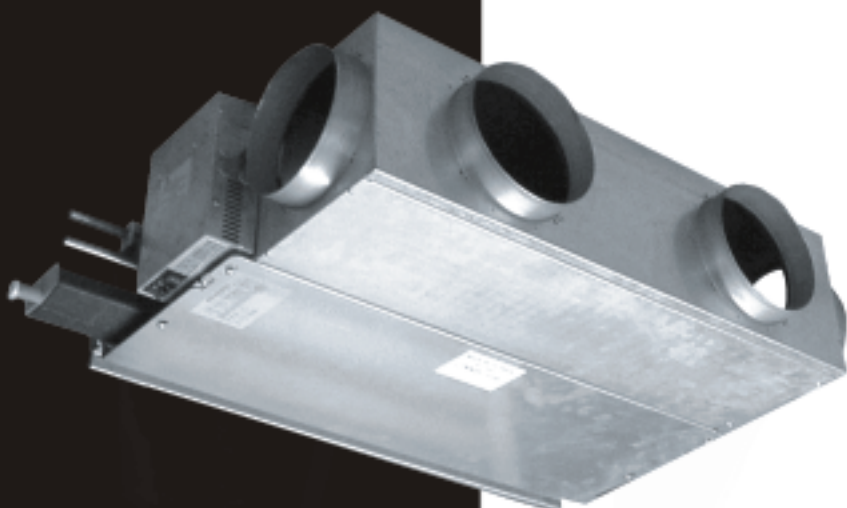


***LENNOX***<sup>®</sup>

**INSTALLATION -  
OPERATING &  
MAINTENANCE MANUAL**



PROVIDING **GLOBAL SYSTEM** SOLUTIONS

**QUANTUM  
WATERSIDE  
FAN COIL  
UNITS**

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Manufacturer reserves the right to change any product specifications without notice.

# QUANTUM WATERSIDE FAN COIL SPECIFICATION

## Casings

The casings shall consist of durable 1.2mm galvanised sheet steel reinforced where required to form a rigid structure.

## Discharged Plenum

The discharge plenum shall be lined with class 0 acoustic insulation. The plenum shall be provided with spigots for duct connection.

## Drip Tray

The drip tray shall be manufactured such that when the unit is mounted level there shall be a positive fall for the condensate water to the drain connection from all areas of the drip tray. There shall be no areas where water can collect in pools. The drip tray shall be insulated with 3mm closed cell foam to Class 0 specification.

## Fans

Double inlet double width fans shall be used driven by a motor using cradle type resilient mountings. The fans impellers shall be at least 160mm diameter and of 'Tablock' construction to ensure good performance and low noise. Each impeller shall be statically & dynamically balanced.

## Motors

Motors shall be single speed permanent split capacitor type. The motors used shall comply with BS 5000 Part 11 1973 (revised 1989). Speed control shall be achieved by applying a variable voltage to the motor winding. Motors are to have maintenance free sealed for life bearings and built in thermal overload protection.

## Insulation

Dual function thermal and acoustic insulation shall be used and shall be to Class 0 specification.

## Heat Exchangers

All heat exchangers shall be tested at a minimum of 25 bar pressure. The coils shall be manufactured using solid drawn copper tubes and aluminium fins. Each coil shall be fitted with an air vent.

## Filters

Standard filters shall be of the washable type. They shall have a performance classification of G2 in accordance with EN779 (EU2) and a flame resistance to DIN 53438:Class F1.

## Connections

All are to be to BS 2871 Part 1:1971 and suitable for brazed or compression fittings. Coil connections shall be at 40mm centres to enable easy fitment of standard water control valves.

## Controls

All units shall be fitted with illuminated ON/Off switch, three speed selector switch and include +5v / +10v trimmer switches to aid commissioning and be complete with 24 Volt AC transformer output to drive controllers and actuators.

## Packaging

Units shall be supplied with suitable packaging to prevent damage and dust contamination. Units shall be clearly marked with the model identification and site reference and supplied with installation instructions.

## Certification

Units shall be supplied with a CE label designating that they comply with CE requirements for safety.

