

INSTALLATION AND SERVICE MANUAL

ClassMate®

Single Package Vertical Unit, Models CMD, CMP

Cooling Split System Unit, Model CMS

SchoolMate®

Ground & Water Source HP Units, Models SMG, SMW



(Internal View of Model CMP Shown)

! WARNING

1. Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death, and could cause exposure to substances which have been determined by various state agencies to cause cancer, birth defects or other reproductive harm. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

! WARNING

2. This unit contains R-410A high pressure refrigerant. Hazards exist that could result in personal injury or death. Installation, maintenance, and service must only be performed by an HVAC technician qualified in R-410A refrigerant and using proper tools and equipment. Due to much higher pressure of R-410A refrigerant, **DO NOT USE** service equipment or tools designed for refrigerants other than R-410A.

! AVERTISSEMENT

1. Une installation, un réglage, une altération, une réparation ou une maintenance impropre risque de causer des dommages, des blessures ou la mort, et d'engendrer une exposition à des substances dont certains États ont déterminé qu'elles étaient cancérigènes ou pouvaient causer des malformations à la naissance et des problèmes de reproduction. Lisez bien les instructions d'installation, d'utilisation et de maintenance avant d'installer ou de réparer cet appareil.
2. Cette unité contient du réfrigérant haute pression R-410A. Il existe des dangers qui pourraient entraîner des blessures corporelles, voire la mort. L'installation, la maintenance et l'entretien doivent être effectués uniquement par un technicien CVC qualifié en réfrigérant R-410A et utilisant les outils et équipements appropriés. En raison de la pression beaucoup plus élevée du réfrigérant R-410A, **N'UTILISEZ PAS** d'équipement ou d'outils de service conçus pour des réfrigérants autres que le R-410A.

IMPORTANT

1. The use of this manual is specifically intended for a qualified installation and service agency. A qualified installation and service agency must perform all installation and service of these appliances.
2. Units contain the refrigerant R-410A. Review the R-410A Material Safety Data Sheet (MSDS) for hazards and first aid measures.
3. Refrigerant charging should only be carried out by an EPA-certified air conditioning contractor.

IMPORTANT

1. Ce manuel est spécifiquement destiné au personnel d'une entreprise qualifiée d'installation et d'entretien. Toutes les opérations d'installation et d'entretien doivent être confiées à une entreprise qualifiée.
2. Les unités contiennent du fluide frigorigène R-410A. Pour les dangers et les mesures de premiers soins, consultez la fiche signalétique du R-410A.
3. L'ajout de frigorigène doit être confié à un spécialiste de la climatisation certifié par l'agence de la protection de l'environnement (EPA) du gouvernement américain.

INSPECTION ON ARRIVAL

1. Inspect unit upon arrival. In case of damage, report it immediately to transportation company and your local factory sales representative.
2. Check rating plate on unit to verify that power supply meets available electric power at the point of installation.
3. Inspect unit upon arrival for conformance with description of product ordered (including specifications where applicable).

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SPECIAL PRECAUTIONS

SPECIAL PRECAUTIONS

THE INSTALLATION AND MAINTENANCE INSTRUCTIONS IN THIS MANUAL MUST BE FOLLOWED TO PROVIDE SAFE, EFFICIENT, AND TROUBLE-FREE OPERATION. IN ADDITION, PARTICULAR CARE MUST BE EXERCISED REGARDING THE SPECIAL PRECAUTIONS LISTED BELOW. FAILURE TO PROPERLY ADDRESS THESE CRITICAL AREAS COULD RESULT IN PROPERTY DAMAGE OR LOSS, PERSONAL INJURY, OR DEATH. THESE INSTRUCTIONS ARE SUBJECT TO ANY MORE RESTRICTIVE LOCAL OR NATIONAL CODES.

Hazard Intensity Levels

1. **DANGER:** Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.
2. **WARNING:** Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.
3. **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.
4. **IMPORTANT:** Indicates a situation which, if not avoided, MAY result in a potential safety concern.

PRÉCAUTIONS PARTICULIÈRES

LES INSTRUCTIONS D'INSTALLATION ET D'ENTRETIEN DE CE MANUEL DOIVENT ÊTRE OBSERVÉES POUR ASSURER UN FONCTIONNEMENT SÉCURITAIRE, EFFICACE ET FIABLE. DE PLUS, LES PRÉCAUTIONS PARTICULIÈRES CI-APRÈS DOIVENT ÊTRE RIGOREUSEMENT RESPECTÉES. SINON, IL Y AURAIT RISQUE DE DÉGÂTS MATÉRIELS OU DE PERTE, DE BLESSURE PERSONNELLE OU DE MORT D'HOMME. CES INSTRUCTIONS SONT SUJETTES À TOUTE DISPOSITION PLUS RESTRICTIVE DES CODES PROVINCIAL OU NATIONAL.

HIÉRARCHIE DES NIVEAUX DE RISQUES

1. **DANGER:** Indique un danger imminent qui, s'il n'est pas évité, entraînera INÉVITABLEMENT des blessures graves, voire mortelles.
2. **AVERTISSEMENT:** Indique un danger potentiel qui, s'il n'est pas évité, RISQUE d'entraîner des blessures graves, voire mortelles.
3. **ATTENTION:** Indique un danger potentiel qui, s'il n'est pas évité, PEUT entraîner des blessures mineures ou modérées.
4. **IMPORTANT:** Indique une situation qui, si elle se matérialise, PEUT entraîner des risques pour la sécurité des personnes.

DANGER

Appliances must not be installed where they may be exposed to potentially explosive or flammable atmosphere.

DANGER

Les appareils ne doivent pas être installés à un endroit où ils risquent d'être exposés à une atmosphère potentiellement explosive ou inflammable.

WARNING

1. Disconnect power supply before making wiring connections or working on this equipment. Follow all applicable safety procedures to prevent accidental power up. Failure to do so can result in injury or death from electrical shock or moving parts and may cause equipment damage.
2. All appliances must be wired strictly in accordance with the wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. Any original factory wiring that requires replacement must be replaced with wiring material having a temperature rating of at least 221°F (105°C).
4. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than rated voltage.
5. This unit contains R-410A high pressure refrigerant. Hazards exist that could result in personal injury or death. Installation, maintenance, and service must only be performed by an HVAC technician qualified in R-410A refrigerant and using proper tools and equipment. Due to much higher pressure of R-410A refrigerant, DO NOT USE service equipment or tools designed for refrigerants other than R410A.
6. When servicing or repairing this equipment, use only factory-approved service replacement parts. Refer to the rating plate on the appliance for complete appliance model number, serial number, and company address. Any substitution of parts or controls not approved by the factory will be at the owner's risk.
7. Units are heavy and care must be taken in the handling and moving of this unit to prevent it from becoming unstable and tipping over. Do not lean a ladder against the unit or put weight on or against it prior to completing the installation to prevent the unit from tipping.

AVERTISSEMENT

1. Débranchez l'alimentation électrique avant d'effectuer des connexions ou de travailler sur l'appareil. Respectez toutes les procédures de sécurité qui s'appliquent pour éviter toute mise en marche accidentelle. Le non-respect de cette directive peut entraîner des blessures ou la mort causées par un choc électrique ou des pièces mobiles, en plus d'endommager l'appareil.
2. Tous les appareils doivent être branchés de manière strictement conforme au diagramme fourni. Tout câblage différent de celui du schéma peut créer des risques de dommages matériels ou de blessures.
3. Tout câblage usine d'origine exigeant un remplacement doit être remplacé par un câble d'indice thermique nominal de 221 °F (105 °C).
4. Assurez-vous que la tension d'alimentation de l'appareil, comme indiqué sur la plaque de série, n'est pas de 5 % supérieure à la tension nominale.
5. Les unités contiennent du fluide frigorigène à haute pression R-410A. Des dangers existent qui, s'ils se matérialisent, pourraient entraîner des blessures ou la mort. L'installation, l'entretien et le service ne doivent être effectués que par un technicien de CVC qualifié quant à l'usage du fluide frigorigène R-410A en utilisant les outils et l'équipement appropriés. En raison de la pression beaucoup plus élevée du fluide frigorigène R-410A, N'utilisez PAS des outils ou de l'équipement de service qui ne sont pas conçus spécifiquement pour le R-410A.

(continued next page)

SPECIAL PRECAUTIONS

AVERTISSEMENT

6. Pour l'entretien et les réparations de cet appareil, utilisez uniquement des pièces d'origine certifiées. Pour la liste complète des pièces de rechange, consultez Modine Manufacturing Company. Le numéro de modèle complet, le numéro de série et l'adresse du fabricant figurent sur la plaque signalétique fixée à l'appareil. Toute substitution de pièce ou de commande non approuvée par le fabricant sera aux risques du propriétaire.
7. Les unités sont lourdes, par conséquent il faut faire attention lors de leur manipulation et déplacement pour éviter toute instabilité et les empêcher de basculer. N'appuyez pas une échelle contre l'unité et ne mettez pas du poids sur celle-ci ou contre celle-ci avant d'avoir terminé l'installation pour l'empêcher de basculer.

CAUTION

1. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% less than the rated voltage.
2. Units not approved for use in potable water systems.
3. Hot water supplied to the hot water heating option must not exceed 200°F (93°C) temperature or 125 PSIG (862 kPa).
4. Do not overcharge the refrigeration system. This can lead to elevated compressor discharge pressure and possibly flooding the compressor with liquid.
5. Do not attempt to reuse any mechanical or electrical component which has been wet. Such component must be replaced.
6. When servicing the unit, some components may be hot enough to cause pain or injury. Allow time for cooling of hot components before servicing.
7. All manufacturer provided unit safety devices and settings must not be adjusted, tampered with, or changed in any way.

ATTENTION

1. Vérifiez que la tension d'alimentation de l'appareil n'est pas inférieure de plus de 5 % à la tension nominale inscrite sur la plaque de série.
2. Ces unités ne sont pas approuvées pour l'usage dans des systèmes à eau potable.
3. La température de l'eau chaude alimentée en vertu de l'option de chauffage de l'eau chaude ne doit pas dépasser 200 °F (93 °C) ou une pression de 125 lb/po² (862 kPa).
4. Ne surchargez pas le système de réfrigération. Cela peut entraîner une pression d'évacuation élevée du compresseur et possiblement son inondation.
5. Ne tentez pas de réutiliser un composant mécanique ou électrique qui a été mouillé. Ces composants doivent être remplacés.
6. Durant l'entretien de l'unité, certains composants peuvent être assez chauds pour causer de la douleur ou une blessure. Laissez les composants chauds se refroidir avant de procéder à tout entretien.
7. Tous les dispositifs et réglages de sécurité de l'unité fournis par le fabricant ne doivent pas être ajustés, altérés ou modifiés de quelque façon que ce soit.

IMPORTANT

1. Start up and adjustment procedures, installation, and service of these appliances must be performed by a qualified installation and service agency.
2. No water-flow can cause a freeze condition resulting in damage to the coil.
3. Never leave the unit filled with water in a building without heat unless antifreeze has been added.
4. All refrigeration checks must be made by a qualified R-410A refrigeration technician.
5. Do not release refrigerant to the atmosphere. When adding or removing refrigerant, all national, state/province, and local laws must be followed.
6. Model CMS units are partial units, complying with partial unit requirements of UL 60335-2-40, and must only be connected to other units that have been confirmed as complying to corresponding partial unit requirements of UL 60335-2-40/CSA C22.2 No. 60335- 2-40, or UL 1995/CSA C22.2 No. 236.
7. To check most of the Possible Remedies in the troubleshooting guide listed in Table 30.1, refer to the applicable sections of the manual.
8. Unit performance will be significantly reduced at or above 7215ft (2200m) and should not be operated above this altitude.
9. This appliance is not intended to be operated or serviced by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
10. Children should be supervised to ensure that they do not play with the appliance.

IMPORTANT

1. Les procédures de démarrage et de réglage, l'installation et le service de ces appareils doivent être confiés à un centre d'installation et de service qualifié.
2. L'absence d'écoulement d'eau risque de causer une condition de gel et d'endommager le serpentin.
3. Ne laissez jamais l'appareil rempli d'eau dans un immeuble non chauffé sans lui ajouter de l'antigel.
4. Toutes les vérifications de réfrigération doivent être effectuées par un technicien de la réfrigération qualifié en matière de fluide frigorigène R-410A.
5. Ne rejetez pas de fluide frigorigène dans l'atmosphère. Respectez toutes les lois locales, provinciales/étatiques et nationales lors de l'ajout ou du retrait de fluide frigorigène.
6. Les unités modèle CMS sont des unités partielles, se conformant aux exigences relatives aux unités partielles UL 60335-2-40, et ne doivent être reliées qu'à d'autres unités qui sont confirmées comme étant conformes aux exigences correspondantes des unités partielles UL 60335-2-40/CSA C22.2 N° 60335-2-40 ou UL 1995/CSA C22.2 N° 236.
7. Pour essayer la plupart des solutions possibles suggérées dans le guide de dépannage du Table 30.1, reportez-vous aux sections correspondantes du manuel.
8. La performance de l'unité sera grandement réduite à une altitude de 7215 pieds (2200 m) et elle ne doit pas être utilisée au-delà de cette hauteur.
9. Cet appareil n'est pas conçu pour être utilisé ou entretenu par des personnes (y compris des enfants) dont les capacités physiques, sensorielles ou mentales sont réduites, ou qui n'ont pas l'expérience et les connaissances suffisantes, à moins d'être supervisées ou d'avoir obtenu des directives concernant l'utilisation de l'appareil par une personne responsable de leur sécurité.
10. Les enfants doivent être supervisés pour s'assurer qu'ils ne jouent pas avec l'appareil.

UNIT LOCATION / INSTALLATION

Table 5.1 - SI (Metric) Conversion Factors

To Convert	Multiply By	To Obtain	To Convert	Multiply By	To Obtain
"W.C.	0.24	kPa	CFH	1.699	m ³ /min
psig	6.893	kPa	Btu/ft ³	0.0374	mJ/m ³
°F	(°F-32) x 0.555	°C	pound	0.453	kg
inches	25.4	mm	Btu/hr	0.000293	kW
feet	0.305	meters	gallons	3.785	liters
CFM	0.028	m ³ /min	psig	27.7	"W.C.

SPECIAL DESIGN REQUESTS

Units are sometimes built with special features as requested by the customer. This manual only covers standard features and does not include any changes made for special feature requests by the customer. Units built with special features are noted with a 5-digit SPO (Special Product Order) Number on the Serial Plate.

UNIT LOCATION

DANGER

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DANGER

Les appareils ne doivent pas être installés à un endroit où ils risquent d'être exposés à une atmosphère potentiellement explosive ou inflammable.

WARNING

Units are heavy and care must be taken in the handling and moving of this unit to prevent it from becoming unstable and tipping over. Do not lean a ladder against the unit or put weight on or against it prior to completing the installation to prevent the unit from tipping.

AVERTISSEMENT

Les unités sont lourdes, par conséquent il faut faire attention lors de leur manipulation et déplacement pour éviter toute instabilité et les empêcher de basculer. N'appuyez pas une échelle contre l'unité et ne mettez pas du poids sur celle-ci ou contre celle-ci avant d'avoir terminé l'installation pour l'empêcher de basculer.

IMPORTANT

1. Start up and adjustment procedures, installation, and service of these appliances must be performed by a qualified installation and service agency.
2. Never leave the unit filled with water in a building without heat unless antifreeze has been added.

IMPORTANT

1. Les procédures de démarrage et de réglage, l'installation et le service de ces appareils doivent être confiés à un centre d'installation et de service qualifié.

