INSTALLATION OPERATING & MAINTENANCE MANUAL

LENNOX®

PROVIDING GLOBAL SYSTEM SOLUTIONS

BALTIC

English
August 2003

IOM MANUAL

Ref. IOM-RT B/0803-E

The present manual applies to the following ROOFTOP versions :

BCK 020 - BCK 025- BCK 030- BCK 035- BCK 040- BCK 045- BCK 050

BHK 020 - BHK 025- BHK 030- BHK 035- BHK 040- BHK 045- BHK 050

BGK 020 - BGK 025- BGK 030- BGK 035- BGK 040- BGK 045- BGK 050

BDK 020 - BDK 025- BDK 030- BDK 035- BDK 040- BDK 045-BDK 050

NOTES FOR UNIT FITTED WITH GAS BURNER:

THE UNIT MUST BE INSTALLED IN ACCORDANCE WITH LOCAL SAFETY CODES AND REGULATIONS AND CAN ONLY BE USED IN WELL VENTILLATED AREA.

PLEASE READ CAREFULLY THE MANUFACTURER'S INSTRUCTIONS BEFORE STARTING THIS UNIT.

THIS MANUAL IS ONLY VALID FOR UNITS DISPLAYING THE FOLLOWING CODES: | GB | | IR | | GR | | DA | | NO | | FI | | IS |

In case these symbols are not displayed on the unit, please refer to the technical documentation which will eventually detail any modifications required to the installation of the unit in a particular country.

CONTENTS

All Baltic units are compliant with the PED directive 97-23-CE.

The following note must be followed carefully.

IMPORTANT NOTICE

All work on the unit must be carried out by a qualified and authorised employee.

Non-compliance with the following instructions may result in injury or serious accidents.

Work on the unit:

• The unit shall be isolated from the electrical supply by disconnection and locking using the main isolating switch.
• Workers shall wear the appropriate personal protective equipment (helmet, gloves, glasses, etc.).

Work on the electrical system:

• Work on electric components shall be performed with the power off (see below) by employees having valid electrical qualification and authorisation.

Work on the refrigerating circuit(s):

• Monitoring of the pressures, draining and filling of the system under pressure shall be carried out using connections provided for this purpose and suitable equipment.
• To prevent the risk of explosion due to spraying of coolant and oil, the relevant circuit shall be drained and at zero pressure before any disassembly or unbrazing of the refrigerating parts takes place.
• There is a residual risk of pressure build-up by degassing the oil or by heating the exchangers after the circuit has been drained. Zero pressure shall be maintained by venting the drain connection to the atmosphere on the low pressure side.
• The brazing shall be carried out by a qualified brazer. The brazing shall comply with the standard NF EN1044 (minimum 30% silver).

Replacing components:

• In order to maintain CE marking compliance, replacement of components shall be carried out using spare parts, or using parts approved by Lennox.
• Only the coolant shown on the manufacturer's nameplate shall be used, to the exclusion of all other products (mix of coolants, hydrocarbons, etc.).

CAUTION:

In the event of fire, refrigerating circuits can cause an explosion and spray coolant gas and oil.

DELIVERY CHECKS

On receipt of a new equipment please check the following points. It is the customer's responsibility to ensure that the products are in good working order:
- The exterior has not been damaged in any way.
- The lifting and handling equipment are suitable for the equipment and comply with the specifications of the handling instructions enclosed here-in.
- Accessories ordered for on site installation have been delivered and are in good working order.
- The equipment supplied corresponds to the order and matches the delivery note.

If the product is damaged, exact details must be confirmed in writing by registered post to the shipping company within 48 hours of delivery (working days). A copy of the letter must be addressed to Lennox and the supplier or distributor for information purposes. Failure to comply will invalidate any claim against the shipping company.

RATING PLATE

The rating plate provides a complete reference for the model and ensures that the unit corresponds to the model ordered. It states the electrical power consumption of the unit on start-up, its rated power and its supply voltage. The supply voltage must not deviate beyond +10/-15 %. The start-up power is the maximum value likely to be achieved for the specified operational voltage. The customer must have a suitable electrical supply. It is therefore important to check whether the supply voltage stated on the unit's rating plate is compatible with that of the mains electrical supply. The rating plate also states the year of manufacture as well as the type of refrigerant used and the required charge for each compressor circuit.

STORAGE

When units are delivered on site they are not always required immediately and are sometimes put into storage. In the event of medium to long-term storage, we recommend the following procedures :
- Ensure that there is no water in the hydraulic systems.
- Keep the heat exchanger covers in position (AQUILUX cover).
- Keep protective plastic film in position.
- Ensure the electrical panels are closed.
- Keep all items and options supplied in a dry and clean place for future assembly before using the equipment.

MAINTENANCE KEY

On delivery we recommend that you keep the key which is attached to an eyebolt in a safe and accessible place. This allows you to open the panels for maintenance and installation work.
The locks are ¼ turn + then tighter (figure 2).

Fig. 2

CONDENSATE DRAINS

The condensate drains are not assembled when delivered and are stored
in the electrical panel with their clamping collars.
To assemble them, insert them on the condensate tray outlets and use a screwdriver to tighten the collars (Figure 3).

Fig. 1

Fig. 3

DIMENSIONS AND WEIGHTS

B BOX
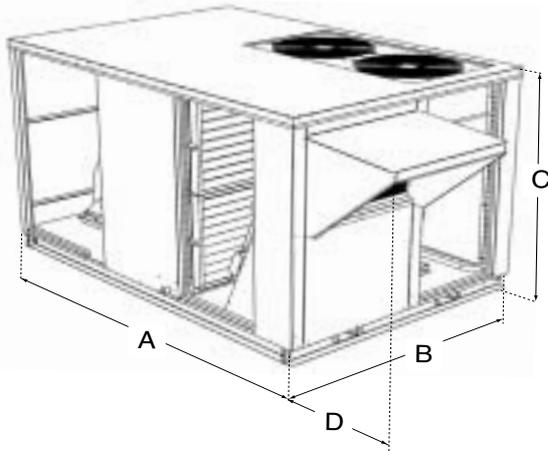
C BOX
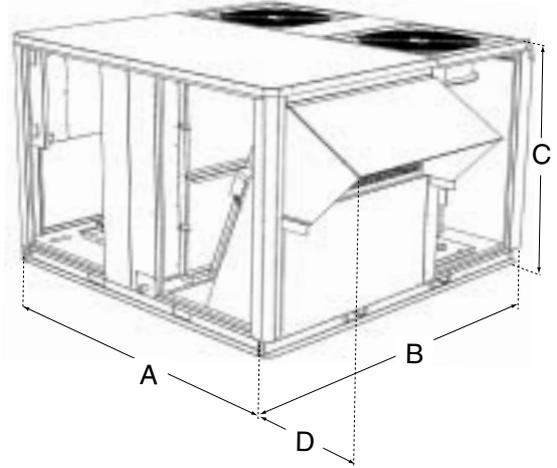
D BOX
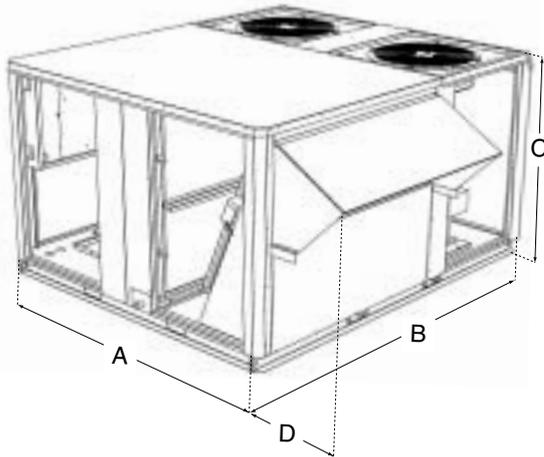
Fig. 4

BALTIC BCK/BHK/BGK/BDK		020	025	030	035	040	045	050
View		*B BOX*	*B BOX*	*C BOX*	*C BOX*	*D BOX*	*D BOX*	*D BOX*
A	mm	2050	2050	1950	1950	1950	1950	1950
B	mm	1418	1418	1913	1913	2233	2233	2233
C	mm	1220	1220	1220	1220	1220	1220	1220
D	mm	478	478	418	418	418	418	418
Weight of standard units								
without hood	kg	377	428	501	503	626	630	638
with hood	kg	400	451	529	531	659	663	671
Weight of gas units								
Standard heat without hood	kg	419	472	567	572	709	718	723
Standard heat with hood	kg	442	495	595	600	742	751	756
High heat without hood	kg	431	484	586	591	730	739	744
High heat with hood	kg	454	507	614	619	763	772	777

LIFTING B BOX

1850 (mini) 1410 (mini)
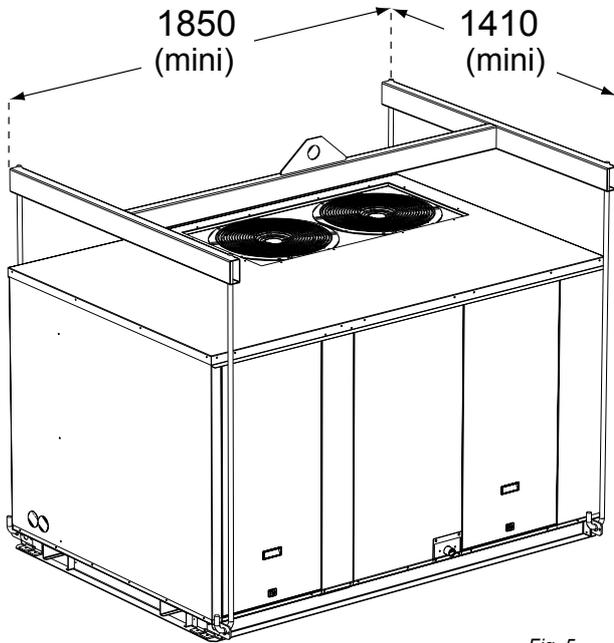
Fig. 5

RETRACTABLE LIFTING LUG

Fig. 6

LIFTING C BOX

1930 (mini) 1700 (mini)

Fig. 7

LIFTING D BOX

2250 (mini) 1700 (mini)
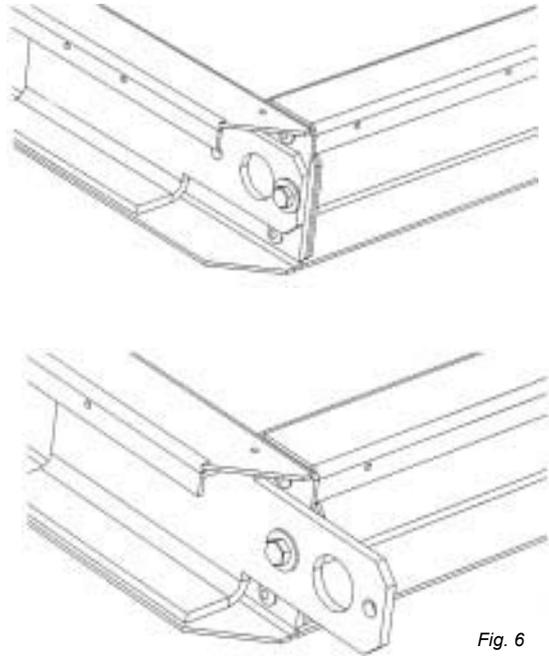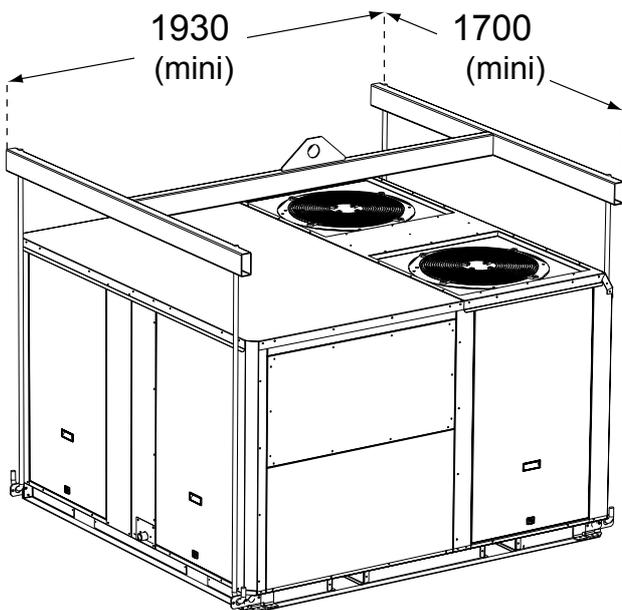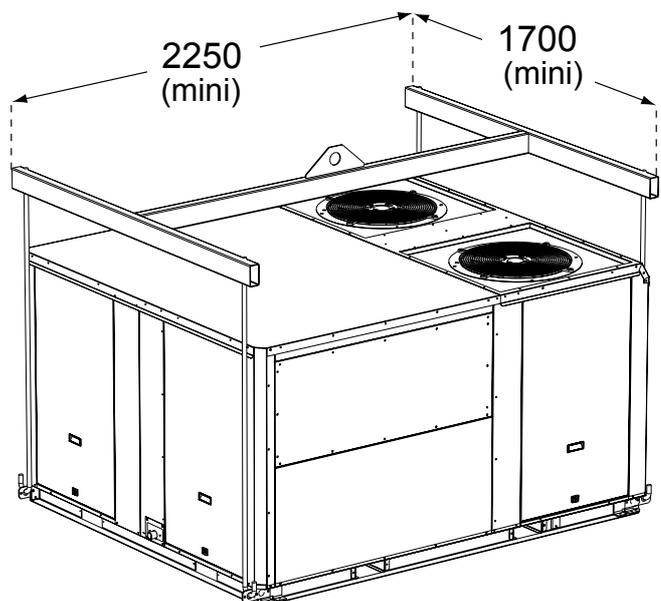
Fig. 8

FORKLIFT PROTECTIONS
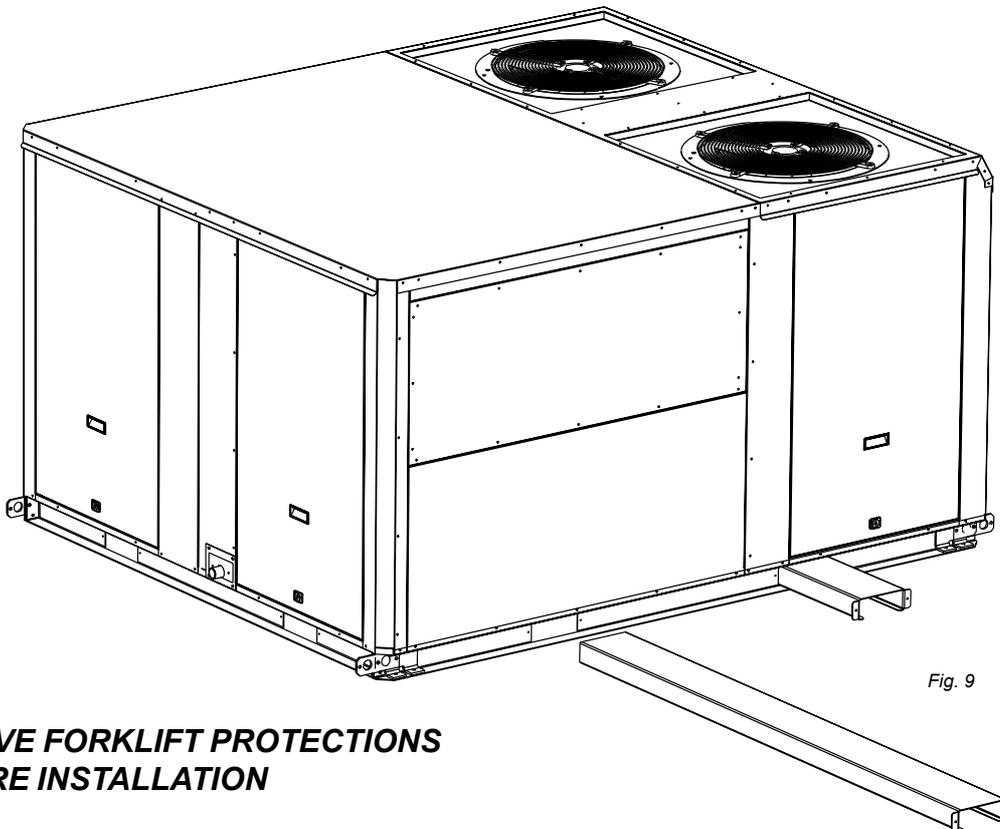
Fig. 9

REMOVE FORKLIFT PROTECTIONS BEFORE INSTALLATION

PRELIMINARY CHECKS

Before installing the equipment, the following points MUST be checked :
-Have the forklift protections been removed ?
-Is there sufficient space for the equipment?
-Is the surface on which the equipment is to be installed sufficiently solid to withstand its weight? A detailed study of the frame must be made beforehand.
-Do the supply and return ductwork openings excessively weaken the structure?
-Are there any obstructing items which could hinder the operation of the equipment?
-Does the electrical power available correspond to the equipment's electrical specifications?
-Is drainage provided for the condensate?
-Is there sufficient access for maintenance?
-Installation of the equipment could require different lifting methods which may vary with each installation (helicopter or crane). Have these been evaluated ?
-Ensure that the unit is installed in accordance with the installation instructions and local applicable codes.
-Check to ensure that the refrigerant lines do not rub against the cabinet or against other refrigerant lines.

In general, make sure no obstacles (walls, trees or roof ledges) are obstructing the duct connections or hindering assembly and maintenance access.

INSTALLATION REQUIREMENTS

The surface on which the equipment is to be installed must be clean and free of any obstacles which could hinder the flow of air to the condensers:

-Avoid uneven surfaces

-Avoid installing two units side by side or close to each other as this may restrict the airflow to the condensers.

Before installing a packaged Rooftop unit it is important to understand :

-The direction of prevailing winds.

-The direction and position of air flows.

-The external dimensions of the unit and the dimensions

of the supply and return air connections.

-The arrangement of the doors and the space required to open them to access the various components.

CONNECTIONS

-Ensure that all the pipe-work crossing walls or roofs are secured, sealed and insulated.
-To avoid condensation problems, make sure that all pipes are insulated according to the temperatures of fluids and type of rooms.

NOTE: The AQUILUX protection sheets fitted to the finned surfaces must be removed prior to start up.

MINIMUM CLEARANCE AROUND THE UNIT

Figure 4 shows the required clearances and service access around the unit.

NOTE : Ensure the fresh air inlet does not face prevailing wind direction.
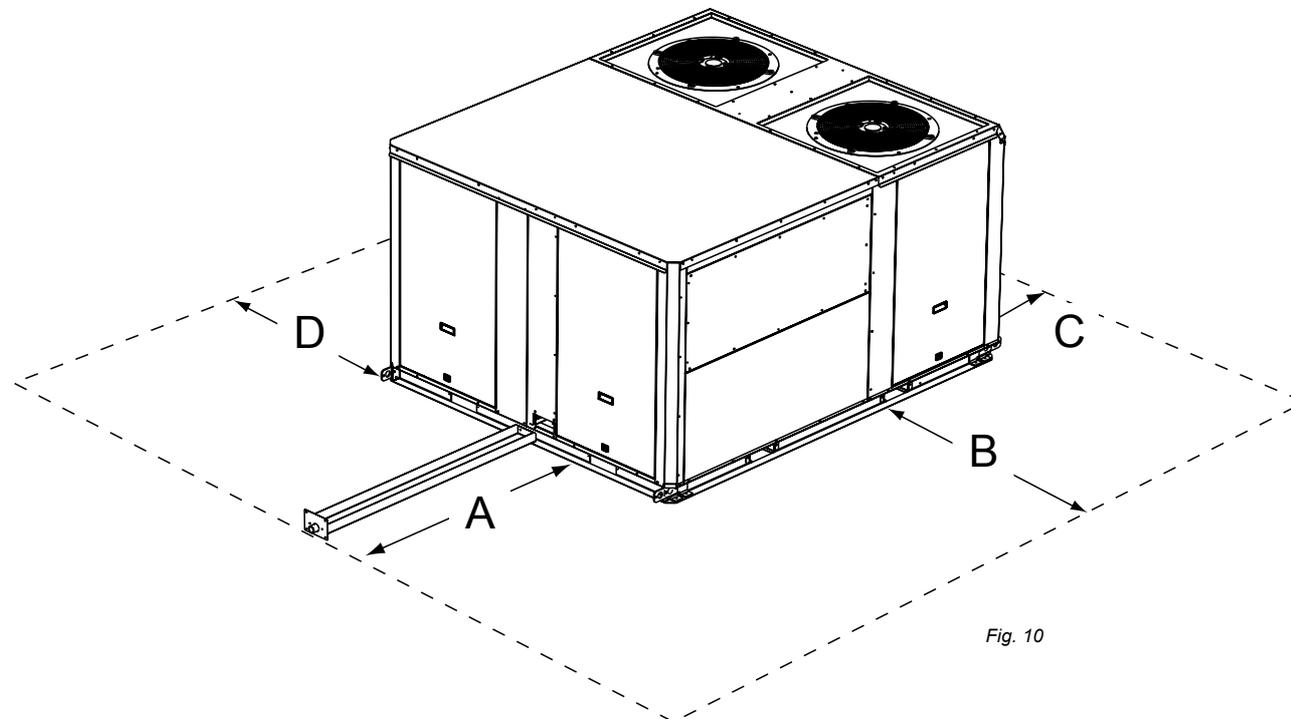
Fig. 10

	A	B	C	D
B box	1000[(1)]	1500[(2)]	1500	1000
C box	1200[(1)]	1500[(2)]	1500	1000
D box	1400[(1)]	1500[(2)]	1500	1000

(1)Add one meter to this distance if units is fitted with Gas Burner.

(2) Double distance if unit fitted with extraction.

As levels are adjustable, observe the following recommendations when installing the equipment.

Above all, ensure that all the adjustable returns are facing outward (figure 11). They are usually turned inside-out for transport.
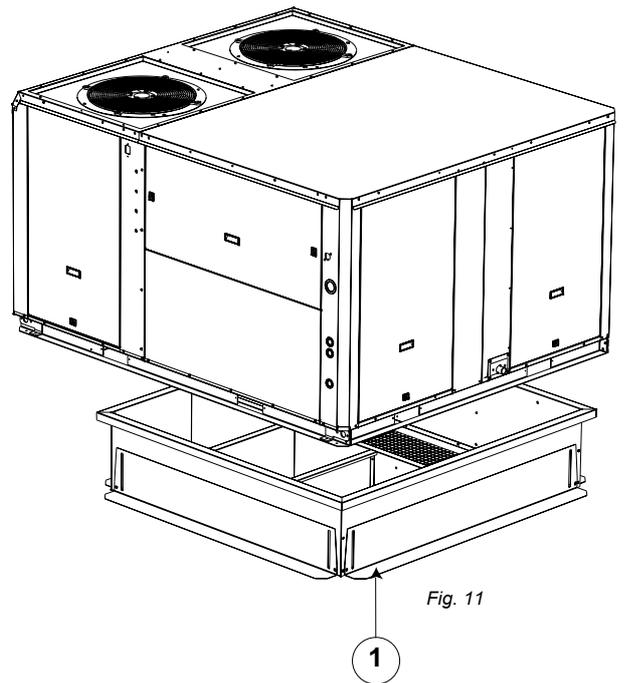
Fig. 11

①

Place the roof mounting frame on the trimmer beam by first lining up the inlet and the outlet opening. ("2"- figure 12)

②
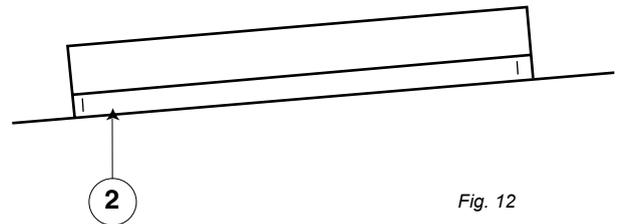
Fig. 12

After levelling the frame, secure the adjustable returns on the trimmer (figure 13).

It is important to centre the unit on the roof frame.

Fig. 13

LENNOX

Baltic
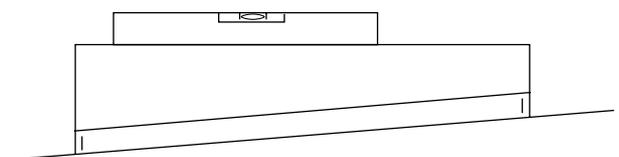
| BCK BHK | 020 | 025 |

ADJUSTABLE ROOFCURB DRAWINGS

(*) without auxiliary electric heater
without hot water coil.

1183

400

1893

104 1085 104

104 1795 104

318 547 318

156

347

2D

476

8 1D

89

542 396 246

Roof opening 1795 x 1085

2D

1D
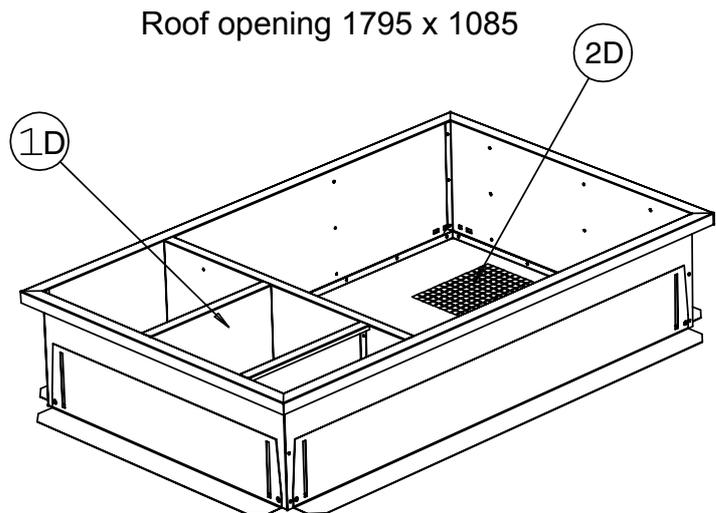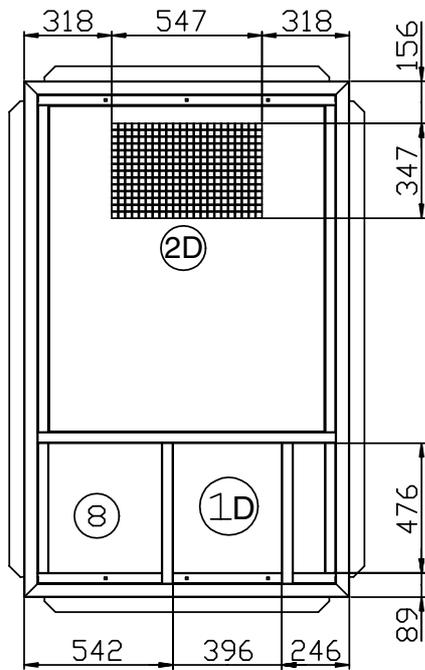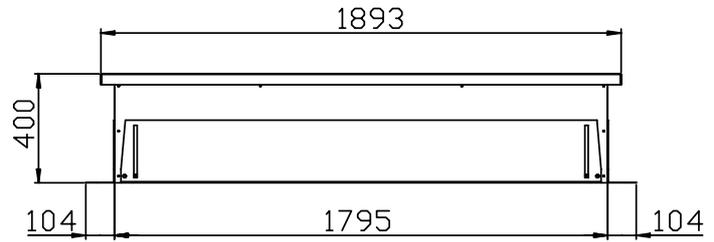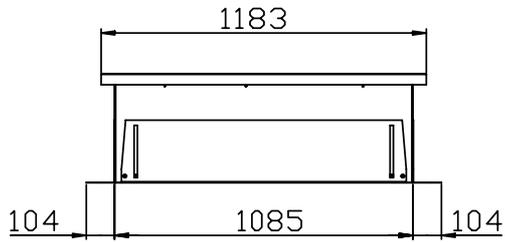
1D	Down Supply Air
2D	Return Air
8	Main Power Entry

ADJUSTABLE ROOFCURB DRAWINGS

BCK BHK **030** **035**

(*) without auxiliary electric heater
without hot water coil.
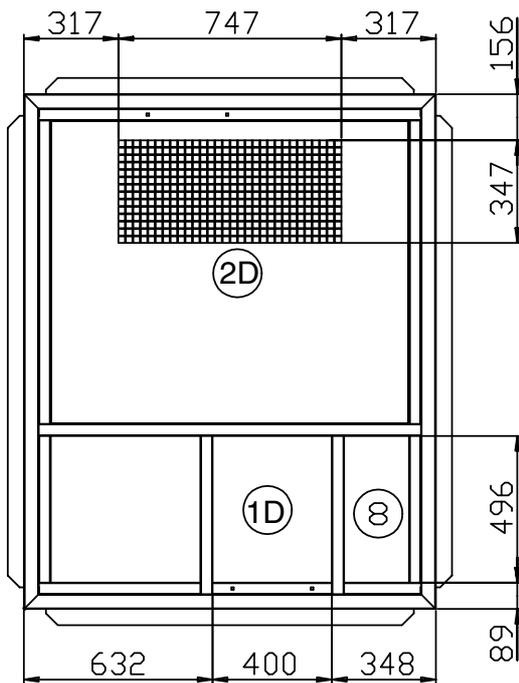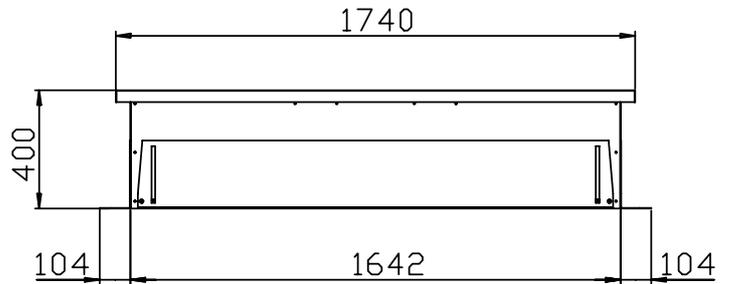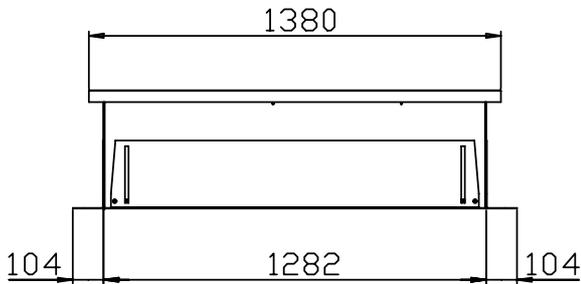
1380

1740

400

104 — 1282 — 104

104 — 1642 — 104

Roof opening 1642 x 1282

317 — 747 — 317 — 156

347

2D

496

1D — 8

89

632 — 400 — 348

1D — 2D

1D Down Supply Air

2D Front supply air

8 Main Power Entry

LENNOX

Baltic
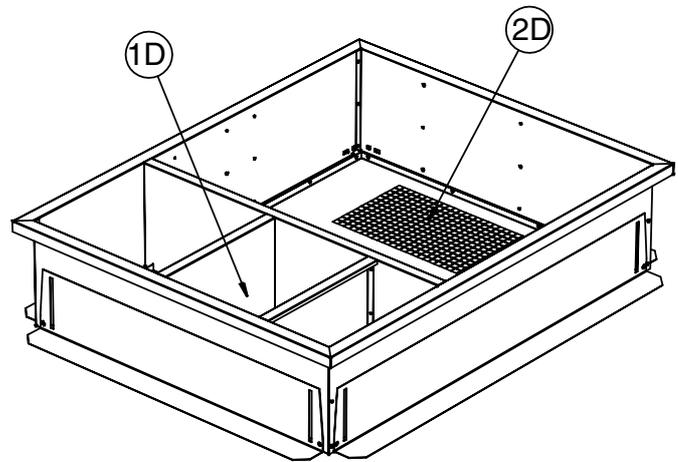
ADJUSTABLE ROOFCURB DRAWINGS

| BCK BHK | 040 | 045 | 050 |

(*) without auxiliary electric heater
without hot water coil.

1630

104   1532   104

1740

400

104   1642   104

279   1072   279   156

347

2D

496

1D   8

89

749   500   382
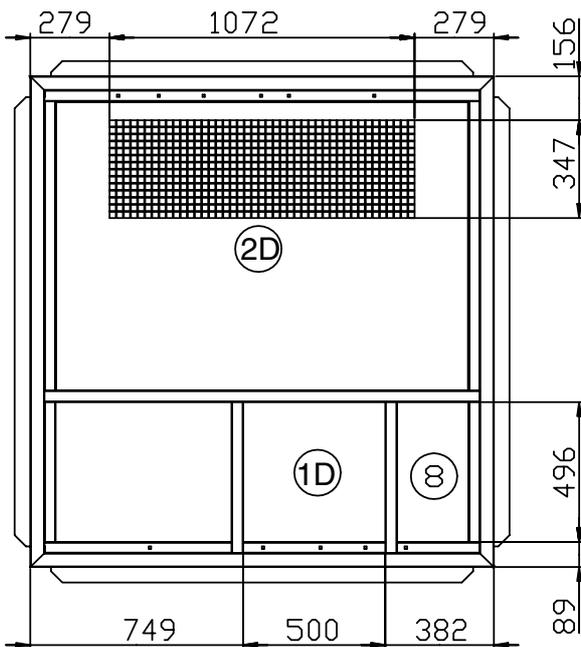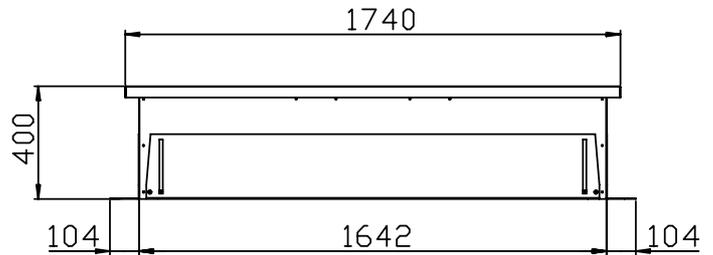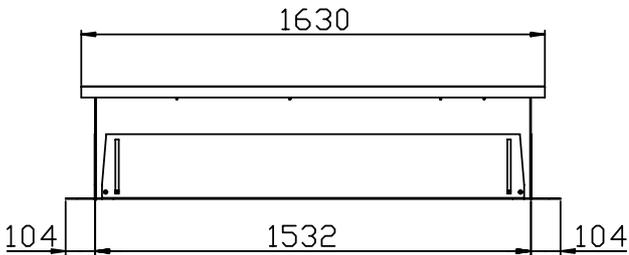
Roof opening 1642 x 1532

1D   2D

1D	Down Supply Air
2D	Front supply air
8	Main Power Entry

LENNOX

Baltic

BGK		
BDK	**020**	**025**

ADJUSTABLE ROOFCURB DRAWINGS

(*) This roofcurb is also necessary for all cooling only or heatpump rooftop with auxiliary electric heater or hot water coil.

1183

1085

104   104

1893

400

104   1795   104

Roof opening 1795 x 1085

318   547   318

156

347

2D

4D

5D

1D

476

89

246   691   246

2D

1D
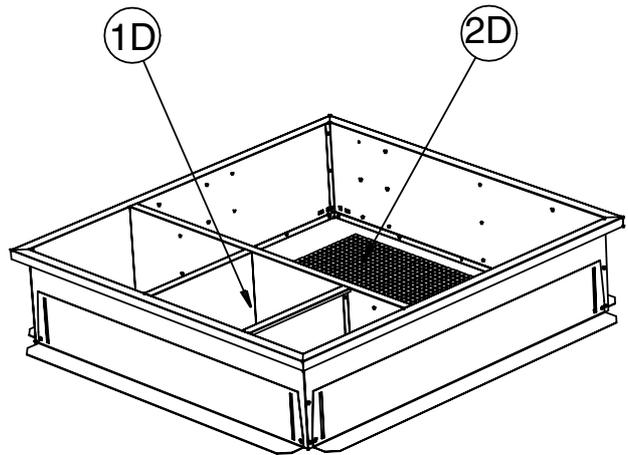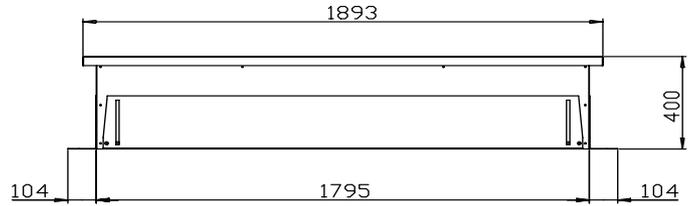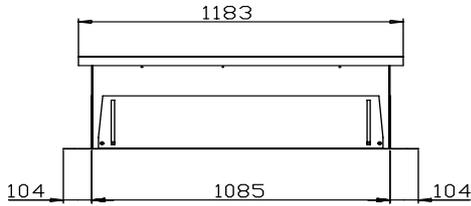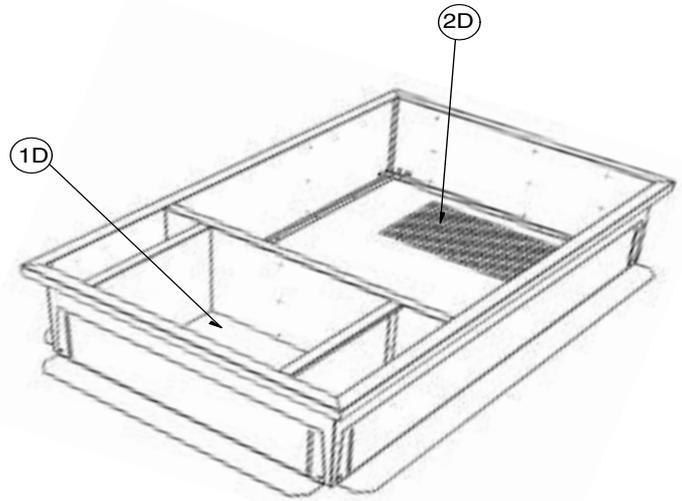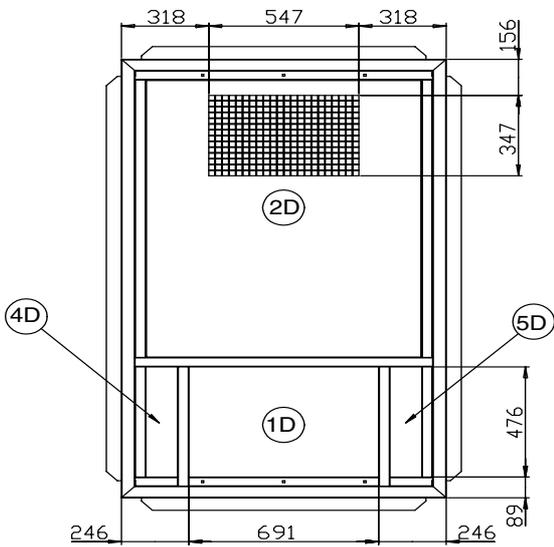
1D	Down Supply Air
2D	DownReturn Air
4D	Down main power entry
5D	Down hot water Entry

LENNOX

Baltic

BGK	030	035
BDK		

ADJUSTABLE ROOFCURB DRAWINGS

(*) This roofcurb is also necessary for all cooling only or heatpump rooftop with auxiliary electric heater or hot water coil.

1380

104 1282 104

1740

400

104 1642 104

747 317

156

347

2D

636

4D

1D

89

350 790 240

Roof opening 1642 x 1282

2D

1D

1D Down Supply Air

2D DownReturn Air

4D Down main power entry

ADJUSTABLE ROOFCURB DRAWINGS

BGK BDK | **040** | **045** | **050**

(*) This roofcurb is also necessary for all cooling only or heatpump rooftop with auxiliary electric heater or hot water coil.

