DIRIS A-100 / A-200

Power quality meter - panel mounted

Works with RJ12 or 333 mV current sensors

DIRIS A-100

DIRIS A-200

Configuration with Easy Config System

Function

The **DIRIS A-100 / A-200** are panel-mounted power quality meters that can communicate either via MODBUS RTU over RS485, MODBUS TCP and BACnet IP over Ethernet. The 4 independent current inputs allow to manage several types and numbers of circuits. The DIRIS A-100 / A-200 are compatible with all types of current sensor technologies: solid-core, split-core and Rogowski coil sensors to match any project requirements and installation constraints.

Advantages

Universal

The DIRIS A-100/A-200 is an all-in-one power quality meter providing a cost-effective answer to all application requirements:

- Native RS485 and dual Ethernet communication and digital inputs/outputs, eliminating the need for additional optional modules.
- Universal power supply 115 - 600 VAC.
- Wide range voltage service monitoring 90 - 690 VAC direct without using potential transformers.
- Compatible with any third party 333mv Current Transformers.

Plug & play

- Unique RJ12 technology provides a quick and reliable connection of current sensors to the power meter.
- Using mV output CTs means that no shorting blocks are needed.
- Fast and simple setup thanks to the screen`s Configuration Wizard.
- Easy Config System is a free configuration software that allows you to create and save configuration templates which can later be uploaded to other A-100/A-200.
- Smart monitoring of protective devices with VirtualMonitor technology - without the need for auxiliary contacts or extra wiring.

Fully customizable

- Upload your own brand logo to customize the screen and embedded webserver.
- Creation of rolling favorite screens to display the measurement datasets that matter most to you.

Advanced features

- Waveform capture automatically triggered by power quality events to rapidly identify disturbances.
- Time of Use calendar configuration (up to 4 seasons and 4 tariffs) to align consumptions with any local utility contract.
- Ground leakage current monitoring, with alarm thresholds for preventative maintenance and quick remedial action.

Better than revenue grade

PreciSense technology provides industry leading accuracy which exceed revenue grade standards, for reliable and repeatable measurements under all conditions:

- Class 0.1 for the meter alone according to ANSI C12.20 and IEC 61557-12 standard.
- Class 0.5 from 2% to 120% of the CT rating for the global measurement chain (with TE/iTR/TF/ACTL-1250 current sensors).

The solution for

> Data center
> Industry
> Building

Strong points

> Universal
> Plug & play
> Fully customizable
> Advanced features
> Better than revenue grade

Conformity to standards

> UL 61010-1
CSA-C22.22
No. 61010-1
Guide FTRZ/PICQ
File E257746

> ANSI C12.20

> PBI Meter per CA Energy Commission

> IEC 61557-12

> IEC 62053-21 -24

Integrated technologies

PreciSense AutoCorrect VirtualMonitor

For more information see our website www.socomec.us

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DIRIS A-100 / A-200

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DIRIS A	***A-100***	***A-100***	***A-200***	***A-200***
Current sensor technology	RJ12	333 mV	RJ12	333 mV
General				
Format	Door Mount	Door Mount	Door Mount	Door Mount
Number of current sensor inputs	4	4	4	4
Available enclosed			•	
Electrical				
Power supply	115 - 600 VAC	115 - 600 VAC	115 - 600 VAC	115 - 600 VAC
Voltage measurement	50 - 600 VAC L-N 90 - 690 VAC L-L	50 - 600 VAC L-N 90 - 690 VAC L-L	50 - 600 VAC L-N 90 - 690 VAC L-L	50 - 600 VAC L-N 90 - 690 VAC L-L
Communication				
RS485 Modbus RTU	•	•	•	•
Ethernet (Modbus TCP/BACnet IP)			•	•
WEBVIEW web interface			•	•
Digital Input / Output	3 / 1	3 / 1	3 / 1	3 / 1
Analog Input / Output	- / -	- / -	- / -	- / -
Energy metering				
±kWh, ±kvarh, kVAh	•	•	•	•
∑P (kW), ∑Q (kvar), ∑S (kVA), PF	•	•	•	•
P (kW), Q (kvar), S (kVA), PF per phase	•	•	•	•
Predictive Power	•	•	•	•
Load curves / demand profiles	•	•	•	•
Peak Demand	•	•	•	•
Multi-tariff	4 (with Time of Use)	4 (with Time of Use)	4 (with Time of Use)	4 (with Time of Use)
Multi - measurement				
U12, U23, U31, V1, V2, V3, f	•	•	•	•
U system, V system	•	•	•	•
I1, I2, I3, In, I system	•	•	•	•
Unbalance U, V, I	•	•	•	•
Phi, cos Phi, tan Phi	•	•	•	•
Power quality				
THD U, V, I	•	•	•	•
Individual Harmonics U, V, I (up to 63rd)			•	•
Ground Leakage Monitoring			•	
Crest Factor I1, I2, I3	•	•	•	•
K-Factor	•	•	•	•
PQ Events (sags, swells, interruptions, overcurrents)	•	•	•	•
Waveform capture			•	•
Alarms				
Measurement thresholds	•	•	•	•
System alarms	•	•	•	•
Protective device	•	•	•	•
Logical (digital input status)	•	•	•	•
History				
Average Values	•	•	•	•
Reference	4825 **0600**	4825 **0601**	4825 **0604**	4825 **0605**

