ZIEHL industrie – elektronik GmbH + Co KG
Daimlerstr.13, 74523 Schwäbisch Hall, Germany
+ 49 791 504-0,   info@ziehl.de,   www.ziehl.de

Temperature Relays and MINIKA®   Mains Monitoring   Digital Panelmeters MINIPAN®   Switching Relays and Controls   Measuring Transducers   Grid- and Plant Protection

Operating Manual WD100V

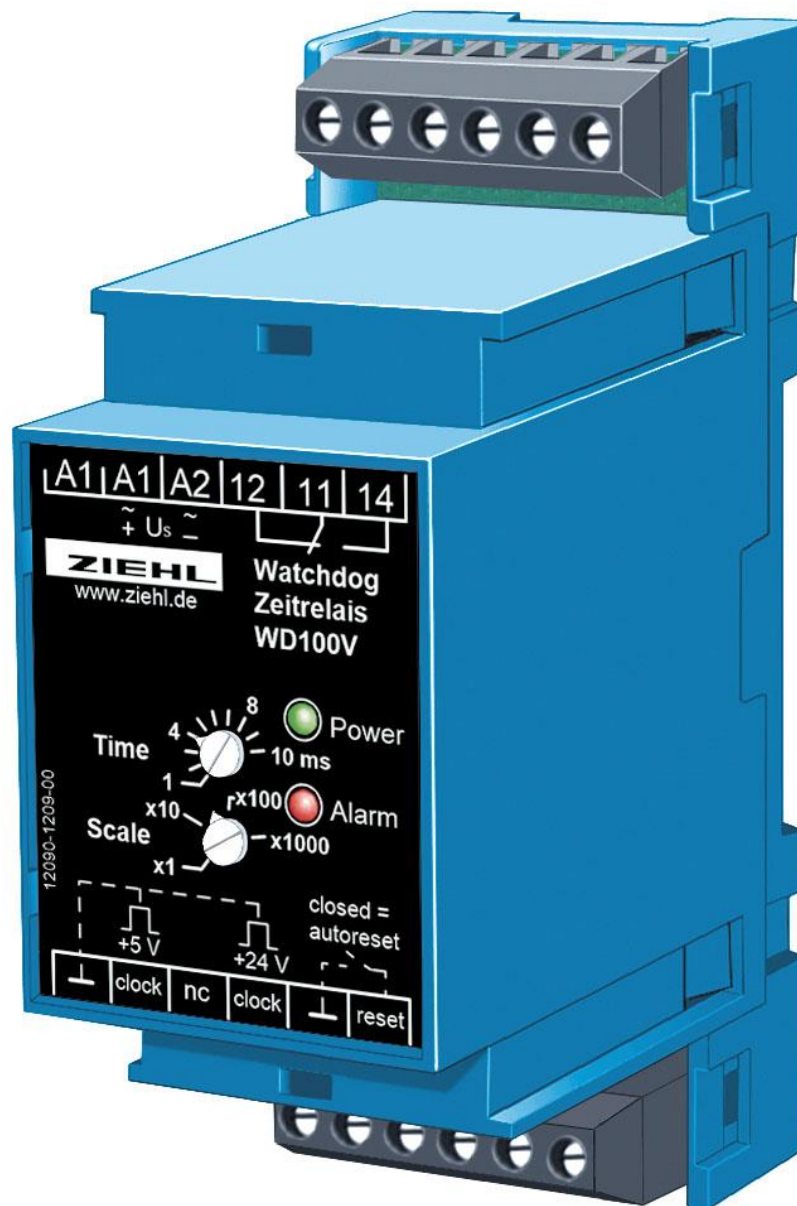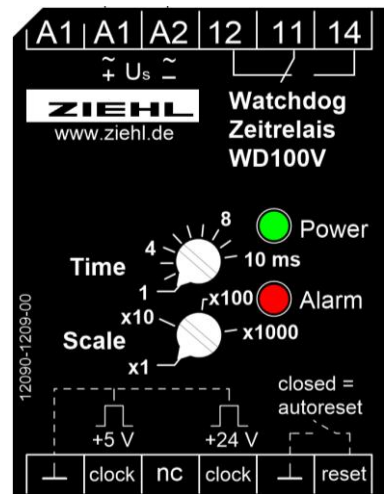updated: 2017-11-06 / sm

