Dometic®

WHEN ORDERING SPARE PARTS, ALWAYS STATE:
MODEL NO. - PRODUCT NO. - QUANTITY - PART NUMBER - DESCRIPTION

Basement Air Conditioning ***Systems***

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INDEX

APPLICATION MANUAL

DUCTED MODELS

REVISION
Form No. 3108514.013 9/00
(Replaces 3108514.005)

APPLICATION MANUAL

DUCTED AIR CONDITIONING

1.0 AIR DISTRIBUTION

■1.1 GENERAL INFORMATION

■ The purpose of an air conditioning system is to provide environmental conditions in a space to keep its occupants comfortable.

The basic elements of a simple forced circulation air system consists of a cooling unit, a centrifugal blower, a temperature sensing device controlling operation of the compressor and blower, suitable air filters, and a duct system.

Air is filtered, cooled, and distributed to various areas of the vehicle. Duct work should deliver this conditioned air as directly, quietly, and economically as possible. If the distribution is not properly sized and balanced, flow of air will not be as calculated and the system will not function properly or efficiently.

■1.2 THE BASIC AIR CONDITIONING CYCLE

The components which are basic to air conditioning systems are illustrated by Figure 1. Air is treated at the conditioning unit, transferred to the conditioned space through the supply duct system and returned to the conditioning unit through the return system. The duct systems are also referred to as the distribution system.

■1.3 FUNCTION OF A DUCT SYSTEM

A duct is a tube, or pipe, that carries air between two points. Strictly speaking, in air conditioning terms, a duct system is the arrangement of ducts between air conditioning equipment and rooms to be cooled, not including such items as filters, cooling coils, etc. However, we shall include in our use of the term "duct system", every item in the air-passage network that offers resistance to air flow. From the standpoint of the blower it makes no difference whether a resistance is caused by filters or by the use of a small duct; effect will be the same. Resistance tends to restrict flow of air through the entire system.

A forced air system is only as good as its air delivery system. Comfort levels are affected by the quantity and velocity of air movement within the space and the proper mixing of the supply air with the room air. Supply air should be furnished in a manner that will direct the air to the sources of the greatest heat loss and/or heat gain. The effects of the gain or loss can then be offset by the supply air. It is important that the selection of the diffusers and grills for the supply and return systems receive careful attention to enable them to accomplish their purpose.

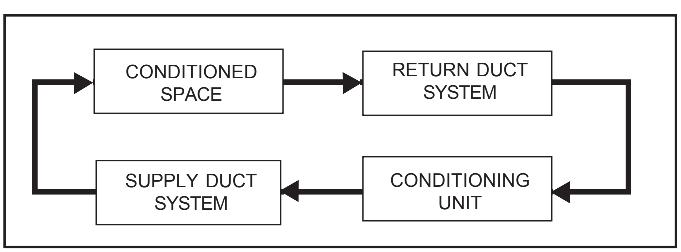
Consideration must be given to all aspects of the supply air distribution patterns: throw, spread, drop, etc. Also, the outlet and return grille velocities must be held within reasonable limits. Any noise generated at the grille is equal to or greater in importance than duct noise.

A window air conditioner (Figure 2) is essentially a device with a minimum duct system, since the only items that offer resistance to air flow are built into the cabinet.

■1.4 FACTORS AFFECTING RESISTANCE TO AIR FLOW

Common observations of daily events tell us something about factors affecting resistance to air flow. We know, for example, that more pressure is required to force a given rate of air flow through a small duct than through a large duct. We also know that streamlining of ducts means less resistance to air flow, and that sharp angled turns must be avoided.

As air passes through ducts, cooling coils, grilles, diffusers, and dampers, the static pressure is reduced by friction and turbulence losses. Good duct design minimizes the need to balance the duct system by sizing the ducts such that the designed pressure drop allows the desired airflow rate to be delivered to each room. An improperly sized duct system will require extensive balancing. Balancing is a procedure by which the air flow allotment is adjusted to supply the correct quantity of conditioned air to each room.



Block diagram of comfort air conditioning cycle. Arrows indicate direction of air flow.
FIG. 1

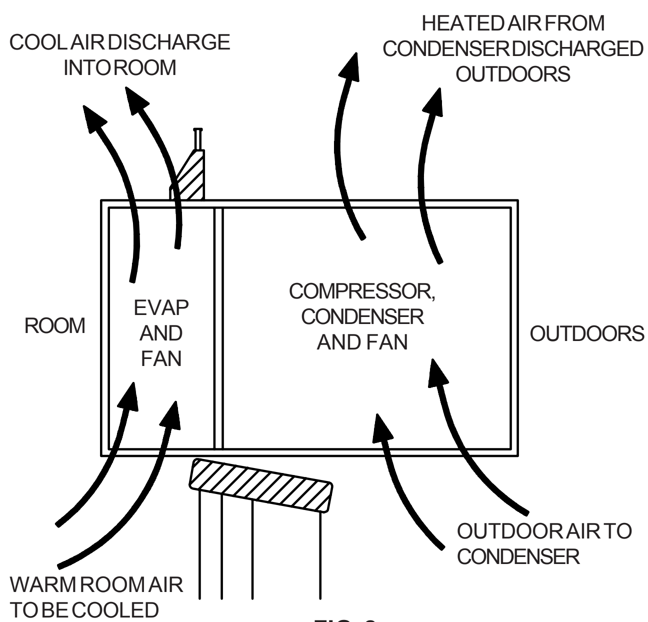


FIG. 2

The Window Air Conditioner represents a minimum duct system, since air to and from the cooler is handled without external ducts.

■1.5 AIR FLOW AND FRICTION

Air flows in a duct system from a region of high pressure to a region of lower pressure. The blower creates the pressure differential which causes the air flow through the duct system. The point of highest pressure in the system is at the outlet of the blower. The point of lowest pressure in the system is at the return opening of the blower. The air pressure constantly decreases as the air flows through the system. The pressure ultimately diminishes to zero as it passes through the register and is diffused into the conditioned space. As air moves through a duct, a pressure drop occurs due to the friction between the air and the walls of the duct. Another factor in pressure drop is the turbulence within the air stream itself. Air moving within a duct does not flow in a placid stream. Rather it moves in a churning and mixing path, or "turbulent flow." The cumulative effect of rubbing friction and turbulence friction is friction loss. Air turbulence in a duct system becomes substantial whenever there is a change in the direction of air flow.

■1.6 ECONOMICS OF DUCT DESIGN

In order to match to the system air delivery capacity, elbows for turning the air must be kept as large as allowed by the unit construction. **Duct depth for Dometic air conditioners may vary with each model series. Confirm the system to be installed and refer to Figure 10, for specific duct configurations required**. High loss elbows must have their resistance lowered by the use of splitters or turning vanes. Refer to Figure 3.

Another factor in duct losses is air leakage. Although leakage is not considered in duct design it should be an installation consideration. Cold air leaking into the surrounding cavity will cause condensation to form under high humidity conditions. Sealing all joints will assure moisture free cavities and maximum distribution of air to the outlets.

In most cases of high resistance encountered in duct systems, one or more of the following points have been overlooked by the installer:

A. Small Diameter

Pressure losses increase as diameter of a duct is reduced. Good design practice is that which enables the installer to put in the smallest size duct that will do the job of delivering required airflow rate with pressure available. No single size of duct will prove to be ideal for all jobs.

B. Length of Duct

Pressure loss increases as duct length is increased. This is almost obvious; a duct which is 6 ft. long has twice the pressure loss of one that is 3 ft. long, provided that both ducts are the same size and both are carrying the same airflow rate.

C. Changes in Direction (Figure 7)

Pressure losses increase when direction of air flow is changed. When air is forced to make a 90° turn in a duct system, pressure loss is much greater than for a straight run of the same length. (Refer to FIG. 7)

Item 1. This sharp-angled bend causes a large pressure loss. A simple way of visualizing such pressure loss is to imagine that these diagrams represent highways on which you are driving a car. As you approach a bend you are forced to slow the car speed to 15 mph. In so doing, a considerable part of energy of the fast-moving car has had to be absorbed by the brakes. The analogy holds for air particles flowing around a sharp bend.

Item 2. This sharp-angled bend on the inside corner causes great pressure loss. The rounded corner on the outside does not help as much as might be anticipated.

Item 3. This is a common form of 90° bend that has relatively low resistance.

Item 4.
If minimum resistance is desired, this extreme example of a smooth, streamlined fitting can be used, although space requirements will be prohibitive in many installations.

