Genesee Scientific
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Drosophila Research
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INVICTUS
DROSOPHILA INCUBATOR

Installation Manual
& Trouble Shooting Guide

Model 59-400L

8430 Juniper Creek Lane • San Diego, California 92126 • USA • 800.789.5550 • www.geneseesci.com

Contents

SPECIFICATIONS FOR MODEL 59-400L DROSOPHILA INCUBATOR

EXTERIOR	28"W x 31"D x 78.5"H with cold rolled 22 gauge steel sides/back/top/bottom welded to 13 gauge steel undercarriage and powder coated with cobalt blue paint. Casters add 4" more to final height. Shipping weight is 400 lbs.
INTERIOR	24"W x 27"D x 57.5"H with 040 white painted aluminum. 22 c.f. capacity.
INSULATION	Two inches of non-CFC foamed-in-place urethane insulation.
COOLING/HEATING	Cooling is provided by a 1/3 HP condensing unit that is air cooled, hermetically sealed, thermostatically controlled (adjustable) and self-contained, with permanently lubricated fan motor bearings. E-coated, oversized aluminum finned copper refrigeration coils promote rapid cool-down and tight control over selected temperature settings with R-134A as the coolant. Evaporative compressor removes condensate collected on the cooling coils. One 750 watt tubular electric resistance coil provides heat for temperature setting above ambient.
TEMPERATURE RANGE	Temperature range is 5-60°C, ±1°C measured at the sensor*. Ambient laboratory temperature should be between 60°-80°F with 6" around sides and back of chamber for heat exchange. High and low temperature mechanical failsafes are included on this model to protect research materials from excessive temperatures. Optional A/V hi low temp alarm. *3 hour maximum cycle for temperatures in the 50-60C range.
ADDITIVE HUMIDITY	No active humidity generation. A pan of water may be placed inside to boost humidity. An RH meter is included so humidity levels can be observed.
AIR FLOW	Chamber air is drawn up through the wire shelves and along the door surface to the cooling coils, where it is conditioned to the proper temperature and forced down the rear wall to the bottom of the chamber.
DOORS	Spring loaded, self-closing, opaque door with black PVC frame. Optional door lock.
SHELVES	Each 23.5" x 23.5" shelf has powder coated epoxy steel wire construction capable of supporting 125 lbs. of evenly distributed weight. Shelves attach to pilaster with stainless steel clips. SIX shelves are included.
LIGHTS	Two vertical warm white (3500K) LED lamps, one on each side of the door opening, wired to a digital timer in the instrument panel. Lamp guards protect the bulbs.
ELECTRICAL	115/60/1 with 15 amp plug. Draws 8.5 amps.

UNCRATING

Immediately upon removing the cardboard crate, unwrap the plastic from around the chamber and examine the chamber for damage. If a chamber arrives damaged, note the damage on the freight receipt and call us. **Do not operate a damaged chamber until you have reported the damage to Genesee Scientific (800-798-5550)**

Remove the chamber from its skid by unscrewing four screws attached to the lower side walls. Additional support may have been added for support during longer shipping distances. Look inside the compressor compartment and remove and wooden supports. Remove the piece of metal support material from the bottom of the door.

CASTERS

Once the chamber has been moved to its final location, install the casters. Tilt chamber to one side and rest the lifted edge on 6” blocks so the casters can be installed safely.

Place a caster stem into the hole in a corner of the chamber base. Screw completely into place. Repeat with remaining casters.

If the chamber is not sitting squarely when a level is placed on the chamber roof, shim the chamber with large metal washers placed between the floor and the appropriate caster wheel(s).

The chamber should be tilted slightly backwards to allow condensate to drain in the correct direction. The chamber should be level side-to-side for the doors to operate correctly.

Do not move the chamber across uneven surfaces or transport the chamber with the casters in place. Excessive force on the caster plates can damage them and prevent the casters from adequately supporting the chamber.

COATED COIL

This chamber has an E-coated coil that is electrostatically dipped and coated up to five times with a material that resists corrosion by acetic acid, propionic acid and other mild acids. Drosophila media are the source of the vapors that condense to form acids that pinhole the aluminum-finned copper coils.

TEMPERATURE CONTROL

Drosophila chambers have an electronic temperature controller with a red upper display and a green lower display. The red upper display indicates the actual chamber temperature, while the green lower display indicates the setpoint. To adjust the temperature, press the up or down arrow key (on the right), until the desired setpoint is displayed in the window. These chambers have an operating range of 5-60°C, ±1°C measured in air (at the sensor).