- Watchdog Time Relay

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1   Display and controls

LED „Power"   => WD100V is working
LED „Alarm"   => no square wave detected

Poti „Time"   => time constant for the applied signal
Poti „Scale"   => multiplier for the time constant

2   Detailed description

The software of the IPC creates a square wave signal (DC 24 V or DC 5 V) with a pulse-time of 500 µs to 10000 ms. The output relay (1 potential free change-over contact) of the watchdog time-relay WD100V is picked up when the supply voltage and the square wave voltage are fed. The relay releases the preset time (Time x Scale) after the last recognized slope when the next slope is missing. Positive slopes as well as negative slopes are monitored. When the square signals recover and the reset-input is closed or supply-voltage is switched on, the relay picks up again (not earlier than 500 ms after switching off).
The output signal can be evaluated by a superordinate control or directly switched into the emergency- stop circuit of the machine.

3   Application and short description

In the control technology of today, the number of industrial PCs (IPC) partly with decentralized intelligence constantly increases. Individual processes are controlled independent of each other. In case of failure or malfunction of one component, it can therefore be necessary to switch off the hardware of a complete machine or plant. Time-Relay WD100V is used to make sure that because of malfunctions in the program flow, caused by short-term voltage interruptions for instance, no undefined status are created.

4   Overview of functions

- Input-signal 24 VDC square wave
- Input signal 5 VDC square wave
- Minimum pulse length 500 µs
- Maximum pulse length 10 s
- Monitoring of positive and negative slopes
- Watchdog-time = Time x Scale (1 ms-10 s)
- Display of state of function with LED (Alarm)
- Reset with external contact or switch
- Universal power-supply AC/DC 24-240 V
- Relay-output (1 change-over contact)