Item 5. Occasionally, a beam or rafter prevents the use of a smooth bend and a right angle bend is necessary. In such cases the use of turning vanes (splitters) will be effective in reducing resistance.

Item 6. Another way to reduce resistance is to change item (3) to a modified version of item (4) by inserting splitters in the sharper bend.

D. Sudden Contraction

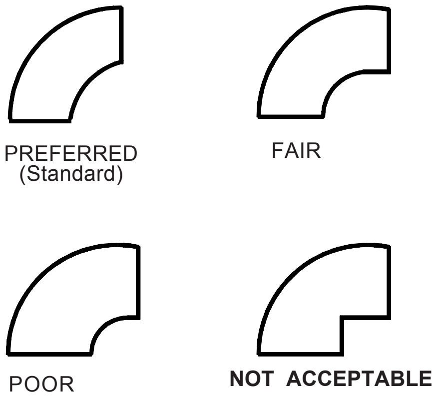
When air is suddenly contracted from a large duct to a small duct, a pressure loss occurs (Figure 8).

E. Sudden Expansions

The pressure loss resulting from the sudden expansion of air from a small duct to a large duct, are much larger than losses due to sudden contraction. As with sudden contraction, much can be done by making air expansion gradual, rather than abrupt. (Figure 9).

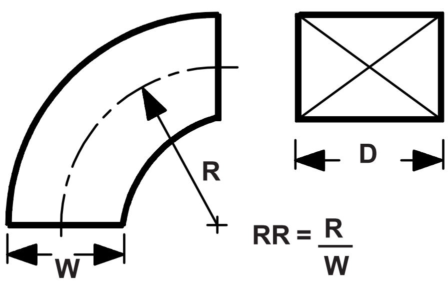
To summarize Section 1.6, the following items contribute to higher pressure losses in a duct system:

1. Smaller diameter ducts
2. Longer duct lengths
3. Changes in direction of air flow
4. Sudden contractions in air stream
5. Sudden expansions in air stream



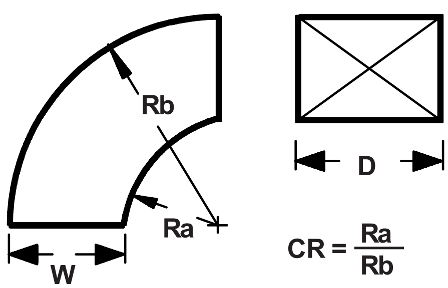
Various Elbows Showing Radius Ratios

FIG. 3



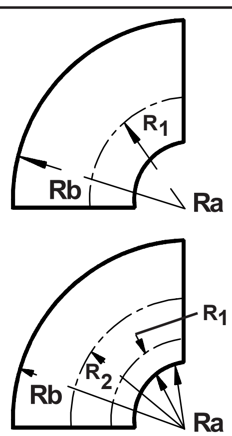
Radius Ratio (RR)
or RR = 1.5

FIG. 4



Curve Ration (CR)
Optimum Reading CR = .05

FIG. 5



$CR = \frac{Ra}{Rb}$

$R1 = 2\,Ra$

$CR = .25$

$CR = \frac{Ra}{Rb}$

$R1 = 2\,Ra$

$R2 = \frac{(Rb - R1)}{2} + Ra$

$CR = .15$

FIG. 6 Using Splitters to reduce resistance.

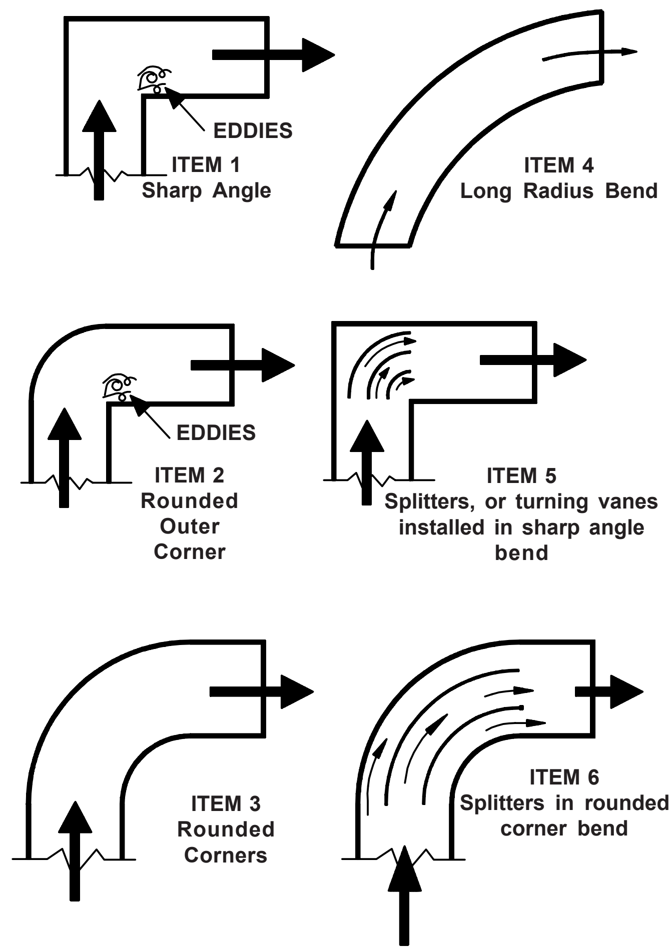


FIG. 7

Different ways of making a 90 degree bend. Some involve greater pressure losses than others.

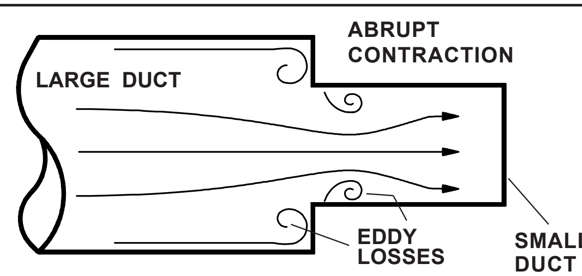


FIG. 8

Pressure losses occur with abrupt reducing fittings.

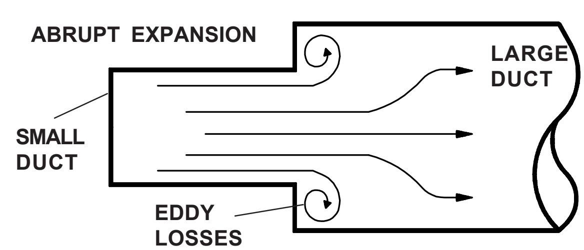


FIG. 9

Abrupt expansion results in excessive pressure losses.

■1.7 REGISTERS, DIFFUSERS, AND GRILLE SELECTION

One of the most important considerations in designing a conditioning system is the selection of the registers, diffusers and grills. Even though a system delivers the required amount of conditioned air to the room, discomfort results if the air is not satisfactorily distributed. Achieving good air distribution is as much an art as it is a science. Careful consideration must be given to the design of the air distribution system. A forced air system is only as efficient as its air delivery components.

Whenever a jet of conditioned air is admitted into a room it affects all the air within that room. Movement of the supply air induces adjacent room air to move along with it. This process of the supply air dragging along the room air and setting it in motion is called "entrainment" of the room air. As the room air mixes with the supply air, the temperature difference between them is reduced. This effect is even more pronounced with a spreading jet than with a non—spreading jet because of the greater surface area.

■1.8 ROOM AIR DISTRIBUTION

The final evaluation of air distribution in a space is determined by the occupants' comfort level. In general, a person is thermally comfortable when their body heat loss just equals their heat production.

During cooling, currents carry warm air up the wall to ceiling level, and stratification forms from the ceiling down. The solution is to project cool air into this region near the ceiling.

Performance of any supply outlet is related to initial velocity and area. As it leaves the outlet, an air jet becomes a mixture of supply and room air, expanding due to the induction of room air.

The buoyant forces with non-isothermal jets cause the jet to rise during heating and drop during cooling. If the jet is projected parallel to and within a few inches of a surface, the jet performance will be affected by the surface, which limits the induction on the surface side of the jet. This creates a low pressure region between the jet and the surface, which draws the jet toward the surface. In fact, this effect will prevail if the angle of discharge between the jet and surface is less than 40°. The surface effect will draw the jet from a ceiling outlet to the ceiling. Surface effect increases the throw for all types of outlets and decreases the drop for horizontally projected air streams.

The air stream from the outlet tends to "hug" the surface. As a matter of fact, this characteristic is almost essential for good comfort air conditioning. Therefore, rather than trying to direct the air away from surfaces, the surfaces should be used intentionally. Note that where the surfaces are used most effectively, the high velocity portions of the air stream have less tendency to enter the occupied zone of the space.