1630

104 · 1532 · 104

1740

400

104 · 1642 · 104

Roof opening 1642 x 1532

279 · 1072 · 279 · 156

347

2D

4D

1D

636

89

351 · 1050 · 229

1D

2D

(1D)	Down Supply Air
(2D)	DownReturn Air
(4D)	Down main power entry

Baltic
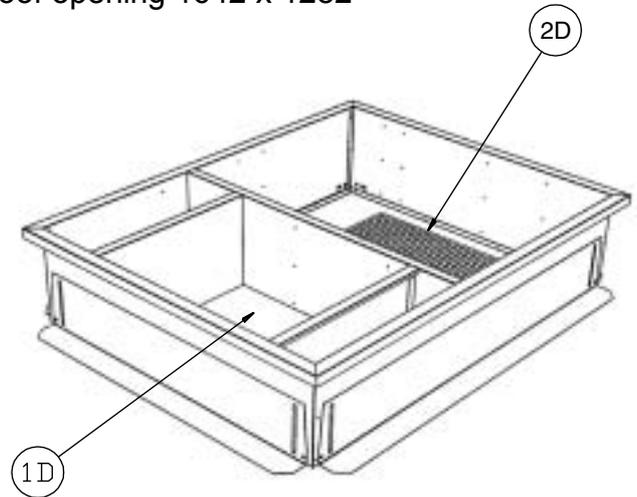
MULTIDIRECTIONAL HORIZONTAL ROOFCURB

| BCK BHK | **020** | **025** |

(*) without auxiliary electric heater
without hot water coil.
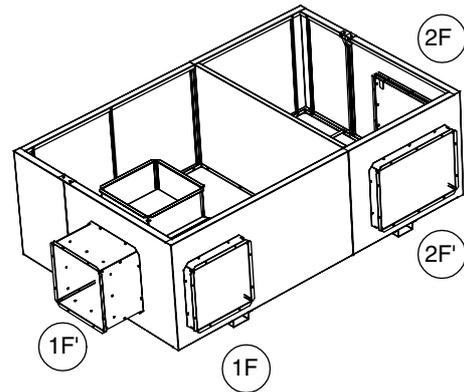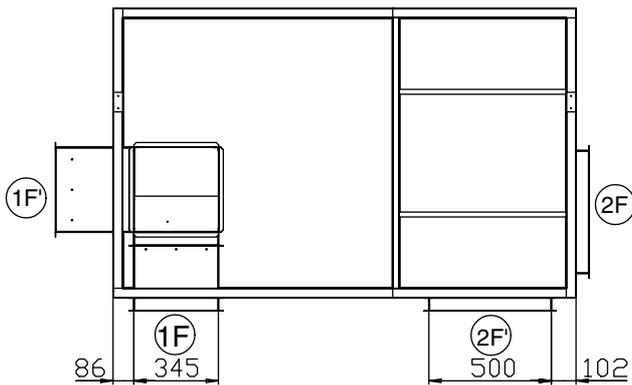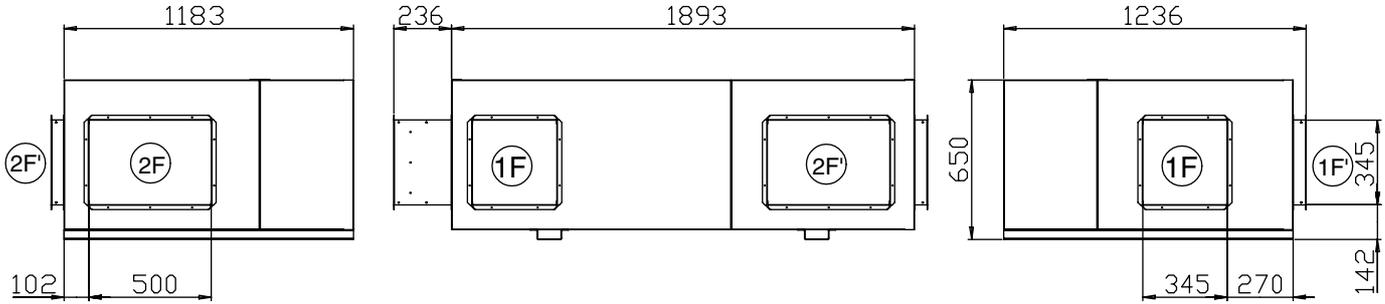
1183 236 1893 1236

2F' 2F 1F 2F' 650 1F 1F' 345

102 500 345 270 142

1F'

2F

1F 2F'

86 345 500 102

2F

1F'

2F'

1F' 1F

1F	Front supply air
1F'	Front supply air
2F	Front return air
2F'	Front return air

WARNING : ONLY ONE OF THE 4 FOLLOWINGS POSSIBILITIES :
2F - 1F / 2F - 1F'
2F' - 1F / 2F' - 1F'

MULTIDIRECTIONAL HORIZONTAL ROOFCURB

| BCK BHK | 030 | 035 |

(*) without auxiliary electric heater
without hot water coil.
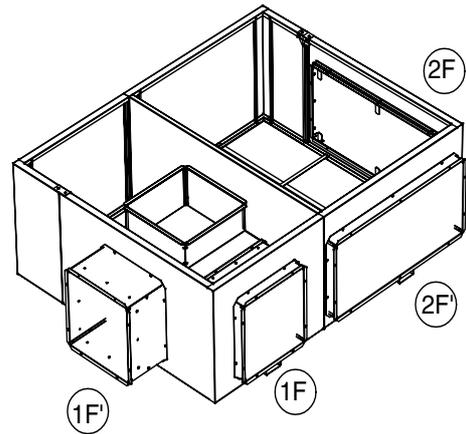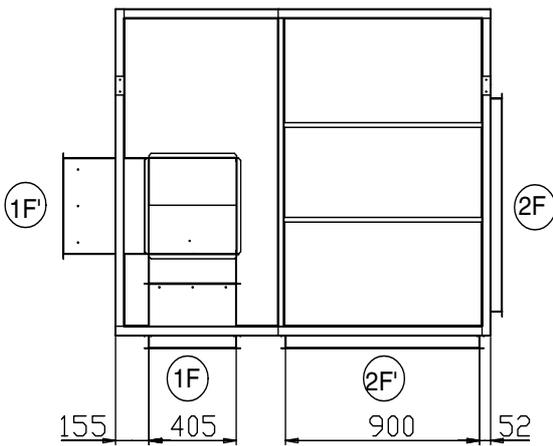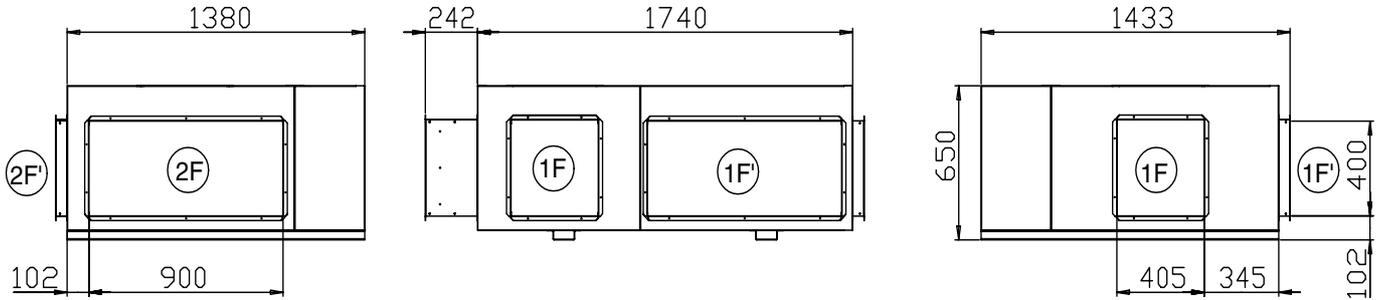
1F Front supply air

1F' Front supply air

2F Front return air

2F' Front return air

WARNING : ONLY ONE OF THE 4 FOLLOWINGS POSSIBILITIES :
2F - 1F / 2F - 1F'
2F' - 1F / 2F' - 1F'

MULTIDIRECTIONAL HORIZONTAL ROOFCURB

| BCK BHK | **040** | **045** | **050** |

(*) without auxiliary electric heater
without hot water coil.

1F Front supply air

1F' Front supply air

2F Front return air

2F' Front return air

WARNING : ONLY ONE OF THE 4 FOLLOWINGS POSSIBILITIES :
2F - 1F / 2F - 1F'
2F' - 1F / 2F' - 1F'

Baltic

BGK BDK **020** **025**

MULTIDIRECTIONAL HORIZONTAL ROOFCURB

(*) This roofcurb is also necessary for all cooling only or heatpump rooftop with auxiliary electric heater or hot water coil.

1F Front supply air

1F' Front supply air

2F Front return air

2F' Front return air

WARNING : ONLY ONE OF THE 4 FOLLOWINGS POSSIBILITIES :
2F - 1F / 2F - 1F'
2F' - 1F / 2F' - 1F'

MULTIDIRECTIONAL HORIZONTAL ROOFCURB

| BGK | 030 | 035 |
| BDK | | |

(*) This roofcurb is also necessary for all cooling only or heatpump rooftop with auxiliary electric heater or hot water coil.

1F Front supply air

1F' Front supply air

2F Front return air

2F' Front return air

WARNING : ONLY ONE OF THE 4 FOLLOWINGS POSSIBILITIES :
2F - 1F / 2F - 1F'
2F' - 1F / 2F' - 1F'

LENNOX

Baltic

MULTIDIRECTIONAL HORIZONTAL ROOFCURB

| BGK BDK | 040 | 045 | 050 |

(*) This roofcurb is also necessary for all cooling only or heatpump rooftop with auxiliary electric heater or hot water coil.

1630

53 · 1740 · 53

1683

650

402

101

102 · 900

1000 · 254

2F'

2F.

1F

2F'

1F'

1F'

2F

1F

2F'

155 · 525 · 900 · 52

1F · 2F'

2F

1F'

2F'

1F
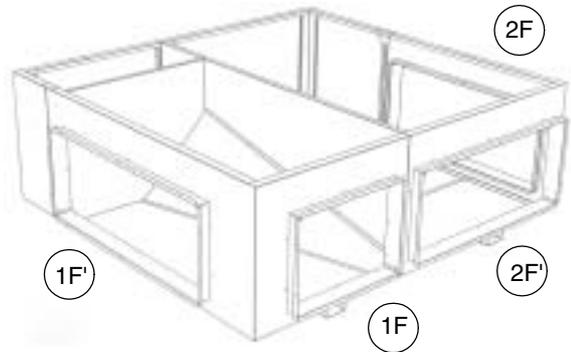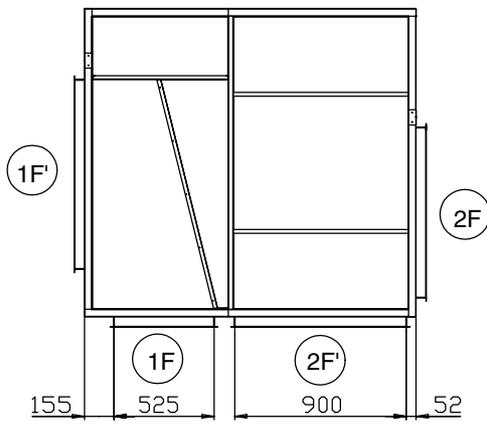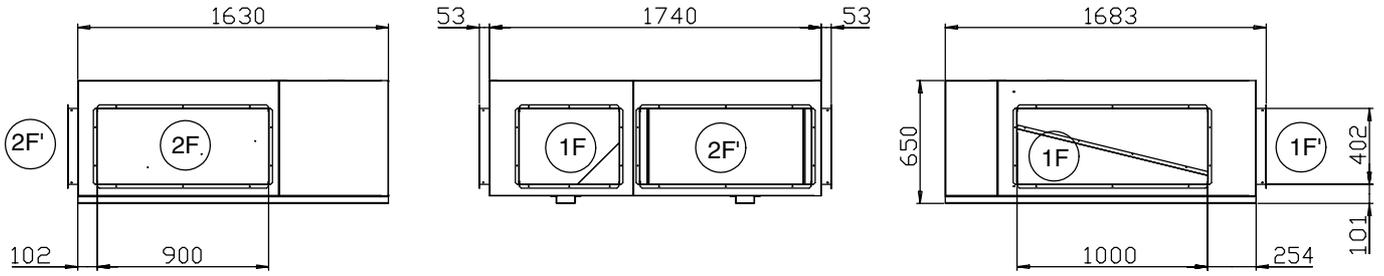
1F	Front supply air
1F'	Front supply air
2F	Front return air
2F'	Front return air

WARNING : ONLY ONE OF THE 4 FOLLOWINGS POSSIBILITIES :
2F - 1F / 2F - 1F'
2F' - 1F / 2F' - 1F'

NON ADJUSTABLE NON ASSEMBLED ROOFCURB INSTALLATION

FRAME PARTS IDENTIFICATION
Figure 14 shows the different parts for identification

INSTALLATION
The roof mounting frame provides support when the units are installed in down-flow configurations.
The non adjustable, non assembled roof mounting frame can be installed directly on decks having adequate structural strength or on roof supports under deck. See page 23 for frame dimensions, location of supply and return air opening

NOTE: frame assembly must be installed flat, levelled within 5mm per linear meter in any direction.

Fig. 14

UNIT FLOOR

UNIT FLOOR INSULATION

UNIT SUPPORT RAIL

AIR DUCT
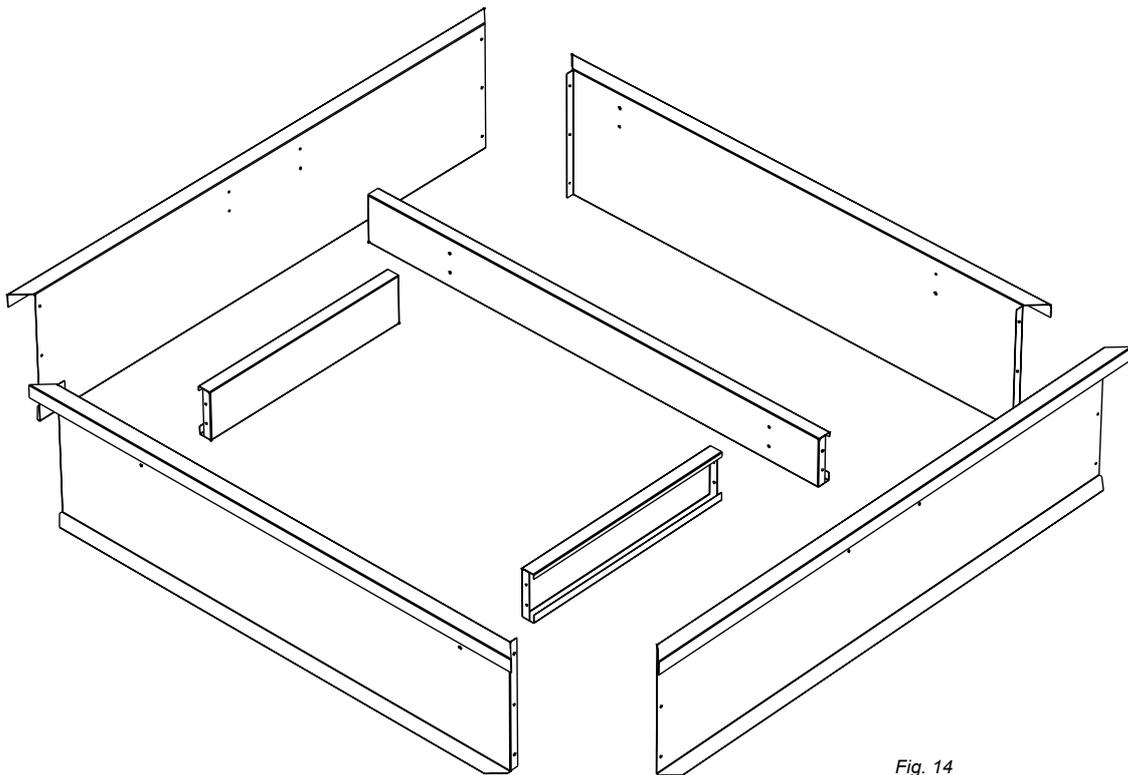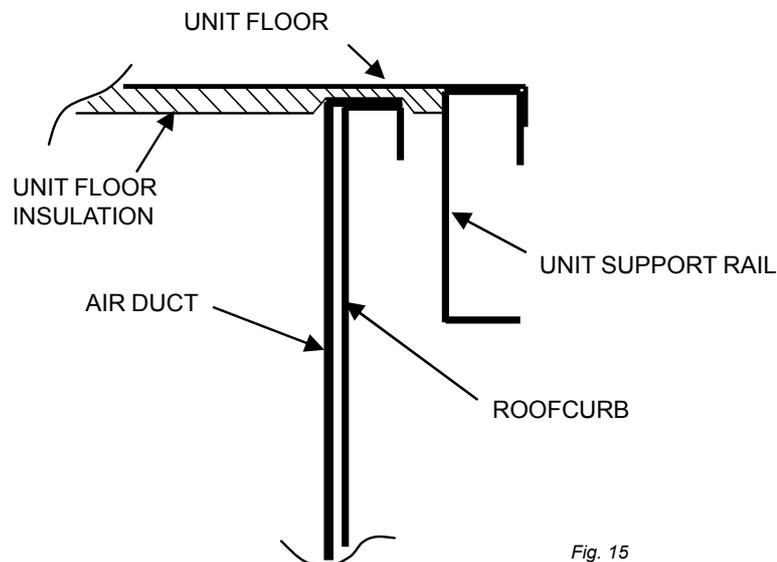
ROOFCURB

Fig. 15

NON ADJUSTABLE HORIZONTAL ROOFCURB

BCK = Cooling only unit
BHK = Heat pump unit
BGK = Cooling only unit with gas fired heating
BDK = Heat pump unit with gas fired heating
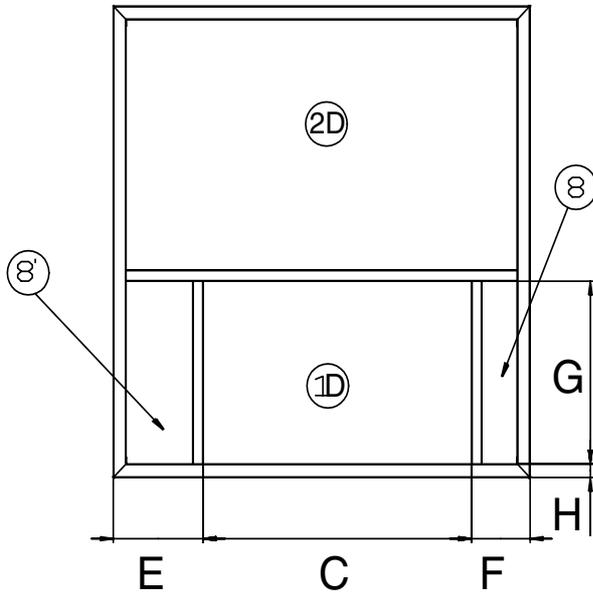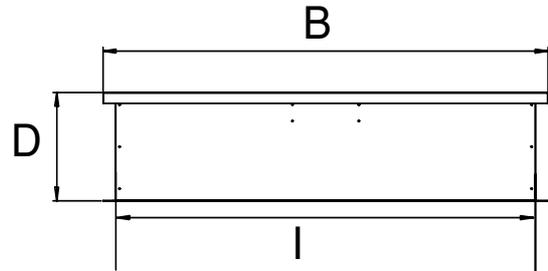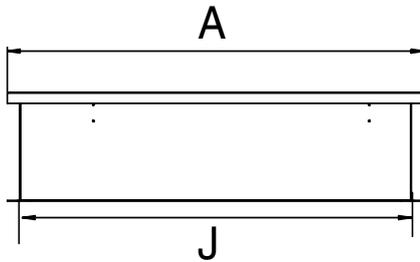
Roof opening I x J
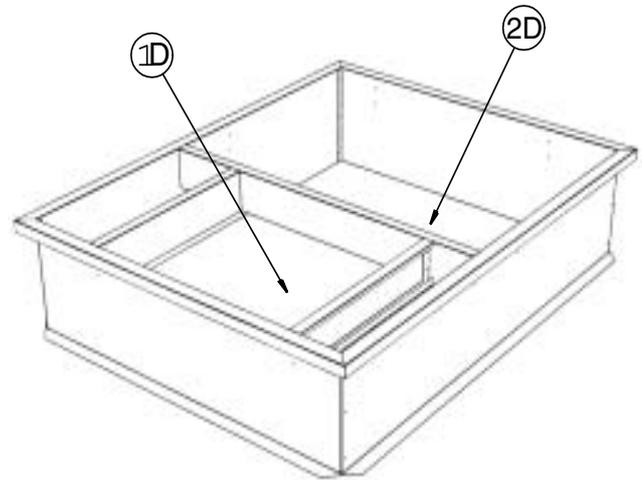
1D Down Supply Air

2D Return Air

8 Main Power Entry 030-035-040-045-050

8' Main Power Entry 020-025

Type	Taille	A	B	C	D	E	F	G	H	I	J
All	020 025	1183	1893	691	400	246	246	515	50	1783	1083
All	030 035	1380	1740	790	400	351	240	675	50	1640	1280
All	040 045 050	1630	1740	1050	400	352	229	675	50	1640	1530

(*) Non adjustable, non assembled roofcurb.

ASSEMBLY

The frame is supplied as a single package and shipped folded down for ease of transport and handling. It is easy field assembled as all parts required are supplied with the frame.

SECURING THE FRAME

To ensure proper mating with units (figure 15), it is mandatory that the roof mounting frame be squared to roof structure as follows:

-With frame positioned levelled in the desired location on roof trusses, tack weld corner of frame.

-Measure frame diagonally from corner to corner as shown in figure 16. These Dimensions must be equal in order for the fame to be square.

-It is extremely important to sight frame from all corner to ensure it is not twisted across. Shim frame under any low side. The maximum slope tolerance is 5mm per linear meter in any direction.

-After the frame has been squared, straightened and shimmed, weld or secure the frame to the roof deck.

NOTE: It must be securely fastened to the roof as per local codes and regulations.
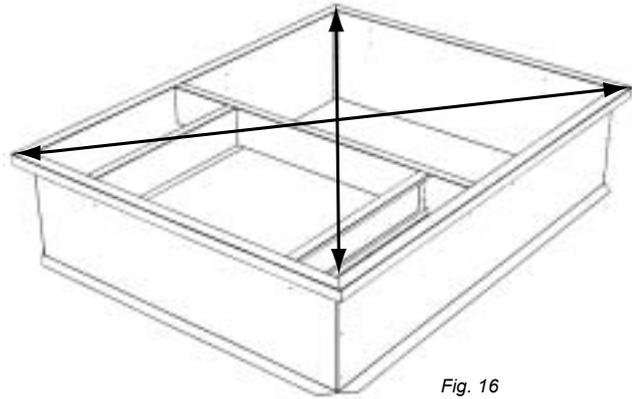
Fig. 16

When the frame is correctly positioned. It is essential to secure the assembly with a disconnected stitched welded seam (20 to 30mm every 200mm) along the outside or by using an alternative method.
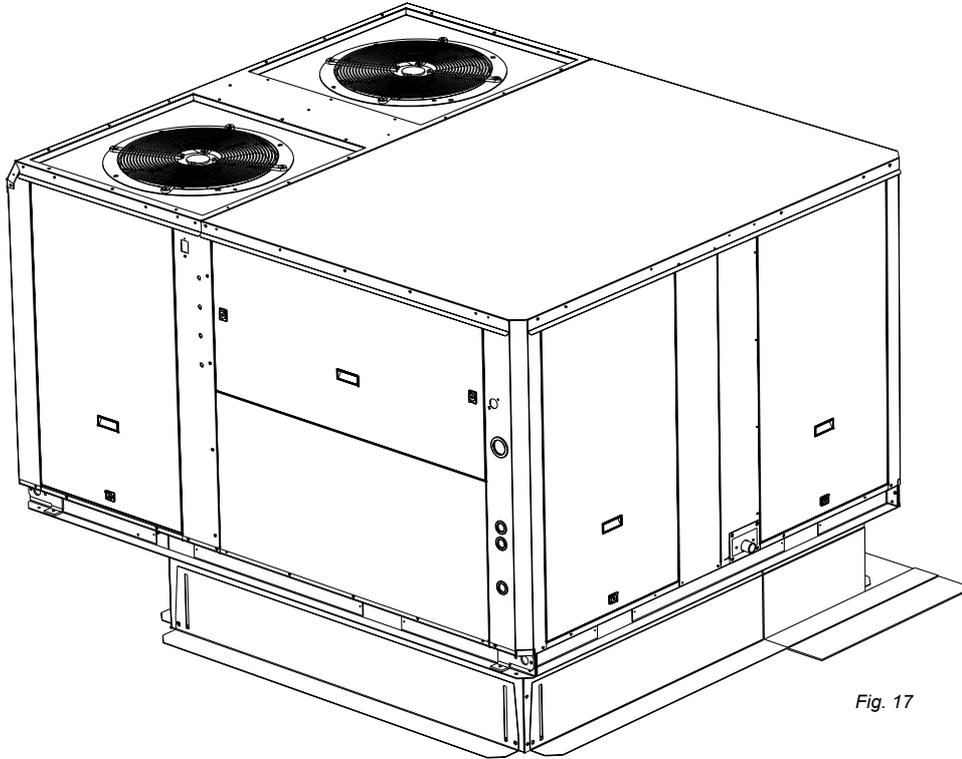
Fig. 17

CURBING AND FLASHING
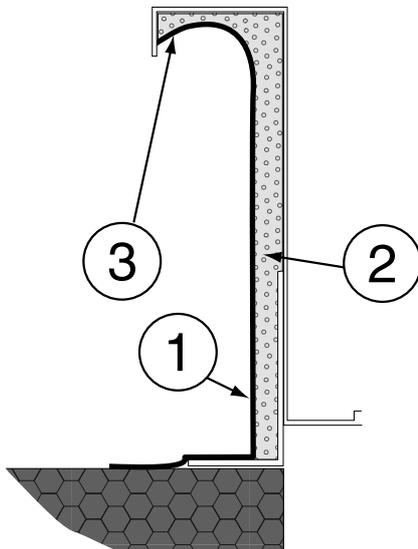
Fig. 18

Outside of frame must be insulated with rigid type insulation; We recommend a minimum of 20 mm thick insulation (2 figure 18).

Check that the insulation is continuous, counter flash and seal around the frame as shown in (1-figure 18).

CAUTION : To be effective, the upstream must end below the drop edge (3 - figure 18).

Where pipes and electrical conduits extend through the roof, flashing must conform to local codes of practice.

Before installing the equipment, make sure that seals are not damaged and check that the unit is secured to the mounting frame. Once in position, the bottom of the equipment must be horizontal.

The installer must comply to local authority standards and specifications.

Economiser

Free cooling can be provided through the use of fresh air where appropriate rather than cooling excessive amounts of return air.

The economiser is factory fitted and tested prior to shipment. It includes two dampers operating from a 24V actuator

Rain hood

It also includes a factory fitted rain hood . Hoods is folded during transportation to limit risks of damage and must be unfolded on site as shown below:
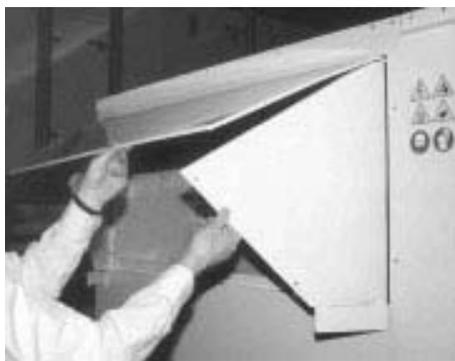
Fig. 19

Extraction

Installed with economiser assembly, the gravity exhaust dampers relieve the pressure when outside air is introduced into the system.

When large amount of fresh air is introduced into the system power exhaust fans can be used to equalise the pressures.

The extraction fan runs when return air dampers are being closed and supply air blower is in operation. The extraction fan runs when outdoor air dampers are at least 50% open (adjustable value) It is overload protected.

NOTE: When horizontal flow configuration is required, the multidirectional roofcurb will be installed

VERTICAL FLOW WITH EXTRACTION
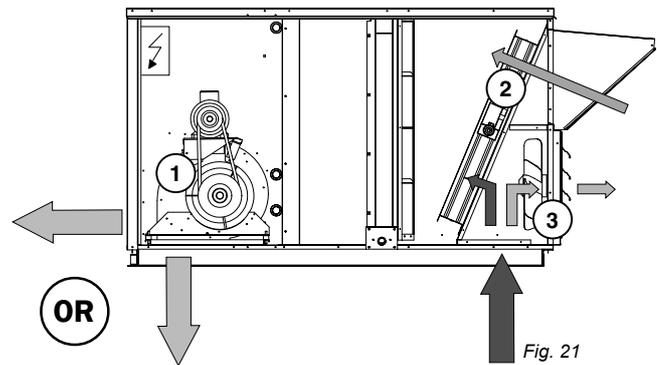
Fig. 21

⇨ Fresh air		**1**	Supply fan
⇨ Return air		**2**	Economiser damper
⇨ Exhaust air		**3**	Exhaust damper or
⇨ Supply air			Exhaust damper + exhaust fan

VERTICAL FLOW STANDARD INSTALLATION
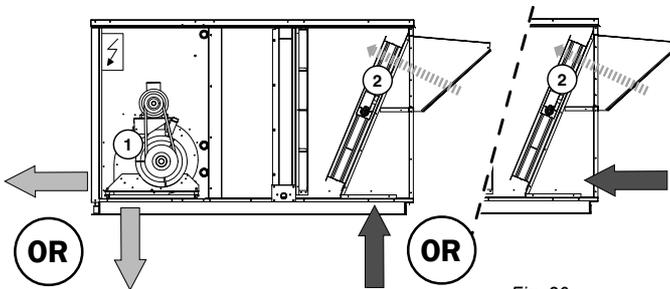
Fig. 20

⇨ Fresh air		**1**	Supply fan
⇨ Return air		**2**	Economiser damper
⇨ Supply air			

HORIZONTAL FLOW WITH MULTIDIRECTIONAL ROOFCURB
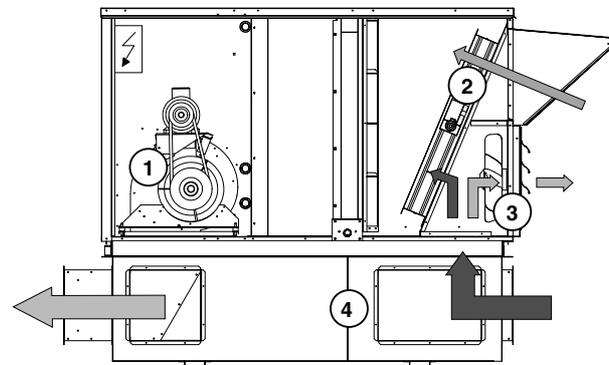
Fig. 22

⇨ Fresh air		**1**	Supply fan
⇨ Return air		**2**	Economiser damper
⇨ Exhaust air		**3**	Exhaust damper or
⇨ Supply air			Exhaust damper + exhaust fan
		4	Multidirectional roofcurb

THIS WORK MUST ONLY BE CARRIED OUT BY TRAINED REFRIGERATION ENGINEERS

FILL THE COMMISSIONNING SHEET AS YOU GO ALONG

BEFORE CONNECTING THE POWER:

- Ensure that the power supply between the building and the unit meets local authority standards and that the cable specification satisfies the start-up and operating conditions.

ENSURE THAT THE POWER SUPPLY INCLUDES 3 PHASES AND A NEUTRAL

- Check the following wire connections for tightness: Main switch connections, mains wires linked to the contactors and circuit breakers and the cables in the 24V control supply circuit.

- Ensure that all drive motors are secure.

- Ensure that the adjustable pulley blocks are secure and that the belt is tensioned with the transmission correctly aligned. Refer to the next section foe details.

- Using the electrical wiring diagram, check the conformity of the electrical safety devices (circuit breaker settings, presence and rating of fuses).

- Check the temperature probe connections.
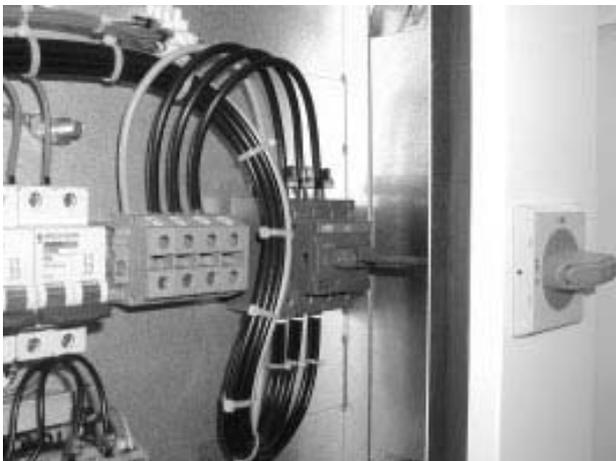
Fig. 23

STARTING THE UNIT

At this point the unit circuit breakers should be open

You will need a **DS50** maintenance controller or Climalook with appropriate Interface.

Fig. 24


```
Language ∧ or ∨
    ENGLISH
   RT 050.001
BIOS 0000 Boot 0000
```
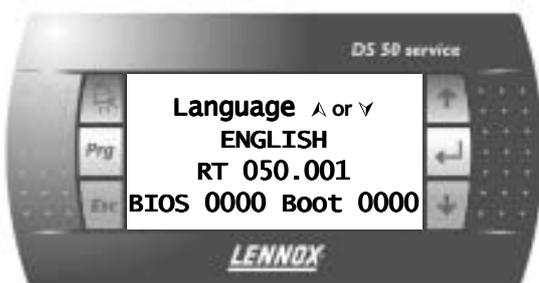
The jumpers are factory set and the configuration switches are adjusted depending on the option the type of unit. Connecting the CLIMATIC diplays.

Fig. 25

Close the 24V Control Circuit breakers.
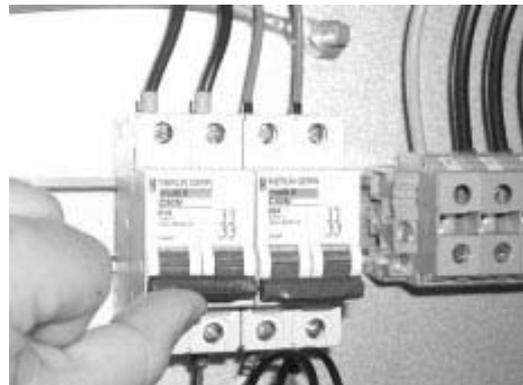
Fig. 26

The CLIMATIC 50 starts after 30s

Reset the DAD photo (If fitted)
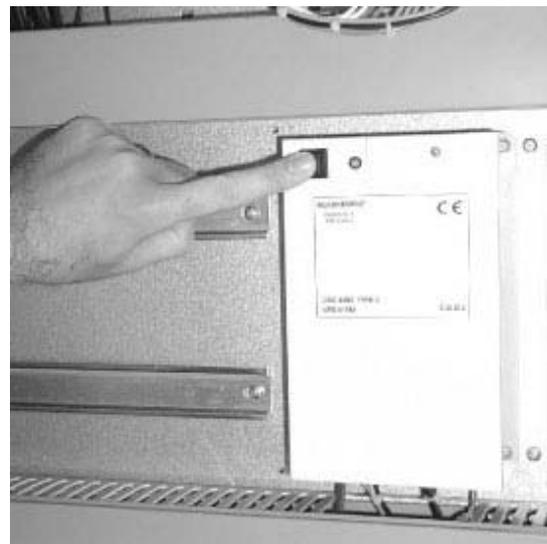
Fig. 27

Check and adjust the control settings.

Refer to the control section in this manual to adjust the different parameters

POWERING THE UNIT

- Power up the unit by closing the isolator switch (if fitted).

- At this point the blower should start unless the climatic does not energise the contactor. In this particular case the blower can be forced by bridging the port NO7 and C7 on connector J14 on the Climatic. Once the fan is running check the rotation direction. Refer to the rotation arrow located on the fan.

- The fans and compressors direction of rotation is checked during the end of line test. They should therefore all turn in either the right or wrong direction.

NOTE : A compressor rotating in the wrong direction will fail.

- If the fan turns in the wrong direction, disconnect the main power supply to the machine at the building's mains switch, reverse two phases and repeat the above procedure.

- Close all circuit breakers and power up the unit, remove the bridge on connector J14 if fitted.

- If now only one of the components rotates in the wrong direction, disconnect the power supply at the machine's isolator switch (if fitted) and reverse two of the component's phases on the terminal within the electrical panel.

- Check the current drawn against the rated values, in particular on the supply fan (ref. page 34).

- If the readings on the fan are outside the specified limits, this usually indicates excessive air flow which will affect the life expectancy and the thermodynamic performances of the unit. This will also increase the risks of water ingress into the unit. Refer to the "Air Flow Balancing" section to correct the problem.

At this point attach the manometers to the refrigerant circuit.

RUN TEST

Start unit in cooling mode

HIGH PRESSURE CONNECTION CIRCUIT N°2

LOW PRESSURE CONNECTION CIRCUIT N°2
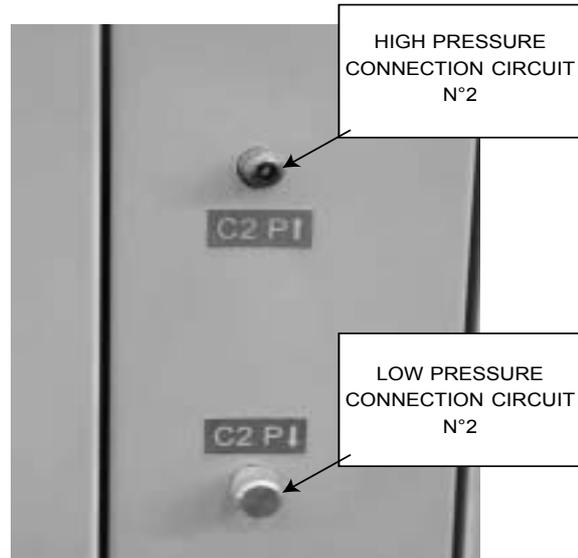
Fig. 28

Thermodynamic readings using manometers and prevailing environmental conditions

No rated values are given here. These depend on the climatic conditions both outside and inside the building during operation. However, an experienced refrigeration engineer will be able to detect any abnormal machine operation.

Safety test

- "Dirty filter" detection test : vary the set-point value **(menu 3413 on DS50)** in respect to the air pressure value. Observe the response of the CLIMATIC™.

- Same procedure for detecting "Missing Filter" **(menu 3412)** or "Air Flow Detection" **(menu 3411)**.

- Check the smoke detection function (if fitted).

- Check the Firestat by pressing the test button(if fitted).

- Disconnect the circuit breakers of the capacitor fans and check the high pressure cut-out points on different refrigerant circuits.