5 Connecting diagram
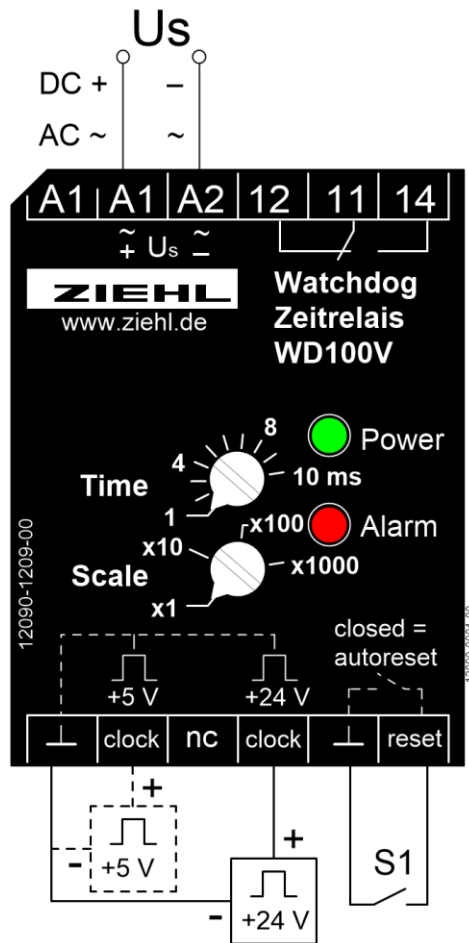
6 Funktionsdiagramm
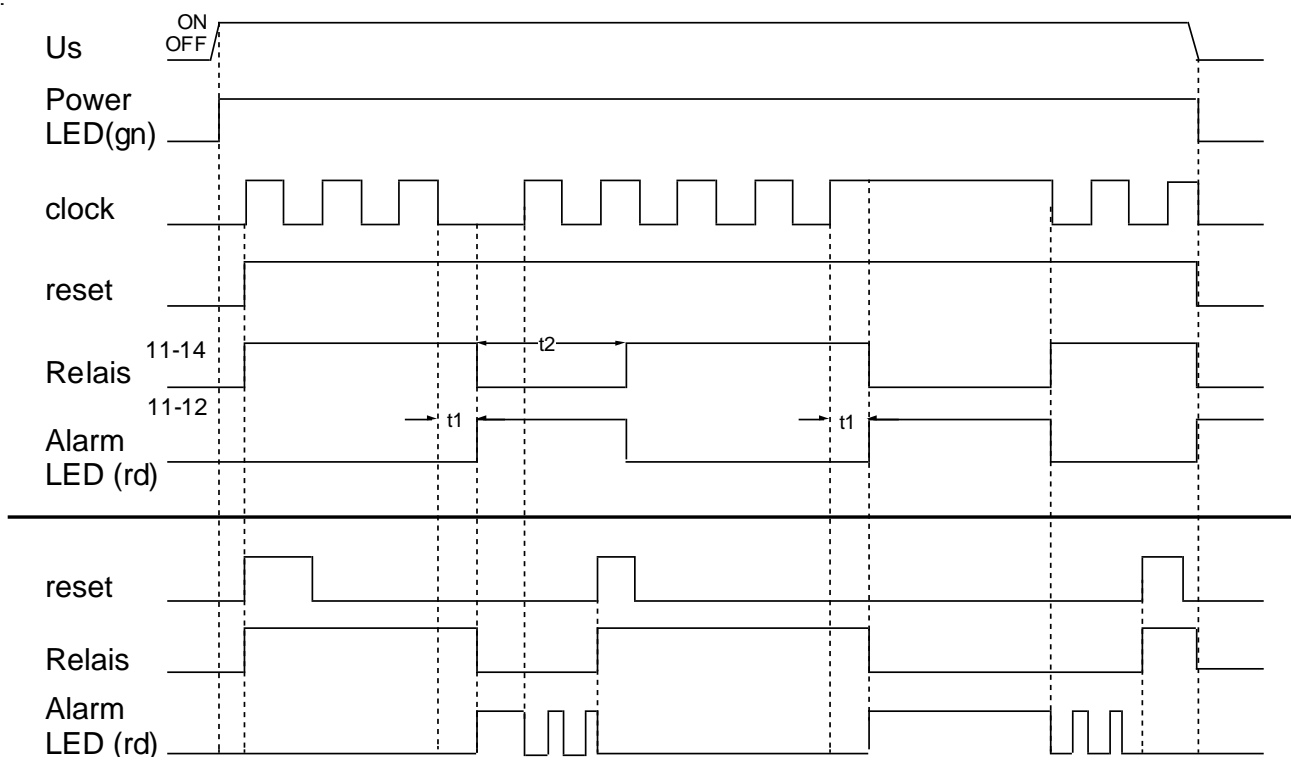
t1 = Time x Scale
t2 = Relay switches off for 500ms

7 Important Information

	Attention! **Before switching on make sure that he operational voltage Us of the lateral type plate and the main voltage are the same!**

	Attention! **Dangerous electrical voltage!** **May cause electric shock and burns.** **Before beginning work, switch the system and the device free of stress.**

	Attention! **When relay is set to operating-current mode! At loss of supply- voltage the relay doesn't switch. Depending on the application we recommend to monitor the supply voltage**

To use the equipment flawless and safe, transport and store properly, install and start professionally and operate as directed.

Only let persons work with the equipment who are familiar with installation, start and use and who have appropriate qualification corresponding to their function. They must observe the contents of the instructions manual, the information which are written on the equipment and the relevant security instructions for the setting up and the use of electrical units. The equipment is built according to EN and checked and leave the plant according to security in perfect condition.

