



The DC measuring transducers MHIT are the latest generation of transducers for high voltage measurement designed by Microelettrica Scientifica. They are the result of the long experience of Microelettrica in this field with the addition compared to the previous line (MHCO) of the full redundancy of the measuring channel which gives a further level of reliability to the product.

The MHIT are designed and manufactured to allow safe and full isolated HV measurement of DC currents and Voltages.

They find their main application in all the DC Traction Substations (Railways, Tramways and Metro) where, directly connected to the high voltage systems (750V, 1,5kV and 3kV) gives very accurate and safe analogue outputs for measuring and protective purposes.

The MHIT line includes three models:

MHIT-V

for VOLTAGE measurement. Directly connected to the high voltage line up to 6kV through internal voltage divider.

MHIT-I

for CURRENT measurement. Connected to the high voltage line through a dedicated shunt (not supplied).

MHIT-VI

For combined CURRENT & VOLTAGE measurement. connected to the high voltage line up to 6kV through internal voltage divider & through a dedicated shunt (not supplied).

Highlights

- HV Transducer for Current & Voltage measurement.
- Direct Connection up to 6kV.
- Fibre Optic connection between HV transmitter and LV receiver.
- Measuring channel fully redundant.
- Autoranging Multivoltage Power supply (self-powered version available as optional).
- Compatible with traction application standards.

Transmitter Unit

Three different models available, one for each type of transducers (current, voltage and current/voltage).

Directly connected to the High Voltage DC system acquires the input signals by a redundant input channel and transmit them, after comparison and confirmation of validity, to the receiver unit through dedicated Fibre Optic connections.

It has an autoranging multivoltage Power supply.

As option a self powered version is available; in this case the power supply is directly taken from the line voltage through a set of dumping resistors.

Receiver Unit

Two models available, respectively suitable to be connected to the current and to the voltage transmitter by means of a dedicated Fibre Optic connection.

The input signal is converted into 4 linear analogue output signals independently programmable (ie. 0-20/4-20mA etc..). The setting of this unit can be easily done using our MSCom2 software tool.

The receiver is equipped with two output relays: one relay is used for autodiagnostic (it trips in case of interruption of the Fibre Optic channels or internal failure of the receiver unit, including power supply failure or as alarm for measurement discrepancy between the two transmitter channels); the second relay can be programmed as alarm for under/over voltage and/or current level.

Optionally a Front face display and Keyboard panel is available for local measurement and programming.

Fibre Optic Link

Transmitter and Receiver units are connected by means of a Fibre Optic link which guarantee a very high insulation level.

Two Fibre Optic type are available both provided with standard ST connectors:

PLASTIC FIBRE : 62,5/125 μ
GLASS FIBRE : 200 μ HSC

The standard length of the fibre optic connection is 5 meters, other lengths are available on request.

Characteristics Transmitter/Receiver

- Measurement solution : 0.1% V_n / 0.05% Full Scale (2 V_n).
channel (0÷1) I_n - 0.05% I_n / 0.05% Full Scale.
channel (0÷10) I_n - 0.5% I_n / 0.05% Full Scale.
- Accuracy class : 0.2
- Responce time : 200 μ s
- Connection : Fiber optic type 200.230.500 μ HCS (plastic) or 62.5/125 μ (glass)
connection type ST.
Fiber optic standard length 5m (max 1 km with glass fiber).

Transmitter Unit

Common characteristics

- Power supply voltage : 48 (-20%) ÷ 132 (+15%) Vdc (class DC3).
48 (-15%) ÷ 110 (+10%) Vac (class AC2).
- Sampling frequency : 5kHz.
- Enclosure : Material - BMCRF9 protection degree IP55.
- Connection terminals : Bolt type terminal M6 for inputs.
ST for fiber optic.
Screw type 2.5mm² for power supply.
- Power supply consumption : 5 VA



MHIT-TV - Voltage measure - (Directly connected to the High Voltage line via self-contained voltage divider)

- Rated input voltage V_n : (1) 1000Vdc - (2) 2000Vdc - (3) 4000Vdc. (other on request)
- Input Impedance : 22M Ω .
- Measurement dynamic range : (0 ÷ ±2) V_n .

MHIT-TI - Current measure - (Directly connected to the line across a normal measuring shunt)

- Rated input current I_n /mV : (1) 60 mVdc - (2) 80 mVdc - (3) 100 mVdc.
- Measurement dynamic range : (0 ÷ ±10) I_n .