To access the mite cycle, turn the high temperature failsafe inside the chamber to above 60°C and push the up arrow on the Watlow temperature controller to 60°C. Allow 2-3 hours for the chamber to heat and then reduce the temperature. *Leaving the temperature at 60°C for more than a few hours can damage the fan motor inside the chamber.*

To return to the operating temperature, push the down arrow on the Watlow temperature controller to the desired setpoint and open the door until the temperature into the chamber reaches the ambient temperature. When the temperature returns to normal, turn the failsafe back to its previous setting.

HIGH AND LOW TEMPERATURE FAILSAFES

Inside the chamber, on the fan housing, are dials with degree markings. These are the temperature failsafe thermostats. Failsafes are a safety feature designed to prevent the chamber from freezing or overheating in the event of a mechanical malfunction in the cooling or heating systems. They shut off lights, the evaporator fan, the heating coil, and the compressor until the temperature inside the chamber falls within their setpoint range. If the high temperature failsafe is positioned at a setting near room temperature, it will turn off the chamber whenever the door is opened for an extended time. If this happens, raising the failsafe temperature to well above room temperature permits the chamber to turn back on. *Please note that the high temperature failsafe inside this chamber should not be set to a setting that is below room temperature or within 10 degrees of the set point. The low temperature failsafe should be set below room temperature and at least 10 degrees below the setpoint.*

Temperature failsafes are bimetal type thermostats that react to the chamber temperature by expansion or contraction. They sense temperature much more slowly than an RTD type sensor, but they are extremely reliable.

PLUGGING IN THE CHAMBER

Plug the chamber into a receptacle that has a rated amperage greater than the amperage draw specified for the chamber. This equipment is completely automatic, designed to operate on 115 volt, 60 cycle AC (USA, Canada, Mexico, Saudi Arabia, Venezuela and Columbia) or 230 volts, 50 cycle AC (Europe, Middle East, Asia, Africa, and Australia).

Every chamber must be grounded. **It should be on a line direct from a meter that is not shared with other equipment.** *Do not use an extension cord to plug the chamber to a wall outlet. Do not break off the ground pin on the plug.*

SHELVES

The lowest shelf should be positioned first, allowing 3-4" from the chamber floor for air flow. No shelf should sit directly on the stainless steel bottom since that would restrict air circulation. Attach the shelf clips to the shelf supports (pilasters) in each corner, using the numbers on them for guidance to make sure the shelves will be level. The little nipple of steel on the shelf clip should point up, to support the edge of the shelf. Then, place the shelf on the clips with the shelves' truncated corners closest to the door. See the images below for examples of how the shelves should look when installed.

LOADING THE CHAMBER

Temperature uniformity inside the chamber is dependent on good airflow down the back wall, across the bottom pan, and up through the shelves. Leave space at the back of the shelves (1-2") for air to be blown to the bottom of the chamber and arrange product or samples so air can be sucked up through them to the top of the chamber. Allow 3-4" of space between the bottom pan and the lowest shelf for best air circulation.

LIGHTS

The two vertical light bulbs (one on each side of the door opening) can be removed without removing the shelves. Grasp the light near the top and bottom of the bulb and pull directly away from the fixture to remove them.

Replacement LED lights can be ordered from Powers Scientific, Inc or purchased online. Make sure to replace with 3500K bulbs, as cooler colors can be deadly to some insects.

LIGHT TIMER (CLOCK)

The digital timer is located in the instrument panel. There are four buttons on the clock. The lower left button reversed the light cycle – if you want to quickly switch the lights on when they are off.

The “Menu” button, along with the “OK” button next to it, walks you through the clock set-up: 24 hour vs. am/pm time, current time, day of the week, etc.

When you get to Program 1, set the lights to turn on. Set the lights to turn off in Program 2. You can set up to 8 pairs of on/off timings per day or week.

To erase a program, set the time for the lights to turn on as “- -:- -“. The paired program for the lights to turn off will automatically disappear.

MAINTENANCE

CARE OF CABINET

The powder coated enamel exterior and interior, as well as the doors, should be cleaned occasionally with soap and hot water (steam). *Do not use a cleaning solution that is corrosive to copper, aluminum or steel*. Substances containing ammonia or Clorox compounds are not recommended due to their corrosive effects. Sanitize with 70% isopropyl alcohol only with the chamber unplugged, to protect from flammable vapors.

Check the MSDS on any cleaning substances you plan to use, to make sure the product does not corrode copper or aluminum or steel. Substances containing ammonia or Clorox compounds are not recommended due to their corrosive effects on even an E-coated coil.

