

**RETURN BIDS TO:**  
**RETOURNER LES SOUMISSIONS À:**  
 Bid Receiving Public Works and Government  
 Services Canada/Réception des soumissions/Travaux  
 publics et Services gouvernementaux Canada  
 189 Prince William Street  
 Room 405  
 Saint John  
 New Brunswick  
 E2L 2B9

## SOLICITATION AMENDMENT MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

### Comments - Commentaires

All enquiries are to be submitted in writing to the Contracting Authority, Darlene Reay, either by facsimile or by e-mail at:  
 darlene.reay@pwgsc.gc.ca.

### Vendor/Firm Name and Address

Raison sociale et adresse du  
fournisseur/de l'entrepreneur

### Issuing Office - Bureau de distribution

Public Works and Government Services Canada  
 The Cambridge Building  
 3 Queen Street/3 rue, Queen  
 PO Box 1268/CP 1268  
 Charlottetown  
 Prince Ed  
 C1A 4A2

<b>Title - Sujet</b> CRAC Unit Replacement, Shared	
<b>Solicitation No. - N° de l'invitation</b> EC015-151290/A	<b>Amendment No. - N° modif.</b> 003
<b>Client Reference No. - N° de référence du client</b> R.072542.001	<b>Date</b> 2014-11-19
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$PWC-008-3493	
<b>File No. - N° de dossier</b> PWC-4-37094 (008)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2014-11-25</b>	<b>Time Zone</b> Fuseau horaire Atlantic Standard Time AST
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Reay, D (PWC)	<b>Buyer Id - Id de l'acheteur</b> pwc008
<b>Telephone No. - N° de téléphone</b> (902) 566-7518 ( )	<b>FAX No. - N° de FAX</b> (506) 636-4376
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b>	

Instructions: See Herein

Instructions: Voir aux présentes

<b>Delivery Required - Livraison exigée</b>	<b>Delivery Offered - Livraison proposée</b>
<b>Vendor/Firm Name and Address</b> <b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<b>Telephone No. - N° de téléphone</b> <b>Facsimile No. - N° de télécopieur</b>	
<b>Name and title of person authorized to sign on behalf of Vendor/Firm (type or print)</b> <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b>	
<b>Signature</b>	<b>Date</b>

---

The following changes in the tender documents are effective immediately. This addendum will form part of the contract documents.

## **REFERENCE - ADDENDUM NO. 2**

### Answer #3

See attached Installation Manual

## **SPECIFICATION**

Delete reference to project number R.07542.001 (in Header at the top of all pages), and replace with R.072542.001.

## **DRAWING**

Reference drawing E1, Mechanical Equipment Schedule.

Change item 3, Panel information from “C4EPC” to “C4EPB”

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





---

## TABLE OF CONTENTS

<b>LIEBERT DS MODEL NUMBER</b> .....	<b>1</b>
<b>TECHNICAL DATA</b> .....	<b>2</b>
Table 1 Air-cooled capacity data, R-407C refrigerant .....	2
Table 2 Air-cooled capacity data, R-22 refrigerant .....	2
Table 3 Physical data - air cooled units .....	3
Table 4 Water-cooled capacity data, R-407C refrigerant .....	4
Table 5 Water-cooled capacity data, R-22 refrigerant .....	4
Table 6 Physical data - water cooled units .....	5
Table 7 Glycol-cooled capacity data, R-407C refrigerant, 40% ethylene glycol .....	6
Table 8 Glycol-cooled capacity data, R-22 refrigerant, 40% ethylene glycol .....	6
Table 9 Physical data - glycol/GLYCOOL cooled units .....	7
Table 10 Motor horsepower requirements .....	8
Table 11 Nema Premium™ Motor Efficiency .....	8
Figure 1 Econ-O-Coil capacity correction factors—water and glycol .....	8
Table 12 Electrical data .....	9
<b>DRAWINGS</b> .....	<b>11</b>
<b>ELECTRICAL FIELD CONNECTIONS</b> .....	<b>11</b>
Figure 2 Electrical field connections - upflow and downflow models .....	11
Table 13 Electrical field connection descriptions .....	11
<b>DOWNFLOW, AIR-COOLED, 28-42kW (8-12 TON)—SEMI-HERMETIC COMPRESSORS</b> .....	<b>12</b>
Figure 3 Dimensions - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic .....	12
Table 14 Weights - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic .....	12
Figure 4 Primary connection locations - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic .....	13
Table 15 Piping data - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic .....	13
Figure 5 Disassembly dimensions - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic .....	14
Table 16 Component weights - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic .....	14
<b>DOWNFLOW, AIR-COOLED, 28-42kW (8-12 TON)—SCROLL OR DIGITAL SCROLL COMPRESSORS</b> .....	<b>15</b>
Figure 6 Dimensions - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll .....	15
Table 17 Weights - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll .....	15
Figure 7 Primary connection locations - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll .....	16
Table 18 Piping data - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll .....	16
Figure 8 Disassembly dimensions - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll .....	17
Table 19 Component weights - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll .....	17
<b>DOWNFLOW, WATER/GLYCOL/GLYCOOL, 28-42kW (8-12 TON)—ALL COMPRESSORS</b> .....	<b>18</b>
Figure 9 Dimensions - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all .....	18
Table 20 Weights - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all .....	18
Figure 10 Primary connection locations - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all .....	19
Table 21 Piping data - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all .....	19
Figure 11 Disassembly dimensions - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all .....	20
Table 22 Component weights - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all .....	20

<b>DOWNFLOW, AIR-COOLED, 53-77kW (15-22 TON)—SEMI-HERMETIC COMPRESSORS . . . . .</b>	<b>21</b>
Figure 12 Dimensions - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic . . . . .	21
Table 23 Weights - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic . . . . .	21
Figure 13 Primary connection locations - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic . . . . .	22
Table 24 Piping data - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic . . . . .	22
Figure 14 Disassembly dimensions - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic. . . . .	23
Table 25 Component weights - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic . . . . .	23
<b>DOWNFLOW, AIR-COOLED, 53-77kW (15-22 TON)—SCROLL OR DIGITAL SCROLL COMPRESSORS . . . . .</b>	<b>24</b>
Figure 15 Dimensions - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll. . . . .	24
Table 26 Weights - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll. . . . .	24
Figure 16 Primary connection locations - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll . . . . .	25
Table 27 Piping data - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll. . . . .	25
Figure 17 Disassembly dimensions - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll . . . . .	26
Table 28 Component weights - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll . . . . .	26
<b>DOWNFLOW, WATER/GLYCOL/GLYCOOL, 53-77kW (15-22 TON)—ALL COMPRESSORS . . . . .</b>	<b>27</b>
Figure 18 Dimensions - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all . . . . .	27
Table 29 Weights - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all . . . . .	27
Figure 19 Primary connection locations - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all . . . . .	28
Table 30 Downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all . . . . .	28
Figure 20 Disassembly dimensions - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all. . . . .	29
Table 31 Component weights - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all. . . . .	29
<b>DOWNFLOW, AIR-COOLED, 105kW (30 TON)—ALL COMPRESSORS . . . . .</b>	<b>30</b>
Figure 21 Dimensions - downflow, air-cooled, 105kW (30 ton)—all . . . . .	30
Table 32 Weights - downflow, air-cooled, 105kW (30 ton)—all . . . . .	30
Figure 22 Primary connection locations - downflow, air-cooled, 105kW (30 ton)—all. . . . .	31
Table 33 Piping data - downflow, air-cooled, 105kW (30 ton)—all . . . . .	31
<b>DOWNFLOW, AIR-COOLED, 105kW (30 TON)—SEMI-HERMETIC COMPRESSORS . . . . .</b>	<b>32</b>
Figure 23 Disassembly dimensions - downflow, air-cooled, 105kW (30 ton)—semi-hermetic. . . . .	32
Table 34 Component weights - downflow, air-cooled, 105kW (30 ton)—semi-hermetic. . . . .	32
<b>DOWNFLOW, AIR-COOLED, 105kW (30 TON)—SCROLL OR DIGITAL SCROLL COMPRESSORS . . . . .</b>	<b>33</b>
Figure 24 Disassembly dimensions - downflow, air-cooled, 105kW (30 ton)—scroll . . . . .	33
Table 35 Component weights - downflow, air-cooled, 105kW (30 ton)—scroll . . . . .	33
<b>DOWNFLOW, WATER/GLYCOL/GLYCOOL, 105kW (30 TON)—ALL COMPRESSORS . . . . .</b>	<b>34</b>
Figure 25 Weights and dimensions - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all . . . . .	34
Table 36 Weights - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all . . . . .	34
Figure 26 Primary connection locations - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all . . . . .	35
Table 37 Piping data - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all. . . . .	35
Figure 27 Disassembly dimensions - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all. . . . .	36
Table 38 Component weights - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all. . . . .	36

<b>UPFLOW, AIR-COOLED, 28-42kW (8-12 TON)—SEMI-HERMETIC COMPRESSORS</b>	<b>37</b>
Figure 28 Dimensions - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic	37
Table 39 Weights - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic	37
Figure 29 Primary connection locations - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic	38
Table 40 Piping data - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic	38
Figure 30 Disassembly dimensions - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic	39
Table 41 Component weights - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic	39
<b>UPFLOW, AIR-COOLED, 28-42kW (8-12 TON)—SCROLL OR DIGITAL SCROLL COMPRESSORS</b>	<b>40</b>
Figure 31 Dimensions - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll	40
Table 42 Weights - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll	40
Figure 32 Primary connection locations - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll	41
Table 43 Piping data - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll	41
Figure 33 Disassembly dimensions - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll	42
Table 44 Component weights - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll	42
<b>UPFLOW, WATER/GLYCOL/GLYCOOL, 28-42kW (8-12 TON)—ALL COMPRESSORS</b>	<b>43</b>
Figure 34 Dimensions - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all	43
Table 45 Weights - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all	43
Figure 35 Primary connection locations - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all	44
Table 46 Piping data - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all	44
Figure 36 Disassembly dimensions - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all	45
Table 47 Component weights - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all	45
<b>UPFLOW, AIR COOLED, 53-77kW (15-22 TON)—SEMI-HERMETIC COMPRESSORS</b>	<b>46</b>
Figure 37 Dimensions - upflow, air cooled 53-77kw (15-22 tons)—semi-hermetic	46
Table 48 Weight - upflow, air cooled, 53-77kW (15-22 ton)—semi-hermetic	46
Figure 38 Primary connection locations - upflow air cooled 53-77kW (15-22 tons), semi-hermetic	47
Table 49 Piping data - upflow, air cooled, 53-77kW (15-22 tons)—semi-hermetic	47
Figure 39 Disassembly dimensional data - upflow, air cooled, 53-77kw (15-22 tons)—semi-hermetic	48
Table 50 Component weights - upflow air cooled 53-77kw (15-22 tons)—semi-hermetic	48
<b>UPFLOW, AIR COOLED, 53-77kW (15-22 TON)—SCROLL OR DIGITAL SCROLL COMPRESSORS</b>	<b>49</b>
Figure 40 Dimensions - upflow, air cooled, 53-77kw (15-22 tons)—scroll/digital scroll	49
Table 51 Weights - upflow, air cooled, 53-77kw (15-22tons)—scroll	49
Figure 41 Primary connection locations - upflow, air cooled, 53-77kw (15-22tons)—scroll	50
Table 52 Piping data - upflow, air cooled, 53-77kw (15-22tons)—scroll	50
Figure 42 Disassembly dimensional - upflow, air cooled, 53-77kw (15-22 tons)—scroll/digital scroll	51
Table 53 Component weights - upflow, air cooled, 53-77kw (15-22 tons)—scroll /digital scroll	51
<b>UPFLOW, WATER/GLYCOL/GLYCOOL, 53-77kW (15-22 TON)—ALL COMPRESSORS</b>	<b>52</b>
Figure 43 Dimensions - upflow, water/glycol/GLYCOOL, 53-77kw (15-22 tons)—all	52
Table 54 Weights - upflow water/glycol/GLYCOOL 53-77kw (15-22 tons)—all	52
Figure 44 Primary connection locations - upflow water/glycol/GLYCOOL 53-77kw (15-22 tons)—all	53
Table 55 Piping data, upflow water/glycol/GLYCOOL 53-77kw (15-22 tons)—all	53
Figure 45 Disassembly dimensional data - upflow water/glycol/GLYCOOL 53-77kw (15-22 tons)—all	54
Table 56 Component weights, upflow water/glycol/GLYCOOL, 53-77kW (15-22 tons) all	54

<b>UPFLOW, AIR COOLED, 105kW (30 TON)—SEMI-HERMETIC COMPRESSORS . . . . .</b>	<b>55</b>
Figure 46 Disassembly dimensions - upflow, air-cooled, 105kW (30 tons)—semi-hermetic . . . . .	55
Table 57 Component weights - upflow, air cooled, 105kW (30 tons)—semi-hermetic . . . . .	55
<b>UPFLOW, AIR COOLED, 105kW (30 TON)—SCROLL COMPRESSORS . . . . .</b>	<b>56</b>
Figure 47 Disassembly dimensions - upflow, air cooled, 105kW (30 tons)—scroll/digital scroll . . . . .	56
Table 58 Component weights - upflow, air cooled, 105kW (30 tons)—scroll/digital scroll . . . . .	56
<b>UPFLOW, AIR COOLED, 105kW (30 TON)—ALL COMPRESSORS . . . . .</b>	<b>57</b>
Figure 48 Weights and dimensions - upflow, air cooled, 105kW (30 tons)—all . . . . .	57
Table 59 Weights - upflow, air cooled, 105kW (30 tons)—all . . . . .	57
Figure 49 Primary connection locations - upflow, air cooled, 105kW (30 tons)—all . . . . .	58
Table 60 Piping data - upflow, air cooled 105kW (30 tons)—all . . . . .	58
<b>UPFLOW, WATER/GLYCOL/GLYCOOL, 105kW (30 TON)—ALL COMPRESSORS . . . . .</b>	<b>59</b>
Figure 50 Dimensions - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all . . . . .	59
Table 61 Weights - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all . . . . .	59
Figure 51 Primary connection locations - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all . . . . .	60
Table 62 Piping data - upflow, upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all . . . . .	60
Figure 52 Disassembly dimensions - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all . . . . .	61
Table 63 Component weights - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all . . . . .	61
<b>ANCILLARY ITEMS . . . . .</b>	<b>62</b>
Figure 53 Floor stand dimensions - downflow, 28-42kW (8-12 ton) models . . . . .	62
Table 64 Floor stand and floor planning dimensional data . . . . .	62
Figure 54 Floor stand dimensions - downflow, 53-77kW (15-22 ton) models . . . . .	63
Table 65 Floor stand and floor planning dimensional data . . . . .	63
Figure 55 Floor stand dimensions - downflow, 105kW (30 ton) models . . . . .	64
Table 66 Floor stand and floor planning dimensional data . . . . .	64
Figure 56 Blower outlet location - upflow, air-cooled, 28-42kW (8-12 ton) . . . . .	65
Table 67 Blower outlet and deck dimensional data . . . . .	65
Figure 57 Blower outlet and deck dimensional data upflow 53-77kW (15-22tons) . . . . .	66
Table 68 Blower outlet and deck dimensional data upflow, 53-77kW (15-22tons) . . . . .	66
Figure 58 Blower outlet and deck dimensional data upflow 105kW (30tons) . . . . .	67
Table 69 Blower outlet and deck dimensional data upflow 105kW (30tons) . . . . .	67
Figure 59 Plenum dimension - upflow, 28-105kW (8-30 ton) models . . . . .	68
Table 70 Plenum dimensional data, in. (mm). . . . .	68
<b>HEAT REJECTION . . . . .</b>	<b>69</b>
<b>Condenser and Drycooler Selection . . . . .</b>	<b>69</b>
Table 71 Liebert DS air-cooled condenser selection . . . . .	69
Table 72 Liebert DS drycooler selection . . . . .	69
Table 73 Liebert DS piggyback condenser selection . . . . .	69
Table 74 Liebert piggyback drycooler/DS matchup data . . . . .	69



---

<b>Condenser and Drycooler Dimensional Data</b> .....	<b>70</b>
Figure 60 Condenser and drycooler dimensions, 2-fan model. ....	70
Figure 61 Condenser and drycooler dimensions, 3- and 4-fan models .....	70
Figure 62 Condenser and drycooler dimensions, 6- and 8-fan models .....	71
Table 75 Condenser physical data. ....	71
Table 76 Drycooler physical data .....	72
<b>Electrical Data - Condensers and Drycoolers</b> .....	<b>73</b>
Table 77 60Hz condenser data. ....	73
Table 78 60Hz condenser data, Quiet-Line (Lee-Temp controlled/fan-cycling) .....	73
Table 79 Lee-Temp receiver electrical data, 50Hz and 60Hz .....	73
Figure 63 Typical piping arrangement, multiple drycoolers and multiple indoor units .....	74
<b>Pump Packages &amp; Expansion Tank - Options</b> .....	<b>75</b>
Figure 64 Pump package .....	75
Figure 65 Pump mounting. ....	75
Figure 66 Expansion tank .....	75
Table 80 Pump data .....	75
Figure 67 Pump curve, 60 Hz .....	75
<b>Indoor Piggyback Condenser Weights and Dimensions</b> .....	<b>76</b>
Figure 68 Piggyback condensers .....	76
Table 81 Unit shipping weight .....	76
Table 82 Motor amperage .....	76
Table 83 Motor performance data .....	76
Table 84 Dimensional data, in. (mm) .....	76
<b>Indoor Piggyback Drycooler Weights and Dimensions</b> .....	<b>77</b>
Figure 69 Piggyback drycoolers. ....	77
Table 85 Unit shipping weight .....	77
Table 86 Electrical data, 60 Hz, 3 ph .....	77
Table 87 Dimensional data, in. (mm) .....	77
<b>GUIDE SPECIFICATIONS</b> .....	<b>78</b>
1.0 General .....	78
2.0 Product .....	78
3.0 Execution .....	88

---

---



## TECHNICAL DATA

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

Model Size	028	035	042	053	070	077	105
<b>FOUR-STEP SEMI-HERMETIC COMPRESSOR</b>							
<b>Net Capacity Data, kW (BTUH), Standard Air Volume and Evaporator Fan Motor</b>							
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)
<b>DIGITAL SCROLL COMPRESSOR (Standard Scroll On 077 And 105 Models)</b>							
<b>Net Capacity Data, kW (BTUH), Standard Air Volume and Evaporator Fan Motor</b>							
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 Air-cooled capacity data, R-22 refrigerant**

Model Size	028	035	042	053	070	077	105
<b>FOUR-STEP SEMI-HERMETIC COMPRESSOR</b>							
<b>Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor</b>							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (KBTUH)	35.1 (119.9)	35.2 (120.0)	42.6 (145.5)	51.7 (176.5)	64.5 (220.0)	71.9 (245.4)	94.1 (321.2)
Sensible kW (KBTUH)	28.2 (96.3)	31.0 (105.8)	36.4 (124.3)	45.6 (155.8)	54.4 (185.7)	60.1 (205.1)	79.1 (270.0)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	34.2 (116.7)	34.1 (116.5)	41.4 (141.4)	50.3 (171.6)	62.7 (213.9)	69.9 (238.7)	91.6 (312.5)
Sensible kW (BTUH)	30.1 (102.8)	34.1 (116.5)	39.1 (133.6)	50.3 (171.6)	58.4 (199.3)	64.6 (220.6)	85.1 (290.5)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (KBTUH)	33.6 (114.7)	33.7 (114.9)	40.7 (138.8)	49.6 (169.2)	61.5 (210.0)	68.6 (234.3)	89.9 (306.9)
Sensible kW (KBTUH)	27.7 (94.4)	30.3 (103.5)	35.6 (121.5)	44.7 (152.5)	53.2 (181.6)	58.8 (200.7)	77.4 (264.1)
<b>DIGITAL SCROLL COMPRESSOR (standard scroll on 077 &amp; 105 models)</b>							
<b>Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor</b>							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	29.6 (100.9)	34.3 (117.1)	40.3 (137.6)	53.8 (183.5)	68.0 (232.2)	73.7 (251.5)	93.2 (318.0)
Sensible kW (BTUH)	26.0 (88.6)	30.7 (104.7)	35.5 (121.1)	46.5 (158.6)	55.8 (190.6)	60.8 (207.6)	78.7 (268.7)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	28.7 (98.0)	33.6 (114.6)	39.2 (133.8)	51.9 (177.3)	66.3 (226.4)	71.9 (245.5)	90.8 (309.9)
Sensible kW (BTUH)	28.7 (98.0)	33.6 (114.6)	39.2 (133.8)	51.9 (177.3)	59.9 (204.5)	65.5 (223.4)	84.8 (289.5)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	28.4 (97.0)	33.1 (112.8)	38.6 (131.9)	51.6 (176.0)	65.2 (222.6)	70.8 (241.5)	89.2 (304.6)
Sensible kW (BTUH)	25.5 (86.9)	30.1 (102.7)	34.7 (118.6)	45.5 (155.4)	54.8 (186.9)	59.7 (203.7)	77.1 (263.2)

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

**Table 3 Physical data - air cooled units**

Model Size	028	035	042	053	070	077	105
<b>EVAPORATOR COIL- A-Frame - Copper Tube/Aluminum Fin</b>							
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)
<b>FAN SECTION - Downflow models - Fixed Pitch, Two Belts</b>							
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 <b>Table 10</b> for examples							
Note: Some options or combinations of options may result in reduced air flow—Consult local representative for recommendations.							
<b>REHEAT SECTION</b>							
<b>Electric Reheat - Three-Stage, Stainless Steel Fin Tubular, capacity does not include fan motor heat</b>							
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)
<b>Electric Reheat - SCR Control, Stainless Steel Fin Tubular (optional selection)</b>							
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)
<b>HUMIDIFIER SECTION</b>							
<b>Infrared Humidifier</b>							
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)
<b>FILTER SECTION - Disposable Type - Nominal Sizes and Quantities, std MERV 7, optional MERV 11</b>							
<b>Downflow Models</b>							
Nominal Size, inches	25x16	25x16	25x16	25x16	25x16	25x16	25x16
Quantity	5	5	5	7	7	7	9
<b>Upflow Models (Front &amp; Rear return) Filters located in separate filter box on rear return, located on lower unit panel</b>							
Nominal Size, inches	25x20	25x20	25x20	25x20	25x20	25x20	25x20
Quantity	4	4	4	6	6	6	8
<b>PIPING CONNECTION SIZES - Air-Cooled Liebert DS Indoor Unit (Not External Line Sizes)</b>							
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
<b>Outdoor Air-Cooled Condenser, std 95°F ambient selection; see table 50 for other selections</b>							
Model (R-22 Refrigerant)	CD*-165	CD*-165	CD*-205	CD*-205	CD*-308	CD*-308	CD*-415
Number of Fans	2	2	2	2	3	3	4
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
<b>Econ-O-Coil Capacity Data (Dual Cool Units), Water (0% Glycol), Net Capacity Data kW (kBTUH)</b>							
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)
<b>Fluid Volumes</b>							
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 4 Water-cooled capacity data, R-407C refrigerant**

Model Size	028	035	042	053	070	077	105
<b>FOUR-STEP SEMI-HERMETIC COMPRESSOR</b>							
<b>Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor</b>							
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)	56.3 (192.0)	62.6 (213.7)	81.3 (277.6)
<b>DIGITAL SCROLL COMPRESSOR (std scroll on 077 &amp; 105 models)</b>							
<b>Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor</b>							
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 5 Water-cooled capacity data, R-22 refrigerant**

Model Size	028	035	042	053	070	077	105
<b>FOUR-STEP SEMI-HERMETIC COMPRESSOR</b>							
<b>Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor</b>							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	38.7 (132.2)	39.4 (134.4)	46.2 (157.6)	57.0 (194.4)	69.5 (237.3)	80.1 (273.4)	104.0 (354.8)
Sensible kW (BTUH)	29.7 (101.4)	32.7 (111.6)	37.9 (129.2)	47.8 (163.0)	56.4 (192.6)	63.4 (216.5)	82.7 (282.4)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	37.9 (129.2)	39.3 (134.2)	44.8 (152.8)	55.4 (189.0)	67.7 (230.9)	78.0 (266.1)	100.9 (344.3)
Sensible kW (BTUH)	31.7 (108.2)	32.7 (111.5)	40.5 (138.3)	51.1 (174.5)	60.4 (206.3)	68.0 (232.0)	88.7 (302.7)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	37.2 (126.8)	37.4 (127.7)	44.0 (150.3)	54.5 (186.1)	66.5 (227.1)	76.9 (262.4)	99.1 (338.2)
Sensible kW (BTUH)	29.2 (99.7)	31.9 (109.0)	37.0 (126.3)	46.8 (159.7)	55.3 (188.9)	62.3 (212.6)	81.0 (276.3)
<b>DIGITAL SCROLL COMPRESSOR (Std Scroll on 077 &amp; 105 Models)</b>							
<b>Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor</b>							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	31.1 (106.3)	36.7 (125.3)	42.7 (145.8)	58.6 (200.0)	73.2 (249.8)	80.5 (274.9)	100.8 (343.9)
Sensible kW (BTUH)	26.6 (90.8)	31.6 (107.9)	36.4 (124.4)	48.4 (165.3)	58.0 (197.8)	63.6 (217.1)	81.8 (279.1)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	30.5 (104.0)	35.4 (120.7)	41.5 (141.8)	57.1 (194.8)	71.3 (243.3)	78.4 (267.6)	97.9 (334.3)
Sensible kW (BTUH)	28.5 (97.4)	35.4 (120.7)	39.2 (133.7)	51.8 (176.9)	62.0 (211.6)	68.2 (232.7)	87.8 (299.6)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	29.9 (102.0)	35.2 (120.0)	40.8 (139.2)	56.1 (191.4)	70.1 (239.2)	77.2 (263.5)	96.2 (328.2)
Sensible kW (BTUH)	26.1 (89.0)	31.0 (105.7)	35.6 (121.6)	47.4 (161.9)	56.8 (194.0)	62.4 (213.1)	80.0 (273.1)

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

**Table 6 Physical data - water cooled units**

Model Size	028	035	042	053	070	077	105
<b>EVAPORATOR COIL - A-Frame - Copper Tube/Aluminum Fin</b>							
Face Area - ft <sup>2</sup> (m <sup>2</sup> )	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)
<b>FAN SECTION - Downflow models - Fixed Pitch, Two Belts</b>							
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 <b>Table 10</b> for examples. Note: Some options or combinations of options may result in reduced air flow—Consult local representative for recommendations.							
<b>REHEAT SECTION</b>							
<b>Electric Reheat - Three (3) Stage, Stainless Steel Fin Tubular; capacity does not include fan motor heat</b>							
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)
<b>Electric Reheat - SCR Control, Stainless Steel Fin Tubular (optional selection)</b>							
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)
<b>HUMIDIFIER SECTION</b>							
<b>Infrared Humidifier</b>							
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)
<b>FILTER SECTION - Disposable Type - Nominal Sizes and Quantities, std MERV 7, optional MERV 11</b>							
<b>Downflow Models</b>							
Nominal Size, inches	25x16	25x16	25x16	25x16	25x16	25x16	25x16
Quantity	5	5	5	7	7	7	9
<b>Upflow Models (Front &amp; Rear Return) Filters located in separate filter box on rear return</b>							
Nominal Size, inches	25x20	25x20	25x20	25x20	25x20	25x20	25x20
Quantity	4	4	4	6	6	6	8
<b>Condenser Flow Requirements - Max design water pressure 150psi (1034kPa), 350psi (2413kPa) available as option</b>							
<b>WATER COOLED SYSTEM - Semi-Hermetic Compressors, Based on 75°F/50% Room Conditions</b>							
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)
<b>WATER COOLED SYSTEM - Digital Scroll Compressors, based on 75°F/50% room conditions</b>							
<b>Std Scroll Compressors</b>							
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)
<b>PIPING CONNECTION SIZES - Water-Cooled Liebert DS Indoor Unit</b>							
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
Hot Water Reheat - O.D. Copper	5/8	5/8	5/8	5/8	5/8	5/8	5/8
<b>Econ-O-Coil capacity data (dual cool units), water (0% glycol), Net Capacity Data kW (kBTUH)</b>							
Cu/Ni coil option must be specified when Econ-O-Coil is applied to open water tower.							
75°F DB, 62.5°F 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)
<b>Fluid Volumes</b>							
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 7 Glycol-cooled capacity data, R-407C refrigerant, 40% ethylene glycol**

Model Size	028	035	042	053	070	077	105
<b>FOUR-STEP SEMI-HERMETIC COMPRESSOR</b>							
<b>Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor</b>							
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)
<b>DIGITAL SCROLL COMPRESSOR (std scroll on 077 &amp; 105 models)</b>							
<b>Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor</b>							
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 8 Glycol-cooled capacity data, R-22 refrigerant, 40% ethylene glycol**

Model Size	028	035	042	053	070	077	105
<b>FOUR-STEP SEMI-HERMETIC COMPRESSOR</b>							
<b>Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor</b>							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	32.6 (111.4)	32.7 (111.6)	38.6 (131.6)	49.0 (167.3)	59.0 (201.5)	67.4 (230.1)	87.2 (297.6)
Sensible kW (BTUH)	27.2 (92.8)	30.0 (102.5)	34.8 (118.8)	44.6 (152.2)	52.2 (178.3)	58.3 (199.1)	76.4 (260.6)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	31.8 (108.6)	32.1 (109.6)	37.7 (128.8)	48.0 (163.9)	57.4 (196.0)	65.3 (223.0)	84.8 (289.5)
Sensible kW (BTUH)	29.1 (99.3)	32.1 (109.6)	37.7 (128.8)	48.0 (163.9)	57.4 (196.0)	65.3 (223.0)	84.8 (289.5)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	31.3 (106.8)	31.4 (107.2)	36.9 (125.9)	47.0 (160.4)	56.5 (192.7)	64.5 (220.2)	83.5 (285.1)
Sensible kW (BTUH)	26.7 (91.0)	29.4 (100.3)	34.0 (116.1)	43.6 (148.9)	51.1 (174.3)	57.1 (194.8)	74.7 (255.0)
<b>DIGITAL SCROLL COMPRESSOR (std scroll on 077 &amp; 105 models)</b>							
<b>Net Capacity Data kW (BTUH), Standard Air Volume and Evaporator Fan Motor</b>							
75°F DB, 62.5°F WB (23.9°C DB, 16.9°C WB) 50% RH							
Total kW (BTUH)	28.0 (95.6)	31.8 (108.6)	37.2 (126.8)	51.0 (174.2)	63.6 (217.2)	69.2 (236.2)	87.5 (298.8)
Sensible kW (BTUH)	25.3 (86.5)	29.7 (101.3)	34.2 (116.8)	45.4 (154.9)	54.1 (184.5)	59.0 (201.5)	76.5 (261.1)
75°F DB, 61.1°F WB (23.9°C DB, 16.2°C WB) 45% RH							
Total kW (BTUH)	27.4 (93.6)	31.4 (107.2)	36.6 (124.9)	49.8 (170.0)	62.0 (211.7)	67.6 (230.6)	85.2 (290.7)
Sensible kW (BTUH)	27.4 (93.6)	31.4 (107.2)	36.6 (124.9)	49.8 (170.0)	58.1 (198.4)	63.7 (217.3)	85.2 (290.7)
72°F DB, 60°F WB (22.2°C DB, 15.5°C WB) 50% RH							
Total kW (BTUH)	27.0 (92.1)	30.4 (103.6)	35.7 (121.7)	49.1 (167.6)	61.1 (208.6)	66.5 (227.0)	84.0 (286.6)
Sensible kW (BTUH)	27.8 (94.8)	30.4 (103.6)	33.5 (114.4)	44.5 (151.9)	53.0 (181.0)	57.9 (197.6)	74.9 (255.7)

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



**Table 9 Physical data - glycol/GLYCOOL cooled units**

Model Size	028	035	042	053	070	077	105
<b>EVAPORATOR COIL- A-Frame - Copper Tube/Aluminum Fin</b>							
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)
<b>FAN SECTION - Downflow models - Fixed Pitch, Two Belts</b>							
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 <b>Table 10</b> for examples Note: Some options or combinations of options may result in reduced air flow—Consult local representative for recommendations.							
<b>REHEAT SECTION</b>							
<b>Electric Reheat - Three (3) Stage, Stainless Steel Fin Tubular, capacity does not include fan motor heat</b>							
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)
<b>Electric Reheat - SCR Control, Stainless Steel Fin Tubular (optional selection)</b>							
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)
<b>HUMIDIFIER SECTION</b>							
<b>Infrared Humidifier</b>							
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)
<b>FILTER SECTION - Disposable Type - Nominal Sizes and Quantities, std MERV 7, optional MERV 11</b>							
<b>Downflow Models</b>							
Nominal Size, inches	25x16	25x16	25x16	25x16	25x16	25x16	25x16
Quantity	5	5	5	7	7	7	9
<b>Upflow Models (Front &amp; Rear return) Filters located in separate filter box on rear return</b>							
Nominal Size, inches	25x20	25x20	25x20	25x20	25x20	25x20	25x20
Quantity	4	4	4	6	6	6	8
<b>Outdoor Drycoolers, std 95°F ambient selection, see table 50 for other selections</b>							
Model (R-22 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
<b>CONDENSER FLOW REQUIREMENTS</b>							
<b>Glycol Cooled System - Semi-Hermetic Compressors, based on 75°F/50% room conditions</b>							
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)
<b>PIPING CONNECTION SIZES -Glycol-Cooled Liebert DS Indoor Unit</b>							
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
Hot Water Reheat - O.D. Copper	5/8	5/8	5/8	5/8	5/8	5/8	5/8
<b>Econ-O-Coil Capacity Data (GLYCOOL units), water (40% ethylene glycol), Net Capacity Data kW (KBTUH)</b> (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)
<b>Fluid Volumes</b>							
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 10 Motor horsepower requirements**

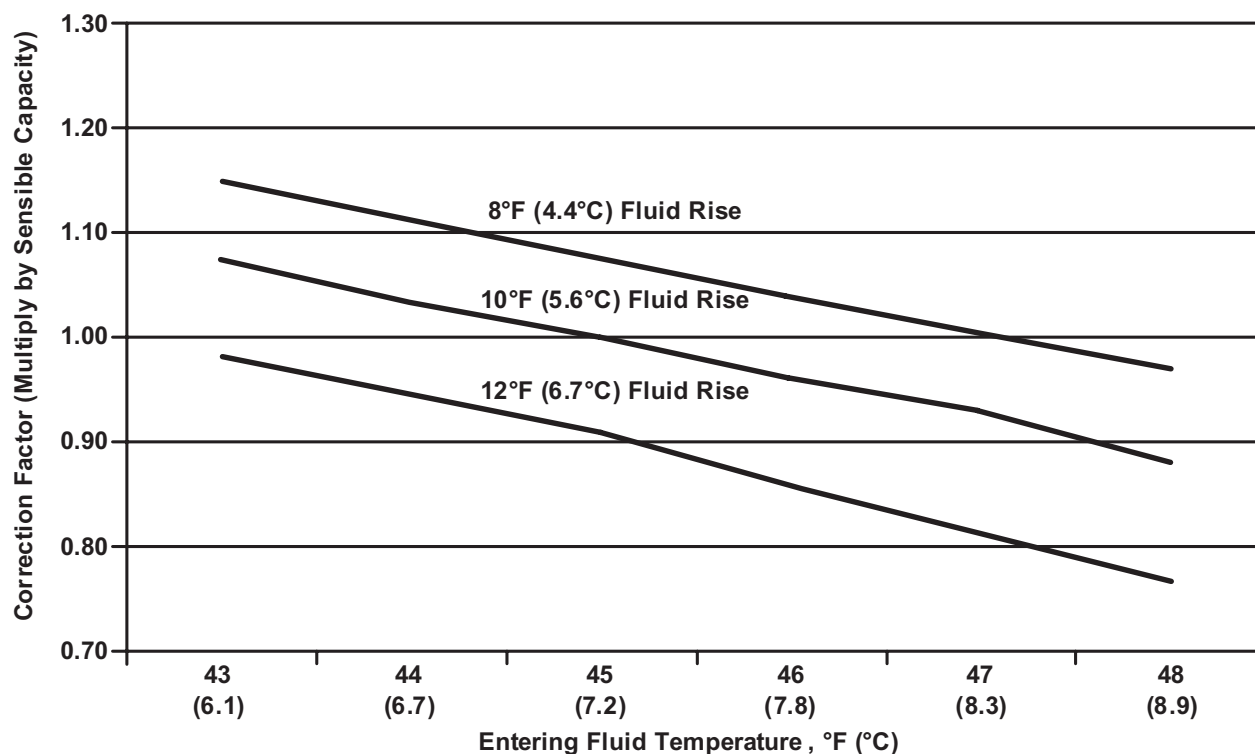
Model	CFM	External Static Pressure						
		0.2"	0.4"	0.6"	0.8"	1.0"	1.2"	1.4"
028	4,400	2	2	2	2	2	3	3
035	5,500	3	3	3	3	5	5	5
042	6,600	5	5	5	5	5	7.5	7.5
053	8,000	3	5	5	5	5	7.5	7.5
070	9,600	5	7.5	7.5	7.5	7.5	10	10
077	11,000	7.5	10	10	10	15	15	15
105	14,600	10	10	15	15	15	15	15

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 11 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 4** = 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 Liebert representative for more precise performance data

Table 12 Electrical data

Reheat Options			Electric, Std. kW				None or Hot Water				Electric, Std. kW				None or Hot Water			
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.

