



## S604 SERIES MULTIFUNCTION POWER METERS

The S604 series includes innovative three-phase network analyzers for the measurement and storage of electrical parameters. All versions for TA standard 1/5 A, for direct link up to 80 A or for Rogowski coils input, enclose the ideal functions for energy management applications. Depending on the model, the device can communicate through the RS485 serial port with ModBUS RTU / ASCII or through the Ethernet port with ModBUS protocol TCP-IP. Onboard Ethernet models is very useful the Web server interface to remotely manage surveys and export logged data for energy audits. The top features of the advanced versions ENERGY Plus are 8 MB for data logs, the recording of harmonics up to 15<sup>th</sup> and the recording of MIN./AVG/MAX values of all the active and reactive powers.



### INSERTION MODE

- Three phase 4 wires
- From 3x400 V to 3x415 V threephase 3 wires
- From 230 V to 240 V single phase



### POWER SUPPLY

- Self-Powered models
- Auxiliary supply models



### DIGITAL I/O'S

- #1/2 alarm/pulse output
- #1 average values calculation (DMD)



### DATA STORAGE

- Active/Reactive Power average values recording (S604B – Basic versions) or All Power MIN/AVG/MAX values di tutte le potenze (S604E Energy Plus versions)
- Up to 8 MB memory for data recording



### TYPICAL APPLICATION

- Monitoring system and energy control.
- Individual machine load monitoring.
- Power peak control
- Switchboards, gensets, motor control centers etc.
- Remote metering and cost allocation



### SETTINGS

- ENERGY POWER PACK (software)
- Web Server
- Front Key buttons



### OPTIONAL COMMUNICATION

- ModbBUS RTU/ASCCI (RS85 port)
- ModBUS TCP-IP (LAN port)



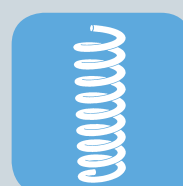
### ENERGY COUNTERS AND MEASUREMENTS

- Total counters
- Inductive / capacitive independent counters
- Bidirectional measurement on 4 quadrants for all powers and energies
- Energy efficiency parameters measurement



### THD & HARMONICS




- Current / Voltage THD Values
- Current / Voltage THD Values up to 15th harmonics



### CURRENT INPUT

- Version for 1 or 5A CT, for direct connection up to 6A or 80A
- 3 current measurement scales for Rogowski model