DIRIS A-100 / A-200

Power quality meter - panel mounted

Works with RJ12 or 333 mV current sensors

Functions

Monitoring

- Real-time visualization of all electrical parameters, available under several formats (bar graphs, tables)
- Phasor diagram to identify potential CT wiring errors

Consumption curves

- Recording of active (kWh), reactive (kvarh) and apparent (kVAh) energies
- Graphical view of monthly, weekly, daily or hourly energy consumptions to detect drifts

Time of Use

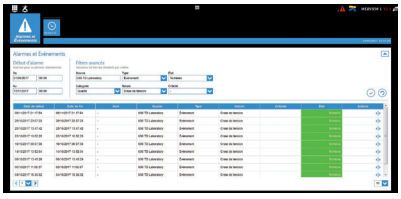
- Custom calendar management
- Energy consumption displayed according to the utility's daily rates, weekdays, seasons and holiday schedules

Measurement history

- History of all electrical parameters (V, I, P, Q, S, THD etc.)
- Time period selection (year, month, day etc.)
- Easy correlation, by displaying multiple parameters on the same graph

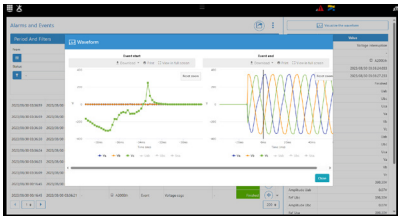
Alarms & Events

- View active alarms and power quality events
- Access to details (duration, amplitude etc.)
- Log of finished alarms & events

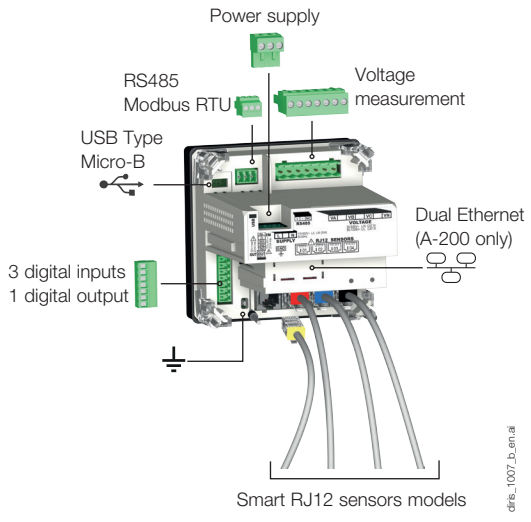


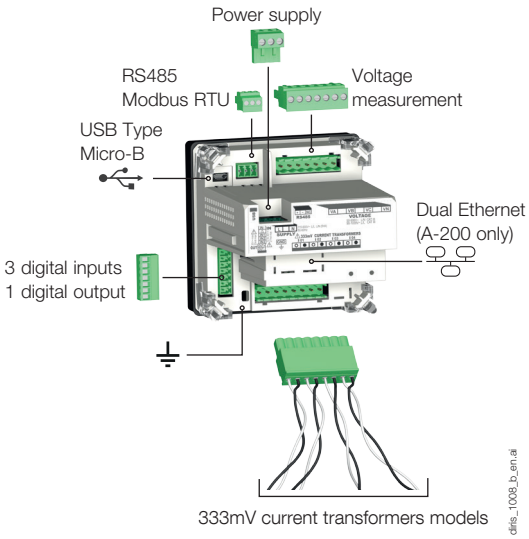
Waveform

- Automatic waveform captures following power quality events.
- Waveform picture and samples can be downloaded from the webserver



