Operating instructions
and instructions for commissioning

Instrument series Gamma 2

Gamma 2 B
Gamma 23 B
Gamma 233 B

Table of contents

General:

The control instruments of the series Gamma 2 serve as control of heating plants with a single-step burner and meet all requirements on modern heating plant controls with regard to control technique and handling.

In particular, the instruments distinguish by two essential features:

1) All control functions are executed by high-efficient microprocessors. Practical control algorithms and intelligent switching components, combined with the application of sophisticated technologies, guarantee an optimum energy consumption.
2) Operation is analogous. A minimum of control elements guarantees the user an easy and comprehensive handling and avoids almost any operating errors.
   The achieved symbiosis of these two features guarantees the trouble-free and customer-oriented use at the best possible comfort level.

Data storage – operating reserve

Individually entered plant parameters and nominal values as well as current time data (hour, operating times, day, year) remain operative even in case of a switching off for a longer period, thanks to the integrated long-term storage and thus guarantee the safe operation of the installation for many years.

Installation notes

Wiring

For wiring the instrument, attention has to be paid to a separate installation of sensor wire and mains-alive cables. The common arrangement of wiring within one cable or one conduit for electrical wiring respectively cable channel is not allowed and can lead to disturbances of the control due to induction.

Ambient temperature

When installing the control into a boiler note that the ambient temperature may not exceed 50°C.

Handling of the operating instructions

The following operating instructions apply to three types of instruments:

A – Gamma 2 B
Atmospherically controlled boiler temperature controller (single-step) for heating- and hot-water mode at floating operation.

B – Gamma 23 B
Atmospherically controlled boiler temperature controller (single-step) for heating- and hot-water mode at floating operation as well as an atmospherically controlled controller circuit for a mixer or mixing battery (quasi-continuous three-point PI controller), including mixer circuit pump logic.

C – Gamma 233 B
Atmospherically controlled boiler temperature controller (single-step) for heating- and hot-water mode at floating operation as well as two atmospherically controlled controller circuits for two mixers or mixing batteries (quasi-continuous three-point PI controller), including pump logic for two mixing circuit pumps.

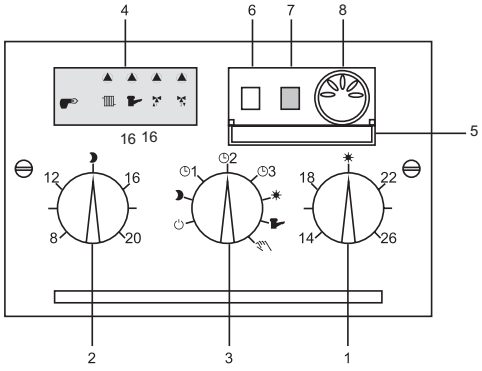
Selecting the operating notes regarding the different types of instruments, the control instrument can be adapted precisely to the plant-specific conditions and the user's requirements.

The symbols R and R used in several chapters indicate important notes which should be followed for the combination with room stations.

R = Operation with room stations

R = Operation without room stations

Operating and indicating instruments



1 Nominal daytime ambient value

With this control switch the desired daytime ambient temperature can be regulated between 14°C and 26°C. The neutral of the switch corresponds to the normal setting of 20°C.

A constant ambient temperature, at any outside temperature conditions, requires a precise regulation of the heating characteristics as well as a correct design of the heating plant according to the heat-demand analysis.

The nominal daytime ambient value refers equally to the direct-controlled boiler circuit and possibly post-connected mixer circuits (Gamma 23 B, Gamma 233 B). A possibly necessary adjustment should always take place in little steps and within a time period of 2-3 hours in order to make sure that a steady condition has been created.

Factory preset: 20°C

2 Nominal ambient temperature reduction value

With this control switch the desired ambient temperature during temperature reduction can be regulated between 8°C and 20°C. At a correct design of the heating plant and a precisely regulated heating characteristic a uniform support operation results at any occurring outside temperature conditions.
The nominal ambient temperature reduction value refers equally to the direct-controlled boiler circuit and possibly post-connected mixer circuits (Gamma 23 B, Gamma 233 B). Even in this case, possibly necessary adjustments should take place step by step and after sufficient time periods in order to guarantee the keeping-up of the support temperature.

Attention:

R Heating circuits combined with a room station, exclusively orientate towards their ambient temperature standards and separate themselves from the setting values of the control instrument.

R Heating circuits without room station continue to work according to the controller's regulation of nominal daytime and temperature reduction values and the selected heating program.

3 Selector switch for modes of operation

With an 8-step selector switch for modes of operation different practical heating- and hot-water programs can be selected individually according to current requirements.

⏻ - Standby mode

With this switch position, the switch off of all control functions with permanent frost monitoring is achieved. All heating circuit pumps are disconnected, possibly existing mixers (Gamma 23 B, 233 B) are closed.

At outside temperatures below frost-protection limit, the heating circuits are controlled according to the minimum temperature preset by the manufacturer. Pump and mixer are released.
At this mode, the hot-water mode is principally locked, however, protected against frost. If the tank temperature should drop below 5°C an increase to 8°C takes place automatically.

R At the operation **without** room station, the boiler is operated beyond the minimum limit according to a minimum nominal ambient value of +10°C with relative temperature reduction characteristic.

R At the operation **with** room station, the boiler is controlled considering the minimum temperature delimitation and the accordingly preset minimum ambient support value with monitoring of the existing ambient temperature.

These measures guarantee the comprehensive protection of the building at low outside temperatures by avoiding ventilation and air condensation.

Application: Switch off of the instrument at complete protection of the building.

◗ - Permanent temperature reduction mode

With this switch position, a continuously reduced mode of all heating circuits is obtained, considering the minimum temperature delimitation preset by the manufacturer. Hot water is prepared at the operating times specified at the automatic mode X-2 of the hot-water circuit according to the regulation of the manufacturer of 50°C or according to an individually preset nominal hot-water value.

Application: Permanent temperature reduction mode during transitional period or winter time in case of longer absence (winter holidays).

Automatic programs
(◷ 1- ◷ 2 – ◷ 3)

At automatic mode three operating time programs with different seizure characteristics are available. During commissioning, these are called according to the selector switch position ◷ 1, ◷ 2 or ◷ 3 as standard programs defined by the manufacturer and cannot be lost and, if necessary, can be overwritten by individual operating times after corresponding treatment at the operating time level.

At all three automatic programs two heating cycles for each weekday are provided, each of which is defined by one switch-on and one switch-off time. In case of standard programs, depending on the selected program, these are seized by the manufacturer with one or two heating cycles according to the following operating times

◷ 1 – Automatic mode 1
(two operating times per day)

This mode should be selected if during daytime an additional reduction of the heating circuits according to specified nominal ambient values shall take place.

Heating circuit	Day	Heating on from to	Instrument
Boiler circuit	Mon – Fri Sat, Sun	5.00 - 8.00 16.00 - 22.00 7.00 - 23.00	Gamma 2 B Gamma 23 B Gamma 233 B
Hot water Circuit	Mon – Fri Sat, Sun	4.30 - 8.00 15.30 - 22.00 6.30 - 23.00	Gamma 2 B Gamma 23 B Gamma 233 B
Mixer circuit 1	Mon – Fri Sat, Sun	5.00 - 8.00 16.00 - 22.00 7.00 - 23.00	Gamma 23 B Gamma 233 B
Mixer circuit 2	Mon – Fri Sat, Sun	5.00 - 8.00 16.00 - 22.00 7.00 - 23.00	Gamma 233 B

◷ 2 – Automatic mode 2

This mode should be selected if during daytime a uniform continuous heating is required for all week days.

Heating circuit	Day	Heating on from to	Instrument
Boiler circuit	Mon-Sun	5.00 - 22.00	Gamma 2 B Gamma 23 B Gamma 233 B
Hot water Circuit	Mon-Sun	4.30 - 22.00	Gamma 2 B Gamma 23 B Gamma 233 B
Mixer circuit 1	Mon-Sun	5.00 - 22.00	Gamma 23 B Gamma 233 B
Mixer circuit 2	Mon-Sun	5.00 - 22.00	Gamma 233 B

◷ 3 – Automatic mode 3
(underfloor heating)

This mode is designed especially for heating plants with combined radiator and underfloor system. Due to the sluggishness of underfloor systems a premature heating and temperature reduction of the mixer circuits takes place (Gamma 23 B, Gamma 233 B).

Heating circuit	Day	Heating on from to	Instrument
Boiler circuit	Mon – Fri Sat, Sun	5.00 - 22.00 7.00 - 23.00	Gamma 2 B Gamma 23 B Gamma 233 B
Hot water Circuit	Mon – Fri Sat, Sun	4.30 - 22.00 6.30 - 23.00	Gamma 2 B Gamma 23 B Gamma 233 B
Mixer circuit 1	Mon – Fri Sat, Sun	4.00 - 20.30 6.00 - 22.00	Gamma 23 B Gamma 233 B
Mixer circuit 2	Mon – Fri Sat, Sun	4.00 - 20.30 6.00 - 22.00	Gamma 233 B

For all three automatic programs the control of the hot-water temperature is effected according to the manufacturer's regulation of 50°C or according to an individually entered nominal hot-water value.

R̸ At the operation **without** room station the heating circuits during respectively between the heating cycles are controlled according to the allowance of the preset nominal daytime ambient value respectively temperature reduction value.

R At the operation **with** room station for each weekday maximum **three** heating cycles with separately variable switch-on and switch-of times and cycle-related ambient allowances can be entered.

Attention: Each heating circuit combined with a room station separates itself automatically from the relative automatic program regulated on the central instrument.
This heating circuit is controlled exclusively according to the standard program preset at the room station respectively individually entered operating times and temperature allowances.

☀ – Permanent daytime mode

This switch position allows for continuous heating according to the specified nominal daytime ambient value under consideration of the minimum temperature delimitation preset by the manufacturer. Hot-water preparation is achieved at the operating times determined at the automatic mode ◷-2 according to the factory preset of 50°C or according to an individually entered nominal hot- water temperature.

Application: Neutralisation of the temperature reduction mode at unusual seizure.

☛ – Hot-water mode

With this switch position only the hot-water mode remains in operation and controls the temperature according to the factory preset of 50°C or according to individual parameters. Hot-water preparation is achieved at the operating times determined at the automatic mode ◷-2.
The heating mode for boiler and possibly existing mixer circuits is interrupted, however, remains protected against frost.

Application: Switch off of the heating mode in case of multiple dwellings at the end of the heating period with entire hot-water mode.

☄ – Manual mode

At this mode all control functions are deactivated. Boiler temperature is limited according to the regulation of the boiler temperature controller. All circulation pumps for boiler and mixer circuits are in operation. Possibly connected mixers are currentless and can be actuated manually according to heating requirements.

Application: Emission measurement
Malfunctions of the controller
Disturbance

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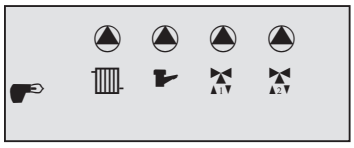
4 Multifunctional information indication

The multifunctional information indication contains the following basic information:

A – Function control of the connected control elements



If the pump symbol ◮ appears over the appertaining heating circuit, this circuit is ready for operation.

☛ Request for burner

◮ Heating circuit pump (directly controlled
▥ heating circuit) in operation

◮ Storage pump in operation
☛ (request for hot water)

◮ Mixer circuit pump 1 in operation
⇕ (Gamma 23 B, Gamma 233 B)

⇕ Control commands to open (▲) respectively to close (▼) mixer 1

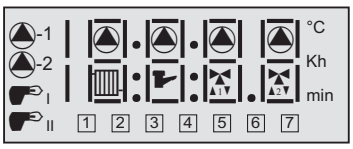
◮ Mixer circuit pump 2 in operation
⇕ (Gamma 233 B)

⇕ Control commands to open (▲) respectively to close (▼)mixer 2

This mode marks simultaneously the normal indication and appears constantly on the display if **no** entry point into the programming level has been made and if there is no error of the external sensor (see section D).

B – Segment test

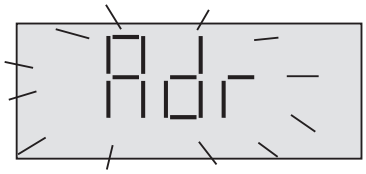
At switch on of the control instrument for the first time and in case of voltage recuperation after a previous power failure, all segments available on the display appear for approx. 5 sec. (segment test).



C – Address check

(only in case of cascade connection of several instruments of the series Gamma)

After termination of the segment test the indication



may light up flashing.

This means that at least two instruments work on the same bus address so that no data interchange is possible. In this case and for all instruments, the corresponding bus address has to be checked on the professional level and, if necessary, to be assigned again. (See Professional level parameter > bus address, page 24)

Attention: As long as the above indication shows, the control operation is totally or at least partially disturbed.

D – Diagnostic system

After termination of the segment test all connected sensors are checked automatically regarding short circuits respectively interruptions (sensor test). If there is no error, the indication changes automatically into normal operation. In case of a possibly occurring error message, two criteria are taken into consideration:

Sensor interruption

Sensor not connected respectively defective sensor line:
As error indication, a flashing |_| symbol appears surrounding optically the heating circuit concerned. An interruption within the external sensor circuits ES 1 and ES 2 is indicated by a triple permanent |_| |_| |_| symbol.

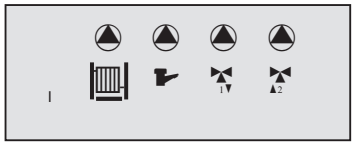
Sensor short circuit

Improper installation leading to short circuits respectively defective sensor line:
As error indication a flashing — symbol appears over the heating circuit concerned. A short circuit within the external sensor circuit is indicated by a triple permanent — —.— symbol.

Attention: In case of interruption or short circuit of the boiler sensor line (line break, line contact or faulty connection), the burner remains in operation and is limited only by the selected regulation of the boiler temperature controller.

The following error messages can appear:
Interruption in the:

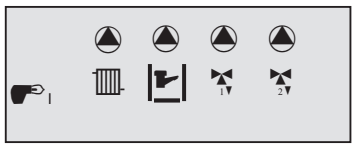
Boiler sensor



Gamma 2 B
Gamma 23 B
Gamma 233 B

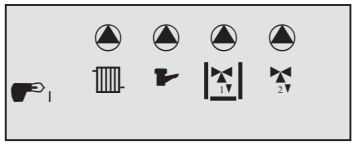
The allocation digit I respectively II appears only if two boiler sensors are connected and corresponding configuration of BS 2.

