

HYDROTHERMAL SYSTEMS
COMPARATO®

www.comparato.com



D NELLO SRL

**MOTORIZED VALVES INSTRUCTION MANUAL
DIAMANT 2000 / DIAMANT PRO**

with *patented* "ALL IN ONE" system



DIAMANT 2000
DATA SHEET



DIAMANT PRO
DATA SHEET

Certified Quality System UNI EN ISO 9001/2008

Diamant 2000

Diamant PRO

The **Diamant 2000 / Diamant PRO** series are the leading models of Comparato's range of products, for both industrial and residential purposes.

Diamant 2000



Diamant PRO

NAME:

The following data are indicated on the housing of the actuator:

- **Trademark and name of the manufacturing company:** Hydrothermal systems
COMPARATO NELLO s.r.l.
Viale della Libertà, 53 • Località Ferrania
17014 Cairo Montenotte (SV) • ITALY
- **Models:** DIAMANT 2000 / DIAMANT PRO
- **Production date:** Year
- **EC regulations compliance**
- **Supply voltage**
- **Type of connection**
- **Auxiliary micro switch, if any**
- **Wiring diagram (inside the cover)**

USE

Diamant 2000 / Diamant PRO motorised valve are specifically used for the interception and regulation of fluids in:

- zone heating systems
- systems using alternative energy
- industrial systems in general using hot and cold fluids
- automation systems in general
- glycol cooling systems
- chemical industry and pharmaceutical industry systems

Diamant 2000 Diamant PRO

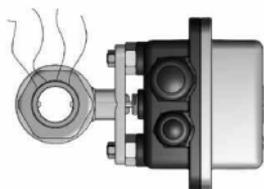
INSTALLATION

CAUTION! FOR ALL DIAMANT 2000 / DIAMANT PRO ACTUATORS

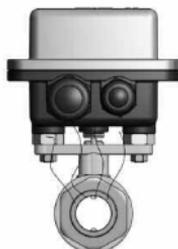
Once installed, the actuator connection should not be at the bottom of the valve. When the valve works with low-temperature fluids (potential frost formation on the valve stem) or with high-temperature fluids (danger of actuator overheating), it is advisable to install it in the **correct position**, as shown in the picture.

2-WAY BALL VALVE:

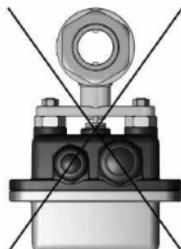
The 2-WAY **Diamant 2000 / Diamant PRO** have no constrained flow direction, therefore their installation is not particularly difficult: in fact, the cut-off is made up of a ball with a through hole. The actuator is supplied in the open position. The installation should be carried out as shown in the picture.



RECOMMENDED POSITION



ALLOWED POSITION



FORBIDDEN POSITION

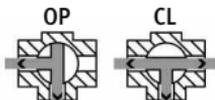


HORIZONTAL 3-WAY BALL VALVE:

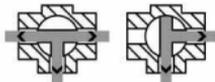
Available version with "T" BALL (3 holes) and "L" BALL (2 holes).
HORIZONTAL 3-WAY versions are available with 2 different balls and a total of 5 hole positions.
BIDIRECTIONAL engine, 90° operation.

POSITIONS LAYOUT AND BALL HOLES MOVEMENT

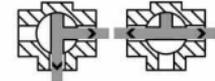
POSITION
T1 - T4



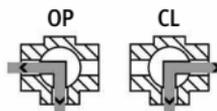
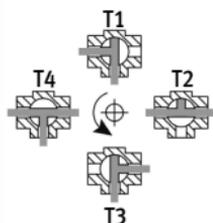
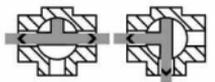
POSITION
T4 - T3



POSITION
T3 - T2



POSITION
T2 - T1



POSITION
L1 - L2

Diamant 2000 Diamant P30



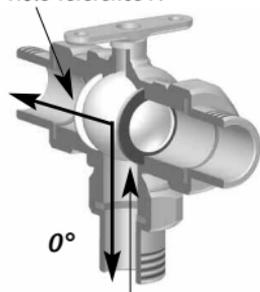
3-WAY VERTICAL BALL VALVE WITH 2-HOLE BALL (DIVERTER)

The 2-HOLE ball version should be used when fluids must not come into contact during the operation phase (deviation).

