

# DIRIS A Power Measurement Devices

The new DIRIS A Power Measurement Devices offer extended functionality and enable you to...

**Reduce costs.** All industries are faced with the need to minimize operating and maintenance costs. In this kind of environment, the measurement system is a key component, enabling energy quality and costs to be monitored.

**Reduce production losses.** The measurement system is at the heart of any solution designed to prevent electrical incidents, or even production downtime, which often generate significant financial losses or material wastes.

**Improve efficiency.** The measurement system is a key factor in identifying malfunctions within the installation, which can then lead to improved energy efficiency. The DIRIS line of products allow you to detect where you consume the most and adapt your energy consumption.

**Enhance performance.** The accuracy class of the measurement units is essential in reducing energy consumption.

Enjoy unparalleled ease of use. Equipped with a large backlit screen, DIRIS A units display a number of key power system values, while remaining easy to view. The direct access keys (four to six depending on the model) enable optimum use of the available functions.

DIRIS units are easy to install. The Easy Config software can be used to quickly and easily create, edit and save configurations.

All units are equipped with an integrated test function that can be utilized to detect incorrect wiring and to automatically correct CT installation errors.

## Features

### Metering

Energy consumed by each building or manufacturing line, in order to distribute and optimize energy costs (multi-utility management)

### Measuring

All electrical or analog values to verify that your facilities are working properly. DIRIS measurement units can measure and display more than 200 parameters with a very high-level of accuracy.

- Class 0.5 ANSI C12.20
- Class 0.5S IEC 62053-22

### Monitoring

Electrical networks via alarm management, secure monitoring of distribution parameters and remote control of electrical apparatus. DIRIS meters allow you to analyze the quality of your network and to avoid the installation deterioration.

### Analyzing

Energy quality via a detailed breakdown of harmonics identifying troughs, outages, overvoltages and overcurrents on the network.

## Applications

- Industrial monitoring
- Energy monitoring in building automation systems
- Renewable energy
- Energy management
- Commercial sub-metering
- Cost allocation



Agency approvals: UL file  
# E257746, CE 2011/65/  
EU, 2014/35/EU LVD,  
2014/30/EU EMC

# DIRIS A Multifunction Meters

The DIRIS A10 is a modular DIN rail mountable multifunction meter for measuring electrical values in low voltage networks. It allows all electrical parameters to be displayed and utilized for communication and/or output functions.

The DIRIS A20 is a panel-mounted unit which gives you access to all the measurements required for successfully carrying out energy efficiency projects and ensuring the electrical distribution is monitored.

## Features

- Easy to use solution for industry, infrastructure and data centers
- Integrated temperature sensor (on A10)
- Detects wiring errors

## Listings

- Compliant with ANSI C12.20 and IEC 61557-12
- Conformity to standards IEC 61557-12, IEC 62053-22 class 0.5S, IEC 62053-23 class 2, UL 61010 File E257746 and ANSI C12.20

## Advantages

### Easy to use

**A10:** Five direct-access pushbuttons enable all measurements to be clearly viewed on its backlit LCD display. Unit is DIN rail mountable.

**A20:** Thanks to its large backlit LCD display and its multiple viewing screens with direct pushbutton access, DIRIS A20 multifunction meters directly display a number of multi-measurement and metering values: +kWh, +kvarh, I, U, V, F, P, Q, S, PF, etc. Designed for panel mounting.

### Integrated temperature sensor (on A10)

Allows variations in temperature to be detected.

### Detects wiring errors

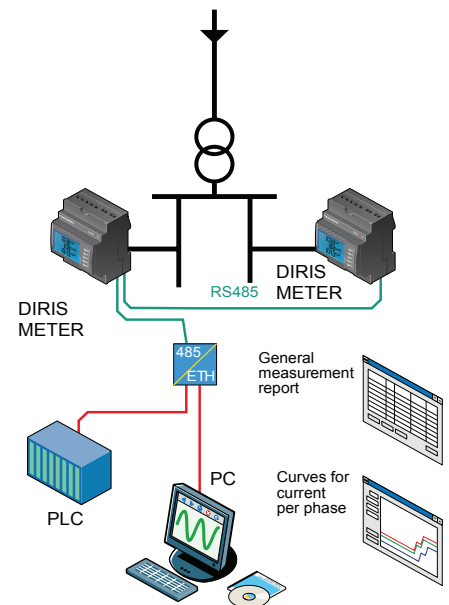
An integrated test function can be utilized to detect incorrect wiring and to automatically correct CT installation errors.

### Compliant with ANSI C12.20 and IEC 61557-12

IEC 61557-12 is a high-level standard for all Performance Monitoring Devices (PMDs) that are designed to measure and monitor electrical parameters in distribution networks. Compliance with IEC 61557-12 ensures a high level of equipment performance, in terms of metrology, and the mechanical and environmental aspects (EMC, temperature, etc.)



