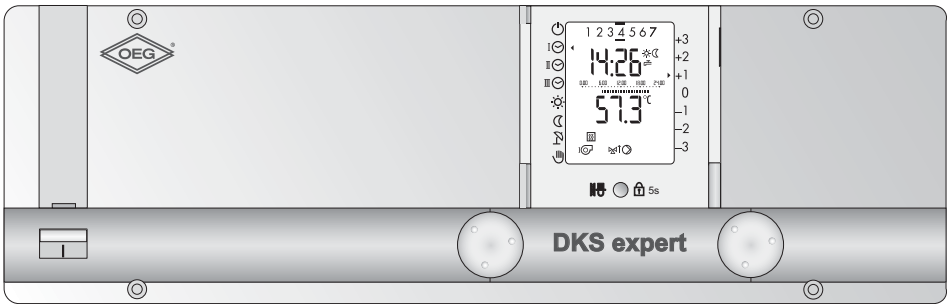
Boiler panel controller
DKS - classic
DKS - expert



Operating manual

Dok. Nr. 112818 31/2011

Dear User

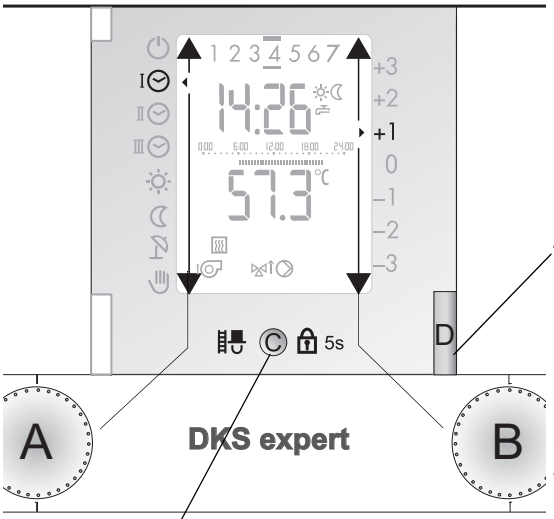
This programmable heating controller is a modern device with a variety of functions, enabling optimal operation of a heating system offering a very high degree of comfort. Most of the necessary settings are made by a technician before the heating controller is used for the first time.

For this reason, you, the **user** of the heating system, should not be intimidated by this comprehensive instruction booklet! All the information you need to operate the controller is in the first part of the booklet. You will find that operation of the device is simple and logical.

 **Please read first the "Safety instructions" on page 7.**

CONTROLS:

Functioning at User Level 1 (**front cover closed**)



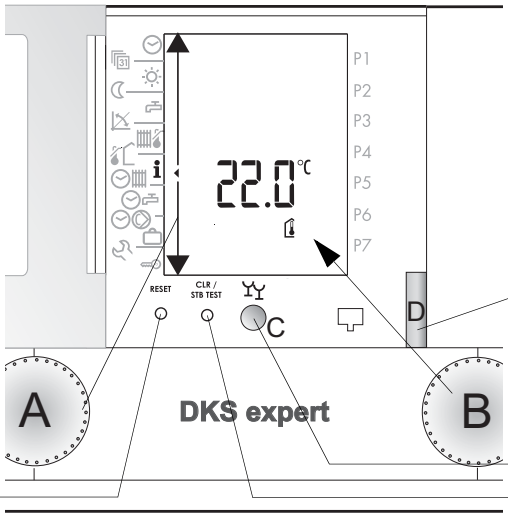
Toggle key D
heating circuits
(DKS expert only)

Selector knob A
Select
operating mode

Setting knob B
Adjust comfort
level

Key C
Technician key
Lock key

Functioning at User Level 2 (**front cover open**)



Toggle key D
heating circuits
(DKS expert only)

