



- Direct connection up to 500V line voltage, up to 5kV with HV adapter
- Monitoring during both live and standby conditions
- Protection against harmful DC voltage exposure
- "Megger" - safe to 1.4kVDC when aux power is OFF
- Immune to earth capacitance and voltage surges
- For use in land, marine, offshore, sub-sea and ocean floor Installations
- Analogue output proportional to meter reading (F-version)

Specifications

General

Auxiliary Supply:	100-120, 200-240, 380-415 or 440-460VAC, 40-70Hz (Fuse 0.5A)
Optional Voltage:	12-48VDC (>9 - <60VDC) (Fuse 2A)
Contact rating:	AC: 100VA - 250V/2A max. DC: 50W - 100V/1A max.
Analogue Output:	Up to 20mA, max 500R
F-versions	Up to 10V, min 100kohm (other on request)
Temperature:	-20 to +70°C
Weight:	0.62kgs
Front protection:	IP54 (IP65 optional)

INTELLIGENT SETTING ASSISTANCE

KPM16xM has a built-in Assistance tool for setting/verification of the trip levels and the analogue output.

When either the **Warning** or **Alarm** potmeter at the rear is operated by user, the meter goes into **Assistance Mode** and meter reading and analogue output will reflect the potmeter setting.

How to set alarm levels:

Firstly adjust potmeter fully clockwise (see that meter goes to the top), then adjust potmeter down to required **Warning** or **Alarm** setpoint. Without any movement of potmeters, the meter will revert to normal Insulation Monitoring Mode after approximately 10 seconds.



How to test analogue output signal:

Adjust any trip level potmeter to activate Assistance Mode. **Example:** On a 4-20mA output, adjust potmeter fully anti clockwise for 4mA and fully clockwise for 20mA.

NOTE:

The standard Insulation Guards KPM161x and KPM163x are protected against sporadic AC and DC voltage surges imposed on the monitored AC network. Exposure to enduring high energy DC voltage (reported to be up to several hundred volts with positive or negative polarity) will instantaneously cause the meter to read false insulation value and may destroy the unit.

The KPM16xM range is designed to comply with specification AODC035 "Code of Practice for the Safe Use of Electricity Under Water" issued by IMCA.

Application

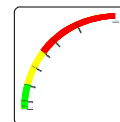
The digitally controlled KPM16xM series monitors insulation level between a non-grounded (IT) AC mains and its protective earth, regardless of whether the mains is live or non-live (standby) in marine and offshore installations.

IDV MEASURING PRINCIPLE

Insulation is measured between the complete galvanically interconnected AC network and its protective earth. The unit injects a sequentially coded measuring signal to the monitored system. The signal flows to ground via the path of the insulation fault, the level of flow indicates the insulation resistance. The measuring accuracy is not influenced by any normal kind of load attached to the AC network.

An AC or DC auxiliary voltage is required for the unit, if powered from a separate source the network can also be monitored during standby conditions. Only **ONE** KPM16xM can be connected to each IT-system. The ohmmeter and the triple-zone status LEDs give at a glance the clear safety message:

- ALARM (red zone)
- WARNING (yellow zone)
- HEALTHY (green zone)



General

HIGH ENERGY DC VOLTAGE IN YOUR AC MAINS, AN UNKNOWN AND NEGLECTED PROBLEM

Experience has confirmed that **full cycle** half-wave and **partial cycle** full-wave rectifier/regulator loads, inverter asymmetrical phases output or a semiconductor failure in heavy power rectifiers/inverters may impose high energy DC voltage on the AC supply line voltages. Intermittent or ENDURING imposed DC voltage is reported to be up to several hundred volts with positive or negative polarity relative to protective earth.

This DC voltage will distort insulation measurements, and may cause breakdown of protective guards. The uncontrolled DC energy can cause functional problems by saturating magnetic cores and influence performance of current and voltage transformers, reactors, motors, regenerative drives, generators and regulators. It is also a fact that this serious malfunction normally remains undetected and unknown to the crew. The M-variant therefore includes a unique DC voltage detection function with an alarm output.

