

DIRIS A60

Power Monitoring Device - PMD

measurement, monitoring and event analysis - door mounting



diris_a60

The solution for

- > Data centres
- > Energy
- > Industry



Strong points

- > Easy to use
- > Detects wiring errors
- > Compliant with IEC 61557-12
- > Software tools
- > EN 50160 compliant

Conformity to standards

- > IEC 61557-12
- > IEC 62053-22 class 0.5 S
- > IEC 62053-23 class 2
- > EN 50160



Function

DIRIS A60 is a power monitoring device (PMD) that incorporates all the functions of the DIRIS A-30.

In addition, it offers logging and viewing of events that are harmful to the installation. All this information can be used and analysed remotely via the free Analysis software, which can be downloaded from the website www.socomec.com

Advantages

Easy to use

Thanks to its large backlit multi-screen display with 6 hotkeys, the DIRIS A60 is easy to use.

Detects wiring errors

The DIRIS A60 has an error correction function for CT connections.

Compliant with IEC 61557-12

IEC 61557-12 is a high-level standard covering all power metering and monitoring devices (PMD).

Conformity to this standard ensures a high level of equipment performance, in terms of metrology, and the mechanical and environmental aspects (EMC, temperature, etc.).

Software tools

- Optional Ethernet Module with Web server function: to monitor and use data remotely without specific software.
- Analysis software: for data analysis to improve the reliability of your electrical installation.
- Easy Config software: for quick and easy PC-based configuration of the A60.

EN 50160 compliant

Measurement method for voltage characteristics of electrical networks in conformity to EN 50160 requirements.

Functions

In addition to the functions of the DIRIS A-30, the DIRIS A60 also:

- shows the current and voltage unbalance
- shows the tangent ϕ
- stores the load curves (60 days with an interval of 10 minutes) for active, reactive and apparent power: ΣP +/-; ΣQ +/-; ΣS
- detects and stores the last 40 events concerning:
 - overvoltage,
 - voltage dips,
 - interruptions,
 - overcurrents.

For each stored event, the DIRIS A60 records the relevant 1/2 cycle RMS curves for voltages V1, V2, V3, U12, U23, U31 and currents I1, I2, I3, In, giving a total of 400 curves.

Other functions:

Multi-measurement

- Currents
 - instantaneous: I1, I2, I3, In, Isystem,
 - average/maximum average: I1, I2, I3, In,
 - unbalance: I unb.
- Voltages & frequency
 - instantaneous: V1, V2, V3, U12, U23, U31, F, Vsystem, Ussystem
 - average/max average: V1, V2, V3, U12, U23, U31, F
 - unbalance: U unb.
- Power
 - instantaneous: 3P, ΣP , 3Q, ΣQ , 3S, ΣS
 - maximum average: ΣP , ΣQ , ΣS
 - predictive: ΣP , ΣQ , ΣS .
- - Power Factor - PF, ΣPF
- Instantaneous total tangent ϕ
- Instantaneous, average and max. average unbalance

Temperatures ⁽¹⁾

- internal,
- external via 3 PT100 probes

Metering

- Active energy: +/- kWh
- Reactive energy: +/- kVarh
- Apparent energy: kVAh

Hours:

Harmonic analysis (up to 63rd)

- Total harmonic distortion
 - Currents: thd I1, thd I2, thd I3, thd In
 - Phase-to-neutral voltage: thd V1, thd V2, thd V3
 - Phase-to-phase voltage: thd U12, thd U23, thd U31
- Individual
 - Currents: HI1, HI2, HI3, HIn
 - Phase-to-neutral voltage: HV1, HV2, HV3,
 - Phase-to-phase voltages: HU12, HU23, HU31

Events ⁽¹⁾

- Alarms on all electrical values

Communications ⁽¹⁾

- RS485 digital (MODBUS)
- Ethernet (Modbus/TCP or Modbus RTU over TCP and Web server)
- Ethernet with RS485 Modbus RTU gateway over TCP

Inputs/ Outputs ⁽¹⁾

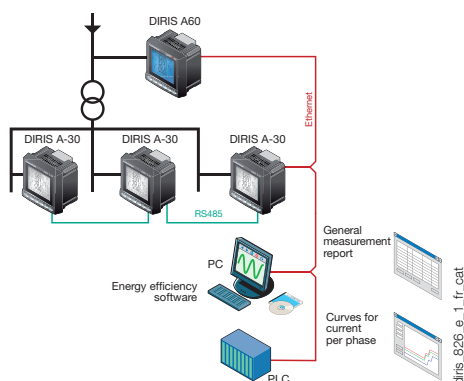
- Pulse metering
- Remote control/command
- Alarm report
- Pulse report

Analogue output

- Analogue 0/4 - 20 mA

⁽¹⁾ Available as an option (see the following pages).