Terminals





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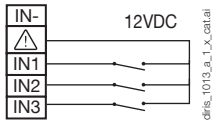
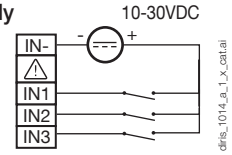
Terminals (continued)

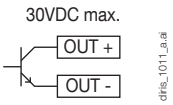
3 Digital inputs
Self-supplied by PMD



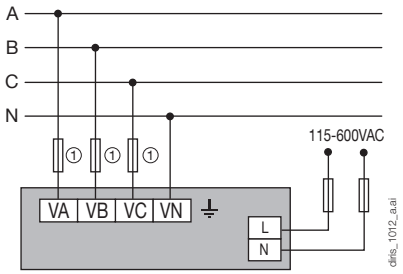
External power supply



1 digital output



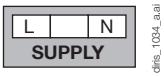
Voltage and power supply connections



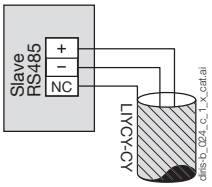
1. 1 A gG / 1 A class CC Listed fuses for UL application.

Ground

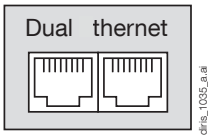
Power supply



RS485

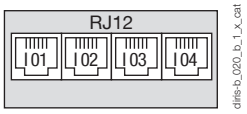


Dual Ethernet

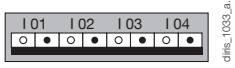


Current measurement

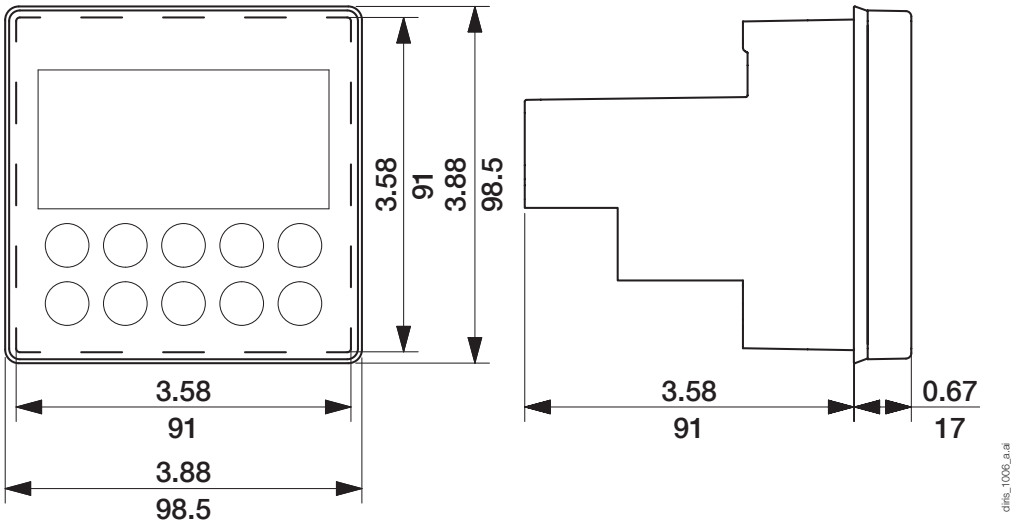
RJ12 version



333mV version



Dimensions (in/mm)



DIRIS A-100 / A-200

Power quality meter - panel mounted

Works with RJ12 or 333 mV current sensors

Current sensors

The DIRIS A-100/A-200 supports various types of current sensors including smart RJ12 solid-core (TE), split-core (TR/iTR), and Rogowski coil (TF) sensors (A-100/A-200 RJ12 models), as well as any 333 mV current sensors (A-100/A-200 333 mV models). Additionally, the DIRIS A-200 RJ12 model (reference 4825 0604) can accommodate zero-sequence ΔIC/ΔIP-R CTs for ground leakage monitoring. This versatile range of sensors makes the DIRIS A-100/A-200 suitable for both new and existing installations.

