Users manual

TERRA-HGL-Heatpump

TERRA
heatpump

Expenditure Sept 2005
TERRA-HGL_ Bedienung_Sept05-engl.cdr

Content

1. general information

With the acquisition of this plant you have decided yourself for a modern and economic heating system
Regular quality controls and improvements,
as well as functional tests in the factory, guarantees
a technically faultless device.

Read these documents attentively.
You will contain important notes and for the sure and economical operation of the plant.

Tip for security:

Installation and maintenance can involve dangers by high Plant pressures, high temperatures and voltage-carrying Parts and being and must be done by experts.
Heat pumps may only be installed by competent experts and put into operation only by a company which is trained by IDM energy systems GmbH

For work on the heat pump all safety data in the corresponding documents, the sticker at the heat pump itself and all the other safety regulations have to been observed.

Transport:

By transport, never incline the thermal pump more then 15°.
The transportation packing should be removed just after the thermal pump is positioned at the place of installation.

Sound emission:

Terra heat pumps are very quiet in operation due to their construction.
Nevertheless it is important that the heating room should be positioned outside of sensitive to noise
living quarter and should be provided with a well closing door closing.

Drying of subfloor or carcass:

The heat pump isn't setup for the increased need of heat for drying subfloor or carcass.
This must be done by equipment specially designed for this task.

Service and maintenance:

A regular maintenance as well as a check and
Care of all important plant parts guarantees at last a safe and thrifty operation of the plant.
We recommend a contract for maintenance.

Cleaning:

If required, the Terra heat pump can be cleaned with a damp cloth. The use of cleansers is not recommended.

Correct EC guidelines

EC machine guideline (89/392/EEC)
EC low voltage guideline (73/23/EEC)
EC-EMV guideline (89/366/EEC)

Correct harmonized EN

EN378
EN60529
EN292/T1/T2
EN294
EN349
EN60335 1/2-40
EN55014
EN55104

Correct national norms/guidelines

ÖNORM M7755 2 (Austria)

Important safety reference:

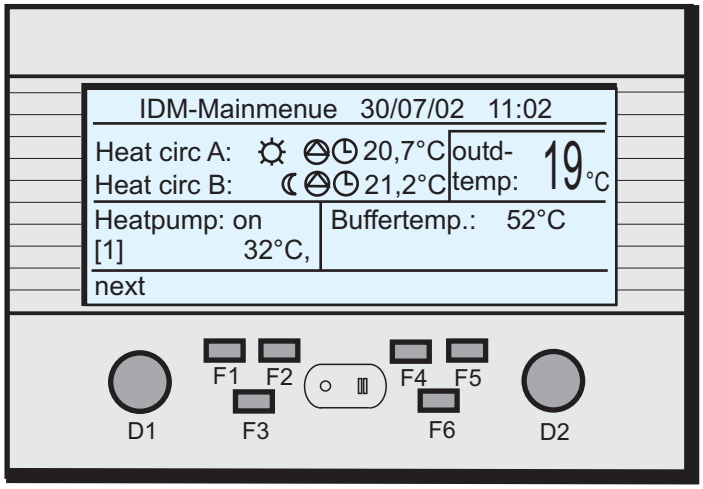
The heat pump is filled with refrigerant. This
Cryogen is non-poisonous and not combustible.

In case of damage however, refrigerant is could flow out of the plant, and could cause superseding of
oxygen.
Due to open fire, toxic disintegration products can arise

By leaving refrigerant (smell) leave the installation site
immediately leaving and close the door.
Contact the customer service.
Works at and in the equipment are permitted only for authorized experts

Reference to disturbances and error messages see Page 20.

2. General Operation



Description of Turnkey and funktion keys

Turnkey D 1 sets:

- Change of room temperature inHeat circuit A and/or B out of the main menu
- "Home"-key (press) out of all other menus

Turnkey D 2 sets:

- Choose a menue point through turning and pressing (= Cursor funktion).
- Change and save Data through turning and pressing
- Display the Cursor through pressing.

Funktion key F 1:

Loading the standard program

Funktion key F 2:

"Help"-key: Nearley every Menue has a Help. To leave the Help press key D1.

Announcements status report from the main menue, if the cursor is not visible (see page 27).

Funktion key F 3:

reserved for the maintainance (fundamental settings), pin secured.

Funktion key F 4:

Chimney cleaning Function, also Fast heating Function

Funktion key F 5:

Immediate storage charging. The storage will be charged at any time without changing the Charging time program.

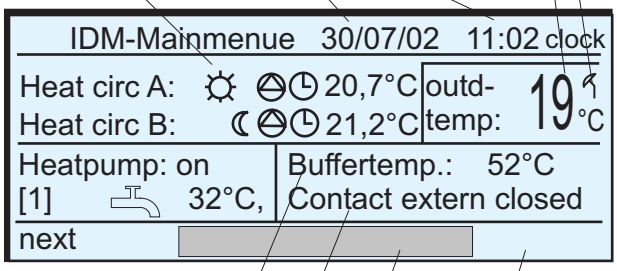
Funktion key F 6:

Display Submenue of Temperatures, Running time, Switch impulses, Running mode, emergancy run, Bath Summer mode and Machine Data.

Terms, which are <u>underlined</u>, are more near described on page 28!

<u>Note:</u> In principle all attitudes on the regulation can be accomplished through turn and press of the right turn-key D2 to.

3. The Display in the Main menu



Sunshade is displayed in Summer-mode

Shows the actual outside temperature

Shows the Day and Time

Shows the heating circuit operation mode:

Heating Circuit Operation with Nominaltemp.

Heating Circuit Operation with temperature saving

Pump in operation

Heat Circuit Operation in Heating program

21,7°C Shows the measured room temperaturewith attached ambient temperature feeler for each heat circuit. If no space temperature sensor is attached or no space influence defined, 0,0°C is indicated here..

Announcement of the current heat pump status (in/out), the heat pump stage ([1] and ev. [2]), and of the Heatpump temperature.
"Tab" is shown if buffer is loading for domestic water

Indicate to the buffer temperature (feeler 6), if an appropriate feeler is attached.

Announcement "contact externally closed", if this contact is used and is closed. With open telephone contact the field is empty. To use of the contact see description of function.

Error messages appear in the grey deposited field in the display. Closer description see page 24.

If a heating circle runs in the cooling-mode, appears here "cool"

Note: If the regulation is not served longer than 1 minute in a submenu , the announcement jumps again in the main menue (excluded with announcement of the temperatures)

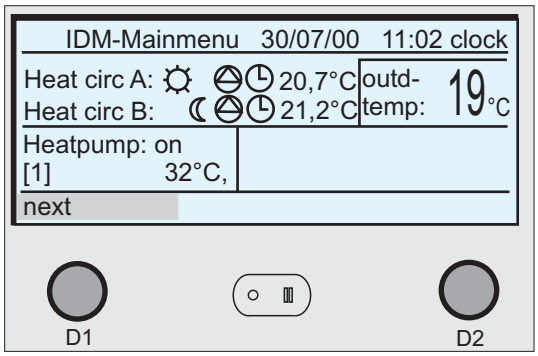
Explanation of the indication symbols:

Turnkey D1 press confirms inputs

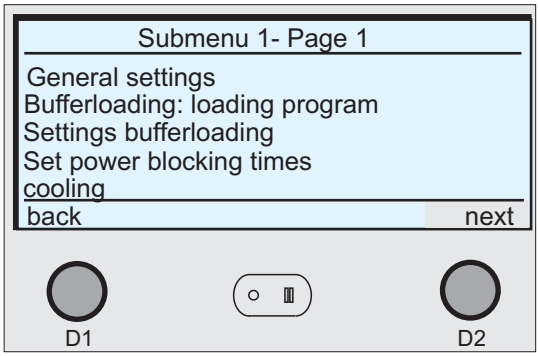
Turnkey D1 turn around the cursor to place and/or to change attitudes

Applies also to Turnkey D2!

