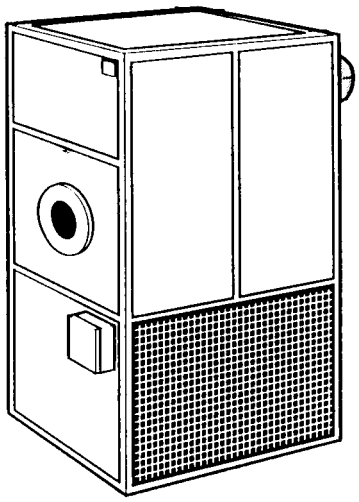
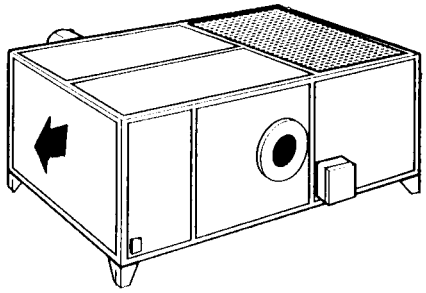
WARM AIR HEATERS SERIES "AS" AND VERSIONS "AS H" "AS EX" "AS EX H"

fitted with automatic forced draught burners gas fired or fuel oil fired

USE,INSTALLATION AND MAINTENANCE MANUAL





CE 0063

MODEL	
SERIAL NUMBER	
VOLTAGE	**230V-1F - 50Hz**
YEAR	

This appliance must be installed in accordance with the rules in force, and used only in a sufficiently ventilated space. Consult instructions before installation and use of this appliance.

THIS MANUAL MUST BE DELIVERED TO THE USER OF THE WARM AIR HEATER AND MUST ALLWAYS FOLLOW THE APPARATUS

ACCORRONI®

VERY IMPORTANT NOTICE

This manual is an essential and integral part of the appliance and must always follow it. The user and any involved people must read it carefully, before starting operating or handling with the appliance.
The manufacturer calls out himself from any liability for damages occurring to persons, animals and things caused by:

- uncorrected use of the apparatus
- wrong destination of its use
- use not in accordance with these manual provisions
- use not in accordance with norms, laws, decrees, provisions, European, national, regional and district-ordinances.
- if the apparatus is not installed, periodically checked or repaired by centres authorized by the manufacturer or by **skilled people, such as technicians with a specific technical knowledge about heating installations in inhabited buildings.**

! CAUTION! This warm air heater must not be used in explosive atmosphere.

The installation planning, installation, setting at work, periodical controls and repairs of this warm air heater must be carried out only by skilled people.
In case of troubles and faulty working, refer always to the authorized maintenance centre or skilled people. In this case the user must disconnect the electric power to the appliance and avoid any attempt of direct repairing, to avoid any damage to the apparatus and to third people, according to what herein described at par. "Faults research".

! CAUTION! Before carrying out these operations cut-off and put the main switch on -O-.

Periodically, at the end of the heating season, the user must call skilled people to clean the combustion chamber, the heat exchanger and other running parts.
Periodically, according to local rules, the user must call skilled people to check the appliance in all operating and security parts and to make a combustion test. The results are to be registered on the "heating plant handbook".
The air inlet filter, if any, must be cleaned everyday, by removing it from its housing and clean by compressed air or wash it (See Par. "Maintenance").
The air inlet grill (6), when dirty, must be cleaned by a brush and by an air-exhauster, without removing the grill.
Should the appliance be moved to another place, be sure this manual follows it, in order the new user and/or installer may consult it.

EXPLANATION OF THE GRAPHICAL SYMBOLS USED ON THE ELECTRIC CONTROL BOARD

Tension	Heating	Only Ventilation	Burner off
			

GENERAL INFORMATION

The warm air heater is suitable for the following uses:

a) **to heat the air, conveyed by its fan unit** through the external walls of its combustion chamber and heat exchanger.
b) **for ventilation only**.

To use it as per point (a), the heater is to be equipped only with a forced-air gas burner, (see list of the matches heater/gas burner at page 12) or liquid fuel. Moreover, it must be connected to the electric line, to the fuel pipe and to a chimney.
To use it as per point (b), it's enough to connect it only to the electric mains line.
This warm air heater is to be used to heat the environment. The device must not be used for other purposes and in particular for an average outlet air temperature over 80°C, during normal operation.

! **CAUTION! The manufacturer is responsible of the working features of the heater only in case the unit is matched with a compatible burner (see table of matches on this handbook at page 12).**

CONSTRUCTIVE TEST AND SECURITY REQUIREMENTS

The warm air heater is composed of an aluminium frame and of an external panelling in prepainted sheet: inside the panels are protected by a glass wool mattress. In the heating section there are a combustion chamber and a heating exchanger. The insulating mattress is protected in this area by galvanized sheet iron, against the overheating dangers. Under the combustion chamber, in the ventilating section, is assembled a centrifugal fan with double suction (galvanized), driven by an electric motor. A hands protection grate with holes 10x10 mm. is provided in the ventilating unit. The grate is screwed on the frame and can be removed only with the help of a tool. The combustion chamber, built in stainless steel for high temperatures is bolted on the frame, so that its thermal expansions don't influence the long life. The heat exchanger, built with normal steel pipes, is strongly welded to the combustion chamber. Inspection and maintenance operations may be carried out through large openings on them.

In the low ventilating section there is a control board with:

- Main switch - commutator "HEATING-STOP BURNER-VENTILATION" - Voltage light - .

The warm air heater is equipped with a combination of 3 thermostats placed on the heat exchanger, assuring the following control and safety functions:

- **FAN:** thermostat normally opened, to start and stop automatically the ventilating unit during "HEATING" phase (calibration at 30°C).
- **LIMIT(TR2):** temperature limit thermostat for the burner, normally closed, to stop the burner, when the outlet air temperature goes over the calibrate value. It resets automatically the burner, when the air goes cooler (calibration at 80°C).
- **LIMIT2(HONEYWELL):** security limit thermostat for the burner, normally closed, to stop safety the burner, in case of abnormal over heating of the outlet air temperature. The resetting of the burner follows by cooling the air and then pushing manually the resetting button of LIMIT2 (calibration at 100°C).

OTHER IMPORTANT SECURITY REQUIREMENTS

Electric equipment. On the finished warm air heaters are carried out the following electric tests, to control their compliance.

- Visual test of the electric circuit and of the connections clamping.
- Continuity of the ground circuit.
- Insulation resistance proof.
- Voltage test.

Temperatures. The temperatures of the accessible zones for the manual use of the warm air heater are in compliance with the norm PrEN1020.

Noise. All possible cunnings have been adopted, to reduce the noise as much as possible: the values in dB(A) are specified in the table at page 12.

Signals. The signals on the drives and alarm devices are realized through graphic symbols according to ISO 7000. At page 1 are explained these graphic symbols.

PLATE OF THE HEATER FEATURES

Each warm air heater carries a glued plate of its features on its frontal side. This plate is made of an ultra destructible film, which, once removed, can't be used again, and has never to be disjoined from the apparatus.
Herein is shown a facsimile of the plate.

