

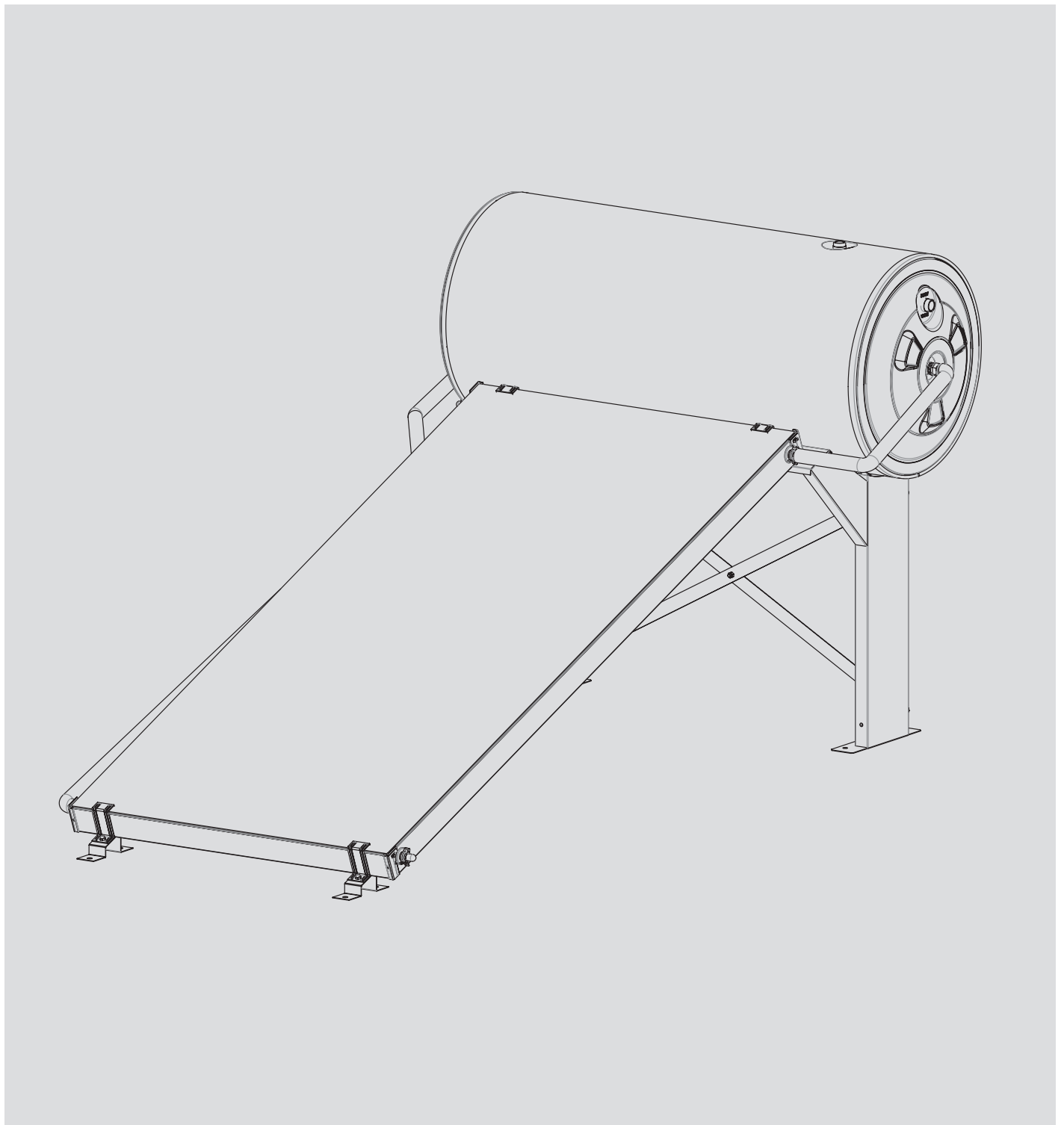
THERMO DR-2

THERMO DR-2 100-1 N

THERMO DR-2 150-1 N

THERMO DR-2 200-1 B

GB - Instruction manual for authorized service personnel



GENERAL INSTRUCTIONS

This manual is an integral and essential part of the appliance.

It should be preserved with care and must accompany the appliance, even if the product is transferred to another owner or user and/or moved to another installation site.

Please read the instructions and warnings contained in this manual carefully; they provide important information for the safe installation, operation and maintenance of this new appliance.

Installation is the responsibility of the buyer and should be performed by qualified personnel in accordance with the instructions contained herein, and in the instruction sheet, provided together with the hydraulic and installation kit. Using this appliance for purposes other than those specified is strictly forbidden.

The manufacturer shall

not be held responsible for any damage due to improper, incorrect and unreasonable use or due to failure to comply with the instructions set out in this manual.

Installation, commissioning, maintenance and any other operation must be carried out by professionally qualified personnel, in conformity with the national installation regulations in force and with any requirements established by local authorities and public health bodies. In any event, before accessing the terminals, all power supply circuits must be disconnected.

Incorrect installation may lead to personal injury or property damage and may harm animals; the manufacturer shall not be held responsible for such damage.

Keep all packaging material (clips, plastic bags, polystyrene foam, etc.) out of reach of children, as it may present a potential hazard.

