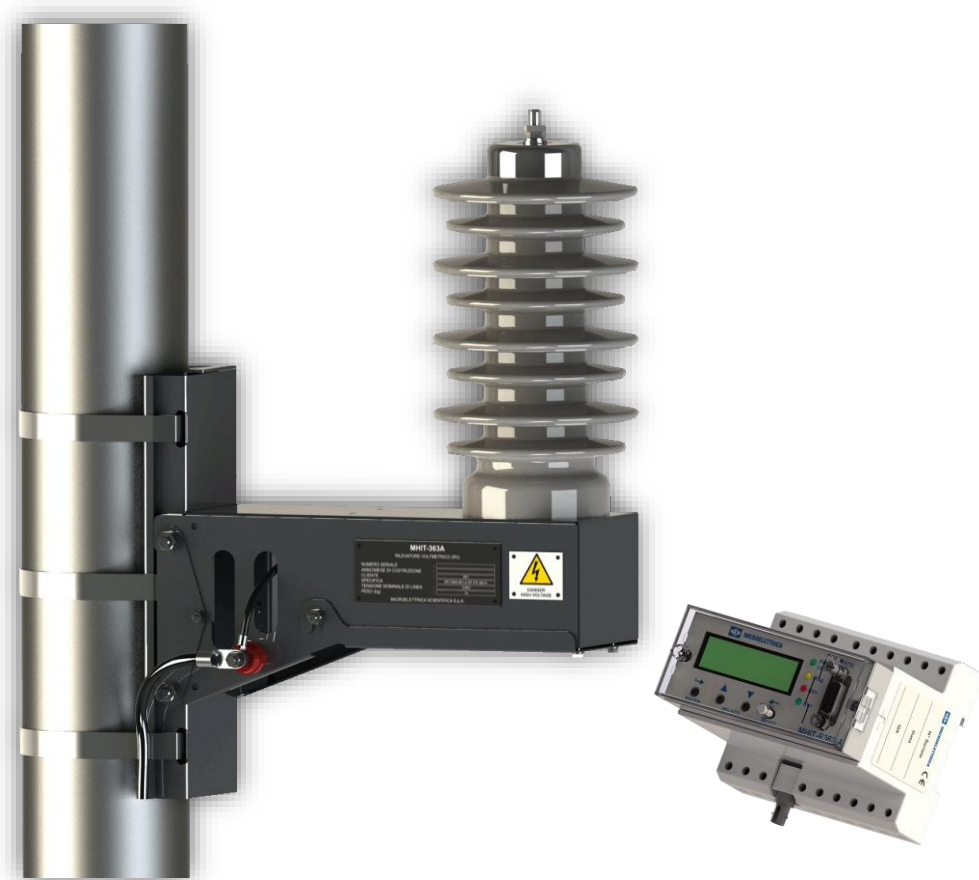


Voltage detector system
For protection and monitoring
Of 3kVdc traction line

TYPE

"MHIT-363A"

OPERATION MANUAL



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1. General norms

1.1 - Storage and Transportation

Must comply with the environmental conditions stated in the product's specification or by the applicable IEC standards.

1.2 - Installation

Must be properly made and in compliance with the operational ambient conditions stated by the Manufacturer.

1.3 - Electrical Connection

Must be made strictly according to the wiring diagram supplied with the Product, to its electrical characteristics and in compliance with the applicable standards particularly with reference to human safety.

1.4 - Measuring Inputs and Power Supply

Carefully check that the value of input quantities and power supply voltage are proper and within the permissible variation limits.

1.5 - Outputs Loading

Must be compatible with their declared performance.

1.6 - Protection Earthling

When earthling is required, carefully check its effectiveness.

1.8 - Safety Protection

Carefully check that all safety means are correctly mounted, apply proper seals where required and periodically check their integrity.

1.9 - Handling

Notwithstanding the highest practicable protection means used in designing M.S. electronic circuits, the electronic components and semiconductor devices mounted on the modules can be seriously damaged by electrostatic voltage discharge which can be experienced when handling the modules.

The damage caused by electrostatic discharge may not be immediately apparent, but the design reliability and the long life of the product will have been reduced. The electronic circuits produced by M.S. are completely safe from electrostatic discharge (8 kV IEC 255.22.2) when housed in their case; dismantling the modules without proper cautions expose them to the risk of damage.

1.10 - Maintenance

Make reference to the instruction manual of the Manufacturer; maintenance must be carried-out by specially trained people and in strict conformity with the safety regulations.

2. General characteristics

Voltage detector system "MHIT-363A", is installed to give support to supervision system, in order to protect the contact line (voltage protection) detecting if the contact line voltage in the section where the device is installed, goes below the set threshold.

Voltage detector system "MHIT-363A", acquires the voltage trend of contact line, allowing the monitoring in case of over voltages, overloads, and transient due to short-circuit.

The system is composed by two parts: transmitter and receiver, connected by fibre optic.

2.1 - Transmitter - MHIT-T363A

Transmitter HV "MHIT-T363A" is installed with an adapter on contact line pole.

The device is composed by an insulator/voltage divider, and one acquisition unit of the contact line voltage value, measurement is transmitted by fibre optic to the receiver unit.

Transmitter HV is directly fed by the 4kVdc of contact line.

2.2 - Receiver - MHIT-R363A

Receiver "MHIT-R363A" is typically installed in SCADA area.

The device receives the voltage value from transmitter unit, compares it with the threshold and sends the voltage presence signalization.

2.3 - Connection between transmitter and receiver

Connection between transmitter "MHIT-T363A" and receiver "MHIT-R363A" is done with fibre optic.

2.3.1 - Fibre optic

Optical cable (double, one is spare) of connection between the two units is provided with a length of 5m (other lengths are optional) complete with ST connector.

Multimode fibre optic grade index 62.5/125µ

Attenuation $\leq 3,5\text{dB/km}$

bandwidth $\geq 160\text{MHz/km}$

2.3.1.1 - Connector

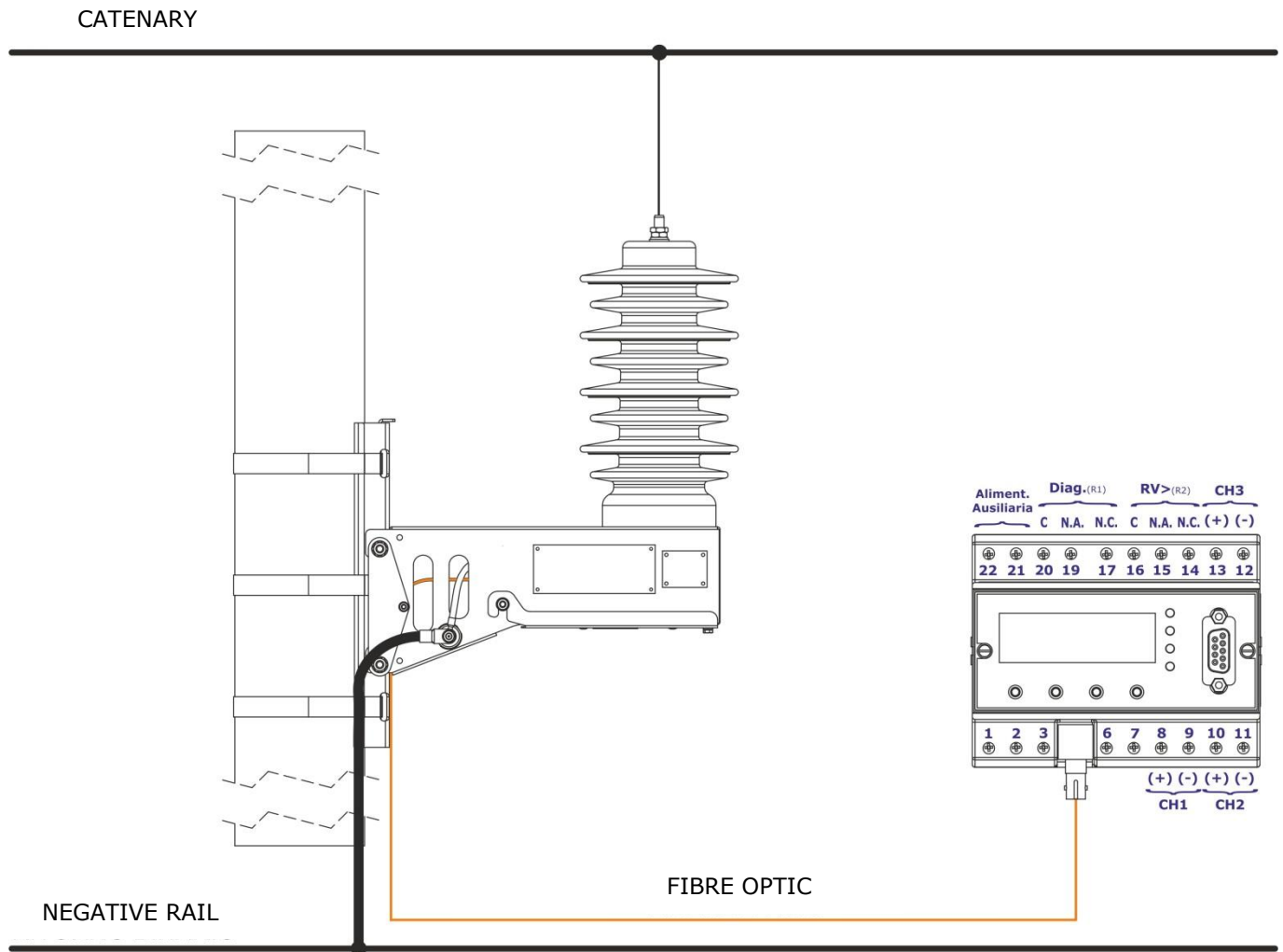
Connectors for connection between transmitter, receiver and on the fibre optic, are equipped with protection cap, that must be removed before making the connection, and preserved in order to be applied in case of unit maintenance.

Absence of the cap for long period can damage quality of the communication.

2.3.1.2 - Bender radius

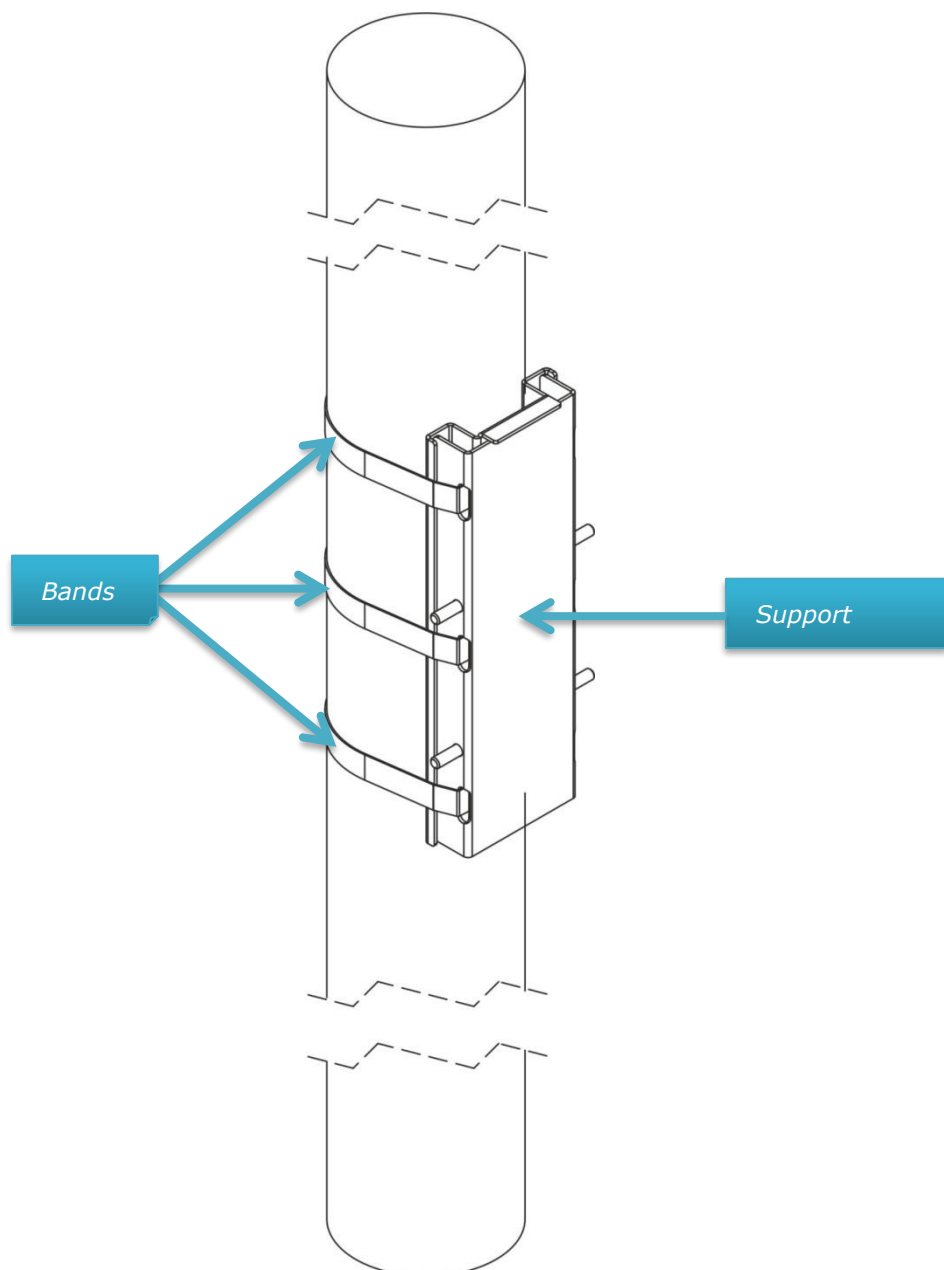
During the installation is necessary to have care about the minimum bender radius, that cannot be lower than 60mm. A lower bender can cause fibre optic damage, and increase the attenuation, up to and overage value.

