

# DIRIS A-40

## Multi-function meters



DIRIS A-40

### Function

The **DIRIS A-40** is a panel-mounted power monitoring device (PMD). It is designed for measuring, monitoring and reporting electrical energy.

The DIRIS A-40 offers a range of functions for measuring voltage, current, power, energy and quality.

It allows the analysis of a single-phase or three-phase load.

### Advantages

#### Assisted configuration

The configuration wizard guides the user step by step. It also detects and corrects configuration errors. This cuts the commissioning time in half and always delivers a reliable result.

#### Connected to the Cloud

The range comprises IoT ready connected products that enable data to be exported automatically for remote operation without any limit on time, distance and time in storage.

#### Smart sensors

Three current sensor formats (solid-core TE, split-core TR/iTR and Rogowski coil TF) allow integration of the DIRIS A-40 into new and existing electrical installations.

See page 220.

#### Better than revenue grade

Compliant with the IEC 61557-12 standard, guaranteeing the quality and accuracy of the Power Meter:

- Class 0.2 for the meter alone.
- Class 0.5 from 2% to 120% of the rated current (full scale), for the global measurement chain (with TE/iTR/TF current sensors).

### Functions

#### Multi-measurement

- Currents
  - I1, I2, I3, In, ISystem
- Voltages & frequency
  - V1, V2, V3, VN, Vsystem, U12, U23, U31, USystem, f
- Powers
  - P1, P2, P3, ΣP, Q1, Q2, Q3, ΣQ, S1, S2, S3, ΣS
  - Predictive powers ΣP, ΣQ, ΣS
- Power factor
  - PF1, PF2, PF3, ΣPF
- Cos φ & tangent φ
  - Instantaneous values per phase

#### Metering

- Active energy: +/- kWh
- Reactive energy: +/- kvarh
- Apparent power: kVAh
- Multi-tariff (8 max.)
- Hour Meter

#### Quality

- Voltage Unbalance
  - Vdir, Vinv, Vhom, Udir, Uinv, Unba, Vnba, Vnb, Unb
- Current unbalance
  - Idir, linv, lhom, Inba, Inb
- Total harmonic distortion
  - Currents THDi1, THDi2, THDi3, THDiN, TDDI
  - Phase-to-neutral voltage THDv1, THDv2, THDv3
  - Phase-to-phase voltage THDu12, THDu23, THDu31
- Individual harmonics up to 63rd
  - Currents: I1h, I2h, I3h, INh
  - Phase-to-neutral voltage: V1h, V2h, V3h
  - Phase-to-phase voltage: U12h, U23h, U31h
- Quality events
  - Voltage sags, interruptions and swells EN50160
  - Kfactor & Crest factor
- Events according to EN 50160
  - Voltage sags, interruptions, voltage swells

#### Monitoring of protective devices

- Auxiliary contact monitoring
- Report and alarm on trips
- Number of operations

#### Demand profiles and historical records

- Active, reactive and apparent power
- Currents, voltages and frequency

#### Alarms

- Alarms for all electrical values, events and input status changes, boolean combinations of multiple alarms
- Time-stamping of events

#### Communication

- DIRIS A-40 RS485 Modbus as standard
- DIRIS A-40 Ethernet Modbus
- DIRIS A-40 PROFIBUS DPV1

#### Inputs

- 3 digital inputs
  - Power supplied from DIRIS A-40 or an external source
  - Function: logical status, status of circuit breaker, pulse metering of multifluid meters.
- 2 logical outputs
  - Function: Command, energy pulse output, load shedding, alarm

### The solution for

- > Industry
- > Building
- > Infrastructure



### Strong points

- > Assisted configuration
- > Connected to the Cloud
- > Compliant with IEC 61557-12
- > Smart sensors

### Integrated technologies



For more information, see page 188.

### Conformity to standards

- > UL 61010 guide FTRZ/PICQ file E257746
- > IEC 61557-12
- > EN 50160



**Functions**

**Monitoring**

- Real-time measurement of electrical values.
- View data as graphs or tables.
- Power quality analysis of the utility supply and of loads.



**Metering**

- Measurement of active, reactive and apparent energies.
- Historical record of measurements.
- Graphic display on monthly, weekly, daily or hourly basis.