Table 12 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.

## DRAWINGS

## ELECTRICAL FIELD CONNECTIONS

Figure 2 Electrical field connections - upflow and downflow models

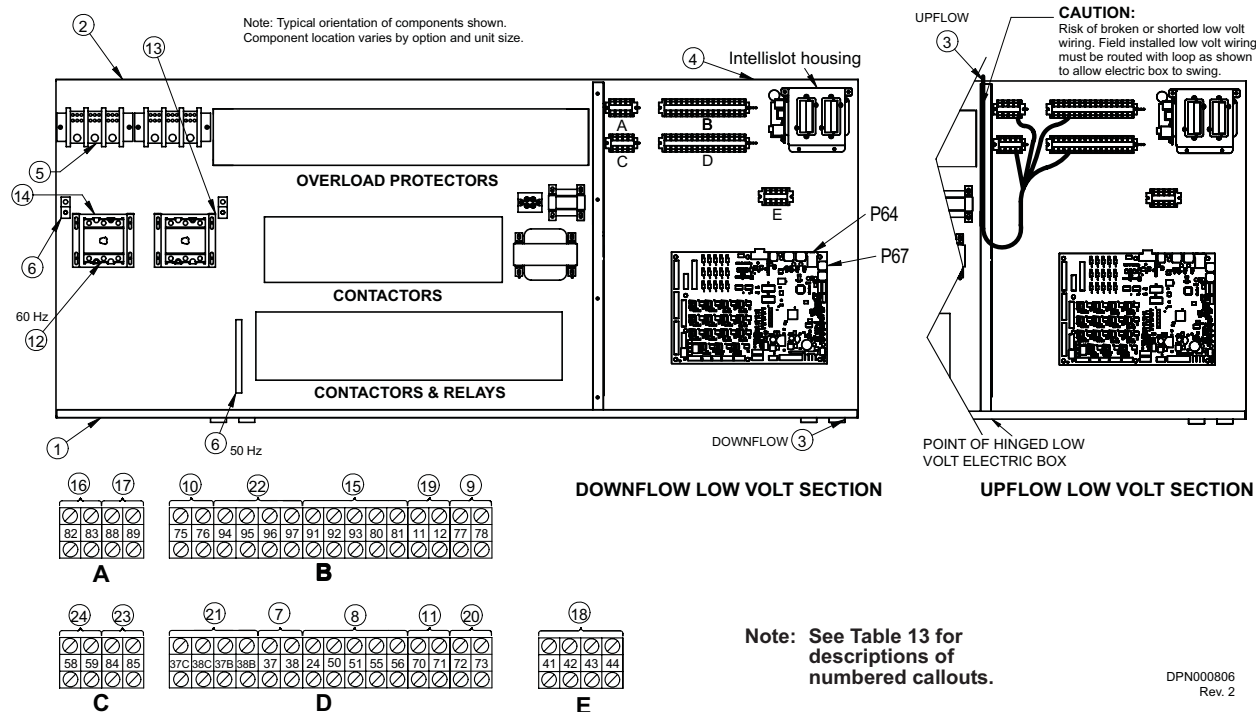
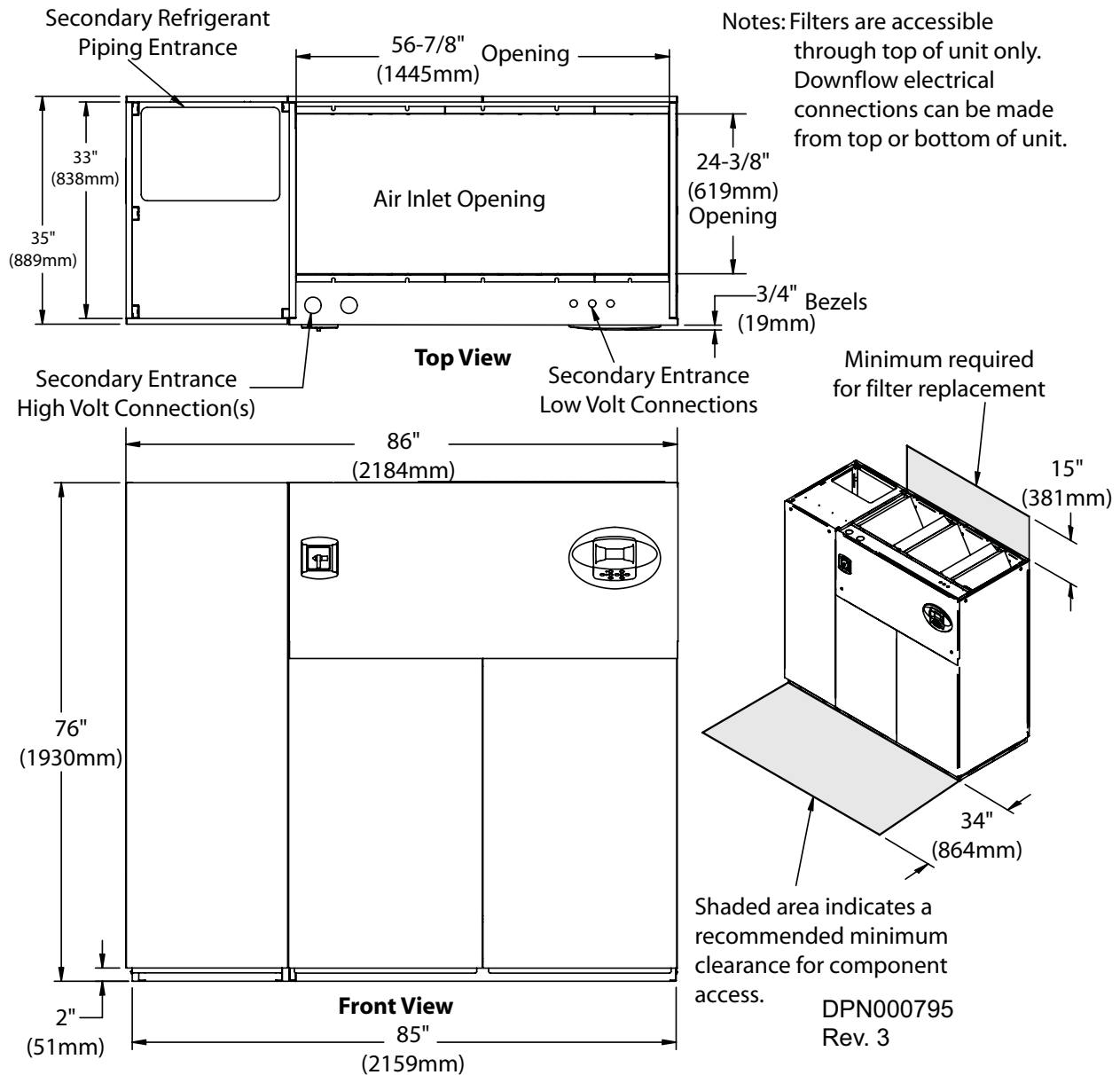


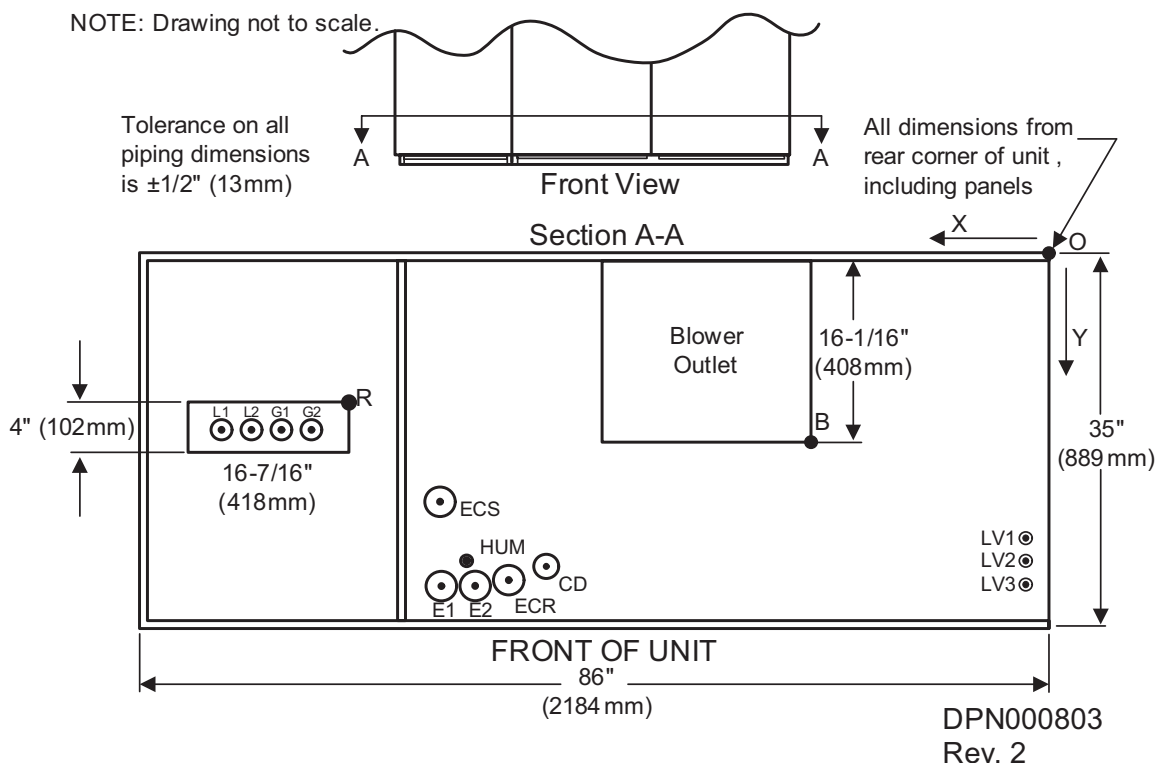
Table 13 Electrical field connection descriptions

STANDARD ELECTRICAL CONNECTIONS	OPTIONAL ELECTRICAL CONNECTIONS
<p>1. <b>Primary high voltage entrance</b> - 2.50" (64mm); 1.75" (44mm); 1.375" (35mm) diameter concentric knockouts located in bottom of box.</p> <p>2. <b>Secondary high voltage entrance</b> - 2.50" (64mm); 1.75" (44mm); 1.375" (35mm) diameter concentric knockouts located in top of box.</p> <p>3. <b>Primary low voltage entrance</b> - Quantity (3) 1.125" (28mm) diameter knockouts located in bottom of unit.</p> <p>4. <b>Secondary low voltage entrance</b> - Quantity (3) 1.125" (28mm) diameter knockouts located in top of box.</p> <p>5. <b>Three-phase electrical service</b> - Terminals are on high voltage terminal block (disregard if unit has optional disconnect switch). Three-phase service not by Liebert.</p> <p>6. <b>Earth ground</b> - Terminal for field-supplied earth grounding wire.</p> <p>7. <b>Remote unit shutdown</b> - Replace existing jumper between Terminals 37 &amp; 38 with field-supplied normally closed switch having a minimum 75VA, 24VAC rating. Use field-supplied Class 1 wiring.</p> <p>8. <b>Customer alarm inputs</b> - Terminals for field-supplied, normally open contacts, having a minimum 75VA, 24VAC rating, between Terminals 24 &amp; 50, 51, 55, 56. Use field-supplied Class 1 wiring. Terminal availability varies by unit options.</p> <p>9. <b>SiteScan</b> - Terminals 77(-) &amp; 78(+) for a 2-wire, twisted-pair, communication cable (available from Liebert) to optional SiteScan.</p> <p>10. <b>Common alarm</b> - On any alarm, normally open dry contact is closed across Terminals 75 &amp; 76 for remote indication. 1A, 24VAC max load. Use Class 1 field-supplied wiring.</p> <p>11. <b>Heat rejection interlock</b> - On any call for compressor operation, normally open dry contact is closed across Terminals 70 &amp; 71 to heat rejection equipment. 1A, 24VAC max load. Use Class 1 field-supplied wiring.</p>	<p>12. <b>Factory-installed disconnect switch.</b></p> <p>13. <b>Secondary disconnect switch and earth ground.</b></p> <p>14. <b>Three-phase electrical service</b> - Terminals are on top of disconnect switch. Three-phase service not by Liebert.</p> <p>15. <b>Smoke sensor alarm</b> - Factory-wired dry contacts from smoke sensor are 91-common, 92-NO, and 93-NC. Supervised contacts, 80 &amp; 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.</p> <p>16. <b>Reheat and humidifier lockout</b> - Remote 24VAC required at Terminals 82 &amp; 83 for lockout of reheat and humidifier.</p> <p>17. <b>Condensate alarm (with condensate pump option)</b> - On pump high water indication, normally open dry contact is closed across Terminals 88 &amp; 89 for remote indication. 1A, 24VAC max load. Use Class 1 field-supplied wiring.</p> <p>18. <b>Analog inputs</b> - Terminals for up to two customer-supplied analog inputs. Device 1 wires to 41(-) and 42(+). Device 2 wires to 43(-) and 44(+).</p> <p>19. <b>Remote humidifier</b> - On any call for humidification, normally open dry contact is closed across Terminals 11 &amp; 12 to signal field-supplied remote humidifier. 1A, 24VAC max load. Use Class 1 field-supplied wiring.</p> <p>20. <b>Auxiliary cool contact</b> - On any call for Econ-O-Coil operation, normally open dry contact is closed across Terminals 72 &amp; 73 on Dual-Cool units only. 1A, 24VAC max load. Use Class 1 field-supplied wiring.</p> <p><b>OPTIONAL LOW VOLTAGE TERMINAL PACKAGE CONNECTIONS</b></p> <p>21. <b>Remote unit shutdown</b> - Two additional contact pairs available for unit shutdown (labeled as 37B &amp; 38B, 37C &amp; 38C). Replace jumpers with field-supplied normally closed switch having a minimum 75VA, 24VAC rating. Use field-supplied Class 1 wiring.</p> <p>22. <b>Common alarm</b> - On any alarm, two additional normally open dry contacts are closed across Terminals 94 &amp; 95 and 96 &amp; 97 for remote indication. 1A, 24VAC max load. Use Class 1 field-supplied wiring.</p> <p>23. <b>Main fan auxiliary switch</b> - On closure of main fan contactor, normally open dry contact is closed across Terminals 84 &amp; 85 for remote indication. 1A, 24VAC max load. Use Class 1 field-supplied wiring.</p> <p>24. <b>Liqui-tect shutdown and dry contact</b> - On Liqui-tect activation, normally open dry contact is closed across Terminals 58 &amp; 59 for remote indication (Liqui-tect sensor ordered separately). 1AMP, 24VAC max load. Use Class 1 field-supplied wiring.</p>

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 14 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)

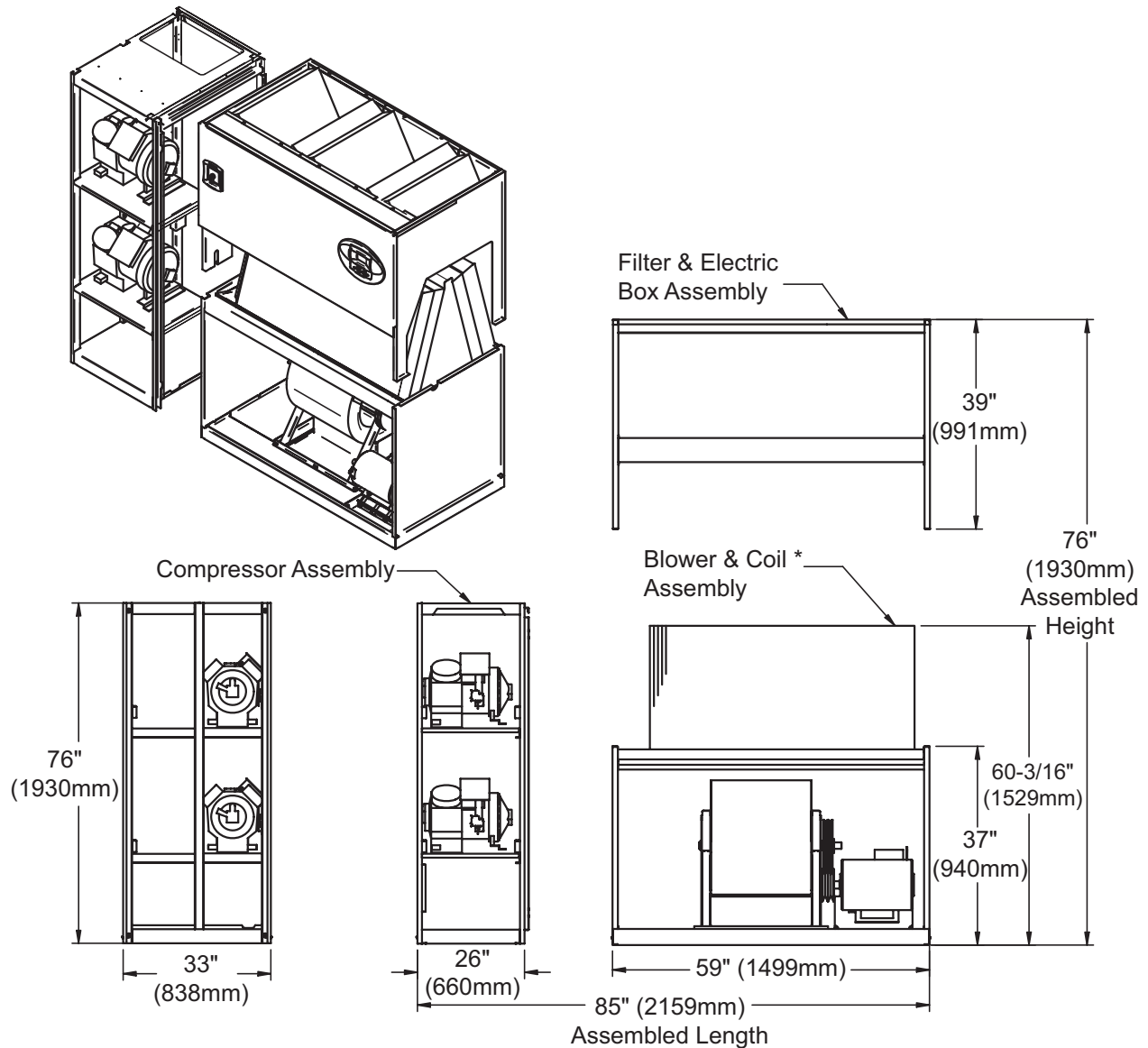
**Figure 4 Primary connection locations - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic**

**Table 15 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*	46 (1168)	29-1/2 (749)	3/4" 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
HS	Hot Water Reheat Supply	Consult local Liebert representative		
HR	Hot Water Reheat Return	Consult local Liebert representative		
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.

DPN000801

Rev. 1

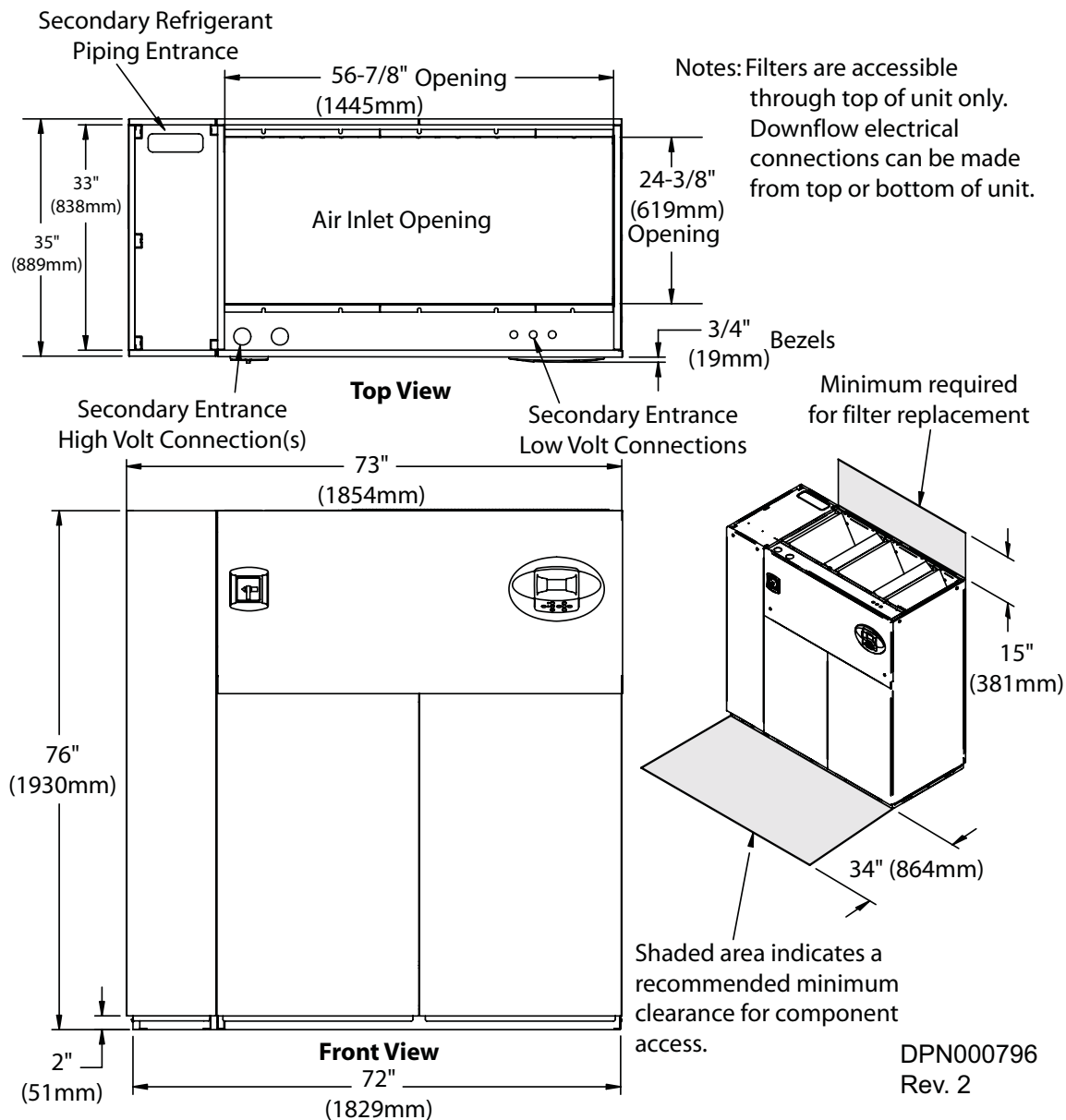
Table 16 Component weights - downflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic

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)



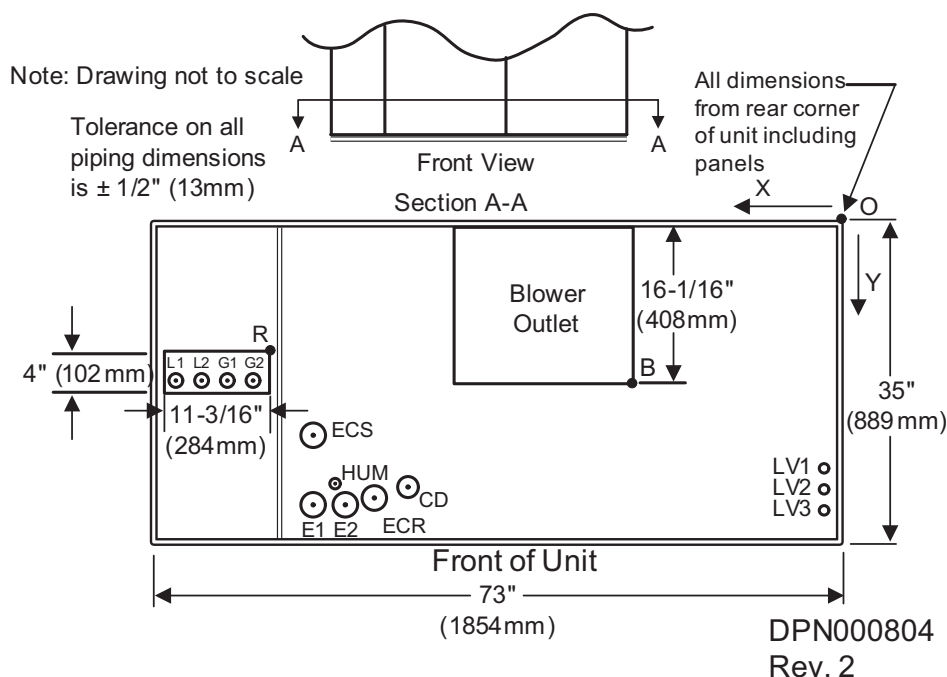
# DOWNFLOW, AIR-COOLED, 28-42kW (8-12 TON)—SCROLL OR DIGITAL SCROLL COMPRESSORS

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



**Table 17 Weights - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll**

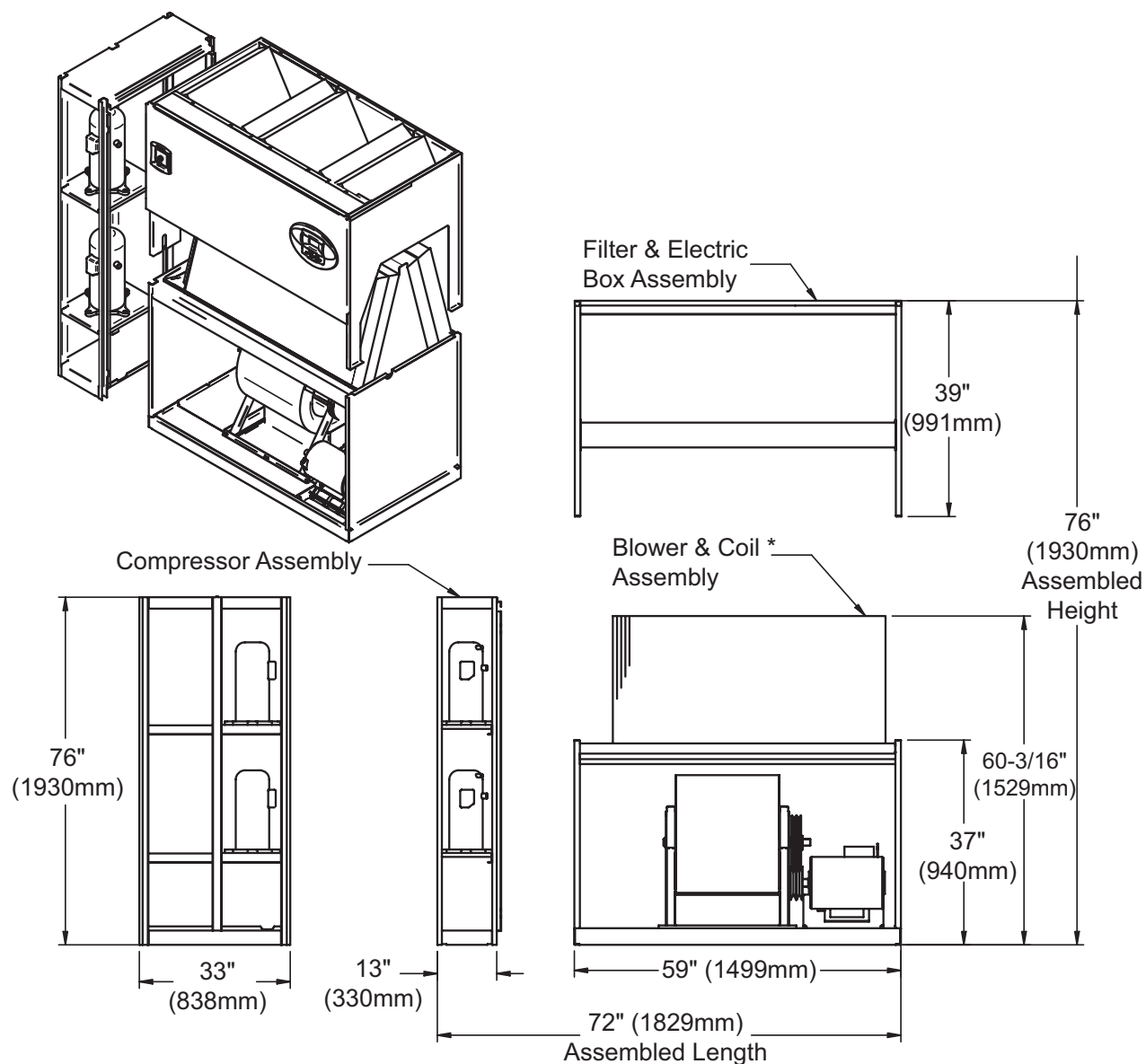
Dry Weight, Approximate, lb. (kg)	
Model Type	Model Size: 028-042
Air-Cooled	1470 (668)
Dual-Cool	1620 (736)

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

**Table 18 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 *	46 (1168)	29-1/2 (749)	3/4" 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
HS	Hot Water Reheat Supply	Consult local representative		
HR	Hot Water Reheat Return	Consult local representative		
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.

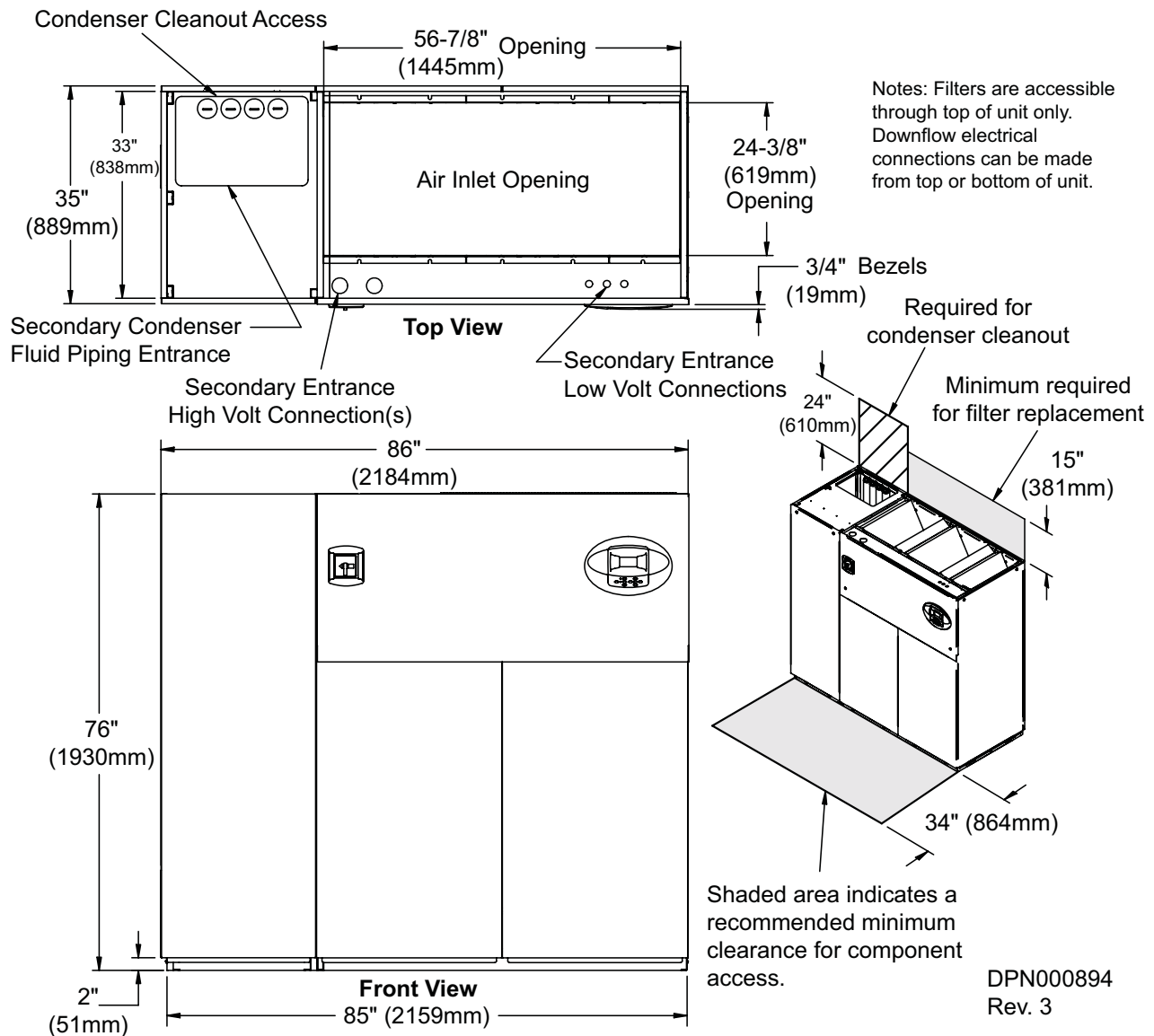
\* Coil can be field-removed for further height reduction.