■2.0 HOW ROOM AIR MOTION IS RELATED TO OUTLET PERFORMANCE

The room air near the supply air stream is entrained by the air stream and, in turn, is replaced by other room air. The room air always moves toward the supply air. The only general statement that can be made regarding room air motion and the number of air changes is that 8 to 10 air changes per hour are required to prevent formation of stagnant regions.

For most applications, a better approach is to supply air in such a way that the high velocity air stream from the outlet does not enter the occupied zone. It is practical to consider the region within 12 inches of the walls as outside the occupied zone as well as the region above the heads of the occupants.

Supply air should be spread in a thin layer over the surfaces, to surround the occupied zone with conditioned air. Air within the occupied zone will then move toward the total air stream, the mixture of primary and room air. The room air carries the load with it into the air stream and room conditions are maintained by constant mixing of room and supply air.

3.0 SPECIFICATIONS & REQUIREMENTS

■3.1 GENERAL INFORMATION

Following are precautions that should be taken into account before installation of this equipment

! WARNING

Improper installation may damage equipment, could endanger life, cause serious injury and/or property damage.

A. Read all installations and operating instructions carefully before starting installation.
B. The Dometic Corporation will not be liable for any damages or injury incurred due to failure in following these instructions.
C. Installation MUST comply with the National Electrical Code and any State or Local codes or regulations.
D. DO NOT add any devices or accessories to this air conditioner except those specifically authorized in writing by Dometic.
E. This equipment must be serviced by qualified personnel and some countries require these people to be licensed.
F. It is the responsibility of the Manufacturer to insure the installed duct work complies with R.V.I.A. Standards or appropriate agency standards.

This guide is for the installation of Dometic's Basement systems and should be used when the original equipment manufacturer constructs the vehicle. The purpose for a ducted basement system is that the original equipment manufacturer has the flexibility of installing this system to a duct distribution system integrally installed within the framing of the vehicle.

Since it is necessary to install all or part of the duct work in the ceiling, sidewall or floor,

⚠ CAUTION

It is the responsibility of the R.V. manufacturer to assure that structural integrity is maintained throughout the coach.

The manufacturer should review each floor plan to determine proper duct design and register location.

The Dometic Product Engineering and Application departments are available for recommendations and suggestions.

If the conditioned air is to be discharged from the ceiling area, the minimum roof cavity thickness for proper installation measured between the roof and ceiling structure is 4 inches. This does not include space required for insulation of the ductwork.

The air conditioner was designed to allow flexibility for layout of duct work and the types of registers employed. To ensure air conditioner maximum performance, certain parameters must be adhered to. Refer to Figures 11-19 for duct sizing and grill placement.

■3.1.1 UNIT SPECIFICATIONS

Refer to the installation instructions provided with your air conditioner.

■3.1.2 COOLING REQUIREMENTS

When determining the cooling requirements of each vehicle, the following should be considered:

A. The size of the vehicle will determine the number of air conditioning units that are required, or the need to pre-wire for additional air conditioners depending on the geographical location of use.
B. Amount of insulation in walls, floor and roof of the vehicle.
C. Identify possible heat sources and plan accordingly:
   1. Skylights - location should not be within 4 feet of the air conditioner return system.
   2. Skylights - should be tinted and double pane.
   3. Roof vents (14 x 14) should be a tinted type, and quantity kept to minimum.
   4. Increased use of slide-outs and/or glass square footage will require tinting with additional insulation in wall and ceiling cavities.
   5. Calculation of heat producing appliances.

■3.1.3 LOCATING SYSTEM

This type of system was designed for installation in a basement storage compartment or mounted directly under the vehicle. The advantages of basement systems are: the units are not exposed to the elements, they are easier to service, and they eliminate the need for roof top systems.

Basement systems are designed exclusively with external ductwork for the cold air discharge. There are not provisions for an electric heater to be installed as part of the unit. The central furnace will supply heating of the vehicle, if installed.

The condenser section must be installed so as to have direct access to the outside ambient. Removal of the heated condenser air is critical for proper operation.

■3.2 AIR DISTRIBUTION SYSTEM SIZING

■ The installer of this air conditioner must design the air distribution system for his particular application by following the guidelines specified within this application manual and unit installation instructions. Several specific requirements **MUST BE** met for the air conditioner to operate correctly:

1. Unit Total Static Pressure (See FIG. 10)
2. Duct Area Requirement (See FIG. 10)
3. Return air to the system must be filtered to prevent dirt accumulation on the evaporator cooling surface.
4. Return air opening must be within minimums specified in the system installation instructions. This figure must include the filter material selected.
5. Since duct work is located within a cavity, it is necessary that all duct work must be wrapped with a minimum R7 insulating blanket with a vapor barrier. This will help prevent heat gain within the duct and possible condensation.

⚠ CAUTION

The Dometic Corporation will not be held liable for roof structural or ceiling damage if the duct work is not adequately wrapped in an insulation blanket.

⚠ CAUTION

It is the responsibility of the installer to ensure the duct work will not collapse or bend during and after installation. The Dometic Corporation will not be liable for any structural damage due to improperly insulated, sealed or collapsed duct work.

FIG. 10

System P/N	Duct Size	Condenser Inlet Req.	Evaporator Inlet Req.	Static Pressure
39115	2x12 min. 3x12 max.	294 in^2	255 in^2	.10 - .25
39125	2x12 min. 3x14 max.	260 in^2	180 in^2	.10 - .25
39335	3x14 min. 5x12 max.	260 in^2	180 in^2	.10 - .25
39045	3x14 min. 5x12 max.	294 in^2	120 in^2	.10 - .25
39524	3x14 min. 5x12 max.	578 in^2	135 in^2	.00 - .50

■3.3 AIR DISTRIBUTION DUCT PREPARATION

Depending on the distribution configuration, ensure that the air entry points have the minimum square inches required for the series of system installed. See Figures 11 through 19 for permissible duct layouts. Duct elbows and/or restrictions must be kept to a minimum. The duct must be pre-built within the structure and sealed along its entire length. If joints or bends leak conditioned air within the cavity, condensation will form.

When the duct is installed within the structure, care must be taken to insure that the duct will not collapse or bend during or after installation of the system to the vehicle.

■3.3.1 LOCATION OF DISTRIBUTION DUCT

The vehicle itself and the placement of interior components will dictate the location of the duct. One must be sure that the registers will not fall near the thermostat or the return filter. The placement must be such that the air distribution from the registers will provide the best possible movement within the living area. Calculations should be made as to the strength of the cavity, to insure structural integrity if notched for location of the duct runs.

■3.4 RETURN REQUIREMENTS

The return air system must be considered when layout of the duct system is in process. This should be located as near to the system as possible to insure adequate return back to the evaporator coil.

■4.0 THERMOSTAT REQUIREMENTS

Some thermostats will require 12 VDC for proper operation. Refer to the installation instructions provided with your specific model.

■4.1 THERMOSTAT LOCATION

The proper location of the thermostat is very important to insure that the system will perform satisfactory for the consumer. If mislocated the comfort level desired will not be obtained. Observe the following general rules when selecting the proper location:

1. Locate it approximately 4-1/2 ft. from the floor.
2. Install on an inside partition, not on an outside wall. Do not locate near doors that lead outside, windows, or adjoining outside walls.
3. Never expose it to direct sunlight or any heat source (example: cook stove, microwave oven, sun, above furnace cabinet or duct work, etc.).
4. Never locate in a room that will be warmer or cooler than the rest of the coach.
5. Avoid locations near the supply grilles or within the direct flow of their discharge air.
6. Do not locate on refrigerator cabinet wall.

■4.2 THERMOSTAT CABLE INSTALLATION

See installation instructions included with your unit for proper method and requirements for thermostat wiring specifications.

■5.0 ELECTRICAL INSTALLATION

See installation instructions included with your unit for proper method and requirements for your specific system.

■5.1 HI-POT REQUIREMENTS

Each system that is built by Dometic is completely checked electrically and hi-pot tested on our production line. Additional hi-pot testing of the system must not be done. Disconnect the system from the power circuit prior to any vehicle high potential test operations.