Via Santa Maria,180 20015 PARABIAGO (MI) - ITALY TEL (0331) 58.87.37 - FAX (0331) 58.42.93		
GENERATORE D'ARIA CALDA A CONVEZIONE FORZATA ABBINABILE A BRUCIATORE AUTOMATICO AD ARIA SOFFIATA FORCED CONVECTION WARM AIR HEATER COMPATIBLE WITH AUTOMATIC FORCED DRAUGHT BURNER GENERATEUR D'AIR CHAUD A CONVECTION FORCEE COMPATIBLE AVEC BRULEUR AUTOMATIQUE A AIR SOUFFLEE		
MOD. TYP.	N°	MESE/ANNO MONTH/YEAR MOIS/ANNEE
PORTATA TERMICA NOMINALE NOMINAL HEAT INPUT DEBIT CALORIFIQUE NOMINAL		kcal/h kW
POTENZA TERMICA NOMINALE PUISSANCE CALORIFIQUE UTILE THERMAL RATED POWER		Kcal/h kW
RESA TERMICA UTILE		%
PERDITE DI CARICO DEL CIRC. DI COMB. CONTRE PRESSION DANS LE CHAM. DE COMB. COUNTERPRESSURE IN COM. CHAMBER		mbar
PORTATA ARIA AIR DELIVERY DEBIT AIR		mc/h
PRESSIONE STATICA UTILE AIR PRESSURE PRESSION AIR DISPONIBLE		Pa
POTENZA ELETTRICA ASSORBITA RATED POWER INPUT PUISSANCE ELECTRIQUE ABSOR.	**n°** **x** kW	
TENSIONE - TENSION		
COMBUSTIBILE GAS FUEL GAS COMBUSTIBLE GAZ	CATEGORIA II2H3+ CATEGORY ITALIA CATEGORIE	
CE 0063 LY	PIN 68AQ217	
COMBUSTIBILE GASOLIO FUEL LIGHT-OIL COMBUSTIBLE MAZUT		

PACKING

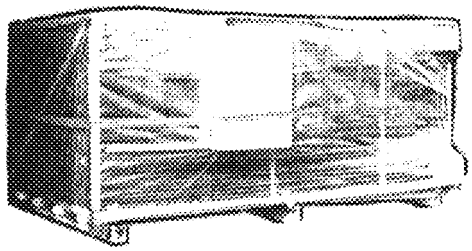
The warm air heater is delivered on a wooden pallet; the electric parts are protected by foam polystyrene boxes and all around by a pluribol film. The air inlet plenum, if any, is packed with pluribol, together with heater or separately according to the models.

TRANSPORT, LOAD AND UNLOAD

Transport, load and unload are to be carried out carefully, to not damage the device and persons, animals and things.
To load and unload the device, may be used a lift truck with enough load capacity, according to the safety factor (see gross weight of the device in the tables at page 12). During load and unload operations, the centre of gravity of the device must stay in the middle, without dangerous inclinations.
After removed the packing, control the integrity of the device. In case of doubt, don't use it, but contact the manufacturer or its agent. Once removed the packing, the heater is shown as a compact device with electric panel and fan/s.

PACKING MATERIALS

The materials, packing rejects (wood, cardboard, polystyrene, nails and so on) are to be collected and eliminated according to the laws in force.
In all cases, don't leave these materials within the reach of children, because they may be a source of danger.



Warm air heater "AS H" packed

POSITIONING

When packing has been removed, the heater is to be positioned as described at page 13.

! CAUTION! Don't turn upside-down the heater, because this could cause damages to it.

TESTS BEFORE SETTING AT WORK

The heater is equipped with an electric control board (figure 6); inside are placed

- a main electromagnetic switch with a voltage light.
- a commutator - HEATING - BURNER STOP - VENTILATION -
- a terminal board, with fuse on principal circuit.

Control that:

1. the electric board is well connected to the one-phase electric line and that the feeding cable has a suitable section as to absorb the Amperes installed on the device and accessories
2. the rotation direction of the fan/s is the one shown on the rotor (figure 8)
3. there are no obstacles both on the delivery and on the recovery of the air, which may obstruct the air circulation, in order not to reduce the capacity of the device and its life.
4. the air delivery tabs are as vertical as possible, as not to reduce the air capacity and deliveries.
5. the air inlet filters, if any, are clean, not to reduce the air capacity.

FURHTER CONTROLS IN THE HEATING PHASE

Control that:

1. the heater is coupled with an automatic forced draught burner, match able with the model of heater (with gas burner, control that the coupling has been realized according to our matches table, page 12).
2. the electric and fuel connections of the burner are realized according to the norms. As regards gas, the installer carrying out gas pipe, must issue the certification of the gas feed plant.
3. the burner capacity is not over the one allowed (see page 12)
4. the calibration of FAN thermostat, is 30°C
5. LIMIT and LIMIT2 are electrically connected to the burner
6. the flue gas exhaust is according to the rules
7. the environment supplies enough comburent air, according to the norms.

N.B. Read carefully the manual of the burner, supplied by its manufacturer

WORKING DESCRIPTION

Heating phase. On the electric board the main switch must be in -1- position and the commutator in -HEATING- position. Whenever the room thermostat calls for heating, the burner begins its self testing- and prep urge cycle. After it, starts the combustion and between 5 minutes, the FAN thermostat starts automatically the ventilating unit. When the burner is switched off by the room thermostat, the ventilating unit keeps turning, to cool the heat exchanger and this will be stopped automatically by the FAN, to avoid deliver cool air.

The burner may be stopped by LIMIT (temperature limit thermostat), if the average outlet air temperature goes over its setting point. The burner may be stopped also by LIMIT2 (security limit thermostat), if the average outlet air temperature goes abnormally overheated over its setting point. To reset the LIMIT2, proceed as described at page 16.

! CAUTION! LIMIT2 intervention shows a working defect, then contact any assistance centre or skilled people

! CAUTION! Before cutting-off the main switch, be sure that the generator is properly cooled, otherwise the long life of the device could be compromised.

STOP

Putting the commutator on -BURNER STOP- position, the burner stops, while the ventilating unit goes on turning till when it's switched off by the FAN, at the end of the cooling phase. Even if the ventilating unit can restart once or more times, the warm air heater maybe considered switched-off.

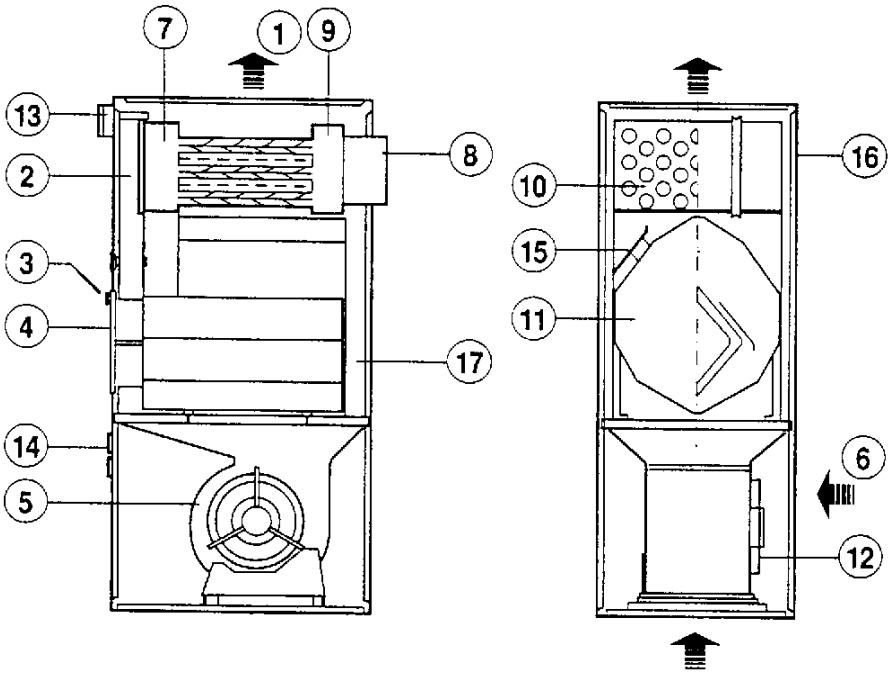
To clear the whole heater, put on -O- the main switch .

Only ventilation phase. Set the commutator on the position "VENTILATION", so that the heater may run only as a fan, keeping the burner disconnected.

