Product Description

Altus Energy Series is a reliable solution for one of the most critical issues in industrial applications: supplying power for all devices in an automation system. With a robust, compact and smart design, the Energy Series power supplies can withstand high levels of electromagnetic interference (EMI) usually found in the industrial environment.

Offering either full-range or selectable dual-voltage alternating current input, and providing respectively 2.5 A and 5 A current at 24 Vdc, the available models are the ideal to use with programmable controllers, human-machine interfaces, sensors, and control panels.

Its low electromagnetic emission levels and high efficiency characteristics allows the installation in commercial and residential environments without causing disturbance to other equipment or to the environment. Offering a stable output voltage, as well as protection against overload and short circuit, the Energy Series provides more availability and productivity to the system.

The picture shows the available 2.5 A and 5 A power supply models.

Its main features are:

- Alternating current input
- 24 Vdc output voltage
- Protection against overload with automatic restart
- Protection against short circuit, overvoltage and overheating
- High efficiency and reliability
- Allows two positions for rail assembly
- Power-on indicator
- Cooling by natural ventilation
- IP20 protection level
- TS35 rail mounting
- Robust cabinet
- Epoxy paint finish

Ordering Information

Included Items

The product package includes de following items:

- AL-1535 or AL-1536 power supply
- 1 four-position connector
- 1 three-position connector
- Installation guide

Product Code

The following codes are required for ordering:

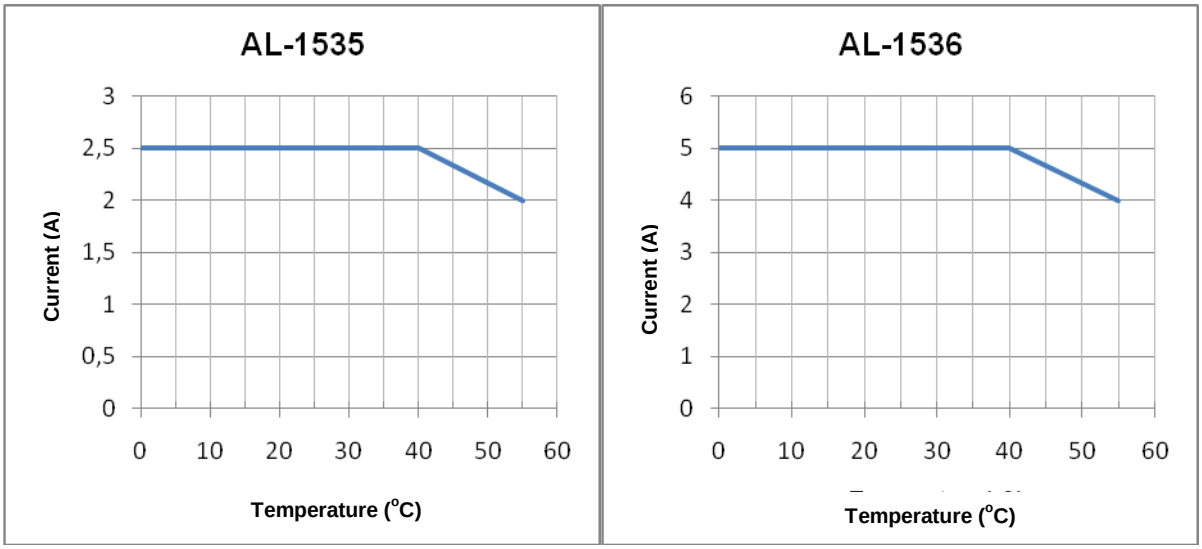
Code	Description
AL-1535	Power Supply 24 Vdc 2.5 A
AL-1536	Power Supply 24 Vdc 5 A

