

Electronic Measuring Relays

Measuring relays for AC/DC / over- and undercurrent



Measuring relays for AC/DC

Type AIN1/410ca - 1.60 - (Uv) Ref. no 16.27-01

Type AIN1/411cq - 1.60 - (Uv) Ref. no 16.27-02

Task

Monitors AC or DC circuits for under- and overcurrent of an adjustable threshold S.

Use

Monitor for drives, electroplating baths, valves, electro-magnetic clutches and brakes, electromagnetic chucks, etc.

Range extensions

Currents exceeding 15 A: with NWN shunt resistor according to DIN 43 703 and measuring relay AUN for voltage range 4 ... 60 mV. For AC, also using SWN current converter according to DIN 42 600.

Hysteresis H and times X, Y and Z

Version /410ca: H fixed 5 % of S, no times.

Version /411cq: H adjustable 5 ... 50 % of S, start time delay X adjustable up to approx. 5 s, pull-in delay Y and dropout delay Z adjustable together up to approx. 0.5 s.

See catalog pages 1.1.1 and 1.1.2

Measuring relays for over- and undercurrent

Type AINF1/410ca - 1.60 - (Uv) Ref.no. 16.27-03

Type AINF1/410cq - 1.60 - (Uv) Ref.no. 16.27-04

Task

Monitors AC or DC circuits for under- and overcurrent by using a window comparator.

Use

Monitor for drives, electroplating baths, valves, electro-magnetic clutches and brakes, electromagnetic chucks, etc.

Range extensions

Currents exceeding 15 A: with NWN shunt resistor according to DIN 43 703 and AUNF measuring relay for voltage range 4 ... 60 mV. For AC, also using SWN current converter according to DIN 42 600.

Hysteresis H and times X, Y and Z

Version /410ca: H fixed 5 % of S, no times.

Version /410cq: H fixed 5 % of S, start time delay X adjustable up to approx. 5 s, pull-in delay Y and dropout delay Z adjustable together up to approx. 0.5 s.

See catalog pages 1.1.3 and 1.1.4

Measuring relays for AC/DC

Type	Ref. no.	Page	Current range	Operating voltage U_V	Version
AIN1/410ca - 1.60 - 42 VAC	16.27-01-003	1.1.1	1 mA ... 15 A	42 V AC	threshold adjustable, H fixed, no times
AIN1/410ca - 1.60 - 24 VAC	16.27-01-005	1.1.1	1 mA ... 15 A	24 V AC	threshold adjustable, H fixed, no times
AIN1/410ca - 1.60 - 115/230 VAC	16.27-01-007	1.1.1	1 mA ... 15 A	115 / 230 V AC	threshold adjustable, H fixed, no times
AIN1/411cq - 1.60 - 42 VAC	16.27-02-003	1.1.2	1 mA ... 15 A	42 V AC	threshold adjustable, H adjustable
AIN1/411cq - 1.60 - 24 VAC	16.27-02-005	1.1.2	1 mA ... 15 A	24 V AC	threshold adjustable, H adjustable
AIN1/411cq - 1.60 - 115/230 VAC	16.27-02-007	1.1.2	1 mA ... 15 A	115 / 230 V AC	threshold adjustable, H adjustable

Measuring relays for over- and undercurrent

Type	Ref. no.	Page	Current range	Operating voltage U_V	Version
AINF1/410ca - 1.60 - 42 VAC	16.27-03-003	1.1.3	1 mA ... 15 A	42 V AC	threshold adjustable, H fixed, no times
AINF1/410ca - 1.60 - 24 VAC	16.27-03-005	1.1.3	1 mA ... 15 A	24 V AC	threshold adjustable, H fixed, no times
AINF1/410ca - 1.60 - 115/230 VAC	16.27-03-007	1.1.3	1 mA ... 15 A	115 / 230 V AC	threshold adjustable, H fixed, no times
AINF1/410cq - 1.60 - 42 VAC	16.27-04-003	1.1.4	1 mA ... 15 A	42 V AC	threshold adjustable, H fixed
AINF1/410cq - 1.60 - 115/230 VAC	16.27-04-007	1.1.4	1 mA ... 15 A	115 / 230 V AC	threshold adjustable, H fixed

Electronic Measuring Relays

AIN measuring relays for AC and DC current

Device	measuring relay for AC/DC current
For the exact type designation and	AIN1/410ca-1.60 - (Uv)
ref. no. please see page 1.0.2	16.27-01-xxx