One of the ball holes (B) is constantly pointed towards the common way of the ball valve, while the other one (A) can be aligned to one of the opposed ways or to the other, with a 180° rotation.

During the movement, there is no fluid mixing.

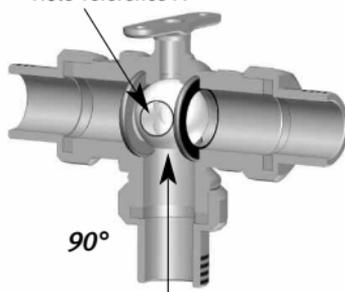
Hole reference A



0°

Hole reference B

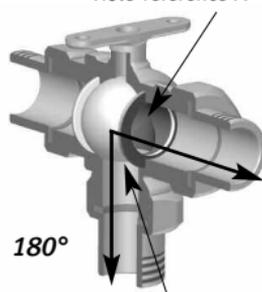
Hole reference A



90°

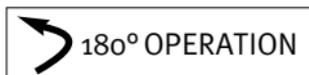
Hole reference B

Hole reference A



180°

Hole reference B



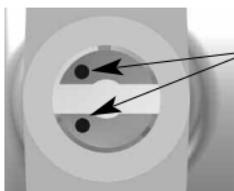
CONTROL ROD, PLAN DETAIL

The ball valve is supplied in **POSITION 1**. Referring to the ball valve as shown in the picture, the communicating ways are the **LEFT** and the **BOTTOM** ones.

During the operation, the fluid flow is progressively cut off on the **LEFT** side; the flow remains interrupted for a few seconds and then is progressively opened again, on the **RIGHT** side. The actuator rotates 180° and the ball rotates counter clockwise.

Now the communicating ways are the **RIGHT** and the **BOTTOM** ones.

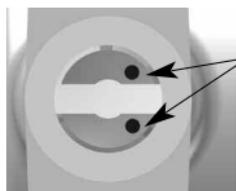
POSITION 1



Hole reference A

0°

POSITION 2



Hole reference A

180°

Diamant 2000 Diamant P30

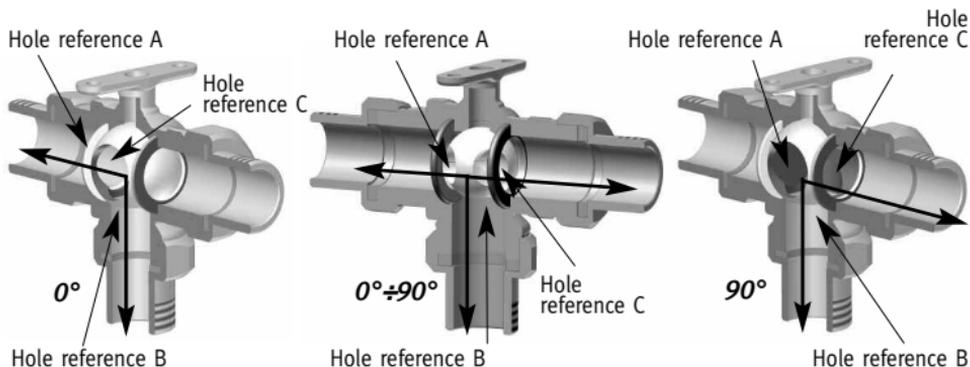


3-WAY VERTICAL BALL VALVE WITH 3-HOLE BALL (MIXING)

The 3-HOLE ball version should be used when fluids must come into contact during the operation phase (mixing).

