

TABLE OF CONTENTS

1. I	NTROD	UCTION						1
2. (ORDER	ITEMS						2
3. F	FUNCTI	ON						2
4. E	BLOCKE	DIAGRAMM						3
5.	TECHNI	CAL DATA						3
5.1.	Gen	eral data						3
5.1.1								
5.1.2		ironmental co	nditions					4
5.1.3	. Lifet	ime						4
5.2.		trical Data						4
5.2.1								
5.2.2								
5.2.3		e behavior						4
5.2.4	. Out	outs						4
6. (OPERA ⁻	TION						5
7. 5	STANDA	ARDS, APPR	OVALS					5
8. H	HOUSIN	IG, DIMENSI	ONS					5
9. <i>A</i>	APPLICA	ATION						5
			•		4	_	0	
Page	;	1	2	3	4	5	6	7
Editio	on	3	3	3	3	3	3	3

1. INTRODUCTION

The 3-Phase Circuit Monitoring Devices SSU31 and SSU32 are available at a favorable price. They are easily installed monitoring relays for the 120 / 208 // 230 / 400V // 290 / 500V 3-phase circuits. These devices are available in two types of design:

The type SSU31/AC...V in the pluggable 35mm version for up to a maximum of 400V, the type SSU32AC...V in 50mm DIN technology for up to a maximum of 600V with detachable terminals. The connection is effected without a neutral conductor (N). The devices monitor the phase sequence (direction of rotation) and the line voltage. They are designed for a frequency range from 45 to 65 Hz.

The devices detect phase failure and switch off in the case of pre-defined undervoltage. In the case of the SSU32 design, undervoltage can be set.

If the mains voltage is within the tolerances, the green LED lights, the output relay is pulled up. In the case of failure, the red LED lights, the green LED turns off and the output relay is released.

The output in the SSU31 is a change-over contact, in the SSU32, a change-over contact and a normally closed contact are available.

The devices have connection compatible to the designs SSU33 or SSU34 respectively.

The devices overcome the CE Regulations and are designed for especially high safety operation and a long life endurance.

Technical specifications subject to change without notice

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Data sheet

SSU31 SSU32

Comat 3-Phase Monitoring relay



2. **ORDER ITEMS**

ComatReleco 3-Phase Monitoring Device SSU31/AC208V SSU32/AC208V ComatReleco 3-Phase Monitoring Device SSU31/AC400V SSU32/AC400V ComatReleco 3-Phase Monitoring Device SSU32/AC500V

Other voltage rates and 400Hz version on request.

Accessories to the pluggable design SSU31:

- Transparent front cover (in the supply): FS-24

- Relay holder with screw connections 11-pole: CS-11, EC11, C11A

- Retention clip: HF-24 - Front insert: FZ-23

3. FUNCTION

The three phases of the AC circuit are monitored according to the following criteria:

- Phase sequence
- Undervoltage
- Phase failure

SSU31: The undervoltage limit value is pre-set and cannot be modified.

SSU32: The undervoltage limit value can be set.

Procedure:

An error is immediately signalized as soon as it is detected:

- The red LED lights
- The green LED turns off
- The relay is released

If the mains voltage and the phase sequence are correct, then

- the red LED turns off

and after approx. 150 ms, the normal condition is restored:

- The green LED lights back on
- The relay is pulled up

FUNCTION DIAGRAM

Fault signal



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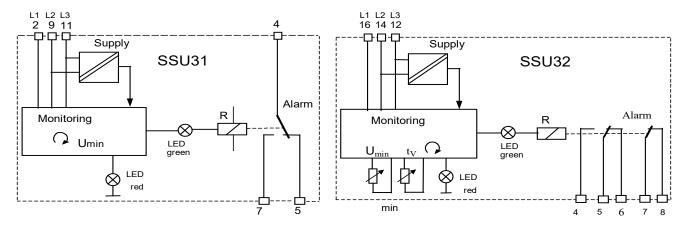
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4. **BLOCKDIAGRAMM**



5. TECHNICAL DATA

5.1. General data

5.1.1. Mechanical data

 SSU31/AC ...V
 SSU32/AC ...V

 Case:
 S2 pluggable, 11-pole
 CN case

 W38, H72, D92 mm
 W50, H75, D110 mm

Type of protection: Case IP40 Terminals IP20

Shock resistance: TW80 (20 g min.)
Vibration resistance: IEC 571

Case material: Noryl SE1 or similar

Weight: approx. 300 g 350 g

Fastening: plugged DIN Rail TS 35

Connections: 11-pole plug IEC67-I-18a Screw terminals removable $2 \times 1.5 \text{ mm}^2 / 1 \times 4 \text{ mm}^2$ Screw terminals removable $2 \times 1.5 \text{ mm}^2 / 1 \times 4 \text{ mm}^2$; M3

Connection configuration 1 --- 2 L1 2 --- 3 --- 3 ---

10

11

3 --- 3 ---4 changeover contact 4 normally-open contact

4 changeover contact 4 normally-open contact 5 normally-closed contact 5 changeover contact

