



FORCED FLOW KIT

pre-assembled solar package
1-2-3 collectors



- > **INNOVATION**
- > **PERFECTION**
- > **COMPLETE KIT**
- > **EASY INSTALLATION**

> **INNOVATION AND PERFECTION:** *COMPLETE KIT, FACTORY ASSEMBLED*

Today there is increasingly high awareness of the environment, its health and above all its protection. Ferroli focuses special attention on alternative energy, looking at the world that surrounds us in a new way. Using the air, sun and water to produce heat and energy is moreover economically advantageous, and helps to reduce polluting emissions.

As a result, Ferroli has developed an exclusive package for its customers and partners, which includes the basic components of the solar heating system already assembled in the factory. Whatever the arrangement of the installation site, assembling the system simply requires positioning the storage cylinder and the "solar column" on the ground, and connecting 4 pipes **(1)**. The system can in this way be completed and tested very quickly and effortlessly, guaranteeing the customer a professional job

(1) two pipes to the solar collectors (not supplied, as these need to be sized on site based on the height of the roof) and two pipes from the column to the storage cylinder (supplied)

every time. The solar expansion vessel, solar circulating pump, domestic hot water expansion vessel, fill/drain valve, non-return valve, flow meter, pressure gauge and variable flow-rate control unit **(2)** all make up part of the "solar column" kit.

If necessary, the top support base for the column can hold a Ferroli wall-hung boiler, thus creating a single, multifunction structure: this is useful in situations when it is difficult to secure the boiler to the wall, or more simply to avoid drilling.

(2) also includes the digital temperature display and the possibility to manage the connection to an external flow meter (not supplied) for measuring solar energy

COMBINATIONS AVAILABLE

> 200 L KIT

1 x ECOTOP VF 2.3 collector
1 x 200 litre storage cylinder with two coils

> 300 L KIT

2 x ECOTOP VF 2.3 collectors
1 x 300 litre storage cylinder with two coils

> 500 L KIT

3 x ECOTOP VF 2.3 collectors
1 x 500 litre storage cylinder with two coils

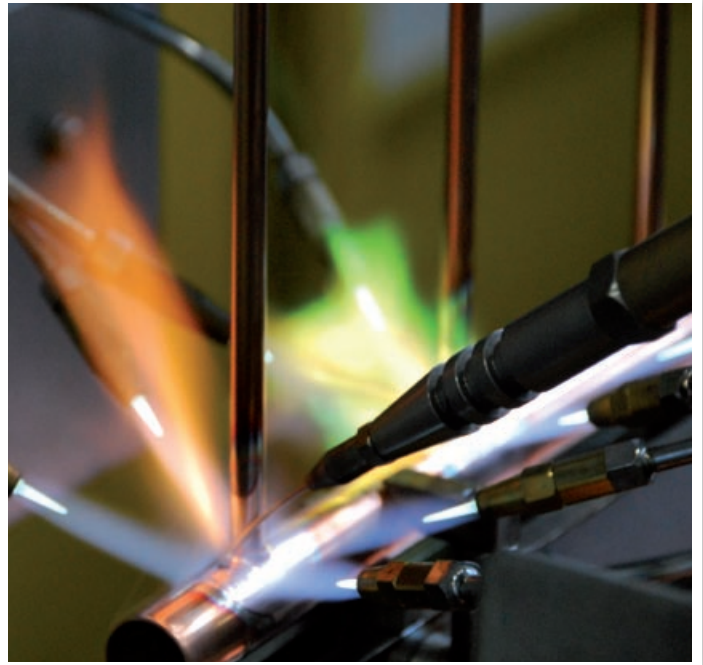
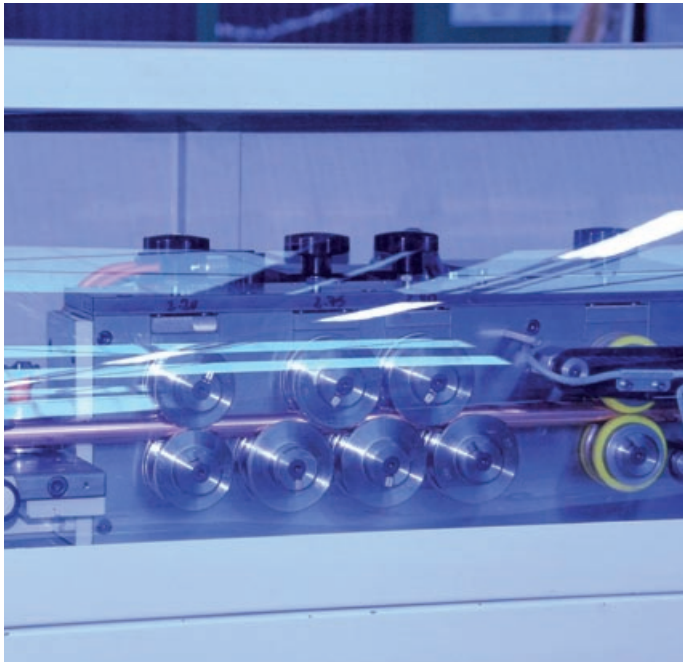
The solar collectors can be flush mounted in the roof using the special optional flush mounting kit (SKIRTING)

