Precision Cooling
For *Business-Critical Continuity™*

Liebert® DS™

System Design Manual - 28-105kW (8-30 Tons), Downflow/Upflow, 60Hz
Floor Mounted, Air-Cooled, Water/Glycol-Cooled, GLYCOOL, Dual-Cool

EMERSON
Network Power

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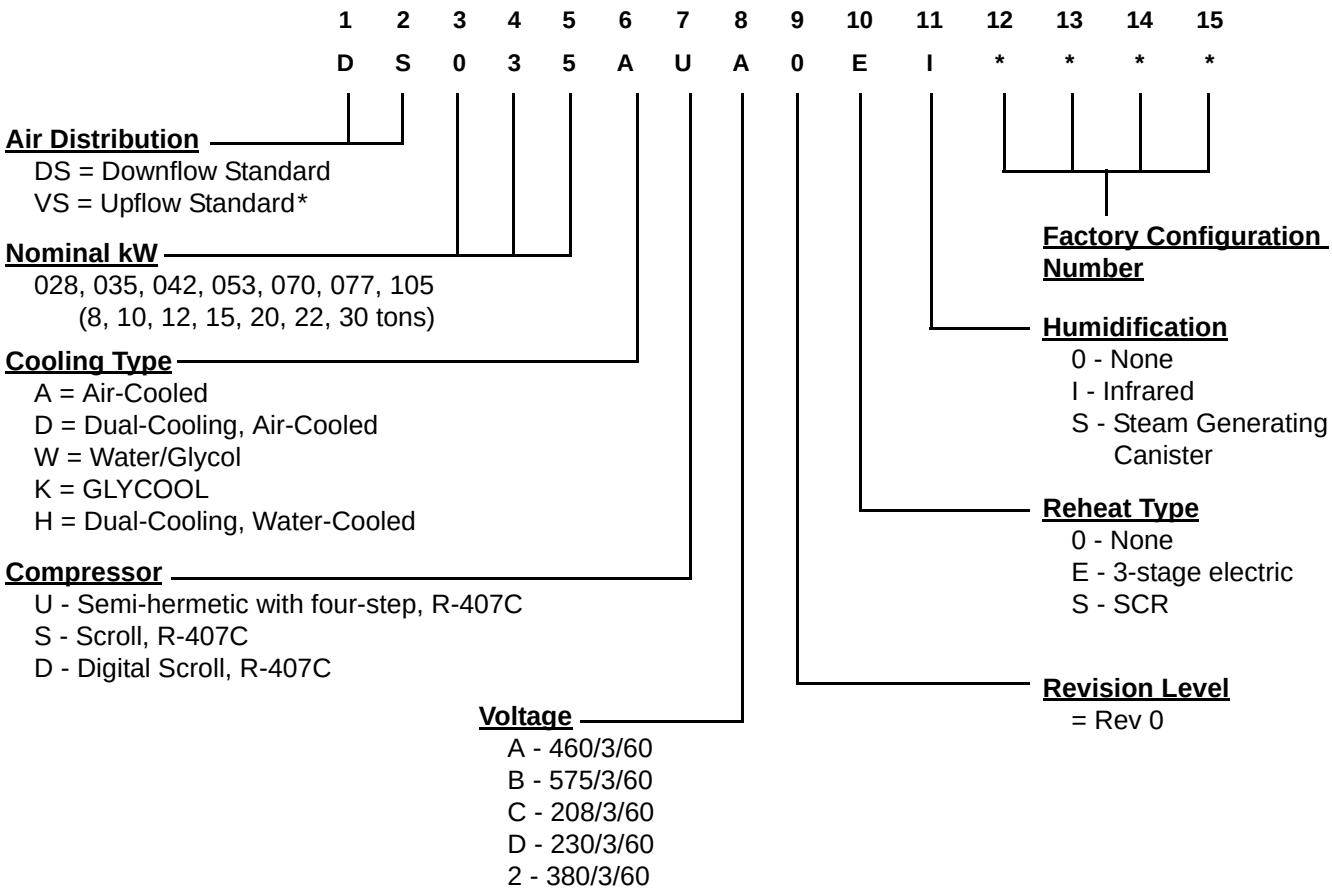
LIEBERT DS MODEL NUMBER



TECHNICAL DATA

Table 1 Air-cooled capacity data, R-407C refrigerant

Model Size	028	035	042	053	070	077	105
FOUR-STEP SEMI-HERMETIC COMPRESSOR							
Net Capacity Data, kW (BTUH), Standard Air Volume and Evaporator Fan Motor							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total, kW (BTUH)	37.1 (126.7)	37.3 (127.2)	42.6 (145.5)	52.6 (179.5)	64.0 (218.5)	70.9 (241.9)	92.3 (314.9)
Sensible, kW (BTUH)	28.4 (96.8)	31.3 (106.8)	36.0 (123.0)	45.2 (154.2)	53.7 (183.2)	59.4 (202.8)	78.0 (266.3)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total, kW (BTUH)	36.1 (123.2)	36.2 (123.4)	41.5 (141.5)	50.6 (172.8)	62.5 (213.2)	68.8 (234.9)	89.7 (306.1)
Sensible, kW (BTUH)	30.1 (102.9)	33.5 (114.3)	38.7 (132.1)	50.6 (172.8)	57.7 (196.9)	63.9 (218.0)	84.0 (286.6)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total, kW (BTUH)	35.4 (120.8)	35.6 (121.4)	40.6 (138.5)	50.2 (171.5)	61.1 (208.6)	67.6 (230.6)	88.0 (300.4)
Sensible, kW (BTUH)	27.8 (94.8)	30.6 (104.4)	35.2 (120.1)	44.2 (150.9)	52.5 (179.2)	58.1 (198.2)	76.3 (260.3)
SCROLL OR DIGITAL SCROLL COMPRESSOR (Standard Scroll on 077 and 105 Models)							
Net Capacity Data, kW (BTUH), Standard Air Volume and Evaporator Fan Motor							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total, kW (BTUH)	30.7 (104.8)	35.9 (122.4)	40.0 (136.4)	52.9 (180.7)	65.8 (224.6)	71.1 (242.8)	92.1 (314.5)
Sensible, kW (BTUH)	25.7 (87.8)	30.7 (104.8)	35.0 (119.3)	45.3 (154.7)	54.4 (185.6)	59.5 (203.1)	78.0 (266.2)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total, kW (BTUH)	29.8 (101.8)	34.4 (117.5)	38.4 (131.2)	51.6 (176.1)	64.2 (219.2)	69.4 (236.7)	89.7 (306.2)
Sensible, kW (BTUH)	27.5 (93.9)	34.4 (117.5)	38.4 (131.2)	48.6 (166.0)	58.4 (199.4)	64.1 (218.7)	84.0 (286.7)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total, kW (BTUH)	29.3 (99.9)	34.2 (116.6)	38.1 (130.0)	50.9 (173.8)	63.2 (215.6)	68.2 (232.8)	88.2 (300.9)
Sensible, kW (BTUH)	25.1 (85.8)	30.0 (102.4)	34.1 (116.5)	44.5 (151.8)	53.4 (182.2)	58.3 (199.1)	76.4 (260.6)

Capacity data is factory-certified to be within 5% tolerance.

Table 2 Physical data - air cooled units

Model Size	028	035	042	053	070	077	105
EVAPORATOR COIL- A-Frame - Copper Tube/Aluminum Fin							
Face Area - sq. ft. (sq. m)	17.1 (1.6)	17.1 (1.6)	17.1 (1.6)	24.7 (2.3)	24.7 (2.3)	24.7 (2.3)	32.3 (3.0)
Rows of Coil	3	3	3	3	3	3	3
Face Velocity - FPM (m/s) - STD Air Vol.	251.0 (1.3)	316.0 (1.6)	380.0 (1.9)	319.8 (1.6)	384.6 (1.9)	441.2 (2.2)	453.6 (2.3)
FAN SECTION - Downflow models - Fixed Pitch, Two Belts							
Standard Air Volume - CFM (CMH) 0.2" external static	4,400 (7,476)	5,500 (9,345)	6,600 (11,213)	8,000 (13,593)	9,600 (16,311)	11,000 (18,690)	14,600 (25,062)
Standard Fan Motor hp (kW)	2 (1.5)	3 (2.2)	5 (3.7)	3 (2.2)	5 (3.7)	7.5 (5.6)	10.0 (0.75)
Optional Air Volume - CFM (CMH) 0.2" external static	5,500 (9,345)	6,600 (11,213)	7,200 (12,233)	9,600 (16,311)	11,000 (18,690)	12,000 (20,390)	15,500 (26,607)
Optional Fan Motor hp	3 (2.2)	5 (3.7)	7.5 (5.6)	5 (3.7)	7.5 (5.6)	10 (7.5)	15 (11.2)
Quantity of Fans	1	1	1	2	2	2	3
Note: Higher static pressures available, see **Table 7** for examples							
Note: Some options or combinations of options may result in reduced air flow—Consult local representative for recommendations.							
REHEAT SECTION							
Electric Reheat - Three-Stage, Stainless Steel Fin Tubular, capacity does not include fan motor heat							
Capacity - kW (KBTUH) - Std Selection	15.0 (51.2)	15.0 (51.2)	15.0 (51.2)	25.0 (85.3)	25.0 (85.3)	25.0 (85.3)	30.0 (102.4)
Capacity - kW (KBTUH) - Opt Selection	10.0 (34.1)	10.0 (34.1)	10.0 (34.1)	15.0 (51.2)	15.0 (51.2)	15.0 (51.2)	20.0 (68.3)
Electric Reheat - SCR Control, Stainless Steel Fin Tubular (optional selection)							
Capacity - kW (KBTUH)	15.0 (51.2)	15.0 (51.2)	15.0 (51.2)	25.0 (85.3)	25.0 (85.3)	25.0 (85.3)	30.0 (102.4)
HUMIDIFIER SECTION							
Infrared Humidifier							
Capacity, lb./hr. (kg/h)	11.0 (5.0)	11.0 (5.0)	11.0 (5.0)	22.0 (10.0)	22.0 (10.0)	22.0 (10.0)	22.0 (10.0)
FILTER SECTION - Disposable Type - Nominal Sizes and Quantities, std MERV 8, optional MERV 11							
Downflow Models							
Nominal Size, inches	25x16	25x16	25x16	25x16	25x16	25x16	25x16
Quantity	5	5	5	7	7	7	9
Upflow Models (Front & Rear return) Filters located in separate filter box on rear return, located on lower unit panel							
Nominal Size, inches	25x20	25x20	25x20	25x20	25x20	25x20	25x20
Quantity	4	4	4	6	6	6	8
PIPING CONNECTION SIZES - Air-Cooled Liebert DS Indoor Unit (Not External Line Sizes)							
Liquid Line - O.D. Copper (2/unit)	1/2	1/2	1/2	5/8	5/8	5/8	5/8
Hot Gas Line - O.D. Copper (2/unit)	5/8	5/8	5/8	7/8	7/8	7/8	1-1/8
Infrared Humidifier - O.D. Copper	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Condensate Drain - FPT	3/4	3/4	3/4	3/4	3/4	3/4	3/4
Condensate Drain w/opt Condensate Pump - OD	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Outdoor Air-Cooled Condenser, std 95°F ambient selection; see Tables 68 and 70 for other selections							
Model (R-407C Refrigerant)	CD*-205	CD*-205	CD*-205	CD*-251	CD*-308	CD*-308	CD*-415
Number of Fans	2	2	2	3	3	3	4
Econ-O-Coil Capacity Data (Dual Cool Units), Water (0% Glycol), Net Capacity Data kW (kBTUH)							
Caution: Cu/Ni coil option must be specified when Econ-o-coil is applied to open water tower							
75°F DB, 62.57 WB (23.9°C DB, 16.9°C WB) 50% RH, 45°F EWT, 55°F LWT							
Total Capacity, kW (kBTUH)	32.5 (111)	39.3 (134)	45.4 (155)	54.2 (185)	62.4 (213)	68.6 (234)	99.3 (339)
Sensible Capacity, kW (kBTUH)	25.8 (88)	31.4 (107)	36.6 (125)	44.8 (153)	51.9 (177)	57.7 (197)	80.9 (276)
Flow Rate - GPM (l/m) @ 10deg F Rise	23.0 (87.4)	28.2 (107.2)	33.7 (128.1)	39.1 (148.6)	45.8 (174.0)	51.7 (196.5)	74.2 (282.0)
Pressure Drop - ft. (kPa), valve, coil	9.4 (64.8)	13.6 (93.7)	18.8 (129.5)	11.5 (79.2)	15.3 (105.4)	19.1 (131.6)	23.0 (158.5)
Fluid Volumes							
Econ-O-Coil Fluid Volume, gal (l)	5 (19.0)	5 (19.0)	5 (19.0)	8 (30.4)	8 (30.4)	8 (30.4)	10 (38.0)

Capacity data is factory-certified to be within 5% tolerance.

Table 3 Water-cooled capacity data, R-407C refrigerant

Model Size	028	035	042	053	070	077	105
FOUR-STEP SEMI-HERMETIC COMPRESSOR							
Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	39.7 (135.6)	39.6 (135.1)	47.4 (161.9)	57.7 (196.8)	71.5 (244.0)	82.1 (280.3)	103.8 (354.4)
Sensible kW (BTUH)	29.4 (100.5)	32.2 (109.9)	38.0 (129.6)	47.2 (161.2)	56.7 (193.5)	64.0 (218.3)	83.0 (283.3)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	38.6 (131.6)	38.9 (132.6)	46.2 (157.7)	56.4 (192.5)	69.3 (236.5)	79.8 (272.5)	101.0 (344.6)
Sensible kW (BTUH)	31.2 (106.5)	34.6 (118.1)	40.7 (138.9)	50.6 (172.8)	60.5 (206.6)	68.4 (233.6)	89.0 (303.9)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	37.9 (129.4)	37.9 (129.5)	45.2 (154.3)	55.4 (189.0)	68.1 (232.5)	78.3 (267.1)	99.1 (338.3)
Sensible kW (BTUH)	28.9 (98.6)	31.6 (107.9)	37.2 (126.8)	46.4 (158.2)	55.3 (189.4)	62.6 (213.7)	81.3 (277.6)
SCROLL OR DIGITAL SCROLL COMPRESSOR (std scroll on 077 & 105 models)							
Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	31.8 (108.5)	37.8 (128.9)	42.7 (145.9)	58.6 (200.0)	73.4 (250.6)	81.9 (279.6)	102.7 (350.4)
Sensible kW (BTUH)	26.2 (89.3)	31.5 (107.5)	36.1 (123.1)	47.6 (162.5)	57.5 (196.2)	63.9 (218.0)	82.2 (280.6)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	30.8 (105.2)	36.7 (125.2)	41.7 (142.4)	57.2 (195.3)	71.3 (243.2)	79.6 (271.6)	99.7 (340.2)
Sensible kW (BTUH)	27.9 (95.3)	33.7 (115.0)	38.8 (132.5)	51.0 (174.0)	61.4 (209.5)	68.4 (233.3)	88.1 (300.7)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	30.4 (103.7)	36.2 (123.4)	39.5 (134.9)	56.1 (191.3)	69.9 (238.5)	78.1 (266.4)	97.7 (333.6)
Sensible kW (BTUH)	25.6 (87.4)	30.9 (105.3)	35.3 (120.5)	46.7 (159.3)	56.3 (192.0)	62.5 (213.4)	80.4 (274.4)

Capacity data is factory-certified to be within 5% tolerance.

Table 4 Physical data - water cooled units

Model Size	028	035	042	053	070	077	105
EVAPORATOR COIL- A-Frame - Copper Tube/Aluminum Fin							
Face Area - ft^2 (m^2)	17.1 (1.6)	17.1 (1.6)	17.1 (1.6)	24.7 (2.3)	24.7 (2.3)	24.7 (2.3)	32.3 (3.0)
Rows of Coil	3	3	3	3	3	3	3
Face Velocity - FPM (m/s) - STD Air Vol.	251.0 (1.3)	316.0 (1.6)	380.0 (1.9)	319.8 (1.6)	384.6 (1.9)	441.2 (2.2)	453.6 (2.3)
FAN SECTION - Downflow models - Fixed Pitch, Two Belts							
Standard Air Volume - CFM (CMH)	4,400 (7,476)	5,500 (9,345)	6,600 (11,213)	8,000 (13,593)	9,600 (16,311)	11,000 (18,690)	14,600 (25,062)
Standard Fan Motor hp (kW)	2 (1.5)	3 (2.2)	5 (3.7)	3 (2.2)	5 (3.7)	7.5 (5.6)	10.0 (0.75)
Optional Air Volume - CFM (CMH)	5,500 (9,345)	6,600 (11,213)	7,200 (12,233)	9,600 (16,311)	11,000 (18,690)	12,000 (20,390)	15,500 (26,607)
Optional Fan Motor hp	3 (2.2)	5 (3.7)	7.5 (5.6)	5 (3.7)	7.5 (5.6)	10 (7.5)	15 (11.2)
Ext. Static Press - inches of water (Pa)	0.2 (50)	0.2 (50)	0.2 (50)	0.2 (50)	0.2 (50)	0.2 (50)	0.2 (50)
Quantity of Fans	1	1	1	2	2	2	3
Note: Higher static pressures available; see **Table 7** for examples. Note: Some options or combinations of options may result in reduced air flow—Consult local representative for recommendations.							
REHEAT SECTION							
Electric Reheat - Three (3) Stage, Stainless Steel Fin Tubular; capacity does not include fan motor heat							
Capacity - kW (KBTUH) - Std Selection	15.0 (51.2)	15.0 (51.2)	15.0 (51.2)	25.0 (85.3)	25.0 (85.3)	25.0 (85.3)	30.0 (102.4)
Capacity - kW (KBTUH) - Opt Selection	10.0 (34.1)	10.0 (34.1)	10.0 (34.1)	15.0 (51.2)	15.0 (51.2)	15.0 (51.2)	20.0 (68.3)
Electric Reheat - SCR Control, Stainless Steel Fin Tubular (optional selection)							
Capacity - kW (KBTUH)	15.0 (51.2)	15.0 (51.2)	15.0 (51.2)	25.0 (85.3)	25.0 (85.3)	25.0 (85.3)	30.0 (102.4)
HUMIDIFIER SECTION							
Infrared Humidifier							
Capacity, lb./hr. (kg/h)	11.0 (5.0)	11.0 (5.0)	11.0 (5.0)	22.0 (10.0)	22.0 (10.0)	22.0 (10.0)	22.0 (10.0)
FILTER SECTION - Disposable Type - Nominal Sizes and Quantities, std MERV 8, optional MERV 11							
Downflow Models							
Nominal Size, inches	25x16	25x16	25x16	25x16	25x16	25x16	25x16
Quantity	5	5	5	7	7	7	9
Upflow Models (Front & Rear Return) Filters located in separate filter box on rear return							
Nominal Size, inches	25x20	25x20	25x20	25x20	25x20	25x20	25x20
Quantity	4	4	4	6	6	6	8
Condenser Flow Requirements - Max design water pressure 150psi (1034kPa), 350psi (2413kPa) available as option							
WATER COOLED SYSTEM - Semi-Hermetic Compressors, Based on 75°F/50% Room Conditions							
THR - kBTUH (kW)	164.4 (48.2)	173.2 (50.7)	211.0 (61.8)	230.5 (67.5)	316.0 (92.6)	365.1 (107.0)	489.6 (143.5)
75°F (23.9°C) EWT, GPM (l/m)	24.4 (92.7)	25.7 (97.7)	31.1 (118.2)	33.9 (128.8)	41.1 (156.2)	47.5 (180.5)	64.4 (244.7)
Pressure Drop - ft. of water (kPa), with bypass	7.2 (21.5)	5.4 (16.1)	7.8 (23.3)	5.8 (17.3)	8.3 (24.8)	10.9 (32.5)	20.0 (59.7)
Pressure Drop - ft. of water (kPa), 3-way valve	15.7 (46.8)	7.9 (23.6)	11.4 (34.0)	7.5 (22.4)	10.7 (31.9)	14.2 (42.4)	22.5 (67.1)
85°F (29.4°C) EWT - GPM (l/m)	38.0 (144.4)	39.1 (148.6)	52.7 (200.3)	49.0 (186.2)	67.2 (255.4)	85.1 (323.4)	119.9 (455.6)
Pressure Drop - ft. of water (kPa), with bypass	11.2 (33.4)	11.8 (35.2)	20.5 (61.2)	11.6 (34.6)	20.9 (62.4)	32.5 (97.0)	63.3 (188.9)
Pressure Drop - ft. of water (kPa), 3-way valve	16.7 (49.8)	17.6 (52.5)	31.2 (93.1)	15.0 (44.8)	27.4 (81.8)	43.0 (128.3)	72.2 (215.4)
WATER COOLED SYSTEM - Scroll or Digital Scroll Compressors, based on 75°F/50% room conditions							
THR - BTUH (kW)	137.7 (40.3)	165.5 (48.5)	194.3 (56.9)	247.1 (72.4)	316.0 (92.6)	365.8 (107.2)	474.3 (139.0)
75°F (23.9°C) EWT - GPM (l/m)	20.8 (79.0)	25 (93.5)	28.7 (109.1)	33.6 (127.7)	41.1 (156.2)	47.6 (180.9)	62.0 (235.6)
Pressure Drop - ft. of water (kPa), with bypass	3.7 (11.0)	5.0 (14.9)	6.7 (20.0)	5.7 (17.0)	8.3 (24.8)	11.0 (32.8)	18.6 (55.5)
Pressure Drop - ft. of water (kPa), 3-way valve	5.3 (15.8)	7.3 (21.8)	9.8 (29.2)	7.3 (21.8)	10.7 (31.9)	14.2 (42.4)	21.0 (62.7)
85°F (29.4°C) EWT - GPM (l/m)	30.5 (115.9)	37.0 (140.6)	45.4 (172.5)	48.3 (183.5)	67.2 (255.4)	85.3 (324.1)	104.7 (397.9)
Pressure Drop - ft. of water (kPa), with bypass	7.4 (22.1)	10.7 (31.9)	15.6 (46.6)	11.3 (33.7)	20.9 (62.4)	32.6 (97.3)	49.3 (147.1)
Pressure Drop - ft. of water (kPa), 3-way valve	11.0 (32.8)	15.9 (47.4)	23.5 (70.1)	14.6 (43.6)	27.4 (81.8)	43.2 (128.9)	56.0 (167.1)
PIPING CONNECTION SIZES - Water-Cooled Liebert DS Indoor Unit							
Water Supply - O.D. Copper	1-5/8" (41)	1-5/8" (41)	1-5/8" (41)	2-1/8" (54)	2-1/8" (54)	2-1/8" (54)	2-1/8" (54)
Water Return - O.D. Copper	1-5/8" (41)	1-5/8" (41)	1-5/8" (41)	2-1/8" (54)	2-1/8" (54)	2-1/8" (54)	2-1/8" (54)
Infrared Humidifier - O.D. Copper	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Condensate Drain - FPT	3/4	3/4	3/4	3/4	3/4	3/4	3/4
Condensate Drain w/opt Condensate Pump - OD	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Econ-O-Coil capacity data (dual cool units), water (0% glycol), Net Capacity Data kW (kBTUH) Cu/Ni coil option must be specified when Econ-O-Coil is applied to open water tower.							
75°F DB, 62.57 WB (23.9°C DB, 16.9°C WB) 50% RH, 45°F EWT, 55°F LWT							
Total Capacity, kW (kBTUH)	32.5 (111)	39.3 (134)	45.4 (155)	54.2 (185)	62.4 (213)	68.6 (234)	99.3 (339)
Sensible Capacity, kW (kBTUH)	25.8 (88)	31.4 (107)	36.6 (125)	44.8 (153)	51.9 (177)	57.7 (197)	80.9 (276)
Flow Rate - GPM (l/m) @ 10°F (5.6°C) Rise	23.0 (87.4)	28.2 (107.2)	33.7 (128.1)	39.1 (148.6)	45.8 (174.0)	51.7 (196.5)	74.2 (282)
Pressure Drop - ft. (kPa), valve, coil	9.4 (64.8)	13.6 (93.7)	18.8 (129.5)	11.5 (79.2)	15.3 (105.4)	19.1 (131.6)	23.0 (158.5)
Fluid Volumes							
Econ-O-Coil Fluid Volume, gal (l)	5 (19.0)	5 (19.0)	5 (19.0)	8 (30.4)	8 (30.4)	8 (30.4)	10 (38.0)
Unit Volume, Without Econ-O-Coil, gal, (l)	4 (15.2)	4 (15.2)	4 (15.2)	7 (26.6)	7 (26.6)	7 (26.6)	8 (30.4)

Table 5 Glycol-cooled capacity data, R-407C refrigerant, 40% ethylene glycol

Model Size	028	035	042	053	070	077	105
FOUR-STEP SEMI-HERMETIC COMPRESSOR							
Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	32.6 (111.1)	32.6 (111.1)	38.4 (131.1)	49.0 (167.3)	59.3 (202.5)	67.4 (230.2)	85.9 (293.1)
Sensible kW (BTUH)	26.5 (90.3)	29.4 (100.4)	34.4 (117.3)	43.8 (149.4)	51.8 (176.8)	58.0 (198.1)	75.5 (257.7)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	31.7 (108.1)	31.9 (109.0)	37.4 (127.5)	47.8 (163.1)	57.3 (195.5)	64.9 (221.4)	83.0 (283.4)
Sensible kW (BTUH)	28.3 (96.5)	31.9 (109.0)	37.4 (127.5)	47.8 (163.1)	57.3 (195.5)	64.9 (221.4)	83.0 (283.4)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	31.2 (106.5)	31.1 (106.2)	36.7 (125.3)	46.8 (159.8)	56.8 (193.8)	64.5 (220.3)	85.9 (293.1)
Sensible kW (BTUH)	26.0 (88.6)	28.7 (98.1)	33.6 (114.6)	42.8 (146.0)	50.7 (173.0)	56.8 (193.9)	75.5 (257.7)
SCROLL OR DIGITAL SCROLL COMPRESSOR (std scroll on 077 & 105 models)							
Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	28.0 (95.5)	31.9 (108.9)	36.6 (124.8)	50.0 (170.8)	61.7 (210.6)	68.1 (232.5)	86.3 (294.5)
Sensible kW (BTUH)	24.6 (84.0)	29.2 (99.5)	33.6 (114.8)	44.2 (150.8)	52.8 (180.1)	58.3 (199.0)	75.7 (258.2)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	27.4 (93.4)	31.4 (107.0)	35.9 (122.5)	48.8 (166.4)	60.3 (205.7)	66.7 (227.7)	83.7 (285.6)
Sensible kW (BTUH)	27.4 (93.4)	31.4 (107.0)	35.9 (122.5)	48.8 (166.4)	56.8 (193.8)	63.0 (215.0)	83.7 (285.6)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	26.8 (91.6)	30.6 (104.5)	35.0 (119.6)	48.0 (163.8)	59.2 (202.2)	65.5 (223.5)	82.9 (283.0)
Sensible kW (BTUH)	24.1 (82.3)	28.5 (97.4)	32.9 (112.2)	43.3 (147.7)	51.7 (176.5)	57.2 (195.2)	74.2 (253.1)

Capacity data is factory-certified to be within 5% tolerance.

Table 6 Physical data - glycol/GLYCOOL cooled units

Model Size	028	035	042	053	070	077	105
EVAPORATOR COIL- A-Frame - Copper Tube/Aluminum Fin							
Face Area - sq. ft. (sq. m)	17.1 (1.6)	17.1 (1.6)	17.1 (1.6)	24.7 (2.3)	24.7 (2.3)	24.7 (2.3)	32.3 (3.0)
Rows of Coil	3	3	3	3	3	3	3
Face Velocity - FPM (m/s) - STD Air Vol.	251.0 (1.3)	316.0 (1.6)	380.0 (1.9)	319.8 (1.6)	384.6 (1.9)	441.2 (2.2)	453.6 (2.3)
FAN SECTION - Downflow models - Fixed Pitch, Two Belts							
Standard Air Volume - CFM (CMH)	4,400 (7,476)	5,500 (9,345)	6,600 (11,213)	8,000 (13,593)	9,600 (16,311)	11,000 (18,690)	14,600 (25,062)
Standard Fan Motor hp (kW)	2 (1.5)	3 (2.2)	5 (3.7)	3 (2.2)	5 (3.7)	7.5 (5.6)	10.0 (0.75)
Optional Air Volume - CFM (CMH)	5,500 (9,345)	6,600 (11,213)	7,200 (12,233)	9,600 (16,311)	11,000 (18,690)	12,000 (20,390)	15,500 (26,607)
Optional Fan Motor hp	3 (2.2)	5 (3.7)	7.5 (5.6)	5 (3.7)	7.5 (5.6)	10 (7.5)	15 (11.2)
Ext. Static Press - inches of water (Pa)	0.2 (50)	0.2 (50)	0.2 (50)	0.2 (50)	0.2 (50)	0.2 (50)	0.2 (50)
Quantity of Fans	1	1	1	2	2	2	3
Note: Higher static pressures available, see **Table 7** for examples Note: Some options or combinations of options may result in reduced air flow—Consult local representative for recommendations.							
REHEAT SECTION							
Electric Reheat - Three (3) Stage, Stainless Steel Fin Tubular, capacity does not include fan motor heat							
Capacity - kW (KBTUH) - Std Selection	15.0 (51.2)	15.0 (51.2)	15.0 (51.2)	25.0 (85.3)	25.0 (85.3)	25.0 (85.3)	30.0 (102.4)
Capacity - kW (KBTUH) - Opt Selection	10.0 (34.1)	10.0 (34.1)	10.0 (34.1)	15.0 (51.2)	15.0 (51.2)	15.0 (51.2)	20.0 (68.3)
Electric Reheat - SCR Control, Stainless Steel Fin Tubular (optional selection)							
Capacity - kW (KBTUH)	15.0 (51.2)	15.0 (51.2)	15.0 (51.2)	25.0 (85.3)	25.0 (85.3)	25.0 (85.3)	30.0 (102.4)
HUMIDIFIER SECTION							
Infrared Humidifier							
Capacity, lb./hr. (kg/h)	11.0 (5.0)	11.0 (5.0)	11.0 (5.0)	22.0 (10.0)	22.0 (10.0)	22.0 (10.0)	22.0 (10.0)
FILTER SECTION - Disposable Type - Nominal Sizes and Quantities, std MERV 8, optional MERV 11							
Downflow Models							
Nominal Size, inches	25x16	25x16	25x16	25x16	25x16	25x16	25x16
Quantity	5	5	5	7	7	7	9
Upflow Models (Front & Rear return) Filters located in separate filter box on rear return							
Nominal Size, inches	25x20	25x20	25x20	25x20	25x20	25x20	25x20
Quantity	4	4	4	6	6	6	8
Outdoor Drycoolers, std 95°F ambient selection, see Tables 69 and 71 for other selections							
Model	D-174	D-174	D-225-16	D-260	D-310	D-350	D-466
Number of Fans	2	2	2	3	3	3	4
CONDENSER FLOW REQUIREMENTS							
Glycol Cooled System - Semi-Hermetic Compressors, based on 75°F/50% room conditions							
THR - kBTUH (kW)	164.4 (48.2)	173.2 (50.7)	211.0 (61.8)	230.5 (67.5)	316.0 (92.6)	365.1 (107.0)	489.6 (143.5)
110°F (43.3°C) EGT-GPM (l/m)	34 (129.2)	35 (133.0)	41 (155.8)	52 (197.6)	66 (250.8)	76 (288.8)	90.0 (342.0)
Pressure Drop-ft. of water (kPa), with bypass	7.9 (23.6)	12.3 (36.7)	16.4 (48.9)	16.0 (47.7)	24.9 (74.3)	32.4 (96.7)	44.2 (131.9)
PIPING CONNECTION SIZES -Glycol-Cooled Liebert DS Indoor Unit							
Glycol Supply - O.D. Copper	1-5/8" (41)	1-5/8" (41)	1-5/8" (41)	2-1/8" (54)	2-1/8" (54)	2-1/8" (54)	2-1/8" (54)
Glycol Return - O.D. Copper	1-5/8" (41)	1-5/8" (41)	1-5/8" (41)	2-1/8" (54)	2-1/8" (54)	2-1/8" (54)	2-1/8" (54)
Infrared Humidifier - O.D. Copper	1/4	1/4	1/4	1/4	1/4	1/4	1/4
Condensate Drain - FPT	3/4	3/4	3/4	3/4	3/4	3/4	3/4
Condensate Drain w/opt Condensate Pump - OD	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Econ-O-Coil Capacity Data (GLYCOOL units), water (40% ethylene glycol), Net Capacity Data kW (kBTUH) (Cu/Ni coil option must be specified when Econ-O-Coil is applied to open water tower)							
75°F DB, 62.57 WB (23.9°C DB, 16.9°C WB) 50% RH, 45°F EWT							
Total Capacity, kW (kBTUH)	28.8 (98.3)	32.8 (112.0)	38.4 (131.0)	47.2 (161.0)	57.1 (195.0)	64.2 (219.0)	86.1 (294.0)
Sensible Capacity, kW (kBTUH)	24.4 (83.3)	28.9 (98.5)	34.0 (116.0)	42.2 (144.0)	50.4 (172.0)	56.5 (193.0)	75.3 (257.0)
Flow Rate - GPM (l/m)	34 (129.2)	35.0 (133.0)	41.0 (155.8)	52 (197.6)	66.0 (250.8)	76.0 (288.8)	90.0 (342.0)
Pressure Drop - ft. (kPa), total unit	38.3 (263.9)	40.5 (279.0)	54.4 (374.8)	39.1 (269.4)	60.8 (418.9)	79.1 (545.0)	79.5 (547.8)
Fluid Volumes							
Unit Volume Without Econ-O-Coil, gal (l)	4 (15.2)	4 (15.2)	4 (15.2)	7 (26.6)	7 (26.6)	7 (26.6)	8 (30.4)
Unit Volume With Econ-O-Coil, gal (l)	9 (34.2)	9 (34.2)	9 (34.2)	14 (53.2)	14 (53.2)	14 (53.2)	17 (64.6)

Table 7 Motor horsepower requirements

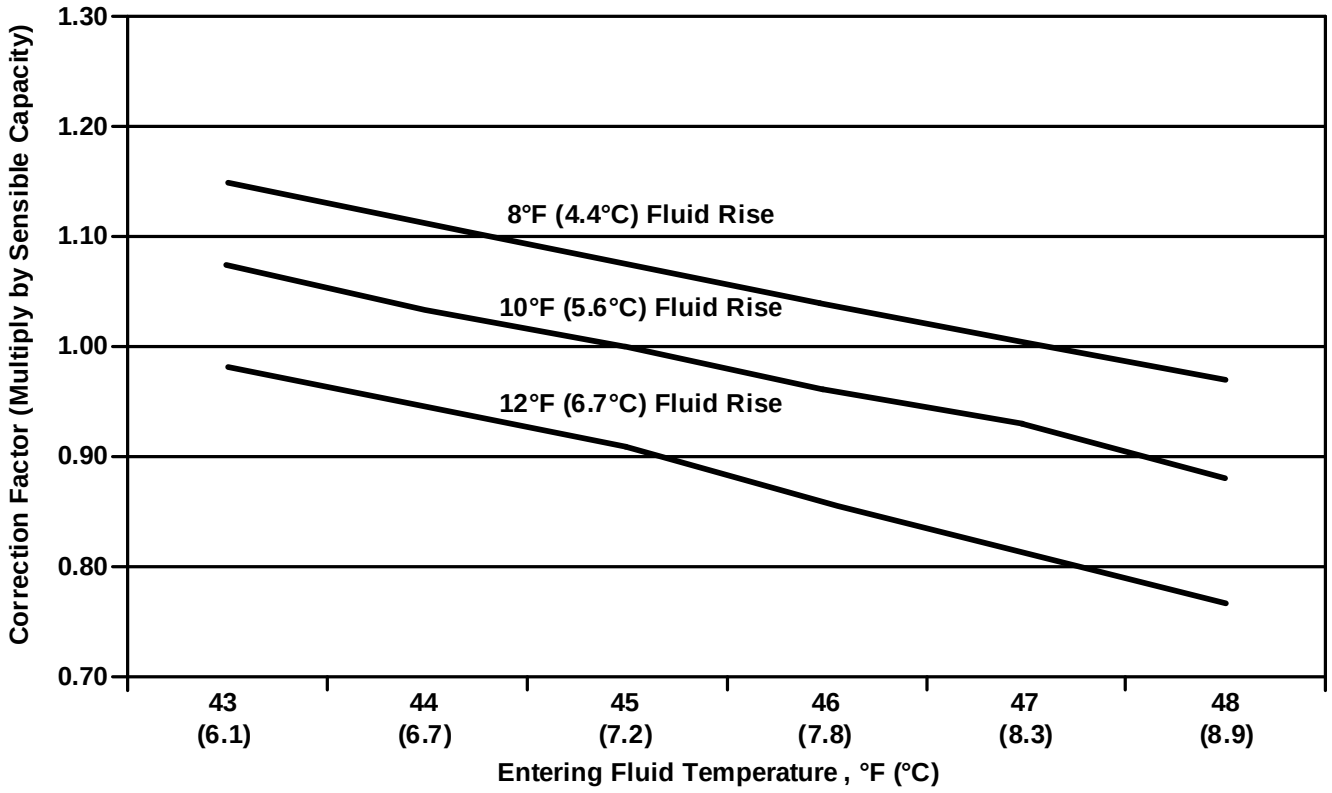
Model	CFM	External Static Pressure						
		0.2"	0.4"	0.6"	0.8"	1.0"	1.2"	1.4"
028	4,400	2	2	2	2	2	3	3
035	5,500	3	3	3	3	5	5	5
042	6,600	5	5	5	5	5	7.5	7.5
053	8,000	3	5	5	5	5	7.5	7.5
070	9,600	5	7.5	7.5	7.5	7.5	10	10
077	11,000	7.5	10	10	10	15	15	15
105	14,600	10	10	15	15	15	15	15

1. Actual brake horsepower is less than hp listed
2. External static pressure is reduced by options such as Econ-O-Coils, high-efficiency filters

Table 8 Nema Premium™ Motor Efficiency

Hp	Motor Efficiency
2	86.5%
3	89.5%
5	89.5%
7.5	91.0%
10	91.7%
15	93.0%

Figure 1 Econ-O-Coil capacity correction factors—water and glycol



Sample Calculation for Adjusted Sensible Capacity

DS070W Econ-O-Coil capacity from **Table 3** = 177,000 BTUH (Sensible Capacity)

@ 10°F TD, 45°F entering water temperature

To estimate capacity using 48°F (8.9°C) water, with 12°F (6.7°C) rise, the correction factor is approximately 0.76 (from **Figure 1**)

Adjusted Sensible Capacity: 177,000 BTUH x 0.76 = 134,520 BTUH (Adjusted Sensible Capacity)

Contact your local Emerson representative for more precise performance data

Table 9 Electrical data

Reheat Options			Electric, Std. kW				None				Electric, Std. kW				None			
Humidifier Options			Infrared or Steam Generating Canister				Infrared or Steam Generating Canister				None				None			
Model	Motor hp	Volts	208	230	460	575	208	230	460	575	208	230	460	575	208	230	460	575
028	2.0	FLA	66.4	63.2	31.8	25.2	55.4	52.5	26.6	23.9	66.4	63.2	31.8	24.7	42.1	41.4	20.8	16.5
		WSA	81.1	77.3	38.9	31.5	59.7	56.8	28.8	25.6	81.1	77.3	38.9	30.2	46.4	45.7	23	18.2
		OPD	80	80	40	30	70	70	35	30	80	80	40	30	60	60	30	25
028	3.0	FLA	69.5	66.0	33.2	26.4	58.5	55.3	28.0	25.1	69.5	66.0	33.2	25.9	45.2	44.2	22.2	17.7
		WSA	84.2	80.1	40.3	33	62.8	59.6	30.2	26.8	84.2	80.1	40.3	31.4	49.5	48.5	24.4	19.4
		OPD	90	80	40	30	80	70	35	30	90	80	40	30	60	60	30	25
035	3.0	FLA	72.9	69.4	34.5	26.4	65.3	62.1	30.6	26.1	72.9	69.4	34.5	26.4	52.0	51.0	24.8	18.7
		WSA	88.5	84.4	41.9	33.0	70.5	67.3	33.1	28.0	88.5	84.4	41.9	32.0	57.2	56.2	27.3	20.6
		OPD	90	90	45	35	90	80	40	35	90	90	45	35	70	70	35	25
035	5.0	FLA	79.0	75.0	37.3	28.6	71.4	67.7	33.4	28.3	79.0	75.0	37.3	28.6	58.1	56.6	27.6	20.9
		WSA	94.6	90.0	44.7	35.8	76.6	72.9	35.9	30.2	94.6	90.0	44.7	34.2	63.3	61.8	30.1	22.8
		OPD	100	100	45	35	90	90	45	35	100	100	45	35	80	80	40	30
042	5.0	FLA	86.5	82.7	41.6	36.1	86.4	82.7	41.6	36.1	86.5	82.5	41.4	32.5	73.1	71.6	35.8	28.7
		WSA	104	99.3	49.9	39.1	93.5	89.8	45.1	38.9	104.0	99.3	49.9	39.1	80.2	78.7	39.3	31.5
		OPD	110	110	50	50	110	110	50	50	110	110	50	45	100	100	50	40
042	7.5	FLA	94.0	89.5	45.0	39.0	93.9	89.5	45.0	39.0	94.0	89.3	44.8	35.4	80.6	78.4	39.2	31.6
		WSA	111.5	106.1	53.3	42.0	101.0	96.6	48.5	41.8	111.5	106.1	53.3	42.0	87.7	85.5	42.7	34.4
		OPD	125	110	60	50	125	110	60	50	125	110	60	45	110	110	50	45
053	3.0	FLA	112.1	107.2	53.9	41	101.4	96	49.2	39.5	112.1	107.2	53.9	41	74.8	73.8	37.6	27.9
		WSA	137.5	131.6	66.2	50.8	109.4	104.0	53.3	42.5	137.5	131.6	66.2	50.3	82.8	81.8	41.7	30.9
		OPD	150	125	70	50	125	125	60	50	150	125	70	50	110	110	50	40
053	5.0	FLA	118.2	112.8	56.7	43.2	107.5	101.6	52.0	41.7	118.2	112.8	56.7	43.2	80.9	79.4	40.4	30.1
		WSA	143.6	137.2	69.0	53.5	115.5	109.6	56.1	44.7	143.6	137.2	69.0	52.5	88.9	87.4	44.5	33.1
		OPD	150	150	70	50	125	125	70	50	150	150	70	50	110	110	60	45
070	5.0	FLA	127.5	122.1	59.5	46.1	126.1	120.2	57.6	46.1	127.5	122.1	59.5	45.4	99.5	98	46	34.5
		WSA	155.2	148.8	72.5	55.2	136.5	130.6	62.4	49.7	155.2	148.8	72.5	55.2	109.9	108.4	50.8	38.1
		OPD	175	150	80	60	175	150	80	60	175	150	80	60	150	125	70	50
070	7.5	FLA	135.0	128.9	62.9	49.0	133.6	127.0	61.0	49.0	135.0	128.9	62.9	48.3	107.0	104.8	49.4	37.4
		WSA	162.7	155.6	75.9	58.1	144.0	137.4	65.8	52.6	162.7	155.6	75.9	58.1	117.4	115.2	54.2	41.0
		OPD	175	175	80	60	175	175	80	60	175	175	80	60	150	150	70	50
077	7.5	FLA	145	138.4	64.4	52.6	145.0	138.4	64.0	52.6	140.7	134.6	64.4	50.1	118.4	116.2	52.4	41.0
		WSA	169.8	162.8	77.8	60.4	156.8	150.2	69.2	56.6	169.8	162.8	77.8	60.4	130.2	128.0	57.6	45.0
		OPD	200	175	90	70	200	175	80	70	175	175	90	70	175	175	70	60
077	10.0	FLA	151.6	144.4	67.4	54.6	151.6	144.4	67.0	54.6	147.3	140.6	67.4	52.1	125.0	122.2	55.4	43.0
		WSA	176.4	168.8	80.8	62.4	163.4	156.2	72.2	58.6	176.4	168.8	80.8	62.4	136.8	134.0	60.6	47.0
		OPD	200	200	90	70	200	200	90	70	200	175	90	70	175	175	80	60
105	10.0	FLA	177.4	170.2	88.4	72.6	177.4	170.2	88.4	72.6	169.9	166.6	84.5	66.1	150.8	148	76.8	61.0
		WSA	204.7	201.3	102.1	79.9	204.7	201.3	102.1	79.9	204.7	201.3	102.1	79.9	165.8	163.0	84.7	67.3
		OPD	250	225	125	100	250	225	125	100	225	225	110	90	225	200	110	90
105	15.0	FLA	192.3	184.2	95.4	78.6	192.3	184.2	95.4	78.6	185.3	180.6	91.5	72.1	166.2	162.0	83.8	67.0
		WSA	220.1	215.3	109.1	85.9	220.1	215.3	109.1	85.9	220.1	215.3	109.1	85.9	181.2	177.0	91.7	73.3
		OPD	250	250	125	100	250	250	125	100	250	250	125	100	225	225	110	90

1. Reduced reheat for 028, 035, and 042 models is 10kW.
2. Reduced reheat for 053, 070, and 077 models is 15kW.
3. Consult local representative for SCR reheat values.
4. Reduced reheat for 105 kW models is 20kW.
5. SCCR - Short Circuit Current Rating 5000 amps rms symmetrical maximum.

Table 9 Electrical data *(continued)*

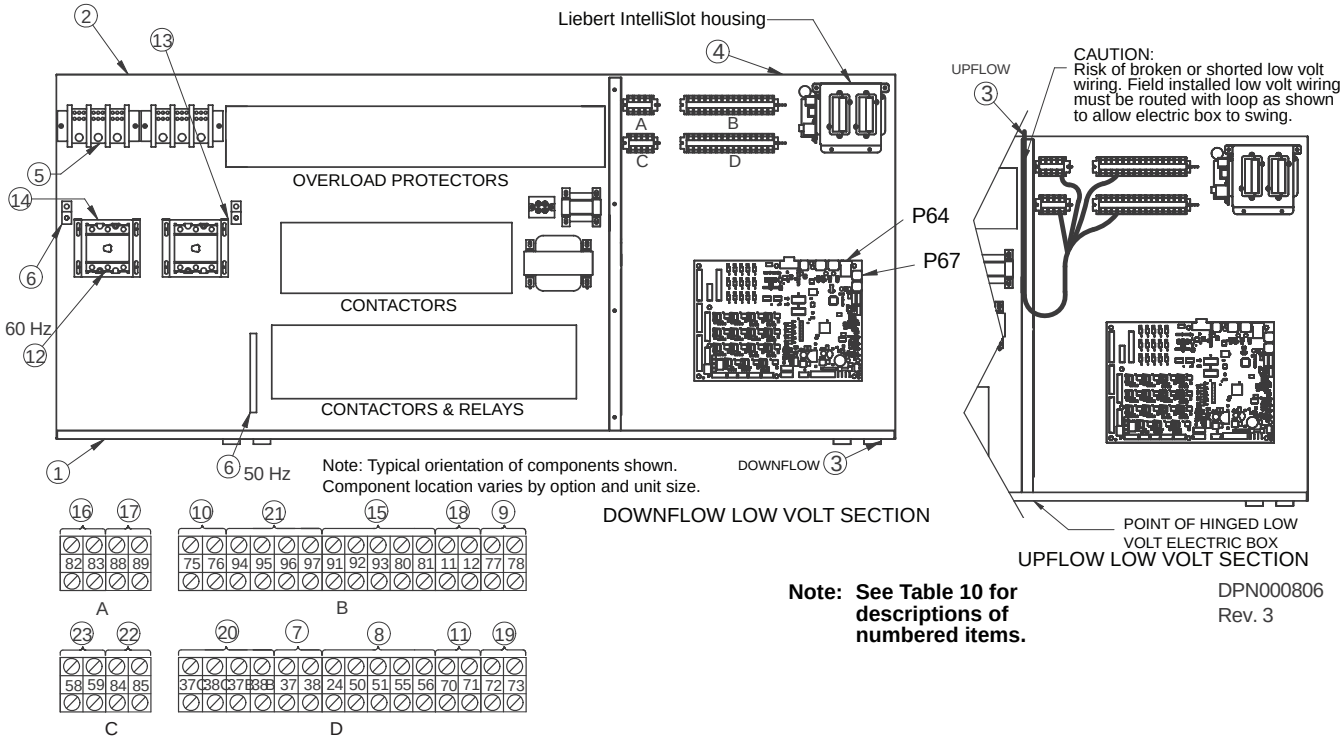
Reheat Options			Electric, Downsized kW							
Humidifier Options			Infrared or Steam Generating Canister				None			
Model	Motor hp	Volts	208	230	460	575	208	230	460	575
028	2.0	FLA	55.4	52.5	26.6	23.9	52.6	50.3	25.3	19.6
		WSA	63.9	61.2	30.8	25.6	63.9	61.2	30.8	23.8
		OPD	70	70	35	30	70	70	35	25
028	3.0	FLA	58.5	55.3	28	25.1	55.7	53.1	26.7	20.8
		WSA	67.0	64.0	32.2	26.8	67.0	64.0	32.2	25.0
		OPD	80	70	35	30	70	70	35	25
035	3.0	FLA	65.3	62.1	30.6	26.1	59.1	56.5	28.0	21.3
		WSA	71.2	68.2	33.8	28.0	71.2	68.2	33.8	25.7
		OPD	90	80	40	35	80	80	40	30
035	5.0	FLA	71.4	67.7	33.4	28.3	65.2	62.1	30.8	23.5
		WSA	77.3	73.8	36.6	30.2	77.3	73.8	36.6	27.9
		OPD	90	90	45	35	90	80	40	30
042	5.0	FLA	86.4	82.7	41.6	36.1	73.1	71.6	35.8	28.7
		WSA	93.5	89.8	45.1	38.9	86.7	83.2	41.7	32.7
		OPD	110	110	50	50	100	100	50	40
042	7.5	FLA	93.9	89.5	45.0	39.0	80.6	78.4	39.2	31.6
		WSA	101.0	96.6	48.5	41.8	94.2	90.0	45.1	35.6
		OPD	125	110	60	50	110	110	50	45
053	3.0	FLA	101.4	96.0	49.2	39.5	84.3	80.8	40.9	31
		WSA	109.4	104.0	53.3	42.5	102.7	98.6	49.9	37.8
		OPD	125	125	60	50	110	110	60	45
053	5.0	FLA	107.5	101.6	52.0	41.7	90.4	86.4	43.7	33.2
		WSA	115.5	109.6	56.1	44.7	108.8	104.2	52.7	40.0
		OPD	125	125	70	50	125	125	60	45
070	5.0	FLA	126.1	120.2	57.6	46.1	99.7	98	46.5	35.4
		WSA	136.5	130.6	62.4	49.7	120.5	115.8	56.2	42.7
		OPD	175	150	80	60	150	125	70	50
070	7.5	FLA	133.6	127.0	61.0	49.0	107.2	104.8	49.9	38.3
		WSA	144.0	137.4	65.8	52.6	128.0	122.6	59.6	45.6
		OPD	175	175	80	60	150	150	70	50
077	7.5	FLA	145	138.4	64.0	52.6	118.4	116.2	52.4	41.0
		WSA	156.8	150.2	69.2	56.6	135.1	129.8	61.5	47.9
		OPD	200	175	80	70	175	175	70	60
077	10.0	FLA	151.6	144.4	67.0	54.6	125.0	122.2	55.4	43.0
		WSA	163.4	156.2	72.2	58.6	141.7	135.8	64.5	49.9
		OPD	200	200	90	70	175	175	80	60
105	10.0	FLA	177.4	170.2	88.4	72.6	150.8	148	76.8	61.0
		WSA	192.4	185.2	96.3	78.9	175.2	168.6	86.0	67.4
		OPD	250	225	125	100	225	200	110	90
105	15.0	FLA	192.8	184.2	95.4	78.6	166.2	162.0	83.8	67.0
		WSA	207.8	199.2	103.3	84.9	190.6	182.6	93.0	73.4
		OPD	250	250	125	100	225	225	110	90

1. Reduced reheat for 028, 035, and 042 models is 10kW.
2. Reduced reheat for 053, 070, and 077 models is 15kW.
3. Consult local representative for SCR reheat values.
4. Reduced reheat for 105 kW models is 20kW.
5. SCCR - Short Circuit Current Rating 5000 amps rms symmetrical maximum.

