Eaton-Williams

QLC

Low Temperature DX Cassette

Installation Manual

QUALITAIR

Document 0412124 Issue 2.1 05/06

Contents

Section Page

Installation & Safety

The units making up the Air Conditioning System must only be installed by a qualified engineer, following the mandatory and local codes of practice.

Handling

Care must be taken when the units are moved or lifted to ensure that everyone and everything is safe. When lifting equipment is used it must be suitable and approved.

Application

Ensure that the unit is only used for suitable purpose/applications.

Electrical Connection

Electrical work and connections must be made only by authorised electricians in accordance with mandatory regulations and local codes of practice.

Warranty

Failure to comply with the manufacturer's installation instructions could affect the performance of the unit and invalidate the warranty. Warranty is also subject to the implementation of a planned service/maintenance agreement as documented in the warranty booklet supplied with the unit.

Safety Procedures

General

1. All works must be carried out in accordance with the manufacturer's installation and operating procedures.
2. Good working practices must be followed at all times so that Mechanical and Electrical hazards are kept to a minimum.
3. The equipment has been fitted with doors and covers to prevent access during operation. These must be kept in place and additional guards fitted if necessary.
4. The equipment must be connected to an external electrical isolator if one is not supplied fitted to the unit.
5. Servicing and maintenance must only be carried out by fully qualified and competent staff. Before any work is started, electrically isolate the units to make sure that they can not be switched on accidentally and allow sufficient time for isolated parts to come to rest before removing panels. Electrical isolation switches must be labelled to show that they are OFF during servicing and maintenance operations.

Note

Some units are dormant in standby mode and can restart without warning if they are not electrically isolated.

6. Care must be taken not to touch components or pipework which may be extremely hot, or cold for a period after the unit is electrically isolated.
7. After completing any tasks ensure all guards, covers and doors are correctly refitted before restoring the power supply to the unit.
8. Air conditioning equipment may generate unacceptable noise levels. If noise levels are unacceptable sound and vibration attenuators may be required. For noise levels guidance refer to technical literature, or contact Qualitair, or their distributors for advice.

SPECIAL NOTES

IF ANYTHING IS NOT CLEAR PLEASE CONTACT YOUR DISTRIBUTOR FOR CLARIFICATION.

System Description

QLC Indoor Unit

The QLC Indoor Unit has been designed to be installed in a false or suspended ceiling, but it can be mounted from a solid ceiling. In its basic form the unit is a cooling only unit with a plastic fascia (supplied separately), but depending on customer specification a variety of option kits can be supplied for site fitting.

Fascia for the QLC Indoor Unit

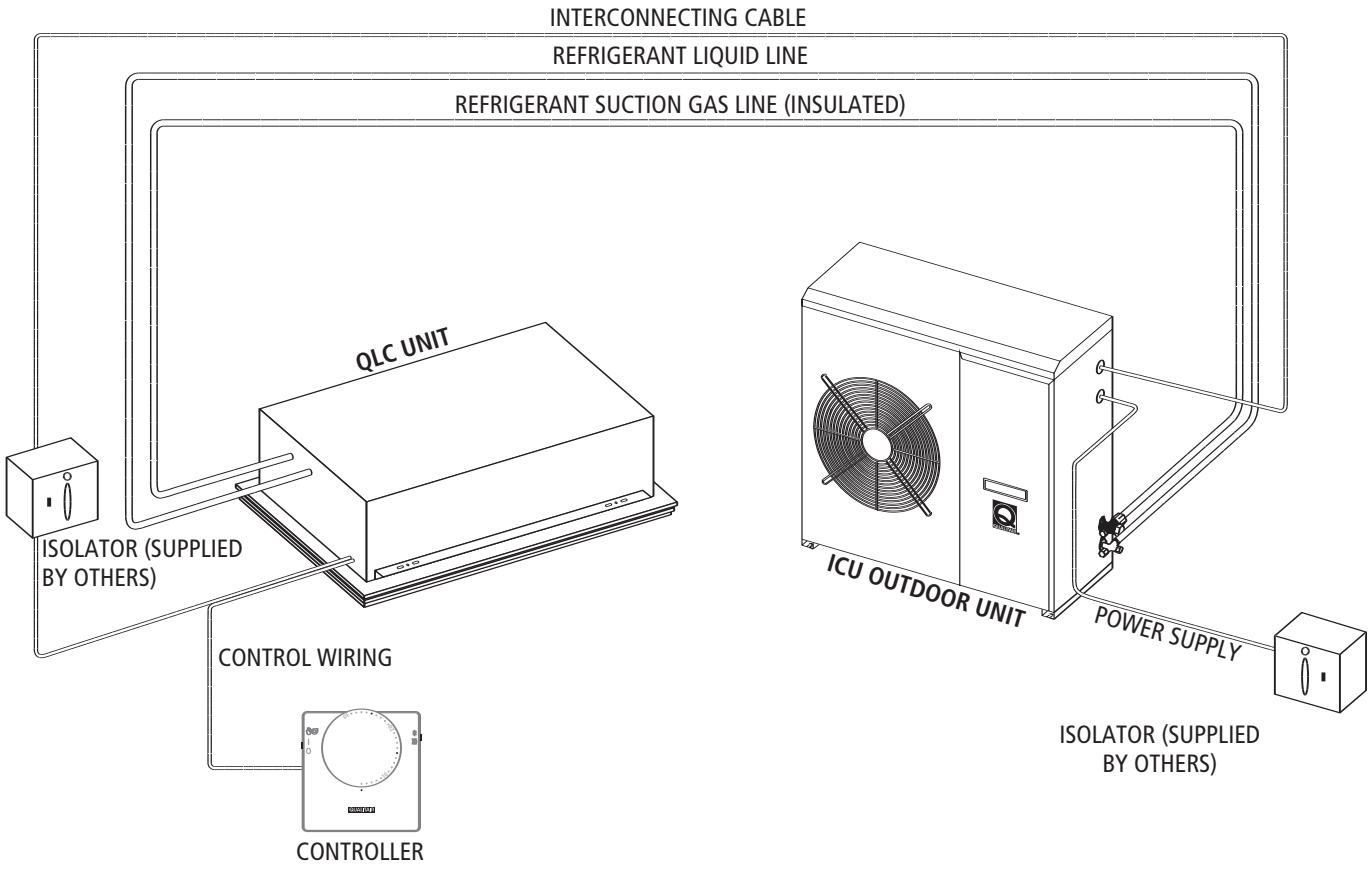
Each QLC Indoor Unit has a Fascia, fitted at site, which is located on the underside of the unit below the suspended ceiling.