Tank sensor



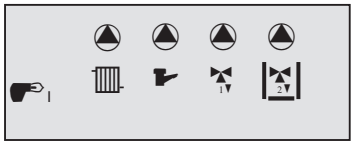
Gamma 2 B
Gamma 23 B
Gamma 233 B

Flow pipe sensor 1 (mixer circuit 1)



Gamma 23 B
Gamma 233 B

Flow pipe sensor 2 (mixer circuit 2)



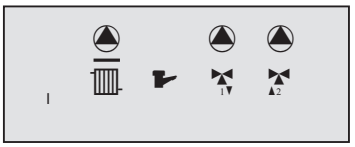
Gamma 233 B

External sensor 1 + 2

The allocation digit I respectively II appears only if two external sensors are connected and corresponding configuration of sensor.

Short circuit in the:

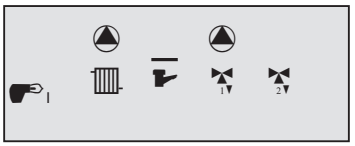
Boiler sensor



Gamma 2 B
Gamma 23 B
Gamma 233 B

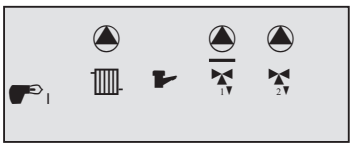
The allocation digit I respectively II appears only if two boiler sensors are connected and corresponding configuration of BS 2.

Tank sensor



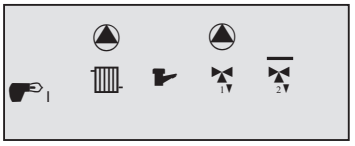
Gamma 2 B
Gamma 23 B
Gamma 233 B

Flow pipe sensor 1 (mixer circuit 1)



Gamma 23 B
Gamma 233 B

Flow pipe sensor 2 (mixer circuit 2)



Gamma 23 B
Gamma 233 B

External sensor 1 + 2

Gamma 2 B
Gamma 23 B
Gamma 233 B

The allocation digit I respectively II appears only if two external sensors are connected and corresponding configuration of ES 2.

5 Inquiry and programming

After opening the swivelling cover at the upper right side of the instrument, a service socket as well as the yellow and blue key become accessible. With these keys the following inquiries and programming procedures can be carried out:

1- Time inquiry

2- Setting of time, calendar and operating times

3- Outside temperature inquiry

4- Programming by the user

5- Programming by the heating plant specialist

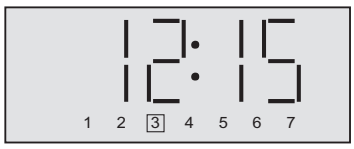
6- Programming via service socket

7- Configuration of the plant (special functions)

Important:
The above values can be modified only in increasing proportion. When reaching the highest value, the indication is reset automatically to the initial value.

5.1 Time inquiry

If the yellow key is actuated for a short time, the current time shows on the display instead of the normal indication. The current weekday is indicated in frame.



The normal indication is reentered by actuating the blue key or automatically after 60 seconds.

5.2 Setting of time, calendar and operating times

a – Setting of time and calendar

All daily values such as time, calendar day, month and year are updated by the manufacturer and principally do not require any correction.

Automatic summer-/wintertime reset
The calendar provided inside the instrument is programmed until the year 2030 and considers the yearly repeating reset dates. A time correction is not necessary.

If in exceptional cases a correction of the current daily values should be necessary, these values can be called and corrected in continuous order in the time-setting mode (see page 11).

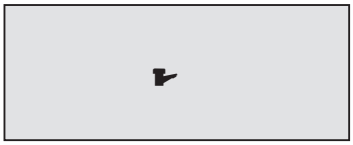
Radio clock option
For an optimum comfort the integration of a radio clock module is recommended to correct possibly occurring deviations automatically and absolutely precisely (see page 43 – Accessories on demand).

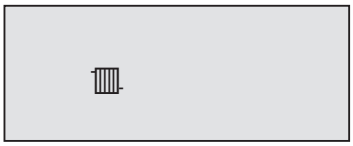
b – Setting of operating times

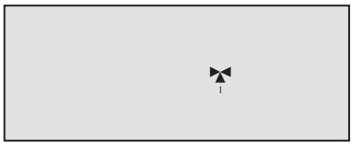
The standard operating times (basic programs) preset by the manufacturer in the three automatic programs ◷ 1, ◷ 2 and ◷ 3can be modified for each heating circuit according to the execution of the instrument. In this way, tailor-made heating programs with different switch-on and switch-off times for each weekday can be obtained.

Selection of heating circuit

The setting mode for the operating times is called after the time setting where, after the last setting value (calendar year) has shown, by repeated actuation of the yellow key the heating circuit to be modified can be selected in the order


Hot-water circuit


Boiler circuit


Mixer heating circuit 1 (Gamma 23 B, Gamma 233 B)


Mixer heating circuit 2 (Gamma 233 B)

and is indicated by the corresponding heating circuit symbol. By actuating the yellow key again, after calling the last heating circuit, the normal indication appears on the display.

Selection of operating times

Reading of the operating times
After selecting the heating circuit to be modified, the operating times level is entered by actuating the **blue key**. Simultaneously, the first switch-on time of the first weekday (Monday) is indicated.
Further operating times in this level are called with the **yellow key** in alternate order of switch on and switch off for the automatically following weekdays.

In order to indicate optically the switch-on respectively switch-off time, the appertaining operating state shows for a **short time**, approx. 2 seconds, **before** the corresponding operating time appears.

ON = switch-on time (start of heating)
OFF = switch-off time (end of heating)

Additionally, besides the indicated operating time, a cycle allocation number – 1 respectively - 2 appears on the left side of the indication which indicates, depending on the selected automatic program, the first or the second switch-on or switch-off time. The corresponding weekday shows below the indicated operating time.

Modification of operating times
A modification of the switch-on or switch-off times is possible only in increasing sense in steps of 30 minutes via the **blue key**.

Day-overlapping heating cycles
If a heating cycle to be programmed covers two days (i.e. switch-off time on the following day), the corresponding time periods for both days have to be entered.

The cycle has to be split into two partial cycles:

1- Start of cycle (switch-on time) up to 23.00 h (last switch-off time of the day)
2- Continuation of cycle (switch-on time) from 00.00 h of the following day until end of cycle (first switch-off time on the following day).

Attention: If, at programming a cycle, the switch-off time is set prior to the switch-on time, this cycle will be skipped.

Important note

For all automatic programs, switch-on **and** switch-off times of the second cycle for not required days always have to be set at 0.00. In this way, the second heating cycle will **not** be taken into consideration.

Reset of operating times (erasing)
After calling the **last switch-off time** on the last weekday (Sunday), the reset function of operating times is called by a further actuation of the yellow key.
With this function, all individually entered switch-on and switch-off times of the selected circuit can be erased and overwritten with the factory-preset standard operating times relative to the selected automatic program ◷ 1, ◷ 2 and ◷ 3.
If the reset function for operating times is called, the blue key has to be pushed until erasing of the switching times is confirmed by the indication > SET <.

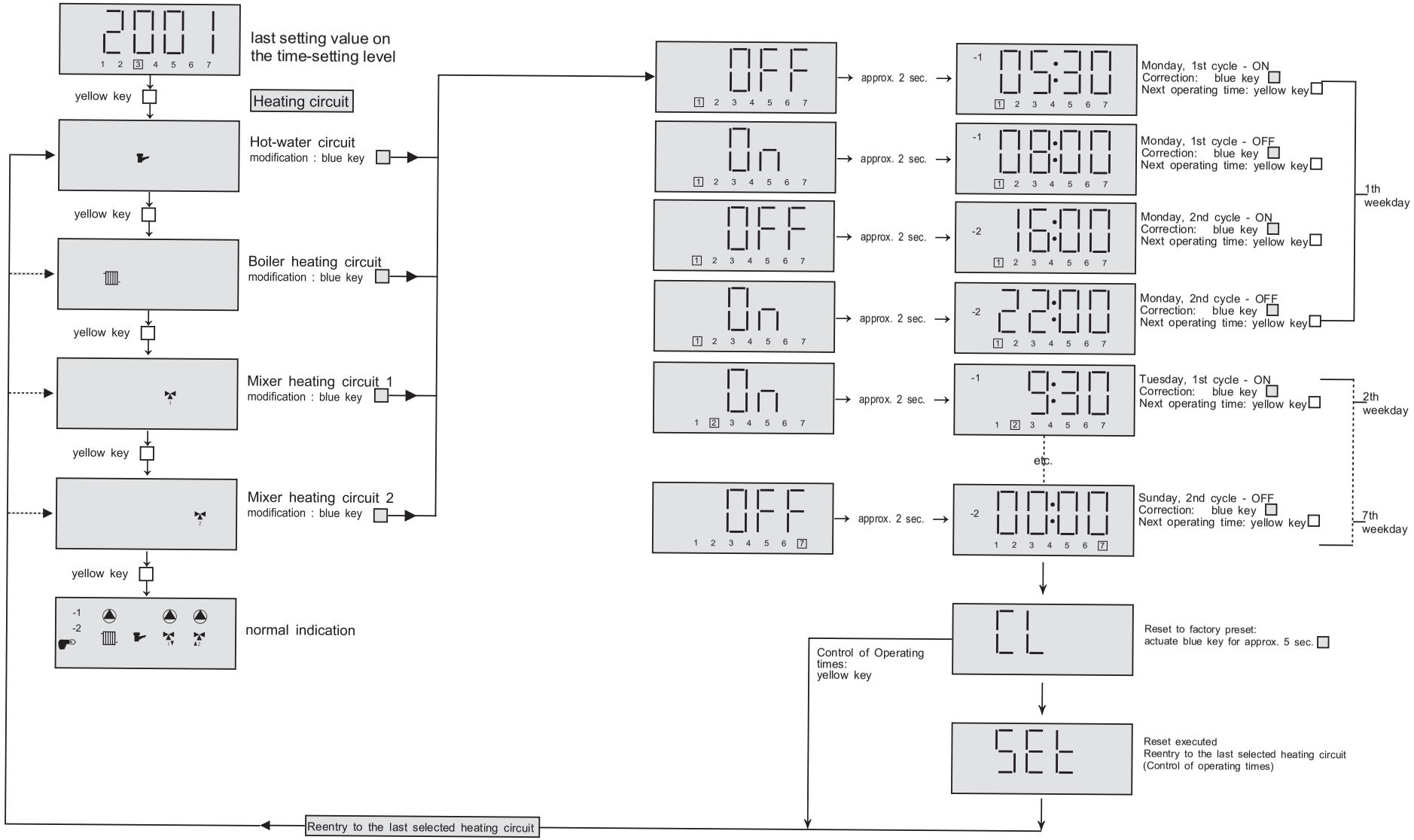
Attention:
Individually entered operating time programs will be definitely lost by erasing and must be entered again.

Modification of following heating circuits
After calling the last switch off-time on the last weekday (Sunday), the previously selected heating circuit is reentered by further actuating the yellow key so that, by a further selection of operating times, the possibly modified operating times can be checked immediately.
Actuating the yellow key again, the following heating circuit can be called and modified in the same way as described above.
In case of modifications of the basic programs, the modified operating times can be written on the tables (see page 14-16) in order to allow a later check or further modifications.

Reentry to the normal indication mode
During setting of operating times an automatic reentry to the normal indication mode takes place at the latest after the last actuation of the yellow respectively blue key.
The reentry is also possible by actuating the yellow key until the normal indication mode appears on the display.

Program structure of the operating-times level
The program structure of the operating-times level on the following pages gives a clear insight and serves to support the programming of individual heating programs.
The following paragraph shows the complete set mode for setting of time and operating time.

General program structure of the operating-time setting



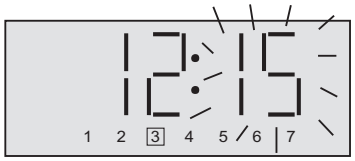
Entry into the time- and operating time setting

To enter into the setting mode the yellow key has to be actuated for approx. 5 seconds.

At the time setting mode the changeable values are indicated flashing and can be modified via the blue key.

The following value is called by actuating the yellow key.