ATTENTION!

The appliance can be used by children older than 8 years and by people with reduced physical, sensory or mental abilities, or who lack adequate experience and the necessary knowledge, provided they are supervised or have been instructed on the safe use of the appliance and on the potential risks connected with it.

Children must not play with the appliance. Any cleaning and maintenance performed by the user must not be effected by unsupervised children.

Do not touch the appliance while barefoot or with wet hands or feet.

All repairs should be performed exclusively by qualified personnel, using authentic spare parts only.

Failure to comply with the above instructions could compromise safety and will exempt the manufacturer from all liability.

No flammable items should be left in the vicinity of the appliance.


Flat plate collectors may only be combined with construction elements (fixing elements, fittings, etc.) and system components supplied by the manufacturer.

The use of alternative construction elements or system components is considered improper use.

The manufacturer shall not be held liable in this regard.

Proper use of the appliance also includes complying with the use and installation instructions and with the supplementary documentation, in addition to the inspection and maintenance terms.


Any other improper use is forbidden.


<p>THIS PRODUCT CONFORMS TO EU DIRECTIVE 2012/19/EU</p>	
<p>The barred dustbin symbol appearing on the device indicates that the product must be disposed of separately from household waste once it reaches the end of its lifespan, and transferred to a waste disposal site for electric and electronic equipment, or returned to the dealer when purchasing a new device of the same kind.</p> <p>The user is responsible for delivering the de-commissioned device to a suitable waste disposal site.</p> <p>Proper separated collection of the de-commissioned device and its subsequent eco-compatible recycling, treatment and disposal helps to prevent negative effects on the environment and health, besides encouraging the reuse of the materials comprising the product.</p> <p>For further details on the available waste collection systems, contact your local waste disposal office, or the dealer from which the product was purchased.</p>	

GENERAL SAFETY INSTRUCTIONS


Key to symbols:

 Failure to comply with this warning may result in personal injury or even death.


 Failure to comply with this warning may result in serious damage to property, plants or animals.


 Obligatory observance of general safety measures and appliance specifications.

Do not perform procedures which involve opening the appliance.


 Electrocutation through exposure to live components. Personal injury caused by burns due to overheated components, or wounds caused by sharp edges or protrusions.

Do not perform procedures which involve removing the appliance from its installation space.


 Electrocutation through exposure to live components.

 Flooding caused by water leaking from disconnected piping.


Do not start or stop the appliance simply by plugging it into the electricity mains supply or unplugging it.


 Electrocutation through contact with a damaged cable or plug, or socket.

Do not damage the power supply cable.


 Electrocutation from non-insulated live wires.


Do not leave anything on top of the appliance.

 Personal injury caused by an object falling off the appliance as a result of vibration.


 Damage to the appliance or items underneath it caused by the object falling off as a result of vibrations.

Do not climb onto the appliance.


 Personal injury caused by the appliance falling over.

 Damage to the appliance or any objects underneath it caused by the appliance falling away from its installation space.


Do not climb onto chairs, stools, ladders or unstable supports to clean the appliance.

 Personal injury caused by falling from a height or cuts (stepladders shutting accidentally).

Do not attempt to clean the appliance without first turning it off and unplugging it or turning off the corresponding switch.

 Electrocutation through exposure to live components.

Install the appliance on a solid wall which is not subject to vibration.

 Noisy operation.

When drilling holes in the wall for installation purposes, take care not to damage any electrical wiring or existing piping

- ⚠ Electrocution caused by exposure to live wires. Explosions, fires or poisoning caused by gas leaking from damaged pipes.
- ⚠ Damage to existing installations. Flooding due to water leaking from damaged pipes.

Protect all connection pipes and wires in order to prevent them from being damaged.

- ⚠ Electrocution through exposure to live wires.
- ⚠ Flooding due to water leaking from damaged pipes.

Make sure that the installation site and any systems to which the appliance must be connected comply with current legislation.

- ⚠ Electrocution through contact with incorrectly-installed live wires.
- ⚠ Damage to the appliance caused by improper operating conditions.

Use suitable manual tools and equipment (in particular, make sure that each tool is in good working condition and that its handle is securely fastened); use them correctly and make sure they do not fall from a height. Replace them once you have finished using them.

- ⚠ Personal injury caused by flying splinters or fragments, inhalation of dust, knocks, cuts, puncture wounds and abrasions.
- ⚠ Damage to the appliance or surrounding objects caused by falling splinters, knocks and incisions.

Use suitable electrical equipment (make sure in particular that the electricity supply cable and the socket are in good condition and that the rotating or moving parts are attached correctly); use this equipment correctly; do not obstruct passageways with the power supply cable and make sure no equipment could fall from a height. Disconnect it and replace it safely after use.

- ⚠ Personal injury from electrocution, flying splinters or fragments, inhalation of dust, shocks, cuts, pricks, abrasions, noise and vibration.
- ⚠ Damage to the appliance or surrounding objects caused by falling splinters, knocks and incisions.

Make sure that all portable ladders are positioned securely, and that they are of adequate strength. Make sure that the steps are intact and not slippery. Never move portable ladders when someone is on them. Provide constant supervision at all times.

- ⚠ Personal injury caused by falling from a height or cuts (stepladders shutting accidentally).

