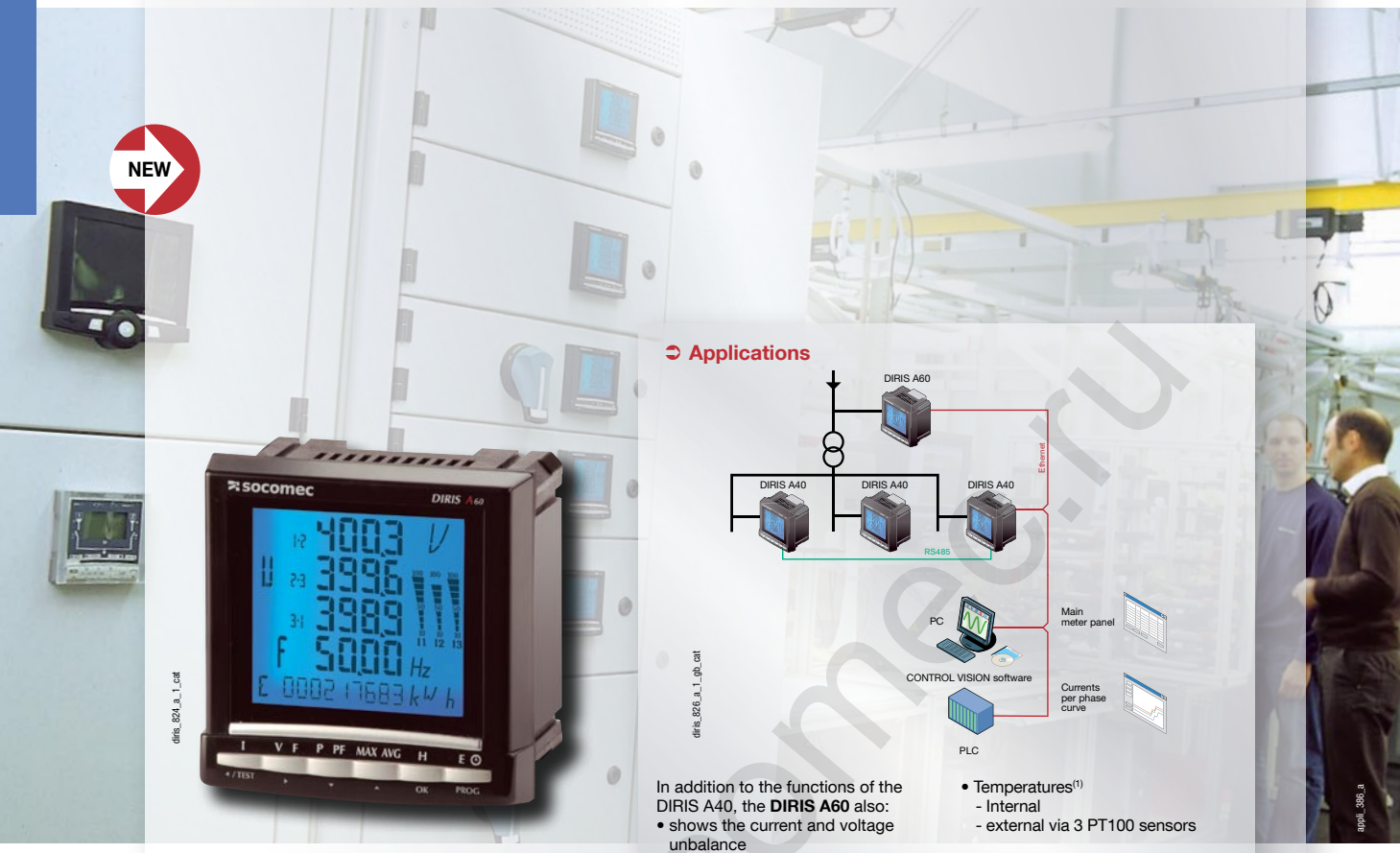
DIRIS A60

NEW



Energy monitoring and management of low voltage/ high voltage electrical installations

➲ Function

DIRIS A60 are measurement units which can provide all the functions offered by the DIRIS A40, and which also allow the user to detect events that may harm the installation, linking these to a graphic representation.
All this information can be used and analysed remotely using quality measurement software.