Product Features

	AL-1535	**AL-1536**
Module type	Full-range power supply	Dual-voltage power supply
Input voltage	90 - 264 Vac	(100 – 120 Vac): 90 - 132 Vac or (200 – 240 Vac): 173 - 264 Vac
Input current	1.1 A @ 115 Vac 0.6 A @ 230 Vac	2.3 A @ 115 Vac 1.2 A @ 230 Vac
Input voltage frequency	47 - 63 Hz	47 - 63 Hz
Peak inrush current at startup	20 A	20 A
Overload protection	Yes, with automatic restart	Yes, with automatic restart
Output voltage	24 Vdc	24 Vdc
Line regulation	+/- 1 %	+/- 1 %
Load regulation	+/- 5%	+/- 5%
Maximum output voltage ripple	20 mV	20 mV
Maximum output current	2.5 A	5.0 A
Output current derating	Decrease to 2.0 A at room temperature of 55 ºC	Decrease to 4.0 A at room temperature of 55 ºC
Indicator	Green LED flashing for energized power supply	Green LED flashing for energized power supply
Output voltage adjustment	23 - 28 Vdc	23 - 28 Vdc
Power	60 W	120 W
Power factor	0.61 @ 115 Vac 0.50 @ 230 Vac	0.67 @ 115 Vac 0.53 @ 230 Vac
Efficiency	85 % @ 115 Vac 87 % @ 230 Vac	84 % @ 115 Vac 86 % @ 230 Vac
Internal fuse nominal current	4 A	5 A
External fuse maximum current	20 A	20 A
Start-up time	1.7 s at 115 Vac 600 ms at 230 Vac	600 ms at 115 Vac 500 ms at 230 Vac
Stable voltage settling time at power loss	20 ms at 115 Vac 100 ms at 230 Vac	40 ms at 115 Vac 40 ms at 230 Vac
Insulation		
Input/Output	1750 Vac per 1 minute	3000 Vac per 1 minute
Input/Ground	1750 Vac per 1 minute	1500 Vac per 1 minute
Output/Ground	400 Vac per 1 minute	500 Vac per 1 minute
Operating temperature	0 - 60 ºC (on the output derating curve)	0 a 60ºC (on the output derating curve)
Storage temperature	-20 - 85 ºC	-20 - 85 ºC
Humidity (without condensation)	20% - 90 %	20% - 90 %
Dimensions (W x H x D)	50.0 x 129.1 x 89.6 mm	50.0 x 129.1 x 134.6 mm
Weight	490 g	790 g
Mounting	DIN rail TS35	DIN rail TS35
Parallel connection	No	No
Serial connection	Two supplies	Two supplies
Connection	Input: terminal block 3 positions Output: terminal block 4 positions	Input: terminal block 3 positions Output: terminal block 4 positions
Cable section (input/output)	1.5 -2.5 mm^2 / 16-14 AWG	1.5 -2.5 mm^2 / 16-14 AWG

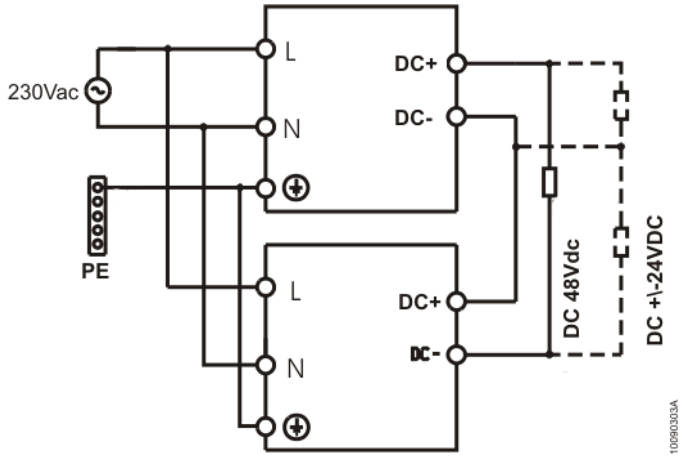
Output Current

The maximum output current of these power supplies depends on the room temperature as the following charts show, considering that the input voltage is within the specifications described on features table on previous page.



Serial Connection

The power supplies support serial connections with two units of each model at most, with the possibility to obtain output voltage of 48 Vdc or +/-24 Vdc. The following figure shows the connection diagram.



WARNING:
Serial connections must be performed between power supplies of the same model.

Ventilation

For ventilation reasons, it is recommended a 30 mm-free space above and below the power supplies, and a 20 mm-free space on each side, since they are cooled by natural ventilation. It is important to keep the supplies' mounting area clean, thus avoiding accumulation of dust, which might cause the equipment to overheat. In case it is not possible to keep the free space mentioned, and the installation area not allowing natural ventilation of the equipment, it is recommended to force ventilation by the use of a device intended to this specific purpose.