Make sure that all materials, components, equipment, etc. used during installation are not liable to fall

from a height

- ⚠ Personal injury or death caused by collapsing and/or falling parts.

Make sure that any rolling ladders are positioned securely, that they are suitably sturdy, that the steps are intact and not slippery. Make sure that the ladders are fitted with handrails on either side of the ladder and parapets on the landing.

- ⚠ Personal injury caused by falling from a height.

During all work carried out at a certain height (generally with a difference in height of more than two metres), make sure that parapets surround the work area or that individual harnesses designed to prevent falls are used. Make sure that the space potentially involved in any accidental fall is free from dangerous obstacles, and that any impact upon falling is cushioned by semi-rigid or deformable surfaces.

- ⚠ Personal injury caused by falling from a height.

Make sure that adequate levels of hygiene and sanitation are maintained in the place of work, in terms of lighting, ventilation, solidity of structures and emergency exits.

- ⚠ Personal injury due to impact, tripping and wounds.

During all work procedures, wear individual protective clothing and equipment.

- ⚠ Personal injury from electrocution, flying splinters or fragments, inhalation of dust, shocks, cuts, pricks, abrasions, noise and vibration.

All procedures inside the appliance must be performed with the necessary caution in order to avoid abrupt contact with sharp parts.

- ⚠ Personal injury caused by cuts, puncture wounds and abrasions.

Do not use insecticides, solvents or aggressive detergents to clean the appliance.

- ⚠ Damage to the plastic and painted parts.

Do not use the appliance for anything other than normal domestic use.

- ⚠ Damage to the appliance caused by operation overload. Damage caused to objects treated inappropriately.

Do not allow children or untrained individuals to operate the appliance.

- ⚠ Damage to the appliance caused by improper use.

Perform all electrical connections using wires with a suitable cross section.

- ⚠ Fire caused by overheating due to electrical current passing through undersized cables.

Protect the appliance and all areas in the vicinity of the work area using suitable material.

- ⚠ Damage to the appliance or surrounding

objects caused by falling splinters, knocks and incisions.

Handle the appliance with care, using suitable protection.

- ⚠ Damage to the appliance or surrounding objects caused by shocks, knocks, incisions and crushing.

Organise the removal of all debris and equipment in such a way as to make movement easy and safe, avoiding the creation of any piles that could yield or collapse.

- ⚠ Damage to the appliance or surrounding objects caused by shocks, knocks, incisions and crushing

Reset all the safety and control functions affected by any work performed on the appliance and make sure they operate correctly before restarting the appliance.

- ⚠ Damage or shutdown of the appliance caused by out-of control operation.

Prior to operating on roofs, structures, surfaces, etc., make sure that these are stable and suitable for the scheduled operations.

- ⚠ Personal injury or death caused by collapsing parts and/or falling from a height.

SPECIFIC SAFETY INSTRUCTIONS FOR THIS APPLIANCE

Before handling, empty all components which may contain hot water, performing bleeding where necessary.

- ⚠ Personal injury from burns.

Descalcify the components, in accordance with the instructions provided on the safety data sheet of the product used. Provide adequate ventilation in the room, wear protective clothing, avoid mixing different products, and protect the appliance and surrounding objects.

- ⚠ Personal injury caused by acidic substances coming into contact with skin or eyes; inhaling or swallowing harmful chemical agents.

- ⚠ Damage to the appliance or surrounding objects due to corrosion caused by acidic substances.

Avoid operating on the product in the event of high insulation levels.

- ⚠ Personal injury caused by burn and scalding.

APPLICATION CONDITIONS

Support Frame

Several different types are available, depending on the desired installation.

The structures supplied support snow loads of 1200 Pa and wind loads of 900 Pa (130 km/h). If necessary, request the assistance of an expert in structural loads.

Support Structure:

Qualified person to inspect and ensure that the installation structure can support the installation of the support frame and solar system. Strengthening of the structure may be required.

Maximum operating pressure

The collector has a maximum operating pressure of 8 bar.

Minimum and maximum angle of inclination

The collector can be installed with an inclination of between 15° and 35°. All collector connections and breather holes must be protected from infiltration of water and dirt.

Collector inclination will normally be determined by the roof pitch, or the pitch of the support frame used. Please refer to the specific mounting system for more information.

Formation of condensation

Early in the morning or late in the afternoon, the glass on the panel may steam up on the inside or experience condensation on the outside.

The damper the air, the greater the likelihood of condensation occurring.

If it does form, the condensation should gradually disappear as soon as suitably sunny conditions are created.

The phenomenon does not jeopardize the correct operation of the system.

Transportation and handling

- The solar collector should be transported in an upright position, avoiding sudden movements.
- During transportation, particular care should be taken when positioning the glass side. Do not place the collectors so that the glass is facing downwards or transport them in this manner.
- Before installing the solar collector, never leave it exposed to the elements with the

glass side facing downwards; if it rains, water could enter the collector. This would cause condensation to form inside the panel.

- Leave the collectors in their packaging until they reach the place where they are to be installed; this will prevent damage.
- Do not rest the rear side of the collectors on uneven or pointed surfaces.
- Always keep the glass side of the collector covered until the system is ready for operation.

