



**METERING INSTRUMENTS**  
DIGITAL MULTIMETERS AND ENERGY METERS  
NETWORK ANALYZERS  
DATA CONCENTRATOR  
COMMUNICATION DEVICES

**ENERGY METERS**  
DIRECT CONNECTION  
OR BY CURRENT  
TRANSFORMERS  
MID CERTIFIED VERSIONS



**control** elettronica



**EMM μD3VA | μ3VA | R3VA**  
VOLTMETERS / AMMETERS



**EMM 4h | μ4h | R4h**  
FLASH MOUNT LED MULTIMETERS



**EMM 4dc | 4d2c**  
FLASH MOUNT LED MULTIMETERS  
FOR DC NETWORKS



**ELM 4**  
FLUSH MOUNT AMMETER



**EMM D4h | μD3h**  
MODULAR LED MULTIMETERS



**EMT 4s**  
POWER TRANSDUCER



**EMT 1C/50 | 1C/300**  
POWER TRANSDUCERS



**EMS 96**  
NETWORK ANALYZER



**EMA 10 | 11 | 14**  
NETWORK ANALYZER



**EMA 90**  
NETWORK ANALYZER



**EMA D9**  
NETWORK ANALYZER



**TTC V-485-50 | I/50 | V-485-300**  
CURRENT TRANSFORMERS



**KIT METERING INSTRUMENT + CURRENT TRANSFORMERS / TT | TTA**



**ENERGY METERS**

DIRECT CONNECTION OR BY CURRENT TRANSFORMERS



**EMC 3b | EMC D3b**  
ENERGY METERS



**EMC D140-485**  
SINGLE PHASE ENERGY METER



**EMI 1 | 1R**  
RS232/RS485 CONVERTER



**EMI 1P-USB**  
USB/RS485 CONVERTER



**EMI 3m**  
GSM-GPRS MODEM



**EMI 5s**  
PROFIBUS/MODBUS CONVERTER



**EMI 10L | 10M**  
ETHERNET GATEWAY





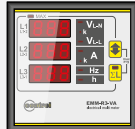

**EML 16**  
DATA CONCENTRATOR

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## VOLTMETERS / AMMETERS

COMPARATIVE TABLE		VOLTMETERS / AMMETERS			
EMM - EMT					
FUNCTIONS / MEASUREMENTS		EMM-µD3VA	EMM-µ3VA	EMM-R3VA	EMM-µD3h
INSTALLATION					
Connection		Single phase/2 phase/3 phase	Single phase/2 phase/3 phase	Single phase/2 phase/3 phase	Single phase/2 phase/3 phase
Through CT		5-1A	5-1A	5-1A	5-1A
Through SHUNT		-	-	-	-
Built-in digital outputs		-	-	-	-
Built-in digital inputs		-	-	-	-
Built-in communication port		-	-	-	-
Voltage/Current accuracy		±0.5%	±0.5%	±0.5%	±0.5%
Active energy accuracy		Cl. 1	Cl. 1	Cl. 1	Cl. 1
Degree of protection		IP42	IP52	IP52	IP42
MEASUREMENTS					
Active energy	Total	-	-	-	■
	Partial	-	-	-	■
Reactive energy	Total	-	-	-	■
	Partial	-	-	-	■
Separate energy count - Import/Export		-	-	-	■
Voltage		■	■	■	■
Current		■	■	■	■
Power		-	-	-	■
Power factor		-	-	-	■
Frequency		■	■	■	■
Cos φ		-	-	-	■
THD (Total Harmonic Distortion)		-	-	-	-
Detailed harmonic analysis (orders)		-	-	-	-
OPTIONS					
Measures accuracy		-	-	-	-
Digital inputs/outputs		■	■	■	■
Analog inputs/outputs		-	-	-	-
Communications ports		-	-	-	RS485
Memory		-	-	-	-

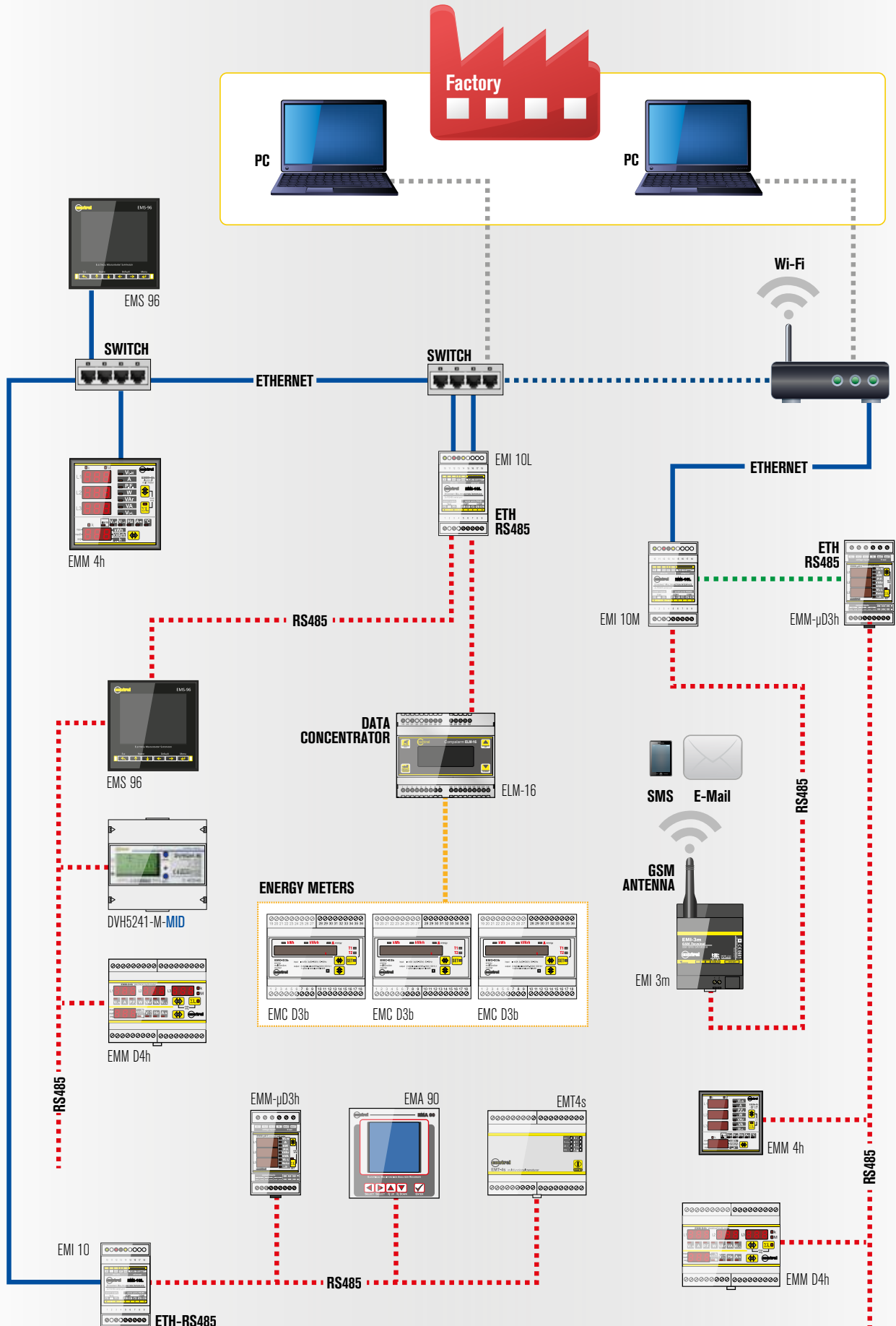
## NETWORK ANALYZERS

COMPARATIVE TABLE		NETWORK ANALYZERS	
EMS, EMA			
FUNZIONI E MISURE		EMS-96	EMA-10
INSTALLAZIONE			
Connection		Single phase / 2 phase / 3 phase	
Through CT		5-1A	
Built-in digital outputs		-	
Built-in digital inputs		-	
Built-in communication port		RS485	
Voltage/Current accuracy		±0.5%	
Active energy accuracy		Cl. 1	
Degree of protection		IP52	
MEASUREMENTS			
Active energy	Total	■	■
	Partial	■	■
Reactive energy	Total	■	■
	Partial	■	■
Separate energy count - Import/Export		■	■
Voltage		■	■
Current		■	■
Power		■	■
Power factor		■	■
Frequency		■	■
Cos φ		■	■
THD (Total Harmonic Distortion)		■	■
Detailed harmonic analysis (orders)		1...20°	1...31°
OPTIONS			
Measures accuracy		■	■
Digital inputs/outputs		■	■
Analog inputs/outputs		■	■
Communications ports		RS485/Ethernet/Profibus/M-Bus/RS485 Master	RS485 / Ethernet / Profibus
Memory		■	■

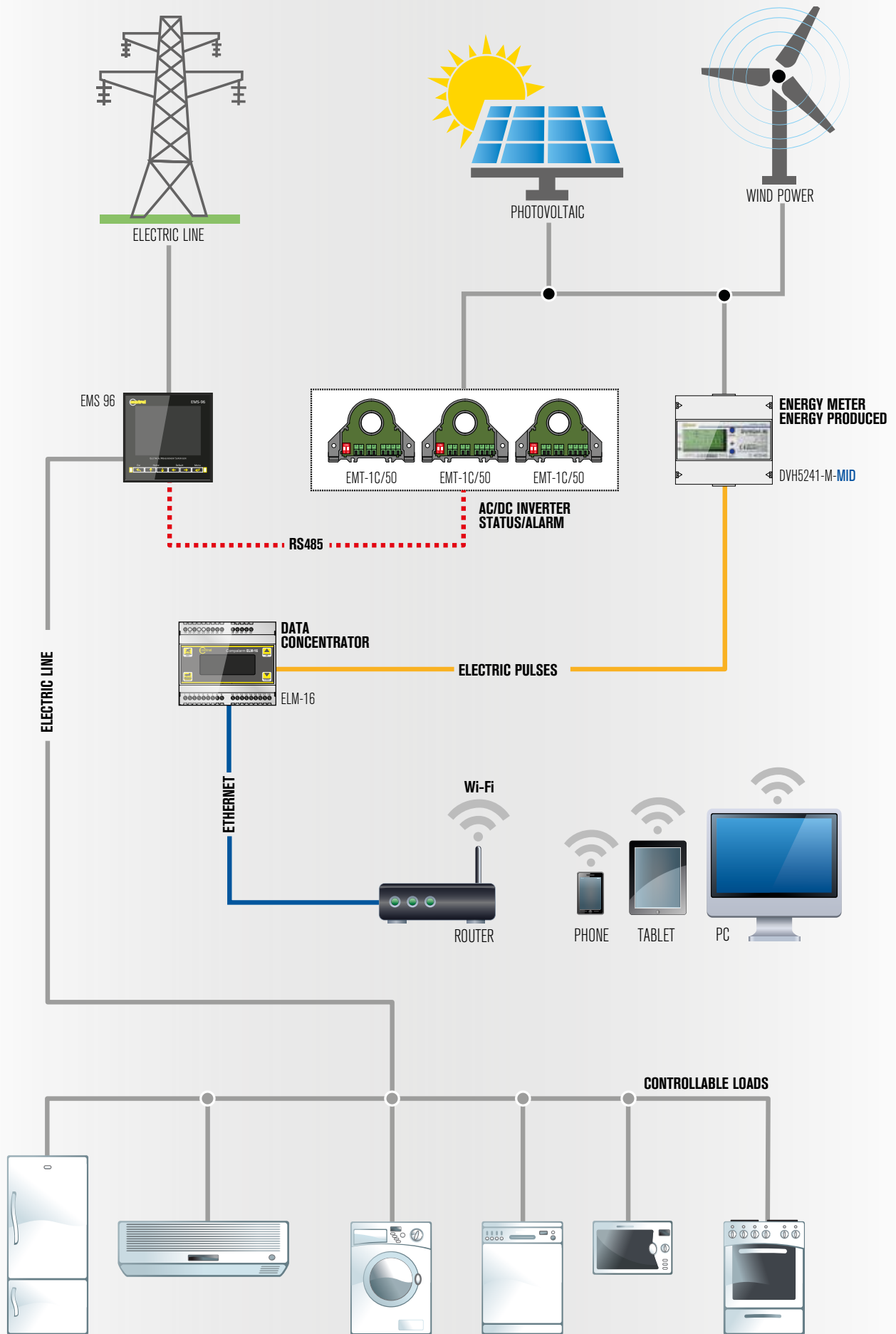




# Energy Installation Management



# Photovoltaic, Wind Power Installation Management





# EMM $\mu$ D3VA | $\mu$ 3VA | R3VA

DIGITAL MEASURING INSTRUMENTS - **VOLTMETER / AMMETER**

Voltage and current measures in True RMS

Storage of minimum, maximum and average(max demand) values

Connection by external CT

Measure in medium voltage by programming the voltage transformer (VT) ratio



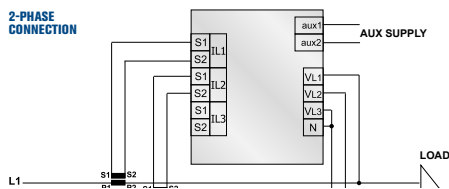
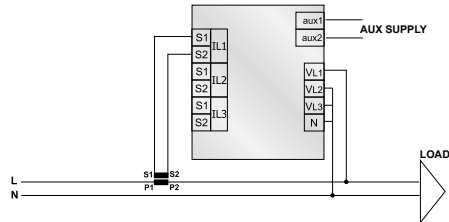
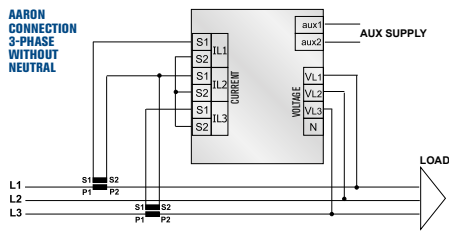
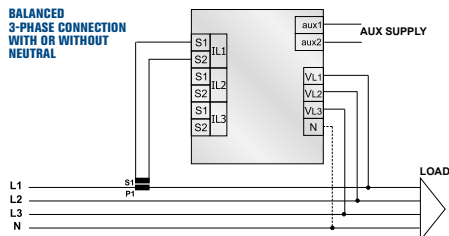
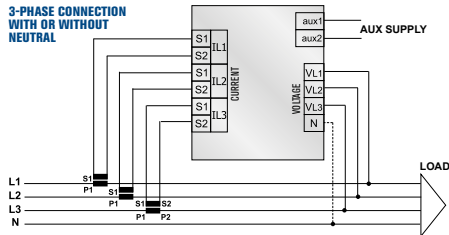
TECHNICAL CHARACTERISTICS	EMM- $\mu$ D3VA	EMM- $\mu$ 3VA	EMM-R3VA
<b>AUXILIARY SUPPLY</b>			
Nominal voltage $U_s$	230VAC	400VAC	400VAC
Operating voltage range	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$
Power consumption	3VA	3VA	3VA
Frequency	50 – 60 Hz	45 – 65 Hz	45 – 65 Hz
<b>VOLTAGE INPUTS</b>			
Measurement range	20...500VAC L-L (20...380VAC L-N)	300...500VAC L-L (175...290VAC L-N)	300...500VAC L-L (175...290VAC L-N)
Method of measuring	True RMS value	True RMS value	True RMS value
Measuring input impedance	1M $\Omega$	1M $\Omega$	1M $\Omega$
Method of connection	Single-phase, two-phase, three-phase orbanced three-phase system	Single-phase, two-phase, three-phase orbanced three-phase system	Single-phase, two-phase, three-phase orbanced three-phase system
<b>CURRENT INPUTS</b>			
Reference current	1A (option) or 5A	1A (option) or 5A	1A (option) or 5A
Measurement range	0,02...5A	0,02...5A	0,02...5A
Method of measuring	True RMS value	True RMS value	True RMS value
Overload capacity	+50% by an external current transformer	+30% by an external current transformer	+30% by an external current transformer
Self-consumption	< 0,5VA	< 0,5VA	< 0,5VA
<b>ACCURACY</b>			
Measures	Voltage	0,5%	0,5%
	Current	0,5%	0,5%
	Frequency	0,5%	0,5%
<b>INSULATION</b>			
Insulation voltage	3kVAC for 1 minute	3kVAC for 1 minute	3kVAC for 1 minute
<b>AMBIENT CONDITION</b>			
Storage temperature	-10...+60°C	-10...+60°C	-10...+60°C
Storage temperature	-25...+70°C	-25...+70°C	-25...+70°C
<b>HOUSING</b>			
Version	3 modules (DIN 50022)	Flush mount 72 x 72 mm	Flush mount 96 x 96 mm
Degree of protection	IP42 on front IP20 Housing and terminals	IP52 on front IP20 Housing and terminals	IP52 on front IP20 Housing and terminals
Weight	400g	500g	500g
<b>CERTIFICATIONS AND COMPLIANCE</b>			
Reference standards	IEC/EN 50081-2, IEC/EN 61000-6-2, IEC/EN 61010-1		

# EMM $\mu$ D3VA | $\mu$ 3VA | R3VA

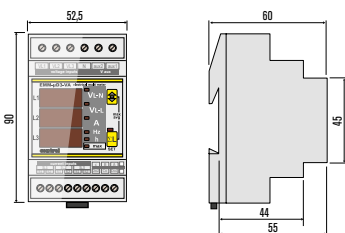
DIGITAL MEASURING INSTRUMENTS - **VOLTMETER / AMMETER**

OPTIONS	
ORDER CODE	DESCRIPTION
C1	Auxiliary Supply 230 V
C2	Auxiliary Supply 115 V
1A	Rated current inputs by external CT 1A
T	Internal current inputs, galvanically insulated
P	2 digital outputs

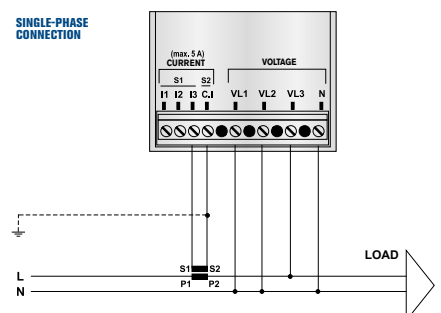
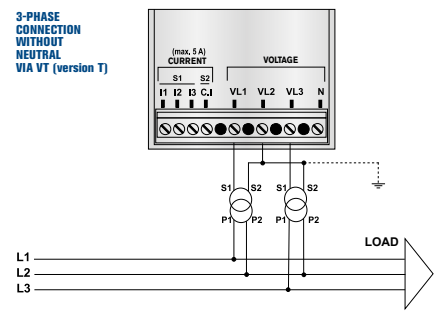
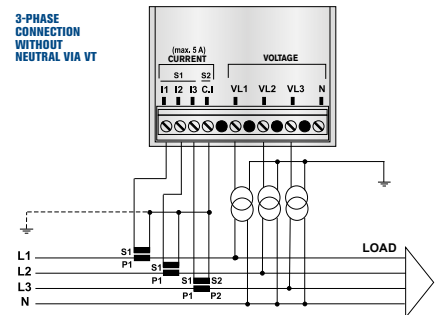
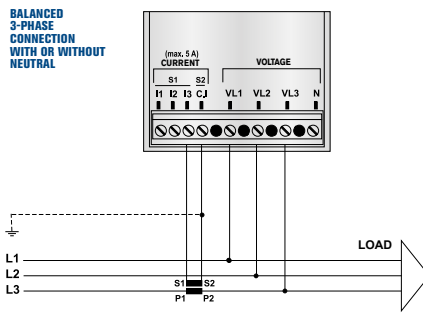
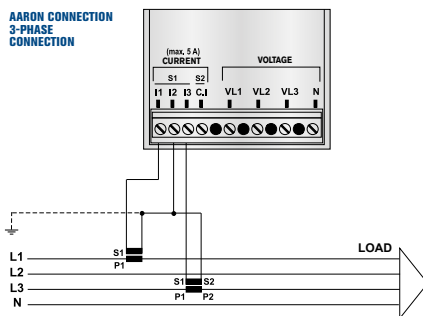
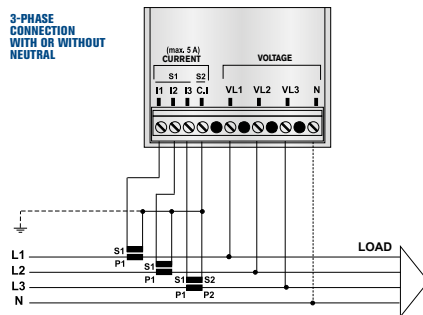
## WIRING DIAGRAMS EMM- $\mu$ D3VA



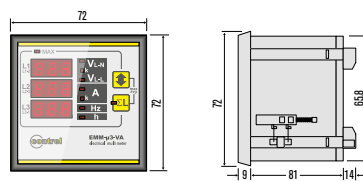
## MECHANICAL DIMENSIONS EMM- $\mu$ D3VA



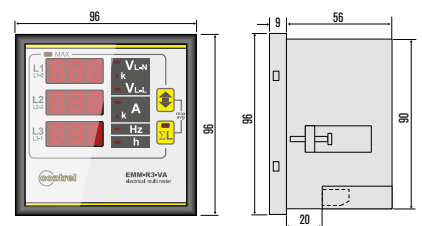
## WIRING DIAGRAMS EMM- $\mu$ 3VA e EMM-R3VA



