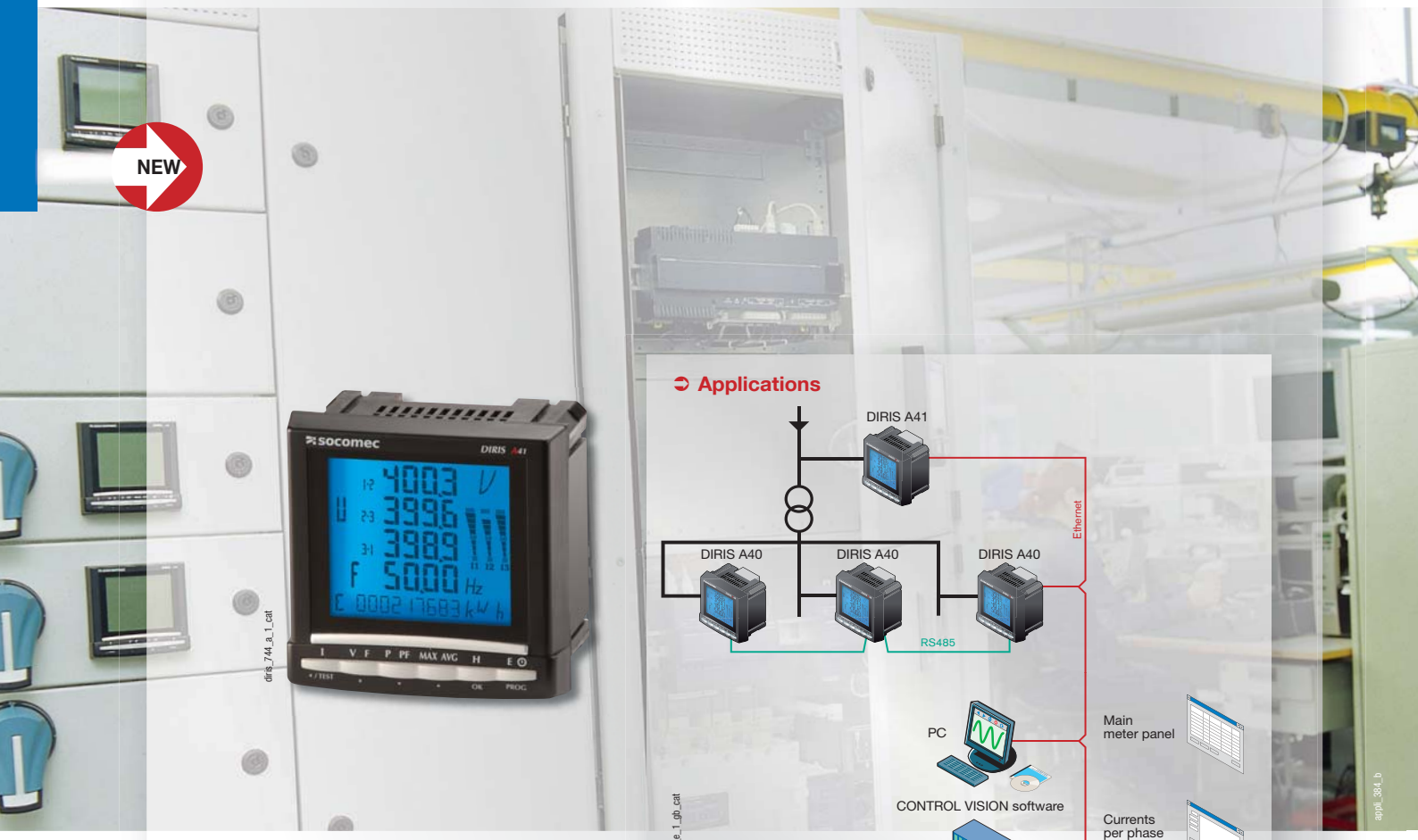
DIRIS A40 / A41

NEW



Monitoring and managing energy for high/low voltage electrical installations

➲ Function

The **DIRIS A40** and **A41** are multifunction meters which ensure the user has access to all the measurements required for energy efficiency projects and monitoring of electrical distribution.
All this information can be used and analysed remotely using the CONTROL VISION software.

