500	1340	1010
.60	1415	1270	965
.70	1325	1195	915
.75	1275	1155	885

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16(R)-411-413-100 BLOWER PERFORMANCE @ 230 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds			
	High	Med-High	Med-Low	Low
0	1700	1580	1430	1315
.05	1665	1550	1420	1300
.10	1635	1520	1405	1285
.15	1600	1490	1390	1270
.20	1570	1460	1370	1250
.25	1540	1430	1345	1230
.30	1505	1400	1315	1215
.40	1430	1340	1260	1165
.50	1370	1280	1200	1110
.60	1300	1215	1130	1030
.70	1235	1150	1045	970
.75	1200	1115	1000	930

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16-413-100 BLOWER PERFORMANCE @ 460 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds		
	High	Medium	Low
0	1570	1480	1135
.05	1545	1455	1135
.10	1520	1430	1130
.15	1490	1405	1125
.20	1465	1375	1115
.25	1435	1350	1105
.30	1405	1320	1090
.40	1345	1265	1050
.50	1285	1200	1020
.60	1220	1140	975
.70	1155	1070	920
.75	1120	1040	885

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16(R)-511-513-75 BLOWER PERFORMANCE @ 230 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds				
	High	Med-High	Medium	Med-Low	Low
0	2765	2475	2225	1945	1670
.05	2735	2450	2205	1930	1655
.10	2705	2430	2190	1915	1640
.15	2670	2405	2170	1900	1620
.20	2635	2380	2145	1880	1605
.25	2600	2355	2125	1860	1585
.30	2530	2300	2075	1820	1540
.40	2455	2240	2025	1775	1495
.50	2380	2180	1970	1725	1445
.60	2300	2110	1910	1670	1385
.70	2260	2075	1875	1640	1355
.75	2220	2040	1840	1605	1325

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16-413-50/75 BLOWER PERFORMANCE @ 460 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds		
	High	Medium	Low
0	1805	1610	1090
.05	1790	1595	1095
.10	1770	1580	1095
.15	1750	1560	1095
.20	1725	1535	1095
.25	1700	1515	1090
.30	1675	1490	1080
.40	1610	1435	1060
.50	1540	1375	1030
.60	1460	1310	990
.70	1370	1235	945
.75	1325	1195	915

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16(R)-411-413-100 BLOWER PERFORMANCE @ 230 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds			
	High	Med-High	Med-Low	Low
0	1740	1585	1500	1370
.05	1710	1565	1475	1350
.10	1675	1545	1450	1330
.15	1645	1525	1425	1310
.20	1615	1490	1400	1290
.25	1580	1465	1375	1265
.30	1550	1440	1345	1240
.40	1485	1380	1290	1190
.50	1420	1320	1230	1135
.60	1350	1260	1165	1075
.70	1255	1165	1105	1015
.75	1220	1125	1070	980

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16-413-100 BLOWER PERFORMANCE @ 460 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds		
	High	Medium	Low
0	1609	1517	1163
.05	1584	1491	1163
.10	1558	1466	1158
.15	1527	1440	1153
.20	1502	1409	1143
.25	1471	1384	1133
.30	1440	1353	1117
.40	1379	1297	1087
.50	1317	1230	1046
.60	1251	1169	999
.70	1184	1097	943
.75	1148	1066	907

NOTE — All cfm is measured external to the unit with dry coil and without filter.

GCS16(R)-511-513-75 BLOWER PERFORMANCE @ 230 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds				
	High	Med-High	Medium	Med-Low	Low
0	2800	2495	2240	1955	1680
.05	2765	2475	2225	1945	1670
.10	2735	2450	2205	1930	1655
.15	2705	2430	2190	1915	1640
.20	2670	2405	2170	1900	1620
.25	2635	2380	2145	1880	1605
.30	2600	2355	2125	1860	1585
.40	2530	2300	2075	1820	1540
.50	2455	2240	2025	1775	1495
.60	2380	2180	1970	1725	1445
.70	2300	2110	1910	1670	1385
.75	2260	2075	1875	1640	1355

NOTE - All cfm is measured external to the unit with dry coil and without fiter.

GCS16(R)-511-513-125 BLOWER PERFORMANCE @ 230 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds				
	High	Med-High	Medium	Med-Low	Low
0	2775	2505	2270	1970	1710
.05	2725	2465	2240	1950	1685
.10	2675	2430	2210	1925	1665
.15	2630	2395	2180	1905	1645
.20	2580	2360	2150	1885	1620
.25	2540	2320	2120	1860	1595
.30	2490	2285	2100	1840	1570
.40	2400	2220	2040	1795	1515
.50	2300	2145	1980	1740	1450
.60	2200	2070	1910	1680	1365
.70	2130	2000	1865	1620	1305
.75	2090	1965	1840	1590	1260

NOTE – All cfm is measured external to the unit with dry coil and without filter.

GCS16(R)-511-513-125 BLOWER PERFORMANCE @ 230 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds				
	High	Med-High	Medium	Med-Low	Low
0	2700	2470	2235	1900	1650
.05	2675	2450	2225	1890	1640
.10	2650	2425	2210	1880	1630
.15	2625	2405	2200	1870	1620
.20	2595	2380	2185	1855	1610
.25	2570	2360	2165	1840	1600
.30	2535	2335	2150	1830	1585
.40	2480	2280	2110	1795	1550
.50	2410	2220	2085	1750	1510
.60	2340	2160	2000	1680	1455
.70	2255	2080	1965	1640	1410
.75	2215	2045	1940	1610	1385

NOTE – All cfm is measured external to the unit with dry coil and without filter.