## MECHANICAL DIMENSIONS EMM- $\mu$ 3VA



## MECHANICAL DIMENSIONS EMM-R3VA



# EMM 4h | $\mu$ 4h | R4h

## DIGITAL MEASURING INSTRUMENTS - FLUSH MOUNT LED MULTIMETERS



TECHNICAL CHARACTERISTICS	EMM-4h	EMM- $\mu$ 4h	EMM- R4h	
<b>AUXILIARY SUPPLY</b>				
Nominal voltage $U_s$	110 - 230 - 400 VAC	400VAC (directly by the voltage inputs)	400VAC (directly by the voltage inputs)	
Operating voltage range	$\pm 15\%$	$\pm 15\%$	$\pm 15\%$	
Power consumption	4VA	3VA	3VA	
Frequency	50 - 60 Hz	45 - 65 Hz	45 - 65 Hz	
<b>VOLTAGE INPUTS</b>				
Measurement range	20...500VAC L-L (20...290VAC L-N)	20...500VAC L-L (20...290VAC L-N)	20...500VAC L-L (20...290VAC L-N)	
Method of measuring	True RMS value	True RMS value	True RMS value	
Measuring input impedance	1M $\Omega$	1M $\Omega$	1M $\Omega$	
Method of connection	Single-phase, two-phase, three-phase orbanced three-phase system	Single-phase, two-phase, three-phase orbanced three-phase system	Single-phase, two-phase, three-phase orbanced three-phase system	
<b>CURRENT INPUTS</b>				
Reference current	1A (option) or 5A	1A (option) or 5A	1A (option) or 5A	
Measurement range	0,02...5A	0,02...5A	0,02...5A	
Method of measuring	True RMS value	True RMS value	True RMS value	
Overload capacity	+20% by an external current transformer	+20% by an external current transformer	+20% by an external current transformer	
Self-consumption	< 0,5VA	< 0,5VA	< 0,5VA	
<b>ACCURACY</b>				
Measures	Voltage	0,5%	0,5%	0,5%
	Current	0,5%	0,5%	0,5%
	Power	1 %	1 %	1 %
	Frequency	0,5%	0,5%	0,5%
	Active energy	Class 1	Class 1	Class 1
<b>INSULATION</b>				
Insulation voltage	3kVAC for 1 minute	3kVAC for 1 minute	3kVAC for 1 minute	
<b>AMBIENT CONDITION</b>				
Storage temperature	-10...+60°C	-10...+60°C	-10...+60°C	
Storage temperature	-25...+80°C	-25...+80°C	-25...+80°C	
<b>HOUSING</b>				
Version	Flush mount 96 x 96 mm	Flush mount 72 x 72 mm	Flush mount 96 x 96 mm	
Degree of protection	IP42 on front IP20 Housing and terminals	IP52 on front IP20 Housing and terminals	IP52 on front IP20 Housing and terminals	
Weight	500g	500g	500g	
<b>CERTIFICATIONS AND COMPLIANCE</b>				
Reference standards	IEC/EN 50081-2, IEC/EN 61000-6-2, IEC/EN 61010-1, IEC/EN 61036-1			
<b>OPTIONS</b>				
ORDER CODE	DESCRIPTION			
C1	Auxiliary Supply 20 $\pm$ 60 VAC/CC (version EMM-4h) - Auxiliary Supply 230 VAC (versions EMM-R4h, EMM- $\mu$ 4h)			
C2	Auxiliary Supply 90 $\pm$ 250 VAC/CC (version EMM-4h) - Auxiliary Supply 110 VAC (versions EMM-R4h, EMM- $\mu$ 4h)			
600	Voltage Inputs 600 V (version EMM-4h)			
1A	Rated Current inputs by external CT 1A			
T	Internal Current inputs, galvanically insulated			

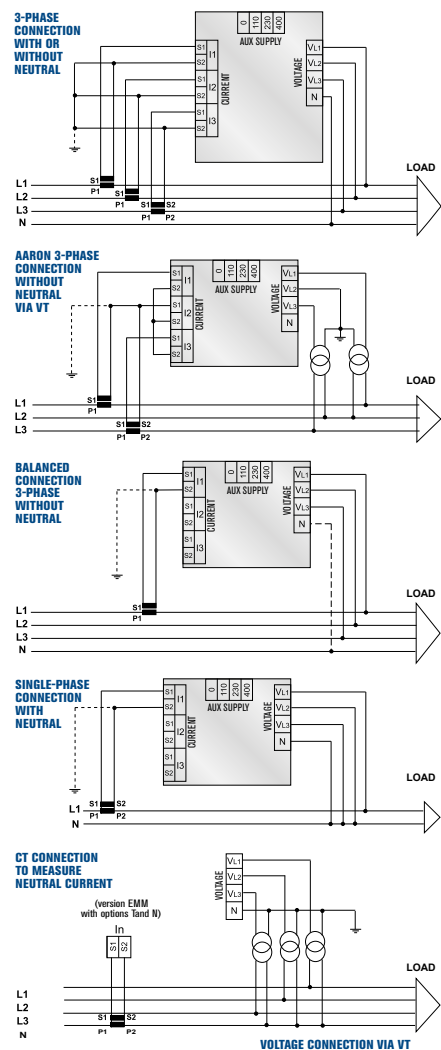


# EMM 4h | $\mu$ 4h | R4h

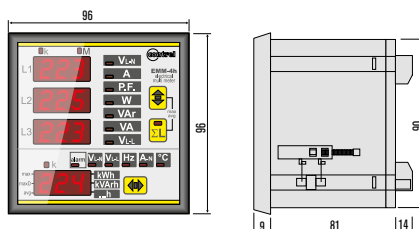
## DIGITAL MEASURING INSTRUMENTS - FLUSH MOUNT LED MULTIMETERS

<b>TT - TTA</b>	Current inputs by miniaturized closed CT (TT) or openable CT (TTA)
<b>N</b>	Neutral current input or differential current input
<b>M</b>	Import/Export energy counters
<b>P</b>	2 digital outputs
<b>DI</b>	1 digital input
<b>A</b>	1 analog outputs
<b>COMMUNICATION PORTS</b>	
<b>485</b>	RS485 serial interface
<b>ETH</b>	Ethernet interface with Web server function (version EMM-4h)
<b>PF/S</b>	Profibus-DP interface (version EMM-4h)
<b>M-Bus</b>	M-Bus interface (version EMM-4h)
<b>LON</b>	LON-Works interface (version EMM-4h)

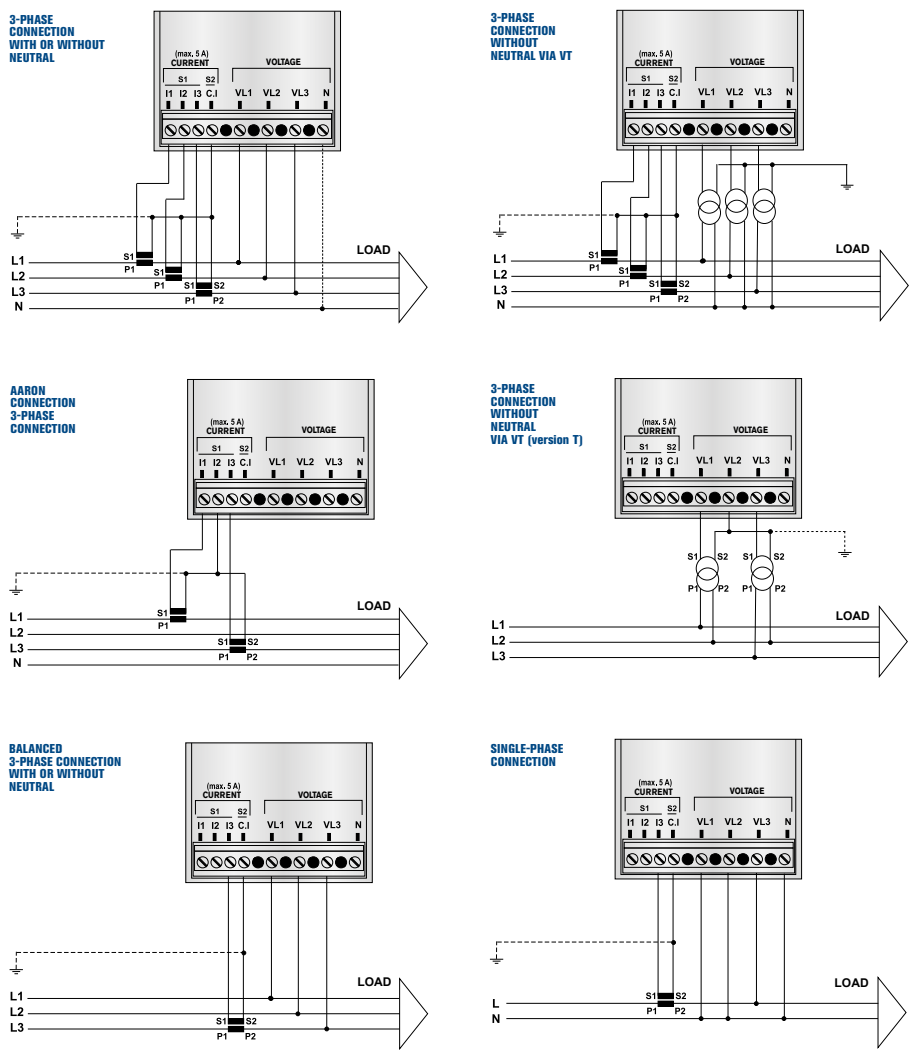
### WIRING DIAGRAMS EMM-4h



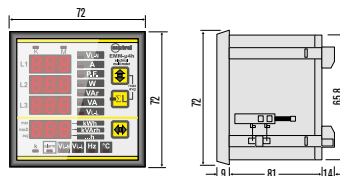
### MECHANICAL DIMENSIONS EMM-4h



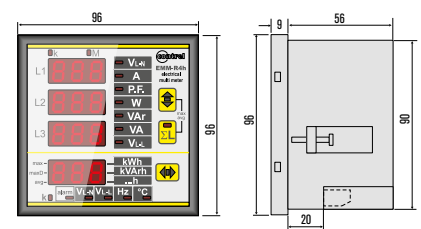
### WIRING DIAGRAMS EMM- $\mu$ 4h e EMM-R4h



### MECHANICAL DIMENSIONS EMM- $\mu$ 4h



### MECHANICAL DIMENSIONS EMM-R4h



# EMM 4dc | 4d2c

DIGITAL MEASURING INSTRUMENTS  
**FLUSH MOUNT**  
**LED MULTIMETERS**  
**FOR DC NETWORKS**



TECHNICAL CHARACTERISTICS		EMM-4dc	EMM-4d2c
<b>AUXILIARY SUPPLY</b>			
Nominal voltage $U_s$		110 - 230 - 380 VAC	110 - 230 - 380 VAC
Operating voltage range		$\pm 10\%$	$\pm 10\%$
Power consumption		4VA	4VA
Frequency		50 - 60 Hz	50 - 60 Hz
<b>VOLTAGE INPUTS</b>			
Measurement range		5...200 VDC	5...200 VDC
Measuring input impedance		1 M $\Omega$	1 M $\Omega$
Method of connection		Line with a common negative voltage and the second shunt inputs Line with a negative common voltage and shunt 1 entrance Line with positive common voltage and 2 shunt inputs Line with only shunt inputs Line for only voltage input	
<b>CURRENT INPUTS</b>			
Connection type		Through SHUNT / HALL sensor (option)	Through SHUNT / HALL sensor (option)
Shunt range		1...60mV 1...150mV (option)	1...60mV 1...150mV (option)
<b>ACCURACY</b>			
Measures	Voltage	Class 0,5 $\pm$ 1 digit	Class 0,5 $\pm$ 1 digit
	Current	Class 0,5 $\pm$ 1 digit	Class 0,5 $\pm$ 1 digit
	Power	Class 1 da $\pm$ 1 digit	Class 1 da $\pm$ 1 digit
	Active energy	Class 1	Class 1
<b>INSULATION</b>			
Insulation voltage		3kVAC for 1 minute	3kVAC for 1 minute
<b>AMBIENT CONDITION</b>			
Operating temperature		-10...+60°C	-10...+60°C
Storage temperature		-25...+80°C	-25...+80°C
<b>HOUSING</b>			
Version		Flush mount 96 x 96 mm	Flush mount 96 x 96 mm
Degree of protection		IP52 on front IP20 Housing and terminals	IP52 on front IP20 Housing and terminals
Weight		500g	500g
<b>CERTIFICATIONS AND COMPLIANCE</b>			
Reference standards		EN 61010-1	EN 61010-1

OPTIONS	
ORDER CODE	DESCRIPTION
C1	Auxiliary supply 20÷60 VAC/VCC
C2	Auxiliary supply 90÷250 VAC/VCC
P	2 digital outputs
DI	1 digital input
HE	Input current Hall sensor
PT100	Temperature input PT100 sensor (version EMM-4d2c)
COMMUNICATION PORTS	
485	RS485 serial interface

# EMM 4dc | 4d2c

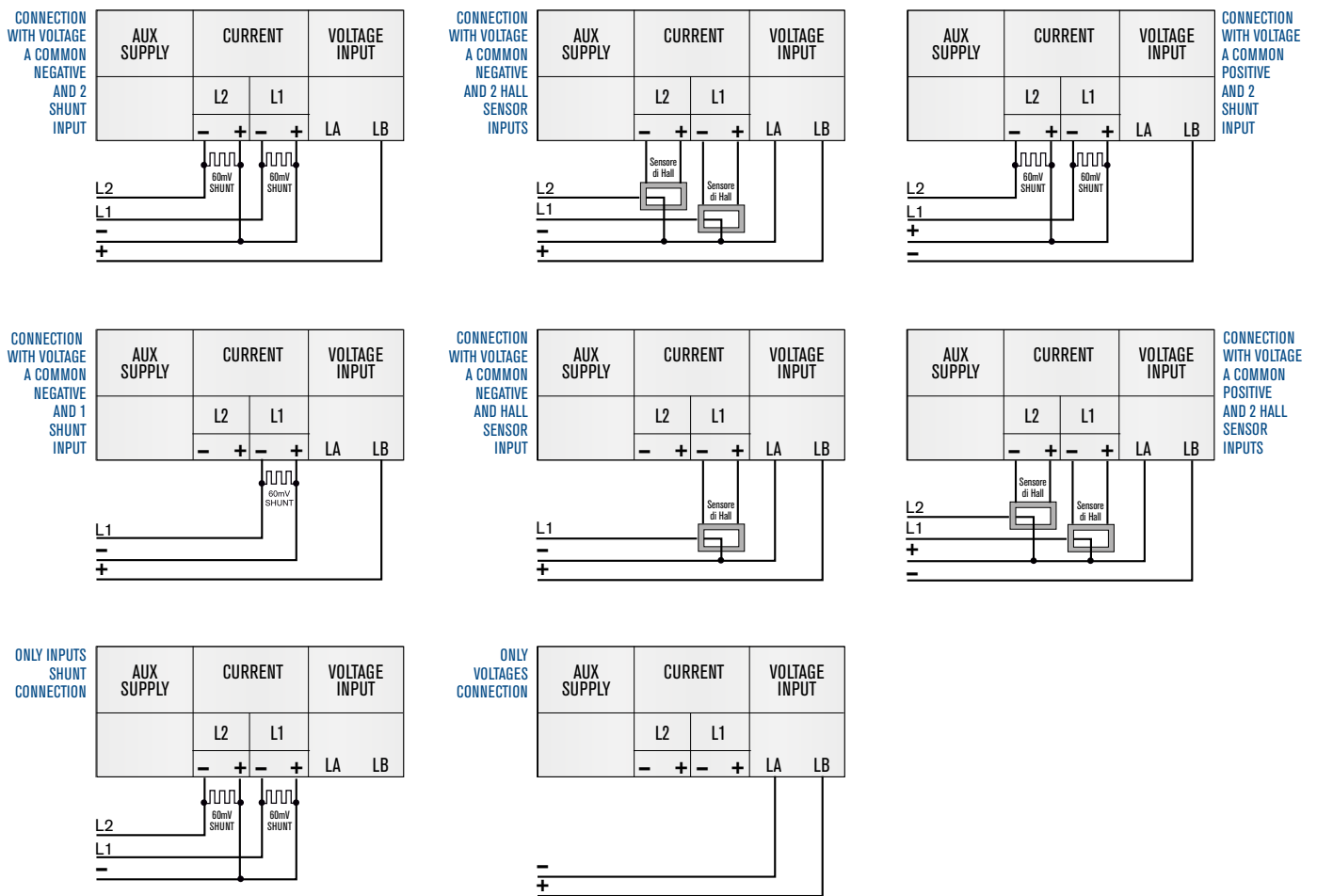
DIGITAL MEASURING INSTRUMENTS

FLUSH MOUNT LED MULTIMETERS FOR DC NETWORKS

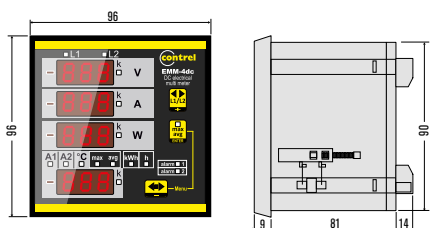
	EMM-4dc				EMM-4d2c			
	IST	MAX	AVG	MD	IST	MAX	AVG	MD
Voltage	•	•	•	-	•	•	-	-
Current	•	•	•	•	•	•	•	•
Active power	•	•	•	•	-	-	-	-
Active energy counter	TOTAL / PARTIAL				-			
Temperature			•		•	•	-	-
Hour counter			•				•	

IST = Instantaneous value / MAX = Highest peak of the instantaneous value / AVG = Time-integrated value / MD = Maximum peak of the integrated value (max demand)

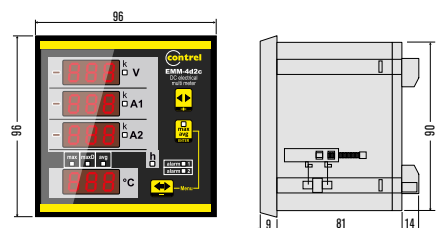
## WIRING DIAGRAMS



## MECHANICAL DIMENSIONS EMM-4dc



## MECHANICAL DIMENSIONS EMM-4d2c





# ELM 4

## DIGITAL MEASURING INSTRUMENTS AMMETER FOR CURRENTS LINE OR DIFFERENTIAL CURRENTS

Ammeter for measuring differential or residual currents (up to four simultaneously) using an external toroidal or for the measurement of the line currents (possibly also separate lines between them) using appropriate external CT.



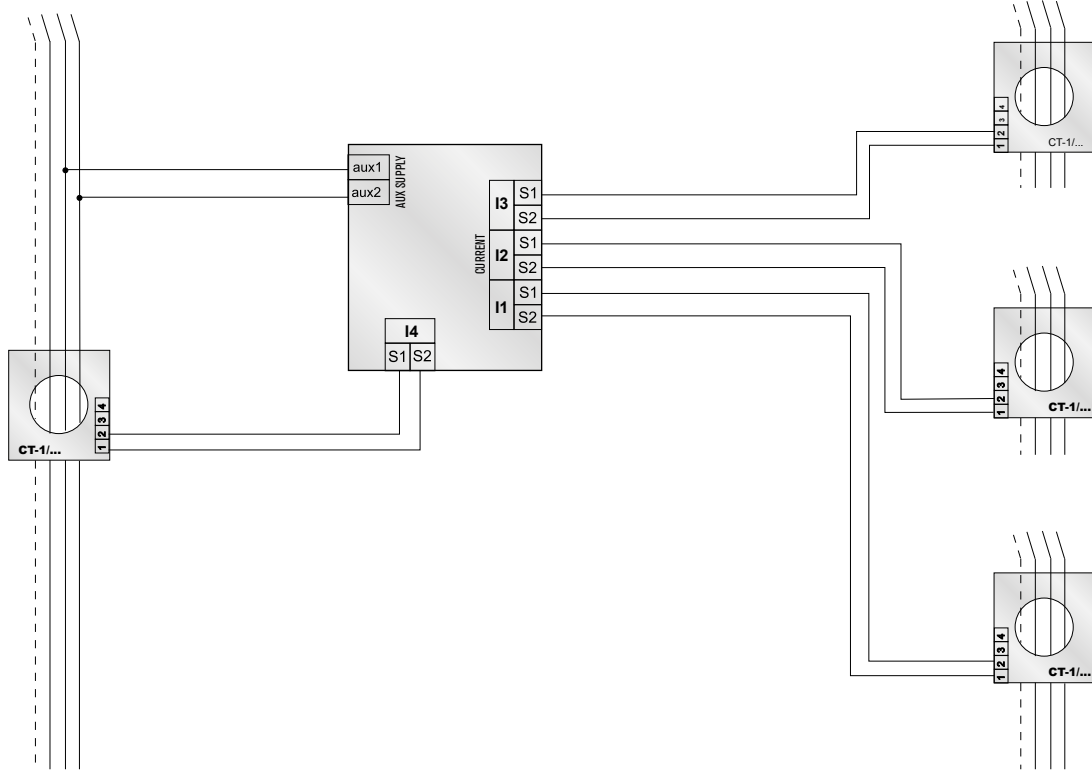
TECHNICAL CHARACTERISTICS		ELM-4
<b>AUXILIARY SUPPLY</b>		
Nominal voltage Us		110 - 230 - 400 VAC
Operating voltage range		±15%
Power consumption		3VA
Frequency		50 - 60 Hz
<b>VOLTAGE INPUTS</b>		
Measurement range		52...693VAC L-L (30...400VAC L-N)
Method of measuring		True RMS value
Measuring input impedance		1 MΩ
Method of connection		Single-phase, two-phase, three-phase or balanced three-phase system
<b>CURRENT INPUTS</b>		
Reference current		5A
Measurement range		0.05...5A
Method of measuring		True RMS value
Overload capacity		+30% by an external current transformer
Self-consumption		< 0.5VA
<b>ACCURACY</b>		
Measures	Voltage	-
	Current	0.5%
	Power	-
	Frequency	-
	Active energy	-
<b>INSULATION</b>		
Insulation voltage		3kVAC for 1 minute
<b>AMBIENT CONDITION</b>		
Operating temperature		-10...+60°C
Storage temperature		-25...+80°C
<b>HOUSING</b>		
Version		Flush mount 96 x 96 mm
Degree of protection		IP52 on front - IP20 Housing and terminals
Weight		500g
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards		IEC/EN 50081-2, IEC/EN 61000-6-2, IEC/EN 61010-1, IEC/EN 61036-1
<b>OPTIONS</b>		
ORDER CODE	DESCRIPTION	
C1	Auxiliary supply 20÷60 VAC/DC	
C2	Auxiliary supply 85÷230 VAC/DC	
CT5	Current inputs by external CT 5A	
CT1	Rated current inputs by external CT 1A	
DO	2 digital outputs	
A	1 analog output	
<b>COMMUNICATION PORTS</b>		
485	RS485 serial interface	

# ELM 4

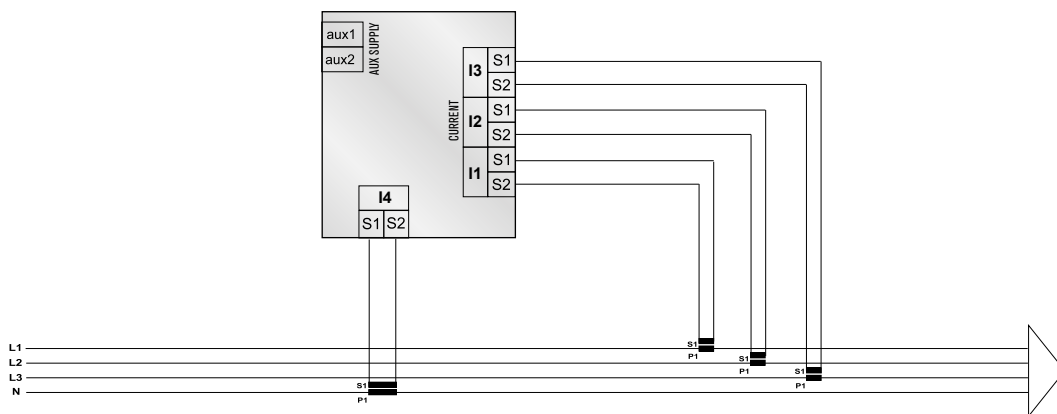
DIGITAL MEASURING INSTRUMENTS

## AMMETER FOR CURRENTS LINE OR DIFFERENTIAL CURRENTS

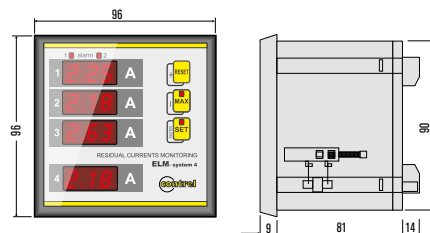
### WIRING DIAGRAMS - DIFFERENTIAL CURRENT INPUTS