DPN000802

Rev. 1

Table 19 Component weights - downflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll

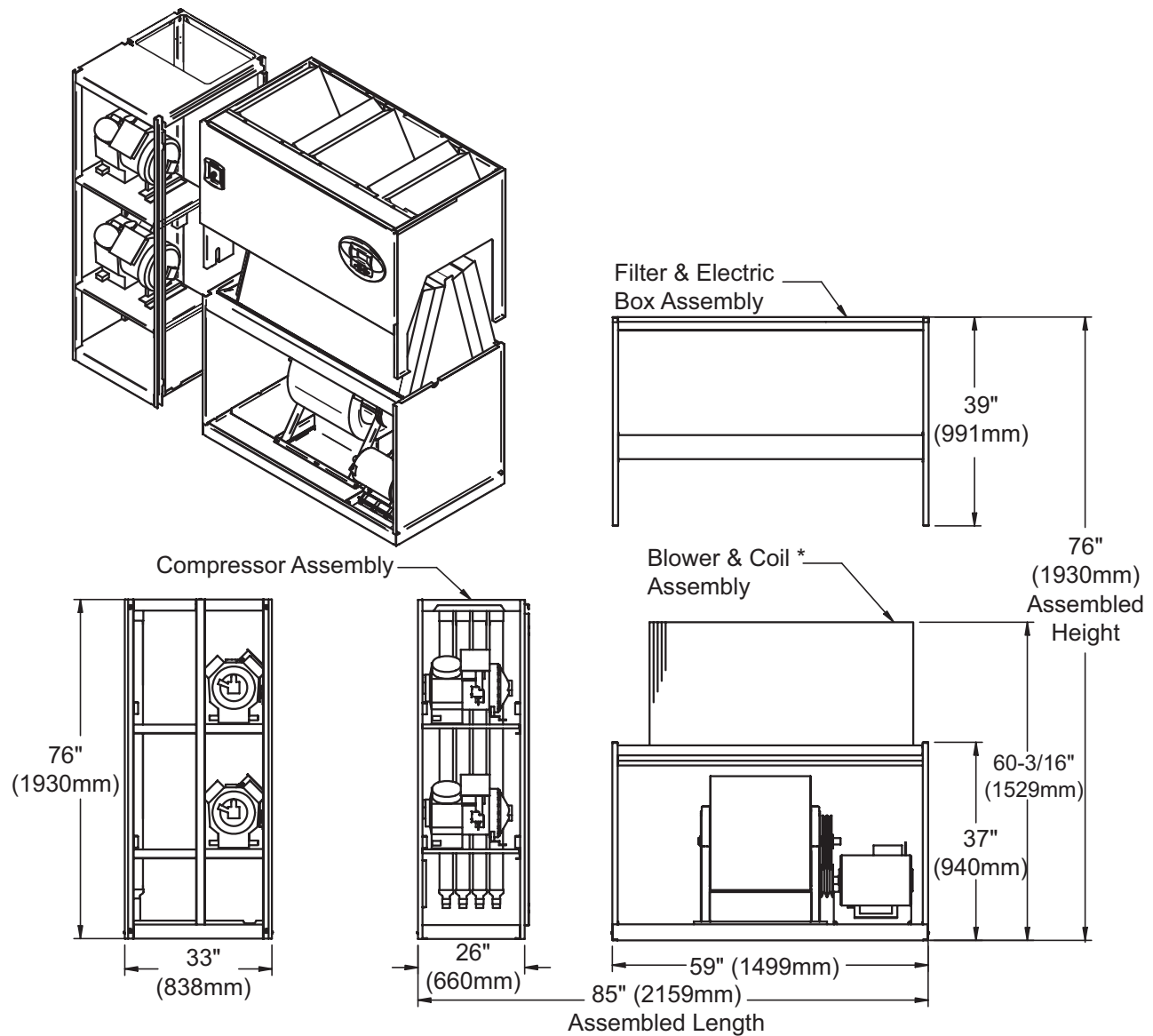
Dry Weight, Approximate, lb. (kg)		
Component	Air Cooled	Dual Cool
Compressor Assembly	490 (223)	490 (223)
Filter & Electric Box Assembly	210 (96)	210 (96)
Blower & Coil Assembly	770 (350)	920 (418)

**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 20 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 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.

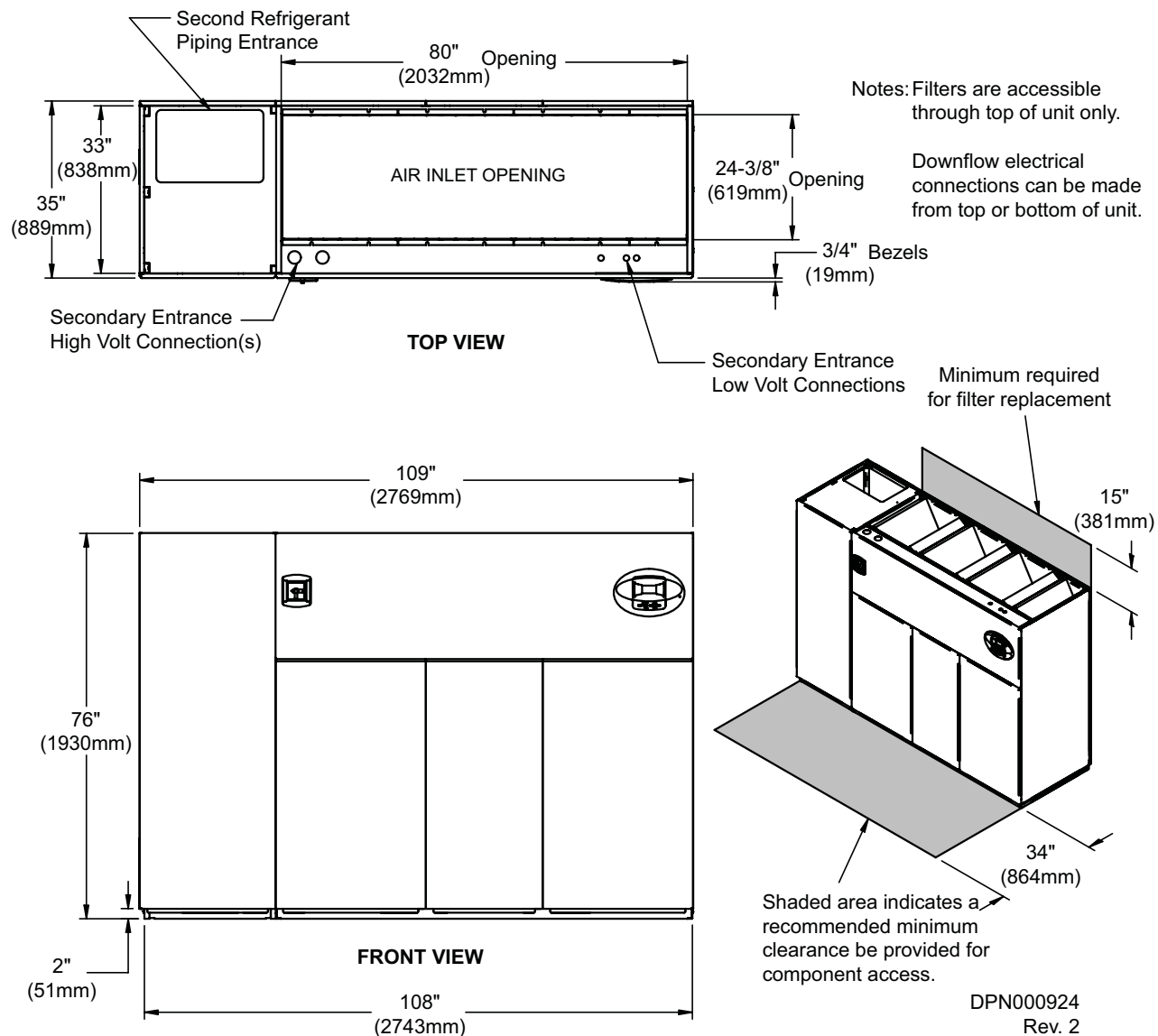
DPN000899  
Rev. 1

Table 22 Component weights - downflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all

Dry Weight, Approximate, Including Panels, lb (kg)				
Component	Semi-Hermetic Compressor		Scroll or Digital Scroll Compressor	
	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)

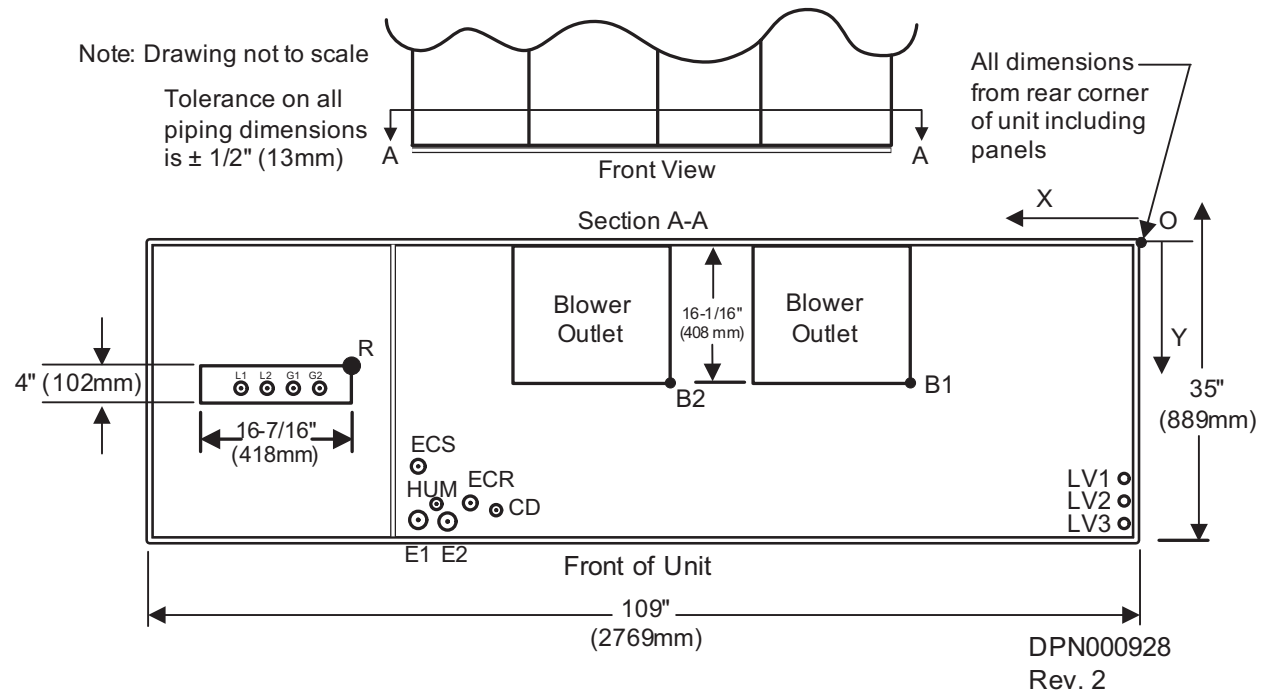
## DOWNFLOW, AIR-COOLED, 53-77kW (15-22 TON)—SEMI-HERMETIC COMPRESSORS

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



**Table 23 Weights - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic**

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

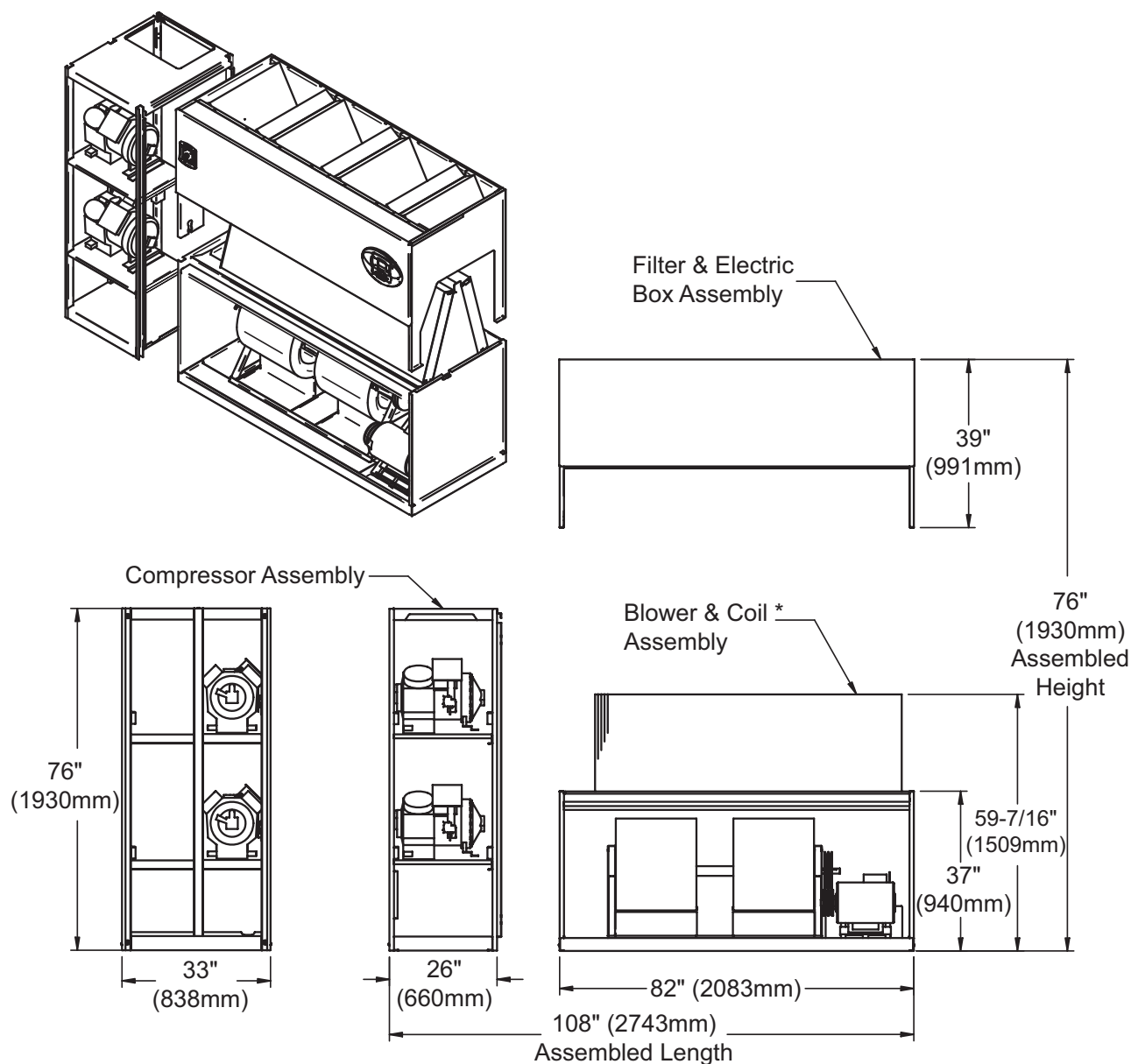
**Figure 13 Primary connection locations - downflow, air-cooled, 53-77kW (15-22 ton)—semi-hermetic**

**Table 24 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)
<b>53kW (15 tons) / 70 &amp; 77kW (20 &amp; 22 tons)</b>				
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 *	69-1/4 (1759)	30 (762)	3/4" 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
HS	Hot Water Reheat Supply	Consult local representative		
HR	Hot Water Reheat Return	Consult local representative		
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.



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.

DPN000926

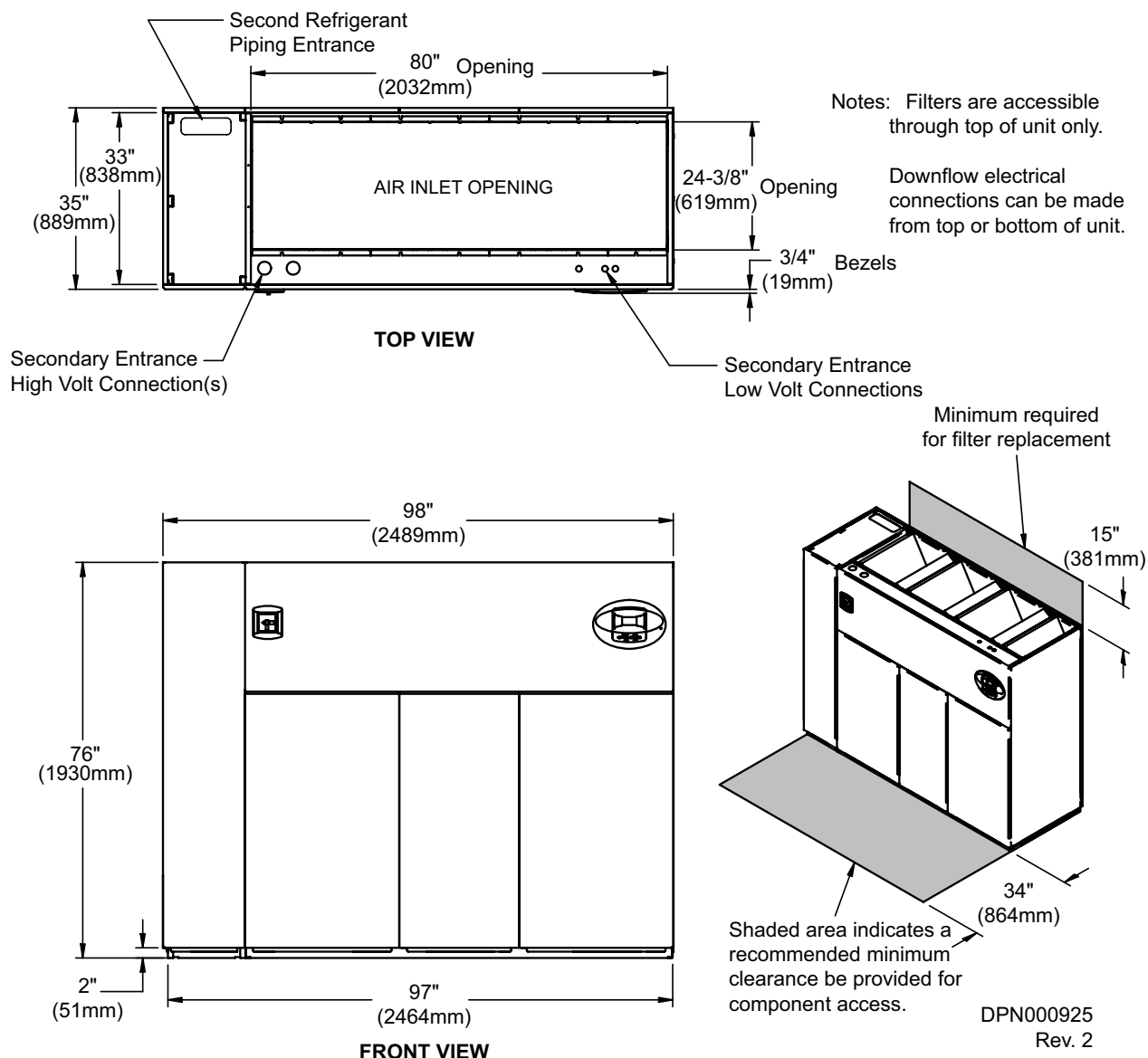
Rev. 2

Table 25 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 26 Weights - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll**

Dry Weight, Approximate, lb. (kg)			
Model Type	Model Size		
	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

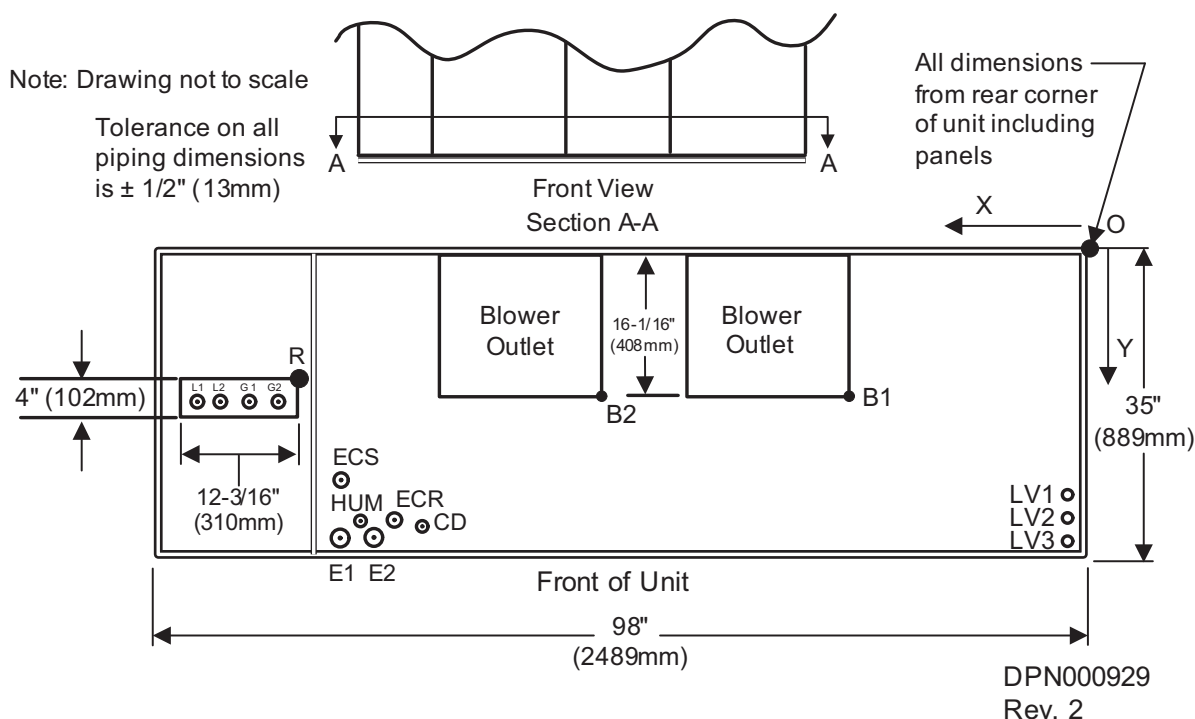
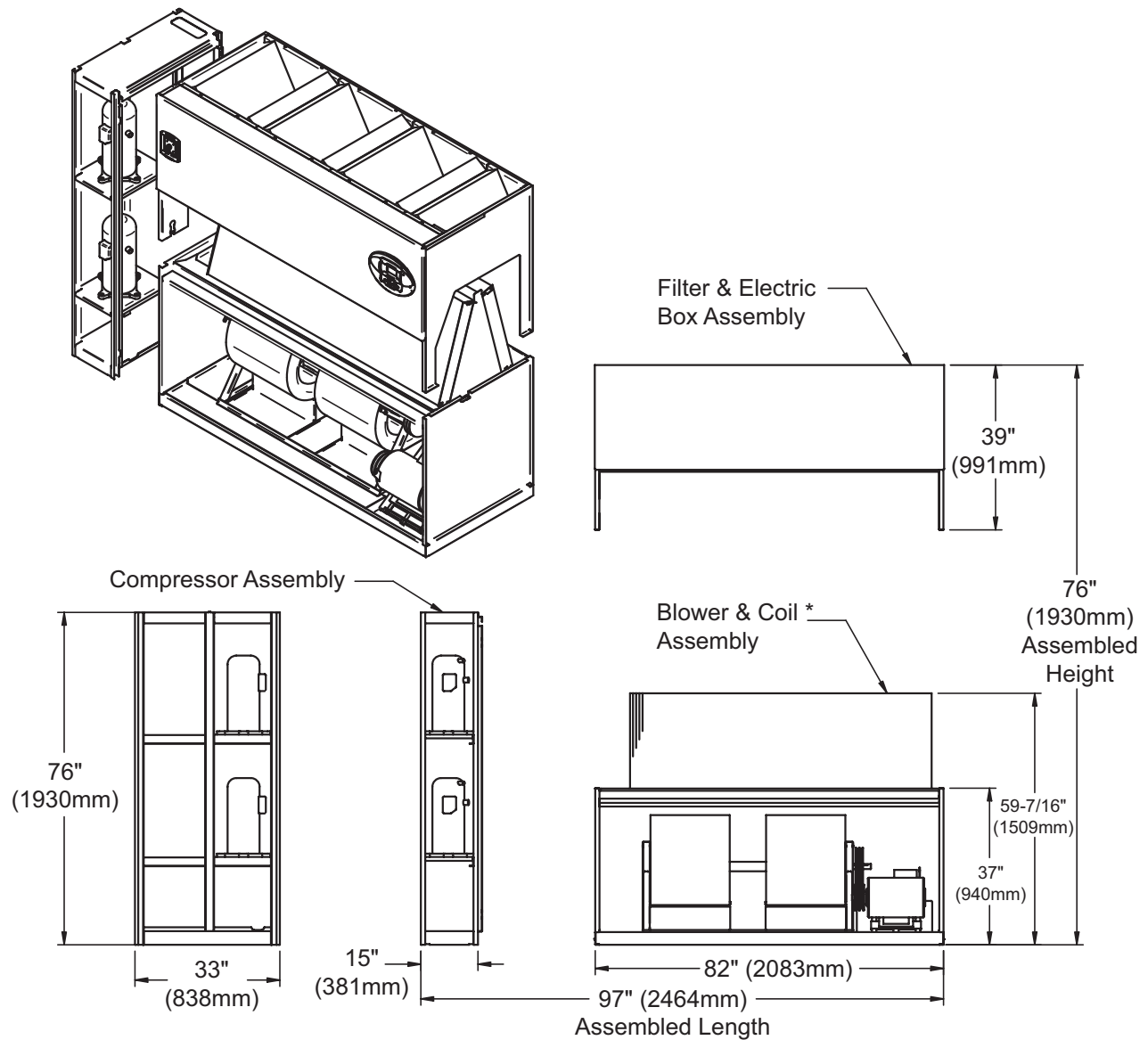


Table 27 Piping data - downflow, air-cooled, 53-77kW (15-22 ton)—scroll/digital scroll

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)
<b>53kW (15 tons) / 70 &amp; 77kW (20 &amp; 22 tons)</b>				
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 *	69-1/4 (1759)	30 (762)	3/4" 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
HS	Hot Water Reheat Supply	Consult local representative		
HR	Hot Water Reheat Return	Consult local representative		
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.

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.

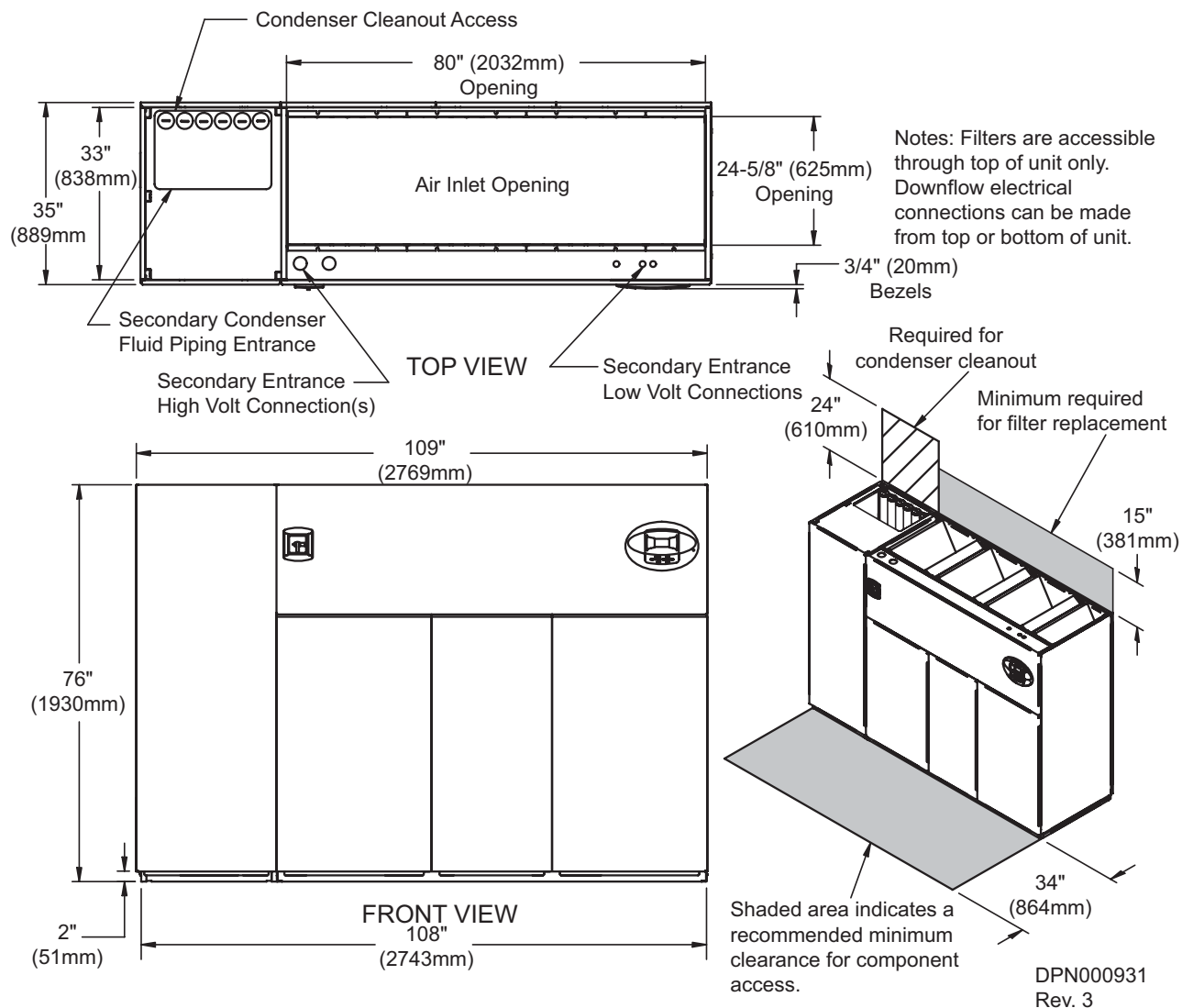
\* Coil can be field-removed for further height reduction.

DPN000927

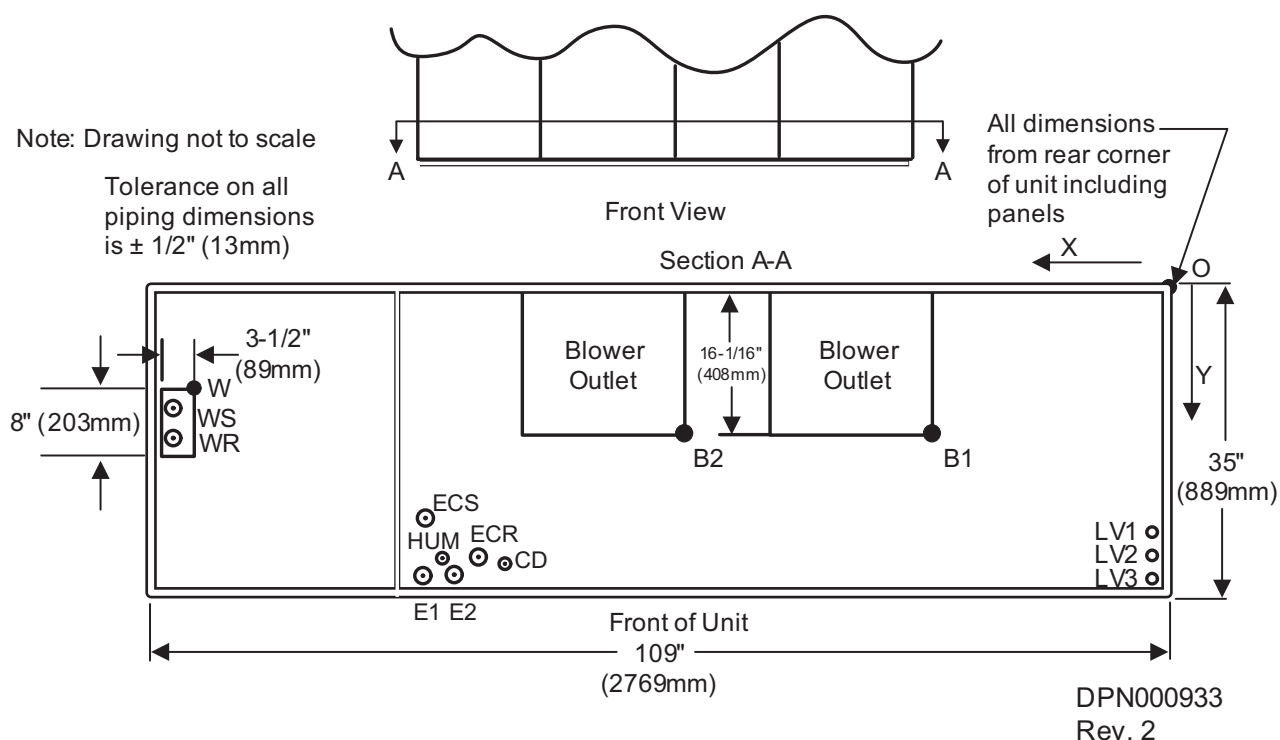
Rev. 2

Table 28 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)

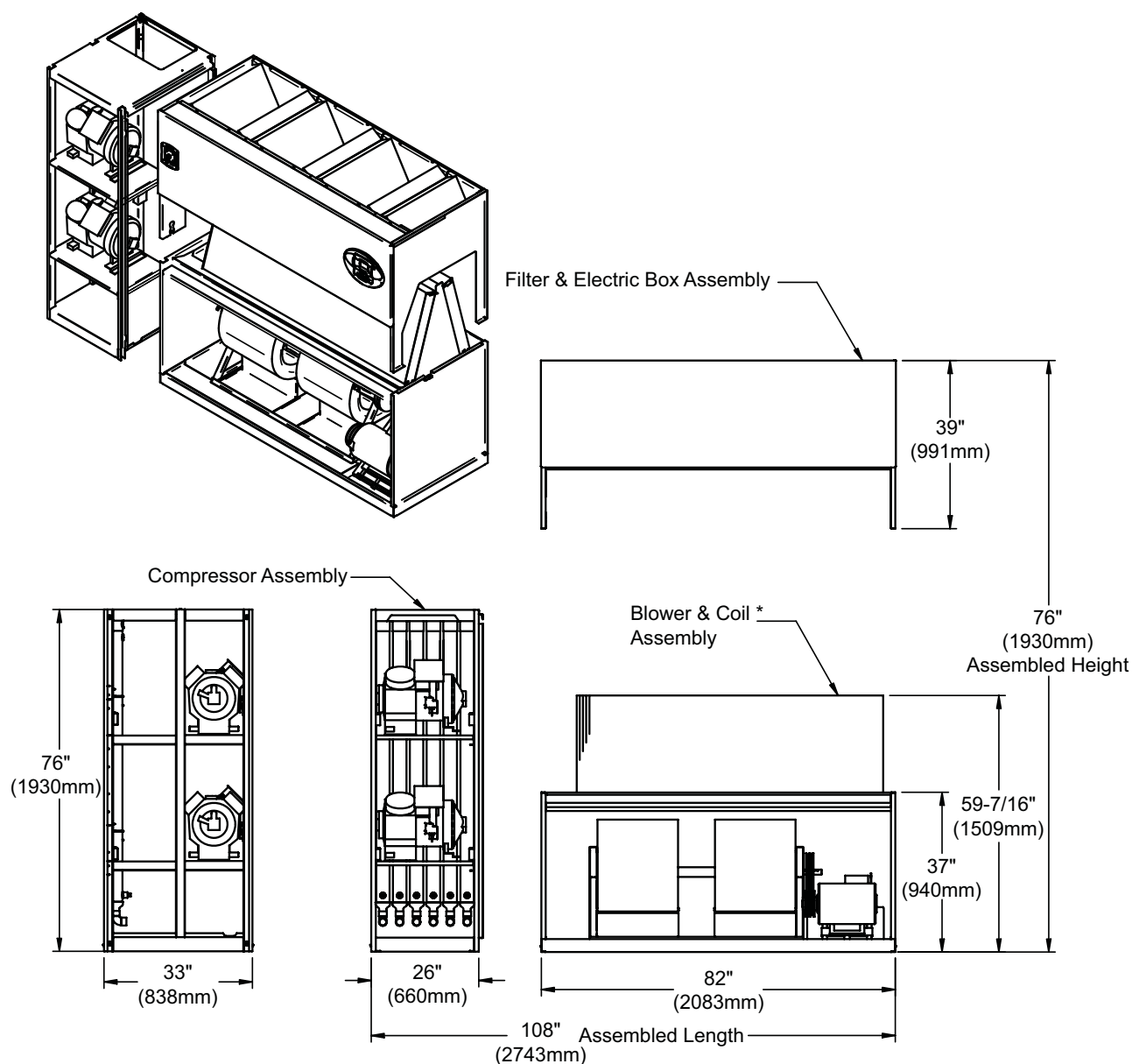
**DOWNFLOW, WATER/GLYCOL/GLYCOOL, 53-77kW (15-22 TON)—ALL COMPRESSORS****Figure 18 Dimensions - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all****Table 29 Weights - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all**

Dry Weight, Approximate, lb. (kg)				
Model Type		Model Size		
		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 30 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 *	69-1/4 (1759)	30 (762)	3/4" 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
HS	Hot Water Reheat Supply	Consult local representative		
HR	Hot Water Reheat Return	Consult local representative		
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.