Selector knob A
Select functions

Setting knob B
Set and query
values

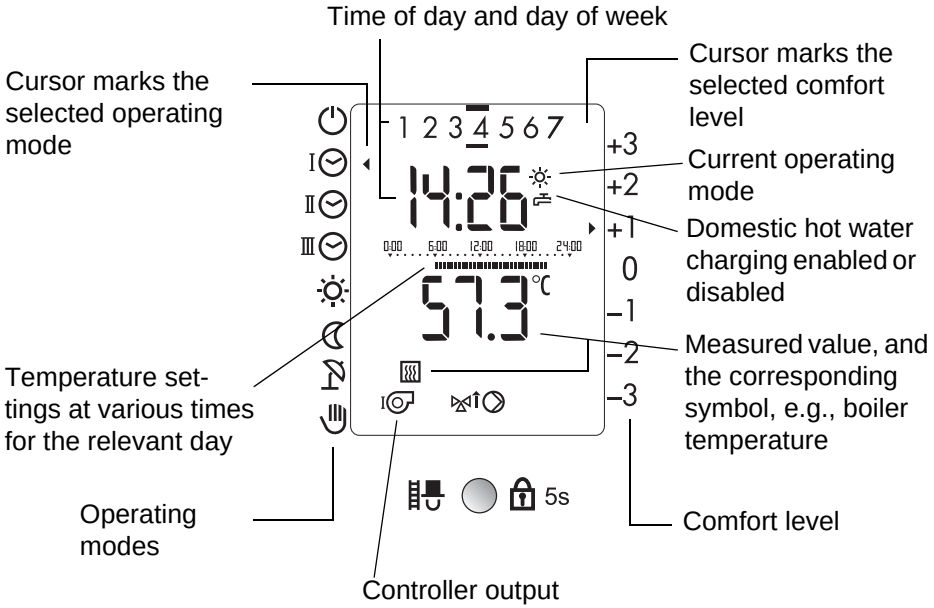
Party key C

RESET key

CLR key

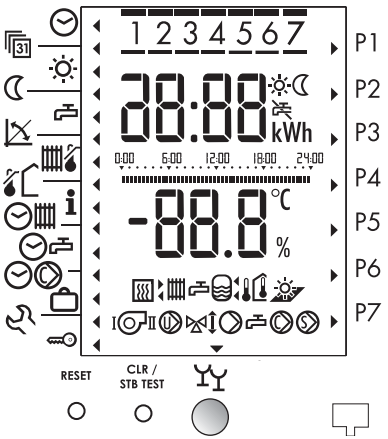
Overview of displays

The diagram shows a typical display in heating mode (Cover closed, User Level).



The diagram shows a display, with all the display symbols used for control. (cover open, User Level 2.).

DKS - classic DKS - expert



Contents

1 Safety instructions

Regulatory compliance and safety information
This programmable controller is a modern electronic device.

CE This equipment complies with the following EC Directives:
- 73/23/EEC "Low Voltage Directive"
- 89/336/EEC "Electro-Magnetic Compatibility (EMC) Directive", including amendment 92/31/EEC

The device is designed to be used with a heating appliance in accordance with the manufacturer's specifications.
No other type of usage is permitted.

Safety
This device uses state-of-the-art technology and conforms to the relevant safety regulations.

⚠ **Danger**
The device is electrically operated. Incorrect installation, or attempts by non-specialists to repair the device, may result in electric shocks, with fatal consequences. Installation and commissioning may be carried out only by appropriately qualified technical personnel. In general, the device and its accessories should not be opened up. Repairs should be carried out only by the manufacturer.

Instructions in this booklet that are marked with a warning symbol ⚠ must be observed.

2 Your heating controller

2.1 What the programmable controller does

When correctly programmed, the device works in conjunction with an appropriate heating system to ensure that heating to the required temperature occurs during the programmed time-intervals. The available boilers (different forms of energy) are used environmental carefully and efficiently according to the necessary heat requirement.

2.2 User settings

As user, you can make the following settings:

- 3.1 Selecting a heating circuit (two heating circuits), page 10
- 3.2 Selecting an operating mode, page 11
- 3.3 Adjusting room temperature heating operations, page 12
- 3.4 Locking, page 12
- 4.1 Switching on the party function, page 15
- 4.2 Setting the time (clock), page 16
- 4.4 Setting the room temperature heating mode, page 17
- 4.5 Setting the room temperature for night reduction heating mode, page 18
- 4.6 Setting the warm water temperature, page 18
- 4.7 Adjusting the heating curve, page 19
- 4.8 Setting the maximum supply temperature, page 20
- 4.9 Setting the heating limit (summer/winter), page 20
- 4.11 Displaying temperatures and values, page 22
- 4.14 Setting the clock programs for heating/D.H.W., page 27
- 4.15 Setting an individual D.H.W. clock program P1, page 29
- 4.16 Setting the circulation pump clock program P1, page 30

All other adjustments should be made by technical personnel only. Faulty adjustments may lead to malfunctioning of the heating system or may shorten its life.

2.3 Temperature information

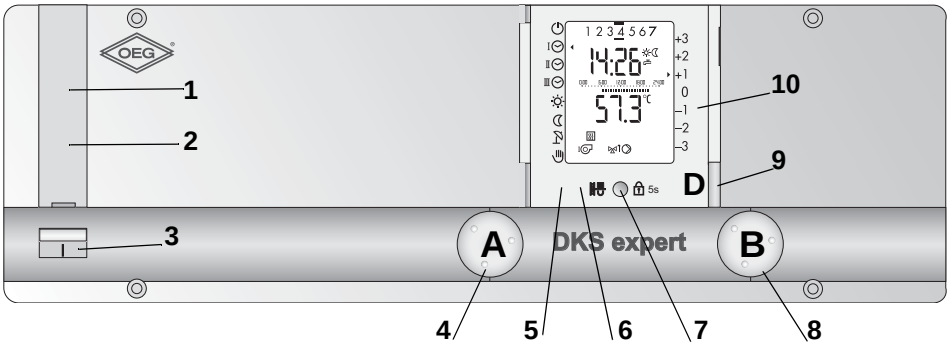
All temperature information is:

- if measured, in °C (Celsius)
- as temperature difference in K (Kelvin)

2.4 Effectiveness of settings

- 1. level: Modified settings become immediately effective
- 2. level: Modified settings become effective by changing the parameter or by closing the cover

2.5 Controls, display and functions



1 **Fuse:** is behind the cover and protects against short-circuit and over current. Replacement after opening the cover.

