HOMOLOGATED BY RFI

DC MULTIFUNCTION PROTECTION RELAY AND TRANSDUCERS FOR RAILWAYS

T.EL.FER. s.r.l. - Head office: via Soprasasso 8/2 – 38121 Trento (TN) Registered office : via Marconi 66/B – 15060 Basaluzzo (AL)
VAT registration of ALESSANDRIA n. 02275860068 – REA Number: AL – 241383 Corporate capital € 60.641,00 i.v.
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THE QUALITY SYSTEM OF T.EL.FER. SRL HAS BEEN FOUND TO COMPLY WITH THE REQUIREMENTS OF UNI EN ISO 9001:2008
CERTIFICATE NUMBER 50 100 11979

DOC: *CO0916 / TF_RP21 – EDS / 001*	ISSUED BY: *AQ*	REV: *0*	DATE: *12/09/2016*

PROTECTIONS	
2x	overvoltage levels V_{M1} and V_{M2}
2x	undervoltage levels V_{m1} and V_{m2}
2x	max overhead line temperature $T_{M>}$
4x	overcurrent forward/reverse/bidirectional programmable thresholds $I_{M1>}$, $I_{M2>}$, $I_{M3>}$, $I_{M4>}$
1x	thermal image protection of the cable/line threshold $I_{TM}1$
1x	Maximum I^2t
2x	Maximum current variation
2x	current steps with di/dt dependance thresholds I_G1 and I_G2
2x	impedance monitoring with di/dt dependance thresholds R1 and R2
2x	overvoltage with 100 Hz component thresholds $V_{100}1$ and $V_{100}2$
2x	switchboard or cable earth fault protection thresholds (64)
2x	Maximum current gradient G
High speed circuit breaker diagnostic relay for : nr. of mechanical procedures – nr. of electric openings – nr. of electric interruptions	

MEASURES	
Overhead line current (with sign)	Earth current
Overhead line voltage	Maximum voltage
Power	Minimum voltage
Environment temperature	Maximum current
Overhead line temperature (computed)	Maximum power

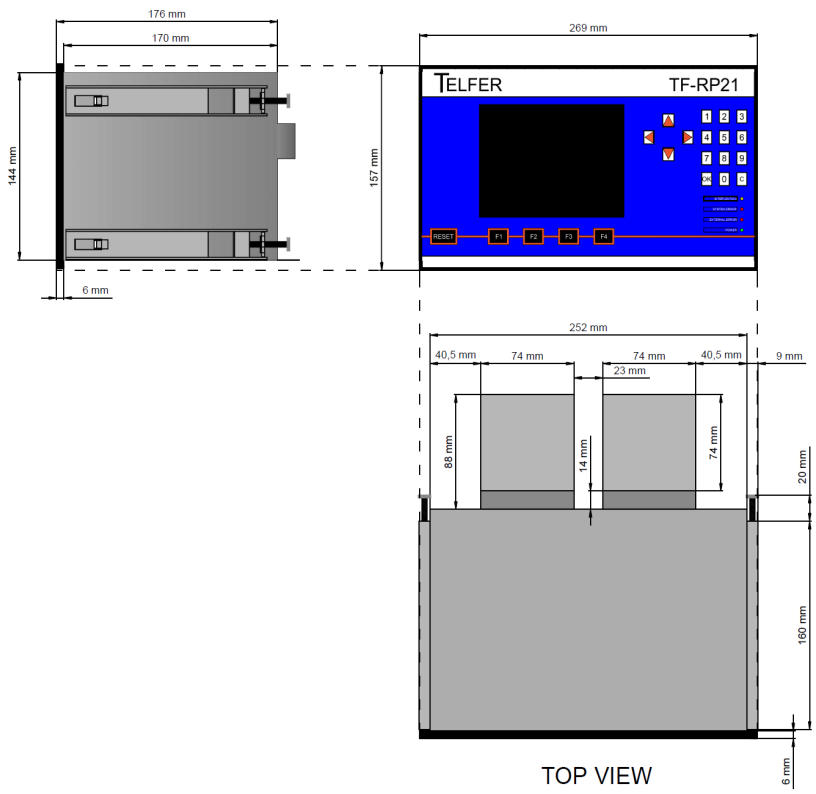
COUNTERS / RECORDERS	
ANALYSIS INTERVAL: 1 min / TOTAL RECORDING TIME: 3 months	**ANALYSIS INTERVAL: 1 hour / TOTAL RECORDING TIME: 18 months**
Supplied energy [kWh]	Supplied energy [kWh]
Input energy [kWh]	Input energy [kWh]
Peak power [kW]	Peak power [kW]
Maximum voltage [V]	Maximum voltage [V]
Minimum voltage [V]	Minimum voltage [V]
Maximum current [A]	Maximum current [A]
Minimum current [A]	Minimum current [A]
	Maximum Overhead line temperature [°C]
	Maximum 100 Hz value [%]

