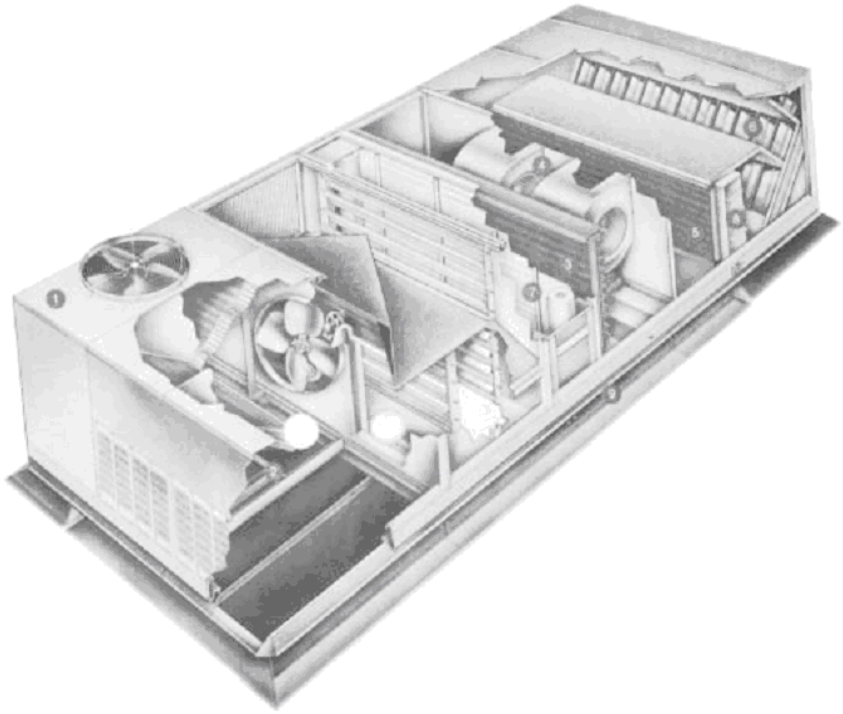
Multizone Units

MULTIZONE UNITS
Commercial – Industrial Heating and Cooling



Features

• Standard & dual duct systems

• Accomodates up to 20 separate zones, 17 thru 60 ton cooling capacity

• Horizontal or down discharge configurations

• Hot deck design features natural or propane gas, hydronic or electric heat

• Compressors mounted in service vestibule for easy access

• Compressors are typically outside of curb perimeter to optimize acoustic performance

• Supply fan sections that accommodate most fan types to provide required air flows in the most efficient manner

• Return fans available to overcome return ducting

• Drum and Tube Heat Exchanger (80% to 85% efficient)
Full Modulation up to 50:1 Turn-Down

• Refrigerant Reheat Coil
Assures Positive Dehumidification
Saves Energy at Part Load

• Stainless Steel Drain

• Hinged Access Doors

• Single Point Power Entry Control Panel
Includes Main Power Disconnect

• Fully Programmable DDC (Optional)
Operator Remote Keypad Station
Features Open Protocol Communications

• Solid State Controller (Standard)

• Custom Built to New or Existing Roof Curbs

• High EER Rating Exceed 10:1

Nominal Cooling	EER	Nominal Cooling	EER
17 TON	10.4	34 TON	10.1
22 TON	10.8	25 TON	10.4
24 TON	10.2	40 TON	10.9
25 TON	10.2	42 TON	10.2
30 TON	10.5	49 TON	10.4
32 TON	10.4	58 TON	10.8

Achievable EER ratings based on optimal cfm capacities 80º /67º F air entering evaporator with 95º F condenser air.

• Filters shall be 2" pleated throwaway type with minimum of 85% arrestance & 30% efficiency. Filter access shall be through a latched & gasketed access doors located on both sides of the unit. (Optional filters shall be 4 or 12 inch high efficiency cartridge filters.)

Casing Construction

The unit exterior casing shall be heavy gauge G90 rated bonderized steel. Unit roof shall feature standing seam construction. The entire unit casing shall be insulated with 1-in. thick 1.5-lb. (2-in. thick 1.5-lb.) fiberglass insulation with hard neoprene backing in a sandwich wall fashion (22-gauge solid liner). The unit exterior shall be finished with industrial enamel (catalyzed epoxy) paint. An integral welded iron channel frame shall support the unit casing. The structural iron frame shall be sandblasted, primed and finished with industrial enamel (catalyzed epoxy) paint.

SPECIFICATIONS

S E R I E S 1 0 0 0 M Z
TWO-DECK MULTIZONE DAMPER

- Extruded aluminum (6063T5) damper frame is not less than .080" (2.03mm) in thickness. Damper frame is 4" (101.6mm) deep.
- There is a 1" (25.4mm) frame on all sides of each deck.
- Blades are extruded aluminum (6063T5) profiles.
- Internal zone dividers *(splitters)* are extruded aluminum (6063T6) profiles.
- Blade gaskets are extruded EPDM. Frame seals are extruded silicone. Gaskets are secured in an integral slot within the aluminum extrusions.
- Bearings are composed of a Celcon inner bearing fixed to a 7/16" (11.11mm) aluminum hexagon blade pin rotating within a polycarbonate outer bearing inserted in the frame, resulting in no metal-to-metal or metal-to-plastic contact.
- Linkage hardware is installed in the frame side and constructed of aluminum and corrosion-resistant, zinc-plated steel, complete with cup-point trunnion screws for a slip-proof grip.
- Blade axles consist of a 7/16" hexagon solid aluminum bar. Drive shaft is 7/16" hexagon, zinc-plated steel.
- Blades are linked between decks with a 7/16" extruded aluminum (6063T6) hexagon rod.
- Dampers are designed for operation in temperatures ranging between -40°F (-40°C) and 212°F (100°C).
- Air leakage through a 24" x 24" (610mm x 610mm) damper does not exceed 3 cfm/ft.^{2} (24 l/s/m^2) against 1" (0.25 kPa) w.g. differential static pressure at standard air.
- Dampers are made to size required without blanking off the free area.
- All sizes are inside frame dimensions.
- The minimum size within each zone is 4½" (108mm) perpendicular to the blades. The minimum size within each deck is 6" (152mm), parallel to the blades.
- The maximum overall inside dimension, perpendicular to the blades, is 120" (3048mm).
- The maximum size within each zone is 75" (1905mm), perpendicular to the blades, when all the blades in the zone are linked. The maximum size within each deck is 36" (914mm), parallel to the blades.
- The maximum spacing between decks is 24" (610mm). Spacing between decks is manufactured in 2" (51mm) increments. All multizone dampers with spacing between decks that exceeds 2" (51mm) are built with a 16 ga. galvanized steel sheet fastened with #8, ½" tek screws.
- Dampers are available in only "Flanged to Duct" mounting type.
- Installation of dampers must be in accordance with current manufacturer's installation guidelines provided with each shipment of TAMCO dampers. (Note that all technical information available on TAMCO's web site at www.tamco.ca supersedes and takes precedence over all information contained within the printed catalog.)
- Intermediate or tubular steel structural support is required to resist applied pressure loads for dampers that consist of two or more sections in both height and width. (See TAMCO Aluminum Damper Installation Guidelines.)

Available only as
"FLANGED TO DUCT" TYPE

Note:
- *Suitable for operation in breathable air environments within stated temperature range.*
- *Also available as Series 1001 MZ, One-Deck Multizone.*

For additional information, refer to:
- *Series 1000 MZ Dimensional Parameters*
- *Series 1000 Specification Sheet*
- *Series 1500, 1500 SW, 1000 & 1000 SW Pressure Drop*
- *Series 1500, 1500 SW, 1000 & 1000 SW Free Area Charts*
- *TAMCO Aluminum Damper Torque Requirements*
- *TAMCO Aluminum Damper Installation Guidelines*

SERIES 1000 MZ
DIMENSIONAL PARAMETERS

TWO-DECK MULTIZONE DAMPER

A MINIMUM & MAXIMUM UNIT SIZES:
MINIMUM: 14"
MAXIMUM: 96"

(MAXIMUM A dimension includes 24" maximum spacing between decks.)

B MINIMUM: 4¼"
MAXIMUM: 120"

(Dimensions refer to inside measurements of external frame.)

C MINIMUM & MAXIMUM DECK SIZES:
MINIMUM: 6"
MAXIMUM: 36"

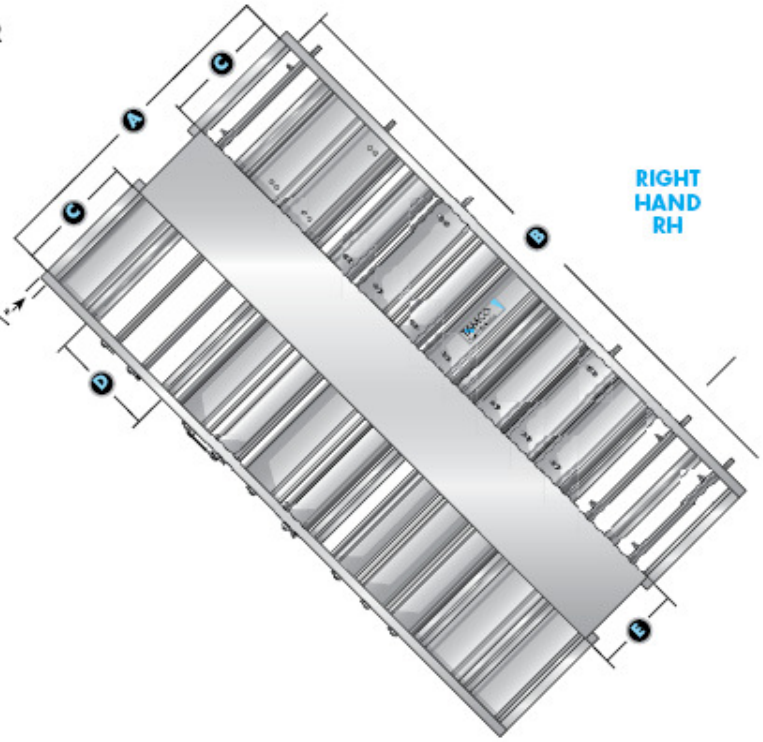
(Dimensions refer to inside measurements of individual deck frames.)

