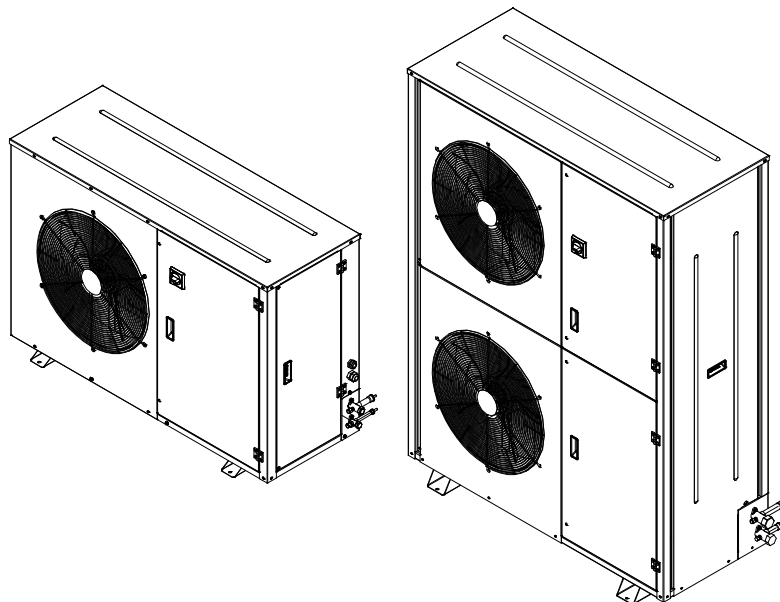

V3 INVERTER SINGLE SCROLL Commercial Condensing Units Variable Capacity

Medium Temperature Applications

ISSUE: 01.03.2021



IMPORTANT!

READ BEFORE PROCEEDING!

GENERAL SAFETY GUIDELINES




This guideline is intended for users to ensure safe installation, operation and maintenance of J&E Hall INVERTER condensing units. This guideline is not intended to replace the system expertise available from the system manufacturers.

This equipment is a relatively complicated apparatus. During installation, operation, maintenance or service, individuals may be exposed to certain components or conditions including, but not limited to: refrigerants, materials under pressure, rotating components, and both high and low voltage. Each of these items has the potential, if misused or handled improperly, to cause bodily injury or death. It is the obligation and responsibility of operating/service personnel to identify and recognize these inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in serious damage to the equipment and the property in which it is situated, as well as severe personal injury or death to themselves and people at the site.

This document is intended for use by owner-authorized operating/service personnel. It is expected that these individuals possess independent training that will enable them to perform their assigned tasks properly and safely. It is essential that, prior to performing any task on this equipment, this individual shall have read and understood this document and any referenced materials. This individual shall also be familiar with and comply with all applicable governmental standards and regulations pertaining to the task in question.

SAFETY SYMBOLS

The following symbols are used in this document to alert the reader to specific situations:

| | |
|--|---|
|  WARNING | Warning! Risk of serious injury or death to person! |
|  CAUTION | Caution! Danger which can lead to serious damages! |
|  NOTICE | Notice! Risk of damage to equipment! |

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Product Features

J&E Hall INVERTER condensing unit adopt stepless inverter scroll technology with energy efficiency 20-30% higher in a flexible plug and play package, for medium and low temperature refrigeration application.

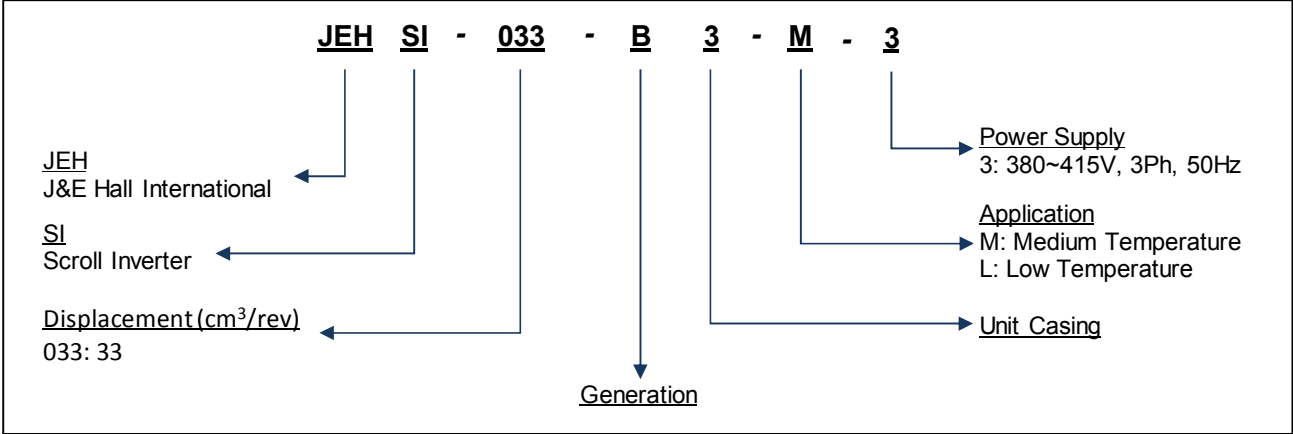
Standard features for all medium and low temperature model:

- SCI hermetic high pressure dome BLDC scroll compressor and crankcase heater
- Compressor Drive (with EMI filter) integrates protection functions: short circuit, overcurrent, ground fault, over voltage and under voltage, over temperature.
- Advanced programmable controller integrates function of oil speed boost for oil return to compressor, suction and discharge superheat control, ample configuration of alarms.
- Capacity modulation based on fixed pressure set point (floating suction setpoint is available when exploiting serial communication with evaporators)
- Vertical liquid receiver with stop valve and fusible plug (pressure relief valve is offered as option).
- Fitted with brazed type liquid line drier & sight glass
- Oil separator and discharge line non returned valve
- External service valves
- Suction and discharge pressure transducers
- Suction, discharge and ambient temperature sensors
- Low pressure switch (adjustable for pump down) – default: auto reset
- High pressure safety switch (manual reset cartridge type)
- Mains switch for isolation of incoming power supply
- Manual motor starter for isolation and protection on 3phase AC Drive
- Fuse protection for 1phase controller and fan motor
- LCD display
- Flexible pressure hoses
- IP rated control panel
- Fan speed controller
- Acoustic insulation on compressor compartment
- Robust weather proof housing
- BACnet and Modbus Protocol feature
- Approved refrigerants: R448A & R449A

Vapor injection feature for *-L-3* models only, benefitted in wider operating evaporating temperature.

- Brazed plate heat exchanger
- Electronic expansion valve
- Vapor injection temperature sensor
- Vapor injection pressure transducer
- Power failure valve

Nomenclature



Product Label

Daikin Refrigeration Malaysia Sdn. Bhd.
Lot 10, Jalan Perusahaan 8,
Kawasan Perusahaan Pekan Banting,
42700 Banting, Selangor, Malaysia.

| | |
|-----------------------|-------------------------------|
| Model | JEHSI-033-B3-M-3 |
| Serial Number | 20532201-XXX |
| Yr/Mth of Manufacture | YYYY/MM |
| Power Supply | 380~415V/3Ph/50Hz |
| Rated Current | 3.9 A |
| Refrigerant | R448A/449A |
| Protection | IPX4 |
| Max Operating Current | 10 A |
| Unit Type | Refrigeration Condensing Unit |

Design Pressure(PS), bar (MPa) : High 28(2.8) Low 19(1.9)
Design Temperature(TS), °C : High -20/120 Low -40/43

Its functioning relies on fluorinated greenhouse gases

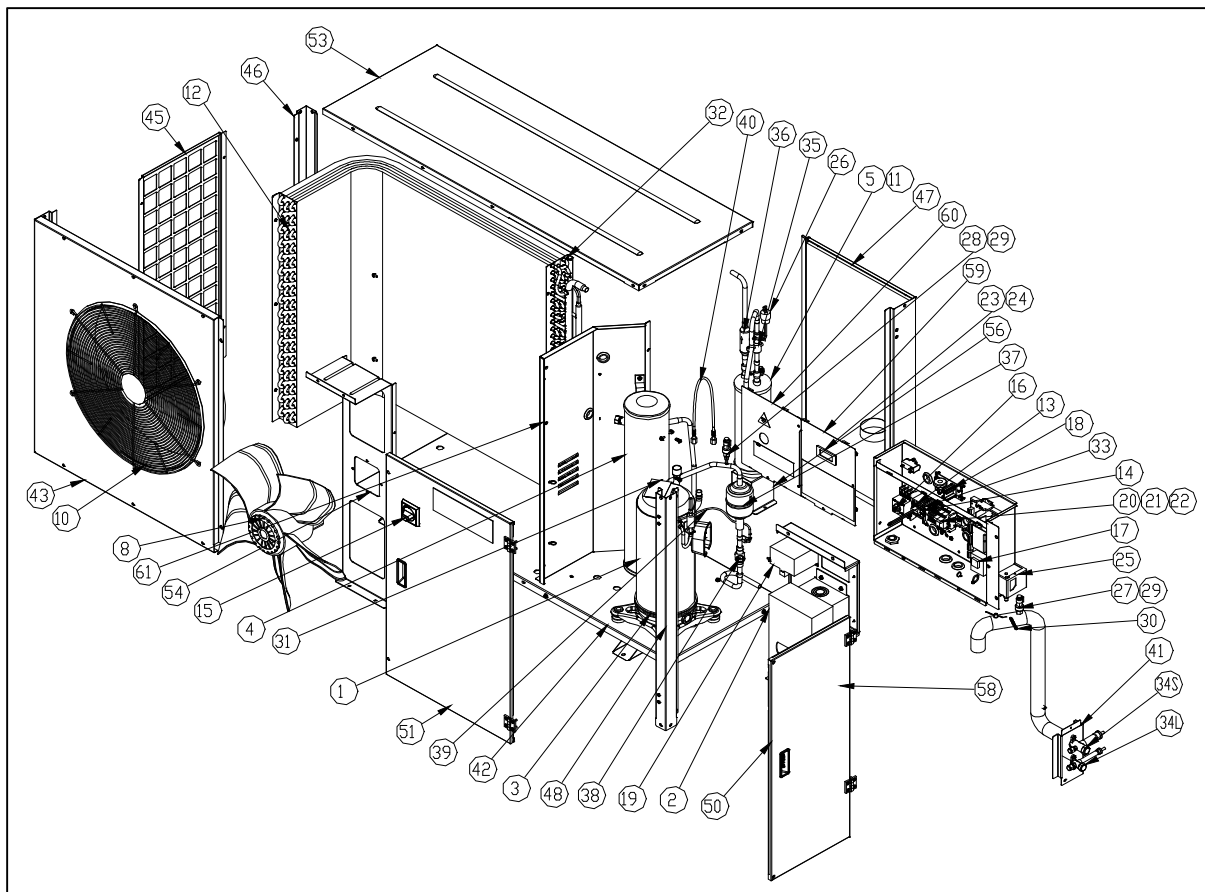
Made in Malaysia

Power Supply Nominal Voltage

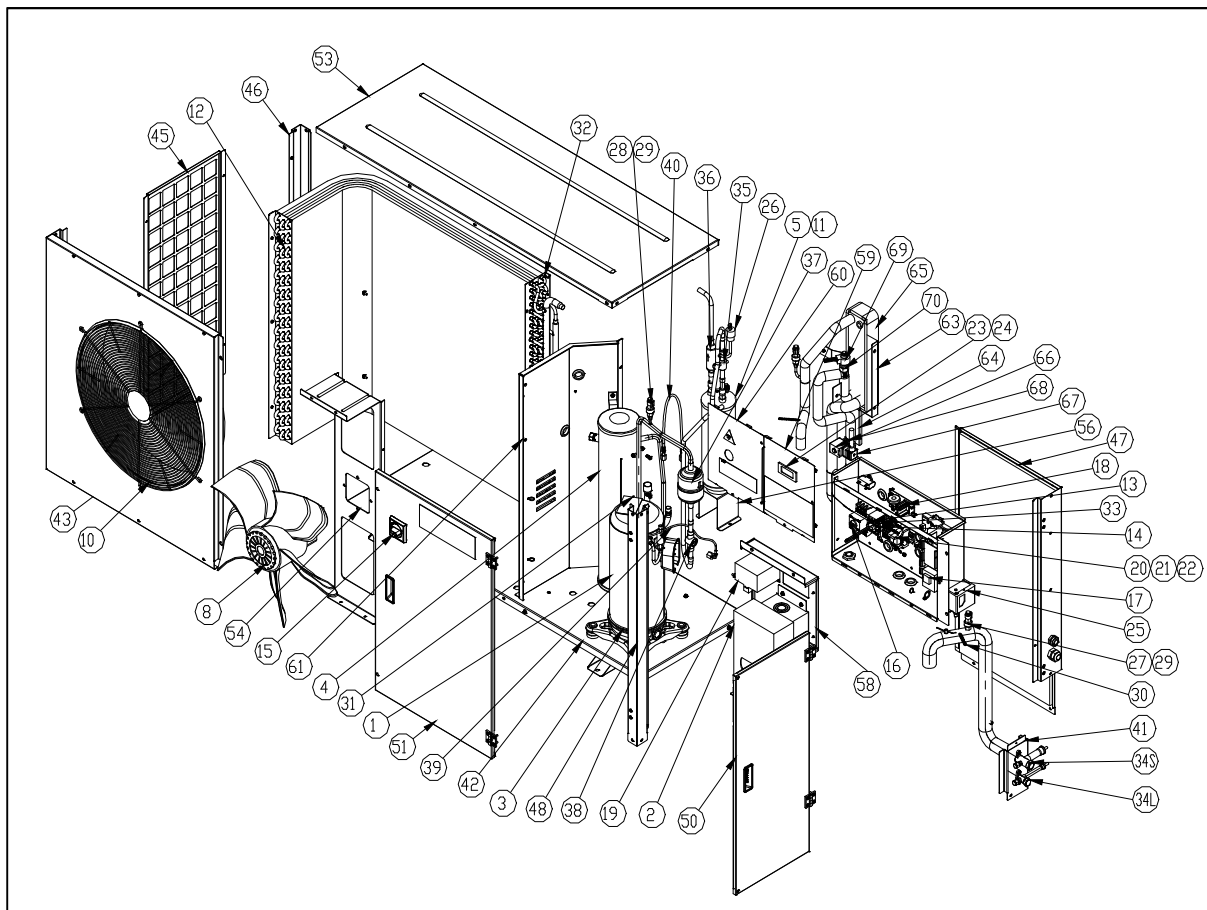
Approved Refrigerant

Exploded Views

JEHSI-033-B3-M-3; JEHSI-066-B3-M-3

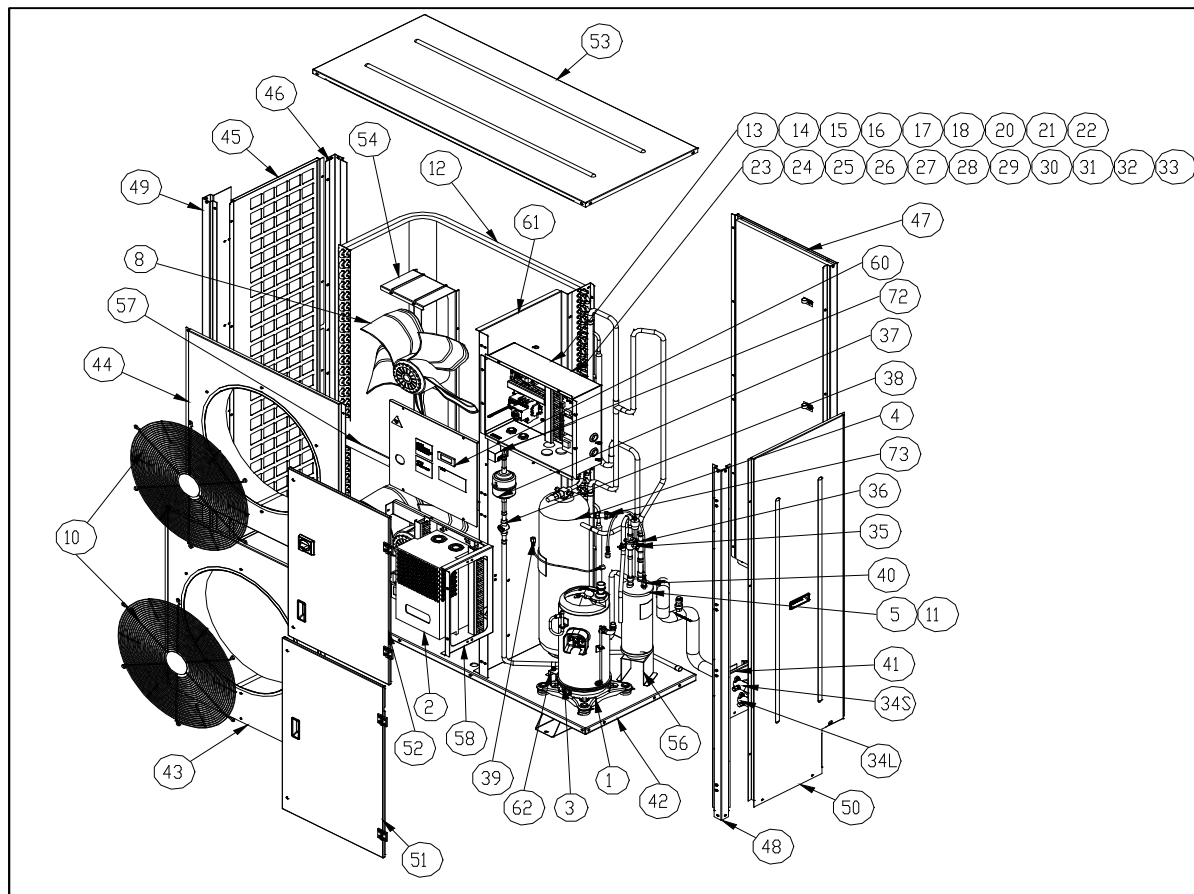


JEHSI-033-B3-L-3; JEHSI-066-B3-L-3

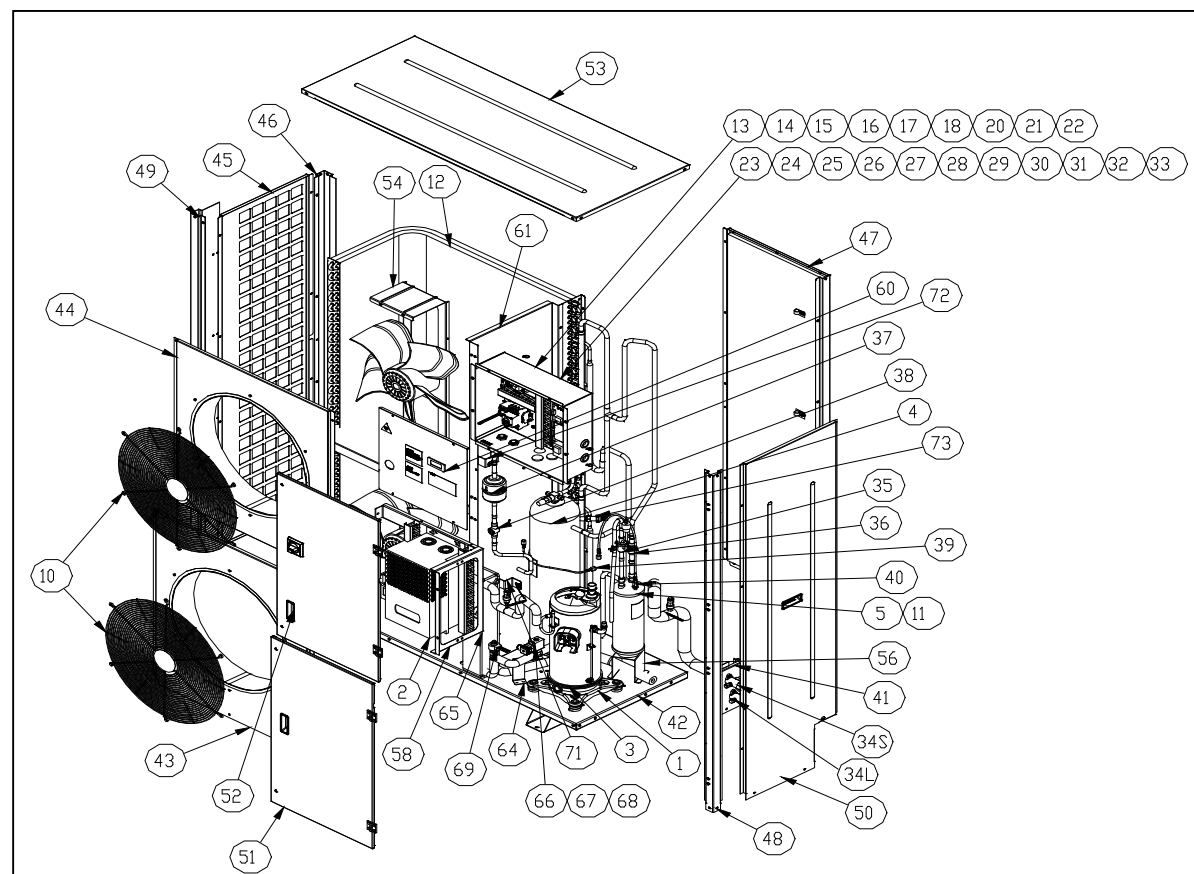


Exploded Views

JEHSI-087-B4-M-3



JEHSI-087-B4-L-3



Exploded Views

Exploded View Indicator

| Item | Description |
|------|--------------------------------|
| 1 | COMPRESSOR |
| 2 | DRIVE |
| 3 | HEATER |
| 4 | LIQ. RECEIVER |
| 5 | OIL SEPARATOR |
| 6 | FAN PROPELLER |
| 7 | FAN MOTOR |
| 8 | FAN |
| 9 | FAN CAPACITOR |
| 10 | FAN GUARD |
| 11 | COMPRESSOR OIL |
| 12 | CONDENSER |
| 13 | ISOLATOR |
| 14 | ISOLATOR-N |
| 15 | ISOLATOR HANDLE |
| 16 | MCB |
| 17 | CONTROLLER |
| 18 | FAN SPEED CONTROLLER |
| 19 | DC CHOKE |
| 20 | CONTROL RELAY |
| 21 | CONTROL RELAY |
| 22 | CONTROL RELAY |
| 23 | REMOTE DISPLAY |
| 24 | CABLE REMOTE DISPLAY |
| 25 | PRESSURE SWITCH LOW |
| 26 | PRESSURE SWITCH HIGH |
| 27 | SENSOR PRESSURE SUCTION |
| 28 | SENSOR PRESSURE DISCHARGE/ VI |
| 29 | CABLE PRESSURE TRANSDUCER |
| 30 | SENSOR TEMPERATURE SUCTION/ VI |
| 31 | SENSOR TEMPERATURE DISCHARGE T |
| 32 | SENSOR TEMPERATURE AMBIENT |
| 33 | FUSE |
| 34 | VALVE SERVICE |
| 35 | VALVE DISCHARGE LINE |
| 36 | VALVE NON - RETURN |
| 37 | FILTER DRIER |
| 38 | SIGHT GLASS |
| 39 | GOMEX LOW PRESSURE |
| 40 | GOMEX OIL RETURN |
| 41 | BRACKET SERVICE VALVE |
| 42 | PANEL BASE |
| 43 | PANEL FAN |
| 44 | PANEL FAN TOP |
| 45 | PANEL LEFT |
| 46 | PILLAR LEFT-REAR |
| 47 | PANEL REAR |
| 48 | PILLAR FRONT RIGHT |
| 49 | PILLAR FRONT LEFT |
| 50 | PANEL RIGHT |
| 51 | PANEL FRONT |
| 52 | PANEL FRONT TOP |
| 53 | PANEL TOP |
| 54 | BRACKET FAN MOTOR |
| 55 | BRACKET ADAPTOR FAN MOTOR |