COMMUNICATION PROTOCOLS
IEC 60870-5-103 over RS485 (PC_01 OR PC_04)*
Modbus over RS485 (PC_02)
Modbus over TCP-IP (PC_03)

OTHER FUNCTIONS	
Autodiagnostic	
Oscillographic recording of all I/O with local display of the last 10 and storage of the last 60 with 123µs resolution	
Time sync through GPS signal or through NTP protocol	
Timing functions	
Optional programmable IEC 61131-3 PLC	
COMMUNICATION PORTS	
1x	RS232 (PC_00)
1x	Optical fiber serial port (PC_04)*
2x	RS485 (PC_01 / PC_02)*
1x	Ethernet 10/100Mbps (PC_03)
* PC_01 & PC_04 are mutually exclusive	
POWER SUPPLY	
85 . . 353VDC	
WEIGHT	
3,6kg	

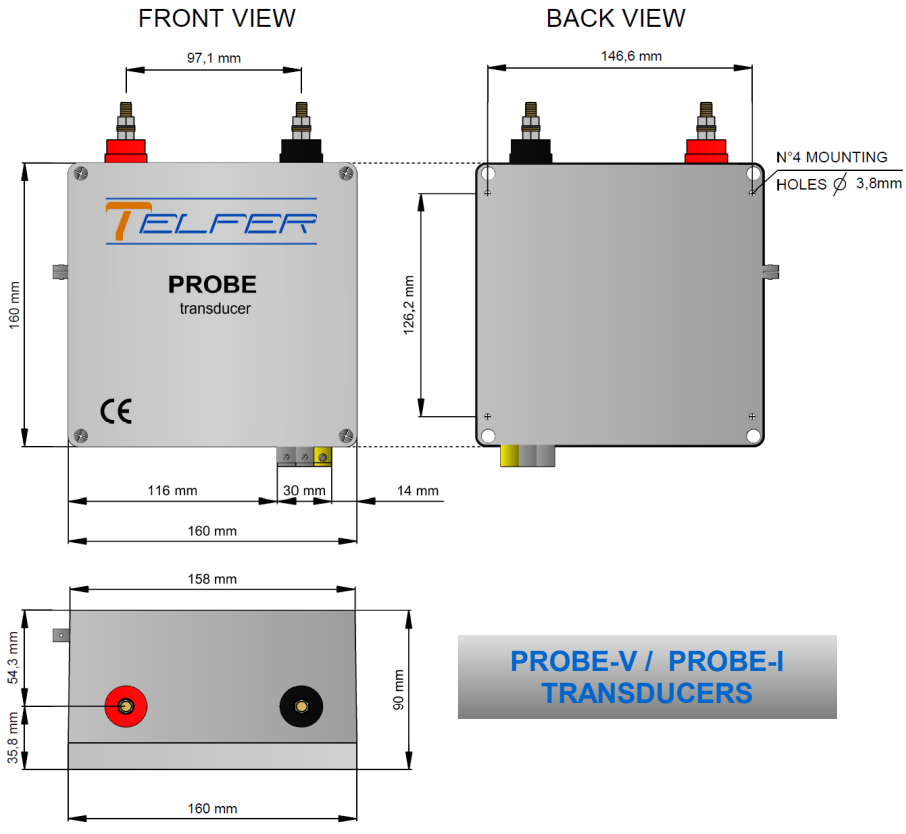
SIDE VIEW

FRONT VIEW



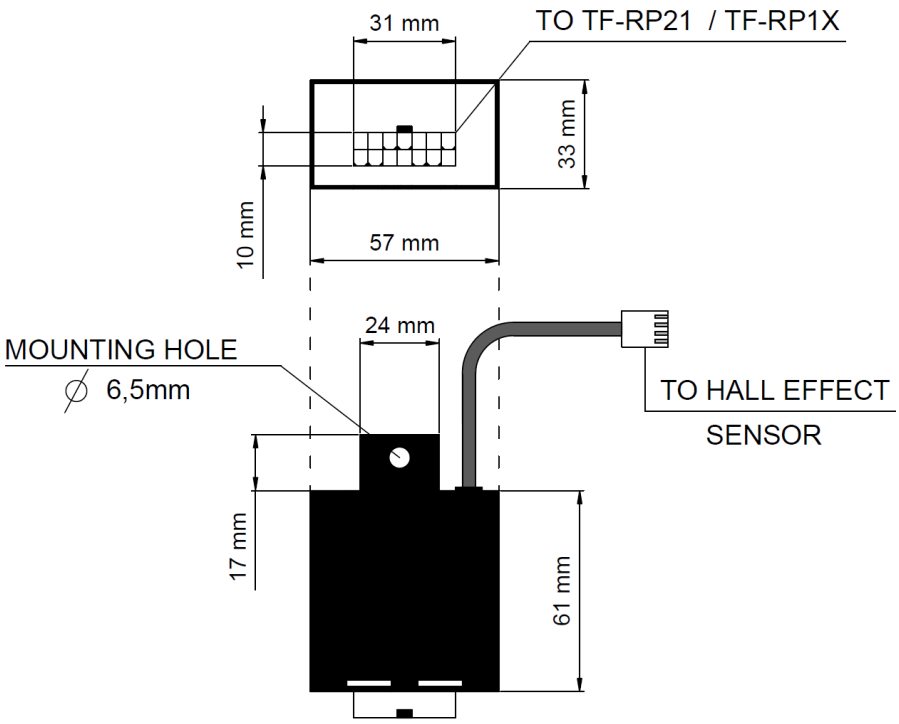
TOP VIEW

VOLTAGE TRANSDUCER PROBE-V
Redundant acquisition channel with real-time congruency check
Fiber optic communication
8.1 kHz sampling rate, 16 bit A/D
Range : -8000 . . + 8000 V
20 kV insulation
Power supply 85 . . 265VDC
CURRENT TRANSDUCER PROBE-I
Fiber optic communication
Redundant acquisition channel with real-time congruency check
8.1 kHz sampling rate, 16 bit A/D
Range : 60mV - 80 mV shunt
20 kV insulation
Power supply 85 . . 265VDC
VOLTAGE TO CURRENT CONVERTER TFC
Translates a 0..8 Volt signal from an HAX 200 / HAX 500 Hall effect current sensor into a 4..20mA signal. It supplies power to the Hall effect current sensor.
Bandwidth: 4kHz
Power supply: ±15V_{DC}



