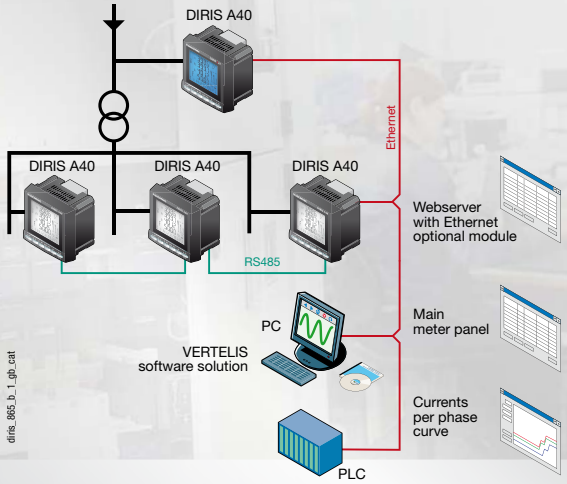
DIRIS A40

NEW

REVENUE GRADE ACCURACY

c UL us LISTED

Applications



Monitoring and managing energy for high/low voltage electrical installations

Function

DIRIS A40 are measurement units which ensure the user has access to all the measurements requirement for successfully carrying out energy efficiency projects and ensuring the electrical distribution is monitored.
All this information can be used and analysed remotely using the VERTELIS software.

Conformity to standards

- IEC 61557-12
- IEC 62053-22 class 0.5S
- IEC 62053-23 class 2
- UL61010-1

Multi-function meter
- Current
  - instantaneous: I1, I2, I3, In, Isystem
  - mean/mean maximum: I1, I2, I3, In
- Voltages & frequency
  - instantaneous: U1, U2, U3, U12, U23, U31, F, Vsystem, Usystem
  - mean/mean maximum: U1, U2, U3, U12, U23, U31, F
- Power
  - instantaneous: 3P, ΣP, 3Q, ΣQ, 3S, ΣS
  - mean maximum: ΣP, ΣQ, ΣS
  - predictive: (ΣP), (ΣQ), (ΣS)
- Power factor
  - instantaneous: 3PF, ΣPF
  - mean/mean maximum: ΣPF
- Temperatures(1)
  - internal

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

Harmonic analysis
- Harmonic distortion rate
  - 1Currents: 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 up to level 63
  - Currents: HI1, HI2, HI3, HIn
  - Phase-to-neutral voltage: HU1, HU2, HU3,
  - Phase to phase voltage: HU12, HU23, HU31

Load curves(1)
- Active and reactive power: ΣP+/-; ΣQ+/-
- Voltages & frequency: U1, U2, U3, U12, U23, U31, F

Events(1)
- Alarms on all electrical values.

Communications(1)
- Analogues 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
- Remote control/command
- Alarm report
- Pulse report

Webserver
- Included in Ethernet module
- Visualisation of all values
- Export to Excel
- Ethernet module with RS485 gateway option, SOCOMEC devices connected to can be consulted in webserver

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

➲ Front panel

1. Backlit LCD screen.
2. Pushbutton for currents and setup wiring correction
3. Pushbutton for voltages and frequency.
4. Pushbutton for active, reactive, and apparent power and power factor.
5. Pushbutton for maximal and average current and power values.
6. Pushbutton for harmonics values.
7. Pushbutton for pulse, hours and electrical energy meters.

➲ Plug-in modules

DIRIS® A40

Pulse outputs

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

JBUS / MODBUS® communication

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

PROFIBUS® DP communication

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

Ethernet communication

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

Ethernet communication with RS485 JBUS/MODBUS gateway

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

Analogue outputs

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

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, SS, 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,
- remote control,
- timed remote control.