### WIRING DIAGRAMS - CURRENT INPUTS BY EXTERNAL CT



### MECHANICAL DIMENSIONS ELM 4



# EMM D4h | $\mu$ D3h

DIGITAL MEASURING INSTRUMENTS

**MODULAR LED  
MULTIMETERS**



TECHNICAL CHARACTERISTICS		EMM-D4h	EMM- $\mu$ D3h
<b>AUXILIARY SUPPLY</b>			
Nominal voltage Us		110 - 230 - 400 VAC	230VAC
Operating voltage range		$\pm 15\%$	$\pm 15\%$
Power consumption		4VA	4VA
Frequency		50 - 60 Hz	50 - 60 Hz
<b>VOLTAGE INPUTS</b>			
Measurement range		20...500VAC L-L (20...290VAC L-N)	20...500VAC L-L (20...290VAC L-N)
Method of measuring		True RMS value	True RMS value
Measuring input impedance		1M $\Omega$	1M $\Omega$
Method of connection		Single-phase, two-phase, three-phase or balanced three-phase system	Single-phase, two-phase, three-phase or balanced three-phase system
<b>CURRENT INPUTS</b>			
Reference current		1A (option) or 5A	1A (option) or 5A
Measurement range		0,02...5A	0,02...5A
Method of measuring		True RMS value	True RMS value
Overload capacity		+30% by an external current transformer	+30% by an external current transformer
Self-consumption		< 0,5VA	< 0,5VA
<b>ACCURACY</b>			
Measures	Voltage	0,5%	0,5%
	Current	0,5%	0,5%
	Power	1 %	1 %
	Frequency	0,5%	0,5%
	Active energy	Class 1	Class 1
<b>INSULATION</b>			
Insulation voltage		3kVAC for 1 minute	3kVAC for 1 minute
<b>AMBIENT CONDITION</b>			
Operating temperature		-10...+60°C	-10...+60°C
Storage temperature		-25...+80°C	-25...+80°C
<b>HOUSING</b>			
Version		6 modules	3 modules
Degree of protection		IP52 on front IP20 Housing and terminals	IP52 on front IP20 Housing and terminals
Weight		500g	300g
<b>CERTIFICATIONS AND COMPLIANCE</b>			
Reference standards		IEC/EN 50081-2, IEC/EN 61000-6-2, IEC/EN 61010-1, IEC/EN 61036-1	
<b>OPTIONS</b>			
ORDER CODE	DESCRIPTION		
C1	Auxiliary supply 20÷60 VAC/DC (version EMM-D4h) - Auxiliary supply 400 VAC (versions EMM- $\mu$ D3h)		
C2	Auxiliary supply 90÷250 VAC/DC (version EMM-D4h) - Auxiliary supply 110 VAC (versions EMM- $\mu$ D3h)		
1A	Rated current inputs by external CT 1A		
T	Internal current inputs, galvanically insulated (version EMM-D4h)		
TT - TTA	Current inputs by miniaturized closed CT (TT) or openable CT (TTA)		
N	Neutral current input or differential current input (version EMM-D4h)		



# EMM D4h | $\mu$ D3h

DIGITAL MEASURING INSTRUMENTS - MODULAR LED MULTIMETERS

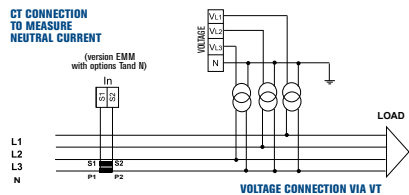
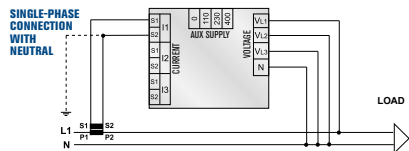
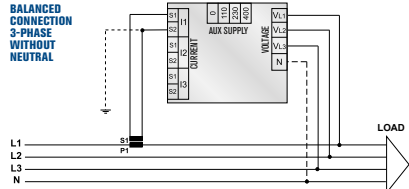
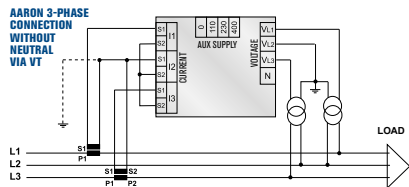
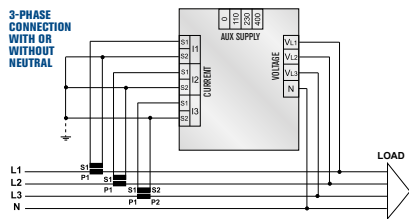
## OPTIONS

ORDER CODE	DESCRIPTION
<b>M</b>	Import/Export energy counters
<b>P</b>	2 digital outputs
<b>DI</b>	1 digital inputs (version EMM-D4h)
<b>A</b>	1 analog output (version EMM-D4h)

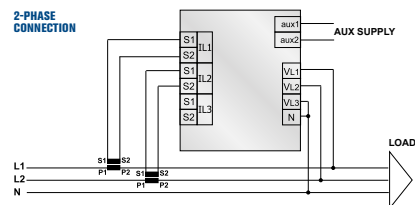
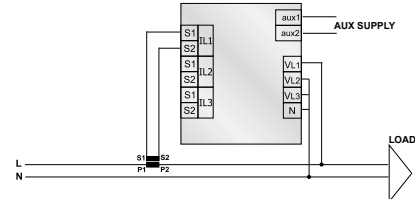
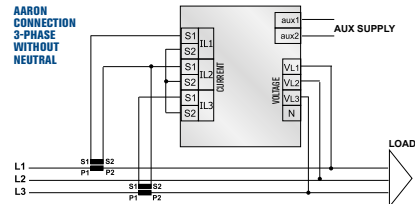
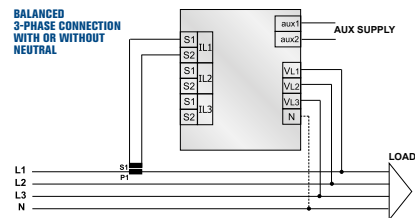
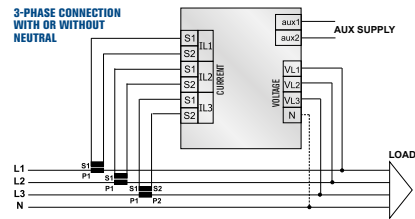
## COMMUNICATION PORTS

<b>485</b>	RS485 serial interface
<b>ETH</b>	1 digital inputs (version EMM-D4h)
<b>LON</b>	1 analog output (version EMM-D4h)

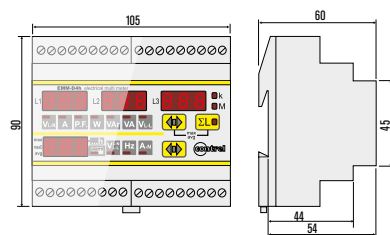
## WIRING DIAGRAMS EMM-D4h



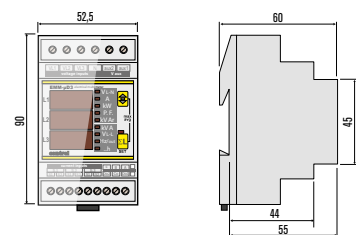
## WIRING DIAGRAMS EMM- $\mu$ D3h



## MECHANICAL DIMENSIONS EMM-D4h



## MECHANICAL DIMENSIONS EMM- $\mu$ D3h



# EMT 4s

## DIGITAL MEASURING INSTRUMENTS MEASUREMENT TRANSDUCER

The EMT-4s is the transducer version of the EMS-96, for DIN-rail mount. This device has the same characteristics as the EMS-96, but has no color display. Instead of the integrated display, the EMT-4s has an interface board that consent the connection in one of the following modes:

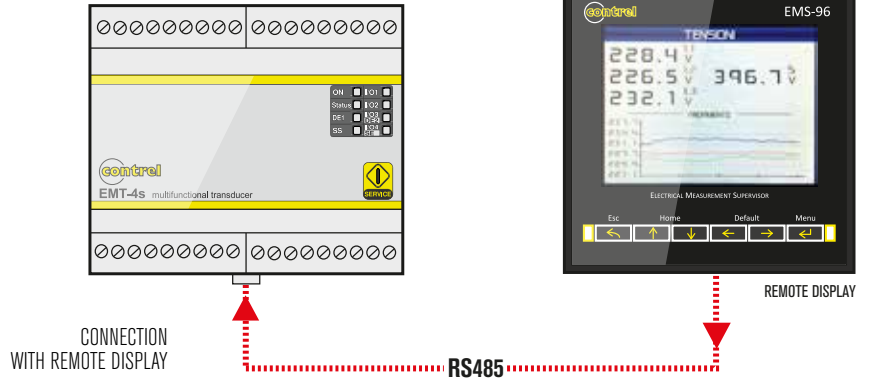
- RS485 communication port
- Remote display communication port



TECHNICAL CHARACTERISTICS		EMT-4s
<b>AUXILIARY SUPPLY</b>		
Nominal voltage Us		110 - 230 - 400 VAC
Operating voltage range		±15%
Power consumption		3VA
Frequency		50 - 60 Hz
<b>VOLTAGE INPUTS</b>		
Measurement range		52...693VAC L-L (30...400VAC L-N)
Method of measuring		True RMS value
Measuring input impedance		1,8MΩ
Method of connection		Single-phase, two-phase, three-phase or balanced three-phase system
<b>CURRENT INPUTS</b>		
Reference current		1A (option), 30A (option) or 5A
Measurement range		0,05...5A
Method of measuring		True RMS value
Overload capacity		6A by an external current transformer
Self-consumption		<0,5VA
<b>ACCURACY</b>		
Measures	Voltage	0,5%
	Current	0,5%
	Power	1 %
	Frequency	0,5%
	Active energy	Class 1
<b>RS485 SERIAL INTERFACE</b>		
Baud-rate		Programmable 4800...38400 bps
Protocol		Modbus RTU
<b>INSULATION</b>		
Insulation voltage		3kVAC for 1 minute
<b>AMBIENT CONDITION</b>		
Operating temperature		-5...+50°C
Storage temperature		-15...+60°C
<b>HOUSING</b>		
Version		6 modules
Degree of protection		IP52 on front IP20 Housing and terminals
Weight		430g
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards		EN61000-6-2, EN61000-6-4, CISPR22-EN55022, EN62053-21, EN62053-22, EN62053-23
<b>OPTIONS</b>		
ORDER CODE	DESCRIPTION	
1A	Rated current inputs by external CT 1A	
TT - TTA	Current inputs by miniaturized closed CT (TT) or openable CT (TTA)	
N	Neutral current input or differential current input	
0.5 s	Active energy Class 0.5s	
0.2 s	Active energy Class 0.2s	
4DI	4 digital inputs	
4DO	4 digital outputs	
<b>COMMUNICATION PORTS</b>		
485	RS485 serial interface	
485M	RS485 serial interface (Master function)	

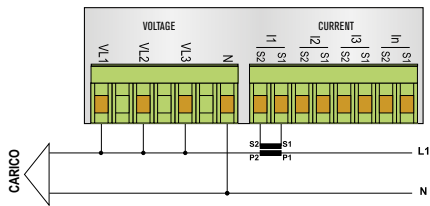
# EMT 4s

## DIGITAL MEASURING INSTRUMENTS MEASUREMENT TRANSDUCER

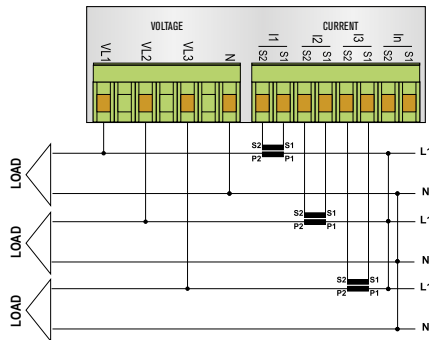


### WIRING DIAGRAMS EMT-4s

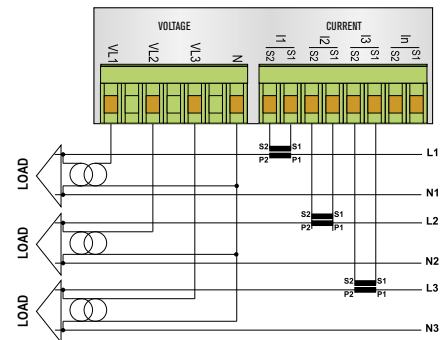
**SINGLE-PHASE 2 WIRE CONNECTION**



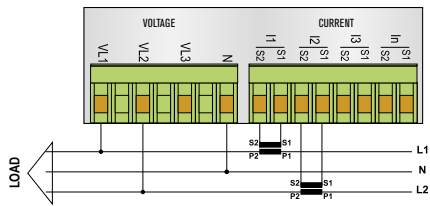
**SINGLE-PHASE 2 WIRE CONNECTION MULTIPLE LOADS**



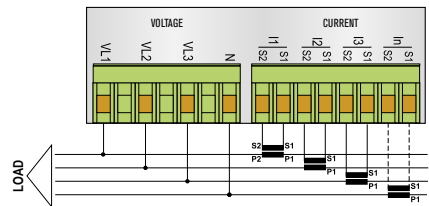
**MULTIPLE SINGLE-PHASE CONNECTION MULTIPLE LOADS**



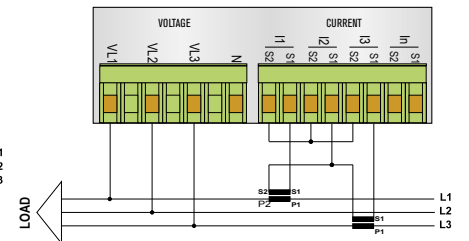
**2-PHASE CONNECTION WITH NEUTRAL**



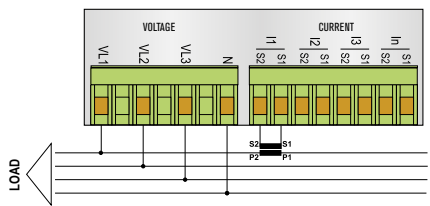
**3-PHASE CONNECTION WITH NEUTRAL**



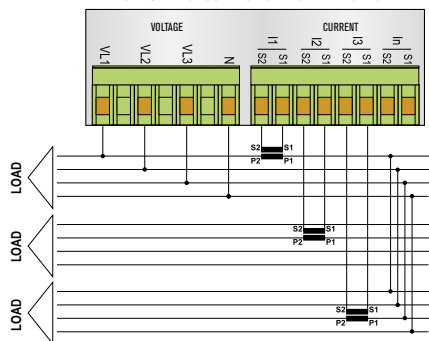
**AARON CONNECTION 3-PHASE WITHOUT NEUTRAL**



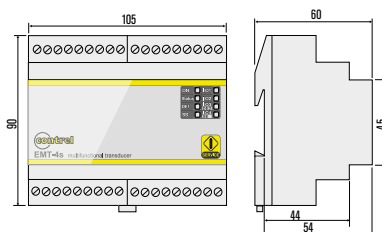
**BALANCED 3-PHASE CONNECTION WITH NEUTRAL**



**BALANCED 3-PHASE CONNECTION MULTIPLE LOADS**



### MECHANICAL DIMENSIONS EMT-4s



# EMT-1C/50 | 1C/300

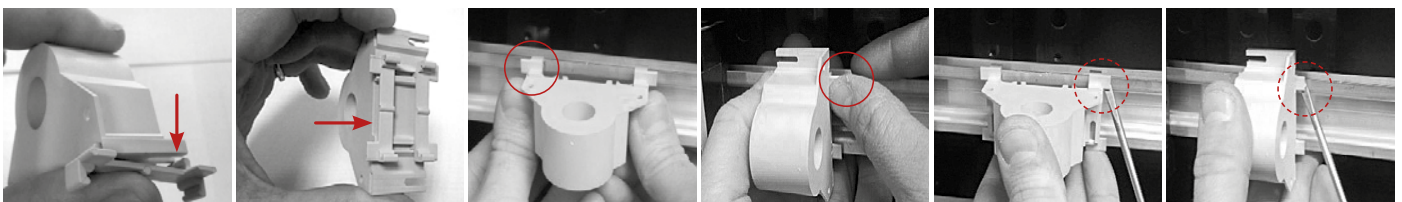
DIGITAL MEASURING INSTRUMENTS  
**MODULAR  
 MEASUREMENT  
 TRANSDUCER**



TECHNICAL CHARACTERISTICS		EMT-1C/50	EMT-1C/50 LV	EMT-1C/300	EMT-1C/300 LV
<b>AUXILIARY SUPPLY</b>					
Nominal voltage $U_s$		9...30 VDC		9...30 VDC	
Operating voltage range		-		-	
Power consumption		< 1,3W		< 1,3W	
Frequency		50 - 60 Hz		50 - 60 Hz	
<b>VOLTAGE INPUTS</b>					
Measurement range		Up to 800 VAC or 1000 VDC	Up to 80 VAC or 100 VDC	Up to 800 VAC or 1000 VDC	Up to 80 VAC or 100 VDC
Method of measuring		True RMS value		True RMS value	
<b>CURRENT INPUTS</b>					
Measurement range		Fino a 50A AC/DC		Fino a 300A AC o 400A DC	
Method of measuring		True RMS value		True RMS value	
<b>ACCURACY</b>					
Measures	Voltage	0.5%		0.5%	
	Current	0.5%		0.5%	
	Power	0.5%		0.5%	
	Frequency	± 0,1		± 0,1	
	Active energy	Class 1		Class 1	
<b>RS485 SERIAL INTERFACE</b>					
Baud-rate		Programmable 1200 - 115200 bps		Programmable 1200 - 115200 bps	
Protocol		Modbus RTU		Modbus RTU	
<b>INSULATION</b>					
Insulation voltage		3 kV on bare wire for current measure 4 kV for Voltage measure		3 kV on bare wire for current measure 4 kV for Voltage measure	
<b>AMBIENT CONDITION</b>					
Operating temperature		-15...+65°C		-15...+65°C	
Storage temperature		-40...+85°C		-40...+85°C	
<b>HOUSING</b>					
Version		DIN rail clips for vertical/horizontal mounting		DIN rail clips for vertical/horizontal mounting	
Filling		Epoxy resin		Epoxy resin	
Degree of protection		IP20		IP20	
Weight		80g		370g	
<b>CERTIFICATIONS AND COMPLIANCE</b>					
Reference standards		EN61000-6-4/2006 + A1 2011; EN64000-6-2/2005 ; EN61010-1/2010		EN61000-6-4/2006 + A1 2011; EN64000-6-2/2005 ; EN61010-1/2010	

## MOUNTING

The EMT-1C can be mounted in any position (see photo below), horizontal or vertical mounting, horizontal or vertical through the two hooks for DIN rail included in the box.





# EMT-1C/50 | 1C/300

## DIGITAL MEASURING INSTRUMENTS MODULAR MEASUREMENT TRANSDUCER

### EMT-1C/50

The EMT-1C/50 is a Single-phase Power meter able to measure TRMS Current AC/DC, and Voltage.

On the RS485 Modbus are available : Irms, Vrms, Watt, Var, Va, Vpk, Ipk, Frequency, Cos $\phi$ , Energy bidirectional and THD.  
The device is fully configurable by RS485.

#### CHARACTERISTICS:

- TRMS Measure, THD available
- 0,5 % Accuracy
- RS485 Modbus integrated
- Bidirectional Energy metering
- Din rail mounting in both side
- Fully configurable by interface software
- Bootloader for updating firmware

### EMT-1C/50 LV

The EMT-1C/50-LV is the LOW VOLTAGE version of the Single-phase Power meter EMT-1C/50, able to measure the RMS AC or DC Current and Voltage.  
On the RS485 Modbus are available:

Irms, Vrms, Watt, Var, Va, Vpk, Ipk, Frequency, Cos $\phi$ , Energy bidirectional and THD.  
The device is fully configurable by RS485.

#### CHARACTERISTICS:

- LOW VOLTAGE VERSION
- TRMS Measure, THD available
- 0,5% Accuracy;
- RS485 Modbus integrated;
- Bidirectional Energy metering
- Din-rail mounting in both side
- Fully configurable by interfacesoftware
- Available measure register: MSW first, LSW first or hundreds

### EMT-1C/300

The EMT-1C/300 is an Energy / Power Meter capable of measuring single-phase current and voltage AC RMS/ DC.  
RS485 Modbus with over 200 registers.

Measure available: Irms, Vrms, Watt, Var, Va, Vpk, Ipk, Frecuenza, Cos $\phi$ , Import/Export energy, THD, min/MAX of RMS measurement.

Suitable for measurements with varying frequencies (Wind, Hydro, Shipbuilding Industries, Aviation), Telecommunication applications, Refrigeration, Motors.  
Suitable for direct measurements between inverter and motor.

