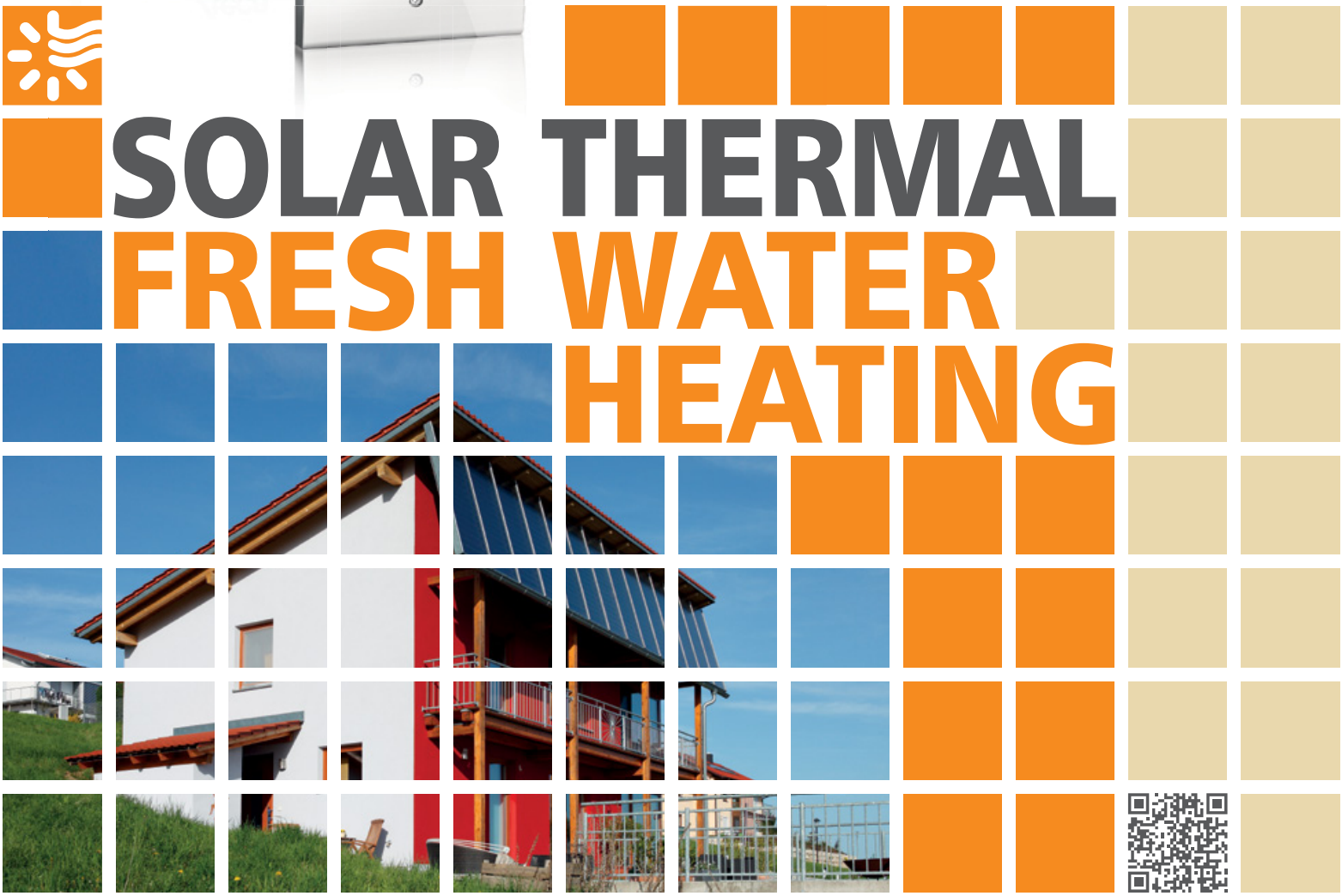
ENGLISH

Steca Elektronik

SOLAR THERMAL FRESH WATER HEATING



»HOT WATER FROM THE SUN FOR BATHS AND SHOWERS, WASHING AND HEATING«

Steca's solar thermal products ensure the safe, effective operation of solar energy systems for domestic water heating and back-up heating. The centrepiece of a solar thermal system is the solar controller which uses the sun as a supply of energy in conjunction with the solar collectors, storage tanks and circulation pumps. It also monitors and controlls technical procedures. The wide range of solar thermal products stands out in terms of high efficiency and ease of operation. This makes the sun – thanks to Steca – into an everyday energy source which can be taken as a matter of course.

EXPLANATION OF SYMBOLS FOR INSIDE PAGES

Collector array
This controller controls a solar energy system with a collector array

Collector array on an east/west roof
This controller controls a solar energy system with collector arrays on a roof with an east/west orientation

1 storage tank
This controller can control a solar energy system with 1 storage tank

2 storage tanks
This controller can control a solar energy system with 2 storage tanks

3 storage tanks
This controller can control a solar energy system with 3 storage tanks

4 storage tanks
This controller can control a solar energy system with 4 storage tanks

Control of radiator heating circuits
This controller is suitable for controlling a radiator heating circuit

Control of surface heating circuits
This controller is suitable for controlling a surface heating circuit

Heating circuit control
external temperature guided

Heating circuit control
room temperature guided

Plate heat exchanger
This controller is suitable for hygienic fresh water heating in the continuous flow principle

Temperature sensor

Pump

Flow rate meter

Tap connection

3-way valve

Solar collector

External heat exchanger

Storage tank

Storage tank with internal heat exchanger

Swimming pool

Radiator

Boiler

CONTENT

»WE ARE THINKING OF TOMORROW.«

Environmental protection in series

»Simple business processes, fair partnerships and transparent communication contribute to our joint success.«

Services and production have an ecological future at the Memmingen electronics specialist company Steca. The company makes a worldwide contribution to reducing power consumption and allowing alternative energy sources to be used efficiently by providing high-performance products.

Steca has established a wide base in order to achieve these goals. The company offers electronic services for residential, automotive, agricultural, environmental, traffic and building technology and also for the industrial and medical sectors. The company also develops products for the environmentally friendly use of solar energy under the brand name of Steca. Steca Elektronik is one of the few manufacturers that cover all three segments of the solar market: PV grid feeding systems, off-grid PV systems and solar thermal systems. Steca also produces battery charging systems that extract the maximum potential from the energy storage system.

Steca sets a good example in its own production methods: the company uses only manufacturing processes that conform to strict ecological criteria. Steca is actively involved in research projects for efficient energy use and climate protection. In 2007, the German federal government therefore listed Steca as an authority for energy generation in the environmental technology atlas „Green Tech made in Germany“.

Steca's environmental policy is based on sustainability and environmental compatibility, with a view to providing services and producing products for an ecological future. The company considers the whole value-added chain from this perspective and also involves its suppliers and customers. Steca is certified in accordance with ISO 14001:2004 and organised in accordance with the EU Environmental Management and Audit Scheme.

Full power for you: Management board Michael, Dietmar and Peter Voigtsberger

»MODULAR CONCEPTS FOR INDIVIDUAL APPLICATIONS.«

Solar thermal systems convert incident solar irradiation into heat that is used to heat domestic hot water or for additional heating. The solar irradiation is converted into heat in the collector whose main component is a selectively-coated absorber. The heat is pumped via a closed piping system, the solar circuit, from the collector to the storage tank. The solar energy system not only provides hot water in the summer and in transitional periods, but can even provide some in winter. A frost-resistant mixture of water and glycol is used to prevent the heat-transfer fluid freezing in the solar circuit. The mature, high-performance technology from Steca guarantees that a large proportion of the hot water requirement can be provided for by using solar energy.

SYSTEM OVERVIEW

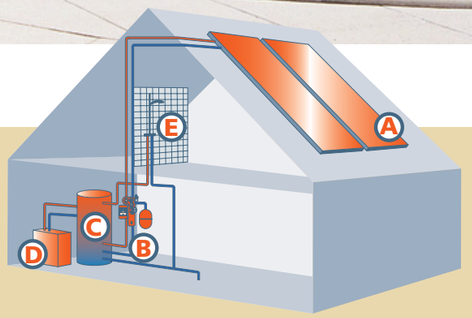
- **Solar controllers**
- **Heating and domestic hot water controllers**
- **System controllers**
- **Remote displays**

SOLAR CONTROLLERS

as temperature differential controllers

The transport of heat from the collector to the storage tank is controlled according to the temperature difference. The controller starts the circulation pump of the solar circuit as soon as the temperature in the collector is several degrees warmer than the temperature at the bottom of the storage tank. This transports the solar fluid from the collector to the lower heat exchanger, where the heat is transferred to the drinking water in the storage tank via the solar circuit heat exchanger. The cooled solar fluid then flows back to the collector in the return pipe.

The heated drinking water rises in the storage tank. The water is stratified in the storage tank according to its density or temperature: the hottest water is at the top (where it is tapped), the coldest water is at the bottom (where cold water is fed in).



Key:

A Solar collector
B Solar pump station
C Storage tank
D Boiler
E Water withdrawal

Overview of devices:

Steca TR 0201
Solar controller
2 inputs, 1 output
(Page 19)

Steca TR 0301
Solar controller
3 inputs, 1 output
(Page 20)

Steca TR 0301sc
Solar controller
3 inputs, 1 output
(Page 22)

Steca TR A301 PWM
Solar controller
3 inputs, 1 PWM output
(Page 23)

Steca TR A501 T
Solar controller
5 inputs, 1 output
(Page 24)

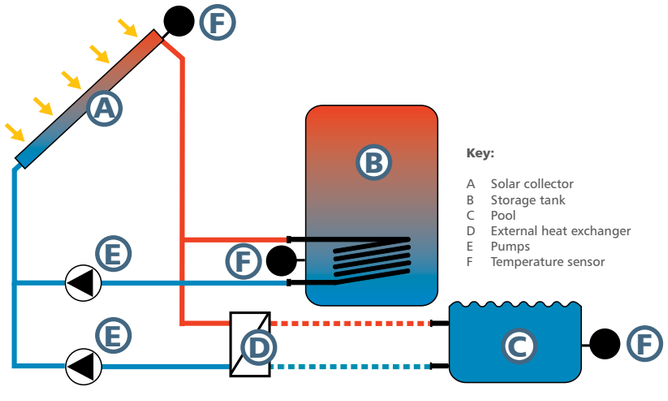
Steca TR A502 TT
Solar controller
5 inputs, 2 outputs
(Page 28)

Steca TR A503 TTR
Solar controller
5 inputs, 3 outputs
(Page 32)

Steca TR 0603mc
Solar controller
6 inputs, 3 outputs
(Page 38)

With the current standard system size for one to two family houses (approx. 1.0 to 1.5 m² collector surface per person and approx. 80-100 l storage tank volume), in summer, the drinking water is primarily heated by the solar energy system. This results in an annual solar coverage (percentage of the total energy requirement for heating drinking water provided by solar energy) of approx. 60%. The remaining 40% must be covered by back-up heating. This is generally provided by a boiler and by the upper heat exchanger for back-up heating, which is located in the storage tank.

You can select a tailor-made controller from the Steca solar thermal controller product family based entirely on the requirements of your solar energy system. A range of monitoring and control functions guarantee that your solar system runs safely and maximise its service life.



Key:

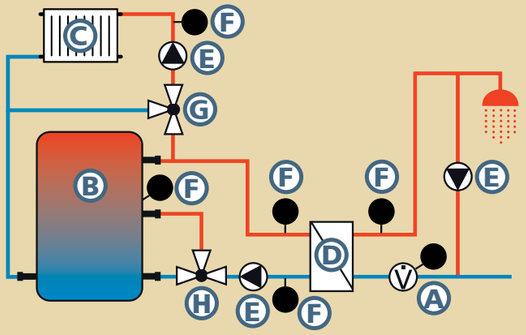
A Solar collector
B Storage tank
C Pool
D External heat exchanger
E Pumps
F Temperature sensor

HEATING AND DOMESTIC HOT WATER CONTROLLERS

Before saving energy became relevant in everyday life, people regulated the temperature in their homes simply by opening and closing the manual valves on the radiators: this required a constant high temperature (70°C to 90°C) of the water in the boiler. This is anything but resource-saving heating technology!

The use of so-called mixers represents significant progress in this area: they direct cooled return water to the hot boiler or buffer storage tank water, to ensure that the supply temperature (temperature of the heating water flowing to the radiators and underfloor heating system) complies with the actual heat requirement. The heating circuit controller controls this process depending on the room or external temperature.

The automatic heating circuit controller is the most energy-efficient type of heating circuit control: a constant comparison of the external or guide room temperature with the selected room temperature keeps the losses in the piping system as low as possible via constant adjustment of the supply temperature.



Key:

A Flow rate meter
B Storage tank
C Radiator
D External heat exchanger
E Pumps
F Temperature sensor
G Mixer
H 3-way valve

Overview of devices:

Steca TH A603 M
Heating controller
6 inputs, 3 outputs
(Page 48)

Steca TH A603 MS
Heating controller (Slave)
6 inputs, 3 outputs
(Page 50)

Steca TR 0201
Solar controller
2 inputs, 1 output
(Page 19)
Alternative usage:
– Storage tank reloading
– Heating return increase

Steca TR A501 T
Solar controller
5 inputs, 1 output
(Page 24)
Alternative usage:
– Thermostat
– Thermostatic back-up heating
– Circulation pump control
– Solid fuel boiler back-up heating
– Storage tank reloading
– Heating return increase

Steca TA FV1
Remote control for the heating controllers Steca TH A603 M and Steca TH A603 MS
(Page 67)

Steca TF A603 MC
DHW controller (stand-alone)
6 inputs, 3 outputs
(Page 54)

Steca TF A603 MCK and Steca TF A603 KS
DHW controller (Master and Slave)
6 inputs, 3 outputs
(Page 56)

Steca TF B001
DHW controller (compact)
1 input, 1 output
(Page 52)

Steca TF B202
DHW controller (compact)
2 inputs, 2 outputs
(Page 53)

Steca TA AF1
External temperature sensor for the heating controllers Steca TH A603 M and Steca TH A603 MS
(Page 67)

Heating drinking water energy-efficiently and hygienically is the responsibility of demand-dependent fresh water technology. It considerably reduces the risk of contamination and legionella multiplication.

If fresh water is withdrawn, the domestic hot water controller detects the removal and has the discharge pump withdraw hot water from the buffer storage tank via the plate heat exchanger. The plate heat exchanger heats the water using the continuous flow heater principle. The domestic hot water controller controls the pump speed of the discharge pump so that the hot water temperature is kept constant at the value set even if the withdrawal quantity changes.

This intelligent control system guarantees low return temperatures to the buffer storage tank and unrestricted hot water comfort.

Fresh water technology is the ideal addition to all heating systems which use buffer storage tanks: e.g. solar thermal systems, wood-fired boilers, heat pumps and water heating stoves.

Application of the heating controller Steca TH A603 M (Master)

SYSTEM CONTROLLERS

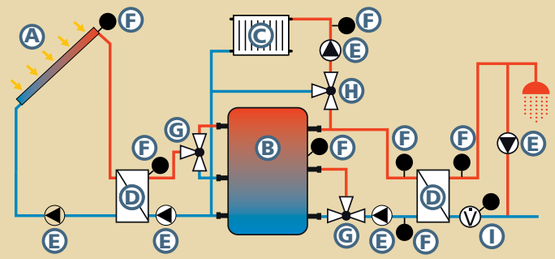
Increasing energy prices drive the operating costs for room heating and drinking water heating ever upwards. Greater use of renewable energy sources is the only way to become gradually more independent of this trend. Using less fossil fuels has a desirable side effect:

a significant reduction in CO_2 emissions.

So-called system controllers are designed to maximise the heat yield of these complex systems – they are specialised in optimising the interaction of various heat sources, hydraulic versions and loads.

The Steca system controllers fulfill these demands: their intelligent control concept guides the heat management of the entire system and guarantees convenient, demand-oriented and reliable provision of heat primarily from renewable energy sources, always focusing on maximum system efficiency.

This is proven by the recorded measurement data which documents yields and consumption; remote data transmission, visualisation and analysis software replace cost-intensive on-site maintenance of the system.



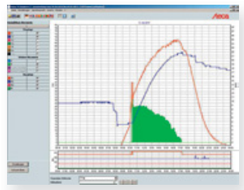
Key:

A Solar collector
B Storage tank
C Radiator
D External heat exchanger
E Pumps
F Temperature sensor
G 3-way valve
H Mixer
I Flow rate meter

Overview of devices:

Steca TR 0704
Solar controller as system controller
7 inputs, 4 outputs
(Page 46)

Steca TR 0603mc
Solar controller as system controller
6 inputs, 3 outputs
(Page 38)



Steca TS Analyzer 2
Analysis software for solar controllers
(Page 66)

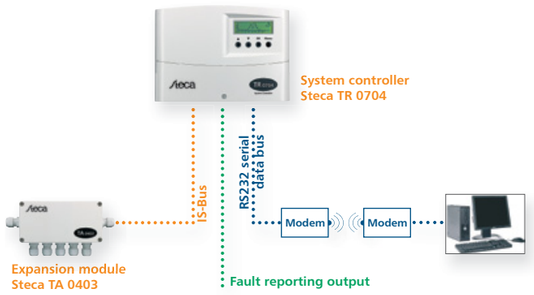
Steca TH A603 M
Heating controller as system controller
(Page 48)

Steca TA 0403
Expansion module for the solar controller Steca TR 0704
(Page 58)

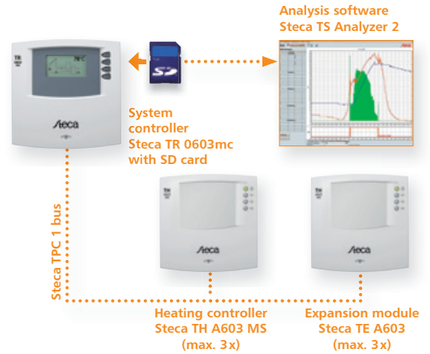
Steca TE A603
Expansion module for the solar controller Steca TR 0603mc and the heating controller Steca TH A603 M
(Page 60)

Steca TH A603 MS
Heating controller (Slave)
(Page 50)

The Steca system controllers offer also high flexibility and modularity: in addition to numerous pre-programmed hydraulic versions, optional functions allow individual integration in the existing hydraulic system. Expansion modules allow the system to be expanded as required.



Application example of the system controller Steca TR 0704 with the expansion module Steca TA 0403



Application example of the system controller Steca TR 0603mc with the heating controller Steca TH A603 MS (max. 3x) and the expansion module Steca TE A603 (max. 3x)

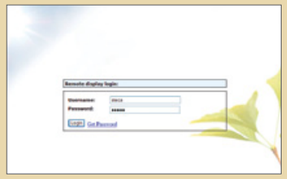
REMOTE DISPLAYS

Monitor the solar energy system remotely – now even from your living room!

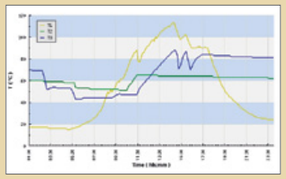
Smart phone, Laptop, Monitor: Everything is possible!
Monitoring solar systems is now far more convenient with the wireless remote display and the Steca TR 0603mc and Steca TR A503 TTR solar controllers.

Thanks to a graphical display of the solar system information and all relevant measurements that the solar controller transfers to the receiving device per router, the system can now be controlled conveniently from your couch.

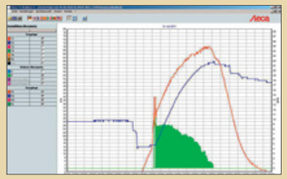
Optimum system monitoring via the Internet remote display
The Steca Internet remote display allows permanent monitoring and performance analysis of one or more solar energy systems. The Steca TK RW2 IFA router allows visualisation of the operation of solar thermal systems: Temperature and performance data are clearly displayed for analysis in an Internet browser window.