# MOUNTING / CONNECTIONS

Thank you for choosing the Lennox Quantum Waterside Fan Coil Unit. Please read the following information carefully prior to installation. These instructions should be kept in a safe place for future reference.

**WARNING:**  
**ISOLATE FROM THE ELECTRICAL SUPPLY  
BEFORE COMMENCING WORK.**

These units can be installed virtually as delivered. They are intended for fitting behind a suspended ceiling or a similar ceiling void and have circular spigots for connecting to ducting. Similarly, they can have a fresh air spigot fitted when specified.

## MOUNTING

In all cases, the units are fixed to the mounting face by means of four slots in the end flanges. Down rods, 10mm in diameter, should be used to support units

1. Unistrut should be mounted to the slab (see dimensional data) and four 10mm down rods fixed to the unistrut.
2. The down rods should have two nuts and two washers to lock the unit in position. The unit can then be lifted into location, hooking the slots (in the top panel) over the washers. The nuts must then be securely tightened.
3. Check to ensure the unit is level and adjust if necessary.
4. Check that water runs into the waste from the drain tray, by pouring water into it.

**NOTE:** To allow for Service Clearances it is recommended that a minimum space of 50mm is provided from top of the unit to underside of slab.

Sufficient space should be provided to allow for clear and safe access to the control panel.

## PIPEWORK CONNECTIONS

### **1. Water flow and return connection**

Plain pipe connection tails are all to BS 2871, Part 1: 1971 and are suitable for brazed or compression fittings. Connection sizes are 15mm or 22mm outside diameter on the cooling coil and 15mm on the heating coil. Actual final connection pipesizes will vary depending on valve configuration where fitted.

### **2. Condensate Tray Connection**

An end facing 22mm outside diameter copper condensate drain connection tube to BS 2871, Part 1: 1971 is fitted as standard to the condensate tray on all units.

### **3. Air Vents and Drains**

Brass air vent and drain tapping points are fitted as standard to all coils. These are positioned at the top and bottom of the header tubes.

## DUCT CONNECTIONS

### **1. Discharge Air Side**

An integral discharge plenum is fitted as standard complete with 197mm or 247mm outside diameter circular spigots. These are to accept standard diameter flexible ducting. Blanking caps are available to order.

### **2. Inlet Air Side**

When specified, units will be fitted with an Air Inlet Plenum, this will have the same number, size and position of circular spigots as on the discharge air side. Blanking caps are available subject to order.

### **3. Fresh Air Spigot**

The fresh air spigot is available in a size of 100mm diameter.

### **4. Condensate pump**

Condensate pump kits are available as an optional factory fitted option. Refer to diagrams indicating electrical wiring details.

### **5. Electrical heating element**

LQWFC150	2KW	LQWFC190	2KW
LQWFC260	2KW	LQWFC330	4KW
LQWFC440	4KW		

Refer to diagrams indicating electrical wiring details.

## ELECTRICAL CONNECTIONS

### **ISOLATE ELECTRICAL SUPPLY BEFORE ATTEMPTING SERVICE WORK.**

A 230V, 50Hz, single phase supply is required. Wiring must be installed by a qualified electrician and conform to current local and national regulations.

1. Wire mains to unit via a double pole isolating switch, fused to IEE regulation. Refer to diagrams indicating electrical wiring details.
2. The electrical connection is via a 2m flying lead with factory fitted connector into socket on control box where an electric heater is NOT fitted. If an electric heater is fitted, to connect mains supply to unit, slacken off the screw holding the control box front cover. Carefully pivot the cover to support it, making sure the wires connecting the cover to the unit are not strained. Connect the mains lead via grommet hole in the side panel to the LIVE, NEUTRAL and EARTH positions on the 12-way terminal block. Replace cover and tighten screw.
3. If a Condensate Lift Pump is specified, this will be pre-wired back to the control box, but the pump assembly will be taped to the unit and must be fixed to the end of the drip tray before installing the unit, using the screws supplied.
4. The fan motors are of the permanent split capacitor type and have a capacitor fixed to the outside of the motor. All motors have thermal overload protection as standard. Access to the fan tray is via removable panels on the bottom face of the unit.

## CONTROLS

All units are fitted as standard with an ON/OFF switch and a FAN SPEED selector switch for three speeds.