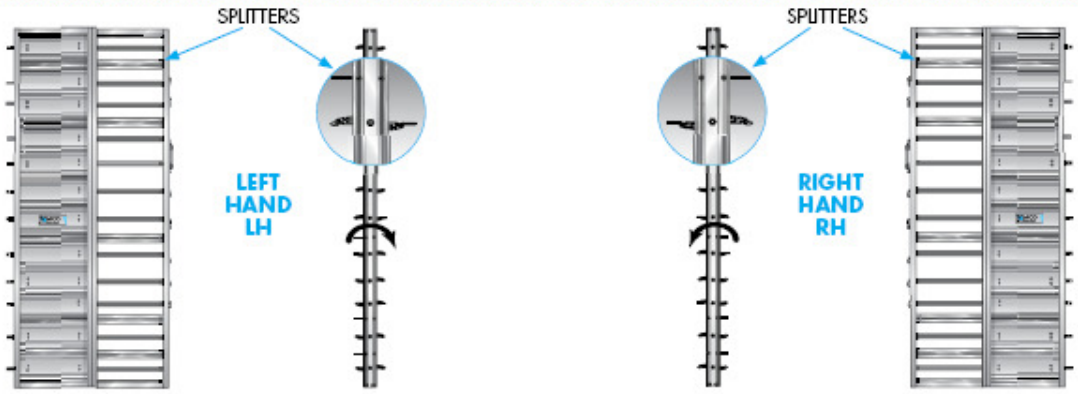
D MINIMUM & MAXIMUM ZONE SIZES:
MINIMUM: 4¼"
MAXIMUM: 75"

(Dimensions refer to inside measurements of individual internal zone dividers or zone frames.)

E MINIMUM & MAXIMUM SPACING BETWEEN DECKS:
MINIMUM: 2"
MAXIMUM: 24"

(Dimensions are measured from the inside edge to the opposite inside edge of the centre frames separating decks.)





CW
ROTATION TO OPEN LEFT SIDE
ROTATION TO CLOSE RIGHT SIDE

CCW
ROTATION TO OPEN RIGHT SIDE
ROTATION TO CLOSE LEFT SIDE

FRONT / TOP END UP / RIGHT HAND

When the labels on the blades are viewed right side up, the damper orientation is Front/Top end up.
When viewed as Front/Top end up, right hand (RH) has drive rods on the right. Left hand (LH) has drive rods on the left.
When the left blades are shut, the right blades are open.
When the right blades are shut, the left blades are open.

SUGGESTED SPECIFICATIONS

SERIES 1000 MZ TWO-DECK MULTIZONE DAMPER

1.0 Extruded aluminum (6063T5) damper frame shall not be less than .080" (2.03mm) in thickness. Damper frame to be 4" deep.

1.1 There shall be a 1" (25 mm) frame on all sides of each deck.

1.2 Blades to be extruded aluminum (6063T5) profiles. Internal zone dividers *(splitters)* to be extruded aluminum (6063T6) profiles.

1.3 Blade seals shall be of extruded EPDM. Frame seals shall be extruded silicone. Seals are to be secured in an integral slot within the aluminum extrusions.

1.4 Bearings are to be composed of a Celcon inner bearing fixed to a 7/16" (11.11mm) aluminum hexagon blade pin, rotating within a polycarbonate outer bearing inserted in the frame, resulting in no metal-to-metal or metal-to-plastic contact.

1.5 Linkage hardware shall be installed in the frame side and constructed of aluminum and corrosion-resistant, zinc-plated steel, complete with cup-point trunnion screws for a slip-proof grip.

1.6 Blade axles shall consist of a 7/16" hexagon solid aluminum bar. Drive shaft shall be 7/16" hexagon, zinc-plated steel.

1.7 Blades shall be linked between decks with a 7/16" extruded aluminum (6063T6) hexagon rod.

1.8 Dampers are to be designed for operation in temperatures ranging between -40°F (-40°C) and 212°F (100°C).

1.9 Leakage shall not exceed 3 cfm/ft² (15.2 l/s/m²) against 1" (.25 kPa) w.g. differential static pressure.

1.10 Dampers shall be made to size required without blanking off free area.

1.11 All sizes shall be inside frame dimensions.

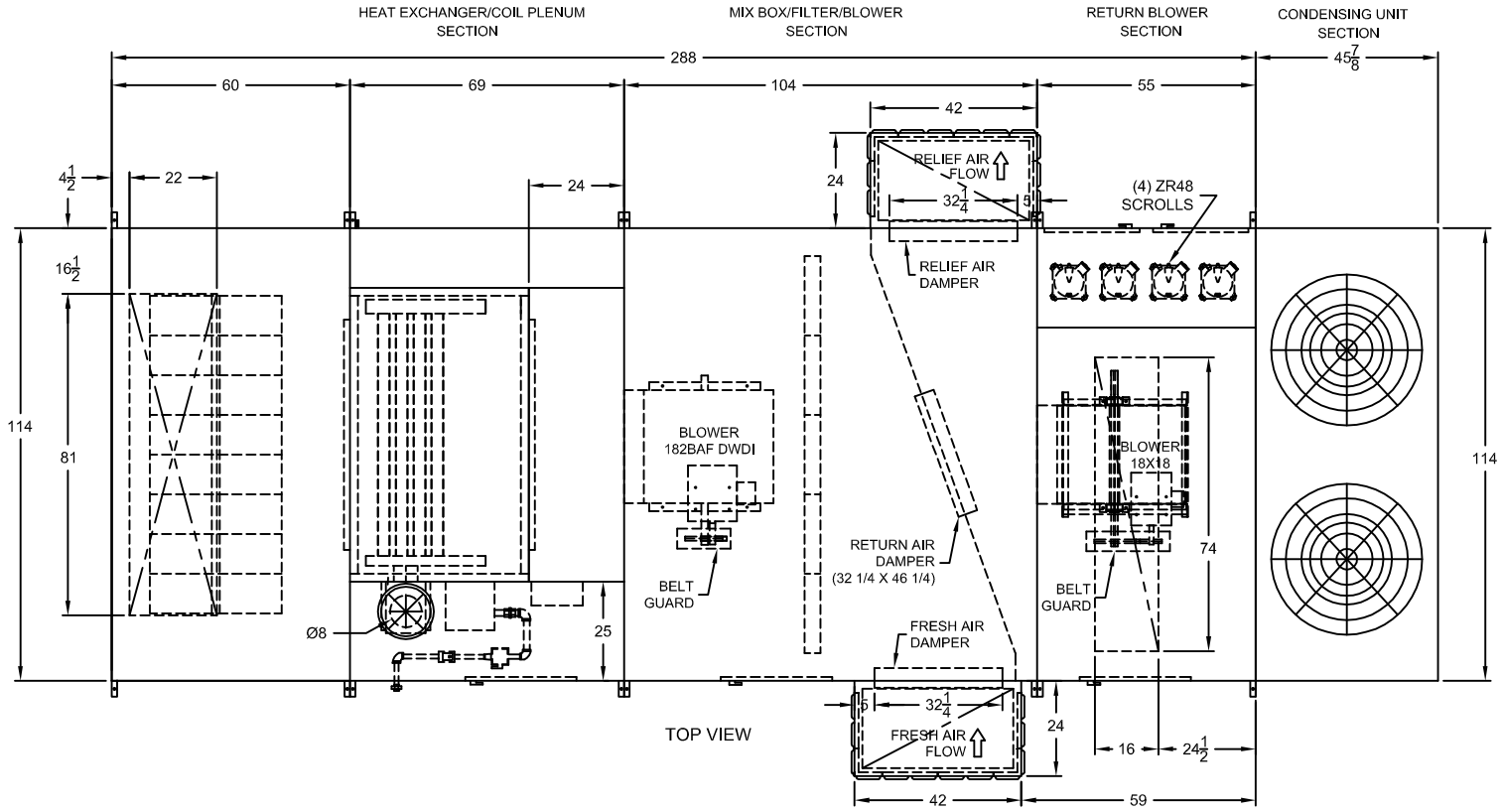
1.12 The minimum size within each zone shall be 4¼" (108 mm) perpendicular to the blades. The minimum size within each deck shall be 6" (254 mm), parallel to the blades.

1.13 The maximum overall inside dimension, perpendicular to the blades, shall be 120" (3048 mm). The maximum size within each zone shall be 75" (1905 mm), perpendicular to the blades, when all the blades in the zone are linked. The maximum size within each deck shall be 36" (914 mm), parallel to the blades.

1.14 The maximum spacing between decks shall be 24" (610 mm). Spacing between decks to be manufactured in 2" (51 mm) increments. All multizone dampers with spacing between decks that exceeds 2" (51 mm) shall be built with a 16 ga. galvanized steel sheet fastened with #8, ½" tek screws.

1.15 Dampers shall be available in "Flanged to Duct" mounting type only.

1.16 Installation of dampers must be in accordance with current manufacturer's installation guidelines provided with each shipment of dampers. Intermediate or tubular steel structural support is required to resist applied pressure loads for dampers that consist of two or more sections in both height and width.



NOTE:
(S) SPLIT FOR SHIPMENT
SEE ROOF CURB DWG. #60-26652
1. 1 1/2 INLET AND DISCHARGE FLANGES.
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED. RECOMMENDED CLEARANCE 24 INCHES
DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

Rev	By	Revision Description	Date

HTDM SERIES

TITLE
HTDM 400 DX15 MZ
HORIZ. CONFIG. GRAVITY VENTED (6000CFM)
OUTDOOR UNIT c/w FLT FILTER, MIX BOX w/ RETURN
PACKAGED COOLING, AND LOUVERED INLET

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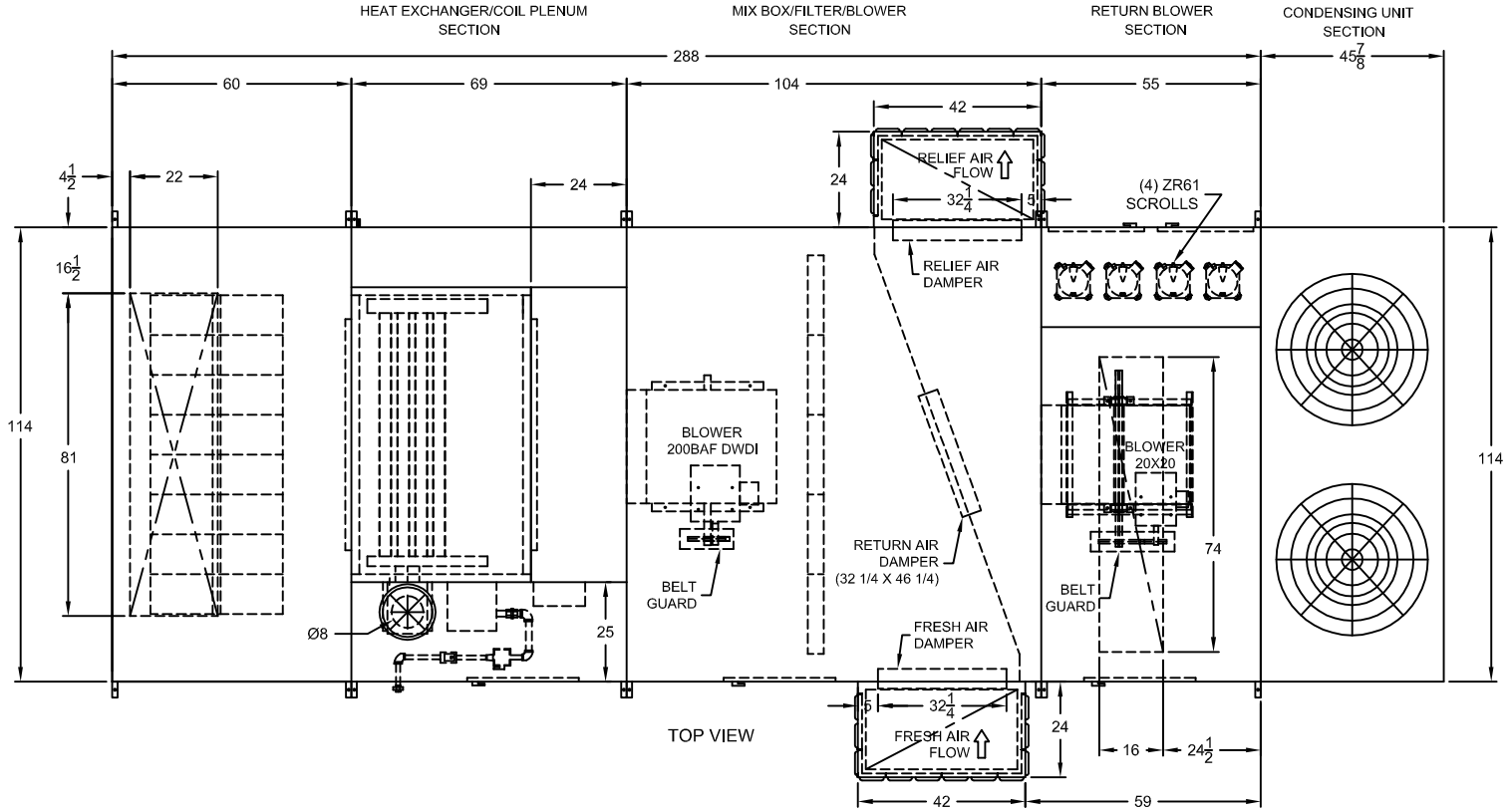

