

IR420-D6 Series

Digital Offline Ground Fault Monitor
For Grounded and Ungrounded Systems



A-ISOMETER® IR420-D6

**Offline Ground Fault Monitor
For Offline AC Grounded and Ungrounded Systems**



IR420-D6

Features

- Insulation monitoring for offline grounded and ungrounded AC systems
- Two separately adjustable response values
- LEDs: Power On, Alarm 1, Alarm 2
- Internal/external test/reset button
- Two separately adjustable SPDT contacts
- Normally energized or normally de-energized operation
- Latching or non-latching behavior
- Detailed LCD display
- Adjustable response delay
- RoHS compliant

Approvals



Description

The IR420-D6 monitors for ground faults on offline loads and circuits on grounded or ungrounded AC systems. The IR420-D6 monitors the system's insulation resistance to ground to detect ground faults.

An external supply voltage is required to power the device. See ordering information for available supply voltages.

Application

- Offline motors and pumps
- General loads with extended periods of time offline

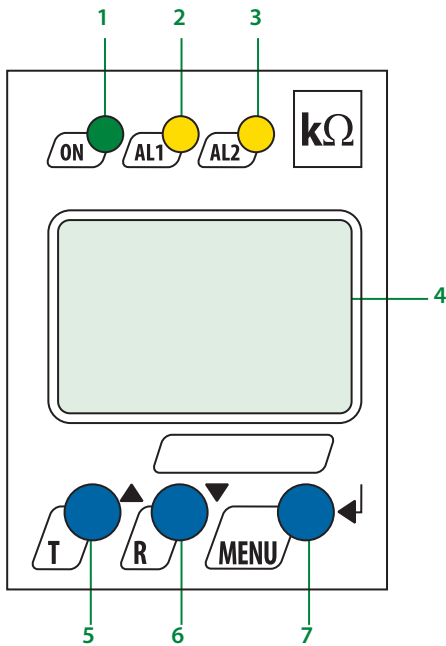
Function

When the insulation resistance from system to ground falls below the set response value, the alarm relays switch and the alarm LEDs activate. Two separately adjustable alarm contacts can be set to a prewarning and main warning alarm. The measured value is indicated on the LCD display. A selectable latching option allows the device to automatically reset or require a manual reset when an alarm has been cleared. TEST and RESET may be activated on the device or via a remote connection.

Measuring principle

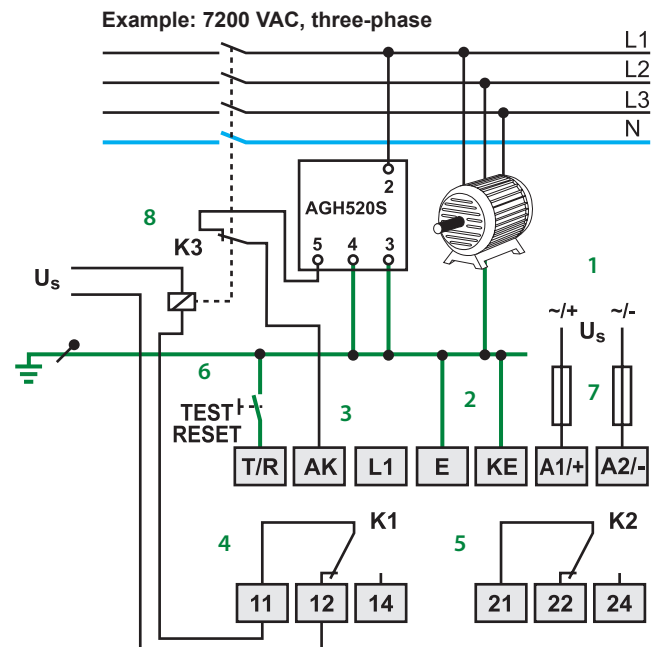
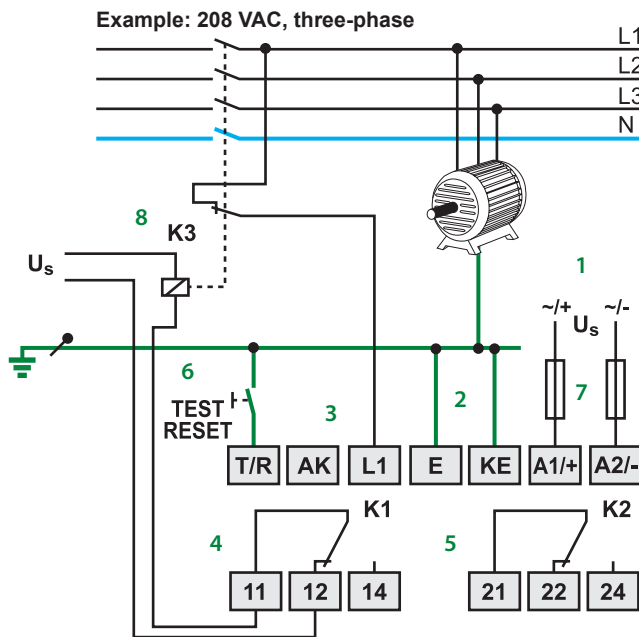
The IR420-D6 uses a superimposed DC voltage measuring principle.

