

COMMERCIAL CONDENSING UNITS TECHNICAL MANUAL

FUSION DIGITAL SCROLL Commercial Condensing Units Variable Capacity

Medium Temperature Applications

ISSUE: 01.05.2017



CE

J&E Hall
International

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Nomenclature

JEHSD - 0600 - M - 3

3: Three Phase

Application:
M: Medium Temperature

Nominal Capacity in Horse Power
0600: 6.0 HP

D: Digital

S: Scroll

JEH: J & E Hall International

Standard Product Configuration

Single Digital Scroll

- Copeland hermetic digital scroll compressor – ZBD (Digital)
- Variable compressor capacity control
- 7.6 litre vertical liquid receiver with fusible plug
- Fitted liquid line drier & sight glass
- Oil separator and discharge check valve
- External service valves
- High & Low pressure transducers
- Manual low pressure switch (adjustable)
- High pressure switch on compressor (Fixed cartridge type)
- Gomax flexible pressure hoses
- IP54 rated control panel
- Mains isolator
- Compressor manual motor starter with short circuit & overload protection
- Compressor contactor
- Advanced programmable controller
- LCD display
- Step down transformer 240V to 24V
- Fuse protection on controller, fan speed controller and backup system
- Mechanical by-pass circuit
- AC modulation fan speed controller
- Alarm relay (volt free)
- Crankcase heater on compressor
- Acoustic insulation to compressor compartment
- Operates with refrigerants R404A, R407A, R407F, R448A & R449A

This manual specifically applies to units manufactured from January 2017 onwards.

Specifications

Unit Data

| Unit Model | Compressor | | | Oil Sep. Charge | Oil Type | Electrical Data | | | | | Coil Volume | Liquid Receiver | Airflow | Connections | | Unit Dry Weight | SPL @ 10m |
|----------------|--------------|--------------|------------|-----------------|----------|-----------------|------------------|------------------|------------|----------|-------------|-----------------|---------|-------------|---------|-----------------|-----------|
| | Type | Swept Volume | Oil Charge | | | Compressor | | | Fan Motors | | | | | Liquid | Suction | | |
| | | | | | | NC ^a | MCC ^b | LRC ^c | No. | FLC | | | | | | | |
| | | | | | | (A) | (A) | (A) | | (A) | | | | | | | |
| | | | | | | (m³/h) | (Litres) | (Litres) | (Litres) | (Litres) | | | | | | | |
| JEHSD-0600-M-3 | ZBD45KQE-TFD | 17.1 | 1.89 | 0.6 | A | 9.3 | 13.5 | 74.0 | 1 | 0.9 | 7.6 | 7.6 | 4150 | 1/2 | 7/8 | 139 | 41 |

Oil Type A = Polyolester Oil - (Copeland Ultra 22 CC, Copeland Ultra 32 CC, Copeland Ultra 32-3MAF, Mobil EAL Arctic 222CC, Uniquema Emkarate RL32CF)

^a NC= Nominal Current @ condition -10°C Te / +32°C Ta MT w with R404A refrigerant

^b MCC = Maximum Continuous Current

^c LRC = Locked Rotor Current

^d Sound Pressure Level @ 10m free field at (-10/+32°C) MT conditions. Alternative conditions may produce different results

Unit Dimensions

| Model | Overall Dimensions (mm) | | | Mounting Dimensions (mm) | |
|----------------|-------------------------|-----|-----|--------------------------|-----|
| | W | D | H | W | D |
| JEHSD-0600-M-3 | 1347 | 561 | 884 | 946 | 500 |

Performance Data:

The performance data shown on pages 6 & 7 have the following criteria:

- TE: Evaporating Temperature
- TA: Ambient Temperature
- HP: Approximate Compressor Horsepower
- CC: Cooling Capacity (Watts)
- PC: Power Consumed (Watts)
- COP: Coefficient of Performance
- Rating Condition: Suction Gas Superheat 10K, Sub-cooling 0K
- Data presented in accordance with BS EN13215:2016

Specifications

Performance Data: Medium Temperature

| MODEL | HP | TE TA | (Watts) | -30 | -25 | -20 | -15 | -10 | -5 | 0 | 5 | 10 |
|-------------------------|------|----------|---------|-----|-----|------|------|-------|-------|-------|-------|-------|
| JEHSD-0600-M-3 R404A | 6.00 | 27 | CC | | | 7240 | 8710 | 10300 | 12100 | 14150 | 16500 | 18950 |
| | | 27 | PC | | | 3820 | 4120 | 4460 | 4800 | 5150 | 5490 | 5880 |
| | | 27 | COP | | | 1.90 | 2.11 | 2.31 | 2.52 | 2.75 | 3.01 | 3.22 |
| | | 32 | CC | | | 6730 | 8090 | 9550 | 11200 | 13100 | 15250 | 17550 |
| | | 32 | PC | | | 4110 | 4420 | 4780 | 5140 | 5500 | 5840 | 6240 |
| | | 32 | COP | | | 1.64 | 1.83 | 2.00 | 2.18 | 2.38 | 2.61 | 2.81 |
| | | 35 | CC | | | 6410 | 7705 | 9080 | 10650 | 12450 | 14500 | 16700 |
| | | 35 | PC | | | 4295 | 4620 | 4995 | 5365 | 5730 | 6075 | 6480 |
| | | 35 | COP | | | 1.49 | 1.67 | 1.82 | 1.99 | 2.17 | 2.39 | 2.58 |
| | | 38 | CC | | | 6090 | 7320 | 8610 | 10100 | 11800 | 13750 | 15850 |
| | | 38 | PC | | | 4480 | 4820 | 5210 | 5590 | 5960 | 6310 | 6720 |
| | | 38 | COP | | | 1.36 | 1.52 | 1.65 | 1.81 | 1.98 | 2.18 | 2.36 |
| | | 43 | CC | | | 5540 | 6650 | 7810 | 9120 | 10650 | 12450 | |
| | | 43 | PC | | | 4830 | 5190 | 5600 | 6000 | 6380 | 6750 | |
| | | 43 | COP | | | 1.15 | 1.28 | 1.39 | 1.52 | 1.67 | 1.84 | |

| MODEL | HP | TE TA | (Watts) | -30 | -25 | -20 | -15 | -10 | -5 | 0 | 5 | 10 |
|-------------------------|------|----------|---------|-----|-----|-----|------|------|-------|-------|-------|----|
| JEHSD-0600-M-3 R407A | 6.00 | 27 | CC | | | | 7940 | 9770 | 11900 | 14400 | 17250 | |
| | | 27 | PC | | | | 3900 | 4090 | 4250 | 4400 | 4510 | |
| | | 27 | COP | | | | 2.04 | 2.39 | 2.80 | 3.27 | 3.82 | |
| | | 32 | CC | | | | 7450 | 9130 | 11100 | 13300 | 15850 | |
| | | 32 | PC | | | | 4270 | 4510 | 4730 | 4940 | 5110 | |
| | | 32 | COP | | | | 1.74 | 2.02 | 2.35 | 2.69 | 3.10 | |
| | | 35 | CC | | | | 7155 | 8735 | 10550 | 12600 | 14950 | |
| | | 35 | PC | | | | 4530 | 4800 | 5060 | 5315 | 5520 | |
| | | 35 | COP | | | | 1.58 | 1.82 | 2.08 | 2.37 | 2.71 | |
| | | 38 | CC | | | | 6860 | 8340 | 10000 | 11900 | | |
| | | 38 | PC | | | | 4790 | 5090 | 5390 | 5690 | | |
| | | 38 | COP | | | | 1.43 | 1.64 | 1.86 | 2.09 | | |
| | | 43 | CC | | | | | 7670 | | | | |
| | | 43 | PC | | | | | 5650 | | | | |
| | | 43 | COP | | | | | 1.36 | | | | |

