Operating Manual
Program Timers
Variotime Single
Variotime Twin

Fig. 1: Variotime Single, first from left with optional accessories mounted
Variotime Twin, first from right

Please note:

This operating manual is designated for use by our OEM customers and as supporting material for their own appliance manuals.

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1	General

Please read this manual carefully before installing, connecting and operating Variotime.

1.1	Safety instructions

- **This timer must be installed by a qualified electrician only.**

- **<u>Danger to life!</u> This timer is powered by the mains supply printed on the label. First install the timer into an appliance before connecting it to the mains. Never touch the live contacts and/or the components at the open back of the timer, and install it in such a way that touching the live parts at the open back of the timer is made impossible during due application of the appliance in which it is installed.**

- **The outputs of the 12 V and 24 V variants do not correspond to the conditions of SELV (safety extra-low voltage). The supply voltage of the appliance in which such a timer is installed must only be SELV, if the outputs also switch SELV.**

- **Protection against accidental contact must be ensured by proper installation of the timer.**

  Install the timer in such a way that the end user of the appliance in which it is installed will be unable - during due application of the appliance - to pull the timer out of the appliance front, as in this case the live contacts at the back of the timer would be exposed.

- **The timer must not come into contact with water.**

- **Do not use the timer to operate appliances which require supervision during operation.**

1.2	Your timer

Variotime is an electronic program timer designed for **installation** into electrical appliances or devices. **The timer must not be operated without prior installation into a protective housing**.

Variotime Single

Variotime Twin

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1.3 Functions of the program timer Variotime

Variotime is an electronic timer with 24 hour and/or 7 day program switching an electric appliance on and off at programmed times.

Variotime switches an electric appliance via a relay. During a programmable period, the relay contacts are closed, closing the electrical circuit and activating the appliance in which the timer is installed. At the end of this period, the relay contacts open again, breaking the electrical circuit and deactivating the appliance.

Variotime Single has one relay for switching one load (1 "channel").

Variotime Twin has two relays for switching two loads (2 "channels") independently, however, with the full scope of functions for each channel.

Scope of functions:

- Time of day in 24 hour or 12 hour format (am/pm)
- 7 day program, optional 24 hour program only
- 16 switching points (8 x ON, 8 x OFF)
- Up to 112 switchings per week by forming program blocks
- Reset function
- Skip function

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2 Description of the functional elements

2.1 Connections

2.1.1 Variotime Single with build-in housing

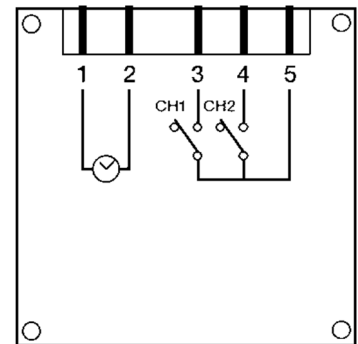|	
① ②	Mains supply contacts
③ ⑤	Relay contacts

Fig. 2: Connections of Variotime Single with build-in housing (shown as ON/OFF version: changeover contact no. 4 not placed)
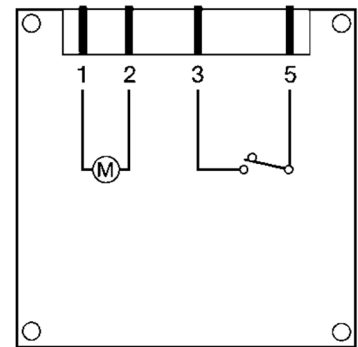
2.1.2 Variotime Twin with build-in housing

① ②	Mains supply contacts
③④⑤	Relay contacts

Fig. 3: Connections of Variotime Twin with panel-mount housing (shown as Version with 1 changeover relay)

2.1.3 Variotime with panel-mount housing

① ②	Mains supply contacts
③ ⑤	Relay contacts

Fig. 4: Connections of Variotime Single with panel-mount housing (shown as ON/OFF version: changeover contact no. 4 not placed)