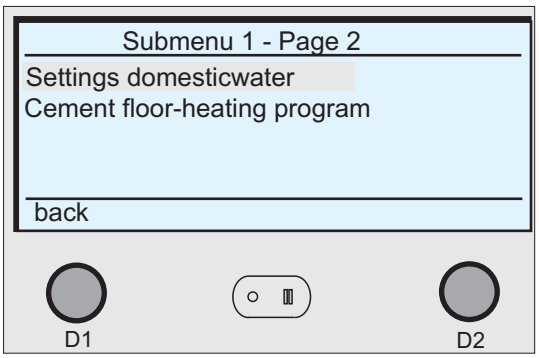
4. Set Tap water temperature



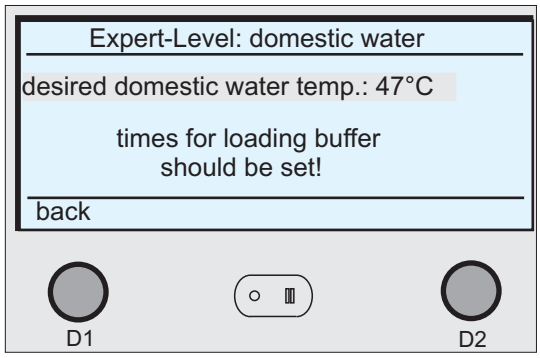
1. D2
2. D2 next D2



3. D2
4. D2 next D2



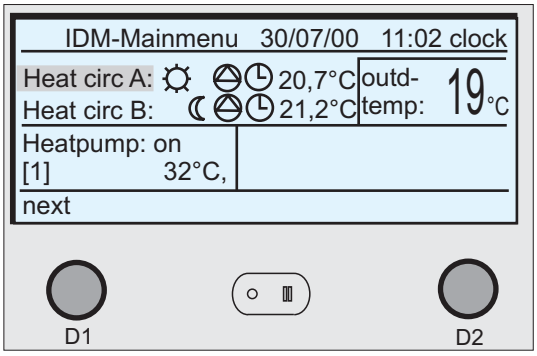
5. D2 Settings domesticwater D2



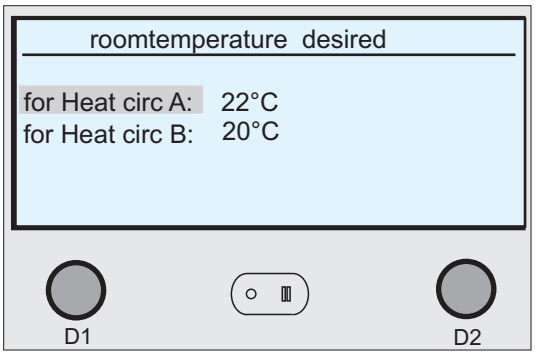
6. D2
7. D2 desired domestic water temp.
8. D2 47°C D2
9. D2 back

Note: Consider during attitude of the desired water temperature that also the memory load time should be accordingly changed.

5. Desired room temperature (Nominaltemperatur) desire - Version 1

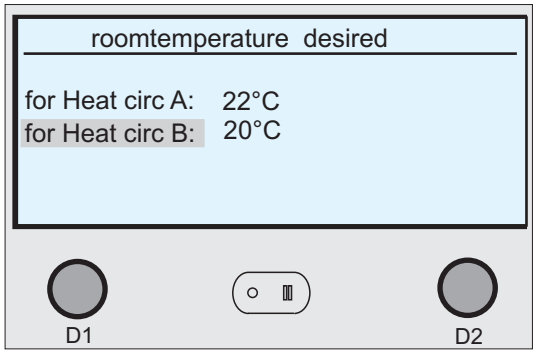


1. D1



2. D1 for Heat circ A:

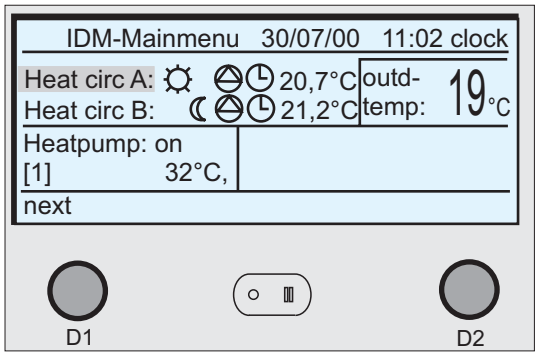
3. D1 21°C



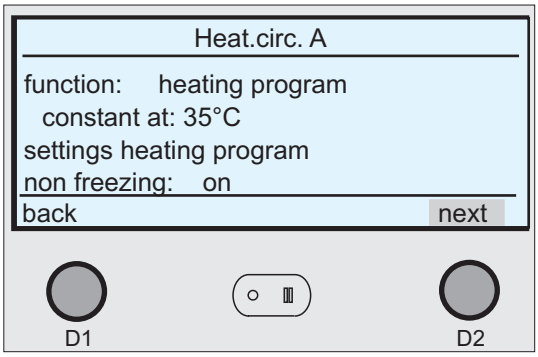
4. D1 for Heat circ B:

5. D1 19°C D1

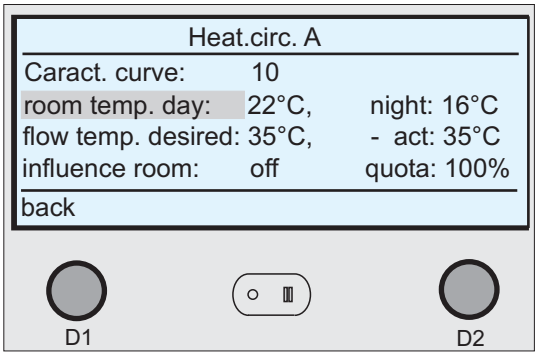
6. Desired room temperature (Nominaltemperatur) desire - Version 2



1. D2
2. D2 Heat circ A / B: D2



3. D2
4. D2 next D2

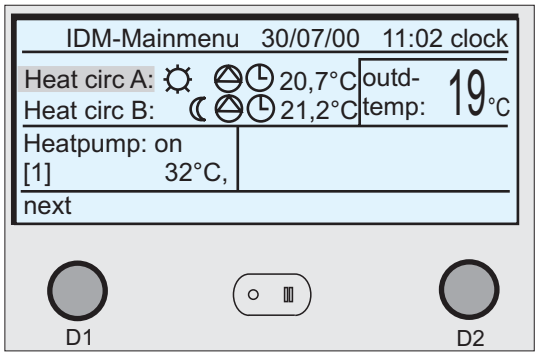


5. D2
6. D2 room temp. day D2
7. D2 20°C
   D2 night D2
8. D2 8°C D2
9. D2 back D2

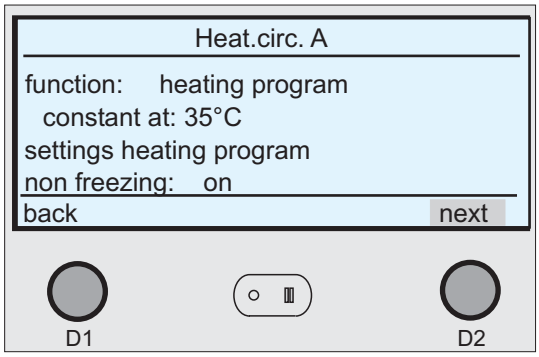
The temperature “Night” sets the night and out of Heating periods temperature (“always low level”)

Note: If you set the night temperature on 8°C, the heating circuit will be switched off during the night. Except for “Non freeze function”.

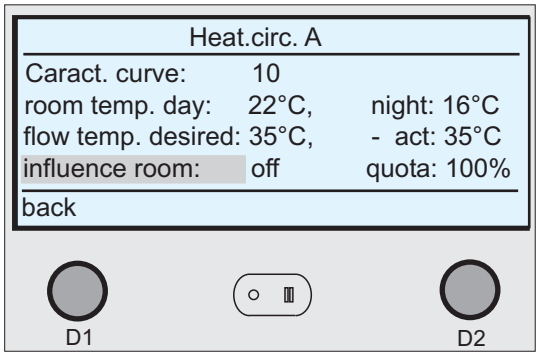
7. Room influence setting



1. D2
2. D2 Heat circ A / B: D2



3. D2
4. D2 next D2



5. D2
6. D2 influence room D2
7. D2 on
   D2 quota D2
8. D2 98% D2
9. D2 back D2

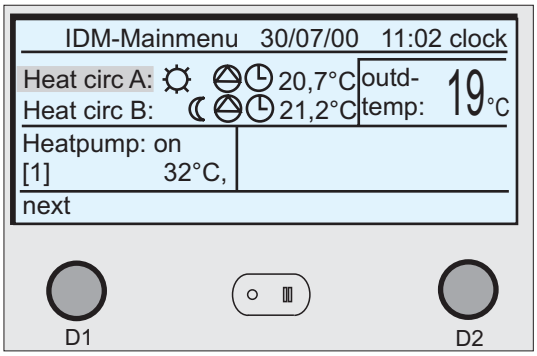
Under “Quota” you can set how strong the control should react onto the room temperature:

- Influence small (<100%) small influence of room temperature onto the heating
- Influence big (>100%) big influence of room temperature onto the heating

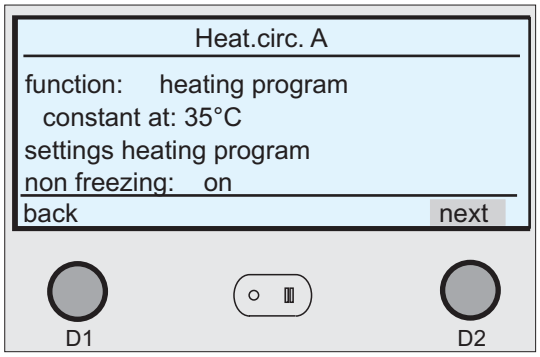
If the room sensor is inside a room with an extra heat source, (e.g. stove) you should set a small quota. The room temperature of that room effects all the other rooms connected to the heat circuit

Note: The room influence can only be switched on if it’s switched on in the service menu

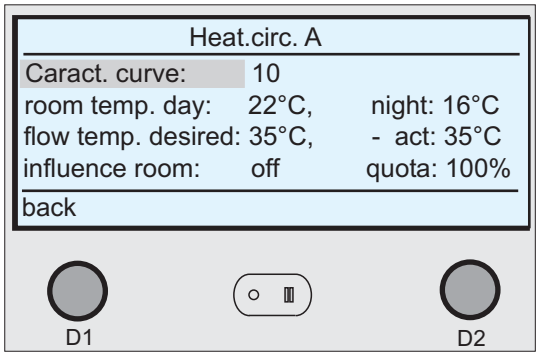
8. Characteristic Curve Settings



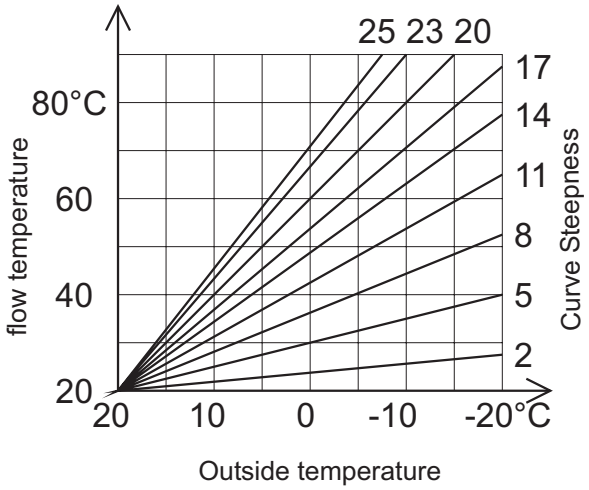
1. D2
2. D2 Heat circ. A / B: D2



3. D2
4. D2 next D2



5. D2 caract curve D2
6. D2 8 D2
7. D2 back D2

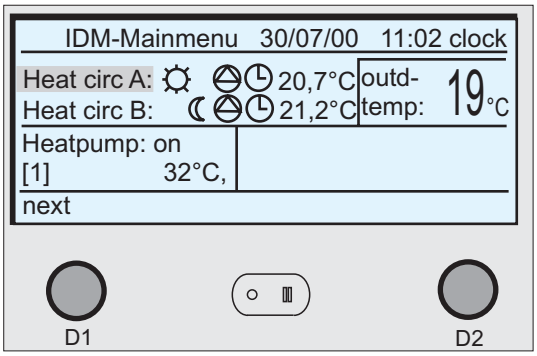


Note: If the appropriate heating circle is defined in the Service menue as floor or wall heating circle, can be adjusted with characteristic maximally 10!

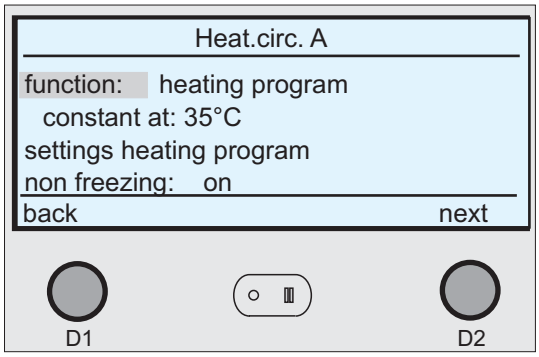
In accompanying diagram the characteristic is represented. The connection of the outside temperature with the necessary flow temperature is specified by the characteristic.

<u>Note:</u> For the correct attitude of the characteristic the interpretation of the heating must admit or must requested by the Installateur if necessary!

9. Set the operation mode of the Heating Circuits



1. D2
2. D2 Heat circ A / B: D2



3. D2 function D2
4. D2 always high level D2
5. D2 back D2

Heating program:

The Heating for Heat circuit A operate by the set Heat timing

- Always high level:

The Radiators for Heat circuit A operate always with nominal Temperature without a drop.

- Always low level:

The Radiators for Heat circuit A always operate with saving temperature.

- Constant temp:

The heating keeps a constant temperature that is set in the next line. Summer-Winter switching and the heating times have no effect

- Off:

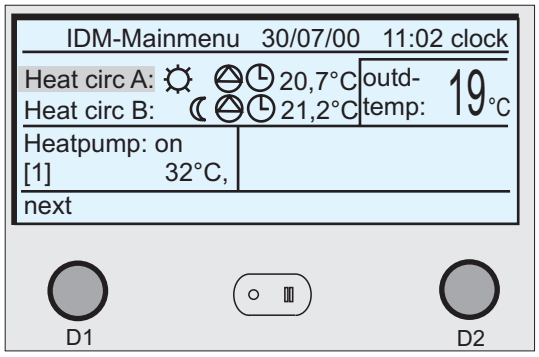
Heat circuit A is switched off. Except for Antifreeze function.

- cooling:

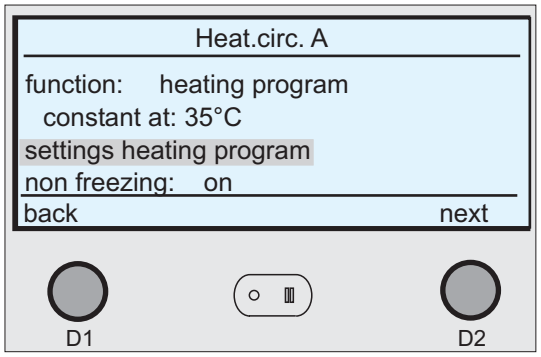
The heating circuit A runs in cooling operation. The temperature must be set for heat circuit A. The Mainmenu shows cooling and the pump for heat circuit A.

Note: In the case of use of the external contact the mode of operation of the heating circles, depending upon attitude in the specialist level, can depend on the switching status of the external contact, sees in addition the description of function.

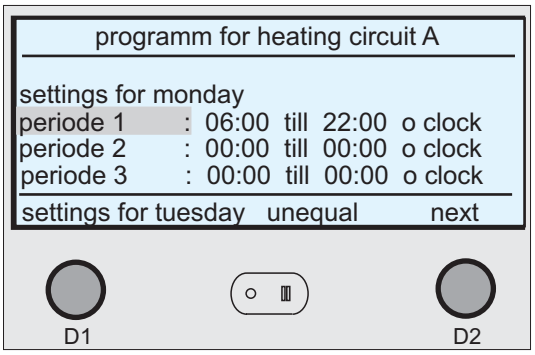
10. Heat program setting



1. D2
2. D2 — Heat circ A / B: — D2



3. D2
4. D2 — settings heat program
5. D2



6. D2
7. D2 — periode 1: — D2
8. D2 — 05:00 till 22:00 — D2
9. D2 — 06:30 till 22:00 — D2
10. D2 — 06:30 till 20:00 — D2
11. ...
12. D2 — settiings for tuesday
13. D2 — unequal
14. D2 — next — D2
15. ...
16. D1

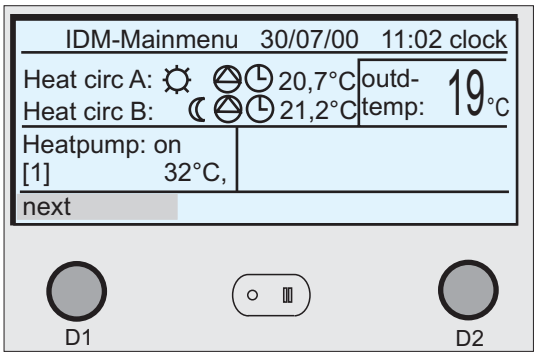
To copy the Heat Time from Monday to Tuesday:

The cursor position is onto “unequal”

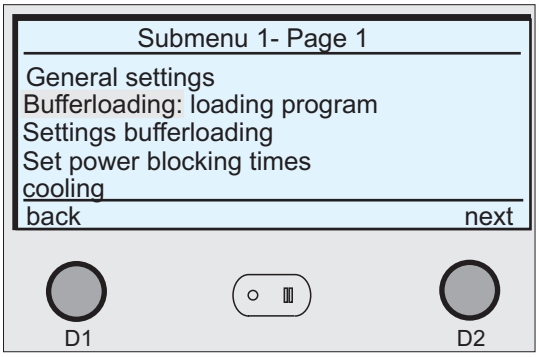
As soon the Heat times are copied to Tuesday it says “unequal” again

The Heat time copying from Tuesday to Wednesday and from Wednesday to Thursday, etc. is done in the same way like from Monday to Tuesday.

