

# **GAS-FIRED CONVECTION HEATERS WITH FAN**

## **W - WR - WD SERIES**

### **Models 8 - 10**

## ***Technical information***

This manual is divided into three sections:

### **- SECTION 1 - GENERAL INFORMATION**

This contains a description of the heaters and their technical features

### **- SECTION 2 - TECHNICAL INFORMATION FOR THE INSTALLER**

This contains all the instructions that the technical installer must comply with to ensure effective plant operation

### **- SECTION 3 - USER OPERATING AND MAINTENANCE INSTRUCTIONS**

This section contains all the information needed to use the appliance correctly and to perform periodic tests

### **Important notes:**

- 1 - To use the appliance correctly and safely, the installer, the user and the service man, must comply with what is indicated in this manual.
- 2 - The word **WARNING!** is followed by information which, because of its importance, must be carefully observed and for which non-compliance may damage the appliance and/or reduce operating safety.
- 3 - The paragraphs written with **bold** characters contain important information, warnings or recommendations which should be carefully considered.
- 4 - The technical data, styling characteristics, components and accessories detailed in this manual are not binding. Accorroni S.r.l. reserves the right to make changes, at any time, that are considered necessary to improve the product.
- 5 - The legal references, standards and technical rules mentioned in this manual are presented merely for the sake of information and should be considered valid as of the date this manual is printed, as indicated on the last page. If new regulations or amendments to current laws go into effect, this will not obligate Accorroni S.r.l. in any way with regard to others.
- 6 - Accorroni S.r.l. is responsible for ensuring that its product conforms to the laws, directives and construction standards in force at the time the product is sold. Knowledge and compliance with legal regulations and standards regarding plant design, installation, operation and maintenance are the exclusive responsibility of the designer, installer and user.

## **SUMMARY**

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# SECTION 1 - GENERAL INFORMATION

## 1. PRINCIPAL CHARACTERISTICS

### 1.1 APPLIANCE CLASSIFICATION

The W, WR, and WD air heaters are defined as "Independent gas-fired convection heaters equipped with a fan in the combustion circuit".

In addition, they are classified according to harmonised European standards EN 437 and prEN 1266 into:

**category** - according to the types of gas, at the different supply pressures, that they can use;

**type** - according to the possible methods to exhaust the combustion productions (see also 4.2.1).

#### 1) Category II<sub>2H3+</sub>

the heater is equipped to use gas that belongs to two families. The atmospheric burner can be fed with gas from the second group (natural gas - group H) and gas from the third group (butane and propane at the two pressure ratings 28-30 and 37 mbar)

#### 2) Type C<sub>12</sub>

The combustion circuit is sealed with respect to the environment in which it is installed and the combustion air supply and combustion product exhaust lines are connected outside the room by means of flues which pass directly through the outside wall of the room.

#### 3) Type C<sub>52</sub>

The combustion circuit is hermetically sealed with respect to the environment in which it is installed and the combustion air supply and combustion product exhaust lines are connected outside the room by means of separate ducts with terminals which need not necessarily be adjacent to each other.

### 1.2 CERTIFICATION - EC MARKING

The W, WR, and WD air heaters, as previously described and classified, have obtained the "CE type test certificate" in conformity with EEC Directive 90/396 and with reference to the harmonised European standard prEN 1266. Attaching the CE marking shown below also guarantees that the appliance conforms with EEC directive 73/23 ("Low voltage") through the harmonised standard EN 60335-1 and EEC directive 89/336 ("Electromagnetic compatibility") through the standards EN 50081-1 and 50082-1.



It is important to point out that, to protect the end user, attaching the CE marking means that the manufacturer must submit a declaration of conformity for the entire line of products with the certified characteristics and performance ratings. This is possible through the use, by the manufacturer, of a Quality Assurance system. The efficiency of that system is controlled by the Organisation which issued the certification.

### 1.3 FUNCTIONAL DESCRIPTION

The system is made up of independent units that are easily installed. There are three versions of these units:

- **For wall installation (W version)**, in spaces under windows, or in all situations where free space is available or where this solution would present technical or functional advantages.
- **For ceiling installation (WR version)**, in rooms, where there is not enough free space on the walls.
- **For ceiling installation, with duct connection (WD version)**, with installation of ducts for distributing the treated air. This makes it possible for a single unit to serve several rooms, with the possibility of changing the air with fresh air.

The W, WR, and WD air heaters consist basically of a heat exchanger unit which exchanges heat between the combustion products of a gas burner and the air flow delivered by a fan.

The air heater is also equipped with an electronic control panel (operated by remote control for installation on the ceiling, installed on the unit if the unit is mounted on the wall) which indicates the unit's main functions and includes a thermostat.

The technology used to build the burner also ensures very low emission of polluting NO<sub>x</sub> (nitrogen oxides) for this category of appliance.



The fan takes in the room air which is then heated as it passes through the heat exchanger. The warm air is discharged directly into the environment through the grille located at the top or front of the appliance.

Fan operation is controlled by a thermostat: to prevent cold air from entering the environment. The fan begins operating shortly after the burner has ignited. The fan runs for a short time after the burner is extinguished, to allow the exchanger to cool off gradually.

If the air filter becomes blocked or if the fan does not turn on or function correctly, and as a consequence the exchanger overheats, a safety device will be triggered that will cut off the gas flow to the burner. This shutdown condition will also be indicated on the control panel.

The combustion products are exhausted outdoors by a centrifugal fan whose correct functioning is controlled by a differential pressure switch. The fan is located after the sealed combustion circuit. The combustion circuit's pressure is always lower than the room's air pressure, thus providing an additional safety feature.

Air heater operation is controlled by the electronic room thermostat on the remote-control panel and by an optional programmable timer that is installed separately.

#### 1.4 CONSTRUCTION CHARACTERISTICS

The casing is built with epoxy-powder painted metal plate which guarantees its durability. In the WD versions with ducts the casing is built with galvanized metal plate and has removable inspection panels.

The air delivery side (in the W and WR versions) has a grille with painted aluminum blades which can be individually oriented to permit you to direct the air flow where you want in the room.

The blades are attached to supports made of heat-resistant plastic. They rotate by means of an exclusive friction system on silicone guides.

There is a small door to the side of the grille which, in the W version for installation on the wall, protects the access to the control panel. This is especially useful when the unit is installed in public places, because it prevents the controls from being set to undesired positions, for example, by children (the small door is not used in the ceiling version since the remote-control panel is installed on the wall).

In the WD versions with ducts the grille and the adjustable blades have been replaced by an air

outlet that is designed to have ducts attached to it. Also the air intake side has been designed to have ducts attached to it.

The air intake side (in the W and WR versions) houses a filter made of regenerable synthetic material in a metal frame which can be removed for cleaning.

The following are installed inside the unit:

- **The heat exchanger unit with gas burner.**

This module, which was developed using patented technical solutions, is made of stainless steel. It is basically made up of a pair of finned tubes which exchange heat very efficiently and a combustion chamber which houses an atmospheric burner which generates an axial flame. The combustion products are exhausted outdoors by a centrifugal fan.

- **The ventilation unit**, which is made up of two centrifugal fans with double intake. They have a high air capacity and a low noise level. They are activated by an electric motor whose rotation speed is controlled from the control panel. The unit is mounted on a galvanized steel support.

- **The set of control devices**, which includes:

- Burner control unit with electronic ionization flame detection.
- Gas solenoid valve with a double closing device and a pressure regulator.
- Differential pressure switch for controlling that the combustion products are exhausted properly.
- Fan control thermostat.
- Safety thermostat.

- **The control panel (operated by remote control in the WR and WD versions).** It is able to control the room temperature by means of a built-in probe and to indicate the functioning status or any problems with the unit. It also allows you to select one of its two ventilation speeds.

#### 1.5 PACKAGE CONTENTS

The unit is shipped in two separate packages:

- a) **The unit:** The air heater is shipped with cardboard packing and polystyrene foam protection corners and sheets. For the W version, for installation on the wall, the electronic control panel is already installed on the unit. Instead, for the WR and WD versions for installation on the ceiling, the control panel is already connected to the unit with four meters of cable; the accessories for



attaching the control panel to the wall are included. This package also contains the following:

- The warranty documents and this technical information manual for the installation and maintenance of the unit.
- A gas conversion kit and an adhesive label.
- The paper template to be used for the installation.

**b) The standard accessories:** this box contains the following material:

#### **WR and WD versions for ceiling installation**

- The ducts and terminals for the exhaust of the combustion products and the intake of the combustion air supply.
- Two clamps with a silicone gasket for holding the ducts.
- Two aluminum tubes, with a diameter of 70 mm and a length of 40 cm, to be used as a sheath when going through the outside wall.

#### **W Version for wall installation**

- The flues and terminals for the exhaust of the combustion products and the intake of the combustion air supply. They are equipped with a flange for mounting them on the rear of the unit.
- A ceramic fiber gasket for the intake duct's mounting flange.
- Screws for installing the ducts and their flanges.

### **1.6 ACCESSORIES SUPPLIED ON REQUEST**

In addition to the material described above, the following accessories can also be supplied on request:

#### **- For all versions**

- Straight flues that are 0.5 and 1 meter long and a 90° elbow, all of which have a diameter of 60 mm. They come complete with connecting clamps. They are used to construct air intake ducts and exhaust flues up to the maximum length of 3 + 3 meters.

#### **- For the WR and WD versions for ceiling installation**

- Air lock with inside/outside air intake plenum system, available in a manual or motorized version.
- Intake grille for the above air lock, with the possibility of installing an air filter.

#### **- For the WR version for ceiling installation**

- Rear base for covering the connections.

#### **- For the WD version with ducts for ceiling installation**

- Air delivery plenum system designed to use insulated flexible pipes with a diameter of 200 mm.
- Insulated flexible pipes with a diameter of 200 mm for distributing heated air. They come in a package that contains 6 meters of flexible pipes.
- Clamps for tightly connecting the insulated flexible pipes.
- 135° Y-branch for use with the insulated flexible pipes.
- Heated air delivery outlets with adjustable fins, air lock and plenum system with a connector that has a diameter of 200 mm.
- Circular diffuser that has a diameter of 200 mm, to be installed on the ceiling, with calibration air lock.
- Grille for passage under doors, 400 x 150 mm.

### **1.7 APPLICATION**

The W, WR, and WD gas-fired air heaters are units that were developed for creating small or medium autonomous systems for winter heating in residential or commercial buildings, restaurants, bars, etc.

These systems are especially suitable for use in the field of building renovation, because the remodeling of building units as residences, offices, stores, or workshops is complicated by a series of technical and structural problems that make it difficult to install a traditional heating system.

These systems represent a new alternative to the traditional gas-fired heating systems. They combine high heating efficiency with low operating costs. This is especially true in rooms that are occupied only during set hours where the gas-fired air heaters' feature of having a very low thermal inertia permits their operating time to be considerably reduced, resulting in considerable energy savings.

It is possible to create modular systems (i.e., systems made up of one or more units) with the W, WR, and WD gas-fired air heaters to satisfy the heating needs of buildings such as apartments, stores, offices, restaurants, and workshops.

Therefore it is necessary to evaluate the heat dispersion of the room or rooms, the extent of solar radiance, and any free supply of heat, and thus the required thermal power. Then it will be necessary to choose the amount and type of units based on values such as the air capacity and the available pressure.



**WARNING! It is important to verify that the installation is in compliance with current regulations and that it is approved, wherever necessary, by the competent inspection authorities.**

### 1.8 THE USE OF DUCTS WITH THE WD VERSION

The technical, functional, and aesthetic characteristics of the W and WR air heaters have been researched to achieve their optimal use inside the rooms where heating is required.

The experience we have acquired in these types of applications has resulted in further possible solutions for the WD version, which was specifically developed for installation on the ceiling with ducts.

This version has a galvanized steel casing and was designed to be connected to intake and

delivery ducts. Since the WD air heaters were designed exclusively for installation on the ceiling, they come complete with a remote-control panel.

This makes it possible to use a single unit to serve several rooms or to install the air heater in a separate room.

Typical examples of these situations could be:

- Efficiency apartments.
- Tourist accommodations, bungalows, etc.
- Doctors' offices, offices.
- Bars, stores, etc., with the system installed in a service room.

Using ducts to distribute the air provides a solution that satisfies most current installation requirements, with the distribution of the treated air at a low noise level. However, it is advisable to contact a qualified heating technician to evaluate specific installation problems.

1.9 TECHNICAL DATA TABLE		Unit	W-WR 8	WD 8	W-WR 10	WD 10
Rated thermal capacity		kW	8,90		10,50	
		kcal/h	7.650		9.030	
Rated thermal power		kW	8,05		9,50	
		kcal/h	6.900		8.150	
Gas flow rate (15 °C - 1.013 mbar)	G20 Methane	m³/h	0,94		1,11	
	G30 Butane	kg/h	0,70		0,83	
	G31 Propane	kg/h	0,69		0,81	
Gas pressure at the burner (15 °C-1.013 mbars)	G20 p 20 mbars	mbar	14,5		12,0	
	G30 p 28-30 mbars	mbar	27,0 - 29,0		27,0 - 29,0	
	G31 p 37 mbars	mbar	36,0		36,0	
Diameter of the gas injector	G20	mm/100	240		280	
	G30 / G31	mm/100	150		170	
Ventilation air capacity	Minimum speed	m³/h	720	670	850	730
	Maximum speed	m³/h	850	730	1.040	850
Noise level at 3 meters	Minimum speed	dBA	42	40	43	42
	Maximum speed	dBA	43	42	45,5	43
Effective pressure	Maximum speed	Pa	/	40	/	40
Gas supply diameter		in.	1/2			
Flue gas discharge / air supply diam.		mm	60			
Electric power supply			230 V ~ / 1 / 50 Hz			
Fuse (rapid type)		A	2			
Power absorbed		W	170	180	180	190
Net weight		kg	56	54	58	56