DRAWINGS

ELECTRICAL FIELD CONNECTIONS

Figure 2 Electrical field connections - upflow and downflow models



Note: See Table 10 for descriptions of numbered items.

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Table 10 Electrical field connection descriptions

STANDARD ELECTRICAL CONNECTIONS

1. **Primary high voltage entrance** - 2.50" (64mm); 1.75" (44mm); 1.375" (35mm) diameter concentric knockouts located in bottom of box.
2. **Secondary high voltage entrance** - 2.50" (64mm); 1.75" (44mm); 1.375" (35mm) diameter concentric knockouts located in top of box.
3. **Primary low voltage entrance** - Quantity (3) 1.125" (28mm) diameter knockouts located in bottom of unit.
4. **Secondary low voltage entrance** - Quantity (3) 1.125" (28mm) diameter knockouts located in top of box.
5. **Three-phase electrical service** - Terminals are on high voltage terminal block (disregard if unit has optional disconnect switch). Three-phase service not by Emerson.
6. **Earth ground** - Terminal for field-supplied earth grounding wire.
7. **Remote unit shutdown** - Replace existing jumper between Terminals 37 & 38 with field-supplied normally closed switch having a minimum 75VA, 24VAC rating. Use field-supplied Class 1 wiring.
8. **Customer alarm inputs** - Terminals for field-supplied, normally open contacts, having a minimum 75VA, 24VAC rating, between Terminals 24 & 50, 51, 55, 56. Use field-supplied Class 1 wiring. Terminal availability varies by unit options.
9. **SiteScan** - Terminals 77(-) & 78(+) for a 2-wire, twisted-pair, communication cable (available from Emerson) to optional SiteScan.
10. **Common alarm** - On any alarm, normally open dry contact is closed across Terminals 75 & 76 for remote indication. 1A, 24VAC max load. Use Class 1 field-supplied wiring.
11. **Heat rejection interlock** - On any call for compressor operation, normally open dry contact is closed across Terminals 70 & 71 to heat rejection equipment. 1A, 24VAC max load. Use Class 1 field-supplied wiring.

OPTIONAL ELECTRICAL CONNECTIONS

12. **Factory-installed disconnect switch**.
13. **Secondary disconnect switch and earth ground**.
14. **Three-phase electrical service** - Terminals are on top of disconnect switch. Three-phase service not by Emerson.
15. **Smoke sensor alarm** - Factory-wired dry contacts from smoke sensor are 91-common, 92-NO, and 93-NC. Supervised contacts, 80 & 81, open on sensor trouble indication. This smoke sensor is not intended to function as, or replace, any room smoke detection system that may be required by local or national codes. 1A, 24VAC max load. Use Class 1 field-supplied wiring.
16. **Reheat and humidifier lockout** - Remote 24VAC required at Terminals 82 & 83 for lockout of reheat and humidifier.
17. **Condensate alarm (with condensate pump option)** - On pump high water indication, normally open dry contact is closed across Terminals 88 & 89 for remote indication. 1A, 24VAC max load. Use Class 1 field-supplied wiring.
18. **Analog inputs** - Terminals for up to two customer-supplied analog inputs. Device 1 wires to 41(-) and 42(+). Device 2 wires to 43(-) and 44(+).
19. **Remote humidifier** - On any call for humidification, normally open dry contact is closed across Terminals 11 & 12 to signal field-supplied remote humidifier. 1A, 24VAC max load. Use Class 1 field-supplied wiring.
20. **Auxiliary cool contact** - On any call for Econ-O-Coil operation, normally open dry contact is closed across Terminals 72 & 73 on Dual-Cool units only. 1A, 24VAC max load. Use Class 1 field-supplied wiring.

OPTIONAL LOW VOLTAGE TERMINAL PACKAGE CONNECTIONS

21. **Remote unit shutdown** - Two additional contact pairs available for unit shutdown (labeled as 37B & 38B, 37C & 38C). Replace jumpers with field-supplied normally closed switch having a minimum 75VA, 24VAC rating. Use field-supplied Class 1 wiring.
22. **Common alarm** - On any alarm, two additional normally open dry contacts are closed across Terminals 94 & 95 and 96 & 97 for remote indication. 1A, 24VAC max load. Use Class 1 field-supplied wiring.
23. **Main fan auxiliary switch** - On closure of main fan contactor, normally open dry contact is closed across Terminals 84 & 85 for remote indication. 1A, 24VAC max load. Use Class 1 field-supplied wiring.
24. **Liebert Liqui-tect™ shutdown and dry contact** - On Liebert Liqui-tect activation, normally open dry contact is closed across Terminals 58 & 59 for remote indication (Liebert Liqui-tect sensor ordered separately). 1AMP, 24VAC max load. Use Class 1 field-supplied wiring.

Note: Refer to specification sheet for total unit full load amps, wire size amps and max overcurrent protective device size.

DOWNFLOW, AIR-COOLED, 28-42KW (8-12 TON)—SEMI-HERMETIC COMPRESSORS

Figure 3 Dimensions - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic

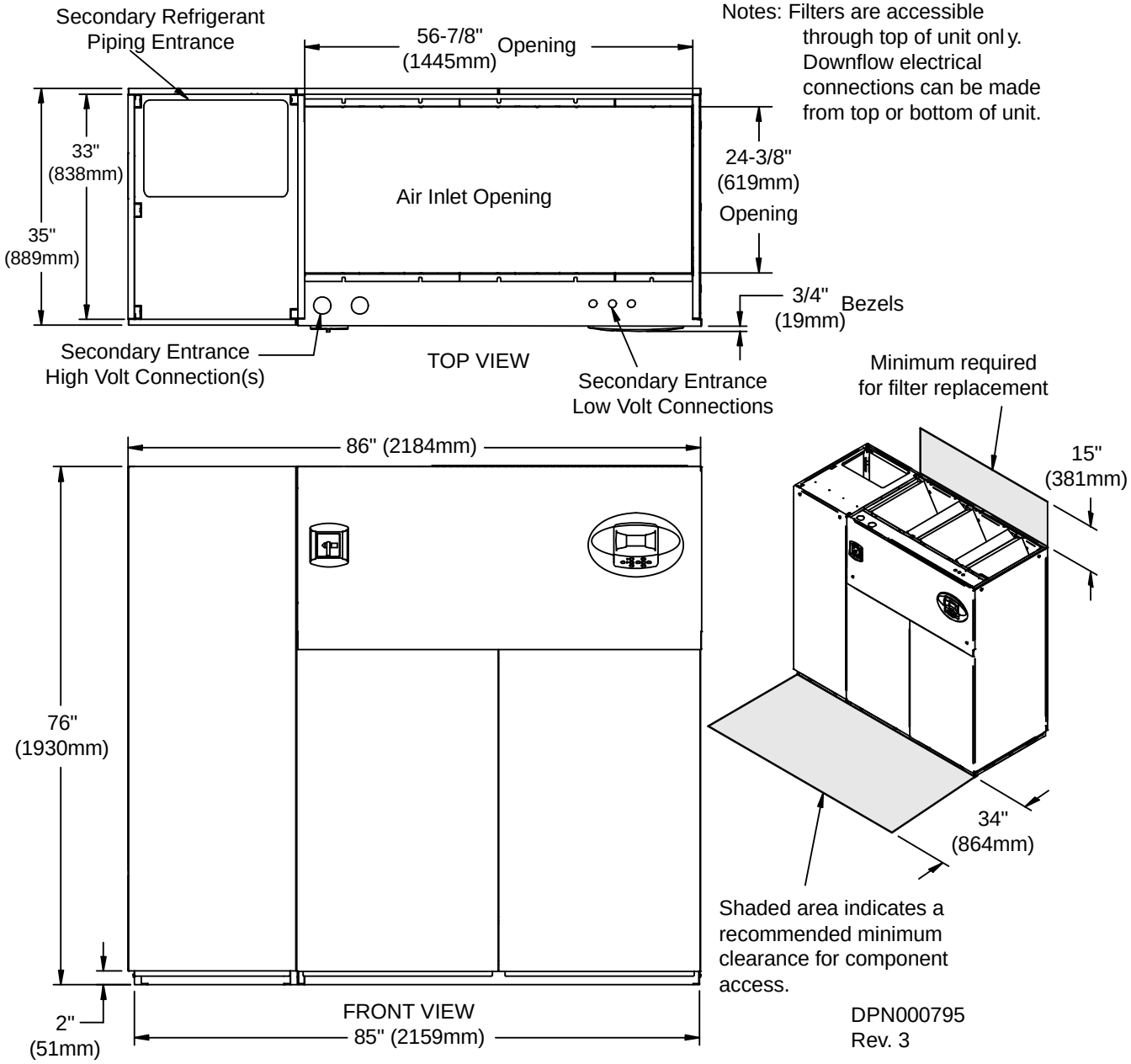


Table 11 Weights - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic

Dry Weight, Approximate, lb. (kg)	
Model Type	**Model Size: 028-042**
Air-Cooled	1780 (809)
Dual-Cool	1930 (877)

Figure 4 Primary connection locations - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic

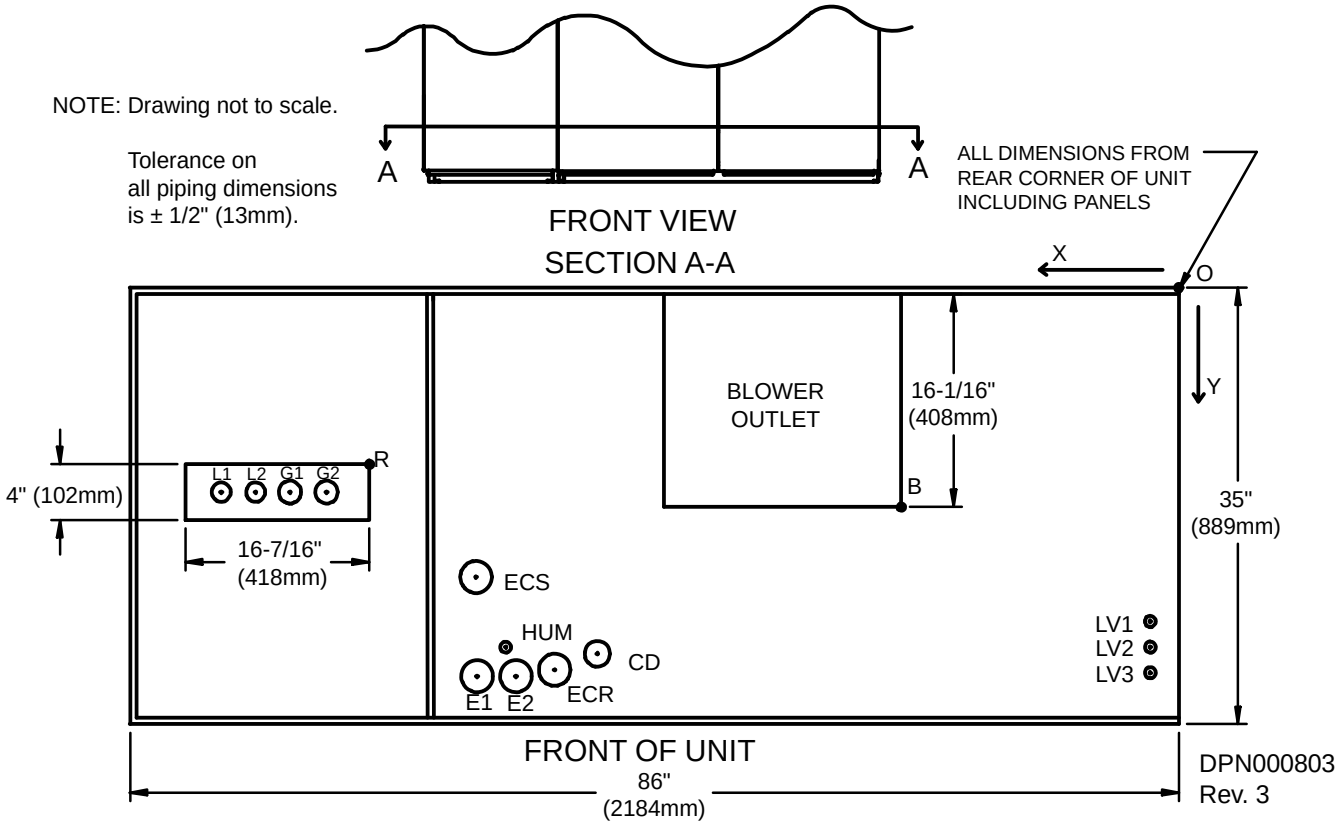
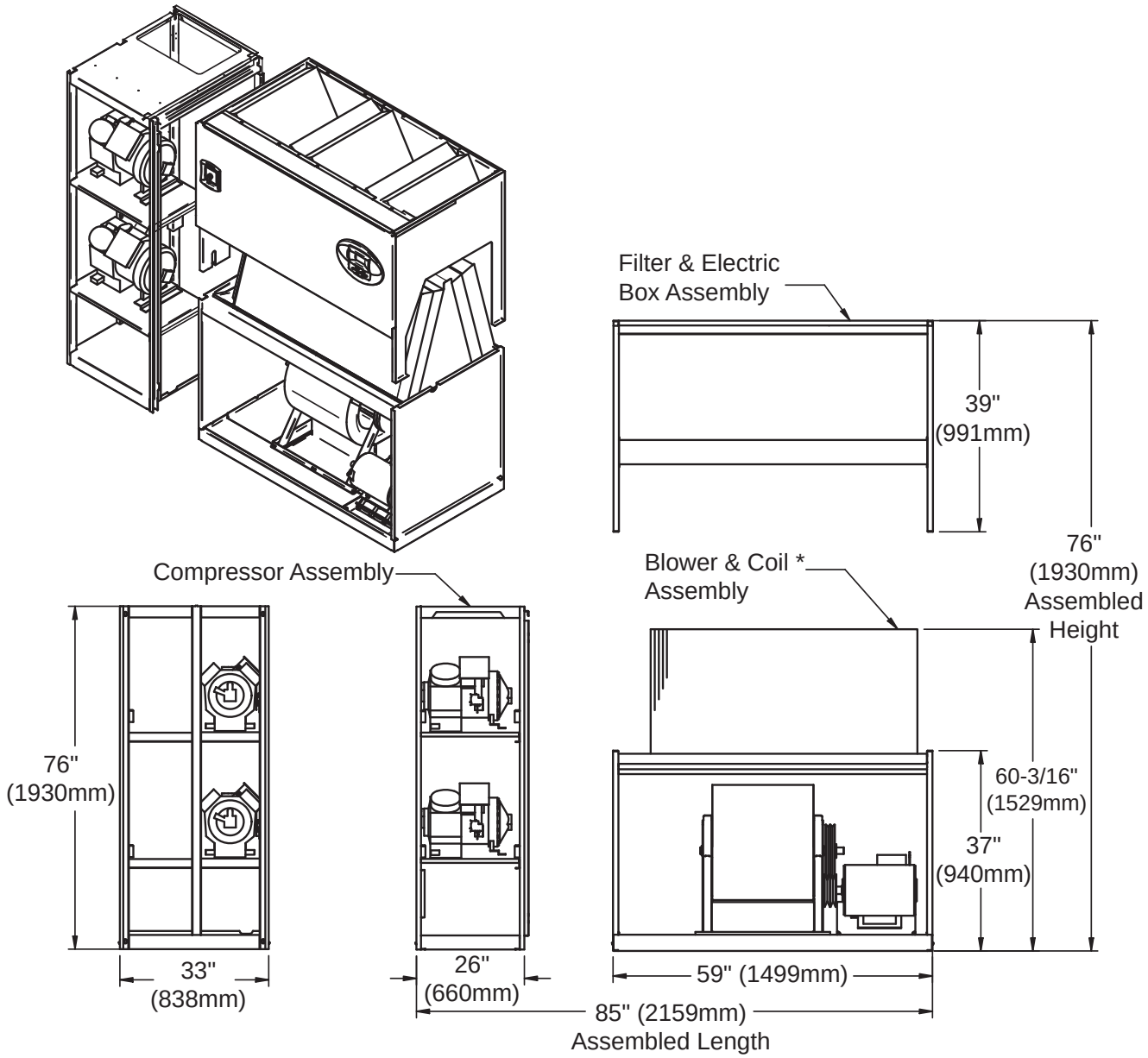


Table 12 Piping data - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic

Point	Description	X in. (mm)	Y in. (mm)	Connection Size / Opening in. (mm)
R	Refrigerant Access	63 (1600)	13-13/16 (351)	16-7/16 x 4 (418 x 102)
L1	Liquid Line System 1	79-3/16 (2011)	16-3/4 (425)	1/2" Cu Sweat
L2	Liquid Line System 2	76-1/2 (1943)	16-3/4 (425)	1/2" Cu Sweat
G1	Hot Gas Discharge 1	73-7/8 (1876)	16-3/4 (425)	5/8" Cu Sweat
G2	Hot Gas Discharge 2	70-1/8 (1780)	16-3/4 (425)	5/8" Cu Sweat
CD	Condensate Drain (infrared humidifier or no humidifier)*	46 (1168)	29-1/2 (749)	3/4" FPT
	Condensate Drain (steam generating humidifier)*	46 (1168)	29-1/2 (749)	1-1/4" FPT
	W/ Optional Pump	46 (1168)	29-1/2 (749)	1/2" Cu Sweat
HUM	Humidifier Supply Line	53-1/2 (1359)	29 (737)	1/4" Cu Sweat
ECS	Econ-O-Coil Supply	54-7/8 (1394)	22-9/16 (573)	1-5/8" Cu Sweat
ECR	Econ-O-Coil Return	49-3/8 (1254)	30-3/4 (781)	1-5/8" Cu Sweat
E1	Electrical Conn. (High Volt)	55-1/2 (1410)	31-1/4 (794)	2-1/2"
E2	Electrical Conn. (High Volt)	52-7/16 (1332)	31-1/4 (794)	2-1/2"
LV1	Electrical Conn. (Low Volt)	2-1/4 (57)	27 (686)	7/8"
LV2	Electrical Conn. (Low Volt)	2-1/4 (57)	29 (737)	7/8"
LV3	Electrical Conn. (Low Volt)	2-1/4 (57)	31 (787)	7/8"
B	Blower Outlet	21-15/16 (558)	18-1/16 (459)	18-3/4 x 16-1/16 (476 x 408)

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

Figure 5 Disassembly dimensions - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic



NOTES: Drawing views are simplified with panels removed to show overall dimensions. See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

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Table 13 Component weights - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic

Dry Weight, Approximate, Including Panels, lb (kg)		
Component	**Air Cooled**	**Dual Cooled**
Compressor Assembly	800 (364)	800 (364)
Filter & Electric Box Assembly	210 (96)	210 (96)
Blower & Coil Assembly	770 (350)	920 (418)

DOWNFLOW, AIR-COOLED, 28-42KW (8-12 TON)—SCROLL OR DIGITAL SCROLL COMPRESSORS

Figure 6 Dimensions - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll

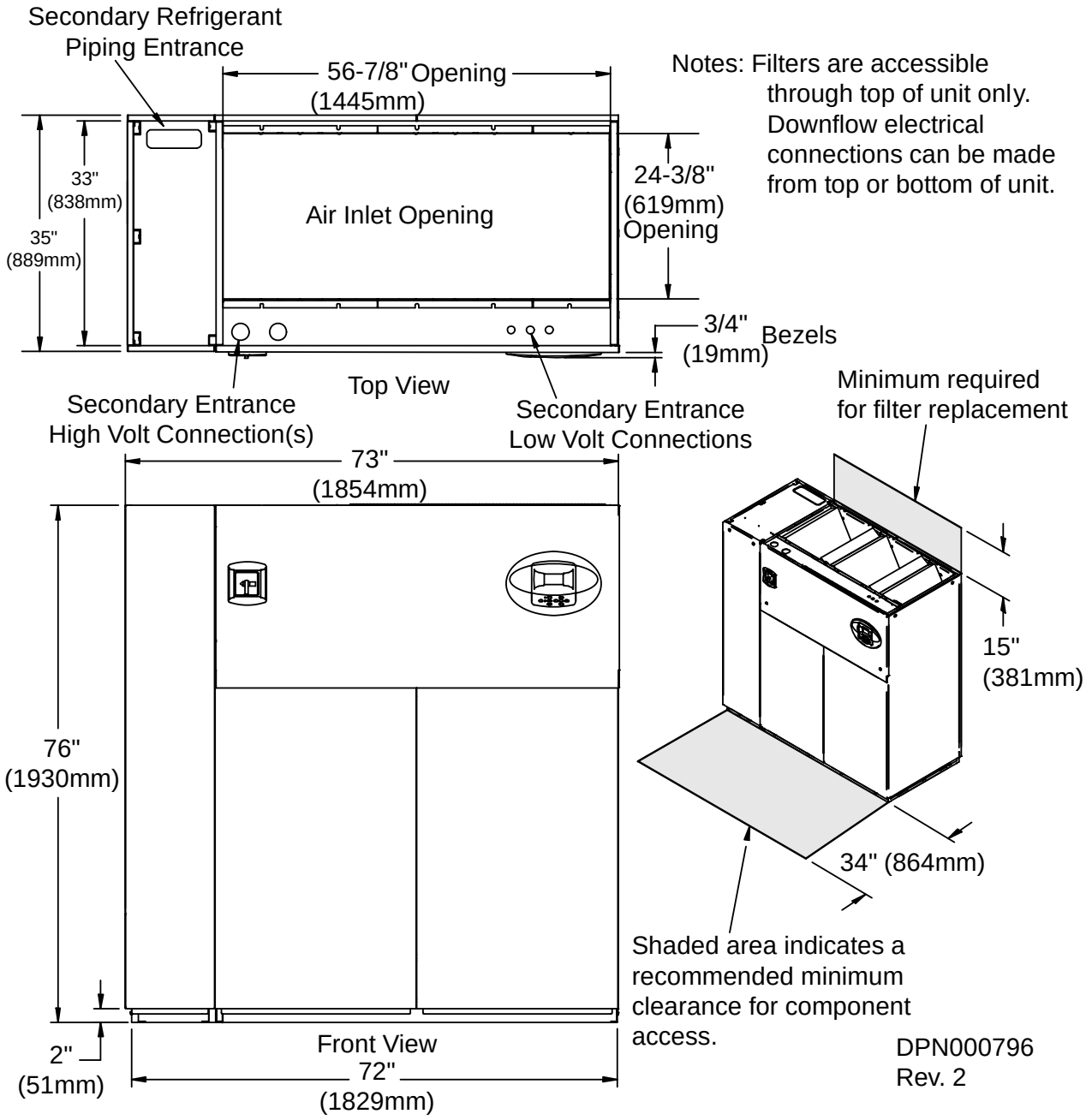


Table 14 Weights - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll

Dry Weight, Approximate, lb. (kg)	
Model Type	**Model Size: 028-042**
Air-Cooled	1470 (668)
Dual-Cool	1620 (736)

Figure 7 Primary connection locations - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll

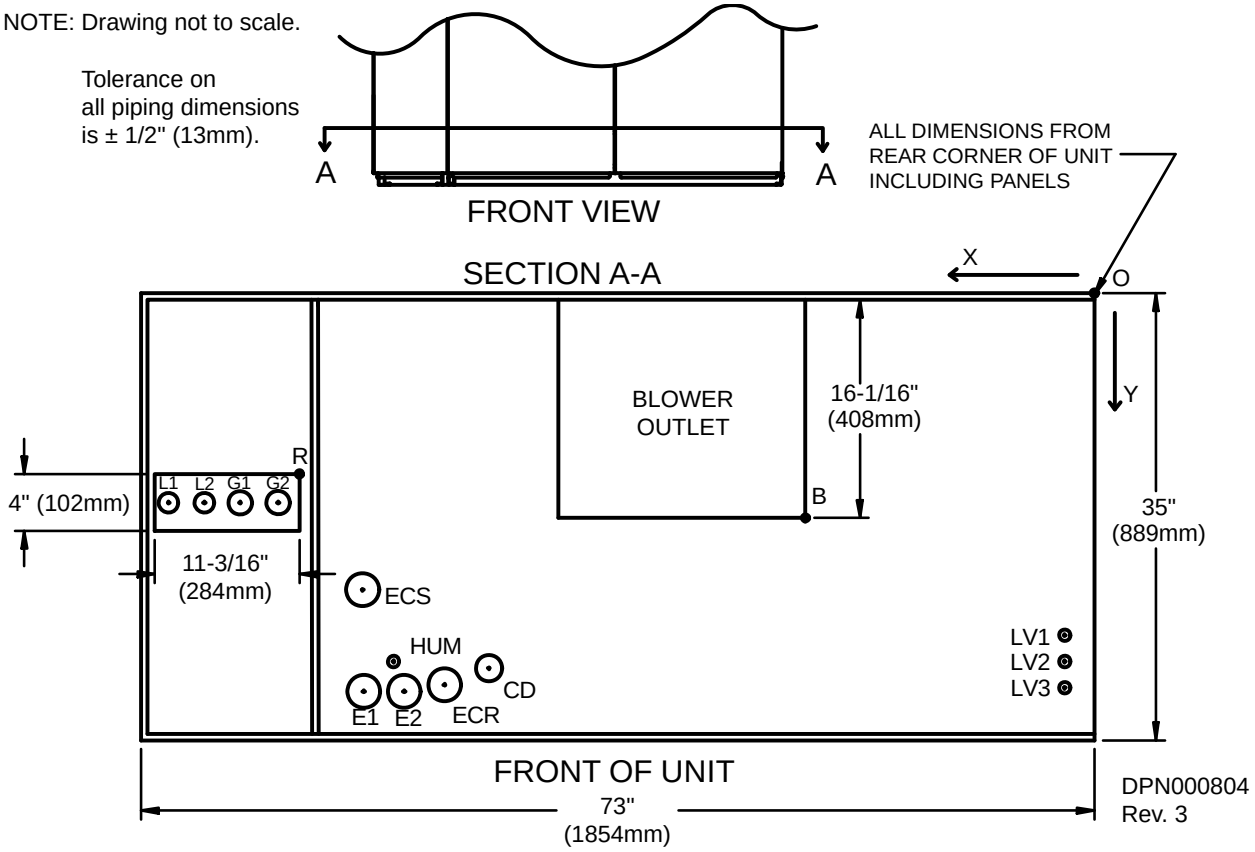
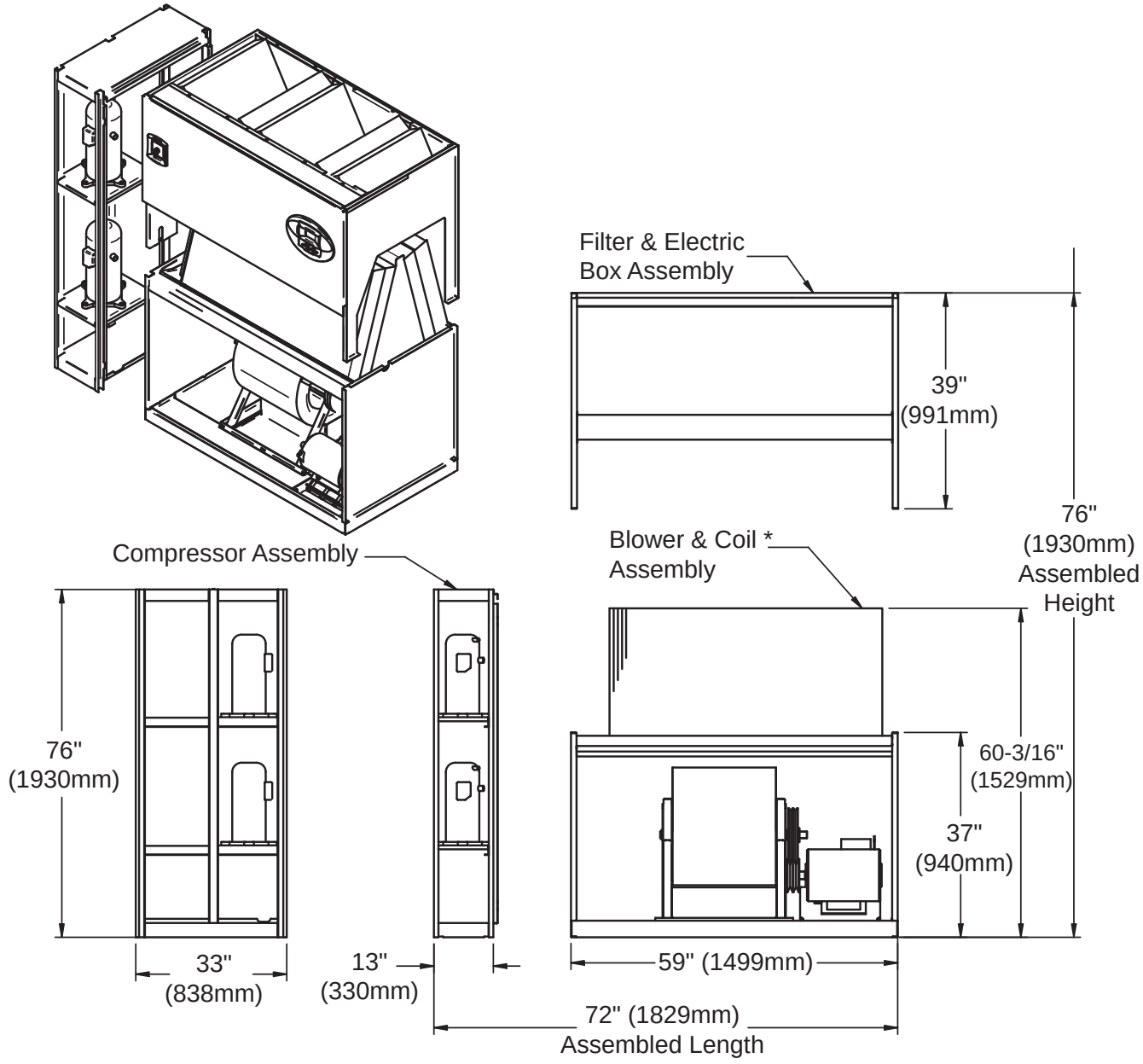


Table 15 Piping data - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll

Point	Description	X in. (mm)	Y in. (mm)	Connection Size / Opening in. (mm)
R	Refrigerant Access	59-5/16 (1507)	14-3/4 (375)	11-3/16 x 4 (284 x 102)
L1	Liquid Line System 1	69-15/16 (1776)	16-13/16 (411)	1/2" Cu Sweat
L2	Liquid Line System 2	67-5/8 (1718)	16-13/16 (411)	1/2" Cu Sweat
G1	Hot Gas Discharge 1	65-1/2 (1664)	16-13/16 (411)	5/8" Cu Sweat
G2	Hot Gas Discharge 2	62-7/16 (1586)	16-13/16 (411)	5/8" Cu Sweat
CD	Condensate Drain (infrared humidifier or no humidifier) *	46 (1168)	29-1/2 (749)	3/4" FPT
	Condensate Drain (steam generating humidifier)*	46 (1168)	29-1/2 (749)	1-1/4" FPT
	W/ Optional Pump	46 (1168)	29-1/2 (749)	1/2" Cu Sweat
HUM	Humidifier Supply Line	53-1/2 (1359)	29 (737)	1/4" Cu Sweat
ECS	Econ-O-Coil Supply	54-7/8 (1394)	22-9/16 (573)	1-5/8" Cu Sweat
ECR	Econ-O-Coil Return	49-3/8 (1254)	30-3/4 (781)	1-5/8" Cu Sweat
E1	Electrical Conn. (High Volt)	55-1/2 (1410)	31-1/4 (794)	2-1/2"
E2	Electrical Conn. (High Volt)	52-7/16 (1332)	31-1/4 (794)	2-1/2"
LV1	Electrical Conn. (Low Volt)	2-1/4 (57)	27 (686)	7/8"
LV2	Electrical Conn. (Low Volt)	2-1/4 (57)	29 (737)	7/8"
LV3	Electrical Conn. (Low Volt)	2-1/4 (57)	31 (787)	7/8"
B	Blower Outlet	21-15/16 (557)	18-1/16 (459)	18-3/4 x 16-1/16 (476 x 408)

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

Figure 8 Disassembly dimensions - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

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Table 16 Component weights - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll

Dry Weight, Approximate, lb. (kg)		
Component	**Air Cooled**	**Dual Cool**
Compressor Assembly	490 (223)	490 (223)
Filter & Electric Box Assembly	210 (96)	210 (96)
Blower & Coil Assembly	770 (350)	920 (418)

DOWNFLOW, WATER/GLYCOL/GLYCOOL, 28-42KW (8-12 TON)—ALL COMPRESSORS

Figure 9 Dimensions - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all

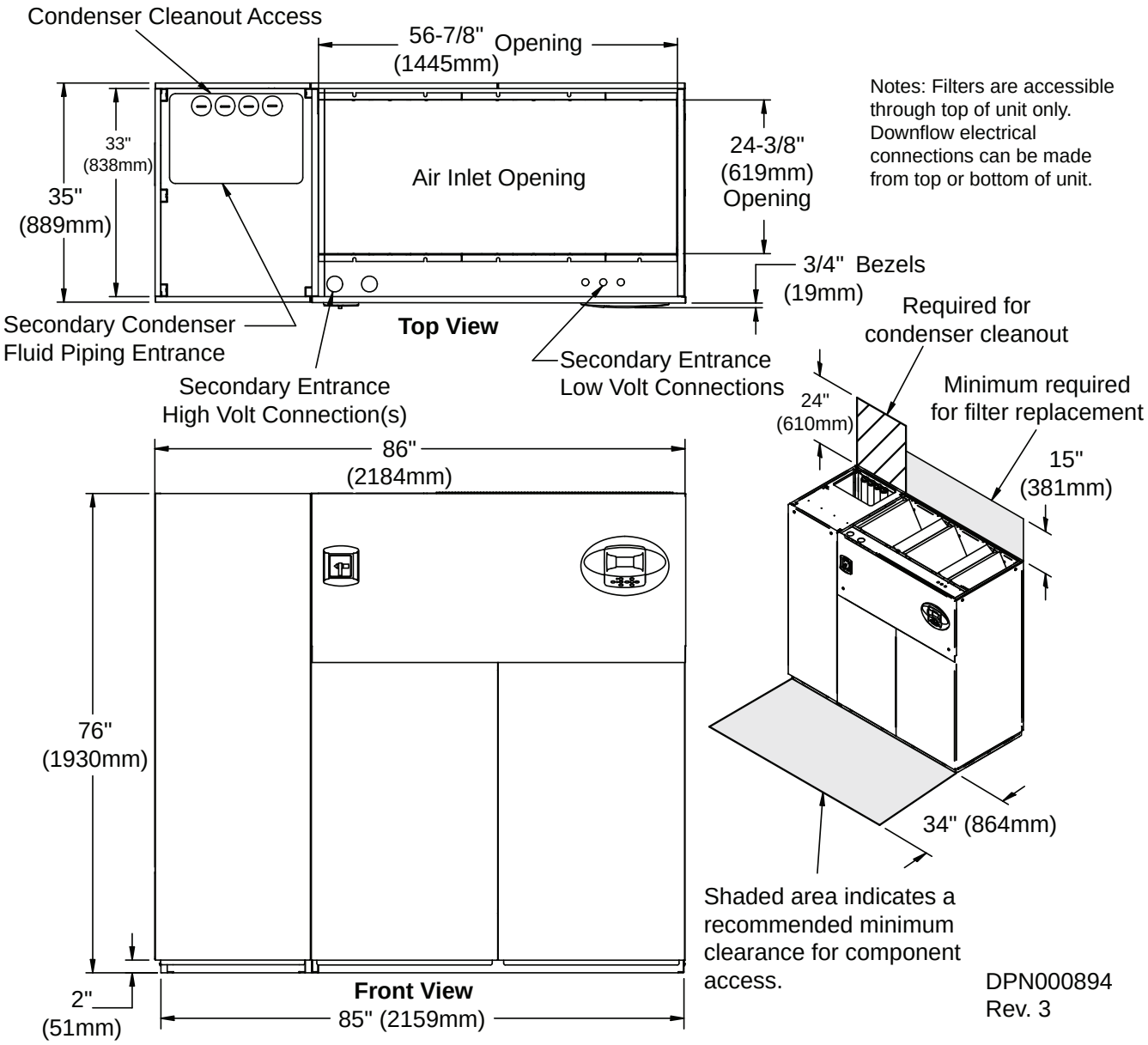


Table 17 Weights - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all

Dry Weight, Approximate, lb. (kg)		
Model Type		**Model Size: 028-042**
Semi-Hermetic Compressor	Water/Glycol	1930 (877)
	GLYCOOL/Dual-Cool	2080 (945)
Scroll or Digital Scroll Compressor	Water/Glycol	1780 (809)
	GLYCOOL/Dual-Cool	1930 (877)

Figure 10 Primary connection locations - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all

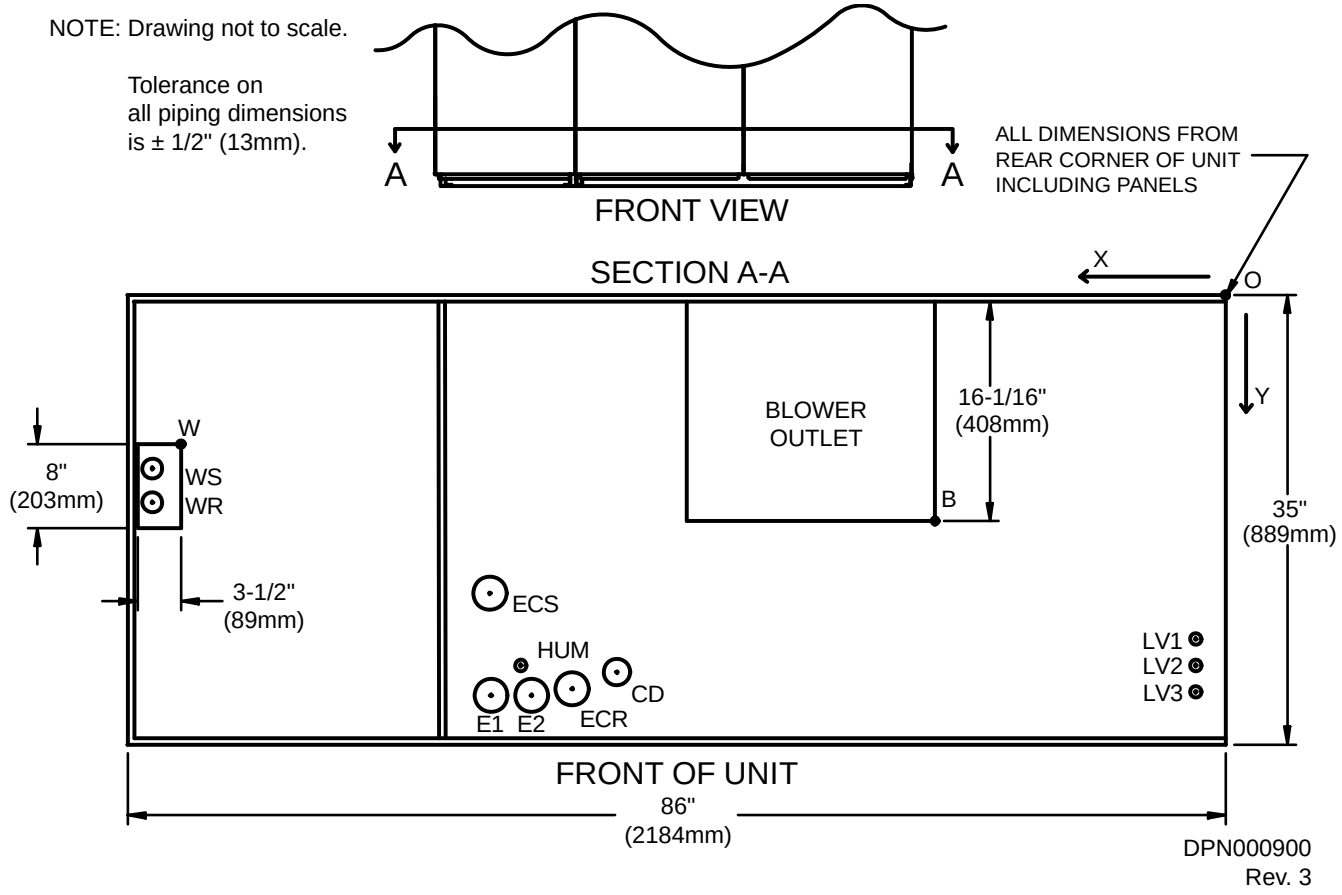
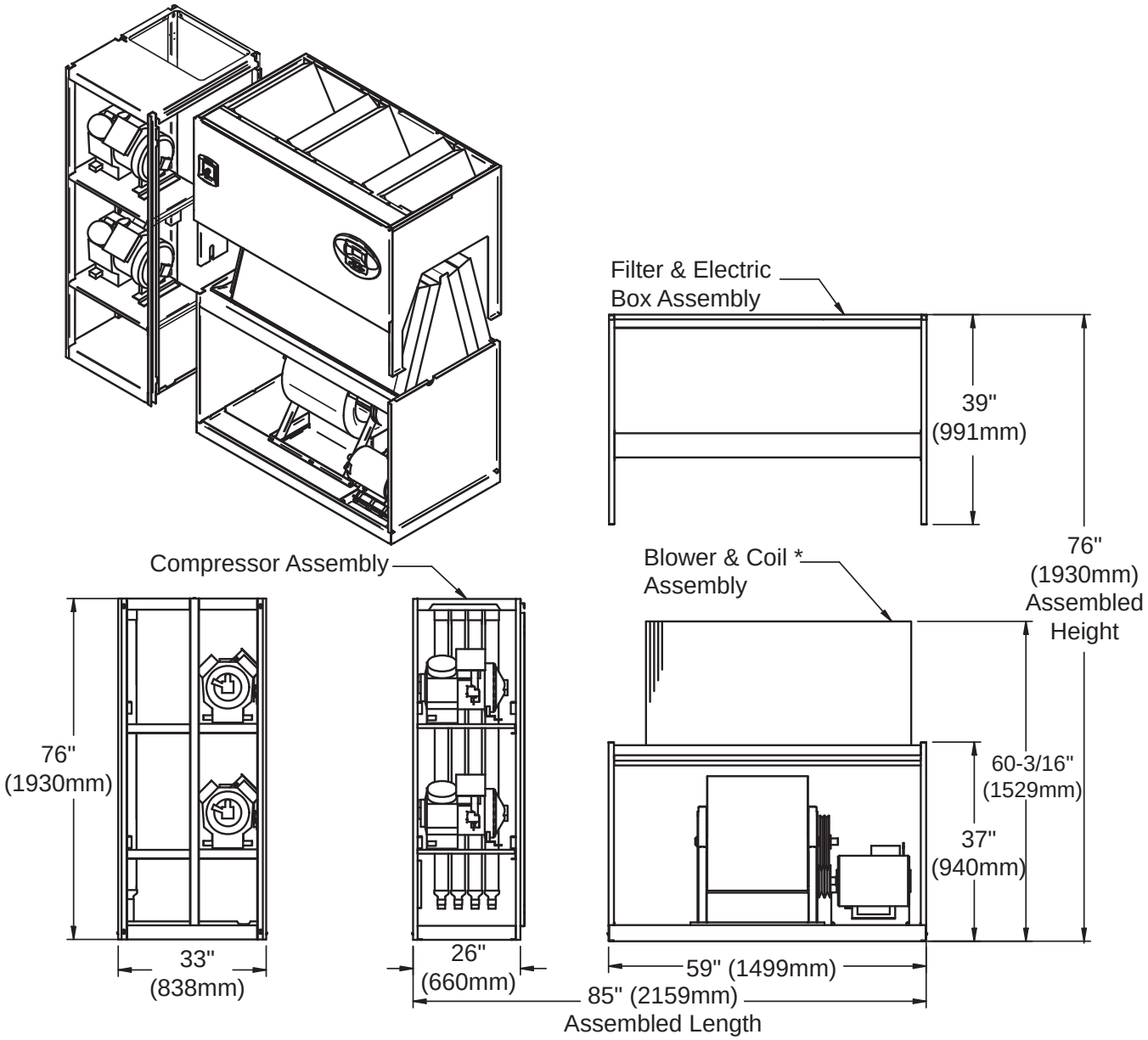


Table 18 Piping data - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all

Point	Description	X in. (mm)	Y in. (mm)	Connection Size / Opening in. (mm)
W	Water/Glycol/GLYCOOL Access	79-15/16 (2030)	9-1/16 (230)	3-1/2 x 8 (89 x 203)
WS	Water/Glycol/GLYCOOL Supply	82-15/16 (2107)	10-15/16 (278)	1-5/8" Cu Sweat
WR	Water/Glycol/GLYCOOL Return	82-15/16 (2107)	14-1/16 (357)	1-5/8" Cu Sweat
CD	Condensate Drain (infrared humidifier or no humidifier) *	46 (1168)	29-1/2 (749)	3/4" FPT
	Condensate Drain (steam generating humidifier) *	46 (1168)	29-1/2 (749)	1-1/4" FPT
	W/ Optional Pump	46 (1168)	29-1/2 (749)	1/2" Cu Sweat
HUM	Humidifier Supply Line	53-1/2 (1359)	29 (737)	1/4" Cu Sweat
ECS	Econ-O-Coil Supply	54-7/8 (1394)	22-9/16 (573)	1-5/8" Cu Sweat
ECR	Econ-O-Coil Return	49-13/16 (1265)	28-1/2 (724)	1-5/8" Cu Sweat
E1	Electrical Conn. (High Volt)	55-1/2 (1410)	31-1/4 (794)	2-1/2"
E2	Electrical Conn. (High Volt)	52-7/16 (1332)	31-1/4 (794)	2-1/2"
LV1	Electrical Conn. (Low Volt)	2-1/4 (57)	27 (686)	7/8"
LV2	Electrical Conn. (Low Volt)	2-1/4 (57)	29 (737)	7/8"
LV3	Electrical Conn. (Low Volt)	2-1/4 (57)	31 (787)	7/8"
B	Blower Outlet	21-15/16 (557)	18-1/16 (459)	18-3/4 x 16-1/16 (476 x 408)

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

Figure 11 Disassembly dimensions - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

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Table 19 Component weights - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all

Dry Weight, Approximate, Including Panels, lb (kg)				
	Semi-Hermetic Compressor		Scroll or Digital Scroll Compressor	
Component	**Water/Glycol**	**GLYCOOL/Dual-Cool**	**Water/Glycol**	**GLYCOOL/Dual-Cool**
Compressor Assembly	950 (432)	950 (432)	800 (364)	800 (364)
Filter & Electric Box Assembly	210 (96)	210 (96)	210 (96)	210 (96)
Blower & Coil Assembly	770 (350)	920 (418)	770 (350)	920 (418)

DOWNFLOW, AIR-COOLED, 53-77KW (15-22 TON)—SEMI-HERMETIC COMPRESSORS

Figure 12 Dimensions - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic

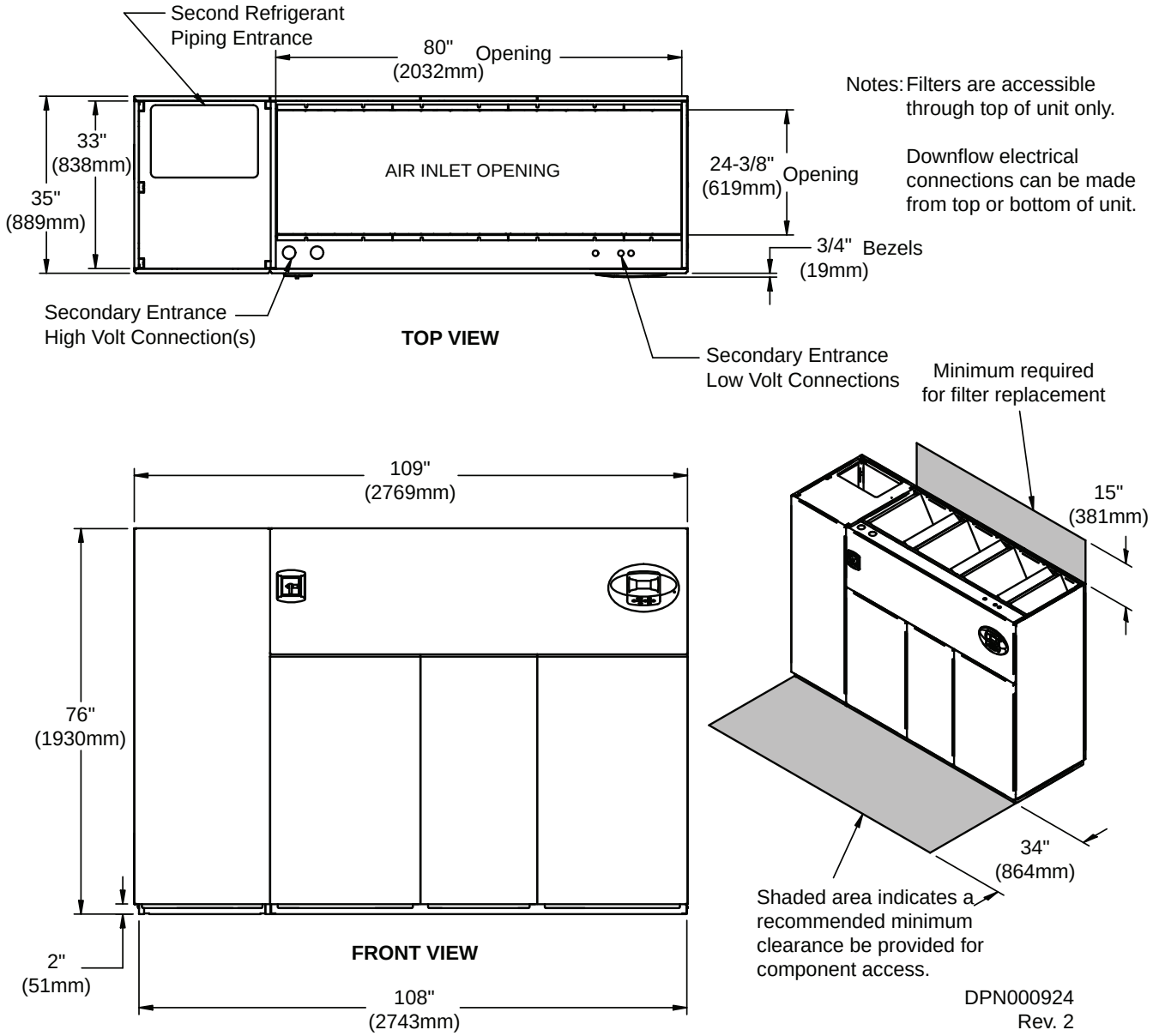


Table 20 Weights - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic

Dry Weight, Approximate, lb. (kg)			
	Model Size		
Model Type	053	070	077
Air-Cooled	2350 (1069)	2400 (1091)	2450 (1114)
Dual-Cool	2530 (1150)	2580 (1173)	2630 (1196)