GCS16(R)-651-653-75 BLOWER PERFORMANCE @ 230 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds				
	High	Med-High	Medium	Med-Low	Low
0	2785	2530	2270	1980	1715
.05	2755	2510	2255	1965	1700
.10	2725	2485	2240	1950	1690
.15	2695	2455	2220	1935	1680
.20	2670	2430	2200	1920	1670
.25	2640	2400	2180	1905	1655
.30	2610	2375	2160	1895	1645
.40	2550	2320	2120	1865	1615
.50	2485	2265	2075	1825	1580
.60	2415	2200	2025	1780	1540
.70	2345	2165	1965	1765	1450
.75	2310	2140	1935	1745	1450

NOTE – All cfm is measured external to the unit with dry coil and without filter.

GCS16(R)-651-653-75 BLOWER PERFORMANCE @ 230 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds				
	High	Med-High	Medium	Med-Low	Low
0	2760	2515	2220	1945	1680
.05	2740	2500	2210	1935	1670
.10	2720	2485	2200	1930	1660
.15	2700	2465	2190	1920	1650
.20	2680	2450	2175	1910	1635
.25	2660	2430	2160	1900	1620
.30	2630	2410	2150	1885	1600
.40	2570	2360	2115	1860	1570
.50	2490	2300	2075	1820	1525
.60	2375	2225	2020	1770	1470
.70	2310	2170	1970	1730	1435
.75	2260	2135	1945	1710	1410

NOTE – All cfm is measured external to the unit with dry coil and without filter.

GCS16(R)-651-653-125 BLOWER PERFORMANCE @ 230 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds				
	High	Med-High	Medium	Med-Low	Low
0	2740	2520	2270	2025	1710
.05	2715	2495	2250	2005	1690
.10	2685	2470	2230	1980	1670
.15	2655	2445	2210	1960	1650
.20	2630	2420	2190	1935	1635
.25	2600	2395	2170	1910	1615
.30	2570	2370	2150	1885	1595
.40	2510	2320	2100	1835	1550
.50	2450	2255	2080	1780	1500
.60	2375	2185	1995	1755	1440
.70	2305	2120	1935	1695	1390
.75	2265	2080	1900	1675	1355

NOTE – All cfm is measured external to the unit with dry coil and without filter.

GCS16(R)-651-653-125 BLOWER PERFORMANCE @ 230 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds				
	High	Med-High	Medium	Med-Low	Low
0	2760	2545	2295	2015	1680
.05	2745	2530	2280	2005	1675
.10	2730	2510	2265	1995	1670
.15	2710	2495	2250	1985	1665
.20	2695	2480	2235	1970	1655
.25	2675	2460	2220	1955	1645
.30	2650	2440	2200	1930	1635
.40	2600	2395	2160	1875	1605
.50	2540	2340	2110	1805	1555
.60	2480	2265	2025	1725	1475
.70	2395	2200	1985	1630	1450
.75	2340	2160	1950	1575	1425

NOTE – All cfm is measured external to the unit with dry coil and without filter.

GCS16-513-653-75/125 BLOWER PERFORMANCE @ 460 VOLTS (With Down-Flo Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds		
	High	Medium	Low
0	2630	2330	1905
.05	2605	2310	1890
.10	2580	2285	1870
.15	2555	2260	1850
.20	2525	2235	1830
.25	2495	2210	1810
.30	2445	2180	1790
.40	2400	2125	1745
.50	2325	2065	1695
.60	2250	2000	1640
.70	2165	1930	1580
.75	2125	1895	1550

NOTE – All cfm is measured external to the unit with dry coil and without filter.

GCS16-513-653-75/125 BLOWER PERFORMANCE @ 460 VOLTS (With Horizontal Supply and Return Air Openings)

External Static Pressure (in. wg.)	Air Volume (cfm) @ Various Speeds		
	High	Medium	Low
0	2655	2350	1920
.05	2630	2330	1905
.10	2605	2310	1890
.15	2580	2285	1870
.20	2555	2260	1850
.25	2525	2235	1830
.30	2495	2210	1810
.40	2435	2155	1765
.50	2365	2095	1720
.60	2200	2030	1665
.70	2205	1965	1610
.75	2165	1930	1580

NOTE – All cfm is measured external to the unit with dry coil and without filter.

FILTER AND ACCESSORY AIR RESISTANCE

Unit Model No.	Air Volume (cfm)	Total Resistance (inches water gauge)										
		1" Filter Furnished With GCS16 Units	REMD16 Down-Flo Economizer				EMDH16 Horizontal Economizer		DF16 Down-Flo Filter Adaptor Kit			Wet Evaporator Coil
			With 1" Filter (Not Furnished)	Less Filter	†With Optional Pleated 2" Filter	††With Optional Fiberglass 2" Filter	With Furnished 1" Filter	Less Filter	With Furnished 1" Filter	†With Optional Pleated 2" Filter	††With Optional Fiberglass 2" Filter	
GCS16-261 GCS16-311 GCS16-410	800	.15	.15	.05	.27	.13	.18	.10	.15	.27	.13	.08
	1000	.18	.18	.06	.34	.18	.26	.15	.18	.34	.18	.09
	1200	.21	.21	.09	.42	.24	.35	.21	.21	.42	.24	.10
	1400	.25	.25	.15	.51	.31	.46	.29	.25	.51	.31	.11
GCS16-510 GCS16-650	1600	.15	.20	.05	.40	.27	.30	.17	.15	.35	.22	.09
	1800	.17	.23	.06	.48	.33	.35	.19	.17	.42	.27	.10
	2000	.20	.27	.08	.56	.39	.40	.22	.20	.49	.32	.11
	2200	.23	.32	.10	.66	.46	.47	.26	.23	.57	.37	.12

† Air resistance with field furnished 2" pleated non-woven cotton fabric filter.
†† Air resistance with field furnished 2" fiberglass media filter.

