PROTECTION RELAYS

MHIT

D.C. measuring converter

- Converter for D.C. Current and/or Voltage measurement.
- Direct connection to D.C. mains rating up to 4 kVcc.
- Fully isolated multi-voltage power suppy.
- Fiber optic connection between HV transducer and LV reciving unit.
- Measurement channel fully diagnosed

The technical specifications reported are not binding and they shouldbeagreedin the related-contract.

General Characteristics
The transducer MHCO provide a measurement of current or voltage fully isolated and safe.

The transducer includes three components: Transmitter, Riceiver, Fiber Optic.

Transmitter
The Transmitter, connected to the system, acquires the inputs and througth a fiber optic transmits it to the receiver.

All versions accept a multi-voltage power supply. The test voltage isolation between inputs and power supply is equal to 18.5kV 50Hz 1min.

MICROELETTRICA

Voltage Transmitter	
MHIT-TV	Converter for Voltage measurement direct connection to D.C. line up to 4000V (voltage divider inside)
Current Transmitter	
MHIT-TI	Transmitter for measuring current, directly connected to the high voltage line through normal shunt (input 60-80-100mV).
Current/Voltage Transmitter	
MHIT-TVI	Transmitter current and voltage in a single unit directly connected to the high voltage line (max 4000Vcc) through the shunt.

Receiver

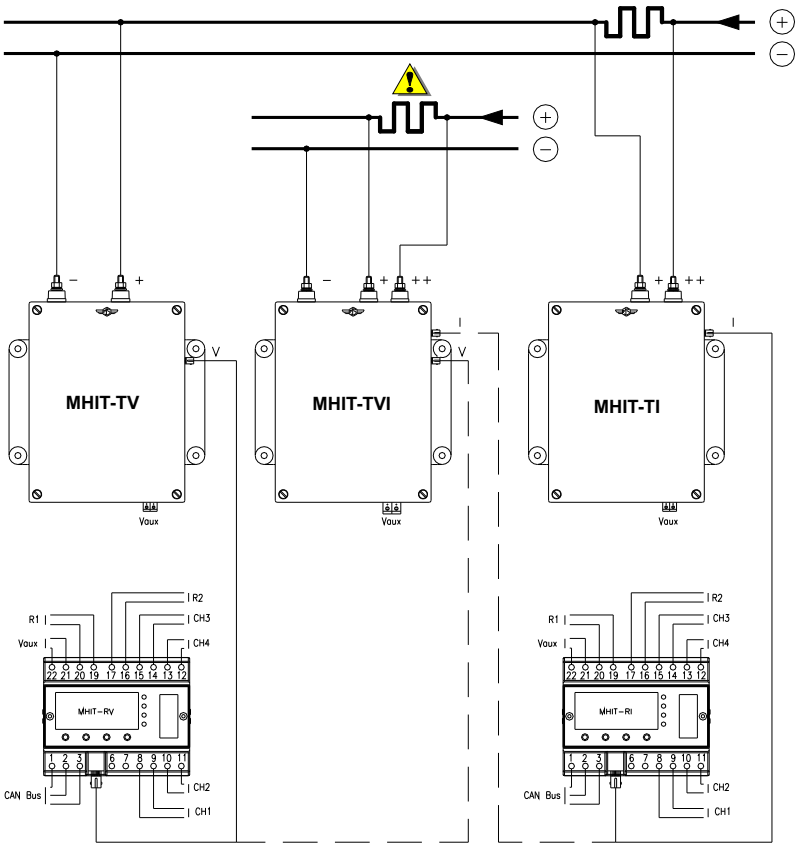
The Receiver connected via optical fiber to the transmitter has four configurable linear analog outputs, one relay output for alarm and internal fault or lack power supply and one programmable output relay. As option a panel for display the acquired measurements and parameterization of the device.

Current and Voltage Receiver	
MHIT-RV	voltage measurements
MHIT-RI	current measurements

Fiber Optic

The optical fiber used for the connection between the transmitter and receiver (equipped with ST connectors) must have the following characteristics: Plastic: 200u HCS - Glass: 62.5/125
The standard length of the optical fiber is 5 meters. (other lengths available on request).