**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.

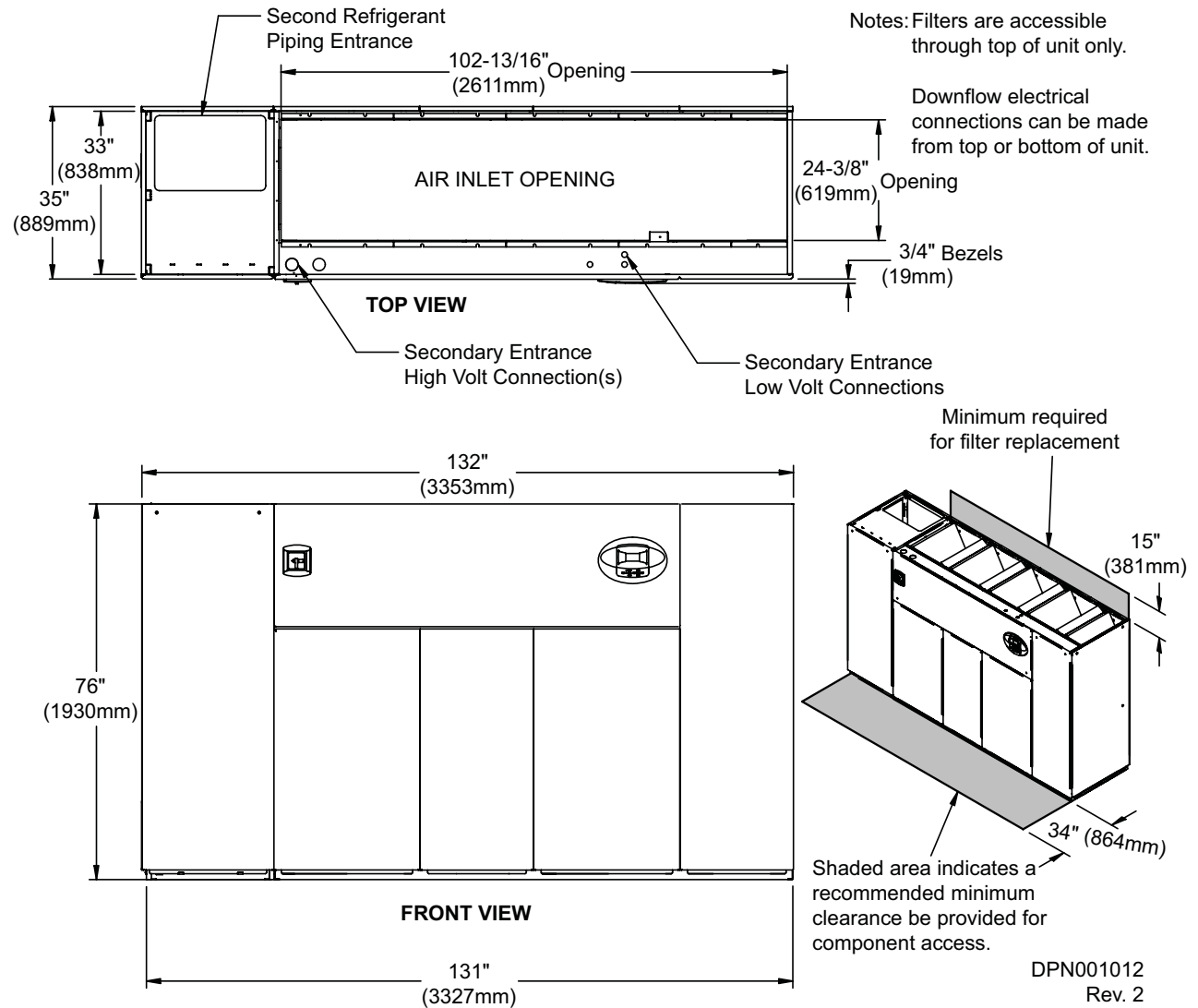
\* Coil can be field-removed for further height reduction.

DPN000932

Rev. 1

**Table 31 Component weights - downflow, water/glycol/GLYCOOL, 53-77kW (15-22 ton)—all**

Dry Weight, Approximate, Including Panels, lb (kg)				
Component	Semi-Hermetic Compressor		Scroll or Digital Scroll Compressor	
	Water/Glycol	GLYCOOL/Dual-Cool	Water/Glyco	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 32 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

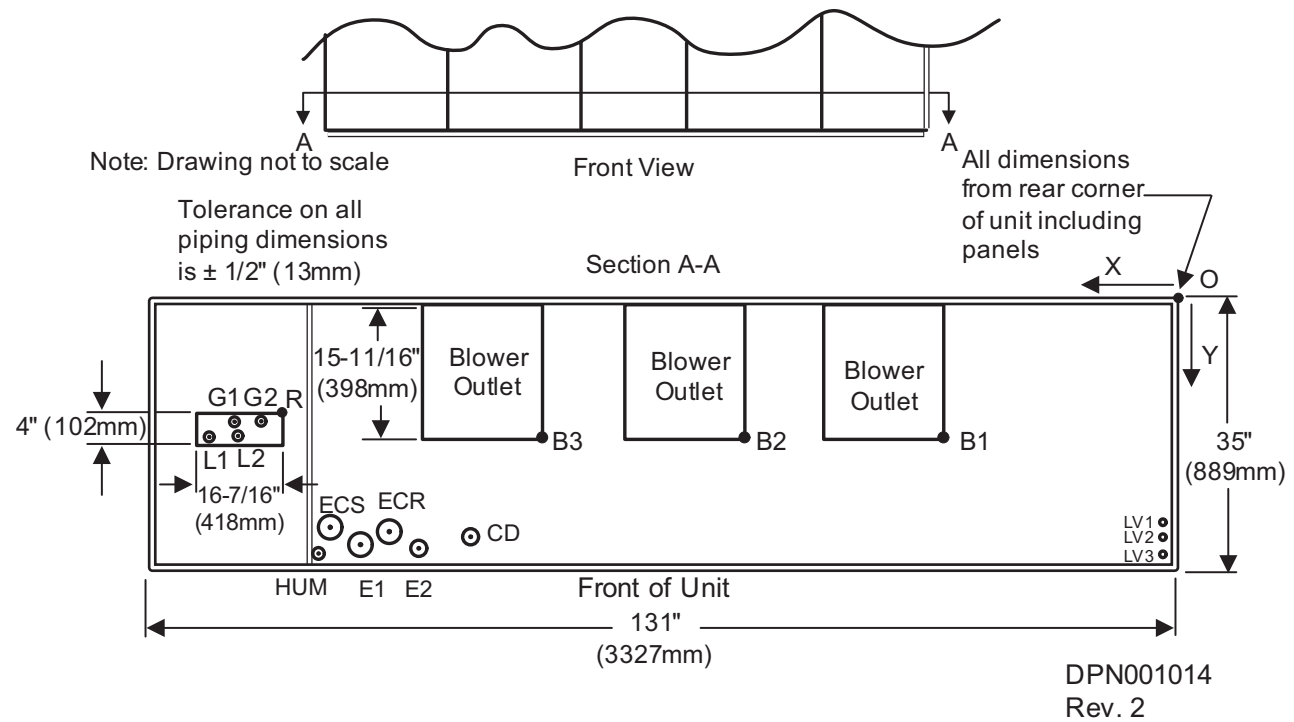


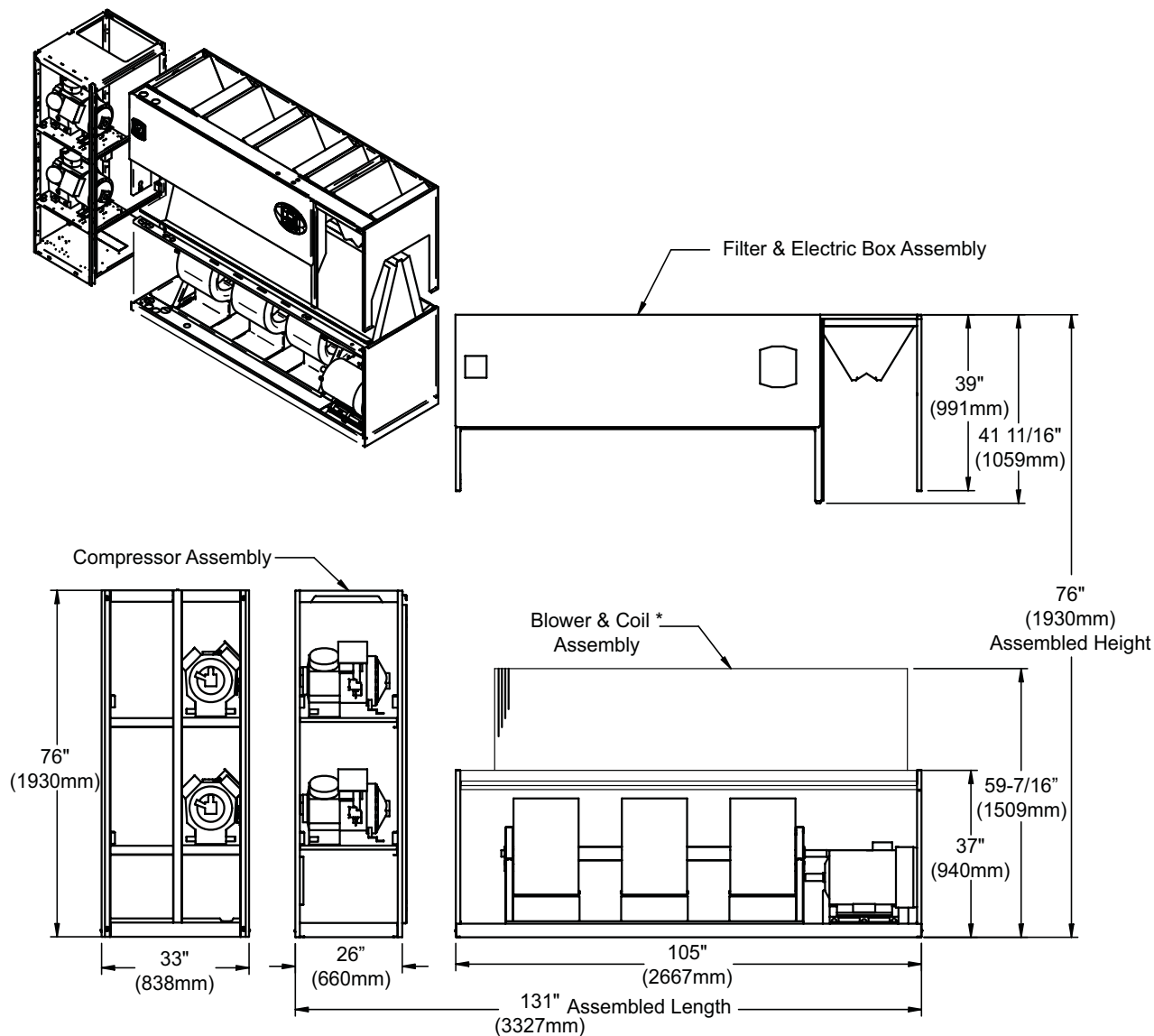
Table 33 Piping data - downflow, air-cooled, 105kW (30 ton)—all

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 *	83-13/16 (2129)	30 (762)	3/4" 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
HS	Hot Water Reheat Supply	Consult local representative		
HR	Hot Water Reheat Return	Consult local representative		
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.

## 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

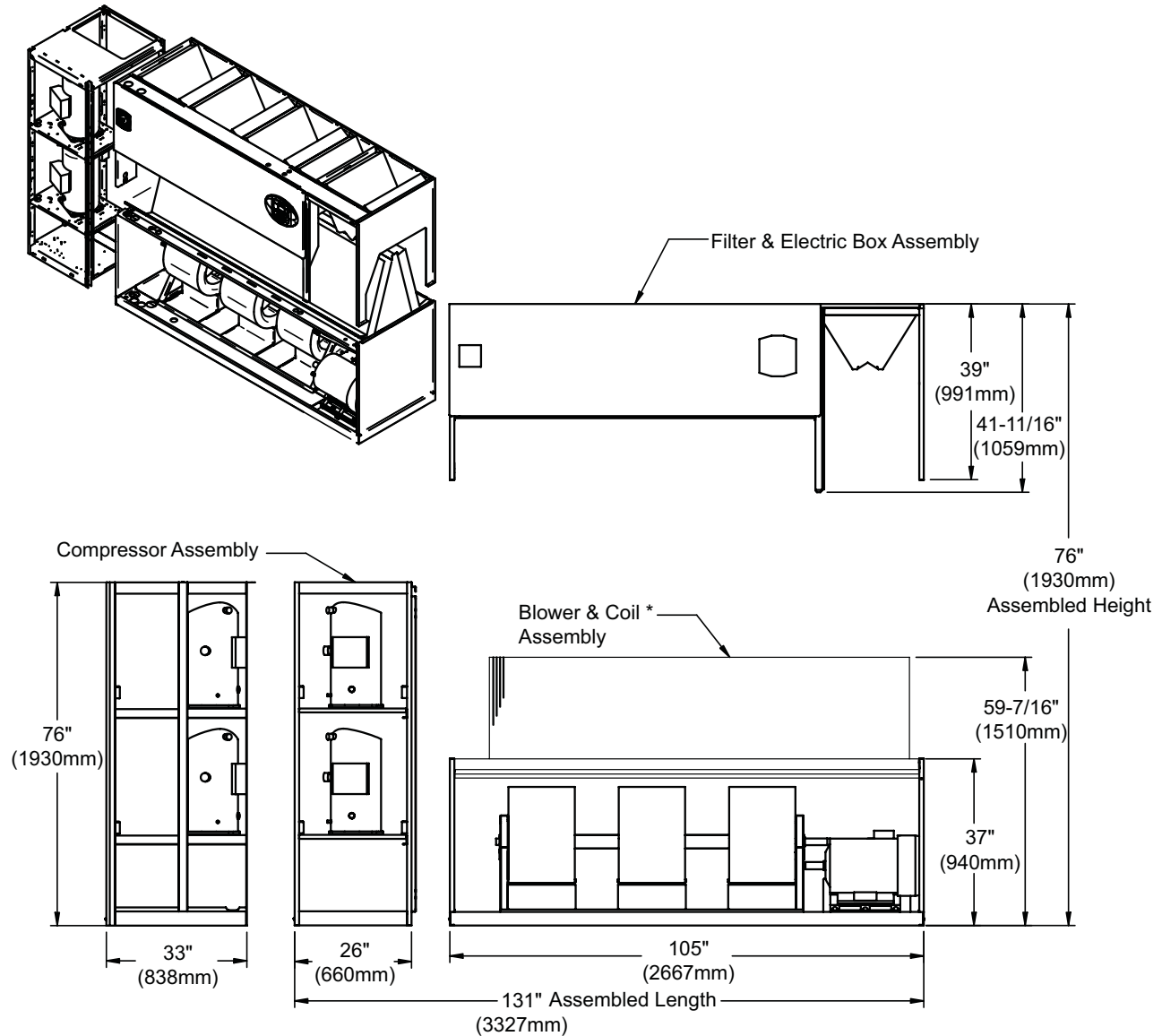
Rev. 0

Table 34 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**

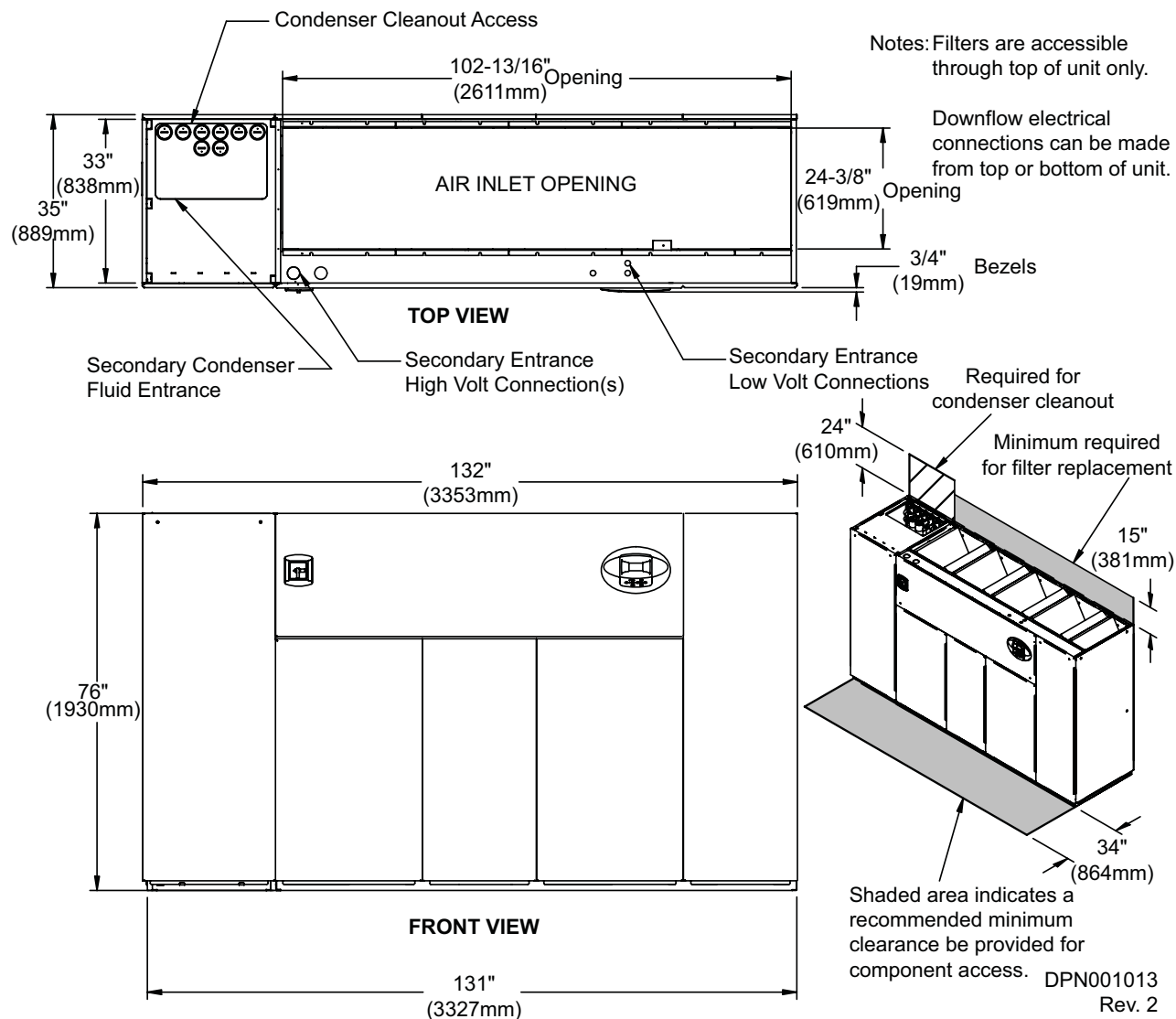


NOTES: Drawing views are simplified with panels removed to show overall dimensions.  
See disassembly and handling instructions in installation manual.  
\* Coil can be field-removed for further height reduction.

DPN001058  
Rev. 0

**Table 35 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 36 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

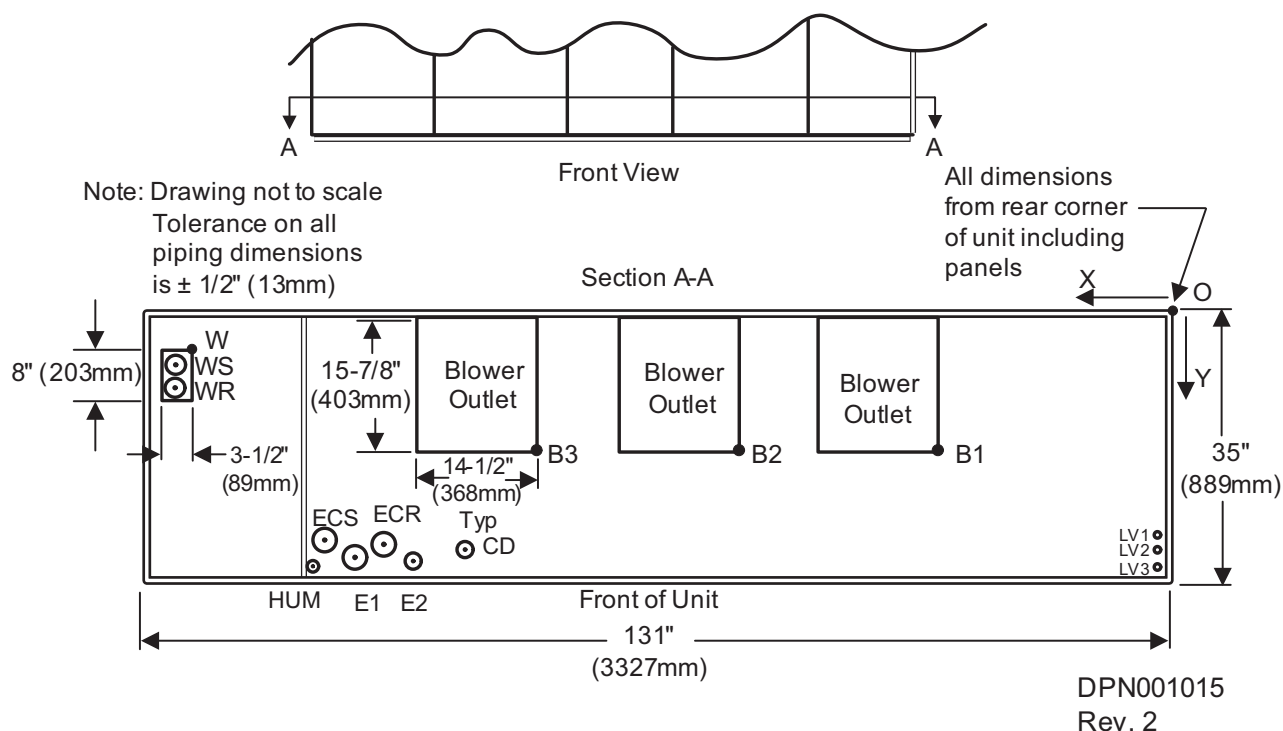
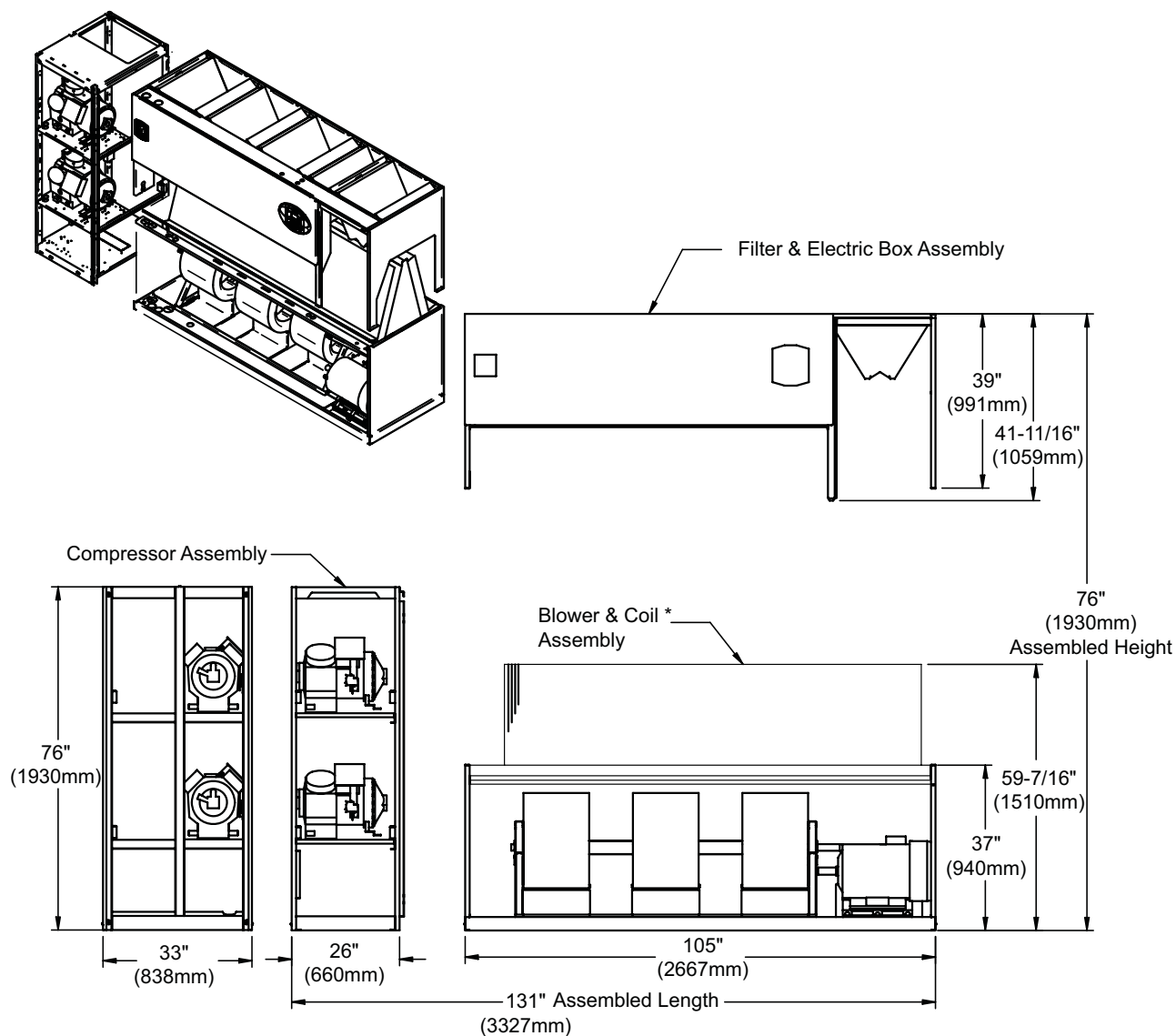


Table 37 Piping data - downflow, water/glycol/GLYCOOL, 105kW (30 ton)—all

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 *	83-13/16 (2129)	30 (762)	3/4" 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
HS	Hot Water Reheat Supply	Consult local representative		
HR	Hot Water Reheat Return	Consult local representative		
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.

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

Dry Weight, Approximate, Including Panels, lb (kg)				
Component	Semi-Hermetic Compressor		Scroll Compressor	
	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

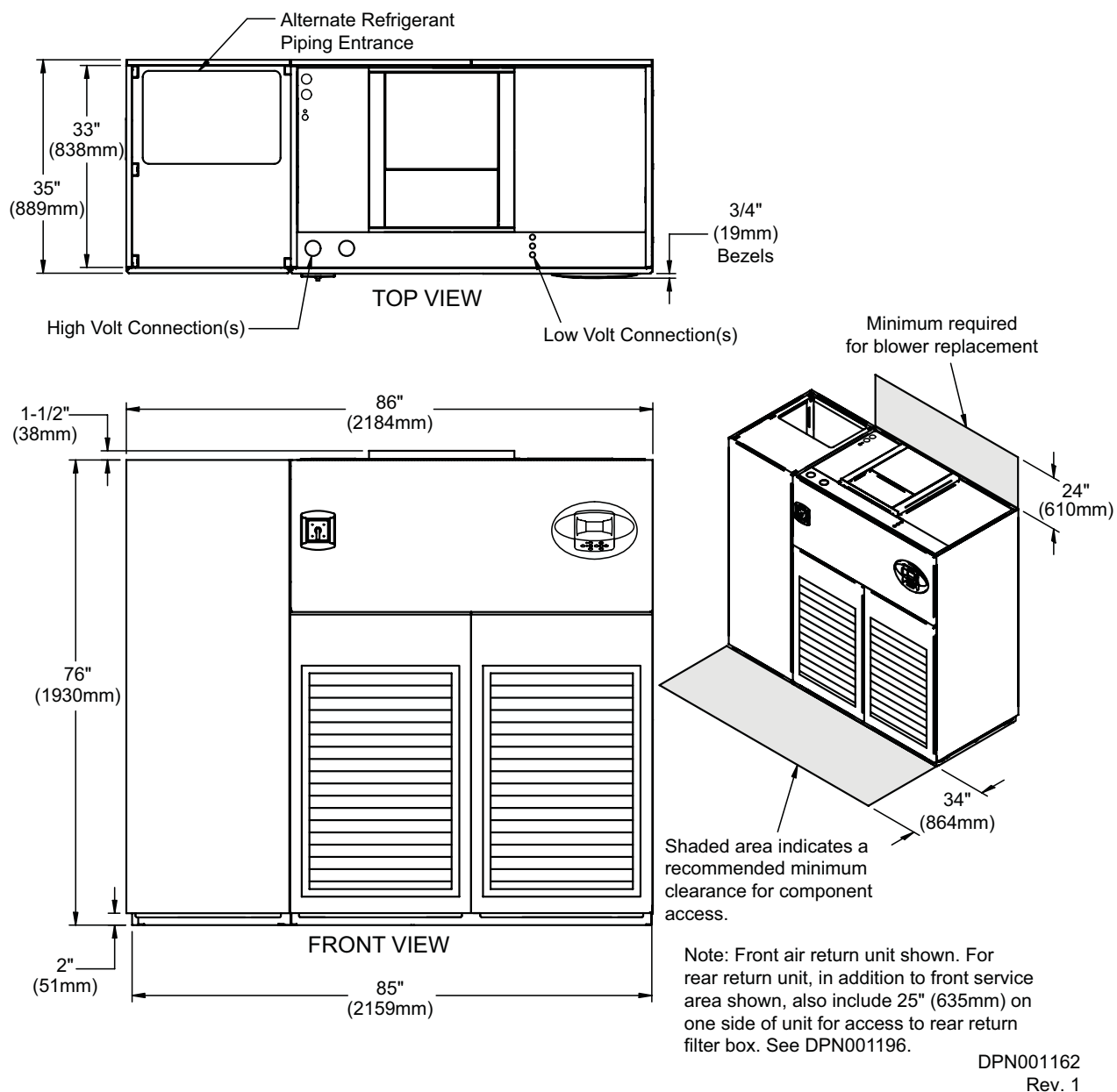
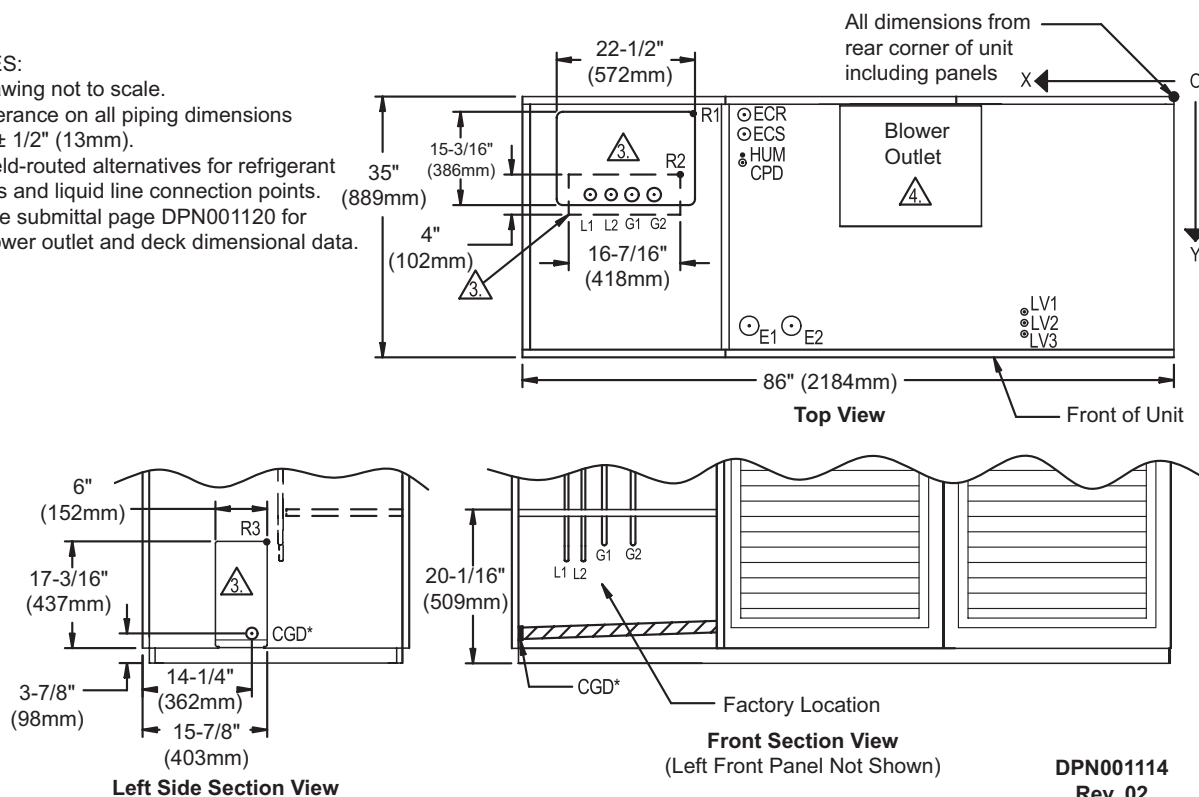


Table 39 Weights - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic

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**
**NOTES:**

1. Drawing not to scale.
2. Tolerance on all piping dimensions is  $\pm 1/2"$  (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.

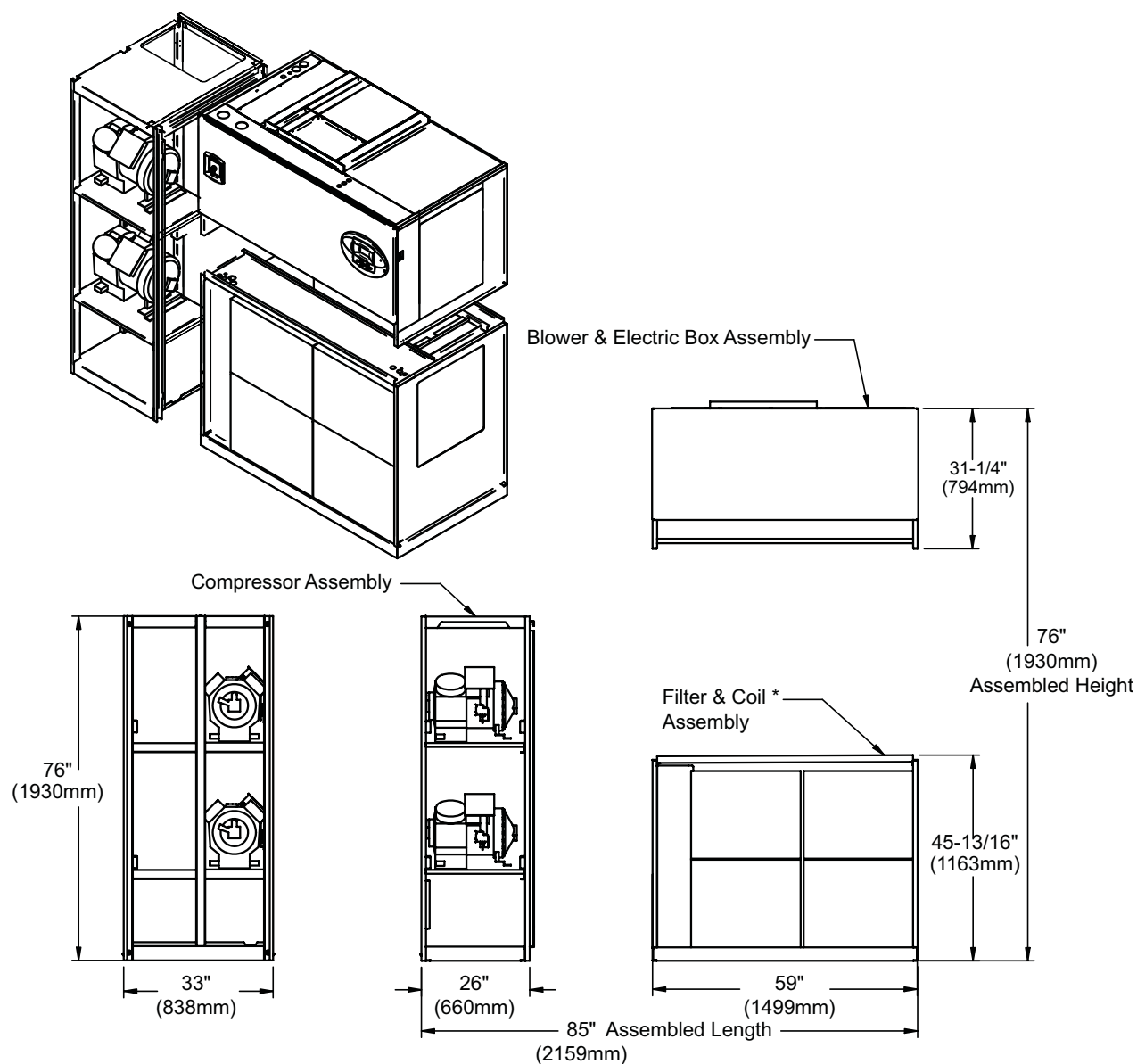

**Table 40 Piping data - upflow, air-cooled, 28-42kW (8-12 ton)—semi-hermetic**

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.