All the kits can be connected in series with a combined instant boiler or in parallel with a heating only boiler, as desired (see the example diagrams on the following pages)



> **PRODUCTS = PRODUCTION**

COMBINATION OF EXCELLENCE FOR THE FERROLI GROUP



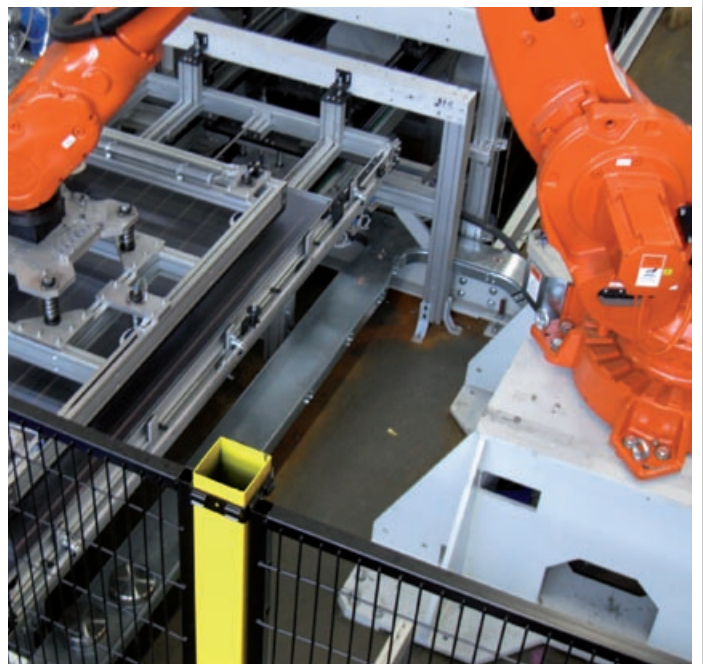
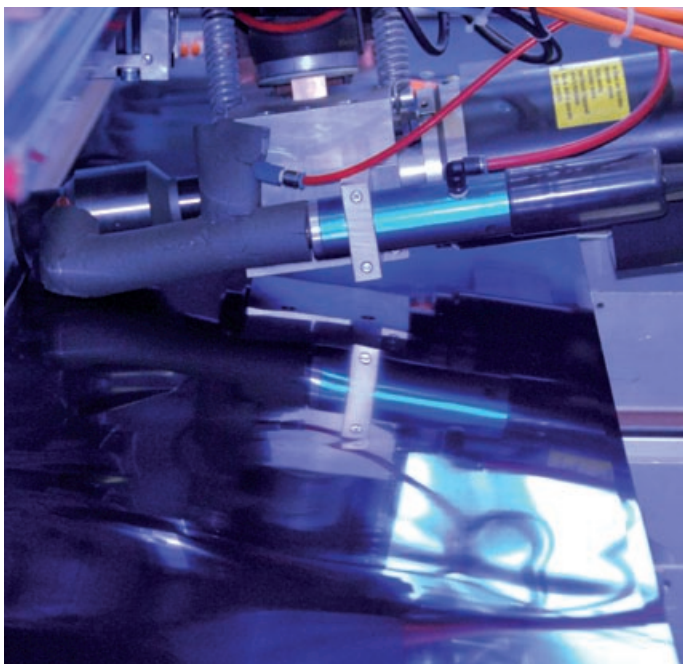
The Ferroli spirit has always been to enter new markets by fully accepting the challenges.

