Single-circuit metering, measurement & analysis

DIRIS A-30

Multifunction power metering & monitoring device - PMD

diris_986_a_us.psd

DIRIS A-30

The solution for

- Industry
- Building
- Infrastructures

Strong points

- User-friendly operation
- Detects wiring errors.
- Customizable
- Web server function
- Compliant with ANSI C12.20

Compliance with standards

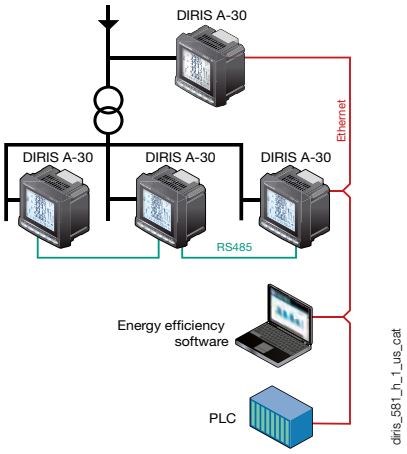
- UL 61010 guide PICQ file E257746
- ANSI C12.20
- IEC 61557-12
- IEC 62053-22 class 0.5 S
- IEC 62053-23 class 2

Function

The **DIRIS A-30** is a power metering and monitoring device that provides the user with all of the measurements needed to complete energy efficiency projects and to ensure the monitoring of electrical distribution.

All the information can be used and analyzed remotely using energy efficiency software packages.

Functional diagram



diris_581_h_1_us_cat

Advantages

User-friendly operation

With its large backlit multiple-display screen with 6 hot keys, the DIRIS A-30 is easy to use.

Detects wiring errors.

The DIRIS A-30 is provided with a correction function for CT wiring errors.

Customizable

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

Compliant with ANSI C12.20

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

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
- Powers
  - instantaneous: 3P, ΣP, 3Q, ΣQ, 3S, ΣS
  - max average: ΣP, ΣQ, ΣS
  - predictive: (ΣP), (ΣQ), (ΣS)
- Power factors
  - instantaneous: 3PF, ΣPF
  - average/max average: ΣPF
- Kfactor

Metering
- Active energy: +/- kWh
- Reactive energy: +/- kvarh
- Effective power: kVAh
- Timetable:

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

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

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

Analog output
- Analog 0/4- 20 mA

(1) Available with additional storage module (see following pages).

Test Equipment Depot
1-800-517-8431
99 Washington Street
Melrose, MA 02176
Phone 781-665-1400
Toll Free 1-800-517-8431
Visit us at www.TestEquipmentDepot.com

socomec Innovative Power Solutions

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 powers and for power factor.
5. Pushbutton for maximum and average values for currents and power levels.
6. Pushbutton for harmonics.
7. Pushbutton for electrical energy meters, timers and impulse counters

Integratable modules

DIRIS® A-30

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 Mbaud).

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, Isys, Vsys, Usys, Ppred, Qpred, 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 counting.

Storage capability

- Memory function up to max. 62 days for P+, P-, Q+, Q- with a TOP for internal or external synchronisation of 5, 8, 10, 15, 20, 30 and 60 minutes.
- Memory function for the last 10 timed and dated 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 et 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.

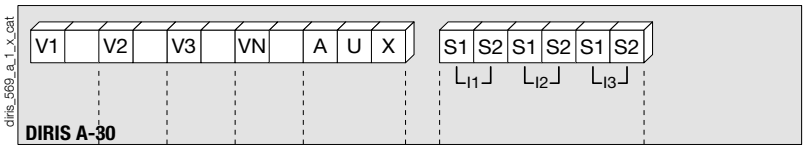
Accessories

UL recognized Current Transformers (please consult us)

IP65 protection

Terminals

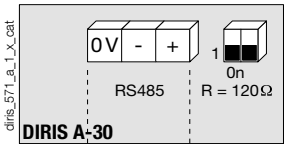
DIRIS A-30



S1 - S2: current inputs

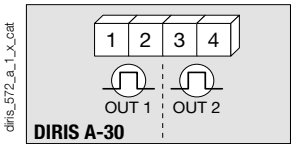
AUX: auxiliary power supplies U_s
V1- V2 - V3 - VN: voltage inputs

Communication module



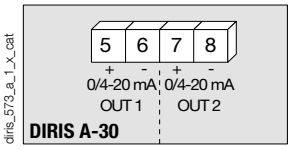
RS485 link.
R = 120 Ω : internal resistance for the RS485 end of line termination.

Pulse output module



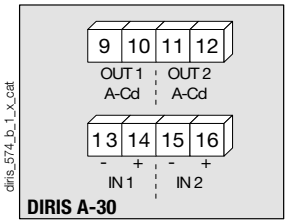
1 - 2: pulse output n°1.
3 - 4: relay output n°2.

Analog output module



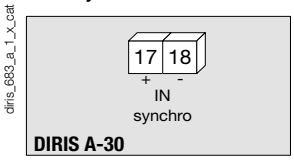
5 - 6: analog output n°1.
7 - 8: analog output n°2.