4. Connection scheme



5.1 – Support pole installation

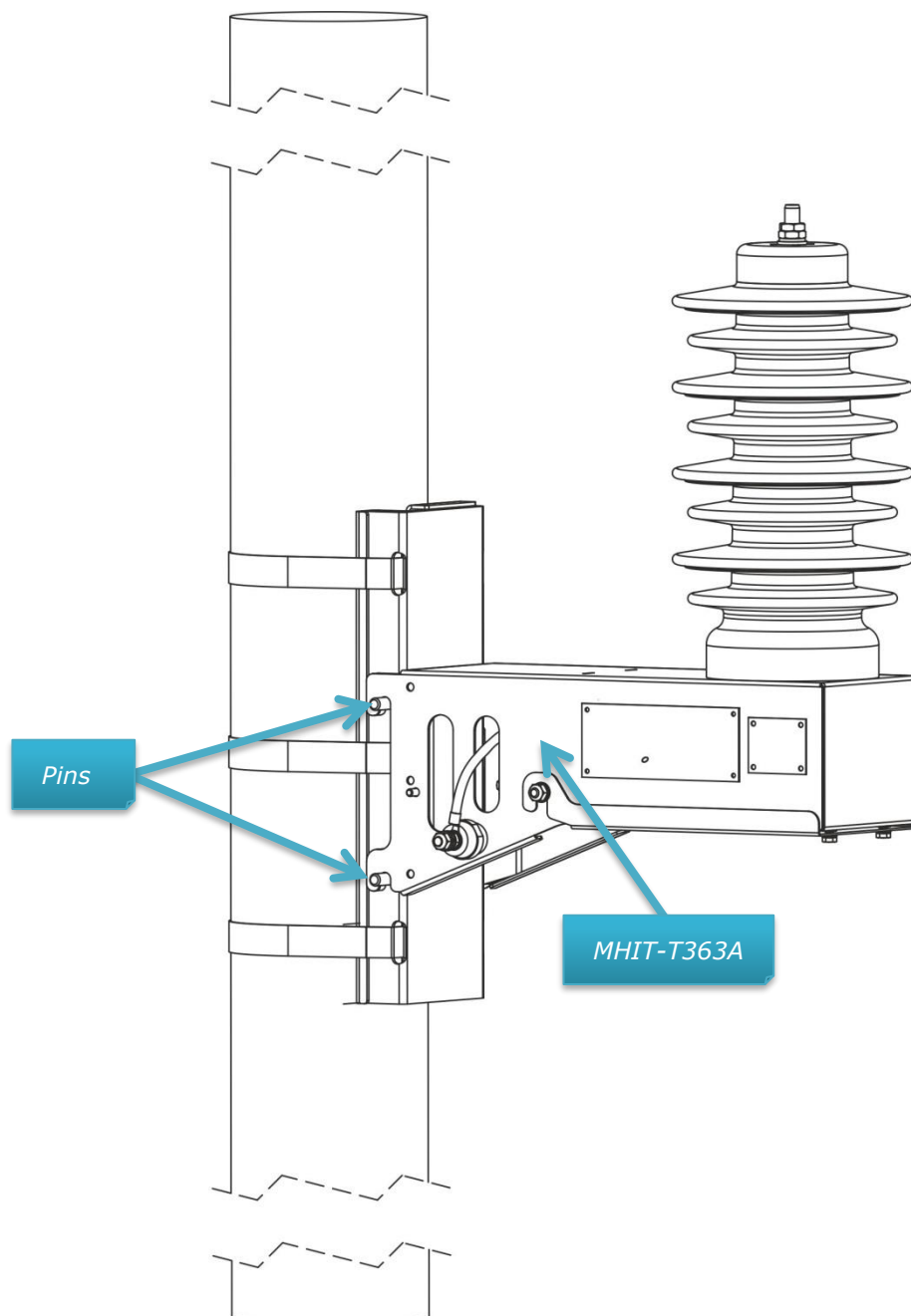
Mounting the transmitter "MHIT-T363A" at the pole is made by stainless steel bands.
The bands and its clamping device are not provided.
support weight is 4 kg



5.2 – Transmitter installation

Mounting the transmitter "MHIT-T363A" at the pole is done fixing the four pins on the at the pole support.

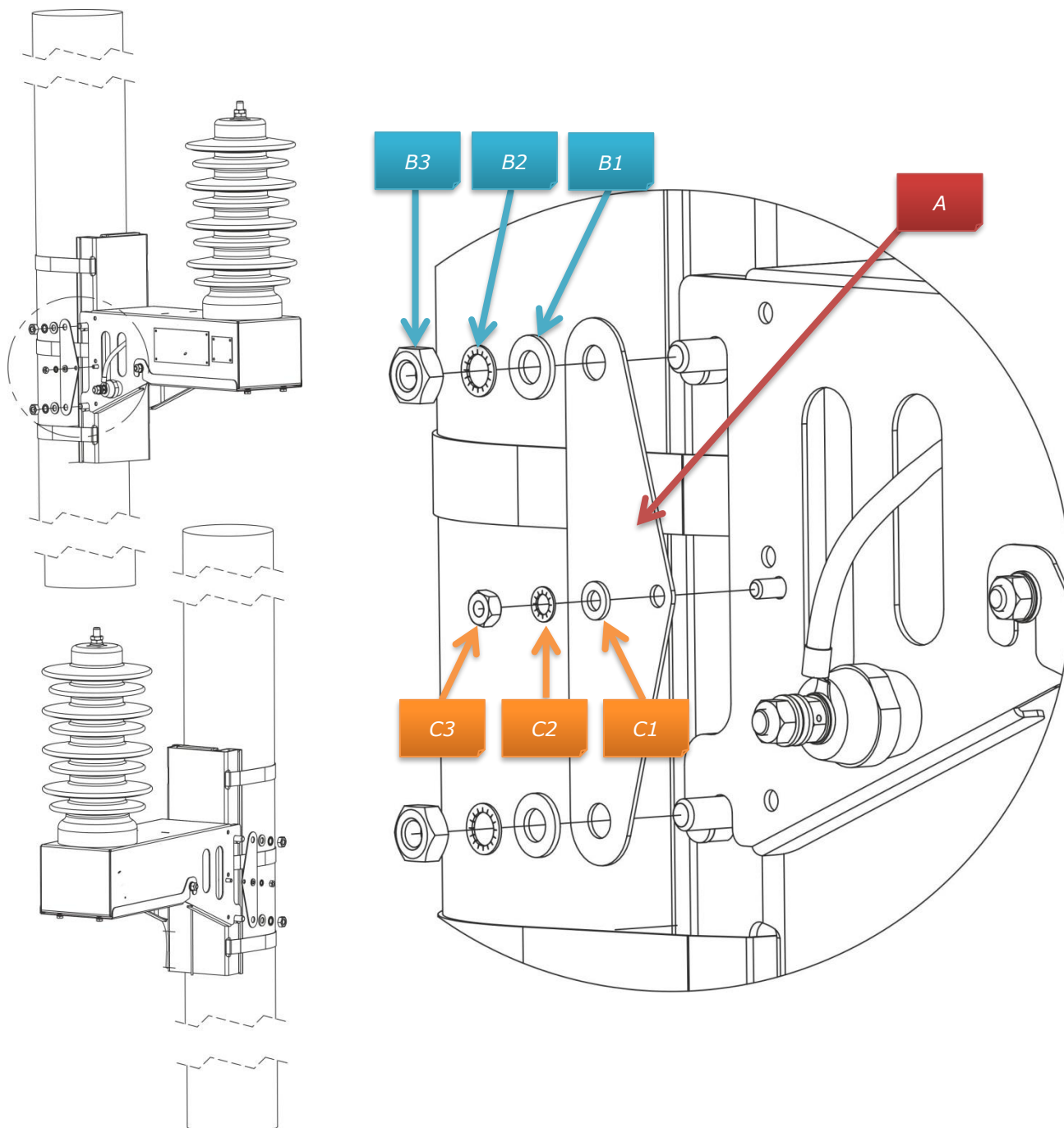
Transmitter weight is 15 kg.



5.3 – Transmitter fixing at the support

Transmitter fixing is done through the assembly of the supplied security plates on the left and right side (see drawing).

	N°2	Security plates		Stainless steel	A
	N°4	Flat ring	M10	Stainless steel	B1
	N°4	Grower ring	M10	Stainless steel	B2
	N°4	Nut	M10	Stainless steel	B3
	N°2	Flat ring	M6	Stainless steel	C1
	N°2	Grower ring	M6	Stainless steel	C2
	N°2	Nut	M6	Stainless steel	C3

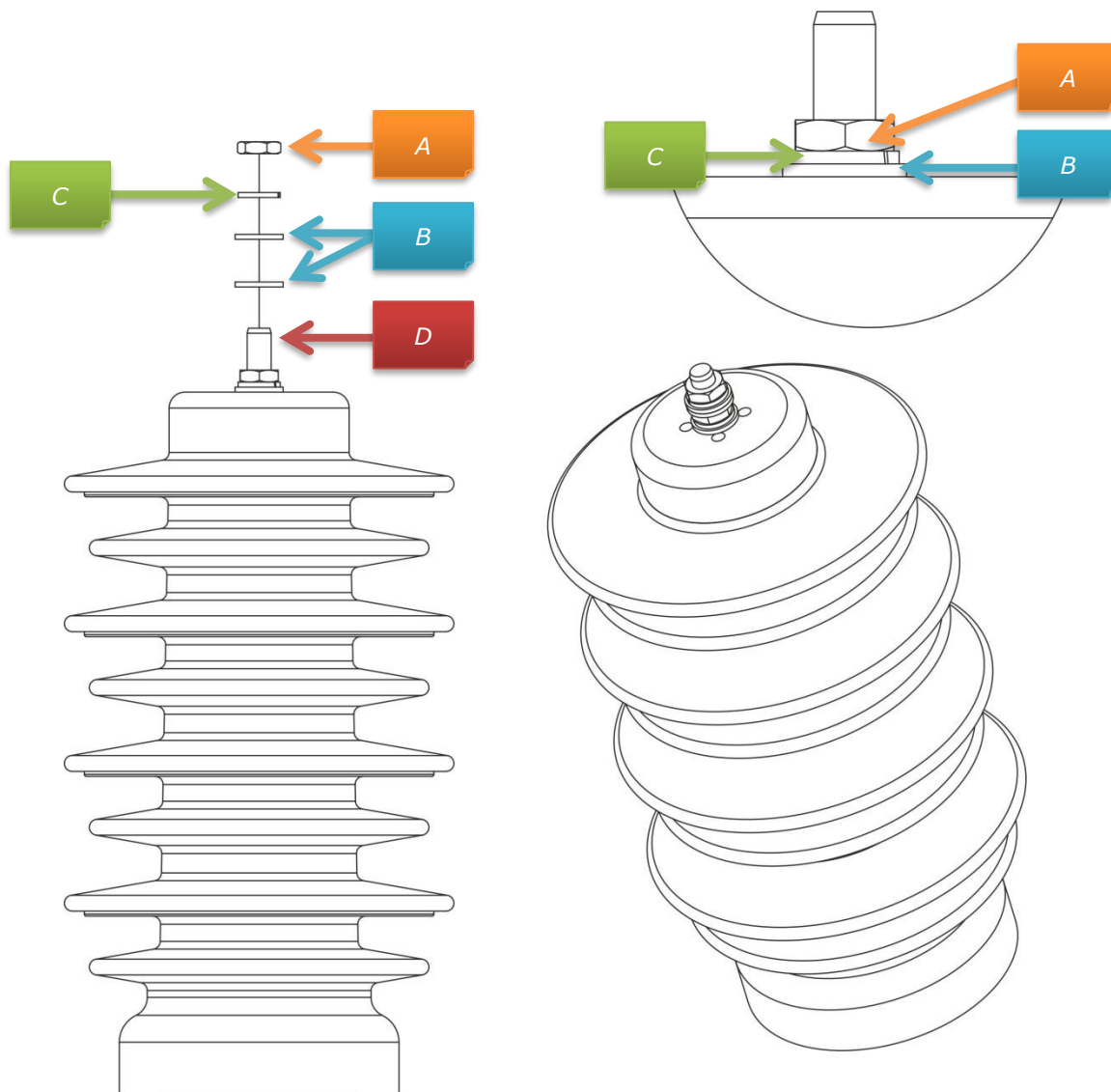


5.4 – Connection between transmitter and contact line

Connection between transmitter "MHIT-T363A" and contact line is done through the isolator/Voltage divider.