Memory

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

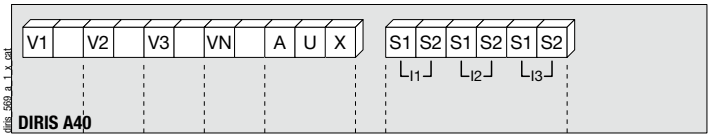
➲ DIRIS A40 - Accessories

IP65 protection

Mounting kit for 144 x 96 mm cut out plate

➲ Terminals

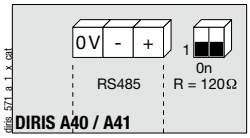
DIRIS A40



S1 - S2: current inputs

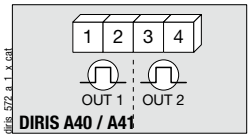
AUX: auxiliary power supply U_s
V1 - V2 - V3 - VN: voltage inputs

Communication module



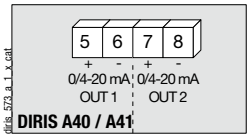
RS485 link.
R = 120 Ω: internal resistance for the RS485 link.

Pulse output module



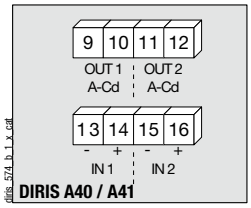
1 - 2 : pulse output n°1.
3 - 4 : pulse output n°2.

Analogue outputs module



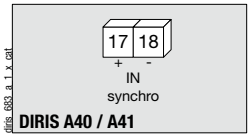
5 - 6 : analogue output n°1.
7 - 8 : analogue output n°2.

2 inputs / 2 outputs module



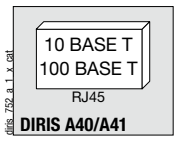
9 - 10 : relay output n°1.
11 - 12 : relay output n°2.
13 - 14 : opto input n°1.
15 - 16 : opto input n°2.

Memory module

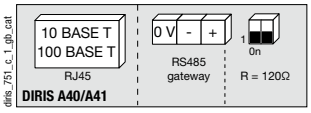


17 - 18 : synchronisation input.

Ethernet Module



Ethernet module + RS485 JBUS / MODBUS gateway



➲ Electrical characteristics

Current measurement on insulated inputs (TRMS)	
Via CT primary	10 000 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 %
Sustained overload	6 A
Intermittent overload	10 I_n for 1 s

Voltage measurements (TRMS)	
Direct measurement between phases	50 … 520 VAC
Direct measurement between phase and neutral	28 … 300 VAC
VT primary	500 000 VAC
VT secondary	60, 100, 110, 173, 190 V a.c.
Frequency	50 / 60 Hz
Input consumption	≤ 0.1 VA
Measurement updating period	1 s
Accuracy	0.2 %
Sustained overload	760 V a.c.

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 %

Auxiliary power supply	
Alternating voltage	110 … 240 VAC
AC tolerance	± 10 %
Direct voltage	120 … 250 VDC / 12 … 48 VDC(1)
DC tolerance	± 20 % / - 6 … + 20 %
Frequency	50 / 60 Hz
Consumption	≤ 10 VA

(1) UL pending.

2 inputs / 2 outputs module: Outputs (alarms / control)	
Number of relays	2(1)
Type	250 V a.c. - 5 A - 1150 VA

2 inputs / 2 outputs module: Phototransistor inputs	
Number	2(1)
Power supply	10 … 30 V d.c.
Minimal signal width	10 ms
Minimum length between 2 impulses	18 ms
Type	phototransistor

Pulse outputs module	
Number of relays	2
Type	100 V d.c. - 0.5 A - 10 VA
Max.number of operations	≤ 10^8

Analogue output module	
Number of outputs	2(2)
Type	insulated
Scale	0 / 4 … 20 mA
Load resistance	600 Ω
Maximum current	30 mA

JBUS / MODBUS communication module	
Link	RS485
Type	2 … 3 half duplex wires
Protocol	JBUS/MODBUS® in RTU mode
JBUS/MODBUS® speed	1400 … 38400 bauds

