MCB-100/101 MULTIFUNCTION DIGITAL TIME RELAY
With 2 CO Contacts
Operating Manual

Precautions for Installation and Safe Use
If below precautions are not properly observed and carried out, it may result in cases with injury or death.
· Disconnect power before working on the device.
· When device is connected to the network, do not remove the front panel.
· Do not clean the device with solvent or similar items. Only clean with dry cloth.
· Verify correct terminal connections before energizing the device.
· Install the device on the electrical panel.
· Contact your authorized reseller in case problems occur with your device.

⚠ **•No responsibility is assured by the manufacturer or any of its subsidiaries for any consequences rising out of not following above precautions.**

1. INTRODUCTION

MCB-100/101 is a multifunction digital timer with 2 CO contacts. It offers wide time adjustment range between 0.1-9999 seconds/minutes.

1.1 Application
MCB-100/101 has 7 different functions with wide adjustable time ranges. The main application area is the industrial and automation control systems.
The device has two dry contacts for START and STOP inputs.

1.2 Product Features
MCB-100/101 has the following features:
· 85-315 VAC/DC - MCB-125
 10-30 VAC/DC - MCB-126
· 7 different functions
· 0.1-9999 seconds/minutes time range
· 2 relay outputs
· Start-Stop dry contact inputs
· Memorizing remaining time of function in case of a power outage
· Custom design LCD with green backlight
· SET, ESC, UP, DOWN buttons are located on front panel for easy programming
· PK25 DIN Rail mounting

1.3 Hardware Features
To operate functions with external triggering, the device has the necessary START and STOP dry contacts.
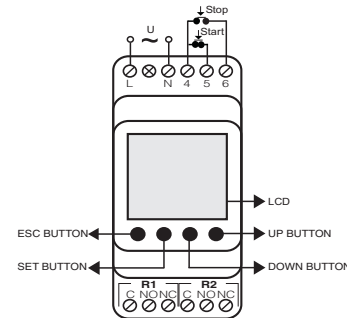
1.3.1. Display
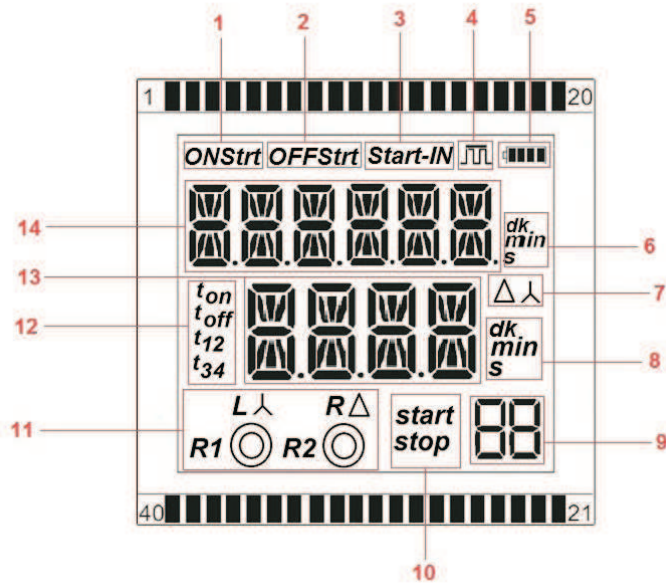
1. **ONSrt :** Indicates that the relay will start as closed.
2. **OFFSrt:** Indicates that the relay will start as open.
3. **Srt-Input Icon:** Indicates that the function is started with external input.
4. Indicates whether function trigger is Level or Edge.
5. Battery
6 and 8. min sec : Indicates whether timing unit is minute or second
7. Time setting indicator for Star-Delta function
9. Numeric Two Digits: Show function number.
10. **Stop:** Indicates that stop input is active. **Start:** Indicates that stop input is active.
11. When R1 or R2 relays are activated, the center of the circles are turned on. **R** and **L** letters are used to indicate left or right direction when inverser relay function is selected. **Star-Delta:** Indicate the output relay state in Star-Delta function.
12. Indicates the time type of functions.
13. In the main menu, it shows the elapsed time.
14. In the main menu, it shows the entered time. In the settings menu, it shows the function names.