If the fuse releases several times, inform your heating expert

2 **Safety temperature limiter STB:** is behind the cover and releases with temperature rise. Remove cover for unblocking.
Inform the heating expert after repeated releasing.

3 **Main switch: ON** upward, **OFF** downward.

4 **Selector knob A:** Controlling/ program selection

5 **RESET key:** behind the front flap, operating only by the **specialist**

6 **CLR/STB-Test key:** behind the front flap

7 **Chimney sweep-/control block button:** with closed cover **Chimney sweep examination may be served only by specialists**
Party function (with opened cover)

8 **Setting knob B:** Adjusting and program functions

9 **Key D: Toggle key for the selection of the heating circuit/boiler with the allocation "green" or "red"**

10 **Front cover closed:** 1. level - **open:** 2. level

RESET and STB-Test and the chimney sweep examination may be served only by specialists, see manual for the specialist.

3 First operating level

3.1 Selecting a heating circuit (two heating circuits)

The corresponding heating circuit must be selected each time before a function can be carried out. Depending on the heating circuit selected, the switch key shows either "red" or "green".

Operating step	Operation	Display
Press the key **D** to select the correct heating circuit "**green**" or "**red**"!		Standard display **D** appears

Your heating expert can tell you which colour refers which heating circuit.
This can then be noted here:

Note reference:	**1 (green)**	**2 (red)**
Heating circuit		
Generator		

3.2 Selecting an operating mode

Set using the knob 

The arrow to the left in the display shows the selected operating mode.
Example front view: The setting I becomes valid immediately.

Symbol	Operating mode	Explanation				
		in accordance with clock program	continuously OFF	continuously ON	continuous heating mode	continuous reduction mode
	Heating OFF (Standby)					
I	Clock program I	(1				
II	Clock program II					
III	Clock program III					
	Heating mode					
	Reduced heating mode					
	Summer mode	(1				
	Manual mode ⚠ Emergency mode					

Legend:

	Heating mode
	Domestic hot water mode

Note: In all operating modes the freeze protection is guaranteed.
Heating limits can switch the heating enterprise off.
On operating mode "Manual/Emergency" please call the specialist.

1) you can define your own domestic hot water-heating program.

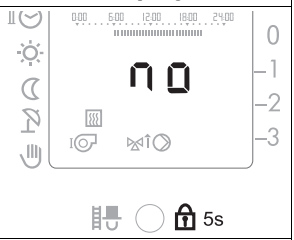
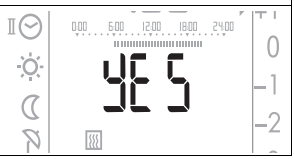
3.3 Adjusting room temperature heating operations

Operation step	Operation	Display
Ambient temperature increase Example: **+1.5 °C**		
Ambient temperature decrease Example: **- 3,0 °C** (save, absence)		

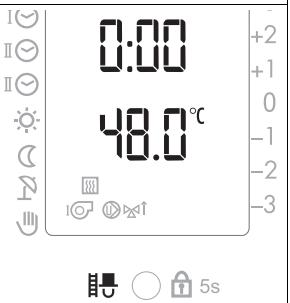
The arrows to the right in the display show the adjusted temperature settings for heating . The adjustment becomes valid immediately.

3.4 Locking 5s

The lock prevents unintentional changes of settings. The lock applies **to both heating circuits/boilers at the same time** and includes all functions, except "measuring of emissions" .

Operation step	Operation	Display
Activate lock	C 5s 5 Sekunden	
Deactivate look	C 5s 5 Sekunden	

3.5 Measuring of emissions (chimney sweep service)

Operation step	Operation	Display
Activate emission measurement	5s 5 seconds	
Deactivate emission measurement	5s 5 seconds	Standard display 1st level appears

Note: Following activation of this function, heating is controlled according to the set maximum temperature. Operation of this function for measuring emissions is limited to 20 minutes and must be reactivated after this time if required.

4 Settings 2nd level (Cover open)

Incorrect changes to the settings may cause the heating system to malfunction or shorten its life.