FIG. 11 - FIG. 19: The following are examples of duct configurations as well as register requirements. Other configurations may be possible and should be approved by Dometic

ADDITIONAL REQUIREMENTS FOR ALL MODELS:

- **Supply air from Air Conditioner must have same square inches as floor ductwork**
- **Damper required in Furnace**
- **Vibration isolators should be used at each mounting point**
- **Supply duct must be insulated**

FIG. 11

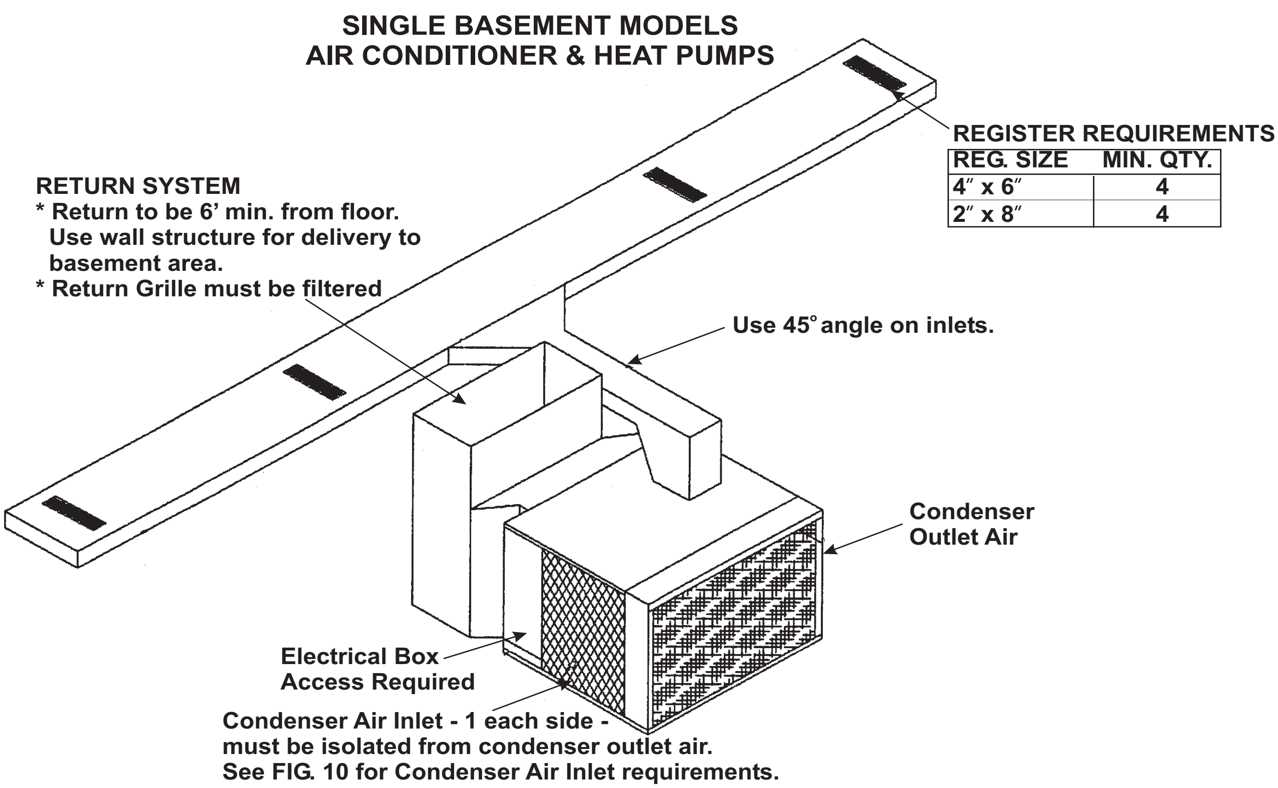


FIG. 12

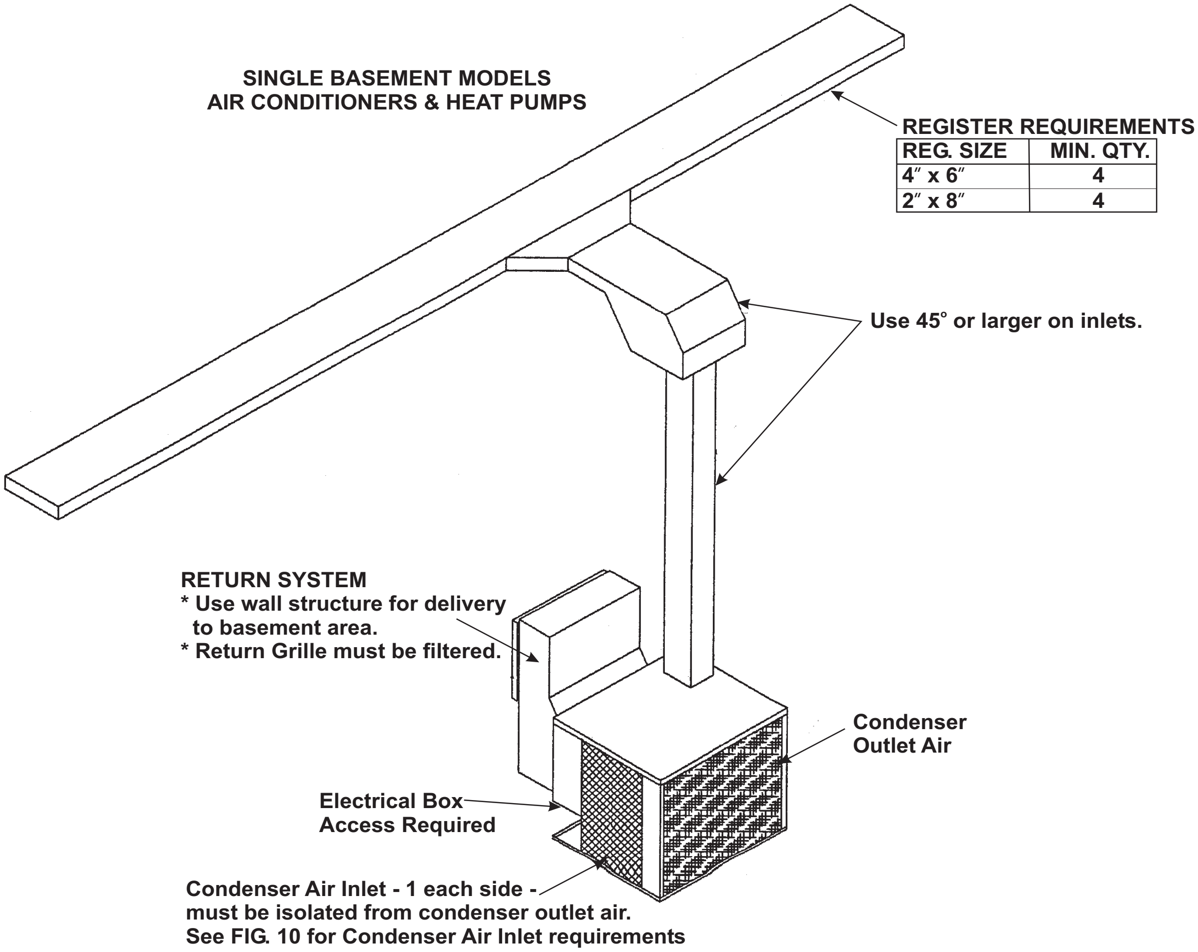

SINGLE BASEMENT MODELS
AIR CONDITIONERS & HEAT PUMPS
REGISTER REQUIREMENTS
REG. SIZE | MIN. QTY.
4″ x 6″ | 4
2″ x 8″ | 4
Use 45° or larger on inlets.
RETURN SYSTEM
* Use wall structure for delivery to basement area.
* Return Grille must be filtered.
Condenser Outlet Air
Electrical Box Access Required
Condenser Air Inlet - 1 each side - must be isolated from condenser outlet air.
See FIG. 10 for Condenser Air Inlet requirements