It is with this same spirit that Ferroli has decided to develop the heart of its solar heating systems **entirely in Italy**: the new generation glazed flat-plate solar collectors.

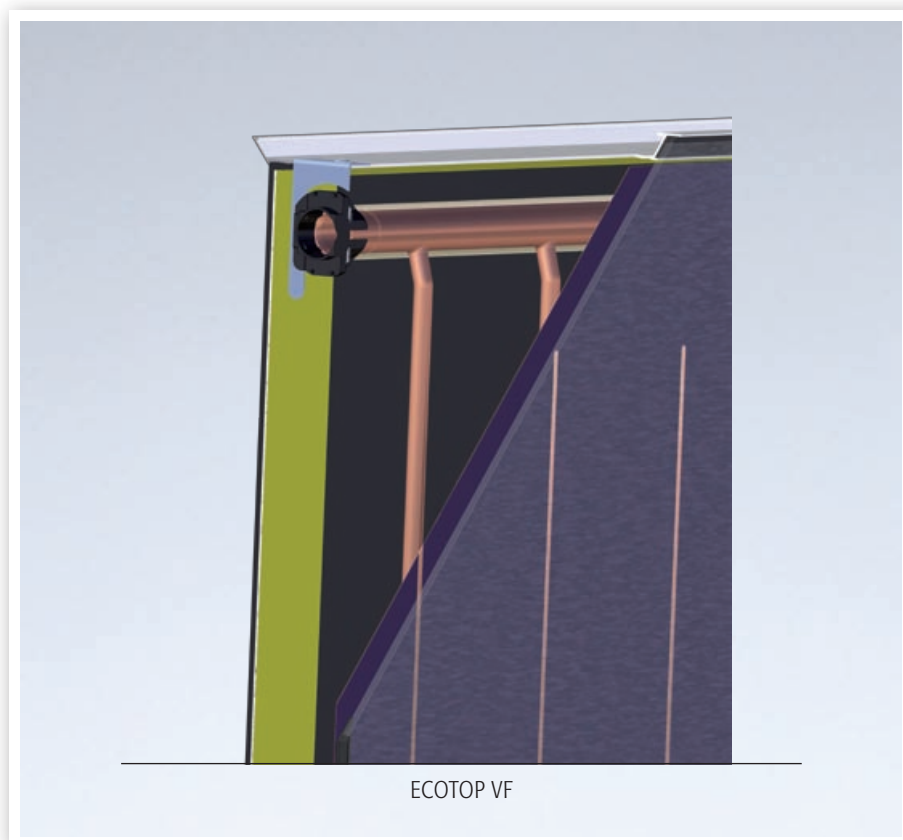
The facilities in Alano di Piave (BL) have been equipped with the most modern manufacturing technology.

A highly automated production line guarantees the quality of the solar collectors according to the most demanding expectations. Two robots can work non-stop to produce these modern solar "heat generators".

Ferroli solar collectors are exported all over the world from the centre of Veneto.



> QUALITY CARE TO DETAILS



The prestigious voluntary **"Keymark"** certification achieved for the entire range of ECOTOP VF and HF flat-plate solar collectors demonstrates the passion and care that Ferroli has dedicated to the design and production of its flat-plate solar collectors.

The use of environmentally-friendly and recyclable materials is the basis for the design of the Ferroli ECOTOP solar collectors.

The aluminium section bar casing guarantees solidity, lightness and is easily recyclable.

