SolvisDirekt – Operation for System Operators and Installers

SolvisStrato with hot water station WWS-xx

Hot water flow rates 24 and 36 l/min

Operating system: A2.08EN

Information about these Instructions

These instructions are intended for the system operator
and the specialist installing the heating system.

Client

On **pages 5 to 23** you will find all the information you
need on how to use the SolvisControl system controller to
operate your heating system safely. If you have any ques-
tions, please consult the firm responsible for installation.

| | These instructions must be kept with the system so that they are also available if required later. |

Installer

Starting on **page 24**, you will find additional information
for the installation technician about starting up the Solvis-
Control system controller and further setting options.

| | We recommend that you participate in a Solvis training course for safe and correct installation of heating systems. |

As we are always interested in improving our instructions,
we appreciate feedback of any kind.

Interested system operators should contact their
installers.

Information and notes
This symbol points out
• useful information and tips for easier operation as well as
• important notes on the correct operation of the system.

Caution
This symbol indicates that non-observance can lead to damage to
materials/objects/appliances.

Danger
This symbol indicates that non-observance can cause personal injury.

Energy saving tips
This symbol refers to suggestions on how to save energy.
This protects the environment and reduces costs.

Contents

Client

Technician

1 Safety Notes

In case of an emergency:

• Switch off the mains voltage immediately.

• Shut off the gas or oil supply.

• Use a suitable fire extinguisher in case of fire.

• Danger of frost damage. You will have to keep the heating system turned on in the winter so that the radiators and pipes lines do not freeze. During periods of absence, use the "leave" function of the heating circuits or switch the heating circuits to "Standby" (**page 35**).

• Wipe down the control console and the storage tank insulation with a wet cloth only.

• The operating element of the SolvisControl system controller must be protected from direct sunlight.

Solvis heating systems use state-of-the-art technology and meet all relevant safety requirements. They are designed with particular emphasis on safety. But improper operation may result in hazards or damages. **Observe the following notes**:

• Read the operating instructions carefully.

• Observe the safety notes to prevent damages to persons, material or devices.

• Operate the system only for its intended use and in good condition. Make sure to have any problems that cannot be solved with the operating instructions handled by qualified technicians from specialist heating companies.

• The system controller was programmed with the special features of your heating system. Make sure to use the controller for this heating system only.

• Do not modify any of the components. Use only original Solvis spare parts.

• This heating system must be installed, repaired and maintained only by qualified technicians from specialist heating companies. Only qualified electricians may work on live parts.

• When working on the system, it must be disconnected from the mains and secured from being switched back on.

2 Information about the System

Congratulations on your purchase of the SolvisDirekt system. The main feature of this system is the central, hygienic and economic water heating.

**General functional description** (Figure on right)
The hot water station WWS-36 as part of the SolvisDirekt system consists of components (1) and (2). The cold water (CW) is heated via a plate heat exchanger (1) through the heating circuit with the help of a buffer discharging station (2) in direct flow to a constant usage temperature. The heat is held in the SolvisStrato stratified buffer tank (3). Instead of a large hot water volume which has greater hygiene risks and requires considerable energy to maintain the temperature, the demand is covered by an efficient fresh water system. The boiler (4) charges the stratified buffer tank. You can connect a room heating system (5). You can easily expand the system into a thermal solar system, consisting of a solar heat transfer station (6) and a collector field (7).

Advantages of the SolvisDirekt system
With the SolvisStrato stratified buffer tank integrated in the fresh water system (**figure on right**), you benefit from our patented stratified charger technology: Compared to standard buffer tanks, you can use the heat more efficiently (SERC comparative test, see SolvisStrato planning document P10) and heat water more conveniently (ITW comparative test).

The system solution is particularly unique thanks to:

• High savings potential for energy costs,

• Hygienic and fresh hot water provided at the target temperature, even with low water levels or after extended periods of standstill,

• Forward-looking upgrading, for example, with a thermal solar system to optimise the return,

• A high degree of installation reliability due to the prefabrication of the functional modules,

• Reliable adaptation to requirements through modules with guaranteed high performance,

• Simple operational monitoring by saving results and

• integration of variable heat sources that can be combined.
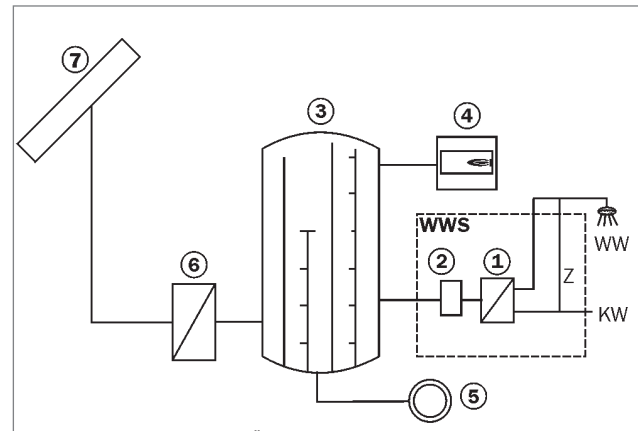
Design of the SolvisDirekt system

1 WWS: Hot water PHE	**4** Boiler
2 WWS: Buffer charging station	**5** Heating circuit
3 Buffer tank	**6** Solar heat transfer station
	7 Collectors
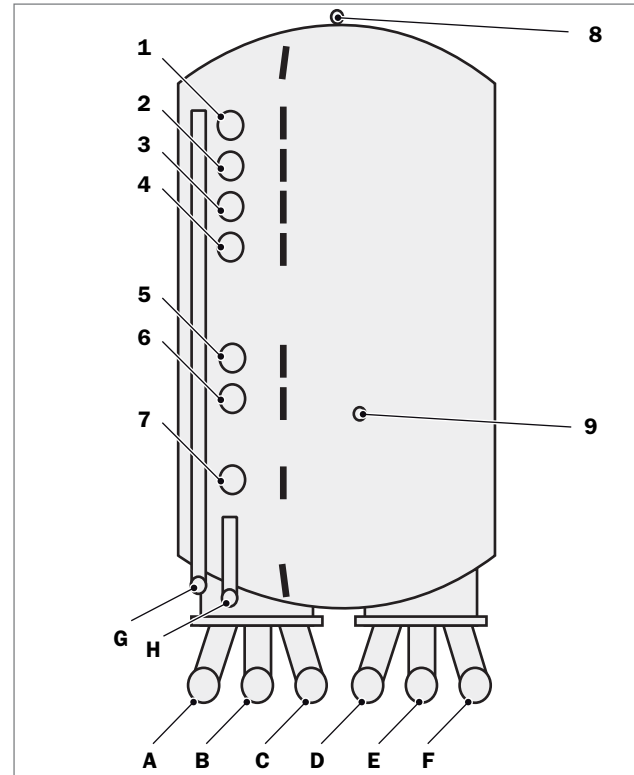
Connections on the SolvisStrato buffer tank

1 – 7 Top connections
8 – 9 Bleeding
A – H Bottom connections

2.1 SolvisStrato stratified buffer tank

The SolvisStrato stratified buffer tank was designed especially for use in solar systems. It is the core element of your heating system. In the Low-Flow System from Solvis, your SolvisStrato can be used with all collector surfaces up to 40 m².

In closed systems, an insulating jacket encases the steel container. All connections are routed downward underneath the insulation. The pipelines connect your SolvisStrato with the hot water station (**section 2.2**), the boiler (**see operating instructions of the manufacturer**), the heating circuits and the solar heat transfer station (**section 2.3**).

The stratified charging system
One of the essential features of the stratified buffer tank is the separation of the water into three zones:

- **Hot water buffer layer**
  In the uppermost layer, there is hot water for heating of drinking water. Depending on the tank size, 90 to 200 l are stored here, so that enough water is heated for small and average dispensable amounts even at times when there is no auxiliary heating, e.g. at night.

- **Heating buffer layer**
  The middle layer contains hot water for the heating.

- **Solar buffer layer**
  The lower layer contains colder water to be heated by the solar power system.

The heat from the collector is delivered into the secondary solar circuit using the solar heat transfer station. The solar flow discharges into a pipe with membrane flaps in the storage tank – the stratified charger. These two elements work in the following way (**figure on right**):

The external solar heat exchanger transmits the heat generated by solar power to the water in the tank. The water in the tank rises. Then the stratified charger ensures that it is layered according to temperature: hot water at the top, hot water below.

> ℹ️ Please contact your installation firm if you have any questions regarding the function and control of your system.

SolvisStrato Stratified Buffer Tank
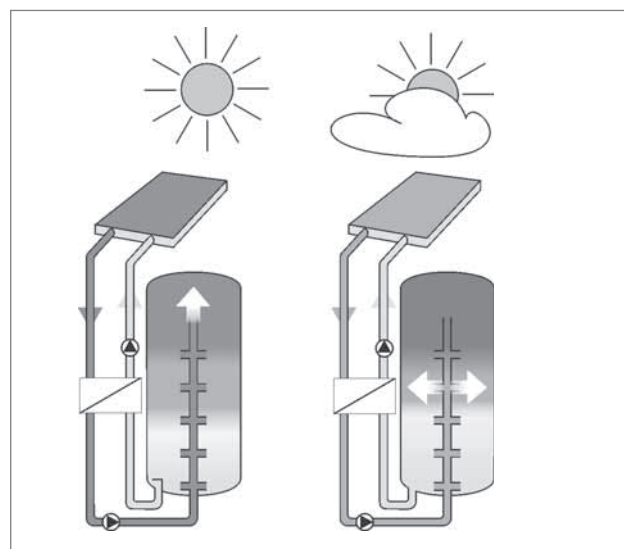
The Solvis stratified charger principle

2.2 Hot water station WWS-xx

The hot water station WWS-xx is as described in **section 2** the core element of the SolvisDirekt system. It includes all components required for heating drinking water to the desired temperature.

The hot water station consists of a plate heat exchanger (PHE) as well as a buffer charging station and it has an integrated volume flow encoder to control the heating of drinking water based on demand. It also includes thermometers to measure the flow and return temperature of the primary circuit of the plate heat exchanger.

All components are mounted on a console that you can either stand upright or mount on the wall using the appropriate mounting hardware. Use flushing valves at each connection to maintain the PHE.

Depending on the demand for hot water, you can choose from two different hot water stations:

• WWS-24, up to 24 l/min hot water flow rate

• WWS-36, up to 36 l/min hot water flow rate

with a temperature increase of 35 Kelvin.
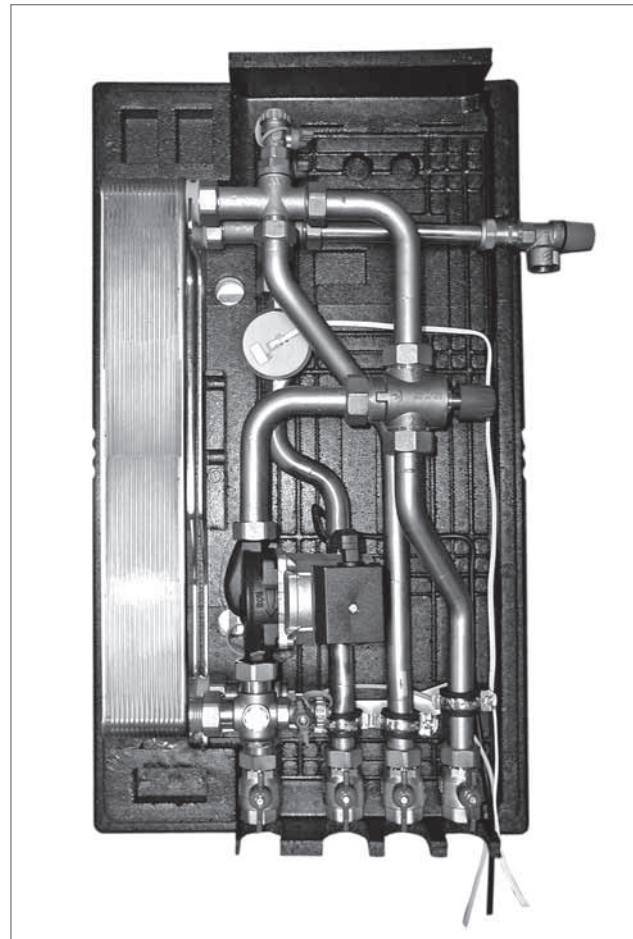
WWS-36 Hot water station

Client

2.3 Solar heat transfer station SÜS-xx

This optional component of your supply unit makes sure that the heat from the sun can be used. A solar heat exchanger functions as the central component to which the solar collector and stratified buffer tank are connected (by means of two hydraulically separate circuits). The Solvis-Control system controller regulates the solar circuit and buffer circuit pumps. It also controls the speed of each pump.

Depending on the size of the connected collector area, there are three different sizes:

• SÜS-20, up to 20 m² opening surface

• SÜS-40, 20 to 40 m² opening surface

• SÜS-80, 40 to 80 m² opening surface.
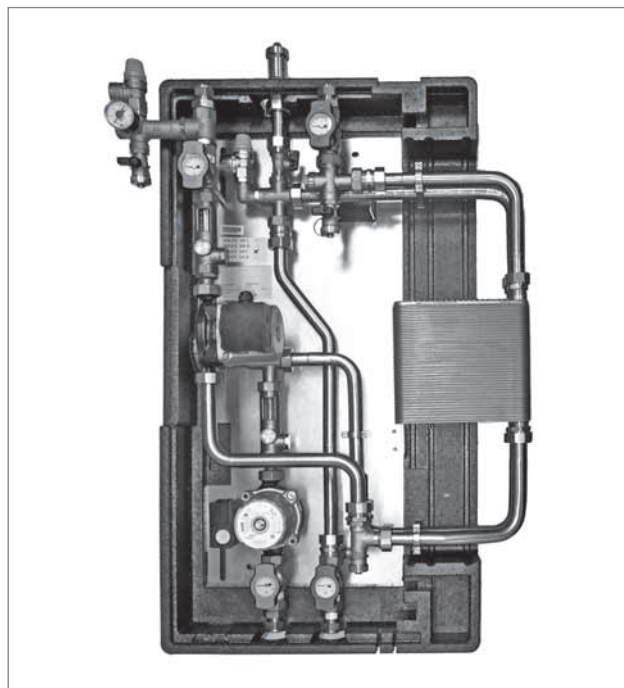
SÜS-20 Solar heat transfer station

2.4 SolvisControl system controller

The system controller coordinates all components.

SolvisControl functions:
• Hygienic water heating with time-controlled auxiliary heating of the buffer
• Time-controlled swimming pool heating in addition to pure solar heating
• Solar circuit control with two speed-controlled pumps, including a frost protection function in the secondary circuit
• Control of two mixed heating circuits
• Heating circuit 1 with floor drying function
• Heat quantity counter for solar circuit
• Circulation

Special features:
• Calendar function with automatic daylight saving time setting
• Output for reading the data using a data logger
• Can be updated at any time using infrared interface (bootloader optional)
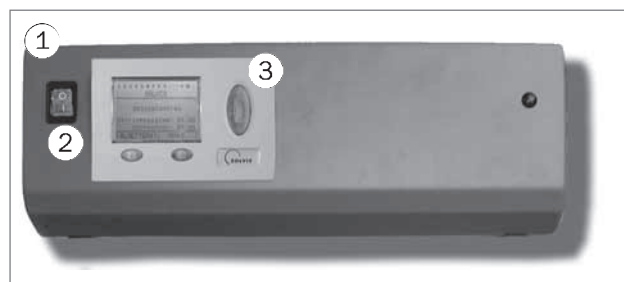
Controller console RK-SC-SD with SolvisControl system controller

Scope of delivery:
1 Console with built-in mains circuit board

2 Mains switch

3 Control unit (cover board)

not in figure:
• WW pump cable harness

• SolvisStrato sensor cable harness with 4 sensors

• 4 x TF-SC temperature sensors, 1 x external sensor

• 4 x screws with 6 mm anchors for wall mounting

• Operating instructions (P32, enclosed)

3 Switching on the System

Start-up: Your heating contractor has installed and started up your system. S/he should also have explained to you how to operate the system.

Resuming operation: If you want to start up the heating system after an extended period of standstill, observe the following instructions:

1. Check that the system is filled and bled of air in accordance with regulations.

2. Ensure that the gas and oil valve on the supply line to the boiler is open.

3. Switch on the boiler. Consult the operating instructions for the boiler to ascertain the start-up procedure.

4. Switch on the system controller using the main switch next to the control board (**figure on right**). The function overview menu is called up approx. 30 seconds after the version display. If the switch does not light up, the power supply has probably been interrupted by the emergency stop switch, which is usually next to the boiler or (outside) on the heating room door.

5. Please always check whether the time and date have been set correctly. Set the time and date if necessary (**page 12**).

If the boiler does not start immediately, check that there is a heating requirement at the controller. There are two main reasons for a missing heating requirement:

1. The storage tank is at the set temperature.
2. There is no heating or hot water requirement.

In both cases, the boiler remains switched off.

A heating requirement is indicated by Output 12 being highlighted in black (**see figure on right**). In this case, the boiler should start up automatically after a while. The hot water or heating buffer in the storage tank (**page 6**) is then heated and supplies the heat consumers. If the temperature in the heating buffer exceeds the target value, the burner is switched off.

Main switch

Switch on the system
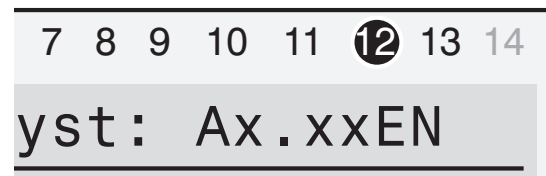
Section of SolvisControl display field. Output 12 is highlighted in black (burner is on). This means the controller is signalling a heating requirement.

Client

4 Operating the System Controller

4.1 Information about SolvisControl

Some concise information on controlling your solar power and heating system:

Your heating and solar power system is controlled by means of the SolvisControl system controller. These are its functions in detail:

You can use it to control:
• The solar system
• Hot water heating
• Hot water circulation
• Two mixed heating circuits
• Auxiliary heating to meet hot water requirement
• Auxiliary heating to meet heating requirement and
• Swimming pool heating.

Below you can see an illustration of the SolvisControl system controller. The most important component is the rotary wheel, which moves the pointer in the display field up and down when turned. The pointer jumps from one menu item to the next. Press the rotary wheel to select a menu item. Depending on the menu, the operating buttons at the bottom have different functions which are shown in the display field above them.

The row of numbers at the top shows the status of the outputs. When a number is highlighted in black, it means

that this output is switched "ON". A hand symbol indicates that this output is being operated manually.

Basic operating method:
Step 1: Turn the rotary wheel: Go to menu item
Step 2: Press rotary wheel: Select menu item
Either a submenu now appears with its own menu items, or you have reached the input mode of a parameter (the backlight of the rotary wheel changes from green to orange, the pointer changes from ◄ to ⚡).
In the input mode of a parameter:
Step 3: Turn the rotary wheel: Select from the preset values
Step 4: Press rotary wheel: Save the selected value

Example:
In the **figure below**, the pointer is at "49". If you press the rotary wheel now, you can set the minutes for the time. Pressing again will save the value.

In this way, you can make important settings which are described in more detail below.

ℹ️ Among other things, the SolvisControl system collector continuously monitors the collector sensor and the storage tank reference sensor and also indicates faults (see **Section 7 "SolvisControl System Controller Messages", p. 22**).

Rotary wheel

Display field

Pointer

Operating buttons

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Operat.Syst: Ax.xxDE
Tue 16.03.2010
Norm.time: 09 : 49◄
------------------------------------
INPUTS
1: T.Heat.Cir.P
   HELP        SERVICE
```

SOLVIS

View of SolvisControl system controller

Client

```
Function overview:
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Operat.Syst: A2.08EN
Sa. 20. 08. 2005
Summertime: 12:39
_ _ _ _ _ _ _ _ _ _ _ _
INPUTS
  1: T.WW.Buffer
  2: T.Warm Water
  3: T.Ref.Sto
  4: Temp. upper
     heating buffer
  8: T.Collector
 10: T.Outdoor
_ _ _ _ _ _ _ _ _ _ _ _
OUTPUTS
_ _ _ _ _ _ _ _ _ _ _ _
HEAT CIR.1     F:17
OPERAT.: TIME/AUTO
        Normal
T.Room.LOWER: 16°C
        TIME PROG:
T.Pre.ACT:   20.6°C
T.Pre.NOM:    5.0°C
        HEAT CURVE:
_ _ _ _ _ _ _ _ _ _ _ _
HEAT CIR.2     F:18
OPERAT.: TIME/AUTO
        Normal
T.Room.LOWER: 16°C
        TIME PROG:
T.Pre.ACT:   21.1°C
T.Pre.NOM:    5.0°C
        HEAT CURVE:
_ _ _ _ _ _ _ _ _ _ _ _
HEAT. REQ      F:21
_ _ _ _ _ _ _ _ _ _ _ _
WW_REQ.1       F:10
REQUIREMENT:
Status: OFF
T.WW.NOM:      48°C
        TIME PROG:
_ _ _ _ _ _ _ _ _ _ _ _
WW_REQ.2       F:11
REQUIREMENT:
Status: OFF
        TIME PROG:
_ _ _ _ _ _ _ _ _ _ _ _
CIRCU          F:16
        TIME PROG:
_ _ _ _ _ _ _ _ _ _ _ _
WW_REQ.3       F:23
T.WW.ACT:      30°C
T.WW.NOM:      30°C
        TIME PROG:
_ _ _ _ _ _ _ _ _ _ _ _
HQC SOLAR      F:30
POWER: 10.8 kW
HEAT QUANT.: 20 kWh
FLOW: 241 l/h
T.Pre-run:     82°C
T.return:      35°C
_ _ _ _ _ _ _ _ _ _ _ _
Floor Dry      F:22
_ _ _ _ _ _ _ _ _ _ _ _
CH.SWEEP       F:35
FUNCTION START

HELP         SERVICE
```

```
Heating times menu:
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Return temp. HEAT CIR.1
[Mo][Tu][We][Th][Fr] Sa Su
06:30 – 22:30    20°C
00:00 – 00:00    20°C
00:00 – 00:00    20°C

Mo Tu We Th Fr [Sa][Su]
07:30 – 00:00    20°C
00:00 – 00:00    20°C
00:00 – 00:00    20°C

Mo Tu We Th Fr Sa Su
00:00 – 00:00    20°C
00:00 – 00:00    20°C
00.00 – 00.00    20°C
```

```
Hot water times menu*:
1 2 3 4 5 6 7 8 9 10 11 12 13 14
 TIME PROG. WW_REQ.1
[Mo][Tu][We][Th][Fr][Sa][Su]
00.10 – 00.00
00.00 – 00.00
00.00 – 00.00

Mo Tu We Th Fr Sa Su
00.00 – 00.00
00.00 – 00.00
00.00 – 00.00
```

```
Circulation time menu*:
1 2 3 4 5 6 7 8 9 10 11 12 13 14
  TIME PROG. CIRCU
[Mo][Tu][We][Th][Fr][Sa][Su]
00.10 – 00.00
00.00 – 00.00
00.00 – 00.00
```

```
Maintenance menu:
1 2 3 4 5 6 7 8 9 10 11 12 13 14
     MAINTENANCE
FUNCTION START
DES.: CH.SWEEP
Status: OFF
Run Time: 0 min
Tot. Runtime: 10 min
Burner perf.: 100%
```

```
Version display**:
1 2 3 4 5 6 7 8 9 10 11 12 13 14
        SOLVIS

    SolvisControl

Operat.Syst: A2.08EN
 Boot Sector: B2.07
```

```
Heating curve menu:
1 2 3 4 5 6 7 8 9 10 11 12 13 14
       HEAT CURVE
HEAT CIR.1
MODE:
CONTROL: Out. Temp
HEAT CURVE: Slope
Room Influenc: 0 %
Increasing
on Start: 0 %
Slope:      0.80
T.Pre.MAX: 70°C
T.Pre.MIN: 20°C
```

```
Extend. ready volume*:
1 2 3 4 5 6 7 8 9 10 11 12 13 14
 TIME PROG. WW_REQ.2
Mo Tu We Th Fr Sa Su
00.00 – 00.00
00.00 – 00.00
00.00 – 00.00
```

```
Swimming pool heating times:
1 2 3 4 5 6 7 8 9 10 11 12 13 14
 TIME PROG. WW_REQ.3
Mo Tu We Th Fr Sa Su
00.00 – 00.00

