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### 1. INTRODUCTION

This under / over voltage monitoring relay type MV53 is based on the ComatReleco ECO-Line (for direct mounting to TS 35 DIN rail). This device monitors AC under and over voltage. The alarm values can be set with two separate DIP switches in several steps. The monitoring input voltage also supplies the power for the circuit of the device, therefore no other external supply is needed for correct operation.

As an output, the MV53 has a relay with one change over contact for a maximum switching capability of 6A, 250V and a load of up to 1750VA.

To monitor the desired over voltage, Vo1, can be selected with a DIP switch in steps of +2,5% up to +17,5% ( e.g. AC270V in the AC230V version, and AC135V in the AC115V version). There are seven different combinations possible. In the same way the under voltage value to monitor, Vu1, can be set with DIP switches. In this case in steps of -5% down to -35% ( e.g. AC149,50V in the AC230V version and AC75V in the AC115V version).

When the monitored voltage is outside these set values, the relay drops out after the set delay time ( $t_{del}$ ) has elapsed. The Alarm delay time can be set from 25msec to 2,5sec with a potentiometer. The output relay pulls in again after a minimum alarm reset time ( $t_r$ ) when the voltage returns to within the set value parameters. There is a defined hysteresis for stable good condition.

The status condition is displayed by a bi colour LED, green indicates ( ok ) and red indicates if the monitored value is outside the selected values.

The device complies with the relevant directives and standards.

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Technical specifications are subject to change without notice

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### 2. ORDER DESIGNATION

ComatReleco Voltage monitoring relay      **MV53/AC230V**  
**MV53/AC115V**

Other Versions available on request.

Fo-61.01-D-401 Datei: MV53

|   |       |       |      |          |      |       |                    |   |
|---|-------|-------|------|----------|------|-------|--------------------|---|
| Gez.  | Entw. | Gepr. | Reg. | Datum    | Ae M | Ausg. | Blatt: 1<br>von: 5 | <b>Data sheet</b><br><b>MV53/AC115-230V, 50-60Hz</b><br><b>AC- Voltage monitoring relay</b> |
|   | UI    |       |      | 19.4.01  |      | A     |                    |   |
|   | UI    | Pd    | wie  | 29.10.01 |      | 1     |                    |   |
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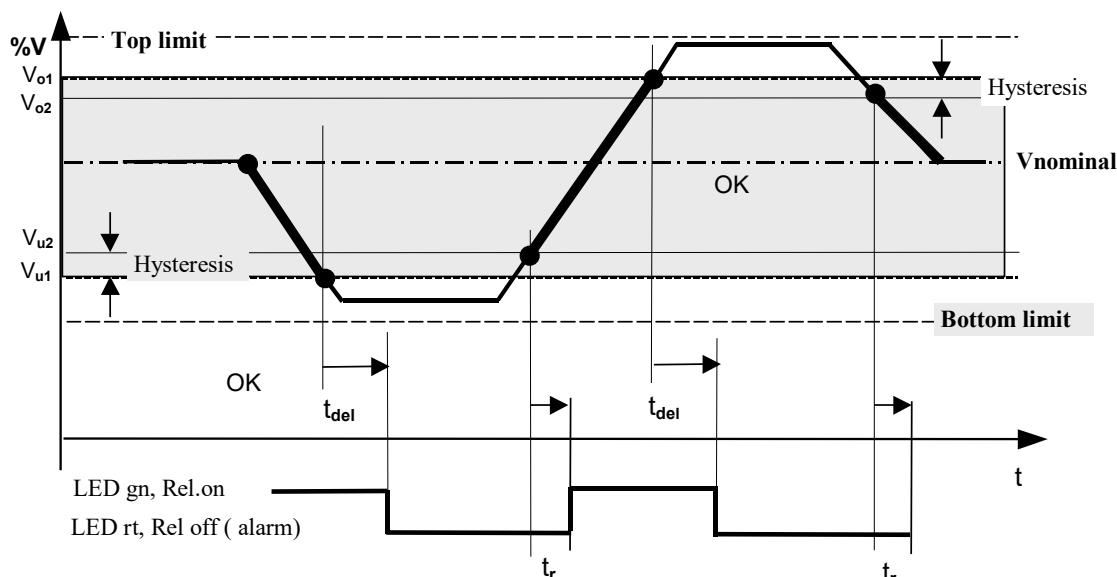
### 3. FUNCTIONS

Concepts

$t_{del}$  : Alarm delay time  
 $V_{o1}$  : Threshold in +% from nominal value  
 $V_{u1}$  : Threshold in -% from nominal value  
 Rel : Output relay  
 $V_{nominal}$ : e.g. AC230V and AC115V