11. Mode of bufferloading



1. D2
2. D2 next D2



3. D2
4. D2 bufferloading D2
5. D2 loading program D2
6. D2 back D2

Bufferloading Settings

loading program:

The warm water storage is charged after the set loading times.

always on:

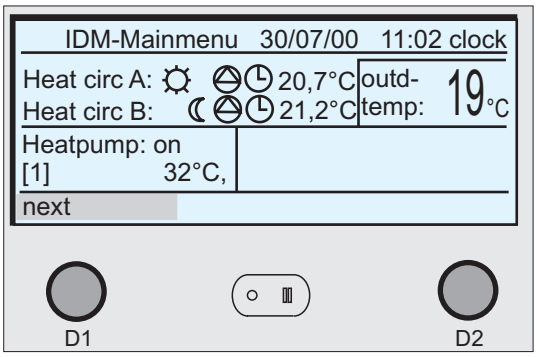
The buffertank will always be loaded as soon the buffer temperature is below the set Temperature.

- always off:

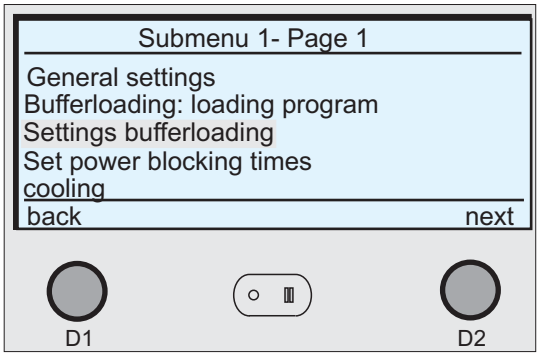
The buffertank is not been heated to provide warm water.

Note: In the case of use of the external contact the mode of operation of the heating circles, depending upon attitude in the specialist level, can depend on the switching status of the external contact, sees in addition the description of function.

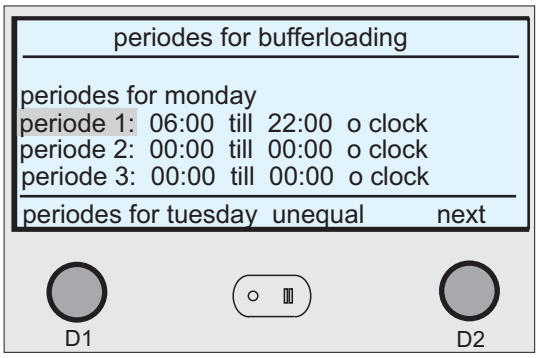
12. Heat program setting



1. D2
2. D2 Weiter D2



3. D2
4. D2 Settings bufferloading
5. D2



6. D2
7. D2 periode 1: D2
8. D2 05:00 bis 22:00 D2
9. D2 06:30 bis 22:00 D2
10. D2 06:30 bis 20:00 D2
11. ...
12. D2 periodes for tuesday
13. D2 unequal
14. D2 next D2
15. ...
16. D1

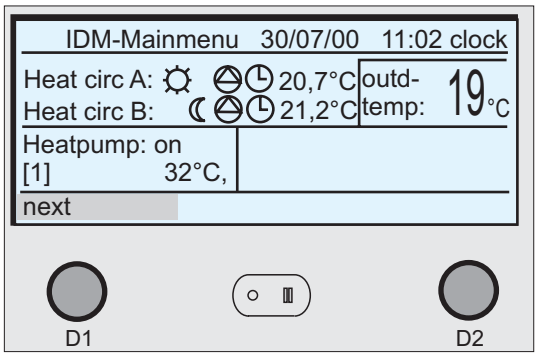
To copy the bufferloading time from Monday to Tuesday:

The cursor position is onto “unequal”

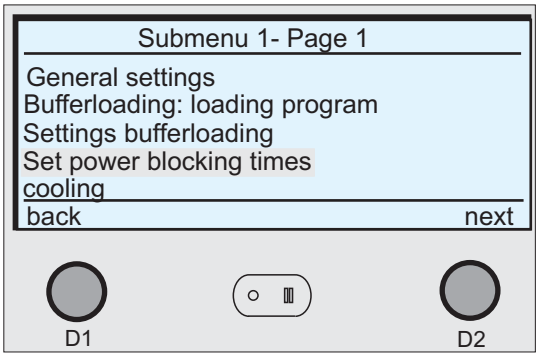
As soon the bufferloading times are copied to Tuesday it says “unequal” again

The bufferloading time copying from Tuesday to Wednesday and from Wednesday to Thursday, etc.is done in the same way like from Monday to Tuesday.

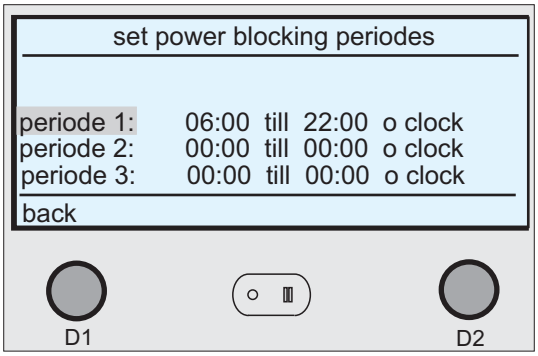
13. Setting power blocking times



1. D2
2. D2 next D2



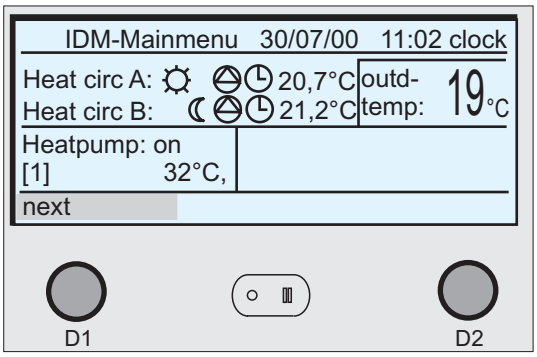
3. D2
4. D2 Set power blocking times
5. D2



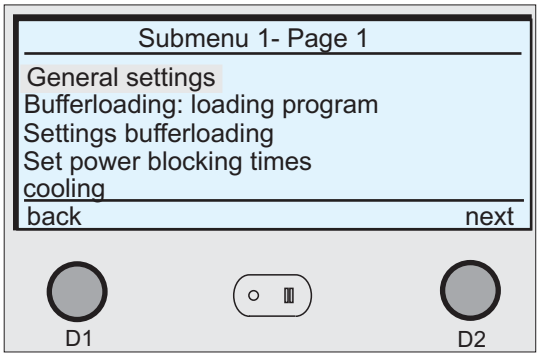
6. D2
7. D2 periode 1: D2
8. D2 05:00 bis 22:00 D2
9. D2 06:30 bis 22:00 D2
10. D2 06:30 bis 20:00 D2
11. ...
12. D2 back D2

<u>Note:</u> The set periodes are valid for every day and can not set indvidually.
During this periodes the heat pump and the pumps won´t operate.