TE solid current sensors

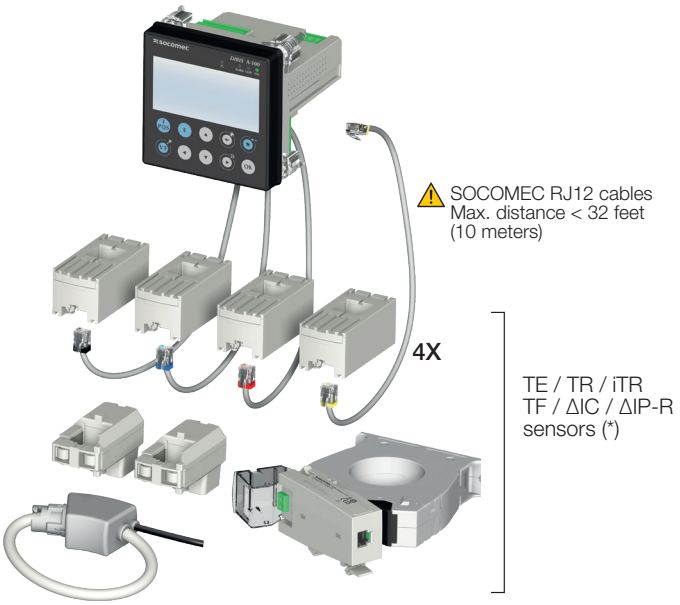
TR/iTR split-core current sensors

TF Rogowski current sensors

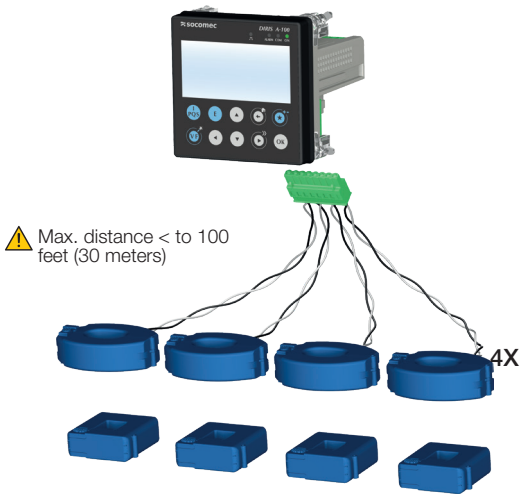
333mV current sensors

ΔIC/ΔIP-R zero sequence CTs

RJ12 smart current sensors



Current transformers with 333 mV outputs

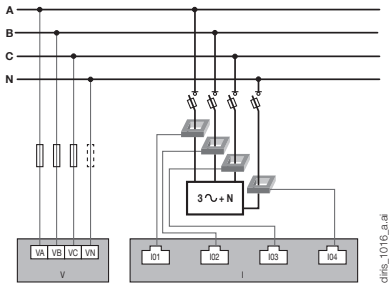


(*) Notes regarding the use of zero sequence CTs:

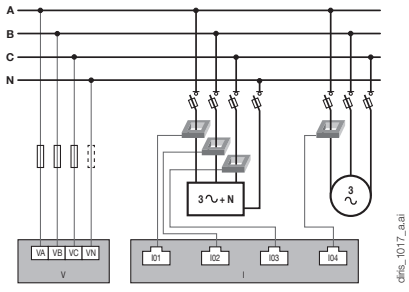
1. ΔIC / ΔIP-R zero sequence CTs for ground leakage monitoring are only compatible with the DIRIS A-200 RJ12 model (part no 48250604).
2. Only one ΔIC / ΔIP-R may be connected on the DIRIS A-200 power meter.
3. DIRIS T-10 RJ12 adaptor (part no 48290620) must be used and ordered separately to connect ΔIC / ΔIP-R to the DIRIS A-200 power meter.

