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1. INTRODUCTION

The 3-phase network monitor SSU34/AC...V is an economical and versatile monitoring relay for 3-phase networks. It can reliably monitor both networks with or without a neutral conductor. The unit monitors the conductors voltages, the frequency, the symmetry and the phase sequence (direction of rotation). For example, feedback-proof monitoring in the case of motor loads is also ensured.

The undervoltage and overvoltage thresholds can each be set using a rotary control. The other monitoring criteria are internally linked and their sensitivity can also be set using a dial.

An additional dial is used to set the alarm delay.

When the supply voltage lies between the preestablished tolerance, the green LED lights on and the output relay is pulled in. In the case of a 3 phase sequence failure the output will be deactivated without the set time delay. In case of a fault, the red LED lights up, the output relay drops out after the set time delay and the green LED goes out (alarm). Two power changeover contacts are available as outputs.

The unit is available for 230/400 V or 290/500 V supply.

The housing has pluggable screw terminals. Mounting on support rail 35 or screw fixing is possible, installation width 50 mm.

Availability and technical specifications subject to change without notice

2. ORDER DESIGNATION

ComatReleco 3-phase monitor	SSU34/AC 100V	
ComatReleco 3-phase monitor	SSU34/AC 173V	(U _{ph} 100V)
ComatReleco 3-phase monitor	SSU34/AC 400V	(U _{ph} 230V)
ComatReleco 3-phase monitor	SSU34/AC 500V	(U _{ph} 290V)

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3. FUNCTION

3.1. Parameters

The three phases of the alternating current supply are monitored according to the following criteria:

- Direction of rotation
- Undervoltage
- Overvoltage
- Phase failure
- Phase angle
- Frequency
- Asymmetric phase position/voltage position

3.2. Possible settings

- Dial "<":(undervoltage)
The switching threshold for symmetric undervoltage
For setting range, see Section 5.2.2
- Dial ">":(overvoltage)
The switching threshold for symmetric overvoltage
For setting range, see Section 5.2.2.
- Dial "Δ" The following parameters are combined on the delta "Δ" dial:
 - Phase angle
 - Frequency
 - Asymmetry
 - Phase failure

No distinction is made between the individual criteria, which can, however, be set altogether as sensitivity delta "Δ". For values, see Section 5.2.2.

The following parameter is recognized in every case:

- Direction of rotation:
If the direction of rotation is incorrect, no alarm delay runs, The alarm is triggered immediately

Dial "alarm delay"

The alarm delay is set with this dial, i.e. the elapsed time from the occurrence of the fault to triggering of the alarm relay.

The reset time t_R cannot be adjusted. For values, see Section 5.2.3.

3.3. Procedure

If a fault is detected, it is immediately indicated visually:

- The red LED "fail" lights on

The alarm delay time (t_{del}) also starts.

If the fault has not been corrected within the set delay time (t_{del}), then the alarm is triggered:

- The relay drops out
- The green LED turns off

When the measured values reach the appropriate range, the visual fault display disappears:

- The red LED turns off

and after about 250 ms the normal state is restored:

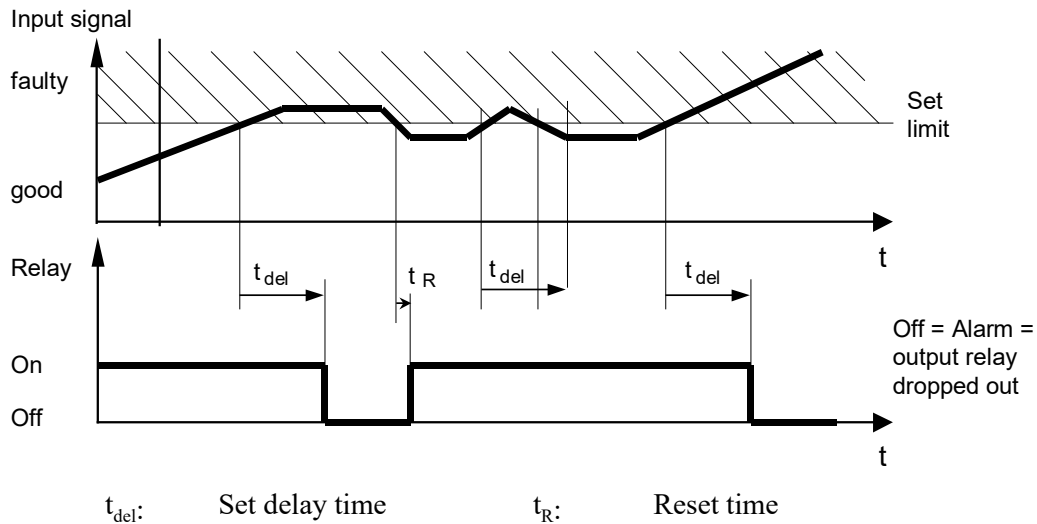
- The output relay are activated
- The green LED lights on

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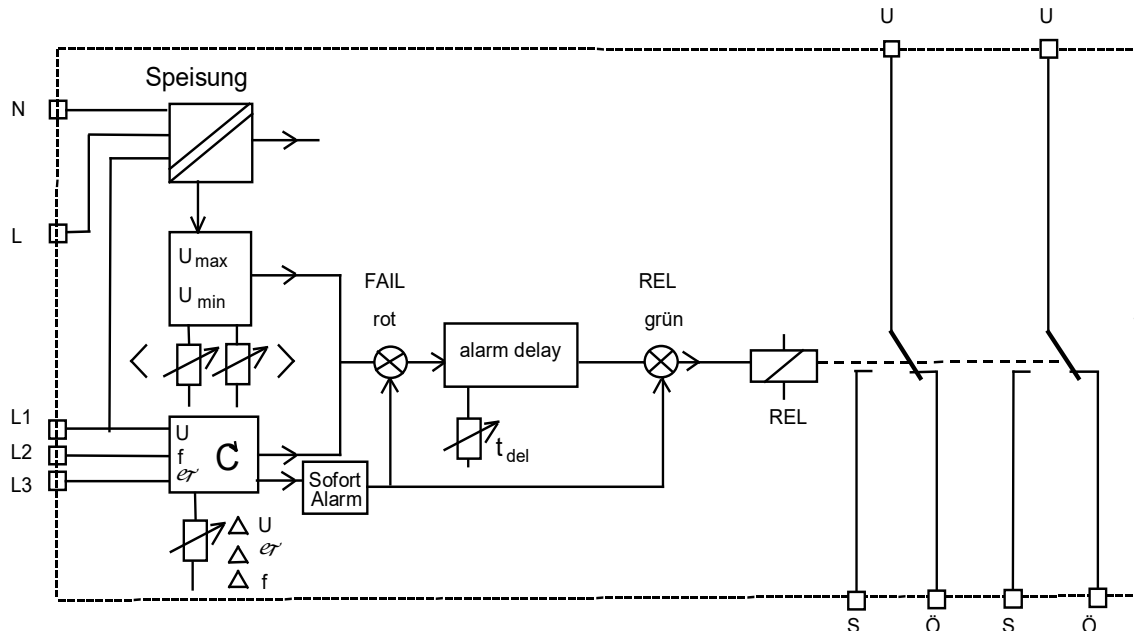
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3.4. Function Diagram



4. CIRCUIT

4.1. Block diagram



4.2. Pin assignment

1: no connection	9: L1
2: no connection	10: no connection
3: NOC contact 1	11: L2
4: NOC contact 1	12: no connection
5: COC contact 1	13: L3
6: NCC contact 2	14: L
7: COC contact 2	15: no connection
8: NCC contact 2	16: N