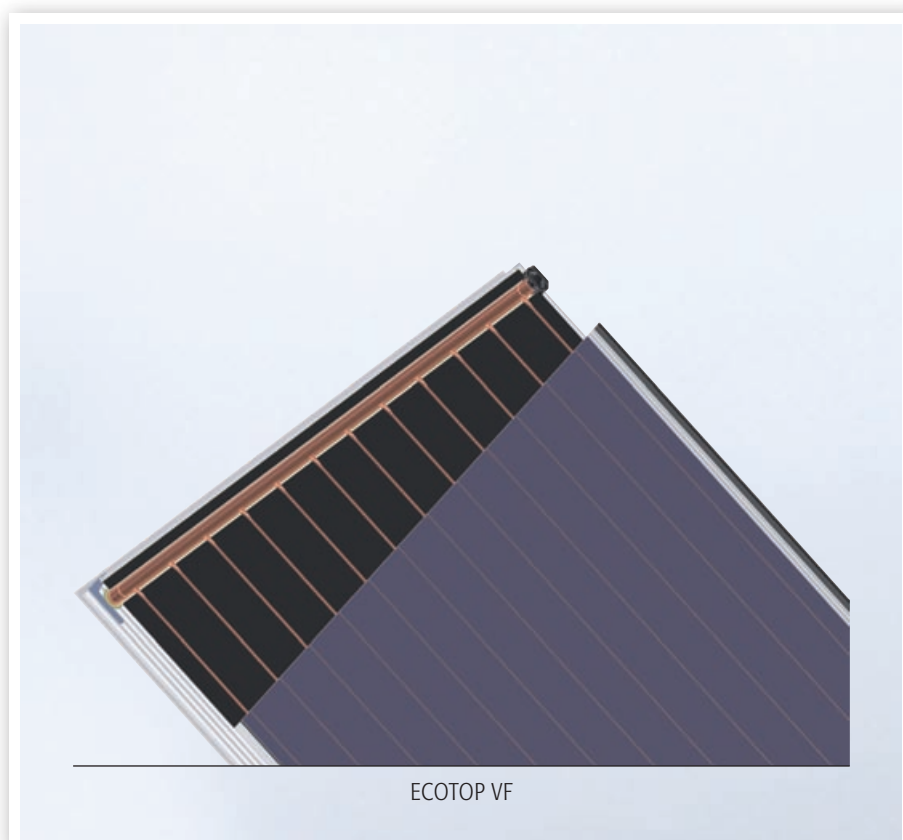
The special glass with a low iron content ensures high transparency to sunlight and helps retain the infrared radiation re-emitted by the heat absorber inside the collector, maximising collector efficiency.

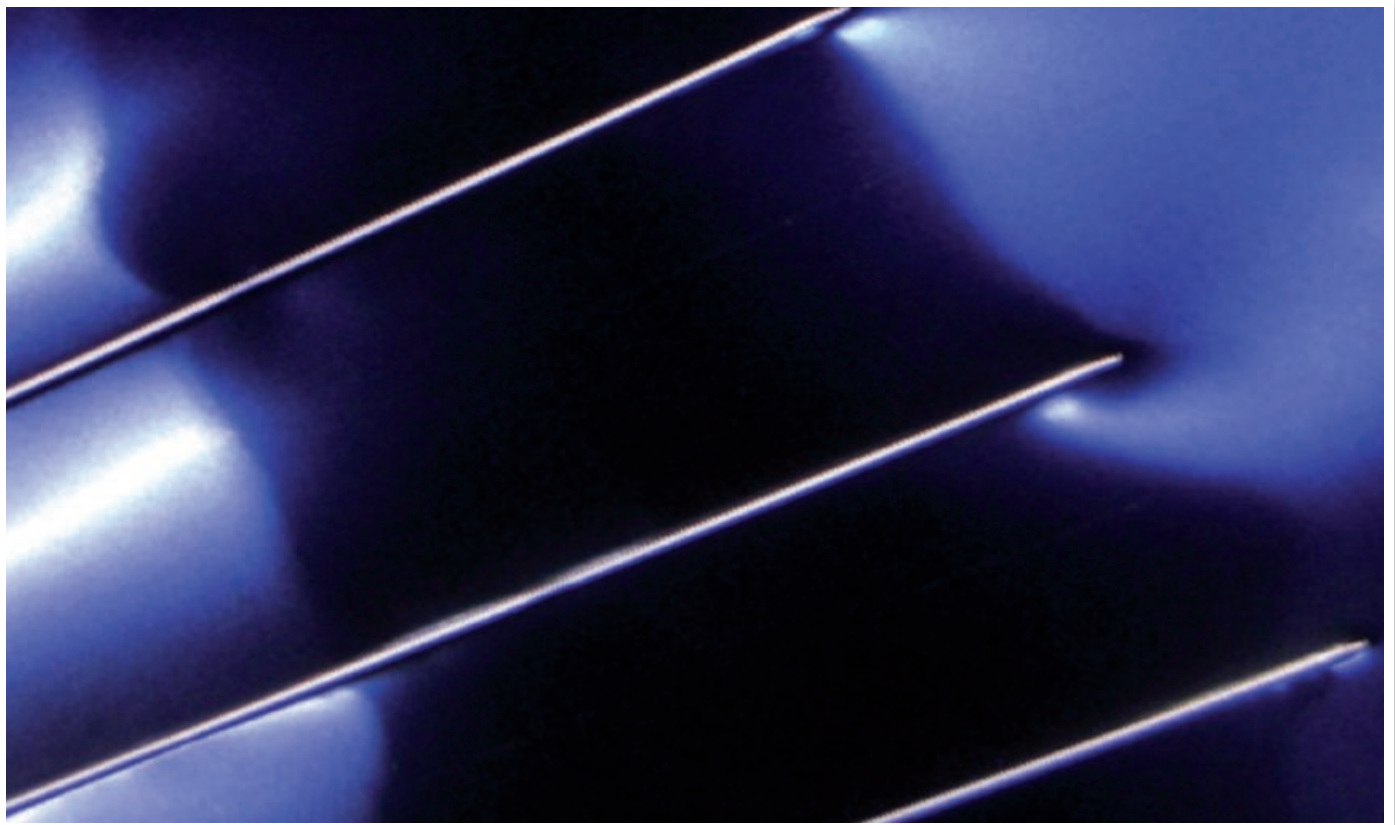
The highly selective absorber, treated using a 100% environmentally-friendly process, can withstand extreme conditions of heat stress, humidity and the elements for many years.