2 input / 2 output module



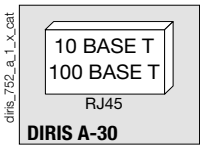
9 - 10: relay output n°1.
11 - 12: relay output n°2.
13 - 14: optical input n°1.
15 - 16: optical input n°2.

Memory module

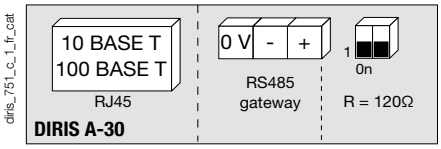


17 - 18: synchronization input.

Ethernet module



Ethernet module + RS485 MODBUS gateway



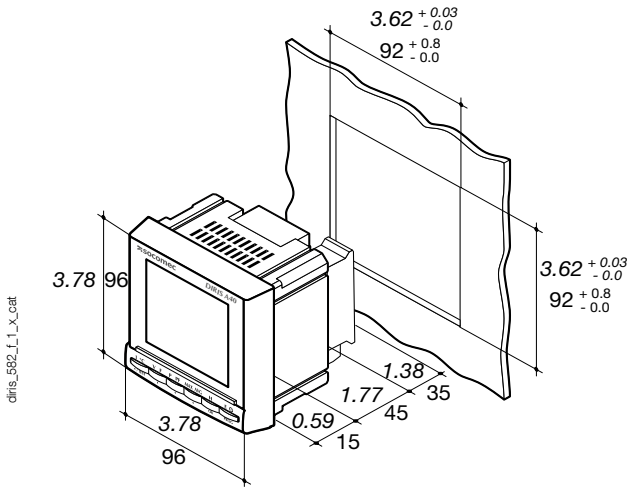
Electrical characteristics

Measurement of currents on insulated inputs (TRMS)	
Via CT primary	9,999 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 s
Voltage measurements (TRMS)	
Direct measurement between phases	50 … 1039 VAC
Direct measurement between phase and neutral	28 … 600 VAC
VT primary measurement	500,000 VAC
VT secondary measurement	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 CT 1 A	10,000,000
Limitation for CT 5 A	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
Auxiliary power supply	
Alternative voltage	110 …400 VAC
AC tolerance	± 10 %
Direct current	120 … 350 VDC / 12 … 48 VDC
DC tolerance	± 20 % / - 6 … + 20 %
Frequency	50 / 60 Hz
Power consumption	≤ 10 VA

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: optical coupler inputs	
Number	2(1)
Power supply	10 … 30 VDC
Minimum width of signal	10 ms
Minimum length between 2 pulses	18 ms
Type	Optical couplers
Pulse output module	
Number of relays	2
Type	100 VDC - 0.5 A - 10 VA
Max. number of manoeuvres	≤ 10^8
Analog output module	
Number of outputs	2(2)
Type	Insulated
Scale	0 / 4 … 20 mA
Load resistance	600 Ω
Maximum current	30 mA
MODBUS communication module	
Link	RS485
Type	2 to 3 half duplex wires
Protocol	MODBUS® RTU
MODBUS® speed	4800 to 38400 baud
PROFIBUS DP communication module	
Link	SUB-D9
Protocol	PROFIBUS® DP
PROFIBUS® speed	9.8 kbaud … 12 Mbaud
Ethernet communication module	
Connection technology	RJ45
Baud rate	10 base T / 100 base T
Protocol	MODBUS TCP or MODBUS RTU on TCP
Operating conditions	
Operating temperature range	- 10 … + 55 °C / +14 °F … +131 °F
Storage temperature	- 20 … + 85 °C / -4 °F … +185 °F
Relative humidity	95%

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

Dimensions (in/mm)



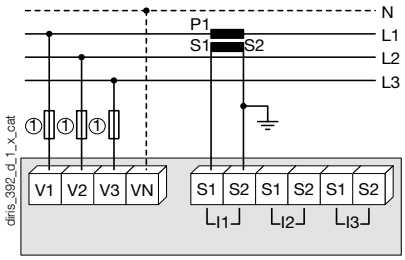
Type	Panel mounting
Dimensions W x H x D	3.78 x 3.78 x 2.36 in / 96 x 96 x 60 mm
Case degree of protection	IP30
Front degree of protection	IP52
Display type	Backlit LCD display
Type of terminal strips	Fixed or detachable
Section of connection for voltages and other terminals	AWG 34 … 10 / 0.2 … 2.5 mm^2
Section of connection for currents	AWG 20 … 9 / 0.5 … 6 mm^2
Weight	14.11 oz / 400 g

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: please consult us. In TNC mode, it is advisable to connect the DIRIS A-30 to earth using the functional earth module.

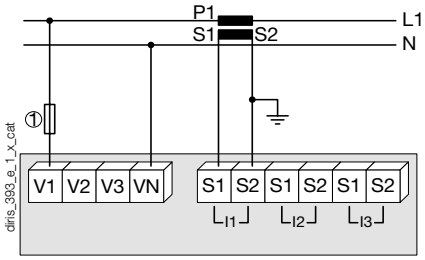
3/4 wires with 1 CTs



The use of 1 CT reduces by 0.5% the accuracy of the phases, the current for which is worked out by vector calculation.