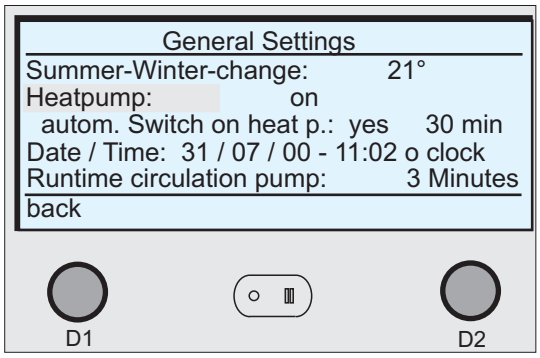
14. Heatpump connection



1. D2
2. D2 next D2



3. D2
4. D2 General Settings



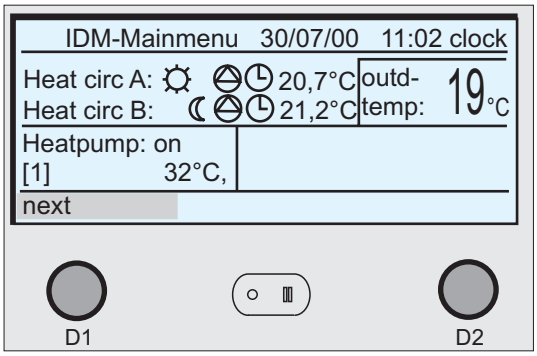
5. D2
6. D2 Heatpump D2
7. D2 on D2
8. D2 back D2

Heatpump connection:

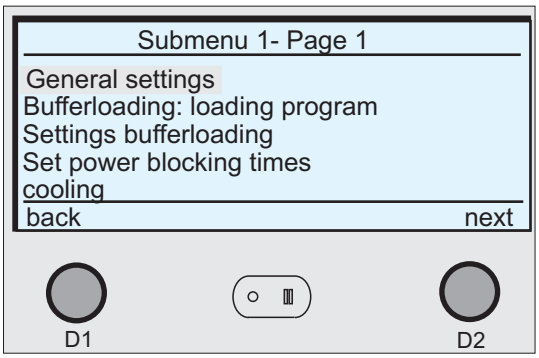
- **on:** The Heatpump is connected and will supply the buffertank and heating with warm water
- **off:** The heatpump is disconnected and won´t supply any warm water to the buffertank or into heating

Note: In the case of use of the external contact the heatpump connection, depending upon attitude in the specialist level, can depend on the switching status of the external contact, sees in addition the description of function.

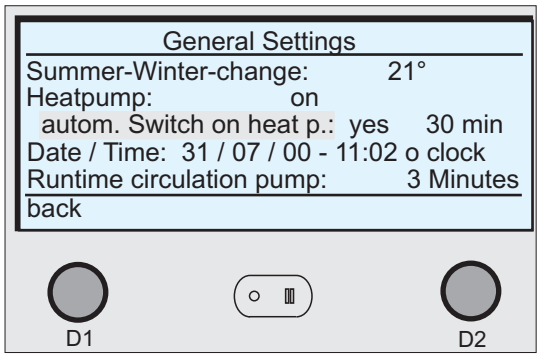
15. Automatic heatpump connection



1. D2
2. D2 next D2



3. D2
4. D2 General Settings

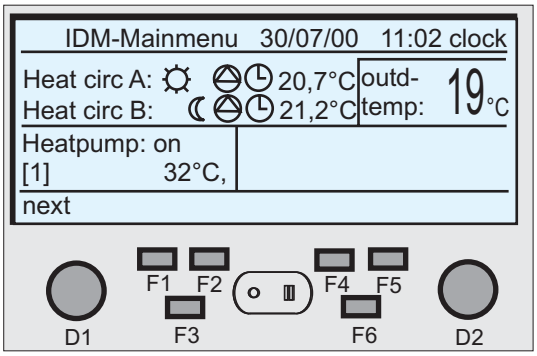


5. D2
6. D2 Autom. Switch on heat p.: D2
7. D2 Yes D2
8. D2 5 min D2
9. D2 back D2

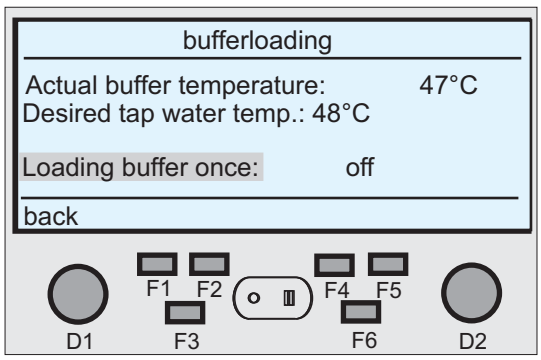
Automatic heatpump connection:

- **Yes:** The automation is switched on and the heat pump will supply the heating with warm water
- **no:** The automation is switched off and the heat pump won´t supply any warm water into the heating
- **time setting:** the engagement of the heat pump is retarded at the adjusted time (e.g. although a solar plant is present)

16. Loading buffer once



1. F5

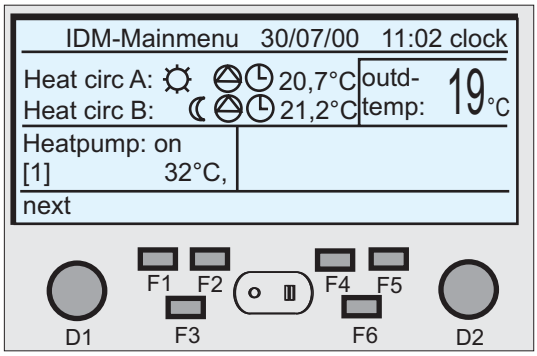


2. D2
3. D2 Loding buffer once
4. D2 off D2
5. D2 back D2

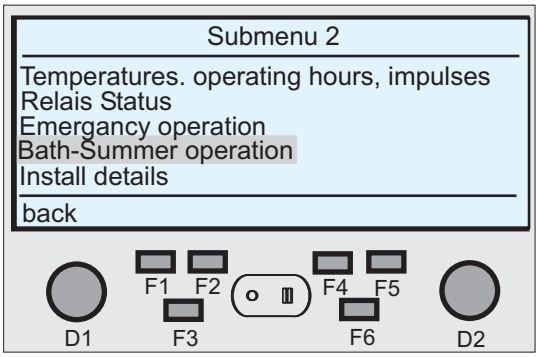
In the “bufferloading” window the actual and the desired temperature in the upper buffer are shown.

Note: The buffer loading once can just get activated if there is a heat pump connected.
The loading just starts if the actual temperature is below 46°C and the desired temperature. It stays activated until the actual temperature is 10°C above the set temperature, reaches 55°C or the heatpump is switched off by the max. temperature of the heatpump.

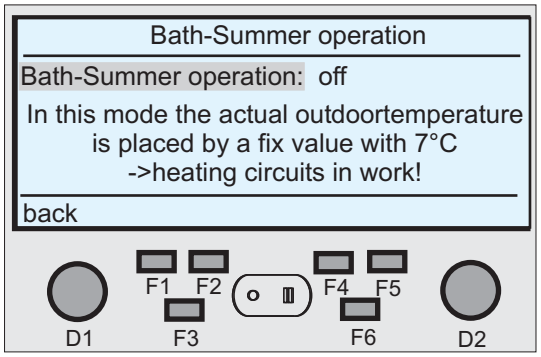
17. Activate Bath-Summer operation mode



1. F6



2. D2
3. D2 Bath-Summer operation: D2



4. D2
5. D2 Bath-Summer operation:
6. D2 off D2
7. D2 back

Note: The Bath- Summer operation mode sets the outside temperature onto constant 7°C.

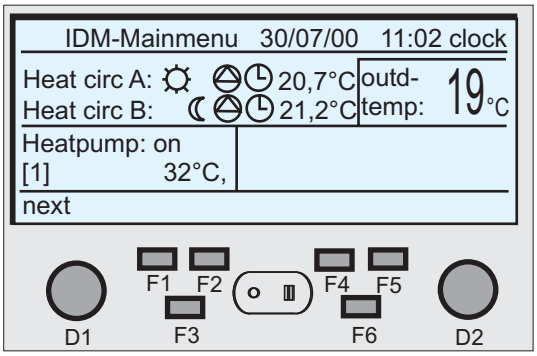
This makes it possible that you can use the Heating also during the summer.

Not used Heating circuits must be switched off.