Installation

DANGER:

RISK OF ELECTRIC SHOCK

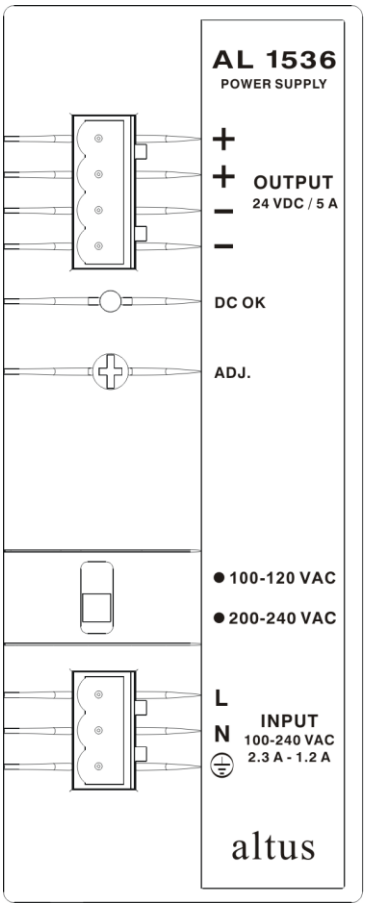
These power supplies may operate with voltages of up to 264 Vac. Special care must be taken during installation, which only trained technicians should perform.

Do not touch the field wire or the housing when operating.

WARNING:

The AL-1536 model is dual-voltage, therefore, the selection switch of the input voltage must be observed.

Electric Assembly



The output connection is composed of a 4-position female terminal, with conductors mounted by means of bolts. The identification of the assembly positions is shown in the following table:

Terminal Position	AL-1535, AL-3536
+	Positive output
+	Positive output
-	Negative output
-	Negative output

The input connection is composed of a 3-position female terminal, MSTB model, with conductors mounted by means of bolts. The identification of the assembly positions is shown in the following table:

Terminal Position	AL-1535, AL-3536
L	Line
N	Neutral
⏚	Ground

The selection switch of the input voltage comprises two positions – one to select the input voltage in the range of 100 Vac – 120 Vac, and another position to perform the selection in the range of 200 Vac – 240 Vac.