## ROGOWSKI MULTI-FUNCTION POWER METERS

	<b>S604B</b>	<b>S604E</b>	<b>S604E-ROG</b>
			
	<b>Three-phase Power Meter BASIC version</b>	<b>Three-phase Power Meter ENERGY Plus version</b>	<b>Three-phase power meter kit including nr.1 S604E + nr. 3 Rogowski coils</b>
<b>GENERAL DATA</b>			
<b>Power supply</b>	180..285 Vac line-neutral, Cat III (self powered models) 85..265 Vac, Aux, Cat II (auxiliary powered models)	85..265 Vac, Aux, Cat II (auxiliary powered models)	180..285 Vac line-neutral, Cat III (self powered models) 85..265 Vac, Aux, Cat II (auxiliary powered models)
<b>Max consumption</b>	3,5 VA - 1 W each phase (self-powered models) 1,6 VA - 1 W (auxiliary powered, RS485 models) 4,5 VA - 1,6 W (auxiliary powered, Ethernet models)	1,6 VA - 1 W (auxiliary powered, RS485 models) 4,5 VA - 1,6 W (auxiliary powered, Ethernet models)	1,6 VA - 1 W (auxiliary powered, RS485 models) 4,5 VA - 1,6 W (auxiliary powered, Ethernet models)
<b>Display</b>	LCD, backlighted, 43x29 mm, 3 rows, 4 digit+symbols	LCD, backlighted, 43x29 mm, 3 rows, 4 digit+symbols	LCD, backlighted, 43x29 mm, 3 rows, 4 digit+symbols
<b>Keyboard</b>	3 front button, 1 protected button	3 front button, 1 protected button	3 front button, 1 protected button
<b>Operating temperature</b>	-25..+55°C	-25..+55°C	-25..+55°C
<b>Sinusoidal vibration amplitude</b>	50 Hz ± 0.075 mm	50 Hz ± 0.075 mm	50 Hz ± 0.075 mm
<b>Memory (instrument with communication port)</b>	1 MB	8 MB	8 MB (min/avg/max)
<b>Recordings</b>	AGV values for active and reactive powers	Min/ Avg/Max values for all powers, selectable	AGV values for active and reactive powers
<b>THD &amp; Harmonics</b>	Voltage and current THD values	Voltage and current THD values Voltage and current up to 15th	Voltage and current THD values Voltage and current up to 15th
<b>Apparent Energy Counters</b>	Total counters or separated inductive/capacitive counters	Total counters or separated inductive/capacitive counters	Total counters or separated inductive/capacitive counters
<b>Wiring modes</b>	Three-phase, 4 wires, 3 currents Three-phase, 3 wires, single phase, 2 currents	Three-phase, 4 wires, 3 currents Three-phase, 3 wires, single phase, 2 currents	Three-phase, 4 wires, 3 currents Three-phase, 3 wires, single phase, 2 currents
<b>Front protection degree</b>	IP51	IP51	IP51
<b>Terminals protection degree</b>	IP20	IP20	IP20
<b>Dimension (l x h x w)</b>	72x90x65 mm	72x90x65 mm	72x90x65 mm
<b>Weight</b>	436 g	436 g	436 g
<b>ACCURACY</b>			
<b>Voltage</b>	±0,2% reading 10% FS...FS (FS=full scale value)	±0,2% reading 10% FS...FS (FS=full scale value)	±0,2% reading 10% FS...FS (FS=full scale value)
<b>Current</b>	±0,4% reading in 5% FS...FS	±0,4% reading in 5% FS...FS	±0,4% reading in 5% FS...FS
<b>Power</b>	±0,5% reading ±0,1% FS (PF=1)	±0,5% reading ±0,1% FS (PF=1)	±0,5% reading ±0,1% FS (PF=1)
<b>Frequency</b>	±0,1% reading ±1 digit in 45...65 Hz	±0,1% reading ±1 digit in 45...65 Hz	±0,1% reading ±1 digit in 45...65 Hz
<b>Active Energy</b>	Class 1 according to IEC/EN 62053-21	Class 1 according to IEC/EN 62053-21	Class 1 according to IEC/EN 62053-21
<b>Reactive Energy</b>	Class 2 according to IEC/EN 62053-23	Class 2 according to IEC/EN 62053-23	Class 2 according to IEC/EN 62053-23
<b>COMMUNICATION</b>			
<b>Serial Port</b>	RS485 optoisolated, 300..57.600 bps (optional)	RS485 optoisolated, 300..57.600 bps	RS485 optoisolated, 300..57.600 bps (optional)
<b>Ethernet Port</b>	10/100 Mbps, RJ45 connector (optional)	10/100 Mbps, RJ45 connector	10/100 Mbps, RJ45 connector (optional)
<b>Supported protocols</b>	ModBUS RTU/ASCII (RS485); http, Ntp, Dhcp, ModBUS TCP-IP (Ethernet)	ModBUS RTU/ASCII (RS485); http, Ntp, Dhcp, ModBUS TCP-IP (Ethernet)	ModBUS RTU/ASCII (RS485); http, Ntp, Dhcp, ModBUS TCP-IP (Ethernet)
<b>I/O</b>			
<b>Voltage Input</b>	3x180/310...3x285/495 Vacm Cat III, 300 V (self powered models) 3x10/17...3x285/495 Vac, Cat III 300 V (auxiliary powered models)	3x180/310...3x285/495 Vacm Cat III, 300 V (self powered models) 3x10/17...3x285/495 Vac, Cat III 300 V (auxiliary powered models)	3x180/310...3x285/495 Vacm Cat III, 300 V (self powered models) 3x10/17...3x285/495 Vac, Cat III 300 V (auxiliary powered models)
<b>Current Input</b>	6A (1/5A CT models); 80 A (80 A models)	6A (1/5A CT models); 80 A (80 A models)	3 selectable scales: 500 / 4.000 / 20.000 A by Rogowski Coils
<b>Digital Input</b>	Nr 1 optoisolated active channel (NO COM), DMD synchronization range 80..276 Vac/dc	-	N1 optoisolated active channel (NO COM), DMD synchronization range 80..276 Vac/dc
<b>Digital Output</b>	Nr 1 (RS485 models) / 2 (NO COM models) optoisolated passive channel, IEC/EN 62053-31	Nr 1 (RS485 models) / 2 (NO COM models) optoisolated passive channel, IEC/EN 62053-31	Nr 1 (RS485 models) / 2 (NO COM models) optoisolated passive channel, IEC/EN 62053-31
<b>PROGRAMMING</b>			
<b>Configuration systems</b>	Front key buttons Energy Power Pack software (ModBUS/Ethernet models) Webserver (Ethernet models)	Front key buttons Energy Power Pack software (ModBUS/Ethernet models) Webserver (Ethernet models)	Front key buttons Energy Power Pack software (ModBUS/Ethernet models) Webserver (Ethernet models)
<b>STANDARD</b>			
<b>Certifications</b>	CE	CE	CE
<b>Directives</b>	2006/95/CE, 2004/108/CE	2006/95/CE, 2004/108/CE	2006/95/CE, 2004/108/CE
<b>Norms</b>	EN 61010-1, EN 61010-2-030, EN 61326-1, EN 55011, EN 61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11, EN61000-6-2	EN 61010-1, EN 61010-2-030, EN 61326-1, EN 55011, EN 61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11, EN61000-6-2	EN 61010-1, EN 61010-2-030, EN 61326-1, EN 55011, EN 61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11, EN61000-6-2



