

de pala

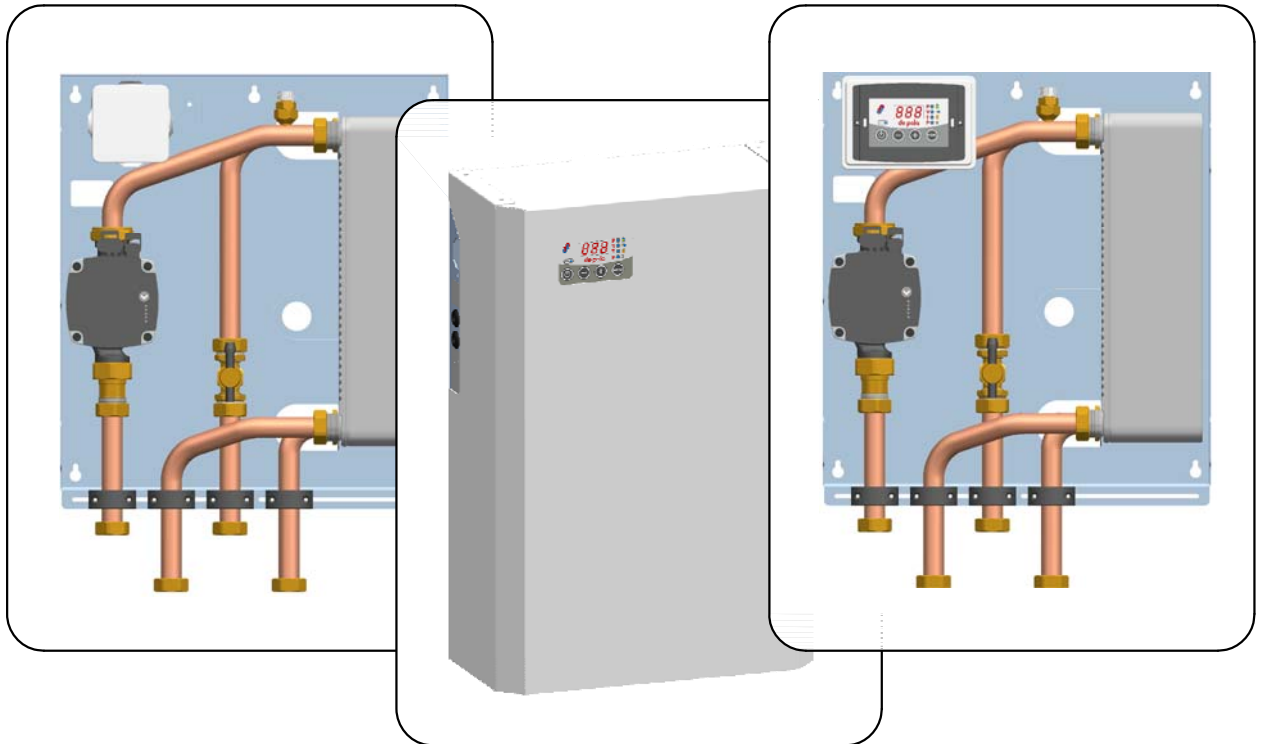
Italian OEM Technology

INSTRUCTION MANUAL

BOX FIRE SERIES BF6

BOX FOR PRODUCTION OF DOMESTIC HOT WATER FROM
A STORAGE TANK WITHOUT LEGIONELLA BACTERIA RISK

serie: _____
codice: B F 6



- 1. OPERATING AND TECHNICAL FEATURES**
- 2. INSTALLATION GUIDE**
- 3. OPERATION AND MAINTENANCE**
- 4. WARRANTY**

de pala Thanks the customer for purchasing our interface heating module used in hot domestic water production from a storage tank

de pala has edited this manual to provide all the necessary information for installation, maintenance and usage for its product Box Fire BF6, therefore these instructions must remain always with the module, as an integred part of it.

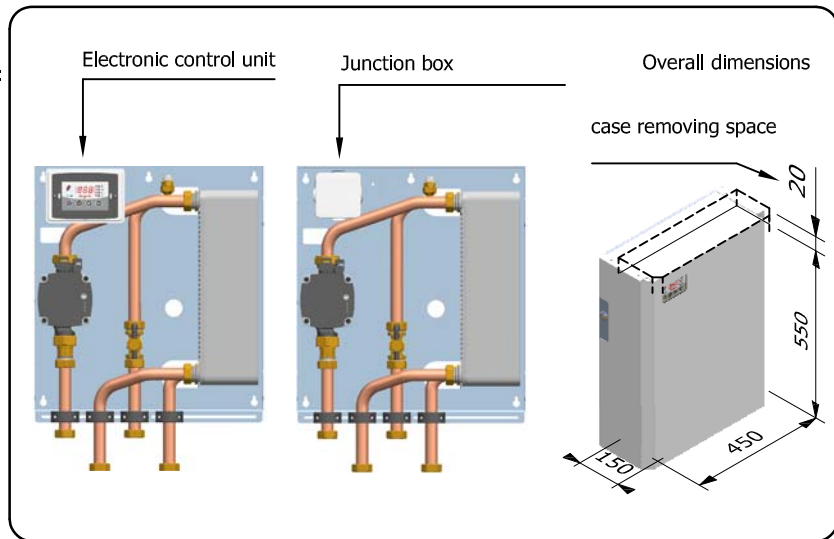
1 OPERATING AND TECHNICAL FEATURES

1.1 WORKING AND HYDRAULIC SCHEME

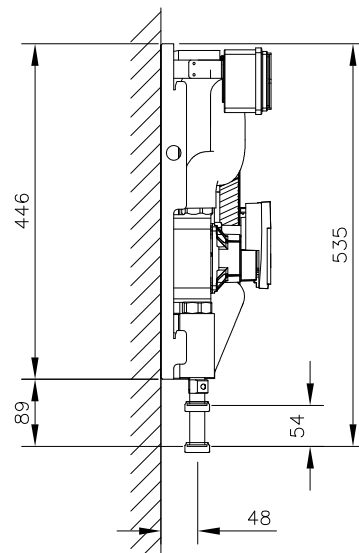
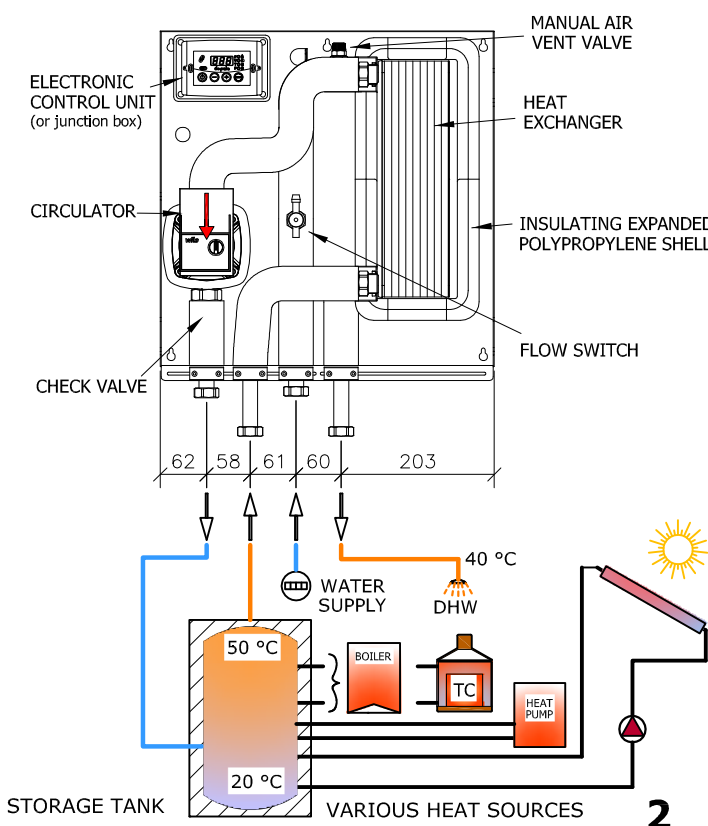
BOX FIRE BF6 is a pre-assembled module that allows to produce DHW from a storage Tank which can be heated by several sources: Boiler, Heat Pump, Fireplace, Solar Cell Panel.

