

Electrical network management

Vigilohm

The IT earthing system to improve electrical network availability

Catalogue
2013



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Functions and characteristics

Overall insulation monitoring

The IM400 provides overall insulation monitoring of electrical installations by injecting a special signal between the installation and earth.

The IM400 accurately measures insulation of systems that contain switching power electronics (speed drives, motor starters, inverters, Thyristors...) and DC components.

The IM400 is compatible with the following applications:

- Power Circuits.
- Control Circuits.
- Photovoltaic Systems.
- Impedant IT systems (HRG).

Main functions

- Measurement
 - insulation resistance.
 - earth leakage capacitance.
- Indications
 - satisfactory insulation resistance (green light).
 - drop in insulation resistance:
 - below prevention threshold (white light and prevention relay actuated)
 - below fault threshold (yellow light and alarm relay actuated).
 - transient faults (yellow light blinking).
 - Loss of connection (wiring) of Vigilohm to the system or to earth.
- Display:
 - measurements.
 - logging of events detected by IM400.
 - trend of system insulation during the last day, week, month, year.
 - all this data is accessible locally on the LCD screen of the IM400 and remotely via a built-in Modbus RS485 communication.

Insulation fault locating

Locating faulty circuits obtained by using the IM400 with XD301, XD312 and XD308C. In addition, an XRM mobile receiver and a current probe can determine the exact location of the fault on the faulty circuit.

Configuration management

On installations with monitoring devices covering variable configurations, only one device at once is allowed to inject a voltage between earth and the installation downstream on the incoming circuit breaker. The system must therefore manage the exclusion of other monitoring devices. This is handled by either:

- External logic relays for simple configurations.
 - Programmable Logic Controller for complex configurations.
- In both cases, the injection inhibition input of the IM400 will be used.

Communication

IM400 has a built in Modbus RS485 port, it is used for remote monitoring and control.

Standards and certifications

The IM400 complies with standards:

- IEC 364, parts 4 and 5.
- IEC 61557-8.
- IEC 61010-1.
- UL508 (pending).
- C22.2 No 14-05CSA (pending).
- DNV (pending).

Installation

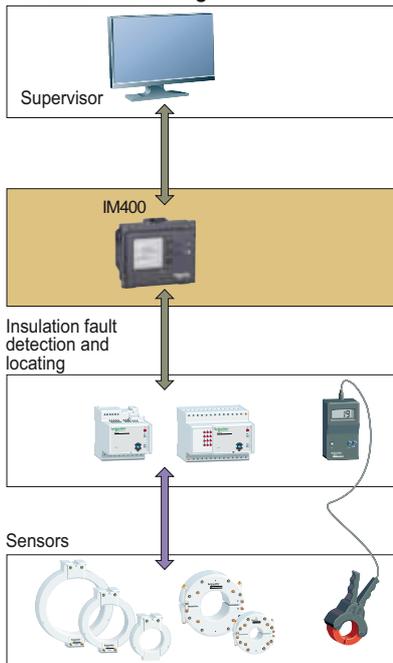
- Horizontal flush mounting on the front face of a cubicle or enclosure.
- Easy mounting in Prisma enclosures using the corresponding mounting plates and front plates that come with the appropriate cut-outs.
- Wall mounting using inserts on the back of the IM400.

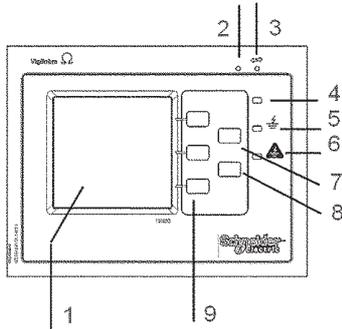
Auxiliaries

- Cardew surge limiter: page 33.
- ZX impedance: page 34.
- IMD-IM400-1700: page 37.
- PHT1000: page 36.

