

## VARIMETER

### Current Relay

BA 9053/040, BA 9053/041, BA 9053/042, BA 9053/060

Translation  
of the original instructions



#### Your Advantages

- Preventive maintenance
- For better productivity
- Quicker fault locating
- Precise and reliable

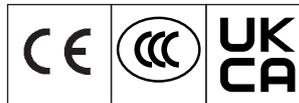
#### Features

- According to IEC/EN 60255-1, IEC/EN 60947-1
- To monitor AC
- Measuring range from 1 ... 10 A (others on request)
- High overload possible
- Galvanic separation between auxiliary circuit - measuring circuit
- Auxiliary supply AC/DC
- With time delay, up to max. 100 sec
- LED indicators for operation and contact position
- Width 45 mm

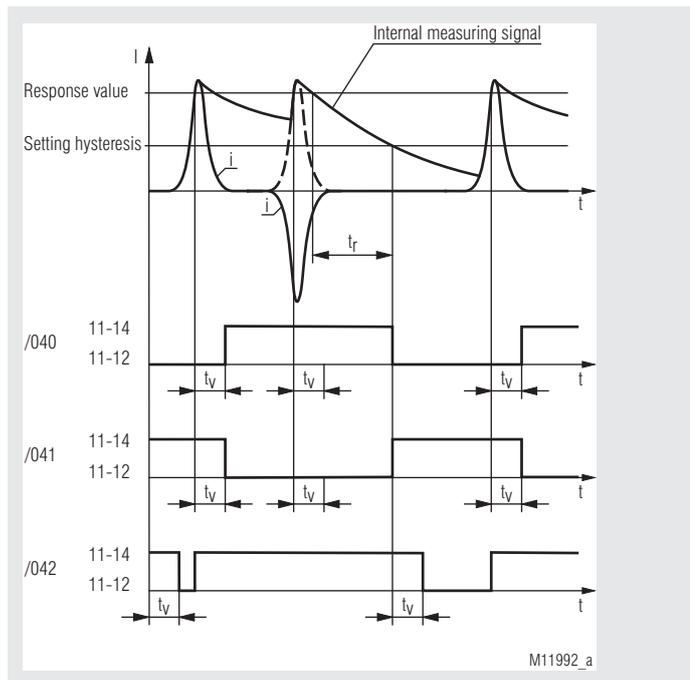
#### Product Description

The current relay BA 9053/04x and BA 9053/06x of the VARIMETER series monitors 1-phase the peak value of a rectified measuring current. The device is set simply and user-friendly via rotary switches on the front of the device. Early detection and preventive maintenance prevent failures of electrical systems and thus guarantee higher operational and system safety.

#### Approvals and Markings



#### Function Diagram



#### Applications

- Monitoring of short pulse currents
- For industrial and railway applications

#### Function

The current relay measures the peak of the rectified measuring current. The AC units are adjusted to the r.m.s value. They have settings for response value and hysteresis. The release time  $t_r$  depends on the hysteresis setting (see function diagram). The response delay  $t_v$  is active after exceeding the setting value.

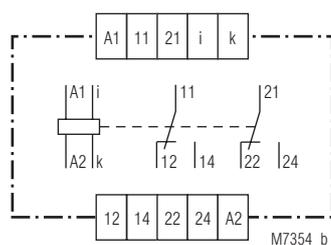
#### Indicators

Green LED: On, when auxiliary supply connected  
Yellow LED: On, when output relay is activated

#### Connection Terminals

Terminal designation	Signal description
A1, A2	Auxiliary voltage
i, k	Current measuring input
11, 12, 14	1st changeover contact
21, 22, 24	2nd changeover contact

#### Circuit Diagrams



**Technical Data****Input (i, k)**

Measuring range	RM (internal measuring resistor (shunt))	Max. perm. cont. current	Max. permiss. current 3 s On, 100 s Off
AC		Device mounted without distance	
1 ... 10 A	3 mΩ	20 A	40 A

**Measuring principle:** Peak value measurement  
**Adjustment:** The AC-devices can also be calibrated for true rms measurement at 50 Hz.  
**Temperature influence:** < 0.05 % / K

**Setting Ranges****Setting**

/04x:  
**Response value:** Infinite variable 0.1  $I_N$  ... 1  $I_N$  relative scale  
**Hysteresis at AC:** Infinite variable 0.5 ... 0.98 of setting value  
/06x:  
**Response value:** Factory set fixed value  
**Hysteresis:** Factory set fixed value  
**Accuracy:**  
**Response value at potentiometer right stop (max):** 0 ... + 8 %  
**Potentiometer left stop (min):** - 10 ... + 8 %  
**Repeat accuracy:** ≤ ± 0.5 %  
**Response time, impulse detection:** ≤ 10 ms  
**Contact pick-up delay:** Typ. 12 ms  
**Time delay  $t_v$ :** Infinite variable at logarithmic scale from 0 ... 5 s; 0 ... 20 s setting 0 s = without time delay  
**Release delay  $t_r$ :** Depending on hysteresis setting  
**Hysteresis potentiom. 0.98:** Approx. 1 s  
**Hysteresis potentiom. 0.5:** Approx. 15 s

**Auxiliary Circuit****Auxiliary voltage  $U_H$  (A1, A2)**

Nominal voltage	Voltage range	Frequency range
AC/DC 24 ... 80 V	AC 18 ... 100 V	45 ... 400 Hz; DC 48 % W
	DC 18 ... 130 V	W ≤ 5 %
AC/DC 80 ... 230 V	AC 40 ... 265 V	45 ... 400 Hz; DC 48 % W
	DC 40 ... 300 V	W ≤ 5 %