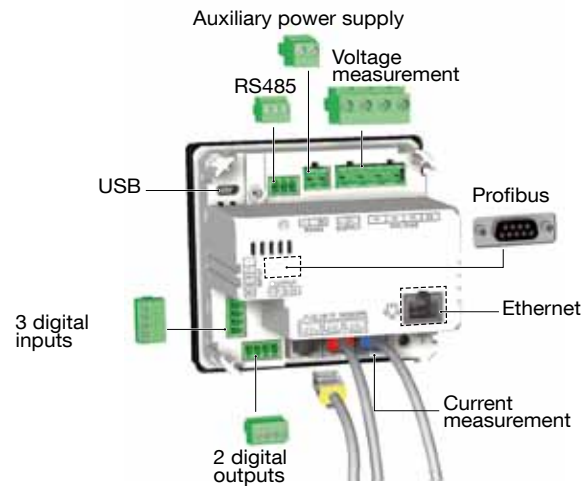


**Alarming**

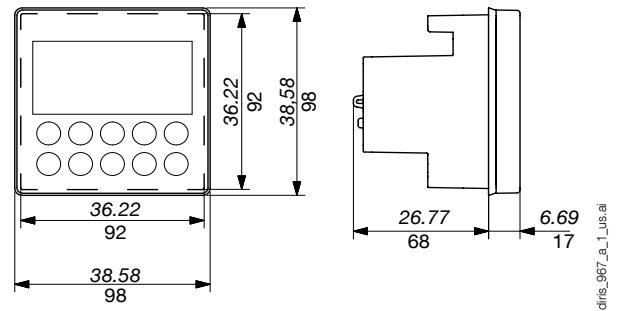
- Display of alarms.
- History of alarms.



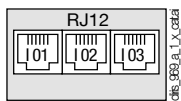
**Terminals**



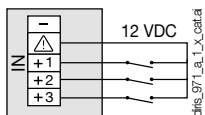
**Dimensions (in/mm)**



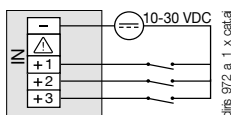
**Current measurement**



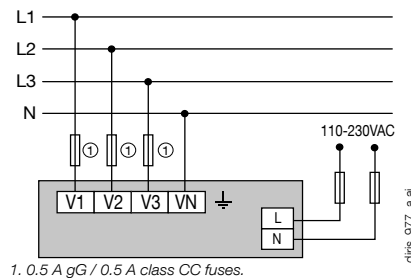
**3 inputs supplied by the product**



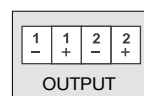
**3 inputs with external power supply**



**Voltage connections inc auxiliary power supply**



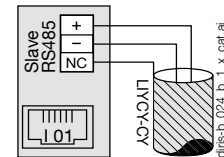
**2 outputs**



**Earth**



**RS485**



## Connections

### Associated current sensors

Various types of current sensors can be connected to the DIRIS A-40: solid-core (TE), split-core (TR/iTR) or Rogowski (TF). This range of sensors is suitable for all types of new or existing installations. A quick RJ12 connection makes wiring easy and reliable and prevents wiring errors. The DIRIS A-40 automatically recognizes the sensor type and rating. This guarantees the overall accuracy of the DIRIS A-40 + current sensor measurement chain.

For more information:

TE solid current sensors



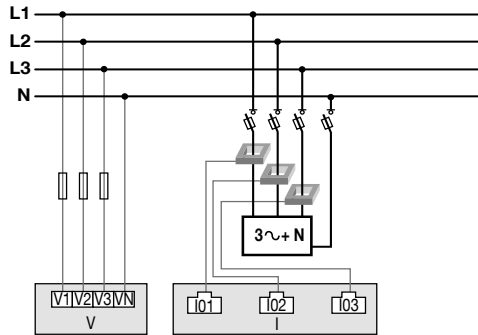
TE / TR/iTR / TF current sensors



### Network and connection examples

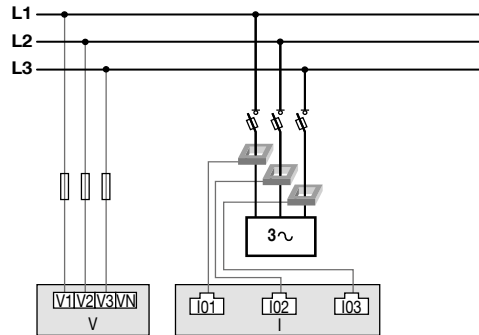
#### Three phase + Neutral

3P+N - 3 CT (1 three-phase load + calculated Neutral)



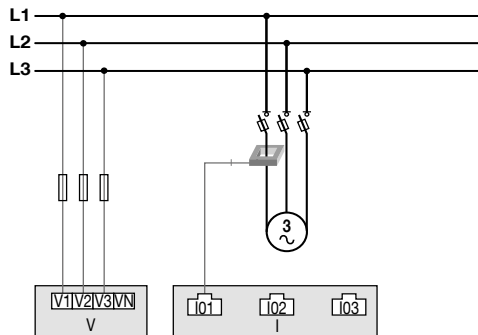
#### Three-phase

3P - 3CT (1 three-phase load)



