

1 General

All refrigeration pipe brazing, evacuation and charging shall be performed by a technician with a current Refrigerant Handling Licence.

IMPORTANT.

Read the additional 'Installation & Maintenance' instructions accompanying each product. Hot Work Permits should be acquired where necessary before work commences. Follow the Refrigerant Handling Code of Practice guidelines.

WARNING.

R32 refrigerant (Class A2L) is mildly flammable.

The system shall be installed, operated and stored in a well-ventilated space. If the refrigerant gas comes into contact with fire, a toxic gas may occur. Be aware that R32 does not contain an odour.

The appliance shall be stored in a room:

- without continuously operating open flames (for example an operating gas appliance) and ignition sources (for example an operating electric heater).
- away from other potential continuously operating sources known to cause ignition of R32 refrigerant.

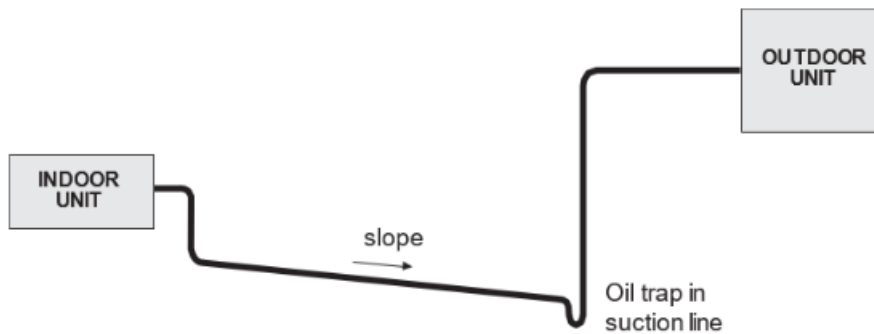
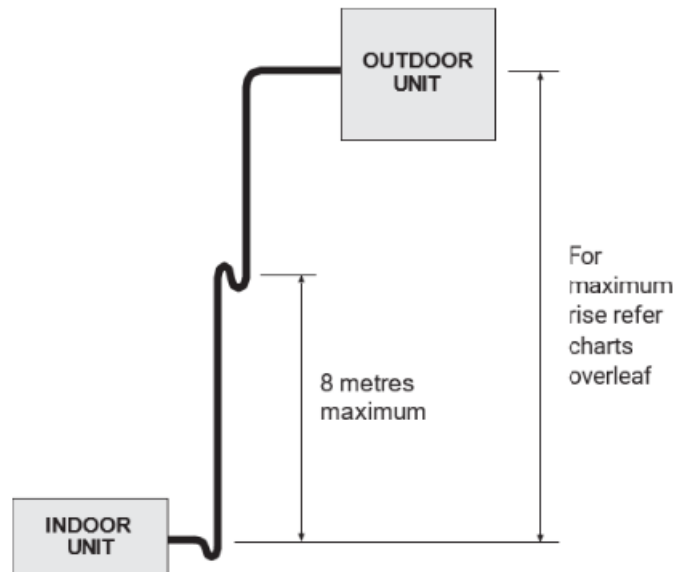
2 Piping

- i. Use clean sealed refrigeration grade piping.
- ii. Pipe to be cut ONLY with a pipe cutter.
- iii. Use long radius bends (2 x pipe dia.)
- iv. Insulate both the gas and liquid line on all units, and seal all insulation joints.
- v. Include a process point on the interconnecting pipework.
- vi. Ensure all open pipe ends are sealed until the final connection is made.
- vii. Purge pipes using Nitrogen during brazing.
- viii. Immediately before removing any brazed seals on pipe stub connections of outdoor units, release any residual pressure using Schraeder valves provided on the pipework after the shut-off valves. **Warning:** Failure to do so may cause injury.
- x. Existing R410A pipework can be re-used when replacing older R410A units with new R32 units provided the interconnecting pipe size is not smaller than that recommended for the new system.

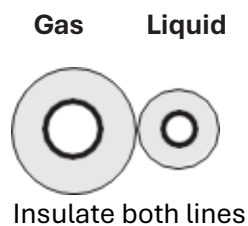
3 Oil Traps

Oil traps must be fitted to vertical suction risers where outdoor unit is above indoor unit. Fit a trap at the bottom of the vertical rise and then at 8 m (maximum) intervals.

Design



4 Piping Insulation



5 Evacuation Procedure

(Pre-Charged Outdoor Units)

Evacuate the Indoor Unit plus interconnecting pipework to achieve a vacuum of 500 microns which is to be held for 15 mins. The use of an electronic vacuum gauge is essential for this exercise.

6 Pre-Charged Units

Pre-charged Outdoor units include charge sufficient for the line length shown in Table 1 and stated in the unit's installation instructions.

Calculate additional refrigerant to suit your line length; note:

- Do not exceed the maximum refrigerant charge specified
- Ensure minimum floor area is not breached.
- For line lengths less than 5m, deduct excess refrigerant, or coil excess pipe out of sight.