| MODEL | HP | TE TA | (Watts) | -30 | -25 | -20 | -15 | -10 | -5 | 0 | 5 | 10 |
|-------------------------|------|----------|---------|-----|-----|-----|------|-------|-------|-------|-------|----|
| JEHSD-0600-M-3 R407F | 6.00 | 27 | CC | | | | 8610 | 10400 | 12400 | 14650 | 17150 | |
| | | 27 | PC | | | | 3980 | 4390 | 4800 | 5190 | 5530 | |
| | | 27 | COP | | | | 2.16 | 2.37 | 2.58 | 2.82 | 3.10 | |
| | | 32 | CC | | | | 7910 | 9690 | 11700 | 13900 | 16350 | |
| | | 32 | PC | | | | 4310 | 4740 | 5160 | 5560 | 5910 | |
| | | 32 | COP | | | | 1.84 | 2.04 | 2.27 | 2.50 | 2.77 | |
| | | 35 | CC | | | | 7390 | 9160 | 11175 | 13400 | 15850 | |
| | | 35 | PC | | | | 4530 | 4970 | 5400 | 5800 | 6150 | |
| | | 35 | COP | | | | 1.63 | 1.84 | 2.07 | 2.31 | 2.58 | |
| | | 38 | CC | | | | | 8630 | 10650 | 12900 | | |
| | | 38 | PC | | | | | 5200 | 5640 | 6040 | | |
| | | 38 | COP | | | | | 1.66 | 1.89 | 2.14 | | |
| | | 43 | CC | | | | | | | | | |
| | | 43 | PC | | | | | | | | | |
| | | 43 | COP | | | | | | | | | |

Specifications

| MODEL | HP | TE TA | (Watts) | -30 | -25 | -20 | -15 | -10 | -5 | 0 | 5 | 10 |
|-------------------------|------|----------|---------|-----|-----|------|------|------|-------|-------|-------|-------|
| JEHSD-0600-M-3 R448A | 6.00 | 27 | CC | | | 6610 | 8130 | 9820 | 11700 | 13850 | 16350 | 19250 |
| | | 27 | PC | | | 3540 | 3920 | 4330 | 4730 | 5130 | 5510 | 5870 |
| | | 27 | COP | | | 1.87 | 2.07 | 2.27 | 2.47 | 2.70 | 2.97 | 3.28 |
| | | 32 | CC | | | 6210 | 7670 | 9310 | 11100 | 13200 | 15650 | 18500 |
| | | 32 | PC | | | 3810 | 4230 | 4640 | 5070 | 5460 | 5830 | 6170 |
| | | 32 | COP | | | 1.63 | 1.81 | 2.01 | 2.19 | 2.42 | 2.68 | 3.00 |
| | | 35 | CC | | | 5945 | 7370 | 8965 | 10725 | 12800 | 15225 | 18075 |
| | | 35 | PC | | | 4000 | 4440 | 4865 | 5295 | 5680 | 6040 | 6360 |
| | | 35 | COP | | | 1.49 | 1.67 | 1.85 | 2.03 | 2.26 | 2.53 | 2.85 |
| | | 38 | CC | | | 5680 | 7070 | 8620 | 10350 | 12400 | 14800 | 17650 |
| | | 38 | PC | | | 4190 | 4650 | 5090 | 5520 | 5900 | 6250 | 6550 |
| | | 38 | COP | | | 1.36 | 1.52 | 1.69 | 1.88 | 2.10 | 2.37 | 2.69 |
| | | 43 | CC | | | | 6560 | 8040 | 9720 | 11700 | | |
| | | 43 | PC | | | | 5020 | 5490 | 5930 | 6310 | | |
| | | 43 | COP | | | | 1.31 | 1.46 | 1.64 | 1.85 | | |

| MODEL | HP | TE TA | (Watts) | -30 | -25 | -20 | -15 | -10 | -5 | 0 | 5 | 10 |
|-------------------------|------|----------|---------|-----|-----|------|------|------|-------|-------|-------|-------|
| JEHSD-0600-M-3 R449A | 6.00 | 27 | CC | | | 6610 | 8130 | 9820 | 11700 | 13850 | 16350 | 19250 |
| | | 27 | PC | | | 3540 | 3920 | 4330 | 4730 | 5130 | 5510 | 5870 |
| | | 27 | COP | | | 1.87 | 2.07 | 2.27 | 2.47 | 2.70 | 2.97 | 3.28 |
| | | 32 | CC | | | 6210 | 7670 | 9310 | 11100 | 13200 | 15650 | 18500 |
| | | 32 | PC | | | 3810 | 4230 | 4640 | 5070 | 5460 | 5830 | 6170 |
| | | 32 | COP | | | 1.63 | 1.81 | 2.01 | 2.19 | 2.42 | 2.68 | 3.00 |
| | | 35 | CC | | | 5945 | 7370 | 8965 | 10725 | 12800 | 15225 | 18075 |
| | | 35 | PC | | | 4000 | 4440 | 4865 | 5295 | 5680 | 6040 | 6360 |
| | | 35 | COP | | | 1.49 | 1.67 | 1.85 | 2.03 | 2.26 | 2.53 | 2.85 |
| | | 38 | CC | | | 5680 | 7070 | 8620 | 10350 | 12400 | 14800 | 17650 |
| | | 38 | PC | | | 4190 | 4650 | 5090 | 5520 | 5900 | 6250 | 6550 |
| | | 38 | COP | | | 1.36 | 1.52 | 1.69 | 1.88 | 2.10 | 2.37 | 2.69 |
| | | 43 | CC | | | | 6560 | 8040 | 9720 | 11700 | | |
| | | 43 | PC | | | | 5020 | 5490 | 5930 | 6310 | | |
| | | 43 | COP | | | | 1.31 | 1.46 | 1.64 | 1.85 | | |

Specifications

Product Information based on the requirements of Commission Regulation EU 2015/1095

Model : JEHS-0600-M-3

| Refrigerant fluid: | | R404A | R407A | R407F | R448A | R449A | |
|---|---|--------|--------|--------|--------|--------|-------|
| Item | Symbol | Value | | | | | Unit |
| Evaporating temperature* | t | -10 | | | | | °C |
| Annual electricity consumption | Q | 22130 | 19926 | 22051 | 21767 | 21767 | kWh/a |
| Seasonal Energy Performance Ratio | $SEPR$ | 2.65 | 2.82 | 2.70 | 2.63 | 2.63 | |
| Parameters at full load and ambient temperature 32°C (Point A) | | | | | | | |
| Rated cooling capacity | P_A | 9.55 | 9.13 | 9.69 | 9.31 | 9.31 | kW |
| Rated power input | D_A | 4.78 | 4.51 | 4.74 | 4.64 | 4.64 | kW |
| Rated COP | COP_A | 2.00 | 2.02 | 2.04 | 2.01 | 2.01 | |
| Parameters at part load and ambient temperature 25°C (Point B) | | | | | | | |
| Declared cooling capacity | P_B | 10.500 | 9.950 | 10.600 | 9.990 | 9.990 | kW |
| Declared power input | D_B | 4.370 | 3.970 | 4.290 | 4.220 | 4.220 | kW |
| Declared COP | COP_B | 2.40 | 2.51 | 2.47 | 2.37 | 2.37 | |
| Parameters at part load and ambient temperature 15°C (Point C) | | | | | | | |
| Declared cooling capacity | P_C | 11.620 | 10.850 | 11.450 | 10.800 | 10.800 | kW |
| Declared power input | D_C | 3.930 | 3.440 | 3.820 | 3.780 | 3.780 | kW |
| Declared COP | COP_C | 2.96 | 3.15 | 3.00 | 2.86 | 2.86 | |
| Parameters at part load and ambient temperature 5°C (Point D) | | | | | | | |
| Declared cooling capacity | P_D | 12.200 | 11.200 | 11.850 | 11.400 | 11.400 | kW |
| Declared power input | D_D | 3.720 | 3.230 | 3.590 | 3.470 | 3.470 | kW |
| Declared COP | COP_D | 3.28 | 3.47 | 3.30 | 3.29 | 3.29 | |
| Parameters at full load and ambient temperature 43°C | | | | | | | |
| Cooling capacity | P_3 | 7.76 | 7.63 | N/A | 8.04 | 8.04 | kW |
| Power input | D_3 | 5.62 | 5.68 | N/A | 5.49 | 5.49 | kW |
| Declared COP | COP_3 | 1.38 | 1.34 | N/A | 1.46 | 1.46 | |
| Other items | | | | | | | |
| Capacity control | Variable | | | | | | |
| Coefficient of degradation for fixed and staged capacity units* | C_d | 0.25 | | | | | |
| Contact details | Daikin Refrigeration Malaysia Sdn. Bhd. Lot 10, Jalan Perusahaan 8, Kawasan Perusahaan Pekan Banting, 42700 Banting, Selangor Darul Ehsan. | | | | | | |

Health and Safety

Important Note:

Only qualified personnel, who are familiar with refrigeration systems and components including all controls, should perform the installation and start-up of the system. 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 codes, ordinances and local by-laws.

