DIRIS A-30/A-41

Power Monitoring Device - PMD

advanced measurement and monitoring - door mounting

DIRIS A-30

DIRIS A-41

Function

The **DIRIS A-30** and **A-41** are Power Monitoring Devices that provide the user with all of the measurements needed to complete energy efficiency projects and to assure monitoring of electrical distribution.
All of this information can be used and analysed remotely using energy efficiency software packages.

Advantages

Easy to use
- Thanks to its large backlit multi-screen display with 6 hotkeys, the DIRIS A-30 and A41 are easy to use.

Detects wiring errors
- The DIRIS A-30 and A-41 have an error correction function for CT connections.

Customisable
The DIRIS A-30 and A-41 can be equipped with additional modules that give the user flexibility throughout the service life of the product. Communication modules and additional digital or analogue inputs/ outputs can be used to increase its range of functionality.

Compliant with IEC 61557-12
Reference standard for PMDs (Power metering & monitoring devices), Standard IEC 61557-12 guarantees performance levels and satisfactory performance from the PMDs under the environmental conditions typical of industrial and tertiary applications.

The solution for

- Healthcare
- Energy
- Industry

Strong points

- Easy to use
- Detects wiring errors
- Customisable
- Compliant with IEC 61557-12

Conformity to standards

- IEC 61557-12
- IEC 62053-22 class 0.5 S
- IEC 62053-23 class 2
- UL

Compatible with

- Current sensors and transducers

Rogowski** sensors & **RAC-1A integrator
Rogowski flexible current sensors combined with the RAC 1A integrator: up to 5000A, 6 diameters to choose from, ideal for existing installations.

Associated current transformers

See "Current transformers".

Sustainable advantages

- 30-year calibration guarantee to avoid the need for recalibration or product replacement.
- Includes ECO mode to reduce device energy consumption.
- RoHS & REACH compliant.

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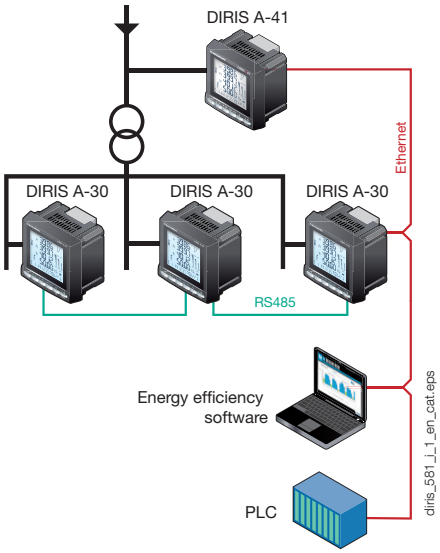
Functional diagram



Functions

Multi-measurement
- Currents
  - instantaneous: I1, I2, I3, In, Isystem
  - average/max average: I1, I2, I3, In
- Voltages & frequency
  - instantaneous: V1, V2, V3, U12, U23, U31, F, Vsystem, Usystem
  - -average/max average: V1, V2, V3, U12, U23, U31, F
- Power
  - instantaneous: 3P, ΣP, 3Q, ΣQ, 3S, ΣS
  - maximum average: ΣP, ΣQ, ΣS
  - predictive: (ΣP), (ΣQ), (ΣS)
- Power factors
  - instantaneous: 3PF, ΣPF
  - average/max average: ΣPF
- Kfactor
- Temperatures (1)
  - internal
  - external via 3 PT100 probes

Metering
- Active energy: +/- kWh
- Reactive energy: +/- kVArh
- Apparent energy: kVAh
- Hours:

Load curves (1)
- Active and reactive power: ΣP+/- ; ΣQ+/-
- Voltages & frequency: V1, V2, V3, U12, U23, U31, F

Harmonic analysis
- 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 harmonics up to 63rd
  - 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 parameters.