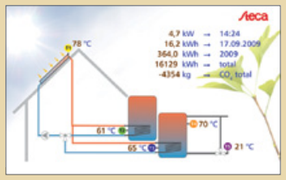
Login page at **www.solarthermalweb.de**



Current measured temperature values displayed on the daily diagram



Professional system analysis with the Steca TS Analyzer 2 software



Solar energy system with two storage tanks displaying the current measured temperature values, instantaneous power, daily, annual and total energy balance and CO_2 saving

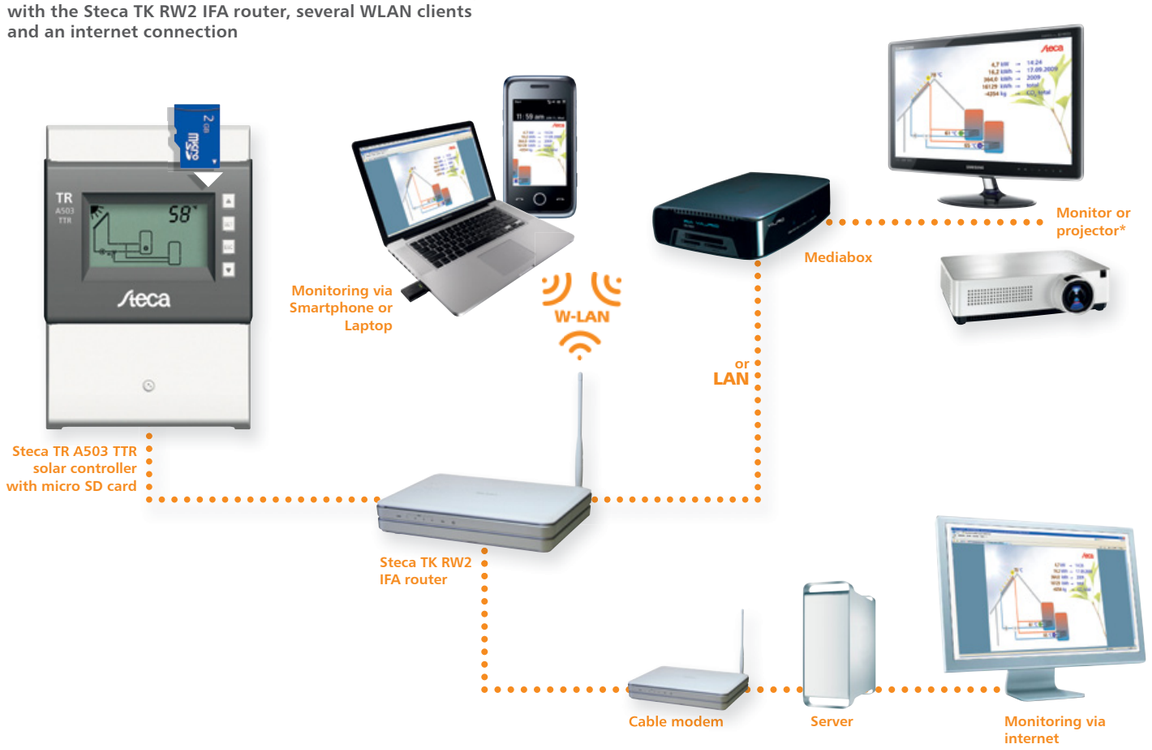
Overview of devices:

Steca TR 0603mc
Solar controller
6 inputs, 3 outputs
(Page 38)

Steca TR A503 TTR
Solar controller
5 inputs, 3 outputs
(Page 32)

Steca TK RW2
IFA-Router
(Page 64)

Solar controller (Steca TR A503 TTR or Steca TR 0603mc) with the Steca TK RW2 IFA router, several WLAN clients and an internet connection



*with HDMI, DVI or composite video input

»HIGH PERFORMANCE TECHNOLOGY FOR MAXIMUM CONVENIENCE«

The entire Steca product portfolio is hallmarked by high performance, convenient installation and easy operation. Steca solar controllers using energy provided by the sun lie at the core of a solar thermal system. Heating circuit controllers provide resource-saving and energy-efficient control of heating circuits. The Steca fresh water controllers provide direct and hygienic heating of drinking water. Thanks to Steca, the solar energy is used efficiently to provide an unlimited degree of hot water convenience.

PRODUCTS

Solar controllers

Heating controllers

Domestic hot water controllers

Expansion modules

Steca TR 0201

2 inputs,1 output

The Steca TR 0201 solar thermal controller provides everything your solar thermal system requires for safe and long-lasting operation.

The microprocessor-controlled regulator monitors and controls solar thermal systems by means of a collector array and a storage tank.

Apart from controlling the solar energy system, the controller also performs important system monitoring and safety functions. The system parameters and measured values can be viewed and altered via the LCD display. The controller is equipped with two inputs for recording the temperature and one output for controlling the solar circuit pump. The range of features of the Steca TR 0201 is supplemented by numerous additional functions such as a maximum storage tank temperature function, a tube collector function, an anti-freeze function, as well as a choice of temperature indications in either degrees Celsius (°C) or Fahrenheit (°F).

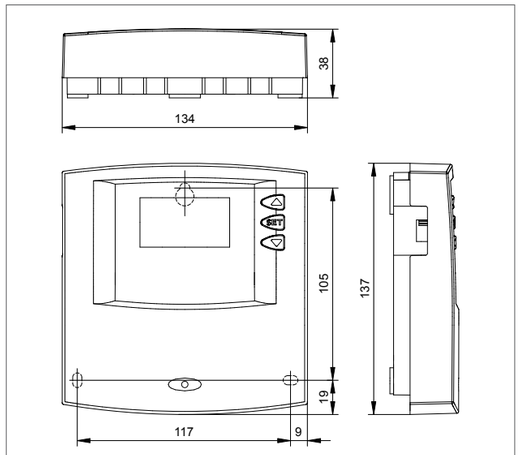
The operational safety of the system is supported by a sophisticated fault diagnosis. The LCD display ensures quick and safe location of occurring errors and facilitates quick troubleshooting.

Product features
- Compact, multipart designer casing
- Maximum storage tank temperature
- Adjustable switch-on temperature difference
- Adjustable switch-off temperature difference
- High level of operational safety through fault diagnosis
- Temperature display °C / °F
- Collector overtemperature disconnection
- Spring clamp terminals allow rapid and easy installation

Displays
- Text LCD display
- Temperature display for storage tank and collector
- Pump operating status display

Operation
- Non-verbal menu navigation
- Side switch for manual, auto, off

Functions
- Interval / tube collector
- Anti-freeze

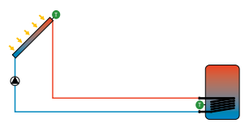


	TR 0201
System voltage	230 V (± 15 %), 50 Hz optional 115 V (± 15 %), 60 Hz
Own consumption	≤ 1 W
Inputs	2 2 x temperature (Pt1000)
Output	1 1 x switch output relay (R1), max. 800 W (230 V)
Turn-on temperature difference	4 K ... 20 K
Turn-off temperature difference	2 K ... 18 K
Ambient temperature	0 °C ... +45 °C
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	134 x 137 x 38 mm
Weight	250 g

Technical data at 25 °C / 77 °F

System types

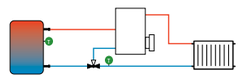
Solart hermal Systems



Internal heat exchanger, intelligent pump control

Further system types

Storage tank reloading



Heating return increase

Areas of application:

inputs/outputs:

Steca TR 0301

3 inputs, 1 output

The Steca TR 0301 was the first controller on the market to be equipped with a graphic display, on which an animated solar circuit of a solar energy system fully indicates the operating status of the system.

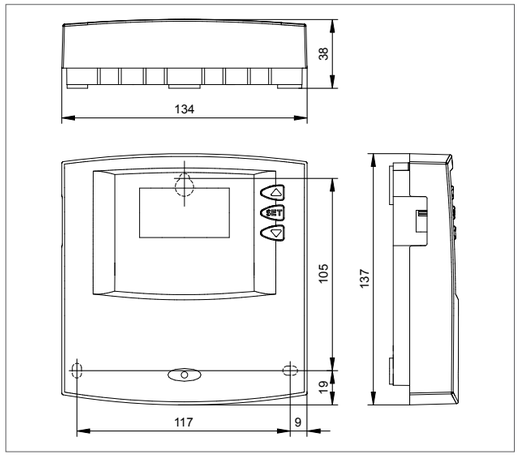
The clearly arranged display ensures easy operation using pictograms. The controller was jointly designed with an internationally renowned design centre. The controller is used for monitoring and controlling solar thermal systems with one collector array and one storage tank. In addition, the controller performs important system monitoring and safety functions to ensure safe and long-lasting operation of the entire system. The numerous additional functions of the Steca TR 0301 also include a maximum storage tank temperature function, a tube collector function, an anti-freeze function, a holiday and storage recool function as well as a choice of temperature indications in either degrees Celsius (°C) or Fahrenheit (°F). The operational safety of the system is supported by a sophisticated fault diagnosis. The multi-coloured LCD backlighting ensures quick and safe location of occurring errors and facilitates quick troubleshooting.

Product features
- Compact, multipart designer casing
- Maximum storage tank temperature
- High level of operational safety through fault diagnosis
- Temperature display °C / °F
- Collector overtemperature disconnection
- Spring clamp terminals allow rapid and easy installation

Displays
- Graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Non-verbal menu navigation
- Side switch for manual, auto, off

Functions
- Holiday (storage tank recooling)
- Interval / tube collector
- Anti-freeze
- Display storage tank top



	TR 0301
System voltage	230 V (± 15 %), 50 Hz optional 115 V (± 15 %), 60 Hz
Own consumption	≤ 1 W
Inputs	3 3 x temperature (Pt1000)
Output	1 1 x switch output relay (R1), max. 800 W (230 V)
Turn-on temperature difference	8 K
Turn-off temperature difference	4 K
Ambient temperature	0 °C ... +45 °C
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	134 x 137 x 38 mm
Weight	250 g

Technical data at 25 °C / 77 °F

System type
1 collector array

Internal heat exchanger, intelligent pump control

Areas of application: inputs/outputs:

Steca TR 0301 U

3 inputs, 1 output

The Steca TR 0301 U controller was specially developed for the North American market based on the Steca TR 0301 basic controller. With its special certification (ETL label) from a Nationally Recognized Testing Laboratory (NRTL) in the US, the controller meets the safety standards and minimum requirements of the North American market.

A feature of the Steca TR 0301 series of controllers is the animated graphic display, which offers a complete visualisation of the solar energy system's operating status and solar circuit.

The clearly arranged display ensures easy operation using pictograms. The controller was jointly designed with an internationally renowned design centre. The controller is used for monitoring and controlling solar thermal systems with one collector array and one storage tank. In addition, the controller performs important system monitoring and safety functions to ensure safe and long-lasting operation of the entire system. The numerous additional functions of the Steca TR 0301 U also include a maximum storage tank temperature function, a tube collector function, an anti-freeze function, a holiday and storage recool function as well as a choice of temperature indications in either degrees Celsius (°C) or Fahrenheit (°F). The operational safety of the system is supported by a sophisticated fault diagnosis. The multi-coloured LCD backlighting ensures quick and safe location of occurring errors and facilitates quick troubleshooting.

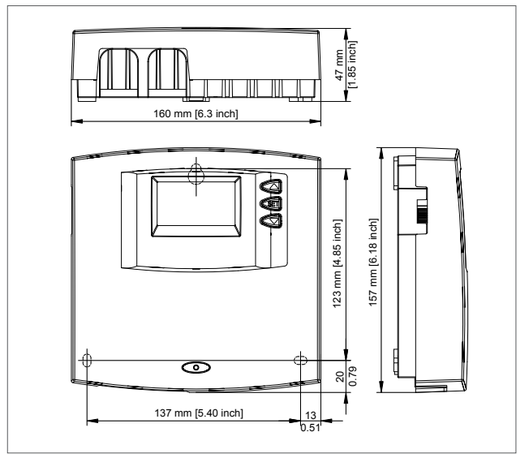
The Steca TR 0301 U controller is supplied with a pre-fitted US mains connection cable and a preinstalled, pluggable pump output.

Product features
- Compact, multipart designer casing
- Maximum storage tank temperature
- High level of operational safety through fault diagnosis
- Temperature display °C / °F
- Collector overtemperature disconnection
- Spring clamp terminals allow rapid and easy installation

Displays
- Graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Non-verbal menu navigation
- Side switch for manual, auto, off

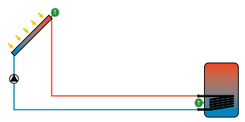
Functions
- Holiday (storage tank recooling)
- Interval / tube collector
- Anti-freeze
- Display storage tank top



	TR 0301 U
System voltage	120 V AC, 60 Hz optional 240 V AC, 60 Hz
Own consumption	≤ 1 W [≤ 0.001 HP]
Inputs	3 3 x temperature (Pt1000)
Output	1 1 x switch output relay (R1), max. 400 W / 0.5 HP (120 V AC) or 800 W / 1 HP (240 V AC)
Line cord	75 inch, 3 x 18 AWG at 221 °F
Turn-on temperature difference	16 F
Turn-off temperature difference	8 F
Ambient temperature	0 °C [+32 °F] ... +45 °C [+113 °F]
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	160 x 157 x 47 mm [6.3 x 6.18 x 1.85 inch]
Weight	350 g [12.35 oz]
Temperature sensors 2 x Pt1000	1.5 m [59 inch] silicone cable with bushing (Measuring range up to + 180 °C [+356 °F])

Technical data at 25 °C / 77 °F

System type
1 collector array



Internal heat exchanger, intelligent pump control

Areas of application: inputs/outputs:

Steca TR 0301sc

3 inputs, 1 output

The Steca TR 0301sc controller is the speed-controllable version of the basic controller, the Steca TR 0301.

In addition to the speed control of the solar circuit pump, the Steca TR 0301sc also allows logging of the solar circuit pump's hours of operation, as well as recording the minimum and maximum temperature values of the collector and the storage tank.

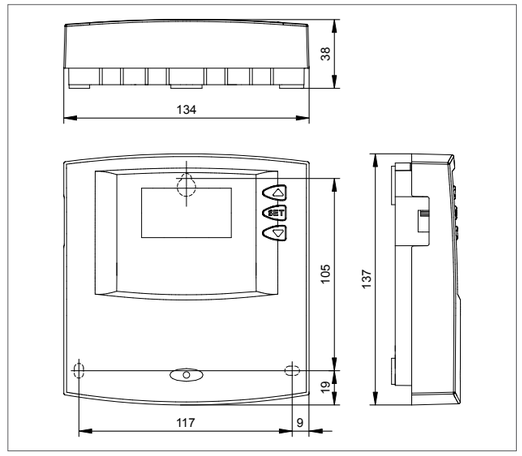
The controller is used for monitoring and controlling solar thermal systems with one collector array and one storage tank. Equipped with an animated and clearly arranged graphic display, the Steca TR 0301sc visualizes the operational status as well as the complete solar circuit of the solar energy system. The consistent use of pictograms helps make the controller easy to operate. The controller also performs important system monitoring and safety functions to ensure safe and long-lasting operation of the entire system. The numerous additional functions of the Steca TR 0301sc also include a maximum storage tank temperature function, a tube collector function, an anti-freeze function, a holiday and storage recool function as well as a choice of temperature indications in either degrees Celsius (°C) or Fahrenheit (°F). The operational safety of the system is supported by a sophisticated fault diagnosis. The multi-coloured LCD backlight ensures quick and safe location of occurring errors and facilitates quick troubleshooting.

Product features
- Compact, multipart designer casing
- Electronic speed control
- Maximum storage tank temperature
- High level of operational safety through fault diagnosis
- Logging of minimum and maximum temperature values
- Temperature display °C / °F
- Collector overtemperature disconnection
- Hours-of-operation logger
- Storage tank target temperature loading
- Spring clamp terminals allow rapid and easy installation

Displays
- Graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Non-verbal menu navigation
- Side switch for manual, auto, off

Functions
- Holiday (storage tank recooling)
- Interval / tube collector
- Anti-freeze
- Display storage tank top



	TR 0301sc
System voltage	230 V (± 15 %), 50 Hz optional 115 V (± 15 %), 60 Hz
Own consumption	≤ 1 W
Inputs	3 3 x temperature (Pt1000)
Output	1 1 x triac for speed control (R1), max. 250 W (230 V)
Turn-on temperature difference	8 K
Turn-off temperature difference	4 K
Ambient temperature	0 °C ... +45 °C
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	134 x 137 x 38 mm
Weight	250 g

Technical data at 25 °C / 77 °F

System type
1 collector array

Internal heat exchanger, intelligent pump control

Areas of application: inputs/outputs:

Steca TR A301 PWM

3 inputs, 1 PWM output

The Steca TR A301 PWM controller was designed for use with new high-efficiency, cost and energy saving solar heating pump technology. This latest generation of electrically commutated circulation pumps have an integrated frequency converter and a permanent magnet motor. The PWM control signal must be specially activated in order to control this type of high-efficiency ECM pump. With this pulse width modulated DC square-wave signal the Steca TR A301 PWM controller can automatically exactly adapt the pump speed via a separate control cable to match the continually changing requirements of the system.

In addition to PWM speed control of the solar circulation pump, the Steca TR A301 PWM also allows hydraulic compensation of the solar energy system via Grundfos Direct Sensors™.

The clear, graphically animated display provides visualisation of the current operating status and also the complete solar circuit. The consistent use of pictograms helps make the controller easy to operate.

The controller also performs important system monitoring and safety functions to ensure safe and long-lasting operation of the entire system.

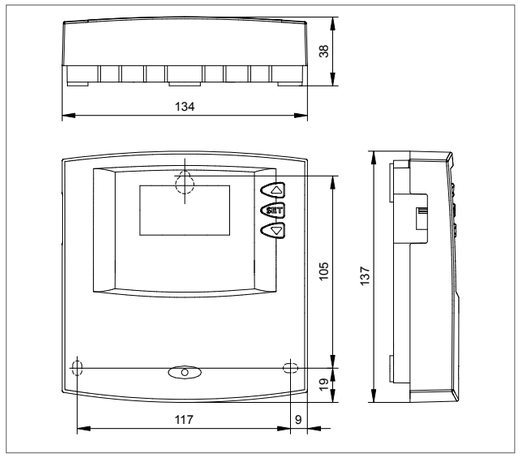
The operational safety of the system is supported by a sophisticated fault diagnosis. The multi-coloured LCD backlight ensures quick and safe location of occurring errors and facilitates quick troubleshooting.

Product features
- Compact, multipart designer casing
- Electronic speed control via pulse width modulation (PWM)
- Maximum storage tank temperature
- High level of operational safety through fault diagnosis
- Logging of minimum and maximum temperature values
- Temperature display °C / °F
- Collector overtemperature disconnection
- Hours-of-operation logger
- Storage tank target temperature loading
- Spring clamp terminals allow rapid and easy installation
- Flow rate and temperature display using Grundfos Direct Sensors™

Displays
- Graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Non-verbal menu navigation
- Side switch for manual, auto, off

Functions
- Flow rate acquisition for hydraulic compensation
- Holiday (storage tank recooling)
- Interval / tube collector
- Anti-freeze



	TR A301 PWM
System voltage	230 V (± 15 %), 50 Hz optional 115 V (± 15 %), 60 Hz
Own consumption	≤ 1 W
Inputs	3 2 x temperature (Pt1000) 1 x Grundfos Direct Sensors™ VFS 1-12 (temperature / flow rate)
Output	1 R1: switched triac output for pump power supply, max. 250 W (230 V) C: PWM control signal for pump speed, 8 mA; 5 V; 250 Hz
Turn-on temperature difference	8 K
Turn-off temperature difference	4 K
Ambient temperature	0 °C ... +45 °C
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	134 x 137 x 38 mm
Weight	250 g

Technical data at 25 °C / 77 °F

System type
1 collector array

Internal heat exchanger, intelligent pump control

Areas of application: inputs/outputs:

Steca TR A501 T

5 inputs, 1 output

The Steca TR A501 T solar thermal controller has been developed to be especially efficient in the widest possible range of applications. It is an ideal solution for all single-circuit systems.

The compact designer casing can be superbly integrated into solar stations, but can of course also be installed on walls or top-hat rails.

A special switched-mode power supply ensures maximum efficiency and economic operation: This reduces own consumption to a minimum and the variable input voltage allows universal use of the device anywhere in the world. The innovative electronic load control technology protects the controller against overloading and installation errors.

The Steca TR A501 T has a triac output for speed control that can also be used as a PWM output for controlling a high-efficiency pump. The equipment is rounded off by five inputs for recording temperature and pulses.

Together with an external pulse encoder, the integrated calorimetry system allows the acquisition of numerical information on the solar yields of the system. The clear, graphically animated display provides visualisation of the system and the current operating status. The consistent use of pictograms guarantees easy operation.

The Steca TR A501 T controller is especially suitable for monitoring and controlling solar thermal systems with a single collector array or simple solar-heated swimming pools. Alternatively, numerous pre-programmed configurations are provided for individual use in other applications, such as back-up heating, solid fuel boilers, thermostats, differencial thermostats / storage tank reloading, return increases and circulation systems.

The Steca TR A501 T also provides important system monitoring and safety functions, such as special error displays for rapid correction of system malfunctions. This ensures long-term, safe and reliable operation of the entire solar system.

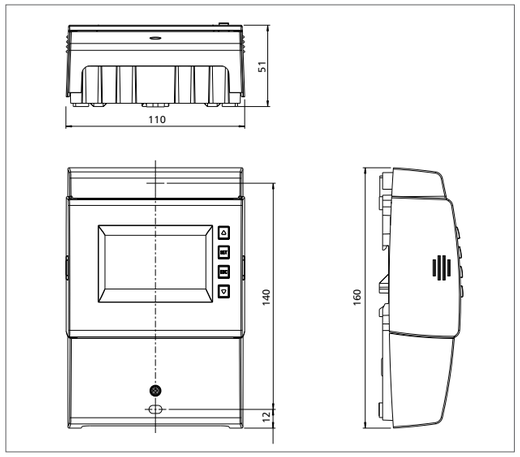
Product features
- Compact, multipart designer casing
- Installation versions: Solar pump stations, wall installation, mounting rails
- Wave packet (Triac) and pulse width modulation (PWM) ensure electronic RPM control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Daily pump start
- Screw terminals allow universal and rapid installation
- Low power consumption thanks to universal and wide-range switched-mode power supply
- Variable input voltage range for worldwide controller deployment
- Electronic overloading control and protection

Displays
- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Non-verbal menu navigation
- Manual switch for manual, auto, off

Functions
- Heat quantity (pulse generator, determination)
- Display showing CO_2 savings
- Reduction of stagnation phases
- Holiday (storage tank recooling)
- Storage tank quick charge
- Interval / tube collector
- Anti-freeze
- Display storage tank top

Areas of application: inputs/outputs:

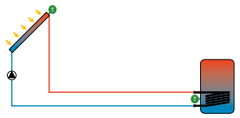


	TR A501 T
System voltage	115 V AC ... 230 V AC, 50 Hz / 60 Hz
Own consumption	≤ 0.8 W
Inputs	5 4 x temperature (Pt1000) 1 x temperature (Pt1000) or pulse
Outputs	1 1 x Triac for speed control (R1), max. 250 W (230 V) or PWM control signal for pump speed (PWM R1)
Hydraulic schemes	8
Ambient temperature	0 °C ... +50 °C
Degree of protection	IP 22 / DIN 40050 [without front panel: IP 20]
Dimensions (X x Y x Z)	110 x 160 x 51 mm
Weight	300 g

Technical data at 25 °C / 77 °F

System types

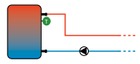
Solar thermal systems



Internal heat exchanger, intelligent pump control

Direct flow-through, intelligent pump control

Further system types

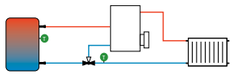


Thermostat

Back-up heating

Circulation function (controlled by temperature / time)

Storage tank reloading



Heating return increase

Solid fuel boiler

Steca TR A501 T U

5 inputs, 1 output

The Steca TR A501 T U controller was especially developed as a compact, efficient and universally applicable solar controller and is the ideal solution for all single-circuit systems. The particularly compact designer casing can be superbly integrated into solar pump stations, but can of course also be installed on walls or top-hat rails.