ICU Outdoor Unit

The unit is comprised of a floor mounting condensing unit, which can also be wall mounted using the ICU Wall Bracket Option Kit. The unit is supplied complete with axial fan and guard, hermetic compressor, shut off service valves, fan speed controller and, low and high pressure switch.

Option Kits

The QLC and ICU units can be supplied with a range of option kits which will require fitting at site. Instructions for fitting are supplied with the Option Kits.



SPECIAL NOTES:

CHECK THAT THE INDOOR UNIT IS CORRECTLY MATCHED TO THE OUTDOOR UNIT
ALL PIPE WORK, INSULATION AND ELECTRICAL CABLING IS TO BE SUPPLIED BY OTHERS.

Location & Mounting of Indoor Unit (QLC)

Preparation of Suspended Ceiling

The ceiling tiles and suspension framework must be cut away and re-supported to suit the size of the unit such that the grille assembly, when fitted to the chassis, will cover all raw edges.

Unit Fixing

The unit should be suspended by four off M10 drop rods secured to the unit supporting angles held in place by M10 nuts and washers. The unit should be suspended 1 to 2mm off the ceiling tile face and must be absolutely level in both directions (use spirit-level to check).

Note 1: In order to reduce the weight of the unit during installation the fan assembly may be easily removed as follows (refer to diagram on page 7 for reference).

(i) Disconnect the motor loom from the unit terminal block.

(ii) On the QLC 10 slacken the two screws at one end of the fan tray and slide the tray towards the screws to disengage the other end then raise the fan tray assembly clear of the chassis – the fixing screws will pass through the keyhole slots.

(iii) On the QLC 15/20 remove the two screws at one end of the fan tray. Slide the fan tray assembly towards the screws to disengage the opposite end and then raise the fan tray assembly to clear the joggle strips in the slots at the screw ends.

Note

When lifting the fan tray do not insert hands into the fan scroll. This can cause the fan impellors to become unbalanced.

Fascia Assembly (Note: leave Fascia in protective wrapping until fitted)

The Fascia is comprised of an inlet grille (2) and a louvred outlet air assembly (3). The inlet grille (2) is attached to outlet assembly by 2 off latch fixings which locate in the air outlet assembly side frame holes.

Fascia Fixing

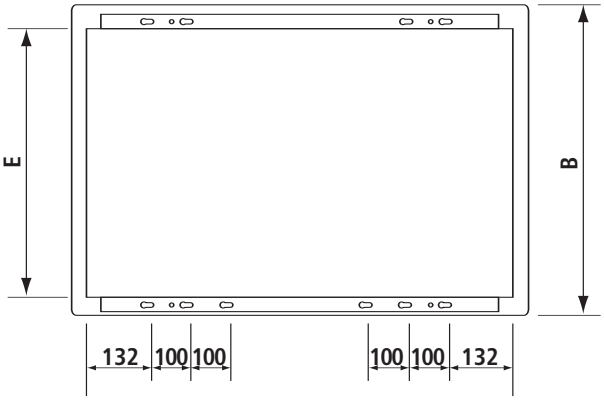
Fit the outlet air assembly (3) to the unit chassis by inserting the two slots along one long side behind the two corresponding capture screw heads on the inner chassis side. Lift the other side of the outlet air assembly to match the two swing bolts on the opposite chassis side. Clamp with the swing bolts and tighten the other two captive screws.

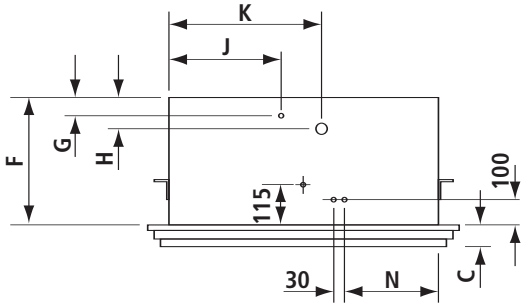
SPECIAL NOTES :

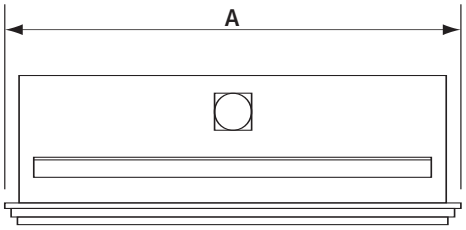
ENSURE THE INDOOR UNIT IS INSTALLED LEVEL TO PREVENT DRAINAGE PROBLEMS
CHECK IF ANY OPTION KITS REQUIRE SITE FITTING BEFORE INSTALLING THE UNITS.