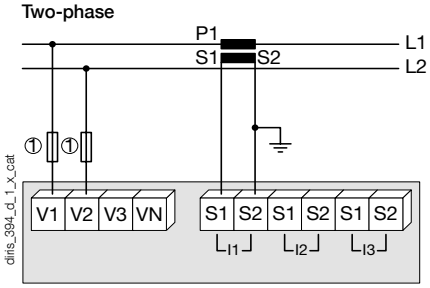
1. 0.5 A gG / 0.5 A class CC fuses.

Single-phase



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

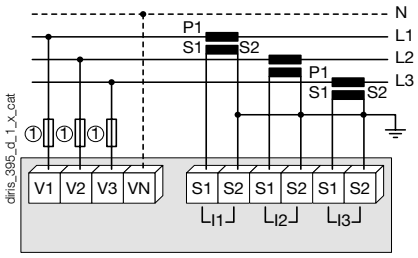
Two-phase



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

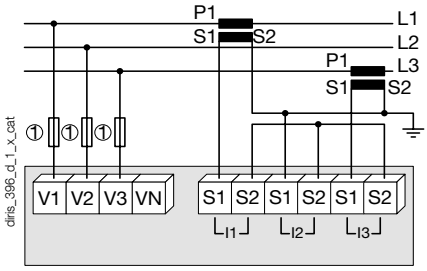
Balanced low-voltage network for DIRIS A-30

3/4 wires with 3 CTs



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

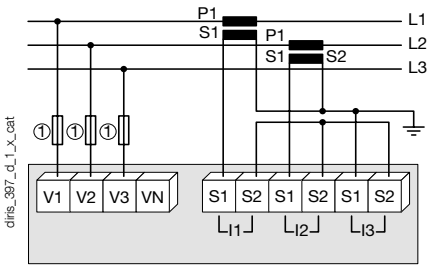
3 wires with 2 CTs



The use of 2 CTs reduces by 0.5% the accuracy of the phase, the current for which is worked out by vector calculation.

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

3 wires with 2 CTs

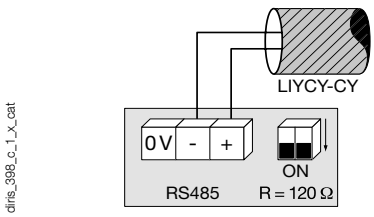


The use of 2 CTs reduces by 0.5% the accuracy of the phase, the current for which is worked out by vector calculation.

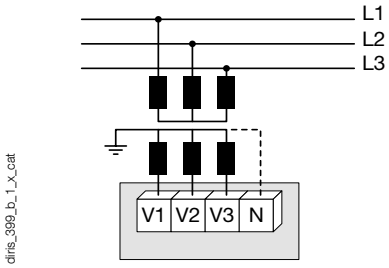
1. 0.5 A gG / 0.5 A class CC fuses.

Additional information

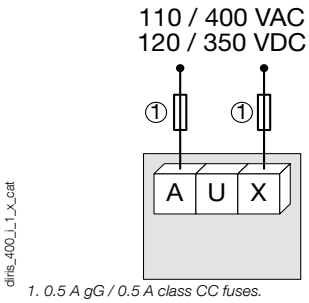
Communication via RS485 link



Connection of potential transformer for HV networks



AC and DC auxiliary power supply



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

socomec
Innovative Power Solutions

References

Basic device Auxiliary power supply U_s	DIRIS A-30 Part number
110 ... 400 VAC / 120 ... 350 VDC	4825 **0403**
12 ... 48 VDC	4825 **0405**

Options Plug-in modules[1]	Part number
Pulse outputs	4825 **0090**
RS485 MODBUS® communication	4825 **0092**
PROFIBUS® DP communication	4825 **0205**
Analog outputs	4825 **0093**
2 inputs - 2 outputs	4825 **0094**
Storage capability	4825 **0097**
Ethernet communication (integrated web server function)[2]	4825 **0203**
Ethernet communication + RS485 gateway (integrated web server function)[2]	4825 **0204**

(1) Ease of integration of additional functions (maximum 4 slots on A-30).
(2) Dimensions: 2 slots.

Accessories	To be ordered in multiples of	Part number
IP65 protection.	1	4825 **0089**
Integration kit for 144 x 96 mm cutout	1	4825 **0088**
Fuse circuit breakers to protect voltage inputs (type RM) 3 pole	4	5701 **0018**
Fuse circuit breakers to protect the auxiliary power supply (type RM) 1 pole + neutral	6	5701 **0017**
gG 10x38 0.5 A fuses	10	6012 **0000**
Range of UL recognized current transformers	1	Consult us
Management software for DIRIS		Consult us

Expert Services

> Our local team offers complete support to ensure the success of your project, from consultation to implementation of your metering system.

Test Equipment Depot
1-800-517-8431
99 Washington Street
Melrose, MA 02176
Phone 781-665-1400
Toll Free 1-800-517-8431
Visit us at www.TestEquipmentDepot.com