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

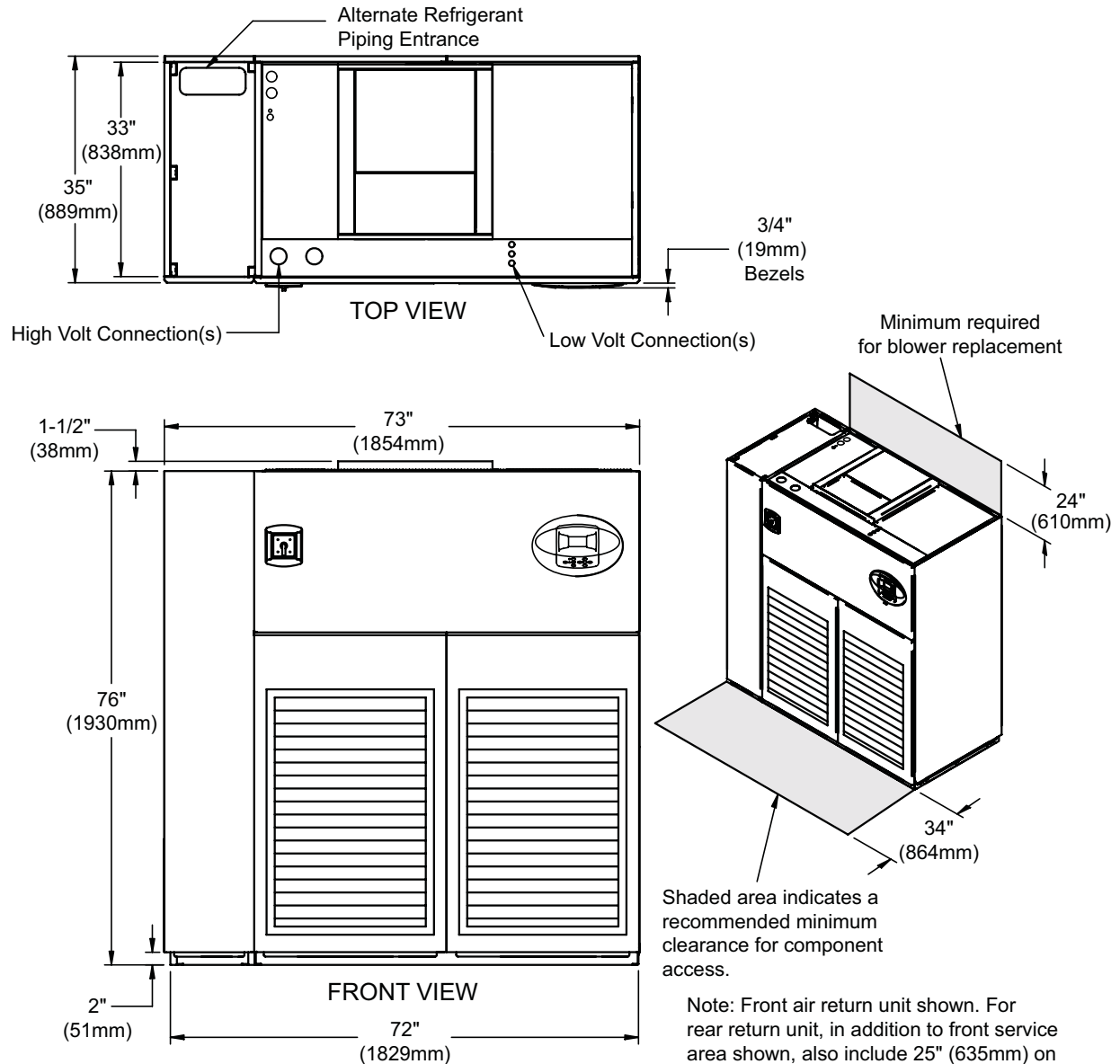
Rev. 0

Table 41 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

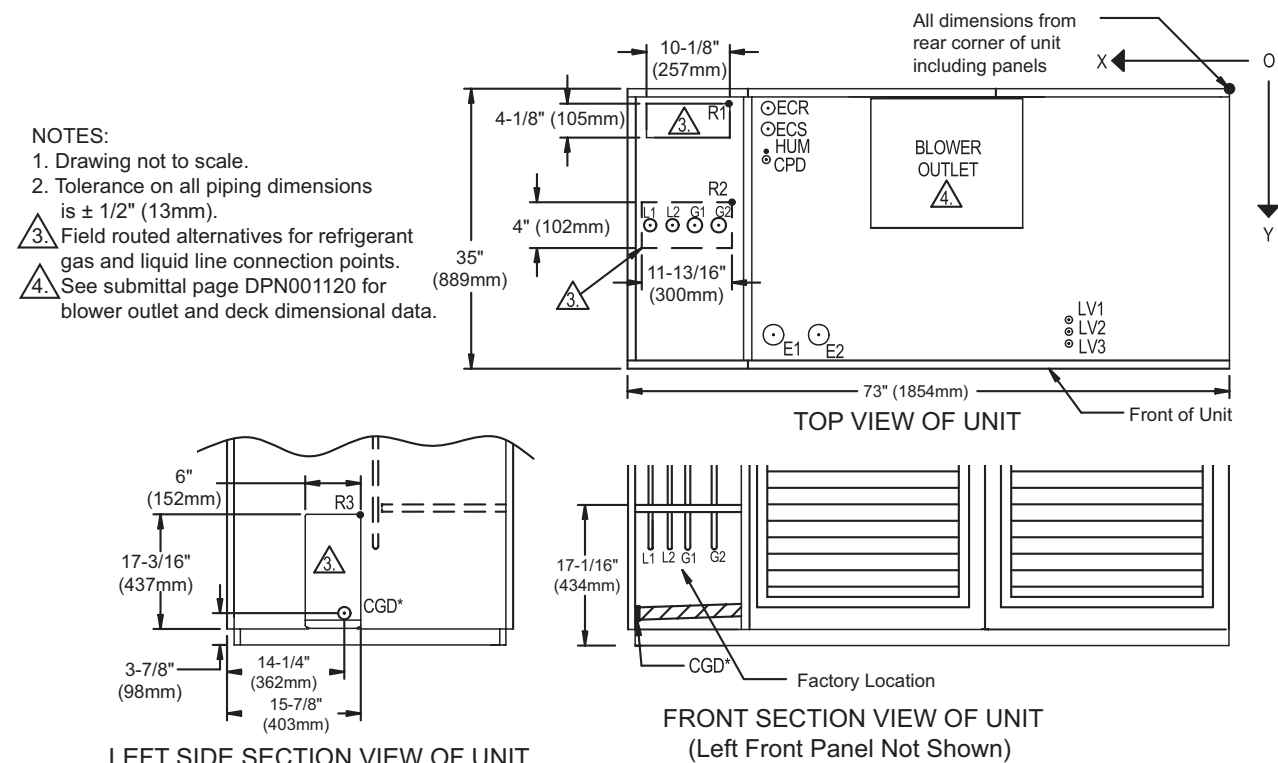
Figure 31 Dimensions - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll



DPN001163  
Rev. 1

Table 42 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**


\* 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

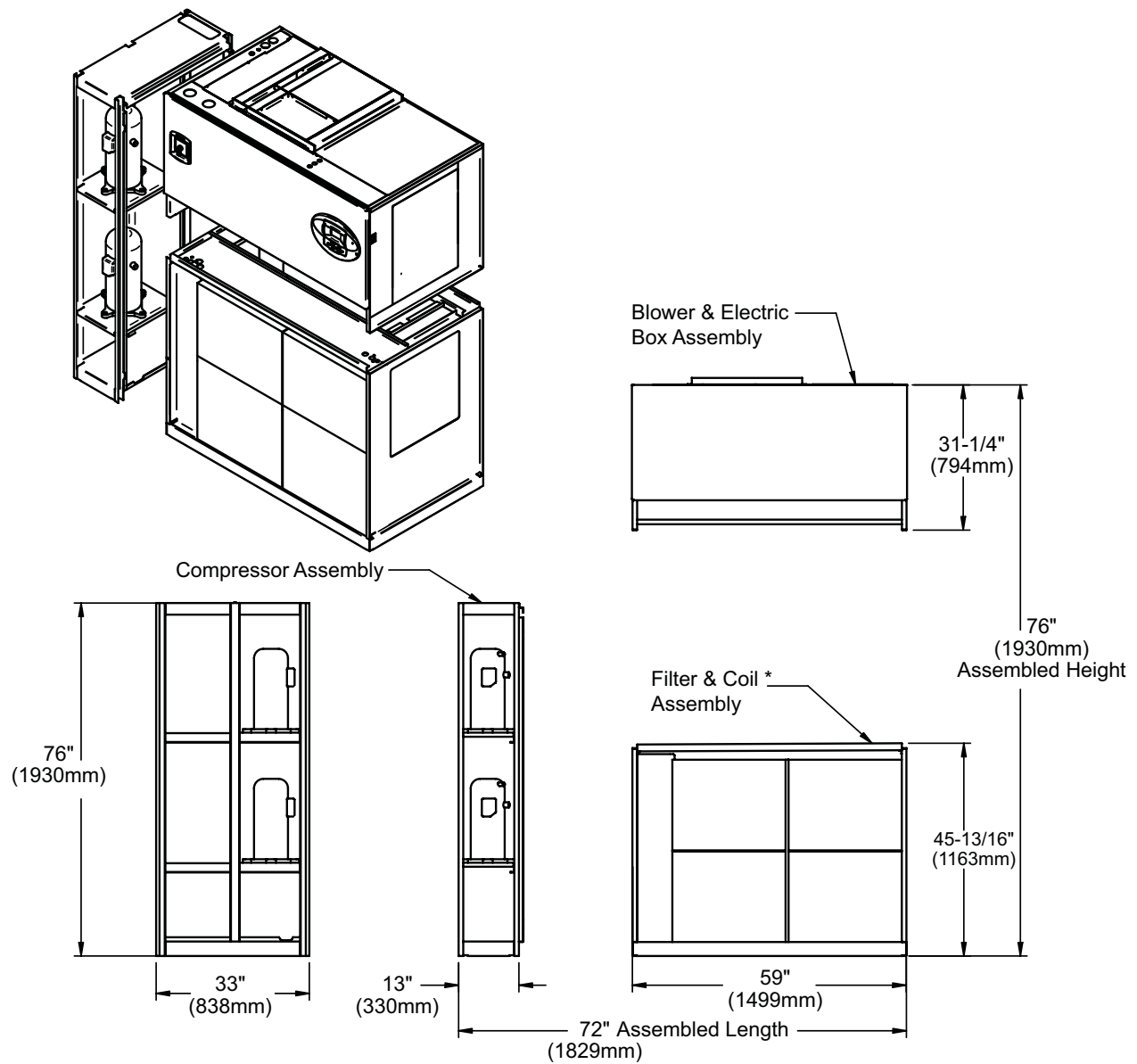
DPN001119  
Rev. 1

**Table 43 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	Refrigerant Access (Top)	60-5/8 (1539)	2-13/16 (71)	10-1/8 x 4-1/8 (257 x 105)
R2	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)	16-5/8 (422)	5/8" Cu Sweat
G2	Hot Gas Discharge 2	70-1/8 (1780)	16-5/8 (422)	5/8" Cu Sweat
R3	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.

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



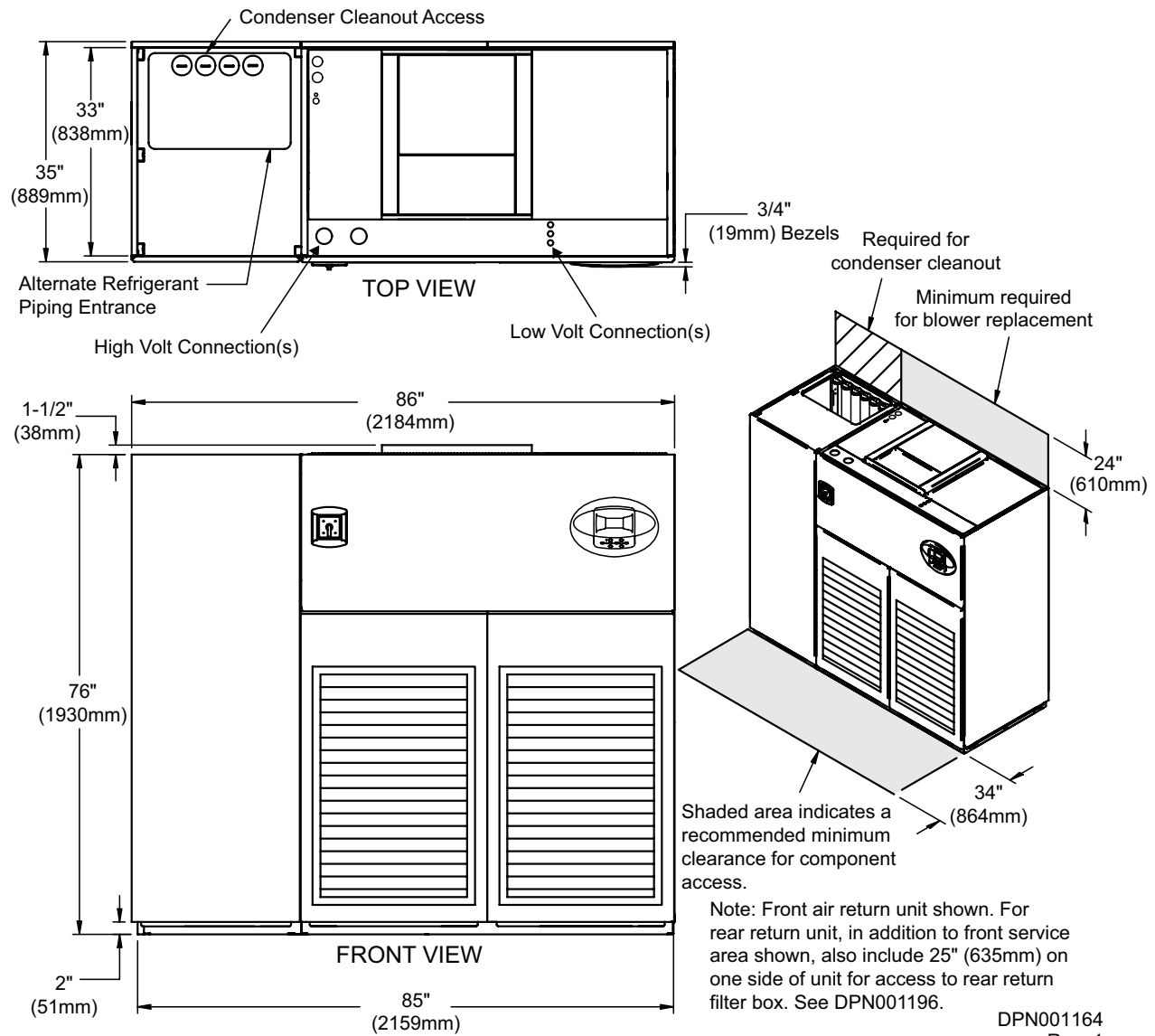
NOTES: Drawing views are simplified with panels removed to show overall dimensions.  
See disassembly and handling instructions in installation manual.

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

DPN001172  
Rev. 0

Table 44 Component weights - upflow, air-cooled, 28-42kW (8-12 ton)—scroll/digital scroll

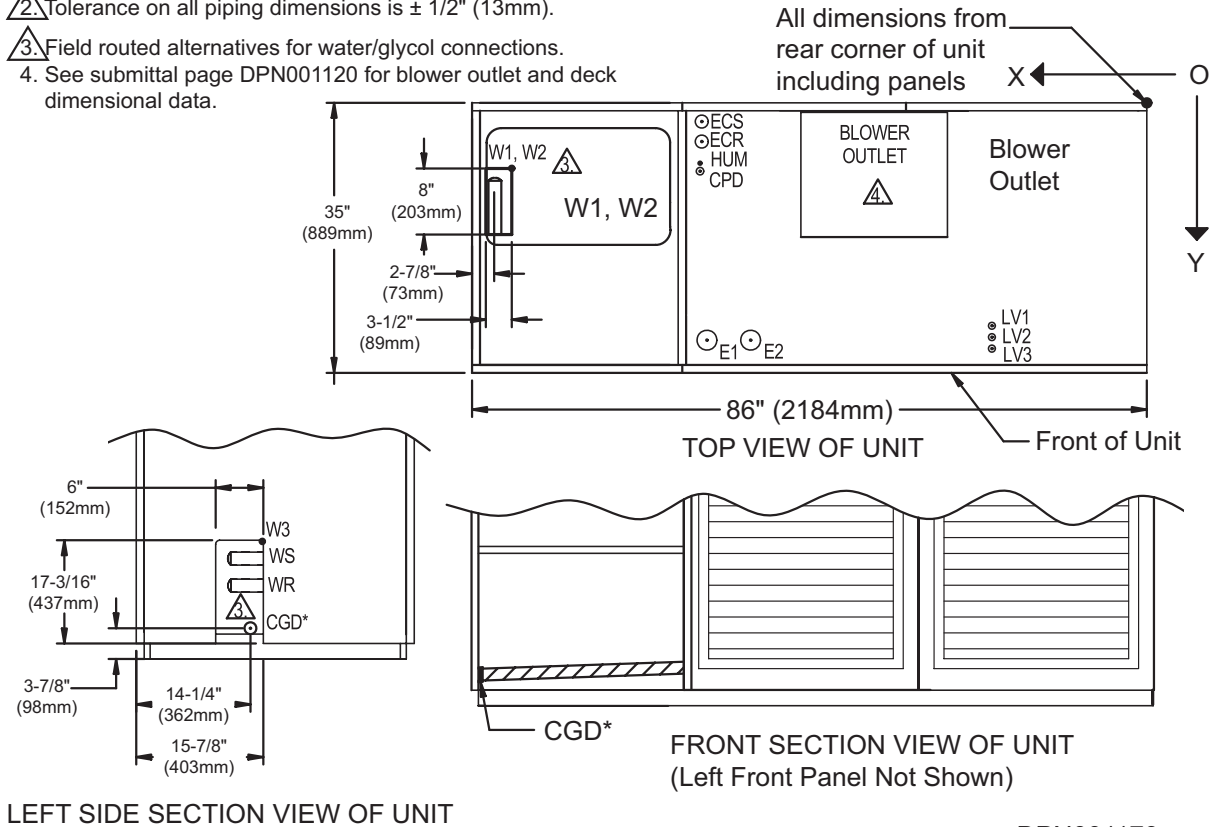
Dry Weight, Approximate, Including Panels, lb (kg)		
Component	Air-Cooled	Dual-Cool
Compressor Assembly	490 (223)	490 (223)
Blower & Electric Box Assembly	510 (231)	510 (231)
Filter & Coil Assembly	520 (236)	670 (304)

**UPFLOW, WATER/GLYCOL/GLYCOOL, 28-42kW (8-12 TON)—ALL COMPRESSORS****Figure 34 Dimensions - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all****Table 45 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  $\pm 1/2"$  (13mm).
3. Field routed alternatives for water/glycol connections.
4. See submittal page DPN001120 for blower outlet and deck dimensional data.



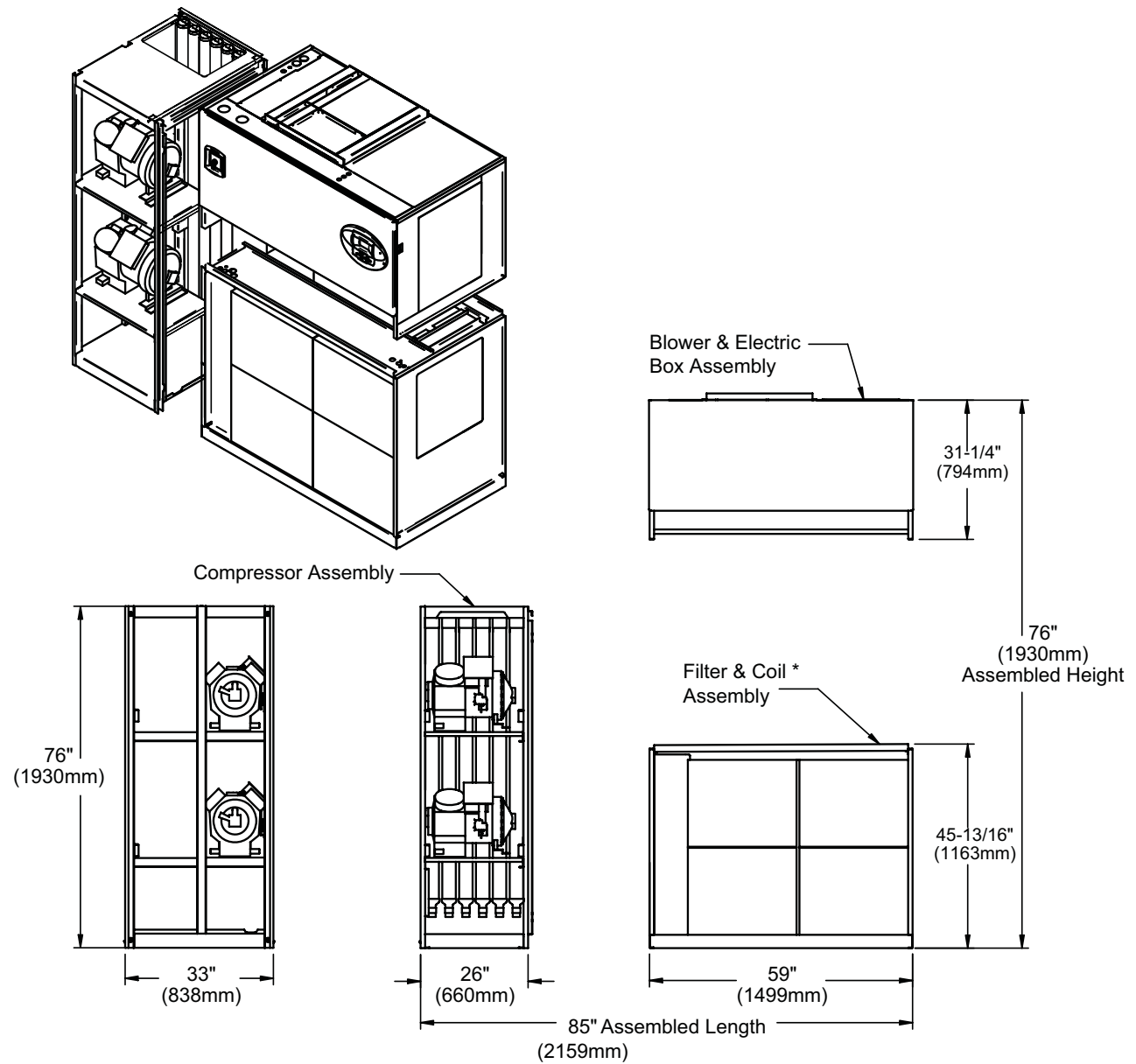
DPN001179  
Rev. 2

**Table 46 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	Water/Glycol/GLYCOOL Access (Bottom)	79-15/16 (2030)	9 (229) 3-1/2	3-1/2 x 8 (89 x 203)
W2	Water/Glycol/GLYCOOL Access (Top)	79-15/16 (2030)	9 (229)	3-1/2 x 8 (89 x 203)
W3	Water/Glycol/GLYCOOL Access (Side)	—	—	6 x 17-3/16 (152 x 437)
WS	Water/Glycol/GLYCOOL Supply	—	—	1-5/8" CU Sweat
WR	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

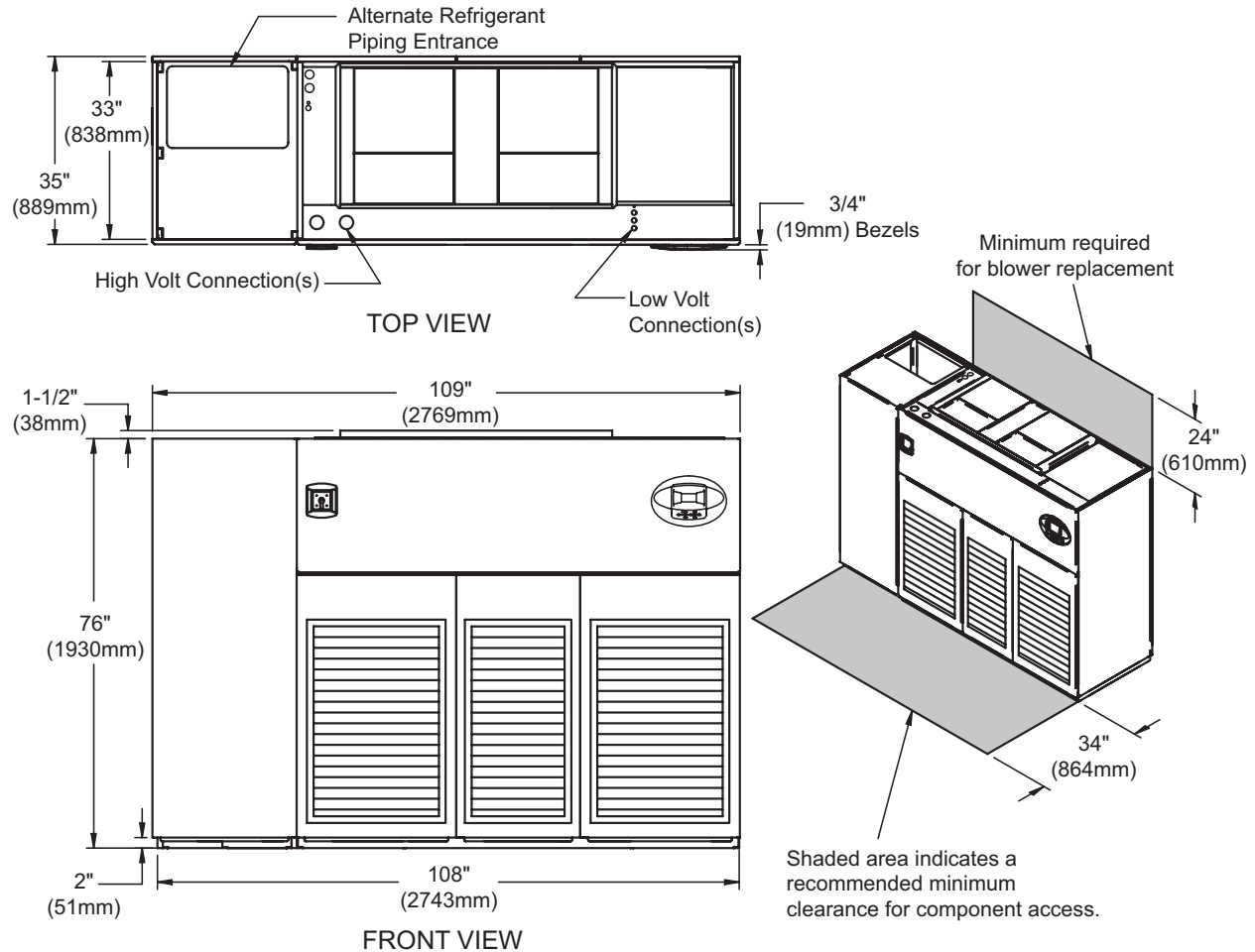


NOTES: Drawing views are simplified with panels removed to show overall dimensions.  
See disassembly and handling instructions in installation manual.  
\* Coil can be field-removed for further height reduction.

DPN001173  
Rev. 0

Table 47 Component weights - upflow, water/glycol/GLYCOOL, 28-42kW (8-12 ton)—all

Dry Weight, Approximate, Including Panels, lb (kg)				
Component	Semi-Hermetic Compressor		Scroll Compressor	
	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**

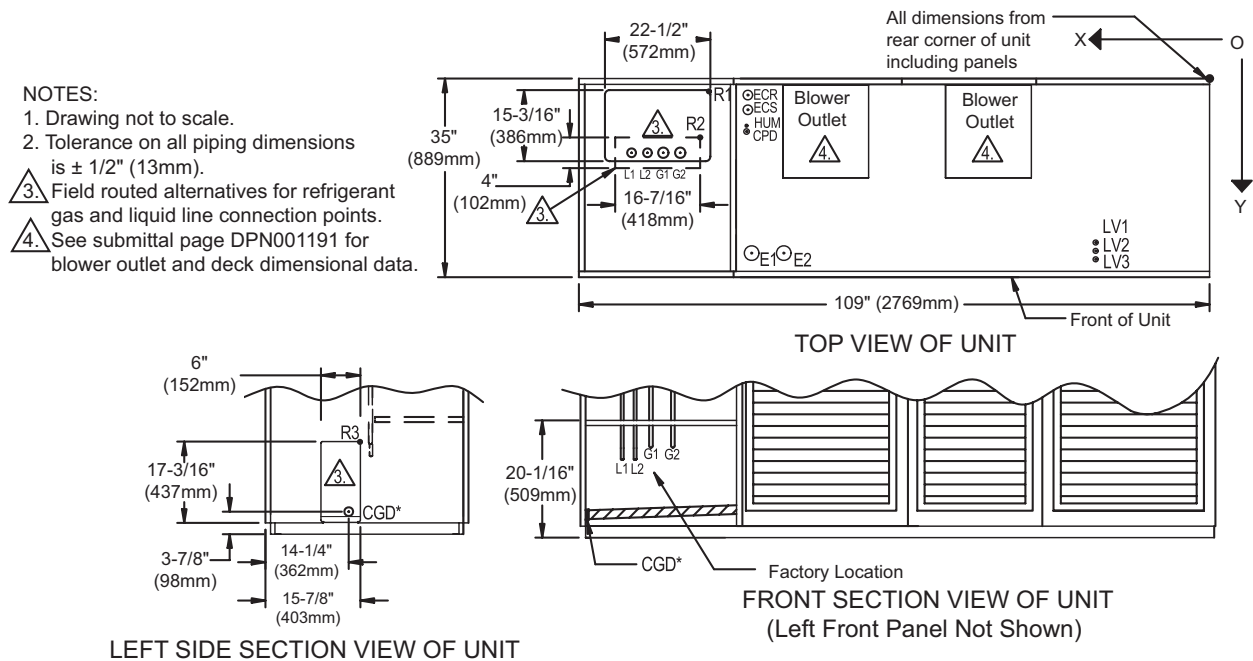
NOTE: Front air return unit shown. For rear return unit, in addition to front service area shown, also include 25" (635mm) on one side of unit for access to rear return filter box. See DPN001196.

DPN001165  
Rev. 1

**Table 48 Weight - upflow, air cooled, 53-77kW (15-22 ton)—semi-hermetic**

Dry Weight, Approximate, lb (kg)		
Model Type	Model Size	
	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

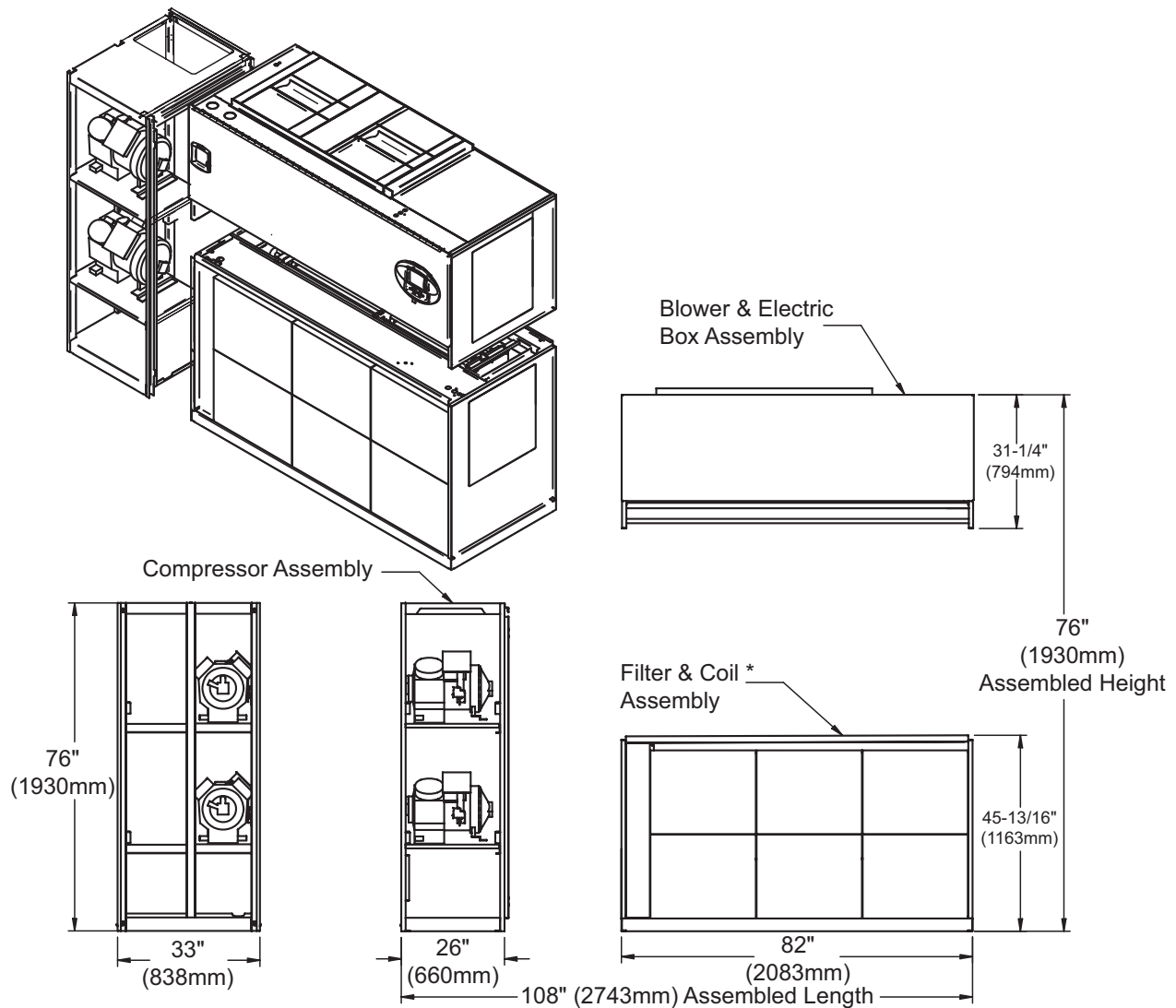
DPN001212  
Rev. 2

**Table 49 Piping data - upflow, air cooled, 53-77kW (15-22 tons)—semi-hermetic**

Point	Description	X	Y	Connection Size / Opening
R1	Refrigerant Access (Top)	83-3/4" (2127mm)	1-7/8" (48mm)	22-1/2" x 15-3/16" (572mm x 386mm)
R2	Refrigerant Access (Bottom)	86" (2184mm)	13-7/8" (352mm)	16-7/16" (418mm) X 4" (102mm)
<b>53kW (15 Tons) / 70 &amp; 77kW (20 &amp; 22 Tons)</b>				
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	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.