QLC Unit Dimensions

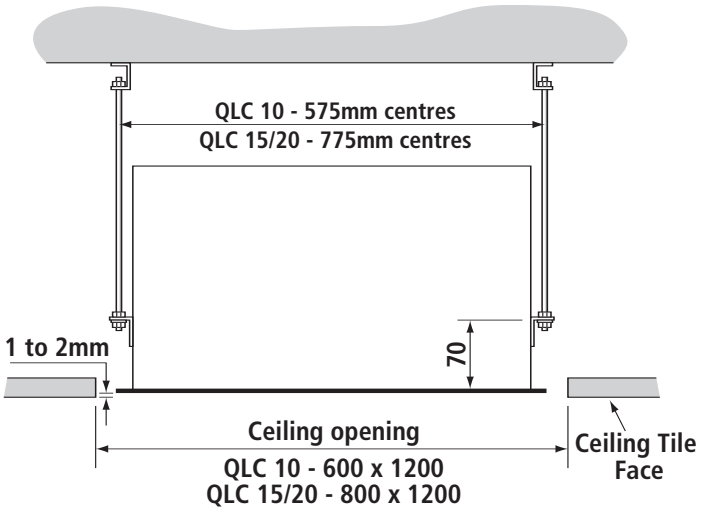
	QLC10	QLC15/20
A Facia Length mm	1245	1245
B Facia Width mm	650	850
C Facia Depth mm	60	60
D Body Length	1165	1165
E Body Width	535	735
F Body Height	299	349
G Refrig Connection	59	50
H Refrig Connection	59	86
J Refrig Connection	217	307
K Refrig Connection	305	417
N Electrical Connection	200	300
Weight kg	59	83