## 1.10 DIMENSIONS - WR and WD versions for ceiling installation

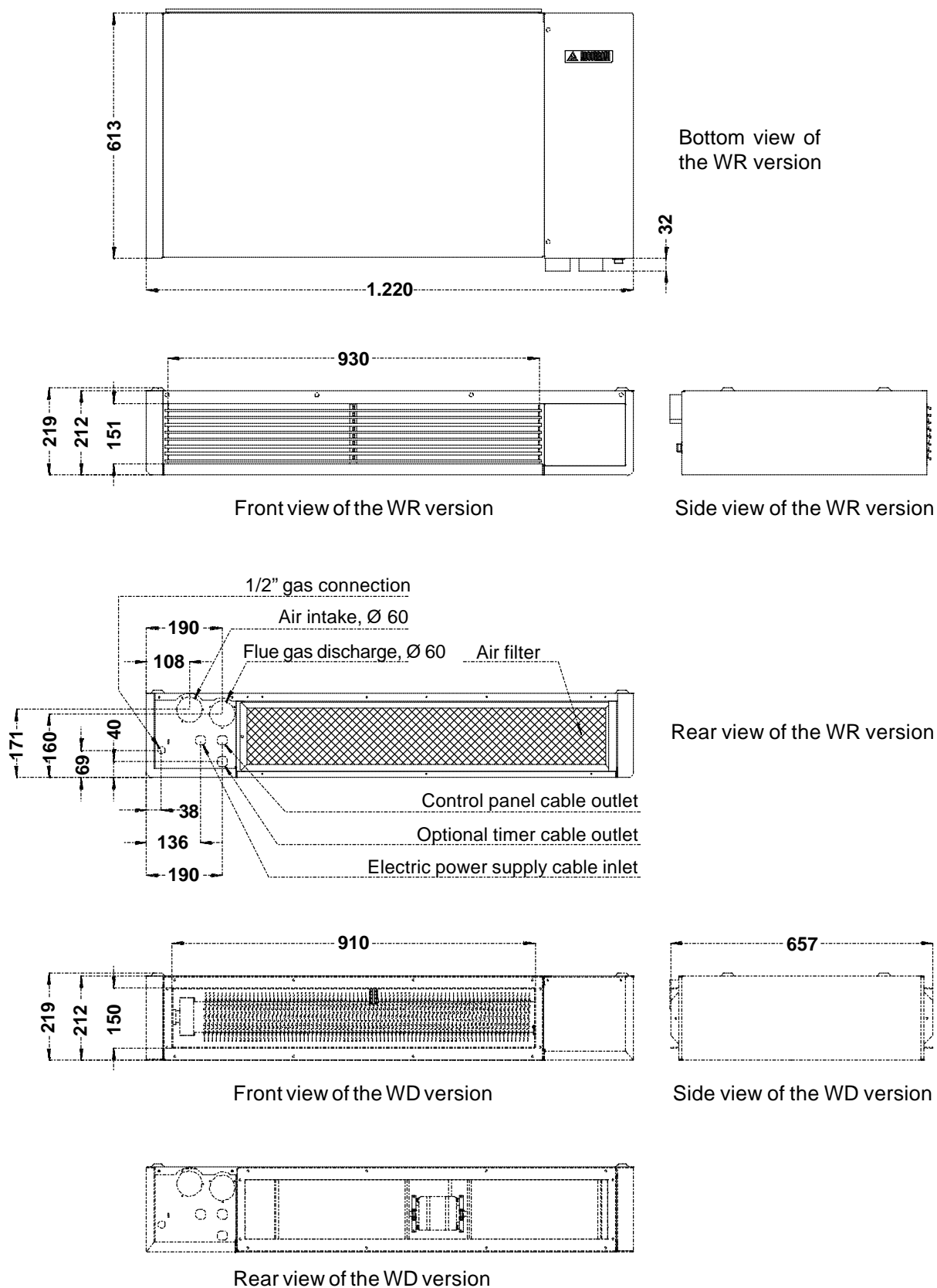


Fig. 1



## 1.10 DIMENSIONS - W version for wall installation

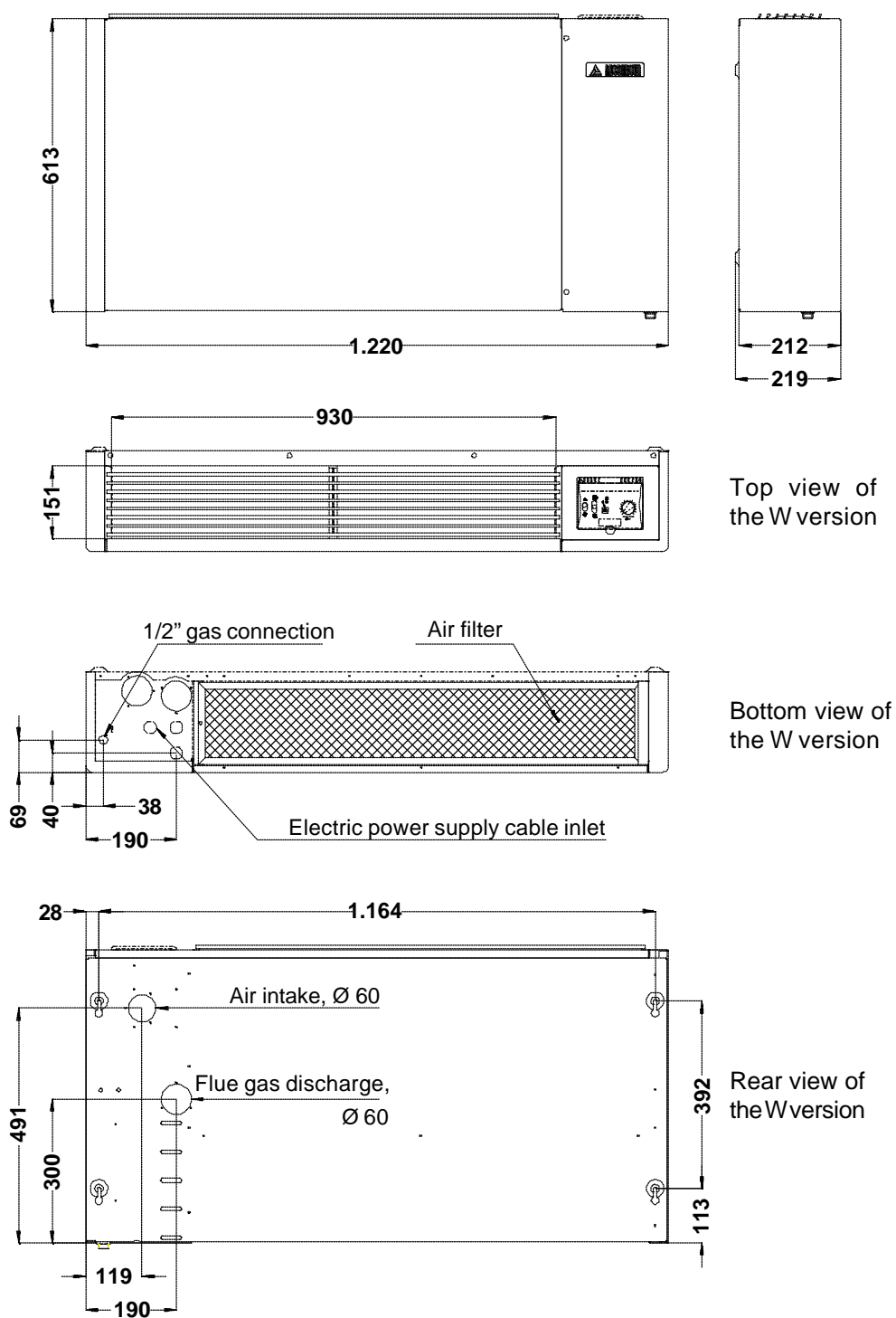


Fig. 2



# 1.11 EXPLODED VIEW - WR version for ceiling installation

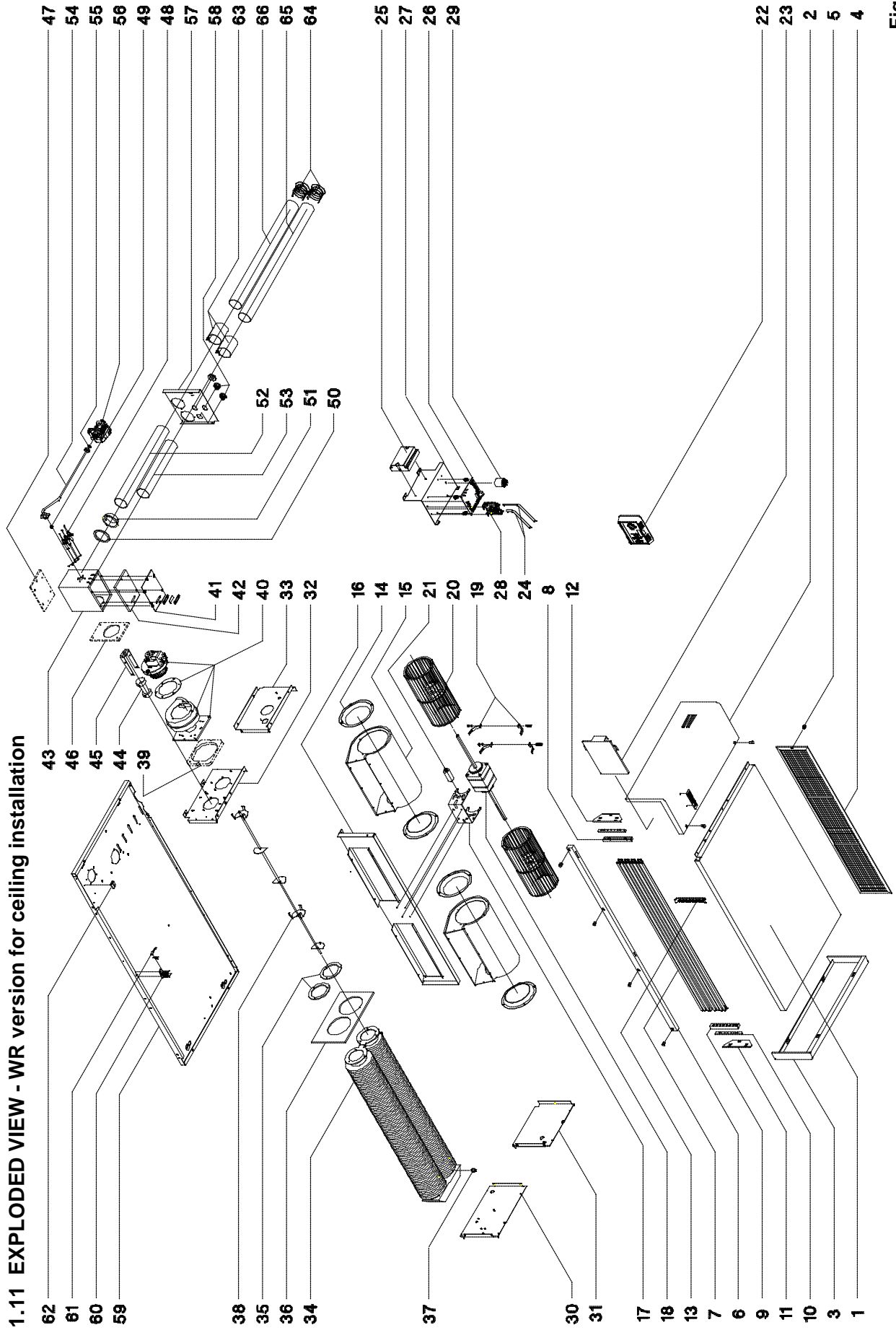


Fig. 3



## LEGEND OF THE COMPONENTS

### WR version for ceiling installation

1	Bottom panel	34	Heat exchanger
2	Angular panel	35	Exchanger gaskets
3	Left panel	36	Exchanger insulating gasket
4	Air filter	37	Fan thermostat
5	Filter attachment knob	38	Turbulator
6	Casing crossbar	39	Flue gas expeller gasket
7	Adjustable grille blades	40	Flue gas expeller
8	Right support for blades	41	Combustion chamber door
9	Left support for blades	42	Door gasket
10	Rubber gasket for blades	43	Combustion chamber
11	Grille left support	44	Burner
12	Grille right support	45	Burner bracket
13	Middle support for blades	46	Exchanger/combustion chamber gasket
14	Fan injector	47	Back plate/combustion chamber gasket
15	Fan scroll	48	Electrodes
16	Fan support	49	Gas injector
17	Fan motor cradle	50	Intake gasket
18	Fan motor	51	Inner intake connector
19	Fan motor attachment U-bolt	52	Inner intake duct
20	Centrifugal fan	53	Inner exhaust flue
21	Fan motor capacitor	54	Gas supply pipe
22	Remote-control panel	55	Gas pipe gasket
23	Door to the controls (not used)	56	Gas solenoid valve
24	Pressure switch tubes	57	Attachment plate
25	Burner control device	58	Bushings
26	Printed electric circuit	59	Back plate
27	Electrical board support	60	Safety thermostat protection
28	Pressure switch	61	Safety thermostat
29	RFI filter	62	Safety thermostat electric terminal board
30	Exchanger left support	63	Clamps for holding the ducts
31	Fan left support	64	Terminals
32	Exchanger right support	65	Exhaust flue
33	Fan right support	66	Intake duct



# 1.11 EXPLODED VIEW - WD version with ducts for ceiling installation

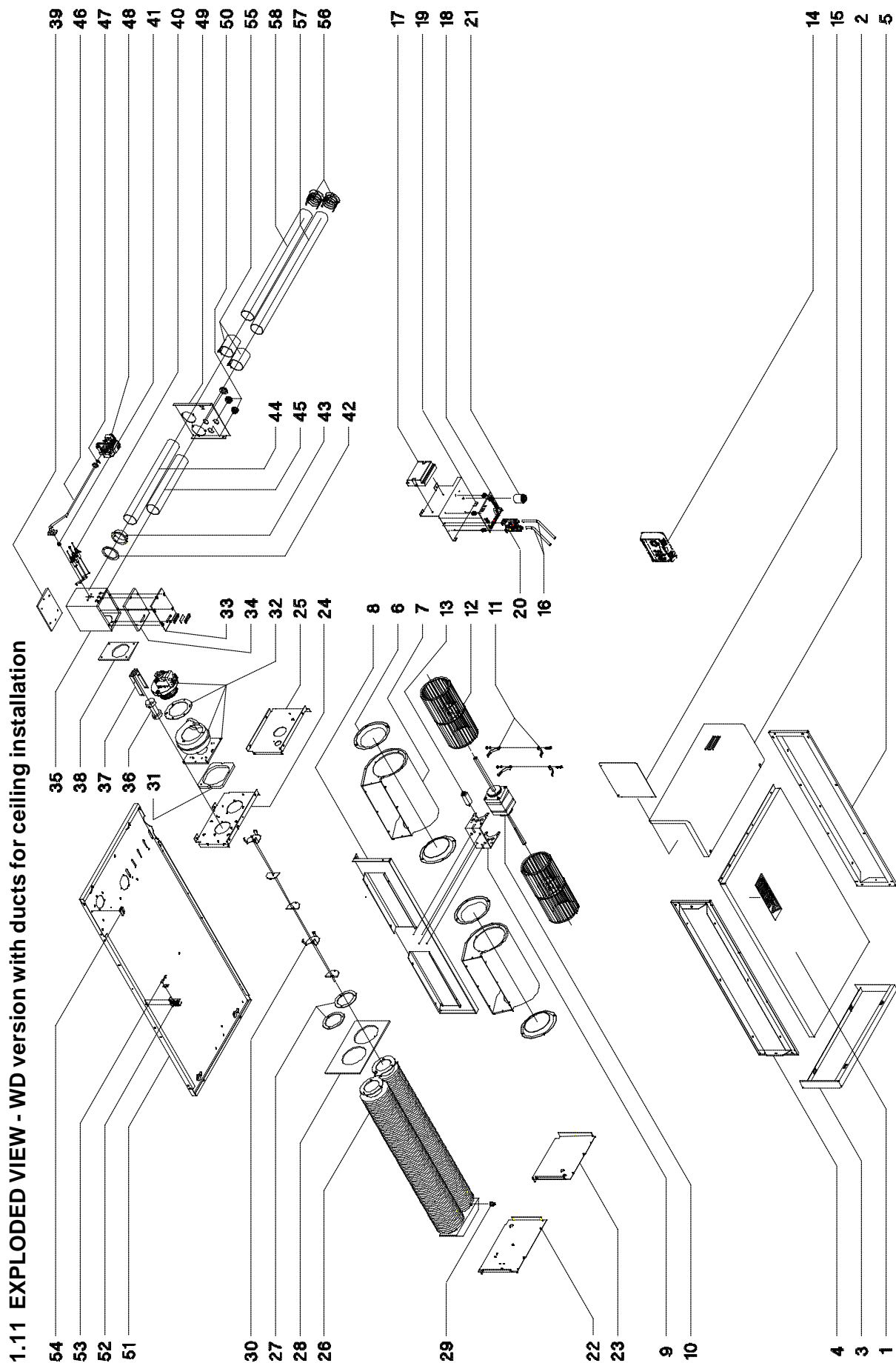


Fig. 4



## LEGEND OF THE COMPONENTS

### WD version with ducts for ceiling installation

1 Bottom panel	30 Turbulator
2 Angular panel	31 Flue gas expeller gasket
3 Left panel	32 Flue gas expeller
4 Air delivery frame	33 Combustion chamber door
5 Air intake frame	34 Door gasket
6 Fan injector	35 Combustion chamber
7 Fan scroll	36 Burner
8 Fan support	37 Burner bracket
9 Fan motor cradle	38 Exchanger/combustion chamber gasket
10 Fan motor	39 Back plate/combustion chamber gasket
11 Fan motor attachment U-bolt	40 Electrodes
12 Centrifugal fan	41 Gas injector
13 Fan motor capacitor	42 Intake gasket
14 Remote-control panel	43 Inner intake connector
15 Door to the controls (not used)	44 Inner intake duct
16 Pressure switch tubes	45 Inner exhaust flue
17 Burner control device	46 Gas supply pipe
18 Printed electric circuit	47 Gas pipe gasket
19 Electrical board support	48 Gas solenoid valve
20 Pressure switch	49 Attachment plate
21 RFI filter	50 Bushings
22 Exchanger left support	51 Back plate
23 Fan left support	52 Safety thermostat protection
24 Exchanger right support	53 Safety thermostat
25 Fan right support	54 Safety thermostat electric terminal board
26 Heat exchanger	55 Clamps for holding the ducts
27 Exchanger gaskets	56 Terminals
28 Exchanger insulating gasket	57 Exhaust flue
29 Fan thermostat	58 Intake duct