IMPORTANT

2. Ne laissez jamais l'appareil rempli d'eau dans un immeuble non chauffé sans lui ajouter de l'antigel.

Handling

1. Each unit will be shipped to the site on a wood skid. Whenever possible, all lifting and handling of the unit should be done with the packing and skid in position.
2. When slinging or using a forklift to lift the unit, the support points should be sufficiently apart to give stability when lifting. Unless otherwise noted, the lifting points should be equidistant from the centerline. Extreme care should be taken not to drop the unit.
3. Considerable damage can occur to the unit during positioning, in particular, to the paneling and exterior paint. Use an adequate number of personnel and the correct tools when moving the unit.
4. The unit is designed to remain upright so care should be taken when lifting the unit up steps.
 - When bringing the unit in through a doorway that is shorter than the unit height, a maximum tilt angle of 60° (1.05 radians) from vertical should not be exceeded.
 - If a unit is tilted less than 60° (1.05 radians) from vertical but beyond 15° (0.26 radians) from vertical, 8hrs should pass before powering on the unit.
 - If a unit is tilted more than 60° (1.05 radians) from vertical, 24hrs should pass before powering the unit. Note, this can damage the equipment beyond repair.
5. The use of torque screwdrivers on panel, cover or component mounting screws is not recommended. Hand-start all screws. If electric drills are used – set at the lowest possible torque.

Preparation

1. Select the unit location. Ensure the wall structure is adequate for the required mounting provisions as outlined in the "INSTALLATION" section.
2. Before installation, ensure that the correct electrical power supply is available for the unit.
3. Each unit requires an independently fused and isolated power supply.
4. If the installation has multiple units, check that unit model and tagging corresponds with the installation plans. Please contact the factory immediately if discrepancies are noted.
5. Check to make sure that the units will have adequate installation clearance around them.
6. Note that each unit has a condensate connection at the rear and suitable provisions should be made for draining. If multiple units tee into a common drain manifold, the drain line must be sized to ensure free draining with all the units in operation.
7. Inspect the wall sleeve installation for gaps that would allow leakage of outdoor air into the space. All joints and abutments should be sealed with waterproof sealant.

(continued on next page)

UNIT LOCATION / INSTALLATION

8. Ensure the wall opening sill height aligns with the outside air and exhaust air openings on the back of the classroom unit. If not, a rear extension is required to provide a sealed transition. Rear extensions are available for purchase from the factory.
9. For ground and water source heat pumps (models SMG and SMW), the installation should be a closed loop system to avoid potential for heavy scaling or biological contamination.

Drainage

Each unit has an internal condensate drain, terminating internally to the unit. A 1.5" (38.1mm) with a 1.125" (28.6mm) condensate drain hole is available on the back side of the unit (see Figure 17.1, Figure 18.1, and Figure 19.1 for the location). This must be connected to the main drain system in accordance with any local codes and general good piping practice.

Water Quality Standards

Note: This section only applies to models SMG and SMW.

Water quality is incredibly important to take into account when selecting and installing a water source heat pump in any application. The installation should be a closed loop system to avoid potential for heavy scaling or biological contamination. All water that passes through a coaxial heat exchanger should be evaluated for potential scaling, corrosion, and erosion characteristics as detailed in Table 6.1 below. Scaling issues should be addressed with a regularly scheduled flushing by a qualified service technician, as this process requires special fluids and pumping equipment. If any values fall outside of the ranges given or a unit is to be installed in a brackish or saltwater application, a secondary heat exchanger outside of the unit is required to avoid the unit warranty being voided. Spin down style water filters are recommended to prevent clogging and to handle the flow rate required.

Table 6.1 - Water Quality

Water Quality Component	Acceptable Range	Concern
pH	7.0 to 9.0	<7.0 Corrosion, >7.5 Scaling
Calcium and Magnesium Carbonate	<100 ppm	Scaling
Ryznar Stability Index (RSI)	6.0 to 7.0	<6.0 Scaling, >7.0 Corrosion
Langlier Saturation Index (LSI)	-0.5 to 0.5	<-0.5 Corrosion, >0.5 Scaling
Iron Fe ²⁺ (Ferrous) Bacterial Iron Potential	<0.2 ppm	Fouling
Iron Oxide	<1.0 ppm	Fouling
Hydrogen Sulfide	<0.5 ppm	Corrosion
Ammonia	<2.0 ppm	Corrosion
Ammonia Ion Compounds (Chloride, Hydroxide, Nitrate, and Sulfate)	<0.5 ppm	Corrosion
Total Dissolved Solids (TDS)	<1000 ppm	Corrosion
Suspended Solids (Filter if Necessary)	<10 ppm & <600 micron size particles, <6.0 ft/s velocity	Erosion

INSTALLATION

Optional Unit Rough-In Accessories

Wall Sleeve and Louver (Optional)

A wall sleeve is designed to provide a sealed plenum from the fresh air intake and exhaust air outlet on the back of the classroom unit to the outside of the building. When a single wall sleeve is used, the intake and exhaust airstreams are separated with a splitter plate. Units may use a single wall sleeve with horizontal splitter plate or double wall sleeves depending on the unit configuration. A louver prevents rain, snow, and other elements from entering the building.

Refer to the latest revision of literature 75-563, "Installation Instructions for Wall Sleeves" or if not provided by the factory, refer to the supplier's recommendations.

Rear Extension (Optional)

A rear extension is designed to provide a sealed transition from the fresh air intake and exhaust air outlet on the back of the classroom unit to the outside of the building, specifically when the wall openings are not aligned. Units are available with a 15" (381mm) deep or 6" (152mm) deep rear extension with adjustable sill heights.

Refer to latest revision of literature AIR75-564, "Installation Instructions for Rear Extensions" or if not provided by the factory, refer to the supplier's recommendations.

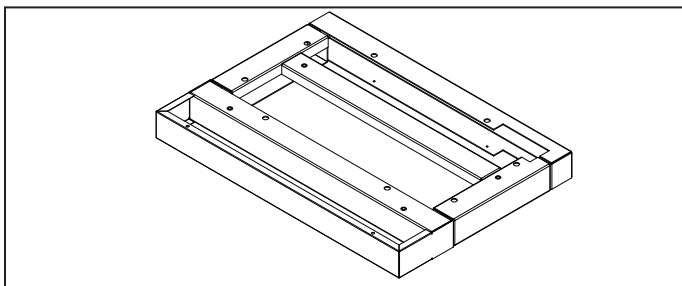
Floor Stand (Optional)

A installed floor stand is designed to be installed below the unit to move the unit up to match existing sill heights.

If supplied by the factory, the recommended procedure for installation is described as follows:

1. Reference unit installation steps on page 7, steps 1 and 2.
2. Floor stand must be secured to the floor. The floor stand has four pre-punched holes. The type of materials used for the floor will determine the type of fastener to use. The factory recommends the use of 1/2" (12.7mm) diameter fasteners with 1-1/2" (38mm) diameter washers. Securing the floor stand to the floor helps to reduce movement and noise due to vibration.
3. The unit needs to be installed to the floor stand. Per instructions on page 7, use mounting hardware supplied by the factory. Otherwise, use field supplied 1/2" (12.7mm) diameter fasteners with 1-1/2" (38mm) diameter washers.

Figure 7.1 - Floor Stand



Installation

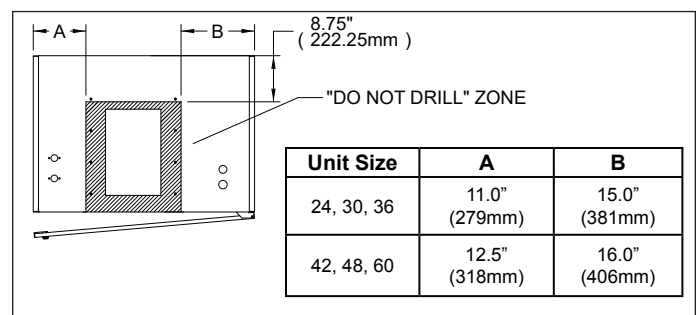
The instructions detailed below are for the Installation of a "Standard" unit. Accommodations and adjustments will be required for the usage of additional unit accessories. Should assistance be required for the installation of these additional items, consult Modine at the phone number listed on the back cover of this manual.

Note: Minimum clearance to combustibles is 0" (0mm).

Remarque: Le dégagement minimal des combustibles est de 0" (0mm).

1. Check the floor for levelness and check to ensure the wall is at a right angle to the floor. Should there be any irregularity, the placement of foam tape on the outside edges of the unit will fill the gaps between the unit and the wall, allowing for the use of a sealant, to create a smooth transition from the unit to the wall.
2. After adjusting for any irregularity in the location site, locate the position for the floor mounting bolts (see Figure 18.1). Drill the appropriate sized holes, for the fasteners that are to be utilized, and insert the anchors that are to be used.
3. Remove the backing strip from the gasket on the wall sleeve. Place the unit in the correct location, ensuring a tight seal with the wall sleeve and the wall.
4. Check to ensure that the unit is plumb and level in both directions. If adjustment is necessary, Modine recommends the placement of metal shims in the outer most corners of the base.
5. The cabinet must be secured to either the back wall or the floor. Securing the cabinet to the floor or wall helps to ensure appropriate seal, reduce movement and noise due to vibration. The floor of the cabinet has four pre-punched holes. The type of materials used for the floor and the walls will determine the type of fastener to use. If unit is mounted on a floorstand, use mounting hardware supplied by the factory, otherwise Modine recommends the use of 1/2" (12.7mm) diameter fasteners with 1-1/2" (38.1mm) diameter washers.
6. After securing the cabinet to either the back wall or the floor, loosen the compressor mounting bolts to finger tight for optimum sound performance.
7. Once the cabinet is leveled and secured, seal any gaps caused by uneven floors or wall surfaces to prevent noise exfiltration through these openings.
8. Make the condensate drain connection and the necessary electrical connections to the unit.
9. When connecting a duct flange or ductwork directly to the top of the unit, do not drill or put screws into the area immediately surrounding the supply air opening(s). See Figure 7.2 (dimensions in inches). Holes in the top of the cabinet indicate recommended mounting locations.
10. See installation manual that shipped with condensing unit for manufacturer's installation recommendations.

Figure 7.2 - Do Not Drill Zone

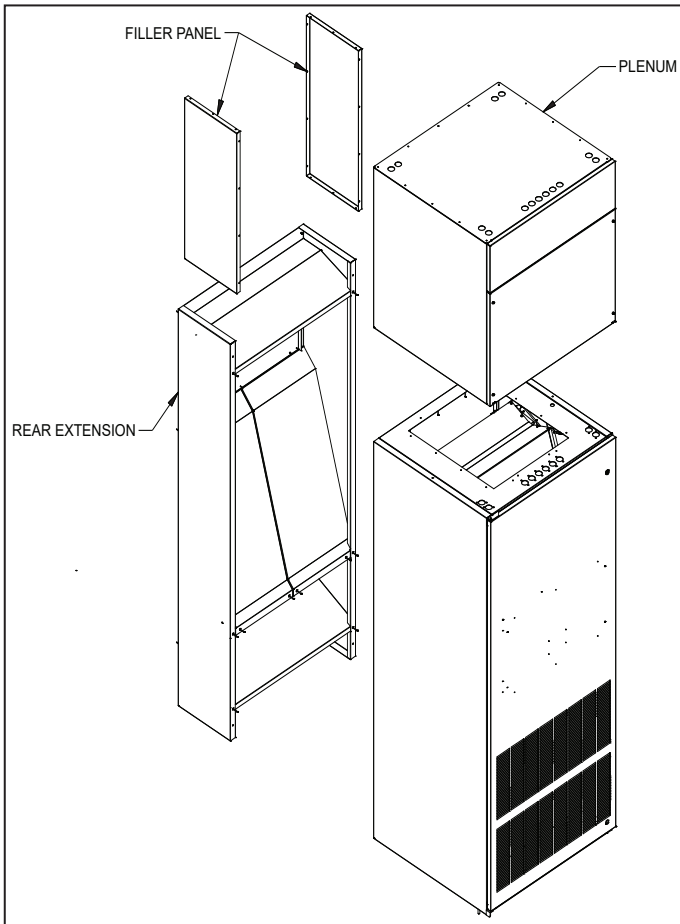


INSTALLATION

Rear Extension, Plenum, and Filler Panel Assembly Installation

See Figure 8.1 for an exploded view of how the cabinet, rear extension, plenum, and filler panels should be installed and assembled in the field, if installed. See separate accessory installation sections for step by step instructions on how each piece is installed.

Figure 8.1 - Rear Extension, Plenum, and Filler Panel Assembly ①



① The drawing is a general example. Not all installations will include all these items. Some items, when included, may look different than shown.

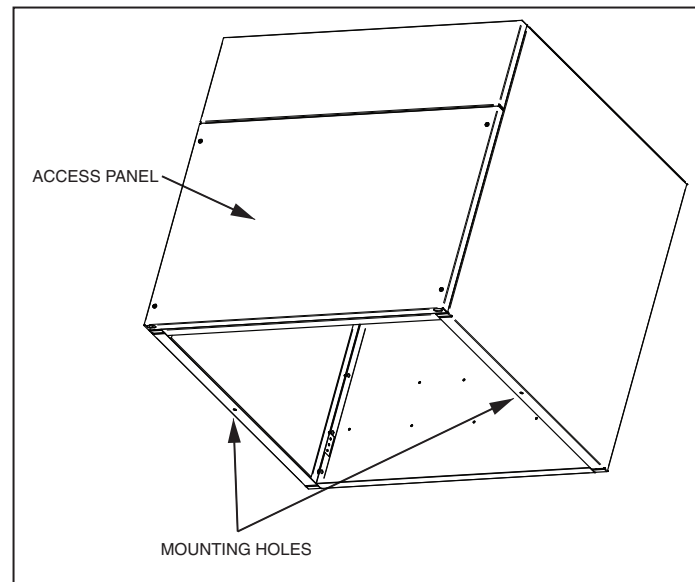
Optional Unit Discharge Accessories Plenum (Optional)

A field installed plenum is designed to discharge air directly into the space without ductwork to distribute air. Plenums are provided in 2" (51mm) height increments, and multiple discharge configurations.

The recommended procedure for installation is described as follows:

1. Unit must be secured to the floor before plenums are mounted on top to prevent injury.
2. Place plenum centered on the top of the unit.
3. Remove the front access panel, so interior base of plenum is available.
4. Mount the plenum by using sheet metal screws (by others) through mounting holes at bottom center of each side panel (see Figure 8.2). Be sure to use a minimum of one screw for each side panel even if you are not able to use holes provided.

Figure 8.2 - Plenum Installation (Top Discharge Shown)



INSTALLATION

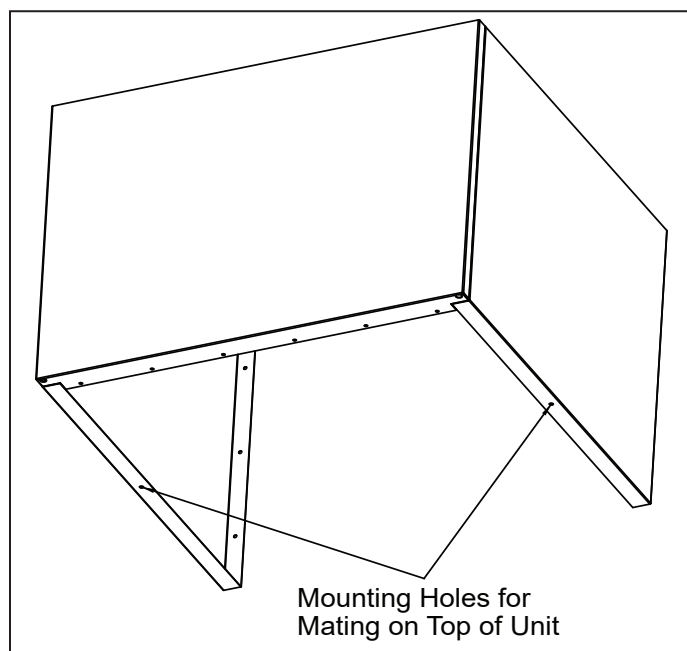
Duct Shroud (Optional)

A field installed duct shroud is designed to cover ductwork that is connected to the unit, until it is above a ceiling. Duct shrouds are provided as 14" (355mm), 26" (660mm), 38" (965mm) or 50" (1270mm) high.