Mo Tu We Th Fr Sa Su
00.00 – 00.00
```

*   Three time blocks

** displayed for approx.
   30 seconds after switching
   on the controller

4.2 Basic settings

You can adjust the factory settings to suit your individual requirements.

ℹ️ If you want to adjust a value, use the rotary wheel to position the pointer directly on the value and then press the rotary wheel. Now turn the rotary wheel until the required value appears and press it again to save the adjusted value.

- **"MESSAGE"**: Status or error messages are displayed first if applicable. Explanation . . . . **Page 22f**

- **Time and date**: Before setting the time, first set the date and specify whether it is "Summertime" or "Norm. time". Daylight savings changes occur automatically.

- **"INPUTS"**: Displays temperature values for hot water buffer (input 1), hot water (input 2), lower storage tank (input 3), heating buffer (input 4), collector (input 8) and external temperature (input 10). Sensor value "9999" means that no sensor is connected or there is sensor/cable breakage.
  "-999" indicates a short circuit. In the example on the right, the outdoor sensor is not connected. An external temperature of 0°C is then accepted for the calculation of the target flow temperature.

- **"OUTPUTS"**: Press the rotary wheel for a list of connected pumps or mixers in their respective switch state ("AUTO/OFF" or "AUTO/ON"). The appendix "AUTO/..." stands for automatic mode.

"HEAT CIR.1/2": Settings for heat circuits:

ℹ️ All functions are sensibly preset at the factory (factory settings are provided in brackets).

- **"OPERAT."**: Set the operating mode to "Time/Auto". If a room sensor is connected, you will see "RAS", set the required operating mode on the room sensor. . . . . **page 15**

- **"Normal"**: Operating status of the controller. "Normal" = normal operation; "Lower" = lowering mode.

- **"T.Room.LOWER"**: Set the desired lowering temperature (outside of the heating times, see below).

- **"TIME PROG"**: Call this heating times menu to set the target room temperature and heating times.
  Set the time window and room temperature . . **page 35**

- **"T.Pre.ACT"**: Actual value of the flow temperature in the heating circuit. The display shows "9999" when no sensor is connected.

- **"T.Pre.NOM"**: Current flow target temperature in the heating circuit.

- **"HEAT CURVE"**: Set the slope (factory setting = 0.8) to a value that is suitable for the building/heating system.
  Setting the heat curve . . . . **page 37**

Function overview:

1 2 3 4 5 6 7 8 9 10 11 12 13 14
Operat.Syst: A2.08EN

MESSAGE
Excess Temp
since:
20.08. at 13:38
_ _ _ _ _ _ _ _ _ _

Sa. 20. 08. 2005
Summertime: 13 : 49
_ _ _ _ _ _ _ _ _ _

INPUTS
 1: T.WW.Buffer
       85°C
 2: T.Warm Water
       45°C
 3: T.Ref.Sto
       81°C
 4: Temp. upper
    heating buffer
       87°C
 8: T.Collector
       95°C
10: T.Outdoor
       9999°C
_ _ _ _ _ _ _ _ _ _

OUTPUTS
_ _ _ _ _ _ _ _ _ _

HEAT CIR.1   F:17
OPERAT.: RAS
         Normal
T.Room.LOWER: 16°C
        TIME PROG:
T.Pre.ACT: 25.5°C
T.Pre.NOM: 5.0°C
     HEAT CURVE:
_ _ _ _ _ _ _ _ _ _

HEAT CIR.2   F:18
OPERAT.: TIME/AUTO
T.Room.LOWER: 16°C
         Normal
        TIME PROG:
T.Pre.ACT: 26.1°C
T.Pre.NOM: 5.0°C
     HEAT CURVE:
_ _ _ _ _ _ _ _ _ _

.
.
.

"HEAT. REQ.": Setting the heating requirement:

E Here you can set the "ECO mode". The boiler will remain off for a limited time, even though the room temperature has not been reached. You will then use more solar energy and save fuel.

Setting the ECO mode . . . .**page 48**.

"WW_REQ.1": Setting hot water heating:

• **"REQUIREMENT: Status"**: Displays whether the hot water requirement function is "ON" or "OFF".

• **"T.WW.NOM"**: Hot water target temperature, factory setting 48°C, maximum value 55°C otherwise the plate heat exchanger may show lime deposits.

• **"TIME PROG"**: Calls the time menu for the auxiliary heating of the hot water storage tank (factory setting: Mo-Su: 24 hours; see also **page 17**) set requested times, if necessary . . . .**page 43**

"WW_REQ.2": Increasing the hot water supply:

• **"REQUIREMENT: Status"**: As with "WW_REQ.1".

• **"TIME PROG"**: By entering the standby times (factory setting: Mo. – Su. deactivated) you can increase the hot water supply if there is an increased demand. **page 44**

"CIRCU": Setting the circulation circuit

• **"TIME PROG"**: Open the circulation times menu. (Factory setting: Mo-Su: 24 hours; **page 17**) set requested times, if necessary . . . .**page 46**

"WW_REQ.3": Setting the swimming pool heater:

• **"T.WW.ACT"**: Actual temperature, swimming pool.

• **"T.WW.NOM"**: Nominal swimming pool temperature, factory setting 30°C.

• **"TIME PROG"**: Calls the time menu for the auxiliary heating of the swimming pool (factory setting: Mo-Su: deactivated) set required times, if necessary . . . .**page 45**

"HQC SOLAR": Heat quantity counter solar circuit

i To use this function, a volume flow measuring unit (**section 4.3, next page**) must be installed in the secondary solar line.

• **"POWER"**: Current heat output in kW.

• **"HEAT QUANTITY"**: Infed heat in kWh.

• **"FLOW"**: Volume flow in l/h.

• **"T.Pre-run"**: Flow temperature in solar circuit in °C.

• **"T.return"**: Return temperature in solar circuit in °C.

"FLOOR DRY": Floor drying heating program

for heat circuit 1. . . . .**page 59**

Maintenance function:

• **"CH.SWEEP"**: Test operation of the burner, e.g. for measuring exhaust gases. . . . .**page 32**

```
_ _ _ _ _ _ _ _ _ _ _
HEAT. REQ       F:21
_ _ _ _ _ _ _ _ _ _ _
WW_REQ.1        F:10
REQUIREMENT:
Status:         OFF
T.WW.NOM:       48°C
        TIME PROG:
_ _ _ _ _ _ _ _ _ _ _
WW_REQ.2        F:11
REQUIREMENT:
Status:         OFF
        TIME PROG:
_ _ _ _ _ _ _ _ _ _ _
CIRCU           F:16
        TIME PROG:
_ _ _ _ _ _ _ _ _ _ _
WW_REQ.3        F:23
T.WW.ACT:       30°C
T.WW.NOM:       30°C
        TIME PROG:
_ _ _ _ _ _ _ _ _ _ _
HQC SOLAR       F:30
POWER:      0.00 kW
HEAT QUANT.:
            0.0 kWh
FLOW:        0 l/h
T.Pre-run:     65°C
T.return:      38°C
_ _ _ _ _ _ _ _ _ _ _
FLOOR DRY       F:22
NOM. VALUE:      5°C
_ _ _ _ _ _ _ _ _ _ _
CH.SWEEP        F:35
FUNCTION START
```

| HELP | | SERVICE |

Client

4.3 Accessories

• **Temperature sensor SolvisControl TF-SC**
as flow sensor for heat circuit 1 (S12), heat circuit 2
(S13) , as circulation sensor (S11) or as hot water
return sensor lets you control the hot water circulation
with SolvisControl. With 3 m connection cable, including
heat-conducting paste, cable ties and insulation bush.
If S11 is connected, you may have to set the times for
circulation. . . . .**page 46**

• **Volume flow encoder VSG-2,5 (figure on right)**
for connection to SolvisControl, input S15. This allows
you to measure and display the current heat output
and the accepted heat quantity in the secondary solar
circuit.
Suitable for up to 1.5 m³/h. Including screw connections
for 18 and 10 CU pipe (solar line).
The impulse rate of the volume flow encoder is
0.5 l/Imp. and is installed on the relevant input (S15)
of the SolvisControl at the factory.
If you are using an on-site volume flow encoder, you will
have to set the impulse rate at input S15. . . .**page 30**

Volume flow encoder VSG 2,5

• **Room sensor RS-SC (figure on right)**
lets you set the room temperature and heating program
in a room that is far removed from the controller.
Set the controller after installation of the controller
(at input S16). . . . .**page 27**
Limitation:
- You can connect only one room sensor.
- You may only operate this sensor at heat circuit 1.
- You are no longer able to heat a swimming pool.

> You can also use the room sensor to control the
> room temperature in the respective room based
> on the flow temperature so that it takes into con-
> sideration external heat sources such as a fire-
> place or sun exposure. All radiator valves in that
> room have to be open for that purpose. You will
> also have to set the so-called "room influence
> factor" on the SolvisControl. More information in
> section "4.4 Using the room sensor". .**page 16**

Room sensor RS-SC

4.4 Using the room sensor (accessory)

You use the room sensor to conveniently set the room temperature and heating program (**figure on right**) without having to go to the heating system.
If it is too cold, for example, even when the radiator valves are open, you can increase the room temperature by turning the adjustment wheel clockwise. If it is too warm, you turn the adjustment wheel anti-clockwise.

Taking the room temperature into consideration:
The room influence factor was set to zero at the factory so that the flow temperature is independent of the room temperature and is only set by the heat curve depending on the outside temperature. Any heat emission from external heat sources (e.g. fireplace or sun exposure) is to be offset by thermostat valves so that the room temperature remains constant. However, the flow temperature remains too high when compared to the outside temperature resulting in more losses. You would save more energy if you lowered the flow temperature to keep the room temperature constant when there is an additional heat supply. This can be accomplished with the room sensor. By setting the room influence factor to values greater than 0%, you can control the influence of the measured room temperature on the value of the flow temperature. This works only if the valves on the radiators in the room are fully open.

If you set the room influence factor to the maximum value of 90%, the flow temperature will basically be calculated based on the measured room temperature. The flow temperature is then influenced by external heat sources so that rooms without room sensors may not be heated adequately any longer, for example, because they are located on the cooler north side of the house.

Setting the room influence factor
The room influence factor was set to 0% at the factory. To save energy by altering the flow temperature, you will have to change the room influence factor when there are room sensors installed to 50% at the controller as follows:

Turn the adjustment wheel until you see the entry "HEAT CURVE" of heating circuit 1 and press the adjustment wheel.
Now turn the adjustment wheel to the entry "Room influenc: 0%". Press the adjustment wheel and set the desired value by turning the adjustment wheel. Press the adjustment wheel once at the end to save the value.

- Changing the room temperature by plus/minus 5°C

- Selection of the following heating programs:
  - Standby mode . . . . ▣
  - Night (lowering) mode . . . . ☾
  - Normal mode . . . . ☼
  - Automatic mode . . . . ◷

ℹ️ You need to adjust the controller after installation of the room sensor. . . . .**page 27**

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

         HEAT CURVE
_____
                              △
Room Influenc: 50% ◀
Increasing
on Start:          0%

                              ▽
  _____    _____
 |           |  |   BACK     |
```
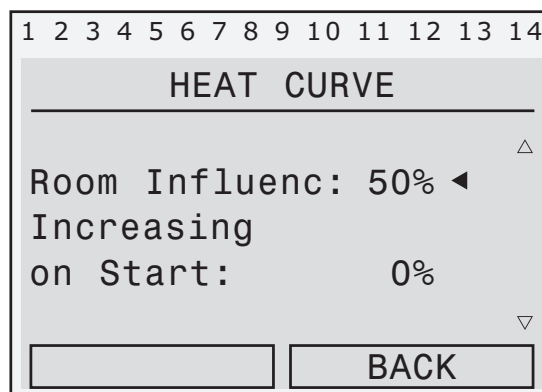
At the pointer position ◀ set the room influence factor

Client

4.5 Overview of time programs

Use the following tables to plan the heating of rooms to a target temperature, the times for auxiliary heating of the hot water buffer, the operation of the circulation pump and the heating of swimming pool water, then transfer the information to your controller.

For the heating circuits, you can define 3 time blocks with 3 heating times, where an individual target temperature can be set for each time period (**page 35**). The auxiliary heating times for hot water heating (**page 43**) and standby times for circulation (**page 46**) can be defined using 3 time blocks with 3 time windows each. You can set two time windows for swimming pool heating (**page 45**).

You must first decide on which weekdays the **common** time windows are to be valid and then enter them. To do this, select the appropriate days of the week and set the time window.

The following tables give an overview of the heating times, hot water times and circulation times that have been set.

Explanation of tables:
Each time block has three different time periods (heating times). Define the days of the week on which each time block applies.
• An "X" indicates that the weekday is activated for this time block. The corresponding weekday is highlighted in black in the heating times menu.

• "–" indicates that the weekday is inactive for this time block.

E   Use the time programs to save energy. Adjust the times to match your routine.

		Valid days of the week for the time block							Heating time			Heating time			Heating time		
		Mo	Tu	We	Th	Fr	Sa	Su	from	till	°C	from	till	°C	from	till	°C
Time block 1																	
Factory setting		X	X	X	X	X	–	–	06:30	22:30	20	00:00	00:00	20	00:00	00:00	20
Setting:	Heat Cir. 1																
	Heat Cir. 2																
Time block 2																	
Factory setting		–	–	–	–	–	X	X	07:30	00:00	20	00:00	00:00	20	00:00	00:00	20
Setting:	Heat Cir. 1																
	Heat Cir. 2																
Time block 3																	
Factory setting		–	–	–	–	–	–	–	00:00	00:00	20	00:00	00:00	20	00:00	00:00	20
Setting:	Heat Cir. 1																
	Heat Cir. 2																

Time programs for heat circuits "HEAT CIR.1" and "HEAT CIR.2"
(setting values for room temperature ("°C") and time windows ("from" and "till") for maintaining it)

	Valid days of the week for the time block							Heating time 1		Heating time 2		Heating time 3	
	Mo	Tu	We	Th	Fr	Sa	Su	from	till	from	till	from	till
Time block 1													
Factory setting								00:10	00:00	00:00	00:00	00:00	00:00
Own setting													
Time block 2													
Factory setting	–	–	–	–	–	–	–	00:00	00:00	00:00	00:00	00:00	00:00
Own setting													
Time block 3													
Factory setting	–	–	–	–	–	–	–	00:00	00:00	00:00	00:00	00:00	00:00
Own setting													

"WW_REQ.1" time program (auxiliary heating times for hot water buffer)

	Valid days of the week for the time block							Heating time 1		Heating time 2		Heating time 3	
	Mo	Tu	We	Th	Fr	Sa	Su	from	till	from	till	from	till
Time block 1													
Factory setting	–	–	–	–	–	–	–	00:00	00:00	00:00	00:00	00:00	00:00
Own setting													
Time block 2													
Factory setting	–	–	–	–	–	–	–	00:00	00:00	00:00	00:00	00:00	00:00
Own setting													
Time block 3													
Factory setting	–	–	–	–	–	–	–	00:00	00:00	00:00	00:00	00:00	00:00
Own setting													

"WW_REQ.2" time program (times for an increased hot water supply)

	Days of the week that are valid for the time block							Heating time 1	
	Mo	Tu	We	Th	Fr	Sa	Su	from	till
Time block 1									
Factory setting	–	–	–	–	–	–	–	00:00	00:00
Own setting									
Time block 2									
Factory setting	–	–	–	–	–	–	–	00:00	00:00
Own setting									

"WW_REQ.3" time program (times for heating a swimming pool)

	Days of the week that are valid for the time block							Operating time 1		Operating time 2		Operating time 3	
	Mo	Tu	We	Th	Fr	Sa	Su	from	till	from	till	from	till
Time block 1													
Factory setting								00:10	00:00	00:00	00:00	00:00	00:00
Own setting													
Time block 2													
Factory setting	–	–	–	–	–	–	–	00:00	00:00	00:00	00:00	00:00	00:00
Own setting													
Time block 3													
Factory setting	–	–	–	–	–	–	–	00:00	00:00	00:00	00:00	00:00	00:00
Own setting													

"CIRCU." time program (time program for standby times of the circulation pump)

5 Maintenance and Care

Wipe off any dirt from the SolvisStrato using a damp cloth.

⚠ **Do not use any solvents to clean the SolvisStrato.**

Heating systems must be maintained regularly according to the German Energy Conservation regulations (EnEV). We recommend that you have your local local specialist perform maintenance annualy. The necessary maintenance work is described in the installation instructions.

6 Troubleshooting

If the boiler does not start up, check that there is a heating requirement (s**ee page 9**). If there is no heating requirement but you believe that there should be one, make sure that the time is set correctly (**page 12**). Next, check the time programs: the heating circuit, water heating or the circulation may be outside of the time windows (**page 16f**). If the circulation is not working, make sure that the operating mode is set to "Time" (**page 46**).

Finally, have a look at the top line on the display and make sure that there is a hand symbol under one of the numbers (**figure on right**). If there is a hand symbol, the relevant output is set to manual mode and must be switched to automatic mode (**page 28**).

If the SolvisControl display no longer responds when you turn the rotary wheel, switch the control off, wait 20 seconds, and then switch it back on again.

Many problems can be resolved in this way. If there is a heating requirement but the boiler does not start up, the boiler may have a malfunction. Check whether it is switched on and press the unlocking button on the boiler's automatic firing system, if necessary. Follow the instructions in the relevant operating instructions.
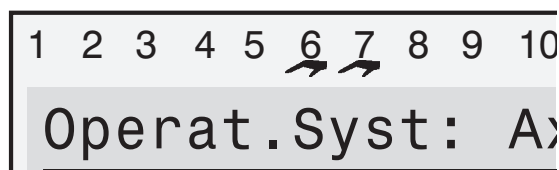
Section of SolvisControl display field. Overview of outputs 1-10. For example, outputs 6 and 7 (solar pumps) on this display are set to manual mode ("HAND"). When they are switched to "AUTO", the hand symbol disappears.

Client

6.1 Problems with the room temperature

Problem	Cause	Remedy
Room temperature too cold	Controller is switched off	Switch the main switch at the control console to on, if necessary.
		Switch the heating emergency switch to on, if necessary.
		Check the main fuse for the heating system.
	Malfunction message on the automatic firing system of the external burner	Resume external burner operation.
		If the burner repeatedly switches off, inform the company responsible for the installation of the boiler.
	Radiator is not warm enough	Open the radiator valve some more**.
	The room temperature cannot be set using the radiator valve	Increase the target room temperature in the time program of the heating circuit* (see **page 35**).
		If necessary, change the slope *, see **table on page 21.**
		Notify the company responsible for installation if you cannot resolve the problem.
Room temperature too warm	Radiator too hot	Close the radiator valve some more**.
	All rooms are overheated or the reference room is too warm**	Decrease the target room temperature in the time program of the heating circuit* (see **page 35**).
		If necessary, change the slope *, see **table on page 21.**
		If necessary, switch the mixer to "AUTO" (**page 28**).
		Notify the company responsible for installation if you cannot resolve the problem.
The reference room is always too warm or too cold**	The heat curve is set incorrectly	Another heating curve must be set, see **table on page 21**.
Hot water temperature is too low even though the storage tank is warm	T.WW.NOM is set too low	Set T.WW.NOM (**page 13**).
	Air in the storage tank	Bleed the storage tank (**notify installer**)

* Each time after a setting has been changed on the system controller, you should wait a while (one or more days) before making any further changes. As a result of physical conditions, changes to the parameters in the control system can often cause fluctuations of the control area (room temperature), which, depending on the existing conditions, can reach a constant value relatively quickly.

** First of all, open all the heating valves fully. If all rooms are too warm or too cold, change the heating curve accordingly on the system controller. If one or more rooms have the correct temperature and the other rooms are too warm, the heating valves must be closed some more in these rooms. There must always be at least one room in which the heating valves are fully opened (reference room). This is usually the room that is most difficult to heat.

6.2 Setting the heat curve

To save energy, the heating curve can be set exactly with the aid of the rules in the **table below**. Corrections should only be made in small steps.

ℹ All corrections require a certain amount of time to take effect. For this reason, wait at least one day before you make any other corrections.

Problem	Solution for heating curve in "Slope" mode	Solution for heating curve in "Temp." mode
All rooms are overheated regardless of the outdoor temperature*	Reduce the target room temperature in the heating times program	Reduce the target room temperature in the heating times program
The room temperature is too low regardless of the outdoor temperature*	Increase the target room temperature in the heating times program	Increase the target room temperature in the heating times program
The room temperature is too low in winter but adequate in autumn and spring	Increase "Slope"	Increase "T.Pre.-20°C"
The room temperature is adequate in winter but too low in autumn and spring	Increase the target room temperature in the heating times program **and** reduce "Slope"**	Increase "T.Pre.+10°C"
The room temperature is adequate in winter but too high in autumn and spring	Reduce the target room temperature in the heating times program **and** increase "Slope"**	Reduce "T.Pre.+10°C"
The room temperature is too high in winter but adequate in autumn and spring	Reduce the "slope"	Reduce "T.Pre.-20°C"

* First of all, open all the heating valves fully. Only when one or more rooms have an adequate temperature and the other rooms are too warm do you have to close the heating valves in those rooms some more. If it is too cold in a room, first turn up the heating valves there before you change the heating curve.

** Set the target room temperature so that the temperature difference is compensated. Finally, change the slope by 0.05 per 2° temperature difference in the opposite direction. **Example**: The room temperature is approximately four degrees too low in autumn and spring, but adequate in winter. You must increase the target room temperature in the heating time programs by this amount and reduce the slope by 0.1.

Heating curve corrections in case of problems with the room temperature

Client

7 SolvisControl System Controller Messages

"Sensor" messages

The connected sensors are monitored. The following messages may arise:

- **"Short Circuit Sensor" (figure on right):**
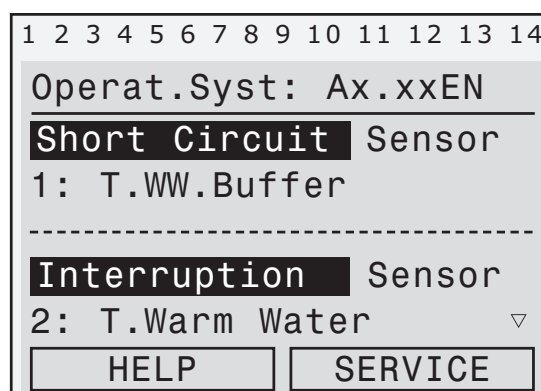 The line or sensor has a short circuit.

- **"Interruption Sensor" (figure on right):**
  Interruption of the sensor line or sensor, which means the cable or sensor is broken, and the electrical circuit is not closed.
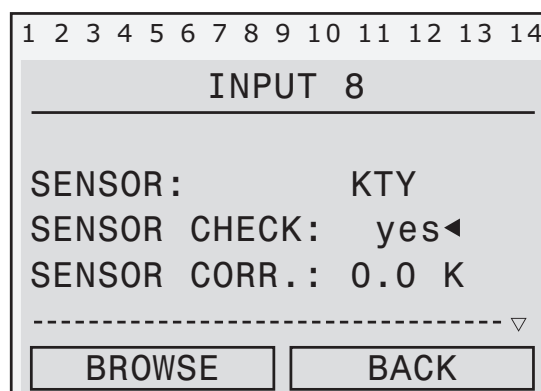
The affected sensor is displayed in the line below. The sensor is reset automatically when it is functioning correctly again.

Monitoring of sensor inputs 1 to 14 is included in the factory settings. If you wish to exempt sensors that are not connected from this monitoring (e.g. sensor 8 – collector sensor), proceed as follows:

Use the "SERVICE" button to open the main menu. Select the "Inputs" entry and press the rotary wheel. Select the relevant input, e. g. "8: T.Collector". Now move the pointer to the entry next to "Sensor Check: Yes" (**figure on right**) and set it to "No" by turning the rotary wheel until "No" appears and then pressing it again. Press "BACK" twice to return to the function overview.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Operat.Syst: Ax.xxEN
Short Circuit  Sensor
1: T.WW.Buffer
----------------------------------------
Interruption   Sensor
2: T.Warm Water            ▽
   HELP          SERVICE
```

Messages for a sensor malfunction

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
      INPUT 8

SENSOR:        KTY
SENSOR CHECK:  yes◄
SENSOR CORR.:  0.0 K
---------------------------------- ▽
   BROWSE         BACK
```
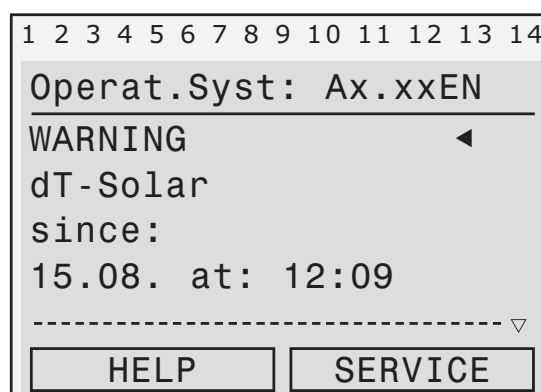
Enter "No" to switch off the sensor check.

"WARNING dT-Solar"

An additional continuous function check of these sensors takes place together with the monitoring of sensors S3 (tank reference sensor "T.Ref.Sto") and S8 (collector temperature sensor "T.Collector") as required for the granting of incentives according to the market incentive program of the German federal government (www.BAFA.de):

The "WARNING dT-Solar" message (**figure on right)** appears when the collector sensor is 60 K warmer than the tank reference sensor for more than 30 minutes while the solar pump is running. The sensor is reset automatically when the temperature difference drops below 60 K.