General Information

Before Installation

- Ensure the units received are the correct models for the intended application.
- Ensure the refrigerant, voltage 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.

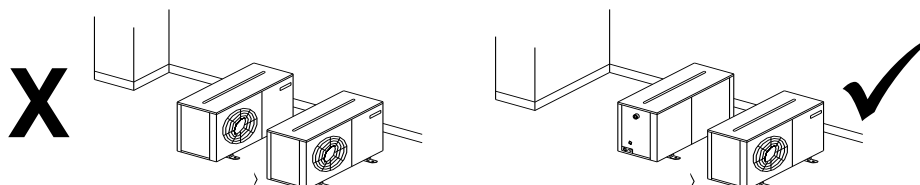
During Installation and subsequent maintenance

- 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 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 and 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 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.
- 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.
- Wherever possible the system should be installed to utilize a pump down configuration.
- After installation, the system should be allowed to run for 3 – 4 hours. The oil level should then be checked and topped up as necessary. It should then be rechecked after 24 hours once the system has stabilized. The oil level should be visible at least $\frac{1}{2}$ - $\frac{3}{4}$ way up the compressor oil sight glass. For details of the oil requirements, please refer to page 29 in the service and maintenance section.

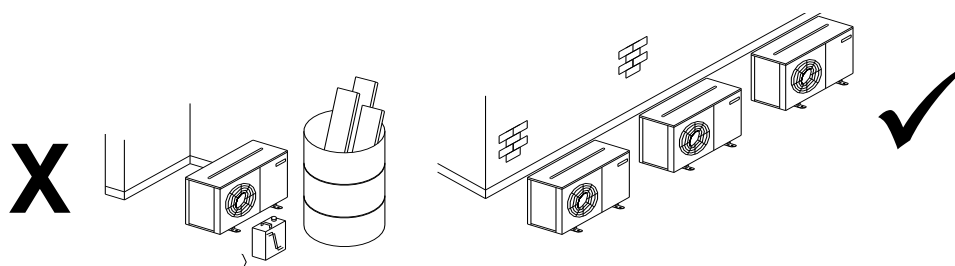
Installation

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.



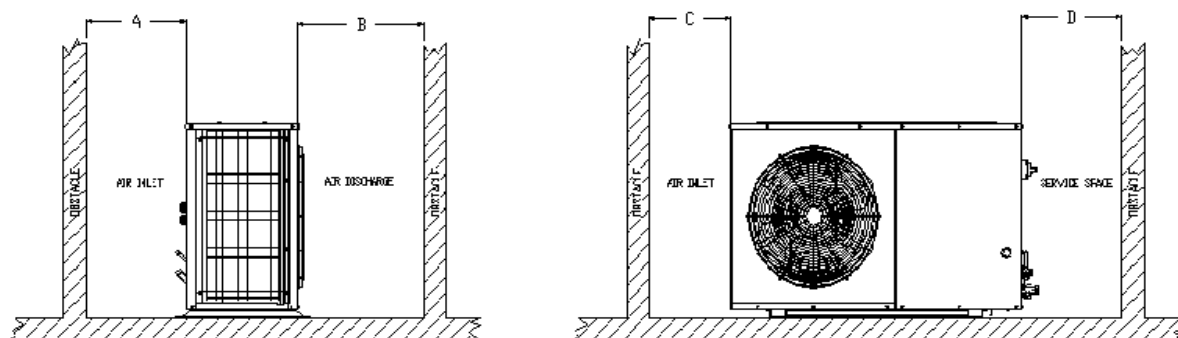
- Ensure that there is no obstruction to air flow into or out of the unit. Remove obstacles which block air intake or discharge.



- The location must be well ventilated, so the unit can draw in and distribute plenty of air thus lowering the condensing temperature.
- To optimize the unit running conditions, the condenser coil must be cleaned at regular intervals.
- The unit must be level in all directions.

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 |

Installation

Field Piping

Important Note:

Pipe sizing should only be determined by qualified personnel. All local codes of practice must be observed in the installation of refrigerant piping.

To ensure satisfactory operation and performance, the following points should be noted for field piping arrangements:

- 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!
- When installing a single condensing unit with multiple evaporators connected which operate independently, care should be taken to ensure that the evaporating pressure/temperature does not fall outside the compressor operating limit at minimum load. If there is potential for this scenario, consider multiple evaporators fed by a single solenoid valve or separate condensing units.
- 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 6m).
- Maximum recommended pipe length is 50 metres.

Correct line sizing will minimize the pressure drop and maintain sufficient gas velocity for proper oil return.

Important Note:

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

Installation

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 (OFN).

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 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 local regulations.

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

Evacuation & Charging

Important Note:

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

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.

Installation

Electrical

Important Note:

The mains electrical supply to the condensing unit must be via a suitable motor rated circuit breaker or fuse. A mains isolator is fitted to all condensing units therefore an additional isolator is not required unless site conditions or regulations dictate differently.

J & E Hall Fusion Digital Scroll condensing units require a 400 volt / 3 phase / 50Hz supply which must include a Neutral and an Earth. These systems are not suitable for any other supply voltages (other than a deviation of $\pm 10\%$ of the above values) and are not suitable for 60Hz supplies.

The three phase supply must be connected to ensure that the compressor motor rotates in the correct direction. Please see note on page 20.

Mains cable type and sizing must be selected for the particular application and the electrical installation should conform to the current local standards.

- Cables to the condensing unit should wherever possible be routed through the cable glands supplied on the rear of the units.
- Connect the mains supply to the units as per the wiring diagram on page 28.

To gain access to the electrical box, turn the mains isolator switch on the end of the unit to the OFF position, remove the screws from the end cover panel and remove panel. The electrical box is located behind the panel. Remove the screws in the electrical box cover to access components.

Important Note:

There must be no more than 10 compressor starts per hour. A higher number reduces the service life of the compressor. There is no minimum off time for scroll compressors, as they start unloaded. However, consideration should be given to ensuring an adequate minimum run time to ensure proper oil return.

Commissioning

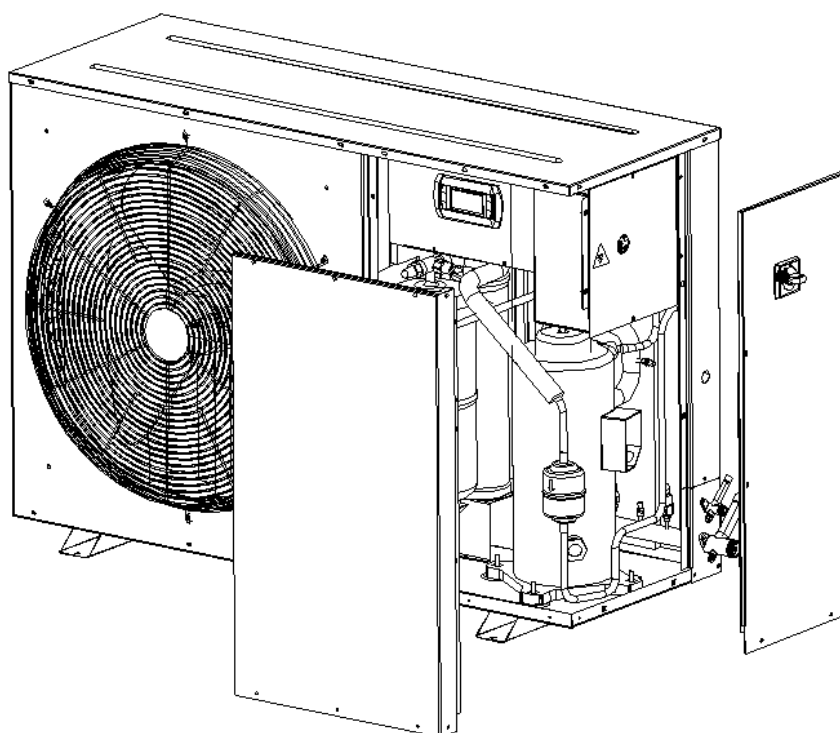
Access to Controller and LCD Display

Important Note:



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

The controller and LCD display are accessed by removing both the end service panel and front panel.