Figure 13 Primary connection locations - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic

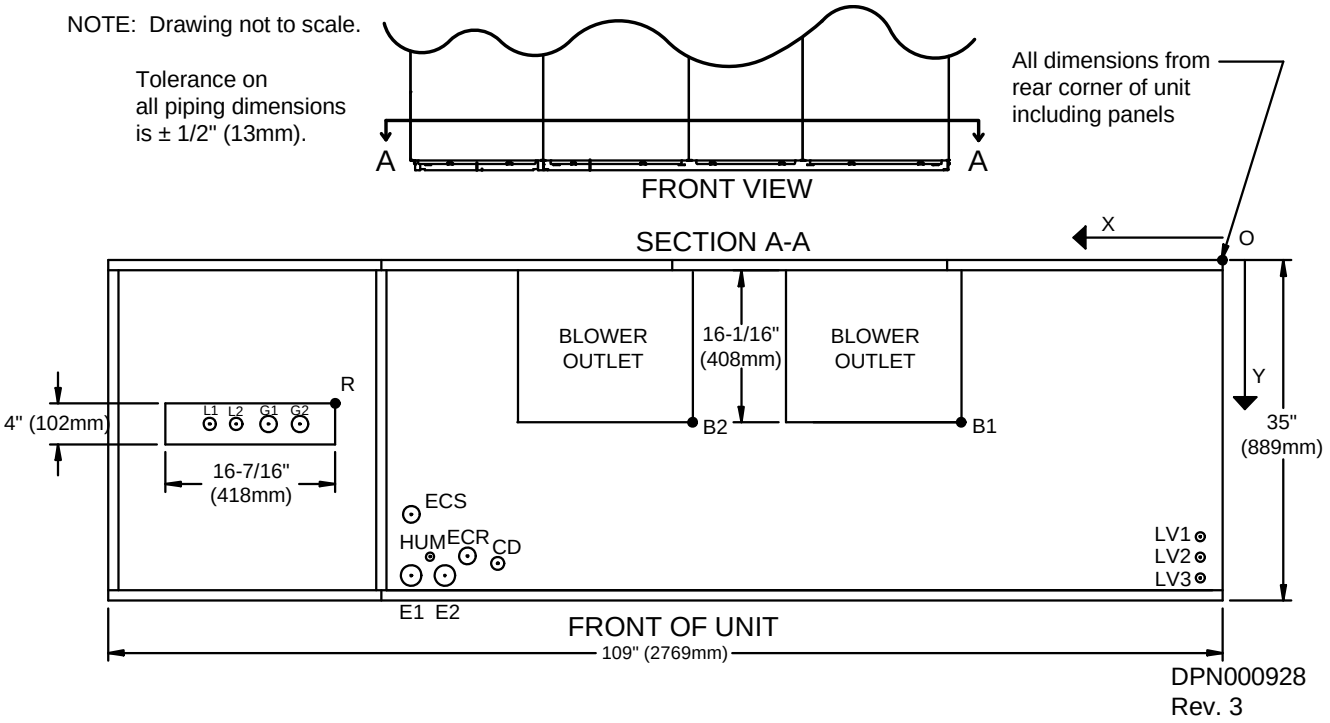


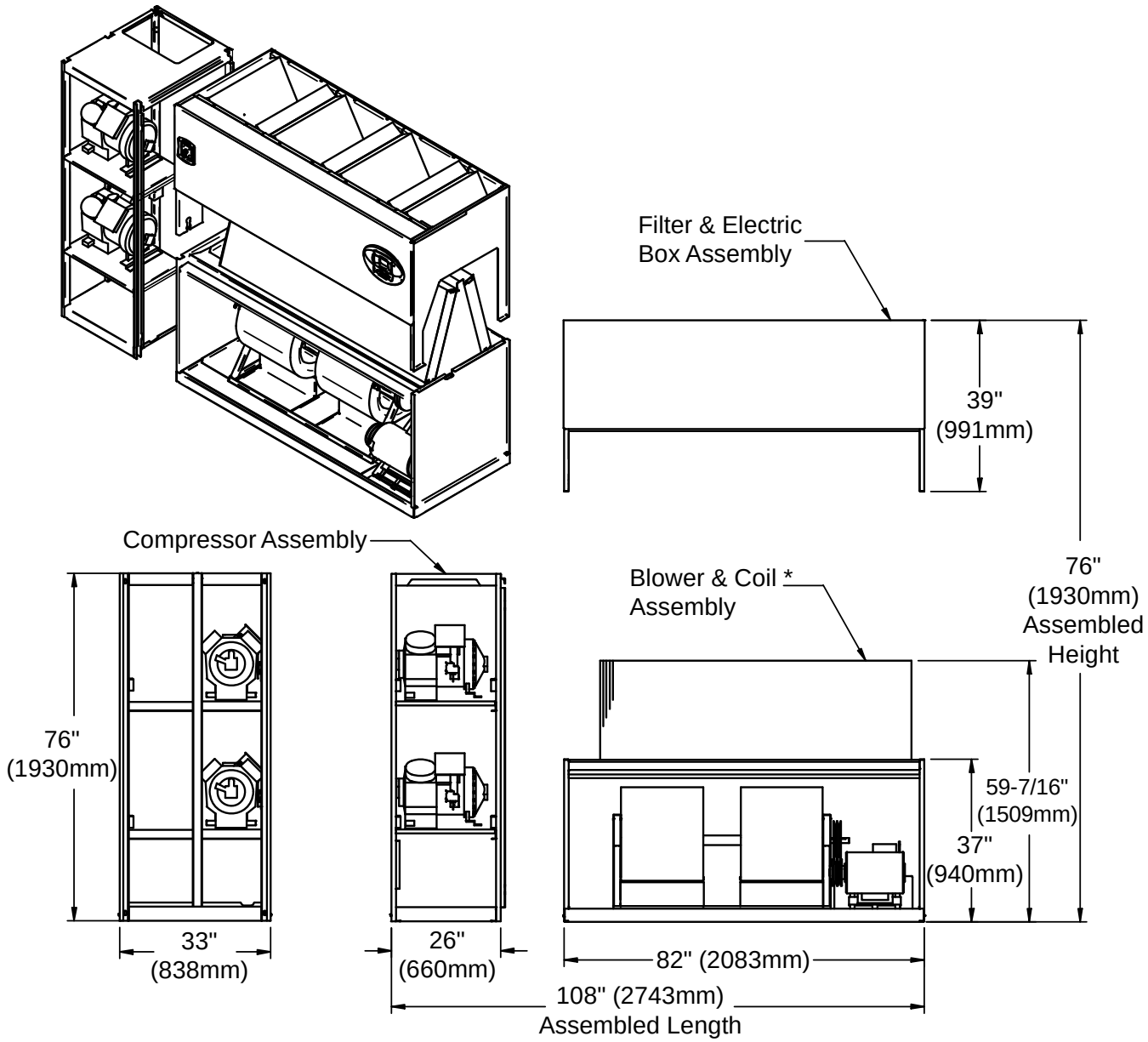
Table 21 Piping data - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic

Point	Description	X in. (mm)	Y in. (mm)	Connection Size / Opening in. (mm)
R	Refrigerant Access	82-3/4 (2102)	13-7/8 (352)	16-7/16 x 4 (418 x 102)
				53kW (15 tons) / 70 & 77kW (20 & 22 tons)
L1	Liquid Line System 1	97 (2464)	16-7/8 (428)	1/2" / 5/8" Cu Sweat
L2	Liquid Line System 2	93-5/16 (2370)	16-7/8 (428)	1/2" / 5/8" Cu Sweat
G1	Hot Gas Discharge 1	90-5/8 (2302)	16-5/8 (422)	7/8" / 1-1/8" Cu Sweat
G2	Hot Gas Discharge 2	88 (2235)	16-5/8 (422)	7/8" / 1-1/8" Cu Sweat
CD	Condensate Drain (infrared humidifier or no humidifier) *	69-1/4 (1759)	30 (762)	3/4" FPT
	Condensate Drain (steam generating humidifier)*	69-1/4 (1759)	30 (762)	1-1/4" FPT
	W/ Optional Pump	69-1/4 (1759)	30 (762)	1/2" Cu Sweat
HUM	Humidifier Supply Line	76-1/2 (1943)	29 (736)	1/4" Cu Sweat
ECS**	Econ-O-Coil Supply	78-5/8 (1997)	22-1/4 (565)	2-1/8" Cu Sweat
ECR**	Econ-O-Coil Return	72 (1829)	29 (737)	2-1/8" Cu Sweat
E1	Electrical Conn. (High Volt)	78-1/2 (1994)	31-1/8 (790)	2-1/2"
E2	Electrical Conn. (High Volt)	75-3/8 (1915)	31-1/8 (790)	2-1/2"
LV1	Electrical Conn. (Low Volt)	1-7/8 (48)	28-1/2 (724)	7/8"
LV2	Electrical Conn. (Low Volt)	1-7/8 (48)	30-1/4 (768)	7/8"
LV3	Electrical Conn. (Low Volt)	1-7/8 (48)	32 (813)	7/8"
B1	Blower Outlet (15 x 15)	23-1/8 (587)	18-1/16 (459)	18-3/4 x 16-1/16 (476 x 408)
	Blower Outlet (15 x 11)	27-3/4 (705)	18-1/16 (459)	14-3/4 x 16-1/16 (375 x 408)
B2	Blower Outlet (15 x 15)	50-3/8 (1280)	18-1/16 (459)	18-3/4 x 16-1/16 (476 x 408)
	Blower Outlet (15 x 11)	54-3/8 (1381)	18-1/16 (459)	14-3/4 x 16-1/16 (375 x 408)

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

** Supplied on Dual Cooling Systems only (4 pipe system)

Figure 14 Disassembly dimensions - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

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Table 22 Component weights - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic

Dry Weight, Approximate, Including Panels, lb (kg)		
Component	**Air Cooled**	**Dual Cool**
Compressor Assembly	970 (441)	970 (441)
Filter & Electric Box Assembly	250 (114)	250 (114)
Blower & Coil Assembly	1230 (560)	1410 (641)

DOWNFLOW, AIR-COOLED, 53-77KW (15-22 TON)—SCROLL OR DIGITAL SCROLL COMPRESSORS

Figure 15 Dimensions - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll

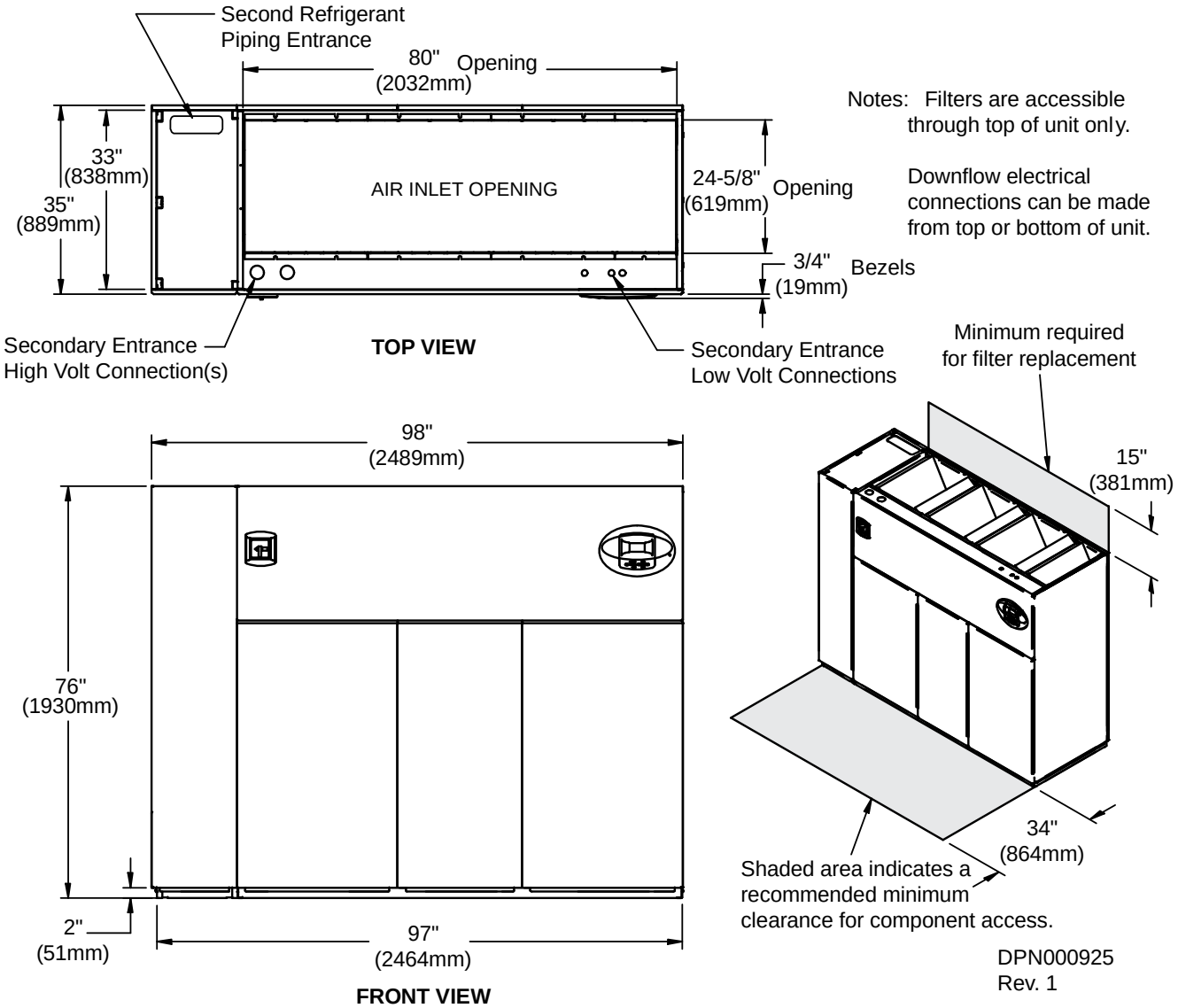


Table 23 Weights - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll

Dry Weight, Approximate, lb. (kg)			
	Model Size		
Model Type	053	070	077
Air-Cooled	1920 (873)	1970 (896)	2020 (919)
Dual-Cool	2100 (955)	2150 (978)	2200 (1000)

Figure 16 Primary connection locations - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll

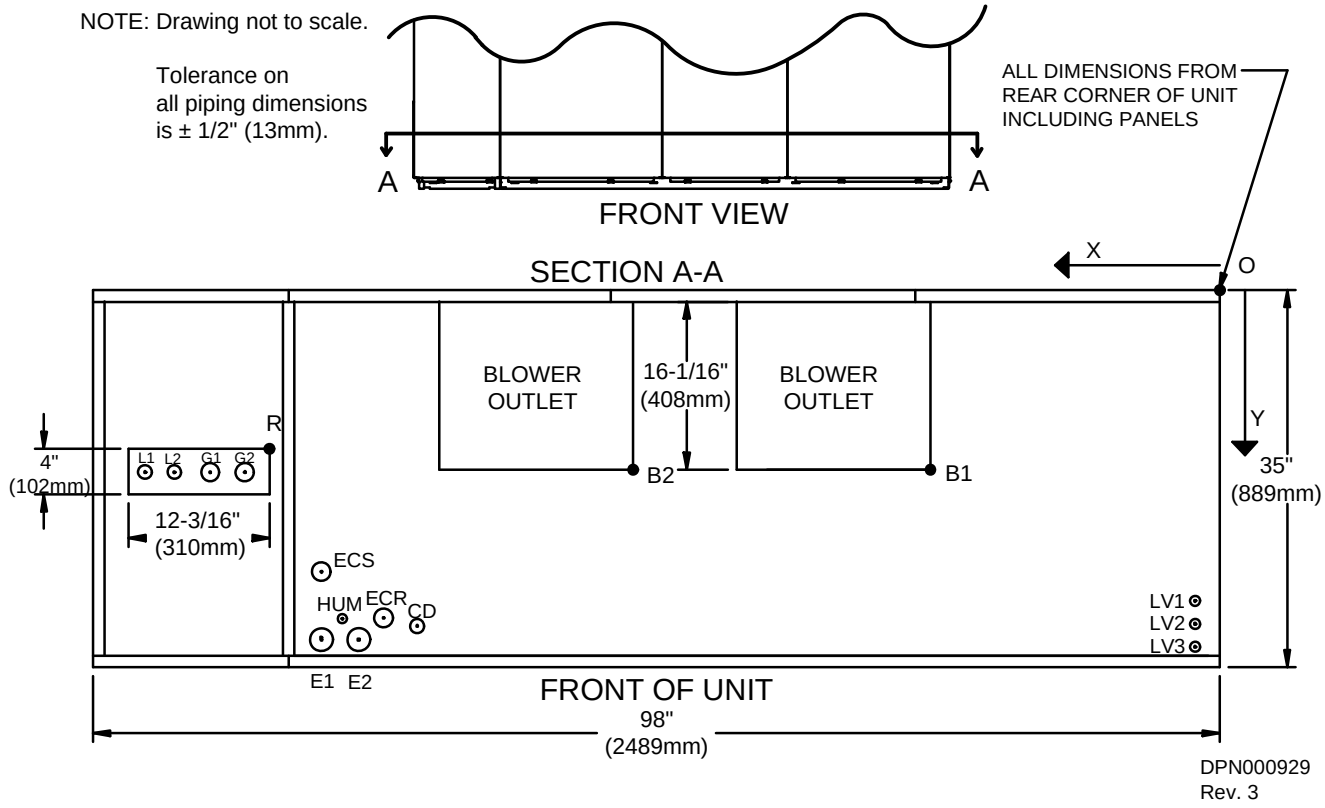


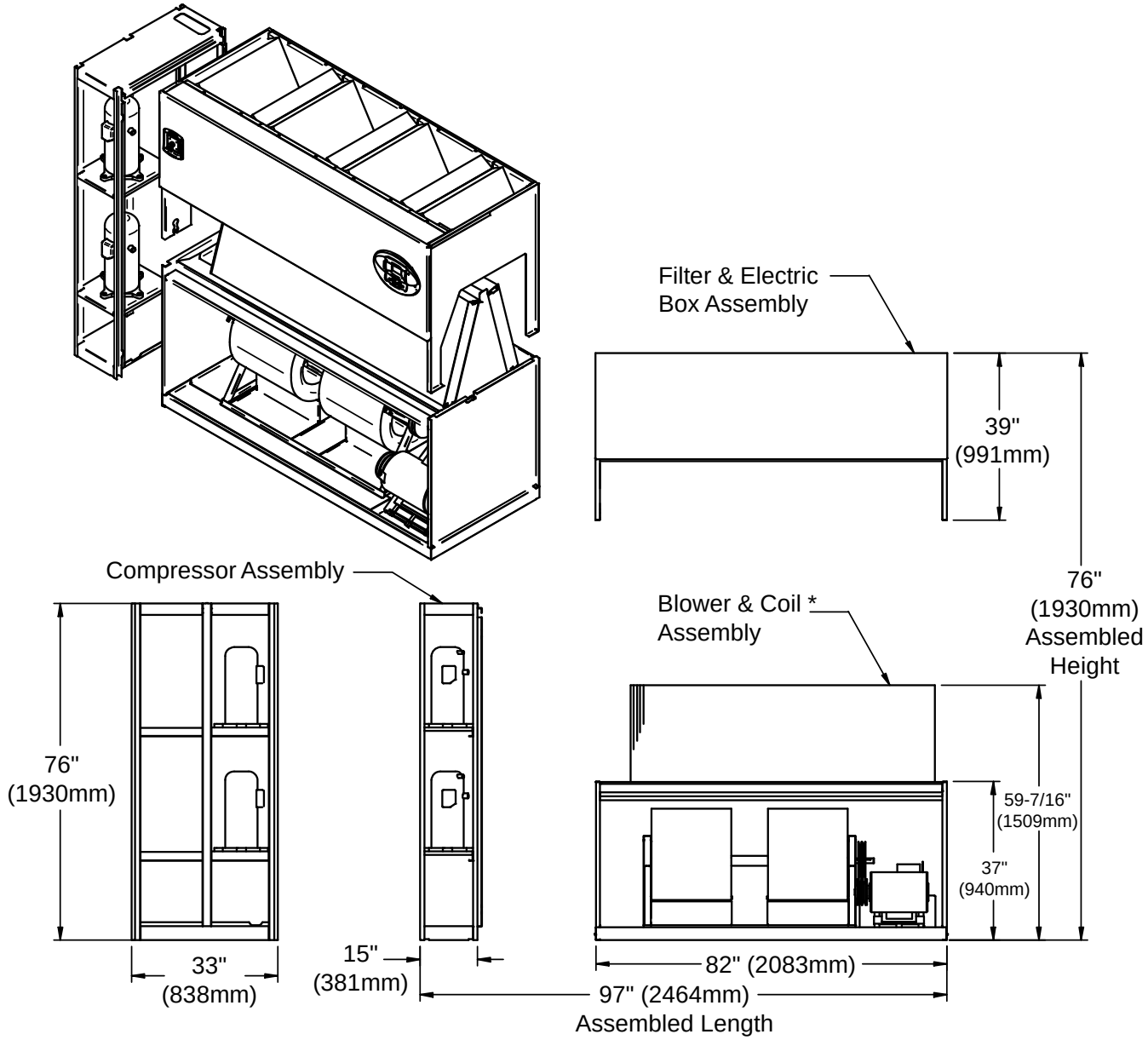
Table 24 Piping data - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll

Point	Description	X in. (mm)	Y in. (mm)	Connection Size / Opening in. (mm)
R	Refrigerant Access	81-3/4 (2076)	14-3/4 (374)	12-3/16 x 4 (310 x 102)
				53kW (15 tons) / 70&77kW (20&22 tons)
L1	Liquid Line System 1	94-11/16 (2405)	16-3/4 (425)	1/2" / 5/8" Cu Sweat
L2	Liquid Line System 2	91-7/8 (2334)	16-3/4 (425)	1/2" / 5/8" Cu Sweat
G1	Hot Gas Discharge 1	88-3/4 (2254)	16-3/8 (416)	7/8" / 1-1/8" Cu Sweat
G2	Hot Gas Discharge 2	85-9/16 (2173)	16-3/8 (416)	7/8" / 1-1/8" Cu Sweat
CD	Condensate Drain (infrared humidifier or no humidifier)*	69-1/4 (1759)	30 (762)	3/4" FPT
	Condensate Drain (steam generating humidifier)*	69-1/4 (1759)	30 (762)	1-1/4" FPT
	W/ Optional Pump	69-1/4 (1759)	30 (762)	1/2" Cu Sweat
HUM	Humidifier Supply Line	76-1/2 (1943)	29 (736)	1/4" Cu Sweat
ECS**	Econ-O-Coil Supply	78-5/8 (1997)	22-1/4 (565)	2-1/8" Cu Sweat
ECR**	Econ-O-Coil Return	72 (1829)	29 (737)	2-1/8" Cu Sweat
E1	Electrical Conn. (High Volt)	78-1/2 (1994)	31-1/8 (790)	2-1/2"
E2	Electrical Conn. (High Volt)	75-3/8 (1915)	31-1/8 (790)	2-1/2"
LV1	Electrical Conn. (Low Volt)	1-7/8 (48)	28-1/2 (724)	7/8"
LV2	Electrical Conn. (Low Volt)	1-7/8 (48)	30-1/4 (768)	7/8"
LV3	Electrical Conn. (Low Volt)	1-7/8 (48)	32 (813)	7/8"
B1	Blower Outlet (15 x 15)	23-1/8 (587)	18-1/16 (459)	18-3/4 x 16-1/16 (476 x 408)
	Blower Outlet (15 x 11)	27-3/4 (705)	18-1/16 (459)	14-3/4 x 16-1/16 (375 x 408)
B2	Blower Outlet (15 x 15)	50-3/8 (1280)	18-1/16 (459)	18-3/4 x 16-1/16 (476 x 408)
	Blower Outlet (15 x 11)	54-3/8 (1381)	18-1/16 (459)	14-3/4 x 16-1/16 (375 x 408)

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

** Supplied on Dual Cooling Systems only (4 pipe system)

Figure 17 Disassembly dimensions - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

DPN000927
Rev. 2

Table 25 Component weights - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll

Dry Weight, Approximate, Including Panels, lb (kg)		
Component	**Air-Cooled**	**Dual-Cool**
Compressor Assembly	540 (246)	540 (246)
Filter & Electric Box Assembly	250 (114)	250 (114)
Blower & Coil Assembly	1230 (560)	1410 (641)

DOWNFLOW, WATER/GLYCOL/GLYCOOL, 53-77KW (15-22 TON)—ALL COMPRESSORS

Figure 18 Dimensions - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all

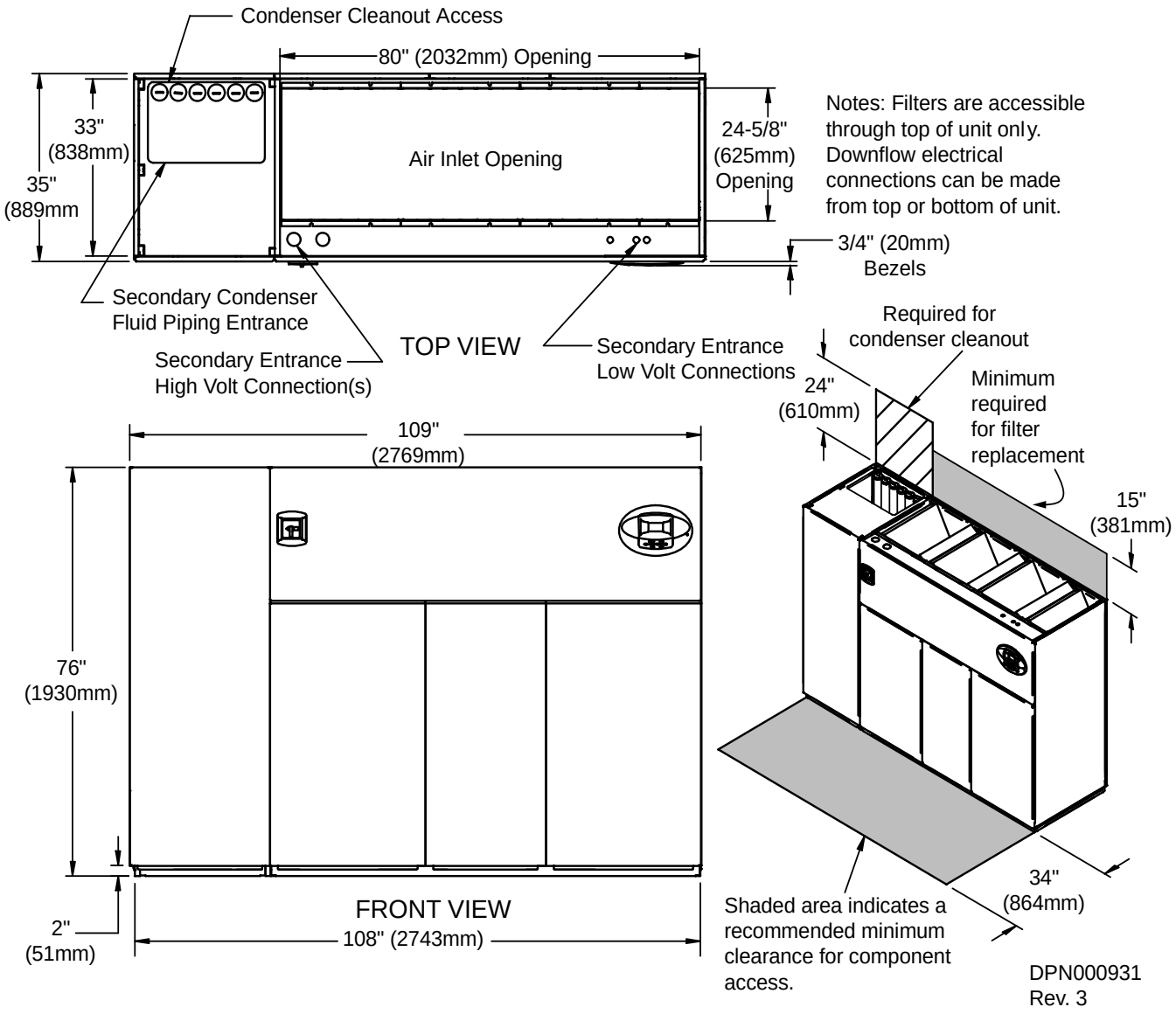


Table 26 Weights - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all

Dry Weight, Approximate, lb. (kg)				
		Model Size		
Model Type		053	070	077
Semi-Hermetic Compressor	Water/Glycol	2650 (1205)	2700 (1228)	2750 (1250)
	GLYCOOL/Dual-Cool	2830 (1287)	2880 (1310)	2930 (1332)
Scroll or Digital Scroll Compressor	Water/Glycol	2220 (1010)	2270 (1032)	2320 (1055)
	GLYCOOL/Dual-Cool	2400 (1091)	2450 (1114)	2500 (1137)

Figure 19 Primary connection locations - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all

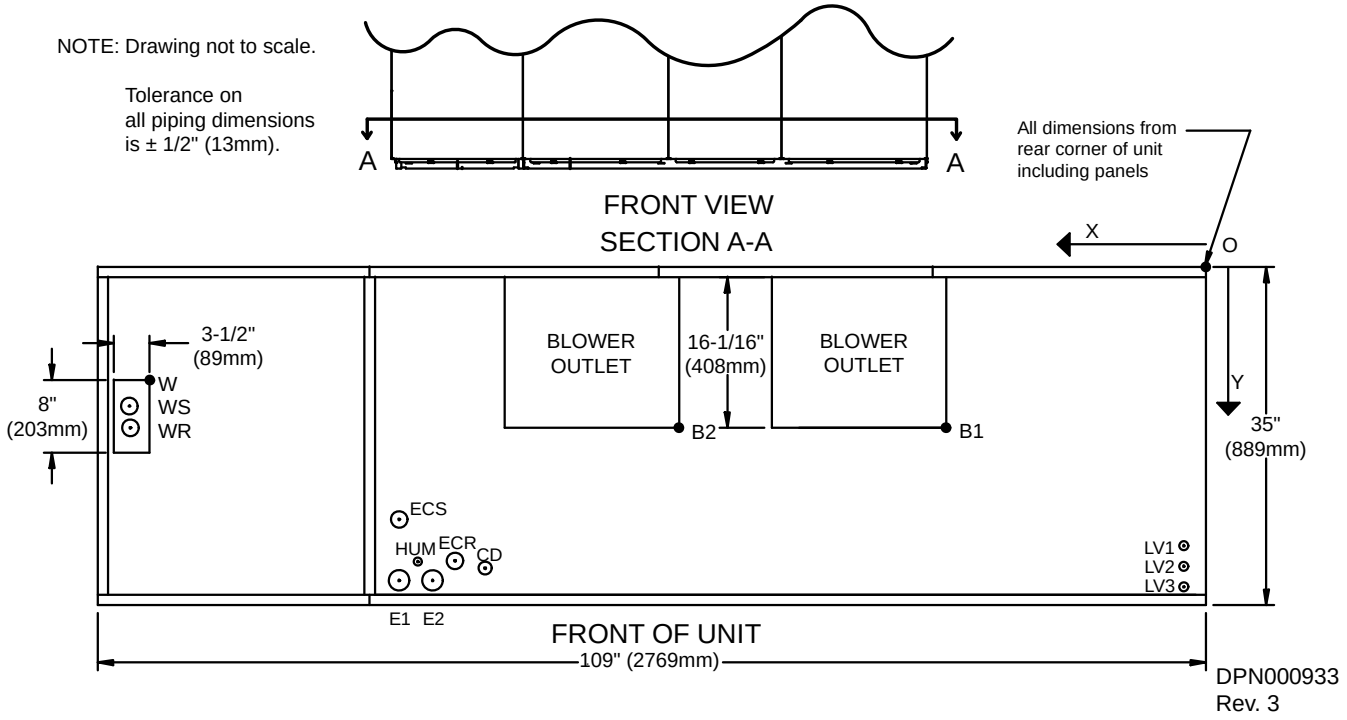


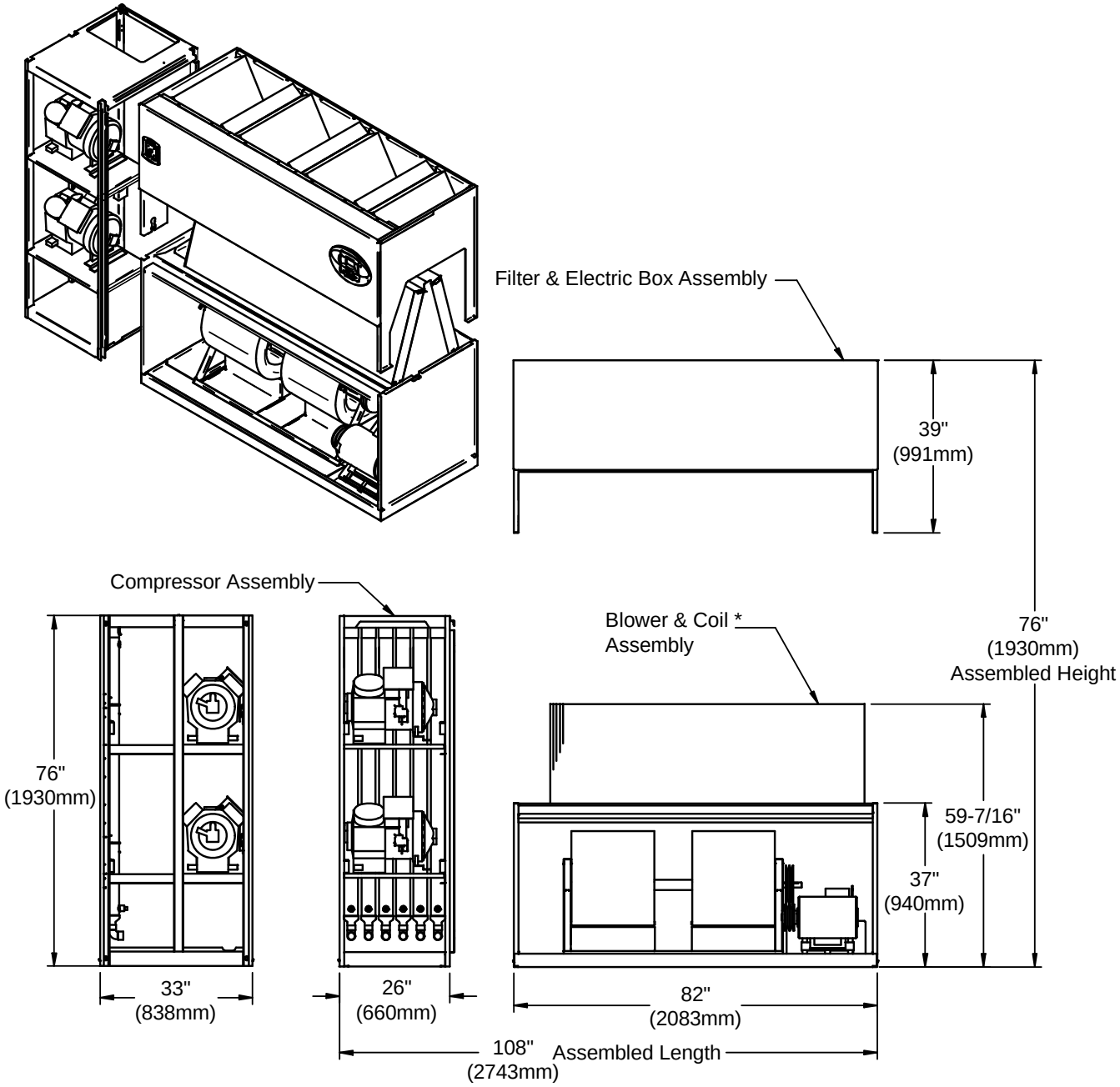
Table 27 Downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all

Point	Description	X in. (mm)	Y in. (mm)	Connection Size / Opening in. (mm)
W	Water/Glycol/GLYCOOL Access	103 (2616)	9 (229)	3-1/2 x 8 (89 x 203)
WS	Water/Glycol/GLYCOOL Supply	104-3/4 (2661)	11 (279)	2-1/8" Cu Sweat
WR	Water/Glycol/GLYCOOL Return	104-3/4 (2661)	15 (381)	2-1/8" Cu Sweat
CD	Condensate Drain (infrared humidifier or no humidifier)*	69-1/4 (1759)	30 (762)	3/4" FPT
	Condensate Drain (steam generating humidifier)*	69-1/4 (1759)	30 (762)	1-1/4" FPT
	W/ Optional Pump	69-1/4 (1759)	30 (762)	1/2" Cu Sweat
HUM	Humidifier Supply Line	76-1/2 (1943)	29 (736)	1/4" Cu Sweat
ECS**	Econ-O-Coil Supply	78-5/8 (1997)	22-1/4 (565)	2-1/8" Cu Sweat
ECR**	Econ-O-Coil Return	72 (1829)	29 (737)	2-1/8" Cu Sweat
E1	Electrical Conn. (High Volt)	78-1/2 (1994)	31-1/8 (790)	2-1/2"
E2	Electrical Conn. (High Volt)	75-3/8 (1915)	31-1/8 (790)	2-1/2"
LV1	Electrical Conn. (Low Volt)	1-7/8 (48)	28-1/2 (724)	7/8"
LV2	Electrical Conn. (Low Volt)	1-7/8 (48)	30-1/4 (768)	7/8"
LV3	Electrical Conn. (Low Volt)	1-7/8 (48)	32 (813)	7/8"
B1	Blower Outlet (15 x 15)	23-1/8 (587)	18-1/16 (459)	18-3/4 x 16-1/16 (476 x 408)
	Blower Outlet (15 x 11)	27-3/4 (705)	18-1/16 (459)	14-3/4 x 16-1/16 (375 x 408)
B2	Blower Outlet (15 x 15)	50-3/8 (1280)	18-1/16 (459)	18-3/4 x 16-1/16 (476 x 408)
	Blower Outlet (15 x 11)	54-3/8 (1381)	18-1/16 (459)	14-3/4 x 16-1/16 (375 x 408)

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

** Supplied on Dual Cooling Systems only (4 pipe system)

Figure 20 Disassembly dimensions - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

DPN000932
Rev. 1

Table 28 Component weights - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all

Dry Weight, Approximate, Including Panels, lb (kg)				
	Semi-Hermetic Compressor		Scroll or Digital Scroll Compressor	
Component	**Water/Glycol**	**GLYCOOL/Dual-Cool**	**Water/Glycol**	**GLYCOOL/Dual-Cool**
Compressor Assembly	1270 (578)	1270 (578)	840 (382)	840 (382)
Filter & Electric Box Assembly	250 (114)	250 (114)	250 (114)	250 (114)
Blower & Coil Assembly	1230 (560)	1410 (641)	1230 (560)	1410 (641)

DOWNFLOW, AIR-COOLED, 105KW (30 TON)—ALL COMPRESSORS

Figure 21 Dimensions - downflow, air-cooled, 105kW (30 ton)—all

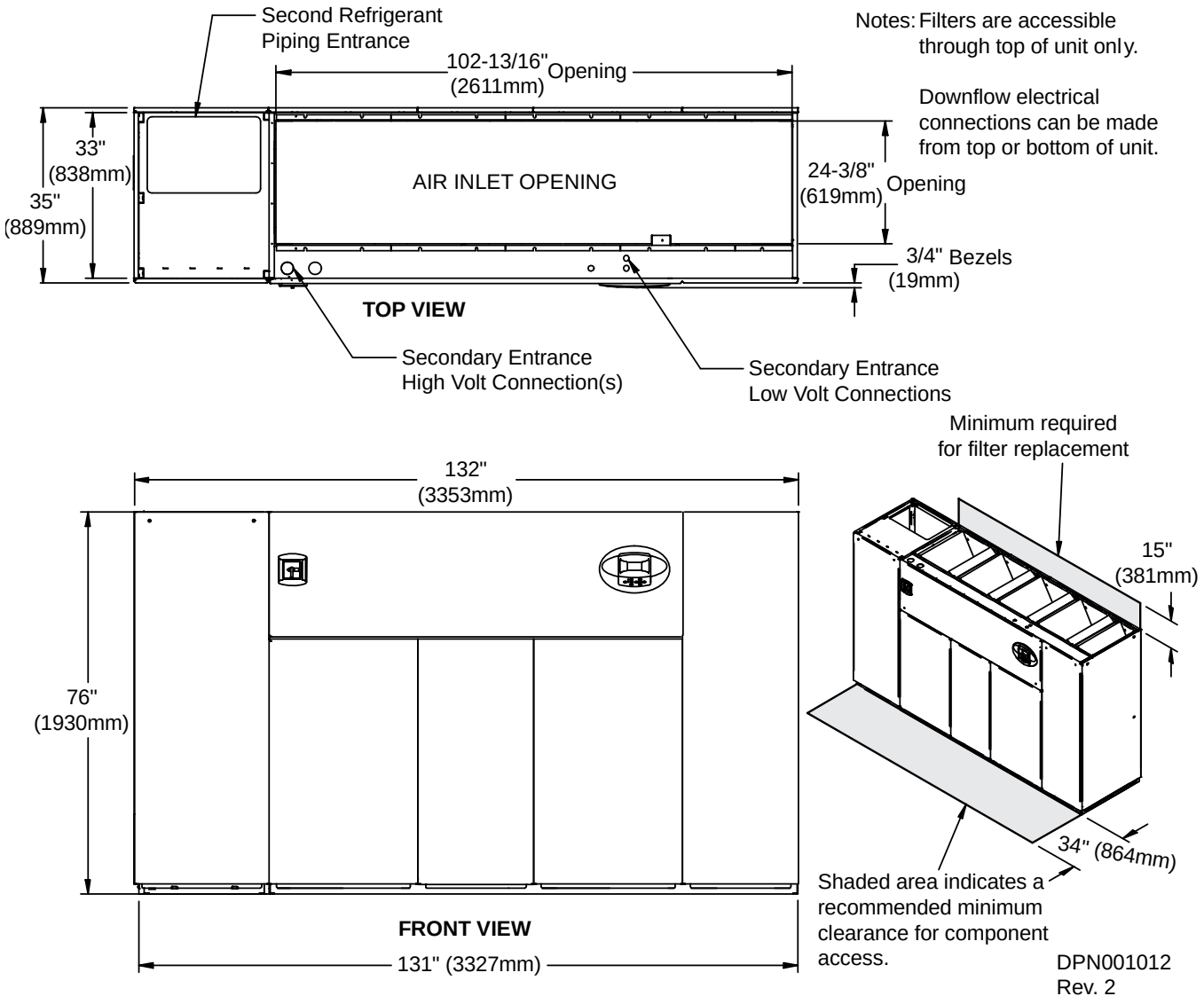


Table 29 Weights - downflow, air-cooled, 105kW (30 ton)—all

Dry Weight, Approximate, lb. (kg)		
Model Type		**Model Size: 105**
Semi-Hermetic Compressors	Air-Cooled	3040 (1382)
	Dual-Cool	3400 (1545)
Scroll Compressors	Air-Cooled	2920 (1327)
	Dual-Cool	3280 (1491)

Figure 22 Primary connection locations - downflow, air-cooled, 105kW (30 ton)—all

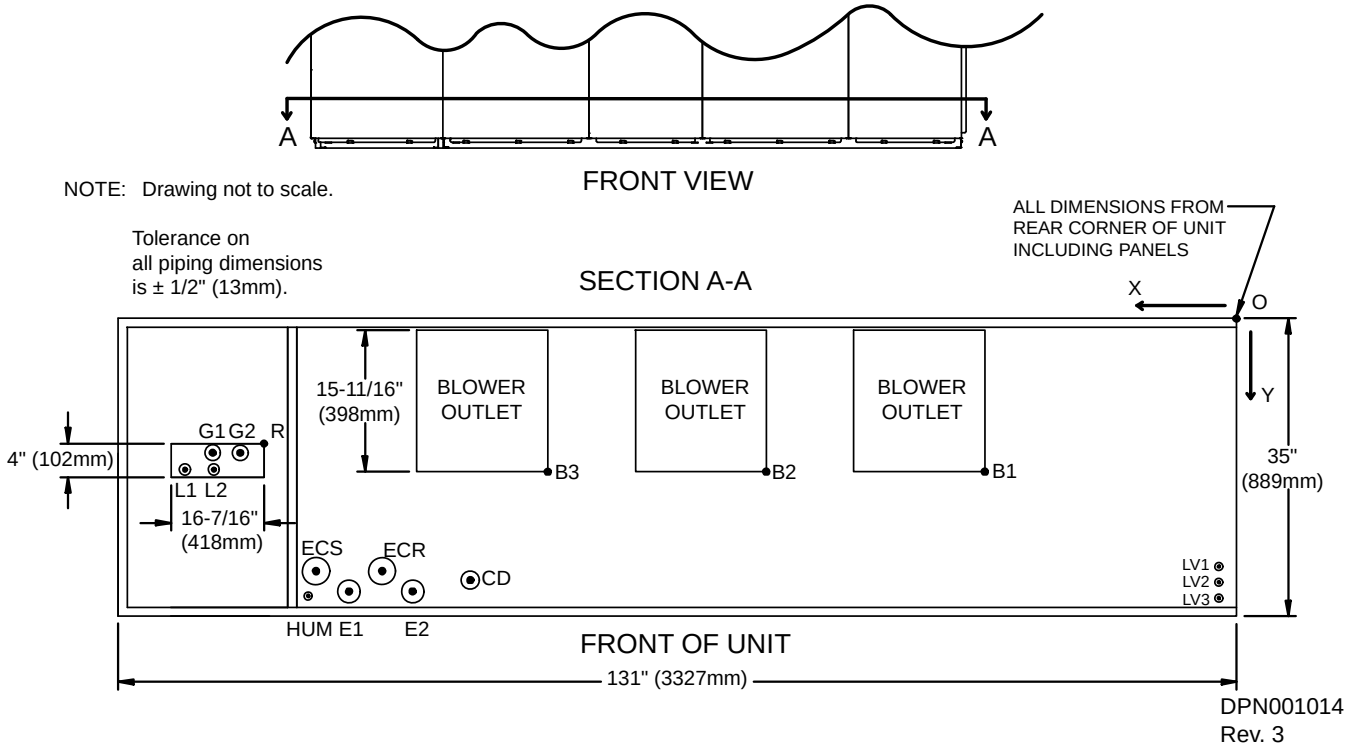


Table 30 Piping data - downflow, air-cooled, 105kW (30 ton)—all

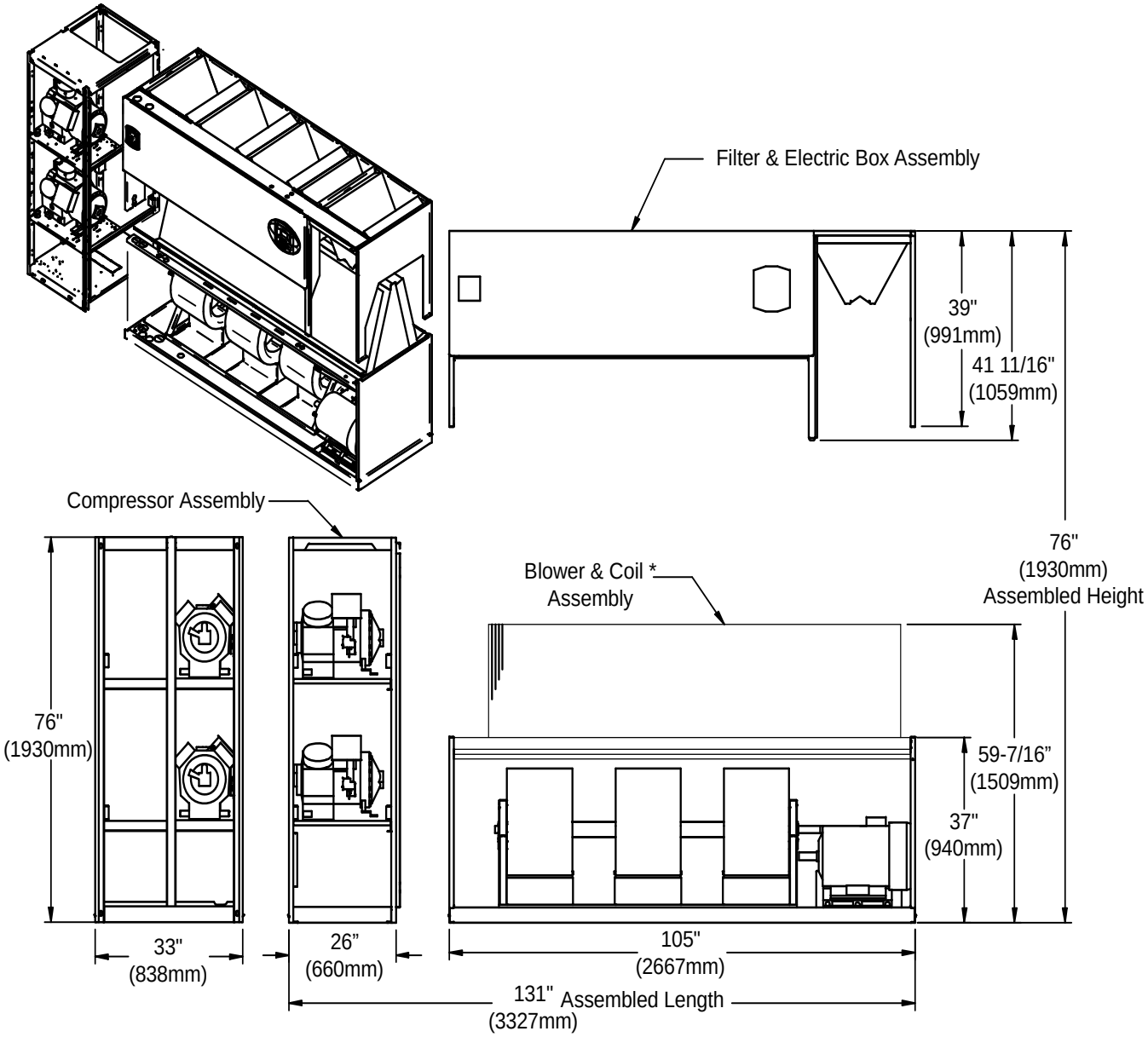
Point	Description	X in. (mm)	Y in. (mm)	Connection Size / Opening in. (mm)
R	Refrigerant Access	109 (2769)	15-3/4 (400)	16-7/16" x 4 (418 x 102)
L1	Liquid Line System 1	121-3/4 (3092)	16-3/4 (425)	5/8" Cu Sweat
L2	Liquid Line System 2	118-1/8 (3000)	16-3/4 (425)	5/8" Cu Sweat
G1	Hot Gas Discharge 1	118-1/4 (3004)	14-1/4 (362)	1-1/8" Cu Sweat
G2	Hot Gas Discharge 2	115-5/8 (2937)	14-1/4 (362)	1-1/8" Cu Sweat
CD	Condensate Drain (infrared humidifier or no humidifier)*	83-13/16 (2129)	30 (762)	3/4" FPT
	Condensate Drain (steam generating humidifier)*	83-13/16 (2129)	30 (762)	1-1/4" FPT
	W/ Optional Pump	83-13/16 (2129)	30 (762)	1/2" Cu Sweat
HUM	Humidifier Supply Line	102-3/4 (2610)	31-3/4 (806)	1/4" Cu Sweat
ECS**	Econ-O-Coil Supply	101-7/8 (2588)	29 (737)	2-5/8" Cu Sweat
ECR**	Econ-O-Coil Return	94-9/16 (2402)	29 (737)	2-5/8" Cu Sweat
E1	Electrical Conn. (High Volt)	98-1/8 (2492)	31-1/4 (794)	2-1/2"
E2	Electrical Conn. (High Volt)	91 (2311)	31-1/4 (794)	2-1/2"
LV1	Electrical Conn. (Low Volt)	2 (51)	28-1/4 (718)	7/8"
LV2	Electrical Conn. (Low Volt)	2 (51)	30-1/4 (768)	7/8"
LV3	Electrical Conn. (Low Volt)	2 (51)	32 (813)	7/8"
B1	Blower Outlet	27-7/8 (708)	18 (457)	14-1/2 x 15-11/16 (368 x 398)
B2	Blower Outlet	52-1/16 (1322)	18 (457)	14-1/2 x 15-11/16 (368 x 398)
B3	Blower Outlet	76-1/4 (1937)	18 (457)	14-1/2 x 15-11/16 (368 x 398)

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

** Supplied on Dual Cooling Systems only (4 pipe system)

DOWNFLOW, AIR-COOLED, 105KW (30 TON)—SEMI-HERMETIC COMPRESSORS

Figure 23 Disassembly dimensions - downflow, air-cooled, 105kW (30 ton)—semi-hermetic



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

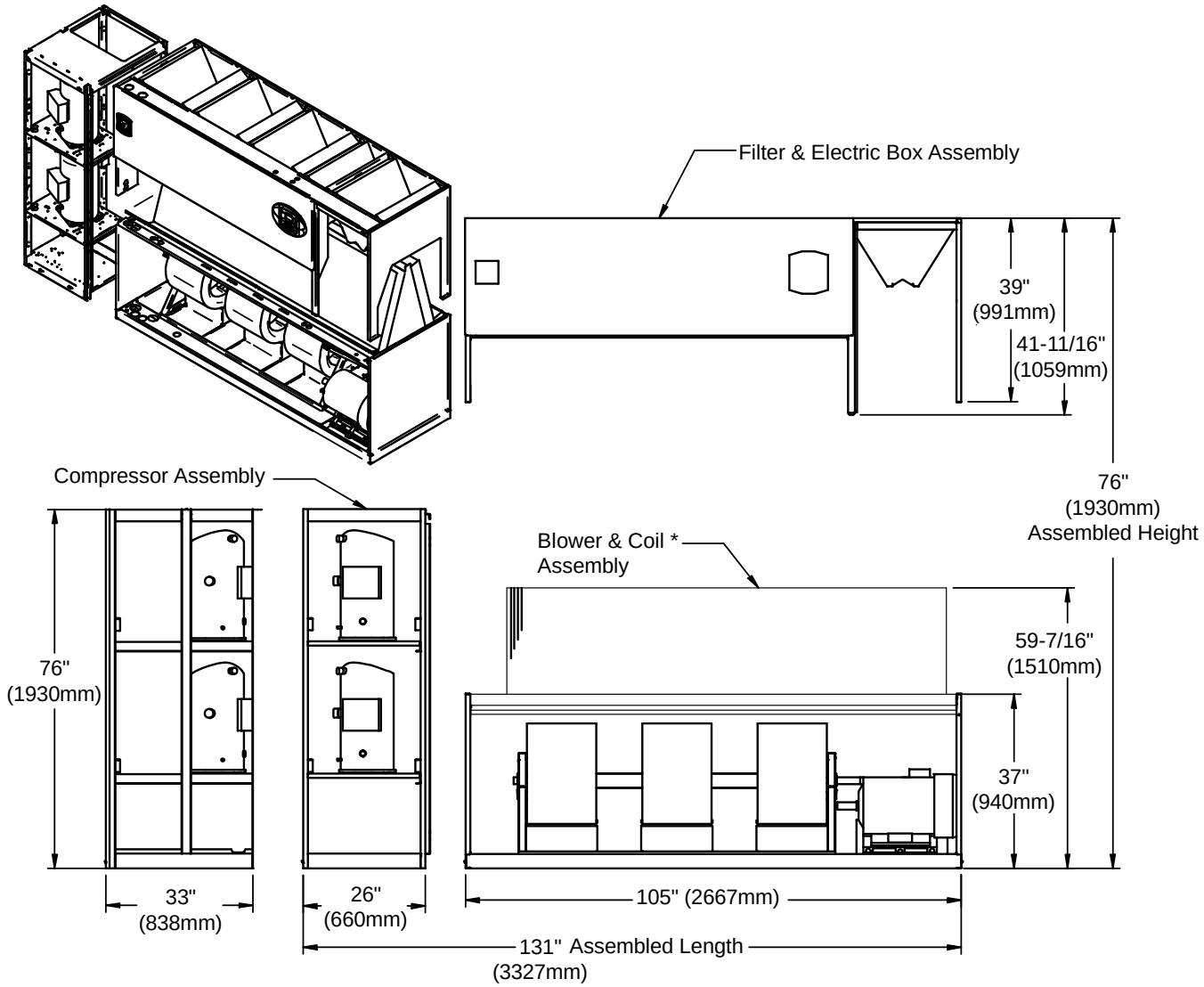
DPN001057
Rev. 0

Table 31 Component weights - downflow, air-cooled, 105kW (30 ton)—semi-hermetic

Dry Weight, Approximate, Including Panels, lb (kg)		
Component	**Air-Cooled**	**Dual-Cool**
Compressor Assembly	950 (432)	950 (432)
Filter & Electric Box Assembly	270 (123)	270 (123)
Blower & Coil Assembly	1820 (827)	2180 (991)

DOWNFLOW, AIR-COOLED, 105KW (30 TON)—SCROLL OR DIGITAL SCROLL COMPRESSORS

Figure 24 Disassembly dimensions - downflow, air-cooled, 105kW (30 ton)—scroll



NOTES: Drawing views are simplified with panels removed to show overall dimensions. See disassembly and handling instructions in installation manual.