Orientation

The solar collectors offer maximum energy performance when the surfaces are facing directly the equator (therefore directly south for Northern Hemisphere installations and directly north for Southern Hemisphere installations). Different local conditions, for example the amount of shade or the direction of the roof slants, may lead to a slight variation of the equator-facing position (the maximum recommended variation is 30° in relation to the equator).

Positioning

Before installing the solar collector you must choose its position, so that the following conditions are satisfied:

- the collector must be placed in areas that are not in the shade during hours of sunlight;
- there must be minimal wind exposure;
- it must be placed as close as possible to the storage cylinder;
- it must be accessible for any necessary maintenance work;
- it must be firmly secured in place and able to withstand wind pressure;
- in order to minimise wind loads, avoid installing the appliance on roof edges. Minimum distance: 1.2 m; increase this distance for tall buildings and heavily exposed areas.

Earthing system and anti-lightning protection

The metal piping used in the solar heating circuit and parts that carry electricity must be proportionally connected to the general earthing system, with a green/yellow copper wire with a minimum section of 16 mm² (H07 VU or R). If an anti-lightning system is in place,

the collectors can be connected to it. The earth connection may be performed using an earth rod. The earth conductor must be installed outside the building. The ground electrode must be connected to the general earthing system using a proportionate wire of the same section.

Work must only be carried out by a company specialising in electrical circuitry.

Warning

Hot water supplied at a temperature above 50°C to the taps at the point of use could cause immediate serious scalds. Children, the disabled and the elderly are more exposed to this risk. We therefore recommend the use of a thermostatic mixer valve screwed onto the appliance water outlet pipe.

This device shall be able to withstand the maximum possible domestic hot water temperature from the solar system. (110 °C).

Stagnation Behaviour

The THERMO DR-2 resistance to overheating has been tested according to 5.2 of EN 12976-2:2017 with extremely sunny climate conditions; these systems are therefore suitable for the climate class type A+ (according to ISO 9806:2018).

Low temperature behaviour

Heat radiating towards a cold night sky may cause frost-related damage, even at air temperatures of 5°C.

If the temperature falls below 5°C, drain the system as follows:

- 1) Close the cold water supply
- 2) Open a hot water tap downward the solar system
- 3) Open the hot water outlet (Fig.1 A) of the tank to allow air to go inside
- 4) Dismount the hydraulic closure (Fig.1 B) of the collector to drain the system
- 5) When the system is drained, close the hot water tap downward the solar system
- 6) Close the hot water outlet of the tank
- 7) Mount the hydraulic closure of the collector
- 8) When it will be necessary to restart the system, please refer to the section "Preparation of the system for operation" an following.