## Principle Diagram



| DIRIS A Multifunction Meters |   |                            |           |          |
|------------------------------|---|----------------------------|-----------|----------|
| Part Number                  | Description   | Operating Voltage          | Frequency | Price    |
| <a href="#">4825U010</a>     | DIN rail mount multifunction meter with backlit LCD display. Without RS485. | 110-277 VAC                | 50/60 Hz  | \$315.00 |
| <a href="#">4825U011</a>     | DIN rail mount multifunction meter with backlit LCD display. With RS485.    | 110-277 VAC                | 50/60 Hz  | \$366.00 |
| <a href="#">4825U200</a>     | Panel mount multifunction meter with backlit LCD display.                   | 110-240 VAC<br>120-250 VDC | 50/60 Hz  | \$437.00 |

## Functions

### Multi-measurement

#### Currents

- Instantaneous: I1, I2, I3, In
- Maximum average: I1, I2, I3, In

#### Voltages & frequency

- Instantaneous: V1, V2, V3, U12, U23, U31, F

#### Power

- Instantaneous: 3P, ΣP, 3Q, ΣQ, 3S, ΣS
- Maximum average: ΣP, ΣQ, ΣS

#### Power factors

- Instantaneous: 3PF, ΣPF

#### Metering

- Active energy: +kWh
- Reactive energy: +kvarh
- Hours
- Harmonic analysis

#### Harmonic analysis

Total Harmonic Distortion (level 51)

- Currents: thd1, thd I2, thd I3
- Phase-to-neutral voltage: thd V1, thd V2, thd V3
- Phase-to-phase voltage: thd U12, thd U23, thd U31

### Dual tariff function (A10)

Selection of one out two billing tariffs

### Events

Alarms on all electrical values

### Communications

RS485 with MODBUS protocol

#### Input

- Tariff selection (A10)
- Remote device status

#### Output

- Remote command of device
- Alarm output
- Pulse output

# DIRIS A10 Multifunction Meter

## Electrical Characteristics

| Current Measurement (TRMS)                   |                                |
|--|--------------------------------|
| Via CT primary                               | 9,999A                         |
| Via CT secondary                             | 5A                             |
| Measurement range                            | 0-11 kA                        |
| Input consumption                            | 0.6 VA                         |
| Measurement updating period                  | 1s                             |
| Accuracy                                     | 0.2%                           |
| Permanent overload                           | 6A                             |
| Intermittent overload                        | 10 In for 1s                   |
| Voltage Measurement (TRMS)                   |                                |
| Direct measurement between phases            | 50-500 VAC                     |
| Direct measurement between phase and neutral | 28-289 VAC                     |
| Input consumption                            | ≤ 0.1VA                        |
| Measurement updating period                  | 1s                             |
| Accuracy                                     | 0.2%                           |
| Permanent overload                           | 800VAC                         |
| Power Measurement                            |                                |
| Measurement updating period                  | 1s                             |
| Accuracy                                     | 0.5%                           |
| Power Factor Measurement                     |                                |
| Measurement updating period                  | 1s                             |
| Accuracy                                     | 0.5%                           |
| Frequency Measurement                        |                                |
| Measurement range                            | 45-65 Hz                       |
| Measurement updating period                  | 1s                             |
| Accuracy                                     | 0.1%                           |
| Energy Accuracy                              |                                |
| Active (according to IEC 62053-22)           | Class 0.5 S                    |
| Reactive (according to IEC 62053-23)         | Class 2                        |
| Metrological LED (EA+)                       |                                |
| Pulse weight                                 | 10,000 pulses/kWh              |
| Color  | Red                            |
| Auxiliary Power Supply                       |                                |
| Alternating voltage                          | 110-277 VAC                    |
| AC tolerance                                 | ±15%                           |
| Frequency                                    | 50/60 Hz                       |
| Consumption                                  | <3VA                           |
| Digital Output (Pulse or Alarm)              |                                |
| Number                                       | 1                              |
| Type   | 20/30 VDC; 0.5 A, 10VA         |
| Max. number of operations                    | ≤10 <sup>8</sup>               |
| Input (tariff)                               |                                |
| Number                                       | 1                              |
| Tariff Pricing Tiers (T1, T2)                | 0 VAC:T1 / 100-277 VAC:T2      |
| Communication                                |                                |
| Link   | RS485                          |
| Type   | 2-3 half duplex wires          |
| Protocol                                     | MODBUS RTU                     |
| MODBUS speed                                 | 2400-38400 baud                |
| Operating Conditions                         |                                |
| Operating temperature                        | +14 to +131° F / -10 to +55° C |
| Storage temperature                          | -4 to +158° F / -20 to +70° C  |
| Relative humidity                            | 85%                            |