1.2.2 Button functionality
SET, ESC, UP and DOWN buttons help to select functions and set their times.

UP button goes to previous menu item in Settings Menu and increase selected parameter value.
DOWN button goes to next menu item in Setting Menu and decrease selected parameter value.
SET button is for entering data. When pressed at least 3 seconds, Setting Menu is selected.
ESC button exits from a menu.

1.2.3 Outputs
MCB-100/101 has two changeover relay outputs. According to VDE 0110 and IEC 60947-1 standards; switching capacity of relay output is 8A, 2000VA, 250 V. and maximum electrical life time is 1x 10^6.

1.2.4 Inputs

1.2.4.1 Start Input and Stop Input:
These inputs are voltage-free dry inputs.
Start Input: For some of the functions, output depends on the state of the start input or input pulses from start input. When user shorts two terminals of this input, start input activates.
Stop Input: When stop input applies, the timing pauses with stop input's leading edge. When stop input is removed, the timing continues to count from it's last value with stop input's trailling edge. Stop input affects all functions as the same without any exception. When user shorts two terminals of this input, stop input activates.
An Example: This function needs td delay time to release relay. When stop input is applied, it stops counting and saves the time t1. With stop input's trailing edge, counting continues from the saved time t1 until delay time td (Here td=t1 + t2). While stop input is active, the relay doesn't change its position.
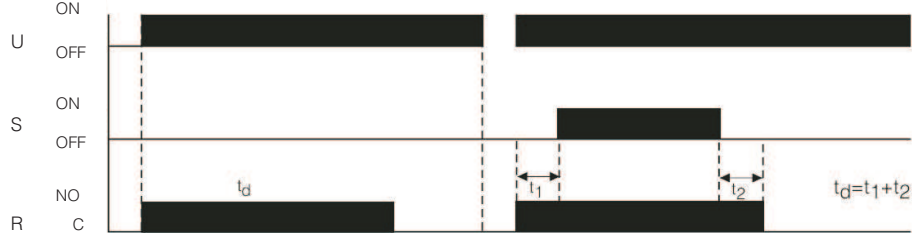
U : Supply Voltage
Stop : Stop Input
R : R1 or R2 Relay
td : Delay Time
t1 : Time elapsed until Stop Input is activated (t1<td)
t2 : Time elapsed after Stop Input is deactivated (td=t1+t2) **5**

2. OPERATING INSTRUCTIONS

When the device is taken out of the box, an installation menu will be displayed. Language and function settings are done in this menu as seen in the figure below. Afterwards, device returnss to main menu and starts operating.
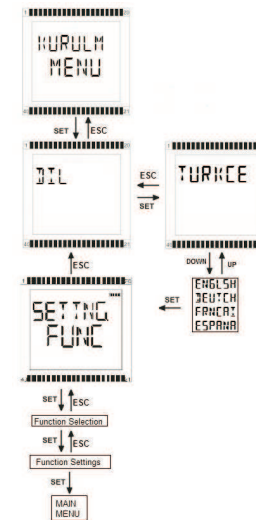
6

To enter Settings Menu, press SET button for 3 seconds. If password is active, ented the password (It is "0000" by factory default). If password is not active, Settings menu is displayed directly.
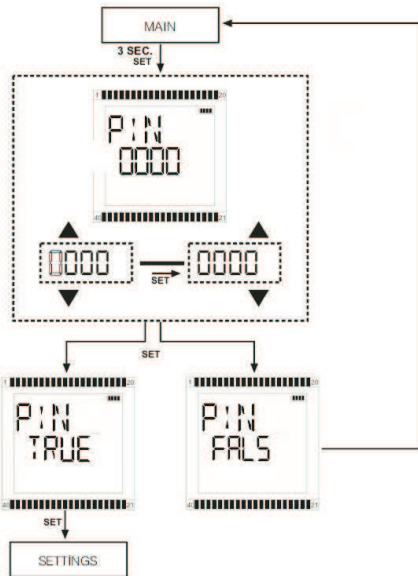

Basic settings map is shown below. There are two main submenus as function selection and display settings.