A specially constructed switched-mode power supply ensures maximum efficiency and economic operation. This reduces own consumption to a minimum and the variable input voltage allows universal use of the device anywhere in the world. The innovative electronic load control technology protects the controller against overloading and installation errors.

The Steca TR A501 T U has a triac output for speed control that can also be used as a 0-10 V output (PWM output on request) for controlling a high-efficiency pump. The equipment is rounded off by five inputs for recording temperature and pulses.

Together with an external pulse encoder, the integrated calorimetry system allows the acquisition of numerical information on the solar yields of the system.

The clear, graphically animated display provides visualisation of the system and the current operating status. The consistent use of pictograms guarantees easy operation of the controller.

The Steca TR A501 T U controller is especially suitable for monitoring and controlling solar thermal systems with a single collector array or simple solar-heated swimming pools. Alternatively, numerous pre-programmed configurations are provided for individual use in other applications, such as back-up heating, solid fuel boilers, thermostats, differencial thermostats / storage tank reloading, return increases and circulation systems.

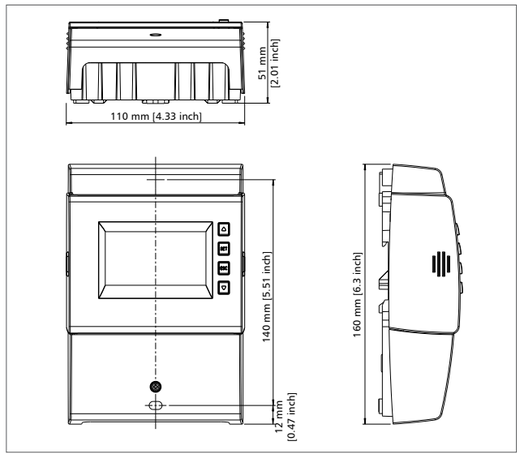
The Steca TR A501 T U also provides important system monitoring and safety functions, such as special error displays for rapid correc-tion of system malfunctions. This ensures long-term, safe and reliable operation of the entire solar system.

Product features
- Compact, multipart designer casing
- Installation versions: Solar pump stations, wall installation, mounting rails
- Wave packet (Triac) and 1-10 V control signal (PWM control signal on request) ensure electronic RPM control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Daily pump start
- Screw terminals allow universal and rapid installation
- Low power consumption thanks to universal and widerange switched-mode power supply
- Variable input voltage range for worldwide controller deployment
- Electronic overloading control and protection

Displays
- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Non-verbal menu navigation
- Manual switch for manual, auto, off

Functions
- Heat quantity (pulse generator, determination)
- Display showing CO_2 savings
- Drain back
- Reduction of stagnation phases
- Holiday (storage tank recooling)
- Storage tank quick charge
- Interval / tube collector
- Anti-freeze
- Display storage tank top



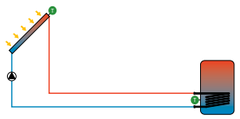
	TR A501 T U
System voltage	115 V AC ... 230 V AC, 50 Hz / 60 Hz
Own consumption	≤ 0.8 W
Inputs	5 4 x temperature (Pt1000) 1 x temperature (Pt1000) or pulse
Outputs	1 1 x Triac for speed control (R1), max. 130 W / 0.17 HP (120 V AC) or 0 - 10 V control signal for pump speed (0 - 10 V R1) / PWM control signal on request
Hydraulic schemes	8
Ambient temperature	0 °C [+32 °F] ... +50 °C [+122 °F]
Degree of protection	IP 22 / DIN 40050 [without front panel: IP 20]
Dimensions (X x Y x Z)	110 x 160 x 51 mm [4.33 x 6.3 x 2.01 inch]
Weight	300 g [10.58 oz]

Technical data at 25 °C / 77 °F

Areas of application: inputs/outputs:

System types

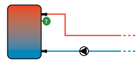
Solar thermal systems



Internal heat exchanger, intelligent pump control

Direct flow-through, intelligent pump control

Further system types

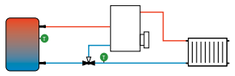


Thermostat

Back-up heating

Circulation function (controlled by temperature / time)

Storage tank reloading



Heating return increase

Solid fuel boiler

Steca TR A502 TT

5 inputs, 2 outputs

The Steca TR A502 TT controller is an ideal solution for all double-circuit systems. It monitors and controls solar thermal systems with up to two differently aligned collector arrays or a maximum of two domestic hot water or buffer storage tanks.

The Steca TR A502 TT is also distinguished by the compact casing, which is typical for this series of devices. It can be superbly integrated into solar stations, but of course it can also be installed on walls or top-hat rails. The variable input voltage range allows universal use of the device worldwide.

The solar controller has five inputs for acquisition of temperature and pulse information and two outputs. These can also be used for controlling high-efficiency pumps. The device is equipped with an additional alarm output. The operating states are visualised on an animated, clearly arranged display.

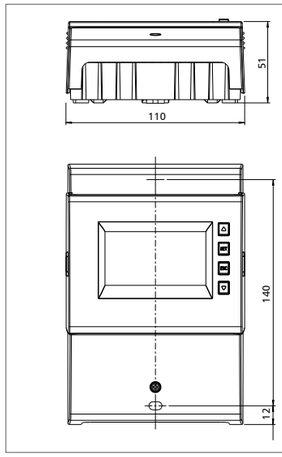
Together with an external pulse encoder, the integrated calorimetry system allows the acquisition of numerical information on the solar yields of the system.

The controller can be used in a wide range of applications and is exceptionally easy to configure and operate: 11 system configurations are pre-programmed. The inputs and outputs are already defined and you can see what is connected at a glance. Installers only need to set the boundary parameters. The system setting “0.1” allows free selection of the controller functions to suit the system type and operating requirements. The ability to be mounted on a wall or top-hat rail emphasises the flexible range of uses for the device.

The specially constructed switching power supply in the Steca TR A502 TT, which is used in all controllers of this series, ensures the maximum possible efficiency and economic operation.

The new electronic load control system protects the device from overloading and installation errors. This ensures long-term, safe and reliable operation of the entire solar system.

The Steca TR A502 TT also provides important system monitoring and safety functions. This ensures long-term, safe and reliable operation of the entire solar system. For rapid correction of system malfunctions special error displays are shown.



Product features
- Compact, multipart designer casing
- Installation versions: Solar pump stations, wall installation, mounting rails
- Wave packet (Triac) and pulse width modulation (PWM) ensure electronic RPM control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Daily pump start
- Screw terminals allow universal and rapid installation
- Low power consumption thanks to universal and wide-range switched-mode power supply
- Variable input voltage range for worldwide controller deployment
- Electronic overloading control and protection

Displays
- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Non-verbal menu navigation
- Manual switch for manual, auto, off

Functions
- Heat quantity (pulse generator, determination)
- Display showing CO_2 savings
- Reduction of stagnation phases
- Active cooling (e.g. to avoid stagnation)
- Holiday (storage tank recooling)
- Circulation (controlled by temperature / time)
- Back-up heating
- Solid fuel boiler
- Storage tank quick charge
- Thermostat
- Differential thermostat
- Interval / tube collector
- Anti-freeze
- Display storage tank top
- Alarm output

	TR A502 TT
System voltage	115 V AC ... 230 V AC, 50 Hz / 60 Hz
Own consumption	≤ 0.8 W
Inputs	5 4 x temperature (Pt1000) 1 x temperature (Pt1000) or pulse
Outputs	2 2 x triac for speed control (R1, R2), max. 250 W (230 V) or PWM control signal for pump speed (PWM R1, PWM R2)
Additional output	1 x potential-free switching output for the safety extra-low voltage
Hydraulic schemes	11
Ambient temperature	0 °C ... +50 °C
Degree of protection	IP 22 / DIN 40050 [without front panel: IP 20]
Dimensions (X x Y x Z)	110 x 160 x 51 mm
Weight	350 g

Technical data at 25 °C / 77 °F

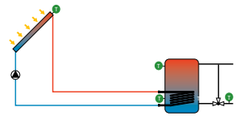
Areas of application:

inputs/outputs:

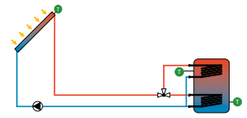
Systems with one storage tank

1 collector array

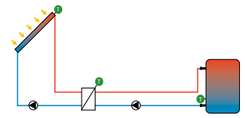
Internal heat exchanger, intelligent pump control



Internal heat exchanger, intelligent pump control, heating return increase



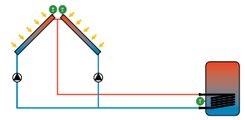
Internal heat exchanger, zone loading, intelligent valve control



External heat exchanger, intelligent pump control

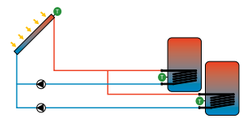
Systems with two storage tanks

2 collector arrays (east/west roof))

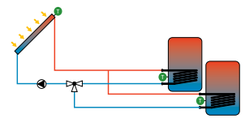


Internal heat exchanger, intelligent pump control

1 collector array



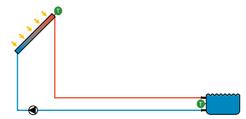
Internal heat exchanger, intelligent pump control



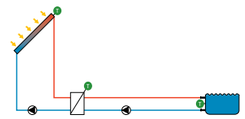
Internal heat exchanger, intelligent valve control

Systems with a swimming pool

1 collector array



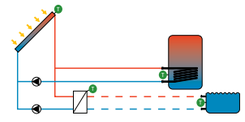
Direct flow-through, intelligent pump control



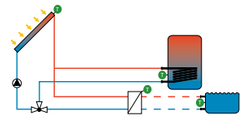
External heat exchanger, intelligent pump control

Systems with one storage tank and a swimming pool

1 collector array



Stand-alone operation of the external heat exchanger, intelligent pump control



Stand-alone operation of the external heat exchanger, intelligent valve control

Steca TR A502 TT U

5 inputs, 2 outputs

The Steca TR A502 TT U controller is an ideal solution for all double-circuit systems. It monitors and controls solar thermal systems with up to two differently aligned collector arrays or a maximum of two domestic hot water or buffer storage tanks.

The Steca TR A502 TT U is also distinguished by the compact casing, which is typical for this series of devices. It can be superbly integrated into solar stations, but of course it can also be installed on walls or top-hat rails. The variable input voltage range allows universal use of the device worldwide.

The solar controller has five inputs for acquisition of temperature and pulse information and two outputs. These can also be used for controlling (0 -10 V / PWM on request) high-efficiency pumps. The device is equipped with an additional alarm output. The operating states are visualized on an animated, clearly arranged display.

Together with an external pulse encoder, the integrated calorimetry system allows the acquisition of numerical information on the solar yields of the system.

The controller can be used in a wide range of applications and is exceptionally easy to configure and operate: 11 system configurations are pre-programmed. The inputs and outputs are already defined and you can see what is connected at a glance. Installers only need to set the boundary parameters. The system setting “0.1” allows free selection of the controller functions to suit the system type and operating requirements. The ability to be mounted on a wall or top-hat rail emphasizes the flexible range of uses for the device.

The specially constructed switching power supply in the Steca TR A502 TT U, which is used in all controllers of this series, ensures the maximum possible efficiency and economic operation.

Product features
- Compact, multipart designer casing
- Installation versions: Solar pump stations, wall installation, mounting rails
- Wave packet (Triac) and 1-10 V control signal (PWM control signal on request) ensure electronic RPM control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Daily pump start
- Screw terminals allow universal and rapid installation
- Low power consumption thanks to universal and widerange switched-mode power supply
- Variable input voltage range for worldwide controller deployment
- Electronic overloading control and protection

Displays
- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Non-verbal menu navigation
- Manual switch for manual, auto, off

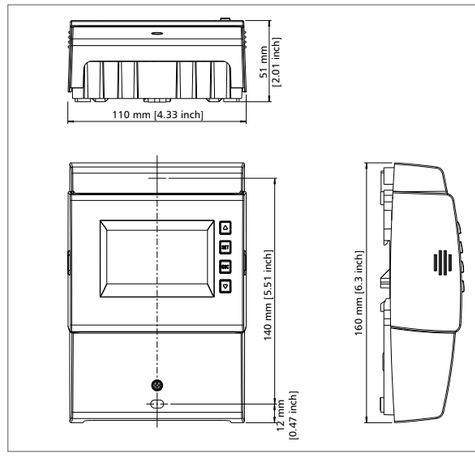
Functions
- Heat quantity (pulse generator, determination)
- Display showing CO_2 savings
- Drain back
- Reduction of stagnation phases
- Active cooling (e.g. to avoid stagnation)
- Holiday (storage tank recooling)
- Circulation (controlled by temperature / time)
- Back-up heating
- Solid fuel boiler
- Storage tank quick charge
- Thermostat
- Differential thermostat
- Interval / tube collector
- Anti-freeze
- Display storage tank top
- Alarm output

Areas of application:

inputs/outputs:

The new electronic load control system protects the device from overloading and installation errors. This ensures long-term, safe and reliable operation of the entire solar system.

The Steca TR A502 TT U also provides important system monitoring and safety functions. This ensures long-term, safe and reliable operation of the entire solar system. For rapid correction of system malfunctions special error displays are shown.



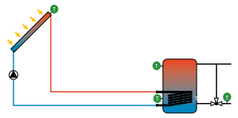
	TR A502 TT U
System voltage	115 V AC ... 230 V AC, 50 Hz / 60 Hz
Own consumption	≤ 0.8 W [≤ 0.001 HP]
Inputs	5 4 x temperature (Pt1000) 1 x temperature (Pt1000) or pulse
Outputs	2 2 x triac for speed control (R1, R2), max. 250 W (230 V) or PWM control signal for pump speed (PWM R1, PWM R2) max. 130 W / 0.17 HP (120 V AC) or 0 - 10 V control signal for pump speed (0 - 10 V R1, 0 - 10 V R2) / PWM control signal on request
Additional output	1 x potential-free switching output for the safety extra-low voltage
Hydraulic schemes	11
Ambient temperature	0 °C [+32 °F] ... +50 °C [+122 °F]
Degree of protection	IP 22 / DIN 40050 [without front panel: IP 20]
Dimensions (X x Y x Z)	110 x 160 x 51 mm [4.33 x 6.3 x 2.01 inch]
Weight	350 g [12.35 oz]

Technical data at 25 °C / 77 °F

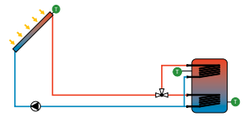
Systems with one storage tank

1 collector array

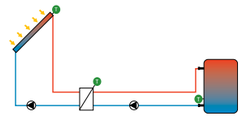
Internal heat exchanger, intelligent pump control



Internal heat exchanger, intelligent pump control, heating return increase



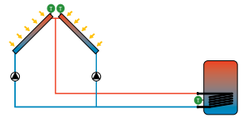
Internal heat exchanger, zone loading, intelligent valve control



External heat exchanger, intelligent pump control

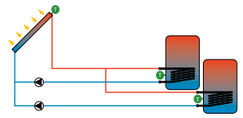
Systems with two storage tanks

2 collector arrays (east/west roof))

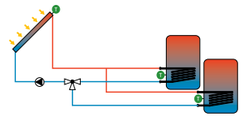


Internal heat exchanger, intelligent pump control

1 collector array



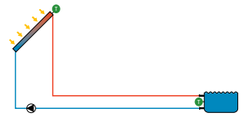
Internal heat exchanger, intelligent pump control



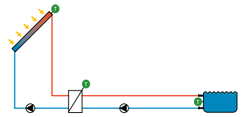
Internal heat exchanger, intelligent valve control

Systems with a swimming pool

1 collector array



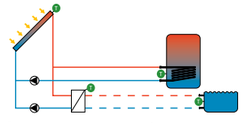
Direct flow-through, intelligent pump control



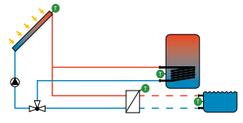
External heat exchanger, intelligent pump control

Systems with one storage tank and a swimming pool

1 collector array



Stand-alone operation of the external heat exchanger, intelligent pump control



Stand-alone operation of the external heat exchanger, intelligent valve control

Steca TR A503 TTR

5 inputs, 3 outputs

Along with the TR A501 T and TR A502 TT controllers, the TR A503 TTR is the third product in this series, which have a compact designer housing allowing universal use.

The TR A503 TTR extends the functionality of this series of devices by providing additional system monitoring functions. Data can be stored on standard Micro-SD cards and Internet visualisation is possible via the Steca TK RW2 IFA router. When used in conjunction with an external pressure sensor, the „System pressure monitoring" controller function provides additional system monitoring. An additional controller output that can be individually customised for additional controller functions is also provided.

As with the other products in this series, a specially constructed switching power supply provides maximum efficiency and economic operation. This reduces own consumption to a minimum. The variable input voltage range allows universal use of the device worldwide.

The TR A503 TTR has two speed-controllable Triac outputs, that can also be configured as PWM outputs for controlling high-efficiency pumps and a relay switched output for additional controller functions. The equipment is rounded off by five inputs for recording temperature and pulses.

Product features
- Compact, multipart designer casing
- Installation versions: Solar pump stations, wall installation, mounting rails
- Wave packet (Triac) and pulse width modulation (PWM) ensure electronic RPM control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Daily pump start
- Screw terminals allow universal and rapid installation
- Low power consumption thanks to universal and wide-range switched-mode power supply
- Variable input voltage range for worldwide controller deployment
- Electronic overloading control and protection
- Communication interface for Internet visualisation using a Steca TK RW2 IFA router

Displays
- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Non-verbal menu navigation
- Manual switch for manual, auto, off

Functions
- Data logging to a Micro-SD card
- Heat quantity (Grundfos Direct Sensors™, pulse generator, determination)
- Display showing CO_2 savings
- System pressure monitoring (e.g. Grundfos Direct Sensors™)
- Reduction of stagnation phases
- Active cooling (e.g. to avoid stagnation)
- Holiday (storage tank recooling)
- Circulation (controlled by temperature / time)
- Back-up heating
- Solid fuel boiler
- Storage tank quick charge
- Thermostat
- Differential thermostat
- Interval / tube collector
- Anti-freeze
- Display storage tank top
- Alarm output

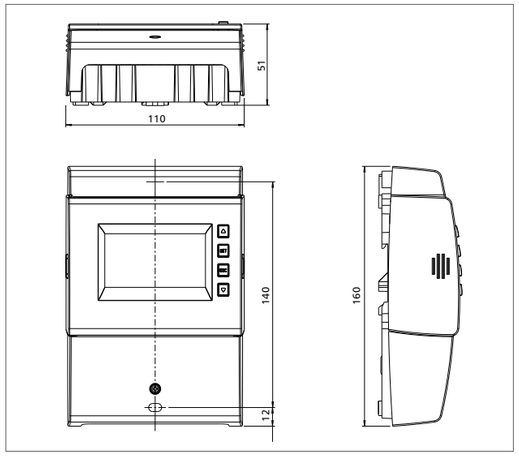
Areas of application:

inputs/outputs: 5 3

The integrated calorimetry system allows the acquisition of numerical information on the solar yields of the system. For more demanding requirements, this can of course be expanded using an external pulse encoder or an additional Grundfos Direct Sensors™.

Steca TR A503 TTR controller monitors and controls solar thermal systems with two differently oriented collector arrays and a maximum of two domestic hot water or buffer storage tanks. The third controller output can be individually customised for additional controller functions.

11 pre-programmed systems enable universal usage. The Steca TR A503 TTR also provides important monitoring and safety functions such as special error messages to quickly troubleshoot faults.
As with the other products in this series the new constructed electronic overloading control protects the TR A503 TTR against overloading and installation errors.



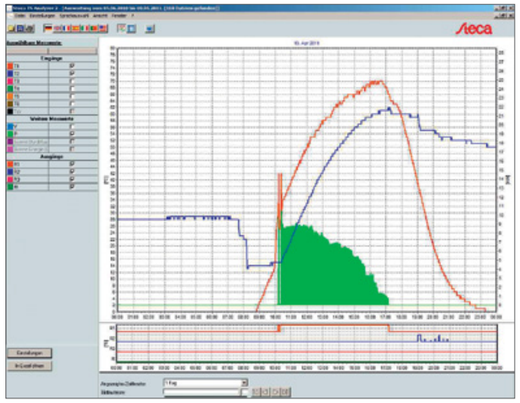
Datalogging on micro SD card and analysis software Steca TS Analyzer 2

The Steca TR A503 TTR stores the solar thermal system's operational data on a Micro-SD card. The analysis software TS Analyzer 2 visualises the system results.