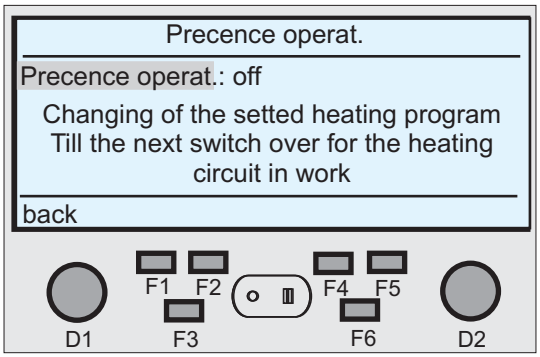
In the main menu and under the displayed Temperatures there are no temperatures shown.

All values are 0,0°C

18. Activate precence operation



1. F4



2. D2
3. D2 Presence operat.:
4. D2 off D2
5. D2 back

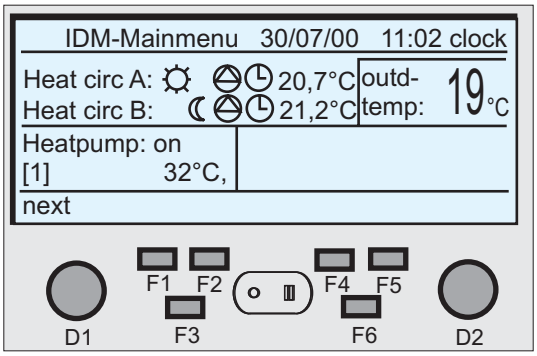
Note: The Bath- Summer operation mode sets the outside temperature onto constant 7°C.

This makes it possible that you can use the Heating also during the summer.

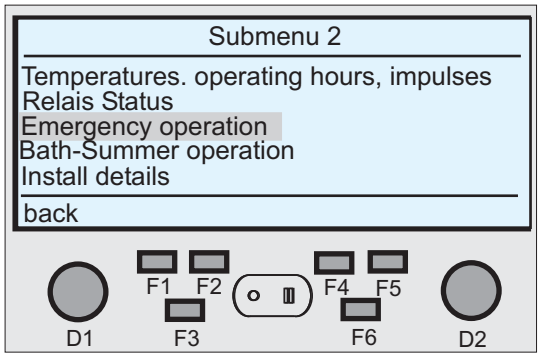
Not used Heating circuits must be switched off.

In the main menu and under the displayed Temperatures there are no temperatures shown.

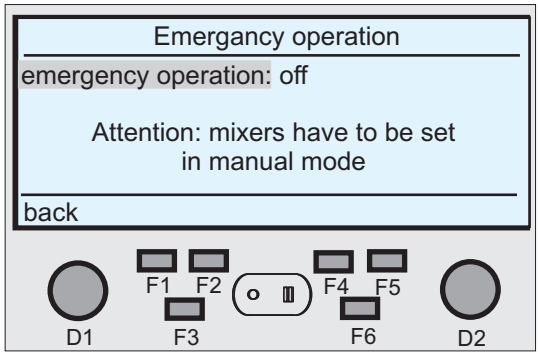
19. Activate emergency operation



1. F6



2. D2
3. D2 Emergency operation: D2

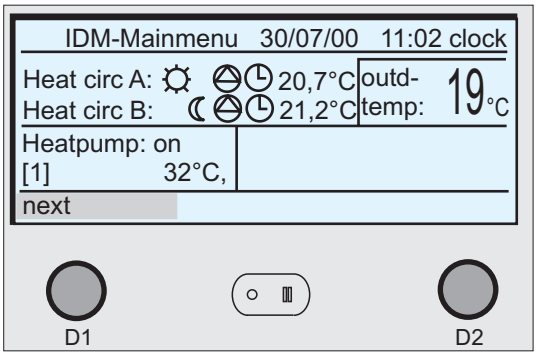


4. D2
5. D2 Emergency operation:
6. D2 off D2
7. D2 back

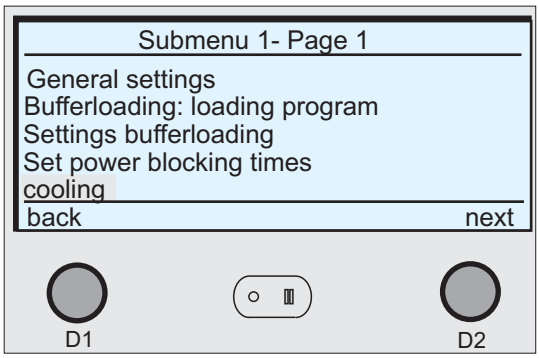
Note: In this function secures the heat supply, if e.g. a sensor is fefect.

Note: The emergency operation switches off as soon you leave the window.

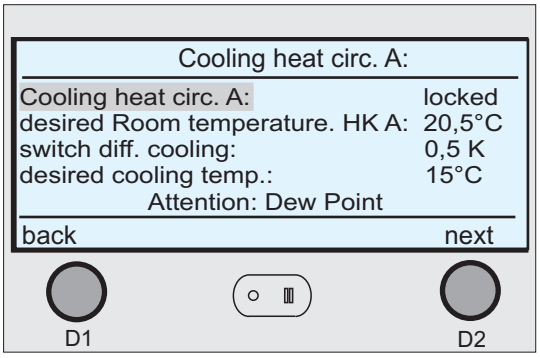
20. Cooling



1. D2
2. D2 Next D2



3. D2
4. D2 Cooling D2



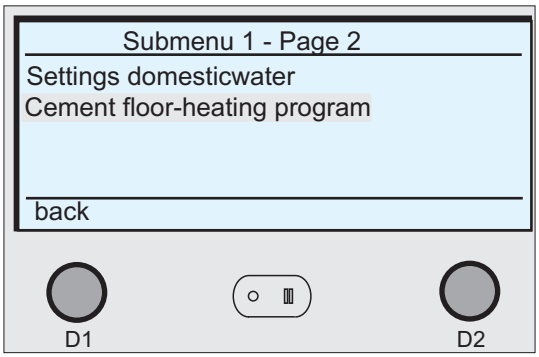
5. D2
6. D2 Cooling heat circ. A: D2
7. D2 locked D2
8. D2 next D2
9. D2
10. D2 Cooling heat circ. B: D2
11. ...

You also can set individual room temperatures for the heating circuits. The temperature is only valid for the cooling not for heating.

You can also set the switch differential and the min. temperature. The mixer mixes the flow temperature onto the min. temperature +2K!

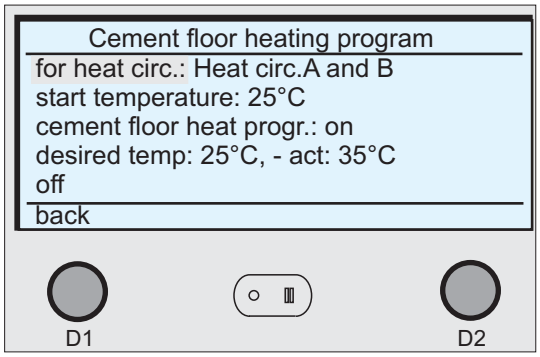
Hinweis: To use the cooling function you need to have a room sensor!

21. Cement floor heat program



Change as described under point 4 in the "Sub*menü 1 - Page 2*"

1. D2
2. D2 Cement floor heat. prog. D2



3. D2 for heat circ: D2
4. D2 heat circ A and B D2
5. D2 start temperature
6. D2 25°C D2
7. D2 Cement floor heat. prog.
8. D2 on D2
9. D2 back

Cement floor heating program:

The Cement floor heating program may be started according to DIN EN 1264-4 with Cementsceed at the earliest 21 days and with anhydride or calcium sulfatesceeds at the earliest 7 days after screed putting.

The desired heating circles are heated for 3 days with 25°C. Subsequently, the temperature is increased daily by 5°C, up to the adjusted maximum temperature of the heating circles. With this maximum inlet temperature the heating circles are heated for 4 days. At the end the flow temperature of the desired heating circles is lowered again around 5°C per day, to 25°C.

While the cement heating are the heating programs for the heating circles not actively, the heating circles become without sinking claimant.

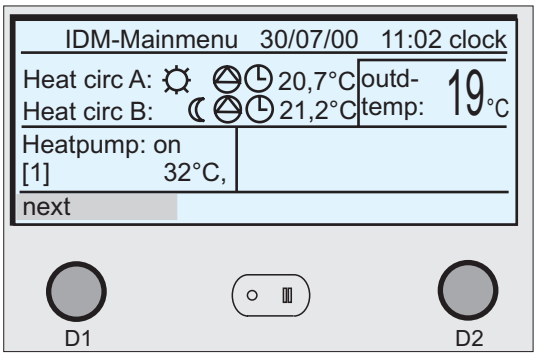
At the display in the window for the cement heating program the following data are indicated: Desired and actual flow temperature as well as operating status (heating phase, up heating phase, back heating phase, out).

