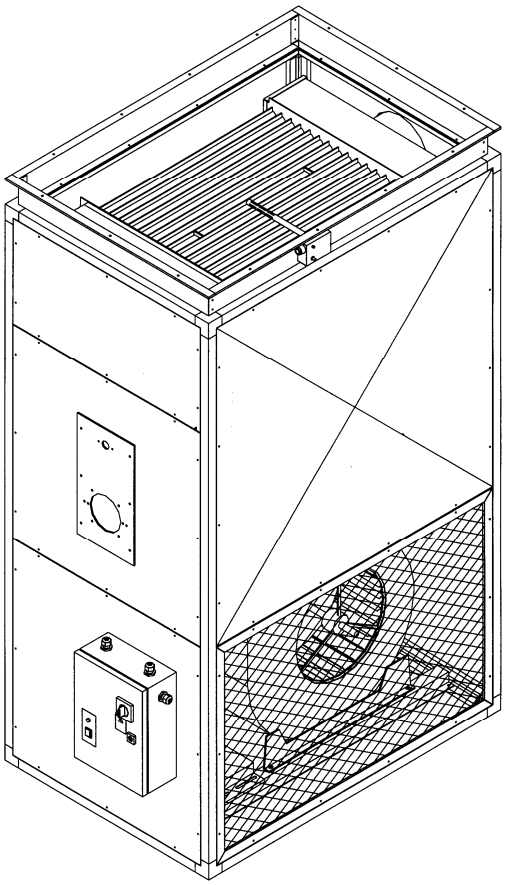
TECHNICAL INFORMATION, ASSEMBLING INSTRUCTIONS, USE AND MAINTENANCE

Vertical warm air heaters

BI SERIES



CE

DESA ITALIA

Dear Customer,

*Thank you for choosing a **BI** series AIR HEATER, an innovative and modern, quality and high performance product which will assure safe and silent working for a long time. This is particularly the case if the heater is put in the hands of **DESA ITALIA** Technical Assistance Department which is specially trained end equipped to keep it working at maximum efficiency with low running costs and has a large number of original spare parts in stock.*

*This instruction manual contains important instructions and suggestions for simple installation and making the best use of the **BI** air heater.*

Once again, thank you.

DESA ITALIA s.p.a.

RANGE

This manual refers to **TYPE**. In the following chart you will find the heaters range and the correspondence between Type and the Commercial and the Trade Name.

TYPE	MODEL
1	BI 60
2	BI 95
3	BI 105
4	BI 120
5	BI 160
6	BI 190
7	BI 225
8	BI 260
9	BI 320
10	BI 390
11	BI 590
12	BI 645
13	BI 770
14	BI 1000
15	BI 1100

GUARANTEE

The **BI** heater has a **SPECIFIC GUARANTEE** running from the date of the purchase, of which the customer must notify the manufacturer. If he is unable to do so the guarantee shall run from the date of manufacture. The details of the guarantee conditions are given in the GUARANTEE CERTIFICATE supplied with the equipment, and which we suggest the Customer read with care.

INDEX

GENERAL
RANGE 2
GUARANTEE 2
GENERAL WARNINGS 4
BASIC SAFETY RULES 5
DESCRIPTION OF THE EQUIPMENT 6
IDENTIFICATION 7
STRUCTURE 7
COMBUSTION CHAMBER DIMENSIONS 8
DIMENSIONS 9
TECHNICAL DATA 10
HANDLING AND TRANSPORTATION 11
LOCATION 12
FUEL CONNECTION 12
FLUE 12
AIR INLET CONNECTION 13
AIR OUTLET CONNECTION 13
FIXED PROTECTIONS 13
DIFFUSION PLENUM 13
AIR INLET FILTER 15
MOUNTING THE BURNER 16
ELECTRICAL CONNECTION 16
TYPE 1 WIRING DIAGRAM 17
TYPE 2 TO 10 WIRING DIAGRAM 18
TYPES 11 TO 14 WIRING DIAGRAM 19
TYPE 15 WIRING DIAGRAM 20
FAN-LIMIT DUAL THERMOSTAT 22
POSITIONING OF FAN, LIMIT AND SAFETY THERMOSTATS 22
FAN-LIMIT-SAFETY THERMOSTATS SETTING 24
FAN START TIMER 25
SETTINGS 25
OIL-FIRED BURNER SETTING 26
FAN SPEED SET-UP 27
CHECKS 28
CONTROLS 28
INDICATORS 29
FAN MOTOR ABSORPTION 29
WORKING CYCLE 29
START UP AND STOP 30
MAINTENANCE 30
AIR FILTER CLEANING 30
BURNER CLEANING 31
HEAT EXCHANGER CLEANING 31
FAN MAINTENANCE 32
LIMIT THERMOSTAT MAINTENANCE 32
FUME SAMPLING POSITION 32
ASSISTANCE 32
FAULTS AND SOLUTIONS 33

The following symbols are used in the manual:

WARNING= Where the work to be carried out requires special care and suitable training.

FORBIDDEN= Where the action MUST NOT be carried out.

This manual consists of 36 pages.

GENERAL WARNINGS

This instruction booklet is an integral part of the equipment and so it has to be carefully kept at all times and always accompany the equipment if it passes to another owner. If the instruction booklet gets damaged or lost, ask DESA ITALIA local technical assistance dept. for another copy.

After removing the packaging, check that all the equipment is present and intact. If there is any failure to correspond with order contact your DESA ITALIA agent who sold the equipment.

The **BI** warm air heater must be installed by an accredited company in accordance with the law 46 of 5th March 1990, which shall issue a statement that the equipment has been properly installed, i.e. in observance of current legislation and the instructions given by DESA ITALIA in this manual.

These machines are designed to heat rooms and must be used for this in accordance with their performance characteristics. DESA ITALIA shall not be contractually or otherwise liable for any damage caused to people, animals or items because of installation mistakes, failure to observe the rules or improper use.

A too high temperature is harmful to health and is also a waster of energy. Do not keep rooms closed for long periods: periodically open windows to change stale air.

The first time the equipment gets switched on, there may is some smell or fumes caused by the evaporation of the liquid protecting the heat exchanger during storage: this is normal and will disappear after a short period. It is advisable to keep rooms ventilated.

If the equipment remains idle for long periods, carry out the following operations at least:

- Put the main electrical switch off;
- Close the main fuel supply tap.

If the heater is idle for long periods, it is advisable to contact DESA ITALIA Technical Assistance Department or other professionally qualified people to restart it.

Only original accessories must be used on the equipment. DESA ITALIA shall not be held liable for any damage deriving from improper sue or non original materials or accessories.

Laws, standards, directives and technical rules referred to in this booklet are only for your information and shall be considered valid only as of the time of going to press. Any new provisions which come into effect or any amendments to current provisions shall not give rise to any obligations for DESA ITALIA as against third parts.

Repairs and maintenance must be carried out by DESA ITALIA Technical Assistance Department or by qualified staff as indicated in this booklet. Do not make modifications to or tamper with the equipment as this may cause dangerous situations to arise and the manufacturer will no longer be responsible for any damage caused.

The plant and utilities must be connected and affixed properly (i.e electrical supply etc.) and must not cause obstructions which may be tripped over.

DESA ITALIA is responsible for its product's compliance with the laws, directives or building standards in force at the time of its sale. The design engeneer, installer and user are respectively and entirely responsible of their awareness of and observance of the legislative provisions and standards dealing with plant design, installation, the working and maintenance of the equipment.

DESA ITALIA shall not be held liable for any failures to observe the instructions contained in this booklet, for the consequences of any handling or usage not specifically provided for or for any translations which may be subject to erroneous interpretation.

This machine has been projected to work with the heat rate and ait throughput values as indicated in the Technical Data paragraph. A too low heat rate and/or a too high air throughput might lead to the condensation of the combustion products, with a consequent irreparable corrosion of the heat exchanger. A too high heat rate and/or a too low air throughput might lead to an anomalous overheating of the heat exchanger with a consequent cut-in of the safety devices and damage of the echanger.

BASIC SAFETY RULES

We remind you that the use of products needing electrical energy, gas or heating oil requires the observance of some basic safety rules, including the following:

- The unassisted use of air heaters by children or disabled people is forbidden.
- Electrical devices or equipment such as switches, domestic appliances etc. must not be used if there is a smell of fuel or unburnt gases etc. In such cases:
  - Ventilate the room by opening doors and windows;
  - Close the fuel shut-off;
  - Call the DESA ITALIA Technical Assistance Dept. or other professionally qualified personnel.
- The equipment must not be touched being barefeet of with wet or damp parts of the body.
- Cleaning and maintenance operations on the equipment must be carried out only when it is switched off with the main electrical switch if the 'off' position, and with the fuel supply cut off.
- It is forbidden to interfere with or alter the safety or regulatory systems without prior authorisation and without following the manufacturer's instructions.
- It is forbidden to pull or twist the electric cables coming out from the equipment, even if the equipment is disconnected from the main electricity supplies.
- Before entering the access doors to the internal parts of the equipment, the main switch must be turned to 'off'.
- It is forbidden to throw away, abandon or leave the packaging material (cardboard, fasteners, plastic bags etc.) within the reach of children, as they may be a source of danger.
- It is forbidden to install the equipment near to flammable materials or where there are aggressive agents in the atmosphere.
- It is forbidden to put objects on top of the equipment or push them inside the boy shell grill and exhaust discharge dust.
- The exhaust flue must not be touched as it may reach temperatures which are dangerously high to the touch during normal working.
- It is forbidden to use adapters, multiple sockets and extension cables for the equipment electrical connection.
- It is not permitted to install the equipment outdoors or in any place where it will be subject to atmospheric agents.
- It is forbidden to directly install the equipment in restricted rooms with no fitting ventilation since the air aspiration might cause a strong depression inside the room, leading to serious inconveniences.

DESCRIPTION OF THE EQUIPMENT

The BI equipment is designed to heat the air in the room using heat energy produces by combustion. Essentially the equipment consists of heat exchanger assemblies exchanging heat from the combustion by-products from a forced gas or heating fuel oil burner by a high performance fan assembly. The air to be heated is aspired by the latter and flows against the heat exchange where its temperature rises to then be distributed either immediately or via suitable channelling. The particular features of the centrifugal fan make the equipment well suited for installation where hot air needs to be distributed through channels or generally where it is necessary to have static pressure available. A special flange (both on inlet and outlet) enables the equipment to be connected up the channelling.
This system gives a notable reduction in the costs of the plant and also works economically, making itself particularly suitable where it is expected it be used intermittently or occasionally. The equipment is designed so that it can also be used to provide ventilation only during the summer months.

GENERAL STRUCTURE FEATURES

Heat exchanger
Built with welded steel and steal-tested in accordance with the **UNI-CIG 9462** standards, it is easy to be inspected for the normal cleaning and maintenance operations. It consists of:

- ***Combustion chamber*** in low thermal load **stainless steel** with suitable shape and size;
- ***Exchange elements*** in stainless steel, with modular, large surface sections with swirl impressions for an optimal heat exchange;
- ***Exhaust manifolds*** in fine steel.

External casing
The external casing consists of removable panels in pre-painted steel and also includes:

- Insulation of the surfaces exposed to radiant heat from the heat exchanger;
- Delivery air flange for connection to the hot air distribution circuit;
- Intake guard with flanges for connection to the intake circuit.

Fan assembly
One or more high performance centrifugal fans producing low noise emissions. These are run by electrical motors connected to a pulley and belt system. The motor has got an adjustable pulley (**type 1** to **type 10**) which means the system can be easily adapted to the particular needs of the customer's premises.

Control and safety thermostats
The heater has a dual thermostat which is calibrated and electrically connected to perform the following functions:

- ***"FAN" function*** (25-35°C, FAN thermostat) - controls fan start up about 60 seconds after burner ignition and stops the fan about 4 minutes after the burner has stopped. This prevents unpleasant cold air being conveyed into the room on start up und utilises the stored heat in the heat exchangers after the burner has been switched off.

- ***"SAFETY" function*** **(type 5** to **15,** TR thermostat) – preset at 80°C, it has the function of stopping the bruner in case of anomalous overheating of the air. Automatic reset, the correct setting has to be set during the first stat-up.

- ***"LIMIT"*** **function** (sealed setting 100°C, LM thermostat) – manual reset, switches the burner off in case of overheating of the air.

Fume discharge outlet
The equipment has a circular outlet to which a metal exhaust pipe can be connected and safely joined.

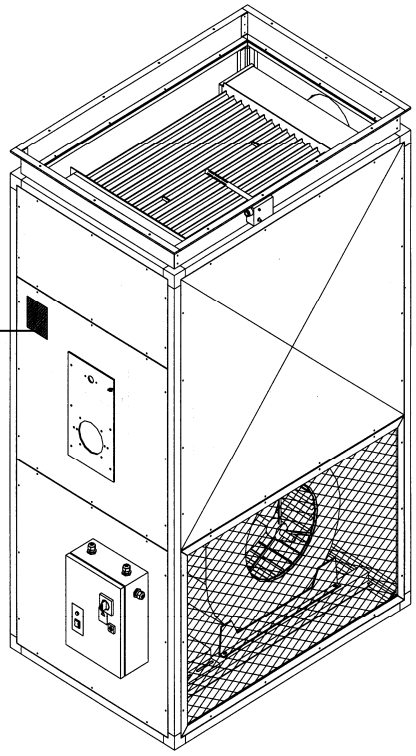
IDENTIFICATION

Hot air generators are identifiable by:

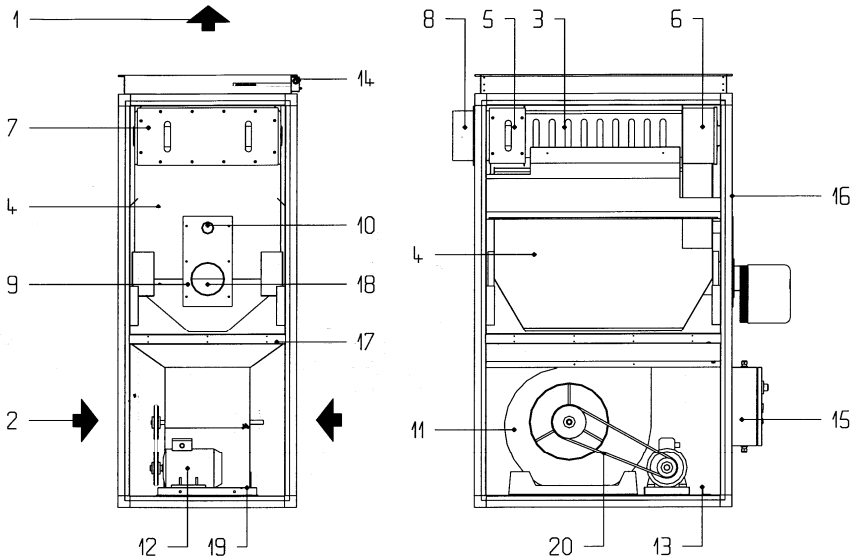
- The Technical Plate bearing their main technical and performance details. The plate is located on the front of the equipment.

