

DIRIS A40 DIRIS A41

Network
analysis

DIRIS Am
DIRIS A20

▶ **DIRIS A40 / DIRIS A41**

Communication interfaces

DIRIS VISION software

CONTROL VISION software

BILLING APPLICATION software



DIRIS A40

1. Backlit LCD display.
2. Direct access key for currents and setup wiring correction.
3. Direct access key for voltages and frequency.
4. Direct access key for active, reactive, apparent power and power factor.
5. Direct access key for currents (maximal and average values) and power.
6. Direct access key for harmonics values.
7. Direct access key for energies and hour run meter.

Functions

DIRIS A40 and **A41** are multi-function meter for measuring the extent of electrical values for all LV/HV networks. They allow starting from the front panel to configure and display all the electric parameters and to exploit the functions of measurement, metering and energies management, harmonics analysis, remote control and control state of control devices, communication and detection of high voltages, peaks and voltage disconnections.

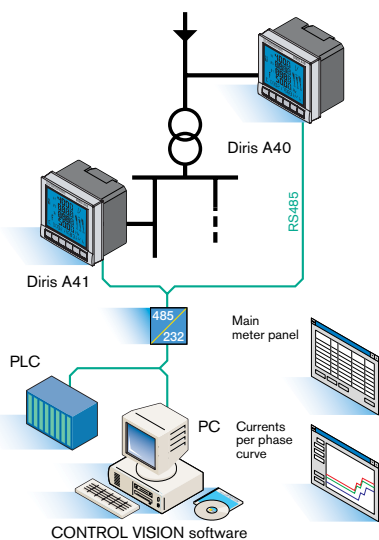
In addition, DIRIS A40 and A41 have a function for correcting connection errors.

Conformity to standards

- IEC 62053-22 class 0.5 S
- IEC 62053-23 class 2
- IEC 61010-1
- IEC 61000-4-2
- IEC 61000-4-3
- IEC 61000-4-4
- IEC 61000-4-5
- IEC 61000-4-6
- IEC 61000-4-8
- IEC 61000-4-11
- IEC 60068-2-6
- IEC 60068-2-11
- IEC 60068-2-30
- UL 61010-1
- CSA C22.2 No. 61010-1



Applications



Using electrical parameters means using several analogue or digital single-function products such as ammeters, voltmeters or wattmeters.

DIRIS A40 and **A41**, with their six direct access keys keyboard and LCD display, allow exploiting all the parameters of a LV and HV installation. These parameters may be centralized on a PC or an automaton through an RS485 link using JBUS/MODBUS® or PROFIBUS® DP protocol. The casing allows the installer easily fit DIRIS A40 or A41 panel board. To facilitate and optimize the operator's work, DIRIS A40 and A41 use one of the most functional principles for integrating communications, metering, harmonics, analog outputs or even alarm relays. Simply fit a module on the rear of the casing to add a function.

Measurement in real effective values (TRMS) of:

- currents per phase and instantaneous neutral, average and maximum values over a programmable period,
- phase-to-neutral and phase-to-phase voltages, instantaneous, average and maximum over a programmable period,

- frequency, instantaneous, average and maximum over a programmable period,
- active power on 4 quadrants (±) per phase and total in instantaneous, average and maximal values over a programmable period,
- reactive power on 4 quadrants (±) per phase and total in instantaneous, average and maximal values over a programmable period,
- apparent power per phase and total in instantaneous, average and maximal values over a programmable period,
- power Factor (PF) per phase and total with inductive or capacitive indication,
- harmonic distortion rate (THD) up to 51 on phase-to-neutral and phase-to-phase voltages and currents (THD 3U, THD 3V, THD 3I, THD In).

Metering

- Active power meter on 4 quadrants.
- Reactive power meter on 4 quadrants.
- Apparent power meter.
- Programmable hour run meter.