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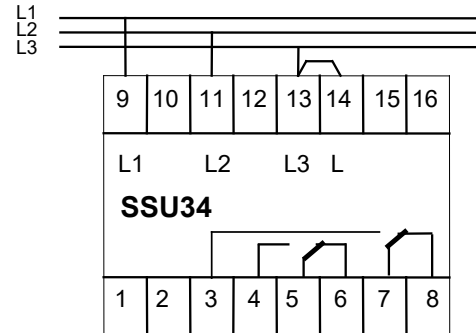
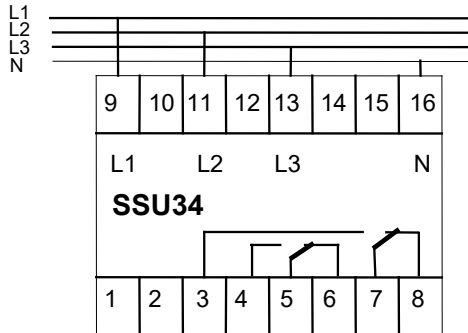
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4.3. Wiring

The unit is wired differently for monitoring networks with or without neutral conductor:

Network with neutral conductor

Network without neutral conductor



Important: The simultaneous connection of L and N may cause damage to the unit!

5. TECHNICAL DATA

5.1. General Data

5.1.1. Mechanical data

Case	W50 x H75 x D110 (Mounting pitch according to DIN EN 50022)
Fixing	Mounted on support rail 35 DIN 46 277 or screw fixing
Protection type	Case IP40; connections IP20
Shock resistance	TW80 (20g min)
Vibration resistance	IEC 571
Case material	Noryl SE1 UL94V-1
Weight	about 350g
Connections	Disconnectable screw terminals (unit can be changed without removing wiring; 1 x 2,5mm ² or. 2 x 1,5mm ²)

5.1.2. Environment conditions

Ambient temperature, storage	-40°C ... +85°C
Ambient temperature, operation	-10°C ... +60°C
Relative humidity	10% ... 95%, non condensing
Transient voltage protection	IEC 255-4, Appendix E Class III

5.1.3. Working life

Expected working life	>> 75'000h
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5.2. Electrical data

5.2.1. Inputs

Version	AC100V	AC173V	AC400V	AC500V
U_{rated} (L1/N) (L1/L2)	\wedge 57V/50Hz Δ 100V/50Hz	100V/50Hz 173V/50Hz	230V/50Hz 400V/50Hz	290V/50Hz 500V/50Hz
$U_{\text{Operation}}$	\wedge 30 ÷ 70V Δ 60 ÷ 125V	60 ÷ 125V 105 ÷ 215V	140 ÷ 285V 240 ÷ 500V	180 ÷ 360V 340 ÷ 625V
U_{max}	\wedge 125V Δ 215V	285V 500V	360V 625V	450V 600V
Input current at test inputs		1,5mA		
Input current at supply inputs	70mA	30mA	25mA	15mA
Power loss	< 5VA			
By jumping of supply failure, see 5.2.2				