Voltage and current sensor connection examples - RJ12 models

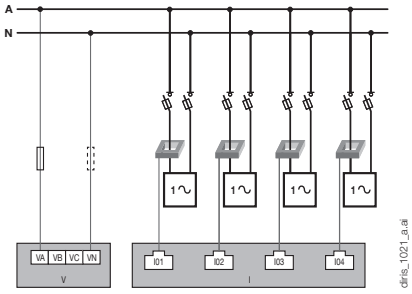
Three-Phase, Four-Wire Wye
3P+N – 4CT
(1 three-phase load + measured neutral)



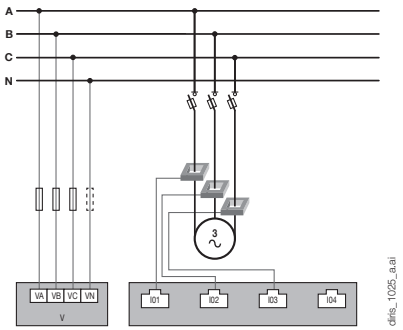
Three-Phase, Four-Wire Wye
3P+N – 3CT & 3P – 1CT
(1 unbalanced three-phase load + calculated Neutral + 1 three-phase balanced load)



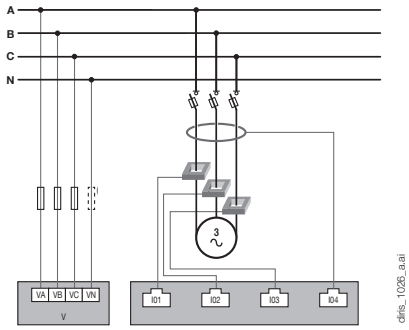
Single-Phase, Two-Wire, Line-to-Neutral
1P+N – 1CT (x4)
(4 single-phase loads)



Three-Phase Four-Wire Delta (High Leg)
3P+N – 3CT
(1 three-phase load)

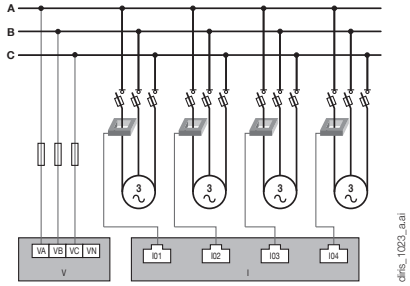


Three-Phase, Four-Wire Wye
3P+N – 3CT
(1 three-phase load with RCM* (IΔ))



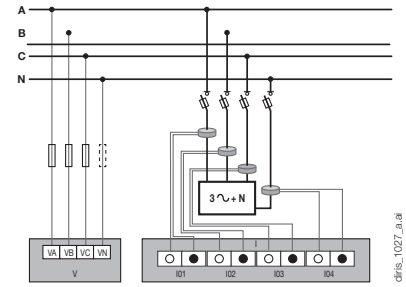
* only for DIRIS A-200 RJ12 model (ref. 48250604).

Three-Phase, Three-Wire Delta
3P – 1CT (x4)
(4 three-phase balanced loads)

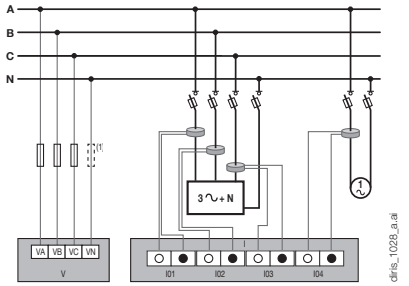


Voltage and current sensor connection examples - 333 mV models

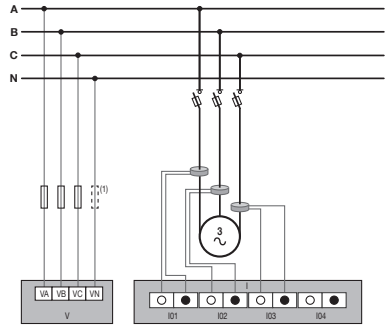
Three-Phase, Four-Wire Wye
3P+N – 4CT
(1 three-phase load + measured neutral)



Three-Phase, Four-Wire Wye
3P+N – 3CT & 1P+N – 1CT
(1 three-phase load + calculated Neutral + 1 single-phase load)



Three-Phase Four-Wire Delta (High Leg)
3P+N – 3CT
(1 three-phase load)



Fuse: 1 A gG / 1 A class CC
Listed fuses for UL application

TE / TR / iTR / TF sensors

333 mV current transformers

Balanced load

Unbalanced load

Zero sequence CT

DIRIS A-100 / A-200

Power quality meter - panel mounted

Works with RJ12 or 333 mV current sensors

Technical characteristics

Electrical characteristics

Power supply	
Voltage	115-600 VAC L/N L/L, CAT III
Frequency	50-60 Hz
Power consumption	A-100: 5VA, A-200: 7VA
Connection (Use copper conductors only)	Removable spring-cage terminal block, 2 positions, 28-12 AWG (1-2.5 mm²) solid or stranded cable with ferrule

