

GB

USA

# Manual



More terminal space  
Easy twist lock  
Undetachable lid  
Captive screws

## MINISOL



Differential  
Temperature Control



ABSTRACT

CONNECTION

INSTALLATION

SETTINGS

SOLUTIONS



[www.pausch.at](http://www.pausch.at)

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Please read before installation!

## FUNCTION

The MINISOL provides a differential temperature controller. It is delivered with 2 temperature sensors (FA and FT + TH30). It switches on, if the temperature at one sensor is higher than at the other sensor. You can adjust, how much warmer one sensor needs to be, for switching on.

🔗 Please read this manual for all details.

## APPLICATIONS

▶ **For solarheating:** A solar collector should only be activated, if the sun shines strong enough. The collector can cool, if it is activated at the wrong time. The differential-controller (DIF) in the MINISOL activates the solar heating only, if there is enough solar energy for economical solar heating available.

▶ **For a buffer:** You can use the MINISOL to load a buffer. Attach the collector sensor at the heat source (such as a heat exchanger), and the bath sensor at the boiler or buffer.

▶ **For cooling:** You can use the MINISOL for cooling, if the collector sensor is placed where you like to cool, and the bath sensor where the heat sink is (such as radiator, ground water heat exchanger).

🔗 To find further details about DIFF setting see "ADJUSTMENT".

## MOUNTING

Open the lid (turn twist lock at '0' position). Mount the MINISOL with 2 screws (clearance 85.5mm) at a planar wall.

⚠ **The assembly place must be:** ▶ not too wet ▶ clean ▶ between  $-10^{\circ}\text{C}$  and  $+30^{\circ}\text{C}$  ▶ unreachable for children. ▶ fireproof (e.g., not on a wooden wall) ▶ outside the protective area of the bath.

⚠ The 4 twist locks have to be locked (position 'I') if the device is in use. And the device and all cables must be fix installed.

## ⚠ IMPORTANT § NOTES

This device works with mains voltage! The electric installation may only be carried out exclusively considering all responsible regulations and norms by a licensed electric expert. The electricity supply must occur over all lines by a switch with at least 3mm contact width (a GFCI ground fault circuit interrupter & a fast circuit breaker with maximal 16A triggering). All conducting touchable parts (pump, valve, temperature sensor, ...) must be earthed ( $\perp$ ). A short circuit can damage the device. PAUSCH GmbH warrants goods of its manufacture as being free of defective materials and faulty workmanship. If warranted goods are returned to PAUSCH GmbH during the period of coverage (maximum 2 years since purchase date of the first buyer), PAUSCH GmbH will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose, secondary damages or for lost profit, lost credit, loss of data. Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However we assume no responsibility for its use. While we provide application assistance personally, through our literature and the PAUSCH GmbH web site, it is up to the customer to determine the suitability of the product in the application. No claim to completeness. Provisory sentence mistake and misprint. Our general terms and conditions AGB (refer to [www.pausch.at/htm/buy/agb.htm](http://www.pausch.at/htm/buy/agb.htm)) applies also. All rights reserved. Copyright 1982...2008 by PAUSCH GmbH. This device fulfills the requirements of the EU guidelines 73/23/EEC, 89/336/EEC, confirmed by the  $\text{CE}$  – sign.

**TECHNICAL DATA**

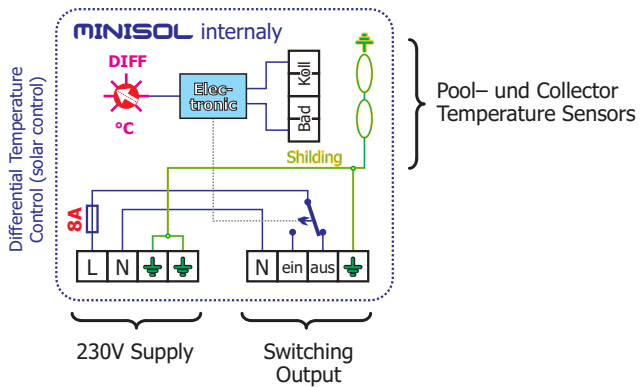
Supply: 230V ±10%, 50Hz +20%.  
Power consumption: < 3VA.  
Switching capacity: 1200VA.  
Protection class: IP44.

Adjustment range for DIFF-temperature: 1°C ... 11°C.  
Dimensions: l=110, h=110, t=60mm.  
Terminals: 12 inside.