Services +
 > Audit
 > Setting up
 > Training
 See page IV



Plug-in modules

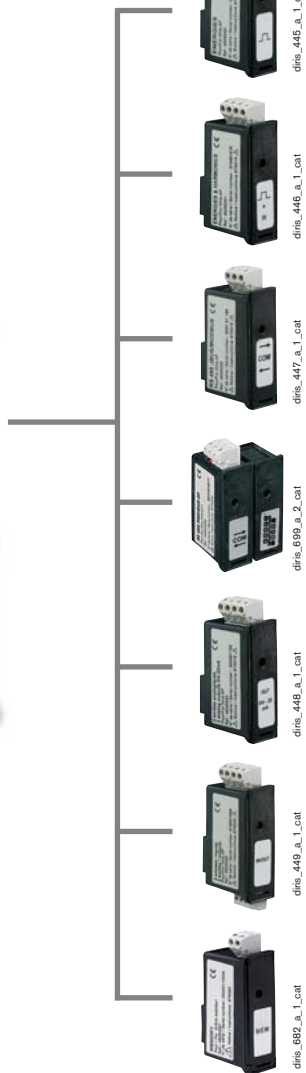
DIRIS® A40

diris_b63_a_1_cat



DIRIS® A41

diris_b64_a_1_cat



diris_445_a_1_cat



diris_446_a_1_cat



diris_447_a_1_cat



diris_699_a_2_cat



diris_448_a_1_cat



diris_449_a_1_cat



diris_882_a_1_cat

Pulse outputs

2 pulse outputs able for configuration (type, weight and run) on \pm kWh, \pm kvarh and kVAh.

Pulse outputs and harmonics

2 pulse outputs able for configuration (type, weight and run) on \pm kWh, \pm kvarh and kVAh. Spectral analysis of harmonics by range and by phase for 3I, In, 3V and 3U up to range 25.

RS485 JBUS / MODBUS® communication

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

RS485 PROFIBUS® DP communication

RS485 link with PROFIBUS® DP protocol (speed up to 1.5 Mbauds).

Analogue outputs

2 outputs able for configuration on 3I, In, 3V, 3U, F, \pm Σ P, \pm Σ Q, Σ S, Σ PFL/C and 30 VDC power supply.
 2 modules may be connected at maximum, that is 4 analogue outputs.

2 inputs - 2 outputs

2 outputs assignable for the control of 3I, In, 3V, 3U, F, \pm Σ P, \pm Σ Q, Σ S, Σ PFL/C, THD 3I, THD In, THD 3V, THD 3U and of the hour meter (storing of the 3 last alarms) or to the remote control. 2 inputs for pulses metering. 3 modules may be connected at maximum, that is 6 inputs / outputs.

Memory

- Storing maximum over 62 days of P+, P-, Q+, Q- with an internal or external synchronisation TOP of 5, 8, 10, 15, 20, 30 and 60 minutes.
- Storing of 10 hour-dated last alarms.
- Storing of minimum and maximum instantaneous last values for 3U, 3V, 3I, In, F, Σ P \pm , Σ Q \pm , Σ S, THD 3U, THD 3V, THD 3I, THD In.
- Storing of 10 last hour-dated (EN 50160 and IEC 61000-4-30):
 - voltage dips,
 - over voltage,
 - voltage cut off.
- Storing of 3U, 3V and F average values based on synchronisation function (maximum 60 days).

Accessories

diris_720_a



IP65 protection

diris_718_a



Device fitted with 144 x 96 mm cut out plate

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DIRIS A40

DIRIS A41
4CT inputs (not UL/CSA)

References

Basic device

Auxiliary power supply U_s	References	References
110 ... 400 VAC / 120 ... 350 VDC (IEC) - 110 ... 240 VAC / 120 ... 250 VDC (UL/CSA)	4825 0A40	4825 0A41
12 ... 48 VDC (not UL/CSA)	4825 1A40	4825 1A41

Optional plug & display modules

Plug-in modules ⁽¹⁾		
Pulse outputs	4825 0090	4825 0090
Pulse outputs and harmonics	4825 0091	4825 0091
RS485 JBUS / MODBUS [®] communication	4825 0092	4825 0092
Analogue outputs	4825 0093	4825 0093
2 inputs - 2 outputs	4825 0094	4825 0094
RS485 PROFIBUS [®] DP communication	4825 0096	4825 0096
Memory	4825 0097	4825 0097

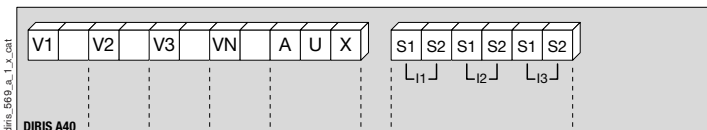
Accessories

IP65 protection cover (not UL/CSA)	4825 0089	4825 0089
Fitting kit for 144 x 96 mm cut out (not UL/CSA)	4825 0088	4825 0088

(1) Ease of integration for additional functions (maximum 4 on A40 and 3 on A41) by clutchable modules on the rear of the device, by the user at any moment.