The parallel distribution of the vertical tubes in the collector guarantees high efficiency and a more optimised operating field of the collector, even when used in multiple configurations.

This ensures more uniform temperature distribution in the collectors and prevents thermal stress on the welding inside the tubing, guaranteeing total collector reliability.

The precision ultrasonic welding of the inner tubing together with the continuous shape and high quality of the copper absorber guarantee the best quality results, with reduced energy consumption in the production process.





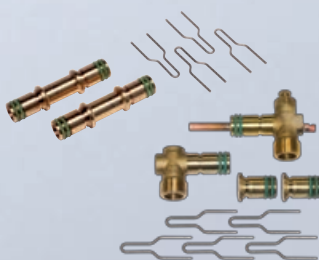
DETAIL OF THE CONNECTIONS
INSIDE THE COLLECTOR

The collector is insulated with high-density rock wool. No CFCs. No compromise.

The quick couplings with special double o-rings ensure simple and error-free assembly and allow natural expansion of the copper tubes without creating mechanical stress on the collector.

The connection fittings feature special ventilation slits to prevent and resolve occasional internal condensate that may occur naturally when there are considerable temperature swings (e.g. night/day).

Tightness of the quick couplings is continually checked in production up to 10 bars, with the couplings designed to withstand pressures up to 30 bars.



WATER CONNECTION KIT

> **POWER. INTELLIGENCE. CONTROL**

GOOD CONTROL ALWAYS MAKES THE DIFFERENCE

In a solar heating system that heats a storage cylinder, heat exchange must be managed intelligently, avoiding wasteful on-off cycles of the solar circulating pump when there not enough radiation on the collectors (wasted electricity). When, on the other hand, there is sufficient solar radiation, the heating of the storage cylinder needs to be optimised, controlling the heat delivered and the fluid temperature so as to improve stratification, that is, the slow and uniform distribution of solar heat in the storage cylinder.



Conventional solar control units in “home” systems for the production of domestic hot water have limited management: when radiation exceeds a certain threshold, the pump starts, below a certain threshold it stops.

If during the day solar radiation increases (e.g. at midday) or decreases in relation to the design values (e.g. cloudy weather, or in the mid seasons), the control unit can only decide whether to turn the pump on or off.

That’s all.

In larger solar systems (more sophisticated and expensive), the control units usually adopt “flow-rate control” on the solar circulating pump, allowing the solar fluid temperature that heats the storage cylinder to be controlled based on the level of radiation.

It’s a little like instinctively adjusting the tap when having a shower if the water comes out too fast and isn’t warm enough.

