



*in-case*

Dreiphasen-Überwachung /  
Three-phase monitoring

ICP

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## BESCHREIBUNG / FEATURES

- Dreiphasenüberwachung für 3x230/400V Netze
- Überwachung von Phasenausfall, Phasenfolge und Phasensymmetrie
- Phasenausfallerkennung auch bei Rückspannung vom Verbraucher
- Dreiphasenüberwachung mit oder ohne neutralem Leiteranschluss
- 4 wählbare Basisfunktionen
- 3 wählbare Spannungsmessfunktionen
- Automatik oder manuelle Resetfunktion
- Einstellbarer Spannungsbereich (150-440V)
- Fehlerspeicherfunktion
- Ausgangsstufe mit 2 Wechsler
- LED Anzeige für Versorgungsspannung, Fehler, Status des Ausgangsrelais, Reaktionstimer und überwachte Parameter
- Gehäusebreite: 22,5mm klemmbar
- 3 phase monitoring relay for 3x230/400V
- Detects phase failure, phase sequence and phase asymmetry
- Detects phase failure with regenerated voltage present
- For power supply with or without neutral connections
- 4 selectable base modes
- 3 selectable voltage measurement functions
- Automatic and manual reset selectable
- Selectable measuring range (150-440V)
- Alarm memory function
- DPCO alarm relay
- LED indicator for supply voltage, alarm, output relay status, reaction timer and setting error
- 22,5mm DIN rail mount housing

## BESTELLDATEN / ORDERING INFORMATION

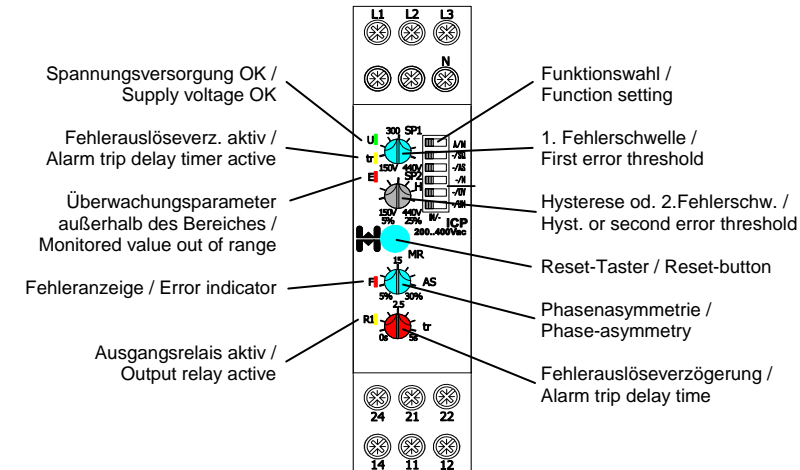
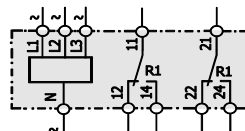
Artikel / Article	Nennspannung / nominal voltage	
ICP 200..400Vac	115-440Vac	30VA / 1,5W
ICP 300..500Vac	180-550Vac	30VA / 1,5W

## TECHNISCHE DATEN / SPECIFICATION

<b>Spannungsbereich / supply voltage variation</b>	Nennspannung / nominal voltage	-20%..+10%
<b>Zulässige Frequenz / frequency range</b>	48 - 63 Hz	
<b>Einschaltdauer / duty cycle</b>	100%	
<b>Wiederholgenauigkeit / repeat accuracy</b>	<1%	
<b>Ausgangsstufe / output relay specification</b>	max. 6A 230V~	
Ue/Ie AC-15*	24V/1,5A 115V/1,5A 230V/1,5A	
Ue/Ie DC-13*	24V/1A	
<b>Lebensdauer / expected life time</b>	2 Wechsler / DPCO	
Mechanisch / mechanical	10 x 10 <sup>6</sup> Schaltspiele / operations	
Elektrisch / electrical	8 x 10 <sup>4</sup> Schaltspiele / operations	
<b>Schrauben / screws</b>	Pozidrive 1	
<b>Anzugsdrehmoment / screw tight. torque</b>	0,6...0,8Nm	
<b>Arbeitsbedingungen / operating conditions</b>	-20 bis +60 °C	nicht kondensierend / non condensing