This message means that very little heat is being collected by the solar heat exchanger.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Operat.Syst: Ax.xxEN
WARNING               ◄
dT-Solar
since:
15.08. at: 12:09
---------------------------------- ▽
   HELP          SERVICE
```
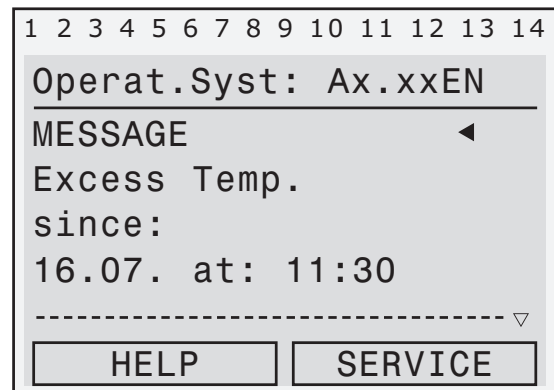
Malfunction in the solar circuit (despite excess heat, no circulation at the collector)

"MESSAGE Excess Temp."

The "WW buffer temp. (S1)" sensor at the top of the tank is monitored for safety reasons. If the temperature is greater than 98°C at this point, the solar pump and burner are switched off. They can no longer be manually switched on, even in the outputs menu. The following message appears in the function overview: "MESSAGE Excess Temp. since: dd.mm. at hh:mm" (**figure on right**) and "PROTEC/OFF" is displayed instead of "AUTO" or "HAND" in the outputs menu for outputs 1 (solar pump) and 12 (burner). This safety function has a hysteresis of 8 K that can be set, i.e. the burner and solar pump can resume operation when the temperature is once again below 90°C (98°C minus 8 K).
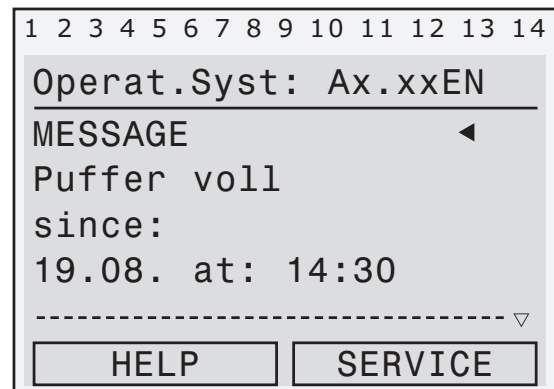
ℹ️ For safety reasons, this safety function should always be activated and its parameters should not be changed.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

Operat.Syst: Ax.xxEN

MESSAGE              ◄
Excess Temp.
since:
16.07. at: 11:30

---------------------------------- ▽
    HELP           SERVICE
```

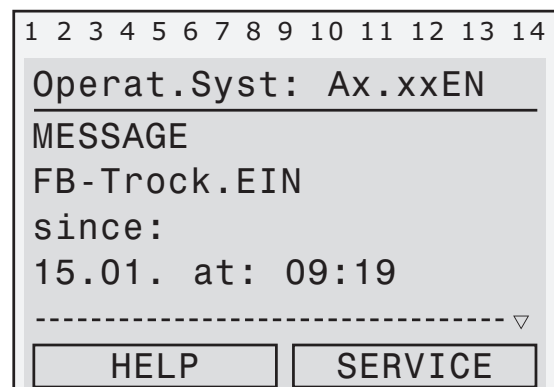**Message "Excess temperature" of protection function**

"MESSAGE Puffer voll"

If the maximum temperatures at the top of the storage tank (S1, "T.Lim.MAX", factory setting 95°C) or at the bottom (S3, "T.Ref.MAX", 90°C) are reached, the solar pump is turned off and the "MESSAGE Puffer voll" ("buffer full") appears. Further explanation on **page 55.**

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

Operat.Syst: Ax.xxEN

MESSAGE              ◄
Puffer voll
since:
19.08. at: 14:30

---------------------------------- ▽
    HELP           SERVICE
```

Message "Puffer voll" of the safety function

"MESSAGE FB-Trock.EIN"

The function monitors the burner and reports a message in the Function overview (**figure on right)**. Meaning: The burner and the heating pump of heating circuit 1 are controlled by the "FB-Trock" function.
This function is a program for dry heating the floor using heating circuit 1 (**page 59**).

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

Operat.Syst: Ax.xxEN

MESSAGE
FB-Trock.EIN
since:
15.01. at: 09:19

---------------------------------- ▽
    HELP           SERVICE
```

Display during dry heating program

Section B
Instructions for the Installer

(please change to user mode: Technician)

8 Setting the Controller and Start-up

8.1 Safety notes

In case of danger:
- Turn off mains voltage immediately.
- In case of fire use suitable fire extinguisher.
- Close oil or gas valve.

Observe regulations:
Read the following information about start-up thoroughly before you commission the system. This prevents damage to the system that can arise from improper handling.

Operate according to the recognised technical regulations. Observe the accident prevention regulations of the Accident Prevention and Insurance Association. Incorrect use and impermissible changes during installation and design result in the exclusion of liability claims.

Wiring:
The electrical connection takes place according to **the section "Wiring plan SolvisControl control board", p. 66.**

8.2 SolvisControl: Selecting the operating mode

The setting options for the SolvisControl are available in three different operating modes. They provide protection against accidental changes. System operators should always select the "Client" operating mode.

All the following settings are made in the "Client" operating mode unless stated otherwise.

Select the "User" menu item in the main menu by turning and pressing the rotary wheel.

Now select the "Client" or "Technician"* operating mode by turning and pressing the rotary wheel (figure on right). Press the "BACK" button to return to the main menu.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

            USER
─────────────────────────────
OPERATING MODE:
Client✓
Technician              ◄
Expert
                              ▽
┌─────────────┐  ┌─────────────┐
│   BROWSE    │  │    BACK     │
└─────────────┘  └─────────────┘
```
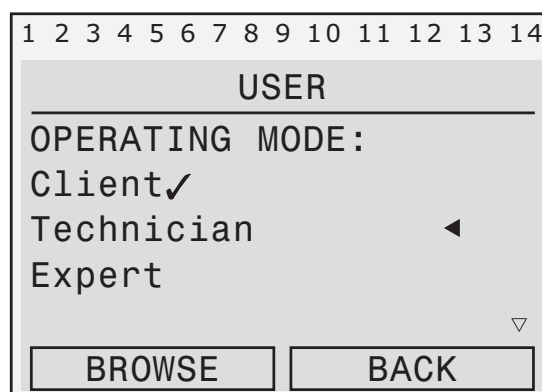
Selecting operating mode ("User" selected). Change to "Technician"*.

8.3 Transfer of the boiler temperature to modulating third-party boilers

You can transfer the required boiler temperature to a modulating third-party boiler as an analogue voltage signal with functions 36 and 37 using output 15.

In the "Outputs" menu, output 15 must be set with the appropriate scaling.

Standard setting of scaling:
150 scale divisions (= 15°C) are supplied with 0.6 V and 900 scale divisions (= 90°C) are supplied with 10.0 V.

You can only change the scaling in the "Expert" operating mode.

─────
* Enter the code for "Technician" mode by pressing, turning and pressing the rotary wheel again.

Technician

Main menu:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
            MENU
Version
User
Date/Time
Meas.Val.Overview
Function Overview
Inputs
Outputs
Functions
Messages
Potentiostat
Data Administration
```

Reset menu*:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
     DATA ADMINISTRATION
Current Funct. Data:
SD-11205.dat

Status: original

Load Factory Setting

Create Backup Copy
Load Backup copy
```

WW Requirements menu:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
       WW REQUIREMENT
WARM WATER TEMP.:
T.WW.ACT:          48°C
T.WW.NOM:          48°C
          TIME PROG:
T.WW.MIN:           0°C
DIFF.ON:           9.0 K
DIFF.OFF:          12 K
Burner perf.:      100%
```

Circulation menu*:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
         CIRCULATION
DES.: CIRCU
OPERAT.:          Time

CIRCU. RETURN:
T.CR.ACT:          48°C
T.CR.NOM:          48°C
          TIME PROG:

DIFF.ON:          -12 K
DIFF.OFF:        -9.0 K

WARM WATER TEMP.:
T.WW.ACT:          48°C
```
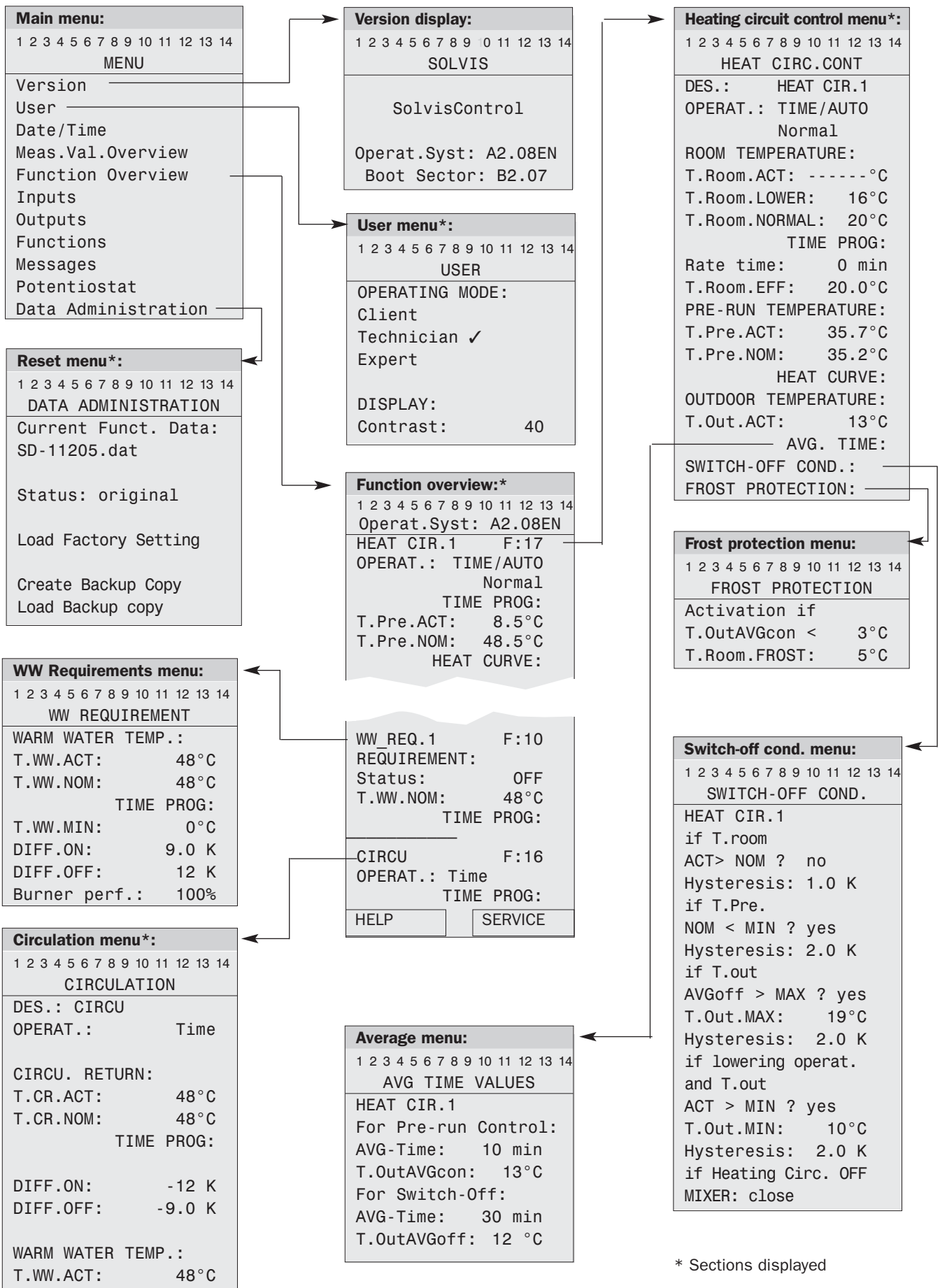
Version display:

```
1 2 3 4 5 6 7 8 9 0 11 12 13 14
          SOLVIS

        SolvisControl

Operat.Syst: A2.08EN
 Boot Sector: B2.07
```

User menu*:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
            USER
OPERATING MODE:
Client
Technician ✓
Expert

DISPLAY:
Contrast:          40
```

Function overview:*

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Operat.Syst: A2.08EN
HEAT CIR.1       F:17
OPERAT.: TIME/AUTO
                Normal
          TIME PROG:
T.Pre.ACT:       8.5°C
T.Pre.NOM:      48.5°C
          HEAT CURVE:
```

```
WW_REQ.1          F:10
REQUIREMENT:
Status:            OFF
T.WW.NOM:          48°C
          TIME PROG:
_____
CIRCU             F:16
OPERAT.: Time
          TIME PROG:
HELP          SERVICE
```

Average menu:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
       AVG TIME VALUES
HEAT CIR.1
For Pre-run Control:
AVG-Time:      10 min
T.OutAVGcon:   13°C
For Switch-Off:
AVG-Time:      30 min
T.OutAVGoff:   12 °C
```

Heating circuit control menu*:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
       HEAT CIRC.CONT
DES.:      HEAT CIR.1
OPERAT.: TIME/AUTO
          Normal
ROOM TEMPERATURE:
T.Room.ACT: ------°C
T.Room.LOWER:    16°C
T.Room.NORMAL:   20°C
          TIME PROG:
Rate time:      0 min
T.Room.EFF:    20.0°C
PRE-RUN TEMPERATURE:
T.Pre.ACT:      35.7°C
T.Pre.NOM:      35.2°C
          HEAT CURVE:
OUTDOOR TEMPERATURE:
T.Out.ACT:        13°C
          AVG. TIME:
SWITCH-OFF COND.:
FROST PROTECTION:
```

Frost protection menu:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
       FROST PROTECTION
Activation if
T.OutAVGcon <      3°C
T.Room.FROST:      5°C
```

Switch-off cond. menu:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
       SWITCH-OFF COND.
HEAT CIR.1
if T.room
ACT> NOM ?  no
Hysteresis: 1.0 K
if T.Pre.
NOM < MIN ? yes
Hysteresis: 2.0 K
if T.out
AVGoff > MAX ? yes
T.Out.MAX:      19°C
Hysteresis:  2.0 K
if lowering operat.
and T.out
ACT > MIN ? yes
T.Out.MIN:      10°C
Hysteresis:  2.0 K
if Heating Circ. OFF
MIXER: close
```

* Sections displayed

8.5 Start-up and sensor installation

Follow the instructions in the three sections of start-up. All hydraulic circuits in the system must be professionally prior to start-up.

ℹ️ Make a backup copy at the SolvisControl after completing any adjustments to the settings.

8.5.1 General settings and plausibility check

• Set time and date . . . .**page 12**

• If a room sensor (accessories, **page 14**) has been connected, activate it in function 17 as follows:
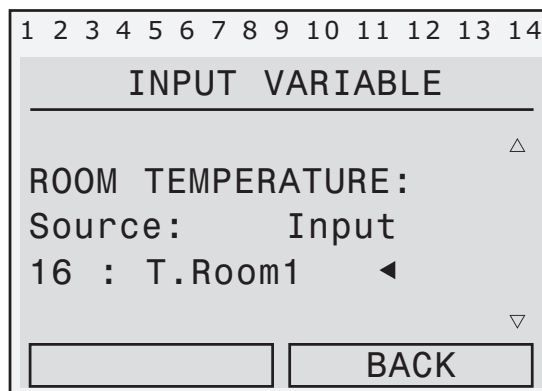
> **Step 1**: In the function overview, turn the rotary wheel until the pointer is behind "HEAT CIR.1 F:17" and press it once.
> **Step 2**: Now go to entry "INPUT VARIABLE:" and press the rotary wheel once.
> **Step 3**: Now turn the rotary wheel until the pointer is behind "Source: User" below the entry "ROOM TEMPERATURE" and press it.
> **Step 4**: Now turn the rotary wheel until the entry "Input" appears and press it again to save this value. In the line below, as just descrbed, set "16: Temp.Room1".
>
> An overview of the settings is shown on the right.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
         INPUT VARIABLE
                                  △
ROOM TEMPERATURE:
Source:      Input
16 : T.Room1       ◄
                                  ▽
 ┌──────────────┐ ┌──────────────┐
 │              │ │     BACK      │
 └──────────────┘ └──────────────┘
```

Room sensor in function "17:HEAT CIR.1" activated

ℹ️ Only heating circuit 1 can be equipped with a room sensor. It is not possible to heat a swimming pool in addition to this. Connect the room sensor at input S16, contrary to the installation instructions (**page 66**).

• **With connected room sensor only**: If the room temperature is to be used to determine the flow temperature, set the room influence factor . . . .**page 15**

• Hiding malfunction messages from sensors that are not connected (disabling sensor check).
  If there are not collectors, for example, sensor check sensor 8 should be deactivated . . . .**page 22**

• Perform a plausibility check of the inputs (e. g. check the temperature on the heating circuit flow against controller values). Call the "Inputs" submenu in the main menu. Sensor value "9999" means that no sensor is connected or there is sensor/cable breakage. "-999" indicates a short circuit.

ℹ️ All temperature sensors in the secondary circuit, except for the solar flow and return sensors (= Pt 1000), are of resistance type PTC 2 kOhm. You can find a measurement value table for checking the sensors in the **appendix on page 65**.

• Perform a function check of the outputs (pumps). When the volume flow sensor is attached, operate the relevant pump in "HAND/ON" mode and check the volume flow display on the SolvisControl. Set the quantity per impulse (impulse rate), if necessary. . . . .**page 30**

Technician

- If not performed during installation: For the mixers that are connected, check the opening direction at the mixer module as follows:
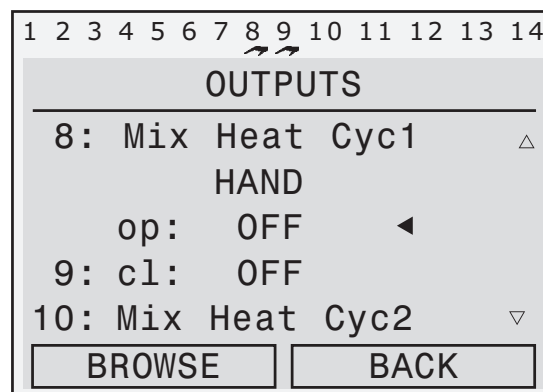
> Open the "Outputs" submenu in the main menu. Now turn the rotary wheel until "AUTO/OFF" or "AUTO/ON" is selected for the "Mix Heat Cyc1" output (if a second heating circuit is connected, do the same for "Mix Heat Cyc2"). Set this entry to "HAND" by pressing, turning and pressing the rotary wheel. Now move the pointer to the entry "op: OFF" (**figure on right**) and press the rotary wheel. The motor should now open the mixer as long as the rotary wheel is pressed. If an incorrect run occurs at plug "SM 1" or "SM 2", swap the "op" and "cl" connections (s. **section "Wiring diagram Solvis-Control control board", p. 66**).

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
             OUTPUTS
  8: Mix Heat Cyc1            △
             HAND
     op:   OFF        ◄
  9: cl:   OFF
  10: Mix Heat Cyc2           ▽
   BROWSE            BACK
```

Open the mixer gradually by pressing the rotary wheel at the pointer position ◄ (switch to "HAND" before)

ℹ️ Switch the outputs from "HAND" back to "AUTO" after checking the outputs.
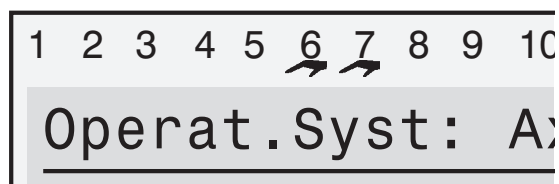
- **Switch outputs to "AUTO"**>:
Check that all outputs are set to "AUTO" to ensure the fault-free functioning of the controller. Simply look at the top line in the display field (see **figure on right**). If you see a hand symbol ⤳ below one of the numbers (= numbers of outputs), the respective output is set to manual mode and must be switched to automatic mode. In the **figure on the right** output 6 and 7 (solar pumps) are in manual mode and must be switched to "AUTO" if collectors are connected.

```
1  2  3  4  5  6  7  8  9  10
Operat.Syst: A
```

Section of SolvisControl display field. Overview of outputs 1-10. For example, outputs 6 and 7 (solar pumps) on this display are set to manual mode. If collectors are connected, set them both to "AUTO". The hand symbol should then disappear.

> In the main menu, select the "Outputs" menu item. Select the operating status of the relevant output (e.g. "solar pump"). Set the "AUTO/..." operating status by pressing and turning the rotary wheel. Press again to save the operating mode. Use the "BACK" button to return to the main menu.

8.5.2 Adjusting the functional data set

All parameters of the functional data set are preset for proper function at the factory. References are made to specific pages, where you can find more information on changing values.

ℹ️ Please check whether the factory settings meet the requirements of the system operator.

Check and, if necessary, change the following parameters:

a) Hot water heating:
- Set hot water nominal temperature "T.WW.NOM (factory setting is 48°C) . . . .**page 13**

- Auxiliary heating of the hot water buffer area ((factory setting: Mo – Su: 00:10 – 00:00) or set times as required . . . .**page 43**

- Check that the hot water heating if functioning properly. If the water is not hot enough: Check to see if the thermal mixing valve (TMV) is set to 65°C at the hot water station. (unscrew adjusting screw until stop and screw in by a quarter turn).

b) Circulation (optional):
- Always leave control mode of circulation pump on
  "Time" . . . .**page 46**

- Circulation times,
  (factory setting: Mo – Su: 00:10 – 00:00)
  set required times, if necessary . . . .**page 46**

c) Heating circuit "HEAT CIR.1"
- Set heating program of room heating
  to "Time/Auto" . . . .**page 34**

- If necessary, set the lowered temperature
  (factory setting: 16°C) . . . .**page 37**

- Heating time and target room temperature heating circuit
  (factory setting: Mo – Fr: 6:30 – 22:30, 20°C;
  Sa/Su: 7:30 – 00:00, 20°C)
  set times/target room temperature,
  if necessary . . . .**page 35**

- The slope is set to 0.8 at the factory. Depending on the
  building/heating type, the correct heating curve must be
  set to ensure that controller functions properly.
  Set heating curve, if necessary . . . .**page 37**

- If no outdoor sensor is connected, "OPERATION: MAL-
  FUNCTION" is displayed in the heating circuit. The con-
  troller reads an outdoor temperature of 0°C and deter-
  mines the corresponding flow target temperature from
  the heating curve. However, it can be set to any flow
  temperature by changing the mode of the controller
  from "OUTDOOR TEMPERATURE" to "FIXED VAL" in
   the heating curve menu (**page 39**) and by setting the
  required flow temperature in normal mode for "T.Pre.-
  20°C" and the required flow temperature in lowering
  mode for "T.Pre.+10°C". See "Setting the heating
  curve in Temp mode". . . . .**page 38**

- Only for underfloor heating with mixer circuit:
  Reduce the maximum flow temperature of the mixed
  heating circuit in the heating circuit of the controller
  function menu to the required value.

If the maximum flow temperature is 35°C, for example,
in the heating circuit controller menu to which the
underfloor heating is connected, you must reduce
"T.PRE.MAX" from 70°C (factory setting) to 35°C,
"Setting flow temperature limit" . . . .**page 38**

⚠ Of course, thermostatic flow temperature limiters
must be installed where they are prescribed.

- Adjust the switch-off conditions of the heating pump to
  the requirements of the system operator.
  More information available on . . . .**page 40**

d) Heating circuit "HEAT CIR.2" (optional):
If a second heating circuit is connected, carry out the
steps described under c).

e) Setting the flows of the solar circuits
For the control to function, there has to be a minimum
flow in the primary and secondary solar circuit set by the
minimum speed level.
Match the minimum speed level of both solar pumps to
the actual pressure loss at the solar circuits . . .**page 56**

f) Swimming pool heating (optional):
After connecting the swimming pool sensor, first set the
controller, ...**page 31**
then the heating times. Factory setting: Mo – Su: 0:00 –
0:00, which means deactivated, only solar heating is
possible; set required time, if necessary . . . . .**page 45**

g) Heat output in the solar circuit (optional):
Set impulse rate for heat quantity measurement at the
volume flow measuring unit, if necessary (accessories,
page 14). . . . .**page 30**

h) Making a backup copy:
Always make a backup copy after completing any adjust-
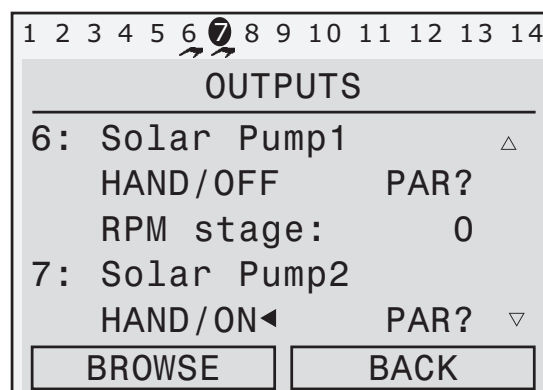ments to the SolvisControl . . . .**page 52**

8.5.3 Documentation and instructions

- Please enter the start-up information in the start-up
  report that is included.

- Instruct the operator concerning the operation of the
  SolvisControl.

- Keep the entire installation and operating instructions
  near the machine.

Technician

8.6 Function check of outputs (pumps)

If you want to switch on a pump manually – such as for a function check – proceed as follows (example using pump in secondary solar circuit):

In the function overview, press the "SERVICE" button. In the main menu, select the "Outputs" entry by turning and pressing the rotary wheel. In the Outputs menu, position the pointer on "AUTO/OFF" beneath the entry "7: Solar Pump2" and press the rotary wheel. Turn the rotary wheel until "HAND/ON" appears, and then press it. The pump is now in operation, and the number "7" in the top row is highlighted black (**figure on right**). Press the "BACK" button several times to return to the function overview.