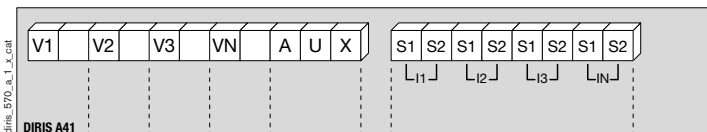
Terminals

• DIRIS A40



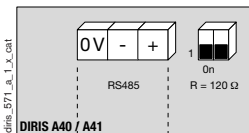
S1 - S2: current inputs
AUX: auxiliary power supply U_s
V1 - V2 - V3 - VN: voltage inputs

• DIRIS A41



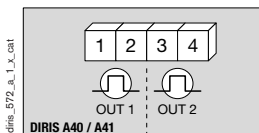
S1 - S2: current inputs
AUX: auxiliary power supply U_s
V1 - V2 - V3 - VN: voltage inputs

• Communication module



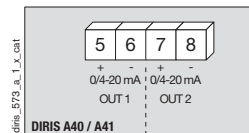
RS485 link
R = 120 Ω : internal resistance for the RS485 link

• Pulse output module



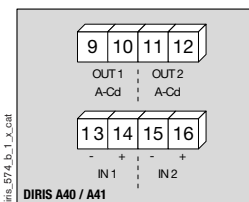
1 - 2: pulse output no. 1
3 - 4: pulse output no. 2

• Analogue output module



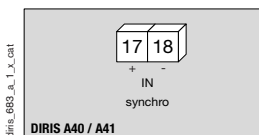
5 - 6: analogue output no. 1
7 - 8: analogue output no. 2

• 2 inputs / 2 outputs module



9 - 10: relay output no. 1
11 - 12: relay output no. 2
13 - 14: opto input no. 1
15 - 16: opto input no. 2

• Memory module



17 - 18: synchronisation input



Electrical characteristics

Current measurement on insulated inputs (TRMS)

CT primary	10 000 A
CT secondary	1 and 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 measurement (TRMS)

Direct measurement between phases (IEC)	18 ... 700 VAC
Direct measurement between phases (UL/CSA)	50 ... 500 VAC
Direct measurement between phase and neutral (IEC)	11 ... 404 VAC
Direct measurement between phase and neutral (UL/CSA)	28 ... 288 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 power supply

AC voltage (IEC)	110 ... 400 VAC
AC voltage (UL/CSA)	110 ... 240 VAC
AC tolerance	± 10%
DC voltage (IEC)	120 ... 350 VDC / 12 ... 48 VDC
DC voltage (UL/CSA)	120 ... 250 VDC
DC tolerance	± 20% / - 6 ... + 20%
Frequency	50 / 60 Hz
Consumption	≤ 10 VA

Inputs

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

Outputs (alarms / control)

Number of relays	2 ... 6
Type	230 VAC - 5 A - 1150 VA

Outputs (pulsed)

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	isolated
Range	0 / 4 ... 20 mA
Charging resistance	600 Ω
Maximum current	30 mA

Communication

Link	RS485
Type	2 ... 3 wires half duplex
Protocol	JBUS/MODBUS® in RTU mode
JBUS / MODBUS® speed	1400 ... 38400 bauds
Protocol	PROFIBUS® DP
PROFIBUS® DP speed	9.8 kbauds ... 1.5 Mbauds

Operating conditions

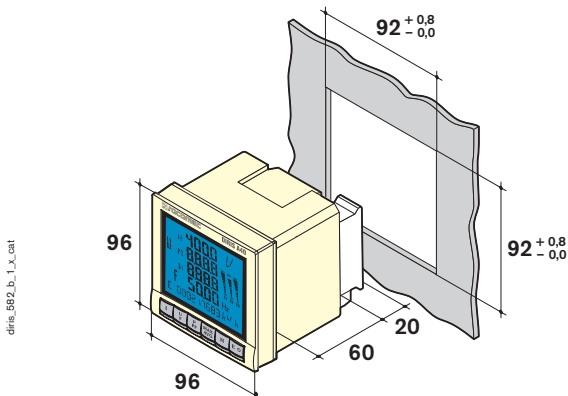
Operating temperature	- 10 ... + 55 °C
Storage temperature	- 20 ... + 85 °C
Relative humidity	95%

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Overall dimensions



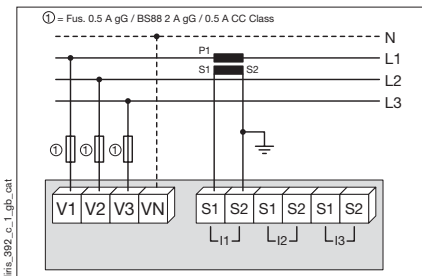
Type	panel mounting
Dimensions W x H x D	96 x 96 x 60 mm
Case protection rating	IP30
Front protection rating	IP52
Display type	LCD
Terminal block type	fixed or pull-out
Voltage and other connection section	0.2 ... 2.5 mm ²
Current connection section	0.5 ... 6 mm ²
Weight	400 g

Connections

Recommendation: when 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.