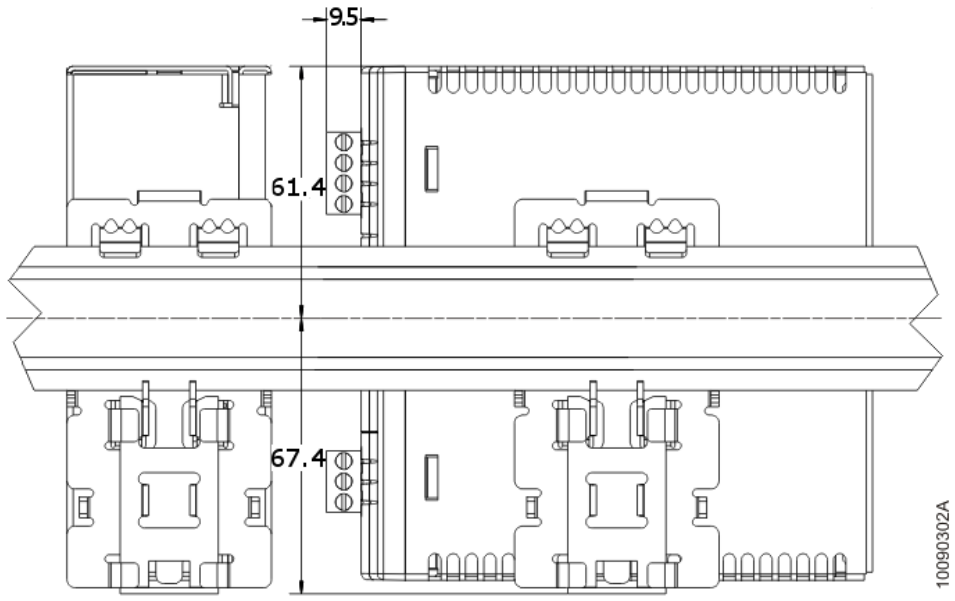
Output Voltage

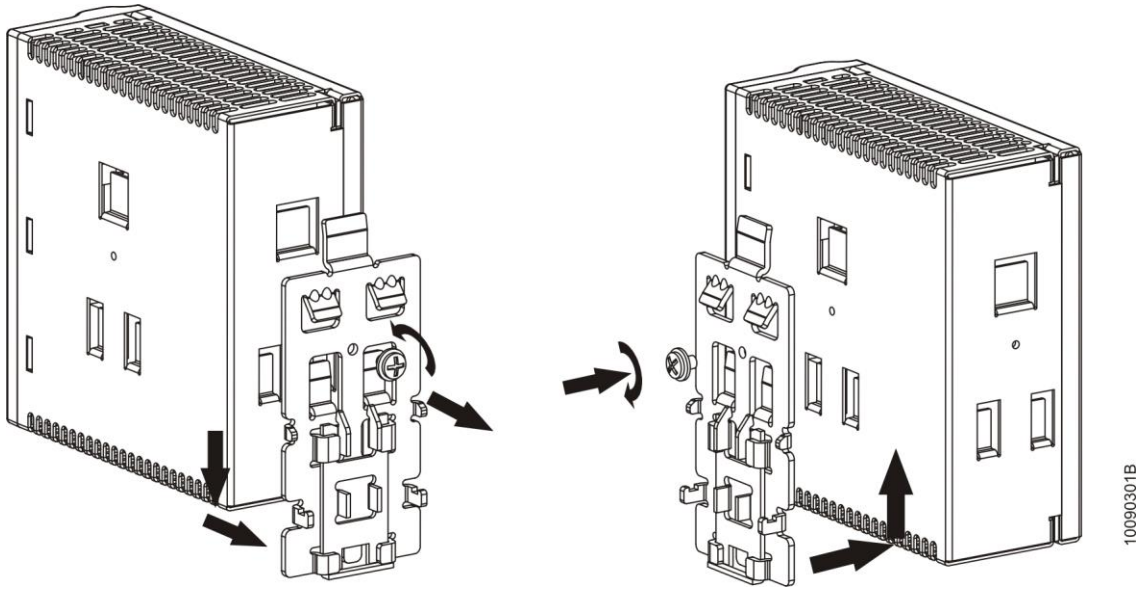
The setpoint available at the frontal panel of the power supply (identified as ADJ) allows output voltage tuning, and can be used to compensate the voltage drop caused by connection cables resistance.

Mechanical Assembly

AL-1535 and AL-1536 power supplies may be assembled in two distinct positions on the mounting rail. In order to change the assembly position it is only need to remove the bolt shown in the diagram below, and change the position rail support in the supply housing, mounting it again by using the same bolt.

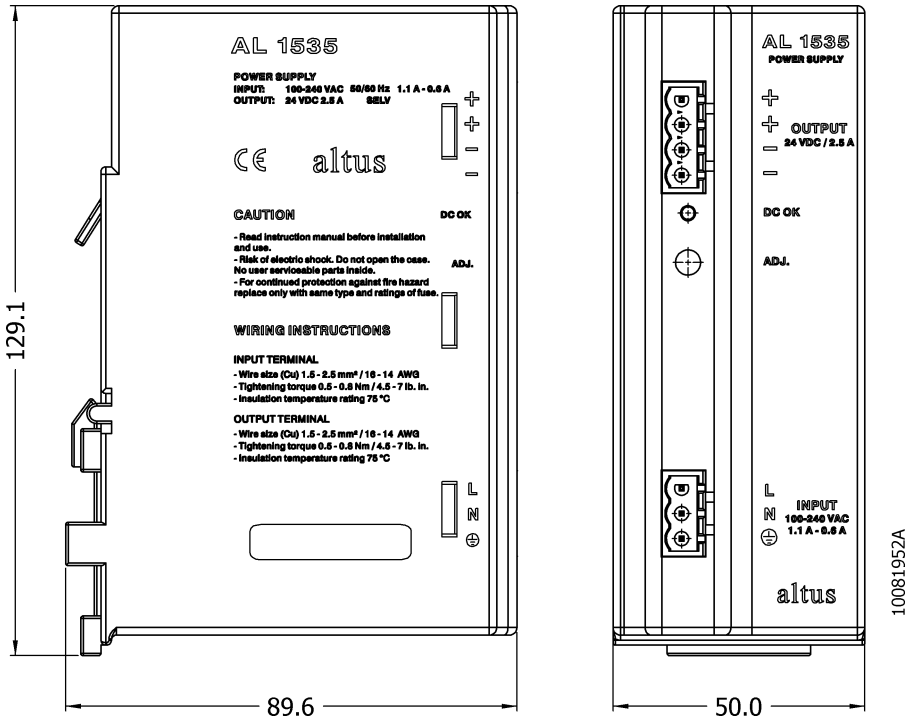
Measures in mm.