Reverse cycle test

This test is designed to check the good operation of the 4-way reversing valves on heat pump reversible systems. Start the reverse cycle by adjusting the cold or hot temperature threshold data according to the indoor and outdoor conditions at the time of test **(menu 3320).**

Baltic   **Flexy**

Site details / Informations site

Site / Site	……………………………………	
Unit Ref/ N° Affaire	…………………………………...	
Installer/ Installateur	……………………………………	

Controller/ Contrôleur	……………….………………..
Model/Model	……………………………………
Serial No/ No Série	……………………………………
Refrigerant / Réfrigérant	……………………………………

(1) ROOF INSTALLATION / INSTALLATION SUR LE TOIT

Sufficient Access OK / Accès Suffisants Yes/Oui ☐ No/ Non ☐	Condensate drain fitted / Drainage condensats Installé Yes/Oui ☐ No/ Non ☐	Roofcurb / Costière OK ☐ Not OK/PasOK ☐

(2) CONNECTIONS CHECK / VERIFICATIONS DE RACCORDEMENTS

Phase check/ Vérification des Phases Yes / Oui ☐ No / Non ☐	Voltage between Phases Tension entre Phases	1 / 2 ………………	2 / 3 ………………	1 / 3 ………………

(3)CLIMATIC CONFIGURATION CHECK / VERIFIER LA CONFIGURATION CLIMATIC

CLIMATIC 50 Configured according to the Options and Specifications / CLIMATIC 50 configuré en fonction des options et des spécifications: Yes/Oui ☐   No/ Non ☐

(4) SUPPLY BLOWER SECTION / VENTILATION TRAITEMENT

Type / Type:		N°1	N°2
Power displayed on plate / Puissance affichée sur la plaque:	KW	……………………	……………………
Voltage displayed on plate / Tension affichée sur la plaque:	V	……………………	……………………
Current displayed on plate / Intensité affichée sur la plaque:	A	……………………	……………………
Fan Type / Type de Ventilateur:		Forward / Action ☐ Backward / Réaction ☐	Forward / Action ☐ Backward / Réaction ☐
Displayed Belt Length / Longueur Courroie affichée:	mm	……………………	……………………
Tension Checked/ Tension Vérifiée:		Yes/Oui ☐ No/ Non ☐	Yes/Oui ☐ No/ Non ☐
Alignment Checked / Alignement Vérifié:		Yes/Oui ☐ No/ Non ☐	Yes/Oui ☐ No/ Non ☐
Motor Pulley Dia/ Poulie Moteur Dia: D_M	mm	……………………	……………………
Fan Pulley Dia/ Poulie Ventilateur Dia: D_P	mm	……………………	……………………
Fan Speed / Vitesse rotation Ventilateur = Motor rpm x D_M / D_P	rpm	……………………	……………………
Averaged Measured Amps / Intensité Mesurée moyenne:	A	……………………	……………………
Shaft Mechanical Power (Refer to airflow balancing) Puissance Mécanique à l'Arbre (Voir section réglage débit)	W	……………………	……………………
Operating point checked / Vérif. Point de fonctionnement:		Yes/Oui ☐ No/ Non ☐	Yes/Oui ☐ No/ Non ☐
Estimated Airflow / Estimation Débit d'Air	m^3/h	……………………	……………………

(5) AIRFLOW PRESS. SENSOR CHECK / VERIF. DES SECURITES PRESSOSTATS D'AIR

Measured pressure drop / Pertes de charge au pressostat …………………………… mbar	Set Points Adjusted / Changement des consignes: Yes/Oui ☐ No/ Non ☐ If Yes enter new values/ Si oui noter les nouvelles consignes: **3410**: ………… **3411**: ………… **3412**: …………

(6) EXTERNAL SENSOR CHECKS / VERIFICATION DES CAPTEURS EXTERNES

Check electrical connections / Vérification des connections électriques: Yes/Oui ☐ No/ Non ☐	Check and record temp. in menu **2110** / Vérifier et mesurer les températures. Dans menu **2110**: Yes/Oui ☐ No/ Non ☐	
	100% Fresh Air / 100% Air neuf	100% return Air / 100% Air repris
Supply Temperature / Température Soufflage	…………………………°C	…………………………°C
Return Temperature / Température reprise	…………………………°C	…………………………°C
Outdoor Temperature / Température extérieure	…………………………°C	…………………………°C

(7) MIXING AIR DAMPERS CHECKS / VERIFICATIONS VOLETS DE MELANGE

Dampers open & close freely/ Volets s'ouvrent et se ferment OK Yes/Oui ☐ No/ Non ☐	% Minimum FA: %minimum Air Neuf: ……………..%	Power exhaust checked/ Ventilateur extraction Yes/Oui ☐ No/ Non ☐	Enthalpy sensor(s) checked/ Control enthalpie installé Yes/Oui ☐ No/ Non ☐

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(8) REFRIGERATION SECTION / SECTION REFRIGERATION

Outdoor Fan Motor Current / Intensité Moteurs Batterie externe:			Check Rotation	Compressor Voltage/ Tension Compresseur.
Motor 1 / Moteur 1	L1 ……..A	L2 …….A	L3 …….A	Yes/Oui ☐ No/ Non ☐	
Motor 2 / Moteur 2	L1 ……..A	L2 …….A	L3 …….A	Yes/Oui ☐ No/ Non ☐	
Motor 3 / Moteur 3	L1 ……..A	L2 …….A	L3 …….A	Yes/Oui ☐ No/ Non ☐	Comp1: …….. V
Motor 4 / Moteur 4	L1 ……..A	L2 …….A	L3 …….A	Yes/Oui ☐ No/ Non ☐	Comp2: …….. V
Motor 5 / Moteur 5	L1 ……..A	L2 …….A	L3 …….A	Yes/Oui ☐ No/ Non ☐	Comp3: …….. V
Motor 6 / Moteur 6	L1 ……..A	L2 …….A	L3 …….A	Yes/Oui ☐ No/ Non ☐	Comp4: …….. V

Compressor Amps COOLING / Intensité Compresseur MODE FROID				Pressures & Temperatures / Pressions & températures			
	Phase **1**	Phase **2**	Phase **3**	Temperatures / Temperatures		Pressures / Pressions	
				Suction/ Asp	Disch / refoul	LP/ BP	HP / HP
Comp 1	…….. A	…….. A	…….. A	……… °C	……… °C	……… Bar	……… Bar
Comp 2	…….. A	…….. A	…….. A	……… °C	……… °C	……… Bar	……… Bar
Comp 3	…….. A	…….. A	…….. A	……… °C	……… °C	……… Bar	……… Bar
Comp 4	…….. A	…….. A	…….. A	……… °C	……… °C	……… Bar	……… Bar

Check Reversing valves./ Vérifier vannes d'inversion: Valve1/Vanne1: Yes/Oui ☐ No/ Non ☐   Valve3/Vanne3: Yes/Oui ☐ No/ Non ☐
Valve2/Vanne2: Yes/Oui ☐ No/ Non ☐   Valve4/Vanne4: Yes/Oui ☐ No/ Non ☐

Compressor Amps HEATING / Intensité Compresseur en Pompe à Chaleur				Pressures & Temperatures / Pressions & températures			
	Phase **1**	Phase **2**	Phase **3**	Temperatures / Temperatures		Pressures / Pressions	
				Suction/ Asp	Disch / refoul	LP/ BP	HP / HP
Comp 1	…….. A	…….. A	…….. A	……… °C	……… °C	……… Bar	……… Bar
Comp 2	…….. A	…….. A	…….. A	……… °C	……… °C	……… Bar	……… Bar
Comp 3	…….. A	…….. A	…….. A	……… °C	……… °C	……… Bar	……… Bar
Comp 4	…….. A	…….. A	…….. A	……… °C	……… °C	……… Bar	……… Bar
HP cut out / Coupure HP	……Bar		LP cut out / Coupure sécurité BP			…………..…. Bar	
Refrigerant charge / Charge réfrigérant		C1 : …………kg		C2 : …………kg	C3 : …………kg		C4 : …………kg

(8) ELECTRIC HEATER SECTION / SECTION RECHAUFFEUR ELECTRIQUE

Type / Type: ……………………………………..			Serial No/ No Série.:………………………..		
AMPS 1st stage (Baltic) / Intensité 1er étage (Baltic)			AMPS 2nd stage (Baltic) / Intensité 2e étage (Baltic)		
1 ………………..	2 ………………..	3 ………………..	1 ………………..	2 ………………..	3 ………………..

(9) HOT WATER COIL SECTION / SECTION BATTERIE EAU CHAUDE

Check Three Way Valve Movement / Vérification Mouvement Vanne trois voies: Yes/Oui ☐ No/ Non ☐

(10) GAS HEATING SECTION / RAMPE GAZ

Gas Burner N°1 / Brûleur gaz N°1		Gas Burner N°2 / Brûleur gaz N°2	
Size / Taille: ………………………	Valve type / Type vanne: ……………………	Size / Taille: ………………………	Valve type / Type vanne: ……………………
Pipe size/ tuyauterie:	Gas type / Type gas : **G**…….	Pipe size/ tuyauterie	Gas type / Type gas : **G**…….
Line press./ press. ligne : ………………………	Drop test / test pression Yes/Oui ☐ No/ Non ☐	line press./ press. ligne : ………………………	Drop test / test pression Yes/Oui ☐ No/ Non ☐
Check manifold pressure/ Pression injection: High fire/Grande allure……….Low fire/Petite allure………..		Check manifold pressure/ Pression injection: High fire/Grande allure………..… Low fire/Petite allure………..	
Pressure cut out airflow press switch / Pression coupure pressostat débit d'air : …………………….mbar /Pa		Pressure cut out airflow press switch / Pression coupure pressostat débit d'air : …………………….mbar /Pa	

Motor amps I moteur: ……….A	Flue temp / temp fumées ……… °C	CO2 %: ………%	CO ppm: ………%	Motor Amps I Moteur: ……….A	Flue temp / temp fumées ………. °C	CO2 %: ………%	CO ppm: ……….%

(11) REMOTE CONTROL BMS CHECK / VERIFICATIONS BMS CONTROL A DISTANCE

Type / Type: ………………………	Sensor type / Type Capteur: …………………………..	KP07 KP/17 checked/ vérifiées: Yes/Oui ☐ No/ Non☐	Interconnect wiring checked: Yes/Oui ☐ No/ Non☐

Comments...
....
....

Baltic *Flexy*

It is recommended that you fill the three tables below before transferring the zone settings to the Climatic controller.

Il est recommandé de remplir les deux tableaux ci-dessous avant de transférer les consignes de zones vers le contrôleur Climatic50.

Refer to control section page 55 / Se référer à la section régulation page 55

Time Zones / Zones horaires

Hour	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

Example					**UNO**				7h15 **ZA**			11h00 **ZB**	14h00			**ZC**			19h00		**UNO**		

Monday																								
Tuesday																								
Wednesday																								
Thursday																								
Friday																								
Saturday																								
Sunday																								

Variables to adjust for each time zone / Consignes à renseigner pour chaque zone horaire

	Start z.A		Start z.B		Start z.C		Start UNO	
	hour (3211)	min (3212)	hour (3213)	min (3214)	hour (3215)	min (3216)	hour (3217)	min (3218)
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								
Sunday								

Description	Unit	Menu	Min	Max	Zone A	Zone B	Zone C	UNOC
Sp Room	°C	3311	8	35				
Mini.Air	%	3312	0	100				
Sp Dyna	°C	3321	0	99.9				
Sp Cool	°C	3322	8	35				
Sp Heat	°C	3323	8	35				
Swap Heater	On/Off	3324	~	~				
Activation	On/Off	3331	~	~				
Swap Heater	On/Off	3332	~	~				
Sp.Dehu	%	3341	0	100				
Sp.Humi	%	3342	0	100				
Fan On/Off	On/Off	3351	~	~				
Fan Dead	On/Off	3352	~	~				
F.Air	On/Off	3353	~	~				
CO2	On/Off	3354	~	~				
Comp.Cool.	On/Off	3355	~	~				
Comp.Heat.	On/Off	3356	~	~				
AuxHeat	On/Off	3357	~	~				
Humidif.	On/Off	3358	~	~				
Low Noise	On/Off	3359	~	~	N/A	N/A	N/A	

BELT TENSION

On delivery, the drive belts are new and correctly tensioned. After the first 50 operating hours check and adjust the tension. 80% of the total elongation of belts is generally produced during the first 15 hours of operation.

Before adjusting the tension, make sure that the pulleys are correctly aligned.

To tension the belt, set the height of motor support plate by moving the plate adjustment screws.

The recommended deflection is 16 mm per metre from centre to centre.

Check that according to the diagram below (figure 30), the following ratio remains the same.

$$\frac{P(mm)}{A(mm)} = 20$$

Fig. 29

The belts should always be replaced when :

- the disk is set to maximum,

- the belt rubber is worn or the wire is visible.

Replacement belts must have the same rated size as the ones they are replacing. If a transmission system has several belts, they must all be from the same manufacturing batch (compare serial numbers).

NOTE :

An under-tensioned belt will slip, heat and wear prematurely. On the other hand, if a belt is over-tensioned, the pressure on the bearings will cause them to over-heat and wear prematurely. Incorrect alignment will also cause the belts to wear prematurely.

A P
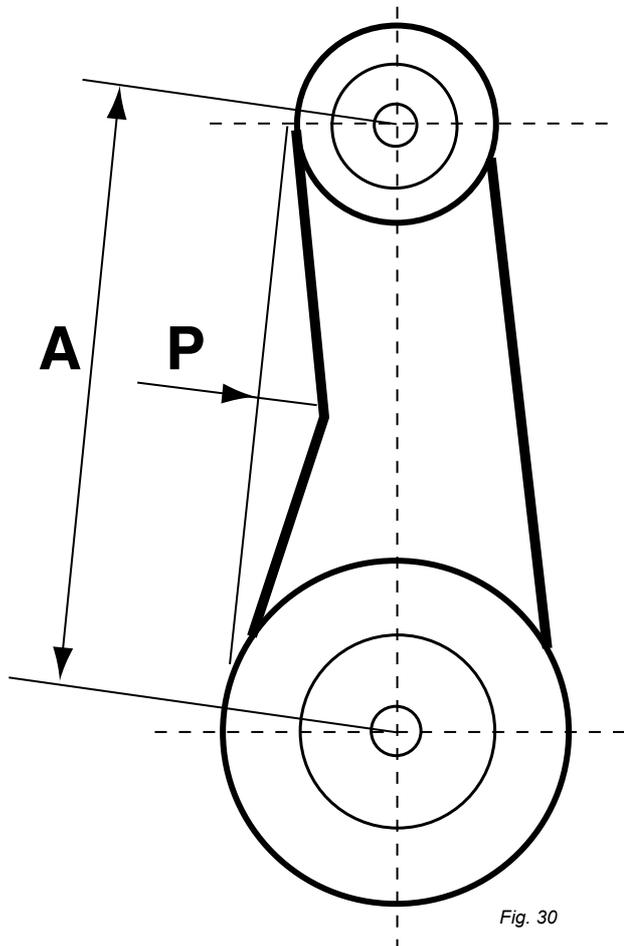
Fig. 30

MOUNTING AND ADJUSTING PULLEYS

Fan pulley removal

Remove the 2 screws and put one of them in the extraction threaded screw.

Screw in fully. The hub and the pulley will separate from each other.
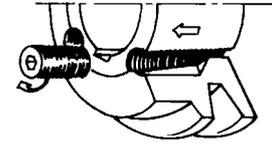
Fig. 31

Remove the hub and the pulley by hand without damaging the machine.

Fan pulley installation

Clean and de-grease the shaft, hub and conical bore of the pulley. Lubricate the screws and install the hub and pulley. Position the screws without turning them.

Place the assembly on the shaft and screw in the screws alternatively and evenly. Using a mallet or a hammer with a wooden wedge, tap on the face of the hub to keep the assembly in place. Torque the screws to 30 Nm.
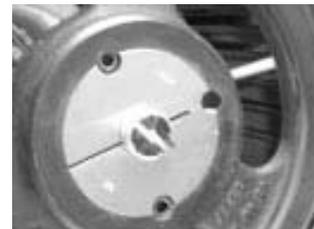
Fig. 32

Take the pulley in both hands and shake it vigorously to make sure everything is in place.

Fill the holes with grease for protection.

NOTE : During installation, the key should never protrude out of its groove.

After 50 operating hours, check that the screws are still in place.

MOTOR PULLEY INSTALLATION AND REMOVAL

The pulley is held in position by the key and a screw located in the groove. After unlocking, removing this screw by pulling against the shaft spindle (if necessary, use a mallet and tap uniformly on the hub to remove it).

To assemble, proceed in the reverse order after having cleaned and de-greased the motor shaft and the pulley bore.

PULLEYS ALIGNMENT

After adjusting one or both of the pulleys, check the transmission alignment using a ruler placed on the inner face of the two pulleys.

NOTE: The warranty may be affected if any major modification is made to the transmission without obtaining our agreement beforehand.
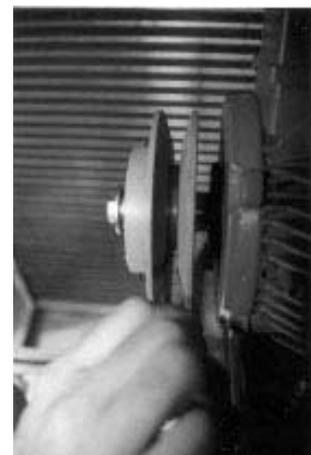
Fig. 33

The actual resistance of ductwork systems is not always identical to the calculated theoretical values. To rectify this, it may be necessary to modify the pulley and belt setting. To this effect, the motors are fitted with variable pulleys.

AIRFLOW BALANCING

Measure the absorbed amps

If the absorbed amps are greater than the rated values, the ventilation system has a lower pressure drop than anticipated. Reduce the flow by reducing the rpm. If the system resistance is significantly lower than design, there is a risk that the motor will overheat resulting in an emergency cut out.

If the absorbed amps are lower than the rated values, your system has a higher pressure drop than anticipated. Increase the flow by increasing the rpm. At the same time you will increase the absorbed power which may result in having to increase the motor size.

To carry out the adjustment and to avoid a time-consuming re-start, stop the machine and if necessary lock the main switch. First unscrew the 4 Allen screw(s) on the pulley (see figure 35).

Pulley type	Pulley External Diameter	Min Dia / Min Dist	Max Dia / Max Dist	NB of turns from fully closed to fully open	Actual diameter (DM) or distance between faces for a given number of turns from fully closed with SPA belt in (mm)										
					0,5	1	1,5	2	2,5	3	3,5	4	4,5	5,0	5,5
8450 /	120	95	116	5	113,9	111,8	109,7	107,6	105,5	103,4	101,3	99,2	97,1	95,0	-
D8450		20,2	28	5	21,0	21,8	22,5	23,3	24,1	24,9	25,7	26,4	27,2	28,0	-
8550 /	136	110	131	5	128,9	126,8	124,7	122,6	120,5	118,4	116,3	114,2	112,1	110,0	
D8550		20,6	31,2	5	21,6	22,7	23,8	24,8	25,9	26,9	28,0	29,1	30,1	31,2	-

Table 1

The easiest way to determine the fan rotation speed is to use a tachometer. If not available the fan rpm can be estimated using the following two methods.

1st Method with the pulley secured in place:

L
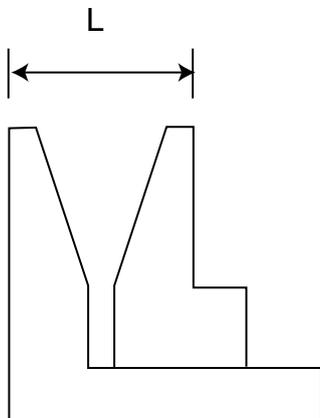
Fig. 34

Measure the distance between the two outside faces of the pulley.

Using table 1 the motor pulley actual diameter can be estimated

ALLEN WRENCH 4
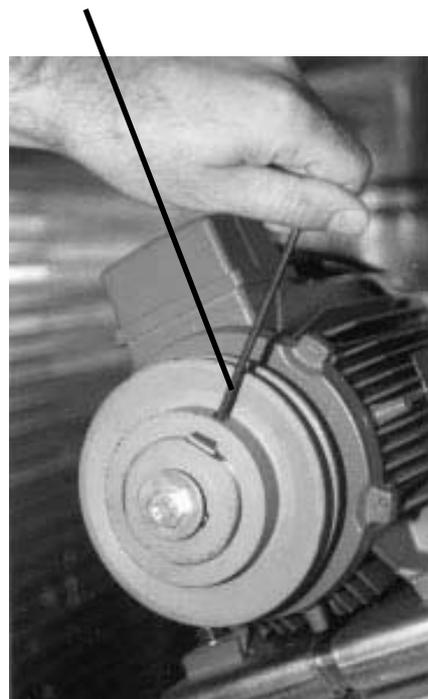
Fig. 35

2nd method when adjusting the pulley :

-Close the pulley fully and count the number of turns from fully closed position. Using table 1 determine the motor pulley actual diameter.

-Record the fix fan pulley diameter.(DF)

-Determine the fan speed using the following formula:

$$\text{rpm}_{FAN} = \text{rpm}_{MOTOR} \times D_M / D_F$$

Where : rpm_{MOTOR} :from the motor plate or table 2

D_M : from table 1

D_F: from machine

Once the pulleys are adjusted and the belt checked and tensioned, start the fan motor and record the Amps and Voltage between the phases :

Using the measured data and table 2

-Theoretical mechanical power at the fan shaft :

$P_{meca\ fan} = P_{meca\ Motor} \times \eta_{Transmission}$

$P_{meca\ fan} = P_{elec} \times \eta_{meca\ motor} \times \eta_{Transmission}$

$P_{meca\ fan} = V \times I \times \sqrt{3} \times \cos\varphi \times \eta_{meca\ motor} \times \eta_{Transmission}$

This formula can be approximated in this way

$$P_{meca\ fan} = V \times I \times 1.73 \times 0.85 \times 0.76 \times 0.9$$

With the fan "rpm" and the mechanical power at the fan shaft an operating point and the supplied airflow can be estimated using the fan curves.

CHECKING AIRFLOW AND ESP

Using the fan curves on page 25, 26, 27, the airflow, the total pressure available (P_{TOT}) and the corresponding dynamic pressure (Pd) can now be estimated, for a specific operating point;

The next step consist in estimating the pressure losses across the unit.

This can be achieved using the "dirty filter pressure sensor" and the accessories pressure drop table:

Also the pressure drop due to the duct inlet into the roof-top unit can be taken as 20 to 30 Pa.

$$\Delta P_{INT} = \Delta P_{filter} + coil + P_{Inlet} + \Delta P_{Options}$$

using the results from above, the external static pressure (ESP) can then be estimated:

$$ESP = P_{TOT} - Pd - \Delta P_{INT}$$

Table 2

Motor Size	Nom, Speed	Cos	meca motor
0,75 kW	1400 rpm	0,77	0,70
1,1kW	1425 rpm	0,82	0,77
1,5kW	1430 rpm	0,81	0,75
2,2kW	1430 rpm	0,81	0,76
3,0kW	1425 rpm	0,78	0,77
4kW	1425 rpm	0,79	0,80
5,5kW	1430 rpm	0,82	0,82

Table 3 - **Accessories pressure drop**

SIZE	Airflow	Economiser (Pa)	EU4 Filters (Pa)	Hot water coil (Pa) S	H	Electric heater (Pa) S	M	H	roofcurb (Pa)	Multi-directional (Pa)
020	2900	8	0	22	31	37	38	40	16	23
	3600	13	6	32	46	55	57	59	24	35
	4300	18	12	43	61	76	79	81	35	50
025	3600	13	6	32	46	55	57	59	24	35
	4500	20	14	46	66	83	85	88	38	55
	5400	28	25	63	89	117	120	123	55	79
030	4300	11	1	29	40	42	45	47	19	18
	5400	17	8	43	59	63	66	69	29	28
	6500	24	15	59	80	89	93	96	42	41
035	5000	14	5	37	51	55	58	61	25	24
	6300	23	14	56	76	84	88	91	39	38
	7600	33	24	77	105	119	123	127	58	56
040	5800	18	0	35	46	50	53	57	16	23
	7200	28	6	51	67	74	78	82	25	35
	8600	40	12	70	91	101	106	111	36	51
045	6500	23	3	43	56	61	65	69	20	29
	8100	36	10	63	82	91	95	100	32	45
	9700	51	18	87	113	126	131	137	46	64
050	7200	28	6	51	67	74	78	82	25	35
	9000	44	14	76	99	110	115	120	39	55
	10 800	63	25	105	136	154	160	166	56	80

EXAMPLE

The unit used for this example is a BGK035ND1M with Economiser and Electric Heater type H

It is fitted with a fan which curve is shown on page 38 and a 2.2kW motor.

- Motor rpm: 1430 rpm

- cos φ = 0.81

- Voltage = 400V

- Current = 3.77A (measured)

$$P_{mech\ fan} = V \times I \times \sqrt{3} \times cos\varphi \times \eta_{mech\ motor} \times \eta_{Transmission}$$
$$= 400 \times 3.77 \times \sqrt{3} \times 0.81 \times 0.76 \times 0.9 = \underline{\textbf{1.45kW}}$$

The unit is also fitted with a transmission kit 7

- Fixed Fan pulley : 160mm

- Motor adjustable pulley type "8450" opened 4 turns from fully closed or measured distance between pulley end plates is 26.4mm: from table 1 it can be determined that the motor pulley has a diameter of **99.2mm**

$$rpm_{FAN} = rpm_{MOTOR} \times D_M / D_F = 1430 \times 99.2 / 160 = \underline{\textbf{886 rpm}}$$

Using the fan curve below the operating point can be located.

It can be determined that the fan is providing approximately **6300 m3/h** with a total pressure P_{TOT} = **530 Pa**
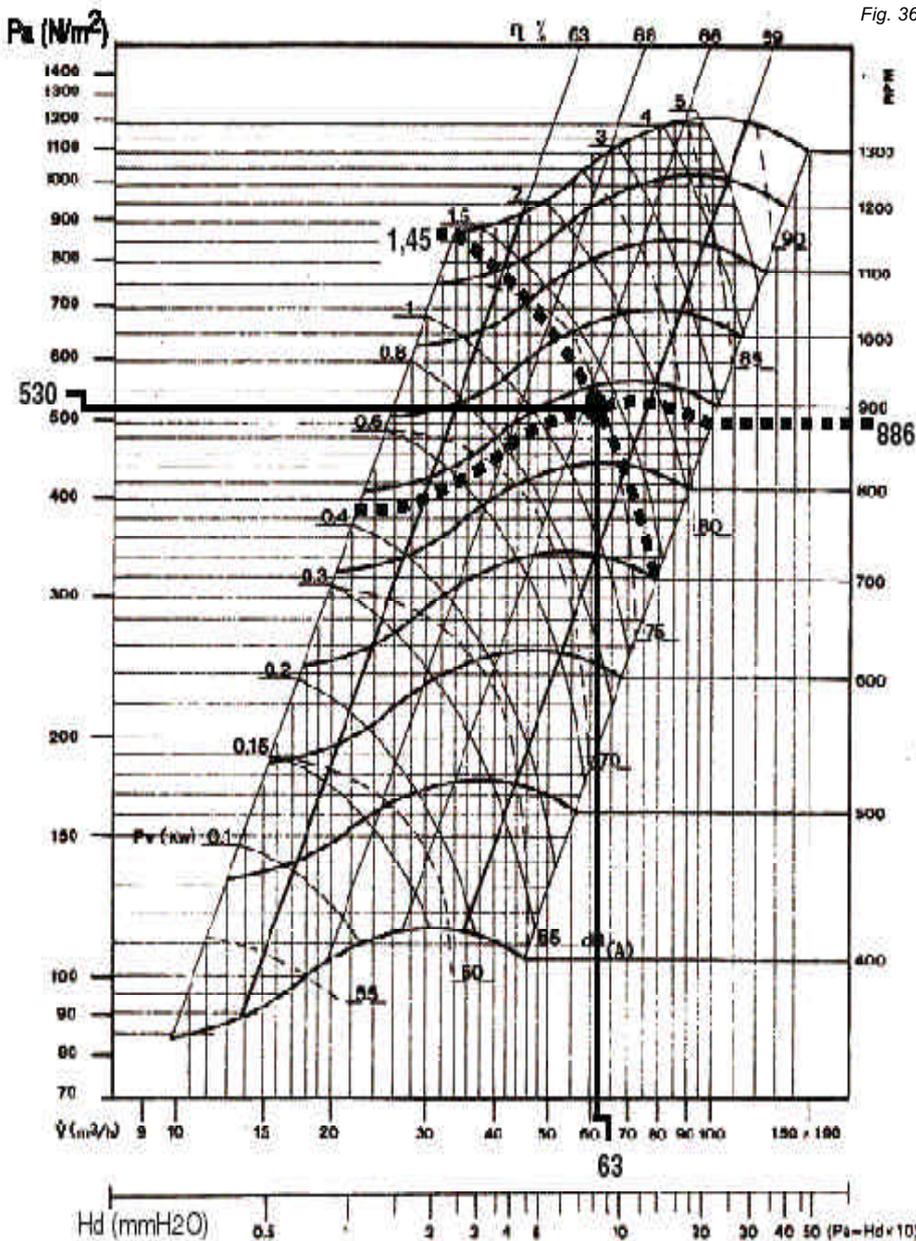
Fig. 36

The pressure losses in the unit are the sum of all pressure drops across the different parts of a unit :

- Coil and filter (measured) = 104 Pa

- Inlet into the unit = 30 Pa

- Options = 23 Pa for economiser and 91 Pa for electric heater H

$$\Delta P = 104 + 30 + 23 + 91 = \underline{\textbf{248 Pa}}$$

The dynamic pressure at 6300m3/h is given at the bottom of the fan curve

$$Pd = \underline{\textbf{81Pa}}$$

The external static pressure available is therefore

$$ESP = P_{TOT} - Pd - \Delta Pl_{NT}$$
$$= 530 - 81 - 248 = \underline{\textbf{201 Pa}}$$

020 025

Fig. 37
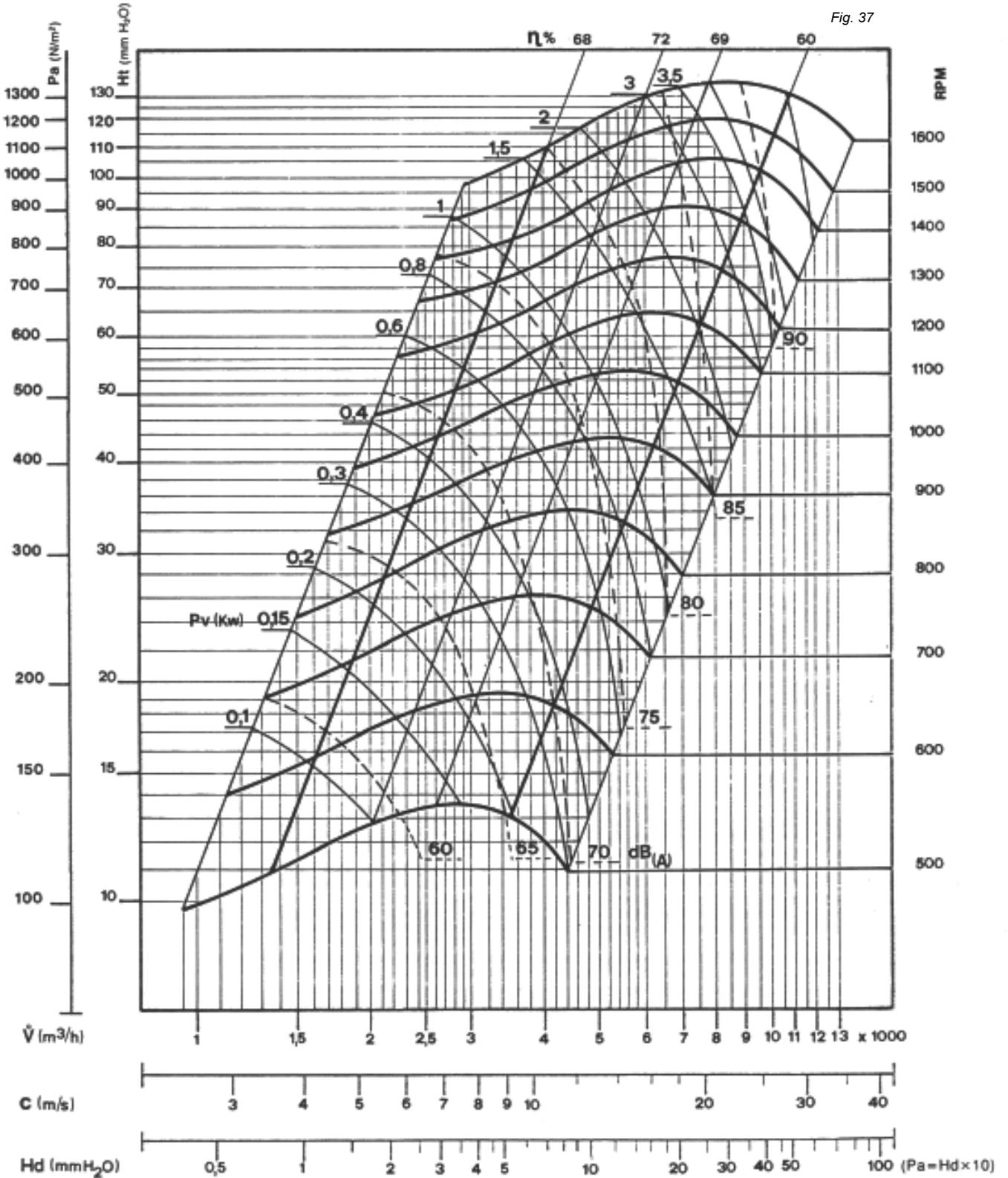
Fig. 38
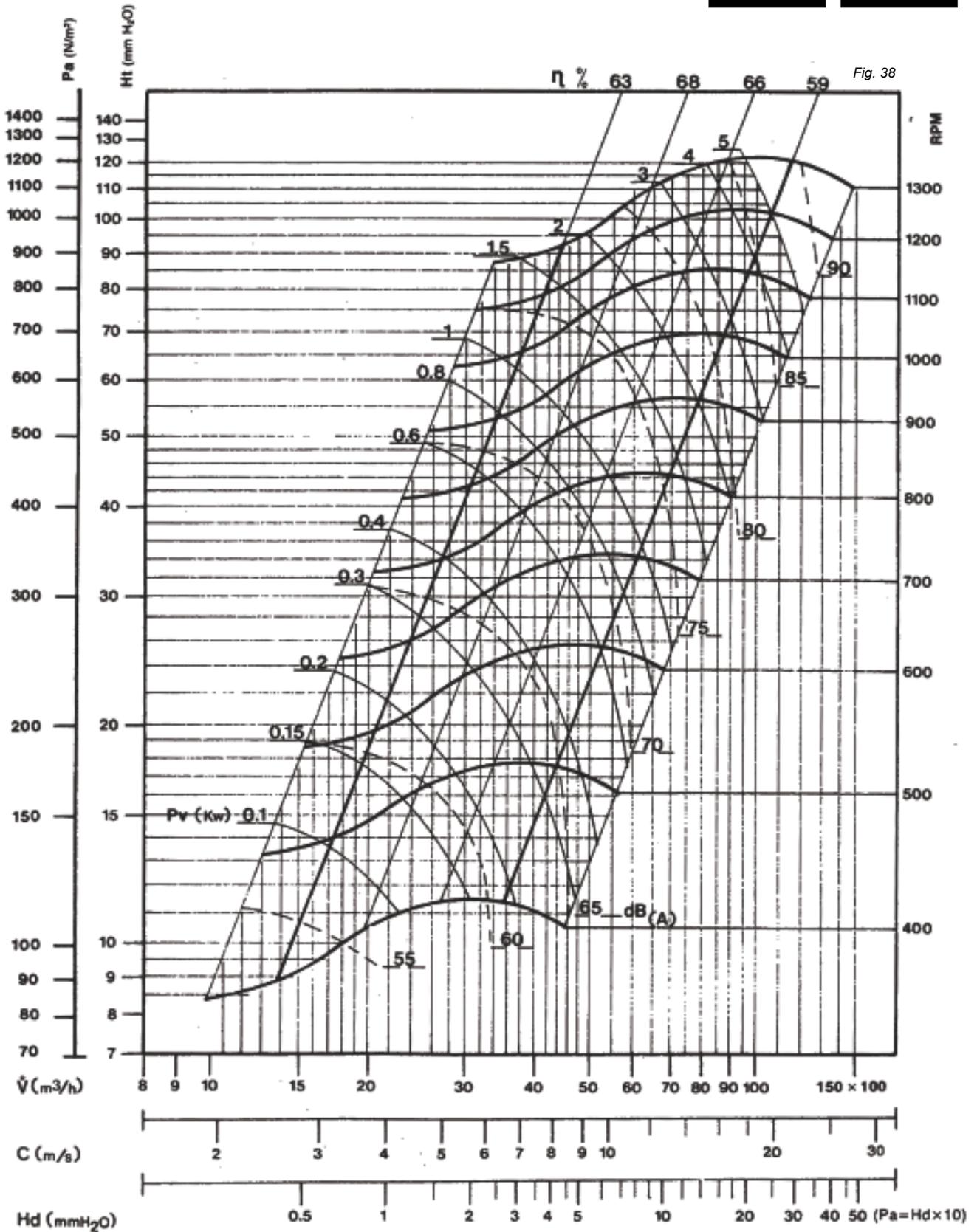
040 **045** **050**

Fig. 39
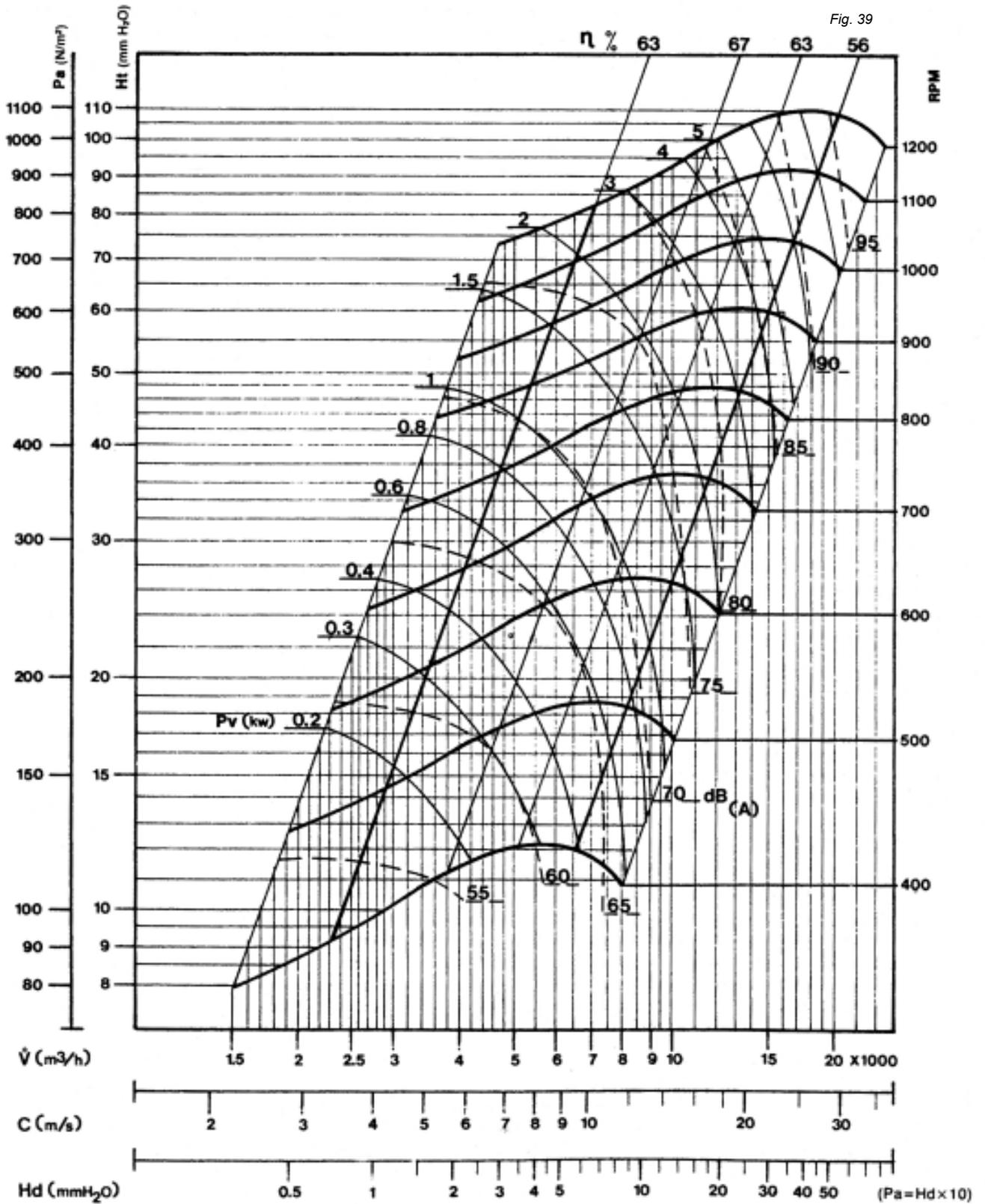
FILTER REPLACEMENT

After opening the filter access panel, lift the filter retaining log.

The filters can then be removed and replaced easily by sliding the dirty filters out and clean ones in.

Fig. 40

Fig. 41

The CLIMATIC controller can monitor the pressure drop across the filter (If option fitted)

The following set points can be adjusted depeding on the installation.

    "Airflow"   in page 3411 = 25Pa by default

    "No filter " in page 3412 = 50Pa by default

    "Dirty Filter" in page 3413 = 250Pa by default

The actual pressure drop measured accross the coil can be read on the Climatic Display DS50 in menu 2120.

The following faults may be identified

-Fault code 0001 AIRFLOW FAILURE, if measured ΔP across the filter and coil is below the value set in page 3411

-Fault code 0004 DIRTY FILTERS, if measured ΔP across the filter and coil is above the value set in page 3413

-Fault code 0005 MISSING FILTERS, if measured ΔP across the filter and coil is below the value set in page 3412

AIR SOCK CONTROL

FANSTART OPERATION

The use of air socks for space conditioning allows high air volumes to be distributed at low velocity and is becoming a common feature in many applications. To accommodate this trend, Air-sock control is offered which allows the air socks to be progressively filled with air on start up. BALTIC has been enhanced with an electronic device to soft start the fan. It takes up to 1 minute to go from 0% of air to full air flow.

This time can be divided in several stages:

- The aim of this first voltage input is to overcome the resistance of the transmission (Pulleys and belts): 0.5s and up to 1000 rpm

- The second stage is to inflate the air sock: 5 to 30s. and 600 to 900 rpm

Finally the air sock is gradually pressurised during the last 5 to 30 second. The motor reaches nominal speed and the controller is bypassed.
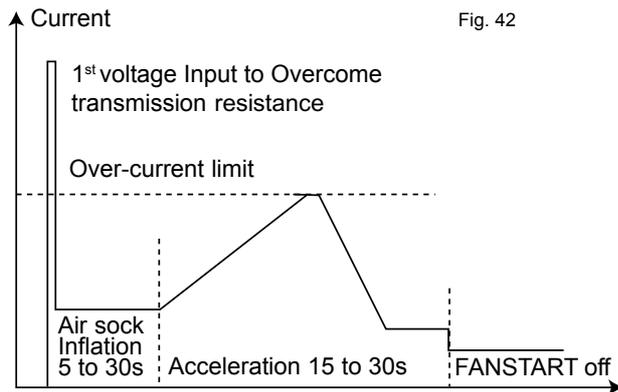
Fig. 42

The motor speed control is achieve through a variation of the supply voltage of each phase at constant frequency.

The thermal overload limit on the motor imposes a current limitation during the acceleration stage. Hence if the selected slope is to steep, a predefined current limit can be reached (potentiometer adjustment) and the controller will automatically reduce the voltage set-point accordingly. Then once the current is back under the high current limit it carries on with the start up cycle.

Safety

Excessive "slow down" limit

The FANSTART will display a fault (red LED) and stop the motor, if the motor slows down excessively (voltage could reach 0V) because of the current limitation during the acceleration stage.

Missing phase safety

The FANSTART will display a fault (red LED) if the current in the third phase is too low or reaches 0 Amps (Three phase supply or motor problem)

Current protection of the Thyristor

The FANSTART will display a fault (red LED) if the current exceeds the thyristor current limits

125A during 0.4s

87.4A during 2s

75A during 6s.