\* EN 60947-5-1 VDE 0435

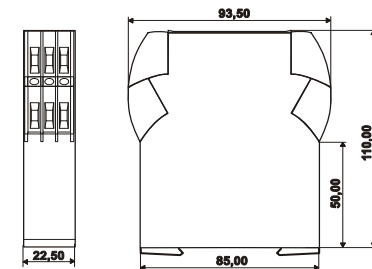
## ANSCHLUSS / CONNECTION BLOCK DIAGRAM



## ZULASSUNG & KENNZEICHNUNG / TYPE APPROVAL INFORMATION



## ABMESSUNGEN / DIMENSIONS (mm)



## MONTAGE / MOUNTING

Die Montage ist mittels Schnapp-Befestigung auf einer symmetrischen Hutschiene nach DIN EN 50022 vorzunehmen. Die Geräte sind für dicht an dicht Montage bei einer Umgebungstemperatur von -20 bis + 60°C geeignet.

Lever opens the spring clip on the base to mount device on a symmetrical DIN rail according to DIN EN 50022. The devices are suitable for mounting side by side without an air gap with an ambient temperature range from -20 to + 60°C.

## Detailed description (English)

The ICP monitors phase-failure, phase-sequence and phase-asymmetry for supplies with or without neutral. Thresholds for the alarm functions, alarm reaction time and phase-asymmetry can be easily adjusted using the rotary switches on the front plate. For monitoring a three-phase/neutral system, the neutral needs to be connected to the N-terminal and the monitoring function must be enabled by a DIP-switch (see function table). The alarm output relay is DPCO.

### SUPPLY-VOLTAGE

The relay is powered by the three-phase supply.

**Note:** The supply-voltage range depends on the nominal voltage of the particular device!

### LED STATUS INDICATION

U	green	ON	Supply voltage is OK
tr	yellow	FLASH	Alarm trip delay time is active
E	red	ON	At least one monitoring function is not within the nominal range
F	red	ON	Setting fault, internal program fault, changing the function mode or at least one phase voltage is below 150V
R1	yellow	ON	Output relay is active

### CONTROLS

The controls of the in-case series are color coded for simplicity. Blue potentiometers or rotary switches are used for set values, time settings are yellow, the time range of a reaction timer is red, and percentage hysteresis is always grey.

SP1	blue	Potentiometer to adjust threshold 1 of the selected monitoring-function (setting range: 150-440V).
H/SP2	grey	Potentiometer to adjust threshold 2 (setting range: 150-440V) respectively hysteresis (setting range: 5-25% of SP1). The interpretation depends on the selected monitoring-function (see DIP-switches OV/UN).
MR	blue	Pressing the MR-button resets an (stored) alarm. <b>Note:</b> The ICP features 2 different manual reset functions: <i>Volatile manual reset (factory setting):</i> If the ICP is in alarm mode, the alarm will be reset when the supply voltage is removed. The alarm can also be reset by pressing the MR-button (without removing the power supply). <i>Non-volatile (Latched) manual reset:</i> With this reset function, if the ICP is in alarm mode when the supply voltage is removed, the alarm condition will be electronically latched. Therefore when the supply voltage is re-established the alarm condition will be re-stored! The only way to reset the alarm is to press the MR-button. (for switching between volatile and non-volatile manual reset see special operating modes)
AS	blue	Potentiometer to adjust the maximum allowable phase-asymmetry (setting range: 5-30%). The phase-asymmetry is the maximum difference between the average voltage level of all phases and the voltage of each single phase.
tr	red	Potentiometer to adjust the alarm trip delay time respectively reaction time (setting range: 0-5 seconds). The alarm condition needs to persist at least the configured time before it is handed over to the output relay.