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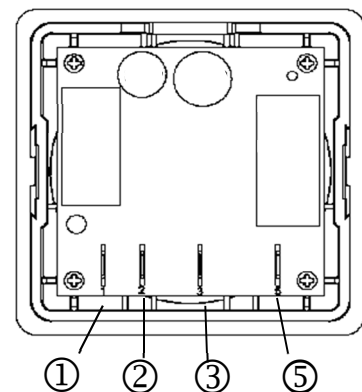
2.2   Functional elements

2.2.1 Variotime Single with 7 day program

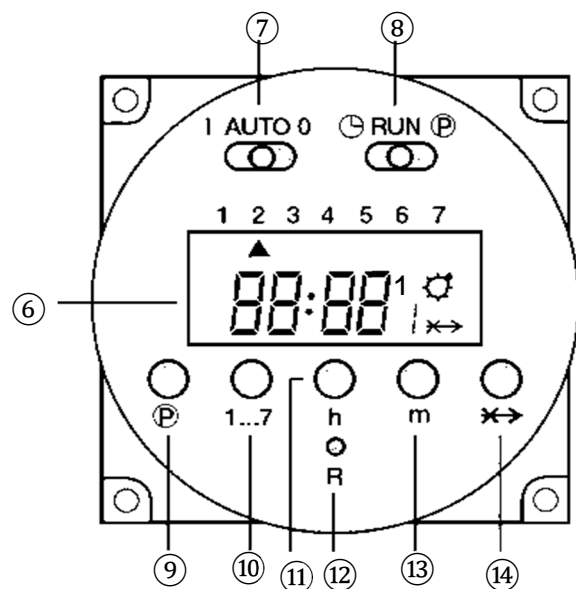|	
⑥	LC display
⑦	Slide switch for setting the operating mode: I = continuous ON AUTO = automatic program 0 = continuous OFF
⑧	Slide switch for setting times: 🕐 position for setting the time of day and the day of the week RUN position: clock and automatic program activated Ⓟ position: programming mode activated
⑨	Ⓟ button to select the switching points when in programming mode
⑩	Day button for setting the days of the week
⑪	Hour button h for setting the hours
⑫	R button (reset) for deleting all settings
⑬	Minute button m for setting the minutes
⑭	Skip button ✷→ to immediately reverse the present operating mode

Fig. 5: Functional elements of Variotime Single with 7 day program

Instead of the language neutral numbering 1-2-3-….7, the days of the week may also be printed as English abbreviations (M-T-W-Th-F-S-Su) on the housing rim above the display.
The day button may alternatively be denominated DAY.
The hour and minute buttons h and m may alternatively be denominated HR and MIN.

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2.2.2 Variotime Single with 24 hour program

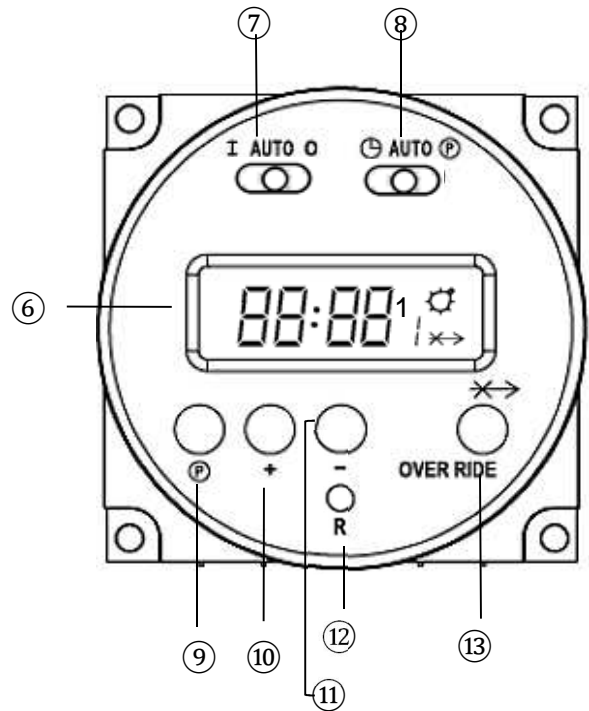|	
⑥	LC display
⑦	Slide switch for setting the operating mode: I = continuous ON AUTO = automatic program 0 = continuous OFF
⑧	Slide switch for setting times: 🕐 position for setting the time of day and the day of the week AUTO position: clock and automatic program activated ℗ position: programming mode activated
⑨	℗ button to select the switching points when in programming mode
⑩	Plus button for setting times
⑪	Minus button for setting times
⑫	R button (reset) for deleting all settings
⑬	Skip button ✖➔ to immediately reverse the present operating mode (printed as OVER RIDE in this version only)