RTD9-65 STEP-DOWN CEILING DIFFUSER AIR THROW DATA

Grille Vanes	Air Volume (cfm)	*Effective Throw (ft.)		
		Horizontal Vanes 180° Straight	Horizontal Vanes 22° Down	Horizontal Vanes 45° Down
2 Ends Open	600	21	20	14
	800	22	21	15
	1000	24	22	16
	1200	25	23	17
	1400	27	25	18
	1600	29	26	19
	1800	31	27	20
	2000	33	28	21
	2200	35	30	22
	2400	38	34	23
1 Side 2 Ends Open	600	15	14	8
	800	16	15	9
	1000	17	16	10
	1200	18	17	11
	1400	19	18	12
	1600	20	18	12
	1800	21	19	13
	2000	23	20	14
	2200	25	22	16
	2400	27	24	17
All Sides And Ends Open	600	11	10	7
	800	12	11	8
	1000	13	12	8
	1200	14	13	9
	1400	15	14	9
	1600	16	14	10
	1800	17	15	10
	2000	18	16	11
	2200	19	17	12
	2400	20	18	12

*Effective throw is terminated at a point where conditioned air velocity has decreased to 50 ft. per minute.

DIFFUSER AIR RESISTANCE

Unit Model No.	Air Volume (cfm)	Total Resistance (inches water gauge)			
		RTD9-65 Diffuser			FD9-65 Diffuser
		2 Ends Open	1 Side 2 Ends Open	All Ends & Sides Open	
GCS16-261 GCS16-311 GCS16-410	800	.15	.13	.11	.11
	1000	.19	.16	.14	.14
	1200	.25	.20	.17	.17
	1400	.33	.26	.20	.20
GCS16-510 GCS16-650	1600	.43	.32	.24	.24
	1800	.56	.40	.30	.30
	2000	.73	.50	.36	.36
	2200	.95	.63	.44	.44

FD9-65 CEILING DIFFUSER AIR THROW DATA

Air Volume (cfm)	*Effective Throw (ft.)
600	7
800	8
1000	8
1200	9
1400	9
1600	10
1800	11
2000	12
2200	12
2400	13

*Effective throw is terminated at a point where conditioned air velocity has decreased to 50 ft. per minute.

GUIDE SPECIFICATIONS

Prepared for the guidance of architects, consulting engineers and mechanical contractors.

General — *Furnish and install a single package combination air to air DX mechanical cooling system and gas fired heating system, complete with automatic controls. The single package unit shall be a standard product of a firm regularly engaged in the manufacture of heating-cooling equipment. The manufacturer shall have parts and service available throughout the United States.*

The installed weight shall not be more than . . . . . lbs. Entire unit shall have a width of not more than . . . . . inches, a depth of not more than . . . . . inches and an overall height of not more than . . . . . inches. The equipment shall be shipped completely factory assembled, precharged, piped and wired internally ready for field connections. In addition, manufacturer shall test operate system at the factory before shipment.

Air Distribution — *Equipment shall be capable of bottom or side (horizontal) handling of conditioned air. All air distribution ducts shall be fiberglass or . . . . . ga. galvanized steel insulated with . . . . . inch thick . . . . . lb. density fiberglass or equivalent.*

Approvals — *All electrical components shall have U.L. Listing. All wiring shall be in compliance with NEC.*

Equipment Warranty — *Heat exchangers have a limited warranty for a full fifteen years. Compressors have a limited warranty for a full five years. Most of the other components have a limited warranty for one year. Refer to the Lennox Equipment Limited Warranty certificate included with the unit for additional details.*

Cooling System — *The total certified cooling capacity shall not be less than . . . . . Btuh with an evaporator air volume of . . . . . cfm, an entering wet bulb air temperature of . . . . . °F, an entering dry bulb air temperature of . . . . . °F and a condenser entering temperature of . . . . . °F. The compressor power input shall not exceed . . . . . kw at these conditions.*

The coils shall be non-ferrous construction with aluminum enhanced fins mechanically bonded to durable copper tubes. Coils shall be pressure leak tested. Coil face area shall be not less than . . . . . sq. ft. (evaporator) and . . . . . sq. ft. (condenser). Optional coil guard(s) shall be available.

The compressor shall be resiliently mounted, have overload protection and internal pressure relief. GCS16 models shall have compressor crankcase heater. The refrigeration system shall have suction and liquid line service gauge ports, liquid line strainer and full refrigerant charge. GCS16(R)-510 & 650 shall have expansion valve and thermometer well. GCS16-261-311-410-510-650 models shall have high pressure switch and loss of charge switch. Control options shall consist of thermostat, timed-off control and low ambient control. Shall be rated in accordance with ARI Standard 210/240-89, DOE test procedures and California Energy Standards.

GCS16 Models Commercial Controls Platform — *Shall be furnished and factory installed. Platform shall include control system and economizer wiring harness. Wiring harness shall be used in conjunction with thermostats, related control systems, and economizer dampers.*

Heating System — The heating capacity output shall be . . . . . Btuh with a gas input of . . . . . Btuh.

Heat exchanger shall consist of cast iron primary combustion chamber and aluminized steel tubular secondary. Inshot type gas burner shall be constructed of aluminized steel with direct spark ignition. Controls shall consist of electronic flame sensor controls, limit control, flame rollout switch, automatic redundant dual gas valve and centrifugal switch on induced draft blower. Unit shall be available for use with natural gas or LPG. Complete service access shall be provided for controls and wiring. Shall be A.G.A. design certified for outdoor installation. Shall be rated and tested according to GAMA, DOE and FTC.

Cabinet — *Shall be galvanized steel with a powdered enamel paint finish electrostatically bonded to the metal. Cabinet panels where conditioned air is handled shall be fully insulated to prevent sweating and minimize sound. Openings shall be provided for power connection and gas line entry. Supply and return air openings shall be flanged. Evaporator coil condensate drain shall be provided. GCS16-261-311-410-510-650 models shall have low voltage terminal strip. Optional lifting lugs shall be available for rigging on GCS16R models. Lifting brackets shall be furnished for field installation on GCS16-261-311-410 models. Lifting brackets shall be factory installed on GCS16-510-650 models.*

Service Access — *All components, wiring and inspection areas shall be completely accessible through removable panels.*

Air Movers — *Centrifugal conditioned air blower shall be direct driven by a multi-speed motor and be capable of delivering . . . . . cfm at an external static pressure of . . . . . inches water gauge requiring not more than . . . . . bhp and . . . . . rpm. Blower shall be statically and dynamically balanced.*

Propeller type condenser fan shall be direct driven by a . . . . . hp motor. Fan motor shall be permanently lubricated and inherently protected.