# 1.11 EXPLODED VIEW - W version for wall installation

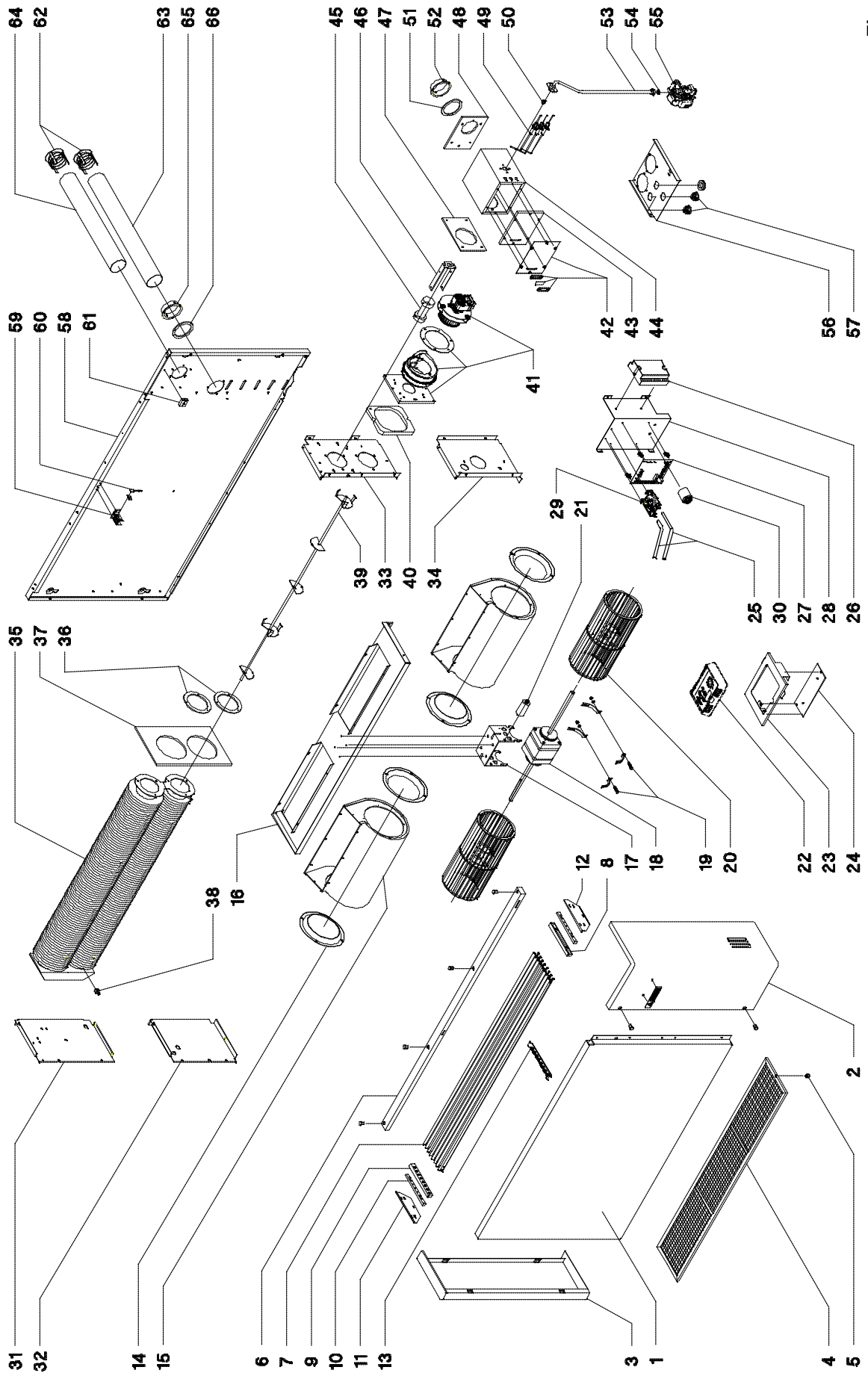


Fig. 5



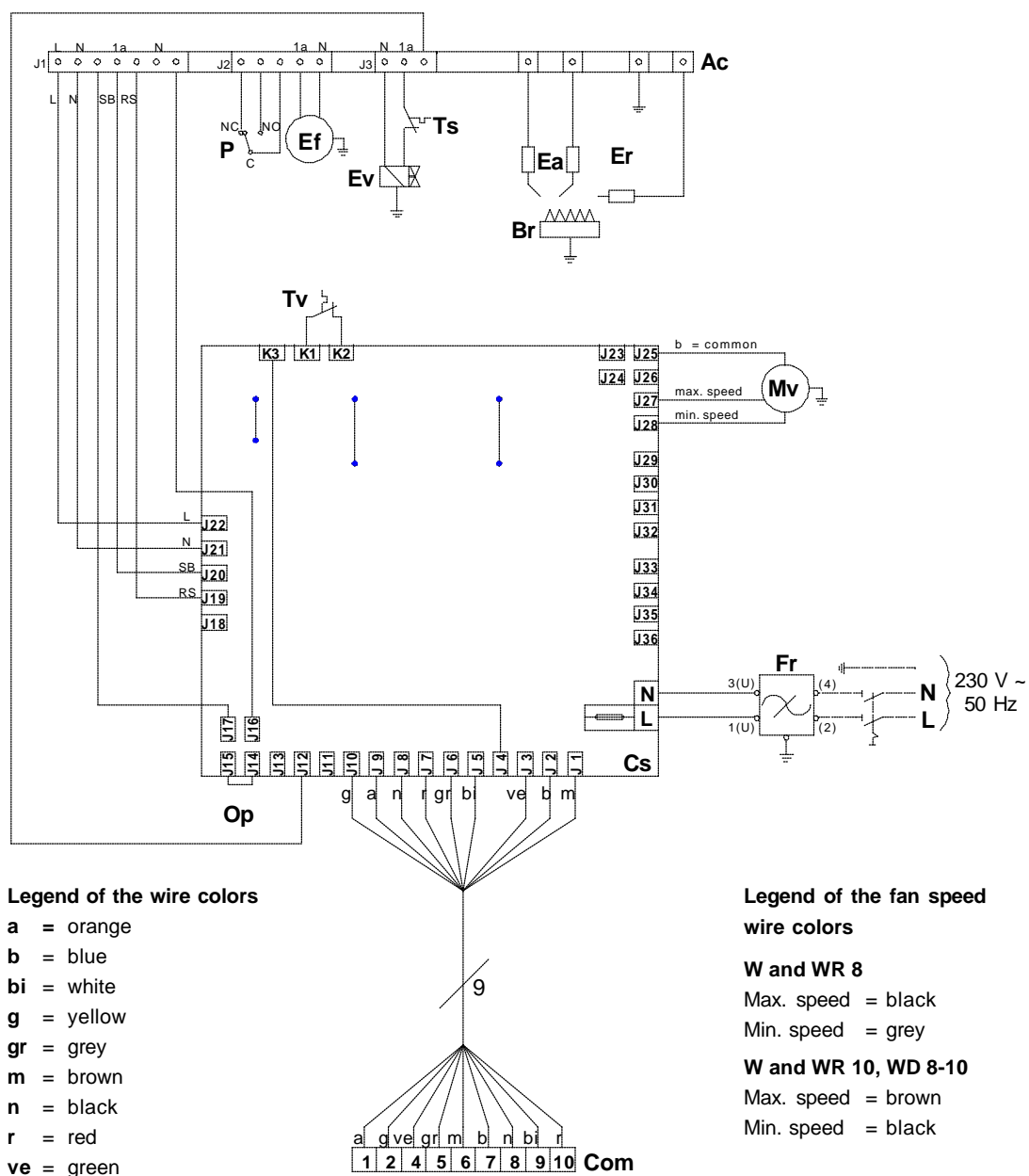
## LEGEND OF THE COMPONENTS

### W version for wall installation


- |                                    |  |
|------------------------------------|--|
| 1 Front panel                      | 34 Fan right support                         |
| 2 Angular panel                    | 35 Heat exchanger                            |
| 3 Left panel                       | 36 Exchanger gaskets                         |
| 4 Air filter                       | 37 Exchanger insulating gasket               |
| 5 Filter attachment knob           | 38 Fan thermostat                            |
| 6 Casing crossbar                  | 39 Agitator                                  |
| 7 Adjustable grille blades         | 40 Flue gas expeller gasket                  |
| 8 Right support for blades         | 41 Flue gas expeller                         |
| 9 Left support for blades          | 42 Combustion chamber door                   |
| 10 Rubber gasket for blades        | 43 Door gasket                               |
| 11 Grille left support             | 44 Combustion chamber                        |
| 12 Grille right support            | 45 Burner                                    |
| 13 Middle support for blades       | 46 Burner bracket                            |
| 14 Fan injector                    | 47 Exchanger/combustion chamber gasket       |
| 15 Fan scroll                      | 48 Back plate/combustion chamber gasket      |
| 16 Fan support                     | 49 Electrodes                                |
| 17 Fan motor cradle                | 50 Gas injector                              |
| 18 Fan motor                       | 51 Intake gasket                             |
| 19 Fan motor attachment U-bolt     | 52 Intake connector                          |
| 20 Centrifugal fan                 | 53 Gas supply pipe                           |
| 21 Fan motor capacitor             | 54 Gas pipe gasket                           |
| 22 Control panel                   | 55 Gas solenoid valve                        |
| 23 Control panel support           | 56 Attachment plate                          |
| 24 Control panel fastening bracket | 57 Bushings                                  |
| 25 Pressure switch tubes           | 58 Back plate                                |
| 26 Burner control device           | 59 Safety thermostat protection              |
| 27 Printed electric circuit        | 60 Safety thermostat                         |
| 28 Electrical board support        | 61 Safety thermostat electric terminal board |
| 29 Pressure switch                 | 62 Terminals                                 |
| 30 RFI filter                      | 63 Exhaust flue                              |
| 31 Exchanger left support          | 64 Intake duct                               |
| 32 Fan left support                | 65 Exhaust connector                         |
| 33 Exchanger right support         | 66 Exhaust gasket                            |



## 1.12 WIRING DIAGRAM



**Ac** = Control equipment  
**Br** = Burner  
**Com** = Remote-control panel terminal board  
**Cs** = Printed circuit  
**Ea** = Ignition electrodes  
**Ef** = Flue gas expeller motor  
**Er** = Flame detection electrode  
**Ev** = Gas solenoid valve  
**Fr** = Noise filter  
**Mv** = Fan motor  
**Op** = Jumper for auxiliary connections

**P** = Differential pressure switch  
**Ts** = Safety thermostat  
**Tv** = Fan thermostat  
 = Fuse

### Important:

- Install a disconnection device upline with contact opening of at least 3 mm.
- Respect the phase-neutral polarity when connecting the 230 V, ~ 50 Hz, single-phase power supply.

**Fig. 6**



## **2. CONTROL AND SAFETY DEVICES**

### **2.1 GAS CONTROLLER**

This device is housed in a heat-resistant and shockproof plastic enclosure and is mounted on the air heater electric board (*fig. 7*). The control device operates on the ionisation flame detection principle, using a special probe on the burner.

**The detection circuit must be fed with single-phase 230 V ~ 50 Hz mains voltage. The circuit is sensitive to the phase-neutral polarity. If this is reversed, the device will lock out within the safety time, even if the flame has a regular shape.**

### **2.2 GAS VALVE**

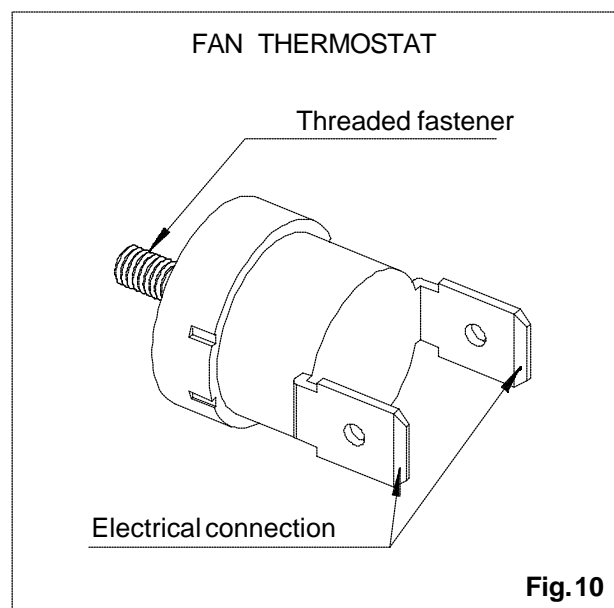
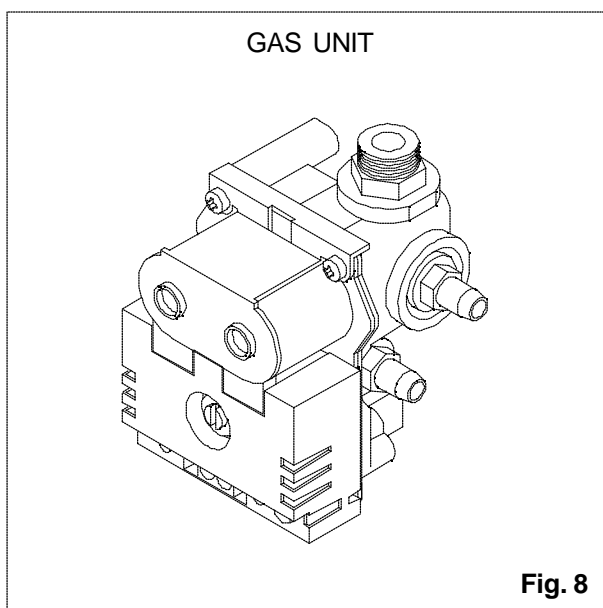
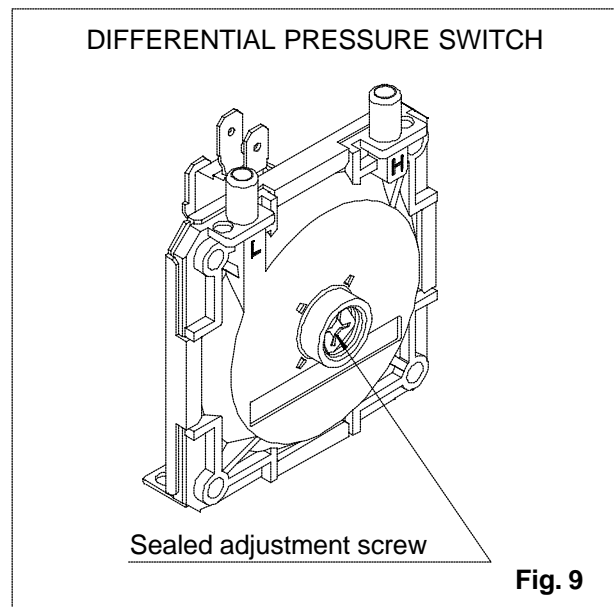
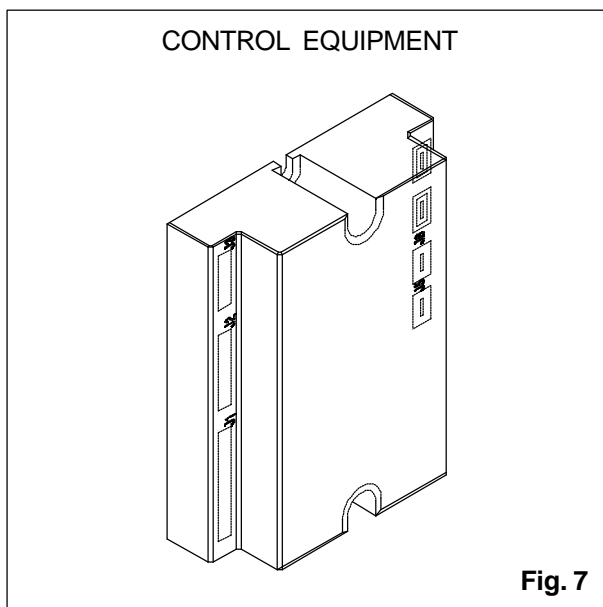
The gas valve includes two, direct operation solenoid valves with class B closing devices