Technical data

Line voltage Uv	please indicate when ordering
Alternating voltage	230 / 115, 42, 24 V AC
Tolerance	± 10 %
Frequency	50 ... 60 Hz
Operating temperature	0 ... + 60 °C
Power consumption	approx. 4 VA
Housing	.60 (page 0.0.1)
Weight	approx. 300 g

(see table) **Input (E)** 4 current ranges selectable

Output

Relay	1 changeover switch
Switching voltage	24 ... 250 V AC or DC
Switching current	0.05 ... 6 A
Switching capacity, AC	max. 1250 VA
Switching capacity, DC	max. 50 W
Switching frequency	max. 5000 / h
Switching cycles	30 x 10 ⁶

Response times

Exceeding threshold / falling below threshold	approx. 25 ms / approx. 100 ms
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Indicators

1 green LED	Power ON
1 red LED	Relay pulled-in

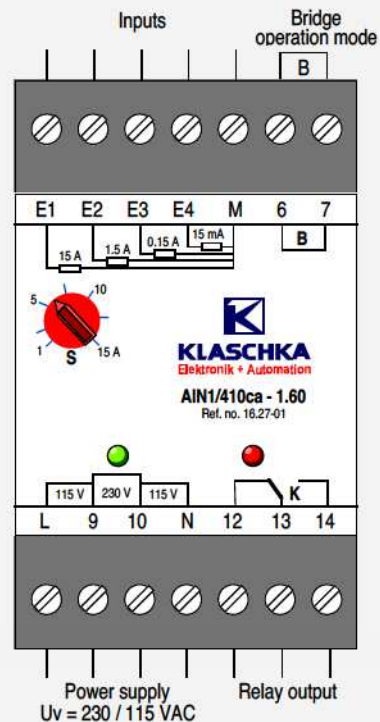
Accuracy

Setting accuracy	± 5 %
Repeatability	± 0.5 %
Temperature dependence	± 0.1 % / °C

Operation mode

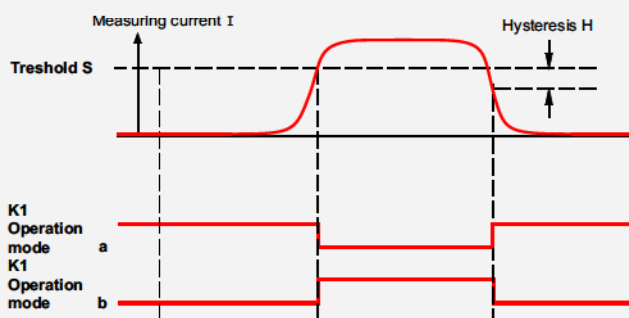
a Overcurrent monitor	without bridge B between the terminals 6-7 the relay drops out when exceeding threshold S.
b Undercurrent monitor	with bridge B between the terminals 6-7 the relay pulls-in when exceeding threshold S.
Hysteresis (H)	fixed 5 % of S, no times

For general description see catalog page 1.0.1



Input	Range	Input resistance	Overload capacity	
			continuous	3 s, 5 % DF*1
E1	1 ... 15 A	5 mΩ	20 A	33 A
E2	0.1 ... 1.5 A	50 mΩ	3 A	6 A
E3	10 ... 150 mA	0.5 Ω	1.2 A	2 A
E4	1 ... 15 mA	5 Ω	0.3 A	0.5 A