Sufficient ventilation is important, But draft is to be avoided.

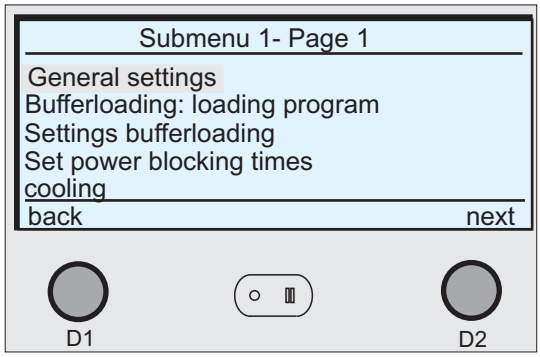
If necessary the cement floor heating program with an adjustable starting temperature can be started.

It is not guaranteed by the cement floor heating program that the screed achieved the moisture content necessary for the voucher-ripe!

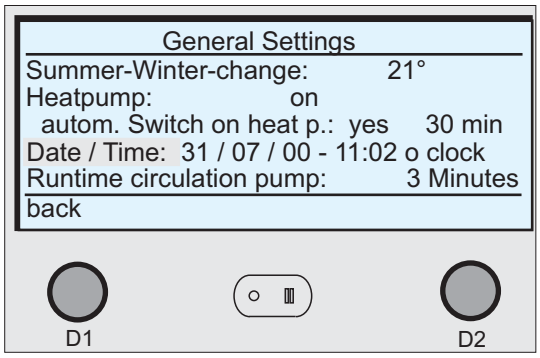
22. Date and time setting



1. D2
2. D2 next D2

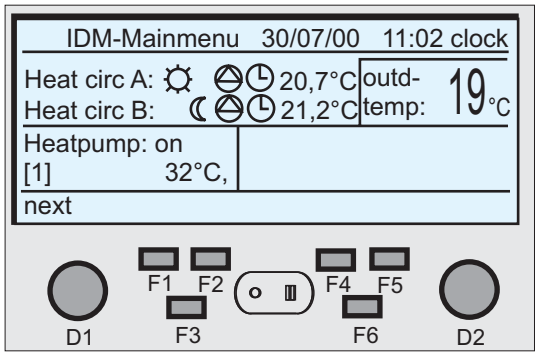


3. D2 General settings D2

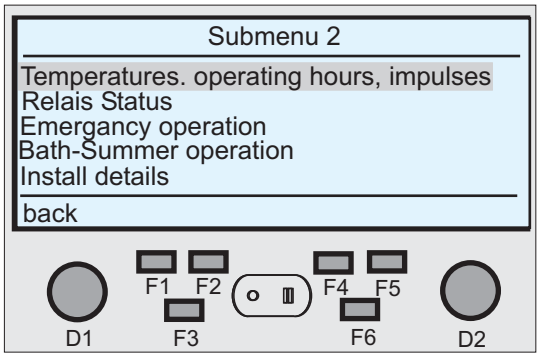


4. D2
5. D2 Date/Time
6. D2 29/06/00-11:02
7. D2 30/06/00-11:02
8. D2 30/06/00-11:02
9. D2 30/07/00-11:02
10. D2 30/07/00-11:02
11. D2 30/07/04-11:02
12. D2 30/07/04-11:02
13. D2 30/07/04-10:02
14 D2 30/07/04-10:02
15. D2 30/07/04-10:05 D2
16. D2 back D2

23. Display all temperatures

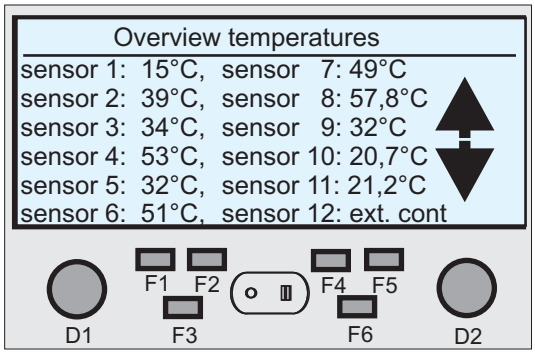


1. F6



2. D2

3. D2 Temperatures, operating hours...



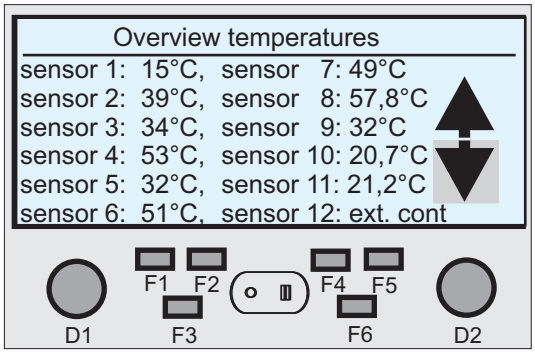
5. D2

6. D2 ↑

This window displays all temperatures
Fühler 1: outside
Fühler 2: flow heatpump
Fühler 3: return heatpump
Fühler 4: brine-/groundwaterreturn
Fühler 5: flow heat circuit A
Fühler 6: buffertemperature
Fühler 7: domestic water
Fühler 8: flow HGL
Fühler 9: flow heat circuit B
Fühler 10: room heat circuit A
Fühler 11: room heat circuit B
Fühler 12: ext. contact

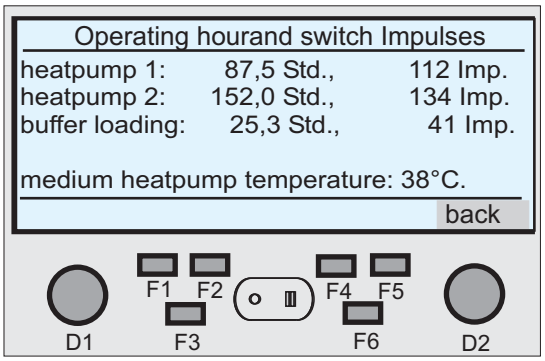
Note: The sensors 4, 6, 7, 9, 10 and 11 just shows a temperature if there is a sensor connected.
Sensor 12 always shows ext. cont.

24. Display operating hoers and Switch impulses



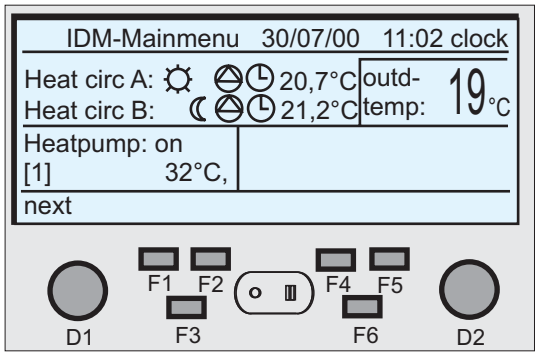
Go to the window “overview temperatures” as described in chapter 23.