Fig. 6: Functional elements of Variotime Single with 24 hour program

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2.2.3 Variotime Twin

⑥	LC display
⑦	Slide switch for setting the operating mode: I = continuous ON AUTO = automatic program 0 = continuous OFF
⑧	Slide switch for setting the times: RUN position: clock and automatic program activated P1 position: programming mode for channel 1 activated P2 position: programming mode for channel 2 activated
⑨	Ⓟ button to select the switching points when in programming mode
⑩	Day button for setting the days of the week
⑪	Hour button h for setting the hours
⑫	R button (reset) for deleting all settings
⑬	Minute button m for setting the minutes
⑭	Skip button ✦➔ to immediately reverse the present operating mode

Fig. 7: Functional elements of Variotime Twin

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2.3   Display symbols

Additionally to the four-digit indication of the time of day, the Variotime display features the following symbols:

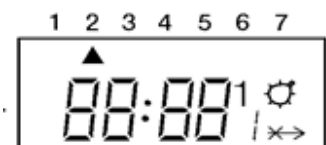| ▲	Day indicator (shown: Tuesday), in 7 day program versions only
1 And/or **2**	Indication of the active channel (shown: channel 1) Variotime Single: always indicates channel 1 Variotime Twin: indicates channel 1 and/or 2
✿	Light bulb symbol to distinguish the switching points In programming mode: ON: ON switching point is being programmed OFF: OFF switching point is being programmed In automatic mode: ON: indicated channel is currently ON OFF: indicated channel is currently OFF
I	Switching point number (shown: switching point 1 ON) ON: when programming switching point 1 OFF: in automatic mode
✕→	Skip function activated
PM or **AM**	Only in versions with 12 hour time format

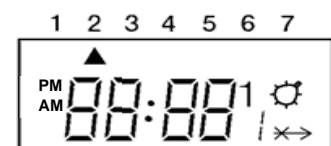Fig. 8: Variotime display with 24 hour time format

Fig. 9: Variotime display with 12 hour time format (am/pm)

2.4   Installation and connection

When installing the program timer please observe the respective detailed drawing regarding dimensions and electrical connections.

2.4.1 Variotime with build-in housing

1.   Connect the relay or both relays (loads) via contacts ③ to ⑤. The on/off versions have only the contacts ③ and ⑤ placed, a changeover version has the contacts ③, ④ and ⑤ placed. Please observe the product label on your timer.

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2.   Connect the program timer to the mains supply via the contacts ① and ②.

3.   Push the timer from behind into its allocated panel cutout and fasten it with four screws.

Fig. 10: Installation of Variotime with build-in housing
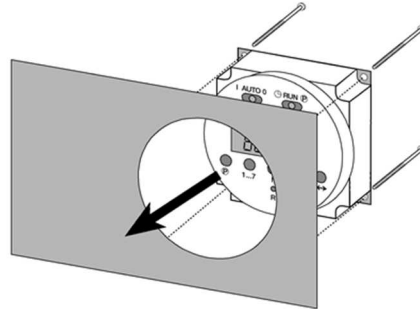
2.4.2 Variotime with panel-mount housing

Two each fixing brackets Diehl Controls material no. 413271110 (see Fig. 1) serve to easily mount the timer at the back of a panel. The notched dovetail-guides engaging into the sides of the timer housing allow secure mounting notwithstanding the panel thickness.