(maximum pressure 50 mbar) and a pressure regulator. The die-cast aluminium casing is equipped with 3/8 RP threaded gas inlet and outlet connections and two inlet and outlet pressure test points. The gas valve is also equipped with an inlet filter (*fig. 8*).

### **2.3 DIFFERENTIAL PRESSURE SWITCH**

The purpose of this device is to interrupt the burner's functioning if the flue gas expeller fan's capacity is insufficient due to a problem with the fan or due to the obstruction of the combustion circuit.

The pressure switch is mounted on the generator's electrical board and is connected to a pressure intake on the exchanger by means of a silicone tube so that it can measure the pressure differential in the combustion circuit. There is an





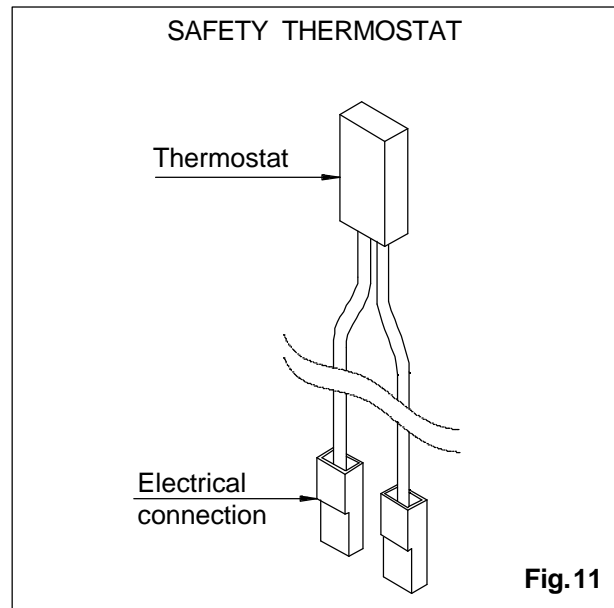
adjustment screw on its front for calibrating it; this operation is performed at the factory according to the unit model and then the screw is sealed (*fig. 9*).

#### **2.4 FAN THERMOSTAT**

This thermostat controls fan operation, making it start when the exchanger has reached the rated operating temperature and stopping it when the exchanger has adequately cooled. The thermostat is attached to a threaded support, located on the exchanger (*fig. 10*).

#### **2.5 SAFETY THERMOSTAT**

The thermostat is designed to interrupt burner operation when the air temperature in the air heater reaches a set value, i.e. when the exchanger overheats due to insufficient air flow or a fan malfunction. The thermostat enclosure uses a special support to attach to the front shield of the appliance (*fig. 11*).



**Fig. 11**



## SECTION 2 - TECHNICAL INFORMATION FOR THE INSTALLER

### **3. IMPORTANT INFORMATION**

#### **3.1 QUALIFICATIONS OF THE INSTALLER**

**IMPORTANT!** Current laws require that these units be installed by specialized personnel in possession of the proper technical and professional qualifications. The installer is required to issue a compliance certificate to the user which certifies that the system was installed correctly in compliance with current regulations.

#### **3.2 RELATED DOCUMENTS**

Notwithstanding their limited scope, the appliances should be installed in accordance with the relevant provisions of the following regulations:

##### **UNITED KINGDOM**

Gas Safety (Installation and Use) Regulations 1984 and BS 6891: 1988. Due account should be taken of any obligations arising from the Health and Safety at Work etc Act 1974, the current Building Regulations, the current I.E.E. Regulations and other relevant codes of practice.

##### **IRELAND**

I.S.3212: 1987, ICP 4, I.S.327. Due account should be taken of any obligations arising from the current Building Regulations, the current I.E.E. Regulations and other relevant codes of practice.

#### **3.3 TRANSPORT AND HANDLING**

The air heater is supplied with standard cardboard packing with two polystyrene foam shells. The packed appliance can be handled by hand or with a fork-lift truck, making sure to observe the instructions reported on the box indicated by the special graphic symbols.

When delivered, check that no visible damage on the packing and/or on the appliance has occurred during transport. If damage is noted, immediately submit a claim to the shipping agent.

**Do not damage the paper installation template when removing the air heater from the packing. You will need to use it to make the holes in the room's wall.**

Check that the packing includes the appliance but also all the parts indicated in point 1.5. Place the material and the documents in a protected area.

#### **3.4 DATA CHECK**

Check that the heater and its technical characteristics match what is indicated by the drawings or other documents.

**The type of gas for which the heater has been designed and the supply pressure are found on the exterior of the packing and on a special label located on the inside of the appliance.**

**WARNING!** If the type gas for which the appliance has been designed is different from the one being used, the conversion operation must be carried out by skilled technical personnel.

#### **3.5 USING THE INSTRUCTIONS**

**WARNING!** When installing or working on the appliance, comply with all the instructions given in this manual. Changes to any type of connection and non-compliance with these instructions will immediately invalidate the warranty and release the manufacturer from all responsibilities.

### **4. INSTALLATION**

#### **4.1 POSITIONING INSTRUCTIONS**

Before carrying out any installation operations, make sure that the following conditions are satisfied regarding the position where the air heater will be installed:

- a) it must be possible to provide a gas supply to the selected point as well as a single-phase 230 Volts ~ 50 Hz power supply line.
- b) It must be possible to make the connections to the combustion air supply duct and combustion product exhaust flue within the specified limits.
- c) The combustion product exhaust terminal's position outside must be in compliance with current regulations.
- d) The unit's installation position must allow access to the parts of the unit subject to maintenance. It is advisable to respect the distances indicated in *figure 12*.
- e) For direct air delivery (W and WR):  
The selected position for the unit must be suitable to correctly distribute the air in the



room. The air flow must not be obstructed by objects such as internal dividers, shelves, furniture, or drapes.

f) For air delivery via ducts (WD):

The selected position must permit the ducts to follow a rational path which keeps pressure drops to a minimum and allows the ducts to be inspected.

#### 4.1.1 Versions for ceiling installation (WR and WD)

The unit must be installed only in a horizontal position. For the WR version make sure that there is a distance of approximately 20 cm between the rear part of the unit and the wall so as to permit correct air intake and to allow the filter to easily be removed for cleaning (*fig. 13*). For the WD version make sure that the air intake system (dampers, plenum systems, ducts, etc.) is accessible and functional.

**IMPORTANT! Verify that the carrying capacity of the surface on which the unit is to be mounted and this surface's material are suitable for supporting the weight of the unit. Make sure that the materials used to attach the unit guarantee its lasting stability.**

#### 4.1.2 Version to be installed on the wall (W)

The unit should be placed on the wall with its lower side at least 20 cm above the floor to allow proper air intake. If the unit is to be installed under a window or under a shelf, make sure that the window sill or the shelf does not obstruct the air flow (*fig. 14*).

## 4.2 AIR INTAKE AND FLUE EXHAUST DUCTS

**WARNING! The material used to build the external wall and any covering (wood, plastic) must not be sensitive to the heat generated by the flue gas exhaust duct. If it is heat sensitive, the passage hole must be protected with insulation that insulates the wall or the covering.**

### 4.2.1 Type definition

As already mentioned in point 1.1, the W, WR, and WD air heaters can be installed with different configurations of the air intake and combustion product exhaust ducts and these different solutions constitute the definition of "type" according to the current standards (*fig. 15*):

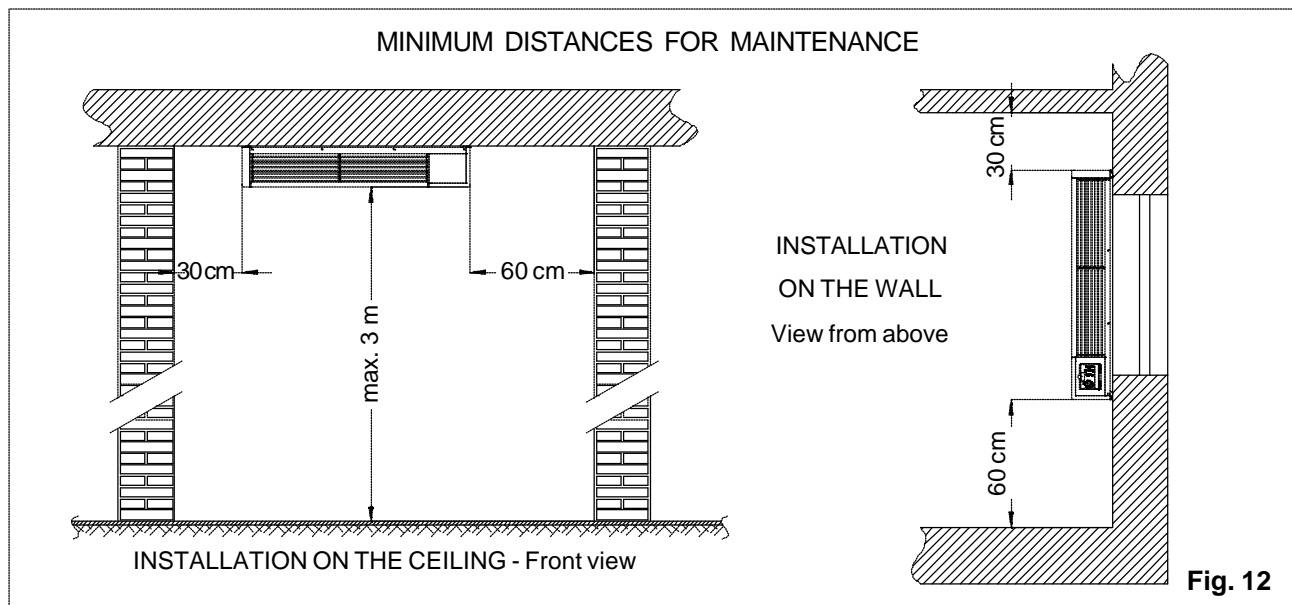
#### - Type C<sub>12</sub>

The combustion circuit is sealed with respect to the room in which the air heater is installed. The intake and exhaust ducts pass directly through the room's outside wall; their terminals are near each other.

#### - Type C<sub>52</sub>

The combustion circuit is sealed with respect to the environment in which the air heater is installed. The ducts are both connected to the outdoors, but their terminals need not be adjacent to each other.

**IMPORTANT! in both these instances the exhaust and intake ducts, including their accessories, are considered to be integral parts of the air heater by current regulations.**





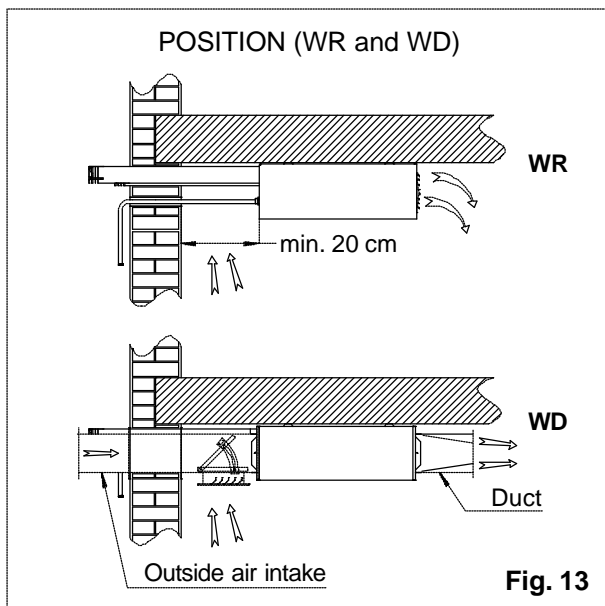


Fig. 13

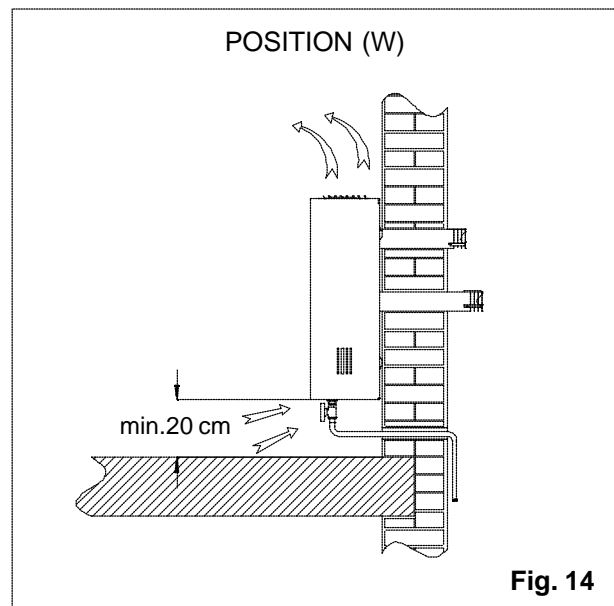


Fig. 14

**Therefore, if you wish to add any components to the standard configuration, you should request them from ACCORRONI S.r.l.**

In any case, any increases to the length of the ducts must respect the limits specified in the next point.