6 --- 6 normally-closed contact

7 normally-open contact 7 ---8 --- 8 normally-closed contact

8 --- 8 normally-closed contact 9 L2 9 normally-closed contact

--- 10 ---

L3 11 --- 12 L3

13 ---

14 L2 15 ---

16 L1

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SSI 132/500

 $100 \text{ ms} \div 200 \text{ ms}$

5.1.2. <u>Environmental conditions</u>

Storage temperature range -40°C ... +85°C Operating temperature range -25°C ... +60°C

Relative humidity 10% ... 95% non-condensing Transient protection IEC 255 Appendix E Class III

5.1.3. Lifetime

Expected lifetime >> 100 000 h

5.2. Electrical Data

5.2.1. <u>Supply</u>

	SSU31/32/208V	SSU31/32/400V	SSU32/500V
$U_{\text{rated }\Delta}$	208 V	400 V	500 V
$\mathbf{U}_{ ext{Operation}}$	160V 235 V	360 V 470 V	450 V 575 V
Net frequency	45 65 Hz	45 65 Hz	45 65 Hz
Power consumption	< 10 VA/1.5 W	< 10 VA/1.5 W	< 15 VA/1.5 W

The supply is simultaneously a measuring input.

The internal supply of the devices is provided by L2/L3.

5.2.2. <u>Inputs L1, L2, L3</u>

	55057/AC206V	330327400 V	<u>33032/300</u>
Nominal input voltage U_{Λ}	3 x 208 V	3 x 400 V	3 x 500 V
Input current max.	25 mA	25 mA	25 mA

SSI I3X/AC208V

Permissible input voltageL1, L2, L3: U_{max} : 240 V AC U_{max} : 460 V AC U_{max} : 600 V AC Measuring criteria: Undervoltage L2-L3: ≤ 166 VAC $\pm 5\%$ ≤ 320 VAC $\pm 5\%$ ≤ 400 VAC $\pm 5\%$

Hyst. 5V Hyst. 10V Hyst. 20V

SSI 13 X /400 V

SSU31: The limit values are fixed.

SSU32: The limit values can be set between $-0\% / -30\% \times U_N$.

Phase sequence: L1, L2, L3: •

Alarm is triggered if two phases are exchanged.

Phase failure: If one or more phases fail, alarm is triggered with a time delay,

the output relay is released.

Undervoltage: 40% of U_N

5.2.3. Time behavior

Alarm delay t_V Relay off , phase sequence error 30 ms $^{+0/-25\%}$. Voltage failure (L1 \leq 30 ms) 150 ms \div 250 ms Undervoltage SSU31 fixed (L2,3) 150 \div 250 ms Undervoltage SSU32 can be set 20 ms \div 5 s

Relay released

Alarm reset Relay on 50 ms

5.2.4. Outputs

Outputs SSU31: contact 1 x U, AgNi SSU32: 1 x U, 1 x S, AgNi

Max. switching voltage250 VMax. switching current6 A (15 A, 20 ms)Switching performance1500 VA / ... 210 W

Lifetime 3 • 10⁷ switching cycles (mech.)

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Minimum alarm signal

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 $\geq 10^5 / 6A 250V, AC1$

6. **OPERATION**

The red LED indicates a failure input condition (switches off in case of alarm). The green LED shows the relay condition (relay pulled in, no alarm). Flashing of the red LED while the green LED is illuminated may indicate that the actual voltage is temporarily lower than the set undervoltage threshold. The undervoltage threshold of the SSU32 devices can be set by means of potentiometer setting.

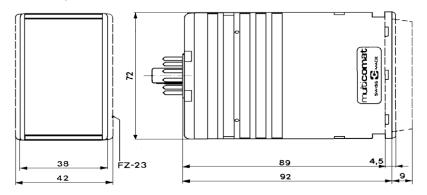
7. STANDARDS, APPROVALS

General regulations:

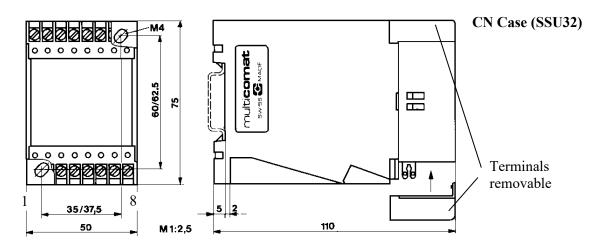
Vibration safety: IEC 571; 68-2-6-FC Resistance to shock: TW80 (20 g)

EMC: IEC 255.4 Annex Class III, IEC 801-4

8. HOUSING, DIMENSIONS



S2 Pluggable (SSU31)



9. APPLICATION

This device monitors phase sequence and undervoltages. It is particularly suitable for pumps, conveyor belts and other installations protection where the phase sequence of the drive is of critical importance. Particularly in the case of portable installations, there is the risk of mistaken connections of L1, L2, L3 or the risk of undervoltage due long length supply lines. Typical application cases are found in the construction industry, or in open-pit mining for gravel, etc.

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