NOTE:
(S) SPLIT FOR SHIPMENT
SEE ROOF CURB DWG. #60-26652
1. 1 1/2 INLET AND DISCHARGE FLANGES.
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED. RECOMMENDED CLEARANCE 24 INCHES
DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

Rev	By	Revision Description	Date

HTDM SERIES

TITLE
HTDM 600 DX20 MZ
HORIZ. CONFIG. GRAVITY VENTED (8000CFM)
OUTDOOR UNIT c/w FLT FILTER, MIX BOX w/ RETURN
PACKAGED COOLING, AND LOUVERED INLET

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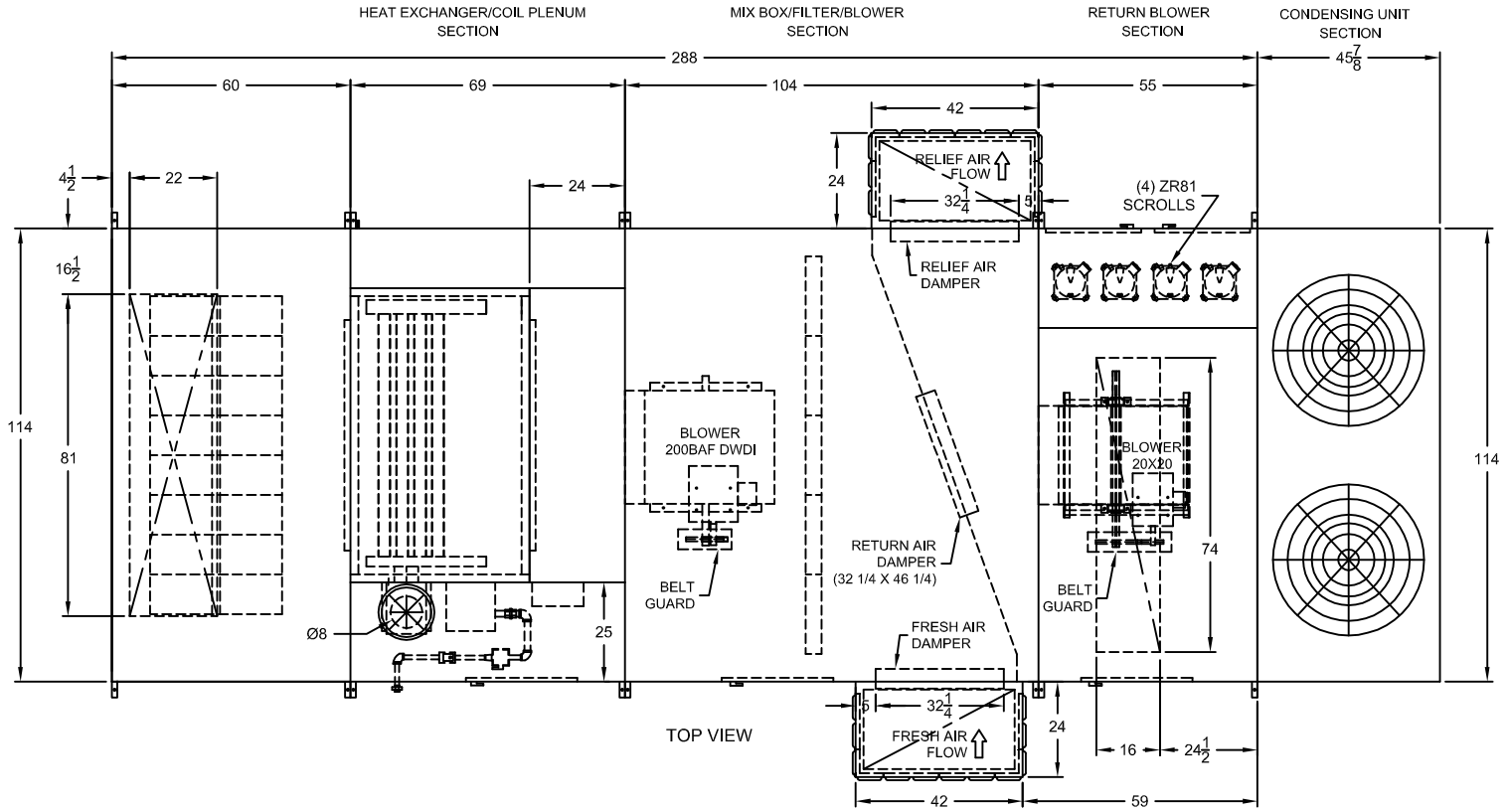

NOTE:
(S) SPLIT FOR SHIPMENT
SEE ROOF CURB DWG. #60-26652
1. 1 1/2 INLET AND DISCHARGE FLANGES.
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED. RECOMMENDED CLEARANCE 24 INCHES
DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

Rev	By	Revision Description	Date

HTDM SERIES

TITLE
HTDM 600 DX25 MZ
HORIZ. CONFIG. GRAVITY VENTED (10000CFM)
OUTDOOR UNIT c/w FLT FILTER, MIX BOX w/ RETURN
PACKAGED COOLING, AND LOUVERED INLET

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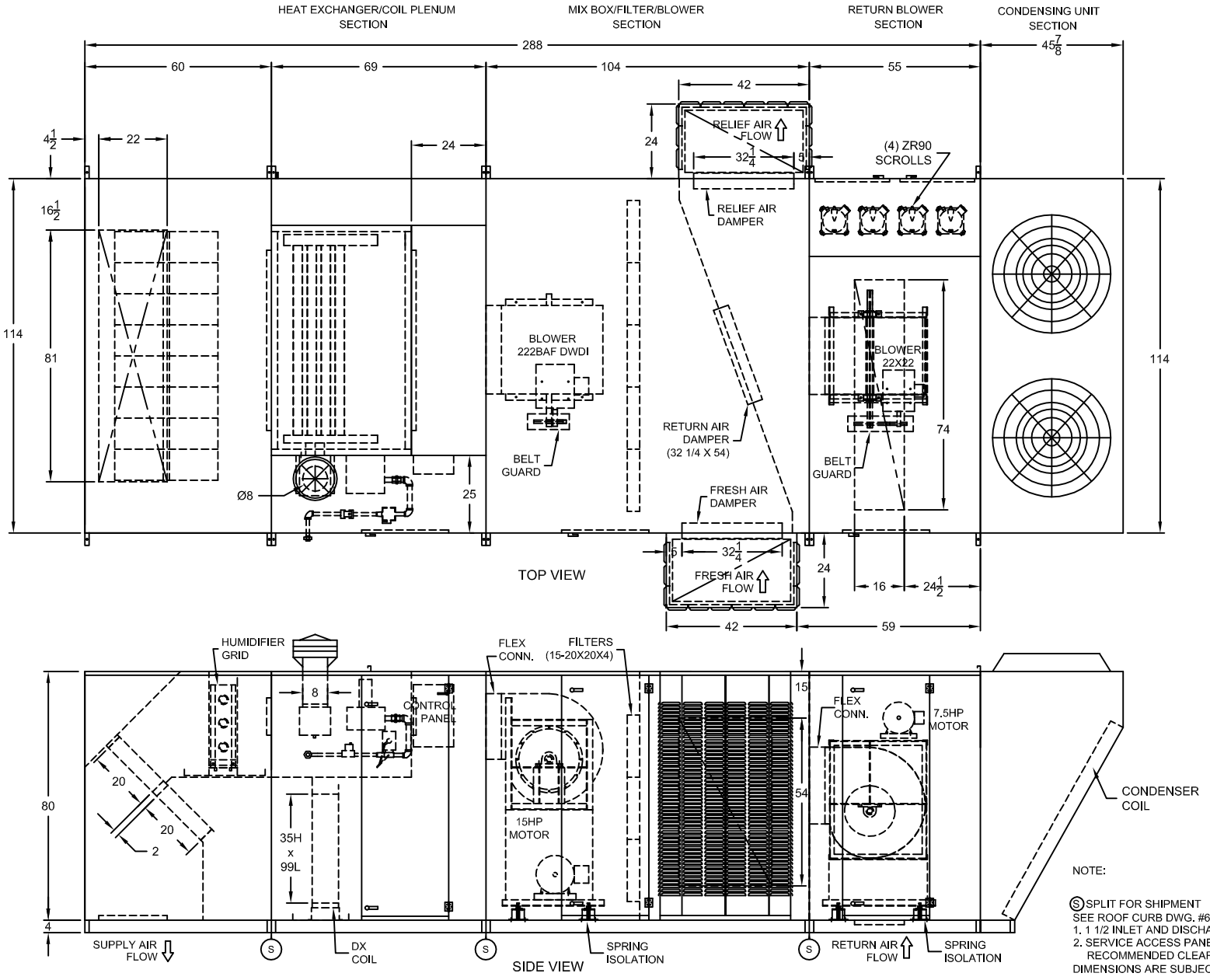

NOTE:

(S) SPLIT FOR SHIPMENT
SEE ROOF CURB DWG. #60-26652
1. 1 1/2 INLET AND DISCHARGE FLANGES.
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED. RECOMMENDED CLEARANCE 24 INCHES
DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

Rev	By	Revision Description	Date

ICE

HTDM SERIES

TITLE
HTDM 600 DX30 MZ
HORIZ. CONFIG. GRAVITY VENTED (12000CFM)
OUTDOOR UNIT c/w FLT FILTER, MIX BOX w/ RETURN
PACKAGED COOLING, AND LOUVERED INLET