➲ Conformity to standards

- IEC 61557-12
- IEC 62053-22 class 0,5 S
- IEC 62053-23 class 2

➲ Applications

In addition to the functions of the DIRIS A40, the **DIRIS A60** also:
- shows the current and voltage unbalance
- shows the tangent phi
- stores the load curves (50 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
  - outages
  - overcurrent

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

Other functions :

Multimeasurement
- Current
  - instantaneous: I1, I2, I3, In, Isystem,
  - maximum: I1, I2, I3, In
  - unbalance: I unb
- Voltages & frequency
  - instantaneous: U1, U2, U3, U12, U23, U31, F, Vsystem, Usystem
  - maximum: U1, U2, U3, U12, U23, U31, F
  - unbalance: U unb
- Powers
  - instantaneous: 3P, ΣP, 3Q, ΣQ, 3S, ΣS
  - moyen maximum: ΣP, ΣQ, ΣS
  - predictive: ΣP , ΣQ , ΣS
- Power factor
  - instantaneous: 3PF, ΣPF
- Total tangent phi
  - maximum: ΣPF
- Temperatures(1)
  - Internal
  - external via 3 PT100 sensors

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

Harmonic analysis (level 63)
- Total harmonic distortion
  - Currents: thd I1, thd I2, thd I3, thd In
  - Phase-to-neutral voltage: thd U1, thd U2, thd U3
  - Phase to phase voltage: thd U12, thd U23, thd U31
- Individual
  - Currents: HI1, HI2, HI3, HIn
  - Phase-to-neutral voltage: HU1, HU2, HU3,
  - Phase to phase voltage: HU12, HU23, HU31

Events(1)
- **Alarms on all electrical values**

Communications (1)
- Analogue 0/4- 20 mA
- Digital RS485 (Jbus/Modbus & Profibus-DP)
- Ethernet (modbus/TCP or Jbus/ Modbus RTU over TCP and Web server)
- Ethernet with RS485 gateway Jbus/Modbus RTU over TCP

Inputs / Outputs(1)
- Pulse metering
- Control/command of devices
- Alarm report
- Pulse report

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

➲ Front panel

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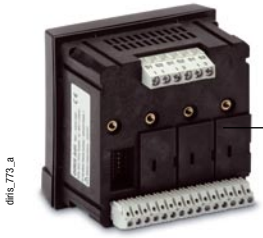
1. *Backlit LCD screen.*
2. *Pushbutton for currents, temperatures and CT setup wiring correction.*
3. *Pushbutton for voltages and frequency.*
4. *Pushbutton for active, reactive, and apparent power and power factor.*
5. *Pushbutton for maximum and average current and power values.*
6. *Pushbutton for harmonics.*
7. *Pushbutton for energies and hour run meter.*

➲ Plug-in modules

DIRIS® A60



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Pulse outputs

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

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JBUS / MODBUS® communication

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

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PROFIBUS® DP communication

- RS485 link with PROFIBUS® DP protocol (speed up to 12 Mbauds).

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Ethernet communication

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

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Ethernet communication with RS485 Gateway JBUS/MODBUS

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

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Analogue outputs

- A maximum of 2 modules may be connected, giving 4 analogue outputs.
  2 outputs assignable to:
  3I, In, 3V, 3U, F, ± ΣP, ± ΣQ, ΣS, ΣPFL/C, I sys, Vsys, Usys, Ppred, Q pred, Spred, internal T°C, T°C 1, T°C 2, T°C3 and to 17 VDC power supply.

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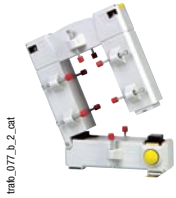
2 inputs - 2 outputs

A maximum of 3 modules may be connected, giving 6 inputs.
2 outputs assignable to :
- monitoring:
  3I, In, 3V, 3U, F, ± ΣP, ± ΣQ, ΣS, ΣPFL/C, THD 3I, THD In, THD 3V, THD 3U, Ppred, Qpred, Spred, internal T°C , T°C 1, T°C2, T°C3 and hour meter,
- remotely controlled,
- timed remote control,
- 2 inputs for pulses metering.

➲ DIRIS A60 - Accessories

Current transformer
(see page XXX)

Current transformers

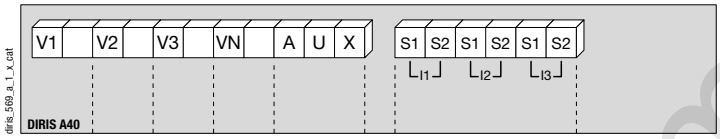


IP65 protection

Device embedded
with kit for 144 x 96 mm cutout

➲ Terminals

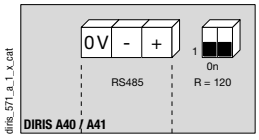
DIRIS A60



S1 - S2: Current inputs

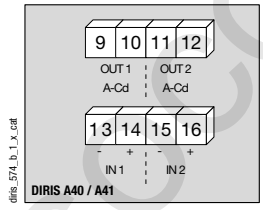
AUX: auxiliary power supplies U_s
V1 - V2 - V3 - VN: voltage inputs

Communication module



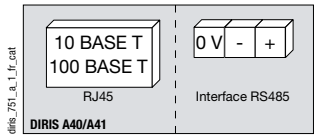
RS485 link.
R = 120 Ω: internal resistance for RS485 link.