	TR A503 TTR
System voltage	115 V AC ... 230 V AC, 50 Hz / 60 Hz
Own consumption	≤ 0.8 W
Inputs	5 4 x temperature (Pt1000) 1 x temperature (Pt1000) or pulse
Additional intputs	2 1 x Grundfos Direct Sensors™ (temperature / flow rate) 1 x Grundfos Direct Sensors™ (temperature / pressure)
Outputs	3 2 x triac for speed control (R1, R2), max. 250 W (230 V) or PWM control signal for pump speed (PWM R1, PWM R2) 1 x switch output relay (R3), 2 A, 115 V AC ... 230 V AC
Additional output	1 x potential-free switching output for the safety extra-low voltage
Hydraulic schemes	11
Ambient temperature	0 °C ... +50 °C
Degree of protection	IP 22 / DIN 40050 [without front panel: IP 20]
Dimensions (X x Y x Z)	110 x 160 x 51 mm
Weight	370 g

Technical data at 25 °C / 77 °F

Steca TR A503 TTR solar controller with the Steca TK RW2 IFA router, several WLAN clients and an internet connection (page 65)

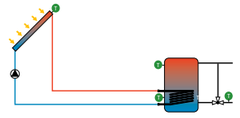


Steca TS Analyzer 2

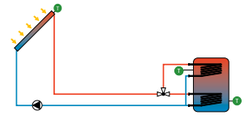
Systems with one storage tank

1 collector array

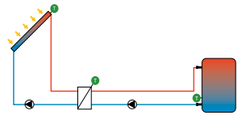
Internal heat exchanger, intelligent pump control



Internal heat exchanger, intelligent pump control, heating return increase



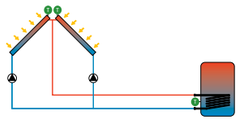
Internal heat exchanger, zone loading, intelligent valve control



External heat exchanger, intelligent pump control

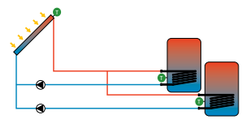
Systems with two storage tanks

2 collector arrays (east/west roof)

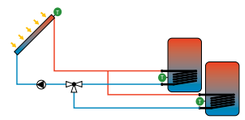


Internal heat exchanger, intelligent pump control

1 collector array



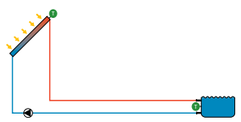
Internal heat exchanger, intelligent pump control



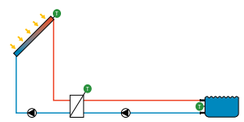
Internal heat exchanger, intelligent valve control

Systems with a swimming pool

1 collector array



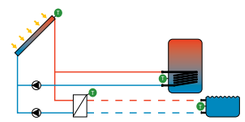
Direct flow-through, intelligent pump control



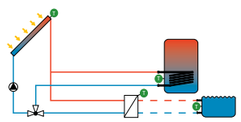
External heat exchanger, intelligent pump control

Systems with one storage tank and a swimming pool

1 collector array



Stand-alone operation of the external heat exchanger, intelligent pump control



Stand-alone operation of the external heat exchanger, intelligent valve control

Steca TR A503 TTR U

5 inputs, 3 outputs

Along with the TR A501 T U and TR A502 TT U controllers, the TR A503 TTR U is the third product in this series, which have a compact designer housing allowing universal use.

The TR A503 TTR U extends the functionality of this series of devices by providing additional system monitoring functions. Data can be stored on standard Micro-SD cards and Internet visualisation is possible via the Steca TK RW2 IFA router. When used in conjunction with an external pressure sensor, the „System pressure monitoring“ controller function provides additional system monitoring. An additional controller output that can be individually customised for additional controller functions is also provided.

As with the other products in this series, a specially constructed switching power supply provides maximum efficiency and economic operation. This reduces own consumption to a minimum. The variable input voltage range allows universal use of the device worldwide.

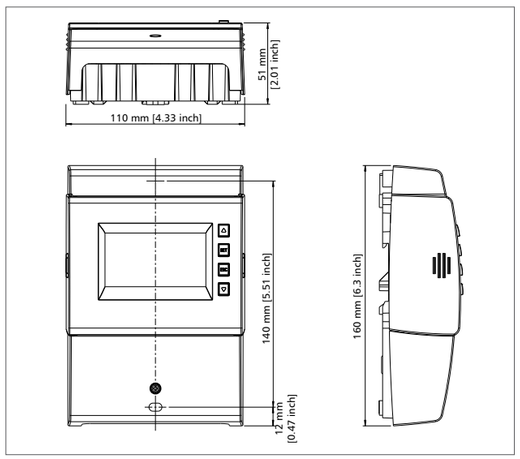
The TR A503 TTR U has two speed-controllable Triac outputs, that can also be configured as 0-10 V outputs (PWM on request) for controlling high-efficiency pumps and a relay switched output for additional controller functions. The equipment is rounded off by five inputs for recording temperature and pulses.

The integrated calorimetry system allows the acquisition of numerical information on the solar yields of the system. For more demanding requirements, this can of course be expanded using an external pulse encoder or an additional Grundfos Direct Sensors™.

Steca TR A503 TTR U controller monitors and controls solar thermal systems with two differently oriented collector arrays and a maximum of two domestic hot water or buffer storage tanks. The third controller output can be individually customised for additional controller functions.

11 pre-programmed systems enable universal usage. The Steca TR A503 TTR U also provides important monitoring and safety functions such as special error messages to quickly troubleshoot faults.

As with the other products in this series the new constructed electronic overloading control protects the TR A503 TTR U against overloading and installation errors.



Product features

- Compact, multipart designer casing
- Installation versions: Solar pump stations, wall installation, mounting rails
- Wave packet (Triac) and 1-10 V control signal (PWM control signal on request) ensure electronic RPM control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Daily pump start
- Screw terminals allow universal and rapid installation
- Low power consumption thanks to universal and widerange switched-mode power supply
- Variable input voltage range for worldwide controller deployment
- Electronic overloading control and protection
- Communication interface for Internet visualisation using a Steca TK RW2 IFA router

Displays

- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation

- Non-verbal menu navigation
- Manual switch for manual, auto, off

Functions

- Data logging to a Micro-SD card
- Heat quantity (Grundfos Direct Sensors™, pulse generator, determination)
- Drain back
- System pressure monitoring (e.g. Grundfos Direct Sensors™)
- Reduction of stagnation phases
- Active cooling (e.g. to avoid stagnation)
- Holiday (storage tank recooling)
- Circulation (controlled by temperature / time)
- Back-up heating
- Solid fuel boiler
- Storage tank quick charge
- Thermostat
- Differential thermostat
- Interval / tube collector
- Anti-freeze
- Display storage tank top
- Alarm output

Areas of application:

inputs/outputs:

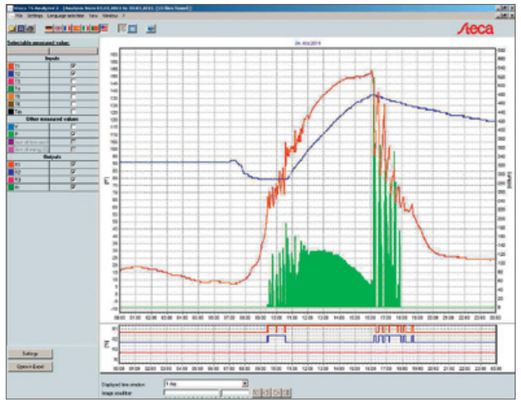
Datalogging on micro SD card and analysis software Steca TS Analyzer 2

The Steca TR A503 TTR U stores the solar thermal system's operational data on a Micro-SD card. The analysis software TS Analyzer 2 visualises the system results.

	TR A503 TTR U
System voltage	115 V AC ... 230 V AC, 50 Hz / 60 Hz
Own consumption	≤ 0.8 W [≤ 0.001 HP]
Inputs	5 4 x temperature (Pt1000) 1 x temperature (Pt1000) or pulse
Additional intputs	2 1 x Grundfos Direct Sensors™ (temperature / flow rate) 1 x Grundfos Direct Sensors™ (temperature / pressure)
Outputs	3 2 x triac for speed control (R1, R2), max. 130 W / 0.17 HP (120 V AC) or 0 - 10 V control signal for pump speed (0 - 10 V R1, 0 - 10 V R2) / PWM control signal on request 1 x switch output relay (R3), 2 A, 115 V AC ... 230 V AC
Additional output	1 x potential-free switching output for the safety extra-low voltage
Hydraulic schemes	11
Ambient temperature	0 °C [+32 °F] ... +50 °C [+122 °F]
Degree of protection	IP 22 / DIN 40050 [without front panel: IP 20]
Dimensions (X x Y x Z)	110 x 160 x 51 mm [4.33 x 6.3 x 2.01 inch]
Weight	370 g [13.05 oz]

Technical data at 25 °C / 77 °F

Steca TR A503 TTR U solar controller with the Steca TK RW2 IFA router, several WLAN clients and an internet connection (page 65)

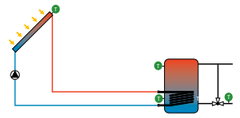


Steca TS Analyzer 2

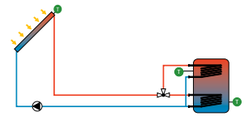
Systems with one storage tank

1 collector array

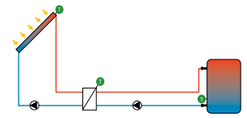
Internal heat exchanger, intelligent pump control



Internal heat exchanger, intelligent pump control, heating return increase



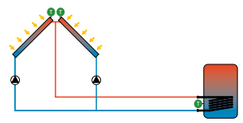
Internal heat exchanger, zone loading, intelligent valve control



External heat exchanger, intelligent pump control

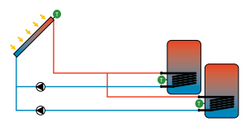
Systems with two storage tanks

2 collector arrays (east/west roof)

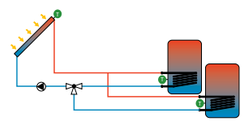


Internal heat exchanger, intelligent pump control

1 collector array



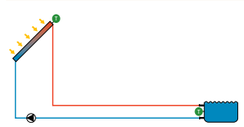
Internal heat exchanger, intelligent pump control



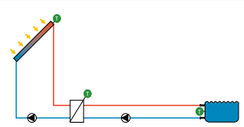
Internal heat exchanger, intelligent valve control

Systems with a swimming pool

1 collector array



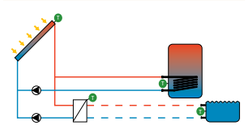
Direct flow-through, intelligent pump control



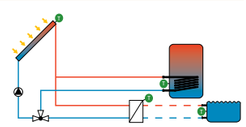
External heat exchanger, intelligent pump control

Systems with one storage tank and a swimming pool

1 collector array



Stand-alone operation of the external heat exchanger, intelligent pump control



Stand-alone operation of the external heat exchanger, intelligent valve control

Steca TR 0502 U

5 inputs, 2 outputs

The Steca TR 0502 U controller was specially developed for the North American market based on the Steca TR 0502 basic controller. With its special certification (ETL label) from a Nationally Recognized Testing Laboratory (NRTL) in the US, the controller meets the safety standards and minimum requirements of the North American market.

The equipment is connected inside the installation casing using either a plug & play solution for the mains and pump connections or alternatively 1/2 inch cut-outs.

This controller provides everything to operate your solar thermal system safely over a long service life. The Steca TR 0502 U controller monitors and controls solar thermal systems with two differently oriented collector arrays and a maximum of two domestic hot water or buffer storage tanks. The large graphic display shows the animated control circuits, which allows you to view the operating statuses of each system. The clearly arranged display ensures easy operation using pictograms. Pre-programmed systems enable universal usage. The Steca TR 0502 U controller has five inputs for recording temperatures or pulse values, as well as two outputs (one is speed-controlled) for controlling pumps or switching valves.

Product features

- Compact, multipart designer casing
- Electronic speed control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Storage tank target temperature loading
- Daily pump start
- Plug & play for 120 V AC mains and pump connections in installation casing
- Screwed connections facilitate fast sensor installation
- Integrated Steca TPC 1 bus

Displays

- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation

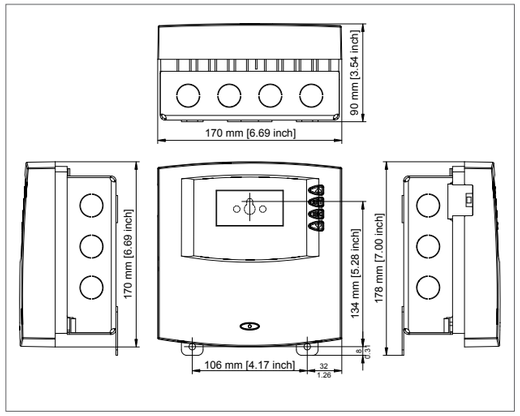
- Multilingual menu navigation
- Side switch for manual, auto, off

Options

- Installation casing with 1/2 inch cut-outs as an alternative to plug & play

Functions

- Heat quantity (Grundfos Direct Sensors™, pulse generator, determination)
- Heating return increase
- Reduction of stagnation phases
- Holiday (storage tank recooling)
- Circulation (controlled by temperature / time / pulse)
- Back-up heating
- Solid fuel boiler
- Storage tank quick charge
- Thermostat
- Differential thermostat
- Timer
- Interval / tube collector
- Anti-freeze
- Display storage tank top
- Alarm output
- Two loading zones

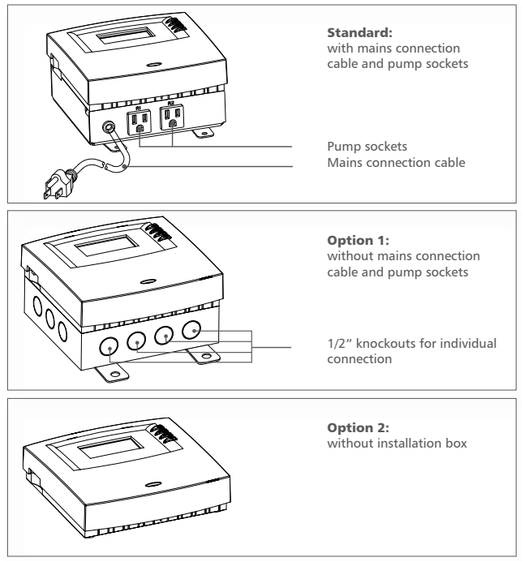


	TR 0502 U
System voltage	120 V AC, 60 Hz optional 240 V AC, 60 Hz
Own consumption	≤ 2 W [0.003 HP]
Inputs	5 4 x temperature (Pt1000) 1 x temperature (Pt1000) or pulse
Additional input	1 x Grundfos Direct Sensors™ (temperature / flow rate)
Outputs	2 1 x triac for speed control (R1), max. 230 W / 0.3 HP (120 V AC) 1 x switch output relay (R2), max. 400 W / 0.5 HP (120 V AC) or R2 voltage free
Additional output	1 x alarm output
Line cord	75 inch, 3 x 18 AWG at 221 °F
Hydraulic schemes	14
Ambient temperature	0 °C [+32 °F] ... +45 °C [+113 °F]
Interfaces	RS232, RS485 (Steca TPC 1 bus)
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	170 x 178 x 90 mm [6.69 x 7.0 x 3.54 inch]
Weight	1.4 kg [45.01 oz]

Technical data at 25 °C / 77 °F

Areas of application:

inputs/outputs:



Standard:
with mains connection cable and pump sockets

Pump sockets
Mains connection cable

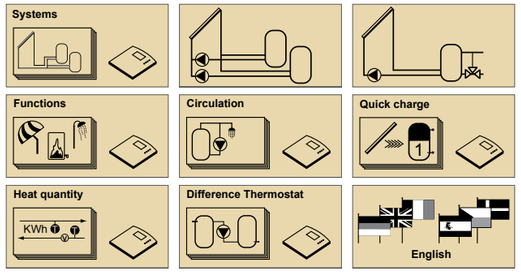
Option 1:
without mains connection cable and pump sockets

1/2" knockouts for individual connection

Option 2:
without installation box

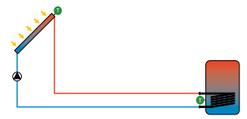
Display examples

The display examples shown here are merely a selection, designed to show the many and diverse function displays of the solar controller Steca TR 0502 U.

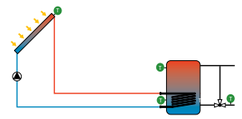


Systems with one storage tank

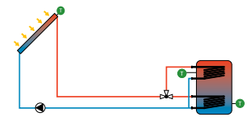
1 collector array



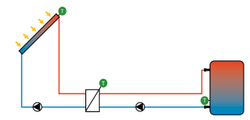
Internal heat exchanger, intelligent pump control



Internal heat exchanger, intelligent pump control, heating return increase



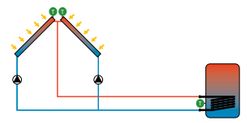
Internal heat exchanger, zone loading, intelligent valve control



External heat exchanger, intelligent pump control

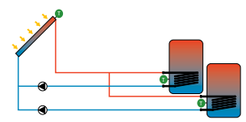
Systems with two storage tanks

2 collector arrays (east/west roof)

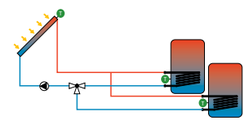


Internal heat exchanger, intelligent pump control

1 collector array



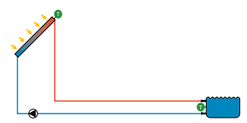
Internal heat exchanger, intelligent pump control



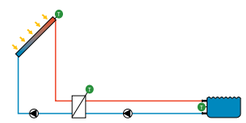
Internal heat exchanger, intelligent valve control

Systems with a swimming pool

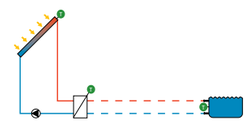
1 collector array



Direct flow-through, intelligent pump control

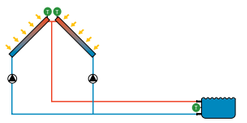


External heat exchanger, intelligent pump control

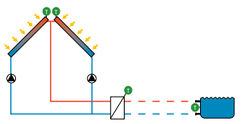


Stand-alone operation of the external heat exchanger, intelligent pump control

2 collector arrays (east/west roof)



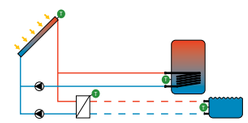
Direct flow-through, intelligent pump control



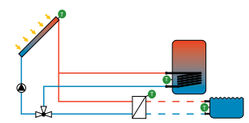
Stand-alone operation of the external heat exchanger, intelligent pump control

Systems with one storage tank and a swimming pool

1 collector array



Stand-alone operation of the external heat exchanger, intelligent pump control



Stand-alone operation of the external heat exchanger, intelligent valve control

Steca TR 0603mc

6 inputs, 3 outputs

The Steca TR 0603mc solar thermal controller unites the features of the already successful Steca TR 0502 and TR 0603 temperature differential controllers.

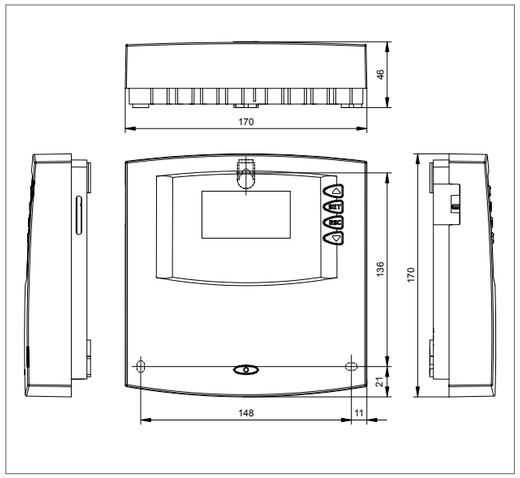
As a particular highlight, the Steca TR 0603mc stores the system's operational data on a SD card. The 40 pre-programmed systems and numerous additional functions allow universal use of the controller. The large graphic display shows the animated control circuits, which allows you to view the operating statuses of each system. The Steca TR 0603mc has six inputs for recording temperatures or pulse values, as well as an extra Grundfos Direct Sensors™ input for combined temperature and flow rate measurement. Pumps and switching valves are controlled using three outputs, some of which can be speed controlled.

