**Application**

The digitally controlled KCM165x 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).

The KCM165x range is designed to comply with specification AODC035 "Code of Practice for the Safe Use of Electricity Under Water" issued by IMCA.

The unit meets IEC60992-504 and the relevant environmental and EMC tests specified in IEC60068-8092 and IEC61000-6033 respectively, to comply with the requirements of the major Classification Societies.

**General**

INTELLIGENT SETTING ASSISTANCE

KCM165x has a built-in Assistance tool for setting/verification of the trip levels and the analogue output.

When either the Warning or Alarm potmeter on the front is operated by user, the slave 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 slave 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.

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The unit meets IEC60992-504 and the relevant environmental and EMC tests specified in IEC60068-8092 and IEC61000-6033 respectively, to comply with the requirements of the major Classification Societies.

**Outputs**

All F versions have an isolated analogue output proportional to meter reading. If output is used for remote meter reading, we recommend 0-1mA for the slave indicator.

**Safety**

When a voltage adapter (ARx or ANx) is used the signal to terminals 4 and 6 on KCM165x is limited to a safe level, avoiding any dangerous voltage exposure to personnel.

**Specifications**

<table>
<thead>
<tr>
<th>General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Auxiliary Supply:</strong></td>
<td>100-120, 200-240, 380-415 or 440-480VAC, 40-70Hz (Fuse 0.5A)</td>
</tr>
<tr>
<td><strong>Optional Voltage:</strong></td>
<td>12-24, 48 or 110VDC (Fuse 2A)</td>
</tr>
<tr>
<td><strong>Contact rating:</strong></td>
<td>AC: 100VA - 250V/2A max. DC: 50W - 100V/1A max.</td>
</tr>
<tr>
<td><strong>Analogue Output:</strong></td>
<td>Up to 20mA, max 500R or Up to 10V, min 100kohm (other on request)</td>
</tr>
<tr>
<td><strong>Temperature:</strong></td>
<td>-20 to +70°C</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>0.8kgs</td>
</tr>
<tr>
<td><strong>Front protection:</strong></td>
<td>IP21</td>
</tr>
</tbody>
</table>

**MEGGER SAFE**

When auxiliary power is OFF the unit input is automatically protected against “megger” test voltages up to 1.4kVDC, and incorrect measurements caused by the unit’s input impedance are avoided.

**Outputs**

All F versions have an isolated analogue output proportional to meter reading. If output is used for remote meter reading, we recommend 0-1mA for the slave indicator.

**Safety**

When a voltage adapter (ARx or ANx) is used the signal to terminals 4 and 6 on KCM165x is limited to a safe level, avoiding any dangerous voltage exposure to personnel.
The MEGACON policy is one of continuous improvement, consequently equipment supplied may vary in detail from this publication.
**KCM165x**

**Description**

**KCM165E1 & KCM165F1 - KCM165N1 & KCM165NF1**

Start of monitoring has a 30 secs delay. This unit is for marine, offshore, sub-sea and ocean floor use. It has a wide measuring range in order to detect degradation of insulation at its origin. An important feature is the unit’s unique inhibit function, controlled by the Load Distortion and Earth-capacitance Detector (LDED).

The LDED function differentiates between a true (resistive) or a false (capacitive) drop in insulation reading, and will maintain reliable and accurate insulation monitoring even if load switching or a major change in load spread capacitance cause meter indication to drop below set relay trip levels. This situation may occur due to the latent high RC product at the high end part of the measuring range. The LDED will then momentarily inhibit all monitoring functions, freeze operation of meter, lamp display, alarm relays and analogue output for duration of a monitoring irregularity.

The unit will restore normal operation at the moment meter deflection rises above set alarm trip levels. The LDED function has minimum 5 secs detection time for any insulation fault.

Direct connection up to 690V line voltage. Up to 25kV via HV Adaptor ARx or ANx series.

**Output diagram**

[Graph showing mA output vs resistance values]

**Output table (example for 4-20mA)**

<table>
<thead>
<tr>
<th>Value (scale)</th>
<th>mA output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1MΩ</td>
<td>20.00mA</td>
</tr>
<tr>
<td>10MΩ</td>
<td>15.19mA</td>
</tr>
<tr>
<td>100MΩ</td>
<td>12.28mA</td>
</tr>
<tr>
<td>300MΩ</td>
<td>10.57mA</td>
</tr>
<tr>
<td>1GΩ</td>
<td>8.63mA</td>
</tr>
<tr>
<td>3GΩ</td>
<td>6.64mA</td>
</tr>
<tr>
<td>10GΩ</td>
<td>4.93mA</td>
</tr>
<tr>
<td>100GΩ</td>
<td>4.20mA</td>
</tr>
<tr>
<td>Open (&gt;12G)</td>
<td>4.00mA</td>
</tr>
</tbody>
</table>

**Range (slave indicator)**

- Indicates alarm trip zone
- Indicates warning trip zone
- Indicates healthy zone

**High Voltage Adaptors up to 25kVAC for KCM165x series**

- HV Adapter for AC Insulation Guards
- ARx series, up to 14kV Line Voltage live or non-live (standby)
- ANx series, up to 25kV System Voltage live or non-live (Starpoint/Neutral connection only)
- Creates safety barrier from live HT network to LV switchboard
- Limits measuring output signal to safe levels
- No restrictions on distance between adapter and LV switchboard

Voltage Adaptors ARx and ANx are used together with Insulation Guard KCM165x when the monitored line voltage is higher than 690VAC. These adapters are a passive low-pass filter for use in 50, 60 or 400Hz networks, and is potted in polyurethane.

These units includes high inductance reactance modules, connected in a special configuration to avoid DC saturation. These Adapters maintains a high AC suppression of its signal output to very low, safe levels, under all conditions.

**Caution**

Terminal 1 must be disconnected during “megger” test.

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**INSULATION GUARD FOR NON-GROUNDED AC NETWORKS**

**KCM165x**

**Analogue Output**

KCM165HF, KCM165HGF, KCM165GF1, KCM165LF1, KCM165F1 and KCM165NF1 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/P2: 0 - 20mA
- O/P3: 4 - 20mA
- O/P4: N/A
- O/P5: N/A

**Reset / Paralleling Disable Function**

KCM165x has a built-in disable function (available only when DC Aux. Supply is applied). When connecting two or more IT-networks together only one unit can be active, the other(s) must be disabled. When unit is disabled the power led will flash every seconds to indicate that unit is inactive.

Use a potential free contact on terminal 19 and 21 to activate the disable function (after 2 secs). When activated the measuring input terminal 4 will be internally disconnected.

A pulse (60ms-2 Sec) on terminal 19,21 will only reset any latching alarm.

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**Dimensions**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Dimensions for Slave instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KCM165x</strong></td>
<td><strong>DIN 72</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>92 x 92mm</td>
</tr>
<tr>
<td>B</td>
<td>64 x 64mm</td>
</tr>
<tr>
<td>C</td>
<td>64mm</td>
</tr>
</tbody>
</table>

Panel cut-out: Maximum panel thickness 10mm

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