The recommended procedure for installation is described as follows:

1. Unit must be secured to the floor before duct shroud can be mounted on top to prevent injury.
2. Place duct shroud centered on the top of the unit.
3. Mount the duct shroud by using sheet metal screws (by others) through mounting holes at bottom center of each side panel (see Figure 9.1). Be sure to use a minimum of one screw for each side panel even if you are not able to use holes provided.

Figure 9.1 - Duct Shroud Installation



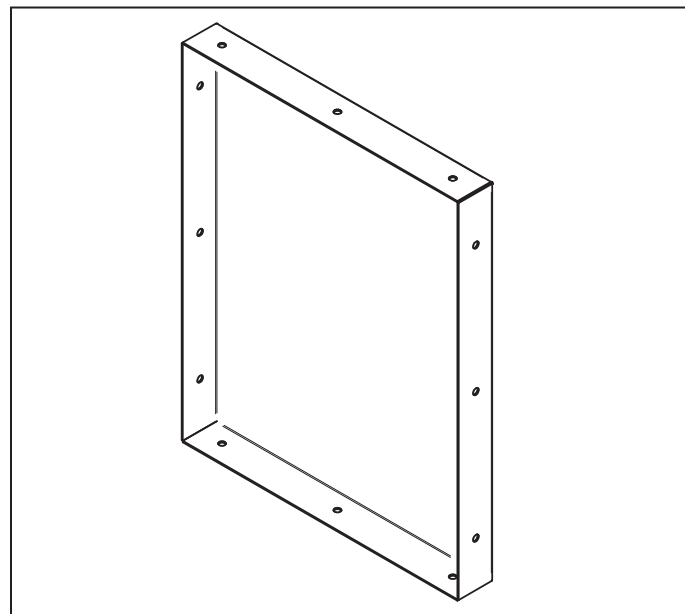
Filler Panel (Optional)

A field installed filler panel is designed to be installed above a rear extension, and behind a plenum or duct shroud so the sheet metal goes all the way to the ceiling, and to the wall.

The recommended procedure for installation is described as follows:

1. Mount the filler panel by using sheet metal screws (by others) through mounting holes on flanges (see Figure 9.2). Be sure to use a minimum of one screw, on two different sides for proper installation of each panel, even if you are not able to use holes provided.

Figure 9.2 - Filler Panel



INSTALLATION

Piping Installation - Hot Water Coils

⚠ CAUTION

1. Units not approved for use in potable water systems.
2. Hot water supplied to the hot water heating option must not exceed 200°F (93°C) temperature or 125 PSIG (862 kPa) pressure.
3. Do not attempt to reuse any mechanical or electrical component which has been wet. Such component must be replaced.

⚠ ATTENTION

1. Ces unités ne sont pas approuvées pour l'usage dans des systèmes à eau potable.
2. La température de l'eau chaude alimentée en vertu de l'option de chauffage de l'eau chaude ne doit pas dépasser 200 °F (93 °C) ou une pression de 125 lb/po² (862 kPa).
3. Ne tentez pas de réutiliser un composant mécanique ou électrique qui a été mouillé. Ces composants doivent être remplacés.

All plumbing connections made in the field must comply with local building codes and be properly leak tested.

Units without Piping Package

1. Hot water coils are supplied from the factory with unions. Field installed piping can be mounted to the supplied unions with 3/4" female sweat connections.
2. Install shut-off valves in lines to and from each coil to allow maintenance or replacement of unit without shutting down and draining entire system.
3. Include a circuit setter in the return line for water flow regulation.
4. It is advisable to use a pipe line strainer before each coil.
5. Provide adequate pipe hangers, supports, or anchors to secure the piping system independently of the coil.

Units with Piping Package

1. Hot water piping packages are supplied factory assembled and installed to the coil. All piping packages include the following: control valve, shut-off valves, strainer, circuit setter, PT ports, and balancing valve (when three-way control valve is selected).
2. Piping package terminations are threaded drop ear connections, and are 3/4". Drop ear connections are attached to fixed plates, and along with the coil provide support for the piping package.

Piping Insulation

Hot water piping and components are recommended to be insulated to reduce heat loss.

Figure 10.1 - Typical 2-Way Piping Schematic ①

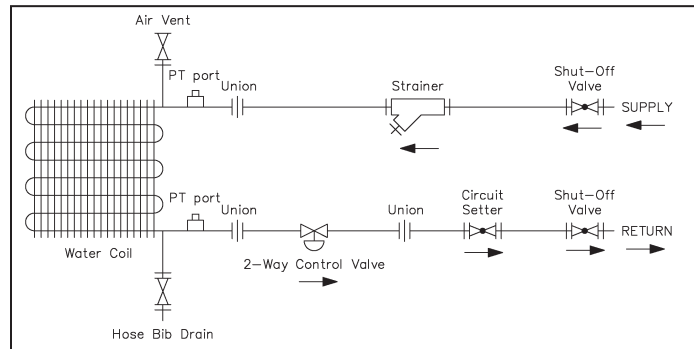
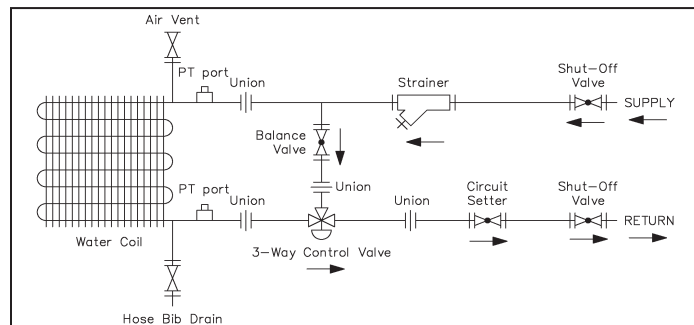


Figure 10.2 - Typical 3-Way Piping Schematic ①



① Schematics are general and represent typical piping components. For factory installed valve and piping packages, multiple components may be combined into single components.

INSTALLATION

Wiring

⚠ WARNING

1. Disconnect power supply before making wiring connections or working on this equipment. Follow all applicable safety procedures to prevent accidental power up. Failure to do so can result in injury or death from electrical shock or moving parts and may cause equipment damage.
2. All appliances must be wired strictly in accordance with the wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. Any original factory wiring that requires replacement must be replaced with wiring material having a temperature rating of at least 105°C.
4. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than rated voltage.

⚠ AVERTISSEMENT

1. Débranchez l'alimentation électrique avant d'effectuer des connexions ou de travailler sur l'appareil. Respectez toutes les procédures de sécurité qui s'appliquent pour éviter toute mise en marche accidentelle. Le non-respect de cette directive peut entraîner des blessures ou la mort causées par un choc électrique ou des pièces mobiles, en plus d'endommager l'appareil.
2. Tous les appareils doivent être branchés de manière strictement conforme au diagramme fourni. Tout câblage différent de celui du schéma peut créer des risques de dommages matériels ou de blessures.
3. Tout câblage usine d'origine exigeant un remplacement doit être remplacé par un câble d'indice thermique nominal de 221 °F (105 °C).
4. Assurez-vous que la tension d'alimentation de l'appareil, comme indiqué sur la plaque de série, n'est pas de 5 % supérieure à la tension nominale.

⚠ CAUTION

1. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% less than the rated voltage.
2. Do not attempt to reuse any mechanical or electrical component which has been wet. Such components must be replaced.

⚠ ATTENTION

1. Vérifiez que la tension d'alimentation de l'appareil n'est pas inférieure de plus de 5 % à la tension nominale inscrite sur la plaque de série.
2. Ne tentez pas de réutiliser un composant mécanique ou électrique qui a été mouillé. Ces composants doivent être remplacés..

1. Installation of wiring must conform with local building codes, or in the absence of local codes, with the National Electric Code ANSI/NFPA 70 - Latest Edition. Unit must be electrically grounded in conformance to this code. In Canada, wiring must comply with CSA C22.1, Part 1, Electrical Code.
2. A wiring diagram is provided with each unit. Refer to this

diagram for all wiring connections. Electric wiring and circuit protection must be sized to carry the full load amp draw of the motor, starter and any controls that are used with the unit. Refer to the Model Serial plate for MCA and MOP values for the unit.

3. If the unit has plenum mounted heating and Modine Controls (Digit 8 = M), the supply air sensor is mounted in the plenum. The sensor needs to be wired to the control terminal strip as indicated on the unit wiring diagram.
4. For units with plenum mounted heat and a freeze protection stat, the stat wires are bundled inside the plenum. The wires need to be routed to the unit's control terminal strip and wired per the unit wiring diagram.
5. For model CMS units, control wiring between the model CMS unit and outdoor condensing unit is to be wired per the wiring diagram.
6. Control wiring may consist of both 24V analog control wiring and low current digital control signal wiring. To avoid signal interference, the two types should be run in separate conduits. If run in the same conduit, the digital signal wiring should be shielded at one end of the wiring run. Wiring should be twisted, stranded, and shielded communication wire.
7. Any damage to or failure of units caused by incorrect wiring of the units is not covered by warranty.
8. The electrical supply can be connected to the unit power lead extension at a customer supplied junction box. The wire gauge must be sized according to the National Electric Code or CSA code based on amp draw and length of run. Use only copper wire.
9. When installing any wiring into the electrical panel, extra cable must be left outside the panel to allow the panel to open fully. Failure to follow these instructions may cause damage to the wiring and/or the unit.

Terminal Strip Connections

The terminal strip connections are designed to clamp down on the wires. To properly connect the wires to the terminal strip:

1. Push a small flat-head screwdriver into the square hole on the terminal. Press firmly until the screwdriver hits the back stop and opens the terminal (see Figure 11.1).
2. Remove approximately 3/8" (9.5mm) of insulation from the end of the wire and push the stripped wire into the oval hole in the terminal.
3. Remove the screwdriver. Pull on the wire to make sure that it is securely clamped in the terminal.
4. Make sure that the terminal clamp is in contact with bare wire (insulation removed).

Figure 11.1 - Terminal Strip



START-UP PROCEDURE

START-UP PROCEDURE

IMPORTANT

1. Start up and adjustment procedures, installation, and service of these appliances must be performed by a qualified installation and service agency.
2. No water-flow can cause a freeze condition resulting in damage to the coil.

IMPORTANT

1. Les procédures de démarrage et de réglage, l'installation et le service de ces appareils doivent être confiés à un centre d'installation et de service qualifié.
2. L'absence d'écoulement d'eau risque de causer une condition de gel et d'endommager le serpentin.

The unit has been factory tested and set for proper operation, but a full unit start-up is recommended.

See start-up sheet examples - Figure 14.1 and Figure 14.1.

For model CMS units, the condensing unit is typically factory charged for a 15-foot (4.58m) lineset by the condensing unit manufacturer. For additional lineset lengths please refer to manufacturer's charging chart. Refer to the installation and maintenance manual provided with the condensing unit for installation, evacuation and system charge information.

For models CMD, CMP, SMG, and SMW, the unit has been factory charged with R-410A refrigerant per Table 12.1.

Table 12.1 - Refrigerant Charge

Model Size	R-410A Charge, lbs-oz (kg)		
	Model CMD	Model CMP	Models SMG, SMW
24	9-6 (4.25)	9-0 (4.08)	3-12 (1.70)
30	n/a	n/a	4-0 (1.81)
36	9-12 (4.42)	11-0 (4.98)	4-14 (2.21)
42	n/a	n/a	5-12 (2.61)
48	11-8 (5.21)	12-0 (5.44)	6-4 (2.83)
60	11-0 (4.98)	11-12 (5.32)	6-4 (2.83)

Pre-Start Checks

1. Check that the supply voltage matches the unit supply voltage listed on the Unit Serial Plate. Verify that all wiring is secure and properly protected. Trace circuits to insure that the unit has been wired according to the wiring diagram.
2. Check that the unit has no visible damage and that all the components are secure.
3. Check that all field electrical and mechanical work has been performed according to all applicable Federal, State, and Local codes.
4. Check the supply voltage to the unit is within +/- 5% of the voltage on the unit serial plate.
5. For model CMS units, check that the system has been correctly flushed.
6. For model CMS units, check that the unit and interconnecting piping have been evacuated correctly and the condensing unit service valves are open.

Unit Start-Up Procedure

1. If the unit has a compressor (models CMD, CMP, SMG, and SMW) and was tilted when bringing into the room, the following guidance should be observed:
 - Less than 60° (1.05 radians) from vertical but beyond 15° (0.26 radians) from vertical, 8hrs should pass before powering on the unit.
 - More than 60° (1.05 radians) from vertical, 24hrs should pass before powering the unit. Note, this can damage the equipment beyond repair.
2. For model CMS units, ensure that the condensing unit start-up procedure has been carried out, as detailed in the condensing unit installation and maintenance manual.
3. For model CMS units, the compressor should be isolated by removing the connection at the Condensing Unit Stage 1 terminal on the indoor unit.
4. For model CMD or CMP units, disconnect and cap the wires to the CP1 contactor coil. This will allow the compressor crankcase heater to operate without the compressor operating. It is necessary to allow at least 4 hours of compressor crankcase heater operation before energizing the compressor.
5. Turn the disconnect switch to the "ON" position.
6. For model CMD or CMP units, after the 4 hour compressor crankcase heater operation time, reconnect the CP1 contactor coil wires.
7. Follow the instructions in the Modine microprocessor book. The control parameters and setpoints have all been factory set to the default values.
8. During the unit operation, measure and record all the information that is required to complete the Start-Up Sheets that are supplied with the unit. Copy the information onto the Start-Up Sheets (Figure 14.1 and Figure 15.1) in this manual for your records.
9. For model CMS units, shut unit down and disconnect the main power. The compressor signal Condensing Unit Stage 1 (disconnected from a previous step) can now be reconnected and main power applied to the system.
10. If unit has Modine Controls installed, verify that the outdoor air sensor is installed in a location where it will see an accurate temperature. If ducting OA to the unit, relocation of this sensor will be required for the unit to operate as intended.

(continued on next page).

START-UP PROCEDURE

Sequence of Operation

Microprocessor: A Carel microprocessor will control the unit and allow for networking and remote monitoring. The microprocessor will monitor the room temperature (either via an optional wall thermostat or return air sensor), supply air and outdoor air. With this information the unit is able to operate at maximum efficiency. The occupied/unoccupied control can be via time clock or from a signal from a building central time clock. If a wall or unit mounted thermostat is selected, the setpoint can be either fully adjustable or +/- three degrees. This allows some control of the room temperature while limiting its adjustment. The thermostat will also have an occupied override button to allow a temporary override until the next scheduled occupancy change.

Please reference Modine Controls System Manual (AIR 2-525) and Quickstart (AIR 2-526) literature pieces for assistance in starting up units configured with Modine Control Systems.

Supply Fan: The fan will run continuously during occupied mode and will be intermittent on a call for cooling or heating during unoccupied mode. A built in fan purge time allows for maximum heating and cooling efficiency.

Cooling: When the temperature increases above the cooling setpoint, the compressor and reversing valve (if a heat pump model) will be energized. The compressor will be limited to the number of starts per hour by anti-cycle protection.