MHIT-TVI - Voltage & Current - (Directly connected to the High Voltage line and a normal measuring shunt)

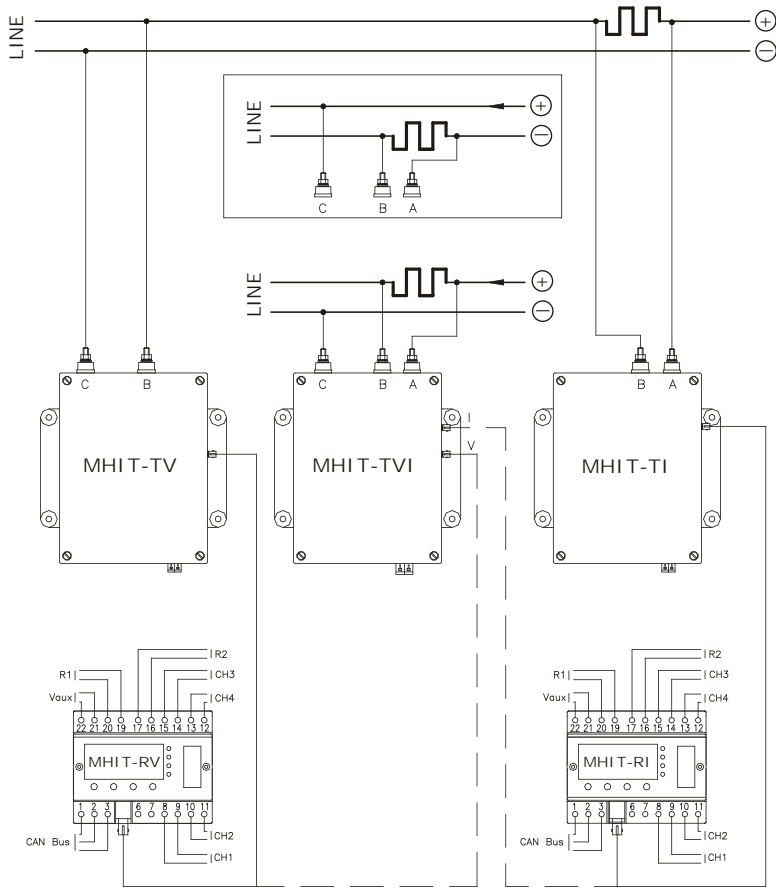
- Rated input voltage V_n : (1) 1000Vdc - (2) 2000Vdc - (3) 4000Vdc. (other on request)
Measurement dynamic range : (0 ÷ ±2) V_n .
- Rated input current I_n /mV : (1) 60 mVdc - (2) 80 mVdc - (3) 100 mVdc.
Measurement dynamic range : (0 ÷ ±10) I_n .

Receiver Unit

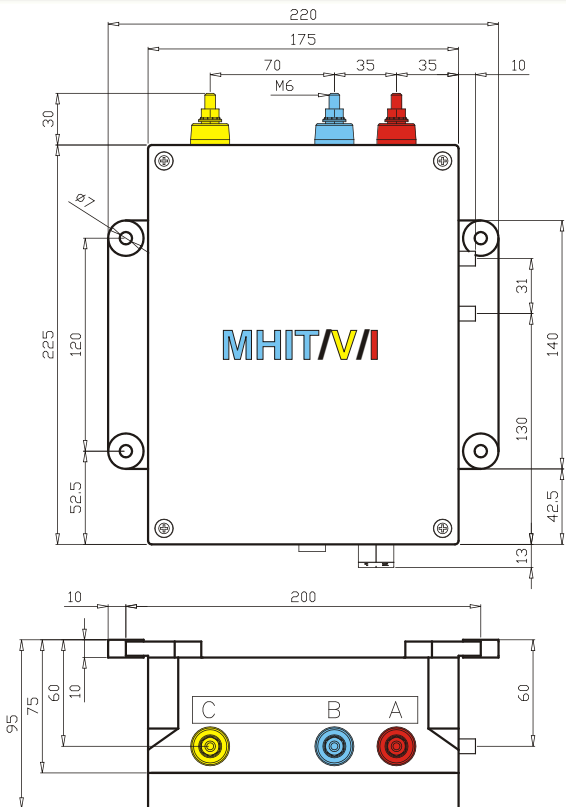
- Power supply voltage : 48 (-20%) ÷ 132 (+15%) Vdc (class DC3).
48 (-15%) ÷ 110 (+10%) Vac (class AC2).
- Measuring input : From fiber optic transmitter MHIT.
- Enclosure : ABS protection degree IP42.
- Connection terminals : Bolt type terminal 2.5mm².
ST for fiber optic.
- Power supply consumption : 7 VA
- Insulation test : 2kV rms for 1 min. power supply/output.
500V between outputs.
- Maximum load on outputs : 500 Ω .
- Power supply consumption : 4 current loop outputs.
Standard output ranges : (0 ÷ 10)mA; (0 ÷ 20)mA; (4 ÷ 20)mA.
- Output relays : rating 6 A; V_n = 250 V
AC resistive switching = 1500VA (400V max)
make = 30 A (peak) 0,5 sec.; break = 0.2 A, 110 Vcc,
L/R = 40 ms (100.000 op.) Mechanical life 10⁶operations