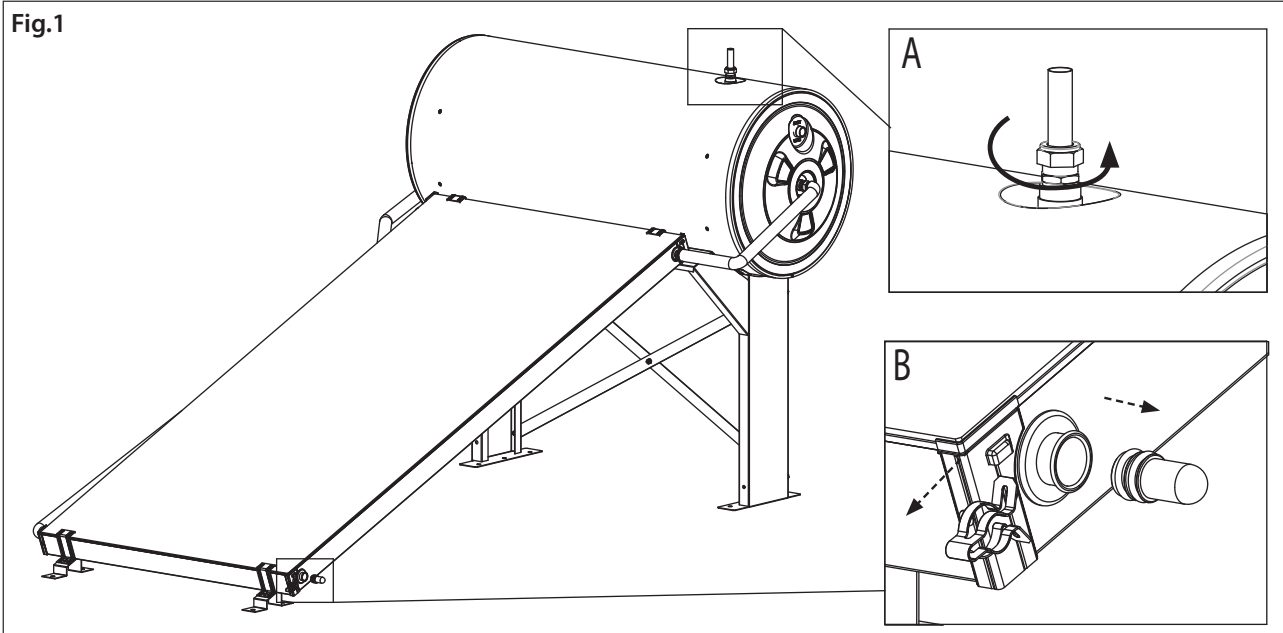


Fig.2

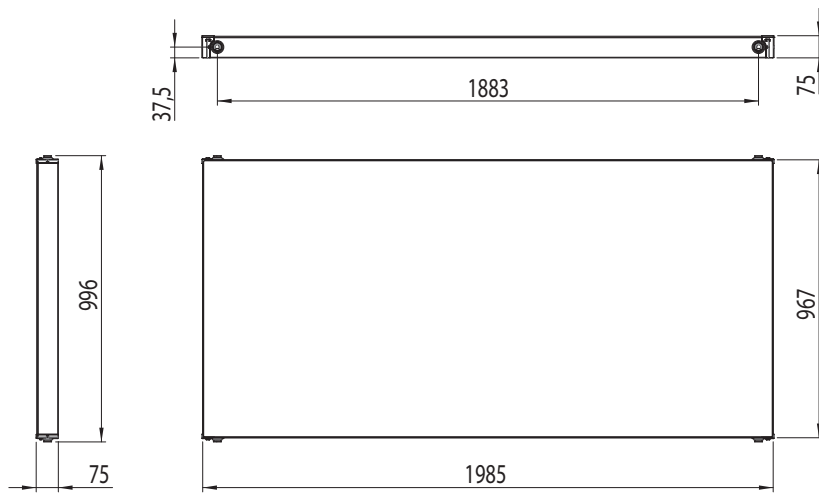
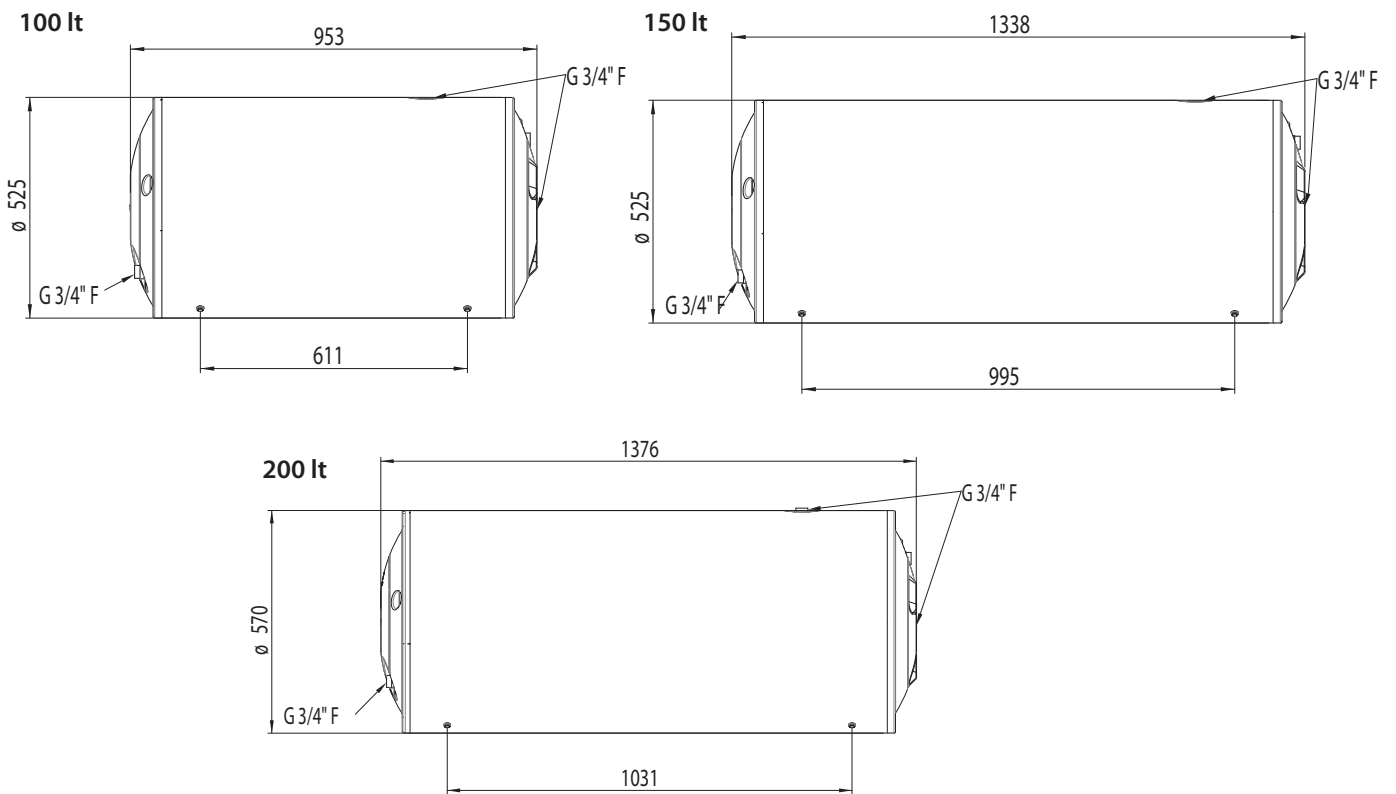


Fig.3

**WARNING:**

The boiler herein can only be used as an integral part of the new solar devices, or as a spare part of the same, produced by Ariston Thermo Spa; the manufacturer does not authorise any other boiler use differing from that listed above.