Heating (models CMP, SMG, SMW only): When the temperature falls below the heating setpoint, the compressor will be energized and the reversing valve de-energized. The compressor will be limited to the number of starts per hour by anti-cycle protection.

Supplemental Heat (on models CMP, SMG, SMW only): If the temperature falls below the second stage heat setpoint, supplementary heat (if installed: electric heaters, hot water or steam coil) will be energized. If two stages of electric heat are fitted, the second stage will only be enabled if the compressor is locked out on its safety devices. If the unit is fitted with a hot water coil the valve will be a normally open type.

Dehumidification (Optional on model CMD, CMP, SMG, SMW units): The unit can be fitted with a humidity sensor to control the humidity level in the room. When the humidity increases above an adjustable setpoint, the compressor and reversing valves are energized. A hot gas reheat coil is turned on using the hot gas from the compressor to re-heat the supply air.

Economizer Ventilation (Digit 9=A, F, or L)

Single-blade damper that pivots using a central single shaft attached to a single actuator allowing for complete balance of the return, outside, and exhaust air streams. Capable of full modulation allowing any mixture of outside air and return air to be possible. Will allow for 100% of the units airflow to be taken from the outside during conditions allowing for full economizer savings.

Low voltage modulating damper actuator operates damper and is spring-return, fail safe. When power is cut to actuator, damper actuator will force damper blade closed to outside air.

Economizer Ventilation with Outside Air Damper (Digit 9=B, G, or M)

Standard economizer operation except with additional outside air damper and actuator provided for protection from outdoor elements when unit is not in use.

Energy Recovery Ventilation (ERV) with Outside Air Damper (Digit 9=C or H)

During cooling operation, cool room return air is drawn across the enthalpy wheel and exhausted external to the room. Warm, humid outdoor air is drawn across the other side of the enthalpy wheel and as the wheel turns, the outdoor ventilation air is cooled and dehumidified. This air is then mixed with the room air and recirculated through the indoor section.

During heating operation, the operation is the same as during cooling except warm humid room exhausted is used to warm and humidify cold and dry outdoor ventilation air.

During economizer operation, the wheel is disabled while the fans continue to provide outdoor air for ventilation and relief of air from the space.

Dual electronically commutated ventilation fans ensure control of airflow through energy wheel and provide wheel frost protection as required. A separate outside air damper with actuator is provided for protection from outdoor elements when unit is not in use.

Exhaust Recovery Ventilation (ERV) with Outside Air Damper and Economizer (Digit 8=C AND Digit 9=E, K, or P)

Standard ERV operation except with the addition of an economizer damper with actuator and return air damper with actuator. This option enables further enhanced economizer functionality by closing off return air allowing up to 100% volume of outside air during free cooling applications.

Figure 13.1 - Ventilation Configuration Digits: B, G, M

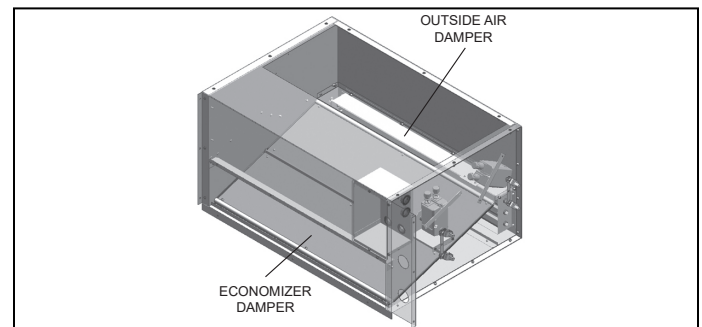
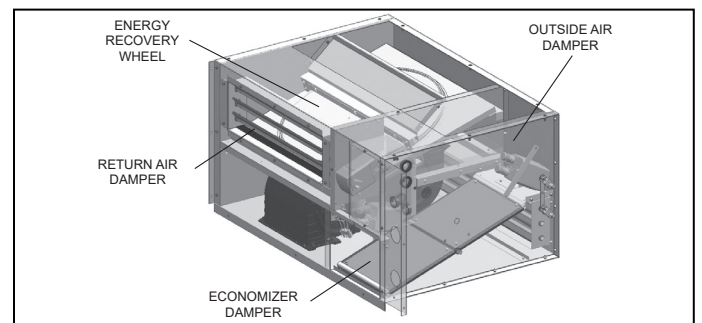



Figure 13.2 - Ventilation Configuration Digits: E, K, P



START-UP SHEET - EXAMPLE

Figure 14.1 - Start-Up Sheet - EXAMPLE Page 1



Airedale ClassMate and SchoolMate Start-Up Sheet

Models CMD, CMP, CMS, SMG, SMW

*THIS DOCUMENT SHOULD BE RETURNED TO MODINE WITHIN 30 DAYS OF STARTUP TO VALIDATE WARRANTY

Date	<input type="text"/>	Job ID	<input type="text"/>	
Unit tag ID	<input type="text"/>	Unit model #	<input type="text"/>	
Room ID	<input type="text"/>	Unit serial #	<input type="text"/>	Last 4 digits <input type="text"/>
Order SPO	<input type="text"/>	Installer	<input type="text"/>	
Diagram #	<input type="text"/>	Sales rep	<input type="text"/>	

Installation Checks

Unit mounted level

Unit bolted to the floor or wall

Wall sleeve installed correctly

Splitter plate installed correctly

Condensate drain installed correctly

Pump tested (If Applicable)

Electrical and mechanical connections tight

Any visual damage to the unit

Cabinet door, brackets and spring pin secure

Pipework and insulation in good condition

Needlepoint Bipolar Ionization (NPBI) installed

Rear extension size

Floor stand fitted

Louver fitted

Thermostat fitted

Occupancy sensor fitted

CO² Sensor fitted

Fire stat fitted

Indoor

Outdoor

Pump or gravity flow	
Pump make and model	<input type="text"/>

Mains Incoming Supply

L1 + L2 or (L1 + N) V

L2 + L3 V

L3 + L1 V

Controls Transformer

Primary	<input type="text"/> V
Secondary	<input type="text"/> V

Supply Fan Motor

Motor size HP

Amps High

Tap @ Lo (+)15%

FLA Medium

Make

Low

Prog rev

CONDENSER FAN DATA ONLY APPLIES TO MODELS CMD AND CMP

Condenser Fan Motor

Motor size HP

FLA

Make

Condenser Fan Motor Outputs

<input type="text"/>	%
<input type="text"/>	%
<input type="text"/>	%

L1

<input type="text"/>	A
<input type="text"/>	A
<input type="text"/>	A

L2

<input type="text"/>	A
<input type="text"/>	A
<input type="text"/>	A

L3

<input type="text"/>	A
<input type="text"/>	A
<input type="text"/>	A

POWERED RELIEF FAN DATA ONLY APPLIES TO MODELS CMS, SMG, AND SMW (OPTIONAL)

Powered Exh Motor

Motor(s) Size (HP)

FLA

RLA

Heat Recovery Section

Motor(s) Size (HP)

ERW 1 Amps Pos 1

ERW 2 Amps Pos 1

FLA Pos 2

Pos 2

Make

Pos 3 <input type="text"/>	Pos 4 <input type="text"/>
Pos 3 <input type="text"/>	Pos 4 <input type="text"/>

Heat RW Motor

Fresh air inlet pre heater


FLA Tested

RLA Setting °F

S/N


START-UP SHEET - EXAMPLE

Figure 15.1 - Start-Up Sheet - Example Page 2

		Airedale ClassMate and SchoolMate Start-Up Sheet Models CMD, CMP, CMS, SMG, SMW		
THIS DOCUMENT SHOULD BE RETURNED TO MODINE WITHIN 30 DAYS OF STARTUP TO VALIDATE WARRANTY				
Controller Information				
Make	<input type="text"/>	Model	<input type="text"/>	
Program revision	<input type="text"/>	Program Rev SPO (Special)	<input type="text"/>	
Thermostat type	<input type="text"/>	Time and date set	<input type="text"/>	
BACnet card fitted	<input type="text"/>	Occupancy input type	<input type="text"/>	
MS/TP address (MAC)	<input type="text"/>	CO2 standby control	<input type="text"/>	
Device Instance (DI)	<input type="text"/>	Electromechanically tested	<input type="text"/>	
LON card fitted	<input type="text"/>	Operation of motion sensor in Unocc	<input type="text"/>	
Neuron ID	<input type="text"/>	Occupancy override type	<input type="text"/>	
Electric Heater				
Amps - stage 1	<input type="text"/> A	<input type="text"/> A	Over-Heat Safety(s) Tested <input type="text"/>	
Amps - stage 2	<input type="text"/> A	<input type="text"/> A		
Total KW rating	<input type="text"/> KW			
Wired Parallel, Delta, Wye	<input type="text"/>			
Coaxial heat exchanger (models SMG or SMW only)				
System Flushed	<input type="text"/>			
Water flow available	<input type="text"/>			
Low water out setpoint (If 0% glycol, set to 40F)	<input type="text"/> °F		Glycol content verified by (Installer) <input type="text"/>	
Glycol mixture in system	<input type="text"/> %			
Refrigeration				
Suction pressure	<input type="text"/> psig	<input type="text"/> psig	<input type="text"/> psig	<input type="text"/> psig
Discharge pressure	<input type="text"/> psig	<input type="text"/> psig	<input type="text"/> psig	<input type="text"/> psig
Superheat	<input type="text"/> °F		<input type="text"/> °F	
Sub cool	<input type="text"/> °F			
Hot gas reheat tested	<input type="text"/>			
Water Temp In (SMG/SMW)	<input type="text"/> °F		<input type="text"/> °F	
Water Temp Out (SMG/SMW)	<input type="text"/> °F		<input type="text"/> °F	
Compressor				
CP model	<input type="text"/>		CP make	<input type="text"/> Copeland Scroll
CP RLA	<input type="text"/> A			
	L1	L2	L3	
CP RLA - Cool stage 1	<input type="text"/> A	<input type="text"/> A	<input type="text"/> A	67% Load
CP RLA - Cool stage 2	<input type="text"/> A	<input type="text"/> A	<input type="text"/> A	100% Load
CP RLA - Heat stage 1	<input type="text"/> A	<input type="text"/> A	<input type="text"/> A	67% Load
CP RLA - Heat stage 2	<input type="text"/> A	<input type="text"/> A	<input type="text"/> A	100% Load
Air Temperatures				
Return air temp (RTN)	<input type="text"/> °F	<input type="text"/> °F	<input type="text"/> °F	<input type="text"/> °F
Supply air temp (SAT)	<input type="text"/> °F	<input type="text"/> °F	<input type="text"/> °F	<input type="text"/> °F
Outside air temp (OAT)	<input type="text"/> °F	<input type="text"/> °F	<input type="text"/> °F	
Indoor coil temp (ICT)	<input type="text"/> °F	<input type="text"/> °F	<input type="text"/> °F	
Air on cond coil temp	<input type="text"/> °F	<input type="text"/> °F	<input type="text"/> °F	
Defrost Timer (model CMP only)				
Operation correct	<input type="text"/>			
Defrost interval time	<input type="text"/> Mins			
Setpoints				
	Cool	Heat		
Occupied Set point	<input type="text"/> 74.0 °F	<input type="text"/> 70.0 °F		
Unoccupied Set point	<input type="text"/> 85.0 °F	<input type="text"/> 62.0 °F		
Standby Set point	<input type="text"/> 76.0 °F	<input type="text"/> 68.0 °F		
Head Pressure Control				
H.P.C tested	<input type="text"/>	H.P.C setting	<input type="text"/> psig	
			S/N <input type="text"/> 0	

START-UP SHEET - EXAMPLE

Figure 16.1 - Start-Up Sheet - Example Page 3

		Airedale ClassMate and SchoolMate Start-Up Sheet	
		Models CMD, CMP, CMS, SMG, SMW	
THIS DOCUMENT SHOULD BE RETURNED TO MODINE WITHIN 30 DAYS OF STARTUP TO VALIDATE WARRANTY			
CO² Sensor			
Sensor reading	<input type="text"/>	ppm	
Bipolar ionization			
Ion reading	<input type="text"/>	Ions / CC	
Economizer Damper			
Build correct	<input type="text"/>	Operation correct	<input type="text"/>
		Damper 0-100% voltages	Min vdc <input type="text"/> Max vdc <input type="text"/>
Outdoor Air Damper			
Build correct	<input type="text"/>	Operation correct	<input type="text"/>
ERV Section			
ERW motor voltage	<input type="text"/>	Outside air ventilation damper correct	<input type="text"/>
Energy wheel motor FLA	<input type="text"/>	Outside air ventilation fan motor RLA	<input type="text"/>
Energy wheel motor RLA	<input type="text"/>	Exhaust air ventilation fan motor RLA	<input type="text"/>
Water/Steam Actuator			
Operation correct	<input type="text"/>	Hot Water or Steam	<input type="text"/>
PIC valve fitted	<input type="text"/>	PIC valve make and model	<input type="text"/>
Low Limit Stat			
Manual or auto reset	<input type="text"/>	Freeze stat setting	<input type="text"/>
Technicians Notes:			
Service Technician	<input type="text"/>		
Service Company	<input type="text"/>		
Service Company Phone	<input type="text"/>		
	S/N	<input type="text" value="0"/>	

DIMENSIONS - MODELS CMD/CMP

Figure 17.1 - Dimensions - Base Unit CMD & CMP

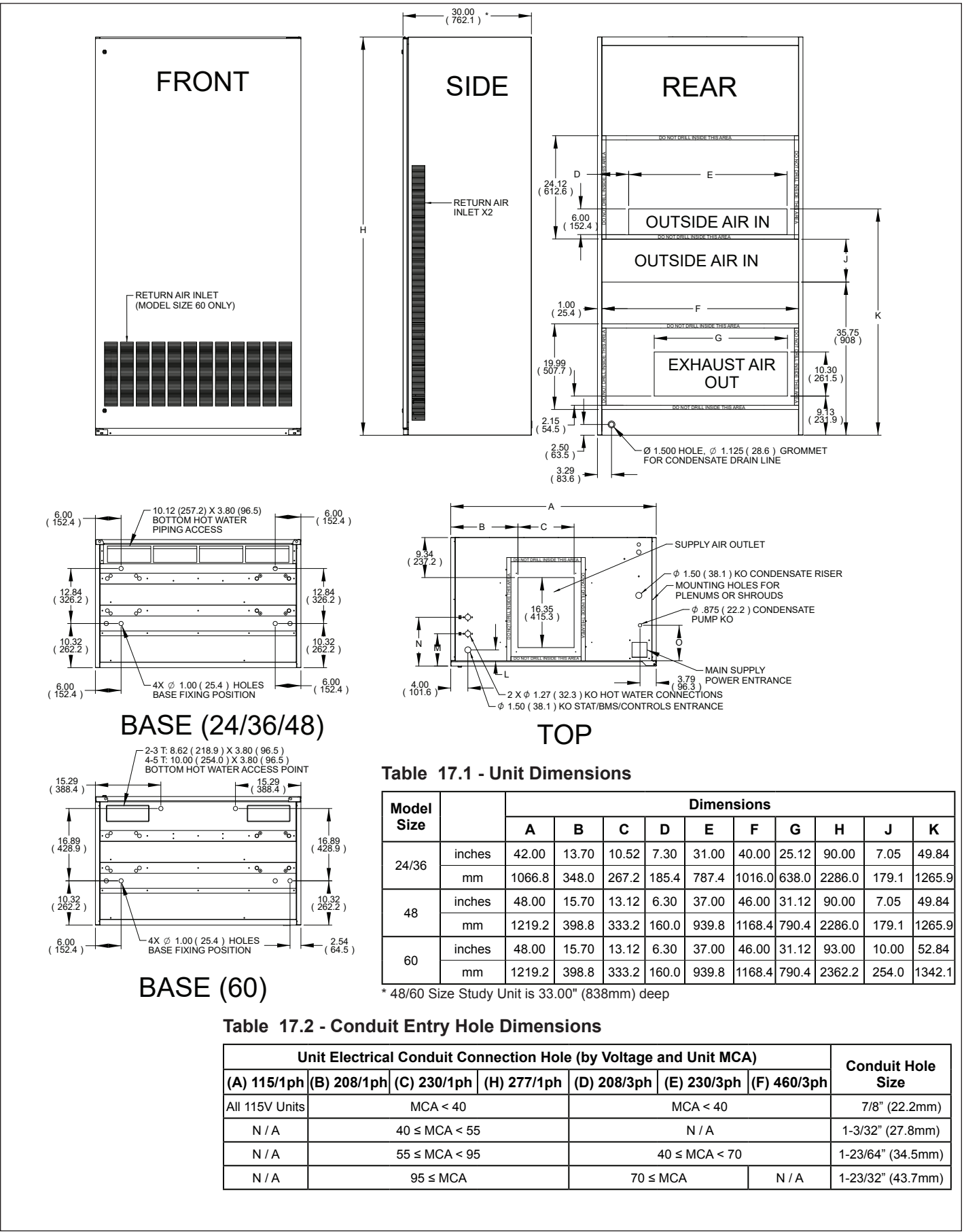


Table 17.1 - Unit Dimensions

Model Size	Dimensions										
	A	B	C	D	E	F	G	H	J	K	
24/36	inches	42.00	13.70	10.52	7.30	31.00	40.00	25.12	90.00	7.05	49.84
	mm	1066.8	348.0	267.2	185.4	787.4	1016.0	638.0	2286.0	179.1	1265.9
48	inches	48.00	15.70	13.12	6.30	37.00	46.00	31.12	90.00	7.05	49.84
	mm	1219.2	398.8	333.2	160.0	939.8	1168.4	790.4	2286.0	179.1	1265.9
60	inches	48.00	15.70	13.12	6.30	37.00	46.00	31.12	93.00	10.00	52.84
	mm	1219.2	398.8	333.2	160.0	939.8	1168.4	790.4	2362.2	254.0	1342.1