Functional diagram



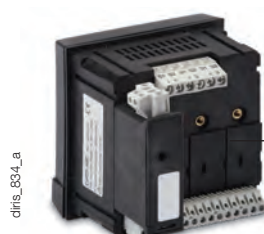
Front panel



1. Backlit LCD display.
2. Pushbutton for currents, temperatures and CT connection correction function.
3. Pushbutton for voltages and frequency.
4. Pushbutton for active, reactive, and apparent power, and power factor.
5. Pushbutton for maximum and average for currents and power values.
6. Pushbutton for harmonic values.
7. Pushbutton for metering and hours.

Plug-in modules

DIRIS® A60*



* With memory module as standard.



Pulse outputs

- 2 configurable pulse outputs (type, weight and run) on $\pm$ kWh, $\pm$ kVAh and kVAh.



MODBUS® communication

- RS485 link with MODBUS® protocol (speed up to 38400 bauds).



Ethernet communication

- Ethernet link with MODBUS/TCP or MODBUS RTU over TCP.
- Integrated Web server function ⁽¹⁾.



Ethernet communication with RS485 MODBUS gateway

- Ethernet link with MODBUS/TCP or MODBUS RTU over TCP.
- Connect 1 to 247 RS485 MODBUS slaves.
- Integrated Web server function ⁽¹⁾.



Analogue outputs

- You can connect a maximum of 2 modules, i.e. 4 analogue outputs. 2 outputs can be allocated to: 3I, In, 3V, 3U, F, $\pm$ Σ P, $\pm$ Σ Q, Σ S, Σ PFL/C, I sys, Vsys, Usys, Ppred, Q pred, Spred, T°C internal, T°C 1, T°C 2, T°C 3 and to 30 VDC power supply.



2 inputs - 2 outputs

- You can connect a maximum of 3 modules, i.e. 6 inputs / 6 outputs.
- 2 outputs can be allocated to:
 - monitoring: 3I, In, 3V, 3U, F, $\pm$ Σ P, $\pm$ Σ Q, Σ S, Σ PFL/C, THD 3I, THD In, THD 3V, THD 3U, Ppred, Qpred, Spred, T°C internal, T°C 1, T°C 2, T°C 3 and of time counter,
 - remote control,
 - timed remote control,
- 2 inputs for pulse metering.



Temperature

- Temperature indication:
- internal,
 - external PT100 probe (T°C 1),
 - external PT100 probe (T°C 2),
 - external PT100 probe (T°C 3).

⁽¹⁾ See "Software associated with DIRIS".

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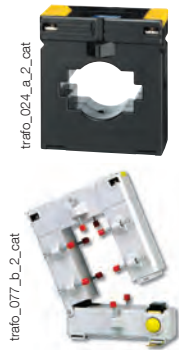
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Accessories

Current transformer

See "Current transformers" pages.



Rogowski sensors



IP65 rating

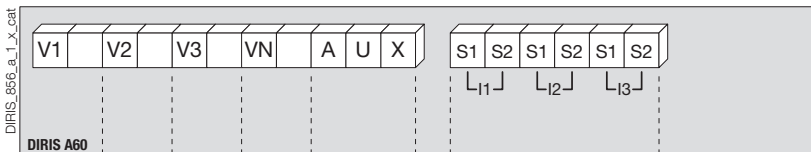


Flush-mounted device with kit for cutout 144 x 96 mm



Terminal blocks

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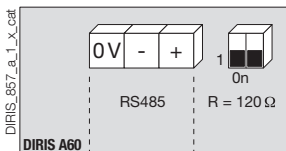


S1 - S2: current inputs

AUX: auxiliary power supplies U_s

V1, V2, V3 - VN: voltage inputs

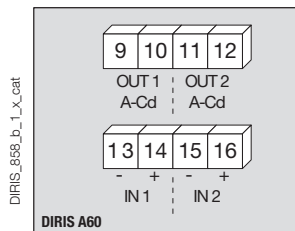
Communication module



RS485 link.