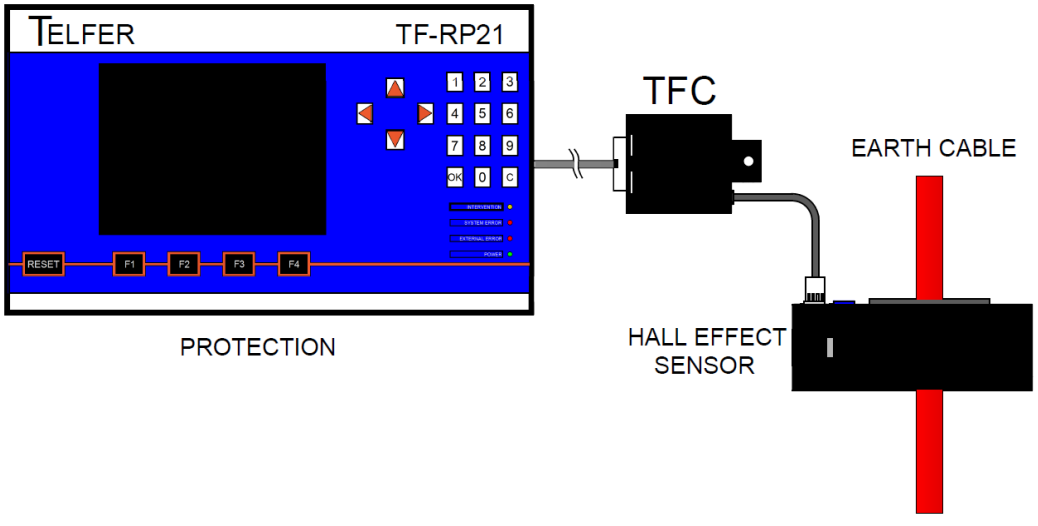
PROBE-V / PROBE-I TRANSDUCERS

FRONT VIEW



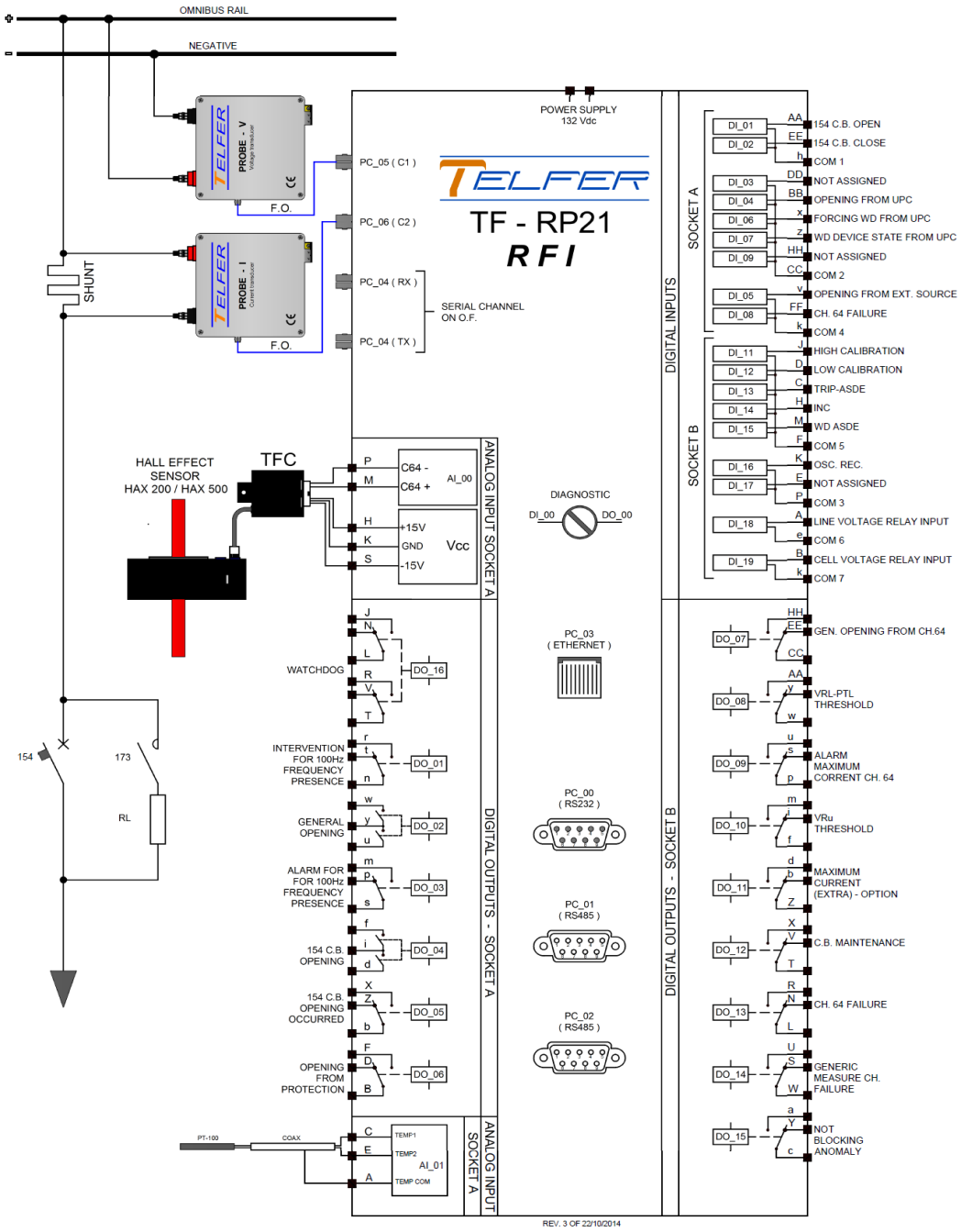
TOP VIEW

TFC



CONNECTIONS BETWEEN TF-RP21 AND TFC

CONNECTIONS LAYOUT WITH PROBE-V, PROBE-I AND TFC



T.EL.FER. CAN VARY THE PRODUCTS SPECIFICATIONS IN ANY MOMENT WITHOUT NOTICE

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