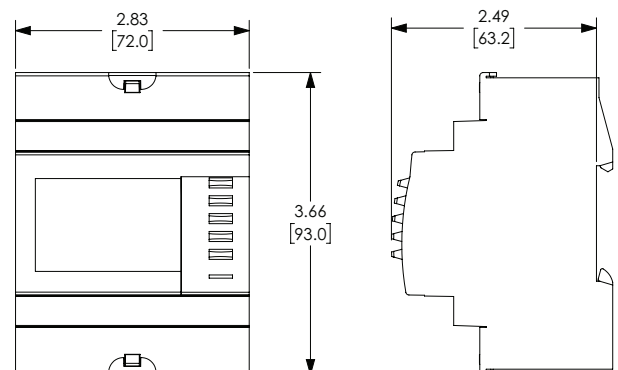
## Front panel



1. Backlit LCD display.
2. Direct access key for currents (instant and maximum), current THD and test function.
3. Direct access key for voltages, frequency and voltage THD.
4. Direct access key for active, reactive and apparent power (instantaneous and max. values) and power factor.
5. Direct access key for energies.
6. Pushbutton for hour meter, temperature and programming menu access.
7. Metrological LED (energy metering indication).

## Case dimensions

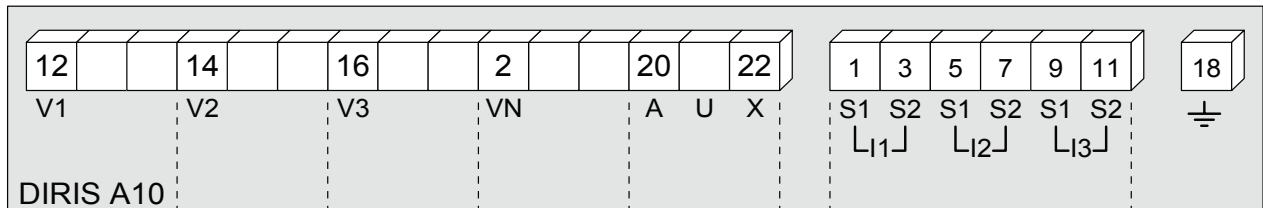
Inches [mm]



| Physical characteristics   |   |
|--|---|
| Type   | Modular   |
| Case degree of protection  | IP30  |
| Front degree of protection                                       | IP52  |
| Display type   | Backlit LCD display, blue background                  |
| Character size and type  | 4 characters, black, 8mm (0.31 in.)                   |
| Voltage and current connection cross-section                     | AWG 12 (4 mm <sup>2</sup> )                           |
| Connection cross-section for AUX supply, input, output and comms | AWG 14 (2.5 mm <sup>2</sup> )                         |
| Weight   | 7.23 oz/205g (4825 U010)<br>7.58 oz./215g (4825 U011) |

# DIRIS A10 Multifunction Meter

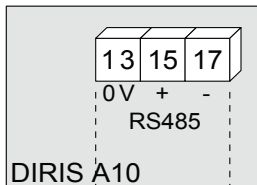
## Terminals



**AUX:** Auxiliary power supply  $U_S$   
**V1, V2, V3 & VN:** voltage inputs

**S1-S2:** Current inputs

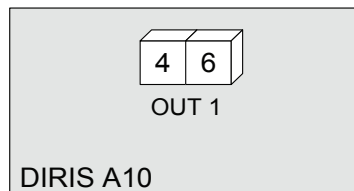
### Communication terminals



DIRIS A10

RS485 link

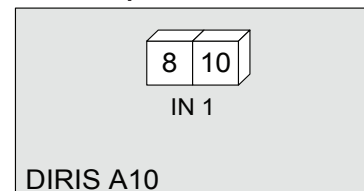
### Pulse or alarm output terminals



DIRIS A10

4-6: Output

### Input terminals



DIRIS A10

8-10: Input

# DIRIS A10 Multifunction Meter

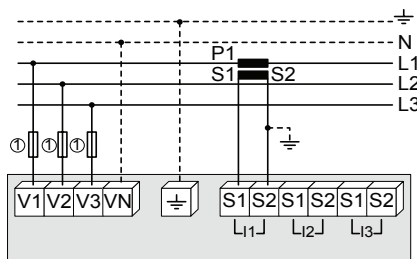
## Connection

### CAUTION:

- For IT grounding systems, it is recommended that the CT secondary is not connected to ground.
- When disconnecting the DIRIS, the secondary of each current transformer must be short-circuited. This operation can be carried out using AutomationDirect's KN-2JM10 shorting jumpers and KN-KBD10 terminal blocks.
- It is recommended that the grounding point for DIRIS A10 and the current transformer secondaries are not grounded at the same time.