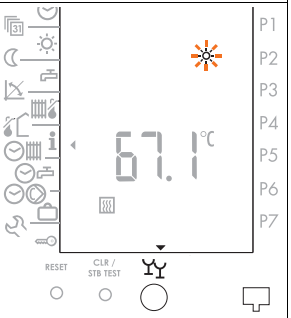
Sym-bol	Function to be set	Factory settings	Setting range	Basic adjustment	Adjustment	Unit
	"Setting the time (clock)"; page 16	pre-sent *	-			h/m
	"Setting the date"; page 17	pre-sent *	until 2079			M/T/J
	"Setting the room temperature heating mode"; page 17	20	10÷30			°C
	"Setting the room temperature for night reduction heating mode"; page 18	15	5÷20			°C
	"Setting the warm water temperature"; page 18	55	10÷70			°C
	"Adjusting the heating curve"; page 19	1.2	0.0÷5.0			-
	"Setting the maximum supply temperature"; page 20	70	10÷90			°C
	"Setting the heating limit (summer/winter)"; page 20	18	0÷40			°C

Sym-bol	Function to be set	Unit
	"Displaying temperatures and values"; page 22	°C
	"The standard clock programs (factory settings)"; page 24 "Setting the clock programs for heating/D.H.W."; page 27	-
	"Setting an individual D.H.W. clock program P1"; page 29	-
	"Setting the circulation pump clock program P1"; page 30	-
	"Vacation program"; page 31	-

Sym-bol	Function to be set	Unit
	Service level	-
	Access code **For technicians only**	-
	"Switching on the party function"; page 15 An active vacation program is deleted	-
RESET	Restarts the controller. No settings are changed!	-
CLR	• "Transfer the value to the standard display (1st level)"; page 23 • "Reload of standard clock programs preset at the factory"; page 26 • Reset the operational data , see "5.1 Query operating data", page 33	-

* Clock reserve = 2 years

4.1 Switching on the party function

Operation step	Operation	Display
Activate party function		
Deactivate party function		Standard display 1st level appears

Note: The party function becomes valid for 3 hours from the start of the next night reduction heating phase according to clock program.

An active vacation program is by activating the party function deleted!

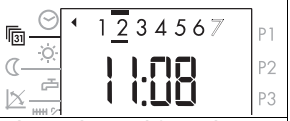
4.2 Setting the time (clock)

Operation step	Operation	Display
Select the function		
Set the time		
Select another function or close the cover The setting is stored		The selected function or the standard display appears

Note: Change from winter time to summer time, and vice versa, is made automatically on the last Sunday of March and again in October. If the controller is not connected to the line, no automatically change happens. As soon as the controller is connected to the line, change happens the following day between 2.00 and 3.00 o‘clock a.m.

4.3 Setting the date

A calendar program is available. This is programmed to the year 2099, and takes leap years into account.

Operation step	Operation	Display
Select date Example: **October 28, 2011**	A	
Set the date Example: **November 28, 2011**	B	
Select another function or close the cover The setting is stored		The selected function or the standard display appears

Note: On setting the date, the day of the week is indicated as follows:
1 = Monday, 2 = Tuesday, 3 = Wednesday, 4 = Thursday, 5 = Friday, 6 = Saturday, 7 = Sunday

4.4 Setting the room temperature heating mode

Operation step	Operation	Display
Select function	A	
Set the selected room temperature. Example: **Heating 22.0 °C** The setting becomes valid immediately!	B	
Select another function or close the cover The setting is stored		The selected function or the standard display appears

4.5 Setting the room temperature for night reduction heating mode ☾

Operation step	Operation	Display
Select function		
Set the room temperature for night reduction heating. Example: **reduced heating 18.0 °C** The setting becomes valid immediately!		
Select another function or close the cover The setting is stored		The selected function or the standard display appears

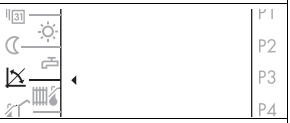
4.6 Setting the warm water temperature

Operation step	Operation	Display
Select function		
Set the domestic warm water temperature. Example: **DHW 55.0 °C**		
Select another function or close the cover The setting is stored		The selected function or the standard display appears

The warm water boiler is now controlled by this temperature.

⚠ **Changes should be discussed with a qualified technician.**

4.7 Adjusting the heating curve

Operation step	Operation	Display
Select function		
Set the heating curve. Example: **Heating curve 1.2**		
Select another function or close the cover The setting is stored		The selected function or the standard display appears

Due to the deviation of room temperature to outside temperature each time, changes should be made as follows:

Outside temperature during the day	**Room temperature**	
	too cold	**too warm**
+5 until +15 °C	Set slope of heating curve to - 0.2 and base to + 5 K.	Set slope of heating curve to + 0.2 and base to - 5 K.
-20 until +5 °C	Set slope of heating curve to + 0.2	Set slope of heating curve to - 0.2.

Changes are only processed slowly by the building. For this reason, only one change should be made per day.

4.8 Setting the maximum supply temperature

Operation step	Operation	Display
Select function	A	
Set the maximum supply temperature. Example: **maximum supply temperature 55 °C**	B	
Select another function or close the cover The setting is stored		The selected function or the standard display appears

The maximum supply temperature is limited to the set value.