Communications (1)
- RS485 (Modbus & Profibus-DP)
- Ethernet (Modbus/TCP or Modbus RTU)
- Ethernet with RS485 Modbus RTU gateway over TCP

Inputs/ Outputs (1)
- Pulse metering
- Remote control/command
- Alarm report
- Pulse report

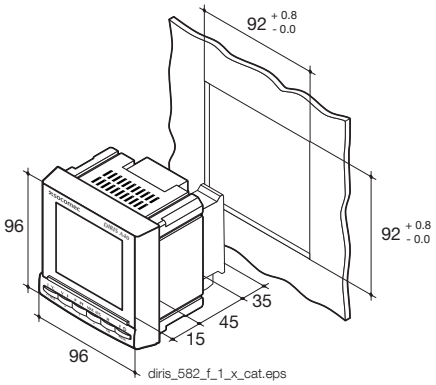
Analogue output
- Analogue 0/4 - 20 mA

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

Front panel

1. Backlit LCD display.
2. Pushbutton for currents and for connection correction function
3. Pushbutton for voltages and frequency.
4. Pushbutton for active, reactive and effective power and power factor.
5. Pushbutton for maximum and average for currents and power values.
6. Pushbutton for harmonics.
7. 7. Pushbutton for electrical energy, time and pulse meters.

Case



Type	Flush mounted
Dimensions W x H x D	96 x 96 x 60 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 mm²
Current connection cross-section	0.5 … 6 mm²
Weight	400 g

DIRIS A-30/A-41

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advanced measurement and monitoring - door mounting

Plug-in modules

DIRIS® A-30

DIRIS® A-41*

** With current measurement module for Neutral as standard.*

Pulse outputs

2 configurable pulse outputs (type, weight and run) on ±kWh, ±kVArh and kVAh.

MODBUS® communication

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

PROFIBUS® DP communication

Sub-D9 link with PROFIBUS® DP protocol (speed up to 12 Mbauds).

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, ±ΣP, ±ΣQ, ΣS, ΣPFL/C, I sys, Vsys, Usys, Ppred, Q pred, Spred, T°C internal, T°C 1, T°C 2, T°C3 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, ±ΣP, ±ΣQ, ΣS, ΣPFL/C, THD 3I, THD In, THD 3V, THD 3U, Ppred, Qpred, Spred, T°C internal, T°C 1, T°C2, T°C3 and of time counter,
- remote control,
- timed remote control,
- 2 inputs for pulse metering.

Memory

- Memory function up to 62 days for P+, P-, Q+, Q- with an internal or external synchronisation signal of 5, 8, 10, 15, 20, 30 and 60 minutes.
- Memory function for the last 10 timestamped alarms.
- Memory function for the last min and max instantaneous values for 3U, 3V, 3I, In, F, ΣP±, ΣQ±, ΣS, THD 3U, THD 3V, THD, 3U, THD, 3V, THD, 3I, THD In.
- Memory function of average values 3U, 3V and F as a function of synchronisation (maximum 60 days).

Ethernet communication

- Ethernet link with MODBUS/TCP or MODBUS RTU over TCP.

Ethernet communication with RS485 MODBUS gateway

- Ethernet link with MODBUS/TCP or MODBUS RTU over TCP.
- Connect 1 to 247 RS485 MODBUS slaves.

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Accessories

Current transformer
See “Current transformers” pages.


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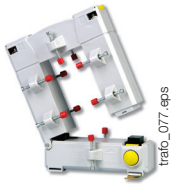

trafo_077.eps

Rogowski sensors


rac_003.eps

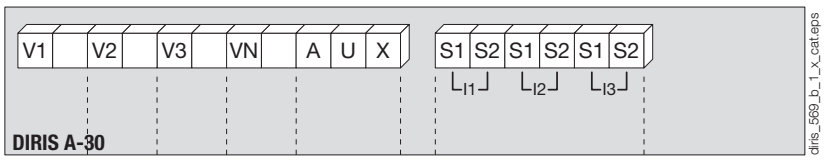

rac_001.eps

IP65 rating


diris_720.eps

Terminal blocks

DIRIS A-30



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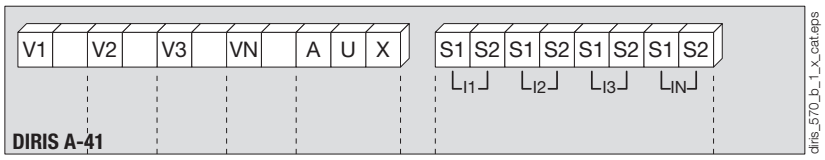
S1 - S2: current inputs

AUX: auxiliary power supply Us
V1, V2, V3 & VN: voltage inputs

DIRIS A-41



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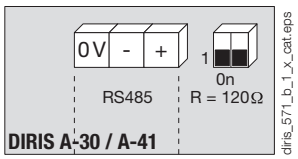
S1 - S2: current inputs

AUX: auxiliary power supply Us
V1, V2, V3 - VN: voltage inputs

Communication module



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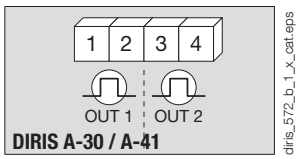
RS485 link.
R = 120 Ω: internal resistance for the RS485 link.