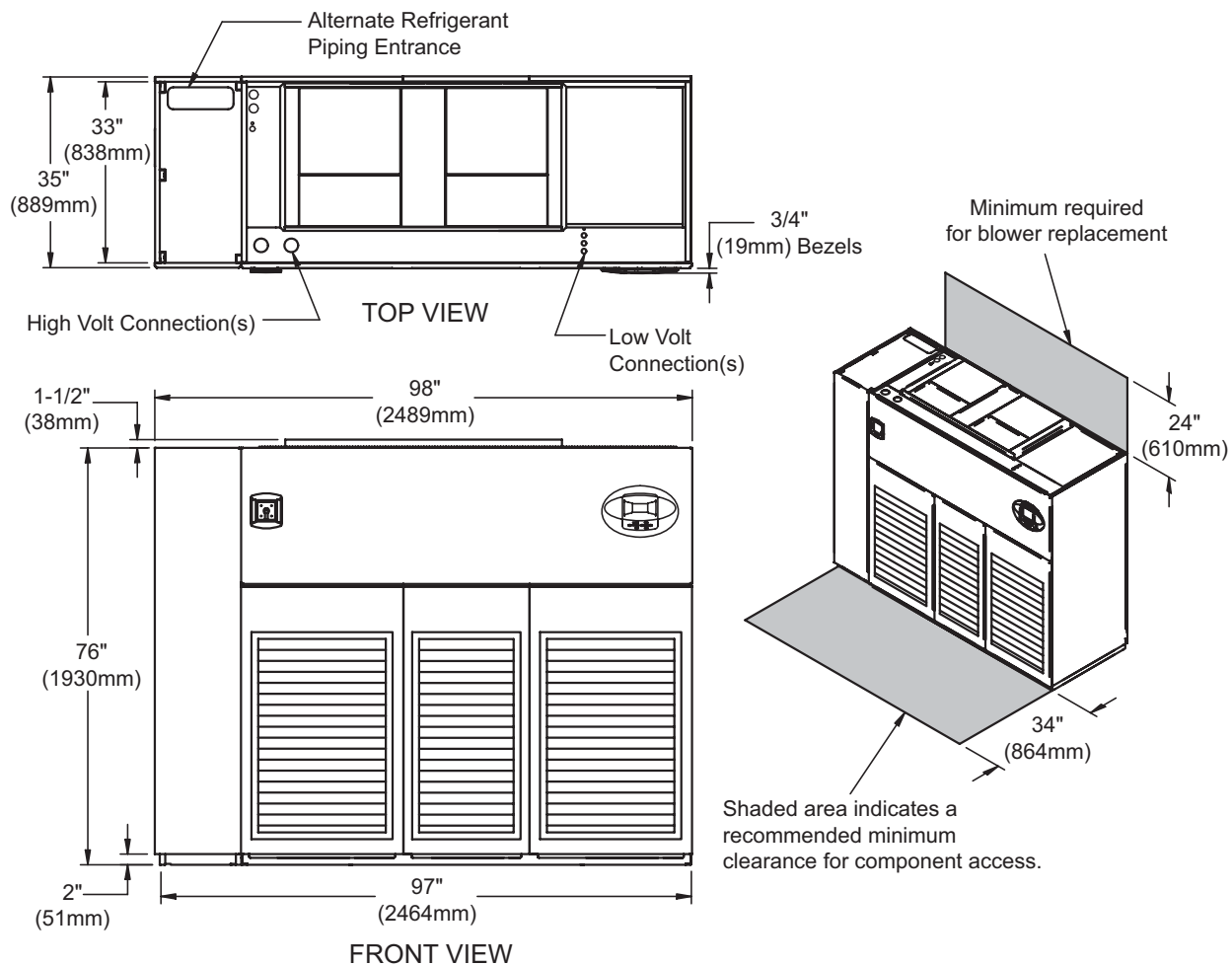
DPN001209  
Rev. 0

Table 50 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.

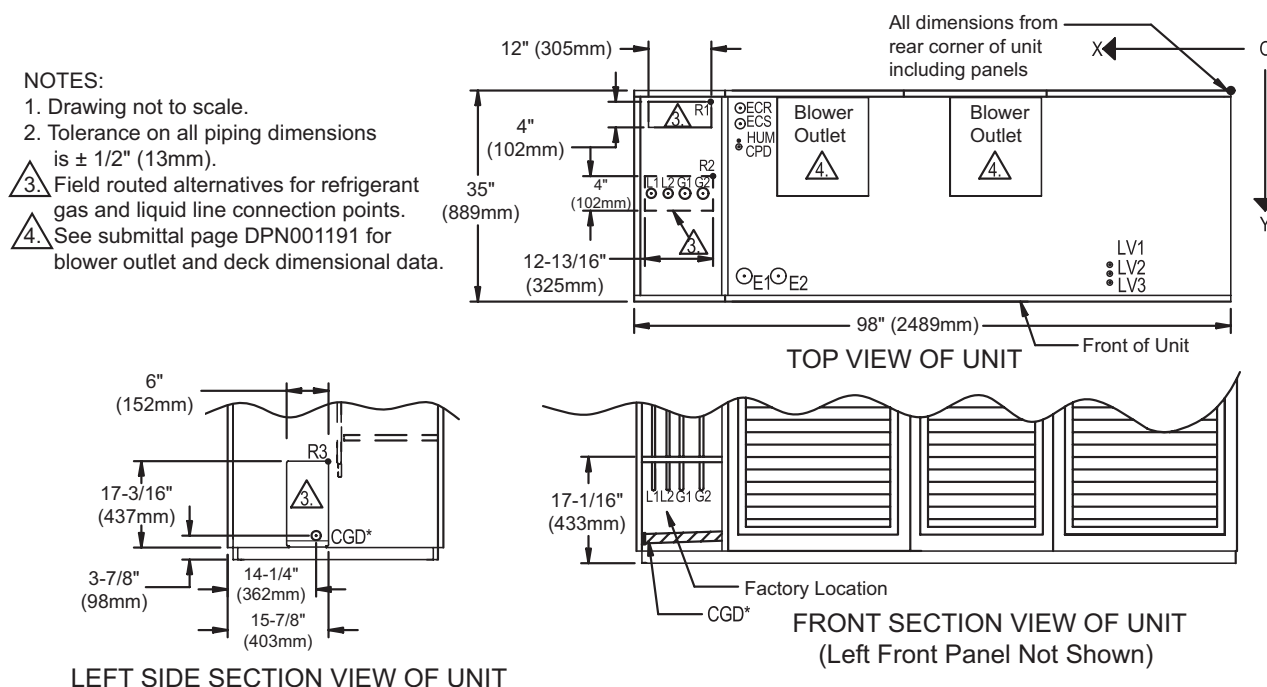
DPN001166  
Rev. 1

**Table 51 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  $\pm 1/2"$  (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.

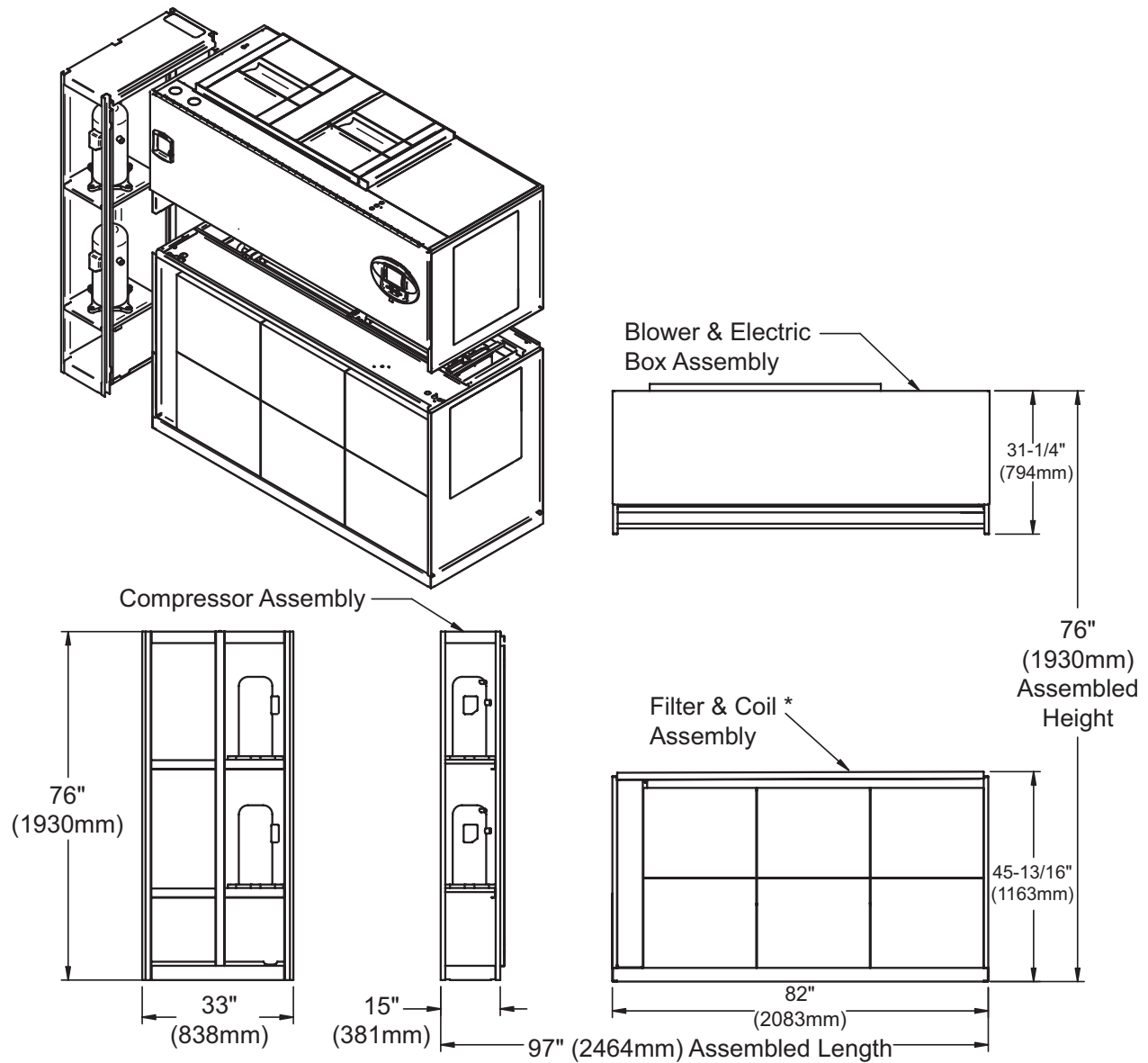
\*\* Supplied on Dual Cooling Systems only

DPN001213  
Rev. 1

**Table 52 Piping data - upflow, air cooled, 53-77kW (15-22tons)—scroll**

Point	Description	X	Y	Connection Size / Opening
R1	Refrigerant Access (Top)	83-5/8" (2124mm)	2" (51mm)	12" x 4" (305mm x 102mm)
R2	Refrigerant Access (Bottom)	82-3/4" (2102mm)	14-3/4" (374mm)	12-3/16" x 4" (310mm x 102mm)
<b>53kW (15tons) / 70 &amp; 77kW (20 &amp; 22tons)</b>				
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	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.

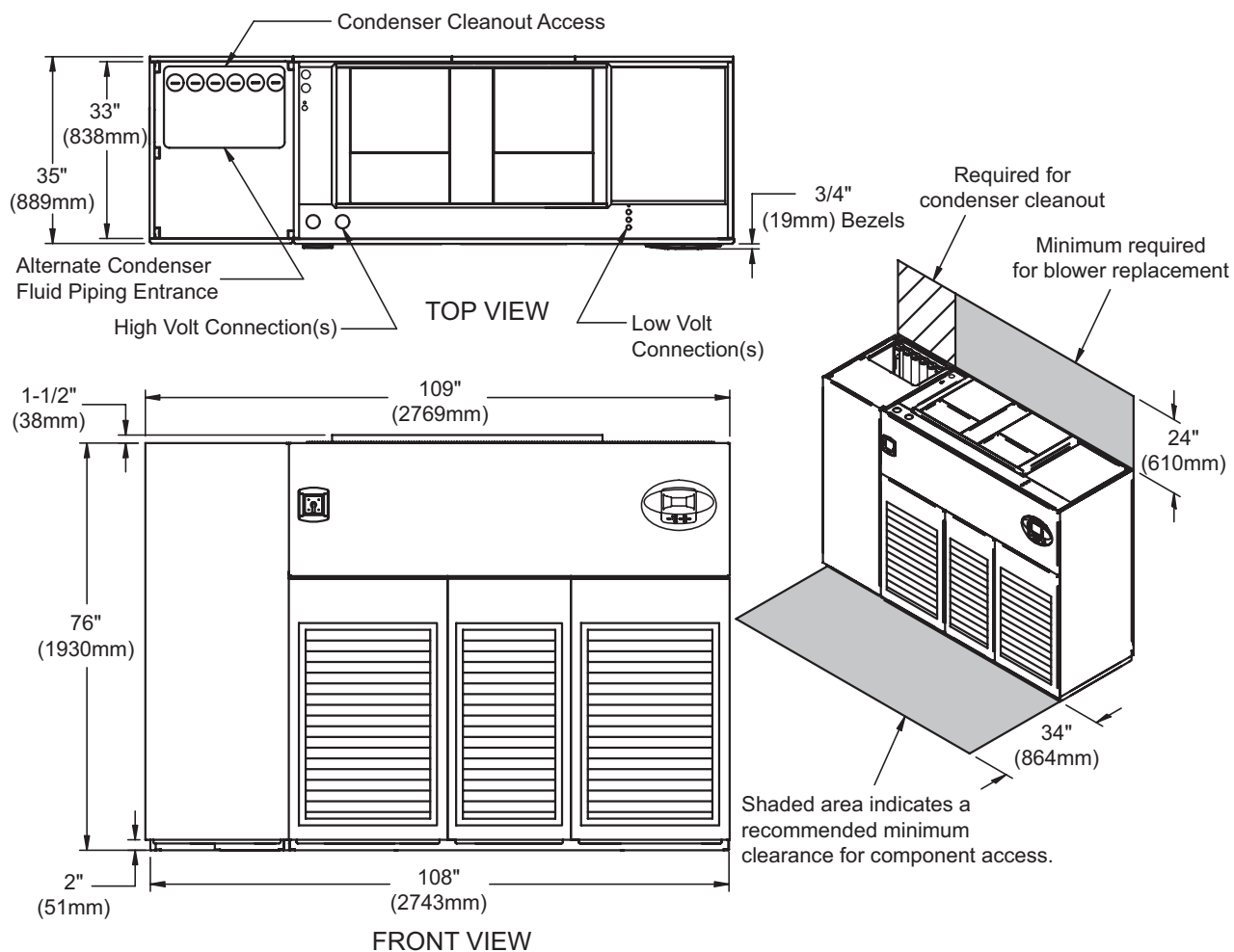
\* Coil can be field-removed for further height reduction.

DPN001210

Rev. 0

Table 53 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)

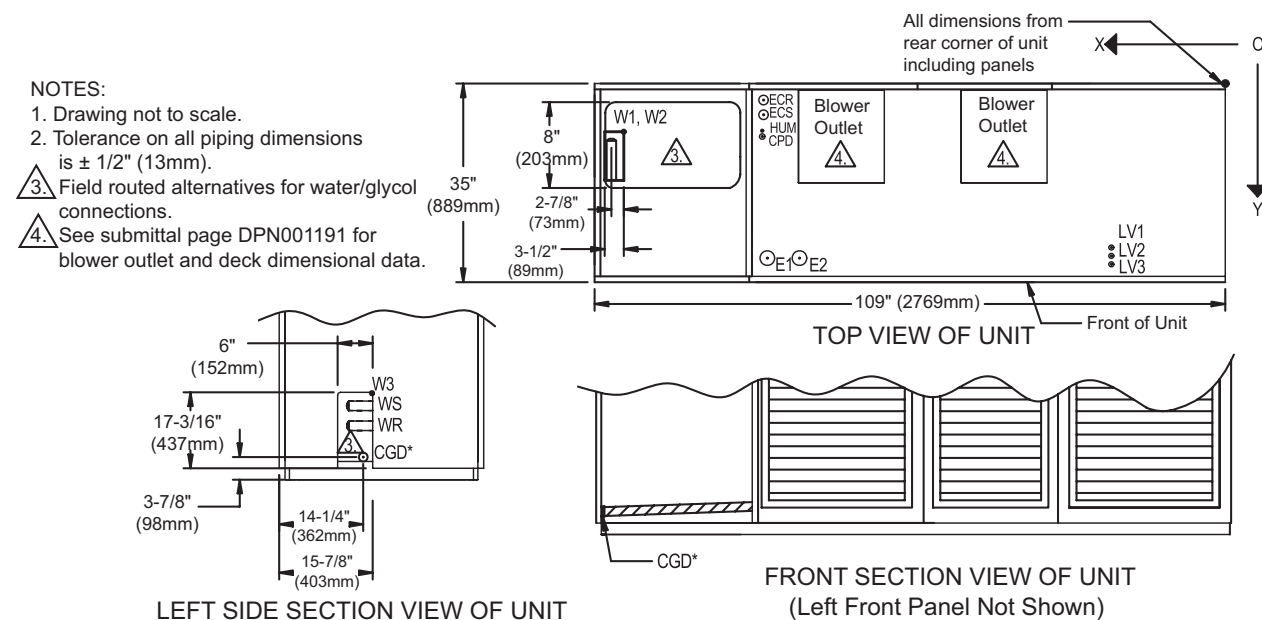
**UPFLOW, WATER/GLYCOL/GLYCOOL, 53-77kW (15-22 TON)—ALL COMPRESSORS****Figure 43 Dimensions - upflow, water/glycol/GLYCOOL, 53-77kw (15-22 tons)—all**

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 54 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

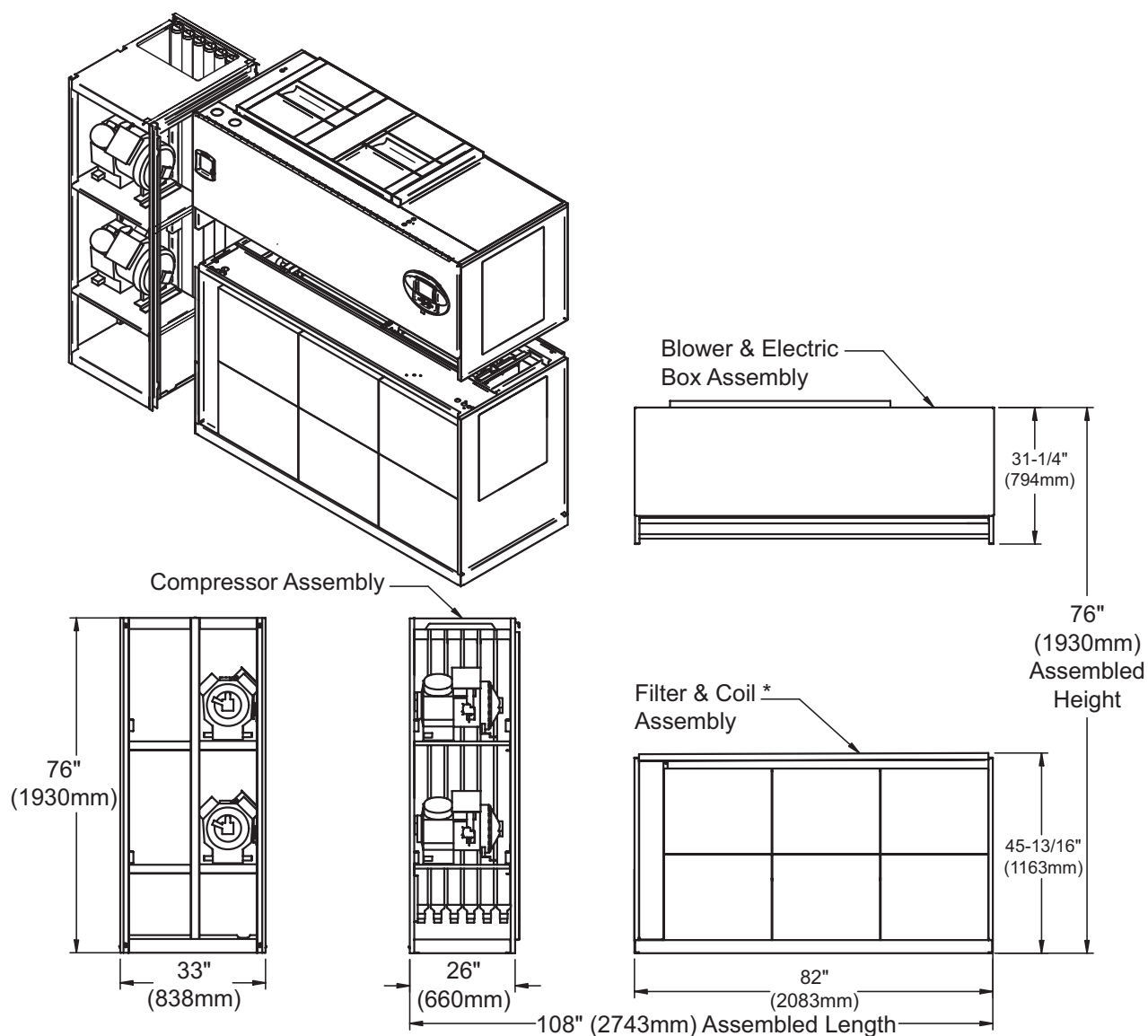
DPN001214  
Rev. 1

**Table 55 Piping data, upflow water/glycol/GLYCOOL 53-77kw (15-22 tons)—all**

Point	Description	X	Y	Connection Size / Opening
W1	Water/Glycol/GLYCOOL Access (Bottom)	102-15/16" (2615mm)	9" (229mm)	3-1/2" x 8" (89mm x 203mm)
W2	Water/Glycol/GLYCOOL Access (Top)	102-15/16" (2615mm)	9" (229mm)	3-1/2" x 8" (89mm x 203mm)
W3	Water/Glycol/GLYCOOL Access (Side)	-	-	6" x 17-3/16" (152mm x 437mm)
WS	Water/Glycol/GLYCOOL Supply	-	-	2-1/8" Cu Sweat
WR	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

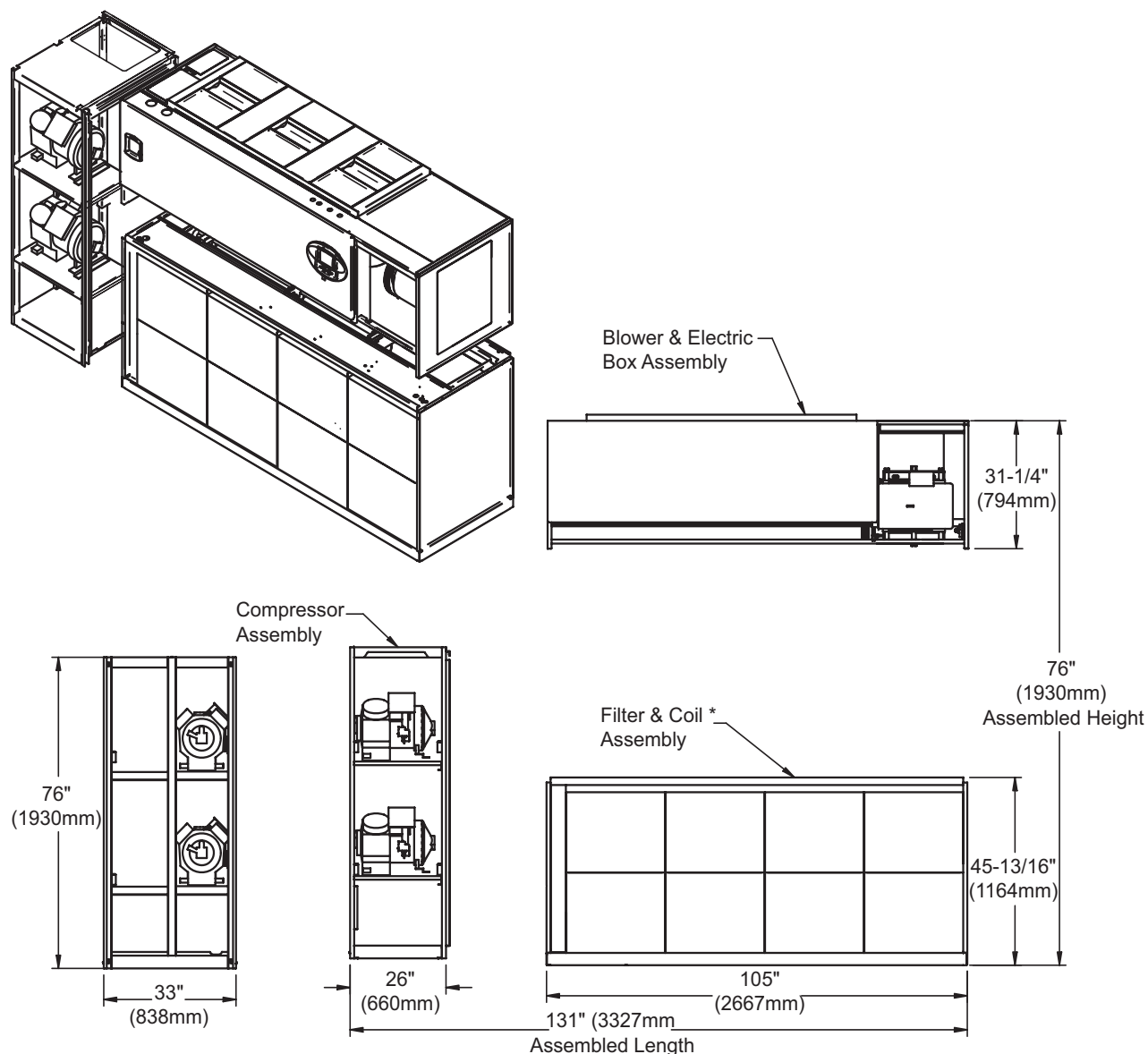
Table 56 Component weights, upflow water/glycol/GLYCOOL, 53-77kW (15-22 tons) all

Dry Weight, Approximate, Including Panels, lb (kg)				
Component	Semi-Hermetic Compressor		Scroll or Digital Scroll Compressor	
	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

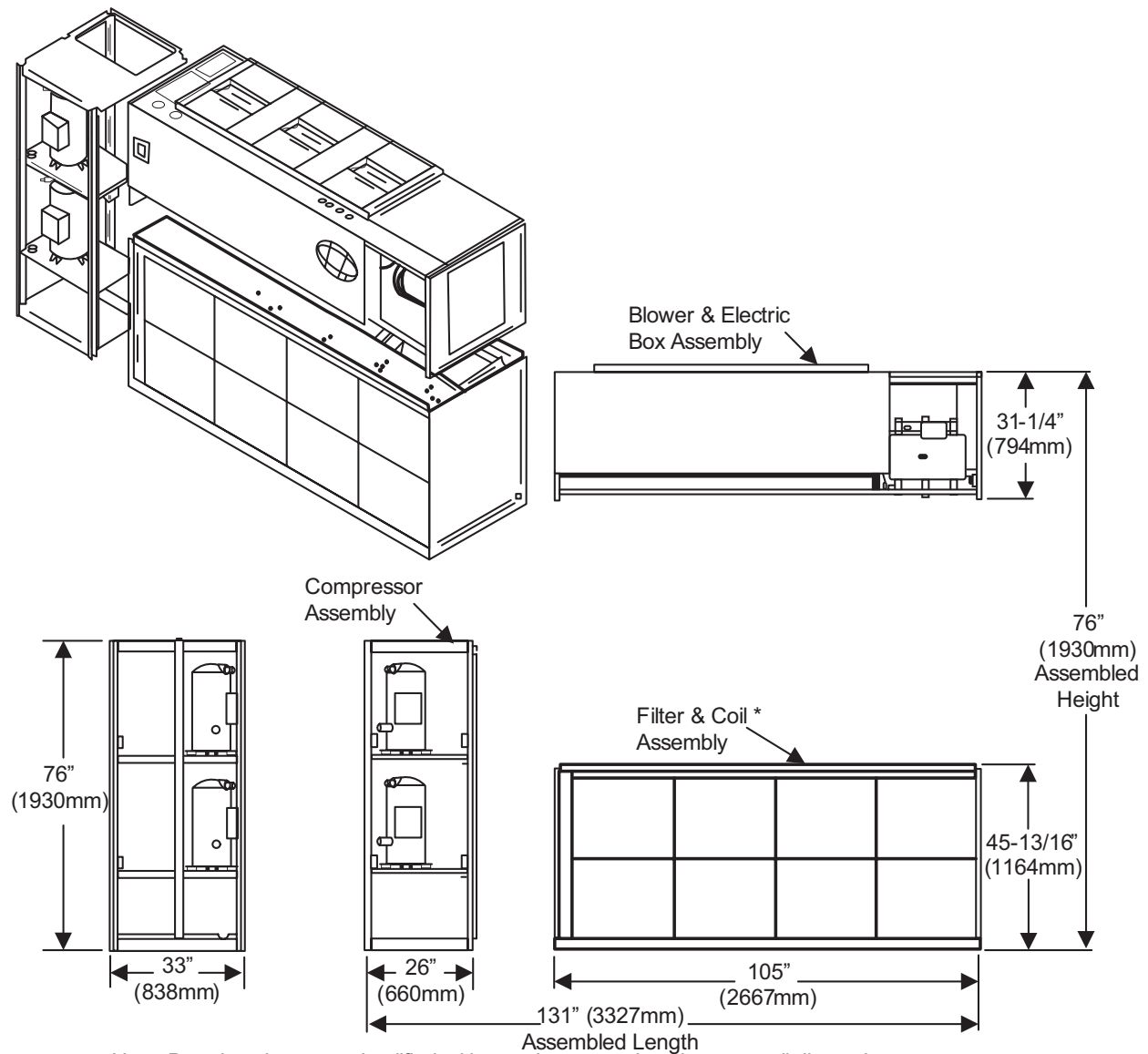
REV 0

Table 57 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



Note: 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

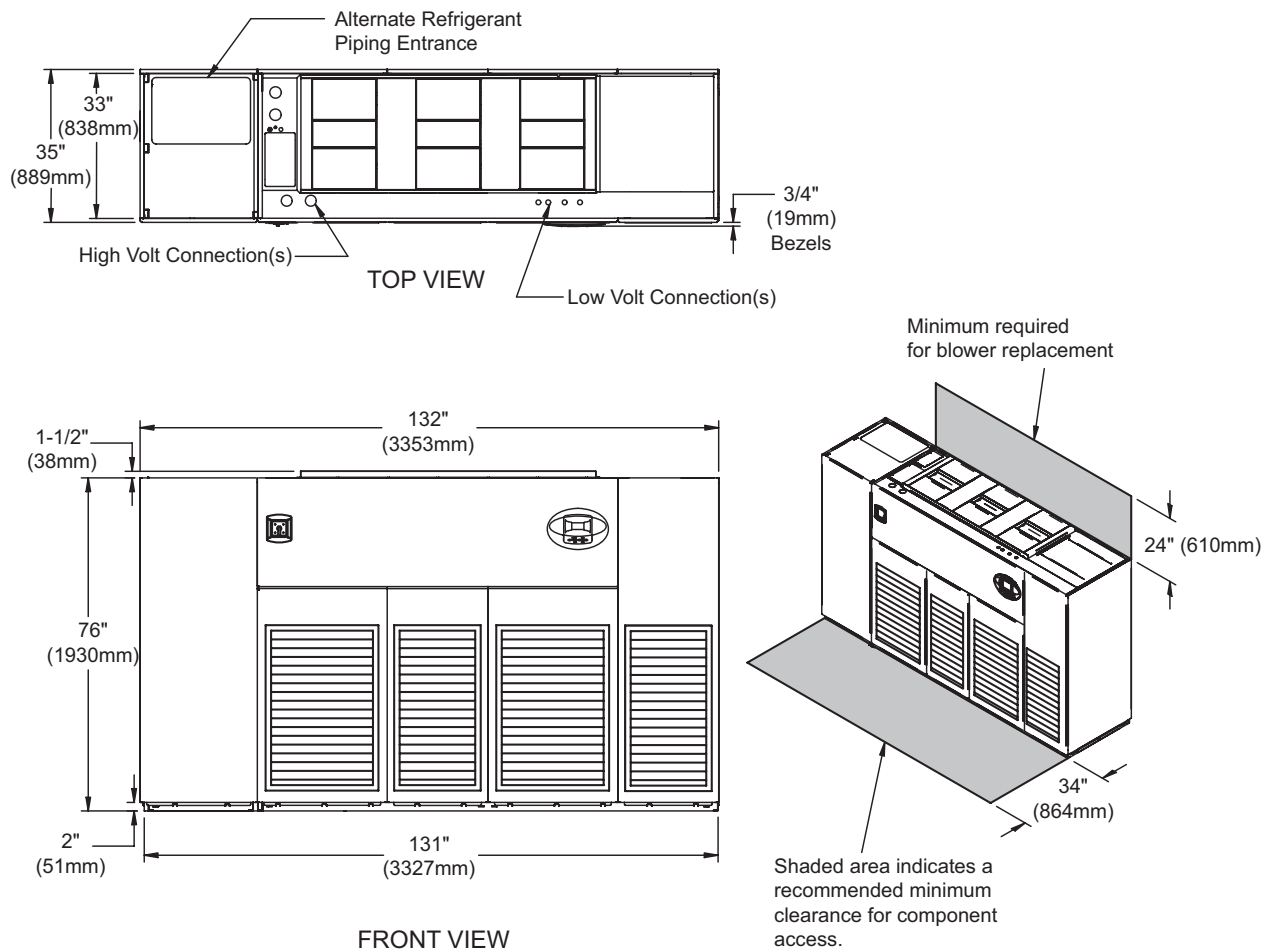
DPN001255  
Rev. 0

Table 58 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 DPN001196.