Diagram

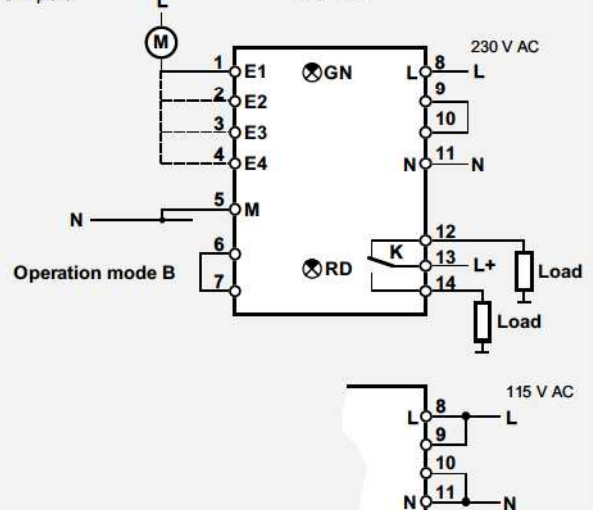


Wiring

AC/DC 2-pole

AC/DC measuring relay with LED

*1Duty Factor



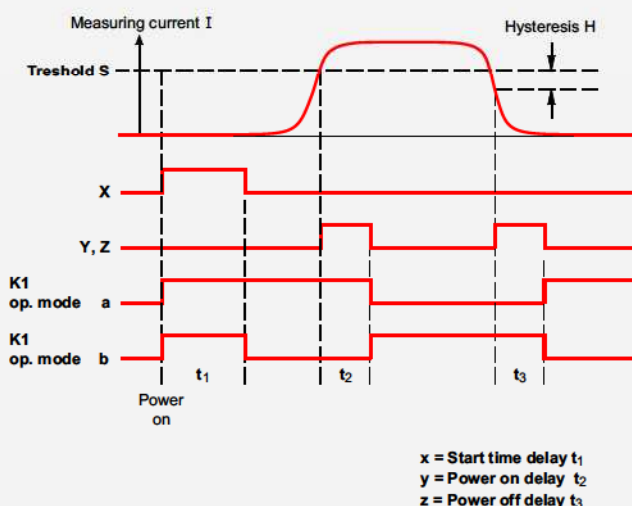
AIN measuring relays for AC and DC current

Device	Measuring relay for AC/DC
For the exact type designation and ref. no. please see page 1.0.2	AIN1/411cq-1.60 - (Uv) 16.27-02-xxx

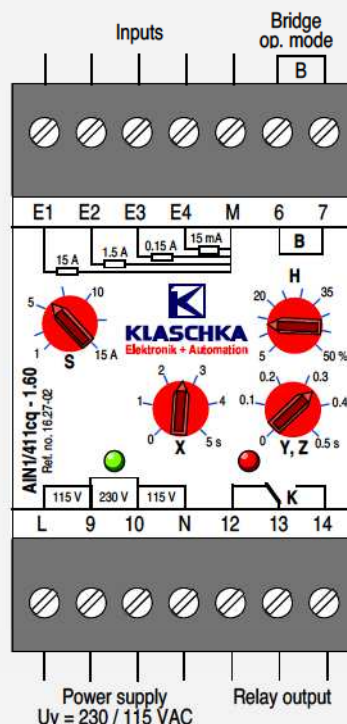
Technical data

Line voltage Uv	please indicate when ordering
Alternating voltage	230 / 115, 42, 24 V AC
Tolerance	± 10 %
Frequency	50 ... 60 Hz
Operating temperature	0 ... + 60 °C
Power consumption	approx. 4 VA
Housing	.60 (page 0.0.1)
Weight	approx. 300 g
(see table) Input (E)	4 current ranges selectable
Output	
Relay	1 changeover switch
Switching voltage	24 ... 250 V AC or DC
Switching current	0.05 ... 6 A
Switching capacity, AC	max. 1250 VA
Switching capacity, DC	max. 50 W
Switching frequency	max. 5000 / h
Switching cycles	30 x 10 ⁶
Response times	
Exceeding threshold / falling below threshold	approx. 25 ms / approx. 100 ms
Indicators	
1 green LED	Power ON
1 red LED	Relay pulled-in
Accuracy	
Setting accuracy	± 5 %
Repeatability	± 0.5 %
Temperature dependence	± 0.1 % / C°
Operation mode	
a Overcurrent monitor	without bridge B between the terminals 6-7 the relay drops out when exceeding threshold S.
b Undercurrent monitor	with bridge B between the terminals 6-7 the relay pulls-in when exceeding threshold S.
Hysteresis (H)	adjustable 5 ... 50 % of S
Start time delay (X)	adjustable up to approx. 5 s
Pull-in (Y) / drop out delay (Z)	tog. adjustable up to approx. 0.5 s