* 48/60 Size Study Unit is 33.00" (838mm) deep

Table 17.2 - Conduit Entry Hole Dimensions

Unit Electrical Conduit Connection Hole (by Voltage and Unit MCA)							Conduit Hole Size
(A) 115/1ph	(B) 208/1ph	(C) 230/1ph	(H) 277/1ph	(D) 208/3ph	(E) 230/3ph	(F) 460/3ph	
All 115V Units	MCA < 40			MCA < 40			7/8" (22.2mm)
N / A	40 ≤ MCA < 55			N / A			1-3/32" (27.8mm)
N / A	55 ≤ MCA < 95			40 ≤ MCA < 70			1-23/64" (34.5mm)
N / A	95 ≤ MCA			70 ≤ MCA		N / A	1-23/32" (43.7mm)

DIMENSIONS - MODEL CMS

Figure 18.1 - Dimensions - Base Unit CMS

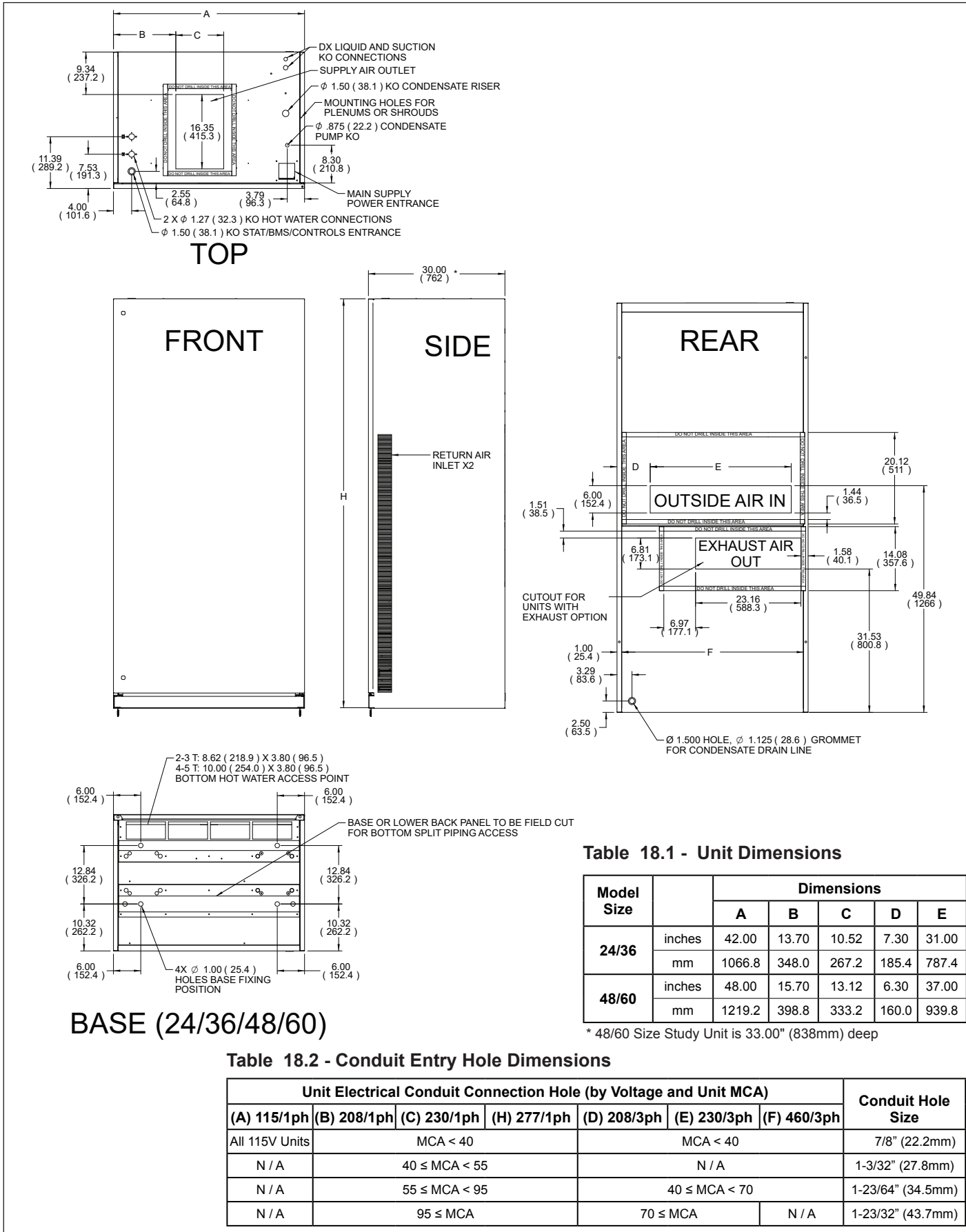


Table 18.1 - Unit Dimensions

Model Size		Dimensions				
		A	B	C	D	E
24/36	inches	42.00	13.70	10.52	7.30	31.00
	mm	1066.8	348.0	267.2	185.4	787.4
48/60	inches	48.00	15.70	13.12	6.30	37.00
	mm	1219.2	398.8	333.2	160.0	939.8

* 48/60 Size Study Unit is 33.00" (838mm) deep

Table 18.2 - Conduit Entry Hole Dimensions

Unit Electrical Conduit Connection Hole (by Voltage and Unit MCA)							Conduit Hole Size
(A) 115/1ph	(B) 208/1ph	(C) 230/1ph	(H) 277/1ph	(D) 208/3ph	(E) 230/3ph	(F) 460/3ph	
All 115V Units	MCA < 40			MCA < 40			7/8" (22.2mm)
N / A	40 ≤ MCA < 55			N / A			1-3/32" (27.8mm)
N / A	55 ≤ MCA < 95			40 ≤ MCA < 70			1-23/64" (34.5mm)
N / A	95 ≤ MCA			70 ≤ MCA		N / A	1-23/32" (43.7mm)

DIMENSIONS - MODELS SMG/SMW

Figure 19.1 - Dimensions - Base Unit SMW & SMG

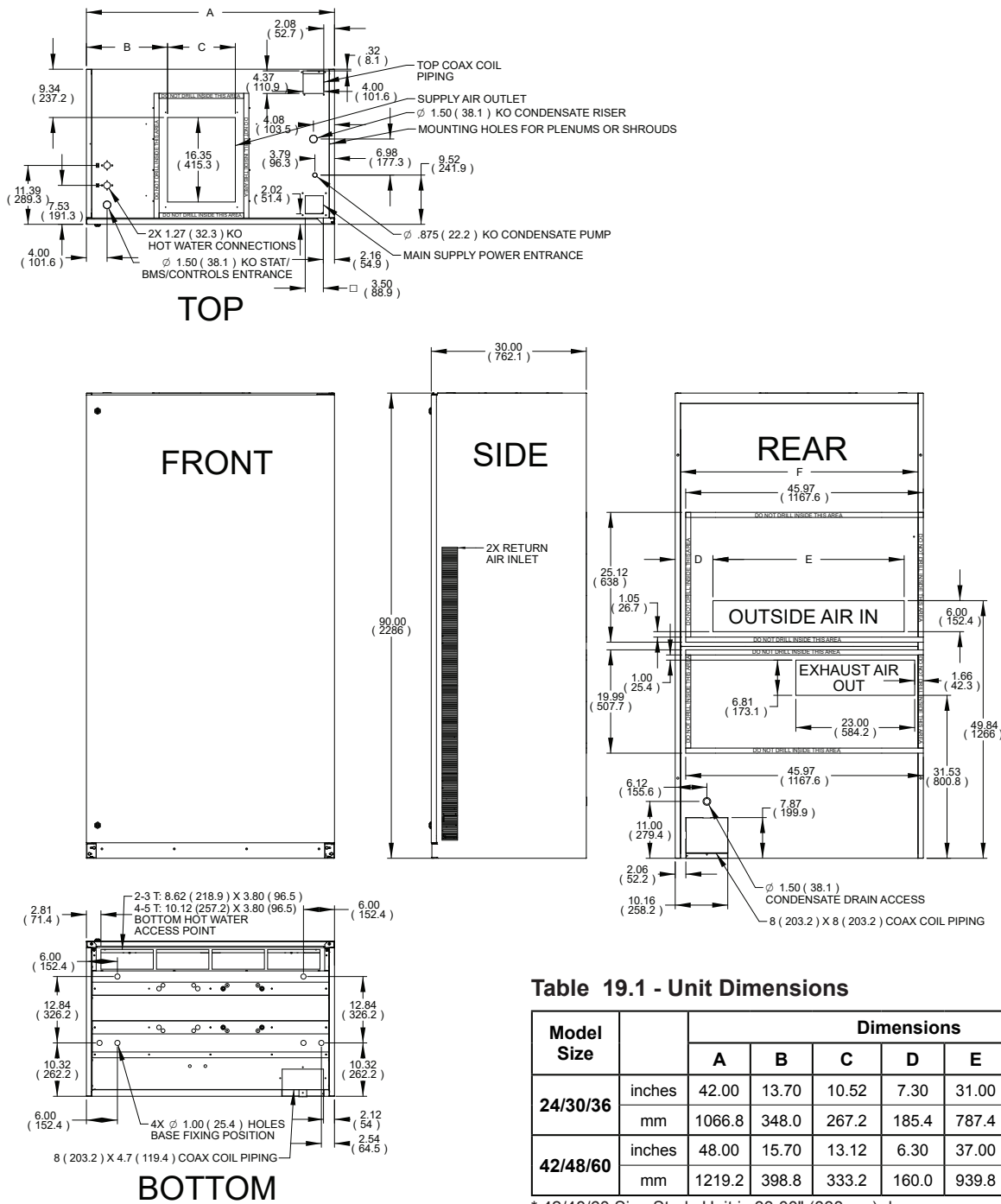


Table 19.1 - Unit Dimensions

Model Size		Dimensions						
		A	B	C	D	E	F	G
24/30/36	inches	42.00	13.70	10.52	7.30	31.00	40.00	25.12
	mm	1066.8	348.0	267.2	185.4	787.4	1016.0	638.0
42/48/60	inches	48.00	15.70	13.12	6.30	37.00	46.00	31.12
	mm	1219.2	398.8	333.2	160.0	939.8	1168.4	790.4

* 42/48/60 Size Study Unit is 33.00" (838mm) deep

Table 19.2 - Conduit Entry Hole Dimensions

Unit Electrical Conduit Connection Hole (by Voltage and Unit MCA)							Conduit Hole Size
(A) 115/1ph	(B) 208/1ph	(C) 230/1ph	(H) 277/1ph	(D) 208/3ph	(E) 230/3ph	(F) 460/3ph	
All 115V Units	MCA < 40			MCA < 40			7/8" (22.2mm)
N / A	40 ≤ MCA < 55			N / A			1-3/32" (27.8mm)
N / A	55 ≤ MCA < 95			40 ≤ MCA < 70			1-23/64" (34.5mm)
N / A	95 ≤ MCA			70 ≤ MCA		N / A	1-23/32" (43.7mm)

PERFORMANCE DATA

Table 20.1 - Performance Data - Air Cooled DX Cooling Units - CMD ①

Unit Size	Compressor Load	Airflow		Cooling ②③					
				Total Capacity		Sensible Capacity		EER	IPLV
		(CFM)	(m3/min)	(MBH)	(kW)	(MBH)	(kW)		
24	100%	800	22.4	24.4	7.2	17.5	5.1	12.1	-
	66%	600	16.8	17.1	5.0	11.1	3.3	-	14.1
36	100%	1100	30.8	34.0	10.0	24.3	7.1	11.0	-
	66%	800	22.4	27.3	8.0	19.3	5.7	-	14.4
48	100%	1500	42.0	46.8	13.7	31.5	9.2	11.6	-
	66%	1100	30.8	37.1	10.9	24.9	7.3	-	16.1
60	100%	1800	50.4	57.0	16.7	41.1	12.0	11.0	-
	66%	1500	42.0	45.5	13.3	32.5	9.5	-	15.0

① Rated in accordance with AHRI 390.

② Full Load Cooling rating point is 80/67°F (26.7/19.4°C) Air On, 95/75°F (35/23.9°C) Outdoor.

③ Part Load Cooling rating point is 80/67°F (26.7/19.4°C) Air On, 80/67°F (26.7/19.4°C) Outdoor.

Table 20.2 - Performance Data - Air Source HP Units - CMP ①

Unit Size	Compressor Load	Airflow		Cooling ②③						Heating ④⑤		
				Total Capacity		Sensible Capacity		EER	IPLV	Capacity		COP
		(CFM)	(m3/min)	(MBH)	(kW)	(MBH)	(kW)			(MBH)	(kW)	
24	100%	800	22.4	22.0	6.4	17.0	5.0	11.2	-	20.9	6.1	3.4
	66%	600	16.8	18.0	5.3	14.6	4.3	-	15.6	19.0	5.6	4.6
36	100%	1100	30.8	34.0	10.0	24.3	7.1	11.0	-	32.8	9.6	3.7
	66%	800	22.4	28.3	8.3	19.3	5.7	-	14.4	28.5	8.4	4.2
48	100%	1500	42.0	45.2	13.2	32.2	9.4	11.0	-	47.2	13.8	4.0
	66%	1100	30.8	36.8	10.8	26.0	7.6	-	15.4	42.7	12.5	4.4
60	100%	1800	50.4	57.0	16.7	41.0	12.0	11.0	-	54.0	15.8	3.5
	66%	1500	42.0	45.5	13.3	32.5	9.5	-	15.0	47.0	13.8	4.4

① Rated in accordance with AHRI 390.