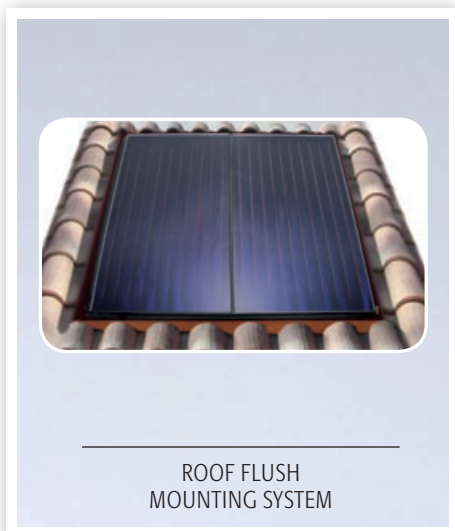
Indeed, in some situations lower flow means an improvement, as it ensures the best balance. In the same way, proportionally reducing the flow-rate in the solar circuit in mid seasons not only saves on power consumption of the solar pump, but uses the less solar energy available more efficiently.

The FERROLI ECOTRONIC TECH 2010 control unit features this and many other exceptional functions for application on small domestic solar heating systems (management of double exposure solar collectors, self-diagnosis, solar energy metering by connecting an optional external flow meter*, control of an optional motor-driven shutter/sunshade* to cover the solar collectors and prevent overheating in summer, and many more). Well done Ferrolì!

*** not supplied**

> ACCESSORIES

HAVING A SOLID SUPPORT IS IMPORTANT



Ferroli supplies a series of dedicated accessories to complete the product:

> ROOF FLUSH MOUNTING SYSTEM

Developed specifically for the ECOTOP VF vertical collectors (2.0, 2.3 and 2.8), allows the three types of collectors to be quickly installed on sloping tile roofs.

Made up of quick and easy to assemble modular elements, with compact dimensions and easy to store and handle with the collectors. **Includes all the collectors' fixing accessories.**

> FRAMES FOR FLAT ROOFS

Built from painted hot galvanised steel with stainless steel bolts, featuring simplified assembly and easy adjustment.

The frames have passed the strictest approval tests on metallic bars for outdoor uses (e.g.

window and door frames), meaning they are also suitable for use in coastal areas and in areas exposed to strong pollution (class 4 as per EN 1670).

Two models, suitable for both VF (vertical) and HF (horizontal) collectors.

> FRAMES FOR SLOPING ROOFS (AND CORRESPONDING BRACKETS FOR TILES: "MARSEILLE" STYLE FLAT TILES, CURVED TILES, SLATE, WOODEN OR SHEET METAL ROOFS)

These are modular and easy to install in unlimited numbers (each collector has a pair of fastening bars that attach to the adjacent one in the group) and are made using the same materials and with the same certification as the frames for flat roofs. They include two fixed brackets for easier collector positioning while working on the roof. Two models, suitable for both VF (vertical) and HF (horizontal) collectors.

> NEWS All the frame systems, both for flat and sloping roofs, are modular (i.e. made up of identical elements), compact in length and easy to store and handle together with the collectors, so as to optimise store space and management for our customers.

That's not all:

> A SPECIAL LINE OF SPECIAL READY-TO-USE (PREMIXED) SOLAR FLUIDS, UNDER THE "FERSOL" BRAND in 5 kg and 25 kg containers.

The main advantages (in addition to system reliability) are:

- 1) factory premixed with quality controlled demineralised water, to prevent calcification and fouling in all installation and operating conditions of the solar heating system;
- 2) precise and constant composition of the solar fluid, without errors or hassles for mixing on site (for example, when cold glycol is hard to mix with water)
- 3) use of specific inhibitors for high temperatures, which vaporise and condense together with the antifreeze glycol, guaranteeing at all times a controlled range of fluid acidity so as to avoid damaging parts of the system or the collector
- 4) tracing dye that indicates (by changing colour) the need to replace the solar fluid
- 5) use of atoxic and environmentally-friendly propylene glycol as the antifreeze component in the mixture



> PRE-CONFIGURED KIT OPTIONS

	PACK 1	PACK 2	PACK 3	PACK 4	PACK 5
TYPE OF FASTENING/INSTALLATION	SLOPING ROOFS WITH FLAT/MARSEILLE STYLE TILES	SLOPING ROOFS WITH CURVED TILES	SLOPING SHEET METAL/DRILLABLE ROOFS	FLUSH MOUNTED WITH THE ROOF	FLAT ROOFS
200 L KIT 	1 x 0XCK3AXA 1 x 076186X0 1 x 076173X0 4 x 077102X0	1 x 0XCK3AXA 1 x 076186X0 1 x 076174X0 4 x 077102X0	1 x 0XCK3AXA 1 x 076186X0 1 x 076197X0 4 x 077102X0	1 x 0XCK3AXA 1 x 076199X0 4 x 077102X0	1 x 0XCK3AXA 1 x 076186X0 2 x 076187X0 4 x 077102X0