Product features
- Flexible and expandable
- Master-slave concept
- Compact, multipart designer casing
- Electronic speed control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Storage tank target temperature loading
- Seasonal systems (loading of pool / storage tank according to the time of the year)
- Daily pump start
- Modular extensions are possible with heating circuit controllers and expansion modules
- Screw terminals allow universal and rapid installation
- Integrated Steca TPC 1 bus

Displays
- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Multilingual menu navigation
- Side switch for manual, auto, off

Functions
- Data logger on SD card
- Heat quantity (Grundfos Direct Sensors™, pulse generator, determination)
- Heating return increase
- Reduction of stagnation phases
- Holiday (storage tank recooling)
- Circulation (controlled by temperature / time / pulse)
- Back-up heating
- Solid fuel boiler
- Storage tank quick charge
- Bypass
- Thermostat
- Differential thermostat
- Timer
- Interval / tube collector
- Anti-freeze



	TR 0603mc
System voltage	230 V (± 15 %), 50 Hz optional 115 V (± 15 %), 60 Hz
Own consumption	≤ 2 W
Inputs	6 5 x temperature (Pt1000) 1 x temperature (Pt1000) or pulse
Additional input	1 x Grundfos Direct Sensors™ (temperature / flow rate)
Outputs	3 2 x triac for speed control (R1, R2), max. 250 W (230 V) 1 x switch output relay (R3), max. 800 W (230 V) or R3 voltage free
Additional output	1 x alarm output
Hydraulic schemes	40
Ambient temperature	0 °C ... +45 °C
Interfaces	SD card, RS232, RS485 (Steca TPC 1 bus)
Data logging	SD card
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	170 x 170 x 46 mm
Weight	450 g

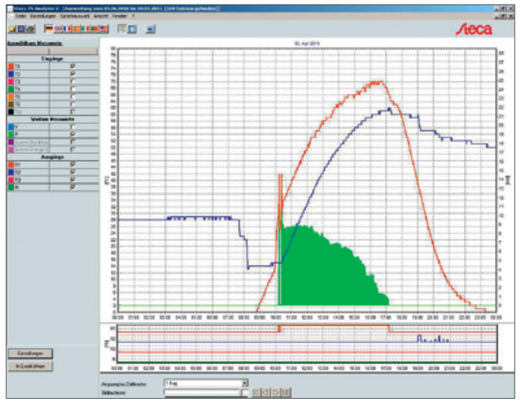
Technical data at 25 °C / 77 °F

Areas of application:

inputs/outputs: 6 / 3

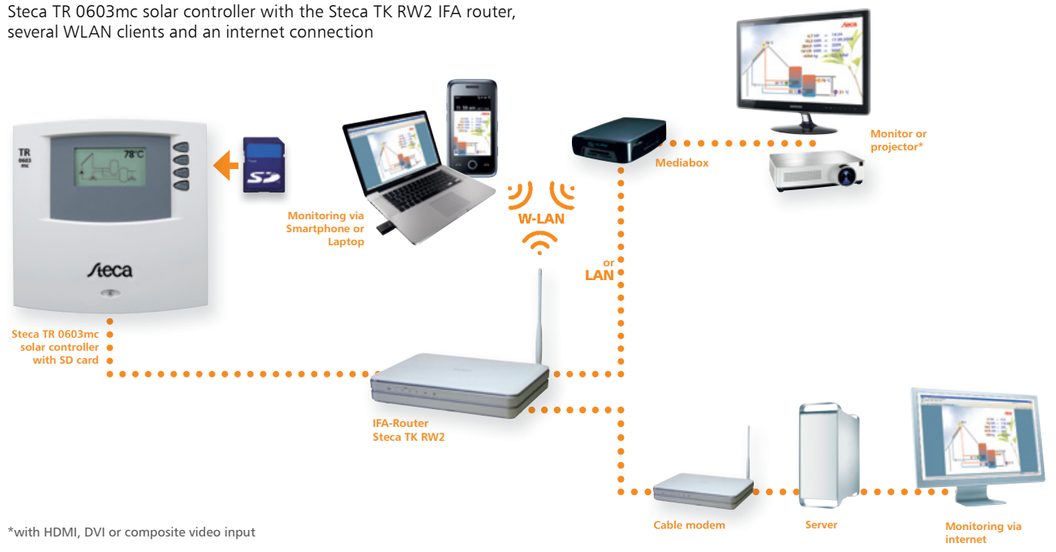
Datalogging on SD card and analysis software Steca TS Analyzer 2

The Steca TR 0603mc stores the solar thermal system's operational data on an SD card. The analysis software TS Analyzer 2 visualises the system results.



Example of application 1:
Steca TR 0603mc solar controller with the Steca TH A603 MS heating controller and the expansion module Steca TE A603

Example of application 2:
Steca TR 0603mc solar controller with the Steca TK RW2 IFA router, several WLAN clients and an internet connection

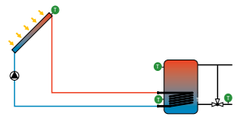


*with HDMI, DVI or composite video input

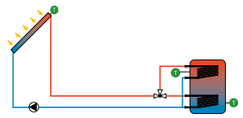
Systems with one storage tank

1 collector array

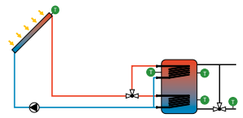
Internal heat exchanger, intelligent pump control



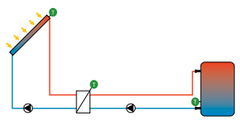
Internal heat exchanger, intelligent pump control, heating return increase



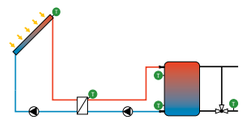
Internal heat exchanger, zone loading, intelligent valve control



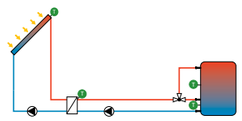
Internal heat exchanger, zone loading, intelligent valve control, heating return increase



External heat exchanger, intelligent pump control

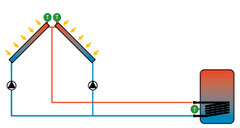


External heat exchanger, intelligent pump control, heating return increase

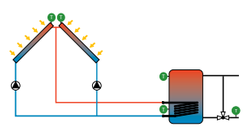


External heat exchanger, zone loading, intelligent valve control

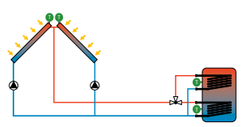
2 collector arrays (east/west roof)



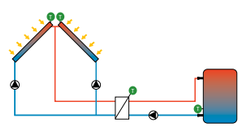
Internal heat exchanger, intelligent pump control



Internal heat exchanger, intelligent pump control, heating return increase



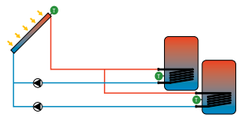
Internal heat exchanger, zone loading, intelligent valve control



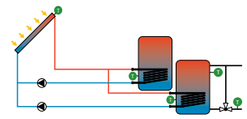
External heat exchanger, intelligent pump control

Systems with two storage tanks

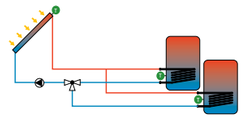
1 collector array



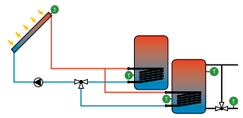
Internal heat exchanger, intelligent pump control



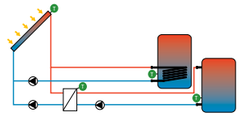
Internal heat exchanger, intelligent pump control, heating return increase



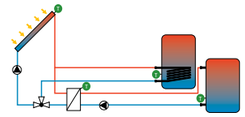
Internal heat exchanger, intelligent valve control



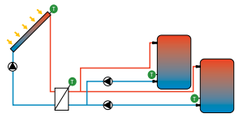
Internal heat exchanger, intelligent valve control, heating return increase



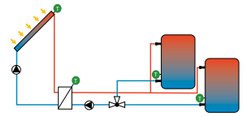
Internal/external heat exchanger, intelligent pump control



Internal/external heat exchanger, intelligent valve control

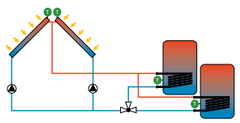


External heat exchanger, intelligent pump control



External heat exchanger, intelligent valve control

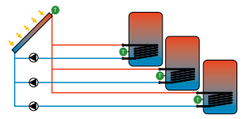
2 collector arrays (east/west roof)



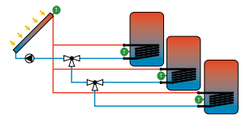
Internal heat exchanger, intelligent valve control

Systems with three storage tanks

1 collector array



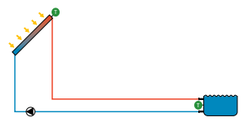
Internal heat exchanger, intelligent pump control



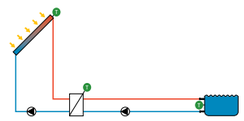
Internal heat exchanger, intelligent valve control

Systems with a swimming pool

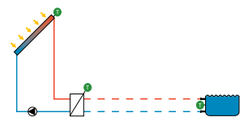
1 collector array



Direct flow-through, intelligent pump control

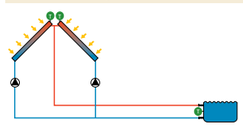


External heat exchanger, intelligent pump control

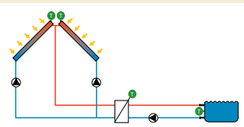


Stand-alone operation of the external heat exchanger, intelligent pump control

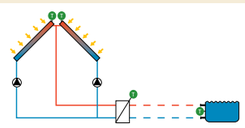
2 collector arrays (east/west roof)



Direct flow-through, intelligent pump control



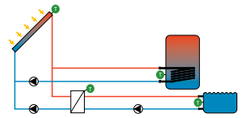
External heat exchanger, intelligent pump control



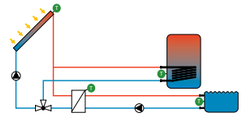
Stand-alone operation of the external heat exchanger, intelligent pump control

Systems with one storage tank and a swimming pool

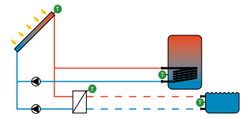
1 collector array



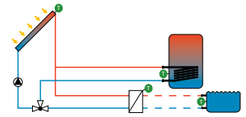
External heat exchanger, intelligent pump control



External heat exchanger, intelligent valve control



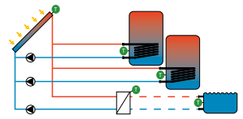
Stand-alone operation of the external heat exchanger, intelligent pump control



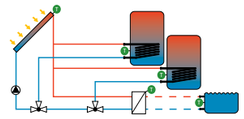
Stand-alone operation of the external heat exchanger, intelligent valve control

Systems with two storage tanks and a swimming pool

1 collector array



Stand-alone operation of the external heat exchanger, intelligent pump control



Stand-alone operation of the external heat exchanger, intelligent valve control

Steca TR 0603mc U

6 inputs, 3 outputs

The Steca TR 0603mc U controller was specially developed for the North American market based on the Steca TR 0603mc basic controller. With its special certification (ETL label) from a Nationally Recognized Testing Laboratory (NRTL) in the US, the controller meets the safety standards and minimum requirements of the North American market.

The equipment is connected inside the installation casing using either a plug & play solution for the mains and pump connections or alternatively 1/2 inch cut-outs.

As a particular highlight, the Steca TR 0603mc U stores the system's operational data on a SD card. The 40 pre-programmed systems and numerous additional functions allow universal use of the controller. The large graphic display shows the animated control circuits, which allows you to view the operating statuses of each system.

The Steca TR 0603mc U has six inputs for recording temperatures or pulse values, as well as an extra Grundfos Direct Sensors™ input for combined temperature and flow rate measurement. Pumps and switching valves are controlled using three outputs, some of which can be speed controlled.

Product features
- Compact, multipart designer casing
- Electronic speed control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Storage tank target temperature loading
- Seasonal systems (loading of pool / storage tank according to the time of the year)
- Daily pump start
- Plug & play for 120 V AC mains and pump connections in installation casing
- Screwed connections facilitate fast sensor installation
- Integrated Steca TPC 1 bus

Displays
- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

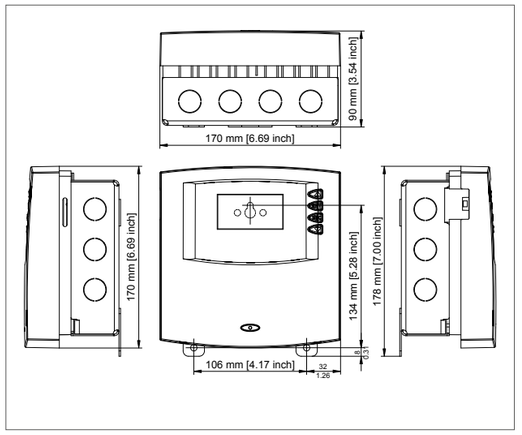
Operation
- Multilingual menu navigation
- Side switch for manual, auto, off

Options
- Installation casing with 1/2 inch cut-outs as an alternative to plug & play

Functions
- Data logger on SD card
- Heat quantity (Grundfos Direct Sensors™, pulse generator, determination)
- Heating return increase
- Reduction of stagnation phases
- Holiday (storage tank recooling)
- Circulation (controlled by temperature / time / pulse)
- Back-up heating
- Solid fuel boiler
- Storage tank quick charge
- Bypass
- Thermostat
- Differential thermostat
- Timer
- Interval / tube collector
- Anti-freeze
- Anti-legionella cyclical storage tank heating
- Display storage tank top
- Alarm output
- Two loading zones

Areas of application:

inputs/outputs:

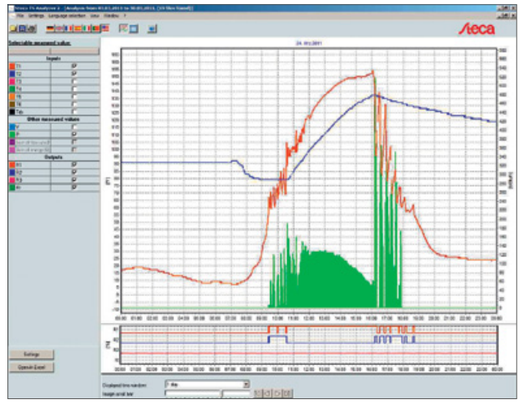


	TR 0603mc U
System voltage	120 V AC, 60 Hz optional 240 V AC, 60 Hz
Own consumption	≤ 2 W [0.003 HP]
Inputs	6 5 x temperature (Pt1000) 1 x temperature (Pt1000) or pulse
Additional input	1 x Grundfos Direct Sensors™ (temperature / flow rate)
Outputs	3 2 x triac for speed control (R1, R2), max. 130 W / 0.17 HP (120 V AC) 1 x switch output relay (R3), max. 400 W / 0.5 HP (120 V AC) or R3 voltage free
Additional output	1 x alarm output
Line cord	75 inch, 3 x 18 AWG at 221 °F
Hydraulic schemes	40
Ambient temperature	0 °C [+32 °F] ... +45 °C [+113 °F]
Interfaces	SD card, RS232, RS485 (Steca TPC 1 bus)
Data logging	SD card
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	170 x 178 x 90 mm [6.69 x 7.0 x 3.54 inch]
Weight	1.5 kg [48.23 oz]

Technical data at 25 °C / 77 °F

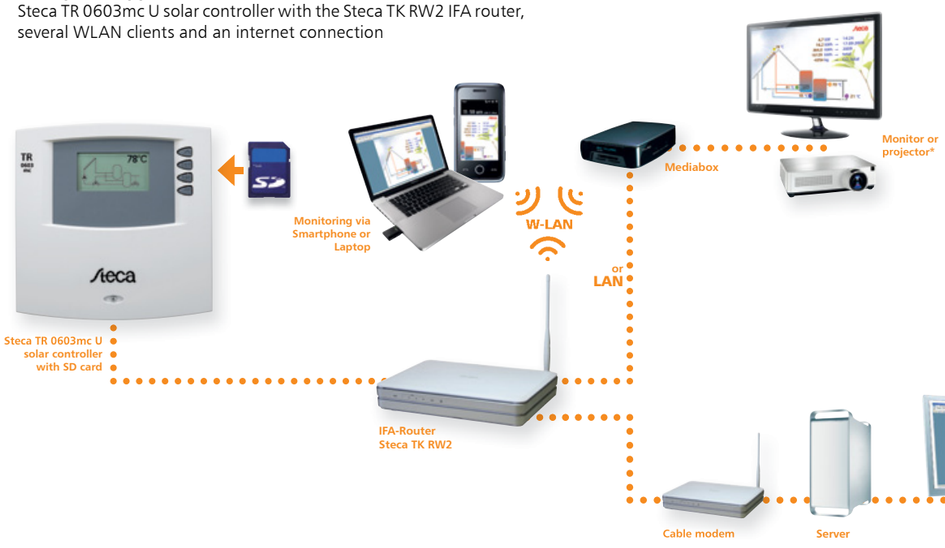
Datalogging on SD card and analysis software Steca TS Analyzer 2

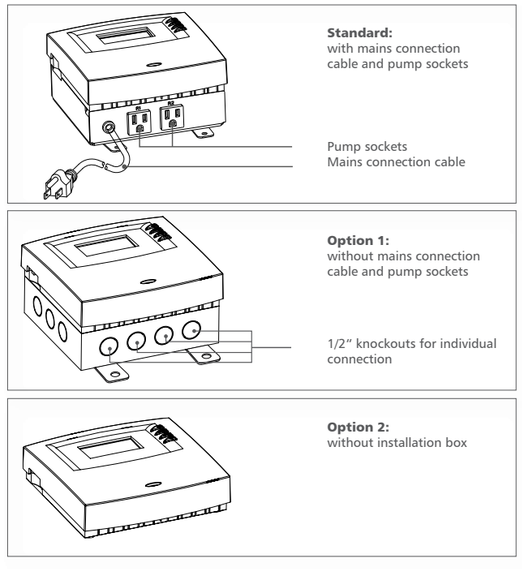
Steca TR 0603mc U stores the solar thermal system's operational data on an SD card. The analysis software TS Analyzer 2 visualises the system results.



Example of application:

Steca TR 0603mc U solar controller with the Steca TK RW2 IFA router, several WLAN clients and an internet connection





Standard:
with mains connection cable and pump sockets

Pump sockets
Mains connection cable

Option 1:
without mains connection cable and pump sockets

1/2" knockouts for individual connection

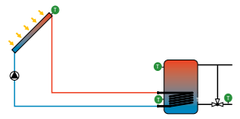
Option 2:
without installation box

*with HDMI, DVI or composite video input

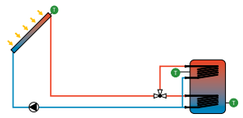
Systems with one storage tank

1 collector array

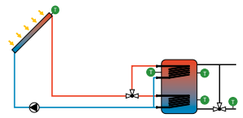
Internal heat exchanger, intelligent pump control



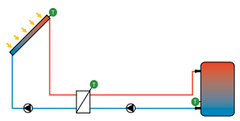
Internal heat exchanger, intelligent pump control, heating return increase



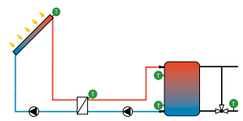
Internal heat exchanger, zone loading, intelligent valve control



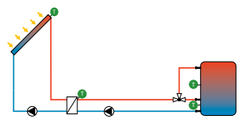
Internal heat exchanger, zone loading, intelligent valve control, heating return increase



External heat exchanger, intelligent pump control

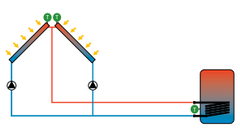


External heat exchanger, intelligent pump control, heating return increase

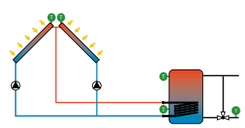


External heat exchanger, zone loading, intelligent valve control

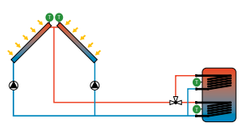
2 collector arrays (east/west roof)



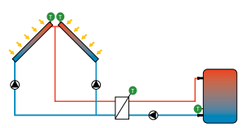
Internal heat exchanger, intelligent pump control



Internal heat exchanger, intelligent pump control, heating return increase



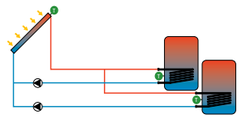
Internal heat exchanger, zone loading, intelligent valve control



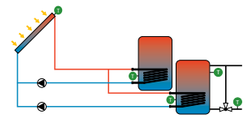
External heat exchanger, intelligent pump control

Systems with two storage tanks

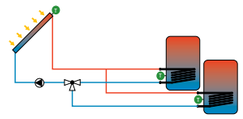
1 collector array



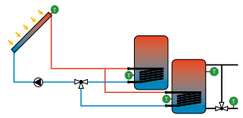
Internal heat exchanger, intelligent pump control



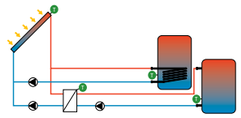
Internal heat exchanger, intelligent pump control, heating return increase



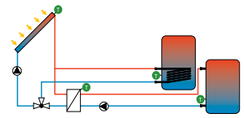
Internal heat exchanger, intelligent valve control



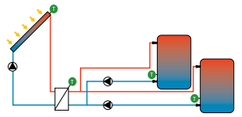
Internal heat exchanger, intelligent valve control, heating return increase



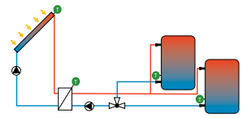
Internal/external heat exchanger, intelligent pump control



Internal/external heat exchanger, intelligent valve control

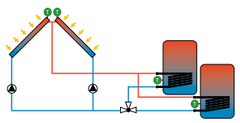


External heat exchanger, intelligent pump control



External heat exchanger, intelligent valve control

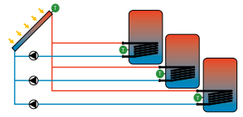
2 collector arrays (east/west roof)



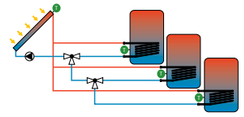
Internal heat exchanger, intelligent valve control

Systems with three storage tanks

1 collector array



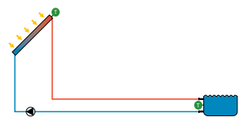
Internal heat exchanger, intelligent pump control



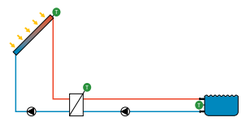
Internal heat exchanger, intelligent valve control

Systems with a swimming pool

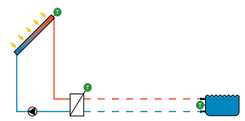
1 collector array



Direct flow-through, intelligent pump control

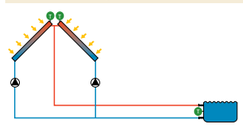


External heat exchanger, intelligent pump control

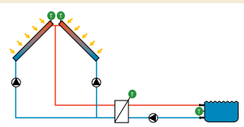


Stand-alone operation of the external heat exchanger, intelligent pump control

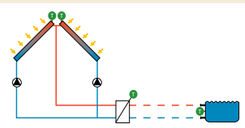
2 collector arrays (east/west roof)



Direct flow-through, intelligent pump control



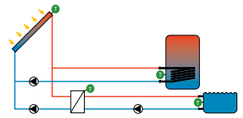
External heat exchanger, intelligent pump control



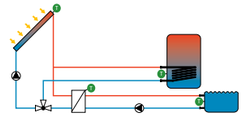
Stand-alone operation of the external heat exchanger, intelligent pump control

Systems with one storage tank and a swimming pool

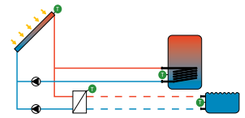
1 collector array



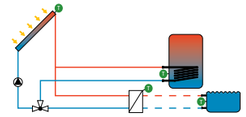
External heat exchanger, intelligent pump control



External heat exchanger, intelligent valve control



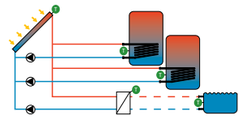
Stand-alone operation of the external heat exchanger, intelligent pump control



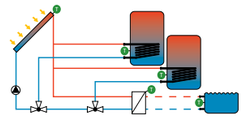
Stand-alone operation of the external heat exchanger, intelligent valve control

Systems with two storage tanks and a swimming pool

1 collector array



Stand-alone operation of the external heat exchanger, intelligent pump control



Stand-alone operation of the external heat exchanger, intelligent valve control

Steca TR 0704

7 inputs, 4 outputs

The Steca TR 0704 system controller is a universal controller for solar energy and heating systems. In addition to a selection of pre-programmed basic systems, freely programmable individual system configurations can also be realised.