DPN001168  
REV 0

Table 59 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

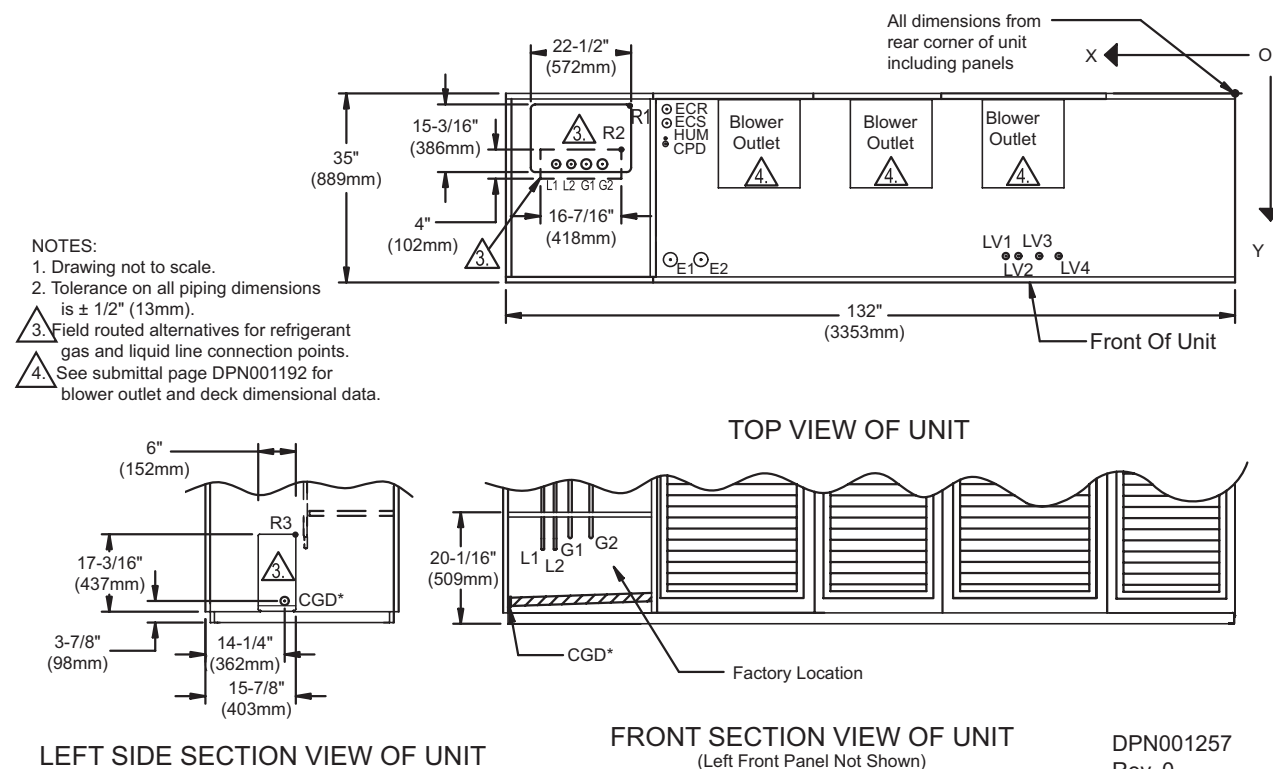


Table 60 Piping data - upflow, air cooled 105kW (30 tons)—all

Point	Description	X	Y	Connection Size / Opening
R1	Refrigerant Access (Top)	106-7/8" (2715mm)	1-7/8" (48mm)	22-1/2" (572mm) X 15-3/16" (386mm)
R2	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	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

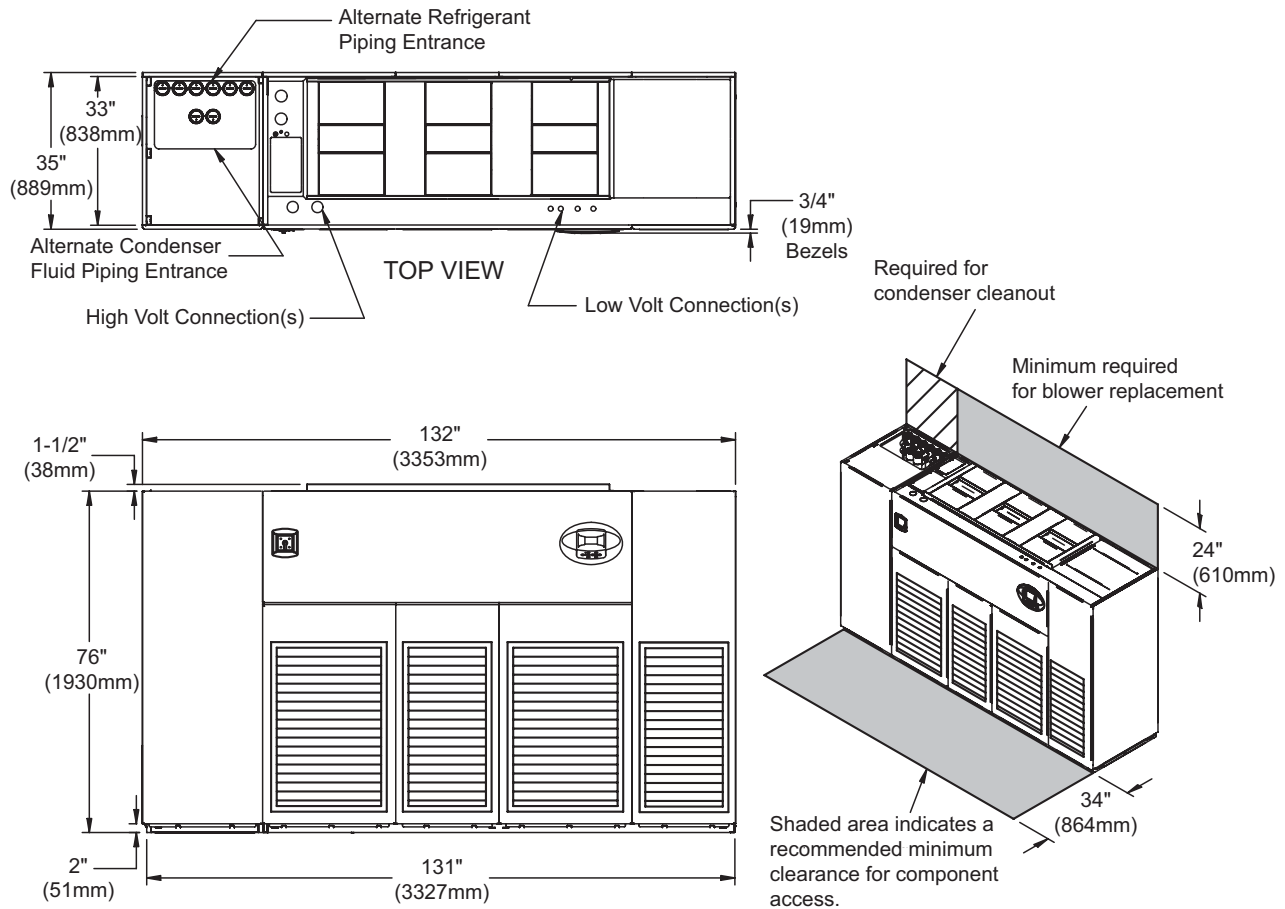
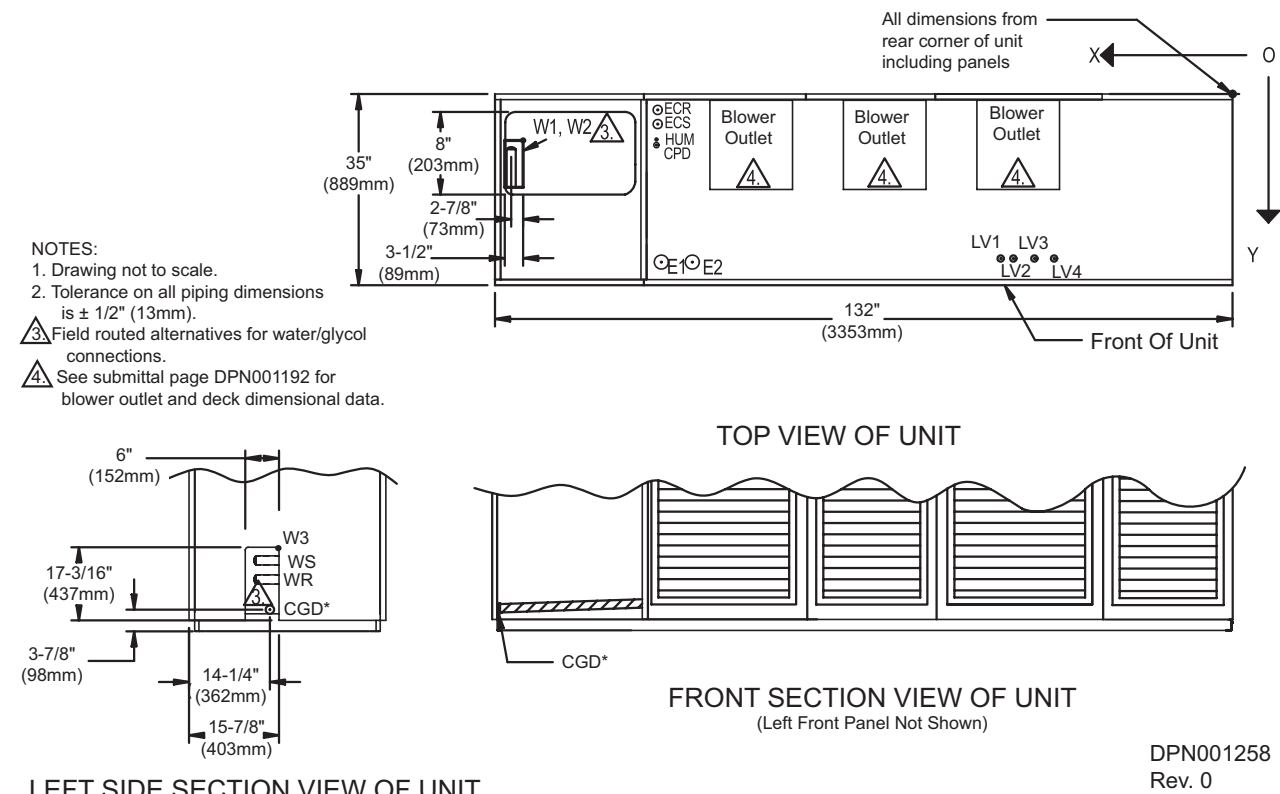






DPN001169  
REV 0

Table 61 Weights - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all

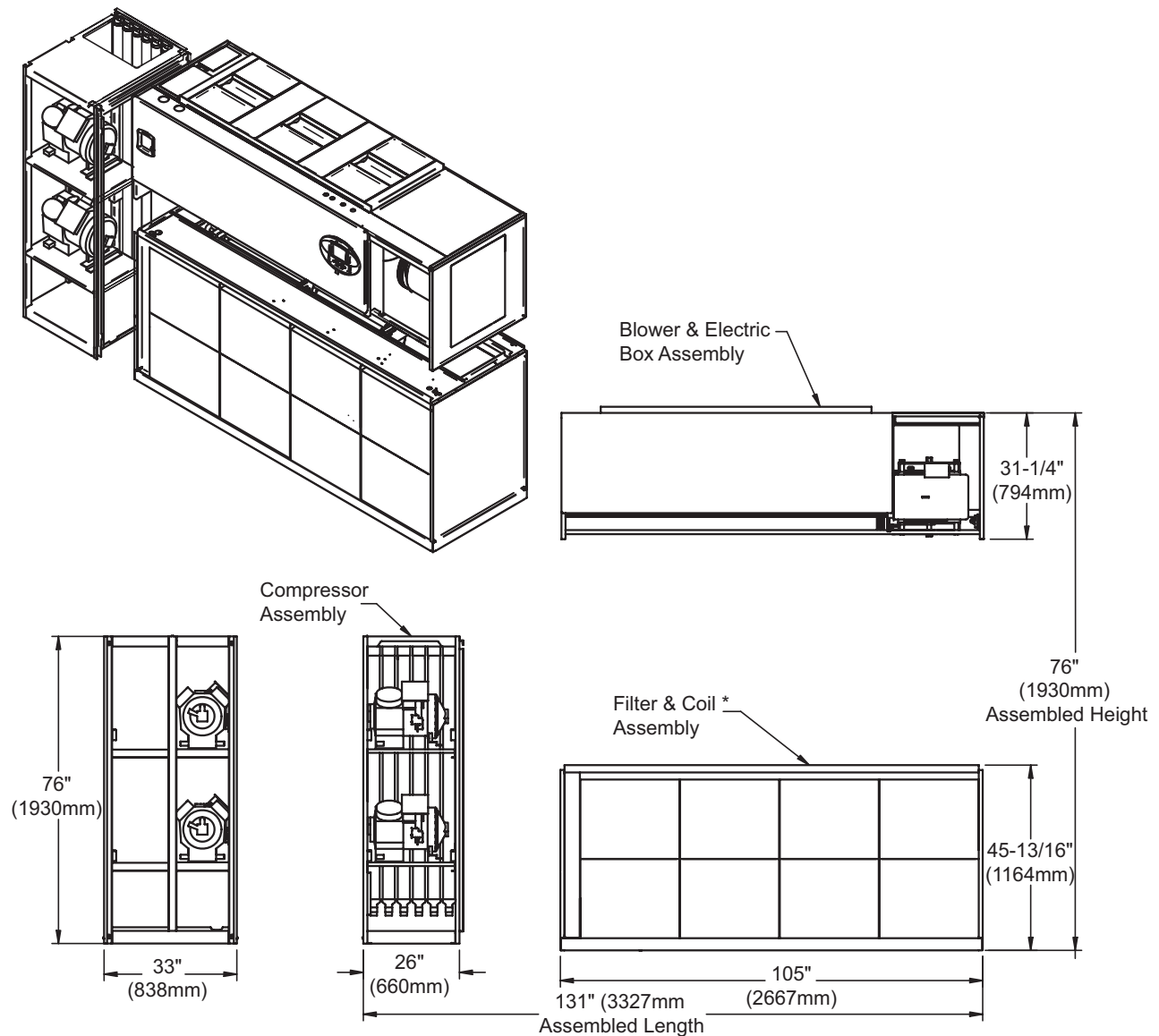
Dry Weight, Approximate, lb (kg)		
Model Type	Model Size: 105	
Semi- Hermetic Compressor	Water/Glycol	3370 (1529)
	GLYCOOL/Dual Cool	3700 (1678)
Scroll or Digital Scroll Compressor	Water/Glycol	3250 (1474)
	GLYCOOL/Dual Cool	3580 (1624)

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

**Table 62 Piping data - upflow, upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all**

Point	Description	X	Y	CONNECTION SIZE / OPENING
W1 	Water/Glycol/GLYCOOL Access (Bottom)	126-1/8" (3204mm)	9" (229mm)	3-1/2" x 8" (89mm x 203mm)
W2 	Water/Glycol/GLYCOOL Access (Top)	126-1/8" (3204mm)	9" (229mm)	3-1/2" x 8" (89mm x 203mm)
W3 	Water/Glycol/GLYCOOL Access (Side)	-	-	6" x 17-3/16" (152mm x 437mm)
WS 	Water/Glycol/GLYCOOL Supply	-	-	2-1/8" Cu Sweat
WR 	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.

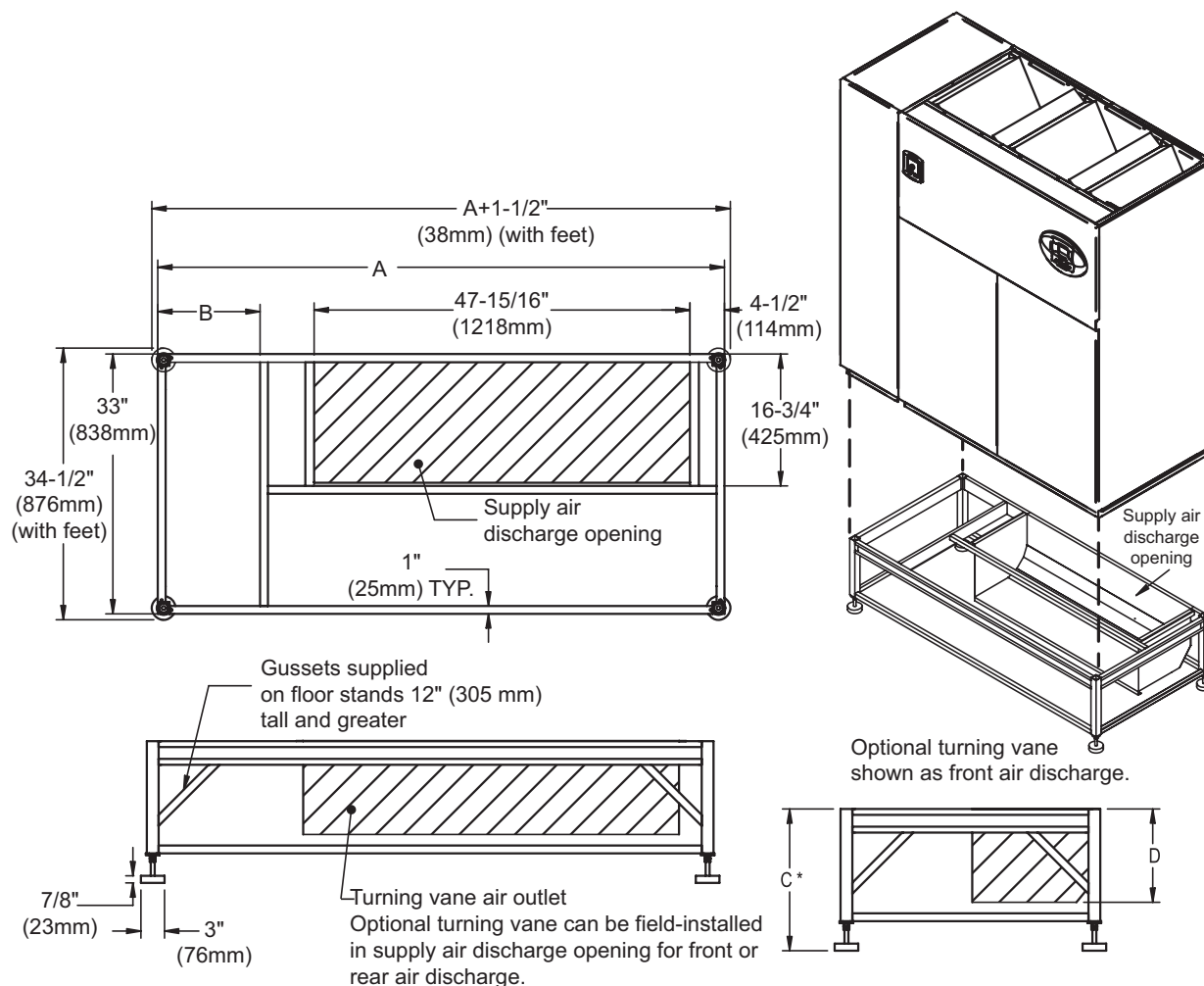
DPN001256  
REV 0

Table 63 Component weights - upflow, water/glycol/GLYCOOL, 105kW (30 tons)—all

Dry Weight, Approximate, Including Panels, lb (kg)				
Component	Semi-Hermetic Compressor		Scroll or Digital Scroll Compressor	
	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  $\pm 1\frac{1}{2}"$  (38mm) adjustment from nominal height C.

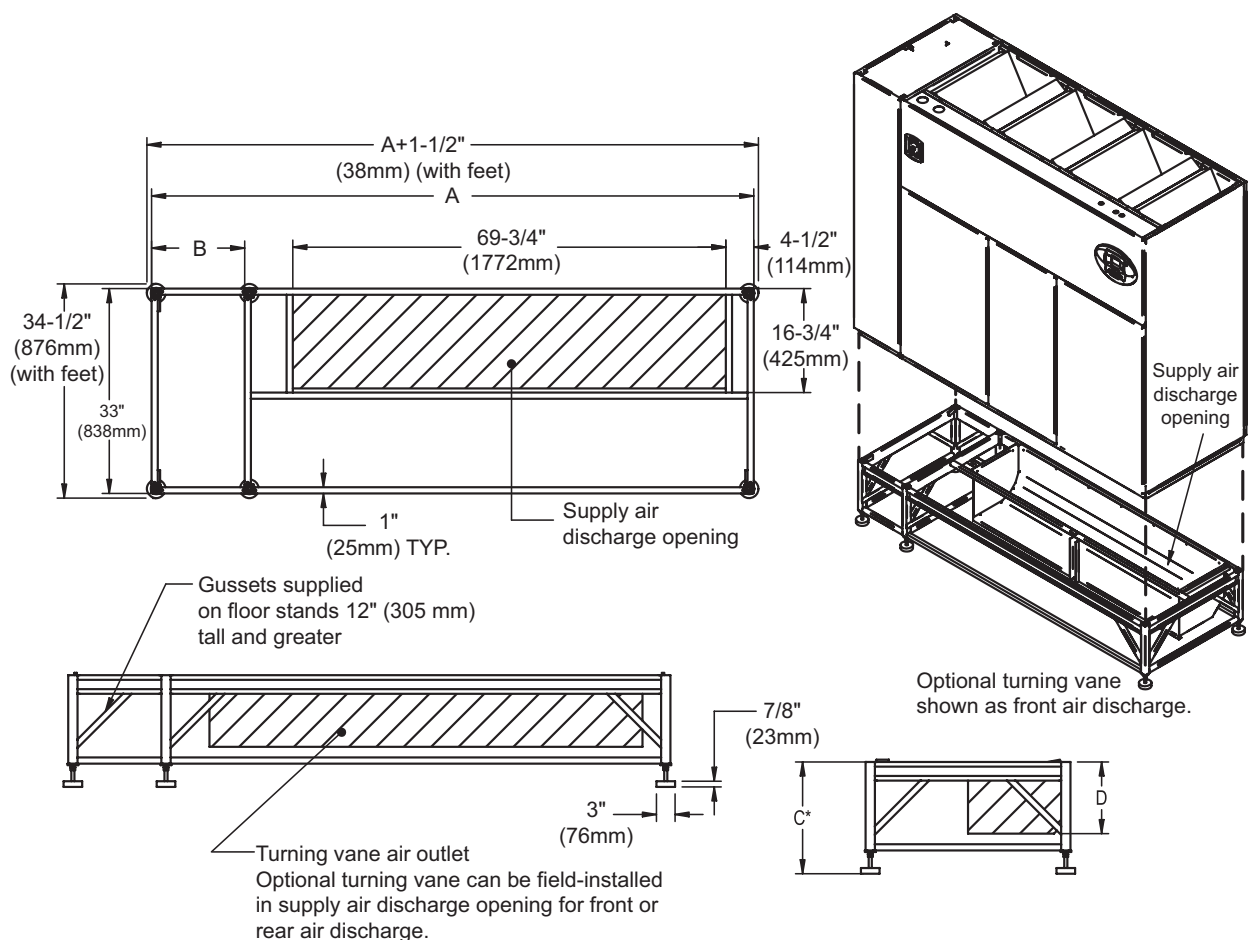
DPN000820  
REV 2

**Table 64 Floor stand and floor planning dimensional data**

Dimensional Data, in. (mm)			Height, in. (mm)	
Model	A	B	C*	D turning vane
Air-Cooled Semi-Hermetic Models and All Water/Glycol/GLYCOOL Models	85 (2159)	26 (660)	9 (229)	4 (111)
			12 (305)	7 (187)
			15 (381)	10 (264)
			18 (457)	13 (340)
Air-Cooled Scroll Models and Air-Cooled Digital Scroll Models	72 (1829)	13 (330)	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).

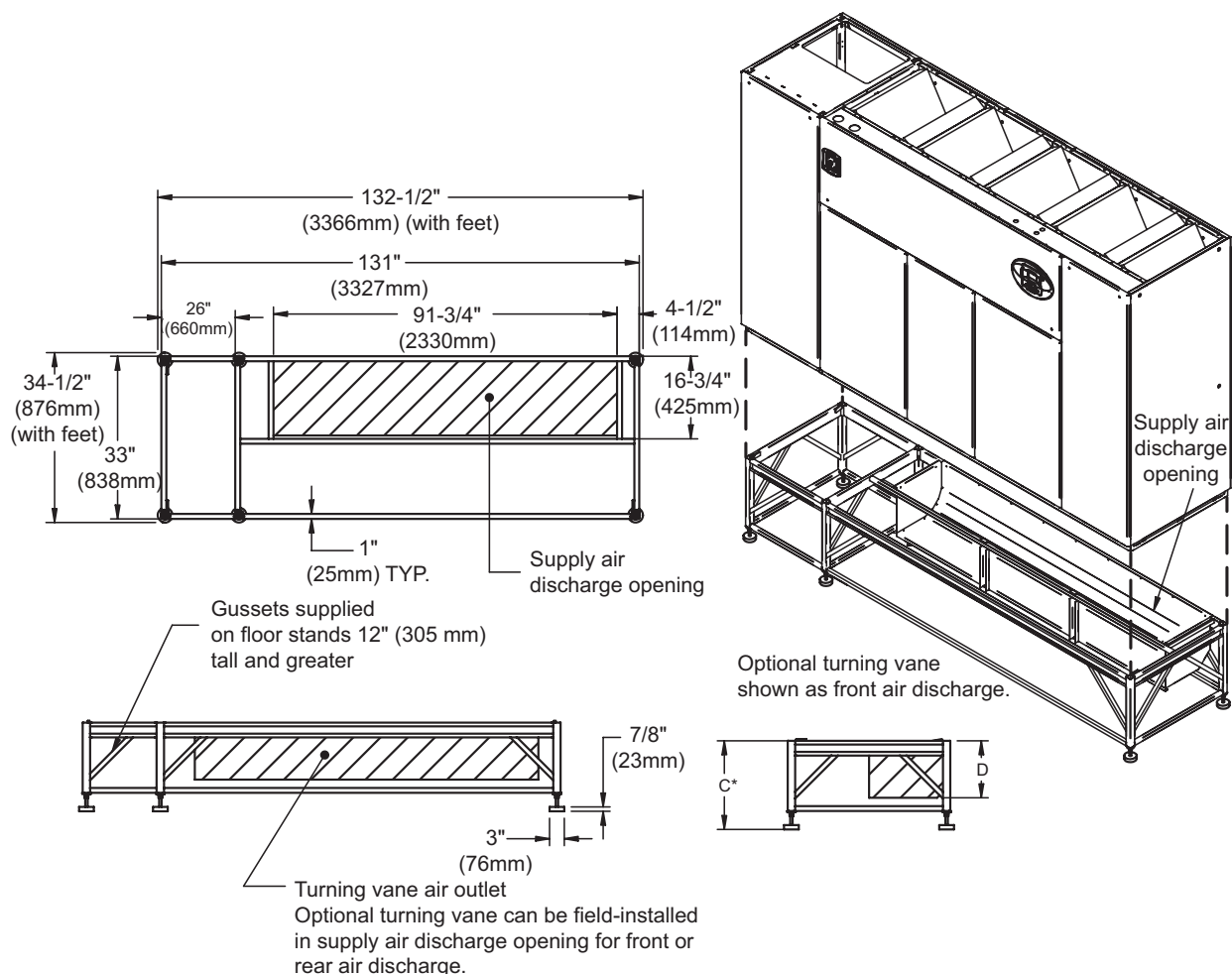
\* Leveling feet are provided with  $\pm 1\frac{1}{2}"$  (38mm) adjustment from nominal height C.

DPN000930  
REV 1

**Table 65 Floor stand and floor planning dimensional data**

Dimensional Data, in. (mm)			Height, in. (mm)	
Model	A	B	C*	D turning vane
Air-Cooled Semi-Hermetic Models and All Water/Glycol/GLYCOOL Models	108 (2743)	26 (660)	9 (229)	4 (111)
			12 (305)	7 (187)
			15 (381)	10 (264)
			18 (457)	13 (340)
Air-Cooled Scroll Models and Air-Cooled Digital Scroll Models	97 (2464)	15 (381)	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).

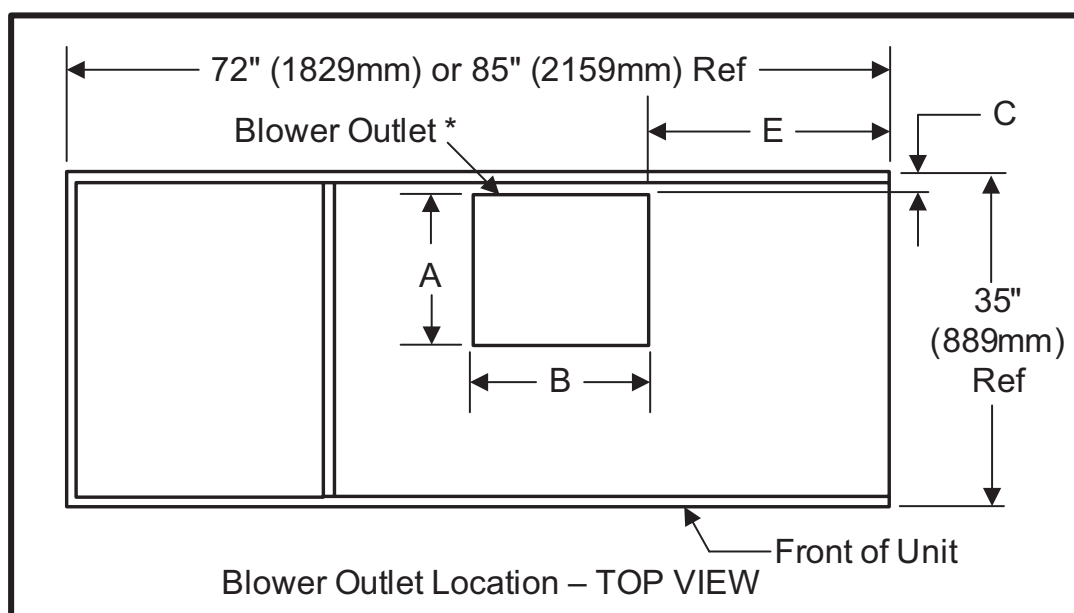
\* Leveling feet are provided with  $\pm 1\text{-}1/2"$  (38mm) adjustment from nominal height C.

DPN001059  
REV 1

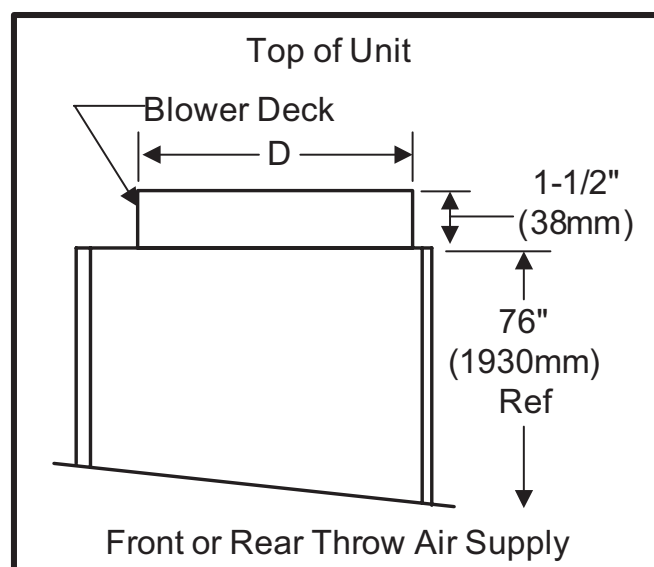
Table 66 Floor stand and floor planning dimensional data

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 Flanges Not Provided

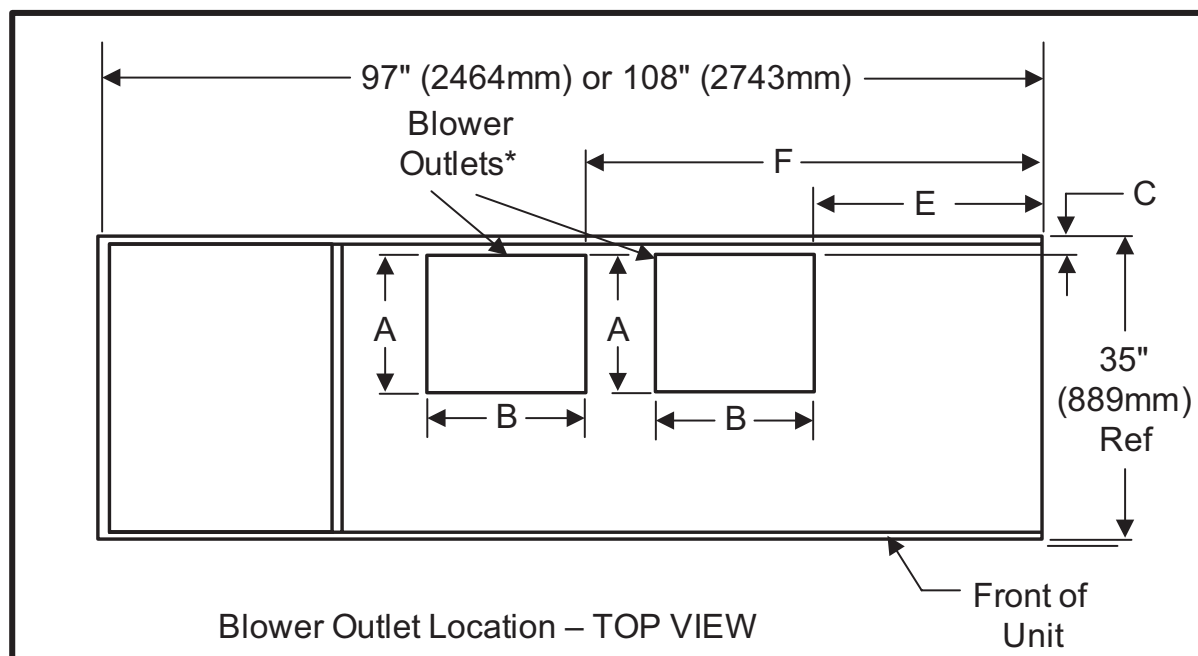


DPN001120  
Rev. 1

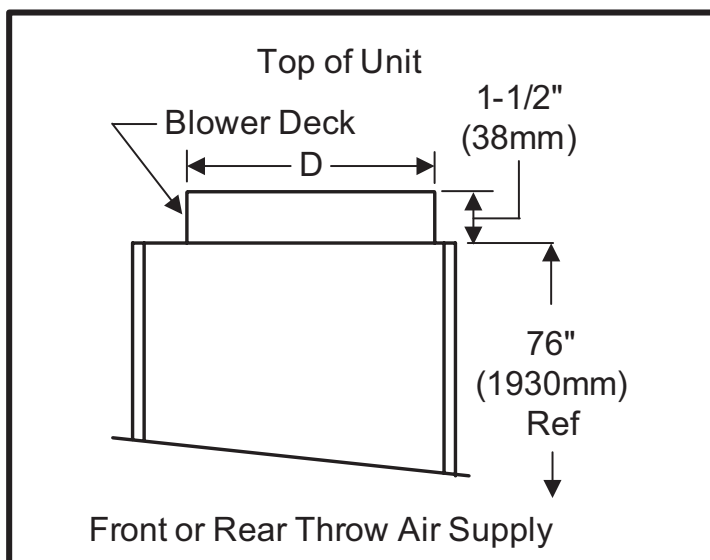
Table 67 Blower outlet and deck dimensional data

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

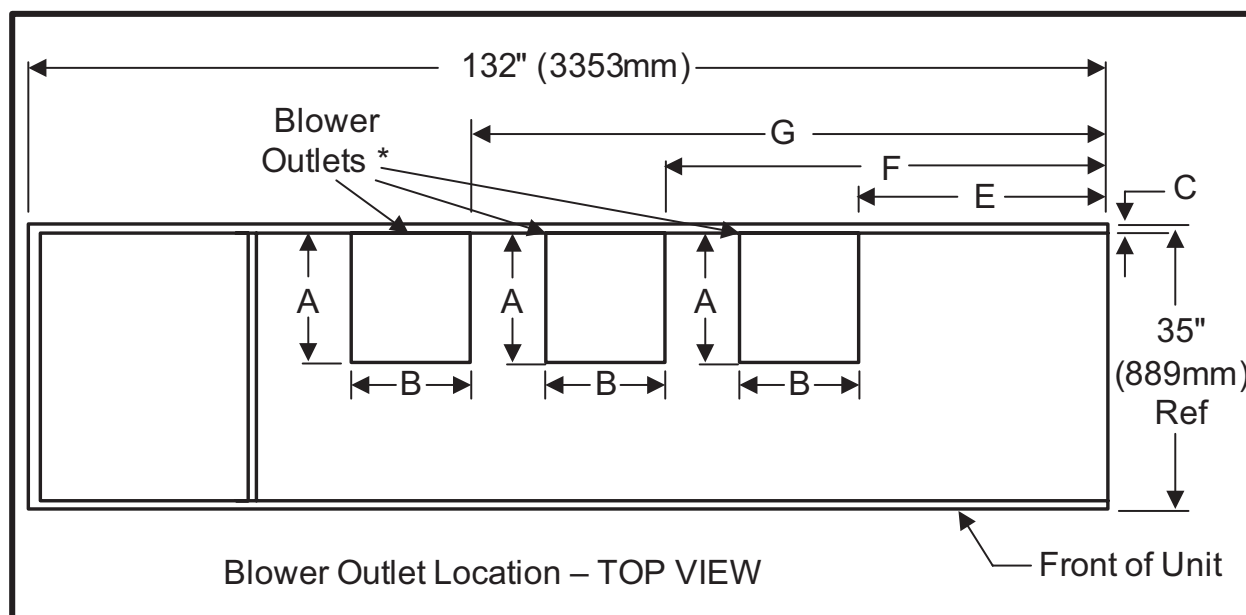


DPN001191  
Rev. 2

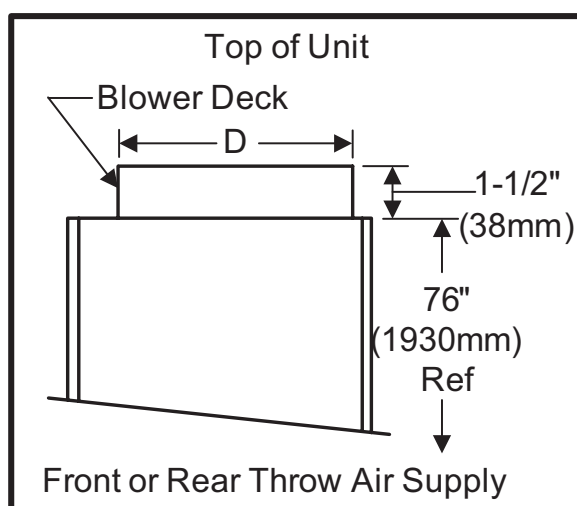
Table 68 Blower outlet and deck dimensional data upflow, 53-77kW (15-22tons)

Models	Blower	Supply	Dimensional Data, inches (mm)					
			A	B	C	D	E	F
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)
		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)
	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)
		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)

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



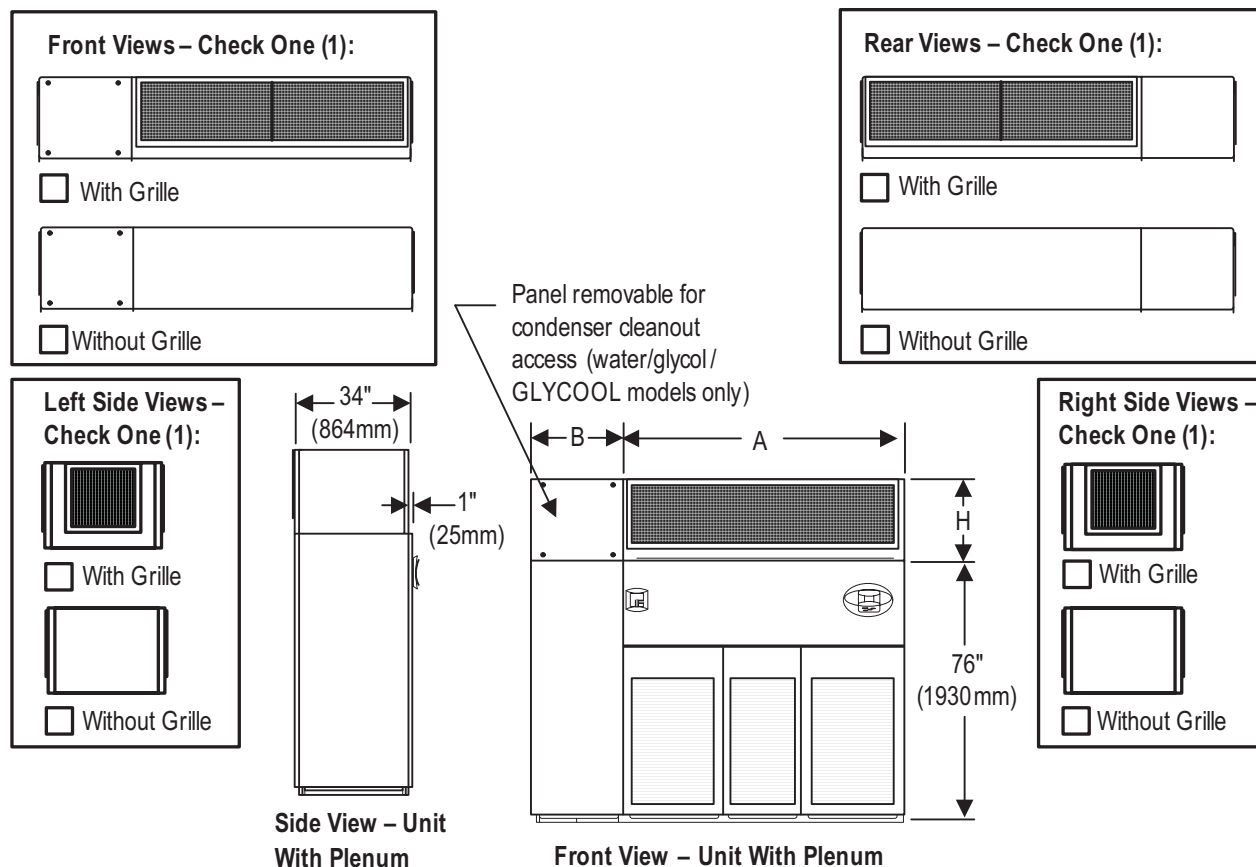
\* Duct Flanges Not Provided



DPN001192  
Rev. 0

Table 69 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 (15-22 ton) 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 .