| | |
|----|---------------------------|
| 56 | BRACKET OIL SEP. |
| 57 | PARTITION FAN |
| 58 | BRACKET DRIVE |
| 59 | CONTROL BOX COVER DISPLAY |
| 60 | CONTROL BOX COVER |
| 61 | PANEL MIDDLE |
| 62 | BRACKET LIQUID PIPE |
| 63 | BRACKET BPHE |
| 64 | BRACKET SOL. VALVE |
| 65 | VI BPHE |
| 66 | VI SOLENOID CABLE |
| 67 | VI SOLENOID COIL |
| 68 | VI SOLENOID BODY |
| 69 | VI- EXV COIL |
| 70 | VI- EXV BODY |
| 71 | BRACKET INJECTION |
| 72 | BRACKET LIQ LINE |

Specifications

Unit Data

| Casing | Model | Appl. | Compressor | | | Oil Separator | Electrical Data | | | | Unit Connections | | Coil Volume | Air flow | Liquid Receiver |
|--------|------------------|-------|-------------|--------------|------------|---------------|-----------------|------|------------|---------|------------------|---------|-------------|----------|-----------------|
| | | | Model | Displacement | Oil Charge | | Compressor | | Fan Motors | | Liquid | Suction | | | |
| | | | | (cm³/rev) | (L) | (L) | NC | MCC | No. | FLC (A) | (inch) | (inch) | (L) | (m³/h) | (L) |
| 3 | JEHSI-033-B3-M-3 | MT | AGK33FDAMTS | 33.2 | 1.9 | 0.6 | 3.9 | 10.8 | 1 | 0.5 | 1/2" | 5/8" | 4.42 | 3350 | 6.2 |
| | JEHSI-066-B3-M-3 | | AGK66FDBMTS | 66.0 | 2.3 | 0.6 | 7.0 | 17.5 | 1 | 0.9 | 1/2" | 3/4" | 6.89 | 4100 | 6.2 |
| 4 | JEHSI-087-B4-M-3 | | AGK87FDCMTS | 87.1 | 2.3 | 0.6 | 8.8 | 24.0 | 2 | 1.8 | 3/4" | 7/8" | 8.73 | 8500 | 13.6 |
| 3 | JEHSI-033-B3-L-3 | MT/LT | AGK33FDAMTS | 33.2 | 1.9 | 0.6 | 4.4 | 10.8 | 1 | 0.5 | 1/2" | 5/8" | 4.42 | 3350 | 6.2 |
| | JEHSI-066-B3-L-3 | | AGK66FDBMTS | 66.0 | 2.3 | 0.6 | 7.9 | 17.5 | 1 | 0.9 | 1/2" | 3/4" | 6.89 | 4100 | 6.2 |
| 4 | JEHSI-087-B4-L-3 | | AGK87FDCMTS | 87.1 | 2.3 | 0.6 | 9.2 | 24.0 | 2 | 1.8 | 3/4" | 7/8" | 8.73 | 8500 | 13.6 |

- Compressor Lubricant: K) Hermetic Oil FVC56EA

Unit SEPR, Sound Data and Dimension

| Model | SEPR (MT condition) | | SPL @ 10m dB(A) | Overall Dimensions (mm) | | | Mounting Dimensions (mm) | | Dry Weight | Gross Weight |
|------------------|---------------------|-------------|-----------------|-------------------------|-----|-------|--------------------------|-----|------------|--------------|
| | R448A, SH10 | R449A, SH10 | | W | D | (kgs) | W | D | (kgs) | (kgs) |
| | | | | | | | | | | |
| JEHSI-033-B3-M-3 | 3.03 | 3.03 | 31.3 | 1334 | 546 | 872 | 945 | 500 | 116 | 154 |
| JEHSI-066-B3-M-3 | 3.39 | 3.39 | 39.8 | 1334 | 546 | 872 | 945 | 500 | 134 | 172 |
| JEHSI-087-B4-M-3 | 3.60 | 3.60 | 44.1 | 1348 | 600 | 1727 | 940 | 560 | 212 | 271 |
| JEHSI-033-B3-L-3 | 3.09 | 3.09 | 31.4 | 1334 | 546 | 872 | 945 | 500 | 127 | 165 |
| JEHSI-066-B3-L-3 | 3.49 | 3.49 | 39.8 | 1334 | 546 | 872 | 945 | 500 | 145 | 183 |
| JEHSI-087-B4-L-3 | 3.77 | 3.77 | 44.1 | 1348 | 600 | 1727 | 940 | 560 | 225 | 284 |

Sound Pressure Level (SPL) measured in an anechoic room at -10°C Te/+32°C Ta MT conditions at 60rps. Alternative conditions may produce different results.

The performance data shown in the tables on pages 7 to 12 has the following criteria:

- Te: Evaporating Temperature
- Ta: Ambient Temperature
- CC: Cooling Capacity (Watts)
- PC: Power Consumed (Watts)
- Data presented in accordance with BS EN13215:2016
- SH: Suction Superheat
- SC: Subcooling
- COP: Coefficient of Performance

Performance Tables

Medium Temperature (R448A/ R449A): 10K SH / 0K SC

| MODEL | SPEED, rps | Te Ta | | -20 | -15 | -10 | -5 | 0 | 5 |
|------------------|------------|----------|-----|------|------|------|------|------|-------|
| JEHSI-033-B3-M-3 | 30 | 27 | CC | 1567 | 1881 | 2246 | 2667 | 3149 | 3695 |
| | 30 | 27 | PC | 884 | 930 | 975 | 1020 | 1066 | 1111 |
| | 30 | 27 | COP | 1.77 | 2.02 | 2.30 | 2.61 | 2.95 | 3.33 |
| | 30 | 32 | CC | 1497 | 1795 | 2142 | 2542 | 2999 | 3517 |
| | 30 | 32 | PC | 905 | 978 | 1050 | 1123 | 1195 | 1268 |
| | 30 | 32 | COP | 1.65 | 1.84 | 2.04 | 2.26 | 2.51 | 2.77 |
| | 30 | 35 | CC | 1453 | 1742 | 2077 | 2463 | 2905 | 3406 |
| | 30 | 35 | PC | 918 | 1006 | 1095 | 1184 | 1272 | 1361 |
| | 30 | 35 | COP | 1.58 | 1.73 | 1.90 | 2.08 | 2.28 | 2.50 |
| | 30 | 38 | CC | 1408 | 1687 | 2011 | 2383 | 2809 | 3293 |
| | 30 | 38 | PC | 930 | 1035 | 1140 | 1245 | 1350 | 1455 |
| | 30 | 38 | COP | 1.51 | 1.63 | 1.76 | 1.91 | 2.08 | 2.26 |
| | 60 | 27 | CC | 3239 | 3873 | 4582 | 5368 | 6231 | 7173 |
| | 60 | 27 | PC | 1733 | 1757 | 1780 | 1803 | 1827 | 1850 |
| | 60 | 27 | COP | 1.87 | 2.20 | 2.57 | 2.98 | 3.41 | 3.88 |
| | 60 | 32 | CC | 3058 | 3665 | 4348 | 5110 | 5951 | 6875 |
| | 60 | 32 | PC | 1750 | 1840 | 1930 | 2020 | 2110 | 2200 |
| | 60 | 32 | COP | 1.75 | 1.99 | 2.25 | 2.53 | 2.82 | 3.13 |
| | 60 | 35 | CC | 2943 | 3535 | 4203 | 4949 | 5778 | 6693 |
| | 60 | 35 | PC | 1760 | 1890 | 2020 | 2150 | 2280 | 2410 |
| | 60 | 35 | COP | 1.67 | 1.87 | 2.08 | 2.30 | 2.53 | 2.78 |
| | 60 | 38 | CC | 2825 | 3401 | 4053 | 4785 | 5602 | 6507 |
| | 60 | 38 | PC | 1770 | 1940 | 2110 | 2280 | 2450 | 2620 |
| | 60 | 38 | COP | 1.60 | 1.75 | 1.92 | 2.10 | 2.29 | 2.48 |
| | 80 | 27 | CC | 4116 | 4906 | 5795 | 6788 | 7891 | 9110 |
| | 80 | 27 | PC | 2587 | 2661 | 2735 | 2809 | 2883 | 2957 |
| | 80 | 27 | COP | 1.59 | 1.84 | 2.12 | 2.42 | 2.74 | 3.08 |
| | 80 | 32 | CC | 3908 | 4659 | 5503 | 6446 | 7496 | 8657 |
| | 80 | 32 | PC | 2470 | 2640 | 2810 | 2980 | 3150 | 3320 |
| | 80 | 32 | COP | 1.58 | 1.76 | 1.96 | 2.16 | 2.38 | 2.61 |
| | 80 | 35 | CC | 3780 | 4506 | 5322 | 6235 | 7252 | 8379 |
| | 80 | 35 | PC | 2400 | 2628 | 2855 | 3082 | 3310 | 3537 |
| | 80 | 35 | COP | 1.57 | 1.71 | 1.86 | 2.02 | 2.19 | 2.37 |
| | 80 | 38 | CC | 3649 | 4349 | 5137 | 6020 | 7003 | 8096 |
| | 80 | 38 | PC | 2330 | 2615 | 2900 | 3185 | 3470 | 3755 |
| | 80 | 38 | COP | 1.57 | 1.66 | 1.77 | 1.89 | 2.02 | 2.16 |
| | 100 | 27 | CC | 5068 | 6004 | 7051 | 8217 | 9511 | 10938 |
| | 100 | 27 | PC | 3008 | 3182 | 3355 | 3528 | 3702 | 3875 |
| | 100 | 27 | COP | 1.68 | 1.89 | 2.10 | 2.33 | 2.57 | 2.82 |
| | 100 | 32 | CC | 4826 | 5713 | 6704 | 7807 | 9030 | 10380 |
| | 100 | 32 | PC | 3160 | 3385 | 3610 | 3835 | 4060 | 4285 |
| | 100 | 32 | COP | 1.53 | 1.69 | 1.86 | 2.04 | 2.22 | 2.42 |
| | 100 | 35 | CC | 4678 | 5535 | 6491 | 7554 | 8734 | 10037 |
| | 100 | 35 | PC | 3125 | 3412 | 3700 | 3988 | 4275 | 4563 |
| | 100 | 35 | COP | 1.50 | 1.62 | 1.75 | 1.89 | 2.04 | 2.20 |
| | 100 | 38 | CC | 4527 | 5353 | 6274 | 7297 | 8433 | 9760 |
| | 100 | 38 | PC | 3090 | 3440 | 3790 | 4140 | 4490 | 4840 |
| | 100 | 38 | COP | 1.47 | 1.56 | 1.66 | 1.76 | 1.88 | 2.02 |

Performance Tables

Medium Temperature (R448A/ R449A): 10K SH / 0K SC

| MODEL | SPEED, rps | Te Ta | | -20 | -15 | -10 | -5 | 0 | 5 |
|------------------|------------|----------|-----|------|-------|-------|-------|-------|-------|
| JEHSI-066-B3-M-3 | 30 | 27 | CC | 2937 | 4130 | 5324 | 6517 | 7710 | 8903 |
| | 30 | 27 | PC | 1706 | 1749 | 1793 | 1836 | 1880 | 1924 |
| | 30 | 27 | COP | 1.72 | 2.36 | 2.97 | 3.55 | 4.10 | 4.63 |
| | 30 | 32 | CC | 2827 | 3897 | 4966 | 6036 | 7105 | 8175 |
| | 30 | 32 | PC | 1770 | 1860 | 1950 | 2040 | 2130 | 2220 |
| | 30 | 32 | COP | 1.60 | 2.09 | 2.55 | 2.96 | 3.34 | 3.68 |
| | 30 | 35 | CC | 2761 | 3756 | 4752 | 5747 | 6742 | 7737 |
| | 30 | 35 | PC | 1810 | 1928 | 2045 | 2163 | 2280 | 2397 |
| | 30 | 35 | COP | 1.53 | 1.95 | 2.32 | 2.66 | 2.96 | 3.23 |
| | 30 | 38 | CC | 2695 | 3616 | 4537 | 5458 | 6379 | 7300 |
| | 30 | 38 | PC | 1850 | 1995 | 2140 | 2285 | 2430 | 2575 |
| | 30 | 38 | COP | 1.46 | 1.81 | 2.12 | 2.39 | 2.63 | 2.83 |
| | 60 | 27 | CC | 5004 | 7134 | 9263 | 11393 | 13523 | 15653 |
| | 60 | 27 | PC | 3103 | 3347 | 3592 | 3836 | 4080 | 4324 |
| | 60 | 27 | COP | 1.61 | 2.13 | 2.58 | 2.97 | 3.31 | 3.62 |
| | 60 | 32 | CC | 4787 | 6694 | 8600 | 10507 | 12413 | 14320 |
| | 60 | 32 | PC | 3270 | 3560 | 3850 | 4140 | 4430 | 4720 |
| | 60 | 32 | COP | 1.46 | 1.88 | 2.23 | 2.54 | 2.80 | 3.03 |
| | 60 | 35 | CC | 4805 | 6540 | 8276 | 10011 | 11747 | 13483 |
| | 60 | 35 | PC | 3463 | 3758 | 4052 | 4346 | 4640 | 4934 |
| | 60 | 35 | COP | 1.39 | 1.74 | 2.04 | 2.30 | 2.53 | 2.73 |
| | 60 | 38 | CC | 4781 | 6356 | 7931 | 9506 | 11081 | 12679 |
| | 60 | 38 | PC | 3630 | 3935 | 4240 | 4545 | 4850 | 5155 |
| | 60 | 38 | COP | 1.32 | 1.62 | 1.87 | 2.09 | 2.28 | 2.46 |
| | 80 | 27 | CC | 8479 | 10114 | 11749 | 13383 | 15018 | 16653 |
| | 80 | 27 | PC | 4402 | 4779 | 5156 | 5533 | 5910 | 6287 |
| | 80 | 27 | COP | 1.93 | 2.12 | 2.28 | 2.42 | 2.54 | 2.65 |
| | 80 | 32 | CC | 7723 | 9386 | 11049 | 12712 | 14375 | 16038 |
| | 80 | 32 | PC | 4540 | 4995 | 5450 | 5905 | 6360 | 6815 |
| | 80 | 32 | COP | 1.70 | 1.88 | 2.03 | 2.15 | 2.26 | 2.35 |
| | 80 | 35 | CC | 7153 | 8862 | 10571 | 12280 | 13989 | 15698 |
| | 80 | 35 | PC | 4690 | 5175 | 5660 | 6145 | 6630 | 7115 |
| | 80 | 35 | COP | 1.53 | 1.71 | 1.87 | 2.00 | 2.11 | 2.21 |
| | 80 | 38 | CC | 6615 | 8362 | 10109 | 11856 | 13603 | |
| | 80 | 38 | PC | 4820 | 5340 | 5860 | 6380 | 6900 | |
| | 80 | 38 | COP | 1.37 | 1.57 | 1.73 | 1.86 | 1.97 | |
| | 100 | 27 | CC | 9980 | 11765 | 13549 | 15334 | | |
| | 100 | 27 | PC | 5932 | 6342 | 6753 | 7164 | | |
| | 100 | 27 | COP | 1.68 | 1.85 | 2.01 | 2.14 | | |
| | 100 | 32 | CC | 9037 | 11117 | 13196 | 15276 | | |
| | 100 | 32 | PC | 6190 | 6710 | 7230 | 7750 | | |
| | 100 | 32 | COP | 1.46 | 1.66 | 1.83 | 1.97 | | |
| | 100 | 35 | CC | 8471 | 10728 | 12984 | 15241 | | |
| | 100 | 35 | PC | 6345 | 6904 | 7462 | 8021 | | |
| | 100 | 35 | COP | 1.33 | 1.55 | 1.74 | 1.90 | | |
| | 100 | 38 | CC | 7905 | 10339 | 12773 | 15207 | | |
| | 100 | 38 | PC | 6500 | 7105 | 7710 | 8315 | | |
| | 100 | 38 | COP | 1.22 | 1.46 | 1.66 | 1.83 | | |