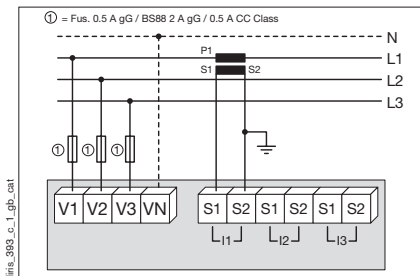
▶ Low voltage balanced network for DIRIS A40

• 3/4 wires with 1 CT

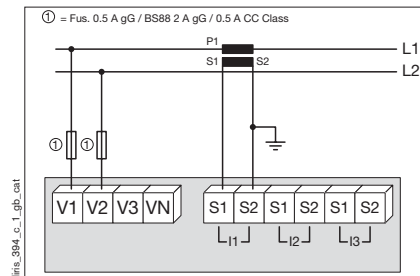


The use of 1 CT reduces by 0.5 % the accuracy of the phase whose current is determined by vector calculation

• Single phase

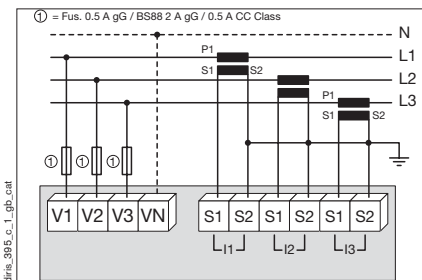


• Two phases

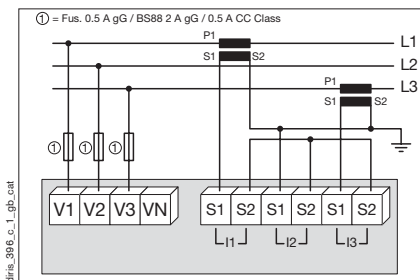


▶ Low voltage unbalanced network for DIRIS A40

• 3/4 wires with 3 CTs

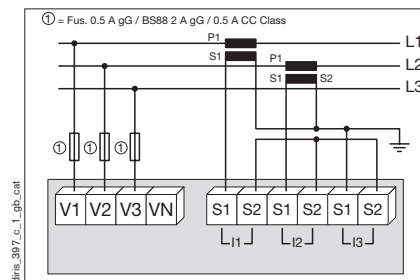


• 3 wires with 2 CTs



The use of 2 CTs reduces by 0.5 % the accuracy of the phase whose current is determined by vector calculation

• 3 wires with 2 CTs



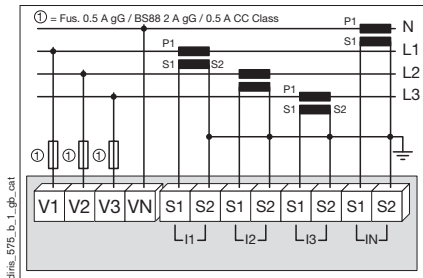
The use of 2 CTs reduces by 0.5 % the accuracy of the phase whose current is determined by vector calculation



Connections

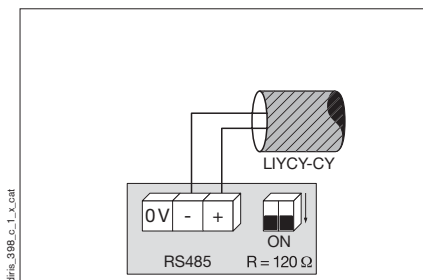
► Low voltage unbalanced network for DIRIS A41

- 4 wires with 4 CTs

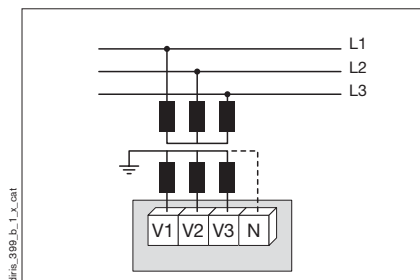


► Other information

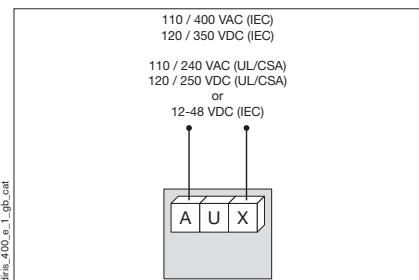
- Communication via RS485 link



- Voltage transformer connection for HV networks



- AC & DC auxiliary power supply



It is recommended that the auxiliary power supply be protected by the use of 500 mA gG, BS88 2A gG or 500 mA CC Class fuses