⚠ **This is not a safety feature. Safety (protection against overheating) must be ensured by a qualified technician.**

4.9 Setting the heating limit (summer/winter)

Average outside temperature is upper as = heating "OFF"

Average outside temperature is lover as (- 2 K) = heating "ON"

Operation step	Operation	Display
Select function	A	
Set the heating limit. Example: **heating limit 20 °C**	B	
Select another function or close the cover The setting is stored		The selected function or the standard display appears

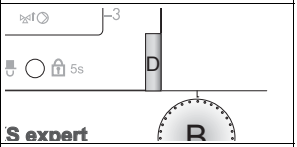
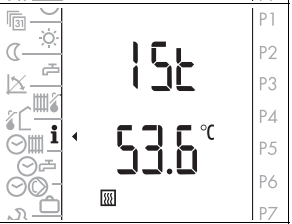
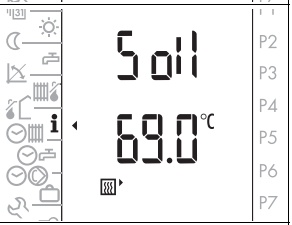
Note: The heating limit in night reduction period can be adjusted on the setting 3-2.

4.10 Displaying the controller output ports

Depending on the state of the unit and the operating mode, some of these symbols will be shown.

Symbole	Designation heating circuit/generator (1=green; 2=red)		DKS - classic	DKS - expert	
				1 green	2 red
	Generator I or burner stage I	b1	X	X	
	Burner stage II	b2	X	X	
	Heating circuit mixing valve open	M+	X	X	X
	Heating circuit mixing valve closed	M-	X	X	X
	Heating circuit circulation pump	U	X	X	X
	Charging pump	L	X	X	
	Circulation pump DHW	C	X	X	
	Solar pump	S	X	X	

4.11 Displaying temperatures and values

Operation step	Operation	Display
Select the heating circuit or generator (in case of setting on 7-0)	D	
Select function	A	
Displaying of temperatures and values Example: **outside temperature 2.8 °C**	B	
Displaying actual value	B	
Displaying set and actual values	B turn quickly	
Select another function or close the cover		The standard display appears

4.11.1 Set values and actual values Soll Ist

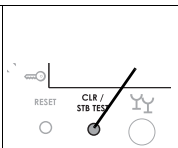
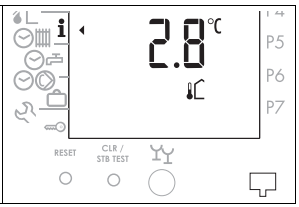
Actual value = measured value
Set value = control value (by turning the setting knob **B** quickly)
Displaying the actual temperatures serves to check the sensors.

Symbol	Designation	Key	Abbr.		Display	
	Boiler flow temperature WEZ 1	green	TK 1	°C	Soll	Ist
	Domestic hot water temperature		TB	°C	Soll	Ist
	Room temperature 1	green	TI 1	°C	Soll	Ist
	Room temperature 2	red	TI 2	°C	Soll	Ist
	Heating circuit supply flow temperature 1	green	TV 1	°C	Soll	Ist
	Heating circuit supply flow temperature 2	red	TV 2	°C	Soll	Ist
	Averaged outside temperature Actual outside temperature		TA TA	°C °C		Ist
	Solar panel temperature		TKO	°C		Ist
	DHW temperature bottom solar		TBU	°C		Ist

If the sensor configurations were saved at start-up, defective sensors will be shown to register 120 °C. Exception: TA = 0 °C.

4.12 Transfer the value to the standard display (1st level)

1. Select the desired value as explained before.
2. Press **CLR** key with a thin object.

Press **CLR** key with a thin object		

3. Close the cover. The desired value is now shown in the standard display.

4.13 The standard clock programs (factory settings)

I P1 = Clock program 1, standard domestic program

Blocks of days		Heating and (domestic hot water)				
Weekday	Marked days	☼	( )	Note	☾	Note
Mo-Fr	1 2 3 4 5 6 7	06.00	(05.00)		22.00	
Sa-So	1 2 3 4 5 6 7	07.00	(06.00)		23.00	

II P2 = Clock program 2, heating with reduced periods on working days

Blocks of days		Heating and (domestic hot water)				
Weekday	Marked days	☼	( )	Note	☾	Note
Mo-Do	1 2 3 4 5 6 7	06.00	(05.00)		08.00	
		15.30	(14.30)		22.00	
Fr	1 2 3 4 5 6 7	06.00	(05.00)		08.00	
		15.30	(14.30)		23.00	
Sa	1 2 3 4 5 6 7	07.00	(06.00)		23.00	
So	1 2 3 4 5 6 7	07.00	(06.00)		22.00	

III P3 = Clock program 3, offices and industrial premises

Blocks of days		Heating and (domestic hot water)				
Weekday	Marked days	☼	( )	Note	☾	Note
Mo-Fr	1 2 3 4 5 6 7	06.00	(05.00)		19.00	
Sa-So	1 2 3 4 5 6 7	-	-		continu.	