Performance Tables

Medium Temperature (R448A/ R449A): 10K SH / 0K SC

| MODEL | SPEED, rps | Te Ta | | -20 | -15 | -10 | -5 | 0 | 5 |
|------------------|------------|----------|-----|-------|-------|-------|-------|-------|-------|
| JEHSI-087-B4-M-3 | 30 | 27 | CC | 3401 | 4600 | 5799 | 7269 | 8740 | 10211 |
| | 30 | 27 | PC | 2465 | 2469 | 2473 | 2478 | 2482 | 2486 |
| | 30 | 27 | COP | 1.38 | 1.86 | 2.34 | 2.93 | 3.52 | 4.11 |
| | 30 | 32 | CC | 3328 | 4220 | 5112 | 6310 | 7508 | 8706 |
| | 30 | 32 | PC | 2740 | 2740 | 2740 | 2740 | 2740 | 2740 |
| | 30 | 32 | COP | 1.21 | 1.54 | 1.87 | 2.30 | 2.74 | 3.18 |
| | 30 | 35 | CC | 3282 | 3991 | 4700 | 5735 | 6769 | 7804 |
| | 30 | 35 | PC | 2905 | 2902 | 2900 | 2898 | 2895 | 2893 |
| | 30 | 35 | COP | 1.13 | 1.38 | 1.62 | 1.98 | 2.34 | 2.70 |
| | 30 | 38 | CC | 3235 | 3762 | 4288 | 5159 | 6030 | 6901 |
| | 30 | 38 | PC | 3070 | 3065 | 3060 | 3055 | 3050 | 3045 |
| | 30 | 38 | COP | 1.05 | 1.23 | 1.40 | 1.69 | 1.98 | 2.27 |
| | 60 | 27 | CC | 6915 | 9483 | 12050 | 15050 | 18050 | 21049 |
| | 60 | 27 | PC | 4460 | 4648 | 4835 | 5023 | 5210 | 5398 |
| | 60 | 27 | COP | 1.55 | 2.04 | 2.49 | 3.00 | 3.46 | 3.90 |
| | 60 | 32 | CC | 6609 | 8644 | 10680 | 13449 | 16217 | 18986 |
| | 60 | 32 | PC | 5160 | 5285 | 5410 | 5535 | 5660 | 5785 |
| | 60 | 32 | COP | 1.28 | 1.64 | 1.97 | 2.43 | 2.87 | 3.28 |
| | 60 | 35 | CC | 6410 | 8134 | 9857 | 12487 | 15118 | 17748 |
| | 60 | 35 | PC | 5580 | 5668 | 5755 | 5843 | 5930 | 6018 |
| | 60 | 35 | COP | 1.15 | 1.44 | 1.71 | 2.14 | 2.55 | 2.95 |
| | 60 | 38 | CC | 6199 | 7617 | 9035 | 11527 | 14018 | 16510 |
| | 60 | 38 | PC | 6000 | 6050 | 6100 | 6150 | 6200 | 6250 |
| | 60 | 38 | COP | 1.03 | 1.26 | 1.48 | 1.87 | 2.26 | 2.64 |
| | 80 | 27 | CC | 9718 | 12601 | 15485 | 18266 | 21048 | 23830 |
| | 80 | 27 | PC | 6486 | 6647 | 6808 | 6969 | 7130 | 7291 |
| | 80 | 27 | COP | 1.50 | 1.90 | 2.27 | 2.62 | 2.95 | 3.27 |
| | 80 | 32 | CC | 9416 | 11589 | 13762 | 16480 | 19198 | 21916 |
| | 80 | 32 | PC | 6920 | 7210 | 7500 | 7790 | 8080 | 8370 |
| | 80 | 32 | COP | 1.36 | 1.61 | 1.83 | 2.12 | 2.38 | 2.62 |
| | 80 | 35 | CC | 9225 | 10977 | 12729 | 15408 | 18088 | 20768 |
| | 80 | 35 | PC | 7180 | 7547 | 7915 | 8282 | 8650 | 9018 |
| | 80 | 35 | COP | 1.28 | 1.45 | 1.61 | 1.86 | 2.09 | 2.30 |
| | 80 | 38 | CC | 9028 | 10361 | 11695 | 14337 | 16978 | |
| | 80 | 38 | PC | 7440 | 7885 | 8330 | 8775 | 9220 | |
| | 80 | 38 | COP | 1.21 | 1.31 | 1.40 | 1.63 | 1.84 | |
| | 100 | 27 | CC | 12134 | 14791 | 17449 | 20098 | 22748 | 25397 |
| | 100 | 27 | PC | 9795 | 9839 | 9883 | 9928 | 9972 | 10016 |
| | 100 | 27 | COP | 1.24 | 1.50 | 1.77 | 2.02 | 2.28 | 2.54 |
| | 100 | 32 | CC | 11703 | 13906 | 16109 | 19296 | 22483 | 25670 |
| | 100 | 32 | PC | 10120 | 10235 | 10350 | 10465 | 10580 | 10695 |
| | 100 | 32 | COP | 1.16 | 1.36 | 1.56 | 1.84 | 2.13 | 2.40 |
| | 100 | 35 | CC | 11431 | 13368 | 15306 | 18815 | 22325 | 25834 |
| | 100 | 35 | PC | 10315 | 10472 | 10630 | 10788 | 10945 | 11103 |
| | 100 | 35 | COP | 1.11 | 1.28 | 1.44 | 1.74 | 2.04 | 2.33 |
| | 100 | 38 | CC | 11150 | 12826 | 14502 | 18334 | 22166 | |
| | 100 | 38 | PC | 10510 | 10710 | 10910 | 11110 | 11310 | |
| | 100 | 38 | COP | 1.06 | 1.20 | 1.33 | 1.65 | 1.96 | |

Performance Tables

Medium/Low Temperature (R448A/ R449A): 10K SH / (SC refer **Table: Subcooling page 30**)

| MODEL | SPEED, rps | Te Ta | | -20 | -15 | -10 | -5 | 0 | 5 |
|------------------|------------|----------|-----|------|------|------|------|-------|-------|
| JEHSI-033-B3-L-3 | 30 | 27 | CC | 1906 | 2213 | 2555 | 2923 | 3330 | 3767 |
| | 30 | 27 | PC | 985 | 988 | 990 | 993 | 995 | 998 |
| | 30 | 27 | COP | 1.94 | 2.24 | 2.58 | 2.95 | 3.35 | 3.78 |
| | 30 | 32 | CC | 1857 | 2151 | 2478 | 2837 | 3234 | 3654 |
| | 30 | 32 | PC | 1060 | 1100 | 1140 | 1180 | 1220 | 1260 |
| | 30 | 32 | COP | 1.75 | 1.96 | 2.17 | 2.40 | 2.65 | 2.90 |
| | 30 | 35 | CC | 1823 | 2112 | 2434 | 2781 | 3165 | 3580 |
| | 30 | 35 | PC | 1105 | 1168 | 1230 | 1293 | 1355 | 1418 |
| | 30 | 35 | COP | 1.65 | 1.81 | 1.98 | 2.15 | 2.34 | 2.53 |
| | 30 | 38 | CC | 1788 | 2067 | 2383 | 2725 | 3104 | 3507 |
| | 30 | 38 | PC | 1150 | 1235 | 1320 | 1405 | 1490 | 1575 |
| | 30 | 38 | COP | 1.55 | 1.67 | 1.81 | 1.94 | 2.08 | 2.23 |
| | 60 | 27 | CC | 4140 | 4773 | 5423 | 6106 | 6777 | 7456 |
| | 60 | 27 | PC | 1920 | 1952 | 1983 | 2015 | 2047 | 2078 |
| | 60 | 27 | COP | 2.16 | 2.45 | 2.73 | 3.03 | 3.31 | 3.59 |
| | 60 | 32 | CC | 3962 | 4584 | 5243 | 5930 | 6653 | 7378 |
| | 60 | 32 | PC | 2020 | 2110 | 2200 | 2290 | 2380 | 2470 |
| | 60 | 32 | COP | 1.96 | 2.17 | 2.38 | 2.59 | 2.80 | 2.99 |
| | 60 | 35 | CC | 3847 | 4472 | 5128 | 5832 | 6565 | 7299 |
| | 60 | 35 | PC | 2080 | 2205 | 2330 | 2455 | 2580 | 2705 |
| | 60 | 35 | COP | 1.85 | 2.03 | 2.20 | 2.38 | 2.54 | 2.70 |
| | 60 | 38 | CC | 3733 | 4350 | 5014 | 5720 | 6462 | 7263 |
| | 60 | 38 | PC | 2140 | 2300 | 2460 | 2620 | 2780 | 2940 |
| | 60 | 38 | COP | 1.74 | 1.89 | 2.04 | 2.18 | 2.32 | 2.47 |
| | 80 | 27 | CC | 5276 | 6065 | 6893 | 7769 | 8644 | 9550 |
| | 80 | 27 | PC | 3703 | 3270 | 2837 | 2403 | 1970 | 1537 |
| | 80 | 27 | COP | 1.42 | 1.85 | 2.43 | 3.23 | 4.39 | 6.21 |
| | 80 | 32 | CC | 5076 | 5841 | 6662 | 7521 | 8406 | 9317 |
| | 80 | 32 | PC | 2700 | 2885 | 3070 | 3255 | 3440 | 3625 |
| | 80 | 32 | COP | 1.88 | 2.02 | 2.17 | 2.31 | 2.44 | 2.57 |
| | 80 | 35 | CC | 4942 | 5706 | 6513 | 7360 | 8238 | 9172 |
| | 80 | 35 | PC | 3903 | 3557 | 3210 | 2863 | 2517 | 2170 |
| | 80 | 35 | COP | 1.27 | 1.60 | 2.03 | 2.57 | 3.27 | 4.23 |
| | 80 | 38 | CC | 4815 | 5562 | 6354 | 7206 | 8097 | 9034 |
| | 80 | 38 | PC | 2850 | 3100 | 3350 | 3600 | 3850 | 4100 |
| | 80 | 38 | COP | 1.69 | 1.79 | 1.90 | 2.00 | 2.10 | 2.20 |
| | 100 | 27 | CC | 6265 | 7205 | 8209 | 9245 | 10324 | 11457 |
| | 100 | 27 | PC | 3585 | 3754 | 3923 | 4093 | 4262 | 4431 |
| | 100 | 27 | COP | 1.75 | 1.92 | 2.09 | 2.26 | 2.42 | 2.59 |
| | 100 | 32 | CC | 6098 | 7014 | 7998 | 9027 | 10093 | 11230 |
| | 100 | 32 | PC | 3610 | 3875 | 4140 | 4405 | 4670 | 4935 |
| | 100 | 32 | COP | 1.69 | 1.81 | 1.93 | 2.05 | 2.16 | 2.28 |
| | 100 | 35 | CC | 5993 | 6901 | 7861 | 8893 | 9949 | 11116 |
| | 100 | 35 | PC | 3625 | 3947 | 4270 | 4593 | 4915 | 5238 |
| | 100 | 35 | COP | 1.65 | 1.75 | 1.84 | 1.94 | 2.02 | 2.12 |
| | 100 | 38 | CC | 5892 | 6775 | 7733 | 8750 | 9825 | 10970 |
| | 100 | 38 | PC | 3640 | 4020 | 4400 | 4780 | 5160 | 5540 |
| | 100 | 38 | COP | 1.62 | 1.69 | 1.76 | 1.83 | 1.90 | 1.98 |

Performance Tables

Medium/Low Temperature (R448A/ R449A): 10K SH / (SC refer **Table: Subcooling page 30**)

| MODEL | SPEED, rps | Te Ta | | -20 | -15 | -10 | -5 | 0 | 5 |
|------------------|------------|----------|-----|-------|-------|-------|-------|-------|-------|
| JEHSI-066-B3-L-3 | 30 | 27 | CC | 3649 | 4542 | 5641 | 6740 | 7839 | 8938 |
| | 30 | 27 | PC | 1898 | 1952 | 2006 | 2060 | 2114 | 2168 |
| | 30 | 27 | COP | 1.92 | 2.33 | 2.81 | 3.27 | 3.71 | 4.12 |
| | 30 | 32 | CC | 3533 | 4475 | 5554 | 6565 | 7575 | 8586 |
| | 30 | 32 | PC | 2145 | 2193 | 2240 | 2288 | 2335 | 2383 |
| | 30 | 32 | COP | 1.65 | 2.04 | 2.48 | 2.87 | 3.24 | 3.60 |
| | 30 | 35 | CC | 3464 | 4436 | 5430 | 6423 | 7417 | 8410 |
| | 30 | 35 | PC | 2152 | 2231 | 2310 | 2389 | 2468 | 2546 |
| | 30 | 35 | COP | 1.61 | 1.99 | 2.35 | 2.69 | 3.01 | 3.30 |
| | 30 | 38 | CC | 3394 | 4396 | 5326 | 6292 | 7258 | 8224 |
| | 30 | 38 | PC | 2200 | 2300 | 2400 | 2500 | 2600 | 2700 |
| | 30 | 38 | COP | 1.54 | 1.91 | 2.22 | 2.52 | 2.79 | 3.05 |
| | 60 | 27 | CC | 5910 | 8305 | 10699 | 13094 | 15489 | 17883 |
| | 60 | 27 | PC | 3542 | 3780 | 4018 | 4256 | 4493 | 4731 |
| | 60 | 27 | COP | 1.67 | 2.20 | 2.66 | 3.08 | 3.45 | 3.78 |
| | 60 | 32 | CC | 5660 | 7911 | 10162 | 12413 | 14664 | 16915 |
| | 60 | 32 | PC | 3770 | 4080 | 4390 | 4700 | 5010 | 5320 |
| | 60 | 32 | COP | 1.50 | 1.94 | 2.31 | 2.64 | 2.93 | 3.18 |
| | 60 | 35 | CC | 5637 | 7770 | 9904 | 12037 | 14170 | 16303 |
| | 60 | 35 | PC | 3957 | 4298 | 4639 | 4979 | 5320 | 5660 |
| | 60 | 35 | COP | 1.42 | 1.81 | 2.14 | 2.42 | 2.66 | 2.88 |
| | 60 | 38 | CC | 5579 | 7603 | 9627 | 11651 | 13675 | 15699 |
| | 60 | 38 | PC | 4130 | 4505 | 4880 | 5255 | 5630 | 6005 |
| | 60 | 38 | COP | 1.35 | 1.69 | 1.97 | 2.22 | 2.43 | 2.61 |
| | 80 | 27 | CC | 9193 | 10851 | 13596 | 16341 | 19086 | 21831 |
| | 80 | 27 | PC | 4960 | 5381 | 5802 | 6222 | 6643 | 7064 |
| | 80 | 27 | COP | 1.85 | 2.02 | 2.34 | 2.63 | 2.87 | 3.09 |
| | 80 | 32 | CC | 8939 | 10679 | 12912 | 15146 | 17379 | 19613 |
| | 80 | 32 | PC | 5450 | 5865 | 6280 | 6695 | 7110 | 7525 |
| | 80 | 32 | COP | 1.64 | 1.82 | 2.06 | 2.26 | 2.44 | 2.61 |
| | 80 | 35 | CC | 8786 | 10479 | 12438 | 14397 | 16355 | |
| | 80 | 35 | PC | 5739 | 6152 | 6565 | 6977 | 7390 | |
| | 80 | 35 | COP | 1.53 | 1.70 | 1.89 | 2.06 | 2.21 | |
| | 80 | 38 | CC | 8633 | 10308 | 11982 | 13657 | | |
| | 80 | 38 | PC | 6030 | 6440 | 6850 | 7260 | | |
| | 80 | 38 | COP | 1.43 | 1.60 | 1.75 | 1.88 | | |
| | 100 | 27 | CC | 12262 | 13952 | 15642 | 17332 | 19023 | 20713 |
| | 100 | 27 | PC | 6417 | 7014 | 7611 | 8208 | 8805 | 9402 |
| | 100 | 27 | COP | 1.91 | 1.99 | 2.06 | 2.11 | 2.16 | 2.20 |
| | 100 | 32 | CC | 11519 | 13157 | 14795 | 16433 | | |
| | 100 | 32 | PC | 7050 | 7595 | 8140 | 8685 | | |
| | 100 | 32 | COP | 1.63 | 1.73 | 1.82 | 1.89 | | |
| | 100 | 35 | CC | 11074 | 12702 | 14330 | 15958 | | |
| | 100 | 35 | PC | 7430 | 8080 | 8729 | 9379 | | |
| | 100 | 35 | COP | 1.49 | 1.57 | 1.64 | 1.70 | | |
| | 100 | 38 | CC | 10628 | 12240 | 13852 | | | |
| | 100 | 38 | PC | 7810 | 8525 | 9240 | | | |
| | 100 | 38 | COP | 1.36 | 1.44 | 1.50 | | | |

Performance Tables

Medium/Low Temperature (R448A/ R449A): 10K SH / (SC refer **Table: Subcooling page 30**)

| MODEL | SPEED, rps | Te Ta | | -20 | -15 | -10 | -5 | 0 | 5 |
|------------------|------------|-------|-----|-------|-------|-------|-------|-------|-------|
| JEHSI-087-B4-L-3 | 30 | 27 | CC | 3753 | 5004 | 6255 | 7954 | 9653 | 11352 |
| | 30 | 27 | PC | 2721 | 2722 | 2723 | 2724 | 2725 | 2726 |
| | 30 | 27 | COP | 1.38 | 4.14 | 2.30 | 2.92 | 3.54 | 4.16 |
| | 30 | 32 | CC | 3935 | 4851 | 5767 | 7155 | 8818 | 10481 |
| | 30 | 32 | PC | 3038 | 3039 | 3040 | 3041 | 3042 | 3043 |
| | 30 | 32 | COP | 1.30 | 1.60 | 1.90 | 2.35 | 2.90 | 3.44 |
| | 30 | 35 | CC | 3644 | 4339 | 5034 | 6675 | 8317 | 9959 |
| | 30 | 35 | PC | 3228 | 3229 | 3230 | 3231 | 3232 | 3233 |
| | 30 | 35 | COP | 1.13 | 1.34 | 1.56 | 2.07 | 2.57 | 3.08 |
| | 30 | 38 | CC | 3604 | 4090 | 4576 | 6196 | 7816 | 9436 |
| | 30 | 38 | PC | 3418 | 3419 | 3420 | 3421 | 3422 | 3423 |
| | 30 | 38 | COP | 1.05 | 1.20 | 1.34 | 1.81 | 2.28 | 2.76 |
| | 60 | 27 | CC | 7831 | 11258 | 14684 | 17806 | 20928 | 24051 |
| | 60 | 27 | PC | 4753 | 4917 | 5080 | 5243 | 5407 | 5570 |
| | 60 | 27 | COP | 1.65 | 2.29 | 2.89 | 3.40 | 3.87 | 4.32 |
| | 60 | 32 | CC | 7984 | 10904 | 13824 | 16506 | 19188 | 21870 |
| | 60 | 32 | PC | 5320 | 5525 | 5730 | 5935 | 6140 | 6345 |
| | 60 | 32 | COP | 1.50 | 1.97 | 2.41 | 2.78 | 3.13 | 3.45 |
| | 60 | 35 | CC | 8065 | 10687 | 13308 | 15726 | 18143 | 20561 |
| | 60 | 35 | PC | 5660 | 5890 | 6120 | 6350 | 6580 | 6810 |
| | 60 | 35 | COP | 1.42 | 1.81 | 2.17 | 2.48 | 2.76 | 3.02 |
| | 60 | 38 | CC | 8169 | 10480 | 12792 | 14946 | 17099 | 19253 |
| | 60 | 38 | PC | 6000 | 6255 | 6510 | 6765 | 7020 | 7275 |
| | 60 | 38 | COP | 1.36 | 1.68 | 1.96 | 2.21 | 2.44 | 2.65 |
| | 80 | 27 | CC | 10160 | 13719 | 17277 | 21137 | 24997 | 28857 |
| | 80 | 27 | PC | 7155 | 7423 | 7690 | 7958 | 8225 | 8493 |
| | 80 | 27 | COP | 1.42 | 1.85 | 2.25 | 2.66 | 3.04 | 3.40 |
| | 80 | 32 | CC | 10665 | 13548 | 16432 | 19897 | 23362 | 26827 |
| | 80 | 32 | PC | 7680 | 8035 | 8390 | 8745 | 9100 | 9455 |
| | 80 | 32 | COP | 1.39 | 1.69 | 1.96 | 2.28 | 2.57 | 2.84 |
| | 80 | 35 | CC | 10972 | 13449 | 15925 | 19153 | 22381 | 25609 |
| | 80 | 35 | PC | 7995 | 8403 | 8810 | 9218 | 9625 | 10033 |
| | 80 | 35 | COP | 1.37 | 1.60 | 1.81 | 2.08 | 2.33 | 2.55 |
| | 80 | 38 | CC | 11268 | 13343 | 15418 | 18409 | 21400 | |
| | 80 | 38 | PC | 8310 | 8770 | 9230 | 9690 | 10150 | |
| | 80 | 38 | COP | 1.36 | 1.52 | 1.67 | 1.90 | 2.11 | |
| | 100 | 27 | CC | 14185 | 18322 | 22459 | 25584 | 28709 | 31835 |
| | 100 | 27 | PC | 9785 | 9879 | 9972 | 10065 | 10158 | 10251 |
| | 100 | 27 | COP | 1.45 | 1.85 | 2.25 | 2.54 | 2.83 | 3.11 |
| | 100 | 32 | CC | 13766 | 17316 | 20866 | 24460 | 28054 | 31648 |
| | 100 | 32 | PC | 10960 | 11020 | 11080 | 11140 | 11200 | 11260 |
| | 100 | 32 | COP | 1.26 | 1.57 | 1.88 | 2.20 | 2.50 | 2.81 |
| | 100 | 35 | CC | 13478 | 16694 | 19910 | 23785 | 27660 | 31535 |
| | 100 | 35 | PC | 11665 | 11705 | 11745 | 11785 | 11825 | 11865 |
| | 100 | 35 | COP | 1.16 | 1.43 | 1.70 | 2.02 | 2.34 | 2.66 |
| | 100 | 38 | CC | 13182 | 16068 | 18954 | 23111 | 27267 | |
| | 100 | 38 | PC | 12370 | 12390 | 12410 | 12430 | 12450 | |
| | 100 | 38 | COP | 1.07 | 1.30 | 1.53 | 1.86 | 2.19 | |

Application Guidelines

Condensing Unit Selection

Selection of the correct size of inverter condensing unit as method below:

Select a condensing unit size which achieves the peak load system cooling capacity demand at its maximum speed.



NOTICE

It should ensure that the condensing unit capacity at minimum speed (30rps) not higher than the necessary cooling capacity for the smallest evaporator in the system. Failure to meet this criterion will cause condensing unit work outside its application envelope and as consequence reduce lifetime.

Example (R448A, Evaporating temperature: -10°C , Ambient temperature 32°C):

Evaporator 1: 5kW

Evaporator 2: 3kW

Evaporator 3: 2.6kW

Evaporator 4: 2.5kW

Total maximum cooling capacity = 13.1kW

Minimum cooling capacity = minimum evaporator capacity = 2.5kW

According to the capacities R448A at $T_e = -10^{\circ}\text{C}$, $T_a = 32^{\circ}\text{C}$, condensing unit JEHSI-066-B4-M-3 (maximum capacity 13.2kW and minimum capacity 5.0kW)

Condensing unit maximum capacity 13.2kW achieves the peak load system cooling capacity 13.1kW but minimum speed 30rps which deliver minimum capacity exceed the necessary cooling capacity for the smallest evaporator (2.5kW).