! CAUTION! Never switch off the device from the main switch, but always from the commutator, the ambient thermostat, the timer, if any: otherwise heat remains in the heat exchanger, without exploiting it, with the risk of deformations of the exchanger itself.

COMPOSITION OF THE HEATER SERIES “AS” AND VERSION “AS H”

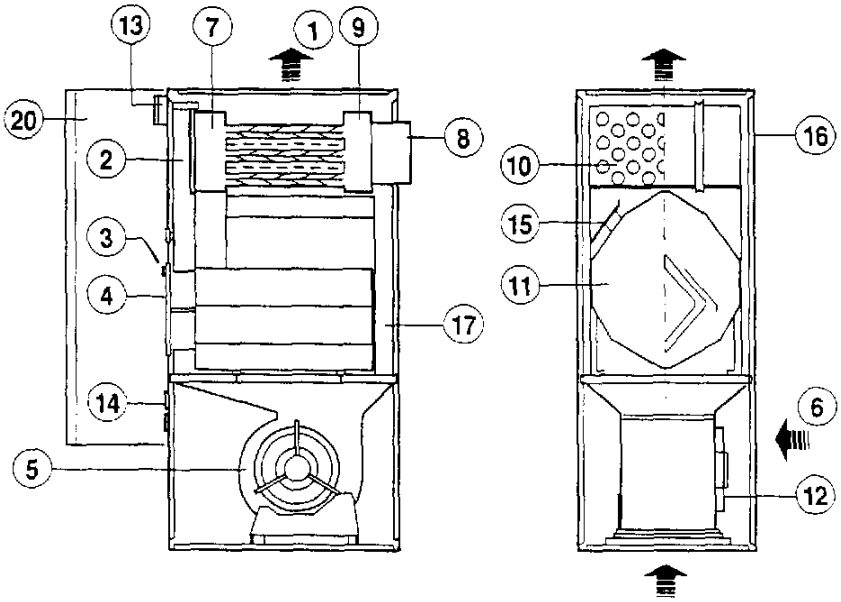
Models “AS40” and “AS70”



1) Air outlet
2) Flue gas box door
3) Flame peephole
4) Burner anchor plate
5) Centrifugal fan
6) Air inlet grill
7) Front flue gas box
8) flue exhaust manifold
9) Back flue gas box
10) Heat exchanger
11) Combustion chamber
12) Fan motor
13) Fan-Limit-Limit2
14) Electric board
15) Air baffles
16) Frame in aluminium profiles
17) Insulated external panels

COMPOSITION OF THE HEATER SERIES “AS EX” AND VERSION “AS EX H”

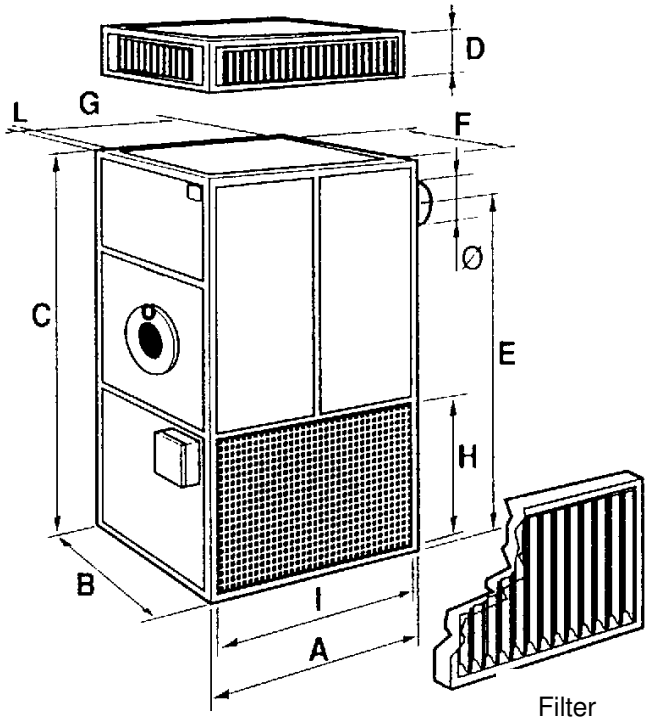
Models “AS40” and “AS70”



1) Air outlet
2) Flue gas box door
3) Flame peephole
4) Burner anchor plate
5) Centrifugal fan
6) Air inlet grill
7) Front flue gas box
8) Flue exhaust manifold
9) Back flue gas box
10) Heat exchanger
11) Combustion chamber
12) Fan motor
13) Fan-Limit-Limit2
14) Electric board
15) Air baffles
16) Frame in aluminium profiles
17) Insulated external panels
20) Protection cabin of the burner of electrical parts.

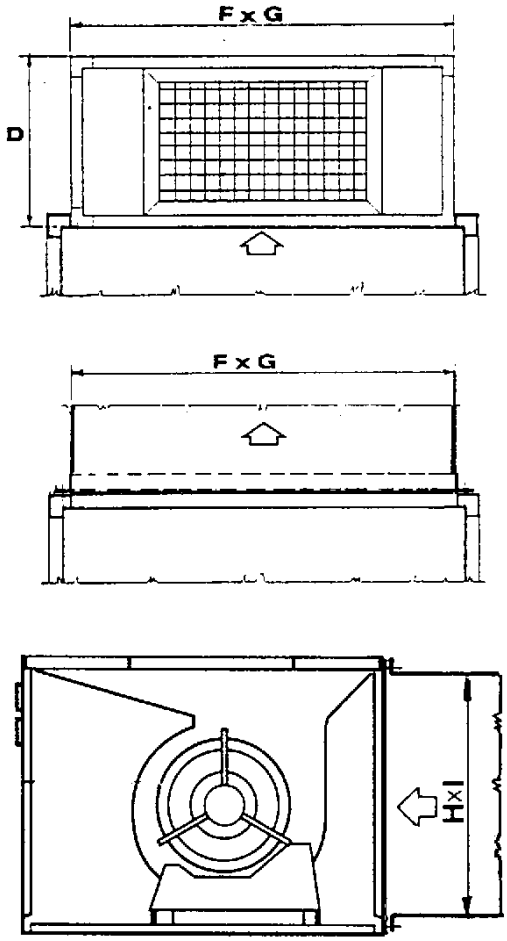
WARM AIR HEATER SERIES “AS” - DIMENSIONS IN mm AND WEIGHTS

Head



Filter

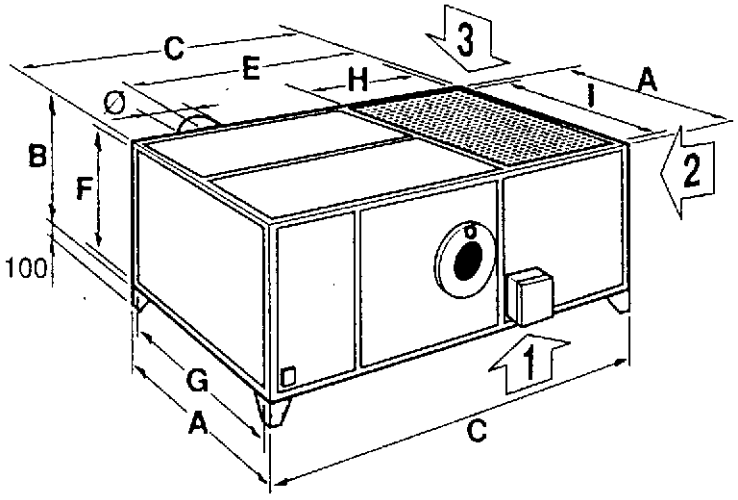
Air inlet grill is on the left till.
The grill position may be reversed