OPTIONAL ACCESSORIES (Must Be Ordered Extra)

Roof Mounting Frame *— Furnish and install a steel roof mounting frame for bottom discharge and return air duct connection. It shall mate to the bottom perimeter of the equipment. When flashed into the roof it shall make a unit mounting curb and provide weatherproof duct connection and entry into the conditioned area. Flashing shall be the responsibility of a roofing contractor. Frame design shall be approved by National Roofing Contractors Association.*

Economizer Dampers *— Furnish and install complete with controls an air mixing damper assembly including outdoor air and recirculated air dampers. REMD16 shall include pressure operated gravity exhaust dampers. The assembly shall provide for the introduction of outside air for minimum ventilation and free cooling. Damper motor shall be 24 volt three position or fully modulating spring return. Controls shall include electronic discharge air sensor, minimum position switch, and solid-state adjustable enthalpy control. Control option available shall consist of differential enthalpy control (return air sensor).*

Horizontal Gravity Exhaust Dampers *— Pressure operated dampers shall install in return air duct for horizontal applications. Damper blades shall ride in nylon bearings and be gasketed for tight seal and quiet operation.*

Outdoor Air Damper Section — *Optional manual outdoor dampers shall be available to provide outdoor air requirements of up to 25%. Damper section field installs external to the unit. Shall be equipped with filter for extra air filtering and bird screen protection.*

Down-Flo Filter Adaptor — *Optional filter adaptor shall field install in GCS16R unit to provide filtering for basic unit in down-flo applications. Shall include air filter.*

Stand-Off Mounting Kit — *Optional kit shall be available to elevate unit above mounting surface in horizontal applications.*

Roof Curb Power Entry Kit — *Optional kit shall provide power entry to the unit through the roof mounting frame.*

Ceiling Diffusers *— Furnish and install a (flush or stepdown) optional combination ceiling supply and return air diffuser. It shall be capable of not less than . . . . . ft. radius of effective throw. Supply and return transitions shall be available, for field installation in the roof mounting frame, to provide duct connection to the diffuser.*

Remote Status Panel *— Shall be available for installation within the conditioned area to observe equipment operation. The panel shall include signal lights for Cool Mode, Heat Mode, Compressor 1, Compressor 2, No Heat and Filter.*

Remote Switching Status Panel *— Shall be available for installation within the conditioned area to control and observe equipment operation. The panel shall include signal lights for Cool Mode, Heat Mode, Compressor 1, Compressor 2, No Heat and Filter. System selector switch and fan switch shall provide operational mode and blower operation. After hours timer switch shall override night setback controls and provide normal operation for time period set.*

Control Systems *— Shall provide a selection of thermostats and related controls to automatically operate the mechanical equipment through the heating or cooling and ventilating cycles as required.*

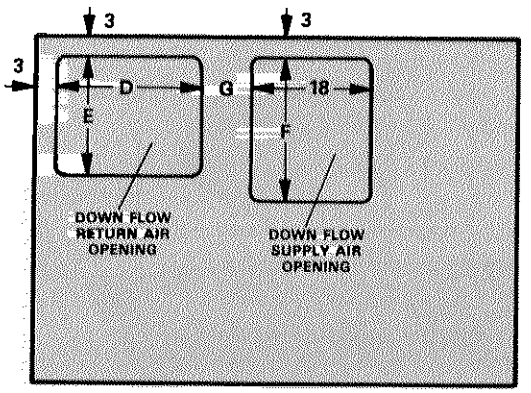
GCS16(R) BASIC UNIT

CORNER WEIGHTS (lbs.)

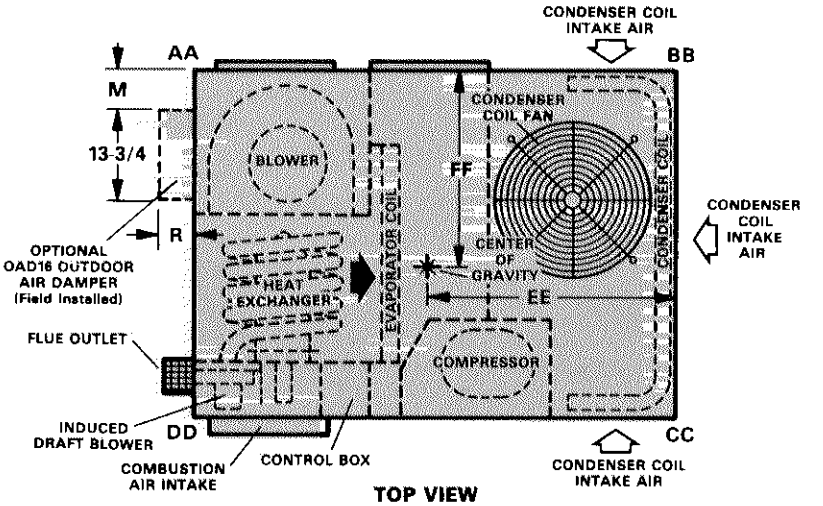
Model No.	AA	BB	CC	DD
GCS16-261	99	107	90	80
GCS16-311	108	117	99	88
GCS16(R)-411-413	111	120	101	90
GCS16(R)-511-513	131	113	130	146
GCS16(R)-651-653	136	124	145	155

CENTER OF GRAVITY (in.)