In above case, it is recommended to connect few evaporators together (regulated by one thermostat) to achieve smallest required capacity higher than the minimum capacity of the condensing unit: by connecting Evaporator 3 and Evaporator 4 via one common thermostat ($2.6\text{kW} + 2.5\text{kW} = 5.1\text{kW}$), which is higher than the minimum capacity of the condensing unit (5.0kW)

Application Envelope

| Operating Limits | Recommendation |
|---|--|
| Discharge gas temperature | 110°C maximum |
| Evaporator outlet superheat | Above 6K (to avoid liquid flood back) |
| Suction gas superheat at compressor inlet | Not more than 20K |
| Voltage supply | Min: 360V, Max: 440V |
| Phase asymmetry | +/- 3% |
| Frequency | 50Hz +/- 1% |
| Outdoor ambient | Min: -15°C , Max: 43°C (contact J&E Hall Limited if high ambient data is required) |

Suction line shall be insulated to avoid:

High superheat during high ambient condition that can create high discharge temperature.

Too low superheat during low ambient condition that can condense refrigerant inside suction line.

Compressor



CAUTION

The scroll compressor inside J&E Hall INVERTER condensing unit is a high-pressure dome compressor, with 6 poles brushless DC motor (BLDCM). The compressor cannot operate without the frequency converter. It will be destroyed immediately if connected directly to the public network.

The pressure inside the shell of compressor is a high (discharge) pressure and have high temperature. Care must be taken when orientate the power supply cables to the main isolator. Never touch the power supply cable to body of compressor, unless heat resistant cables are used.

| Compressor speed | Minimum | Maximum |
|------------------|---------|---------|
| rps | 30 | 100 |
| rpm | 1800 | 6000 |

Indicator:

rps: revolution per second of motor shaft (rotor)

rpm: revolution per minute of motor shaft (rotor)

P: number of poles of motor (always an even number)

$\text{rps} = F / (P/2)$; $\text{rpm} = \text{rps} \times 60$



J& E Hall Inverter Condensing Unit has to be installed and commissioned by competent personnel, who are familiar with refrigeration systems and components including all controls. To avoid potential injury, use care when working around coil surfaces or sharp edges of metal cabinets. All piping and electrical wiring should be installed in accordance with all applicable standards and local laws.

General Information

Before Installation

Ensure the units received are the correct models for the intended application.

Ensure the refrigerant; electrical supply and MWP are all suitable for the proposed application.

Check there is no damage to the units. Any damage should be advised to the supplier immediately.

Check that the proposed equipment locations are suitable and provide adequate support for the weight of the units.

Offloading and Lifting

Whenever a condensing unit is lifted, it should be from the base and, where possible, all packing and protection is kept in position.

If lifting equipment is required, ensure that it is suitable, certificated, and that the operatives are qualified to use it.

When using a fork-lift or pallet truck to lift the unit, the two support points should be sufficiently apart to give stability when lifting and suitably placed to distribute the load on the forks.

If slings are used, care should be taken to ensure that the slings do not crush the casework or coil.

When lifting by crane, use spreader bars to prevent compressing the top of the equipment.

Do not drop the unit. Should this inadvertently happen, it should be immediately unpacked and inspected for damage.

Use the appropriate spreader bars/lifting sling with the holes and lugs provided.

During Installation and subsequent maintenance

Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations, and experienced with this type of equipment.

Safe working methods are identified and operatives have suitable Personal Protective Equipment (PPE).

Ensure the working area has adequate ventilation during brazing procedures.

The units contain moving machinery and electrical power hazards, which may cause severe injury or death. Disconnect and shut off power and wait until all LEDs on frequency converter goes off, before installation or service of the equipment.

Refrigerant release into the atmosphere is illegal. Proper evacuation, recovery, handling and leak testing procedures must be observed at all times.

Units must be earthed.

No maintenance work should be attempted prior to disconnecting the electrical supply.

The electrical covers and fan guards must remain fitted at all times.

Use of the units outside of the design conditions and the application for which the units were intended may be unsafe and be detrimental to the units, regardless of short term or long term operation.

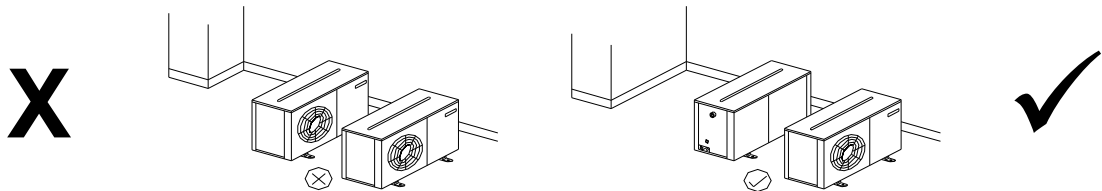
The units are not designed to withstand loads or stresses from other equipment or personnel. Such extraneous loads or stress may cause failure/leak/injury.

Installation

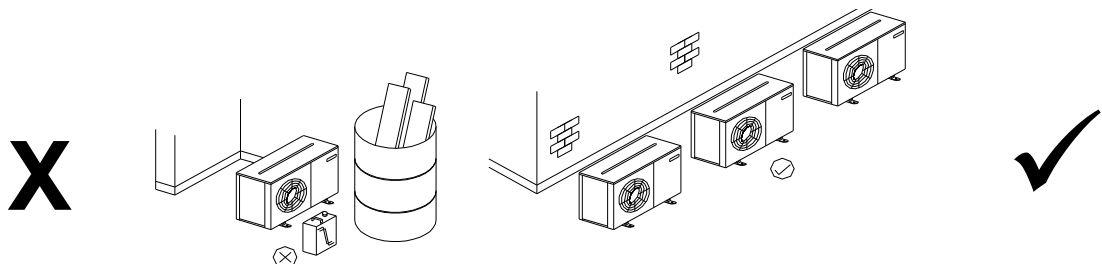
Unit location

In order to achieve maximum cooling capacity, the installation location for the condensing unit should be carefully selected.

Install the condensing unit in such a way so that hot air ejected by the condensing unit cannot be drawn in again (short circuit of hot discharge air). Allow sufficient space for maintenance around the unit.



Ensure that there is no obstruction to air flow into or out of the unit. Remove obstacles which block air intake or discharge.



The location must be well ventilated, so the unit can draw in and distribute plenty of air thus lowering the condensing temperature.
Air leaving the condenser should avoid facing prevailing wind, which impede air flow and thus causing high condensing temperature.
To optimize the unit running conditions, the condenser coil must be cleaned at regular intervals.
The unit must be level in all directions.
It is recommended to install the unit on rubber grommet or vibration dampers.
Wall mounting on brackets is only suitable for models JEHSI-033 & JEHSI-066.

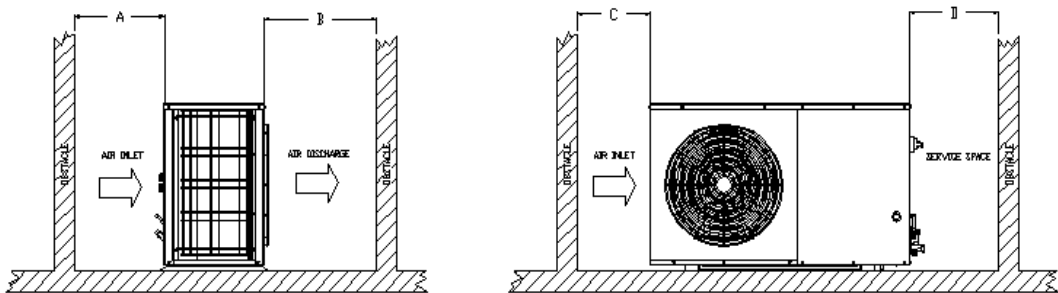


Special attention should be given if unit installed near to the sea as this can reduce unit lifespan due to corrosion of metal parts.

NOTICE

Installation Clearances

The installation location should allow sufficient space for air flow and maintenance around the unit.



| ALL MODELS | A | B | C | D |
|------------------|--------|---------|--------|--------|
| Minimum Distance | 300 mm | 1000 mm | 300 mm | 500 mm |

Field Piping



NOTICE

Pipe sizing should only be determined by qualified personnel. Correct line sizing will minimize the pressure drop and maintain sufficient gas velocity for proper oil return. All applicable standards must be observed in the installation of refrigerant piping.

To ensure satisfactory operation and performance, the following points should be noted:

- Pipework routes must be as simple and as short as possible.
- Avoid low points on pipework where oil can accumulate.
- Suction gas velocity must be sufficient to ensure good oil return.
- Use only clean, dehydrated refrigeration grade copper tube with long radius bends.
- Avoid flare type connections and take great care when brazing. Use only silver alloy rods.
- Run braze without over filling to ensure there is no leakage into the tube.
- To prevent oxidation, blow oxygen free nitrogen through pipework when brazing.
- Install insulation on all suction lines and on all pipes penetrating walls or passing through hot areas.
- Adequately support all pipe work at a maximum of 2 metre intervals.
- Where the condensing unit is situated below the indoor unit (coldroom evaporator / display case), the height difference between the two units should be no more than 6 metres.
- In vertical pipework, the use of U-trap and double suction risers is often required. These suction risers must always be fitted with a U-trap at the bottom and a P-trap at the top and never be higher than 4m unless a second U-trap system is fitted.
- Additional oil may be required if piping length exceeds 20m or multiple oil traps are fitted. Check the oil level closely during commissioning and add oil as necessary. Add oil in small amounts. Do not overfill the compressor!
- Suction pipework should slope gently back towards the unit to assist oil return to the compressor. A fall of approximately 2cm per metre of pipework is acceptable.
- Liquid lines should be sized to ensure a full supply of liquid refrigerant to the expansion device. Careful attention should be paid to sizing of liquid lines on large risers (maximum rise 6m).
- In some circumstances, a suction accumulator (not supplied) may be required. It offers protection against refrigerant flood back during operation and also against off-cycle migration by adding internal free volume to the low side of the system.
- Tests must be conducted to ensure the amount of off-cycle migration to the compressor does not exceed the compressor's charge limit of 6kgs.
- Wherever possible the system should be installed to utilize a pump down configuration.
- Maximum recommended pipe length is 25m from the closest indoors.



NOTICE

One of the main factors affecting equipment reliability and compressor service life is refrigeration circuit contamination.

During installation, circuit contamination can be caused by:

- Brazing & Welding Oxides
- Filings & Particles from de-burring pipework
- Brazing Flux
- Moisture & Air

Pressure Testing

The condensing units are pressure tested in the factory prior to dispatch. All units come with a holding charge of oxygen free nitrogen. Remove the holding charge indication tag which is tied to service valve before installation.

Once the pipework installation is complete, it should be pressure tested prior to evacuation to test for leaks. A pressure leak test should be carried out using oxygen free nitrogen (OFN). **NEVER USE OXYGEN FOR PRESSURE TESTING SYSTEMS.** A calibrated nitrogen pressure regulator must always be used. Before starting any pressure testing, ensure the area surrounding the system is safe, inform relevant personnel and fit warning signs indicating high pressure testing. Also, use correct PPE as required.

Always pressurize the system slowly, preferably in stages up to the maximum required pressure. Maximum test pressures applicable to the unit are as follows:

| Test pressure | |
|-----------------------|-----------------------|
| High side | Low side |
| 28 barG (405 psiG) | 19 barG (275 psiG) |

Listen for any possible leaks and check all joints with bubble spray. If any leaks are discovered, release pressure slowly from system until empty, repair leak and then restart pressure testing procedure. Never attempt to repair a leak on a pressurized system.

A strength test should also be incorporated (to installed pipework only) according to applicable standards.

Once testing has been completed satisfactorily, release the pressure from the system gradually and safely to external atmosphere.

Evacuation & Charging



Moisture prevents proper functioning of the compressor and the refrigeration system. Ensure that a good quality vacuum pump is used to pull a minimum vacuum of 250 microns (0.25 torr).

NOTICE

Once pressure testing has been completed, the system can now be evacuated to remove air and any moisture from the piping. This can be done as follows:

Ensure any nitrogen charge is safely released from the system.

Connect a gauge manifold to the connections on the service valves on the condensing unit.

Connect a vacuum pump and vacuum gauge to the system.

Ensure all gauge manifold and service valves are open as required.

Evacuate the system until vacuum is below 250 microns (0.25 torr).

Note: A triple evacuation procedure is recommended for all new systems or where moisture is suspected.

Once the system is isolated and the vacuum pump is switched off, any rise in pressure indicates that either there may be a leak in the system or moisture is still present. In this case, recheck the system for leaks, repair as necessary, and then restart the evacuation procedure. Once completed satisfactorily, the vacuum pump and vacuum gauge can be removed.

At this point, the refrigerant charge can be added to the system as required. Refrigerants must be charged in the liquid phase. Charging of liquid into the suction side of the system should **ONLY** be done with a metering device. Use calibrated weighing scales to record the amount of refrigerant added to the system.

Electrical

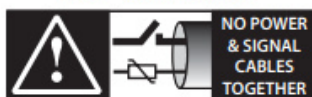
Below table lists recommended wiring sizes for the condensing unit power supply cables. These wiring sizes are valid for a cable length up to 30m.

| Model | Cable size, mm ² (from network to unit main switch) |
|--------------------------------------|--|
| JEHSI-033-B3-M-3 JEHSI-033-B3-L-3 | 4 |
| JEHSI-066-B3-M-3 JEHSI-066-B3-L-3 | 4 |
| JEHSI-087-B3-M-3 JEHSI-087-B3-L-3 | 6 |

Note: Above is just a guideline for wire size. Installer might specify cable size different from this guideline, depending on the wire material and length, system design, ambient temperature, etc.

Cables to the condensing unit should wherever possible be routed through the cable glands supplied on the rear panel and routed through the wire bush/cable gland designated for the incoming supply at the control box casing.

IMPORTANT



READ CAREFULLY IN THE TEXT!

Separate power cables as much as possible from the probe and digital input cables to avoid possible electromagnetic disturbance. Never run power cables and signal cables in the same conduits.

- Connect the mains supply to the units as per the wiring diagrams on pages 39 – 41.
- Ensure that the power supply corresponds to the unit and that the power supply is stable.
- Connect power supply according to the present norm and legal requirement. Ensure that the unit is properly connected to ground.
- The unit is equipped with a motor circuit breaker with overload protection for frequency drive. Overload protection is preset from factory and value can be found on the wiring diagram adhered on the control box cover.
- Unit equipped with manual reset high pressure switch and auto reset low pressure switch, which directly open the digital input “Safe Torque Off (STO)” on the drive. When the STO contact is open, the drive stops operating, bypassing the software control.

Phase Sequence for Correct Compression



NOTICE

BLDC scroll compressor require proper phase sequence to secure correct rotation direction and therefore compression. The phase sequence has to be secured between drive and compressor. Compressor rotation direction is not influenced by the phase sequence between network and unit drive.

Warning When Touching Unit When OFF



WARNING

Frequency converters contain DC-link capacitors that can remain charged even when the frequency converter is not powered. To avoid electrical hazards, disconnect AC mains and wait at least 5 minutes for the capacitors to fully discharge before performing any service or repair work. Failure to obey this instruction before conduct service or repair could result in death or serious injury.

The digital inputs are not a safety switch. The frequency converter still is powered even it was cut off by digital input via alarms activation. Thus, do not remove 3 phase connections to the frequency converter, compressor connections or other power connections while the frequency converter is connected to power.

Earth Leakage Current



CAUTION

This product integrates a frequency converter which can cause ground leakage current exceeds 3.5mA.

According to IEC 61800-5-1 a reinforced Protective Earth connection must be ensured with a min. 10mm² or an additional PE wire which must at least the same cross section as the mains supply wires- must be terminated separately.

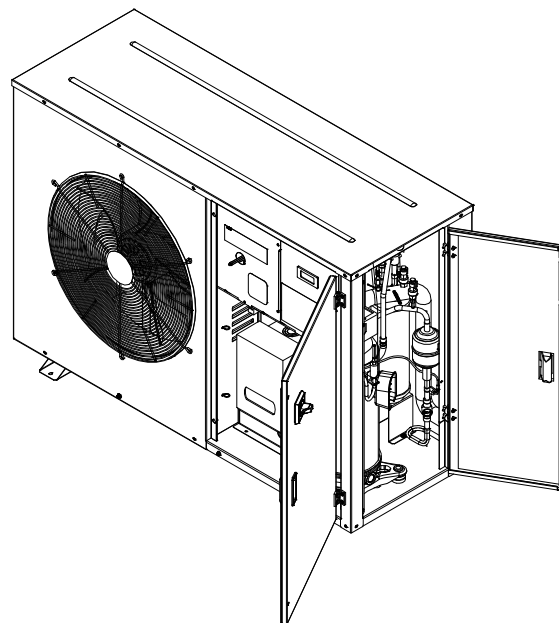
This product can cause a DC current in the protective conductor. If a residual current device (RCD) is used for extra protection on the mains supply side, it must be a Type B (time delayed). The use of RCD and protective earth for the frequency converter must always follow national and local regulations.

Commissioning



Before performing any service/maintenance work on the unit, ensure that the power supply is switched off and then wait at least 5 minutes to allow the capacitor to fully discharge. Failure to do so may result in serious injury or death.

To gain access to the electrical box, turn the mains isolator switch on the front of the unit to the OFF position, loosen the screws on the left-hand side of the door and open door. The electrical box is located behind the front door. Remove the screws in the electrical box cover to access components.



Access to Controller and LCD Display



Only Authorized personnel are allowed to access the controller and LCD display.



Please wait approximate 1 minute for controller initialization after switching on the main isolator.

Pre startup checks

Before starting the condensing unit, the following checks should be carried out as a minimum:

- Check electrical supply is correct and all connections are sound.
- All moving parts are free and guards fitted.
- Compressor oil level satisfactory.
- LCD display cable is connected to the controller to enable settings.
- Change the required setting to suit type of application. Else, maintain as factory default setting for medium temperature application.

| Description | Factory Default Setting | Remark |
|---|---|---|
| Refrigerant preset on controller | R448A | Type of refrigerant available for selection: R448A, R449A, R404A |
| Low Pressure Switch | Cut In: 3barG, Differential: 1barG (Auto Reset) | To cut off compressor when suction pressure drops below 2barG * Software low pressure alarm threshold 1.2barG (Cae26) |
| High Pressure Switch | Cut Out: 28barG, Manual Reset: 22barG | Manual reset on the cartridge type high pressure switch is required after fault is removed. |
| Unit Status On/Off on keyboard | Off position | Must log in through service password to turn on the unit |
| Crankcase Heater Activation | Activated only when by regulation and/or alarm | Compressor crankcase heater will be activated when compressor off and external temperature is below 15°C. (Cag43, Cag44) |
| Condenser Fan Modulation | Setpoint: 16barG, differential: 3barG, Proportional. Cut In Only when compressor is turned ON | Fan starts to rotate when compressor is turn ON and discharge pressure more than 13barG. Fan runs at full speed when pressure more than 19barG. |

- All valves in correct operating position.
- Initial refrigerant charge through liquid line.
- Crankcase heater energized for a minimum of 12 hours before compressor start-up.
- Gauge manifold connected to both low and high sides of system.

Commissioning



Unit is equipped with electronic controller and frequency converter, which had been pre-programmed with parameters ready for use with the actual unit. Parameters for operation with refrigerant R448A is defaulted. The parameter needs to be changed if another refrigerant is to be used (Refer to Refrigerant Selection).

Enter Service Password “1001” to access to the controller.

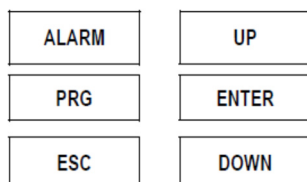
Before running the unit, the controller settings for **Refrigerant Selection** on page 22 should be checked/alterd as required:

Running the unit

- Switch unit on by controller (see page 22).
- Run the unit and check compressor and condenser fan operation.
- Check system pressures and temperatures, gas charge and running currents of unit to ensure correct operation.
- Check transducer / sensor readings are accurate (calibrated equipment required).
- Check compressor suction superheat. This should be between 10K and 20K at normal operating conditions.
- Final adjustment of controller settings.
- Allow the system to run for 3 – 4 hours. Check compressor oil level and top up with the correct oil type as required (see page 6). Recheck the compressor oil level again after 24 hours operation.
- Carry out final leak test and ensure all panels/covers are fitted and screws tightened.
- Log all information along with the system model and serial numbers for future reference.
- Complete refrigerant labelling to comply with F-Gas regulations.
- Ensure that the customer / responsible person is provided with basic operating instructions and where electrical isolators are situated in case of emergency.

The User Terminal Interface – LCD Display

The user terminal can be used to perform all the operations allowed by the program, display the operating conditions of the unit at all times, and set the parameters. It can be disconnected from the main board, and in fact is not required for operation.



LCD Display Button Functions

| | |
|-------|---|
| ALARM | Displays the alarms. Press around 2 seconds to reset the alarm manually after fault is removed. |
| UP | If the cursor is in the home position (top left corner), scrolls up the screens in the same group; if the cursor is in a setting field, and increases the value. |
| DOWN | If the cursor is in the home position (top left corner), scrolls down the screens in the same group; if the cursor is in a setting field, and decreases the value. |
| ENTER | Used to move the cursor from the home position (top left corner) to the setting fields, in the setting fields confirms the set value and moves to the next parameter. |
| PRG | Accesses the menu for selecting the group of parameters to be displayed/modified (access to the parameters is confirmed by pressing the [Enter] button). |
| ESC | Used to move back to previous screen/sub-menu. Continuous pressing of the ESC button will eventually return to the HOME screen. |

Controller Home Screen

Start Up Screen

Following controller power-up and initialization process (approximately 1 minute), the controller home screen will appear as follows:

```
LT 08:17 10/02/21
Evaporating: -9.9-barG
Condensing: -5.6barG
Actual speed: 0.0rps
Unit OFF by keyboard
```

The suction pressure, discharge pressure and compressor running rps of the unit are displayed. If Unit Off by keyboard is indicated in the lower box, then the unit is switched OFF on the controller. To switch the unit ON, follow instructions on page 22 (Switch Unit ON/OFF (By Controller)). Further information on the system conditions can be displayed by pressing the DOWN arrow.