Solar collectors transform direct and diffused radiating energy from the sun into thermal energy (heat).

For this to occur, sunlight must be captured by the surface of the absorber. The latter consists of a uniform network of tubes through which heat is conveyed. The specific shape of the collector prevents undesired heat dispersal into the environment.

The accumulator tank stores the hot water until required. The accumulator tank should be suitably sized so as to compensate for short periods of adverse weather conditions.

The **structure** simplifies collector installation. Several different types are available depending on the desired installation. The fluid (domestic water) circulates naturally due to the thermosiphon effect, and transports heat from the collectors to the accumulator tank.

The **solar heating system** for the production of domestic hot water consists of the following components:

- Solar collector/s
- Structure
- Solar heating circuit hydraulic fittings
- Solar accumulator tank

SOLAR COLLECTOR

	DR2.0-2 N	DR2.0-2 B
Gross area	1,92 m ²	1,92 m ²
Aperture area	1,77 m ²	1,77 m ²
Absorber area	1,73 m ²	1,73 m ²
η_0 *	0,68	0,74
a1*	4,25 W/(m ² K)	4,05 W/(m ² K)
a2*	0,015 W/(m ² K ²)	0,014 W/(m ² K ²)
Fluid content	1,8 l	1,8 l
Maximum operating pressure	8 bar	8 bar
Net weight	30,6 kg	30,6 kg

* Data refers to aperture area

SOLAR DIRECT CYLINDER FOR NATURAL CIRCULATION SYSTEMS

	CNA 100 DR-2	CNA 150 DR-2	CNA 200 DR-2
Capacity	100 l	150 l	200 l
Maximum operating pressure	6 bar	6 bar	6 bar
Test pressure	9 bar	9 bar	9 bar
Maximum DHW temperature	105 °C	105 °C	105 °C
Weight	34 kg	44 kg	51 kg
Insulation thickness	55 mm	55 mm	48 mm

ELECTRICAL CONNECTION**ELECTRICAL WORK TO BE CARRIED OUT BY A QUALIFIED ELECTRICIAN AND TO COMPLY TO THE REQUIREMENTS SANS 10142-1****WARNING: THIS APPLIANCE MUST BE EARTHED & BONDED****Before working on the appliance, shut off mains power with its external power switch.**

Before installing the appliance it is recommended to thoroughly check the electrical system to verify compliance with established regulations; the manufacturer is not liable for damage caused by lack of grounding or anomalous power supply.

Check that the mains power supply is rated for the heater's maximum power draw (refer to the nameplate) and that the electrical cables are suitably rated and regulatory. Multi-plugs, extensions and adapters may not be used.

Do not use the plumbing, heating or gas pipes for grounding the appliance. If the appliance has a power cord which requires replacement, use a cable of equivalent type (H05VV-F 3x1 mm², dia 8,5 mm).

WARNING! For information on how to replace the power cord, contact an authorised service centre or professionally qualified personnel.

The power cord (H05VV-F 3x1 mm², dia 8,5 mm) must be routed into the hole (fig.4) in the back of the appliance and connected to the thermostat terminals (fig. 5).

Use a two-pole switch conforming with CEI-EN (contact gap of at least 3 mm, preferably equipped with fuses) to disconnect the appliance's power supply. The appliance must be grounded with a cable (yellow/green and longer than the phase cable) connected to the terminals marked "⊕" (fig.6).

Before starting up the appliance, check that the power rating matches that given on the nameplate. If the appliance has no power cord, it can be installed in one of the following ways:

- connection to mains with a rigid pipe (if the appliance has no cable clamp);
- with a flexible cable (H05VV-F 3x1mm², dia. 8.5 mm) if the appliance has a cable clamp.

Preparing the system for operation

The collector cover must be left on until the final commissioning stage. This avoids overheating and reduces the risk of burns. The system can be filled and started for the first time only if a heat extractor is present. Check the flange screws are tightened when the direct cylinder is installed.

Ensure that the connections to the water supply is carried out in accordance with EN 806-1 and in any case in accordance with the applicable local regulations.