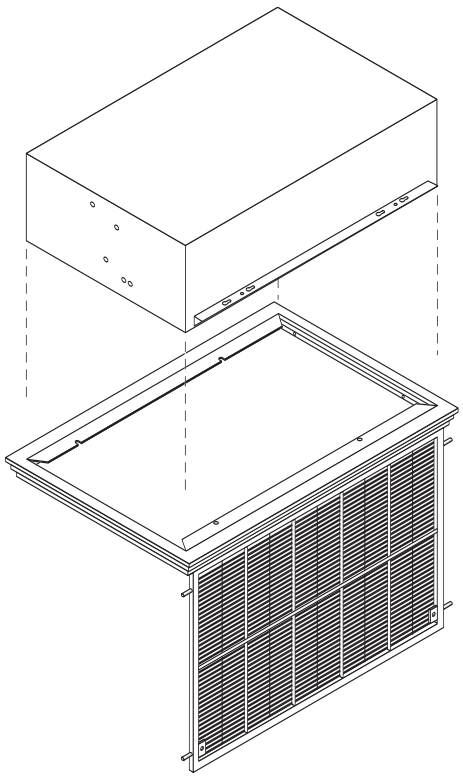




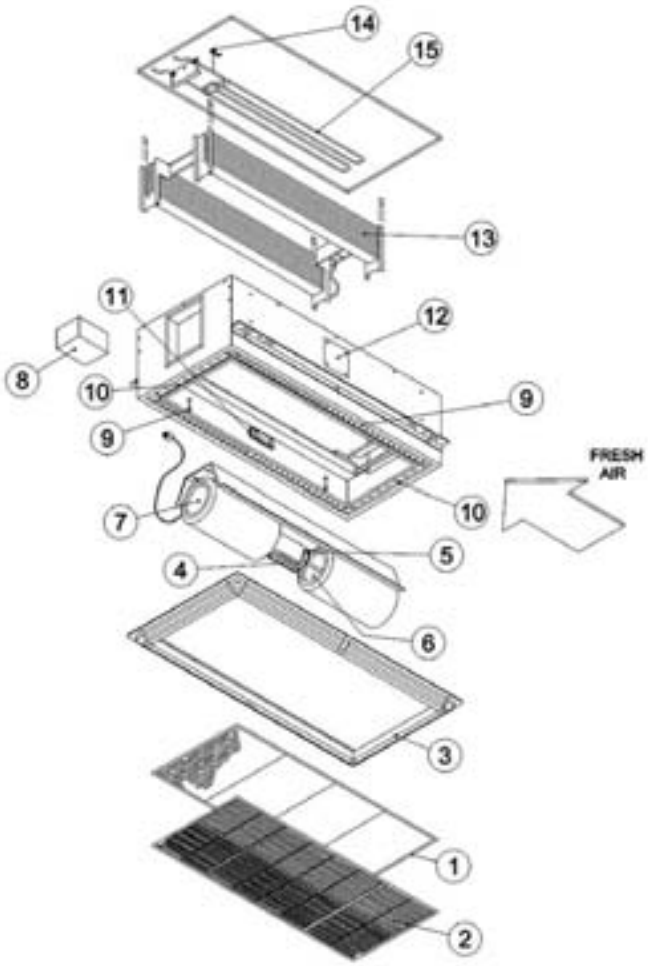
Ceiling Opening



Facia Location

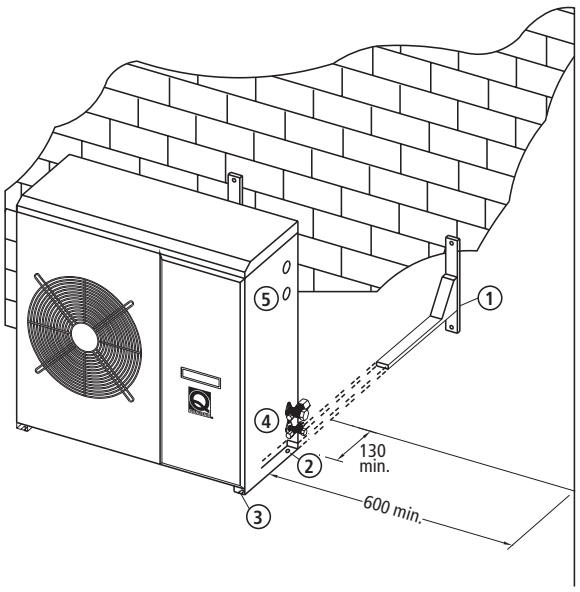


Indoor Unit Access

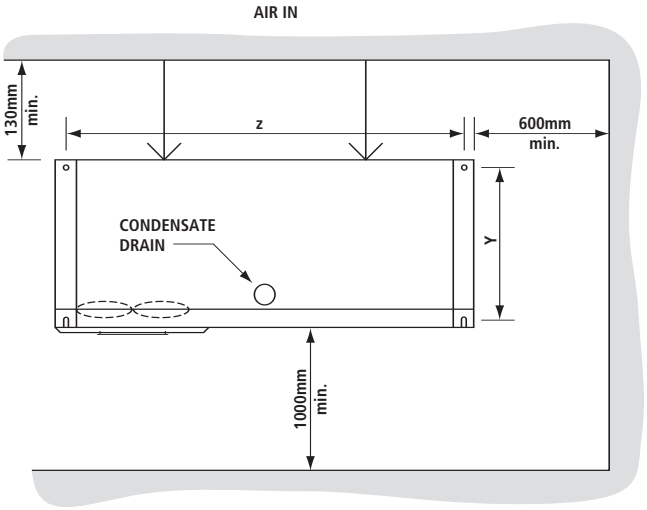


Item No.	Unit Component	Acess Details/Fixings
(1)	Filter	Remove inlet grille
(2)	Inlet Grille	2 off slide latches
(3)	Facia Outlet	2 off screws & 2 off keyhole fixings
(4) (5) (6) (7)	Fan Deck Assembly	2 off screws and slide out
(8)	Controller	N/A
(9)	Outlet Air Assembly Swing Bolts	N/A
(10)	Air Outlet Channel	N/A
(11)	Electrical Connections	N/A
(12)	Duct Distribution Outlet	N/A
(13)	Cooling Coil	N/A
(14)	Heater Thermostat	Access by removing fan tray
(15)	Heater Element	Access by removing fan tray

Location & Mounting of Outdoor Unit (ICU)

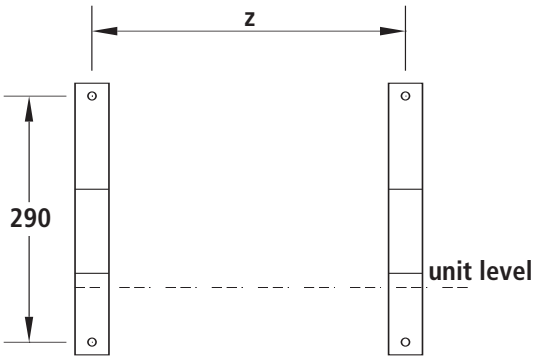


ICU Unit Positioning



ICU Wall Bracket Fixing

	ICU40	ICU55	ICU80
Width mm	720	800	800
Height mm	610	765	765
Depth mm	250	320	320
Weight kg	42	60	64
Dim 'Y' mm	220	290	290
Dim 'Z' mm	670	750	750
Indoor Unit	QLC10	QLC15	QLC20



ICU Wall Bracket Fixing

Location
The unit can either be mounted on a level surface or suspended from a vertical wall using the Qualitair wall mounting Optional kit (1). The unit should always be mounted on a load bearing wall and not a partition wall. Ensure there is sufficient free area around the unit as shown above.

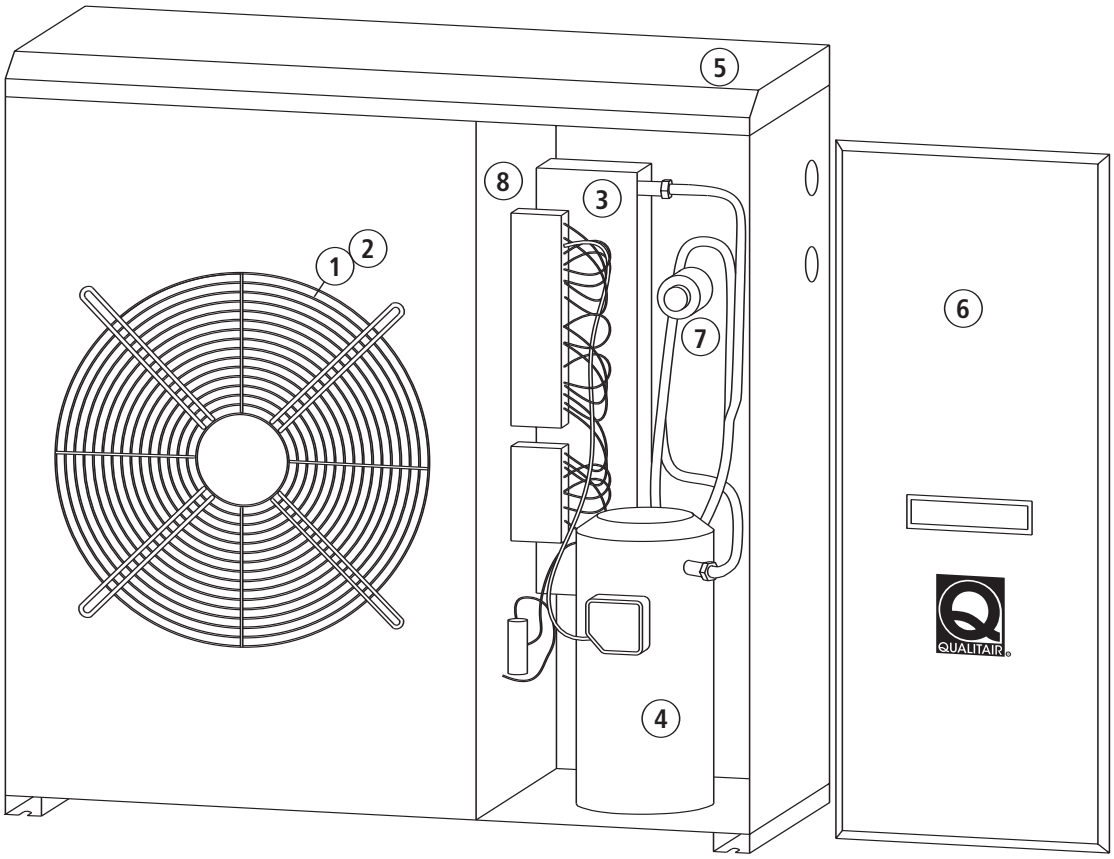
Fixing
Two off hole fixings (2) and two off slot fixings (3) suitable for M10 fixings are provided in the base of the unit to secure the unit to a suitable plinth, or to the wall mounting bracket kit. If required, the contractor should install the unit on anti - vibration pads.