FIG. 13

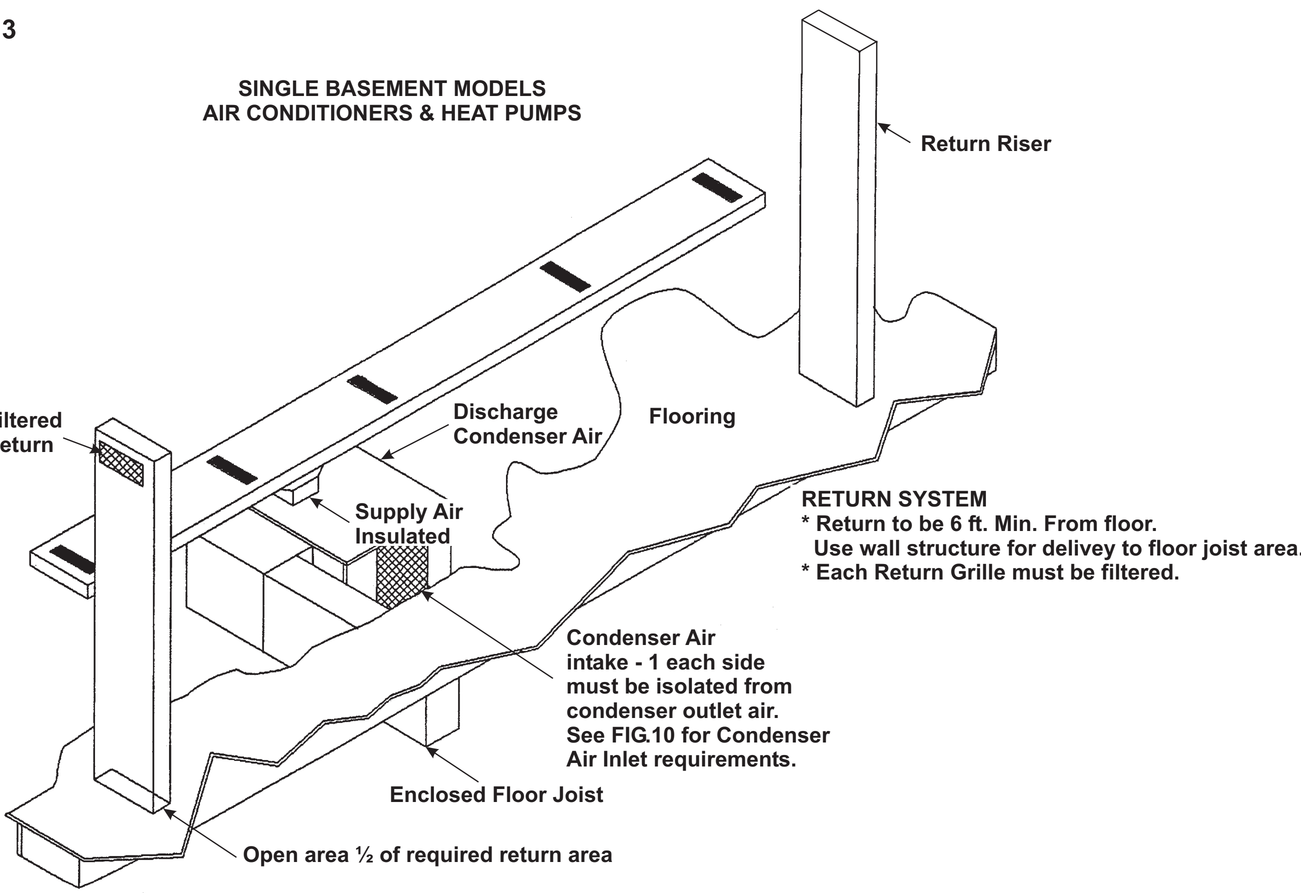
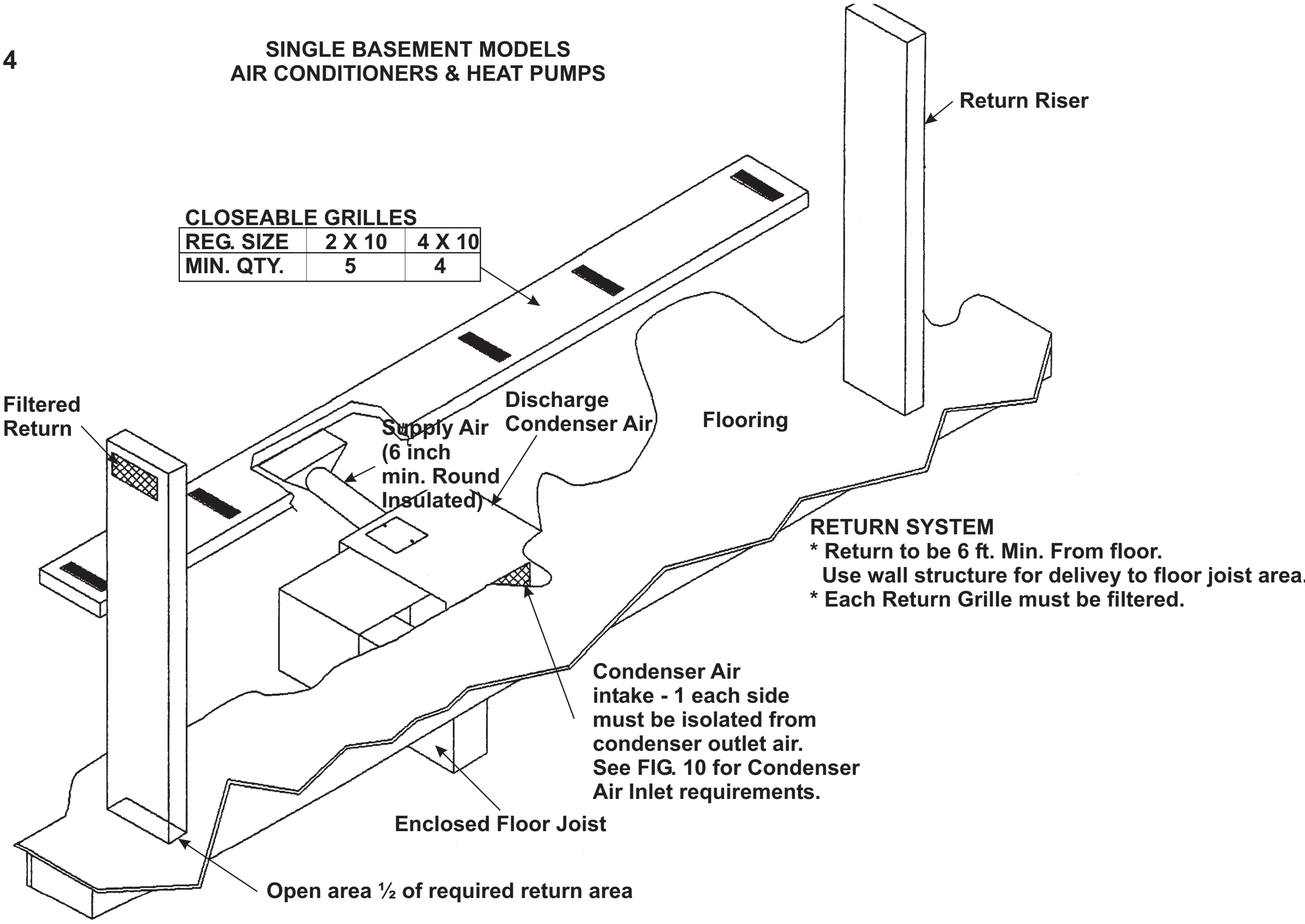

SINGLE BASEMENT MODELS
AIR CONDITIONERS & HEAT PUMPS
Return Riser
Filtered Return
Discharge Condenser Air
Flooring
Supply Air Insulated
RETURN SYSTEM
* Return to be 6 ft. Min. From floor.
Use wall structure for delivey to floor joist area.
* Each Return Grille must be filtered.
Condenser Air intake - 1 each side must be isolated from condenser outlet air.
See FIG.10 for Condenser Air Inlet requirements.
Enclosed Floor Joist
Open area ½ of required return area