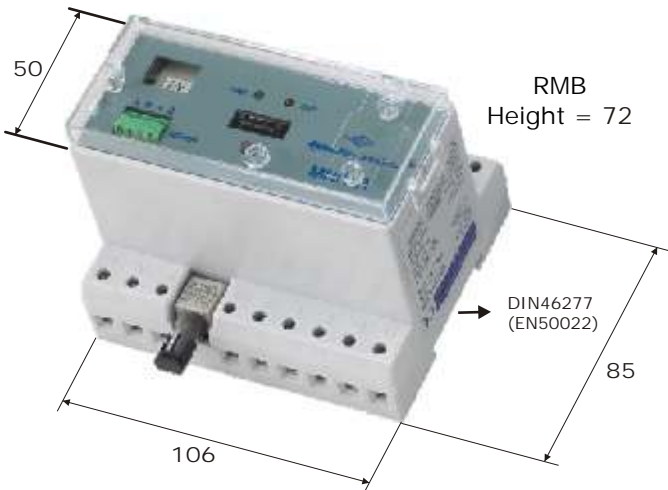
Wiring Diagram



Overall Dimensions (mm)



TRANSPARENT COVER
 Dimensions = 45x108
 Height = 9



Electrical Characteristics & International Standards

REFERENCE STANDARDS CE Directive - EN50123 - IEC60255 - RFI.DMA/IM.LA/SSE.360 - RFI.DMA/IM.LA/STC/SSE.401

■ Dielectric test voltage	IEC 60255-5 EN50123	cat IV - 2kV, 50/60Hz, 1 min. (EN50124-1 cat OV4 /18.5kV)
■ Impulse test voltage	IEC 60255-5 EN50123	cat IV - 5kV, 50/60Hz, 1 min. (EN50124-1 cat OV4 / 40kV)

Environmental Standard Reference

■ Operation ambient temperature	EN60870-2-2	class C1 (3k5)	-10°C / +55°C -25°C / +70°C	(powered) (not powered)
■ Environmental testing (Cold)	IEC60068-2-1		-10°C / 16h -25°C / 16h	(powered) (not powered)
(Dry heat)	IEC60068-2-2		+55°C; UR 35%; 16h +70°C; UR 35%; 16h	(powered) (not powered)
(Change of temperature)	IEC60068-2-14		+55°C; -10°C; 3h +70°C; -25°C; 3h	(powered) (not powered)
(Damp heat, steady state)	IEC60068-2-78		+40°C; UR=95%; 96h	(powered)
■ Vibration tests	EN60255-21-1	Class 2	10-500Hz; 2g	
■ Shock and bump tests	EN60255-21-2	Class 1	10g-15g	
■ Seismic test	EN60255-21-3	Class 2	1g(xy), 2g(z)	

CE EMC Compatibility (EN50081-2 - EN50082-2)

<i>Description</i>		<i>Level</i>	<i>Value</i>	<i>Accep.</i>
■ Electromagnetic radiated emission	EN55011 IEC61000-6-4	class A	30-1000MHz (tab 1 EN50081-2)	A
■ Electromagnetic conducted emission	EN55022 IEC61000-6-4	class B	0.15-30 MHz 10V (tab 1 EN50081-2)	A
■ Radiated, radio-frequency, electromagnetic field immunity test	EN60870-2-1 A.5.1 IEC61000-4-3 +A1	level 3	80-1000MHz 80%AM 10V/m 800-960MHz; 1-2.7GHz - 1KHz	A
■ Electric discharge immunity test	EN60870-2-1 A.3.1 IEC61000-4-2	level 3	6kV contact - 8kv air	B
■ Power frequency magnetic field immunity test	EN60870-2-1 A.4.1 IEC61000-4-8	level 5	100A/m continuous 50/60Hz (1000A-1s)	A
■ Immunity to conducted disturbance, inducted by radio-frequency fields	EN50082-2 IEC61000-4-6	level 3	(150kHz-80MHz) 80%AM 1kHz sinwave 10Vrms	A
■ Damped oscillatory magnetic field immunity test	EN60870-2-1 A.4.3 IEC61000-4-10	level 3	30A/m 0.1-1MHz	A
■ Electrical fast transient/burst immunity test	EN60870-2-1 A.2.3 IEC61000-4-4	level 3	2kV(m.c.) (power supply) 1kV(m.c.) (signal)	B
■ Oscillatory waves immunity test (ring wave)	EN60870-2-1 A.2.5 IEC61000-4-12	level 2	1kV(m.c.) (power supply) 0.5kV(m.d.) (signal)	A
■ Power supply and electromagnetic compatibility	EN60870-2-1	class DC3 class AC2	+/-15%	A
■ Surge immunity test	EN60870-2-1 EN60870-2-1 A.2.2 IEC61000-4-5	VR3 level 3	5% 8/20µs - 2kV(m.c.) - 1kV(m.d.)	A B
■ Voltage dips, short interruptions and voltage variations immunity tests	EN60870-2-1 A.1.5 IEC61000-4-11 EN60870-2-1 A.1.4 IEC61000-4-11		20ms (%U=100)	A A



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