➲ Conformity to standards

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

➲ Applications

Multi measurement
- Current
  - instantaneous: I1, I2, I3, In, Isystem
  - average/maximum average: I1, I2, I3, In
- Voltages & frequency
  - instantaneous: U1, U2, U3, U12, U23, U31, F, Vsystem, Usystem
  - average/maximum average: U1, U2, U3, U12, U23, U31, F
- Power
  - instantaneous: 3P, ΣP, 3Q, ΣQ, 3S, ΣS
  - average/maximum average: ΣP, ΣQ, ΣS
  - predictive: (ΣP), (ΣQ), (ΣS)
- Power factor
  - instantaneous: 3PF, ΣPF
  - average/maximum average: ΣPF
- Temperatures(1)
  - internal
  - external via 3 PT100 sensors

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

Harmonic analysis
- Harmonic distortion rate
  - 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 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

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

Front panel



diris_744x_a_1_cat

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 maximum 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



diris_773_a

DIRIS® A41



diris_774_a



diris_445_a_1_cat

Pulse outputs

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



diris_447_a_1_cat

JBUS / MODBUS® communication

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



diris_775_a_1_cat

PROFIBUS® DP communication

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



diris_777_a_1_cat

Ethernet communication

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



diris_776_a

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



diris_448_a_1_cat

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, I sys, Vsys, Usys, Ppred, Q pred, Spred, internal T°C, T°C 1, T°C 2, T°C 3 and to 17 VDC power supply



diris_449_a_1_cat

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.



diris_682_a_1_cat

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 minimum and maximum 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_747_a_2_cat

Temperature

Temperature indication
- Internal
- External sensor PT 100 (T°C 1)
- External sensor PT 100 (T°C 2)
- External sensor PT 100 (T°C 3)

➲ DIRIS A40 / A41 - Accessories

Current transformer
(see page 334)


trafo_024_a_2_cat


trafo_077_b_2_cat

IP65 protection


diris_720_a_2_cat

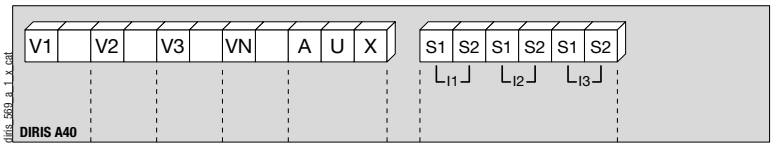
Mounting kit for 144 x 96 mm cut out plate



diris_718_b_1_cat

➲ Terminals

DIRIS A40

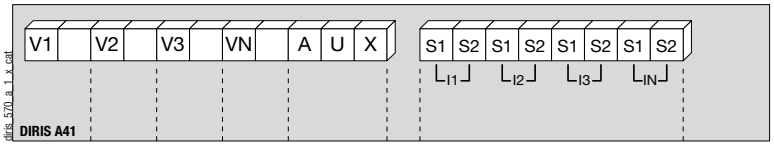


diris_663_a_1_x_cat

S1 - S2: current inputs

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

DIRIS A41

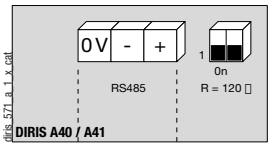


diris_670_a_1_x_cat

S1 - S2: current inputs

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

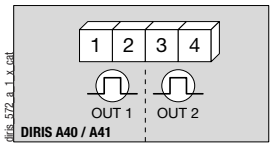
Communication module



diris_671_a_1_x_cat

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

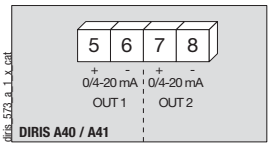
Pulse output module



diris_672_a_1_x_cat

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

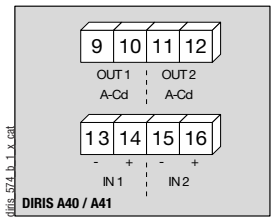
Analogue output module



diris_673_a_1_x_cat

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

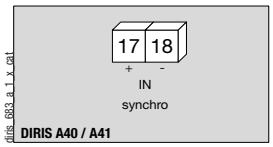
2 inputs / 2 outputs module



diris_674_b_1_x_cat

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

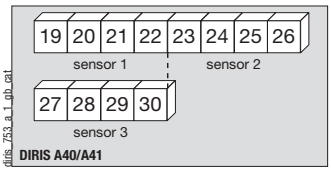
Memory module



diris_683_a_1_x_cat

17 - 18: synchronisation input.