⚠ If the Plate gets lost or damaged, ask for a duplicate from DESA ITALIA Technical Department.

MANUFACTURER IDENTIFICATION CE				
AIR HEATER				
Model				
Serial number				
Country		PIN		
		Code		
Type		Year		
Thermal capacity				Kw
Thermal power				Kw
Air flow (+20°C)				m^3/h
Working static pressure				Pa
Electrical supply				
Fan motor power				Kw
Max fan current				Pa
Protection rating			IP 20	



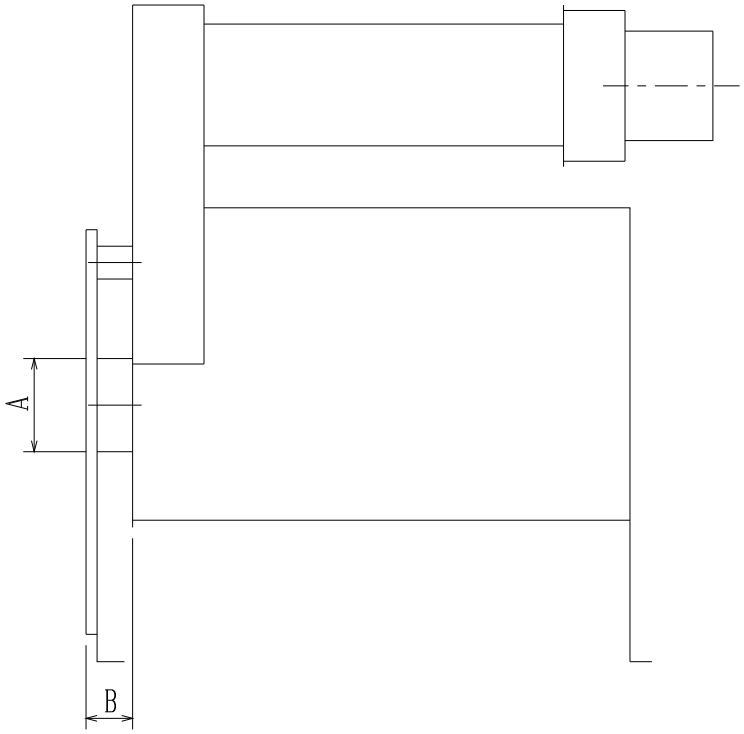
STRUCTURE



1. Air outlet
2. Air aspiration
3. Fume tubes
4. Combustion chamber
5. Back fume manifold
6. Front fume manifold
7. Inspection doors
8. Chimney
9. Burner flange
10. Combustion viewer
11. Centrifugal fan/s
12. Electric motor
13. Belt tightener
14. Dual thermostat
15. Electric equipment
16. Casing
17. Base attaching screws
18. Burner outlet
19. Motor mount plate
20. Transmission

COMBUSTION CHAMBER DIMENSIONS

The three fume-cycle heat exchanger and combustion chamber have the following dimensions.

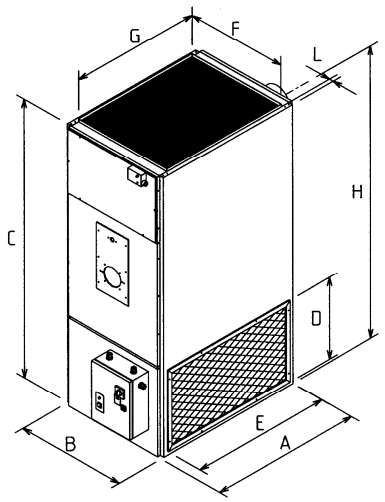


TYPE	1	2 3		4	5	6	7	8	9	10	11	12	13	14	15
A	120	150	170	170	170	170	220	220	220	220	300	300	300	300	300
B	80	80	80	80	150	150	130	130	130	130	140	140	150	150	180

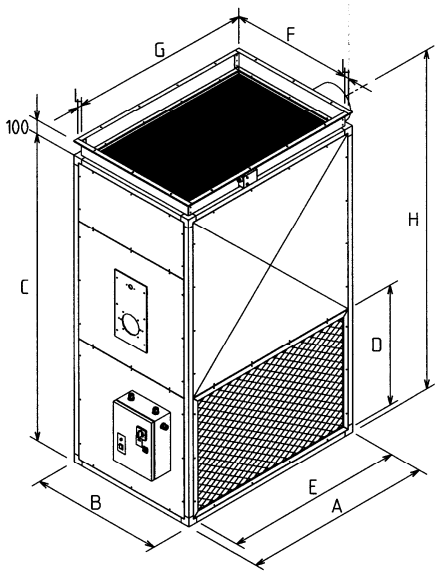
Measurements in millimetres;

DIMENSIONS

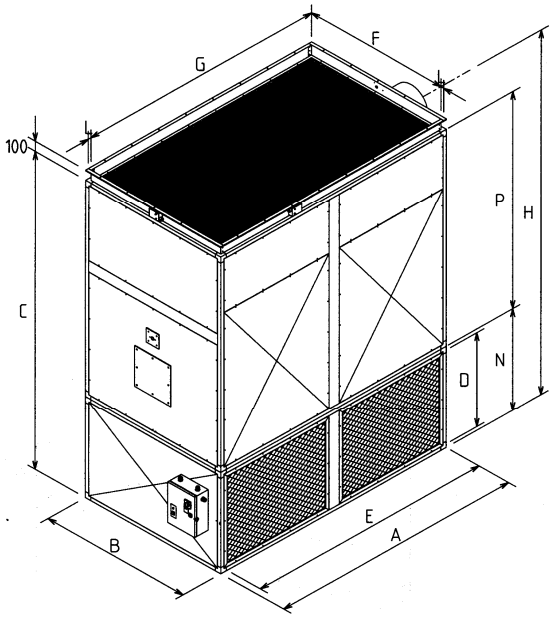
Type 1÷4



Type 5÷10



Type 11÷15



Type	A	B C		D	E	F	G	H	L	N	P	∅ chimney
1	812	540	1580	400	625	490	600	1305	27			150
2	890	680	1800	500	715	630	700	1475	27			180
3	1060	760	1926	500	900	700	900	1667	30			200
4	1060	760	1926	500	900	700	900	1667	30			200
5	1300	900	2120	781	1182	840	1240	1905	30			250
6	1300	900	2120	781	1182	840	1240	1905	30			250
7	1500	1000	2120	781	1382	940	1440	1905	30			250
8	1500	1000	2120	781	1382	940	1440	1905	30			250
9	1700	1200	2350	781	1582	1140	1640	2160	30			300
10	1700	1200	2350	781	1582	1140	1640	2160	30			300
11	2090	1270	2870	882	1972	1210	2030	2585	30	1000	1870	330
12	2090	1270	2870	882	1972	1210	2030	2585	30	1000	1870	330
13	2500	1500	3120	882	2382	1440	2440	2815	30	1000	2120	370
14	2500	1500	3120	882	2382	1440	2440	2815	30	1000	2120	370
15	3500	1500	3120	882	3382	1440	3440	2815	30	1000	2120	380

Measurements in millimetres;

TECHNICAL DATA

	TYPE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Heating capacity	KW	60,0	94,0	103,2	122,3	161,2	190,0	225,8	258,8	322,6	391,0	460,6	590,0	645,3	769,0	1000
	Kcal/h	51600	80850	88790	105150	138600	163400	194225	222600	277470	336250	396160	507300	554940	661500	860000
Heating power	Kw	54,0	82,2	93,0	107,0	145,3	168,2	203,5	230,3	290,7	347,6	415,0	523,2	581,4	682,9	883,7
	kcal/h	46450	70700	80000	92000	125000	144600	175000	198100	250000	298950	356900	450000	500000	587400	760000
Efficiency	%	90,1	87,4	90,1	87,5	90,1	88,5	90,1	89,0	90,1	88,9	90,1	88,7	90,1	88,8	88,3
Combustion chamber pressure	Pa	20	25	8	22	8	2	17	39	21	32	20	20	20	23	10
Combustion chamber volume	m3	0,08	0,13	0,23	0,23	0,49	0,49	0,64	0,64	1,05	1,05	1,62	1,62	2,7	2,7	4,36
Net fumes temperature	°C	200	252	206	252	210	249	205	248	204	227	205	238	192	237	260
Combustion by-products mass	Kg/h	117,7	183,8	194,6	238,0	295,6	343,4	424,5	472,5	614,5	736,2	912,8	1101,0	1253,0	1422,0	1731,4
Fuel consumption																
- oil	kg/h	5,06	7,9	8,7	10,3	13,6	16,0	19,0	21,8	27,2	32,9	40,8	49,7	54,4	64,8	84,3
Air flow rate at +20°C	m3/h	4300	6000	7600	7600	9600	11500	13400	15300	19000	23000	28700	34500	40200	49000	67000
Working static pressure	Pa	160	160	160	160	220	200	200	180	200	170	280	220	220	180	200
Thermal jump	K	37	40	37	42	45	43	45	45	45	45	42	45	43	42	39
LIMIT thermostat setting	°C	100														
FAN thermostat setting	°C	25-35														
SAFETY thermostat setting	°C	-	-	-	-	80										
Electrical supply type		mono	three-phase													
Electrical tension	V-50Hz	230 ~	400 3N ~													
Fan motor electrical power	Cv	0,75	1,50	2,00	2,00	3,00	4,00	4,00	5,50	5,50	7,50	10,0	12,5	15,00	20,00	2x12,5
	kW	0,55	1,10	1,50	1,50	2,20	3,00	3,00	4,00	4,00	5,50	7,50	9,00	11,00	15,00	2x9,0
Electrical power																
- oil burner	Kw	0,17	0,17	0,38	0,38	0,38	0,37	0,37	0,37	0,37	0,45	0,65	0,65	1,10	1,10	1,80
Fan motor absorption																
- 230V 50Hz~	A	3,7	4,8	6,4	6,4	8,8	12,1	12,1	15,8	15,8	20,7	28,6	32,9	38,9	53,6	2x33,0
- 400V 50Hz 3N~	A		2,8	3,6	3,6	5,1	7,0	7,0	9,1	9,1	12,0	16,5	19,0	22,5	31,0	2x19,0
Electrical protection rating	IP	20														
Net weight (2)	Kg	130	180	249	249	412	437	520	525	694	734	1072	1162	1497	1622	2090
Category		II_{2H3+}														
Type		B23														
Working field	°C	-15 / +40														

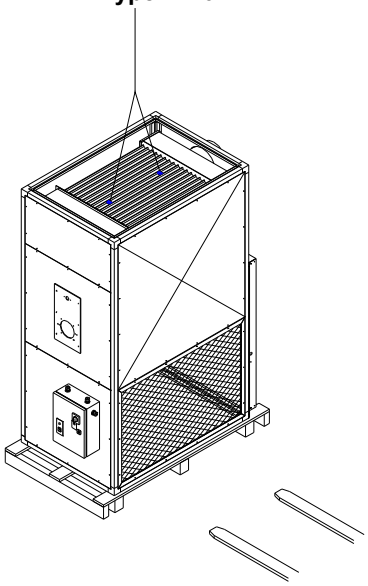
1. Net weight expressed in Kg, without oil burner;

The declared aeraulic do not consider the head losses due to eventual accessoires (filters, blast gate damper, aspiration grates etc.).

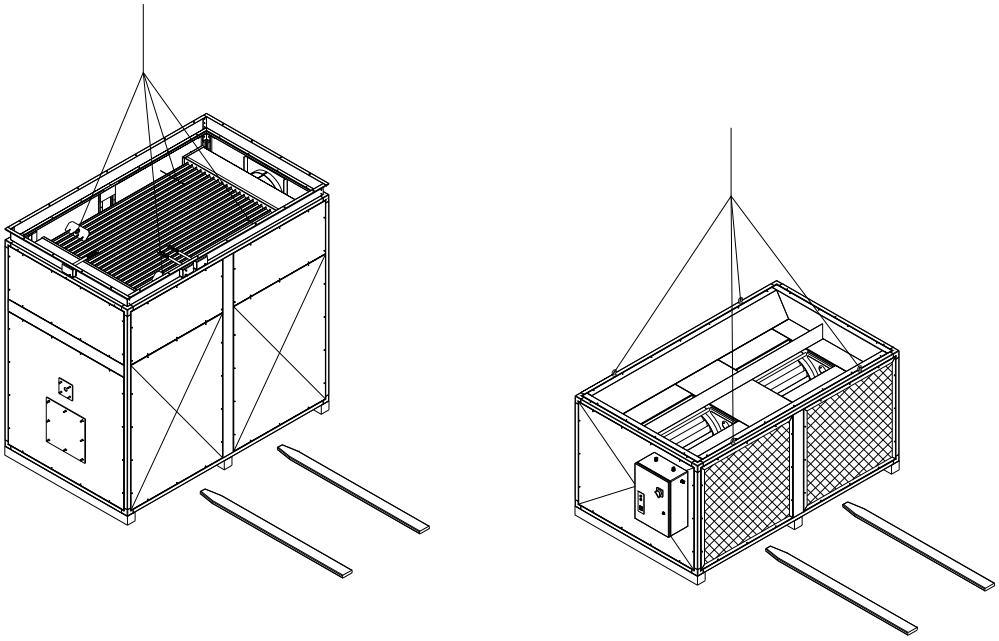
HANDLING AND TRANSPORTATION

Moving the equipment must be carried out by properly equipped personnel with equipment which is suitable for the weight of the heater. If a fork lift is used, the equipment should be taken up at the bottom using the guides in the supporting base. If a crane is employed use the eye-bolts at the top of the heat exchanger to lift the equipment.