## RC150 ROGOWSKI COILS

An air-cored toroidal winding is placed around the conductor, the magnetic field produced by the current induces in the coil a voltage proportional to the rate of change of current. Integrating this voltage the output become proportional to the current (as for a current transformer). Coil length varies from 25 to 300 cm for a cord diameter up to 8 mm



### TECHNOLOGY

- The junction point is insensitive to both the position of the internal conductor and to currents carried by external conductors
- Coil and cable shielded against electromagnetic noise



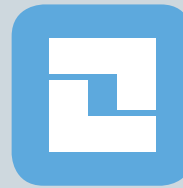
### ENGINEERING

- Cross section reduced up to approx. 8mm
- High flexibility



### CALIBRATION

- Better than 1% accuracy, even close to the junction point
- Accessible calibration point for easy recalibration, if required



### OPTIMAL LOCK

- Secure lock even in presence of vibration and/or pull-ups
- Stable lock ensuring repeatability in measurement



### INSTALLATION

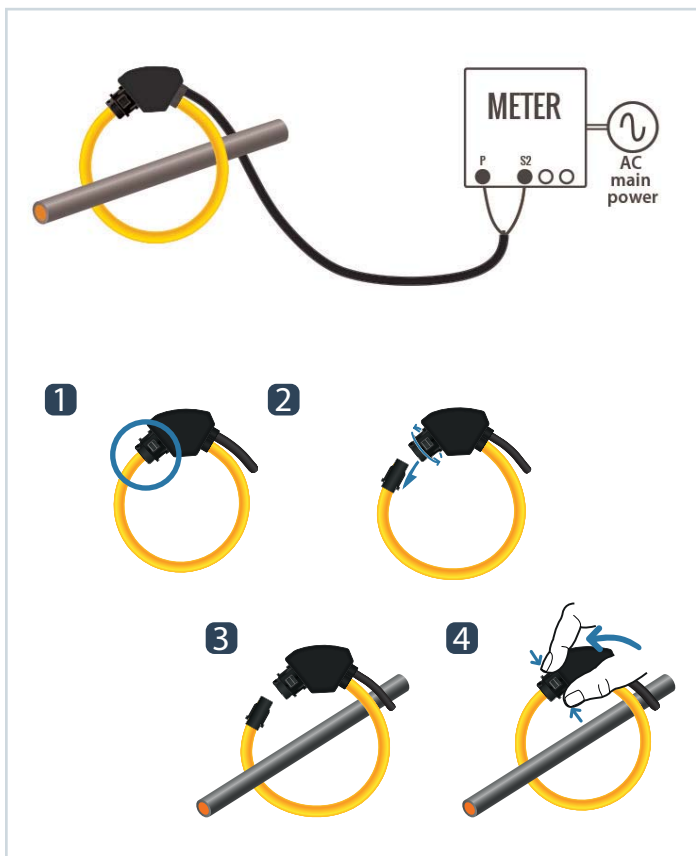
- Limited access applications
- Non-Intrusive Current Measurement



