



PULS UB40.241 DIN Rail Controller Instruction Manual

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PULS UB40.241 DIN Rail Controller



INSTRUCTION

Read this first

Before operating this device, please read this manual thoroughly and retain this manual for future reference! This device may only be installed and put into operation by qualified personnel. If damage or malfunction should occur during operation, immediately turn power off and send device to the factory for inspection. The device does not contain serviceable parts. The information presented in this document is believed to be accurate and reliable and may change without notice. For any clarifications the English translation will be used.

WARNING

Risk of electrical shock, fire, personal injury, or death:

- Turn power off before working on the device. Protect against inadvertent re-powering.
- Do not open, modify or repair the device.
- Use caution to prevent any foreign objects from entering the housing.
- Do not use in wet locations or in areas where moisture or condensation can be expected.
- Do not touch during power-on and immediately after power-off. Hot surfaces may cause burns.

Product Description

The UB40.241 is an uninterruptible power supply controller (DC-UPS), which is used in combination with a 24V power supply and one external 24V-battery pack to bridge power failures. The controller can be used with any type of SELV power supply as long as the maximum output current ratings of the UB40.241 are not exceeded. When the power supply provides sufficient voltages, the DC-UPS controller charges the battery. When the power supply voltage fails, the energy stored in the battery is released to the DC bus in a regulated process.

Intended Use

- This device is designed for installation in an enclosure and is intended for commercial use, such as in industrial control, process control, monitoring and measurement equipment or the like.
- Do not use this device in equipment, where malfunctioning may cause severe personal injury or threaten human life without additional appropriate safety devices, that are suited for the end-application.
- If this device is used in a manner outside of its specification, the protection provided by the device may be impaired.

Installation Instructions

- Turn power off and disconnect the battery fuse before working on the device.
- Install the device in an enclosure providing protection against electrical, mechanical and fire hazards. Install the device onto a DIN rail according to EN 60715 with the battery terminals on the bottom of the unit.
- The input can be powered from a regulated power supply or a similar DC source. Use an appropriately sized power supply, which can deliver the additionally required internal current consumption of the DC-UPS and the required current for charging the batteries. If a power supply with a continuous output current greater than 50A is used, a fuse with 63A B- or C-Characteristic must be connected between the power supply and the DC-UPS. The continuous voltage between the input and ground must not exceed 60Vdc. The input must be powered from a PELV or SELV source or an "SELV or PELV isolated secondary circuit" in order to maintain a SELV or PELV output. Check for correct input and battery polarity. The device will not operate when the voltage is reversed.

Use only VRLA lead acid batteries with a capacity between 12Ah and 200Ah.

- Make sure that the wiring is correct by following all local and national codes. Use appropriate copper cables that are designed for a minimum operating temperature of 60°C for ambient temperatures up to +45°C, 75°C for ambient temperatures up to +60°C and 90°C for ambient temperatures up to +70°C. Ensure that all strands of a stranded wire enter the terminal connection.
- Do not use wires smaller than 6mm² (AWG 10) and not longer than 2x1m between the power supply and the DC-UPS controller. Longer or smaller gauge wires can cause malfunctioning of the system. Do not use wires smaller than 6mm² (AWG 10) and not longer than 2x1.5m between the battery and the DC-UPS controller. Longer or smaller gauge wires can change performance of the system.
- Use two fuses each 35A or 40A in parallel (ATOF® 287 035 or ATOF® 287 040 from Littelfuse or an UL listed fuse with the same characteristics) in the battery circuit.
- The battery fuse protects the wires between the battery and the DC-UPS and shall be located close to the battery.
- The device is designed for pollution degree 2 areas in controlled environments. No condensation or frost is allowed.
- The device is suitable for indoor applications. Outdoor applications are also allowed as long as the device is installed in a control cabinet that fulfills all requirements specified in this installation manual (controlled environment, condensation, ...).
- The device is designed as "Class of Protection III" equipment according to IEC 61140.
- The enclosure of the device provides a degree of protection of IP20. The enclosure does not provide protection against spilled liquids.
- The isolation of the devices is designed to withstand impulse voltages up to 1.5kV according to IEC 60664-1.