Commissioning

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.
- Both of the mechanical bypass switches on the control panel are in the **OFF** (0) position.
- LCD display cable is connected to the controller to enable settings.
- Check setting of LP back up control (factory set).
- Overload set correctly.
- All valves in correct operating position.
- Initial refrigerant charge.
- Crankcase heater energized for a minimum of 12 hours before compressor start-up.
- Gauge manifold connected to both low and high sides of system.

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

Before running the unit, the controller settings on page 18 should be checked/alterd as required:

Running the Unit

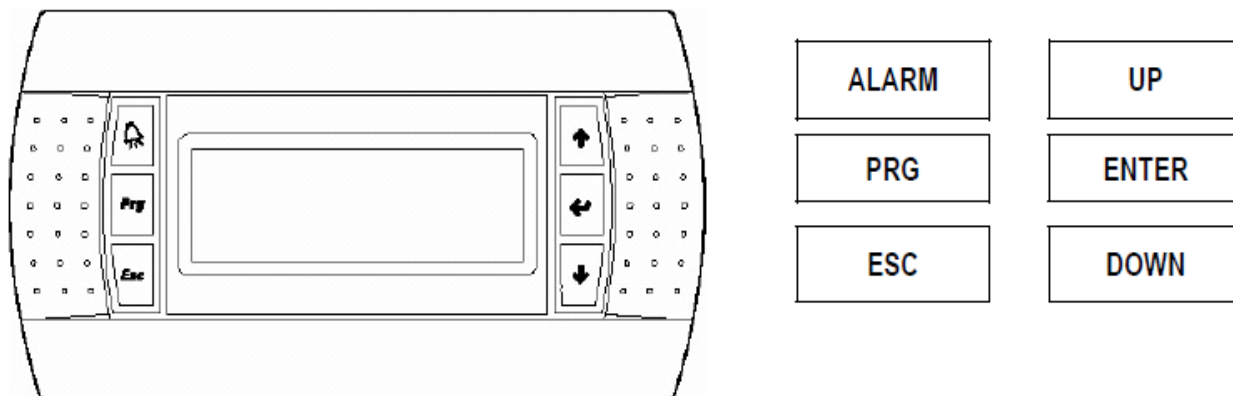
- Switch unit on at controller (see page 19).
- Run the unit and check compressor and condenser fan operation.
- Check system pressures and temperatures, gas charge and running currents of motors to ensure correct operation.
- Check transducer/sensor readings are accurate (calibrated equipment required).
- Check compressor superheats.
- Final adjustment of controller settings.
- Check compressor oil level and adjust as necessary.
- 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.
- Ensure that the customer / responsible person are provided with basic operating instructions and where electrical isolators are situated in case of emergency.

Commissioning

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.



Button Functions

| | |
|-------|---|
| ALARM | Displays the alarms |
| 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, 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, 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. |

Important Note:

All controller parameters are preset in the factory and are not accessible due to password protection. The only settings which can be changed are the compressor setpoint (suction pressure), the refrigerant type and the time/date. The fan setpoint is also preset but can be adjusted if required.

Commissioning

Controller Home Screen

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



The low pressure and high pressure conditions of the unit are displayed. If **OFF by Key** is indicated in the lower box, then the unit is switched OFF on the controller. To switch the unit ON, follow instructions on page 19. Further information on the system conditions can be displayed by pressing the DOWN arrow:



Commissioning

Changing Set Point & Refrigerant Selection

1. With controller Home screen displayed, Press PRG button to go Main Menu screen and select "B. Setpoint" using DOWN button. Press ENTER button. Screen B01 is displayed.



2. Using ENTER button, move the cursor from the 'home' position to the Compressor Setpoint and adjust value as required by using UP or DOWN buttons.
3. Press the ENTER button again to move the cursor to the Fan Setpoint and adjust the value as required. Please note that the Setpoint value of 16.0 bar is recommended for R404A/R407A/R407F/R448A/R449A operation.
4. Press ENTER button once more to return the cursor to the 'home' position.
5. From screen B01, use the DOWN button to move to the next screen – B02.



6. At screen B02, the Refrigerant Type can be selected. The default refrigerant is set as R404A.
7. To change the refrigerant, press ENTER to move the cursor from the 'home' position to the refrigerant type.
8. Use UP or DOWN buttons to scroll to different refrigerants.
9. With required refrigerant selected, press ENTER button to return cursor to 'home' position.
10. Press ESC button repeatedly to return to Home screen.
11. The unit is now ready to run once the controller is set to ON.

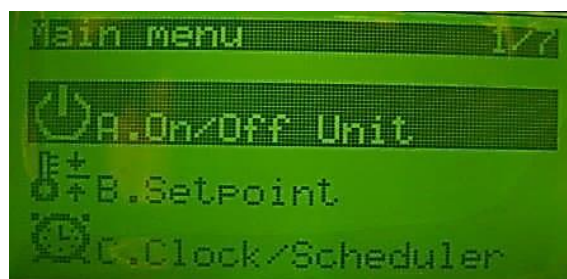
IMPORTANT NOTE:

The only refrigerants which should be selected are R404A, R407A, R407F, R448A & R449A.

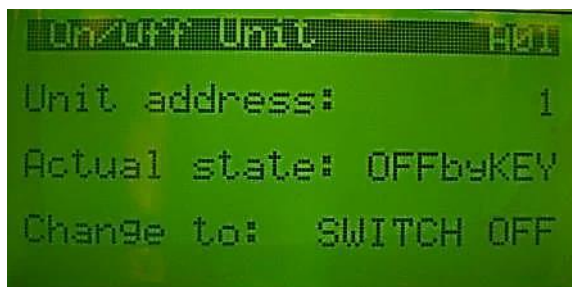
Commissioning

Switch Unit On/Off (By Controller)

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



2. Press ENTER button. Screen A01 is displayed.



3. Press ENTER button to move cursor from home position to SWITCH OFF value. Switch Unit ON by using UP/DOWN arrows. Press ENTER button to confirm.



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).

Commissioning

Compressor Operation

The compressor(s) operate in accordance to the suction pressure setpoint which is programmed into the controller. There is a differential pressure setting both above and below the setpoint. This allows stable operation of the compressors without constantly switching on & off due to small variations in suction pressure. This range is known as the Neutral Zone. When the compressor(s) are operating within this zone, there will be no change to capacity status (i.e. no compressor switched on/off or additional loading/unloading of variable capacity compressor).

Once the suction pressure goes outside the Neutral Zone, then the controller reacts by increasing or decreasing capacity, depending on whether the pressure is above or below the Neutral Zone. The rate at which the capacity increases or decreases depends upon the setting of the Minimum and Maximum timers within the controller. This means that the further away the suction pressure moves away from the Neutral Zone (either above or below), the quicker the controller will adjust the compressor capacity.

On Digital twin compressor units, the compressor with the capacity control is always the first to start and the last to stop.

Digital Scroll compressor motors are designed to run only in one direction. The correct rotation of a three phase compressor motor depends on the connection of the three incoming phases to the unit. Correct rotation can be determined by a drop in suction pressure and a rise in discharge pressure when the compressor is energized. Running the compressor for a short period of time in reverse direction will have no negative impact but prolonged running in reverse direction may cause premature failure. ***To reverse the rotation of a three phase digital scroll compressor, shut off the incoming power supply to the unit, swap connection of any two of the three incoming phases at the unit isolator, reapply power to the unit and following compressor restart, recheck operating pressures.***

Digital compressor:

At initial start-up, the digital compressor will run at 50% capacity for three minutes followed by 1 minute at 100% capacity. Following this, the compressor will modulate the capacity according to the system requirement in relation to the suction pressure set-point.