When specified, the water control valves will have a controller that will be fitted to the exterior of the control box.

These are all fitted into the control box and pre-wired.

## **1. Fan Speed**

Out of 6 speeds available, SL (Super Low), EL(Extra Low), L(Low), ML(Med/Low), M(Med), and H(High), the fan speed selector switch will be wired for three speeds. Speed adjustment and fine tuning is achieved by following the instructions indicated on the label that is positioned on the underside of the unit, adjacent to the control box.

Each model size has its specific settings, examples as detailed on page 5 of this document.

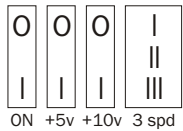
An example of adjusting the speed setting is described below:-

E.g.: If unit is selected for Medium/Low (ML) speed, then the speed selector switch is set at position II and other positions L and M, as below:

Position I	=	L (Low Speed)
Position II	=	ML (Med/Low Speed)
Position III	=	M (Medium Speed)

If selected speed is EL then this would be Position II with SL and L other positions. If selected speed is H then this would be position III with M and ML other positions.

# FAN SPEED SETTINGS



## FAN SPEED SETTINGS

To achieve the design speed use a combination of main tapplings on the transformer and switch positions on the outside of the control box.

150	Main tapping			Fan speed switches			Output Volts
	W	Y	R	Switch	+5 V	+10 V	@design speed
EL	120	135	150	I	0	0	120
L	120	135	150	I	0	1	130
ML	135	150	165	II	0	0	150
M	150	165	180	II	1	0	170
H	165	180	195	III	1	0	200

190	Main tapping			Fan speed switches			Output Volts
	W	Y	R	Switch	+5 V	+10 V	@design speed
EL	120	135	150	I	0	0	120
L	120	135	150	I	0	1	130
ML	120	135	150	II	1	0	140
M	135	150	165	II	0	0	150
H	135	150	165	III	1	0	170

260	Main tapping			Fan speed switches			Output Volts
	W	Y	R	Switch	+5 V	+10 V	@design speed
SL	120	135	150	I	0	0	120
EL	120	135	150	I	0	1	130
L	120	135	150	II	1	0	140
ML	135	150	165	II	0	0	150
M	150	165	180	II	1	0	170
H	165	180	195	III	1	1	200

330	Main tapping			Fan speed switches			Output Volts
	W	Y	R	Switch	+5 V	+10 V	@design speed
EL	120	135	150	I	0	0	120
L	120	135	150	I	0	1	130
ML	120	135	150	II	1	0	140
M	135	150	165	II	0	0	150
H	150	165	180	II	1	0	170

440	Main tapping			Fan speed switches			Output Volts
	W	Y	R	Switch	+5 V	+10 V	@design speed
EL	120	135	150	I	0	0	120
L	120	135	150	I	0	1	130
ML	120	135	150	II	1	0	140
M	135	150	165	II	0	0	150
H	165	180	195	II	0	0	180

480	Main tapping			Fan speed switches			Output Volts
	W	Y	R	Switch	+5 V	+10 V	@design speed
EL	120	135	150	I	0	1	130
L	120	135	150	II	0	1	145
ML	135	150	165	II	0	1	160
M	150	165	180	II	0	1	175
H	165	180	195	III	0	0	195

# PERIODIC MAINTENANCE

## **PERIODIC MAINTENANCE PROCEDURE**

The following routine maintenance operations should be carried out twice a year or at such shorter intervals as may be dictated by climatic conditions or cleanliness of conditioned space.

### **1. Routine Precautions**

**SWITCH OFF POWER SUPPLY AT THE MAINS OUTLET BEFORE COMMENCING ANY WORK ON THE EQUIPMENT.**

**DO NOT OPERATE FAN FOR LONG PERIODS (OVER 2 HOURS) UNDER FREE AIR CONDITIONS. I.E WITHOUT DUCTWORK CONNECTED.**

**DO NOT USE STEAM JET OR HIGH PRESSURE HOT WATER TO CLEAN COIL SURFACES.**

### **2. General**

- Thoroughly clean chassis, baseplate, drain tray.
- Clean casing. The unit exterior surfaces should be inspected monthly and any signs of corrosion or scratches should be treated immediately.