Operating elements



- 1 - Power ON LED "ON"; flashes during connection error
- 2 - Alarm LED "AL1," Insulation fault, alarm 1 reached (flashes during connection error)
- 3 - Alarm LED "AL2," Insulation fault, alarm 2 reached (flashes during connection error)
- 4 - LCD display
- 5 - Test button "T": Activates self-test
Arrow up key: Scrolls up inside device's menu
- 6 - Reset button "R": Resets device
Arrow down key: Scrolls down inside device's menu
- 7 - MENU key: Activates device's internal menu
Enter key: Confirm changes inside device's menu

Sample Wiring Diagrams



- 1 - Supply voltage U_s (see ordering information) via 5A fuse
- 2 - Equipment ground connections
- 3 - Connection to monitored system
- 4 - Alarm relay K1: Alarm 1
- 5 - Alarm relay K2: Alarm 2

- 6 - Combined external test and reset button "T/R":
Quick press (< 1.5 s) = RESET
Hold (> 1.5 s) = TEST
- 7 - Recommended line protection via fuse
- 8 - External control logic to ensure IR420-D6 is not operating while system is energized (not included with device)

Technical data A-ISOMETER® IR420-D6

Insulation coordination acc. to IEC 60664-1/IEC 60664-3

Rated insulation voltage	400 V
Rated impulse voltage/pollution degree	4 kV / III
Protective separation (reinforced insulation) between (A1, A2) – (L1, AK, E, KE, T/R) – (11, 12, 14) - (21, 22, 24)	
Voltage test according to IEC 61010-1	2.21 kV

Supply voltage

Supply voltage U_s	see ordering information
Power consumption	≤ 3 VA

System specifications

Nominal system voltage U_n without AGH	offline
Nominal contact voltage of the N/C contact of K3 (switch-on contactor) with AGH520S	AC 50...400 Hz, 0...7200 V

Response values

Response value R_{an1} (Alarm 1)	100 kΩ...10 MΩ (1 MΩ)*
Response value R_{an2} (Alarm 2)	100 kΩ...10 MΩ (100 kΩ)*
Relative percentage error	± 15 %
Hysteresis	+ 25 %

Specified time

Response time t_{an} at $R_f = 0.5 \times R_{an}$ and $C_e = 1 \mu\text{F}$	≤ 4 s
Start-up delay t	0...10 s (0 s)*
Response delay t_{on}	0...99 s (0 s)*

Measuring circuit

Measuring voltage U_m	± 12 V
Measuring current I_m (at $R_f = 0 \Omega$)	≤ 10 μA
Internal DC resistance R_i	≥ 1.2 MΩ
Impedance Z_i at 50 Hz	≥ 1,1 MΩ
Permissible extraneous DC voltage U_{fg}	≤ DC 300 V
Permissible system leakage capacitance C_e	≤ 10 μF