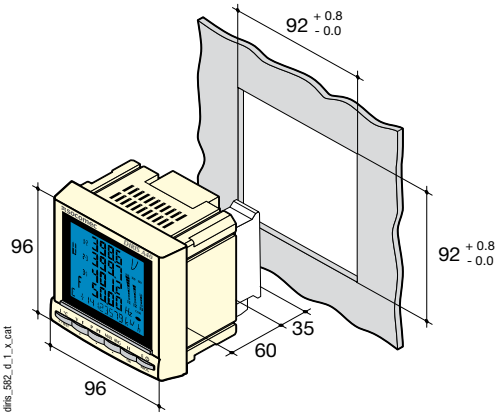
PROFIBUS-DP communication module	
Link	SUB-D9
Protocol	PROFIBUS® DP
PROFIBUS® speed	9.8 kbauds … 12 Mbauds

Ethernet Communication Module	
Connectique	RJ45
Speed	10 base T / 100 base T
Protocol	MODBUS TCP or JBUS/MODBUS RTU over TCP

Operating conditions	
Operating temperature	- 10 … + 40 °C
Storage temperature	- 20 … + 85 °C
Relative humidity	80 %

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

➲ Case



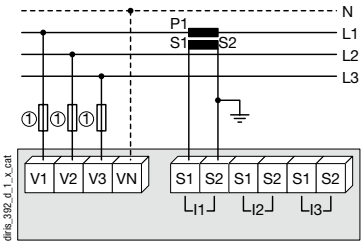
Type	Panel mounting
Dimensions W x H x D	96 x 96 x 95 mm
Case protection index	IP30
Front protection rating	IP52
Display type	LCD
Terminal blocks type	fixed or pull-out
Voltage and other connection section	0.2 … 2.5 mm² / AWG 24 - 12
Current connection section	0.5 … 6 mm² / AWG 20 - 10
Weight	400 g

➲ DIRIS A40 - Connections

Recommandation: when disconnecting the DIRIS, the secondaries of each current transformer must be short-circuited. This operation can be carried out automatically via a SOCOMEC product, the PTI, can be found in the SOCOMEC catalogue, consult us.
In TNC neutral system it is recommanded to use functional earth module.

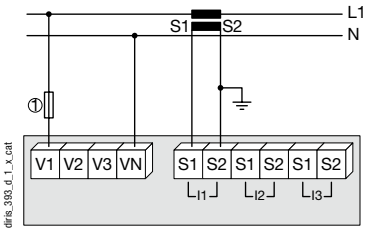
Low voltage balanced network for DIRIS A40

3/4 wires with 1 CT



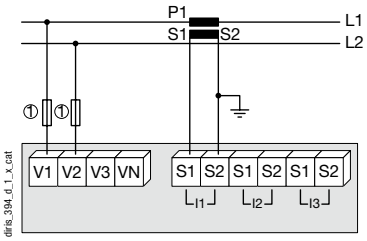
Use of 1 CT reduces by 0.5% the accuracy of the phases, the current of which is worked out by vector calculation.
1. Fus. 0.5 A gG / BS88 2 A gG / 0.5 A CC Class

Single phase



1. Fus. 0.5 A gG / BS88 2 A gG / 0.5 A CC Class

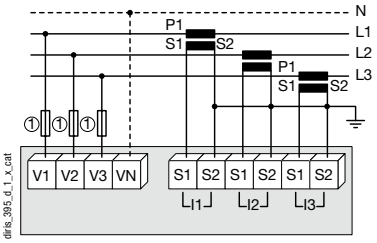
Two phase



1. Fus. 0.5 A gG / BS88 2 A gG / 0.5 A CC Class

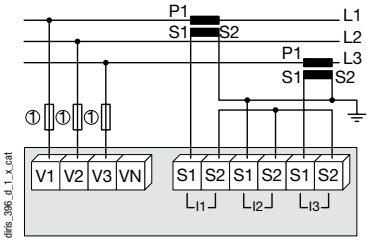
Low voltage unbalanced network for DIRIS A40