Box Fire module BF6 allows separation between primary and secondary circuits, with an optimal warmth transfer due to an heat exchanger (see diagram at page 3).

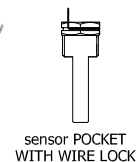
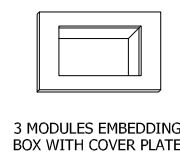
BF6 prevents water ponding, reducing legionella bacteria risk.



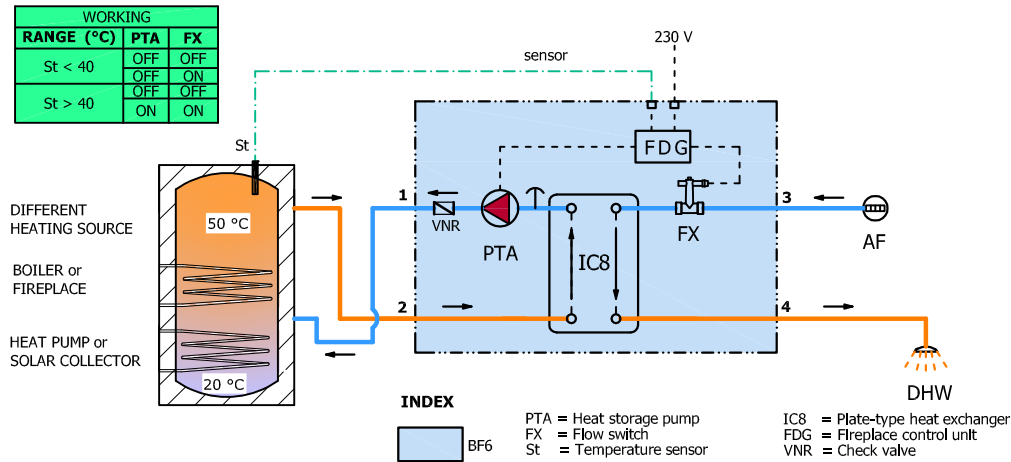
MAIN COMPONENTS AND HYDRAULIC CICUITS



OPTIONAL KITS (IR and IC types)



BOX FIRE BF6 - GENERAL WORKING SCHEME



WORKING

Thanks to FDG, PTA circulator is activated if storage tank temperature is at least 40 °C (*) and flow switch notes water (minimal flow rate equal 3 liter per minutes).

Modules without control unit must follow the working principle explained above.

WARNING - SCORCH DANGER: to prevent water overheating insert mixing valve.

(*) Default temperature value set in control unit (see control unit instructions in pages 6-7).

1.2 TECHNICAL FEATURES

BOX FIRE BF6 model::

- **mod. BF62** (to exchange power up to **25 kW** → Fireplace power **35 kW**)
- **mod. BF63** (to exchange power up to **35 kW** → Fireplace power **50 kW**)
- **mod. BF64** (to exchange power up to **50 kW** → Fireplace power **70 kW**)

All BOX FIREs can be supplied with case and control unit (already connected)..

<p>Input: 230 Vac Max working temperature: 90 °C Max working pressure: 6 bar Heating circuits pipe fitting: Ø 3/4"</p>	<p>Circulator connections 1", Distance between centers 130 mm Circulator Absorbed power: max 52 W Grundfos max 45 W Wilo Plate-type heat exchanger brazed welding Heat exchanger Insulating shell in expanded polypropylene Pipes insulated Zinc plated steel frame 12 / 10 Bright steel case painted white RAL 9016</p>
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Below values (customized) indicate input storage temperature for control unit that activate many components in sequence:

Thermostat PTC: 30 °C → Not used in this BF6 model

Thermostat VALV: 40 °C → Pump drives for domestic hot water when flow switch contacts are closed

Thermostat PIR: 70 °C → Not used in this BF6 model

CIRCULATOR 7 m GRUNDFOS - 4 SPEEDS



WORK AND SPEED LEDS

Normal working



- green
- yellow leds in accord to absorbed power

Press 2 seconds to enter in speed mode. Leds blinking. Press fast to change speed and select wished curve.

SPEED 1



- red
- yellow
-
-
-

SPEED 2



- red
- yellow
-
- yellow
-

SPEED 3



- red
- yellow
-
- yellow
- yellow

SPEED 4



- red
- yellow
-
-
- yellow

Choose speed and wait that circulator returns in normal working. Speed 4 is default selected.

ALARM STATE



- red
 -
 -
 -
 - yellow
- lock rotor



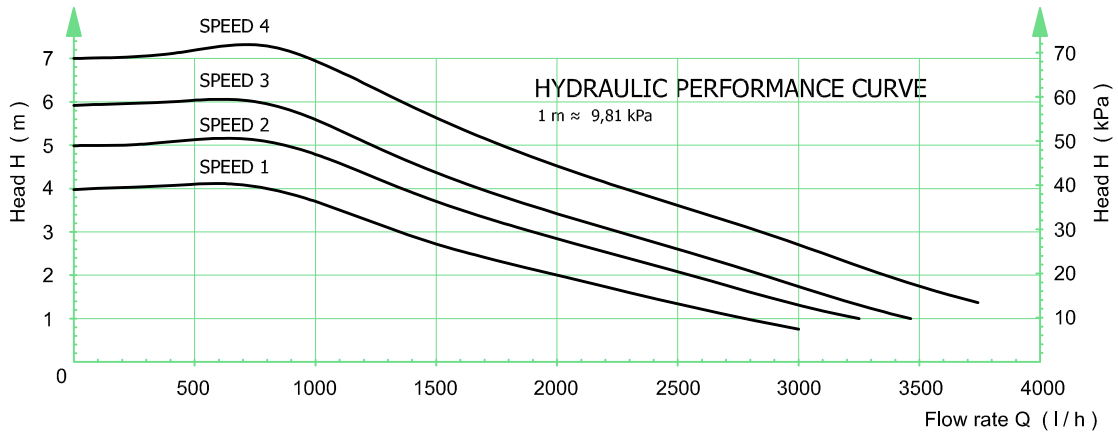
- red
 -
 -
 -
 - yellow
- low voltage supply



- red
 -
 -
 -
 -
 -
 -
 -
 -
- electronic fault

Circulator has mechanics device for rotor releasing. To use it operate to the screw in center of the pump, pushing and spinning it. Electric sheathing for electric motor isn't required.