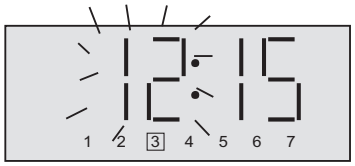
Minutes



Setting range
00.....59

Modification: blue key
Following value: yellow key

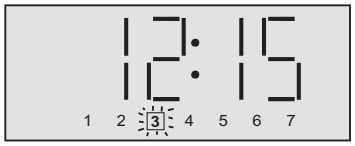
Hours



Setting range
00.....23

Modification: blue key
Following value: yellow key

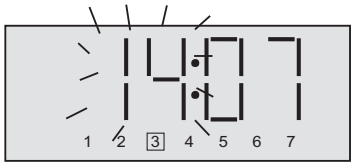
Weekday



Setting range
1.....7

Modification: blue key
Following value: yellow key

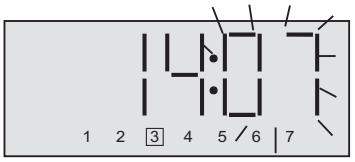
Calendar day



Setting range
1.....31

Modification: blue key
Following value: yellow key

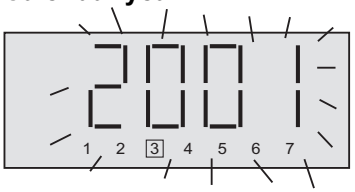
Calendar month



Setting range
1.....12

Modification: blue key
Following value: yellow key

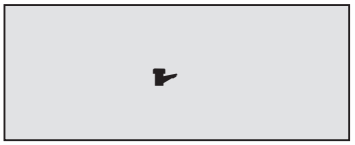
Calendar year



Setting range
1994.....2030

Modification: blue key
Following value: yellow key

A – Selection of heating circuit



Hot-water circuit

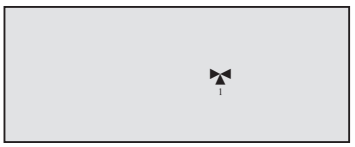
Info and modification:
See B – Selection of operating times

Next heating circuit: yellow key

Boiler circuit

Info and modification:
See B – Selection of operating times

Next heating circuit: yellow key



Mixer heating circuit 1 (Gamma 23 B, 233 B)

Info and modification:
See B – Selection of operating times

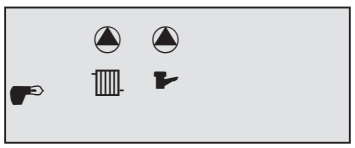
Next heating circuit: yellow key

Mixer heating circuit 2 (Gamma 233 B)

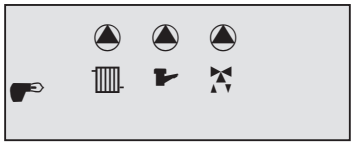
Info and modification:

See B – Selection of operating times

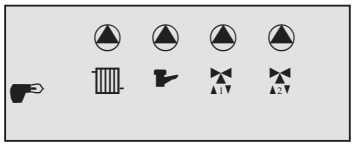
Reentry to the normal indication mode:
yellow key



Gamma 2 B



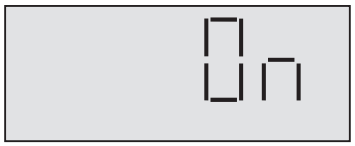
Gamma 23 B



Gamma 233 B

B – Selection of operating times

Blue key: first operating time of the selected heating circuit

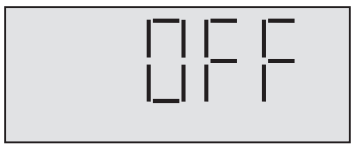


Heating mode

1st switch-on time of the selected heating circuit on Monday [1]

– 1
– 2
– 3

Modification: blue key
Next operating time: yellow key

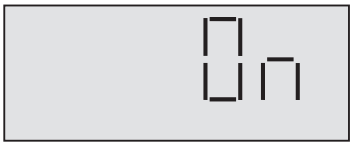


Reduced mode

1st switch-off time of the selected heating circuit on Monday [1]

– 1
– 2
– 3

Modification: blue key
Next operating time: yellow key

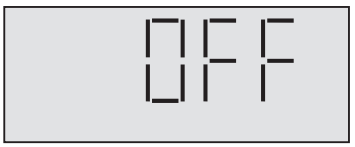


Heating mode

2nd switch-on time of the selected heating circuit on Monday [1]

– 1
– 2
– 3

Modification: blue key
Next operating time: yellow key

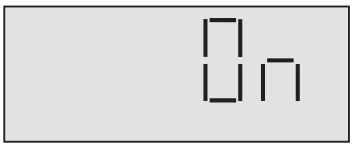


Reduced mode

2nd switch-off time of the selected heating circuit on Monday [1]

– 1
– 2
– 3

Modification: blue key
Next operating time: yellow key

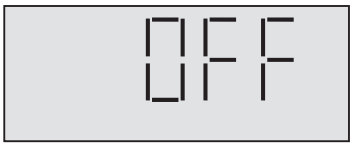


Heating mode

1st switch-on time of the selected heating circuit on Tuesday [2]

– 1
– 2
– 3

Modification: blue key
Next operating time: yellow key



Reduced mode

1st switch-off time of the selected heating circuit on Tuesday [2]

– 1
– 2
– 3

Modification: blue key
Next operating time: yellow key

Further programming as for Monday

TUESDAY

WEDNESDAY

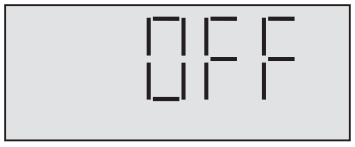
THURSDAY

FRIDAY

SATURDAY

SUNDAY

Last operating time: yellow key

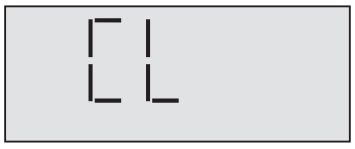


Reduced mode

Last switch-off time of the selected heating circuit on Sunday 7

– 1
– 2
– 3

Modification: blue key
Reset function of operating times: yellow key

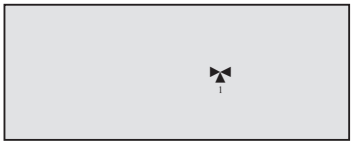


Cancel operating times: actuate blue key for approx. 5 sec. acknowledgement: SET

Control of operating times: yellow key

Actuating the yellow key, reentry to the selection of heating circle is effected with call of the last selected heating circuit.

A – Selection of the heating circuit



Example:
Mixer circuit 1

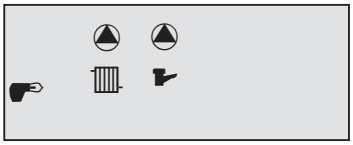
Actuating the blue key, a new entry to the selection of operating times takes place. Thus, modified operating times can be controlled immediately and corrected in case of wrong entries.

Actuating the yellow key, the following heating circuit is selected.

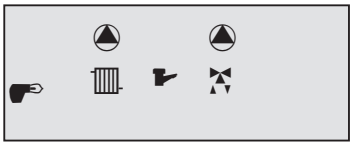
Example:
Mixer circuit 2

Info and modification: see B – Selection of operating times

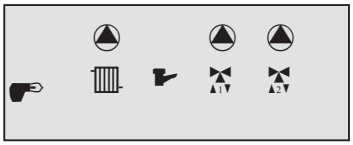
Reentry to the normal indication mode:
yellow key (if necessary, to be actuated several times).



Gamma 2 B



Gamma 23 B



Gamma 233 B

Individual adjustment of operating times

1 – Automatic mode 1

Day	Heating circuit	Heating cycle I Switch-on time	Heating cycle I Switch-off time	Heating cycle II Switch-on time	Heating cycle II Switch-off time
Mon 1	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Tue 2	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Wed 3	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Thu 4	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Fri 5	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Sat 6	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Sun 7	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				

Individual adjustment of operating times

🕒 2 – Automatic mode 2

		Heating cycle I		Heating cycle II	
Day	Heating circuit	Switch-on time	Switch-off time	Switch-on time	Switch-off time
Mon 1	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Tue 2	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Wed 3	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Thu 4	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Fri 5	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Sat 6	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Sun 7	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				

Individual adjustment of operating times

🕒 3 – Automatic mode 3

		Heating cycle I		Heating cycle II	
Day	Heating circuit	Switch-on time	Switch-off time	Switch-on time	Switch-off time
Mon 1	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Tue 2	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Wed 3	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Thu 4	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Fri 5	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Sat 6	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				
Sun 7	Boiler circuit				
	Hot-water circuit				
	Mixer circuit 1				
	Mixer circuit 2				

5. 3 Outside temperature inquiry

After a short actuation of the yellow key, the current outside temperature appears

common external sensor

If the controller is equipped with two external sensors, the allocation number I shows next to the indication.

external sensor I

If a second external sensor is connected and cleared on the configuration level, the current outside temperature of the second external sensor shows by actuating the blue key again.

external sensor II

The allocation number II is indicated next to the temperature.
The normal indication is reentered by actuating the yellow key or automatically after 30 seconds.

5.4 User level

Programming by the user of the plant

This program level is mainly reserved for the user of the plant and serves for indication or correction of plant-specific setting values which refer to individual heat requirements and consumption-typical information.

These programming steps include

- settings of heating characteristics
- determination of reduced mode
- nominal hot-water temperature
- parameter reset
- running hours of burner
- burner starts

which will be called subsequently in the above order.

Note: For a better understanding the parameters of the user level described below are explained in connection with the parameter setting.
The user is asked to get knowledge of these functions **prior** to enter the user level in order to guarantee that in case of necessary corrections correct values according to the requirements will be entered.

Entry of the user level

Entry is achieved by actuating the blue key for approx. 5 seconds.

Attention: During this period of time the current outside temperature appears temporarily on the display.

After the entry has been completed and the yellow key is actuated, the parameters are indicated with increasing identification numbers and the corresponding value.

The indicated parameter value is modified always **increasingly** by actuating the blue key and returns to its initial value after the highest value has been reached .

Exit from the user level

If within a time period of 60 seconds no further inquiry or correction is done, the exit takes place automatically with simultaneous change-over to the normal indication.

Exit also takes place if after calling the last program step (reset) the yellow key is actuated again.

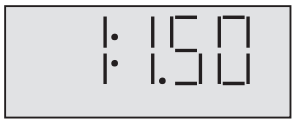
User level Gamma 2 B

Note:
If the factory preset should be modified, in the section > individual setting value < personal plant- specific values can be entered.

Entry: Actuate blue key for approx. 5 seconds

Attention: During this period of time, the current outside temperature appears temporarily on the display.

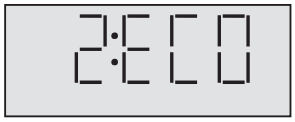
Parameter 1 Steepness of heating characteristics boiler heating circuit



Factory preset: 1.50
Setting range: 0.20....3.50
Individual setting value:

Modification: blue key
Next parameter: yellow key

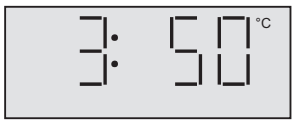
Parameter 2 Function in reduced mode



Factore preset: ECO
Setting values: ECO, AbS
Individual setting value:

Modification: blue key
Next parameter: yellow key

Parameter 3 Nominal hot-water value



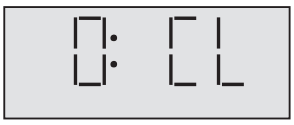
Factory preset: 50°C
Setting range: 20....80°C
Individual setting value:

Modification: blue key
Next step: yellow key

Parameter 4

Factory preset: OFF
Setting range: OFF, 1....7
Individual setting value:

Reset



Reset to factory preset of all previous parameters.
At reset 0 : S E T appears on the display.

Reset: actuate blue key for approx. 5 seconds
Next step: yellow key

Running-time counter of the burner
Current running time

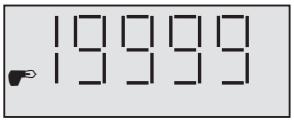
Factory preset: 00000
Range of indication: 00000....19999
Individual reading data:

Date	Value of counter

Rest: actuate
blue key for approx. 5 seconds

Next step: yellow key

Burner-starts counter
Current burner starts

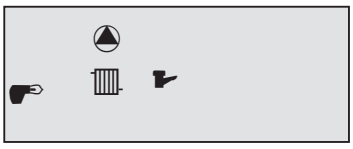


Factory preset: 00000
Range of indication: 00000....19999
Individual reading data:

Date	Value of counter

Rest: actuate
blue key for approx. 5 seconds

After actuating the yellow key the normal indication appears on the display.



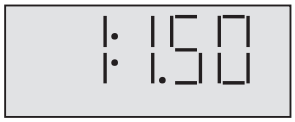
User level Gamma 23 B

Note:
If the factory preset should be modified, in the section > individual setting value < personal plant-specific values can be entered.

Entry: Actuate blue key for approx. 5 seconds

Attention: During this period of time the current outside temperature appears temporarily on the display.

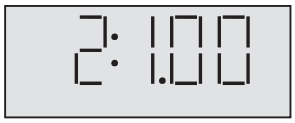
Parameter 1 Steepness of heating characteristics boiler heating circuit



Factory preset: 1.50
Setting range: 0.20....3.50
Individual setting value:

Modification: blue key
Next parameter: yellow key

Parameter 2 Steepness of heating characteristics mixer heating circuit



Factory preset: 1.00
Setting range: 0.20....3.50
Individual setting value:

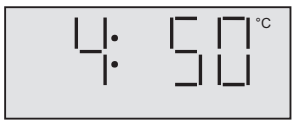
Modification: blue key
Next parameter: yellow key

Parameter 3 Function in reduced mode

Factore preset: ECO
Setting values: ECO, AbS
Individual setting value:

Modification: blue key
Next parameter: yellow key

Parameter 4 Nominal hot-water value



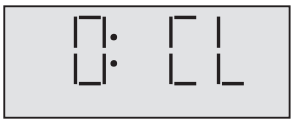
Factory preset: 50°C
Setting range: 20....80°C
Individual setting value:

Modification: blue key
Next step: yellow key

Parameter 5

Factory preset: OFF
Setting range: OFF, 1....7
Individual setting value:

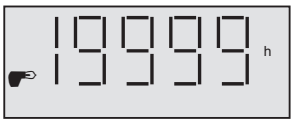
Reset



Reset to factory preset of all previous parameters.
At reset 0 : S E T appears on the display.

Reset: actuate blue key for approx. 5 seconds
Next step: yellow key

Running-time counter of the burner
Current running time

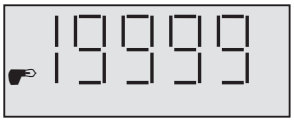


Factory preset: 00000
Range of indication: 00000....19999
Individual reading data:

Rest: actuate
blue key for approx. 5 seconds
Next step: yellow key

Date	Value of counter

Burner-starts counter
Current burner starts

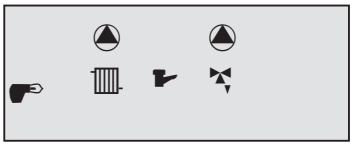


Factory preset: 00000
Range of indication: 00000....19999
Individual reading data:

Rest: actuate
blue key for approx. 5 seconds

Date	Value of counter

After actuating the yellow key the normal indication appears on the display.



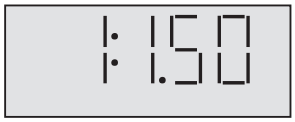
User level Gamma 233 B

Note:
If the factory preset should be modified, in the section > individual setting value < personal plant-specific values can be entered.

Entry: Actuate blue key for approx. 5 seconds

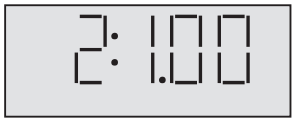
Attention: During this period of time the current outside temperature appears temporarily on the display.