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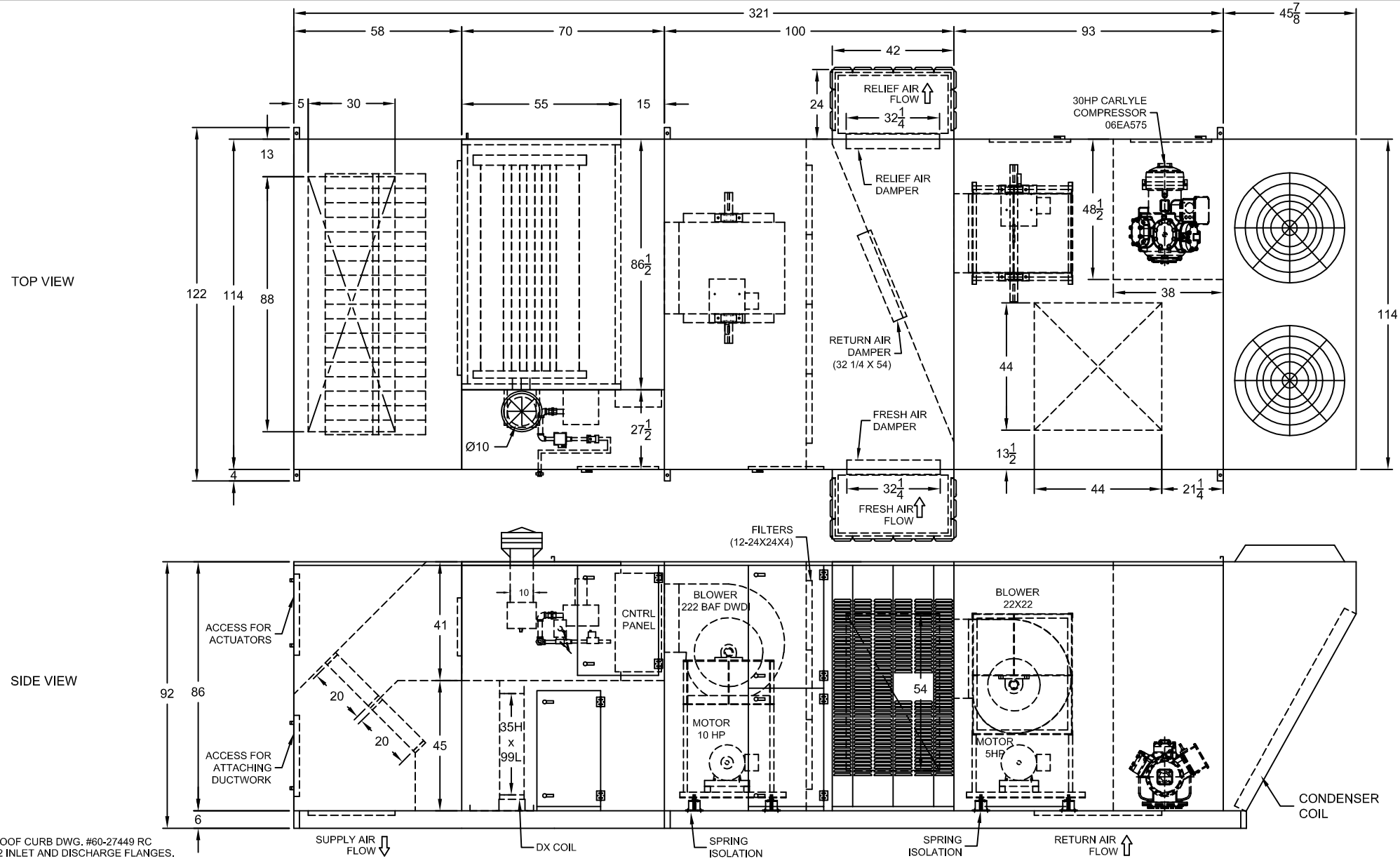

NOTE:

SEE ROOF CURB DWG. #60-27449 RC
1. 1 1/2 INLET AND DISCHARGE FLANGES.
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED.
RECOMMENDED CLEARANCE 24 INCHES
DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

Rev	By	Revision Description	Date

WESTERN

TITLE
HTDM 1000 DX 30 MZ
HORIZ. CONFIG. GRAVITY VENTED (12000CFM)
OUTDOOR UNIT c/w FLT FILTER, MIX BOX w/ RETURN
PACKAGED COOLING, AND LOUVERED INLET

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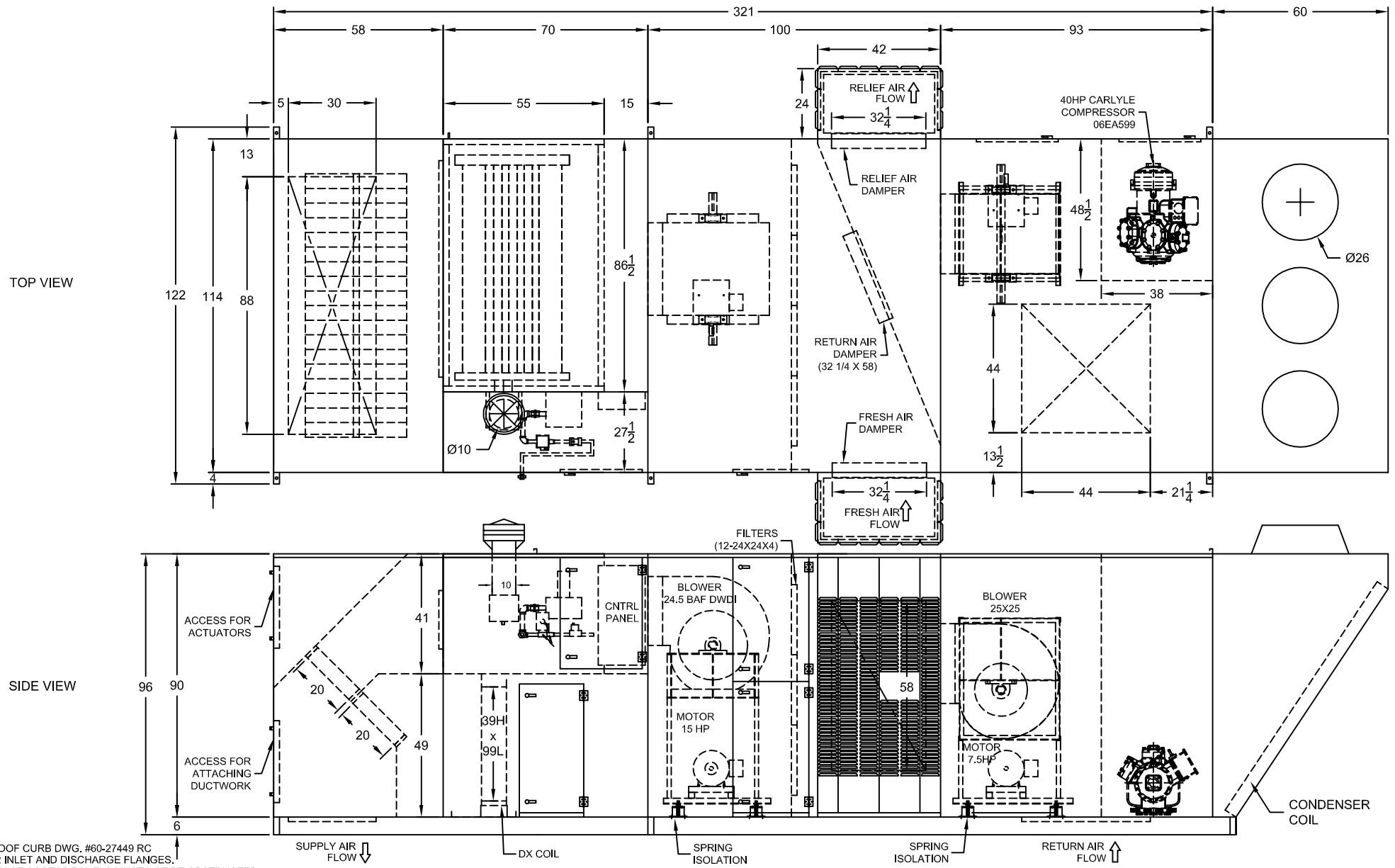

NOTE:

SEE ROOF CURB DWG. #60-27449 RC
1. 1 1/2 INLET AND DISCHARGE FLANGES.
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED.
RECOMMENDED CLEARANCE 24 INCHES
DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

Rev	By	Revision Description	Date

WESTERN

TITLE
HTDM 1000 DX 35 MZ
HORIZ. CONFIG. GRAVITY VENTED (14000CFM)
OUTDOOR UNIT c/w FLT FILTER, MIX BOX w/ RETURN
PACKAGED COOLING, AND LOUVERED INLET

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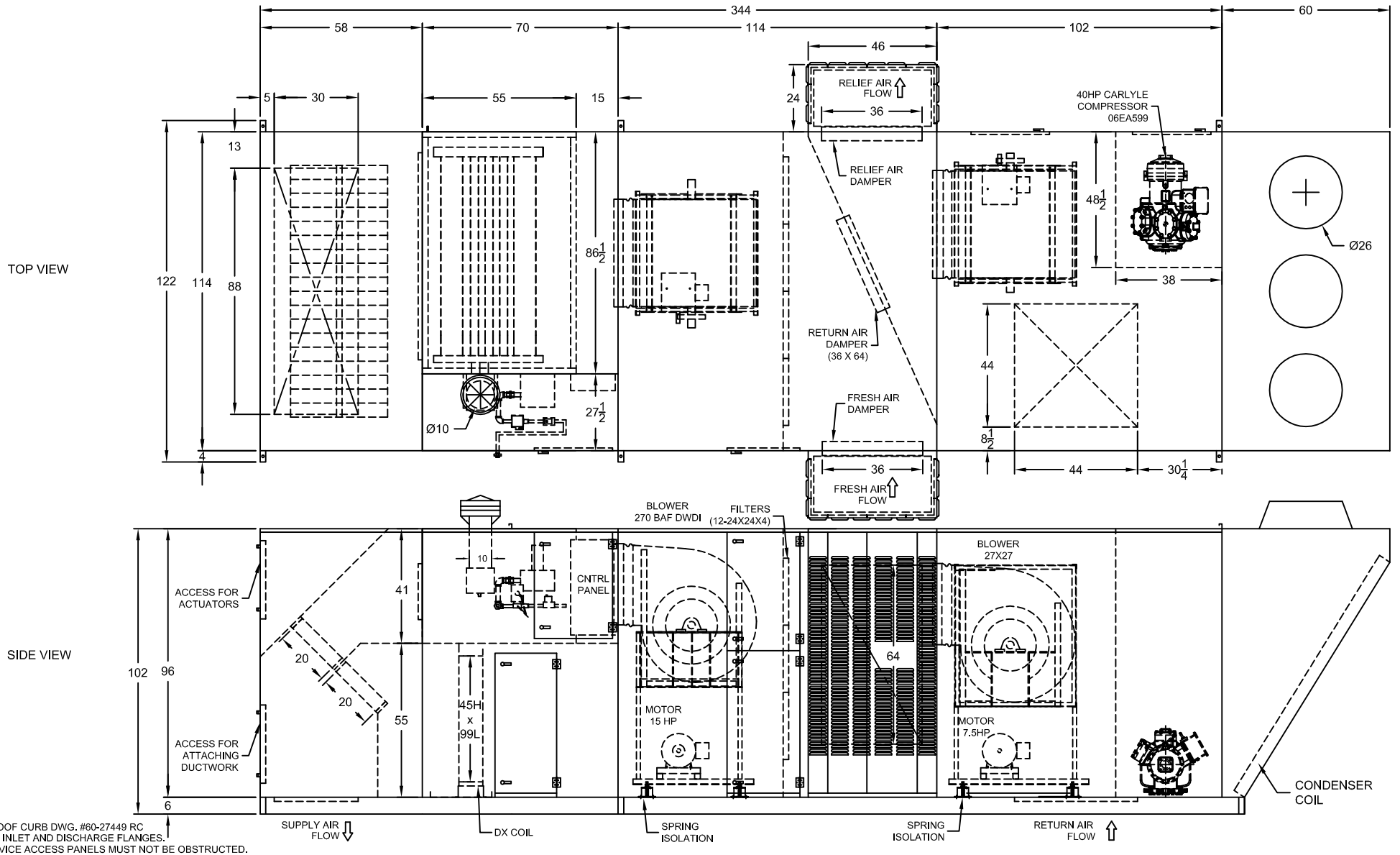