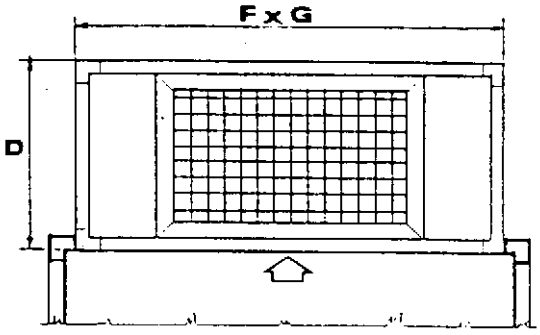


	HEATER			Head	Flue exh	Airoutlet		Air inlet		Burner plate height	Frame profile	Flue	Heater weight		Head
	Legth	Width	Height	Height	height	connection						exhaust	net	packed	net weight
MOD.	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**L**	∅	**Kg**	**Kg**	**Kg**
AS40	660	530	1430	305	1215	490	620	480	620	760	20	150	148	155	11
AS70	870	636	1750	305	1500	596	830	630	830	950	20	180	220	230	17

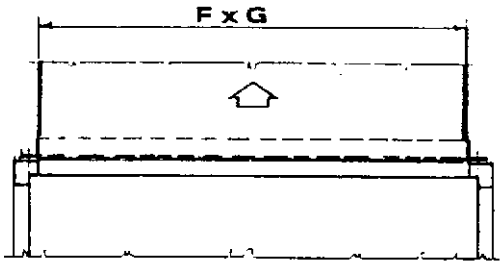
N.B. On dimension “E” and “J” tolerance about 10mm.

WARM AIR HEATER SERIES “AS H” - DIMENSIONS IN mm AND WEIGHTS



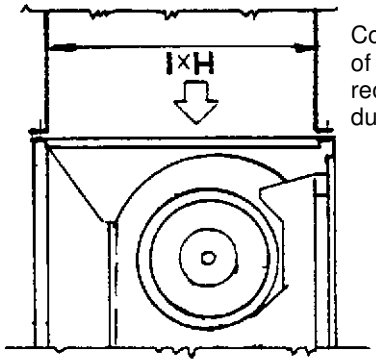


Connection of the head to the heater



Connection of the air delivery duct

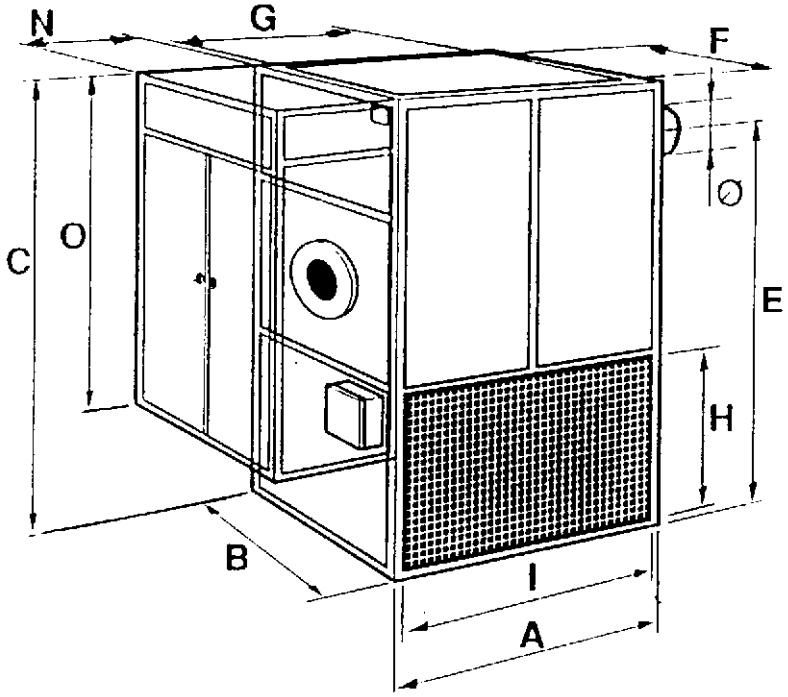
AIR INLET GRILL: on request between position 1 - 2 - 3.
The head is the same of the series “AS”.
The order must indicate the positioning (right or left).
The drawing shows the left positioning.

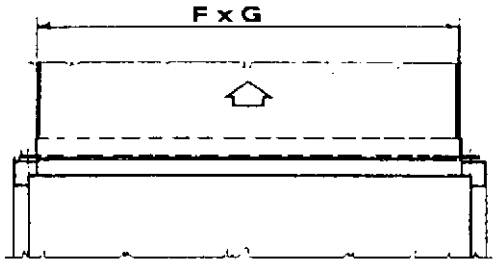


Connection of the air recovery duct

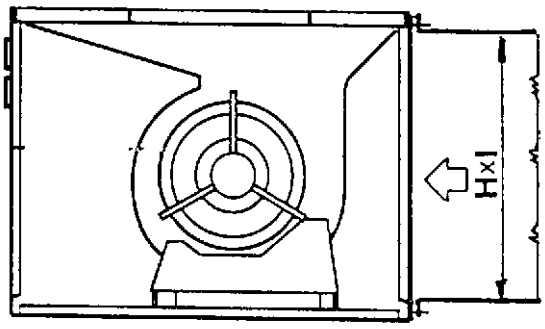
	HEATER			Head	Flue exh	Airoutlet		Airinlet		Frame	Flue	Heater weight		Head
	Legth	Width	Height	Height	height	connection		connection		profile	exhaust	net	packed	net weight
MOD.	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**L**	∅	**Kg**	**Kg**	**Kg**
AS H40	660	530	1430	305	1215	490	620	480	620	20	150	148	155	11
AS H70	870	636	1750	305	1500	596	830	630	830	20	180	220	230	17

WARM AIR HEATER SERIES “AS EX”- DIMENSIONS IN mm AND WEIGHTS





Connection of the air delivery duct

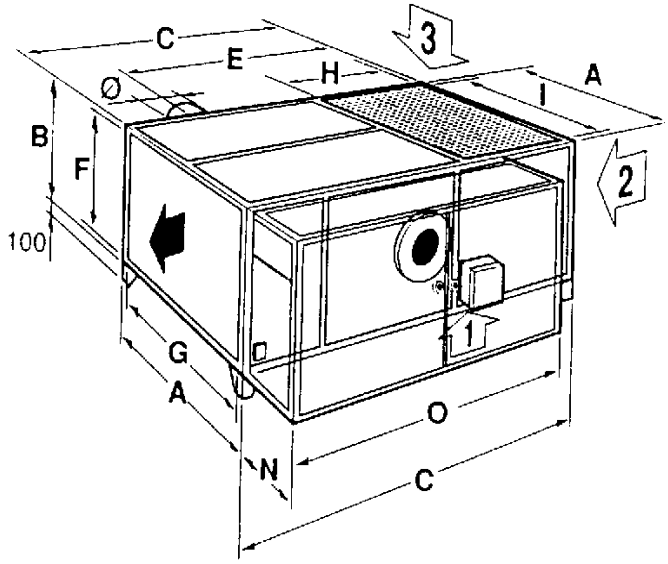


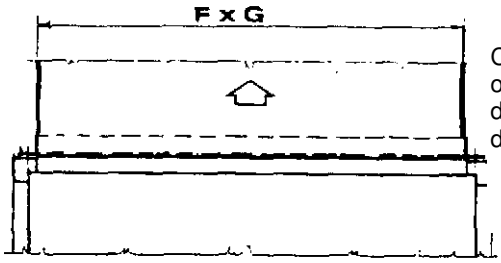
Connection of the air recovery duct

Air inlet grill is on the left.
The grill position may be reversed.