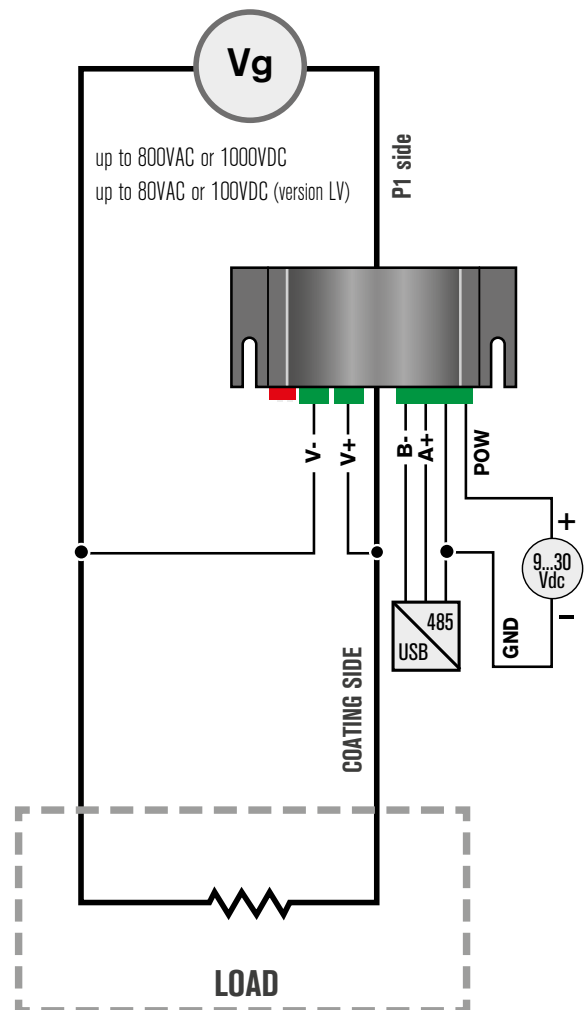
### EMT-1C/300 LV

The EMT-1C/300-LV is the LOW VOLTAGE version of the Energy / Power Meter EMT-1C/300, capable of measuring single-phase current and voltage AC/DC TRMS.

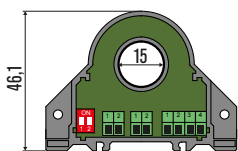
RS485 Modbus with over 200 registers.

Measure available: Measure available: Irms, Vrms, Watt, Var, Va, Vpk, Ipk, Frecuenza, Cos $\phi$ , Import/Export energy, THD, min/MAX of RMS measurement.

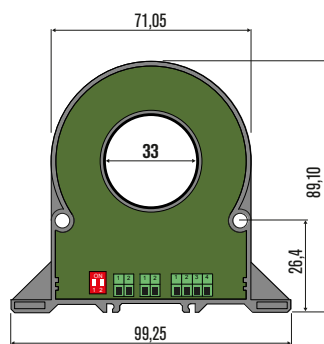
#### WIRING DIAGRAMS EMT-1C/50 E EMT-1C/300



#### MECHANICAL DIMENSIONS EMT-1C/50



#### MECHANICAL DIMENSIONS EMT-1C/300



# EMS 96

## DIGITAL MEASURING INSTRUMENTS NETWORK ANALYZER

The **EMS-96** network analyzer has been designed to combine the maximum possible easiness of operation together with a wide choice of advanced functions.

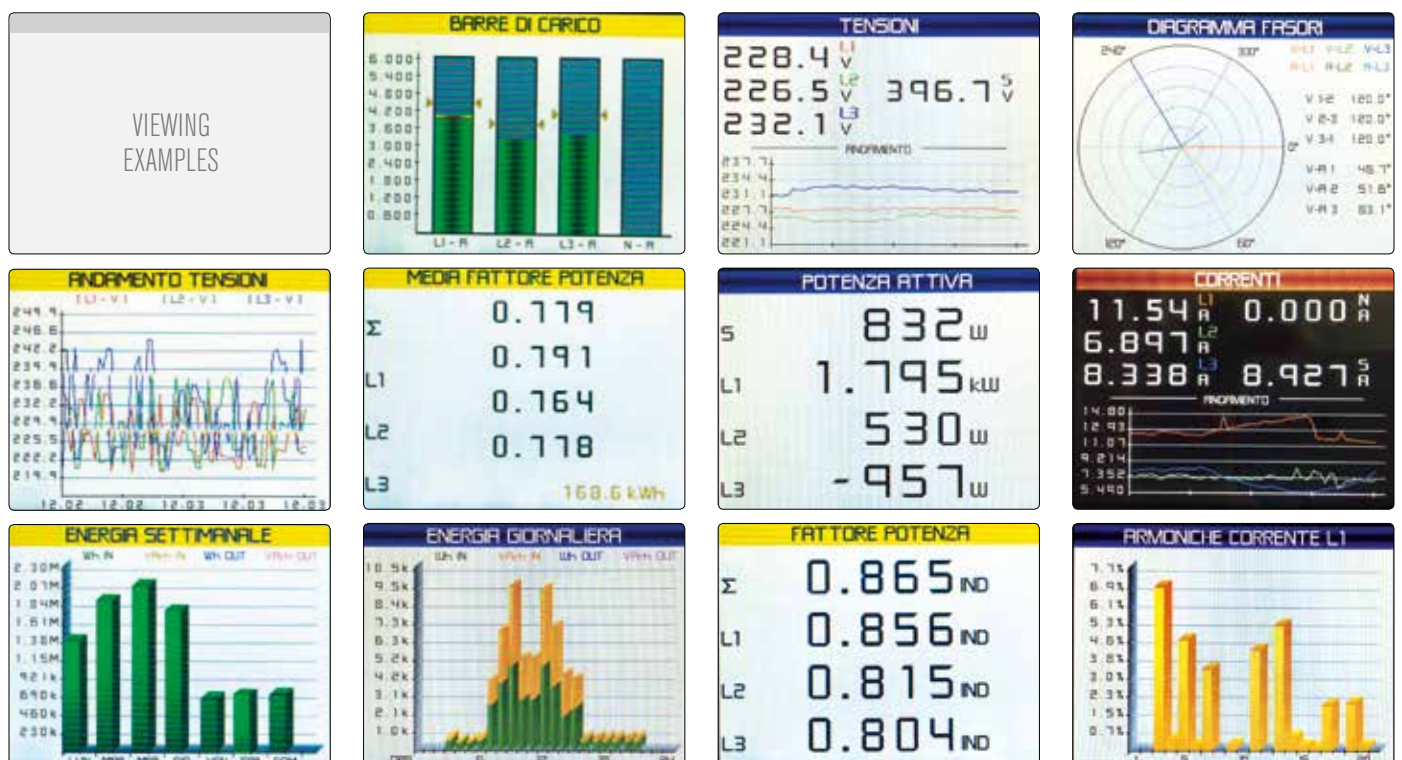
The TFT color display offers a user-friendly interface. The rich variety of functions, makes the EMS-96 the ideal choide for a wide rage of applications.



TECHNICAL CHARACTERISTICS		EMS 96
<b>AUXILIARY SUPPLY</b>		
Nominal voltage Us		90 - 250 VAC/CC
Operating voltage range		± 15%
Power consumption		8VA max
Frequency		50 ⇄ 60 Hz
<b>VOLTAGE INPUTS</b>		
Measurement range		52...690VAC L-L (30...400VAC L-N)
Method of measuring		True RMS value
Measuring input impedance		>1.8MΩ
Method of connection		Single-phase, two-phase, three-phase orbalanced three-phase system
<b>CURRENT INPUTS</b>		
Reference current		1A (option) or 5A
Measurement range		0,05...5A
Method of measuring		True RMS value
Overload capacity		+20% by an external current transformer
Self-consumption		0,05VA
<b>ACCURACY</b>		
Measures	Voltage	± 0,5%
	Current	± 0,5%
	Power	± 0,5%
	Frequency	± 0,2%
	Active energy	Class 1 - EN 62053-21, EN 62053-22
<b>DIGITAL OUTPUTS</b>		
Number of outputs		2
Pulse duration		TON_min 30ms, TOFF_min 30ms
Voltage		10...300 VCC - 12...250VAC
Max current		150 mA
<b>INSULATION</b>		
Insulation voltage		3.7kVAC for 1 minute
<b>DISPLAY</b>		
Display type		TFT
Format		320 x 240 pixel
Dimension		3,5"
<b>AMBIENT CONDITION</b>		
Operating temperature		-10...+50°C
Storage temperature		-15...+70°C
<b>HOUSING</b>		
Version		Flush mount 96 x 96 mm
Degree of protection		IP52 on front - IP20 Housing and terminals
Weight		440g
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards		EN 62053-21, EN 62053-22, EN 50082-1, EN 61000-6-2, EN 61010-2

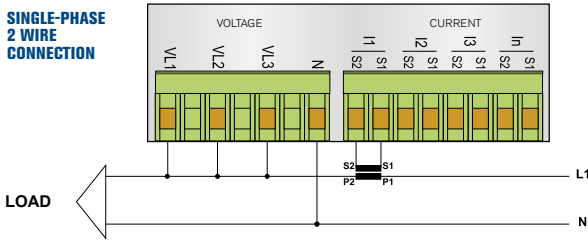
OPTIONS	
ORDER CODE	DESCRIPTION
<b>C1</b>	Auxiliary supply 20 ÷ 60 VCA/DC
<b>1A</b>	Rated current inputs by external CT 1A
<b>TT - TTA</b>	Current inputs by miniaturized closed CT (TT) or openable CT (TTA)
ACCURACY	
<b>0.5 s</b>	Active energy 0.2 s (EN 62053-21, EN 62053-22)
<b>0.2 s</b>	ACCURACY Active energy 0.2 s (EN 62053-21, EN 62053-22)
<b>H</b>	Detailed harmonic analysis (1...20°), graph energy consumption , data logging
EXPANSION MODULES *	
<b>4DI e 2DO</b>	4 digital inputs and 2 digital outputs (energy count pulses function)
<b>2DI e 4DO</b>	2 digital inputs and 4 digital outputs (2 outputs for energy count pulses)
<b>6DO</b>	6 digital inputs (2 outputs for energy count pulses)
<b>4AO</b>	4 analog outputs
<b>2AO</b>	2 analog outputs
<b>2DO e 4AO</b>	2 digital inputs (energy count pulses) and 4 analog outputs
<b>2DO e 2AO</b>	2 digital inputs (energy count pulses) and 2 analog outputs
<b>2DO e 4DO/R</b>	2 digital inputs (energy count pulses) and 4 relays
<b>RI-SIM e PT100</b>	Insulation monitoring for out-voltage networks, 1 PT100 input and 2 relays
<b>RI-R e PT100</b>	Insulation monitoring for networks, 1 PT100 input and 2 relays
<b>RI-SM e 2AI</b>	Insulation monitoring for out-voltage networks, 2 analog inputst and 2 relays
<b>RI-R e 2AI</b>	Insulation monitoring for networks, 2 analog inputs and 2 relays
COMMUNICATION PORTS *	
<b>485</b>	RS485 serial interface
<b>TCP</b>	Ethernet interface with Modbus TCP function and RS485 serial interface
<b>ETH-WEB</b>	Ethernet interface with Web server function and RS485 serial interface
<b>PF</b>	Profibus-DP interface and RS485 serial interface
<b>M-Bus</b>	M-Bus interface and RS485 serial interface
<b>485 (COM2)</b>	Second RS485 serial interface
<b>ETH-WEB/S</b>	Ethernet interface with Web server function and RS485 serial interface (master function)

\* You can select only one option

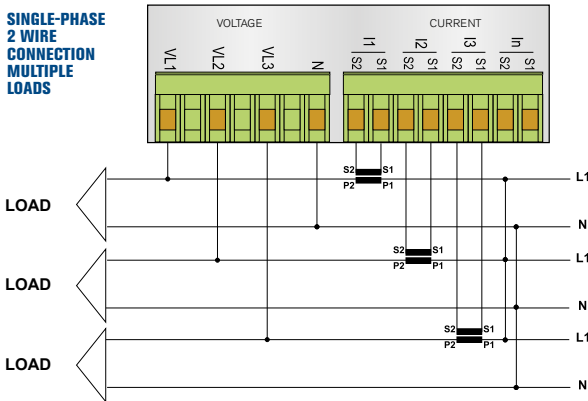


### WIRING DIAGRAMS

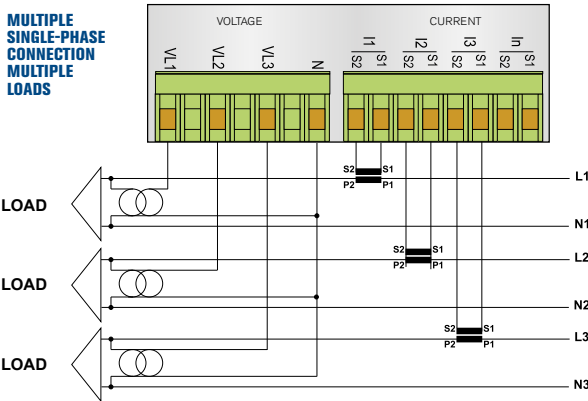
**SINGLE-PHASE  
2 WIRE  
CONNECTION**



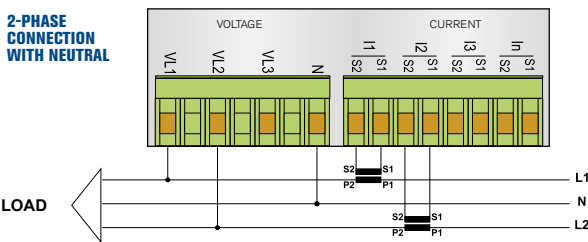
**SINGLE-PHASE  
2 WIRE  
CONNECTION  
MULTIPLE  
LOADS**



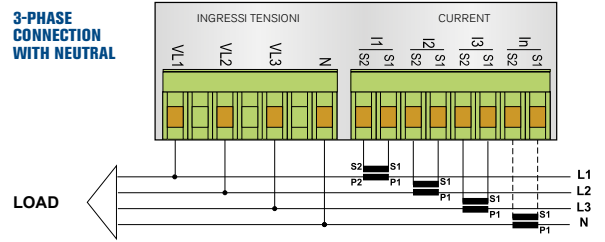
**MULTIPLE  
SINGLE-PHASE  
CONNECTION  
MULTIPLE  
LOADS**



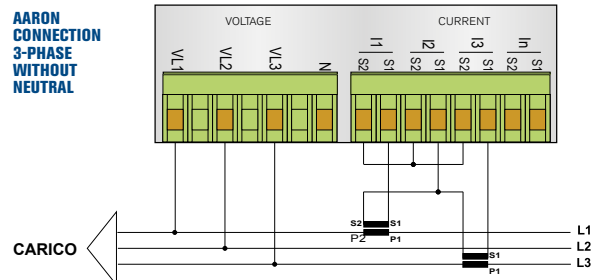
**2-PHASE  
CONNECTION  
WITH NEUTRAL**



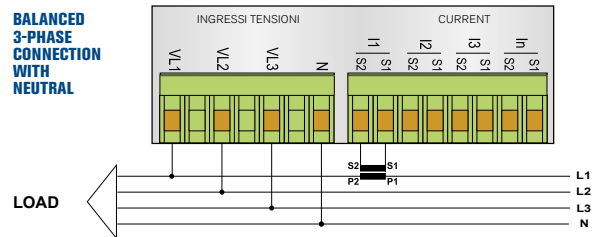
**3-PHASE  
CONNECTION  
WITH NEUTRAL**



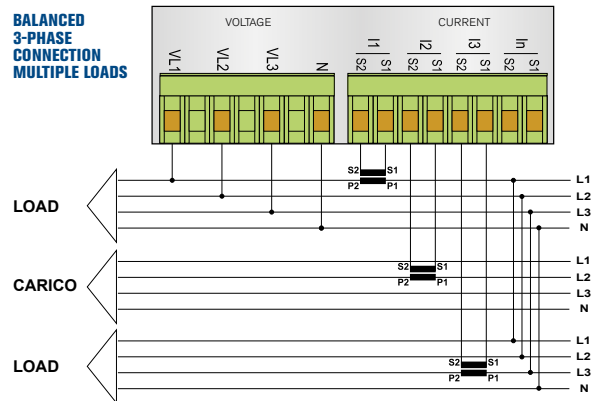
**AARON  
CONNECTION  
3-PHASE  
WITHOUT  
NEUTRAL**



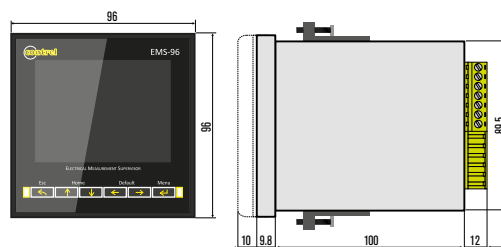
**BALANCED  
3-PHASE  
CONNECTION  
WITH NEUTRAL**



**BALANCED  
3-PHASE  
CONNECTION  
MULTIPLE LOADS**



### MECHANICAL DIMENSIONS



# EMA 10 | 11 | 14

## DIGITAL MEASURING INSTRUMENTS - NETWORK ANALYZER



EMA 10



EMA 11



EMA 14

TECHNICAL CHARACTERISTICS		EMA 10	EMA 11	EMA 14
<b>AUXILIARY SUPPLY</b>				
Nominal voltage Us		90 - 260 VAC/DC	90 - 260 VAC/DC	90 - 260 VAC/DC
Operating voltage range		±15%	±15%	±15%
Power consumption		5VA	5VA	5VA
Frequency		30 ÷ 500 Hz	30 ÷ 500 Hz	30 ÷ 500 Hz
<b>VOLTAGE INPUTS</b>				
Measurement range		10... 600VAC L-L	10... 600VAC L-L	10... 600VAC L-L
Method of measuring		True RMS value	True RMS value	True RMS value
Measuring input impedance		2MΩ	2MΩ	2MΩ
Method of connection		Single-phase, two-phase, three-phase or balanced three-phase system	Single-phase, two-phase, three-phase or balanced three-phase system	Single-phase, two-phase, three-phase or balanced three-phase system
<b>CURRENT INPUTS</b>				
Reference current		1A (option) or 5A	1A (option) or 5A	1A (option) or 5A
Measurement range		0,01... 5A	0,01... 5A	0,01... 5A
Method of measuring		True RMS value	True RMS value	True RMS value
Overload capacity		10A by an external current transformer	10A by an external current transformer	10A by an external current transformer
Self-consumption		0,2 VA	0,2 VA	0,2 VA
<b>ACCURACY</b>				
Measures	Voltage	± 0,5%	± 0,5%	± 0,5%
	Current	± 0,5%	± 0,5%	± 0,5%
	Power	± 0,5%	± 0,5%	± 0,5%
	Frequency	± 0,2%	± 0,2%	± 0,2%
	Active energy	Class 1	Class 1	Class 1
<b>INSULATION</b>				
Insulation voltage		3,7kVAC for 1 minute	3,7kVAC for 1 minute	3,7kVAC for 1 minute
<b>DISPLAY</b>				
Display type		Graphic LCD display	Graphic LCD display	Red LED 14 segments
Format		128 x 128 pixel	128 x 128 pixel	3 rows x 4 digit
Dimension		50 x 50 mm	70 x 70mm	50 x 50 mm
<b>AMBIENT CONDITION</b>				
Operating temperature		-10... +50°C	-10... +50°C	-10... +50°C
Storage temperature		-15... +70°C	-15... +70°C	-15... +70°C
<b>HOUSING</b>				
Version		Flush mounting 144 x 144 mm	Flush mounting 144 x 144 mm	Flush mounting 144 x 144 mm
Degree of protection		IP42 on front IP20 Housing and terminals	IP42 on front IP20 Housing and terminals	IP42 on front IP20 Housing and terminals
Weight		430 g	430 g	430 g
<b>CERTIFICATIONS AND COMPLIANCE</b>				
Reference standards		N 61010-1, EN62053-21, EN62053-22		



# EMA 10 | 11 | 14

## DIGITAL MEASURING INSTRUMENTS - NETWORK ANALYZER

### OPTIONS

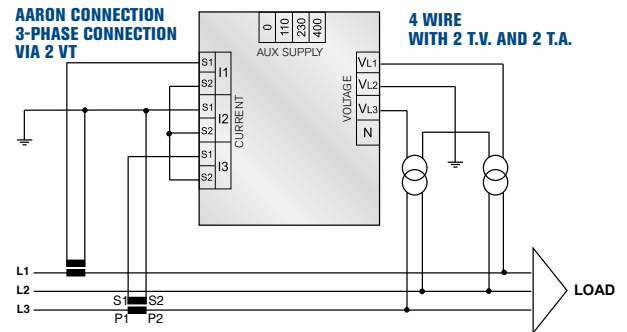
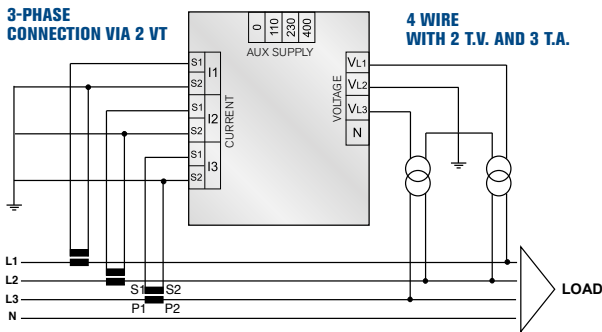
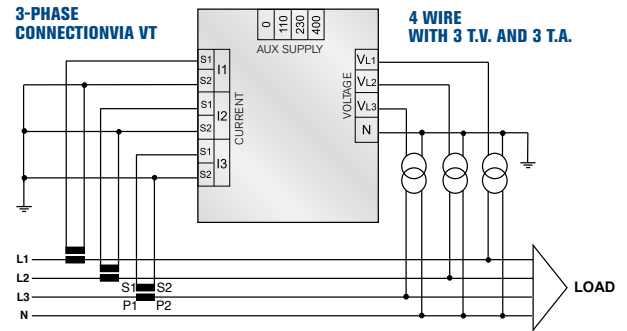
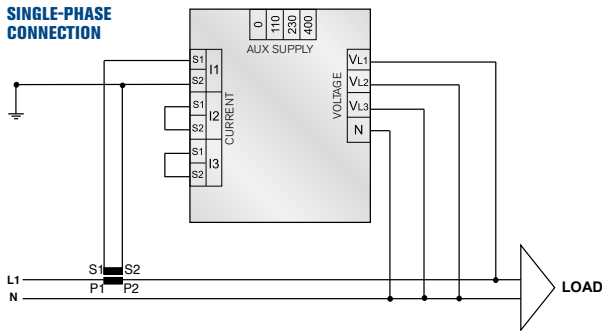
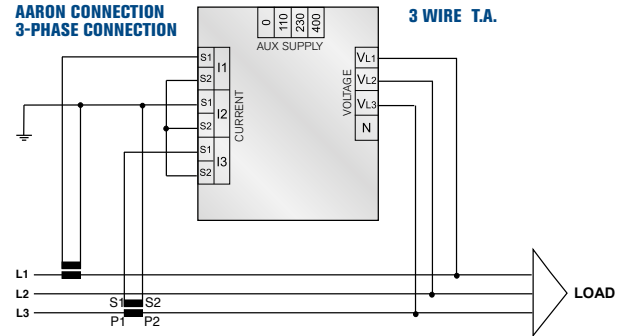
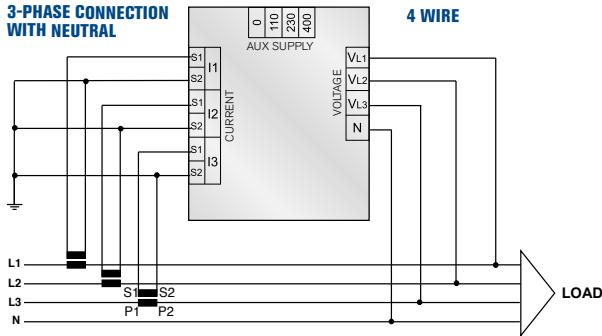
ORDER CODE	DESCRIPTION
<b>C1</b>	Auxiliary supply 20 ÷ 60 VCA/DC
<b>1A</b>	Rated current inputs by external CT 1A
<b>0.5</b>	Active energy 0.5
<b>H</b>	Detailed harmonic analysis (1...31°)
<b>MEM1</b>	1MB data memory
<b>6DI</b>	6 digital inputs