Wiring Diagram - Standard version with external auxiliary power supply



N.B. : STANDARD VERSION SHUNT ON POSITIVE

Three transmitter versions are available: current, voltage or current/voltage measures

Characteristics Transmitter (MHIT-T...)	
Power supply voltage MHIT-TV/ MHIT-TI	48 (-20%) ÷ 132 (+15%) Vcc (class DC3) 48 (-15%) ÷ 110 (+10%) Vca (class AC2)
Outputs	Fiber Optic type 200.230.500 HCS (plastic) or 62.5/125 (glass) Connection type ST. Fiber Optic standard length 5m (max. 1Km with glass)
Sampling frequency	5 kHz
Enclosure	Material: BMCRF9 protection degree IP44
Connection terminals	Bolt type terminals (M6) for inputs; ST for the F.O. ; Screw type 4 mm2 for Power Supply
Power supply consumption	≤5VA
MHIT-TV - Directly connected to the H.V. line via internal voltage divider	
Rated input voltage	(1) 1000 Vcc; (2) 2000 Vcc; (3) 4000 Vcc (Other values on request)
Input impedance	>22 MΩ
Measurement range	(0 -ä- ±2)Vn
MHIT-TI - Directly connected to the H.V. line across a normal measuring shunt	
Rated input current	(1) 60 mVcc ; (2) 80 mVcc ; (3) 100 mVcc (Other values on request)
Measurement range	(0 -ä- ±10)In
MHIT-TVI - Directly connected to the H.V. line and across a normal measuring shunt (on positive).	
Rated input voltage	(1) 1000 Vcc; (2) 2000 Vcc; (3) 4000 Vcc (Other values on request)
Input impedance	>22 MΩ
Measurement range	(0 -ä- ±2)Vn
Rated input current	(1) 60 mVcc ; (2) 80 mVcc ; (3) 100 mVcc (Other values on request)
Measurement range	(0 -ä- ±10)In
Characteristics of transfer Transmitter / Receiver	
Measurement resolution	0.1% Vn / 0.05% F.S. for voltage converter (2Vn) 0.05% In / 0.05% F.S. for current converter (channels 0...1xIn) 0.5% In / 0.05% F.S. for current converter (channels 0...10xIn)
Class	0.2
Reponse time	200 µsec.

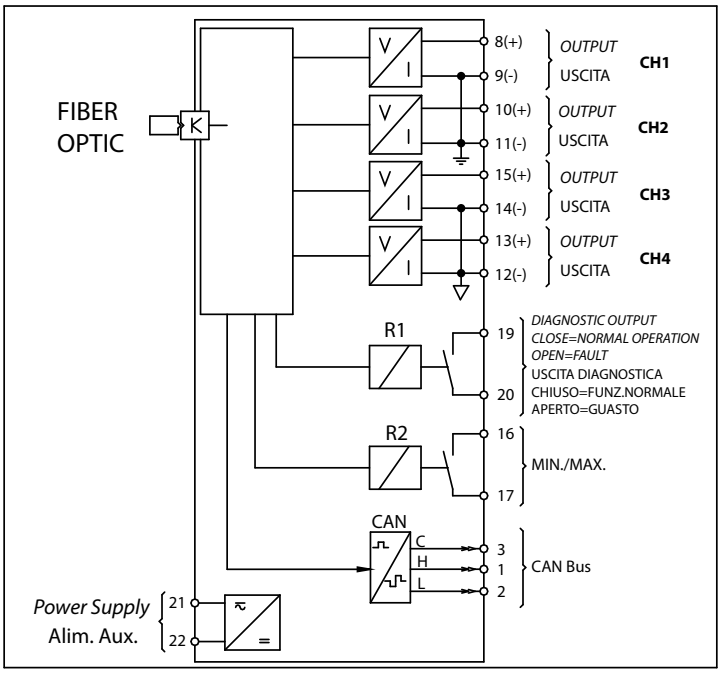
Two receiver models are avaiable, one to be connected to the voltage transmitter and the other to be connected to che current transmitter. It is availabe display unit for measurement reading and settings. The unit have two output relays:

- R1 - normally energized Diagnostics (interruption fiber optic, lack auxiliary power supply, transmitter anomaly).
- R2 - programmable threshold voltage/current, through the communications software MSCom2.

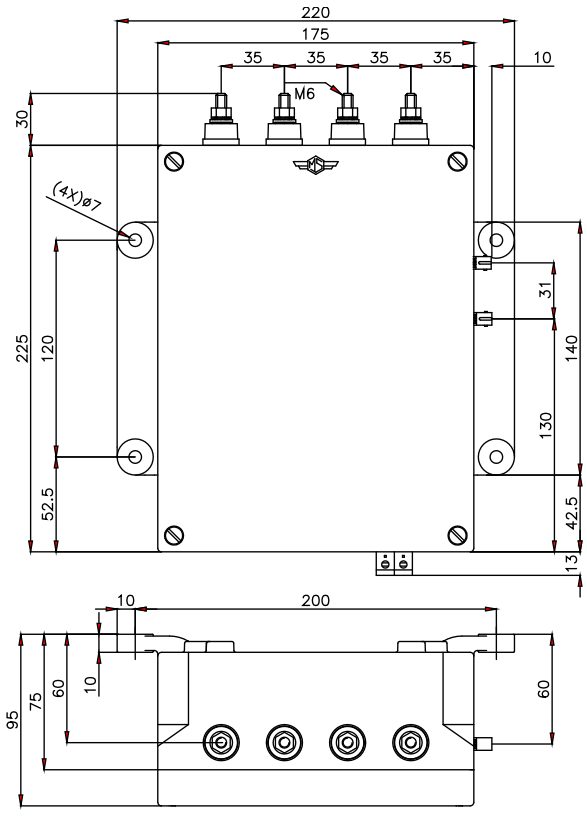
Receiver unit characteristics (MHIT-R...)	
Power Supply Consumption	□ 7VA
Power supply voltage	48 (-20%) --- 132 (+15%) Vcc (class DC3) 48 (-15%) --- 110 (+10%) Vca (class AC2)
Input	Fiber Optic
Output	4 current loops (configurable) Range standard : (0 --- 20)mA ; (4 --- 20)mA ; (0 --- 10)mA
Maximun analog burder	500Ω
Enclosure	ABS protection degree IP42
Insulation	2kV rms for 1 min. between power supply / output 500V between outputs groups
Connections terminals	Bolt type terminals (2.5 mmq) - ST for Fiber Optic