If, in any case the information in the instructions manual is not sufficient, please contact our company or the responsible representative.

Instead of the industrial norms and regulations written in this instructions manual valid for Europe, you must observe out of their geographical scope the valid and relevant regulations of the corresponding country.

8 Installation

- mount on 35 mm mounting rail according to EN 60715
- wall-mount with 2 x screws M4
- connecting wires refer to the connection plan.

9 Commissioning

Supply voltage and square wave voltage according to connection diagram.
Set the watchdog time (Time x Scale) so the alarm is triggered. Increase the watchdog time until the alarm LED goes off or flashes. The adjusted multiplicator (scale) should be as low as possible.

10 Application example motor release

L+ DC24V
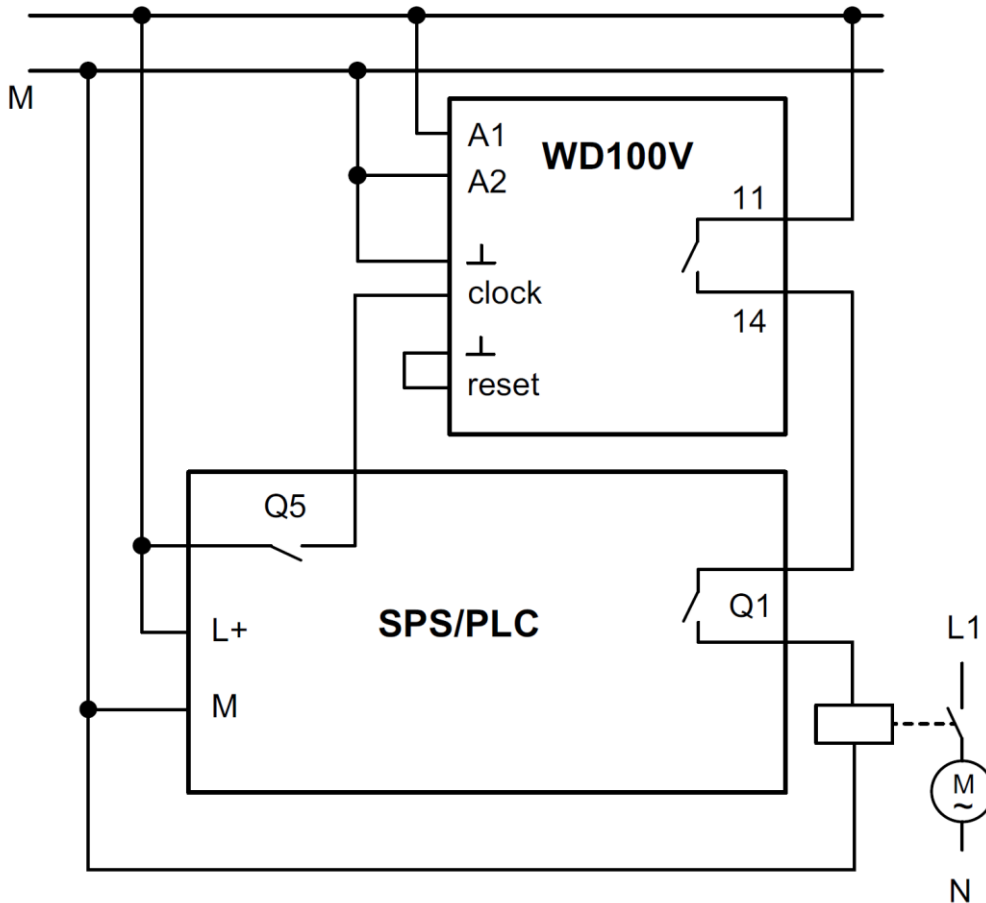
Q1 = relay output PLC
Q5 = square wave output PLC

The software of the monitored control (PLC, IPC) makes a clock signal at the output Q5 (DC 24 V, transistor). The relay of the WD100V picks up only when the input recognizes a clock signal. The time between two slopes has to be shorter than the time set at the WD100V (time x scale).