A transparent cover Diehl Controls material no. 413271185 is available as optional accessory. It can be snapped onto the Variotime housing (see Fig. 1).

1.   Push the timer into the panel cutout (66 x 66 mm) of your appliance from the front.

Fig. 11: Installation of Variotime with panel-mount housing
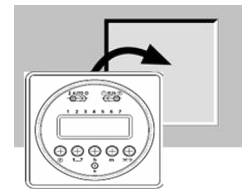
2.   Fasten the timer from behind using the two fixing brackets. Push them into the dovetail guides at the housing sides so that their arms point towards the panel. Push them forward until their arms wedge the timer to the panel.
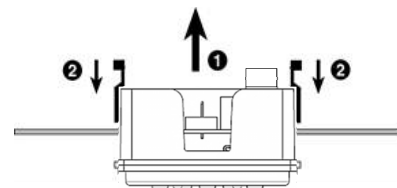
Fig. 12: Installation with fixing brackets

3.   Connect the relay or both relays (loads) via contacts ③ to ⑤. The on/off versions have only the contacts ③ and ⑤ placed, a changeover version has the contacts ③, ④ and ⑤ placed. Please observe the label on your timer.

4.   Connect the timer to the mains supply via the contacts ① and ②.

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<div style="border:1px solid black">

3   Operating Variotime

</div>

As the operation of the timer versions
- Variotime Single standard version with 24 hour and/or 7 day program
- Variotime Single special version with 24 hour program only
- Variotime Twin standard version with 24 hour and 7 day program

is widely identical, notwithstanding the housing type or the time format, these versions will explicitly be mentioned only if necessary.

The timer is fully operable only after connection to the mains supply, completion of the connections mentioned in section 2.3 and setting of the time of day and the day of the week.

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3.1   Initial power up

</div>

When connecting Variotime to the mains, all display segments appear for approx. 2 seconds.

Subsequently, the display flashes "0:00" and the day indicator▲ at day 1 (= Monday). This indication remains as long as the program timer stays connected to the mains, waiting for the input of time of day and day of the week.

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3.1.1 Setting the day of the week and

the time of day

</div>

Proceed as follows:

1.   Variotime Single: set the right-hand slide switch to ⊕ position.

Variotime Twin: set the right-hand slide switch to position RUN and press the buttons h and m simultaneously for approximately 2 to 3 seconds.

The display stops flashing.

2.   Press the day button and set the day of the week as follows:

1 = Monday	3 = Wednesday	5 = Friday	7 = Sunday
2 = Tuesday	4 = Thursday	6 = Saturday	

With every pressing action the day indicator▲ advances one day. If the day button is pressed continuously, the day indicator ▲ keeps advancing until button is released again.

24 hour version: not applicable.

3.   Set the present time of day via the buttons h and m (24 hour version: buttons plus or minus).

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Keeping the buttons pressed for longer than 2 seconds activates the fast setting mode which stops when they are released again.

4.   Set the right-hand slide switch to RUN position (24 hour program: AUTO position).

The program timer accepts the time setting. The colon in the time display starts to flash. From now on, the time of day will run on accurately to the second.

Variotime Twin: approximately 15 seconds after the setting has been completed, the program timer accepts the time setting. The colon in the time display starts to flash. From now on, the time of day will run on accurately to the second.

Repeat steps 1 to 4 to change the day of the week and/or the time of day.

3.1.2 Channel indication

Variotime Single features one channel, that is, one relay, for controlling a single load. Therefore, the timer display shows "1" by default on the upper right next to the digits indicating the time of day (see 2.3).

Variotime Twin features a two channels (two relays). Therefore, it can control two loads independently at the same time. The channel which is actively executing an automatic program is displayed as "1" or "2" on the upper right next to the digits indicating the time of day (see 2.3). If both channels are active, they are being displayed side by side as "12".