2 inputs / 2 outputs module

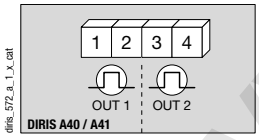


9 - 10: relay output n°1.
11 - 12: relay output n°2.
13 - 14: opto input n°1.
15 - 16: opto input n°2.

Ethernet module + RS485 gateway JBUS/MODBUS

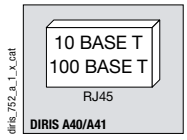


Pulse output module

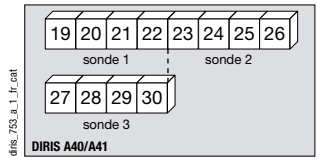


1 - 2: pulse output n°1.
3 - 4: pulse output n°2.

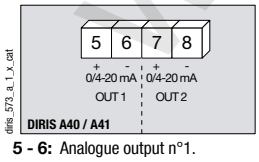
Ethernet Module



Temperature module



Analogue output module



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

➲ Characteristics

Current measurement on insulated inputs (TRMS)	
CT primary	10 000 A
CT secondary	1 or 5
Measurement range	0 … 11 kA
Input consumption	≤ 0.1 VA
Measurement updating period	1 s
Accuracy	0.2 %
Sustained overload	6 A
Intermittent overload	10 I_n for 1 s

Voltage measurements (TRMS)	
Direct measurement between phases	50 … 700 VAC
Direct measurement between phase and neutral	28 … 404 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 %
Sustained overload	760 VAC

Current-voltage product	
Limitation for 1A CT	10 000 000
Limitation for 5A CT	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 supply	
AC voltage	110 …400 VAC
AC tolerance	± 10 %
DC voltage	120 … 350 VDC
DC tolerance	± 20 %
Frequency	50 / 60 Hz
Consumption	≤ 10 VA

Outputs (alarms / control)	
Number of relays	2 ... 6
Type	250 VAC - 5 A - 1150 VA

Phototransistor inputs	
Number	2 … 6
Power supply	10 … 30 VDC
Minimum signal width	10 ms
Minimum length between 2 impulses	18 ms
Type	phototransistor

Outputs (pulses)	
Number of relays	2
Type	100 VDC - 0.5 A - 10 VA
Max. number of operations	≤ 10^8

Outputs (analogue)	
Number of outputs	2 … 4
Type	insulated
Range	0 / 4 … 20 mA
Charging resistance	600 Ω
Maximum current	30 mA

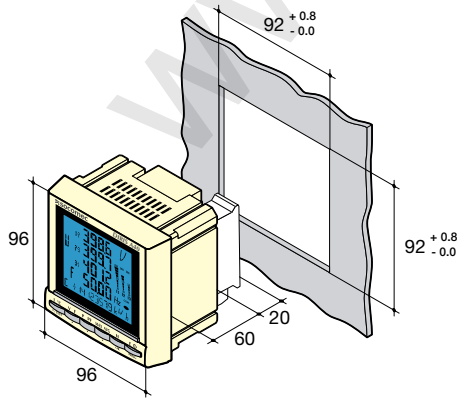
Communication	
Link	RS485
Type	2 … 3 half duplex wires
Protocol	JBUS/MODBUS® in RTU mode
JBUS/MODBUS® speed	1400 … 38400 bauds
Protocol	PROFIBUS® DP
PROFIBUS® speed	9,8 kbauds … 12 Mbauds

Ethernet communication	
Link	RJ45
Speed	10 base T / 100 base T
Protocol	MODBUS TCP or JBUS/MODBUS RTU over TCP

Temperature inputs	
Type	PT100
Link	2 or 4 wires
Range	- 20°C ... 150°C
Accuracy	+/- 1 digit
Maximum length	300 cm

Operating conditions	
Operating temperature	- 10 … + 55°C °C
Storage temperature	- 20 … + 85°C °C
Relative humidity	95 %

➲ Case



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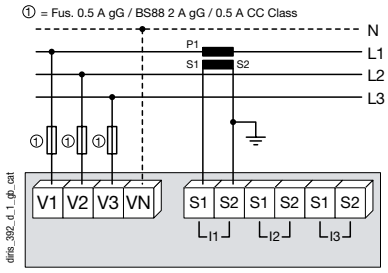
Type	panel mounting
Dimensions W x H x D	96 x 96 x 60 mm
Case protection rating	IP30
Front protection rating	IP52
Display type	LCD
Terminal blocks type	fixed or pull-out
Voltage and other connection section	0.2 … 2,5 mm²
Current connection section	0.5 … 6 mm²
Weight	400 g

➲ DIRIS A60 - Connection

Recommendation: While disconnecting the DIRIS, the secondaries of each current transformer must be short-circuited. This operation can be carried out automatically from a product in the SOCOMEC catalogue, PTI: Please consult us.