### TYPICAL APPLICATIONS

- Very high current monitoring
- Harmonics and transients monitoring
- DC ripple measurement
- Power monitoring and control systems
- Measuring devices, lab instrumentation
- Welding machine control

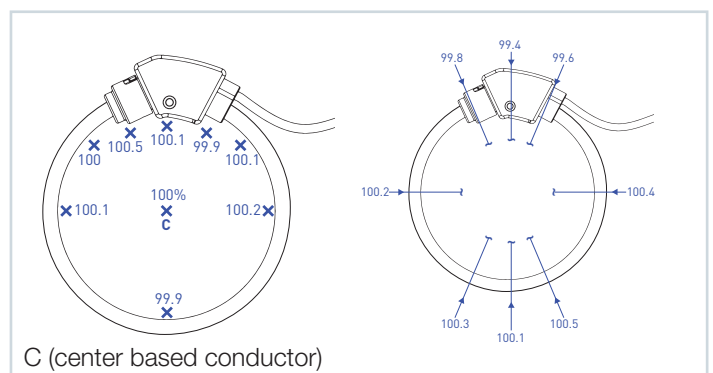
### INSTALLATION



### DIMENSION



### ACCURACY RANGE



## HIGH PERFORMANCE ROGOWSKI COILS

### RC150



**Rogowski coils** have been used for the detection and measurement of electric currents for decades. They are based on a simple principle where an “air-cored” coil is placed around the conductor in a toroidal fashion and the magnetic field produced by the current induces a voltage in the coil. The voltage output is proportional to the rate of change of current. This voltage is integrated, thus producing an output proportional to the current. By using precision winding techniques, especially developed for the purpose, the coils are manufactured so that their output is not influenced by the position of the conductor within the toroid, and to reject interference from external magnetic fields caused, for example, from nearby conductors. Basically, a Rogowski coil current measuring system consists of a combination of a coil and conditioning electronics. Rogowski coil current transducers are used for the AC measurement.

#### TECHNICAL FEATURES

##### GENERAL DATA

Coil length	From 25 to 300 cm
Coil diameter	From 8 ±0,2 mm to 57 cm
Cable length	3 m
Lock	Bayonet
Protection Degree	IP67
Material	UL94-V0
Operating temperature	-30..+80°C
Weight	da 150 a 500 g

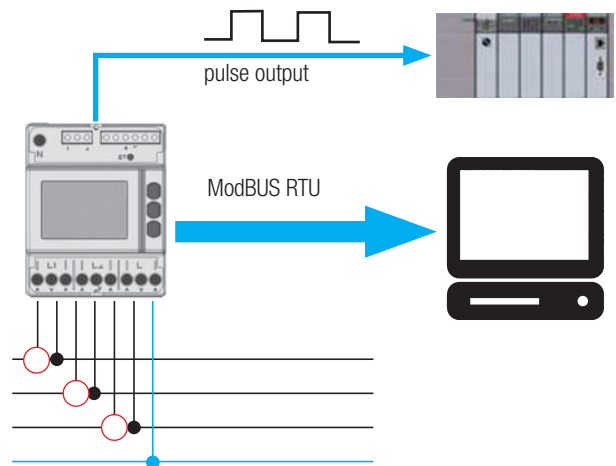
##### ELECTRICAL DATA

Output level (RMS)	100 mV / 1 kA @50 Hz (standard)
Transducer resistance	70..900 Ω (RC150)
	300..2.000 Ω (RC190)
Accuracy	Better than ±1% reading valuer (conductor diameter 15 mm)
Frequency	From 40 Hz a 20 kHz
Working voltage	1.000 Vrms CAT III, 600 Vrms CAT IV, pollution degree 2
Test voltage	7.400 Vrms / 1 min