	PACK 6	PACK 7	PACK 8	PACK 9	PACK 10
TYPE OF FASTENING/INSTALLATION	SLOPING ROOFS WITH FLAT/MARSEILLE STYLE TILES	SLOPING ROOFS WITH CURVED TILES	SLOPING SHEET METAL/DRILLABLE ROOFS	FLUSH MOUNTED WITH THE ROOF	FLAT ROOFS
300 L KIT 	1 x 0XCK2BXA 2 x 076186X0 1 x 076173X0 1 x 076175X0 1 x 077103X0	1 x 0XCK2BXA 2 x 076186X0 1 x 076174X0 1 x 076177X0 1 x 077103X0	1 x 0XCK2BXA 2 x 076186X0 1 x 076197X0 1 x 076198X0 1 x 077103X0	1 x 0XCK2BXA 1 x 076199X0 1 x 076200X0 1 x 072171X0 1 x 077103X0	1 x 0XCK2BXA 2 x 076186X0 2 x 076187X0 1 x 077103X0

The kit includes: solar kit, fastening bars and brackets for tile/sloping roofs (or skirting for flush mounting or support frames for flat roofs), connections to the solar collectors, FERSOL LT ready-to-use premixed solar fluid (frost protection down to -12°C), interconnection between collectors and between the solar column and the storage cylinder, solar probe with 1.2 m cable, storage cylinder probe, additional probe to control the circulating pump for a heating only boiler. The solar column includes: solar expansion vessel 24 l, sanitary expansion vessel 18 l, safety valve 1/2", flow-meter with flow limiter, fill/flush/drain valves, non-return valve, pressure gauge set, variable flow pump, solar control.

Not included in the kit: pair of connection pipes to the solar collectors, deaerator kit (P/N 072153X0, available as an optional accessory) connection pipes to optional boiler, thermostatic mixer (P/N 013002X0, available as an optional accessory), solar collector probe extension cable.

> CONNECTION DIAGRAMS

SERIES - PARALLEL

CONNECTION DIAGRAM WITH BOILER IN SERIES (the top coil of the solar storage cylinder is not connected)

For example, the following condensing
boilers can be used:

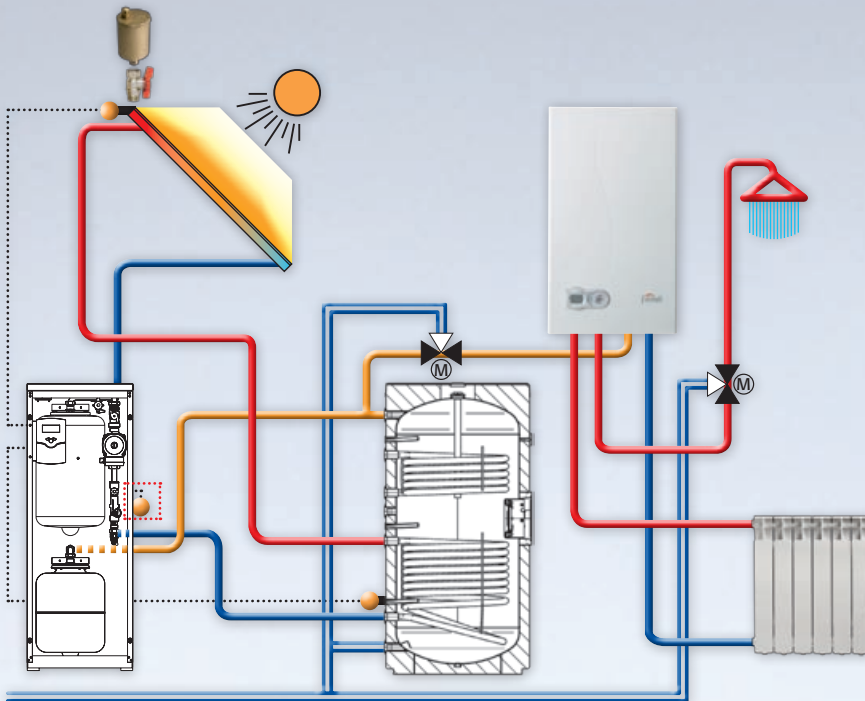
• **FERROLI ECONCEPT TECH 25C**

or the following standard boilers:

• **FERROLI DOMITECH C24/F24**

• **FERROLI DOMIPROJECT C24/F24**

Thanks to their compact dimensions,
these boilers can also be installed
directly ON TOP OF the solar column.