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**CONNECTION**

This picture shows stylised the MINISOL insides with the function of the 12 screw terminals:



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- ▶230V Supply: Connect here the 230V mains. The electricity supply must occur over all lines by a switch with at least 3mm contact width. Use a GFCI ground fault circuit interrupter and a fast circuit breaker with a trigger current of maximum 16A.
- ▶Switching Output: Connect a 230V motorized

valve or a magnetic valve or a pump.

- ▶Temperature Sensors: Connect here the accompanied collector- and poolsensor. Use a shielded cable if necessary (refer to page 5 and 6). The clips in front of the terminals are connected with earth potential (⊥). Push the cable shielding into these clips.

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**TIP:**

- 💡 If You also need a maximum limiting, use the solar controller **SOLAX** or **DIGISOL**.
- 💡 If You also need to switch a swimming pool filter pump, use the pool control **SOLPOOL**. It is endowed with a solar controller.

- 💡 If You need a control for a solar- and a caloric heating, use the **KOMBISOL**. If You need it for a swimming pool, use the **DPOOL**. These devices give the solar power priority and use the caloric heating only if there is not enough solar energy available.

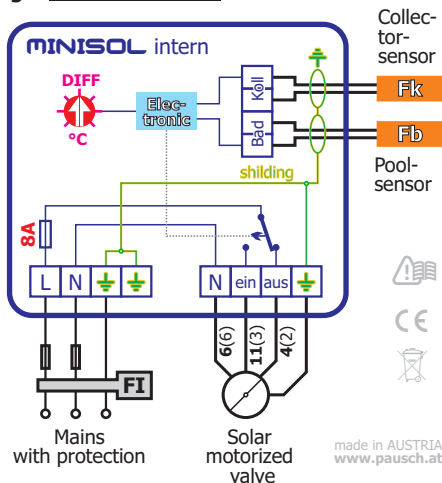
SOLUTIONS

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**Here is a MINISOL displayed, that is switching a motorized valve:**

If the collector sensor is warmer than the pool sensor, as adjusted (DIFF-dial) → MINISOL is switching on and there are 230V between the terminals 'N-ein' → the motorized valve is opening. If not, 230V are between 'N-aus' and the motorized valve is closing.

- You can connect a magnetic valve like a circulating pump (see below).
- For connecting a new 3way motorized valve from the company 'Praher', the **bold** printed terminal numbers are valid. Please refer to the valve manual!



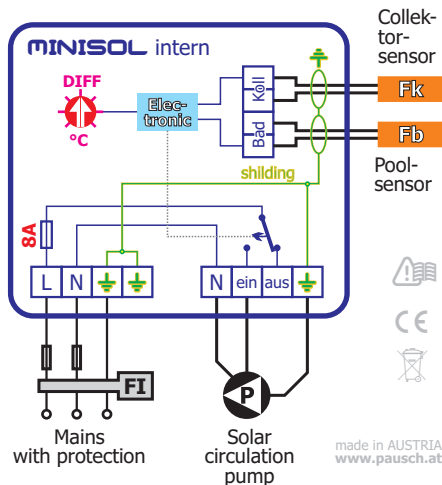
CONNECTION

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**Here is a MINISOL displayed, that is switching a circulation pump:**

If the collector sensor is warmer than the pool sensor, as adjusted (DIFF-dial) → MINISOL is switching on and there are 230V between the terminals 'N-ein' → the circulation pump is running. If not, 230V are between 'N-aus' and the pump is off.

- You can also connect a magnetic valve like the pump.




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**By the way:** This product contains valuable raw materials. Dispose it, hence, constitutionally at the end of its life.


## TEMPERATURE SENSORS


The following construction forms are electrically identical and can be used arbitrarily:

 The mooring-sensor (**FA**) is fixed at a pipe with a bell, tape or silicone rubber. It is normally used to measure the solar collector temperature (TKOLL). The FA is also available with a 20m or 30m long shielded cable FKS.

 The surface-sensor (**FO**) fits ideally for elastic mat collectors. It is stuck with silicone rubber between the mat ribs.

 The immersion-sensor (**FT**) is put into an immersion sleeve (TH...). Usually to sense the pool temperature (TBAD). Also available with 5m long cable.

 Some collectors are equipped with an immersion sleeve, with a 6mm diameter hole. The miniature immersion-sensor (**FT6**) fits into this sleeve.