62.5A during 20s.

Start up sequence too long

A fault (red LED) will appear if after 1min20s the FANSTART Control is not bypassed and the motor running from the mains.

Phase rotation check

If the phase rotation is incorrect the FANSTART Control will display a fault (Red LED). Two of the phases must then be inverted and the start up cycle resumed.
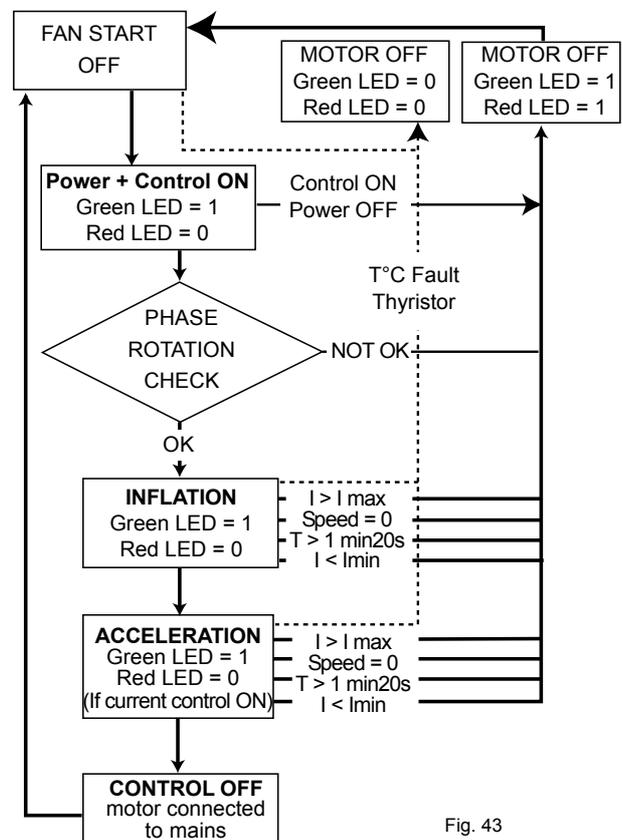
Fig. 43

HYDRAULIC CONNECTIONS

The hot water coil is fitted with a three way proportional valve and two isolating shut off valves. Two spanners must be used to tighten the connections. One spanner must maintain the valve body when connecting the pipe-work to the main. Failure to do so may damage the pipes joints and invalidates the warranty.

Filling up and starting the system

- Adjust the control for Heating by reducing the simulated ambient temperature down to 10°C

- Check that the red indicators located under the valve actuator are moving correctly with the signal.

Fig. 44   *red indicators*
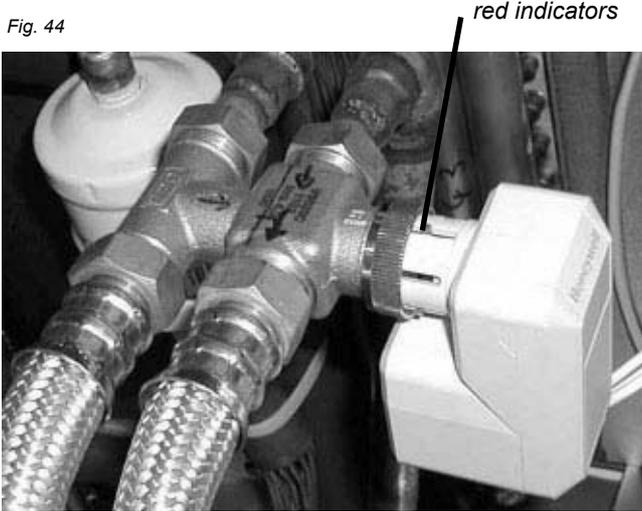
- Fill the hydraulic system and bleed the coil using the air vents. Check incoming hot water.

- Check the various connection for possible leaks

FREEZE PROTECTION

1) Glycol for freeze protection.

Check the hydraulic system contains Glycol for protection against freezing.

> **GLYCOL IS THE ONLY EFFECTIVE PROTECTION AGAINST FREEZING**

The antifreeze must protect the unit and avoid icing under winter conditions.

WARNING: Mono-ethylene glycol based fluids may produce corrosive agents when mixed with air.

2) Drain the installation.

You must ensure that the manual or automatic air bleeders have been installed on all high points in the system. In order to drain the system check that all the drain cocks have been installed on all low points of the system.

> **HEATING HOT WATER COILS FROZEN DUE TO LOW AMBIENT CONDITIONS ARE NOT COVERED BY THE WARRANTY.**

ELECTROLYTIC CORROSION

Attention is drawn to the corrosion problems resulting from electrolytic reaction created by unbalanced earth connections.

> **ANY COIL DAMMAGED BY ELECTROLYTIC CORROSION IS NOT COVERED BY THE WARRANTY**

Fig. 45
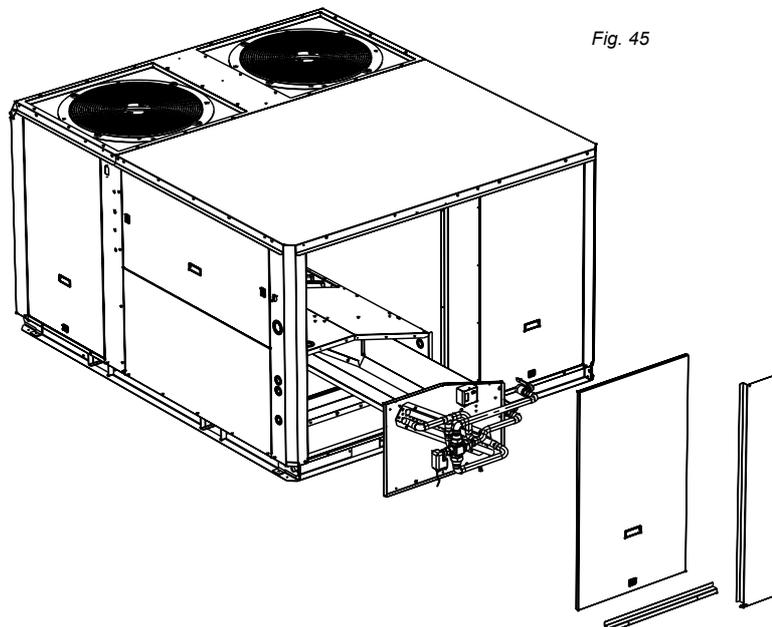
Connection HWC B Box Downflow
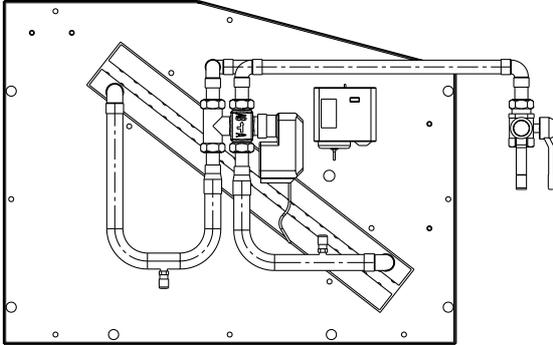
Fig. 46

Connection HWC B Box Horizontal Flow
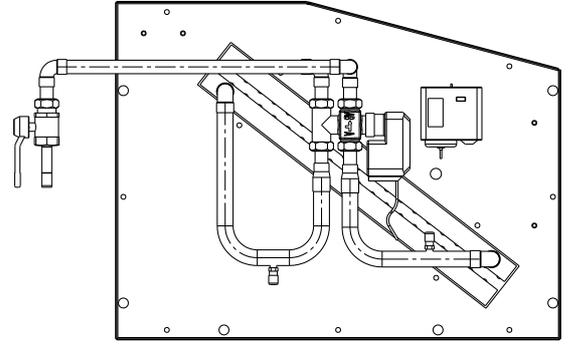
Fig. 47

Connection HWC C Box Downflow
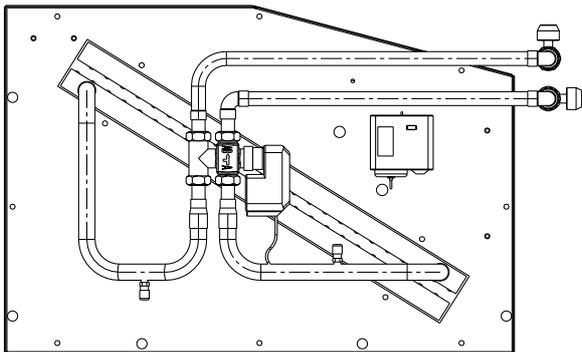
Fig. 48

Connection HWC C Box Horizontal Flow
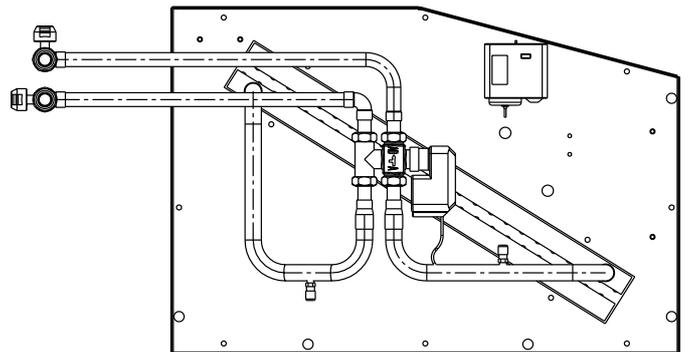
Fig. 49

Connection HWC D Box Downflow
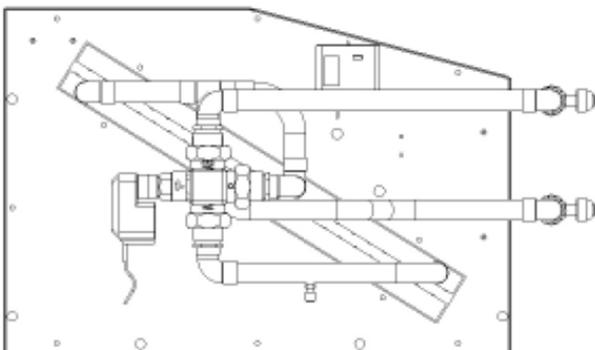
Fig. 50

Connection HWC D Box Horizontal Flow
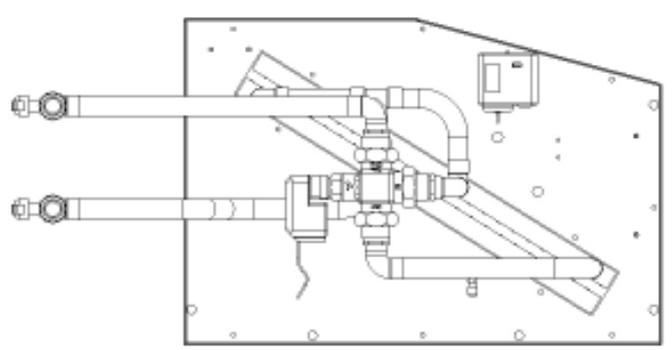
Fig. 51

Pipe Internal diameters (DN)		
	ϕS	ϕH
B020	20	20
B025	20	20
B030	20	20
B035	20	20
B040	25	25
B045	25	25
B050	25	25

GENERAL INFORMATION

The Baltic electric heaters are stand alone options which are fitted in the heating section of the unit. As for the hot water coil or the gas burner this option slides into the heating compartment located under the supply fan.

In order to reduce the pressure drops the airflow is ducted around the shielded resistances. The resistances are made smooth stainless steel tubes with a capacity of 6W/cm2.

It is protected as standard, against overheat via a high temperature overload protection set at 90°C and located less than 150mm after the heater itself.

There are three sizes available for each size of unit:

S: Standard heat

M: Medium heat

H: High heat

The standard and Medium heat electric heaters, are staged control with 50% or 100%. The high heat versions is controlled through a fully modulating triac.

Module size (kW)	380V		400V		415V	
	Current (A)	Cap (kW)	Current (A)	Cap (kW)	Current (A)	Cap (kW)
12	16,3	10,8	17,0	11,8	17,8	12,8
24	32,6	21,5	34,0	23,5	35,6	25,6
36	48,9	32,3	51,1	35,3	53,3	38,4
48	65,2	43,0	68,1	47,0	71,1	51,3
54	73,4	48,4	76,6	52,9	80,0	57,7

Fig. 52

PRELIMINARY CHECKS BEFORE START-UP

NOTE :

ANY WORK ON THE GAS SYSTEM MUST BE CARRIED OUT BY QUALIFIED PERSONNEL.

THIS UNIT MUST BE INSTALLED IN ACCORDANCE WITH LOCAL SAFETY CODES AND REGULATIONS AND CAN ONLY BE USED IN WELL VENTILLATED AREA.

PLEASE READ CAREFULLY THE MANUFACTURER'S INSTRUCTIONS BEFORE STARTING A UNIT.

BEFORE COMMISSIONING A UNIT WITH GAZ BURNER, IT IS MANDATORY TO ENSURE THAT THE GAZ DISTRIBUTION SYSTEM (type of gas, available pressure…) IS COMPATIBLE WITH THE ADJUSTMENT AND SETTINGS OF THE UNIT.

Check access and clearance around the unit

- Make sure one can move freely around the unit.

- A minimum one-meter clearance must be left in front of the burnt gas exhaust flue.

- Combustion air inlet and burnt gas exhaust(s) must Not be obstructed in any way.

Supply Network Pipe Sizing

MALE THREADED CONNECTION FOR GAZ BURNER: 3/4"

Check that the gas supply line can provide the burners with the pressure and the gas flow rate necessary to provide the heating output duty.

- The gas supply to a Rooftop gas unit must be according to Sound Engineering Practice and the local safety codes and regulations.

- In any case the pipe-work connected to each Rooftop must not be smaller than the diameter of the connection on the Rooftop unit.

- Make sure that a shut-off isolation valve has been installed before EACH Rooftop.

- Check the supply voltage to the ignition control board (it must be between 220 and 240V).

STARTING UP THE GAS BURNER

MAXIMUM WORKING PRESSURE: 8bar   *Fig. 53*
MAXIMUM WORKING TEMPERATURE: 125°C

Purge the pipe-work near the connection on the ignition control Valve for a few seconds.

- Check that the Centrifugal Fan Blower in the unit is running.

- Set the control to "ON" This will priorities the gas burner.

- Increase the set temperature (room set point temperature) to a temperature higher than the actual room temperature.

Standard start-up Chronology

Table 4

Time in seconds / Operations	1	2	3	4	5	6	7	8	9	10	11	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	398	399	400	401
Control operation sequence	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■			
Extraction fan			■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■			
Smoke extraction fan "ON"				■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■			
30 to 45 seconds pre-Ventilation				■	■	■	■	■	■	■		■	■	■	■	■	■																
Fire-up spark electrode 4s																		■	■	■	■												
Opening of the gas valve "High Heat"																		■	■	■	■	■	■	■	■	■	■	■				■	
Flame propagation towards the ionisation probe																		■	■	■	■	■											
If Ionisation within 5sec: Normal running																		■	■	■	■	■	■	■	■	■	■	■					
Otherwise fault on gas ignition control block																							■	■	■	■	■	■	■	■			
After 5 minutes, fault reported on the climatic controller																																	■

If incorrect sequence refer to the fault analysis table to identify the problem.

PRESSURE ADJUSTMENTS ON HONEYWELL

PRESSURE REGULATING VALVE TYPE VK 4125 P

Pressure regulator adjustment with 300mbar gas supply:

- The Burner must run in High Heat mode for this check.

Fig. 54

INLET PRESSURE MEASURING PORT

- Place the tube of the "accurate" manometer on the Inlet pressure port figure 54 of the Gas Regulating Valve after having loosened the screw by two turns

- Check and adjust if necessary the valve Inlet pressure to 20 mbar (G20) or 37 mbar for propane (G31) or 25 mbar for Groningue (G25).

Fig. 55

High Heat Injection Pressure Checks

Check and adjust if necessary the valve OUTLET pressure to 8.4 mbar (G 20) / 31.4 mbar for propane (G31) and 12.3mbar for Groningue (G25).

Fig. 56

The out pressure must be measured on the pressure tap located on the gas injector support bar to avoid the pressure drop due to the elbow after the valve

Fig. 57

Low Heat Injection Pressure Checks

-Carefully disconnect the wire on the coil of the valve as shown below

Fig. 58

- Check and adjust if necessary the Outlet pressure to 3.5 mbar (G20) or 14 mbar for propane (G31) and 5 mbar for Groningue(G25)

Fig. 59

Fig. 60

- Reconnect the wires on the coil

- Re-tighten all pressure adjustment screws and nuts.

PRESSURE ADJUSTMENTS ON HONEYWELL

PRESSURE REGULATING VALVE TYPE VK 4105

Pressure regulator adjustment with 300mbar gas supply:

- The Burner must run in High Heat mode for this check.

- Place the tube of the "accurate" manometer on the Inlet pressure port (figure 61) of the Gas Regulating Valve after having loosened the screw by two turns.

Fig. 61

INLET PRESSURE MEASURING PORT

HIGH HEAT ADJUSTMENT UNDERNEATH

LOW HEAT ADJUSTMENT
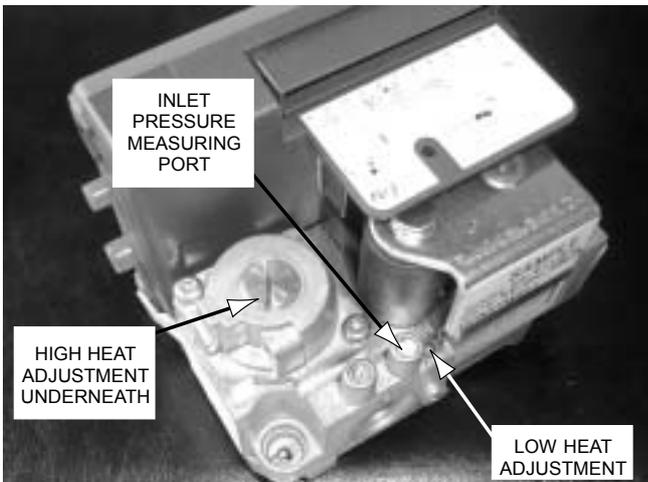
- Check and adjust if necessary the valve Inlet pressure to 20.0 mbar (G20) or 37.0 mbar for propane (G31) or 25 mbar for Groningue (G25).

Fig. 62

High Heat Injection Pressure Checks

- Place the tube of the "accurate" Manometer to the OUT port on the Gas injector support bar after having loosened the nut.

Fig. 63

Check and adjust if necessary the valve OUTLET pressure to 8.4 mbar (G 20) / 31.4 mbar for propane (G31) and 12.3mbar for Groningue (G25).

Low Heat Injection Pressure Checks

- Switch the control to Low Heat

- Check and adjust if necessary the Outlet pressure to 3.5 mbar (G20) or 14 mbar for propane (G31) and 5 mbar for Groningue(G25).

Fig. 64

- Re-tighten all pressure adjustment screws and nuts.

Pressure adjustments table for each type of gas

Table 5

Category	Supply pressure	Low Heat injection	High Heat Injection
G20	20.0 mbar	3.5 mbar	8.4 mbar
G25 (Groningue)	25.0 mbar	5.0 mbar	12.3 mbar
G31 (GPL)	37.0 mbar	14.0 mbar	31.4 mbar

BURNER SAFETY CHECKS

Smoke extractor pressure switch Test.

- With the gas burner running, disconnect the flexible tube fitted to the pressure taping on the pressure switch (fig. 65).

- The Flame must disappear and the extraction fan must carry on running.

- However, NO fault will be displayed (Gas ignition control block or CLIMATIC).

Fig. 65

- After reconnecting the tube, the Burner will restart after a period of 30 to 45 seconds pre-ventilation.

Gas pressure switch test

-With the gas burner running, close the shut off valve located before the rooftop.

Fig. 66

-The burner stops completely.

-However, No fault light will be displayed on the Gas ignition control block.. After 6 Minutes, the CLIMATIC will display a fault.

-Reset the CLIMATIC.

Ionisation Probe test

-With the gas burner running, disconnect the terminal plug coming from the ionisation probe to the gas ignition control box.

Fig. 67

-The flame disappears

-The fan is still running and attempting to restart the burner (restart cycle 30 to 45 seconds).

-if the ignition probe is not reconnected at the end of the ignition sequence the burner will stop completely.

-The fault light on the gas ignition control block is ON.

-Manually reset the gas ignition control block to eliminate the fault.

IN CASE OF PROBLEMS REFER TO THE START UP SEQUENCE FLOWCHART NEXT PAGE

GAS BURNER FIRE-UP SEQUENCE
Fig. 68

```
                    ┌─────────────────────────────┐
                    │   Operation from control    │
                    │   Thermostat GAS = Closed   │
                    └─────────────────────────────┘
                                  │
                    ╱─────────────────────────╲
                   ╱   Supply Thermostat Limit ?  ╲──── NO ──────────────────┐
                   ╲      (Auto reset)           ╱                           │
                    ╲─────────────────────────╱                             │
                           YES │                                            │
                    ╱─────────────────────────╲                             │
                   ╱   Gaz low pressure switch?  ╲──── NO ──────────────────┤
                   ╲                           ╱                            │
                    ╲─────────────────────────╱                            │
                           YES │                                           │
          ┌──────────►┌─────────────────────────────┐◄──────┐             │
          │           │  Gaz ignition control block signal │             │
          │           └─────────────────────────────┘      │             │
          │           ┌─────────────────────────────┐      │             │
          │           │      Extraction Fan ON      │      │             │
          │           └─────────────────────────────┘      │             │
          │                         │                       │             │
          │           ╱─────────────────────────╲          │             │
          │          ╱   Air pressure switch ON    ╲── NO ──┤             │
          │          ╲   Backfire thermostat ON ?  ╱                      │
          │           ╲─────────────────────────╱                        │
          │                  YES │                                        │
          │           ┌─────────────────────────────┐   ┌──────────────┐ │
          │           │ Pre-ventilation 30 to 45 seconds│ │ Gas control  │ │
          │           └─────────────────────────────┘   │ Valve closes │ │
          │           ┌─────────────────────────────┐   │   BURNER     │◄┤
          │           │     Fire-up Electrode 4s    │   │   STOPS      │ │
          │           └─────────────────────────────┘   └──────────────┘ │
          │           ┌─────────────────────────────┐                    │
          │           │       Gas valve open        │                    │
          │           └─────────────────────────────┘                    │
          │                         │                                     │
          │           ╱─────────────────────────╲    ┌──────────────┐    │
          │          ╱  Ionisation 1 second after  ╲  │ Gas control  │    │
          │          ╲  the end of sparking ?     ╱NO►│ Valve closes │    │
          │           ╲─────────────────────────╱    │ BURNER STOPS │    │
          │                  YES │                    │ Fault on Gas │    │
          │           ┌─────────────────────────────┐│ control block│    │
          │           │   Gas valve remains open    │◄└──────────────┘    │
          │           └─────────────────────────────┘       │             │
          │           ┌─────────────────────────────┐  ┌──────────────┐  │
          │           │      Normal operation       │  │ 6 minutes Delay │◄┘
          │           └─────────────────────────────┘  └──────────────┘
          │                         │                         │
          │           ╱─────────────────────────╲    ┌──────────────────┐
          │◄── NO ───╱   Air press switch ON       ╲  │ FAULT ON CLIMATIC│
          │          ╲  or Backfire thermostat ?  ╱  └──────────────────┘
          │           ╲─────────────────────────╱
          │                  YES │
          │           ╱─────────────────────────╲
          │          ╱    Signal from ionisation   ╲── YES ──┐
          │          ╲    probe still ON?         ╱          │
          │           ╲─────────────────────────╱           │
          └──── NO ──────────┘
```

GAS BURNER TROUBLESHOUTING

If faults reported on CLIMATIC

-Reset the CLIMATIC.

-Check voltage: 230V after circuit breaker.

-Check GAS isolation shut-off valves are open.

-Check GAS pressure at the inlet of the GAS valves. It must be >20 mbar when the Burners shut down.

-Adjust the set points to priorities the burner. Increase the value of the room temperature set point to a temperature higher than actual room temperature.

Table 6

STAGE	NORMAL	POSSIBLE OPERATION	ACTION FAULT	POSSIBLE SOLUTION
Heating Requested	Contactors engaged	Contactors do not engage	+ Check "Safety Thermostats" In the air flow before the gas heat exchanger.	Replace component
Contactors are engaged	Extraction Fans are running	Nothing happens	+ Check the free movement of the fan wheel + Check the supply temperature limitation thermostats + Check gas low pressure switch + Check electrical connection on the gas Ignition Control Block and on connection board + Check the fan voltage supply voltage	+ Replace thermostat + Open gas supply + Replace connection board if necessary
Extraction fan is ON	After 30 to 45 seconds : pre-ventilation the fire-up electrode should spark	Continuous ventilation happens without sparks from fire-up electrode	+ Check the fire-up electrode + Check the pressure drop at the pressure switch : It must be higher than **165 Pa** + Check the good operation of the pressure switch using an Ohmmeter and by artificially creating a depression in the tube. + Check the operation the Backfire thermostat.	+ Re-position the pressure switch tube + Change the pressure switch + Reset or replace the Thermostat
Continuous ventilation and sparks from fire up electrode	After a few seconds the gas burner fires-up	After 4 seconds the GAS burner still not operating and safety shutdown by the ignition Control Block.	+ Check injection pressure during start-up (value for High Heat) + Check the supply voltage to the ignition control box (continuous voltage) + Remove the control box from the gas block.	+ Remove the air from the gas pipe-work + Adjust the injection pressure to high heat value. + Change the control box if the gas valve is OK. + Change the gas valve.
		Within 4 seconds the GAS burner fires-up BUT safety shutdown from the ignition Control Block.	+ Check that the High / Low control is connected (for valve VK 4125 P). + Check the position and connections of the Ionisation Probe. It must not be Earthed (230 V) + Check the Polarity of the 230 V connection on the gas burner transformer. + Measure the Ionisation Current : It must be higher than 1,5 microAmps. + Check the type of gas.	+ Check the whole electrical supply. + Adjust the supply and injection pressure if gas is different from natural gas G20 : (G25 gas of Groningue for example).

DISASSEMBLING THE GAS BURNER FOR MAINTENANCE PURPOSES

Preliminary Safety Recommendations

- Isolate the unit using the main isolator switch.

- Close off the isolating gas valve located before the unit.

- Disconnect the Pipe-work. Do not discard the seals.

Fig. 69

Disassembling the gas "burner support bar"

- Disconnect the Electrical Connector on the electric connection board

- Remove the two screws which hold the gas Bar in Place

-Carefully remove the gas " burner support bar " avoiding any damages to the electrodes.

Fig. 70

Fig. 71

Disassembling the flue

- Electrically disconnect the fan and remove the screws holding it in place.

-Take care not to loose any cage nuts in the smoke box.

ATTENTION: Check the correct position of the pressure tube used by the extraction pressure switch.
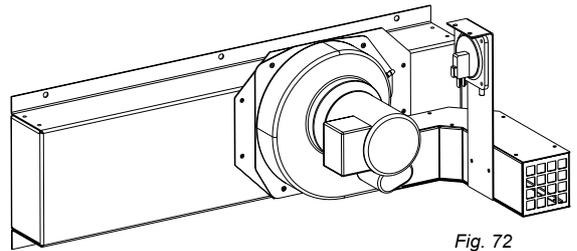
Fig. 72

Required Equipment List for maintenance Adjustment and Start-up

- An accurate manometer from 0 to 3500 Pa (0 to 350 mbar): 0.1% full scale.

- A Multimeter with Ohmmeter and Micro-amps scale

- An Adjustable Spanner

- Tube Spanner Set: 8, 9, 10, and 13.

- Flat Screwdrivers diameter 3 and 4, Fillips n°1

- Vacuum cleaner
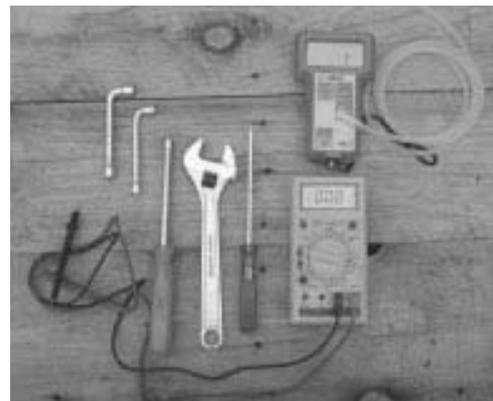
Fig. 73

- Paint brush

GAS INJECTORS SUPPORT BAR
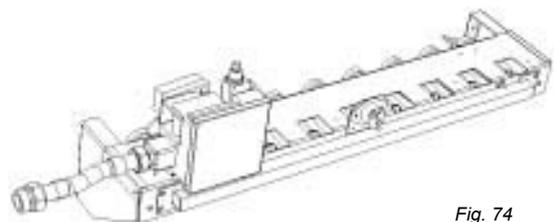
Fig. 74

GAS MODULE-20KW-B-BOX
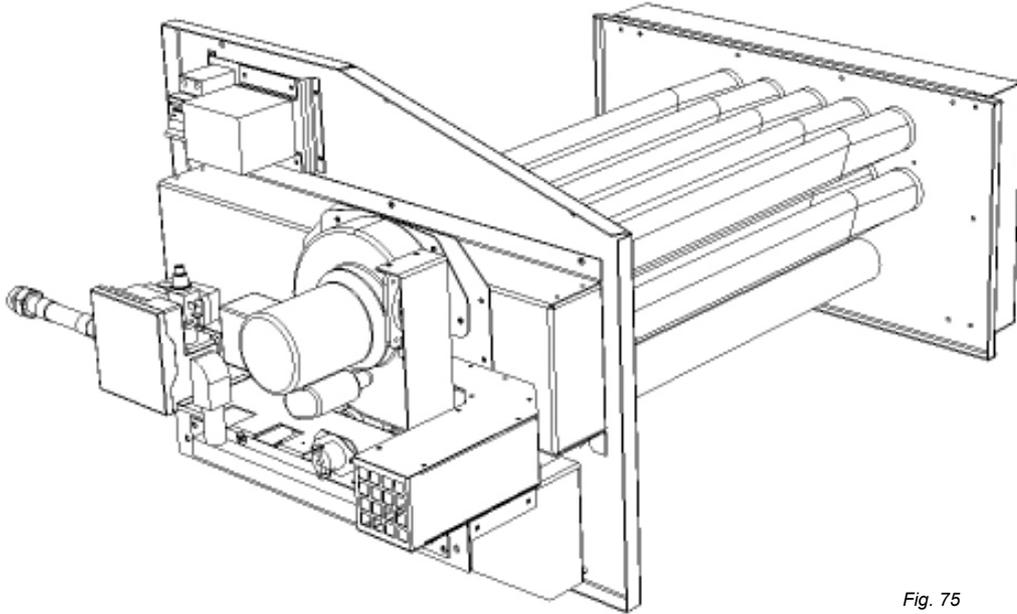
Fig. 75

GAS MODULE-33KW-B-BOX
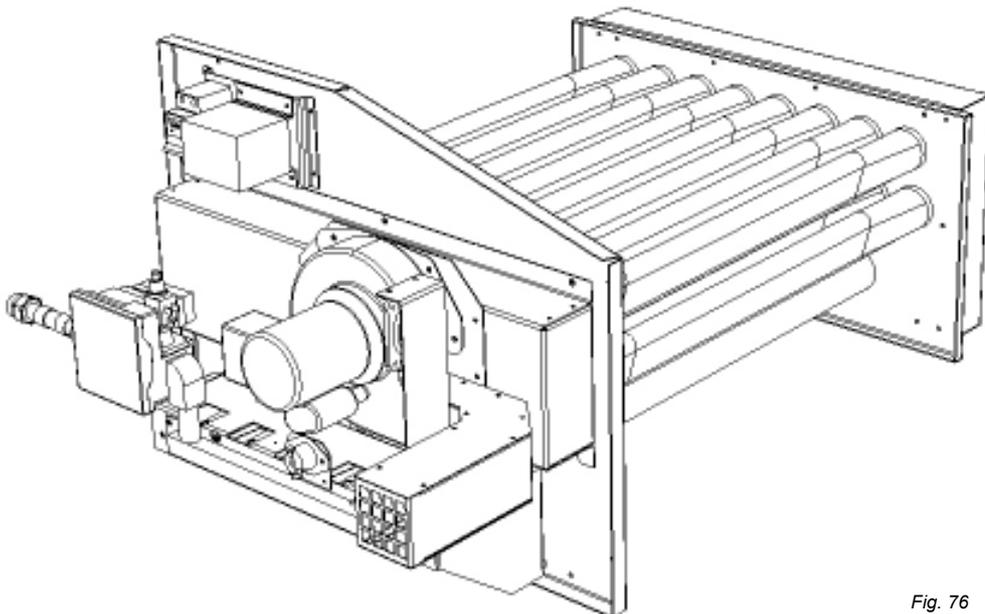
Fig. 76

GAS MODULE-20KW-C-BOX
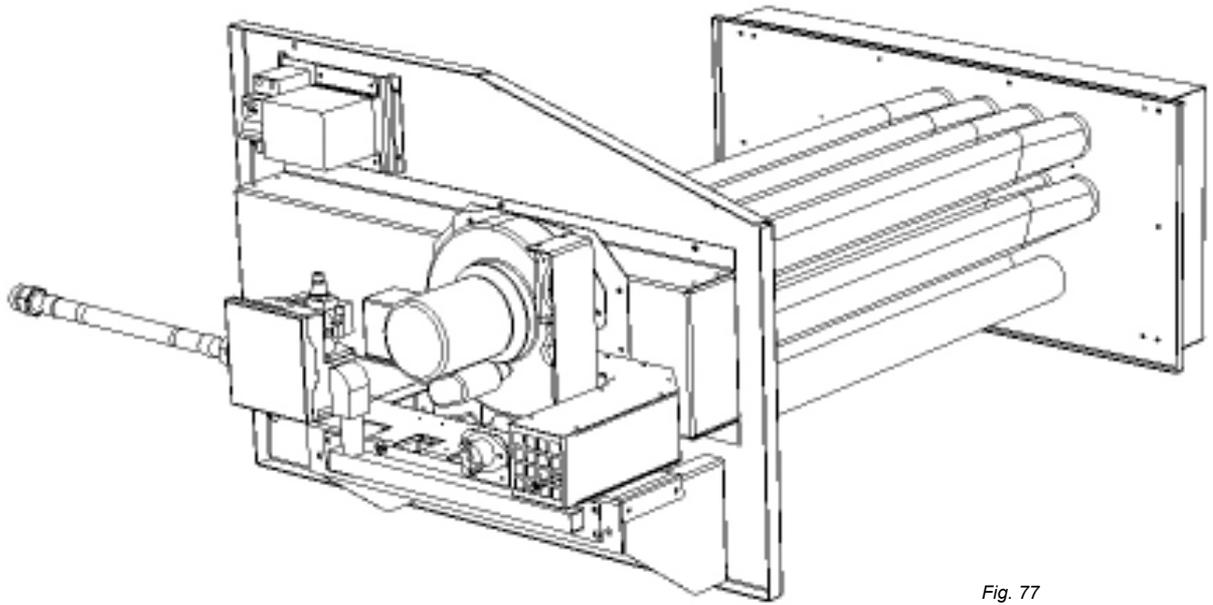
Fig. 77

GAS MODULE-46KW-C-BOX
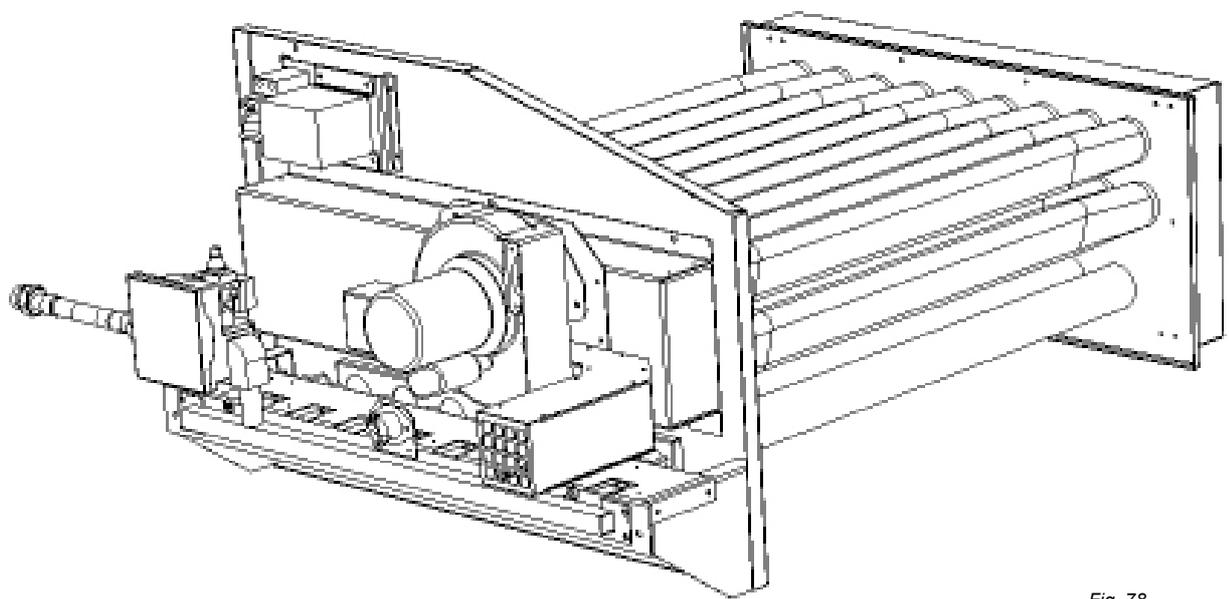
Fig. 78

GAS MODULE-46KW-C-BOX
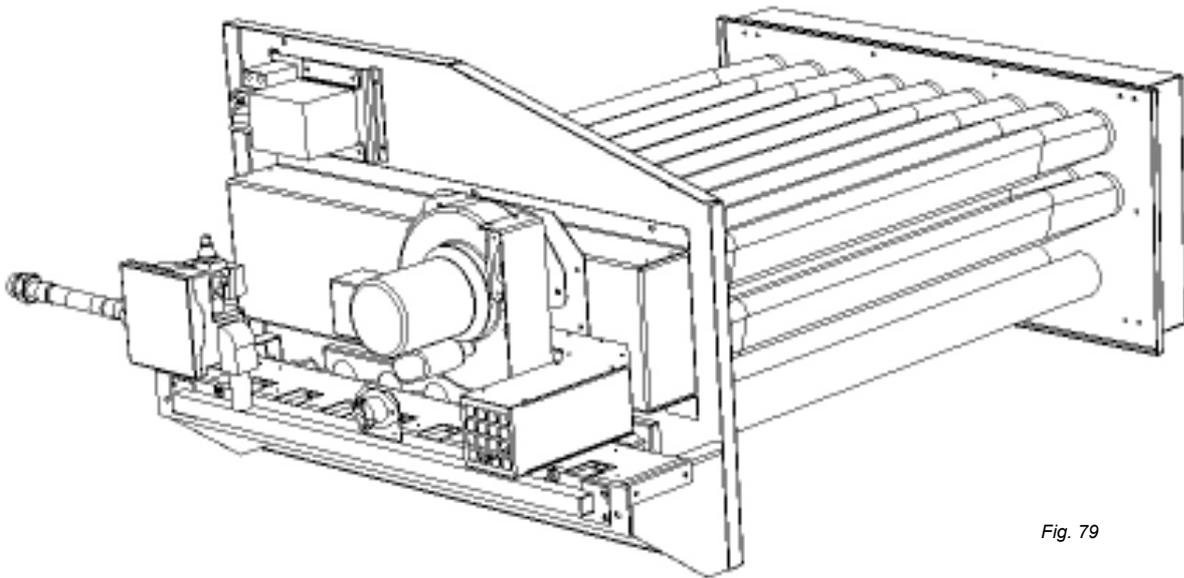
Fig. 79

GAS MODULE-60KW-D-BOX
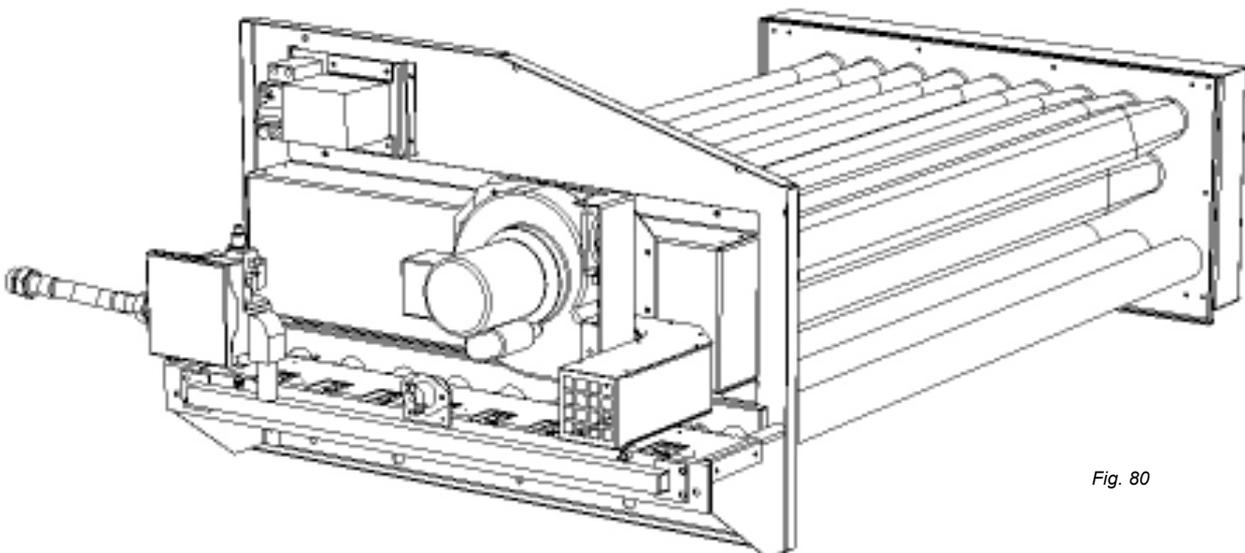
Fig. 80

CLIMATIC 50

The new generation of microprocessor based control, CLIMATIC™ 50 is fitted to the BALTIC Rooftop range.