### **3. Routine Checks**

- Check voltage at supply point with unit running.

### **4. Condensate Trays**

- Check condensate drains are clean and free running.
- Check condensate hose connections are secure and leak free.
- Clean the condensate tray thoroughly.
- Check and clean condensate pump if fitted.
- Check operation of tray, drains or pump by introducing water into tray.

### **5. Controls**

- Check all connections for burning or wear. Replace if necessary.
- Ensure all electrical connections are secure.
- Check functions of controls according to operating procedures.

### **6. Fan Motor and Fan**

A regular check on the fan/motor assembly is advisable to ascertain if any overheating of the motor is occurring and that the fan impeller is free running and has not sustained any damage.

Check that fans and fan motor are properly aligned.

Check all securing screws, bolts and nuts are tight.

### **7. Coil**

The coil should be inspected every six months to ascertain if any foreign matter has accumulated between the fins and that the coil connections are free from leaks.

Should the fins become contaminated too frequently, it is advisable to check that the air filter is functioning correctly.

Use a soft brush and vacuum cleaner to remove any dust between fins. Comb fins if required.

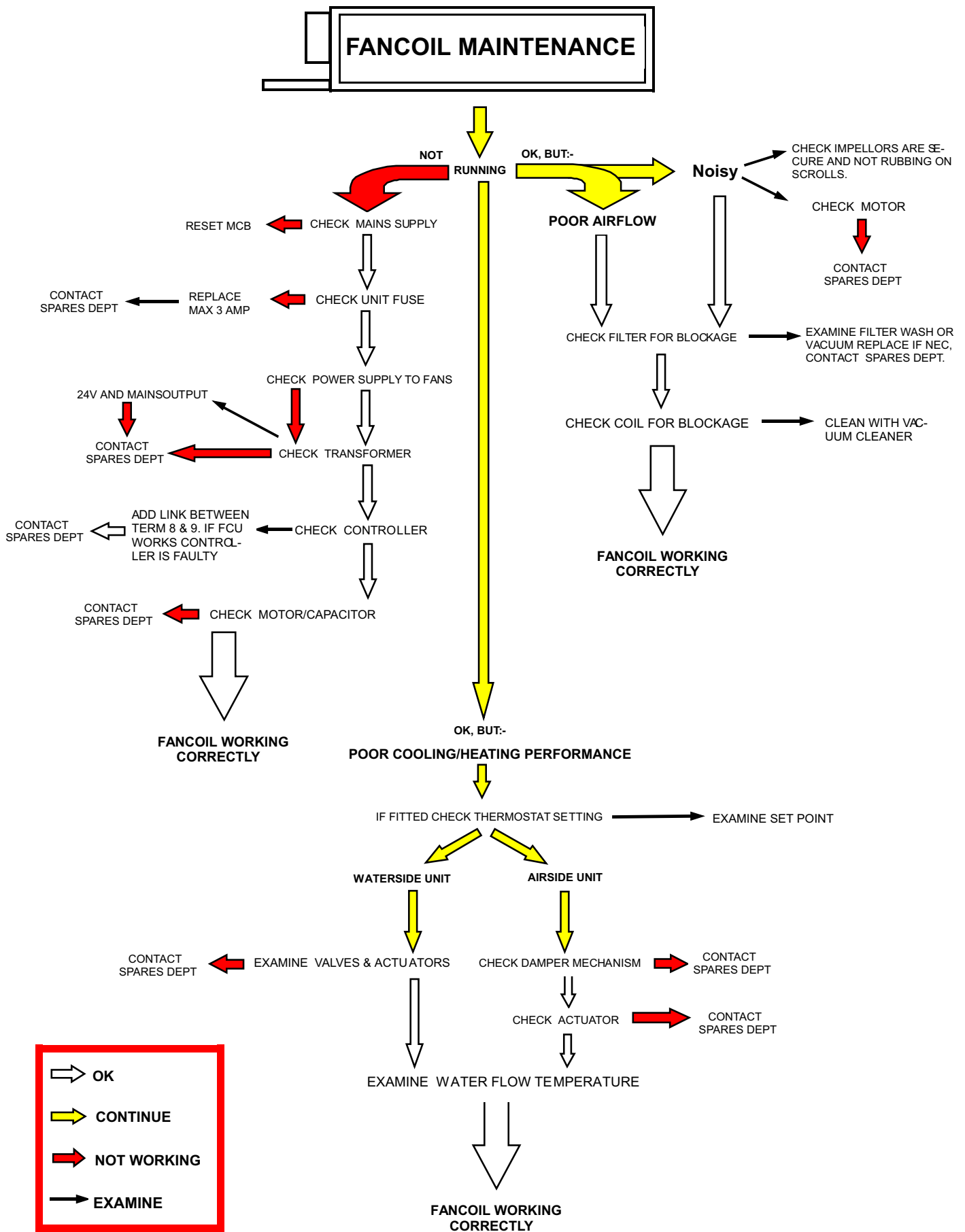
**DO NOT RUN UNIT WITHOUT FILTER FITTED.**