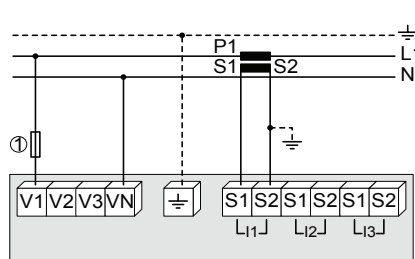
### Low voltage balanced network

#### 3/4 wires with 1 CT



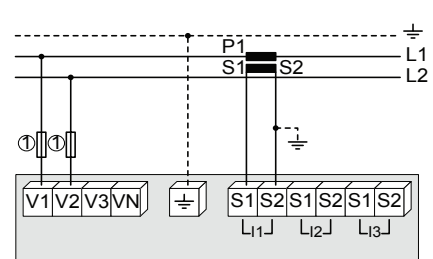
1. Fuses 0.5A gG / 0.5A class CC

#### Single-phase



1. Fuses 0.5A gG / 0.5A class CC

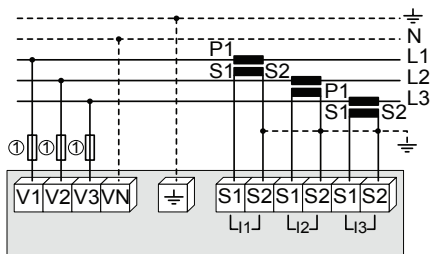
#### Two phase



1. Fuses 0.5A gG / 0.5A class CC

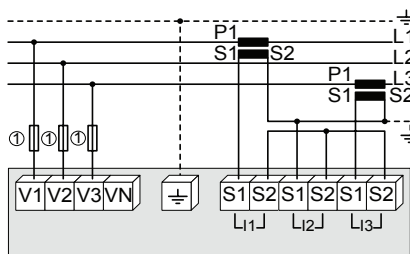
### Low voltage unbalanced network

#### 3/4 wires with 3 CTs



1. Fuses 0.5A gG / 0.5A class CC

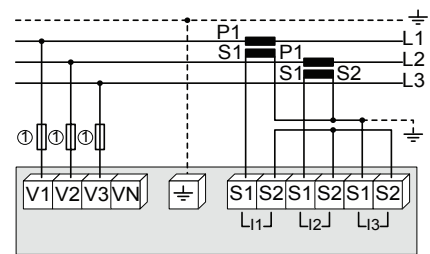
#### 3 wires with 2 CTs



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

1. Fuses 0.5A gG / 0.5A class CC

#### 3 wires with 2CTs

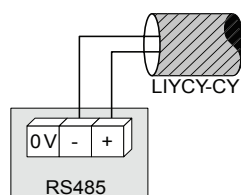


Use of 2 CTs reduces by 0.5% the accuracy of the phases, the current of which is worked out by vector calculation.

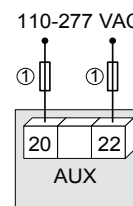
1. Fuses 0.5A gG / 0.5A class CC

## Additional information

### Communication via RS485 link



### AC auxiliary power supply



1. Fuses 0.5A gG / 0.5A class CC

# DIRIS A20 Multifunction Meter

## Electrical Characteristics

| Current Measurement (TRMS)                       |                                |
|--|--------------------------------|
| Via CT primary                                   | 9,999 A                        |
| Via CT secondary                                 | 5A                             |
| Measurement range                                | 0-11 kA                        |
| Input consumption                                | 0.6 VA                         |
| Measurement updating period                      | 1s                             |
| Accuracy   | 0.2%                           |
| Permanent overload                               | 6A                             |
| Intermittent overload                            | 10 I <sub>n</sub> for 1s       |
| Voltage Measurement (TRMS)                       |                                |
| Direct measurement between phases                | 50-500 VAC                     |
| Direct measurement between phase and neutral     | 28-289 VAC                     |
| Input consumption                                | ≤ 0.1 VA                       |
| Measurement updating period                      | 1s                             |
| Accuracy   | 0.2%                           |
| Permanent overload                               | 800VAC                         |
| Power Measurement                                |                                |
| Measurement updating period                      | 1s                             |
| Accuracy   | 0.5%                           |
| Power Factor Measurement                         |                                |
| Measurement updating period                      | 1s                             |
| Accuracy   | 0.5%                           |
| Frequency Measurement                            |                                |
| Measurement range                                | 45-65 Hz                       |
| Measurement updating period                      | 1s                             |
| 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                              | 110-240 VAC                    |
| AC tolerance                                     | +/-10%                         |
| Direct voltage                                   | 120-250 VDC                    |
| DC tolerance                                     | +/-20%                         |
| Frequency  | 50/60 Hz                       |
| Consumption                                      | 10VA                           |
| Digital Output, optional module (Pulse or Alarm) |                                |
| Number   | 1                              |
| Type   | 100VDC; 0.5A; 10VA             |
| Max. number of operations                        | ≤ 10 <sup>8</sup>              |
| Communication                                    |                                |
| Link   | RS485                          |
| Type   | 2-3 half duplex wires          |
| Protocol   | Modbus RTU                     |
| MODBUS® speed                                    | 1400-38400 baud                |
| Operating Conditions                             |                                |
| Operating temperature                            | +14 to +131° F / -10 to +55° C |
| Storage temperature                              | -4 to +185° F / -20 to +85° C  |
| Relative humidity                                | 95%                            |