 Our chromium-plated brass immersion sleeves have 1/2" pipe thread and submerged depths of 30mm (**TH30**), 100mm (**TH100**), or 150mm (**TH150**). Use the **TH2SPVC** sleeve for corrosive liquides (salty, acid, chemically loaded water, ...).

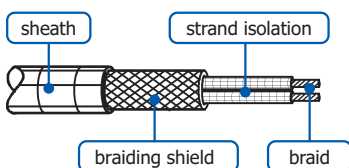
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## SENSOR CABLE 'FKS'

Please use our sensor cable **FKS** for high reliability and accuracy. It is specially produced for temperature sensor applications.



⚠ Disturbances can be induced into an unshielded cable by other close installed cables. This makes the relay flutter and cripples the contacts of the relay. Furthermore the sensor can be easily damaged by indirect lightning. Therefore please use the shielded sensor cable **FKS** for a cable length of 5m and above!

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### SENSOR CABLE

The sensors have approx. 20cm long black connection strands. So they need to be lengthened.

#### Thus connect to a cable:

① **Junction with a strand wire:** ① Strip. ② Twine strand firmly together. ③ Put on the provided shrink tubing (**SHRINKSEAL**) . ④ Heat it up with a lighter, till a sealing glue oozes out at the edges. Press the still warm tube a little, to remove air inside. This durable connection is absolutely waterproof.

② **Connection with a stiff wire:** Use the waterproof crimp connection (**CRIMPSEAL**) : ① Strip. ② Insert sensor strand and stiff wire. ③ Crimp with a crimping plier. ④ Heat with a lighter. The CRIMPSEAL wrapping shrinks and seals.

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### SENSOR CABLE

⚠ In theory you can use any 2-pole cable with minimum 0.15mm<sup>2</sup> cross section. Keep in mind that small cross section and high lengths causes measurement errors (details at our homepage: [www.pausch.at](http://www.pausch.at)). Interfering signals from near cables and induction of lightning overvoltage can jam or destroy the controller and the sensor.

⚠ Therefore use our shielded cable (FKS) at lengths of more than 5m. Connect the shielding with earth (⊕) at the MINISOL: ① Strip the sheath. ② push the braiding shield to the back. ③ Increase the interwoven screen at the beginning of the sheath. ④ Thread by the so resulted hole both strand wires. ⑤ twine the now empty braiding firmly together. ⑥ Connect this braiding together with the yellow/ green earth (⊕) wire.

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### SENSOR PLACING

The pool sensor should be close to the bath in a suction pipe, the collector sensor should be placed at the return pipe on a high place. The placement is ok, if the temperatures can be measured correctly also if the heating is not active. **Don't** put an unshielded sensor cable together with other cables in the same raceway. Use the FKS cable!

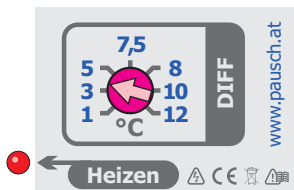
### SETTINGS

You can adjust the differential temperature inside the MINISOL.

⚠ Before opening the lid, switch electricity off. Don't touch parts that can conduct electricity (like fuse holder).

The **DIFF** rotary knob specifies how much the collector must be warmer than the pool water, so that MINISOL switches on the heating. Because the activation of the heating also costs a bit electric energy, heating is worthwhile only from approx. 3°C difference. To not give away too much solar energy, don't adjust the DIFF-Temp higher than 7°C.

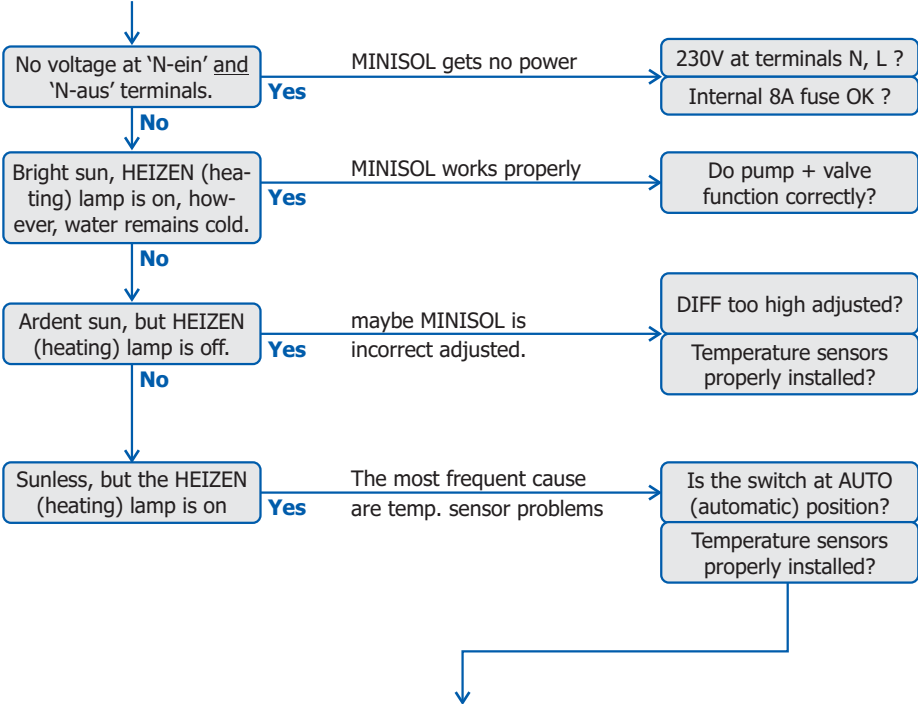
⚠ Adjusting a too low temperature, sometimes you get only a little bit solar energy while the system is consuming electric energy. If adjusted too high, too much solar energy remains unused in the collector.