P1 = Separate clock program of domestic hot water

Blocks of days		Domestic hot water		
Weekday		Note		Note
Mo-So	00.00		00.00	
Note				
Note				

Note: There is no individual DHW program preset at the factory.

P1 = Clock program of circulation

Blocks of days	Circulation pump			
Weekday		Note		Note
Mo-So	06.00		08.00	
Mo-So	11.30		13.30	
Mo-So	17.00		21.00	

Note: ☼ = start clock program (start of heating in according with setting 3-6).
The clock program of domestic hot water starts ever 1 hour first of the heating program.

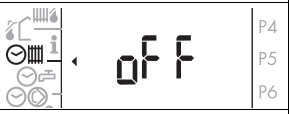
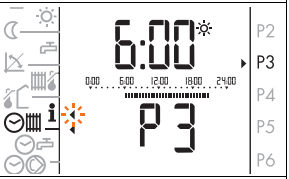
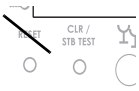
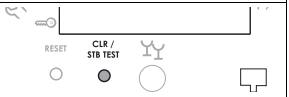
4.13.1 Cooperation of the standard and the individual D.H.W. clock program (Example)

Operating mode 1st Level	**Standard clock program domestic hot water P1/P2/P3** factory setting = on	**Individual D.H.W. clock program P1** There is no individual DHW program preset at the factory	active clock program
	on = active off = inactive see "4.15.1, page 29	**always active** see chapter "4.15.2, page 30	
I **P1**	**on**/off	P1	I + P1
II **P2**	on/**off**	P1	P1
III **P3**	**on**/off	P1	III + P1

With position "**off**" only the individual domestic hot water clock program P1 is active. With position "**on**", the two clock programs (standard/individual) overlay, i.e. both clock programs are active at the same time.

4.13.2 Reload of standard clock programs preset at the factory

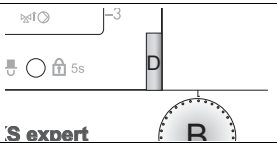
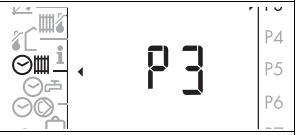
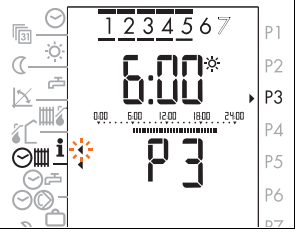
The standard clock programs preset at the factory can be reloaded at any time, see "4.13 The standard clock programs (factory settings)", on page 24.

Operation step		Operation	Display
1	Open cover Select function		
2	Select program P1 until P3 Example: **Program P3**		
3	Display clock program Example: **Program P3**		
4	Press **CLR** key with a thin object		
5	Close cover, the standard clock program is reloaded	Close cover	The standard display appears

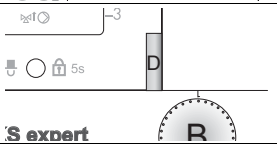
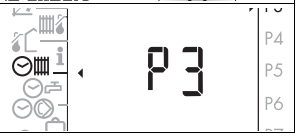
4.14 Setting the clock programs for heating/D.H.W.

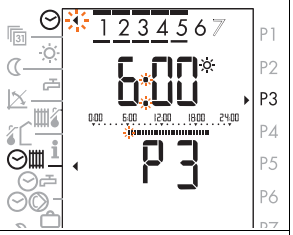
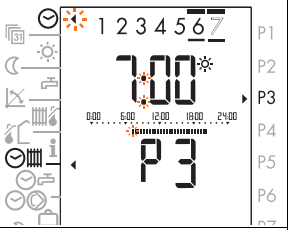
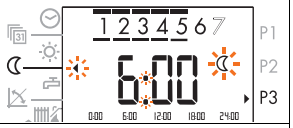
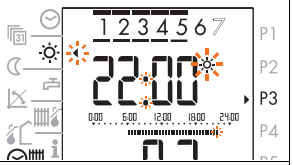
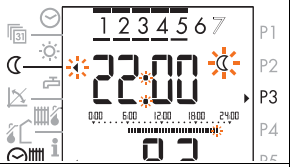
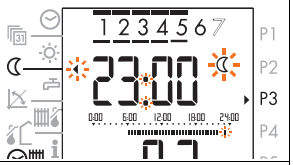
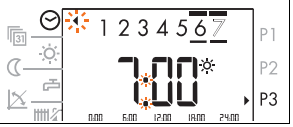
A clock program defines the periods during which the room temperature or domestic hot-water temperature (DHW temperature charging starts one hour earlier) should correspond to the set temperature.