Input : 230 Vac single-phase
 Absorbed power: 2÷52 W (EEI≤0.20)
 Max working pressure: 10 bar
 Fluid temperature: +2 ÷ 110 °C
 Pipe fitting IN / OUT: 1" GAS
 Distance between centers: 130 mm
 Insulation class: IP 44
 Body material: Cast iron



CIRCULATOR 6 m WILO - 3 SPEEDS or Δp-V MODE

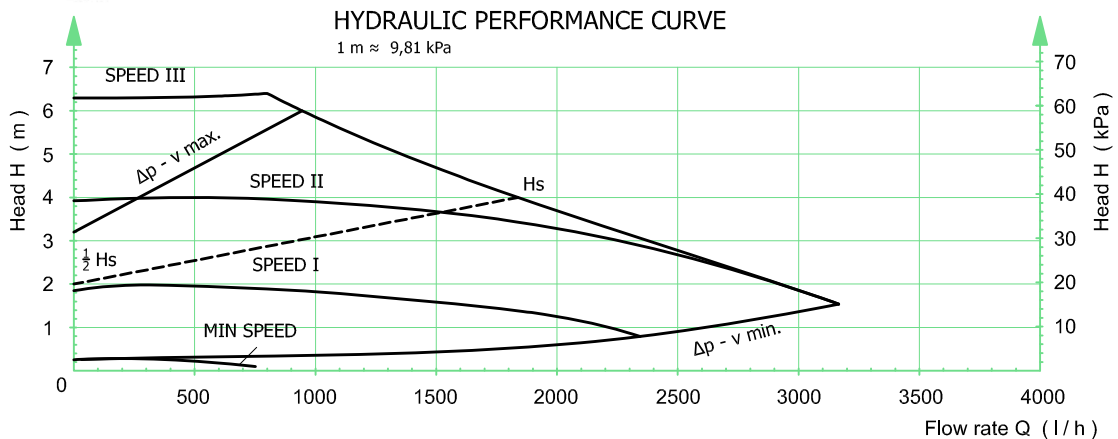


Input : 230 Vac monophase
 Absorbed power: 3÷45 W (EEI≤0.20)
 Max working pressure: 6 bar
 Fluid temperature: 0 ÷ 100 °C
 Pipe fitting IN / OUT: 1" GAS
 Distance between centers: 130 mm
 Insulation class: IPx4D
 Body material: Cast iron with cathaphoresis treatment

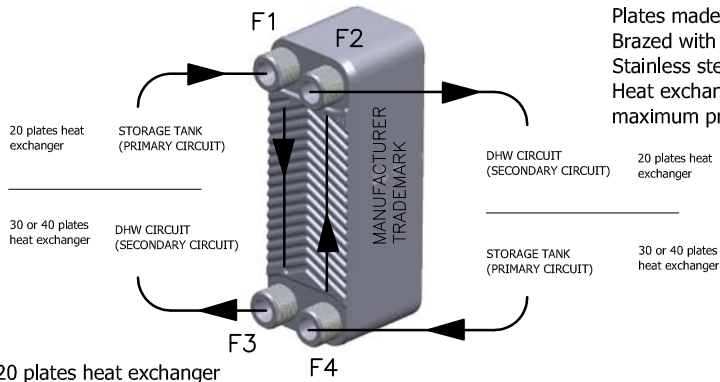
PERFORMANCE CURVE SELECTION

Spinning red knob to set Δp-V value (3 selectable speeds) where head change linearly from 1/2 Hs to Hs, with Hs dependent to knob position.

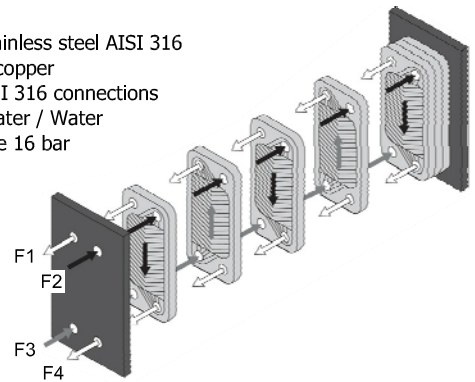
Circulator has anti-lock rotor and motor protections systems from overheating, overtension, shutdown and dry running



HEAT EXCHANGER



Plates made of stainless steel AISI 316
 Brazed with pure copper
 Stainless steel AISI 316 connections
 Heat exchange Water / Water
 maximum pressure 16 bar



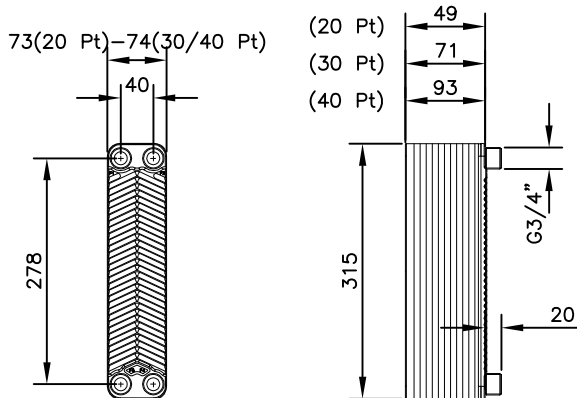
20 plates heat exchanger

Primary circuit fluid (storage tank) releases heat and circulates between the connections F1 and F3.
 Secondary circuit fluid (DHW circuit) absorbs heat and circulates between the connections F4 and F2.
 Connections F2 and F4 of the secondary circuit are positioned at the trademark manufacturer side.

30 or 40 plates heat exchanger

Primary circuit fluid (storage tank) releases heat and circulates between the connections F2 and F4.
 Secondary circuit fluid (DHW circuit) absorbs heat and circulates between the connections F3 and F1.
 Connections F2 and F4 of the primary circuit are positioned at the trademark manufacturer side.

It is highly recommended to connect the pipes in order to have liquids flowing in counter current as shown on the drawing below.