#### 4.2.2 Duct length limits

If the duct passes directly through an outside wall that is more than 40 cm thick, an intake and/or exhaust duct with a diameter of 60 mm that is 1 meter long can be supplied upon request. The length of the ducts must not exceed the limit of 6 meters, considered as the sum of the lengths of both ducts (for example, 3 m of intake duct + 3 m of exhaust duct, etc.), otherwise the resulting

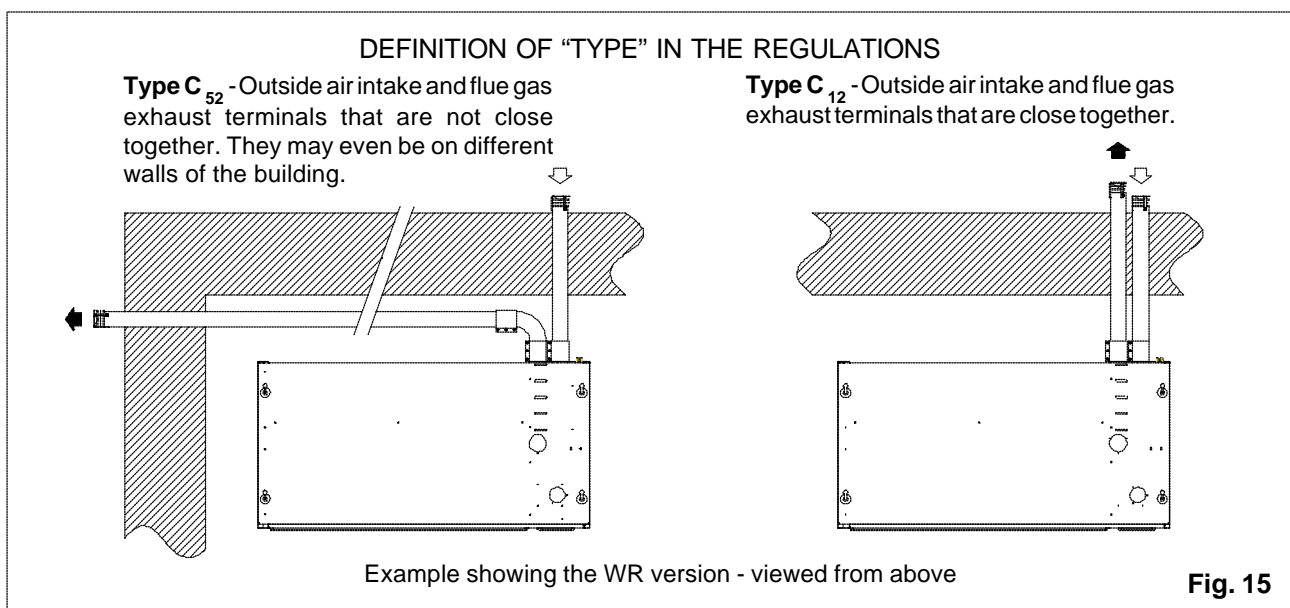
pressure drop may not allow the unit to function properly, thus triggering the differential pressure switch.

**It should be remembered that an elbow in the duct is the equivalent of a straight segment of approximately 50 cm.**

#### 4.3 OUTSIDE POSITIONING OF THE FLUE GASEXHAUST TERMINAL

The position of the outside exhaust terminal for combustion products with respect to windows, ventilation openings, etc. must be in compliance with the requirements of current applicable regulations.

If the air heater is installed in rooms on the ground floor and the exhaust faces sidewalks at





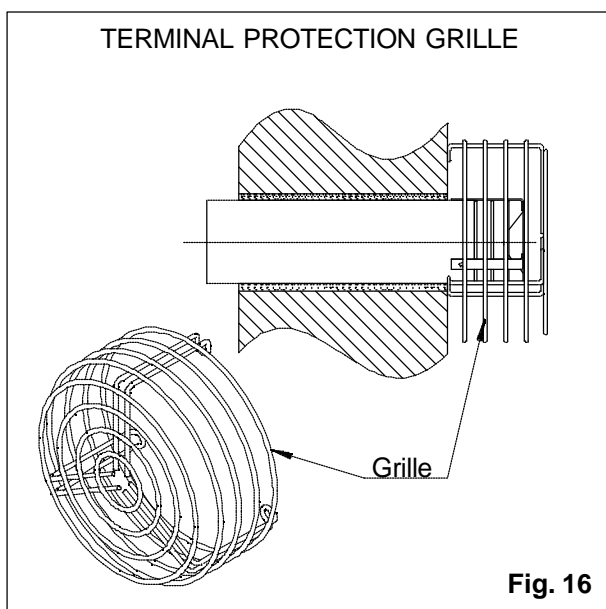


Fig. 16

the level of pedestrians, a special protection grille must be applied, which is supplied on request (*fig. 16*).

#### 4.4 INSTALLATION OPERATIONS

Set up the gas and electricity supply lines based on the installation design.

##### 4.4.1 Air heater mounting preparations

**Versions for ceiling installation (WR and WD):** Once the unit's position has been determined, bend the supplied paper template on the dashed line and apply it to the ceiling with adhesive tape (*fig. 17*).

- a) Indicate the position of the four holes to be made for installing the unit by means of screw anchors or another system that is suitable for the type of structure.
- b) On the wall indicate the position of the two

holes that must go through the wall for the exhaust and intake ducts. These holes must be made as perpendicular as possible to the wall with a core drill having a diameter of 70 mm (*fig. 17*).

The positions for the electric power supply cable entrance and the gas delivery tube are also shown on the template. They can be brought to these positions depending on the type of system chosen.

- c) Cut a section of aluminum pipe with a diameter of 70 mm that is equal to the thickness of the wall. These segments must then be installed in the wall as a sheath for the ducts.
- d) Use the following procedure to remove the right angular panel of the air heater casing: First remove the two fastening screws on the front. Then use the tip of the screwdriver as a lever to free the fastening springs on the rear. Free the left panel's fastening springs in the same way, by pulling sideways until they are released.

**Version for wall installation (W):** Once the unit's position has been determined, bend the supplied paper template on the dashed line and apply it to the wall with adhesive tape (*fig. 18*)

- a) Indicate the position of the holes to be made (Four holes for installing the unit by means of screw anchors, and two holes that go through the wall for the exhaust and intake ducts. These holes must be made as perpendicular as possible to the wall with a core drill having a diameter of 70 mm).

The positions for the electric power supply

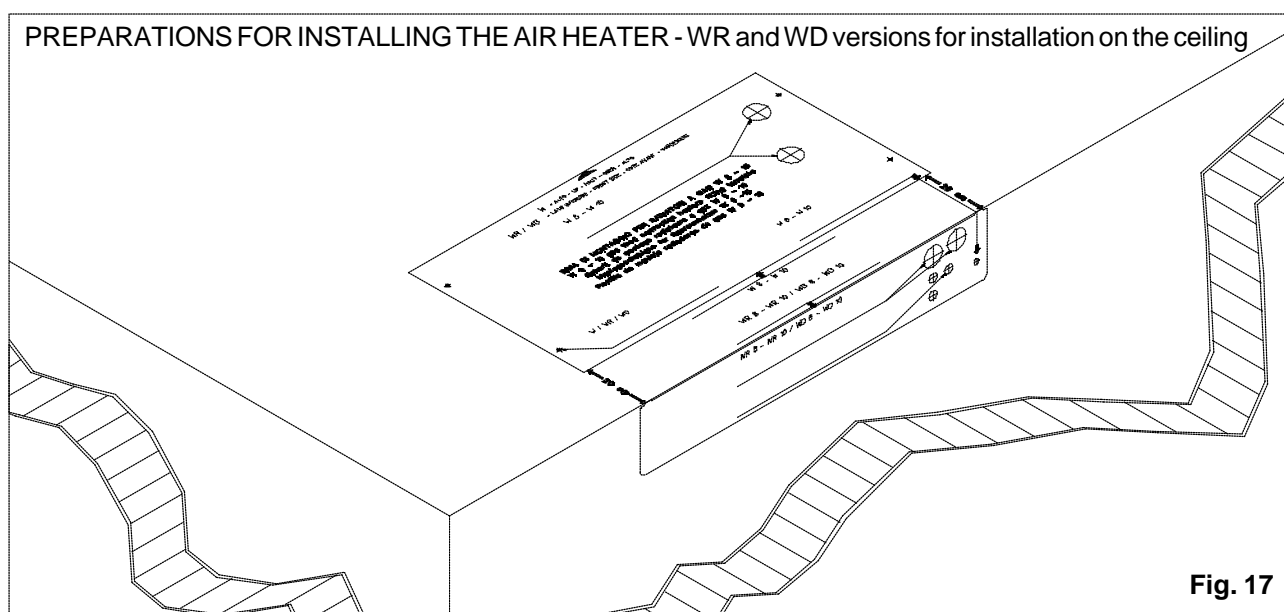


Fig. 17



## PREPARATIONS FOR INSTALLING THE AIR HEATER - W version for installation on the wall

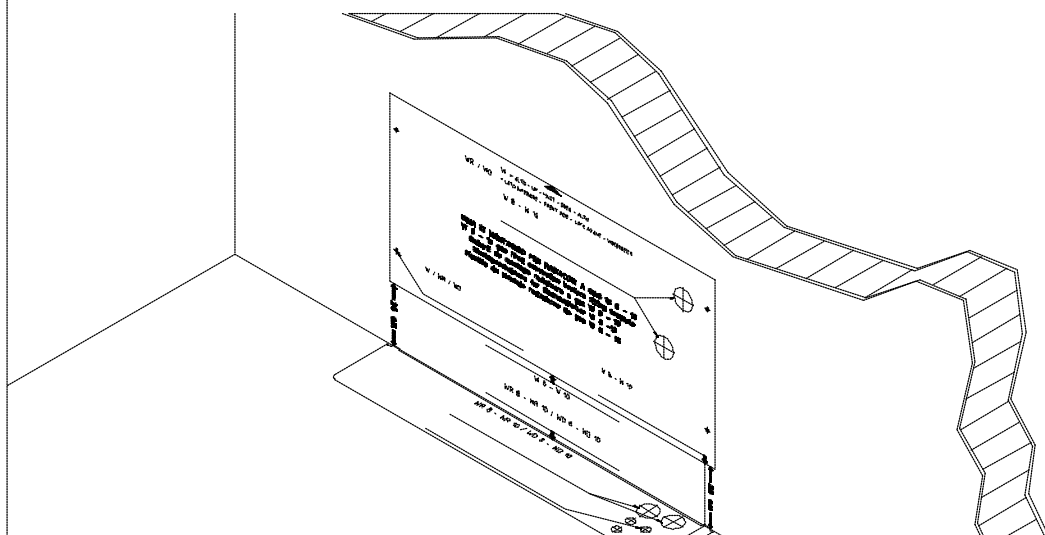


Fig. 18

cable entrance and the gas delivery tube are also shown on the template. They can be brought to these positions depending on the type of system chosen.

- b) Use the following procedure to remove the right angular panel of the air heater casing: First remove the two fastening screws on the front. Then use the tip of the screwdriver as a lever to free the fastening springs on the rear.

Free the left panel's fastening springs in the same way, by pulling sideways until they are released.

### 4.4.2 Mounting the combustion air supply intake duct and combustion product exhaust flue

#### Versions for ceiling installation (WR and

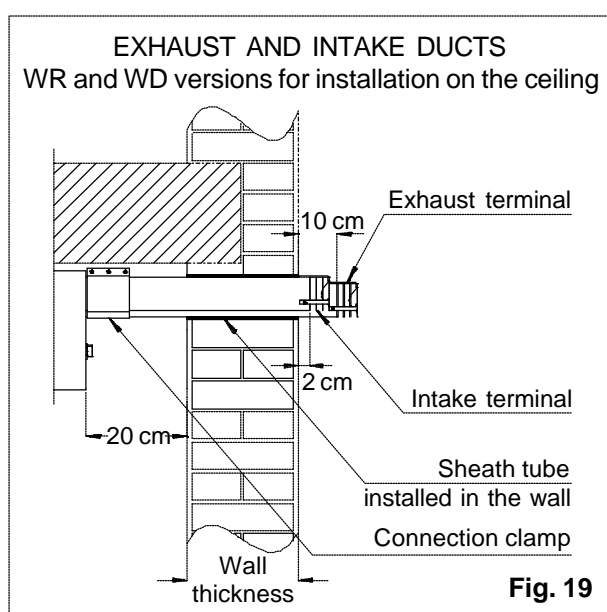


Fig. 19

**WD):** The air heater is equipped with a series of ducts for walls that are up to 40 cm thick, assuming that the unit's rear is 20 cm from the wall. If the walls are thicker, ducts that are 100 cm long are available on request.

Mount the duct according to the procedure described below:

- Measure the thickness of the wall where the ducts are to pass through. Verify that the ducts are long enough, according to what is shown in *fig. 19*.
- Any cuts must be made on the free ends opposite the wind protection terminals. Make sure that they are cut squarely and trim off any burrs. **NOTE: The exhaust flue is the longer of the two.**
- Insert the ducts into the pipes that were previously installed in the wall. Install the metal connection clamps with a silicone gasket on the ducts' free end without tightening them. They will be connected to the unit's connectors.

If the ducts will not follow a straight path, you need to request the necessary components, such as 45° and 90° elbows, etc., from your supplier.

**IMPORTANT!** If the exhaust duct is subject to low temperatures, prevent the formation of condensation by suitably insulating the duct (for example, using insulation for temperatures up to 200°C).

**Version for wall installation (W):** This type of installation requires that the exhaust and air intake ducts be installed on the unit before it is attached to the wall. The air heater is equipped



with standard ducts for walls that are up to 40 cm thick. If your walls are thicker, ducts that are 100 cm long are available on request.

Mount the duct according to the procedure described below:

- a) Precisely measure the thickness of the wall where the ducts are to pass through.
- b) If necessary, cut a piece off both ducts whose length is the difference between 40 cm and the effective thickness of the wall (*fig. 20*). Any cuts must be made on the ends opposite the connection flanges. Make sure that they are cut squarely and trim off any burrs. **NOTE: The exhaust flue is the longer of the two. It sticks out compared to the connection flange.**
- c) Use the provided screws to attach the ducts to the connectors on the unit's rear. Make sure to place the gaskets on the duct flanges.
- d) Check that the flue gas exhaust pipe is correctly inserted in the flue gas expeller fan scroll and fasten it in place with the supplied self-drilling screw.

#### 4.4.3 Mounting the unit

##### Versions for ceiling installation (WR and WD)

**WARNING! For your safety, due to the weight of the unit and the possible difficulties of installing it, it is advisable to use a mechanical hoisting device for positioning the air heater. For these same reasons and also to avoid damaging the unit itself, it is necessary for it to be put into place by two people.**

- a) Use suitable means to raise the air heater to

its position and align the four fastening holes. Tighten the anchoring points so that they are safe and stable.

- b) Place the exhaust and intake ducts near the connectors on the unit until they are aligned. Adjust the position of the metal connection clamps with their gaskets. Tighten the clamps' fastening screws and make sure that they are correctly sealed.
- c) Check that the outside terminals are in the correct corresponding position (*fig. 19*) and touch up the plastering around the holes through which the ducts pass..

##### Version for wall installation (W)

**WARNING! It is advisable to use two people to raise the air heater and put it into position so as to avoid any possible damage to the wall or the unit.**

- a) Raise the air heater, insert the ducts in the holes, and carefully push it towards the wall until it comes into contact with it.
- b) Adjust the position of the unit and attach it with the screws to the screw anchors that were previously inserted in the wall. If the wall is not perfectly straight, use spacers at the points where the attachments are to be made.
- c) Check that the outside terminals are in the correct corresponding position (*fig. 20*) and touch up the plastering around the holes through which the ducts pass. Attach the wind protection terminals to the outside ends of the ducts by completely inserting them in place and attaching them to the ducts by means of the supplied self-drilling screws.