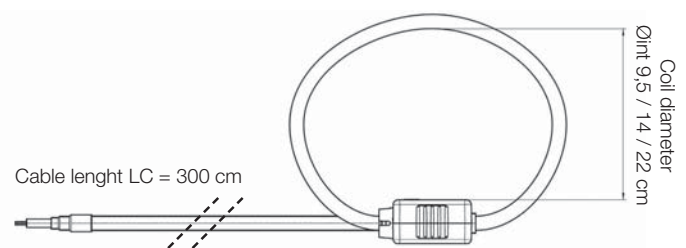
##### STANDARD

Marking	CE
Norms	EN 61010-1, EN 61010-031, EN 61010-2-031, EN 61010-2-032

#### APPLICATION NOTE



#### ROGOWSKI COIL KIT / SPARE PARTS



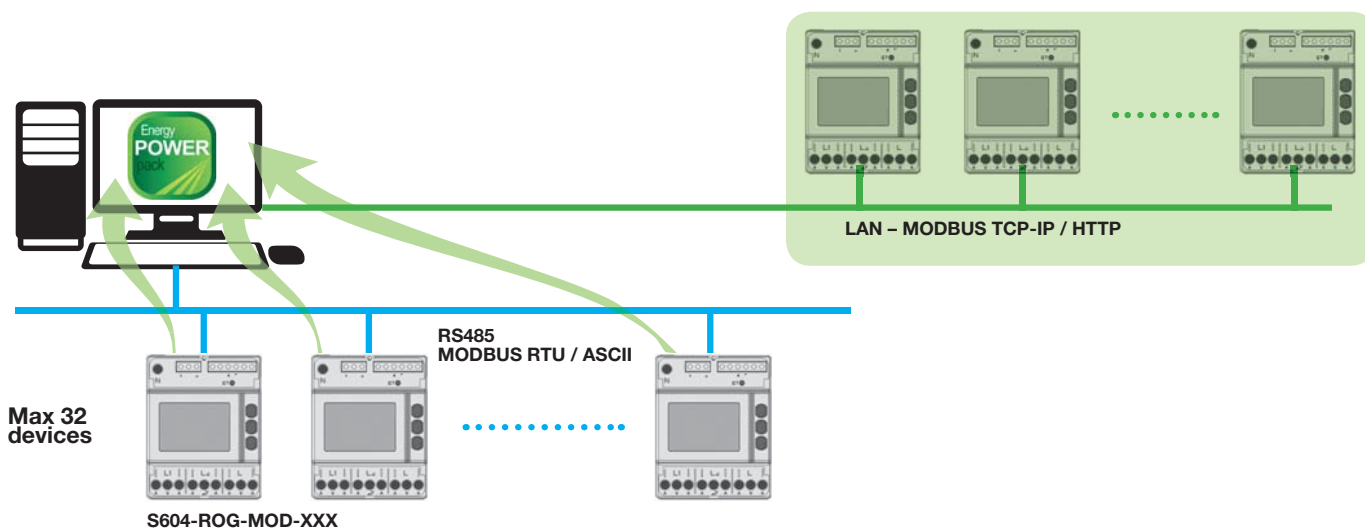
**S60B-ROG and S604E-ROG models are supplied as KIT in bundle with 3 Rogowski coils available in 3 different circumferences (30, 45, 70 cm)**