* Coil can be field-removed for further height reduction.

DPN001058
Rev. 0

Table 32 Component weights - downflow, air-cooled, 105kW (30 ton)—scroll

Dry Weight, Approximate, Including Panels, lb (kg)		
Component	**Air-Cooled**	**Dual-Cool**
Compressor Assembly	830 (377)	830 (377)
Filter & Electric Box Assembly	270 (123)	270 (123)
Blower & Coil Assembly	1820 (827)	2180 (991)

DOWNFLOW, WATER/GLYCOL/GLYCOOL, 105KW (30 TON)—ALL COMPRESSORS

Figure 25 Weights and dimensions - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all

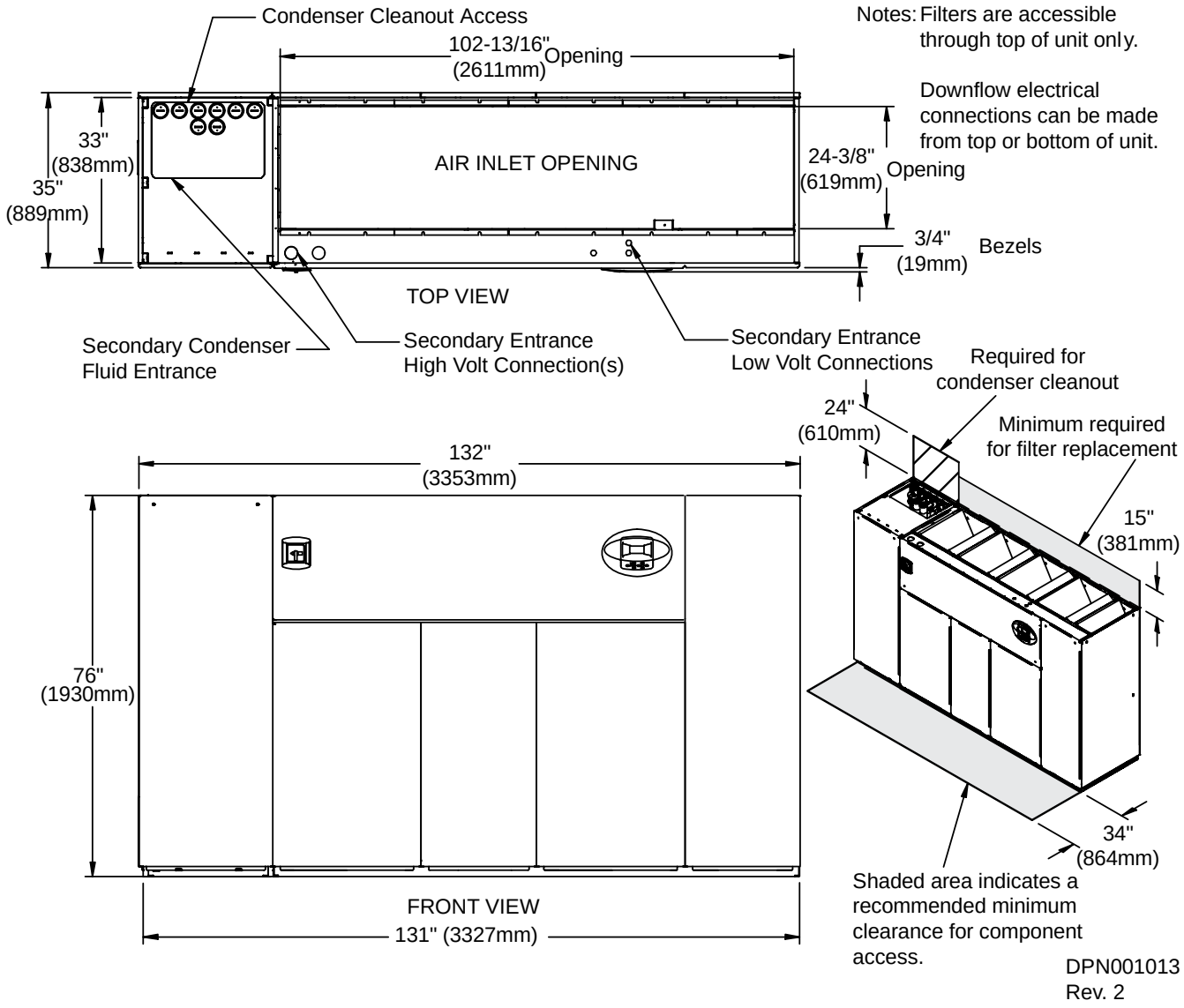


Table 33 Weights - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all

Dry Weight, Approximate, lb. (kg)		
Model Type		**Model Size: 105**
Semi-Hermetic Compressors	Water/Glycol	3410 (1550)
	GLYCOOL/Dual-Cool	3770 (1714)
Scroll Compressors	Water/Glycol	3290 (1495)
	GLYCOOL/Dual-Cool	3650 (1659)

Figure 26 Primary connection locations - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all

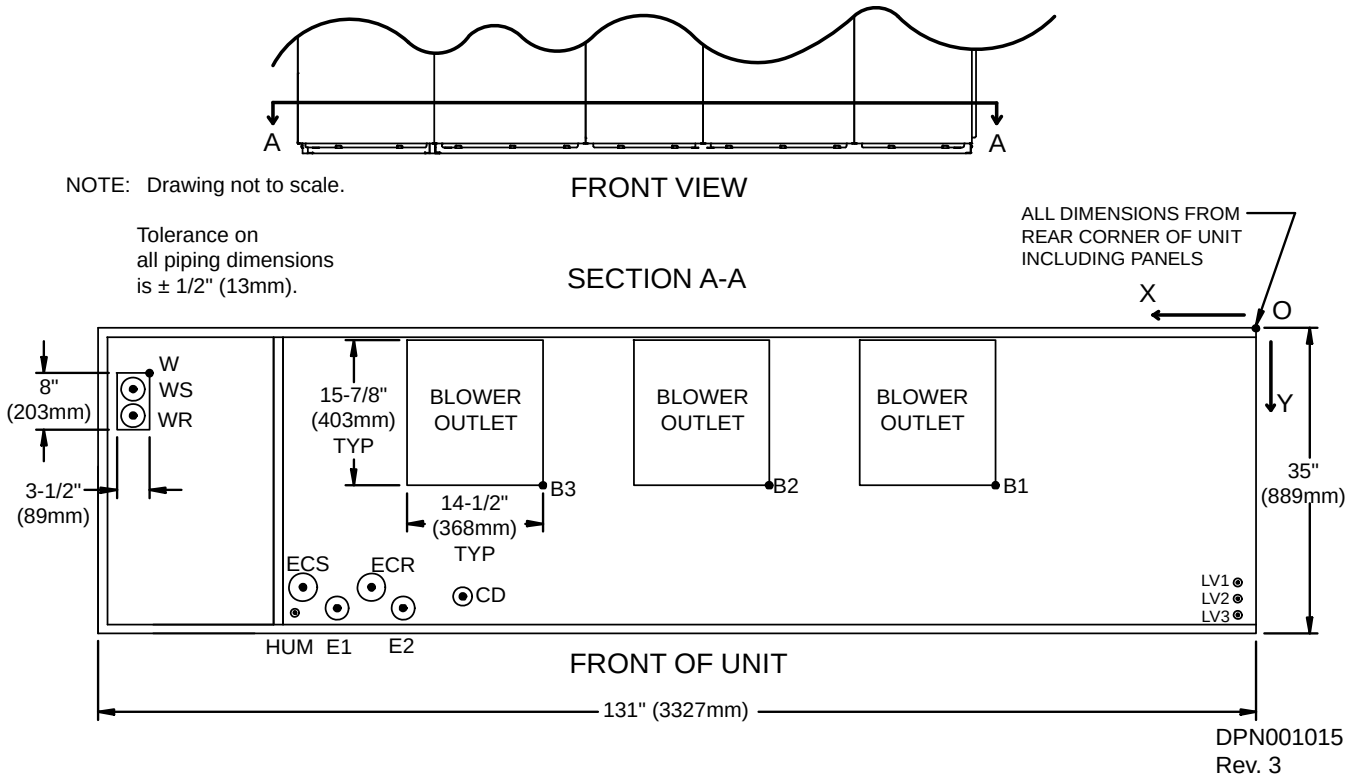


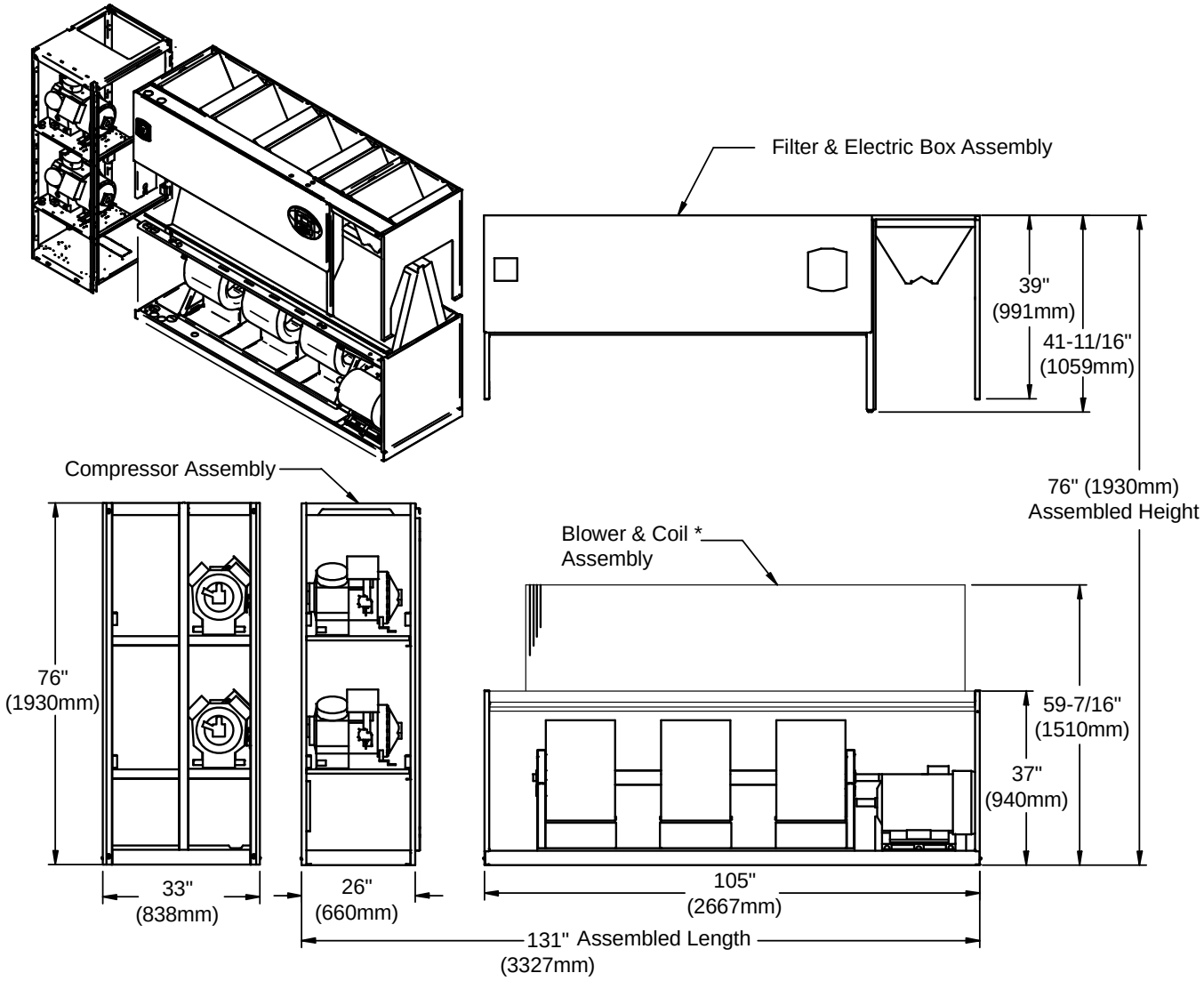
Table 34 Piping data - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all

Point	Description	X in. (mm)	Y in. (mm)	Connection Size / Opening in. (mm)
W	Water/Glycol/GLYCOOL Access	125-15/16 (3199)	9 (229)	3-1/2 x 8 (89 x 203)
WS	Water/Glycol/GLYCOOL Supply	127-7/8 (3248)	10-1/16 (256)	2-1/8" Cu Sweat
WR	Water/Glycol/GLYCOOL Return	127-7/8 (3248)	13-1/4 (337)	2-1/8" Cu Sweat
CD	Condensate Drain (infrared humidifier or no humidifier)*	83-13/16 (2129)	30 (762)	3/4" FPT
	Condensate Drain (steam generating humidifier)*	83-13/16 (2129)	30 (762)	1-1/4" FPT
	W/ Optional Pump	83-13/16 (2129)	30 (762)	1/2" Cu Sweat
HUM	Humidifier Supply Line	102-3/4 (2610)	31-3/4 (806)	1/4" Cu Sweat
ECS**	Econ-O-Coil Supply	101-7/8 (2588)	29 (737)	2-5/8" Cu Sweat
ECR**	Econ-O-Coil Return	94-9/16 (2402)	29 (737)	2-5/8" Cu Sweat
E1	Electrical Conn. (High Volt)	98-1/4 (2496)	30 (762)	2-1/2"
E2	Electrical Conn. (High Volt)	88-7/16 (2246)	30 (762)	2-1/2"
LV1	Electrical Conn. (Low Volt)	2 (51)	27-1/2 (796)	7/8"
LV2	Electrical Conn. (Low Volt)	2 (51)	30-1/4 (768)	7/8"
LV3	Electrical Conn. (Low Volt)	2 (51)	32 (813)	7/8"
B1	Blower Outlet	28-1/4 (718)	18 (457)	14-1/2 x 15-7/8 (368 x 403)
B2	Blower Outlet	52 (1321)	18 (457)	14-1/2 x 15-7/8 (368 x 403)
B3	Blower Outlet	75-11/16 (1922)	18 (457)	14-1/2 x 15-7/8 (368 x 403)

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

** Supplied on Dual Cooling systems only (4 piping system).

Figure 27 Disassembly dimensions - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all



NOTES: Drawing views are simplified with panels removed to show overall dimensions. See disassembly and handling instructions in installation manual.

* Coil can be field-removed for further height reduction.

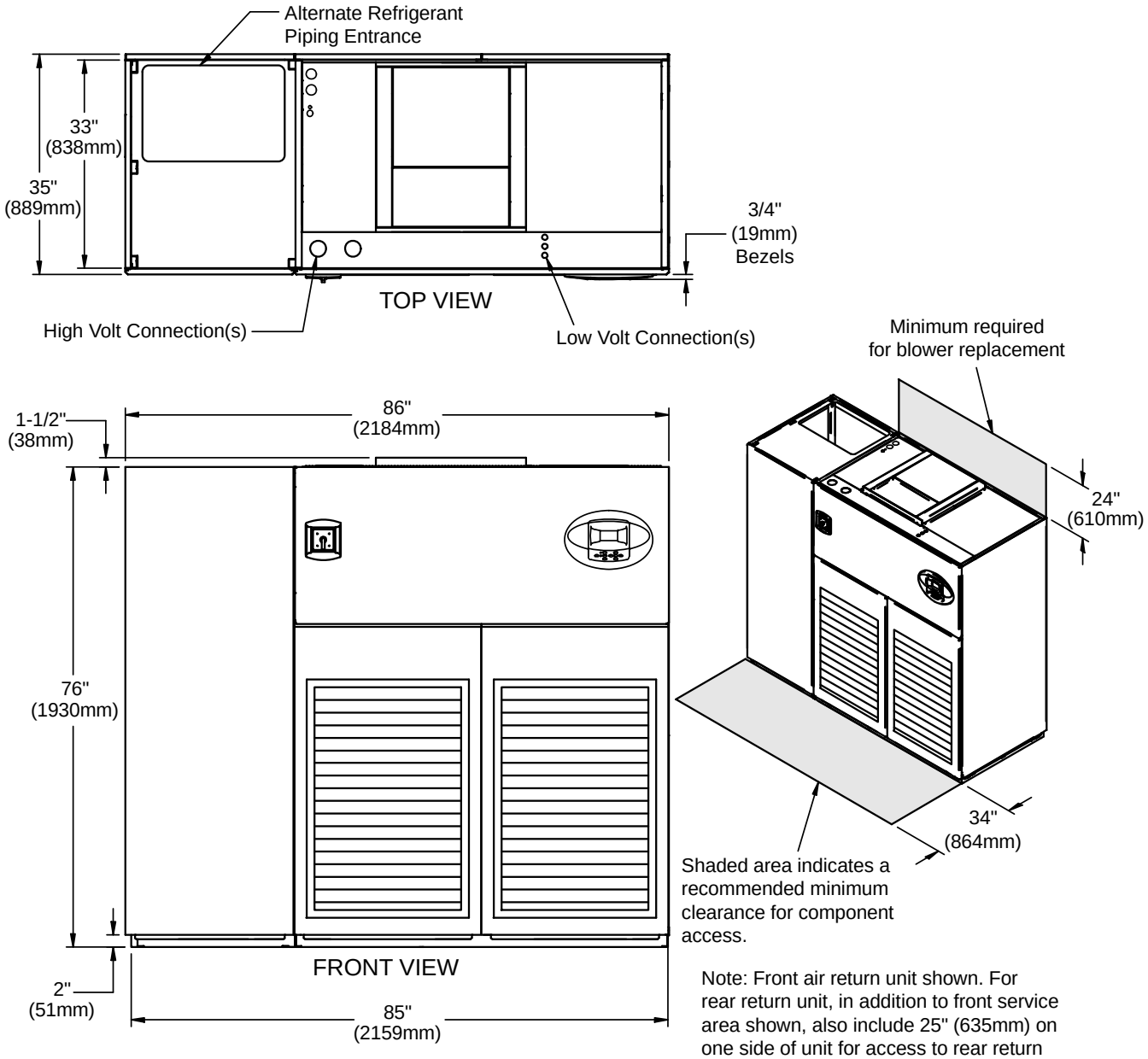
DPN001060
Rev. 0

Table 35 Component weights - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all

Dry Weight, Approximate, Including Panels, lb (kg)				
	Semi-Hermetic Compressor		Scroll Compressor	
Component	Water/Glycol	GLYCOOL/Dual-Cool	Water/Glycol	GLYCOOL/Dual-Cool
Compressor Assembly	1320 (600)	1320 (600)	1200 (545)	1200 (545)
Filter & Electric Box Assembly	270 (123)	270 (123)	270 (123)	270 (123)
Blower & Coil Assembly	1820 (827)	2180 (991)	1820 (827)	2180 (991)

UPFLOW, AIR-COOLED, 28-42KW (8-12 TON)—SEMI-HERMETIC COMPRESSORS

Figure 28 Dimensions - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic



Note: Front air return unit shown. For rear return unit, in addition to front service area shown, also include 25" (635mm) on one side of unit for access to rear return filter box. See DPN001196.

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Table 36 Weights - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic

Dry Weight, Approximate, lb. (kg)	
Model Type	**Model Size: 028-042**
Air-Cooled	1830 (830)
Dual-Cool	1980 (898)

Figure 29 Primary connection locations - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic

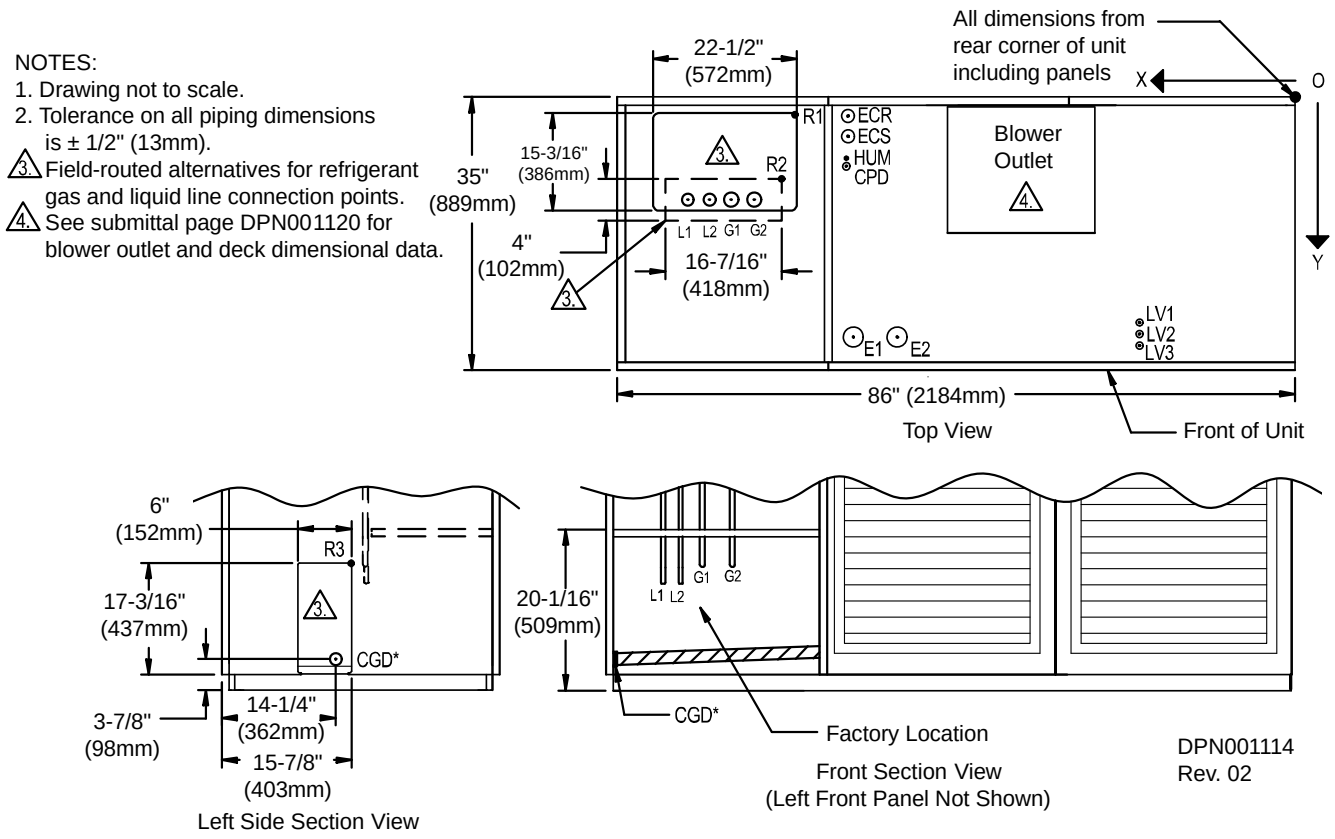


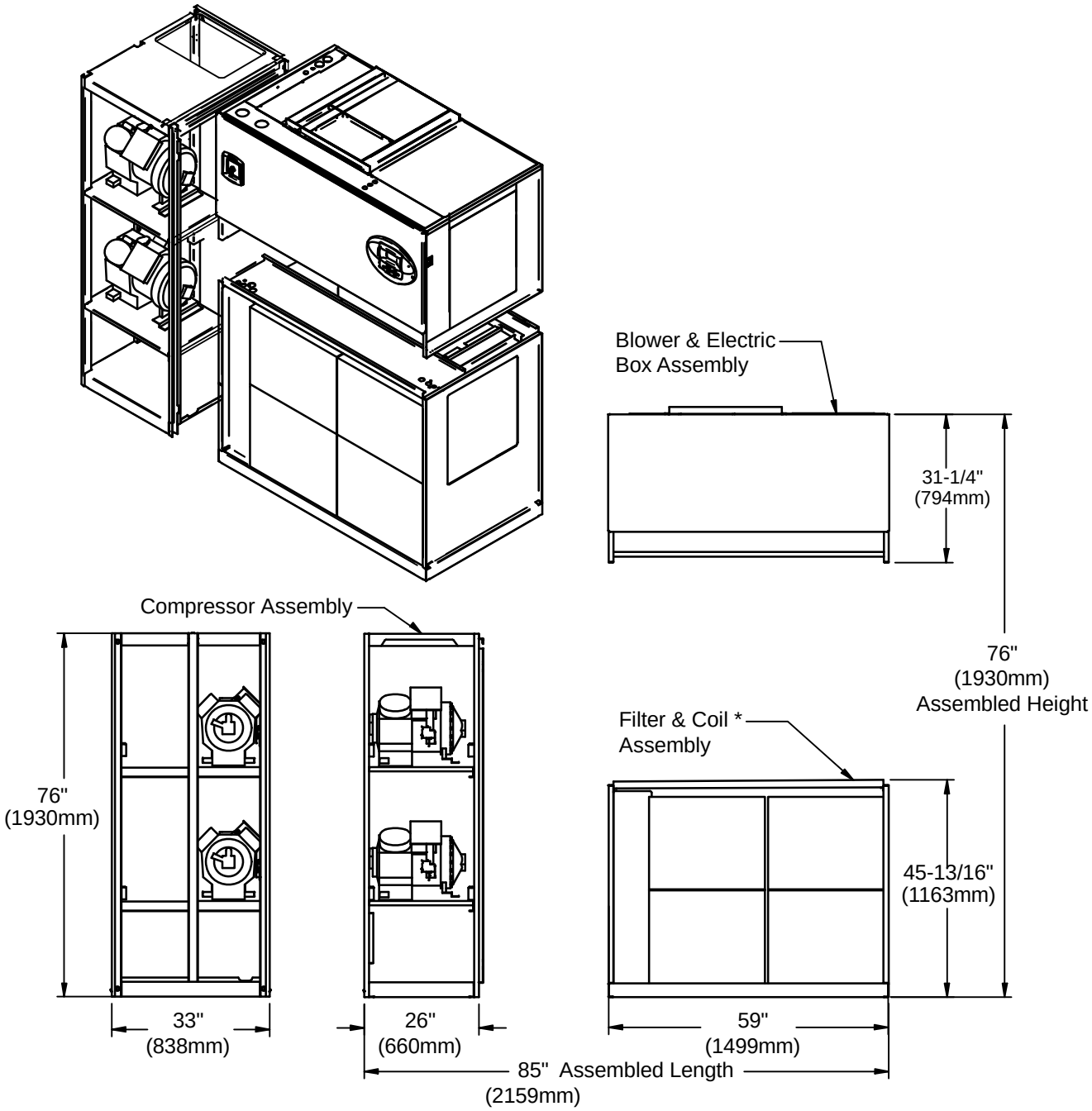
Table 37 Piping data - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic

Point	Description	X in. (mm)	Y in. (mm)	Connection Size / Opening in. (mm)
R1 ③	Refrigerant Access (Top)	60-11/16 (1542)	1-7/8 (48)	22-1/2 x 15-3/16 (572 x 386)
R2 ③	Refrigerant Access (Bottom)	63 (1600)	13-13/16 (351)	16-7/16 x 4 (418 x 102)
L1	Liquid Line System 1	79-3/16 (2011)	16-3/4 (425)	1/2" Cu Sweat
L2	Liquid Line System 2	76-1/2 (1943)	16-3/4 (425)	1/2" Cu Sweat
G1	Hot Gas Discharge 1	73-7/8 (1876)	16-3/4 (425)	5/8" Cu Sweat
G2	Hot Gas Discharge 2	70-1/8 (1780)	16-3/4 (425)	5/8" Cu Sweat
R3 ③	Refrigerant Access (Side)	—	—	6 x 17-3/16 (152 x 437)
CGD*	Condensate Gravity Drain	—	—	3/4" FPT
CPD	Condensate Pump Discharge (Opt)	56-1/4 (1429)	11-1/8 (283)	1/2" Cu Sweat
HUM	Humidifier Supply Line	56-1/4 (1429)	9-1/8 (233)	1/4" Cu Sweat
ECS**	Econ-O-Coil Supply	56 (1423)	7-5/16 (186)	1-5/8" Cu Sweat
ECR**	Econ-O-Coil Return	56 (1423)	4-1/2 (114)	1-5/8" Cu Sweat
E1	Electrical Conn. (High Volt)	52-3/8" (1330mm)	30" (762mm)	2-1/2"
E2	Electrical Conn. (High Volt)	46-7/8 (1191)	30" (762mm)	2-1/2"
LV1	Electrical Conn. (Low Volt)	19-1/2 (495)	29-1/16 (738)	7/8"
LV2	Electrical Conn. (Low Volt)	19-1/2 (495)	30-1/2 (775)	7/8"
LV3	Electrical Conn. (Low Volt)	19-1/2 (495)	31-15/16 (811)	7/8"

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

** Supplied on Dual Cooling Systems only

Figure 30 Disassembly dimensions - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

DPN001171
Rev. 0

Table 38 Component weights - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic

Dry Weight, Approximate, Including Panels, lb (kg)		
Component	**Air-Cooled**	**Dual-Cool**
Compressor Assembly	800 (364)	800 (364)
Blower & Electric Box Assembly	510 (231)	510 (231)
Filter & Coil Assembly	520 (236)	670 (304)

UPFLOW, AIR-COOLED, 28-42KW (8-12 TON)—SCROLL OR DIGITAL SCROLL COMPRESSORS

Figure 31 Dimensions - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll

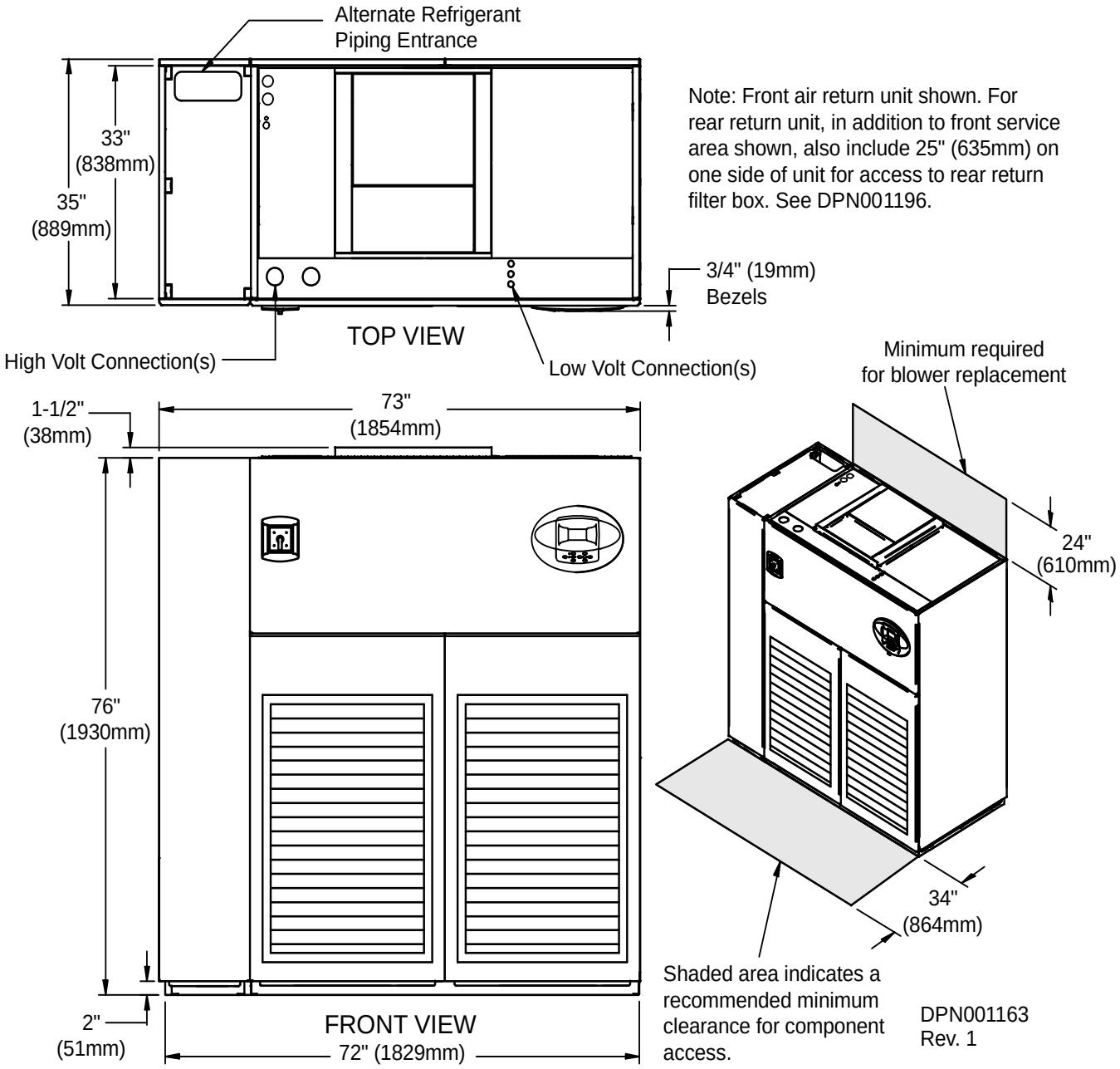


Table 39 Weights - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll

Dry Weight, Approximate, lb. (kg)	
Model Type	**Model Size: 028-042**
Air-Cooled	1520 (689)
Dual-Cool	1670 (758)

Figure 32 Primary connection locations - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll

NOTES:
1. Drawing not to scale.
2. Tolerance on all piping dimensions is ± 1/2" (13mm).
3. Field routed alternatives for refrigerant gas and liquid line connection points.
4. See submittal page DPN001120 for blower outlet and deck dimensional data.

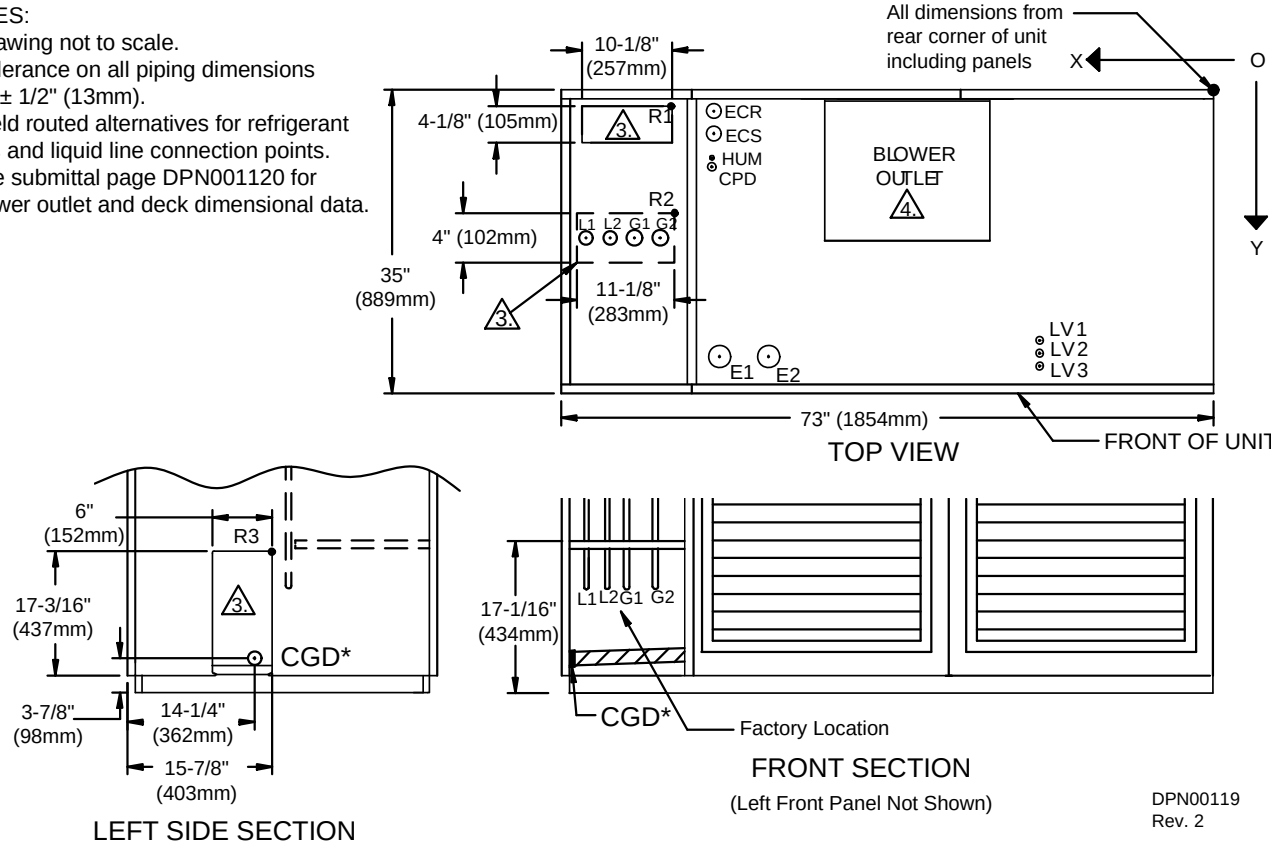


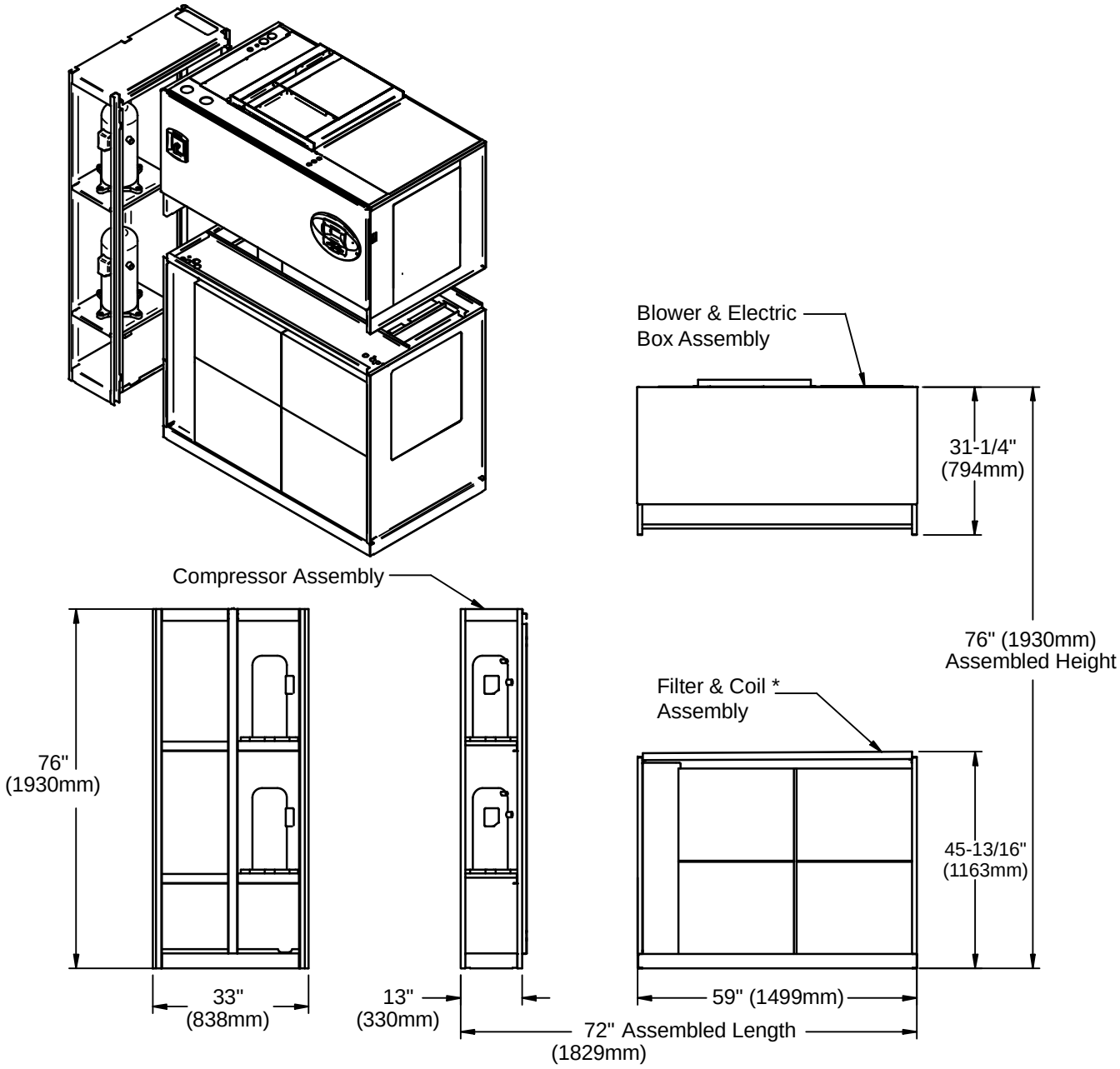
Table 40 Piping data - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll

Point	Description	X in. (mm)	Y in. (mm)	Connection Size / Opening in. (mm)
R1 (3)	Refrigerant Access (Top)	60-1/2 (1537)	1-7/8" (48mm)	10-1/8 x 4-1/8 (257 x 105)
R2 (3)	Refrigerant Access (Bottom)	59-3/8" (1508mm)	14-3/4" (375mm)	11-1/8 x 4 (283 x 102)
L1	Liquid Line System 1	70" (1778mm)	16-3/4 (425)	1/2" Cu Sweat
L2	Liquid Line System 2	67-5/8" (1718mm)	16-3/4 (425)	1/2" Cu Sweat
G1	Hot Gas Discharge 1	65-3/8" (1661mm)	16-5/8 (422)	5/8" Cu Sweat
G2	Hot Gas Discharge 2	63" (1600mm)	16-5/8 (422)	5/8" Cu Sweat
R3 (3)	Refrigerant Access (Side)	—	—	6 x 17-3/16 (152 x 437)
CGD*	Condensate Gravity Drain	—	—	3/4" FPT
CPD	Condensate Pump Discharge (Opt)	56-1/4 (1429)	11-1/8 (283)	1/2" Cu Sweat
HUM	Humidifier Supply Line	56-1/4 (1429)	9-1/8 (233)	1/4" Cu Sweat
ECS**	Econ-O-Coil Supply	56 (1423)	7-5/16 (186)	1-5/8" Cu Sweat
ECR**	Econ-O-Coil Return	56 (1423)	4-1/2 (114)	1-5/8" Cu Sweat
E1	Electrical Conn. (High Volt)	52-3/8 (1330)	30 (762)	2-1/2"
E2	Electrical Conn. (High Volt)	46-7/8 (1191)	30 (762)	2-1/2"
LV1	Electrical Conn. (Low Volt)	19-1/2 (495)	29-1/16 (738)	7/8"
LV2	Electrical Conn. (Low Volt)	19-1/2 (495)	30-1/2 (775)	7/8"
LV3	Electrical Conn. (Low Volt)	19-1/2 (495)	31-15/16 (811)	7/8"

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

** Supplied on Dual Cooling Systems only

Figure 33 Disassembly dimensions - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

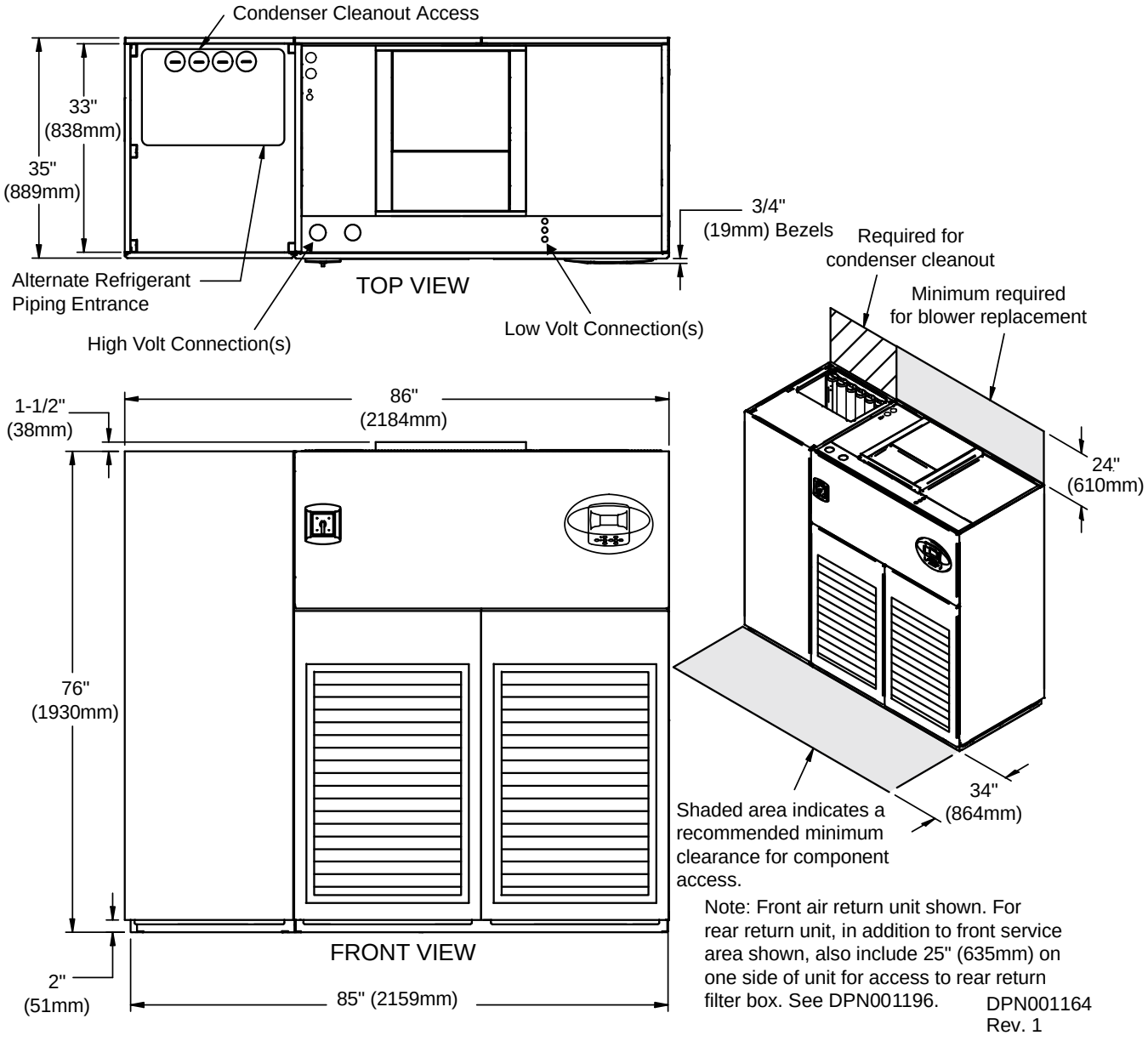
DPN001172
Rev. 0

Table 41 Component weights - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll

Dry Weight, Approximate, Including Panels, lb (kg)		
Component	**Air-Cooled**	**Dual-Cool**
Compressor Assembly	490 (223)	490 (223)
Blower & Electric Box Assembly	510 (231)	510 (231)
Filter & Coil Assembly	520 (236)	670 (304)

UPFLOW, WATER/GLYCOL/GLYCOOL, 28-42KW (8-12 TON)—ALL COMPRESSORS

Figure 34 Dimensions - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all



Note: Front air return unit shown. For rear return unit, in addition to front service area shown, also include 25" (635mm) on one side of unit for access to rear return filter box. See DPN001196.