Service Connections
The refrigerant pipe (4) and electrical connections (5) are located at the right hand end of the unit, and the condensate drain for the heat pump unit is located on the base of the unit.

Air Entry
Ensure there is adequate air entry at the back of the unit as detailed above.

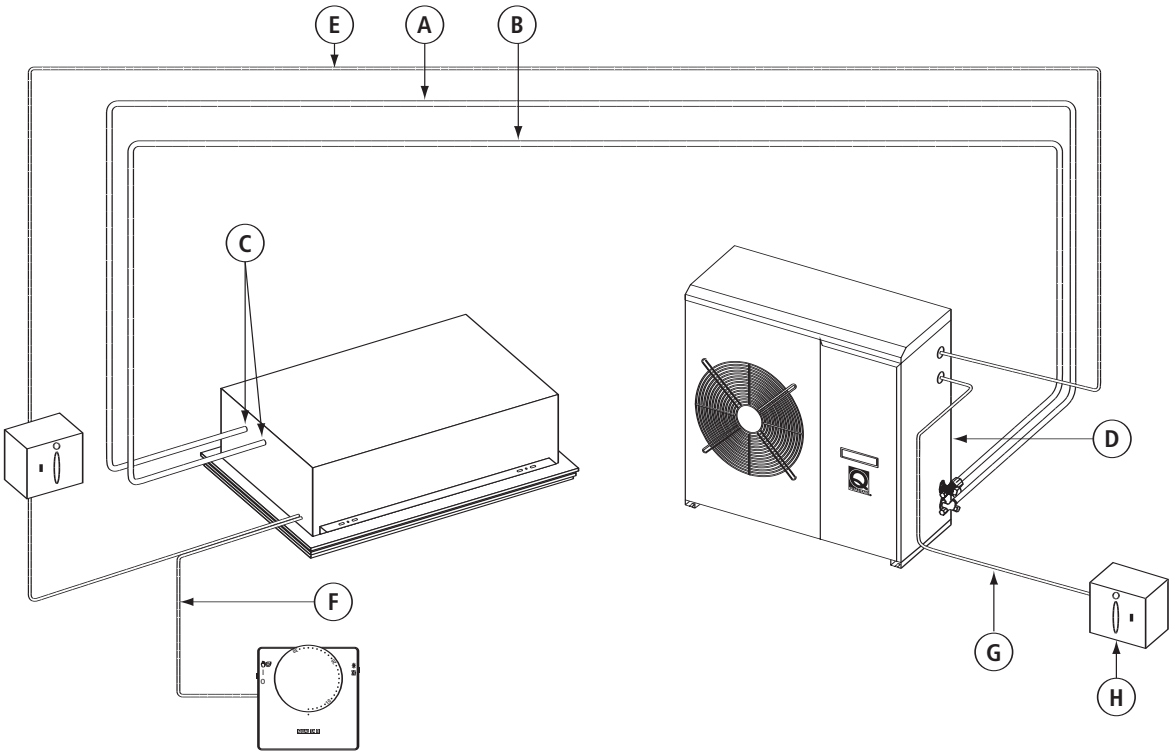
SPECIAL NOTES :
ENSURE CONDENSER HAS ADEQUATE CLEARANCE AROUND IT AND IS NOT AFFECTED BY NEIGHBOURING CONDENSING UNITS.

Outdoor Unit Access (ICU)



Item No.	Unit Component	Acess Details/Fixings
(1)	Fan Guard	Front access set screw fixings
(2)	Fan/motor (fixed to rear of fan guard)	Front access set screw fixings on guard
(3)	Condenser Coil	Access from rear of unit
(4)	Compressor	Remove "service access panel"
(5)	Removable top panel	Front and side access screw fixings
(6)	Service access panels	Front access screw fixings
(7)	HP & LP cut-outs / winter start timer	Remove "service access panel"
(8)	Electrics/customers connection	Remove "service access panel"