CONDENSER CLEANING

Under the cabinet there is a radiator-type device known as the condenser. A fan draws air through the condenser across the compressor and out again. An accumulation of dirt on the condenser or restriction of air flow around it will decrease the compressor efficiency, and may result in compressor damage or higher electric usage. Periodically clean/vacuum the condenser for best operation.

Maintain air flow across the condensing unit at all times. Maximum ambient temperature at the condenser should be 80°F or less.

WARRANTY

In the continental United States, your Invictus incubator comes with a comprehensive L:5:1 warranty. This warranty states that in the event of manufacture defect, all parts and labor are covered for one year from the date of shipment through the manufacturer. The

compressor motor (part only), is under warranty for a total of five years through the manufacturer. The evaporator coil (part only) is under warranty through Genesee Scientific for the lifetime of the original coil: seven years.

This warranty becomes void in the case of improper product use, unapproved spare part replacement or accessories and unauthorized modifications to the incubator. Warranty valid in United States only.
Incubators shipped internationally have a two years parts-only warranty.

TROUBLESHOOTING

If you are having a problem with your chamber, even if it is no longer in warranty, call us (1.215.230.7100) and ask for the INVICTUS product specialist. *Have your chamber model number and serial number ready* and be well informed about the problem. We will ask very specific questions about the chamber's performance.

If the chamber is located in the USA and under warranty, we will contact a local service company to repair a warranty problem. Regardless of the warranty status, we will listen to your descriptions of performance problems and help to identify the causes.

WATLOW PM SERIES TEMPERATURE CONTROLLER

Watlow temperature controllers have a red upper display and a green lower display. The actual chamber temperature value appears in the red upper display, while the corresponding temperature setpoint appears in the green lower display.

To change the temperature setpoint for the chamber, push the up or down arrow keys until the correct setting appears in the green lower display of the controller.

Note: These controls have been calibrated at the factory. If you wish to calibrate them at your facility, use an NIST certified digital temperature sensor positioned next to the chamber sensor on the side wall. Press the green ⇗⇙ key until the word "i.CA" or “CA1” appears in the display. Use the arrow keys to enter a positive or negative offset, to make the Watlow green display match the NIST certified sensor readings. A positive offset increases the input value and a negative offset decreases the input value. Press the ∝ key to return to the setpoint display

3 Chapter 3: Keys and Displays

Upper Display:

In the Home Page, displays the process value, otherwise displays the value of the parameter in the lower display.

Zone Display:

Indicates the controller zone that the remote user interface (RUI) is currently communicating with.

1 to 9 = zones 1 to 9

A = zone 10
b = zone 11
C = zone 12
d = zone 13
E = zone 14
F = zone 15
H = zone 16

Lower Display:

Indicates the set point or output power value during operation, or the parameter whose value appears in the upper display.

EZ Key:

This key can be programmed to do various tasks, such as starting a profile.

Infinity Key ∞

Press to back up one level, or press and hold for two seconds to return to the Home Page.

Advance Key ⊙

Advances through parameter prompts.

Temperature Units Indicator Lights:

Indicates whether the temperature is displayed in Fahrenheit or Celsius.

Output Activity:

Number lights indicate activity of outputs 1 through 5. A flashing light indicates retransmit activity.

Percent Units Indicator

Lights when the controller is displaying values as a percentage or when the open-loop set point is displayed.

Profile Activity;

Lights when a profile is running. Flashes when a profile is paused.

Communications Activity

Flashes when another device is communicating with this controller.

Up and Down Keys ▲ ▼

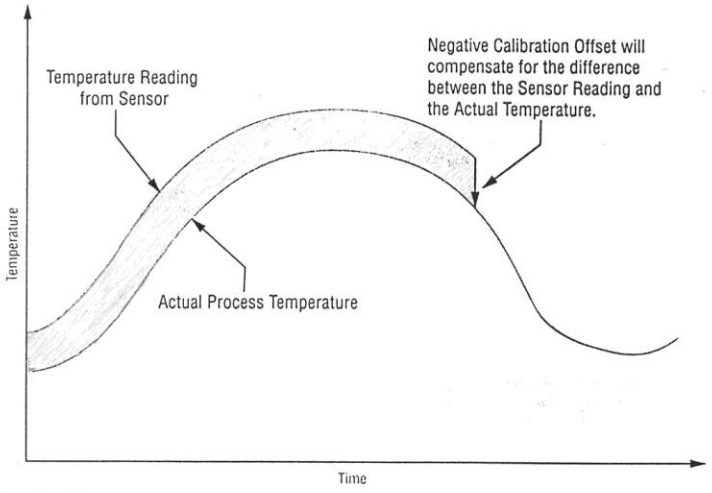
In the Home Page, adjusts the set point in the lower display. In other pages, changes the upper display to a higher or lower value, or changes a parameter selection.