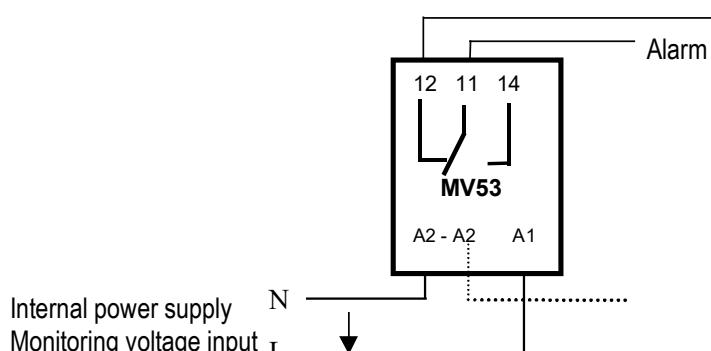
$t_r$  : Reset delay time  
 $V_{o2}$  : Threshold for hysteresis  
 $V_{u2}$  : Threshold for hysteresis

Over voltage-under voltage monitoring response



The alarm condition is triggered when the maximal set value ( $V_{o1}$ ), in +% from the  $V_{NOM}$  is exceeded or when the monitored voltage is lower than the minimal set value ( $V_{u1}$ ) in -% from the  $V_{NOM}$ . The alarm condition is reset after a time  $t_r$  when the values  $V_{u2}$  or  $V_{o2}$  are reached as shown in the diagram.  
See "OPERATION" for possible values of  $V_{o1}$  and  $V_{u1}$ .

### 4. WIRING / CONNECTION



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| Gez. | Entw. | Gepr. | Reg. | Datum    | Ae M | Ausg. | Blatt: 2 |
|------|-------|-------|------|----------|------|-------|----------|
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Data sheet

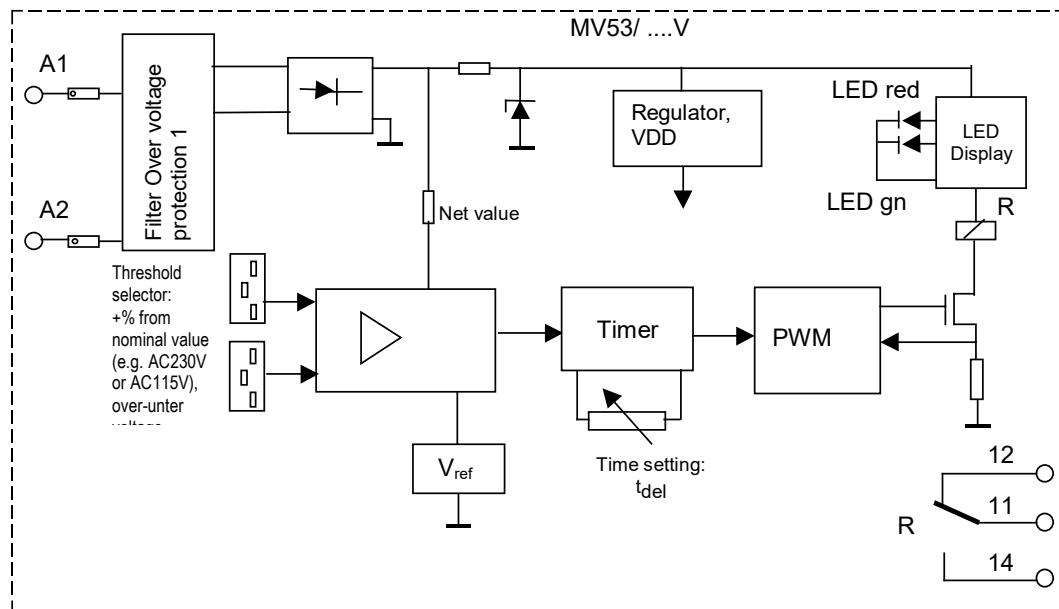
**MV53/AC115-230V, 50-60Hz**

AC- Voltage monitoring relay

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## 5. BLOCK DIAGRAM



## 6. TECHNICAL DATA

### 6.1. General Data

#### 6.1.1. Mechanical Data

|                            |  |
|----------------------------|--|
| Case                       | DIN-Case ( DIN 43 880 ), b22.5 x h90 x d70mm                         |
| Protection                 | IP 40, terminals IP 20   |
| Case material              | NORYL SE1 ( UL 94V-1 ) or equivalent                                 |
| Weight (without packing)   | 80g  |
| Fastening                  | TS 35 DIN / EN 50022   |
| Vibration- and shock-proof | IEC 68-2-6 / FC, IEC 571   |
| Connection                 | Shielded Terminals 2 x 1.5 mm <sup>2</sup> , 1 x 2.5 mm <sup>2</sup> |
| Tightening torque          | Pozi drive or standard screw driver no. 2 ≤ 0.8 Nm                   |