3.1.3 Power failure

In case of a power failure, Variotime will retain the time of day and the day of the week for a minimum of 5 minutes. The longer the program timer has been connected to the mains and has been able to charge prior to the failure, the longer is its buffer time. The automatic program remains stored in the memory but cannot be executed.

If the power returns within the buffer time, Variotime will keep on running normally and will resume the automatic switching program.

If the power failure exceeds the buffer time, the last stored automatic program remains in the memory, however, Variotime loses the time of day and the day of the week. When the power returns, these have to be set first before the program timer can resume the automatic switching program.

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3.2   Setting the operating modes

The three principal operating modes of Variotime are

- continuous operation mode
- deactivation mode
- automatic operation mode

The operating mode is set with the left-hand slide switch.

3.2.1 Continuous operation mode

In this mode, the appliance in which Variotime is installed is switched on continuously. Any automatic program is deactivated.

Variotime Single

Proceed as follows:

1.   Set the left- hand slide switch to position I.

The relay switches on if it was off before. On the right side of the time digits, 1 (= channel 1) and the light bulb symbol ☼ appear.

If the relay was on before, the indication does not change and will stay the same as long as this mode continues.

2.   Terminate the continuous operation by setting the slide switch to position AUTO.

The timer resumes the automatic program and displays the present status accordingly.

Variotime Twin

In this version, both channels can be set to continuous operation independently. Possible combinations are:

- channel 1 in continuous operation mode and channel 2 unchanged
- channel 2 in continuous operation mode and cannel unchanged
- Both channels in continuous operation mode

Proceed as follows:

1.   Set the left-hand slide switch to position I.

2.   Press the skip button ✖➜ to select the desired channel:

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pressing the skip button ✦→ once selects channel 1. The channel indicator 1 flashes. After approximately 3 seconds, 1 stops flashing and the light bulb symbol ✿ appears.

pressing the skip button ✦→ twice selects channel 2. The channel indicator 2 flashes. After approximately 3 seconds, 2 stops flashing and the light bulb symbol ✿ appears.

The order of setting the channels is not important. If both channels are in continuous operation mode, the display will show "12" and the light bulb symbol ✿ steadily.

3. Terminate the continuous operation mode of both channels by setting the slide switch to the position AUTO.

The timer resumes the automatic program and displays the present status accordingly.

Change a current setting by terminating first and resetting again.

3.2.2 Deactivation mode

In this mode, the appliance in which Variotime is installed is switched off continuously. Any automatic program is deactivated.

Variotime Single

Proceed as follows:

1. Set the left-hand slide switch to position 0.

The relay switches off if it was on before. On the right side of the time digits, 1 (= channel 1) flashes as long as this mode continues.

2. Reactivate the automatic program by setting the left-hand slide switch back to position AUTO.

The timer resumes the automatic program and displays the present status accordingly.

Variotime Twin

In this version, both channels can be deactivated independently. Possible combinations are:

- channel 1 deactivated and channel 2 unchanged
- channel 2 deactivated and cannel 1 unchanged
- Both channels deactivated

Proceed as follows:

1. Set the left-hand slide switch to position 0.

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2.   Press the skip button ⤅ to select the desired channel:

pressing the skip button ⤅ once selects channel 1. The channel indicator 1 flashes.

pressing the skip button ⤅ twice selects channel 2. The channel indicator 2 flashes.

The order of setting the channels is not important. If both channels are in deactivation mode, 1 and 2 flash simultaneously and will continue to do so until this mode is terminated.

3.   Reactivate both channels by setting the left-hand slide switch to position AUTO.

The timer resumes the automatic program and displays the present status accordingly.

Change a current setting by terminating first and resetting again.

3.2.3   Automatic mode

In the automatic mode, the appliance in which Variotime is installed is being controlled according to the inputted program. The display shows the present status. During normal program execution, the left-hand slide switch is in position AUTO and the right-hand slide switch is in position RUN (24 hour program: AUTO).