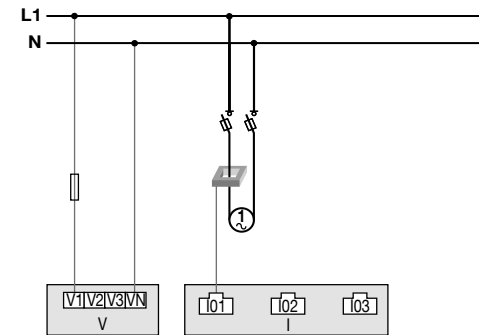
#### Three-phase

3P - 1CT (1 balanced three-phase load)



#### Single-phase

1P+N - 1CT (1 single-phase load)



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

If self-supplied, a fuse must always be added to the Neutral.



## DIRIS A-40 characteristics

### Electrical characteristics

Auxiliary power supply	
Alternative voltage	110/400 VAC or 120/300 VDC - Cat III
Frequency	50/60 Hz
Power consumption	5 VA AC / 1.5 VA DC (4825 0500) 8 VA AC / 2.5 VA DC (4825 0501 & 4825 0502)
Connection	Removable spring-cage terminal block, 2 x 2 positions, AWG 10 ... 24 / 0.5 ... 2.5 mm <sup>2</sup> solid cable or AWG 15 ... 30 / 0.25 ... 1.5 mm <sup>2</sup> stranded cable with ferrule

### Measurement characteristics

Power and energy measurement	
Accuracy	Class 0.2 for the DIRIS A-40 only
Active energy and active power	Class 0.5 with TE, TF or ITR sensors Class 1 with TR sensors
Accuracy of reactive energy	Class 2 with TE, TR or TF sensors
Power factor measurement	
Accuracy	Class 0.5 with TE, TF or ITR sensors Class 1 with TR sensors
Voltage measurement	
Characteristics of the network measured	50-300VAC (Ph/N) - 87-520VAC (Ph/Ph) - CAT III
Frequency range	45 to 65Hz
Frequency accuracy	Class 0.02
Network type	Single-phase/ Two-phase / Two-phase with neutral / Three-phase / Three-phase with neutral
Measurement by voltage transformer	Primary: 400 000 VAC Secondary: 60, 100, 110, 173, 190 VAC
Input consumption	≤ 0.1 VA
Accuracy of voltage measurement	Class 0.2
Connection	Removable spring-cage terminal block, 4 positions, AWG 10 ... 24 / 0.5 ... 2.5 mm <sup>2</sup> solid cable or AWG 15 ... 30 / 0.25 ... 1.5 mm <sup>2</sup> stranded cable with ferrule
Current measurement	
Number of current inputs	3
Associated current sensors	Solid TE, split-core TR/ITR, flexible TF current sensors
Accuracy	0.2 DIRIS A-40 class only Class 0.5 with TE, TF or ITR sensors Class 1 with TR sensors
Connection	Specific Socomec cable with RJ12 connectors

### Input characteristics

Number	3
Type / Power supply	Optocoupler with internal (12 VDC ± 10%) or external (12-24 VDC ± 20%) polarisation
Input function	Logical status, protective device monitoring, pulse metering of multifluid meters.
Connection	Removable screw terminal block, 5 positions, AWG 15 ... 35 / 0.14 to 1.5 mm <sup>2</sup> stranded or solid cable

### Output characteristics

Number	2
Type	Optocoupler 30 Vd.c. max 20mA max - SELV
Output function	Command, energy pulse output, load shedding, alarm
Connection	Removable screw terminal block, 4 positions, AWG 15 ... 35 / 0.14 to 1.5 mm <sup>2</sup> stranded or solid cable

### Communication characteristics

DIRIS A-40 RS485	
Link	RS485
Connection type	2 to 3 half duplex wires
Protocol	Modbus RTU
Baud rate	1200 to 115 200 baud
USB	Configuration of DIRIS A-40

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## References

DIRIS A-40 monitoring devices		Reference
DIRIS A-40	RS485 Modbus - 3 inputs / 2 outputs	4825 0500
DIRIS A-40	Ethernet Modbus TCP or Bacnet IP - webserver - RS485 Modbus - 3 inputs / 2 outputs	4825 0501
DIRIS A-40	Profibus DPV1 - RS485 Modbus - 3 inputs / 2 outputs	4825 0502

## Expert Services

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