Pulse output module



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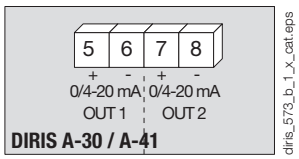
1 - 2: pulse output n°1.
3 - 4: pulse output n°2.

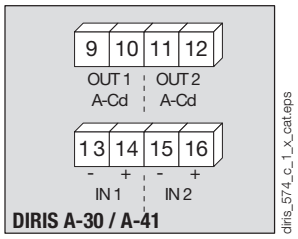
Analogue output module



diris_573_b_1_x_cat.eps

5 - 6: analogue output n°1.
7 - 8: analogue output n°2.

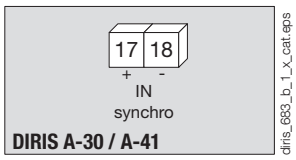
2 input / 2 output module



diris_574_c_1_x_cat.eps

9 - 10: relay output n°1.
11 - 12: relay output n°2.
13 - 14: opto input n°1.
15 - 16: opto input n°2.

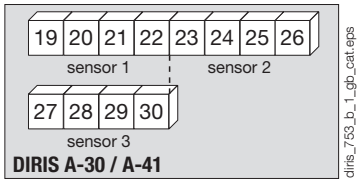
Memory module



diris_683_b_1_x_cat.eps

17 - 18: synchronisation input.

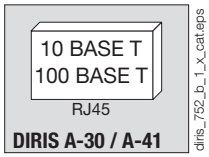
Temperature modulemodule



diris_753_b_1_gb_cat.eps

Probe 1	Probe 2	Probe 3
19: red	23: red	27: red
20: red	24: red	28: red
21: white	25: white	29: white
22: white	26: white	30: white

Ethernet module



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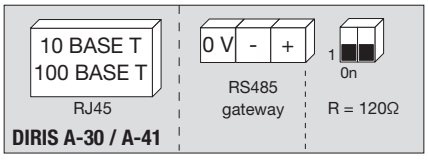
Ethernet module + RS485 MODBUS gateway



diris_751_d_1_gb_cat.eps

Electrical characteristics

Measurement of currents on insulated inputs (TRMS)	
Via CT primary	9999 A
Via CT secondary	1 or 5 A
Measurement range	0 … 11 kA
Input consumption	≤ 0.1 VA
Measurement updating period	1 s
Accuracy	0.2%
Permanent overload	6 A
Intermittent overload	10 I_n for 1 sec
Voltage measurements (TRMS)	
Direct measurement between phases	50 … 1039 VAC
Direct measurement between phase and neutral	28 … 600 VAC
VT primary	500,000 VAC
VT secondary	60, 100, 110, 173, 190 VAC
Frequency	50 / 60 Hz
Input consumption	≤ 0.1 VA
Measurement updating period	1 s
Accuracy	0.2%
Current-voltage product	
Limitation for 1A CT	10,000,000
Limitation for 5A TC	10,000,000
Power measurement	
Measurement updating period	1 s
Accuracy	0.5%
Power factor measurement	
Measurement updating period	1 s
Accuracy	0.5%
Frequency measurement	
Measurement range	45 … 65 Hz
Measurement updating period	1 s
Accuracy	0.1%
Energy accuracy	
Active (according to IEC 62053-22)	Class 0.5 S
Reactive (according to IEC 62053-23)	Class 2
Protocol	MODBUS TCP or MODBUS RTU over TCP
Temperature module (inputs)	
Type	PT100
Connection	2, 3 or 4 wires
Dynamic	-20 °C ... 150 °C
Accuracy	±1 digit
Maximum length	300 cm
Operating conditions	
Operating temperature	-10 … +55 °C
Storage temperature	-20 … +85 °C
Relative humidity	95%
Auxiliary power supply	
AC voltage	110 …400 VAC
AC tolerance	±10%
DC voltage	120 … 350 VDC / 12 … 48 VDC
DC tolerance	±20% / - 6 … + 20%
Frequency	50 / 60 Hz
Consumption	≤ 10 VA