Parameter 1 Steepness of heating characteristics boiler heating circuit



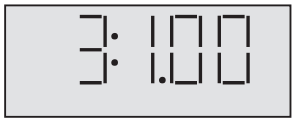
Factory preset: 1.50
Setting range: 0.20....3.50
Individual setting value:
Modification: blue key
Next parameter: yellow key

Parameter 2 Steepness of heating characteristics mixer heating circuit 1



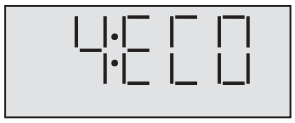
Factory preset: 1.00
Setting range: 0.20....3.50
Individual setting value:
Modification: blue key
Next parameter: yellow key

Parameter 3 Steepness of heating characteristics mixer heating circuit 2



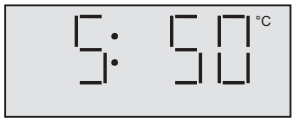
Factory preset: 1.00
Setting range: 0.20....3.50
Individual setting value:
Modification: blue key
Next parameter: yellow key

Parameter 4 Function in reduced mode



Factory preset: ECO
Setting values: ECO, AbS
Individual setting value:
Modification: blue key
Next parameter: yellow key

Parameter 5 Nominal hot-water value

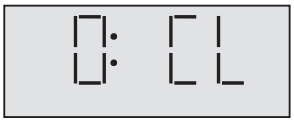


Factory preset: 50°C
Setting range: 20....80°C
Individual setting value:
Modification: blue key
Next step: yellow key

Parameter 6

Factory preset: OFF
Setting range: OFF, 1....7
Individual setting value:

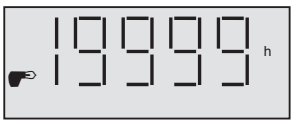
Reset



Reset to factory preset of all previous parameters.
At reset 0 : S E T appears on the display.

Reset: actuate blue key for approx. 5 seconds
Next step: yellow key

Running-time counter of the burner
Current running time



Factory preset: 00000
Range of indication: 00000....19999
Individual reading data:

Rest: actuate
blue key for approx. 5 seconds
Next step: yellow key

Date	Value of counter

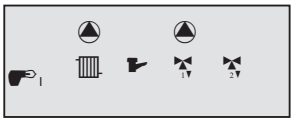
Burner-starts counter
Current burner starts

Factory preset: 00000
Range of indication: 00000....19999
Individual reading data:

Reset: actuate
blue key for approx. 5 seconds

Date	Value of counter

After actuating the yellow key the normal indication appears on the display.



Functional description of parameter and program steps at the user level

Steepness of heating characteristics

a – directly controlled heating circuit (Gamma 2 B, Gamma 23 B, Gamma 233 B)

b – mixer heating circuit 1 (Gamma 23 B, Gamma 233 B)

c – mixer heating circuit 2 (Gamma 233 B)

The steepness of the heating characteristics describes the relation of boiler (respectively modification of the flow-pipe temperature) to outside temperature modification and can be regulated separately for each heating circuit.

The steepness values refer to a reference outside temperature of – 12°C taken as basis of the heat requirement calculation and can be readjusted for other reference values.

The heating characteristic should be modified only in small steps and after sufficient long time periods so that, with the normally rather sluggish heating systems, a steady condition can be obtained.

Corrections are recommended in steps from 0.1 after 1 – 2 days.

For the operation **without** room control, for a precise reset of the heating characteristics, the selector switch should be positioned temporarily at continuous day mode (✳) in order to not disturb the stabilising process by temperature decreasing periods.

Furthermore, the most frequented room should be considered to observe the ambient temperature.

If the heating radiators are correctly designed, thermostat valves only serve to regulate external heat and should nearly be opened completely. During setting period, additional heat sources (open fireplaces, tiled stoves, etc.)should not be operated. Furthermore, one should not let in too much air during this period.

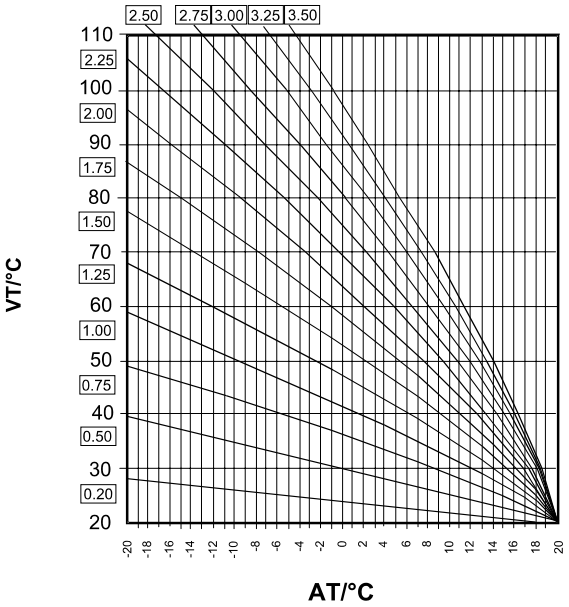
R For the operation with room control an automatic adoption of the heating characteristics takes place if the corresponding parameter has been activated.

At correct set heating characteristics the ambient temperature remains constant according to the set nominal daytime ambient value and independent form outside temperatures.

Recommended setting values

Underfloor heating systems:	0.3	1.0
Radiator heating systems:	1.2	2.0
Convector heating systems:	1.5	2.0

Heating characteristics diagram



Attention: The working range of the heating characteristics is limited depending on the regulation of minimum and maximum limiting temperature. Outside temperature is not considered for the limiting ranges.

Reduced mode

During the reduced mode two operational modes can be selected.

1 – Temperature-decreasing mode

According to the preset operating-time programs the heating pump of the decreased heating circuit remains in operation. The boiler- respectively flow-pipe temperature is specified by reduced heating characteristics according to a set nominal decreasing ambient value. Temperature will not drop below the preset minimum temperature of the decreased heating circuit.

Application: Buildings with low insulation values and high cooling losses.

2 – ECO mode

During ECO mode the corresponding heating circuit is totally switched off if the outside temperature **does not exceed** the preset frost- protection limit.

For this purpose, burner and mixer circuit pumps are out of function, the boiler circuit pump switches off decelerated in order to avoid a safety switch-off due to a post heating of the boiler. The minimum limiting function is deactivated. In case the

outside temperature should be or drop below the preset frost-protection limit, the controller changes from the switched-off mode to the **reduced mode** and controls the corresponding heating circuit temperature according to the preset temperature reduction characteristics under consideration of the preset minimum temperature.

Application: Buildings with high insulation values (complete heat protection).

Attention:

1. Mixer heating circuits which start functioning **prior** to the boiler heating circuit (underfloor heating systems) cause, despite switch off of the boiler heating circuit, an increase of the boiler temperature to the required level. The boiler heating circuit remains switched off by blocking the boiler circuit pump.
2. At activated ECO mode all **temperature reduction functions** are changed over into the **switch-off functions of** the heating programs preset by the selector switch. Switch position ☽ – constant temperature reduction mode becomes the constant frost-safe switch-off mode.

Nominal hot-water value

All controllers of the series Gamma 2 are equipped with an electronic tank temperature control to load an indirectly heated hot-water cylinder.
The nominal value specifies the amount of the hot-water temperature to be controlled during the operative times of the hot-water circuit.
The tank is loaded if the preset nominal value has not been reached by switching on burner and tank loading pump. Loading is completed as soon as the temperature inside the hot-water tank is above 5 K to the corresponding nominal value. The burner is out of function, the tank loading pump is switched off decelerated in order to avoid a safety switch off due to post heating of the boiler.

Legionella protection

Legionalla protection is activated at the pre-programmed weekday (1...7) between 21:00 – 22:00 o'clock.
In case the value of the tank temperature at that time should be below 65°C it will be increased to 70°C.

Running hours of the burner

Detection of the running hours of the burner serves at one hand as supporting information for the detection of heating costs and, on the other hand, as a limiting value for necessary maintenance works.
The number of running hours of the burner refers to the actual running times of the burner if a feedback is given by the burner. In this way, pre-purging/pre-heating/and delay times of the ignition automate are not included in the result.

Attention: The running hours are counted only at connected feedback line!
In case of burners without feedback (boilers with atmospheric burners, etc.) the feedback entry BZ (terminal 20) can be connected to the burner inquiry (terminal 1). In this case, all burner-specific delay times are counted.
In case of an open feedback entry the running hours are **not** counted (indication 00000).

Burner starts

The indication of the burner starts can give information on the economic use of a heating plant, since the amount of standstill losses is reduced by longer running times of the burner and a smaller number of switching on of the burner.

Attention: The burner starts are counted only at connected feedback line!
In case of burners **without** feedback (boilers with atmospheric gas burners) the feedback entry BZ (terminal 20) can be connected to the burner inquiry (terminal 1). In this case, all burner-specific delay times are counted.
In case of an open feedback entry the running hours are **not** counted (indication 00000).

5.5 Professional level
Programming by the heating plant specialist

This programming level requires a comprehensive knowledge of control-technical processes in heating plant technique and should remain exclusively under the responsibility of the heating plant specialist. This level contains all control-technical parameters which require a precise adoption to the different systems in order to guarantee a troublefree and most economic possible operation of the heating plant.

The individual programming steps in this level include

- frost-protection setting
- summer switch off
- boiler start relief
- minimum boiler temperature delimitation
- maximum boiler temperature delimitation
- burner-switch difference
- boiler parallelism
- minimum running time of burner
- minimum temperature delimitation of the mixer circuits
- maximum temperature delimitation of the mixer circuits
- tank priority
- tank start relief
- pump lag
- bus address
- summer-/winter reset
- parameter reset

and are called subsequently in the above order.

Note: For a better understanding the parameters of the professional level described below are explained in connection with the parameter setting and can contribute as support for programming.

Entry into the professional level

Entry is achieved by simultaneously actuating the blue and the yellow key for approx. 5 seconds and is confirmed with the indication HF (Heizungsfachmann / heating specialist).

After the entry has been completed and the yellow key is actuated, the parameters are called in succession with increasing identification numbers and the corresponding values.

The indicated parameter value is modified **always increasingly** by actuating the blue key and returns to its initial value after the highest value has been reached .

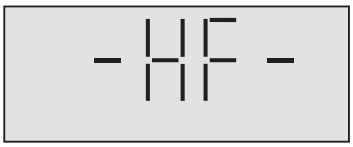
Reentry from the user level

If within a time period of 60 seconds no further inquiry or correction is done, reentry takes place automatically with simultaneous change over to the normal indication. Reentry also takes place if after calling the last program step (parameter reset) the yellow key is actuated.

Note: If the factory preset should be modified, in the section > individual setting value < personal plant- specific values can be entered.

Entry: Actuate simultaneously blue **and** yellow key for approx. 5 seconds

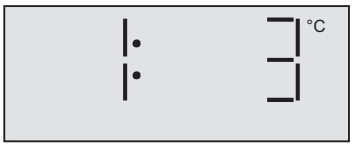
Confirmation:



Indication shows for approx. 2 seconds, then appears:

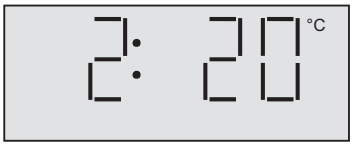
For Gamma 2 B

Parameter 1 frost-protection limit



Factory preset: 3°C
Setting range: -10...+10°C
Individual setting value:
Modification: blue key
Next parameter: yellow key

Parameter 2 summer switch off

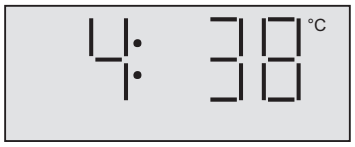


Factory preset: 20°C
Setting range: 10...30°C
Individual setting value:
Modification: blue key
Next parameter: yellow key

Parameter 3 boiler start relief

Factory preset: ON
Setting range: ON - OFF
Individual setting value:
Modification: blue key
Next parameter: yellow key

Parameter 4 minimum boiler temperature

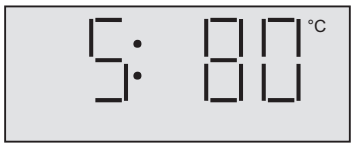


Factory preset: 38°C
Setting range: 10...95°C
Individual setting value:

Modification: by authorised specialists only, after consultation of the boiler manufacturer.

Next parameter: yellow key

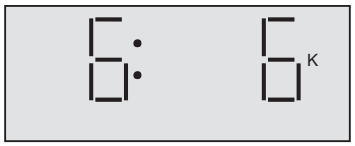
Parameter 5 maximum boiler temperature



Factory preset: 80°C
Setting range: 10...95°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

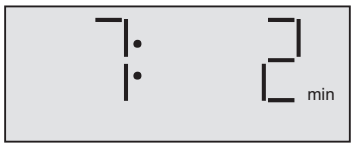
Parameter 6 burner-switch difference



Factory preset: 6 K
Setting range: 2...30 K
Individual setting value:

Modification: blue key
Next parameter: yellow key

Parameter 7 minimum running time of burner



Factory preset: 2 min.
Setting range: 0...10 min.
Individual setting value:

Modification: blue key
Next parameter: yellow key

Parameter 8 tank priority/parallel tank mode

Factory preset: ON
Setting ranges: ON (priority)
OFF (parallel tank mode)
Individual setting value:

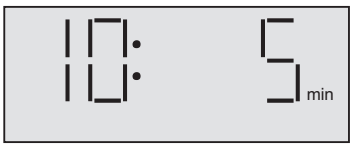
Modification: blue key
Next parameter: yellow key

Parameter 9 tank start relief

Factory preset: ON
Setting ranges: ON (with tank start relief)
OFF (without tank start relief)
Individual setting value:

Modification: blue key
Next parameter: yellow key

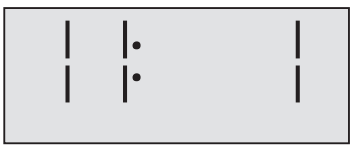
Parameter 10 pump lag for boiler circuit pump and tank loading pump



Factory preset: 5 min.
Setting range: 0...60 min.
Individual setting value:

Modification: blue key
Next parameter: yellow key

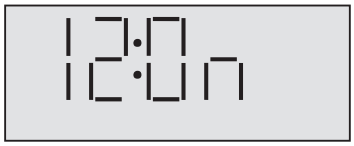
Parameter 11 bus-address participant-number for interface



Factory preset: 1
Setting range: 1...5
Individual setting value:

Modification: blue key
Next parameter: yellow key

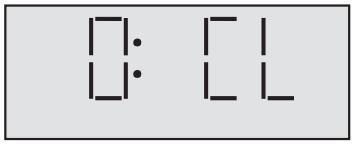
Parameter 12 automatic summer-/winter reset according to internal calendar



Factory preset: ON
Setting ranges: ON (with automatic reset)
OFF (without automatic reset)
Individual setting value:

Modification: blue key
Next parameter: yellow key

Parameter reset (total reset in all program levels)

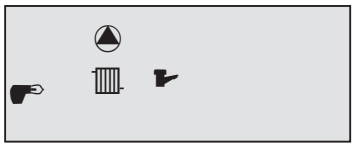


Reset to factory preset of all previous parameters in the professional level **and** in the user level.