Input

Calibration Offset

Calibration offset allows a device to compensate for an inaccurate sensor, lead resistance or other factors that affect the input value. A positive offset increases the input value, and a negative offset decreases the input value.

The input 1 offset value can be viewed or changed with Calibration Offset 1 [CAL 1] (User Menu).



Calibration offset.

GRASSLIN INTERMATIC DIGITAL CLOCK SIMPLE INSTRUCTIONS

Press MENU until the screen is clear. If “24” is flashing (at the very top of the screen) and you want military time, push “OK”. Otherwise, push the + button on the lower left for AM/PM time. Push “OK”.

Set the current time and day of the week. Press the OK button when the time shown is accurate. Use the + or – buttons on the left to make changes to the blinking numbers and press OK to finalize each selection. Use the + or – buttons to scroll down the days of the week to set the current day. Press OK.

Now you will see “Prog. 01” flashing. Press OK.

Set the time for the lights to turn on. Press OK after setting hours, minutes.

Set the days of the week for the lights to turn on at this time. When all the days are flashing, push OK, and the lights will go on every day at this time.

Now you will see “Prog. 02” flashing.

Set the time for the lights to turn off. Press OK after setting hours, minutes.

Set the days of the week for the lights to turn off at this time. When all the days are flashing, push OK, and the lights will go off every day at this time.

Press “Menu” when you see the flashing “Prog. 03” to end the programming.

If you want to erase all the programs, so the lights will be on all the time or off all the time, go through the set-up again and at Program 1, rotate the numbers until dashes appear in the display. Removing Program 1 automatically removes Program 2. If the lights are off and you want them on, or vice versa, push the OVR button on the far left (+ button).

Contact fpomeroy@intermatic.com for help programming more complex on/off programs.

Please note that the attached manual is not in chronological order:

page

INTERMATIC® GRASSLIN

Instruction Manual

20 memories time switches

WARRANTY

If within one (1) year from the date of purchase, this product fails due to a defect in material or workmanship, Intermatic Incorporated will repair or replace it, at its sole option, free of charge. This warranty is extended to the original household purchaser only and is not transferable. This warranty does not apply to: (a) damage to units caused by accident, dropping or abuse in handling, acts of God or any negligent use; (b) units which have been subject to unauthorized repair, opened, taken apart or otherwise modified; (c) units not used in accordance with instructions; (d) damages exceeding the cost of the product; (e) sealed lamps and/or lamp bulbs, LED's and batteries; (f) the finish on any portion of the product, such as surface and/or weathering, as this is considered normal wear and tear; (g) transit damage, initial installation costs, removal costs, or reinstallation costs.

INTERMATIC INCORPORATED WILL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. THIS WARRANTY IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. ALL IMPLIED WARRANTIES, INCLUDING THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY MODIFIED TO EXIST ONLY AS CONTAINED IN THIS LIMITED WARRANTY, AND SHALL BE OF THE SAME DURATION AS THE WARRANTY PERIOD STATED ABOVE. SOME STATES DO NOT ALLOW LIMITATIONS ON THE DURATION OF AN IMPLIED WARRANTY, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

This warranty service is available by either (a) returning the product to the dealer from whom the unit was purchased, or (b) mailing the product, along with proof of purchase, postage prepaid to the authorized service center listed below. This warranty is made by: Intermatic Incorporated/After Sales Service/7777 Winn Rd., Spring Grove, Illinois 60081-9698/815-675-7000 http://www.intermatic.com Please be sure to wrap the product securely to avoid shipping damage.

INTERMATIC INCORPORATED
SPRING GROVE, IL 60081-9698
158--00590

Mode

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The "+" key serves to change over between automatic, AUTO to override (OVR) ON and override (OVR) OFF (CH1).

+1h

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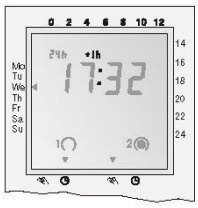

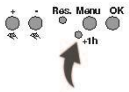

The +1h key is for the change to daylight savings time.