General Service Connections

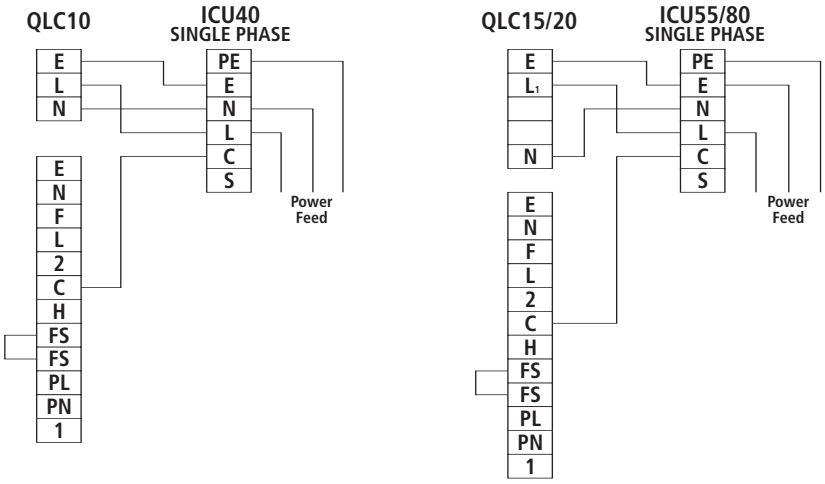


General Service Connections						
A - Liquid Line Sizes	QLC10		QLC15		QLC20	
Run <15 m	1/4"		1/4"		3/8"	
15 m - 30 m	1/4"		3/8"		3/8"	
B - Suction Line Sizes	QLC10		QLC15		QLC20	
Direction of run	H	V	H	V	H	V
Run <15 m	5/8"	1/2"	5/8"	5/8"	3/4"	3/4"
15 m - 30 m	5/8"	1/2"	3/4"	5/8"	7/8"	3/4"
C - QLC Refrigerant Connections	QLC10		QLC15		QLC20	
Liquid Connections	1/4"		1/4"		3/8"	
Suction Connections	5/8"		5/8"		3/4"	
D - ICU Refrigerant Connections	QLC10		QLC15		QLC20	
Liquid Connections	1/4"		1/4"		3/8"	
Suction Connections	5/8"		5/8"		3/4"	
E - Interconnecting Cable - No. of Cores	QLC10		QLC15		QLC20	
A/C Unit	4		4		4	
A/C Unit + Heaters	4		4		4 (6)	
F - Controller Cable - No. of Cores	QLC10		QLC15		QLC20	
A/C Unit	4		4		4	
A/C Unit + Heaters	5		5		5	
G - Mains Power Cable - No. of Cores	QLC10		QLC15		QLC20	
Single Phase System (230V 50Hz)	3		3		3	
Three Phase System (415V 50Hz)	N/A		N/A		5	
H - System Fuse Ratings - HRH (AMPS/Phase)	QLC10		QLC15		QLC20	
A/C Unit	10		16		20 (10)*	
A/C Unit + Heaters	16		20		20 (10)*	

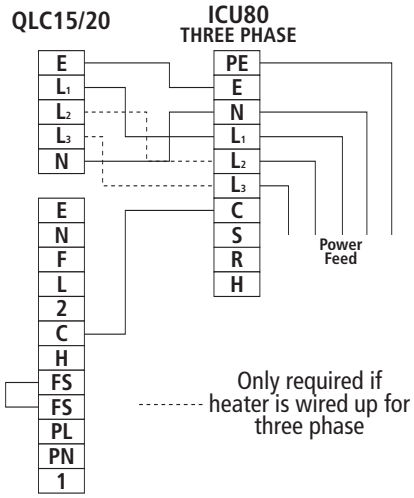
* Figures in brackets are for three phase condensing units.

Power & Control Connections

Single Phase Systems



Three Phase Systems



Wiring-up the Unit

Electrical terminations should be made onto the screw terminal side of the indoor and outdoor unit terminal blocks.

Wiring Requirements

Power supply – Connection of isolation power supply to the outdoor unit.

Interconnecting Wiring – Power and signal cables run between outdoor and indoor unit.

Controls Wiring – Connections between wall mounted controller and indoor unit.

Details of the fuse ratings and cable requirements are given on page 10.

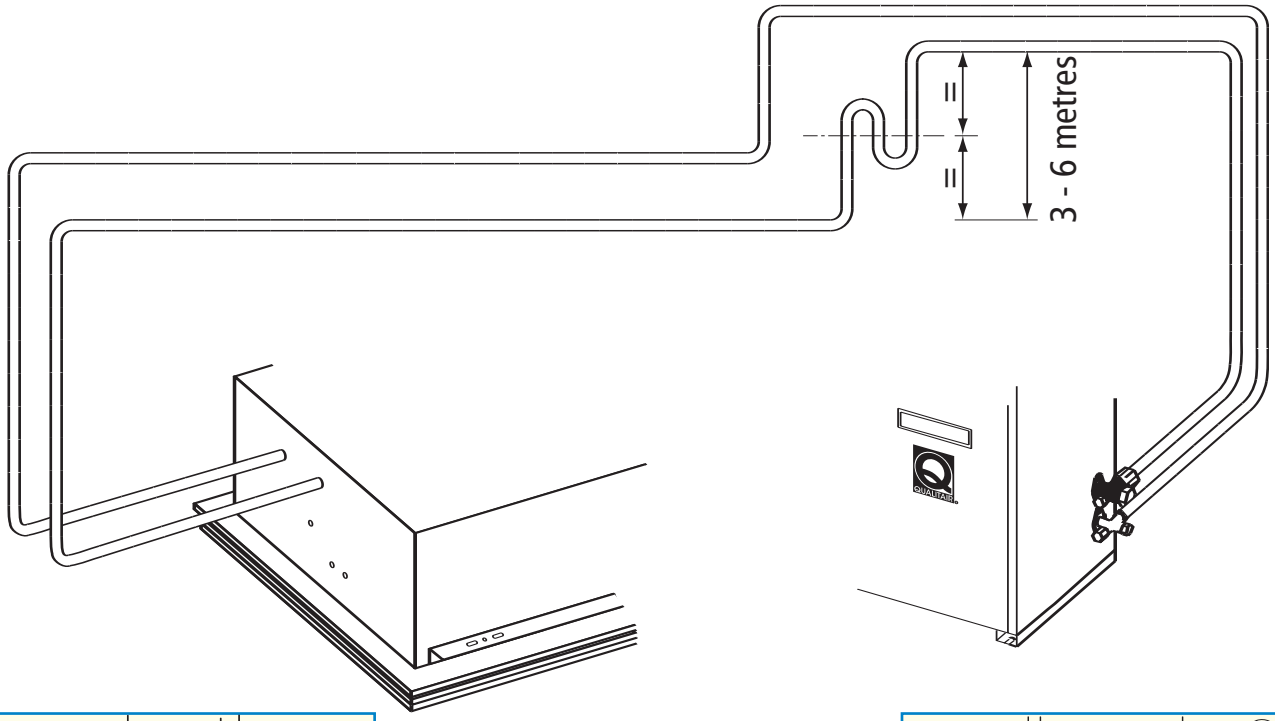
Terminations

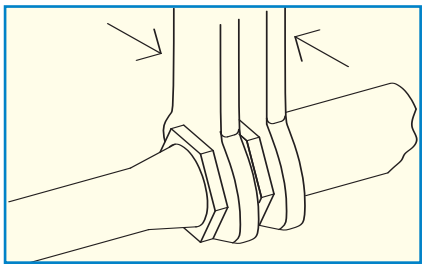
Details of cable terminations and interconnections are shown above.