Vacuum operation:

Do not operate scroll compressors in a vacuum condition, as this will cause the scrolls to overheat very quickly causing premature failure.

System charge:

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.

Commissioning

Safety Pressure Switch Settings (Mechanical)

The Saginomiya SNS low pressure switch fitted to the JEH Digital Scroll condensing unit has adjustable cut-out and differential. High pressure protection is provided by a cartridge type high pressure switch (HP1) which has fixed settings.

High Pressure Safety

The high pressure safety switch is required to stop the compressor should the discharge pressure exceed the values shown in the following table. The differential pressure is fixed at 6 bar (87 psi). Once tripped, it will create an alarm condition which requires manual reset at the controller.

| | |
|--------------------------|-------------------------------|
| Refrigerant | R404A/R407A/R407F/R448A/R449A |
| Cut Out / Cut In (bar g) | 28 / 22 |
| Cut Out / Cut In (psi g) | 410 / 323 |

Low Pressure Safety

The adjustable low pressure safety switch provides compressor protection from low suction pressure/evaporating temperature in Normal (controller) operation. In mechanical bypass mode, it provides compressor control. It also protects the compressor against deep vacuum operation, a potential cause of failure due to internal arcing and overheating. The low pressure switch is factory set as below. For Normal (controller) operation, please do not adjust this setting.

For operation in bypass mode, the low pressure control should be set to control the compressor (fixed speed only for twin compressor) at the required SST according to the application. **If adjusted for operation in bypass mode, the low pressure control must be reset to factory setting as below before returning to Normal (controller) operation.**

| | |
|--------------------------|-------------------------------|
| Unit | JEHSD-0600-M-3 |
| Refrigerant | R404A/R407A/R407F/R448A/R449A |
| Application | M* |
| Cut Out / Cut In (bar g) | 1.0 / 3.0 |
| Cut Out / Cut In (psi g) | 15 / 44 |

* *Medium Temperature*

AC Fan Speed Modulation Controller

The fan speed control is factory preset with a ± 3.0 barG differential setting. With this setting, the fan operation is as follows:

| | |
|------------------------|-------------------------------|
| Refrigerant | R404A/R407A/R407F/R448A/R449A |
| Fan Setpoint (bar g) | 16 |
| Fan start run (bar g) | 13 |
| Fan Full Speed (bar g) | 19 |

The fan under FSC control starts at 45% of full fan speed and modulates up to 100%.

Commissioning

Manual Bypass Operation

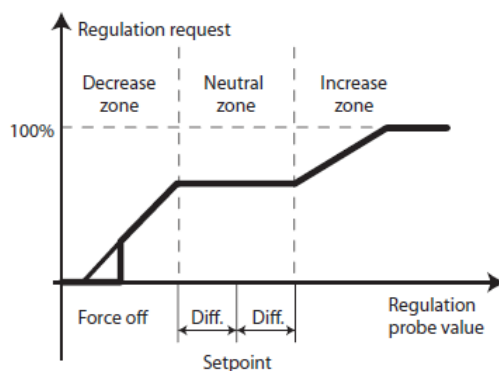
In the event of failure of the main electronic controller, the unit can be run **temporarily** in mechanical bypass mode. By changing the position of the two manual bypass switches mounted in the cover of the controller electrical box from '0' to '1', the compressor will run at 100% capacity – controlled by the adjustable LP switch (see page 21). In bypass mode, the condenser fan will run without fan speed control.

Note: Please ensure the two bypass switches are always at “0” position while running in electronic controller mode!

Control Logic

Parameters for neutral zone compressor control

1. Preset differentials for neutral zone, activation zone and deactivation zone.



```

COMPRESSOR Gfc07
Neutral zone conf19

NZ diff.: 0.3bar
Activ.diff.: 0.5bar
Deact.diff.: 0.5bar
  
```

Neutral zone

The operating principle is schematized in the above figure:

Inside the neutral zone the capacity request sent by the controller is constant (except when there is a modulation device and modulation is enabled inside the neutral zone) and the value satisfies the pressure control request in those specific operating conditions. Therefore within this zone no device is stopped or started.

In the decrease zone, the request also decreases at a rate that depends on the deviation from the set point, and vice-versa in the increase zone the request increases proportionally to the deviation.

For the increase and decrease zones, the following can be used:

- Fixed times: the request decreases or increases constantly as time elapses.
- Variable times: the request decreases or increases more quickly (according to the settings) as the deviation from the set point increases.

Note: The figure shows the increase and decrease with fixed times.

Control Logic

Parameters for neutral zone compressor control

As well as the decrease and increase differentials, 4 time parameters are preset, two for each zone, which represent the maximum and minimum time to reach the request, equal to 0% or 100%, for the decrease and increase respectively.

Example: the decrease/increase times (minimum and maximum) represent the time needed to change from maximum to minimum capacity and vice-versa, and not the time between the deactivation/activation of the individual device. For example, in the case of 4 devices with the same capacity, an increase time of 180 s means that one device is activated every 45 s.

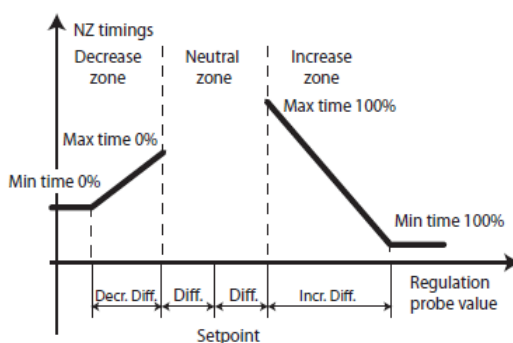
In the situation shown in the figure, the request sent by the controller decreases/increases slowly as soon as the controlled value is outside of the Neutral zone, while it decreases/increases quickly the further the controlled value moves away from the Neutral zone; in this way the response of the system is faster when further from steady conditions.

Note: When using fixed times, the maximum and minimum must be set to the same value. In this case, the request sent by the controller decreases/increases constantly inside the deactivation/ activation differential.

1. Preset loading and unloading time

```
Compressor Gfc09
Neutral zone
Load min.time: 120s
Load max.time: 600s
```

```
Compressor Gfc10
Neutral zone
Unload min.time: 120s
Unload max.time: 600s
```



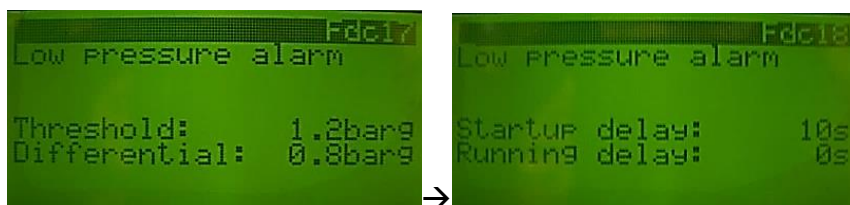
2. Preset time interval for loading and unloading compressor

```
Gfc13
Compressors
Load up time: 10s
Load down time: 10s
```


Alarm Information

Alarm Settings

1. Low pressure alarm (by transducer)



2. High pressure alarm (by transducer)



3. High condensing coil temperature alarm



4. High discharge alarm for fixed scroll compressor (if applicable)



Alarm Information

Alarm Codes

Type of alarm

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.

| Code | Description | Reset type |
|------|---|--|
| A01 | Clock board error | Auto |
| A08 | Suction temperature probe fault | Auto |
| A09 | Outdoor temperature probe fault | Auto |
| A10 | Condensing coil temperature probe fault | Auto |
| A11 | Discharge temperature probe fault | Auto |
| A13 | Discharge pressure transducer fault | Auto |
| A14 | Suction pressure transducer fault | Auto |
| A15 | Outside of operating envelope (Digital scroll) | Auto |
| A16 | Condensing coil high temperature | Auto |
| A17 | Compressor high discharge temperature alarm | Auto |
| A19 | Compressor overload trip | Auto |
| A24 | Low pressure alarm by transducer | Auto: |
| A25 | High pressure alarm by transducer | Auto: less than 3 times in 30 minutes Manual: 3 times or more in 30 minutes |
| A26 | Low pressure alarm by pressure switch | Auto |
| A27 | Compressor high pressure alarm by pressure switch | Manual |

Alarm LED

| | |
|----------|-----------------------|
| Off | No alarm |
| On | Only auto reset alarm |
| Blinking | Manual reset alarm |

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.