OVERALL DIMENSIONS
 mod. **IC8**

HEAT EXCHANGER PERFORMANCE - BF6 WITH HEAT STORAGE TANK

BOX FIRE MODEL	BF63	BF64
N° PLATES	30	40
PRIMARY FLOW RATE l/h	1900	2250
IN / OUT STORAGE CIRCUIT TEMPERATURE °C	50 / 30	50 / 30
PRESSURE DROP ON PRIMARY CIRCUIT	1,6 m (*)	1,5 m (*)
PRESSURE DROP ON SECONDARY CIRCUIT	2,2 m (*)	1,9 m (*)
DOMESTIC WATER FLOW RATE l/min	25	30
IN / OUT DOMESTIC WATER TEMPERATURE °C	15 / 40	15 / 40
EXCHANGED POWER kW (**)	44	52

HEAT EXCHANGER PERFORMANCE - BF6 WITH FIREPLACE

BOX FIRE MODEL	BF62	BF63
N° PLATES	20	30
PRIMARY FLOW RATE l/h	1400	2000
IN / OUT STORAGE CIRCUIT TEMPERATURE °C	80 / 65	80 / 65
PRESSURE DROP ON PRIMARY CIRCUIT	1,7 m (*)	1,7 m (*)
PRESSURE DROP ON SECONDARY CIRCUIT	0,4 m (*)	0,7 m (*)
DOMESTIC WATER FLOW RATE l/min	10	14,4
IN / OUT DOMESTIC WATER TEMPERATURE °C	15 / 50	15 / 50
EXCHANGED POWER kW (**)	25	35

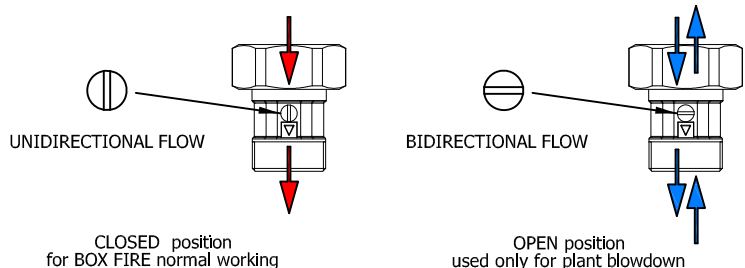
(*) 1 m ~ 10 kPa (**) 1 kW ~ 860 kcal / h

CHECK VALVE



Check valve
 mod. **VNR34**
 Brass body
 Threaded unions
 3/4" male
 1" female

To change positions spin 90° the pawl, with screwdriver



ELECTRONIC CONTROL UNIT WITH 3 ADJUSTABLE THERMOSTAT FDG

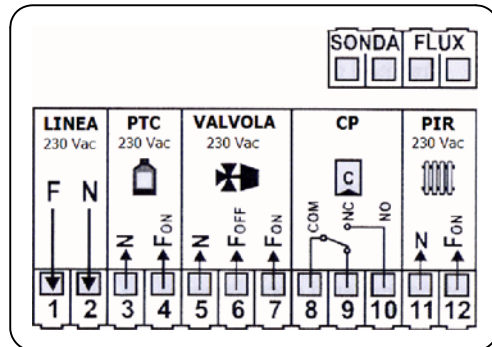
OPERATING INSTRUCTIONS



Working leds

- P Fireplace pump on
- V Valve on
- T Boiler off
- P Pump Heat. Plant on

ELECTRICAL BOARD



INPUT: 230 Vac - 50 Hz / Fuse 3.15 A

ABSORBED POWER: 2 VA

OVERALL DIMENSIONS: 120 x 80 x 50 mm

DEFAULT SETTING: Pump enabled at 40 °C

INPUT	sensor		Heat storage sensor	Range temperature 0 + 100 °C (+/- 1 °C)	NTC 10 kΩ a 25 °C		
	FLUX		Flow switch	Input ON / OFF	Cloused contact = hyphen appears on display device		
THERMOSTAT A04 (30 °C)	PTC		NOT USED	Output 230 Vac 5 A max	3 (N)	4 (F. ON)	
THERMOSTAT A05 (40 °C)	PTA		circulating pump	Output 230 Vac 5 A max in deviation	5 (N)	6 (F. OFF)	7 (F. ON)
THERMOSTAT A06 (70 °C)	CP		NOT USED	Free contacts 250 V 5 A max	8 (COM)	9 (NC)	10 (NO)
	PIR		NOT USED	Output 230 Vac 3 A max	11 (N)	12 (F. ON)	

CENTRAL UNIT FDG FUNCTIONS

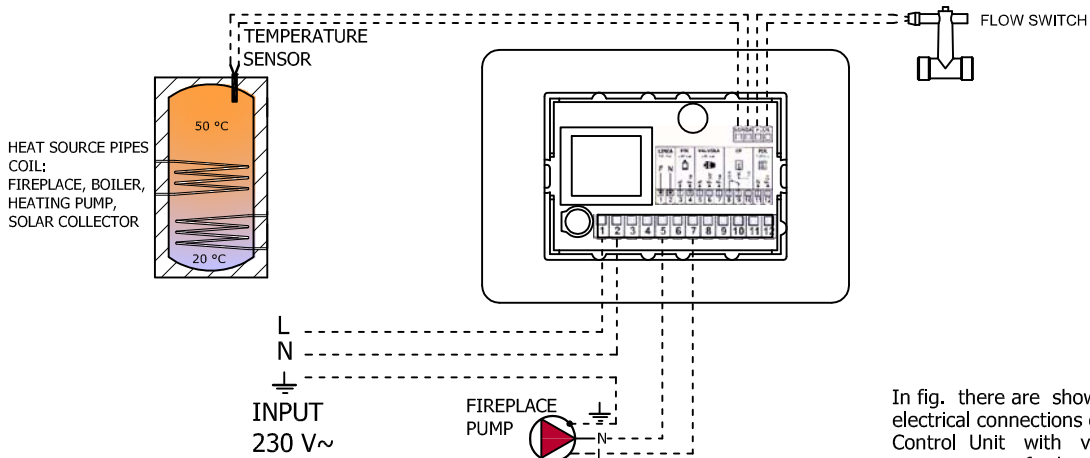
1. ON / OFF

Push for some seconds button to switch controller ON / OFF
 - State OFF is signalled by OFF led lighting

2. ALARM FUNCTION

If input temperature readed by SENSOR is over Alarm value thermostat **A01 (92°C)**:
 - the acoustic and visual signal is activated
 - the acoustic signal can be OFF for 5 minutes pushing any button (**SILENCE function**)
 - after those 5 minutes, if alarm condition still ON, acoustic signal start again

DIAGRAM OF FUNCTIONS OF CENTRAL UNIT mod. FDG



In fig. there are shown the electrical connections of the Control Unit with various components of the Plant: Fireplace, Boiler, Valve for domestic hot water, Fireplace pump, Heating Plant pump.