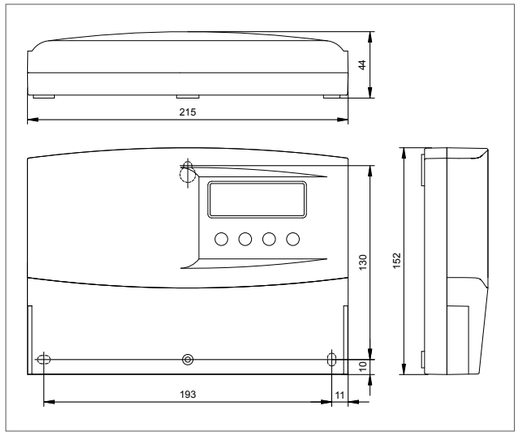
The standard Steca TR 0704 has three calorimeters and one hours-of-operation logger for each of the four controller outputs. A special feature is the ability to not only display the current values of temperature, irradiation and energy volumes, but also to display the accumulated values over several days in the form of a graphical curve via a graphical LCD display. The modular construction of the Steca TR 0704 system controller allows the control system to be expanded with up to four extra Steca TA 0403 I/O modules. Every extra I/O module has its own microprocessor with four temperature recording inputs and three switching outputs, some of which can be speed controlled. This means that the controller can be expanded at any time to a maximum of 23 inputs and 16 outputs. The basic version of the Steca TR 0704 system controller has seven inputs for recording temperature, irradiation or flow rate and four outputs for controlling circulation pumps or switching valves. Communication with external peripherals is provided by an IS bus, an alarm output and an RS232 interface.

Product features
- Electronic speed control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Storage tank target temperature loading
- Remote data transfer and remote parameter setting
- Modular extension with I/O module is possible
- Spring clamp terminals allow rapid and easy installation

Displays
- Multifunction graphical LCD display
- Animated representation of the systems and operating states

Operation
- Single-language menu navigation, different languages available

Functions
- Data logger integrated
- Heat quantity (pulse generator)
- Heating return increase
- Reduction of stagnation phases
- Circulation (controlled by temperature / time)
- Back-up heating
- Solid fuel boiler
- Thermostat
- Differential thermostat
- Timer
- Interval / tube collector
- Anti-freeze
- Anti-legionella cyclical storage tank heating
- Alarm output
- Radiation switch
- Synchronised output
- Two loading zones



	TR 0704
System voltage	230 V (± 15 %), 50 Hz optional 115 V (± 15 %), 60 Hz
Own consumption	≤ 3 W
Inputs	7 2 x temperature (Pt1000) or radiation 5 x temperature (Pt1000) or pulse
Outputs	4 2 x triac for speed control, max. 250 W (R1), 480 W (R2) (230 V) 2 x switch output relay (R3, R4), max. 800 W (230 V) or R4 voltage free
Hydraulic schemes	>70
Ambient temperature	0 °C ... +45 °C
Interfaces	RS232, IS bus
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	215 x 152 x 44 mm
Weight	570 g

Technical data at 25 °C / 77 °F

Areas of application:

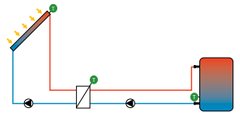
inputs/outputs:

Beispiele möglicher Anlagensysteme

Systems with one storage tank

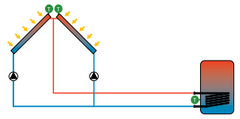
1 collector array

Internal heat exchanger, intelligent pump control

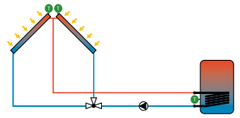


External heat exchanger, intelligent pump control

2 collector arrays (east/west roof)



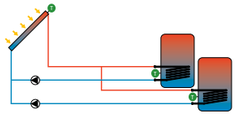
Internal heat exchanger, intelligent pump control



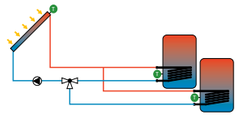
Internal heat exchanger, intelligent valve control

Systems with two storage tanks

1 collector array

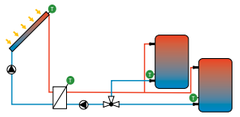


Internal heat exchanger, intelligent pump control

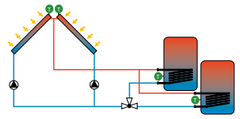


Internal heat exchanger, intelligent valve control

2 collector arrays (east/west roof)



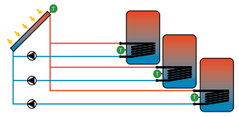
External heat exchanger, intelligent valve control



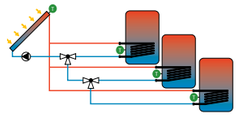
Internal heat exchanger, intelligent valve control

Systems with three storage tanks

1 collector array

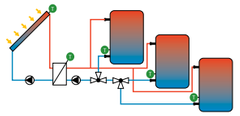


Internal heat exchanger, intelligent pump control

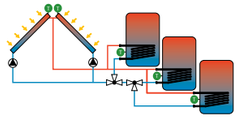


Internal heat exchanger, intelligent valve control

2 collector arrays (east/west roof)



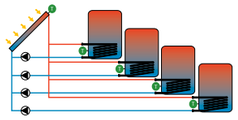
External heat exchanger, intelligent valve control



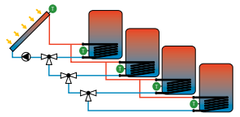
Internal heat exchanger, intelligent valve control

Systems with four storage tanks

1 collector array

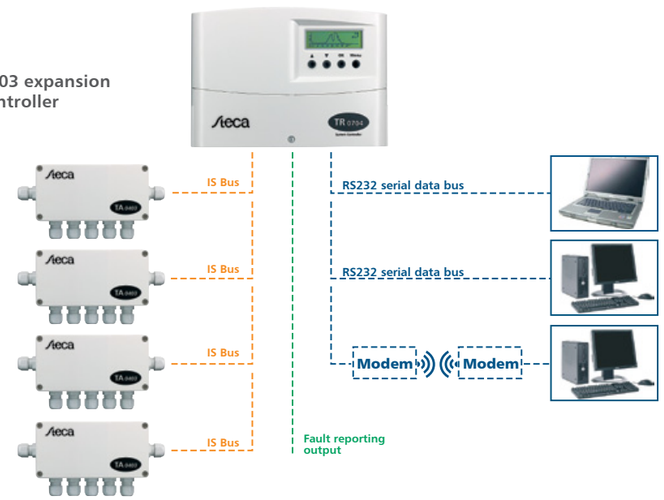


Internal heat exchanger, intelligent pump control



Internal heat exchanger, intelligent valve control

Application functions of the Steca TA 0403 expansion module with the Steca TR 0704 solar controller (schematic representation):



Steca TH A603 M

Heating circuit controller (Master)

The Steca TH A603 M is a stand-alone heating circuit controller for regulating mixed heating circuits easily and efficiently.

To limit the degree of loss as effectively as possible while ensuring the single-room control (e.g. thermostatic valve) operates optimally, the supply temperature in the heating circuit must be continuously adjusted. The necessary supply temperature is determined by the Steca TH A603 M controller based on the ambient temperature and/or the temperature of a control room and is set by the regulated mixer.

The heating circuit can be regulated on the basis of atmospheric conditions or a control room to ensure requirements are met as effectively as possible. Both radiator and surface heating circuits are available. The many functions built into the Steca TH A603 M such as surplus management, heat quantity measurement, building frost protection, holiday reduction and screed drying ensure that system operation is both reliable and convenient.

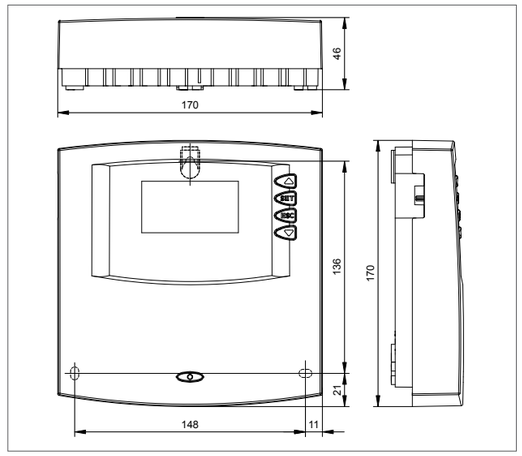
Animated control circuits are displayed on the unit's large graphic display to visualise each of the system's operating statuses. The Steca TH A603 M includes six inputs for recording temperatures or pulse values as well as an additional Grundfos Direct Sensors™ input for combined temperature and flow rate measurement. The heating circuit pump and the mixer valve are controlled via three outputs.

Product features
- Flexible and expandable
- Master-slave concept
- Compact, multipart designer casing
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Daily pump start
- Modular extensions are possible with heating circuit controllers and expansion modules
- Integrated Steca TPC 1 bus

Displays
- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Multilingual menu navigation
- Side switch for manual, auto, off

Functions
- Buffer storage tank loading
- Surplus management
- Remote control
- Heat quantity (Grundfos Direct Sensors™, pulse generator)
- Building frost protection
- Night-time reduction, night-time shut-off
- Holiday reduction
- Screed drying



	TH A603 M
System voltage	230 V (± 15 %), 50 Hz optional 115 V (± 15 %), 60 Hz
Own consumption	≤ 2 W
Inputs	6 5 x temperature (Pt1000) / remote control 1 x temperature (Pt1000) / remote control or pulse
Additional input	1 x Grundfos Direct Sensors™ (temperature / flow rate)
Outputs	3 2 x triac mixer valve control (R1, R2), max. 250 W (230 V) 1 x relay pump control (R3), max. 800 W (230 V)
Additional output	1 x alarm output or backup heating requirement
Hydraulic schemes	4
Ambient temperature	0 °C ... +45 °C
Interfaces	RS232, RS485 (Steca TPC 1 bus)
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	170 x 170 x 46 mm
Weight	450 g

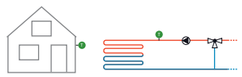
Technical data at 25 °C / 77 °F

Areas of application:

inputs/outputs: 6 3

System types

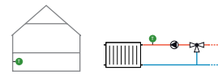
Basic systems



System with surface heating, external temperature guided heating circuit control

System with surface heating, room temperature guided heating circuit control

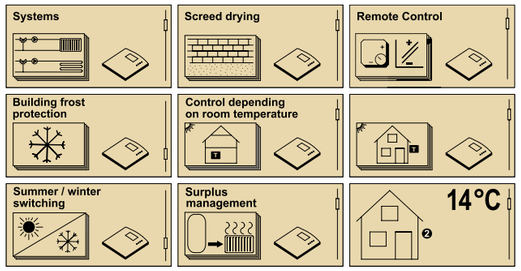
System with radiator, external temperature guided heating circuit control



System with radiator, room temperature guided heating circuit control

Graphic display

The heating controller TH A603 M is also equipped with a fully animated graphic display. This serves to represent the different system layouts and numerous functions in a clearly laid out display that is easy to understand. The strength of this controller lies in its ease of use and high level of functionality.



Display examples

Accessories

Remote control Steca TA FV1

The Steca TA FV1 remote control allows the room temperature to be recorded, adjusted and the operating mode to be changed for a heating circuit remotely.

Bus connection

The system can be expanded by integrating the Steca TH A603 MS (Slave) heating controller in the Steca TPC 1 bus of the Steca TH A603 M heating controller. Up to three Steca TH A603 MS (Slave) heating controllers can be operated on the Steca TPC 1 bus of the Steca TH A603 M (Master).

External temperature sensor Steca TA AF1

The external temperature sensor Steca TA AF1 is required to record the external temperature for weather-guided heating circuits.

Example of application:

Heating controller Steca TH A603 M with the heating controller Steca TH A603 MS

Steca TH A603 MS

Heating circuit controller (Slave)

The Steca TH A603 MS is a heating circuit controller (Slave) for regulating mixed heating circuits easily and efficiently. It was specially designed to expand the Steca TR 0603mc system controller and Steca TH A603 M (Master) heating circuit controller.

Maximum energy efficiency and optimal operation of individual room control (e.g. thermostat valve) require continuous adjustment of the supply temperature. Steca TH A603 MS determines the required supply temperature in accordance with the external temperature or the temperature of a guide room, which then sets the activated mixer.

Steca TH A603 MS works with radiators and with surface heating circuits. The many functions built into the Steca TH A603 MS such as surplus management, heat quantity measurement, building frost protection, holiday reduction and screed drying ensure that system operation is both reliable and convenient.

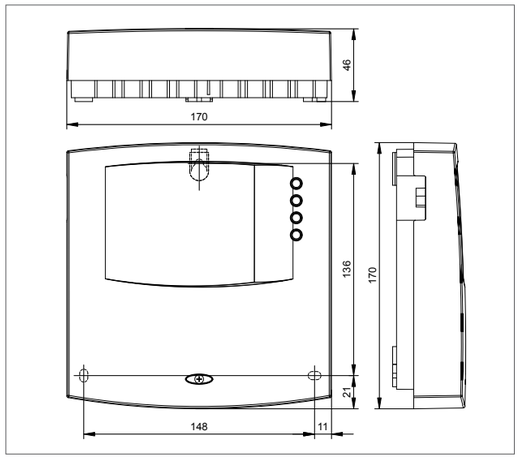
Up to three Steca TH A603 MS heating circuit controllers can be connected as bus slaves via the Steca TPC 1 bus to the Steca TR 0603mc (Master) system controller or the Steca TH A603 M (Master) heating circuit controller. The functions and parameters for the Steca TH A603 MS are set via the user-friendly operating menu of the master, which also provides information on the current operation of the system. Four LEDs provide information on the operating status of each slave.

Product features
- Flexible and expandable
- Master-slave concept
- Compact, multipart designer casing
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Daily pump start
- Integrated Steca TPC 1 bus
- Screw terminals allow universal and rapid installation

Displays
- Measured values via the Steca TR 0603mc graphical LCD display or the Steca TH A603 M (Master)
- 4 LEDs show operating states

Operation
- User-friendly operation by using the Steca TR 0603mc or Steca TH A603 M (Master) menu system
- Side button for TPC 1 bus addressing

Functions
- Buffer storage tank loading
- Surplus management
- Remote control
- Heat quantity (Grundfos Direct Sensors™, pulse generator)
- Building frost protection
- Night-time reduction, night-time shut-off
- Holiday reduction
- Screed drying



	TH A603 MS
System voltage	230 V (± 15 %), 50 Hz optional 115 V (± 15 %), 60 Hz
Own consumption	≤ 2 W
Inputs	6 5 x temperature (Pt1000) / remote control 1 x temperature (Pt1000) / remote control or pulse
Additional input	1 x Grundfos Direct Sensors™ (temperature / flow rate)
Outputs	3 2 x triac mixer valve control (R1, R2), max. 250 W (230 V) 1 x relay pump control (R3), max. 800 W (230 V)
Additional output	1 x alarm output or backup heating requirement
Hydraulic schemes	4
Ambient temperature	0 °C ... +45 °C
Interfaces	RS232, RS485 (Steca TPC 1 bus)
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	170 x 170 x 46 mm
Weight	450 g

Technical data at 25 °C / 77 °F

Areas of application:

inputs/outputs:

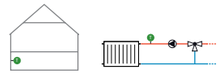
System types

Basic systems

System with surface heating, external temperature guided heating circuit control

System with surface heating, room temperature guided heating circuit control

System with radiator, external temperature guided heating circuit control



System with radiator, room temperature guided heating circuit control

Accessories

Remote control Steca TA FV1
The Steca TA FV1 remote control allows the room temperature to be recorded, adjusted and the operating mode to be changed for a heating circuit remotely.

Bus connection
The respective system can be expanded by connecting the TH A603 MS (Slave) heating controller to the Steca TPC 1 bus of the Steca TR 0603mc system controller or Steca TH A603 M (Master) heating controller. Up to three Steca TH A603 MS heating controllers can be connected as bus slaves.

External temperature sensor Steca TA AF1
The external temperature sensor Steca TA AF1 is required to record the external temperature for weather-guided heating circuits.

Example of application 1:
System controller Steca TR 0603mc with the heating controller Steca TH A603 MS

Example of application 2:
Heating controller Steca TH A603 M with the heating controller Steca TH A603 MS

Steca TF B001

Domestic hot water controller (compact)

Steca TF B001 is a particularly cost-effective domestic hot water controller for heating drinking water directly and hygienically in a continuous-flow water heating principle for fresh water stations with ranges from 0-20 l/min, 0-40 l/min and 0-80 l/min.

In order to minimise the measurement sensor equipment required for efficiency reasons, a new intelligent and self-learning control algorithm was developed at the Steca fresh water laboratories. It permits highly-efficient energy transfer from the primary buffer to the secondary drinking water circuit with just a single multifunctional Grundfos Direct Sensors™ for measuring flow and temperature. OEM customers have flexible options for integrating alternative analogue flow meters.

The Steca TF B001 demonstrates its versatility by facilitating speed control of both standard glandless pumps and innovative high-efficiency pumps.

Its minimal dimensions make the Steca TF B001 easy to integrate in compact fresh water stations.

A specially-designed switching power supply ensures maximum efficiency and economic operation. This is characterised by the extremely low own consumption of the controller. At the same time, the variable input voltage range allows it to be used universally and globally.

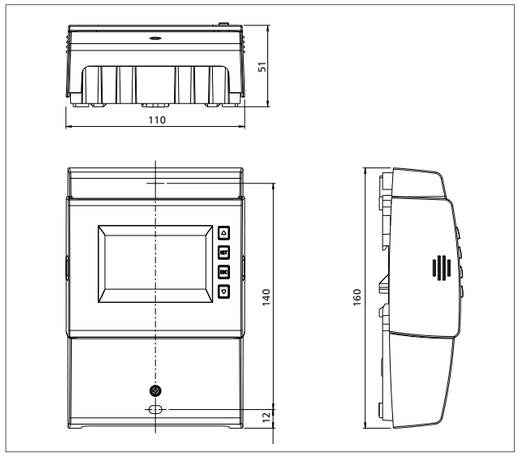
Electronic load control technology protects the unit against overloading and installation errors.

In order to guarantee permanent and reliable hygienic drinking water supply, the Steca TF B001 performs important system monitoring and safety functions, in addition to controller operation. Special error displays are shown to allow you to rectify errors rapidly.

Product features
- Compact, multipart designer casing
- Installation versions: Fresh water stations, wall installation, mounting rails
- Wave packet (Triac) and pulse width modulation (PWM) ensure electronic RPM control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Screw terminals allow universal and rapid installation
- Low power consumption thanks to universal and widerange switched-mode power supply
- Variable input voltage range for worldwide controller deployment
- Electronic overloading control and protection

Displays
- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Non-verbal menu navigation
- Manual switch for manual, auto, off



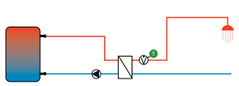
	TF B001
System voltage	115 V AC ... 230 V AC, 50 Hz / 60 Hz
Own consumption	≤ 1 W (standby)
Input	1 1 x Grundfos Direct Sensors™ (temperature / flow rate)
Output	1 1 x triac for speed control (R1), max. 250 W (230 V) or PWM control signal for pump speed (PWM R1)
Ambient temperature	0 °C ... +50 °C
Degree of protection	IP 22 / DIN 40050 [without front panel: IP 20]
Dimensions (X x Y x Z)	110 x 160 x 51 mm
Weight	350 g

Technical data at 25 °C / 77 °F

Note:
The Steca TF B001 controller is only available in conjunction with domestic hot water systems approved by Steca.

System types

Basic systems



Basic system

Areas of application:

inputs/outputs:

Steca TF B202

Compact Fresh Water Controller

The Steca TF B202 is a particularly cost-effective fresh water controller for heating drinking water directly and hygienically using the continuous-flow water heating principle, for fresh water stations with ranges of 0-20 l/min, 0-40 l/min and 0-80 l/min.

The new intelligent and self-learning control algorithm developed in the Steca fresh water laboratory allows a highly efficient transfer of energy from the primary buffer to the secondary drinking water circuit and uses a multifunctional Huba Control flow sensor for monitoring the flow rate and temperature. OEM customers have flexible options for integrating alternative analogue flow meters.

The Steca TF B202 demonstrates its versatility by facilitating speed control of both standard glandless pumps and innovative high-efficiency pumps. The Steca TF B202 can also control a circulation pump. The controller offers time, temperature or impulse dependent control methods.

Its minimal dimensions make the Steca TF B202 easy to integrate in compact fresh water stations.

A specially-designed switching power supply ensures maximum efficiency and economic operation: This reduces own consumption to a minimum. The variable input voltage range allows universal use of the device worldwide.

The electronic load control technology provides protection against overloading and installation errors.