Checking for leaks

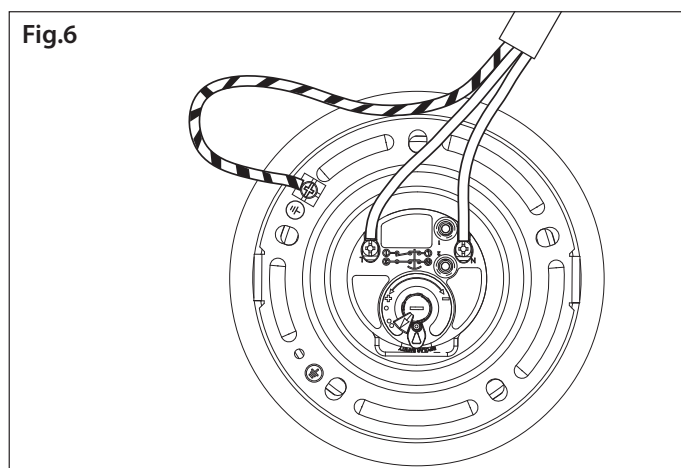
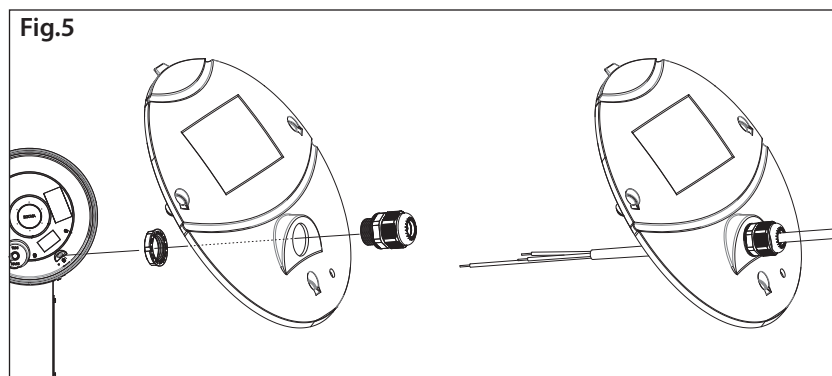
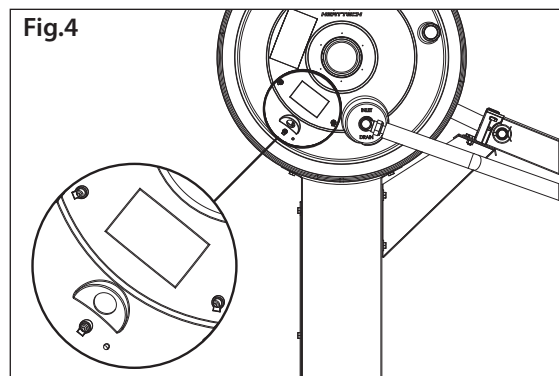
Perform a pressure test as soon as the collectors and pipes have been fitted.

- Fill the system with water using a non-pressurised method (see following section).
- Raise the pressure to approx. 1 bar; make sure that the system and all its connections are watertight and that the safety valve is working correctly.

Cleaning the system

Before filling the system, you must first clear the piping of all residue which may have accumulated during manufacturing and installation.

- Completely rinse the system until all residue has been removed.
- Next, completely empty the system.



ANTI-LEGIONELLA RECOMMENDATIONS

Legionella are small rod shaped bacteria which are a natural constituent of all fresh waters. Legionnaires' disease is a pneumonia infection caused by inhaling of Legionella species. Long periods of water stagnation should be avoided; it means the solar system should be used or flushed at least weekly.

The European standard CEN/TR 16355 gives recommendations for good practice concerning the prevention of Legionella growth in drinking water installations but existing national regulations remain in force.

WARNING:

For storage without heating element, it is sold without a thermal disinfection device that carries out a "thermal disinfection cycle" to restrict the Legionella growth inside the tank; as a consequence, if, for any reason, some of the conditions for Legionella growth could occur, it's hardly recommended to install a device to avoid it.

OPERATION, CHECKS AND MAINTENANCE

IN CASE OF ANY EMERGENCY PLEASE CLOSE WATER SUPPLY AND SHUT DOWN ELECTRICAL SUPPLY. IMMEDIATELY CONTACT AUTHORIZED SERVICE PERSONNEL

Instructions for system operation

In general, the solar heating system requires little maintenance.

System check after the operation or maintenance

- Make sure that the installation kit is properly bound to the support structure.
- Check that all screws and clamps of the fixing kit are carefully tightened.
- Check that all nuts, ogives and clips of the hydraulic kit are well positioned.
- Make sure that the pressure test has been performed and that all fittings are tight.

Regular system check

In addition to the check carried out by the manager, solar heating systems must also be checked at regular intervals by an authorised technician:

- Every year, preferably before the period of maximum solar energy use, to ensure the system is operating correctly and to check the condition of all components.
- The necessary maintenance intervals for the system are defined when the appliance is commissioned.

During maintenance the following components should be checked:

- Solar Collectors:
 - Cleaning: Using soapy water and a sponge clean all dirt from the collector class.
 - Glazing & Seals: Inspect for any cracks or deuteriation.
 - Shading: Ensure that the collector is not covered in shade by any vegetation.
- Valves
 - T&P Valve: Inspect valve mechanism, ensure that it is free from any build-up and still functioning. Confirm valve overflow is not plugged.
 - Pressure Control Valve: Inspect valve and ensure that the expansion relief valve is still functioning. Confirm valve overflow is not plugged.
 - Thermostatic Valve: Inspect valve and ensure that the valve is still correctly operating.

- Plumbing, insulation, and wiring connections
 - Inspect for fluid leaks at pipe connections. Check insulation connections and seals. All wiring should be tight.
 - Inspect for damage or degrading of insulation covering pipes and wiring.
 - Flashing and sealants around roof penetration should be in good condition.
- Support Structures
 - Check all nuts and bolts attaching the collectors and tank to any support structure for tightness.
- Storage System
 - Check storage tank, etc, for any cracks, leaks, rust, or other signs of corrosion.
 - Open storage tank and manually remove any sediment.
 - Inspect condition of anode rod and replace if necessary.

Decommissioning and disposal

The disposal of materials from the collector must comply with current legislation. All costs associated with disassembly, transportation and disposal must be borne by the end user.

