



- Direct connection up to 690V line voltage, up to 6,6kV with HV adapter for both single or three phase systems
- Monitoring during both live and standby conditions
- For use in land, marine, offshore, sub-sea and ocean floor Installations
- Complies with IMCA D 045 Code of Practice
- "Megger" - safe to 1.4kVDC when aux power is OFF
- Immune to earth capacitance and voltage surges
- Analogue output proportional to meter reading
- Optional slave indicator

## Specifications

Auxiliary Supply:	100-120, 200-240, 380-415 or 440-460VAC, 40-70Hz (Fuse 0.5A)
Optional Voltage:	12-24, 48 or 110VDC (Fuse 2A)
Supply tolerance:	± 10%
Power rating:	1,5VA
Analogue Output:	Up to 20mA, max 500R Up to 10V, min 100kohm (other on request)
Temperature:	-20 to +70°C
Weight:	0.5kgs
Front protection:	IP21

## The Ultra-Reliability Concept (Paralleling of Transducers)

To obtain ultimate operational safety multiple MCM163x transducer inputs and outputs can be permanently paralleled.

At any time only ONE transducer should be enabled. The selected transducer is activated by applying auxiliary power to unit. Accidental enabling of more than one transducer will give distorted reading, but will not harm the transducer.

The MCM163x range is designed to comply with specification IMCAD 045 "Code of Practice for the Safe Use of Electricity Under Water" issued by IMCA.

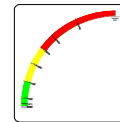
The unit meets IEC60092-504 and the relevant environmental and EMC tests specified in IEC60068/60092 and IEC61000/60533 respectively, to comply with the requirements of the major Classification Societies.

## Application

The digitally controlled MCM163x 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).

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 MCM163x can be connected to each IT-system. The optional slave indicator give at a glance the clear safety message:

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



## General

### IDV MEASURING PRINCIPLE

Insulation is measured between the complete galvanically interconnected AC network and its protective earth. The unit injects a DC voltage signal into 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.

### 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

The unit is supplied with an isolated **analogue output** proportional to insulation level. If output is used for remote meter reading, we recommend 0-1mA for the slave indicator.

### SAFETY

When a voltage adapter (CHx or ANx) is used the signal to terminals 4 and 6 on MCM163x is limited to a safe level, avoiding any dangerous voltage exposure to personnel.

## Description

### MCM163F

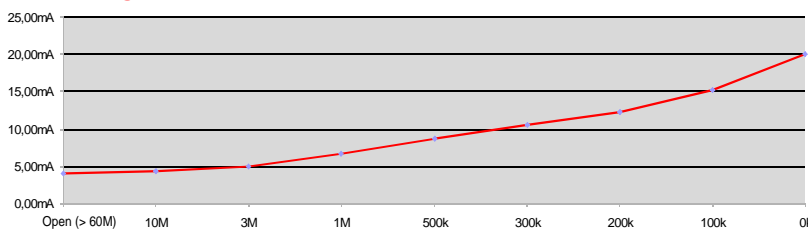
Scale range: 0-10MΩ - ∞ (>60MΩ)

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).

(Recommended for thruster standby monitoring)

Direct connection up to 690V line voltage. Up to 6,6kV via HV adaptor CH163x or AN6,6 series.

## Output diagram

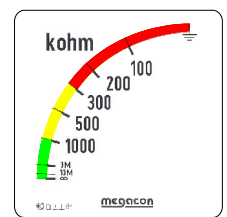


## Output table (example for 4-20mA)

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

Coloured sectors show recommended areas:  
 - Indicates alarm zone  
 - Indicates warning zone  
 - Indicates healthy zone

## Range (slave indicator)



## High Voltage Adaptors up to 6,6kVAC for MCM163F

- HV Adaptor for AC Insulation Transducers
- CH163x series, up to 5000V Line Voltage live or non-live (standby)
- AN6,6 up to 6600V 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 CH163x series and AN6,6 are used for Insulation Transducer MCM163F when the monitored line voltage is higher than 690VAC. These adaptors 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.



CH163/1,4 up to 1.4kVAC



CH163/3,6 up to 3.6kVAC



CH163/5 up to 5kVAC

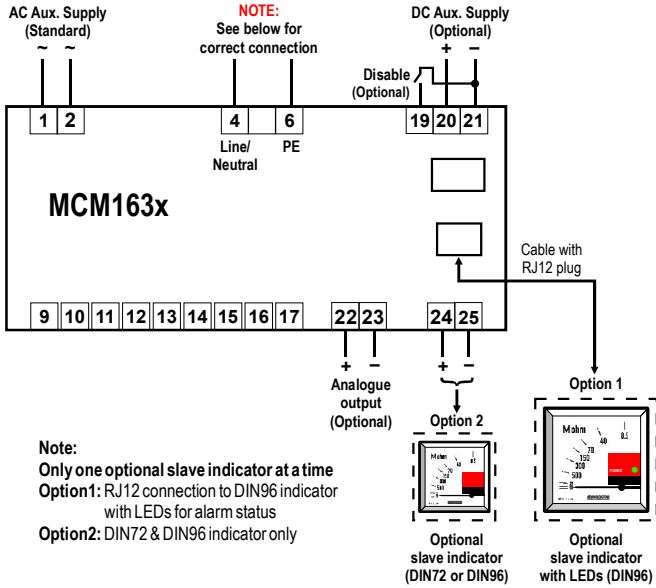


AN6,6 up to 6,6kVAC

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



Connection



Analogue Output

MCM163F have an analogue output proportional to insulation level. (Special outputs are available on request)