The conductor is fixed to the stainless-steel isolator/voltage divider using the bolt "D", with its nut "A" "B" and "C" grower ring.

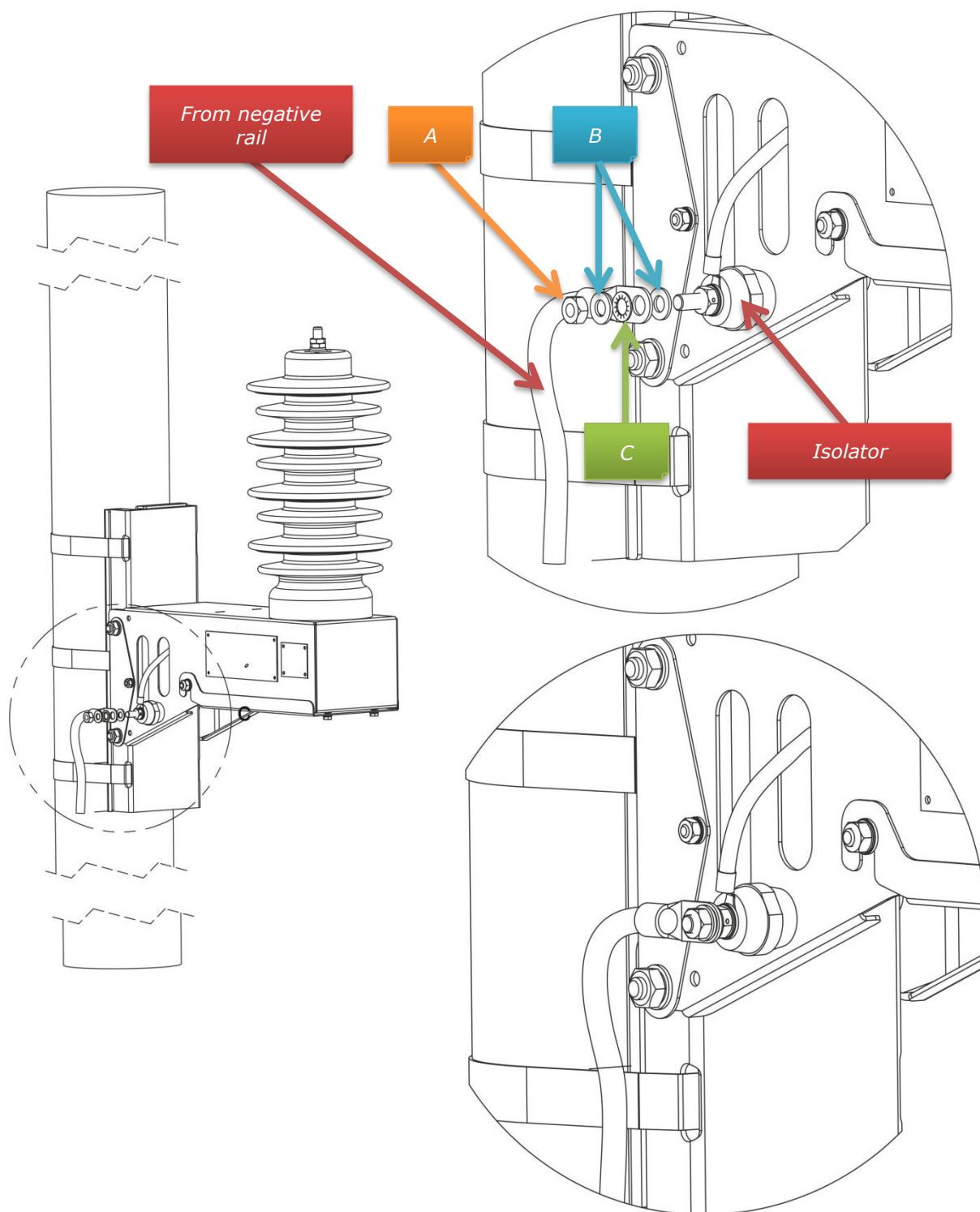
			N°2	Nut	M12	Stainless steel	A
			N°3	Flat ring	M12	Stainless steel	B
			N°2	Grower ring	M12	Stainless steel	C



5.5 – connection between transmitter and negative rail

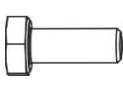
Connection between transmitter "MHIT-T363A" and negative rail, occurs through a special insulator on the side.

	N°1	Nut	M8	Stainless steel	A
	N°2	Flat ring	M8	Stainless steel	B
	N°1	Grower ring	M8	Stainless steel	C

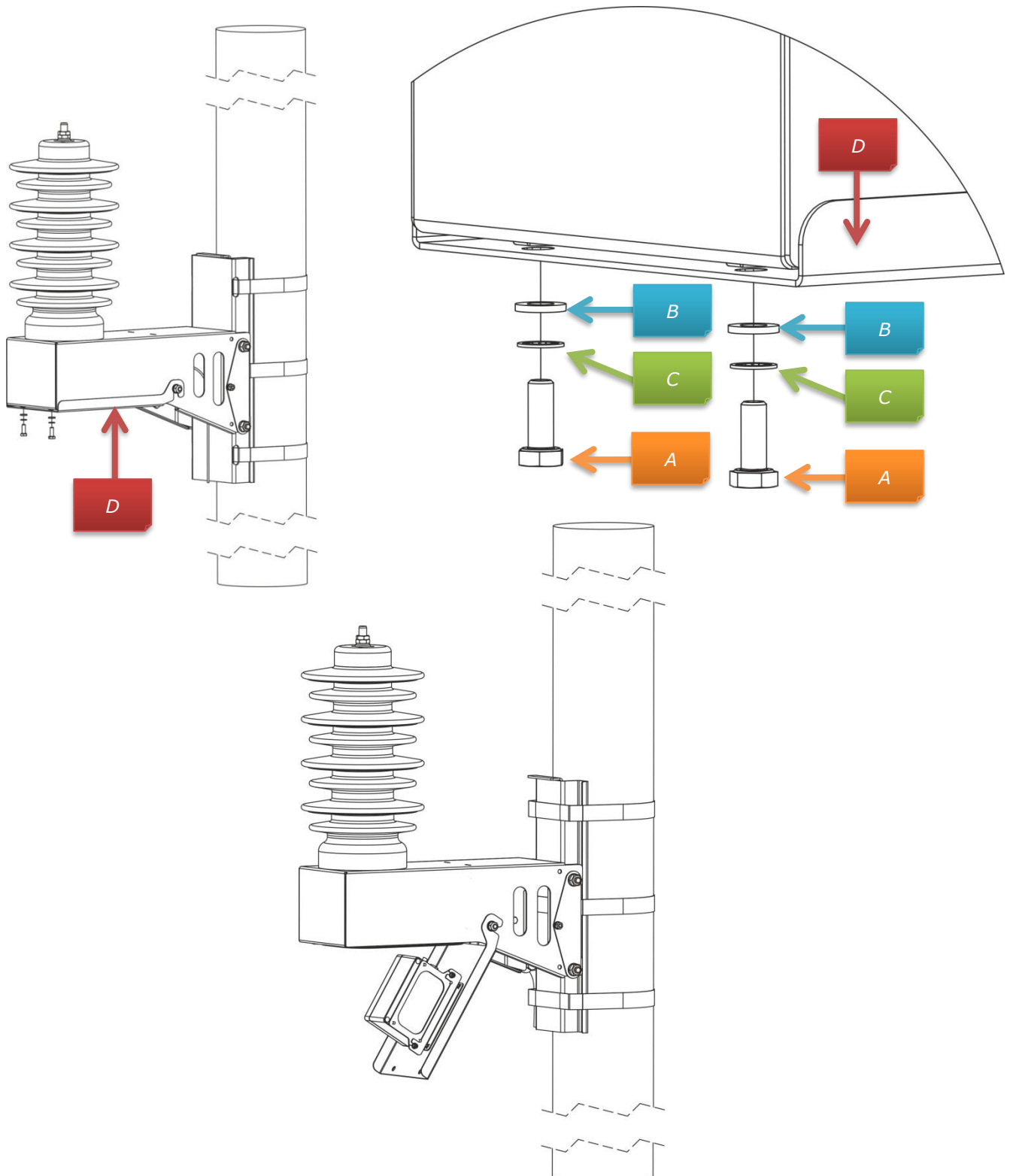


5.6 – Optical cable (fibre optic) connection

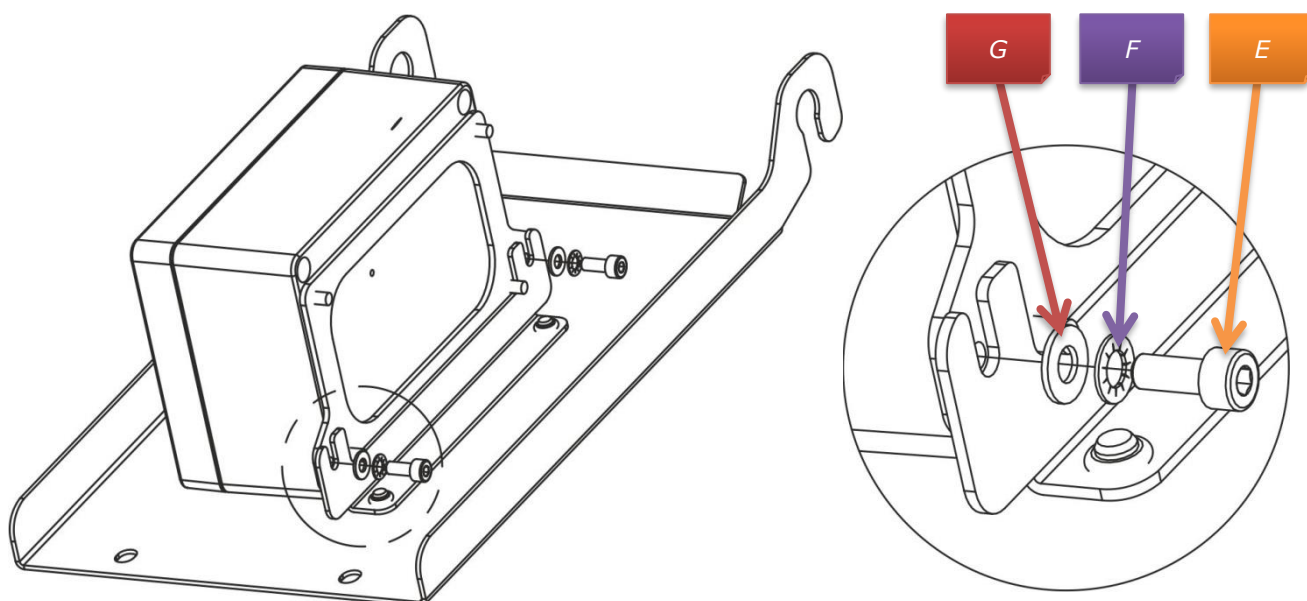
Connection between transmitter "MHIT-T363A" and receiver "MHIT-R363A", is done via fibre optic.

