



## F.B.R. solar plants

F.B.R. solar plants work with sealed circulation in order to guarantee excellent performances in any weather conditions.

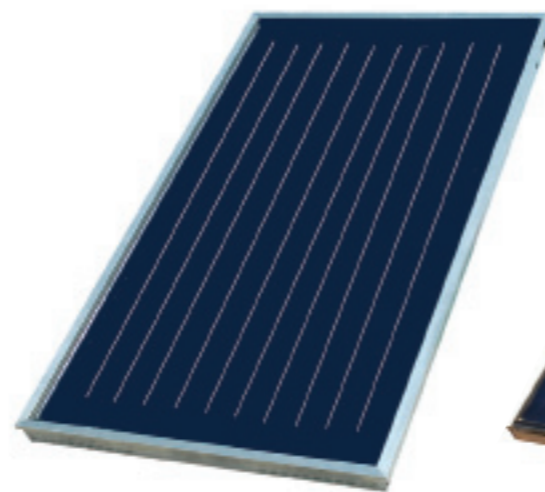
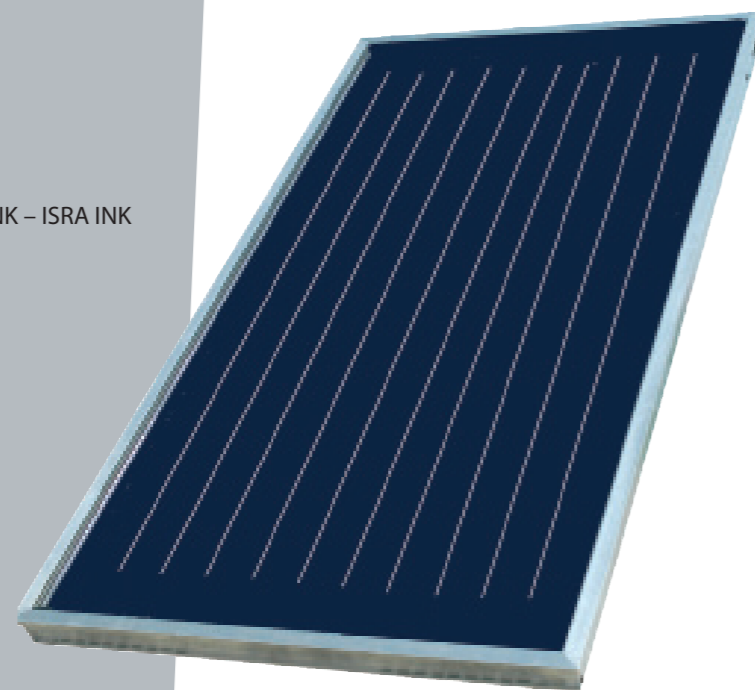
Hot water plants (ISA, ISA INK – as in-roof model, ISA CSS – as vacuum model) are composed of:

- solar collector - CST 2.5 vertical (CST INK 2.5 vertical - as in-roof model, CSS - as vacuum model)
- tank with double coils completed with pumping station
- digital control unit
- expansion vase
- thermostat mixer
- antifreeze liquid.

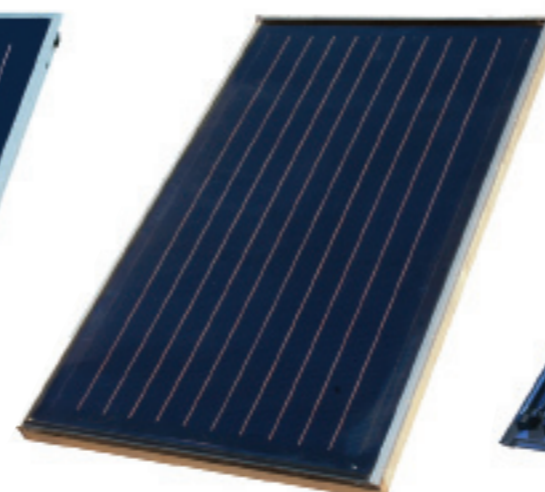
Heating and hot water plants are available with TANK IN TANK (ISRA TANK – ISRA INK TANK), with 2 tanks (ISRA – ISRA INK), with TOTAL SPEAKER tank (ISRA TS – ISRA INK TS). They are composed of:

- solar collector - CST 2.5 vertical (CST INK 2.5 vertical - as in-roof model)
- tank (KOMBI or GENIUS or TOTAL SPEAKER)
- two lines pumping station
- digital control unit
- expansion vase
- thermostat mixer
- antifreeze liquid.