<b>4DO</b>	4 digital outputs
<b>2 DI e 2 DO</b>	2 digital inputs and 2 digital outputs
<b>2 AO</b>	2 analog outputs
<b>4 AO</b>	4 analog outputs

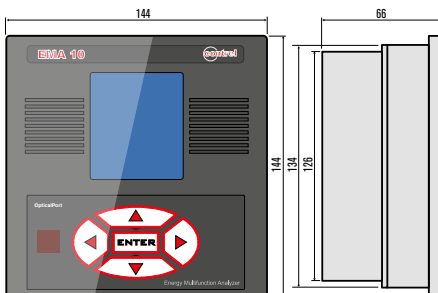
### COMMUNICATION PORTS

<b>485</b>	RS485 serial interface
<b>ETH</b>	Ethernet interface with Web server function
<b>PF/S</b>	Profibus-DP interface

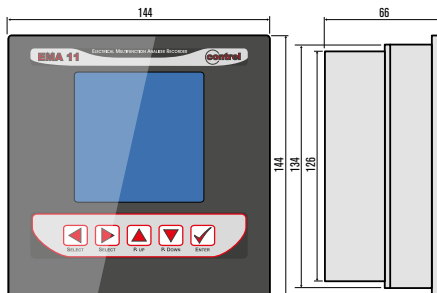
### WIRING DIAGRAMS EMA 10, 11, 14 - EMA 90



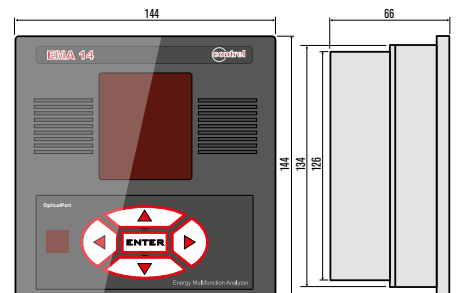
### MECHANICAL DIMENSIONS EMA 10



### MECHANICAL DIMENSIONS EMA 11



### MECHANICAL DIMENSIONS EMA 14



# EMA 90

## DIGITAL MEASURING INSTRUMENTS NETWORK ANALYZER

TECHNICAL CHARACTERISTICS		EMA 90
<b>AUXILIARY SUPPLY</b>		
Nominal voltage $U_s$		90 - 260 VAC/DC
Operating voltage range		$\pm 15\%$
Power consumption		5VA
Frequency		30 ÷ 500 Hz
<b>VOLTAGE INPUTS</b>		
Measurement range		10...600VAC L-L
Method of measuring		True RMS value
Measuring input impedance		2M $\Omega$
Method of connection		Single-phase, two-phase, three-phase orbanced three-phase system
<b>CURRENT INPUTS</b>		
Reference current		1A (option) or 5A
Measurement range		0,01...5A
Method of measuring		True RMS value
Overload capacity		10A by an external current transformer
Self-consumption		0,2VA
<b>ACCURACY</b>		
Measures	Voltage	$\pm 0,5\%$
	Current	$\pm 0,5\%$
	Power	$\pm 0,5\%$
	Frequency	$\pm 0,2\%$
	Active energy	Class 1
<b>INSULATION</b>		
Insulation voltage		3.7kVAC for 1 minute
<b>DISPLAY</b>		
Display type		Graphic LCD display
Format		128 x 128 pixel
Dimension		50 x 50 mm
<b>AMBIENT CONDITION</b>		
Operating temperature		-10...+50°C
Storage temperature		-15...+70°C
<b>HOUSING</b>		
Version		Flush mount 96 x 96 mm
Degree of protection		IP52 on front IP20 Housing and terminals
Weight		430g
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards		EN 61010-1, EN62053-21, EN62053-22

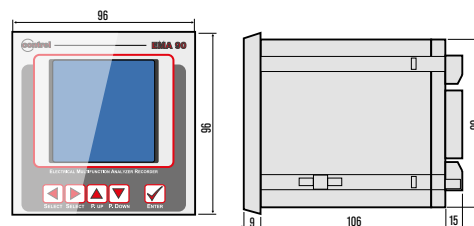
OPTIONS	
ORDER CODE	DESCRIPTION
C1	Auxiliary supply 20 ÷ 60 VCA/DC
1A	Rated current inputs by external CT 1A
0.5	Active energy 0.5
H	Detailed harmonic analysis (1...31 <sup>st</sup> )
MEM1	1MB data memory
4DI	4 digital inputs
2DO	2 digital outputs
2DO/R	2 relays
1 AO	1 analog output



### WIRING DIAGRAMS EMA 90

See page 24

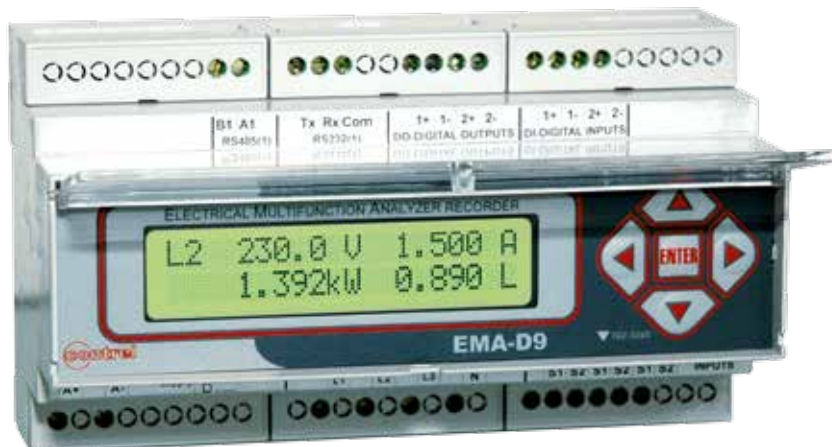
### MECHANICAL DIMENSIONS EMA 90



COMMUNICATION PORTS	
485	RS485 serial interface
ETH	Ethernet interface with Web server function
PF/S	Profibus-DP interface

# EMA D9

## DIGITAL MEASURING INSTRUMENTS NETWORK ANALYZER



TECHNICAL CHARACTERISTICS		EMA D9
<b>AUXILIARY SUPPLY</b>		
Nominal voltage $U_s$		90 - 250 VAC/DC
Operating voltage range		$\pm 15\%$
Power consumption		5VA
Frequency		30 ÷ 500 Hz
<b>VOLTAGE INPUTS</b>		
Measurement range		10...600VAC L-L
Method of measuring		True RMS value
Measuring input impedance		2M $\Omega$
Method of connection		Single-phase, two-phase, three-phase or balanced three-phase system
<b>CURRENT INPUTS</b>		
Reference current		1A (option) or 5A
Measurement range		0.01...5A
Method of measuring		True RMS value
Overload capacity		10A by an external current transformer
Self-consumption		0.2VA
<b>ACCURACY</b>		
Measures	Voltage	$\pm 0.5\%$
	Current	$\pm 0.5\%$
	Power	$\pm 0.5\%$
	Frequency	$\pm 0.2\%$
	Active energy	Class 1
<b>INSULATION</b>		
Insulation voltage		3.7kVAC for 1 minute
<b>DISPLAY</b>		
Technology		Alphanumeric LCD
Format		2 x 20 characters
Dimension		90 x 20 mm
<b>AMBIENT CONDITION</b>		
Operating temperature		-10...+50°C
Storage temperature		-15...+70°C
<b>HOUSING</b>		
Version		9 modules
Degree of protection		IP52 on front - IP20 Housing and terminals
Weight		500g
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards		EN 61010-1, EN62053-21, EN62053-22

# EMA D9

## DIGITAL MEASURING INSTRUMENTS NETWORK ANALYZER

### OPTIONS

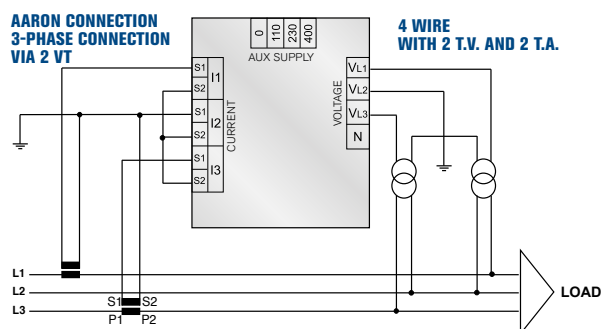
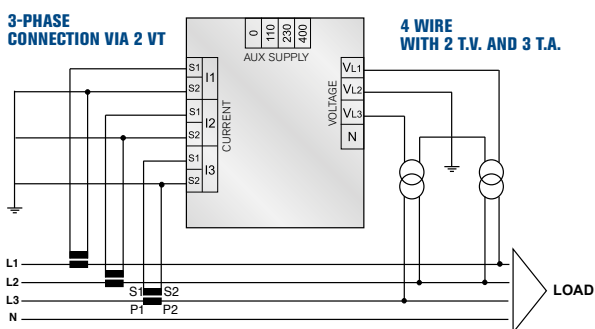
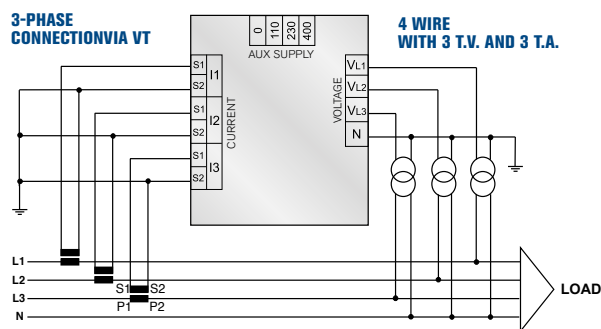
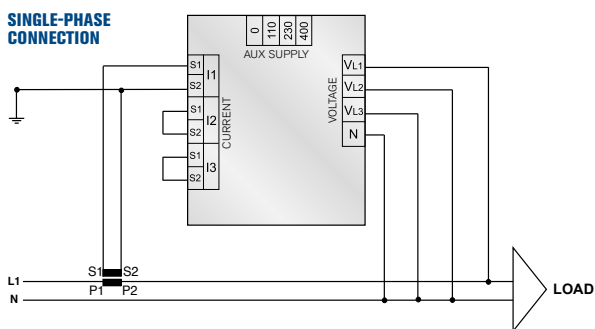
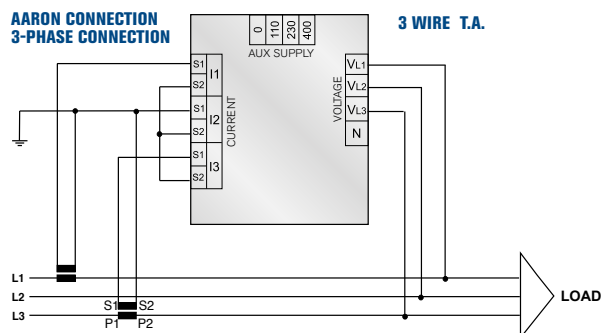
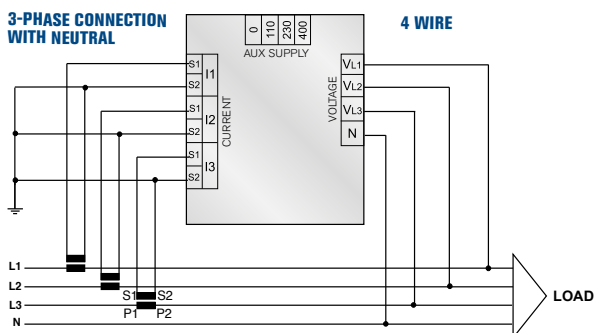
ORDER CODE	DESCRIPTION
<b>C1</b>	Auxiliary supply 20 ÷ 60 VCA/DC
<b>1A</b>	Rated current inputs by external CT 1A
<b>H</b>	Detailed harmonic analysis (1...31°)
<b>MEM1</b>	1MB data memory

<b>4DI</b>	4 digital inputs
<b>2DO/R</b>	2 relays
<b>AO</b>	Analog outputs (by external converter)

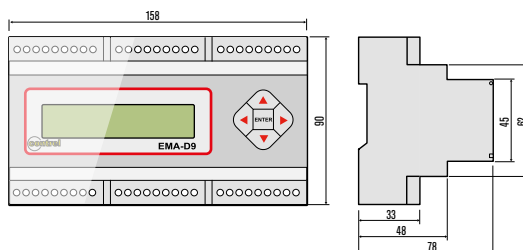
### COMMUNICATION PORTS

<b>485</b>	RS485 serial interface
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### WIRING DIAGRAMS EMA D9

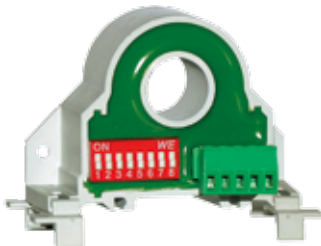


### MECHANICAL DIMENSIONS EMA D9



# TTC V-485/50 | TTC I/50 | TTC V-485/300

DIGITAL MEASURING INSTRUMENTS  
CURRENT TRANSFORMER



TTC V-485 / 50



TTC I / 50



TTC V-485 / 300

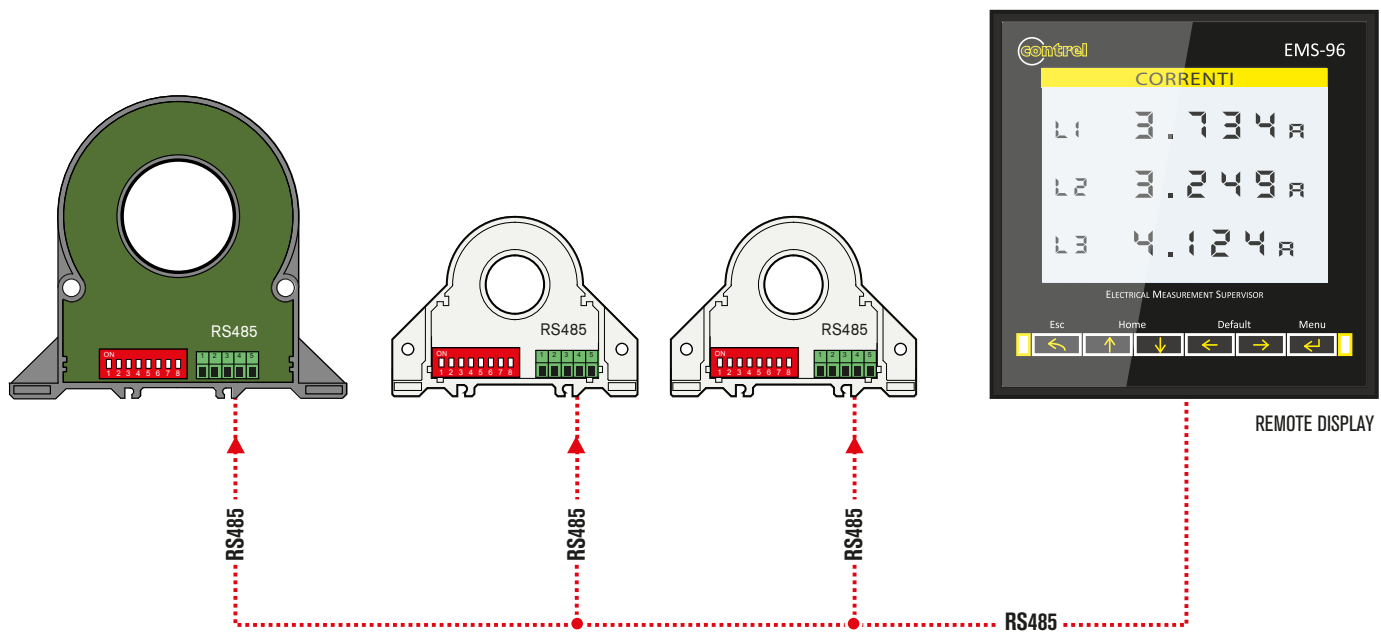
TECHNICAL CHARACTERISTICS		TTC V-485 / 50	TTC I / 50	TTC V-485 / 300
<b>AUXILIARY SUPPLY</b>				
<b>Nominal voltage Us</b>		12...30 VDC	12...30 VDC Loop passivo di Current	12...30 VDC Loop passivo di Current
<b>Power consumption</b>		< 20 mA	< 3,5mA	< 3,5mA
<b>Frequency</b>		50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
<b>CURRENT INPUTS</b>				
<b>Measurement range</b>		50A o 25A (dip-switch setting) Bipolar (+/- 50A DC or +/-25A DC)	50A o 25A (dip-switch setting) Bipolar (+/- 50A DC or +/-25A DC)	300A o 150A (dip-switch setting) Bipolar (+/- 50A DC or +/-25A DC)
<b>Method of measuring</b>		True RMS value	True RMS value	True RMS value
<b>Overload capacity</b>		2kA pulse, 300A continous	2kA pulse, 300A continous	2kA pulse, 300A continous
<b>ACCURACY</b>				
<b>Measures</b>	<b>Current</b>	0,5%	0,5% f.s.	0,5% f.s.
<b>RS485 SERIAL INTERFACE</b>				
<b>Protocol</b>		Modbus-RTU	-	Modbus-RTU
<b>Baud-rate</b>		Programmable 1200 - 115200 bps	-	Programmable 1200 - 115200 bps
<b>OUTPUT STATIC</b>				
<b>Number of outputs</b>		1	1	1
<b>Voltage esterna</b>		0...10V	0...20mA	0...20mA
<b>INSULATION</b>				
<b>Insulation voltage</b>		3 kV on bare wire	3 kV on bare wire	3 kV on bare wire
<b>AMBIENT CONDITION</b>				
<b>Operating temperature</b>		-15...+65°C	-15...+65°C	-15...+65°C
<b>Storage temperature</b>		-40...+85°C	-40...+85°C	-40...+85°C
<b>HOUSING</b>				
<b>Version</b>		DIN rail clips for vertical/horizontal mounting	DIN rail clips for vertical/horizontal mounting	DIN rail clips for vertical/horizontal mounting
<b>Filling</b>		Epoxy resin	Epoxy resin	Epoxy resin
<b>Degree of protection</b>		IP20	IP20	IP20
<b>Weight</b>		72g	72g	72g
<b>CERTIFICATIONS AND COMPLIANCE</b>				
<b>Reference standards</b>		EN 61000-6-4/2007-01 EN 64000-6-2 EN 61010-1/2001	EN 61000-6-4/2007-01 EN 64000-6-2 EN 61010-1/2001	EN 61000-6-4/2007-01 EN 64000-6-2 EN 61010-1/2001



# TTC V-485/50 | TTC I/50 | TTC V-485/300

DIGITAL MEASURING INSTRUMENTS  
CURRENT TRANSFORMER

## WIRING DIAGRAMS TTC V 485 / 50 - TTC V 485 / 300



### TTC I/50

The **TTC I/50** is an isolated, contact-less direct and alternating TRMS current transducer. The device's function and look are very similar to those of an active standard CT, but with the remarkable feature of measuring the continuous component of the pass-through current. The transducer has one analog output 4...20mA on loop, two dip-switches are available to range setting and bipolar function. AC/DC Loop Powered Current Transformer TRMS, 0...50A, bipolar, analog 4...20mA output, adjustable range by Dip-Switch, DIN rail mounting.

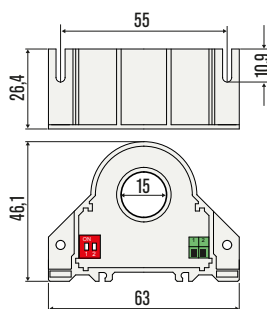
### TTC V-485/50

The **TTC V-485/50** is an isolated, contact-less direct and alternating RMS current transformer. The device's function and look are very similar to those of an active standard CT, but with the remarkable feature of measuring the continuous component of the pass-through current. The transformer has two different output, one RS485 Modbus RTU Output that allow to customize span and zero, one analog output 0...10V with dip-switch range setting.

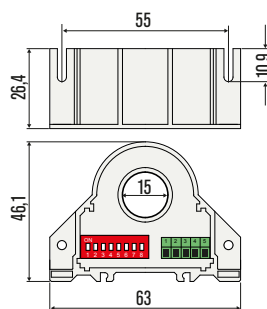
### TTC V-485/300

The **TTC V-485/300** is a AC/DC current transformer, galvanically isolated from the measuring circuit. The device in the function and appearance is very similar to a standard active TA, however, able to measure the DC component and AC TRMS. The transformer is equipped with RS485 Modbus serial output and an analog output 0-10V. Through the serial port can be configured freely span and zero and assign the Modbus address.

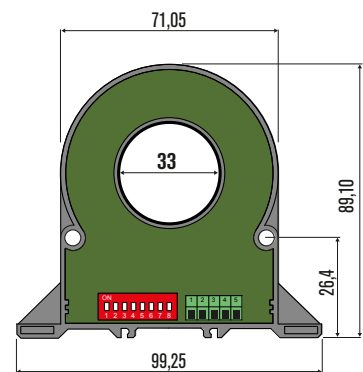
## MECHANICAL DIMENSIONS TTC I/50



## MECHANICAL DIMENSIONS TTC V-485/50



## MECHANICAL DIMENSIONS EMT-1C/300



# KIT WITH METERING INSTRUMENTS AND CURRENT TRANSFORMERS TT | TTA

Instruments and multifunction network analyzers are designed to allow to perform the measurement by the miniaturized current sensors. This solution is ideal for use in case of maintenances and addition of measurement points on existing plants.

Thanks to their very compact in size and easy to mount, these sensors can be easily used in critical applications and with space problems.

The openable current sensors, TTA series, easier installation and reduce costs of any plant shutdown.