② Full Load Cooling rating point is 80/67°F (26.7/19.4°C) Air On, 95/75°F (35/23.9°C) Outdoor.

③ Part Load Cooling rating point is 80/67°F (26.7/19.4°C) Air On, 80/67°F (26.7/19.4°C) Outdoor.

④ Full Load Heating rating point is 70/60°F (21.1/15.6°C) Air On, 47/43°F (8.3/6.1°C) Outdoor.

⑤ Part Load Heating rating point is 70/60°F (21.1/15.6°C) Air On, 62/56.5°F (16.7/13.6°C) Outdoor.

Table 20.3 - Performance Data - Energy Recovery Wheel (optional) ①

Unit Size	Airflow		Cooling ②			Heating ③		
			Total Capacity Recovered		Effectiveness (%)	Total Capacity Recovered		Effectiveness (%)
	(CFM)	(m3/min)	(MBH)	(kW)		(MBH)	(kW)	
All	200	5.6	8.6	2.5	76.3	7.6	2.2	78.8
	300	8.4	11.6	3.4	68.8	10.5	3.1	72.3
	400	11.2	13.8	4.0	61.5	12.7	3.7	65.9
	500	14.0	15.2	4.5	54.3	14.3	4.2	59.4

① Rated in accordance with AHRI 1060.

② Cooling rating point is 75/63°F (23.9/17.2°C) Room, 95/78°F (35/25.6°C) Outdoor.

③ Heating rating point is 70/58.5°F (21.1/14.7°C) Room, 35/33°F (1.7/0.6°C) Outdoor.

PERFORMANCE DATA

Table 21.1 - Performance Data - Ground Source Units - SMG ⑤⑥⑦

Unit Size	Flow Rate		Compressor Load	Airflow		Cooling ①			Heating ②		
						Capacity		EER	Capacity		COP
	(GPM)	(l/min)		(CFM)	(m3/min)	(MBH)	(kW)		(MBH)	(kW)	
24	6	22.7	100%	800	22.4	23.7	6.9	16.5	19.0	5.6	3.9
			66%	600	16.8	17.5	5.1	18.0	15.0	4.4	3.9
30	8	30.3	100%	950	26.6	30.6	9.0	15.8	23.9	7.0	3.7
			66%	700	19.6	23.4	6.9	18.8	19.7	5.8	3.8
36	9	34.1	100%	1100	30.8	36.1	10.6	16.7	28.6	8.4	3.7
			66%	800	22.4	26.2	7.7	20.6	22.1	6.5	3.7
42	10	37.9	100%	1250	35.0	42.5	12.5	16.6	34.5	10.1	3.9
			66%	1000	28.0	31.6	9.3	19.0	27.1	7.9	3.8
48	12	45.4	100%	1500	42.0	50.4	14.8	17.2	39.3	11.5	3.8
			66%	1100	30.8	36.4	10.7	20.5	31.2	9.1	3.9
60	15	56.8	100%	1800	50.4	60.5	17.7	15.9	48.9	14.3	3.7
			66%	1500	42.0	46.5	13.6	19.0	38.7	11.3	3.9

① Cooling rating point is 80.6/66.2°F DB/WB Entering Coil Temp, 77°F Entering Water Temp.

② Heating rating point is 68°F DB Entering Coil Temp, 32°F Entering Water Temp.

Table 21.2 - Performance Data - Water Source Units - SMW ⑤⑥⑦

Unit Size	Flow Rate		Compressor Load	Airflow		Cooling ①			Heating ②		
						Capacity		EER	Capacity		COP
	(GPM)	(l/min)		(CFM)	(m3/min)	(MBH)	(kW)		(MBH)	(kW)	
24	6	22.7	100%	800	22.4	22.9	6.7	14.8	27.0	7.9	5.1
			66%	600	16.8	16.5	4.8	13.9	21.0	6.2	5.1
30	8	30.3	100%	950	26.6	29.6	8.7	14.5	31.3	9.2	4.7
			66%	700	19.6	21.7	6.4	14.5	25.7	7.5	5.0
36	9	34.1	100%	1100	30.8	34.2	10.0	14.5	42.8	12.5	5.0
			66%	800	22.4	24.1	7.1	14.5	30.5	8.9	5.0
42	10	37.9	100%	1250	35.0	40.5	11.9	14.6	50.2	14.7	4.9
			66%	1000	28.0	29.0	8.5	13.9	38.0	11.1	4.9
48	12	45.4	100%	1500	42.0	48.7	14.3	15.0	58.0	17.0	5.0
			66%	1100	30.8	33.5	9.8	14.5	42.5	12.5	5.1
60	15	56.8	100%	1800	50.4	58.6	17.2	13.8	73.8	21.6	4.9
			66%	1500	42.0	42.8	12.5	14.3	55.4	16.2	5.1

③ Cooling rating point is 80.6/66.2°F DB/WB Entering Coil Temp, 86°F Entering Water Temp.

④ Heating rating point is 68°F DB Entering Coil Temp, 68°F Entering Water Temp.

⑤ Data in accordance to ISO Standard 13256-1 reflects ISO fan and pump power correction factors at 0° ESP.

⑥ Data shows unit performance using 15% (by mass) methanol-water solution.

⑦ Entering water temperature for part-load (66%) is 68°F in cooling and 41°F in heating.

TECHNICAL DATA

Table 22.1 - Technical Data - All Models (IP Units)

UNIT SIZE			24	30 ①	36	42 ①	48	60
INDOOR (Evaporator) COIL - Face Area		in ²	720	720	720	863	863	863
OUTDOOR (Condenser) COIL - Face Area (Model CMD, CMP only)		in ²	952	952	952	1156	1156	1360
SUPPLY FAN			Direct Drive Centrifugal					
Fan Quantity			1	1	1	1	1	1
Motor Size (Qty 1)		HP	3/4	3/4	3/4	3/4	3/4	3/4
Motor Type			Electronically Commutated Motor (ECM)					
Indoor Coil Airflow		CFM	800	950	1,100	1,300	1,500	1,800
Rated/Max External Static Pressure		in.Wg	0.10/0.50	0.10/0.50	0.15/0.50	0.20/0.50	0.20/0.50	0.20/0.50
COMPRESSOR (Models CMD, CMP, SMG, SMW only)			Copeland Scroll ULTRATECH					
Stages			0, 67%, 100%					
Refrigerant Type			HFC-R410A					
EXHAUST FAN (Standard/Optional as indicated)			Backward Curved Motorized Impellor					
Fan Quantity (if selected)			1	1	1	1	1	1
Models CMD, CMP (Standard)	Outdoor Coil Airflow	CFM	2,100	n/a	2,100	n/a	2,800	2,800
	Motor Type		Electronically Commutated Motor (ECM)					
	Max Room Exhaust Airflow	CFM	800	n/a	1,100	n/a	1,500	1,800
	Rated/Max External Static Pressure	in.Wg	0.10/0.50	n/a	0.15/0.50	n/a	0.20/0.50	0.20/0.50
Models CMS, SMG, SMW (Optional)	Motor Type		Speed Controlled PSC Motor					
	Max Room Exhaust Airflow	CFM	750	800	900	1,100	1,200	1,200
	Max External Static Pressure	in.Wg	0.25	0.25	0.25	0.25	0.25	0.25
UNIT WEIGHT								
Operating Weight	Standard Unit, Models CMD, CMP ②	lbs.	753	n/a	753	n/a	850	890
	Standard Unit, Models CMS ②	lbs.	560	n/a	560	n/a	630	630
	Study Package Unit, Models CMD, CMP	lbs.	828	n/a	828	n/a	950	990
	Standard Unit, Models SMG, SMW ②	lbs.	655	655	655	765	765	765
	Study Package Unit, Models SMG, SMW	lbs.	730	730	730	865	865	865
FILTER			MERV 8, 13					
Quantity			2	2	2	2	2	2
Dimensions		in.	16 x 25	16 x 25	16 x 25	20 x 25	20 x 25	20 x 25
ELECTRIC HEATING (optional)								
Electric Heating Capacity Range		kW	3 to 15	3 to 15	3 to 20	3 to 20	3 to 20	3 to 20
Stages	3 through 9kW		1	1	1	1	1	1
	10 through 20kW		2	2	2	2	2	2
HOT WATER HEATING (optional)								
Unit Mounted - 1 Row	Heating Capacity - 3/6 GPM ③	MBH	70/82	④	74/88	④	82/101	87/111
	Water Pressure Drop - 3/6 GPM	psig	0.37/1.23	④	0.37/1.23	④	0.37/1.23	0.37/1.23
Unit Mounted - 2 Row	Heating Capacity - 3/6 GPM ③	MBH	94/106	④	101/118	④	113/139	122/158
	Water Pressure Drop - 3/6 GPM	psig	0.75/2.50	④	0.75/2.5	④	0.88/2.94	0.88/2.94
Plenum Mounted - 1 Row	Heating Capacity - 3/6 GPM ③	MBH	71/83	④	78/94	④	82/102	84/106
	Water Pressure Drop - 3/6 GPM	psig	0.45/1.50	④	0.45/1.50	④	0.45/1.50	0.45/1.50
Plenum Mounted - 2 Row	Heating Capacity - 3/6 GPM ③	MBH	93/107	④	104/126	④	109/139	111/146
	Water Pressure Drop - 3/6 GPM	psig	0.13/0.44	④	0.13/0.44	④	0.13/0.44	0.13/0.44
STEAM HEATING (optional)								
Plenum Mounted - 1 Row	Heating Capacity - 2/5 psig ③	MBH	93/97	④	103/108	④	116/122	124/131

① Sizes 30 and 42 are available only on models SMG and SMW.

② Operating Weight based on unit equipped with Standard Economizer, 20 Gauge casing, Hot Gas Reheat Coil, and 1-Row Hot Water Heating Coil.

③ Hot water/steam heating capacity based on an Air On 33°F (24MBH), 38°F (36MBH), 47°F (4Ton), and 51°F (5 Ton). The Air On based on 450 CFM outside air at 0°F and 70°F room ambient for 24 MBH unit, and 500 CFM outside air at 0°F and 70°F room ambient for 36, 48, and 60 MBH unit. For Hot Water: Entering water temperature 180°F, and water flow rate of 3 and 6 GPM. For Steam: Steam pressure of 2 and 5 psig.

④ Refer to the Breeze AccuSpec Submittal Package for ratings on Sizes 30 and 42.

TECHNICAL DATA

Table 23.1 - Technical Data - All Models (SI Units)

UNIT SIZE			24	30 ^①	36	42 ^①	48	60
INDOOR (Evaporator) COIL - Face Area		m ²	0.465	0.465	0.465	0.557	0.557	0.557
OUTDOOR (Condenser) COIL - Face Area (Model CMD, CMP only)		m ²	0.614	0.614	0.614	0.746	0.746	0.877
SUPPLY FAN			Direct Drive Centrifugal					
Fan Quantity			1	1	1	1	1	1
Motor Size		kW	0.56	0.56	0.56	0.56	0.56	0.56
Motor Type			Electronically Commutated Motor (ECM)					
Indoor Coil Airflow		m ³ /min	22.4	26.6	30.8	36.4	42.0	50.4
Rated/Max External Static Pressure		kPa	0.025/0.124	0.025/0.124	0.037/0.124	0.050/0.124	0.050/0.124	0.050/0.124
COMPRESSOR (Models CMD, CMP, SMG, SMW only)			Copeland Scroll ULTRATECH					
Stages			0, 67%, 100%					
Refrigerant Type			HFC-R410A					
EXHAUST FAN (Standard/Optional as indicated)			Backward Curved Motorized Impellor					
Fan Quantity (if selected)			1	1	1	1	1	1
Models CMD, CMP (Standard)	Outdoor Coil Airflow	m ³ /min	58.8	n/a	58.8	n/a	78.4	78.4
	Motor Type		Electronically Commutated Motor (ECM)					
	Max Room Exhaust Airflow	m ³ /min	22.4	n/a	30.8	n/a	42.0	50.4
	Rated/Max External Static Pressure	kPa	0.025/0.124	n/a	0.037/0.124	n/a	0.050/0.124	0.050/0.124
Models CMS, SMG, SMW (Optional)	Motor Type		Speed Controlled PSC Motor					
	Max Room Exhaust Airflow	m ³ /min	21.0	22.4	25.2	30.8	33.6	33.6
	Max External Static Pressure	kPa	0.063	0.063	0.063	0.063	0.063	0.063
UNIT WEIGHT								
Operating Weight	Standard Unit, Models CMD, CMP ^②	kg	341	n/a	341	n/a	385	404
	Standard Unit, Models CMS ^②	kg	254	n/a	254	n/a	286	286
	Study Package Unit, Models CMD, CMP	kg	376	n/a	376	n/a	431	449
	Standard Unit, Models SMG, SMW ^②	kg	297	297	297	347	347	347
	Study Package Unit, Models SMG, SMW	kg	331	331	331	392	392	392
FILTER			MERV 8, 13					
Quantity			2	2	2	2	2	2
Dimensions		mm	406x635	406x635	406x635	508x635	508x635	508x635
ELECTRIC HEATING (optional)								
Electric Heating Capacity Range		kW	3 to 15	3 to 15	3 to 20	3 to 20	3 to 20	3 to 20
Stages	3 through 9kW		1	1	1	1	1	1
	10 through 20kW		2	2	2	2	2	2
HOT WATER HEATING (optional)								
Unit Mounted - 1 Row	Heating Capacity - 0.19/0.38 L/s ^③	kW	20.5/24.0	⊕	21.7/25.8	⊕	24.0/29.6	24.6/32.5
	Water Pressure Drop - 0.19/0.38 L/s	kPa	2.55/8.48	⊕	2.55/8.48	⊕	2.55/8.48	2.55/8.48
Unit Mounted - 2 Row	Heating Capacity - 0.19/0.38 L/s ^③	kW	27.5/31.1	⊕	29.6/34.6	⊕	33.1/40.7	35.8/46.3
	Water Pressure Drop - 0.19/0.38 L/s	kPa	5.17/17.23	⊕	5.17/17.23	⊕	6.07/20.27	6.07/20.27
Plenum Mounted - 1 Row	Heating Capacity - 0.19/0.38 L/s ^③	kW	20.8/24.3	⊕	22.9/27.5	⊕	24.0/29.9	24.6/31.1
	Water Pressure Drop - 0.19/0.38 L/s	kPa	0.45/1.50	⊕	0.45/1.50	⊕	0.45/1.50	0.45/1.50
Plenum Mounted - 2 Row	Heating Capacity - 0.19/0.38 L/s ^③	kW	27.3/31.4	⊕	30.5/36.9	⊕	31.9/40.7	32.5/42.8
	Water Pressure Drop - 0.19/0.38 L/s	kPa	0.90/3.03	⊕	0.90/3.03	⊕	0.90/3.03	0.90/3.03
STEAM HEATING (optional)								
Plenum Mounted - 1 Row	Heating Capacity - 13.8/34.5 kPa ^③	kW	27.3/28.4	⊕	30.2/31.7	⊕	34.0/35.8	36.3/38.4

① Sizes 30 and 42 are available only on models SMG and SMW.