Diagram



For general description see catalog page 1.0.1

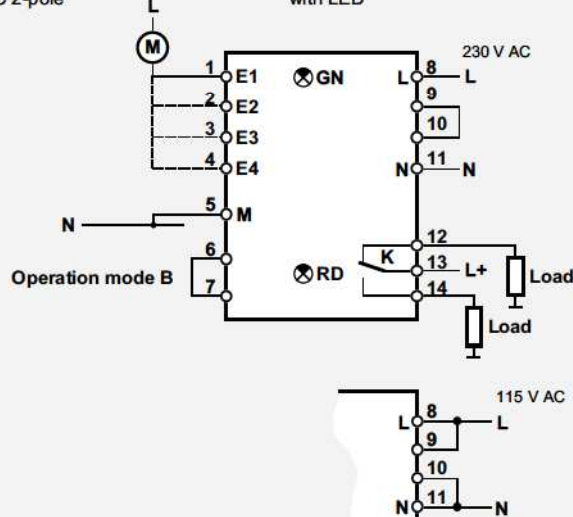


Input	Range	Input resistance	Overload capacity	
			continuous	3 s, 5 % DF
E1	1 ... 15 A	5 mΩ	20 A	33 A
E2	0.1 ... 1.5 A	50 mΩ	3 A	6 A
E3	10 ... 150 mA	0.5 Ω	1.2 A	2 A
E4	1 ... 15 mA	5 Ω	0.3 A	0.5 A

Wiring

AC/DC 2-pole

AC/DC measuring relay with LED



Electronic Measuring Relays

AINF measuring relays for AC and DC current

Device

AINF measuring relay for over- and undercurrent

For the exact type designation and
ref. no. please see page 1.0.2

AINF1/410ca-1.60 - (U_v)
16.27-03-xxx

Technical data

Line voltage U _v	please indicate when ordering
Alternating voltage	230 / 115, 42, 24 V AC
Tolerance	± 10 %
Frequency	50 ... 60 Hz
Operating temperature	0 ... + 60 °C
Power consumption	approx. 4 VA
Housing	.60 (page 0.0.1)
Weight	approx. 300 g

(see table) Input (E) 4 current ranges selectable

Output

Relay	1 changeover switch
Switching voltage	24 ... 250 V AC or DC
Switching current	0.05 ... 6 A
Switching capacity AC / DC	max. 1250 VA / max. 50 W
Switching frequency / cycles	max. 5000 / h / 30 x 10 ⁶

Response times

Exceeding threshold / falling below threshold approx. 25 ms / approx. 100 ms

Indicators

1 green LED	Power ON
1 red LED	Relay pulled-in

Accuracy

Setting accuracy	± 5 %
Repeatability	± 0.5 %
Temperature dependence	± 0.1 % / °C

Operation mode

a without wire bridge between the terminals 6-7 the relay drops out when exceeding the low threshold and pulls-in when exceeding the high one

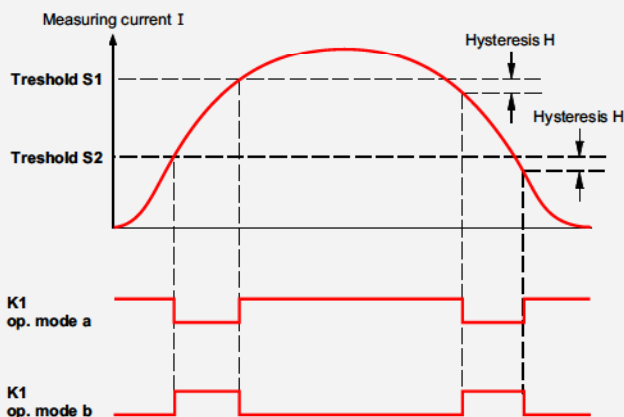
b with wire bridge between the terminals 6-7 the relay pulls-in when exceeding the low threshold and drops out when exceeding the high one

Hysteresis (H) fixed 5 % of S, no times

For general description see catalog page 1.0.1

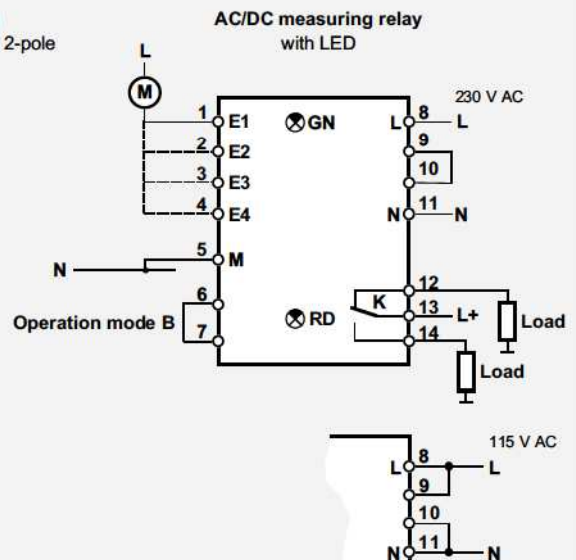
Input	Range	Input resistance	Overload capacity	
			continuous	3 s, 5 % DF
E1	1 ... 15 A	5 mΩ	20 A	33 A
E2	0.1 ... 1.5 A	50 mΩ	3 A	6 A
E3	10 ... 150 mA	0.5 Ω	1.2 A	2 A
E4	1 ... 15 mA	5 Ω	0.3 A	0.5 A