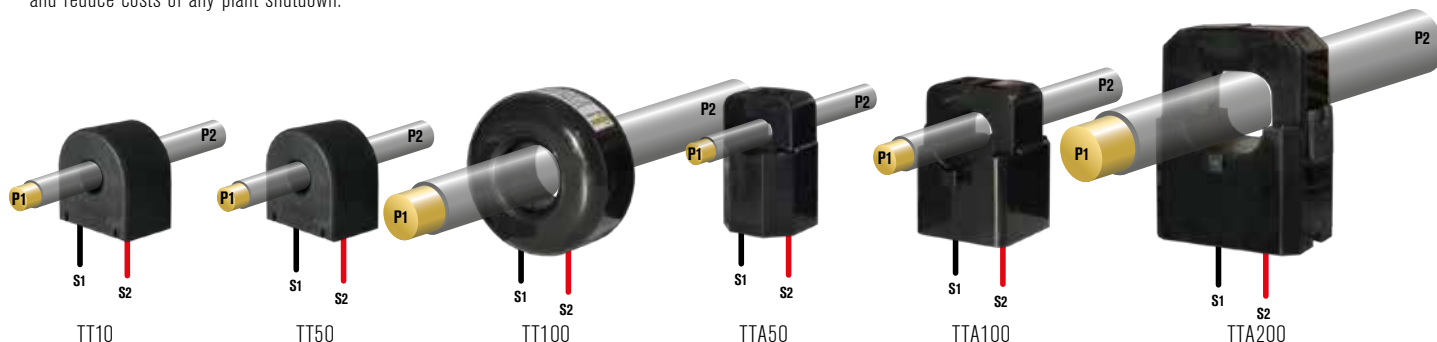
TT-TTA



EMM-uD3h

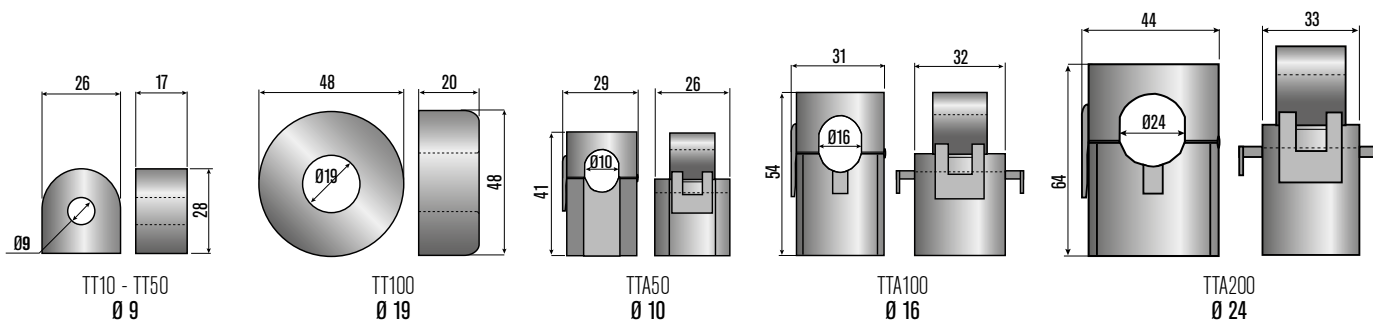


EMS-96



TECHNICAL CHARACTERISTICS		TT10	TT50	TT100	TTA50	TTA100	TTA200
<b>CURRENT INPUT</b>							
Reference current		10A	50A	100A	50A	100A	200A
Measurement range		0,1÷16A	0,3÷63A	0,6÷125A	0,3÷63A	0,6÷125A	0,2÷250A
<b>ACCURACY</b>							
Measures	Voltage				0,5%		
	Current				0,5%		
	Power				1%		
	Active energy				1%		
<b>INSULATION</b>							
Insulation voltage	2,5kVAC for 1 minute						
<b>AMBIENT CONDITION</b>							
Storage temperature	-15...+60°C						
<b>HOUSING</b>							
Type	Solid-core	Solid-core	Solid-core	Split-core	Split-core	Split-core	Split-core
Core size	9 mm	9 mm	19 mm	10 mm	16 mm	16 mm	24 mm

## MECHANICAL DIMENSIONS TT | TTA



TT10 - TT50  
Ø 9

TT100  
Ø 19

TTA50  
Ø 10

TTA100  
Ø 16

TTA200  
Ø 24

# ENERGY METERS WITH DIRECT CONNECTION OR BY CT FOR SINGLE PHASE AND THREE PHASE SYSTEMS - MID APPROVED



“... for efficient control of energy consumption”

## CERTIFIED MID ENERGY METERS

ACEAN type energy meters will be available even in the MID certified version. In the European Union, each measuring instrument, which data is used for a billing, must be certified according to the MID - Measuring Instruments Directive.

## ACCURACY

Class B per EN50470-3

Class C per EN50470-3

## MULTIFUNCTION KEYS

Multifunction keys to program the device and scroll the measurements

## METROLOGIC LED

The flashing rate of the LED is proportional to the energy consumption

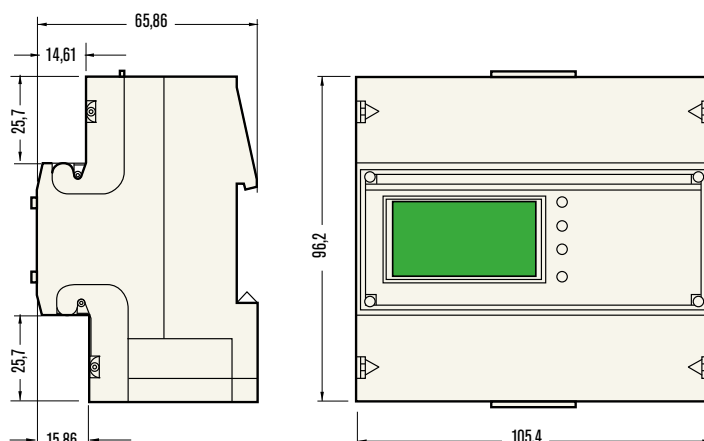
## SEALABLE TERMINAL

The energy meters are equipped with a set of sealable terminal covers

## METER WITH 5+2 OR 6+1 DIGITS

The active energy count is from 0 to 999999,9kWh

## MECHANICAL DIMENSIONS



## DIRECT CONNECTION

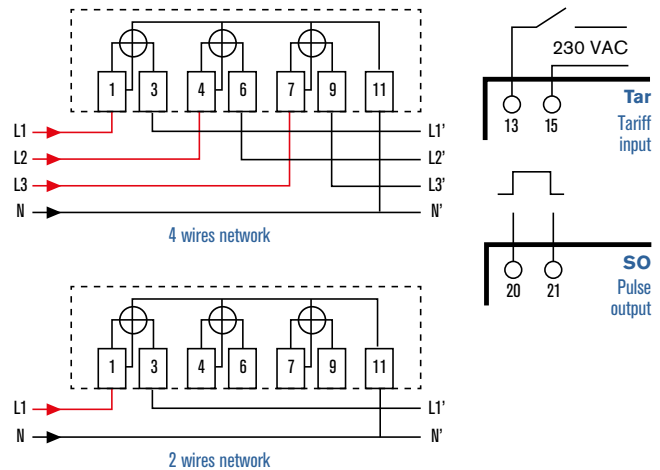
TYPE	Max current	COMMUNICATION PORT	WIRING CONNECTION	LOAD PROFILES
<b>DVH 5141</b>	<b>65 A</b>	-	4 OR 2 WIRE	-
<b>DVH 5161</b>	<b>100 A</b>	-	4 OR 2 WIRE	-
<b>DVH 5241</b>	<b>65 A</b>	RS485 MODBUS-RTU	4 OR 2 WIRE	-
<b>DVH 5261</b>	<b>100 A</b>	RS485 MODBUS-RTU	4 OR 2 WIRE	-
<b>DDH 5141</b>	<b>65 A</b>	-	3 WIRE	-
<b>DDH 5161</b>	<b>100 A</b>	-	3 WIRE	-
<b>DDH 5241</b>	<b>65 A</b>	RS485 MODBUS-RTU	3 WIRE	-
<b>DDH 5261</b>	<b>100 A</b>	RS485 MODBUS-RTU	3 WIRE	-
<b>DDH 5341</b>	<b>65 A</b>	RS485 MODBUS-RTU	3 WIRE	4 LOAD-PROFILES SIMULTANEOUSLY
<b>DDH 5361</b>	<b>100 A</b>	RS485 MODBUS-RTU	3 WIRE	4 LOAD-PROFILES SIMULTANEOUSLY

## CONNECTION BY CT

TYPE	Max current	COMMUNICATION PORT	WIRING CONNECTION	LOAD PROFILES
<b>MDVH 5181</b>	<b>5A</b>	-	4 OR 2 WIRE	-
<b>MDVH 5281</b>	<b>5A</b>	RS485 MODBUS-RTU	4 OR 2 WIRE	-
<b>MDDH 5181</b>	<b>5A</b>	-	3 WIRE	-
<b>MDDH 5191</b>	<b>1A o 5A</b>	-	3 WIRE	-
<b>MDDH 5281</b>	<b>5A</b>	RS485 MODBUS-RTU	3 WIRE	-
<b>MDDH 5291</b>	<b>1A o 5A</b>	RS485 MODBUS-RTU	3 WIRE	-
<b>MDDH 5381</b>	<b>5A</b>	RS485 MODBUS-RTU	3 WIRE	4 LOAD-PROFILES SIMULTANEOUSLY
<b>MDDH 5391</b>	<b>1A o 5A</b>	RS485 MODBUS-RTU	3 WIRE	4 LOAD-PROFILES SIMULTANEOUSLY

# DVH 5141 (65A) | DVH 5161 (100A)

ENERGY METER WITH DIRECT THREE - PHASE CONNECTION

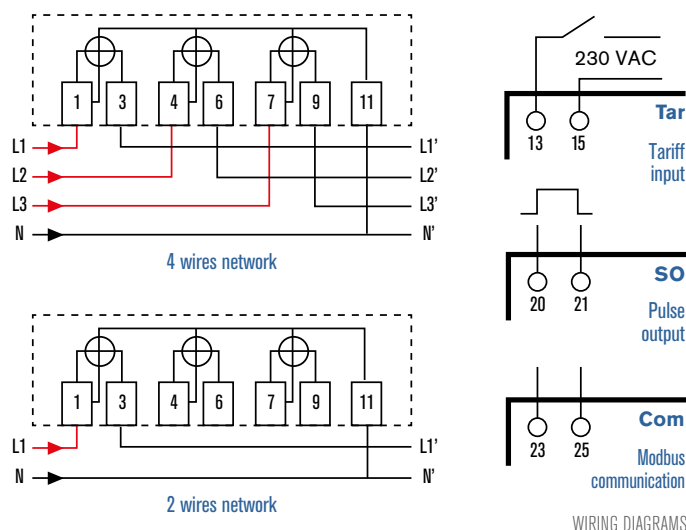


WIRING DIAGRAMS

TECHNICAL CHARACTERISTICS	DVH 5141-65A	DVH 5161-100A
<b>VOLTAGE INPUTS</b>		
Nominal voltage $U_s$	90 - 260 VAC/CC	90 - 260 VAC/CC
Operating voltage range	$\pm 15\%$	$\pm 15\%$
Power consumption	5VA	5VA
<b>CURRENT INPUTS</b>		
Connection type	Direct three-phase connection	Direct three-phase connection
Reference current	10 A	10 A
Max current	<b>65 A</b>	<b>100 A</b>
Start current	40 mA	40 mA
<b>ACCURACY</b>		
Active energy (EN62053-21)	Class C (MID) 0,5%	Class C (MID) Class C (MID) 0,5%
<b>METROLOGIC LED</b>		
Pulse number	<b>1000</b> pulses/kWh	<b>500</b> pulses/kWh
Pulse duration	30ms	30ms
<b>TARIFF INPUT</b>		
Nominal Voltage	0 ... 230Vac	0 ... 230Vac
Max Voltage	265 Vac	265 Vac
<b>STATIC OUTPUTS</b>		
Output number	1	1
Pulse length	Programmable 30 $\div$ 500 ms	Programmable 30 $\div$ 500 ms
Max Voltage	15 Vdc	15 Vdc
Max Current	15 mA	15 mA
<b>RS485 SERIAL INTERFACE</b>		
Protocol	-	-
Baud-rate	-	-
<b>HOUSING</b>		
Version	6 modules (DIN 43880)	6 modules (DIN 43880)
Mechanical dimensions (mm)	105.4 x 96.2 x 65.86	105.4 x 96.2 x 65.86
Weight	520 g	520 g
Degree of protection	IP 51	IP 51
<b>AMBIENT OPERATING CONDITIONS</b>		
Mounting	Indoor use only	Indoor use only
Operating temperature	-25°C ... +55°C	-25°C ... +55°C
Storage temperature	-25°C ... +55°C	-25°C ... +55°C
Mechanical environment	Class M2	Class M2
Electromagnetic environment	Class E2	Class E2
Relative humidity	75%	75%
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards	EN 62053-31, EN 50470-1, EN 50470-3	EN 62053-31, EN 50470-1, EN 50470-3

# DVH 5241 (65A) | DVH 5261 (100A)

ENERGY METER WITH DIRECT THREE-PHASE CONNECTION - RS485 SERIAL INTERFACE

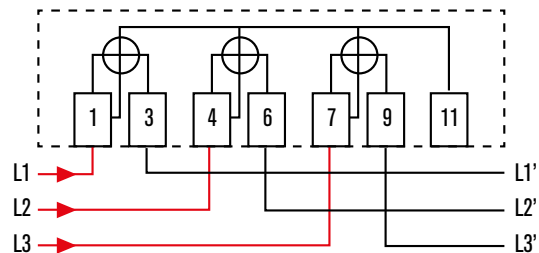


WIRING DIAGRAMS

TECHNICAL CHARACTERISTICS	DVH 5241-65A	DVH 5241-100A
<b>VOLTAGE INPUTS</b>		
Nominal voltage $U_s$	3 x 230 / 400 V (-20 % / +15%)	3 x 230 / 400 V (-20 % / +15%)
Operating voltage range	50 Hz / 60 Hz	50 Hz / 60 Hz
Power consumption	< 5VA / <2 W	< 5VA / <2 W
<b>CURRENT INPUTS</b>		
Connection type	Direct three-phase connection	Direct three-phase connection
Reference current	10 A	10 A
Max current	<b>65 A</b>	<b>100 A</b>
Start current	40 mA	40 mA
<b>ACCURACY</b>		
Active energy (EN62053-21)	Class C (MID) 0,5%	Class C (MID) Class C (MID) 0,5%
<b>METROLOGIC LED</b>		
Pulse number	1000 pulses/kWh	5000 pulses/kWh
Pulse duration	30ms	30ms
<b>TARIFF INPUT</b>		
Nominal Voltage	0 ... 230Vac	0 ... 230Vac
Max Voltage	265 Vac	265 Vac
<b>STATIC OUTPUTS</b>		
Output number	1	1
Pulse length	Programmable 30 ÷ 500 ms	Programmable 30 ÷ 500 ms
Max Voltage	15 Vdc	15 Vdc
Max Current	15 mA	15 mA
<b>RS485 SERIAL INTERFACE</b>		
Protocol	Modbus RTU Modbus ASCII	Modbus RTU Modbus ASCII
Baud-rate	Programmable 300÷19200 bps	Programmable 300÷19200 bps
<b>HOUSING</b>		
Version	6 modules (DIN 43880)	6 modules (DIN 43880)
Mechanical dimensions (mm)	105.4 x 96.2 x 65.86	105.4 x 96.2 x 65.86
Weight	520 g	460 g
Degree of protection	IP 51	IP 51
<b>AMBIENT OPERATING CONDITIONS</b>		
Mounting	Indoor use only	Indoor use only
Operating temperature	-25°C ... +55°C	-25°C ... +55°C
Storage temperature	-25°C ... +70°C	-25°C ... +70°C
Mechanical environment	Class M2	Class M2
Electromagnetic environment	Class E2	Class E2
Relative humidity	75%	75%
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards	EN 50470-1, EN 50470-3	EN 50470-1, EN 50470-3

# DDH 5141-M | DDH 5161-M

ENERGY METER WITH DIRECT THREE - PHASE CONNECTION 3 WIRE



3 wires network (without neutral)

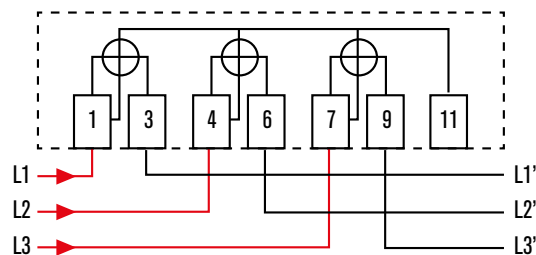
WIRING DIAGRAMS

TECHNICAL CHARACTERISTICS	DDH 5141-M	DDH 5161-M
<b>VOLTAGE INPUTS</b>		
Nominal voltage Us	3 x 400 V or 3 x 230 V	3 x 400 V or 3 x 230 V
Operating voltage range	50/60 Hz	50/60 Hz
Power consumption	-	-
<b>CURRENT INPUTS</b>		
Connection type	Direct three-phase connection	Direct three-phase connection
Reference current	10 A	10 A
Max current	<b>65 A</b>	<b>100 A</b>
Start current	40 mA	40 mA
<b>ACCURACY</b>		
Active energy (EN62053-21)	Class C (MID) 0,5%	Class C (MID) 0,5%
<b>METROLOGIC LED</b>		
Pulse number	1000 pulses/kWh	5000 pulses/kWh
Pulse duration	30ms	30ms
<b>TARIFF INPUT</b>		
Nominal Voltage	0 ... 230Vac	0 ... 230Vac
Max Voltage	265 Vac	265 Vac
<b>STATIC OUTPUTS</b>		
Output number	1	1
Pulse lenght	Programmable 30 ÷ 500 ms	Programmable 30 ÷ 500 ms
Max Voltage	15 Vdc	15 Vdc
Max Current	15 mA	15 mA
<b>RS485 SERIAL INTERFACE</b>		
Protocol	-	-
Baud-rate	-	-
<b>HOUSING</b>		
Version	6 modules (DIN 43880)	6 modules (DIN 43880)
Mechanical dimensions (mm)	105.4 x 96.2 x 65.86	105.4 x 96.2 x 65.86
Weight	520 g	460 g
Degree of protection	IP 51	IP 51
<b>AMBIENT OPERATING CONDITIONS</b>		
Mounting	Indoor use only	Indoor use only
Operating temperature	-25°C ... +55°C	-25°C ... +55°C
Storage temperature	-25°C ... +70°C	-25°C ... +70°C
Mechanical enviroment	Class M2	Class M2
Electromagnetic enviroment	Class E2	Class E2
Relative humidity	75%	75%
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards	EN 50470-1, EN 50470-3	EN 50470-1, EN 50470-3



# DDH 5241-M | DDH 5261-M

ENERGY METER WITH DIRECT THREE-PHASE CONNECTION 3 WIRE - RS485 SERIAL INTERFACE



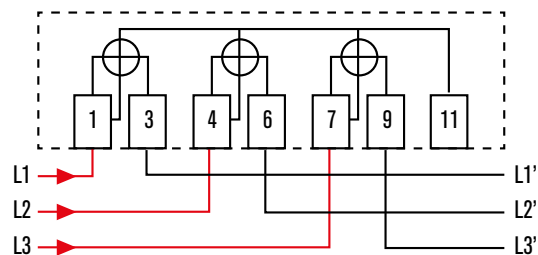
3 wires network (without neutral)

WIRING DIAGRAMS

TECHNICAL CHARACTERISTICS	DDH 5241-M	DDH 5261-M
<b>VOLTAGE INPUTS</b>		
Nominal voltage $U_s$	3 x 400 V or 3 x 230 V	3 x 400 V or 3 x 230 V
Operating voltage range	50/60 Hz	50/60 Hz
Power consumption	-	-
<b>CURRENT INPUTS</b>		
Connection type	Direct three-phase connection	Direct three-phase connection
Reference current	10 A	10 A
Max current	<b>65 A</b>	<b>100 A</b>
Start current	40 mA	40 mA
<b>ACCURACY</b>		
Active energy (EN62053-21)	Class C (MID) 0,5%	Class C (MID) 0,5%
<b>METROLOGIC LED</b>		
Pulse number	1000 pulses/kWh	5000 pulses/kWh
Pulse duration	30ms	30ms
<b>TARIFF INPUT</b>		
Nominal Voltage	0 ... 230Vac	0 ... 230Vac
Max Voltage	265 Vac	265 Vac
<b>STATIC OUTPUTS</b>		
Output number	1	1
Pulse length	Programmable 30 ÷ 500 ms	Programmable 30 ÷ 500 ms
Max Voltage	15 Vdc	15 Vdc
Max Current	15 mA	15 mA
<b>RS485 SERIAL INTERFACE</b>		
Protocol	Modbus RTU Modbus ASCII	Modbus RTU Modbus ASCII
Baud-rate	Programmable 300÷19200 bps	Programmable 300÷19200 bps
<b>HOUSING</b>		
Version	6 modules (DIN 43880)	6 modules (DIN 43880)
Mechanical dimensions (mm)	105.4 x 96.2 x 65.86	105.4 x 96.2 x 65.86
Weight	520 g	460 g
Degree of protection	IP 51	IP 51
<b>AMBIENT OPERATING CONDITIONS</b>		
Mounting	Indoor use only	Indoor use only
Operating temperature	-25°C ... +55°C	-25°C ... +55°C
Storage temperature	-25°C ... +70°C	-25°C ... +70°C
Mechanical environment	Class M2	Class M2
Electromagnetic environment	Class E2	Class E2
Relative humidity	75%	75%
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards	EN 50470-1, EN 50470-3	EN 50470-1, EN 50470-3

# DDH 5341-M | DDH 5361-M

ENERGY METER WITH DIRECT THREE-PHASE CONNECTION 3 WIRE  
RS485 SERIAL INTERFACE - LOAD PROFILES



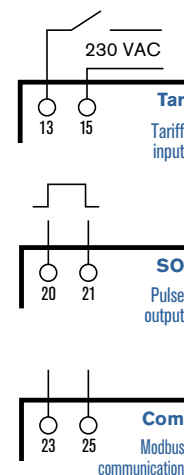
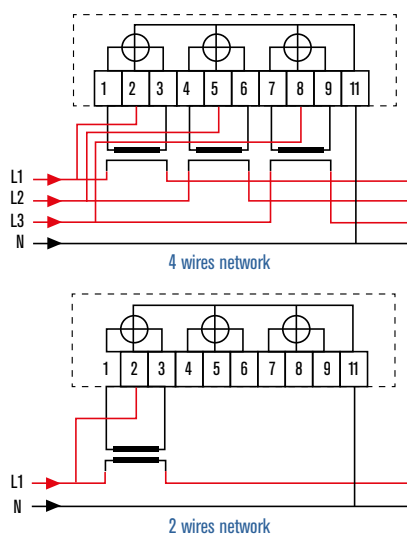
3 wires network (without neutral)