3. ANTI FREEZING FUNCTION - NOT USED

If the temperature read by the sensor is under the value of the Anti freezing thermostat **A03 (6°C)**:

- Fireplace pump PTC is ON
- The display shows **ICE**

4. STANDBY FUNCTION

If the system is **OFF** in condition of **ALARM** or **ANTI FREEZING**:

- The device starts **ON**

5. ANTIBLOCK PUMP (PTC and PIR) FUNCTION

If the PTC or PIR are off for a time over Timer Antiblock **t01**

(about a week):

- The output **PTC** or **PIR** are activated for **t02 seconds** (30 sec) therefore pumps are on
- display shows **blP**

The function is ON also in **STANDBY**

6. TEST PTC FUNCTION - NOT USED

Press \ominus button:




- **PTC** Pump will be ON until you release the button
- The display shows **tSt**

7. TEST PIR FUNCTION - NOT USED

Press \oplus button:

- **PIR** Pump will be ON until you release the button
- il display shows **tSt**




8. MAIN MENU

Enter MENU (MENU), now can see thermostat value and the corresponding led will blink   

To change value go on this:

- through \oplus increase value
- through \ominus decrease value

Wait 10 seconds or scroll all parameters whit MENU (MENU)

MAIN MENU PARAMETERS (*)		LED	MIN	DEFAULT	MAX	TYPICAL VALUES
Fireplace pump thermostat PTC	A04		25	30	85	NOT USED
Circulation pump PTA	A05		25	40	85	45
Heating pump thermostat PIR	A06		25	70	85	NOT USEDE

(*) (CUSTOMIZED)

BF6 use only A05 thermostat (40 °C)

SENSOR OF TEMPERATURE

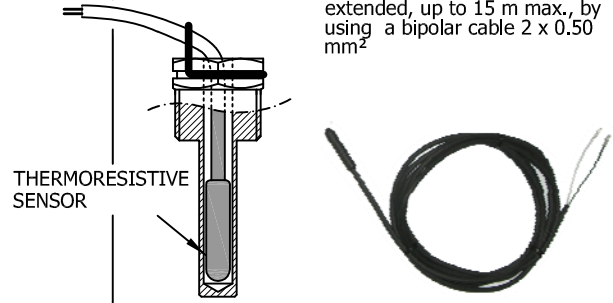
Measures and checks water temperature.

It is made of a thermoplastic capsule $\varnothing 6 \times 30$ mm and of a cable $\varnothing 3.2$ mm diameter, lenght 2 m, bipolar (2 x 0.30 mm²).

Inside the capsule there is a thermoresistive sensor type **NTC 10 k Ω \pm 1% a 25 °C**.

Sensor of temperature works in the range of temperature -50÷120 °C, has a time of response of about 6 sec, is electrically insulated >20 M Ω at 500 Vac and IP68 protected.

It must be used inside the brass pocket.
In case of necessity the connection Sensor cable can be extended, up to 15 m max., by using a bipolar cable 2 x 0.50 mm²



9. OUTPUT MANAGEMENT - NOT USED

If the temperature measured by the sensor is over **A04 (30 °C)** thermostat:

- **PTC** pump will be ON (**Fireplace pump**)

If the temperature measured by the sensor is over **A07 (70 °C)** thermostat:

- **PIR** pump will be on (**heating pump**)
- The boiler pump will be OFF

10. DOMESTIC HOT WATER FUNCTION

If the temperature is over **A05 (40 °C)** thermostat

And if the temperature is under **A02 (95 °C)** thermostat

And if the Flow Switch contact is closed (FLUX ON) because there is hot water request (the display shows the top-left segment)

- The pump starts running to produce DHW

11. INSTALLER MENU (the admission to this menu is only for INSTALLERS or EXPERT PERSONNEL, because modified parameters could damage the product or could make the product not fit for the applications)

To enter the MENU push **together** buttons MENU (MENU) e \uparrow for about 5 seconds

To visualise the parameters use buttons \oplus and \ominus

To visualise the parameter value push button MENU (MENU)

To modify the value push buttons \oplus or \ominus **together** with button MENU (MENU)

To see the list of the parameters and memorise push button MENU (MENU)

To exit and memorise wait about 10 seconds

INSTALLER MENU PARAMETERS		CODE	MIN	DEFOULT	MAX	notes
Control unit main setting		CFG	1	1	50	1 = single sensor mode, 2 = double sensor mode 20 / 30 / 40 / 50 = not available mode
ALARM thermostat (°C)		A 01	85	92	99	
SECURITY thermostat (°C)		A 02	20	95	99	
ANTI FREEZING thermostat (°C)		A 03	4	6	8	not used
ANTI CONDENSATE thermostat (°C)		A 07	25	40	85	not used
Differential thermostat S1-S2 (°C)		A 31	2	5	20	used in configuration n°2 only
Hysteresis PTC thermostat (°C)		i 04	1	2	20	not used
Hysteresis PTA thermostat (°C)		i 05	1	2	20	
Hysteresis PIR thermostat (°C)		i 06	1	2	20	not used
Hysteresis anti condensate thermostat (°C)		I 07	1	2	20	not used
Hysteresis VALVE thermostat (°C)		I 15	1	2	20	used in configuration n°2 only
Hysteresis differential thermostat (°C)		I 31	1	1	10	used in configuration n°2 only
ANTI BLOCK timer (h)		t 01	1	168	255	not used
Time of activation pump ANTI BLOCK (sec)		t 02	0	20	99	not used
Safety		P01	0	1	1	0 = off; 1 = on

12. SIGNAL FAILURE OR ALARMS

Blinking message **LO** (out of range to the low temperature - under 0°C) = **SENSOR BROKEN**

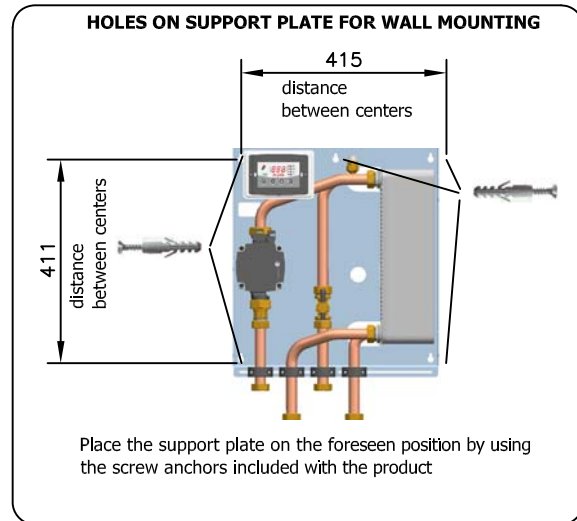
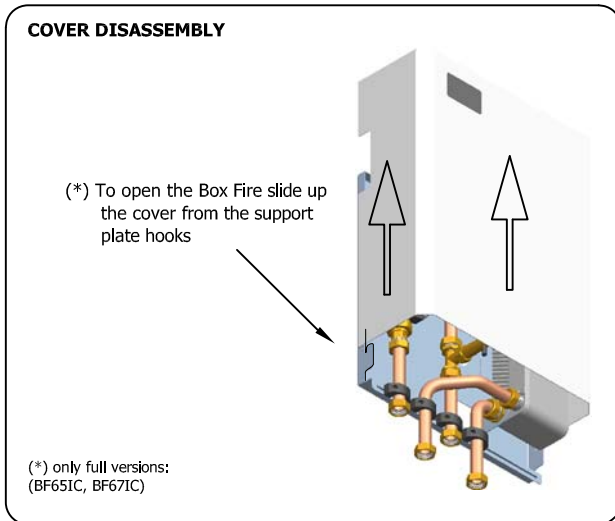
Blinking message **HI** (out of range to the high temperature - over 100°C) = **SENSOR IN SHORT CIRCUIT**

2 SETTING

Installation of this product should follow proper working rules, according to the requirements of the present manual and **in compliance with laws and regulations of each country, by skilled personnel** who will assume the responsibility of the work.