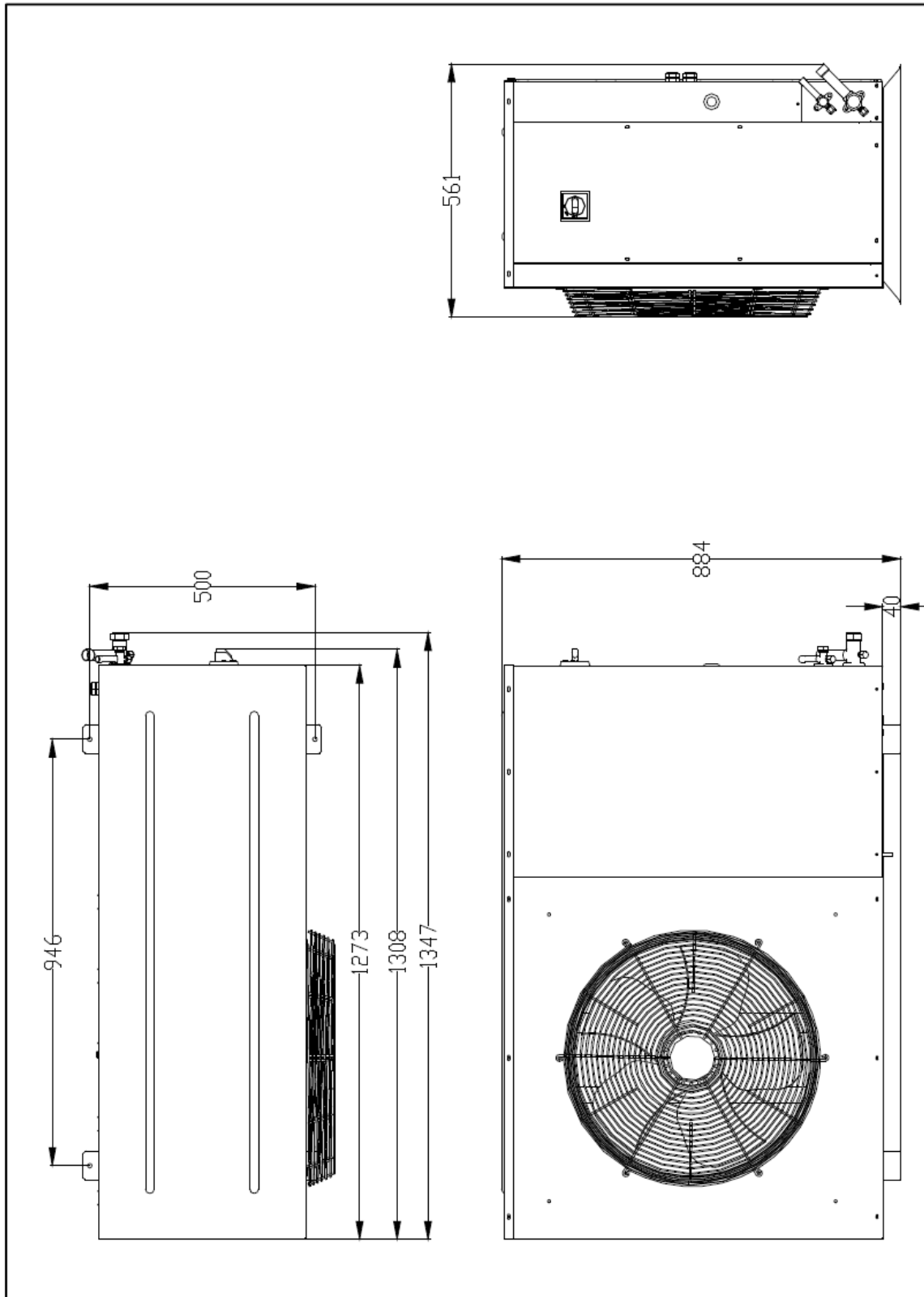
To Reset Alarm Condition:

- Press **ALARM** button for more than 5 seconds.
- Power controller **OFF** then back **ON**.

Drawings

Dimensional drawing:

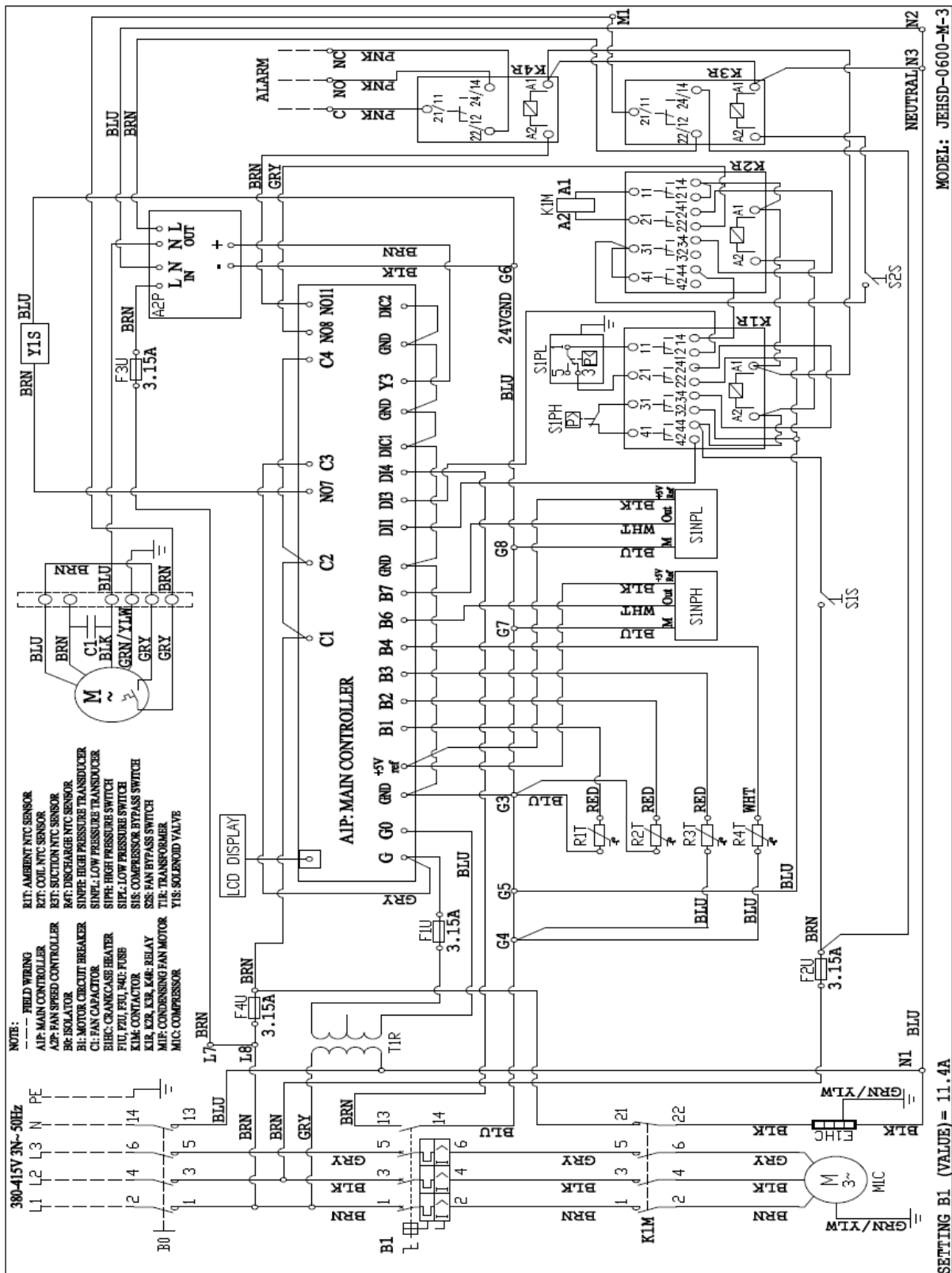
JEHSD-0600-M-3



Drawings

Electrical Wiring Diagram:

JEHSD-0600-M-3



Service & Maintenance

Important Note:



Warning! – Disconnect the mains electrical supply before servicing or opening the unit.