Type 1÷10



Type 11÷15



⚠ WARNING!

Handling and transportation must be carried out with the greatest care to avoid damage the equipment and putting people in danger.

It is forbidden for people to stand close to the equipment during handling and transportation manoeuvres.

It is forbidden to stack more pieces of equipment than the indication on the packaging itself and the greatest care must be taken in aligning the packages so that they are stable.

If the equipment must be moved by hand, ensure that sufficient human strength is available for the task in relation to the weights indicated in the paragraph “TECHNICAL DATA” and to where and how far the equipment has to be moved.

The use of protective gloves is advisable.

LOCATION

The place of installation must be established by the plant project engineer or competent person and must take account of the technical requirements and current legislation and regulations which demand the obtaining of an authorisation (e.g. building, architectural and fire regulations, environmental legislation and so on). Before installing the equipment it is therefore advisable to apply for and obtain all the necessary authorisations.

To be correctly installed, the BI series heater has to satisfy the following:

- Be placed on a level surface which is able to support its weight;
- Observe the distances indicated in this manual so that there is a proper air flow and the normal cleaning and maintenance operations can be properly carried out;
- Maintain the safety distances from flammable materials;
- Be easily connected to a flue;
- Be easily connected uo to the fuel tank;
- Be near to an electrical socket;
- Allow easy carrying out of maintenance and monitoring operations;
- Have the openings and ventilation required by the law in force.

The installation is not advisable:

- In aggressive atmosphere rooms;
- In tight rooms where the sound level of the heater might be amplified by reverberations or resonances;
- In coins where it might settle leaves or anything else might obstruct the air flow, reducing the equipment efficiency;
- Outside;
- In depressed rooms.

⚠ **WARNING!**

The hot air generators **type**s 11 to 15 are, for ease of transport, shipped in two separated sections (base and body). To install, proceed as follows:

- Position the base so that the electrical panel is on the same side as the burner;
- Mount the centring pins provided on the upper part of the base;
- Place the body over the base making sure that the two frames are perfectly aligned.

FUEL CONNECTION

The oil connection must be carried out by the authorised and qualified personnel who must follow the indications in the manual strictly as well as the law currently in force.

FLUE

The fume channel and connection to the flue must be in accordance with the law and regulations currently in force, using rigid pipes resistant to mechanical, thermal and chemical stresses resulting from combustion. Recommendations:

- Avoid or at least limit the horizontal stretches which must in any case tend in an upward direction;
- Use piping with smooth inner surfaces made from a suitable material which is resistant to the thermal and chemical stresses caused by combustion, with a diameter equal to or larger than that of the connector on the equipment it self;
- Avoid sharp bend and diameter reductions;
- Place in the system a well for taking samples for analyses of the combustion by-products.

⚠ The chimney has to ensure the minimal depression previewed by the Regulations in force, considering as “zero” the pressure at the flue connection (see chart page 8).

⚠ The non-insulated discharge channels might be a source of danger.

⚠ Unfitting or badly dimensioned flues or discharge channels might amplificate the combustion sound level and negatively affect the combustion parameters.

⚠ The tightness of the joints has to be realized with materials resistant at temperature of at least 350°C (e.g. filler, mastic, silicones preparations).

AIR INLET CONNECTION

Connect any eventual channelling to the hot air distribution circuit to the equipment upper delivery flange, interposing a vibration damper joint to prevent vibrations being transmitted to the pipes.

⚠ WARNING!
The dimensioning of eventual air inlet and outlet channels has to be previewed by qualified personnel in compliance with the maximal performances of the heater as indicated in the "TECHNICAL DATA".

AIR OUTLET CONNECTION

Connect any channelling in the air recovery circuit to the side opening. The equipment is made to take the connection on the left and on the right side. To adapt the air intake side it is enough to invert the mounting of the side closing panel/s with the intake grid/s.

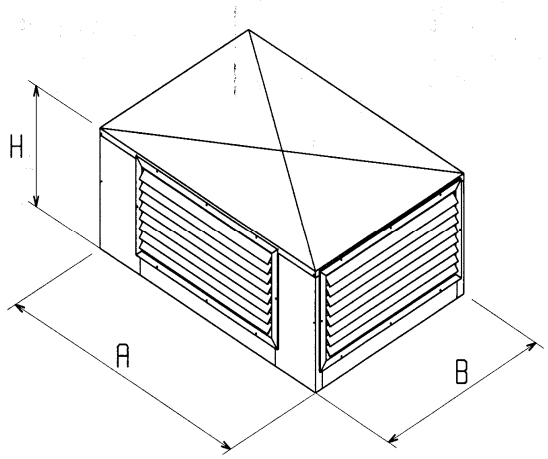
FIXED PROTECTIONS

To prevent accidental contact with the moving parts of the heater, it is not allowed to remove the equipment permanent guards and protections, which consist of the following:

- Air recovery grid/s;
- Side closing panel/s;
- Burner guard.

DIFFUSION PLENUM

If the heater is to be installed inside the room to be heated, it is necessary to use a diffusion plenum which is supplied as an accessory. To obtain optimal air diffusion it is recommended that the equipment gets installed close to a perimeter wall, or at the centre of the room itself, with the air delivery on three or four sides respectively.



DIMENSIONAL FEATURES

Type	A	B	H	Openings N°	Air terminal dimensions
1	540	800	350	4	250 X 400
2	680	890	550	4	600 X 400
3	760	1060	550	4	600 X 400
4	760	1060	550	4	600 X 400
5	900	1300	550	4	800 X 400
6	900	1300	550	4	800 X 400
7	1000	1500	550	4	800 X 400
8	1000	1500	550	4	800 X 400
9	1200	1700	550	4	1000 X 400
10	1200	1700	550	4	1000 X 400
11	1270	2090	550	6	800 X 400
12	1270	2090	550	6	800 X 400
13	1500	2500	550	6	1000 X 400
14	1500	2500	550	6	1000 X 400
15	1500	3500	550	8	1000 X 400

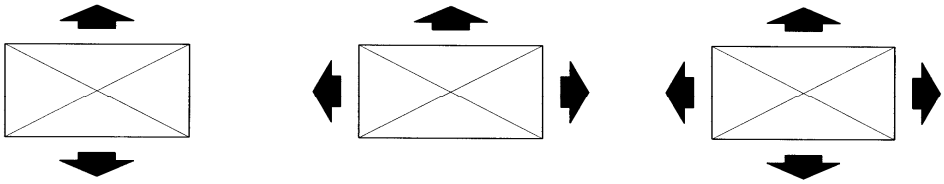
MOUNTING INSTRUCTIONS

- Free the diffusion plenum from its packaging;
- Remove the delivery air outlets and the closing panel from the plenum;
- Place the plenum on the top of the equipment;
- Fix the plenum to the equipment using the screws provided, entering through the delivery outlet openings and the closing panel;
- Remount the delivery outlets and the closing panel.

⚠ WARNING!
The plenum top surface cannot be walked on.

THROW DISTANCE

The scheme shows the throw distances in metres at which the remaining velocity is reduced to 0.1 m/s depending on the inclination of the fins per individual plenum with one, two or three openings.

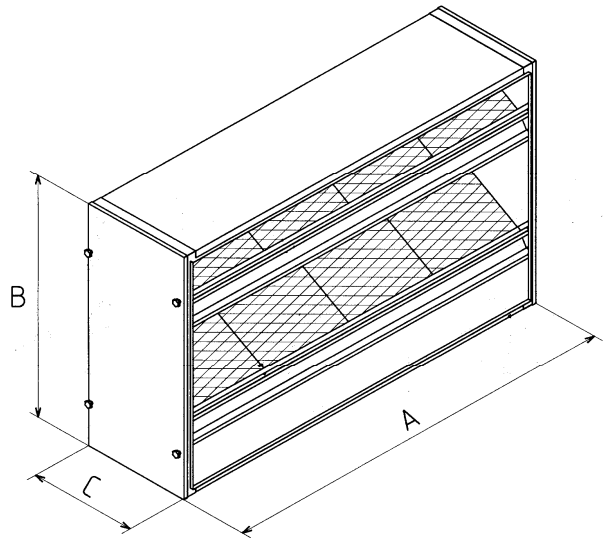


	Opening on 2 sides				Opening on 3 sides				Opening on 4 sides			
Fin inclination	0°	20°	30°	45°	0°	20°	30°	45°	0°	20°	30°	45°
1	44	35	28	21	36	29	23	17	31	25	20	15
2	42	33	27	20	34	27	22	16	29	24	19	14
3	48	39	31	23	40	31	26	19	35	28	22	16
4	48	39	31	23	40	31	26	19	35	28	22	16
5	59	46	38	28	48	38	31	23	42	33	27	20
6	75	60	48	36	61	48	40	29	54	43	33	25
7	82	65	53	39	67	53	44	32	58	47	38	27
8	93	74	60	45	76	60	49	36	66	54	44	32
9	106	80	63	46	82	63	52	39	68	54	45	34
10	112	88	72	54	91	72	59	43	79	63	51	38
11	104	82	68	56	79	66	54	45	70	55	45	37
12	122	97	80	66	98	77	64	53	81	64	53	44
13	147	116	96	80	118	93	77	64	98	77	64	53
14	147	116	96	80	118	93	77	64	98	77	64	53
15	164	134	116	102	134	106	95	76	116	89	74	61

⚠ WARNING!

It is not allowed to have air diffused from one side only of the plenum.

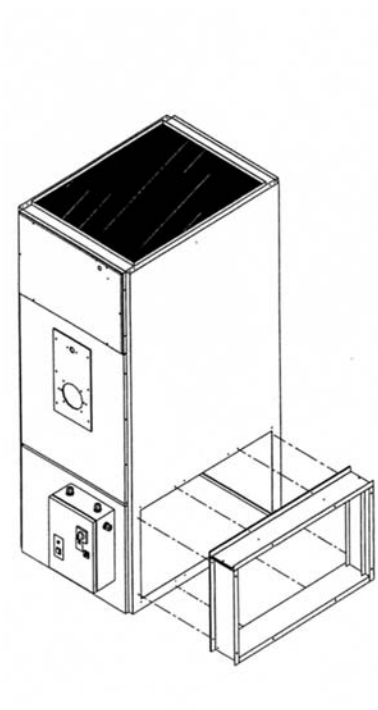
AIR INLET FILTER



Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	690	780	965	965	1300	1300	1500	1500	1700	1700	2090	2090	2500	2500	3500
B	459	559	559	559	832	832	832	832	832	832	1000	1000	1000	1000	1000
C	115	165	165	165	325	325	325	450	450	450	450	450	450	450	450
Cells N°	1	1	1	1	4	4	6	6	9	9	12	12	12	12	24
ΔP (Pa)	12	20	23	23	17	27	25	35	23	38	32	45	35	50	70

MOUNTING INSTRUCTIONS

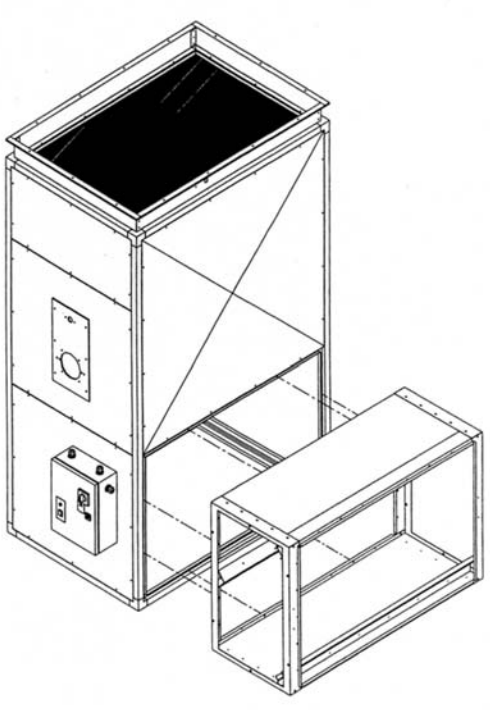
Type 1÷4



Type 1÷4

- Determine the filter mounting side;
- Mount the filter using the screws supplied.

Type 5÷15



Type 5÷15

- Extract the filtering cells from the frame;
- Determine the filter mounting side;
- Mount the filter using the screws supplied;
- Reinsert the filtering cells.

MOUNTING THE BURNER

To proceed with the installation of the oil burner, respect and follow the instructions contained in the specifically manual of the burner in detail.

ELECTRICAL CONNECTION

The equipment is supplied with the electrical panel mounted as standard and with the motor/s and the FAN-LIMIT thermostat/s connected. The connections to be carried out are therefore the following:

- The mains electrical connection;
- The connections to the burner;
- The connections to the room thermostat;
- Any other accessories (fire barrier lock, humidifier, etc.).

For all connections use the cable grips in the electrical and the terminal block in the panel itself, in accordance with the specific wiring diagram for each equipment model.

⚠ WARNING!

Install a magnetothermal switch before the equipment of suitable size based on the technical details indicated in the paragraph “Technical and performance features” and in accordance with the law in force.

- Have authorised personnel to check out the cable diameters and maximum electrical plant power absorption by the equipment as indicated on the plate;
- Always earth the equipment. Leave the earth cable a little longer than the line wires so that, if they are accidentally pulled, it is the last to get detached;
- Respect the polarities when making the electrical connections.