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

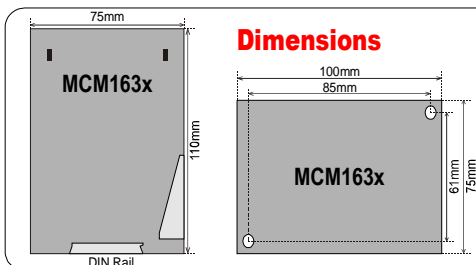
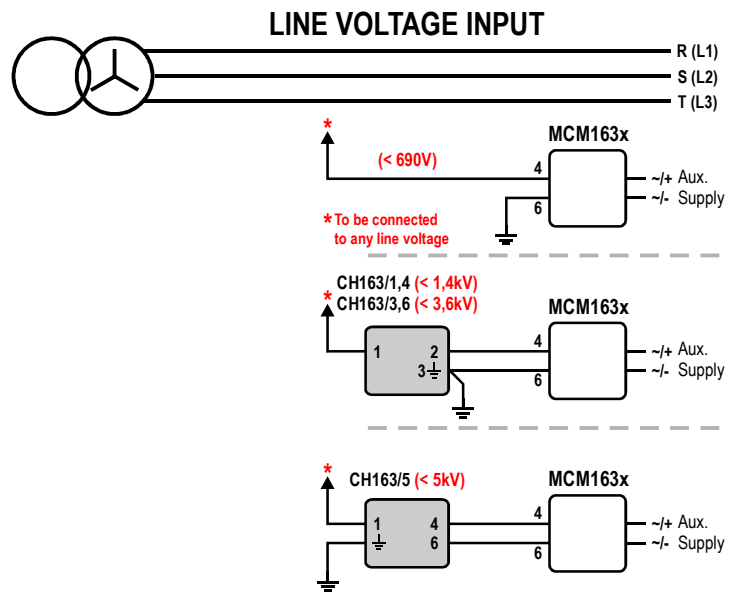
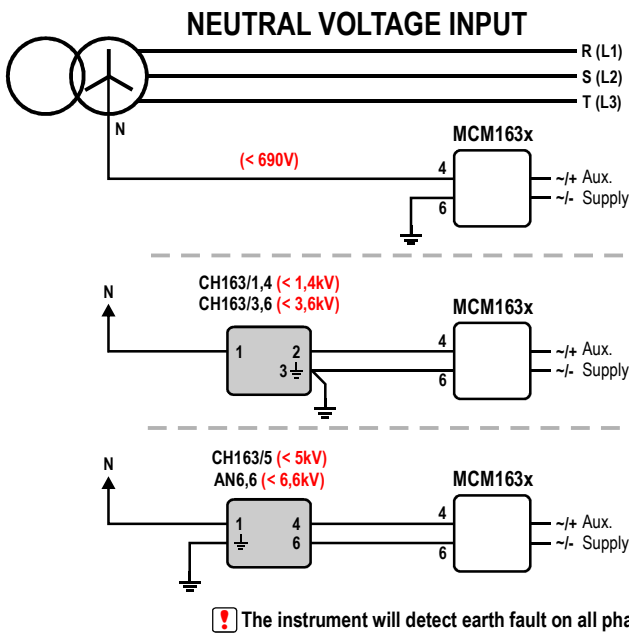
O/P1	0 - 10mA	O/P6	N/A
O/P2	0 - 20mA	O/P7	N/A
O/P3	4 - 20mA	O/P8	0 - 10VDC
O/P4	N/A	O/P9	N/A
O/P5	N/A	O/P10	N/A

Paralleling Disable Function

MCM163F 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 2 seconds to indicate that unit is inactive.

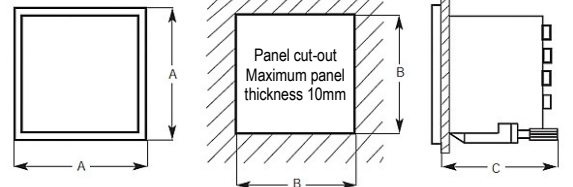
Use a potential free contact on terminal 19 and 21 to activate the disable function (after 2 secs). When activated the measuring input terminal 4 will be internally disconnected.

Connection



Dimensions for Slave instrument

	DIN 72	DIN96
A	72 x 72mm	96 X 96mm
B	68 x 68mm	92 x 92mm
C	64mm	64mm



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ORDERING EXAMPLE:

Type: MCM163F  
 Aux. Supply: 200-240VAC  
 Network Voltage: 3,6kVAC  
 Analogue O/P: (O/P3) 4-20mA  
 Range: 0 - 10Mohm