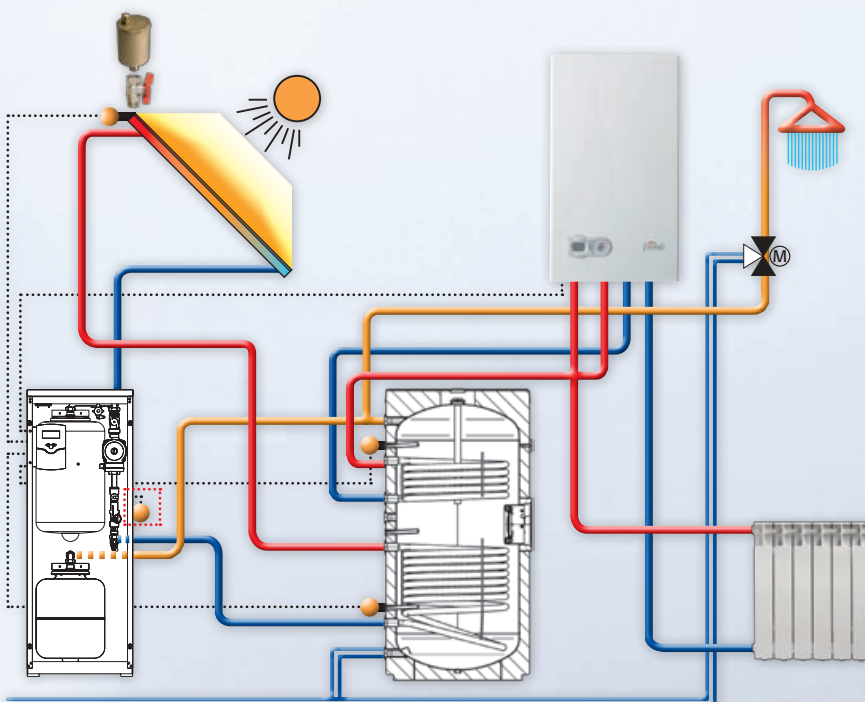
FUNCTIONAL SCHEME

CONNECTION DIAGRAM WITH BOILER IN PARALLEL

For example, the following condensing
boilers can be used:

• **FERROLI ECONCEPT TECH
10A/18A**

Thanks to their compact dimensions,
these boilers can also be installed
directly ON TOP OF the solar column.



FUNCTIONAL SCHEME

> CERTIFICATION

DIN CERTCO - KEYMARK

DIN CERTCO

Gesellschaft für Konformitätsbewertung mbH



CERTIFICATE

The company

Ferrolì S.p.A.
Via Ritonda 78/A
37047 SAN BONIFACIO (VR)
ITALY

with its production site in

Alano di Piave

hereby receives the confirmation that the product/s

Solar collectors

of the type

ECOTOP VF 2.3

conforms to

DIN EN 12975-1:2006-06
DIN EN 12975-2:2006-06

Specific CEN KEYMARK Scheme Rules for Solar Thermal Products version 10.07 (Edition: 2009-02)

and is granted the licence to use the marks



in conjunction with the Registration No. below.

Registration No.: 011-7S735 F

This Certificate is valid until 2014-03-31.



DAP-ZE-2460.00

See annex for further information.

DIN CERTCO Gesellschaft für
Konformitätsbewertung mbH
Alboinstraße 56, 12103 Berlin



2009-03-30

Dipl.-Ing. Dipl.-Wl.-Ing. Sören Scholz
- Head of Certification Body -

S. Scholz

> *NOTES*

Lined area for notes, consisting of multiple horizontal dotted lines.



NOTICE FOR DEALERS:

As part of its efforts to constantly improve its range of products, with the aim of increasing the level of customer satisfaction, the company stresses that the appearance, dimensions, technical data and accessories may be subject to variation.

Consequently, ensure that the customer is provided with up-to-date technical and/or sales documents (price lists, catalogues, brochures, etc....).

The products described in this document are covered by warranty if purchased and installed in Italy.