Leds and output relays			
	Fiber optic operation and Vaux avaiable	Interrupted fiber optic (*) and Vaux availble	Vaux not avaiable
Green Led	ON	ON	OFF
Red Led	Threshold alarm	Flashing	OFF
R1 (Diagnostic)	Energized (close contact)	Not energized (open contact)	Not energized (open contact)
R2 (**)	Threshold alarm - Energized (close contact)		Not energized (open contact)

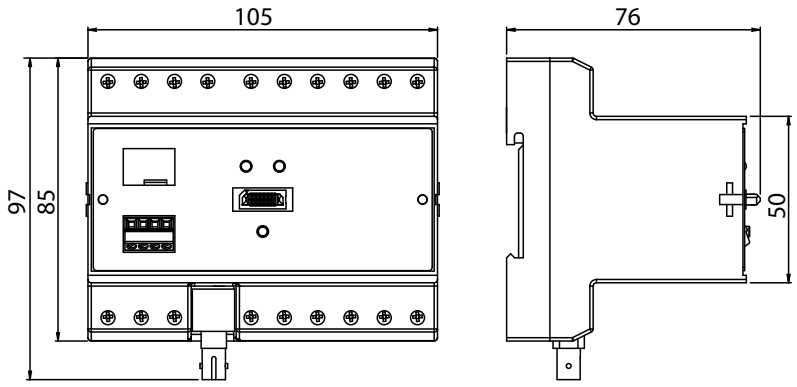
(*) or shunt broken in the current version
(**) the threshold trip level can be set by software "MSCom2"., the threshold is an absolute value.



Overall Dimensions - Transmitter (mm)



Overall Dimensions - Receiver (mm)



REFERENCE STANDARD CE Directive - EN50123 - IEC60255 - RFI.DMA/IM.LA/SSE.360		
Dielectric test voltage	IEC60255-5	cat IV - 2kV
	EN50123	(EN50124-1 cat OV4 - 18.5kV)
Impulse test voltage	IEC60255-5	cat IV - 5kV
	EN50123	(EN50124-1 cat OV4 - 40kV)

Enviromental Rif.Std. (IEC 60068)				
Operation ambient temperature		EN60870-2-2	class C1 (3k5)	-10°C / +55 C
Environmental testing	(Cold) (Dry heat) (Change of temperature) (Damp heat, steady state)	IEC60068-2-1 IEC60068-2-2 IEC60068-2-14 IEC60068-2-3		-10°C ; 16h +55°C ; U.R.<=35%; 16h +55°C ; -10°C ; 3h +40°C ; U.R.<=93%; 96h
Resistance to vibration		IEC60255-21-1	class 2	10-500 Hz ; 2 g
Resistance to vibration and shock (bump-shock)		EN50123	class 1	10 g - 15 g
Sismatic stress resistance			class 2	1 g (xy), 2 g (z)