NOTICE

All controller parameters are preset in the factory and are not accessible due to password protection. It depends on the inserted password for different level of accessibility.

Press "PRG" to enter screen Password management

Password for Accessibility Level

```
Password management
Insert password: 0000
```

- User: 0000 (only can change suction line setpoint (screen Ab01, default 3.3barG) and Condensing setpoint (Screen Ab05, default: 16barG), not authorization to switch on/off by keyboard).
- Service: 1001 (access for all operation parameter, except "advanced" configuration parameter).

- Manufacturer: 9009 (access to "advanced" configuration parameters, e.g. C. Compressor-> Advanced, to change type of Refrigerant, compressor model etc).



NOTICE

To change the parameter, the unit must be in OFF mode. To access through different level, first need to logout from existing password by scrolling to mask Ge02 Logout.

Changing Set Point

```
Suction line Ab01
User setp.: 3.3barG
Act.setp.: 3.3barG
Prop. band: 6.0barG
Integral time: 50sec
Control by: FIXED SETP.
```

1. With controller Home screen displayed, Press PRG button to go Main Menu screen and select "A. Unit Status", press ENTER and select "b. Setpoint" by DOWN button. Screen Ab01 is displayed. To adjust the setpoint, you need the cursor to be by the User setp., then use UP/DOWN buttons to adjust value and then press ENTER to confirm setting.

```
Condensing Ab05
User setp.: 16.0barG
Act.setp.: 16.0barG
Diff.: 3.0barG
Control by: PROPORTIONAL
```

2. Return the cursor to its 'home starting point' before you can move to the next screen Ab05 by pressing the DOWN button. Press ENTER until cursor point to User setp., use UP/DOWN button to adjust value. Press ENTER to confirm the setting and then ESC button repeatedly to return to Home screen. Please note that the set point value of 16.0 bar is recommended for R448A/R449A operation.

Commissioning

Refrigerant Selection

*Applicable only with manufacturer password,

All below steps must be accomplished if refrigerant is changed from default:

```
Comp.Advan. Cag001
Refrigerant type:
R448A
```

1. Press PRG to go to main menu, select "C. Compressor" and press ENTER. Select "g. Advanced" and press ENTER. Enter screen Cag01: Refrigerant Type. Press ENTER to move cursor and UP/DOWN button to select type of refrigerant. Press ENTER for execution and press DOWN button to move to next screen.

```
Comp.Advan. Cag002
BLDC settings
Motor Type:
SIAM AGK66FDB-R448A
Set defaults: YES
Poles numbers: 6
Type drive: PSD1*354**
```

2. Cag02: Select the compressor model. Refer compressor nameplate on the unit to ensure correct model is selected.

- Change Set Default: YES. Press ENTER for execution. Press ESC button to go back to "g. Advanced". Press ENTER and DOWN button to go to below screen.

```
Comp.Advan. Cag49
Start-up Pressure
differential control
Max Pressure differ.
admitted: 9.0barg
```

3. Cag49: Change Max pressure differ. admitted: 9.0bar. Press ENTER for execution.

```
Comp.Advan. Cag52
Speed management
Start-up forced
speed: 60.0rps
Max speed: 100.0rps
Min speed: 30.0rps
```

4. Cag52: Start-up forced speed: 60.0rps; Max speed: 100.0rps; Min speed: 30.0rps

- Press ENTER for the execution



NOTICE

Ensure all data on Cag02, Cag49 and Cag52 are changed accordingly if Cag01 is modified on the type of refrigerant.

Switch Unit ON / OFF (By Controller)

*Applicable only with service password and manufacturer password

```
LT 08:17 10/02/21
Evaporating: -9.9-barg
Condensing: -5.6barg
Actual speed: 0.0rps
Unit OFF by
keyboard
```

```
Unit Status 3/3
a.Main info
b.Setpoint
c.On/Off
```

```
Main menu 1/0
A.Unit Status
I/O B.Inputs/Outputs
C.Compressors
```

```
On/Off Hc01
Status:UnitOn
OFF ON
[ENTER] to switch unit
```

1. With controller Home screen displayed, Press PRG button to go Main Menu screen and select "A. Unit Status".

2. Press ENTER button. Screen "Unit Status" is displayed. Select "c. On/Off" and then press ENTER button.

3. Switch Unit ON by using ENTER button. Indicator pointing to ON means Unit is ON. (Press ENTER button if want switch to OFF position.

4. Press ESC button repeatedly to return to Home Screen. This should now show ON by KEY at the bottom of the screen.

5. The unit will start up following a short delay (assuming all conditions for compressor start-up are met).

Compressor Model Selection

*Applicable only with manufacturer password

Only one Scroll BLDC compressor controlled via Power+ inverter can be selected. The type of compressor is chosen in Compressors-> Advanced (Cag02).



The BLDC compressor is managed via Modbus and works only if connected to inverter drive. If there is no communication with the drive, the compressor will not be able to operate.

NOTICE

If the controller is replaced, the new system can be configured manually under the menu Compressors -> Advanced-> screen Cag02. Select YES for Set defaults and press ENTER.

Controller and drive must be powered and connected via serial; the address of power+ must be 1 (default).

The type of compressor is selected from the list of available compressors; the number of motor poles and the correct model of drive are defined automatically.

Below is a list of currently available compressors in controller:

Application: Low temperature

| Motor Type (R448A) | Motor Type (R449A) | Motor Type (R404A) |
|---------------------|---------------------|---------------------|
| SIAM AGK33FDA-R448A | SIAM AGK33FDA-R449A | SIAM AGK33FDA-R404A |
| SIAM AGK66FDB-R448A | SIAM AGK66FDB-R449A | SIAM AGK66FDB-R404A |
| SIAM AGK87FDC-R448A | SIAM AGK87FDC-R449A | SIAM AGK87FDC-R404A |

If the model of drive is the same model or larger than the drive selected based on the type of BLDC compressor, the default values can be written and controller can control the compressor. Otherwise, the message "Not compatible" will be shown.

Compressor Operation

Envelope management

The compressor working zone in the software is defined based on the following measurements:

- Condensing pressure
- Evaporation pressure
- Discharge temperature

and compares these against the compressor envelope. The controller manages the demand for capacity sent to the drive, in a controlled manner in order to maintain the compressor operating conditions within the limits of pressure and temperature defined by the manufacturer (zone 1a-1b). The actions to keep the compressor within the operating zone specified by the manufacturer are:

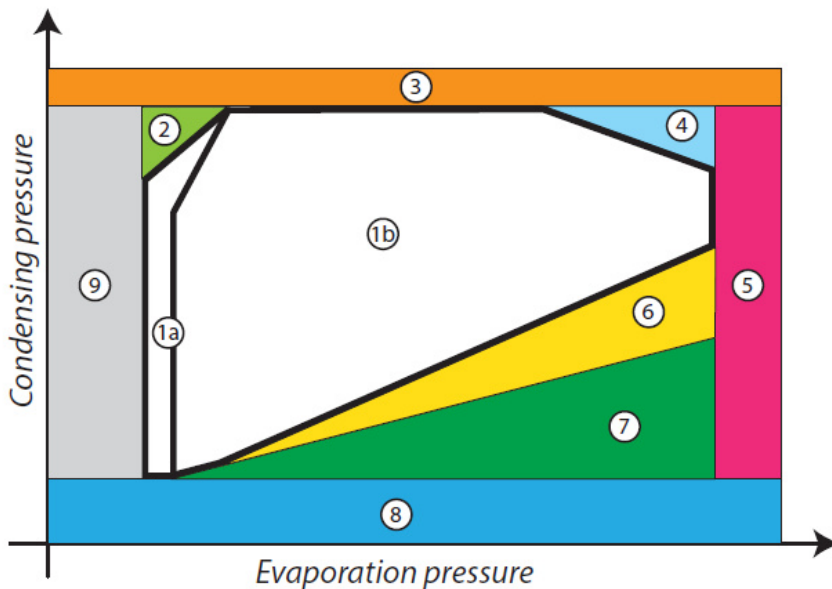
- Decrease in acceleration or deceleration, when compressor operation approaches the limits, until holding the speed when operation is at the limit.
- Speed reduction when operation is beyond the high condensing pressure or high compression ratio limits, so as to return within the permitted operating zone.

When compressor operation remains too long in a zone outside of the envelope, an alarm is generated (mask Cag55, default 60sec). The zone number and description is shown on the alarm mask. During start-up, when the compressor operates at a fixed speed for the minimum ON time, this alarm is disabled.

The discharge temperature alarm is always active.

The following zones are defined:

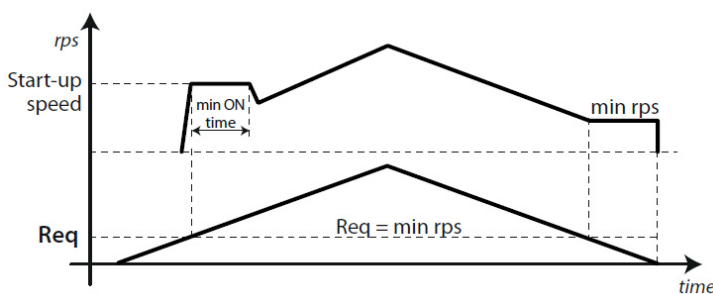
Commissioning



1. Inside the envelope (a, b with different maximum discharge temperature)
2. High compression ratio
3. High condensing pressure
4. High current
5. High evaporation pressure
6. Low compression ratio
7. Low pressure differential
8. Low condensing pressure
9. Low evaporation pressure

Inverter compressor start-up:

Compressor is managed to start-up by adapting operating speed so as to guarantee that the desired conditions and excellent lubrication are reached very quickly. For this reason, when starting the compressor is operated at a settable fixed speed (Cag52) for the minimum ON time. During this stage, the out-of-envelope alarm is disabled, but speed control remains active if approaching or exceeding zone 2 (maximum compression ratio), 3 (maximum condensing pressure) or 4 (current limit).



If 45 seconds after compressor start-up, the pressure differential is less than 0.2barG higher than the value measured at start-up, the controller stops the compressor and generates a "No compressor start-up" alarm. This alarm is automatically reset and controller tries to start the compressor five times after a 30 second delay. After the fifth attempt, the alarm is no longer automatically reset.

The corresponding parameters are in loop:
Compressors -> Advanced -> masks Cag50, Cag51, Cag52:

```
Comp.Advan. Cag50
Start-up failure
control
Pressure difference
min.variation: 0.2barG
Control period: 45s
```

```
Comp.Advan. Cag51
Start-up failure
control
Restart delay: 30s
Max retry number: 5
```

```
Comp.Advan. Cag52
Speed management
Start-up forced
speed: 60.0rps
Max speed: 100.0rps
Min speed: 30.0rps
```

Pressure differential during start-up

The BLDC compressor cannot start if the pressure differential is greater than 9.0barG. This limit depends on the maximum current delivered by the inverter. As soon as the pressure differential falls below the minimum threshold, the compressor can start.

The corresponding parameters are in loop: Compressors -> Advanced -> mask Cag49:

When the pressure differential is below 9barG – 0.5 barG (fixed value), the compressor is ready to start.

Commissioning

Minimum pressure differential for lubrication

The min. pressure differential threshold for correct lubrication is related to the type of BLDC compressor and cannot be modified. The low-pressure differential alarm is generated when the difference between condensing pressure and evaporation pressure (DeltaP) remains below the limit defaulted for a set time, and consequently excellent lubrication is not guaranteed. The alarm stops the compressor and is reset automatically. The alarm is not active during defrosting.

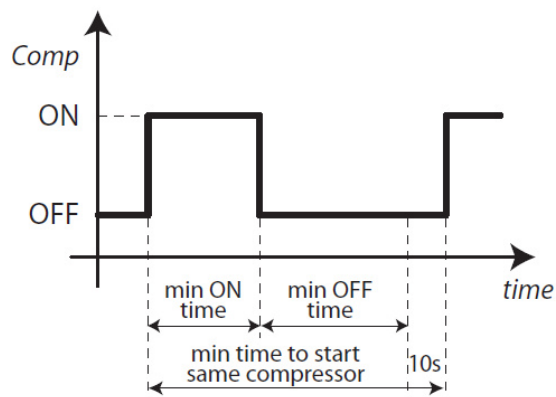
```
Comp.Advan. Cag55
Envelope control
Out of envelope
alarm timeout: 60s
Low pressure diff.
alarm timeout: 60s
```

The corresponding parameters are in loop: Compressors -> Advanced-> mask Cag55:

Times

Time management includes a minimum On time, a minimum Off time and a minimum time between two consecutive starts. These parameters can be modified under Compressors -> Configuration -> mask Caf35:

```
Comp.Config. Caf35
Compressor controlled
by BLDC timings
Min on time: 180s
Min off time: 180s
Min time to start
same compressor: 370s
```

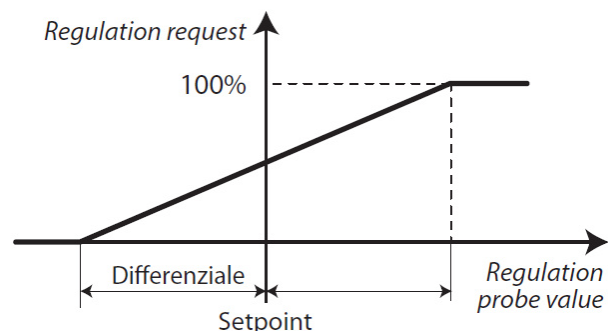


Compressor control

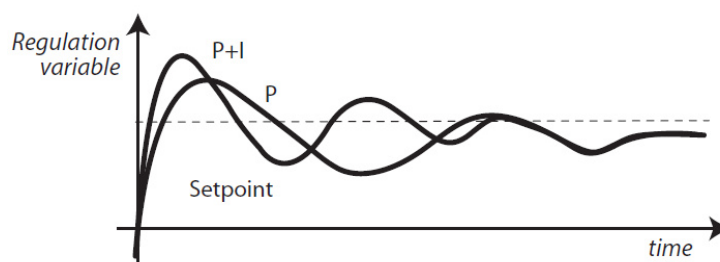
Control can be proportional or proportional + integral (P, P+I). The corresponding parameters are in loop: Compressors -> Regulation -> mask Cab14.

The set point is in the centre of the band. Proportional control is illustrated in the following figure:

```
Comp.Regul. Cab14
PI press. regulation
Differential: 6.0barg
Integral time: 50sec
```



With proportional + integral control, the integral time is summed to the effect of proportional control, giving a null control error in steady operation. This type of control is illustrated in the following figure:



Commissioning

The integral action depends on time and the deviation from the set point. The integral time represents how fast integral control is implemented:

- Low values bring fast actions yet more instability
- High values bring slower actions and more stability

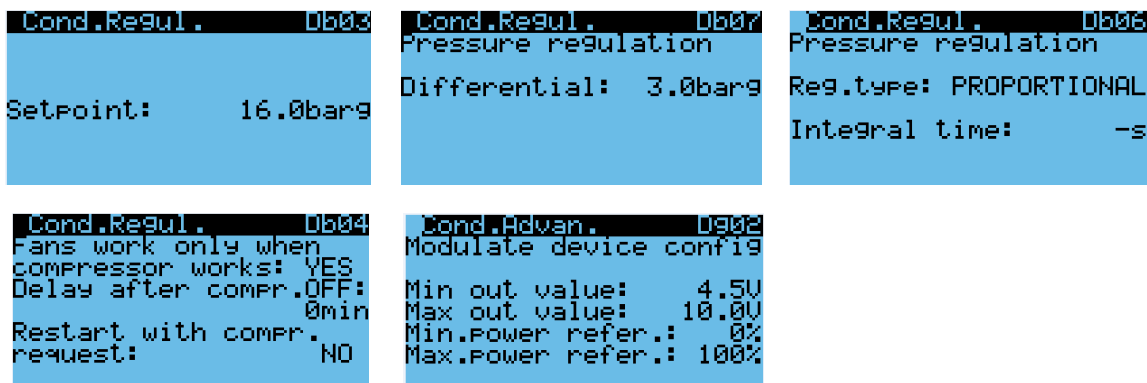
The values should not be set too low, to avoid system instability. Two types of control can be set, in loop Compressors -> Regulation -> mask Cab01

- Fixed set point: Default
- Floating set point: Only available by exploiting serial communication with the evaporators. Serial communication allows information to be exchanged in real time between the controller and the MPXPRO devices.

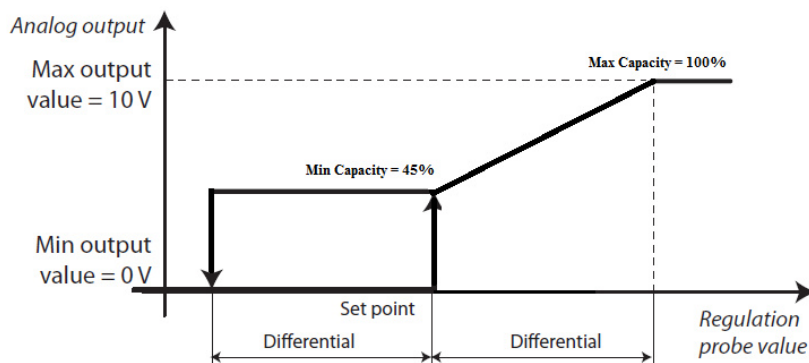
AC Fan Speed Modulation

One of the AC fan is controlled by a phase cut modulating device based on pressure input. The fan speed control is factory preset with a $\pm 3.0\text{barG}$ differential setting. With this setting, the fan operation is as follows:

The meaning of the parameters that associate with modulating device on masks Db03, Db07, Db04, Db06 and Dg02 are illustrated in the following graph.



The fan under FSC control will start at 100% speed for approximately 5 seconds before start modulates between 45% ~ 100% of full fan speed.



Fan control can be switched to be controlled by external temperature probe if fault discharge pressure transducer. Associated parameter to be changed on masks: Dg14, Dg15.

The controller can manage an EC fan as well. Please contact J&E Hall in case EC fan is required on the unit.

Recommended fan settings to gain higher energy efficiency as published in the

Ecodesign data sheets are as follows:

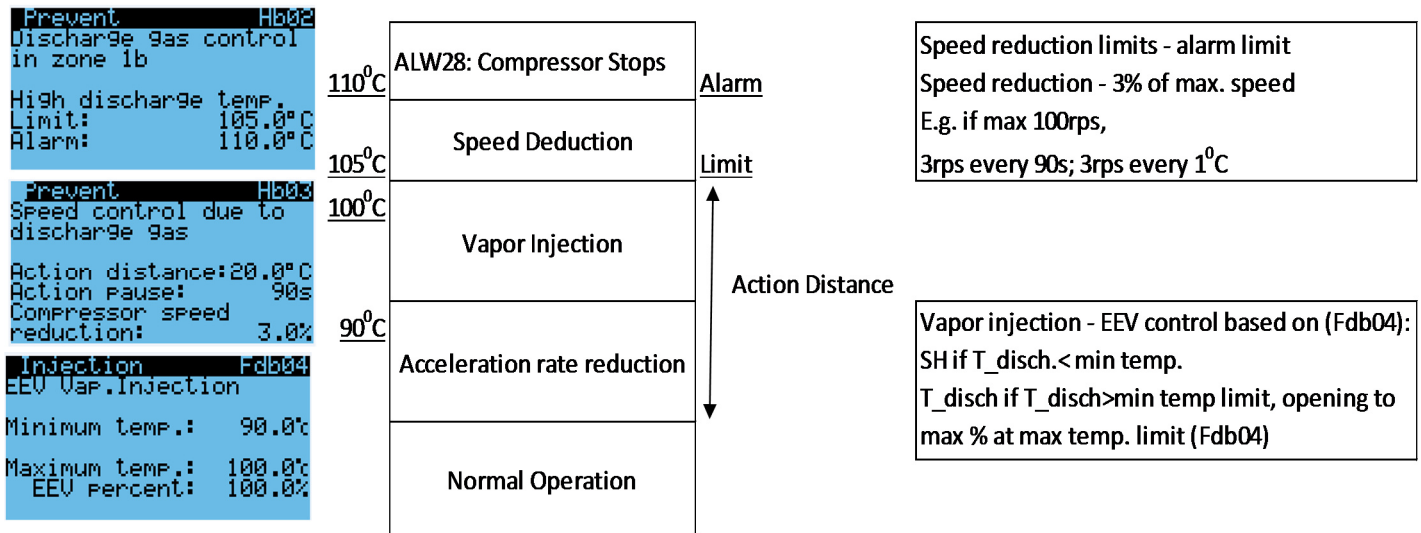
| | |
|--|----------------------------------|
| Refrigerant | R448A/R449A |
| Setpoint limits (Db02) | Minimum: 10barG; Maximum: 28barG |
| Setpoint (Db03) | 13.5barG |
| Cut off enable (Db05) | No |
| Pressure Regulation Differential (Db07) | 5.5barG |

High Discharge Temperature Management

The envelope of a BLDC compressor is also limited by high discharge temperature. Near the limit value, compressor speed will start slowing, until stopping on reaching the limit. If the temperature continues to rise, a safety algorithm will be activated to gradually reduce it. The corresponding parameters are under submenu: Compressors ->Advanced -> mask Hb02, Hb03, Fdb04.