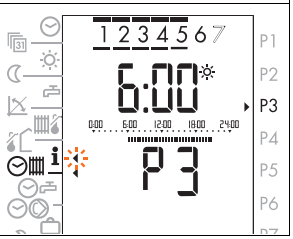
4.14.1 Checking the clock program for heating/D.H.W. mode

Operation step		Operation	Display
1	Select heating circuit (in case of setting on 7-0)	D	
2	Open cover Select function	A	
3	Select program P1 until P3 Example: **Program P3**	B	
4	Display clock program Example: **Program P3**	A	

4.14.2 Changing the clock program for heating/D.H.W mode

Operation step		Operation	Display
1	Open cover Select function	A	
2	Select heating circuit	D	
3	Select program P1 until P3 Example: **Program P3**	B	

Operation step		Operation	Display
4	Activate changes Example: **Program P3**	A 2 x	
5	Select block (or day of the week) and time for which the setting applies ("starting point"). Fast rotation accelerates setting.	B	
6	Change between night reduction heating and heating mode	A	
7	Set the heating period The black segments will be added	B	
8	Select set night reduction heating period	A	
9	Set the night reduction heating period Black segments, if any are marked, will be deleted.	B	
10	Select new day/period for further changes. Repeat steps as given above.	A	

Operation step		Operation	Display
11	Leave function The finished clock program is now saved. The program can now be checked again, or will be saved when the cover is closed. The standard display appears.	A or close cover	

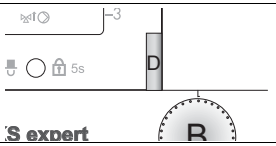
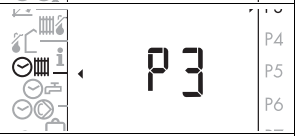
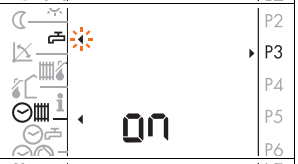
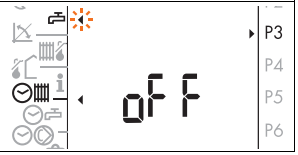
Note: The shortest period to be set for heating mode is 30 minutes.

4.15 Setting an individual D.H.W. clock program P1

Note: Only the clock program **P1**exists.

4.15.1 Separating the clock program D.H.W. from the standard clock program heating

To program and activate an individual D.H.W. clock program, it must be separated from the standard clock program for heating.

Operation step		Operation	Display
1	Select heating circuit (in case of setting on 7-0)	D	
2	Open cover Select function	A	
3	Select program P1 until P3 Example: **Program P3**	B	
4	Select function: Factory setting P1 - P3 is "**on**" **on** = D.H.W. according to "Setting the clock programs for heating/ D.H.W."; page 27	A 1 x	
5	**off** = D.H.W "AUS" or individual D.H.W. clock program is active	B	

Note: If the individual D.H.W. clock program is not separated, it overlaps with the standard clock program of heating and both are active.

4.15.2 Display and change the individual D.H.W. clock program

Operation step	Operation	Display
Select function		

Further control steps:
"4.14.1 Checking the clock program for heating/D.H.W. mode", on page 27, and
"4.14.2 Changing the clock program for heating/D.H.W mode", on page 27.
The symbols in the display apply to change between an active and inactive domestic hot water charge.

4.16 Setting the circulation pump clock program P1

Note: Only the clock program **P1**exists.

4.16.1 Display and change the circulation pump clock program

Operation step	Operation	Display
Open cover Select function		

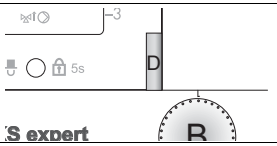
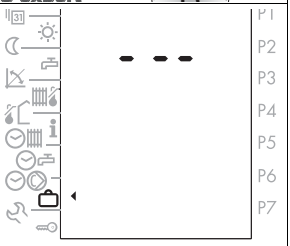
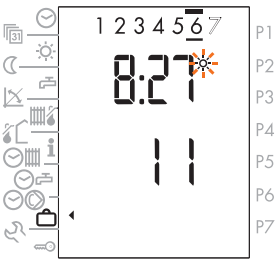
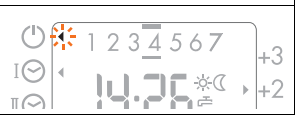
Further control steps:
"4.14.1 Checking the clock program for heating/D.H.W. mode", on page 27, and
"4.14.2 Changing the clock program for heating/D.H.W mode", on page 27.
The symbols in the display apply to change between an active and inactive circulation pump.