It inherits 15 years of technology and field operating experience from its predecessors the CLIMATIC™1 and CLIMATIC™ 2. LENNOX has found the latest hardware technology available on the market place and developed a software specifically designed for Rooftop applications, maximising the LENNOX Rooftop efficiency and performance.

COMMUNICATION LINKS

Master / Slave

Rooftop can now be connected together (up to 12) via a double shielded pair of wire (0.75mm2 not supplied by Lennox) and use different running modes, as explained bellow, with no cost increase.

Fig. 81
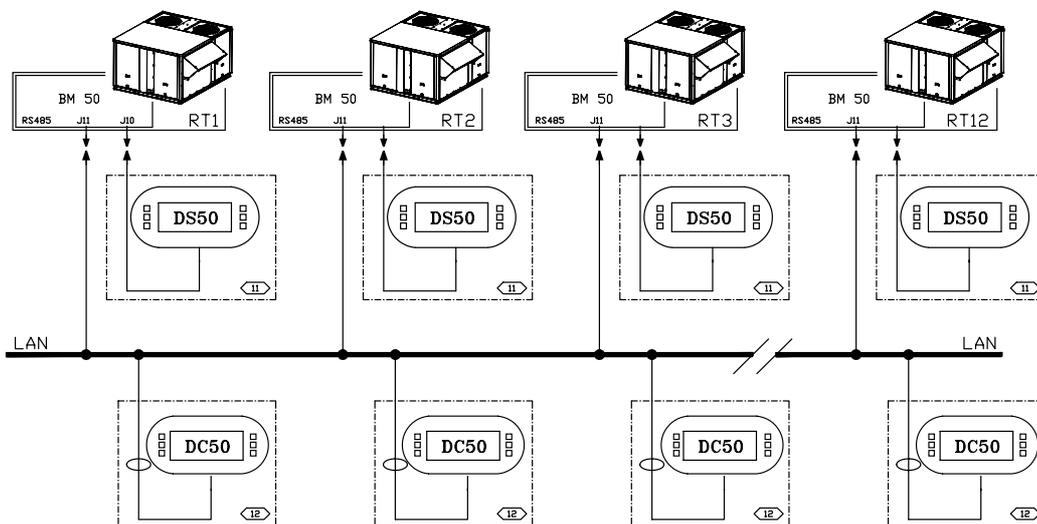
Table 7

	FAN	SET POINT	ROOM TEMP	COOLING HEAT MODE
1.Total master / slave	MASTER	MASTER	MASTER	N/A
2. Master / slave temperature	MASTER	STAND ALONE	MASTER	N/A
3 Master / slave average	MASTER	STAND ALONE	AVERAGE	N/A
4 Master / slave heating / cooling	STAND ALONE	STAND ALONE	STAND ALONE	MASTER
5 Back-up	All units are stand alone one unit is waiting for a failure to start			
6 Rolling Back-up	All units are stand alone, one unit is waiting for a failure to start. This back-up unit changes every Tuesday			

_ 1 : Master slave mode "total"

The master gives the ventilation order, its set point and its room temperature/humidity to all other rooftops.

_ 2 : Master slave mode "temperature"

The master gives the ventilation order and its room temperature/humidity to all other rooftops, but they have their own set point.

_ 3 : Master slave mode "average"

The master gives the ventilation order and the room temperature/humidity used by all rooftop is the average of all rooftop. Each rooftop has its own set point.

_ 4 : Master slave mode "cooling/heating"

All rooftop are stand-alone but the slaves have to have the same running mode as the master (Cooling or heating).

_ 5 : Back-up mode

One rooftop is the back-up unit and will operate if any of the other rooftop has a failure.

_ 6 : Rolling Back-up mode

Same as above, except the "back-up" unit will be different each Tuesday. On top of that, the outside temperature/humidity given to all rooftop can either be the average of rooftop or be the external humidity/temperature of the master, making possible the use of a single "weather station" for the whole site.DS50 Comfort Display / DC50 Service Display.

DS 50 : SERVICE DISPLAY / DC 50 : COMFORT DISPLAY

Fig. 82
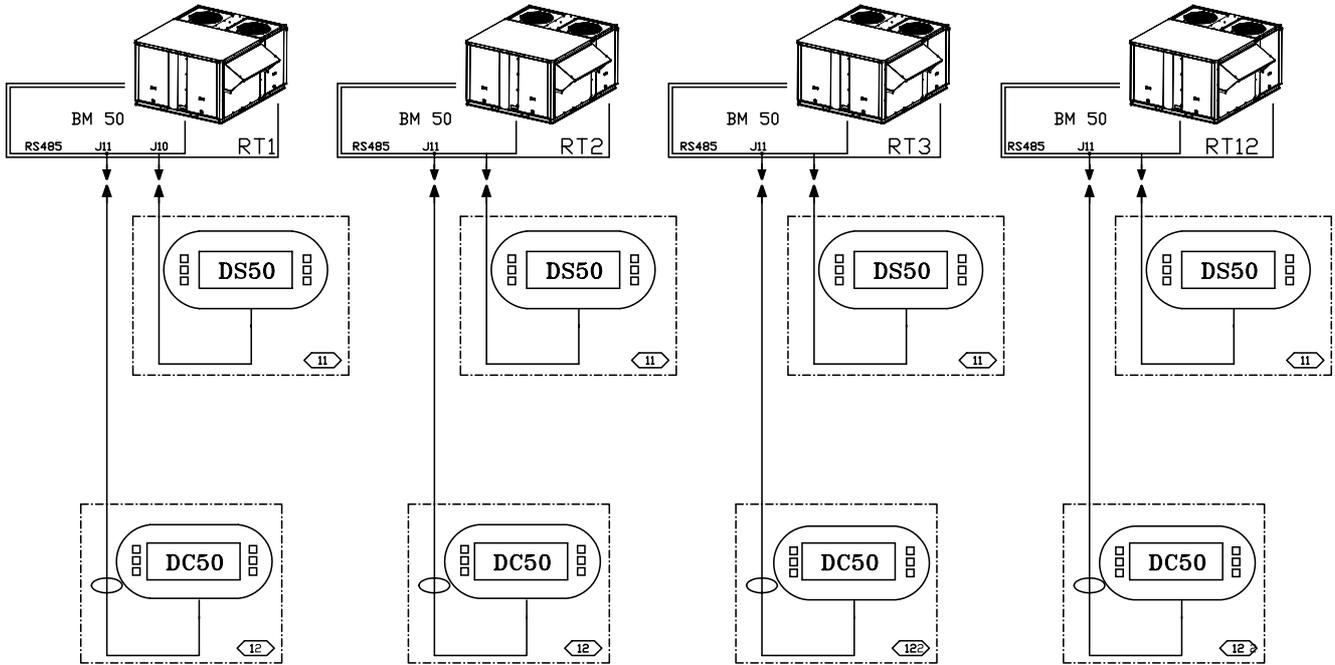
CLIMALINK / CLIMALOOK

Fig. 83
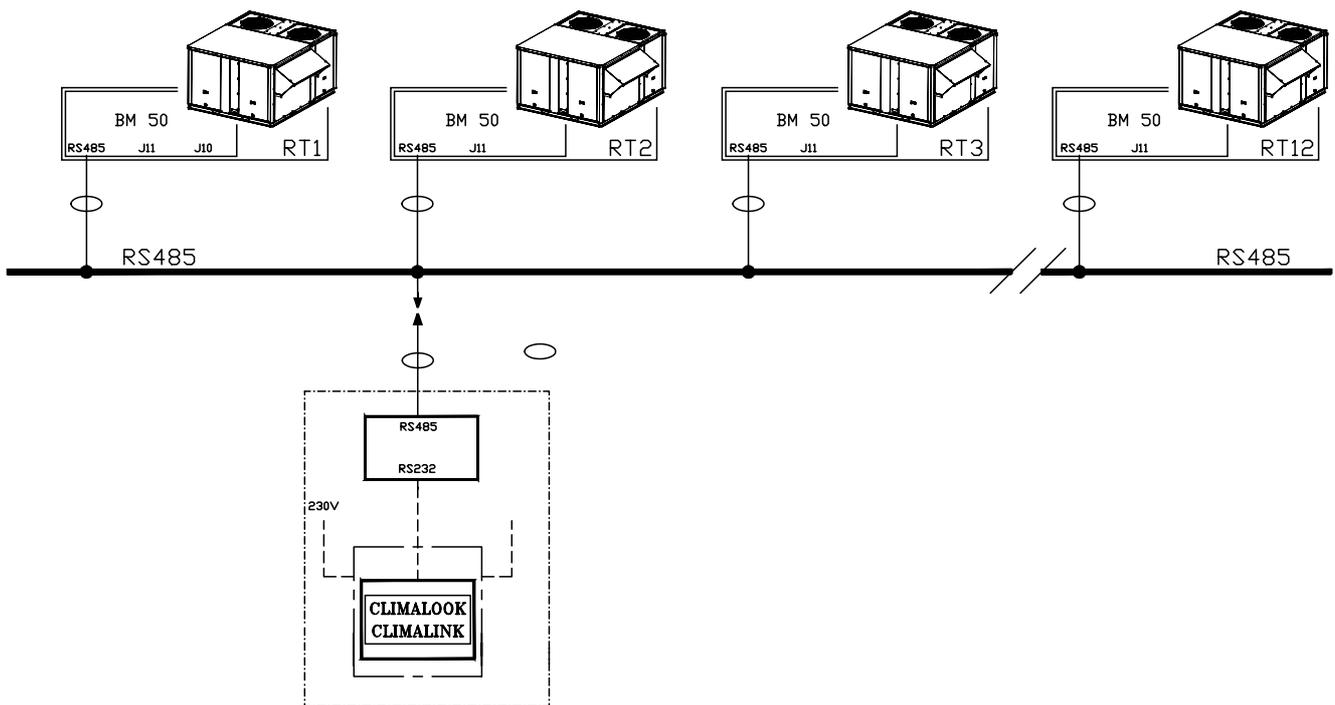
CLIMATIC 50 SOFTWARE FEATURES AND LOGIC

CLIMATIC™ 50 provides flexibility and the ability to control multiple Rooftops on a single site.
Enhanced with a 16 bit processor at 14Mhz and a 2 Megabytes flash memory, CLIMATIC™ 50 has been designed to save energy and to extend the operational life of the BALTIC product range. It is able to control 50 fault signals and manage security algorithms generating various fault signals. In terms of comfort, CLIMATIC™ 50 provides an innovative PI control.
CLIMATIC™ 50 offers incredible flexibility. For example, advanced users can go in the heart of the regulation and adjust the reactivity of the PI algorithm or set the supply temperature limits .

As a standard feature, CLIMATIC™50 provides 4 scheduling time zones per day on 7 days. On each of the 4 time zones, heating set point, cooling set point, minimum fresh air, humidity set point high and up, and even the different authorisations for cooling and heating can be adjusted. CLIMATIC™ 50 provides a choice of different remote displays depending on customer requirement and application of the system. As a standard feature, it is possible to set alarms (adjustable value low and high) on room temperature and humidity.

CONTROL SOFTWARE LOGIC
With the CLIMATIC™ 50 Lennox is going away from the traditional step control

Capacity factor
It is used to determine the exact capacity required at any time in order to react quicker and more accurately to any change in demand.
The capacity factor is a percentage of the total cooling or heating capacity.

Example:
On a three circuit rooftop unit with two compressors running out of three has a capacity factor of 66%
In the same way, a three circuit rooftop with a modulating electric heater running at 20% of its full capacity has a CF:
CF = 25%+25%+25%+5% = 80%

The Capacity factor will increase, decrease, or freeze depending on the temperature difference between the set point and the room temperature but also on the way this room temperature is changing:


Fig. 84

Δ   tnioP teS / pmeT mooR

+4	**CAPACITY FACTOR IS FROZEN**	**CAPACITY FACTOR IS INCREASED (ADD CAPACITY)**
+2		
0		
-2	**CAPACITY FACTOR IS DECREASED (REDUCE CAPACITY)**	**CAPACITY FACTOR IS FROZEN**
-4		

Room Temp / Decreasing   Room Temp / Increasing
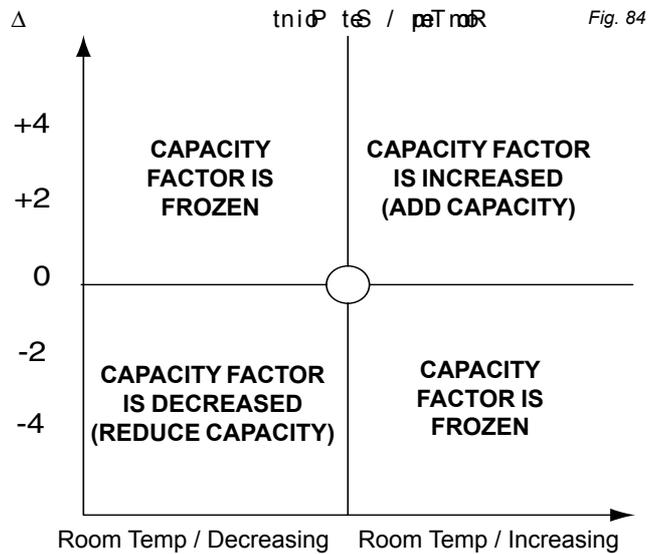
Example:
The room set point is 25°C with a 3 compressor unit.

Table 8

Delta vs room set point	Room Temp.	Cap. factor	COMP 1	COMP 2	COMP 3
+0	Increasing	0%	OFF	OFF	OFF
+1	Increasing	35%	ON	OFF	OFF
+2	Increasing	70%	ON	ON	OFF
+3	Increasing	100%	ON	ON	ON
+2	Decreasing	100%	ON	ON	ON
+1	Decreasing	100%	ON	ON	ON
0	Decreasing	100%	ON	ON	ON
-1	Decreasing	60%	ON	ON	OFF
0	Increasing	60%	ON	ON	OFF

Reactivity.
The reactivity determines how fast the capacity factor should vary.
It is given in: Percentage of capacity / >Degree °C (Room Temp. VS Set Point) / minute

Example :
If the reactivity is set to 3 % / °C / min
Then:
Capacity factor can go from 0 to 30% in 10 minutes if Room Temp. VS Set Point is 1°C
Or capacity factor will go from 0 to 60 % in 4 minutes if Room Temp. VS Set Point is 5°C

The reactivity can be adjusted with the CLIMATIC™ 50 The larger the reactivity the faster the rooftop will react to a change.

The next table shows the effect of a change of the reactivity on the capacity factor: This shows that by increasing the reactivity, the unit reaches the set point quicker but the energy consumption (capacity factor) is larger.

REACTIVITY : 3   *Table 9*

DELTA +5	15%	75%	100%
DELTA +3	9%	45%	90%
DELTA +1	1%	15%	30%
	1MIN	5MIN	10MIN

REACTIVITY : 6   *Table 10*

DELTA +5	30%	100%	100%
DELTA +3	18%	90%	100%
DELTA +1	2%	30%	60%
	1MIN	5MIN	10MIN

OTHER FEATURES

Dynamic Set Point

This feature allows the set point to change according to the outside temperature.

Example:
If the set point is 25°C
And the dynamic set point is set to 6°C

Then, when the outdoor temperature reaches: 31°C (25°C + 6°C) the set point will follow the outdoor temperature with a 6°C temperature difference.

Fig.85
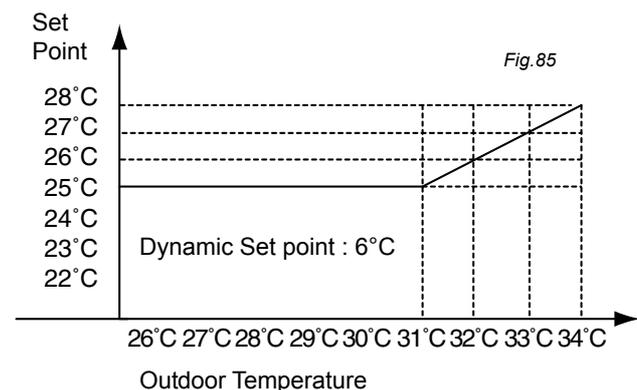
If you do not want to use this feature, set the dynamic set point to 99

Time Zones and scheduling

With the Climatic50 the scheduling has been completely reviewed:
The first day of the week is Monday.
Automatic switch from winter time to summer time.
Unoccupied mode from one to seven days
Three occupied and one unoccupied zone per day

For each zone a series of set points and feature can be adjusted or selected, depending on the type of display which is being used.

Table 11

LIST OF SET POINTS PER ZONE	CONFORT DISPLAY	SERVICE DISPLAY
AMBIANT TEMPERATURE		
Average set point	Yes	Yes
Dynamic Set Point	Yes	Yes
Cooling Set Point	0	Yes
Heating Set point	0	Yes
Heating Priority	0	Yes
FRESH AIR REHEAT activated	0	Yes
Heating priority	0	Yes
HUMIDITY		
Dehumidification	0	Yes
Humidification	0	Yes
AUTHORIZATION		
Free Cooling	0	Yes
Fresh Air by CO2	0	Yes
Mechanical cooling	0	Yes
Mechanical heating	0	Yes
Auxiliary heating	0	Yes
OTHER		
Fan Mode :On / Off / Auto	0	Yes
Minimum fresh air (%)	Yes	Yes
SCHEDULING		
Beginning of the zone for each day	Yes	Yes

Table 12

	8h00	12h00	14h00	20h00	
Monday	**Unoc.**	ZA	ZB	ZC	**Unoc.**
Tuesday					
Wed.					
Thursday					
Friday					
Saturday					
Sunday					

Each zone is determined by its starting time.

Forced modes

3 hours Override
A three hours override period can be forced on the CLIMATIC™50:
With this feature, a new room temperature set point and fresh air requirement can be imposed for a three hour period; It will then revert to the original setting at the end of the override period or earlier by switching off the override on the controller display.

Forced unoccupied zone.
The unoccupied zone settings can be forced for a period of up to seven days. It will then revert to the original settings at the end of the defined period or earlier by switching off the forced unoccupied mode on the controller display.

Heating priorities
It is possible to set heating priorities depending on the outdoor temperature.

Example:
It could be decided based on energy costs, that on a dual fuel unit, it should run in heat pump mode when the temperature is above 0°C and switch to gas burner below that point.

Staggered start

After a power cut, the units can be made to restart one after the other to prevent any current surge.
There is no need for a link between the units, they just have to be given an address during commissioning and they will restart 10 seconds x their "address number" after the power is switched back on.

Example:
If a unit is given the address N°3 it will be switched-on 30 seconds (3 x 10sec) after the power is switched back on.

Fresh air adjustment and calibration on Economiser

The actual fresh air volume brought into the system is not always proportional to the percentage of opening of the fresh air damper. That is particularly true when the return air duct system has been sized to produce excessive pressure drop.
This often results in bringing into the system an excessive amount of fresh air, hence increasing the running cost of the system.

Fig.86
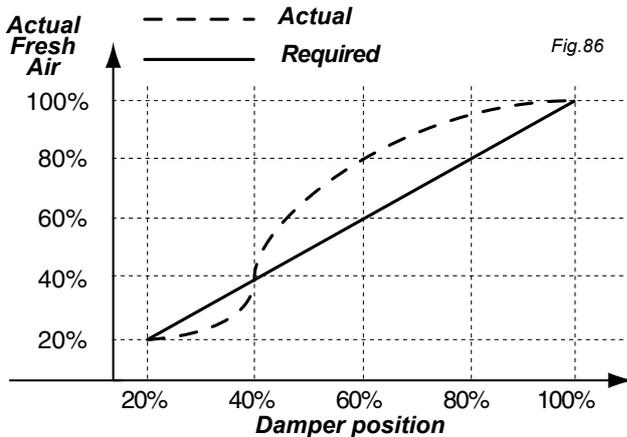
The control of fresh air is now achieved through the use of three temperature sensors: One in the supply air flow, one in the return air and one for the outdoor temperature.
Using these three sensors, the Climatic50 will calculate and memorise the exact percentage of fresh air for each position of the damper.

$$T_{supply\ air} = T_{return\ air} \times \%_{Return\ air} + T_{fresh\ air} \times \%_{fresh\ air}$$

The calibration sequence will take place periodically when all cooling or heating inputs are off.

Dynamic Defrost

This new feature patented under INPI 91.033.063 allows the unit to start the defrost cycle only when required.
This is achieved through the measurement of the temperature difference between the coil and the outdoor.

The defrost will be initiated shortly after the Climatic50 has located the largest gradient in the curve.

The defrost cycle ends when one of these two condition is completed whichever comes first:
+ Three defrost cycles max.
+ 4 minutes.

Fig.87
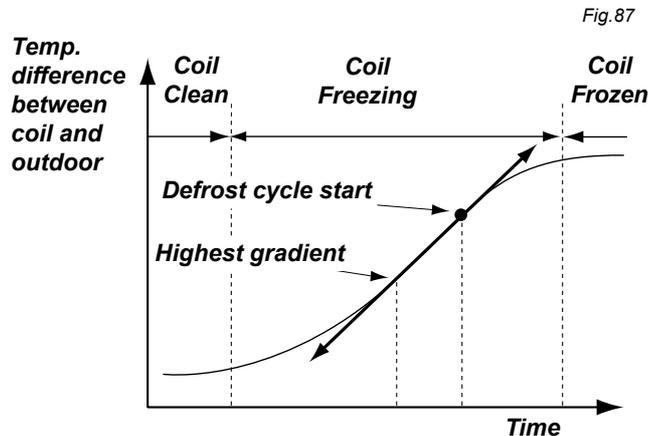
Alternate defrost

All dual circuits Baltic units have "Alternate Defrost" as a standard feature.
When one circuit is going through a defrost cycle the second circuit is running in heat pump mode. This reduces the need for costly electric heater to maintain the supply air temperature to an acceptable level of comfort during the defrost cycles.

Fig.88
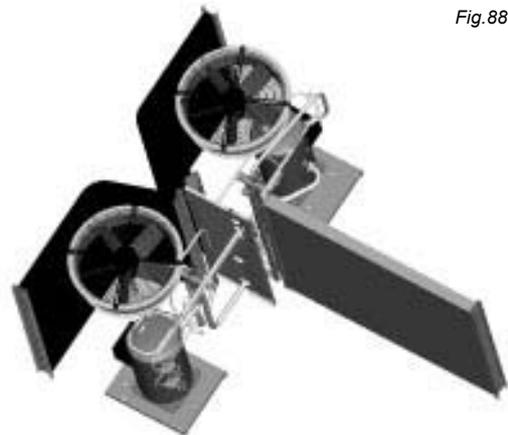
CONTROL INTERFACES AND DISPLAYS
DC50 COMFORT DISPLAY

This is a remote controller for non-technical customer. This display give information such as running mode status of the fan, set point, % of fresh air and outside air temperature.
It can be used to set or change the scheduling of the different time zones, the temperature set point, and the % of fresh air for each zone. It also has the capacity to set a 3 hours override and to force the unoccupied mode for up to 7 days. It displays the real time clock and different faults signals.

Keys

Time zone settings
Increase a value or go to "Override menu"

Set time

Change field or validate

24.2°C ON

FA:20% DynFan:Auto
Out:40.0°C Z:A Cool

Back to main Screen or Cancel "Override"

Decrease a value or go to "Override menu"

Main Screen

Room Temp

Dynamic Set Point Activated

Fan status

Fan auto means that fan will stop if there is no demand for cooling or heating.

Actual Fresh Air

24.2°C ON

FA:20% DynFan:Auto
Out:40.0°C Z:A Cool

Outdoor air temperature

Current Time zone
Z:A
Z:B
Z:C
Uno
Ove
BMS

Unit operating Mode : Cool or Heat

Override 3 hours :

From main screen press any of the two arrow keys as shown bellow:

Main screen :

24.2°C ON

FA:20% DynFan:Auto
Out:40.0°C Z:A Cool

Override menu :

Increase

Override 3 hours
Room SP : 24.0°C
Mini FA : 20%
Unoc :

Valid / Go next line

Valid go main screen

Decrease
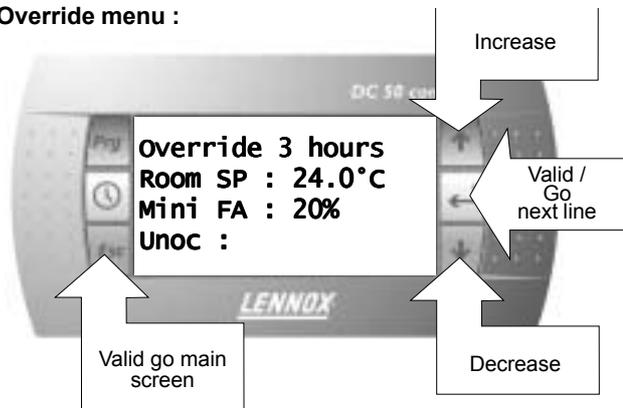
It will revert back to main screen after 15 seconds, if no activity

Forced Unoccupied zone :
Select "unoc" in the override menu and validate
UP to 7 days unoccupied period (starting from current day).

Set unoccupied Period
Room SP : 24.0°C
Mini FA : 20%
Uno :M T W T F S S

+1 day unoccupied

Valid

-1 day unoccupied
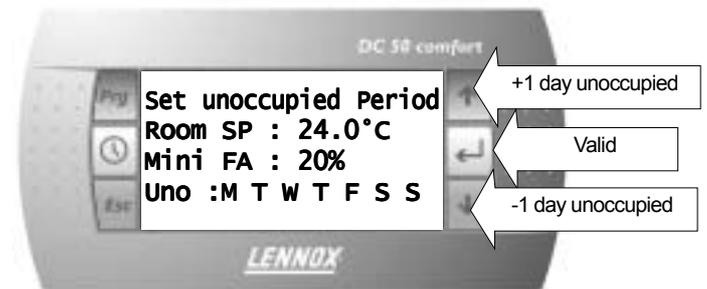
Clock Menu :

From main screen press the clock key, the following menu appears:

12 h 24

Thursday March 27

Increase

Valid

Decrease
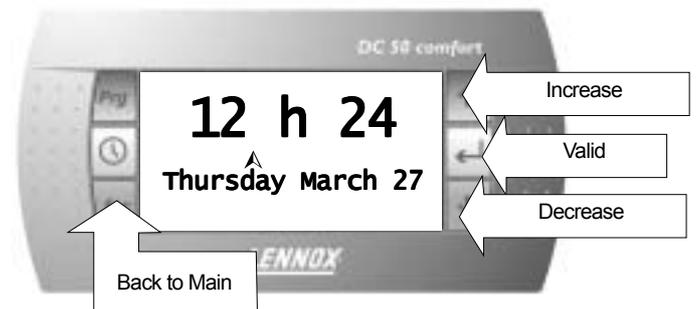
Back to Main

"Time Zone" Menu

From main screen press the "Prg" key, the following menu appears:

Schedule — Increase — Change Time zone — Valid / Go next line — Back to main — Decrease

```
Time zone : A
ROOM SP : 24.0°C
Min FA : 20%
```

It will reverts back to main screen after 15 seconds if no activity.

"Scheduling" Menu

The scheduling menu can be accessed from the "time zone" menu by pressing "Prg" again

Increase — Change day — Valid / Go next line — Back to main — Decrease

```
Day : Monday
Start
ZA:8h00 Z.B.12h00
ZC:22h00 uno:22h00
```

Alarm screen

Filter Alarm: All keys are locked, the only way to escape this screen is to clean the filter

RED — AMBER

```
24.2°C ON
Alarm : Filter
Clean filter
```

Major Alarm

RED — AMBER — Alarms History

```
24.2°C OFF
Alarm : MAJOR
call for maintenance
```

Alarm History Menu

RED — AMBER — Alarms Detail

```
Alarm 02
01-03/03.12h10*127
02 ➢ 03/03.12h05*127
03-27/02.12h03 = 127
```

You can scroll down this menu using the arrow keys and select one of the alarm message by pressing the return key.

Alarm details

This menu allows you to view details on the selected fault as shown below:

RED — AMBER

```
Alarm 00
03/03 12h05*125
Compressor 2
High Pres./Elec.Power
```
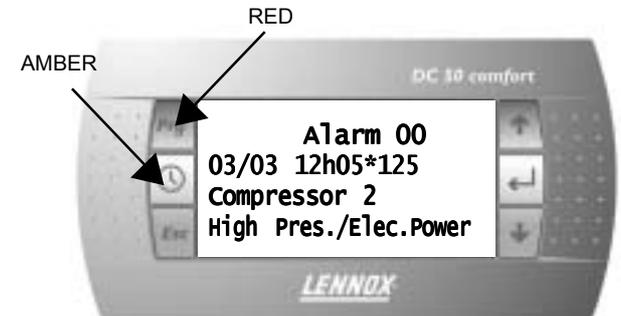
Switching ON and OFF the unit

Pressing the return key on the main screen will display the following message:

WARNING : Switching Off the unit disable all safety Protections

```
Do you want to
switch off the unit ?
NO
```

Move up and down to display "YES" then pressing the return key again will switch off the unit.

```
24.2°C OFF
```
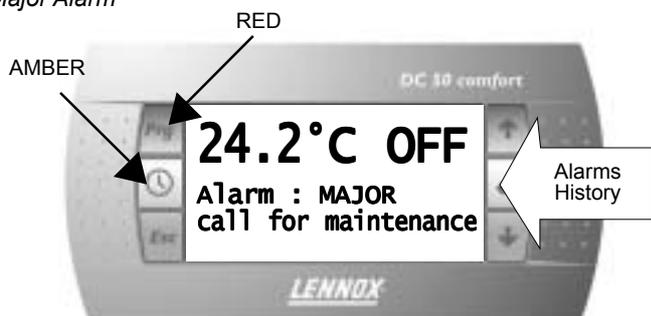
It can then be switched back ON by pressing the return key once more.

DS50 SERVICE DISPLAY

This new service display controller is a plug and play feature but it can also be remotely installed.
Plugging the DS50 will freeze a DC50

Keys

Short cut to alarm menu

Move up in a menu or increase a value

Change Time zone

Language ⋀ or ⋁
ENGLISH
RT 050.001
BIOS. 0000 Boot 0000

Enter Valid Select

Go back to screen (1)

Move down in a menu or decrease value

Start up screen or Screen(1)

LENNOX SERVICE TOOL

Press Prg to start

Screen (2) language selection

Start

Language ⋀ or ⋁
ENGLISH
RT 050.001
BIOS. 0000 Boot 0000
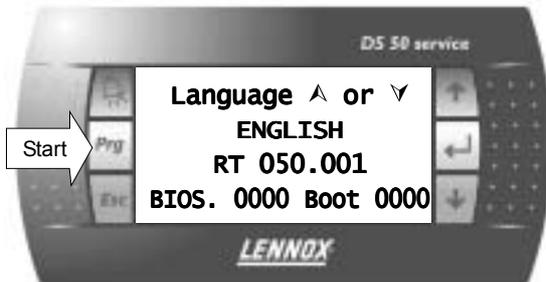
Five languages are available in addition to English. The required language must be specified at the time of order. In this menu the specified language can be selected using the up and down keys. The "prg" key validates the choice and start the controller.

Select item Capital letter

Rooftop Number

Current Time zone

(0000)01   ZoneA
1-ALARM   12h44
2-Data   Tuesday
3-Setting   April 03

Main menu (0000)

Moving down the menus

Pressing the arrow keys allows you to move up and down the menu tree. The selected item changes to CAPITAL letter. It can then be selected by pressing the "return" or "select" key.

(0000)01   ZoneA
1-ALARM   12h44
2-Data   Tuesday
3-Setting   April 03

Down

(0000)01   ZoneA
1-ALARM   12h44
2-Data   Tuesday
3-Setting   April 03

SELECT

Sub-menu Data (2000)

Menu reference

(2000)01
1-GENERAL
2-Control
3 ⋁ Information
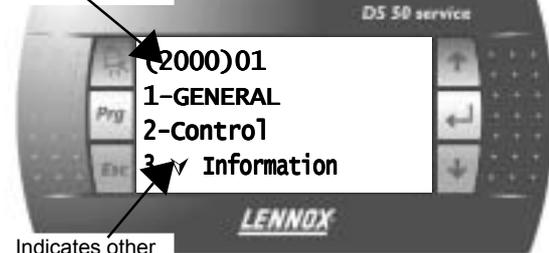
Indicates other menus below

If the menu GENERAL is selected, the controller then displays a second level sub-menu.

By selecting the item TEMPERATURE and pressing return, a third

(2100)01
1-TEMPERATURE
2-Humidity
3-Other
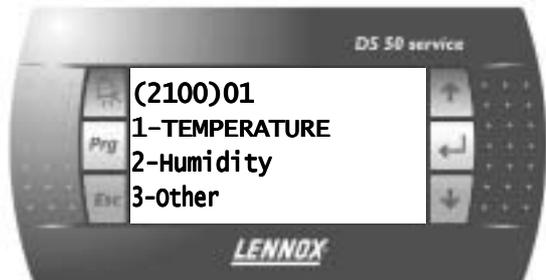
level page is displayed as shown bellow:

(2110)01
1-OUTSIDE   40°C
2-Room   24.5°C
3-Supply   10.0°C

3 x
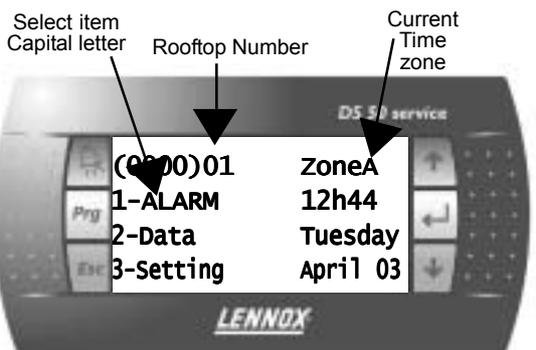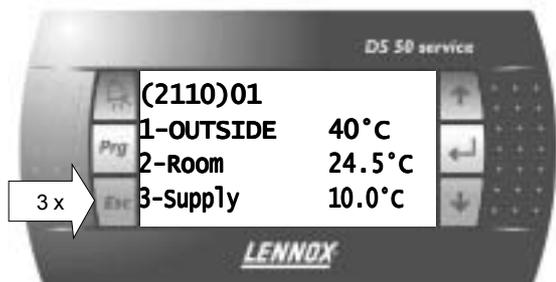
Pressing "ESC" at any time sends you back one level up the menu tree. In the example shown above "ESC" must be pressed 3 times to go back to the main menu (0000) Pressing "ESC" will invalidate any changes made to a value in a setting page.

Alarms
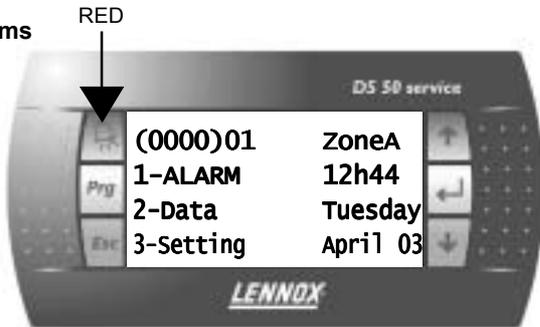
Select the alarm menu using the arrow keys and press return.
The faults history is then displayed in the page (1000):
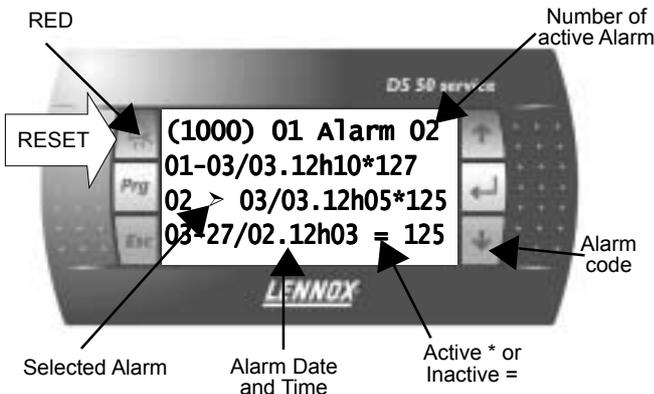
Pressing the "ALARM" key resets all the alarms
The number of active alarms goes to 0, no active alarm shown in the menu, the "bell" key is switched off.
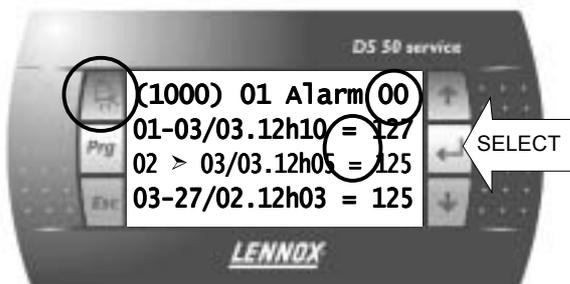
Pressing the "return" key will display details of the selected alarm

Clock settings

The clock setting menu can be accessed from the main menu by selecting the menu "SETTING" and then navigating down through the sub-menus until page (3120).
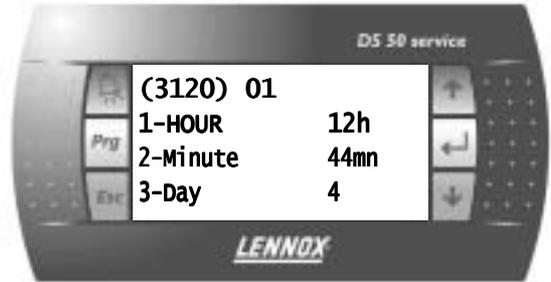
Selecting the HOUR for displays the page 3121 shown bellow:
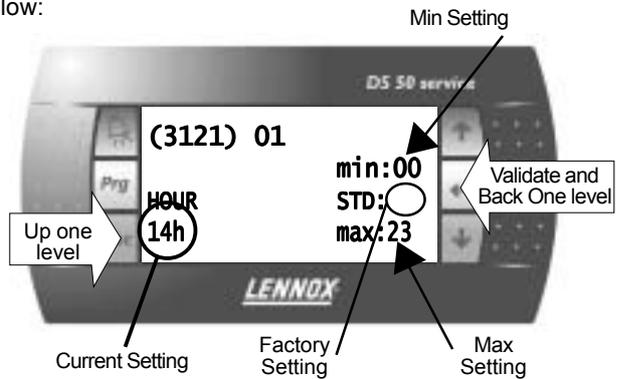
Zone Settings

From Main menu (0000) navigate down to sub-menu "SETTINGS", zone settings (3310).
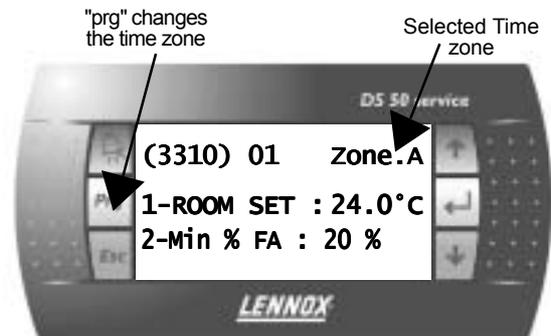
In this particular page, pressing the "prg" key, changes the time zone. If "ROOM SET" is selected, this displays the room set point for the specific time zone shown in the top corner.
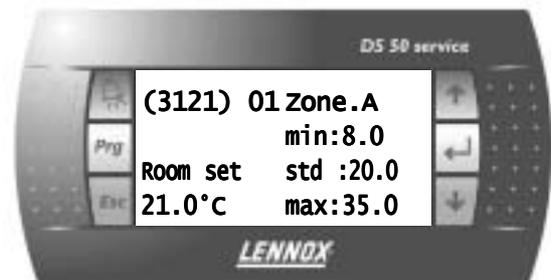
Pressing the "prg" validates any changes made, and move to the next time zone. "ESC" does not validate the changes and move back one step in the menu tree.