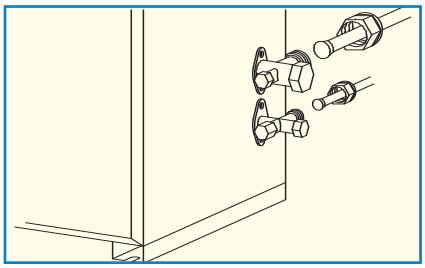
Note:- A wiring diagram is located within both the indoor unit and the outdoor units.

SPECIAL NOTES :
REFER TO KIT INSTRUCTIONS FOR ELECTRICAL CONNECTION OF SITE OPTION KITS !
DO NOT MEGA OR FLASH TEST WITH ELECTRONIC PCB'S IN CIRCUIT
INDOOR AND OUTDOOR UNITS SHOULD HAVE LOCAL ELECTRICAL ISOLATORS.

Refrigerant Pipe Connections







Pipe Installation

Run the suction and liquid lines in appropriately sized refrigeration copper tubing as detailed on page 10 of this installation manual. When calculating the effective run take into account any bends or oil traps.

Note: 90 deg elbow equivalent length = 25 x pipe O.D.

Note: Oil trap equivalent length = 50 x pipe O.D

Where the vertical separation exceeds 3 metres, oil traps must be fitted at half the vertical distance as shown above. Ensure the refrigerant lines are adequately supported using refrigerant pipe clips.

Unit Connections

The indoor and outdoor unit connections are terminated in male flare connections as detailed on page 10 of this manual. Place flare nuts onto the copper tube before preparing the tube with a flaring tool (above right). When connecting to the male flares ensure both surfaces are clean and coat the flared surface with refrigerant oil to help ensure a leak free joint. When tightening the joint use two spanners to prevent twisting of the connections as detailed (above left). Please note that the indoor unit is factory charged with 50psi of dry air or nitrogen which can be safely released to atmosphere.

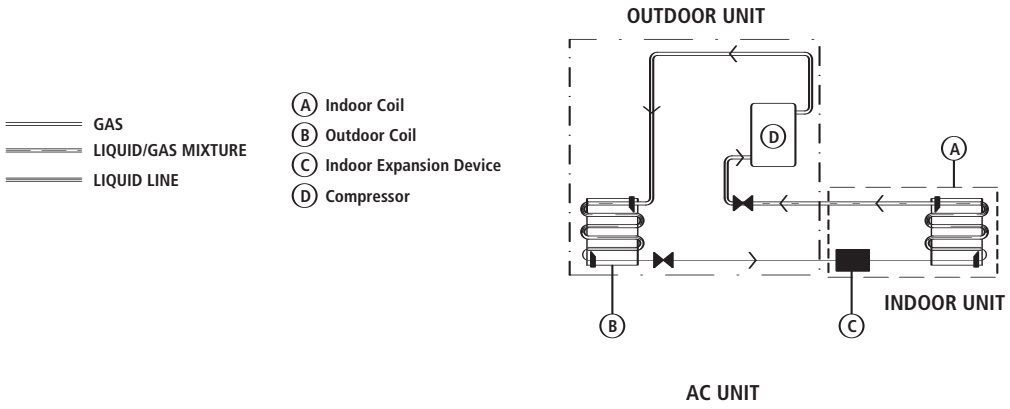
Insulation

Suction lines must be insulated to a minimum thickness of 3/8". Hot areas should be avoided when routing liquid lines and consideration should be given to separate insulation of liquid lines to prevent heat absorption.

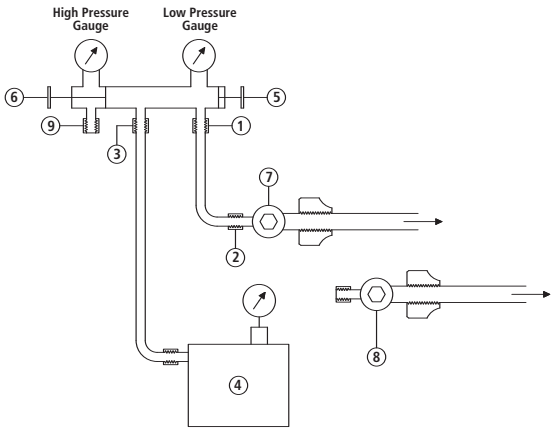
SPECIAL NOTES :
SLEEVE, SEAL AND WATERPROOF ANY BUILDER WORKS HOLES.