Function Selection Submenu: A new function is set from function selection menu. In this submenu, user chooses a function, sets t parameter/parameters for selected function; assigns relay output and selects the activation of memory feature to keep remaining timer value.

Display Configurations Submenu: Changing password, adjusting contrast, activating backlight or changing language is done from this submenu.
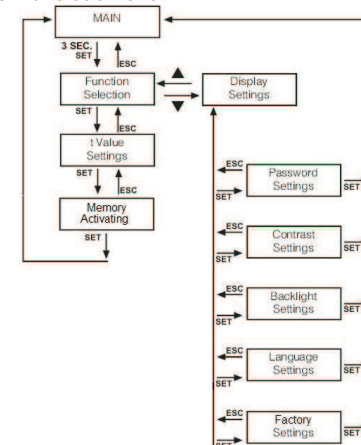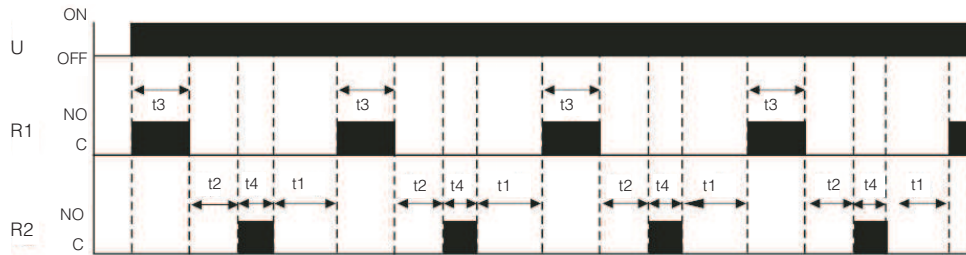
2.1 Functions:

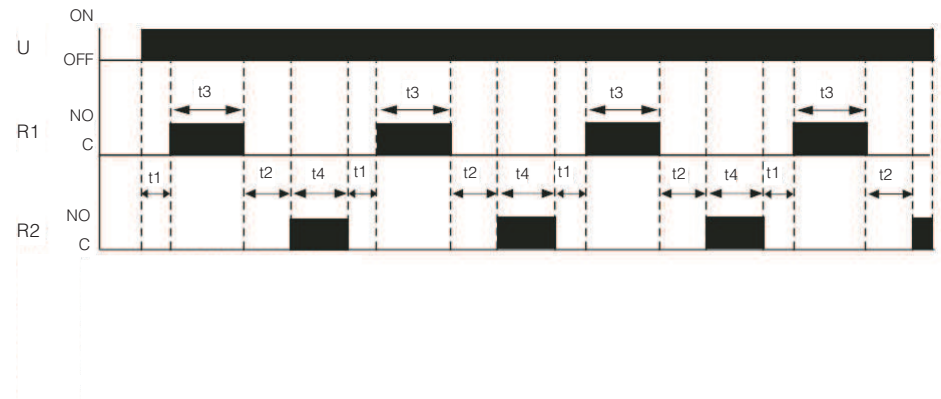### 1. Inverser (right - left) Relay/Relay ON start

When the supply voltage is applied, Relay R1 is activated and **"t3"** time starts. At the end of **"t3"** time, Relay R1 is deactivated and **"t3"** time starts. At the end of **"t2"** time, R2 is activated and **"t4"** time starts. At the end of **"t4"** time, R2 is deactivated and **"t1"** time starts. At the end of **"t1"** time, R1 is activated again. This cycle is repeated while supply voltage is on.