Diagram



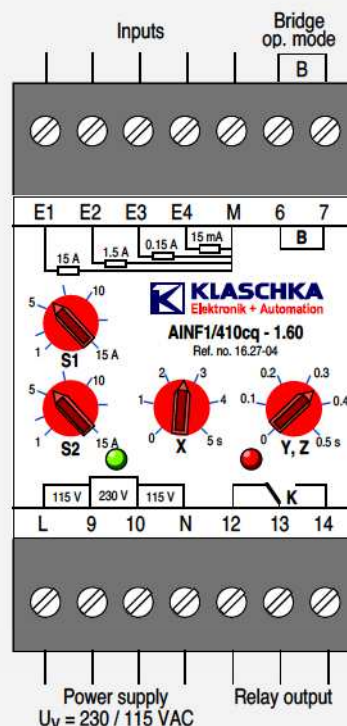
Wiring

AC/DC 2-pole

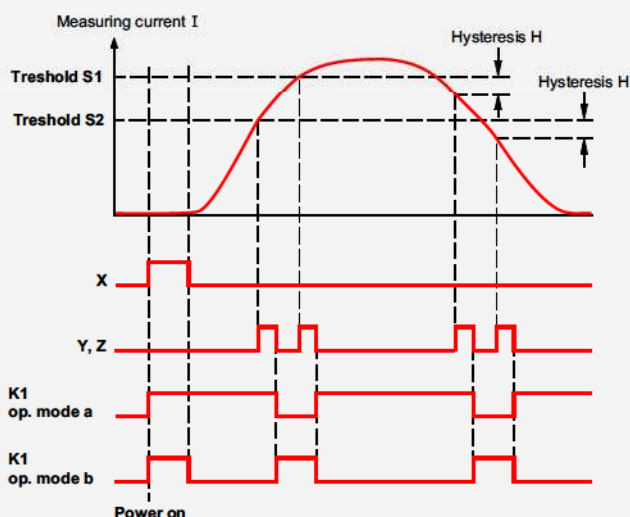


Device	AINF measuring relay for over- and undercurrent
For the exact type designation and ref. no. please see page 1.0.2	AINF1/410cq-1.60 - (Uv) 16.27-04-xxx
Technical data	
Line voltage U_v	please indicate when ordering
Alternating voltage	230 / 115, 42, 24 V AC
Tolerance / frequency	$\pm 10\%$ / 50 ... 60 Hz
Operating temperature / power consumption	0 ... + 60 °C / approx. 4 VA
Housing	.60 (page 0.0.1)
Weight	approx. 300 g
(see table) Input (E)	4 current ranges selectable
Output	
Relay	1 changeover switch
Switching voltage	24 ... 250 V AC or DC
Switching current	0.05 ... 6 A
Switching capacity AC / DC	max. 1.250 VA / max. 50 W
Switching frequency / cycles	max. 5000 / h / 30 x 10 ⁶
Response times	
Exceeding threshold / falling below threshold	approx. 25 ms / approx. 100 ms
Indicators	
1 green LED	Power ON
1 yellow LED	Relay pulled-in
Accuracy	
Setting accuracy	$\pm 5\%$
Repeatability	$\pm 0.5\%$
Temperature dependance	$\pm 0.1\%$ / °C
Operation mode	
a	without wire bridge between the terminals 6-7 the relay drops out when exceeding the low threshold and pulls-in when exceeding the high one
b	with wire bridge between the terminals 6-7 the relay pulls-in when exceeding the low threshold and drops out when exceeding the high one
Hysteresis (H)	fixed 5 % of S
Start time delay (X)	adjustable up to approx. 5 s
Pull-in (Y) / dropout delay (Z)	adj. together up to approx. 0.5 s

For general description see catalog page 1.0.1



Diagram



Wiring

AC/DC 2-pole

AC/DC measuring relay with LED