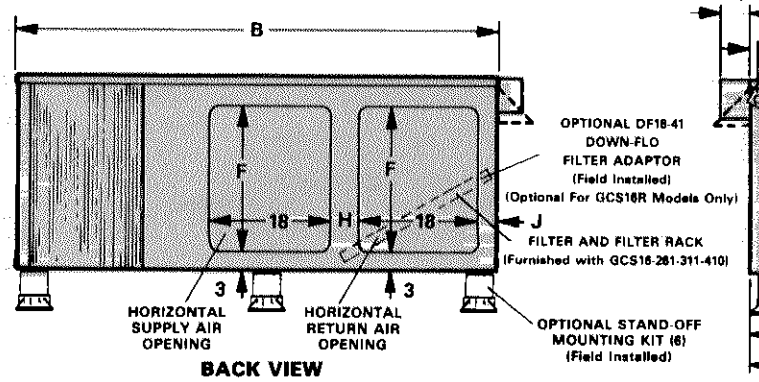
Model No.	EE	FF
GCS16-261 GCS16-311 GCS16(R)-411-413	28	17-1/2
GCS16(R)-511-513	39-7/8	30-1/2
GCS16(R)-651-653	38-1/2	31-3/4



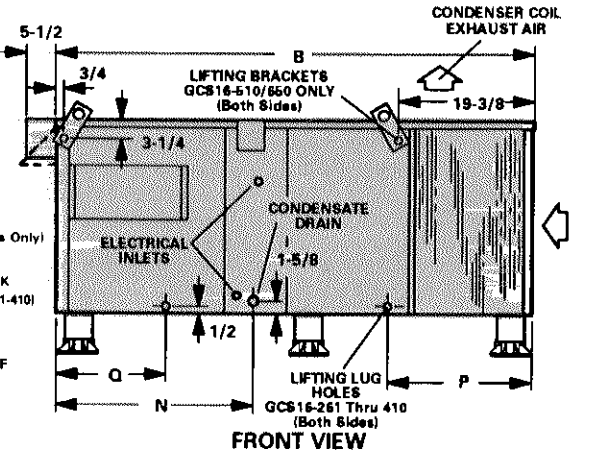
TOP VIEW BASE SECTION



TOP VIEW

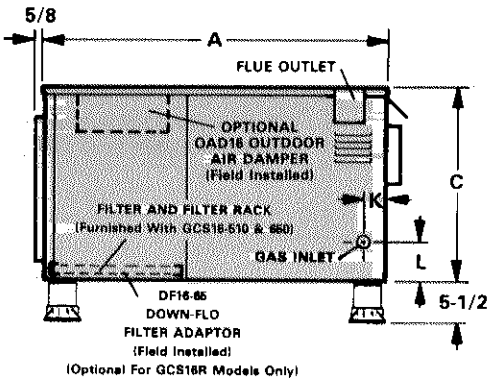


BACK VIEW
(With Horizontal Supply & Return Air)

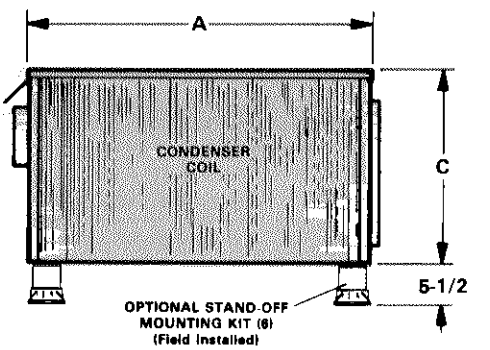


FRONT VIEW

All "R" Model Unit Brackets must be ordered extra.



END VIEW



END VIEW

Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
GCS16-261 GCS16-311 GCS16(R)-411-413	46	60	23	18	13	13	10	3	4	3-1/8	4-1/8	2	26-3/4	13-1/4	10	5
GCS16(R)-511-513 GCS16(R)-651-653	52	72-1/2	29	22	18	22	7-1/2	5	3	4-1/8	8-1/8	5	28	21-1/2	17	8