Code	Description
RC150-025-100-3M	Rogowski Coil L=25cm Øint.8cm,100mV/1KA-50Hz,cable L=3mt.
RC150-035-100-3M	Rogowski Coil L=35cm Øint.11cm,100mV/1KA-50Hz,cable L=3mt.
RC150-040-100-3M	Rogowski Coil L=40cm Øint.12cm,100mV/1KA-50Hz,cable L=3mt.
RC150-060-100-3M	Rogowski Coil L=60cm Øint.19cm,100mV/1KA-50Hz,cable L=3mt.
RC150-090-100-3M	Rogowski Coil L=90cm Øint.28cm,100mV/1KA-50Hz,cable L=3mt.
RC150-120-100-3M	Rogowski Coil L=120cm Øint.38cm,100mV/1KA-50Hz,cable L=3mt.
RC150-180-100-3M	Rogowski Coil L=180cm Øint.57cm,100mV/1KA-50Hz,cable L=3mt.
RC150-RIC-KIT30	Rogowski Coil Kit Spare Parts RC150 L= 30cm Ø int. 9,5 cm, 100mV/1KA-50Hz,cable L=3mt.
RC150-RIC-KIT45	Rogowski Coil Kit Spare Parts RC150 L= 45cm Ø int. 14 cm, 100mV/1KA-50Hz,cable L=3mt.
RC150-RIC-KIT70	Rogowski Coil Kit Spare Parts RC150 L= 70cm Ø int. 22 cm, 100mV/1KA-50Hz,cable L=3mt.
RC150-025-100-5	Rogowski Coil L=25cm Øint.8cm,100mV/1KA-50Hz,cable L=5mt.
RC150-040-100-5	Rogowski Coil L=40cm Øint.11cm,100mV/1KA-50Hz,cable L=5mt.

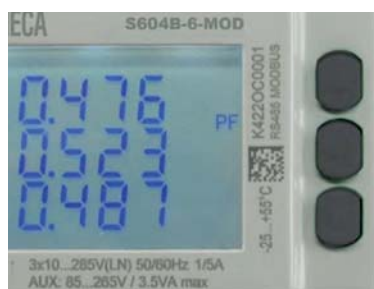
Kit / coil length	Order Code	Øint / internal diameter	Cable length
30 cm	S604B-ROG-000-30	9,5 cm	300 cm
	S604B-ROG-MOD-30		
	S604B-ROG-ETH-30		
	S604E-ROG-MOD-30		
45 cm	S604E-ROG-ETH-30	14 cm	300 cm
	S604B-ROG-000-45		
	S604B-ROG-MOD-45		
	S604B-ROG-ETH-45		
70 cm	S604E-ROG-MOD-45	22 cm	300 cm
	S604E-ROG-ETH-45		
	S604B-ROG-000-70		
	S604B-ROG-MOD-70		
	S604B-ROG-ETH-70		
	S604E-ROG-MOD-70		
	S604E-ROG-ETH-70		

## PROGRAMMING SYSTEM

## ETHERNET / MODBUS COMMUNICATION / PROGRAMMING



## FRONT KEY BUTTONS



Readings, settings and recording are available through front key buttons with 7 display page groups management.



Configuration tool for Energy power meters SERVER S604B and S604E. ENERGY POWER PACK assures reading and visualization of all measurements, it also provides a overall setup of parameters, downloading and converting recording and it manages remote connections



By Web Server it's possible visualizing all device values and associate a recording exportable into a csv file