If the discharge temperature exceeds the maximum limit, the high temperature alarm is activated and the compressor is stopped. The alarm is reset manually.

***EEV Vapor Injection applicable to *-L-3* models only.**



Mechanical safety pressure switch

Mechanical pressure switches will cut out the STO connection on the drive to stop the compressor, when any of below is fulfilled:

1. Suction pressure is lower than the (cut in – differential) on the Saginomiya SNS low pressure switch.
2. Discharge pressure is higher than the cut-out pressure of the manual reset cartridge type pressure switch.

Once tripped, it will create Alarm: ALW25 and Code: 16. High pressure switch needs to be **manual reset** by access to the part from hinged right door (for JEHSI-033-B3-M/L and JEHSI-066-B3-M/L) and hinged front top door (for JEHSI-087-B4-M/L).

The low-pressure switch is factory set as below to ease alarms identification, which either activated by pressure switches or pressure transducer (defaulted in controller). Thus, please do not adjust the factory default setting listed in below table.

| Mechanical Safety Device | Refrigerant | R448A/R449A |
|--------------------------|------------------------------|--------------------|
| Low Pressure Switch | Application | Medium Temperature |
| | Cut In (barG) | 3.0 |
| | Differential (barG) | 1.0 |
| High Pressure Switch | Cut Out/ Manual Reset (barG) | 28/22 |

Note: In case number of recycling pump down exceeds 5 times/hour (factory setting), manual reset on low pressure alarms will be activated. Value on Mask Hc03 will need to be adjusted to avoid unnecessary unit trigger off.

Pipe Size Selection



NOTICE

Do not assume that the suction/liquid connections sizes on the condensing unit are the correct sizes to run your interconnecting refrigeration pipes.

As a piping design concept, convenience store application will operate at part load condition. It is a concern that too big suction cross section area will cause refrigerant do not obtain sufficient velocity to carry oil returned back to compressor. Below table provide a guideline for quick selection of suction pipe size.

Table: Suction Pipe Size Selection

| Model | % Refrigerant flow | Oil return speed limited (rps) for each pipe size | | | | | | | | | |
|--------------------------------------|--------------------|---|----------|----------|-----|-----|-----|-----|-----|-----|-----|
| | | 1 3/8 | 1 1/4 | 1 1/8 | 1 | 7/8 | 3/4 | 5/8 | 1/2 | 3/8 | 1/4 |
| JEHSI-033-B3-M-3 JEHSI-033-B3-L-3 | 100% | | | 94 | 70 | 51 | 37 | 26 | 20 | 20 | 20 |
| | 90% | | | 105 | 78 | 56 | 40 | 28 | 20 | 20 | 20 |
| | 80% | | | 118 | 88 | 62 | 44 | 31 | 20 | 20 | 20 |
| | 70% | | | | 100 | 71 | 50 | 34 | 22 | 20 | 20 |
| | 60% | | | | 118 | 84 | 57 | 39 | 25 | 20 | 20 |
| | 50% | | | | | 101 | 68 | 45 | 29 | 20 | 20 |
| | 40% | | | | | | 85 | 54 | 34 | 20 | 20 |
| | 30% | | | | | | 114 | 72 | 43 | 24 | 20 |
| | 20% | | | | | | | 109 | 61 | 34 | 20 |
| | 10% | | | | | | | | | 60 | 26 |
| JEHSI-066-B3-M-3 JEHSI-066-B3-L-3 | 100% | | 57 | 44 | 34 | 24 | 20 | 20 | 20 | 20 | 20 |
| | 90% | | 75 | 49 | 37 | 27 | 20 | 20 | 20 | 20 | 20 |
| | 80% | | 117 | 55 | 41 | 30 | 21 | 20 | 20 | 20 | 20 |
| | 70% | | | 71 | 47 | 34 | 24 | 20 | 20 | 20 | 20 |
| | 60% | | | | 55 | 40 | 28 | 20 | 20 | 20 | 20 |
| | 50% | | | | 85 | 47 | 33 | 21 | 20 | 20 | 20 |
| | 40% | | | | | 59 | 40 | 26 | 20 | 20 | 20 |
| | 30% | | | | | | 53 | 34 | 20 | 20 | 20 |
| | 20% | | | | | | | 51 | 30 | 20 | 20 |
| | 10% | | | | | | | | 58 | 29 | 20 |
| JEHSI-087-B4-M-3 JEHSI-087-B4-L-3 | 100% | 52 | 42 | 32 | 25 | 20 | 20 | 20 | 20 | 20 | 20 |
| | 90% | 58 | 46 | 36 | 27 | 20 | 20 | 20 | 20 | 20 | 20 |
| | 80% | 64 | 52 | 40 | 30 | 22 | 20 | 20 | 20 | 20 | 20 |
| | 70% | 72 | 59 | 46 | 34 | 25 | 20 | 20 | 20 | 20 | 20 |
| | 60% | 82 | 67 | 53 | 40 | 29 | 20 | 20 | 20 | 20 | 20 |
| | 50% | 97 | 78 | 63 | 47 | 34 | 24 | 20 | 20 | 20 | 20 |
| | 40% | 118 | 95 | 76 | 59 | 43 | 29 | 20 | 20 | 20 | 20 |
| | 30% | | | 97 | 75 | 56 | 39 | 25 | 20 | 20 | 20 |
| | 20% | | | | 108 | 80 | 57 | 37 | 22 | 20 | 20 |
| | 10% | | | | | | 105 | 71 | 42 | 22 | 20 |

Pipe Size Selection

To find optimum suction pipe side for oil return.

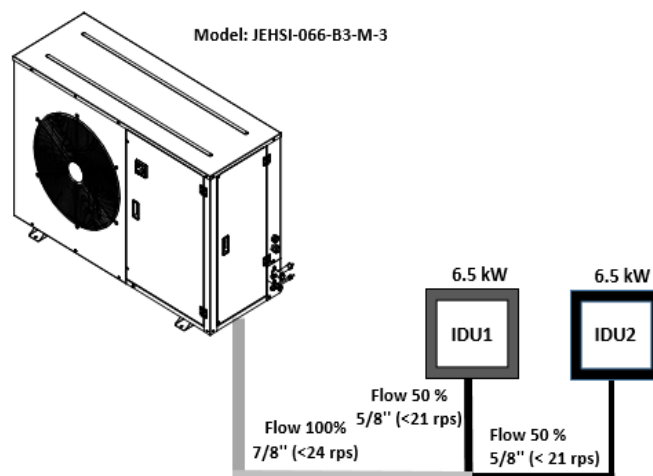
Example:

1. Calculate % of refrigerant flow for each indoor

- Total cooling load = $6.5 + 6.5 = 13\text{kW} = 100\%$
- Flow for IDU 1 = $6.5/13 = 50\%$
- Flow for IDU 2 = $6.5/13 = 50\%$

2. Select suction pipe size using above table based on optimum minimum speed not lower than 30rps. Refer figure for the selected suction pipe size.

3. Conclusion: Minimum running speed of compressor for oil return with this combination of piping is 21rps.



Liquid Line Insulation

(Only applicable to *-L-3* models)

Liquid line connecting CCU service valve to the evaporator must be well insulated with recommended wall thickness of minimum 3/8".

Expansion Valve and Liquid Line Selection

(Only applicable to *-L-3* models)

The lower liquid temperature for model *-L-3* which integrate vapor injection feature, can increase evaporator expansion valve and unit cooling capacities. Therefore, selection of the expansion valve and liquid line needs to be done by taking into consideration the amount of sub-cooling shown in the following table:

Pipe Size Selection

Table: Subcooling

| MODEL | SPEED, rpm | Ta / Te | -20 | -15 | -10 | -5 | 0 | 5 |
|------------------|---------------|---------|------|------|------|------|------|------|
| JEHSI-033-B3-L-3 | 30 | 27 | 26.6 | 23.6 | 19.6 | 15.8 | 11.4 | 7.1 |
| | 30 | 32 | 26.1 | 23.1 | 20.1 | 16.3 | 12.4 | 8.6 |
| | 30 | 35 | 26.0 | 23.7 | 21.5 | 17.6 | 13.7 | 9.8 |
| | 30 | 38 | 25.8 | 24.3 | 22.8 | 18.9 | 15.0 | 11.1 |
| | 60 | 27 | 28.9 | 27.4 | 25.9 | 21.1 | 15.8 | 10.5 |
| | 60 | 32 | 29.4 | 27.9 | 26.4 | 21.6 | 16.8 | 12.0 |
| | 60 | 35 | 30.9 | 28.9 | 26.9 | 22.8 | 18.7 | 14.6 |
| | 60 | 38 | 32.4 | 29.9 | 27.4 | 24.0 | 20.6 | 17.2 |
| | 80 | 27 | 31.4 | 28.4 | 25.4 | 21.5 | 17.0 | 12.6 |
| | 80 | 32 | 31.9 | 28.9 | 25.9 | 22.0 | 18.0 | 14.1 |
| | 80 | 35 | 32.0 | 29.0 | 26.0 | 22.4 | 18.9 | 15.3 |
| | 80 | 38 | 32.0 | 29.0 | 26.0 | 22.9 | 19.7 | 16.6 |
| | 100 | 27 | 31.4 | 28.4 | 25.4 | 22.4 | 18.9 | 15.4 |
| | 100 | 32 | 31.9 | 28.9 | 25.9 | 22.9 | 19.9 | 16.9 |
| | 100 | 35 | 32.2 | 29.4 | 26.7 | 23.5 | 20.3 | 17.1 |
| | 100 | 38 | 32.4 | 29.9 | 27.4 | 24.1 | 20.7 | 17.4 |
| JEHSI-066-B3-L-3 | 30 | 27 | 23.0 | 18.4 | 13.7 | 10.9 | 8.0 | 5.2 |
| | 30 | 32 | 23.5 | 18.9 | 14.2 | 11.4 | 8.5 | 5.7 |
| | 30 | 35 | 23.3 | 19.3 | 15.4 | 13.1 | 10.9 | 8.6 |
| | 30 | 38 | 23.0 | 19.8 | 16.6 | 14.9 | 13.2 | 10.5 |
| | 60 | 27 | 23.6 | 22.1 | 20.6 | 17.6 | 14.6 | 11.6 |
| | 60 | 32 | 24.1 | 22.6 | 21.1 | 18.1 | 15.1 | 12.1 |
| | 60 | 35 | 25.8 | 23.7 | 21.7 | 18.6 | 15.6 | 12.6 |
| | 60 | 38 | 27.4 | 24.8 | 22.2 | 19.2 | 16.1 | 13.1 |
| | 80 | 27 | 24.2 | 21.0 | 17.7 | 15.8 | 13.8 | 11.9 |
| | 80 | 32 | 24.7 | 21.5 | 18.2 | 16.3 | 14.3 | 12.4 |
| | 80 | 35 | 26.3 | 22.9 | 19.4 | 15.5 | 11.6 | |
| | 80 | 38 | 27.9 | 24.3 | 20.6 | 14.8 | | |
| | 100 | 27 | 24.6 | 21.4 | 18.1 | 15.2 | 12.6 | 10.0 |
| | 100 | 32 | 25.1 | 21.9 | 18.6 | 15.3 | | |
| | 100 | 35 | 25.8 | 22.6 | 19.5 | 16.1 | | |
| | 100 | 38 | 26.5 | 23.4 | 20.3 | | | |
| JEHSI-087-B4-L-3 | 30 | 27 | 21.5 | 19.1 | 16.8 | 15.5 | 11.3 | 7.3 |
| | 30 | 32 | 23.4 | 19.9 | 16.4 | 14.6 | 12.8 | 10.8 |
| | 30 | 35 | 22.1 | 19.3 | 16.6 | 16.0 | 15.4 | 13.4 |
| | 30 | 38 | 20.7 | 18.7 | 16.7 | 17.3 | 17.9 | 15.9 |
| | 60 | 27 | 21.5 | 20.3 | 18.5 | 16.5 | 13.8 | 10.8 |
| | 60 | 32 | 21.9 | 20.4 | 18.9 | 16.7 | 14.4 | 11.9 |
| | 60 | 35 | 24.1 | 22.6 | 21.1 | 18.2 | 15.3 | 12.3 |
| | 60 | 38 | 26.3 | 24.8 | 23.3 | 19.8 | 16.2 | 12.6 |
| | 80 | 27 | 20.2 | 19.1 | 17.3 | 15.8 | 14.1 | 12.1 |
| | 80 | 32 | 20.8 | 18.8 | 16.8 | 15.6 | 14.3 | 12.3 |
| | 80 | 35 | 24.3 | 22.0 | 19.8 | 17.1 | 14.4 | 11.7 |
| | 80 | 38 | 27.7 | 25.2 | 22.7 | 18.6 | 14.5 | |
| | 100 | 27 | 22.4 | 20.5 | 19.8 | 18.6 | 17.6 | 14.6 |
| | 100 | 32 | 23.6 | 21.6 | 19.6 | 18.9 | 18.1 | 16.1 |
| | 100 | 35 | 24.5 | 22.5 | 20.5 | 19.7 | 18.8 | 16.8 |
| | 100 | 38 | 25.4 | 23.4 | 21.4 | 20.5 | 19.5 | |

System Charge



NOTICE

Never start the compressor under vacuum. Ensure an adequate liquid charge has been introduced to the high side of the system before starting to ensure a minimum operating pressure on the suction side of 0.5 bar is maintained, otherwise overheating of the scrolls and subsequent damage may occur. Refrigerant blend must be charged in liquid form to avoid change of chemical properties.

Condensing unit must not run and service valves must be closed for initial refrigerant charge. The service port on the receiver outlet rotolock valve (liquid line) can be used for initial charge. Charge refrigerant as close as possible to the nominal system charge (will vary depending on the tube size and lengths) before the compressor with both all service valves turn to OPEN position.

Compressor Charge Limit = 6kgs

For the adjustment of refrigerant charge until the installation reaching a level of stable nominal working condition, slowly throttling liquid in through Schrader valve on the suction service valve. Charge system until reaching suction superheat 6~12K at desired evaporating temperature. Suction superheat, suction and condensing pressures (temperatures) could be found on the info screen of the controller. During optimizing charging, ensure oil sight glass doesn't start foaming.

A proper refrigerant charge should secure stable condition at minimum and maximum heat load within the limits of the condensing unit's application envelope.

- Minimum heat load conditions, which occurred during winter. Condenser should not be flooded by liquid refrigerant, receiver and liquid line should be able to contain remaining charge at this condition.
- Maximum heat load conditions, which occurred during summer. All evaporators are working with maximum air/liquid flow via evaporators and refrigerant charge should be enough to feed to all evaporators.



NOTICE

Refrigerant charge by judging the liquid sight glass does not guarantee as 100% correct way.

To avoid system overcharging, which can cause higher energy consumption and low compressor sump superheat.

Compressor sump superheat = temperature of (compressor shell-bottom at 30mm above foot shell – condensing saturated vapor at that time)

- Ensure compressor sump superheat more than 10K.

The system approximate maximum charge can be calculated as below:

Approximate Maximum Charge = (Receiver Volume + Internal volume of Liquid Line) * 0.9

When the compressor operates under stabilized conditions, the oil level must be visible in the sight glass (floating ball). Foam filling the oil sight glass indicates presence of large concentration of liquid to the compressor.

No additional oil is required for installation with good oil returns, line runs up to 30m. Additional oil might be required if lines exceeded 30m, with minimum oil level must not lower than ¼ of sight glass. Top-up the oil while compressor is idle, via suction schrader connector with a suitable pump.

Controller Settings

The controller inside the condensing unit had been preset from factory, in accordance to the following lists:

Note: In case controller is replaced, it shall be checked to ensure correct refrigerant selection and compressor model (Refer Procedure Refrigerant Selection).

B - Inputs/Outputs

| Mask Index | UoM | Type | Channel | Min | Max | Offset |
|-----------------------|------|-------------|---------|-----|------|--------|
| Analog Input | | | | | | |
| Bab01 | barg | 0-5V | B1 | 0 | 17.3 | 0 |
| Bab05 | °C | NTC | B3 | | | 0 |
| Bab07 | barg | 0-5V | B2 | 0 | 34.5 | 0 |
| Bab15 | °C | NTC | B8 | | | 0 |
| Bab29 | °C | HTNC | B4 | | | 0 |
| Digital input | | | | | | |
| Baa00 | | NO | ID01 | | | |
| Baa01 | | NO | ID02 | | | |
| Baa02 | | NO | ID03 | | | |
| Analog Output | | | | | | |
| Bad01 | | PWM (0-10V) | 1 | | | |
| Digital Output | | | | | | |
| Bacbt | | NO | DO6 | | | |
| Bacen | | NO | DO5 | | | |
| Baceq | | NO | DO8 | | | |
| Bacev | | NO | DO3 | | | |

C- COMPRESSOR

| Mask Index | Variable Description | Default Setting | UoM |
|------------|--|-----------------|----------------|
| Cab01 | Regulation mode | 0 | PRESSURE |
| Cab01 | Regulation type | 1 | FIXED SETPOINT |
| Cab02 | Setpoint limits - Minimum | 1.4 | barg |
| Cab02 | Setpoint limits - Maximum | 5.5 | barg |
| Cab03 | Setpoint | 3.3 | barg |
| Cab14 | PID press regulation - Differential | 6 | barg |
| Cab14 | PID press regulation - Integral time | 50 | s |
| Cae24 | Suction high pressure alarm - threshold | 16.0 | barg |
| Cae25 | Suction high pressure alarm diff. | 1.0 | barg |
| Cae25 | Alarm delay | 5 | s |
| Cae26 | Suction low pressure alarm | | ABSOLUTE |
| Cae26 | Suction low pressure alarm - threshold | 1.2 | barg |
| Cae27 | Suction low pressure alarm diff. | 0.8 | barg |
| Cae27 | Alarm delay | 10 | s |
| Caf35 | Compressor Controlled by BLDC, timings - Min on time | 180 | s |
| Caf35 | Compressor Controlled by BLDC, timings - Min off time | 180 | s |
| Caf35 | Compressor Controlled by BLDC, timings - Min time to start same compressor | 370 | s |
| Caf95 | Compressor controlled by BLDC, force off - Enable | NO | |
| Caf95 | Compressor controlled by BLDC, force off - Threshold | 1.5 | barg |
| Caf95 | Compressor controlled by BLDC, force off - Differential | 1 | barg |
| Caf95 | Compressor controlled by BLDC, force off - Delay | 15 | s |
| Cag01 | Refrigerant type | R448 | |

| Mask Index | Variable Description | Default Setting | UoM |
|------------|--|-----------------|----------------|
| Cag02 | BLDC setting - Motor Type | | |
| Cag02 | BLDC setting - Set defaults | 0 | NO |
| Cag03 | Request in case of regulat. Probes fault: | 50 | % |
| Cag43 | BLDC settings - Crankcase heater | | Compressor Off |
| Cag43 | BLDC settings - Crankcase current | 24 | % |
| Cag43 | BLDC settings - STO alarm management | | MAN RESET |
| Cag44 | Crankcase heater Ambient temp control - Enable | Yes | |
| Cag44 | Crankcase heater Ambient temp control - Threshold | 15.0 | °C |
| Cag44 | Crankcase heater Ambient temp control - Differential | 1.0 | °C |
| Cag49 | Start-up pressure differential control - Max pressure differ. Admitted | 9.0 | barg |
| Cag50 | Start-up Failure control - Pressure difference min. variation | 0.2 | barg |
| Cag50 | Start-up Failure control - Control period | 45 | s |
| Cag51 | Start-up Failure control - Restart delay | 30 | s |
| Cag51 | Start-up Failure control - Max retry number | 5 | -- |
| Cag52 | Speed management - Start-up forced speed | 60 | rps |
| Cag52 | Speed management - Max speed | 100 | rps |
| Cag52 | Speed management - Min speed | 30 | rps |
| Cag53 | Speed management - Deceleration rate | 1.6 | rps/s |
| Cag53 | Speed management - Acceleration rate | 1.0 | rps/s |
| Cag53 | Speed management - Switch-off rate | 2.0 | rps/s |
| Cag54 | Envelope control - Speed reduction rate | 0.8 | rps/s |
| Cag54 | Envelope control - Min speed admitted | 20.0 | rps/s |
| Cag55 | Envelope control - Out of envelop alarm timeout | 60 | s |
| Cag55 | Envelope control - Low pressure diff. alarm timeout | 60 | s |