4.17 Vacation program

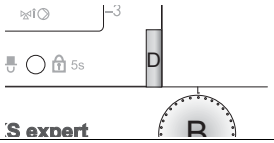
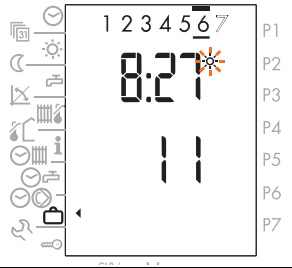
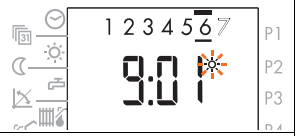
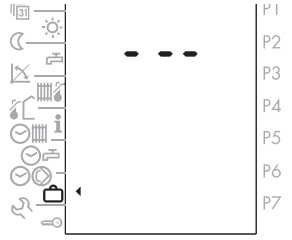
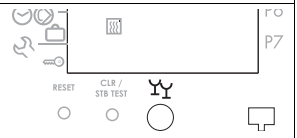
With the vacation program only room protection heating is active (adjuster 3-0), the domestic hot water is switched off. For programming, only the date for the vacation program's end must be set. The vacation program begins at 24:00 o'clock on the day of its setting. The vacation program ends at the change of date (midnight 12:00 p.m.).

Pressing the "Party Key" cancels an active vacation program.

4.17.1 Setting the vacation program

Operation step		Operation	Display
1	Select heating circuit (in case of setting on 7-0)	D	
2	Select function	A	
3	Set the date of end of vacation.	B	
4	Leave function The finished vacation program is now saved. The vacation program becomes active starting from 24:00 o'clock.	Close cover	Standard display appears
5	As soon as the vacation program is active, a cursor flashes in the case of the symbol ⏻		

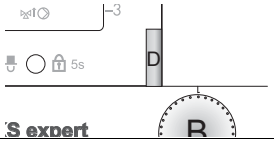
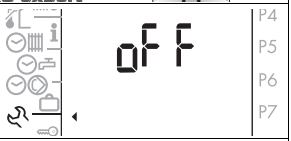
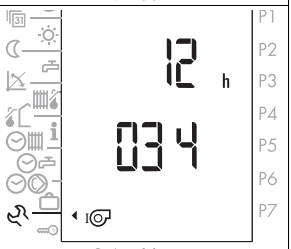
4.17.2 Vacation program display/change/terminate

Operation step		Operation	Display
1	Select heating circuit (in case of setting on 7-0)	D	
2	**display:** Select function The end of the vacation program appears	A	
3	**change:** Change the date of vacation end	B	
4	**terminate:** Turn with adjusting knob **B** to the left side until appears "**---**" The vacation program is deleted or...	B	
5	...the vacation program can also be deleted with the Party key.	C	
6	Leave the function	Close cover	The standard display appears

5 Service level

5.1 Query operating data

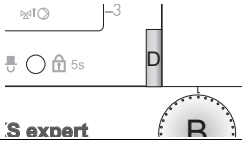
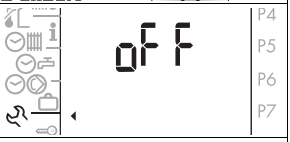
The operation hours and switching cycles of the burner stages as well as further data can be queried.

Operation step	Operation	Display
Select generator (in case of setting on 9-0)	D	
Select service level	A	
Select function "dat"	B 1 x	
Query data Example: **Operation hours of the burner stage I = 12'034 hours**	A	
Leave the function	Close cover	The standard display appears

Operating data		**Key D**	**Unit**
I	Operating hours burner stage I	**green**	**h**
I	Switching cycles burner stage I	**green**	

5.2 3. Level

This function is reserved for technicians only!

Operation step	Operation	Display
Select heating circuit (in case of setting on 7-0)		
Select service level		
This function is reserved for technicians only!	 1 x	
Select another function or close the cover		The standard display appears

5.3 Error message

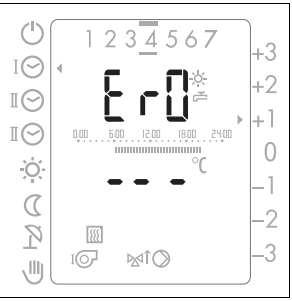
5.3.1 General information

In case of an error the backlight of the display switches on. On level 1 (cover closed) in place of the time the display appears "Er 1... 8", in place of the selected temperature - an error-number "00 to 99" or "-".

Er 0 =		Error eBUS
Er 1 =	01	Error STB
Er 1 =	02	Error burner by connector S3 from burner

eBUS-error

Short-circuit in the eBUS wiring



6 Definitions

Start of occupation	The start of the occupation period, as programmed on the timer.
Occupation period	The period of time for which the system is heated to normal temperature.
Technician levels	These setting levels are reserved for technicians. They contain setting parameters for adaptation of the controller to the heating system.
Heating-curve adaptation	Automatic adaptation of the heating curve for the building.
Actual value	The measured temperature.
Optimisation	Automatic advancing of the time at which heating is to begin, in accordance with the heating requirement.
Setpoint	Temperature, defined by user or technician, to which the heating controller regulates the actual temperature.

7 Index

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