Measurement characteristics

Standards		
Active energy accuracy	ANSI C12.20	Class 0.2 DIRIS A-100/A-200 alone
	IEC 61557-12	Class 0.2 DIRIS A-100/A-200 alone Global accuracy class from 2% to 120% of In (meter + sensors): - Class 0.5 system accuracy with TE, iTR, TF, ACTL-1250 current sensors - Class 1 system accuracy with TR or ACTL-0750 current sensors
Reactive energy accuracy	IEC 62053-24	Class 1 DIRIS A-100/A-200 alone Class 2 system accuracy with TE, TR/iTR or TF current sensors

Voltage measurement	
Voltage range	50-600 VAC L-N UL CAT III 90-690 VAC L-L UL CAT III 50-1039 VAC L-L IEC CAT III
Frequency range	45 to 65 Hz
Electrical service type	Single-Phase, Two-Wire, Line-to-Neutral, Single-Phase, Two-Wire, Line-to-Line, Single-Phase, Three-Wire (Split-Phase), Three-Phase, Three-Wire Delta, Three-Phase, Four-Wire Wye, Three-Phase Four-Wire Delta (High Leg)
Measurement by voltage transformer	Primary: 400 000 VAC Secondary: 60, 100, 110, 173, 190 VAC
Input consumption	≤ 0.1 VA
Connection (Use copper conductors only)	Removable spring-cage terminal block, 4 positions, 28-12 AWG (1-2.5 mm²) solid or stranded cable with ferrule

Current measurement	
Number of current inputs	4
Associated current sensors	- Smart RJ12 sensors: solid-core TE, split-core TR and iTR, flexible TF current sensors - 333 mV current sensors: split-core ACTL 0750- xxx, ACTL-1250-xxx - ΔIC circular solid-core and ΔIP-R circular split-core zero-sequence CT with T-10 RJ12 adaptor

Input/output characteristics

Inputs	
Number	3
Type / Power supply	Optocoupler with internal (12 VDC ± 10%) or external (10-30 VDC) polarisation 27 mA max.
Input function	Logical state, pulse meter, breaker status or sync. pulse signal (input 1)
Connection	Removable screw terminal block, 5 positions, stranded or solid 18-16 AWG (0.5-1.5 mm²)
Outputs	
Number	1
Type	Optocoupler 30 VDC max 20 mA max - SELV
Output function	Configurable alarm signal (current, power, etc.) when threshold is exceeded or remote control through communication command
Connection	Removable screw terminal block, 4 positions, stranded or solid 18-16 AWG (0.5-1.5 mm²)

Communication characteristics

RS485	
Link	RS485
Connection type	Half-Duplex, 2 wires
Protocol	Modbus RTU
Baud rate	9600 to 115200 bauds
Ethernet (A-200 only)	
Link	Ethernet
Connection type	RJ45 10/100 Mbs
Protocol	Modbus TCP/IP, BACnet IP
USB	
Link	USB Type Micro-B
Purpose	Configuration via Easy Config System and firmware upgrade via Product Upgrade Tool

Environmental characteristics

Storage temperature	-40 ... +85°C / -40 ... +185°F (ANSI C12.1)
Operating temperature	-25 ... +70°C / -13 ... +158°F (ANSI C12.1)
Humidity	5 to 95% RH non condensing (ANSI C12.1)
Degree of pollution	2

References

DIRIS A power meters		
DIRIS A-100	RS485 - Smart RJ12 current sensors	4825 **0600**
DIRIS A-100	RS485 - 333 mV current sensors	4825 **0601**
DIRIS A-200	RS485 + Dual Ethernet - Smart RJ12 current sensors	4825 **0604**
DIRIS A-200	RS485 + Dual Ethernet - 333 mV current sensors	4825 **0605**

Accessories	Sold in multiples of	Reference
DIN-rail mounting accessory	1	4825 **0690**
3-pole RM Class CC fuse holder to protect voltage inputs	4	5705 **0003**
2-pole RM Class CC fuse holder to protect power supply input	6	5701 **0002**
1A/5A secondary CT adapter with RJ12 output	1	4829 **0599**
6.5-ft USB Cable for configuration - Type A to Type Micro-B	1	4829 **0050**