WIRING DIAGRAMS

TECHNICAL CHARACTERISTICS	DDH 5341-M	DDH 5361-M
<b>VOLTAGE INPUTS</b>		
Nominal voltage Us	3 x 400 V or 3 x 230 V	3 x 400 V or 3 x 230 V
Operating voltage range	50/60 Hz	50/60 Hz
Power consumption	-	-
<b>CURRENT INPUTS</b>		
Connection type	Direct three-phase connection	Direct three-phase connection
Reference current	10 A	10 A
Max current	<b>65 A</b>	<b>100 A</b>
Start current	40 mA	40 mA
<b>ACCURACY</b>		
Active energy (EN62053-21)	Class C (MID) 0,5%	Class C (MID) 0,5%
<b>METROLOGIC LED</b>		
Pulse number	1000 pulses/kWh	5000 pulses/kWh
Pulse duration	30ms	30ms
<b>TARIFF INPUT</b>		
Nominal Voltage	0 ... 230Vac	0 ... 230Vac
Max Voltage	265 Vac	265 Vac
<b>STATIC OUTPUTS</b>		
Output number	1	1
Pulse lenght	Programmable 30 ÷ 500 ms	Programmable 30 ÷ 500 ms
Max Voltage	15 Vdc	15 Vdc
Max Current	15 mA	15 mA
<b>RS485 SERIAL INTERFACE</b>		
Protocol	Modbus RTU Modbus ASCII	Modbus RTU Modbus ASCII
Baud-rate	Programmable 300÷19200 bps	Programmable 300÷19200 bps
<b>HOUSING</b>		
Version	6 modules (DIN 43880)	6 modules (DIN 43880)
Mechanical dimensions (mm)	105.4 x 96.2 x 65.86	105.4 x 96.2 x 65.86
Weight	520 g	460 g
Degree of protection	IP 51	IP 51
<b>AMBIENT OPERATING CONDITIONS</b>		
Mounting	Indoor use only	Indoor use only
Operating temperature	-25°C ... +55°C	-25°C ... +55°C
Storage temperature	-25°C ... +70°C	-25°C ... +70°C
Mechanical enviroment	Class M2	Class M2
Electromagnetic enviroment	Class E2	Class E2
Relative humidity	75%	75%
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards	EN 50470-1, EN 50470-3	EN 50470-1, EN 50470-3

# MDVH 5181 | MDVH 5281

ENERGY METER WITH CONNECTION BY CT /5A

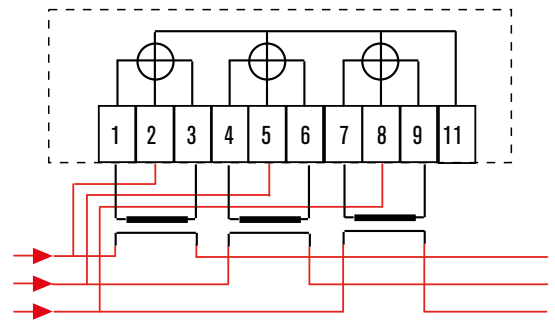


WIRING DIAGRAMS

TECHNICAL CHARACTERISTICS	MDVH 5181-TA (5A)	MDVH 5281-CT (5A)
<b>VOLTAGE INPUTS</b>		
Nominal voltage $U_s$	3 x 230 / 400 V (-20 % / +15%)	3 x 230 / 400 V (-20 % / +15%)
Operating voltage range	50 Hz / 60 Hz	50 Hz / 60 Hz
Power consumption	< 5VA / <2 W	< 5VA / <2 W
<b>CURRENT INPUTS</b>		
Connection type	Connection by CT /5A	Connection by CT /5A
Reference current	5 A	5 A
Max current	6 A	6 A
Start current	5 mA	5 mA
<b>ACCURACY</b>		
Active energy (EN62053-21)	Class C (MID) 0,5%	Class C (MID) 0,5%
<b>METROLOGIC LED</b>		
Pulse number	5000 pulses/kWh	5000 pulses/kWh
Pulse duration	30ms	30ms
<b>TARIFF INPUT</b>		
Nominal Voltage	0 ... 230Vac	0 ... 230Vac
Max Voltage	265 Vac	265 Vac
<b>STATIC OUTPUTS</b>		
Output number	1	1
Pulse lenght	Programmable 30 ÷ 500 ms	Programmable 30 ÷ 500 ms
Max Voltage	15 Vdc	15 Vdc
Max Current	15 mA	15 mA
<b>RS485 SERIAL INTERFACE</b>		
Protocol	-	Modbus RTU Modbus ASCII
Baud-rate	-	Programmable 300÷19200 bps
<b>HOUSING</b>		
Version	6 modules (DIN 43880)	6 modules (DIN 43880)
Mechanical dimensions (mm)	105.4 x 96.2 x 65.86	105.4 x 96.2 x 65.86
Weight	460 g	460 g
Degree of protection	IP 51	IP 51
<b>AMBIENT OPERATING CONDITIONS</b>		
Mounting	Indoor use only	Indoor use only
Operating temperature	-25°C ... +55°C	-25°C ... +55°C
Storage temperature	-25°C ... +70°C	-25°C ... +70°C
Mechanical enviroment	Class M2	Class M2
Electromagnetic enviroment	Class E2	Class E2
Relative humidity	75%	75%
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards	EN 62053-31, EN 50470-1, EN 50470-3	EN 62053-31, EN 50470-1, EN 50470-3

# MDDH 5181-M | MDDH 5191-M

ENERGY METER WITH CONNECTION BY CT /5A OR CT /1A - 3 WIRE



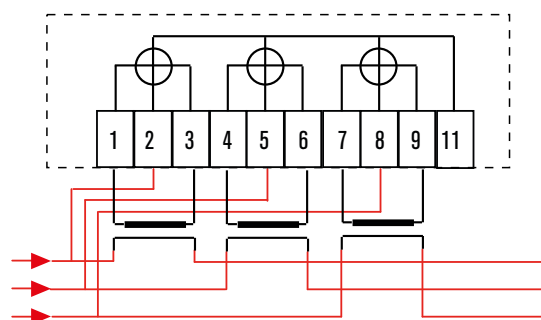
3 wires network (without neutral)

WIRING DIAGRAMS

TECHNICAL CHARACTERISTICS	MDDH 5181-M	MDDH 5191-M
<b>VOLTAGE INPUTS</b>		
Nominal voltage Us	3 x 400 V or 3 x 230 V	3 x 400 V or 3 x 230 V
Operating voltage range	50/60 Hz	50/60 Hz
Power consumption	-	-
<b>CURRENT INPUTS</b>		
Connection type	Connection by CT /5A	Connection by CT /5A or CT /1A
Reference current	10 A	10 A
Max current	<b>5 A</b>	<b>1A e 5A</b>
Start current	40 mA	40 mA
<b>ACCURACY</b>		
Active energy (EN62053-21)	Class C (MID) 0,5%	Class C (MID) 0,5%
<b>METROLOGIC LED</b>		
Pulse number	1000 pulses/kWh	5000 pulses/kWh
Pulse duration	30ms	30ms
<b>TARIFF INPUT</b>		
Nominal Voltage	0 ... 230Vac	0 ... 230Vac
Max Voltage	265 Vac	265 Vac
<b>STATIC OUTPUTS</b>		
Output number	1	1
Pulse lenght	Programmable 30 ÷ 500 ms	Programmable 30 ÷ 500 ms
Max Voltage	15 Vdc	15 Vdc
Max Current	15 mA	15 mA
<b>RS485 SERIAL INTERFACE</b>		
Protocol	-	-
Baud-rate	-	-
<b>HOUSING</b>		
Version	6 modules (DIN 43880)	6 modules (DIN 43880)
Mechanical dimensions (mm)	105.4 x 96.2 x 65.86	105.4 x 96.2 x 65.86
Weight	520 g	460 g
Degree of protection	IP 51	IP 51
<b>AMBIENT OPERATING CONDITIONS</b>		
Mounting	Indoor use only	Indoor use only
Operating temperature	-25°C ... +55°C	-25°C ... +55°C
Storage temperature	-25°C ... +70°C	-25°C ... +70°C
Mechanical enviroment	Class M2	Class M2
Electromagnetic enviroment	Class E2	Class E2
Relative humidity	75%	75%
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards	EN 50470-1, EN 50470-3	EN 50470-1, EN 50470-3

# MDDH 5281-M | MDDH 5291-M

ENERGY METER WITH CONNECTION BY CT /5A OR CT /1A - 3 WIRE - RS485 SERIAL INTERFACE



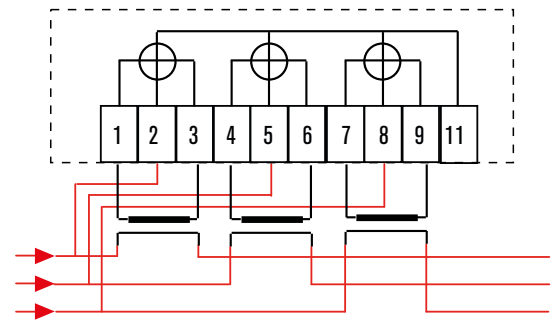
3 wires network (without neutral)

WIRING DIAGRAMS

TECHNICAL CHARACTERISTICS	MDDH 5281-M	MDDH 5291-M
<b>VOLTAGE INPUTS</b>		
Nominal voltage $U_s$	3 x 400 V or 3 x 230 V	3 x 400 V or 3 x 230 V
Operating voltage range	50/60 Hz	50/60 Hz
Power consumption	-	-
<b>CURRENT INPUTS</b>		
Connection type	Connection by CT /5A	Connection by CT /5A or CT /1A
Reference current	10 A	10 A
Max current	<b>5 A</b>	<b>1A e 5A</b>
Start current	40 mA	40 mA
<b>ACCURACY</b>		
Active energy (EN62053-21)	Class C (MID) 0,5%	Class C (MID) 0,5%
<b>METROLOGIC LED</b>		
Pulse number	1000 pulses/kWh	5000 pulses/kWh
Pulse duration	30ms	30ms
<b>TARIFF INPUT</b>		
Nominal Voltage	0 ... 230Vac	0 ... 230Vac
Max Voltage	265 Vac	265 Vac
<b>STATIC OUTPUTS</b>		
Output number	1	1
Pulse lenght	Programmable 30 ÷ 500 ms	Programmable 30 ÷ 500 ms
Max Voltage	15 Vdc	15 Vdc
Max Current	15 mA	15 mA
<b>RS485 SERIAL INTERFACE</b>		
Protocol	Modbus RTU Modbus ASCII	Modbus RTU Modbus ASCII
Baud-rate	Programmable 300÷19200 bps	Programmable 300÷19200 bps
<b>HOUSING</b>		
Version	6 modules (DIN 43880)	6 modules (DIN 43880)
Mechanical dimensions (mm)	105.4 x 96.2 x 65.86	105.4 x 96.2 x 65.86
Weight	520 g	460 g
Degree of protection	IP 51	IP 51
<b>AMBIENT OPERATING CONDITIONS</b>		
Mounting	Indoor use only	Indoor use only
Operating temperature	-25°C ... +55°C	-25°C ... +55°C
Storage temperature	-25°C ... +70°C	-25°C ... +70°C
Mechanical enviroment	Class M2	Class M2
Electromagnetic enviroment	Class E2	Class E2
Relative humidity	75%	75%
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards	EN 50470-1, EN 50470-3	EN 50470-1, EN 50470-3

# MDDH 5381-M | MDDH 5391-M

ENERGY METER WITH CONNECTION BY CT /5A OR CT /1A - 3 WIRE - RS485 SERIAL INTERFACE - LOAD PROFILES



3 wires network (without neutral)

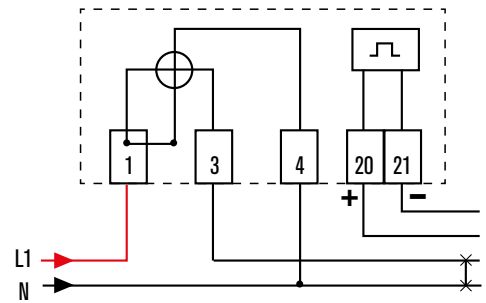
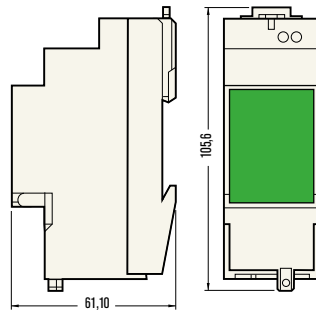
WIRING DIAGRAMS

TECHNICAL CHARACTERISTICS	MDDH 5381-M	MDDH 5391-M
<b>VOLTAGE INPUTS</b>		
Nominal voltage Us	3 x 400 V or 3 x 230 V	3 x 400 V or 3 x 230 V
Operating voltage range	50/60 Hz	50/60 Hz
Power consumption	-	-
<b>CURRENT INPUTS</b>		
Connection type	Connection by CT /5A	Connection by CT /5A or CT /1A
Reference current	10 A	10 A
Max current	<b>5 A</b>	<b>1A e 5A</b>
Start current	40 mA	40 mA
<b>ACCURACY</b>		
Active energy (EN62053-21)	Class C (MID) 0,5%	Class C (MID) 0,5%
<b>METROLOGIC LED</b>		
Pulse number	1000 pulses/kWh	5000 pulses/kWh
Pulse duration	30ms	30ms
<b>TARIFF INPUT</b>		
Nominal Voltage	0 ... 230Vac	0 ... 230Vac
Max Voltage	265 Vac	265 Vac
<b>STATIC OUTPUTS</b>		
Output number	1	1
Pulse lenght	Programmable 30 ÷ 500 ms	Programmable 30 ÷ 500 ms
Max Voltage	15 Vdc	15 Vdc
Max Current	15 mA	15 mA
<b>RS485 SERIAL INTERFACE</b>		
Protocol	Modbus RTU Modbus ASCII	Modbus RTU Modbus ASCII
Baud-rate	Programmable 300÷19200 bps	Programmable 300÷19200 bps
<b>HOUSING</b>		
Version	6 modules (DIN 43880)	6 modules (DIN 43880)
Mechanical dimensions (mm)	105.4 x 96.2 x 65.86	105.4 x 96.2 x 65.86
Weight	520 g	460 g
Degree of protection	IP 51	IP 51
<b>AMBIENT OPERATING CONDITIONS</b>		
Mounting	Indoor use only	Indoor use only
Operating temperature	-25°C ... +55°C	-25°C ... +55°C
Storage temperature	-25°C ... +70°C	-25°C ... +70°C
Mechanical enviroment	Class M2	Class M2
Electromagnetic enviroment	Class E2	Class E2
Relative humidity	75%	75%
<b>CERTIFICATIONS AND COMPLIANCE</b>		
Reference standards	EN 50470-1, EN 50470-3	EN 50470-1, EN 50470-3



# WH 6165

ENERGY METER WITH DIRECT SINGLE - PHASE CONNECTION



MECHANICAL DIMENSIONS

WIRING DIAGRAMS

TECHNICAL CHARACTERISTICS	WH 6165
<b>VOLTAGE INPUTS</b>	
Nominal voltage $U_s$	230 V ( $\pm 10\%$ )
Operating voltage range	50 Hz / 60 Hz
Power consumption	0.5 W
<b>CURRENT INPUTS</b>	
Connection type	Direct single-phase connection
Reference current	10 A
Max current	65 A
Start current	40 mA
<b>ACCURACY</b>	
Active energy (EN62053-21)	Class B (MID EN50470-1 & 50470-3) Class C (MID) 1%
<b>METROLOGIC LED</b>	
Pulse number	1000 pulses/kWh
Pulse duration	30 ms
<b>TARIFF INPUT</b>	
Nominal Voltage	-
Max Voltage	-
<b>STATIC OUTPUTS</b>	
Output number	1000 pulses/kWh
Pulse length	30ms
Max Voltage	-
Max Current	-
<b>RS485 SERIAL INTERFACE</b>	
Protocol	-
Baud-rate	-
<b>HOUSING</b>	
Version	2 modules (DIN 43880)
Mechanical dimensions (mm)	36 x 94 x 65
Weight	150 g
Degree of protection	IP 51
<b>AMBIENT OPERATING CONDITIONS</b>	
Mounting	Indoor use only
Operating temperature	-25°C ... +55°C
Storage temperature	-25°C ... +70°C
Mechanical environment	Class M1
Electromagnetic environment	Class E2
Relative humidity	75%
<b>CERTIFICATIONS AND COMPLIANCE</b>	
Reference standards	EN 62053-31, EN 50470-1, EN 50470-3

# EMC 3b | EMC D3b

ENERGY METERS - FLUSH MOUNTING OR DIN-RAIL MOUNTING



TECHNICAL CHARACTERISTICS		EMC-3b	EMC-D3b
<b>AUXILIARY SUPPLY</b>			
Rated voltage Us		110-230-400 VAC	400VAC
Operating limits		±15%	±15%
Power consumption		4VA	3VA
Frequency		50 - 60 Hz	45 - 65 Hz
<b>VOLTAGE INPUTS</b>			
Measurement range		20...500VAC L-L (20...290VAC L-N)	20...500VAC L-L (20...290VAC L-N)
Method of measuring		True RMS value	True RMS value
Measuring input impedance		1MΩ	1MΩ
Method of connection		Single-phase, direct connection 3 or 4 wires, balanced three-phase	
<b>CURRENT INPUTS</b>			
Rated current		1A (option) or 5A	1A (option) or 5A
Measurement range		0,02...5A	0,02...5A
Measuring method		True RMS value	True RMS value
Overload capacity		+30% by an external current transformer	+30% by an external current transformer
Self-consumption		<0,5VA	<0,5VA
<b>ACCURACY</b>			
Measures	Voltage	Class 0,5 f.s. ± 1 digit	Class 0,5 f.s. ± 1 digit
	Current	Class 0,5 f.s. ± 1 digit	Class 0,5 f.s. ± 1 digit
	Power	Class 1 f.s. da ± 1 digit	Class 1 f.s. da ± 1 digit
	Frequency	Class 0,5 f.s. ± 1 digit	Class 0,5 f.s. ± 1 digit
	Active energy	Class 1	Class 1
<b>INSULATION</b>			
Insulation voltage		3kVAC for 1 minute	3kVAC for 1 minute
<b>AMBIENT CONDITION</b>			
Operating temperature		-10...+60°C	-10...+60°C
Storage temperature		-25...+80°C	-25...+80°C
<b>HOUSING</b>			
Version		Flush mount 96 x 96 mm	6 modules
Degree of protection		IP52 on front IP20 Housing and terminals	IP52 on front IP20 Housing and terminals
Weight		500g	400g
<b>CERTIFICATIONS AND COMPLIANCE</b>			
Reference standards		IEC/EN 50081-2, IEC/EN 61000-6-2, IEC/EN 61010-1, IEC/EN 61036-1	

OPTIONS	
ORDER CODE	DESCRIPTION
C1	Auxiliary supply 20÷60 VAC/DC (version EMC-3b)
C2	Auxiliary supply 90÷250 VAC/DC (version EMC-3b)
C3	Auxiliary supply 250 VAC/DC (version EMC-3b)
C4	Auxiliary supply 110 VAC/DC (version EMC-3b)
600	Voltage inputs 600 V (version EMM-4h)
1A	Rated current inputs by external CT 1A

T	Internal current inputs, galvanically insulated
TT - TTA	Current inputs by miniaturized closed CT (TT) or openable CT (TTA)
N	Neutral current input or differential current input (version EMM-D4h)
P	2 digital outputs
DI	1 digital input

COMMUNICATION PORTS	
485	RS485 serial interface

# EMC D140-485

## ENERGY METER WITH DIRECT SINGLE PHASE CONNECTION - RS485 SERIAL INTERFACE

The **EMC-D140-485** is a single-phase energy meter for direct connection, for currents up to 45A.

The energy accuracy is compliant with reference standard EN62053-21 (Class 1).

Apart from energy metering, it can measure additional indications, for a total of 10 measurements that can be visualized on the LCD display.

The **EMC-D140-485** has a standard 1U modular housing and is supplied with sealable terminal blocks.