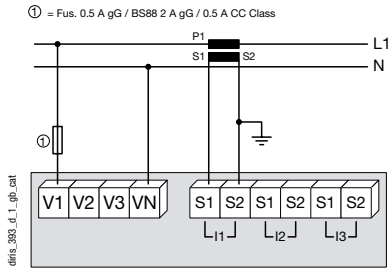
Low voltage balanced network for DIRIS A60

3/4 wires with 1 CT

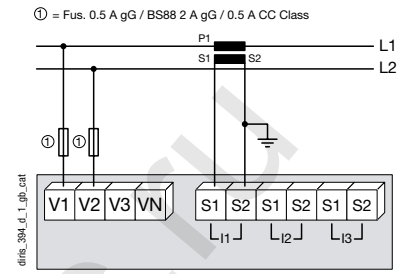


Use of 1 CT reduces by 0.5% the accuracy of the phases whose current is worked out by vector calculation.

Single phase

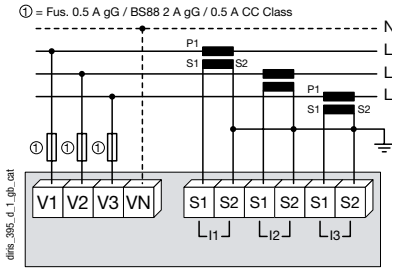


Two phase

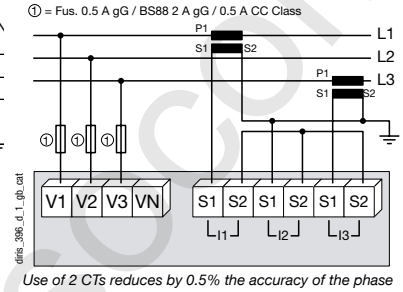


Low voltage unbalanced network for DIRIS A40

3/4 wires with 3 CTs

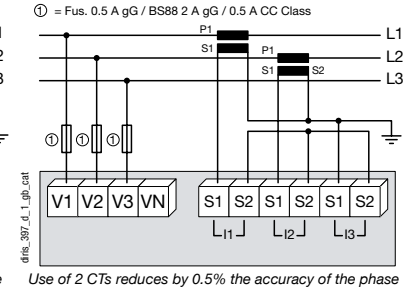


3 wires with 2 CTs



Use of 2 CTs reduces by 0.5% the accuracy of the phase whose current is worked out by vector calculation.

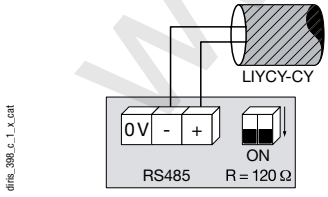
3 wires with 2 CTs



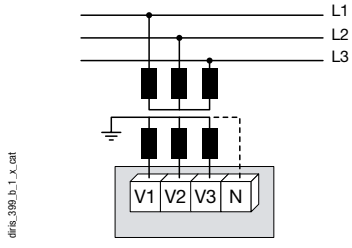
Use of 2 CTs reduces by 0.5% the accuracy of the phase whose current is worked out by vector calculation.

Additional information

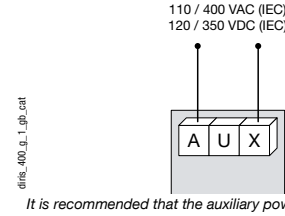
Communication via RS485 link



Connection of voltage transformer for HV networks



Connection of voltage transformer for HV networks



It is recommended that the auxiliary power supply be protected by the use of 500 mA gG fuses.

➲ References

Standard device Auxiliary power supply U_s	DIRIS A60 Reference
	4825 **0207**

Accessories

Description	Reference
IP65 protection	4825 **0089**
Panel mounting kit for a 144 x 96 mm cutout	4825 **0088**

Optional features

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

(1) Ease of integration for additional functions (maximum 4) by clutchable modules on the rear side of the device, by the user at any moment.