Table 13

Main Screen	Code	Description	Code	Description	Code	Description	Code	UNIT	Min	Factory	Max
1-Alarm	1000	1-(date).(time)	**1100**								
		2-(date).(time)	**1200**								
		3-(date).(time)	**1300**								
2-Data	2000	1-General	**2100**	1-Temperature	**2110**	Outside		°C			
						Room		°C			
						Supply		°C			
						Return		°C			
					2-Humidity	**2120**	Outside		%.		
						Room		%.			
						Outside		g/kg			
						Room		g/kg			
					3-Other	**2130**	Air Pres.		Pa		
						CO2		ppm			
						Sw On/Off		On/Off			
						Sw Reset		On/Off			
						Sw Unoc.		On/Off			
					4-Customized	**2140**	Temp. 1		°C		
						Temp. 2		°C			
						Temp. 3		°C			
						Temp. 4		°C			
						Humi. 1		%.			
						Humi. 2		%.			
						Humi. 3		%.			
						Humi. 4		%.			
					5-Customized	**2150**	Switch 1		On/Off		
						Switch 2		On/Off			
						Switch 3		On/Off			
						Switch 4		On/Off			
						Switch 5		On/Off			
						Switch 6		On/Off			
					6-Customized	**2160**	Relay 1		On/Off		
						Relay 2		On/Off			
						Relay 3		On/Off			
						Relay 4		On/Off			
						Relay 5		On/Off			
		2-Control	2200	1-Room	**2210**	Sp Cool		°C			
						Sp Heat		°C			
						Capa Cool		%			
						Capa Heat		%			
						Sw Dis.Cool		On/Off			
						Sw Dis.Heat		On/Off			
				2-Reheat	**2220**	Set Point		°C		
						Capacity		%			
				3-Humidity	**2230**	Sp Dehu		%		
						Sp Humi		%			
						Capa Dehu		%			
						Capa Humi		%			
				4-TCB	**2240**	Sw G		On/Off		
						Sw Y1		On/Off			
						Sw Y2		On/Off			
						Sw W1		On/Off			
						Sw W2		On/Off			
						Sw B		On/Off			

Main Screen Code	Description	Code	Description	Code	Description	Code	UNIT	Min	Factory	Max
	3-Fan	**2300**	1-Ventilation	**2310**	Config.		List			
					State		List			
					Sw State		On/Off			
					Fire/Smoke		On/Off			
					Relay		On/Off			
					Low Speed		On/Off			
					Sw Speed		On/Off			
			2-Extraction	**2320**	State		List			
					Relay		On/Off			
			3-Condenser 1	**2330**	Config.		List			
					State		List			
					Sw State		On/Off			
					Relay		On/Off			
			4-Condenser 2	**2340**	Config.		List			
					State		List			
					Sw State		On/Off			
					Relay		On/Off			
			5-Condenser 3	**2350**	Config.		List			
					State		List			
					Sw State		On/Off			
					Relay		On/Off			
			6-Condenser 4	**2360**	Config.		List			
					State		List			
					Sw State		On/Off			
					Relay		On/Off			
	4-Fresh Air			**2410**	Config.		List			
					State		List			
					Opening		%			
	5-Compressor	**2500**	1-Compressor 1	**2510**	Config.		List			
					State		List			
					Defrost T		°C			
					Sw State		On/Off			
					Sw Low P.		On/Off			
					Relay		On/Off			
					H.Pump		On/Off			
					Sw Disable		On/Off			
			2-Compressor 2	**2520**	Config.		List			
					State		List			
					Defrost T.		°C			
					Sw State		On/Off			
					Sw Low P.		On/Off			
					Relay		On/Off			
					H.Pump		On/Off			
					Sw Disable		On/Off			
			3-Compressor 3	**2530**	Config.		List			
					State		List			
					Defrost T.		°C			
					Sw State		On/Off			
					Sw Low P.		On/Off			
					Relay		On/Off			
					H.Pump		On/Off			
					Sw Disable		On/Off			
			4-Compressor 4	**2540**	Config.		List			
					State		List			
					Defrost T.		°C			
					Sw State		On/Off			
					Sw Low P.		On/Off			
					Relay		On/Off			
					H.Pump		On/Off			
					Sw Disable		On/Off			

Main Screen Code	Description	Code	Description	Code	Description	Code	UNIT	Min	Factory	Max
			5-Other	2550	Low Amb.		On/Off			
					W/Cond.1		°C			
					W/Cond.2		°C			
	6-Aux. Heater	2600	1-Gas	2610	Config.		List			
					State		List			
					Sw State 1		On/Off			
					Sw State 2		On/Off			
					Relay 1		On/Off			
					Relay 2		On/Off			
					High		On/Off			
					Modulat.		%			
					Sw Disable		On/Off			
			2-Elec. H.	2620	Config.		List			
					State		List			
					Sw State 1		On/Off			
					Sw State 2		On/Off			
					Relay 1		On/Off			
					Relay 2		On/Off			
					Modulat.		%			
					Sw Disable		On/Off			
			3-Hot W/Coil	2630	Config.		List			
					State		List			
					Opening		%			
					Sw Freeze		On/Off			
					Sw Disable		On/Off			
			4-Pump	2640	Config.		List			
					State		List			
					Sw State		On/Off			
					Relay		On/Off			
	7-Humidif.			2710	Config.		List			
					State		List			
					Sw State		On/Off			
					Modulat.		%			
	8-Com.	2800	1-Outside	2810	Value		°C			
					Sensor		°C			
					Link		°C			
					BMS		°C			
					Value		%.			
					Sensor		%.			
					Link		%.			
					BMS		%.			
			2-Room	2820	Value		°C			
					Sensor		°C			
					Link		°C			
					BMS		°C			
					Value		%.			
					Sensor		%.			
					Link		%.			
					BMS		%.			

Main Screen Code	Description	Code	Description	Code	Description	Code	Description	Code	UNIT	Min	Factory	Max	description
3000	3-Setting	3100	1-General	3110	1-Order	1-On/Off		3111	On/Off	~	Off	~	*[On / Off] Unit
						2-Reset Al.		3112	On/Off	~	Off	~	*[Reset] Discharges the safety measures of the unit
						3-Resume		3113	On/Off	~	Off	~	*[Override] Cancel any override action set with the DC50
						4-Test		3114	List	0	0	2	*[TEST] Test set point "LENNOX"
				3120	2-Clock	1-Hour		3121	h	0	~	23	*[Clock] Clock setting "Hour"
						2-Minute		3122	m	0	~	59	*[Clock] Clock setting "Minute"
						3-Day		3123	~	1	~	31	*[Clock] Clock setting "Day"
						4-Month		3124	~	1	~	12	*[Clock] Clock setting "Month"
						5-Year		3125	~	2	~	99	*[Clock] Clock setting "Year"
		3200	2-Schedule	3210	1-Time	1-Start Uno		3211	h	0	22	23	*[Zone Setting] Starting time "Hour" for "Unoccupied" zone
						2-Start Uno		3212	m	0	0	59	*[Zone Setting] Starting time "Minutes" for "Unoccupied" zone
						3-Start z.A		3213	h	0	6	23	*[Zone Setting] Starting time "Hour" for "Zone A"
						4-Start z.A		3214	m	0	0	59	*[Zone Setting] Starting time "Minutes" for "Zone A"
						5-Start z.B		3215	h	0	22	23	*[Zone Setting] Starting time "Hour" for "Zone B"
						6-Start z.B		3216	m	0	0	59	*[Zone Setting] Starting time "Minutes" for "Zone B"
						7-Start z.C		3217	h	0	22	23	*[Zone Setting] Starting time "Hour" for "Zone C"
						8-Start z.C		3218	m	0	0	59	*[Zone Setting] Starting time "Minutes" for "Zone C"
				3220	2-Anticipation	1-Foot		3221	°C	-10	10	20	*[Anticipation Function] bottom of the slope in °C. Limit of activation of the function. This allows an anticipated startup in the morning depending on the outdoor temperature. Only for the "Zone-A"
						2-Gradient		3222	~	0	0	100	*[Anticipation Function] Slope in "Minutes of anticipation per degrees".This allows an anticipated startup in the morning depending on the outdoor temperature.Only for the "Zone-A"
		3300	3-Control	3310	1-Customer	1-Sp Room		3311(1)	°C	8	20	35	*[Room SP] Required room temperature set point in °C. Middle of the dead zone.
						2-Mini.Air		3312(1)	%	0	20	100	[Room SP] Required room minimum fresh air rate in % Middle of the dead zone.
				3320	2-Room	1-Sp Dyna		3321(1)	°C	0	99,9	99,9	*[Room SP] Required value for the Dynamic Set Point. Allows the room set point to change according to outdoor temperature
						2-Sp Cool		3322(1)	°C	8	21	35	*[Room SP] Required maximum room temperature in °C. Cooling set point
						3-Sp Heat		3323(1)	°C	8	19	35	*[Room SP] Required minimum room temperature in °C. Heating set point
						4-Swap Heater		3324(1)	On/Off	~	Off	~	*[OFF] Heat Pump and then Heater [ON] Heater and then Heat Pump
				3330	3-Reheat	1-Activation		3331(1)	On/Off	~	Off	~	*[F-Air Reheat] Activate reheating of the fresh air in the dead zone to maintain supply temperature.
						2-Swap Heater		3332(1)	On/Off	~	Off	~	*[F-Air Reheat] Prioritise the heating mode for fresh air reheat. [OFF] Heat Pump and then Heater [ON] Heater and then Heat Pump
				3340		1-Sp Dehu		3341(1)	%	0	100	100	*[Humidity] Desired Maximum relative humidity in Room (in %). – Dehumidification set point.
						2-Sp Humi		3342(1)	%	0	0	100	*[Humidity] Desired Minimum relative humidity in Room (in %). – Humidification set point.

ALL CODES SHOWING (1) CAN BE ADJUSTED FOR EACH TIME ZONE

ALL CODES SHOWING (1) CAN BE ADJUSTED FOR EACH TIME ZONE

Main Screen Code	Description	Code	Description	Code	Description	Code	UNIT	Min	Factory	Max	description
			5-Enable	3350	1-Fan On/Off	3351(1)	On/Off	~	On	~	*[Enable] Stopping and running of the Fan Blower.[OFF] the blower is stopped, [ON] the blower is running.
					2-Fan Dead	3352(1)	On/Off	~	On	~	*[Enable] Stopping and running of the fan in the "Control Dead Zone". [OFF] the blower is stopped, [ON] the blower is running.
					3-F.Air	3353(1)	On/Off	~	On	~	*[Enable] Run eco: [ON] the Economiser is running, [OFF] the Economiser if stopped.
					4-CO2	3354(1)	On/Off	~	On	~	*[Enable] Run CO2 Sensor: [ON] Switch-on the CO2 on a Zone, [OFF]Stop the CO2 sensor on a zone.
					5-Comp.Cool.	3355(1)	On/Off	~	On	~	*[Enable] [OFF] Force the unloading of compressors in cooling mode.
					6-Comp.Heat.	3356(1)	On/Off	~	On	~	*[Enable] [OFF] Force the unloading of compressors in heating mode.
					7-AuxHeat	3357(1)	On/Off	~	On	~	*[Enable] [OFF] Force the unloading of heating module (electric, gas or heat water coil)
					8-Humidif.	3358(1)	On/Off	~	On	~	*[Enable] [OFF] Force the unloading of humidity control.
					9-Low Noise	3359(1)	On/Off	~	Off	~	*[Enable] Force the noise reduction mode. [ON] 50% of the compressors are unloaded in "Unocupied" zone
			6-Capacity	3360	1-Room	3361	~	1	4	100	*[Capacity Factor] Reactivity : Refer to "Climatic features" in *IOM for details
					2-Reheat	3362	~	1	4	100	*[Capacity Factor] Reactivity: Refer to "Climatic features" in *IOM for details
			7-Safety	3370	1-Room Low	3371	°C	5	5	20	*[Safety Limit] Room temperature "Low Limit" in °C Threshold of activation of an alarm
					2-Room High	3372	°C	20	40	40	*[Safety Limit] Room temperature "High Limit" in °C Threshold of activation of an alarm
					3-Sup.Lo.1	3373	°C	9 or 5	10 or 8	19	*[Safety Limit] Supply temperature low Limit (in °c) - Threshold of activation of the 1° level of security: Reduce the "Capacity Factor" by one stage of compressor and switch to minimum Fresh Air,
					4-Sup.Lo.2	3374	°C	7 or 3	8 or 6	17	*[Safety Limit] Supply temperature low Limit (in °c) - Threshold of activation of the 2° level of security: Reduce the "Capacity Factor" to zero and switch to 0% Fresh Air,open the HWC valve.
					5-Sup.Lo.3	3375	°C	5 or 1	6 or 2	15	*[Safety Limit] Supply temperature low Limit (in °c) - Threshold of activation of the 3° level of security. - Alarm threshold, the unit is switched off.
					6-Sup.Hi.1	3376	°C	20	40	70	*[Safety Limit] Supply temperature high Limit (in °c) - Threshold of activation of the 1° level of security: reduce the capacity factor by one stage of compressor. Close the HWC valve.
					7-Sup.Hi.2	3377	°C	20	60	70	*[Safety Limit] Supply temperature high Limit (in °c) - Threshold of activation of the 2° level of security: Alarm threshold: Reduce the capacity factor to 0
					8-Room Low	3378	%	0	0	100	*[Safety Limit] Room relative humidity low Limit (in %) - Threshold of activation of the alarm
					9-Room High	3379	%	0	100	100	*[Safety Limit] Room humidity high Limit (in %) - Threshold of activation of the alarm
	4-Ventilation			3410	1-Air Flow	3411	Pa	0	25	1000	*[Safety Limit] Airflow Detection Threshold of pressure difference in Pa indicating Low Airflow Rate. If the pressure difference across the filter is lower than this threshold the safety is activated.

Main Screen Code	Description	Code	Description	Code	Description	Code	Description	Code	UNIT	Min	Factory	Max	description
4-Ventilation						3410	1-Air Flow	3411	Pa	0	25	1000	*[Safety Limit] Airflow Detection Threshold of pressure difference in Pa indicating Low Airflow Rate. If the pressure difference across the filter is lower than this threshold the safety is activated.
							2-No Filter	3412	Pa	0	50	1000	*[Safety Limit] Missing Filters. Threshold of pressure difference in Pa indicating absence of filters. If the pressure difference across the filter is lower than this threshold the safety is activated.
							3-Dirty Fil	3413	Pa	0	250	1000	*[Safety Limit] Dirty Filters. Threshold of pressure difference in Pa indicating Filters are Dirty. If the pressure difference across the filter is Higher than this threshold the safety is activated.
5-Fresh Air				3510	1-Out.Limit			3511	°C	-20	0	40	*[Fresh air Damper] mimimum outdoor temperature limit in °C. If the outdoor temperature is lower than this limit the control in free cooling is not allowed. The fresh air damper is then set to the minimum setting.
					2-Maximum			3512	%	0	100	100	*[fresh air Damper] Maximum allowable opening of the fresh air damper in %
					3-Start Ext			3513	%	0	30	100	*[Extraction] Threshold of activation of the power exhaust fan according to the position of the economiser damper in %.
					4-Mini.Co2			3514	ppm	0	1000	2000	*[CO2] Fresh air damper minimum opening threshold in ppm
					5-Maxi.Co2			3515	ppm	0	1500	2000	*[CO2] Fresh air damper maximum opening limit in ppm
6-Compressor		3600	1-Out.Limit	3610	1-Cool. 50			3611	°C	-10 or 10	20	40	*[Limit of Regulation] * 1° If Option Regulation all seasons - Reduction speed of the fans condenser - Threshold of outside temperature (in °c). - If the outside temperature is lower than this threshold the fans condenser function in low speed * 2° If not - Unloading 50% of the Compressors in Cooling - Threshold of outside temperature is lower than this threshold 50% of the compressors are used by the Regulation
					2-Cool.100			3612	°C	-10 or 10	12	40	*[Limit of Regulation] * 1° If Option Regulation all seasons - Stopping of the fans condenser - Threshold of outside temperature (in °c). - If the outside temperature is lower than this threshold the fans condenser are stopped * 2° If not - Unloading 100% of the Compressors in Cold - Threshold of outside temperature is lower than this threshold the compressors are not used by the Regulation
					3-Heat.100			3613	°C	-50	-20	40	*[Limit of Regulation] Unloading 100% of the Compressors in Heating - Threshold of outside temperature (in °c). - If the outside temperature is lower than this threshold the compressors are not used by the Regulation
			2-Defrost	3620	1-Type			3621	List	0	0	1	*[Function Defrost] Choice of defrost: 1 = "cycling" or 0 = "dynamic"
					2-Outside			3622	°C	8	10	20	*[Function Defrost] Authorization of defrost - Threshold of outside temperature (in °c)
					3-Coil			3623	°C	-10	-2	10	*[Function Defrost] Authorization of defrost - Threshold of coil temperature (in °c)
					4-Time Limit			3624	m	30	45	90	*[Function Defrost] Time limit for icing, (in minute) -For the dynamic defrost the unit will run this minimum amount of time. If cycling defrost this is the time delay to start the defrost once the temperature conditions are met.
					5-Time Fc			3625	~	1	3	5	*[Function Defrost] Number of condenser fan start-ups to end defrost. If the number of start-ups can not be achieved within 4min the defrost will end.
			3-Safety	3630	1-W/Cd Mini			3631	°C	4	5	20	*[Safety limit] Low Temperature Limit for water heat exchanger output (in °c) - Threshold of activation of the safety limit.
					2-W/Cd Maxi			3632	°C	20	45	46	*[safety limit] High Temperature Limit for water heat exchanger output (in °c) - Threshold of activation of the safety limit.

Main Screen Code	Description	Code	Description	Code	Description	Code	UNIT	Min	Factory	Max	description
	7-Aux. Heater	3710	1-Out.Limit			3711	°C	-20	10	40	*[Limit of Regulation] Unloading 100% of heaters - Threshold of outside temperature (in °c). If the outside temperature is higher than this threshold Heaters are switched off.
			2-Sp Mixing			3712	°C	0	5	10	*[Electrical heater] Regulation all seasons of FLEXY FX - Threshold of temperature of mixture (in °c) - If the temperature of mixture is lower than this threshold Electrical Heaters are activated
			3-Maximum			3713	%	0	100	100	*[Electrical heater] For Electric Heater with Triac: Maximum power of use of Electrical heater (in %)
	8-Config.	3800	1-Option	3810	1-Size	3811	~	List	0	?	*[Configuration] Type of unit
					2-LAK	3812	On/Off	~	~	~	*[Configuration] Low Ambient Kit "all season control"
					3-Defrost+	3813	On/Off	~	~	~	*[Configuration] Activation of the "Optimized Defrost" Option. Only for Flexy 85_100 with split airflow.
					4-Hu. Pack	3814	On/Off	~	~	~	*[Configuration]Activation of the Humidity Management Option
					5-P. Air	3815	List	0	0	2	*[Configuration] Configuration of the diffrencial pressure sensor: 0Pa; 500Pa; 1000Pa
					6-AuxHeat	3816	List	0	0	6	*[Configuration] Configuration of the Heating Input: HWC S/H; Electric Heater S/M/H or Gas S/H
					7-F.Air	3817	List	0	0	3	*[Configuration] Configuration of the Fresh Air / Economiser: NO, 100% fixed or 0-50% or 0-100% Modulating.
					8-TCB	3818	On/Off	~	~	~	*[Configuration] Configuration of the Thermostat Control Board.
			2-Out. Custom.3820		1-BM50.1	3821	List	0	0	6	*[Configuration] Free output to be customised on the BM50
					2-BE50.1	3822	List	0	0	6	*[Configuration] Free output to be customised (first output of the extension board BE50)
					3-BE50.2	3823	List	0	0	6	*[Configuration] Free output to be customised (Second output of the extension board BE50)
					4-BE50.3	3824	List	0	0	6	*[Configuration] Free output to be customised (Third output of the extension board BE50)
					5-BE50.4	3825	List	0	0	6	[Configuration] Free output to be customised (Fourth output of the extension board BE50)
			3-In. Custom.3830		1-BM50.1	3831	List	0	0	8	*[Configuration] Free input to be customised on the BM50
					2-BM50.2	3832	List	0	0	8	*[Configuration] Free input to be customised on the BM50
					3-BE50.1	3833	List	0	0	8	*[Configuration] Free input to be customised (intput on the extension board BE50)
					4-BE50.2	3834	List	0	0	8	*[Configuration] Free input to be customised (intput on the extension board BE50)
					5-BE50.3	3835	List	0	0	8	*[Configuration] Free input to be customised (intput on the extension board BE50)
					6-BE50.4	3836	List	0	0	8	*[Configuration] Free input to be customised (intput on the extension board BE50)
			4-In.% Custom.3840		1-BE50.1	3841	List	0	0	4	*[Configuration] Free input to be customised on the BM50
					2-BE50.2	3842	List	0	0	4	*[Configuration] Free input to be customised on the BM50
					3-BE50.3	3843	List	0	0	4	*[Configuration] Free input to be customised (intput on the extension board BE50)
					4-BE50.4	3844	List	0	0	4	*[Configuration] Free input to be customised (intput on the extension board BE50)

Main Screen Code	Description	Code	Description	Code	Description	Code	Description	Code	UNIT	Min	Factory	Max	description
	9-Com.	3900	1-Display	3910	1-Sp Mini.	3911			°C	8	17	21	*[Model] Minimum temperature for the required room temperature setpoint at the middle of the dead zone.
					2-Sp Maxi.	3912			°C	21	27	35	*[Model] Maximum temperature for the required room temperature setpoint at the middle of the dead zone.
					3-Offset	3913			°C	-5	0	5	*Offset of the value measured by the ambient temperature sensor
					4-Standard Sp	3914			On/Off	~	Off	~	*Allows a reset of ALL set point to standard factory settings (when available).No possible for configurations. and clock as there is no factory settings for these.
			2-Link	3920	1-ID	3921			~	1	1	12	*[Configuration] Identification adress for the unit from 1 to 12.
					2-Number	3922			~	1	1	12	*[Configuration] Number of units on the BUS. Unit with address N°1 is always the master.
					3-Type	3923			List	0	0	6	*Master / Slave relationship: refer to IOM "Climatic section" for details.
					4-Type	3923			List	0	0	2	*Configuration of the sharing of the Outdoor humidity and temperature.
			3-BMS	3930	1-ID	3931			~	1	1	200	*[Configuration] Identification number on the 485 Bus
					2-Watchdog	3932			~	0	0	255	*[BMS] Activation of the control by a computer or an automat - mode BMS is activated if this value is different from zero, This value is decreased every second
					3-BMS Unoc.	3933			On/Off	~	Off	~	*[BMS] Cancel the override unoccupied mode
					4-Speed	3934			On/Off	~	Off	~	*Blower Speed Control in the dead zone: [ON] the unit runs in High Speed mode [OFF] the unit runs in Low Speed mode

SAFETY AND ERROR CODES
Table 14

CODE	DESCRIPTION LIGNE1	DESCRIPTION LIGNE2
1	Air Flow	Failure
4	Filters	Dirty
5	Filters	Missing
11	Electrical Heater	Faulty
12	Supply Air	Over Temp.
13	Room	Temp. Too Low
14	Gas Burner, 1	Faulty
15	Gas Burner, 2	Faulty
22	Supply Air	Temp. To Below
23	Room	Temp. Too High
31	Humidifier	Faulty
32	Room	Humidity Too Low
33	Room	Humidity Too High
41	Pump	Faulty
81	Room Temperature	Faulty Sensor
82	Room Humidity	Faulty Sensor
83	Outside Temperature	Faulty Sensor
84	Outside Humidity	Faulty Sensor
85	Supply Temperature	Faulty Sensor
86	Condenser Temp.	Faulty Sensor 1
87	Condenser Temp.	Faulty Sensor 2
88	Return or Mixing T.	Faulty Sensor
91	Blower Fan	Faulty
92	Air Condenser	Faulty, System 1
93	Air Condenser	Faulty, System 2
94	Air Condenser	Faulty, System 3
95	Air Condenser	Faulty, System 4
96	Water Condenser	Temp. To Below
97	Water Condenser	Over Temp.
98	Water Condenser	Faulty, Flow
99	Fire / Smoke	Error
111	Air Condenser Temp.	Faulty Sensor, 1
115	Compressor 1	High Pres/Elec.Power
117	Compressor 1	Low Pressure
121	Air Condenser Temp.	Faulty Sensor, 2
125	Compressor 2	High Pres/Elec.Power
127	Compressor 2	Low Pressure
131	Air Condenser Temp.	Faulty Sensor, 3
135	Compressor 3	High Pres/Elec.Power
137	Compressor 3	Low Pressure
141	Air Condenser Temp.	Faulty Sensor, 4
145	Compressor 4	High Pres/Elec.Power
147	Compressor 4	Low Pressure

COMMISSIONING

Here is a list of essential points to be checked when commissioning a unit :

- 3111 : switch on and off the unit

- 3113 : cancel any "overrides" set with a DC50

- 3120 : real-time clock

- 3810 : configuration of unit and option

- 3920 : unit ID for multiple unit connections

- Adjust all time zones and corresponding parameters as detailed on page 31 of this IOM

- 3220 : set the anticipation if required

- 3360 : set capacity factor if necessary

- 3620 : set defrost type and parameters

- 3370 / 3410 : set safety limits

This list maybe changed depending on options and features fitted.

It is possible to connect up to 12 CLIMATIC50 with Climalook2 or 8 rooftops equipped with CLIMATIC2 and 12 with CLIMATIC 50 when Climalook 3 or Climalink is installed.

CLIMALINK 2

This product consist in a central unit and a communication interface.

This unit is designed to be connected to a maximum of 12 rooftops fitted with CLIMATIC 50 controllers via a RS485 interface. A connection diagram is provided in the box. The central unit must be installed in a dry, secured location. Once the unit is connected and powered up, it is entirely automatic and does not require a screen a keyboard or a mouse. After a power failure, the central unit must be restarted using the ON/OFF button.

To avoid this Lennox recommend to connect the central unit to a pulsating current power outlet or "UPS". Lennox cannot be held responsible in the event this recommendation is not acted upon.

CLIMALOOK 2

This product is identical to the CLIMALINK 2 but it is equipped with a 15inch TFT flat screen, a mouse and a numeric keypad to have a local display of the installation. It can be connected to up to 12 CL50 controller via a RS485 interface.

CLIMALOOK 3

Climalook 3 provides the same features as Climalook 2 as it can be connected to 12 rooftops equipped with CLIMATIC 50 controller but it can also be connected to 8 rooftops fitted with CLIMATIC2 controller and KP01 board (Flexy and Linea already on site).

NOTE: In order to connect a unit fitted with CLIMATIC2 you must ensure that the program version is at least LF20. Otherwise it must be upgraded to LF20 before connection to Climalook 3

Climalook uses the internet explorer interface for local operation. The local operating mode is completely automatic and does not require any configuration. Like Climalink, Climalook can receive remote queries thanks to its internal modem and an analogue telephone line. Climalook and Climalink do not work with ISDN telephone lines.

KP 01 board

KP 14 interface

Led flashing during dialogue with the PC

Details of the connection

J18
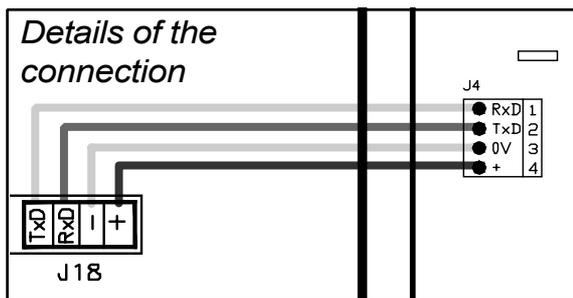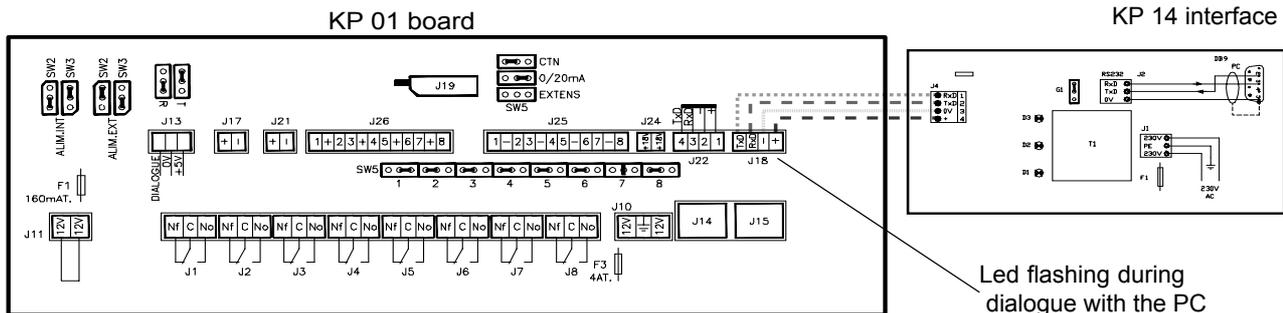
NOTE : To function correctly each RTU requires an address to be set using a KP02 (setpoint 91).
To register in the climatic the power to the climatic must be switched off twice after entering the value.

Whenever the power is switched on it is necessary to wait 5 minutes after the welcome page is displayed to allow the software to fully update.

CONNECTION TO CLIMATIC2 and KP01 BOARD

The connections between the units and the Climalink/ Climalook must be done using a double shielded pair of wire (not supplied by Lennox) This cable must have external metal braiding, and its cross-section must be at least 0.5mm2 with a maximum of 1mm2

Each cable will be connected to the COM B port on the KP01 Board, and particular attention must be taken to the order of connections. The cable coming out of the KP14 with a BD9 plug at the end will be connected to the SERIAL Port at the back of the central unit.
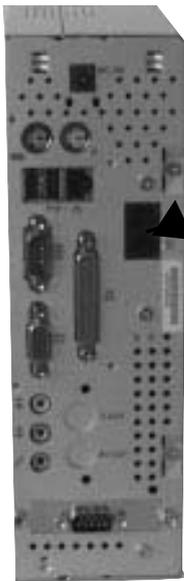

The cable coming out of the KP14 with a BD9 plug at the end will be connected to the SERIAL Port at the back of the central unit.

CONNECTION TO CLIMATICTM 50 USING INTERFACE 435/232

RS 485 daughter-board

Plug for telephone link RJ11. Cable supplied with the unit.
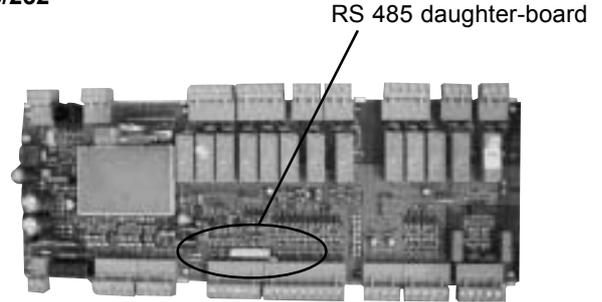
After the starting procedure of the Climalook 3 central unit, the LED next to the B PORT on the CLIMATIC KP01 board will start to flash. The CPU connects to the boards one after the other , and so it is normal for the LED to stop flashing occasionally.

When all the connections are established, press the on/off button. The programs are launched automatically, and the LED located to the right of the Com B on the CLIMATIC KP01 board should flash.
Note the site telephone number in order to make the remote query.

It is possible to connect up to 12 rooftops fitted with CLIMATIC 50 when using a Climalook 3.
The connections between the units and the Climalink/ Climalook must be done using a double shielded pair of wire (not supplied by Lennox) This cable must have external metal braiding, and its cross-section must be at least 0.5mm2 with a maximum of 1mm2

The wires will be connected to each CLIMATIC50 485 ports You must ensure the connection order is correct:
  + on +,
  - on -
  and gnd on gnd.

Note the site telephone number in order to make the remote query
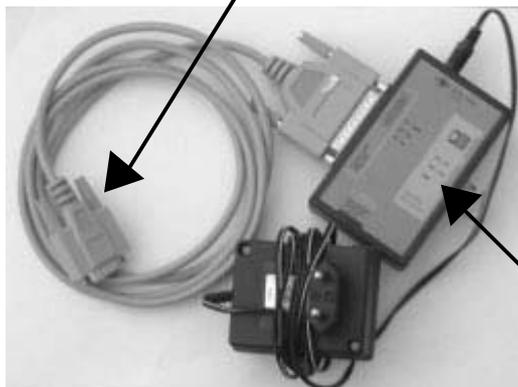
The cable terminated by a DB9 plug, coming out of the 485/232 interface will be connected to the SERIAL port on the Climalook central unit
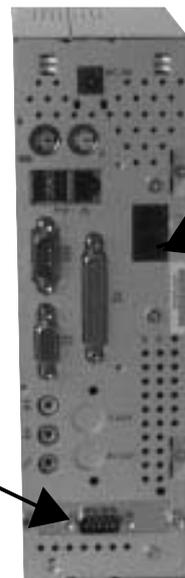
Plug for telephone link RJ11. Cable supplied with the unit.

After the starting up procedure is completed the LED on the INTERFACE will start flashing.

SETTINGS FOR THE CONNECTIONS

Depending on the version of Windows you are running, access the « Make new connection» function.

Click on next

Enter the telephone number to which your ClimaLook's modem is connected.

Click

Click

Click on next
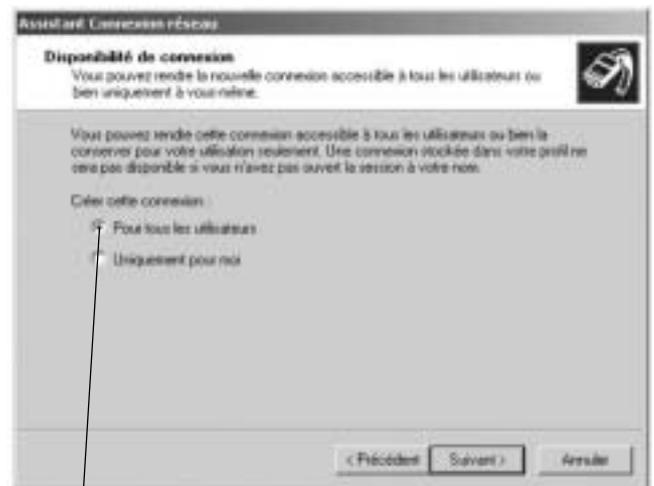
Click

Enter the site name   Click on Finish

Type "Administrateur"

Click   Type "VISION"

The modem dials the number, and then the two modems hook up.

In the task bar next to the time display you should see the symbol indicating connection with the remote computer.

On some versions of Windows, a dialogue box may ask you to enter the password again. In this case:

- for User enter Administrateur

- for password enter VISION

- leave the workgroup field empty.

You can now start Internet Explorer.

Type "http:// Lennox" in the Address field

The first time you log in, Windows asks you to confirm your login identifiers:

- for User enter **Administrateur**
- for password enter **VISION**
- leave the workgroup field **empty.**

After this formality, you gain access to:

THE WELCOME PAGE

First of all you must lower the virtual keyboard window, before choosing the language.

NOTE : To operate the program it is necessary to minimise the virtual keyboard.

Then click on the flag corresponding to the language you want to use.

Enter your access code and confirm. The access code **999** serves as a temporary code until you have configured your own security code.

If your code is valid you will access the next menu. Otherwise you remain on the same page.

There are three access levels:

1st level: use of the User,

Schedule, Macro and History pages.

2nd level: ditto, plus the Service page.

3rd level: ditto, plus the Access page.

If the local application is not functioning, it is possible you may remain on the same page, even if your access code is valid. In this case, it is necessary to first restart the local central unit before continuing.

THE MAIN PAGE

The colour outline around the roof-top unit and the operating temperatures indicate the unit's status:

Green: Operating mode,

White: Stop mode,

Orange : Night mode,

Red: Fault mode,

This page gives you the basic information about how your installation functions. The roof-top unit's number corresponds to its EPROM number.

Discharge temperature	Ambient temperature
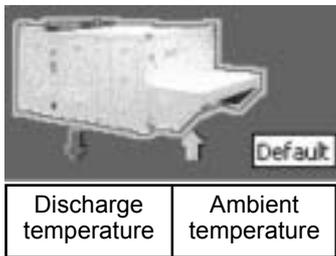
Position the mouse on one of the units to obtain information indicating this unit's status.

If the unit does not exist, is not powered up, or if communication with it is impossible, its icon disappears from the screen. The program attemps to communicate with absent units every ten minutes.

To access a unit's operating details, just click on it once.

20 seconds automatic refresh on this screen.

THE USER PAGE

This is the page used most frequently. It enables you to display and modify a number of settings on your unit.

Use the refresh function to update the values read.

Some settings are read-only, others can be modified.

Read-only setting:

Night mode	Off

Modifiable setting:

On / Off	On Off

Unit's day and time

RT1 RT2 RT3 RT4 RT5 RT6 RT7 RT8

The bottom of the page displays the unit currently being queried, and can also be used to change the unit by clicking. This takes you to the user page for the new machine.

If the unit does not exist, is not powered up, or if communication with it is impossible, its icon disappears from the screen. The program attemps to communicate with absent units every ten minutes.

It is possible modify several settings at the same time.

The settings will only be modified if the «submit» function is confirmed.

If your unit has - or had - a fault, it is outlined in red on the main page. You can use the fault module to trouble-shoot:

If the fault is still present, it is displayed here:
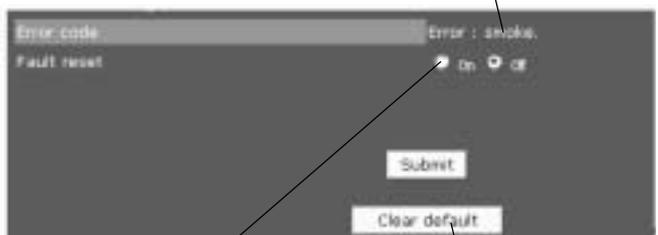
The fault reset function is used to clear the unit's errors if this is possible. If the error persists, the fault returns.

The clear default function is used to reset the software memory of defaults. It does not erase the unit's faults.

For some settings, a small icon is displayed at the end of the line

Click on it to get a history of this setting.

Use the refresh function to update the values read

The empty fields correspond to occasions when the CLIMALOOK / CLIMALINK unit has stopped
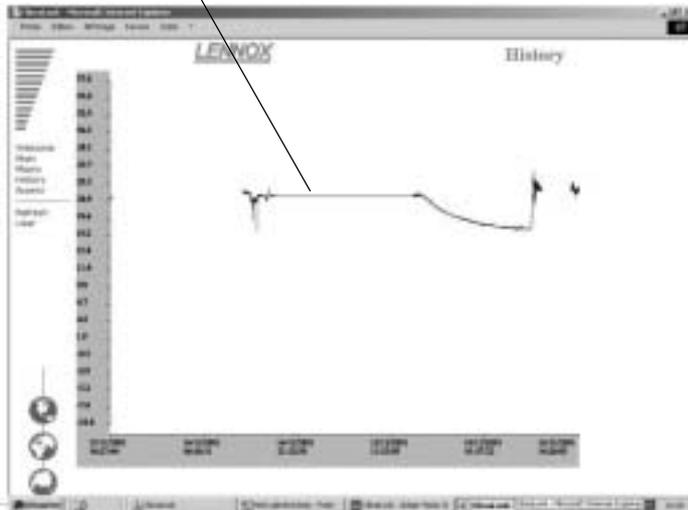
- To access the Service page for another unit, simply click on this unit.
- To return to the User page, click on the User menu.
- To access the Schedule page, click on the Schedule menu.

+ Supply temperature / Room temperature / Outdoor air temperature + Faults (last 10 days)

THE SCHEDULE PAGE

This page is used to display and modify all the configuration settings for each zone of a unit's operating schedule.

Use the refresh function to update the values read.

The menus

Welcome page
Main page
Macro page
General History page
Access codes page

Welcome
Main
Macro
History
Access

To refresh the values
Service page or experienced user
Schedule page which shows all the set points for the different modes.

Refresh
Service
Planning
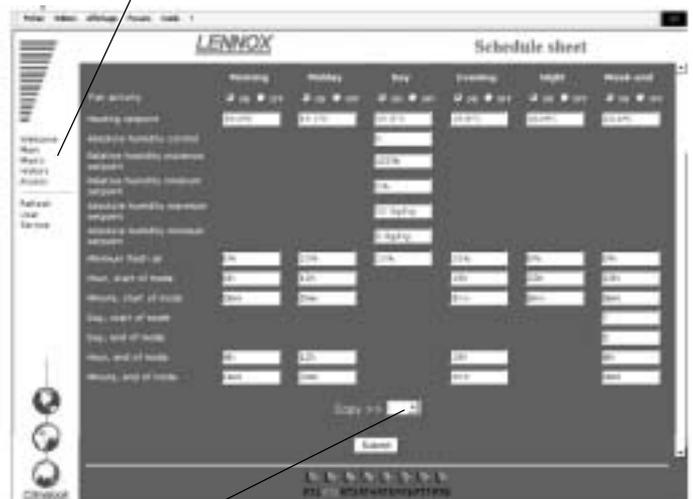
THE SERVICE PAGE

The Service page is for technical users who know exactly how to adjust air-conditioning units. It is protected by a second level password.