2.1 POSITIONNING AND WALL MOUNTING

All modules BOX FIRE have a **support plate** for wall mounting on which are assembled all hydraulic and electric components, connected, wired and tested. The full equipped version includes a protective cover for the whole product. To install the module, the protective cover must be removed.



2.2 HYDRAULIC CONNECTIONS

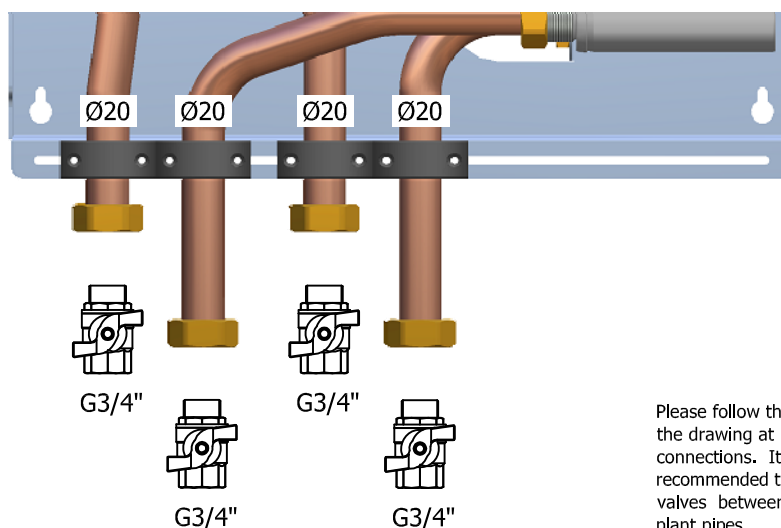
It is necessary to avoid forcing and twisting the copper connections to ensure a long last of the module. To counteract the torque exerted on the connecting pipe folder with the plumbing, hold the nut of the pipe to be connected by using a wrench or similar.

INTERNAL HYDRAULIC TEST

To prevent leak and ensure perfect seal of the components, every single Box Fire module is internally tested in a hydraulic circuit under 6 bar of pressure before delivery.

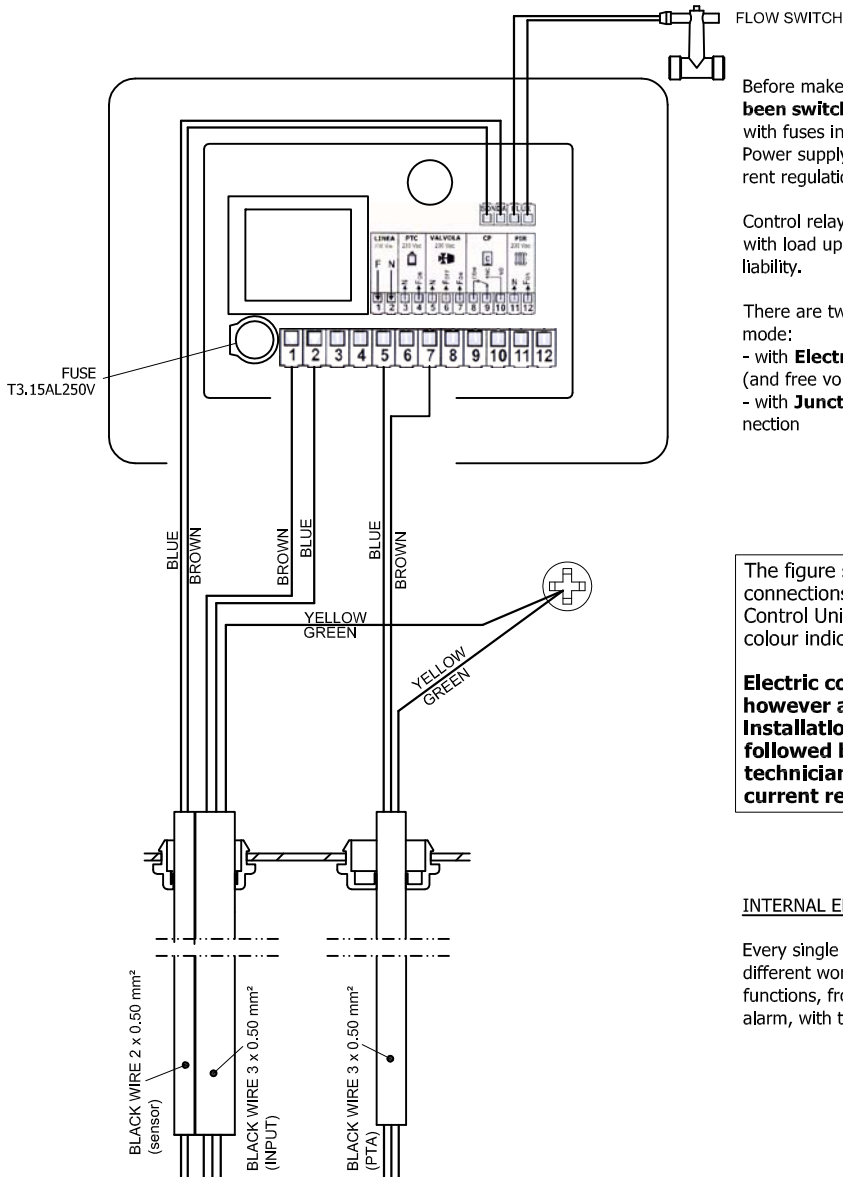
Once the module has been positioned it is necessary to tight all the nuts on the copper pipes. Heating circuit pipes mount Ø20 mm nuts; sanitary water pipes mount Ø14 mm nuts. For an easier maintenance of the Box Fire it is highly recommended to insert manual on-off valves Ø3/4" gas male attachments between the module and the plant pipes.

HYDRAULIC CONNECTIONS



Please follow the instructions shown on the drawing at page 2 for hydraulic connections. It is strongly recommended to insert manual on - off valves between the module and the plant pipes.

2.3 WIRING HARNESS



Before make electric connections, **be sure that power supply has been switched off**. Connect power supply line to a two-pole switch with fuses including earth connection. Power supply line to the Box Fire must be installed according to current regulations.

Control relay is guaranteed only for the motor pumps and valves with load up to 100 W, misuse releases the manufacturer from any liability.