NOTE:

SEE ROOF CURB DWG. #60-27449 RC
1. 1 1/2 INLET AND DISCHARGE FLANGES.
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED.
RECOMMENDED CLEARANCE 24 INCHES
DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

Rev	By	Revision Description	Date

WESTERN

TITLE
HTDM 1000 DX 40 MZ
HORIZ. CONFIG. GRAVITY VENTED (16000CFM)
OUTDOOR UNIT c/w FLT FILTER, MIX BOX w/ RETURN
PACKAGED COOLING, AND LOUVERED INLET

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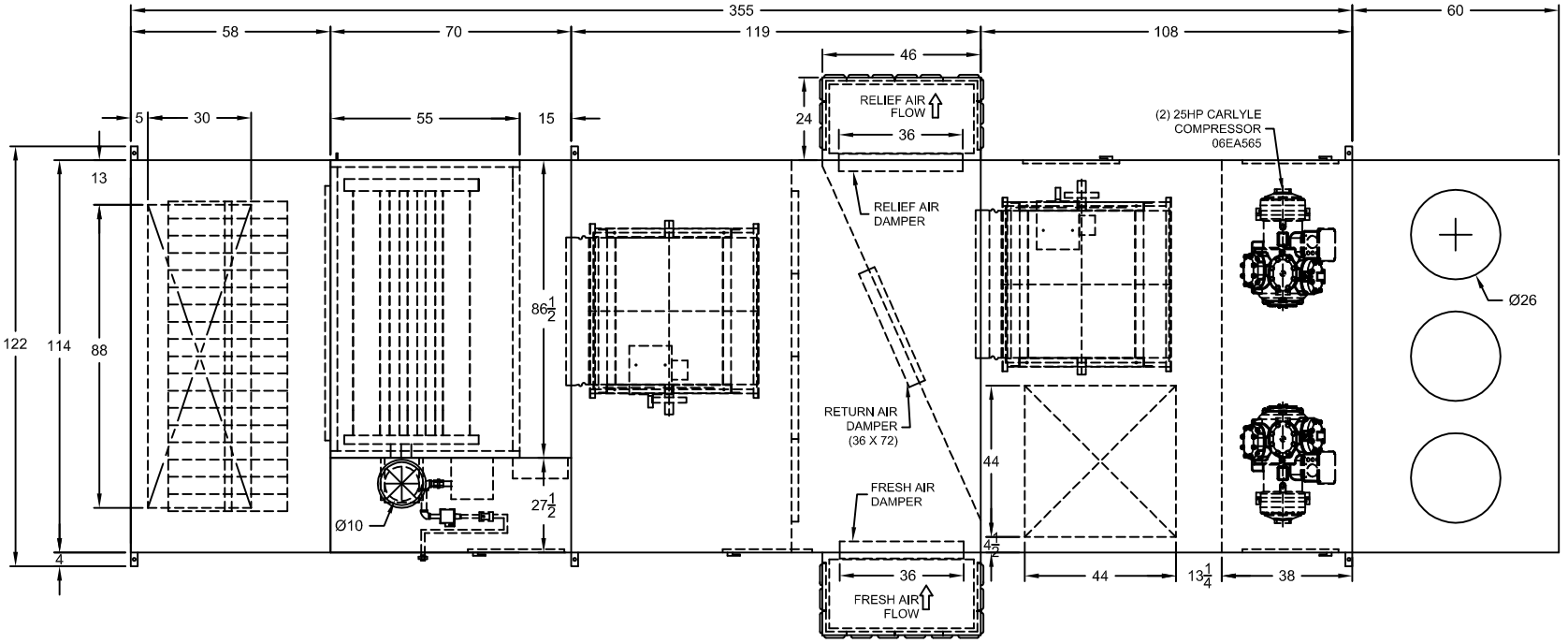
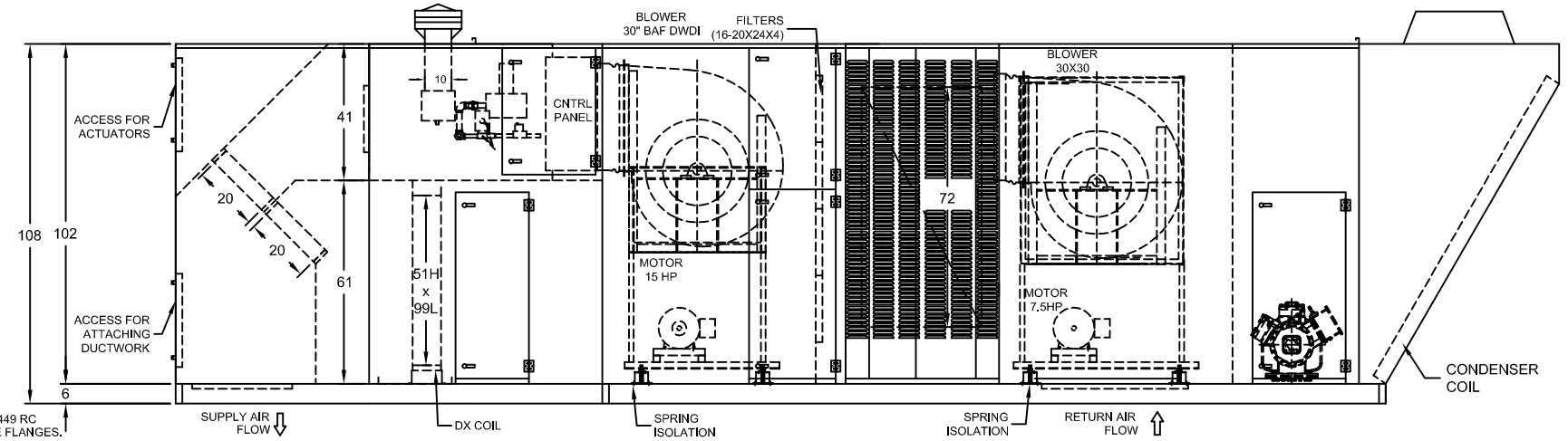
TOP VIEW



SIDE VIEW



NOTE:

SEE ROOF CURB DWG. #60-27449 RC
1. 1 1/2 INLET AND DISCHARGE FLANGES.
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED.
RECOMMENDED CLEARANCE 24 INCHES
DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

Rev	By	Revision Description	Date

WESTERN

TITLE
HTDM 1000 DX 50 MZ
HORIZ. CONFIG. GRAVITY VENTED (18000CFM)
OUTDOOR UNIT c/w FLT FILTER, MIX BOX w/ RETURN
PACKAGED COOLING, AND LOUVERED INLET

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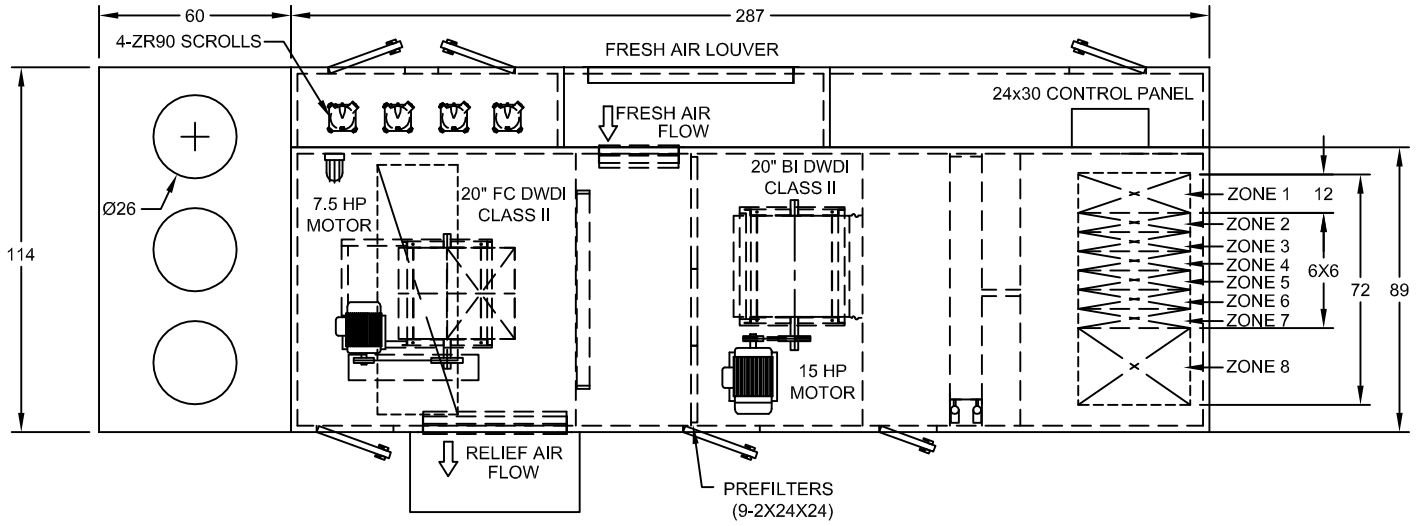
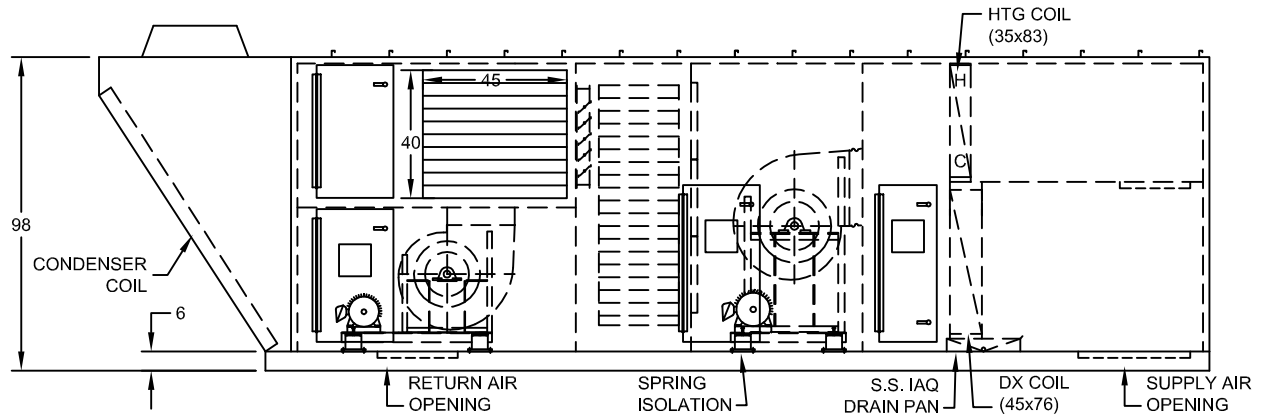


