

Isolated Power System Monitor (IPM400)

The Isolated Power System Monitor (IPM400) permanently monitors the insulation resistance between line 1/line 2 and earth in isolated power systems, which are mainly found in Group 2 Medical Locations.

The Isolated Power System Monitor is set to give an alarm when the insulation of the complete network drops below the set value; this is typically 250k Ohms. The minimum setting recommended by the standard is 50k Ohms. This feature also ensures that any Patient Monitoring Equipment below 250k Ohms will give an alarm.

The current and temperature of the Isolation Transformer are also permanently monitored. If the windings become too hot or overloaded the alarm is triggered but again the system will continue to operate as normal, giving time for the completion of the operation or the removal of the faulty equipment. The IPM400 system has an integrated insulation monitor and webserver.

It can monitor up to 8 external alarms (typically UPS) and display these on the LCD screen and via the selected remote alarm.

Communication to peripheral units is provided by web-server and email functionality. The IPM400 includes an internal 10W power supply.

Features

- Insulation monitor for detecting earth faults on an IT network
- Temperature & Transformer-Load Current Monitor
- Configurable Transformer load trip point
- Configurable Transformer over temperature protection
- 8 channels for monitoring digital signals via relay or electronic contacts
- Communication interface with ModBus RTU Protocol for transmitting measured values and network status.
- Webserver with TCP/IP functionality, connected via standard network plugs
- Programmable volt free changeover contact for RA006 clinical alarm and BMS
- Driver function to display isolation and transformer status on remote alarm units with the optional capability of a remote test function for special markets
- Remote alarm compatibility with RA006, RA004 and RA003 (future: RA008)
- Compliant to HD60364-7-710.



Product Specification

Nominal ac isolation voltage	AC300V	Temperature-Monitor		Capacity	0,5 .. 2,5mm ²
Contact circuits	AC250V	Trip resistance R _g (Terminals Z1/ Z2)	>3,5kΩ	Search Current Generation	
Insulation group to DIN VDE 0110 (01.89)	dirty group 3	Response delay (self-time)	~ 1,5s	Measurement current	
AC Test Voltage		Wiring		load-independent dc current	≤1mA
Electronic - relay contacts	AC2000V	Type of cable	screened, twisted pair	direction	pulsing +/-
Electronic - Modbus interface	AC2000V	Max length	3m	Impedance between line and earth	
Relay contacts - Modbus interface	AC2000V	Transformer Load-Monitor		during search (minimum)	50kΩ
Relay contacts - RJ45 Jack	AC2000V	Current Transformer		maximal	250kΩ
RJ45 Jack - Modbus interface	AC2000V	Ratio @ AC230V	1:1000	during pause	10MΩ
Electronic - RJ45 Jack	AC1500V	Ratio @ AC110V	1:2000	Modbus Communication	
Operation class	continuous	Load	~16Ω	Interface	RS485, isolated
Supply voltage UsAC	100-230V -10%/ +15%, 50/60Hz	Trip point		Communication	Modbus RTU Slave
Power consumption		Adjustable	100 to 15,000VA, Δ1VA	Baud Rate	2400, 9600 or 19200Baud
With peripheral units and alarm state	+230mA/-200mA	Hysteresis	ca.20%	Address Range	1..255
Relay contacts		Response delay (self-time)	~ 1,5s	Parity	Even/Odd
K1 (Main/Common Alarm)	normal open contact	Wiring		Supported Command	Read Multiple Register
Function	active / failsafe	Type of cable	screened, twisted pair	Command Code	0x03
K2 (Insulation Alarm)	normal open contact	Max length	3m	Starting Address	0x00
Function	active / failsafe	Insulation Monitor		Register Count	1, 2 or 4
K3 (Optional Alarm)	normal open contact	Rated voltage for measuring circuit	AC 265V, 50-60Hz	Wiring	
Function	active / failsafe	Measuring voltage	DC14V	Type of cable	screened, twisted pair
Switching capacity	1100VA	Measuring current	max.58μA	Max length	1000m
Nominal contact voltage	250V	DC internal resistance (Terminal L1, L2 to PE)	240kΩ	Capacity	0,5 .. 2,5mm ²
Continuous current	5A	Measuring circuit impedance (Terminal L1, L2 to PE)		TCP/IP Communication	
Breaking capacity		Line-voltage ≤AC300V	220kΩ	Interface	10Base T
At AC230V, cos.φ=0,4	3A	Response value		Connection	RJ45, CAT5
At DC110V, L/R=0	0,3A	Adjustable	50kΩ ... 500kΩ, Δ1kΩ	EMC requirement	ferrite over the network cable
Mechanical		Factory Setting	250kΩ	Würth, type 742 712 22	2 loops
Operational temperature	-10°C .. +50°C	Hysteresis	ca.20%	MAC Address	00:50:C2:9E:Fx:xx
Storage temperature	-40°C .. +80°C	Response delay (self-time)	~ 1,5s	Factory Settings	
Humidity classification to DIN 40 040	F	Digital Inputs		Hostname	IPM400
Ingress protection to DIN 40 050	IP30	Digital Inputs	DI1, DI2, DI3, DI4, DI5, DI6, DI7, DI8	DHCP	disabled
Terminals to VBG4	IP20	Actuating Voltage	DC 20V	IP-Address	192.168.77.42
Mounting		Alarm OFF	off(0)	Gateway	192.168.77.51
Direction	equal	Alarm on K1	on(1)	Subnet Mask	255.255.255.0
Rail Mounting	DIN EN 60 715	Alarm on K2	on(2)	Primary DNS	192.168.77.250
Terminals		Alarm on K3	on(3)	Secondary DNS	213.237.150.188
Type	plug-able screw terminals	Used Contact	normal open (1), normal closed (0)	Auxiliary Equipment	
Wire capacity	0.5to 2,5mm ²	Wiring		Max Output at U1-U2	240mA
Weight	~500g	Type of cable	screened, twisted pair	Auxiliary Loads at 24Vdc	
Dimensions	105mm x 95mm x 75mm	Max length	3m	RA003	70mA
Requirements on IT-Network		Capacity	0,5 .. 2,5mm ²	RA004	120mA
Nominal voltage	AC 230V, 50Hz	Remote Alarm Communication		RA005 / RA006 (THD)	40mA
Max line capacitance to earth	0,5μF/Phase	Interface	RS485, non-isolated	RA005/ RA006 / RA007 (SMD)	24mA
Max load current through CT	100A	Communication	specific broadcast protocol	24V-Relay	40mA
		Wiring			
		Type of cable	screened, twisted pair		
		Max length	1000m		



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