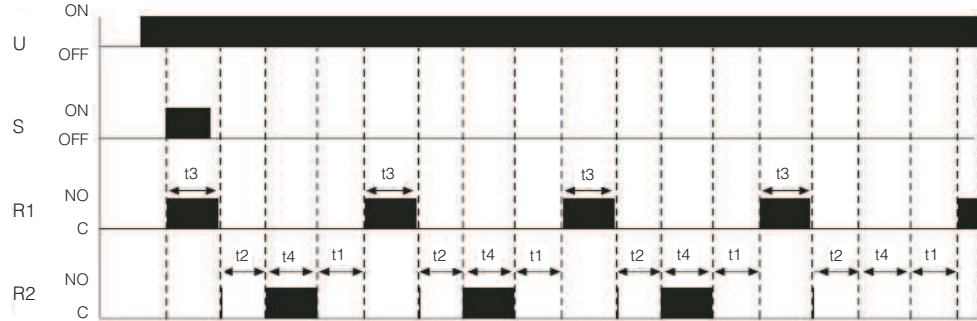U   : Supply Voltage
R1   : R1 Relay
R2   : R2 Relay

2. Inverser (right - left) Relay/Relay OFF start

Function is similar to the ON Start version (function 12) with the exception that the output relay starts as passive.

3.Inverser (right - left) Relay/Start by external trigger leading edge/Relay ON start
When the supply voltage is applied and Start Input is activated, Relay R1 is activated and **"t3"** time starts. At the end of **"t3"** time, Relay R1 is deactivated and **"t3"** time starts. At the end of **"t2"** time, R2 is activated and **"t4"** time starts. At the end of **"t4"** time, R2 is deactivated and **"t1"** time starts. At the end of **"t1"** time, R1 is activated again. This cycle is continues while supply voltage is on and Start Input is activated.

4.Inverser (right - left) Relay/Start by external trigger leading edge/Relay OFF start
Function is similar to the ON Start version (function 14) with the exception that the output relay starts as passive.
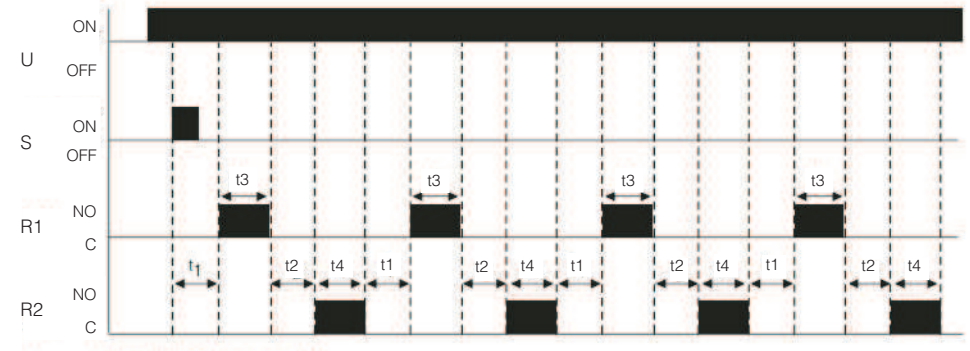
5. Dual Time ON Delay

When the device is energized, **"t1"** time starts. After **"t1"** time, R1 relay activates and **"t2"** time starts. After **"t2"** time, R2 relay activates. The relays stay active until supply voltage is removed.

6. Dual Time OFF Delay

When the device is energized, R1 and R2 relays activate and **"t1"** time starts. After **"t1"** time, R1 relay deactivates and **"t2"** time starts. After **"t2"** time, R2 relay deactivates. The function starts again if the supply voltage is removed and applied again.

7. Star Delta Timer

When the device is energized, R1 relay (star relay) is activated and the $t_\curlywedge$ time begins. When the $t_\curlywedge$ time is complete, R1 is deactivated and the second time delay t_Δ begins. When the t_Δ time is complete, R2 relay (delta relay) activates. R2 relay stays active while the supply voltage is applied. When the supply voltage is removed and reapplied, function starts again. enerjisi kesilip tekrar verildiğinde fonksiyon resetlenir.