CE EMC Compatibility				
Electromagnetic emission	EN55011		30-1000MHz (tab1 EN50081-2)	A
Conducted disturbances immunity test	EN55022	class B	0.15-30 MHz (tab1 EN50081-2)	10V A
Radiated electromagnetic field immunity test	EN60870-2-1 A.5.1 → IEC61000-4-3 EN50082-2 → EN50140, EN50204 EN50082-2 → ENV50140	level 3 level 3 level 3	80-1000MHz 80%AM 900MHz/200Hz	10V/m B 10V/m A
Electrostatic discharge test	EN60870-2-1 A.3.1 → IEC61000-4-2	level 3	6kV contatto / 8kV aria	B
Power frequency magnetic test	EN60870-2-1 A.4.1 → IEC61000-4-8	level 5	continui 100 A/m	50/60Hz A
Conducted disturbances immunity test	EN50082-2 → IEC61000-4-6	level 3	(80 ±5)% AM1 kHz sinwave	A
Damped oscillatory magnetic field	EN60870-2-1 A.4.3 → IEC61000-4-10	level 3	30 A/m, 0.1÷1 MHz	
Electrical fast transient/burst (Fast Trasient)	EN60870-2-1 A.2.3 → IEC61000-4-4	level 3	2kV (m.c.)	B
Dumped Oscillatory waves	EN60870-2-1 A.2.5 → IEC61000-4-1	level 3	1kV (m.c.)	
Power supply tollerance	IEC60870-2-1	class DC3 class AC2		
Residual power supply	EN60870-2-1	VR3	≤ 5%	
Surge immunity test	EN60870-2-1 A.2.2 → IEC61000-4-5	level 3	8/20µs 2kV (m.c.)	B
Voltage interruptions	EN60870-2-1 A.1.5 → IEC61000-4-11		20ms	
Voltage ripple	EN60870-2-1 A.1.4 → IEC61000-4-11			A=B

Characteristics	
Accuracy at reference value of influencing factors	Class 0.2
Average power supply consumption TX	5VA
Average power supply consumption RX	7VA
Output relay	rating 6 A; Vn = 250 V A.C. 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.) – Meccanichal life 10^6 op

Voltage Transmitter - Order Code : MHIT-TV - 2	
MHIT-TV	2
	Rated Input Voltage
	1 = 1000 Vcc
	2 = 2000 Vcc
	3 = 4000 Vcc
	4 = ____ Vcc (specifiy value)

Current transmitter - Order Code : MHIT-TI - 2-2		
MHIT-TI	2	Measurement range
	Rated Input Voltage	2
	1 = 60 mVcc	1 = 1x
	2 = 80 mVcc	2 = 10x(*)
	3 = 100 mVcc	
	4 = ____ mVcc (specifiy value)	

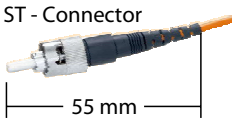
Voltage/Current Transmitter - Order Code : MHIT-TVI - 3-2-1			
MHIT-TVI	3	2	1
	Rated Input Voltage	Rated Input Current	Measurement range
	1 = 1000 Vcc	1 = 60 mVcc	1 = 1x
	2 = 2000 Vcc	2 = 80 mVcc	2 = 10x(*)
	3 = 4000 Vcc	3 = 100 mVcc	
	4 = ____ Vcc (specifiy value)	4 = ____ mVcc (specifiy value)	

Voltage Receiver - Order Code : MHIT-RV - 1-2-1-3				
MHIT-TVI	1	2	1	3
	Channel 1 (CH1)	Channel 2 (CH2)	Channel 3 (CH3)	Channel 4 (CH4)
	1 = (0 ÷ 20)mA(*)	1 = (0 ÷ 20)mA(*)	1 = (0 ÷ 20)mA	1 = (0 ÷ 20)mA
	2 = (4 ÷ 20)mA	2 = (4 ÷ 20)mA	2 = (4 ÷ 20)mA(*)	2 = (4 ÷ 20)mA(*)
	3 = (0 ÷ 10)mA	3 = (0 ÷ 10)mA	3 = (0 ÷ 10)mA	3 = (0 ÷ 10)mA

Current Receiver - Order Code : MHIT-RI - 1-2-1-3-1					
MHIT-RI	1	2	1	3	1
	Channel 1 (CH1)	Channel 2 (CH2)	Channel 3 (CH3)	Channel 4 (CH4)	Measurement range
	1 = (0 ÷ 20)mA(*)	1 = (0 ÷ 20)mA(*)	1 = (0 ÷ 20)mA	1 = (0 ÷ 20)mA	1 = 1x
	2 = (4 ÷ 20)mA	2 = (4 ÷ 20)mA	2 = (4 ÷ 20)mA(*)	2 = (4 ÷ 20)mA(*)	2 = 10x(*)
	3 = (0 ÷ 10)mA	3 = (0 ÷ 10)mA	3 = (0 ÷ 10)mA	3 = (0 ÷ 10)mA	

(*) Default

Optic Fiber - Order Code : MHIT-FO - 1	
MHIT-FO	1
	Fibra Ottica
	1 = 5 mt (standard)
	2 = _____mt (specifiy length)



The technical specifications reported are not binding and they should be agreed in the contract.

For further technical information on our products visit www.microelettrica.com

Microelettrica Scientifica S.p.A.

20090 Buccinasco (MI) , Via Lucania 2, Italy
Tel.: +39 02 575731
E-mail: info@microelettrica.com
www.microelettrica.com

KNORR-BREMSE
SELECTRON
NEW YORK AIR BRAKE
KIEPE ELECTRIC
IFE
EVAC
MERAK
ZELISKO
MICROELETTRICA
RAILSERVICES