DPN001187

Rev. 0

**Table 70 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 71 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-22	Outdoor Condenser	95 (35)	CD*-165	CD*-165	CD*-205	CD*-205	CD*-308	CD*-308	CD*-415
		100 (38)	CD*-165	CD*-205	CD*-205	CD*-308	CD*-415	CD*-415	CD*-510
		105 (41)	CD*-205	CD*-205	CD*-308	CD*-308	CD*-415	CD*-510	CD*-616
	Outdoor Quiet-Line Condenser	95 (35)	CD*-143	CD*-143	CD*-214	CD*-286	CD*-409	CD*-409	CD*-572
		100 (38)	CD*-214	CD*-214	CD*-214	CD*-286	CD*-409	CD*-409	CD*-572
		105 (41)	CD*-214	CD*-286	CD*-286	CD*-409	CD*-477	CD*-572	CD*-572
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*-510	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 72 Liebert DS drycooler selection

Drycooler Type	Ambient Temperature °F (°C)	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 73 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-22	Piggyback	95 (35)	PB-675	PB-675	PB-925	PB-925	PB-1100	PB-1350	N/A
		100 (38)	PB-675	PB-675	PB-925	PB-1100	PB-1350	N/A	N/A
		105 (41)	PB-925	PB-925	PB-1350	PB-1350	PB-1350	N/A	N/A
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 74 Liebert piggyback drycooler/DS matchup data

Drycooler Selections		Liebert DS Model					
Drycooler Type	Ambient Temp. °F (°C)	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

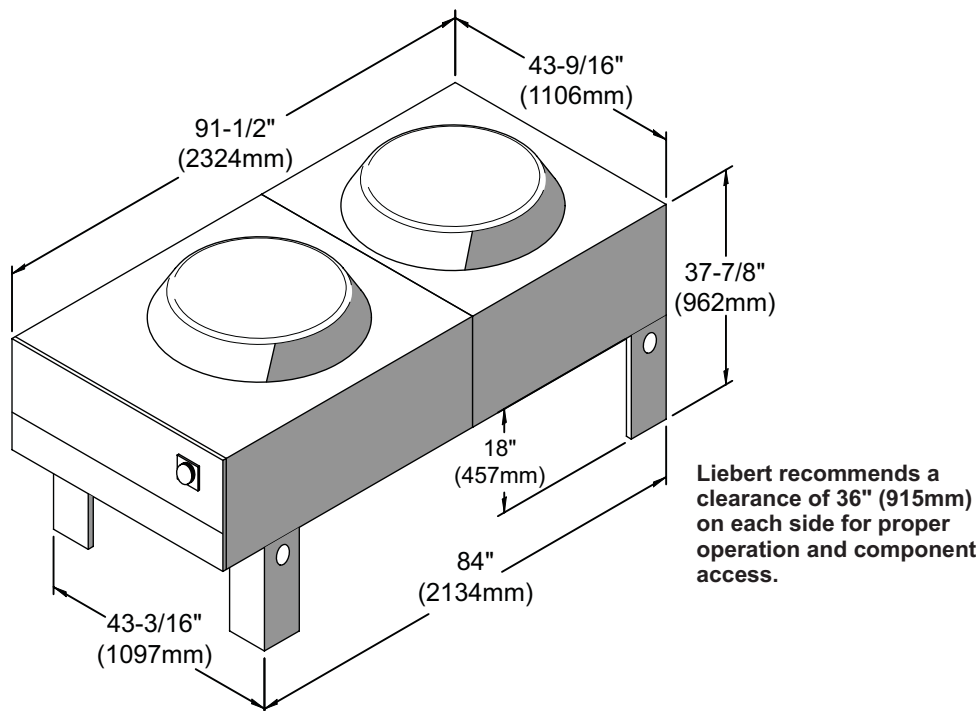


Figure 61 Condenser and drycooler dimensions, 3- and 4-fan models

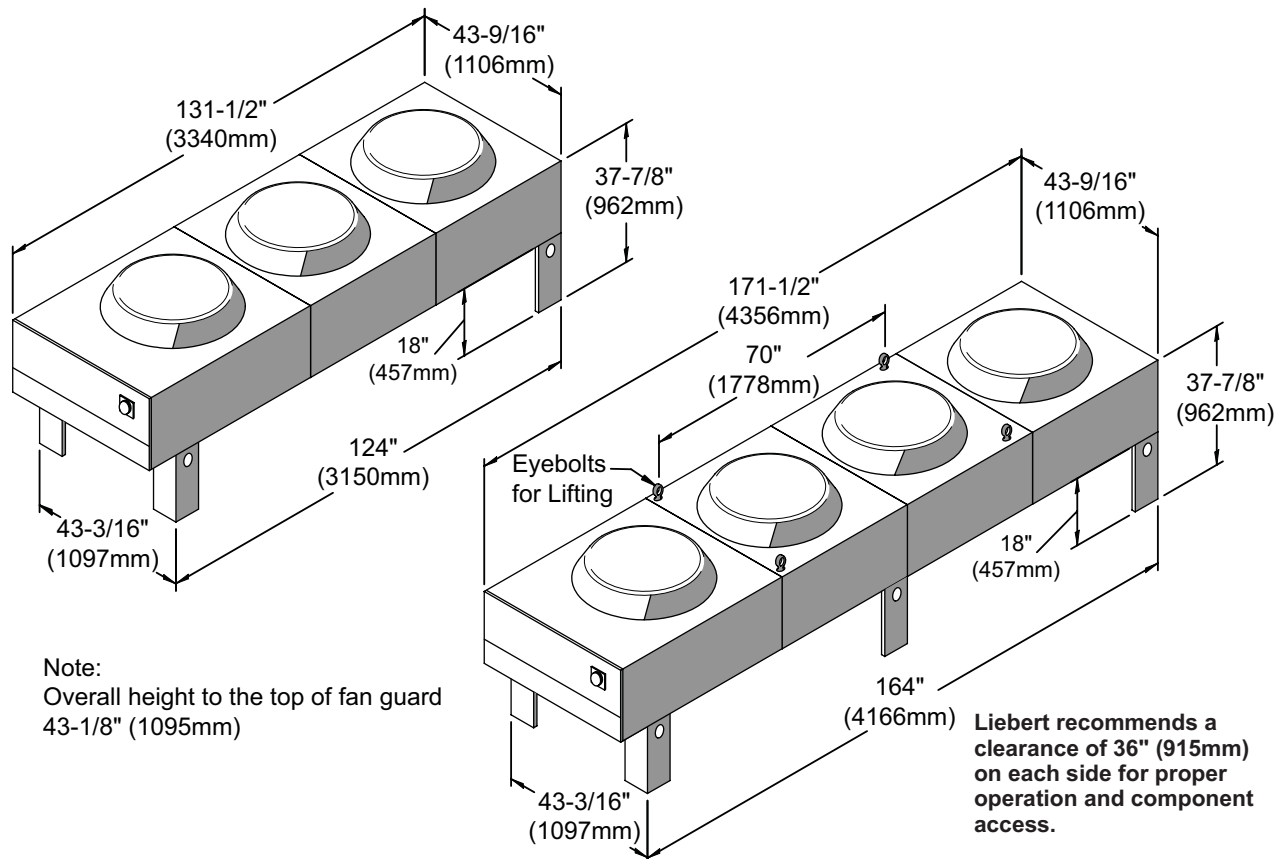




Figure 62 Condenser and drycooler dimensions, 6- and 8-fan models

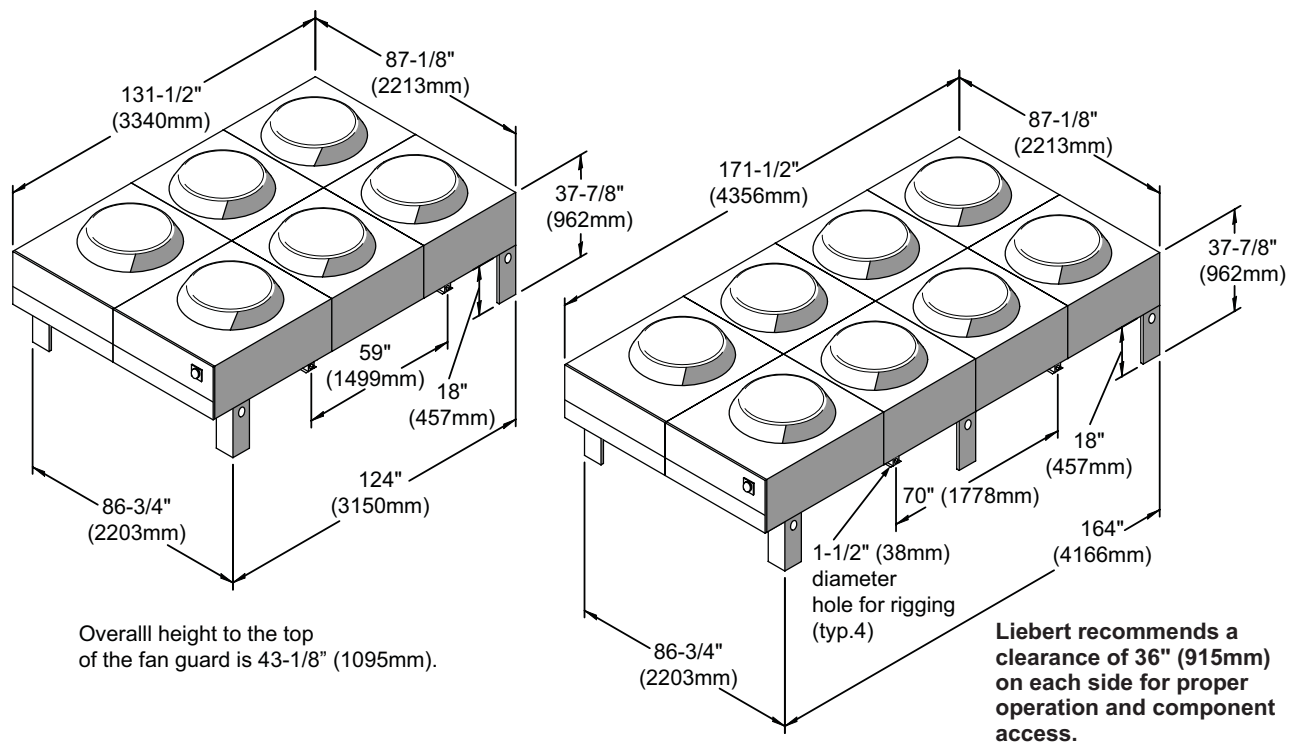


Table 75 Condenser physical data

Model #	Number of Fans	Number of Circuits	Connection Size, OD, In.		Net Weight lb (kg)
			Hot Gas	Liquid	
Standard Models					
CD*165	2	2	7/8	5/8	425 (193)
CD*205	2	2	1-1/8	7/8	495 (225)
CD*251	3	2	1-1/8	7/8	500 (227)
CD* 308	3	2	1-3/8	1-1/8	670 (304)
CD* 415	4	2	1-3/8	1-1/8	840 (381)
CD*510	4	2	1-5/8	1-1/8	1188 (539)
CD*616	6	2	1-5/8	1-1/8	1380 (626)
Quiet-Line Models					
DCD*143	2	2	1-1/8	7/8	515 (234)
DCD*214	3	2	1-1/8	7/8	840 (381)
DCD*286	4	2	1-1/8	7/8	1105 (501)
DCD*409	6	2	1-5/8	1-1/8	1380 (626)
DCD*572	8	2	2-1/8	1-1/8	2430 (1102)

- Interconnection piping (field-supplied and installed) required. Configure piping for parallel refrigerant flow between condenser sections.

**Table 76 Drycooler physical data**

<b>Model #</b>	<b>No. of Fans</b>	<b>Internal Volume, gal. (L)</b>	<b>Net Weight lb. (kg)</b>
-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.

## ELECTRICAL DATA - CONDENSERS AND DRYCOOLERS

Table 77 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	25	30.6	31.8	35
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	15	21.0	21.9	25	28.0	28.9	30
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	15
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 78 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	15
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 79 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



## PUMP PACKAGES &amp; EXPANSION TANK - OPTIONS

Figure 64 Pump package

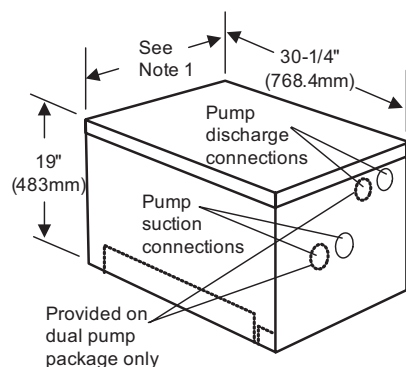
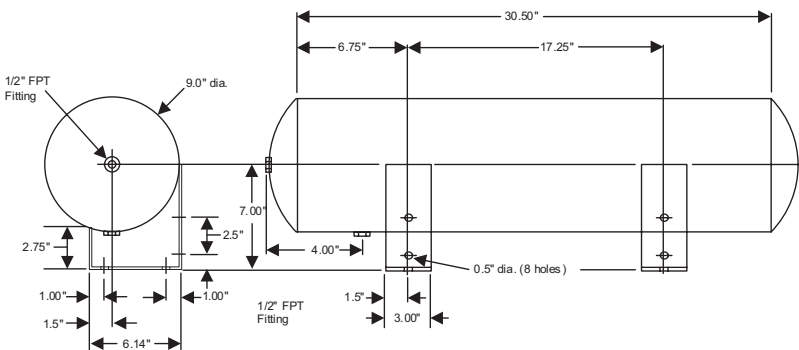


Figure 64 Expansion tank

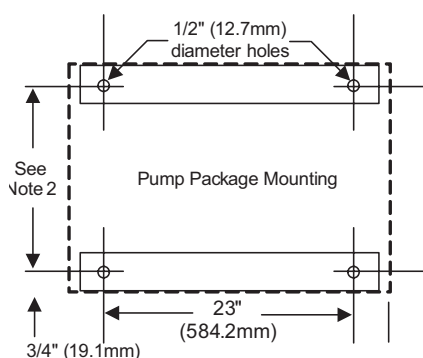


## Expansion Tank (P/N 1C16717P1)

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.

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 representative.

Table 80 Pump data

Pump Model	Connections		hp	ph	Electric @ 60Hz			
	NPT Suction	Female Discharge			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):

$$\text{Total FLA} = \text{Pump FLA} + \text{Drycooler FLA}$$

To Calculate Total Pump and Drycooler Wire Size Amps (WSA):

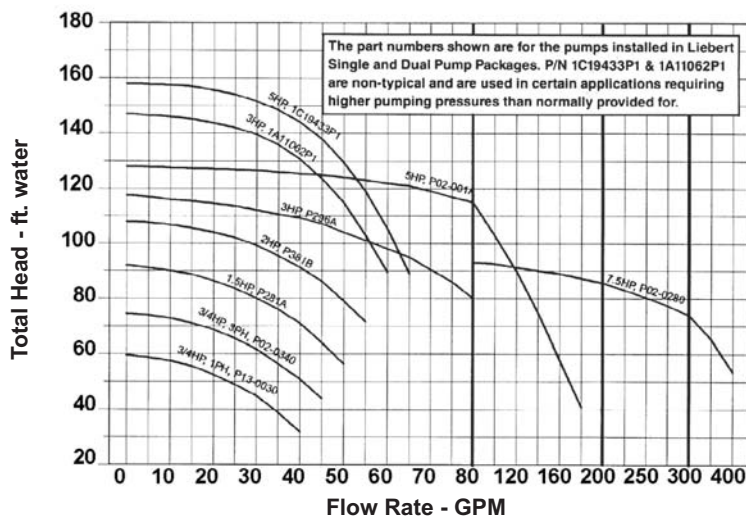
$$\text{Total WSA} = \text{Largest Motor FLA} \times 1.25 + \text{Sum of other Motor FLA values}$$

To Calculate Total Pump and Drycooler Maximum Overcurrent Protective Device (OPD):

$$\text{Total OPD} = \text{Largest Motor FLA} \times 4.0 + \text{Sum of other Motor FLA values}$$

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

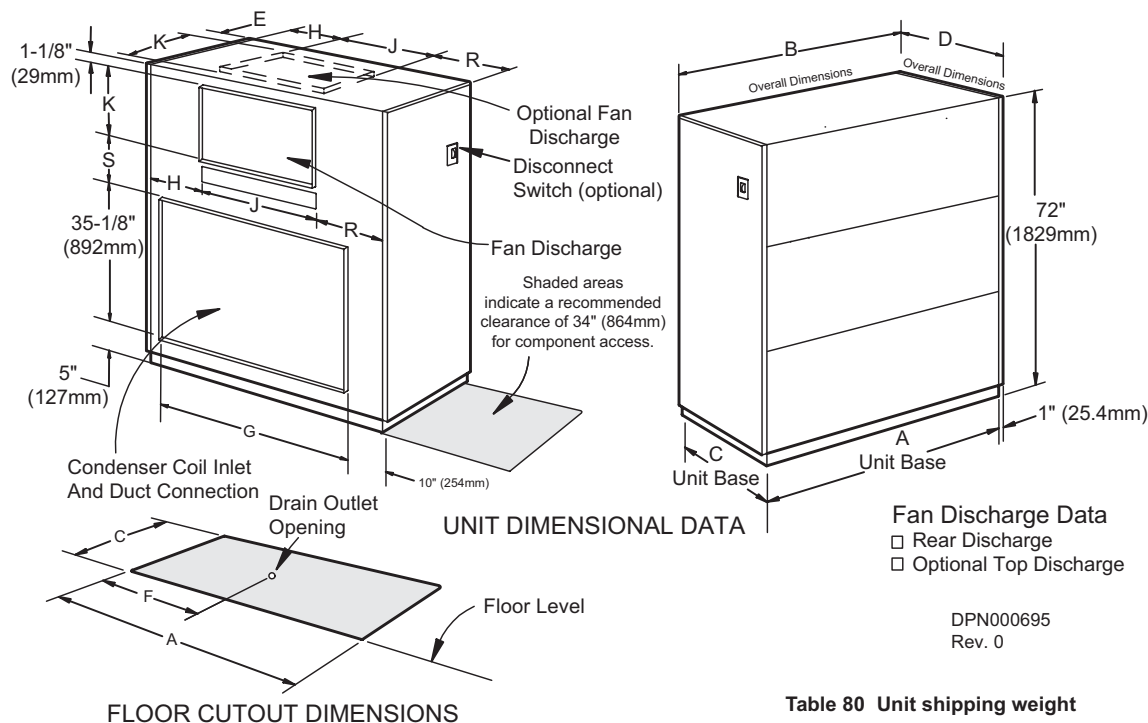


Table 80 Unit shipping weight

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 81 Motor amperage

hp	Volts, 60 Hz								Volts, 50 Hz							
	208				230				460				575			
	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA
2.0	7.8	51.0	6.8	44.0	3.4	22.0	2.7	17.6	7.0	50.6	6.1	44.0	3.5	25.3		
3.0	10.6	73.6	9.6	64.0	4.8	32.0	3.9	25.6	10.1	58.5	8.8	51.0	5.1	29.3		
5.0	16.7	106.0	15.2	88.0	7.6	44.0	6.1	35.2	15.8	95.0	13.7	82.7	7.9	47.5		
7.5	25.3	129.4	22.0	111.4	11.0	55.7	9.0	44.8	25.1	153.5	21.8	133.5	12.5	76.8		
10.0	30.8	186.0	28.0	162.0	14.0	84.0	11.0	66.0	30.2	165.0	27.6	185.0	15.1	82.5		
15.0	46.2	267.0	42.0	225.0	21.0	116.0	17.0	93.0								

FLA = Full Load Amps; LRA = Lock Rotor Amps

Table 82 Motor performance data

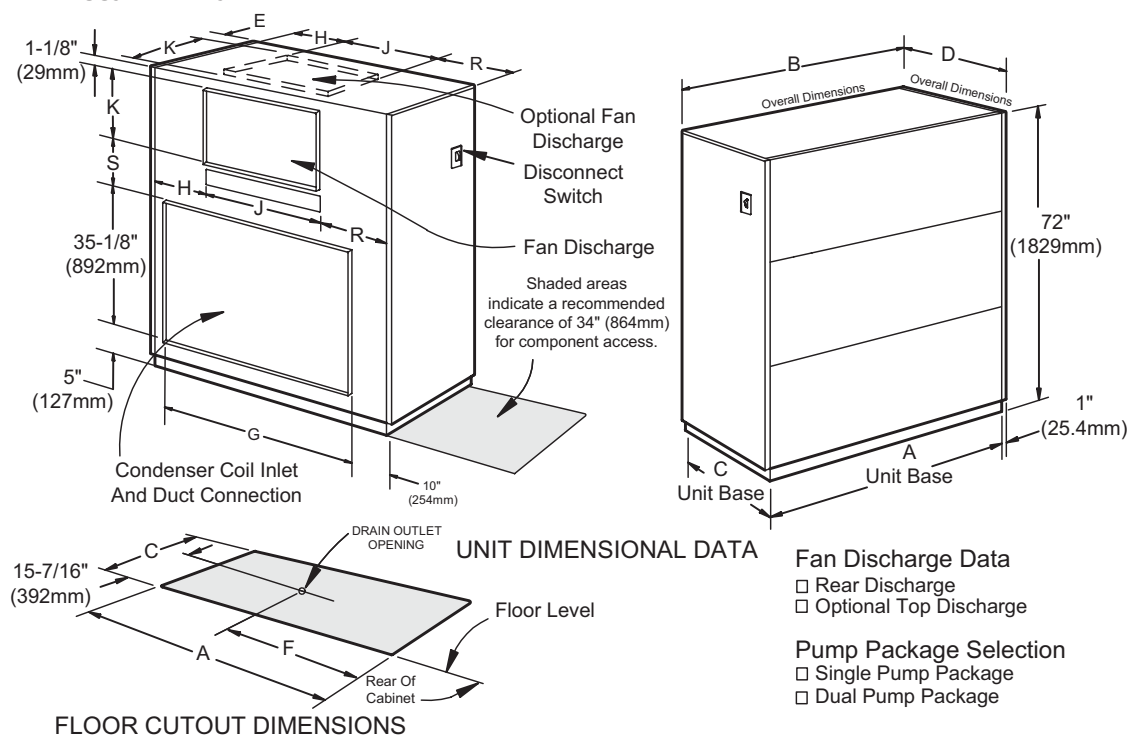
Model	No. of Fans	CFM / m <sup>3</sup> / hr	hp/RPM			
			Ext. Static Pressure - in. (Pa)			
			0.25 (62.3)	0.50 (125)	0.75 (187)	1.0 (249)
PB-350A	2	7600/12,920	2/580	3/650	3/720	3/790
PB-550A	2	6600/11,200	2/575	3/650	3/725	3/800
PB-675A	2	6900/11,730	2/605	3/680	3/750	3/820
PB-925A	2	12,500/21,250	7-1/2/760	7-1/2/810	7-1/2/870	7-1/2/920
PB-1100A	2	12,300/20,910	7-1/2/780	7-1/2/830	7-1/2/890	7-1/2/940
PB-1350A	2	16,500/28,050	10/640	10/695	10/740	15/790

Table 83 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)

## 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.

DPN000710  
Rev. 0

Table 84 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 85 Electrical data, 60 Hz, 3 ph

Model	Sys. Volts	Drycooler			Std. Pump Package			Total Package			Opt. Pump Package			Total Package		
		hp	FLA	WSA	hp	FLA	WSA	FLA	WSA	MFS	hp	FLA	WSA	FLA	WSA	MFS
PD-102	208	3	10.6	13.2	1.5	5.7	7.2	16.3	18.9	45	2	7.5	9.4	18.0	20.7	45
	230	3	9.6	12.0	1.5	5.2	6.5	14.8	17.2	40	2	6.8	8.5	16.4	18.8	45
	460	3	4.8	6.0	1.5	2.6	3.3	7.4	8.6	20	2	3.4	4.3	8.2	9.4	20
	575	3	3.9	4.9	1.5	2.1	2.6	6.0	7.0	15	2	2.7	3.4	6.6	7.6	15
PD-150	208	3	10.6	13.2	2	7.5	9.4	18.0	20.7	45	3	10.6	13.2	21.1	23.8	50
	230	3	9.6	12.0	2	6.8	8.5	16.4	18.8	45	3	9.6	12.0	19.2	21.6	45
	460	3	4.8	6.0	2	3.4	4.3	8.2	9.4	20	3	4.8	6.0	9.6	10.8	20
	575	3	3.9	4.9	2	2.7	3.4	6.6	7.6	15	3	3.9	4.9	7.8	8.8	15
PD-223	208	7.5	24.2	30.3	3	10.6	13.2	34.8	40.8	110	5	16.7	20.9	40.9	47.0	110
	230	7.5	22.0	27.5	3	9.6	12.0	31.6	37.1	90	5	15.2	19.0	37.2	42.7	100
	460	7.5	11.0	13.8	3	4.8	6.0	15.8	18.6	45	5	7.6	9.5	18.6	21.4	50
	575	7.5	9.0	11.3	3	3.9	4.9	12.9	15.2	40	5	6.1	7.6	15.1	17.4	40
PD-290	208	7.5	24.2	30.3	5	16.7	20.9	40.9	47.0	110	3	10.6	13.2	34.8	40.8	100
	230	7.5	22.0	27.5	5	15.2	19.0	37.2	42.7	100	3	9.6	12.0	31.6	37.1	90
	460	7.5	11.0	13.8	5	7.6	9.5	18.6	21.4	50	3	4.8	6.0	15.8	18.6	45
	575	7.5	9.0	11.3	5	6.1	7.6	15.1	17.4	40	3	3.9	4.9	12.9	15.2	40
PD-333	208	10	30.8	38.5	5	16.7	20.9	47.5	55.2	110	3	10.6	13.2	41.4	49.1	125
	230	10	28.0	35.0	5	15.2	19.0	43.2	50.2	125	3	9.6	12.0	37.6	44.6	110
	460	10	14.0	17.5	5	7.6	9.5	21.6	25.1	60	3	4.8	6.0	18.8	22.3	60
	575	10	11.0	13.8	5	6.1	7.6	17.1	19.9	50	3	3.9	4.9	14.9	17.7	45

ph = phase; FLA = Full Load Amps; WSA = Wire Size Amp; MFS = Max. Fuse Size

Table 86 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 or upflow 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.

#### 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. Site inspection by contractor.s

##### 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 MERV8 rating (45% ASHRAE 52.1) or ASHRAE 52.2 MERV11 rating (60-65% ASHRAE 52.1).

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

Filters shall be 2" ASHRAE 52.2 MERV7 (40% ASHRAE 52.1) pre-filter, with 2" ASHRAE 52.2 MERV11 (60-65% ASHRAE 52.1) 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.

### **2.5.1 Hot Water Reheat**

The hot water reheat coil shall have copper tubes and aluminum fins with a capacity of \_\_\_\_ BTUH (kW) when supplied with \_\_\_\_ °F (°C) entering water temperature at \_\_\_\_ GPM (l/s) flow rate. Maximum pressure drop shall be \_\_\_\_ psi (kPa). The hot water reheat control system shall be factory pre-piped with a two-way modulating control valve and cleanable Y-strainer.

## **2.6 Dual Refrigeration System**

Each unit shall include two (2) independent refrigeration circuits and shall include hot gas mufflers (semi-hermetic compressor units only), liquid line filter driers, refrigerant sight glass with moisture indicator, 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 local representative 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. (m<sup>2</sup>) 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-22 Refrigerant**

The system shall be designed for use with R-22 refrigerant.

### **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 iCOM™ Microprocessor Control With Small Graphic Display

The 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.

**Hot Water/Econ-O-Coil Flush Cycles** - Hot water reheat coils and Econ-O-Coils are periodically flushed 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 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 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 65-85°F (18-29°C)\*
- Temperature Sensitivity +1-10°F (0.6-5.6°C)
- Humidity Setpoint 20-80% RH\*
- Humidity Sensitivity 1-30% RH
- High Temperature Alarm 35-90°F (2-32°C)
- Low Temperature Alarm 35-90°F (2-32°C)
- 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 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 iCOM Microprocessor Control With Large Graphic Display (Optional)**

The iCOM unit control with large graphic display shall include all of the features as the 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 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 iCOM Wall Mount Large Graphic Display (Optional)**

The 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 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 125°F (52°C). 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 Liebert 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 Lee-Temp System**

The winter control system for the air-cooled condenser shall be Lee-Temp. The Lee-Temp system shall allow startup and positive head pressure control with ambient temperatures as low as -30°F (-34.4°C). The 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 Lee-Temp receiver shall be factory-insulated and mounted ready for the field connection to the air-cooled condenser. The 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. 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 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-22 or 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 drycooler shall be the low profile, slow speed, multiple direct drive, propeller fan type. The drycooler shall be constructed of aluminum and contain a copper tube aluminum fin coil with an integral electric control panel and disconnect switch. The drycooler shall be designed for \_\_\_\_ °F (°C) ambient.

### 2.11.1 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.

### 2.11.1 Dual Pump Package

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



## **2.12 Liqui-tect Sensors**

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

## **2.13 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.

### **2.13.1 Seismic Rated Floor Stand (Optional)**

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

### **2.13.2 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.

## **2.14 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. A door shall be included in the front of the plenum to enable front filter access. Air shall enter the plenum from the top.

## **2.14 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.

## **2.14 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.

**NOTES**





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

Emerson Network Power, the global leader in enabling business-critical continuity, ensures network resiliency and adaptability through a family of technologies—including Liebert power and cooling technologies—that protect and support business-critical systems. Liebert solutions employ an adaptive architecture that responds to changes in criticality, density and capacity. Enterprises benefit from greater IT system availability, operational flexibility and reduced capital equipment and operating costs.

While every precaution has been taken to ensure the accuracy and completeness of this literature, Liebert Corporation assumes no responsibility and disclaims all liability for damages resulting from use of this information or for any errors or omissions.

© 2007 Liebert Corporation

All rights reserved throughout the world. Specifications subject to change without notice.

® Liebert is a registered trademark of Liebert Corporation.

All names referred to are trademarks

or registered trademarks of their respective owners.

SL-18815\_REV0\_R12-07

### Emerson Network Power.

The global leader in enabling *Business-Critical Continuity*.

■ AC Power

■ Connectivity

■ DC Power

■ Embedded Computing

■ Embedded Power

■ Monitoring

■ Outside Plant

■ Power Switching & Controls

■ Precision Cooling

### Technical Support / Service

#### Web Site

[www.liebert.com](http://www.liebert.com)

#### Monitoring

800-222-5877

[monitoring@emersonnetworkpower.com](mailto:monitoring@emersonnetworkpower.com)

Outside the US: 614-841-6755

#### Single-Phase UPS

800-222-5877

[upstech@emersonnetworkpower.com](mailto:upstech@emersonnetworkpower.com)

Outside the US: 614-841-6755

#### Three-Phase UPS

800-543-2378

[powertech@emersonnetworkpower.com](mailto:powertech@emersonnetworkpower.com)

#### Environmental Systems

800-543-2778

Outside the United States

614-888-0246

#### Locations

##### United States

1050 Dearborn Drive

P.O. Box 29186

Columbus, OH 43229

##### Europe

Via Leonardo Da Vinci 8

Zona Industriale Tognana

35028 Piove Di Sacco (PD) Italy

+39 049 9719 111

Fax: +39 049 5841 257

##### Asia

7/F, Dah Sing Financial Centre

108 Gloucester Road, Wanchai

Hong Kong

852 2572220

Fax: 852 28029250

### EmersonNetworkPower.com

■ Racks & Integrated Cabinets

■ Services

■ Surge Protection

*Business-Critical Continuity*, Emerson Network Power and the Emerson Network Power logo are trademarks and service marks of Emerson Electric Co.

©2007 Emerson Electric Co.