When the clock is missing completely or at a missing slope, the output relay of the WD100V opens contacts 11-14 and the motor is switched off respectively switching on is inhibited.

11 Error search

Power LED is off
  ⇨ Check supply-voltage.
Relay releases an alarm and switches back shortly after that
  ⇨ Watchdog-time to low. Increase watchdog-time (Time x Scale).

12 Technical data

Rated supply voltage Us	DC/AC 24 – 240 V	0/50/60 Hz
Tolerance	DC 20.4 - 297 V	AC 20 - 264 V
Power consumption	< 1.5 W	< 5 VA

Output relay K1	1 change over contact	
Switching voltage	max. AC 300 V; DC 300 V	
min. voltage / current	12 V 10 mA	
conventional thermal current Ith	max. 3 A	
Switching power max. AC cos φ = 1	750 VA (250 V * 3 A)	

Contact life electrical	2×10^5 operating cycles AC 250 V / 3 A 5×10^5 operating cycles AC 250 V / 2 A 1×10^6 operating cycles AC 250 V / 0,8 A
Utilization category Rated operational current	AC-15 Ie = 2 A Ue = 250 V
Rated operational voltage	DC-13 Ie = 2 Ue = 24 V DC-13 Ie = 0,8 A Ue = 60 V DC-13 Ie = 0,4 A Ue = 120 V DC-13 Ie = 0,2 A Ue = 240 V

Inputs

Clock-input +24VDC	DC 24 V square wave (low ≤ 4V, high ≥ 12V)
Clock-input +5VDC	DC 5 V square wave (low ≤ 1,1V, high ≥ 3V)
Reset-input	Button for reset Bridge = auto reset
Switching-time	Delay contact 10ms
Tolerance	±10% of preset value (-32 … +70 °C)
Time until ready	< 200ms
Resistance of input clock 24V	app. 25 kΩ
Resistance of input clock 5V	app. 7 kΩ

Testing conditions   EN 61010-1

Rated impulse voltage	4000 V
Overvoltage category	III
Pollution degree	2
Rated insulation voltage Ui	300 V
On Period	100%

EMC-Tests   EN 61326-1 industrial environment

|	
emission	EN 61326-1; CISPR 11 class B
immunity	EN 61326-1 industrial environment
Electrical fast transient / Burst	EN 61000-4-4 ±4 kV Pulse 5/50 ns, f = 5 kHz, t = 15 ms, T = 300 ms
SURGE	IEC 61000-4-5 ±2 kV

Environmental conditions

Ambient temperature range	-32 °C ... +70 °C
Storage temperature range	-40 °C …+70 °C
Altitude	Up to 2000 m
Climatic conditions	5-85% rel. humidity, no condensation
External wiring temperature range	-5 °C …+70 °C

Housing	Design V2 switchgear mounting
Mounting height	55 mm
Width	2 TE
Dimensions (W x H x D)	35 x 90 x 58 mm
Line connection solid wire	1 x 0.34 – 4 mm² / AWG 22 - 12
Stranded with insulated ferrules	1 x 0.1 -2.5 mm² / AWG 27 - 14
Insulation Strip length	8 mm
Torque	0.5 Nm (3.6 lb.in)
Protection housing / terminals	IP 30 / IP 20
Attachment	35 mm standard rail according to EN 60 715 or screws M 4 (additional bar not included)
Weight	app. 100 g