With the reset appears
0 : SET on the display.

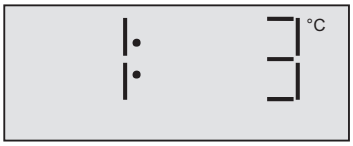
Reset: actuate blue key for approx. 5 seconds

After actuating the yellow key, reentering from The professional level is achieved and the normal indication appears on the display.



For Gamma 23 B

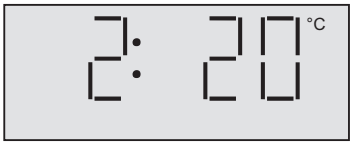
Parameter 1 frost-protection limit



Factory preset: 3°C
Setting range: -10...+10°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

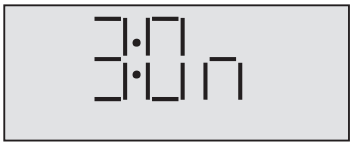
Parameter 2 summer switch off



Factory preset: 20°C
Setting range: 10...30°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

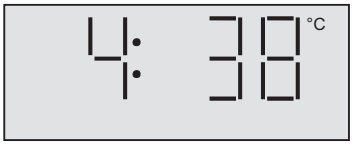
Parameter 3 boiler start relief



Factory preset: ON
Setting range: ON - OFF
Individual setting value:

Modification: blue key
Next parameter: yellow key

Parameter 4 minimum boiler temperature

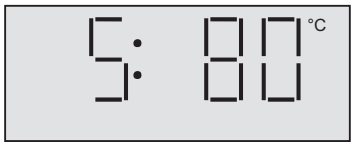


Factory preset: 38°C
Setting range: 10...95°C
Individual setting value:

Modification: by authorised specialists only, after consultation with the boiler manufacturer.

Next parameter: yellow key

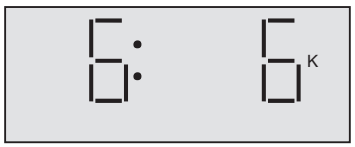
Parameter 5 maximum boiler temperature



Factory preset: 80°C
Setting range: 10...95°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

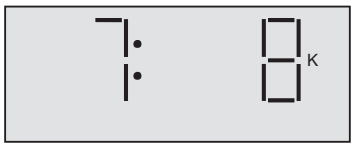
Parameter 6 burner-switch difference



Factory preset: 6 K
Setting range: 2...30 K
Individual setting value:

Modification: blue key
Next parameter: yellow key

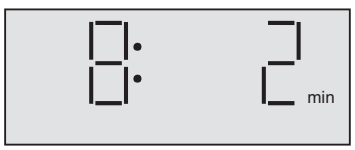
Parameter 7 boiler parallelism
(boiler rate-time value at mixer inquiry)



Factory preset: 8 K
Setting range: 0...20 K
Individual setting value:

Modification: blue key
Next parameter: yellow key

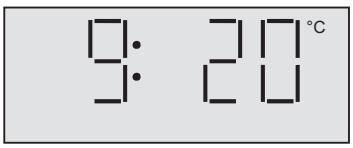
Parameter 8 minimum running time of burner



Factory preset: 2 min.
Setting range: 0...10 min.
Individual setting value:

Modification: blue key
Next parameter: yellow key

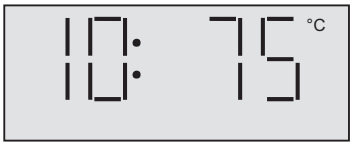
Parameter 9 minimum temperature delimitation mixer heating circuit



Factory preset: 20°C
Setting range: 10...95°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

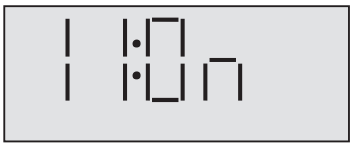
Parameter 10 maximum temperature delimitation mixer heating circuit



Factory preset: 75°C
Setting range: 10...95°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

Parameter 11 tank priority/parallel tank mode



Factory preset: ON
Setting ranges: ON (priority)
OFF (parallel mode)
Individual setting value:

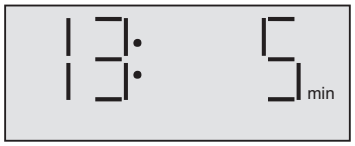
Modification: blue key
Next parameter: yellow key

Parameter 12 tank start relief

Factory preset: ON
Setting ranges: ON (with tank start relief)
OFF (without tank start relief)
Individual setting value:

Modification: blue key
Next parameter: yellow key

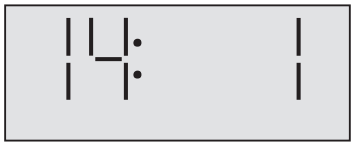
Parameter 13 pump lag for boiler circuit pump and tank loading pump



Factory preset: 5 min.
Setting range: 0...60 min.
Individual setting value:

Modification: blue key
Next parameter: yellow key

Parameter 14 bus-address participant-number for interface



Factory preset: 1
Setting range: 1...5
Individual setting value:

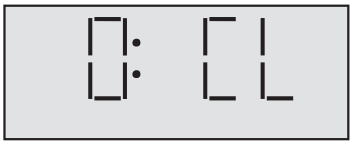
Modification: blue key
Next parameter: yellow key

Parameter 15 automatic summer-/winter reset according to internal calendar

Factory preset: ON
Setting ranges: ON (with automatic reset)
OFF (without automatic reset)
Individual setting value:

Modification: blue key
Next parameter: yellow key

Parameter reset (total reset in all program levels)

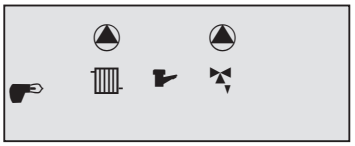


Reset to factory preset of all previous parameters in the professional level **and** in the user level.

With the reset appears
0 : SET on the display.

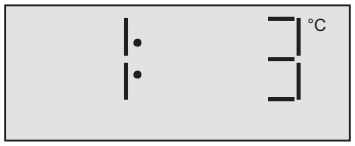
Reset: actuate blue key for approx. 5 seconds

After actuating the yellow key reentering from the professional level is achieved and is indicated by the normal indication.



For Gamma 233 B

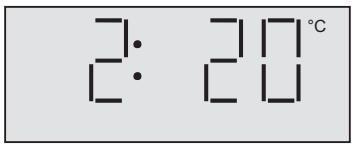
Parameter 1 frost-protection limit



Factory preset: 3°C
Setting range: -10...+10°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

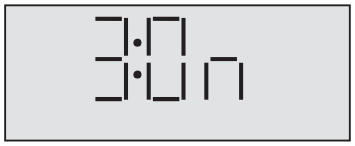
Parameter 2 summer switch off



Factory preset: 20°C
Setting range: 10...30°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

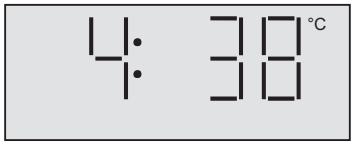
Parameter 3 boiler start relief



Factory preset: ON
Setting range: ON - OFF
Individual setting value:

Modification: blue key
Next parameter: yellow key

Parameter 4 minimum boiler temperature

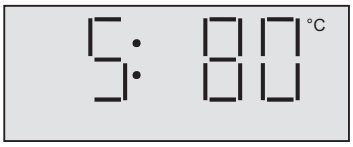


Factory preset: 38°C
Setting range: 10...95°C
Individual setting value:

Modification: by authorised specialists only, after consultation with the boiler manufacturer.

Next parameter: yellow key

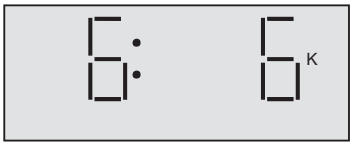
Parameter 5 maximum boiler temperature



Factory preset: 80°C
Setting range: 10...95°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

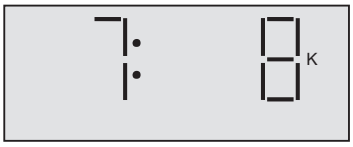
Parameter 6 burner-switch difference



Factory preset: 6 K
Setting range: 2...30 K
Individual setting value:

Modification: blue key
Next parameter: yellow key

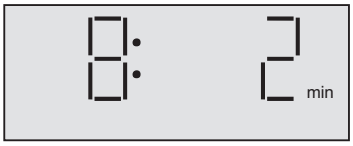
Parameter 7 boiler parallelism
(boiler rate-time value at mixer inquiry)



Factory preset: 8 K
Setting range: 0...20 K
Individual setting value:

Modification: blue key
Next parameter: yellow key

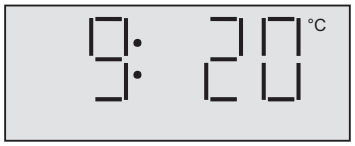
Parameter 8 minimum running time of burner



Factory preset: 2 min.
Setting range: 0...10 min.
Individual setting value:

Modification: blue key
Next parameter: yellow key

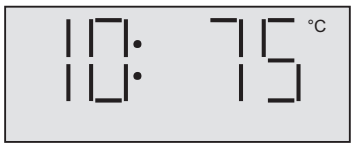
Parameter 9 minimum temperature delimitation mixer heating circuit 1



Factory preset: 20°C
Setting range: 10...95°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

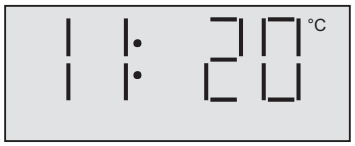
Parameter 10 maximum temperature delimitation mixer heating circuit 1



Factory preset: 75°C
Setting range: 10...95°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

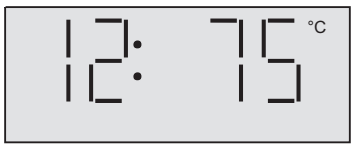
Parameter 11 minimum temperature delimitation mixer heating circuit 2



Factory preset: 20°C
Setting range: 10...95°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

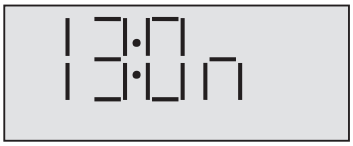
Parameter 12 maximum temperature delimitation mixer heating circuit 2



Factory preset: 75°C
Setting range: 10...95°C
Individual setting value:

Modification: blue key
Next parameter: yellow key

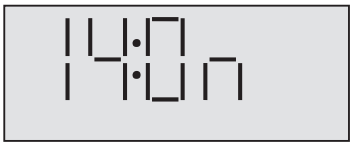
Parameter 13 tank priority/parallel tank operation



Factory preset: ON
Setting ranges: ON (priority)
OFF (parallel tank operation)
Individual setting value:

Modification: blue key
Next parameter: yellow key

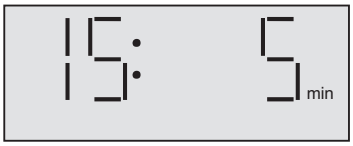
Parameter 14 tank start relief



Factory preset: ON
Setting ranges: ON (with tank start relief)
OFF (without tank start relief)
Individual setting value:

Modification: blue key
Next parameter: yellow key

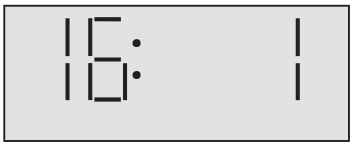
Parameter 15 pump lag for boiler circuit pump and tank loading pump



Factory preset: 5 min.
Setting range: 0...60 min.
Individual setting value:

Modification: blue key
Next parameter: yellow key

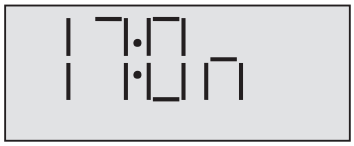
Parameter 16 bus-address participant-number for interface



Factory preset: 1
Setting range: 1...5
Individual setting value:

Modification: blue key
Next parameter: yellow key

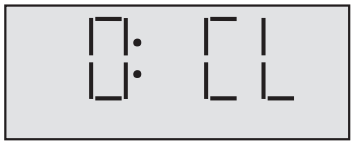
Parameter 17 automatic summer-/winter reset according to internal calendar



Factory preset: ON
Setting ranges: ON (with automatic reset)
OFF (without automatic reset)
Individual setting value:

Modification: blue key
Next parameter: yellow key

Parameter reset (total reset in all program levels)

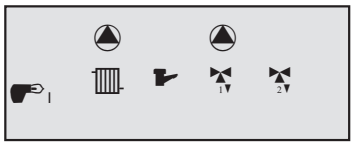


Reset to factory preset of all previous parameters in the professional level **and** in the user level.

With the reset appears
0 : SET on the display.

Reset: actuate blue key for approx. 5 seconds

After actuating the yellow key reentry from the professional level is achieved and is indicated by the normal indication.



Functional description of parameters in the professional level

(Page 23 – 30)

Frost protection-limit

The control instrument is equipped with an electronic frost protection in order to avoid a freezing up of the heating plant in switch-off mode.
If the outside temperature (current value) should drop below the set limit value, heating mode is released according to the requirements.
The heating pumps are activated, possibly connected mixer sopen, the temperature does not drop below the minimum boiler temperature.

Attention: Setting values lower than the factory preset (+3°C) may only be selected if the frost protection of the heating plant is guaranteed by constructional measures.

Summer switch off

Summer switch off works according to two different criteria:

1 – Rapid switch off (rapid temperature rise). Summer switch off is activated if the current (real) outside temperature exceeds the setting value by 2 K. Switch off is nullified if the **current and mean** outside temperature is minor than 1 K as the set value.

2 – Switch off according to mean temperatures (crawl temperature increase)
Summer switch off is also activated if the current and mean outside temperature reaches the set value.
Switch off is nullified if the current and mean outside temperature together drop below the set value by 1 K.

At activated summer switch off existing mixers are closed and all heating circuit pumps are disconnected. Hot water preparation remains in function according to the preset heating program.

Boiler start release

The boiler start release, which can be activated, serves as protection of the boiler against corrosion which can be caused on heating at cold condition by condensation in the dew point range. Should the boiler temperature drop below the minimum limiting value by 2 K, all consumer circuits are separated from water by disconnecting the heating circuit pumps and closing the mixers. The heating circuits are released as soon as the boiler temperature has exceeded the minimum limiting value plus half the burner-switch difference.