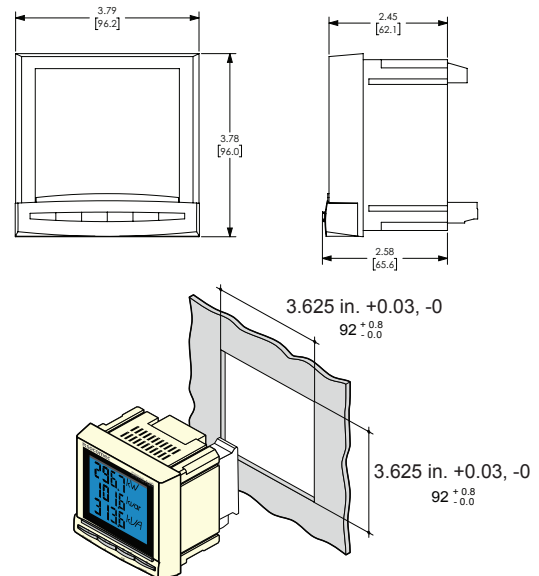
Front panel



- 1 Backlit LCD display.
2. Direct access for currents (instantaneous and max. values), current THD and test function.
3. Direct access key for voltages, frequency and voltage THD.
4. Pushbutton for active, reactive, and apparent power (instantaneous and max. values) and power factor.
5. Direct access key for energies, hour meter and programming menu.

## Case dimensions

Inches [mm]

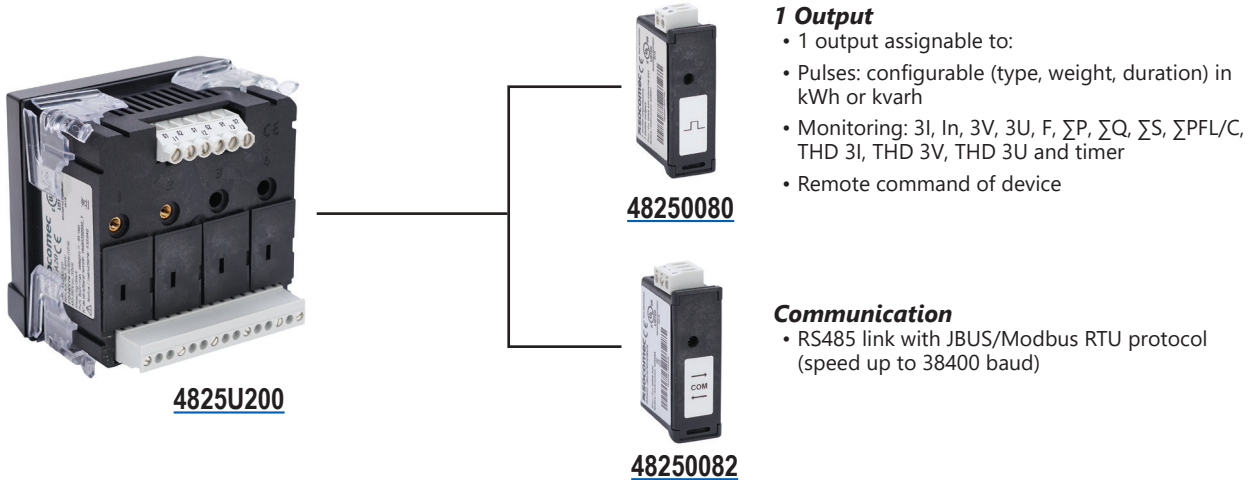


Please see our website [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete engineering drawings.

| Physical characteristics                   |                                      |
|--|--------------------------------------|
| Type                                       | Panel mounting                       |
| Case degree of protection                  | IP30                                 |
| Front degree of protection                 | IP52                                 |
| Display type                               | Backlit LCD display, blue background |
| Character size and type                    | 4 characters, black, 15mm (0.59 in.) |
| Terminal block type                        | Fixed or plug-in                     |
| Voltage and other connection cross-section | AWG 24-14 (0.2-2.5 mm <sup>2</sup> ) |
| Current connection cross-section           | AWG 20-10 (0.5-6 mm <sup>2</sup> )   |
| Weight                                     | 14.11 oz / 400 g                     |