When a "foreign" positive DC voltage exceeding 17V or a negative DC voltage exceeding 3V are detected on the monitored AC supply the DC detection function will within 20 seconds disable the insulation measuring function to avoid false readings, isolate the unit input, activate LED "DC EXPOSURE" and trip relay 3. In this mode unit will sustain continuous high-energy exposure up to **+/- 800VDC**. The "pathfinder" function identifies polarity of imposed DC. At 10 minutes intervals the unit senses if DC is still present and will reset automatically and restore normal operation when DC exposure ends.

To detect presence of harmful DC voltage connect a voltmeter between any AC supply line voltage and protective earth, and set the meter function switch to AC and DC alternately.

Description

KPM161M & KPM161MF - KPM161GM & KPM161GMF

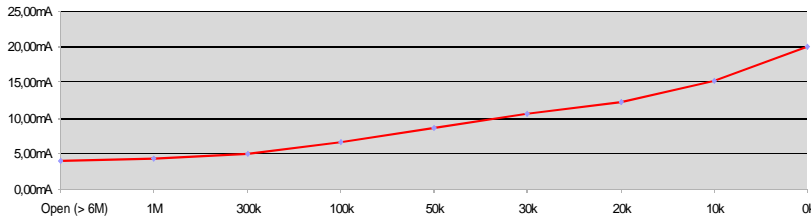
This unit is used for hospital, industrial, marine and offshore installations. Start of monitoring function is delayed when auxiliary power is switched on (default 5 secs delay).

Direct connection up to 500V line voltage.

Model	Latch	Output	Adjustments	Trip level	Delay
KPM161M	-	-	WARNING:	0-1MΩ	0-30secs
KPM161MF	-	X	ALARM:	0-1MΩ	0,1-3secs
KPM161GM*	X	-			
KPM161GMF*	X	X			

PATHFINDER FUNCTION
The pathfinder indicates polarity of DC exposure by the flashing pattern of lamp DC EXPOSURE (Positive polarity gives steady light and flashing for negative polarity).

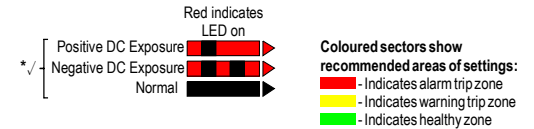
Output diagram



Relay Operation

Scale range: 0-1000kΩ - ∞ (>6MΩ)

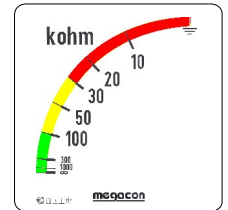
	Warning	Alarm	DC Exposure Alarm	Fail Safe	Latch
R1	✓				
R2		✓		✓	✓
R3			* ✓		



Output table (example for 4-20mA)

Value (scale)	mA output
0kΩ	20.00mA
10kΩ	15.22mA
20kΩ	12.32mA
30kΩ	10.61mA
50kΩ	8.68mA
100kΩ	6.69mA
300kΩ	4.98mA
1MΩ	4.28mA
Open (>6MΩ)	4.00mA

Range



Description

KPM163M & KPM163MF - KPM163GM & KPM163GMF

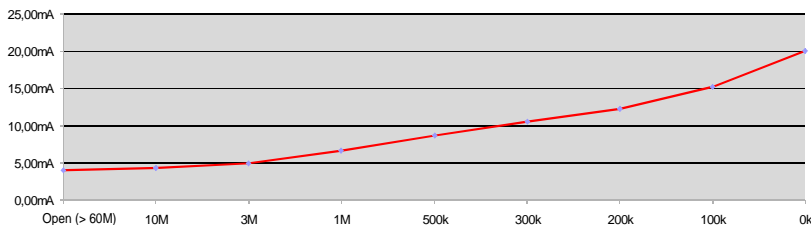
This unit is used for marine, ROV and offshore installations. Start of monitoring function is delayed when auxiliary power is switched on (default 10 secs delay).

Direct connection up to 500V line voltage. Up to 6,6kV via HV adaptor CH163x or AN6,6 series.