One of the ball holes (B) is constantly pointed towards the common way of the ball valve, while the other two holes (A & C), placed at 90° to each other, allow the full flow between one of the two opposed ways and the common (central) one, or any intermediate mixing position.

The complete operating angle is 90°.

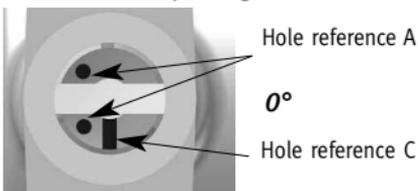


CONTROL ROD, PLAN DETAIL

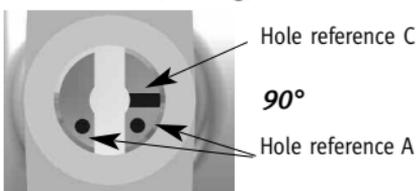
The ball valve is supplied in **POSITION 1**. Referring to the ball valve as shown in the picture, the communicating ways are the **LEFT** and the **BOTTOM** ones. During the operation, the fluid flow is progressively deviated from the **LEFT** way to the **RIGHT** way, without ever interrupting the flow. The actuator rotates 90° and the ball rotates counter clockwise.

Now the communicating ways are the **RIGHT** and the **BOTTOM** ones.

POSITION 1 (opening)



POSITION 2 (closing)



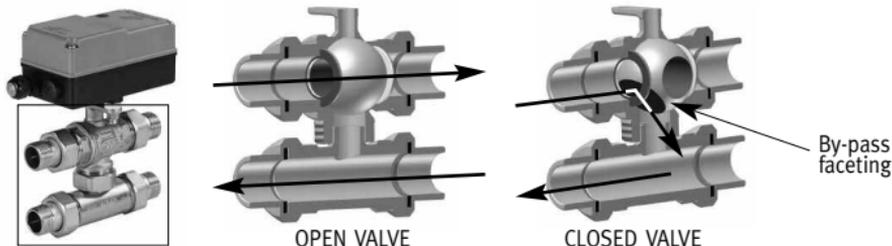
Diamant 2000

Diamant PRO

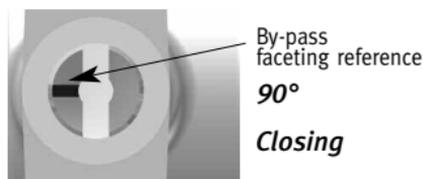
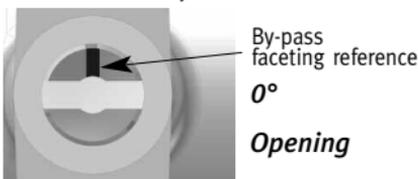
BY-PASS BALL VALVE

The BY-PASS type ball valve should be used in heating systems when the fluid has to be intercepted, allowing a limited flow between outlet and return.

The ball has a through hole and it is faced; therefore, in the open position, the operation is similar to that of a two-way ball valve. In the closing position, the faceting generates the BY-PASS, allowing the communication between the intercepted way to the central one.



CONTROL ROD, PLAN DETAIL



TECHNICAL DATAS OF BALL VALVES

Type	Pressures		Temperatures		Valve with spacer Temperatures	
	Nominal	Differential	Minimum	Maximum	Minimum	Maximum
2/3-WAY / By-pass	16 bar	16 bar	-10°C	+110°C	-20°C	+110°C
2-WAY ISO 5211	40 bar	16 bar	-10°C	+110°C	-20°C	+160°C
3-WAY ISO 5211 HORIZ.						
Ø 1/4" - 3/4"	30 bar	16 bar	-10°C	+110°C	-20°C	+160°C
Ø 1"	16 bar	16 bar	-10°C	+110°C	-20°C	+160°C
3-WAY ISO 5211 VERT.						
Ø 1/2"	25 bar	16 bar	-10°C	+110°C	-20°C	+120°C
Ø 3/4" - 1"	16 bar	16 bar	-10°C	+110°C	-20°C	+120°C
2-WAY AISI 316	64 bar	16 bar	-10°C	+110°C	-20°C	+160°C
2-WAY PVC	16 bar	16 bar	0°C	+ 25°C		
3-WAY PVC	10 bar	16 bar	0°C	+ 40°C		