5.2.2. Measurement criteria

Type	AC100V	AC173V	AC400V	AC500V
– Undervoltage threshold (70% ÷ 95%)	\wedge 40 ÷ 45V Δ 70 ÷ 95V Adjustable on dial "<" Hysteresis 1 ÷ 25V	70 ÷ 95V 121 ÷ 165V	160 ÷ 225V 280 ÷ 390V	200 ÷ 280V 350 ÷ 485V
– Overvoltage threshold (105% ÷ 120%)	\wedge 59 ÷ 68V Δ 105 ÷ 120V Adjustable on dial ">" Hysteresis 1 ÷ 25V	105 ÷ 120V 182 ÷ 208V	235 ÷ 275V 410 ÷ 480V	300 ÷ 350V 520 ÷ 600V
- Phase angle, frequency, asymmetric phase position:	The fault signals are added up. If the fault sum exceeds a certain value (settable with the sensitivity setting delta D), an alarm is triggered (fault). The specified scale values are applicable for individual faults.			
– Values:				
ΔU : (based on UL1-N) (based on UL1-L2)	5 ÷ 25V 10 ÷ 50V	10 ÷ 50V 17 ÷ 87V	20 ÷ 100V 35 ÷ 173V	20V ÷ 100V 35V ÷ 173V
$\Delta \varphi$:	3 ÷ 15° 3 ÷ 15° 3° ÷ 15° 3° ÷ 15°			
Δf :	3Hz ÷ 15Hz 3Hz ÷ 15Hz 3Hz ÷ 15Hz 3Hz ÷ 15Hz			
Phase sequence:	L1, L2, L3; If two phases are interchanged, an alarm is triggered immediately without any alarm delay (relay time ≤ 50ms).			
Phase failure:	If one or more phases fail, an alarm is triggered (fault). (If this is the phase which is also used for the supply, the alarm is triggered immediately $t \approx 200\text{ms}$.) Short circuit of power supply (supply phase) $t \leq 100 \text{ ms}/V_{\text{RATED}} = 10 \text{ half-waves}$			

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5.2.3. Time characteristics

Alarm delay t_{del}	200ms ^(+0%,-25%) ÷ 5s ^(+25%,-0%)	(Rel off)
	Settable on dial t_{del}	
Alarm reset time t_R	100ms ÷ 400ms	(Rel on)
Minimum alarm signal	100ms ÷ 200ms	(Rel dropped out)
Minimum fault signal	50ms ÷ 200ms	
Phase failure reaction time	≤ 50ms	

5.2.4. Outputs

Contacts	2 changeover contact Ag alloy
	Switching voltage range (12) - 250V
Switching current	5A (15A, 20ms)
Switching capacity	1250VA / 150W
Working life	5 · 10 ⁶ (mechanical cycles)
	≥ 10 ⁵ at 5A, 250V

6. **OPERATION**

Four dials are available for the operator (<; >; Δ; alarm delay).

<	:	Undervoltage threshold
>	:	Overvoltage threshold
Δ	:	Sensitivity (U, f, φ)

alarm delay : Alarm delay time

The red LED "fail" indicates a deviation from the set input parameters.

The green LED shows the relay status.

This LED is switched off in the case of an alarm, ie. when the relay has dropped out.

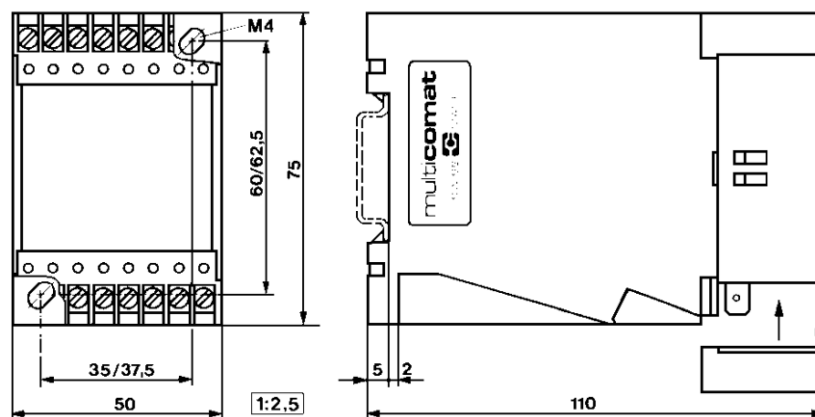
If only the green LED lights, the supply voltage is within the parameters.

7. **STANDARDS, APPROVALS**

Vibration resistance	IEC 571 ; 68-2-6-FC
Shock resistance	TW80 (20g)
Immunity to interferences	IEC 255-4 Appendix Class III, IEC 801-4

8. **CASE, DIMENSIONS**

Case N



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