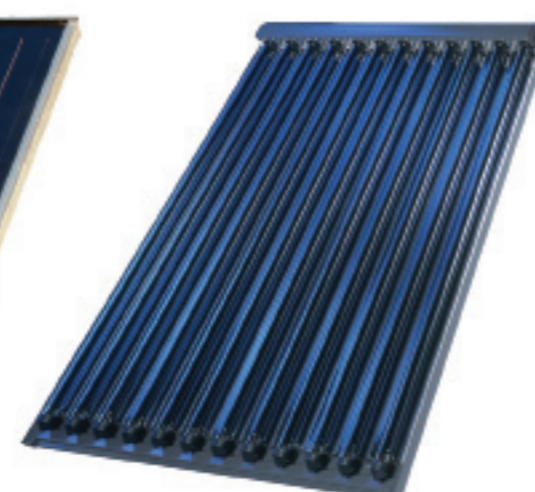
As regards 2 tanks version solar plant has a second tank for hot water production.



Vertical Solar Collector (CST mod.)



In-roof Solar Collector (CST INK mod.)



Vacuum Solar Collector (CSS mod.)



Horizontal Solar Collector (mod. Horizontal CST)



## Solar Plants

## F.B.R. solar tank

The large range of F.B.R. tanks meets different needs of heating and hot water production, starting from small flats to house districts, villas or trading and manufacturing sites.

Tanks are verified according to DIN 4753 P.3 rule and are available with 2 coils (B VETRI) and vacuum (BV VETRI).

KOMBI tank (B KOMBI) is glass porcelained with enamel coating at 850°C according to DIN 4753 rule.

TOTAL SPEAKER (B TS) has a pleated spiral tube in stainless steel AISI 316 T for hot water production.

PUFFER tank is available in 2 versions, one for not worked heating (B PUFFER) and one with coil (BS PUFFER) and is suitable for containing heating hot water coming from various energy sources (gas boilers, wood boilers, fireplaces, thermal-kitchen, etc.).

GENIUS tank (BG) has a deviated valve and a differential thermostat in order to avoid that boiler inefficiently heats water contained into the tank during bad or poor weather conditions.

In this way we achieve a strong energy saving.



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All purpose heating solutions



## F.B.R. solar collectors

Paying attention to environmental issues, F.B.R. enlarges their heating solutions range with the solar plants to be installed in already existing heating plants or brand-new ones.

CST collectors (both vertical and horizontal) are designed for providing excellent performances also in bad and poor weather conditions. Available in 2 dimensions (2-2,5 m<sup>2</sup>), they can be installed with different inclination angles through the mounting rack kits. Thanks to the care in the appearance they can be armoniously inserted in the existing architecture. The frame of the in-roof collectors (CST INK) is made of glued laminated fir.

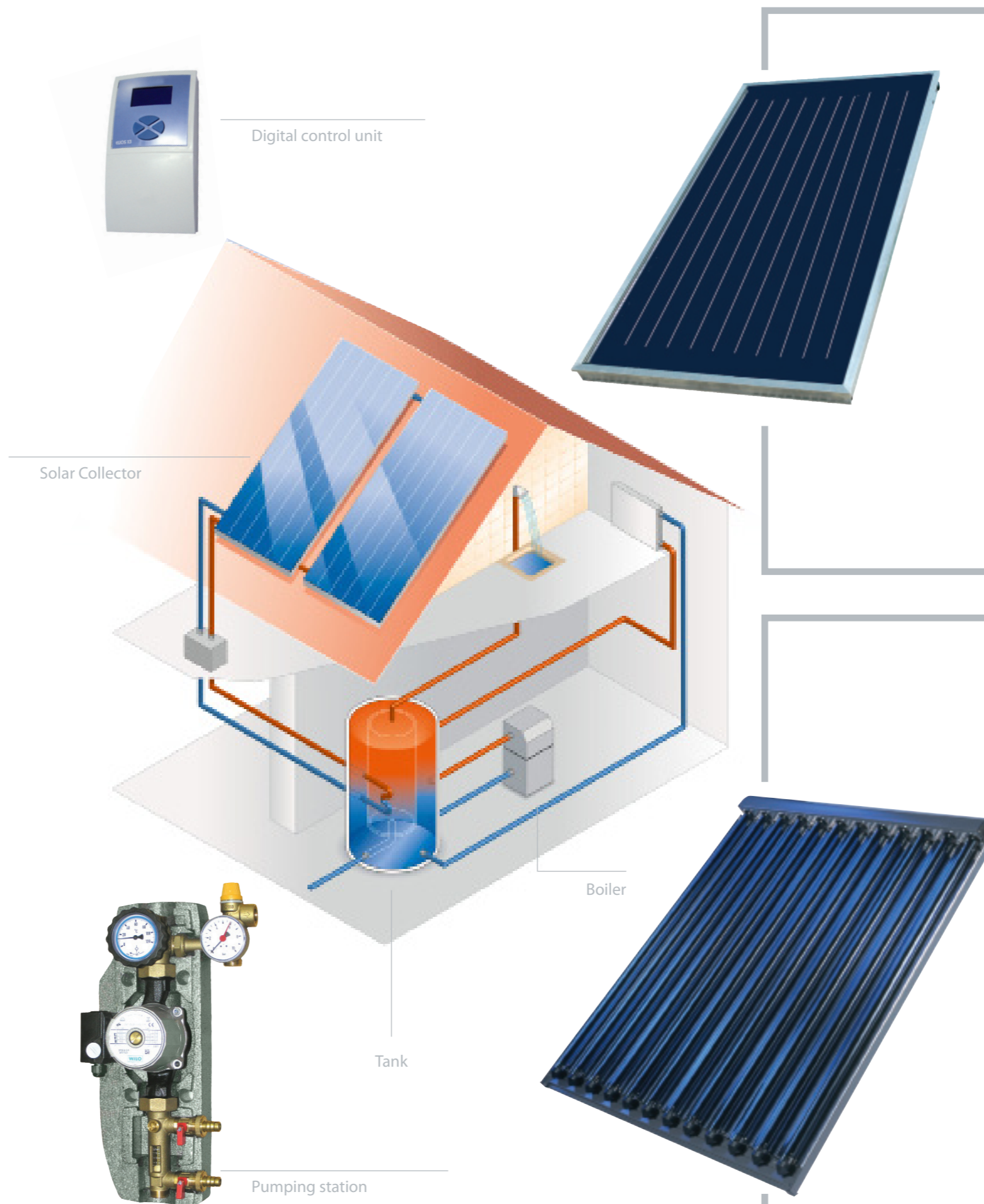
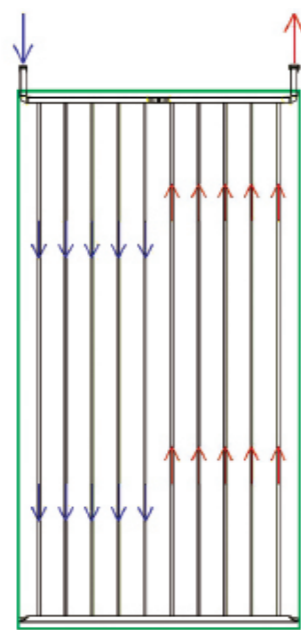