**Nominal consumption:** 4 VA; 1.5 W at AC 230 V Rel. energized  
1 W at DC 80 V Rel. energized

**Technical Data****Output**

**Contacts:** 2 changeover contacts  
**Thermal current  $I_{th}$ :** 2 x 5 A  
**Switching capacity**  
to AC 15:  
NO contact: 2 A / AC 230 V IEC/EN 60947-5-1  
NC contact: 1 A / AC 230 V IEC/EN 60947-5-1  
To DC 13: 1 A / DC 24 V IEC/EN 60947-5-1  
**Electrical life**  
to AC 15 at 3 A, AC 230 V: 5 x 10<sup>5</sup> switch. cycl. IEC/EN 60947-5-1  
**Short-circuit strength**  
**max. fuse rating:** 6 A gG / gL IEC/EN 60947-5-1  
**Mechanical life:** 50 x 10<sup>6</sup> switching cycles

**General Data**

**Operating mode:** Continuous operation  
**Temperature range**  
Operation:  
≤ 10 A: - 40 ... + 60 °C  
≥ 15 A: - 40 ... + 50 °C (higher temperature with limitations on request)  
Storage: - 40 ... + 70 °C  
**Altitude:** ≤ 2000 m  
**Clearance and creepage distances**  
Rated impulse voltage / pollution degree  
Measuring range ≤ 10 A  
Aux. voltage / measuring input: 6 kV / 2 IEC 60664-1  
Auxiliary voltage / contacts: 6 kV / 2 IEC 60664-1  
Measuring input / contacts: 6 kV / 2 IEC 60664-1  
Contacts 11, 12, 14 / 21, 22, 24: 4 kV / 2 IEC 60664-1  
Measuring range ≥ 15 A: 4 kV / 2 IEC 60664-1  
**EMC**  
Electrostatic discharge: 8 kV (air) IEC/EN 61000-4-2  
HF irradiation  
80 MHz ... 1 GHz: 20 V/m IEC/EN 61000-4-3  
1 GHz ... 2.7 GHz: 10 V/m IEC/EN 61000-4-3  
Fast transients: 4 kV IEC/EN 61000-4-4  
Surge voltages between  
wires for power supply: 2 kV IEC/EN 61000-4-5  
Between wire and ground: 4 kV IEC/EN 61000-4-5  
HF wire guided: 10 V IEC/EN 61000-4-6  
Interference suppression: Limit value class B EN 55011  
**Degree of protection**  
Housing: IP 40 IEC/EN 60529  
Terminals: IP 20 IEC/EN 60529  
**Housing:** Thermoplastic with V0 behaviour according to UL subject 94  
**Vibration resistance:** Amplitude 0.35 mm IEC/EN 60068-2-6 frequency 10 ... 55 Hz  
**Climate resistance**  
≤ 10 A: 40 / 060 / 04 IEC/EN 60068-1  
≥ 15 A: 40 / 050 / 04 IEC/EN 60068-1  
**Terminal designation:** EN 50005  
**Wire connection:** 2 x 2.5 mm<sup>2</sup> solid or 2 x 1.5 mm<sup>2</sup> stranded wire with sleeve  
Insulation of wires or sleeve length: 8 mm  
**Wire fixing:** Plus-minus terminal screws M3.5 with self-lifting clamping piece IEC/EN 60999-1  
**Fixing torque:** 0.8 Nm  
**Mounting:** DIN-rail IEC/EN 60715  
**Weight**  
AC-device: 280 g  
AC/DC-device: 200 g

**Dimensions**

**Width x height x depth:** 45 x 75 x 120 mm

## Classification to DIN EN 50155

### Vibration and

**shock resistance:** Category 1, Class B IEC/EN 61373

**Service temperature classes:** OT1, OT2 compliant  
OT3 and OT4 with operational limitations

**Protective coating of the PCB:** No

## Standard Types

BA 9053/040 AC 1 ... 10 A AC/DC 24 ... 80 V 0 ... 5 s

Article number: 0068307

- For overcurrent monitoring
- Energized on trip
- Measuring range: AC 1 ... 10 A
- Auxiliary voltage  $U_H$ : AC/DC 24 ... 80 V
- Time delay by  $I_{an}$ : 0 ... 5 s
- Width: 45 mm

BA 9053/041 AC 1 ... 10 A AC/DC 80 ... 230 V 0 ... 5 s

Article number: 0069297

- For overcurrent monitoring
- De-energized on trip
- Measuring range: AC 1 ... 10 A
- Auxiliary voltage  $U_H$ : AC/DC 80 ... 230 V
- Time delay by  $I_{an}$ : 0 ... 5 s
- Width: 45 mm

BA 9053/042 AC 1 ... 10 A AC/DC 80 ... 230 V 0 ... 5 s

Article number: 0069248

- For undercurrent monitoring
- De-energized on trip
- Measuring range: AC 1 ... 10 A
- Auxiliary voltage  $U_H$ : AC/DC 80 ... 230 V
- Time delay by  $I_{an}$ : 0 ... 5 s
- Width: 45 mm

BA 9053/060 AC 2 A 0.5 % AC/DC 24 ... 80 V 0 s

Article number: 0069638

- For overcurrent monitoring
- Energized on trip
- Measuring range: AC 2 A fixed
- Hysteresis: 0,5 % fixed
- Auxiliary voltage  $U_H$ : AC/DC 24 ... 80 V
- Time delay by  $I_{an}$ : 0 s fixed
- Width: 45 mm