```
1 2 3 4 5 6 ❼ 8 9 10 11 12 13 14
           OUTPUTS
6: Solar Pump1              △
   HAND/OFF       PAR?
   RPM stage:         0
7: Solar Pump2
   HAND/ON◄        PAR?   ▽
   BROWSE           BACK
```

Outputs 6 and 7 (solar pumps) are set to manual mode. Output 6 to "HAND/OFF", output 7 to "HAND/ON" (note that 7 is highlighted in black in the row of numbers above)

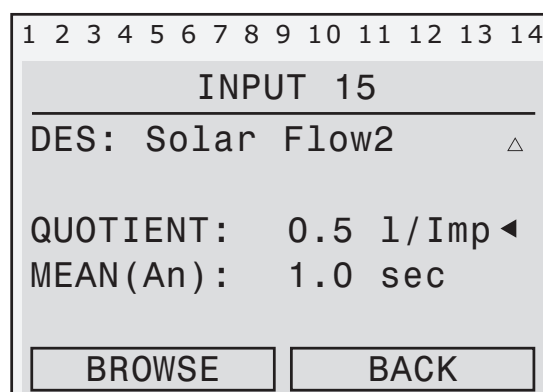## 8.7 Setting the impulse rate (optional)

If you have installed a volume flow measuring unit for measuring the solar yield, be sure that the correct quantity per impulse is set on the controller.

The volume flow measuring unit from Solvis (item no.: 09499, order separately) has a quantity of 0.5 l per impulse (factory setting at controller).
If you are using on-site volume flow measuring units, you have to set the quantity per impulse at input 15 of the SolvisControl.

You can only make the setting in the "Technician" oper-ating mode. To do this, proceed as follows:

In the function overview, press the "SERVICE" button. In the main menu, select the "Inputs" entry by turning and pressing the rotary wheel. In the Outputs menu, position the pointer on "PAR?" beneath the entry "15: Flow.Sol.2" and press the rotary wheel. Turn the rotary wheel in the menu that opens up until the pointer is on "QUOTIENT: 0.5 l/Imp" (**figure on right**). Set the value you require by pressing and turning the rotary wheel until the required value appears and then pressing it again. Press the "BACK" button several times to return to the function overview.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
           INPUT 15
DES: Solar Flow2           △

QUOTIENT:    0.5 l/Imp◄
MEAN(An):    1.0 sec
   BROWSE           BACK
```

At the pointer position ◄ set the quantity per impulse

8.8 Connecting the swimming pool sensor (optional)

A swimming pool should be heated as shown in the diagrams on **pages 67f**. Install sensor S16 as an immersion sensor in the swimming pool discharge to the filter.

After connecting the sensor and pump, you must:
1. Change the sensor type for input S16,
2. Deactivate the room sensor in function "17:HEAT CIR.1" and
3. Set the heating times to conventional swimming pool heating. Settings only as of "Technician" operating mode (**page 25**).

ℹ If the controller is used for swimming pool heating, you can no longer connect a room sensor because it also uses input S16.

1. Settings for sensor type input S16

Step 1: In the function overview, turn the rotary wheel to the entry "INPUTS" and press it. In the Inputs menu, go to "PAR?" beneath the entry "16: Temp.Room1" and press the rotary wheel.
Step 2: Turn the rotary wheel in the menu that opens up until the pointer is on "DES: Temp.Room1". Press and turn the rotary wheel until you see "T.swimming pool" and press the rotary wheel to save the entry.
Step 3: Go to the entry "SENSOR: RAS". Press and turn the rotary wheel until you see "KTY 10" and press it to save the entry.

The **figure on the right** summarizes the settings.

```
Sensor menu:
1 2 3 4 5 6 7 8 9 10 11 12 13 14
        INPUT 16
TYPE:           ANALOG
MEASURED        VALUE:
        Temperature

DESIGNATION
GROUP: General
DES: T. swimming pool

SENSOR:         KTY 10
SENSOR CHECK: Yes
SENSOR CORR.: 0.0 K

MEAN VALUE: 1.0 sec
  BROWSE          BACK
```

Settings for the swimming pool sensor

2. Deactivating the room sensor in function 17

Step 1: In the function overview, turn the rotary wheel until the pointer is behind "HEAT CIR.1 F:17" and press it once.
Step 2: Now go to entry "INPUT VARIABLE:" and press the rotary wheel once.
Step 3: Now turn the rotary wheel until the pointer is behind "Source: Input" below the entry "ROOM TEMPERATURE" and press it.
Step 4: Now turn the rotary wheel until the entry "Operator" appears and press it again to save this value.

The **figure on the right** summarizes the settings.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

    INPUT VARIABLE

                        △
ROOM TEMPERATURE:
Source:      User ◄
     unused
                        ▽

              BACK
```

Room sensor in function "17:HEAT CIR.1" deactivated

3. Setting the heating times
When the sun shines, the unused solar heat is to be used for heating the swimming pool to the target temperature. If you want to use the swimming pool at particular times, you must set these as auxiliary heating times ......**page 45**

Technician

9 "Functions" Menu Overview

All functions are briefly explained on **page 62f**. Menu overviews of the most important functions are reproduced in the following sub-sections. From the function overview, (**page 11**) you receive the menu of the individual functions when you position the pointer next to the number of the function (e.g. "HEAT CIR.1 F:17") and press the rotary wheel.

Status diagnosis at the controller

ℹ️ When the controller is in the "Technician" operating mode, you can easily troubleshoot in the individual functionsusing the "Function status" submenu. A check mark next to a condition means that it has been met (**page 49**).

9.1 Maintenance function "CH.SWEEP"

Call: Position the pointer at the previous entry in the function overview: "CH. SWEEP: F:35" and press the rotary wheel.
Description: The burner is switched to continual mode for maintenance or exhaust measurements using this function.

The burner and the heating circuit pump are switched on simultaneously when the pointer is positioned at "FUNCTION START" and you press the rotary wheel. You will also see in the function overview under the entry "HEAT CIR.1" the mode: "MAINTENANCE". The run time of the burner is then 20 minutes (unless an excess temperature protector* switches off the burner beforehand). If this happens, you must wait until the boiler has cooled down before you can restart the function.

The "Status" menu line indicates whether this function (the burner) is active. States: "ON" or "OFF". You can switch off the burner immediately by pressing the rotary wheel at the pointer position "FUNCTION STOP". After the burner has been switched off, the heating circuit pump remains switched on for a few minutes.

• **"Tot. Runtime"**: Total runtime of the burner. The total run time can only be changed from "Technician" operating mode (or higher).

• **"Burner perf."**: The burner performance value can be set from "Technician" operating mode (or higher), but this does not affect the burner of the external boiler.

```
Menu, plain text

1 2 3 4 5 6 7 8 9 10 11 12 13 14
          MAINTENANCE
FUNCTION START
– – – – – – – – – – –
DES.: CH.SWEEP
Status: OFF
Run Time: 0 min


Tot. Runtime: 10 min
Burner perf.: 100%
```

Maintenance function menu overview

---

* Safety mechanism protection function in the SolvisControl system controller: Turn off system at 98°C storage tank temperature (top), restart possible at 80°C.

9.2 Heating circuit control function "HEAT CIR.1"

9.2.1 Menu item description

Description: This function controls the heating circuit pump and the heating inflow mixer.

- **"OPERAT."**: You can set the heating programs in the "OPERAT." menu line (**section "Possible settings"**). "OPERAT." should be set to "TIME/AUTO" so that your SolvisControl can have automatic control.

- "**ROOM TEMPERATURE**":

- **"T.room.ACT"**: The room temperature is displayed here with connected room sensor (**page 14**). It can be higher or lower than the actual temperature, depending on the setting of the adjustment wheel on the room sensor.
  - **"T.Room.LOWER"**: Low-mode temperature, which is the target temperature for the rooms outside of the set heating times (e.g. at night). (Factory setting: 16°C).
  - **"T.Room.NORMAL"**: Target room temperature when the "NORMAL" operating mode is set (**item b on the following page**). (Factory setting: 20°C).
  - **"Rate time"**: How many minutes earlier the boiler is to start when the outdoor temperature is below -10°C. Only set when it is too cold in the rooms with low morning temperatures although the target room temperature has already been reached according to the time program.
  - **"T.Room.EFF"** Target temperature that currently applies based on the settings and the system time.

- **"TIME PROG"**: Time program (only active in the "TIME/AUTO" control mode) for setting time windows for heating the rooms and the associated target room temperature (**page 35**).

- **"PRE-RUN TEMPERATURE"**: Current flow temperature "T.Pre.ACT" and target value "T.Pre.NOM".

- **"HEAT CURVE"**: For further explanations of parameters, see **page 36.**

- **"OUTDOOR TEMPERATURE"**: The current outdoor temperature can be read from "T.Out.ACT". Use "AVG. TIME" to form 10 and 30 minute average values for the outdoor temperature, which are required for the flow temperature control and the "SWITCH-OFF COND." function.

- **"SWITCH-OFF COND."**: Use this to call up the menu that includes the shut-off conditions of the heating circuit pump. For further information, see **page 40.**

- **"FROST PROTECTION"**: In this submenu, both limit temperatures can be set. The burner and the heating circuits are switched on when the temperature is below these values. For further information, see **page 41.**

Menu, plain text	Factory setting	Own Setting
1 2 3 4 5 6 7 8 9 10 11 12 13 14 HEAT CIRC.CONT DES.: HEAT CIR._1 FUNCTION STATUS: INPUT VARIABLE: OUTPUT VARIABLE: OPERAT.: TIME/AUTO	Time/AUTO	
ROOM TEMPERATURE: T.Room.ACT: ------	-	
T.Room.LOWER: 16°C	16	
T.Room.NORMAL: 20°C	20	
TIME PROG:	see page 35	
Rate time: 0 min	0	
T.Room.EFF: 20°C	-	

PRE-RUN TEMPERATURE:
T.Pre.ACT: 50°C
T.Pre.NOM: 50°C
    HEATING CURVE:
 	
OUTDOOR TEMPERATURE:
T.Out.ACT: 5°C
    AVG. TIME:
	s. page 37	

SWITCH-OFF COND.:	s. page 40	
FROST PROTECTION:	see page 41	

Heating circuit control menu overview

Technician

9.2.2 Possible settings

1. Setting the heating program:

Various operating modes can be set for each heating circuit:

Turn the rotary wheel until "OPERAT.: TIME/AUTO" (see **figure on right**) is selected with the pointer. Set the required mode by pressing, turning and pressing the rotary wheel again.

Explanation of heating programs:

a) **"TIME/AUTO" or "RAS":** If a room sensor is connected, you activate it with the "RAS" setting. At the room sensor, you can select the following heating programs: "AUTO/TIME", "NORMAL", "LOWERED" and "STANDBY". With "TIME/AUTO" The system automatically changes from normal to lowering mode according to the set heating time (see **following page**). The current operating mode is then displayed as "NORMAL" or "LOWER" in the line below. The flow temperature is reduced in lowering mode. This results from the parallel movement of the heating curve by the difference of "T.Room.NORMAL" to "T.Room.LOWER". In addition, the heating pump is switched off in lowering mode and the flow temperature is set to 5°C when the outdoor temperature is above 10°C (factory setting). For more details, see section **"4. Setting possibilities SWITCH-OFF CONDITION:").**

b) **"NORMAL":** The room is heated to "T.Room.NORMAL", the set heating times are deactivated, and lowering mode is never activated. The value "T.Room.NORMAL" has a factory setting of: 20°C and can be set in the heating circuit menu (**see previous page**).

c) **"LOWERED":** The rooms in the heating circuit are constantly controlled to the lowered temperature (factory setting: 16°C), the set heating times are deactivated, and normal mode is never activated.

d) **"PARTY":** Heating continues in normal operation until the time set in the following line is reached. The time when automatic mode applies must be entered under "till 00:00" (**figure on right**).

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Operat.Syst: Ax.xxEN
HEAT CIR.1      F:17      △
OPERAT.:  TIME/AUTO ◄
          NORMAL
          TIME PROG:
T.Pre.ACT:      45°C  ▽
   HELP        SERVICE
```

Automatic mode

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Operat.Syst: Ax.xxEN
HEAT CIR.1      F:17      △
OPERAT.: PARTY
     till 00:00◄h
          TIME PROG:
T.Pre.ACT:      35°C  ▽
   HELP        SERVICE
```
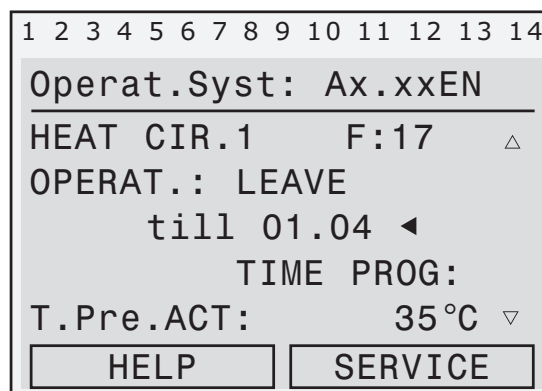
Display view for setting restart of automatic mode

e) "LEAVE" (figure on right)

[E] The heating circuit is switched to lowering mode until the end of the day (midnight) on the specified date. The system is then switched to automatic mode ("TIME/AUTO").

f) "HOLIDAY": The entered day is treated as a Saturday, which means the heating times for Saturdays apply. All subsequent days are treated as a Sunday until the end of the day (midnight) on the specified date. The system is then switched to automatic mode ("TIME/AUTO").

g) "STANDBY": The controller performs a frost protection function of the heating circuits, which means the target room temperature is fixed at 5°C and the heating circuits are switched on when the outdoor temperature is below the frost protection temperature "T.Room.FROST" (**page 41**).

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

Operat.Syst: Ax.xxEN
_____
HEAT CIR.1      F:17      △
OPERAT.: LEAVE
      till 01.04 ◄
            TIME PROG:
T.Pre.ACT:       35°C  ▽
 ┌─────────┐  ┌──────────┐
 │  HELP   │  │ SERVICE  │
 └─────────┘  └──────────┘
```

Display view for setting restart of automatic mode

2. Setting heating times/target room temperature:

The submenu "TIME PROG. HEAT CIR.1" is preset at the factory for heating rooms with a target room temperature of 20°C for all time windows (**figure on right**). The time windows are only active in the "TIME/AUTO" operating mode. The rooms are heated to the lowered temperature "T.Room.LOWER" outside of these times. You can change these times and target temperatures according to your requirements.

I. Specify the days when the time windows apply

Call up the "TIME PROG" menu by positioning the pointer on this entry in the function overview and pressing the rotary wheel. Scroll to the required day of the week by turning the rotary wheel and select it by briefly pressing the rotary wheel until the day is highlighted in black and press again.

II. Enter the start and end of the time window

Use the pointer to scroll to the first time field below the days of the week and press the rotary wheel. Set the start of the time window by pressing the rotary wheel. Press the rotary wheel to finish and save the entry. Continue by entering the end time.

III. Enter the target room temperature

Change the target room temperature by selecting the field next to the end time.

Proceed with the setting of other time blocks (e.g. blocks for "Sa" and "Su") as described above. Return to the function overview menu by selecting the "BACK" button.

Menu, plain text	Factory setting	Own Setting
1 2 3 4 5 6 7 8 9 10 11 12 13 14 TIME PROG. HEAT CIR.1		
Mo Tu We Th Fr Sa Su	Mo — Fr	
06:30 — 22:30 20°C	6:30–22:30	
00:00 — 00:00 20°C	—	
00:00 — 00:00 20°C	—	
Mo Tu We Th Fr Sa Su	Sa — Su	
07:30 — 00:00 20°C	7:30–00:00	
00:00 — 00:00 20°C	—	
00:00 — 00:00 20°C	—	
Mo Tu We Th Fr Sa Su	-	
00:00 — 00:00 20°C	—	
00:00 — 00:00 20°C	—	
00:00 — 00:00 20°C	—	

Menu overview for time program heating circuit

Technician

3. Setting the heat curve:

Call: "HEAT CURVE": in the menu section "HEAT CIR.1" of the function overview.

A systematic procedure is required to precisely set the correct heating curve. Proceed as follows:

First open all radiator valves completely.

Set the slope of the heating curve according to one of the **tables on page 37 or 38**. If a room cannot be brought to the required room temperature despite the fully opened heating valves, the radiator temperature is too low and the target room temperature in the relevant time windows must be increased at the SolvisControl system controller. If **all** heated rooms are too warm, the target room temperature in the time windows must be lowered a little. If some rooms have the correct temperature and others are too warm, the radiator valves in the rooms that are too warm must be closed some more. Change the slope of the heating curve if the target room temperature has to be continually adjusted (**page 21**).

Menu, plain text	Factory setting	Own Setting
1 2 3 4 5 6 7 8 9 10 11 12 13 14 HEAT CURVE		
HEAT CIR.1		
MODE:		
CONTROL: Out. Temp	Out. Temp.	
HEAT CURVE: Slope	Slope	
Room Influenc: 0%	0	
Increasing on Start: %	0	
Slope: 0.80	0.8	
T.Pre.MAX: 70°C	70	
T.Pre.MIN: 20°C	20	

Menu overview heating curve heating circuit

What is a heating curve?

The heating curve specifies how high the flow temperature must be for a measured outdoor temperature so that the rooms can be heated to the required temperature. The controller can keep the temperature in the heated rooms constant, regardless of the current outdoor temperature. The controller distinguishes between two different representations of the heating curve. You can set it to "Slope" or "Temp.":

In the heating curve menu turn the rotary wheel until "HEAT CURVE: Slope" (**figure on right**) is selected with the pointer. The form of representation can be changed by pressing and turning the rotary wheel until the required value ("Slope" or "Temp.") appears and then pressing it again.

The differences between these two representations are explained on the following pages.

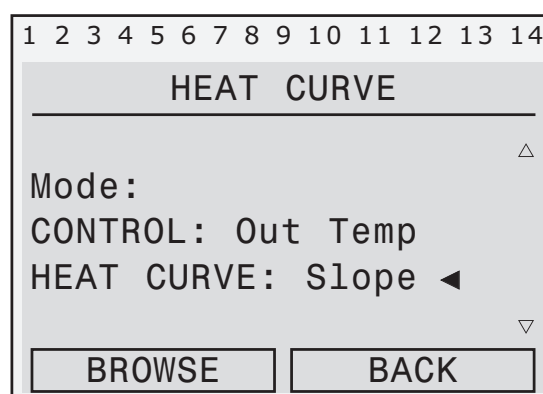### Which setting options for the heating curve are there?

You can increase the target room temperature in the time windows at your SolvisControl. The heating curve is shifted parallel to higher flow temperatures, i.e. for the same outdoor temperature, the flow temperature is increased and the rooms can be heated to a warmer temperature.

Secondly, the slope of the heating curve can be changed.

Every heating system requires an appropriate heating curve setting due to the special properties of the heating system and the building to be heated.

```
 1  2  3  4  5  6  7  8  9  10  11  12  13  14

            HEAT CURVE
                                          △
Mode:
CONTROL: Out Temp
HEAT CURVE: Slope ◄
                                          ▽
    BROWSE              BACK
```

Selecting the type of heating curve

SOLVIS

a) Setting the lowered temperature:

In the function overview, turn the rotary wheel until "HEAT CIR.1 F:16" is selected with the pointer. Press the rotary wheel. In the heating circuit menu, also select the entry "T.Room.LOWER:". Now turn the rotary wheel until the required value appears and press it again to save the lowered temperature.

E For optimum savings you can always set "T.Room.LOWER" 4 – 5 K lower than the target room temperature.

You can set the target room temperature in the heating times menu ("TIME PROG.:") (**item 2, p. 35**).
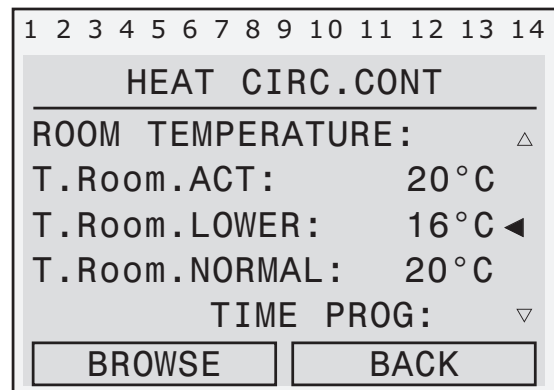
b) Changing the slope of the heating curve:

Heating curve setting in "Slope" mode
Below, you can see the family of heating curves that can be set with the slope value and the selected room temperature.
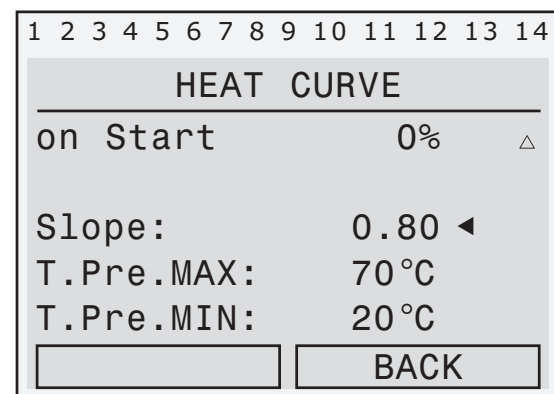
In the heating curve menu, turn the rotary wheel until "Slope" (**figure on right**) is selected by the pointer. The slope can be set by pressing and turning the rotary wheel until the required value appears and then pressing it again.

The flow target temperatures determined from this heating curve are limited by the values "T.Pre.MAX" and "T.Pre.MIN", which means that if the flow target temperature is greater than "T.Pre.MAX", it will be changed to "T.Pre.MAX". If it is less than "T.Pre.MIN", the heating circuit will be switched off.

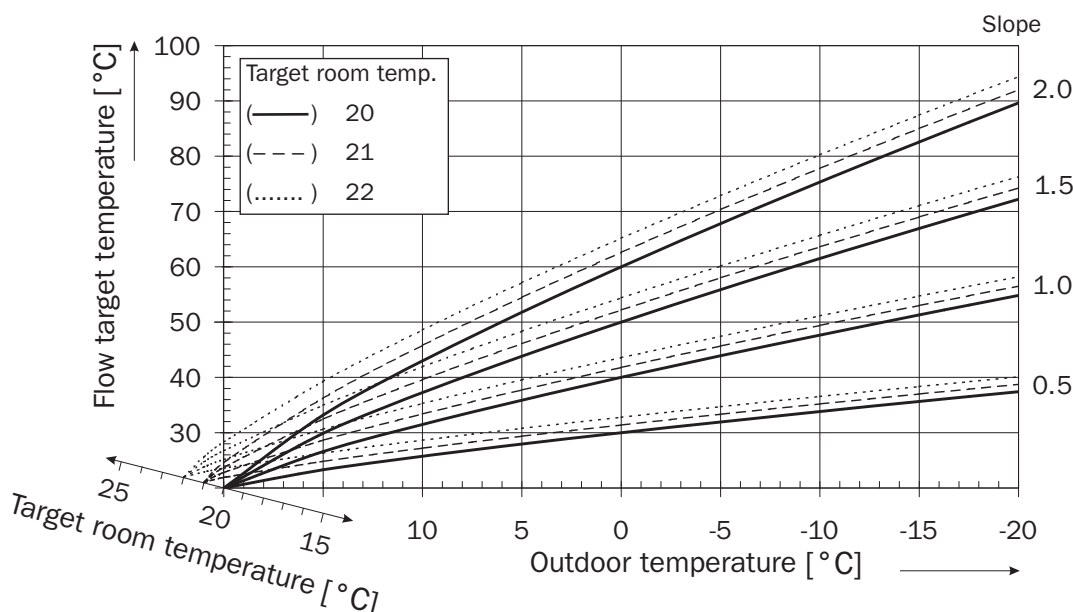Recommended values for the slope of the heating curve are provided in the **table to the right**.

```
1  2  3  4  5  6  7  8  9  10  11  12  13  14

          HEAT CIRC.CONT
─────────────────────────────────────
ROOM TEMPERATURE:                △
T.Room.ACT:              20°C
T.Room.LOWER:            16°C ◄
T.Room.NORMAL:           20°C
          TIME PROG:             ▽
┌──────────────┐  ┌──────────────┐
│   BROWSE     │  │    BACK      │
└──────────────┘  └──────────────┘
```

At the pointer position ◄ enter the lowered temperature

```
1  2  3  4  5  6  7  8  9  10  11  12  13  14

          HEAT CURVE
─────────────────────────────────────
on Start                  0%     △

Slope:                  0.80 ◄
T.Pre.MAX:               70°C
T.Pre.MIN:               20°C
┌──────────────┐  ┌──────────────┐
│              │  │    BACK      │
└──────────────┘  └──────────────┘
```

Enter the slope at the pointer position

Building	Slope
Old building	1.5
New construction	1,1
Underfloor heating	0.8
Low energy house	0.7

Recommended values for the slope of the heating curve

Example:
The target room temperature is set to 20°C and the slope to 1.5. The flow temperature is then controlled when the outdoor temperature is 15°C to 30°C. When the outdoor temperature is 0°C, the flow temperature is regulated to 50°C.

Technician

Heating curves in "Slope" mode for various target room temperatures

Setting the heating curve in "Temp." mode.

The "Temp." mode is used in the same manner as the heating curves. The heating curves are selected using a target flow ("pre-run") temperature of 20°C and outdoor temperature of 20°C and adjustable target flow ("pre-run") temperature of -20°C (**figure on right**). The curvature can also be influenced by the point adjustable target flow temperature for an outdoor temperature of +10°C (**figure in center**).

The target flow temperature derived from the heating curve are limited by the two values "T.Pre.Max" and "T.pre.MIN".