Minimum boiler delimitation

Depending on the type of the heating boiler, the control instrument possesses a minimum delimitation regulation preset by the manufacturer.
The boiler is switched on if the set value is not reached and switched off if set value and preset burner-switch difference have been exceeded.
During heating mode temperature will not drop below the set delimitation value.

Exceptions: Switch off of the standby mode above frost-protection limit

Switch off at reduced automatic mode with activated ECO function

Switch off at permanent reduced mode with activated ECO function

Automatic summer switch off

Maximum boiler delimitation

In accordance with the requirements of the heating plants prescriptions regarding low-temperature systems, the instruments of the series **Gamma 2** are equipped with an electronic maximum delimitation. It switches off the burner if the boiler temperature exceeds the set limiting value. The burner is switched on again if the boiler temperature has dropped by half the value of the set burner-switch difference plus a reserve of 2 K below the regulated value of the maximum delimitation.

Burner-switch difference

The burner-switch difference can be adopted to the hydraulic conditions of the plant in order to increase the burner running times and to reduce standstill times.
The setting value indicates the temperature difference between switch on and switch off of the burner and is symmetrical to the request value concerned.

Boiler parallelism

If the real requirement of the directly controlled heating circuit (sliding boiler heating circuit) is minor than the requirement of the mixer heating circuits, the latter specify the height of the boiler temperature according to your requirements.
In order to guarantee a precise control of the mixer heating circuits the request value concerned is admitted with an additional temperature increase and provides a sufficient control reserve.

Minimum burner running time

Besides the burner-switch difference a minimum burner running time can be preset in order to increase the burner running times and to reduce standstill times. If the set maximum boiler temperature is reached, the minimum burner running time is deactivated.

Minimum temperature delimitation of the mixer heating circuits
(Gamma 23 B, Gamma 233 B)

This function limits the flow-pipe temperature of the mixer heating circuit concerned in decreasing direction according to the preset limiting value.
Below this value the outside temperature is no longer taken into consideration, the controller works in a constant operation according to the regulation.
During heating mode the temperature will not drop below the preset limiting value.

Exceptions: Switch off of the standby mode above frost-protection limit
Switch off at reduced automatic mode with activated ECO function
Switch off at permanent reduced mode with activated ECO function
Automatic summer switch off

Application: Minimum underfloor delimitation
Ventilation pre-control
Convector heating systems

Maximum temperature delimitation of the mixer heating circuits
(Gamma 23 B, Gamma 233 B)

This function limits the flow-pipe temperature of the mixer heating circuit concerned in increasing direction according to the preset limiting value.
Above this value the outside temperature is no longer taken into consideration, the controller works in a constant operation according to the regulation.
During heating mode the preset limiting value will not be exceeded.

Application: Maximum underfloor delimitation

Attention: In order to protect underfloor heating plants against inadmissible overheating in limit cases a maximum temperature delimitation should in any case be installed independently from the controller. For this purpose, we recommend a thermostat to be put on over the switch contact of which the pilot phase of the pump control circuit is looped. The thermostat is to be regulated at maximum admissible plant temperature.

Calorifier priority – parallel mode

At parallel calorifier mode, during one calorifier load all heating circuit pumps are switched off and available mixers closed. The boiler energy is used exclusively to load the hot-water calorifier.
At parallel calorifier mode the heating circuits remain in function during calorifier loading. Overtemperatures occurring during calorifier laoding are regulated in case of existing mixer heating circuits.

Attention: At parallel calorifier mode, directly controlled boiler heating circuits are supplied with the calorifier loading temperature in case of hot-water request and do no longer work according to atmospheric influences.

Calorifier start release

At activated calorifier start release, in case of a boiler request, the loading pump is released only if the boiler temperature exceeds the set nominal tank value.
With this a tank discharge is almost completely avoided and a complete boiler protection is guaranteed.

Attention: This function should be deactivated in case of nominal calorifier values exceeding 60°C in order to avoid a safety switch off!

Pump lag

After switch off the burner, depending on the request, the boiler circuit pump or the boiler loading pump are deactivated decelerated in order to avoid a boiler switch off in case of high temperatures. The set value refers equally to the boiler heating circuit pump and the calorifier loading pump.

Bus address

In case of several heating- and hot-water circuits controlled by mixer or thermostat, the present instrument conception allows the cascade connection from up to five individual instruments. These are specified by a corresponding interface number which, via the bi-directional data bus allows a selective communication between the base unit and the interactive sub-units. Each sub-unit is able to transfer the data of maximum 3 room stations via the assigned interface.
Principally, the number 1 is always assigned to the base unit.
Further information can be found in the operating instructions of the room station.

Summer -/winter reset

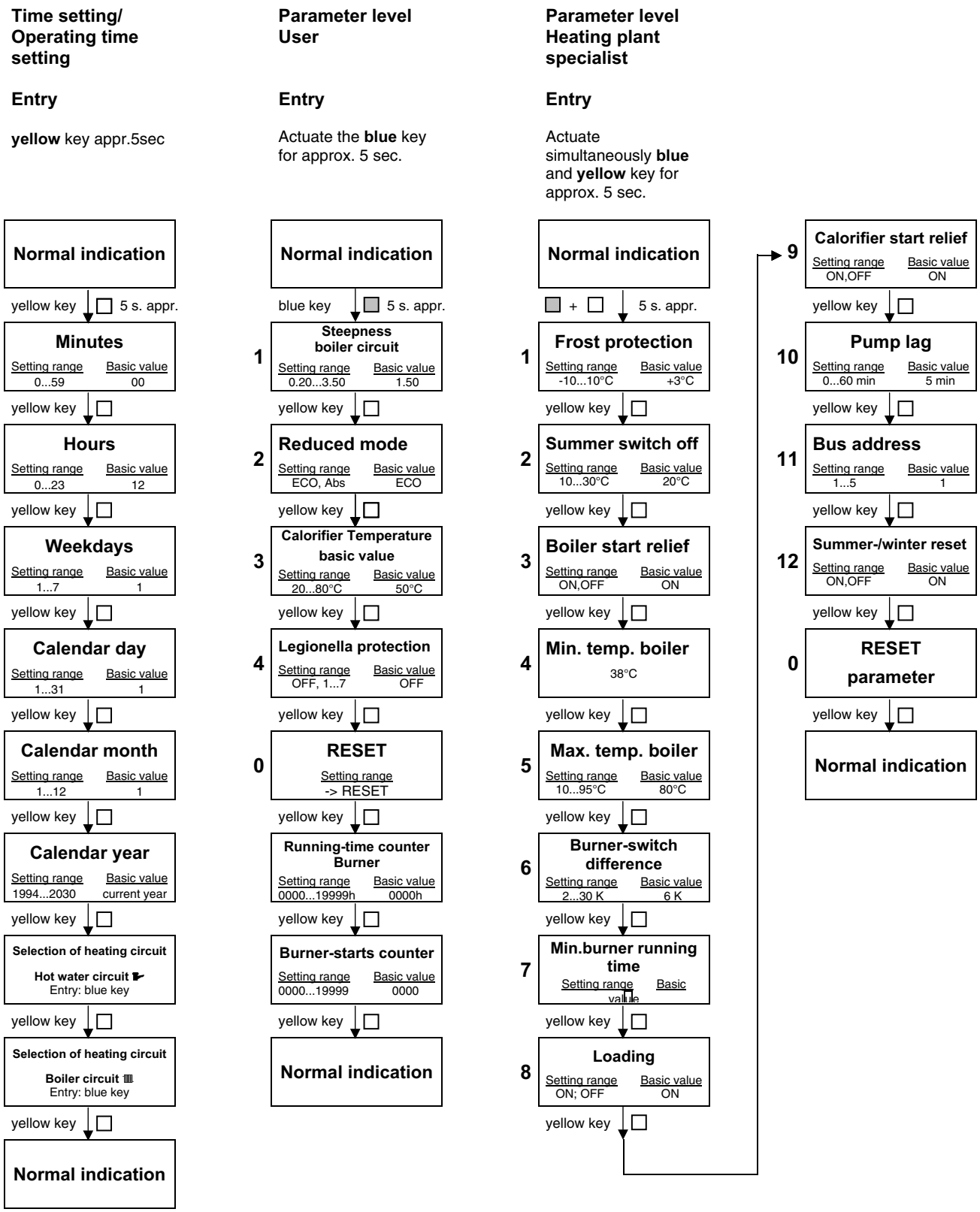
In some rare cases for which the yearly-repeating reset dates from winter to summer and vice versa do not exist, the automatic reset can be switched off.

Application: Countries which do not change time.

Parameter reset

If the reset function is activated, with the exception of the minimum boiler temperature delimitation, all parameters of the professional level including running hours and burner starts are reset to the factory preset.

Parameter structure Gamma 2 B



Parameter structure Gamma 23 B

Time setting/ Operating time setting

Entry

yellow key appr.5sec

Parameter level User

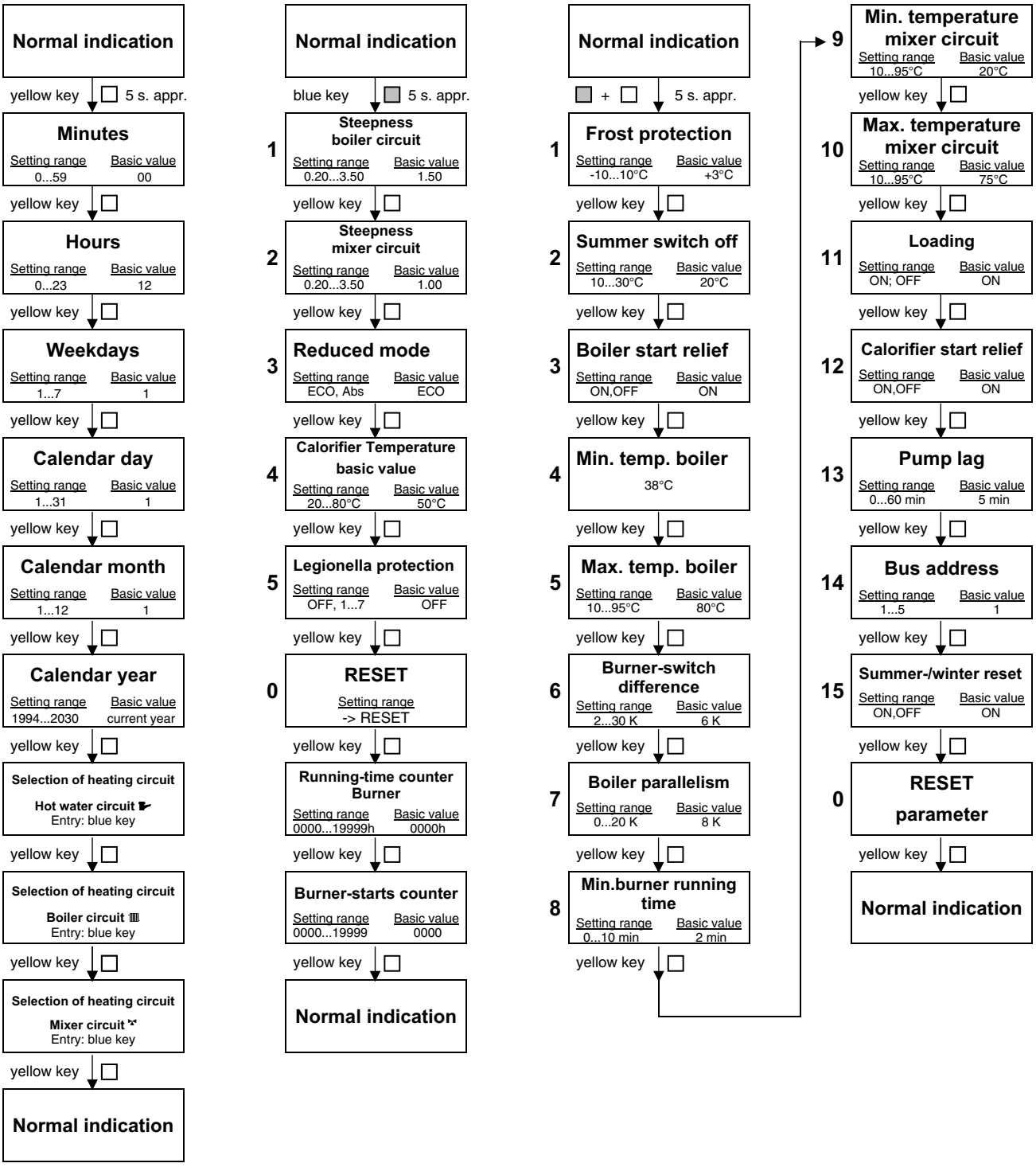
Entry

Actuate the **blue** key for approx. 5 sec.

Parameter level Heating plant specialist

Entry

Actuate simultaneously **blue** and **yellow** key for approx. 5 sec.



Parameter structure Gamma 233 B

Time setting/ Operating time setting

Entry

yellow key appr.5sec

Normal indication

yellow key ☐ 5 s. appr.

Minutes
Setting range: 0...59 | Basic value: 00

yellow key ☐

Hours
Setting range: 0...23 | Basic value: 12

yellow key ☐

Weekdays
Setting range: 1...7 | Basic value: 1

yellow key ☐

Calendar day
Setting range: 1...31 | Basic value: 1

yellow key ☐

Calendar month
Setting range: 1...12 | Basic value: 1

yellow key ☐

Calendar year
Setting range: 1994...2030 | Basic value: current year

yellow key ☐

Selection of heating circuit
Hot water circuit
Entry: blue key

yellow key ☐

Selection of heating circuit
Boiler circuit
Entry: blue key

yellow key ☐

Selection of heating circuit
Mixer circuit 1
Entry: blue key

yellow key ☐

Selection of heating circuit
Mixer circuit 2
Entry: blue key

yellow key ☐

Normal indication

Parameter level User

Entry

Actuate the **blue** key for approx. 5 sec.

Normal indication

blue key ☐ 5 s. appr.