ACTUATOR'S OPTIONALS

Diamant 2000 and Diamant PRO actuators can be provided with emergency manual override on the top (see picture 1) or lever on the spacer for insulation (the spacer is also available without lever for manual override, see picture 2).

Diamant 2000

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MANUAL OVERRIDE DIRECTION (1)



Push the button and rotate the lever ANTI-CLOCKWISE



Actuator with 90° rotation



Actuator with 180° rotation

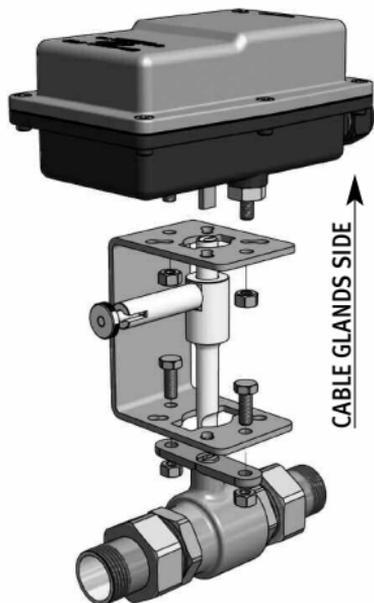
ATTENTION

The valve can be manually operated only when electrically disconnected or if the actuator is broken. If the valve is blocked, please follow below instructions:

- disconnect the actuator
- remove the actuator
- try to move the ball using a screwdriver or a wrench suitable for the valve rod.

We would recommend not to overstress the valve to avoid damages to the body or to the actuator's connection. If the ball remains blocked, remove and replace the valve.

HOW TO INSTALL THE SPACER FOR INSULATION WITH LEVER FOR MANUAL OVERRIDE (2)



Please proceed as per following instructions and be careful to respect positioning of all components:

1. Place the actuator with cable glands oriented towards you and put the spacer with the vertical connection piece on the right side.
2. With the actuator in open position, fix the central rod paying attention that the lever for the manual opening is opposite to the cable glands.
3. Tighten the screws to fix the spacer between valve and actuator.
4. Electrically connect the actuator and make it open and close to test it works properly. Looking the actuator from above, you will see the lever moving anticlockwise from open to close position.

ATTENTION:

Not compliance with the provisions above may cause dangerous situations for operators and/or the system integrity..

Diamant 2000

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TECHNICAL FEATURES OF THE ACTUATOR

- Electric motor: bidirectional
- Power supply: 230V o 110V o 24V 50Hz (60Hz on demand)
- Operating time ( 90°): 35 sec. Torque 11 Nm • ( 180°): 70 sec. Torque 11 Nm
( 90°): 12 sec. Torque 11 Nm • ( 180°): 24 sec. Torque 11 Nm
( 90°): 4 sec. Torque 5 Nm • ( 180°): 8 sec. Torque 5 Nm
- Maximum power consumption: from 4,8 VA (230V 50 Hz version)
from 5,1 VA (110V 50 Hz version)
from 5,2 VA (24V 50 Hz version)
- Class protection: IP 65 (DIAMANT 2000) / IP 67 (DIAMANT PRO)
- Power output of the auxiliary micro: 1A, resistive
- Operational room temperature: minimum -10°C maximum 50°C

ELECTRICAL CONNECTIONS

Before making the electrical connections the supply power must be properly disconnected by qualified personnel, according to the diagram shown under the cover.