$R = 120 \Omega$: internal resistance for the RS485 link.

2 input / 2 output module



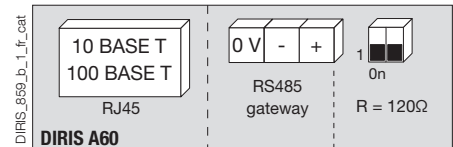
9 - 10: relay output n°1.

11 - 12: relay output n°2.

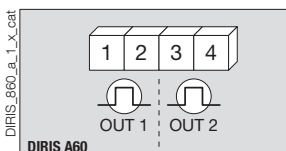
13 - 14: opto input n°1.

15 - 16: opto input n°2.

Ethernet module + RS485 MODBUS gateway



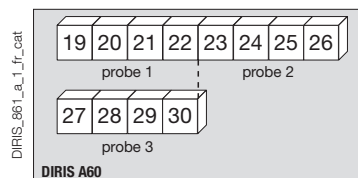
Pulse output module



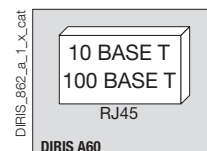
1 - 2: pulse output n°1.

3 - 4: pulse output n°2.

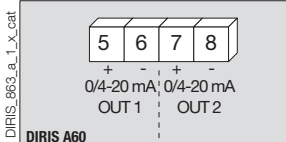
Temperature module



Ethernet module



Analogue output module



5 - 6: analogue output n°1.

7 - 8: analogue output n°2.

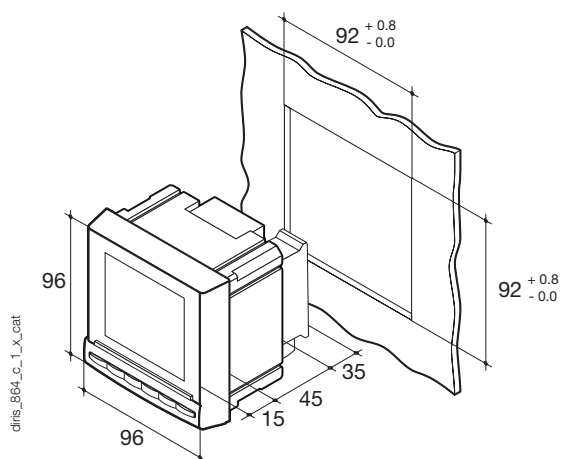
Electrical characteristics

Measurement of currents on insulated inputs (TRMS)		Module 2 inputs - 2 outputs: outputs (alarms / control)	
Via CT primary	9999 A	Number of relays	2 ⁽¹⁾
Via CT secondary	1 or 5	Type	250 VAC - 5 A - 1150 VA
Measurement range	0 ... 11 kA	Module 2 inputs - 2 outputs: optocoupler inputs	
Input consumption	≤ 0.1 VA	Number	2 ⁽¹⁾
Measurement updating period	1 s	Power supply	10 ... 30 VDC
Accuracy	0.2%	Minimum signal width	10 ms
Permanent overload	6 A	Minimum duration between 2 pulses	18 ms
Intermittent overload	10 I _n for 1 sec	Type	Optocouplers
Voltage measurements (TRMS)		Pulse output module	
Direct measurement between phases	50 ... 700 VAC	Number of relays	2
Direct measurement between phase and neutral	28 ... 404 VAC	Type	100 VDC - 0.5 A - 10 VA
VT primary	500,000 VAC	Max. number of operations	≤ 10 ⁸
VT secondary	60, 100, 110, 173, 190 VAC	Analogue output module	
Frequency	50 / 60 Hz	Number of outputs	2 ⁽²⁾
Input consumption	≤ 0.1 VA	Type	Insulated
Measurement updating period	1 s	Range	0 / 4 ... 20 mA
Accuracy	0.2%	Load resistance	600 Ω
Permanent overload	800 VAC	Maximum current	30 mA
Current-voltage product		MODBUS communication module	
Limitation for 1A CT	10,000,000	Link	RS485
Limitation for 5A TC	10,000,000	Type	2 ... 3 fils half duplex
Power measurement		Protocol	MODBUS® RTU
Measurement updating period	1 s	MODBUS® speed	4800 ... 38400 bauds
Accuracy	0.5%	Ethernet communication module	
Power factor measurement		Connection	RJ45
Measurement updating period	1 s	Speed	10 base T / 100 base T
Accuracy	0.5%	Protocol	MODBUS TCP or MODBUS RTU over TCP
Frequency measurement		Temperature inputs	
Measurement range	45 ... 65 Hz	Type	PT100
Measurement updating period	1 s	Connection	2, 3 or 4 wires
Accuracy	0.1%	Dynamic	-20 °C ... 150 °C
Energy accuracy		Accuracy	±1 digit
Active (according to IEC 62053-22)	Class 0.5 S	Maximum length	300 cm
Reactive (according to IEC 62053-23)	Class 2	Operating conditions	
Auxiliary power supply		Operating temperature	-10 ... +55 °C
AC voltage	110 ... 400 VAC	Storage temperature	-20 ... +85 °C
AC tolerance	±10%	Relative humidity	95%
DC voltage	120 ... 350 VDC		
DC tolerance	±20%		
Frequency	50 / 60 Hz		
Consumption	≤ 10 VA		