RJ12 Solid-core current sensors [1]

Model	Nominal current range (A)	Real range covered (A)	Window size (in/mm)	Reference
TE-18	5 … 20	0.1 … 24	Ø 0.33 / 8.6	4829 **0500**
TE-18	25 … 63	0.5 … 75	Ø 0.33 / 8.6	4829 **0501**
TE-25	40 … 160	0.8 … 192	0.53 x 0.53 / 13.5 x 13.5	4829 **0502**
TE-35	63 … 250	1.26 … 300	0.82 x 0.82 / 21 x 21	4829 **0503**
TE-45	160 … 630	3.2 … 756	1.22 x 1.22 / 31 x 31	4829 **0504**
TE-55	400 … 1000	8 … 1200	1.61 x 1.61 / 41 x 41	4829 **0505**
TE-90	600 … 2000	12 … 2400	2.52 x 2.52 / 64 x 64	4829 **0506**

(1) Refer to pages 348-351 for more information on TE current sensors

RJ12 Split-core current sensors [2]

Model	Nominal current range (A)	Real range covered (A)	Window size (in/mm)	Reference
TR-10 / iTR-10	25 … 63	0.5 … 75.6	Ø 0.39 / 10	4829 **0555** / 4829 **0655**
TR-14 / iTR-14	40 … 160	0.8 … 192	Ø 0.55 / 14	4829 **0556** / 4829 **0656**
TR-21 / iTR-21	63 … 250	1.26 … 300	Ø 0.83 / 21	4829 **0557** / 4829 **0657**
TR-32 / iTR-32	160 … 600	3.2 … 720	Ø 1.26 / 32	4829 **0558** / 4829 **0658**

(2) Refer to pages 352-353 for more information on TR/iTR current sensors

RJ12 Flexible Rogowski current sensors [3] [4]

Model	Nominal current range (A)	Real range covered (A)	Window size (in/mm)	Reference
TF-40	100 … 400	2 … 480	Ø 1.57 / 40	4829 **0573**
TF-80	150 … 600	3 … 720	Ø 3.15 / 80	4829 **0574**
TF-120	400 … 2000	8 … 2400	Ø 4.72 / 120	4829 **0575**
TF-200	600 … 4000	12 … 4800	Ø 7.87 / 200	4829 **0576**
TF-300	1600 … 6000	32 … 7200	Ø 11.81 / 300	4829 **0577**
TF-600	1600 … 6000	32 … 7200	Ø 23.62 / 600	4829 **0578**
Set of 3 RJ12 female/female connectors for RJ12 lead extension between power meter and TF sensor				4829 **0670**

(3) TF Rogowski sensors come with a 6-ft cable lead with RJ12 male connector

(4) Refer to pages 354-355 for more information on TF current sensors

RJ12 sensor lead cables	Cable length (ft / m)										
	0.32/0.1	0.64/0.2	0.96/0.3	1.64/0.5	3.3/1	6.5/2	9.84/3	16.4/5	22.9/7	32.8/10	164/50 reel + 100 connectors
Number of cables	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
1	-	-	-	-	-	-	-	4829 **0602**	-	4829 **0603**	4829 **0601**
3	4829 **0580**	4829 **0581**	4829 **0582**	4829 **0595**	4829 **0583**	4829 **0584**	4829 **0606**	4829 **0607**	4829 **0608**	4829 **0609**	-
4	-	-	-	4829 **0596**	4829 **0588**	4829 **0589**	-	-	-	-	-
6	4829 **0590**	4829 **0591**	4829 **0592**	4829 **0597**	4829 **0593**	4829 **0594**	-	-	-	-	-

References (continued)