- By pressing the +1h key 1 hour is added to the current time.
- +1h is shown on the display.
- By pressing +1h again 1 hour is subtracted from the current time.

del

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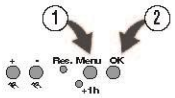
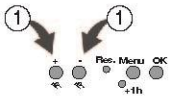
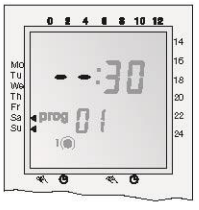


Select Menu, then select OK key until getting onto the ON time of the program you want to delete.



Select "--" with (+/-) key and confirm with OK.



Note:
Switching programmes are deleted in ON-OFF pairs. If you delete a single ON instruction, the corresponding OFF instruction is also deleted.

P-- prog

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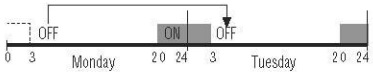
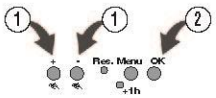
Shift
Should the OFF command be the following day of ON command then select "+" key then select Menu or OK.

Example:
Mo-Fr
20:00 p.m. - 03:00 a.m. ON
03:00 a.m. - 20:00 p.m. OFF
→
Mo-Fr
20:00 p.m. - 03:00 a.m. ON
Tu-Sa
03:00 a.m. - 20:00 p.m. OFF



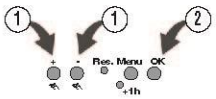
P-- prog

Set hour OFF

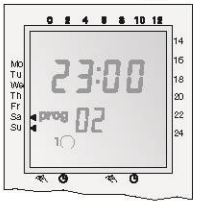


Select hour (+/-) and confirm with OK.

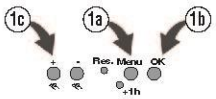
Set minutes OFF



Select minutes (+/-) and confirm with OK.



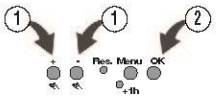
Set week day OFF



Should the OFF command be the same day of ON command then select Menu to terminate programming or select OK to go to a new program ON setting.

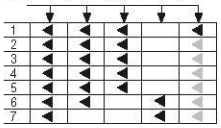
P-- prog

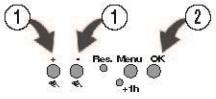
Set week day ON



Select week day (+/-) and confirm with OK.

Possible week blocks and individual days

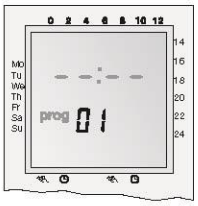




Select Ch1 or Ch2 (+/-) and confirm with OK.

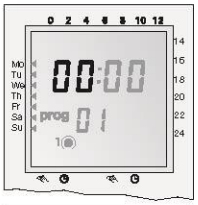
P-- prog

Sequence to follow after setting time and week day while running Menu mode or adding programs to the pre-set P01 to P03.

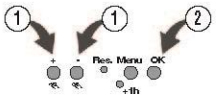


Select program ON

and confirm with OK.

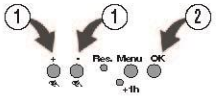


Set hour ON



Select hour (+/-) and confirm with OK.

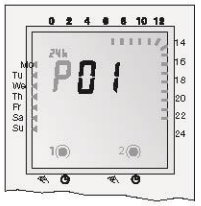
Set minutes ON

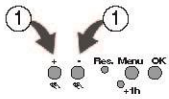


Select minutes (+/-) and confirm with OK.

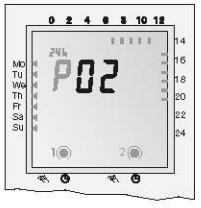
P0x prog

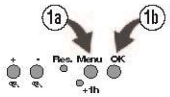
Sequence to follow after setting time in the Reset mode.





Select pre-set program (+/-).



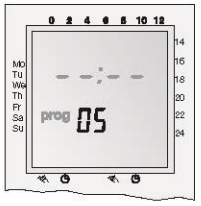


Once selected the program desired there are following options:

Menu: terminate programming

OK: Going through pre-set programs to modify selection (any program ON or OFF can be modified by using "+" or "-" keys and confirming with OK) or accept it with OK key to go the next free memory location in order to add new user defined programs (see pg 30).

e.g. after selecting P02 you should also program:
Sa-Su 22:30 ON (prog05)
23:00 OFF (prog06)



Prog. 9

P01: Mo - Su, 1 x ON/OFF

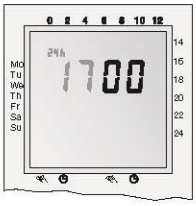
P01: Mo - Su, 2 x ON/OFF

P01: Mo - Su, 3 x ON/OFF

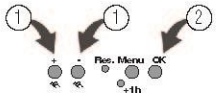
Programs P01-03
The switching on and off times for programs P01 to P03 are preset (pre).
The user can change these programs.