There are two different electric wiring, depending on the Box Fire mode:
 - with **Electronic Control Unit**: white colour cable for power supply (and free voltage signal to boiler)
 - with **Junction Box** (without control unit): terminals for wiring connection

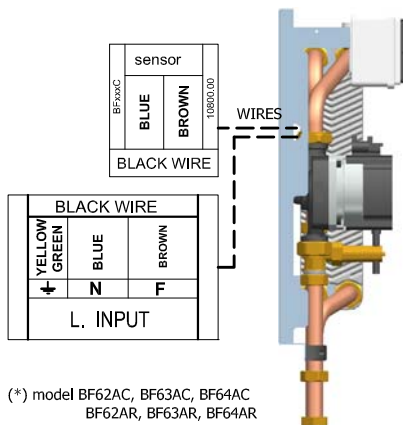
The figure shows the electric connections inside Electronic Control Unit, with cables and wires colour indication.

Electric connections and however any maintenance or Installation work has to be followed by a skilled technician according to current regulations.

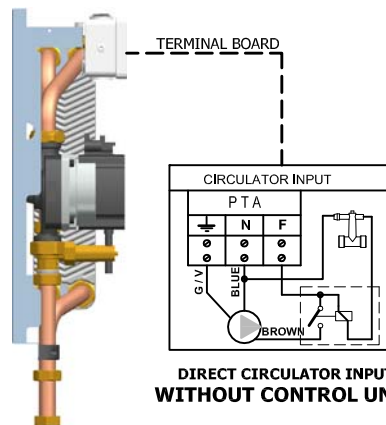
INTERNAL ELECTRIC TEST

Every single Electronic Control Unit is tested before delivery under different working situations to verify the correct working of its functions, from Anti Freezing alarm to max. operative temperature alarm, with temperature from 2 to 99 °C

ELECTRIC CONNECTIONS with Electronic Control Unit (*)

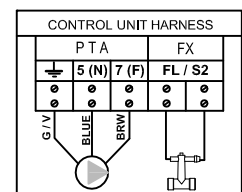


CONNECTIONS WITH TERMINAL BOARD BOX FIRE without control unit (*)



! WARNING !

With De Pala Control unit FDG observe following scheme



3 FIRST STARTING AND MAINTENANCE

Before installing the module it is necessary to clean carefully system circuits. Dirt inside circuits may cause module malfunction. Once the electric and hydraulic Box Fire connections have been completed it is necessary to load open vessel circuits and also to load expansion vessel circuits up to foreseen pressure values.

To ensure a correct functioning of the circulation pumps, both primary and secondary circuits must be completely free of air inside. Use the air vents mounted on the top pipes of the Box Fire and the central screw of the circulation pumps to vent out the circuits completely.

WARNING! Switching on circulation pump with air inside the circuits may cause overheating and generate definitive damages on its MOTOR. Misuse releases the manufacturer from any liability.

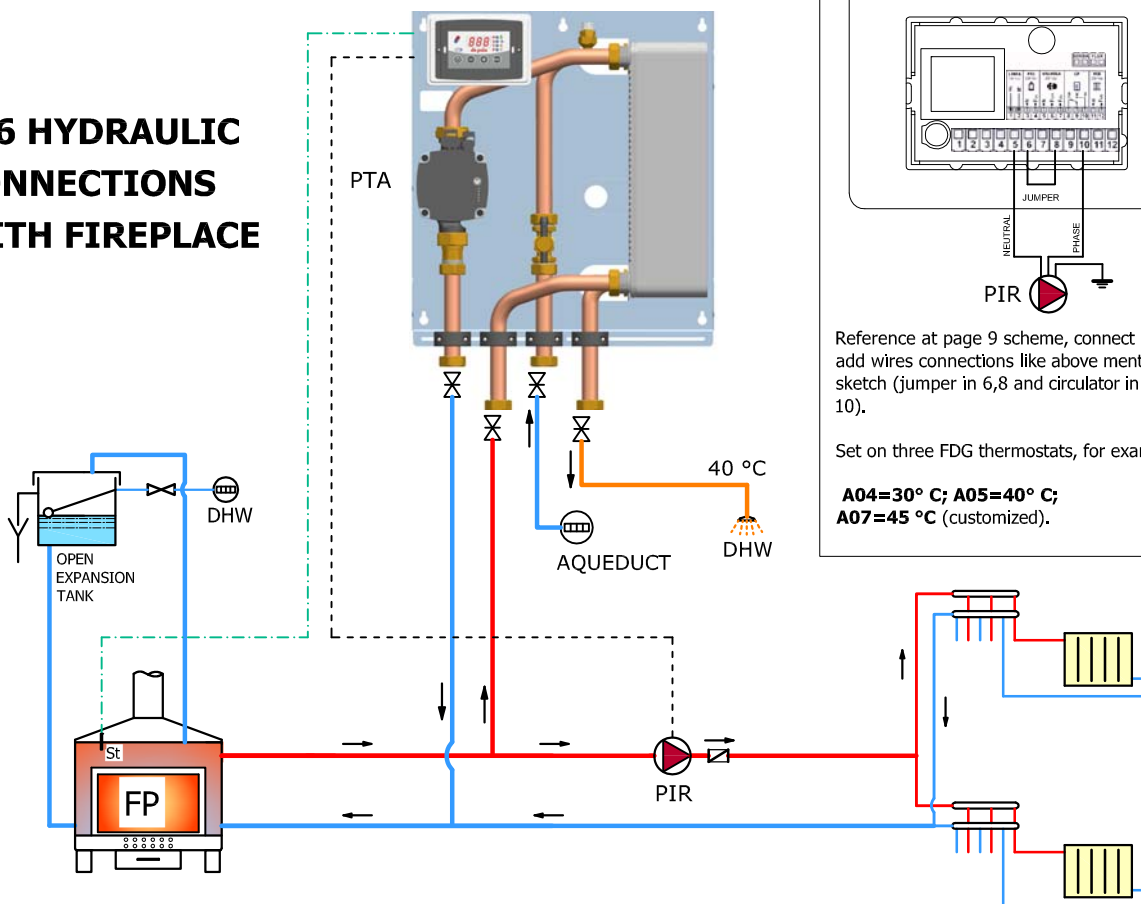
Heat up the sensor with a lighter or a hair dryer to test works of BOX FIRE pumps. Verify complete absence of water leak on primary and secondary circuit with both circuits under pressure. Circulator pumps have different speeds to be selected manually depending on hydraulic plant features and on the basis of the technical data flow foreseen by the technical planner. Default speed is the maximum one.

Maintenance of Box Fire and its components have to be made by well skilled personnel according to current regulations and following this instruction manual. Before proceeding with maintenance operations, please be sure that **power supply has been switched off** . Before proceeding with extraordinary maintenance operations that requires to move / disconnect the Box Fire, please be sure that manual on-off valves have been closed completely.