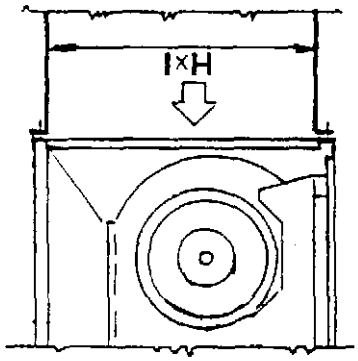
	HEATER			Flue exh.	Air delivery		Air inlet		Burner cabin		Flue	Heater weight	
	Legth	Width	Height	Height	connection		connection		Depth	Height	exhaust	net	packed
MOD.	**A**	**B**	**C**	**E**	**F**	**G**	**H**	**I**	**N**	**O**	∅	**Kg**	**Kg**
AS EX40	660	530	1430	1215	490	620	480	620	500	1280	150	168	175
AS EX70	870	636	1750	1500	596	830	630	830	500	1540	180	248	258

WARM AIR HEATER SERIES “AS EX H”- DIMENSIONS IN mm AND WEIGHTS





Connection of the air delivery duct

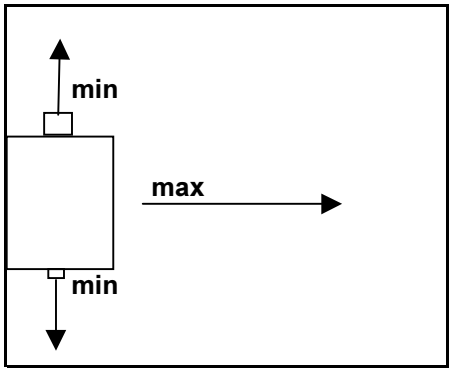


Connection of the air recovery duct

AIR INLET GRILL: on request position 1 - 2 - 3.
to be canalised.
The order must indicate the positioning (right or left).
The drawing shows the left positioning.

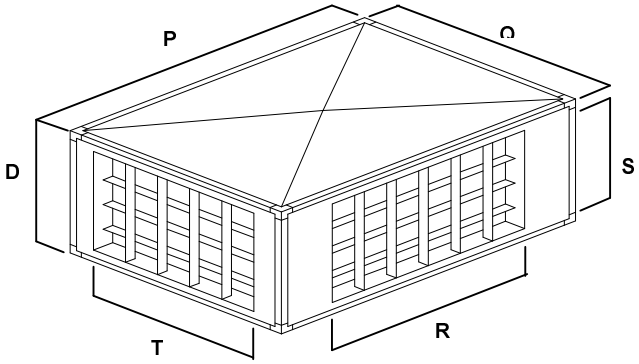
	HEATER			Head	Flue exh	Airoutlet		Airinlet		Frame	Flue	Heater weight	
	Legth	Width	Height	Height	height	connection		connection		profile	exhaust	net	packed
MOD.	**A**	**B**	**C**	**E**	**F**	**G**	**H**	**I**	**N**	**O**	**∅**	**Kg**	**Kg**
AS EX H40	660	530	1430	1215	490	620	480	620	500	1430	150	173	180
AS EX H70	870	636	1750	1500	596	830	630	830	500	1750	180	254	264

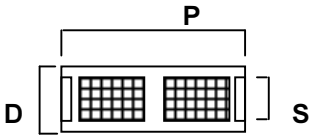
WARM AIR HEATER SERIES "AS" AND VERSIONS "AS H"
STANDARD HEAD (PLENUM) FOR AIR DIRECT DELIVERY
Air throws from the heads through grills on three sides and dimensions in mm.

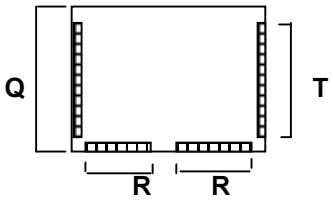


MOD.	P	Q	D	R	T	S	n° nozzles (1)	Air blows in m max (2)	min
AS40	615	485	305	300	300	200	1+1+1	18	18
AS70	825	591	305	550	300	200	1+1+1	32	32

1) Short side (Q) + long side (P) + Short side (Q)
2) Throws are related to an air final speed of 0,15 m/sec. and being the air deflector blades of the grill 0° deflected. In case of deflection of 30°, multiply the throws value x 0,65

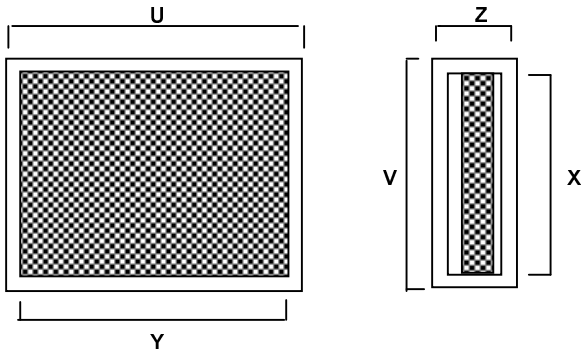






N.B. T x S ED R x S = The dimensions referes to single grill

WARM AIR HEATER SERIES "AS" AND VERSIONS "AS H" "AS EX" "AS EX H"
FILTER BOXES ON THE AIR INLET
Pressure drop of the filters and dimensions in mm.:



MOD.	U	V	Z	Y	X	Pleated filters: n° of filters x height x length x thickness (1)	Press. drop Pa (2)
AS 40	620	480	200	580	440	1x490x600x50	30
AS 70	830	630	200	790	590	1x640x810x50	35

1) Efficiency according to ASHRAE52/76 DUST WEIGHT: 87%
2) Pressure drop referred to a new filter, unobstructed.

WARM AIR HEATER SERIES "AS" AND VERSIONS "AS H" "AS EX" "AS EX H" - TECHNICAL WORKING FEATURES

WARM AIR HEATER	MOD.	AS40	AS70
THERMAL RATED CAPACITY	Kcal/h	38.700	72.000
	Kw	45,0	83,7
THERMAL RATED POWER	Kcal/h	35.000	65.000
	Kw	40,7	75,6
THERMAL YIELD	%	90,4	90,3
GAS CONSUMPT. METHANEG20at20mbar	mc/h	4,80	8,90
at 15°C-1013mbar NAT. GAS G25at25mbar	mc/h	5,53	10,30
PROPANE G31 at 37mbar	Kg/h	3,43	6,38
BUTANE G30 at 28mbar	Kg/h	3,48	6,48
COUNTERPRESSURE IN COMB. CHAMBER	mbar	0,22	0,22
COMBUSTION CHAMBER VOLUME	mc	0,05	0,17
COMBUSTION CIRCUIT VOLUME	mc	0,08	0,22
PRE-PURGE AIR MINIMUM VOLUME	mc (1)	0,4	1,1
CATEGORY	**ITALY**	**II2H3+**	**II2H3+**
MIDDLE TEMPERATURE OF THE FLUE with comburent air temperature of 20°C	°C	228	229
CONSUMPTION WITH GAS OIL WORKING PCI 10.200 Kcal/Kg.	Kg/h	3,8	7,1
AIR DELIVERY	mc/h at 18°	2.750	5.100
USEFUL STATIC PRESSURE AIR SIDE	Pa (2)	50	90
POWER OF THE FANS MOTORS	Kw x n°	0,200	0,736
ABSORPTION OF THE MOTORS 230V 1F	A	1,95	7,4
NOISE LEVEL (at 4m.)	dB(A)	62	72

1) According to prEN1020
2) With warm air heater without air inlet filter. For the filter pressure loss see page 12.