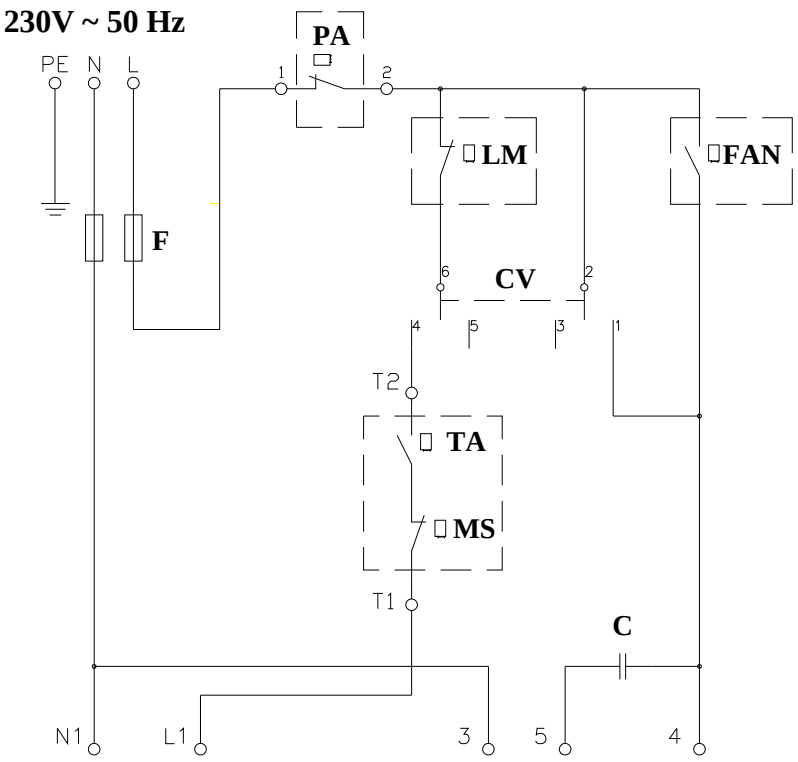
In order to shut off the burner if there is any fault, the electrical panel has a safety relay (LX) with a contact connected in series with the burner if the equipment safety thermostat is triggered (LM) or when the fan assembly stops due to the activation of the motor thermal relay.

ELECTRICITY SUPPLY DIMENSIONING CHART

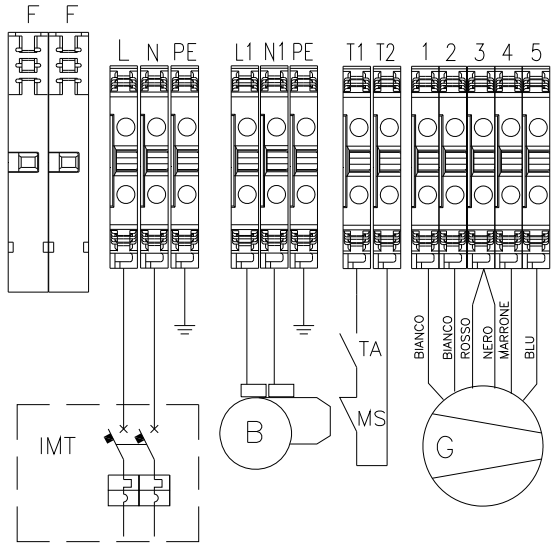
Type	Supply voltage	Maximal Installed power (1)	Maximal absorbed current (1)	Main breaker	Motor fuses (1)	Auxiliary fuses(2)	Burner fuses (2)	Line conductor section (3)	Earth conductor section (3)
		(Kw)	(A)	(A)	(A)	(A)	(A)	(mm^2)	(mm^2)
1	230V 50Hz~	0,55	3,7	-	-	6,3	-	1,5	1,5
2	400V 50Hz 3N~	1,10	2,8	25	6	2	2	1,5	1,5
3	400V 50Hz 3N~	1,50	3,7	25	6	2	2	1,5	1,5
4	400V 50Hz 3N~	1,50	3,7	25	6	2	2	1,5	1,5
5	400V 50Hz 3N~	2,20	5,2	25	6	2	2	1,5	1,5
6	400V 50Hz 3N~	3	7,1	25	12	2	2	2,5	2,5
7	400V 50Hz 3N~	3	7,1	25	12	2	4	2,5	2,5
8	400V 50Hz 3N~	4	9,2	25	16	2	4	2,5	2,5
9	400V 50Hz 3N~	4	9,2	25	16	2	4	2,5	2,5
10	400V 50Hz 3N~	5,50	12,1	25	16	2	4	2,5	2,5
11	400V 50Hz 3N~	7,50	16,5	40	20	4	2	2.5	2.5
12	400V 50Hz 3N~	9	19	63	32	4	10	4	4
13	400V 50Hz 3N~	11	22,5	63	32	4	4	4	4
14	400V 50Hz 3N~	15	31	80	40	4	4	6	6
15	400V 50Hz 3N~	2x9	2x19	80	32	4	6	10	10

(1) Without burner;
(2) Included with the heater supply;
(3) The cable section ensures a less than 5% voltage drop over a length of 30 m.

TYPE 1 WIRING DIAGRAM



SWITCHBOARD CONNECTING TERMINAL



ELECTRICITY SUPPLY
230 V ~ 50 Hz

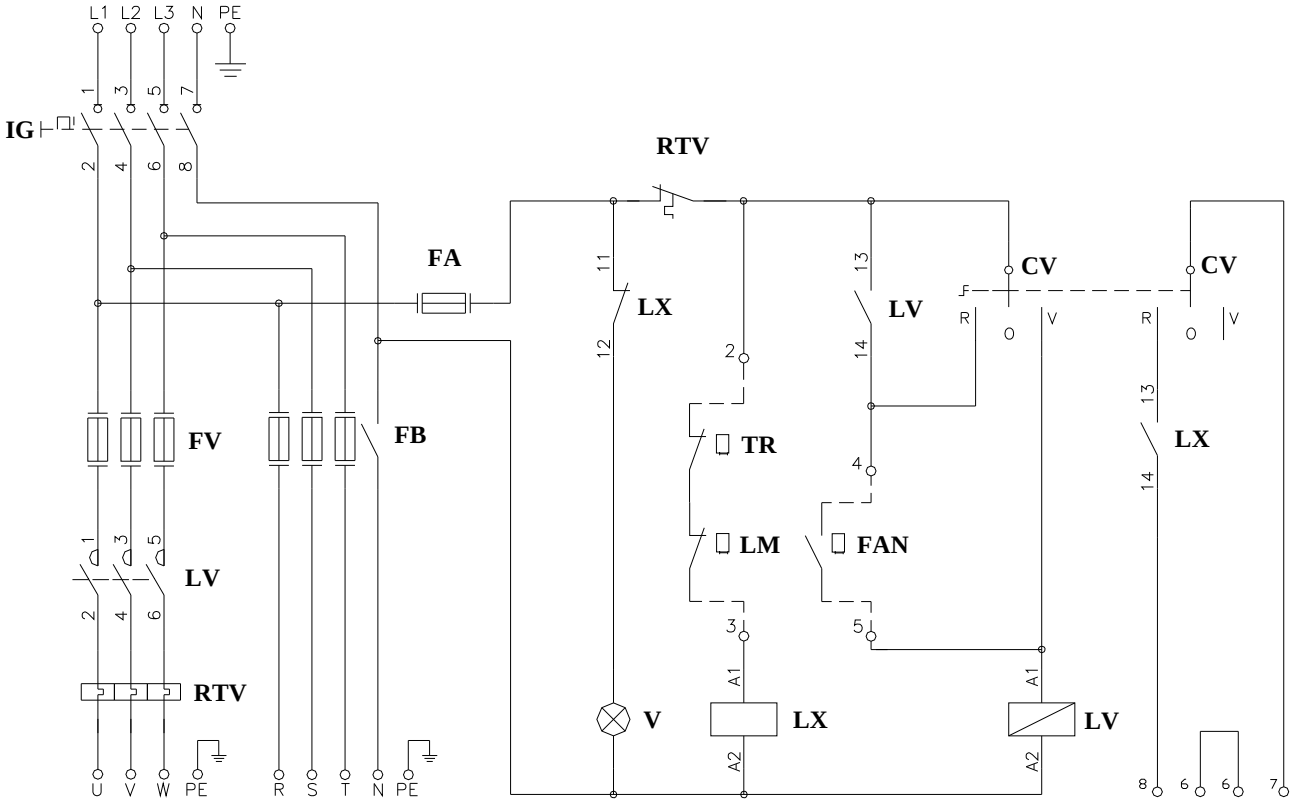
Contents:

FAN - FAN Thermostat (25-35°C)
LM - LIMIT Thermostat (100°C)
F - Safety fuses
PA - Motor internal protection
G - Fan motor
C - Fan motor condense
B - Burner
CV - Heating/stop/ventilation switch
TA* - Room thermostat
IMT* - Magnetothermal switch
MS* - (possibe) micro fire barrier lock

* External to the equipment and not included in the supply. To be installed by the customer.

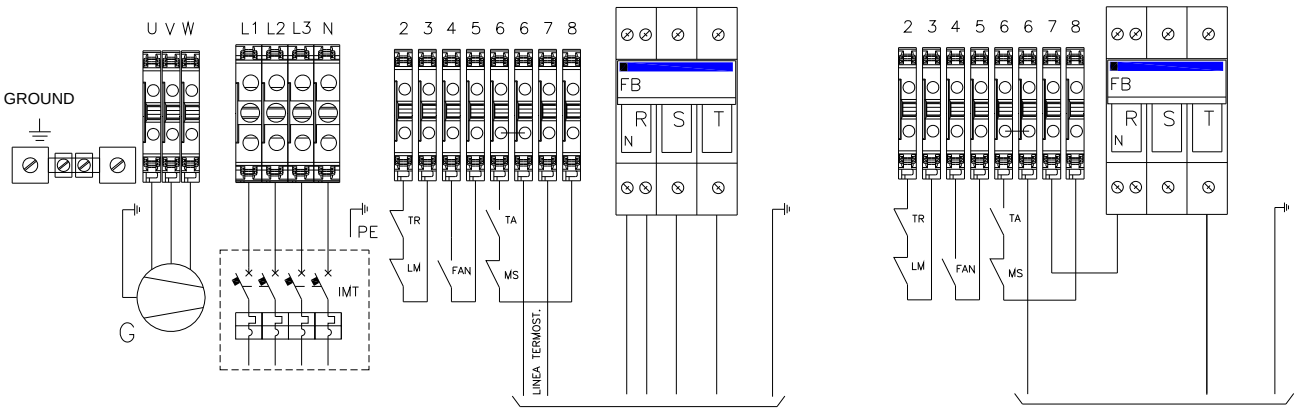
TYPE 2 TO 10 WIRING DIAGRAM

400V~ 3+N 50 Hz



SWITCHBOARD CONNECTING TERMINAL

MONOPHASIC BURNER ELECTRIC SUPPLY VARIANT



ELECTRICITY SUPPLY
400 V ~ 3+N 50 HZ

BURNER SUPPLY
400 V ~ 3+N 50 HZ

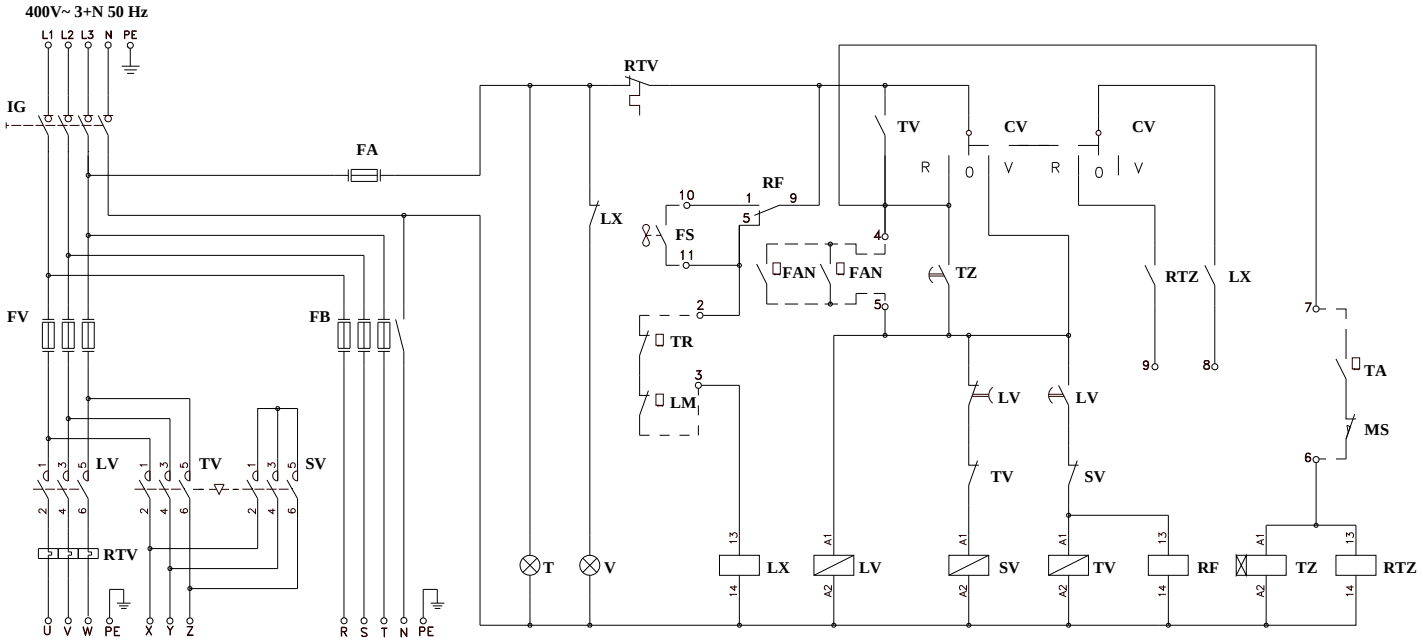
BURNER SUPPLY
230 V ~ 50 HZ

Contents

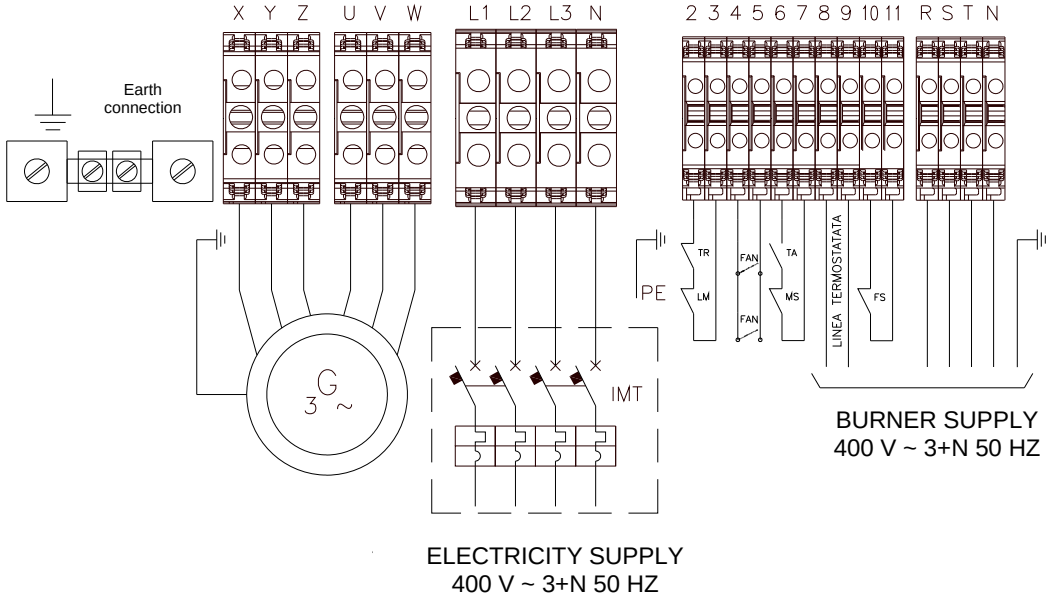
FAN	FAN thermostat (25-35°C)	**FB**	Burner fuse
LM	LIMIT thermostat (100°C)	**FV**	Fan motor fuse
TR**	SAFETY thermostat (preset 80°C)	**CV**	Heating/stop/ventilation switch
LV	Line remote control switch	**TA***	Room thermostat
LX	Burner safety stop relay	**MS***	(possible) micro fire barrier lock
RTV	Thermal relay	**IMT***	Magnetothermal switch
V	Burner safety stop indicator	**IG**	Main switch
FA	Auxiliary fuse	**G**	Fan motor

* External to the equipment and not included in the supply. To be installed by the customer.
** Only for **type 5 TO 10**.