#### 6.1.2. Ambient conditions

|                       |                         |
|-----------------------|-------------------------|
| Storage temperature   | -40°C ÷ +85°C           |
| Operating temperature | -25°C ÷ +60°C           |
| Relative humidity     | 10 ÷ 95% non condensing |

#### 6.1.3. Working life

|                    |                      |
|--------------------|----------------------|
| Expected Life time | >50 000h             |
| Contact            | see output ( 6.2.4 ) |

## 6.2. Electrical data

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|      | UI    |       |      | 19.4.01  |      | A     |                 |
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**Data sheet**

**MV53/AC115-230V, 50-60Hz**

**AC- Voltage monitoring relay**

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| Type                                | .../AC230V   | .../AC115V  |
|-------------------------------------|--|---|
| Nominal monitoring voltage          | AC230V   | AC115V  |
| Supply range                        | AC130V ÷ 270V  | AC70V÷140V  |
| Frequency                           | 45Hz ÷ 65Hz  |   |
| Inrush current                      | $\leq 1,5A$ , $\tau \leq 100\mu s$                           |   |
| Over loading capability             | 300V, 10 sec   |   |
| Adjustable monitoring               | $U_{NOM} = 230V: -35\%...-5\%; +2.5\% ...17.5\%$ (149V-270V) | $U_{NOM} = 115V: -35\%...-5\%; +2.5\% ...17.5\%$ (75V-135V) |
| Tolerance over voltage:             | $\pm 1\%$ from $Voltage_{NOM} // 0^\circ$ to $50^\circ C$    |   |
| Tolerance under voltage             | $\pm 2.5\%$ from $Voltage_{NOM} // 0^\circ$ to $50^\circ C$  |   |
| Hysteresis                          | <3%  |   |
| Frequency dependency for monitoring | $\leq 0.02\% / Hz$   |   |
| Current consumption                 | $\leq 20$ mA   |   |
| Power consumption                   | $\leq 10VA / \leq 2,2W$                                      | $\leq 5VA / 1,5W$   |
| Transient protection                | IEC 255 - 4: 5kV, 2.5 Ws // EN 61000-4-5: A1-A2 2kV          |   |

### 6.2.1. Time response

|                             |  |
|-----------------------------|--|
| Alarm reset time            | $70\text{ms} \pm 25\text{ ms}$ min. alarm time |
| Signal delay time*          | $\leq 100\text{ms}$                            |
| Supply failure protection   | $\geq 10\text{ms}$                             |
| Minimal alarm time          | $130\text{ms} \pm 25\text{ms}$                 |
| Power on delay ( start up ) | $\leq 3,5\text{s}$                             |
| Temperature stability       | $\pm 1\%$ over the entire temperature range    |

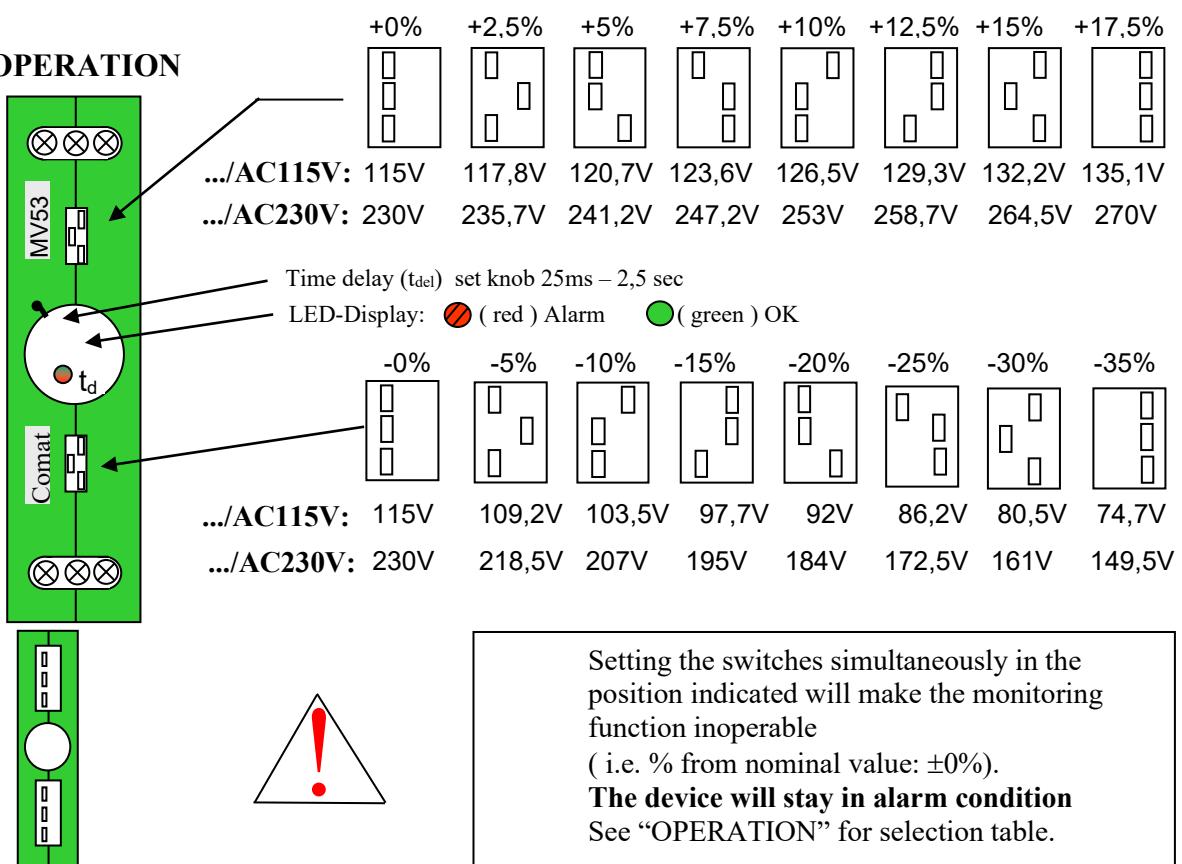
\*A fast decrease or increase in the monitoring voltage ( $dv/dt$ ) could yield to a longer signal delay time.