Individual program, P--
Under the menu option P-- you have the option of creating a user-defined program.
This program can be changed at any time. There are up to 20 memory locations available for 10 OFF and 10 ON commands.
You can allocate a corresponding weekday or week block to each memory location.

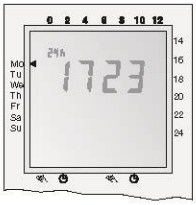
8



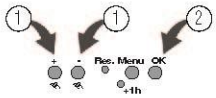
Set minutes



Select minutes (+/-) and confirm with OK.



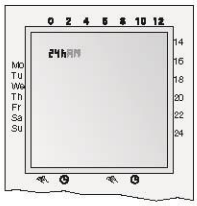
Set week day



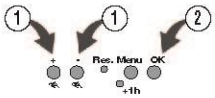
Select week day (+/-) and confirm with OK.

7

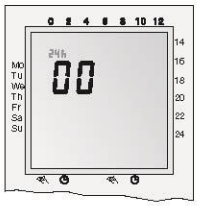
Sequence to follow after selecting programming by pre-set programs or Menu mode.



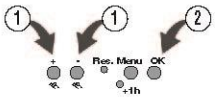
Set display format 24h or am/pm



Select 24h or am/pm (+/-) and confirm with OK.



Set hour



Select hour (+/-) and confirm with OK.

Menu / Prog 6

Setting of this programmable timer is depending of the user preference to use pre-set programs or defining own programming.

Using Pre-set programs (first time installation)

Using Reset key you can adjust the following values:

24h or am/pm:	see pg 6
Time (hour and minutes):	see pg 6
Week day:	see pg 7
Pre-set programs P01 to P03:	see pg 7

User defined programming by Menu mode

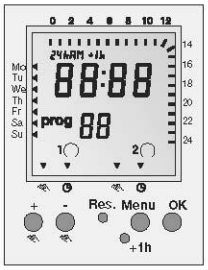
Using Menu key you can adjust / review the following values:

24h or am/pm:	see pg 6
Time (hour and minutes):	see pg 6
Week day:	see pg 7
Programs P--:	see pg 7

5

OK
reset

▮ : Overview of daily switching program
24h/AM : Setting of 24h or am/pm
+1h : Summer/winter clock changes
◂ : Weekday display
◉ : Switching status display ON/OFF
✍ : Manual operation / fixed ON / fixed OFF
◔ : Automatic operation



+/- : Adjustment keys: By pressing the key longer than 2 sec. you can adjust the timer in steps of 5 units
Res. : Reset
Menu : By pressing the menu key programming is terminated and the system reverts to automatic operation
OK : Confirmation of programming

4

Set switching ON time: Hour
Hour blinking, using +/- to select, then OK

Set switching ON time: Minute
Minutes blinking, using +/- to select, then OK

Set switching ON time: Days
Mo-Su blinking, using +/- to select, then OK

Set switching OFF time: Hour
Hour blinking, using +/- to select, then OK

Set switching OFF time: Minute
Minutes blinking, using +/- to select, then OK/Menu

A maximum of 20 memory locations can be occupied
10 switching ON times
10 switching OFF times

Menu

RUN

3

First installation setting

Set time: Format 24h or am/pm
24h blinking, using +/- to select, then OK

Set time: Hour
Hour blinking, using +/- to select, then OK

Set time: Minute
Minute blinking, using +/- to select, then OK

Set time: Day
Monday blinking, using +/- to select, then OK

Set Program: P01 / P02 / P03 or P--
Using +/- to select, then OK to set ON/OFF times
or
press Menu to terminate programming

Note:
P01-03 are pre-set

Menu OK

P01-03, P--
Set switching times:
First free memory location blinks.
Press "-" to go back one memory location.
Press OK for setting the switching times

Review/adjust

Menu

Prog01
Set switching times:
First free memory location blinks.
Press OK for setting the switching times

2

Safety precautions

- The connection and installation of electrical devices may only be carried out by a qualified electrician.
- Interventions in and changes to the device result in the voiding of the warranty claim.
- Observe your national regulations and the respective safety provisions.
- Switch-off commands have priority over switch-on commands.

WIRING DIAGRAM