Electrical characteristics (continued)

Module 2 inputs - 2 outputs: outputs (alarms / control)	
Number of relays	2(1)
Type	250 VAC - 5 A - 1150 VA
Module 2 inputs - 2 outputs: optocoupler inputs	
Number	2(1)
Power supply	10 … 30 VDC
Minimum signal width	10 ms
Minimum duration between 2 pulses	18 ms
Type	Optocouplers
Pulse output module	
Number of relays	2
Type	100 VDC - 0.5 A - 10 VA
Max. number of operations	≤ 10^8
Analogue output module	
Number of outputs	2(2)
Type	Insulated
Range	0 / 4 … 20 mA
Load resistance	600 Ω
Maximum current	30 mA
MODBUS communication module	
Link	RS485
Type	2 … 3 fils half duplex
Protocol	MODBUS® RTU
MODBUS® speed	4800 … 38400 bauds
PROFIBUS DP communication module	
Link	SUB-D9
Protocol	PROFIBUS® DP
PROFIBUS® speed	9.8 kbauds … 12 Mbauds
Ethernet communication module	
Connection	RJ45
Speed	10 base T / 100 base T
Protocol	MODBUS TCP or MODBUS RTU over TCP
Temperature module (inputs)	
Type	PT100
Connection	2, 3 or 4 wires
Dynamic	-20 °C ... 150 °C
Accuracy	±1 digit
Maximum length	300 cm
Operating conditions	
Operating temperature	-10 … +55 °C
Storage temperature	-20 … +85 °C
Relative humidity	95%

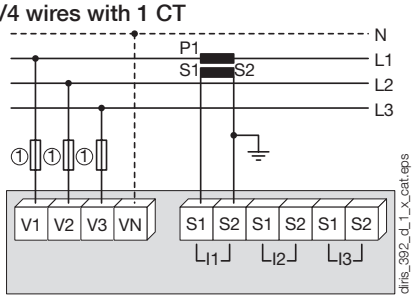
(1) Max. 3 modules / DIRIS.
(2) Max. 2 modules / DIRIS.

Connections

Balanced low-voltage network for DIRIS A-30

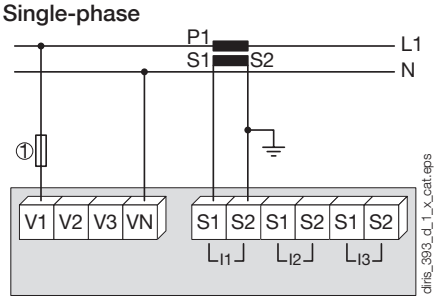
Recommendation: When disconnecting the DIRIS, the secondary of each current transformer must be short-circuited.
This operation can be carried out automatically by a SOCOMEC PTI, which can be found in the SOCOMEC catalogue: please consult us.
With a TNC earthing system, it is advisable to connect the DIRIS A-30/A-41 to earth using the functional earth module.

3/4 wires with 1 CT



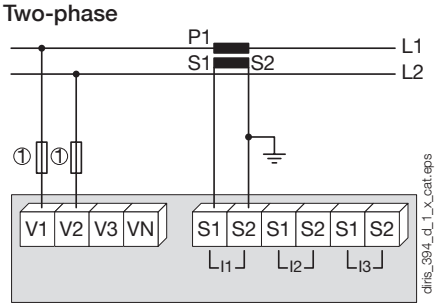
Use of 1 CT reduces by 0.5% the accuracy of the phases for which the current is deduced by vector calculation.
1. 0.5 A gG / 0.5 A class CC fuses.