# DIRIS A20 Multifunction Meter

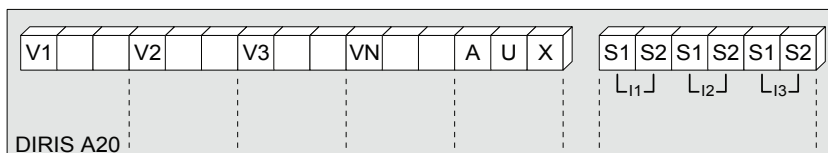
## Plug-in Modules



| DIRIS A20 (4825U200) Plug-in Modules |   |               |         |
|--------------------------------------|---|---------------|---------|
| Part Number                          | Description   | Module type   | Price   |
| <b>48250080</b>                      | Optional configurable output module for the DIRIS A20               | Output        | \$68.00 |
| <b>48250082</b>                      | Optional Modbus RTU (RS485) communications module for the DIRIS A20 | Communication | \$62.00 |

**Note: Diris A20 can accept a maximum of two plug-in modules.**

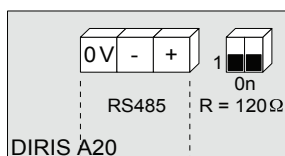
## Terminals



**S1, S2: Current inputs**

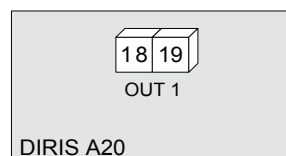
**AUX: Auxiliary power supply  $U_S$**   
**V1, V2, V3 and Vn: voltage inputs**

### Communication module



**RS485 link**  
**R=120Ω: Selectable internal resistance for RS485 end of line termination**

### Pulse output or alarm module



**18-19: Output**

# DIRIS A20 Multifunction Meter

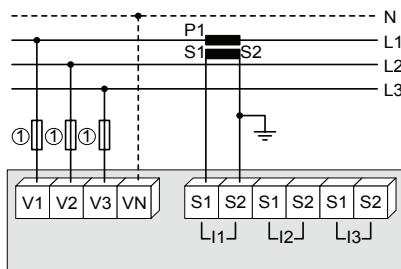
## Connection

### CAUTION:

- For IT grounding systems, it is recommended that the CT secondary is not connected to ground.
- When disconnecting the DIRIS, the secondary of each current transformer must be short-circuited. This operation can be carried out using AutomationDirect's KN-2JM10 shorting jumpers and KN-KBD10 terminal blocks.