			N°2	Screws	M6	Stainless steel	A
			N°2	Flat ring	M6	Stainless steel	B
			N°2	Grower ring	M6	Stainless steel	C

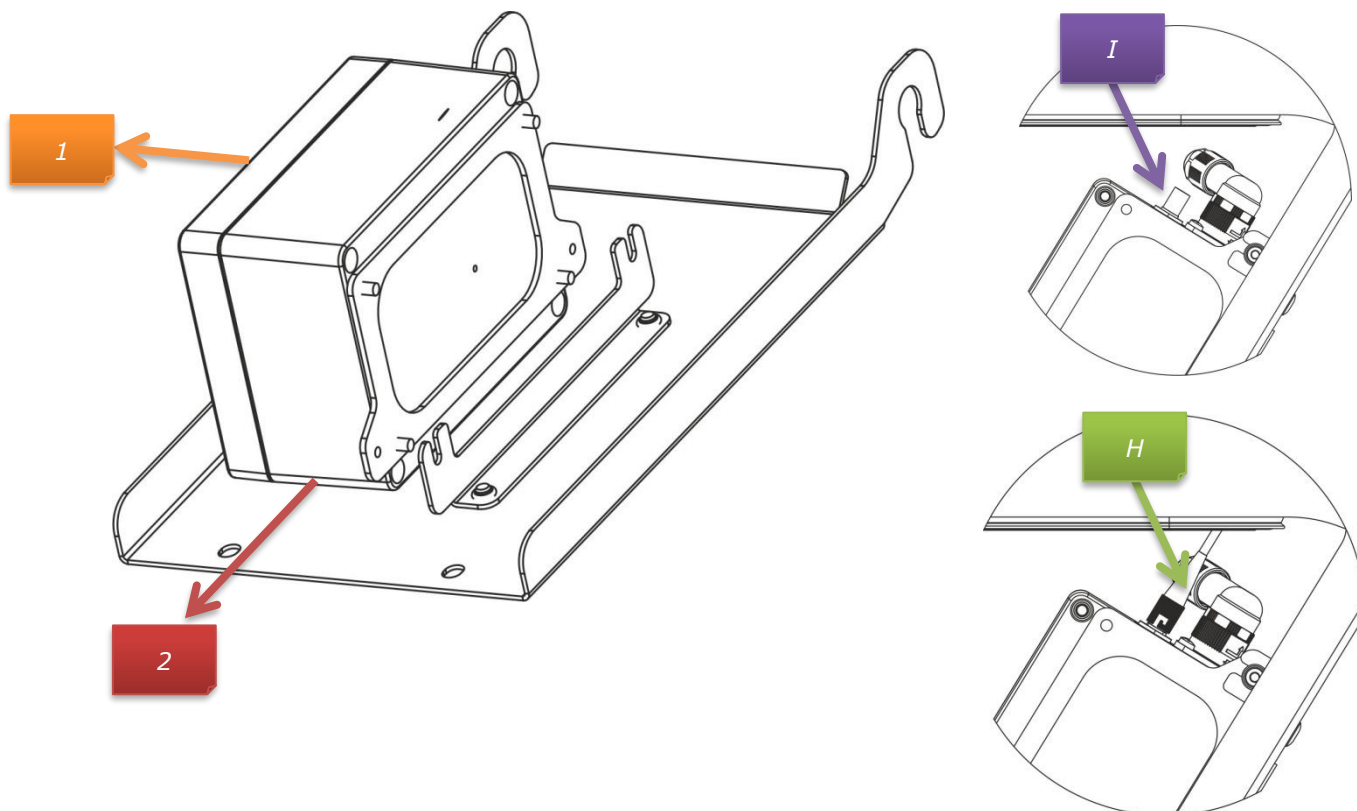
To connect the optical cable from the receiver "MHIT-R363A", open the "D" key to access the transmitter "MHIT-T363A".



Unscrew the screws "E", to unlock the transmitter box

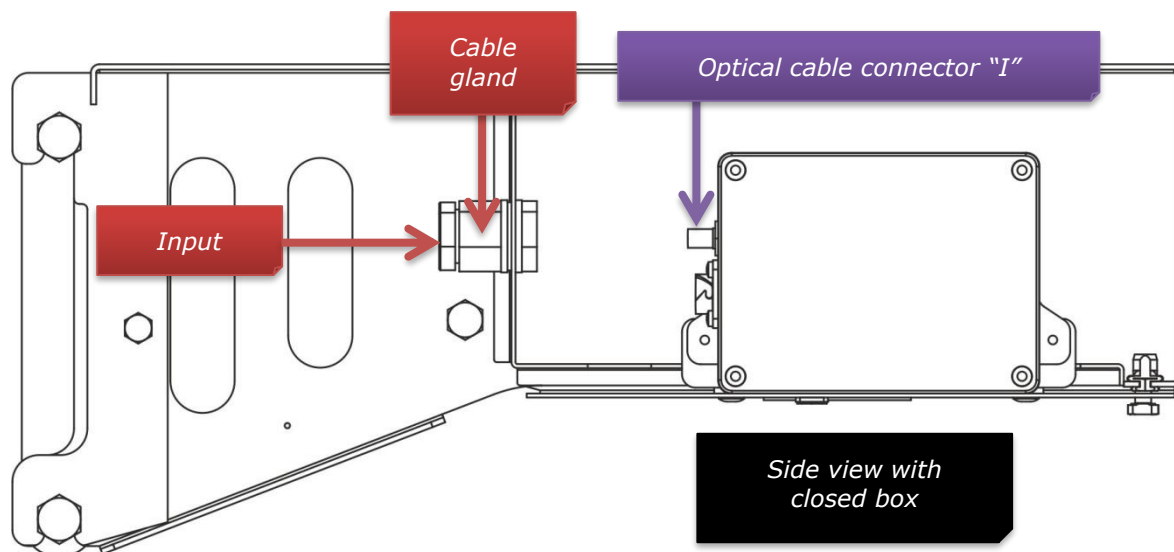


Slightly move the box in the direction of "1", and then later in the direction of "2" for a chance to connect the "H" in the optical cable to the connector on the Transmitter box place "I".

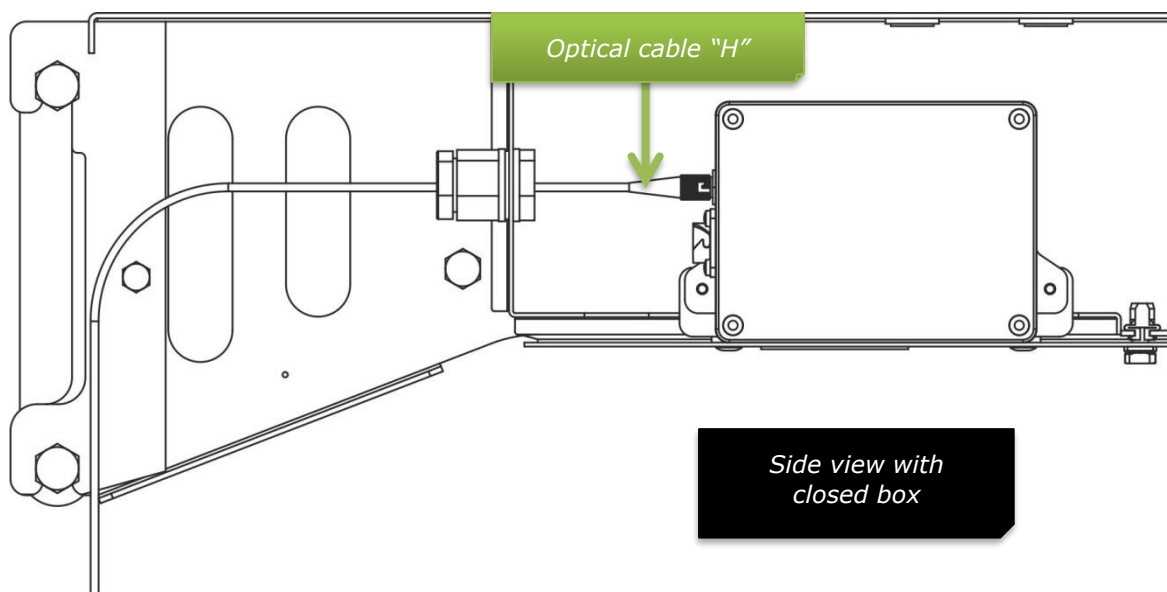


Over this, reposition the transmitter box in place, tighten the fixing screws and close the door.

In the back of the "MHIT-T363A" is installed a cable gland (M20-min/max cable 8/13 mm) used to carry the transmitter optical. Its size is such that the installation of the optical fibre is greatly facilitated.

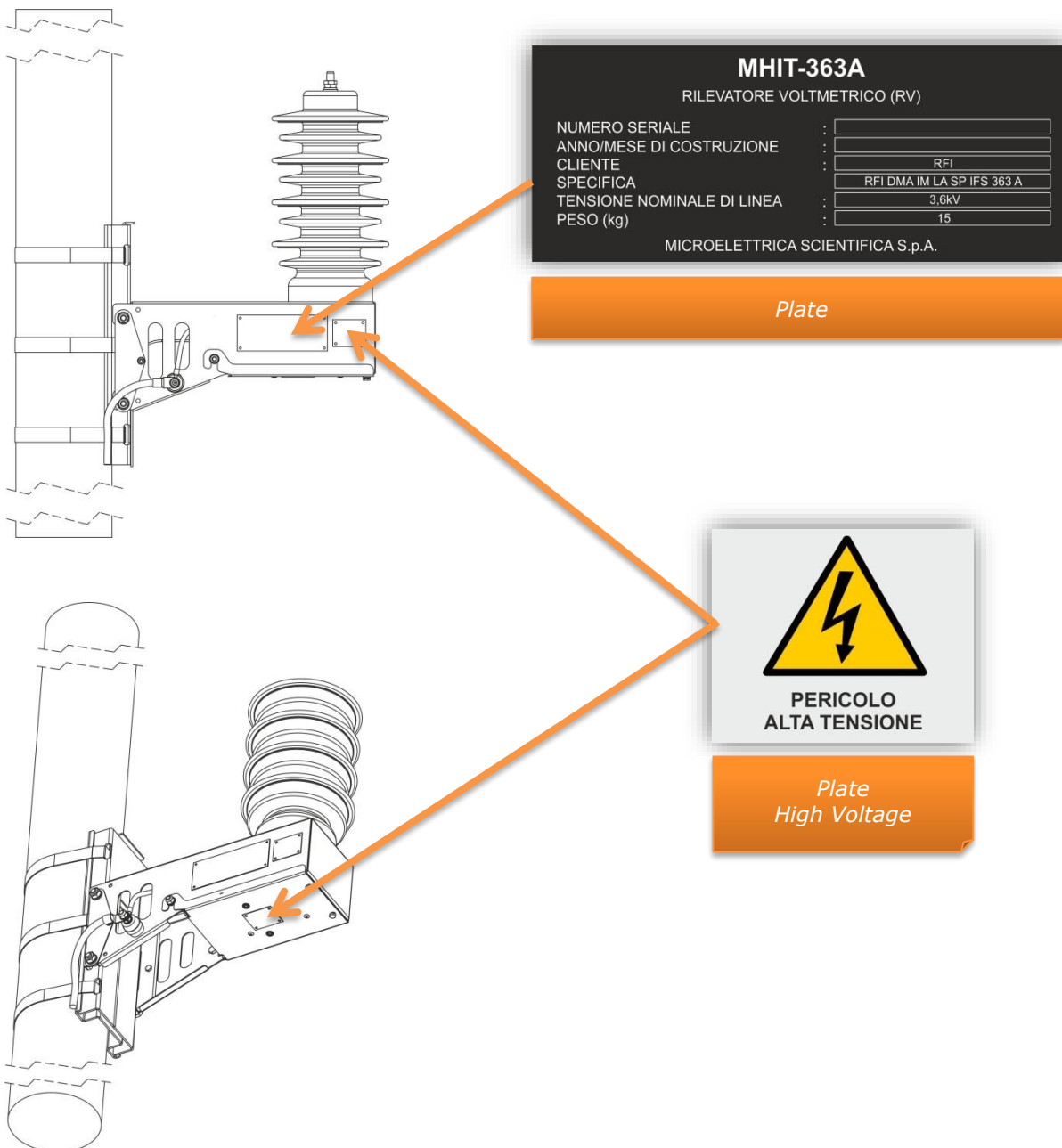


During installation you must ensure that the minimum bending radius **shall not be less than 6 cm**. Lower curvature may lead to breakage of the optical fibre or increase the loss in dB admitted causing an incorrect digital information transfer between transmitter and receiver.