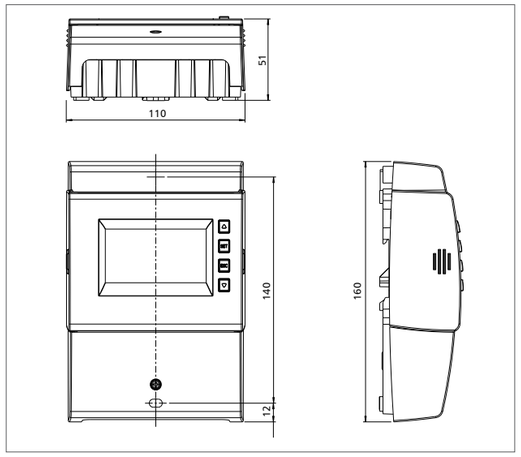
In addition to the normal control functions, the Steca TF B202 also takes over important system monitoring and safety functions. This ensures a permanent and safe supply of hygienic drinking water. Special error displays are shown to allow you to rectify errors rapidly.

Product features
- Compact, multipart designer casing
- Installation versions: Fresh water stations, wall installation, mounting rails
- Wave packet (Triac) and pulse width modulation (PWM) ensure electronic RPM control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Screw terminals allow universal and rapid installation
- Low power consumption thanks to universal and widerange switched-mode power supply
- Variable input voltage range for worldwide controller deployment
- Electronic overloading control and protection

Displays
- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Non-verbal menu navigation
- Manual switch for manual, auto, off

Functions
- Circulation (controlled by temperature / time / pulse)



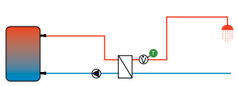
	TF B202
System voltage	115 V AC ... 230 V AC, 50 Hz / 60 Hz
Own consumption	≤ 1 W (standby)
Inputs	2 2 x temperature (Pt1000)
Additional input	1 x Huba Control flow sensor, type 200 DN10 (temperature / flow rate)
Outputs	2 2 x triac for speed control (R1, R2), max. 250 W (230 V)
Ambient temperature	0 °C ... +50 °C
Degree of protection	IP 22 / DIN 40050 [without front panel: IP 20]
Dimensions (X x Y x Z)	110 x 160 x 51 mm
Weight	350 g

Technical data at 25 °C / 77 °F

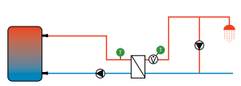
Note:
The Steca TF B202 controller is only available in conjunction with domestic hot water systems approved by Steca.

System types

Basic systems



Basic system



Basic system and circulation function

Areas of application:

inputs/outputs:

Steca TF A603 MC

Domestic hot water controller

The Steca TF A603 MC is a stand-alone domestic hot water controller for heating drinking water directly and hygienically using the continuous flow heater principle.

With an all new control algorithm, the Steca TF A603 MC controller is well equipped to channel energy from a buffer storage tank to the drinking water circuit with particular speed and efficiency. Owing to its auto-adaptive control algorithm, the controller is capable of adjusting to the specific conditions of each system as soon as the equipment is initially set up, ensuring a constant hot drinking water temperature to address hygienic considerations.

A primary objective in this regard is to keep the return temperature to the buffer storage tank as low as possible in order to additionally increase the efficiency and yield of the solar system. This is supported by a zone feed function using water from the buffer storage tank via a 3-way switching valve.

The Steca TF A603 MC can also control a circulation pump. In doing so, time-based, temperature-based, or pulse-based control is possible.

A particular highlight of the Steca TF A603 MC controller is the fact that the unit saves the system's operating data to a SD card. Animated control circuits are displayed on the unit's large graphic display to visualise the respective system's operating statuses. The Steca TF A603 MC includes six inputs for recording temperatures or pulse values as well as an additional Grundfos Direct Sensors™ input for combined temperature and flow rate measurement. Pumps and switching valves are controlled via three outputs, some of which are speed controlled.

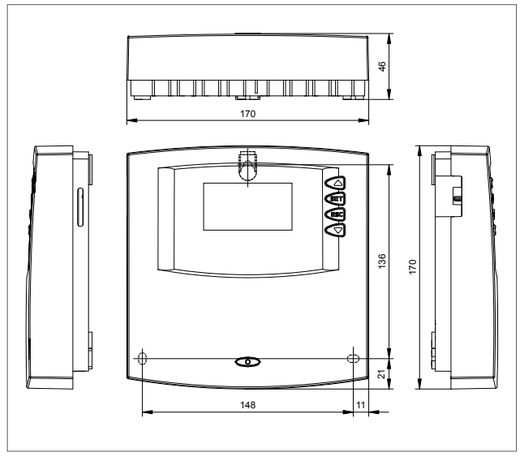
Product features
- Compact, multipart designer casing
- Electronic speed control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Daily pump start
- Integrated Steca TPC 1 bus

Displays
- Multifunction graphical LCD display with backlighting
- Animated representation of the systems and operating states

Operation
- Multilingual menu navigation
- Side switch for manual, auto, off

Functions
- Auto-adaptive control algorithm
- Data logger on SD card
- Heat quantity (Grundfos Direct Sensors™, pulse generator)
- Circulation (controlled by temperature / time / pulse)
- Back-up heating
- Thermal disinfection
- Alarm output

Note:
The Steca TF A603 MC controller is only available in conjunction with domestic hot water systems approved by Steca.



	TF A603 MC
System voltage	230 V (± 15 %), 50 Hz optional 115 V (± 15 %), 60 Hz
Own consumption	≤ 2 W
Inputs	6 5 x temperature (Pt1000) 1 x temperature (Pt1000) or pulse
Additional input	1 x Grundfos Direct Sensors™ (temperature / flow rate)
Outputs	3 2 x triac for speed control (R1, R2), max. 250 W (230 V) 1 x switch output relay (R3), max. 800 W (230 V) or R3 voltage free
Additional output	1 x alarm output or backup heating requirement
Ambient temperature	0 °C ... +45 °C
Interfaces	SD card, RS232, RS485 (Steca TPC 1 bus)
Data logging	SD card
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	170 x 170 x 46 mm
Weight	450 g

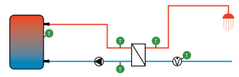
Technical data at 25 °C / 77 °F

Areas of application:

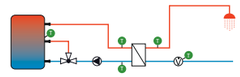
inputs/outputs: 6 3

System types

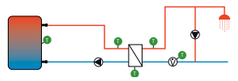
Basic systems



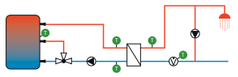
Basic system



Basic system with zone feeding buffer storage tank return



Basic system and circulation function

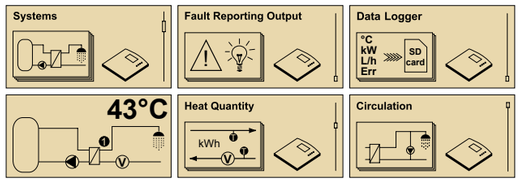


Basic system with zone feeding buffer storage tank return and circulation function

Graphic display

The domestic hot water controller Steca TF A603 MC is also equipped with a fully animated graphic display. This serves to represent the different system layouts and numerous functions in a clearly laid out display that is easy to understand. The strength of this controller lies in its ease of use and high level of functionality.

Display examples:



Data logging on SD card

The Steca TF A603 MC stores the system's operational data on an SD card. This can be used for evaluation purposes.

Steca TF A603 MCK (Master) and Steca TF A603 KS (Slave)

Domestic hot water controllers (cascaded)

The Steca TF A603 MCK and Steca TF A603 KS are fresh water controllers for direct hygienic heating of drinking water using the continuous-flow water heating principle. The Steca TF A603 MCK (master) can be connected to a maximum of three Steca TF A603 KS (slaves) to form a four-stage fresh water cascade.

Cascading fresh water stations is a good way of using existing standardised, low-cost fresh water stations designed for single and two-family homes to provide the larger draw-off capacities needed for apartment complexes and multi-story residential buildings.

This allows small draw-off volumes to be implemented for large buildings at very good heat transfer ratios because not all of the stations need to be operated at the same time. The reliability of the hot water supply is increased by this because the cascading makes several stations available at the same time.

A new control algorithm in the Steca TF A603 MCK and Steca TF A603 KS controllers allows the energy in the buffer tank to be transferred to the drinking water circuit in an especially fast and efficient manner. Immediately after initial commissioning the self-learning algorithm in the controllers adapts to the special aspects of each respective system to provide a constant drinking water temperature under hygienic conditions.

Steca TF A603 MCK
and Steca TF A603 KS

This is performed with the specific aim of achieving the lowest possible temperature in the return flow to the buffer tank, in order to further increase the efficiency and yields of the solar system. This is supported by a zone feeding function for the buffer tank water, implemented using a 3-way switching valve.

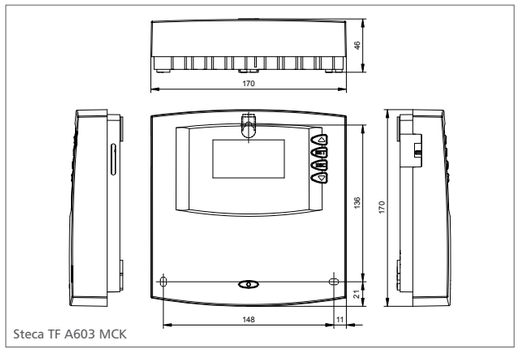
The Steca TF A603 MCK also allows control of a circulation pump on a time, temperature or pulse dependent basis.

Product features
- Flexibel und erweiterbar
- Master-Slave-Konzept
- Compact, multipart designer casing
- Electronic speed control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Daily pump start
- Integrated Steca TPC 1 bus

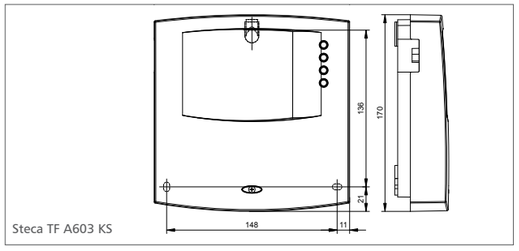
Displays
- A multifunction graphical LC display with backlighting shows the measurements from the controllers connected to the Steca TPC 1 bus.
- Animated representation of the different systems and operating states on the display of the Steca TF A603 MCK
- 4 LEDs show the operating states of the Steca TF A603 KS

Cascading functions
- Auto-adaptive control algorithm
- Data logger on SD card
- Heat quantity (Grundfos Direct Sensors™, pulse generator)
- Circulation (controlled by temperature / time / pulse)
- Back-up heating
- Thermal disinfection
- Alarm output

Operation
- Multilingual menu navigation
- Side switch for manual, auto, off (Steca TF A603 MCK)
- Side switch for Steca TPC 1 bus addressing (Steca TF A603 KS)



Steca TF A603 MCK



Steca TF A603 KS

Note:
The Steca TF A603 MCK and Steca TF A603 KS are only available in conjunction with a fresh water station approved by Steca.

Areas of application: inputs/outputs: 6 3

	TF A603 MCK	TF A603 KS
System voltage	230 V (± 15 %), 50 Hz optional 115 V (± 15 %), 60 Hz	
Own consumption	≤ 2 W	
Inputs	6 6 x temperature (Pt1000)	
Additional input	1 x Grundfos Direct Sensors™ (temperature / flow rate)	
Outputs	3 2 x triac for speed control (R1, R2), max. 250 W (230 V) 1 x switch output relay (R3), max. 800 W (230 V) or R3 voltage free	
Additional output	1 x alarm output or backup heating requirement	
Ambient temperature	0 °C ... +45 °C	
Interfaces	SD card, RS232, RS485 (Steca TPC 1 bus)	RS232, RS485 (Steca TPC 1 bus)
Data logging	SD card	via Steca TF A603 MCK
Degree of protection	IP 20 / DIN 40050	
Dimensions (X x Y x Z)	170 x 170 x 46 mm	
Weight	450 g	

Technical data at 25 °C / 77 °F

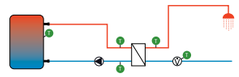
Steca fresh water laboratory

Test stand of a 4-way fresh water cascade

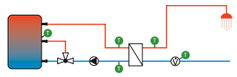
Hydraulic "harp" to regulate draw-off volumes

System types

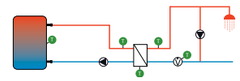
Basic systems



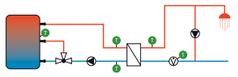
Basic system



Basic system with zone feeding buffer storage tank return



Basic system and circulation function

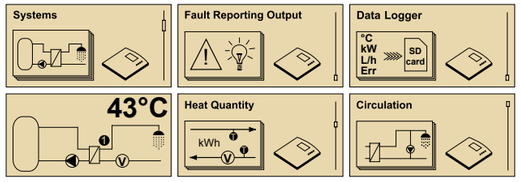


Basic system with zone feeding buffer storage tank return and circulation function

Graphic-display

The Steca TF A603 MCK fresh water controller has a fully animated graphical display for displaying information from and operating the TF A603 MCK master controller and all Steca TF A603 KS slave controllers. This serves to represent the different system layouts and numerous functions in a clearly laid out display that is easy to understand. The strength of this controller lies in its ease of use and high level of functionality.

Display examples:



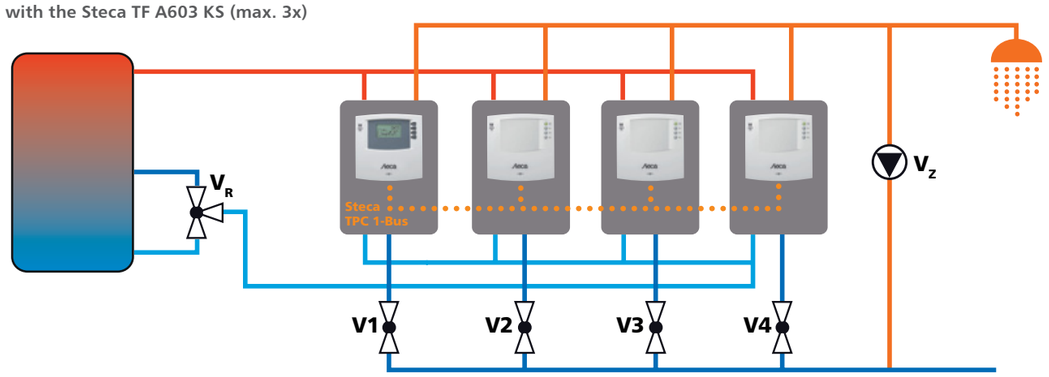
Data logging on SD card

The Steca Steca TF A603 MCK stores the operational data of the whole system (measurement values of the master and all connected slaves) on an SD card. This can be used for evaluation purposes.

Bus connection

The system can be expanded by integrating the Steca TF A603 KS (slave) fresh water controller in the Steca TPC 1 bus of the TF A603 MCK (master) fresh water controller. Up to three Steca TF A603 KS fresh water controllers can be connected as bus slaves.

Four-stage cascade:
The Steca TF A603 MCK fresh water controller with the Steca TF A603 KS (max. 3x)



Steca TA 0403

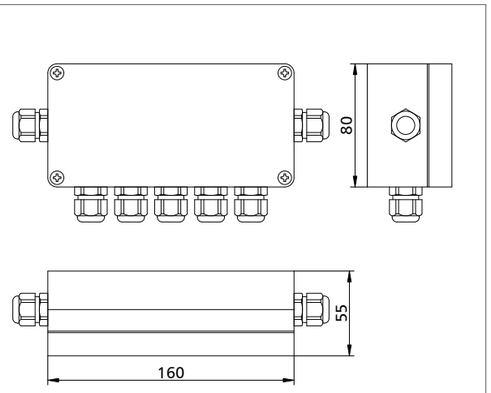
4 inputs, 3 outputs

The Steca TA 0403 expansion module, with freely programmable functions and extra inputs/outputs, was specially developed to extend the range of applications of our Steca TR 0704 system controller.

The Steca TA 0403 module has four sensor inputs and three outputs. Steca TR 0704 system controller provides the control signals and power supply via the Steca IS bus. All functions and control parameters of the Steca TA 0403 can be set with the user-friendly menu of the system controller. Up to four Steca TA 0403 modules can be operated by a single Steca TR 0704 system controller via the IS data bus. The operator of the solar energy system then has the possibility of realising individual systems with up to 23 inputs and 16 outputs. Existing systems can be extended at any time through the use of extra Steca TA 0403 modules in conjunction with a Steca TR 0704 system controller.

Product features

- Steca IS bus networking with the Steca TR 0704 allows the realisation of individual systems with up to 23 inputs and 16 outputs
- Measurement values shown on the Steca TR 0704 graphical LCD display
- User-friendly programming of the inputs / outputs by using the Steca TR 0704 menu system
- The Steca TR 0704 provides control signals and voltage supply via the Steca IS bus
- Spring clamp terminals allow rapid and easy installation
- IP 65 jet waterproof casing

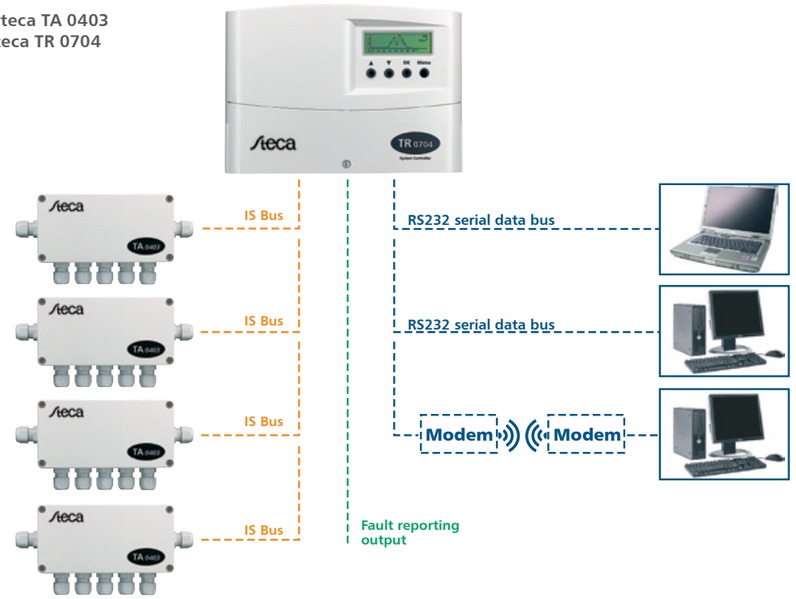


	TA 0403
Own consumption	230 V (± 15 %), 50 Hz optional 115 V (± 15 %), 60 Hz
Inputs	≤ 1.5 W
Outputs	4 4 x temperature (Pt1000) or pulse
Ambient temperature	3 1 x triac (R1), max. 200 W (230 V) 2 x switch output relay (R2, R3), max. 800 W (230 V)
Interfaces	0 °C ... +45 °C
Degree of protection	IS bus
Dimensions (X x Y x Z)	IP 65 / DIN 40050 / EN 60529
Weight	160 x 80 x 55 mm
Gewicht	350 g

Technical data at 25 °C / 77 °F

inputs/outputs

Application functions of the Steca TA 0403 expansion module with the Steca TR 0704 solar controller
(schematic representation):



Data recording and visualisation of measurement data

All measured values recorded from the TA 0403 expansion module(s) can also be graphically represented on the Steca TR 0704 system controller display. A generously dimensioned data storage system allows the measured values from the last 15 days to be displayed in the form of a graphical curve. The running times of the pumps over the last 15 days, or even the last 13 months, can also be graphically displayed for analysis. The irradiation, output and flow values can also be displayed over the following periods: 15 days, 13 months, the last 5 years, and a 5 year total overview.

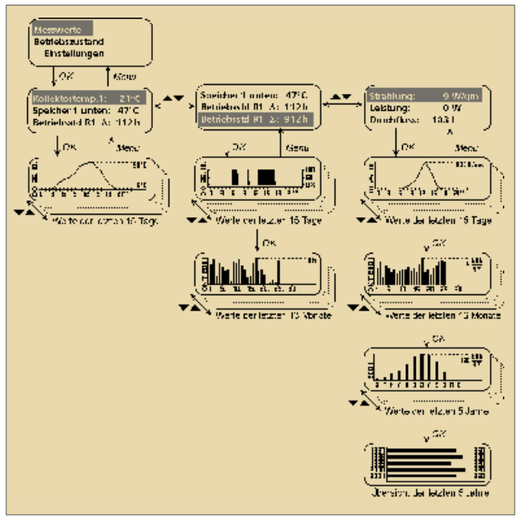


Fig 2: Data logger graphics and the menu structure of the Steca TR 0704 controller

Steca TE A603

Expansion module (Slave)

The Steca TE A603 expansion module facilitates modular expansion of the Steca TR 0603mc and Steca TH A603 M system controllers. Optional functions and system expansions allow these system controllers to be adapted individually to the system to be controlled.

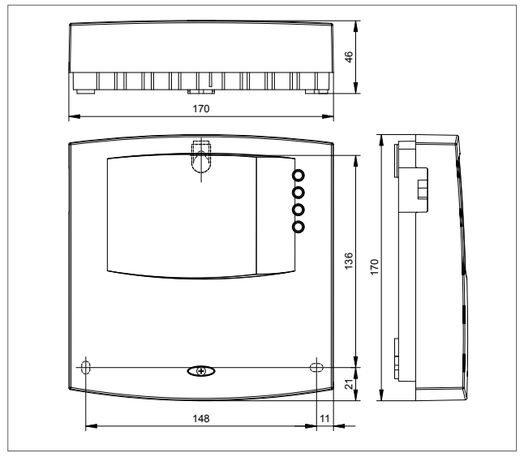
The Steca TE A603 includes six inputs for recording temperatures or pulse values as well as an additional Grundfos Direct Sensors™ input for combined temperature and flow rate measurement. Pumps and switching valves are controlled using three outputs, some of which can be speed controlled. Up to three Steca TE A603 expansion modules can be connected as bus slaves via the Steca TPC 1 bus to the Steca TR 0603mc or Steca TH A603 M system controller. The user friendly menu of the system controller is not only used to adjust all functions and parameters of the expansion module, but also monitor while it is running. Four LEDs provide information on the operating status of the expansion module.