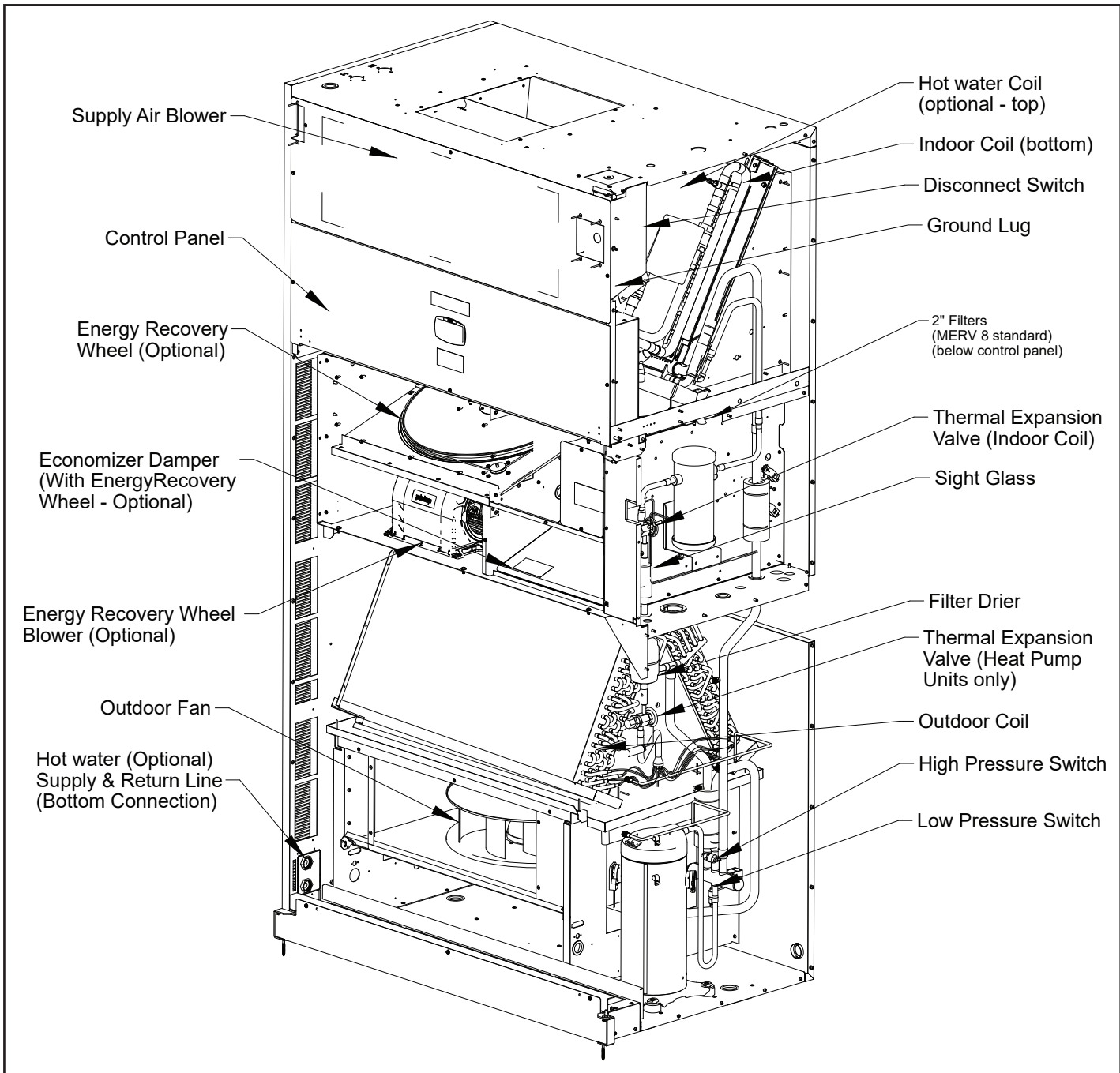
② Operating Weight based on unit equipped with Standard Economizer, 20 Gauge casing, Hot Gas Reheat Coil, and 1-Row Hot Water Heating Coil.

③ Hot water/steam heating capacity based on an Air On 33°F (0.6°C) for Size 24, 38°F (3.3°C) for Size 36, 47°F (8.3°C) for Size 48, and 51°F (10.5°C) for Size 60. The Air On based on 450 CFM (12.6 m³/min) outside air at 0F (-17.8C) and 70F (21.1C) room ambient for Size 24 and 500CFM (14 m³/min) outside air at 0F (-17.8C) and 70F (21.1C) room ambient for Sizes 36, 48, and 60. For Hot Water: Entering water temperature 180°F (82.1°C), and water flow rate of 3 and 6 GPM (0.19 and 0.38 L/s).

④ Refer to the Breeze AccuSpec Submittal Package for ratings on Sizes 30 and 42.

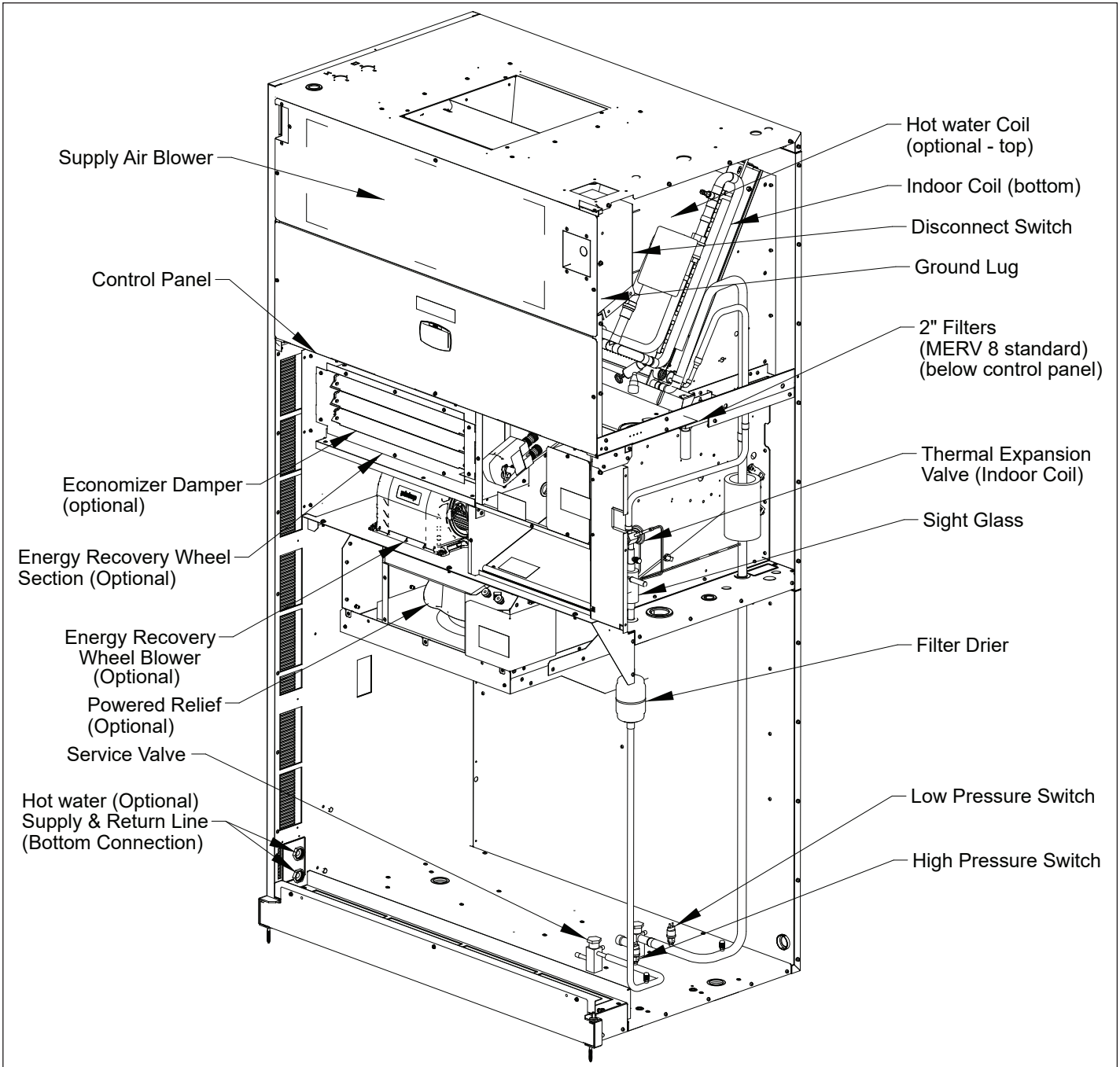
COMPONENT LAYOUT - MODELS CMD/CMP

Figure 24.1 - Component Layout - Models CMD/CMP



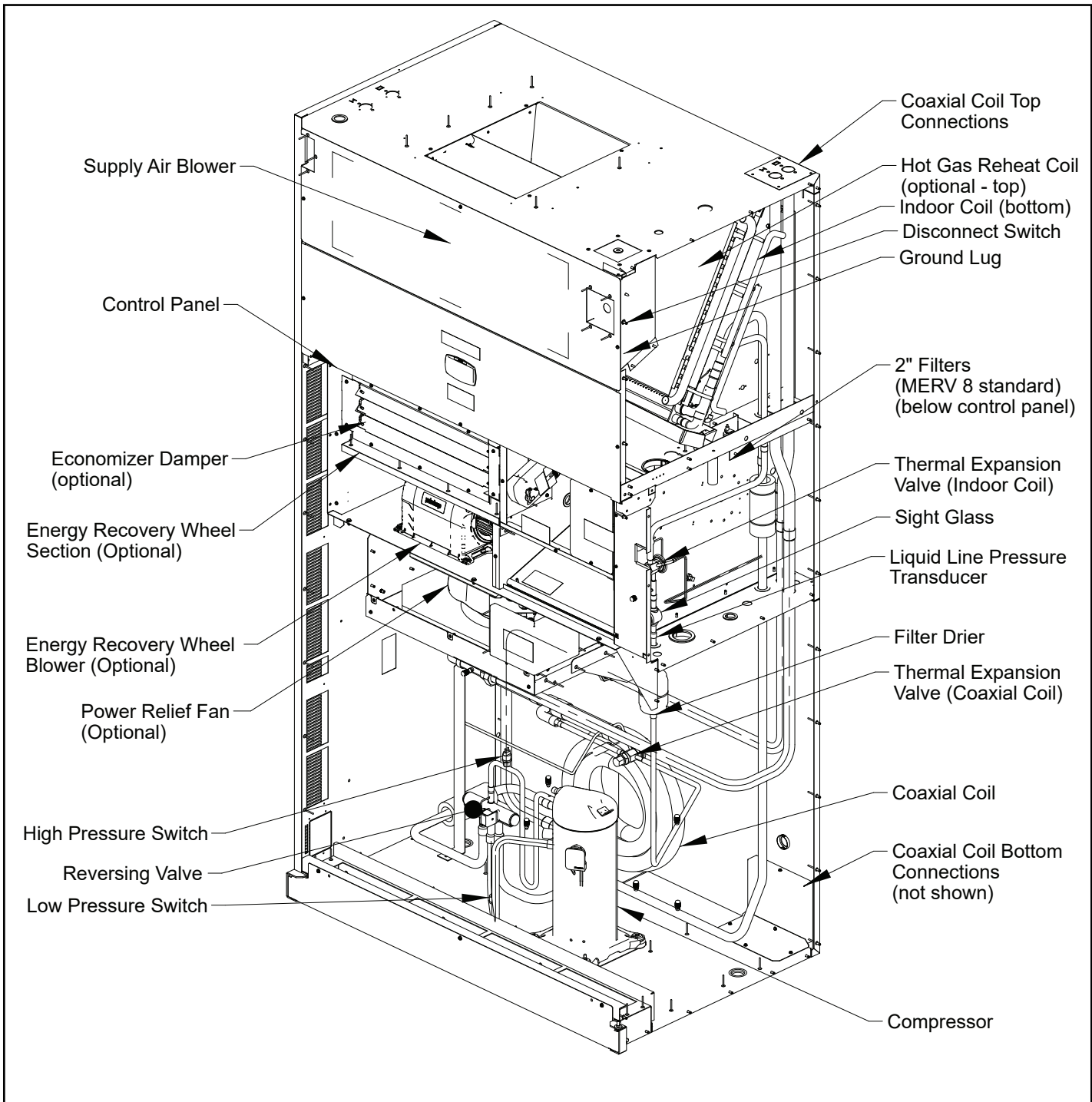
COMPONENT LAYOUT - MODEL CMS

Figure 25.1 - Component Layout - Model CMS



COMPONENT LAYOUT - MODELS SMG/SMW

Figure 26.1 - Component Layout - MODELS SMG/SMW



MAINTENANCE

WARNING

1. Disconnect power supply before making wiring connections or working on this equipment. Follow all applicable safety procedures to prevent accidental power up. Failure to do so can result in injury or death from electrical shock or moving parts and may cause equipment damage.
2. When servicing or repairing this equipment, use only factory-approved service replacement parts. A complete replacement parts list may be obtained by contacting the factory. Refer to the rating plate on the appliance for complete appliance model number, serial number, and company address. Any substitution of parts or controls not approved by the factory will be at the owner's risk.

AVERTISSEMENT

1. Débranchez l'alimentation électrique avant d'effectuer des connexions ou de travailler sur l'appareil. Respectez toutes les procédures de sécurité qui s'appliquent pour éviter toute mise en marche accidentelle. Le non-respect de cette directive peut entraîner des blessures ou la mort causées par un choc électrique ou des pièces mobiles, en plus d'endommager l'appareil.
2. Pour l'entretien et les réparations de cet appareil, utilisez uniquement des pièces d'origine certifiées. Pour la liste complète des pièces de rechange, consultez Modine Manufacturing Company. Le numéro de modèle complet, le numéro de série et l'adresse du fabricant figurent sur la plaque signalétique fixée à l'appareil. Toute substitution de pièce ou de commande non approuvée par le fabricant sera aux risques du propriétaire.

CAUTION

1. Do not attempt to reuse any mechanical or electrical component which has been wet. Such component must be replaced.
2. When servicing the unit, some components may be hot enough to cause pain or injury. Allow time for cooling of hot components before servicing.

ATTENTION

1. Ne tentez pas de réutiliser un composant mécanique ou électrique qui a été mouillé. Ces composants doivent être remplacés.
2. Durant l'entretien de l'unité, certains composants peuvent être assez chauds pour causer de la douleur ou une blessure. Laissez les composants chauds se refroidir avant de procéder à tout entretien.

IMPORTANT

1. Start up and adjustment procedures, installation, and service of these appliances must be performed by a qualified installation and service agency.
2. No water-flow can cause a freeze condition resulting in damage to the coil.
3. To check most of the Possible Remedies in the troubleshooting guide listed in Table 30.1, refer to the applicable sections of the manual.

IMPORTANT

1. Les procédures de démarrage et de réglage, l'installation et le service de ces appareils doivent être confiés à un centre d'installation et de service qualifié.
2. L'absence d'écoulement d'eau risque de causer une condition de gel et d'endommager le serpentin.
3. Pour essayer la plupart des solutions possibles suggérées dans le guide de dépannage du Table 30.1, reportez-vous aux sections correspondantes du manuel.

The routine care and maintenance of this unit will increase longevity, provide for the proper operational performance, and reduce the probability of failure.

Once the unit is operational, it will be necessary to perform certain routine maintenance/service checks. Following is a Maintenance Schedule with the recommended checks. If your unit is equipped with special features, there may be additional checks that are required. Consult Modine for assistance.

The use of torque screwdrivers on panel, cover or component mounting screws is not recommended. Hand-start all screws. If electric drills are used – set at the lowest possible torque.

Any time the refrigerant system is opened, the Filter Drier and Sight Glass should be replaced.

Access

1. Access to the unit is gained by opening the door using the Modine door key that is provided.
2. Access to the compressor, outdoor coil, and condenser fan is gained by removal of the floor foam under and in front of the condenser blankoff panel, then the panel itself in the bottom section of the unit.
3. Access to the supply fan is gained by carefully lowering the control panel. Two blankoff panels make up the top section of the unit and need to be removed prior to accessing the control panel. Remove screws around perimeter of blankoff panel.