DPN001164
Rev. 1

Table 42 Weights - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all

Dry Weight, Approximate, lb. (kg)		
Model Type		**Model Size: 028-042**
Semi-Hermetic Compressors	Water/Glycol	1980 (898)
	GLYCOOL/Dual-Cool	2130 (966)
Scroll or Digital Scroll Compressors	Water/Glycol	1830 (830)
	GLYCOOL/Dual-Cool	1980 (898)

Figure 35 Primary connection locations - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all

NOTES:
1. Drawing not to scale.
2. Tolerance on all piping dimensions is ± 1/2" (13mm).
3. Field routed alternatives for water/glycol connections.
4. See submittal page DPN001120 for blower outlet and deck dimensional data.

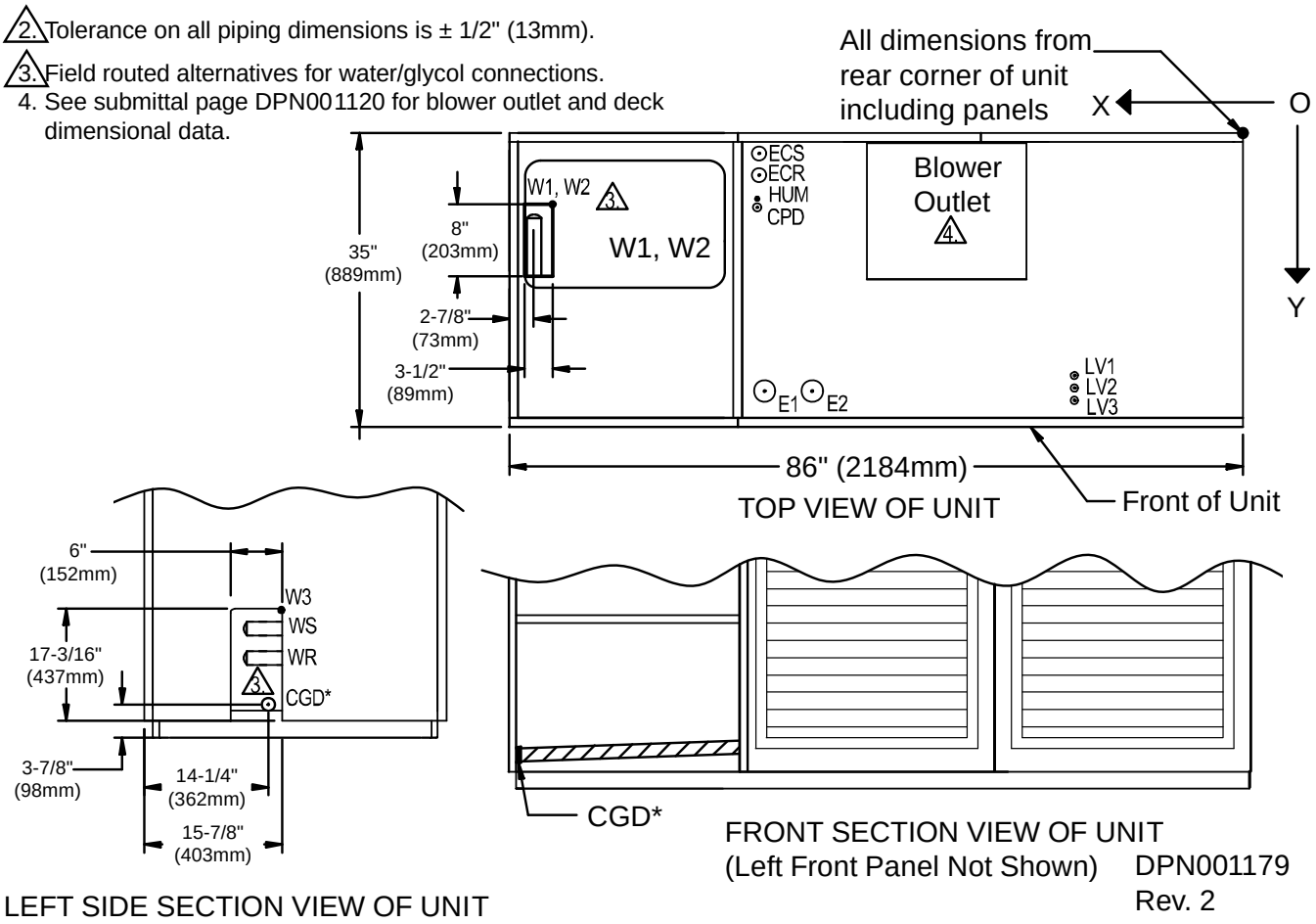
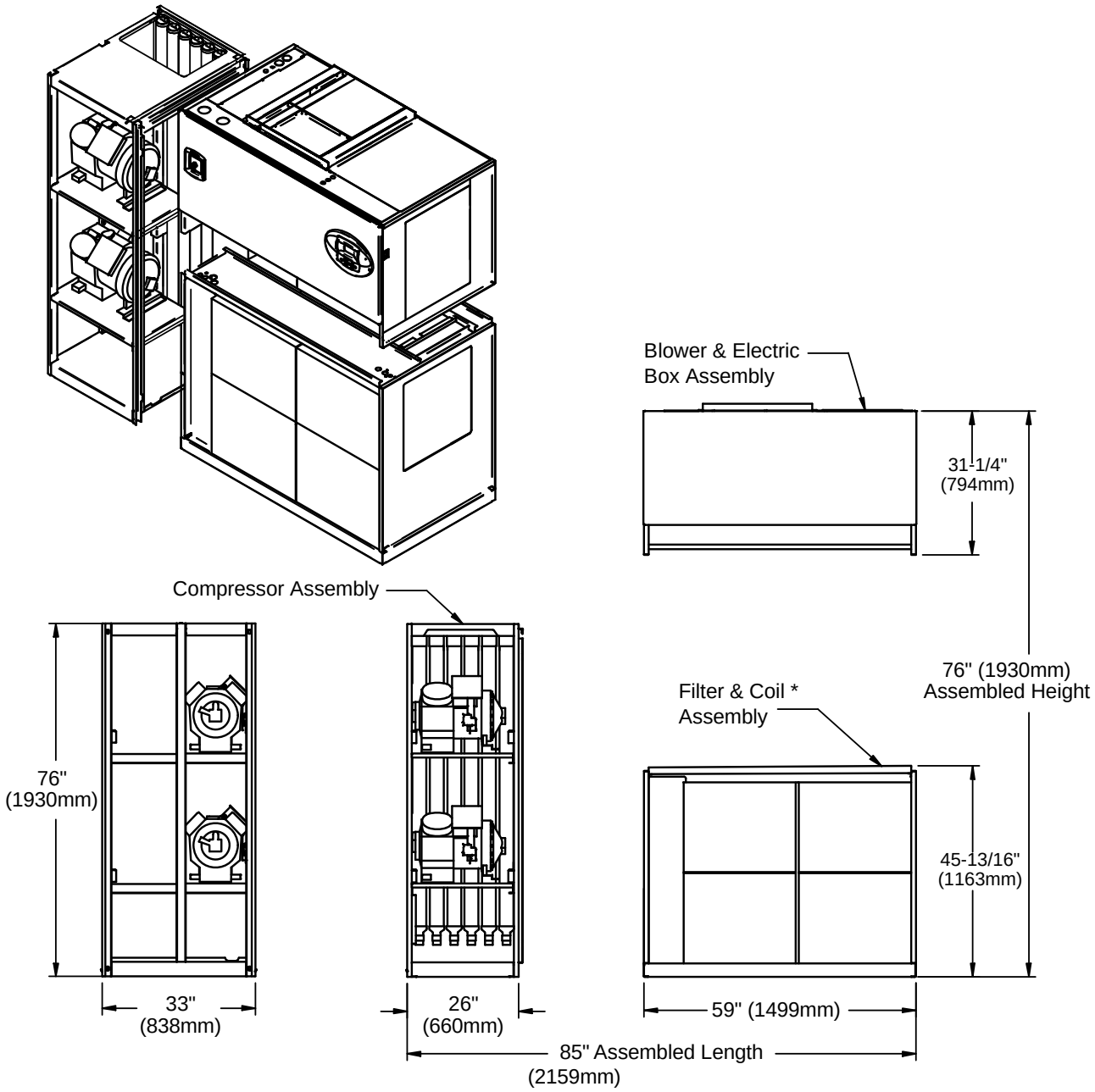


Table 43 Piping data - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all

Point	Description	X in. (mm)	Y in. (mm)	Connection Size / Opening in. (mm)
W1 3	Water/Glycol/GLYCOOL Access (Bottom)	79-15/16 (2030)	9 (229) 3-1/2	3-1/2 x 8 (89 x 203)
W2 3	Water/Glycol/GLYCOOL Access (Top)	79-15/16 (2030)	9 (229)	3-1/2 x 8 (89 x 203)
W3 3	Water/Glycol/GLYCOOL Access (Side)	—	—	6 x 17-3/16 (152 x 437)
WS 3	Water/Glycol/GLYCOOL Supply	—	—	1-5/8" CU Sweat
WR 3	Water/Glycol/GLYCOOL Return	—	—	1-5/8" CU Sweat
CGD	Condensate Gravity Drain	—	—	3/4" FPT
CPD	Condensate Pump Discharge (Opt)	56-1/4 (1429)	11-1/8 (282)	1/2" CU Sweat
HUM	Humidifier Supply Line	56-1/4 (1429)	9-1/8 (232)	1/4" CU Sweat
ECS	Econ-O-Coil Supply	56 (1423)	7-5/16 (186)	1-5/8" CU Sweat
ECR	Econ-O-Coil Return	56 (1423)	4-1/2 (114)	1-5/8" CU Sweat
E1	Electrical Conn. (High Volt)	55-3/8 (1407)	30-7/8 (784)	2-1/2"
E2	Electrical Conn. (High Volt)	49-7/8 (1267)	30-7/8 (784)	2-1/2"
LV1	Electrical Conn. (Low Volt)	19-1/2 (495)	29-1/16 (738)	7/8"
LV2	Electrical Conn. (Low Volt)	19-1/2 (495)	30-1/2 (775)	7/8"
LV3	Electrical Conn. (Low Volt)	19-1/2 (495)	31-15/16 (811)	7/8"

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

Figure 36 Disassembly dimensions - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

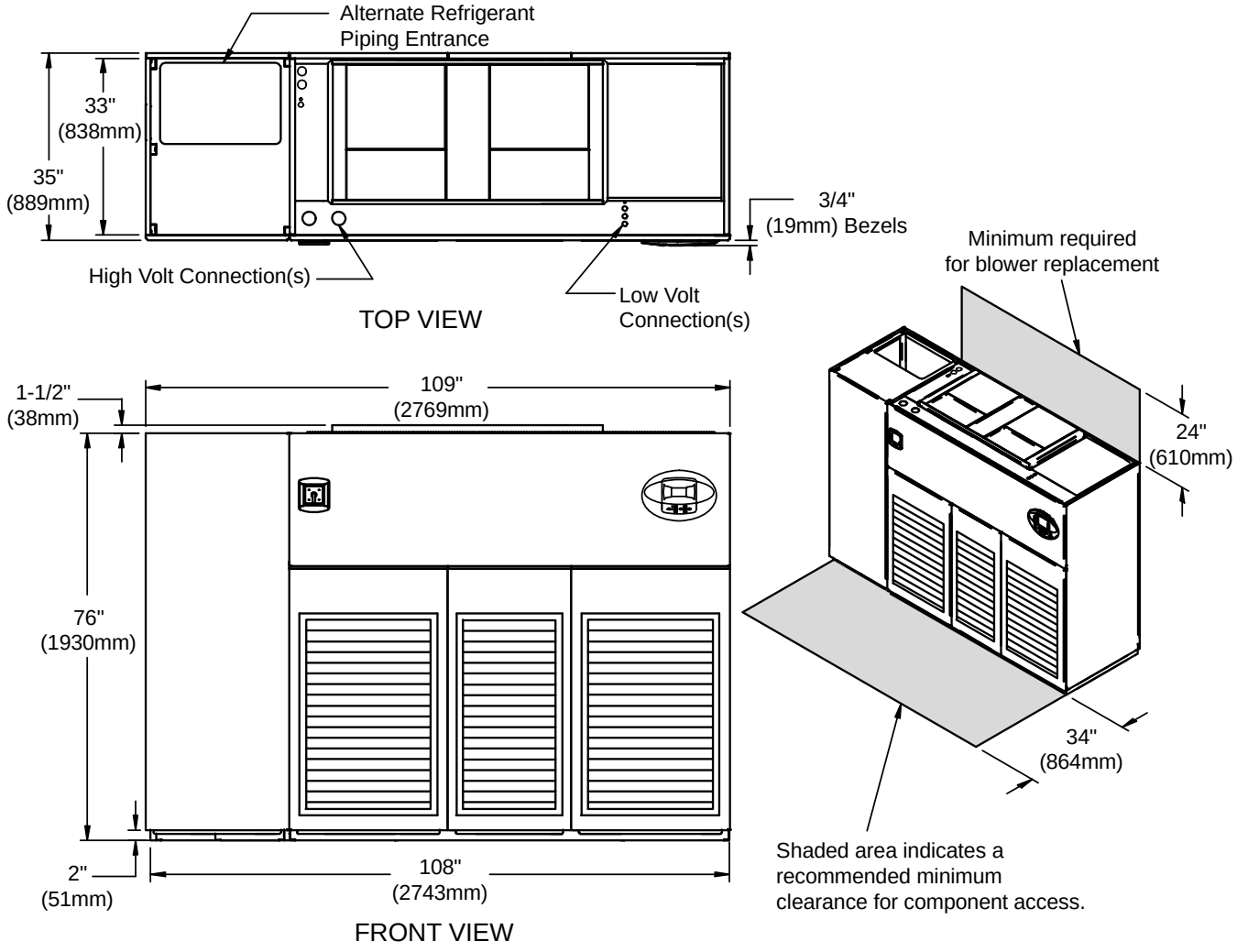
DPN001173
Rev. 0

Table 44 Component weights - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all

Dry Weight, Approximate, Including Panels, lb (kg)				
	Semi-Hermetic Compressor		Scroll Compressor	
Component	**Water/Glycol**	**GLYCOOL/Dual-Cool**	**Water/Glycol**	**GLYCOOL/Dual-Cool**
Compressor Assembly	950 (432)	950 (432)	800 (364)	800 (364)
Blower & Electric Box Assembly	510 (231)	510 (231)	510 (231)	510 (231)
Filter & Coil Assembly	520 (236)	670 (304)	520 (236)	670 (304)

UPFLOW, AIR COOLED, 53-77KW (15-22 TON)—SEMI-HERMETIC COMPRESSORS

Figure 37 Dimensions - upflow, air cooled 53-77kw (15-22 tons)—semi-hermetic



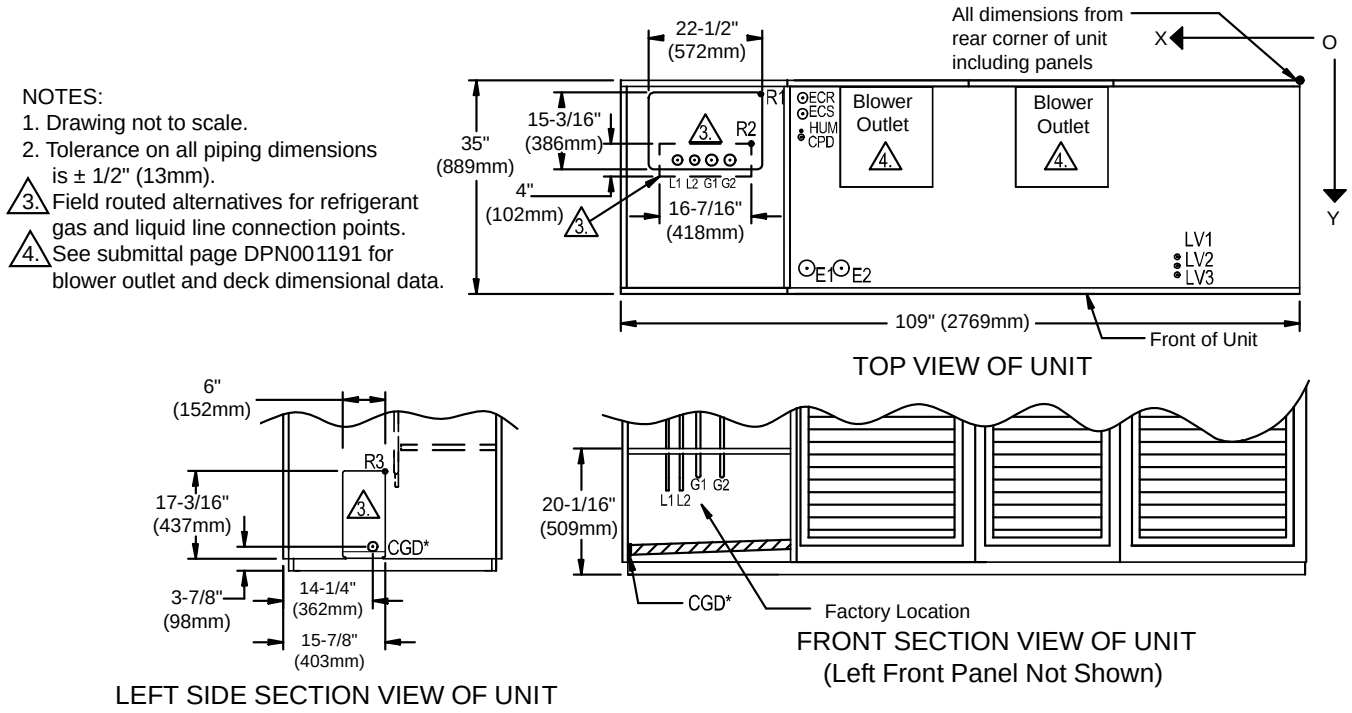
NOTE: Front air return unit shown. For rear return unit, in addition to front service area shown, also include 25" (635mm) on one side of unit for access to rear return filter box. See DPN001196.

DPN001165
Rev. 1

Table 45 Weight - upflow, air cooled, 53-77kW (15-22 ton)—semi-hermetic

Dry Weight, Approximate, lb (kg)		
	Model Size	
Model Type	053	070, 077
Air Cooled	2350 (1069)	2500 (1134)
Dual Cool	2530 (1150)	2680 (1216)

Figure 38 Primary connection locations - upflow air cooled 53-77kW (15-22 tons), semi-hermetic



* Field pitch Condensate Drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

** Supplied on Dual Cooling Systems only

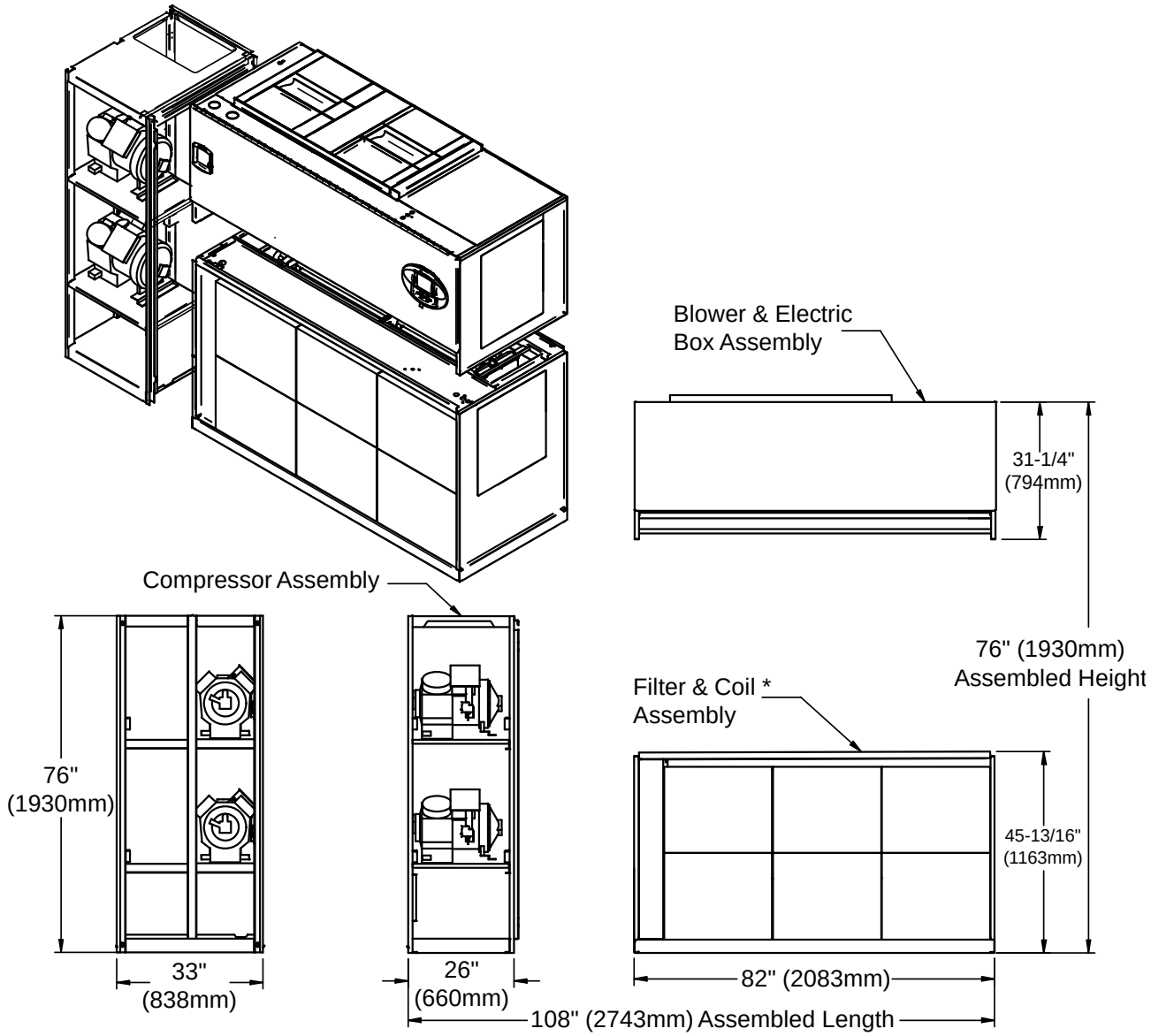
DPN001212
Rev. 2

Table 46 Piping data - upflow, air cooled, 53-77kW (15-22 tons)—semi-hermetic

Point	Description	X	Y	Connection Size / Opening
R1 (3)	Refrigerant Access (Top)	83-3/4" (2127mm)	1-7/8" (48mm)	22-1/2" x 15-3/16" (572mm x 386mm)
R2 (3)	Refrigerant Access (Bottom)	86" (2184mm)	13-7/8" (352mm)	16-7/16" (418mm) X 4" (102mm)
				53kW (15 Tons) / 70 & 77kW (20 & 22 Tons)
L1	Liquid Line System 1	97" (2464mm)	16-3/4" (425mm)	1/2" / 5/8" Cu Sweat
L2	Liquid Line System 2	93-5/16" (2370mm)	16-3/4" (425mm)	1/2" / 5/8" Cu Sweat
G1	Hot Gas Discharge 1	90-5/8" (2302mm)	16-5/8" (422mm)	7/8" / 1-1/8" Cu Sweat
G2	Hot Gas Discharge 2	88" (2235mm)	16-5/8" (422mm)	7/8" / 1-1/8" Cu Sweat
R3 (3)	Refrigerant Access (Side)	-	-	6" x 17-3/16" (152mm x 437mm)
CGD*	Condensate Gravity Drain	-	-	3/4" FPT
CPD	Condensate Pump Discharge (Opt)	79-5/16" (2015mm)	11-7/8" (302mm)	1/2" Cu Sweat
HUM	Humidifier Supply Line	79-5/16" (2015mm)	9-7/8" (251mm)	1/4" Cu Sweat
ECS	Econ-O-Coil Supply	78-5/8" (1998mm)	7-7/8" (200mm)	2-1/8" Cu Sweat
ECR	Econ-O-Coil Return	78-5/8" (1998mm)	4-5/8" (117mm)	2-1/8" Cu Sweat
E1	Electrical Conn. (High Volt)	75-3/8" (1915mm)	30" (762mm)	2-1/2"
E2	Electrical Conn. (High Volt)	69-7/8" (1775mm)	30" (762mm)	2-1/2"
LV1	Electrical Conn. (Low Volt)	19-1/2" (495mm)	29-1/16" (738mm)	7/8"
LV2	Electrical Conn. (Low Volt)	19-1/2" (495mm)	30-1/2" (775mm)	7/8"
LV3	Electrical Conn. (Low Volt)	19-1/2" (495mm)	31-15/16" (811mm)	7/8"

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

Figure 39 Disassembly dimensional data - upflow, air cooled, 53-77kw (15-22 tons)—semi-hermetic



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

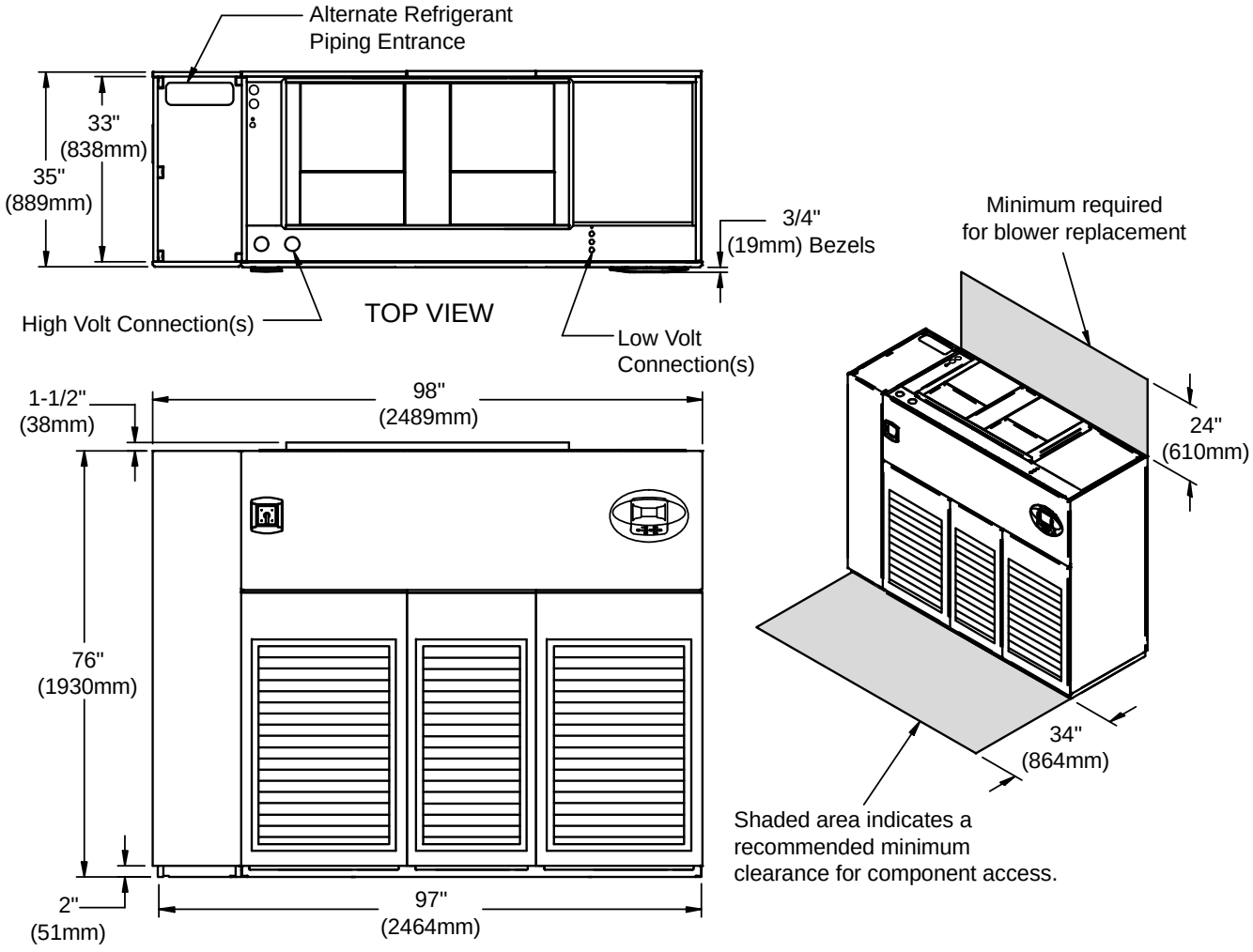
DPN001209
Rev. 0

Table 47 Component weights - upflow air cooled 53-77kw (15-22 tons)—semi-hermetic

Dry Weight, Approximate, Including Panels, lb (kg)		
Component	**Air Cooled**	**Dual Cool**
Compressor Assembly	970 (441)	970 (441)
Blower & Electric Box Assembly	770 (349)	770 (349)
Filter & Coil Assembly	760 (345)	940 (426)

UPFLOW, AIR COOLED, 53-77KW (15-22 TON)—SCROLL OR DIGITAL SCROLL COMPRESSORS

Figure 40 Dimensions - upflow, air cooled, 53-77kw (15-22 tons)—scroll/digital scroll



NOTE: Front air return unit shown. For rear return unit, in addition to front service area shown, also include 25" (635mm) on one side of unit for access to rear return filter box. See DPN001196.

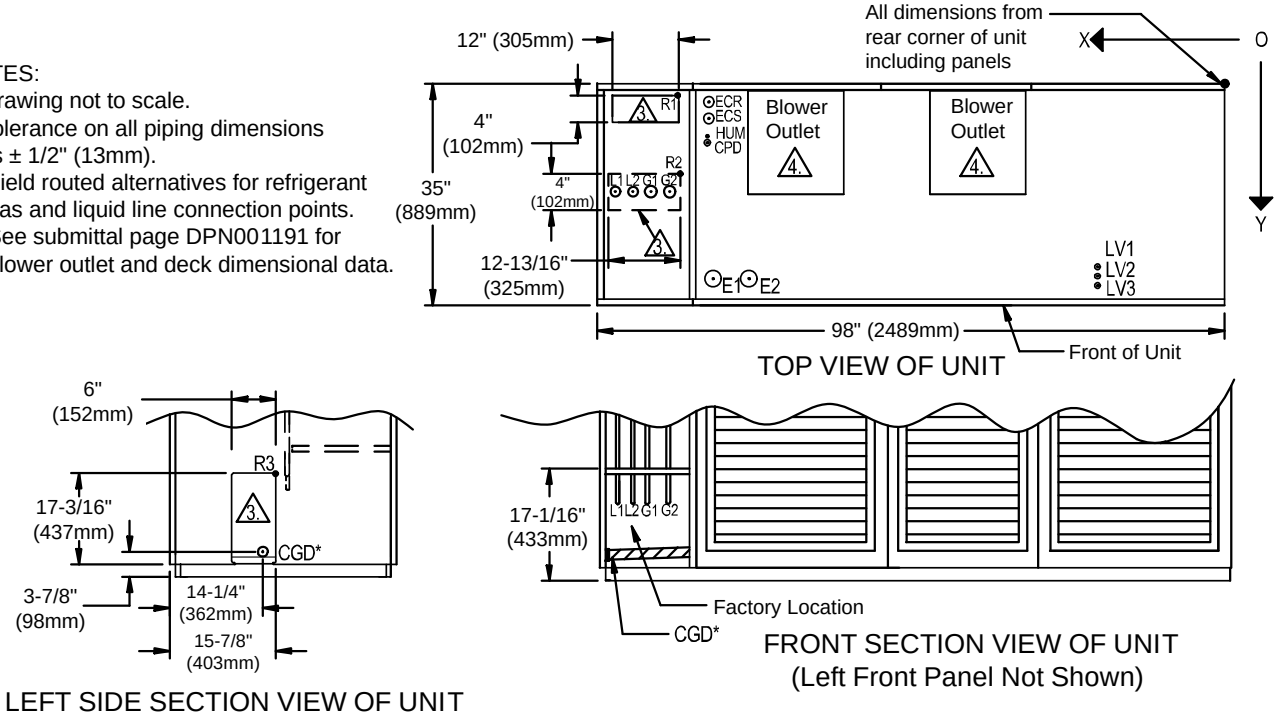
DPN001166
Rev. 1

Table 48 Weights - upflow, air cooled, 53-77kw (15-22tons)—scroll

Dry Weight, Approximate, lb (kg)	
Model Type	**Model Size: 053, 070, 077**
Air Cooled	2070 (939)
Dual Cool	2250 (1021)

Figure 41 Primary connection locations - upflow, air cooled, 53-77kw (15-22tons)—scroll

NOTES:
1. Drawing not to scale.
2. Tolerance on all piping dimensions is ± 1/2" (13mm).
3. Field routed alternatives for refrigerant gas and liquid line connection points.
4. See submittal page DPN001191 for blower outlet and deck dimensional data.



* Field pitch Condensate Drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

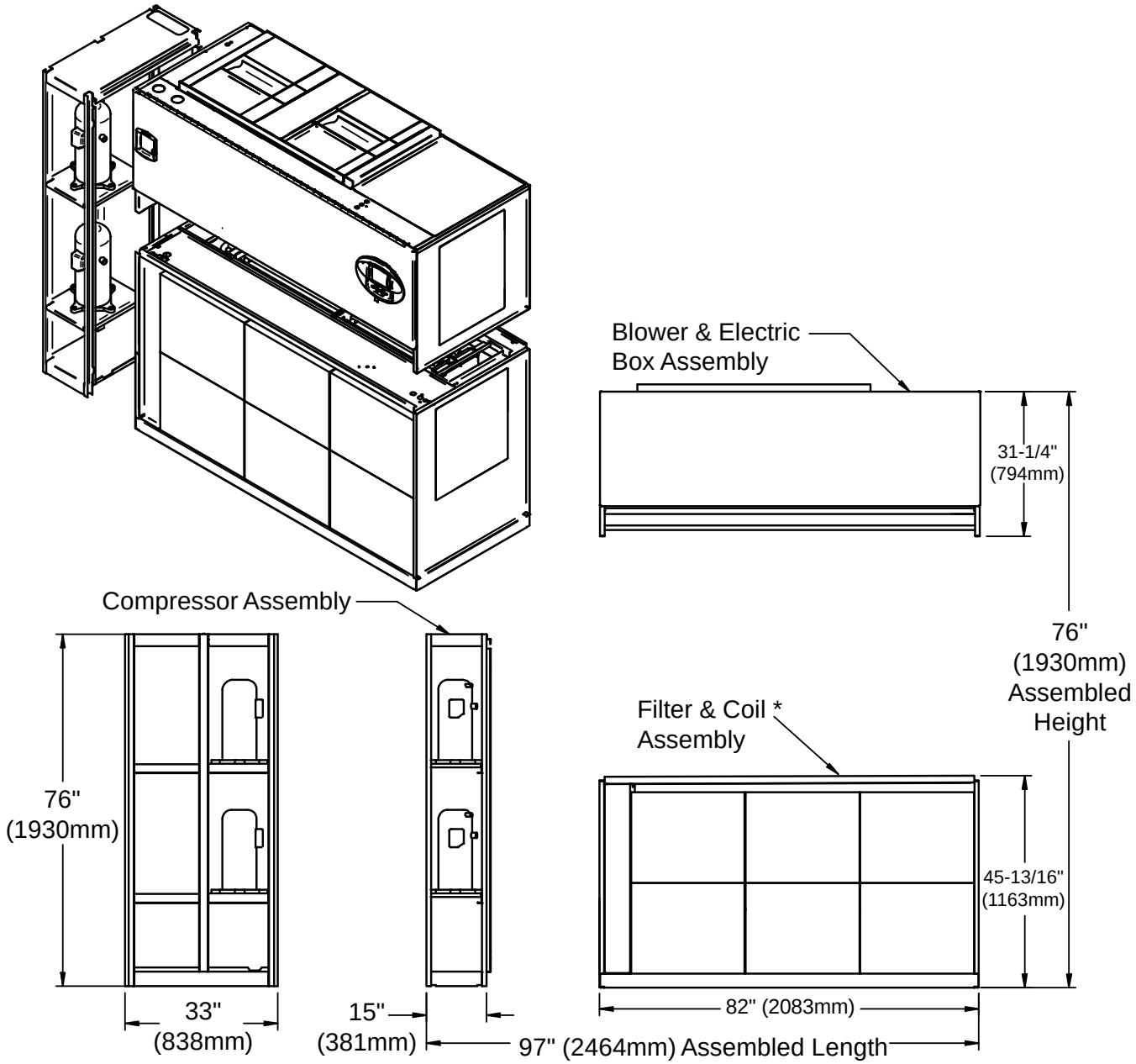
** Supplied on Dual Cooling Systems only

DPN001213
Rev. 1

Table 49 Piping data - upflow, air cooled, 53-77kw (15-22tons)—scroll

Point	Description	X	Y	Connection Size / Opening
R1 (3)	Refrigerant Access (Top)	83-5/8" (2124mm	2" (51mm	12" x 4" (305mm x 102mm)
R2 (3)	Refrigerant Access (Bottom)	82-3/4" (2102mm	14-3/4" (374mm	12-3/16" x 4" (310mm x 102mm)
				53kW (15tons) / 70 & 77kW (20 & 22tons)
L1	Liquid Line System 1	94-11/16" (2405mm	16-3/4" (425mm	1/2" / 5/8" Cu Sweat
L2	Liquid Line System 2	91-7/8" (2334mm	16-3/4" (425mm	1/2" / 5/8" Cu Sweat
G1	Hot Gas Discharge 1	88-3/4" (2254mm	16-3/8" (416mm	7/8" / 1-1/8" Cu Sweat
G2	Hot Gas Discharge 2	85-9/16" (2173mm	16-3/8" (416mm	7/8" / 1-1/8" Cu Sweat
R3 (3)	Refrigerant Access (Side)	-	-	6" (152mm) X 17-3/16" (437mm)
CGD*	Condensate Gravity Drain	-	-	3/4" FPT
CPD	Condensate Pump Discharge (Opt)	79-5/16" (2015mm	11-7/8" (302mm	1/2" Cu Sweat
HUM	Humidifier Supply Line	79-5-16" (2015mm	9-7/8" (251mm	1/4" Cu Sweat
ECS	Econ-O-Coil Supply	78-5/8" (1998mm	7-7/8" (200mm	2-1/8" Cu Sweat
ECR	Econ-O-Coil Return	78-5/8" (1998mm	4-5/8" (117mm	2-1/8" Cu Sweat
E1	Electrical Conn. (High Volt)	75-3/8" (1915mm	30" (762mm	2-1/2"
E2	Electrical Conn. (High Volt)	69-7/8" (1775mm	30" (762mm	2-1/2"
LV1	Electrical Conn. (Low Volt)	19-1/2" (495mm	29-1/16" (738mm	7/8"
LV2	Electrical Conn. (Low Volt)	19-1/2" (495mm	30-1/2" (775mm	7/8"
LV3	Electrical Conn. (Low Volt)	19-1/2" (495mm	31-15/16" (811mm	7/8"

Figure 42 Disassembly dimensional - upflow, air cooled, 53-77kw (15-22 tons)—scroll/digital scroll



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

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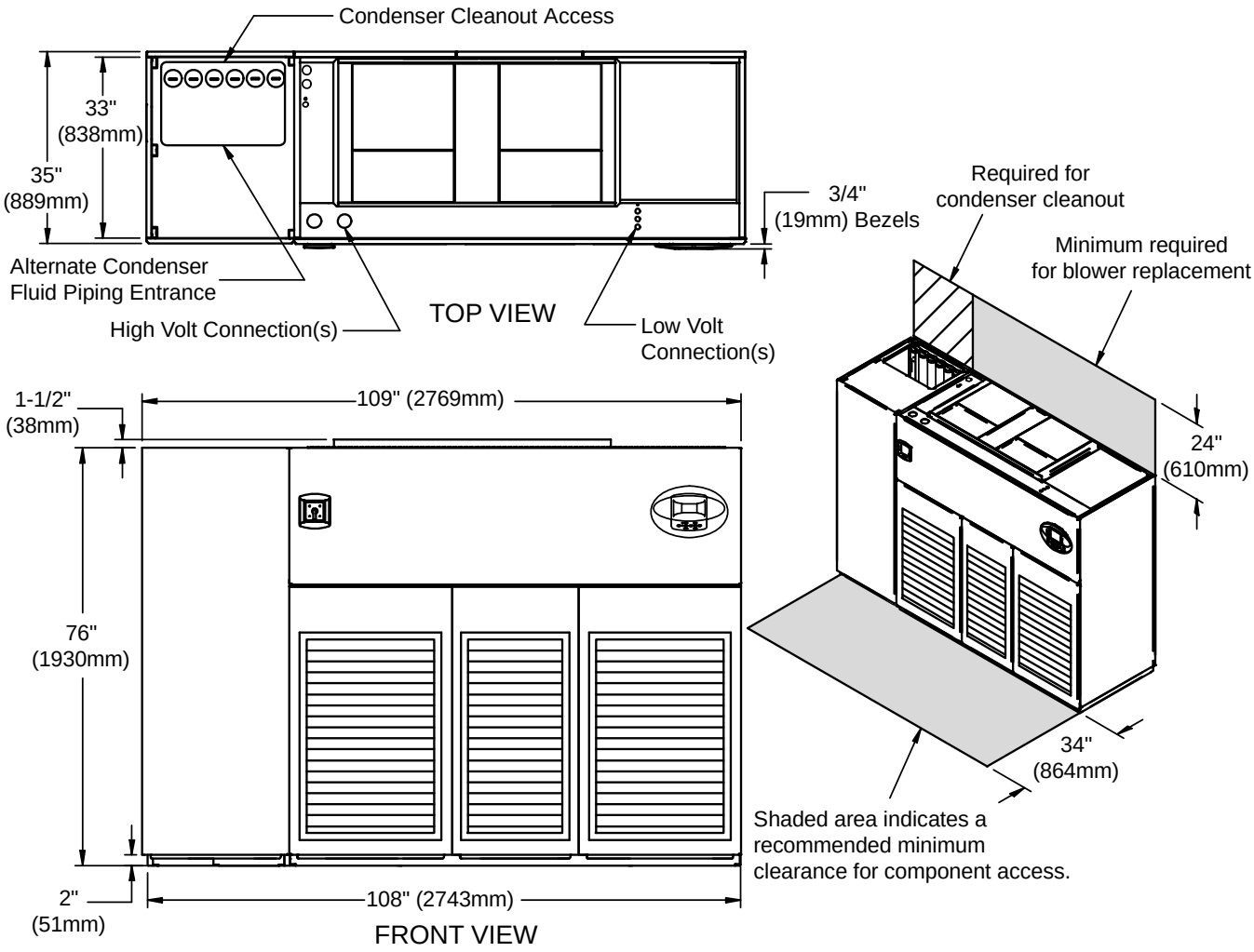
Rev. 0

Table 50 Component weights - upflow, air cooled, 53-77kw (15-22 tons)—scroll /digital scroll

Dry Weight, Approximate, Including Panels, lb (kg)		
Component	**Air Cooled**	**Dual Cool**
Compressor Assembly	540 (246)	540 (246)
Blower & Electric Box Assembly	770 (349)	770 (349)
Filter & Coil Assembly	760 (345)	940 (426)

UPFLOW, WATER/GLYCOL/GLYCOOL, 53-77KW (15-22 TON)—ALL COMPRESSORS

Figure 43 Dimensions - upflow, water/glycol/GLYCOOL, 53-77kw (15-22 tons)—all



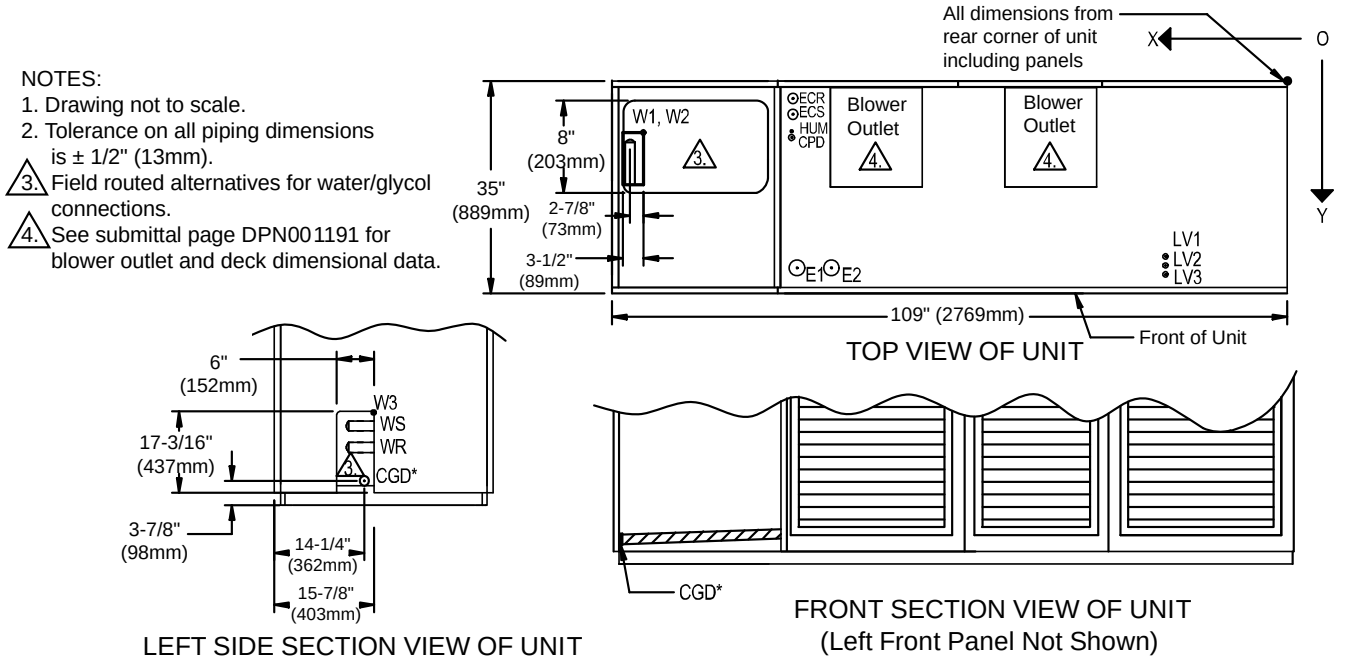
NOTE: Front air return unit shown. For rear return unit, in addition to front service area shown, also include 25" (635mm) on one side of unit for access to rear return filter box. See DPN001196.

DPN001167
Rev. 1

Table 51 Weights - upflow water/glycol/GLYCOOL 53-77kw (15-22 tons)—all

Dry Weight, Approximate, lb (kg)			
Model Type		**Model Size**	
		053	**070, 077**
Semi-Hermetic Compressor	Water/Glycol	2650 (1205)	2800 (1270)
	GLYCOOL/Dual Cool	2830 (1287)	2980 (1352)
Scroll or Digital Scroll Compressor	Water/Glycol	2370 (1075)	
	GLYCOOL/Dual Cool	2550 (1157)	

Figure 44 Primary connection locations - upflow water/glycol/GLYCOOL 53-77kw (15-22 tons)—all



* Field pitch Condensate Drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

** Supplied on Dual Cooling Systems only

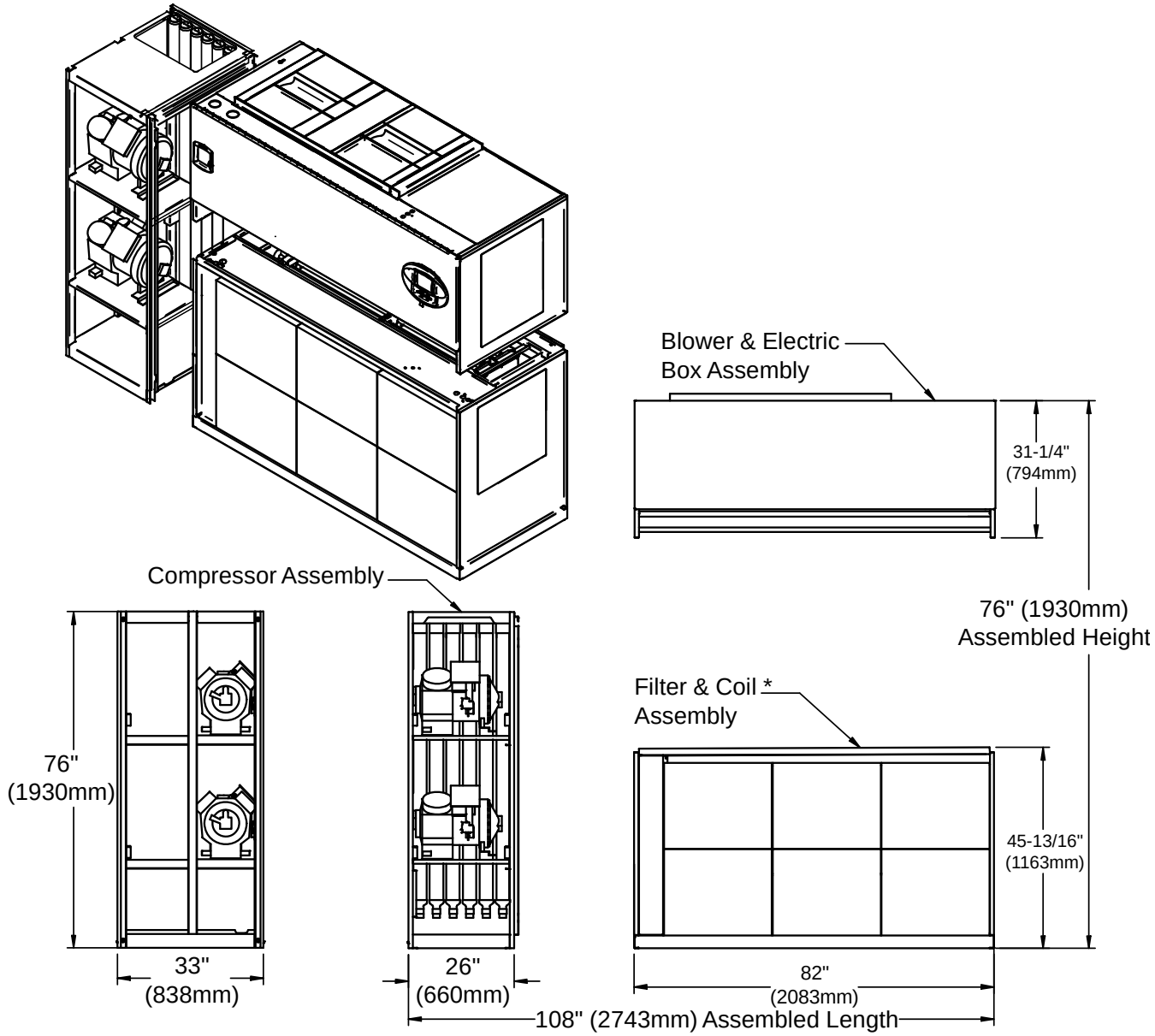
DPN001214
Rev. 1

Table 52 Piping data, upflow water/glycol/GLYCOOL 53-77kw (15-22 tons)—all

Point	Description	X	Y	Connection Size / Opening
W1 (3)	Water/Glycol/GLYCOOL Access (Bottom)	102-15/16" (2615mm)	9" (229mm)	3-1/2" x 8" (89mm x 203mm)
W2 (3)	Water/Glycol/GLYCOOL Access (Top)	102-15/16" (2615mm)	9" (229mm)	3-1/2" x 8" (89mm x 203mm)
W3 (3)	Water/Glycol/GLYCOOL Access (Side)	-	-	6" x 17-3/16" (152mm x 437mm)
WS (3)	Water/Glycol/GLYCOOL Supply	-	-	2-1/8" Cu Sweat
WR (3)	Water/Glycol/GLYCOOL Return	-	-	2-1/8" Cu Sweat
CGD*	Condensate Gravity Drain	-	-	3/4" FPT
CPD	Condensate Pump Discharge (Opt)	79-5/16" (2015mm)	11-7/8" (302mm)	1/2" Cu Sweat
HUM	Humidifier Supply Line	79-5/16" (2015mm)	9-7/8" (251mm)	1/4" Cu Sweat
ECS	Econ-O-Coil Supply	78-5/8" (1998mm)	7-7/8" (200mm)	2-1/8" Cu Sweat
ECR	Econ-O-Coil Return	78-5/8" (1998mm)	4-5/8" (117mm)	2-1/8" Cu Sweat
E1	Electrical Conn. (High Volt)	75-3/8" (1915mm)	30" (762mm)	2-1/2"
E2	Electrical Conn. (High Volt)	69-7/8" (1775mm)	30" (762mm)	2-1/2"
LV1	Electrical Conn. (Low Volt)	19-1/2" (495mm)	29-1/16" (738mm)	7/8"
LV2	Electrical Conn. (Low Volt)	19-1/2" (495mm)	30-1/2" (775mm)	7/8"
LV3	Electrical Conn. (Low Volt)	19-1/2" (495mm)	31-15/16" (811mm)	7/8"

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

Figure 45 Disassembly dimensional data - upflow water/glycol/GLYCOOL 53-77kw (15-22 tons)—all



NOTES: Drawing views are simplified with panels removed to show overall dimensions. See disassembly and handling instructions in installation manual.