Model	Latch	Output	Adjustments	Trip level	Delay
KPM163M	-	-	WARNING:	0-1MΩ	0-30secs
KPM163MF	-	X	ALARM:	0-1MΩ	0,1-3secs
KPM163GM*	X	-			
KPM163GMF*	X	X			

PATHFINDER FUNCTION
The pathfinder indicates polarity of DC exposure by the flashing pattern of lamp DC EXPOSURE (Positive polarity gives steady light and flashing for negative polarity).

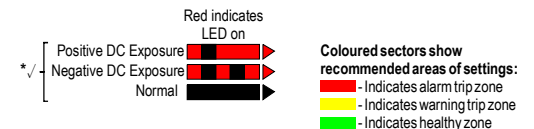
Output diagram



Relay Operation

Scale range: 0-10MΩ - ∞ (>60MΩ)

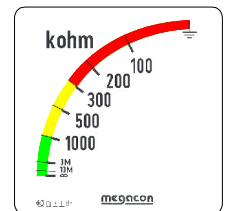
	Warning	Alarm	DC Exposure Alarm	Fail Safe	Latch
R1	✓				
R2		✓		✓	✓
R3			* ✓		



Output table (example for 4-20mA)

Value (scale)	mA output
0kΩ	20.00mA
100kΩ	15.18mA
200kΩ	12.30mA
300kΩ	10.59mA
500kΩ	8.67mA
1MΩ	6.69mA
3MΩ	4.98mA
10MΩ	4.28mA
Open (60MΩ)	4.00mA

Range



High Voltage Adaptors up to 6,6kVAC for KPM163xM series



CH163/1,4 up to 1.4kVAC
(for KPM163xM series)



CH163/3,6 up to 3.6kVAC
(for KPM163xM series)



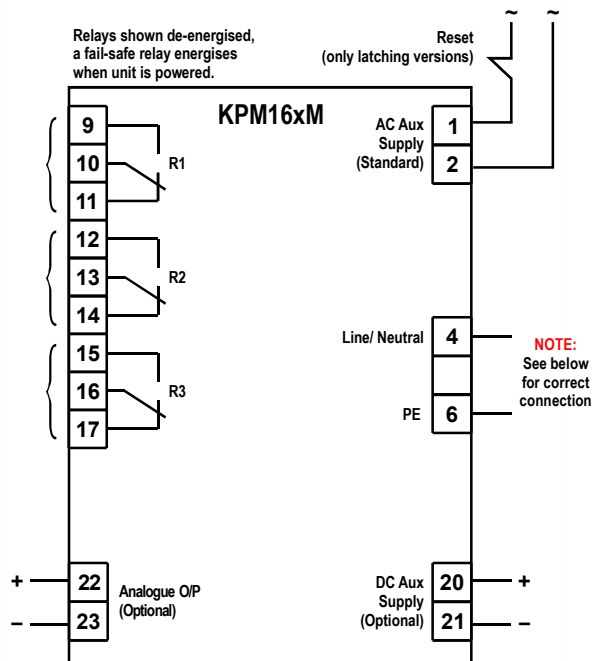
CH163/5 up to 5kVAC
(for KPM163xM series)



AN6,6 up to 6,6kVAC
(for KPM163xM series)

The MEGAICON policy is one of continuous improvement, consequently equipment supplied may vary in detail from this publication.





Outputs

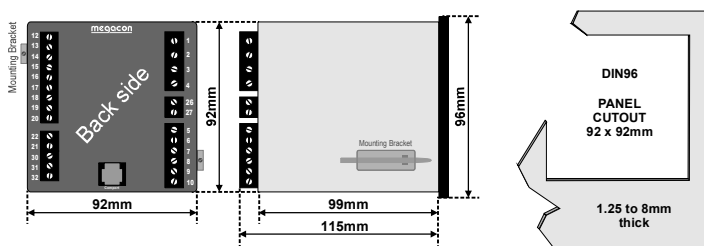
The unit has C/O relay outputs for insulation Warning and Alarm and DC exposure alarm. The insulation alarm relay is fail to safety configured. The trip LED flashes when the set trip level is passed, the relay trips when the delay has elapsed. The timer resets if the fault is removed during countdown. Trip levels and delays are settable on unit rear.