Single-phase



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

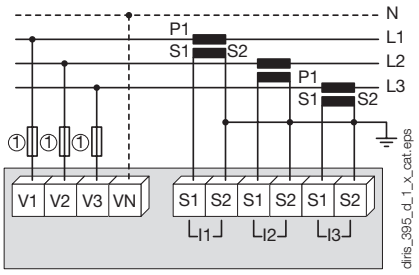
Two-phase



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

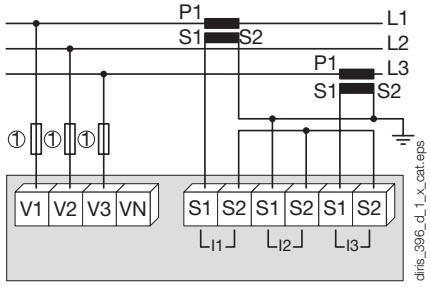
Balanced low-voltage network for DIRIS A-30

3/4 wires with 3 CTs



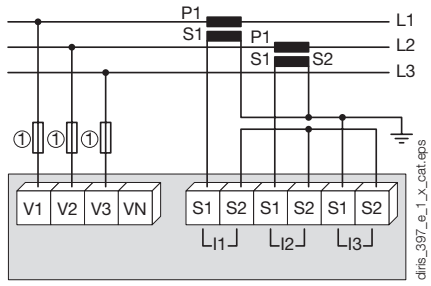
1. 0.5 A gG / 0.5 A class CC fuses.

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.

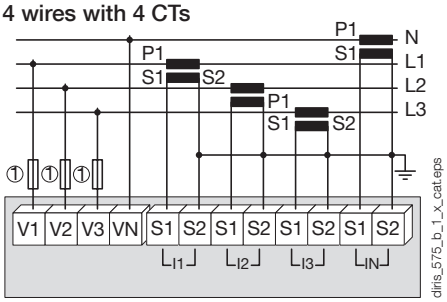
3 wires with 2 CTs



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.

Balanced low-voltage network for DIRIS A-41

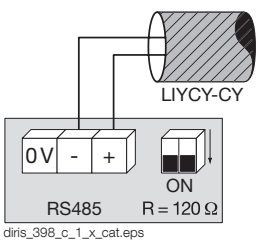
4 wires with 4 CTs



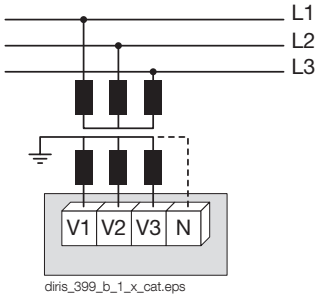
1. 0.5 A gG / 0.5 A class CC fuses.

Additional information

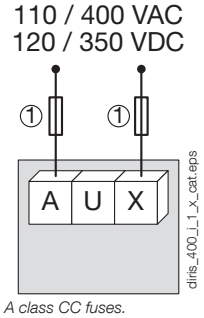
Communication via RS485 link



Connection of voltage transformer for HV networks



AC & DC auxiliary power supply



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

References

Basic device	DIRIS A-30		DIRIS A-41 with CT on the neutral
Auxiliary power supply $_{Us}$	**Reference**		**Reference**
110 ... 400 VAC / 120 ... 350 VDC	4825 **0403**		4825 **0404**
12 ... 48 VDC	4825 **0405**		4825 **0406**

Options			
Plug-in modules(1)	**Reference**		**Reference**
Pulse outputs	4825 **0090**		4825 **0090**
RS485 MODBUS® communication	4825 **0092**		4825 **0092**
PROFIBUS® DP communication	4825 **0205**		4825 **0205**
Analogue outputs	4825 **0093**		4825 **0093**
2 inputs / 2 outputs	4825 **0094**		4825 **0094**
Memory	4825 **0097**		4825 **0097**
Ethernet communication(2)	4825 **0203**		4825 **0203**
Ethernet communication + RS485 MODBUS gateway(2)	4825 **0204**		4825 **0204**
Temperature inputs	4825 **0206**		4825 **0206**

(1) Easy integration of additional functions (maximum 4 slots on A-30 and 3 on A-41).
(2) Footprint: 2 slots.

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

Expert Services

SERVICES EXPERTS

Socomec offers a wide range of services to continuously ensure a functional and accurate energy monitoring system:
- Device installation
- System audit
- Commissioning
- Training for your teams

Ideal for ISO 50001 sites (periodic verification):
- Measurement consistency check to 3%

For further information, please talk to your Socomec contact.