TYPES 11 TO 14 WIRING DIAGRAM



SWITCHBOARD CONNECTING TERMINAL



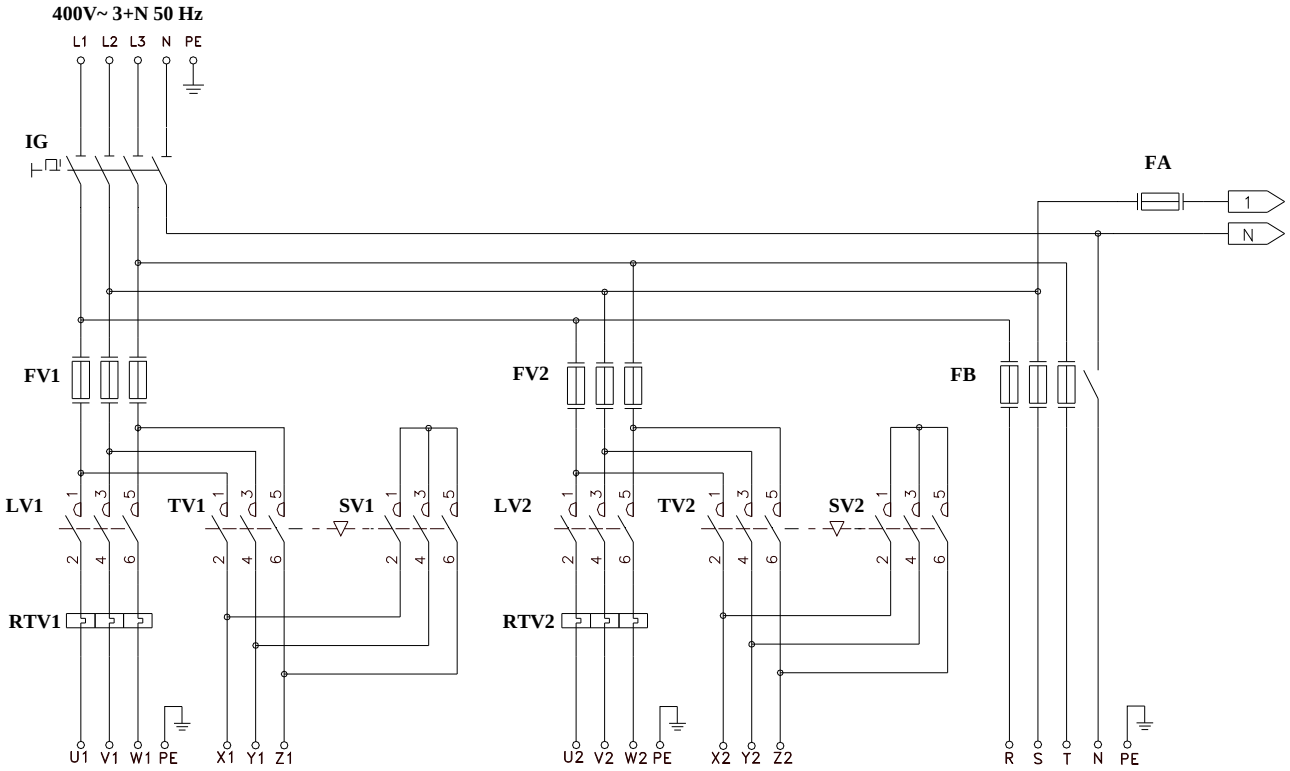
Contents

FAN	FAN thermostat (25-35°C)
LM	Termostato LIMIT (100°C)
TR	SAFETY thermostat (preset 80°C)
TZ	Fan start timer
LV	Remote line switch + pneumatic starter
SV	Star remote control swtich
TV	Triangle remote control switch
LX	Safety burner stop relay
RTV	Thermal relay
RTZ	Burner starting relay
RF	Flow switch control relay
T	Voltage flag
V	Safety burner stop flag
FA	Auxiliary charges fuses
FB	Burner fuses
FV	Fan motor fuses
FS	Fan flow switch control
CV	Heating/stop/ventilation switch
TA*	Room thermostat
MS*	(possible) micro fire barrier lock
IMT*	Magnetothermal switch
IG	Main switch
G	Fan motor

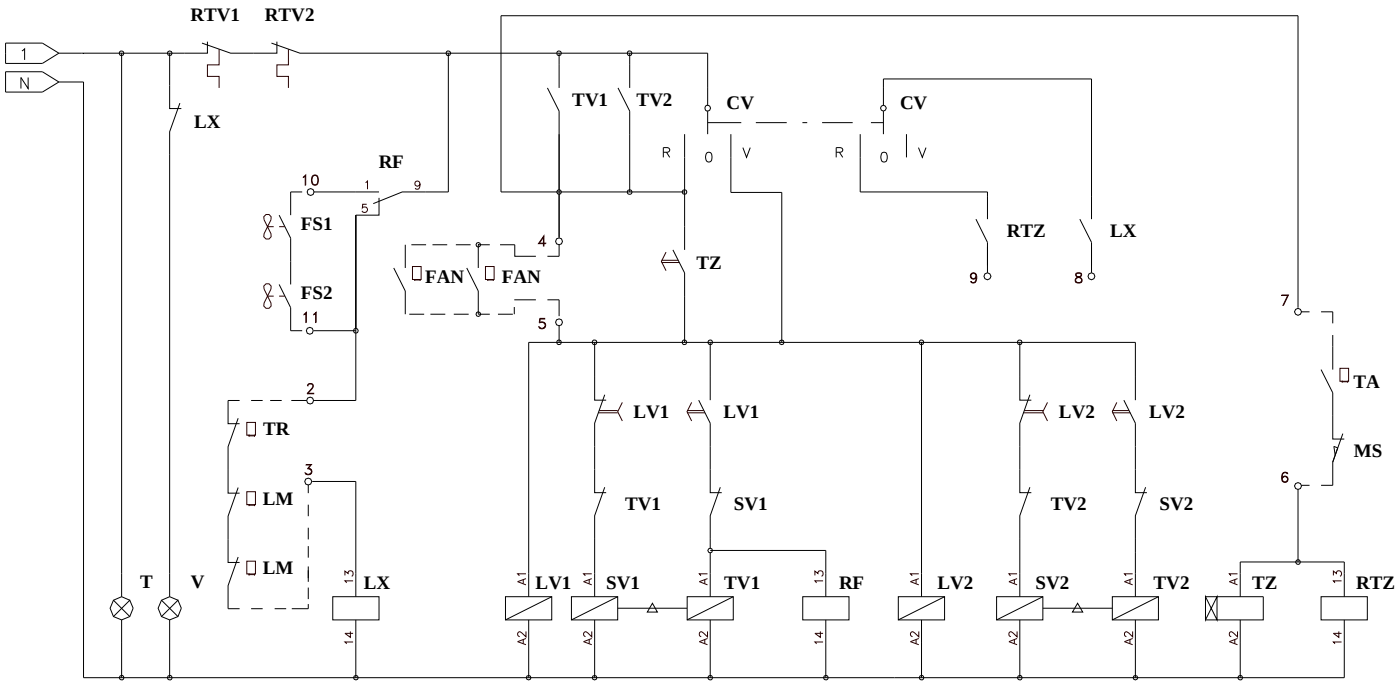
* External to the equipment and not included in the supply. To be installed by the customer.

TYPE 15 WIRING DIAGRAM

CAPACITY:

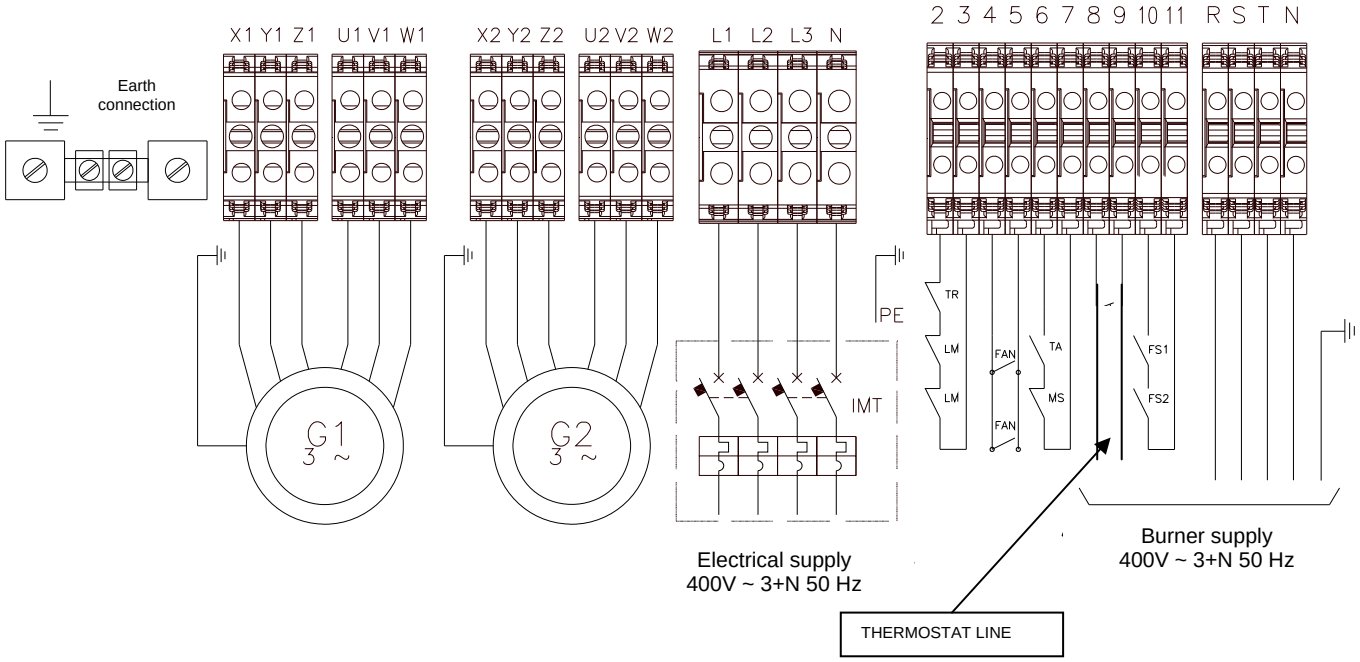


CONTROL:



For contents and switchboard connecting terminal, see next page.

SWITCHBOARD CONNECTING TERMINAL



Contents

FAN	FAN thermostat (25-35°C)
LM	LIMIT thermostat (100°C)
TR	Safety thermostat (preset 80°C)
TZ	Fan start timer
LV1-2	Remote line switch + pneumatic timer
SV1-2	Star remote control switch
TV1-2	Triangle remote control switch
LX	Safety burner stop relay
RTV1-2	Thermal relay
RTZ	Burner starting relay
RF	Flow switch control relay
T	Voltage flag
V	Safety burner stop flag

FA	Auxiliary charges fuses
FB	Burner fuses
FV1-2	Fan motor fuses
FS1	Fan flow switch control 1
FS2	Fan flow switch control 2
CV	Heating/stop/ventilation switch
TA*	Room thermostat
MS*	(possible) micro fire barrier lock
IMT*	Magnetothermal switch
IG	Main switch
G1-2	Fan motor

* External to the equipment and not included in the supply. To be installed by the customer.

FAN-LIMIT DUAL THERMOSTAT

This thermostat sensor is positioned at the hot air delivery outlet and has the double function of controlling the start up and the stopping of the fan (FAN function), as well as the safety shutting off of the equipment in case of overheating.

- **FAN FUNCTION (FAN Thermostat – setting 25-35°C)** Causes the fans to start up about 60 seconds after burner, ignition and causes them to stop about 4 minutes after the burner has switched off. This prevents the emission of unpleasant cool air on start up and to utilise the thermal energy accumulated in the heat exchanger to ensure its complete use before the system is stopped (calibrated 35°C). The function is carried out by an thermostat, with sensor in the air outlet.

- **SAFETY FUNCTION (Typ 5÷15) Thermostat TR – Pre-setting at 80°C**, will interrupt the burners' run in case of air overheating. Automatic reset. The function will be carried out by a thermostat with the sensor at the air outlet. The right setting have to be done at the first equipment's start up.

- **LIMIT FUNCTION (LM THERMOSTAT – permanent setting 100°C)**, this must be reset manually and cuts off the burner in case of overheating of the air. If the 'limit' is triggered the resetting is done using a special button after having first ensured that the causes of the fault have been removed (calibrated at 100°C).