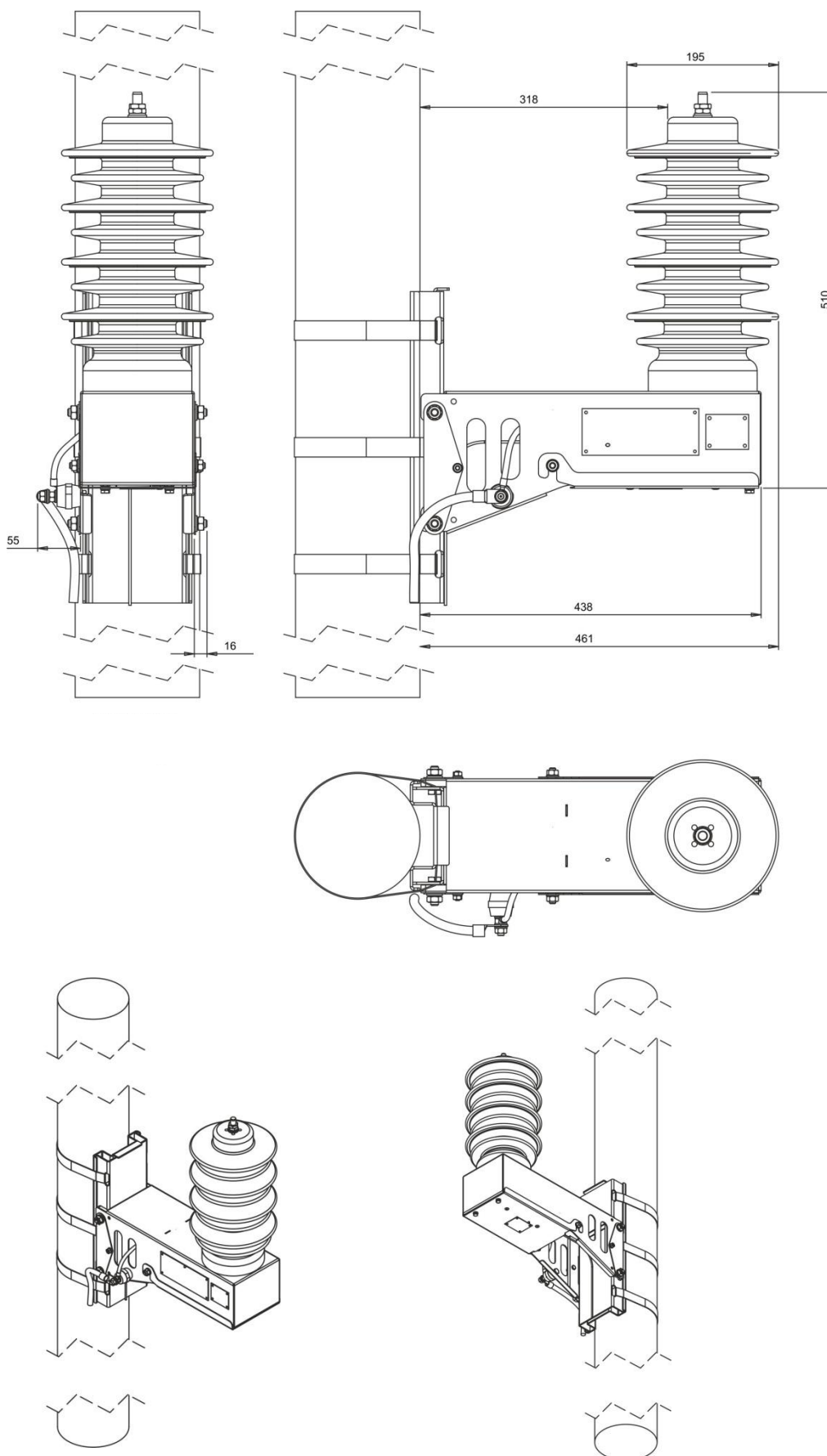


5.7 – Identification Plates

The Transmitter bears the serial number on the nameplate on the side of the AT Box



5.8 – Overall dimension



5.9 - Characteristics

Electrical Characteristics

Nominal voltage	4 kVdc
Aux. Voltage	From contact line 3 kVdc - (1200 ÷ 3900)Vdc
Maximum permanent voltage	3.9 kV
Minimum voltage	1.2 kV
Temporary voltage (t ≤ 10s)	4.5 kV
Transient maximum voltage (tmax ≤ 1s)	6 kV
Start-up time	> 700ms
Impedance	1 MΩ
Precision at nominal voltage	± 1 %
Thermal stability	± 0.01 %F.S./°C
Insulation (1.2/50 µs pulse atmospheric)	± 140 kV

Insulator/voltage divider

Material	Silicone rubber
Insulation (1.2/50 µs pulse atmospheric)	± 140 kV
Dry power frequency insulation	60 kV; 1min. 50Hz

Auxiliary power supply

Auxiliary power supply	None (powered by contact line)
------------------------	--------------------------------

Temperature

Operation	-20 ÷ + 55° C
Storage	+70 -30 ÷ ° C

Enclosure

Protection degree	IP65
Material	Stainless steel
Weight	15 kg
Connections	Screw (M12) for signal inputs/screw (M8) for earth connection/ST for the F.O.

6. Receiver unit - MHIT-R363A

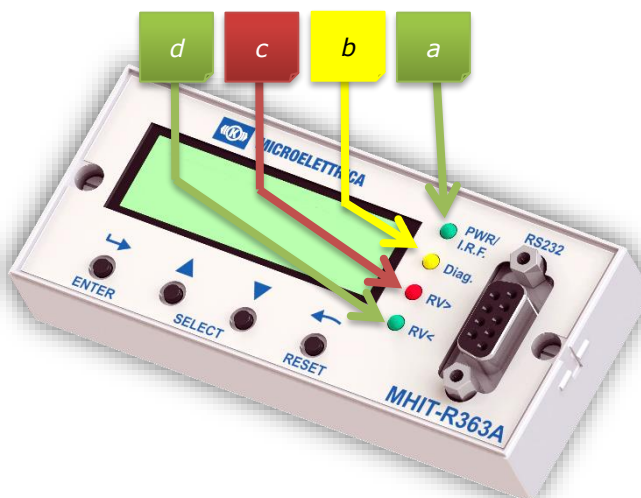
Receiver

“MHIT-R363A”



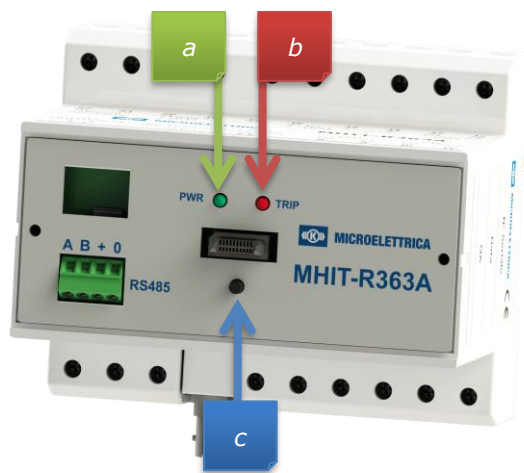
6.1 - Signalization

There are four LEDs on the front Front Face Panel (FFP):



a)	LED Green	PWR/ I.R.F.	<i>ON</i>	Receiver in normal operation
			<i>Flashing</i>	Internal fault Receiver
b)	LED Yellow	Diag.	<i>Flashing</i>	Presence Anomaly/alarms (Fibre optic Transmitter Failure, Absence Tension)
			<i>OFF</i>	No Anomaly
c)	LED Red	RV >	<i>ON</i>	Contact line voltage <i>Above</i> the threshold value set [Sup]
d)	LED Green	RV <	<i>ON</i>	Contact line voltage <i>lower than</i> the threshold fixed [Inf]

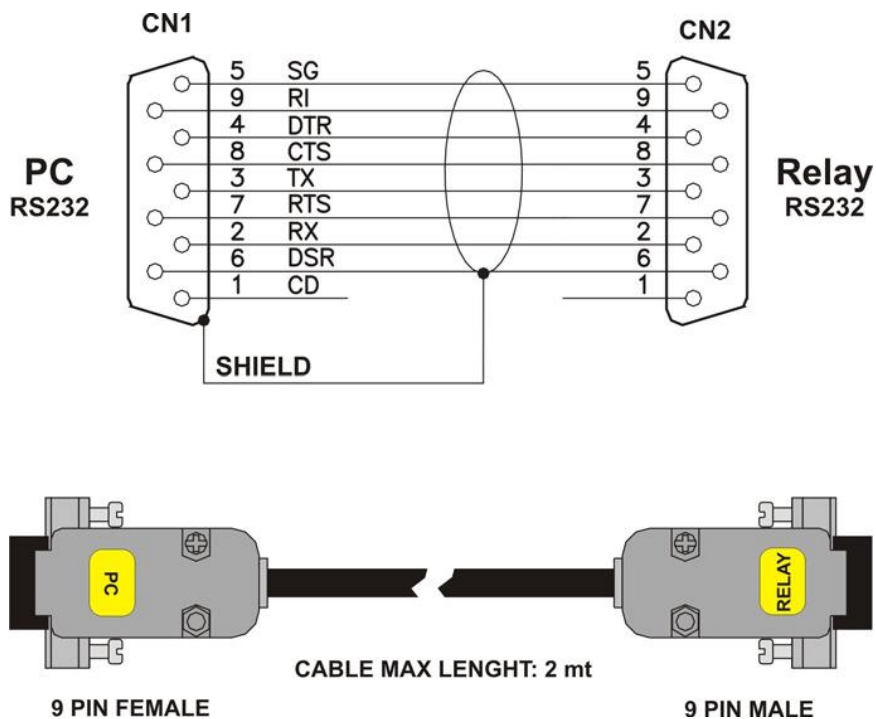
The base **Relay Main Body (RMB)** is equipped with two LEDs visible when the front panel is removed.



a)	LED Green	PWR/ IRF	<i>ON</i>	Receiver normal operation
			<i>Flashing</i>	Receiver internal fault
b)	LED Red	TRIP	<i>Flashing</i>	Presence Anomaly/alarms (Fibre optic Transmitter Failure, Absence Tension)
			<i>OFF</i>	No anomaly
c)	Button	RESET		Not used in this application

6.2 - Communication serial port on the front panel (FFP)