To make the connections, unscrew the screws and remove the housing cover in order to access the terminal strip and the printed circuit board. Remove the side plug which closes the cable gland housing, screw the cable gland and proceed to the electrical connection. During the electrical connection, tighten the cable in the cable gland and make sure it is properly placed (fig. 2-3), close the cover tightening the screws; the seal must fit perfectly in its housing (fig. 1).

Tighten the screws with a manual screwdriver.

Note: any electrical connection which does not comply with the attached diagrams can seriously damage the equipment.

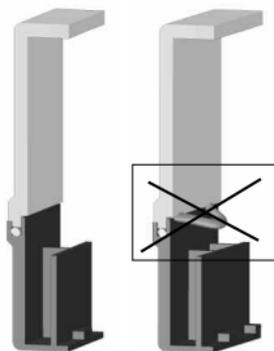
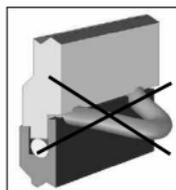


FIG.1



SUITABLE



FIG.2

NOT SUITABLE



FIG.3

Diamant 2000

Diamant PRO

ELECTRICAL FEATURES:

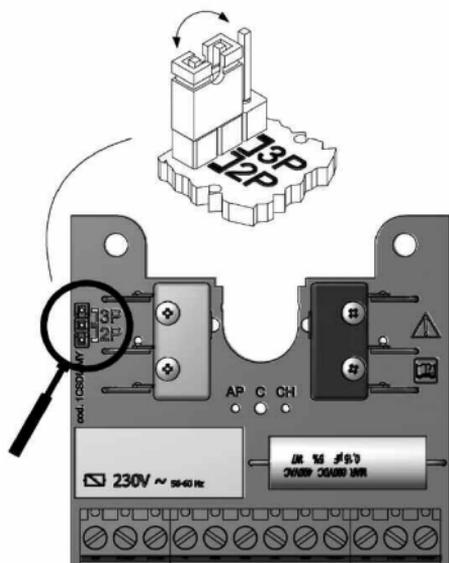
The electrical systems must be planned taking into account the environment they will be installed into. The IP class protection of electrical components indicates its level of protection against the penetration of solids and liquids.

The actuators were designed to have an IP65 (Diamant 2000) and IP67 (Diamant PRO) electrical protection (it is recommended to keep away from direct sunlight and to stick to the allowed temperature range).

All the other equipments must be earthed.

Moreover, thermo-magnetic switches, fuses and circuit breakers must be installed upstream the actuator, in order to ensure the compliance with the safety condition required by the existing laws.

ALL DIAMANT 2000 / DIAMANT PRO MOTORIZED VALVES ARE EQUIPPED WITH AN **"ALL IN ONE"** SYSTEM, which allows to set the 2-POINT or 3-POINT electrical control with a jumper-type selector, according to the user's needs (as shown in the pictures below).



CAUTION

In case of replacement, if the 3-POINT actuator version is earlier than the ALL-IN-ONE one, reverse the connection on the terminal strip 2 & 3.