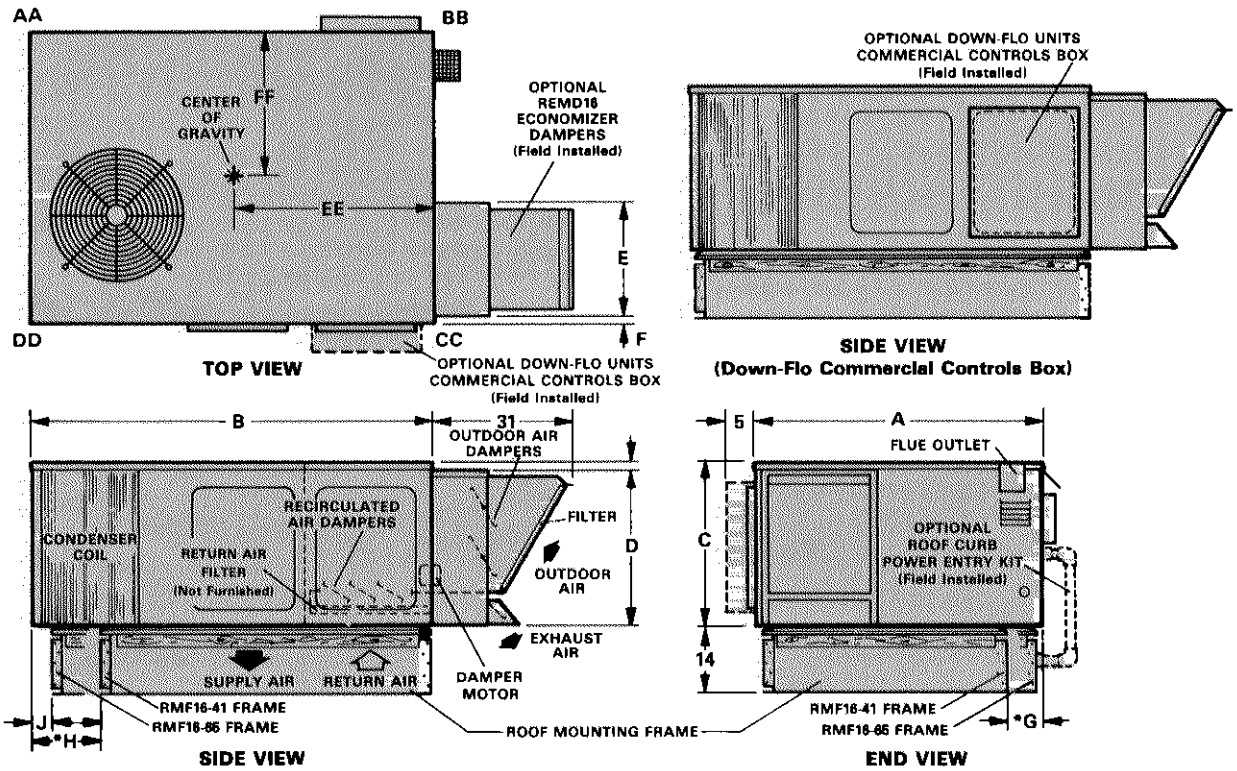
GCS16 UNIT WITH REMD16 ECONOMIZER DAMPER SECTION AND RMF16 ROOF MOUNTING FRAME

CORNER WEIGHTS (lbs.)

Model No.	AA	BB	CC	DD
GCS16-261	97	99	161	142
GCS16-311	105	107	172	152
GCS16-410	106	108	176	155
GCS16-510	148	217	182	125
GCS16-650	168	237	177	130

CENTER OF GRAVITY (in.)

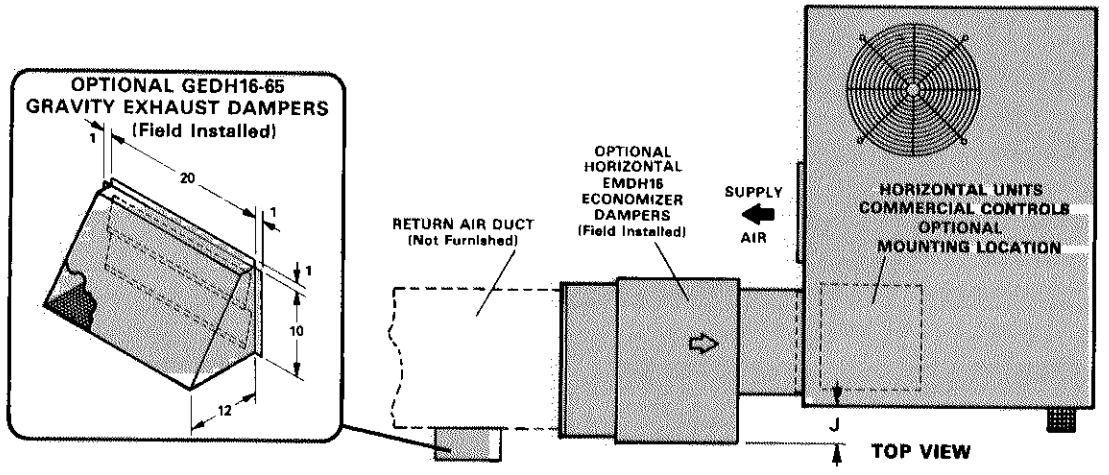
Model No.	EE	FF
GCS16-261		
GCS16-311	28-3/4	28-1/4
GCS16-410		
GCS16-510	29-5/8	23-13/16
GCS16-650	30-7/8	22-3/4

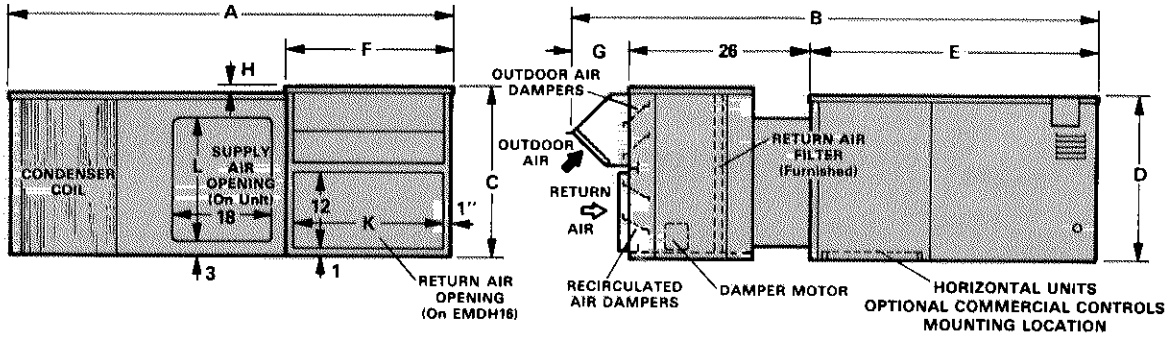


Model No.	A	B	C	D	E	F	*G	*H	J
GCS16-261									
GCS16-311	46	60	23	21-3/4	16-1/8	3/4	----	----	----
GCS16-411-413									
GCS16-511-513	52	72-1/2	29	27-3/4	20-1/4	1-1/2	7	16	3-1/2
GCS16-651-653									

* Dimensions reflect usage with RMF16-41 mounting frame.