- **ELECTRICAL CONNECTION AND SETTING METHOD**

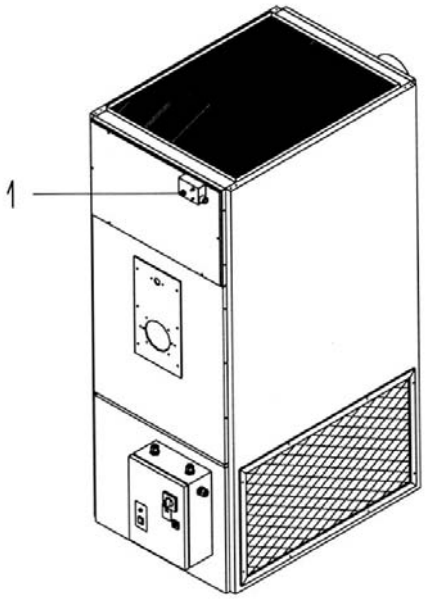
The hot air generator comes with its electrical connections and dual thermostat calibration already done. If these operations have to be carried out for any reason (as a result of maintenance work, checks or parts replacement), the instructions to follow are given below.

POSITIONING OF FAN, LIMIT AND SAFETY THERMOSTATS

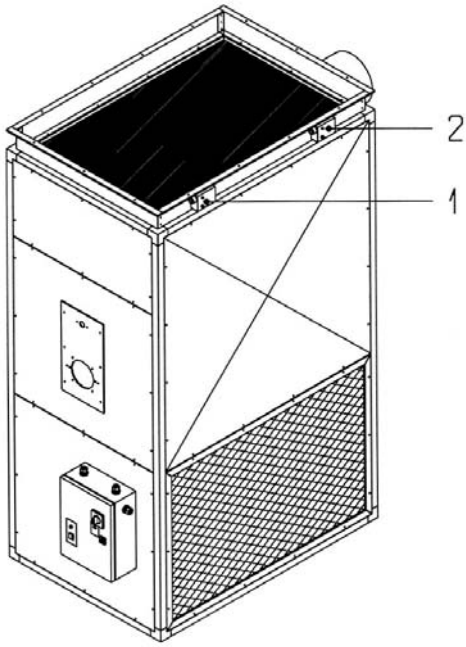
POSITIONING

Equipments **Typ 1÷10**, will be delivered with the thermostat(s) still moounted in the right position.

Typ 1÷4



Typ 5÷10

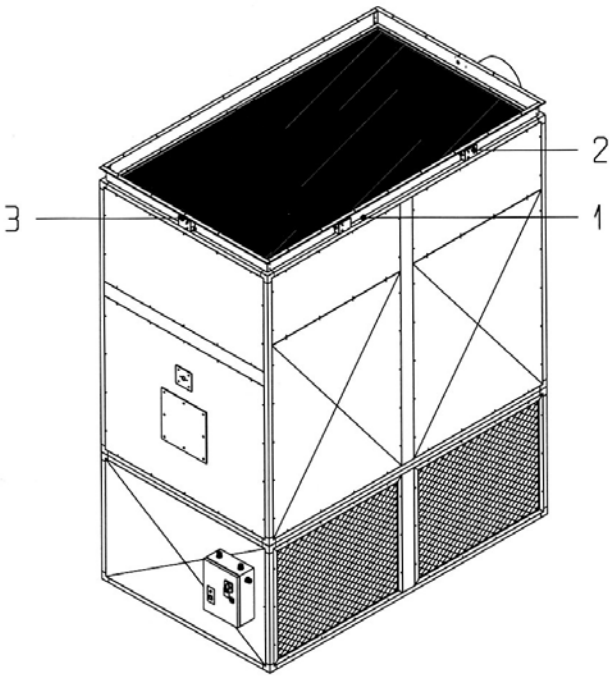


Contents:

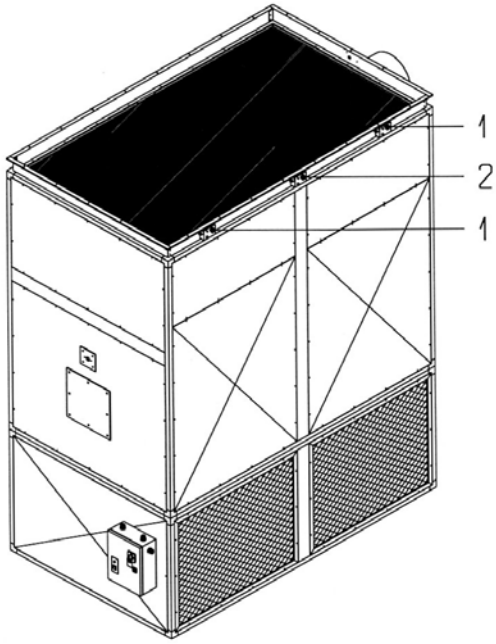
1. Bi-thermostat (FAN – LM):
   FAN function connected. Setting (by manufacturer) 25–35°C;
   LIMIT function connected. Setting (by manufacturer) 100°C.
2. Bi-thermostat (TR):
   ONLY SAFETY function connected. Setting (by manufacturer) 80°C.

The equipments **typ 11 to 15** , will be delivered, due theirs possibility to be handled, in 2 separated sections. For this reason the thermostats will be connected to the electric boards but not positioned: they need to be positioned during the installation. Please follows this instructions:

Typ 11÷14



Typ 15



Contents:

1. Bi-thermostat (FAN - LM):
   FAN function connected. Setting 25 – 35°C;
   LIMIT function connected. Setting 100°C;
2. Bi-thermostat (TR):
   ONLY SAFETY function connected. Setting (by manufacturer) 80°C.
3. Bi-thermostat (FAN):
   ONLY FAN function connected. Setting (by manufacturer) 25-35°C;

⚠ WARNING!

The different thermostats and their positioning are recognisable and can not be inverted thanks to a labelling on the thermostats and on the placements sites on the equipment. Furthermore, the different length of their sheathing helps.

FAN-LIMIT-SAFETY THERMOSTATS SETTING

The thermostats will be supplied with the setting pointed out in the table here under:

FAN thermostat:	25 – 35°C
LIMIT (1) thermostat	100°C
SAFETY (2) thermostat	Pre-setting 80°C

(1) The LIMIT thermostat have a permanent setting and do not have to be touched;
(2) The SAFETY Thermostat **(Typ 5÷15)** need to be set as specified in the manual during the installation.

To control od re-set the set-point in the different thermostats, operate as hereby descripted:

Contents:

1. White automatic-manual ventilation switch (where available).
2. FAN function electrical connections.
3. Dual thermostat graduated reading.
4. Fixture holes.
5. Fans stop temperature flag.
6. LIMIT-SAFETY intervention temperatures flag
7. Cable grip slits. Inserting a screwdriver the terminal is released and it is possible to pass the wire. Removing the end of the screwdriver the terminal locks the wire auto matically into the terminal.

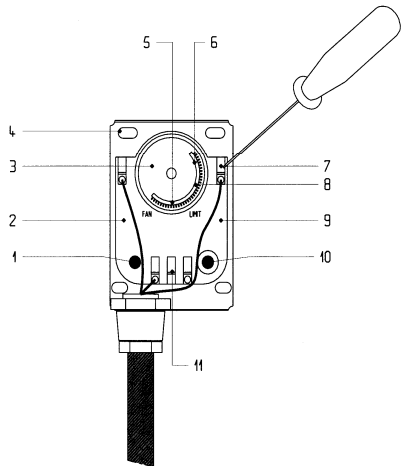
WARNING!
Pull gently on the wire to make sure it is in fact locked in place.

8. Fan starts temperature flag.
9. LIMIT-SAFETYfunctions electrical connections.
10. Red button to release LIMIT response.
11. Metal bridge (where available).

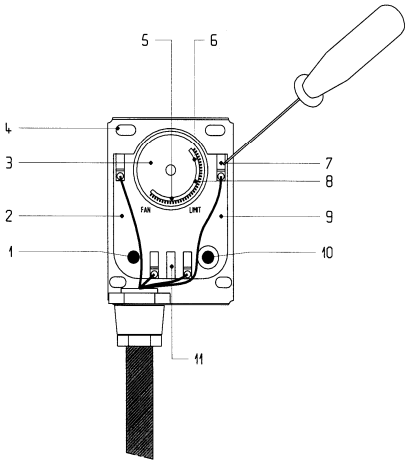
WARNING!

For the **typ 1** the metal bridge **11** must be present.
For the models from **typ 2** until **typ 15** the metal bridge **11** must be removed.

Typ 1



Typ 2÷15



SAFETY THERMOSTAT SETTING (Typ 5÷15)

The setting have to be done as follows:

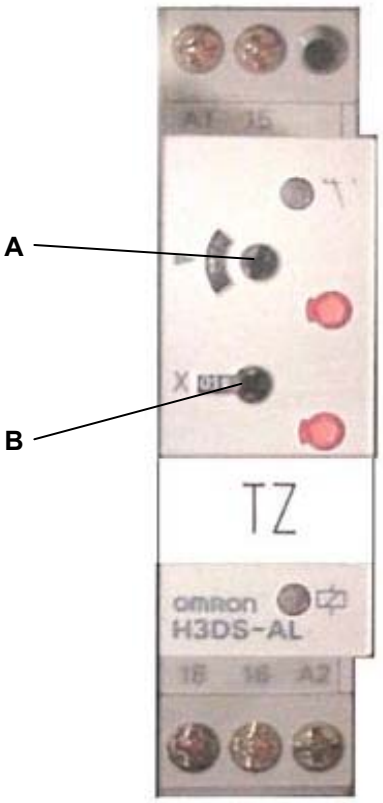
- Start the equipment in normal running conditions;
- Make sure that the burner ist set at the right heating power;
- Make sure that the air flow is correct;
- As the equipments runs at full capacity, check the air temperature close to the TR safety thermostat sensor (verifying the positioning of graduated reading), and after this set the intervention temperature at list 15-20 degrees over. For example, if the air temperature would be 40°C, then the thermostat intervention temperature have to be 60°C.

FAN START TIMER

POSITIONING
Housed inside the electrical panel in the models t**yp 11** to **typ 14**.

FUNCTION
This is connected in parallel with the FAN (FA) thermostat and controlled by the RTZ relay with the function of ensuring the start up of the fan assembly after a maximum time of 1 minute from the ignition of the burner flame. The fan assembly is controlled only by the FAN (FA) thermostat.

SETTING
The **TZ** timer is supplied electrically on the closing of the room thermostat's contact (TA) which coincides with the ligh-ting of the burner flame. The stopping of the fan assembly is controlled only by the FAN (FA) thermostat.
Owing to the different cycle times of the installed burner it is essential to carry out an adjustment of the time set on the TZ timer.
To make this adjustment proceed as follows:



1. Time with a stop-watch the time between the closing of the room thermostat contact (TA) and the ignition of the burner flame (time of any control test for the gas ramp seal, pre-wash time etc.).
2. Increase time by 1 minute and set it at the TZ timer, using cross cut screw after having selected a suitable scale means of the micro-switches 1.
   A: Set on value 10;
   B: Set on 0,1min.

⚠ **WARNING!**
When the setting has been carried out run complete cycle of the generator ignition sequence and make sure that the fan does in fact come on **1 minute maximum** from the ignition of the burner flame.

SETTINGS

BURNERS MATCHING TABLE
The burners which can be matched for the best performance of the generators are as follows:
RIELLO Oil burners:

Typ	Burner model	Electrical supply
1	R40 G5	230V 50Hz ~
	RG 2	230V 50Hz ~
2	R40 G10	230V 50Hz ~
	RG 2	230V 50Hz ~
3	R40 G10	230V 50Hz ~
	RG 2	230V 50Hz ~
4	R40 G20	230V 50Hz ~
	RG 3	230V 50Hz ~
5	R40 G20	230V 50Hz ~
	RG 3	230V 50Hz ~
6	R40 G20	230V 50Hz ~
	RG 4S	230V 50Hz ~
7	R40 G20S	230V 50Hz ~
	RG 4S	230V 50Hz ~
8	RL 28 tc	230V 50Hz ~
	RL 28/1 tc	230V 50Hz ~
	RG 5S	230V 50Hz ~
9	RL 28 tc	230V 50Hz ~

	RL 28/1 tc	230V 50Hz ~
	RL 34/1 MZ tc	230V 50Hz ~
10	RL 38 tc	230V 50Hz ~
	RL 34/1 MZ tc	230V 50Hz ~
11	RL 50 tc	400V 50Hz 3N ~
	RL 44 MZ tc	400V 50Hz 3N ~
12	RL 50 tc	400V 50Hz 3N ~
13	RL 70 tc	400V 50Hz 3N ~
14	RL 70 tc	400V 50Hz 3N ~
15	RL 100 tc	400V 50Hz 3N ~

OIL-FIRED BURNER SETTING

The assembly and adjustment of the oil-fired burner must be carried out by authorised personnel strictly following the burner's own instruction booklet.

FAN SPEED SET-UP

The equipment is supplied as standard with the transmission ratio adjusted in such a way that the nominal air flow can be obtained with plenum diffusion through three or four of its sides and with air intake from one or two sides through the intake grills.

⚠ WARNING!
Air diffusion from one side only of the plenum is not allowed.

For any usage other then the above mentioned normal working, involving the diffusion of channelled air, the insertion of filter and so on, i.e. any arrangement which cause variations in the air resistance, it is essential to carry out a check on the air flow and regulate it, if necessary, so that it is at the nominal levels.
This check can be carried out with precise instruments or for a good rough approximation, by checking the thermal jump between the air delivery and air intake when the burner is set at its nominal thermal capacity. The result should be checked against the data indicated in the paragraph TECHNICAL DATA.

It is in any case necessary to check that the direction of rotation of the fans is the same as that of the arrow on the screw. To alter the direction of rotation, in the case of a three phase electric motor, just invert one phase of the supply line without interfering with the electrical panel. It is also necessary to check that the motor output does not exceed that indicated on the plate; if necessary change the fan rpm to obtain this result.

To change the fan rpm proceed as follows:

TYP 1÷4
- Loosen screws **2** to slacken the belts;
- Remove belt **1**;
- Slacken the dowels **4** of the moving part of the pulley **3** with a hexagonal wrench **5**;
- Turn the mobile part of the pulley so as to obtain the desired pitch line diameter;
- Tighten the dowels hard **4** at the hollow in the boss;
- Mount and tighten the belt **1**.