* Coil can be field-removed for further height reduction.

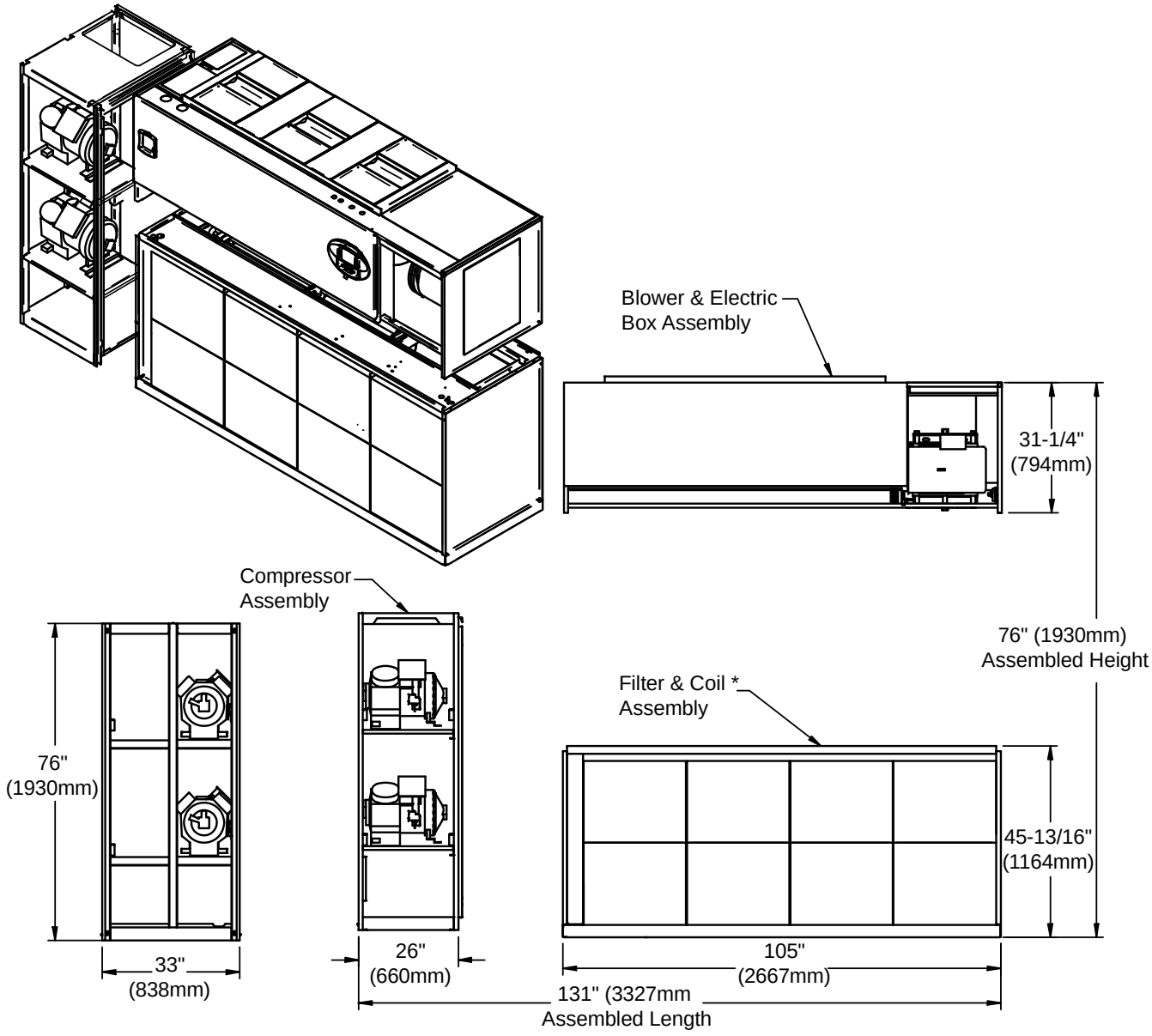
DPN001211
Rev. 0

Table 53 Component weights, upflow water/glycol/GLYCOOL, 53-77kW (15-22 tons) all

Dry Weight, Approximate, Including Panels, lb (kg)				
	Semi-Hermetic Compressor		Scroll or Digital Scroll Compressor	
Component	**Water/Glycol**	**GLYCOOL/Dual Cool**	**Water/Glycol**	**GLYCOOL/Dual Cool**
Compressor Assembly	1270 (578)	1270 (578)	840 (382)	840 (382)
Blower & Electric Box Assembly	770 (349)	770 (349)	770 (349)	770 (349)
Filter & Coil Assembly	760 (345)	940 (426)	760 (345)	940 (426)

UPFLOW, AIR COOLED, 105KW (30 TON)—SEMI-HERMETIC COMPRESSORS

Figure 46 Disassembly dimensions - upflow, air-cooled, 105kW (30 tons)—semi-hermetic



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

DPN001254
REV 0

Table 54 Component weights - upflow, air cooled, 105kW (30 tons)—semi-hermetic

Dry Weight, Approximate, Including Panels, lb (kg)		
Component	**Air Cooled**	**Dual Cool**
Compressor Assembly	950 (431)	950 (431)
Blower & Electric Box Assembly	1080 (490)	1080 (490)
Filter & Coil Assembly	970 (440)	1300 (590)

UPFLOW, AIR COOLED, 105KW (30 TON)—SCROLL COMPRESSORS

Figure 47 Disassembly dimensions - upflow, air cooled, 105kW (30 tons)—scroll/digital scroll

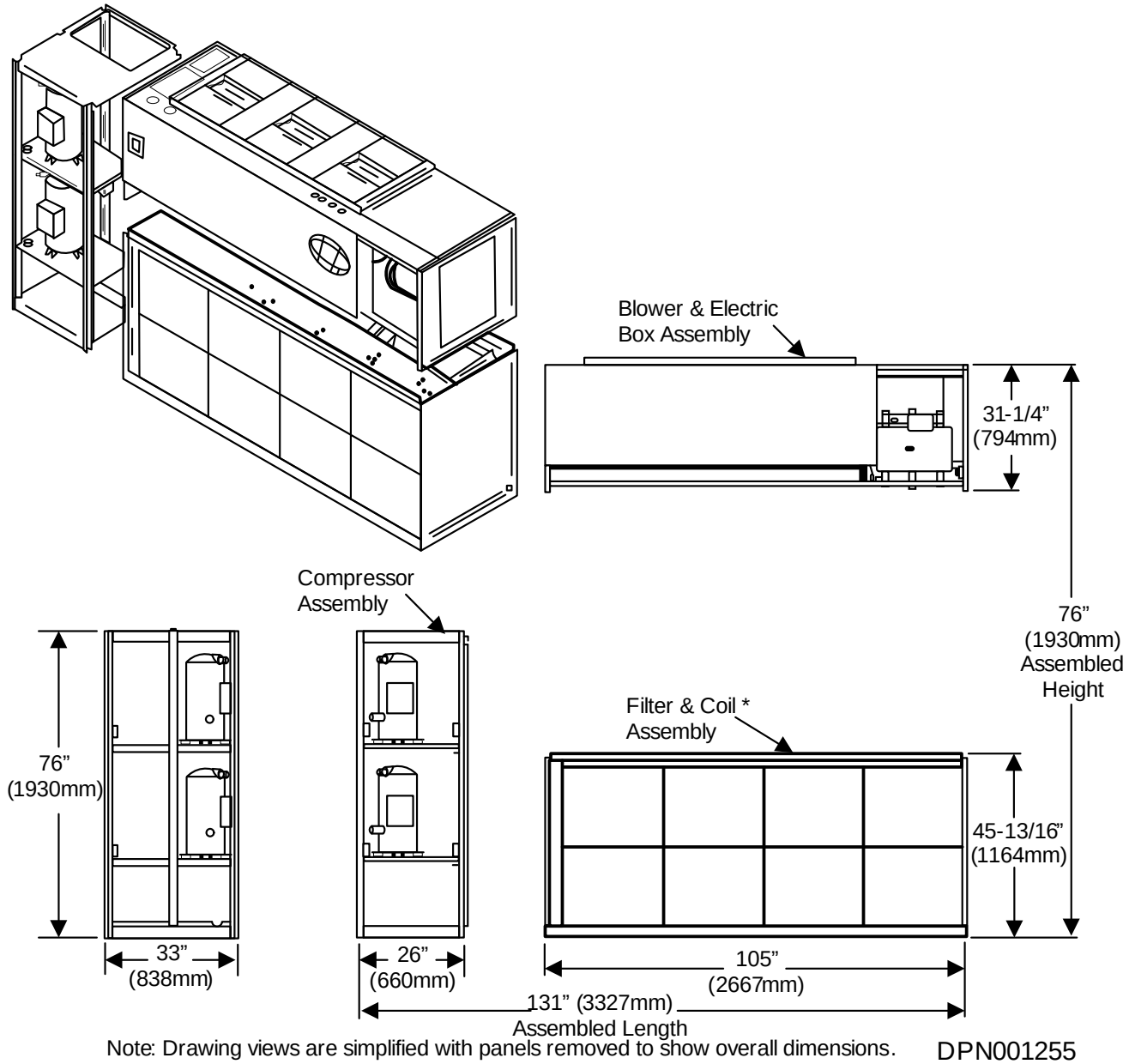
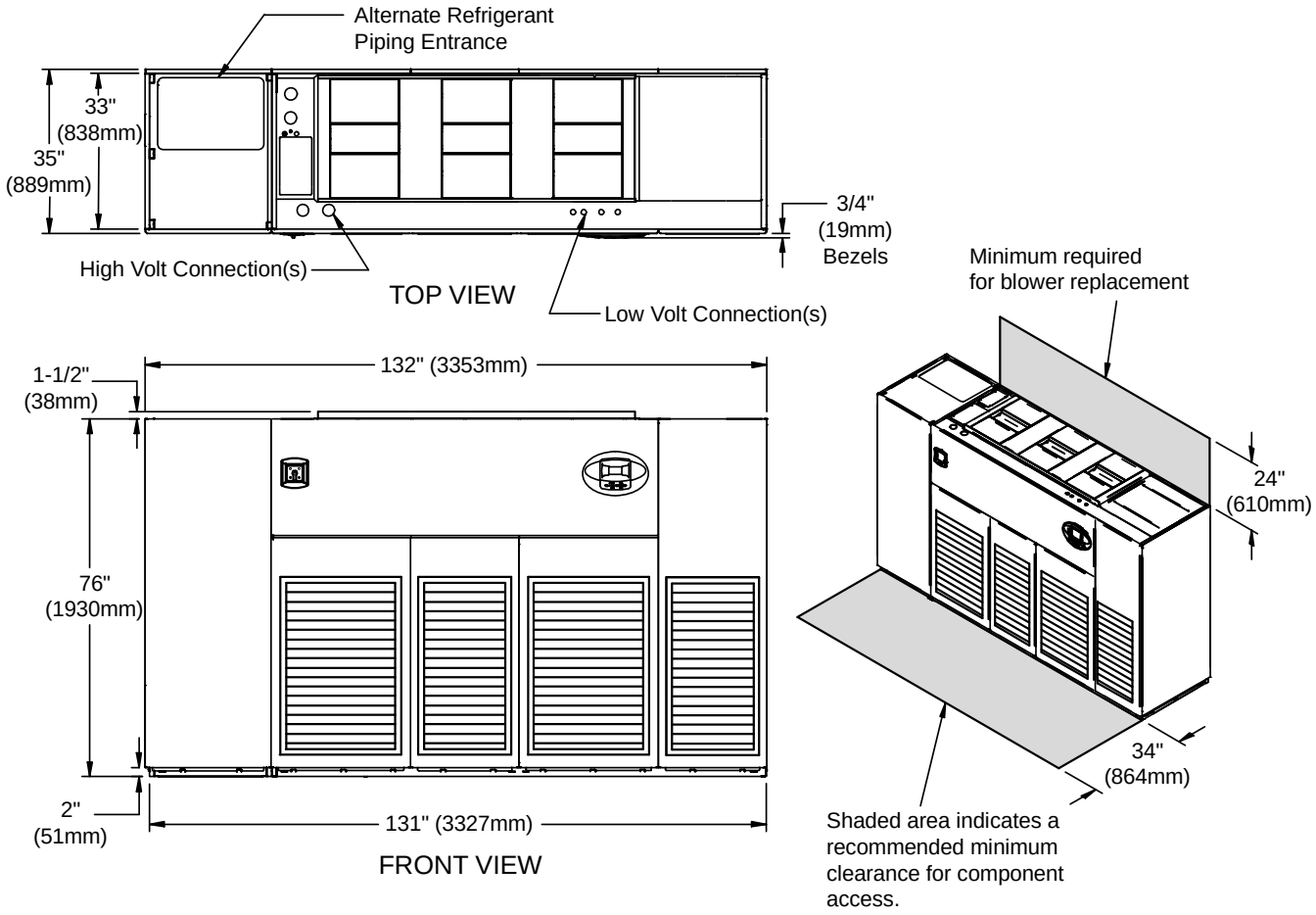


Table 55 Component weights - upflow, air cooled, 105kW (30 tons)—scroll/digital scroll

Dry Weight, Approximate, Including Panels, lb (kg)		
Component	**Air Cooled**	**Dual Cool**
Compressor Assembly	830 (376)	830 (376)
Blower & Electric Box Assembly	1080 (490)	1080 (490)
Filter & Coil Assembly	970 (440)	1300 (590)

UPFLOW, AIR COOLED, 105KW (30 TON)—ALL COMPRESSORS

Figure 48 Weights and dimensions - upflow, air cooled, 105kW (30 tons)—all



Note: Front air return unit shown. For rear return unit, in addition to front service area shown, also include 25" (635mm) on one side of unit for access to rear return filter box. See DPN00 1196.

DPN001168
REV 0

Table 56 Weights - upflow, air cooled, 105kW (30 tons)—all

Dry Weight, Approximate, lb (kg)	
Model	**105**
Semi- Hermetic Air Cooled	3000 (1361)
Semi-Hermetic Dual Cool	3330 (1510)
Scroll or Digital Scroll Air Cooled	2880 (1306)
Scroll or Digital Scroll Dual Cool	3210 (1456)

Figure 49 Primary connection locations - upflow, air cooled, 105kW (30 tons)—all

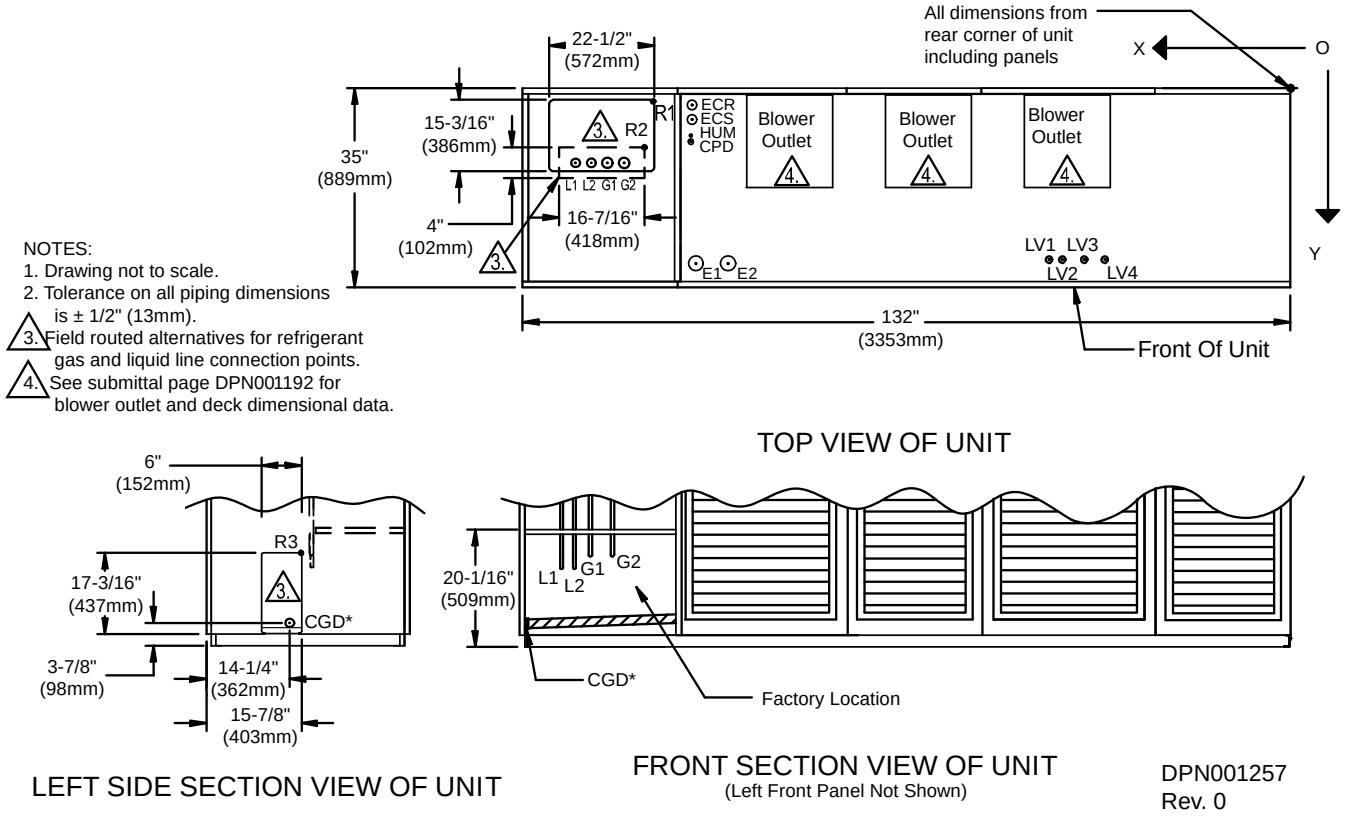


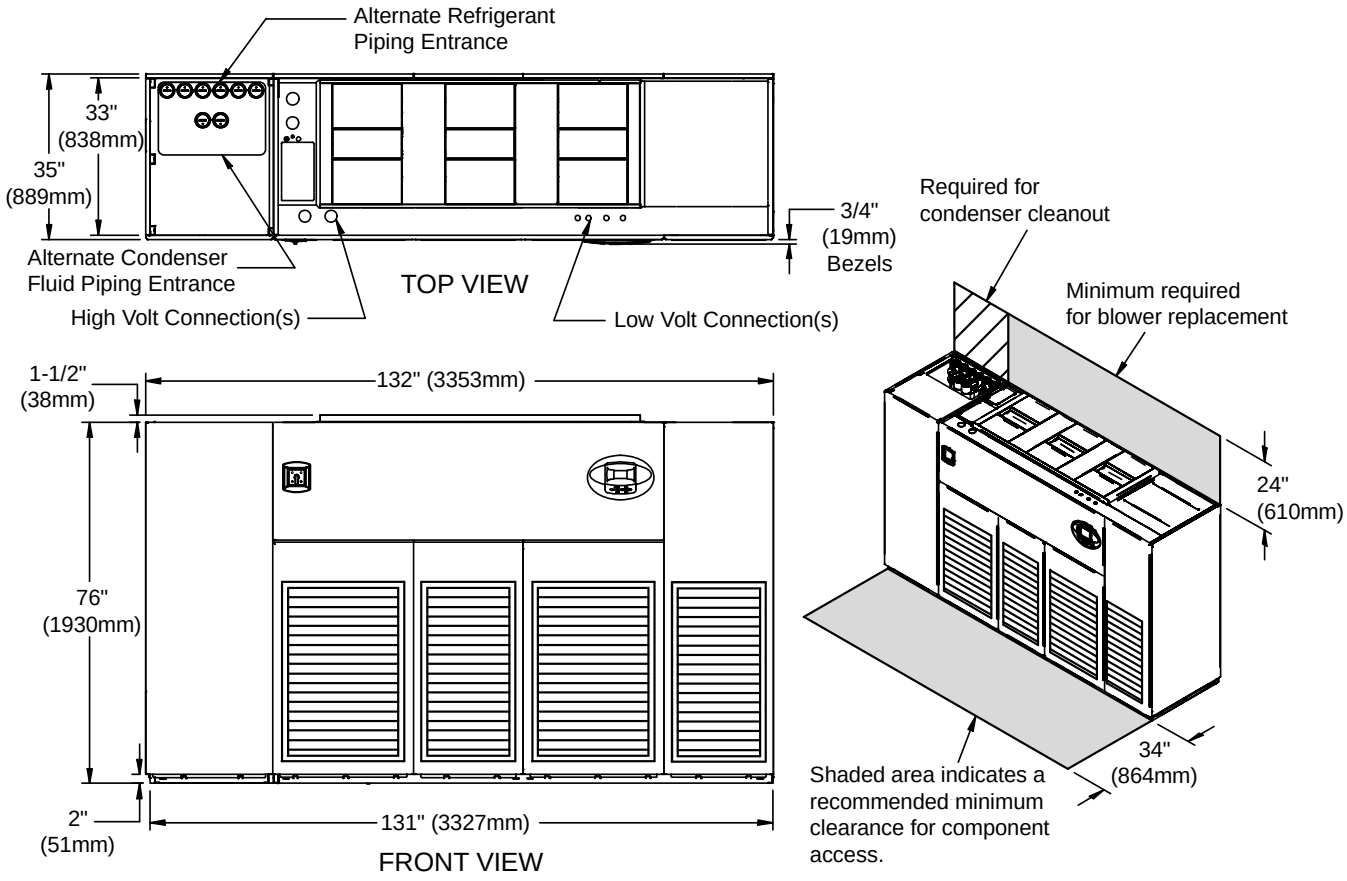
Table 57 Piping data - upflow, air cooled 105kW (30 tons)—all

Point	Description	X	Y	Connection Size / Opening
R1 3	Refrigerant Access (Top)	106-7/8" (2715mm)	1-7/8" (48mm)	22-1/2"(572mm) X 15-3/16" (386mm)
R2 3	Refrigerant Access (Bottom)	109-1/8" (2772mm)	13-7/8" (352mm)	16-7/16" (418mm) X 4" (102mm)
L1	Liquid Line System 1	121-3/4" (3092mm)	16-3/4" (425mm)	5/8" Cu Sweat
L2	Liquid Line System 2	118-1/8" (3000mm)	16-3/4" (425mm)	5/8" Cu Sweat
G1	Hot Gas Discharge 1	118-1/4" (3004mm)	14-1/4" (362mm)	1-1/8" Cu Sweat
G2	Hot Gas Discharge 2	115-5/8" (2937mm)	14-1/4" (362mm)	1-1/8" Cu Sweat
R3 3	Refrigerant Access (Side)	-	-	6" (152mm) X 17-3/16" (437mm)
CGD*	Condensate Gravity Drain	-	-	3/4" FPT
CPD	Condensate Pump Discharge (Opt)	102-3/8" (2600mm)	13-5/8" (346mm)	1/2" Cu Sweat
HUM	Humidifier Supply Line	101-1/8" (2569mm)	13-1/8" (333mm)	1/4" Cu Sweat
ECS	Econ-o-coil Supply	101-1/8" (2569mm)	10-1/4" (260mm)	2-5/8" Cu Sweat
ECR	Econ-o-coil Return	101-1/8" (2569mm)	5-1/4" (133mm)	2-5/8" Cu Sweat
E1	Electrical Conn. (High Volt)	98-1/2" (2502mm)	30" (762mm)	2-1/2"
E2	Electrical Conn. (High Volt)	93" (2362mm)	30" (762mm)	2-1/2"
LV1	Electrical Conn. (Low Volt)	41-1/8" (1045mm)	30-3/8" (772mm)	7/8"
LV2	Electrical Conn. (Low Volt)	38-7/8" (987mm)	30-3/8" (772mm)	7/8"
LV3	Electrical Conn. (Low Volt)	35-1/8" (892mm)	30-3/8" (772mm)	7/8"
LV4	Electrical Conn. (Low Volt)	31-5/8" (803mm)	30-3/8" (772mm)	7/8"

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

UPFLOW, WATER/GLYCOL/GLYCOOL, 105KW (30 TON)—ALL COMPRESSORS

Figure 50 Dimensions - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all



Note: Front air return unit shown. For rear return unit, in addition to front service area shown, also include 25" (635mm) on one side of unit for access to rear return filter box. See DPN00 1196.

DPN001169
REV 0

Table 58 Weights - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all

Dry Weight, Approximate, lb (kg)		
Model Type		**Model Size: 105**
Semi- Hermetic Compressor	Water/Glycol	3370 (1529)
	GLYCOOL/Dual Cool	3700 (1678)
Scroll or Digital Scroll Compressor	Water/Glycol	3250 (1474)
	GLYCOOL/Dual Cool	3580 (1624)

Figure 51 Primary connection locations - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all

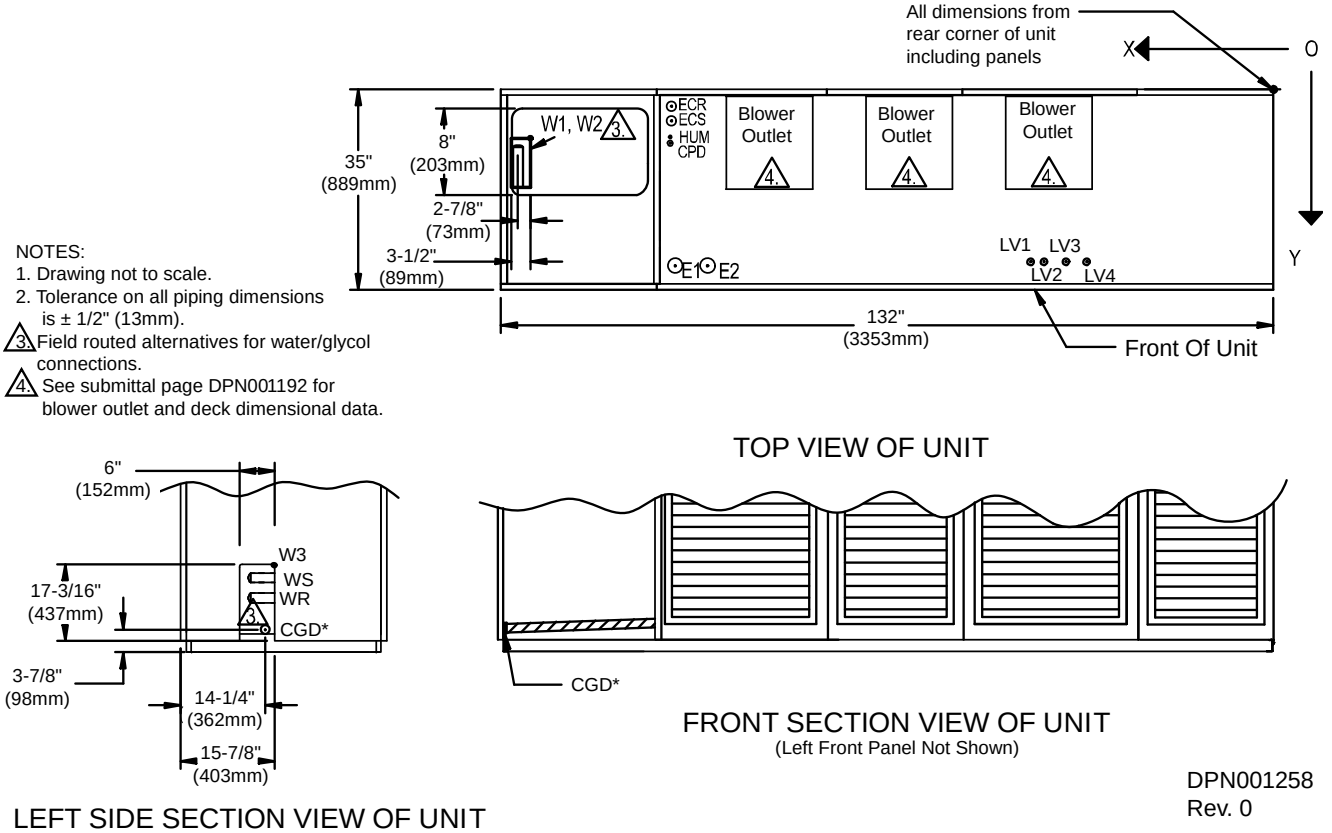
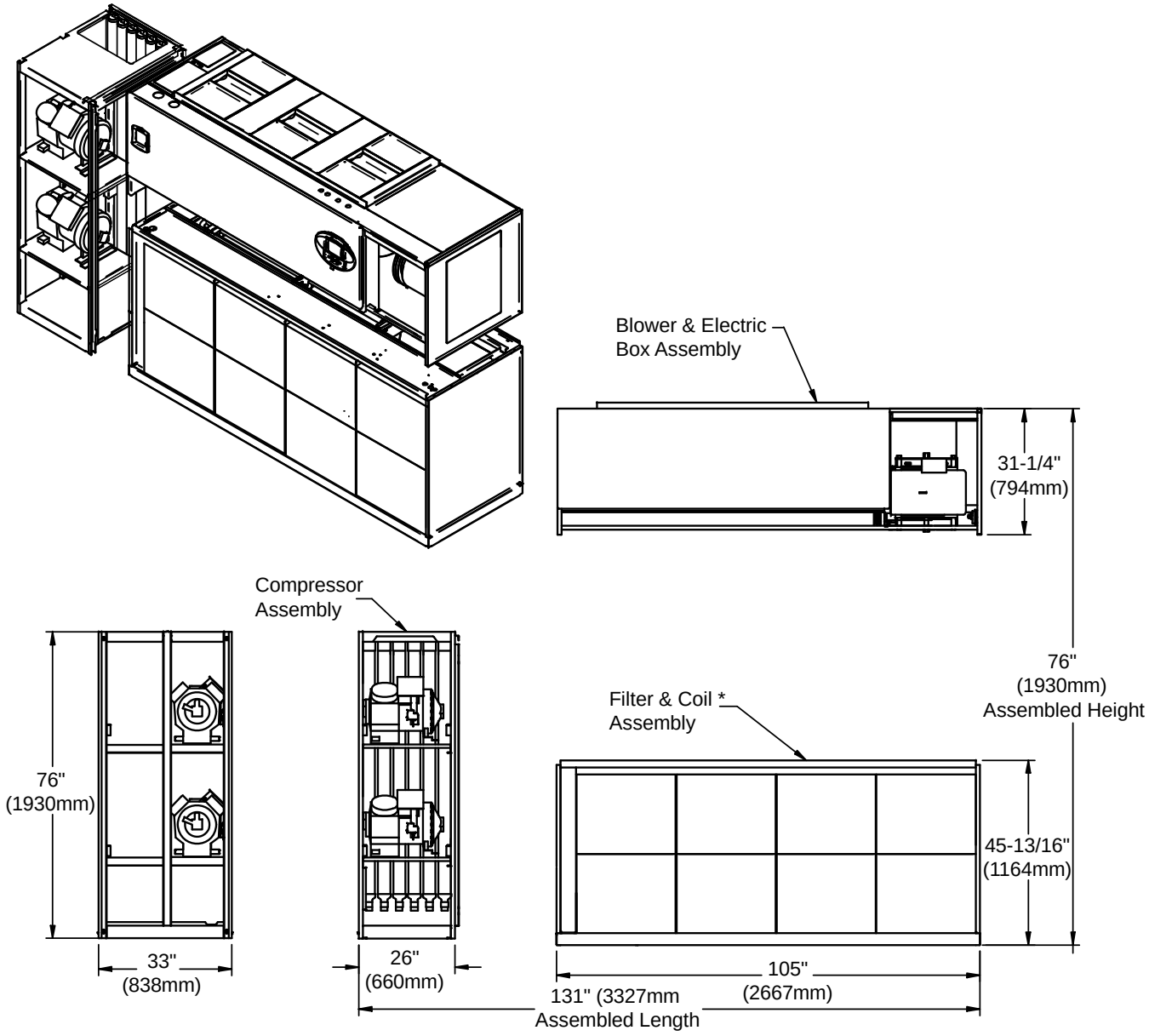


Table 59 Piping data - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all

Point	Description	X	Y	CONNECTION SIZE / OPENING
W1 3	Water/Glycol/GLYCOOL Access (Bottom)	126-1/8" (3204mm)	9" (229mm)	3-1/2" x 8" (89mm x 203mm)
W2 3	Water/Glycol/GLYCOOL Access (Top)	126-1/8" (3204mm)	9" (229mm)	3-1/2" x 8" (89mm x 203mm)
W3 3	Water/Glycol/GLYCOOL Access (Side)	-	-	6" x 17-3/16" (152mm x 437mm)
WS 3	Water/Glycol/GLYCOOL Supply	-	-	2-1/8" Cu Sweat
WR 3	Water/Glycol/GLYCOOL Return	-	-	2-1/8" Cu Sweat
CGD*	Condensate Gravity Drain	-	-	3/4" FPT
CPD	Condensate Pump Discharge (Opt)	102-3/8" (2600mm)	13-5/8" (346mm)	1/2" Cu Sweat
HUM	Humidifier Supply Line	101-1/8" (2569mm)	13-1/8" (333mm)	1/4" Cu Sweat
ECS	Econ-O-Coil Supply	101-1/8" (2569mm)	10-1/4" (260mm)	2-5/8" Cu Sweat
ECR	Econ-O-Coil Return	101-1/8" (2569mm)	5-1/4" (133mm)	2-5/8" Cu Sweat
E1	Electrical Conn. (High Volt)	98-1/2" (2502mm)	30" (762mm)	2-1/2"
E2	Electrical Conn. (High Volt)	93" (2362mm)	30" (762mm)	2-1/2"
LV1	Electrical Conn. (Low Volt)	41-1/8" (1045mm)	30-3/8" (772mm)	7/8"
LV2	Electrical Conn. (Low Volt)	38-7/8" (987mm)	30-3/8" (772mm)	7/8"
LV3	Electrical Conn. (Low Volt)	35-1/8" (892mm)	30-3/8" (772mm)	7/8"
LV4	Electrical Conn. (Low Volt)	31-5/8" (803mm)	30-3/8" (772mm)	7/8"

* Field pitch condensate drain line a minimum of 1/8" (3.2 mm) per foot (305 mm). All units contain a factory-installed condensate trap. Do not trap external to the unit. Drain line may contain boiling water. Select appropriate drain system materials. The drain line must comply with all local codes.

Figure 52 Disassembly dimensions - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all



NOTES: Drawing views are simplified with panels removed to show overall dimensions.
See disassembly and handling instructions in installation manual.
* Coil can be field-removed for further height reduction.

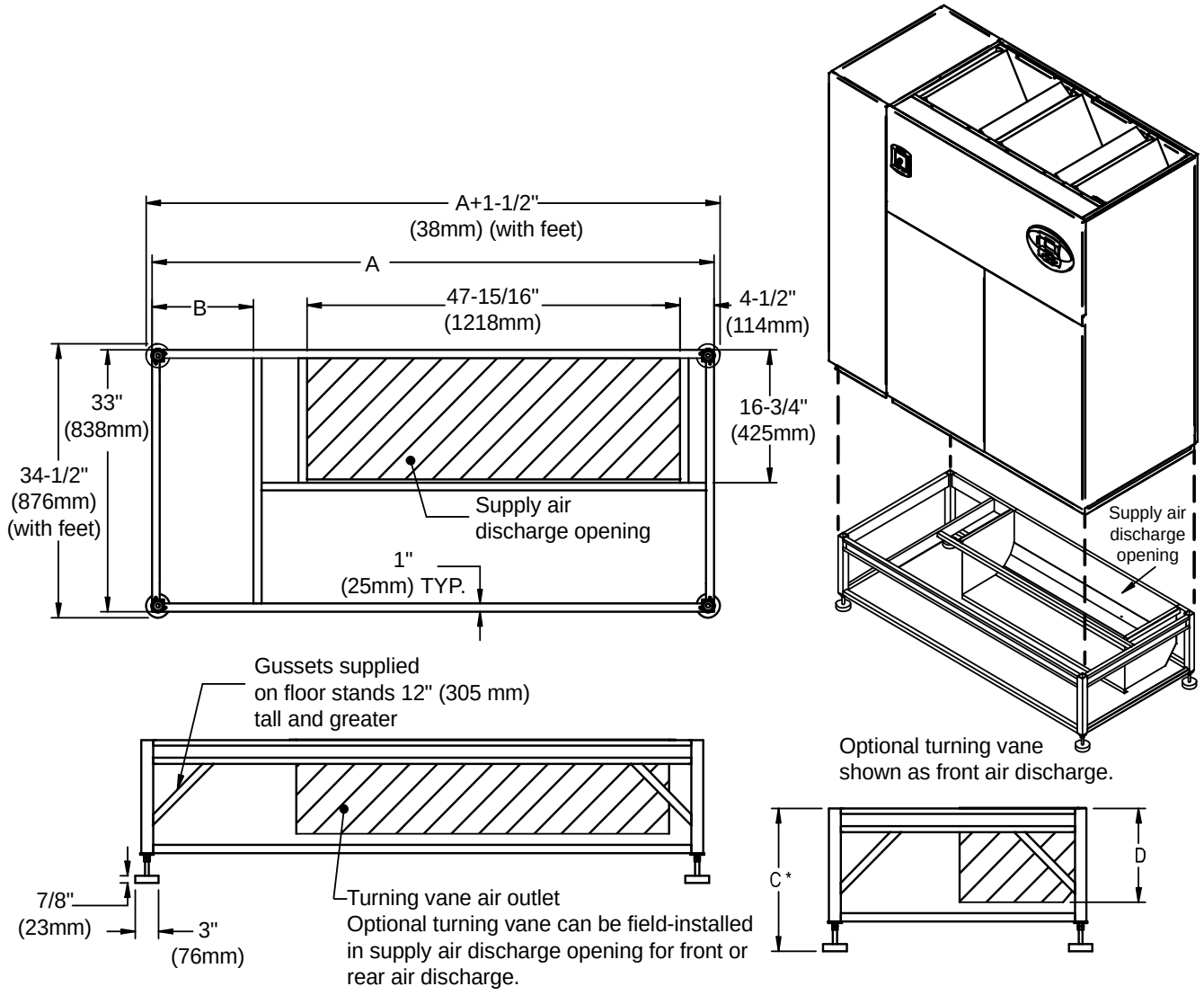
DPN001256
REV 0

Table 60 Component weights - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all

Dry Weight, Approximate, Including Panels, lb (kg)				
	Semi-Hermetic Compressor		Scroll or Digital Scroll Compressor	
Component	**Water/Glycol**	**GLYCOOL/Dual Cool**	**Water/Glycol**	**GLYCOOL/Dual Cool**
Compressor Assembly	1320 (599)	1320 (599)	1200 (544)	1200 (544)
Blower & Electric Box Assembly	1080 (490)	1080 (490)	1080 (490)	1080 (490)
Filter & Coil Assembly	970 (440)	1300 (590)	970 (440)	1300 (590)

ANCILLARY ITEMS

Figure 53 Floor stand dimensions - downflow, 28-42kW (8-12 ton) models



NOTE: Right side of paneled unit is flush with right side of floorstand. All other paneled sides overhang floor stand 1" (25mm). * Leveling feet are provided with ± 1-1/2" (38mm) adjustment from nominal height C.

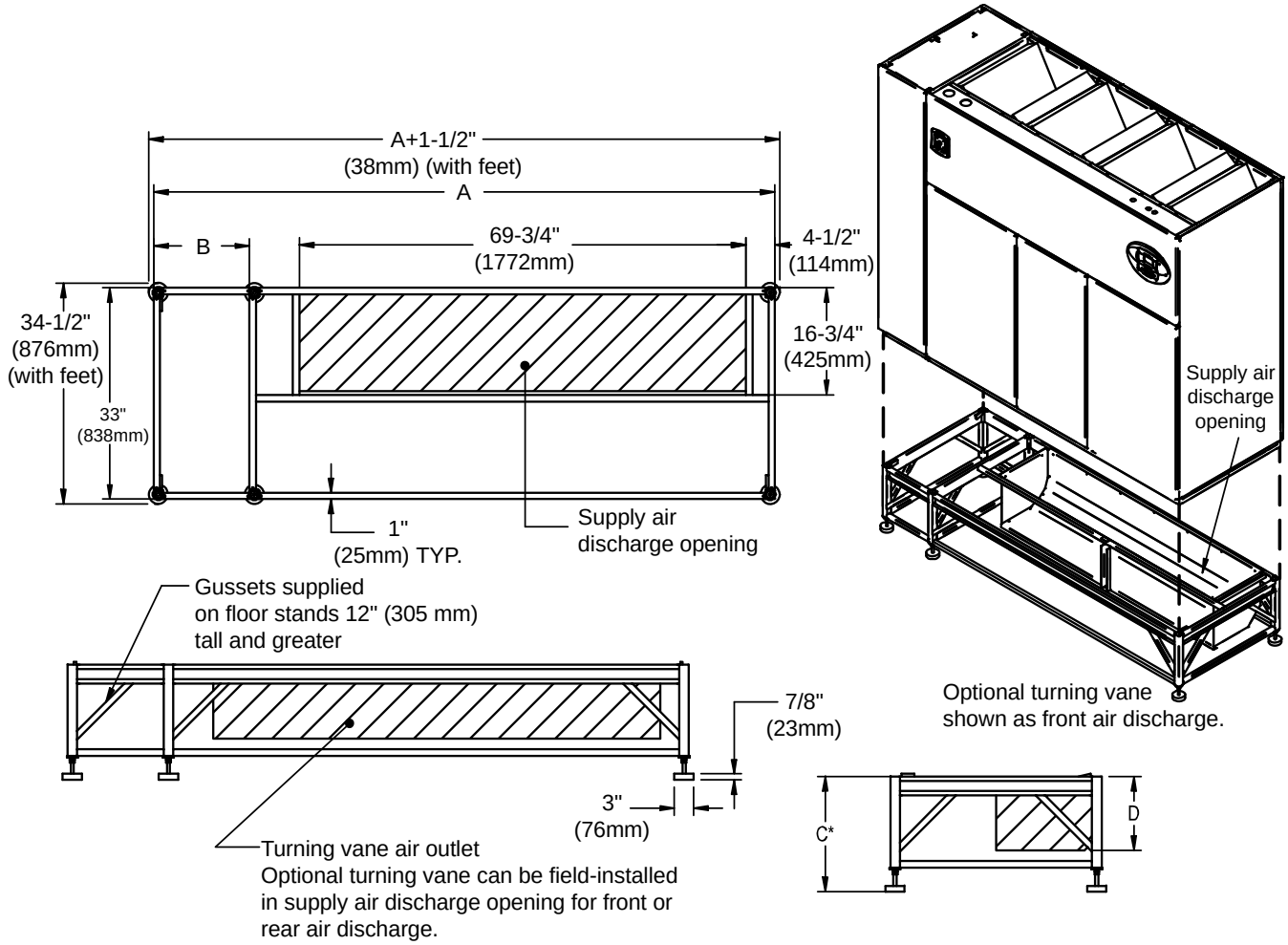
DPN000820
REV 2

Table 61 Floor stand and floor planning dimensional data

Dimensional Data, in. (mm)		
Model	**A**	**B**
Air-Cooled Semi-Hermetic Models and All Water/Glycol/GLYCOOL Models	85 (2159)	26 (660)
Air-Cooled Scroll Models and Air-Cooled Digital Scroll Models	72 (1829)	13 (330)

Height, in. (mm)	
C*	**D turning vane**
9 (229)	4 (111)
12 (305)	7 (187)
15 (381)	10 (264)
18 (457)	13 (340)
21 (533)	16 (416)
24 (610)	19 (492)

Figure 54 Floor stand dimensions - downflow, 53-77kW (15-22 ton) models



NOTE: Right side of paneled unit is flush with right side of floor stand. All other paneled sides overhang floor stand 1" (25mm). * Leveling feet are provided with ± 1-1/2" (38mm) adjustment from nominal height C.

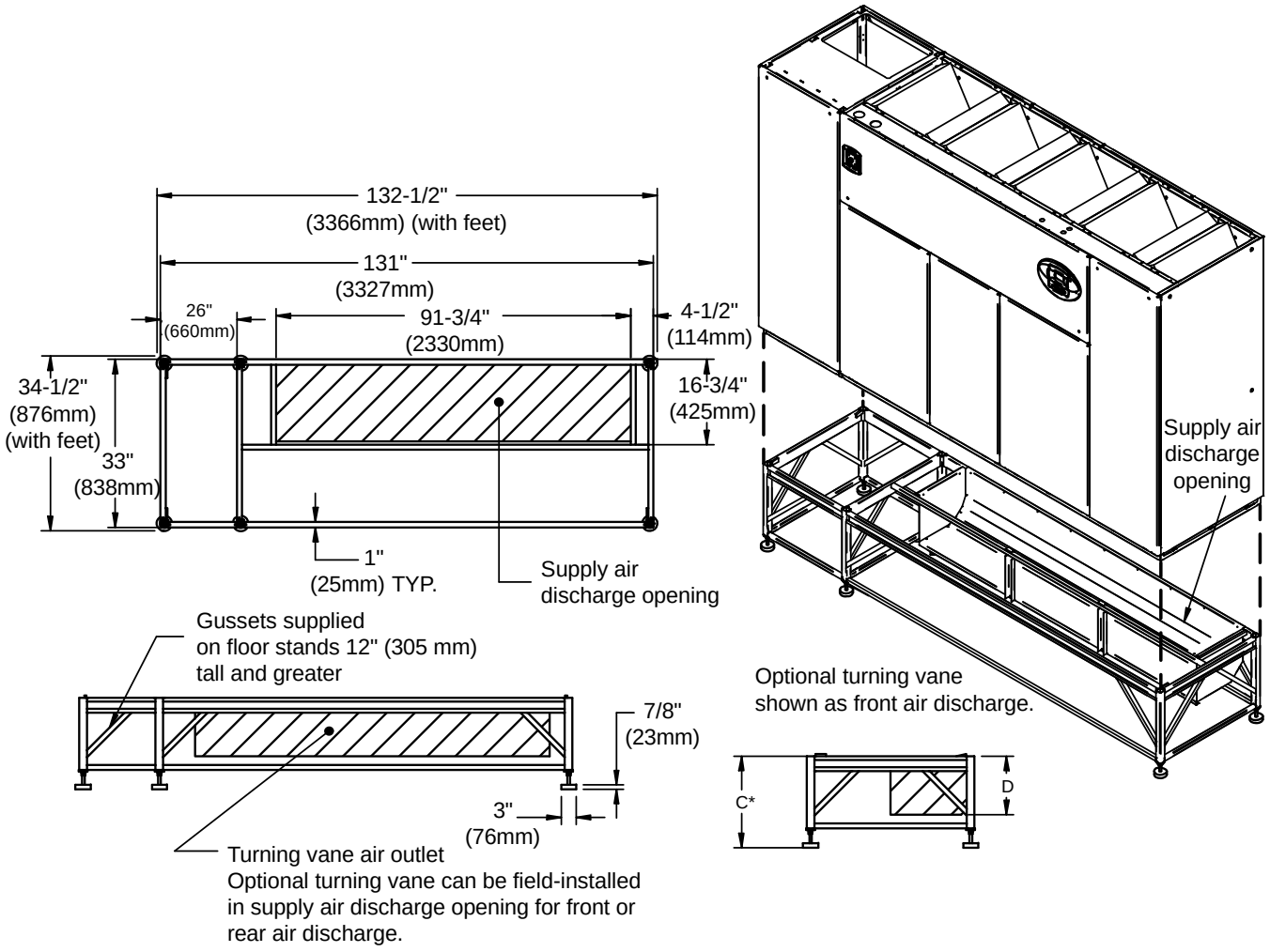
DPN000930
REV 1

Table 62 Floor stand and floor planning dimensional data

Dimensional Data, in. (mm)		
Model	**A**	**B**
Air-Cooled Semi-Hermetic Models and All Water/Glycol/GLYCOOL Models	108 (2743)	26 (660)
Air-Cooled Scroll Models and Air-Cooled Digital Scroll Models	97 (2464)	15 (381)

Height, in. (mm)	
C*	**D turning vane**
9 (229)	4 (111)
12 (305)	7 (187)
15 (381)	10 (264)
18 (457)	13 (340)
21 (533)	16 (416)
24 (610)	19 (492)

Figure 55 Floor stand dimensions - downflow, 105kW (30 ton) models



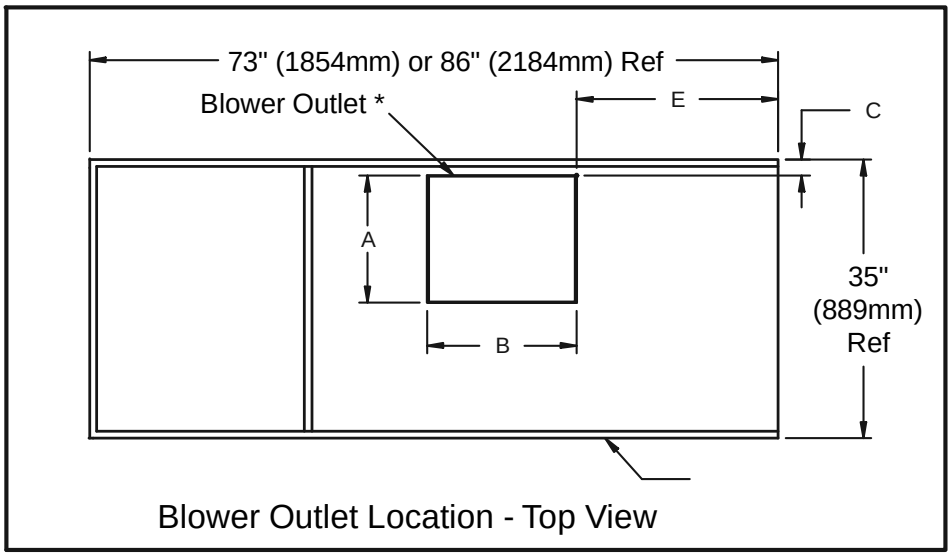
NOTE: Right side of paneled unit is flush with right side of floorstand. All other paneled sides overhang floor stand 1" (25mm).* Leveling feet are provided with ± 1-1/2" (38mm) adjustment from nominal height C.