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.
- 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. The oil level should be visible at least ½ way up the oil sight glass.

| | |
|------------------------|---------------------------------------|
| Compressor Model | ZBD45KQE-TFD |
| Applicable Refrigerant | R404A / R407A / R407F / R448A / R449A |
| Recommended Oils | Polyolester - Emkarate RL 32 3-MAF |
| | Polyolester - Mobil EAL Arctic 22 CC |

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. Controls

- Check settings and operation of controller and transducers/sensors.
- Check settings and operation of pressure switches.
- Check overload setting.
- Check fan speed control setting and operation.

5. 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.

6. 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.

7. 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.

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 TCO₂Eq (Tonnes CO₂ Equivalent) are as follows:

| Refrigerant | GWP | Refrigerant Charge - kg | | |
|-------------|------|--------------------------|---------------------------|----------------------------|
| | | 5T CO ₂ Eq | 50T CO ₂ Eq | 500T CO ₂ Eq |
| R404A | 3922 | 1.3 | 12.7 | 127 |
| R407A | 2107 | 2.4 | 23.7 | 237 |
| R407F | 1825 | 2.7 | 27.4 | 274 |
| 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 TCO₂Eq value:
$$\frac{\text{Refrigerant charge (kgs)} \times \text{Refrigerant GWP}}{1000}$$

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 TCO₂Eq 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

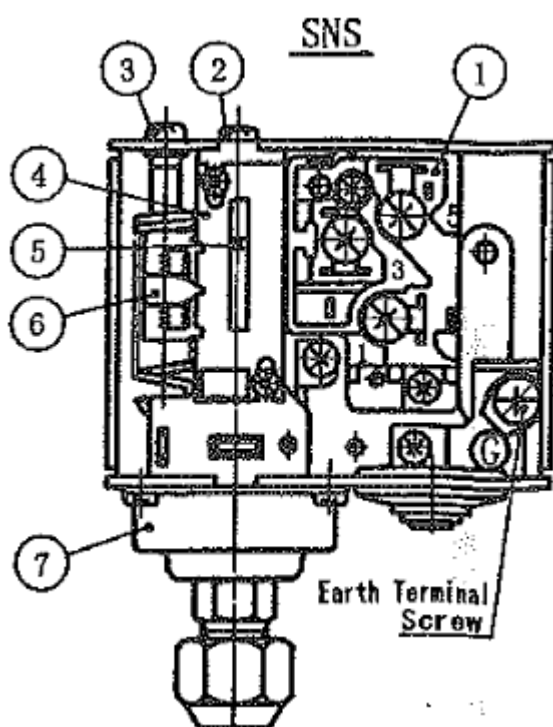
| Ref. | GWP | Charge (kg) | TCO ₂ Eq. |
|-------|--------|-------------|----------------------|
| R404A | 3921.6 | | |
| R407A | 2107 | | |
| R407F | 1825 | | |
| | | | |

Technical Information

SNS Pressure Switch

Safety pressure switch settings:

The pressure switch fitted to condensing units with auto reset for low pressure is factory preset to 1.0 bar cut-out. **Do not set pressure control below this setting.**



- | | |
|---------------------------------|-------------------------------|
| 1. Micro Switch | 5. Low Pressure Range Pointer |
| 2. Range Adjusting Screw | 6. Differential Pointer |
| 3. Differential Adjusting Screw | 7. Low Pressure Bellows Cover |
| 4. Low Pressure Scale Plate | |

Setting procedure for SNS Pressure switch:

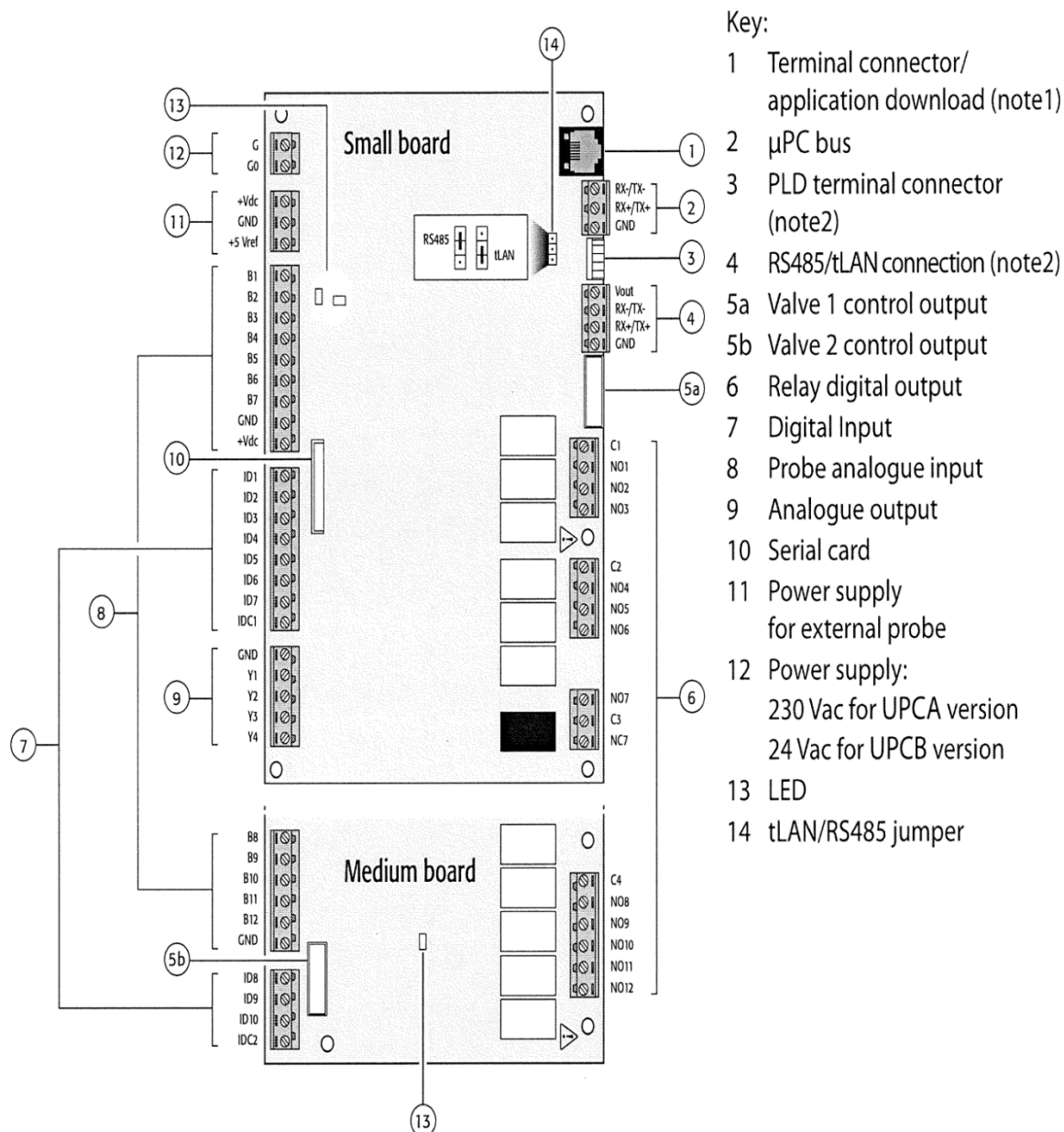
Turning the range adjusting screw counterclockwise increases the setting pressure. Turning the range adjusting screw clockwise decreases the setting pressure.

Turning the differential adjusting screw clockwise increases the differential. Turning the differential adjusting screw anti-clockwise decreases the differential setting.