### DESCRIPTION

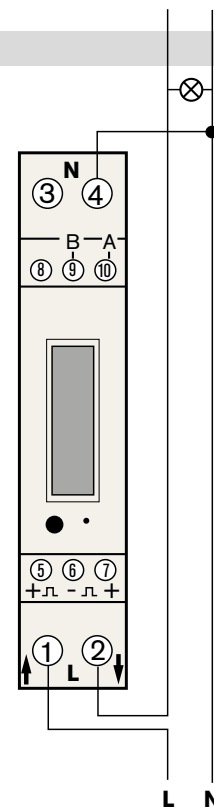
- Modular DIN
- Rail housing, 1U
- Direct connection for currents up to 45A
- Active energy measure complies EN62053
- 21 class 1
- LCD display with 5+1 digits
- Button for measure selection and programming
- Import/Export active energy
- Pulse LED for active energy consumption
- Indication of instantaneous consumption (active power)
- Programmable static outputs for pulse
- RS485 serial interface
- Modbus
- RTU protocol



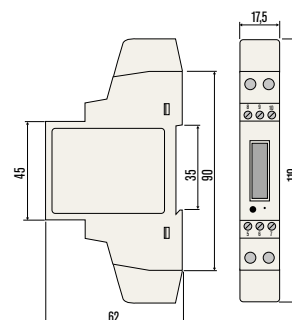
TECHNICAL CHARACTERISTICS	EMC D140-485
<b>VOLTAGE</b>	
Nominal voltage $U_n$	230VAC - 110 VAC
Operating voltage range	0.7 - 1.3 $U_n$
Frequency	50 - 60 Hz
Power assorbita/dissipata	10VA / $\leq 2W$
<b>CURRENT</b>	
Current di riferimento ( $I_{ref}$ )	5A
Max current ( $I_{max}$ )	45A
Operating current range	0.4% $I_{ref}$ - $I_{max}$
<b>ACCURACY</b>	
Active energy (EN62053-21)	Class 1
<b>LED PULSE</b>	
Pulse number	1000imp / kWh
<b>STATIC OUTPUT</b>	
Pulse number	Progr. 1-10-100-1000 pulses / kWh
<b>RS485 SERIAL INTERFACE</b>	
Protocol	Modbus RTU
Baud-rate	1200...9600 bps
Parity	Dispari/Pari/Nessuna
Stop bit	1
Data format	8
<b>AMBIENT OPERATING CONDITIONS</b>	
Mounting	Indoor use only
Operating temperature	-25...+55°C
Storage temperature	-30...+70°C
Operating humidity	<85%
<b>INSULATION VOLTAGE</b>	
Rated insulation voltage	4kV for 1 minute
Rated impulse withstand voltage	6kV
<b>HOUSING</b>	
Version	1 module (DIN)
Degree of protection	IP51
<b>CERTIFICATIONS AND COMPLIANCE</b>	
Reference standards	EN62053-21 - EN50470-3 EN62053-23

### WIRING DIAGRAMS

- TERMINAL 1 L-in
- TERMINAL 2 L-out
- TERMINAL 3-4 Neutral wire
- TERMINAL 5-6-7 Pulse outputs
- TERMINAL 9-10 RS485 serial interface



### MECHANICAL DIMENSIONS



# EMI 1 | 1R

COMMUNICATION DEVICES - RS232/RS485 CONVERTER



EMI 1



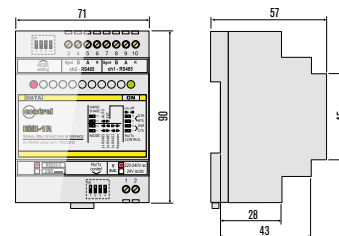
EMI 1R

TECHNICAL CHARACTERISTICS	EMI 1 - 1R
<b>AUXILIARY SUPPLY</b>	
Rated voltage Us	230VAC
Operating limits	±20%
Power consumption	7VA max
Frequency	50 - 60 Hz
<b>RS232 SERIAL INTERFACE</b>	
Data format	Serial asynchronous uart/nrz
Line length	15 m MAX
Type of terminal	DB-9
<b>RS485 SERIAL INTERFACE</b>	
Baud rate	1000 m MAX
	57600 bit/s MAX
<b>USB 2.0</b>	
Consumption	50 mA MAX
Voltage	4.25 ... 5.25 VDC
Terminals	MINI-B
<b>INSULATION</b>	
Insulation voltage	3.7kVAC for 1 minute
<b>AMBIENT CONDITION</b>	
Operating temperature	-20...+60°C
Storage temperature	-20...+80°C
<b>HOUSING</b>	
Version	4 modules
Degree of protection	IP20
Weight	300g
<b>CERTIFICATIONS AND COMPLIANCE</b>	
Reference standards	EN 50081-1, EN 50082-2

OPTIONS	DESCRIPTION
<b>Emi-1</b>	RS232/RS485 converter, opto-isolated, 220-240VAC power supply (110-120VAC on request). Repeater drive for RS485 bus extension.
<b>Emi-1R</b>	RS232/RS485 converter DIN-rail mounting, opto-isolated, 220-240VAC power supply (110-120VAC on request). Repeater drive for RS485 bus extension.
<b>Emi-1R USB</b>	USB/RS485 converter DIN-rail mounting, opto-isolated, 220-240VAC power supply (110-120VAC on request). Repeater drive for RS485 bus extension.

Converter that can interface "slave" devices connected in an RS485 bus with a "master" equipped with RS232 interface port. When configured appropriately, it can also be used as RS485 repeater whenever the devices connected to the bus are many or the maximum distance among the bus devices is longer than the allowed. **Instead RS232 serial interface can provide USB port.**

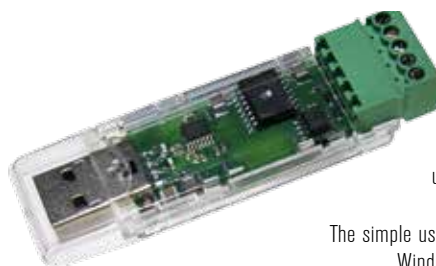
## MECHANICAL DIMENSIONS EMI-1R



TECHNICAL CHARACTERISTICS	EMI 1P-USB
<b>AUXILIARY SUPPLY</b>	
Rated voltage Us	From PC 5V @ 100mA
Type of connection	USB
<b>RS485 SERIAL INTERFACE</b>	
Type of terminal	Screw (removable)
Baud-rate	Max baud-rate 500Kbit/s
<b>AMBIENT CONDITION</b>	
Operating temperature	-10...+65°C
Storage temperature	-15...+80°C
<b>HOUSING</b>	
Degree of protection	IP20
Weight	100 g
<b>CERTIFICATIONS AND COMPLIANCE</b>	
Reference standards	EN 61000-6-4 / N 64000-6-2 EN 61010-1 / EN 60742

## EMI-1P USB

DIGITAL MEASURING INSTRUMENTS  
USB/RS485 CONVERTER



The EMI-1P USB is a Serial Converter Isolated up to 2.5kV, based on chip USB FTDI.

The simple use is guaranteed by the Windows validation drivers that you download automatically when you have your PC connected to the network.

This device allows you to connect in a safe way to any Modbus devices on RS485.

# EMI 3m

## COMMUNICATION DEVICES - MODEM GSM-GPRS

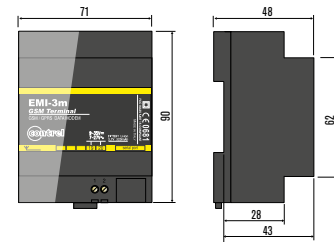
EMI-3m is an industrial DIN rail GSM modem for the transfer of data, SMS and faxes in GSM networks. Control by ITU, GSM, GPRS and Custom AT commands. EMI-3m come with either a Serial or USB interface and its modular enclosure fits easily into equipment or machinery. Designed to operate in harsh conditions, simplifies the development of M2M and IoT application. Quad band GSM / GPRS / EDGE communication with automatic or manual selection on bands 850 / 900 / 1800 / 1900 MHz for data, sms, fax and voice applications. Full Type Approved and compliant with ETSI GSM Phase 2+ and with Part 15 of the FCC Rules.

TECHNICAL CHARACTERISTICS	EMI-3m
<b>AUXILIARY SUPPLY</b>	
Rated voltage Us	9.5...35 VDC - 9.5...27 VAC
Operating limits	-
Power consumption	< 5W
Optional backup battery	Li-Poly
<b>MODEM GSM/GPRS</b>	
Frequency bands	Quad band 850 / 900 / 1800 / 1900 MHz
Output power	Class 4 for GSM850 Class 4 for GSM900 Class 1 for GSM1800 Class 1 for GSM1900
<b>SIM INTERFACE</b>	
Type of SIM	U-SIM compatible
<b>GSM/GPRS ANTENNA CONNECTION</b>	
Type of connector	SMA o FME
Type of connector	
Connection	RS232 (RJ45 connector)
Baud-rate	Programmable 300 ... 115200 bps
<b>INSULATION</b>	
Insulation voltage	3kVAC for 1 minute
<b>AMBIENT CONDITION</b>	
Operating temperature	-40...+85°C
Storage temperature	-40...+90°C
<b>CERTIFICATIONS AND COMPLIANCE</b>	
Comply with standards	EN 60950-1:2006, EN 60950-1 A11:2009, EN 60950-1 A1:2010 EN 60950-1 A12:2011, EN 50385:2002 EN 301 489-7 V1.3.1:2005-11, EN 301 489-1 V1.9.2:2011-09 EN 301 511 V9.0.2:2003-03

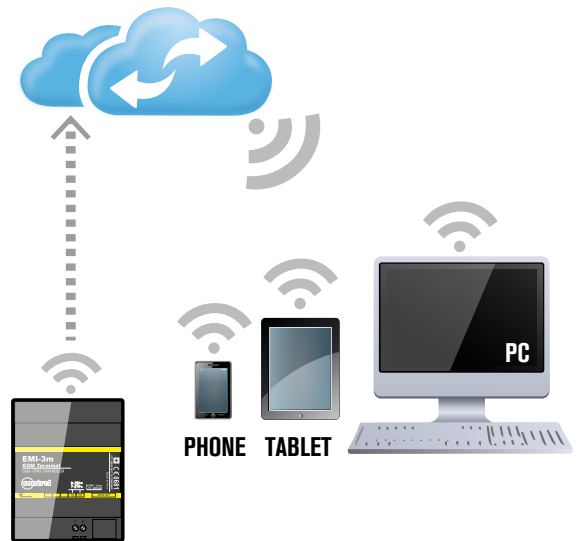
OPTIONS EXTERNAL GSM ANTENNA				
ORDER CODE				
STRIP + SMA		Adhesive antenna for non-metallic surfaces.	MiniSTUB SMA	Antenna to be fitted directly on connector.
STRIP + FME			MiniSTUB FME	
MAGNETIC + SMA		Magnetic antenna for metallic surfaces.	MiniFINGER SMA	Multi band outdoor antenna. Mounting: Wall / Pole
MAGNETIC + FME			MiniFINGER FME	
BODY SMA		Body mount outdoor antenna. IP69K	FINGER SMA	Multi band outdoor antenna. Mounting: Wall / Pole
BODY FME			FINGER FME	



### MECHANICAL DIMENSIONS EMI-3m



### WIRING DIAGRAMS EMI-3m



EMI-3m  
MODEM  
GSM-GPRS

Multimeter  
EMM-μD3h

Multimeter  
EMM-μD3h

Modbus  
RS485



EMI-10m  
Gateway

Modbus  
RS485

# EMI 5s

## COMMUNICATION DEVICES PROFIBUS DP/RS485 CONVERTER

Converter/Gateway to control equipments with Modbus protocol within an installation Profibus.



### PROFIBUS CONNECTOR

PIN	FUNCTION	PINOUT
1	Shield	
2	Disconnect	
3	RxD/TxD-P (B)	
4	CNTR-P	
5	DGND	
6	VP	
7	Disconnect	
8	RxD/TxD-N (A)	
9	Disconnect	

### TECHNICAL CHARACTERISTICS

#### EMI 5s

#### AUXILIARY SUPPLY

Rated voltage Us	80 ... 240 VAC/DC - 20 ... 60 VAC/DC
Power consumption	4 VA

#### PROFIBUS INTERFACE

Baud-rate	9.600 bps - 19.200 bps - 45.450 bps - 93.750 bps - 187.500 bps - 500.000 bps - 1.5 Mbps - 3 Mbps
Supported protocol	Profibus DP-VO
Type of connector	DB9F

#### INSULATION

Insulation voltage	3kV for 1 minute
--------------------	------------------

#### AMBIENT CONDITION

Operating temperature	-10...+60°C
Storage temperature	-25...+70°C

#### HOUSING

Version	6 module
Degree of protection	IP52
Weight	500g

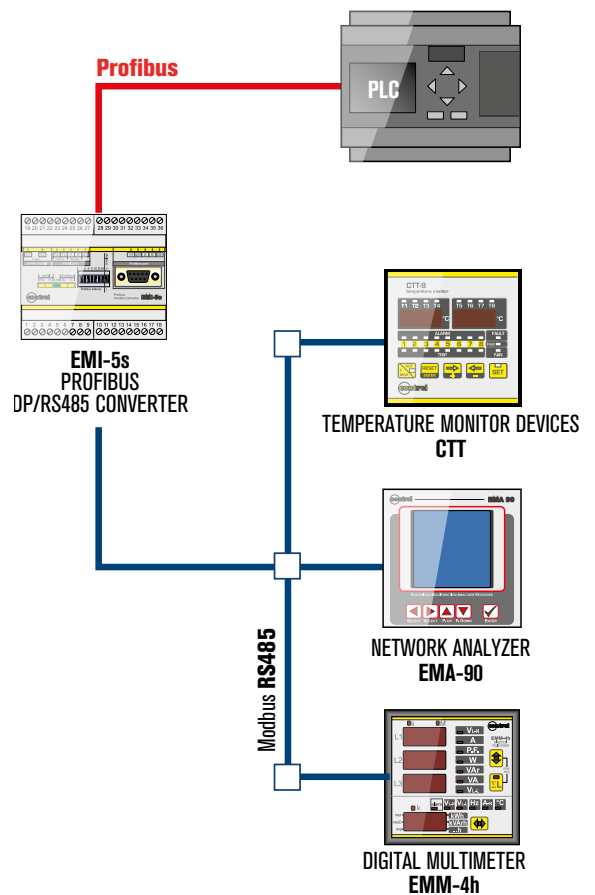
#### CERTIFICATIONS AND COMPLIANCE

Comply with standards	EN 61000-2, EN 61000-4
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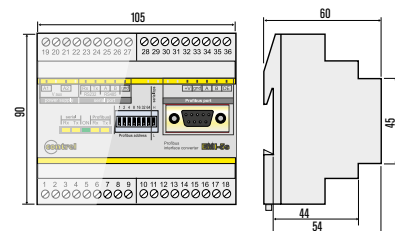
### OPTIONS

ORDER CODE	DESCRIPTION
EMI-5s	For EMM, EMA, CTT and HRI instruments
EMI-5s-D	For energy meter MID approved

### WIRING DIAGRAMS EMI-5s



### MECHANICAL DIMENSIONS EMI-5s





## COMMUNICATION DEVICES

The monitoring of electrical networks often use a high-speed Ethernet backbone to collect data from multiple devices and share information among users. The Ethernet Gateway **EMI-10L** can help to reduce the cost and complexity of connecting, configuring and managing a network of meters, sensors and other remote tools.

It provides reliable connectivity between Modbus serial devices and TCP/IP networks, without changing their existing infrastructure and is perfect for converting from a system based on a serial bus system based on Ethernet.

The **EMI-10L** allows users to configure the Ethernet parameters, the parameters of the serial communication and perform a possible solution of the problems through a web interface with a detailed diagnosis of the communication.

The **EMI-10L** supports 10BaseT and 100 BaseT.

This Ethernet gateway enables the integration of up to 32 serial Modbus devices.

### BENEFITS

Increase your efficiency allowing you to make quick decisions based on data made available to you:

- Access simple, fast, shared information from all electrical network products via Modbus TCP / IP
- Network architecture and flexible modular
- Transfer of data to Modbus RS485 to Ethernet Modbus TCP / IP.

### COMMUNICATION

- Use your existing LAN infrastructure to reduce the cost of lines of communication and network management
- Fast 10 or 100 megabits per second, Ethernet communications eliminates bottlenecks transferring monitoring data to the same network speed.

### DESCRIPTION

- Ethernet 10 / 100Base-T
- RS485 serial interface
- Integration of up to 32 serial devices Modbus
- Support for Modbus TCP/IP serial master
- Web interface for configuration, diagnostics and maintenance
- Customizable security through different levels of access (read-only access or full)
- Log-in safe with a password
- Languages available in Italian, English and German

## TECHNICAL CHARACTERISTICS EMI-10L / EMI-10M

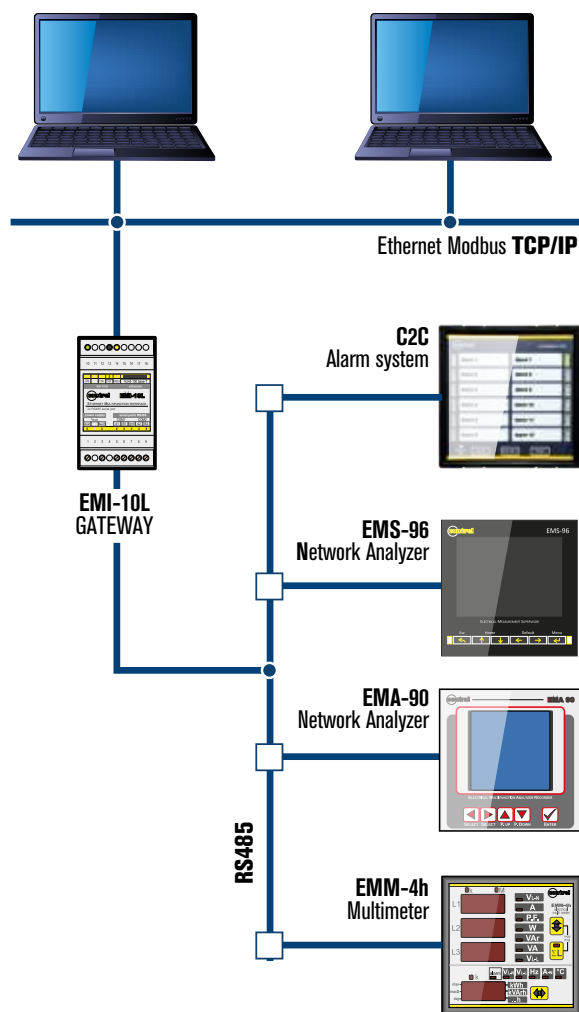
AUXILIARY SUPPLY	
Rated voltage Us	100 ... 240 VAC - 24 VAC/DC
Power consumption	4 VA
RS485 SERIAL INTERFACE	
Baud rate	Programmable 1200 ... 115200 bps
Protocol	Modbus RTU
Number of connected instruments	32 max
ETHERNET INTERFACE	
Network interface	RJ45 Ethernet 10BASE-T o 100BASE-T (auto-sensing)
Protocols supported	HTTP, Modbus TCP/IP
INSULATION	
Insulation voltage	3kVAC for 1 minute
AMBIENT CONDITION	
Operating temperature	-10...+60°C
Storage temperature	-25...+70°C
HOUSING	
Version	3 modules
Degree of protection	IP52
Weight	100 g
CERTIFICATIONS AND COMPLIANCE	
Comply with standards	EN 60950-1:2001, EN 60950-1 A11:2004, IEC 60950-1:2005, EN 60950-1 A11:2006 A1:2010 A12:2011, EN 61000-2, EN 61000-4

## OPTIONS

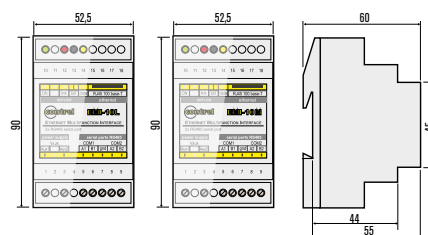
ORDER CODE	DESCRIPTION
EMI-10L	Ethernet Gateway
EMI-10M	Ethernet Gateway + log memory



## SYSTEM ARCHITECTURE



## MECHANICAL DIMENSIONS EMI-10L / EMI-10M



# EML 16

## DATA CONCENTRATOR

The data concentrator EML-16 provides a function of collected pulses and an interface to supervisory systems. The EML-16 can be applied as a tool for counting of consumption of energy meters, water, gas, heat, etc.. It supports RS485 communication and TCP/IP communication.



### TECHNICAL CHARACTERISTICS EML 16

AUXILIARY SUPPLY	
Rated voltage Us	90 ÷ 260 VAC/CC 20 ÷ 60 VAC/CC
Operating limits	±15%
Power consumption	4,5VA
Frequency	50 - 60 Hz
COUNTER INPUTS	
Number of inputs	16
Voltage presents on the inputs	24 - 48 - 115 - 230 VAC/CC
Current input	5mA max
Type of inputs filter	Digitale
RS485 SERIAL INTERFACE	
Baud-rate	Programmable 1200 - 115200 bps
Protocol supported	Modbus RTU
ETHERNET INTERFACE	
Network interface	RJ45 Ethernet 10BASE-T o 100BASE-T (auto-sensing)
Protocols supported	HTTP, Modbus TCP/IP
INSULATION	
Insulation voltage	2,5kVAC for 1 minute
AMBIENT CONDITION	
Operating temperature	0...+60°C
Storage temperature	-20...+80°C
HOUSING	
Version	6 module
Degree of protection	IP52 on front IP20 Housing and terminals
Weight	500 g
CERTIFICATIONS AND COMPLIANCE	
Reference standards	EN50082-1, EN50082-2, EMC 89/336/EEC

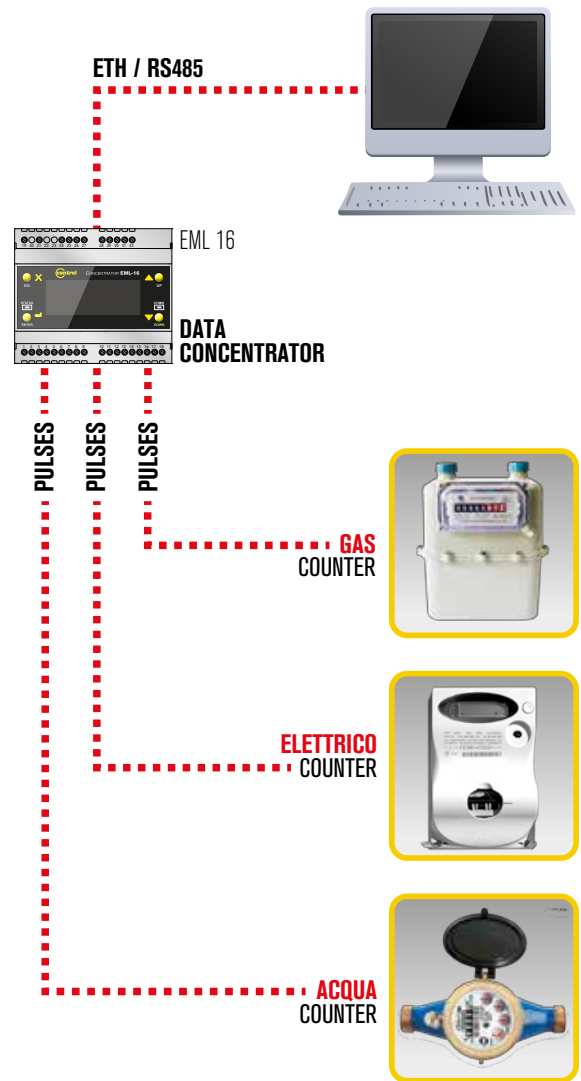
### OPTIONS

ORDER CODE	DESCRIPTION
C1	20 ÷ 60 VAC/CC
24	Input voltage 24VAC/CC
48	Input voltage 48VAC/CC
115	Input voltage 115VAC/CC
230	Input voltage 230VAC/CC

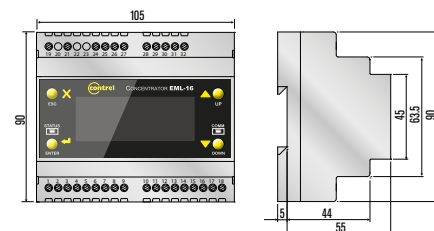
### COMMUNICATION PORTS

485	RS485 serial interface
ETH	Ethernet interface with Web server function

### WIRING DIAGRAMS EML 16



### MECHANICAL DIMENSIONS EML 16



CERTIFICAZIONI



CERTIFICATIONS



CSQ  
ISO 9001:2008  
9105.C035

IQNET  
ISO 9001:2008  
IT - 417

DESIGN, PRODUCTION AND SALE OF ELECTRONIC DEVICES FOR:  
PROTECTION  
MEASUREMENT  
ALARM SYSTEMS  
INSULATION MONITORING  
MANAGEMENT SOFTWARE



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ISO 9001:2008  
9105-C035

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