TOP VIEW



SIDE VIEW

NOTES:

1. 1 1/2 INLET AND DISCHARGE DUCT FLANGES
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED RECOMMENDED CLEARANCE 24 INCHES.
3. DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES. FOR REFERENCE USE ONLY, SUBJECT TO CHANGE WITHOUT NOTICE

Rev	By	Revision Description	Date

WESTERN SALES

TITLE
12,000CFM ROOFTOP AIR HANDLING UNIT (MULTIZONE)
MIXING BOX c/w RELIEF, HEATING WATER COILS, PACKAGED DX COOLING, RETURN AIR BLOWER, SUPPLY AIR BLOWER
MODEL: AH-120-BI-R/A-RO-DX30MZ

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TYPICAL SPECIFICATIONS

CASING

The unit exterior casing shall be heavy gauge G90 rated bonderized steel. Unit roof shall feature standing seam construction. The entire unit casing shall be insulated with 1-in. thick 1.5-lb. (2-in. thick 1.5-lb.) fiberglass insulation with hard neoprene backing in a sandwich wall fashion (22-gauge solid liner). The unit exterior shall be finished with industrial enamel (catalyzed epoxy) paint. An integral welded iron channel frame shall support the unit casing. The structural iron frame shall be sandblasted, primed and finished with industrial enamel (catalyzed epoxy) paint.

BLOWER/MOTOR SECTION

The fan section and motor assembly shall be constructed in accordance with the requirements of the Air Moving and Conditioning Association (AMCA). The assembly shall be designed to house the fan(s), bearings, motor, and v-belts, which shall be selected for at least 50% above the rated motor capacity. The fan(s) and motor shall be mounted on a welded unitary base made of angle iron frame. The frame shall be sandblasted, primed and finished with industrial enamel (catalyzed epoxy) paint. The unitary base shall be provided with seismic spring vibration isolation. The blower section shall have a hinged access door with Ventlock handles to allow easy maintenance of filters and belts. The NEMA T-Frame motor shall be mounted on an adjustable base located within the fan section. The blower wheel shall be statically and dynamically balanced, and mounted on a turned, ground and polished shaft with rigid bearing supports. The shaft shall be designed with a maximum operating speed not exceeding 75% of the first critical speed. The bearings shall be split taper lock ball bearing type L20 minimum life of 100,000 hours (L10 200 kHr).

Fan performance shall be based on tests conducted in accordance with AMCA Standard Test Code for Air moving Devices. (All fans shall have sharply rising pressure characteristic extending throughout the operating range and continuing to rise well beyond the efficiency peak to assure quiet and stable operation under all conditions. Horsepower characteristics shall be truly non-overloading and shall reach a peak in the normal selection area.) Fan manufacturer shall provide sound power ratings in the eight octave bands, which shall be based on AMCA Standard 300-67, test, setup number one. Sound power ratings shall be referenced 10-12 watts. A factory dynamic balance shall be made on all fans after their assembly. An IRD or PMC analyzer shall be used to measure velocity, and the final reading shall not exceed 0.1 inches per second. The exact level of vibration shall be recorded on the fan as proof of the final dynamic balance at the factory.

COOLING CONTROLS

Cooling control shall be achieved via a Honeywell T775 multi-stage sequencer. The sequencer shall be controlled with an analog signal provided by the discharge air thermostat. As the discharge air thermostat requires cooling the signal shall increase, thereby turning on the stages at specific set points. The set points shall be set with appropriate offset and differential to ensure accurate discharge temperature is maintained. The stages are to be sequenced without turning on and off of compressors to minimize unnecessary wear on the compressors. Upon sensing a call for cooling from the space, the compressors shall provide full cooling until the space sensor is satisfied, upon which time the cooling shall revert to discharge air control. A low discharge temperature set point with a large differential shall

be set to prevent the compressor from cycling on and off. The compressor will remain on low setting until cooling is disabled manually or the ambient temperature falls below the minimum set point.

ELECTRICAL CONTROL EQUIPMENT

Electrical assembly and components shall be in strict accordance with the latest provisions and requirements of the National Electric Code. Control cabinet shall be designed and constructed to ETL specifications. A safety disconnect switch shall be mounted on the unit. The controls shall be located in a weatherproof cabinet. Provisions for service padlocking shall be provided. The following items shall be located within the cabinet: fuses, starters, control relays, timing and holding relays, resistors and numbered terminal strips. All components shall be labeled and cross-referenced to control and field wiring diagrams. The control circuit shall be 24V, single phase. Wiring shall be neatly run in "PANDUIT" wiring duct. Low and/or line voltage thermostats shall be furnished shipped loose for installation by others. Unit shall be equipped with automatic low limit freeze protection with bypass timer.

DAMPERS & FILTER SECTION

The dampers are to be galvanized steel (aluminum airfoil low leak) type (with seals). The dampers shall be equipped with 2-position (modulating) actuators. The filters shall be 2" pleated throwaway type with minimum of 85% arrestance and 30% efficiency. Filter access shall be through a latched and gasketed access doors located on both sides of the unit. (Final filters shall be 4 or 12 inch high efficiency cartridge filters.)

REMOTE CONTROL PANELS

Remote NEMA 1(12) locking control panel shall be equipped with summer/off/winter switch and blower on, burner on, flame failure and loaded filter lights. (A remote adjustment potentiometer shall control damper positioning.) (An LCD display shall provide system temperature and set points.)

FLUID COILS

Fluid coils are intended for use with water, glycol, or other appropriate heat transfer fluids. Coils are to be designed to maximize performance under specified conditions with minimal air-side pressure drop.
All water coils designed with 1/2” or 5/8” tubes are to be ARI performance certified and shall bear the ARI symbol.
Tubes and return bends shall be constructed from seamless UNS C12200 copper conforming to ASTM B224 and ASTM E527. Properties shall be O50 light annealed with a maximum grain size of 0.040 mm.
Tubes are to mechanically expanded into fins (secondary surface) for maximum heat transfer. Materials are to be 3/8” diameter x (0.014, 0.022) wall thickness, 1/2” diameter x (0.016, 0.025) wall thickness, or 5/8” diameter x (0.020, 0.025, 0.035, 0.049) wall thickness.
Secondary surface (fins) shall be of the plate-fin design using aluminum or copper, with die-formed collars. Fin design to be flat, waffle, or sine-wave in a staggered tube pattern to meet performance requirements.
Collars will hold fin spacing at specified density, and cover the entire tube surface. Aluminum properties are to be Alloy 1100 per ASTM B209, with O (soft) temper; copper is to be Alloy 11000 per ASTM B152-06 with soft (anneal) temper. Fins are to be free of oils and oxidation.

Headers are to be constructed of seamless UNS C12200, Type L (drawn) copper material sized to match specified connection size. Type K (drawn) copper headers and Schedule 40 steel headers shall be offered as optional materials.
Die-formed copper end caps are brazed on the inside of the headers, unless spun-closed (for sizes up to 1-3/8”). 1/4” vents and drains are to be provided for all fluid coils.
Connection material shall be copper, or Schedule 40 steel or red brass pipe. The type of connection is to be sweat type, MPT or FPT, grooved, or flanged as required.
Coil casing material shall be of G90 galvanized steel, 16 gauge minimum. Heavier material, stainless steel, copper, or aluminum casing are to be provided as required.
Intermediate tube supports are to be provided on all coils 48” and longer fin length. Coil casing on top and bottom of coils are to have double-flange construction, allowing for vertical stacking of coils.
All coils are to be brazed with minimum 5% silver content (BCup-3) filler material to insure joint integrity. Low-fuming, flux-coated bronze braze-weld material is to be used for ferrous to non-ferrous joints.
Coils shall be tested at 550 psig using dry nitrogen, submerged under water. Dual-operator verification shall determine that all coils are leak-free.
Fluid coils shall be designed to withstand 300ºF maximum operating fluid temperature, and 250 psig maximum operating pressure.

EVAPORATOR COILS

Evaporator coils are intended for use with a wide range of applications and refrigerant types. Coils are to be designed to maximize performance under specified conditions with minimal air-side pressure drop.
Coils shall be UL recognized as Refrigerant Containing Component. Coils to be used with refrigerant R-410A shall have undergone cycle testing, and shall be safety listed with 750 psig rating.
Tubes and return bends shall be constructed from seamless UNS C12200 copper conforming to ASTM B224 and ASTM E527. Properties shall be O50 light annealed with a maximum grain size of 0.040 mm.
Tubes are to mechanically expanded into fins (secondary surface) for maximum heat transfer. Materials are to be 3/8” diameter x (0.014, 0.022) wall thickness, 1/2” diameter x (0.016, 0.025) wall thickness, or 5/8” diameter x (0.020, 0.025, 0.035, 0.049) wall thickness.
Secondary surface (fins) shall be of the plate-fin design using aluminum or copper, with die-formed collars. Fin design to be flat, waffle, or sine-wave in a staggered tube pattern to meet performance requirements.
Collars will hold fin spacing at specified density, and cover the entire tube surface. Aluminum properties are to be Alloy 1100 per ASTM B209, with O (soft) temper; copper is to be Alloy 11000 per ASTM B152-06 with soft (anneal) temper. Fins are to be free of oils and oxidation.
Headers are to be constructed of seamless UNS C12200, Type L (drawn) copper material sized to match specified connection size. Type K (drawn) copper headers shall be offered as optional material.
Die-formed copper end caps are brazed on the inside of the headers, unless spun-closed (for sized up to 1-3/8”).
Evaporator coils shall be designed with brass liquid distributors (as required), and copper sweat suction connections. Distributors shall be capped using soft-solder for ease of cap removal; suction connections shall be capped.
Coil casing material shall be of G90 galvanized steel, 16 gauge minimum. Heavier material, stainless steel, copper, or aluminum casing are to be provided as required.
Intermediate tube supports are to be provided on all coils 48” and longer fin length. Coil casing on top and bottom of coils are to have double-flange construction, allowing for vertical stacking of coils.