## 2.2 Settings
2.2.1 Function Selection:

Function sub-menu is reached by pressing SET button in Settings menu. The functions that the device offers can be browsed with UP or DOWN buttons. The user selects the desired function enters its adjustment menu by pressing SET button.
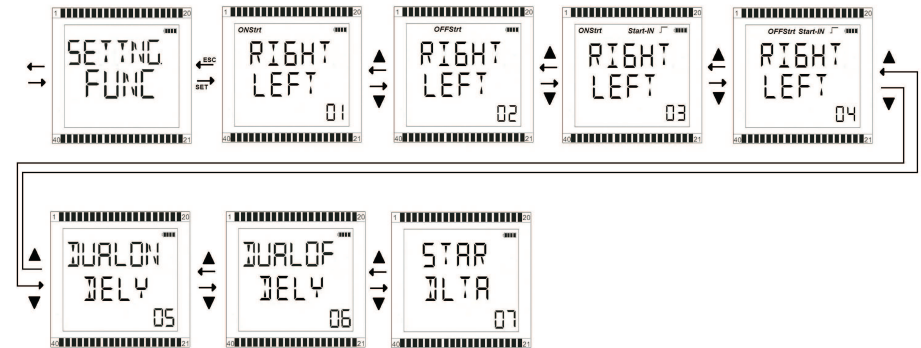
2.2.2 Time Setting :
After selecting the function, user sets t value/values according to the application need. Time range for **"t"** is between 0.1 seconds-9999 seconds and 0.1 minutes-9999 minutes. Setting starts from left digit towards right digit. User uses UP button to increase value of the digit and DOWN button to decrease. The user presses SET button to move to the next digit on the right and the ESC button to move back to a previous digit. After entering a number, user selects unit (minutes or seconds) by pressing UP or DOWN. Finally, the selected values are stored by pressing SET button.

Example Time Setting (0.1 - 9.9) :
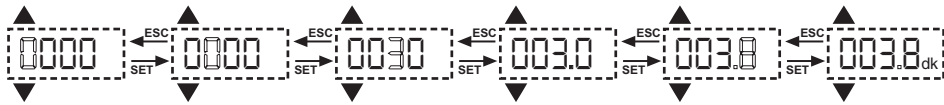
**Example Time Setting (10 - 9999) :**

2.2.4 Memory
Device has an internal memory. If the memory option is activated while setting 1st, 2nd, 3rd and 4th functions; elapsed time and relay positions will be stored when the power goes out. When the power comes back on, the device continues from the stored time and relay position. If the memory option isn't
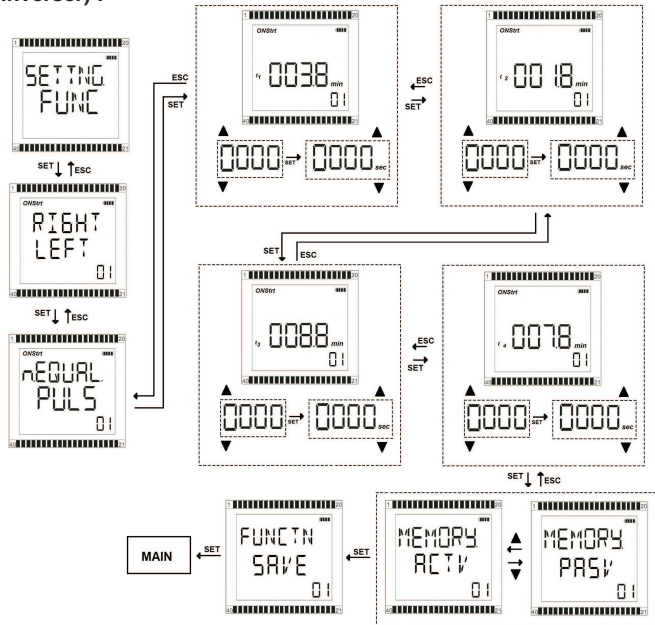
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activated while setting a function, elpased time and relay positions are not stored in case of a power outage and the device starts the function from the start when the power comes back on.
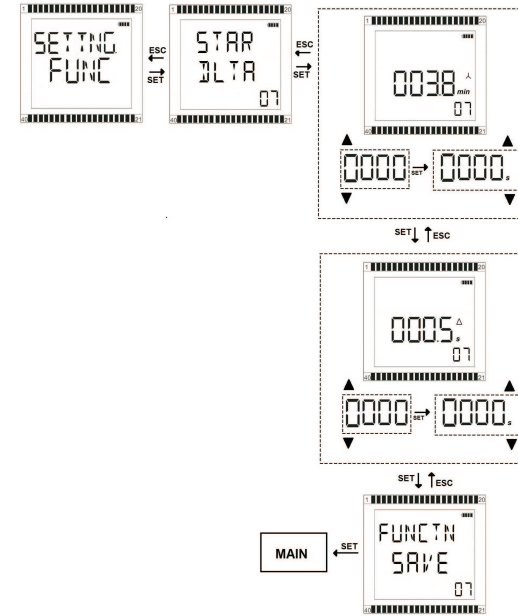
FUNCTION SETTINGS
Dual Time :