#### 4.4.4 Gasconnection

**IMPORTANT! It is necessary to mount a gas on-off valve upline from the unit. The valve must be located in a position that can be easily accessed by the user.**

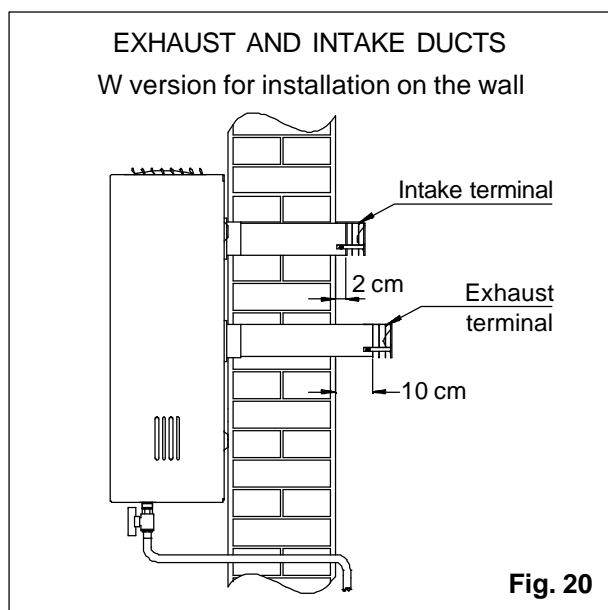
Connect the gas supply line to the air heater which is equipped with a 1/2" male threaded connector.

Check the seal on the gas piping and make sure that it is in conformity with the current regulations regarding gas systems.

#### 4.4.5 Electricalconnections

Ensure that a single-phase, 230 V, ~ 50 Hz electric power supply is available.

**The electrical system must be properly isolated by means of an omnipolar circuit**





**breaker, whose contacts open by at least 3 mm and which has an adequate capacity, to be used as a general switch to turn off the units.**

Insert the power supply cable through its bushing, making sure to cut the wires so that the yellow/green ground cable is longer than the other two. In case of accidental disconnection this precaution allows the ground cable to be disconnected last.

Connect the power supply cable to the phase connectors (L), to the neutral wire (N) of the mains filter (FR), and to the air heater's ground terminal (see the wiring diagram). Use the supplied 6.3 x 0.8 mm faston type terminals to connect the phase and neutral wires.

**Observe phase/neutral polarity, otherwise the control equipment will generate a safety shutdown. Verify that the system has been grounded in compliance with the electrical standards.**

#### **4.4.6 Remote-control panel (only for the WR and WD versions to be ceiling installed)**

The remote-control panel is equipped with a probe for measuring the room temperature. Its position must be chosen not only for ease of use, but also so as to avoid air currents, heat sources, and sources of excessive humidity which could alter the temperature measurement.

Also avoid installing it in recesses. Do not obstruct the openings in the panel for the same reasons as in the last paragraph. However, it is advisable to install it at a height of approximately 1.5 meters from the ground.

To install it on the wall, use the two screw anchors supplied with a diameter of 4 mm. Unhook the rear part of the panel by using the proper tools to release the four snap fasteners.

Make two holes in the wall with a center distance of 120 mm. Insert the screw anchors and attach the rear part of the panel to the wall. Put the front part of the panel back by snapping it in place.

If you should need to insert the panel's connection cable inside trunking, you must disconnect the cable from the terminal board on the panel. When you have put the cable in place, re-establish the electrical connection by putting the cable in its proper position on the terminal board (see the wiring diagram).

If you need to insert it in trunking underneath, the cable could exit from the wall in correspondence to the hole in the rear part of the panel, so as not

to leave the cable in view. The original hole which the cable should have passed through must be closed with the plastic cap provided. If the panel is attached to a metal structure or wall, this structure or wall must be grounded.

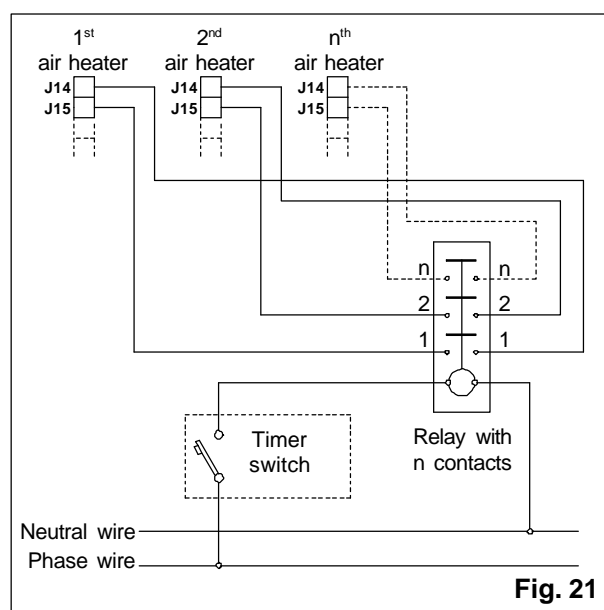
#### **4.4.7 Using a programmable timer**

If you would like to have the air heater function automatically at preset times, it is possible to install a programmable timer.

A jumper for auxiliary connections (OP - see *the wiring diagram*) is provided on the unit's electrical board between the J14 and J15 faston connectors (4.8 x 0.8 mm type) of the terminal board on the printed circuit. Remove the jumper and connect the above connectors to the timer's switch. Use the bushing (*fig. 1*) for the connection cable's exit.

#### **4.4.8 Connecting more than one unit with a single external programmable timer**

To operate several units with just one programmable timer follow the diagram in *figure 21* and use the same J14 and J15 connectors listed in the previous point. You have to use a normally-open contact relay with an adequate





rating to make this special connection.

## **5. COMMISSIONING**

**WARNING! The commissioning of the appliance must be performed by skilled technical personnel.**

### **5.1 TESTS**

**5.1.1** Before starting the air heater, make sure that all the current provisions and standards relevant to the installation of these appliances have been observed. Pay particular attention to the correct positioning of the combustion product exhaust terminal.

**5.1.2** Make sure that the single-phase, 230 V ~ 50 Hz electric power supply and the earth wire are connected to the special air heater terminals. The phase conductor must be connected to the terminal marked with the letter "L", otherwise the control equipment will generate a safety lockout.

**5.1.3** Check that the burner is designed for the type of gas to be used (*table on page 7*).

**WARNING! The appliance is delivered already set in the factory to use natural gas G20, with a supply pressure of 20 mbar. Instead, if gas from the third group is used (LPG), first carry out the operations described in point 6.1.**

**5.1.4** Check that the gas on-off valves on the meter and on the air heater are open. Make sure that the air inside the gas supply piping has been purged.

### **5.2 IGNITION**

#### **5.2.1 Ignition procedure**

(Refer to figure 22 when reading the following section )

**a)** Turn the room thermostat knob (E) clockwise to the maximum value.

**b)** Turn switch (A) upwards to the "ON" position to start the ignition cycle. Make sure that the red LED of the "Reset" button (B) is unlit.

If it is lit, this means that the burner's control equipment is in a lockout state. In this case press the button to reset the control equipment. The red LED will turn off and from this moment the air heater startup cycle will begin.

From the moment at which the burner is ignited, the flame must be detected by the special ionisation sensor within a specific safety time, otherwise the control equipment enters the lock out mode, indicated when the red light on the button turns on (B).

This may occur in particular in a new appliance due to air in the gas piping. In this case, wait about one minute and reset the appliance by pressing the "reset" button (D) to begin a new cycle. Repeat the operation until the residual air has been purged and the ignition is regular.

The exchanger heating phase will begin after the burner has been ignited (this is indicated by the green LED (C)). The exchanger will reach the rated operating temperature after approximately three minutes. At this point a thermostat will start the fan for distributing warm air in the room.

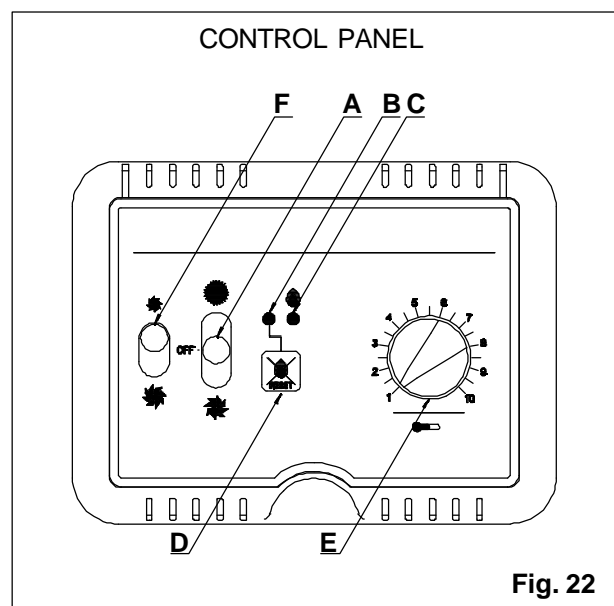
When the room reaches the desired temperature, adjust the room thermometer by slowly turning its knob counterclockwise until the burner turns off (this is indicated by the green LED C). At this point the air heater will function completely automatically and will keep the room at the desired temperature.

#### **5.2.2 Controls**

**WARNING! When operations or visual inspections are performed on the air heater, be extremely cautious and work under safe conditions.**

Insert the water column pressure gauge tube into the pressure outlet on the gas unit (*fig. 23*) after having backed off the set screw a few turns. Start the air heater and check that the pressure at the burner corresponds to what is indicated in the technical data table.

If the pressure of the gas delivered to the burner does not correspond to the value indicated, use the special pressure set screw (*fig. 23*), after



**Fig. 22**



having removed the protection plug, to obtain the specified value. Turn it counterclockwise to decrease the pressure and clockwise to increase the pressure (this operation can be carried out only when using methane gas G20).

Turn the room thermostat dial to the minimum value and check that the burner shuts off.

Remove the pressure gauge tube and tighten the pressure regulator screw, carefully checking the seal. Replace the regulator protection plug.

**WARNING! When the burner turns off, the fan will continue to operate for a few minutes, to properly cool the exchanger. Therefore, it is important not to turn off the air heater using the mains switch, that also cuts off the power supply to the fan, since this might lead to overheating.**

Then repeat the start-up operation to observe and check that the burner has ignited correctly and that the flame is stable.

**For installation with ducts (WD).** While the burner is functioning, use the switch (F) to select the minimum fan speed, and run the unit for approximately 20 minutes. During this period verify that the heated air freely and properly exits the duct's grilles or outlets. If there are any obstacles or incorrect adjustments to the outlets, or if the size of the ducts is incorrect, the safety system could be activated. If this occurs, try to locate and eliminate the possible causes of the overheating.

Once the checks have been completed, put the casing's panels back in place and make sure that they are correctly attached. Place the plastic

finishing caps in any fastening holes that have remained open.

### 5.3 USER INFORMATION

**It is recommended that the user be informed about all the procedures necessary to use the air heater correctly, with particular reference to the ignition and shutdown phases and about the importance of periodic tests, which must be performed at least once every year by skilled personnel.**

## 6. GAS TYPE CHANGE

### 6.1 SWITCHING FROM GAS IN THE SECOND GROUP (NATURAL GAS) TO GAS IN THE THIRD GROUP (LPG)

- a) Check that the envelope supplied with the air heater contains the replacement injector, the screw block with pin and the adhesive label, on which to indicate the new type of gas being used, to replace the original one
- b) check that the diameter of the injector indicated for the type of gas to be used (see *technical data table on page 7*) corresponds to what is stamped on the injector.
- c) Close the gas on-off valve and disconnect the electric power supply. Remove the air heater casing's right angular panel by first removing the two screws located on the front (protected by plastic caps) and then using the point of a screwdriver as a lever to release the fastening springs in the rear.
- d) Remove the 2 screws which attach the gas supply pipe connector to the combustion chamber (*fig. 24*). Gently remove the connector until the injector is free and unscrew it using a 10-mm hex wrench. Insert a new injector and retighten it to ensure a proper seal. Put the connector back in place and attach it to the combustion chamber with the two screws.
- e) Unscrew the pressure regulator protection plug located on the gas unit. Insert the screw block with pin in the place of the protection plug and tighten it so as to put the regulator out of service (*fig. 24*). **Keep the pressure regulator protection plug for future use.**
- f) insert the water column pressure gauge tube into the upstream pressure inlet on the burner (*fig. 23*) after having backed off the closing screw a few turns
- g) start the air heater according to what is

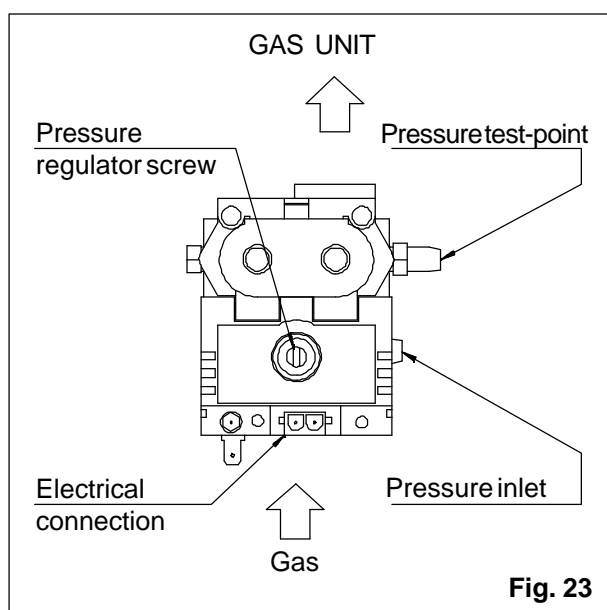


Fig. 23



indicated in point 5.2. Check that the supply pressure corresponds to what is indicated in the technical data table. If the gas supply pressure does not correspond to the value indicated, use the pressure regulator (second stage) installed externally to obtain the correct value

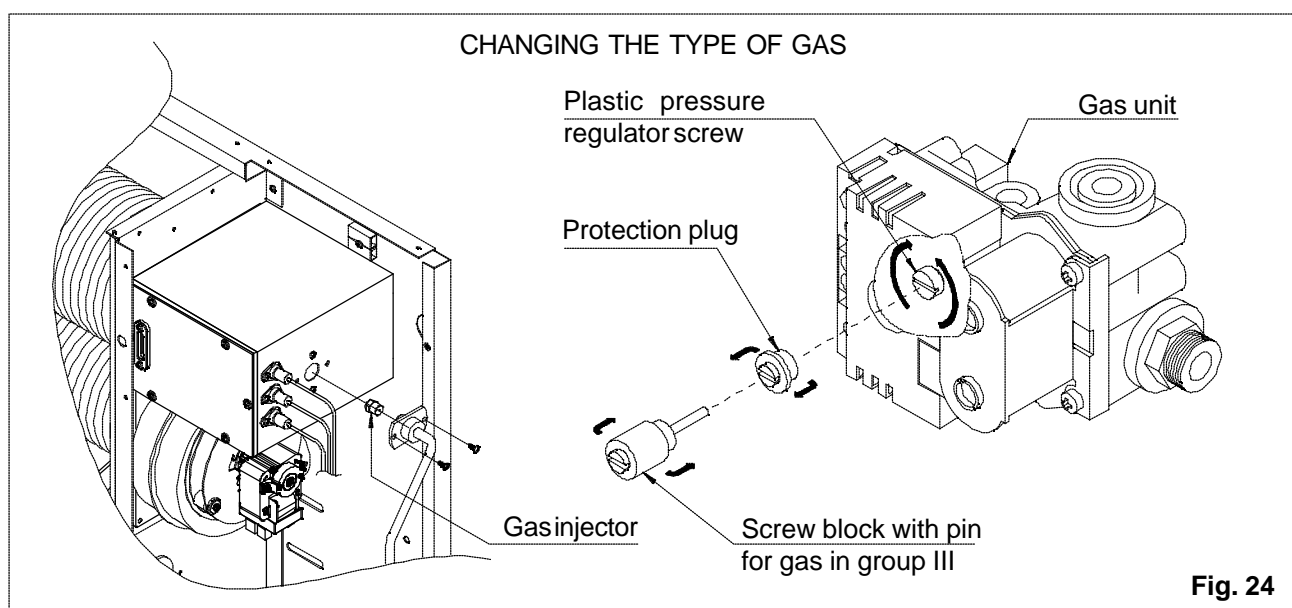
- h) remove the pressure gauge tube and tighten the pressure inlet screw
- i) use a special spray or electronic leak detector to identify any leaks in the gas circuit
- j) Put the air heater casing's right angular panel back in its position and fasten it in place.