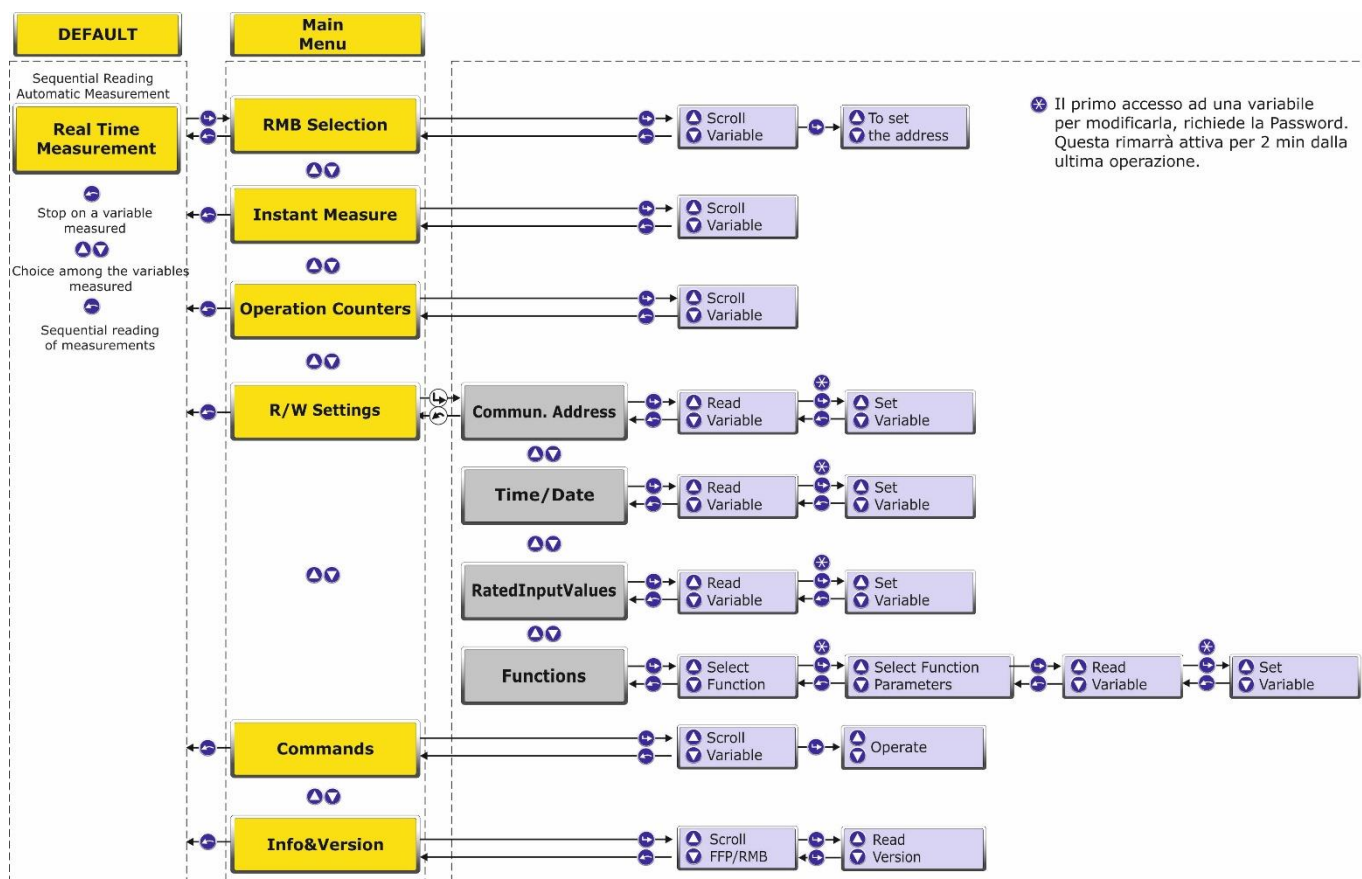
Physical RS232 connection is available on the front with a 9-pin D-sub female connector. Through this port, it is possible to control the relay RMB and acquire all available information.



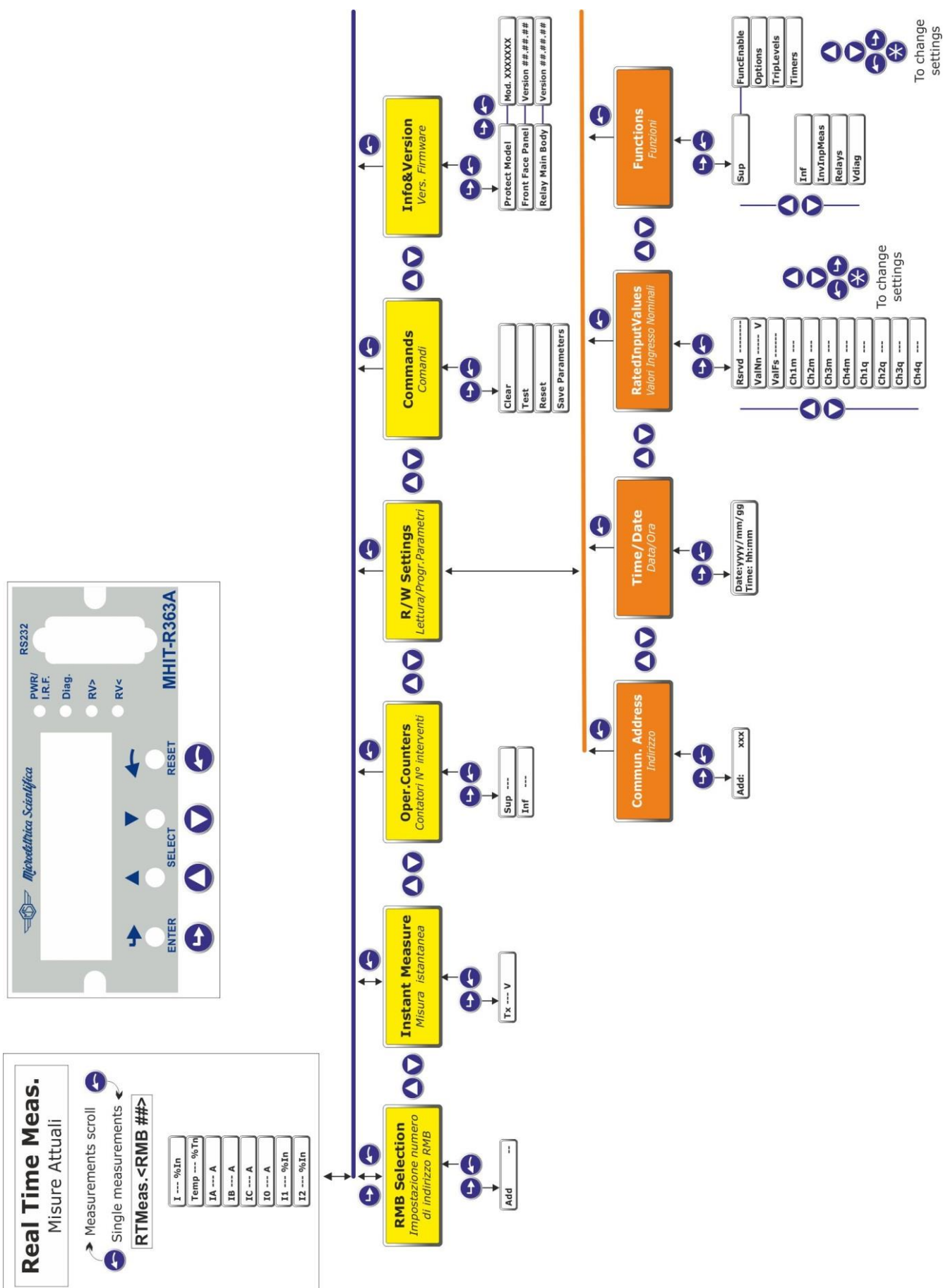
6.3 - Relay Management

The relay can be controlled either locally, through the 4 buttons and the LCD display, and remotely from a PC connected to the serial port (RS232).

The front panel is equipped with backlit LCD display 2 x 16 characters with all available information. Command buttons operate according to the diagram below.



6.4 - Keyboard diagram



6.5 – Menu and programming

6.5.1 - Real Time Measurement

Default behaviour present the automatic selection of real time measurement

Scrolling can be stop on desiderate value and start again by pressing reset button .

When stop on one variable, a symbol  appear on one measurement side, and the other variables can be selected with  buttons.

6.5.2 - RMB selection

Select the address node on RMB base for communication and supervision.

- "Real Time Meas" 
- "RMB Selection" 
- "Add # # #" 
-  Insert address node from 1 to 250
-  To confirm
-  To return

	Display	Description
Add	= 1 ÷ 250	Serial communication address node of RMB

6.6 - Instantaneous Measure

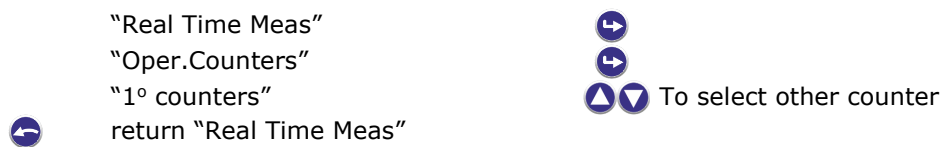
Real time measurement can be fix in every time selecting the "Instant Measure" menu:



	Display	Description
<i>Tx</i>	= 0 ÷ 65535 V	Contact line voltage value measured in real time

6.7 – Operation Counters

Operation of the functions here below are counted and recorded in "Operation Counters" menu.



	Display	Description
<i>Sup</i>	= ----	Counter Not available
<i>Inf</i>	= ----	Counter Not available

6.8 – Read Write Setting

ATTENTION!

Before changing settings, disconnect the optical fibre from the receiver.

Once you have finished programming, send the command "Save Parameters", see section "commands (Commands)".

-  "Main Menu"
-  select "R/W Setting"
-  Select one of following meu: 

6.8.1 - Communication Address

-  "Communication Address" 
-  "Add: #" 
-  "Password ????" (If not inserted; see § password)
-  To select the address (1-250)
-  To Confirm.

Default address is 1.

	Display	Description	Setting range	Step	Unit
Add	1 -	Modbus address node	1 ÷ 250	1	-

6.9 - Time/Date

-  "Time/Date"  Date: current date, time: current time
-  "20YY/....."  To set years,
-  "20XX/MM"  To set months,
-  "20XX/XX/DD"  To set days,
-  "20XX/XX/XX" 
-  "hh/mm"  To set hours,
-  "XX/mm"  To set minutes,
-  To confirm
-  Exit

Date and time not available on receiver MHIT-363A.

6.9.1 - Rated Input Values

-  "Nominal input value"
-  1° Variable
-  To scroll the variables
-  To modify the selected variables
-  "Password ????"
-  To set the variable value,
-  To confirm.

	Display		Description	Setting range	Step	Unit
<i>Rsrvd</i>	-	-	Reserved (not available)	- ÷ -	-	-
<i>ValNm</i>	4000	V	Rated Voltage	1 ÷ 5000	1	V
<i>ValFs</i>	2	-	The full scale of the measuring part unit nominal dynamic.	1 ÷ 20	1	-
<i>Ch1m</i>	200	-	Analog output channel 1 gain.	0 ÷ 2000	1	-
<i>CH2m</i>	200	-	Analog output channel 2 gain.	0 ÷ 2000	1	-
<i>Ch3m</i>	200	-	Analog output channel 3 gain.	0 ÷ 2000	1	-
<i>Ch4m</i>	200	-	Reserved (not available)	- ÷ -	1	-
<i>Ch1q</i>	10	-	Offset of the analog output channel 1.	10 ÷ 30	1	-
<i>Ch2q</i>	10	-	Offset of the analog output channel 2.	10 ÷ 30	1	-
<i>Ch3q</i>	10	-	Offset of the analog output channel 3.	10 ÷ 30	1	-
<i>Ch4q</i>	10	-	Reserved (not available)	- ÷ -	1	-

Programming example of outputs: voltage Receiver "MHIT-R363A" values to enter for an output (0 ÷ 20) mA or (4 ÷ 20) mA, on channel 1 (CH1) with a nominal voltage "Vn" or "2Vn":

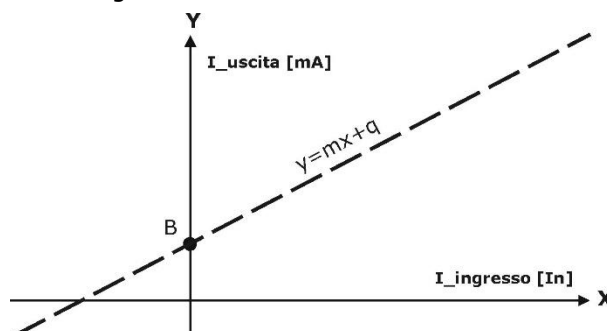
Channels Settings								Dynamic Range	
(y1)	(y2)			(x1)	(x2)			Chm (gain)	Chq (offset)
0	÷	20	but	≡	0	÷	2 VN	200	10
0	÷	20	but	≡	0	÷	1 VN	400	10
4	÷	20	but	≡	0	÷	2 VN	160	14
4	÷	20	but	≡	0	÷	1 VN	320	14

These values can be applied in any combination to channel "CH2, CH3."
For other settings contact Microelettrica Scientifica.

Other output channel values can be obtained by applying the following formulas:

$$CHm \text{ (gain)} = 100 \cdot \frac{y_2 - y_1}{x_2 - x_1}$$

$$CHq \text{ (offset)} = \frac{y_2 \cdot x_1 + y_1 \cdot x_2}{x_2 - x_1} + 10$$



6.9.2 - Functions

-   "Functions",
-  1° function,
-   To scroll through the functions, variables,
-  To read write function parameters
-   To select different fields.
 - Function enable
 - Options
 - Levels
 - Delays
-  To access to selected fields and read parameter
-  To modify actual parameters;
-   To set a new value.