DPN001059
REV 1

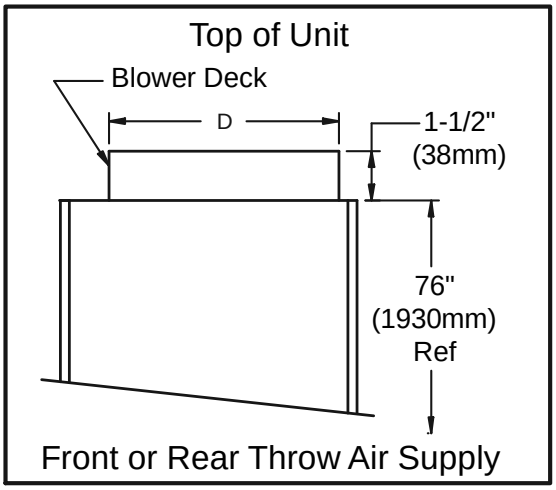
Table 63 Floor stand and floor planning dimensional data

Height, in. (mm)	
C*	**D turning vane**
9 (229)	4 (111)
12 (305)	7 (187)
15 (381)	10 (264)
18 (457)	13 (340)
21 (533)	16 (416)
24 (610)	19 (492)

Figure 56 Blower outlet location - upflow, air-cooled, 28-42kW (8-12 ton)



* Duct flange not provided

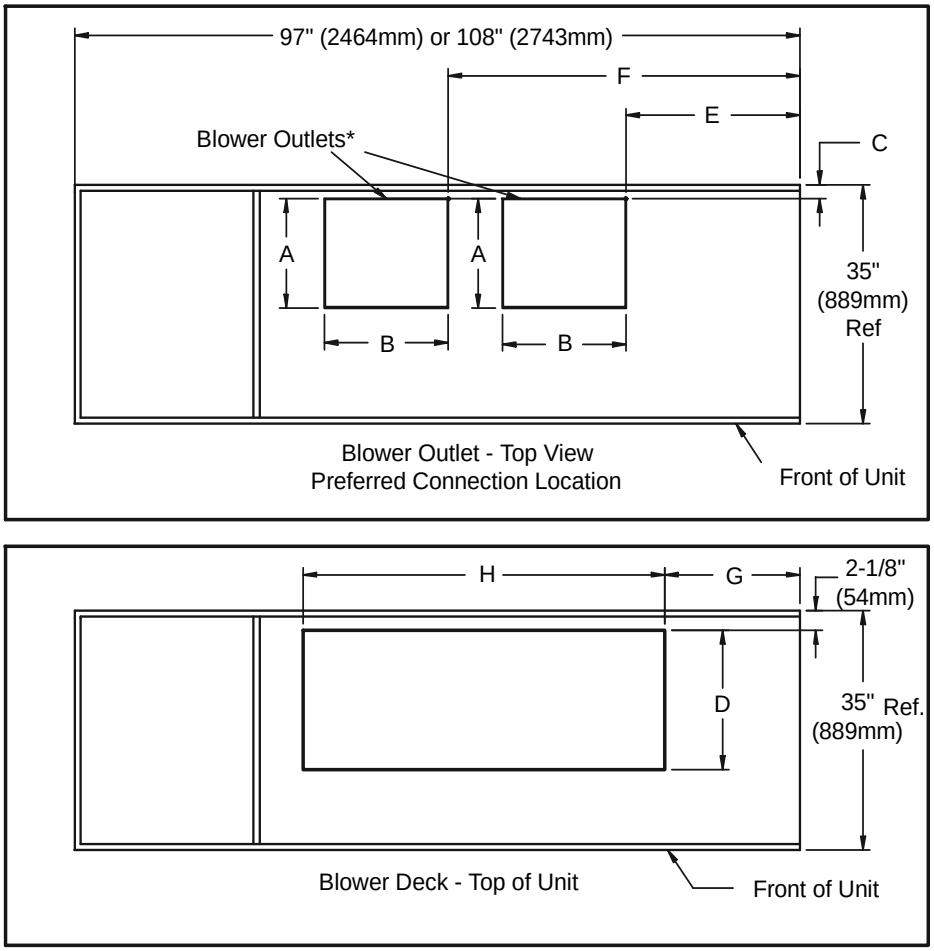


DPN001120
Rev. 2

Table 64 Blower outlet and deck dimensional data

Dimensional data, in. (mm)							
Model	**Blower**	**Supply**	**A**	**B**	**C**	**D**	**E**
28-42kW (8-12ton)	15 x 15	Front Throw	15-7/8 (404)	18-5/8 (472)	2-1/8 (54)	25-5/8 (651)	25 (635)
		Rear Throw	15-7/8 (404)	18-5/8 (472)	11-5/8 (295)	25-5/8 (651)	25 (635)
	15 x 11	Front Throw	15-7/8 (404)	14-1/2 (368)	2-1/8 (54)	25-5/8 (651)	25 (635)
		Rear Throw	15-7/8 (404)	14-1/2 (368)	11-5/8 (295)	25-5/8 (651)	25 (635)

Figure 57 Blower outlet and deck dimensional data upflow 53-77kW (15-22tons)



* Duct flanges not provided.

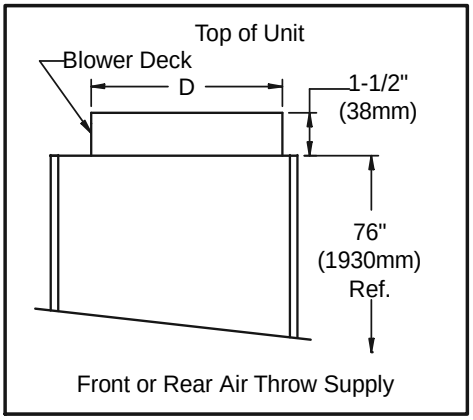


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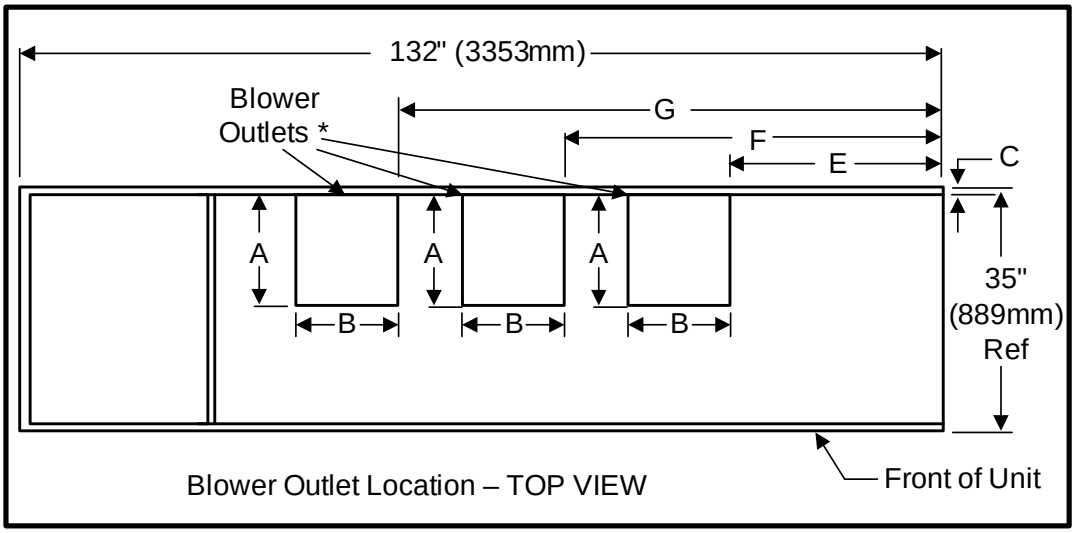
Table 65 Blower outlet and deck dimensional data upflow, 53-77kW (15-22tons)

Models	Blower	Supply	Dimensional Data, inches (mm)							
			A	B	C	D	E	F	G	H
53-77kW (15-22 Tons)	15 x 15	Front Throw	15-7/8 (404)	18-5/8 (472)	2-1/8 (54)	25-5/8 (651)	27-3/4 (705)	55-1/2 (1410)	25-1/8" (638mm)	50-1/2" (1283mm)
		Rear Throw	15-7/8 (404)	18-5/8 (472)	11-5/8 (295)	25-5/8 (651)	27-3/4 (705)	55-1/2 (1410)	25-1/8" (638mm)	50-1/2" (1283mm)
	15 x 11	Front Throw	15-7/8 (404)	14-11/16 (373)	2-1/8 (54)	25-5/8 (651)	31-3/8 (797)	58-7/16 (1484)	27-3/4" (705mm)	47" (1194mm)
		Rear Throw	15-7/8 (404)	14-11/16 (373)	11-5/8 (295)	25-5/8 (651)	31-3/8 (797)	58-7/16 (1484)	27-3/4" (705mm)	47" (1194mm)

Figure 58 Blower outlet and deck dimensional data upflow 105kW (30tons)



* Duct Flanges Not Provided

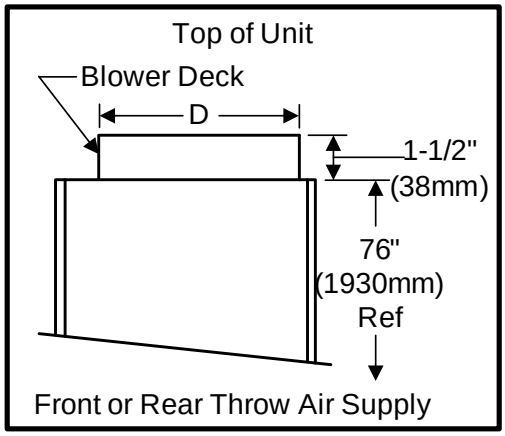


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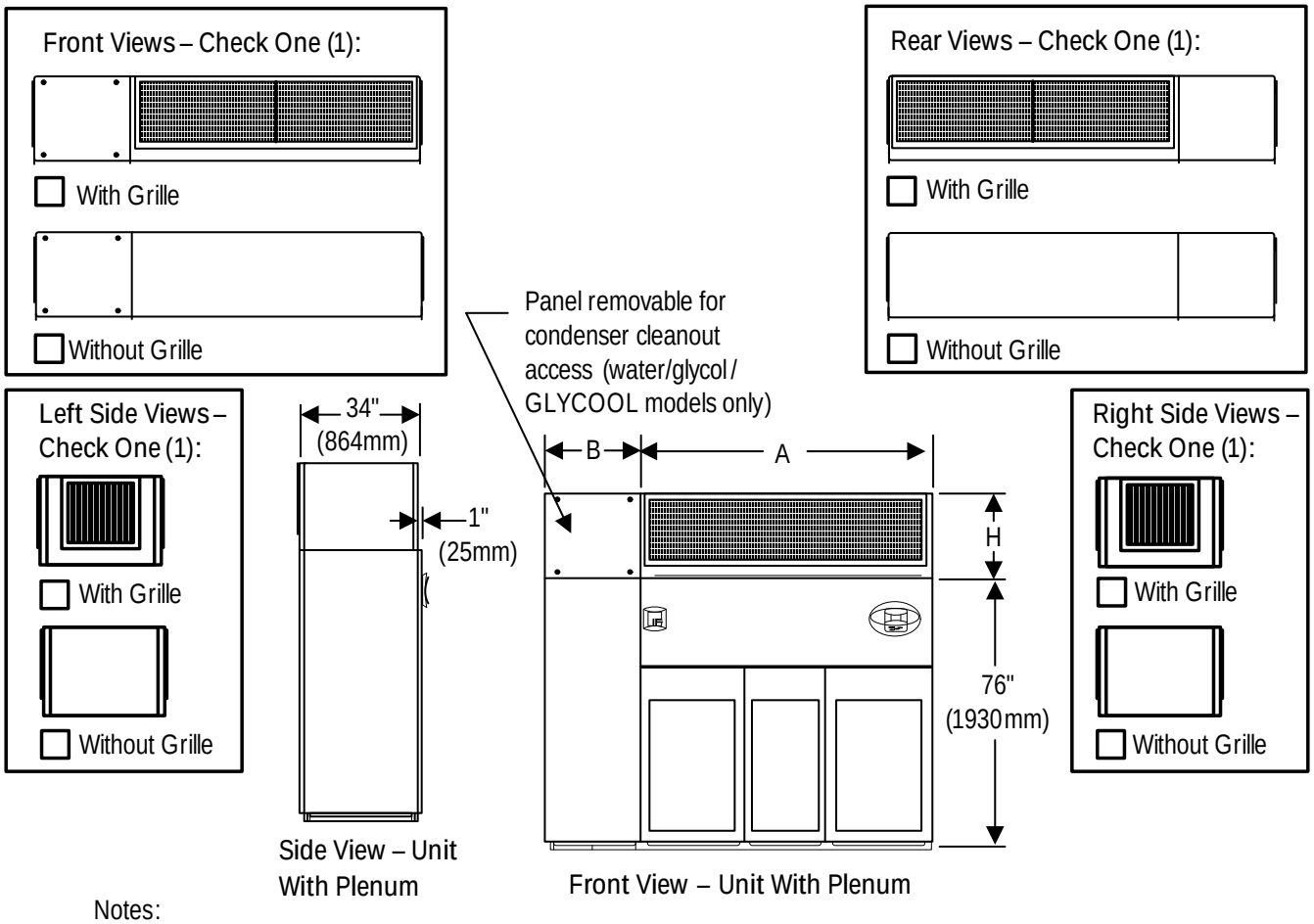
Table 66 Blower outlet and deck dimensional data upflow 105kW (30tons)

Models	Blower	SUPPLY	Dimensional Data, inches (mm)						
			A	B	C	D	E	F	G
105kW (30 Tons)	15 x 11	Front Throw	15-7/8 (404)	14-11/16 (373)	2-1/8 (54)	25-5/8 (651)	30-3/4 (781)	54-1/2 (1384)	78-1/8 (1984)
		Rear Throw	15-7/8 (404)	14-11/16 (373)	11-5/8 (295)	25-5/8 (651)	30-3/4 (781)	54-1/2 (1384)	78-1/8 (1984)

Figure 59 Plenum dimension - upflow, 28-105kW (8-30 ton) models



Notes:

1. Typical 53-77kW (15-22ton) unit orientation shown with grille plenum . View varies by unit size and plenum selection .
2. All plenums are shipped flat and must be field assembled .
3. Optional grille plenum kits must include front or rear grille .
4. Non-grille plenums are open on the top and not designed with duct flange .

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Table 67 Plenum dimensional data, in. (mm)

Dimensional data, in. (mm)			Grille Size, in (mm) - Nominal		Height in. (mm)
Model	**A**	**B**	**Front/Rear Grilles**	**Side Grille**	**H**
28-42kW (8-12 ton) Air-Cooled Scroll and Air-Cooled Digital Scroll Models	59-1/4 (1505)	13-3/4 (349)	18 x 55 (457 x 1397)	18 x 20 (457 x 508)	20 (508)
28-42kW (8-12 ton) Semi-Hermetic and all Water/Glycol/GLYCOOL Models	59-1/4 (1505)	26-3/4 (679)	18 x 55 (457 x 1397)	18 x 20 (457 x 508)	24 (610)
53-77kW (15-22 ton) Air-Cooled Scroll and Air-Cooled Digital Scroll Models	82-1/4 (2089)	15-3/4 (400)	18 x 78 (457 x 1981)	18 x 20 (457 x 508)	36 (914)
53-77kW (15-22 ton) Semi-Hermetic and all Water/Glycol/GLYCOOL Models	82-1/4 (2089)	26-3/4 (679)	18 x 78 (457 x 1981)	18 x 20 (457 x 508)	
105kW (30 ton) All Models	105-1/4 (2673)	26-3/4 (679)	(1) 18 x 20 (457 x 508) (1) 18 x 78 (457 x 1981)	18 x 20 (457 x 508)	

HEAT REJECTION

CONDENSER AND DRYCOOLER SELECTION

Table 68 Liebert DS air-cooled condenser selection

Refrigerant	Air-Cooled Condenser Selection		Liebert DS Model						
	Condenser Type	Ambient Temperature °F (°C)	028	035	042	053	070	077	105
R-407C	Outdoor Condenser	95 (35)	CD*-205	CD*-205	CD*-205	CD*-251	CD*-308	CD*-308	CD*-415
		100 (38)	CD*-205	CD*-205	CD*-251	CD*-308	CD*-415	CD*-415	CD*-616
		105 (41)	CD*-251	CD*-251	CD*-308	CD*-415	CD*-415	CD*-616	CD*-616
	Outdoor Quiet-Line Condenser	95 (35)	CD*-214	CD*-214	CD*-286	CD*-286	CD*-409	CD*-409	CD*-572
		100 (38)	CD*-214	CD*-214	CD*-286	CD*-409	CD*-477	CD*-572	N/A
		105 (41)	CD*-286	CD*-286	CD*-409	CD*-409	CD*-572	CD*-572	N/A

Table 69 Liebert DS drycooler selection

Drycooler Type	Ambient Temperature ºF (ºC)	Liebert DS Model						
		028	035	042	053	070	077	105
Outdoor Drycooler	95 (35)	D-174	D-174	D-225-16	D-260	D-310	D-350	D-466
	100 (38)	D-225-16	D-225-16	D-310	D-350	D-419	D-466	D-620-32
	105 (41)	D-310-16	D-350-16	D-419	D-491-32	D-620-32	D-650-40	D-880-52
Outdoor Quiet-Line Drycooler	95 (35)	D-173-16	D-178-16	D-205	DD-248	D-347-32	D-347-32	D-453
	100 (38)	D-205-16	D-205-16	D-347-32	D-347-32	D-453-32	D-453-32	N/A
	105 (41)	D-356-32	D-356-32	D-453-32	D-453-32	D-453-32	N/A	N/A

Table 70 Liebert DS piggyback condenser selection

Refrigerant	Air-Cooled Condenser Selection		Liebert DS Size						
	Condenser Type	Ambient Temp. °F (°C)	028	035	042	053	070	077	105
R-407C	Piggyback	95 (35)	PB-925	PB-925	PB-1100	PB-1350	N/A	N/A	N/A
		100 (38)	PB-1100	PB-1100	PB-1350	N/A	N/A	N/A	N/A
		105 (41)	PB-1100	PB-1350	N/A	N/A	N/A	N/A	N/A

Table 71 Liebert piggyback drycooler/DS matchup data

Drycooler Selections		Liebert DS Model					
Drycooler Type	Ambient Temp. ºF (ºC)	028	035	042	053	070	077
Piggyback Drycooler	95 (35)	PD-133/150	PD-150	PD-223	PD-290	PD-333	PD-333
	100 (38)	PD-223	PD-223	PD-333	N/A	N/A	N/A
	105 (41)	PD-333	PD-333	PD-333	N/A	N/A	N/A

CONDENSER AND DRYCOOLER DIMENSIONAL DATA

Figure 60 Condenser and drycooler dimensions, 2-fan model

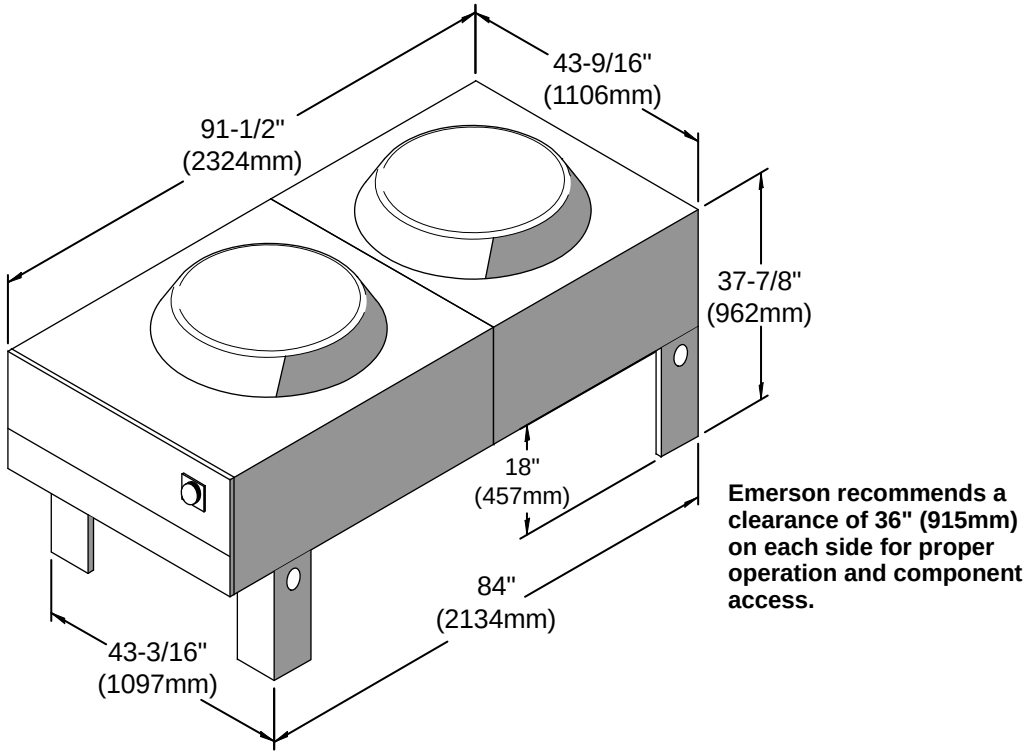


Figure 61 Condenser and drycooler dimensions, 3- and 4-fan models

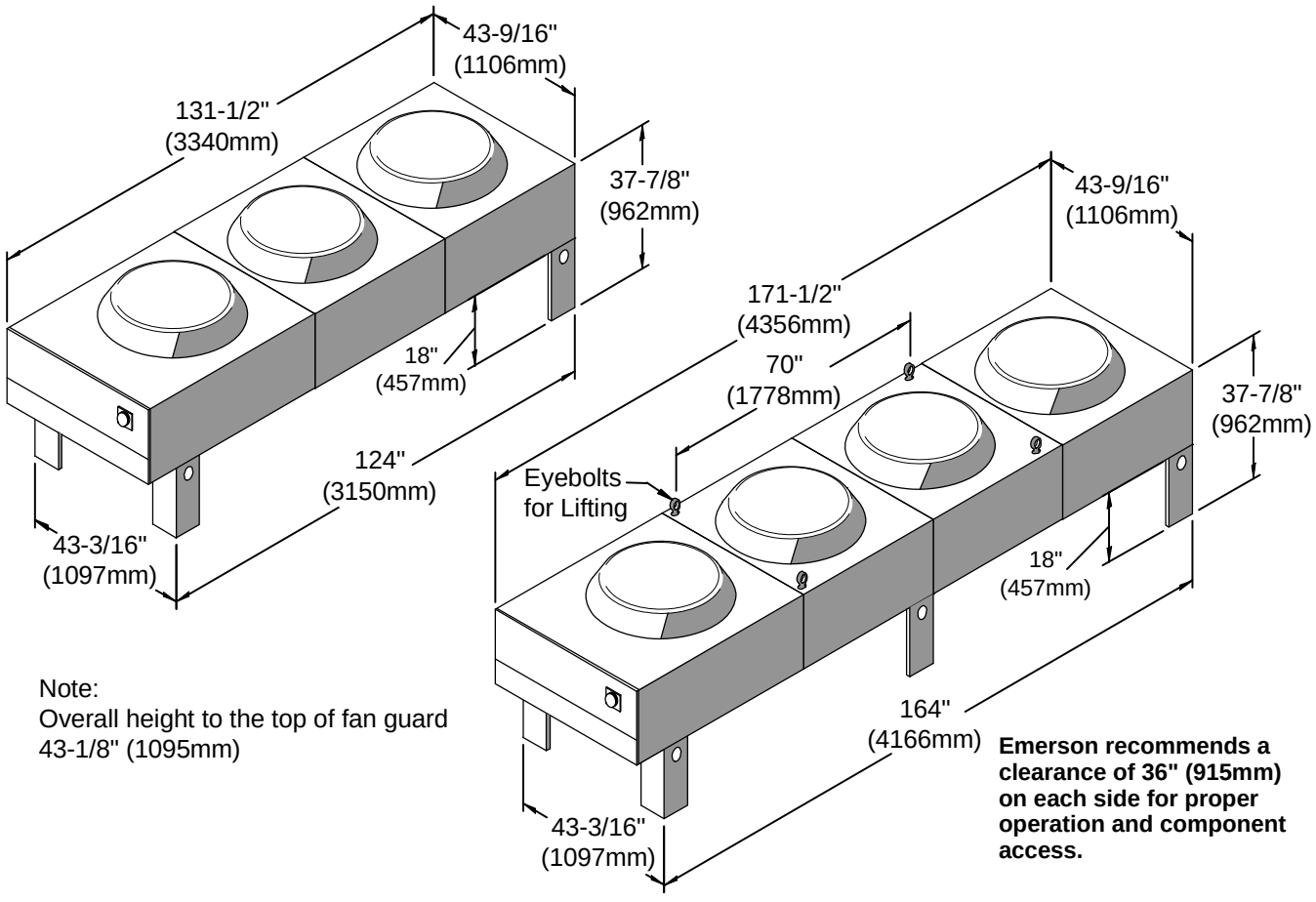


Figure 62 Condenser and drycooler dimensions, 6- and 8-fan models

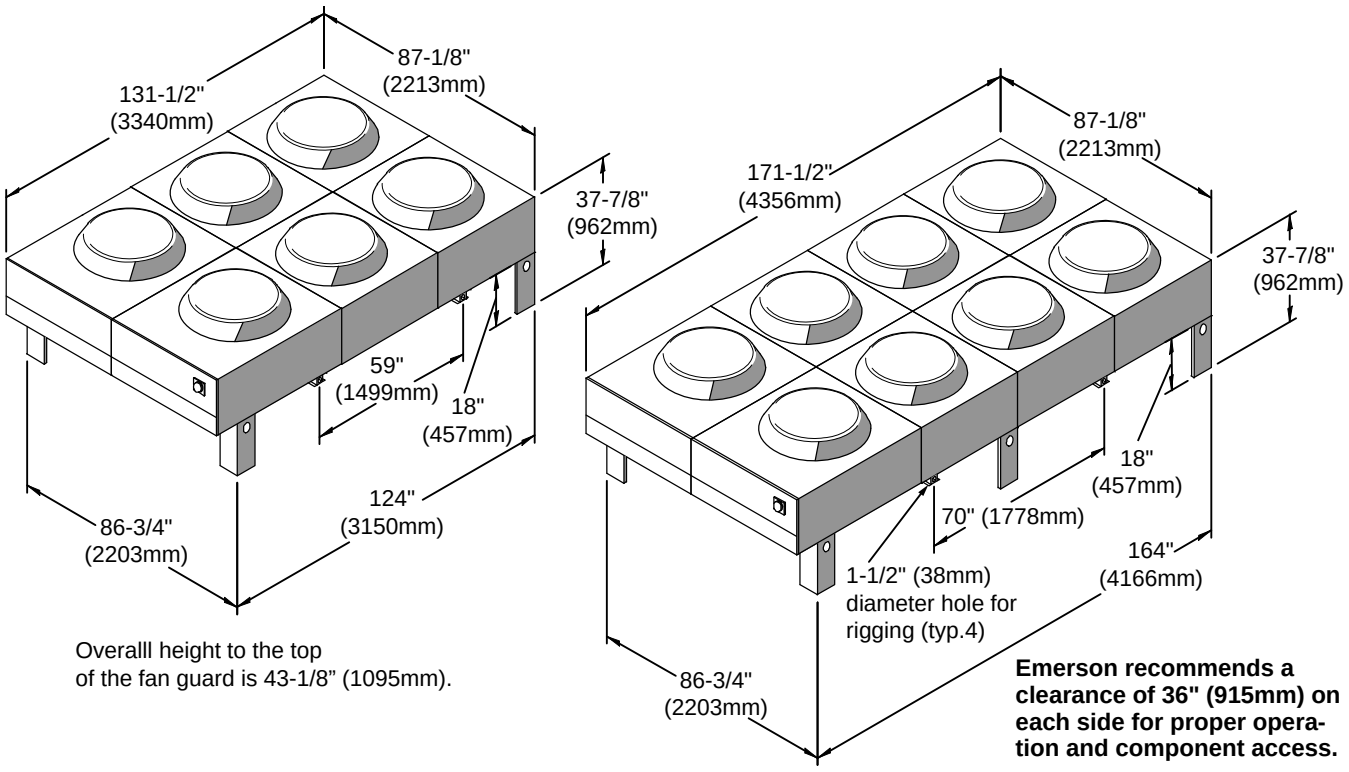


Table 72 Condenser physical data and R-407C refrigerant required per condenser circuit

Model Number	Number of Fans	Number of Circuits	Connection Size, OD, In.		Net Weight lb (kg)	Dual Circuit lb/circuit (kg/circuit)	
			Hot Gas	Liquid		FSC or VFD	Lee-Temp (includes receiver)
Standard Models							
CD*165	2	2	7/8	5/8	425 (193)	5 (2.3)	26 (11.8)
CD*205	2	2	1-1/8	7/8	495 (225)	7 (3.2)	54 (24.4)
CD*251	3	2	1-1/8	7/8	500 (227)	10 (4.6)	36 (16.3)
CD*308	3	2	1-3/8	1-1/8	670 (304)	11 (5.0)	55 (24.9)
CD*415	4	2	1-3/8	1-1/8	840 (381)	24 (10.9)	102 (46.2)
CD*510	4	2	1-5/8	1-1/8	1188 (539)	29 (13.2)	142 (64.4)
CD*616	6	2	1-5/8	1-1/8	1380 (626)	26 (11.8)	108 (49.0)
Quiet-Line Models							
DCD*143	2	2	1-1/8	7/8	515 (234)	N/A	61 (27.7)
DCD*214	3	2	1-1/8	7/8	840 (381)	N/A	77 (34.9)
DCD*286	4	2	1-1/8	7/8	1105 (501)	N/A	119 (54.0)
DCD*409	6	2	1-5/8	1-1/8	1380 (626)	N/A	125 (55.8)
DCD*572	8	2	2-1/8	1-1/8	2430 (1102)	N/A	186 (84.4)

Table 73 Drycooler physical data

Model #	No. of Fans	Internal Volume, gal. (L)	Net Weight lb. (kg)
-033	1	1.2 (4.6)	390 (177)
-069		2.4 (9.2)	410 (186)
-092		3.7 (13.9)	430 (195)
-109		4.9 (18.6)	450 (204)
-112		5.8 (22.0)	470 (213)
-139	2	4.8 (18.2)	565 (256)
-174		6.9 (26.2)	605 (274)
-197		9 (34)	645 (293)
-225		11.1 (42.1)	685 (310)
-260	3	10.0 (37.8)	826 (375)
-310		13.1 (50.0)	886 (402)
-350		19.4 (73.3)	946 (429)
-352	4	13.1 (49.6)	1040 (471)
-419		17.4 (65.9)	1120 (508)
-466		22.0 (83.3)	1150 (522)
-491		26.3 (99.6)	1200 (544)
-620	6	27.0 (102.2)	1940 (880)
-650		33.0 (124.9)	2000 (907.2)
-700		40.0 (151.4)	2060 (934.4)
-790	8	35.0 (132.5)	2550 (1157)
-880		44.0 (166.5)	2730 (1238.3)
-940		52.0 (196.8)	2910 (1320)

All drycooler fan motors are 3/4 hp.

Table 74 Liebert Quiet-Line drycooler physical data

Model #	No. of Fans	Internal Volume, gal. (L)	Net Weight lb. (kg)
-040	1	2.4 (9.2)	410 (186)
-057		3.7 (13.9)	430 (195)
-060		4.9 (18.6)	450 (204)
-080	2	4.8 (18.2)	565 (256)
-111		6.9 (26.2)	605 (274)
-121		9.0 (34.0)	645 (293)
-158	3	10.0 (37.9)	825 (374)
-173		13.1 (50.0)	885 (401)
-178		19.4 (73.3)	860 (390)
-205	4	13.1 (50.0)	1070 (485)
-248		17.4 (65.9)	1160 (526)
-347	6	27.0 (102.2)	1770 (803)
-356		39.3 (148.8)	1890 (857)
-453	8	35.0 (132.5)	2320 (1052)
-498		52.6 (199.1)	2680 (1216)

Table 75 Standard drycooler piping connection sizes—1 fan to 4 fans

Drycooler Model #	No. Fans	# of Internal Coil Circuits	# of Inlets/ Outlets	Inlet & Outlet Connection Size, OD Copper, in.
033	1	4*	1/1	1-3/8
069		4, 8*	1/1	1-3/8
092		6, 12*, 16	1/1	1-5/8
109		8	1/1	1-3/8
109		16*	1/1	2-1/8
112		8	1/1	1-3/8
112		16*, 26	1/1	2-1/8
139	2	8, 16*	1/1	2-1/8
174		16*, 24	1/1	2-1/8
197		16*, 32	1/1	2-1/8
225		16, 26*	1/1	2-1/8
260	3	16, 24*	1/1	2-1/8
310		16, 32*	1/1	2-1/8
350		16, 32*	1/1	2-1/8
350		48	1/1	2-5/8
352	4	16, 24*	1/1	2-1/8
419		16, 32*	1/1	2-1/8
466		26	1/1	2-1/8
466		40*	1/1	2-5/8
491		16	1/1	2-1/8
491		32, 48*	1/1	2-5/8

* = Standard Circuiting

Table 76 Standard drycooler piping connection sizes—6 fans and 8 fans

Drycooler Model #	No. Fans	# of Internal Coil Circuits	# of Inlets/ Outlets	Inlet & Outlet Connection Size, ID Sweat, in.
620	6	32, 64*	2/2	2-1/8
650		40, 52*	2/2	2-1/8
650		80	4/4	2-1/8
700		32, 64*	2/2	2-1/8
700		96	4/4	2-1/8
790	8	32, 64*	2/2	2-1/8
880		52	2/2	2-1/8
880		80*	4/4	2-1/8
940		32, 64	2/2	2-1/8
940		96*	4/4	2-1/8

* = Standard Circuiting

Table 77 Drycooler piping connection sizes—Quiet-Line models

Model #	# of Fans	# of Internal Coil Circuits	# of Inlets/Outlets	Inlet & Outlet Connection Size, OD Copper, in.
040	1	4, 8*	1/1	1-3/8
057		12*	1/1	1-5/8
057		16	1/1	2-1/8
060		8	1/1	1-3/8
060		16*	1/1	2-1/8
080	2	8, 16*	1/1	2-1/8
111		16*, 24	1/1	2-1/8
121		16*, 32	1/1	2-1/8
158	3	16, 24*	1/1	2-1/8
173		16, 32*	1/1	2-1/8
178		16, 32*	1/1	2-1/8
178		48	1/1	2-1/8
205	4	16, 24*	1/1	2-1/8
248		16, 32*	1/1	2-1/8
				Inlet & Outlet Connection Size, ID Sweat, in.
347	6	32, 64*	2/2	2-1/8
356		32, 64*	2/2	2-1/8
356		96	4/4	2-1/8
453	8	32, 64*	2/2	2-1/8
498		32, 64	2/2	2-1/8
498		96*	4/4	2-1/8

* = Standard Circuiting

ELECTRICAL DATA - CONDENSERS AND DRYCOOLERS

Table 78 60Hz condenser data

Model #		83, 104			165, 205			251, 308			415, 510			616			830, 1010		
# of Fans		1			2			3			4			6			8		
Input Voltage	ph	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD
Fan Speed Controlled																			
208/230	1	4.8	6.0	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
460		2.5	3.1	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
575		1.9	2.4	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
208/230	3	—	—	—	8.3	9.5	15	11.8	13.0	15	15.3	16.5	20	23.6	24.8	30	30.6	31.8	40
460		—	—	—	4.2	4.8	15	5.9	6.5	15	7.6	8.2	15	11.8	12.4	15	15.2	15.8	20
575		—	—	—	3.3	3.8	15	4.7	5.2	15	6.1	6.6	15	9.4	9.9	15	12.2	12.7	15
VFD Controlled																			
208/230	3	3.7	4.6	15	7.2	8.1	15	10.7	11.6	15	14.2	15.1	20	N/A	N/A	N/A	N/A	N/A	N/A
460		1.8	2.3	15	3.5	4.0	15	5.2	5.7	15	6.9	7.4	15	N/A	N/A	N/A	N/A	N/A	N/A
Lee-Temp Controlled/Fan-Cycling																			
208/230	3	3.5	4.4	15	7.0	7.9	15	10.5	11.4	15	14.0	14.9	20	21.0	21.9	25	28.0	28.9	35
460		1.7	2.1	15	3.4	3.8	15	5.1	5.5	15	6.8	7.2	15	10.2	10.6	15	13.6	14.0	20
575		1.4	1.8	15	2.8	3.2	15	4.2	4.6	15	5.6	6.0	15	8.4	8.8	15	11.2	11.6	15

FLA = Full Load Amps; WSA = Wire Size Amps; OPD = Maximum Overcurrent Protection Device

Table 79 60Hz condenser data, Quiet-Line (Lee-Temp controlled/fan-cycling)

Model #	ph	63			119, 127, 143			214			286			409			572		
# of Fans		1			2			3			4			6			8		
Input Voltage	ph	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD
208/230	3	1.8	2.3	15	3.6	4.1	15	5.4	5.9	15	7.2	7.7	15	10.8	11.3	15	14.4	14.9	20
460		0.9	1.1	15	1.8	2.0	15	2.7	2.9	15	3.6	3.8	15	5.4	5.6	15	7.2	7.4	15
575		0.7	0.9	15	1.4	1.6	15	2.1	2.3	15	2.8	3.0	15	4.2	4.4	15	5.6	5.8	15

FLA = Full Load Amps; WSA = Wire Size Amps; OPD = Maximum Overcurrent Protection Device

Table 80 Lee-Temp receiver electrical data, 50Hz and 60Hz

Rated Voltage - Single Phase	120			200/208/230		
Watts/Receiver	150	300	450	150	300	450
Full Load Amps	1.4	2.8	4.2	0.7	1.4	2.1
Wire Size Amps	1.8	3.5	5.3	0.9	1.8	2.7
Maximum Overcurrent Protection Device, Amps	15	15	15	15	15	15

Table 81 60Hz electrical values—Drycoolers without pump controls, standard models

# of Fans	Model #	Voltage, 60 Hz	Phase	FLA	WSA	OPD
1	33, 69, 92, 109, 112	208/230	1	4.8	6.0	15
			3	3.5	4.4	15
		460	3	1.7	2.1	15
		575	3	1.4	1.8	15
2	139, 174, 197, 225	208/230	3	7.0	7.9	15
		460	3	3.4	3.8	15
		575	3	2.8	3.2	15
3	260, 310, 350	208/230	3	10.5	11.4	15
		460	3	5.1	5.5	15
		575	3	4.2	4.6	15
4	352, 419, 466, 491	208/230	3	14.0	14.9	20
		460	3	6.8	7.2	15
		575	3	5.6	6.0	15
6	620, 650, 700	208/230	3	21.0	21.9	25
		460	3	10.2	10.6	15
		575	3	8.4	8.8	15
8	790, 880, 940	208/230	3	28.0	28.9	35
		460	3	13.6	14.0	20
		575	3	11.2	11.6	15

Table 82 60Hz electrical values—Drycoolers without pump controls, Quiet-Line models

# of Fans	Model #	Voltage, 60 Hz	Phase	FLA	WSA	OPD
1	40, 57, 60	208/230	3	1.8	2.3	15
		460		0.9	1.1	15
		575		0.7	0.9	15
2	80, 111, 121	208/230	3	3.6	4.1	15
		460	3	1.8	2.0	15
		575	3	1.4	1.6	15
3	158, 173, 178	208/230	3	10.5	11.4	15
		460	3	5.1	5.5	15
		575	3	4.2	4.6	15
4	205, 248	208/230	3	5.4	5.9	15
		460	3	2.7	2.9	15
		575	3	2.1	2.3	15
6	347, 356	208/230	3	10.8	11.3	15
		460	3	5.4	5.6	15
		575	3	4.2	4.4	15
8	453, 498	208/230	3	14.4	14.9	20
		460	3	7.2	7.4	15
		575	3	5.6	5.8	15

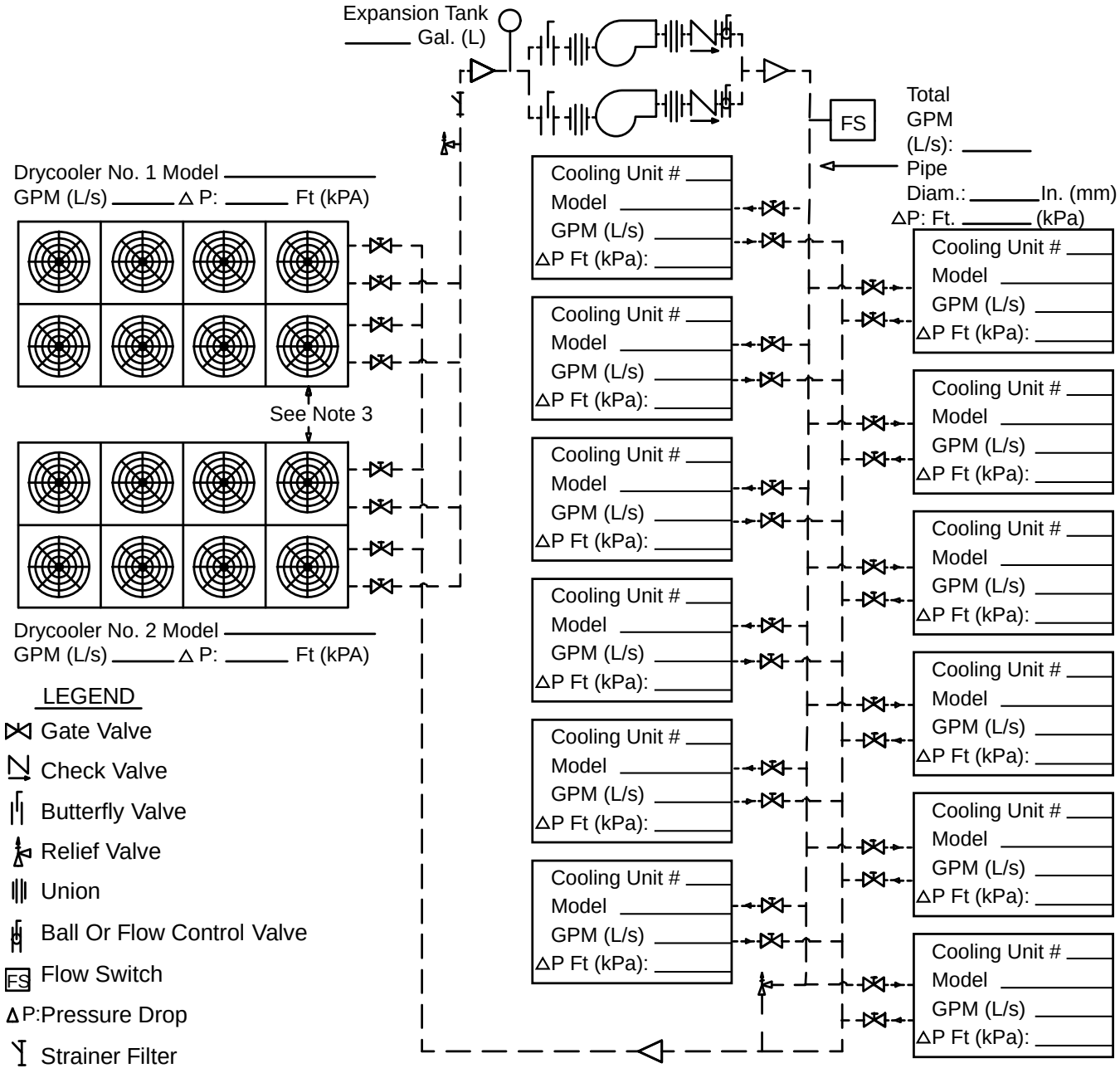
Table 83 60Hz electrical values—standard drycoolers with integral pump controls

	Number of Fans														
	2			3			4			6			8		
Model #	139, 174, 197, 225			260, 310, 350			352, 419, 466, 491			620, 650, 700			790, 880, 940		
Pump HP	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD
208/230/3/60															
0.75	10.5	11.4	15	14.0	14.9	20	17.5	18.4	25	24.5	25.4	30	31.5	32.4	40
1.5	13.6	15.3	20	17.1	18.8	25	20.6	22.3	25	27.6	29.3	35	34.6	36.3	40
2.0	14.5	16.4	20	18.0	19.9	25	21.5	23.4	30	28.5	30.4	35	35.5	37.4	45
3.0	17.6	20.3	30	21.1	23.8	30	24.6	27.3	35	31.6	34.3	40	38.6	41.3	50
5.0	23.7	27.9	40	27.2	31.4	45	30.7	34.9	50	37.7	41.9	50	44.7	48.9	60
7.5	31.2	37.3	60	34.7	40.8	60	38.2	44.3	60	45.2	51.3	70	52.2	58.3	80
10.0	37.8	45.5	70	41.3	49.0	70	44.8	52.5	80	51.8	59.5	90	58.8	66.5	90
15	53.2	64.8	110	56.7	68.3	110	60.2	71.8	110	67.2	78.8	110	74.2	85.8	125
460/3/60															
0.75	5.0	5.4	15	6.7	7.1	15	8.4	8.8	15	11.8	12.2	15	15.2	15.6	20
1.5	6.4	7.2	15	8.1	8.9	15	9.8	10.6	15	13.2	14.0	20	16.6	17.4	20
2.0	6.8	7.7	15	8.5	9.4	15	10.2	11.1	15	13.6	14.5	20	17.0	17.9	20
3.0	8.2	9.4	15	9.9	11.1	15	11.6	12.8	15	15.0	16.2	20	18.4	19.6	25
5.0	11.0	12.9	20	12.7	14.6	20	14.4	16.3	20	17.8	19.7	25	21.2	23.1	30
7.5	14.4	17.2	25	16.1	18.9	25	17.8	20.6	30	21.2	24.0	30	24.6	27.4	35
10.0	17.4	20.9	30	19.1	22.6	35	20.8	24.3	35	24.2	27.7	40	27.6	31.1	45
15	24.4	29.7	50	26.1	31.4	50	27.8	33.1	50	31.2	36.5	50	34.6	39.9	60
575/3/60															
0.75	4.1	4.5	15	5.5	5.9	15	6.9	7.3	15	9.7	10.1	15	12.5	12.9	15
1.5	5.2	5.8	15	6.6	7.2	15	8.0	8.6	15	10.8	11.4	15	13.6	14.2	20
2.0	5.5	6.2	15	6.9	7.6	15	8.3	9.0	15	11.1	11.8	15	13.9	14.6	20
3.0	6.7	7.7	15	8.1	9.1	15	9.5	10.5	15	12.3	13.3	15	15.1	16.1	20
5.0	8.9	10.4	15	10.3	11.8	15	11.7	13.2	15	14.5	16.0	20	17.3	18.8	20
7.5	11.8	14.1	20	13.2	15.5	20	14.6	16.9	25	17.4	19.7	25	20.2	22.5	30
10.0	13.8	16.6	25	15.2	18.0	25	16.6	19.4	30	19.4	22.2	30	22.2	25.0	35
15	19.8	24.1	40	21.2	25.5	40	22.6	26.9	40	25.4	29.7	45	28.2	32.5	45

Table 84 60Hz electrical values—Quiet-Line drycoolers with integral pump controls

	Number of Fans											
	3			4			6			8		
Model #	158, 173, 178			205, 248			347, 356			453, 498		
Pump H.P.	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD
208/230/3/60												
0.75	8.9	9.8	15.0	10.7	11.6	15.0	14.3	15.2	20.0	17.9	18.8	25.0
1.5	12.0	13.7	20.0	13.8	15.5	20.0	17.4	19.1	25.0	21.0	22.7	25.0
2.0	12.9	14.8	20.0	14.7	16.6	20.0	18.3	20.2	25.0	21.9	23.8	30.0
3.0	16.0	18.7	25.0	17.8	20.5	30.0	21.4	24.1	30.0	25.0	27.7	35.0
5.0	22.1	26.3	40.0	23.9	28.1	40.0	27.5	31.7	45.0	31.1	35.3	50.0
7.5	29.6	35.7	50.0	31.4	37.5	60.0	35.0	41.1	60.0	38.6	44.7	60.0
10.0	36.2	43.9	70.0	38.0	45.7	70.0	41.6	49.3	80.0	45.2	52.9	80.0
15	51.6	63.2	100.0	53.4	65.0	110.0	57.0	68.6	110.0	60.6	72.2	110.0
460/3/60												
0.75	4.3	4.7	15.0	5.2	5.6	15.0	7.0	7.4	15.0	8.8	9.2	15.0
1.5	5.7	6.5	15.0	6.6	7.4	15.0	8.4	9.2	15.0	10.2	11.0	15.0
2.0	6.1	7.0	15.0	7.0	7.9	15.0	8.8	9.7	15.0	10.6	11.5	15.0
3.0	7.5	8.7	15.0	8.4	9.6	15.0	10.2	11.4	15.0	12.0	13.2	15.0
5.0	10.3	12.2	15.0	11.2	13.1	20.0	13.0	14.9	20.0	14.8	16.7	20.0
7.5	13.7	16.5	25.0	14.6	17.4	25.0	16.4	19.2	30.0	18.2	21.0	30.0
10.0	16.7	20.2	30.0	17.6	21.1	35.0	19.4	22.9	35.0	21.2	24.7	35.0
15	23.7	29.0	45.0	24.6	29.9	50.0	26.4	31.7	50.0	28.2	33.5	50.0
575/3/60												
0.75	3.4	3.7	15.0	4.1	4.4	15.0	5.5	5.8	15.0	6.9	7.2	15.0
1.5	4.5	5.1	15.0	5.2	5.8	15.0	6.6	7.2	15.0	8.0	8.6	15.0
2.0	4.8	5.5	15.0	5.5	6.2	15.0	6.9	7.6	15.0	8.3	9.0	15.0
3.0	6.0	7.0	15.0	6.7	7.7	15.0	8.1	9.1	15.0	9.5	10.5	15.0
5.0	8.2	9.7	15.0	8.9	10.4	15.0	10.3	11.8	15.0	11.7	13.2	15.0
7.5	11.1	13.4	20.0	11.8	14.1	20.0	13.2	15.5	20.0	14.6	16.9	25.0
10.0	13.1	15.9	25.0	13.8	16.6	25.0	15.2	18.0	25.0	16.6	19.4	30.0
15	19.1	23.4	40.0	19.8	24.1	40.0	21.2	25.5	40.0	22.6	26.9	40.0

Figure 63 Typical piping arrangement, multiple drycoolers and multiple indoor units



Notes:

1. Pressure and temperature gauges (or ports for same) are recommended to monitor component pressure drops and performance.
2. Flow measuring devices, drain and balancing valves to be supplied by others and located as required.
3. See product literature for installation guidelines and clearance dimensions.
4. Drawing shows dual pump package. Alternate pump packages with more pumps may be considered, consult supplier

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PUMP PACKAGES & EXPANSION TANK - OPTIONS

Figure 64 Pump package

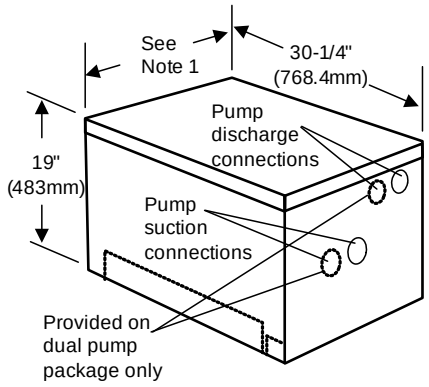
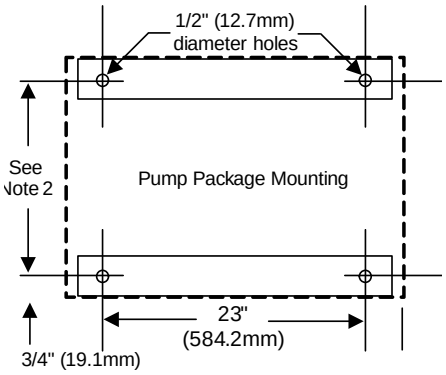


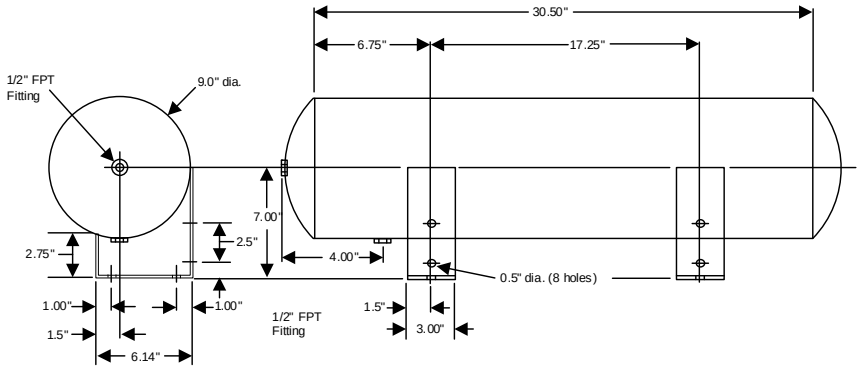
Figure 65 Pump mounting



Notes

1. Single pump packages are 17-1/4" (438.2mm) wide. Dual pump packages are 32-1/4" (819.2mm) wide.
2. Mounting holes are 15-11/32" (389.7mm) apart on single pump packages and 30-11/32" (770.7mm) apart on dual pump packages.
3. 7-1/2hp dimensions not shown—Consult local Emerson representative.