## 6.2 SWITCHING FROM GAS IN THE THIRD GROUP (LPG) TO GAS IN THE SECOND GROUP (NATURAL GAS)

- a) Check that the adaptation kit envelope contains the replacement injector and the adhesive label on which to indicate the new type of gas being used, to replace the previous label.
- b) Check that the injector diameter required for the type of gas to be used (*see the technical data table on page 7*) corresponds to the diameter stamped on the injector.
- c) Close the gas on-off valve and disconnect the electric power supply. Remove the air heater casing's right angular panel by first removing the two screws located on the front (protected by plastic caps) and then using the point of a screwdriver as a lever to release the fastening

springs in the rear.

- d) Remove the 2 screws which attach the gas supply pipe connector to the combustion chamber (*fig. 24*). Gently remove the connector until the injector is free and unscrew it using a 10-mm hex wrench. Insert a new injector and retighten it to ensure a proper seal. Put the connector back in place and attach it to the combustion chamber with the two screws.
- e) on the gas unit, remove the screw block with pin located on the pressure regulator to reset regulation operation (*fig. 24*)
- f) start the air heater according to what is indicated in point 5.2
- g) insert the water column pressure gauge tube into the pressure outlet on the gas unit burner (*fig. 23*) after having backed off the closing screw a few turns. Check that the supply pressure corresponds to what is indicated in the technical data table. If the gas supply pressure to the burner does not correspond to the value indicated, use the pressure regulator (*fig. 23*) to obtain the correct value. Turn counterclockwise to decrease the pressure and clockwise to increase the pressure
- h) remove the pressure gauge tube and tighten the pressure inlet screw. Insert the regulator protection plug (original equipment)
- i) use a special spray or electronic leak detector to identify any leaks in the gas circuit





- j) Put the air heater casing's right angular panel back in its position and fasten it in place.

## **7. OPERATING DEFECTS**

### **7.1 PRELIMINARY TESTS**

Before performing specific tests, make sure that:

- a) The electric power supply is properly connected (pay particular attention to the phase-neutral polarity and ground connector) and that any external adjustment components (for example, the programmable timer) function correctly.
- b) The gas supply is correct, the gas on-off valve is open, and the pressure to the burner corresponds to what is indicated in the technical data table.
- c) The external terminals of the combustion air intake duct and the combustion product exhaust flue are not obstructed and that the material they are made of has not deteriorated.
- d) The control panel functions correctly.

### **7.2 POSSIBLE DEFECTS**

The following is a list of possible defects along with their probable causes. *The information indicated in italics refers to repair operations or corrections which are the responsibility of the authorised Technical Service Centre.*

#### **7.2.1 The appliance does not start even if the conditions described in the previous points are correct.**

- a) the flame detection circuit of the control equipment is malfunctioning and the initial self-check does not allow the cycle to continue.
  - *Replace the control equipment (see point 8.1).*
- b) The flame detection electrode has an earth leakage.
  - *Check the correct position of the electrode. The ceramic insulation material may be cracked and this is difficult to determine visually. In case of doubt, replace the electrode (see point 8.7).*
- c) The differential pressure switch's contacts are frozen in the position they assume when the draft is correct.
  - *Change the pressure switch if its microswitch does not reset the contacts to the proper position (see point 8.4).*
- d) The flue gas expeller fan's motor has failed

and the differential pressure switch will not allow startup to proceed.

- *Change the fan. Be careful to reassemble the unit as shown in figure 31 (see point 8.8).*

#### **7.2.2 The control equipment does not shut down, but the cycle remains in a continuous preventilation phase**

- a) The differential pressure switch will not allow startup to proceed because the flue gas exhaust flue or the air supply duct is obstructed.
    - *First eliminate any obstructions from the terminals. In any case check the entire path of the ducts for damage or alterations.*
  - b) The differential pressure switch will allow startup to proceed because the flue gas expeller fan does not function correctly and does not develop enough suction.
    - *Check to see if there are any problems of wear with the rotation of the fan motor. Make sure that the fan is positioned correctly, that there is nothing that interferes with the rotation, and that there are not any deformations. If necessary, change the fan. Be careful to reassemble the unit as shown in figure 31 (see point 8.8).*
  - c) The differential pressure switch will not allow startup to proceed because it is broken or its electrical connection has been interrupted.
    - *Check that the connection cable and the corresponding terminals are in good condition. Do not attempt to adjust the pressure switch by removing the seal; instead, change it.*
  - d) The differential pressure switch will not allow startup to proceed because the pressure inlet tube is obstructed or the silicone connection tube is disconnected or broken.
    - *Make sure that the silicone tube is connected correctly and that it does not have any holes or cuts in it. If it is not damaged, check the steel pressure inlet tube and remove any obstructions or deposits from it. It will be necessary to access the inside of the exchanger's flue gas collector to completely carry out this operation.*
- #### **7.2.3 At the end of the preventilation phase, the ignition electrodes do not discharge and the control equipment shuts down within the safety time**
- a) The ignition transformer is malfunctioning.



- *Replace the controller which contains the transformer. Because these are electronic components, it is advisable not to attempt to replace just the transformer, especially if you do not use the proper tools.*

**b)** The ignition electrode is no longer connected to the equipment connector.

- *Restore the connection or replace the electrodes. Do not make any connections so as to avoid reducing the cable insulation level.*

**c)** The ignition electrode(s) is (are) not correctly positioned or the ceramic insulation is damaged, with a subsequent leakage of the ignition discharge.

- *Replace the ignition electrode(s).*

#### **7.2.4 At the end of the preventilation phase, the ignition discharge takes place, but the flame does not ignite and the control equipment shuts down within the safety time**

**a)** There is no gas supply or there is air inside the piping.

- *Determine the reason why there is no gas supply by first checking the on-off valves on the delivery line. Completely bleed off any residual air and restart the unit.*

**b)** The gas solenoid valves do not open because the coils are malfunctioning or their electrical connection has been interrupted.

- *Check that the connection cable and the corresponding terminals are in good condition. Use a special tool to verify if the coils have failed and replace them, if necessary (see point 8.3).*

**c)** The safety thermostat is malfunctioning and does not allow the solenoid valves to open.

- *Replace the safety thermostat (see point 8.6).*

#### **7.2.5 At the end of the preventilation phase, the ignition electrode sparks and the flame ignites correctly, but the control equipment shuts down within the safety time**

**a)** The phase-neutral electric power supply is not correctly connected to the respective terminals, marked as "L" and "N", and reversing the polarity may deactivate the flame detection device.

- *Check using a multimeter or phase detector and correctly connect the cables to the corresponding terminals.*

**b)** The flame detection electrode is not correctly positioned and is not in contact with the flame.

- *Check if the electrode is properly connected and if there are any deformations. Comply with what is indicated in figure 30.*

**c)** The flame detection electrode electric connection has been interrupted.

- *Check the electrode connection to the control equipment. If the cable or ceramic insulation is damaged, replace the electrode in accordance with the positions shown in figure 30.*

#### **7.2.6 The control equipment locks out during normal operation**

**a)** The gas supply was cut off and the equipment, after repeating the ignition cycle, and without detecting the flame within the safety time period, entered the lock out mode.

- *Determine why the gas supply to the air heater was interrupted. Restart the appliance using the Reset button on the control panel.*

**b)** The incorrect positioning of the external intake and exhaust terminals has caused combustion products to return and this prevents the flame from igniting properly and from being detected by the electrode.

- *Change the positions of the outside terminals, keeping in mind that the exhaust terminal must stick out farther than the intake terminal (see fig. 19 and fig. 20). Check that the terminals are not installed inside niches or recesses in the walls and that there are no obstructions that prevent the air from circulating freely.*

**c)** The safety thermostat cuts off the supply to the gas solenoid valve because overheating has occurred due to incorrect operation or a failure of the convection fan(s).

- *Check for obstructions or dust deposits on the filter and/or on the fan. Replace the malfunctioning fan, if necessary (see point 8.9).*

**d)** The safety thermostat cuts off the supply to the gas solenoid valve because overheating has occurred due to incorrect operation of the fan control thermostat.

- *Replace the fan control thermostat (see point 8.5).*

#### **7.2.7 The burner stops while it is operating, even though the room temperature does not require it**

**a)** The control panel's room thermostat is defective or the panel (in the versions to be



installed on the ceiling) is not correctly positioned in the room to detect the temperature properly.

- *If you believe that the panel's position is correct, but there is still a defect, it will be necessary to replace the panel. Because these are electronic components, do not attempt repairs on the panel's printed circuits.*
- b) The differential pressure switch stops the burner because the flue gas expeller fan's capacity is not correct due to an obstruction in the ducts or to the ducts being too long.
- *Remove any obstructions and/or check the length of the ducts in accordance with what is*

*indicated in point 4.2.2.*

## **8. REPLACING PARTS**

Since specific technical skills are required to replace the parts listed below, it is recommended to advise the user to always contact skilled technical personnel. For safety and quality reasons, it is recommended to use original spare parts when replacing components.

**WARNING! All the following operations must be carried out while the heater is turned off, and disconnected the gas and electric supplies.**

### **8.1 CONTROL EQUIPMENT**

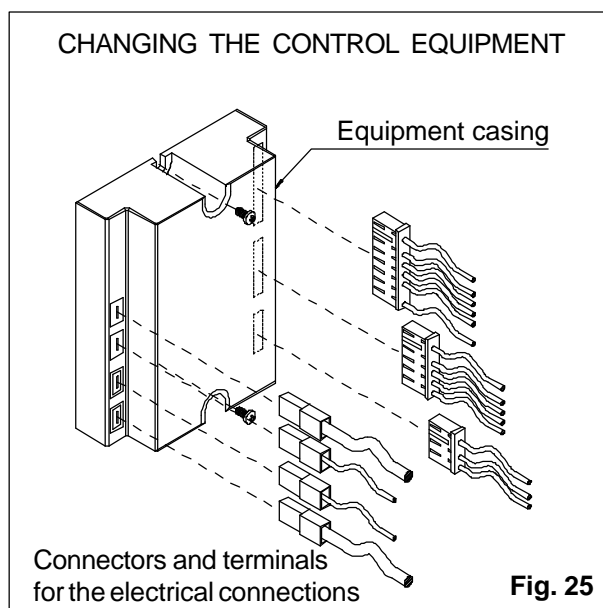
Disconnect the cables by pulling on the terminals and extracting the connectors, releasing them first from the special retainer. Replace the equipment and attach it using the two self-threading screws. Insert the terminals and the connectors into their respective positions (fig. 25).

### **8.2 FUSES**

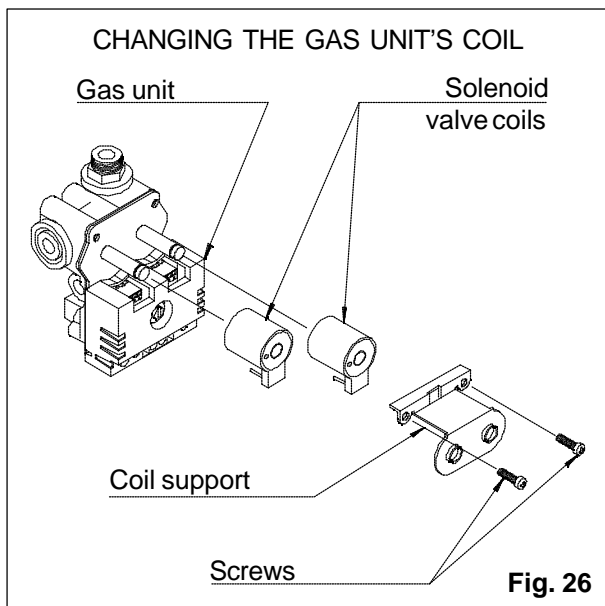
Remove the blown fuse from the printed circuit on the electrical board inside the air heater. Replace it with a new fuse (5 x 20 - 2 Amps - instantaneous type) by exerting slight pressure until it enters its position.

### **8.3 GAS SOLENOID VALVES**

Disconnect the electric connection on the gas unit. Remove the two screws that attach the metal support block of the coils and remove it from the housing. Pull out the coil(s) from the unit and replace them with new ones. Replace the metal support block in the correct position and tighten the fastening screws. Re-establish the







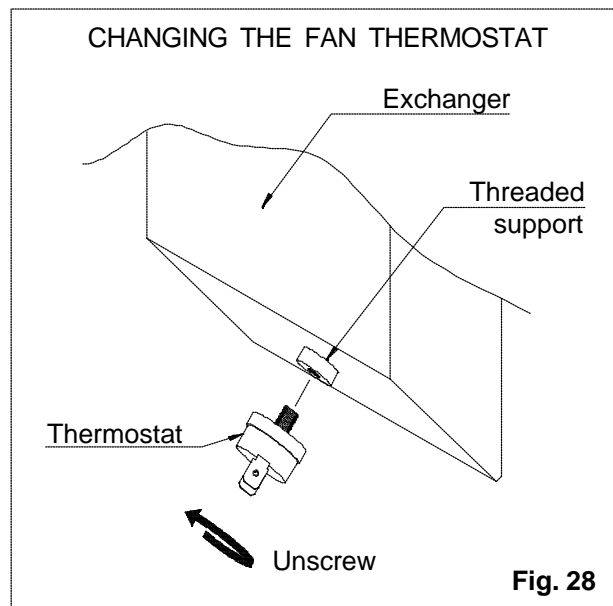
electrical connection (*fig. 26*).

#### 8.4 DIFFERENTIAL PRESSURE SWITCH

Disconnect the electrical connection and the silicone tubes. Unscrew the screws and remove the pressure switch. Install the new pressure switch (which has been calibrated specifically for your air heater model) and re-establish the connections, making sure that you place the contacts in their proper positions. Put the silicone tube back in place (*fig. 27*).