### Low voltage balanced network

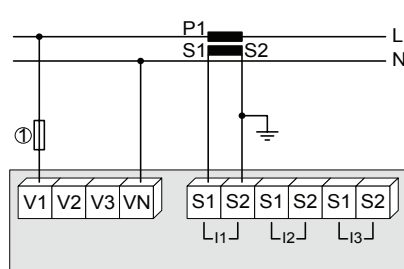
#### 3/4 wires with 1 CT



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

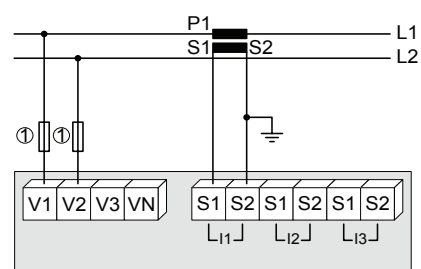
1. Fuses 0.5A gG / 0.5A class CC

#### Single-phase



1. Fuses 0.5A gG / 0.5A class CC

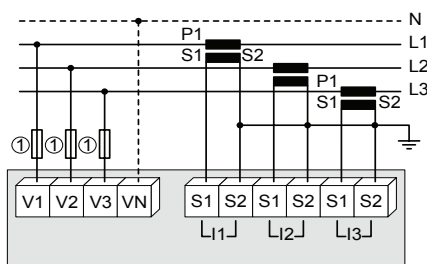
#### Two phase



1. Fuses 0.5A gG / 0.5A class CC

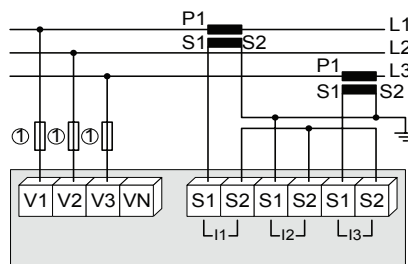
### Low voltage unbalanced network

#### 3/4 wires with 3 CTs



1. Fuses 0.5A gG / 0.5A class CC

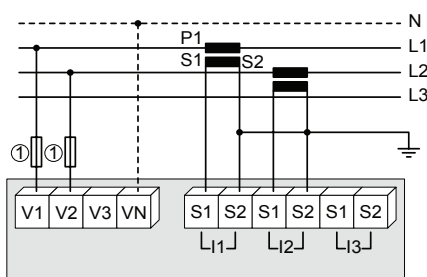
#### 3 wires with 2 CTs



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

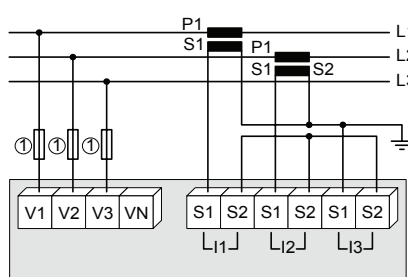
1. Fuses 0.5A gG / 0.5A class CC

#### 2 wires with 2 CTs



1. Fuses 0.5A gG / 0.5A class CC

#### 3 wires with 2CTs

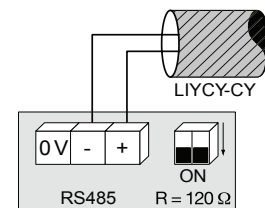


Use of 2 CTs reduces by 0.5% the accuracy of the phases, the current of which is worked out by vector calculation.