Function	Type	Display	Variable	Default	Unit	Description	Setting range	Step
Password		=	0000-9999	1111	-	Password for change setting		
Sup	FuncEnable	→	Status	Enable		Protection function enable	Enable/Disable	-
	Options	→	No Parameters			No parameters		
	TripLevels	→	Sup	2250	V	RV> threshold	1000 ÷ 6000	1
	Timers	→	No available			No parameters		
Inf	FuncEnable	→	No Parameters			No parameters		
	Options	→	No Parameters			No parameters		
	TripLevels	→	Inf	2150	V	RV< threshold	1000 ÷ 6000	1
	Timers	→	No available			No parameters		
InvInp Meas	FuncEnable	→	Status	Enable		Protection function enable	Enable/Disable	-
	Options	→	No Parameters			No parameters		
	TripLevels	→	No Parameters			No parameters		
	Timers	→	No Parameters			No parameters		
Relays	FuncEnable	→	No Parameters			No parameters		
	Options	→	Op_R2	N.D.		N.D. Norm. De energized/ N.E. Norm. energized	N.D./N.E.	-
	TripLevels	→	No Parameters			No parameters		
	Timers	→	No Parameters			No parameters		
Vdiag	FuncEnable	→	Status	Enable		Protection function enable	Enable/Disable	-
	Options	→	No Parameters			No parameters		
	TripLevels	→	Vdiag	1200	V	Permanent minimum voltage for operation.	900 ÷ 1500	1
	Timers	→	No Parameters			No parameters		

6.9.3 - Superior limit for contact line over threshold.

<i>FuncEnable</i>	→	Enable	[Disable / Enable]
<i>Options</i>	→	No Parameters	No parameter
<i>TripLevels</i>	→ Sup	2250	V (1000 ÷ 6000) step 1 V
<i>Timers</i>	→	No available	No parameter

FuncEnab : function status Disable/Enable
Sup : Superior limit for contact line over threshold.

Operation

When the contact line voltage exceeds the programmed value [Sup] threshold relay RV RV > > picks up and the corresponding led lights up.

6.9.4 - Inferior limit for contact line over threshold.

<i>FuncEnable</i>	→	Enable	[Disable / Enable]
<i>Options</i>	→	No Parameters	No parameter
<i>TripLevels</i>	→ Inf	2150	V (1000 ÷ 6000) step 1 V
<i>Timers</i>	→	No available	No parameter

FuncEnab : function status Disable/Enable
Inf : inferior limit for contact line over threshold.

Operation

When the contact line voltage drops below the programmed value [Inf] threshold relay energizes and the corresponding led RV RV > < turn ON.

6.9.5 - Measurement inversion

<i>FuncEnable</i>	→	Enable	[Disable / Enable]
<i>Options</i>	→	No Parameters	No parameter
<i>TripLevels</i>	→	No Parameters	No parameter
<i>Timers</i>	→	No Parameters	No parameter

FuncEnab : function status Disable/Enable

Operation

Reverses the sign of the measure provided by the transmitter.

Note: the InvInpMeas parameter is programmed at the factory to work properly when installed on a pole.

6.9.6 – Output relays configuration

<i>FuncEnable</i>	→	No Parameters	[Disable / Enable]
<i>Options</i>	→	Op_R2	N.D. [N.D. / N.E.]
<i>TripLevels</i>	→	No Parameters	No parameter
<i>Timers</i>	→	No Parameters	No parameter

<i>FuncEnab</i>	:	function status Disable/Enable
<i>Op_R2</i>	:	N.D. normally not energized / N.E. Normally energize

Operation

The OP_R2 parameter defines the configuration of output relay R2 (threshold relay RV >).
The relay R1 (alarms) is not configurable and is always excited in normal operation of the device.

6.9.7 - Vdiag – Minimum operation voltage

<i>FuncEnable</i>	→	Disable	[Disable / Enable]
<i>Options</i>	→	No Parameters	No parameter
<i>TripLevels</i>	→	Vdiag	1200 V (900 ÷ 1500) step 1 V
<i>Timers</i>	→	No available	No parameter

<i>FuncEnab</i>	:	function status Disable/Enable
<i>Vdiag</i>	:	Permanent minimum threshold of operation

Operation

If the function is enabled:

If contact line voltage drops below the threshold [Vdiag] alarm relay (R1) is instantly ($t < 30\text{ms}$) energised to provide permanent faults signalization.

The alarm is reset automatically once the contact line voltage is above the threshold VDiag + 5%.

If the function is disabled:

Alarm relay (R1) is energised physical turns off the transmitter (transmitter remains turned on until about 700V and up to about 1 second after the contact line voltage has fallen to zero volts).

The alarm is reset automatically once the contact line voltage goes above the threshold voltage of switching on (about 900V).

6.10 - Commands

-  "Commands"
-  1° Control,
-  To select others, control variables
-  To operate with selected control

Display	Description
Clear	Clear the memory with events counter, events recorder, etc.
Test	Start the internal diagnostic of the receiver
Reset	No used in this application
Save Parameters	Save in internal memory the set parameters

6.11 - Version & Info

The menu displays the protection model, the Firmware version of FFP and the RMB version currently in communication

-  "Real Time Meas"
-  "Info&Version",
-  "Protect. Model",
-  "Mod. XXXXXX",
-  Ritornare a "Protect. Model",
-  to "FrontFacePanel",
-  "Version ##.##.##.##",
-  Return to "FrontFacePanel",
-  to "RelayMainBody",
-  "Version ##.##.##.##",
-  Return to "RelayMainBody",
-  Return to "Info&Version".
-  Return to "Real Time Meas".

6.12 - Output relays

Voltage presence signaling		
R2	Threshold relay (RV>)	The relay is Normally De-energized (N.C.), when the value of the contact line voltage is below the threshold value set [Inf]. The relay is energized (n.o.), when the value of the contact line voltage exceeds threshold set [Sup].
Alarm signaling		
R1	Alarm relay (Diag)	The relay is normally energized (n.o. contact). The relay de-energises (N.C.), in the presence of faults (operating Voltage < contact line voltage; Watchdog, receiver off or not powered, , fibre optic damaged)

6.13 - Password

In the system there are three different passwords: RMB, FFP, communication software

6.13.1 - Password FFP

This password will be required every time the user wants to write in the "R/W Settings" of FFP and/or send by FFP a command on the menu "Commands".

The default password is "**1111**"

When prompted for a password, proceed as follows:

The Display shows the message: "Password?"

- | | | | |
|---|---------------------------------------|---|---------------------------|
|  | to choose 1 st digit (1-9) |  | To confirm |
|  | to choose 2 nd digit (1-9) |  | To confirm |
|  | to choose 3 rd digit (1-9) |  | To confirm |
|  | to choose 4 th digit (1-9) |  | To complete the procedure |

The password is required every time we try to change a variable to the first time we entry in menus "R/W Settings" and/or "Commands". Password remains valid for 2 minutes after the last operation, or until you return to viewing the current measures (RT Meas).

After entering your Password FFP, the "#" symbol appears before the variable that can be changed.

PASSWORD MODIFICATION:

*To **MODIFY** the password on FFP:*

Open the MS-Com software and connect the relay
Open the "Settings" menu
Type the desired password (other than the default one – Example: 1234) in the area "FFP Password" (see fig. 1)

N.B. Whenever you reopen the MScOm program, Password FFP is not displayed (see fig. 2) and cannot be changed until you entered the Password MScOm (see § 7.3) by selecting the button 

Select the "Send" button to confirm the change to the relay

Fig.1



Fig.2



6.13.2 - Password MODBUS

This password will be required for a possible supervision system whenever the system is programmed in such a way as to change any parameter of relay calibration and/or send any command through the relay itself.

DEFAULT STATE (DISABLED): Password = 2295; Address = 8001

When set to 2295, the password is actually disabled and a DCS or any other supervisory system can be programmed either to change the parameters of the relay, both to send commands through the relay itself without writing any password.

ENABLING/DISABLING PASSWORD:

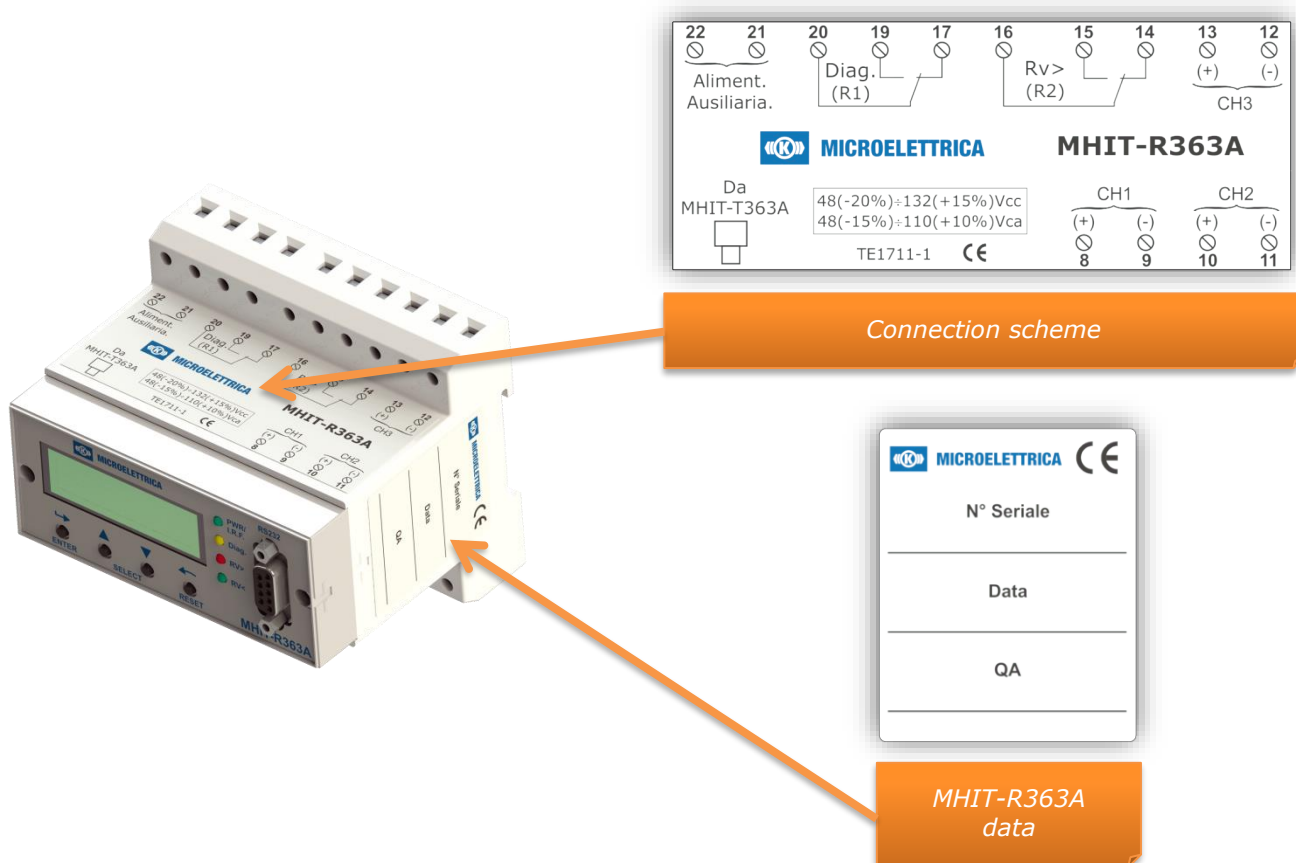
To **ENABLE** Password Modbus supervision system must write the desired password (other than the default one) at 8001.

To **DISABLE** the Password Modbus supervision system should write once the DEFAULT password (2295) at 8001.