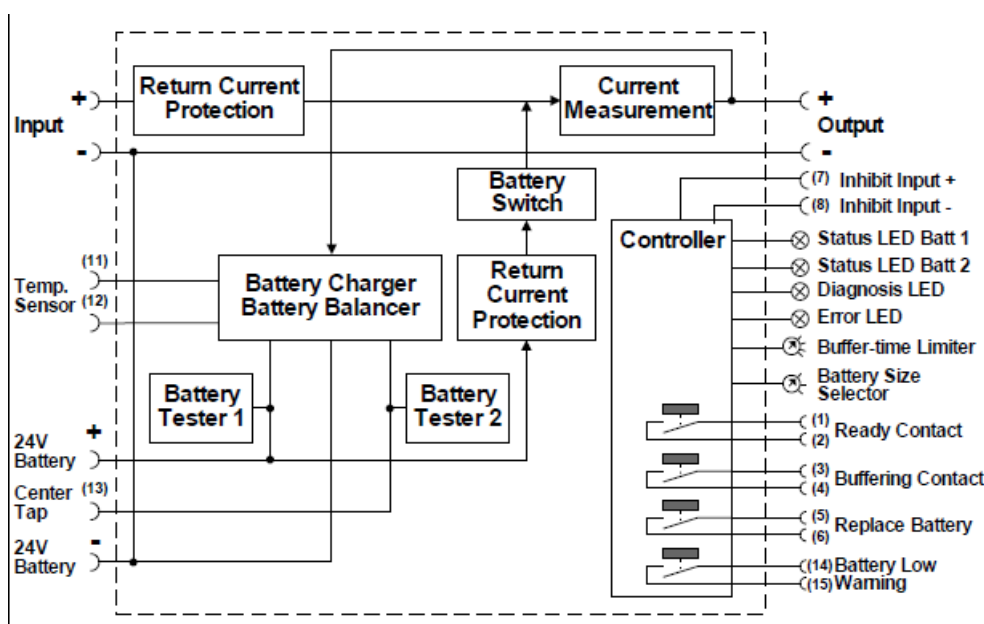
- A disconnecting means shall be provided for the input and the battery input of the device.
- The device is designed for convection cooling and does not require an external fan. Do not obstruct airflow and do not cover ventilation grid!
- Keep the following minimum installation clearances: 40mm on top, 20mm on the bottom, 5mm left and right side. Increase the 5mm to 15mm in case the adjacent device is a heat source. When the device is permanently loaded with less than 50%, the 5mm can be reduced to zero.
- The device is designed for altitudes up to 5000m (16400ft). Above 2000m (6560ft) a reduction in output current is required.
- The maximum surrounding air temperature is +70°C (+158°F). The operational temperature is the same as the ambient or surrounding air temperature and is defined 2cm below the device.
- The device is designed to operate in areas between 5% and 95% relative humidity.
- Use a 4A fuse (ATOF® 287 004 from Littelfuse or an UL listed fuse with same characteristics) between the connection point of the two 12V batteries and the “Center
- Tap” connection point of the DC-UPS. An equivalent protection is included on the original battery modules. The center tap connection is not mandatory but enables an individual charging and monitoring of the two batteries.
- Optionally, a PT1000 temperature sensor can be connected to terminals point 11 and 12 to measure the battery temperature. This adjusts the charging voltage according to the battery temperature which extends the battery life. This sensor is already installed in the original battery modules.

Technical Data

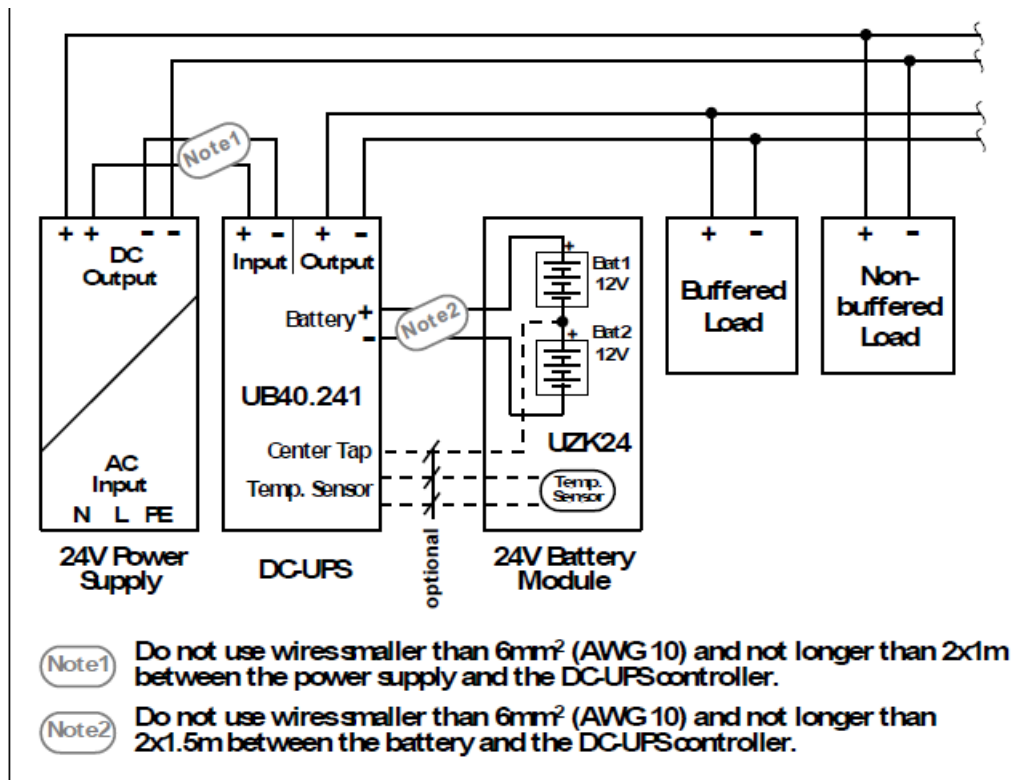
Technical Data		
All values are typical figures specified at 24Vdc input voltage, 40A output current in power supply mode at 25°C ambient, no charging and after a 5 minutes run-in time unless otherwise noted.		
Input voltage	DC 24V	±25%
Min. input voltage to start charging and to enable battery mode	23V	
Transfer voltage to switch into battery mode	22.2V	
Internal current consumption	3.2A / 6.2A	<65Ah / ≥65Ah, includes charging current
Voltage loss	55mV / 110mV	Input to output at 20A / 40A
	110mV / 220mV	Battery input to output at 20A / 40A
Output current	50A	Below +50°C
	40A	At +60°C
	30A	At +70°C
	60A	Short term, up to 5s