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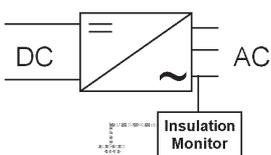
Insulation monitoring





1. Display indicating:
 - the value of the overall insulation resistance R
 - other information as selected via function keys.
2. Red self-test light, indicating internal IM400 fault or wiring connection lost or over capacitance.
3. Yellow light, flashing according to the communication.
4. Green light, indicating a normal insulation value. Blinking indicates the injection inhibition.
5. White light, indicating a pre-alarm.
6. Yellow light, indicating an insulation fault. Blinking indicates a transient fault.
7. Function key to access the menu.
8. Function key to Escape to the previous screen.
9. Three contextual keys.

Inverter without transformer ⁽¹⁾



Vigilohm IM400

Type of installation to be monitored

AC or mixed AC/DC IT systems ⁽¹⁾	Phase-to-phase voltage with IM400 connected to neutral	≤ 830 V AC ⁽¹⁾ or 1700 V AC
	With IM400 connected to phase	≤ 480 V AC ⁽¹⁾ or 1000 V AC
	Frequency	45-440 Hz
DC or rectified systems	Line voltage	< 830 V DC ⁽¹⁾ or 1000 +15% V DC

Electrical characteristics

Range for insulation resistance readings		10 Ω to 10 MΩ
Range for capacitance readings		0.1 μF to 500 μF (2000 μF for PV applications)
Signalling	Number of thresholds	2 (protected password)
	Threshold settings	1st Preventive: 0.1 kΩ to 500 kΩ 2nd Alarm: 1 kΩ to 1 MΩ
Dielectric strength		4000 V AC / 5500 V DC 7.3 kV impulse
Auxiliary supply voltage	50/60/400 Hz	100 to 440 V AC
	DC	100 to 440 V DC
Auxiliary supply voltage tolerances		+/-15 %
Maximum device consumption		25 VA / 10W
Measurement voltage	Variable	15 Vp, 33 Vp, 120 Vp
Measurement current	Variable	375 μAp, 825 μAp, 3 mA
Fault Locating current		3.75 mA
Extraneous d.c. voltage Ufg		506 V
50 Hz/DC impedance		40 kΩ (directly connected)
Device test		Self-test / manual test
Output contact	Quantity	2
	Type of contact	Changeover
	Breaking Capacity	AC 250 V: 6 A DC 48 V: 1 A, 10 mA minimum load
Injection inhibition (voltage supplied by the IM400)	Voltage	24 V DC
	Current	5 mA

Mechanical characteristics

Weight		0.75 kg
Degree of protection	Front face	IP54
	Back case	IP20

Other characteristics

Multi-language display		8 languages
Tamperproof settings		Password
Temperature range	Operating	-25°C to +55°C [65°C ⁽²⁾]
	Storage	-40°C to +70°C

Fault locating with other devices and accessories

Automatic	Detectors XD301/312/308C
Manual	Mobile receiver XRM + probes
HV plate commercial reference	IMD-IM400-1700 (for network up to 1.7 kV without fault location)
	50248 (for network up to 1.7 kV with fault location)

⁽¹⁾ When the insulation monitor is linked to a non insulated inverter it is necessary to take into account the DC voltage limit rather than the AC limit.

⁽²⁾ Failsafe: a failsafe relay operates in the event of an accidental interruption of auxiliary power or a fault.

⁽³⁾ With HV subassembly and 230 +15% V AC power supply.

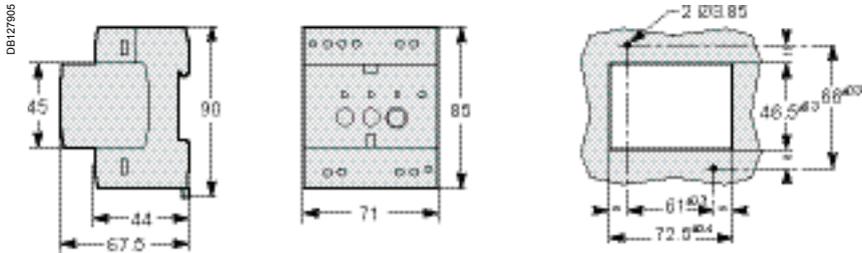
Commercial reference:

- IMD-IM400

IM9, IM9-OL

Mounting on symmetrical DIN rail

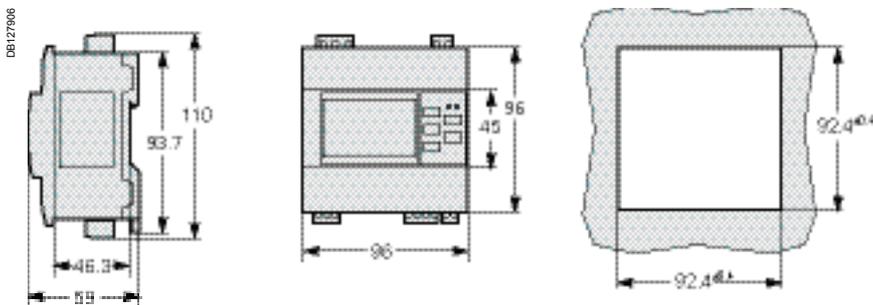
Cutout



IM10, IM20, IM10-H, IM20-H

Mounting on symmetrical DIN rail

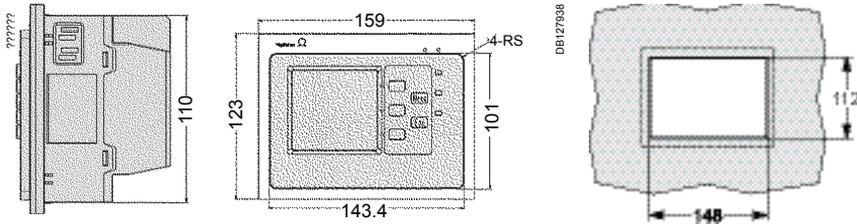
Cutout



IM400

Flush mounting

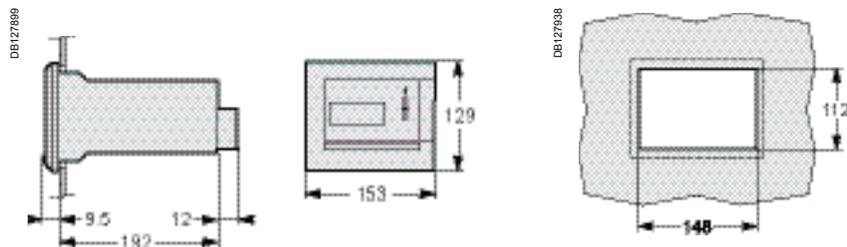
Cutout



XM300C, XL308, XL316

Flush mounting

Cutout

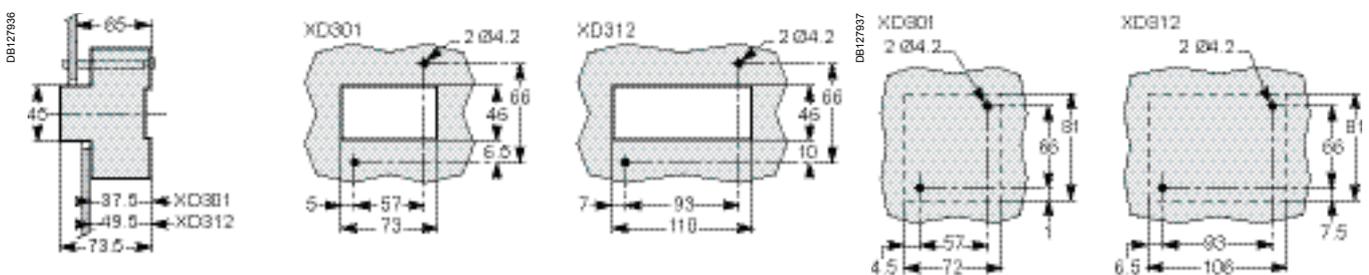


XD301, XD312

Flush mounting

Cutout

Surface mounting



IM400

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