1 **Steepness boiler circuit**
Setting range: 0.20...3.50 | Basic value: 1.50

yellow key ☐

2 **Steepness mixer circuit 1**
Setting range: 0.20...3.50 | Basic value: 1.00

yellow key ☐

3 **Steepness mixer circuit 2**
Setting range: 0.20...3.50 | Basic value: 1.00

yellow key ☐

4 **Reduced mode**
Setting range: ECO, Abs | Basic value: ECO

yellow key ☐

5 **Calorifier Temperature basic value**
Setting range: 20...80°C | Basic value: 50°C

yellow key ☐

6 **Legionella protection**
Setting range: OFF, 1...7 | Basic value: OFF

yellow key ☐

0 **RESET**
Setting range: -> RESET

yellow key ☐

Running-time counter Burner
Setting range: 0000...19999h | Basic value: 0000h

yellow key ☐

Burner-starts counter
Setting range: 0000...19999 | Basic value: 0000

yellow key ☐

Normal indication

Parameter level Heating plant specialist

Entry

Actuate simultaneously **blue** and **yellow** key for approx. 5 sec.

Normal indication

☐ + ☐ 5 s. appr.

1 **Frost protection**
Setting range: -10...10°C | Basic value: +3°C

yellow key ☐

2 **Summer switch off**
Setting range: 10...30°C | Basic value: 20°C

yellow key ☐

3 **Boiler start relief**
Setting range: ON,OFF | Basic value: ON

yellow key ☐

4 **Min. temp. boiler**
38°C

yellow key ☐

5 **Max. temp. boiler**
Setting range: 10...95°C | Basic value: 80°C

yellow key ☐

6 **Burner-switch difference**
Setting range: 2...30 K | Basic value: 6 K

yellow key ☐

7 **Boiler parallelism**
Setting range: 0...20 K | Basic value: 8 K

yellow key ☐

8 **Min.burner running time**
Setting range: 0...10 min | Basic value: 2 min

yellow key ☐

9 **Min. temperature mixer circuit 1**
Setting range: 10...95°C | Basic value: 20°C

yellow key ☐

10 **Max. temperature mixer circuit 1**
Setting range: 10...95°C | Basic value: 75°C

yellow key ☐

11 **Min. temperature mixer circuit 2**
Setting range: 10...95°C | Basic value: 20°C

yellow key ☐

12 **Max. temperature mixer circuit 2**
Setting range: 10...95°C | Basic value: 75°C

yellow key ☐

13 **Loading**
Setting range: ON; OFF | Basic value: ON

yellow key ☐

14 **Calorifier start relief**
Setting range: ON,OFF | Basic value: ON

yellow key ☐

15 **Pump lag**
Setting range: 0...60 min | Basic value: 5 min

yellow key ☐

16 **Bus address**
Setting range: 1...5 | Basic value: 1

yellow key ☐

17 **Summer-/winter reset**
Setting range: ON,OFF | Basic value: ON

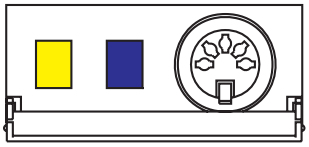
yellow key ☐

0 **RESET parameter**

yellow key ☐

Normal indication

5.6 Programming via service socket



Note: The connections of the service socket are identical with the data bus connections 23 – 26 on the rear patch plugs ledge X1.

The 5-pole socket serves for programming purposes via room station RS-10.

5.7 Special functions

1 – Extended outside temperature control

a – Mean value method:
If a second external sensor is connected, the controller works according to the mean value of the sensors which should be installed in different directions.

Application: Single-circuit systems with seizing character varying in space.

The presence of a second external sensor has to be communicated in any case to the controller at commissioning.
For this purpose, the instrument has to be switched off (mains switch on the switchboard section – OFF) and switched on again with pushed blue key until the indication >SET< appears on the display.

Thus the additional external sensor is accepted by the instrument and integrated to the control functions. All parameters related to the outside temperature (summer switch off, frost protection, etc.) refer to the mean temperature value.

b – Outside temperature control related to heating circuits
In case of two-circuits systems with areas divided in space and different outside temperatures (e.g. north.-south seizure, the external sensors can be assigned to both control circuits.

Application:

Gamma 23 B
External sensor 1 – directly controlled boiler heating circuit
External sensor 2 – mixer heating circuit

Gamma 233 B
External sensor 1 – directly controlled heating circuit
External sensor 2 – mixer heating circuit 1
mixer heating circuit 2

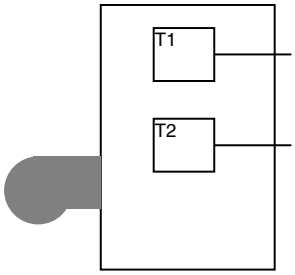
Assignment can be made only via a room station or laptop with corresponding hard- and software. This function **cannot** be activated with the central unit.

1 – Extended boiler temperature control

In case of heating boilers with greater volumes there are normally temperature differences which can be used to increase the lifetime of the burners and to reduce losses due to standstill times.

For this purpose, a second temperature sensor can be installed at the lower area of the boiler if this option has been provided by the manufacturer. The boiler temperature is controlled by an automatic commutation of the measuring point according to the request of the burner. The sensor installed at the upper area of the boiler is responsible for switch on the burner according to the preset guide value and switch difference, the lower sensor serves to switch off.

Example: Nominal boiler temperature = 60°C
switch difference 6 K (± 3 K)



Switch on of the burner if the upper sensor T 1 detects a boiler temperature of 57°C.

Switch off of the burner if the lower sensor T 2 detects a boiler temperature of 63°C.

Attention: With this special function, it has to be considered that unstable states may occur in directly controlled heating circuits due to the inevitable high temperature differences. For this reason, the application of this function has to be checked from case to case.

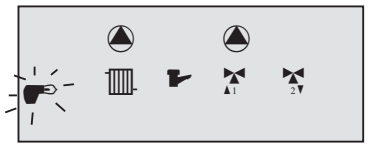
The presence of a second boiler sensor has to be communicated in any case to the controller at commissioning.
For this purpose, the instrument has to be switched off (mains switch on the switchboard section – OFF) and switched on again with pushed blue key until the indication >SET< appears on the display.

Thus the second boiler sensor is accepted by the instrument and integrated to the control

3 – Boiler fault recognition

Via an intelligent control algorithm a boiler fault message is given **without** feedback line. Thanks to this innovative function, a quick fault analysis and specific elimination of the fault is possible.

Fault message is indicated by a flashing burner symbol on the display.



In case of connected room stations, this fault message is transferred via data bus and, thanks to an early recognition of the boiler fault, avoids considerable losses due to cooling down.

4 – Pump anti-blocking protection

During longer switch-off periods (standby mode, hot-water mode, summer switch off), the heating circuit pumps are switched on every day (12.00 h) for approx. 10 seconds and possibly existing mixers are opened for a short time in order to protect the pumps against blocking due to corrosion.

5 – Plant identification

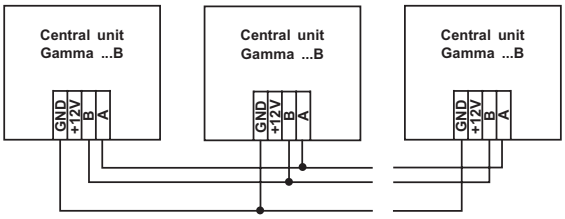
In case of instrument types containing control circuits which, according to the current execution of the plant, are not needed or needed only in the future (hot-water circuit, mixer circuit), these can be put out of operation in order to avoid fault messages by **not** installed sensors.

For this purpose, the instrument has to be switched off (mains switch on the switchboard section – OFF) and switched on again with pushed blue key. The working control circuits are acknowledged for a short time by the indication >SET<.

6 – Cascade connection of several control instruments

Heating plants with several heating and hot-water circuits which can no longer be controlled by one instrument can be extended by several central units with corresponding control circuit features. Cascade connection is limited to 5 instruments, data transfer (outside temperature, request values, hot-water temperatures, etc.) is effected via a three-core shielded data-bus line with parallel connection to the equally named terminals A, B and GND.

functions.



Installation

The instruments of the series Gamma are designed exclusively as units for incorporation. For the installation in boiler switchboard sections or panels, a section of 138 x 92 mm (W x H) is required. The thickness of the front panel can vary between 1 and 3 mm. The required depth for installation is approx. 90 mm including electric cabling.

The instrument is installed from the front side and is fastened by a quarter clockwise turn under slight pressure of the quick-clamping devices provided at the left and right side inside the case. Removal is done in opposite direction.

Electrical installation

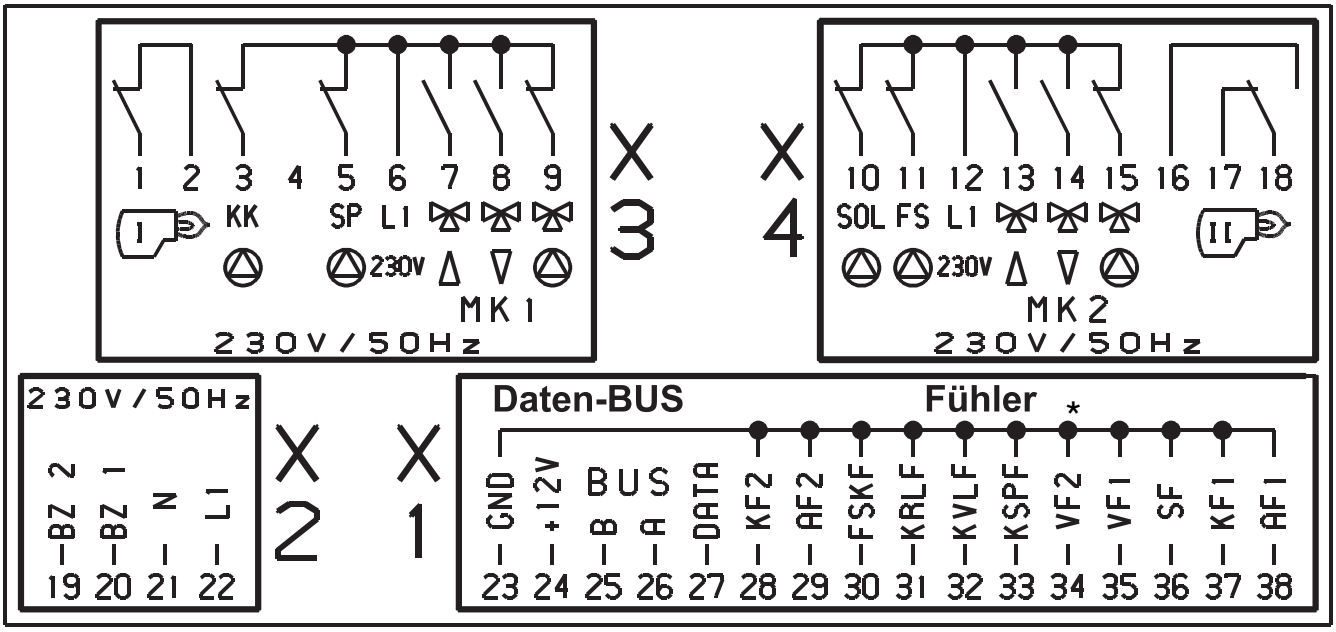
Electrical installation and cabling to the control equipment is done at the back side of the instrument corresponding to the identification on the coloured-marked connection panels.

All connecting terminals work with safety low voltages and must in no case get into contact with the mains voltage.
At non observance the instrument will definitely be destroyed.

230 V / 50 Hz

Connecting terminals on the red-marked panels principally work with mains voltage according to operation condition.

Electrical connection
Gamma 2 B



* Data bus Sensor

Main circuit connection

1 – Input burner relay
2 – Output burner relay
3 – Boiler circuit pump
4 –
5 – Calorifier loading pump
6 – L 1 / 230 V
7 –
8 –
9 –
10 –
11 –
12 –
13 –
14 –
15 –
16 –
17 –
18 –
19 –
20 – Running-hours counter burner
21 – N / 230 V } Mains connection
22 – L 1 / 230 V }

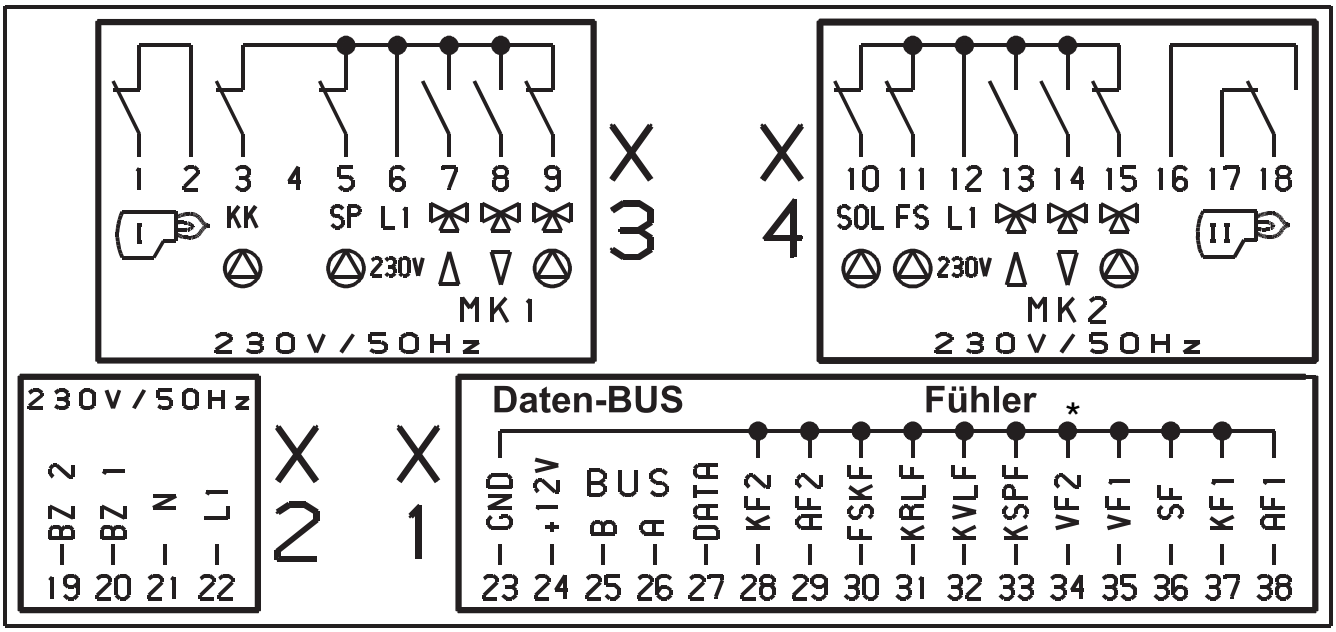
Sensor-/data-bus connection

23 – GND for bus and sensor
24 – +12 V supply voltage
25 – Bus RS 485 signal B
26 – Bus RS 485 signal A
27 – Input radio clock receiver
28 – Boiler sensor (2)
29 – External sensor (2)
30 –
31 –
32 –
33 –

35 –
36 – Calorifier sensor
37 – Boiler sensor (1)
38 – External sensor (1)

Attention: Connecting terminals which are not marked on the above connection seizure diagram are not considered for this type of instruments.