MAINTENANCE

Maintenance Schedule

Note: See the installation and maintenance manual provided with the condensing unit for manufacturer recommended maintenance information.

Every THREE (3) MONTHS

Change the main filters, by sliding the filter out of the track. The filters are positioned under the indoor coil. Never run the unit without filters.

Every SIX (6) MONTHS (Before the heating and cooling season)

1. Check the refrigeration system performance (Suction and Discharge pressures) and compare with the Start-Up Sheet. If there is any significant variation, then the fault should be found and corrected. Refer to the troubleshooting section.
2. If it is determined that the unit is under-charged, careful inspection of the refrigeration circuit should be carried out to identify the source of the leak. Concentrate on schrader valve fittings and capillary line connections.
3. If the Filter/Drier requires replacing either due to Compressor burn out or collection of non-condensables follow the proper Filter/Drier replacement procedure.
4. Check that the High and Low Pressure Switches are cutting out the Compressor at the correct settings.

Switch		Cut Out	Cut In	Differential
High Pressure	psig	580	435	145
	kPa	3999	2999	1000
Low Pressure	psig	15	44	34
	kPa	103	303	234

5. The gauges can then be removed from the system. Do not forget to replace the caps on the Schrader valves.
6. With the Disconnect Switch in the "OFF" position, inspect all electrical circuits for loose connections and signs of overheating, arcing, chafing or other physical damage. The electrical control section should also be wiped clean of all dirt that may affect the unit operation.
7. Check for correct fan operation, no excessive noise or vibrations.
8. Wash the condenser coil filters (Optional).
9. Check the electric heat (Optional). See procedure below.
10. Wash down the cabinet using mild detergent and treat any paint damage or rust as necessary.
11. Check the control wiring and sensors. Check the operation and sequencing of controls and ensure that all relevant set points are recorded.
12. Visually inspect the compressor mounting isolators to ensure there is no damage or deterioration to isolators.

Every EIGHTEEN (18) MONTHS

Energy Recovery Wheel (Optional)

The Energy Recovery Wheel is mounted in a fully assembled cartridge for easy installation, removal and maintenance.

Rotary counterblow heat exchangers (heat wheels) with laminar airflow are "self cleaning" with respect to dry particles. Small particles may pass through, while larger particles that land on the surface are blown clear as the flow direction is reversed. For this reason, the primary need for cleaning is to remove films of oil based aerosols that have condensed on energy transfer surfaces.

1. Only applicable to STUDY package) Remove filter blankoff.
2. (ONLY applicable to STUDY package 48/60 MBH capacities) Remove ventilation adder on the front of the ERV assembly.
3. Remove the bolts holding the ERV assembly to the right hand and left hand side panels and lower sound panel section. Disconnect the ERV plug and socket and slide the entire assembly out of the unit. It is recommended that two people are used for this operation.
4. Remove the top panel of the ERV assembly and disconnect the wheel motor plug and socket. Lift the wheel (attached to plate), top edge first, out of the ERV assembly. After detaching the wheel belt, unscrew the wheel fasteners and crossbar and remove the wheel from the plate.
5. Clean the wheel according to the Cleaning Airxchange Energy Recovery Wheels instructions available on the Airxchange website: www.airxchange.com.

MAINTENANCE

Electric Heat (Optional)

1. Check that the electrical connections are secure.
2. Check the operation of the electric heaters.
3. Check the operation of the manual and auto-reset overheat cut-out switches. The auto-reset overheat cut-out switch opens at 150°F (65.5°C) and the manual reset overheat cut-out switch opens at 180°F. (82.1°C)


Replacement Parts

For ease of identification when ordering replacement parts or contacting the factory about your unit, please quote the unit type and unit serial number. This information can be found on the serial plate attached to your unit. See Figure 29.1.

When a component part fails, a replacement part should be obtained through our Parts Department. If the part is considered to be under warranty, the following details are required to process this requirement:

1. Full description of part required, including Unit's part number, if known.
2. The original equipment serial number.
3. An appropriate purchase order number.

Figure 29.1 - Serial Plate EXAMPLE

			
Modine Manufacturing Company 604 Liberty Ln West Kingston, RI 02892 Phone: 1-866-823-1631			
CLASSMATE UNIT			
SERIAL NUMBER / NUMERO DE SERIE 715515 0220-1133			
MODEL NUMBER / NUMERO DE MODELE CMP36FCMBCSNNA12N		COMPRESSOR AMPS 5.7 RLA 38 LRA	
VOLTS / PHASE / Hz 460V3~ 60Hz		ELECTRIC HEAT 17.2 A	
CONDENSER FAN (1.34 HP) 1.75 FLA 1000 W	SUPPLY MOTOR (1.34 HP) 3 FLA 560 W	CONDENSATE PUMP (n/a HP) n/a FLA n/a W	
ERV VENT MOTORS(2): (n/a HP) n/a FLA n/a W	ENERGY WHEEL (n/a HP) n/a FLA n/a W	CIRCULATING PUMP (n/a HP) n/a FLA n/a W	
FULL LOAD AMPS (FLA) 20.4 A	MIN. CIRCUIT AMPS (MCA) 25 A	MAX. OVERCURRENT PROTECTION (MOP) 5 A	
REFRIGERANT 30	FACTORY CHARGED 4.99kg (11.00lb)	MAX PRESSURE 4140 kPa (600 PSIG)	
MAXIMUM EXTERNAL STATIC PRESSURE PRESSION STATIQUE EXTERIEUR MAXIMUM		125 Pa (0.25 ^{INCH} H ₂ O)	
CLEARANCE TO COMBUSTIBLE MATERIAL DÉGAGEMENT DE MATIÈRES COMBUSTIBLES		0 m (0 ^{IN} PD)	
MAXIMUM DISCHARGE TEMPERATURE TEMPÉRATURE DE DÉPART MAXIMUM		52 C (125 F)	
Short-circuit current 5kA rms symmetrical, 460V maximum.			
OPTIONAL STEAM / HOT WATER COIL:			
	HOT WATER	STEAM	
MAX TEMP: C(F)	93(200)	149(300)	
MAX PRESS: kPa(PSIG)	862(125)	345(50)	
SH1019188 REV I			

TROUBLESHOOTING

Table 30.1 - Troubleshooting - General

Trouble	Possible Cause	Possible Remedy
A. Unit Not Operating - Power On	1. Unit mounted disconnect in the "OFF" position.	1. Turn the disconnect switch to the "ON" position.
	2. Unit switched OFF in the microprocessor.	2. Consult microprocessor documentation.
	3. Delay on start set incorrectly.	3. Consult microprocessor documentation.
	4. Unit not in occupied mode.	4. Consult microprocessor documentation.
	5. Fire/smoke alarm tripped.	5. De-energize and re-energize unit.
	6. Tripped circuit breakers.	6. Reset the tripped circuit breaker(s).
	7. Loose mains or control wiring.	7. With power OFF inspect the field wiring connections in the connection box.
	8. Occupancy sensor malfunction.	8. Inspect connections beginning with sensor input from microprocessor.
	9. Hot water freeze protection stat tripped.	9. Reset stat.
B. Unit Operating - No Mechanical Heating (Heat Pump Units) or Cooling	1. Heating/cooling not required.	1. Verify applicable set point with return air temperature.
	2. No output from microprocessor.	2. Consult microprocessor documentation.
	3. System pressure switch(es) tripped.	3. Inspect high and low system pressures.
	4. Internal overload switch on compressor tripped (open).	4. Wait for compressor motor windings to cool down (This switch is automatic reset).
	5. Loose control wiring connections.	5. Inspect connections beginning with compressor output from the microprocessor.
	6. Tripped circuit breakers.	6. Reset the tripped circuit breaker(s).
	7. Low temperature unit lockout.	7. Consult microprocessor setpoints.
	8. Occupancy sensor malfunction.	8. Inspect connections beginning with sensor input from microprocessor.
	9. Float switch tripped.	9. Check condensate pan and piping for blockage.
C. No Fan	1. Motor tripped on internal overload.	1. Let motor cool down and reset - possible bad motor or blocked filter.
	2. Fan not required	2. Consult microprocessor documentation, or set thermostat to "ON".
	3. No power to the fan.	3. Check to make sure plugs are locked in place and check for 24V control signal.
	4. Current sensor fault.	4. Inspect sensor for proper operation, replace if faulty.
D. Electric Heat Not Operation (Optional)	1. Electric heat not required.	1. Consult microprocessor documentation.
	2. Faulty electric heat relay.	2. Check operation of relay and wiring connections.
	3. Overheat cutout switch is tripped (open).	3. This switch requires manual reset. Check current draw of heating elements and compare to nameplate. Check location of sensing probe. To avoid incidental tripping of switch, to not power off unit in electric heating mode.
	4. Faulty heating element(s).	4. Replace elements as necessary.
E. Hot Water Valve Not Operational (Option)	1. Heating not required.	1. Consult microprocessor documentation.
	2. Loose wiring connections.	2. Inspect connections beginning with valve output from the microprocessor. Ensure 24Vac is present at actuator.
	3. Faulty heating actuator.	3. Rest and replace actuator if faulty.
	4. Isolation valves closed.	4. Check that valves are open.
	5. Valve actuator not receiving a control signal.	5. Check for 2-10Vdc control signal from microprocessor or control source.
F. Low Suction Pressure (LP Switch Tripped)	1. Low refrigeration charge.	1. Measure unit operating pressures. Add charge and check for leaks.
	2. Clogged filter(s).	2. Replace filter(s) as necessary.
	3. Clogged liquid line filter drier.	3. Replace drier with a direct replacement. Follow proper procedure.
	4. Improper expansion valve setting or valve malfunctioning.	4. Check operation and check superheat.
	5. Low/restricted supply airflow.	5. Check diffusers, filters, and supply motor to ensure proper airflow.

TROUBLESHOOTING (CONT)

G. Low Discharge Pressure	1. Low refrigeration charge.	1. Measure unit operating pressures. Add charge and check for leaks.
	2. Faulty compressor.	2. Replace compressor.
	3. Faulty reversing valve.	3. Evacuate system and replace reversing valve.
	4. Outdoor air sensor out of calibration.	4. Check outdoor air sensor for accuracy.
H. High Suction Pressure	5. Excessive load.	5. Check occupancy of space.
	6. Expansion valve malfunctioning (overfeeding).	6. Check remote bulb and regulate superheat.
	7. Faulty compressor.	7. Replace compressor.
I. High Discharge Pressure	1. Improper installation of wall sleeve and louver.	1. Ensure separate plate is in contact with the back of the louver blades and no re-circulation of exhaust air takes place.
	2. Dirty condenser coils.	2. Clean condenser coils.
	3. System overcharged.	3. Remove excess refrigerant.
	4. Noncondensables in system.	4. Evacuate refrigerant circuit and recharge.
	5. Condenser fan speed is too slow (cooling mode).	5. Adjust the condenser fan speed controller.
J. Condensate Leaking	1. Condensate drain not piped up.	1. Pipe condensate drain.
	2. Condensate pan/line plugged.	2. Clean drain pan and piping.
	3. Condensate pump (optional) faulty.	3. Check operation of condensate pump. Replace pump if necessary.
K. Defrost Cycle Not Working (Heat Pump)	1. Incorrect settings for defrost cycle.	1. Consult microprocessor documentation.
	2. Coil temperature sensor out of position.	2. Check the position of the sensor. It should be embedded in the condenser coil.
L. Microprocessor Not Working - Faulty Operation	1. 1. Loose sensor wire connectors.	1. Inspect sensor connections at the microprocessor.
	2. Strategy file corrupted.	2. Consult microprocessor documentation.
	3. Loose control wiring.	3. Check 24V power supply wiring and control wiring.

MODEL IDENTIFICATION

Figure 32.1 - Model Number Designations

1-3	4,5	6	7	8	9	10	11	12	13	14	15,16	17
MS	MBH	SV	G	C	VC	F	CC	DS	DO	HP	HO	-

1-3 - Model Series (MS)

ClassMate (Air Cooled)

- CMD - DX Cooling
- CMP - Heat Pump
- CMS - Split Fan Coil Unit

SchoolMate (Water Cooled)

- SMG - Ground Source Heat Pump
- SMW - Water Source Heat Pump

4,5 - Nominal Capacity (MBH)

- 24 - 24,000 Btu/Hr
- 30 - 30,000 Btu/Hr
- 36 - 36,000 Btu/Hr
- 42 - 42,000 Btu/Hr
- 48 - 48,000 Btu/Hr
- 60 - 60,000 Btu/Hr

6 - Supply Voltage (SV)

- A - 115/60/1
- B - 208/60/1
- C - 230/60/1
- D - 208/60/3
- E - 230/60/3
- F - 460/60/3

7 - Generation (G)

- A - First Generation
- B - Second Generation
- C - Third Generation

8 - Control (C)

- M - Modine Control System
- F - Factory Installed Free Issue
- B - By Others - Field Installed

9 - Ventilation Configuration (VC)

No Exhaust ①

- A - Economizer
 - B - Economizer with OA Damper
 - C - ERV with OA Damper
 - E - ERV with OA & RA Damper & Economizer
- ① On CMD/CMP models, the condenser fan provides exhaust capability.

Gravity Damper Exhaust

- F - Economizer
- G - Economizer with OA Damper
- H - ERV with OA Damper
- K - ERV with OA & RA Damper & Economizer

Powered Exhaust

- L - Economizer
- M - Economizer with OA Damper
- P - ERV with OA & RA Damper & Economizer

10 - Filtration (F)

- A - MERV 8
- C - MERV 13

11 - Case Construction (CC)

- A - 20Ga (Standard)
- B - 16Ga
- S - STUDY Package 20Ga

12 - Door Mounted Stat (DS)

- N - None
- H - Horizontal Stat

13 - Door Mounted Other (DO)

- N - None
- S - Occupancy Sensor

14 - HGRH & Pump Option (HP)

- N - None
- A - HGRH Coil
- B - HGRH Coil & Condensate Pump
- C - Condensate Pump

15,16 - Heating Option (HO)

00 - None

Electric (in Unit)

- 03 - 3 kW (1-stage)
- 05 - 5kW (1-stage)
- 08 - 7.5 kW (1-stage)
- 09 - 9kW (1-stage)
- 10 - 10 kW (2-stage)
- 12 - 12kW (2-stage)
- 15 - 15 kW (2-stage)
- 18 - 18 kW (2-stage)
- 20 - 20 kW (2-stage)

Hot Water (in Unit)

- 82 - 1 Row Coil - Bottom Connection
- 84 - 2 Row Coil - Bottom Connection
- 92 - 1 Row Coil - Top Connection
- 94 - 2 Row Coil - Top Connection

17 - Coaxial Coil Option (SMG/SMW)

No Circulator Pump

- 1 - Copper, Bottom Connections
- 3 - Copper, Top Connections

With PL-36 Circulator Pump

- A - Copper Coil, Bottom Connections
- C - Copper Coil, Top Connections

With PL-55 Circulator Pump

- E - Copper Coil, Bottom Connections
- G - Copper Coil, Top Connections

Digit 18 - Heating Valve Package ①

- N - None
- 1 - Modulating 2-Way (2.8-8.9 GPM)
- 2 - Modulating 2-Way (4.7-15 GPM)
- 3 - Modulating 3-Way (2.8-8.9 GPM)
- 4 - Modulating 3-Way (4.7-15 GPM)
- 5 - PIC Valve 2-Way (1.5-7.5 GPM)
- 6 - PIC Valve 2-Way (2.4-12 GPM)

① This digit is for future use and will be implemented in Q1 of 2024.

As Modine Manufacturing Company has a continuous product improvement program, it reserves the right to change design and specifications without notice.



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