## ORDER CODES

Code	Description
<b>POWER METERS</b>	
S604B-6-MOD	Three phase power meter, BASIC version, for CT/5A, RS485 Modbus,1MB mem. log.
S604B-6-ETH	Three phase power meter, BASIC version, for CT/5A, Ethernet, 1MB mem. log.
S604B-80-MOD	Three phase power meter, BASIC version, 80A-RS485 Modbus,1MB mem. log.
S604B-80-ETH	Three phase power meter, BASIC version, 80A- Ethernet,1MB mem. log.
S604E-6-MOD	Power Meter, Energy PLUS x TA1/5A-RS485 Modbus,8MB log. harmonics
S604E-6-ETH	Power Meter Energy PLUS x TA1/5A-Ethernet,8MB log. harmonics
S604E-80-ETH	Power Meter Energy PLUS 80A-Ethernet,8MB log. harmonics
S604E-ROG-MOD-45	Power Meter Kit Energy PLUS RS485 Modbus,8MB log.harm.+3 Rogowski RC150 L= 45cm Øint.14cm
S604E-ROG-MOD-70	Power Meter Kit Energy PLUS RS485 Modbus,8MB log.harm.+3 Rogowski RC150 L= 70cm Øint.22cm
S604E-ROG-ETH-30	Power Meter Kit Energy PLUS Ethernet,8MB log.harm.+ 3 Rogowski RC150 L= 30 cm Øint. 9,5 cm
S604E-ROG-ETH-45	Power Meter Kit Energy PLUS Ethernet,8MB log.harm.+ 3 Rogowski RC150 L= 45 cm Øint. 14cm
S604EROGETH45-5	Power Meter Kit Energy PLUS Ethernet,8MB log.harm.+ 3 Rogowski RC150 L= 45 cm Øint. 14cm, probes cable 5m
S604EROGETH45-10	Power Meter Kit Energy PLUS Ethernet,8MB log.harm.+ 3 Rogowski RC150 L= 45 cm Øint. 14cm, probes cable 10m
S604E-ROG-ETH-70	Power Meter Kit Energy PLUS Ethernet,8MB log.harm.+ 3 Rogowski RC150 L= 70cm Øint. 22cm
S711B6MOD	LCD 96x96 BASIC Power Meter, TA1/5A-RS485 Modbus,1MB mem. log.,1 DI 2 DO
S711E6MOD	LCD 96x96 Energy PLUS Power Meter, TA1/5A-RS485 Modbus,8MB log.,1 DI 2 DO, harmonics
S711E6MODAO	LCD 96x96 Energy PLUS Power Meter, TA1/5A-RS485 Modbus,8MB log.,1 DI 2 DO 1AO, harmonics
S711E6ETH	LCD 96x96 Energy PLUS Power Meter, TA1/5A-Ethernet,8MB log, 1 DI 2 DO, harmonics
S711EROGMOD30	LCD 96x96 Energy PLUS Power Meter Kit, RS485 Modbus,8MB log.,1 DI 2 DO,Arm.+3 Rogowski RC150 L= 30cm Øint.9,5cm
S711EROGMOD45	LCD 96x96 Energy PLUS Power Meter Kit, RS485 Modbus,8MB log.,1 DI 2 DO, harmonics, 3 Rogowski RC150 L= 45cm Øint.14cm
S711EROGMOD70	LCD 96x96 Energy PLUS Power Meter Kit, RS485 Modbus,8MB log.,1 DI 2 DO,Arm.+3 Rogowski RC150 L= 70cm Øint.22cm
S711EROGMOD30AO	LCD 96x96 Energy PLUS RS485 Modbus,8MB log.,1 DI 2 DO 1 AO, harmonics, 3 Rogowski RC150 L= 30cm Øint.9,5cm
S711EROGMOD45AO	LCD 96x96 Energy PLUS Power Meter Kit, RS485 Modbus,8MB log.,1 DI 2 DO 1 AO, harmonics, 3 Rogowski RC150 L= 45cm Øint.14cm
S711EROGMOD70AO	LCD 96x96 Energy PLUS RS485 Modbus,8MB log.,1 DI 2 DO 1 AO, harmonics, 3 Rogowski RC150 L= 70cm Øint.22cm
S711EROGETH30	LCD 96x96 Energy PLUS Power Meter Kit , Ethernet,8MB log.,1 DI 2 DO, harmonics, 3 Rogowski RC150 L= 30 cm Øint. 9,5 cm
S711EROGETH45	LCD 96x96 Energy PLUS Power Meter Kit , Ethernet,8MB log.,1 DI 2 DO, harmonics, 3 Rogowski RC150 L= 45 cm Øint. 14cm
S711EROGETH70	LCD 96x96 Energy PLUS Power Meter Kit, Ethernet,8MB log.,1 DI 2 DO, harmonics, 3 Rogowski RC150 L= 70cm Øint. 22cm
<b>SOFTWARE</b>	
E-POWER PACK	Management software for S604 Series power meters
<b>SOFTWARE</b>	
S117P1	RS232/USB, TTL/USB, RS485/USB asynchronous and optoisolated serial converter
S107USB	RS485/USB optoisolated serial converter, portable version