Electrical connection
Gamma 23 B



* Data bus Sensor

Main circuit connection

1 – Input burner relay
2 – Output burner relay
3 – Boiler circuit pump
4 –
5 – Calorifier loading pump
6 – L 1 / 230 V
7 – Mixer valve “OPEN
8 – Mixer valve “CLOSED
9 – Mixer heating circuit pump
10 –
11 –
12 –
13 –
14 –
15 –
16 –
17 –
18 –
19 –
20 – Running-hours counter burner
21 – N / 230 V } Mains connection
22 – L 1 / 230 V }

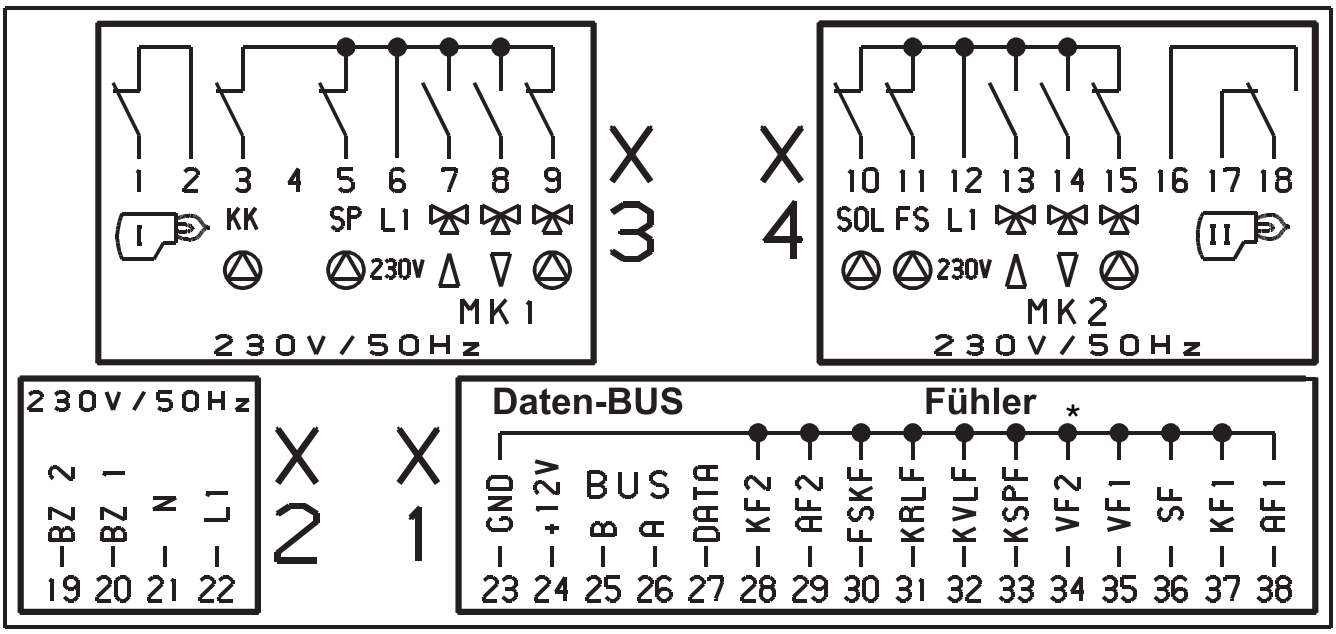
Sensor-/data-bus connection

23 – GND for bus and sensor
24 – +12 V supply voltage
25 – Bus RS 485 signal B
26 – Bus RS 485 signal A
27 – Input radio clock receiver
28 – Boiler sensor (2)
29 – External sensor (2)
30 –
31 –
32 –
33 –

35 – Flow sensor mixer heating circuit
36 – Calorifier sensor
37 – Boiler sensor (1)
38 – External sensor (1)

Attention: Connecting terminals which are not marked on the above connection seizure diagram are not considered for this type of instruments.

Electrical connection
Gamma 233 B



* Data bus Sensor

Main circuit connection

1 – Input burner relay
2 – Output burner relay
3 – Boiler circuit pump
4 –
5 – Calorifier loading pump
6 – L 1 / 230 V
7 – Mixer valve “OPEN”
8 – Mixer valve “CLOSED”
9 – Mixer heating circuit pump
10 –
11 –
12 – L 1 / 230 V
13 – Mixer valve 2 “OPEN”
14 – Mixer valve 2 “CLOSED”
15 – Mixer heating circuit pump 2
16 –
17 –
18 –
19 –
20 – Running-hours counter burner
21 – N / 230 V } Mains connection
22 – L 1 / 230 V }

Sensor-/data-bus connection

23 – GND for bus and sensor
24 – +12 V supply voltage
25 – Bus RS 485 signal B
26 – Bus RS 485 signal A
27 – Input radio clock receiver
28 – Boiler sensor (2)
29 – External sensor (2)
30 –
31 –
32 –
33 –
34 - Flow sensor mixer heating circuit 2
35 – Flow sensor mixer heating circuit 1
36 – Calorifier sensor
37 – Boiler sensor (1)
38 – External sensor (1)

Attention: Connecting terminals which are not marked on the above connection seizure diagram are not considered for this type of instruments.

Accessories

External sensor AF 200

In case of atmospheric-influenced heating mode, the controller is operated with one respectively two external sensors AF 200.

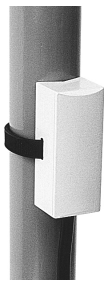
Installation

The external sensor should be installed at approx. one third of the building height (minimum distance to floor ground 2 m) at the coldest side of the building (north respectively north-east). In case of another preferred seizure direction the corresponding side of the building has to be chosen. For the installation of the sensor other heat sources (chimneys, hot air from air shafts, sunlight, etc.) which could falsify the measured value have to be considered. Cable exit has to be directed always to the bottom in order to avoid penetration of humidity. For the electrical installation a 2-core cable with a minimum cross section of 1 mm² is prescribed.

The resistance value of the sensor is 2000 Ω at 25°C (PTC resistance).

Attention: The sensor line has to be laid separately.
The parallel laying of sensor- and mains lines inside one only cable duct is not allowed and can lead to considerable disturbances of the control operation!

Flow-pipe sensor VF 202



The flow-pipe sensor VF 202 serves to measure the flow-pipe temperature of mixer controlled heating circuits.

The sensor should be installed in a distance of at least 50 cm to the circulation pump on a metallic bright point of the flow pipe.

The sensor is attached to the pipe with the supplied tightening strap even with the pipe surface. The enclosed heat-conduction paste serves for a better heat transfer and has to be applied at the contact point **prior to the installation**.

Electrical connection
The flow-pipe sensor VF 202 is supplied with integrally cast cable (cable length 2 m) which can be extended if necessary.

Boiler sensor

KVT 20

Calorifier sensor

The temperature sensor KVT 20 is designed as immersion sensor and serves to detect the boiler and hot-water temperature. The sensor is entered into the immersion pocket together with the sensor elements of the safety temperature limit (STB), the boiler temperature control (KTR) and the boiler temperature indication (KTA). The tensioning spring integrated in the sensor provides the necessary contact pressure.

Attention has to be paid to that the sensor cable is not bent or damaged. If necessary, the sensor cable can be extended. The resistance value of the sensor is 2000 ∠ at 25°C (PTC resistance).

Regarding electrical values, boiler sensor and calorifier sensor are identical and distinguish only by the length of the connection cable.

Boiler sensor:	KVT 20 / 2 / 6	2 m
Calorifier sensor:	KVT 20 / 5 / 6	5 m

Accessories on demand

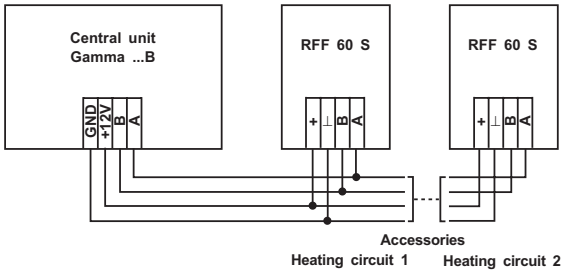
Room control with remote control RFF 60 S

RFF 60 S
This accessory detects the current room temperature and allows to correct the desired room temperature by ± 6 K.

The integrated mode selector causes a continuous heating respectively temperature reduction or automatic mode according to the automatic program preset at the central unit.

Electrical connection

The electrical coupling of one respectively several accessories with the central unit is done via a four-core shielded data-bus line (preferably unit-stranded cable J – Y [St] Y 2 x 2 x 0.6).
Connection is done at the equally named connecting terminals.



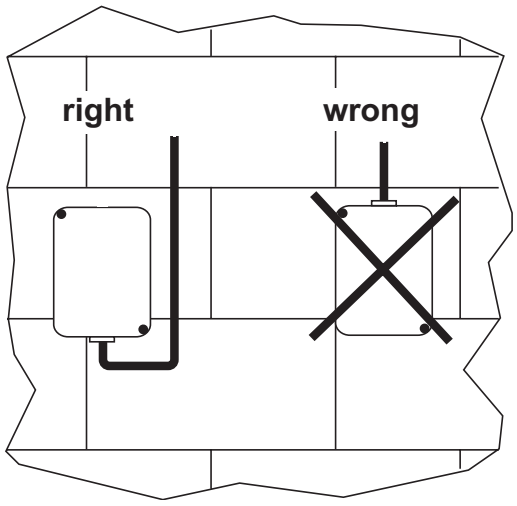
Radio-clock module Gamma FU 77

On demand, all control instruments of the series Gamma can be equipped with a radio-clock module receiver.

This module will be installed at a place suitable for reception inside the building and connected with the corresponding connections of the controller.
If a sufficient reception is guaranteed, the time model radiated by the DCF-77 transmitter causes a synchronisation precise to one second of the switch clock integrated in the instrument and does not only consider the annual summer-/winter reset but also the reset for leap years.

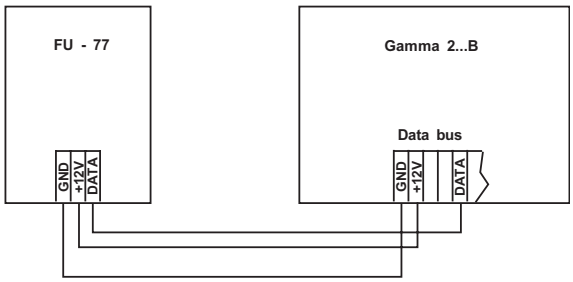
In case of connected room stations (Gamma-RS 10 respectively RS 20) the switch clocks integrated in these accessories are also synchronised.

Installation of the radio-clock receiver



Electrical connection

The radio-clock model is connected with the central unit via a three-core cable (e.g. NYM 3 x 0.75). Connection is done at the equally named connecting terminals.



Resistance values of the sensor elements (flow pipe, boiler-, external- and calorifier sensor) at

(°C)	(k Ω)	
- 20	1,383	
- 18	1,408	
- 16	1,434	
- 14	1,459	
- 12	1,485	
- 10	1,511	
- 8	1,537	
- 6	1,563	
- 4	1,590	
- 2	1,617	
- 0	1,644	
2	1,644	
4	1,699	
6	1,727	
8	1,755	Outside temperature
10	1,783	
12	1,812	
14	1,840	
16	1,869	
18	1,898	
20	1,928	
25	2,002	
30	2,078	
35	2,155	
40	2,234	
45	2,314	
50	2,395	
55	2,478	
60	2,563	
65	2,648	
70	2,735	
75	2,824	
80	2,914	
85	3,005	
90	3,098	
95	3,192	
100	3,287	

Boiler (flow-pipe temperature)

Hot-water temperature

Technical data

General

Connecting voltage: 230 V + 6%/-10%
Nominal frequency: 50-60 Hz
Pilot fuse: max. 6.3 A / time-lag type
Relay exits:
Contact scanning:
Relay for burner 8 A (cos Phi ≧ 0.8)
All other relays 6 A (cos Phi ≧ 0.8)
Casing dimensions: 144 x 96 mm (W x H)
Ambient temperature: 0°C...50°C
Storage temperature: -25°C...60°C
Protection type: IP 30
Protection class
according to EN 60529: III
Radio protection: EN 55014 (1993)
Resistance to disturbances: EN 55104 (1995)
EC conformity: 89/336/EC
Switch clock:
To each heating circuit as well as to the
hot-water circuit 2 operating cycles per day (14 per week) can be assigned.
The smallest operating interval is 30 min.
Data storage: several years
Selector switch:
8 positions (including the
3 clock operating programs)
Bus interface:
RS 485 for the connection of a PC respectively
laptop, room station or modem

Control of the hot-water circuit

Nominal hot-water temperature: 20°C...80°C
Factory preset: 50°C
Operating difference:
Factory preset: 5 K

Control of the boiler circuit

Daytime ambient temperature:
14°C...26°C
Factory preset: 20°C
Reduction temperature:
8°C...20°C
Factory preset: 14°C
Minimum delimitation:
Factory preset: 38°C
Maximum delimitation:
10°C...95°C
Factory preset: 80°C
Burner-switch difference:
2...30 K
Factory preset: 6 K
Boiler parallelism
0...20 K
Factory preset: 8 K
Minimum running time of burner:
0...10 min.
Factory preset: 2 min.
Heating curve:
0.20...3.5
Factory preset: 1.50

Control of mixer heating circuits

Control operating:
Three-point controller with
PI characteristic
Daily ambient temperature:
14°C...26°C
Factory preset: 20°C
Decreasing temperature:
8°C...20°C
Factory preset: 14°C
Minimum delimitation:
10°C...95°C
Factory preset: 20°C
Maximum delimitation:
10°C...95°C
Factory preset: 75°C
Heating curve:
0.20...3.50
Factory preset: 1.00

Other technical data

Frost protection:
-10°C...10°C
Factory preset: 3°C
Outside-temperature switch off:
10°C...30°C
Factory preset: 20°C
Pump lag:
0...60 min.
Factory preset: 5°C
Legionella protection
65°C once a week

With the reservation of modifications
Art. 0450007011 - 0524