FIG. 14



REG. SIZE	2 X 10	4 X 10
MIN. QTY.	5	4

FIG. 15

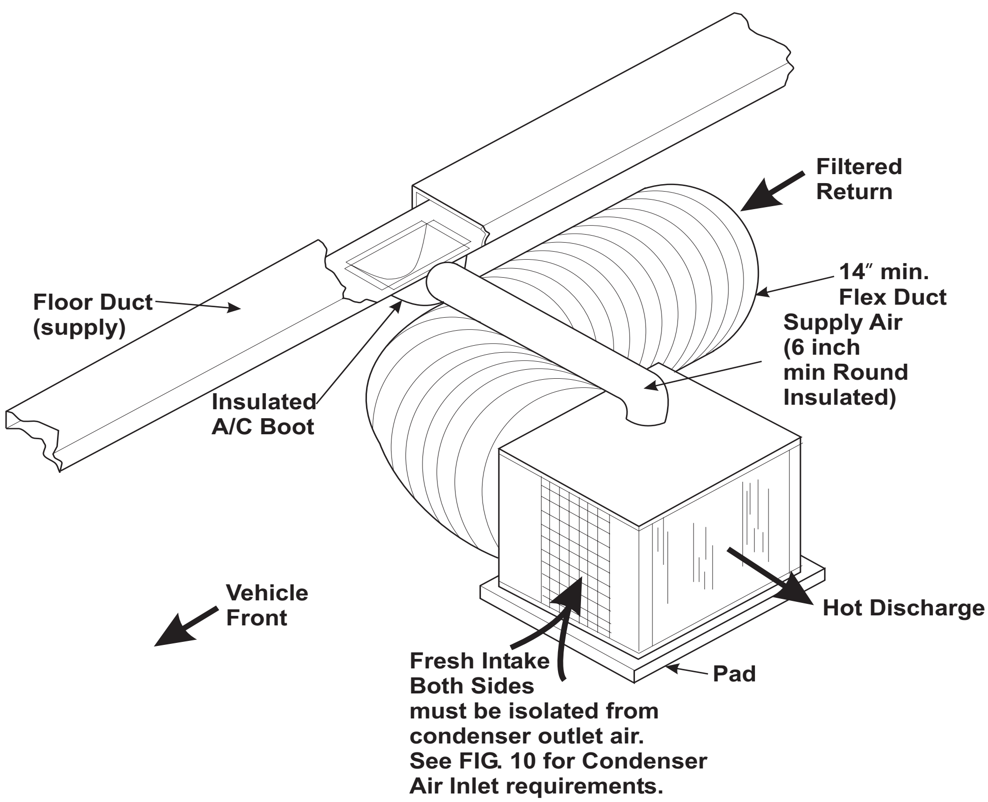
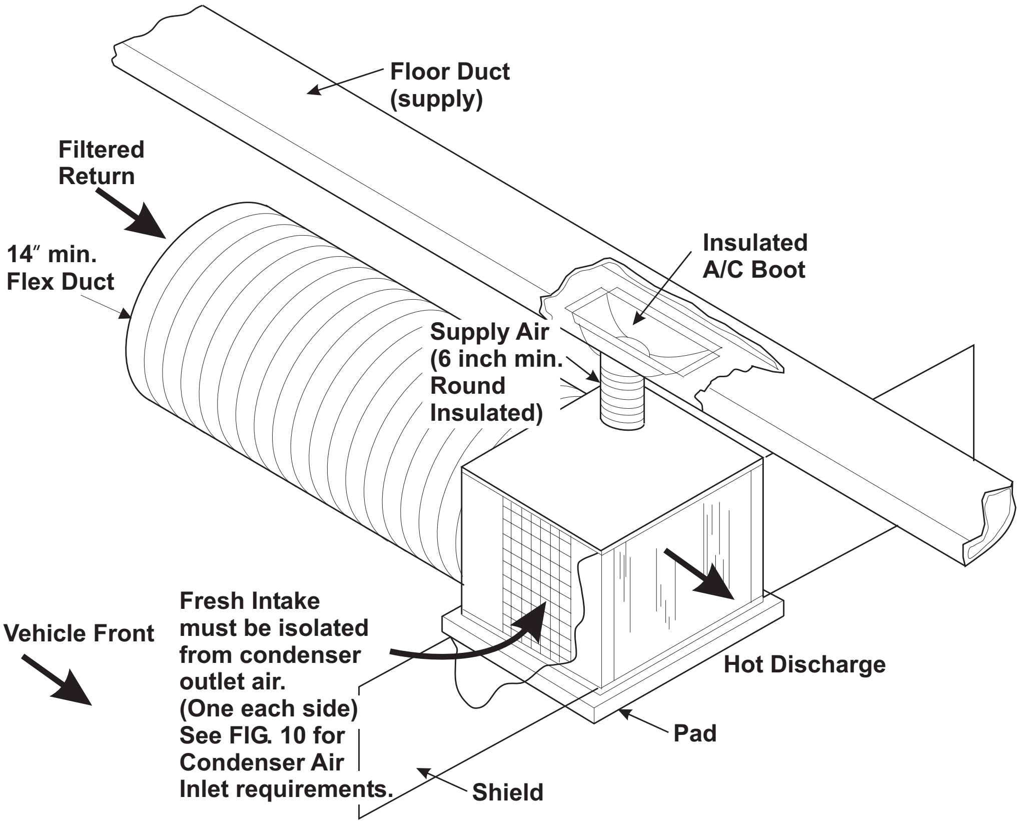


FIG. 16



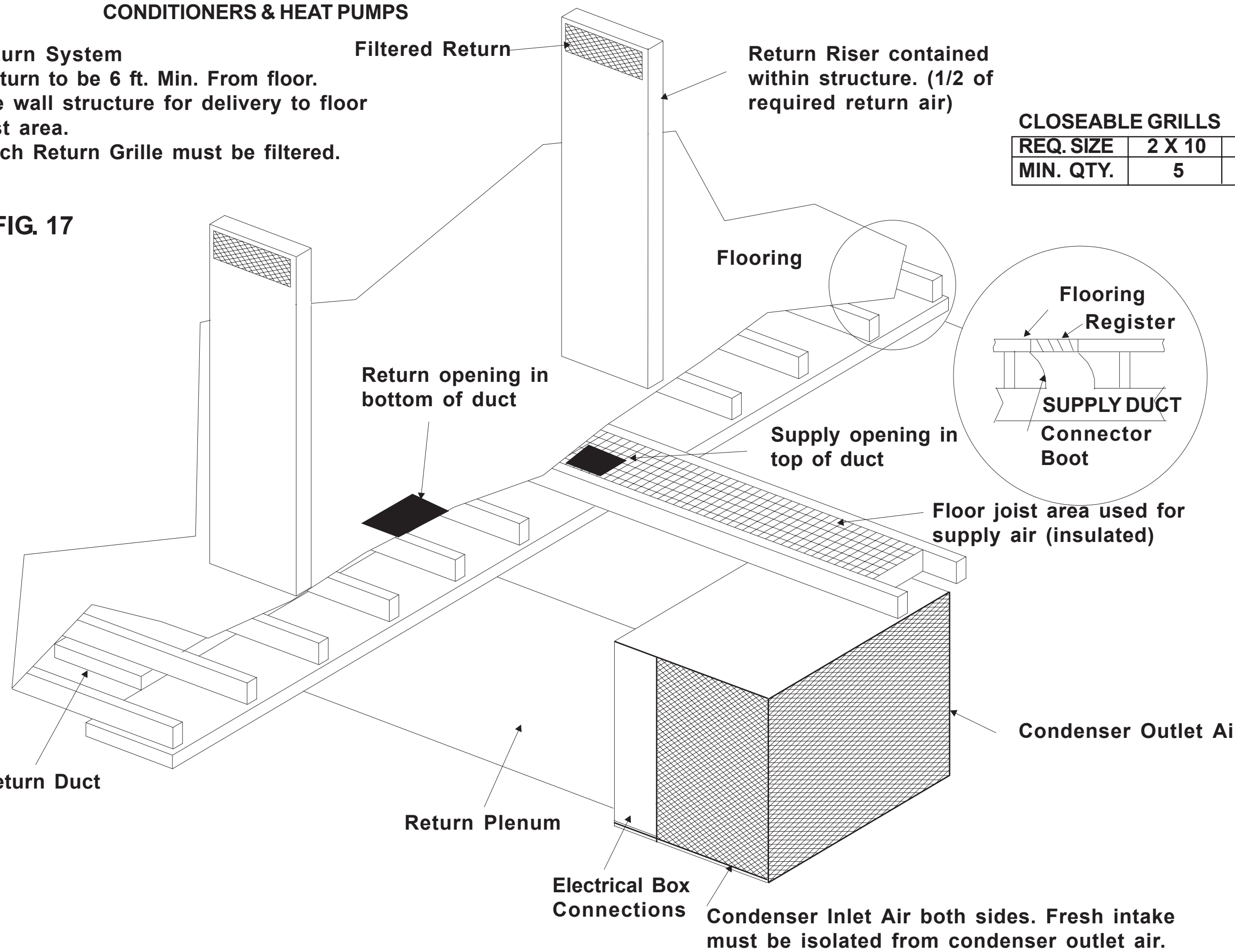
SINGLE BASEMENT MODELS-AIR CONDITIONERS & HEAT PUMPS

Return System
*Return to be 6 ft. Min. From floor. Use wall structure for delivery to floor joist area.
*Each Return Grille must be filtered.