3.3   Setting the switching points

Generally, Variotime can be programmed with 16 switching points per channel (8 ON and 8 OFF) spread over 24 hours. The switching points are numbered as follows:

- switching points with uneven numbers (1, 3, 5, 7, 9, 11, 13 and 15) are ON points. They are indicated by the light bulb symbol ☼ in the display.
- switching points with even numbers (2, 4, 6, 8, 10, 12, 14 and 16) are OFF points. The light bulb symbol is off.

In order to avoid errors in the program logic, the switching points should always be programmed in pairs, that is, always an ON point and subsequently the corresponding OFF point.

The 112 switchings per week result from the possibility to assign identical switching points to several days of the week. Diehl Controls advises to set up a time schedule first as a basis to input a complex block program for several days. For setting, use the day button with the following combinations:

- single days of the week
  1 = Monday   2 = Tuesday   3 = Wednesday   4 = Thursday 5 = Friday
  6 = Saturday 7 = Sunday
- day block 12345   = daily from Mondays through to Fridays
- day block 67   = daily on Saturdays and Sundays

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- day block 123456 = daily from Mondays through to Saturdays
- day block 1234567 = daily from Mondays through to Sundays (7 days a week)

Each pressing of the day button advances the day indicator▲ by one day until day 7 is reached. Then the day blocks are called up one after the other, resuming again with the single days at day 1.

In the 24 hour version, the 16 switching points are spread over 24 hours only.

In Variotime Twin, the full 16 switching points are available for both channels independently.

The shortest interval between the switching points is 1 minute.

Proceed as follows:

1. **Variotime Single:** set the right-hand slide switch to position Ⓟ.

    Variotime Twin: set the right-hand slide switch to position P1 (channel 1) or P2 (channel 2). Both channels have to be programmed individually.

    The display flashes "0:00", on the top right the (selected) channel is indicated, on the bottom right "I" is indicated (switching point 1 ON). The light bulb symbol ☼ appears.

2. Set the time for the switch on point using the buttons h and m, then assign it to the days of the week by pressing the day button. The order of the settings is not important.

3. Pressing the button Ⓟ advances Variotime to the next switching point 2 (OFF).

    The display flashes "0:00", on the top right the (selected) channel is indicated, on the bottom right "2" is indicated (switching point 2 OFF).

4. Set the time for the switch poff point using the buttons h and m, then assign it to the days of the week by pressing the day button. The order of the settings is not important.

5. Pressing the button Ⓟ advances Variotime to the next switching point 3 (ON).

    Repeat steps 1 to 4 until all times for switching on and off have been programmed (16 maximum) in the same manner.

6. Reset the right-hand slide switch to the position RUN (24 hour version: AUTO).

The display reverts to the present time of day and day of the week. Supposing that the left-hand slide switch is in position AUTO, Variotime immediately executes the program set for the present time and indicates the status as described above. From now on, Variotime will follow the inputted automatic program day for day and week for week until the settings are changed.

To check or change switching points proceed as follows:

7. Set the right-hand slide switch to position Ⓟ (Variotime Twin: P1 or P2).

8. Select the individual switching points by pressing the button Ⓟ repeatedly.

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Follow this procedure to check of change switching points any time.

9. Having finished, set the right-hand slide switch back to position RUN (24 hour program: AUTO).

To cancel individual switching points proceed as follows:

10. Set the right-hand slide switch to position ℗ (Variotime Twin: P1 orr P2).

11. Press button ℗ repeatedly until the relevant switch on point is selected.

12. Now press the skip button ✳➔ and the button ℗ simultaneously for approximately 2 or 3 seconds. The display flashes „0:00" showing the switching point has been canceled.

13. Proceed likewise to cancel the linked switch off point to avoid logic errors.

14. Set the right-hand slide switch back to position RUN (24 hour program: AUTO).

To cancel the entire automatic program use the reset function (see 3.4).

3.4   Reset function

The reset function is recommended for extensive changes in the automatic program. It cancels the previous input entirely and resets the timer into initial power up status. So a new program can be created without having to access the individual switching points.

In order to avoid resetting the timer inadvertently, the button R is recessed and has to be pressed using a ball pen or similar instrument.