#### 8.5 CONVECTION FAN CONTROL THERMOSTAT

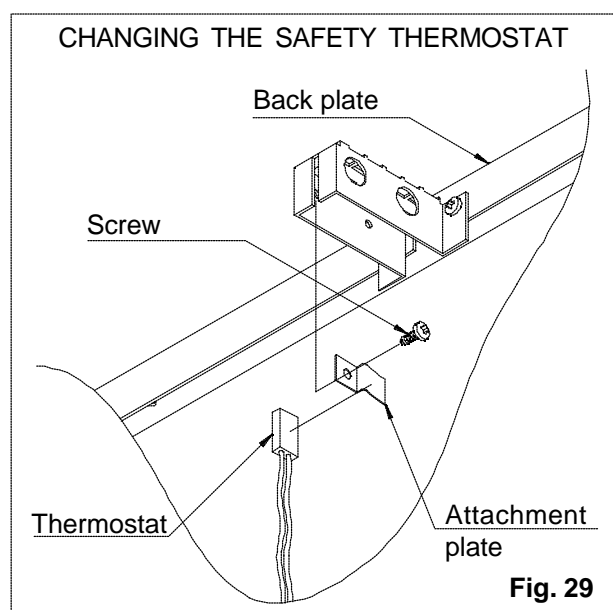
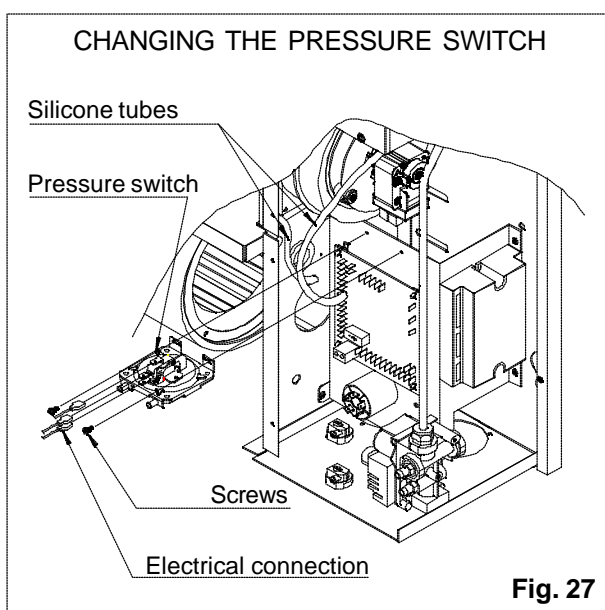
Disconnect the cables and unscrew the thermostat from the threaded support. Insert the new thermostat, screwing it all the way in by



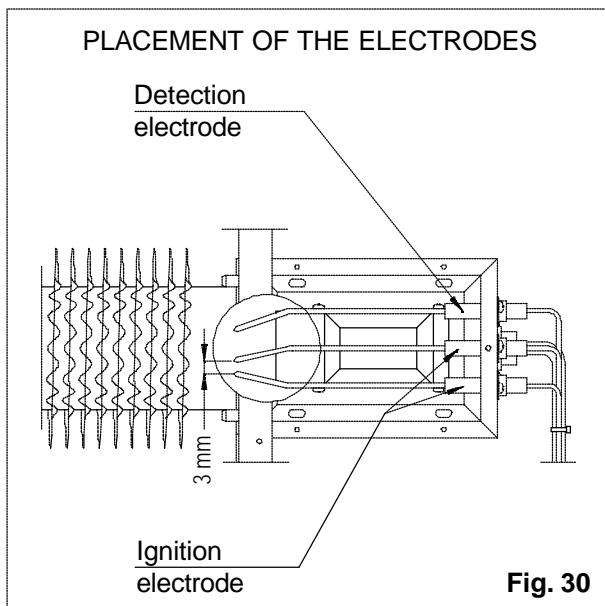
hand (do not use tools which might damage the thermostat). Make sure that the distance between the thermostat enclosure and the threaded support is not greater than 3 mm, to guarantee that the sensor remains in contact with the wall of the exchanger. Re-establish the electrical connection (*fig. 28*).

#### 8.6 SAFETY LIMIT THERMOSTAT

Disconnect the electric connection of the thermostat on the terminal board. Release the thermostat by disassembling the attachment plate from the support. Mount the new thermostat by reversing the order of the previous operations. Make sure to insert the side of the thermostat with the printed data facing the air heater shield (*fig. 29*).

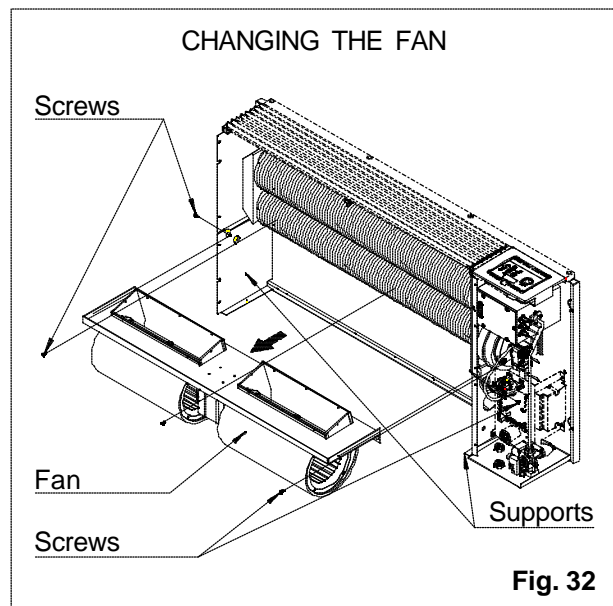
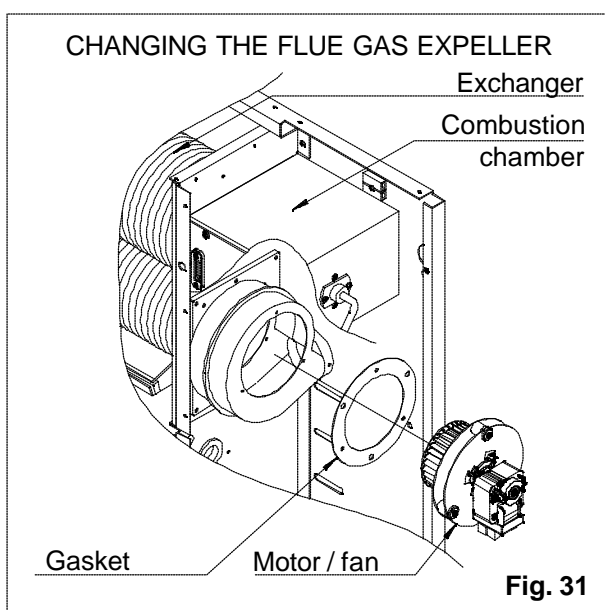






### 8.7 ELECTRODES

Disconnect the cable connection on the control equipment. Remove the fastening screws and pull out the electrodes from the burner plate. Insert the new electrodes, attach the supports and re-establish the electrical connection. To check the position of the electrodes on the burner, remove the combustion chamber door, making sure not to damage the seal gasket. The position of the electrodes with respect to the burner must correspond to what is shown in *figure 30*. Replace the door while checking that the relative gasket is in the correct position.



### 8.8 FLUE EXHAUST FAN

Disconnect the motor electrical connection and loosen the three scroll fastening screws. Gently remove the motor-fan unit and, respecting the original position, insert the new unit (*fig. 31*). Tighten the screws and re-establish the electrical connection. Make sure the fan rotates correctly and without friction.

**IMPORTANT!** To access the flue gas expeller in the WR and WD versions for ceiling installation, free the inside intake duct by undoing the fastenings and sliding the external duct along the aluminum sheath installed in the wall. When you have changed it, make sure that you put the duct correctly back in place and check that the connections are sealed well.

### 8.9 CONVECTION FAN

Disconnect the electrical connection from the fan motor connections. Unscrew the screws that attach the fan support to the air heater's back panel. Insert the new fan, including supports, in its position (*fig. 32*). Attach the fan support using the screws that were previously removed and re-establish the electrical connection.



## **9. PERIODIC MAINTENANCE**

### **OPERATIONS**

#### **9.1 USER INFORMATION**

It is recommended to advise the user to carry out the operations indicated in point 11.1 of this manual at least once every two months.

#### **9.2 YEARLY INSPECTION**

##### **9.2.1 Control and safety devices**

**WARNING! Specific technical skills are required to test the control and safety devices and this is why it is important to contact skilled personnel.**

##### **9.2.2 Cleaning the unit**

Remove the air heater casing's right angular panel by first removing the two screws that hold it in place (protected by plastic caps) and then using the point of a screwdriver as a lever to release the fastening springs in the rear. Remove the left panel and the front panel by releasing the snap springs. Remove any dust deposits from the intake filter and from the air delivery grille.

Also clean the exchanger's exterior and the fan's exterior using a brush or a jet of compressed air. Remove any dust deposits from the safety and fan thermostats and from the room thermostat sensor.

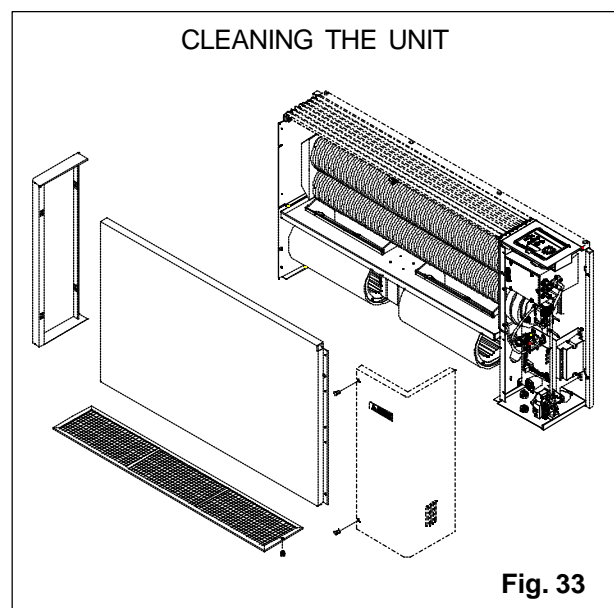
Remove the 6 screws which attach the door to the combustion chamber. Remove it, making sure not to damage the seal gasket. Check the condition of the burner and its parts. Check that there are no carbon deposits inside the exchanger

pipe. If deposits are found, look for the causes of what is likely to be non-efficient combustion. Put the door back in place, making sure that the corresponding gasket is in the correct position.

Check that the external intake and exhaust terminals are in the correct position and that they are clean.

Check the condition of the electric system and check the efficiency of the connections.

Carefully replace the components and check that they operate correctly (*fig. 33*). Carefully carry out all the operations described from point 5.1 to point 5.2.2 and, if problems arise, consult chapter 7 about operating defects.





## SECTION 3 - OPERATING AND MAINTENANCE INSTRUCTIONS FOR THE USER

### **10. START-UP**

#### **10.1 FIRST FIRING AND TESTING**

**WARNING! The first firing of the appliance and the commissioning tests must be performed by skilled technical personnel. Non-compliance with this procedure will invalidate the warranty conditions and release the manufacturer from all responsibilities.**

#### **10.2 TESTS**

Before operating the heater, make sure that the installer has correctly carried out the installation operations according to the regulations in force.

#### **10.3 IGNITION**

**WARNING! Any operation on the appliance not expressly described below must be performed by skilled personnel.**

**10.3.1** Check that the gas on-off valves are open and the electric power supply is on.

**10.3.2** (The instructions to the control panel functions which follow refer to fig. 35).

- a) Turn the room thermostat knob (E) clockwise to the maximum value.
- b) Turn switch (A) upwards to the "ON" position to start the ignition cycle. Make sure that the red LED of the "Reset" button (B) is unlit.

If it is lit, this means that the burner's control equipment is in a lockout state. In this case press the button to reset the control equipment. The red LED will turn off and from this moment the air heater startup cycle will begin.

From the moment that the burner ignites, the flame should be detected by the ionization probe within the safety time, otherwise the control equipment shuts down. This situation is indicated by the red LED (B) lighting up.

This can easily take place with a new system that still has air in its gas lines. In this case wait approximately one minute and release the unit by pressing the "Reset" button (D) to start a new cycle. Repeat this operation until the residual air has been bled off and ignition takes place normally.

**If the shutdown condition persists, this generally indicates that there is a fault or an operating defect. In this case it is recommended to contact a specialized technician.**

The exchanger heating phase will begin after the burner has been ignited (this is indicated by the green LED (C)). The exchanger will reach the rated operating temperature after approximately three minutes. At this point a thermostat will start the fan(s) for distributing warm air in the room.

When the room has reached the desired temperature, adjust the room thermostat by turning the control dial slowly (counterclockwise) until the burner turns off (indicated by the green led C). From this point on the air heater will be completely automatic and will maintain the desired room temperature.

- c) Set the most suitable ventilation for the room by means of switch (F). Turning the switch upwards will activate the minimum speed, and turning it downwards will activate the maximum speed.

#### **10.4 SHUTDOWN**

**10.4.1** To turn off the air heater for a short period of time, just use the room thermostat, just set the switch (A) to the "OFF" position, without moving the temperature regulation dial.

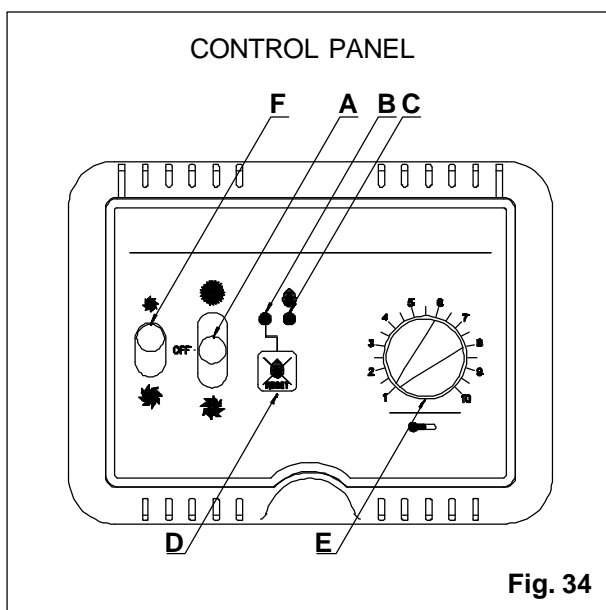


Fig. 34



**WARNING!** When the burner turns off, the fan will continue to operate for a few minutes, to properly cool the exchanger. Therefore, it is important not to turn off the air heater using the main switch, that also cuts off the power supply to the fan, since this might lead to overheating.

**10.4.2** To turn off the air heater for an extended period of time:

- a) set the switch (A) to the “OFF” position
- b) after the fan has turned off, disconnect the electric power supply at the main switch
- c) close the gas on-off valve

## **10.5 SUMMER VENTILATION**

During the summer the air heater can be used for ventilating the room by performing the following operations to deactivate the burner:

- a) Close the gas on-off valve.
- b) Activate the electric power supply by means of the main switch.
- c) Turn switch (A) to the “VENTILATION” position and use switch (F) to select the desired speed.
- d) Turn switch (A) to the “OFF” position to stop the fan.

## **11. APPLIANCE MAINTENANCE**

### **11.1 ROUTINE MAINTENANCE TO BE PERFORMED BY THE USER**

It is recommended that the following operations be carried out at the beginning of each heating season and then at least once every month during operation:

**WARNING! The operations described in points a) b) c) and d) must be performed while the air heater is not functioning, and with the gas and electric supplies turned off.**

- a) check that the external terminal of the intake/exhaust duct is not obstructed or that the flueing arrangement has not deteriorated
- b) Use just a damp cloth to clean the unit's external parts. At the most you can use a mild detergent.
- c) Make sure that the air circulation slits in the remote-control panel (WR and WD) are not obstructed by dust as this could cause the room temperature probe to detect incorrect values. Use a soft brush to clean it.
- d) Use compressed air or a vacuum cleaner to clean the air intake filter (W and WR). The air filter must be cleaned more frequently if the unit is installed in a dusty area.

**The filter must be cleaned very carefully, because if it does not function correctly, the entire unit's functioning could be adversely affected.**

- e) make sure that the operation of the appliance is normal, as described in point 10.3.

### **11.2 ANNUAL AIR HEATER INSPECTION**

To reduce possible failures to a minimum and to keep the air heater operating at peak efficiency, it is recommended that a general inspection of the air heater be carried out at least once a year by skilled personnel.

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