The units are presented in groups, and it is possible to display and modify several settings, as in the User page.

The settings will only be modified if the «submit» function is confirmed.

In addition it is possible to copy all the displayed settings and then paste them in another unit you have chosen.

The settings will only be modified if the «submit» function is confirmed.

THE MACRO PAGE

This page enables you to modify all the units on your site in one action.
You can choose to perform one or more actions.
Modify the value or values you want to submit.
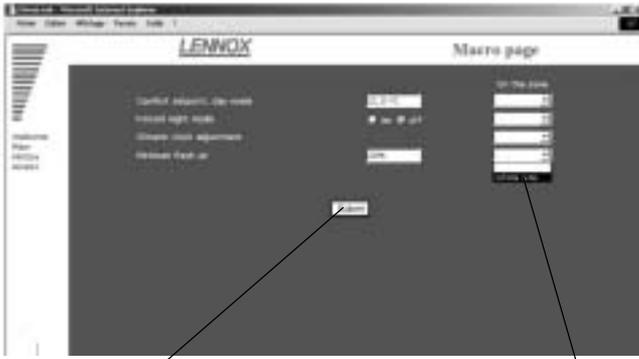
Click on "Submit"   Select "Entire site"

The standard Macros are: - Adjust the Comfort thermostat
                            - Set to Night mode
                            - Set fresh air to the minimum
                            - Set the time on the Climatic
                              boards.

THE HISTORY PAGE

This page is provided in addition to the individual history you've already seen in the User page. It tells you when local communication starts and stops, and gives you the users' access codes.

This is a read-only page. The history is automatically cleared to ensure refreshment doesn't take too long.
This page will also show units faults.

THE ACCESS PAGE

This page enables users who have a third level access code to attribute access codes to other users.

The acccess code 999 is your first access code. Remember to delete it once you have created your own access codes.

To create a new user: Click on name
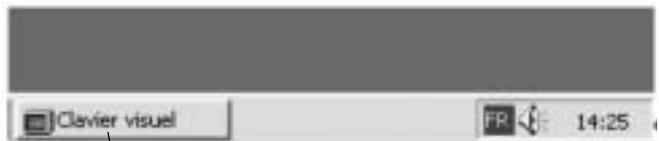
Use the virtual keyboard on the task bar

Use the keyboard to enter the name, password (maximum of 4 digits) and the access level.

       1 = use of the User, Schedule, Macro and
       History pages.
       2 = same level, plus the Service page.
       3 = same level, plus the Access page.

Reposition the keyboard in the task bar
by clicking on the minus sign in the
top right-hand part of the keyboard.

Confirm by clicking on «Submit»

PROBLEM SOLVING

### *Impossible to enter your access code, you remain on the welcome page.*

Local communication has been interrupted. You must restart the local unit.

After restarting, you must wait for 5 to 10 minutes until the unit is ready to be queried once more.

The values read do not seem to move.

The values are not in fact refreshed automatically, and for all the pages you must use the Refresh function to be sure you are reading the latest values.

The keyboard has disappeared from the task bar.

Click on Start / Programs / StartUp
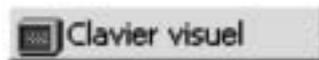
The local unit is not answering the phone

The local unit is - or was - powered down, and you must press the On/off button. See recommendations at the beginning of the document.

The unit is not connected to a direct analogue phone line.

How to check the ClimaLink is functioning correctly after installation:

Connect up the unit and the KP14

Connect the cables to the J18 inputs on the Climatic boards.

After a few minutes, the central unit should start its dialogue. The LED on the Climatic board to the right of the J18 input should flash.

If this does not happen, check the wiring.

The only way to examine the problem in more detail is to obtain a monitor and a mouse and contact the Lennox services.

After installing a ClimaLook or ClimaLink central unit, it is vital to perform the telephone communication tests.

Take a test telephone set and make sure you have a connection.

Note the telephone number to which the central unit is connected.

Connect the central unit and ask a person on the remote site to test communication.

Obviously the central unit must be the only device installed on the phone line. It cannot share the line with a fax or another modem.

BCK = Cooling only rooftop

1 Fully modulating electric heater (TRIAC)
2 Staged electric heater
3 Hot water coil
4 -
5 Economiser
6 Extraction fan
7 -
8 Firestat
9 Smoke detector
10 -
11 DS50
12 DC50
13 CO2 sensor
14 Air sock control
15 -
16 -
17 -
18 -
19 -
20 -
21 -
22 -
23 -
24 TCB
25 -
26 -
27 Main switch
28 Air pressostat

BHK = Heat pump rooftop
0 Heat pump
1 Fully modulating electric heater (TRIAC)
2 Staged electric heater
3 Hot water coil
4 -
5 Economiser
6 Extraction fan
7 -
8 Firestat
9 Smoke detector
10 -
11 DS50
12 DC50
13 CO2 sensor
14 Air sock control
15 -
16 -
17 -
18 -
19 -
20 -
21 Dynamic defrost
22 -
23 -
24 TCB
25 -
26 -
27 Main switch
28 Air pressostat

BGK = Cooling only rooftop with with gas fired heating
1 -
2 -
3 -
4 Gas burner
5 Economiser
6 Extraction fan
7 -
8 Firestat
9 Smoke detector
10 -
11 DS50
12 DC50
13 CO2 sensor
14 Air sock control
15 -
16 -
17 -
18 -
19 -
20 -
21 -
22 -
23 -
24 TCB
25 -
26 -
27 Main switch
28 Air pressostat

BDK = Heat pump rooftop with gas fired heater
0 Heat pump
2 -
3 -
4 Gas burner
5 Economiser
6 Extraction fan
7 -
8 Firestat
9 Smoke detector
10 -
11 DS50
12 DC50
13 CO2 sensor
14 Air sock control
15 -
16 -
17 -
18 -
19 -
20 -
21 Dynamic defrost
22 -
23 -
24 TCB
25 -
26 -
27 Main switch
28 Air pressostat

WARNING : ONLY ONE HEATING INPUT CAN BE INSTALLED

DIAGRAM REFERENCE LEGEND

|				
-A1	Soft starter		-KM9-KM10	Condenser 1 / condenser 2 fan motor contactor
-B2	Smoke detection head		-KM11-KM12	Compressor -MG1-MG2 contactor
-B4	Gas manifold ionisation probe		-MC1-MC2	Condenser -MC1-MC2 fan motor
-B6	Gas manifold ignition electrode		-ME1-ME2	Extraction fan motor -ME1-ME2 contactor
-B13	Dirty air filter pressure switch / air flow rate		-MG1-MG2	Compressor -MG1-MG2 contactor
-B14	Hot water battery antifreeze thermostat		-MR1	Economiser damper motor
-B16	Fire thermostat		-MR3	Fresh air damper motor
-B17	Gas manifold smoke minimum gas pressure switch			
-B19	Blower fan motor -MS1-MS2 stoptherme		-MS1	Blower fan motor -MS1-MS2
-B21	Gas manifold extraction air pressure switch		-Q1	Blower fan motor -MS1-MS2 protection
-B23-B24	Extraction fan motor -ME1-ME2 stoptherme		-Q5	Extraction fan motor -ME1-ME2 protection
-B25-B26	Electric battery -E1-E2 safety klixon		-Q9	Condenser -MC1-MC2 fan motor protection
-B29	Gas manifold air flow rate safety klixon		-Q11-Q12	Compressor -MG1-MG2 protection
-B32	Gas manifold flashback safety klixon		-QF1	Primary circuit protection -T1
-B41-B42	Compressor -MG1-MG2 high pressure safety switch		-QF2	Primary circuit protection -T3
-B45	Gas manifold 1 / gas manifold 2 regulation klixon		-QF3	Secondary circuit protection -T3
-B51-B52	Compressor -MG1-MG2 low pressure safety switch		-QG	Main switch
-B61-B62	Compressor -MG1-MG2 high pressure control switch		-QE1-QE2	Heater -E1-E2 protection
-B71-B72	Condenser -MC1-MC2 fan motor stoptherme			
-B81-B82	Scroll compressor -MG1-MG2 protection module		-T1	Control circuit transformer 400v / 24v
-BE50	Climatic 50 extension board		-T3	Burner power supply transformer 400 / 230v
-BG10	CO2 sensor			
-BH10	Regulation hygrometry probe		-TCB	control thermostat
-BH11	External hygrometry probe			
			UF	Cooling unit
-BT10	Regulation temperature probe		UT	Air treatment unit
-BT11	External temperature probe			
-BT12	Blower temperature probe		-V1	Electric heater static contactor
-BT17	Return air sensor			
-BT91-BT92	Defrost temperature sensor compressor 1-2		-YV2	Hot water 3-way valve
-BM50	Climatic 50		-YV11-YV12	Compressor -MG1-MG2 cycle reversing valve
BX 50	Multiplexer Climatic 50		-YV31	Burner gas solenoid valve
-C1-C2-C3-C4	Condensator		-YV41	Gas manifold safety solenoid valve
-E1-E2	Heater -E1-E2		-YV51	Gas manifold main solenoid valve
-E11	Smoke detector printed circuit			
-E14	Burner control box		-Z*	Capacity resistance circuit
-EF47	Gaz burner printed circuit			
-F1	Secondary circuit -T1 128VA / 24V protection fuse			
-KA31	Gas burner fault relay			
-KE1-KE2	Heater -E1-E2 contactor			
-KM1	Blower fan motor -MS1-MS2 contactor			
-KM5	Extraction fan motor -ME1-ME2 contactor			

BCK = Cooling only unit
BHK = Heat pump unit
BGK = Cooling only unit with gas fired heating
BDK = Heat pump unit with gas fired heating

## MAIN CURRENT DIAGRAM TRI / 400V / 50Hz + N + T

CLIMATIC 50 CONTROLLER
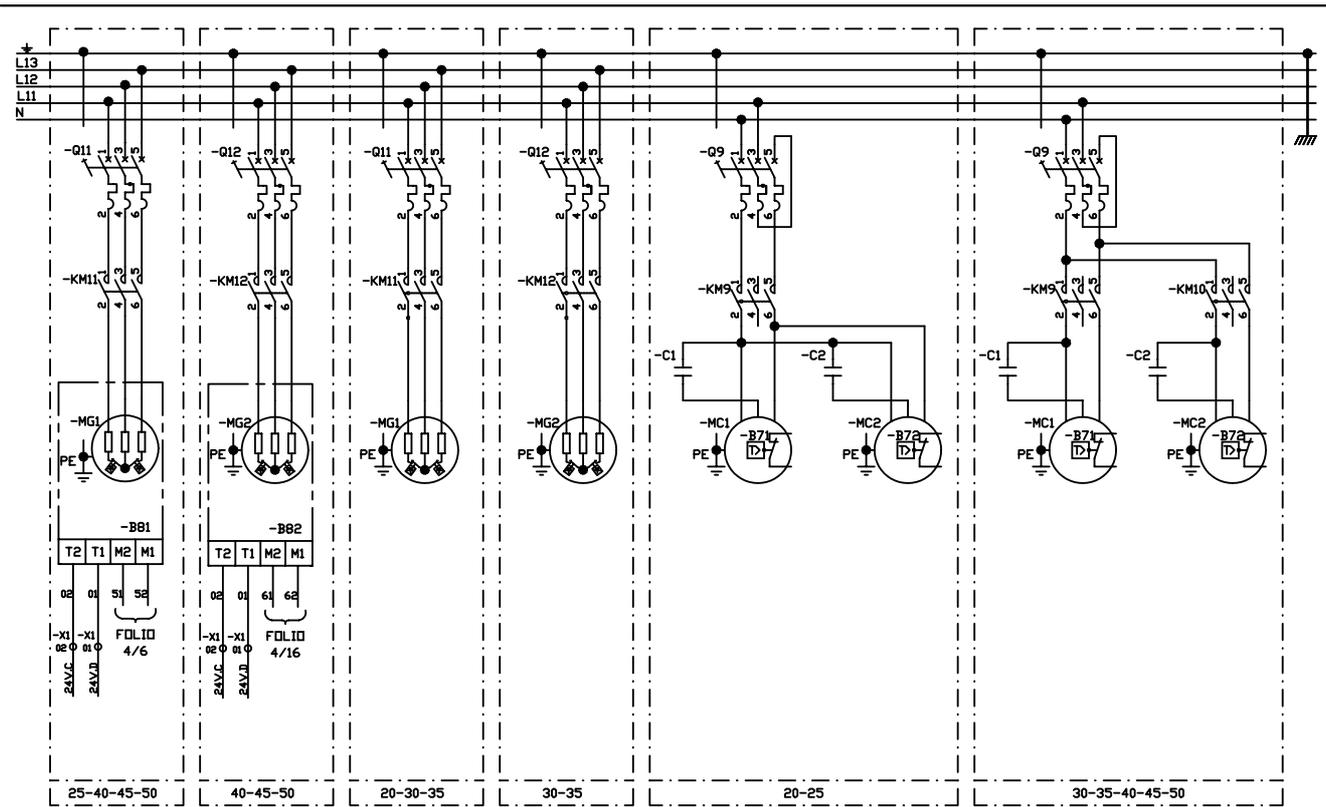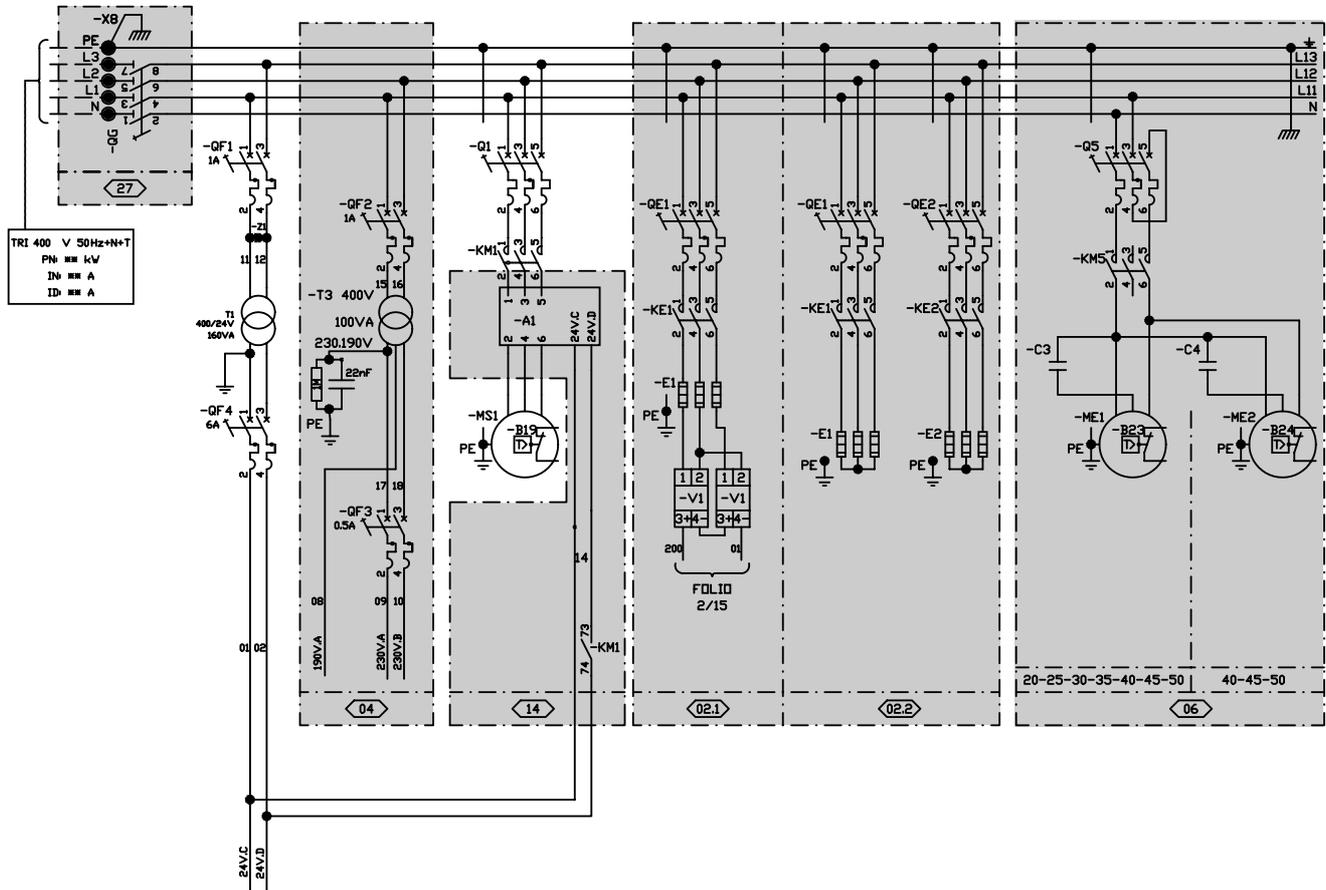
CLIMATIC 50 INPUT BCK / BHK / BGK / BDK

CLIMATIC 50 OUTPUT BCK / BHK
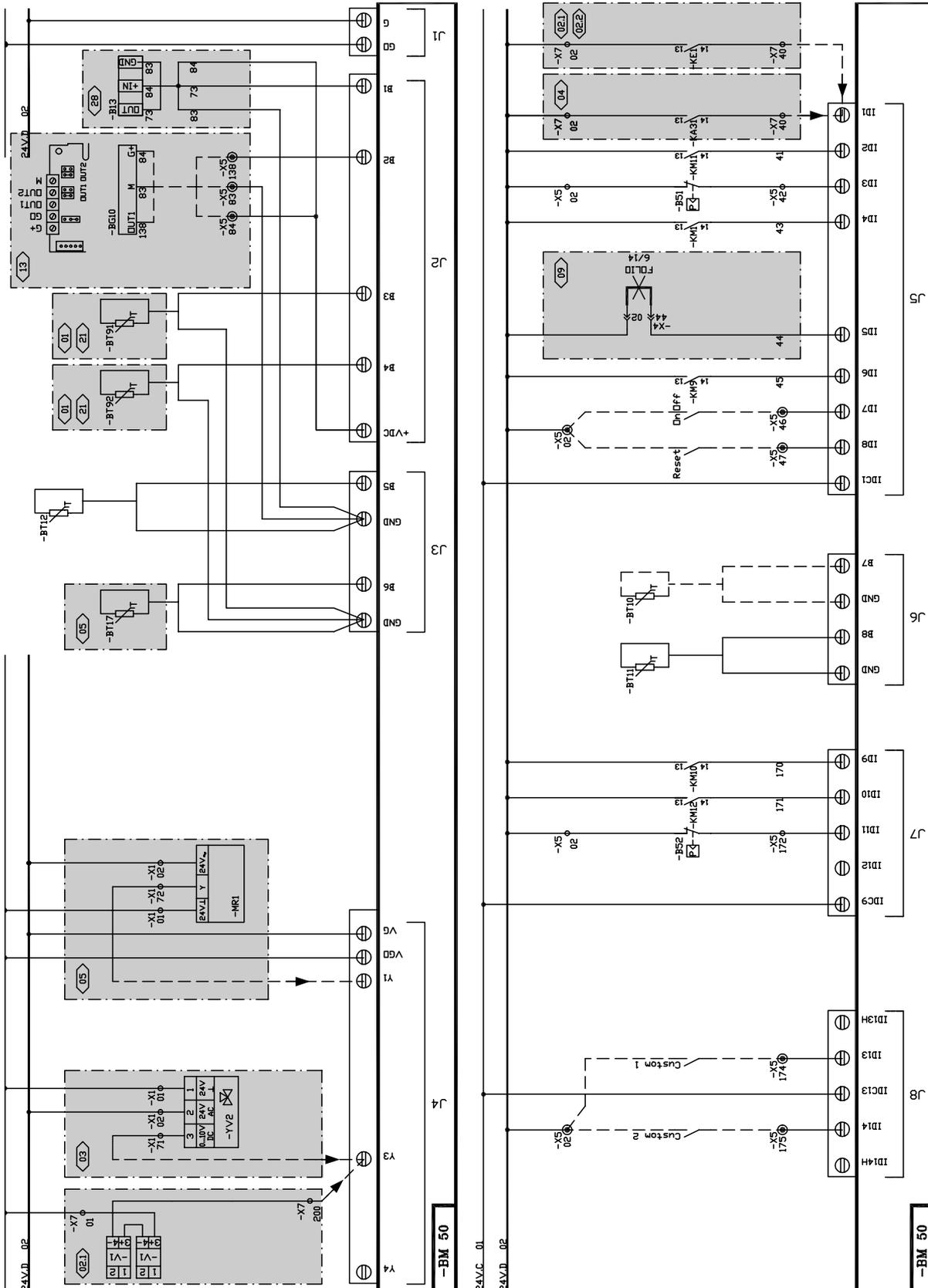
CLIMATIC 50 OUTPUT BGK / BDK
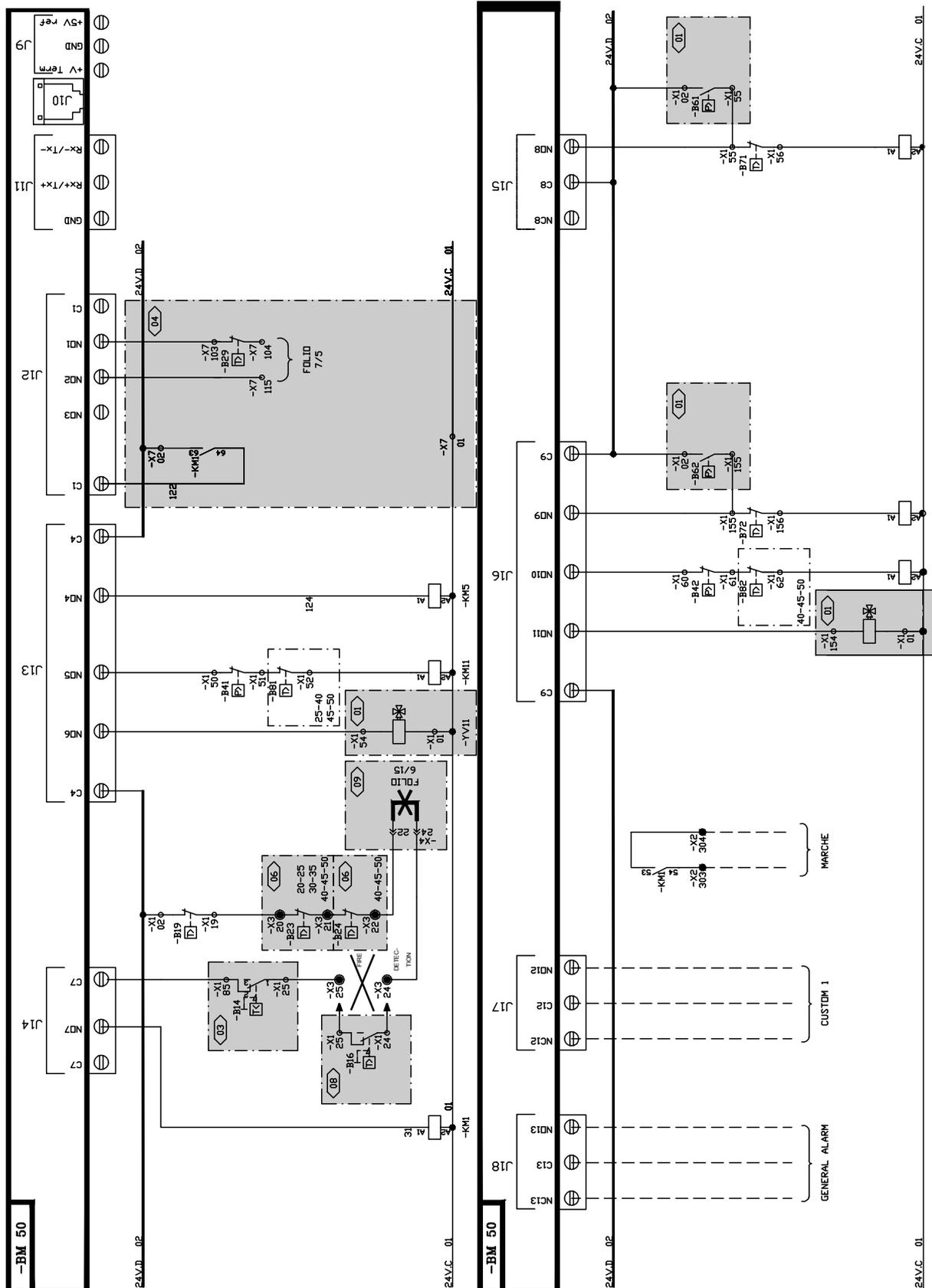
DAD SMOKE DETECTOR
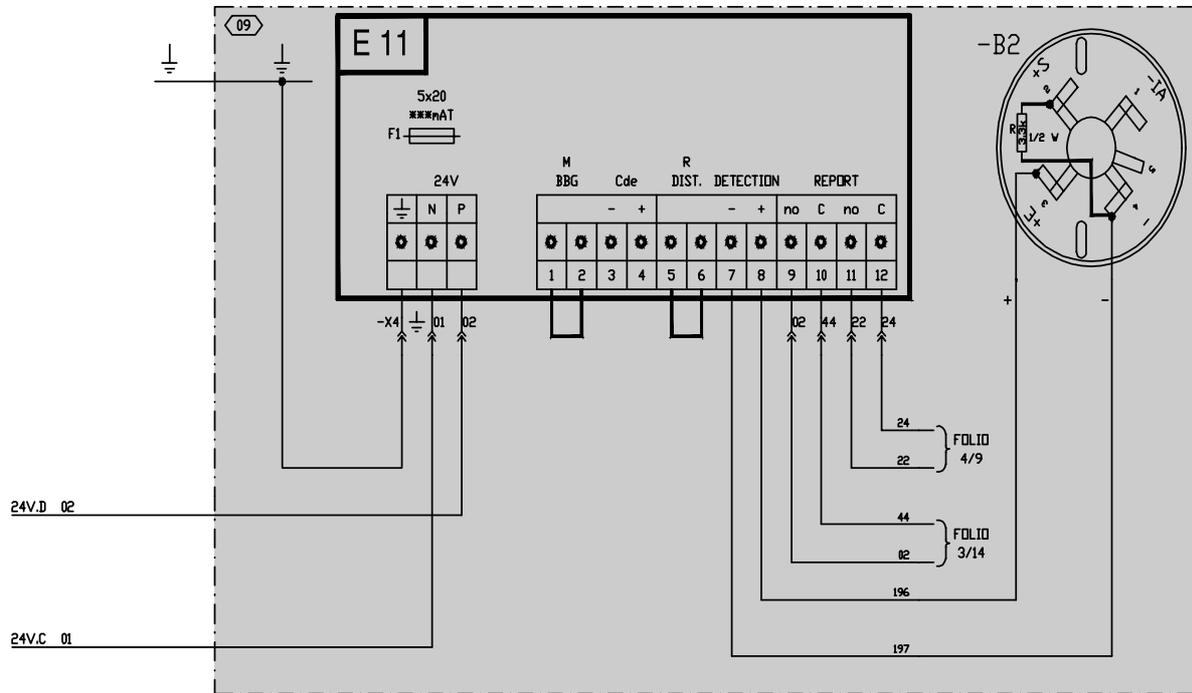
INPUT - OUTPUT EXTENSION BOARD (TCB)
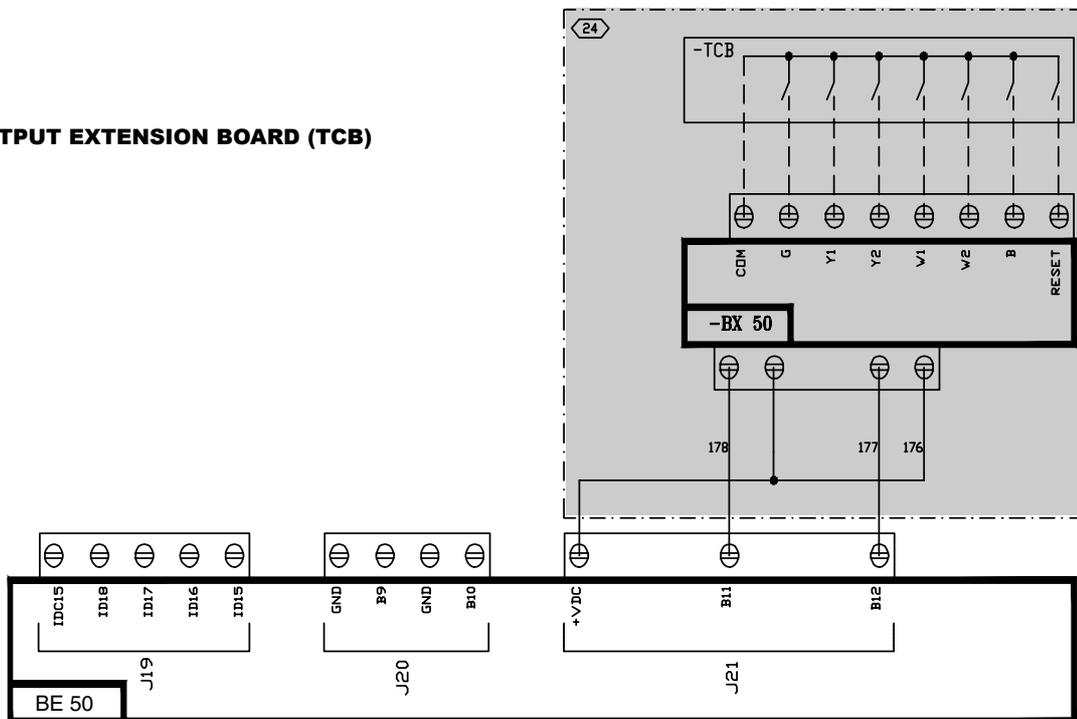
WIRING DIAGRAM GAS BURNER 15 / 20 / 30 / 40 / 60 Kw
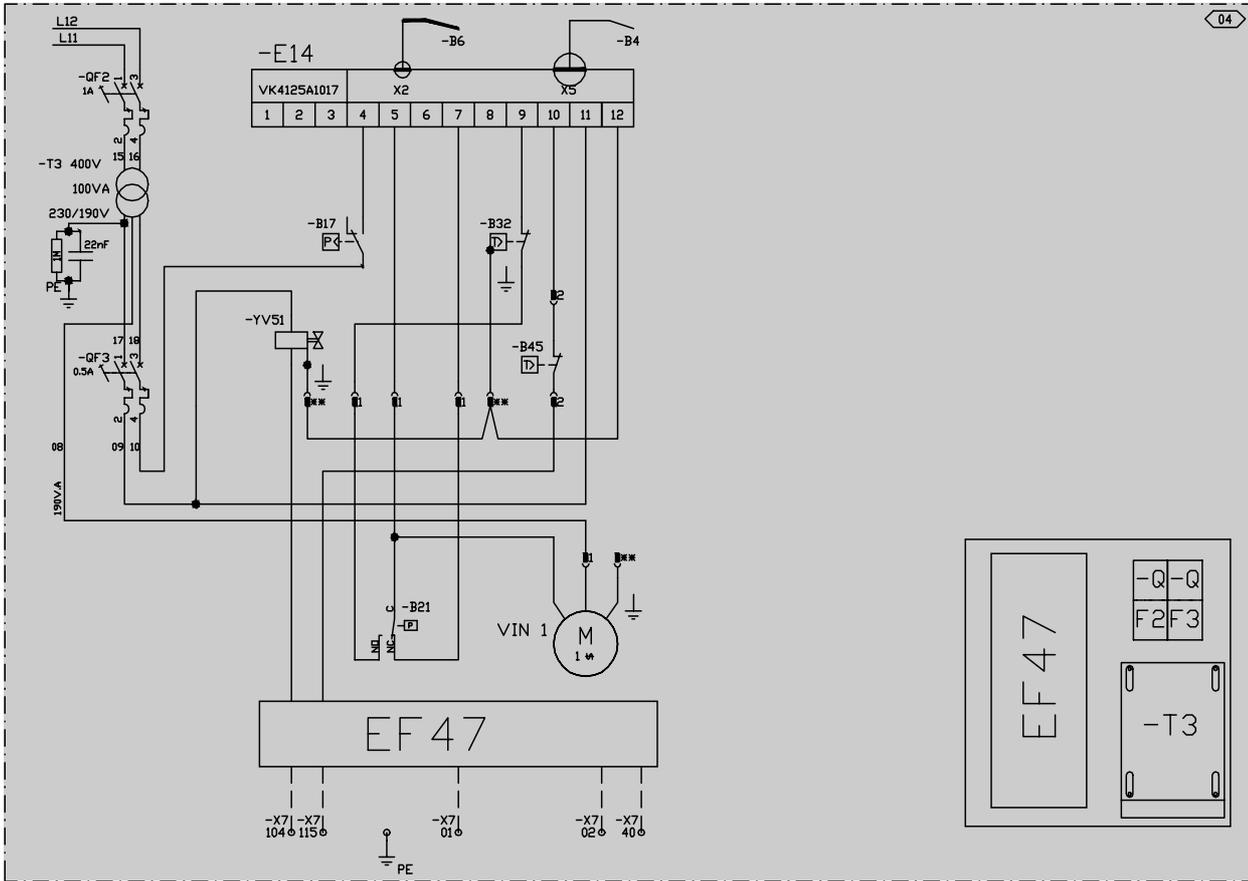
FULLY MODULATING ELECTRIC HEATER
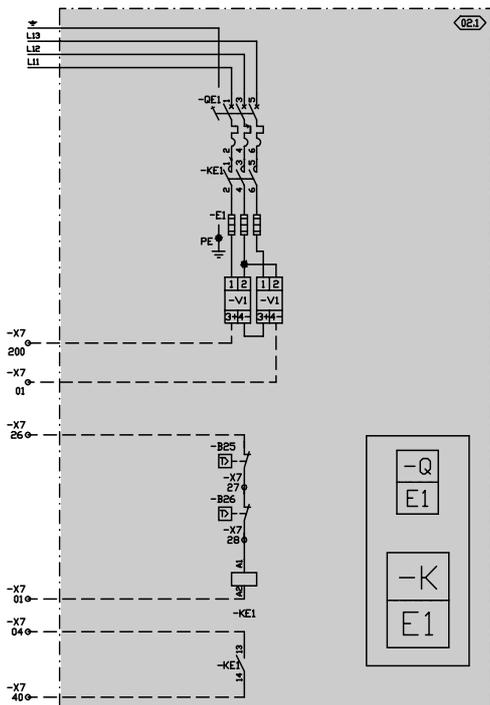
STAGED ELECTRIC HEATER
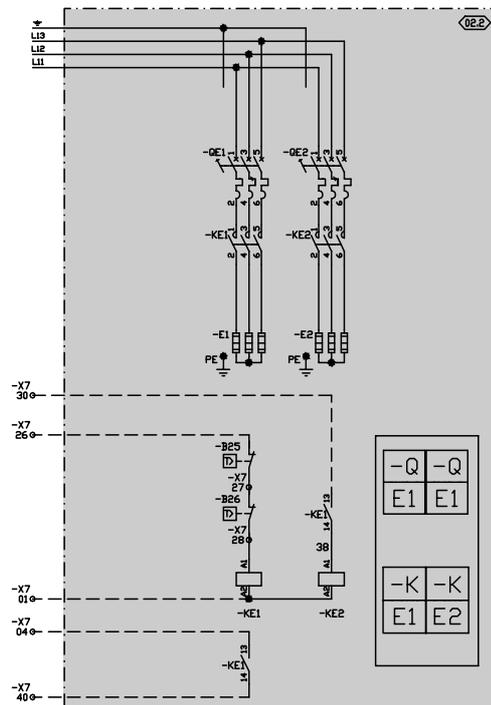
STANDARD

A : Freezed Input / Output
B : Customized Input / Output

Logical Output Board (2 outputs : 1 freezed, 1 customized)

A 1 - Alarm, General
B 2 - Customized (choose 1 output between those 5 possibilities°
- Alarm, FilterS
- Alarm, Blower
- Alarm, Compressors
- Alarm, Heaters
- Free, for BMS

Logical Input Board (4 inputs : 2 freezed, 2 customized)
A 1 - ON/OFF
A 2 - Reset alarm
B 3 & 4 - Customized (choose, for each input (2) between those 7 possibilities)
- Disable, Compressors & Heaters
- Disable, Compressors
- Disable, Heaters
- Disable, Cooling
- Disable, Heating
- Fault contact, Humidifier
- Free, for BMS

HUMIDITY CONTROL OR TCB

Logical Output Board (4 outputs : 0 freezed, 4 customized)
B 1 to 4 - Customized (choose, for each input (4) between those 5 possibilities)
- Alarm, Filters
- Alarm, Blower
- Alarm, Compressors
- Alarm, Heaters
- Free, for BMS

**Logical Input Board** (4 outputs: 0 freezed, 4 customized)

B 1 to 4 - Customized (choose, for each input (4) between those 7 possibilities)

- Disable, Compressors & Heaters
- Disable, Compressors
- Disable, Heaters
- Disable, Cooling
- Disable, Heating
- Fault contact, Humidifier
- Free, for BMS

**Analogue Input Board** (4 outputs: 0 freezed, 4 customized)
B 1 to 4 - Customized (choose, for each input (4) between those 4 possibilities)
- Override room temp set point 0-10°C (0-10V)
- Override fresh air set point 0-100%
- Free temperature (NTC probe)
- Free relative humidity (4-20mA)

LENNOX

Baltic

BCD :	Condenser coil
BEC :	Hot water coil
BEV1 :	Evaporator coil
BT12 :	Blower temperature sensor
B14 :	Hot water coil antifreeze thermostat
B41 :	Compressor -MG1 high pressure safety switch
B42 :	Compressor -MG2 high pressure safety switch
B51 :	Compressor -MG1 low pressure safety switch
B52 :	Compressor -MG2 low pressure safety switch
B61 :	HP switch control for defrost
B62 :	HP switch control for defrost

|	
CA :	Check valve
DT :	Thermostatic expansion valve
FD :	Filter drier
MC1 - MC2 :	Condenser - MC1 - MC2 fan motor
MG1 - MG2 :	Compressor
MG1 - MG2 :	Contactor
MS1 :	Blower fan motor MS1
VAM :	Manual check valve
VRM :	Manual control valve
YV2 :	Hot water 3-way valve

BHK-020-025
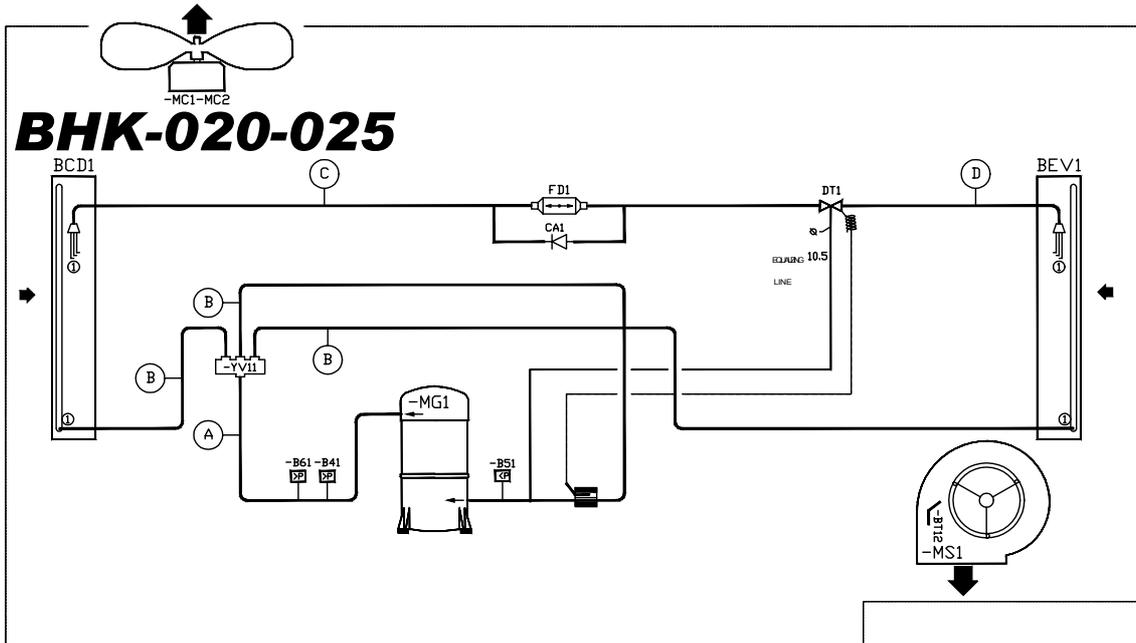
PIPE DIAMETERS	20/25
D	5/8"
C	1/2"
B	1"1/8
A	7/8"