## Selective surface

Caption surface is made of titan copper TiNOX (TiNOX ARTLINE for CST INK model). It is highly selective and soldered through ultrasound technique in order to gain an effective heating transmission. This surface assures 95% solar absorption and 5% emission. Insulation is guaranteed by rockwool protection (50mm bottom thick and 20 mm lateral thick). The transparent tempered glass (4 mm thick) covers effectively the solar collector and can be easily replaced, if necessary.

As regards vacuum collector version (CSS), a vacuum is created between the glass cover and the absorbent surface in order to cancel any heat loss by convection. CSS collector is available both with 12 and 18 glass tubes. The profile is made of covered aluminium, grey coloured (RAL 7015).

F.B.R. solar collectors and plants are qualified by Solar Keymark European certification and certified by test report according to UNI EN 12975-1-2:2006 and UNI EN 12976-1-2:2006.



### CST model

		CST 2.5	CST 2	CST INK 1,4	CST INK 1,65	CST INK 2,5
Total area	m <sup>2</sup>	2,65	2,3	1,38	1,64	2,54
Opening area	m <sup>2</sup>	2,35	1,99	1,22	1,48	2,34
Absorber area	m <sup>2</sup>	2,31	1,965	1,16	1,39	2,31
Absorption	%	95%	95%	95%	95%	95%
Emission	%	5%	5%	5%	5%	5%
Tempered transparent glass cover	mm	4	4	4	4	4
Recommended throughput	l/h/m <sup>2</sup>	15-40	15-40	15-40	15-40	15-40
Max operating pressure	bar	10	10	10	10	10
Bottom insulation	mm	50	50	50	50	50
Lateral insulation	mm	20	20	-	-	-
Liquid volume	l	1,30	1,10	1,0	1,10	1,30
Absorber dimensions	mm	1100x2101	935x2101	1050x1100	1100x1300	1100x2101
Total collector dimensions	mm	2206x1205x100	2206x1040x100	1170x1180x100	1170x1400x100	2170x1170x100
Weight	Kg	55	48	38	41	59

### CSS model

		CSS 12	CSS 18
Numbers of tubes		12	18
Total area	m <sup>2</sup>	2,28	3,41
Opening area	m <sup>2</sup>	2,0	3,0
Collector capacity	l	1,6	2,4
Max operating pressure	bar	10	10
Max operating temperature	C°	295	295
Stand-by losses 0,25l (m2 min) If a 40°c ca.	mbar	5	11
Stand-by losses 0,66l (m2 min) If a 40°c ca.	mbar	13	32
Heating flow and return connection	mm	15	15
Materials	Al/Cu/Glas/Silicon/PBT/EPDM/TE		
Pipe material	Borosilicate 3.3		
Selective area material	Nitrite of aluminium		
Tube dimensions (out/in/thickness/length)	mm	47/37/1,6/1500	
Total collector dimensions	mm	1390x1640x100	2080x1640x100
Weight	Kg	37	54