Displays, memory

Display range, measuring value	10 kΩ...20 MΩ
Relative percentage error	± 15 %
Password	off / 0...999 (off)*
Fault memory alarm relay	on/off (off)*

Outputs

Cable length test and reset button	≤ 10 m
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Switching elements

Number of switching elements	2 SPDT contacts				
Operating principle	Normally energized or deenergized operation (N/D)*				
Electrical service life, number of cycles	10,000				
Contact data acc. to IEC 60947-5-1					
Utilization category	AC-13	AC-14	DC-12	DC-12	DC-12
Rated operational voltage	230 V	230 V	220 V	110 V	24 V
Rated operational current	5 A	3 A	0.1 A	0.2 A	1 A
Minimum current	1 mA at AC/DC ≥ 10 V				

Environment/EMC

EMC	IEC 61326				
Operating temperature	- 13 °F...+ 130 °F (- 25 °C...+ 55 °C)				
Climatic class acc. to IEC 60721					
Stationary use (IEC 60721-3-3)	3K5 (except condensation and formation of ice)				
Transport (IEC 60721-3-2)	2K3 (except condensation and formation of ice)				
Long-time storage (IEC 60721-3-1)	1K4 (except condensation and formation of ice)				
Classification of mechanical conditions IEC 60721					
Stationary use (IEC 60721-3-3)	3M4				
Transport (IEC 60721-3-2)	2M2				
Long-time storage (IEC 60721-3-1)	1M3				

Connection

Connection type	screwless-type terminals				
Connection properties:					
rigid / flexible	0.2...2.5 mm ² (AWG 24...14)				
flexible with connector sleeve	0.2...1.5 mm ² (AWG 24...16)				
Stripping length	10 mm				
Release force	50 N				
Test aperture, diameter	2.1 mm				

General data

Operating mode	continuous operation				
Mounting	any position				
Degree of protection, internal components (IEC 60529)	IP30				
Degree of protection, terminals (IEC 60529)	IP20				
Enclosure material	polycarbonate				
DIN rail mounting acc. to	IEC 60715				
Screw mounting	2 x M4 with mounting clip				
Product standards	DIN EN 61557-8: 1998-05				
	EN 61557-8: 1997-03, IEC 61557-8: 1997-02, ASTM F1134-94				
Operating manual	BP101014				
Weight	≤ 150 g				

()* = factory setting

Ordering information				
Type	Supply voltage* U_s	Response value R_{an}	System leakage capacitance C_e	Art. No.
IR420-D6-1	DC 9.6...94 V/AC 42...460 Hz 16...72 V	100 k Ω ...10 M Ω	$\leq 10 \mu\text{F}$	B 9101 6415
IR420-D6-2	DC 70...300 V/AC 42...460 Hz 70...300 V	100 k Ω ...10 M Ω	$\leq 10 \mu\text{F}$	B 9101 6407

* absolute values

Accessories				
Type	Nominal system voltage* U_n	Art. No.	Type	Art. No.
AGH520S	AC 50...400 Hz 0...7200 V	B 913 033	Mounting clip for screw mounting (one piece per device)	B 9806 0008

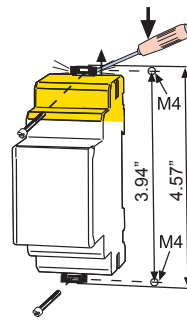
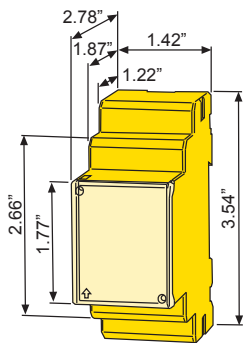
Dimensions

(dimensions in inches)

Open the front plate cover in direction of arrow.

Screw fixing

Note: The upper mounting clip must be ordered separately (see ordering information).



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