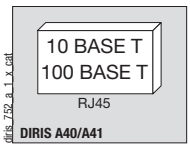
Temperature module



diris_753_a_1_gb_cat

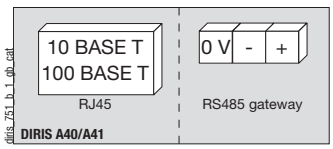
Sensor 1	Sensor 2	Sensor 3
19: Red	**23:** Red	**27:** Red
20: Red	**24:** Red	**28:** Red
21: White	**25:** White	**29:** White
22: White	**26:** White	**30:** White

Ethernet Module



diris_752_a_1_x_cat

Ethernet module + RS485 JBUS / MODBUS gateway



diris_751_b_1_gb_cat

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 … 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 power supply	
Alternating voltage	110 … 400 VAC
AC tolerance	± 10 %
Direct voltage	120 … 350 VDC / 12 … 48 VDC
DC tolerance	± 20 % / - 6 … + 20 %
Frequency	50 / 60 Hz
Consumption	≤ 10 VA

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

2 inputs / 2 outputs module: Phototransistor inputs	
Number	2(1)
Power supply	10 … 17 VDC
Minimal signal width	10 ms
Minimum length between 2 impulses	18 ms
Type	phototransistor

Pulse outputs 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
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

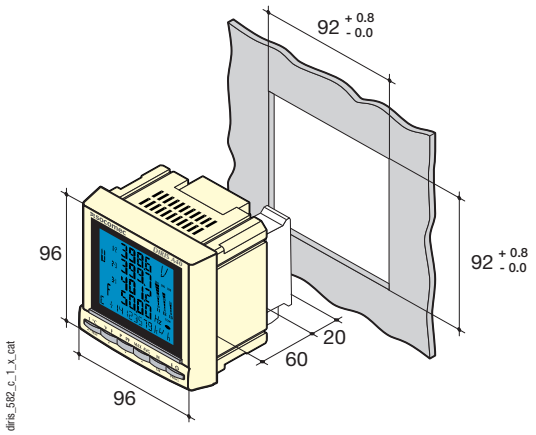
Ethernet Communication Module	
Connectique	RJ45
Speed	10 base T / 100 base T
Protocol	MODBUS TCP or JBUS/MODBUS RTU over TCP

Module temperature (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.

Case



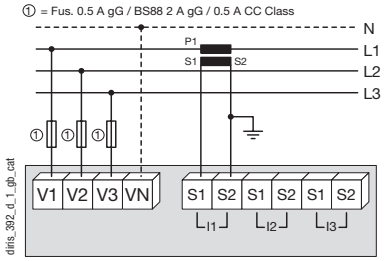
Type	Panel mounting
Dimensions W x H x D	96 x 96 x 60 mm
Case protection index	IP30
Front protection rating	IP52
Display type	LCD
Terminal blocks type	fixed or pull-out
Voltage and other connection section	0.2 … 2.5 mm²
Current connection section	0.5 … 6 mm²
Weight	400 g

➲ DIRIS A40 / A41 - Connections

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

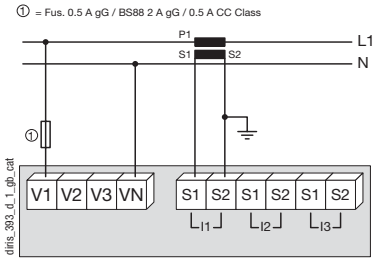
Low voltage balanced network for DIRIS A40

3/4 wires with 1 CT

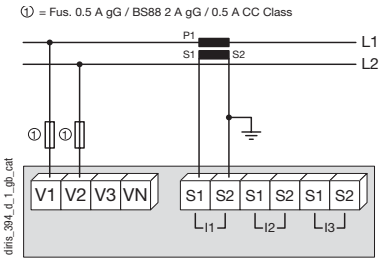


Use of 1 CT reduces by 0.5% the accuracy of the phases, the current of which is worked out by vector calculation.