7 Refrigerant Charging

Refrigerant charge to be introduced as liquid only and by weight or volume (not by system pressure or sight glass). Sight glasses are not recommended because of flash gas in liquid line.

Temperzone recommends accurate charging/adding of refrigerant using digital refrigeration scales (spring balance is not acceptable).

For units supplied pre-charged, the actual line length and the final charge is crucial to correct operation. If you fear some charge has been lost, recover all the existing charge and re-charge accurately.

8 Refrigerant Pipe Sizes

Liquid line sizes given in the following tables are interconnecting pipe sizes and are not necessarily the same size as the pipe stub connections exiting the Indoor or Outdoor unit.

On any unit with variable capacity compressors, do not oversize the interconnecting piping as this will reduce the refrigerant velocities significantly with the associated danger of not returning the oil to the compressor.

9 Oil

Oil should be added on extended line lengths (refer tables overleaf). Strictly adhere to recommended quantities.

Inverter compressors designed for R32 use polyol ester oil (POE) or polyvinyl ether oil (PVE) – whichever is specified. POE oil can be used as an alternative to PVE oil.

Polyol ester oils (POE) are type *NXG5020*. Do not use mineral oil. Polyvinyl ether oils (PVE) are type *FW68S*.

Please refer to Table 1 or the unit Specification data sheet to ensure the use of the

correct oil.

10 Crankcase Heaters

Crankcase heaters are fitted to all compressors. Disconnect the crankcase heater if the total line length is less than 8 m.

11 Pipe Length Capacity Loss

Maximum line lengths given represent **actual** measured line length between Indoor and Outdoor units. The **equivalent** line length is significantly more than actual line length because it includes an allowance for bends and vertical piping. Use the equivalent line length when calculating pressure losses or performance losses.

12 Commissioning

Each outdoor unit is supplied with a *Commissioning Sheet* to assist installers completing the Start Up Procedure outlined in the *Installation & Maintenance* pamphlet. We recommend you complete the form, send a copy to Temperzone and keep the original yourself for possible future reference.

13 Manufacturer's Note

The manufacturer reserves the right to make changes at any time without notice or obligation. Should any instruction in this guide conflict with any *Installation & Maintenance* pamphlet supplied with a unit, then the most recently dated publication should be considered correct.

Table 1 SPLIT SYSTEM PIPING REQUIREMENTS

(Units Supplied Pre-Charged)

Model	Scroll Compressor	Standard Unit Limitations			Maximum Vertical Separation		Refrigerant Charging		Oil Charging		Oil Type
		Gas	Liquid	Max. Line Length m	Outdoor Unit above Indoor Unit m	Indoor Unit above Outdoor Unit m	Precharge for 15m Line Length (R32) kg	Additional Charge for Pipe Line Length g/m (R32)	Add Oil Beyond m	Additional Oil ml/m	
OSA 171RLSF	YPV030LT-3X9-LBK	19	9.5	60	20	20	4.1	60	40	10 ml/m	POE-46 (NXG5020 or equivalent*)
OSA 171RLTF	YPV030LT-4X9-LBK	19	9.5	60	20	20	4.1	60	40	10 ml/m	POE-46 (NXG5020 or equivalent*)
OSA 211RLTF	YPV038LT-4X9-LBK	19	9.5	60	20	20	5.2	60	40	10 ml/m	POE-46 (NXG5020 or equivalent*)
OSA 251RLTF	YPW050ST-4X9-LBK	22	13	60	20	20	8.25	105	40	20 ml/m	POE-46 (NXG5020 or equivalent*)
OSA 351RLTF	AVB66FT2MT	28	13	90	20	20	(10m) 9.05	115	40	20 ml/m	PVE (FW68S or equivalent*) or POE-46

Note: As charge amount increases so to does the minimum floor area required to disperse refrigerant in the unlikely event of a leak.

Refer 'R32 Refrigerant Handling' document supplied with units,

* Oil Type Equivalents POE Oils:

- Emcarate RL32-3MAF
- Emcarate RL68H
- Chemplas POE

PVE Oils:

- Idemitsu PVE-FVC32D
- Danfoss 320HV

Estimating Effective Line Length for Performance Loss	Suction Line Bend	Equivalent Pipe Length	Standard Unit Limitations allow the unit to be installed without any extra protection other than adjustment of the refrigeration gas and/or oil charge.
When calculating performance losses for long line lengths allowances must be made for bends in the pipework. The tabled data (right) is based on Long Radius 90° bends (2 x pipe dia.). Add this allowance for every bend to the total line length to calculate an 'effective' line length for performance loss. No allowance has been included for any effect from vertical lift.	16 mm	0.30 m	
	19 mm	0.42 m	
	22 mm	0.50 m	
	28 mm	0.61 m	
	35 mm	0.76 m	