KPM161MF, KPM161GMF, KPM163MF and KPM163GMF have an analogue output proportional to meter reading. (Special outputs are available on request)

Add suffix from table below to type designation to specify output required:

O/P1	0 - 10mA	O/P6	N/A
O/P2	0 - 20mA	O/P7	N/A
O/P3	4 - 20mA	O/P8	0 - 10VDC
O/P4	N/A	O/P9	N/A
O/P5	N/A	O/P10	N/A

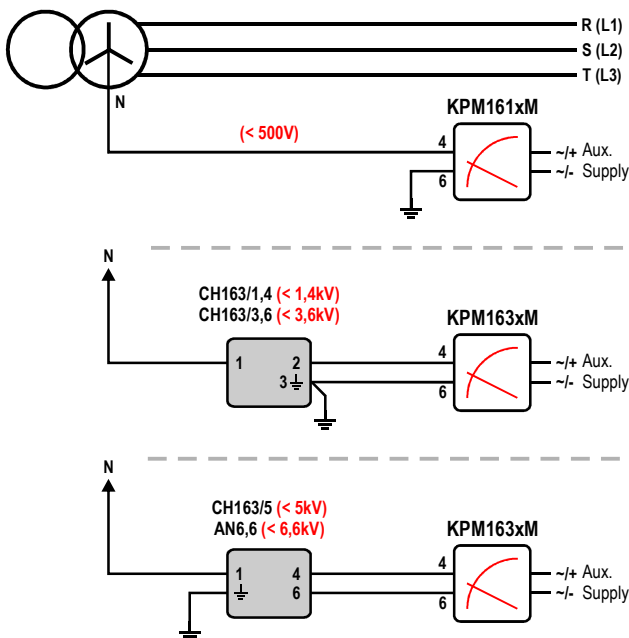
Dimensions



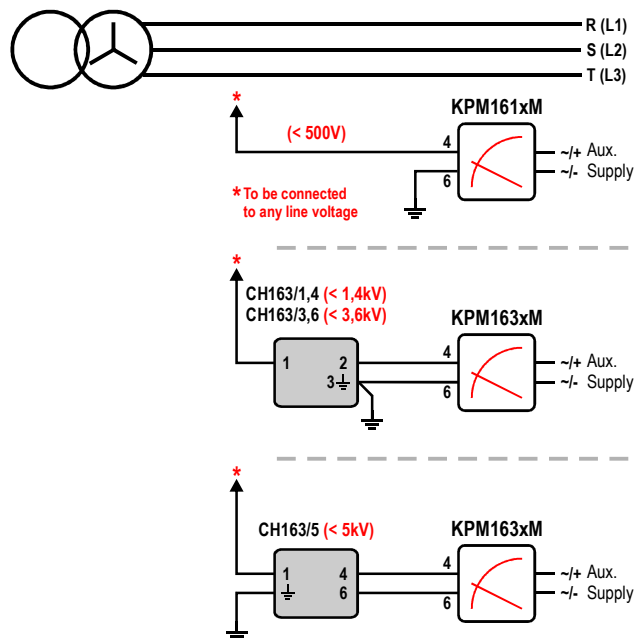
SAFETY

When a voltage adapter (CHx.) is used the signal to terminals 4 and 6 on KPM161M and KPM163M is limited to a safe level, avoiding any dangerous voltage exposure to personnel.

NEUTRAL VOLTAGE INPUT



LINE VOLTAGE INPUT



The unit meets IEC60092-504 and the relevant environmental and EMC tests specified in IEC60068/60092 and IEC61000/60533 respectively, to comply with the requirements of the major Classification Societies.

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ORDERING EXAMPLE:

Type: KPM163MF
 Aux. Supply: 200-240VAC
 Network Voltage: 3,6kVAC
 Analogue O/P: (O/P3) 4-20mA
 Range: 0-10Mohm