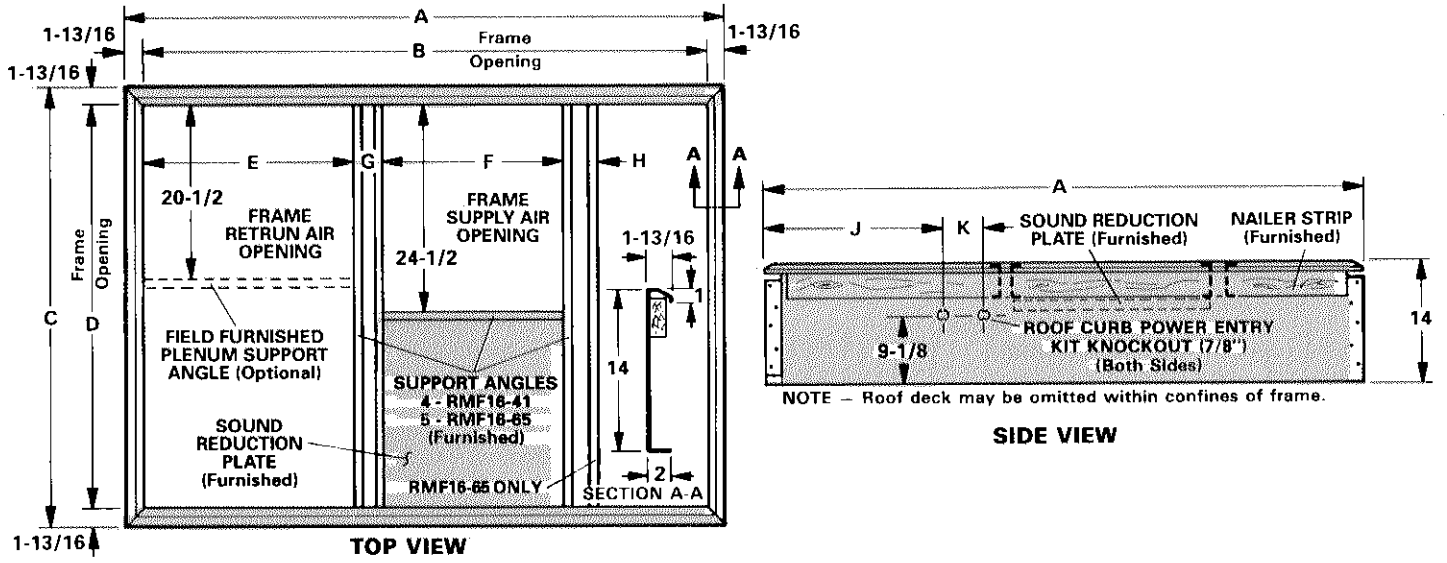
GCS16 UNIT WITH EMDH16 HORIZONTAL ECONOMIZER DAMPER SECTION AND GEDH16-65 GRAVITY EXHAUST DAMPERS





Model No.	A	B	C	D	E	F	G	H	J	K	L
GCS16-261 GCS16-311 GCS16-411-413	63	81-1/2	26	23	46	26	9-1/2	3	3	24	13
GCS16-511-513 GCS16-651-653	79-1/2	90	30-3/8	29	52	30-1/2	12	1-1/2	7	28-7/8	22

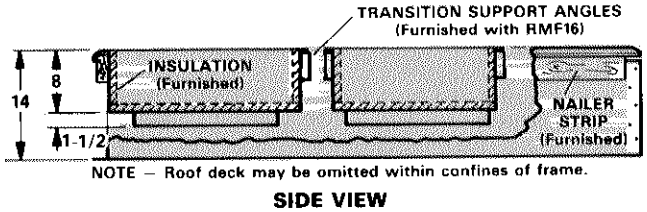
RMF16-41 & 65 ROOF MOUNTING FRAME WITH DOUBLE DUCT OPENING FOR GCS16 UNITS



Model No.	A	B	C	D	E	F	G	H	J	K
RMF16-41	56-3/8	52-3/4	44-7/8	41-1/4	24-3/8	20-9/16	*4	----	22-3/16	4-1/2
RMF16-65	69	65-3/8	50-1/2	46-7/8	24-1/4	20-1/2	4	4	27	5

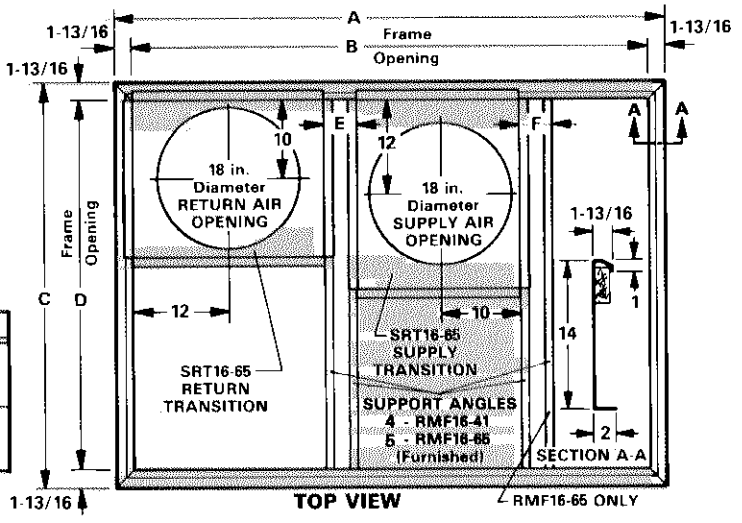
*3-1/4 inches with GCS16-261-311-410 units.

RMF16-41 & 65 ROOF MOUNTING FRAME FOR GCS16 UNITS WITH SRT16-65 SUPPLY AND RETURN AIR TRANSITIONS FOR FD9-65 & RTD9-65 CEILING DIFFUSERS

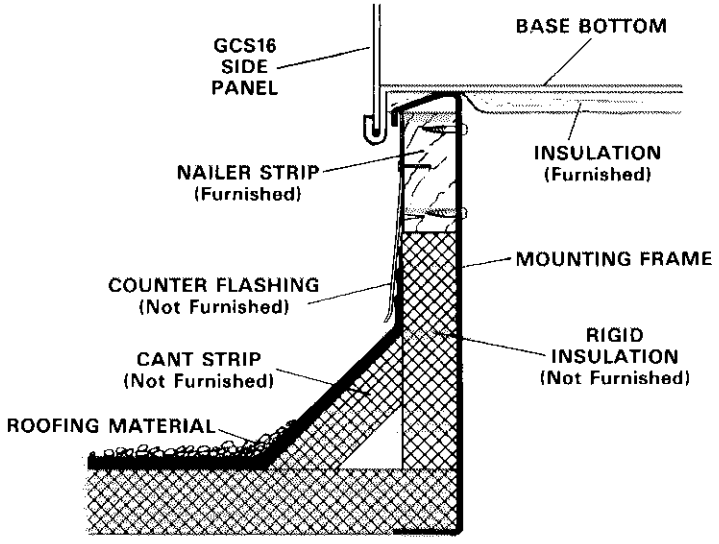


Model No.	A	B	C	D	E	F
RMF16-41 with SRT16-65	56-3/8	52-3/4	44-7/8	41-1/4	*4	----
RMF16-65 with SRT16-65	69	65-3/8	50-1/2	46-7/8	4	4

*3-1/4 inches with GCS16-261-311-410 units.