Refrigerant Commissioning

Refrigerant Schematic Diagram



Evacuation and Charging Connections



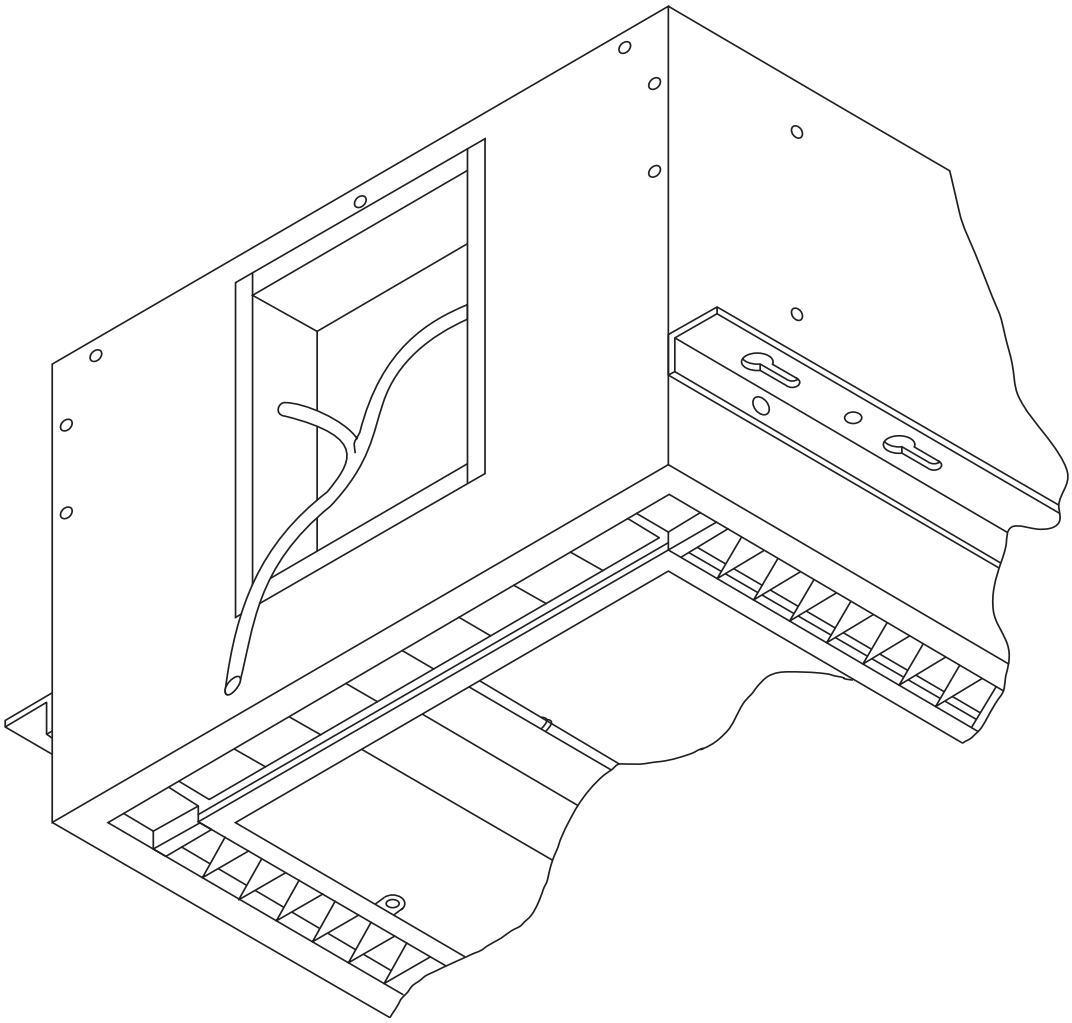
Site Top-up and Extended Pipe Run Refrigerant Charge (R407C)			
	QLC10 / ICU40(3)	QLC15 / ICU55(5)	QLC20 / ICU80(7)
Site Top-up Charge (cooling only)	150	0	0
Extended Pipe Run Charge > 5m	25 gms/m	25 gms/m	40 gms/m
Factory Base Charge for A/C Unit (5m)	1100 gms	1600 gms	1900 gms

Evacuation, Charging and Refrigerant Procedures

After completing the refrigerant connections the following steps should be followed with reference to the Evacuation and Charging Connections above.

- ❏ Service gauges - Connect the low pressure port (1) of a manifold gauge set to the suction line outdoor unit shut off valve service port (2).
- ❏ Vacuum Pump - Connect the centre line port (3) of the manifold gauge set to the vacuum pump (4) and operate the pump to ensure a vacuum of 200 microns.
- ❏ Ensure gauge low pressure port (5) is open and high pressure port (6) is closed.
- ❏ System Isolation - After achieving the specified system vacuum close the gauge low pressure port (5) and switch off the vacuum pump. Leave the system for 1 hour and check that the vacuum is maintained. If not, check for leaks, rectify and repeat the pumping down to 200 microns.
- ❏ Refrigerant Charging - Open both the outside unit shut off valves (7 & 8) to release the factory refrigerant into the system. Weigh in the site top-up charge using a charging station and any additional extended pipe run charge as detailed in the table above.
- ❏ Disconnect the vacuum pump and connect the gauge high pressure port (9) to the discharge line of the outdoor unit shut off valve (10), ensuring that the gauge central port (3) is closed. Run the system, allow pressures to stabilise and ensure correct operation. After final commissioning remove the gauge set, fit all valve caps and carry out a final refrigerant leak test.

Ancillary Service Connections



Condensate Removal

As standard the condensate is removed by gravity drainage. The drains are run in two off flexible hoses (one off per drain tray) which are run to the outside of the unit and joined with a 'Y' connector, which is housed within the connection of the unit.

Condensate Connection

When using gravity drainage connect the flexible hose onto 15mm copper or similar and secure using a jubilee clip or similar. Ensure the clip is not over tightened such that it cuts the flexible hose.

SPECIAL NOTES :
ENSURE ALL CONNECTIONS EXTERNAL TO THE UNIT CASING AND DRAIN PIPEWORK IS ADEQUATELY INSULATED TO PREVENT FREEZING OR CONDENSATION.

Final Checks

	Check
1. Have all option kits been fitted?	
2. Have units been mounted level and correct drainage been checked?	
3. Have the suction line, expanded liquid line (if required) and condensate drains (if required) been adequately insulated?	
4. Has the correct HRC external fusing / isolation been installed?	
5. Has the additional site top-up and extended pipe run refrigerant charge been measured into the system?	
6. Has the control system been explained to the customer and the operating manual sheet handed over with the appropriate section completed?	
7. Has the warranty booklet been read and completed?	

Note
If a service contract is not taken out only a 1-year warranty is applicable.

PRODUCT RANGES

- Air-cooled & Water-cooled Liquid Chillers
- Packaged Roof-Top Units
- Full Range of Air Handling Units
- Fan Coil Units
- Package Telecommunications Units
- Fresh Air Units
- Condensing Units
- Air Cooled Condensers
- Low Temperature Cassettes
- Cellar & Storage Low Temperature Cooling Units
- Packaged In-Wall Units
- Stand-alone Humidifiers
- OEM Process Cooling Control Units
- Custom Designed Packages
- Constant & Variable Air Volume Units

Eaton-Williams

Eaton-Williams Air Conditioning
Station Road, Edenbridge
Kent TN8 6EG, England
Telephone: +44 (0)1732 866055
Facsimile: +44 (0)1732 866653
www.eaton-williams.com