WARM AIR HEATERS SERIES "AS" AND VERSIONS "AS H" "AS EX" "AS EX H:COMBINATION BETWEEN HEATERS AND FORCED-DRAUGHT GAS BURNERS CE. CATEGORY: H2H3+ COUNTRY:ITALY

HEATER			BURNERS R.B.L. RIELLO				BURNERS BALTUR			BURNERS FINTERM-JOANNES(1			BURNERS LAMBORGHINI		
MODEL	Thermal capacity Kw	Counterpressure in comb.chamber mbar	MODEL	TYPE	Output kW min	Output kW max	MODEL	Output kW min	Output kW max	MODEL	kW min	kW max	MODEL	Output kW min	Output kW max
AS40	**45**	**0,22**	**Riello40FS5**	552M	23	58	**BTG 6**	30,6	56,3	**JM 6**	27	66,6	**EM 6-E**	27	66,6
			BS1- BS1D	911T1	16	52	**BTG 6 P**	30,6	56,3						
AS70	**83,7**	**0,22**	**Riello40FS8**	553M	46	93	**BTG 11**	48,8	99	**JM 12**	49,8	120	**EM 16-E**	80	160
			BS2 - BS2D	912T1	35	92	**BTG 11 P**	48,8	99						
							SPARK30LX	60	340						

Remark 1) Brands Joannes and Termonafta. In the version Termonafta the models AZ.... are called HT.....

INSTALLATION OF HEATER AND FITTING

! CAUTION ! : THIS SECTION OF THE MANUAL BELONGS TO THE INSTALLER AND TO SKILLED PEOPLE.

LOCATING AND CLEARANCE OF THE HEATER

The warm air heater must be located and installed according to the laws, norms, rules and provisions in force.

! CAUTION ! : Heaters must not be installed in potentially explosive, flammable or corrosive atmospheres. Heaters must be installed such that the gas ignition control system is not directly exposed to water spray, rain or dripping water.

In locating heaters, consider general space-heating requirements, availability of gas, and proximity to vent locations. Heaters should be located so heated air streams wipe exposed walls without blowing directly against them. In multiple unit installations, arrange units so that each supports the air stream from another, setting up circulatory air movement in the area. In buildings exposed to prevailing winds, a large portion of the heated air should be directed along the windward wall. Avoid interference of air streams as much possible.

If the room has air extractors, locate the heater in the opposite wall and provide for air inlet grills to reintegrate air.

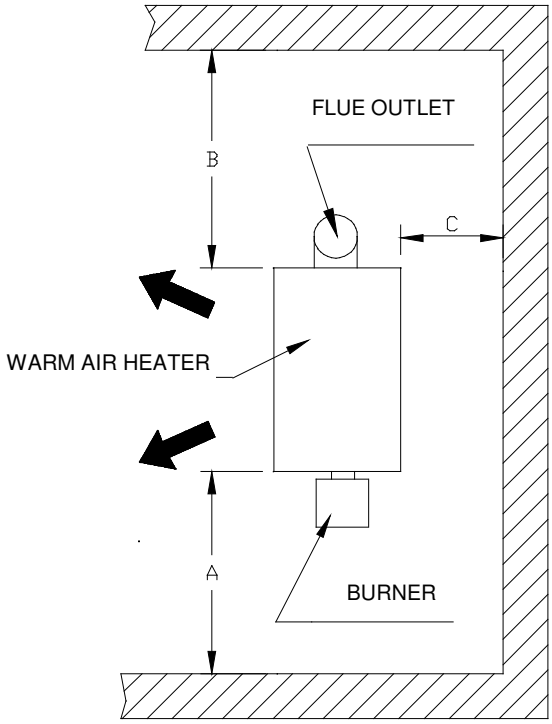
LOCATING THE HEATER

For safety installation and maintenance needs the heaters must be installed at a minimum distance from walls, stocked materials, machinery etc.…
The above minimum distances must be increased for safety needs according to laws, norms, rules and provisions in force , if any, specially regarding distances from combustibles stuff.

MOD.	A (1) (mm)	B (2) (mm)	C (mm)
AS 40	600	450	300
AS 70	800	450	300

1) This distance must be verified according to the dimensions of the burner.

2) This distance must be verified according to the dismounting need of the flue pipe.



INSTALLATION

The installation of the warm air heater must be carried out by skilled people; it must be executed according to the laws, norms, rules, European, national, regional and district-provisions, of which the installer must be aware.

CHOICE OF THE BURNER

Forced-air gas burner: the installer must choose a burner match able with the heater. For this make reference to what herein described at page 12.
The burners must have short head and adjusted in order to get the average combustion results as from page 12.

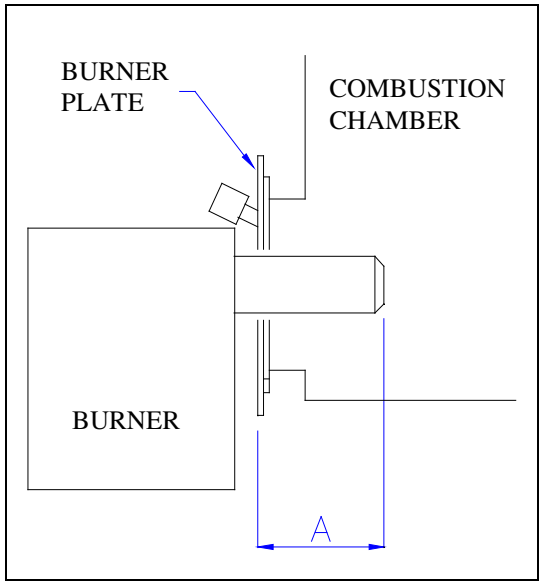
INSTALLATION OF THE BURNER

For all the following operations, the installer must read and follow carefully the instructions in the manual of the burner manufacturer and any other direction given by him.

1. Bore the burner plate (4) of the burner and tight well the burner on it. For this operation use bolts of the same specification and size indicated in the burner manual.
2. Make the electric connections from the burner to the electric control board of the heater, following our electric diagram given on page 17 according to the model.
3. Make the electric connection of the room thermostat and timer, if any, to the burner.
4. Carry out all necessary operations for installation, adjustment and control.

! CAUTION!

For exploit the maximum length of the combustion chamber and for avoid the flame touch its bottom, the combustion head of the burner must be inserted for a length "A" between a minimum and maximum as described in the present list.



Mod.	A min. (mm)	A max. (mm)
AS40	120	160
AS70	120	170

GAS PIPE

The gas pipe is to be planned and realized according to the laws, norms, rules and provisions in force. The diameters of the pipes are to be calculated, considering the power of the installed heater and its distance from the counter; they are to be dimensioned so that the total pressure loss between the counter and any heater doesn't exceed the value allowed by the norms in force.
Install near the heater a cock and a gas filter. As regards natural gas, be sure that the counter is able to deliver the required gas quantity. As regards propane, adopt a two-stage pressure reducing system: install a first-stage pressure device reducer near the tank, calibrated at 1,5 bar and a second reducer just before the pipe enters the room.

GAS INTERCEPTION DEVICE AND ALARM

The warm air heater is to be provided with an alarm and gas interception device, in case of gas leakage, according to what foreseen by the laws, norms and rules in force.

ELECTRIC CONNECTIONS (see electric diagram at page 17)

- Install an electric main switch, near the heater, having suitable voltage and power.
- From the above main-switch connect the electric cables to the terminal board of the heater.
- Make use of cables having section suitable for the absorptions required by the heater and the accessories.
- Make the electric connections from the "fire damper", if any, to the electric control board of the heater.