D - CONDENSER

| | | | |
|------|---------------------------------------|------|-------------------|
| Db02 | Setpoint limits - Minimum | 10.0 | barg |
| Db02 | Setpoint limits - Maximum | 28.0 | barg |
| Db03 | Setpoint | 16.0 | barg |
| Db04 | Fans only work when compressor works | Yes | NO |
| Db05 | Cut-Off enable | 0 | NO |
| Db06 | Pressure regulation - reg type | 1 | P+I |
| Db06 | Pressure regulation - Integral time | 180 | s |
| Db07 | Pressure regulation - differential | 3.0 | barg |
| De01 | Condenser pressure high alarm | | ABSOLUTE |
| De01 | Condenser high pressure - alarm delay | 5 | s |
| De02 | Condenser high pressure - threshold | 28.0 | barg |
| De02 | Condenser high pressure - alarm diff | 7 | |
| De03 | Condenser pressure low alarm | | ABSOLUTE |
| De03 | Condenser low pressure - alarm delay | 5 | s |
| De04 | Condenser low pressure - alarm diff | 1.0 | barg |
| De04 | Condenser low pressure - threshold | 6.0 | barg |
| Dg01 | Modulating speed device | 2 | PHASE CUT CONTROL |
| Dg02 | Min out value | 4.5 | V |
| Dg02 | Max out value | 10 | V |
| Dg02 | Min power ref | 0 | % |
| Dg02 | Max power ref | 100 | % |
| Dg03 | Rising time | 5 | s |
| Dg03 | Falling time | 5 | s |
| Dg03 | Num. control fans | 1 | |

Only applicable to *-L-3* models

F -OTHER FUNCTIONS - LIQ./VAP. INJECTION

| Mask Index | Variable Description | Default Setting | UoM | Type | Channel | Min | Max | Offset |
|------------|---|-----------------|------|------|---------|-----|------|--------|
| Fda01 | Pressure transducer | 0 | barg | 0-5V | B5 | 0 | 34.5 | 0 |
| Fda02 | Temperature probe | 0 | °C | NTC | B6 | | | 0 |
| Fda11 | Power failure valve | | | NO | DO4 | | | |
| Fdb02 | Injection type | 2 | EEV | | | | | |
| Fdb04 | Discharge temp. BLDC comp. liquid injection minimum temperature | 90 | °C | | | | | |
| Fdb04 | Discharge temp. BLDC comp. liquid injection maximum temperature | 100 | °C | | | | | |
| Fdb04 | Discharge temp. BLDC comp. liquid injection maximum percent | 100 | % | | | | | |
| Fdb09 | SH setpoint | 11 | K | | | | | |
| Fdb09 | Low SH threshold | 5 | K | | | | | |
| Fdb09 | LOP threshold | -50 | K | | | | | |
| Fdb09 | MOP threshold | 50 | K | | | | | |
| Fdb10 | PID proportional gain | 15 | -- | | | | | |
| Fdb10 | PID Integral time | 150 | s | | | | | |
| Fdb10 | PID Derivative Time | 5 | s | | | | | |
| Fdb11 | EEV inj. manual mode | 0 | NO | | | | | |
| Fdb11 | EEV inj. manual mode: EEV Steps | 0 | % | | | | | |
| Hb01 | High pressure prevent - Manufacturer envelope threshold | 28.0 | barg | | | | | |
| Hb01 | Custom envelope | NO | | | | | | |
| Hb01 | Threshold | 0.0 | barg | | | | | |
| Hb02 | Discharge gas control in zone 1b - high discharge temp limit | 105 | °C | | | | | |
| Hb02 | Discharge gas control in zone 1b - alarm | 110 | °C | | | | | |
| Hb03 | Speed control due to discharge control - action distance | 20 | °C | | | | | |
| Hb03 | Action pause | 90 | s | | | | | |
| Hb03 | Compressor speed reduction | 3 | % | | | | | |
| Hc01 | Common HP type | Auto | | | | | | |
| Hc01 | Common HP delay | 0 | s | | | | | |
| Hc02 | Common LP start delay | 5 | s | | | | | |
| Hc02 | Common LP delay | 20 | s | | | | | |
| Hc03 | Low pressure time of semi-automatic alarm evaluation | 60 | min | | | | | |
| Hc03 | N of retries before alarm becomes manual | 5 | | | | | | |
| Hc05 | Leak detector alarm - enable alarm | NO | | | | | | |
| Hc05 | Switch off compressor. | NO | | | | | | |
| Hc05 | Switch off fans. | NO | | | | | | |
| Hc05 | Leak alarm delay | 1 | s | | | | | |
| Hc07 | BLDC compressor - envelope reset | AUTO | | | | | | |
| Hc07 | Evaluation time | 60 | min | | | | | |
| Hc07 | N of retries before alarm becomes manual | 5 | | | | | | |
| Hc09 | BLDC compressor - Power+ reset | AUTO | | | | | | |
| Hc09 | Evaluation time | 60 | min | | | | | |
| Hc09 | N of retries before alarm becomes manual | 5 | | | | | | |
| Hc08 | Reset History alarm | NO | | | | | | |

Controller Settings

Alarm Settings

The alarms below are in ascending order of priority. When there is any alarm, the alarm code will be displayed on the main screen and the alarm LED will be on or blinking.

| Alarm Code | Display description | Reset | Delay | Alarm relay | Action |
|------------|--|---------------|-------------|-------------|--|
| ALU02 | Regulation probe(s) missing | Automatic | Not present | Not present | Shutdown Unit |
| ALA01 | Discharge temperature probe broken or disconnected | Automatic | 60 s | R2 | Related functions disabled |
| ALA02 | Condenser pressure probe broken or disconnected | Automatic | 60 s | R1 | Related functions disabled |
| ALA03 | External temperature probe broken or disconnected | Automatic | 60 s | R2 | Related functions disabled |
| ALA24 | Suction pressure probe broken or disconnected | Automatic | 60 s | R1 | Related functions disabled |
| ALA25 | Suction temperature probe broken or disconnected | Automatic | 60 s | R2 | Related functions disabled |
| ALA46 | Vapor injection pressure probe broken or disconnected | Automatic | 60 s | R1 | Related functions disabled |
| ALA47 | Vapor injection temperature probe broken or disconnected | Automatic | 60 s | R1 | Related functions disabled |
| ALB01 | Low common suction pressure by pressostat Num.autom.reset: /in min | Semiautomatic | 5/60min | R1 | Shutdown compressor |
| ALB02 | High common condensing pressure by pressostat | Automatic | 0 s | R1 | Shutdown compressor |
| ALB03 | Low condenser pressure alarm | Automatic | 5 s | R1 | Fan Forcing at 0% |
| ALB04 | High condenser pressure alarm | Automatic | 5 s | R1 | Fan Forcing at 100% (5 min.) and shutdown compressor |
| ALB15 | High suction pressure alarm | Automatic | 5 s | R1 | - |
| ALB16 | Low suction pressure alarm | Automatic | 10 s | R1 | - |
| ALC01 | Alarm 1 compressor 1: | Automatic | 0 s | Config. | Shutdown compressor |
| ALG01 | Clock board error | Automatic | - | R2 | Related functions disabled |
| ALG02 | Extended memory error | Automatic | - | R2 | Related functions disabled |
| ALT01 | Compressors working hours | Manual | - | Not present | - |
| ALT19 | DSH Low Liquid flowback | Manual | 60 s | R1 | Shutdown compressor |
| ALW24 | Power+ n° Device Offline | Semiautomatic | 2 s | R1 | Shutdown compressor |
| ALW25 | Power+ n° | Semiautomatic | Not present | R1 | Shutdown compressor |
| ALW26 | Compressor start failure (tempt.: / max.:) | Semiautomatic | Not present | R1 | - |
| ALW27 | Envelope alarm Zone: Num.autom.reset: /in min | Automatic | 5/60min | R1 | Shutdown compressor |
| ALW28 | High discharge gas temperature | Automatic | 10 s | R1 | - |

R1: serious alarm; R2: normal alarm

Note: Bcen activation (serious alarm) is based on Alarm Relay R1

Controller Settings

Details Error Code From Activation Of ALW25

| Code | Description | Possible Cause | Solution |
|------|---|---|--|
| 1 | Overcurrent | The drive has detected a current supplied that is too high due to: - sudden strong load increase; - wrong parameters values or inadequate motor. | Check the drive and compressor model and the cables. |
| 2 | Motor overload | The current supplied has exceeded the motor rated current over the maximum time accepted | Check the drive and compressor model and the cables. |
| 3 | Overvoltage | The DC voltage of the intermediate circuit has exceeded the limits envisioned due to high over-voltage peaks on the power supply network. | - |
| 4 | Undervoltage | The DC voltage of the intermediate circuit is below the limits envisioned due to: - insufficient power supply voltage; - fault inside the drive. | In the event of temporary cut-off of the power supply, reset the alarm and re-start the drive. Check the power supply voltage. |
| 5 | Drive overtemperature | The temperature inside the drive has exceeded the maximum level allowed. | Check that the quantity and flow of cooling air are regular. Check that there is not dust in the heat sink. Check the environment temperature. |
| 6 | Drive under temperature | The temperature of the drive is inferior to the minimum level allowed. | Closed metal panel to warm up the ambient where the drive is installed. |
| 7 | Overcurrent HW | The drive has detected an instantaneous current supplied that is too high due to: - sudden strong load increase; - motor cables short circuit; - Incorrect compressor model. | Check the compressor model and the cables. |
| 10 | CPU error | Loss of data in memory | Call for assistance |
| 11 | Parameter default | Execution of reset parameter default command; Parameters user setting corrupted | Set parameters again |
| 12 | DC bus ripple | Input power supply phase loss, three-phase power supply unbalance | Check the input power supply phases to the drive |
| 13 | Data communication fault | Data reception failure | Check the serial connection. Switch the drive off and back on again. |
| 14 | Drive thermistor fault | Internal fault | Call for assistance |
| 16 | Drive disabled (STO input open or de-energized) | Cable disconnected External pressure switches disconnected | Check the wiring. Manual reset high pressure switch |
| 17 | Motor phase fault | Compressor cable disconnected | Check the connections of the compressor cable |
| 19 | Speed fault | Wrong parameters values or unsuited load | Switch the drive off and back on again and check the parameters are properly set. Check the motor load. |
| 23 | STO detection error | Internal fault | Call for assistance |
| 25 | Ground fault | The drive has detected a ground current too high | Check ground insulation of the motor and wires. |
| 26 | CPU sync error 1 | Overload CPU | Call for assistance |
| 27 | CPU sync error 2 | Loss of data in memory | Call for assistance |
| 28 | Drive overload | The current supplied has exceeded the drive rated current over the maximum time accepted | Check the compressor model and the cables. |

Controller Settings

Alarm LED

| | |
|-----------|---|
| Off | No alarm |
| Steady On | Alarm not active – auto or manual reset |
| Blinking | Alarm active |

Auto: An alarm condition is created but when cleared the unit will restart automatically.

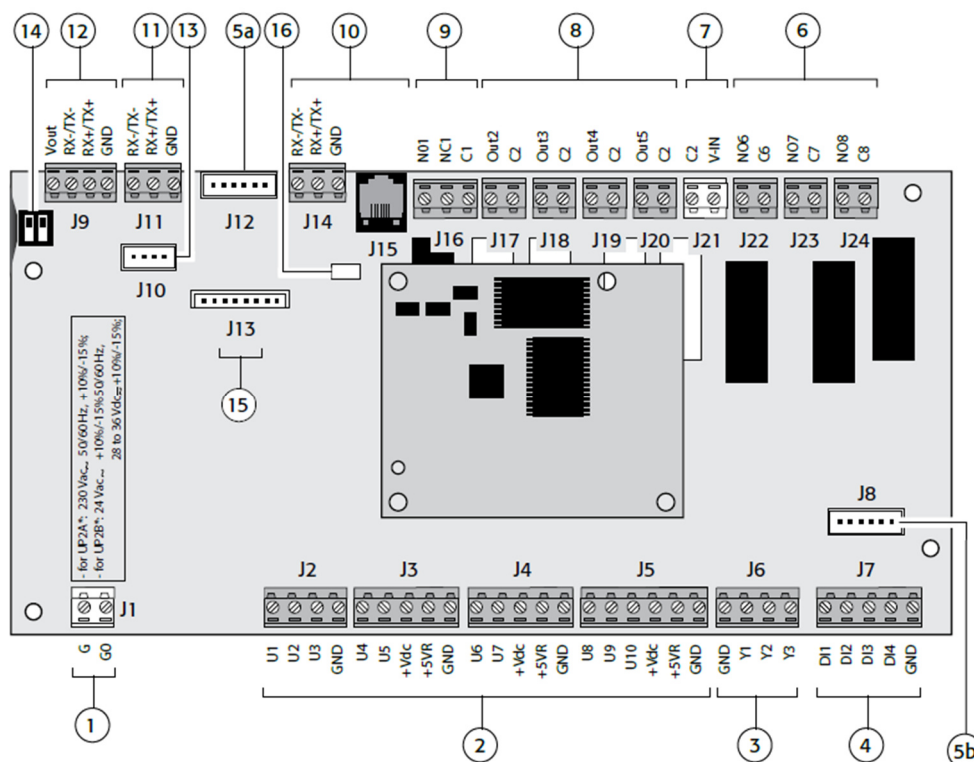
Manual: An alarm condition is created but requires resetting manually before the unit can restart.

To Reset Alarm Condition: Press ALARM button for a few seconds.

BACnet and Modbus Protocol

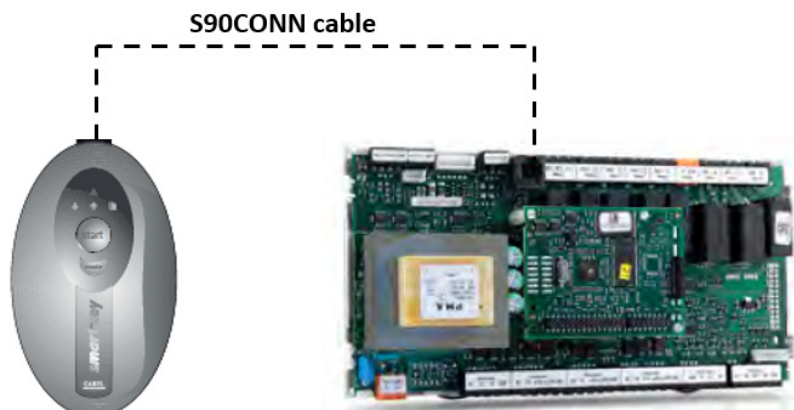
No serial card is required if Modbus over RS485 serial port (J11).

A Serial card is required to be plugged in the J13 connector if Bacnet over RS485 (MSTP) or IP.



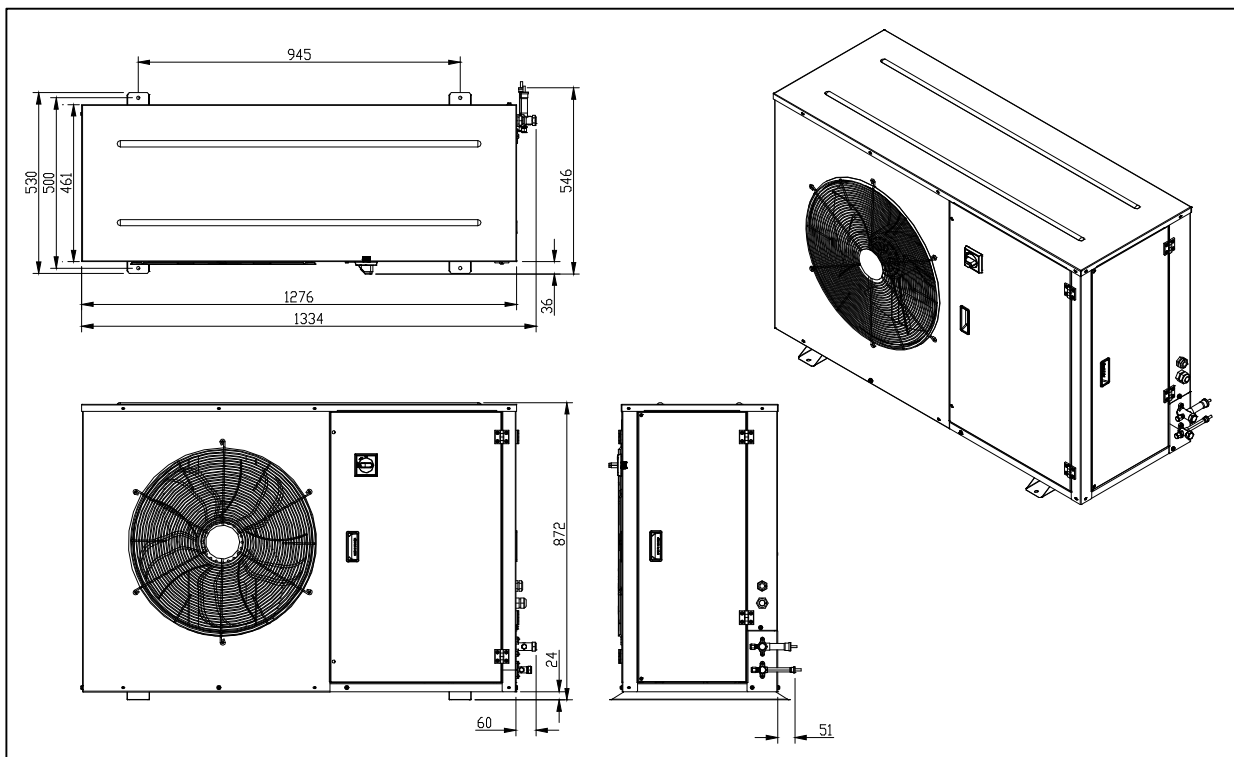
Software Update

The pCO smart key can be used to load the program into the controller. It is connected directly via the telephone connector using the cable supplied, with the power supply comes from the controller.

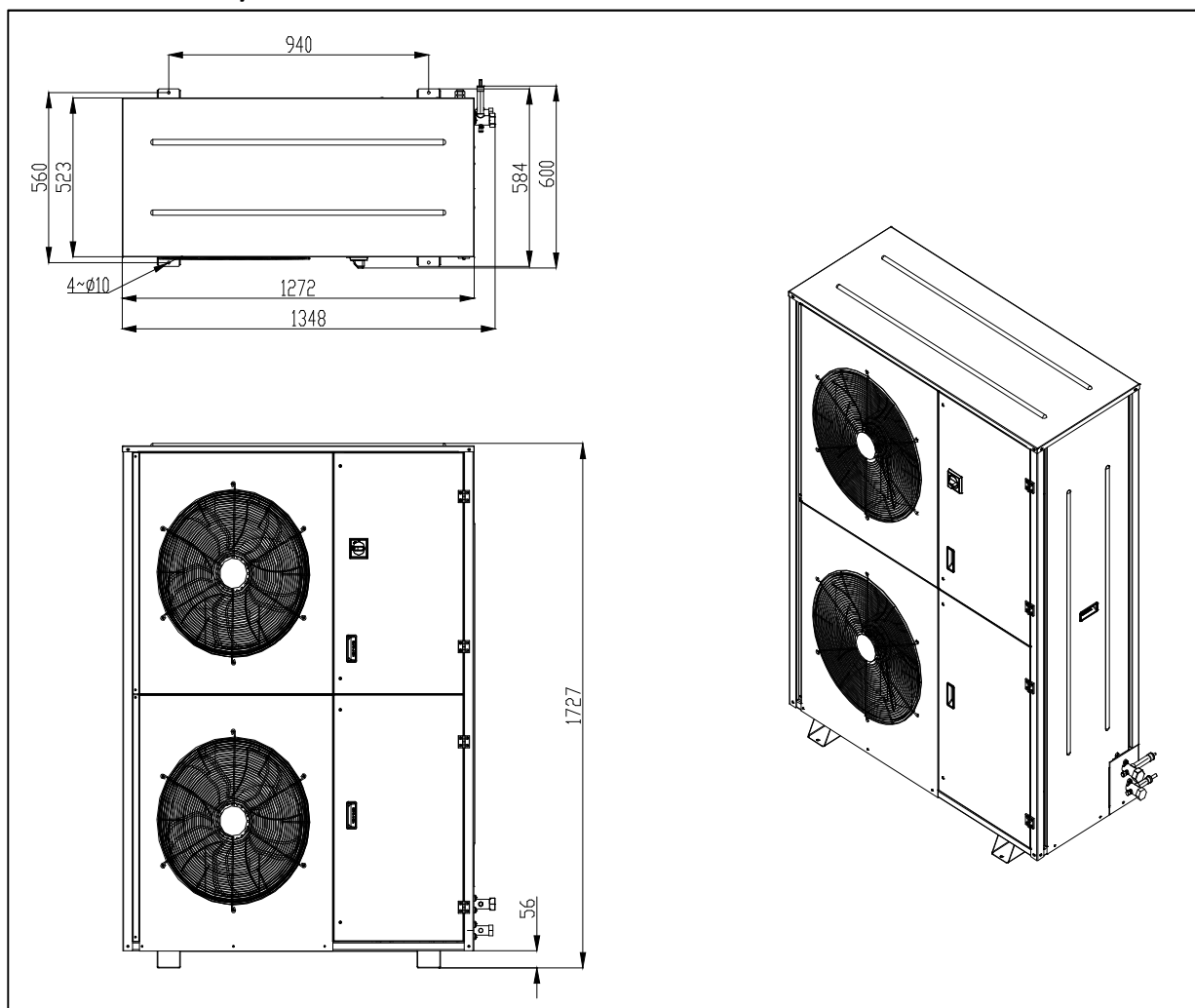


Dimensional Drawings

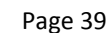
JEHSI-033-B3-M/L-3, JEHSI-066-B3-M/L-3



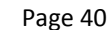
JEHSI-087-B4-M/L-3



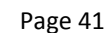
JEHSI-033-B3-M-3, JEHSI-033-B3-L-3



JEHSI-066-B3-M-3, JEHSI-066-B3-L-3



JEHSI-087-B4-M-3, JEHSI-087-B4-L-3



Service & Maintenance

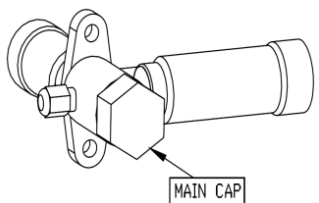
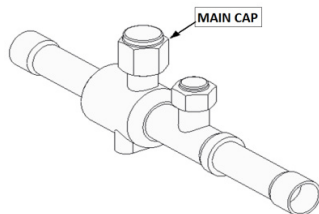
Disconnect the mains electrical supply and wait at least 5 minutes for capacitors to fully discharge before opening the unit for service/repair.