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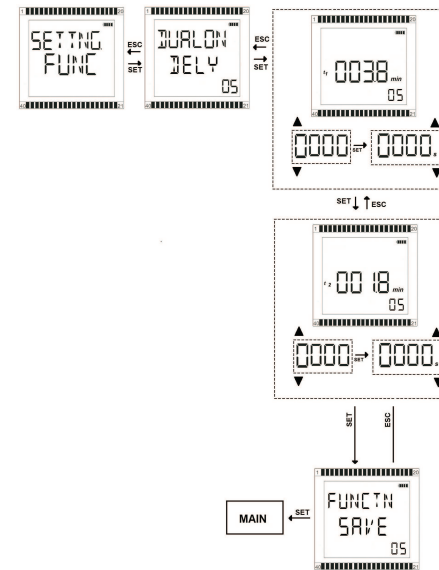
Right-Left Relay (Inverser) :


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Star Delta :

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2.3.4 Display Settings :

In this submenu, user can change password, contrast, backlight and language settings and return to factory default settings.

In Password submenu, user can activate or deactivate the password. To change password, the user should first enter current password, then new password twice. In Contrast menu, user can change contrast level from 1 to 5. In Backlight menu, user can choose a setting from "always on", "always off", "on for 5 seconds", "on for 10 secods" and "on for 20 seconds" options. In Language menu, device supports 5 languages as Turkish, English, German, French, Spanish.
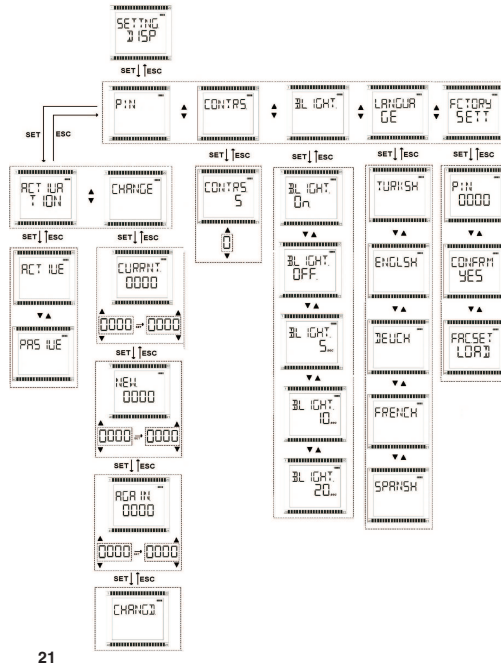
3 MAIN SCREEN
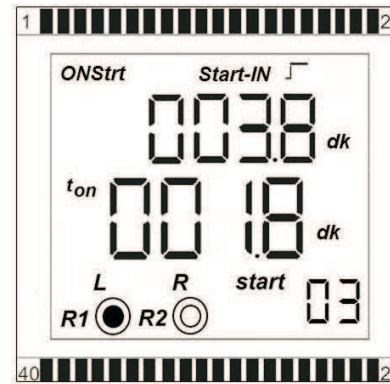
This is an example to explain main screen.
- Top line shows the function: In this case, Onstrt (ON start), Strt- Input (Start Input) and Edge Trigger is selected.
- First line shows the adjusted time.
- Second line shows the elapsed time value.
- **"start"** icon indicates that "Strt-Input" is active.
- The number 01 indicate that 1st function is selected.
- ⊙ icon next to R1 indicates that R1 relay is active.