All coils are to be brazed with minimum 5% silver content (BCup-3) filler material to insure joint integrity.
Coils shall be tested at 550 psig using dry nitrogen, submerged under water. Dual-operator verification shall determine that all coils are leak-free.
Coils shall be shipped with nitrogen charge to verify leak-free integrity, and to prevent moisture migration into coil.
Coils shall be certified to withstand 750 psig working pressure.

CONDENSER COILS

Condenser coils are intended for use with a wide range of applications and refrigerant types. Coils are to be designed to maximize performance under specified conditions with minimal air-side pressure drop.
Coils shall be UL recognized as Refrigerant Containing Component. Coils to be used with refrigerant R-410A shall have undergone cycle testing, and shall be safety listed with 750 psig rating.
Tubes and return bends shall be constructed from seamless UNS C12200 copper conforming to ASTM B224 and ASTM E527. Properties shall be O50 light annealed with a maximum grain size of 0.040 mm.
Tubes are to mechanically expanded into fins (secondary surface) for maximum heat transfer. Materials are to be 3/8” diameter x (0.014, 0.022) wall thickness, 1/2” diameter x (0.016, 0.025) wall thickness, or 5/8” diameter x (0.020, 0.025, 0.035, 0.049) wall thickness.
Internally enhanced rifled or cross-hatched tubes can be offered as an option.
Secondary surface (fins) shall be of the plate-fin design using aluminum or copper, with die-formed collars. Fin design to be flat, waffle, or sine-wave in a staggered tube pattern to meet performance requirements.
Collars will hold fin spacing at specified density, and cover the entire tube surface. Aluminum properties are to be Alloy 1100 per ASTM B209, with O (soft) temper; copper is to be Alloy 11000 per ASTM B152-06 with soft (anneal) temper. Fins are to be free of oils and oxidation.
Headers are to be constructed of seamless UNS C12200, Type L (drawn) copper material sized to match specified connection size. Type K (drawn) copper headers shall be offered as optional material.
Die-formed copper end caps are brazed on the inside of the headers, unless spun-closed (for sized up to 1-3/8”).
Condenser coils shall be designed with copper sweat connections, and shall be shipped with caps on connections.
Coil casing material shall be of G90 galvanized steel, 16 gauge minimum. Heavier material, stainless steel, copper, or aluminum casing are to be provided as required.
Coils designed for hot-gas applications shall have oversized tube sheet holes for hot gas feeds to allow for free expansion and contraction of tubes during operation.
Intermediate tube supports are to be provided on all coils 48” and longer fin length. Coil casing on top and bottom of coils are to have double-flange construction, allowing for vertical stacking of coils.
All coils are to be brazed with minimum 5% silver content (BCup-3) filler material to insure joint integrity.
Coils shall be tested at 550 psig using dry nitrogen, submerged under water. Dual-operator verification shall determine that all coils are leak-free.
Coils shall be shipped with nitrogen charge to verify leak-free integrity, and to prevent moisture migration into coil.
Coils shall be certified to withstand 750 psig working pressure.

REFRIGERATION COMPRESSORS

Compressors shall be either hermetic or semi-hermetic type.

A) Semi-Hermetic- Semi-hermetic reciprocating compressors shall be provided on systems with total cooling capacity of 25 Tons and larger. Up to 40 tons a single compressor will be used and multiple semi-hermetic compressors over 40 Tons. Compressors shall be completely factory assembled, piped, insulated, internally wired and tested. Units shall be shipped in one piece and come fully charged with refrigerant and filled with compressor oil. Units shall be rated in accordance with ARI standards. The refrigerant system shall be leak tested, evacuated and refrigerant charged at the factory. Compressors shall be suction gas cooled and come with integral spring vibration isolators, oil level sight glass, discharge mufflers, vibrasorbers, automatic reversible oil pump, oil filter screen. Oil charging valve, crankcase heater which de-energizes during compressor operation, liquid line service valves. Unit shall also have the following safety control features:
    - Low pressure cutout
    - High pressure cutout, manual reset
    - Adjustable low ambient lockout
    - Liquid line solenoids incorporating pump down system
    - Anticycling time device (to prevent excessive cycling and premature wear on compressor and contactors) and phase and brownout protection.
    - Oil failure control

Provide cylinder suction pressure unloaders for capacity control, with minimum steps required to provide coil frost protection, based on refrigerant circuit suction temperatures. Provide filter dryers, sight glasses and compressor service valves for each individual compressor. Provide hot gas bypass for each compressor. Compressor staging to be provided by a Honeywell T775 Series standalone controller mounted in the unit.

B) Hermetic compressors- Compressors shall be set on resilient neoprene mounts and complete with line voltage break internal overload protection, internal pressure relief valve and crankcase heater. Each unit shall have a minimum of two compressors. Whereby a unit utilizing two compressors the first stage compressor must be a digital scroll operating with a Emerson EC3 series stand-alone superheat controller with a built in synchronization control for the digital scroll. Unit will provide turndown on cooling. Multiple refrigeration circuits shall be separate from each other. Refrigeration circuits shall be complete with liquid line filter-driers, and service ports fitted with Schraeder fittings. Units shall incorporate load compensated thermal expansion valves with external equalizers (electronic expansion valves on digital systems) and combination sight glass moisture indicators. System charge will be designed for 10 degrees Fahrenheit. Each system shall be factory run and adjusted prior to shipment. Controls shall include:
    - Compressor motor contactors
    - Overload protection control
    - Cooling relays
    - Ambient compressor lockout
    - Dual pressure controls
    - Anti-cycle timers

- Hot gas bypass on lead compressor to maintain adequate suction pressure in the event of low loads
  (only when digital scrolls are not being used)

Packaged units shall operate down to 50 degrees Fahrenheit as standard. Minus 40 refrigeration systems are available as an option. Compressors shall be located on the side of the unit in a service enclosure complete with hinged access doors.