! **CAUTION! Don't connect the timer in series with the main supply line, but to the room thermostat one, because this will cause the cut-off of the whole appliance, when the timer intervenes. The heat will remain in the appliance with danger of thermal deformation of the exchanger.**

CONNECTION OF THE FLUE GAS EXHAUST TO THE CHIMNEY

For the correct working of the heater and environment protection, it must be connected to a suitable dimensioned chimney, built with special materials and installed according to the laws, norms, rules, European, national, regional and district-provisions in force

ASSEMBLING OF PLENUM FOR DIRECT AIR DELIVERY

Plenum, if any, is to be assembled as described at pages 7 and 8: put some silicone on the contact surfaces.
In the standard model, plenum is provided of grits on the three sides, with directional tabs both vertical and horizontal. When adjust these tabs, try to incline them as less as possible, in order not to reduce the air delivery and its capacity too.

TESTS BEFORE STARTING

- Control that the burner flame is regular, it does not touch the bottom of the combustion chamber.
- Control if the rotation direction of the fan is the one shown on the arrow, placed on the rotor (see fig. 8).
- Control through an amperometer the absorption of the motor and verify that it's under the values stated at page 12.
- Control the correct operation of the three thermostat FAN, LIMIT, LIMIT2, see page 16.
- Carry out a combustion test and obligatory trials, and keep record of them, according to the laws, norms, rules and provisions in force.

Electric board Fig. 6 Fig. 8
from "AS25" to "AS65"
and versions "AS H" "AS EX" "AS EX H"

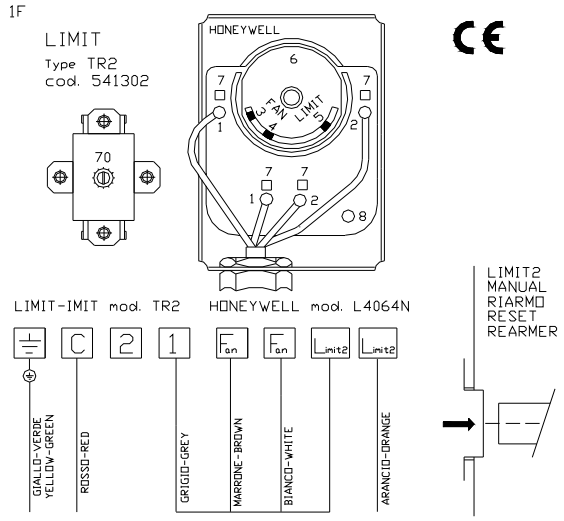
Three thermostat composed of a FAN-LIMIT2 brand HONEYWELL mod. L4064N and a LIMIT with automatic reset brand IMIT mod. TR2. For warm air heaters single phase

- **FAN (HONEYWELL)-** fan thermostat, normally open, to automatic start and stop the fan when the average air outlet temperature reaches a pre-set value. The set point is fixed by moving the second lever in a scale plate, placed inside the Fan-Limit casing. The setting value is at 30°C . Setting this value over, a delay on fan starting may be caused , so increasing fuel consumption and impairing the long life of the heater. On the cooling phase, the thermostat stops the fan at about 8°C, lower his starting point. Fan thermostat has a white button that must be always kept pulled-on, otherwise the ventilator keeps running.
- **LIMIT2 (HONEYWELL)-** Security limit thermostat for the burner, normally closed with manual reset, to automatic stop the burner in case the average air outlet temperature overheat above the pre-set value. The set point at 100°C, is fixed by the manufacturer with the third set point lever right side in the scale plate inside the Fan-Limit. **This set point must not be changed**. The LIMIT2, when intervening , stops the burner, while the fan keeps turning to cool the heat exchanger. To reset the burner, first wait the air outlet temperature drops down; than remove, the plastic cap of the reset button, placed on the casing cover, then push this reset red button .
- **LIMIT (TR2) -** Temperature limit thermostat for the burner, normally closed , to automatic stop the burner when the average air outlet temperature exceeds the pre-set value. The set point, fixed by the manufacturer inside the casing, is at 70°C; and can be increased maximum at 80°C. The burner reset is automatic, when air outlet temperature drops of about 8°C, below his set point.

NOTICE! when LIMIT2 intervene, be sure the cause is not:

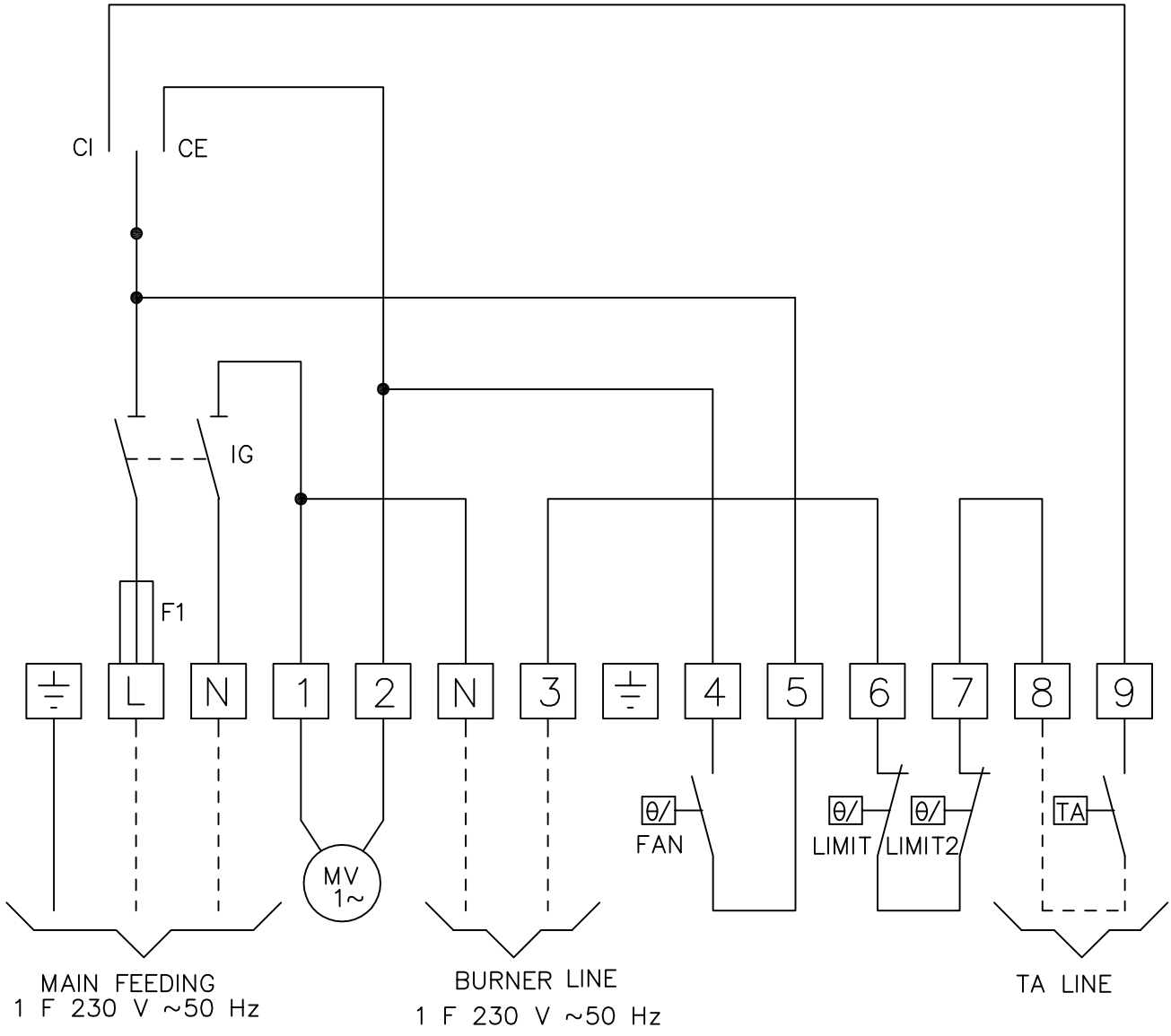
- a lower air delivery due to obstructions on the inlet or outlet air system, air filters, if any dirty...
- a stop of the heater from the main switch or a black-out
- a fire dumper intervention
- a sensor bulbs bending down towards the heat exchanger, that anticipate the LIMIT2 intervention.