### 6.2.2. Output contact

|                         |                                |
|-------------------------|--------------------------------|
| Output                  | 1 x CO, $\mu$ , contact AgNi   |
| Switching voltage       | ( 5 ) $\div$ 250V              |
| Switching current       | ( 10mA ) $\div$ 6A // 20A/20ms |
| Switching load          | 1750VA // ...170W              |
| Mechanical service life | $> 2 \times 10^7$              |

7.

## OPERATION



8.

## STANDARDS / DIRECTIVES / CONFORMITY

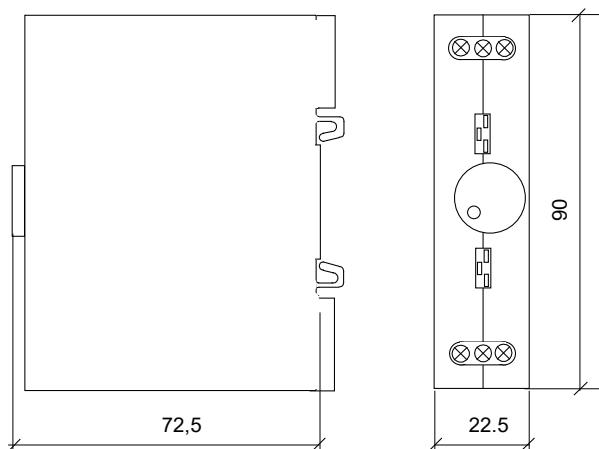
|                          |                      |                       |
|--------------------------|----------------------|-----------------------|
| Vibration safety         | IEC 571              | Item 6.3              |
| Immunity to interference | IEC 255-4            | Appendix E, Class III |
|                          | EN 50082-2           | EN 61000-4-2 Air: 8kV |
|                          | EN 61000-4-4         | $\geq$ Level 3        |
|                          | ENV 50140            | 10V/m                 |
|                          | ENV 50204            | 10V/m                 |
|                          | ENV 50141            | 10V                   |
| Interference emission    | as per EN 50081-1    | EN 55022 Class B      |
| Low voltage              | EN 60065             |                       |
| Measuring relays         | IEC 255-6            |                       |
| Approvals                | cURus in preparation |                       |
| Conformity, labelling    | CE, cURus            |                       |

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Datei: MV53

|   |       |       |      |          |      |       |                 |   |
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|   | UI    | Pd    | wie  | 29.10.01 |      | 1     |                 |   |
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## 9. CASE



## 10. APPLICATION

The MV53 voltage monitor is designed for the monitoring of single phase voltages. It should be installed in areas where unacceptable supply conditions would cause damage to plant and control systems.

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|------|-------|-------|------|----------|------|-------|--------------------|
|      | UI    |       |      | 19.4.01  |      | A     |                    |
|      | UI    | Pd    | wie  | 29.10.01 |      | 1     | M:                 |
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### Data sheet

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AC- Voltage monitoring relay

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