### **8. Filter**

Regular cleaning of return air filter is essential, every three to six months depending on the working environment of the unit. Dirty filters will reduce the air volume handled by the unit, thus adversely affecting its performance.

Clean the filter using a vacuum cleaner OR remove the filter from the unit and fully immerse in warm water with a mild detergent. Rinse in clear water, allow to dry before replacing.

# FANCOIL MAINTENANCE



When contacting Spares Dept please specify Unit type, size and Ref number.



## ELECTRICAL DATA

MODEL	FAN SPEED	Volts	Motor	Full Load	Start
			Power W	Current A	Current A
LQWFC 150	H	200	95	0.42	0.53
	M	170	71	0.32	0.41
	ML	150	56	0.26	0.32
	L	130	45	0.21	0.25
	EL	120	40	0.18	0.21
LQWFC 190	H	170	117	0.52	0.72
	M	150	97	0.43	0.55
	ML	140	81	0.36	0.47
	L	130	70	0.31	0.40
	EL	120	59	0.26	0.34
LQWFC 260	H	200	168	0.75	1.09
	M	170	133	0.59	0.81
	ML	150	106	0.47	0.63
	L	140	81	0.36	0.47
	EL	130	70	0.31	0.40
LQWFC 330	H	170	217	0.96	1.23
	M	150	174	0.77	0.96
	ML	140	138	0.61	0.74
	L	130	102	0.45	0.61
	EL	120	86	0.38	0.52
LQWFC 440	H	180	244	1.07	1.30
	M	150	207	0.91	1.10
	ML	140	180	0.79	0.94
	L	130	153	0.67	0.80
	EL	120	141	0.61	0.74
LQWFC 480	H	195	262	1.16	1.40
	M	175	244	1.04	1.26
	ML	160	220	0.97	1.17
	L	145	197	0.87	1.05
	EL	130	155	0.67	0.81

## COIL WATER CONTENT

MODEL	Water Temp.	No of rows	Water content litres
Heating	NA	1	0.09
150/3R	Low	3	1.41
150/4R	Low	4	1.88
150/3R	High	3	1.41
150/4R	High	4	1.88
Heating	NA	1	0.12
190/3R	Low	3	1.84
190/4R	Low	4	2.46
190/3R	High	3	1.84
190/4R	High	4	2.46
Heating	NA	1	0.16
260/3R	Low	3	2.39
260/4R	Low	4	3.19
260/3R	High	3	2.39
260/4R	High	4	3.19
Heating	NA	1	0.20
330/3R	Low	3	3.04
330/4R	Low	4	4.06
330/3R	High	3	3.04
330/4R	High	4	4.06
Heating	NA	1	0.27
440/3R	Low	3	4.00
440/4R	Low	4	5.33
440/3R	High	3	4.00
440/4R	High	4	5.33
Heating	NA	1	0.53
480/4R	High	4	5.33