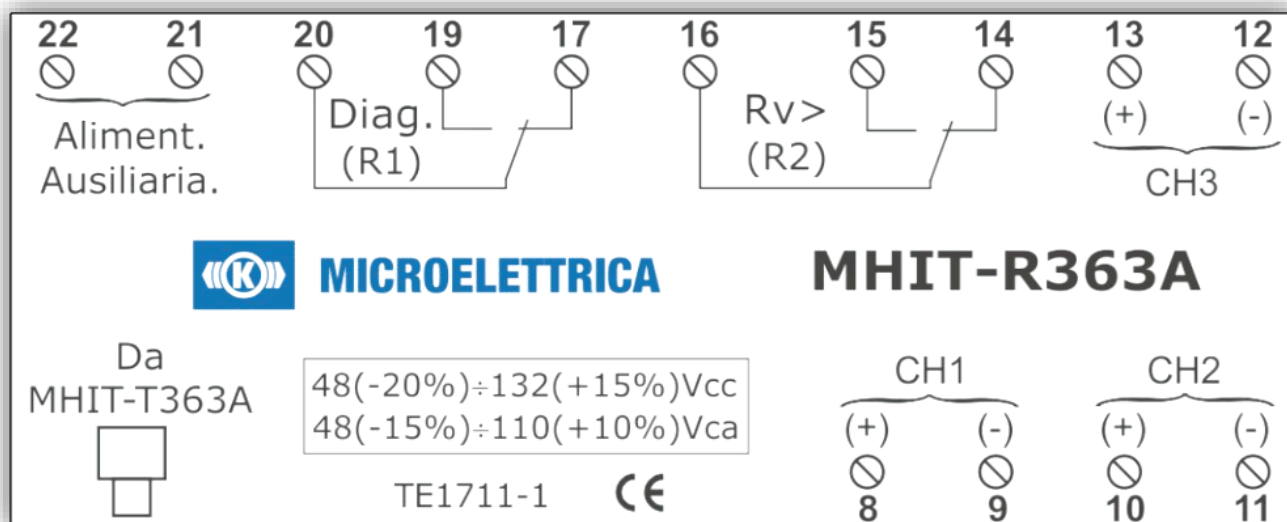
6.13.3 - Password MCom

This password will be required every time you want to send it to a change in the calibration parameters or implement a command through the relay using the MCom management software. The user can decide whether to enter a password (see Operating Manual MCom) or if you leave the password disabled, simply by selecting the OK button when prompted for a password.

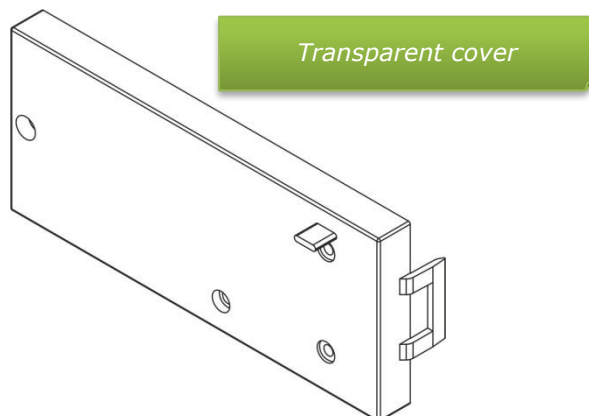
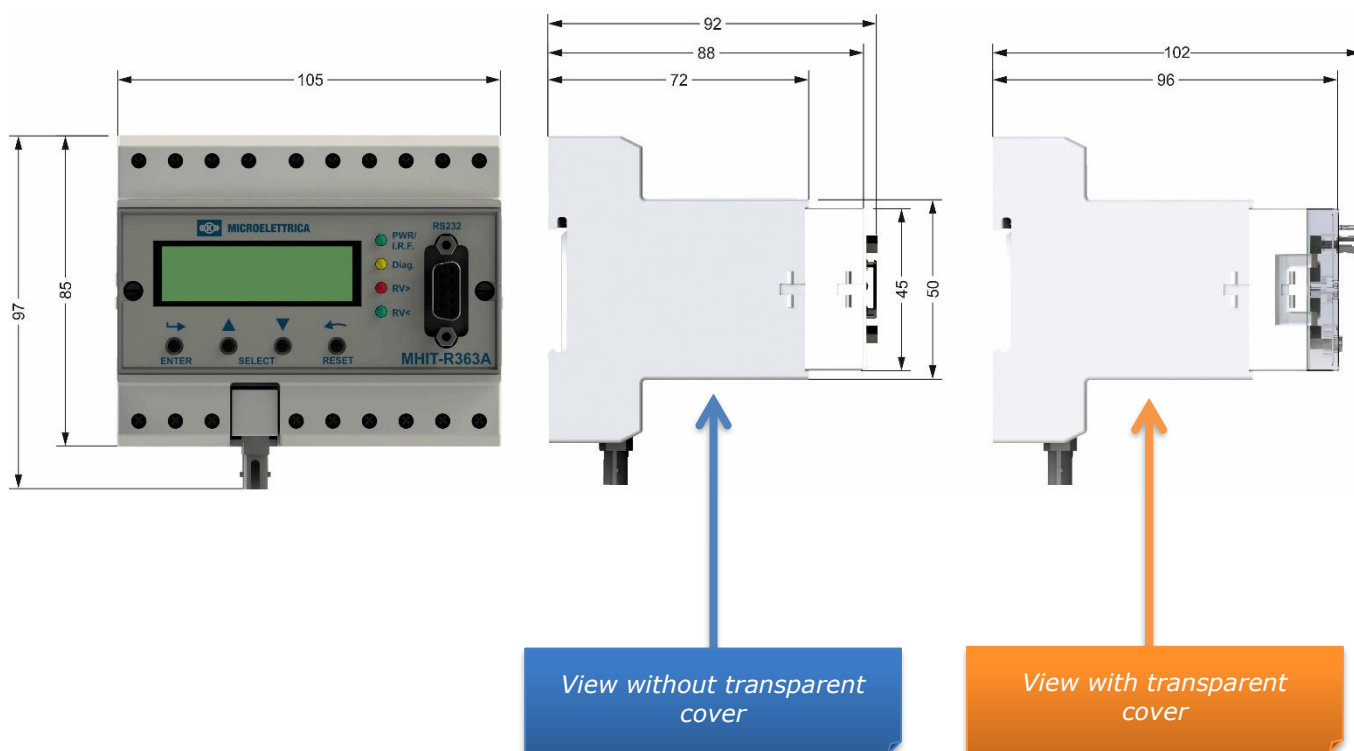
6.14 – identification label



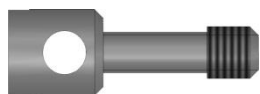
6.15 – Block diagram



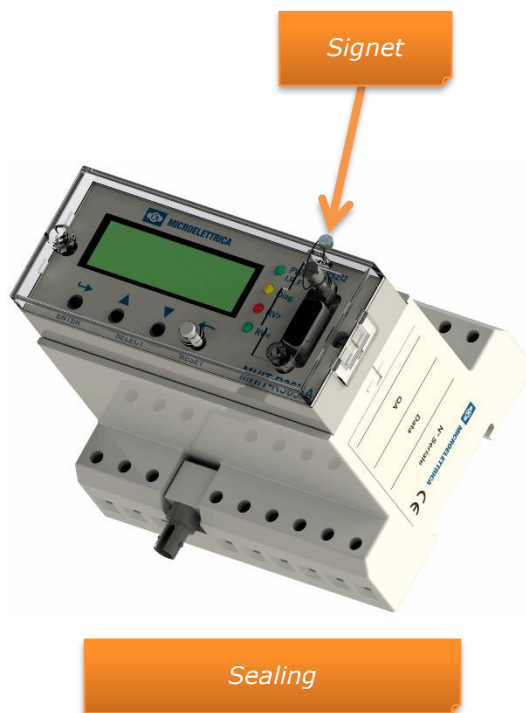
6.16 – Overall dimension



6.17 - Sealing



N°1 Screw for Sealing M6



6.18 -Receiver Characteristics

General Characteristics

Auxiliary Power Supply	48 (-20%) ÷ 132 (+15%) Vdc (class DC3) 48 (-15%) ÷ 110 (+10%) Vca (class AC2)
Voltage interruptions	20ms
Average power supply consumption	≤ 50mA
Operation ambient temperature	-20 ÷ +55 °C
Stock temperature	-30 ÷ +70 °C
Weight	0.5 Kg
Mounting	DIN rail 46277 (EN 50022)
Environmental conditions	indoor

Response time

Excitation (RV>)	≤ 20ms (typical ≤ 10ms)
De-excitation (RV<)	≤ 15ms
Start-up	
V line 1.3 kV	≤ 150ms
V line 2.2 kV	≤ 100ms

Output relay characteristics (RV>, Diag)

Output relays	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.) – Mechanical life 106op.
---------------	--

Analog output

Analog output	<i>CH1</i> (0 ÷ 40)mA ≡ (0 ÷ 8000)Vcc - F(V/I) = 200V/mA <i>CH2</i> (0 ÷ 40)mA ≡ (0 ÷ 8000)Vcc - F(V/I) = 200V/mA <i>CH3</i> (0 ÷ 40)mA ≡ (0 ÷ 8000)Vcc - F(V/I) = 200V/mA
Maximum load	500 ohm
Response time	≤ 1ms
Measure stability	200ppm/°C
Signal noise ratio	≤ 60db

Measurement input

Measurement input	Fibre optic from MHIT-T363A
Connection	ST for Optic Fiber

Enclosure

Enclosure	ABS with IP42
Connection	Terminals for 2.5mm ² cables

Voltage threshold

Threshold value	(1000 ÷ 6000)V, step 1V
Precision	3%
Thermal stability	200ppm/°C
histeresys	(1000 ÷ 6000)V, step 1V

7. Electrical Characteristics

Reference Standard CE Directive - EN50123 - IEC60255 - RFI.DMA/IM.LA/SSE.360

Dielectric test voltage	IEC60255-5 EN50123	cat IV - 2kV (EN50124-1 cat OV4 - 18.5kV)
Impulse test voltage	IEC60255-5 EN50123	cat IV - 5kV (EN50124-1 cat OV4 - 40kV)

Enviromental Rif.Std. (IEC 60068)

Operation ambient temperature	EN 60870-2-2	class C1 (3k5)	-10 °C / +55 °C
Environmental testing (Cold)	IEC 60068-2-1		-10 °C ; 16h
(Dry heat)	IEC 60068-2-2		+55 °C ; U.R.<=35% ; 16h
(Change of temperature)	IEC 60068-2-14		+55 °C ; -10 °C ; 3h
(Damp heat, steady state)	IEC 60068-2-3		+40 °C ; U.R.=93% ; 96h
Resistance to vibration	IEC 60255-21-1	class 2	10-500 Hz ; 2g
Resistance to vibration and shock (bump-shock)	IEC 60255-21-2	class 1	10g - 15g
Sismatic stress resistance	IEC 60255-21-3	class 2	1 g (xy) , 2 g (z)

CE EMC Compatibility

Electromagnetic emission	EN 55011		30-1000 MHz (tab1 EN50081-2)	A
Conducted disturbances immunity test	EN 55022	class B	0.15-30 MHz (tab1 EN50081-2)	10 V A
Radiated electromagnetic field immunity test	EN60870-2-1 A.5.1 → IEC 61000-4-3	level 3	80-1000 MHz 80%AM	10 V/m B
	EN50082-2 → EN 50140, EN 50204	level 3	900 MHz/200 Hz	10 V/m A
	EN50082-2 → ENV 50140	level 3		A
Electrostatic discharge test	EN60870-2-1 A.3.1 → IEC 61000-4-2	level 3	6 kV contact / 8 kV air	B
Power frequency magnetic test	EN60870-2-1 A.4.1 → IEC 61000-4-8	level 5	Continuous 100 A/m	50/60 Hz A
Conducted disturbances immunity test.	EN50082-2 → IEC 61000-4-6	level 3	(80 +/-5)% AM1 kHz sinwave	A
I Damped oscillatory magnetic field	EN60870-2-1 A.4.3 → IEC 61000-4-10	level 3	30 A/m, 0.1-1 MHz	B
Electrical fast transient/burst (Fast Trasient)	EN60870-2-1 A.2.3 → IEC 61000-4-4	level 3	2 kV(m.c.)	B
Dumped Oscillatory waves	EN60870-2-1 A.2.5 → IEC 61000-4-1	level 2	1 kV(m.c.)	
Residual power supply	IEC 60870-2-1	class DC3 class AC2		
Power supply tollerance	IEC 60870-2-1	VR3	<=5%	
Surge immunity test	EN60870-2-1 A.2.2 → IEC 61000-4-5	level 3	8/20us 2 kV(m.c.)	B
Voltage interruptions	EN60870-2-1 A.1.5 → IEC 61000-4-11		20 ms	
Voltage ripple	EN60870-2-1 A.1.4 → IEC 61000-4-11			A=B

Characteristics

Accuracy at reference value of influencing factors	Class 0,2
Average power supply consumption TX	5 VA
Average power supply consumption RX	7 VA
Output relays	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.) - Mechanical life 10 ⁶ op.

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