Direct cylinder maintenance

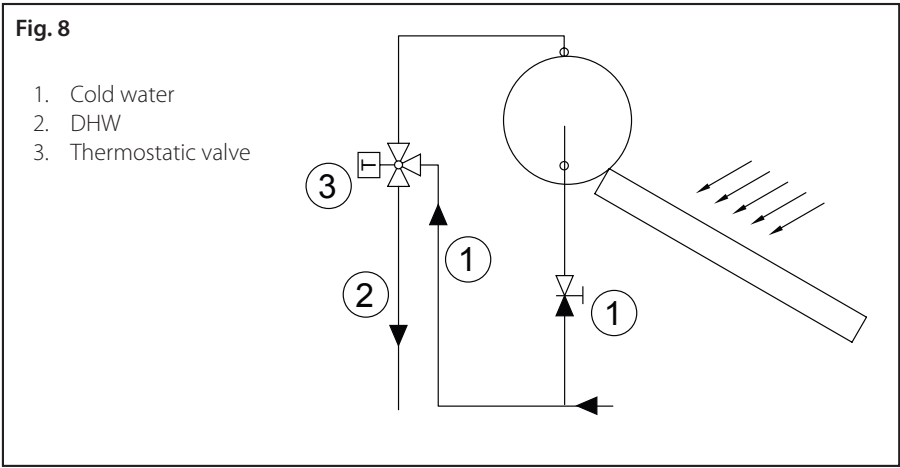
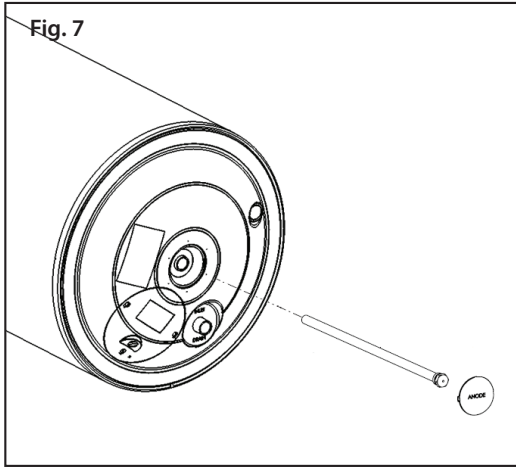
A drain tap must be fitted upstream of the safety unit so that maintenance work can be carried out on the direct cylinder.

A drainage system should also be provided where necessary, so that the stored water can flow out easily if the direct cylinder needs to be emptied.

If no water is drawn off and the water is stored for 30 days or longer, empty the system and rinse thoroughly with water.

Check the condition of the magnesium anode (Fig.7) every year, and replace it if necessary.

Before checking and/or replacing the magnesium anode, empty the direct cylinder.



PROBLEMS - CAUSES - SOLUTIONS

PROBLEM	CAUSE	SOLUTION (carried out by an authorised technician)
<ul style="list-style-type: none"> The solar accumulator tank does not heat up when there is sunshine 	System not airtight Incorrect orientation	<ul style="list-style-type: none"> Identify the non-airtight points and seal them. Correct the system position

HYDRAULIC CONNECTION

SOLAR INSTALLATION TO BE CARRIED OUT BY SOLAR QUALIFIED INSTALLER ONLY. THE INSTALLATION MUST COMPLY TO THE REQUIREMENTS OF SANS 10254, 10252-1 AND SANS 10106. THE INSTALLER TO ISSUE A CERTIFICATE OF COMPLIANCE (CoC) AS PER THE REQUIREMENTS OF SANS 10106.

CAUTION!

For countries which have enacted European standard EN 1487, the overpressure device supplied with the appliance (if present) is non-conforming. The regulatory device must be calibrated to a maximum pressure of 0.7 MPa (7 bar) and include at least a cock, check valve and control, safety valve and hydraulic load cutout.

Some countries may require the use of alternative safety devices, as required by local law; the installer must check the suitability of the safety device he tends to use. Do not install any shut-off device (valve, stop cock, etc.) between the safety unit and the heater itself.

The appliance's drain outlet must be connected to a drain pipe of diameter at least equal to the of the outlet itself,

with a funnel to permit an airgap of at least 20 mm for visual inspection to prevent damage or injury to persons, animals and property when the device operates; the manufacturer is not liable for any such consequences. Use a hose to connect the overpressure device to the mains cold water supply; fit a cock if necessary. Fit a drain pipe to to handle circumstances in which the drain cock is opened.

When installing the overpressure safety device, do not tighten it fully down, and do not tamper with its settings. It is normal that water drip from the overpressure safety device when the appliance is heating. For this reason one must install a drain, open to the air, with a continuously downwards sloping pipe, in an area not subject to subzero temperatures. If the mains pressure is close to the valve's setting, fit a pressure reducer as far away from the appliance as possible. If you decide to install mixer units (taps or shower), purge the pipes of any potentially damaging impurities first.

The appliance must not be supplied with water of hardness less than 12°F, nor with especially hard water (greater than 25°F); we recommend installing a water softener, properly calibrated and controlled - do not allow the residual hardness to fall below 15°F.

Before using the appliance, we recommend filling its tank with water and draining it completely so as to remove any residual impurities.