## WEIGHTS, MINIMUM No. SPIGOTS, COIL CONNECTIONS

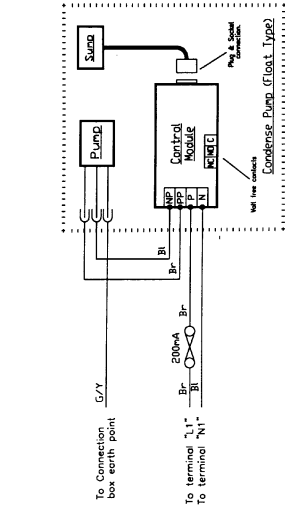
MODEL	WEIGHT kg	MINIMUM No. SPIGOTS		COIL CONNECTIONS (mm)	
		Total	Front	CW	LPHW
LQWFC150	34	2	1	15	15
LQWFC190	42	2	1	15	15
LQWFC260	55	2	1	15	15
LQWFC330	70	3	2	22	15
LQWFC440	90	3	2	22	15
LQWFC480	93	4	4	22	15

# WIRING DIAGRAM

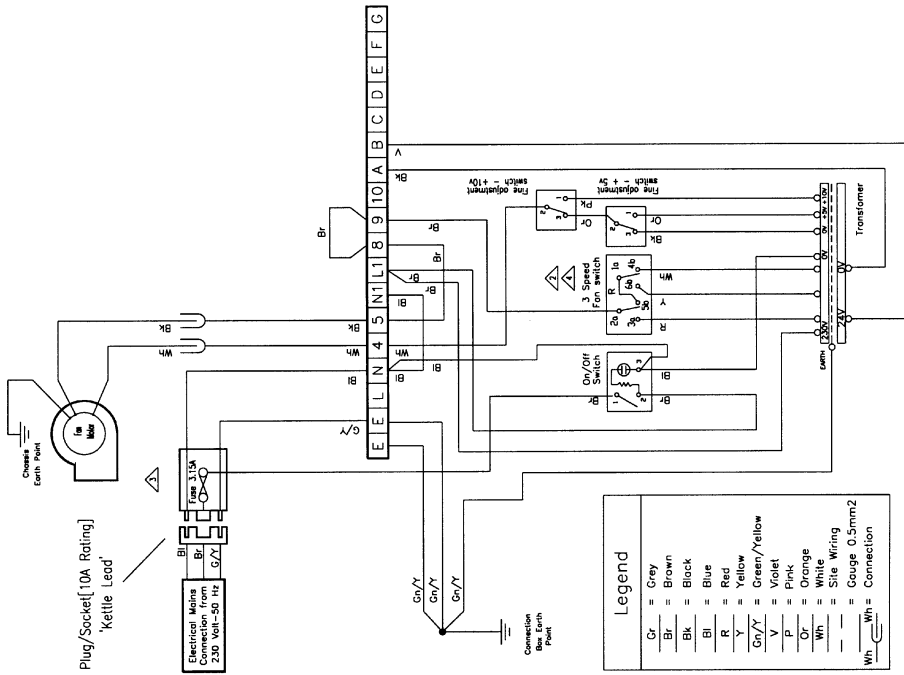
CAD DRAWING

Z304187

WIRING DIAGRAM



4 CONDENSATE PUMP..FLOAT TYPE [OPTIONAL]



Legend

- Gr = Grey
- Br = Brown
- Blk = Black
- Bl = Blue
- R = Red
- Y = Yellow
- Gr/Y = Green/Yellow
- V = Violet
- P = Pink
- Or = Orange
- Wh = White
- Wh = Slave Wiring
- Wh = Connection

WI = Gauge 0.5mm<sup>2</sup>

LOAD 276 IS JUN 96

REV NO.	DATE	REVISION	APPD	REV NO.	DATE	REVISION	APPD	REV NO.	DATE	REVISION	APPD	USAGE	NEXT PRINT
△	0.312	NEW FAN SWITCH NOS. ADDED. FAN SPEED TABLE REMOVED.		A	1.7.96	INITIAL PROJECT						LC/LD/MC	
△	2.0.99			△	27.03.99	SEE LEN U0890107							
△	10.04.00	PRODUCTION ISSUE & CONDENSATE PUMP OPTION ADDED.		△	10.10.00	CHANGE TO SHOW 'CT' FORMING NUMBERING.							
△	21.03.01	TRANS PUG/SOCKET ADDED.		△	21.03.01								

DESIGN OF - STANDARD WATERSIDE FAN COIL UNIT WITH 3 SPEED SWITCH/2x FINE ADJUSTMENT SWITCHES.