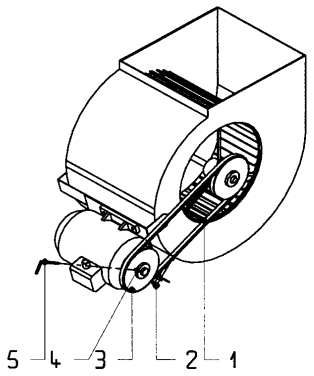
Typ 5÷10
- Loosen screw **1** to slacken the belts;
- Remove belt **5**;
- Slacken the dowels **3** of the moving part of the pulley **4** with a hexagonal wrench **2**;
- Turn the mobile part of the pulley so as to obtain the desired pitch line diameter;
- Tighten the dowels hard **3** at the hollow in the boss;
- Mount and tighten the belt **5**.

⚠ WARNING!
Never stretch the belts too tight as the fan shaft could break. Hand pressure on the belt should be able to move it by 20-30 mm.

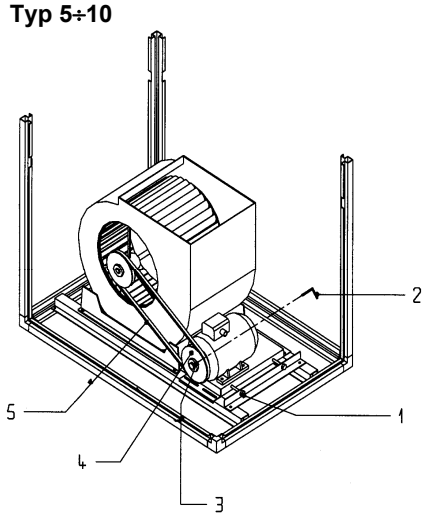
⚠ Increasing the pitch line diameter of the pulley motor increases the fan rpm and the motor's electrical absorption. Reducing the pitch line diameter of the pulley motor increases the fan rpm and the motor's electrical absorption.

The equipments **typ 11÷15** are provided with a fixed gearing transmission and to change the rpm of the fan the exchange of a poulley is needed.

Typ 1÷4



Typ 5÷10



CHECKS

To ensure the proper working of the equipment it is necessary certain basic parameters must be checked. Switch the equipment on and carry out the following:

- Check that the fan assembly starts up about 1 minute after the burner runs.

When the generator is up to temperature and working normally (after about 20 minutes of continuous working), carry out the following operations:

- Check there are no leaks of combustible materials.
- Check the fuel pressure, using the meter (where possible).
- Check that the fumes temperature is that given in the paragraph TECHNICAL DATA, with a tolerance of +/- 10°C.
- Check the setting of the dual thermostat is that indicated in the chapter TECHNICAL DATA.
- Check the graduated reading on the dual thermostat indicates 50-60°C and that the LIMIT function is not triggered.
- Check that the thermal jump corresponds to that indicated in the chapter TECHNICAL DATA, with tolerance of ±5°C.
- Turn the dual thermostat's dial manually to simulate the intervention of the LIMIT thermostat and check that the burner is in fact switched off.
- Open the room thermostat's contact and check that it acts only on the burner and does not also cause the fan assembly to stop.
- Check the motor absorption does not exceed that indicated on the plate.
- Check the thermal safety relay is set at the motor absorption value.
- Check that the fan runs 4 minutes longer after the turn off of the burner, before to stop.
- Check that the intervention temperature of the safety fan is 15-20 °C over the air temperature close to the sensor of the safety fan.

⚠ It is compulsory to check that no condensation will appare into the heat exchanger durino the running. Fot this ckeck, after ½ Hour of running turn the burner off, and check both through the chimney connection and the smokes pipes the absence of humidity into the smokes collector and exhausts pipes.

CONTROLS

HEATING-STOP-VENTILATION SWITCH

This is located on the equipment's electrical panel and its function is select the working cycle:

- When set at the 'heating' symbol it programs the equipment so that the fan and burner function automatically according to the demands for heat.
- When set at 'fan' it controls the equipment excluding the burner. Only the fan is active providing summer ventilation.
- When set at 'stop' it stops the hot air generator. The fan works for a certain time to use up the heat accumulated in the heat exchanger.

ROOM THERMOSTAT

To be installed about 1.5 m above ground and in an area sheltered from hot or cold air currents. It controls the switching on and off of the equipment to maintain the temperature at the set level. It must be requested as an accessory additional to the standard delivery.

BURNER RESET BUTTON

Located on the burner itself, its function is to reset the burner when it gets locked off.

LIMIT THERMOSTAT RESET BUTTON

A red button on the FAN-LIMIT dual thermostat with the function of resetting the burner after a overheating lock.

FAN MOTOR THERMICAL PROTECTION RESET BUTTON

Located into the control box, on the thermic relais block, needs to restart the fan functioning after a block for malfunctioning or exceeding electrical absorbance by the fan motor.

⚠ **WARNING!**

Before any resetting it is essential to find and remove the cause of the safety system being triggered. If in any doubt call the nearest authorised technical assistance centre which will give you any assistance you require.

INDICATORS

VOLTAGE ON INDICATOR
Located on the electrical panels of the **types 11÷15** models. It is an orange light which comes on when there is voltage.

BURNER LOCKED INDICATOR
This red button is located on the burner and lights up when the burner is locked. It is also the reset button.

SAFETY STOP BUTTON
This red button is located on the electrical panel of the **Types 11÷15** models and lights up in the following cases:
- LIMIT thermostat triggered;
- Fan motor thermal safety triggered.

FAN MOTOR ABSORPTION

FAN MOTOR ELECTRICAL ABSORPTION MEASUREMENT

To check the motor absorption proceed as follows:
1. Insert ammeter in one phase of the mains supply;
2. Set the equipment at summer ventilation, so as to cut out all other parts (burner and auxiliaries);
3. Take the ammeter reading for the electrical absorption and check against the details on the motor's plate, also given in the paragraph TECHNICAL DATA.

If it is necessary to check the absorption reading **after the remote control switch** or the remote starter, proceed as follows:
1. Insert the ammeter in a phase of the motor's supply after the remote control switch or the remote starter;
2. Set the equipment at summer ventilation, so as to cut out all other parts (burner and auxiliaries);
3. Take the ammeter reading for the electrical absorption and check against the details on the motor's plate, also given in the paragraph TECHNICAL DATA.

If the case of equipment with direct start up (**typ 2÷10**) the absorption measured corresponds to that of the line and must be checked on the data on the motor plate and given in the paragraph TECHNICAL DATA.
If the case of equipment with star/Y reduced tension start up (**typ 11÷15**), the absorption measured corresponds to that of the phase and, divided by 1.73, must be checked against the data on the motor plate and given in the paragraph TECHNICAL DATA.

WORKING CYCLE

VENTILATION CYCLE

This cycle works in accordance with the following stages:
- Give power to the equipment;
- Set the main switch on posiotion "ventilation";
- The fan assembly only now works and intake temperature re air is directed into the room.

HEATING CYCLE

This cycle works in accordance with the following stages:
- Give power to the equipment;
- Set the main switch on posiotion "heating";
- Set room thermostat to the desired temperature;
- The burner is now given electrical supply and, after the combustion chamber pre-wash function, the flame is ignited;
- After about 1 minute the fan runs and hot air is delivered into the room.

When the temperature set at the thermostat has been reached the burner stops and after about 2 to 3 minutes the fan also stops. The whole cycle is repeated when the temperature in the room falls below the set value.

START UP AND STOP

START UP
Follow the instructions in the chapter WORKING CYCLE.

STOP
To stop the equipment it is necessary follow the procedure below:
- Set the room thermostat at 'no frost' or set the switch at "STOP";
- Wait for the fan to stop and then, if necessary, switch off the mains supply.

⚠WARNING!
Never stop the generator by cutting off the supply at the mains as the thermal energy accumulated in the heat exchanger may trigger the LIMIT safety device resulting in the need to carry out a manual unlocking. If this is repeated there is also a danger of dangerously overheating the heat exchanger.

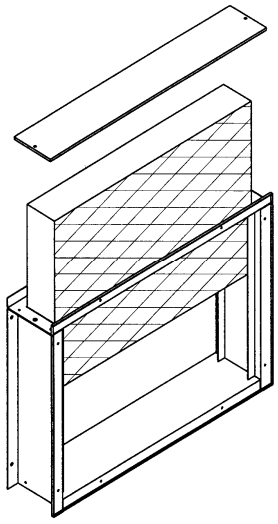
MAINTENANCE

For the proper working and conservation of the equipment periodic maintenance and cleaning operations need to be carried out.
Any such work must be carried out by specialised personnel which is authorised and the work should be done when the equipment is cold and the electrical and combustible fuel supplies cut off. All maintenance and cleaning operations which require the use of ladders or other access means must be used with sui table and absolutely safe equipment.

AIR FILTER CLEANING

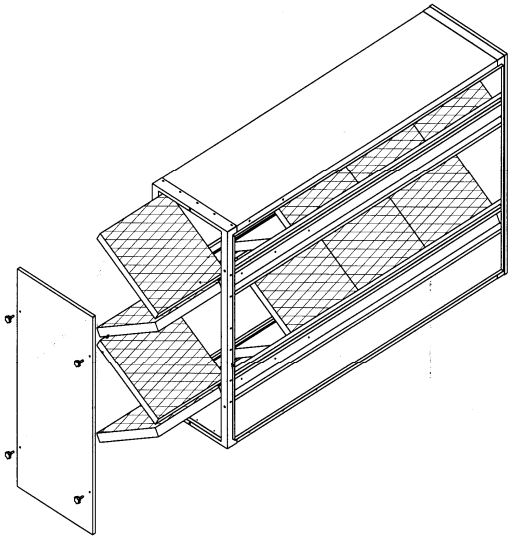
The cleaning of any intake air filter present must be periodically carried out and it is an extremely important task. If the filter baffle is too dirty, the air flow will be reduced and cause overheating od the air and the heat exchanger which leads to the LIMIT thermostat being triggered. How often the cleaning is necessary will depend on the environment in which the equipment is installed but as a rough guide it should be carried out on a weekly basis.
To clean the filter, proceed as follows:

Type 1÷4



- Remove the upper panel and remove the filtrating cells from the box.
- Clean the filter cell with an air jet, vacuum cleaner or sim ply by knocking the cell. For more complete cleaning immerse the cell in warm water with a neutral detergent rinse and dry out away from sources of heat.
- Remount the cell when it is perfectly dry.

Type 5÷15



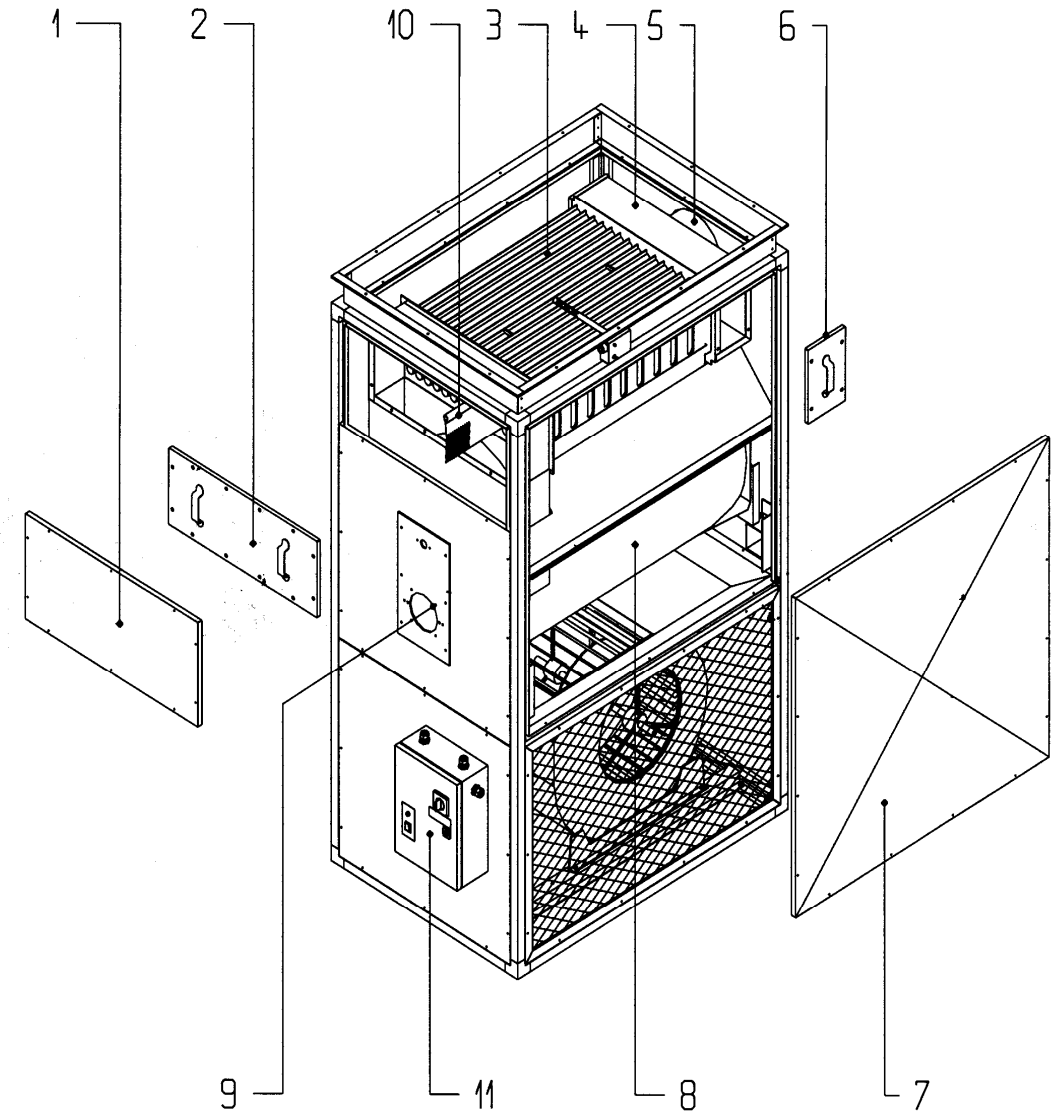
- Remove the side panel and remove the filtration cell from the box.
- Clean the filter cell with an air jet, vacuum cleaner or sim ply by knocking the cell. For more complete cleaning immerse the cell in warm water with a neutral detergent rinse and dry out away from sources of heat.
- Remount the cell when it is perfectly dry.

BURNER CLEANING

The cleaning of the burner must be carried out by authorised people strictly following the burner own instructions manual.