Diamant 2000

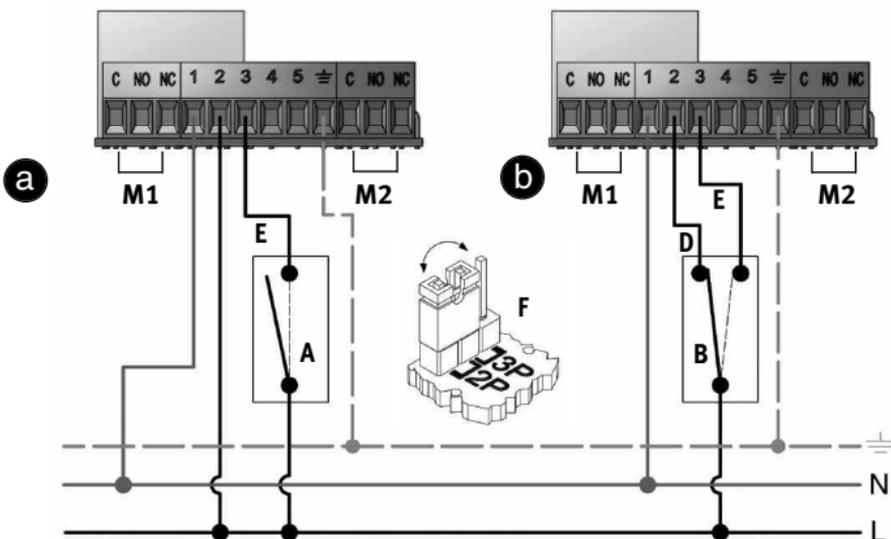
Diamant PRO

DIAMANT ELECTRICAL CONNECTIONS

2-POINT CONNECTION

usually electrically CLOSED

3-POINT CONNECTION



M1 AUX. MICRO SWITCH FREE IN OPEN POSITION
M2 AUX. MICRO SWITCH FREE IN CLOSING POSITION

CAPTION:

- 1 - Neutral
- 2 - Closing phase
- 3 - Opening phase
- 4 - Outlet opening phase
- 5 - Outlet closing phase

- C - Common
- NO - Normally open
- NC - Normally closed
- M1 - Opening auxiliary micro
- M2 - Closing auxiliary micro

- A - Cutout-type control
- B - Switch-type control
- D - Closing
- E - Opening
- F - Jumper
- ⊥ - Earth

The "a" figure shows the connections of the 2-POINT actuator. The fixed phase must be connected to terminal 2; at the same time, the phase on terminal 3 causes the valve to open, whereas cutting the phase on the same terminal, it closes (automatic electrical closing).

The "b" figure shows the connections of the 3-POINT actuator. If the phase is present on terminal 2, the valve connected to the actuator closes; instead, if the phase is on terminal 3, the valve opens (no contemporaneous phase on terminal 2 and 3 is allowed).

Connect the neutral on terminal 1 both for 2-POINT and 3-POINT versions.

With the 2-POINT connection, it is possible to activate multiple actuators with the same control device (thermostat, relay, etc.). With the 3-POINT connection, it is possible to activate only one actuator with a control device and to make in-between settings in order to make a modulation, provided it is used with a suitable control device.

Diamant 2000

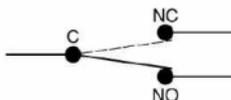
Diamant PRO

CONNECTION OF AUXILIARY MICROS

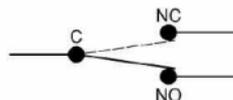
M1 (opening auxiliary micro)

M2 (closing auxiliary micro)