FOR FINEST SPECS REFER TO: PANT INSIDE N/A PANT OUTSIDE N/A

BY: M.S. S.A. M.T.L. N/A © 17.12.98

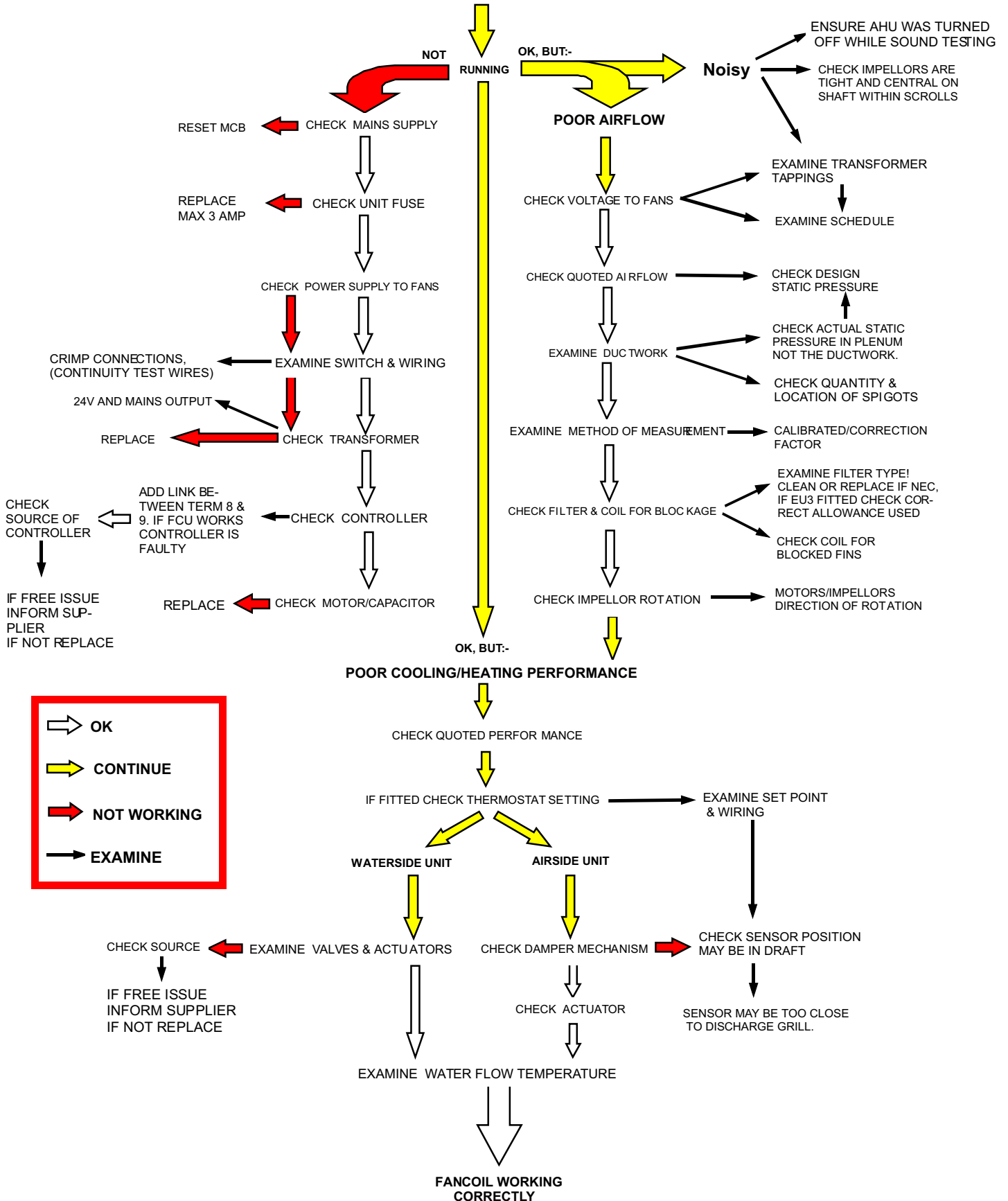
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# FAULT FINDING