BF6 AND FIREPALCE EXAMPLE CONNECTION

PIR can be controled by BOX FIRE comand unit or fireplace comand unit. BF6 pump is driven by BOX FIRE FDG in accord to its temperature sensor at 40 °C with flow switch agreement. In case pumps work together, total flow rate will be divided inversely to primary heating exchanger circuit loss of head.

BF6 HYDRAULIC CONNECTIONS WITH FIREPLACE



3.1 TROUBLESHOOTING

<u>ISSUE</u>	<u>CAUSE</u>	<u>SOLUTION</u>
Control Unit show LO indication	sensor issue Ambient temperature below 0 Freeze risk	Verify sensor wiring on control unit terminals. Verify sensor cable conditions. Verify sensor conditions.
Control Unit show HI indication	sensor in short circuit Fireplace temperature > 100 °C	Fireplace is in overheating condition. Blow out the fire and vent out Fireplace circuit. If Fireplace is not working verify sensor conditions with a professional Tester
Control Unit doesn't work	Missing power supply	Verify Box Fire input by 230 Vac power supply. Check control unit fuse conditions.
Control Unit doesn't show flow switch hyphen	Flow switch and wiring defects	When DHW flow, with tester verify flow switch closing output

4 WARRANTY



PURCHASE DATE __ / __ / ____

<p>LABEL WITH CODE AND SERIAL NUMBER</p> <p>BOX FIRE BF6</p> <p>SERIES: _____ . _____</p> <p>CODE: <u> B F 6 </u> _____</p>
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Dear Customer,

Thank you for purchasing a De Pala product. Please read all instructions carefully before operation, to ensure your complete understanding and to obtain the best possible performance from the unit.

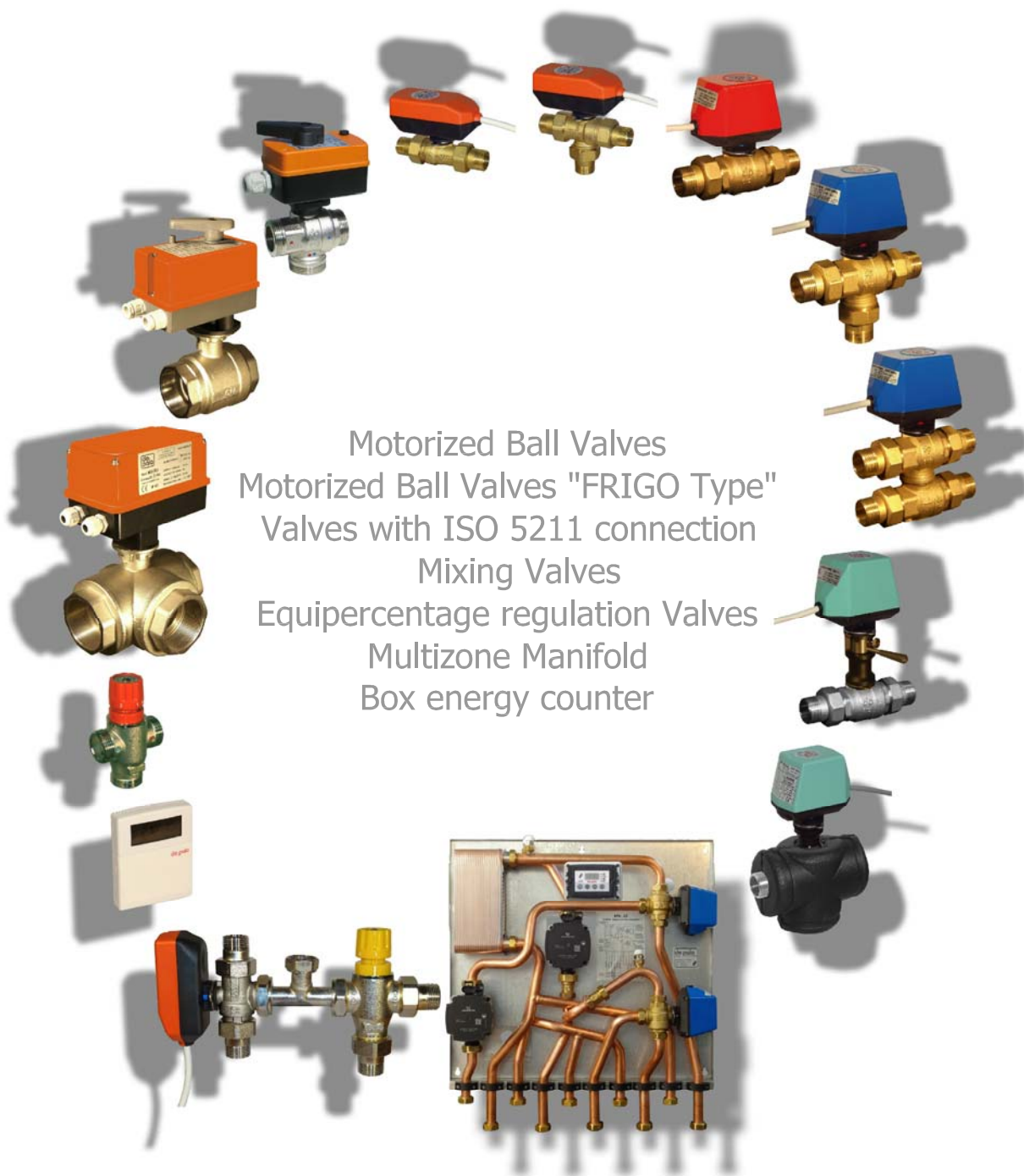
Validity of the present warranty is subject to the following four conditions:

- 1) Code and Serial Number of the Box Fire written on the above label have to correspond to the label on the back plate of the Box Fire bought;
- 2) Write the purchase date and keep the invoice;
- 3) Fill in the Warranty form with all necessary data;
- 4) Send the form to the manufacturer De Pala within 8 days from purchase


Despite careful testing of our equipment, component or functional failures may occur. De Pala grants a warranty for a period of 24 months from the manufacturing date which is stamped on. During this period De Pala undertakes to repair or replace the equipment, whatever defect it presents, free of charge.

Warranty does not include costs of transporting equipment to and from the repair workshop. No liability is taken from any other claims which may arise due to consequential damage arising from the use of De Pala's products. The present warranty is the only valid warranty. Eventual adulteration or falsification of the Warranty form and / or the present sheet nullify the warranty. De Pala Company guarantee its products only to customers with valid purchase invoice and warranty form filled completely.

FURTHER DE PALA PRODUCTS



Motorized Ball Valves
Motorized Ball Valves "FRIGO Type"
Valves with ISO 5211 connection
Mixing Valves
Equipercantage regulation Valves
Multizone Manifold
Box energy counter

 **de pala**

Via del Lavoro, 10 · 33080 Roveredo in Piano (Pordenone) · ITALY
Tel. +39 0434 920466 +39 0434 923166 Fax +39 0434 591473
e-mail: info@depala.it web: www.depala.it