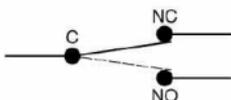
NON-OPEN VALVE



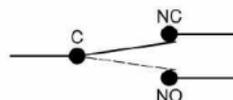
NON-CLOSED VALVE



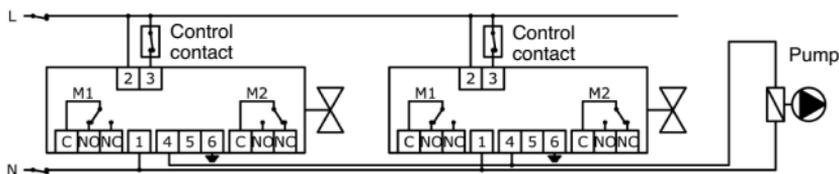
OPEN VALVE



CLOSED VALVE

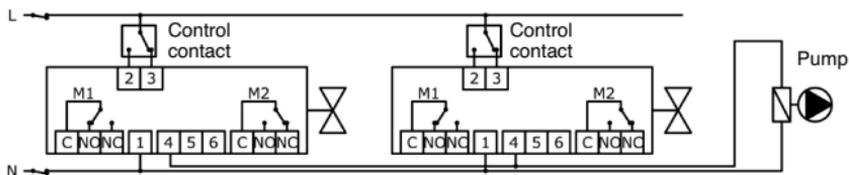


EXAMPLES OF ELECTRICAL CONNECTIONS



M1 AUX. MICRO SWITCH FREE IN OPEN POSITION
M2 AUX. MICRO SWITCH FREE IN CLOSING POSITION

CONNECTION OF THE PUMP STOP WITH TWO OR MORE 2-POINT ACTUATORS



M1 AUX. MICRO SWITCH FREE IN OPEN POSITION
M2 AUX. MICRO SWITCH FREE IN CLOSING POSITION

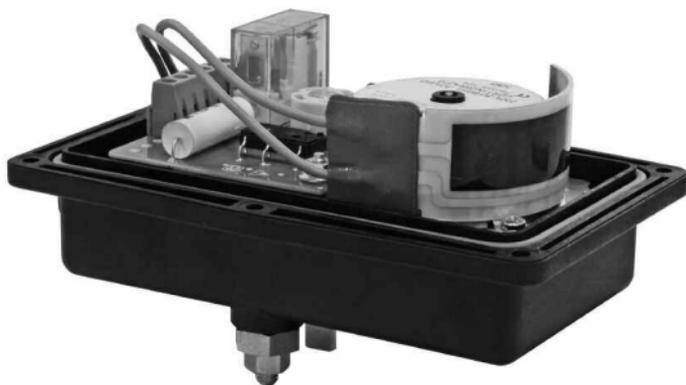
CONNECTION OF THE PUMP STOP WITH TWO OR MORE 3-POINT ACTUATORS

ANTI-CONDENSING HEATER

The anti-condensing heater prevents the risk of condensation inside the actuator. To activate the heating effect of the resistance, connect the two resistance wires using suitable faston connectors.

The supply voltage must be equal to the one indicated on the tag. The technical features are indicated on the adhesive tag.

Anti-condensing Heater



Diamant 2000

Diamant PRO

GENERAL WARRANTY CONDITIONSA

WARRANTY

The **Diamant 2000 / Diamant PRO** motorised valves are covered by a 5-year warranty (except **Diamant PRO with ISO 5211 connection**, which is covered by a 3-year warranty), from the date marked on the base of the actuator (year of production). For any returned good, users should contact the Reseller they bought the items from.

The goods should be returned postage-free.

DURING THE WARRANTY PERIOD

During the warranty period, **COMPARATO NELLO S.r.l.** will repair or replace, free of charge, any product or component, provided it turns out to have a manufacturing defect. Any repair or replacement of the component or of the product itself does not extend the warranty period.

COMPARATO NELLO S.r.l., reserves the right to replace the Product with an identical one; if the product is out of production, it will be replaced with one with identical specifications, provided that, according to the unquestionable opinion of **COMPARATO NELLO S.r.l.**, the repair is not economically excusable.

WARRANTY EXCLUSION PROVISION

Interventions and/or repairs and/or spare parts will not be covered by this Warranty if it turns out that they are defective because of:

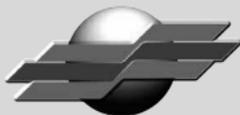
- tampering
- failure due to carelessness and/or unskilfulness during the installation (wrong, incomplete or missing assembling/wiring/setting)
- electrostatic discharge, electric discharge conducted/induced because of lightning or other phenomena not ascribable to the product, irradiated electromagnetic disturbances, intermittent or discontinuous power supply.
- defects or damages caused by fall, breakage, liquid seepage
- repairs made by unauthorized people
- products with expired warranty
- systems made in a non-workmanlike manner
- any other damage not directly ascribable to **COMPARATO NELLO S.r.l.**

In order to provide an up-to-date service, Comparato Nello S.r.l. reserves the right to modify technical data, drawings, graphs and photos of this instruction manual at any time, without prior notice.

Diamant 2000

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COMPARATO



HYDROTHERMAL SYSTEMS
COMPARATO NELLO SRL

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