BCK-020-025
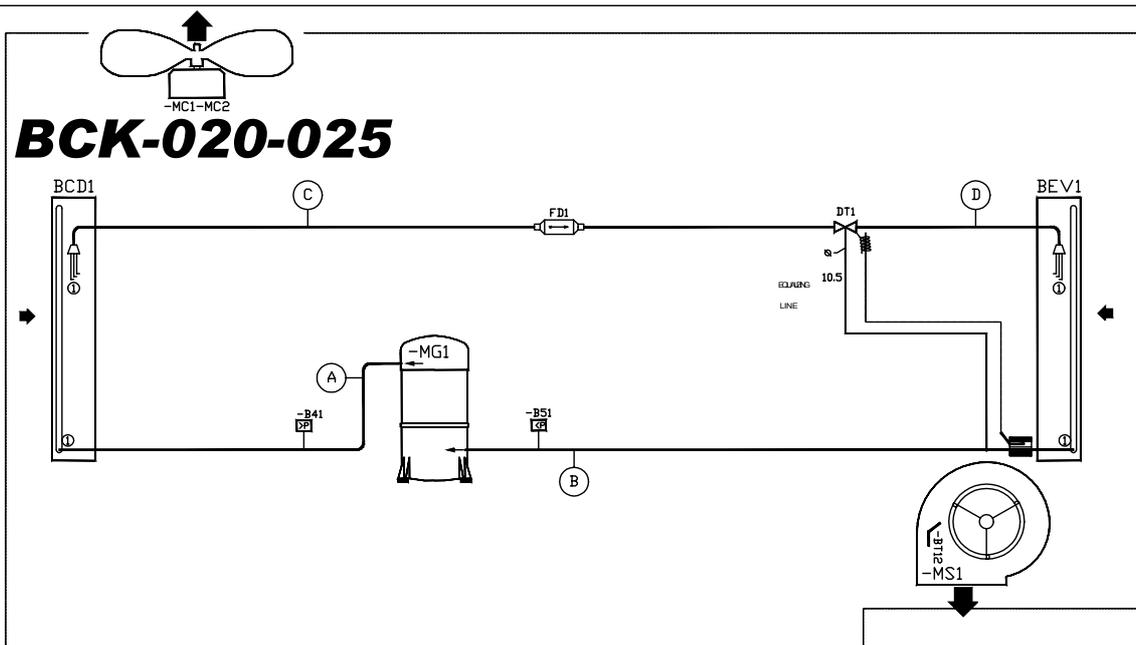
PIPE DIAMETERS	20	25
D	5/8"	5/8"
C	1/2"	1/2"
B	7/8"	1"1/8
A	7/8"	7/8"

BHK-030-035-040-045-050
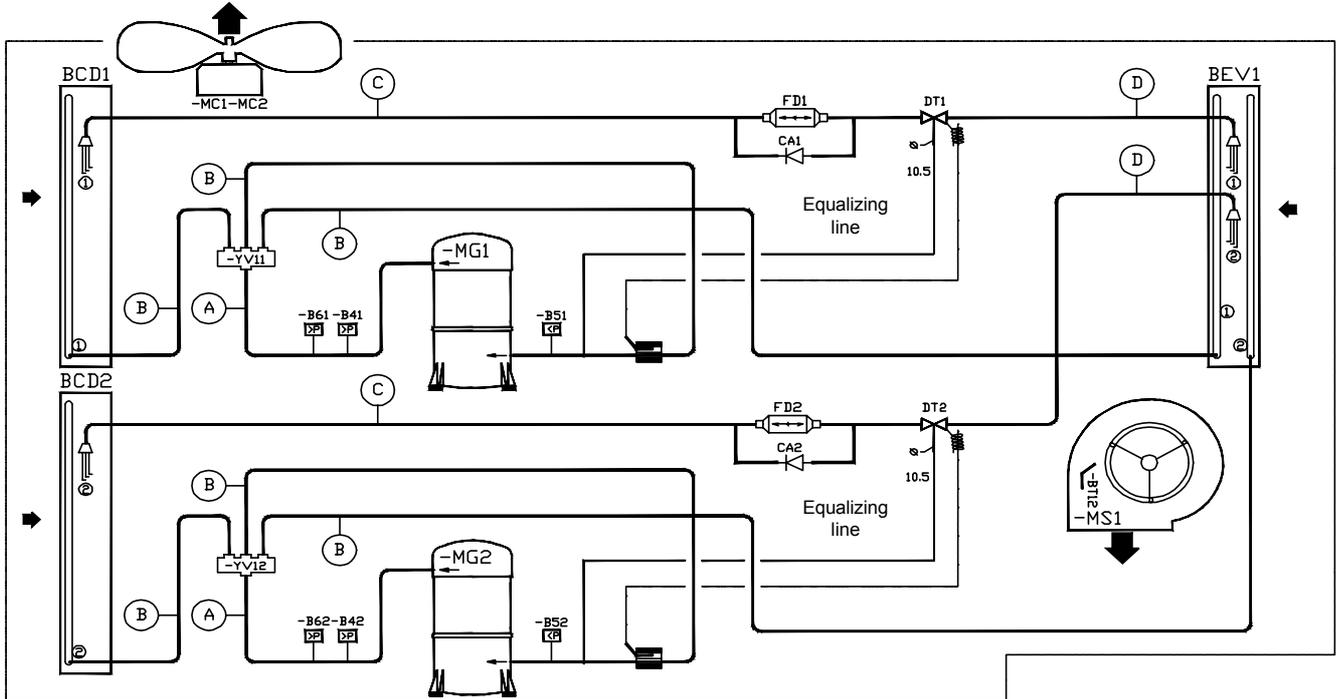
		30/35	40	−MG1	45	−MG2	50
Pipe Diameters	D	5/8"	5/8"	5/8"		7/8"	7/8"
	C	1/2"	1/2"	1/2"		5/8"	5/8"
	B	7/8"	1'1/8	1'1/8		1'1/8	1'1/8
	A	5/8"	7/8"	7/8"		7/8"	7/8"

BCK-030-035-040-045-050
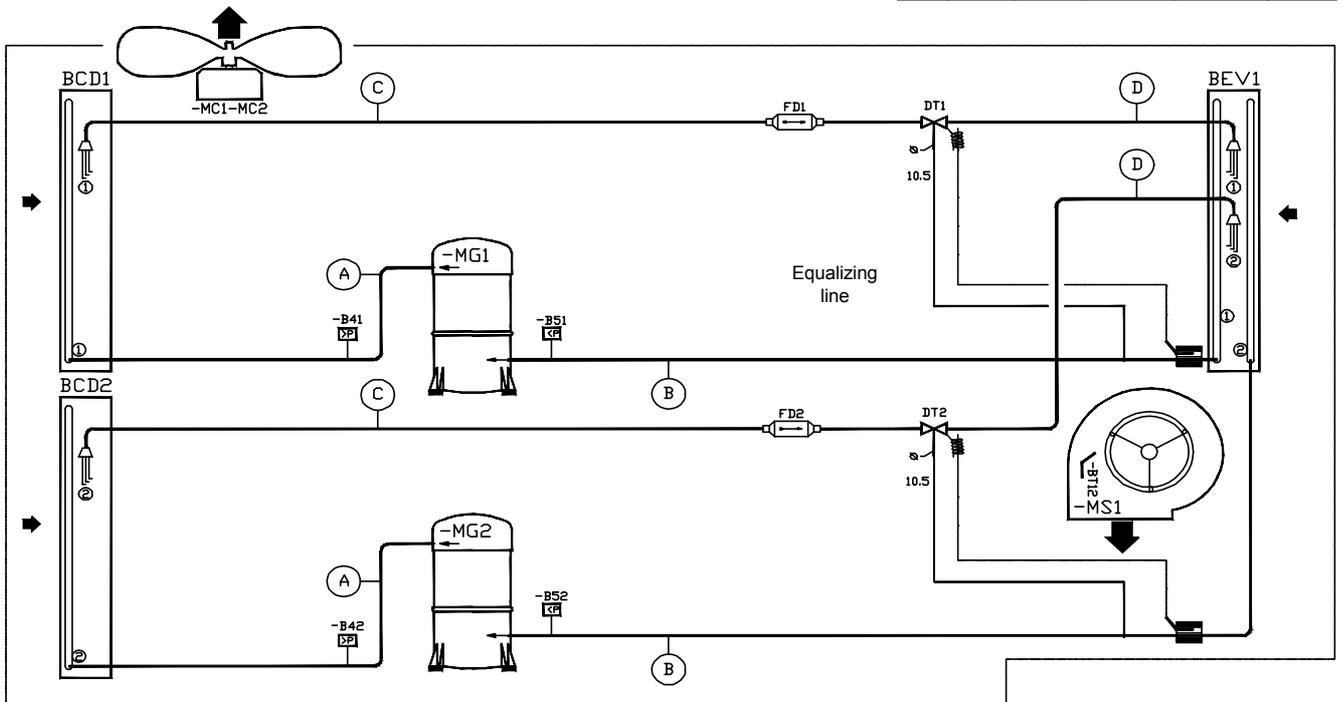
		30/35	40	−MG1	45	−MG2	50
Pipe Diameters	D	5/8"	5/8"	5/8"		7/8"	7/8"
	C	1/2"	1/2"	1/2"		5/8"	5/8"
	B	7/8"	1'1/8	1'1/8		1'1/8	1'1/8
	A	5/8"	7/8"	7/8"		7/8"	7/8"

REFRIGERATION

Table 15

FAULT	POSSIBLE CAUSE AND SYMPTOMS	SOLUTION
LP PROBLEMS and LP CUT OUTS	Refrigerant charge too low	Measure the superheat and sub-cooling: Good if 5°C<SC<10°C and 5°C<SH<10°C Bad if SC>10°C and SH too Low Check superheat adjustment and charge unit (a leak check must be carried out)
	In Heat Pump Mode the temperature difference between T outdoor and Tevap. (Dew) is too high 5°C < Delta T < 10°C excellent 10°C < Delta T < 15°C acceptable 15°C < Delta T < 25°C too high	If too high check the coils are clean or check coil internal pressure drop between the liquid line and the suction line Good if < 3bar Too high if > 3bar (coil blocked)
	Refrigeration circuit blocked in distribution	Stop the fan and create icing of the coil. Check all circuits freeze evenly across the whole surface of the coil If some parts of the coil do not freeze this could indicate a problem with the distribution
	Liquid line drier blocked. High temperature difference between inlet and outlet of the drier	Change filter drier
	Contaminant in the expansion valve	Attempt to free the valve adjusting element by freezing the valve and then heating the thermostatic element. Replace the valve if necessary
	Expansion valve not adjusted properly	Adjust the expansion Valve
	Ice plug in the expansion valve.	Heat the main body of the valve. If the LP increases and then decreases gradually, empty the circuit and replace the drier.
	Incorrect insulation of the thermostatic bulb of the expansion valve	Superheat too low: adjust superheat Move the thermostatic element along the pipe Insulate the Thermostatic element of the valve
	Low Pressure Switch cut out point too high	Check the cut out pressure of the Low Pressure switch: It must be 0.7+/- 0.2bar and must closes at 2.24 +/- 0.2 bar
	LP cut out due to not enough defrost on heat pumps	Adjust the CLIMATIC settings to extend the defrost cycles or shorten the time between defrosts
HP PROBLEMS AND HP CUT OUTS	Incorrect Airflow rates	*Heat pump mode :* Check the filter before the indoor coil measure and estimate the airflow rate increase the speed of the fan *Cooling mode :* Check the condenser fan (Amps)
	Moisture or contaminants in the system	Summer operation Several hours after the unit has stopped, check the correspondance between the measured pressure and the outdoor temperature

REFRIGERATION

FAULT	POSSIBLE CAUSE AND SYMPTOMS	SOLUTION
HP PROBLEMS AND HP CUT OUTS	Moisture or contaminants in the system	If the circuit pressure is higher (<1bar) than the saturated pressure corresponding to the measured outdoor temperature, there is possibility that some contaminants are present in the system. Reclaim the refrigerant, and vacuum the circuit (Ensure very low and slow vacuum for R407c) Recharge the unit
	Condenser coil is obstructed	Check the condenser coil and clean is necessary
	Recycled Hot Air	Check clearance around the condenser
Strong variations of pressure (2 to 3 bar) Thermostatic Expansion Valve "hunting"	Incorrect adjustment of the expansion valve Low refrigerant charge Filter drier obstructed with gas bubbles at the expansion valve inlet Moisture in the system	Refer to LP problems and LP cut out section
Very high discharge temperature, **High amps measured at compressor**	Very high superheat, very hot compressor	Open the superheat adjustment on the expansion valve. Check the pressure drop on the filter drier in the suction line
	Four Way reversing valve possibly blocked, abnormal noise from the valve, low LP and increasing HP	Check operation of the valve by going through cycle inversions. Change if necessary. Refer to LP problems

INDOOR FAN BLOWER

FAULT	POSSIBLE CAUSE AND SYMPTOMS	SOLUTION
High amps on action Fan motor	Pressure drop in the ducting installation too low.	Reduce the rotation speed of the fan Measure and estimate the airflow and pressure and compare with the specification from customer.
High amps on reaction Fan motor	Pressure drop in the ducting installation too high.	Reduce the rotation speed of the fan Measure and estimate the airflow and pressure and compare with the specification from customer.
Unstable running and high vibration	Fan jumping from one operating point to the other.	Change rotation speed of the fan.

OUTDOOR AXIAL FAN

FAULT	POSSIBLE CAUSE AND SYMPTOMS	SOLUTION
Heat Pump mode: Circuit breaker open	High Amps due to a low voltage from the main supply	Check the voltage drop when all components are running. Change the circuit breaker for one with a higher rating.
	High amps due to freezing of the coil	Check the adjustable amps on the motor starter. Adjust the defrost cycle set points.
	Flexy: Water ingress in the motor connection box.	Change the component

ELECTRIC HEATER

FAULT	POSSIBLE CAUSE AND SYMPTOMS	SOLUTION
High Temperature trip out on electric heater	Low airflow rate	Measure and estimate the airflow and pressure and compare with the specification from customer.
	Incorrect position of the Klixon	Check that the Klixon, is positioned in the airflow, relocate Klixon if necessary Check that there is no heat transfer from the Klixon support.

ELECTRIC HEATER

FAULT	POSSIBLE CAUSE AND SYMPTOMS	SOLUTION
Water found in the ventilation section	Cooling mode: Water carried away from the coil because of excessive airflow and speed on the coil.	Estimate the airflow rate and check the speed is lower than 2.8 m/s
	Low air pressure in the compartment due to a high airflow rate or a high pressure drop before the fan	Check filter Reduce airflow rate
Water ingress in the filter compartment	Check seals around the ventilation section.	Check the door seal Check for the presence of silicone seals in the corners of the door and at the bottom of the refrigeration section bulkhead.
	Water ingress through a leaking fresh air hood or when running 100% fresh air	Check the seals and flanges in the fresh air hood Reduce the airflow rate if necessary

Rooftops are generally placed on the roof but can also be installed in technical rooms. These units are very robust but a minimum regular maintenance is required. Some moving parts in the units can suffer from wear and tear and must be checked regularly (belts). Other parts can get clogged by dirt carried in the air (filters) and must be cleaned or replaced.

These units are designed to produce cooled or heated air through the use of a refrigeration vapour compression system, it is therefore imperative to monitor the refrigeration circuit operating pressures and check the pipe-work for leaks.

The table below, details a possible maintenance plan, including the operations to be carried out and the periodicity at which they must be accomplished. It is recommended to follow such a plan to keep a rooftop unit in good working order. Regular maintenance of your rooftop will extend its operating life and reduce operating faults

---

Symbols and Legend :

0   Operation which can be carried out by on-site maintenance technicians.

Δ   Operation which **must** be carried out by qualified personnel, trained to operate on this type of equipment.

NOTE :

- Times are given for information purpose only and may vary depending on the unit size and type of installation.

- Coil cleaning must be carried out by qualified personnel using appropriate methods that won't damage the fins or the tubes.

- It is recommended to keep a minimum stock of common replacement parts in order to be able to carry out regular maintenance operations (i.e. filters). You can contact your local Lennox representative which can assist you in establishing a parts list for each type of equipment.

- The access ports to the refrigeration circuits MUST be leak checked every time gauges are connected to the service ports.

Table 16

TASK	OPERATING MODE	MONTHLY	QUARTERLY	6 MONTHLY	YEARLY B4 WINTER	ESTIMATED TIME (mn)
Clean or replace filters: Disposable, or metal frame.	Replace filters with new ones if disposable. Vacuum clean or blow the dirt. Wash and dry carefully. +Replace media if necessary. Blocked filter will reduced the performance of the unit. THE UNIT MUST NOT OPERATE WITHOUT FILTERS	O				20
Visual check of the oil level	Visually check the oil level through the sight glass on the side of the compressor casing	O				2
Position check of the compressor crankcase heater.	Check the heating resistance is fitted properly and tight around the compressor body.	O				2
Belt tension check.	Check belt tension (Info in IOM) Replace belt if necessary.	O				10
Centrifugal fan bearings check	Isolate unit from the main power supply; Push the fan wheel manually and check for abnormal noises. Bearings are lubricated for life but may need replacement after 10000 hours	O				10
Check absorbed Amps	Check absorbed Amps on all three phases; compare with the nominal value given in the electrical wiring diagram.		Δ			15
Check Smoke detector	Start the unit. Trigger the smoke detector by moving a magnet around the detector head. Reset unit and control.		Δ			5
Check Climatic control, set-points and variables	Refer to the commissioning sheet; Check all set points are set according to this document.		Δ			15
Check clock settings	Check the time and date of the control		O			5
Check the position and tightness of refrigeration components	Check systematically all connections and fixings on the refrigeration circuit. Check for oil traces, eventually a leak test should be conducted. Check operating pressures correspond to the ones indicated on the commissioning sheet		Δ			30
Check Airflow rate safety switch (if fitted).	Shut down supply fan. The fault must be detected within 5 seconds.			O		
Check freeze protection on HWC				Δ		5
Check three way valve on HWC	Increase room set-point 10°C above the actual room temperature. Check operation of the piston. It must move away from the valve head. Reset the control.			Δ		5
Check economiser actuator operation	Check all fixings and transmission. Stop the unit using the control. The fresh air damper must closes. Start the unit the fresh air damper should open			Δ		5
Check refrigeration 4way valve	With the unit running in cooling mode increase the room set-point temperature by 10°C. The unit should switch to heat pump mode. Reset the control.			Δ		5
Check tightness of all electrical connections	Power down the unit and check and tighten all screws, terminal and electric connections, taking a particular attention to the power lines and low voltage control wires			Δ		30

TASK	OPERATING MODE	MONTHLY	QUARTERLY	6 MONTHLY	YEARLY B4 WINTER	ESTIMATED TIME (mn)
Check HP / LP safety switches	Install manifold gauges on the circuit to be checked. Shut down the axial fans and wait for the HP switch to shut down the compressor: 29bar (+1 /-0) auto-reset 22bar (+ - 0.7) Reconnect fans. Switch off the centrifugal supply fan and wait for the LP switch to cut out: 0.5bar (+ - 0.5) reset 1.5bar (+0.5).					15
Check outdoor fans and fan guards	Check the fan blades conditions and all fan guards and protections				0	5
Check position of all sensors	Check the good positioning and operation of all sensors. Check the values given in the control system. Replace sensor if necessary				0	5
Check and clean if necessary all fresh air grilles	Check the fresh air grilles (if fitted). If dirty or damaged, remove them from unit and clean with high pressure water cleaner. Refit on unit once clean and dry.				0	5
Check indoor and outdoor coils, clean if necessary	Visually check the coils for dirt. If not too dirty, cleaning with a light brush may be enough (WARNING: Fins and copper tubes are very fragile! Any damage WILL reduce the performances of the unit). If very dirty, deep industrial cleaning is required using de-greasing agents.(External contractors must be called).				0	1h if cleaning
Check electric heater element for excessive corrosion	Isolate the unit; Pull the electric heater out of the heater module box and check the resistances fo traces of corrosion; Replace resistance as required;				0	1h if replacement
Check anti-vibration mountings, for wear and tear.	Visually check anti-vibration mountings on compressors and centrifugal fan. Replace if damaged.				0	1h if replacement
Check refrigeration circuit for traces of acid in the oil	Take a sample of oil from the refrigeration circuit.				Δ	
Check Glycol concentration in the HWC circuit	Check the glycol concentration in the pressurised water circuit. (a concentration of 30% gives a protection down to aprox. - 15°C) check the circuit pressure				Δ	30
Check defrost cycle with 4-way valve inversion.	Switch the unit to heat pump mode. Change the set point to obtain the standard defrost mode and reduce the cycle time to the min value. Check the operation of the defrost cycle.				Δ	30
Gas burner module check for corrosion	Pull out the burner to access the tubes (refer to Gas burner section in the IOM)				Δ	30
Sweeping and cleaning the gas burner	Clean the in-shot burners and the blower wheel lightly with a brush. Sweep the flue and flue box. Wipe-off the dust from the housing of the motor. Clean combustion air inlet louvers Pull-out baffles from the tubes, sweep the tubes CHECK FLUE BOX GASKET				Δ	30
Gas supply pressures / connections checks	refer to Gas burner section in the IOM for details				Δ	15
Gas regulation valve settings	refer to Gas burner section in the IOM for details				Δ	30
Check gas burner safety switches	refer to Gas burner section in the IOM for details				Δ	30

CERTIFICATION

N° QUAL/2001/15834b

LENNOX FRANCE
DIVISION DE LGL FRANCE

CONCEPTION, FABRICATION ET CESSION INTERNE DE ROOF TOP
ET CENTRALES DE TRAITEMENT D'AIR.

*DESIGN, MANUFACTURING AND INTERNAL TRANSFER OF ROOF TOP
AND AIR HANDLING UNITS.*

2, rue Lavoisier ZI de Longvic BP 60 F-21602 LONGVIC CEDEX

AFAQ certifie que pour les activités et les sites référencés ci-dessus toutes les dispositions mises en oeuvre
pour répondre aux exigences requises par la norme internationale :
*AFAQ certifies that all the arrangements covering the above mentioned activities and locations are established
to meet the requirements of the international standard :*

ISO 9001 : 2000

ont été examinées et jugées conformes.
have been examined and found conform.

2003-01-24

| (année/mois/jour) | Il est valable jusqu'au* *It is valid until** | 2006-01-23 | (year/month/day) |

Le Président du Comité de Certification *The President of the Certification Committee*	Le Directeur Général d'AFAQ *The Managing Director of AFAQ*	Le Représentant de l'Entreprise *On Behalf of the Firm*
C. GUERIN	**O. PEYRAT**	**E. MOUTON**

AFAQ - 116, AVENUE ARISTIDE BRIAND - BP 40 / F-92224 BAGNEUX CEDEX FRANCE

LENNOX

Site industriel de LONGVIC
ZI de LONGVIC – BP 60
21602 LONGVIC – France

Téléphone : +33 (0)3 80 77 41 41
Fax : +33 (0)3 80 66 66 35

DECLARATION DE CONFORMITE DU CONSTRUCTEUR
Conformément
à la Directive européenne « Equipement sous pression » 97/23/CE,

CE CONFORMITY DECLARATION
As defined by
« Pressure equipment » Directive 97/23/EC,

LGL France SA, ZI Les Meurières – 69780 Mions – France

La société soussignée certifie sous sa seule responsabilité que l'ensemble de nos fabrications de roof top désignés par les types suivants :
The company hereby declare, under its own responsibility, that the entire roof top range which designations are :

FCA   FHA   FGA   FDA   FCK   FHK   FGK   FDK
FXA   FXK
BCK   BHK   BGK   BDK

Qui contiennent des fluides frigorigènes classés en groupe 2 (R22 et R407C),
Which are containing refrigerating fluids classified in group 2 (R22 et R407C),

Sont conformes aux dispositions de la Directive « Equipements sous pression », 97/23/CE
Is in compliance with the requirements of « Under pressure equipments » directive, 97/23/EC :

Catégorie *Category* : II
Module d'évaluation *Evaluation Module* : D1
Organisme notifié *Notified body* : Bureau VERITAS
                            17 bis, place des reflets – La DEFENSE 2 – 92400 Courbevoie.

Sont conformes aux dispositions de la Directive - *Are in compliance with the requirements of*
« Machines », 98/37/CE - *« Machinery »*, 98/37/EC
« Basse Tension », 73/23/CEE modifiée - *« Low voltage »*, 73/23/EEC amended
« CEM», 89/336/CEE - *« EMC »*, 89/336/EEC
« Appareils à gaz », 90/396/CEE modifiée - *« Gas machines »*, 90/396/EEC amended

Ces produits sont fournis avec un marquage de conformité .
The products are provided with a marking of conformity.

Date : 22 Mai 2003 / May 22th 2003

E. MOUTON
Directeur du site de Longvic

13/06 2003 VEN 14:51 FAX

☎002/002

AFNOR CERTIFICATION
Groupe AFNOR

Organisme certificateur
AFNOR CERTIFICATION
11, avenue Francis de Pressensé
93571 SAINT-DENIS LA PLAINE Cedex
☎ : (33) 1.47.62.76.60 - Fax : (33) 1.49.17.91.91
Site Internet : http://www.marque-nf.com

Marque NF – Matériels de Détection Incendie

NF
Matériel
d'incendie
Cnmis
8.01

C N MIS
LA SECURITE CERTIFIEE

Organisme mandaté
Comité National Malveillance Incendie Sécurité SAS
C.N.M.I.S. SAS - 16, avenue Hoche - 75008 PARIS
☎ : (33) 1.53.89.00.40 - Fax : (33) 1.48.63.40.63
Site Internet : http://www.cnmis.org

CERTIFICAT DE DROIT D'USAGE DE LA MARQUE NF
(LICENCE)

N° DROIT D'USAGE		La Société :	FINSECUR
DAD 013 J0	Le 27/05/2003	Pour son usine de	15, rue du Général Négrier 78800 HOUILLES

Correspondant C.N.M.I.S SAS	
José CAMPO	Tél : 01 53 89 00 48
	Fax : 01 45 63 40 63

Date de fin de validité :
31/03/2004

N° Dossier C.N.M.I.S SAS
03 03 18
Conformité aux normes :
NF S 61-961 de Septembre 2000

MODIFICATIONS

Est autorisée à apposer la marque NF sur le matériel désigné ci-après :

Désignation technique du matériel   : **Détecteur Autonome Déclencheur**

Désignation commerciale   : **LOTUS 1 W2C**

Caractéristiques certifiées   : **Type II**
Elément sensible   : **2 TYPE E4**
            (Les autres caractéristiques sont reprises dans les rapports d'essai)

Ce matériel fonctionne avec   : **Voir liste des matériels associés**

Références et date des rapports d'essais   : **DH 03 01 76 du 14 Mai 2003 (Fiche Technique N° 1441)**

Fonctions supplémentaires   : **Voir rapports référencés ci-dessus**

N.B : Cette décision dispense le titulaire de la présentation des Procès Verbaux d'essai (incluant les rapports d'essais) de conformité aux normes du matériel ci-dessus.

PARIS, le 11 juin 2003
Par mandat d'AFNOR CERTIFICATION
Le C.N.M.I.S. S.A.S

C N MIS
LA SECURITE CERTIFIEE

Le Directeur Général
Denis CLUZEL

Ce certificat annule et remplace tout certificat antérieur, sa date de validité est confirmée sous réserve des contrôles effectués par AFNOR CERTIFICATION et/ou le C.N.M.I.S. SAS qui peuvent prendre toute sanction conformément aux Règles Générales de la marque NF et au Règlement R075. Ce certificat atteste que les produits désignés sont certifiés conformes au référentiel technique du Règlement R075 et que le système qualité de la société a été évalué selon ce même Règlement. Il n'engage en aucun cas AFNOR CERTIFICATION et le C.N.M.I.S. SAS quant à la conformité réglementaire de l'installation dans laquelle les produits objets de ce certificat seront utilisés.

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ACCREDITATION N° 5-0015

LENNOX®

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SÉCURITÉ FEU
Réaction au feu

cofrac
LABORATOIRE
ACCREDITE
SOUS LE
N° 1-0300
ESSAIS

L'accréditation COFRAC atteste uniquement
de la compétence technique du laboratoire
pour les essais couverts par l'accréditation.

PROCÈS-VERBAL DE CLASSEMENT
DE RÉACTION AU FEU D'UN MATÉRIAU

Prévu à l'Article 68 de l'Arrêté du Ministère de l'Intérieur du 30 juin 1983,
modifié par l'arrêté du 28 août 1991
Laboratoire pilote agréé du Ministère de l'Intérieur (arrêté du 05/02/59, modifié)

N° 96.43170

Valable 5 ans à compter du 15/09/1997

Matériau présenté par	:	la Société ISOVER SAINT GOBAIN Les Miroirs 18 avenue d'Alsace 92096 COURBEVOIE
Marque commerciale	:	CLIMAVER 274 Panneau NU ou PRIMITIF 2 V M0
Description sommaire	:	Feutre rigide en laine de verre (fibres de verre liées par une résine synthétique thermodurcissable) revêtu sur la face apparente d'un voile de verre noir, et sur l'autre face d'un voile de verre jaune pâle, renforcé par des fils de verre. Épaisseur totale : 25 mm
Nature de l'essai	:	Essai par rayonnement Mesure du Pouvoir Calorifique Supérieur
Classement :		**M0**

Durabilité du classement (Annexe 22) : Non limitée a priori
compte tenu des critères résultant des essais décrits dans le rapport d'essais N° 96.43170 annexé.

Le classement indiqué ne préjuge pas de la conformité des matériaux commercialisés aux échantillons soumis aux essais et ne saurait en aucun cas être considéré comme un certificat de qualification tel que défini par la loi. Cette conformité peut être attestée par les certificats de qualification reconnus par le ministère chargé de l'industrie, et notamment par la marque NF - Réaction au Feu.

Champs/Marne le : 15 septembre 1997

Le technicien responsable de l'essai

Dina FAUCHE

Le chef du laboratoire Réaction au Feu

Guy TOUCHAIS

Sont seules autorisées les reproductions intégrales du présent procès-verbal de classement ou de l'ensemble procès-verbal de classement et rapport d'essais annexé.

PARIS - MARNE-LA-VALLÉE - GRENOBLE - NANTES - SOPHIA ANTIPOLIS
CENTRE SCIENTIFIQUE ET TECHNIQUE DU BATIMENT

84, avenue Jean-Jaurès - Champs-sur-Marne - BP 2 - F-77421 Marne-la-Vallée Cedex 2
Tél. 33 01 64 68 82 27 ou 64 68 84 12 - Fax : 33 01 64 68 82 79
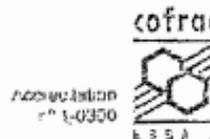
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SÉCURITÉ FEU
Réaction au feu

PROCÈS-VERBAL DE CLASSEMENT
DE RÉACTION AU FEU D'UN MATÉRIAU

Prévu à l'article 88 de l'Arrêté du Ministère de l'Intérieur du 30 juin 1983,
modifié par l'arrêté du 28 août 1991
Laboratoire pilote agréé du Ministère de l'Intérieur (arrêté du 05/02/59, modifié)

N° RA01-1042

Valable 5 ans à compter du 9 novembre 2001

Matériau présenté par	:	La Société LIBELTEX NV Marialoopsteenweg 51 8760 MEULEBEKE BELGIQUE
Marque commerciale	:	T200

Description sommaire :
Médias filtrants composés de 100% fibres polyester, ignifugées en partie.
Masses surfaciques nominales : 80 – 140 – 200 et 300 g/m².
Épaisseurs nominales : 10 – 14 – 20 et 25 mm. Coloris : Blanc.

Nature de l'essai : Essai au Brûleur Électrique
Essais-Complémentaires

Classement : **M1** valable pour une gamme d'épaisseurs de 10 à 25 mm

Durabilité du classement (Annexe 22) : Non limitée a priori (Filtre non régénérable)
compte tenu des critères résultant des essais décrits dans le rapport d'essais N° RA01-1042 annexé.

Le classement indiqué ne préjuge pas de la conformité des matériaux commercialisés aux échantillons soumis aux essais et ne saurait en aucun cas être considéré comme un certificat de qualification tel que défini par la loi. Cette conformité peut être attestée par les certificats de qualification reconnus par le ministère chargé de l'Industrie, et notamment par la marque NF - Réaction au Feu.

Champs/Marne le : 9 novembre 2001

Le technicien responsable de l'essai   Le chef du laboratoire Réaction au Feu

Nicolas ROURE   Martial BONHOMME

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PARIS - MARNE-LA-VALLÉE GRENOBLE - NANTES - SOPHIA ANTIPOLIS
CENTRE SCIENTIFIQUE ET TECHNIQUE DU BÂTIMENT

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Accréditation
n° 1-0300

ESSAIS

PROCÈS-VERBAL DE CLASSEMENT
DE RÉACTION AU FEU D'UN MATÉRIAU

Prévu à l'article 88 de l'Arrêté du Ministère de l'Intérieur du 30 juin 1983,
modifié par l'arrêté du 28 août 1991
Laboratoire pilote agréé du Ministère de l'Intérieur (arrêté du 05/02/59, modifié)

N° RA00-461

Valable 5 ans à compter du 17 octobre 2000

Matériau présenté par	:	La Société SAINT GOBAIN ISOVER FRANCE Les Miroirs 18 avenue d' Alsace 92400 COURBEVOIE
Marque commerciale	:	CLIMAVER 202 - FIB-AIR ISOL

Description sommaire :
Feutre en laine de verre (fibres de verre liées par une résine thermodurcissable) revêtu sur une face d'une feuille d'aluminium renforcée d'une grille de verre. Le complexe aluminium est contrecollé à l'aide d'une colle polyéthylène.
Épaisseurs : 25 à 50 mm. Masse volumique nominale de la laine de verre : 30 kg/m^3

Nature de l'essai : Essai par rayonnement avec joint simulé suivant avis CECMI en date du 08 avril 1993.
Mesure du Pouvoir Calorifique Supérieur

Classement :   **M0**

Durabilité du classement (Annexe 22) : Non limitée
compte tenu des critères résultant des essais décrits dans le rapport d'essais N° RA00-461 annexé.

Le classement indiqué ne préjuge pas de la conformité des matériaux commercialisés aux échantillons soumis aux essais et ne saurait en aucun cas être considéré comme un certificat de qualification tel que défini par la loi. Cette conformité peut être attestée par les certificats de qualification reconnus par le ministère chargé de l'industrie, et notamment par la marque NF - Réaction au Feu.

Champs/Marne le : 17 octobre 2000

Le technicien vérificateur

Bruce LE MADEC

Le Chef du laboratoire Réaction feu
responsable de l'essai

Martial BONHOMME

Sont seules autorisées les reproductions intégrales du présent procès-verbal de classement ou de l'ensemble procès-verbal de classement et rapport d'essais annexé.

PARIS - MARNE-LA-VALLÉE - GRENOBLE - NANTES - SOPHIA ANTIPOLIS
CENTRE SCIENTIFIQUE ET TECHNIQUE DU BÂTIMENT

84, avenue Jean-Jaurès - Champs-sur-Marne - BP 2 - F-77421 Marne-la-Vallée Cedex 2
Tél. : 01 64 68 84 12 - Fax : 01 64 68 84 79 - E-mail : reaction@cstb.fr - http://www.cstb.fr/feu

(Directive 90/396/CEE « Appareils à gaz »)
(« Gas appliances » 90/396 EEC Directive)
Numéro : 1312BO3925

AFNOR CERTIFICATION, *après examen et vérifications, certifie que l'appareil :*
AFNOR CERTIFICATION, after examination and verifications, certifies that the appliance:

- **Fabriqué par :**
  Manufactured by

  LENNOX FRANCE
  Z.I. LONGVIC
  BP 60
  F-21602 LONGVIC CEDEX

- **Marque commerciale et modèle(s) :**
  Trade mark and model(s) :

  | **LENNOX** |

  ➢ **BG-B20 – BG-B33 – BG-C20**
  ➢ **BG-C46 – BG-D33 – BG-D60**

- **Genre de l'appareil :**
  Kind of the appliance :

  MODULE DE CHAUFFAGE POUR
  CLIMATISEURS DE TOITURE (B22)
  GAS AIR HEATER UNIT FOR ROOF TOP (B22)

- **Désignation du type :**
  Type designation:

  BG-B20

Pays de destination *Destination countries*	**Pressions (mbar)** *Pressures (mbar)*	**Catégories** *Categories*
DK-SE-IT	**20**	**I2H**
SE	**37**	**I3P**
DE	**20 ; 50**	**I2E ; I3P**
BE	**20/25 ; 37**	**I2EB ; I3P**
GB-ES-PT-CH	**20 ; 28-30/37**	**II2H3P**
NL	**25 ; 37/50**	**II2L3P**
FR	**20/25 ; 37**	**II2Er3P**

est conforme aux exigences essentielles de la directive "Appareils à gaz" 90/396/CEE (29/06/1990).
is in conformity with the essential requirements of the "Gas appliances" directive 90/396/EEC (29/06/1990).

CERTIGAZ
Le Directeur Général

Yannick ONFROY

Paris le : 1er juillet 2003

LENNOX

Baltic

Bureau Veritas S.A. is a Notified Body under the number 0062

ATTESTATION D'APPROBATION DE SYSTEME DE QUALITE
CERTIFICATE OF QUALITY SYSTEM APPROVAL

N° CE-PED-D1-LNX001-02-FRA-Rev.A

BUREAU VERITAS S.A., agissant dans le cadre de sa notification (numéro d'organisme notifié 0062), atteste que le système de qualité appliqué par le fabricant pour la production, l'inspection finale et les essais des équipements sous pression identifiés ci-après, a été examiné selon les prescriptions du module D1 de l'annexe III de la directive "Equipements sous pression" N° 97/23/CE et est conforme aux dispositions correspondantes de la directive.

BUREAU VERITAS S.A., acting within the scope of its notification (notified body number 0062), attests that the quality system operated by the manufacturer for production, final inspection and testing of the pressure equipment identified hereunder has been examined against the provisions of annex III, module D1, of the Pressure Equipment directive n° 97/23/EC, and found to satisfy the provisions of the directive which apply to it.

Fabricant (nom) / Manufacturer (name): **LENNOX France (Division de LGL France)**

Adresse / Address: **Site de LONGVIC**
2, rue LAVOISIER BP60
21602 LONGVIC CEDEX

Marque commerciale / Trade mark: **LENNOX**

Description des équipements: **Climatiseurs autonomes de toitures « ROOFTOP »**
Equipment description:

Identification des équipements concernés (liste en annexe le cas échéant) : **Liste en annexe**
Identification of equipment concerned (list attached where necessary):

Cette attestation est valable jusqu'au .... **14 JUIN 2005**
This certificate is valid until....

Le maintien de l'approbation est soumis à la réalisation par le Bureau Veritas des audits, essais et vérifications selon le contrat signé par le fabricant et le Bureau Veritas.
The approval is conditional upon the surveillance audits, tests and verifications to be carried out by Bureau Veritas as per the provisions stated in the agreement signed by both the manufacturer and Bureau Veritas.

Cette attestation est présumée nulle et le fabricant supportera seul les conséquences de son utilisation, si les assurances - données par le fabricant lors de la demande d'intervention - en matière (a) d'application de son système qualité approuvé, (b) de conformité de son équipement au type et (c) d'inspection et d'essais des produits finis se révèlent inexactes et, de manière générale, si le fabricant ne respecte pas l'une ou l'autre des obligations mises à sa charge par la directive n° 97/23/CE du 29 mai 1997 telle que transposée dans le(s) droit(s) national(aux) applicable(s).
This certificate shall be deemed to be void and the manufacturer shall alone bear any consequences pursuant to its use, where the manufacturer fails to comply with his undertakings as per the agreement in respect of (a) implementation of the approved quality system, (b) conformity of the equipment with the type and (c) inspection and tests on the final product, and generally where the manufacturer fails in particular to comply with any of his obligations under directive nr 97/23/EC of 29 May 1997 as transposed in the applicable law(s).

Etabli à / Made at	Le / On	Signé par / Signed by	Signature / Signature
LYON/DARDILLY	26 JUIN 2003	A.RELIGIEUX	

Code d'enregistrement / Registration code: 2003/2905/P

La présente attestation est soumise aux Conditions Générales de Service de Bureau Veritas jointes à la demande d'intervention signée par le demandeur.
This certificate is subject to the terms of Bureau Veritas General Conditions of Service attached to the agreement signed by the applicant.

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http://www.bureauveritas.com/ped

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**BUREAU
VERITAS**

ANNEXE à l'attestation d'approbation de système de qualité
Annex to the certificate of quality system approval

N° CE-PED-D1-LNX001-02-FRA-Rev A

Liste des équipements concernés
List of the concerned equipment

Désignation des familles de produit standard

Gammes	Modèles
Flexy (fluide R22) : FCA, FHA, FGA,FDA Flexy (fluide R407C) : FCK, FHK, FGK, FDK	050-060-070-085-100-120-140-160-190
Flexy à condensation à eau : FCK, FHK, FGK, FDK	060W-070W-085W-100W-120W-140W-160W-190W
Flexy « 4 volets » : FXA, FXK	025-030-035-040-055-070-085-100-110-140-170
Baltic R407C : BCK, BHK, BGK, BDK	020-025-030-035-040-045-050

Désignation des familles de produit spéciaux

Gammes	Modèles
FCA, FHA, FCK, FHK	200-250-300
FXK	200

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