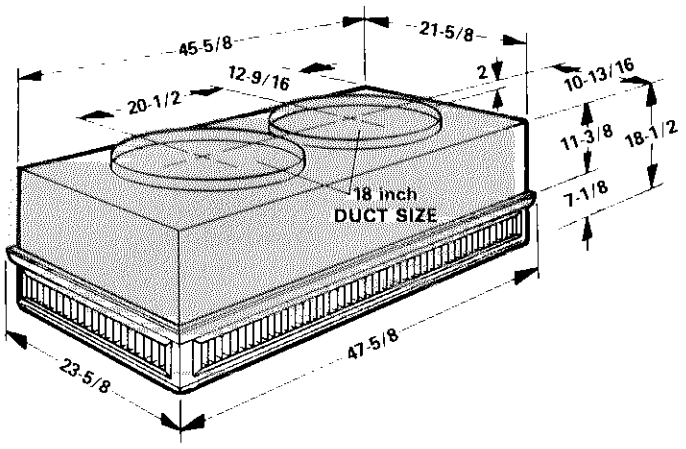
TYPICAL FLASHING FOR RMF16-41 & 65 ROOF MOUNTING FRAMES WITH GCS16 SERIES UNITS



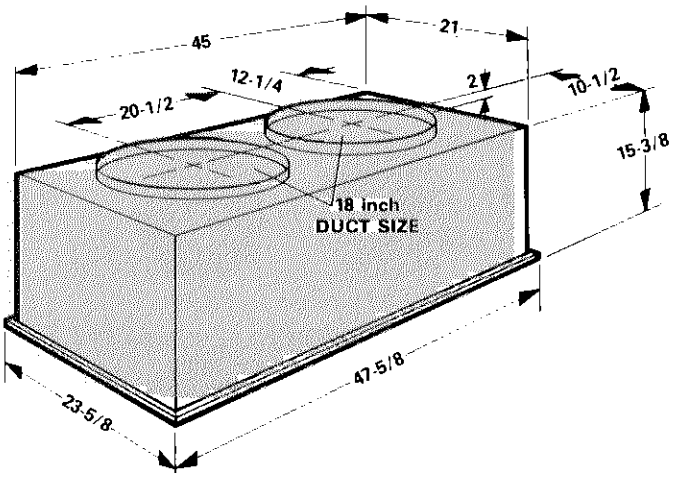
DIMENSIONS (inches)

COMBINATION SUPPLY AND RETURN AIR CEILING DIFFUSERS

RTD9-65 STEP-DOWN DIFFUSER

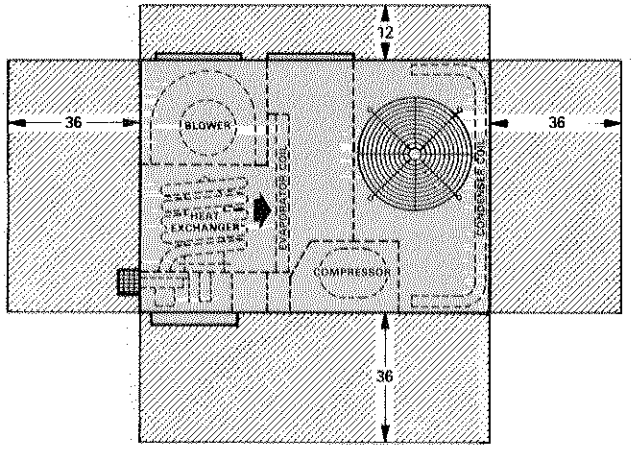


FD9-65 FLUSH DIFFUSER



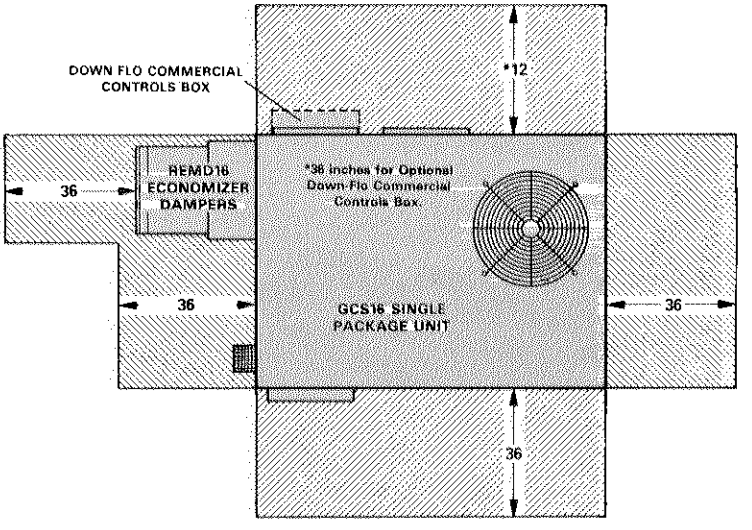
INSTALLATION CLEARANCES (inches)

GCS16(R) BASIC UNIT



NOTE — Top Clearance Unobstructed.

GCS16 UNIT WITH REMD16 ECONOMIZER



NOTE Top Clearance Unobstructed.

GCS16 UNIT WITH EMDH16 ECONOMIZER AND GEDH16-65 GRAVITY EXHAUST DAMPERS