By turning these two adjusting screws, the desired setting pressure and differential are obtained. Lock the spindles with the locking plate after setting.

Technical Information

Medium Version Controller



Please Note: The battery in the controller should be changed every three years.

Technical Information

Medium Version Controller

Do not dispose of the product as municipal waste; it must be disposed of through specialist waste disposal centres.

- The product contains a battery that must be removed and separated from the rest of the product according to the instructions provided, before disposing of the product.
- Improper use or incorrect disposal of the product may have negative effects on human health and on the environment.
- The public or private waste collection systems defined by local legislation must be used for disposal.
- In the event of illegal disposal of electrical and electronic waste, the penalties are specified by local waste disposal legislation.

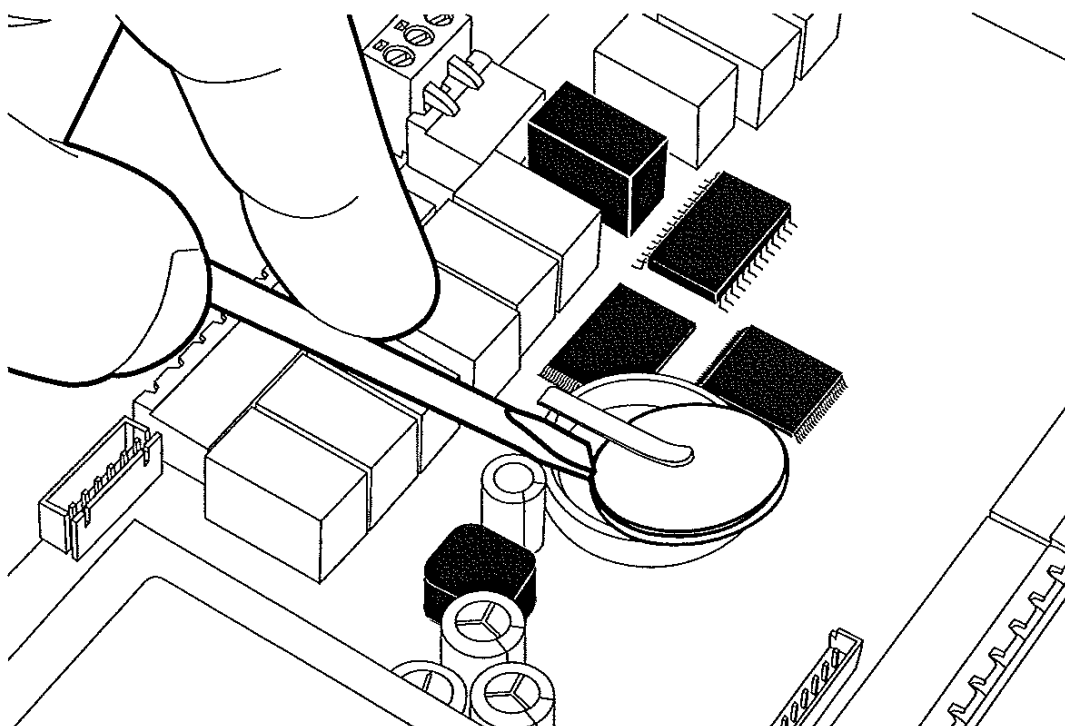


Fig. 4.c

IMPORTANT WARNINGS

The CAREL product is a state-of-the-art device, whose operation is specified in the technical documentation supplied with the product or can be downloaded, even prior to purchase, from the website www.carel.com.

The customer (manufacturer, developer or installer of the final equipment) accepts all liability and risk relating to the configuration of the product in order to reach the expected results in relation to the specific final installation and/or equipment. The failure to complete such phase, which is required/indicated in the user manual, may cause the final product to malfunction; CAREL accepts no liability in such cases. The customer must use the product only in the manner described in the documentation relating to the product. The liability of CAREL in relation to its products is specified in the CAREL general contract conditions, available on the website www.carel.com and/or by specific agreements with customers.

Technical Information

Oil Separator



Technical Data

| | |
|----------------------------------|-----------|
| Operating Medium | R404A |
| Design Pressure, DP (MPa) | 3.4 |
| Design Temperature, TS (°C) | -40 ~ 130 |
| Maximum Allowable pressure (MPa) | 3.1 |
| Weight (kg) | 3.5 |
| Marking | CE |

| Type | Part No. | Connection ODF | PED Category | Volume Litres | Initial Oil Charge Litres |
|------|----------|-------------------|-----------------|------------------|---------------------------------|
| RSPW | 55877 | 7/8" | Cat. I | 3.1 | 0.6 |

Certification

DOC/002-15(1)



DAIKIN REFRIGERATION MALAYSIA SDN. BHD.
LOT 10, JALAN PERUSAHAAN 8, KAWASAN PERUSAHAAN PEKAN BANTING,
42700 BANTING, SELANGOR DARUL EHSAN, MALAYSIA.

Declaration of Conformity

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

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
oswiadcza 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 Macinheit der Abkühlung
Unità condensante commerciale di refrigerazione
kølecondenseringsenheden til kommercielt brug
Unidade de condensação de refrigeração
Εμπορική Μονάδα Συμπύκνωσης Ψύξης
AGREGAT SKRAPLAJĄCY - CHŁODNICTWO KOMERCYJNE

Model Designations:
Baumuster-Bezeichnungen:
Designations Modèles:
Aanduidingen Model:
Designaciones Modelo:
Indicazioni de Modello:
modelbetegelse:
Designações do modelo:
Ονομασίες 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 apéndice 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.
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J & E Hall Limited, Hansard Gate, West Meadows, Derby, DE21 6JN, United Kingdom.

General Manager

Teh Yeow Chong

Issue Date: 22 March 2016

Certification

DOC/006-15(0)



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.

*Model Designations:
Baumuster-Bezeichnungen:
Designation Modeles:
Aanduidingen Model:
Designaciones Modelo:
Indicazioni de Modello:
modelbetegnelse:
Designações do modelo:
Ονομασίες μοντέλων:
Oznaczenia modelu:*

JEHS-0200-M-1
JEHS-0250-M-3
JEHS-0350-M-1
JEHS-0400-M-3
JEHS-0680-M-3
JEHSD-0600-M-3

JEHS-0200-M-3
JEHS-0300-M-1
JEHS-0350-M-3
JEHS-0500-M-3
JEHS-0800-M-3
JEHSDT-1200-M-3

JEHS-0250-M-1
JEHS-0300-M-3
JEHS-0400-M-1
JEHS-0600-M-3
JEHS-1000-M-3
JEHSDT-1500-M-3

JEHS-0200-L-3
JEHS-0500-L-3
JEHS-1000-L-3

JEHS-0300-L-3
JEHS-0600-L-3

JEHS-0400-L-3
JEHS-0750-L-3



Certification

DOC/009-15(1)

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-M-1 | JEHS-0350-M-3 | JEHS-0400-M-1 | JEHS-0400-M-3 | JEHS-0500-M-3 |
| JEHS-0600-M-3 | JEHS-0680-M-3 | JEHS-0800-M-3 | JEHS-1000-M-3 | JEHSD-0600-M-3 |
| JEHSDT-1200-M-3 | JEHSDT-1500-M-3 | JEHS-0400-L-3 | JEHS-0500-L-3 | JEHS-0600-L-3 |
| JEHS-0750-L-3 | JEHS-1000-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 |
| Vessel | Liquid receiver | II | Module A2 |
| Vessel | Oil separator | I | Module A |
| Vessel | Check valve | SEP | - |
| Vessel | Filter drier | SEP | - |
| Piping | System Piping | SEP | - |
| Piping | Sight glass | SEP | - |
| Piping | Coil | SEP | - |
| Piping | Service valve | SEP | - |

Category: II

Evaluation module: A2

Notified body number: 2561

Notified body name & address: Hartford Steam Boiler UK Limited


Unit 7, Brewery Yard, Deva City Office Park, Trinity Way, Salford, M3 7BB, United Kingdom.

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

The products are provided with a  2561 marking of conformity.



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: 19 July 2016

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