ATTENTION! During the first ignition check the position of the sensor bulbs are not bending down towards the heat exchanger and doesn't touch the heat exchanger itself, as this would affect the sensitivity of the thermostats and anticipate the LIMIT2 intervention.



For Honeywell

1) Fan connection
2) Security LIMIT2 connection
3) FAN off pointer
4) FAN on pointer
5) LIMIT2 pointer to stop burner
6) Hold dial when setting pointer
7) Female receptacle: push screw driver to insert wire
8) Red boutton for reset the security LIMIT2



----- Installer connections

IG = Main switch
CE = VENTILATION – Position of the commutator
CI = HEATING – Position of the commutator
FAN = Automatic control thermostat of the ventilator
LIMIT = General thermostat of the burner with automatic resetting
LIMIT2 = Main security thermostat of the burner with manual resetting
MV = Fan motor
TA = Room thermostat
F1 = Fuse of line (8 A for AS 40, 16 A for AS 70)

HONEYWELL – IMIT TR2 – HONEYWELL

ACCORRONI srl	DESCRIZIONE: Connection electric diagram of the warm air heater Mod. AS 40 and Mod. AS 70 Voltage 1F 230V ~50Hz

DATA	SCALA	FIRMA	SOSTITUISCE N°	DISEGNO N°
20–07–2001				SE10101

MAINTENANCE

The maintenance of the warm air heater is to be carried out by service center authorized by the manufacturer or by skilled people, according to the laws. The burner maintenance is to be carried out by service centre authorized by the burner manufacturer. For a correct and safe working of the heater and for its long life, the following operations are to be carried out:

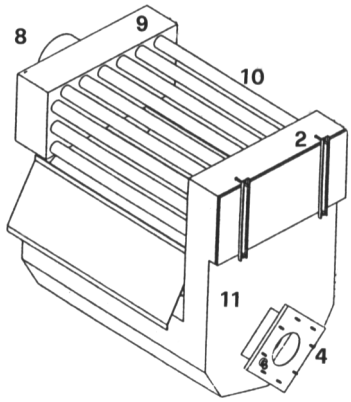
CAUTION: Before beginning any maintenance operation, cut off the heater electric feed and the fuel feed.

CLEANING OF THE HEAT EXCHANGER

The heat exchanger is to be kept clean by soot and incrustations, not to decrease the capacity of the heat exchange. The cleaning is to be carried out at the end of every heating season or more often, if the exchanger gets dirty or if the local rules foresee shorter terms. If the burner has difficulties to start, the cause of it may be also the soot forming in the exchanger and that obstructs the exhausting gas passage. This may depend on: draught defect, fuel of bad quality, burner with low air delivery, different phases of ignition and switching off within short time. To clean the exchanger operate as follows:

FLUE PIPES (10)

Remove the frontal panel and the cover of the flue box (2). Remove turbolators from the pipes and clean them inside. Collect the soot on the front side, so avoiding its fall in the combustion chamber, before putting the cover of the flue box again, control if the gasket in fibre glass is integral, otherwise replace it with another one of the same measure and feature. Remove the pipe on the pipe fitting to chimney (8) and clean the back flue box (9).



COMBUSTION CHAMBER (11)

Take away the burner from its anchor plate (4).
Clean the external walls from soot and incrustations.
Control that the combustion chamber hasn't born damages.
Control that the gasket of the burner supporting plate and the 4 gaskets on the combustion chamber door are in good conditions, otherwise replace them with gaskets of the same material.
Remark: all gaskets are free of asbestos and according to the EEC-norms.
The humidity in the soot means that the exhaust gas condense and corrode the heat exchanger; so avoid this defect. The exhaust gas temperature is required to be always higher than the one of the condensate point.

FILTER CLEANING ON THE AIR INLET

The filter is an optional accessory.
A dirty filter reduces the air passage, so increases the outlet temperature and decreases the thermal exchange and the heater yield. So it's very important to clean the filter at least once a day. For the cleaning operate as follows:

- Remove the filter from the filters box.
- Shake it and leave the thicker dust falling.
- Blow the filter with counter current compressed air.
- Periodically, for a more accurate cleaning, wash the filter in lukewarm water with detergent; dry and put the filter in its seat again.

CAUTION! After washing it three times, the filter is to be replaced with a new one having the same features.

MAINTENANCE

VENTILATING UNIT

- Control periodically, at least once every beginning of each season, the rotation direction of the ventilating unit as shown by the arrow on the fan, see fig. 8.
- Control the Ampere absorption of the motor/s: the absorption must not exceed the value specified at page 12.

BURNER

As regards burner maintenance, follow what specified on the manual of the burner manufacturer.

1. Moreover verify the seal of the flue pipe
2. Verify the seal and the good condition of the chimney and the flue pipe.

COMBUSTION ANALYSIS

At least once every heating season, if the rules don't show shorter terms, carry out a combustion analysis; record the analysis result according to local rules.
REMARK: according to local rules remarked all replaced components too.

SUMMARY TABLE OF THE MINIMUM MAINTENANCE INTERVALS

MIN. INTERVAL	PERIODICAL MAINTENANCE
At least once a day	- Cleaning of air filters, if any
At least once at the beginning of a heating season.	- Cleaning and general control of the heat exchanger. - Cleaning and general control of the ventilating unit. - Practical operation control of the electric parts and of the securities. - Combustion analysis, if the rules don't foresee shorter terms.

FAULTS RESEARCH

Make reference of th efollowing table to detect the faults which may arise. If the problem can't be solved through the remedies proposed there of, try to understand which part of the heater is not running or doesn't work well and contact skilled people or the service center authorized by the manufacturer. When in the paragraph - REMEDIES - you find the word - CALL -, it means that: You must contact skilled people or the service center meanwhile switch off completely the warm air heater.

PROBLEM:	CAUSE:	REMEDY:
1. The main switch is on -I- and the commutator on -VENTILATION- position but the voltage light isn't switched on and the ventilating unit doesn't turn.	1. The electric board isn't under tension. 2. The fuse on the control circuit is burnt.	1. Control if the main switch before the electric board is on. 2. Change the fuse with a new one with the same features.
2. Main switch on -I-, voltage light ON, commutator on -HEATING- position, room thermostat ON: the burner doesn't run.	1. The room thermostat or the timer aren't well connected. 2. The burner is defective. 3. The main thermostat LIMIT has intervened. 4. Security LIMIT2 has intervened.	1. Call someone to repair or replace the component. 2. Call someone to control the burner. 3. Wait till the air decreases at about 65°C. 4. Operate as page 15 to reset the burner.
3. As point 2, but the burner after the prepurge phase is blockes and the flame doesn't follow.	1. The burner is defective or perhaps there is no more fuel.	1. Call the supplier or the service center of the burner manufacturer.
4. The burner works, but the ventilating unit delays to start and after starting, it switches on and off continuously.	1. The FAN is high calibrated. 2. The FAN is defective. 3. The outlet air temperature is under 0°C. 4. There is little gas/gas oil delivery.	1. Calibrate it at 35°C. 2. Call someone to replace it. 3. Try to increase this temperature. 4. Call the service center authorized for the burner.
5. The burner works but the ventilator also after the heating phase, doesn't start.	1. The electric motor/s is burn't, or there is a fault or defective.	1. Call someone to control all ventilating unit.
6. The burner, while working, stops before the room thermostat or timer intervention.	1. LIMIT has intervenued. 2. Security LIMIT2 has intervenued.	1. Remedy point 2. 2. Remedy point 2.

CONTENTS