You can change the slope of the heating curve by increasing the limit "T.Pre.+10°C" or decreasing the limit "T.Pre.-20°C".

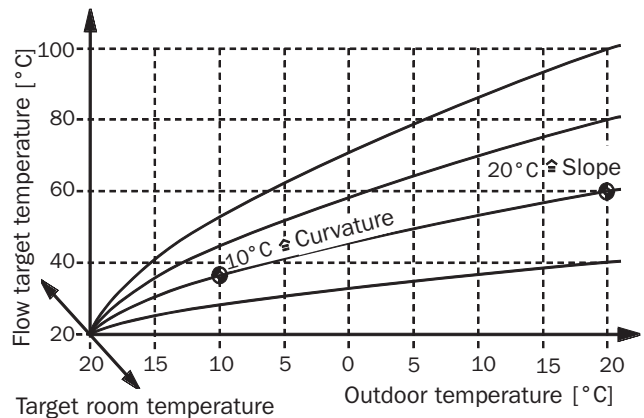Recommended values for the slope of the heating curve are provided in the **table below**.

Heating curves in "Temp." mode for a target room temperature of 20°C (parallel shifted for other temperatures)

Example: The target room temperature is set to 20°C, the slope to (-20°C/60°C) and the curvature to (+10°C/38°C). The flow temperature is then adjusted to approx. 30°C for an outdoor temperature of 15°C. For an outdoor temperature of 0°C, the flow temperature is adjusted to approx. 45°C.

Building	T.Pre.+10°C	T.Pre.-20°C
Old building	50	80
New construction	40	64
Underfloor heating	37	52
Low energy house	35	50

Recommended values for the slope of the heating curve ("Temp." mode)

At the pointer position ◄ change the temperature limits using the rotary wheel

Setting the flow temperature limits

"T.Pre.MAX" and "T.Pre.MIN" limit the flow temperature: The heating pump switches off when the calculated flow ("pre-run") temperature is lower than "T.Pre.MIN". If the calculated flow temperature is higher than "T.Pre.MAX", "T.Pre.MAX" is set as the flow temperature. This ensures that overheating does not occur (which is required for underfloor heating). Of course, thermostatic flow temperature limiters must be installed where they are prescribed.

In the heating circuit menu, turn the rotary wheel until "T.Pre.MAX: 70°C" is selected (see **figure on right**). Enter the required maximum flow temperature by pressing and turning the rotary wheel and then pressing it again. To enter the minimum flow ("pre-run") temperature, repeat the steps for "T.Pre.MIN: 20°C". Use the "BACK" button to return to the function menu.

At the pointer position ◄ enter the maximum flow (pre-run) temperature.
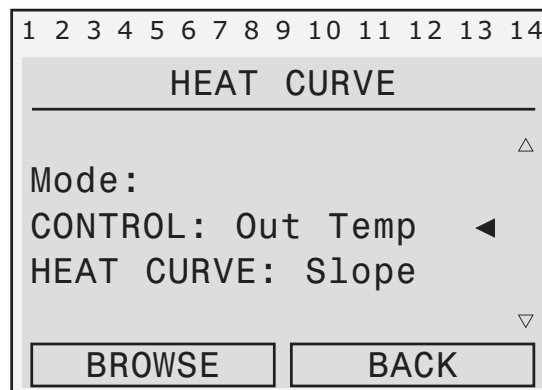
Setting the calculated flow ("pre-run") temperature
The SolvisControl lets you manipulate the type and manner of the calculation for the flow temperature. There are two modes for this: "Fixed value" and "Outside temp."
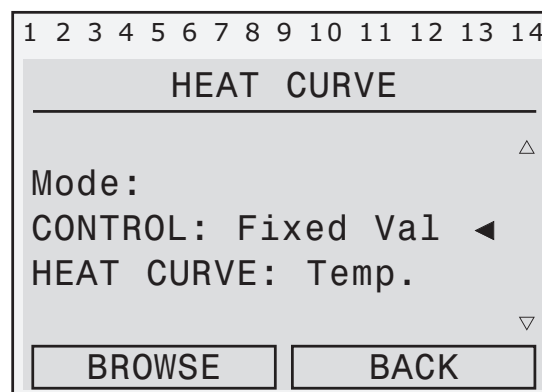
• "**Outside temp.**" (see **figure on right**): The flow temperature will be kept between "T.Pre.MIN" and "T.Pre.MAX" depending on the outside temperature, as described on **pages 36ff**.
You may have to change the slope and the parallel shift (= target room temperature) of the heating curve (**page 37**).

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

         HEAT CURVE
                                  △

Mode:
CONTROL: Out Temp    ◄
HEAT CURVE: Slope
                                  ▽
    BROWSE            BACK
```

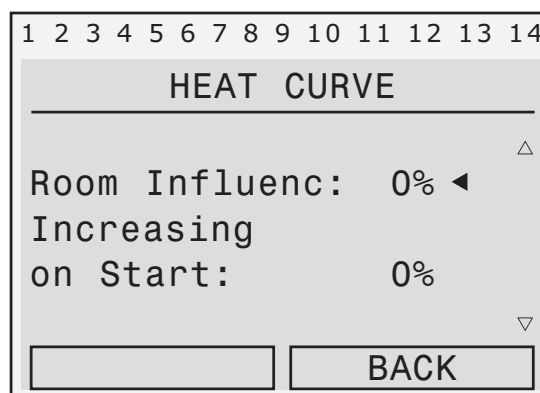**At the pointer position ◄ change the mode using the rotary wheel**

• "**Fixed value**" (figure center right): The flow temperature is controlled in normal mode at "T.Pre.-20°C" and in lowering mode at "T.Pre.+10°C". When "Fixed value" has been selected (**figure bottom right**), the mode of the heating curve automatically changes from "Slope" to "Temp." (temperature). The values for "Room Influenc" and "Increasing on Start" are then irrelevant. This setting is only permitted in exceptional cases according to heating system regulations.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

         HEAT CURVE
                                  △

Mode:
CONTROL: Fixed Val   ◄
HEAT CURVE: Temp.
                                  ▽
    BROWSE            BACK
```

Method for calculating the outdoor temperature according to the "Fixed Val" mode

Additional settings in "Out. Temp" mode:
• "**Room influence**": If there are external heat sources, you can use the temperature measured by the room sensor to save energy by calculating the flow temperature. Here you can set the influence of the room temperature from 0 to 90 %, see . . . .**page 15**

• "**Increasing on Start**": (**figure bottom right**)
Increases the flow temperature when reheating after lowering mode. The flow temperature is slowly reduced to the normal temperature again within the first hour. This reduces the reheating time.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

         HEAT CURVE
                                  △

Room Influenc:   0% ◄
Increasing
on Start:        0%
                                  ▽
                      BACK
```

At the pointer position ◄ set the "Increase on Start"

Technician

4. "SWITCH-OFF COND.:" settings

You can determine when the heating circuit pump is to be switched off in the switch-off condition menu (figure on right). In order to set the switch-off conditions, the controller must be in the "Technician" operating mode.

a) **"T.Room", room influence**: The first switch-off condition of the heating circuit (room temperature is higher than target room temperature) is set to "no" at the factory, because no room sensor is provided for this system.

b) **"T.Pre", flow influence**: In the second switch-off condition, the controller switches off the heating circuit when the flow target temperature determined using the heating curve is lower than the set minimum flow temperature "T.Pre.MIN". This function is activated and set with a hysteresis of 2 K at the factory. This means that the heating circuit is switched on again when the target flow ("pre-run") temperature is higher than the set minimum flow ("pre-run") temperature "T.Pre.MIN" plus 2K.
Example for the activated switch-off condition:
Heating circuit 1 is within a time window with "T.Room.NORMAL" = 20°C and "T.Pre.MIN" = 20°C. The heating pump is switched off if the flow temperature (determined with the outside temperature and the heating curve) is lower than 20°C. It is switched on again starting at a target flow temperature of 22°C.

c) **"T.Out", outdoor temperature influence in normal mode (summer/winter switch)**: You can use "T.Out.MAX" to set the outdoor temperature at which the heating circuit is switched off. The average outdoor temperature is calculated over 30 minutes. The function is activated in the factory and "T.Out.MAX" is 17°C. This means the heating circuit is switched off when the outside temperature is greater than 17°C + 2 K = 19°C. Hysteresis was set to 2 Kelvin at the factory, which means the heating circuit will not switch back on unless the median outside temperature is less than "T.Out.MAX" (= 17°C).
An example for the activated switch-off condition:
Heating circuit 1 is within a time window with "T.Room.NORMAL" = 20°C, the heating pump is switched off if the median outside temperature is 19.1°C or more. It is turned back on when the median outside temperature falls to 17°C.

[i] Adapt "T.Out.MAX" to meet the insulation of the house.

Menu, plain text	Factory setting	Own Setting
1 2 3 4 5 6 7 8 9 10 11 12 13 14 SWITCH-OFF COND. HEAT CIR.1		
if T.Room ACT > NORMAL ? no	No	
Hysteresis: 1.0 K	1.0	
if T.Pre. NOM < MIN ? yes	Yes	
Hysteresis: 2.0 K	2.0	
if T.Out AVGoff > MAX ? yes	Yes	
T.Out.MAX: 19°C	19	
Hysteresis: 2.0 K	2.0	
if lowering operat. and T.Out ACT > MIN ? yes	Yes	
T.Out.MIN: 10°C	10	
Hysteresis: 2.0 K	2.0	
if Heating Circ. OFF Mixer: close	closed	

Menu overview switch-off conditions heating circuit

d) **"T.Out", outdoor temperature influence in lowering mode**: Use "T.Out.MIN" to specify the outdoor temperature at which the heating circuit pump is to be switched off during lowering mode. This function is activated and "T.Out.MIN" is set to 10°C with a hysteresis of 2 K at the factory.
An example for active switch-off condition:
Heating circuit 1 is in lowering mode, and the heating pump switches off if the current outdoor temperature exceeds 12°C. It is turned on again when the outside temperature drops below 10°C.

[E] Depending on the insulation of the house, you may want to set "T.Out.MIN":
- poor insulation: up to 15°C
- good insulation: less than 10°C.

e) Finally, in the last line, set how you want the controller to control the mixer in the heating circuit when the heating circuit pump is switched off. Options: Mixer set to "unchanged", "control", "closed" (factory setting) or "open".

SOLVIS

5. **"FROST PROTECTION" submenu:**
This function is used for frost protection when the system is switched to "Standby" (**page 35**). The controller must be in the "Technician" operating mode to set the values.

- **"T.OutAVGcon"**: Average value of the outdoor temperature that is determined over 10 minutes (factory setting). The frost protection function is activated if this is lower than 3°C (factory setting).

- **"T.Room.FROST"**: Factory setting 5°C. The target room temperature is kept at 5°C.

Menu, plain text	Factory setting	Own Setting
1 2 3 4 5 6 7 8 9 10 11 12 13 14 FROST PROTECTION		
Activation if T.OutAVGcon < 3°C	3	
T.Room.FROST: 5°C	5	

"FROST PROTECTION" menu overview, heating circuit

9.3 Heating circuit control function "HEAT CIR.2"

The SolvisControl system controller can control a second mixed heating circuit. To do this, a second heating circuit control function has been configured at the factory with the same parameters as the first one. For this reason, the same explanations apply as in **section 9.2**. However, you cannot connect a room sensor to heating circuit 2 (contrary to what is written there). The following inputs and outputs are used for the second heating circuit: Outputs 4 (heating circuit pump), 10 and 11 (mixer on/off) as well as input 13 (flow ("pre-run") temperature).

Menu, plain text	Factory setting	Own Setting
1 2 3 4 5 6 7 8 9 10 11 12 13 14 HEAT CIRC.CONT DES.: HEAT CIR.2 FUNCTION STATUS: INPUT VARIABLE: OUTPUT VARIABLE:		
OPERAT.: TIME/AUTO	Time/AUTO	
ROOM TEMPERATURE: T.Room.ACT: ---°C T.Room.LOWER: 16°C	16	
T.Room.NORMAL: 20		
TIME PROG:	see page 35	
Rate time: 0 min	0	
T.Room.EFF: 5.0°C	5	
PRE-RUN TEMPERATURE: T.Pre.ACT: 55°C T.Pre.NOM: 55°C HEATING CURVE:	s. page 37	
OUTDOOR TEMPERATURE: T.Out.ACT: 15°C AVG. TIME:		
SWITCH-OFF COND.:	s. page 40	
FROST PROTECTION:	see page 41	

Menu overview heating circuit

Technician

9.4 Hot water requirement function "WW_REQ.1"

Description: This function controls the hot water heating of your system. All factory settings enable convenient water heating according to the hygienic continuous flow principle.

- **"T.WW.ACT"**: The temperature at S1 (buffer top). Other parameters are explained in the section **"Possible settings"**.

- **"TIME PROG"**: It is used to call up the time program with the time windows for auxiliary heating of the hot water buffer area to generate hot drinking water. The factory settings are specified **in the upper table on page 17**. Outside of these times, hot drinking water can only be drawn off until the hot water buffer has cooled down.

Possible settings:
- **"T.WW.NOM"**: for setting the individual target hot water temperature, factory setting: 48°C.

ℹ️ The primary side of the system for water heating is limited by a thermal mixing valve to 65°C. This is why the target hot water temperature cannot be higher than 55°C.
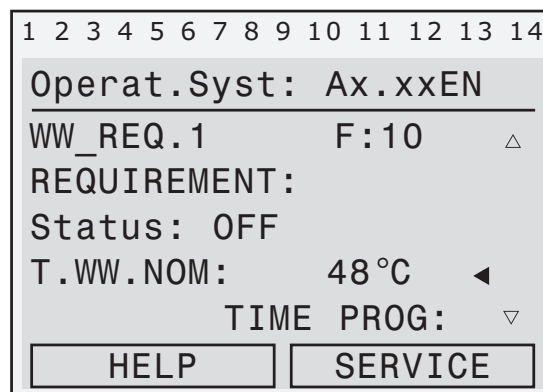
E The lower the target hot water temperature, the more energy you save. One degree lower results in an increased solar coverage of approx. 1%. Legionella are not a problem here as the hot water is always freshly generated. If you chiefly take showers, you can set the temperature to 42 to 44°C, depending on the insulation and length of the hot water pipes. If you chiefly take baths, the temperature should be around 46 to 48°C.

In the Function overview, turn the rotary wheel until the pointer is at "T.WW.NOM" (**figure bottom right**). Now change the value by pressing, turning and pressing the rotary wheel again.

- **"T.WW.MIN"**: The hot water minimum temperature is the target value for the hot water temperature outside of the auxiliary heating times. The hot water buffer temperature is kept at 12 to 15°C for the lowest setting (0°C, factory setting). This saves the most energy.

Menu, plain text	Factory setting	Own Setting
1 2 3 4 5 6 7 8 9 10 11 12 13 14 ___ WW REQUIREMENT ___ DES.: WW_REQ.1 FUNCTION STATUS: INPUT VARIABLE: OUTPUT VARIABLE: WARM WATER TEMP.:		
T.WW.ACT: 48°C		
T.WW.NOM: 48°C	48	
TIME PROG: T.WW_MIN: 0°C	0	
DIFF.ON: 9.0 K	9.0	
DIFF.OFF: 12 K	12	
Burner perf.: 100%	100	

Hot water control menu overview, "WW_REQ.1"

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Operat.Syst: Ax.xxEN
_____
WW_REQ.1          F:10    △
REQUIREMENT:
Status: OFF
T.WW.NOM:         48°C    ◄
          TIME PROG:     ▽
 ┌─────────┐  ┌─────────┐
 │  HELP   │  │ SERVICE │
 └─────────┘  └─────────┘
```

Setting the target hot water temperature

• **Setting the hot water buffer auxiliary heating times**:
You can change the time windows for water heating to
meet your needs:

**1. Determine the days for which the time windows are
active**

In **figure on right**, all days are highlighted. If you want to
enter times for workdays and weekends separately, you
must deselect the weekdays "Sa" and "Su". Turn the
rotary wheel and jump to the day you want to change.
To deselect, briefly press the rotary wheel, turn it until
the day is no longer highlighted in black and press the
rotary wheel.

2. Enter the start and end of the time window

Use the pointer to scroll to the first time field below the
days of the week (**figure on right**) and press the rotary
wheel. Set the start of the time window by turning the
rotary wheel; the time increases in 10-minute intervals.
Press the "* 10" button on the rotary wheel while it is
being turned to switch to 100-minute intervals. Press
the rotary wheel to finish and save the entry. Continue
by entering the end time.

Repeat this procedure for setting the other time blocks
(e.g. block for "Sa" and "Su"). However, all days have
been deselected for the second time block and you
must highlight the respective days.
Use the "BACK" key to return to the function overview
menu.

E By reducing the hot water standby time, you can
save energy.

• **Setting the temperature increase**: The hot water buffer
temperature is determined from the sum of "T.WW.NOM"
and "DIFF.ON". Auxiliary heating is started if sensor S1
("T.ww.ACT") in the hot water buffer is below this value.
Auxiliary heating is not switched off until the temperature
rises to "T.WW.NOM" plus "DIFF.OFF". The factory setting
"DIFF.ON" = 9.0 K and "DIFF.OFF" = 12 K should only be
changed in exceptional circumstances. For this reason,
settings are only possible in the "Technician" operating
mode as follows.

In the function overview, turn the rotary wheel until the
pointer selects the "WW_REQ.1 F:10" line (**figure in
center**). Call up the function menu by pressing the rotary
wheel. Move the pointer behind "DIFF.ON" or "DIFF.OFF"
(**figure on right)** and change the value.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

   TIME PROG. WW_REQ.1

 Mo Tu We Th Fr Sa Su
 00.10⌐- 00.00h
 00.00 - 00.00h
 00.00 - 00.00h
                          ▽
 ┌──────────┐  ┌──────────┐
 │   * 10   │  │  ABORT   │
 └──────────┘  └──────────┘
```

**Display view for setting the start time of the
hot water buffer auxiliary heating time
(pointer ⌐ is in "Change" mode)**

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

Operat.Syst: Ax.xxEN
WW_REQ.1        F:10   ◄ △
REQUIREMENT:
Status: OFF
T.WW.NOM:       48°C
         TIME PROG:   ▽
 ┌──────────┐  ┌──────────┐
 │   HELP   │  │ SERVICE  │
 └──────────┘  └──────────┘
```

**Calling up the "WW_REQ.1" function (hot water
requirement)**

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

    WW REQUIREMENT

T.WW.MIN:       40°C   △
DIFF.ON:      9.0   K ◄
DIFF.OFF:      12   K


Burner perf.:  100%   ▽
 ┌──────────┐  ┌──────────┐
 │  BROWSE  │  │   BACK   │
 └──────────┘  └──────────┘
```

**Setting the "DIFF.ON" switch-on temperature
difference (only in exceptional cases)**

Technician

9.5 Hot water requirement function "WW_REQ.2"

Description: Use this function to enlarge the hot water buffer so that more hot water is produced during times of increased demand. The buffer is enlarged by using a sensor at a lower level of the stratified buffer tank (S9, "T.H. Buffer U") instead of the sensor at the top (S1, "T.WW.Buffer").

Use a time program to specify when you want this additional hot water buffer to be available. The factory setting for the time windows in the time program is zero so that the additional hot water buffer stays switched off.

• **"T.WW.ACT"**: The temperature at S9 (bottom heating buffer).

• **"T.WW.NOM"**: Target hot water temperature for increased hot water demand. It corresponds to the target hot water temperature from menu "WW_REQ.1".

Possible settings

• **"T.WW.MIN":** The same explanations as for "WW_REQ.1" apply (**see previous section**).

• **"TIME PROG":**: Use this menu item to open the setting menu of the hot water buffer auxiliary heating times. You can set the time windows for additional enlargement of the hot water buffer to meet your needs here. An explanation on how to do this is found in the hot water requirement function "WW_REQ.1".

• **Setting the temperature increase**: The same explanations as for "WW_REQ.1" apply, you only have to select "WW_REQ.2 F:11".

Menu, plain text	Factory setting	Own Setting
1 2 3 4 5 6 7 8 9 10 11 12 13 14		
WW REQUIREMENT		
DES.: WW_REQ.2		
FUNCTION STATUS:		
INPUT VARIABLE:		
OUTPUT VARIABLE:		
WARM WATER TEMP.:		
T.WW.ACT: 48°C		
T.WW.NOM: 48°C	48	–
TIME PROG:		
T.WW.MIN: 0°C	0	
DIFF.ON: 9.0 K	9.0	
DIFF.OFF: 12 K	12	

Hot water control menu overview, "WW_REQ.2"

9.6 Hot water requirement function "WW_REQ.3" (swimming pool heating)

Description: This function heats up the water in the swimming pool if the heating times were set under "TIME PROG".

The heating takes place outside the auxiliary heating times whenever there is sufficient solar energy to do so. The heating times have been deactivated at the factory, which means the water in the swimming pool is heated with solar energy only.

• **"T.WW.ACT"**: The temperature at S16 (swimming pool water temperature).

Possible settings:

• **"T.WW.NOM"**: Target temperature of the swimming pool water. Factory setting: 30°C.

• **"TIME PROG."**: Use this menu item to open the setting menu of the swimming pool water heating times. You can set the time windows according to your needs here. An explanation on how to do this is found in the hot water requirement function "WW_REQ.1".

• **"DIFF.ON"**: Switch-on temperature difference at which the swimming pool pumps are started for heating if a variety of other conditions have been met (see also **Functions 20 – 24 in the section "Overview of functions" page 62**).

• **"DIFF.OFF"**: Switch-off temperature difference at which the swimming pool pumps are turned off again.

You should only change the switch-on and switch-off temperature differences in exceptional cases.

Target value for solar auxiliary heating

E To increase the solar coverage, we recommend that you set the target value for solar auxiliary heating 2 K higher than the target value for conventional auxiliary heating "T.WW.NOM". If there is quite a bit of sunshine, the swimming pool water then can be 2 K warmer. You can use this additional solar heat to cover 2-3 days (for indoor pools).

Proceed as follows in "Technician" mode:

Press the "SERVICE" key in the function overview and select "Functions" in the main menu. In the Functions menu, open "28: COMPARISON DIFF FUNC.5 PAR?". In the function, turn the rotary wheel until the pointer is behind "DIFF.ON: 0.0 K" (**figure on right**). Now press the rotary wheel and turn it until you see "2.0" and press it again. "DIFF.OFF" remains at "-1.0". Use "BACK" to return to the function overview.

Menu, plain text	Factory setting	Own Setting
1 2 3 4 5 6 7 8 9 10 11 12 13 14		
___WW REQUIREMENT___		
DES.: WW_REQ.3		
FUNCTION STATUS:		
INPUT VARIABLE:		
OUTPUT VARIABLE:		
WARM WATER TEMP.:		
T.WW.ACT: 30°C		
T.WW.NOM: 30°C	30	
TIME PROG:		
T.WW_MIN: 0°C	0	
DIFF.ON: -1.0 K		
DIFF.OFF: 0.0 K		
Burner perf.: 100%	100	

Menu overview hot water requirement "WW_REQ.3" for swimming pool heating with boiler

ℹ️ If a swimming pool sensor is connected, you cannot connect a room sensor because it uses the same input. Additional settings are required at the controller . . . .**page 31**

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

        COMPARISON
    _____

VALUEb:          30.0°C   △


DIFF.ON:          0.0⤋K
DIFF.OFF:        -1.0 K

   ┌──────────┐  ┌──────────┐
   │  BROWSE  │  │   BACK   │
   └──────────┘  └──────────┘
```

**Set the value "2.0" at the pointer position ⤊ .
The value "0" means solar auxiliary heating has the same target value as conventional auxiliary heating.**

Technician

9.7 Circulation control function "CIRCU"

Description: When you have long hot water pipes, the water needs to run for a while before it comes out hot at the tap. This wastes precious drinking water.

You can remedy the situation with an additional water pipe, called a circulation pipe, which circulates the drinking water until it reaches its target temperature at the tap. The factory settings ensure that you can immediately get hot water from the tap when you need it.

- **"OPERAT"**: Do not change the "Time" controller mode for the circulation pump. The "Time" controller mode controls the circulation pump using a time-dependent temperature controller. Hot water is immediately available at the tap at the times that you set. Outside of those time windows, the circulation pump is always switched off.
- **"T.CR.ACT"**: The current temperature of the drinking water in the circulation return pipe.
- **"T.CR.NOM"**: Target temperature, corresponds to T.WW.NOM.

The pump switches on when:

a) One of the time blocks is active **and**

b) the circulation sensor S11 has cooled to less than the target temperature "T.CR.NOM" by the value "DIFF.ON".

Example: According to the factory settings, "DIFF.ON" = -12 K, "DIFF.OFF" = -9.0 K and "T.CR.NOM" = 48°C. At: "T.CR.ACT" = 48 – 12 = 36°C, the circulation pump switches on, and at: "T.CR.ACT" = 48 – 9 = 39°C, it switches back off.

- **"TIME PROG."**: You can set time windows to control the circulation pump here. Outside of these times, the pump will not operate and circulation will not take place.

Possible settings:

In the circulation menu (**top right figure**), select the parameter you require and press the rotary wheel. Then turn the rotary wheel until it displays the value you require. Pressing the rotary wheel saves the value. (Some parameters can only be changed in the "Technician" operating mode.)