## NEW FANCOIL FAULT FINDING



# SPARE PARTS LIST

Part Number	Description	Size Used On :				
		150	190	260	330	440
E142	Air Vent (409992007)	X	X	X	X	X
Z303677	Cooling Coil 3 row (Low Temp. 5 - 8 deg.C Flow)	X				
Z303678	Cooling Coil 3 row (Low Temp. 5 - 8 deg.C Flow)		X			
Z303679	Cooling Coil 3 row (Low Temp. 5 - 8 deg.C Flow)			X		
Z303680	Cooling Coil 3 row (Low Temp. 5 - 8 deg.C Flow)				X	
Z303681	Cooling Coil 3 row (Low Temp. 5 - 8 deg.C Flow)					X
Z303677	Cooling Coil 3 row (High Temp. 9 - 14 deg.C Flow)	X				
Z303785	Cooling Coil 3 row (High Temp. 9 - 14 deg.C Flow)		X			
Z303782	Cooling Coil 3 row (High Temp. 9 - 14 deg.C Flow)			X		
Z303787	Cooling Coil 3 row (High Temp. 9 - 14 deg.C Flow)				X	
Z303877	Cooling Coil 3 row (High Temp. 9 - 14 deg.C Flow)					X
Z303768	Cooling Coil 4 row (Low Temp. 5 - 8 deg.C Flow)	X				
Z303771	Cooling Coil 4 row (Low Temp. 5 - 8 deg.C Flow)		X			
Z303790	Cooling Coil 4 row (Low Temp. 5 - 8 deg.C Flow)			X		
Z303837	Cooling Coil 4 row (Low Temp. 5 - 8 deg.C Flow)				X	
Z303775	Cooling Coil 4 row (Low Temp. 5 - 8 deg.C Flow)					X
Z303839	Cooling Coil 4 row (High Temp. 9 - 14 deg.C Flow)	X				
Z303771	Cooling Coil 4 row (High Temp. 9 - 14 deg.C Flow)		X			
Z303793	Cooling Coil 4 row (High Temp. 9 - 14 deg.C Flow)			X		
Z303834	Cooling Coil 4 row (High Temp. 9 - 14 deg.C Flow)				X	
Z303878	Cooling Coil 4 row (High Temp. 9 - 14 deg.C Flow)					X
Z301771	Fan Tray Assembly	X				
Z301772	Fan Tray Assembly		X			
Z301773	Fan Tray Assembly			X		
SZ301774	Fan Tray Assembly				X	
SZ302066	Fan Tray Assembly					X
SZ200669	Motor - Single Shaft (240v 50HZ)	X			X	
SZ200668	Motor - Twin Shaft (240v 50HZ)		X	X	X	X (x2)
SZ201112	Impeller - Aluminium.	X	X (x2)	X (x2)	X (x3)	X (x4)
ZZ-S211500030	Rocker Switch (On / Off)	X	X	X	X	X
ZZ-S211500031	Rocker Switch - 3 Position (Speed Change)	X	X	X	X	X
Z201657	Transformer (Auto 1.5amp.)	X	X	X	X	
Z202103	Filter Assembly (EU2)	X				
Z202104	Filter Assembly (EU2)		X			
Z202105	Filter Assembly (EU2)			X		
Z202106	Filter Assembly (EU2)				X	
Z202107	Filter Assembly (EU2)					X
Z203290	Filter Assembly (EU3)	X				
Z203291	Filter Assembly (EU3)		X			
Z203292	Filter Assembly (EU3)			X		
Z203293	Filter Assembly (EU3)				X	
Z203294	Filter Assembly (EU3)					X
SZ303887	Drip Tray Assembly	X				
SZ303888	Drip Tray Assembly		X			
SZ303889	Drip Tray Assembly			X		
SZ303890	Drip Tray Assembly				X	
SZ303891	Drip Tray Assembly					X
Z301812	Plenum Dust / Spigot Caps (200 dia.)	X	X	X	X	X
Z304030	Plenum Dust / Spigot Caps (250 dia.)	X	X	X	X	X
Z291043	Condensate Pump Kit	X	X	X	X	X

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