HEAT EXCHANGER CLEANING

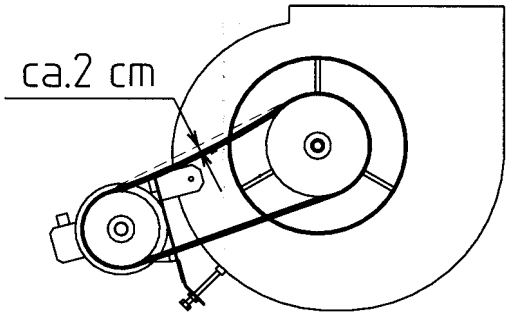
The cleaning of the heat exchanger must be carried out by authorised people and is subject to specific regulations. Generally speaking, the operation should be carried out annually at the start of each winter.
Proceed as follows:



- Remove the inspection panel **1**;
- Remove the inspection door **2**;
- Remove the burner;
- Only on **type 1÷4**, disconnect the chimney pipe from the connector **5**;
- Only on **type 5÷15**, remove the side panels **7** and the inspection doors **6**;
- Pull out any tubing **10**;
- Clean the tube pack **3** with a tube brush and, with a vacuum cleaner through the burner opening **9** remove any soot and obstructions which have been depositating in the combustion chamber **8**;
- Remove the soot and obstrucions depositated in the rear fume manifold **4** using a vacuum cleaner in the chimney connector **5** for **type 1÷4**, or through the side inspection openings for **type 5÷15**;
- Reassemble everything taking care that the seal is good and replacing any seals if necessary.

FAN MAINTENANCE

Periodically check the tightness of the transmission belts and the alignment between the motor pulley and the fan pulley. The belts must not be more taut than necessary to stop them slipping; when the two sides of the belt are pressed with the hands, it should give by at least 2-3 cm. Adjust tightness with the belt-tightening bolts.



The motor bearings are hermetic, pre-loaded and have a grease reservoir, which means that in normal usage they do not require maintenance.

The bearings on **type 1÷10** fans are also hermetic pre-loaded.

The **type 11 - 12 - 13 - 1 4 - 15** (the last only on the side opposite the transmission) have single-piece support bearings which do not normally require greasing but have a grease connection.

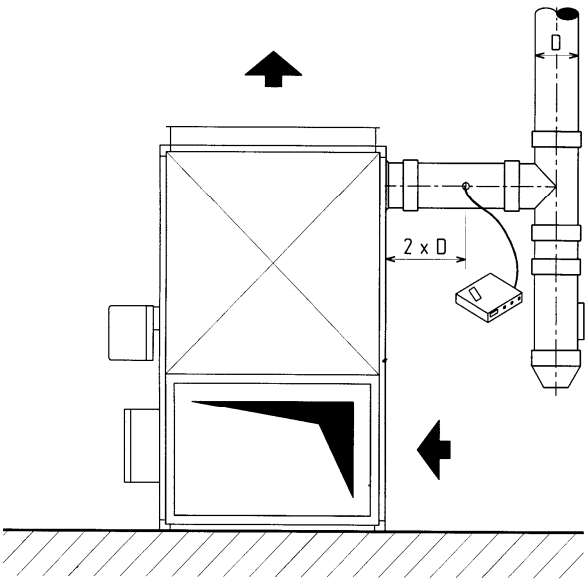
On the transmission side in the case of **type 13 - 14** there are cast iron pedestal bearings which have to be greased periodically with lithium soap-based grease to be introduces after having been introduced after the pedestal has been opened.

LIMIT THERMOSTAT MAINTENANCE

Verify the functionality of the LIMIT dual thermostat every year by turning normally the graduated reading beyond the 100°C and veryfing that the burner turns off. Moreover, verify that the reset is regular by acting on the provided unblocking button.

FUME SAMPLING POSITION

The distancese indicated below must be respected when taking samples for analyses of the equipment combustion:



ASSISTANCE

The mounting, start-up and maintenance of the hot air generators by Tecnoclima must be carried out by authorised technicians. You may request the direct technical assistance from the nearest Manifacturer's Assistance centre.

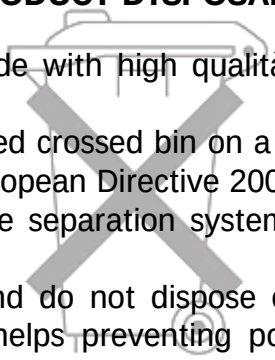
FAULTS AND SOLUTIONS

FAULT	CAUSE	SOLUTIONS
THE GENERATOR DOESN'T WORK NEITHER IN VENTILATION NOR IN HEATING MODE	No voltage	*Check electrical connections* *Check line fuses and auxiliaty charges wholeness*
THE GENERATOR DOESN'T WORK IN VENTILATION MODE	No electricity supply to tha fan motor	*Check electrical connections* *Check line fuses and auxiliary charges wholeness* *Check for an eventual cut-in of the motor thermal protection (only three-phase electricity supply versions)*
THE GENERATOR DOESN'T WORK IN HEATING MODE	No electricity supply to the oil burner	*Check electrical connections* *Check line fuses and auxiliary charges wholeness* *Check the room thermostat positive connection* *Check for an eventual cut-in of the motor thermal protection (only three-phase electricity supply versions)* *Check for an eventual LIMIT thermostat cut-in*
THE OIL BURNER FLAME TURNS ON BUT IT TURNS OFF FEW SECONDS LATER	Incorrect electrical connection	*Check the electricity supply (phase + neutral + earth)*
	To be verified or out of order burner	*Check the burner setting* *Replace the electronic control box of the burner* *Check and/or replace the burner photocell*

FAULT	CAUSE	SOLUTIONS
THE BURNER STOPS ANOMALOUSLY AND CASUALLY	LIMIT thermostat cut-in	*Check the opening of the flow directing fins* *Check for the absence of obstructions on air inlet grids* *Check fan motor*
	Burner flame detached	*Check the burner setting* *Check that the generator doesn't work in a depressed room*
	Room thermostat incorrectly installed	*Check that the room thermostat sensor is not installed on the hot air outlet*
LIMIT THERMOSTAT CUT-IN	Obstruction on the air circuit	*Check the opening of the flow directing fins* *Check for the absence of obstructions on air inlet grids*
	Hot air recirculation	*Check the opening of the flow directing fins so that it can be excluded a hot air recirculation from outlet to inlet* *Check the air inlet temperature*
	To be verified or out of order fan	*Check that the fan wheel is clean* *Check the fan motor efficiency* *Check the state and the tension of the belts (for three-phase versions)* *Verify an eventual anomalous cut-in of the fan motor thermal protection (for three-phase versions)*
	Excessive thermal power	*Check the burner setting*
FAN MOTOR THERMAL PROTECTION CUT-IN (FOR THREE-PHASE VERSIONS)	Excessive fan motor electric absorption and/or heating	*Check that the air diffusion plenum is mounted* *Check the electricity supply voltage* *Check the air inlet temperature*
THE FAN DOESN'T START WITHIN ABOUT A MINUTE FROM THE STARTING OF THE BURNER	Insufficient thermal power	*Check the burner setting*
	To be verified or out of order FAN-LIMIT dual thermostat	*Check FAN index setting* *Replace the FAN-LIMIT dual thermostat*

FAULT	CAUSE	SOLUTIONS
THE FAN DOESN'T STOP WITHIN ABOUT 4 MINUTES FROM THE STOPPING OF THE BURNER	Too high room temperature	*Check the air inlet temperature* *Check for an eventual solar irradiation*
	To be verified or out of order FAN-LIMIT dual thermostat	*Check FAN index setting* *Verify that the white button Is on the AUT position* *Replace the FAN-LIMIT dual thermostat*
THE FAN DOESN'T WORK	To be verified or out of order fan	*Check the fan motor efficiency* *Check the capacitor of the fan motor (for three-phase versions)* *Verify transmission belts (for three-phase versions)* *Verify an eventual cut-in of the fan motor thermal protection (for three-phase versions)*
	To be verified or out of order FAN-LIMIT dual thermostat	*Check FAN index setting* *Replace the FAN-LIMIT dual thermostat*
THE FAN RUNS INTERMITTENTLY	To be verified or out of order FAN-LIMIT dual thermostat	*Check FAN index setting* *Replace the FAN-LIMIT dual thermostat*
	Insufficient thermal power	*Check the burner setting*
THE FAN PRESENTS FUNCTION LAPSES	Hot air recirculation	*Check the opening of the flow directing fins so that it can be excluded a hot air recirculation from outlet to inlet* *Check the air inlet temperature*
THE GENERATOR GETS ANOMALOUSLY DIRTY	Incorrect burner setting	*Check the burner setting*
	Obstructed chimney	*Clean the fumes discharge and the chimney*
INTERNAL CONDENSATION OF THE CUMBUSTION PRODUCTS	Insufficient thermal power	*Check the burner setting*
DIFFICULTIES TO REACH THE TEMPERATURE SET ON THE ROOM THERMOSTAT	Low thermal exchange rate due to dirty heat exchanger	*Clean the heat exchanger*
	Incorrect burner setting	*Check the burner setting*
	Incorrectly installed room thermostat	*Check that the room thermostat sensor is not installed on the hot air outlet*

PRODUCT DISPOSAL



This product was designed and made with high qualità material and components which can be recycled and reused.
When finding the symbol of a wheeled crossed bin on a product, be aware of the fact that the component is covered by the European Directive 2002/96/EC.
Get informed about your local waste separation system as far as electric and electronic products are concerned.
Respect your in force local rules and do not dispose old products with your household waste. A correct product disposal helps preventing possible negative consequences on human and environmental health.

NOTES

EC CONFORMITY DECLARATION
DÉCLARATION DE CONFORMITÉ À LA CE
EU-ÜBEREINSTIMMUNGSERKLÄRUNG
CONFORMITEITSVERKLARINGVOOR DE EU
DICHIARAZIONE DI CONFORMITÀ
DECLARACION DE CONFORMIDAD CON LA CE
FÖRSÄKRAN OM ÖVERENSSTÄMMELSE
EU:N VAATIMUSTENMUKAISUUSVAKUUTUS
EU OVERENSSTEMMELSESERKLÆRING
EU-SAMSVAR
DEKLARACJA ZGODNOŚCI WE
ЗАЯВЛЕНИЕ О СООТВЕТСТВИИ ТРЕБОВАНИЯМ СТАНДАРТОВ ЕС
EC MEGFELELŐSÉGI NYILATKOZAT
PROHLÁŠENÍ O DODRŽENÍ NAŘÍZENÍ EC
EC ATITIKTIES DEKLARACIJA
EL VASTAVUSAVALDUS
EC ATBILSTĪBAS DEKLARĀCIJA
ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ ΕΚ
AT UYGUNLUK BEYANI
VYHLÁSENIE ZHODY S ODPORÚČANIAMI EURÓPSKEHO SPOLOČENSTVA
DECLARAȚIA DE CONFORMITATE CU RECOMANDĂRILE COMUNITĂȚII EUROPENE
ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ НА ЕВРОПЕЙСКАТА ОБЩНОСТ
DEKLARACIJA USKLAĐENOSTI S PREPORUKAMA EUROPSKE UNIJE
ДЕКЛАРАЦІЯ ВІДПОВІДНОСТІ ЄС

DESA ITALIA s.p.a. Via Tione, 12 - 37010 - Pastrengo (VR) ITALY

Portable forced air heaters: - Appareils de chauffage individuels à air forcé: - Tragbare hochdruck-heissluftturbinen: - Mobiele ventilator-luchtverwarmer: - Generatore d'aria calda: - Calentadores móviles de aire forzado: - Portabel värmefläkt med forcerat luftflöde: - Siirrettävä kuumailmapuhallin: - Flytbare luftcirkulations apparater: - Flyttbar varmekanon: - Przenośne nagrzewnice powietrza pod ciśnieniem: - Тепловой генератор: - Hordozható hőlégfúvók: - Přenosná topná tělesa na dm chan vzduch: - Kilnojami aukšto slėgio oro šildytuvai: - Kaasaskantav õhusoojendi: - Pārvietojamie gaisa sildītāji ar piespiedu gaisa padevi: - Φορητη θερμαστρα εξαναγκασμενησ ροησ αερα: - Priprava za vpihavanje toploga zraka: - Portatıf basinçli hava isiticilar: - Prenosný tlakový teplovzdušný ohrievač: - Încălzitoare portabile de aer: - Преносими отоплители под налягане: - Uređaj za upuh toploga zraka: - Портативні повітрянагрівачі:

BI 60 - BI 95 - BI 105 - BI 120 - BI 160 - BI 190 - BI 225 - BI 260 BI 320 - BI 390 - BI 590 - BI 645 - BI 770 - BI 1000 - BI 1100

It is declared that these models conform to: - Ces modèles ont été déclarés conformes à:
Hiermit wird bescheinigt, daß diese Modelle in Übereinstimmung: - Hierbij wordt verklaard dat deze modellen:
Si dichiara che questi generatori sono conformi: - Se declara por este medio que estos modelos:
Ovanstående modeller överensstämmer: - Näiden mallien todistetaan täten noudattavan:
Det attesteres herved, at anførte modeller er i overensstemmelse: - Det erklæres at disse modellene er i samsvar:
Oświadcza się, że niniejsze modele zgodne są z zarządzeniem: - Настоящим мы заявляем, что эти нагреватели отвечают требованиям стандартов на оборудование: - Kijelentjük, hogy fenti modellek megfelelnek
Prohlašujeme, že tyto modely odpovídají Nařízení pro stroje: - Vastab järgmistele el direktiividele ja standarditele:
Atbilst sekojošu es standartu un direktīvu prasībām: - Δηλώνεται ότι αυτά τα μοντέλα είναι σε συμμόρφωση με την οδηγία περί Μηχανημάτων: - Įšbu modellerin: - Potvrdzujeme, že tieto modely sú zhodné s nariadením: - Declară că modelele sunt produse conform hotărârii: - Декларира, че горепосочените модели съответстват Директивата за: - Očituje se da su spomenuti modeli sukladni sa uredbom: - Декларується що ці моделі відповідають:

98/37 CE, 91/368, 93/44, EMC 89/336, 92/31, 93/68, 73/23

Pastrengo, 06/04/2010

Raffaele Legnani (Managing Director)

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