Setting the circulation times: Entering values
Three blocks are available, each with three time windows. All the days of the week are selected at the factory, and the standby times are entered as in **figure on right**. Change the times as described on **page 43** under **"Setting auxiliary heating times for the hot water buffer"**.

E — You can save energy by limiting the circulation times.

Menu, plain text	Factory setting	Own Setting
1 2 3 4 5 6 7 8 9 10 11 12	13 14	
CIRCULATION	–	
DES.: CIRCU		
FUNCTION STATUS:		
INPUT VARIABLE:		
OUTPUT VARIABLE:		
OPERAT.: Time	Time	
CIRCU. RETURN:		
T.CR.ACT: 36°C		
T.CR.NOM: 48°C	48	–
TIME PROG:		
DIFF.ON: -12 K	-12	
DIFF.OFF: -9.0 K	-9.0	

Menu overview "CIRCULATION"

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

      TIME PROG. CIRCU.
 Mo Tu We Th Fr Sa Su
 00.10ꜜ- 00.00h
 00.00 - 00.00h
 00.00 - 00.00h
                          ▽
 ┌─────────────┐ ┌─────────────┐
 │    * 10     │ │    ABORT    │
 └─────────────┘ └─────────────┘
```

At the pointer position ⚡ is where you read or set the start time for the circulation time window

9.8 Heat quantities counting functions

Solar circuit "HQC SOLAR":

Call up: "F:30" in the Function overview menu.

Description: This function helps you to check your solar system and shows how much solar energy it has collected.

ℹ️ To use this function, a volume flow sensor (VSM-SC, item no.: 09499, please order separately) must be installed in the solar line. Otherwise, "FLOW", "POWER" and "HEAT QUANT" will always be zero.

You may also use a different volume flow sensor with impulse output. The volume in litre/impulse must then be set correctly in the SolvisControl (**page 30**).

- **"Status":** "CALIBRATED" or "UNCALIBRATED". We use extremely accurate temperature sensors for measuring solar flow and solar return temperatures (Pt 1000), which means calibration is not necessary.

- **"FROST PROTECTION":** The amount of antifreeze in the secondary solar circuit is fixed at 0%. The volume flow sensor is located in the secondary side of the plate heat exchanger ("PHU"). This circuit between the storage tank and PHE is run using heating water.

- **"T.Pre-run:"** Flow temperature in secondary solar circuit, sensor S5, "T.Solar Pre2". Temperature of the heating water after running through the plate heat exchanger. The stratified charger stores the heated heating water in the layer with the same temperature.

- **"T.return:"** Return temperature in secondary solar circuit, sensor S6, "T.Solar Ret2". Temperature of cold heating water that is extracted from the storage tank from below.

- **"POWER":** The current heat output generated in the solar heat exchanger. Calculated from the temperature difference "DIFF" (= "T.Pre-run" – "T.return") and the current flow "FLOW" of the heat carrier in the solar circuit.

- **"HEAT QUANTITY":** This shows how much heat energy the solar system collected while it was running.

Menu, plain text

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
        HEAT  QUANT.
DES.: HQC SOLAR
INPUT VARIABLE:
SERVICE MENU:


Status:UNCALIBRATED


FROST PROTECTION: 0%


T.Pre-run:        77°C
T.return:         26°C
Diff:           50.5 K
FLOW:          122 l/h


POWER:        7.15 kW
HEAT QUANT.:
              324.2 kWh
```

Menu overview for heat quantity function

Technician

9.9 REQ. HEATING function

When necessary, the function "REQ. HEATING" will send a requirement signal to the automatic firing system of the boiler.

• **"REQ. TEMPERATURE"**:
- **"T.Req.ACT."**: Current **upper** temperature in heating buffer
- **"T.Req.NOM"**: Target temperature for heat requirement (= greatest flow (pre-run) temperature of heating circuits). The burner starts when the actual temperature at the **upper** heating buffer is lower than the flow (pre-run) temperature "T.Req.NOM" increased by "DIFF.ON" (= 1 K).

• **"SHUT-OFF TEMPERATURE"**:
- **"T. Off ACTUAL"**: Current temperature in the **lower** heating buffer – **"T.OFF TARGET"**: Target temperature corresponds to "T.Req.NOM".
The burner stops when the actual temperature in the **lower** heating buffer is higher than the greatest flow (pre-run) temperature "T.OFF TARGET" by "DIFF.OFF" (= 0 K).

Example: "T.Req.NOM" = 47°C, "DIFF.ON" = 1 K and "DIFF.OFF" = 0 K (factory setting). The temperature of the heating buffer is at least 47°C (lower) and 48°C (upper).

• **"Base Temperature"**: If the boiler temperature "T.Req.ACT" drops below **"T.Req.MIN"** (= 0°C), the burner switches on for **"Minimum Runtime Burner"** = 90 seconds.

"ECO OPERAT.:"

$\boxed{E}$ This function enables you to save even more energy. You accept the fact that it might remain a bit colder for a certain amount of time and that the burner stays off, meaning only solar energy can be used.

• **"Undercoverage"**: Percentage of the flow (pre-run) for a tolerated lowering of the same by 1 hour. Starting with full heating operation, the burner switches off and solar heat has priority. It switches back on when the target flow temperature drops below the requirement threshold. The course of the requirement threshold is calculated as follows:
dT x dt = const = undercoverage x target flow ("pre-run") temperature, and is shown in the diagram below. "dT" is the difference in temperature for the requirement threshold and "dt" is the time change.
**Example**: You accept an undercoverage of 20% of the flow temperature, meaning that for one hour, 40°C instead of 50°C suffices. If the current flow temperature is 30°C, for example, the burner would resume operation after 30 minutes. If the flow temperature drops below 30°C, the burner would start immediately. If during those 30 minutes solar energy warms up the tank enough to bring the flow ("pre-run") temperature up to 40°C, the burner would restart after an hour. If the temperature were to reach 45°C, the burner would remain off for two hours, and so forth.


```
Menu, plain text

1 2 3 4 5 6 7 8 9 10 11 12 13 14
         REQ. HEATING
DES.: HEAT. REQ
FUNCTION STATUS:
INPUT VARIABLE:
OUTPUT VARIABLE:
REQ. TEMPERATURE:
T.Req.ACT:          48°C
T.Req.NOM:          47°C
DIFF.ON:           1.0 K
SHUT-OFF TEMPERATURE:
T. Off ACTUAL:      38°C
T.OFF TARGET:       47°C
DIFF.OFF:          0.0 K
Base Temperature:
T.Req.MIN:           0°C
Minimum Runtime
Burner:           90 sec
ECO OPERAT.:
Undercoverage:        0%
```

Heating requirement menu overview


```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

        REQ. HEATING

Minimum Runtime           △
Burner:           90 Sec


ECO OPERAT.:
Undercoverage:     0% ◄
   BROWSE           BACK
```

Setting the undercoverage in the "REQ.HEATING" menu
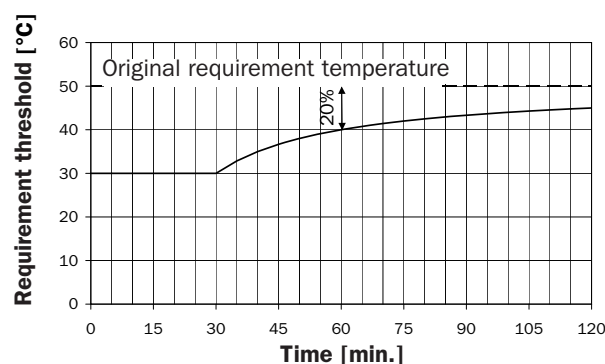
Requirement threshold in eco mode, with an undercoverage of 20% and a requirement temperature of 50°C
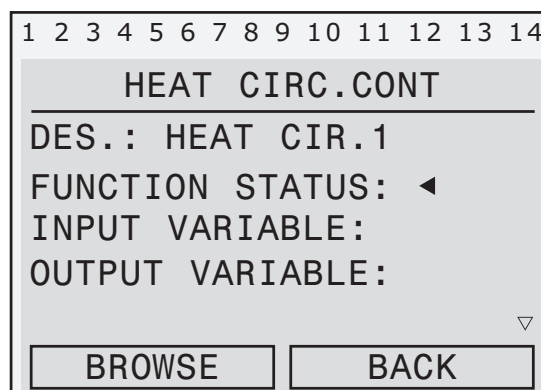
10 Additional Information for Installers

10.1 Checking functions

You can check functions quickly with the "FUNCTION STATUS" subfunction that is available at the start of most function menus (**figure on right**).

The following example explains the "FUNCTION STATUS" menu using heating circuit 1 as an example:

- **"ENABLE HEAT CIR.1/PUMP/MIXER"**: If the line has a check mark (✓), it means that the function can control this object. In the figure below, for example, the pump is not enabled. This can be due to many reasons. To find out which ones, proceed to the next step by looking at the input variables. For example, it shows that a hot water priority is defined, which means the pump is blocked when the hot water buffer requires auxiliary heating. In the next step, you would need to determine whether there is a requirement arising from the hot water.

- **"Status" of "HEAT CIRCUIT PUMP"/"MIXER"**: Tells the status of the output as controlled by the function. Compare this information with the display of the statuses of the outputs in the first line (no. 3 is highlighted in black: Pump "on" otherwise "off", no. 8 black: Mixer "op.", no. 9 black: Mixer "cl.", otherwise "off").
Example: If the "HEAT CIR.1" function and the pump are both enabled, "Status" of the heating circuit pump will show whether or not the pump is operating. However, if the "HEAT CIR.1" function is not enabled, (for example, because the "Floor Dry" function is active), the pump status will always be off, regardless of whether it was activated by the "Floor Dry" function or not.

- **"FROST PROTECTION MODE"**: If the line has a check mark (✓), it means that the respective heating circuit is in frost protection mode.

- **"LIMIT T.Pre.NOM"**: A check mark (✓) behind the queries means that the target flow ("pre-run") temperature is within the limits "T.Pre.MIN" and "T.Pre.MAX".

- **"SWITCH-OFF COND."**: Here, the queries of the switch-off conditions from the respective heating circuit are given inversely, which means if all switch-off conditions are met, the pump would not be shut off. Only the last query "LOWERING MODE and T.Out.: ACT. < MIN" is evaluated when the heating circuit is in lowering mode.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

      HEAT CIRC.CONT
DES.: HEAT CIR.1
FUNCTION STATUS:  ◄
INPUT VARIABLE:
OUTPUT VARIABLE:
                              ▽
  BROWSE             BACK
```

In the "HEAT CIR.1" heating circuit control menu, select the "FUNCTION STATUS:" entry.

Menu, plain text	Possible displays
1 2 3 4 5 6 7 8 9 10 11 12 13 14 FUNCTION STATUS	
ENABLE HEAT CIR.1 ✓	
ENABLE PUMP	✓
ENABLE MIXER ✓	
HEAT CIRCUIT PUMP Status: off	on, off
MIXER Status: off	off, op., cl.
FROST PROT MODE	✓
LIMIT T.Pre.NOM: T.Pre-run: NOM < MAX ✓ T.Pre-run: NOM > MIN ✓	
SWITCH-OFF CONDITIONS: T.Room: ACT < NOM ✓ T.Pre-run: NOM > MIN ✓ T.Out: AVGoff < MAX? ✓ Lowering mode and T.Out.: ACT < MIN?	✓

Menu overview switch-off conditions heating circuit

Technician

10.2 Frequently asked questions about SolvisControl

10.2.1 How are the solar pumps controlled?

When does the primary solar circuit pump switch on?
Whenever the collector temperature ("T.Collector", input 8) is higher than the temperature in the lower part of the storage tank ("T.Ref.Sto", input 3) by SolvisControl set switch-on difference ("DIFF.ON"). This only happens in the "AUTO" operating function. "DIFF.ON" should be the same as the switch-off difference "DIFF.OFF" plus a hysteresis of approx. 5 K.

Explanation:
You should enter a hysteresis so that the pump does not switch off immediately when the value drops below 15 K. Factory setting on the SolvisControl: "DIFF.OFF" = 10 K and "DIFF.ON" = 15 K.
Switch-on condition:
Solar circuit ON:
"T.Collector" – "T.Ref.Sto" $\geq$ "DIFF.ON"

When does the primary solar circuit pump switch off?
Whenever the "Collector temperature – Reference temperature" difference exceeds the set value of "DIFF.OFF" (factory setting 10 K) on the controller.

Switch-off condition:
Solar circuit OFF: "T.Collector" – "T.Ref.Sto" < "DIFF.OFF"

| **i**	We recommend that "DIFF.OFF" = 10 K and for "DIFF.ON" = "DIFF.OFF" + 5 K.

How does the speed control work?
The primary solar pump has a speed control. The flow is set in such a way as to make water in the tank reach the hot water standby temperature as quickly as possible (12 K above target hot water temperature). Higher temperatures are not advisable, as they would make the collector less effective. The pump runs at its highest speed for 90 seconds, then it drops down to the target temperature on the collector sensor (S8). This is the quickest way to raise the collector operating temperature. The collectors reach an optimal minimum temperature that can be held constant by raising or lowering the flow when temperatures rise or fall. Higher temperatures can also occur when the maximum speed has been reached. Do not reduce the flow in the solar circuit; the flow meter must be completely open.

This controller guarantees that the collectors warm up quickly when the sun begins to shine. This, together with the stratified charger, brings the tank to standby more quickly. Compared with conventional systems, the burner needs to provide less auxiliary heat.

How is the secondary solar circuit pump controlled ?
The pump in the secondary solar circuit is switched on when the pump of the primary circuit switches on and the flow (pre-run) temperature of the primary circuit T_{VL1} (S7) is higher than the temperature in the lower part of the storage tank "T.Ref.Sto" plus a switch-on temperature difference of 8 K. It is turned off when the primary solar circuit pump switches off or T_{VL1} < "T.Ref.Sto" + 5 K.

The speed is controlled so that the flow (pre-run) temperature of the secondary solar circuit T_{VL2} (**figure below**) is 7 K higher than the hot water target temperature (T.WW.NOM). A frost protection function ensures that the heat exchanger does not freeze in winter.
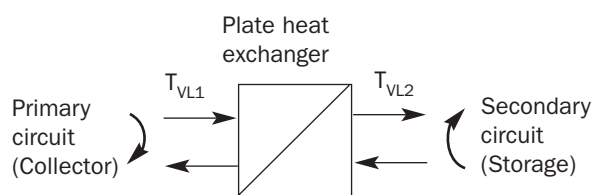
Principle of the solar heat transfer station

When does the safety function deploy?
The maximum tank temperatures "T.Lim.MAX" (upper) and "T.Ref.MAX" (lower) are factory preset to 95°C and 90°C. Specifying a maximum tank temperature allows for a two-fold safety function, meaning the solar pump switches off when:

a) The temperature at the "T.WW.Buffer" (input 1) sensor is greater than the maximum temperature "T.Lim.MAX"

or

b) The temperature at the "T.Ref.Sto" (input 3) sensor is greater than "T.Ref.MAX"

A hysteresis (factory setting 3 K) is taken into account so that the solar pump does not switch back on immediately if "T.WW.Buffer" drops below its set value. The solar pump switches back on when:

a) "T.WW.Buffer" < "T.Lim.MAX" – "Hysteresis"

or

b) "T.Ref.Sto" < "T.Ref.MAX" – "Hysteresis".

10.2.2 How is the hot water pump controlled?

Hot water is produced in accordance with the continuous flow principle using an external plate heat exchanger (PHE). You can use SolvisControl to adjust the target hot water temperature.

The "T.Warm Water" sensor (input 2) controls the hot water exit temperature. To control it quickly, you must use this temperature sensor as an immersion sensor in the hot water output of the plate heat exchanger. Our hot water station, WWS-36, is set up like that when it is delivered.

When you open the hot water tap, the control switches on the hot water pump at output A2

SolvisControl controls the speed of the A2 hot water pump based on temperature so that the target hot water temperature is constantly available when you open the tap.

10.2.3 How is auxiliary heating controlled?

If the solar system cannot provide enough energy, auxiliary heating for the hot water buffer layer must come from an external boiler. A requirement signal is sent to the automatic firing system for this purpose. If you have an external boiler, the boiler pump will be controlled automatically as well. SolvisControl has four different functions that can require auxiliary heating:

1. **Function: "10: Requirement WW", "WW_REQ.1"**
   If the temperature at sensor S1 ("T.WW.Buffer") drops below the set temperature increase of 12 K to the target hot water temperature, the boiler switches to service water priority and loads this section of the tank.

2. **Function: "11: Requirement WW", "WW_REQ.2"**
   If the temperature at sensor S9 ("T.H. Buffer U") drops below the set temperature increase of 12 K to the target warm water temperature, the boiler switches to service water priority and loads this section of the tank.

3. **Function: "21: Requirement Heating", "HEAT_REQ"**
   The heating buffer layer lies below the warm water buffer layer. If the temperature in the upper layer (sensor S4, "T.H. Buffer U") is lower than the target flow ("pre-run") temperature of the heating circuit plus the switch-on temperature difference ("DIFF.ON" = 1 K), heat will be requested. The boiler switches off when the temperature in the lower layer of the heating buffer (sensor S9, "T.H. Buffer U") is higher than the target flow temperature plus the switch-off temperature difference ("DIFF.OFF" = 0.1 K).

4. **Function: "23: Requirement WW", "WW_REQ.3"**
   If the temperature at the sensor heating buffer upper "Temp. upper heating buffer" drops below the set increase of 10 K to the target swimming pool temperature, the heating buffer is loaded.

Technician

10.3 Overview of other SolvisControl parameters

10.3.1 The "DATA ADMINISTRATION" menu

Displaying the designation of a function data set
The "DATA ADMINISTRATION" menu displays the designation of a set of function data. It shows the file name this functional data had when it was saved to the hard disk.

• **"Status"**: After a data set is loaded, the status of the functional data is "original". As soon as a change has been made to the functional data, the status becomes "modified".

i To rename a data set, transfer the function data to the bootloader, use the "Memorymanager" program to save the function data to a PC hard disk, change the file name there, and use the bootloader to reload the file to SolvisControl.

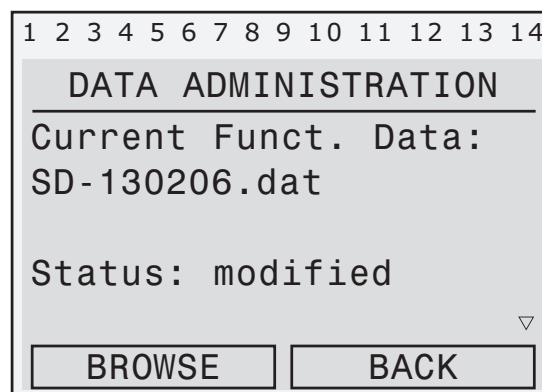Opening the "DATA ADMINISTRATION" menu:

In the function overview, press the "SERVICE" button. Move the pointer down using the rotary wheel to the entry: "Data Administration" and press the rotary wheel. Press "BACK" twice to return to the function overview.
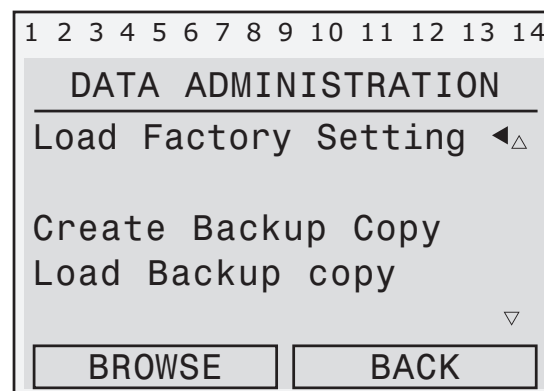
Loading/saving the factory settings
If you must reload the factory settings after accidental changes are made, you can do this in the "DATA ADMINIS-TRATION" menu. You can also make a backup copy of your own settings and load it.

i You can only restore the factory settings/backup copy in the operating modes "Technician" and "Expert".

In the main menu, select the "Data Administration" entry by turning and pressing the rotary wheel. Move the pointer to "Load Factory Setting" (**figure above**). Press the rotary wheel and confirm with "Yes". Press the "BACK" button to return to the main menu. Proceed in the same way for "Create Backup Copy" or "Load Backup Copy".

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
    DATA ADMINISTRATION
Current Funct. Data:
SD-130206.dat

Status: modified
                            ▽
   [ BROWSE ]      [ BACK ]
```

Displaying the name of a functional data set

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
   DATA ADMINISTRATION
Load Factory Setting ◄△

Create Backup Copy
Load Backup copy
                            ▽
   [ BROWSE ]      [ BACK ]
```

Press the rotary wheel to load the factory settings

Updating software/configuration

You can use the bootloader (item no. 10452) to update configurations or the entire software. For example, you can download data from our web site and use the "Memory-Manager" software to install it on the bootloader. You can only update controller data in the "Expert" (**p. 25**) operating mode.

ℹ️ If the software you transfer contains new functions or enhancements for existing functions, you need to check the parameters of the relevant functions. You may have to adjust the standby times and usage temperatures.
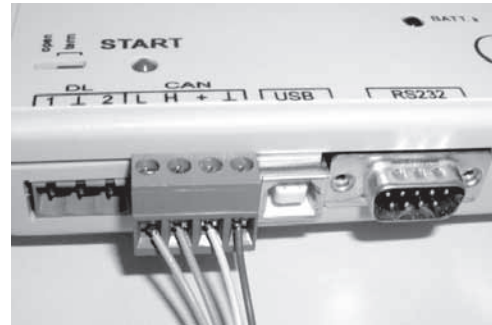
Updating the function data:

1. **Connect the bootloader:** Use the 4-wire CAN bus cable (top right figure) to connect the bootloader to the plug contact on the SolvisControl control board (centre right figure).

2. **Activate the "Expert" operating mode**: (page 25).

3. **Open the "DATA ADMINISTRATION" menu** If you are not already in the main menu, open it with the "Service" button and turn the rotary wheel until the pointer is on "Data Administration". Press the rotary wheel.

4. **Open the download functional data menu**: In the "DATA ADMINISTRATION" menu, turn the rotary wheel until the pointer is positioned behind "BOOTLD. => CONTR." (right figure below) and press it.

5. **Start downloading**: The queries for functional data updates should be set as follows:

Connecting the CAN bus to the bootloader
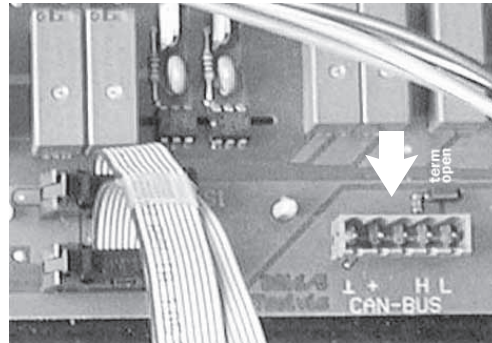
Connecting the CAN bus to the SolvisControl board

Open the menu for updating functional data

Menu, plain text	Setting
1 2 3 4 5 6 7 8 9 10 11 12 13 14 　BOOTLD. => CONTR. DATA SOURCE: Bootld. Storage point: 1	1 to 7 as in the Bootld.
DATA TARGET: Controller Functional data: Overwrite?　　　　　yes	Do not change
Factory setting: Overwrite?　　　　　　no	Set to "yes"
Configuration data: Overwrite?　　　　　　no	Do not change
!!! CAUTION !!! ALL COUNTER STATES 　　ARE LOST!	
REALLY DOWNLOAD DATA START?　　　　　　　no	To start: Enter "yes".
CAN-IR interface Activate?　　　　　　yes	Do not change

6. **Press the "START" button on the bootloader.**

7. **Check:** Is the required functional data loaded? Open the "DATA ADMINISTRATION" menu**.**

10.3.2 Solar control function "SOLAR 1"

Open: In the Functions menu, function "2: SOLAR CONTROL"

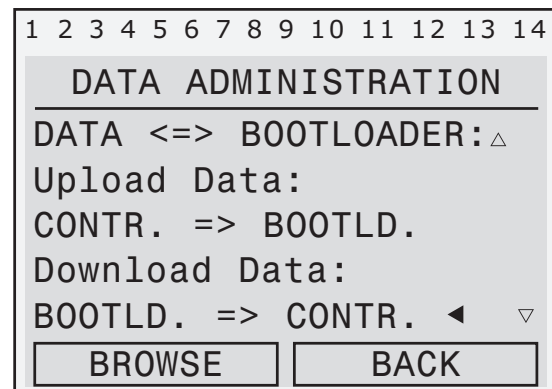**Description**: This function controls the solar circuit of your solar system. The factory settings guarantee you the best possible utilization of the available sunlight.

The "T.Coll.ACT" line shows the temperature of the collector at the hottest point. At "DIFF.ON" and "DIFF.OFF", you can read the switch-on and switch-off temperature differences, respectively.

The temperature at the S3 storage tank reference sensor (see system diagram in the appendix) can be read at "T.Ref.ACT" and the temperature at the hot water buffer temperature sensor (S1) can be read at "T.Lim.ACT".

Menu, plain text	Factory setting
1 2 3 4 5 6 7 8 9 10 11 12 13 14	
SOLAR CONTROL	
DES.: SOLAR 1	
FUNCTION STATUS:	
INPUT VARIABLE:	
OUTPUT VARIABLE:	
COLLECTOR TEMPERATURE:	
T.Coll.ACT: 30°C	
T.Coll.MAX: 120°C	
Hysteresis: 20 K	
REFERENCE TEMPERATURE:	
T.Ref.ACT: 24°C	
T.Ref.MAX: 90°C	90
Hysteresis: 3.0 K	3
DIFFERENCE COLL-REF:	
DIFF.ON: 15 K	15
DIFF.OFF: 10 K	12
LIMIT TEMPERATURE:	
T.Lim.ACT: 58°C	
T.Lim.MAX: 95°C	95
Hysteresis: 3.0 K	

Solar control menu overview

Possible settings:

For example **Setting the switch-off difference**:
The controller must be in the "Technician" operating mode (**page 25**). Proceed as follows:

Press the "SERVICE" button in the function overview to go to the main menu. In the main menu, select the "Functions" menu item and press the rotary wheel. In the Functions overview menu, select the menu item function "PAR?" of function "2: SOLAR CONTROL" and press the rotary wheel. Turn the rotary wheel until "DIFF. OFF: 10 K" is selected with the pointer (see **figure right**). Now you can change the value by pressing, turning and pressing the rotary wheel. Press "BACK" several times to return to the function overview.

ℹ️ You should only change the switch-on and switch-off differences in exceptional cases.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

     SOLAR CONTROL
 ─────────────────────────
                        △
DIFFERENCE COLL-REF:
DIFF.ON:          15 K
DIFF.OFF:         10 K◄
                        ▽
 ┌──────────┐  ┌──────────┐
 │  BROWSE  │  │   BACK   │
 └──────────┘  └──────────┘
```

At the pointer position ◄, read or set the collector switch-off temperature difference

Collector maximum temperature

This function protects the solar system components by preventing the solar pump from restarting when steam has formed in the collector.