When UP or DOWN buttons are pressed while on the main screen, the name of the selected function is displayed. By pressing the ESC button, main screen is displayed again.

Connection Diagram :

MCB-100

Un : 85 - 315 V AC f:50/60 Hz
⊶ : 2C/O, 2000VA / 6A
Y3676/Rev.1

CE

MCB-101

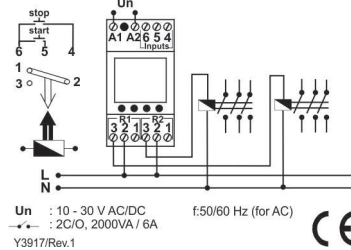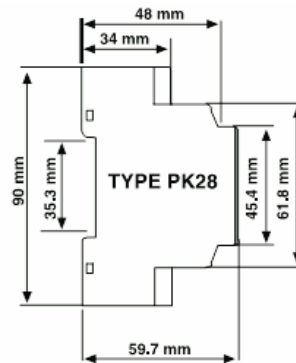Un : 10 - 30 V AC/DC f:50/60 Hz (for AC)
⊶ : 2C/O, 2000VA / 6A
Y3917/Rev.1

CE

Dimensions :

TYPE PK28

48 mm
34 mm
90 mm
35.3 mm
45.4 mm
61.8 mm
59.7 mm
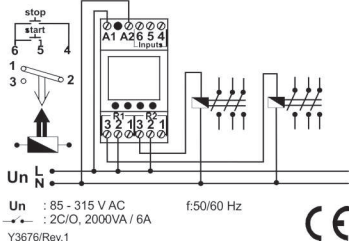
Teknik Özellikler

Input Circuits
Operating Voltage   85-315 VAC / DC - MCB-100
                                     10-30 VAC/DC - MCB-101
Operating Voltage Tolerance   ±20%
Operating Frequency   DC supply 0 Hz, AC supply 50/60 Hz
Input Contacts   2 Dry Contacts (Start, Stop)

Timing
Time Range   Selectable
                                     0.1 . 9999 Seconds
                                     0.1 . 9999 Minutes
Reset Time   < 100 ms
Repetition Error   ±0.2% of Adjusted Time
Timing Setting Error   < 0.5 %

Output Circuits
Output Contacts   2 C/O Contact
Switching Capacity   6 A, 2000VA
Voltage according to VDE 0110, IEC 60947-1 250 V
Maximum Electrical Life   1x 10^6

General Features
Dimensions   Width 36.0 mm
                                     Length 90.0 mm
                                     Depth 59.7 mm

Cable Selection	2,5mm^2 stranded
	4,0mm^2 solid
Weight	0.25 kg
Installation	Rail Mount
Enclosure and Terminal Protection Class	IP40 / IP20
Operating Temperature	+5...+50 °C

Standards	
Product Standard	IEC 61812-1 10.1996, EN 61812-1 + A11/8.1999,
	DIN VDE 0435 part 2021
EMC Directives	2004/108/EC
Electromagnetic Compliance	IEC 61000-6-2, EN 61000-6-4
ESD	IEC 61000-4-2, EN 61000-4-2 (level 3 6 kV / 8 kV)
HF Radiation Resistance	IEC 61000-4-3, EN 61000-4-3 (level 3 10 V/m)
Burst	IEC 61000-4-4, EN 61000-4-4 (level 3 2 kV / 5 kHz)
Surge	IEC 1000-4-5, EN 61000-4-5 (level 4 2 kV L-L)
HF Line Emission	IEC 1000-4-6, EN 61000-4-6 (level 2 10 V)
Low Voltage Directive	2006/95/EC
RoHs Directive	2002/95/EC

Isolation Data	
Rated Impulse Withstand Voltage	VDE 0110, IEC 664 (4 kV / 1.2-50 ?s)
Test Voltage Between All Isolated Circuits	2.5 kV, 50 Hz, 1 min.
Pollution Category	IEC/EN 60664-1, VDE 0110, UL 508 (3)
Overvoltage Category	IEC/EN 60664-1, VDE 0110, UL 508 (III)

MENU MAP