CLOSEABLE GRILLS

REQ. SIZE	2 X 10	4 X 10
MIN. QTY.	5	4

FIG. 17



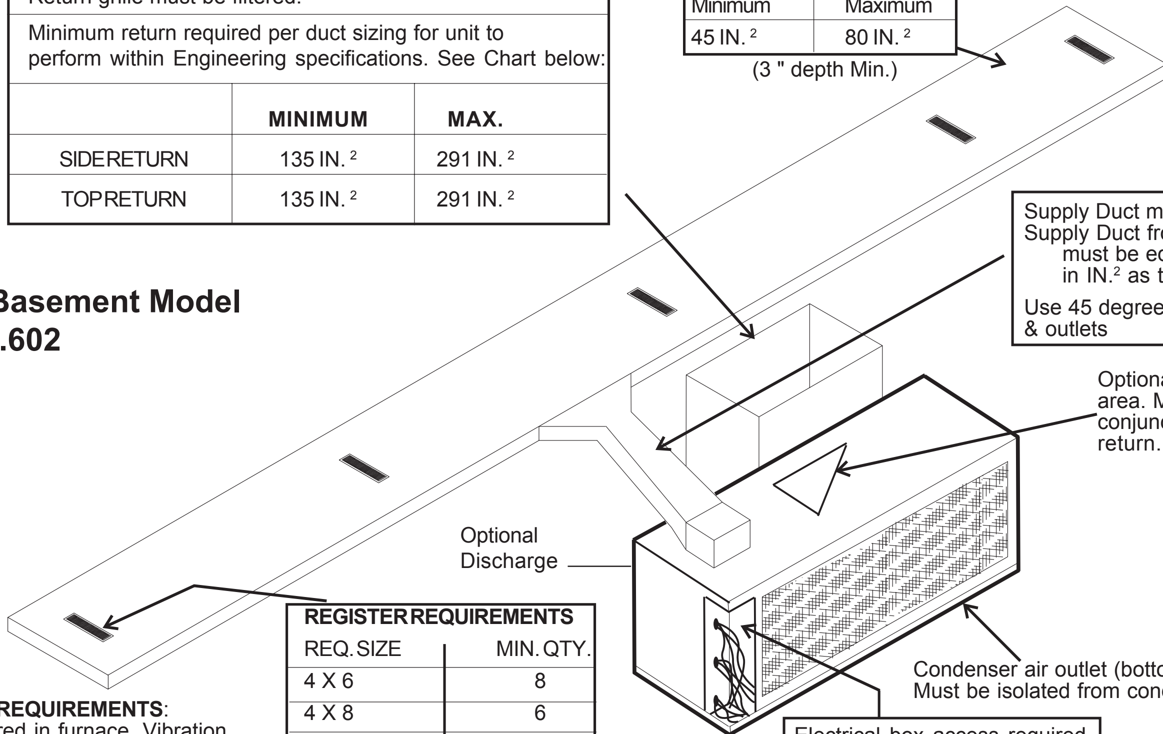
RETURN SYSTEM		
Return to be 6 ft. minimum from floor. Use wall structure for delivery to basement area. Return grille must be filtered.		
Minimum return required per duct sizing for unit to perform within Engineering specifications. See Chart below:		
	MINIMUM	**MAX.**
SIDE RETURN	135 IN. ^{2}	291 IN. ^{2}
TOP RETURN	135 IN. ^{2}	291 IN. ^{2}

INSULATED DUCT	
Minimum	Maximum
45 IN. ^{2}	80 IN. ^{2}

(3 " depth Min.)

FIG. 18

Dual Basement Model 39524.602



Supply Duct must be insulated. Supply Duct from air conditioner must be equal to or greater in IN.^{2} as the floor ductwork.

Use 45 degree angle on inlets & outlets

REGISTER REQUIREMENTS	
REQ. SIZE	MIN. QTY.
4 X 6	8
4 X 8	6
4 X 10	5
4 X 12	4

Electrical box access required.
Circuit #1 - 20 Amp
Circuit #2 - 20 Amp

ADDITIONAL REQUIREMENTS: Damper required in furnace. Vibration isolators should be used at each mounting point. 12 VDC required for thermostat operation.

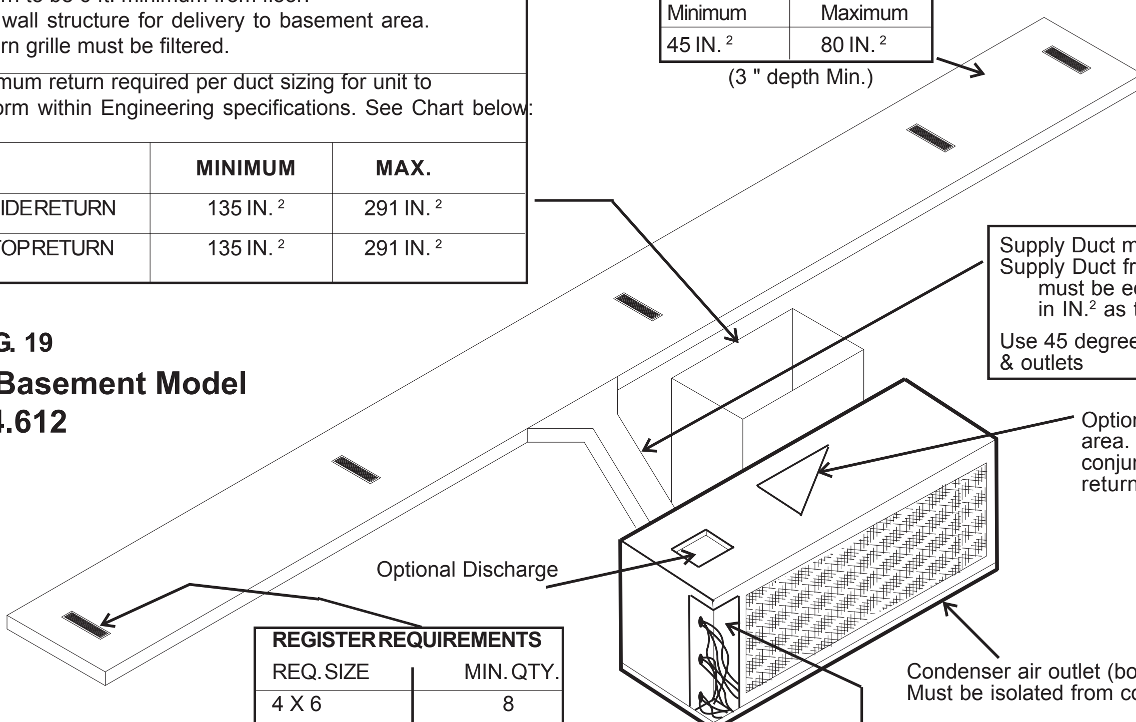
RETURN SYSTEM		
Return to be 6 ft. minimum from floor. Use wall structure for delivery to basement area. Return grille must be filtered.		
Minimum return required per duct sizing for unit to perform within Engineering specifications. See Chart below:		
	MINIMUM	**MAX.**
SIDE RETURN	135 IN. ^{2}	291 IN. ^{2}
TOP RETURN	135 IN. ^{2}	291 IN. ^{2}

INSULATED DUCT	
Minimum	Maximum
45 IN. ^{2}	80 IN. ^{2}

(3 " depth Min.)

FIG. 19

Dual Basement Model 39524.612



Supply Duct must be insulated. Supply Duct from air conditioner must be equal to or greater in IN.^{2} as the floor ductwork.

Use 45 degree angle on inlets & outlets

REGISTER REQUIREMENTS	
REQ. SIZE	MIN. QTY.
4 X 6	8
4 X 8	6
4 X 10	5
4 X 12	4

Electrical box access required.
Circuit #1 - 20 Amp
Circuit #2 - 20 Amp

ADDITIONAL REQUIREMENTS: Damper required in furnace. Vibration isolators should be used at each mounting point. 12 VDC required for thermostat operation.

FIG. 20

RETURN SYSTEM

Return to be 6 ft. minimum from floor.
Use wall structure for delivery to basement area.
Return grille must be filtered.