If MINISOL is heating, the red signal 'Heizen' is illuminated.

**PROBLEM SOLUTION**

Check these points if MINISOL is not operating as expected or visit [www.pausch.at](http://www.pausch.at):



At problems with the temp. measurement:

- Maybe there is a poor junction of the sensor cable at the temperature sensor or in the MINISOL.
- ▶Check whether the sensors TBAD and TKOLL are not exchanged. ▶cool the TBAD sensor with an ice cube and check if the MINISOL

switches on. ▶check if the MINISOL operates correctly if the sensors are directly connected. ▶measure the resistance of the temperature sensors with an ohmmeter:

- 0°C ÷ 1630Ω; 10°C ÷ 1783Ω; 15°C ÷ 1854Ω;
- 20°C ÷ 1927Ω; 25°C ÷ 2000Ω; 30°C ÷ 2076Ω;
- 35°C ÷ 2152Ω; 40°C ÷ 2230Ω; 50°C ÷ 2417Ω;
- 60°C ÷ 2597Ω; 70°C ÷ 2785Ω; 80°C ÷ 2980Ω.

- ⚠ Nerver manipulate under voltage. Pay attention to your safety!
- 🔗 Find more information at: [www.pausch.at](http://www.pausch.at) info@pausch.at

ABSTRACT

## COGNATE CONTROLS

We are producing a range of solar- and pool controls. →Find details at our homepage [www.pausch.at](http://www.pausch.at)



**SOLAX solar controller** with adjustable differential- und maximum temperature (20°C to 40°C). 2 potential free changeover contacts enable to drive for example a motorized valve and a circulation pump at the same time. Switch for Manual/Off/Auto. Easy to service pluggable housing (SOLAX is plugged into the base with its terminals). Switching performance max. 8A per contact.

CONNECTION



**DIGISOL** like SOLAX but **additionally** with a large **LCD**, all hysteric- and measurement temperatures are individually **calibratable**. A switch for Manual/Off/Auto, and a switch for changing the displayed temperature between pool/collector/adjusted max.temp. New: Even more accurate and reliable because of 30µm hard **gold** plated junctions!

INSTALLATION



**KOMBISOL Solar- and conventional heating control** in one device. Only if the adjusted minimum temperature is undershot because of too less solar energy, the conventional heating is used. →Priority for the sun. A switch for the solar- and one for the conventional part with the positions manual/Auto/Off. Adjustable DIFF-, MIN- and MAX-Temperature. Outputs: 2 potential free changeover contacts for solar, and one potential free closing contact for the conventional heating. Switching performance is maximum 8A per contact.

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**SOLPOOL pool control with included solar control**. Adjustable differential- und maximum temperature (5°C to 40°C).

Version **230** **without** motor protection for 230V filterpumps.

Version **400** **with** motor protection for 230V and 400V filterpumps between 0.7A bis 7.4A (250W to 3.8KW (0.34PS bis 5.10PS) for 400V).

SOLUTIONS



**DPOOL intelligent waterproof pool control with solar and conventional heating control** (both heating systems can be used together with **priority** for solar). Terminals for dosage clearance. New: °C-dynamic filtertiming, night current, automatic holiday mode, unused relays outputs can be used for other functions (universal outputs), electronic dryrun protection for the filter pump, additional timer for heating, universal inputs.