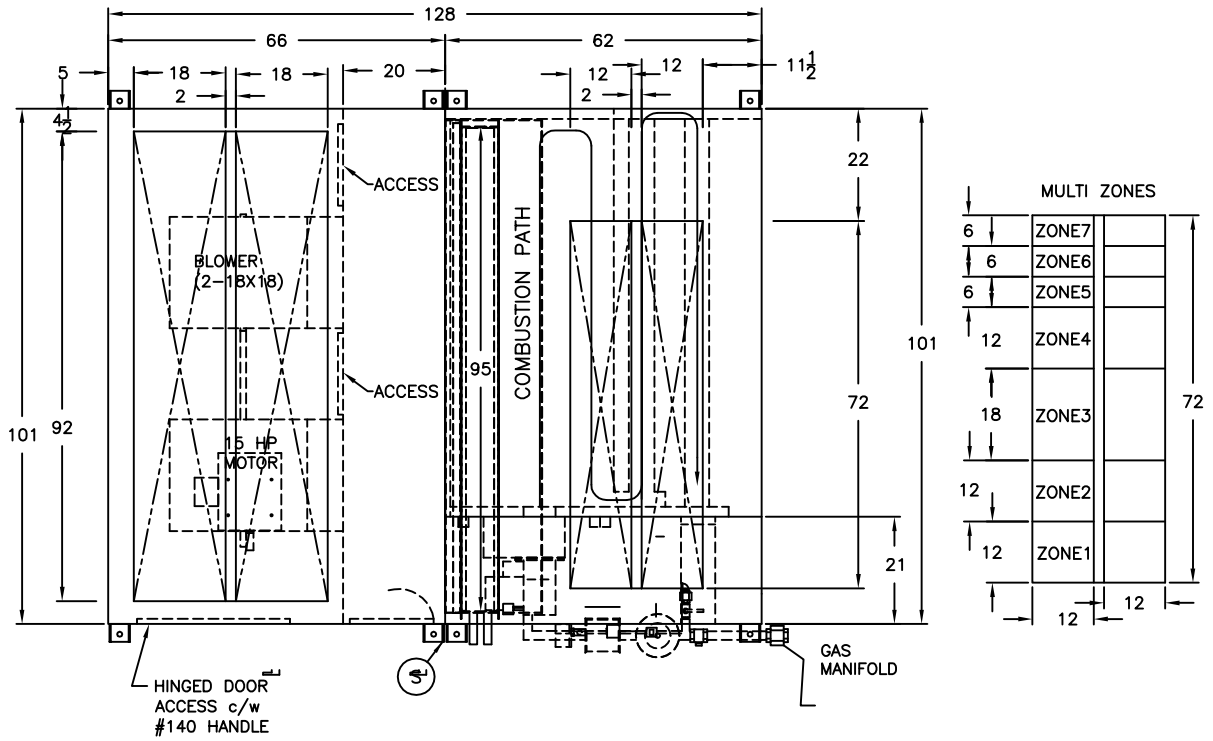
GIDM/GIDMH TYPE HEAT EXCHANGER & BURNER

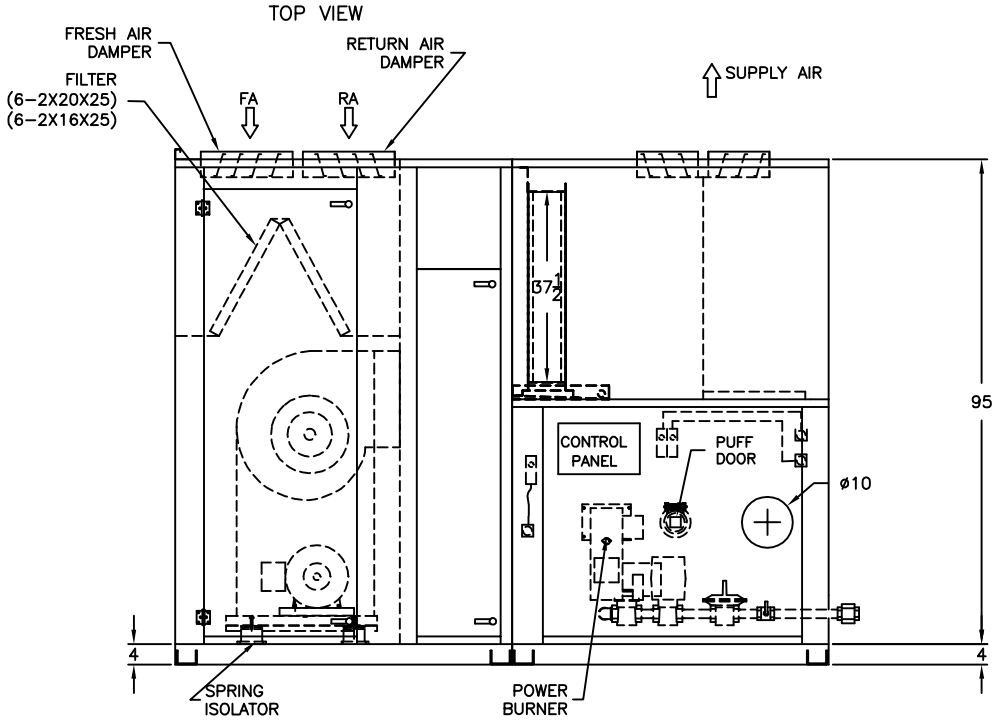
The heat exchanger shall be of four pass design with a primary combustion chamber and multi-tube secondary. Internal turbulators or other flue restrictor to boost efficiency are unacceptable. The entire primary heat transfer surface shall be constructed of Type 409 Series stainless steel, and shall be cooled in its entirety by the air to be heated. The secondary heat transfer surface shall also be constructed from Type 409 Series stainless steel. The stainless steel tubes shall be continuously welded into the secondary front and rear header tube sheets to ensure an airtight seal. Mechanically swedging the tubes are unacceptable. All heat transfer surfaces, including headers and the front collector box, shall be inside the casing and in the airstream. The construction of the heat exchanger shall permit free, unrestricted lateral, vertical, and peripheral expansion during the heating and cooling cycle without damage or strain to any part. The heat exchanger shall be designed to prevent contamination of heated air with the product of combustion. A spring loaded pressure relief door with glass view port shall be provided. The entire heater casing shall be lined with a 22 gauge liner.
The heater shall have of a power type 409 stainless steel burner, with integral combustion air blower and motor; combustion air proving switch, removable pilot assembly and positive pilot combustion air supply. The combustion air damper shall be interlocked with the main gas valve to insure a proper air/gas mixture. A solid state programmable safeguard relay with UV Scanner and purge card shall continuously monitor main and pilot flame. The main and pilot valve train to the burner shall be completely factory pre-piped. This assembly shall be wired and include the following minimum components; main and automatic shut off valves and adequate unions and test ports for service. A 6,000 volt transformer shall accomplish ignition of pilot flame. The unit shall be suitable for natural gas and designed and certified by ETL and C.G.A to provide full gas modulation. Depending on the burner selection, turndown from 100% to 70% of output are achievable.

HTDM TYPE HEAT EXCHANGER

The heat exchanger shall be of two-pass design, made up of at least 16-gauge stainless steel drum and tubes. The primary and secondary heat transfer surfaces shall be constructed of Type 409 series stainless steel, with internal stainless steel high efficiency enhancing baffles. The stainless steel tubes shall be continuously welded into the secondary front and rear header tube sheets to ensure an airtight seal. Units shall be provided with multiple condensate drains. The heat exchanger section shall have an internal radiation shield to maintain a jacket loss of less than 2% of rated output. All heat transfer surfaces, including headers and the front collector box, shall be inside the casing and in the airstream. The construction of the heat exchanger shall permit free, unrestricted lateral, vertical, and peripheral expansion during the heating and cooling cycle without damage or strain to any part. The burner shall be constructed with at least 14-gauge stainless steel and with the air baffles being made up of 430 stainless steel to ensure high durability and life of the burner. The burner assembly shall be a blow through positive pressure type with an intermittent pilot ignition system. Flame supervision shall be with a solid

state programmed flame relay complete with flame rod. The unit's burner motor and modulating gas valve must be electronically controlled to guarantee, to the customer, a highly efficient unit at all times and applications. The unit efficiency shall be a minimum of 80% through the entire operating range and shall be independently tested and verified by ETL. The main and pilot manifolds shall be completely factory pre-piped to the burner. This assembly shall be wired and include the following minimum components; main and pilot manual shut-off valves, main and pilot regulators, main and pilot automatic shut off valves and adequate unions and test ports for unconstrained service. There must also be a means of collecting and disposal of condensate formed in the flue gas by means of a 409 stainless steel flue box with drain and heat exchanger drains. Drains shall be made of copper (stainless steel) tubing.





NOTES:
SEE ROOF CURB DWG. # 60-1
Ⓢ SPLIT FOR SHIPMENT
1. 1 1/2 INLET AND DISCHARGE FLANGES
2. SERVICE ACCESS PANELS MUST NOT BE OBSTRUCTED RECOMMENDED CLEARANCE 24 INCHES.
3. DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

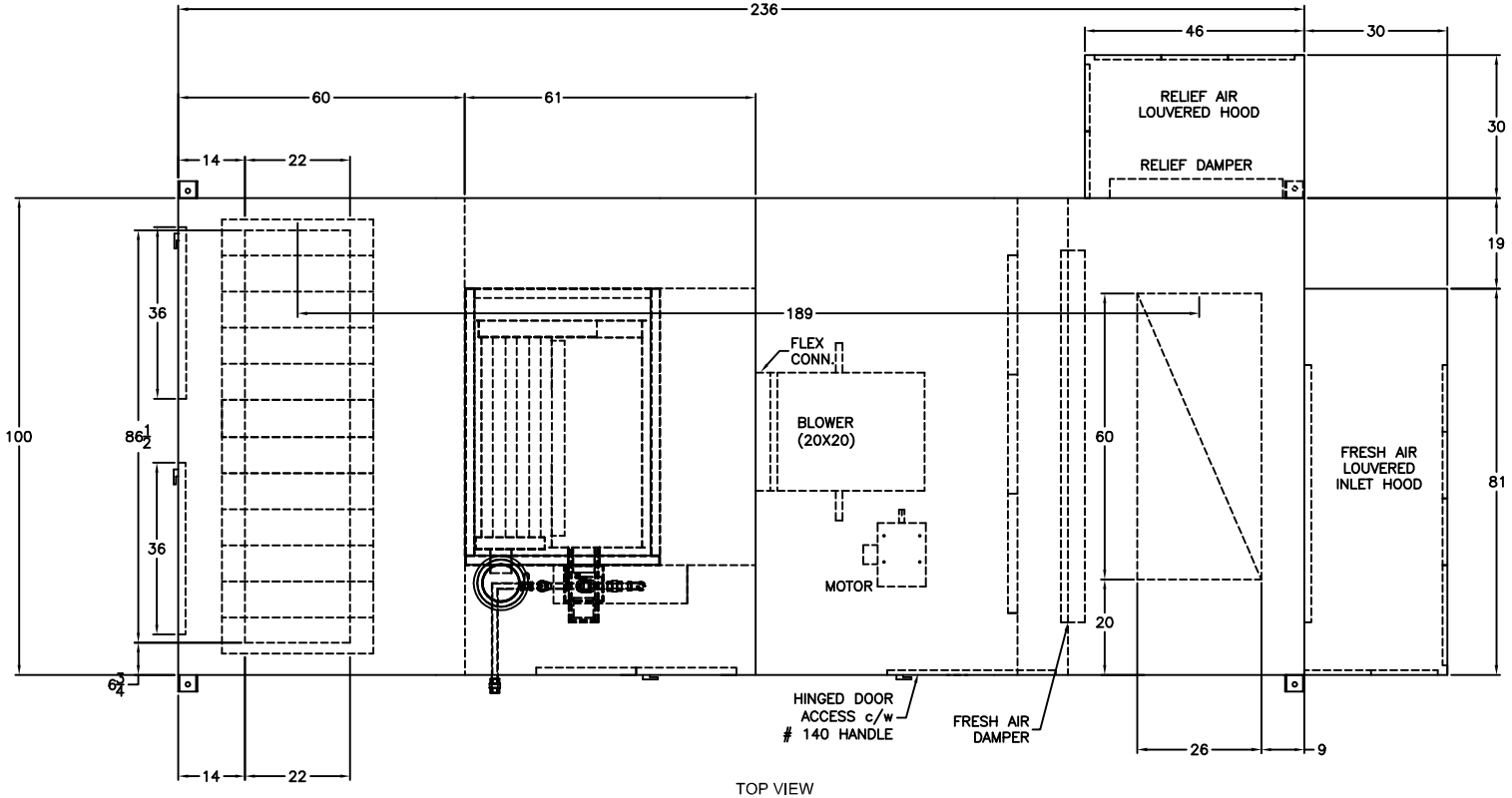
FOR REFERENCE USE ONLY, SUBJECT TO CHANGE WITHOUT NOTICE

WESTERN
GIDM SERIES

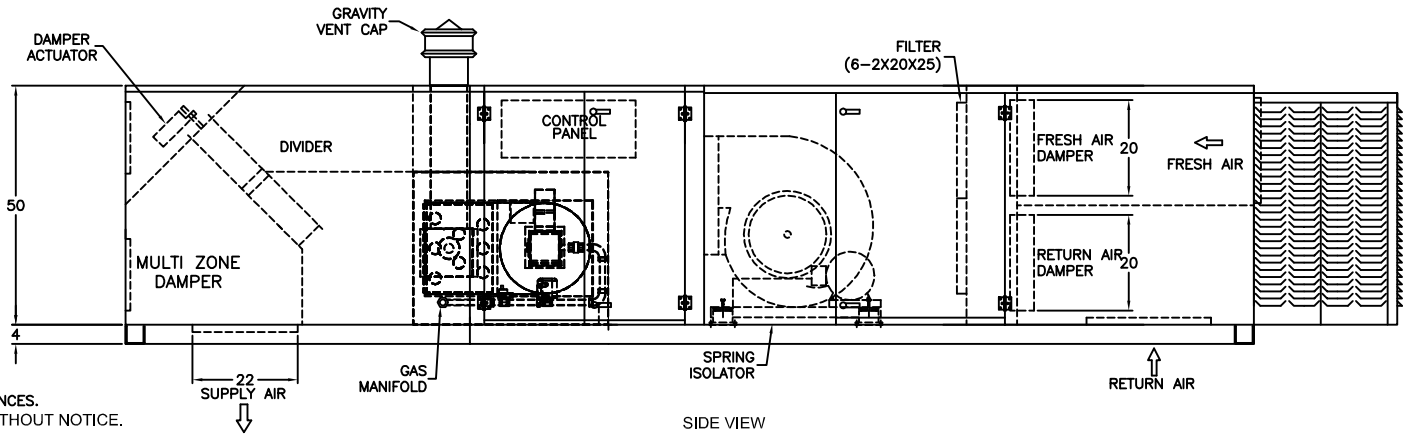
Rev	By	Revision Description	Date

TITLE
GIDM 85-100 HORIZONTAL CONFIGURATION

DRAWN BY	ISSUED BY	SCALE	DRW. NO.
GDD		1:28	60-01750B
CHK. BY	DATE	JOB NO.	PAGE J-22



TOP VIEW



SIDE VIEW

NOTES:
SEE ROOF CURB DWG. # 60-1
1. 1 1/2 INLET AND DISCHARGE FLANGES.
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Rev	By	Revision Description	Date

WESTERN

TITLE

HTDM 400 HORIZONTAL CONFIG. OUTDOOR UNIT
GRAVITY VENTED C/W FLAT FILTER SECTION
MIX BOX w/ RELIEF AND MULTI ZONE SUPPLY

DRAWN BY	ISSUED BY	SCALE	DRW. NO.
GDD			P00002
CHK. BY	DATE	JOB NO.	PAGE J-23