Subject to technical modifications

13 Housing Type V2

Dimensions in mm
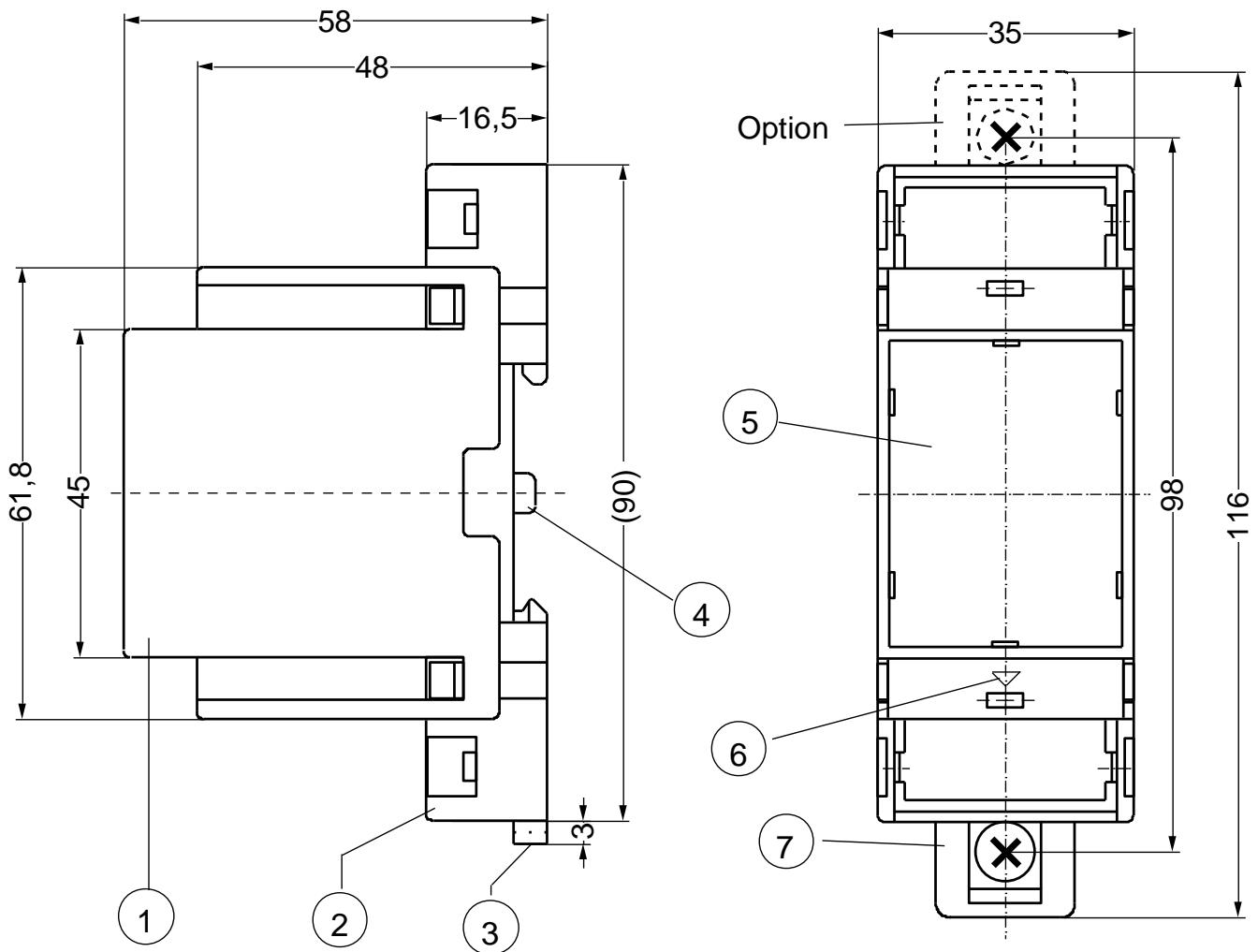
1 Oberteil / cover
2 Unterteil / base
3 Riegel / bar for snap mounting
4 Plombenlasche / latch for sealing
5 Frontplatteneinsatz / front panel
6 Kennzeichen für unten / position downward
7 Riegel bei Wandbefestigung mit Schrauben. Riegelbohrung ø 4,2 mm /
   For fixing to wall with screws, ø 4,2 mm