333 mV split-core current sensors

Model	Primary rating (A)	Real range covered (A)	Accuracy	Window size (in/mm)	Output lead length (ft / m)	Reference
TR-10W	63	3 … 75.6	0.50%	Ø 0.39 / 10	22 / 7	194S **5010**
TR-14W	160	8 … 192	0.50%	Ø 0.55 / 14	22 / 7	194S **5014**
TR-21W	250	12.5 … 300	0.50%	Ø 0.83 / 21	22 / 7	194S **5021**
TR-32W	600	30 … 720	0.50%	Ø 1.26 / 32	22 / 7	194S **5032**
ACTL-0750-20	20	0.2 … 24	0.75%	0.78 x 0.78 / 20 x 20	8 / 2.4	**USACTL0750020**
ACTL-0750-20-C06	20	0.2 … 24	0.50%	0.78 x 0.78 / 20 x 20	8 / 2.4	**USACTL0750020C06**
ACTL-0750-50	50	0.5 … 60	0.75%	0.78 x 0.78 / 20 x 20	8 / 2.4	**USACTL0750050**
ACTL-0750-50-C06	50	0.5 … 60	0.50%	0.78 x 0.78 / 20 x 20	8 / 2.4	**USACTL0750050C06**
ACTL-0750-100	100	1 … 120	0.75%	0.78 x 0.78 / 20 x 20	8 / 2.4	**USACTL07500100**
ACTL-0750-100-C06	100	1 … 120	0.50%	0.78 x 0.78 / 20 x 20	8 / 2.4	**USACTL07500100C06**
ACTL-0750-150	150	1.5 … 180	0.75%	0.78 x 0.78 / 20 x 20	8 / 2.4	**USACTL07500150**
ACTL-0750-150-C06	150	1.5 … 180	0.50%	0.78 x 0.78 / 20 x 20	8 / 2.4	**USACTL07500150C06**
ACTL-0750-200	200	2 … 240	0.75%	0.78 x 0.78 / 20 x 20	8 / 2.4	**USACTL07500200**
ACTL-0750-200-C06	200	2 … 240	0.50%	0.78 x 0.78 / 20 x 20	8 / 2.4	**USACTL07500200C06**
ACTL-0750-250	250	2.5 … 300	0.75%	0.78 x 0.78 / 20 x 20	8 / 2.4	**USACTL07500250**
ACTL-0750-250-C06	250	2.5 … 300	0.50%	0.78 x 0.78 / 20 x 20	8 / 2.4	**USACTL07500250C06**
ACTL-1250-250	250	2.5 ... 300	0.75%	Ø 1.77 x 1.26 / 45 x 32	8 / 2.4	**USACTL1250250**
ACTL-1250-250-C06	250	2.5 ... 300	0.50%	Ø 1.77 x 1.26 / 45 x 32	8 / 2.4	**USACTL1250250C06**
ACTL-1250-250-C02	250	2.5 ... 300	0.20%	Ø 1.77 x 1.26 / 45 x 32	8 / 2.4	**USACTL1250250C02**
ACTL-1250-400	400	4 ... 480	0.75%	Ø 1.77 x 1.26 / 45 x 32	8 / 2.4	**USACTL1250400**
ACTL-1250-400-C06	400	4 ... 480	0.50%	Ø 1.77 x 1.26 / 45 x 32	8 / 2.4	**USACTL1250400C06**
ACTL-1250-400-C02	400	4 ... 480	0.20%	Ø 1.77 x 1.26 / 45 x 32	8 / 2.4	**USACTL1250400C02**
ACTL-1250-600	600	6 ... 720	0.75%	Ø 1.77 x 1.26 / 45 x 32	8 / 2.4	**USACTL1250600**
ACTL-1250-600-C06	600	6 ... 720	0.50%	Ø 1.77 x 1.26 / 45 x 32	8 / 2.4	**USACTL1250600C06**
ACTL-1250-600-C02	600	6 ... 720	0.20%	Ø 1.77 x 1.26 / 45 x 32	8 / 2.4	**USACTL1250600C02**

Commissioning		Reference
1/2 day remote commissioning	Remote commissioning including installation verification, programming and communication testing	9230**100027**
1/2 day on-site commissioning	On-site commissioning including installation verification, programming and communication testing	9230**100004**

Expert Services

Our service engineers are an essential part of our team, and they are dedicated to ensuring your power monitoring system provides accurate and reliable measurements to your EPMS software or SCADA system.

Our services include:

- Site audits to verify the proper wiring of your system
- Personnel training on how to configure, operate and maintain power monitoring equipment and associated software
- Remote and on-site commissioning to ensure that your system is up and running quickly, with peace of mind.

For further information, please contact your nearest SOCOMEC branch.