Single phase

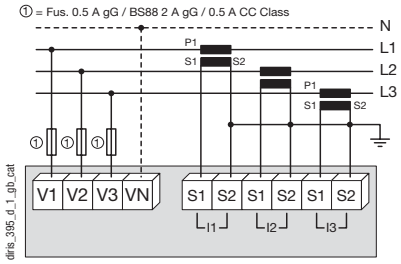


Two phase

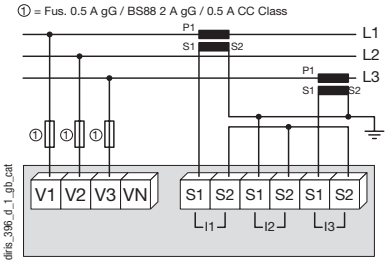


Low voltage unbalanced network for DIRIS A40

3/4 wires with 3 CTs

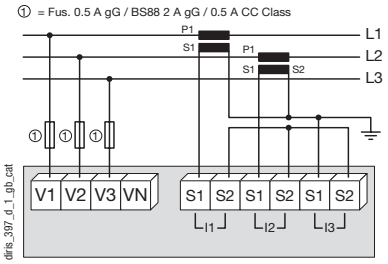


3 wires with 2 CTs



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

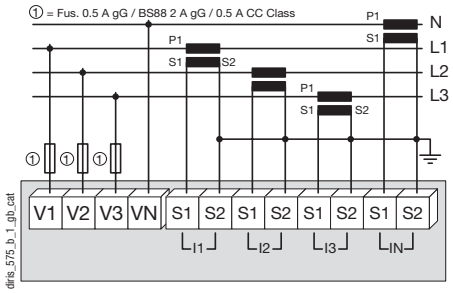
3 wires with 2 CTs



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

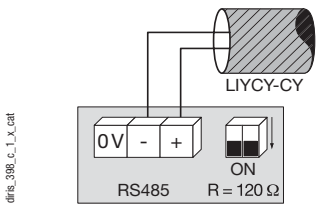
Low voltage unbalanced network for DIRIS A41

4 wires with 4 CTs

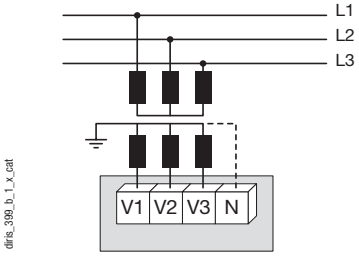


Additional information

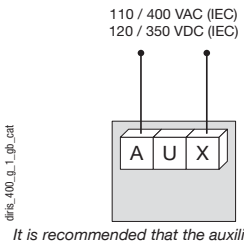
Communication via RS485 link



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.

References



Basic device	DIRIS A40		DIRIS A41 with CT on the neutral
Auxiliary power supply U_s	**Reference**		**Reference**
110 ... 400 VAC / 120 ... 350 VDC	4825 **0201**		4825 **0202**
12 ... 48 VDC	4825 **1201**		4825 **1202**

Options

Plug-in modules[1]	Reference		Reference
Pulse outputs	4825 **0090**		4825 **0090**
Sub D9 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 **0205**		4825 **0205**
Memory	4825 **0097**		4825 **0097**
Ethernet communication	4825 **0203**		4825 **0203**
Ethernet communication + RS485 gateway JBUS/MODBUS	4825 **0204**		4825 **0204**
Temperature inputs	4825 **0206**		4825 **0206**
Functional Earth	4825 **0087**		4825 **0087**

Accessories

Description of accessories	To be ordered in multiples of	Reference	To be ordered in multiples of	Reference
IP65 protection	1	4825 **0089**	1	4825 **0089**
Panel mounting kit for a 144 x 96 mm cutout	1	4825 **0088**	1	4825 **0088**
Fuse combination switches for the protection of voltage inputs (type RM) 3 poles	4	5601 **0018**	4	5601 **0018**
Fuse combination switches for the protection of the auxiliary supply (type RM) 1 pole + neutral	6	5601 **0017**	6	5601 **0017**
Fuses type gG 10x38 0.5 A	10	6012 **0000**	10	6012 **0000**
Current transformers range		See page 334		See page 334

(1) Ease of integration for additional functions (maximum 4 on A40 and 3 on A41).

Services and Technical assistance

Our expertise extends to a complete offer of services like commissioning installation audit, training, maintenance and project engineering.