(1) Max. 3 modules / DIRIS.

(2) Max. 2 modules / DIRIS.

Case



Type	Flush mounted
Dimensions W x H x D	96 x 96 x 80 mm
Case Ingress Protection rating	IP30
Front panel Ingress Protection rating	IP52
Display type	Backlit LCD display
Terminal blocks type	Fixed or plug-in
Voltage and other terminals connection cross-section	0.2 ... 2.5 mm ²
Current connection cross-section	0.5 ... 6 mm ²
Weight	450 g

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Power Monitoring Device - PMD

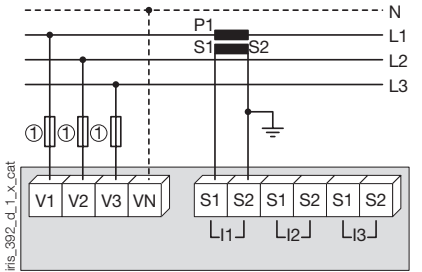
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Connection

Low voltage balanced network for DIRIS A60

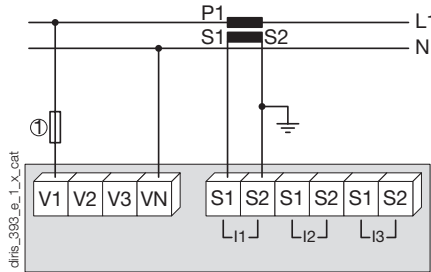
Recommendation: When disconnecting the COUNTIS device, S, the secondary of each current transformer must be short-circuited. This operation can be carried out automatically by a SOCOMEC PT1, which can be found in the SOCOMEC catalogue: please consult us.

3/4 wires with 1 CT



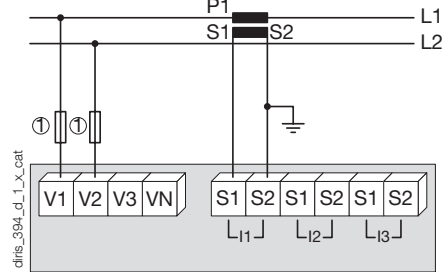
Use of 1 CT reduces by 0.5% the accuracy of the phases for which the current is deduced by vector calculation.
1. 0.5 A gG / 0.5 A class CC fuses.

Single-phase



1. 0.5 A gG / 0.5 A class CC fuses.

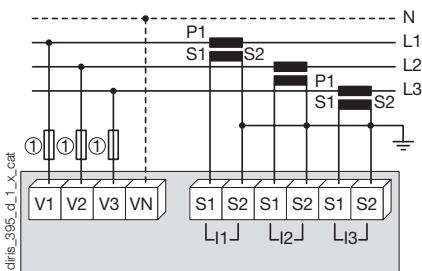
Two-phase



1. 0.5 A gG / 0.5 A class CC fuses.