### DIP-switches for basic functions

A/M		<b>Automatic reset (A):</b> Automatic reset of an alarm.		<b>Manual reset (M):</b> An alarm can only be reset by pressing the MR-button. <b>Note:</b> For volatile / non-volatile manual reset see special operating modes!
-/SQ		<b>Sequence OFF (-):</b> No monitoring of phase-sequence.		<b>Sequence ON (SQ):</b> The phase-sequence is monitored for the correct order. (OK = L1, L2, L3, ...)
-/AS		<b>Asymmetry OFF (-):</b> No monitoring of phase-asymmetry.		<b>Asymmetry ON (AS):</b> The phase-asymmetry is monitored with the corresponding setting (AS-Potentiometer).
-/N		<b>Neutral OFF (-):</b> No monitoring of the neutral conductor.		<b>Neutral ON (N):</b> Check neutral conductor for availability.

**Note:** These functions can be used in any combination.

### DIP-switches for monitoring function

OV		<b>Over-voltage monitoring „OVER“:</b> This function generates an alarm if at least one monitored value exceeds the over-voltage threshold level (ET, adjustable with control SP1). The alarm condition is not given any more, if the monitored value falls below the fall-back threshold level (FT, adjustable with control H/SP2 - hysteresis). If any monitored value falls below 150V, the device immediately generates an alarm and a device fault (see LED-indicator F).
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-		<b>Under-voltage monitoring „UNDER“:</b> This function generates an alarm if at least one monitored value falls below the under-voltage threshold level (ET, adjustable with control SP1). The alarm condition is not given any more, if the monitored value exceeds the fall-back threshold level (FT, adjustable with control H/SP2 - hysteresis). If any monitored value falls below 150V, the device immediately generates an alarm and a device fault (see LED-indicator F).
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-		<b>Over- and Under-voltage monitoring „INNER“:</b> This function generates an alarm if at least one monitored value exceeds the over-voltage threshold level (UET, adjustable with control SP1) or falls below the under-voltage threshold level (LET, adjustable with control H/SP2). The alarm condition is not given any more, if the monitored value lies between the upper-fall-back threshold level (UFT <sup>1</sup> ) and the lower-fall-back threshold level (LFT <sup>1</sup> ). If any monitored value falls below 150V, the device immediately generates an alarm and a device fault (see LED-indicator F).
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OV		This setting is has no associated function
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## Legend:

L12	Phase conductor voltage between L1 and L2
L23	Phase conductor voltage between L2 and L3
L31	Phase conductor voltage between L3 and L1
tr	Alarm trip delay time
R1	Output relay state
ET	Error threshold
UET	Upper Error threshold
LET	Lower Error threshold
FT	Fallback threshold
UFT	Upper fallback threshold
LFT	Lower fallback threshold
t	Time

**Note:** It is not necessary to remove the supply voltage before making any changes in the setting of the controls. If either threshold or function is changed the red LED-indicator F is active for a short time for checking purposes. The new settings are immediately active. Depending on the change of the settings, the output relay might be switched off temporary.

## OUTPUT RELAY

Active All monitoring functions are within the nominal range, the device is OK.  
Inactive At least one monitoring function is not within the nominal range or the device has an internal fault (see LED-indicator F).

**Note:** The output relay is galvanically isolated from the power supply terminals!

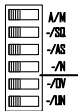
## SPECIAL OPERATING MODES

The following special operating modes are available for the ICP:

- #2 Volatile
- #4 Non-volatile

The factory setting is „#2 - Volatile“. To switch between the special operating modes consider the following steps:

1. Write down the actual DIP-switch settings
2. Turn off the power supply
3. Change the DIP-switch positions as shown below:



4. Press the MR-button **and keep pressed!**
5. Turn on the power supply
6. As soon as the LED-indicator F flashes, the MR-button can be released
7. Every stroke on the MR-button changes the special operating mode. The actual mode is indicated with a special flashlight signal on the LED-indicator F. The flash signal is composed as follows: Number of operating mode = number of flashlight signals followed by a short pause. This signal is repeated constantly. The last-selected special function mode is automatically stored.
8. Turn off the power supply
9. Restore the original DIP-switch settings
10. The device can be put in operation again