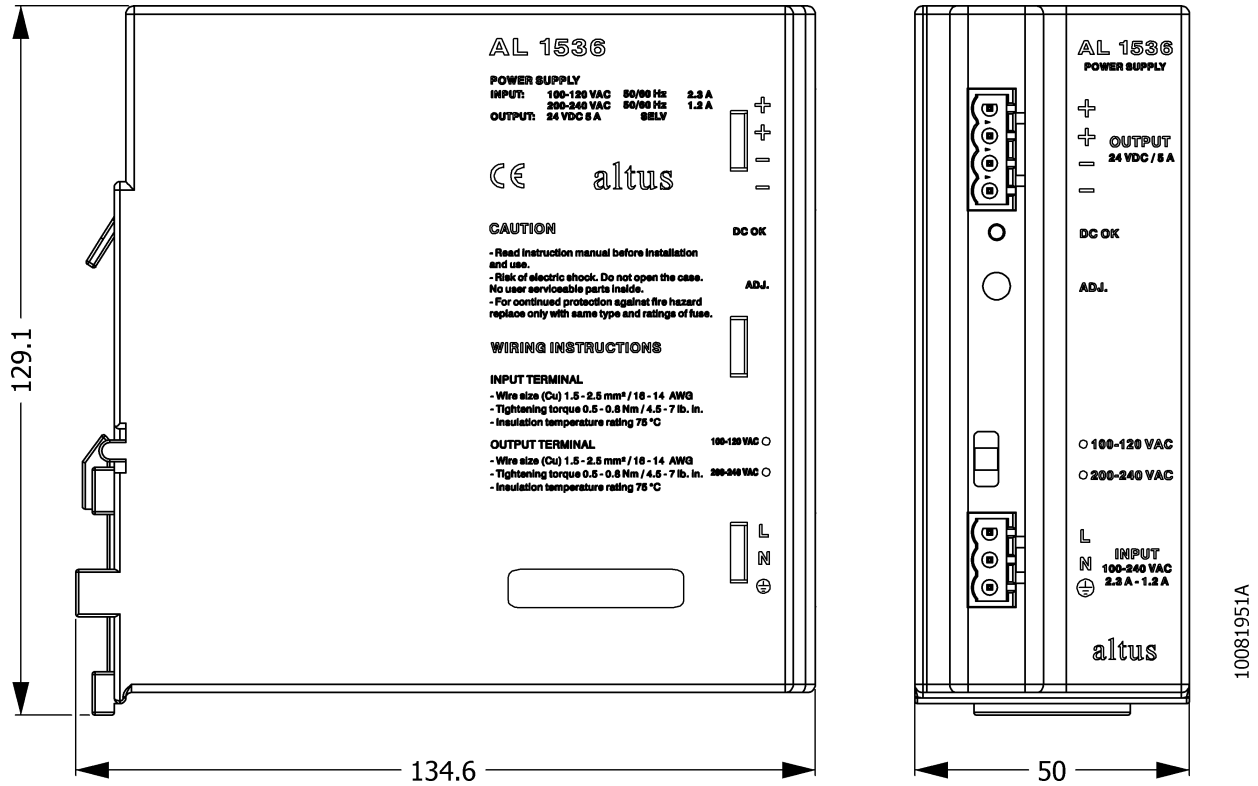




Physical Dimensions

Dimensions in mm.





Preventive Maintenance

Preventive maintenance consists of the following procedures:

- Cleaning the unit, removing the dust
- Clearing of ventilation windows
- Checking of rail mounting
- Fasting the bolts of connection terminals