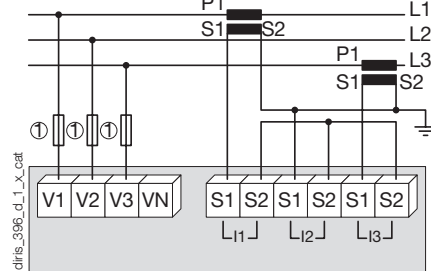
Low voltage unbalanced network for DIRIS A60

3/4 wires with 3 CTs



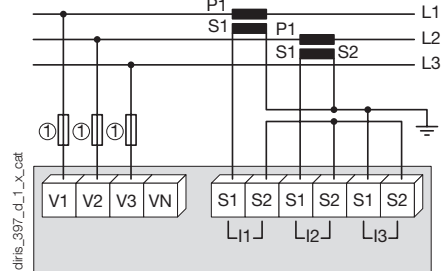
1. 0.5 A gG / 0.5 A class CC fuses.

3 wires with 2 CTs



Use of 2 CTs reduces by 0.5% the accuracy of the phase for which the current is deduced by a vector calculation.
1. 0.5 A gG / 0.5 A class CC fuses.

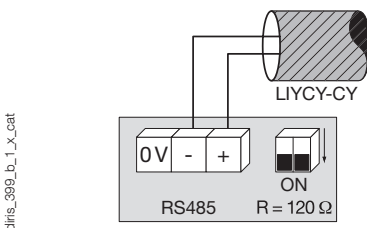
3 wires with 2 CTs



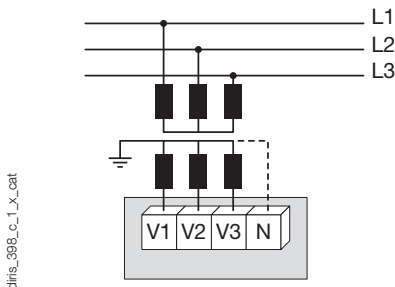
Use of 2 CTs reduces by 0.5% the accuracy of the phase for which the current is deduced by a vector calculation.
1. 0.5 A gG / 0.5 A class CC fuses.

Additional information

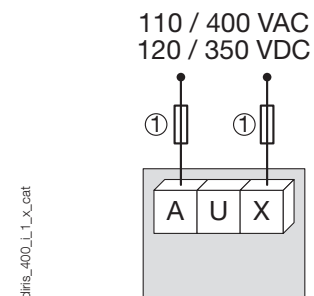
Communication via RS485 link



Connection of voltage transformer for HV networks



AC & DC auxiliary power supply networks



1. 0.5 A gG / 0.5 A class CC fuses.

References

Basic device	DIRIS A60
Auxiliary power supply U_s	Reference
110 ... 400 VAC / 120 ... 350 VDC	4825 0207
Options	
Plug-in modules⁽¹⁾	Reference
Pulse outputs	4825 0090
RS485 MODBUS [®] communication	4825 0092
Analogue outputs	4825 0093
2 inputs / 2 outputs	4825 0094
Ethernet communication (built-in Ethernet Web server software) ⁽²⁾	4825 0203
Ethernet communication + RS485 MODBUS gateway (built-in Ethernet Web server software) ⁽²⁾	4825 0204
Temperature inputs	4825 0206

(1) Easy integration of additional functions (maximum 3 slots per device).

(2) Footprint: 2 slots.

Accessories	Available for order in multiples of	Reference
IP65 rating	1	4825 0089
Flush-mounting kit for cutout 144 x 96 mm	1	4825 0088
Fused disconnect switches to protect voltage inputs (type RM) 3 pole	4	5701 0018
Fused disconnect switches to protect the 1 pole + neutral auxiliary power supply (RM type)	6	5701 0017
0.5 A 10x38 gG fuses	10	6012 0000
Ferrite for use with communication modules	1	4899 0011
Current transformer range	1	See "Current transformers" pages
PT100 temperature probe, M6 screw	1	4825 0208
PT100 temperature probe, M6 lug	1	4825 0209
Software associated with DIRIS	See "Easy Config System" pages	
Automatic CT short-circuiting device	See "Current transformers" pages	

Expert Services



EXPERT SERVICES

Socomec offers a wide range of services to continuously ensure a functional and accurate energy monitoring system:

- Device integration
- System audit
- Commissioning
- Training for your teams

Also, Ideal for ISO 50001 sites (periodic verification):

- Measurement consistency check to 3%
- Measurement accuracy check to 0.2%

For further information, please talk to your Socomec contact.