The solar pump switches off when the temperature on the S8 (input 8) collector sensor exceeds the maximum collector temperature, "T.Coll.MAX", which is set to 120°C at the factory. The solar pump does not restart until the collector cools below "T.Coll.MAX" minus a "hysteresis" of 20 K (adjustable), assuming the other switch-on conditions (maximum tank limit or switch-on difference) have been met.

> **i** You should only change "T.Coll.MAX" from 120°C and the "hysteresis" from 20 K in exceptional cases. To avoid accidental changes, you can only change these settings in the "Technician" operating mode and up.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

         SOLAR  CONTROL
 ─────────────────────────────
                            △
COLLECTOR TEMPERATURE:
T.Coll..ACT:      85°C
T.Coll..MAX:     120°C◄
Hysteresis:       20 K    ▽
 ┌──────────────┐ ┌──────────────┐
 │   BROWSE     │ │    BACK      │
 └──────────────┘ └──────────────┘
```

Read/change the maximum collector temperature "T.Coll.MAX" at the pointer position ◄.

Maximum temperature in the upper storage tank

In "AUTO" operating mode, the solar pump switches off when the hot water buffer layer (S1 sensor, "Buffer temp. Upper", input 1) reaches the maximum tank temperature, "T.Lim.MAX" (safety function, see **p. 50 under "When does the safety function deploy?"**). The message "Puffer voll" ("buffer full") appears.

> **i** We recommend that you do not change the maximum tank temperature of "T.Lim.MAX" = 95°C and "hysteresis" = 3 K, which are set at the factory. The tank is designed for a maximum temperature of 95°C. When this temperature is reached, you will also receive the warning message, "Excess temperature" (**section 7**).

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

         SOLAR  CONTROL
 ─────────────────────────────
                            △
LIMIT TEMP.:
T.Lim.ACT:        65°C
T.Lim.MAX:        95°C◄
Hysteresis:      3.0  K    ▽
 ┌──────────────┐ ┌──────────────┐
 │   BROWSE     │ │    BACK      │
 └──────────────┘ └──────────────┘
```

Read/change the maximum storage tank temperature above at the pointer position ◄.

Maximum temperature in the lower storage tank

The solar pump switches off when the lower solar buffer layer (S3 sensor, "Storage Reference", input 3) reaches the set maximum tank temperature, "T.Ref.MAX" (**page 50 under "When does the safety function deploy?"**). The "Puffer voll" message appears.

> **i** We recommend that you leave the maximum storage tank temperature "T.ref.MAX" at 90°C. You should only change the "hysteresis" of 3 K in exceptional cases. To avoid accidental changes, you can only change these settings in the "Technician" operating mode and up.

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14

         SOLAR  CONTROL
 ─────────────────────────────
                            △
REFERENCE TEMP:
T.Ref.ACT:        25°C
T.Ref.MAX:        80°C◄
Hysteresis:      3.0  K    ▽
 ┌──────────────┐ ┌──────────────┐
 │   BROWSE     │ │    BACK      │
 └──────────────┘ └──────────────┘
```

Read/change the maximum storage tank temperature below at the pointer position ◄.

Technician

10.3.3 Setting and checking the solar circuits

The minimum speed levels of 22 (primary circuit) and 10 (secondary circuit) ensure a minimum flow for the greatest assumable pressure loss in the solar circuits. If the loss of pressure in the solar circuits is small, you should adjust the minimum speed level to save drive energy. **The maximum speed level must remain set to 30**.

i Professional installation is a prerequisite for setting the solar pump. Both solar circuits (primary and secondary circuit) must be professionally flushed and bled of air, and their safety equipment must be properly installed. Install the sensors as described in the installation instruction for the solar heat transfer station (**Solvis document no.: P 40 or P 42**).

Set the speed control on both solar pumps to level three and open the adjusting valve in the primary circuit completely (delivery state).
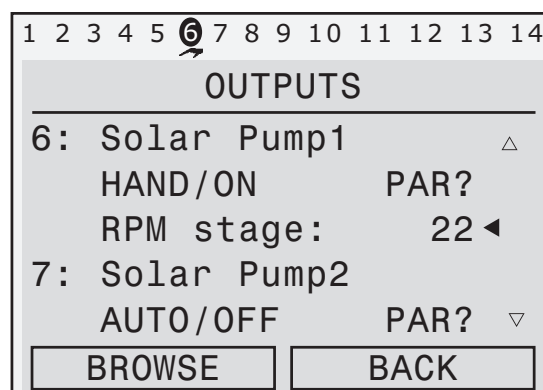
Setting the primary circuit:
• Determine the minimum speed of the solar pump in the primary circuit as follows:
  - Calculating the minimum flow:

$$\frac{\text{Absorber surface area [m}^2\text{] x 10 [l/m}^2\text{ h]}}{60\ [\text{min/h}]} = \text{x} \left[\frac{\text{l}}{\text{min}}\right]$$
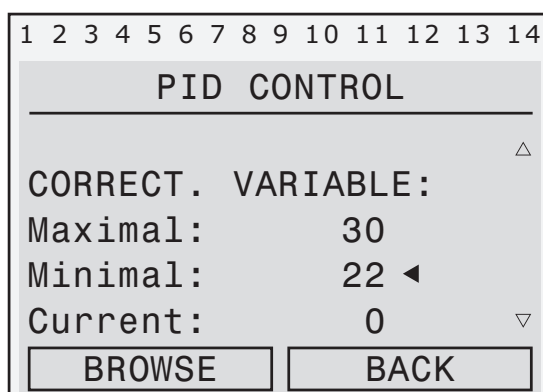
  - Determining the minimum speed:
  Switch output 6 to "HAND/ON" (figure on right),
  Lower the speed until the calculated volume flow has set. This speed is the minimum speed level. Switch output 6 back to "AUTO".

• Setting the minimum speed level:
  In the "Technician" operating mode (**page 25**), set the minimum speed level as follows:

Press the "SERVICE" button in the function overview to go to the main menu. In the main menu, select the "Functions" entry by turning and pressing the rotary wheel. In the functions menu that has just been displayed, select the "PID SOLAR1 PAR?" entry under "3: PID CONTROL". In the PID control menu, turn the rotary wheel until the pointer is at "Minimal: 22" (**figure on right**). Now you can press the wheel, turn it until the required number is displayed, and press it again to set the minimum speed level. Press the "BACK" button three times to return to the function overview.

```
1 2 3 4 5 ⑥ 7 8 9 10 11 12 13 14
          OUTPUTS
6: Solar Pump1              △
   HAND/ON         PAR?
   RPM stage:        22 ◄
7: Solar Pump2
   AUTO/OFF         PAR?   ▽
   BROWSE            BACK
```

Specify the speed level by pressing, turning and pressing the rotary wheel at the pointer position ◄

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
         PID CONTROL

                            △
CORRECT. VARIABLE:
Maximal:          30
Minimal:          22 ◄
Current:           0        ▽
   BROWSE            BACK
```

Set the minimum speed level by pressing, turning and pressing the rotary wheel at the pointer position ◄

Setting the secondary circuit:

- Determine the minimum speed of the solar pump in the secondary circuit as follows:
  - Calculating the minimum volume flow:

$$\frac{\text{Absorber surface area } [\text{m}^2] \times 9\ [\text{l/m}^2\ \text{h}]}{60\ [\text{min/h}]} = x \left[\frac{\mathrm{l}}{\min}\right]$$
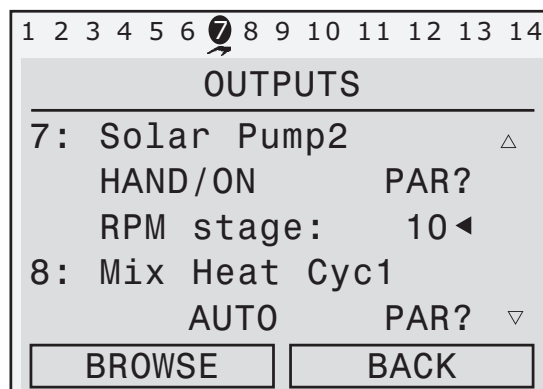
  - Determining the minimum speed:
    Switch output 7 to "HAND/ON" (figure on right), Lower the speed until the calculated volume flow has set. This speed is the minimum speed level. Switch output 7 back to "AUTO".

i Maintain a minimum speed level of at least 10 at all times. In the secondary circuit, if you cannot set the minimum volume flow using the setting of the speed level alone, you can adjust it using the adjusting valve.

- Setting the minimum speed level:
  In the "Technician" operating mode (**page 25**), set the minimum speed level as follows:

Press the "SERVICE" button in the function overview to go to the main menu. In the main menu, select the "Functions" entry by turning and pressing the rotary wheel. In the functions menu that is now displayed, select the "PID SOLAR2 PAR?" entry under "5: PID CONTROL". In the PID control menu, turn the rotary wheel until the pointer is at "Minimal: 10" (**figure on right**). Now you can press the wheel, turn it until the required number is displayed, and press it again to set the minimum speed level. Press the "BACK" button three times to return to the function overview.

i Now create a new backup copy (**p. 52**).

```
1 2 3 4 5 6 ⑦ 8 9 10 11 12 13 14
            OUTPUTS
7: Solar Pump2              △
   HAND/ON        PAR?
   RPM stage:      10◄
8: Mix Heat Cyc1
          AUTO    PAR?     ▽
   BROWSE            BACK
```

Specify the speed level by pressing, turning and pressing the rotary wheel at the pointer position ◄

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
          PID CONTROL
                           △
CORRECT. VARIABLE:
Maximal:         30
Minimal:         10 ◄
Current:          0        ▽
   BROWSE            BACK
```
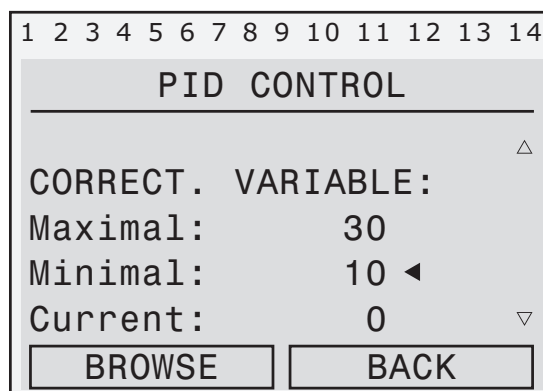
Set the minimum speed level by pressing, turning and pressing the rotary wheel at the pointer position ◄

Technician

10.3.4 "START FUNCTION"

Auxiliary start function for evacuated tube collectors

Activate this function only when use evacuated tube collectors from SolvisLuna. Sometimes heated heat transfer fluid covers the sensors on these collectors too late, meaning the solar pump starts too late. This function briefly activates the solar pump at specific intervals, transporting the contents of the collector to the sensor to determine the actual temperature for normal operation. To save energy, flush intervals only occur when the weather makes them necessary. The controller determines whether this is the case based on the temperature measured at the collector. You can activate this function beginning at "Technician" (**page 25**) operating mode as follows:

In the main menu, select the "Functions" menu item and press the rotary wheel. Select the menu item "PAR?" of function "8: START FUNCTION" and press the rotary wheel. In the start function menu turn the rotary wheel until the pointer is behind "INPUT VARIABLE:" and press the rotary wheel. In the Input Variable menu, select the entry "Status: OFF" below the "ENABLE START FUNCT" line. Press the rotary wheel and turn it until "ON" appears (**figure above**). Activate the auxiliary start function by pressing the rotary wheel once more. "BACK" takes you back to the Start Functions menu, where you will find the possible settings listed below. You can view other menu entries there by turning the rotary wheel (**bottom figures**). Use "BACK" to return to the Solar control menu.

You have the following setting options:

1. **"07:00" – "20:00"**: The period when the auxiliary start function is active (factory settings).

2. **"Run Time"**: Runtime of the solar pump (0... 120 s, factory setting: 15 s)

3. **"Interval"**: Interval before the solar pump restarts. Maximum value; the interval is automatically adjusted to the current change in temperature at the evacuated tube collector. (0... 120 min., factory setting 20 min)

4. **"Aktiv.Grad"**: Activation gradient (0... 99, factory setting: 20). Solar pump switch-on threshold when the collector temperature is warmer (by "Aktiv.Grad") than the mean of the last 250 minutes.
Lower numerical values: Frequent start attempts (risk: Unnecessary power consumption from too many start attempts). Higher numerical values: Fewer start attempts (risk: The solar pump switches on too late, causing you to loose some solar energy).
Fine adjustment: If more than ten start attempts are needed for a solar run, raise the "Aktiv. Grad.". For less than four start attempts, lower the "Aktiv. Grad.".

Activating the auxiliary start function at the pointer position ⚡ by pressing the rotary wheel

Setting an activation time for the auxiliary start function

Setting an activation gradient and displaying start attempts for the current day

10.3.5 "Floor dry" function

Open: In the Function overview, turn the rotary wheel until the pointer is behind "Floor Dry F:22", and press the rotary wheel.

Description: The "Floor Dry" function can be used to provide heat for drying a concrete floor using underfloor heating. To do so, you must create a temperature profile (max. 25 stages) in the function. Each stage lasts 24 hours. This feature controls heating circuit 1.

- **"FNCT.VAR"** Function variable; must always be set to "Temperature".

- **"Cyclical"**: If this is set to "no", the system will only run through the activated stages once. Otherwise, the cycle will repeat indefinitely.

- **"Int. Sync"**: Length of a stage, in hours.

- **"CURRENT STAGE"**: Indicates which stage is active.

- **"NOM. VALUE"**: Display the target value of the active stage.

- **"Stage 1" to "Stage 25"**: Shows the target value in [°C]. If it is set to "OFF", this stage will be skipped.

- **"If ENABLE = Off"**: Shows the target value for the flow temperature in [°C] for stages or functions that are blocked or not activated.

Use "START PROFILE" to start the function:

In the function overview, turn the rotary wheel until the pointer is at "START PROFILE" and press the rotary wheel. The display changes to "STOP PROFILE" and the line below it shows the current temperature of the stage. The function ends after the stages have completed (24 hours/stage) or when you press the rotary wheel twice for the same position.

⚠ No limit is set for the target flow ("pre-run") temperature. Therefore, temperatures may reach up to 90°C.

Possible settings

For each stage you require, you must replace "OFF" with a temperature. **Example**: You want to heat for four days with a maximum temperature of 50°C. Including a warm-up phase and a cool-down phase, the total length is 14 days. Enter the stages as shown in the figure to the right.

```
 1 2 3 4 5 6 7 8 9 10 11 12 13 14
 Operat.Syst: A2.08EN
 ─────────
 Floor Dry      F:22◄
 START PROFILE
 NOM. VALUE:  5.0°C
 ─────────
 ┌────────┐    ┌────────┐
 │ HELP   │    │ SERVICE │
```

Opening the dry system heating function by pressing the rotary wheel

Menu, plain text

```
 1 2 3 4 5 6 7 8 9 10 11 12 13 14
 ____ PROFILE FUNCT ____
 DES.: FLOOR DRY
 INPUT VARIABLE:
 OUTPUT VARIABLE:

 FNCT.VAR: Temperature
 Cyclical: No
 Int. Sync: 24.0 hours

 START PROFILE

 CURRENT STAGE:     0
 NOM. VALUE:      5.0°C

 Stage 1:        25°C
 Stage 2:        30°C
 Stage 3:        35°C
 Stage 4:        40°C
 Stage 5:        45°C
 Stage 6:        50°C
 Stage 7:        50°C
 Stage 8:        50°C
 Stage 9:        50°C
 Stage 10:       45°C
 Stage 11:       40°C
 Stage 12:       35°C
 Stage 13:       30°C
 Stage 14:       25°C
 Stage 15:       OFF
  .
  .
  .
 Stage 25:       OFF
 If ENABLE =     off
                5.0°C
```

Floor drying function with a typical temperature profile

Technician

11 Appendix

11.1 Information on SolvisControl system controller

11.1.1 "Inputs" menu item

The sensors on the inputs are described here. The positions of the sensors are shown in the system diagrams in the **Appendix (p. 67f**). The following measured quantities **("display name"/sensor designation)** are displayed:

1: Hot water buffer temperature ("T.WW.Buffer"/S1)
The sensor is in the upper third of the storage tank, and it displays the temperature of the water in that location (hot water buffer). It must be at least 10 K to 12 K above the target hot water temperature to guarantee that the water that comes out of the tap reaches the set hot water temperature. If that is not the case, you must check (**p. 43**) the "DIFF.ON" temperature increase. In the second step, check whether the auxiliary heating provided by the boiler is working correctly.

2: Hot water temperature ("T.Warm Water"/S2)
The sensor is directly in the output of the hot water heat exchanger. It displays the temperature of the heated drinking water after it has passed through the heat exchanger.

3: Storage tank reference temperature ("T.Ref.Sto"/S3)
The sensor is at the bottom of the tank. It displays the temperature used to switch on the solar pump when there is a difference between the collector and the storage tank (S8 – S3).

4: Upper heating buffer ("Temp. upper heating buffer"/S4)
The sensor is located at the top of the buffer below the hot water buffer sensor S1. It limits the upper layer of the tank, which holds heating water required for room heating. The temperature it displays should be at least as high as the higher target flow ("pre-run") temperature in the heating circuits.

5: Solar flow ("T.Solar Pre2"/S5)
Temperature sensor in the flow of the secondary solar circuit (plate heat exchanger storage tank) necessary for recording solar yields.

6: Solar return ("T.Solar Ret2"/S6)
Temperature sensor in the return of the secondary solar circuit (plate heat exchanger storage tank), required for recording solar yields.

7: Solar flow ("T.Solar Pre1"/S7)
The sensor is located in the flow (from the collector) of the primary solar circuit.

8: Collector temperature ("T.Collector"/S8)
It displays the temperature measured at the hottest part of the collector (at the collector outlet).

9: Lower heating buffer ("T.H.Buffer U"/S9)
The sensor is located about in the middle of the tank. It limits the lower layer of the tank, which holds heating water required for room heating. If the hot water demand is particularly high at certain time, this sensor can increase the hot water buffer area.

10: Outdoor temperature ("Outside temp"/S10)
Shows the outdoor temperature. The sensor should be mounted roughly 2 meters above the ground on one of the building's exterior walls that does not receive direct sunlight (such as the north side).

11: Circulation temperature ("T.Cir.Ret"/S11)
The temperature measured in the circulation pipe (if applicable). The sensor must be mounted on the return of the circulation pipe, between the pipe and the insulation. It should not be directly next to the pump.

12: Flow ("pre-run") temp. Heating circuit ("T.Heat.Cir.P1"/S12)
Temperature sensor on the flow of mixed heating circuit 1. It uses the mixer to control the flow temperature.

13: Flow ("pre-run") temp. Heating circuit ("T.Heat.Cir.P2"/S13)
Temperature sensor on the flow of mixed heating circuit 2. It uses the mixer to control the flow temperature.

14: Return temperature of the hot water heat exchanger ("T.WW.Ret"/S14)
The sensor is located on the return of the primary circuit of the hot water heat exchanger. It displays the temperature of the storage tank water used for generating hot water when it returns to the tank.

15: Flow measurement ("Solar Flow.2"/S15)
Optional. display of the volume flow in the secondary solar in l/h. The volume flow meter is located in the return of the secondary solar circuit.

16: Room temperature ("T.Room1"/S16), alternatively: Swimming pool temperature ("T. swimming pool"/S16)
Connection of room sensor or temperature sensor for swimming pool heating as immersion sensor in the sequence of the filter circuit.

11.1.2 "Outputs" menu item

The following lists the designations, switch states, pump speeds and mixer states as displayed at the outputs. You can set the switch states ("HAND/ON" – "HAND/OFF" – "AUTO/..." -), where the respective state is indicated by "AUTO/OFF" or "AUTO/ON" based on the current condition.

The outputs are assigned as follows:

1: Swimming pool pump contactor ("Pool pump")
To control both pumps for heating the swimming pool, parallel to the primary swimming pool pump, you have to connect a contactor at output 1.

2: Hot water pump ("WW Pump")
The speed of the hot water pump is controlled in the "AUTO/..." setting (**section 9.4**). The speed level is displayed.

3: Heating circuit pump 1 ("Heat C Pump1")
The pump for the first mixed heating circuit can be switched on or off in the "AUTO/..." setting depending on your needs (**section 9.2**).

4: Heating circuit pump 2 ("Heat C Pump2")
The pump for the second mixed heating circuit can be switched on or off in the "AUTO/..." setting depending on your needs (**section 9.3**).

5: Circulation pump ("Circu Pump")
The circulation pump can be switched on or off in the "AUTO/..." setting depending on your needs (**section 9.7**).

6: "Solar Pump1"
The speed of the solar pump in the primary circuit is controlled in the "AUTO/..." setting (**section 10.3.2**), and that speed is displayed here.

7: "Solar Pump2"
The speed of the solar pump in the secondary circuit is controlled in the "AUTO/..." setting (**section 10.2.1**), and that speed is displayed here.

8: Heating circuit mixer 1 open ("Mix Heat Cyc1")
The mixer in heating circuit 1 can automatically open wider if you need it to. Behind the switch state "off: OFF" you can open the mixer in manual mode (**page 28, top**).

9: Heating circuit mixer 1 closed ("cl: OFF")
The mixer in heating circuit 1 can automatically close more if you need it to. Behind the switch state "cl.: OFF" you can close the mixer in manual mode (**page 28, top**).

10: Heating circuit mixer 2 open ("Misch.Hzkr2")
The mixer in heating circuit 2. For an explanation, refer to output 8.

11: Heating circuit mixer 2 closed ("cl: OFF")
The mixer in heating circuit 2. For an explanation, refer to output 9.

12: Requirement boiler ("Req.Burner")
The automatic firing system of the boiler receives a signal to start the boiler when there is a need for heat and the unit is set to "AUTO/..." (**section 9.9**).

13: Charging pump ("**Load pump**")
Pump for charging the SolvisStrato buffer tank by external boiler. The after run was set to 2 min in the factory and can be set (in "Technician" mode) under "Outputs" – "13: LOAD PUMP" – "AFTER RUN:".

14: "Data line"
For connection of a data logger or bootloader.

15: "Analog output"
Modulation signal 0 to 10 V for gas or oil boiler.

Technician

11.1.3 Overview of functions

Fct.-no.	Function	Description
1	COMPARISON COMP.	Enable for solar circuit. Prevents steam from forming in the secondary circuit.
2	SOLAR CONTROL SOLAR1	Enables switch-on of solar pump in primary circuit, temperature comparisons, maximum temperatures (**page 54**).
3	PID CONTROL PID SOLAR1	Controls the speed of the solar pump in the primary circuit (**page 50**).
4	COMPARISON DIFF. FUNCT	Checking Solar VL1 larger buffer ref. + hysteresis as enable for the solar pump in the secondary circuit (**page 50**).
5	PID CONTROL PID SOLAR2	Controls the speed of solar pump in the secondary circuit (**page 50**).
6	PID CONTROL PID SOLAR3	Frost protection function for the secondary solar circuit (**page 41**)
7	TIMER FUNCT. TIMER 1	90 second start-up of the solar pump at maximum speed level 30.
8	START FUNCTION SOL START	Start-up of solar pump with vacuum tube collectors (**page 58**).
9	FUNCTION CTRL CONTROL SOL	Performs delta-T check in the solar circuit ("Warning dT Solar", **page 22**).
10	WW REQUIREMENT WW_REQ1	Hot water requirement at burner (**page 42**)
11	WW REQUIREMENT WW_REQ2	Hot water requirement at burner for enlarged hot water buffer (**page 44**)
12	CIRCULATION WW-PROD	Hot water ("WW") standby function, control of WW pump A2 with WW standby.
13	CIRCULATION WW-DRAW	Hot water tapping function, control of WW pump A2 with WW tapping process.
14	LOGIC FUNCTION OR 1	Evaluates the status of "WW-PROD" and "WW-DRAW" to enable "HYG WW PR." function.
15	PID CONTROL HYG WW PR.	Speed control of hot water pump (**page 51**).
16	CIRCULATION CIRCU	Circulation function switches the circulation pump A5 (**page 46**).
17	HEAT CIRC.CONT HEAT CIRC.1	Heating circuit control for mixed heating circuit 1 (**page 33**).
18	HEAT CIRC.CONT HEAT CIRC.2	Heating circuit control for mixed heating circuit 2 (**page 41**).
19	MIXER CONTROL Mixt Ctrl1	Controls the mixer for the floor drying function.
20	ANALOG FUNCT. MAX(AN)	Evaluates the higher flow target temperature from heating circuit 1 and 2, "Floor Dry" as well as swimming pool to pass it on to the "REQ. Heating" function.
21	REQ. HEATING HEAT. REQ	Heating requirement at burner (page 51).
22	PROFILE FUNCT Floor Dry	Activation and setting of a floor drying program for mixed heating circuit 1 (**page 59**).
23	WW REQUIREMENT WW_REQ3	Sets the target temperature and heating times for a swimming pool. **Setting on page 13, description of function on page 45.**
24	COMPARISON DIFF. FUNCT1	Enables swimming pool pumps, if: HPo > "T.FL.TARGET" + 7 K. Switch-off: HPo ? "T.FL.Soll" + 4 K.
25	COMPARISON DIFF. FUNCT2	Enables swimming pool pumps, if: "WW_REQ." and "HEAT-REQ." on "OFF" and HPo > "T.swimming pool" + 5 K. Switch-off: HPo ? "T. swimming pool" + 2 K
26	COMPARISON DIFF. FUNCT3	Enables swimming pool pumps, if S1 > "T.WW.REQ.1" + 19 K. Switch-off: S1 ? "T.WW.REQ.1" + 16 K.
27	COMPARISON DIFF. FUNCT4	Enables swimming pool pumps, only if simultaneously in effect: HPo > "T.WW.NOM" + 2 K. Switch-off: HPo < "T.WW.Nom."

Fct.-no.	Function	Description
28	COMPARISON DIFF. FUNCT.5	Enables swimming pool pumps only if "T.swimming pool" is 1 K less than target temperature. Setting the target temperature: **"WW_REQ.3" on page 13**
29	LOGIC FUNCTION AND 1	Switches on swimming pool pump if "DIFF.FUNCT.1" to "DIFF.FUNCT.5" are met (= only with stored solar heat).
30	HEAT QUANT. HQC SOLAR	Heat quantity counter in secondary solar circuit (**page 47**).
31	LOAD PUMP LD PUMP 2	Controls switching swimming pool pump on or off with conventional auxiliary heating.
32	COMPARISON MAX. FUNCT	Monitors the maximum temperature of the S1 storage tank (max. 95°C, **page 23**).
33	ANALOG FUNCT. SUM 1	Sets target temperature of solar pumps (= "T.WW.NOM" + 7 °K) to compensate performance losses in the **secondary** solar circuit
34	ANALOG FUNCT. SUM 2	Sets target temperature of solar pumps (= "Result: SUM 1" + 5 °K, = = "T.WW.NOM" + 12 K) to compensate performance losses in the **primary** solar circuit
35	MAINTENANCE CH.SWEEP	Starts burner for chimney sweep (**page 32**).
36	LOGIC FUNCTION OR 2	Enables function "ANALOG 1" if there is a heating requirement.
37	ANALOG FUNCT. ANALOG 1	Determines the temperature for output A15 (analogue output, **page 25**). Requirement temperature plus various offsets for each type of requirement.

Technician

11.1.4 Technical data

Electrical connection	
Mains voltage	230 V/50-60 Hz
Microfuse	6.3 A/230 V fast-acting
Ambient temperature	0 to 45°C
Power consumption	Approx. 5 W (in slumber mode, without pumps)
Timer function without power supply	Approx. 1-2 days

Sensors and display	
Temperature sensor type	PTC 2 kOhm (all sensors except S5 and S6: PT 1000)
Temperature display	-50 to +199°C
Display resolution	0.1 K
Measurement accuracy	Typically 0.4 and max. ± 1°C in 0 to 100°C range

Sensor and function check	
Display "9999"	Sensor not connected, sensor (cable) breakage
Display "999"	Sensor (cable) short circuit

Inputs and sensor positions	
S1: Temperature sensor	Upper buffer (on cable harness, included in delivery)
S2: Temperature sensor	Hot water sensor (included in delivery)
S3: Temperature sensor	Storage tank reference (on cable harness, included in delivery)
S4: Temperature sensor	Upper heating buffer (on cable harness, included in delivery)
S5: Temperature sensor	Solar flow, secondary (cable harness FKB-SÜS)
S6: Temperature sensor	Solar return, secondary (cable harness FKB-SÜS)
S7: Temperature sensor	Solar flow, primary (cable harness FKB-SÜS)
S8: Temperature sensor	Collector temperature (FKY 5,5)
S9: Temperature sensor	Lower heating buffer (on cable harness, included in delivery)
S10: Temperature sensor	Outdoor temperature (optional)
S11: Temperature sensor	Temperature of circulation return (optional)
S12: Temperature sensor	Heating flow, heating circuit 1 (optional)
S13: Temperature sensor	Heating flow, heating circuit 2 (optional)
S14: Temperature sensor	Return temperature hot water heat exchanger
S15: Volume flow measuring unit (impulse input)	Volume flow in secondary solar cycle (optional)
S16: Temperature sensor	Room sensor, alternative: Swimming pool water temperature

Outputs	
A1: Primary swimming pool pump and contactor (parallel)	Switch output 230 V/max. 0.7 A
A2: Hot water production pump [1]	Speed controller, wave packet, 230 V, max. 1.7 A
A3: Heating circuit pump, heating circuit 1 (optional)	Switch output 230 V/max. 3 A
A4: Heating circuit pump, heating circuit 2 (optional)	Switch output 230 V/max. 3 A
A5: Circulation pump (optional)	Switch output 230 V/max. 3 A
A6: Solar circuit pump, primary (optional) [1]	Speed controller, wave packet, 230 V, max. 1.7 A
A7: Solar circuit pump, secondary (optional) [1]	Speed controller, wave packet, 230 V, max. 1.7 A
A8: Heating circuit mixer, heating circuit 1 open	Switch output 230 V/max. 3 A
A9: Heating circuit mixer, heating circuit 1 closed	Switch output 230 V/max. 3 A
A10: Heating circuit mixer, heating circuit 2 open	Switch output 230 V/max. 3 A
A11: Heating circuit mixer, heating circuit 2 closed	Switch output 230 V/max. 3 A
A12: Heating requirement, burner	Switch output 230 V/max. 3 A
A13: Charging pump	Switch output 230 V/max. 3 A
A14: Data transfer	Switch output floating max. 230 V / 3 A
A15: Analogue output	Modulation 0 to 10 V for gas or oil boiler (**page 25**)

Interfaces	
DL	Connection for data line, 2-wire
CAN BUS	Connection for data line, 4-wire
Infrared IR	Data transfer to the controller front (e.g. bootloader)

⚠️ [1] No electronically controlled pumps (e.g. WILO E series, Grundfos UPE, etc.) or pumps with 3-phase motors may be connected to the speed-controlled outputs.

11.2 Resistance measurement values of the temperature sensors

Temperature [°C]	Resistance [W]		Temperature [°C]	Resistance [W]	
	PTC (2 kOhm)	PT 1000		PTC (2 kOhm)	PT 1000
0	1,630	1,000	80	2,980	1,309
10	1,772	1,039	90	3,182	1,347
20	1,922	1,078	100	3,392	1,385
25	2,000	1,097	110	3,607	1,423
30	2,080	1,117	120	3,817	1,461
40	2,245	1,155	130	3,915	1,498
50	2,417	1,194	140	4,008	1,536
60	2,597	1,232	150	4,166	1,573
70	2,785	1,271			

The sensor values can be checked if a defective sensor is suspected. Unconnected sensors have resistance values that are shown in the table at different temperatures. These can be checked with an ohmmeter.

Sensor types and their application:

• **PTC (2 kOhm):**   All sensors except the solar flow and return

• **PT 1000:**   Solar flow and return

11.3 Power consumption SolvisDirekt system

Control	SolvisControl system controller
Electrical voltage supply	230 V AC/50 Hz
Maximum power consumption hot water station [W]	132
Maximum power consumption solar heat exchange station [W]	250
Maximum power consumption heat circuit pump 1 [W]	100
Maximum power consumption heat circuit pump 2 [W]	100
Maximum power consumption swimming pool pump* [W]	100
Maximum total power consumption [W]	682

* The secondary swimming pool pump is operated by a contactor.

Technician

11.4 Connection diagram for SolvisControl control board

Inputs
S1 Sensor buffer upper
S2 Sensor hot water
S3 Sensor storage tank reference
S4 Sensor heating buffer upper
S5 Sensor solar flow, secondary (opt)
S6 Sensor solar return, secondary (opt)
S7 Sensor solar flow, primary (opt)
S8 Sensor solar collector (optional)
S9 Sensor heating buffer lower
S10 Sensor outdoor (opt ona)
S11 Sensor drinking water circuit on return
S12 Sensor heating circuit 1 flow
S13 Sensor heating circuit 2 flow
S14 Sensor hot water return
S15 Volume flow encoder solar cr (opt)
S16 Sensor room heating circuit 1 / Pool

Outputs
A1 Pump swimming pool, primary, sluice secondary (opt ona)
A2 Pump hot water production
A3 Pump heating circuit 1
A4 Pump heating circuit 2
A5 Pump circulation
A6 Pump solar circuit, primary (opt)
A7 Pump solar circuit, secondary (opt)
A8 Mixer heating circuit 1 open (opt)
A9 Mixer heating circuit 1 closed (opt)
A10 Mixer heating circuit 2 open (opt)
A11 Mixer heating circuit 2 closed (opt)
A12 Signal heat requirement burner (floating)
A13 Pump charging
A14 Data transfer (DL)
A15 Analogue output (0 - 10 V)
CAN-BUS not used

Heat requirement Burner (floating)

File: Wiring plan SD
Status: 17 May 2010

Mains
230 VAC,
50 HZ

230 VAC

S 6.3AM

S1 Ribbon cable for the cover board of the SolvisControl system controller

analogue 0 to 10 V power modulation to automatic firing system at gas/oil burner

Mains switch

to sensor cable harness SR
(8-wire)

to sensor cable harness SÜS
(10-wire)

SOLVIS

11.5 System diagrams

SolvisDirekt system with SolvisControl system controller, two storage tanks, two mixed heating circuits and optional swimming pool

Optional: Connection of a swimming pool (on site)

Pool

S16

TWC
TWC
TWW

A5

S11

WWS-36
SIv, 10 bar

S16
S10

RK-SC-SD 2

T_{max}

A2

S14   S2

SR-xxx
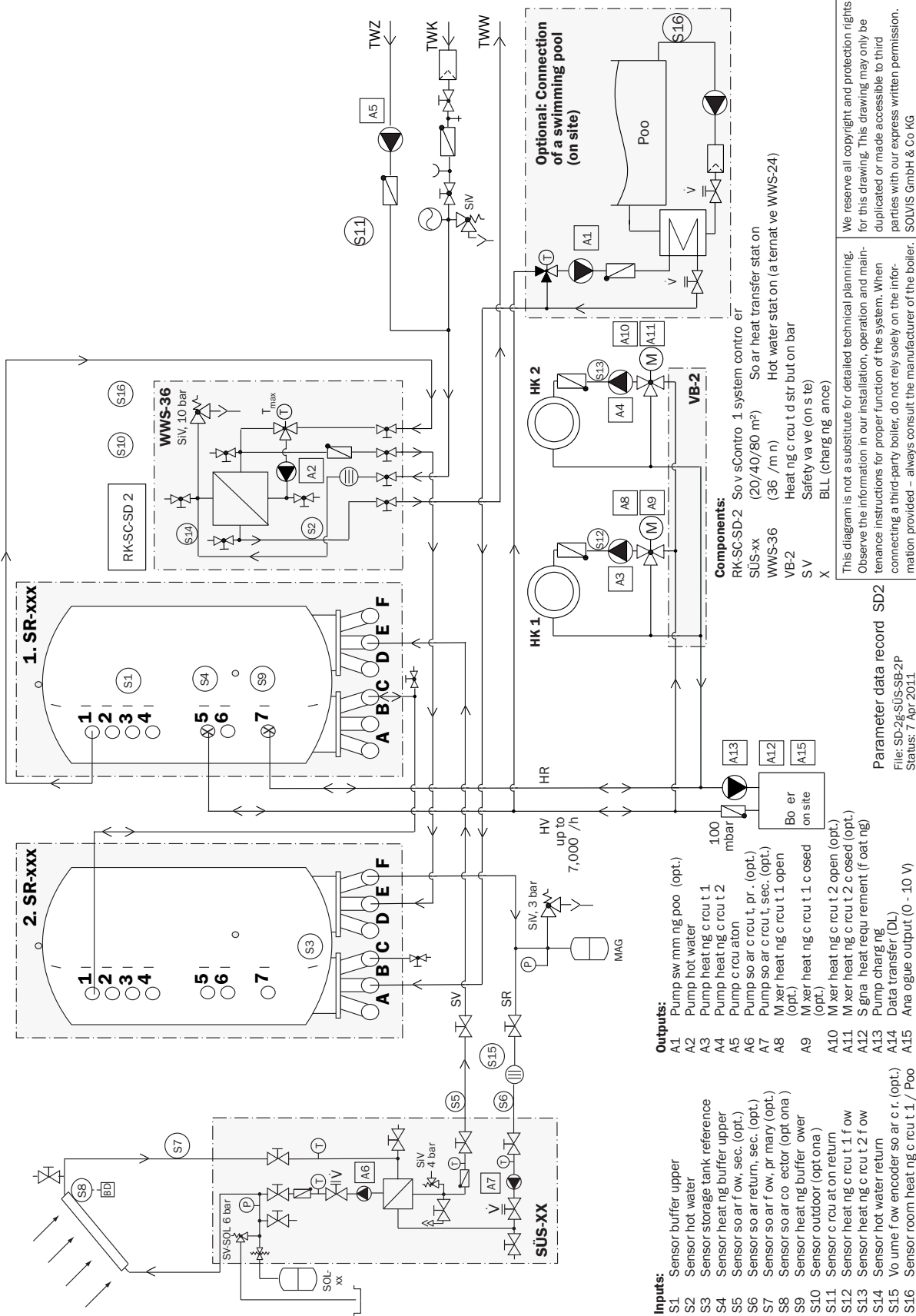
S1 S4   S9   S3

1 2 3 4   5 6   7

A B C D E F

up to 7,000 l/h

HC 2

S13   A10 A11
A4   M   VB-2

HC 1

S12   A8 A9
A3   M

A13   A12 A15

100 mbar

Boiler on site

HR

SV

SR

HV

SIv, 3 bar

P

MAG

S15

S5

S6

S7

S8   BD

SV-SOL 6 bar

SÜS-XX

SIv, 4 bar

A6

A7

P

SOL-xx

Components:

RK-SC-SD-2	SolvisControl 1 system controller
SÜS-xx	(20/40/80 m²) Solar heat transfer station
WWS-36	(36 l/min) Hot water station (alternative WWS-24)
VB-2	Heating circuit distributor on bar
SV	Safety valve (on site)
X	BLL (charging balance)

This diagram is not a substitute for detailed technical planning. Observe the information in our installation, operation and maintenance instructions for proper function of the system. When connecting a third-party boiler, do not rely solely on the information provided – always consult the manufacturer of the boiler.

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Parameter data record SD2
File: SD-2g-SÜS-SB-1P
Status: 7 Apr 2011

Inputs:

S1	Sensor buffer upper
S2	Sensor hot water
S3	Sensor storage tank reference
S4	Sensor heating buffer upper
S5	Sensor solar flow, sec. (opt.)
S6	Sensor solar return, sec. (opt.)
S7	Sensor solar flow, primary (opt.)
S8	Sensor solar collector (optional)
S9	Sensor heating buffer lower
S10	Sensor outdoor (optional)
S11	Sensor circulation return
S12	Sensor heating circuit 1 flow
S13	Sensor heating circuit 2 flow
S14	Sensor hot water return
S15	Volume flow encoder solar cr. (opt.)
S16	Sensor room heating circuit 1 / Pool

Outputs:

A1	Pump swimming pool (opt.)
A2	Pump hot water
A3	Pump heating circuit 1
A4	Pump heating circuit 2
A5	Pump circulation
A6	Pump solar circuit, pr. (opt.)
A7	Pump solar circuit, sec. (opt.)
A8	Mixer heating circuit 1 open (opt.)
A9	Mixer heating circuit 1 closed (opt.)
A10	Mixer heating circuit 2 open (opt.)
A11	Mixer heating circuit 2 closed (opt.)
A12	Signal heat requirement (float ng)
A13	Pump charging
A14	Data transfer (DL)
A15	Analogue output (0 - 10 V)

SOLVIS

System diagram SolvisDirekt system with SolvisControl system controller, two mixed heating circuits with optional swimming pool

Optional: Connection of a swimming pool (on site)

Pool

1. SR-xxx

2. SR-xxx

WWS-36
SIV, 10 bar

RK-SC-SD 2

HK 2

HK 1

VB-2

SÜS-XX

SOL-xx

SV-SOL 6 bar

SIV, 4 bar

SIV, 3 bar

MAG

Bo er on site

100 mbar

HR

HV up to 7,000 /h

TWZ

TWK

TWW

SiV

Components:

RK-SC-SD-2	So vsContro 1 system contro er	
SÜS-xx	(20/40/80 m²)	So ar heat transfer stat on
WWS-36	(36 /m n)	Hot water stat on (a ternat ve WWS-24)
VB-2		Heat ng c rcu t d str but on bar
S V		Safety va ve (on s te)
X		BLL (charg ng ance)

Inputs:
S1 Sensor buffer upper
S2 Sensor hot water
S3 Sensor storage tank reference
S4 Sensor heat ng buffer upper
S5 Sensor so ar f ow, sec. (opt.)
S6 Sensor so ar return, sec. (opt.)
S7 Sensor so ar f ow, pr mary (opt.)
S8 Sensor so ar co ector (opt ona)
S9 Sensor heat ng buffer ower
S10 Sensor outdoor (opt ona)
S11 Sensor c rcu at on return
S12 Sensor heat ng c rcu t 1 f ow
S13 Sensor heat ng c rcu t 2 f ow
S14 Sensor hot water return
S15 Vo ume f ow encoder so ar c r. (opt.)
S16 Sensor room heat ng c rcu t 1 / Poo

Outputs:
A1 Pump sw mm ng poo (opt.)
A2 Pump hot water
A3 Pump heat ng c rcu t 1
A4 Pump heat ng c rcu t 2
A5 Pump c rcu aton
A6 Pump so ar c rcu t, pr. (opt.)
A7 Pump so ar c rcu t, sec. (opt.)
A8 M xer heat ng c rcu t 1 open (opt.)
A9 M xer heat ng c rcu t 1 c osed (opt.)
A10 M xer heat ng c rcu t 2 open (opt.)
A11 M xer heat ng c rcu t 2 c osed (opt.)
A12 S gna heat requ rement (f oat ng)
A13 Pump charg ng
A14 Data transfer (DL)
A15 Ana ogue output (0 - 10 V)

Parameter data record SD2
File: SD-2g-SÜS-SB-2P
Status: 7 Apr 2011

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11.6 Circuitry of the burner requirement

1. Version

Auxiliary heating contact on boiler requires 230 V voltage signal:

In this case, you have to put a wire jumper between the "L" and "T1" contacts on output 12 of the SolvisControl mains circuit board (**figure on right**).

In addition to the safety equipment in the boiler, you can install an additional safety temperature monitor or safety temperature limiter at the "ST" connection.

⚠ Never use the 230 V voltage from the T2 contact as a voltage supply for the boiler's automatic firing system. The safety measures in the boiler would be by-passed and there would be no switch-off safety in case of a malfunction.
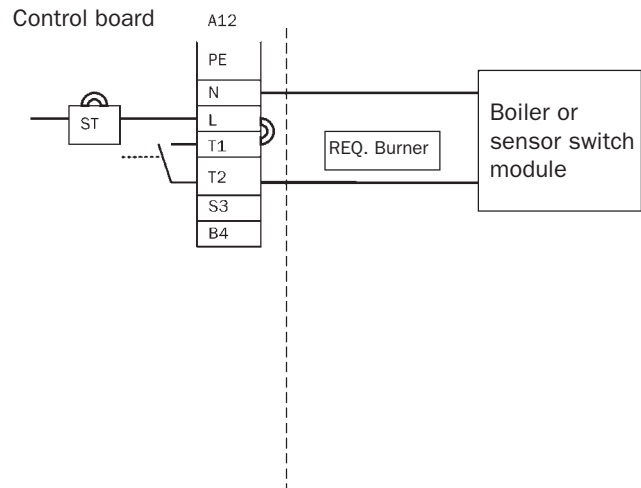
Boiler connection with 230 V voltage signal

2. Version

Auxiliary heating contact on boiler requires a floating contact:

You must remove the wire jumper mounted on the "ST" contact (**figure on right**). This keeps the switch contact between the T1 and T2 contacts a sufficient distance away from the 230 V strip conductors.
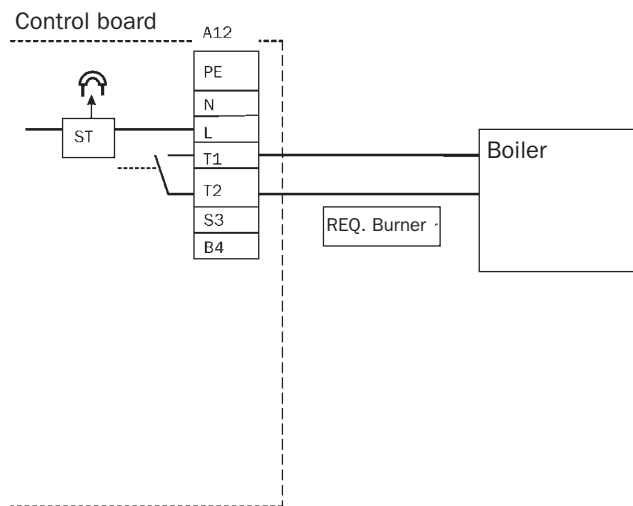
Boiler connection with floating contact

3. Version

Modulating boiler with temperature controlled by 0-10 V interface:

The boiler connection for modulating boilers with (0 to 10 V) can be implemented using analogue output A15 (**see page 70**).

Technician

Transfer of the boiler flow temperature to modulating boilers

The required boiler flow temperature is output as an analogue voltage signal (0 to 10 volts) with function 39 via analogue output A15 to a modulating boiler.
Analogue output 15 must be set with the corresponding scaling in the "Outputs" menu according to boiler type and manufacturer.

Standard settings for scaling:
The factory-set controller scaling is the scaling for a standard boiler
150 scale divisions (15°C) is assigned
0.6 V and 900 scale divisions (90°C) is assigned 10.0 V.
The relationship of the voltage signal to the boiler flow temperature is shown in the adjacent diagram.
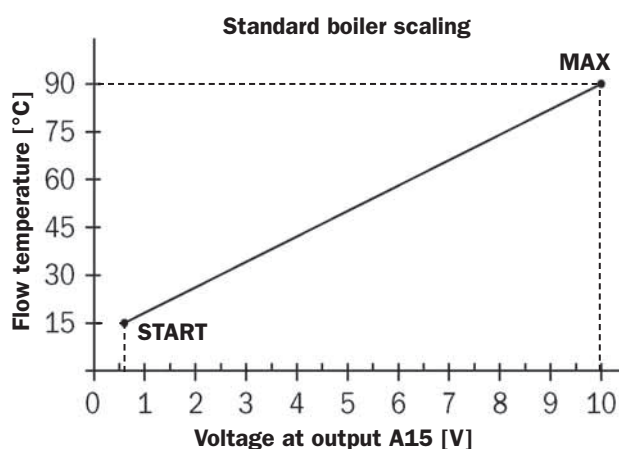
Setting the scaling:
The appropriate values must be taken from the specific data provided by the boiler manufacturer, as shown in the adjacent sample table or the diagram above.

Standard boiler scaling

Scale divisions	Flow temperature [°C]	Input voltage [V]	Boiler status
	—	0.0	Off
150	15	0.6	On/START
	50	5.0	On
900	90	10.0	On/MAX

Flow temperature specifications for standard boilers

Use the adjacent table to enter the values determined by the boiler manufacturer.
The scaling is then set according to these values.

Scale divisions	Flow temperature [°C]	Input voltage [V]	Boiler status
			Off
			On/START
			On
			On/MAX

Flow temperature specifications for other boiler manufacturers

You can only change the scaling in the "Expert" operating mode. To do so, use Code 0128 (see **page 26**).

In the function overview, press the "SERVICE" button. In the main menu, select the "Outputs" entry by turning and pressing the rotary wheel. In the Outputs menu, position the pointer on "PAR?" beneath the entry "15: Analog output" and press the rotary wheel. In the menu that then appears, turn the rotary wheel until the pointer is at the corresponding parameter values (figure on right). Press and turn the rotary wheel to change parameters. Press the rotary wheel again to save the value that you set. Press the "BACK" button several times to return to the function overview.

Scaling output A15

12 Index