Product features
- Flexible and expandable
- Master-slave concept
- Compact, multipart designer casing
- Electronic speed control
- High level of operational safety through fault diagnosis
- Hours-of-operation logger
- Software update possible
- Steca TPC 1 bus networking with the Steca TR 0603mc or Steca TH A603 M (Master) allows the realisation of individual systems
- Integrated Steca TPC 1 bus
- Screw terminals allow universal and rapid installation

Displays
- Measured values via the Steca TR 0603mc graphical LCD display or the Steca TH A603 M (Master)
- 4 LEDs show operating states

Operation
- User-friendly operation by using the Steca TR 0603mc or Steca TH A603 M (Master) menu system
- Side button for Steca TPC 1 bus addressing

Functions
- 2 x heat quantity (Grundfos Direct Sensors™, pulse generator)
- Active cooling (e.g. to avoid stagnation)
- Circulation (controlled by temperature / time / pulse)
- Back-up heating (with optimization for solar power)
- Solid fuel boiler
- Bypass
- 3 x thermostat
- 3 x differential thermostat
- 2 x timer
- Interval / tube collector
- Anti-legionella cyclical storage tank heating
- Alarm output
- Synchronised output
- Additional solar storage tank for connected solar controller
- Booster function



	TE A603
System voltage	230 V (± 15 %), 50 Hz optional 115 V (± 15 %), 60 Hz
Own consumption	≤ 2 W
Inputs	6 5 x temperature (Pt1000) 1 x temperature (Pt1000) or pulse
Additional input	1 x Grundfos Direct Sensors™ (temperature / flow rate)
Outputs	3 2 x triac for speed control (R1, R2), max. 250 W (230 V) 1 x switch output relay (R3), max. 800 W (230 V) or R3 voltage free
Additional output	1 x alarm output or 1 x voltage free (SELV)
Hydraulic schemes	40
Ambient temperature	0 °C ... +45 °C
Interfaces	RS232, RS485 (Steca TPC 1 bus)
Degree of protection	IP 20 / DIN 40050
Dimensions (X x Y x Z)	170 x 170 x 46 mm
Weight	450 g

Technical data at 25 °C / 77 °F

inputs/outputs

Bus connection

By connecting the expansion modules Steca TE A603 (Slave) to the Steca TPC 1 bus of the system controller Steca TR 0603mc or heating controller Steca TH A603 M (Master), the corresponding system can be expanded.

Example of application 1:
System controller Steca TR 0603mc with the expansion module Steca TE A603

Example of application 2:
System controller Steca TR 0603mc with the heating controller Steca TH A603 MS and the expansion module Steca TE A603

Example of application 3:
Heating controller Steca TH A603 M with the heating controller Steca TH A603 MS and the expansion module Steca TE A603

»PROFESSIONAL SYSTEM MONITORING FOR PERMANENT CHECKING AND PERFORMANCE ANALYSIS.«

Steca offers optimum system solutions for monitoring one or more solar systems. Everything is possible, from graphical displays to online visualisation! Solar systems, and all the relevant measurements, can be displayed on a smart phone, laptop or monitor to provide convenient monitoring. The Internet remote display provides a clear online representation of temperature and performance data for analysis. Measurements can be displayed graphically using Steca software solutions and professionally evaluated over long periods of time.

SYSTEM MONITORING

Monitoring

Software

Accessories

Steca TK RW2

IFA router for online visualisation

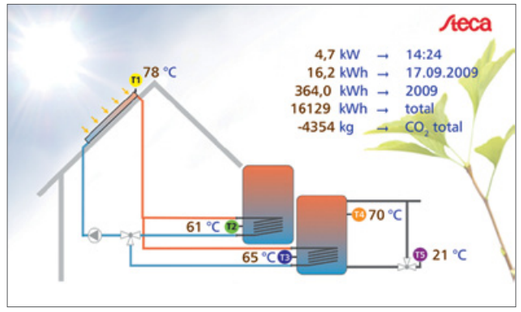
The Steca Internet remote display allows permanent monitoring and performance analysis of one or more solar energy systems. The Steca TK RW2 IFA router allows visualisation of the operation of solar thermal systems: Temperature and performance data are clearly displayed for analysis in an Internet browser window.

This works in a simple way: The Steca TR 0603mc or Steca TR A503 TTR solar thermal controllers cyclically send measurements to the IFA router. The Steca TK RW2 processes the data and forwards it to a central server via cable modem. The server archives this information and presents it visually in the Internet - as system images, graphics, tables, diagrams and even as a slide slow. These visualisations can also be sent from the IFA router to a smartphone or laptop via WLAN or via mediabox to a monitor* or a projector*.

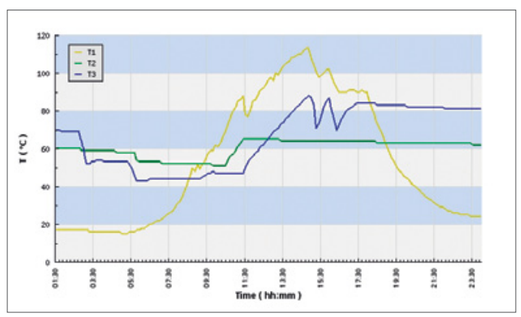
Not only the momentary values for each solar energy system are visualised but also the changes in temperature over time using easy to understand diagrams. If a heat meter is also used then, in addition to momentary values, the system is even capable of displaying energy balances and CO_2 savings.

By logging in with their personal user name and password the operator can use the Internet to monitor their system information from any location in the world.

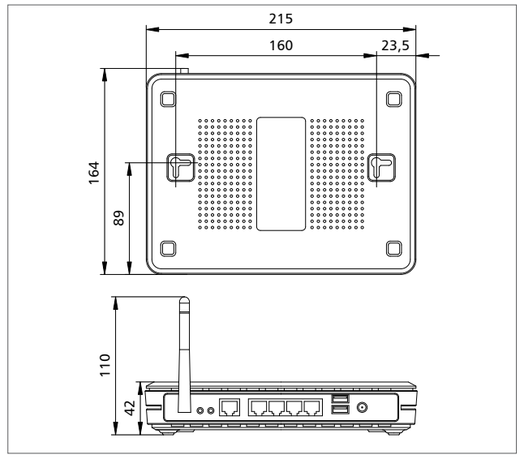
This allows simultaneous management and monitoring for correct operation of multiple systems. The raw data archived on the server can be downloaded for detailed analysis with Steca TS Analyzer 2. Historical information is permanently available for comparative monitoring of system functions. This allows malfunctions and the origins of faults to be quickly recognised, analysed and corrected, which greatly improves the operational reliability of the system.



Solar energy system with two storage tanks displaying the current measured temperature values, instantaneous power, daily, annual and total energy balance and CO_2 saving



Current measured temperature values displayed on the daily diagram



*with HDMI, DVI or composite video input

Steca TR A503 TTR solar controller with the Steca TK RW2 IFA router, several WLAN clients and an internet connection
(see set 1)

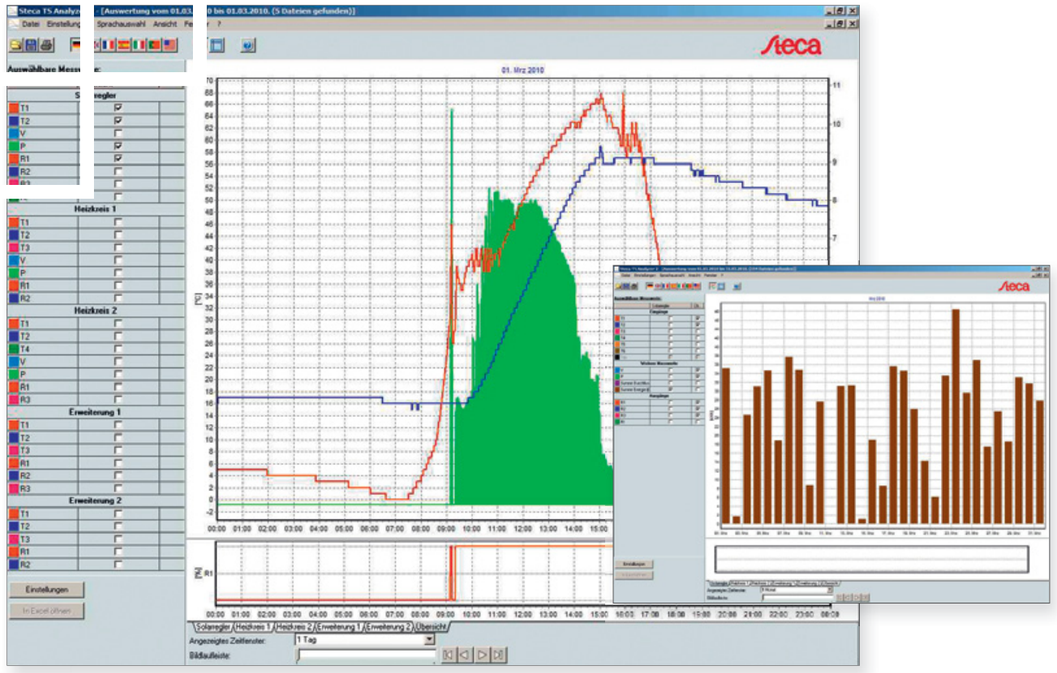
Steca TR 0603mc solar controller with the Steca TK RW2 IFA router, several WLAN clients and an internet connection
(see set 2)

IFA-Router Sets

There is is a suitable data cable connection between the IFA router set and the solar controller. Various sets are available:

Set 1: Steca TK RW2 with USB/TTL-cable to connect with Steca TR A503 TTR.
Set 2: Steca TK RW2 with serial data cable and USB adapter to connect with Steca TR 0603mc.

*with HDMI, DVI or composite video input



PROFESSIONAL SYSTEM ANALYSIS

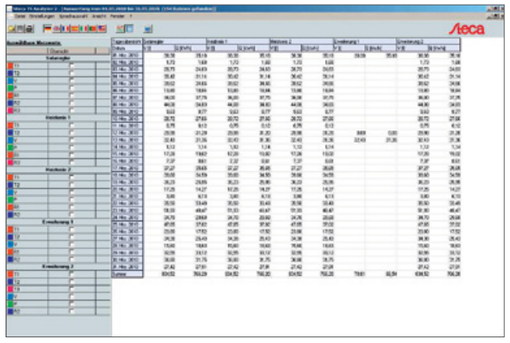
with the Steca TS Analyzer 2 software

The solar controllers Steca TR A503 TTR and Steca TR 0603mc are able to log all operating data of the solar system directly to a SD card. The analysis software Steca TS Analyzer 2 is visualizing all that data: temperatures, operating times of pumps, heat flow volume und flow – to get comparisons all measurements are visualized in plots even in longer timeframes.

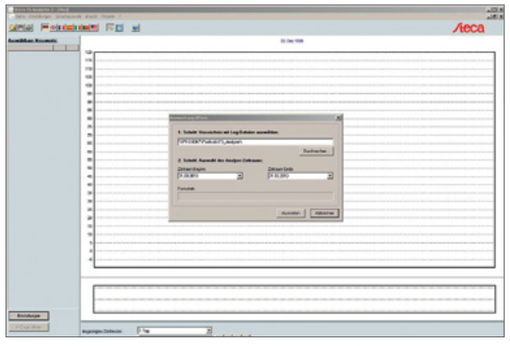
In master-slave mode the data of every node can be analysed seperatly and compared to others. The monitoring is completing the documentation: The state of the solar system, errors and alarms will be displayed. The software is also featuring an export to spreadsheet processing.

Because of this digital data acquisition and the convenient views in the software the user is always in focus of the performance of the solar system. The free monitoring software is also very easy to use and configure individually.

Steca TR A503 TTR and Steca TR 0603mc paired with the free Software Steca TS Analyzer 2 will continue the success of the globally sold solar controller series of Steca.



Heat quantity in table form



System data based on a hour, day, month, quarter or annual profile

Steca TA FV1

Remote controller for the heating controller Steca TH A603 M / MS

If a room guided heating circuit is installed in the building, the remote control Steca TA FV1 is required to control the temperature. The room temperature sensor Pt1000 is already integrated in the device. The rated supply temperature or the required room temperature can be controlled conveniently from home via a hand wheel. You can force switching from day operation to night-time reduction or night-time shut-off by turning the wheel all the way to the right or left.

If a weather-guided heating circuit is installed, Steca TA FV1 can also be used to determine the room temperature and to reduce or increase the supply temperature.

Product features
- Simple installation
- High accuracy
- Screw terminals allow universal and rapid installation

	TA FV1
Degree of protection	IP 30
Dimensions (X x Y x Z)	75 x 75 x 25 mm
Temperature sensor	Pt1000
Measuring range	-30 °C … +60 °C

Technical data at 25 °C / 77 °F

Steca TA AF1

External temperature sensor for the heating controller Steca TH A603 M / MS

The Steca TA AF1 is a temperature sensor for recording the external temperature in weather-guided heating circuits. The recorded external temperature is transferred to the heating controllers Steca TH A603 M or Steca TH A603 MS, which then set the corresponding supply temperature.

In room guided heating circuits, Steca TA AF1 can be used optionally to display the external temperature.

A robust, impact-resistant casing protects the external temperature sensor against the effects of the weather.

Product features
- Suitable for outdoor installation
- High accuracy
- Weatherproof, UV-resistant design
- Screw terminals allow universal and rapid installation
- IP 65 jet waterproof casing

	TA AF1
Degree of protection	IP 65
Cable feed	M 16
Dimensions (X x Y x Z)	64 x 58 x 36 mm
Temperature sensor	Pt1000
Measuring range	-50 °C … +90 °C

Technical data at 25 °C / 77 °F

Steca TA OP1

Overvoltage protection

The Steca TA OP1 overvoltage protection unit is a connection socket in a splash-proof IP 65 protective casing and serves to protect the collector sensor against local lightning strikes and externally induced voltage spikes.

A varistor protective diode protects against atmospheric overvoltages that can lead to the destruction of the collector sensor. The use of the Steca TA OP1 is generally recommended for extra protection of the collector sensor in any type of solar thermal system. In addition, the simple operation of the coil-spring clamps allows rapid and simple installation of the collector sensors using a sensor extension cable.

Product features
- Spring clamp terminals allow rapid and easy installation
- IP 65 jet waterproof casing

Electronic protection functions
- Varistors provide secure protection against local lightning strikes and externally induced voltage spikes

	TA OP1
Ambient temperature	-25 °C … +70 °C
Degree of protection	IP 65 / DIN 40050
Dimensions (X x Y x Z)	80 x 80 x 50 mm
Weight	50 g

Technical data at 25 °C / 77 °F

Steca TA VM1 and Steca TA VM2

Flow meter

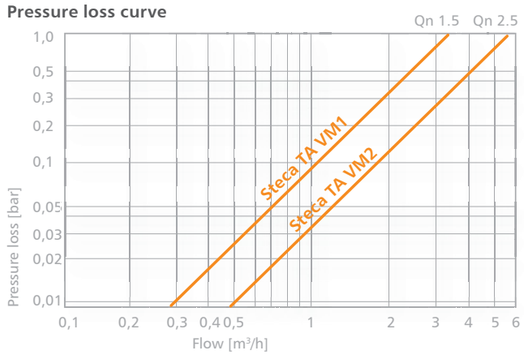
The Steca TA VM1 and Steca TA VM2 flow meters allow flow rate measurement of the water/water-glycol heat transfer fluid.

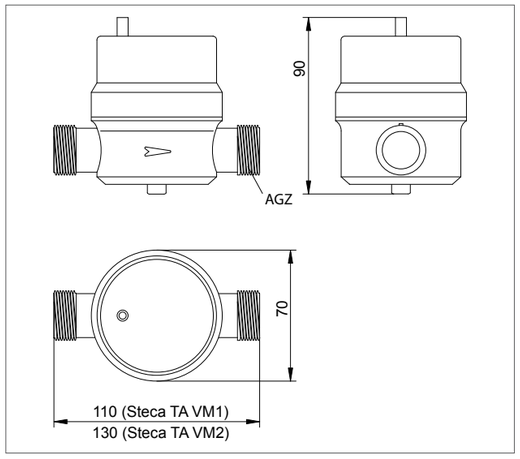
A contact maker (e.g. reed relay) is used to send a pulse to the solar thermal controller every time a defined quantity of fluid has passed through the system (e.g. 1 litre = 1 impulse or 10 litres = 1 impulse). At the same time, the controller determines the temperature difference between the supply and return temperatures and then calculates the heat quantity generated, by using this difference, the flow rate and the specific material characteristics of the heat transfer fluid. The heat quantity calculated is then finally displayed by the controller in kWh.

Product features

- Installation and connection dimensions according to DIN ISO 4064
- For horizontal and vertical installation
- The series is equipped with special 2-point sapphire bearing and stainless-steel axle as a single-jet impeller counter in dry-running design with magnetic coupling and has been conceived according to the latest technology
- To avoid disturbances caused by unclean water, only the impeller sits in the fluid path
- The counter can be rotated for easier reading

Pressure loss curve





	TA VM1	TA VM2
Pulse rate	1 l/Impuls	10 l/Impuls
Nominal diameter	DN 15	DN 20
Max. operating pressure (according DIN 2401)	10 bar	
Max. operating temperature	90 °C	
Nominal flow	1.5 m³/h	2.5 m³/h
Max. flow	3 m³/h	5 m³/h
Connecting threads on meter body according ISO 228/1 (AGZ - Inch)	G ¾ B	G 1 B
Connecting threads of couplings according DIN 2999 (AGV - Inch)	R ½	R ¾
Contact loading (without series resistor)	28 V	
Cable length	1.5 m	
Dimensions (X x Y x Z)	110 x 70 x 90 mm	130 x 70 x 90 mm
Weight	0.8 kg	1 kg

Technical data at 25 °C / 77 °F

Steca Pt1000

Immersion sensor

Immersion sensors allow temperature recording in liquid and gaseous media and are designed for installation in existing immersion sleeves or immersion sleeves provided by the customer.

The standard measurement unit contains a Pt1000 temperature sensor, according to DIN EN 60 751, class B, with a two-core switch.

Product features

- For installation in immersion sleeves

	Pt1000
Measuring range	-50 °C ... +180 °C
Diameter	6 mm
Length silicon cable	1,500 mm
Bushing length	50 mm
Bushing material	stainless steel

Technical data at 25 °C / 77 °F

Steca Pt1000 RAF

Pipe sensor

The Steca Pt1000 RAF is a pipe sensor, with tensioning band and axial sensor pipe, for temperature recording in ducts and pipes (e.g. cold and warm water pipes), or in heating loops.

The standard measurement unit contains a Pt1000 temperature sensor, according to DIN EN 60 751 class B, in a two-core connection.

Product features

- For fastening to pipes, including pipe clamp

	Pt1000 RAF
Measuring range	-50 °C ... +180 °C
Diameter	15 mm
Length silicon cable	3,000 mm
Bushing length	20 mm
Bushing material	aluminium

Technical data at 25 °C / 77 °F

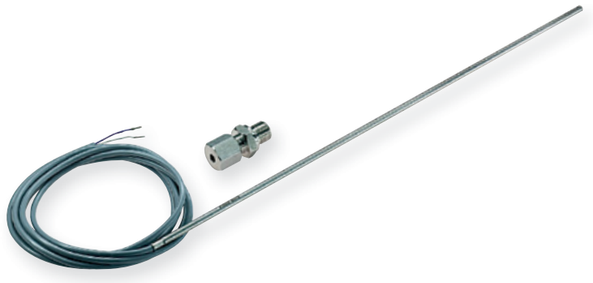
Steca Pt1000 MWT

Sheathed resistance thermometer

The properties of the Steca Pt1000 MWT sheathed resistance thermometer make it suitable for use in all measurement locations where an application specific installation length, and trouble free exchange of the units, is desired. The good heat transfer between the protective pipe and the temperature sensor allow short response times and high measurement accuracy. The standard measurement unit contains a Pt1000 temperature sensor, according to DIN EN 60 751 class B, in a two-core connection.

Product features

- Adjustable immersion depth using a screwed clamping ring



	Pt1000 MWT
Measuring range	-10 °C ... +105 °C
Diameter	4.5 mm
Length PVC-cable	2,000 mm
Bushing length	350 mm
Bushing material	stainless steel
Screw connection	G 1/4"
Material of screw connection	stainless steel
Material of clamping ring	stainless steel

Technical data at 25 °C / 77 °F

»STECA SOLAR ELECTRONICS PRODUCTS AND SOLUTIONS FOR AN ECOLOGICAL FUTURE.«

Steca has long stood for ideas and innovations as an electronic manufacturing services (EMS) provider and manufacturer of Steca brand product lines in solar electronics and battery charging systems. As a leading supplier of products for the solar electronics industry, Steca sets the international standard for the regulation and control of solar energy systems. In the three market segments PV grid connected, PV off grid and Solar thermal, the Steca brand is synonymous with innovation and vision. In conception, development, production and marketing, the company is committed to the highest quality standards.

OTHER PRODUCT AREAS

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Systems for difficult roofs

Residential systems

Commercial systems

PV OFF GRID

Solar home systems

Inverter systems

Hybrid systems

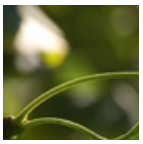
BATTERY CHARGING SYSTEMS

Mobile Use

Stationary Use

Equipment

ROOM FOR NOTES



Steca Elektronik

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