The condensing units are designed to give long life operation with minimum maintenance. However, they should be routinely checked and the following service schedule is recommended under normal circumstances:
The removal of the top, side and front panels ensures that all parts are accessible.

1. Compressor – Inspect at regular intervals

- Check for refrigerant leaks on all joints and fittings. Retighten the valve cap according to the Table: Tightening Torque.
- Check mountings for tightness and wear.
- Check operation of crankcase heater.
- Check electrical connections.
- Ensure that no abnormal noise or vibration is detected during test run.
- Check the compressor oil levels and top up if required.

Table: Tightening Torque

| Model | Thread/Size: Tightening Torque (Nm) | | | |
|--------------------------------------|---|-------------------------|--|--|
| | Service Valves | | Ball Valve | Schrader Valve 1/4" SAE, Oil Return Port, Liquid receiver and Low Pressure Switch |
| | Suction | Liquid | Discharge | |
| | Main Cap | | | Schrader Cap |
| JEHSI-033-B3-M-3 JEHSI-033-B3-L-3 | M22*1.0mm (30-35 Nm) | M18*1.0mm (25-30 Nm) | M16*1.5mm (40-45Nm) | 7/16" - 20UNF (14-16 Nm) |
| JEHSI-066-B3-M-3 JEHSI-066-B3-L-3 | M25*1.0mm (42-47 Nm) | | | |
| JEHSI-087-B4-M-3 JEHSI-087-B4-L-3 | M33*1.5mm (42-47Nm) | M25*1.0mm (42-47Nm) | | |
| Graphic |  | |  | - |

2. Condenser Fan Motor & Blade – Clean and inspect at regular intervals

- Check for abnormal noise, vibration and fan imbalance.
- Ensure that the fan motor is clean and spins freely.
- Check that the condenser fan blade is clean and free from restriction and damage/imbalance.
- Note: The fan motor is pre-lubricated and factory sealed so no maintenance is necessary.

3. Condenser Coil – Clean and inspect at regular intervals.

- Check and remove the dirt and debris between the fins using a soft brush, low pressure compressed air/inert gas or a low-pressure sprayer utilizing clean water. A suitable chemical coil cleaner may be used as required. Accumulations of dirt on the condenser face can be removed with a soft bristle hand brush. When using liquids, ensure electrical items are isolated and correctly protected.
- DO NOT USE HIGH PRESSURE JET WASHERS.
- Check and remove any obstacles which may hinder the airflow through the condenser coil.

Service & Maintenance

4. Frequency Drive

- Check heat sink and internal fans freely rotating and dust free.
- Check on all electrical connections, ensuring screw terminals are correctly torqued (power terminal: Max. 1.5Nm, auxiliary terminal: Max. 0.5Nm)

5. Controls

- Check settings and operation of pressure switches.
- Check overload setting.
- Check fan speed control setting and operation.

6. Power Supply – Inspect at regular intervals.

- Check the running current and voltage for the condensing unit.
- Check the electrical wiring and tighten the wires onto the terminal blocks if necessary.

7. Refrigerant Charge (Refer Section Refrigerant Charge)

- Check the refrigerant charge by ensuring that the system is operating correctly, the pressures are as expected and that the liquid line sight glass shows a full bore of liquid refrigerant.
- Carry out a full leak test.

8. Unit decommissioning and disposal

- At the end of the unit's useful life, a suitably qualified engineer should decommission it. The refrigerant and compressor oil are classed as hazardous waste and as such must be reclaimed and disposed of in the correct manner, including completion of waste transfer paperwork. The unit components must be disposed of or recycled as appropriate in the correct manner.

NOTICE



Disposal requirement:

Your refrigeration product is marked with this symbol. This means that electrical and electronic products shall not be mixed with unsorted household waste. Do not try to dismantle the system yourself: the dismantling of the refrigeration system, treatment of the refrigerant, of oil and of other parts must be done by a qualified installer in accordance with relevant local and national legislation. Refrigeration equipment must be treated at a specialized treatment facility for re-use, recycling and recovery. By ensuring this product is disposed of correctly, you will help to prevent potential negative consequences for the environment and human health. Please contact J & E Hall for more information.

Batteries must be removed from the controller and disposed of separately in accordance with relevant local and national legislation.

9. Warranty

- The warranty as provided by J & E Hall on its products is subject to correct application, siting and installation procedures together with subsequent recorded maintenance/servicing carried out in accordance with our recommendations. Failure to do so could result in the withdrawal of our warranty. Please go to our website for our detailed warranty terms and conditions: **www.jehall.co.uk**

F-Gas Information

From 1/1/2015, F-Gas Regulation EU 517/2014 came into force replacing the old Regulation EC 842/2006. This affects system labelling, information supplied within documentation and also the way in which thresholds for frequency of leak testing refrigeration systems are calculated. Please be aware of the following:

- The models of equipment covered in this Technical Manual rely on fluorinated greenhouse gases for their functioning.
- All unit models come from the factory pressurized with OFN (Oxygen Free Nitrogen) only.
- The GWP (Global Warming Potential) values of refrigerants which are specified for use along with the three new thresholds for leak testing requirements based on TCO₂ Eq (Tonnes CO₂ Equivalent) are as follows:

| Refrigerant | GWP | Refrigerant Charge - kg | | |
|-------------|------|--------------------------|---------------------------|----------------------------|
| | | 5T CO ₂ Eq | 50T CO ₂ Eq | 500T CO ₂ Eq |
| R448A | 1387 | 3.6 | 36.0 | 360 |
| R449A | 1397 | 3.6 | 35.8 | 358 |


- Changes to leak testing requirements are as follows:

| OLD LEGISLATION | NEW LEGISLATION | LEAK CHECKING FREQUENCY |
|--------------------|----------------------------|--|
| 3-30 kgs | 5-50 TCO ₂ Eq | Every 12 months but can be increased to 24 months if fitted with a fixed leak detection system. |
| 30-300 kgs | 50-500 TCO ₂ Eq | Every 6 months but can be increased to 12 months if fitted with a fixed leak detection system. |
| 300+ kgs | 500+ TCO ₂ Eq | Every 6 months - however automatic leak detection system is mandatory which requires servicing every 12 months |


To calculate TCO₂ Eq value: $\text{Refrigerant charge (kgs)} \times \frac{\text{Refrigerant GWP}}{1000}$

Please note: From 1st January 2017, the new legislation applies to systems which previously were exempt from leak testing under the 'below 3kg' charge limit.

A refrigerant charge label is supplied with each unit (inside the electrical box) manufactured from January 2015. The total refrigerant charge for the system and the TCO₂ Eq value must be entered on the label with indelible ink and must be adhered in the proximity of the product charging port. The label supplied will represent the refrigerants approved for use with that particular unit. An example of the unit label is as follows:


Contains fluorinated greenhouse gases

| Ref. | GWP | Charge (kg) | TCO ₂ Eq. |
|-------|------|-------------|----------------------|
| R448A | 1387 | | |
| R449A | 1397 | | |



Declaration of Conformity

Konformitätsbescheinigung
Déclaration de Conformité
Conformiteitsverklaring
Declaracion de Conformidad
Dichiarazione di Conformità
Overensstemmelseserklæring
Declaração de Conformidade
Δήλωση Συμμόρφωσης
Deklaracja zgodności

DAIKIN REFRIGERATION MALAYSIA SDN. BHD.

**LOT 10, JALAN PERUSAHAAN 8, KAWASAN PERUSAHAAN PEKAN BANTING,
42700 BANTING, SELANGOR DARUL EHSAN, MALAYSIA.**

declare under our sole responsibility that the products
bescheinigen auf unsere eigene Verantwortung, daß die Produkten
déclarons sous notre seule responsabilité que les produits
verklaren onder onze uitsluitende verantwoordelijkheid de producten
declaramos sobre nuestra sola responsabilidad que los productos
dichiariamo sotto nostra sola responsabilità che i prodotti
erklærer som eneansvarlige, at produktet
declaramos sob a nossa responsabilidade exclusiva que os produtos
δηλώνει υπό την αποκλειστική της ευθύνη ότι τα προϊόντα
oświadcza z pełną odpowiedzialnością, że produkty

COMMERCIAL REFRIGERATION CONDENSING UNIT

Unidad que condensa comercial de la refrigeración
Unité de condensation commerciale de réfrigération
Commerciële condenserende koel-unit
Kommerzielle kondensierende Maeinheit der Abkühlung
Unità condensate commerciale di refrigerazione
kølekondenseringsenheden til kommercielt brug
Unidade de condensação de refrigeração
Εμπορική Μονάδα Συμπύκνωσης Ψύξης
AGREGAT SKRAPLAJĄCY - CHŁODNICTWO KOMERCYJNE

Model Designations:
Baumuster-Bezeichnungen:
Désignations Modèles:
Aanduidingen Model:
Designaciones Modelo:
Indicazioni de Modello:
modelbetegnelse:
Designações do modelo:
Όνομασίες μοντέλων:
Oznaczenia modelu:

See Appendix 1 overleaf
Sehen sie anhang 1 umseitig
Voir l'annexe 1 au verso
Zie ommezijde voor bijlage 1
Vea el apendice 1 a la vuelta
Veda overleaf l'appendice 1
se appendiks 1 på bagsiden
Ver Apêndice 1 verso
Βλ. Παράρτημα 1 στο πίσω μέρος της σελίδας
Patrz na odwrocie Załącznik 1

which this declaration relates is in conformity with the requirements of the following directives
auf diese Bescheinigung sich beziehen, sind den Vorschriften der Normen entsprechend
auxquels se réfèrent cette déclaration, sont conformes aux prescriptions des directives
waarop deze verklaring betrekking heeft, in overeenstemming is/zijn met de eisen van de volgende richtlijnen
a los cuales se refieren esta declaración, son conformes a las prescripciones de las directivas
alla quale si riferisce questa dichiarazione, sono conformi alle prescrizioni delle direttive
som denne erklæring vedrører, er i overensstemmelse med kravene fremsat i følgende direktiver
que esta declaração está conforme os requerimentos das seguintes directrizes
τα οποία αφορά αυτή η δήλωση συμμορφώνονται με τις απαιτήσεις των παρακάτω οδηγιών
których dotyczy ta deklaracja są zgodne z wymaganiami następujących Dyrektyw

Machinery Directive *
IEC/ EN 60335-1
IEC/ EN 60335-2-89

2006/42/EC
Safety of Household and Similar Electrical Appliances: Part I
Safety of Household and Similar Electrical Appliances: Part II

Eco-design Directive
Commission regulation (EU) 2015/1095

2009/125/EC
Ecodesign requirements for condensing units

- * J&E Hall International is authorised to compile the Technical Construction File.
- * J&E Hall International hat die Berechtigung die Technische Konstruktionsakte zusammenzustellen.
- * J&E Hall International est autorisé à compiler le Dossier de Construction Technique.
- * J&E Hall International is gevolmachtigd het Technisch Constructiedossier op te stellen.
- * J&E Hall International está autorizado a compilar el Archivo de Construcción Técnica.
- * J&E Hall International è autorizzata a redigere il File Tecnico di Costruzione.
- * J&E Hall International er bemyndiget til at kompilere teknikkonstruktionsfilen.
- * J&E Hall International tem autorização para compilar o Ficheiro de Construção Técnica.
- * J&E Hall International είναι εξουσιοδοτημένη να καταρτίσει τον Τεχνικό Φάκελο Κατασκευής.
- * J&E Hall International jest upoważniony do opracowania dokumentacji technicznej.

J & E Hall Limited, Hansard Gate, West Meadows, Derby, DE21 6JN, United Kingdom.

General Manager



Teh Ycow Chong

Issue Date: 6 January 2021

Declaration of Conformity

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42700 BANTING, SELANGOR DARUL EHSAN, MALAYSIA.

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modelbetegnelse:
Designações do modelo:
Ονομασίες μοντέλων:
Oznaczenia modelu:

JEHR-0050-B1-M-1
JEHR-0067-B1-M-1
JEHR-0100-B1-M-1
JEHR-0113-B1-M-1
JEHR-0040-B1-M-1
JEHR-0051-B1-M-1
JEHR-0063-B1-M-1
JEHR-0077-B1-M-1
JEHR-0095-B1-M-1
JEHR-0140-B2-M-1
JEHR-0140-B2-M-3
JEHR-0150-B2-M-1
JEHR-0150-B2-M-3

JEHR-0115-B1-L-1
JEHR-0135-B1-L-1
JEHR-0175-B2-L-1
JEHR-0175-B2-L-3
JEHR-0180-B2-L-1
JEHR-0180-B2-L-3

JEHSD-0400-B3-M-3
JEHSDT-1200-B5-M-3

JEHSI-033-B3-M-3
JEHSI-066-B3-L-3

JEHR-0170-B2-M-1
JEHR-0170-B2-M-3
JEHR-0225-B2-M-1
JEHR-0225-B2-M-3
JEHR-0300-B2-M-1
JEHR-0300-B2-M-3
JEHS-0200-B2-M-1
JEHS-0200-B2-M-3
JEHS-0250-B2-M-1
JEHS-0250-B2-M-3
JEHS-0300-B2-M-1
JEHS-0300-B2-M-3
JEHS-0350-B2-M-1

JEHR-0210-B2-L-1
JEHR-0210-B2-L-3
JEHR-0225-B2-L-1
JEHR-0225-B2-L-3
JEHS-0300-B2-L-3
JEHS-0400-B3-L-3

JEHSD-0600-B3-M-3
JEHSDT-1600-B6-M-3

JEHSI-033-B3-L-3
JEHSI-087-B4-M-3

JEHS-0350-B2-M-3
JEHS-0350-B3-M-1
JEHS-0350-B3-M-3
JEHS-0400-B3-M-1
JEHS-0400-B3-M-3
JEHS-0500-B3-M-3
JEHS-0600-B3-M-3
JEHS-0680-B3-M-3
JEHS-0800-B4-M-3
JEHS-1000-B4-M-3
JEHS-1300-B4-M-3
JEHS-1500-B6-M-3

JEHS-0500-B3-L-3
JEHS-0600-B3-L-3
JEHS-0750-B4-L-3
JEHS-0950-B4-L-3 EVI
JEHS-1150-B4-L-3 EVI
JEHS-1400-B4-L-3 EVI

JEHSD-0800-B4-M-3

JEHSI-066-B3-M-3
JEHSI-087-B4-L-3



DAIKIN REFRIGERATION MALAYSIA SDN. BHD. (34543-W)

Lot 10, Jalan Perusahaan 8, Kawasan Perusahaan Pekan Banting, 42700 Banting, Selangor Darul Ehsan, Malaysia.

Tel: +603-31872911 Fax: +603-31878597

EU Declaration of Conformity 2014/68/EU

We declare under our sole responsibility that the following products:

Refrigeration Condensing Unit

Model Designations:

| | | | |
|------------------|------------------|----------------------|----------------------|
| JEHS-0350-B3-M-1 | JEHS-0680-B3-M-3 | JEHS-0500-B3-L-3 | JEHSD-0400-B3-M-3 |
| JEHS-0350-B3-M-3 | JEHS-0800-B4-M-3 | JEHS-0600-B3-L-3 | JEHSD-0600-B3-M-3 |
| JEHS-0400-B3-M-1 | JEHS-1000-B4-M-3 | JEHS-0750-B4-L-3 | JEHSD-0800-B4-M-3 |
| JEHS-0400-B3-M-3 | JEHS-1300-B4-M-3 | JEHS-0950-B4-L-3 EVI | JEHSDT-1200-B5-M-3 |
| JEHS-0500-B3-M-3 | JEHS-1500-B6-M-3 | JEHS-0951-B4-L-3 EVI | JEHSDT-1600-B6-M-3 |
| JEHS-0600-B3-M-3 | JEHS-0400-B3-L-3 | JEHS-1150-B4-L-3 EVI | JEHS-1400-B4-L-3 EVI |
| JEHSI-087-B4-M-3 | JEHSI-087-B4-L-3 | | |

Which are assemblies that containing refrigerating fluids classified in Group 2 and comply the requirements of **PRESSURE EQUIPMENT DIRECTIVE 2014/68/EU**. The details of pressure equipment as listed below.

| Pressure equipment | Part description | Category | Conformity assessment |
|--------------------|---|----------|--|
| Safety device | High pressure switch | IV | Module B & D |
| Vessel | Compressor | I or II | - or Module A2 or Module D1 |
| Vessel | Liquid receiver | II | Module A2 or Module D1 or Module B & D |
| Vessel | Oil separator | I or II | Module A or Module D1 or Module B & D |
| Vessel | Filter drier | SEP | - |
| Vessel | Brazed plate heat exchanger | SEP | - |
| Piping | Flexible hose, System Piping & Pressure accessories | SEP | - |
| Piping | Sight glass & Valves | SEP | - |
| Piping | Condenser | SEP | - |

Category: II

Evaluation module: A2

Notified body number: 2833

Notified body name & address: Hartford Steam Boiler Ireland Limited
28 Windsor Place Lower Pembroke Street, Dublin 2, Ireland.

Technical standards and specification:

are in conformity with the **Machinery Directive 2006/42/EC** and **Eco-design Directive 2009/125/EC**.

MD IEC/ EN 60335-1 & IEC/ EN 60335-2-89

Eco Commission regulation (EU) 2015/1095



J & E Hall Limited, Hansard Gate, West Meadows, Derby, DE21 6JN, United Kingdom

DAIKIN REFRIGERATION MALAYSIA SDN. BHD.

Teh Yeow Chong
General Manager
Issued Date: 6 January 2021

DAIKIN REFRIGERATION MALAYSIA SDN. BHD. (34543-W)

Lot 10, Jalan Perusahaan 8, Kawasan Perusahaan Pekan Banting, 42700 Banting, Selangor Darul Ehsan, Malaysia.

Tel: +603-31872911 Fax: +603-31878597

PED Statement for Product

Refrigeration Condensing Unit

Model Designations :

| | | | |
|------------------|------------------|------------------|------------------|
| JEHR-0050-B1-M-1 | JEHR-0140-B2-M-3 | JEHS-0200-B2-M-3 | JEHR-0175-B2-L-3 |
| JEHR-0067-B1-M-1 | JEHR-0150-B2-M-1 | JEHS-0250-B2-M-1 | JEHR-0180-B2-L-1 |
| JEHR-0100-B1-M-1 | JEHR-0150-B2-M-3 | JEHS-0250-B2-M-3 | JEHR-0180-B2-L-3 |
| JEHR-0113-B1-M-1 | JEHR-0170-B2-M-1 | JEHS-0300-B2-M-1 | JEHR-0210-B2-L-1 |
| JEHR-0040-B1-M-1 | JEHR-0170-B2-M-3 | JEHS-0300-B2-M-3 | JEHR-0210-B2-L-3 |
| JEHR-0051-B1-M-1 | JEHR-0225-B2-M-1 | JEHS-0350-B2-M-1 | JEHR-0225-B2-L-1 |
| JEHR-0063-B1-M-1 | JEHR-0225-B2-M-3 | JEHS-0350-B2-M-3 | JEHR-0225-B2-L-3 |
| JEHR-0077-B1-M-1 | JEHR-0300-B2-M-1 | JEHR-0115-B1-L-1 | JEHS-0300-B2-L-3 |
| JEHR-0095-B1-M-1 | JEHR-0300-B2-M-3 | JEHR-0135-B1-L-1 | JEHSI-033-B3-M-3 |
| JEHR-0140-B2-M-1 | JEHS-0200-B2-M-1 | JEHR-0175-B2-L-1 | JEHSI-033-B3-L-3 |
| JEHSI-066-B3-M-3 | JEHSI-066-B3-L-3 | | |

Which are containing refrigerating fluids classified in Group 2 and classified in category I according to **PRESSURE EQUIPMENT DIRECTIVE 2014/68/EU**.

The products are provided with a CE marking of conformity as they fulfill the following requirements:

Technical standards and specification:

are in conformity with the **Machinery Directive 2006/42/EC** and **Eco-design Directive 2009/125/EC**.

MD IEC/ EN 60335-1 & IEC/ EN 60335-2-89

Eco Commission regulation (EU) 2015/1095



J & E Hall Limited, Hansard Gate, West Meadows, Derby, DE21 6JN, United Kingdom



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Derby, DE21 6JN
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