Proceed as follows:

1. Press the button R. All indications in the display disappear, it flashes "0:00" and the day indicator▲ at day 1. The automatic program is canceled completely.

2. Now set the present time of day and the day of the week again as described in 3.1. Variotime is ready for a new program.

3.5   Skip function

The skip function reverses the current operating mode of the appliance in which Variotime is installed with immediate effect and is canceled automatically on reaching the next switching point. It serves to override individual switching points without having to change the automatic program.

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Example:

Variotime is in ON mode, that is, according to the automatic program, the appliance in which the timer is installed is presently switched on. Pressing the skip button ✳➔ immediately switches the appliance off, remaining so until the skip button ✳➔ is either pressed again or the next switching point is reached. This switching point is being executed again according to the automatic program. Staying with the example, the appliance remains switched off until the next switch on point is reached.

Vice versa, a switched off appliance is switched on by pressing the skip button ✳➔ . When reaching the next switching point the skip function is canceled, however, the appliance remains on as a switch off point is always followed by a switch on point.

Variotime Single

Proceed as follows:

1. Press the skip button ✳➔ once. The appliance changes into the opposite operation mode. The skip symbol ✳➔ appears in the display, so does the light bulb symbol ✿ if the appliance was off before, or it disappears if the appliance was on before.

Variotime Twin

Proceed as follows:

1. Press the skip button ✳➔ once. The channel indicator 1 flashes and the load connected to channel 1 is switched.

   Press the skip button ✳➔ twice. The channel indicator 2 flashes and the load connected to channel 2 is switched.

   After approximately 3 seconds, the channel indication stops flashing and the skip symbol ✳➔ appears in the display, so does the light bulb symbol ✿ if the load was off before, or it disappears if the load was on before.

This operation mode continues until the next switching point is reached which will be executed according to the program. The skip symbol ✳➔ disappears.

2. To cancel the skip function press the skip button ✳➔ again as described above. The skip symbol ✳➔ disappears and Variotime reverts to the current operation mode according to its programming.

4	Technical Data

Functions	
Time program	7 day program, 24 hour program only optional
Time format	24 hours or 2x 12 hours (am/pm)
Reset function	yes
Shortest switching interval	1 minute
Operating modes	ON, OFF, Automatic
Product features	
Programmable switching points	16 (8x ON, 8x OFF). Forming program blocks for days with the same switching schedule results in a max. of 112 switching points per week (56x ON, 56x OFF)
Display	7 day indicators, 4-digit time display, 2-digit indication of the activated channel(s), 2-digit indication of the switching point, indication of operation mode and skip function with symbols, AM/PM indication with 12 hour time format
Operation	Via 6 buttons and 2 slide switches with 3 positions each
Quantity of relays	1 (Variotime Single) or 2 (Variotime Twin)
Technical Data	
Rated voltage	220-240 V AC, 110-120 V AC, 12 V AC/DC, 24 V AC/DC
Rated frequency	50/60 Hz
Stand by power consumption	< 0.5 W
Buffer time	$\geq$ 5 minutes
Switch rating	Variotime Single with build-in housing: 1x 10 A/250 V AC Variotime Single with panel-mount housing: 1x 16 A/250 VAC Variotime Twin: 2x 5(2) A/250 V AC
Max. ambient temperature	T55°C
Outer dimensions	Variotime with build-in housing: 62 x 62 x 30.5 mm Variotime with panel-mount housing: 72 x 72 mm Details see relevant timer drawing

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Additional data for Variotime with panel-mount housing only	
Purposes/construction	Time control, electronic, incorporated
Mounting	Fitting into a panel opening
Mode of action	Type 1.B.S
Degree of contamination	3
Rated impulse voltage	2500 V (Input 110-120 V ac) 800 V (Input 24 V or 12 V) 4000 V (Output 250 V ac)
Connections	
Mains and power relays	Tab terminals 6.3 x 0.8 mm in compliance with EN 61210
Approvals	VDE – ENEC and UL/CSA (technical conditions apply)

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