1. Fuses 0.5A gG / 0.5A class CC

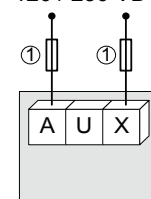
### Additional information

#### Communication via RS485 link



#### AC & DC auxiliary power supply

110 / 240 VAC  
120 / 250 VDC



1. Fuses 0.5A gG / 0.5A class CC

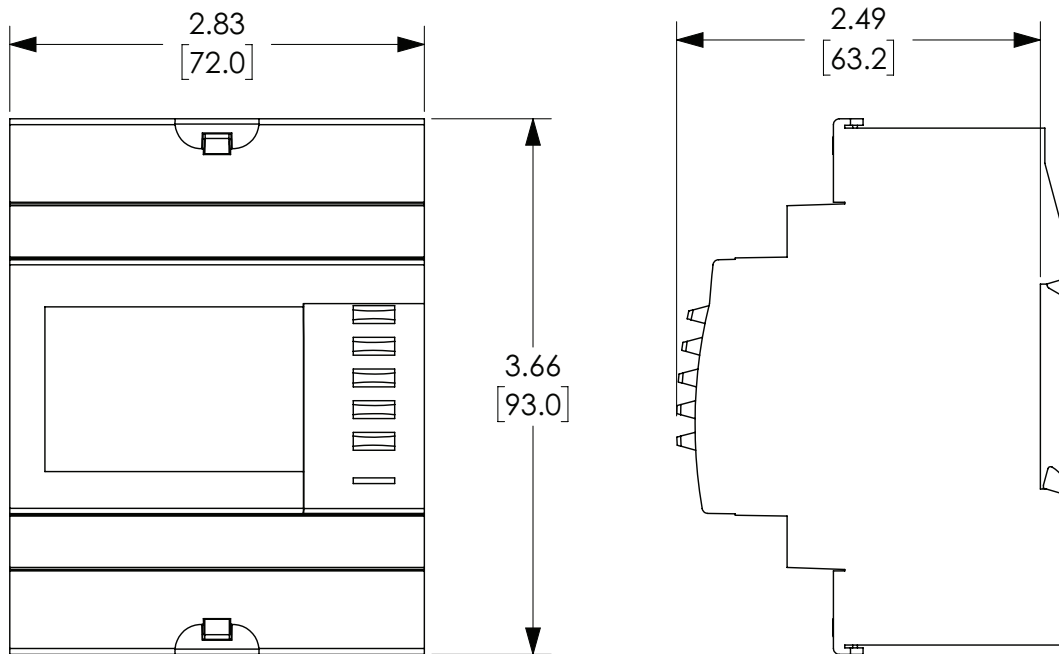


# DIRIS Multifunction Meters

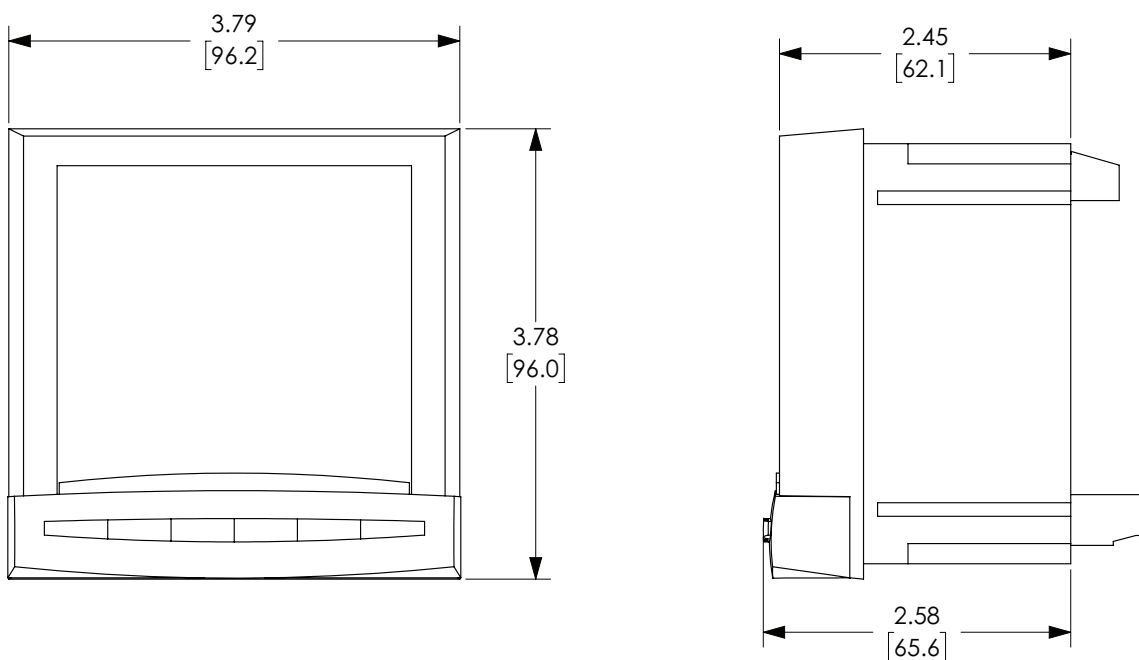
## Dimensions

Inches [mm]

### 4825U01x DIRIS A10 DIN Rail Mount Multifunction Meter (inches [mm])



### 4825U200 DIRIS A20 Panel Mount Multifunction Meter (inches [mm])

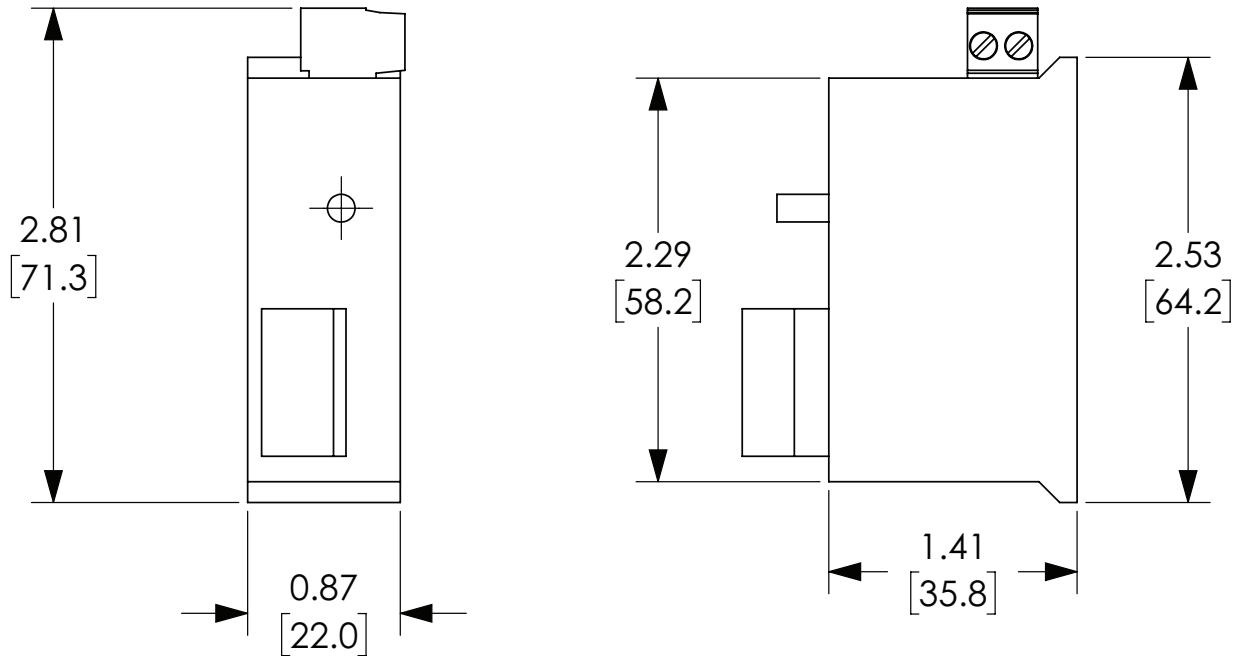


# DIRIS Multifunction Meters

## Dimensions

Inches [mm]

### 48250080 Optional Output Module for DIRIS A20



### 48250082 Optional RS485 Module for DIRIS A20