Figure 64 Expansion tank



Expansion Tank (P/N 1C16717P1)

This tank, included in a standard pump package, has an internal volume of 8.8 gal. (33 l) and a maximum pressure of 100 psi (690 kPa).

This tank is sized for a typical "open" system with a fluid volume of less than 75 gal. (280l). When used in a "closed" system, volumes of up to 140 gal. (910l) can be accommodated. The use of a safety relief valve, field-supplied, is recommended for systems "closed" to atmospheric venting. Other piping accessories for filling, venting, or adjusting the fluid in the system, are recommended, but not included.

Table 85 Pump data

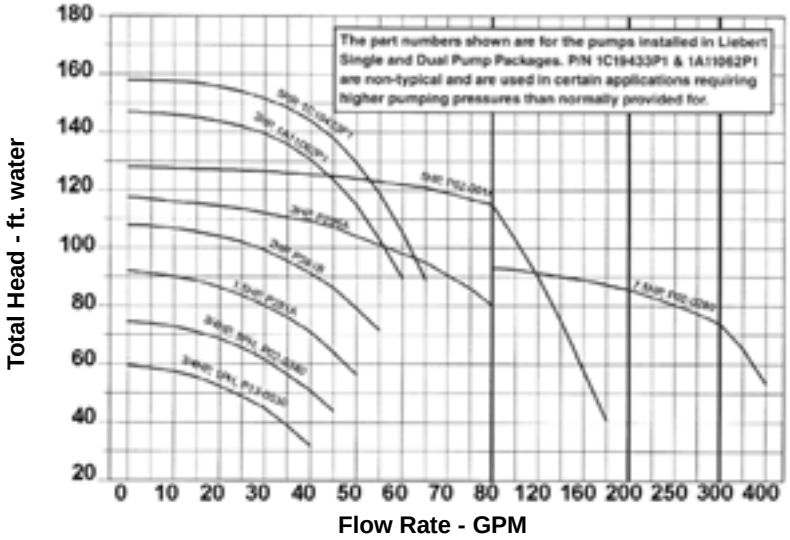
Pump Model	Connections		hp	Electric @ 60Hz				
	NPT Suction	Female Discharge		ph	208 FLA	230 FLA	460 FLA	575 FLA
3/4	1-1/4"	3/4"	3/4	1	7.6	6.9	N/A	N/A
3/4	1-1/4"	3/4"	3/4	3	3.5	3.2	1.6	1.3
1-1/2	1-1/4"	3/4"	1-1/2	3	6.6	6.0	3.0	2.4
2	1-1/4"	3/4"	2	3	7.5	6.8	3.4	2.7
3	1-1/2"	1"	3	3	10.6	9.6	4.8	3.9
5	1-1/2"	1-1/4"	5	3	16.7	15.2	7.6	6.1
7-1/2	3"	3"	7-1/2	3	24.2	22.0	11.0	9.0

To Calculate Total Pump and Drycooler Full Load Amps (FLA):
Total FLA = Pump FLA + Drycooler FLA

To Calculate Total Pump and Drycooler Wire Size Amps (WSA):
Total WSA = Largest Motor FLA x 1.25 + Sum of other Motor FLA values

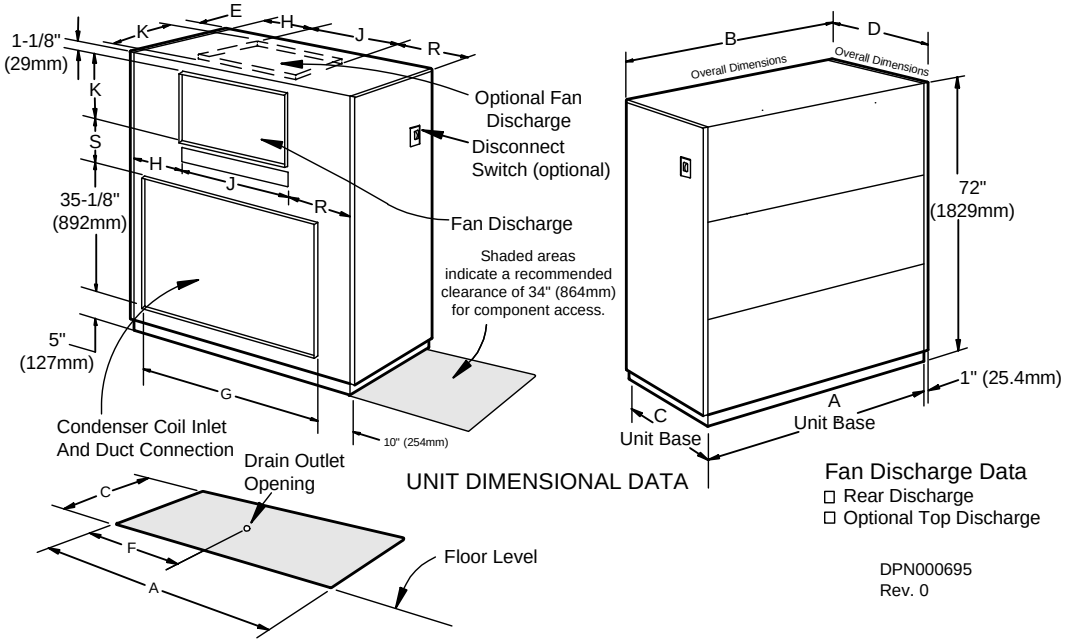
To Calculate Total Pump and Drycooler Maximum Overcurrent Protective Device (OPD):
Total OPD = Largest Motor FLA x 2.25 + Sum of other Motor FLA values
Select standard fuse size (15A, 20A, 25A, 30A, etc.)

Figure 65 Pump curve, 60 Hz



INDOOR PIGGYBACK CONDENSER WEIGHTS AND DIMENSIONS

Figure 66 Piggyback condensers



NOTE: A 1" (25.4mm) flange is provided on all units for duct connection to coil duct opening and fan air discharge opening.

Table 85 Unit shipping weight

Model	Domestic Package lb. (kg)	Export Package lb. (kg)
PB-350A	1180 (535)	1330 (603)
PB-550A	1180 (535)	1330 (603)
PB-675A	1180 (535)	1330 (603)
PB-925A	1630 (739)	1780 (807)
PB-1100A	1630 (739)	1780 (807)
PB-1350A	1630 (739)	1780 (807)

Table 86 Piggyback condenser electrical data, 60 Hz, 3 phase [1]

	Volts, 60 Hz											
	208			230			460			575		
hp	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD	FLA	WSA	OPD
2.0	7.5	9.4	15	6.8	8.5	15	3.4	4.3	15	2.7	3.4	15
3.0	10.6	13.3	20	9.6	12	20	4.8	6	15	3.9	4.9	15
5.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7.5	24.2	30.3	50	22.0	27.5	45	11.0	13.8	20	9.0	11.3	20
10.0	30.8	38.5	60	28.0	35	60	14.0	17.5	30	11.0	13.8	20
15.0	46.2	57.8	100	42.0	52.5	90	21.0	26.3	45	17.0	21.3	35

1. See **Table 89** for separate power feed needed for Lee-Temp receiver heaters.

Table 87 Piggyback airflow and static pressure data

Model	No. of Fans	CFM / m^3 / hr	HP/RPM			
			Ext. Static Pressure - in. (Pa)			
			0.25 (62.3)	0.50 (125)	0.75 (187)	1.0 (249)
PB-350A	2	7600/12,920	2/580	3/650	3/720	3/790
PD-102; PB-550A	2	6600/11,200	2/575	3/650	3/725	3/800
PD133; PD150; PB-675A	2	6900/11,730	2/605	3/680	3/750	3/820
PD223; PB-925A	2	12,500/21,250	7.5/760	7.5/810	7.5/870	7.5/920
PD290; PB-1100A	2	12,300/20,910	7.5/780	7.5/830	7.5/890	7.5/940
PD290; PB-1350A	2	16,500/28,050	10/640	10/695	10/740	15/790

Values are without filter box. Ext. Static Pressure = filter pressure drop + other static drops.

Table 88 Dimensional data, in. (mm)

Model	A	B	C	D	E	F	G	H	J	K	R	S
PB-350A	72 (1829)	74 (1880)	31 (787)	32 (813)	1-1/8 (29)	33 (838)	60 (1524)	8-5/8 (219)	50-3/16 (1275)	16-1/16 (408)	13-3/16 (335)	14-11/16 (373)
PB-550A	72 (1829)	74 (1880)	31 (787)	32 (813)	1-1/8 (29)	33 (838)	60 (1564)	8-5/8 (219)	50-3/16 (1275)	16-1/16 (408)	13-3/16 (335)	14-11/16 (373)
PB-675A	72 (1829)	74 (1880)	31 (787)	32 (813)	1-1/8 (29)	33 (838)	60 (1564)	8-5/8 (219)	50-3/16 (1275)	16-1/16 (408)	13-3/16 (335)	14-11/16 (373)
PB-925A	97 (2464)	99 (2515)	33 (838)	34 (864)	3-1/8 (79)	45-1/2 (1156)	85 (2159)	23-5/16 (592)	50-3/16 (1275)	16-1/16 (408)	23-1/2 (597)	14-11/16 (373)
PB-1100A	97 (2464)	99 (2515)	33 (838)	34 (864)	3-1/8 (79)	45-1/2 (1156)	85 (2159)	23-5/16 (592)	50-3/16 (1275)	16-1/16 (408)	23-1/2 (597)	14-11/16 (373)
PB-1350A	97 (2464)	99 (2515)	33 (838)	34 (864)	3-1/8 (79)	45-1/2 (1156)	85 (2159)	16-5/16 (421)	63-7/8 (1622)	19-1/8 (486)	16-13/16 (427)	11-5/8 (295)

Table 89 Separate electrical supply requirements for Liebert Lee-Temp receivers, 60 Hz, 1 Ph

Voltage	120	120	208/230	208/230
Watts/Receiver	**150**	**300**	**150**	**300**
FLA	2.5	5.0	1.4	2.8
WSA	3.1	6.2	1.8	3.6
OPD	15	15	15	15

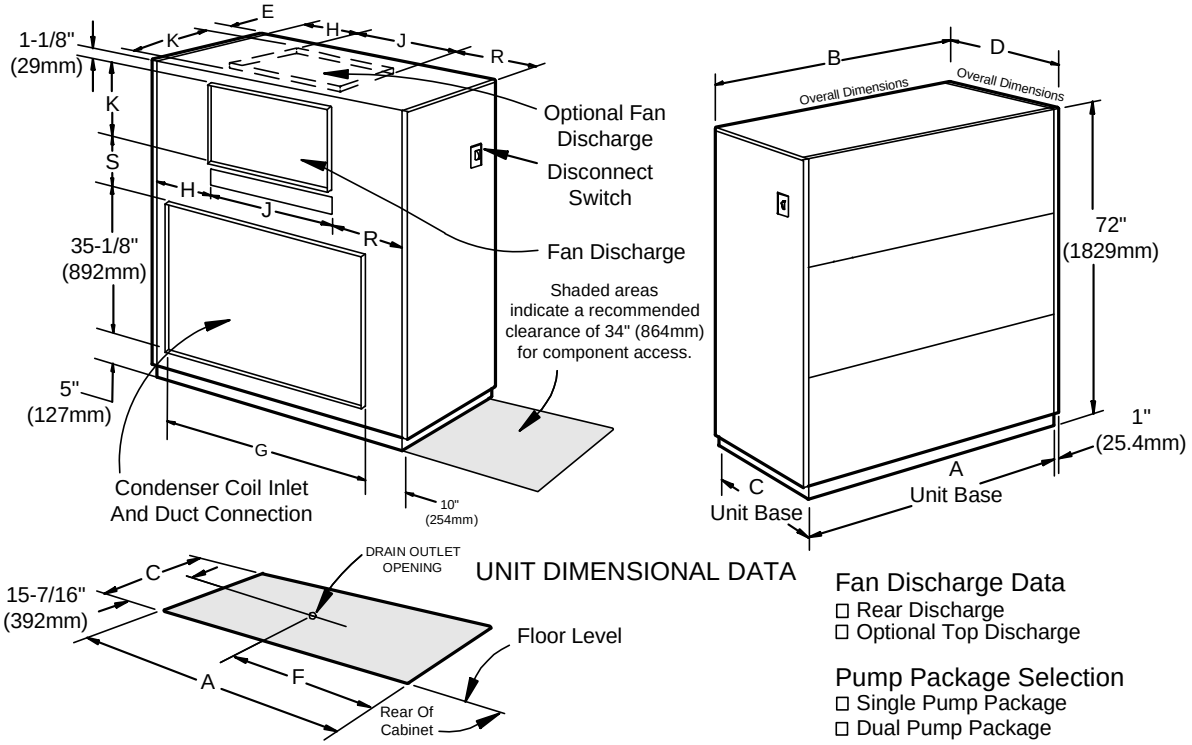
Only one independent input power supply is needed per piggyback unit; connect to Term. 90 & 91.

Table 90 Piggyback condenser physical data. 60 Hz

Model	Number of Circuits	Connection Size, OD, In.		Condenser Charge Per Circuit R-407C lb (kg)
		Hot Gas	Liquid	
PB-350	2	5/8	1/2	18 8.2)
PB-550	2	5/8	1/2	17 (7.8)
PB-675	2	7/8	1/2	25 (11.2)
PB-925	2	7/8	1/2	22 (9.9)
PB-1100	2	1-1/8	5/8	34 (15.5)
PB-1350	2	1-1/8	5/8	34 (15.5)

INDOOR PIGGYBACK DRYCOOLER WEIGHTS AND DIMENSIONS

Figure 67 Piggyback drycoolers



Note: A 1" (25.4mm) flange is provided on all units for duct connection to coil duct opening and fan air discharge opening.

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Table 91 Unit shipping weight

Model	Domestic Package lb. (kg)	Export Package lb. (kg)
PD-102	1230 (558)	1380 (626)
PD-133	1230 (558)	1380 (626)
PD-150	1230 (558)	1380 (626)
PD-223	1680 (726)	1830 (830)
PD-290	1680 (726)	1830 (830)
PD-333	1680 (726)	1830 (830)

Table 92 Electrical data, piggyback drycooler, 60 Hz, 3 ph

			Drycooler No Pumps			Drycooler Std. Pump Package					Drycooler - Optional Pump Package				
			Total Unit			Pump Only		Total Unit			Pump Only		Total Unit		
Model	Voltage	Blower Motor HP	FLA	WSA	OPD	hp	FLA	FLA	WSA	OPD	hp	FLA	FLA	WSA	OPD
PD-102 PD-133	208	3	10.6	13.2	20	1.5	6.6	17.2	19.9	30	2	7.5	18.1	20.8	30
	230	3	9.6	12.0	20	1.5	6.0	15.6	18.0	25	2	6.8	16.4	18.8	25
	460	3	4.8	6.0	15	1.5	3.0	7.8	9.0	15	2	3.4	8.2	9.4	15
	575	3	3.9	4.9	15	1.5	2.4	6.3	7.3	15	2	2.7	6.6	7.6	15
PD-150	208	3	10.6	13.3	20	2	7.5	18.1	20.8	30	3	10.6	21.2	23.9	30
	230	3	9.6	12.0	20	2	6.8	16.4	18.8	25	3	9.6	19.2	21.6	30
	460	3	4.8	6.0	15	2	3.4	8.2	9.4	15	3	4.8	9.6	10.8	15
	575	3	3.9	4.9	15	2	2.7	6.6	7.6	15	3	3.9	7.8	8.8	15
PD-223	208	7.5	24.2	30.3	50	3	10.6	34.8	40.9	60	5	16.7	40.9	47.0	70
	230	7.5	22.0	27.5	45	3	9.6	31.6	37.1	50	5	15.2	37.2	42.7	60
	460	7.5	11.0	13.8	20	3	4.8	15.8	18.6	25	5	7.6	18.6	21.4	30
	575	7.5	9.0	11.3	20	3	3.9	12.9	15.2	20	5	6.1	15.1	17.4	25
PD-290	208	7.5	24.2	30.3	50	3	10.6	34.8	40.9	60	5	16.7	40.9	47.0	70
	230	7.5	22.0	27.5	45	3	9.6	31.6	37.1	50	5	15.2	37.2	42.7	60
	460	7.5	11.0	13.8	20	3	4.8	15.8	18.6	25	5	7.6	18.6	21.4	30
	575	7.5	9.0	11.3	20	3	3.9	12.9	15.2	20	5	6.1	15.1	17.4	25
PD-333	208	10	30.8	38.5	60	3	10.6	41.4	49.1	70	5	16.7	47.5	55.2	80
	230	10	28.0	35.0	60	3	9.6	37.6	44.6	70	5	15.2	43.2	50.2	70
	460	10	14.0	17.5	30	3	4.8	18.8	22.3	35	5	7.6	21.6	25.1	35
	575	10	11.0	13.8	20	3	3.9	14.9	17.7	25	5	6.1	17.1	19.9	30

ph = phase; FLA = Full Load Amps; WSA = Wire Size Amp; OPD = Maximum Overcurrent Protection Device

Table 93 Dimensional data, in. (mm)

Model	A	B	C	D	E	F	G	H	J	K	R	S
PD-102	72 (1829)	74 (1880)	31 (787)	32 (813)	1-1/8 (29)	33 (838)	60 (1524)	8-5/8 (219)	50-3/16 (1275)	16-1/16 (408)	13-3/16 (335)	14-11/16 (373)
PD-133	72 (1829)	74 (1880)	31 (787)	32 (813)	1-1/8 (29)	33 (838)	60 (1524)	8-5/8 (219)	50-3/16 (1275)	16-1/16 (408)	13-3/16 (335)	14-11/16 (373)
PD-150	72 (1829)	74 (1880)	31 (787)	32 (813)	1-1/8 (29)	33 (838)	60 (1524)	8-5/8 (219)	50-3/16 (1275)	16-1/16 (408)	13-3/16 (335)	14-11/16 (373)
PD-223	97 (2464)	99 (2515)	33 (838)	34 (864)	3-1/8 (79)	46-1/2 (1181)	85 (2159)	23-5/16 (592)	50-3/16 (1275)	16-1/16 (408)	23-1/2 (597)	14-11/16 (373)
PD-290	97 (2464)	99 (2515)	33 (838)	34 (864)	3-1/8 (79)	46-1/2 (1181)	85 (2159)	23-5/16 (592)	50-3/16 (1275)	16-1/16 (408)	23-1/2 (597)	14-11/16 (373)
PD-333	97 (2464)	99 (2515)	33 (838)	34 (864)	3-1/8 (79)	46-1/2 (1181)	85 (2159)	16-5/16 (421)	63-7/8 (1622)	19-1/8 (486)	16-13/16 (427)	11-5/8 (295)

GUIDE SPECIFICATIONS

1.0 GENERAL

1.1 Summary

These specifications describe requirements for a Mission Critical Cooling system. The system shall be designed to control temperature and humidity conditions in rooms containing electronic equipment, with good insulation and vapor barrier. The manufacturer shall design and furnish all equipment to be fully compatible with heat dissipation requirements of the room.

1.2 Design Requirements

The Precision Cooling system shall be a Liebert self-contained, factory-assembled unit with downflow air delivery. The system shall have a net total cooling capacity of ____ kW (BTUH) with a net sensible cooling capacity of ____ kW (BTUH) based on an entering air temperature of ____ °F (°C) dry bulb and ____ °F (°C) wet bulb. The unit is to be supplied with ____ volt ____ ph ____ Hz electrical service. Net capacities shall include losses due to fan motor heat. The indoor precision cooling unit shall have a short circuit current rating (SCCR) of 5,000A RMS symmetrical, determined in accordance with the U.S. National Electric Code Section 409, Standard 508a SB, based on test data performed at certified third-party laboratories.

1.3 Submittals

Submittals shall be provided after the agreement of the proposal and shall include: Single-Line Diagrams; Dimensional, Electrical and Capacity Data; Piping and Electrical Connection Drawings.

2.0 PRODUCT

2.1 Frame

The frame shall be MIG welded, formed sheet metal. It shall be protected against corrosion using the auto-phoretic coating process. The frame shall be capable of being separated into three parts in the field to accommodate rigging through small spaces.

2.1.1 Downflow Air Supply

The supply air shall exit from the bottom of the unit with the air scrolled towards the front of the unit.

2.1.1 Upflow Top Air Supply, Front Throw

The supply air shall exit from the top of the cabinet with the air throw towards the front.

2.1.1 Upflow Top Air Supply, Rear Throw

The supply air shall exit from the top of the cabinet with the air throw towards the back.

2.1.1 Upflow Rear Air Supply

The supply air shall exit from the back of the cabinet.

2.1.2 Downflow Air Return

The return air shall enter the unit from the top.

2.1.2 Upflow Air Return, Front

The return air shall enter the unit from the front of the cabinet through factory installed grilles. Grilles shall be painted black.

2.1.2 Upflow Air Return, Rear

The return air shall enter the unit from the back of the cabinet.

2.1.3 Exterior Panels

The exterior panels shall be insulated with a minimum 1 in. (25mm), 1.5 lb. (0.68 kg) density fiber insulation. The main front panel shall have captive 1/4 turn fasteners. The main unit color shall be _____.

2.1.3.1 Double-Skin Panels (Optional)

The exterior panels shall be internally lined with 20 gauge sheetmetal, sandwiching the insulation between the panels, for easy cleaning.

2.2 Filters, Downflow Unit

The filter chamber shall be located within the cabinet, and filters shall be removable from the top of the unit. Filters shall be arranged in a V-bank configuration to minimize air pressure drop.

2.2.1 Filters, 4"

Filters shall be deep pleated 4" filters with an ASHRAE 52.2 MERV 8 rating or ASHRAE 52.2 MERV 11 rating.

2.2.1 Filters, 2" Pre-Filter With 2" Filter

Filters shall be 2" ASHRAE 52.2 MERV 8 pre-filter, with 2" ASHRAE 52.2 MERV 11 efficiency filter.

2.2.2 Extra Filter Set

____ extra set(s) of filters shall be provided per system.

2.3 Blower Section

The blower section shall be designed for ___ CFM (CMH) at an external static pressure of ___ in. wg. (Pa). The fans shall be the centrifugal type, double width, double inlet and shall be dynamically balanced as a completed assembly. The shaft shall be heavy duty steel with self-aligning, permanently sealed, pillow block bearings with a minimum L3 life of 200,000 hours. The fans shall draw air through the A-frame coil to ensure even air distribution and maximum coil performance. A static regain duct shall be factory-installed to the bottom of the blower.

2.3.1 Motor

The fan motor shall be ____ hp (kW) at 1750 RPM @60hz (1450 RPM @50hz), mounted to an automatic, spring-tensioning base. The motor shall be removable from the front of the cabinet.

2.3.1.1 Premium Efficiency Motor

The fan motor shall be Open Drip-Proof, Premium efficiency and shall meet NEMA Premium standard. Motor efficiency shall be ____%.

2.3.1.1 TEFC Motor (Optional)

The motor shall be Totally Enclosed Fan Cooled for protection in harsh environments.

2.3.2 Drive Package

The motor sheave and fan pulley shall be double-width fixed pitch. Two belts, sized for 200% of the fan motor horsepower shall be provided with the drive package. An auto-tension system shall provide constant tension on the belts. Belts, shaft, blower bearings, sheave and pulley shall be warranted for five years (parts only).

2.4 Humidifier

A humidifier shall be factory-installed inside the unit. Bypass air slots shall be included to enable moisture to be absorbed into the air stream. The humidifier capacity shall be ____lb./hr (kg/hr). The humidifier shall be removable from the front of the cabinet.

2.4.1 Infrared Humidifier

The humidifier shall be of the infrared type consisting of high intensity quartz lamps mounted above and out of the water supply. The humidifier pan shall be stainless steel and arranged to be removable without disconnecting high voltage electrical connections. The complete humidifier section shall be pre-piped, ready for field connection to water supply. The humidifier shall be equipped with an automatic water supply system and shall have an adjustable water-overfeed to prevent mineral precipitation. A high-water detector shall shut down the humidifier to prevent overflowing. A factory-provided air-gap shall prevent backflow of the humidifier supply water.

2.4.1 Steam Generating Canister Humidifier

A canister-type steam canister shall be factory-installed in the cooling unit and shall be controlled by the microprocessor control system. It shall be complete with disposable canister, all supply and drain valves, steam distributor and electronic controls. The need to change canister shall be indicated on the microprocessor control panel. The humidifier shall be designed to operate with water conductivity from 200-500 micromhos. An air-gap within the humidifier assembly shall prevent backflow of the humidifier supply water.

2.5 Reheat

The environmental control unit shall include a factory-installed reheat to control temperature during dehumidification.

2.5.1 3-Stage Electric Reheat

The electric reheat coils shall be low watt density, 304/304 stainless steel fin tubular construction, protected by thermal safety switches, shall be ____ kW (____ BTUH) controlled in three stages. The reheat elements shall be removable from the front of the cabinet.

2.5.1 SCR Electric Reheat

The electric reheat coils shall be low watt density, 304/304 stainless steel fin tubular construction, protected by thermal safety switches, ____ kW (____ BTUH) controlled by multiple pulses to achieve tight temperature control. The reheat elements shall be removable from the front of the cabinet.

2.6 Dual Refrigeration System

Each unit shall include two (2) independent refrigeration circuits and shall include hot gas mufflers (semi-hermetic compressors units only), liquid line filter driers, refrigerant sight glass with moisture indicator (semi-hermetic compressors units only), externally equalized expansion valves and liquid line solenoid valves. Compressors shall be located outside the airstream and shall be removable and serviceable from the front of the unit.

2.6.1 Semi-Hermetic Compressor With Four-Step Unloaders Control

The compressor shall be semi-hermetic with a suction gas cooled motor, vibration isolators, thermal overloads, oil sight glass, automatic reset high pressure switch with control lockout after three failures, pump-down low pressure transducer, suction line strainer, service valves, reversible oil pumps for forced feed lubrication, a maximum operating speed of 1750 RPM. The system shall include cylinder unloaders on the semi-hermetic compressors. The unloaders shall be activated by solenoid valves which are controlled from the microprocessor control. In response to the return air temperature, the microprocessor control shall activate the unloader solenoids and the liquid line solenoids such that four stages of refrigeration cooling are obtained. The stages shall be: 1) one compressor, partially loaded, 2) two compressors partially loaded, 3) one compressor partially loaded, one compressor fully loaded, 4) two compressors fully loaded. On a call for dehumidification, the microprocessor control shall insure that at least one compressor is on full for proper humidity control.

2.6.1 Digital Scroll Compressors

The compressor shall be scroll-type with a variable capacity operation capability. Compressor solenoid valve shall unload the compressor and allow for variable capacity operation. The compressor shall be suction gas cooled motor, vibration isolators, thermal overloads, automatic reset high pressure switch with lockout after three failures, rotalock service valves, pump down low pressure transducer, suction line strainer, and a maximum operating speed of 3500 RPM. Consult factory for 575V availability.

2.6.1 Scroll Compressors

The compressor shall be scroll-type. The compressor shall be suction gas cooled motor, vibration isolators, thermal overloads, automatic reset high pressure switch with lockout after three failures, rotalock service valves, pump down low pressure transducer, suction line strainer and a maximum operating speed of 3500 RPM.

2.6.1.1 Crankcase Heaters (Optional)

The compressors shall include crankcase heaters, powered from the indoor unit electric panel.

2.6.2 Evaporator Coil

The evaporator coil shall be A-frame design with offset orientation and have ____sq. ft. (m2) face area, three rows deep. It shall be constructed of rifled copper tubes and aluminum fins and have a maximum face velocity of ____ ft. per minute (m/s) at ____ CFM (CMH). A stainless steel condensate drain pan shall be provided.

2.6.2.1 Polymeric Coating (Optional)

The coil shall be coated with a high performance polymeric coating process to provide corrosion resistance within 2 to 12 pH range.

2.6.3 R-407C Refrigerant

The system shall be designed for use with R-407C refrigerant, which meets the EPA clean air act for phase-out of HCFC refrigerants.

2.7 Liebert iCOM™ Microprocessor Control With Small Graphic Display

The Liebert iCOM unit control shall be factory-set for Intelligent Control which uses “fuzzy logic” and “expert systems” methods. Proportional and Tunable PID shall also be user selectable options. Internal unit component control shall include the following:

Compressor Short Cycle Control - Prevents compressor short-cycling and needless compressor wear.

System Auto Restart - The auto restart feature will automatically restart the system after a power failure. Time delay is programmable.

Sequential Load Activation - On initial startup or restart after power failure, each operational load is sequenced with a minimum of one second delay to minimize total inrush current.

Econ-O-Coil Flush Cycles - Econ-O-Coils are flushed periodically to prevent a buildup of contaminants.

Predictive Humidity Control - Calculates the moisture content in the room and prevents unnecessary humidification and dehumidification cycles by responding to changes in dew point temperature.

The Liebert iCOM control shall be compatible with all Liebert remote monitoring and control devices. Options are available for BMS interface via MODbus, Jbus, BACNet, Profibus and SNMP.

The Liebert iCOM control processor shall be microprocessor based with a 128x64 dot matrix graphic front monitor display and control keys for user inputs mounted in an ergonomic, aesthetically pleasing housing. The display & housing shall be viewable while the unit panels are open or closed. The controls shall be menu driven. The display shall be organized into three main sections: User Menus, Service Menus and Advanced Menus. The system shall display user menus for: active alarms, event log, graphic data, unit view/status overview (including the monitoring of room conditions, operational status in % of each function, date and time), total run hours, various sensors, display setup and service contacts. A password shall be required to make system changes within the service menus. Service menus shall include: setpoints, standby settings (lead/lag), timers/sleep mode, alarm setup, sensor calibration, maintenance/wellness settings, options setup, system/network setup, auxiliary boards and diagnostics/service mode. A password shall be required to access the advanced menus, which include the factory settings and password menus.

The User Menus Shall be Defined as Follows:

Active Alarms: Unit memory shall hold the 200 most recent alarms with time and date stamp for each alarm.

Event Log: Unit memory shall hold the 400 most recent events with ID number, time and date stamp for each event.

Graphic Data View: Eight graphic records shall be available: return air temperature, return air humidity, supply air temperature, outdoor temperature and four custom graphs.

Unit View - Status Overview: Simple or Graphical "Unit View" summary displays shall include temperature and humidity values, active functions (and percent of operation) and any alarms of the host unit.

Total Run Hours: Menu shall display accumulative component operating hours for major components including compressors, Econ-O-Coil (FC), fan motor, humidifier and reheat.

Various Sensors: Menu shall allow setup and display of optional custom sensors. The control shall include four customer accessible analog inputs for sensors provided by others. The analog inputs shall accept a 4 to 20 mA signal. The user shall be able to change the input to 0 to 5VDC or 0 to 10VDC if desired. The gains for each analog input shall be programmable from the front display. The analog inputs shall be able to be monitored from the front display.

Display Setup: Customer shall pre-select the desired grouping of display languages at the time of the order from the following choices:

Group 1: English, French, Italian, Spanish, German

Group 2: English, Russian, Greek

Group 3: English, Japanese, Chinese, Arabic

Service Contacts: Menu shall allow display of local service contact name and phone number.

The Service Menus Shall be Defined as Follows:

Setpoints: Menu shall allow setpoints within the following ranges:

- Temperature Setpoint 65-85ºF (18-29ºC)*
- Temperature Sensitivity +1-10ºF (0.6-5.6ºC)
- Humidity Setpoint 20-80% RH*
- Humidity Sensitivity 1-30% RH
- High Temperature Alarm 35-90ºF (2-32ºC)
- Low Temperature Alarm 35-90ºF (2-32ºC)
- High Humidity Alarm 15-85% RH
- Low Humidity Alarm 15-85% RH

* The microprocessor may be set within these ranges, however, the unit may not be able to control to extreme combinations of temperature and humidity.

Standby Settings/Lead-Lag: Menu shall allow planned rotation or emergency rotation of operating and standby units.

Timers/Sleep Mode: Menu shall allow various customer settings for turning on/off unit.

Alarm Setup: Menu shall allow customer settings for alarm notification (audible/local/remote). The following alarms shall be available:

- High Temperature
- Low Temperature
- High Humidity
- Low Humidity
- Compressor Overload (Optional)
- Main Fan Overload (Optional)
- Humidifier Problem
- High Head Pressure
- Change Filter
- Fan Failure
- Low Suction Pressure
- Unit Off

Audible Alarm: The audible alarm shall annunciate any alarm that is enabled by the operator.

Common Alarm: A programmable common alarm shall be provided to interface user selected alarms with a remote alarm device.

Remote Monitoring: All alarms shall be communicated to the Liebert monitoring system with the following information: Date and time of occurrence, unit number and present temperature and humidity.

Sensor Calibration: Menu shall allow unit sensors to be calibrated with external sensors.

Maintenance/Wellness Settings: Menu shall allow reporting of potential component problems before they occur.

Options Setup: Menu shall provide operation settings for the installed components.

System/Network Setup: Menu shall allow Unit-to-Unit (U2U) communication and setup for teamwork modes of operation (up to 32 units).

Teamwork Modes of Operation: Saves energy by preventing operation of units in opposite modes multiple units.

Auxiliary Boards: Menu shall allow setup of optional expansion boards.

Diagnostics/Service Mode: The Liebert iCOM control shall be provided with self-diagnostics to aid in troubleshooting. The microcontroller board shall be diagnosed and reported as pass/not pass. Control inputs shall be indicated as on or off at the front display. Control outputs shall be able to be turned on or off from the front display without using jumpers or a service terminal. Each control output shall be indicated by an LED on a circuit board.

Advanced Menus

Factory Settings: Configuration settings shall be factory-set based on the pre-defined component operation.

Change Passwords: Menu shall allow new passwords to be set or changed.

2.7.1 Liebert iCOM Microprocessor Control With Large Graphic Display (Optional)

The Liebert iCOM unit control with large graphic display shall include all of the features as the Liebert iCOM with small graphic display, except that it includes a larger graphical display and shall include the additional features of: "System View," Spare Parts List, Unit Diary.

The Liebert iCOM control processor shall be microprocessor based with a 320x240 dot matrix graphic front monitor display panel and control keys for user inputs mounted in an ergonomic, aesthetically pleasing housing.

System View - Status Overview: "System View" shall display a summary of operation for the total number of operating units within a Unit-to-Unit (U2U) configuration.

Spare Parts List: Menu shall include a list of critical spare parts, their quantity and part numbers.

Unit Diary: Menu shall include a free field area within the unit memory where unit history may be stored for reference.

2.7.2 Liebert iCOM Wall Mount Large Graphic Display (Optional)

The Liebert iCOM Large Graphic Display Kit shall include an ergonomic, aesthetically pleasing housing, a 320x240 dot matrix graphic display and a 120V power supply. The Wall Mount Large Graphic Display shall be used to allow remote location of a "System View" display and all features of the Large Graphic User, Service and Advanced menus for use with Liebert iCOM-controlled products connected for Unit-to-Unit (U2U) communications.

2.8 Dual-Cooling Source

The dual-cooling source system shall consist of an air- or water-cooled compressorized system with the addition of a chilled water coil (Econ-O-Coil), a modulating control valve and a comparative temperature sensor. The system shall be able to function either as a modulating chilled water system or as a compressorized system, or as a combination of both. The primary cooling mode shall be chilled water. Switchover between the two cooling modes shall be performed automatically by the microprocessor control. Four (4) pipes shall be included on water/glycol systems: Econ-O-Coil supply, Econ-O-Coil return, condenser supply and condenser return.

2.8.1 Dual-Cooling Source Control Valve

The water circuit shall include a three-way modulating valve. The microprocessor positions the valve in response to room conditions. Cooling capacity will be controlled by bypassing chilled water around the coil. The modulating valve travel for dehumidification shall be proportional.

2.8.2 Cu-Ni Coil (Optional)

A 70/30 Cu-Ni Econ-O-Coil shall be provided for Dual-Cooling units that are applied to a cooling tower loop or other open water system. This option is required on open cooling tower applications.

2.8.3 Polymeric Coating on Econ-O-Coil and DX Coil (Optional)

The coil shall be coated with a high performance polymeric coating process to provide corrosion resistance within 2 to 12 pH range.

2.9 Miscellaneous Options

2.9.1 Non-Locking Disconnect Switch (Optional)

The manual disconnect switch shall be mounted in the high voltage section of the electrical panel. The switch shall be accessible with the door closed.

2.9.1 Locking Disconnect Switch (Optional)

The manual disconnect switch shall be mounted in the high voltage section of the electrical panel. The switch shall be accessible from the outside of the unit with the door closed and prevent access to the high voltage electrical components until switched to the "OFF" position.

2.9.2 High Temperature Sensor (Optional)

The firestat shall be factory-installed in the unit and shall be factory-set to 125ºF (52ºC). It shall immediately shut down the environmental control system when activated. The sensor shall be mounted with the sensing element in the return air.

2.9.3 Smoke Sensor (Optional)

The smoke sensor shall immediately shut down the environmental control system and activate the alarm system when activated. The smoke sensor shall be mounted in the electrical panel with the sensing element in the return air compartment. The smoke sensor is not intended to function as or replace any room smoke detection system that may be required by local or national codes. The smoke sensor shall include a supervision contact closure.

2.9.4 Condensate Pump, Dual Float (Optional)

The condensate pump shall have a minimum capacity of 145 GPH (548 l/h) at 20 ft. (58 kPa) head. It shall be complete with integral dual-float switches, pump-and-motor assembly and reservoir. The secondary float shall send a signal to the local alarm and shut down the unit upon high water condition.

2.9.5 Low Voltage Terminal Package (Optional)

Factory-installed and wired terminals shall be provided for customer connection to lock out the reheat and humidifier upon contact closure. Two (2) extra N/O common alarm contacts shall be provided. Two (2) extra remote shutdown terminals shall be provided.

2.9.6 Remote Humidifier Contact (Optional)

A pair of N/O contacts shall be provided for connection to a remote humidifier.

2.9.7 Main Fan Overload (Optional)

A pair of N/O contacts shall be factory-installed and wired to indicate Main Fan Overload.

2.9.8 Compressor Overload (Optional)

A pair of N/O contacts shall be factory-installed and wired to each compressor to indicate Compressor Overload.

2.10 Air-Cooled Systems

The indoor evaporator unit shall include refrigerant piping, with a factory holding charge of nitrogen. The hot-gas and liquid lines shall be spun shut and shall include a factory-installed Schrader valve. Field relief of the Schrader valve shall indicate a leak-free system.

2.10.1 Air-Cooled Condenser

The Emerson-manufactured outdoor air-cooled condenser shall be the low profile, multiple direct drive, propeller fan type. The condenser shall balance the heat rejection of the compressor at ____ °F (°C) ambient. The condenser shall be constructed of aluminum and contain a copper tube, aluminum fin coil arranged for (horizontal) (vertical) air discharge.

2.10.1.1 Fan Speed Control

The winter control system for the air-cooled condenser shall be Liebert Fan Speed Control. The variable speed motor shall operate from 0 to 230 volts single phase, 10 to 1050 RPM. It shall be designed with ball bearings, permanent lubrication, internal overload protection, 40°C rise at full speed, 65°C rise at 10 RPM. The control system shall be complete with transducers, thermostats and electrical control circuit, factory prepackaged in the integral condenser control box. The transducer shall automatically sense the highest head pressure of either operating compressor and control the variable speed fan on the air-cooled condenser to properly maintain the head pressure. The fan speed control system shall provide positive startup and operation in ambient temperature as low as -20°F (-28.9°C). The air-cooled condenser shall have a ____ volt, ____ ph ____ Hz power supply.

2.10.1.1 Variable Frequency Drive Control

The winter control system for the air-cooled condenser shall be Liebert VFD Control. The control system shall include a variable frequency drive, inverter duty fan motor operating from 0% to 100% motor RPM based on head pressure, refrigerant pressure transducers, ambient-temperature thermostat(s), motor overload protection and electrical control circuit, factory- wired in the control panel. VFD control shall be furnished on the fan adjacent to the connection end of the condenser, which runs continuously with the compressors. The variable speed fan motor shall be an inverter duty motor with permanently lubricated ceramic bearings. The Liebert variable frequency drive control system shall provide overload protection for the variable speed motor. Each ambient-temperature-controlled On/Off fan motor shall have built-in overload protection. The transducer shall automatically sense the highest head pressure of either operating compressor and control the variable speed fan on the air-cooled condenser to properly maintain the head pressure. Transient Voltage Surge Suppression and locking disconnect is standard and shall be factory-installed and wired in the enclosed condenser electrical panel section. The VFD control system shall provide positive startup and operation in ambient temperature as low as -20°F (-28.9°C). The air-cooled condenser shall have a ____ volt, three phase, ____ Hz power supply

2.10.1.1 Lee-Temp System

The winter control system for the air-cooled condenser shall be Liebert Lee-Temp. The Liebert Lee-Temp system shall allow startup and positive head pressure control with ambient temperatures as low as -30°F (-34.4°C). The Liebert Lee-Temp package shall include the following components for each refrigeration circuit: insulated receiver, pressure relief valve, head pressure three-way control valve and rotalock valve for isolating the refrigerant charge. The Liebert Lee-Temp receiver shall be factory-insulated and mounted ready for the field connection to the air-cooled condenser. The Liebert Lee-Temp heater shall require a separate power supply of ____ volt, single phase.

2.10.2 Quiet-Line Condenser (Optional)

Fan motors shall be 12-pole, 570 RPM, equipped with rain shields and permanently sealed ball bearings. Motors shall include built-in overload protection. Motors shall be rigidly mounted on die-formed galvanized steel supports. Liebert Lee-Temp winter control system is required on Quiet-Line models. Disconnect switch shall be a standard feature.

2.10.3 Condenser Disconnect Switch (Optional)

A disconnect switch shall be factory-mounted and wired to the condenser control panel, accessible from the exterior (standard on Quiet-Line and VFD Condenser models).

2.10 Water/Glycol Systems

2.10.1 Paradenser™ Condenser

The water-cooled condensers for each circuit shall be cleanable, shell-and-tube, counter flow type. The heads shall be removable to allow for cleaning of the water tubes. Condensers shall be rated for a maximum refrigerant pressure of 400 psi at 200°F (2758 kPa at 93.3°C). The condenser shall be capable of operating with R-407C refrigerant. The unit shall require ____ GPM (l/m) of ____ °F (°C) water and have a maximum pressure drop of ____ psi (kPa).

2.10.2 Water/Glycol Regulating Valve, 2-Way With Bypass

The condenser shall be pre-piped with a two-way regulating valve which is head pressure actuated. A gate-valve shall bypass the regulating valve.

2.10.2 Water/Glycol Regulating Valve, 3-Way

The condenser shall be pre-piped with a three-way regulating valve which is head pressure actuated.

2.10.3 Pressure Rating, 150 psi (1034 kPa)

The condenser water circuit shall be designed for a pressure of 150 psi (1034 kPa).

2.10.3 Pressure Rating, 350 psi (2413 kPa)

The condenser water circuit shall be designed for a pressure of 350 psi (2413 kPa).

2.10.4 GLYCOOL Systems

2.10.4.1 GLYCOOL Coil

The GLYCOOL (Econ-O-Coil) shall be constructed of copper tubes and aluminum fins. The coil shall be A-frame or V-frame in order to minimize air pressure drop, and shall be nested with the DX coil. The Econ-O-Coil shall be upstream of the DX coil to enable pre-cooling of the air.

The Econ-O-Coil shall have a net Sensible Cooling Capacity of ____ BTUH (kW) with 45°F (7.2°C) entering glycol solution temperature. The system shall require ____ GPM (l/s) and the total unit pressure drop shall not exceed ____ feet of water (kPa), when in the Econ-O-Coil mode of operation.

2.10.4.2 GLYCOOL Three-Way Control Valve

The GLYCOOL coil shall be equipped with a fully proportional 3-way control valve. This motorized control valve shall control the amount of flow to the GLYCOOL (Econ-O-Coil) coil to control room temperature and relative humidity.

2.10.4.3 High Pressure System, 350 psi (2413 kPa)

The GLYCOOL system shall be designed for a pressure of 350 psi (2413 kPa).

2.10.4.3 Cu-Ni Econ-O-Coil

A 70/30 Cu-Ni Econ-O-Coil shall be provided for when the Econ-O-Coil is cooling tower loop or other open water system. This option is required on open cooling tower applications.

2.11 Drycooler

The Liebert drycooler is a low-profile, direct-drive propeller fan-type air cooled fluid cooling unit. The drycooler shall be constructed with an aluminum cabinet and a copper-tube aluminum fin coil. All electrical connections and controls are enclosed in an integral, weatherproof section of the drycooler. The drycooler shall be designed for ____ °F (°C) ambient.

2.11.1 Drycooler Control Options

2.11.1.1 Fan Cycling Control

A thermostatic control cycles the fan on a single-fan drycooler in response to leaving fluid temperatures. Two or more thermostats shall be employed on drycoolers with two or more fans to cycle fans or groups of fans in response to leaving fluid temperatures. The thermostat setpoints shall be listed on the factory-supplied schematic.

2.11.1.2 Pump Controls

Single Pump Option - Pump controls for a single glycol pump up to 7.5 hp shall be incorporated into the same integral electrical panel as the drycooler fan controls and may include fuses or circuit breakers as required for the pump motor. Pump voltage, phase and frequency shall be same as drycooler voltage, phase and frequency.

Dual Pump Option - Pump controls for a dual glycol pump system shall operate one pump as primary and the second pump shall operate as a standby pump. Pump controls shall be incorporated into the same integral electrical panel controlling drycooler fans. A field-supplied flow switch shall sense loss of flow and switch to the standby pump for continuous system operation. An internal switch shall allow manual selection of the primary (lead) pump.

2.12 Pump Package

This system shall be provided with a centrifugal pump mounted in a weatherproof and vented enclosure. The pump shall be rated for ____ GPM (l/m) at ____ ft. of head (kPa) and operate on ____ volt, 3-phase, ____ Hz.

2.12.1 Dual Pump Package

The dual pump package shall include pumps, enclosure, field-mounted flow switch. The standby pump shall automatically start upon failure of the lead pump by drycooler pump controls or by a separate factory-wired control box and shall include a lead/ lag switch for the pumps. Each pump shall be rated for ____ GPM (l/s) at ____ feet of head (kPa).

2.13 Liebert Liqui-tect Sensors

Provide ____ (quantity) solid state water sensors under the raised floor.

2.14 Floor Stand

The floor stand shall be constructed of a welded steel frame. The floor stand shall have adjustable legs with vibration isolation pads. The floor stand shall be ____ inches (mm) high.

2.14.1 Seismic Rated Floor Stand (Optional)

The floor stand shall be seismic rated and shall be bolted to the unit frame.

2.14.2 Floor Stand Turning Vane (Optional)

A turning vane shall be supplied with the floor stand and shall be designed for the specified floor stand height.

2.15 Return Air Plenum for Downflow Units

The air plenum shall be constructed of 20 gauge steel, powder coated to match unit color. The plenum shall be ___" high. Discharge air grilles shall be painted black and shall be included on the [Front], [Rear], [Left side], or [Right Side] of the plenum.

2.15 Discharge Air Plenum for Upflow Units, With Discharge Grille(s)

The air plenum shall be constructed of 20 gauge steel, powder coated to match unit color. The plenum shall be ___" high. Discharge air grilles shall be painted black and shall be included on the [Front], [Rear], [Left side], or [Right Side] of the plenum.

2.15 Discharge Air Plenum for Upflow Units, Without Discharge Grille(s)

The air plenum shall be constructed of 20 gauge steel, powder coated to match unit color. The plenum shall be ___" high. Air shall discharge from the top of the plenum.

3.0 EXECUTION

3.1 Installation of Precision Air Conditioning Units

3.1.1 General

Install precision air conditioning units in accordance with manufacturer's installation instructions. Install units plumb and level, firmly anchored in locations indicated, and maintain manufacturer's recommended clearances.

3.1.2 Electrical Wiring

Install and connect electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's electrical connection diagram submittal to electrical contractor.

3.1.3 Piping Connections

Install and connect devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's piping connection diagram submittal to piping contractor.

3.1.4 Field Quality Control

Start up cooling units in accordance with manufacturer's startup instructions. Test controls and demonstrate compliance with requirements. These specifications describe requirements for a computer room environmental control system. The system shall be designed to maintain temperature and humidity conditions in the rooms containing electronic equipment.

The manufacturer shall design and furnish all equipment to be fully compatible with heat dissipation requirements.

NOTE

These Guide Specifications comply with the outlines of the Construction Specifications Institute *per CSI MP-2-1 and MP-2-2. In correspondence, refer to SL-18815GS_REV02_04-09.*

NOTES

Ensuring The High Availability Of Mission-Critical Data And Applications.

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