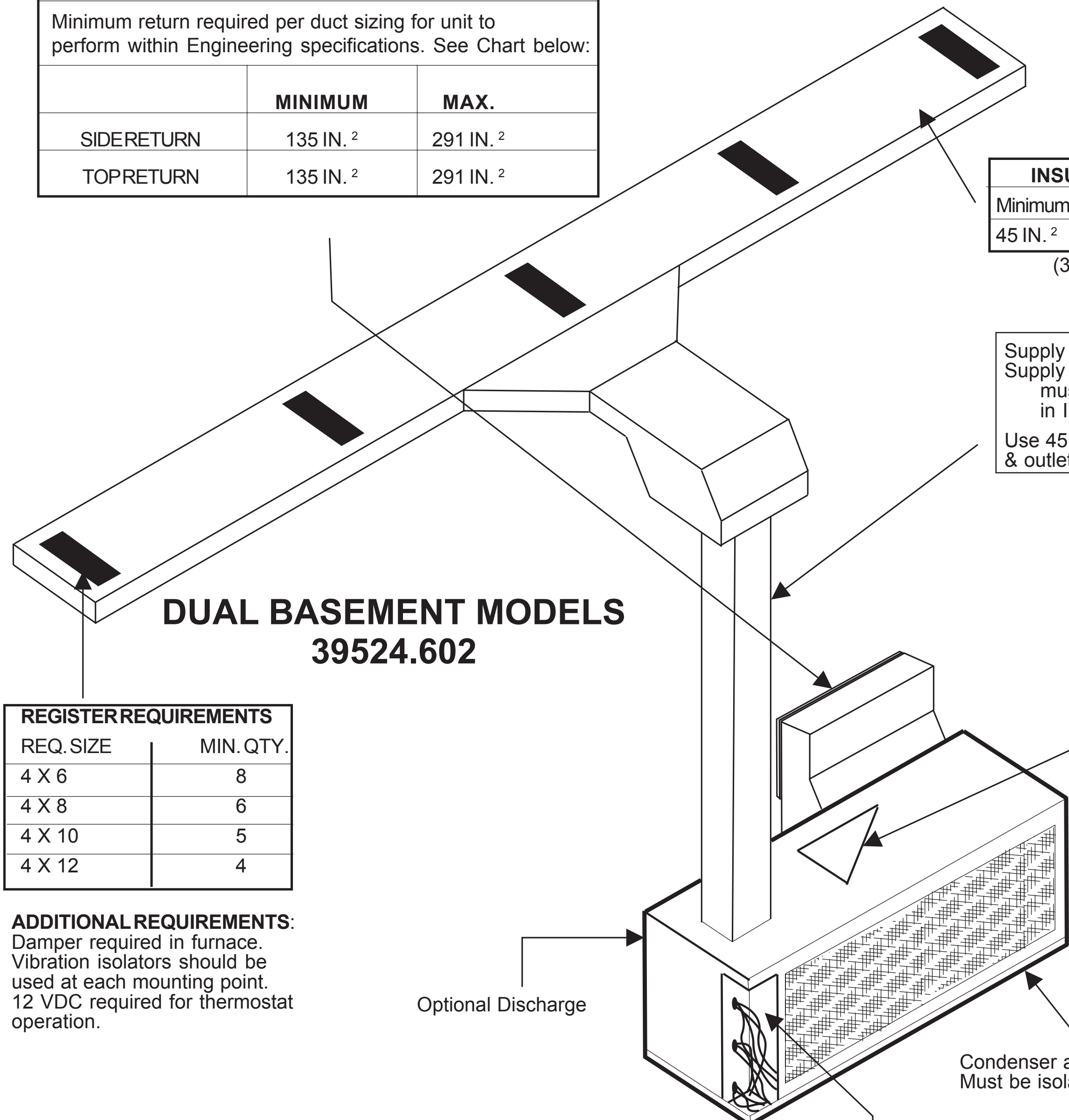
Minimum return required per duct sizing for unit to perform within Engineering specifications. See Chart below:

	MINIMUM	MAX.
SIDE RETURN	135 IN. ^{2}	291 IN. ^{2}
TOP RETURN	135 IN. ^{2}	291 IN. ^{2}

INSULATED DUCT

Minimum	Maximum
45 IN. ^{2}	80 IN. ^{2}

(3 " depth Min.)



DUAL BASEMENT MODELS 39524.602

REGISTER REQUIREMENTS

REQ. SIZE	MIN. QTY.
4 X 6	8
4 X 8	6
4 X 10	5
4 X 12	4

ADDITIONAL REQUIREMENTS:
Damper required in furnace.
Vibration isolators should be used at each mounting point.
12 VDC required for thermostat operation.

6.0 APPLICATION REVIEW

It is recommended that the vehicle manufacturer follow the Application Guidelines as an aid to the installation of a Dometic ducted system. The Application Manual should be used to insure optimum design and performance. Drawings of each proposed installation may be sent for evaluation and written approvals from The Dometic Corporation. Mail all information to:

The Dometic Corporation
509 South Poplar Street
LaGrange, Indiana 46761
Attn: Engineering - Application Development

Date: ____________________

Manufacturer Name: ____________________________

Address: ____________________________

City: ____________________________

State: ____________________________ Zip: ____________________________

Phone: (   ) ________________________ Fax: (   ) ________________________

Attn: ____________________________

Title: ____________________________

Vehicle Type: ____________________________ Trade Name: ____________________________

Length: ______________________ ft.

All information received becomes the property of The Dometic Corporation and will only be released with written approval from the Manufacturer.

Any approvals received or warranted are only for those vehicle designs that are on file with The Dometic Corporation and/or requested by the Manufacturer.

Include information on each vehicle series that ducted systems are to be installed.

These instructions DO NOT cover or warrant the final installation of the duct work that carries conditioned air within the vehicle cavities.

The installer is responsible for the integrity of the insulated duct within the structure to insure that moisture laden air does not condense on duct surfaces. If proper practices are not adhered to, condensation will collect during high ambient conditions. Damage caused by condensation will not be covered by The Dometic Corporation warranties

7.0 APPENDIX

1. **ACTUAL LENGTH:** refers to the measured length, in feet from the conditioning equipment to the outlet.

2. **AIR, AMBIENT**: generally, the air surrounding an object.

3. **AIR, OUTDOOR**: air taken from outdoors, not previously circulated through the system.

4. **AIR, RECIRCULATED**: air returned to the conditioned unit where it is reconditioned and again supplied to the conditioned space.

5. **AIR, RETURN**: air returned to the conditioner from the conditioned space.

6. **AIR CHANGES** (per unit time): the number of room volumes of air replaced or exchanged (usually per hour).

7. **AIR CONDITIONING:** the process of treating air so as to control simultaneously its temperature, humidity, cleanliness, and motion or distribution to the requirements of a conditioned space.

8. **BRITISH THERMAL UNIT (Btu)**: approximately, the heat required to raise the temperature of 1 lb. of water – 17.2°C.

9. **CONDENSATION**: the process by which a vapor is changed to a liquid by the removal of heat.

10. **DIFFUSER, AIR**: a supply air outlet composed of deflecting elements discharging air in various directions and patterns to accomplish mixing of supply and room air.

11. **DRAFT**: the withdrawal of more heat from a person's skin than normally withdrawn as the result of one or more of the factors high air velocity, low air temperature, and direction of airflow.

12. **ENVELOPE**: refers to the surfaces of a structure which are exposed to ambient (outdoor) conditions.

13. **EVAPORATION**: the process by which a liquid is changed to a vapor by the addition of heat.

14. **FREE AREA**: the total area of the opening in an air inlet or outlet through which air can pass.

15. **GRILLE**: a louvered or perforated covering of an inlet or outlet opening through which air flows.

16. **INCH OF WATER (in. W.C.)**: a unit of pressure equal to the pressure of a column of water 1 inch high at 2.54 cm at 4°C.

17. **PRESSURE DROP**: static pressure loss, as from one end of a duct to the other, due to friction, etc.

18. **REGISTER**: a combination grille and damper covering an air inlet or outlet opening.

19. **RELATIVE HUMIDITY**: approximately, the ratio of the density of the water vapor in the air to the saturation density of water vapor at the same temperature, expressed as a percentage.

20. **STATIC PRESSURE**: the force per unit area, perpendicular to the direction of flow in a duct.

21. **STRATIFIED ZONE**: a region in which room air velocity is less than 4.6 m min. Smoke will "hang" in this region for a relatively long time.

22. **THROW**: the distance an airstream travels after leaving a supply outlet before the velocity is reduced to the terminal velocity.

23. **VELOCITY PRESSURE**: the pressure in an airstream capable of producing the same velocity if applied to move the air through an orifice in such a manner that all pressure energy applied is converted to kinetic energy.

Important Notice

All information contained within is for the installation of Dometic Ducted Air Conditioners. These guidelines give minimum requirements for duct sizing, duct arrangement and register location so that you receive maximum performance from the system.

These instructions DO NOT cover or warrant the final installation of the duct work that carries conditioned air within the ceiling cavity.

The installer is responsible for the integrity of the insulated duct within the structure to insure that moisture laden air does not condense on duct surfaces. If proper practices are not adhered to, condensation will collect during high ambient conditions. Damage caused by condensation will not be covered by The Dometic Corporation warranties.