3/4 wires with 3 CTs



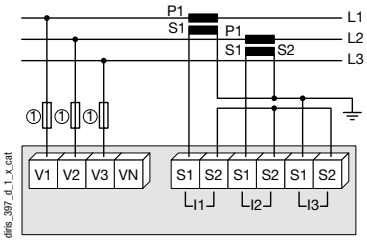
1. Fus. 0.5 A gG / BS88 2 A gG / 0.5 A CC Class

3 wires with 2 CTs



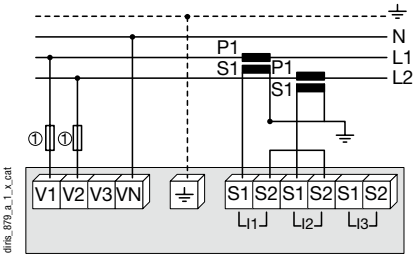
Use of 2 CTs reduces by 0.5% the accuracy of the phase, whose current is worked out by vector calculation.
1. Fus. 0.5 A gG / BS88 2 A gG / 0.5 A CC Class

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.
1. Fus. 0.5 A gG / BS88 2 A gG / 0.5 A CC Class

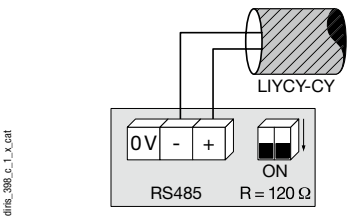
2 ph, 3 wires with 2 CTs



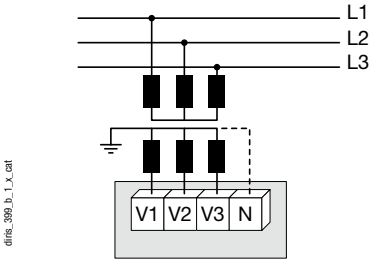
1. Fus. 0.5 A gG / 0.5 A class CC

Additional information

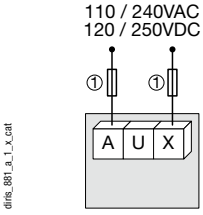
Communication via RS485 link



Voltage transformer 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 fuses or class CC 0.5A.
1. Fus. 0.5 A gG / BS88 2 A gG / 0.5 A CC Class

References

Basic device Auxiliary power supply U_s	DIRIS A40 Reference
110 ... 240 VAC / 120 ... 250 VDC	4825 **U201**
12 ... 48 VDC(1)	4825 **1201**

(1) UL pending, please consult us.

Options

Plug-in modules(1)	Reference
Pulse outputs	4825 **0090**
Sub D9 JBUS/MODBUS® communication	4825 **0092**
Analogue outputs	4825 **0093**
2 inputs / 2 outputs	4825 **0094**
RS485 PROFIBUS®DP communication	4825 **0205**
Memory	4825 **0097**
Ethernet communication	4825 **0203**
Ethernet communication + RS485 gateway JBUS/MODBUS	4825 **0204**
Functional Earth	4825 **0087**

(1) Ease of integration for additional functions (maximum 4).

Accessories

Description of accessories	To be ordered by multiple	Reference
IP65 protection(1)	1	4825 **0089**
Panel mounting kit for a 144 x 96 mm cutout(1)	1	4825 **0088**
Fuse combination switches for the protection of voltage inputs (type RM) 3 poles	4	5601 **0018**
Fuse combination switches for the protection of the auxiliary supply (type RM) 1 pole + neutral	6	5601 **0017**
Fuses Class CC 0.5 A	10	6CC0 **5000**

(1) Not UL.

Services and Technical assistance

Our expertise extends to a complete offer of services like commissioning installation audit, training, maintenance and project engineering.
It will provide a monitoring solution for "turnkey" projects.

Integrated webserver

Included in our Ethernet optional modules.
It allows the visualization of all measured values through IP adress with a web explorer, and all connected Socomec devices (up to 256 devices) to its RS485 gateway option.
Combined with our memory optional module it allows to export to Excel files load curves with up to several month of data.