1. D2
2. D2 ↓ D2

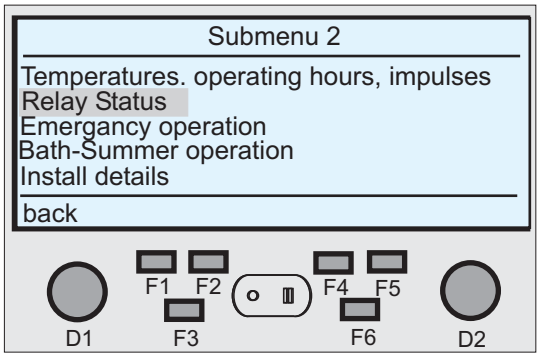


3. D2 back D2

25. Display relays status

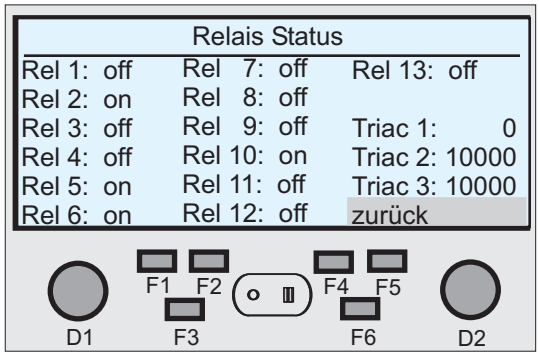


1. F6



2. D2

3. D2 Relay Status D2



4. D2

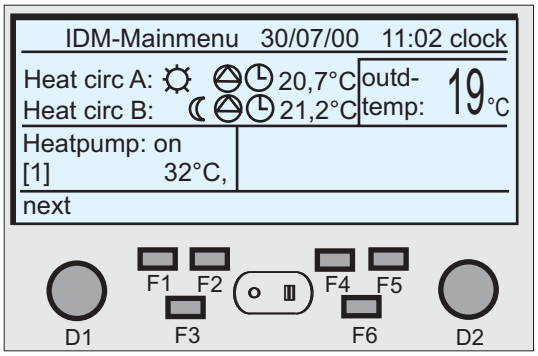
5. D2 back

Note: the triac1 to 3 are depending on the rpm.
Max rpm = 10000, 0 = off

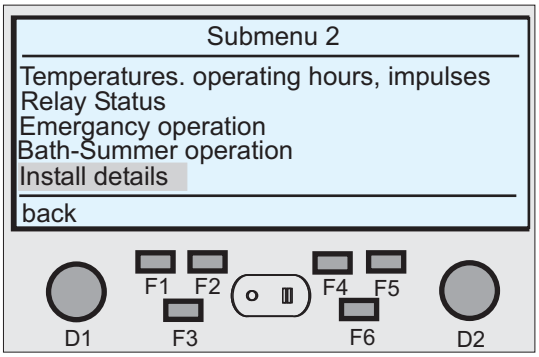
Here you can see all Relay positions:

Relay 1:	Brine-/Groundwaterpump
Relay 2:	Heatpump 1
Relay 3:	Mixer Heat circuit A - open
Relay 4:	Mixer Heat circuit A - close
Relay 5:	Heatpump 2
Relay 6:	Pump Heat circuit B
Relay 7:	Mixer Heat circuit B - open
Relay 8:	Mixer Heat circuit B - close
Relay 9:	cooling valve
Relay 10:	Mixer HGL - open
Relay 11:	Mixer HGL - close
Relay 12:	circulation pump
Relay 13:	error display
Triac 1:	exchanger pump (0 = off)
Triac 2:	loading pump (0 = off)
Triac 3:	pump heat circuit A (0 = off)

26. Display installation details

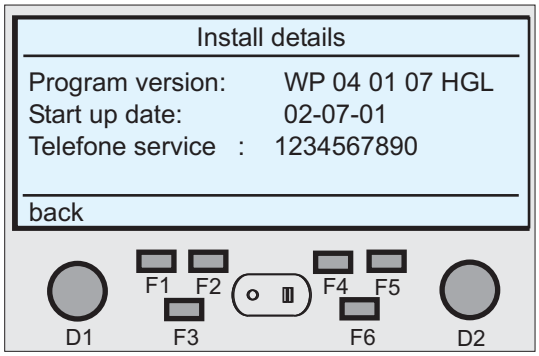


1. F6



2. D2

3. D2 Installation details D2



4. D2

5. D2 back

Following information are shown:

- program version
- start up date
- service telephone number

In case of a malfunction you can ring for service

27. Error Display

A Varity of errors can be recognised and displayed by the control unit..

The red LED shines in case of an error. The illustration shows the position of the displayed error.

Displayed Errors:

- "1" High pressure: The heat pump was switched off by the High pressure switch. At more than 3 switches off this way in 24 hours the heat pump is blocked and has to be switched off and back on by the main switch.

- "2" Low Pressure: The heat pump was switched off by the Low pressure switch. At more than 3 switches off this way in 24 hours the heat pump is blocked and has to be switched off and back on by the main switch.

- "3" Thermo relais error: The heat pump was switched off by the Thermo relay switch (Motor protection). At more than 3 switches off this way in 24 hours the heat pump is blocked and has to be switched off and back on by the main switch.

-"4" Ground water error: The Groundwater temperature is to low. After a temperature increase the Heat pump switches back on automatically.

- "5" Heat Pump power: The Heat pump is operating for more than 180 minutes without increasing the temperature. As soon the temperature increases the Heat Pump switches back on.

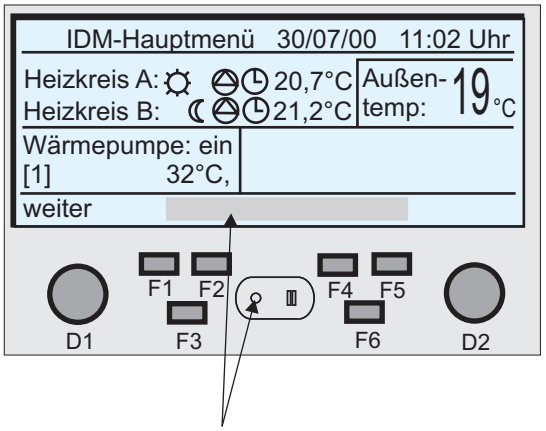
- "6" free

-"7" Sensor out of order: One of the necessary sensors is not working. You can find out which by going to "overview temperatures" (page 17)

- "8" check Heat Pump: The relation between operation hours and switch impulses is bad.

- "9" Gap: The gap between flow and return temperature of the heat pump is too big. Check mixers.

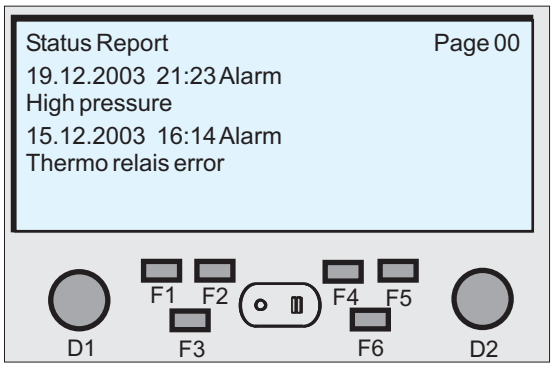
- "10" Heat Pump Over temperature: The heat pump was switched off by the Max. temperature threshold and will switch back on as soon the temperature reaches 49°C.



The red LED shines in case of an error.
The illustration shows the position of the displayed error..

NOTE:
The errors No. 1, 2 and 3 can be acknowledged by out and restarting of the heatpump. The announcement of the other errors expires, as soon as the error cause is eliminated.

In the "**status report**" the arisen errors can also later be queried. In addition in the main menue turn the cursor from the window and press the key F2. The status report remains also after switching off of the heatpump.



28. Glossary

Nominaltemperature: Desired temperature during the adjusted heat times (usually during the daily), standard attitude = 20°C..

Nominaloperation: The respective heating circuit is operated in such a way that in the appropriate areas the nominal temperature (computational) adjusts itself.

Nominaloperation time: That time, in which the nominal temperature for the heating is valid (standard: 6:00 till 22:00h)

Safetemperature: Desired room temperature out of the desired heating times (normally during the night), standard attitude = 16°C

Safeoperation: The respective heating circuit is operated in such a way that in the appropriate areas the nominal temperature (computational) adjusts itself.

Safeoperation time: That time, in which the save-temperature for the heating is valid. Can be adjusted not directly, but arises as a result of the attitude of the nominal operation time.

Heat program: In the heating program the nominal operating times are adjusted ,then also the saving periods of operation are specified defined. The heating program can be stopped for each heating circle separately.

Heat time: equal with nominaloperat time

Constanttemperature: Desired temperature for the adjusted heating circuit, indipendend from the temperature outdoor, from heatprogram and from Summer-Winter-change.

Caracteristic curve: Coleration between the outdoor temperature and the flow temperature from heating.

Curve steepness: Individual attitude of the heat curve, a higher attitude causes higher flow temperatures.

flow temperature: The temperature, the respective heat circuit is provided. Indipendedend from the function of the heat circuit(norm-, safe operation), from outdoor temperature, from the caracteristic curve and from the room influence.

Room influence: The acutal room temperature will be considered for the calculation of the flowtemperaure from the heating circuit
- room to warm: flowtemperature decrease
- room to cold: flowtemperature increase

Room influence -quota: A higher attitude, sets a stronger reaction of the control onto the room temperature

Buffer loading program: Times ,when the buffer will be loaded.

Buffer loading time: In this desired time the buffer will be loaded if necessary, out of this time it is not possible to charge the buffer.

Power blocking times: Some power suppliers block the main currency at different times. In this times the heat pump won´t operate. The times can be set, that the control reacts in the right way.