Derate between +50°C and +70°C		
Power losses	6.0W	At 40A in power supply mode, full batteries
	9.9W	At 40A in battery mode
Temperature range	-25°C to +70°C	
Max. wire size (litz wire)	10mm ²	For power terminals
Wire size AWG	AWG 22-8	For power terminals
Max. wire diameter	5.2mm	For power terminals
Wire stripping length	12mm / 0.5inch	For power terminals
Tightening torque	2.3Nm / 20lb.inch	For power terminals
Max. wire size (litz wire)	1.5mm ²	For signal connector
Wire size AWG	AWG 22-14	For signal connector
Max. wire diameter	1.5mm	For signal connector
Wire stripping length	6mm/ 0.25inch	For signal connector
Tightening torque	0.4Nm/ 3.5lb.inch	For signal connector
Max. wire size (litz wire)	1.5mm ²	Battery-low terminals
Wire size AWG	AWG 24-16	Battery-low terminals
Max. wire diameter	1.6 mm	Battery-low terminals
Wire stripping length	7mm / 0.28inch	
Size (wxhxd)	46x124x127mm	Without DIN rail
Weight	530g / 1.17lb	

Functional Diagram



Wiring Scheme



Functional Description

The output can supply any kind of loads, including inductive loads and capacitive loads. If capacitors with a capacitance $>40\text{mF}$ are connected to the output, the unit might switch off in order to protect itself. Do not apply return voltages from the load to the output terminals higher than 35V.

Green Status LEDs

- This LEDs are on solid, when the battery is charged more than 85%. During battery charging, the LEDs are flashing with a slow frequency. Rapid flashing is an indication of a buffer event. After the unit is turned on with charged batteries, it can take 20s or longer that the signal switches from charging to ready. The LEDs are off when replace battery signal is active or the temperature of the DC-UPS or battery is too hot. LED1 refers to battery 1, which is electrically closer to the (+) pole and LED 2 refers to battery 2, which is closer to the (-) pole.

Yellow Diagnoses LED

- This LED reports an overload situation: input currents above 40A, an expired buffer time (flashes for 15 minutes), an activated inhibit input or when the battery should be replaced.

Red Check Wiring LED

- This LED indicates a failure in the installation such as too low or too high input voltage, too low battery voltage, too high or too low battery temperature, too high DC-UPS controller temperature, incorrect wiring, blown or missing battery fuse.

Buffer-time Limiter

- The buffer time during a buffer event can be set to 10s, 30s, 1min, 3min, 10min or infinity with the dial on the front. This can save battery energy for faster recharge and expand the lifetime of the battery. When the dial is set to infinity, buffering continues until stopped by the battery deep-discharge protection.

Battery Size Selector

- Set the dial on the front of the unit according to the used battery size, which allows an optimal use of the individual battery sizes. Set the unit to 12Ah for battery sizes between 12-17Ah, to 26Ah for 18-34Ah batteries, to 38Ah for 35-50Ah batteries, to 65Ah for 51-80Ah batteries, to 100Ah for 81-130Ah batteries and to 150Ah for 131-200Ah batteries.

Inhibit Input

- The inhibit input disables or stops buffering. In power supply mode, a continuous input of 10-30V is required. During buffering, a short input of 10-30V for at least 250ms is required to stop buffering. The current of the inhibit input is limited to 6mA by the DC-UPS control unit.

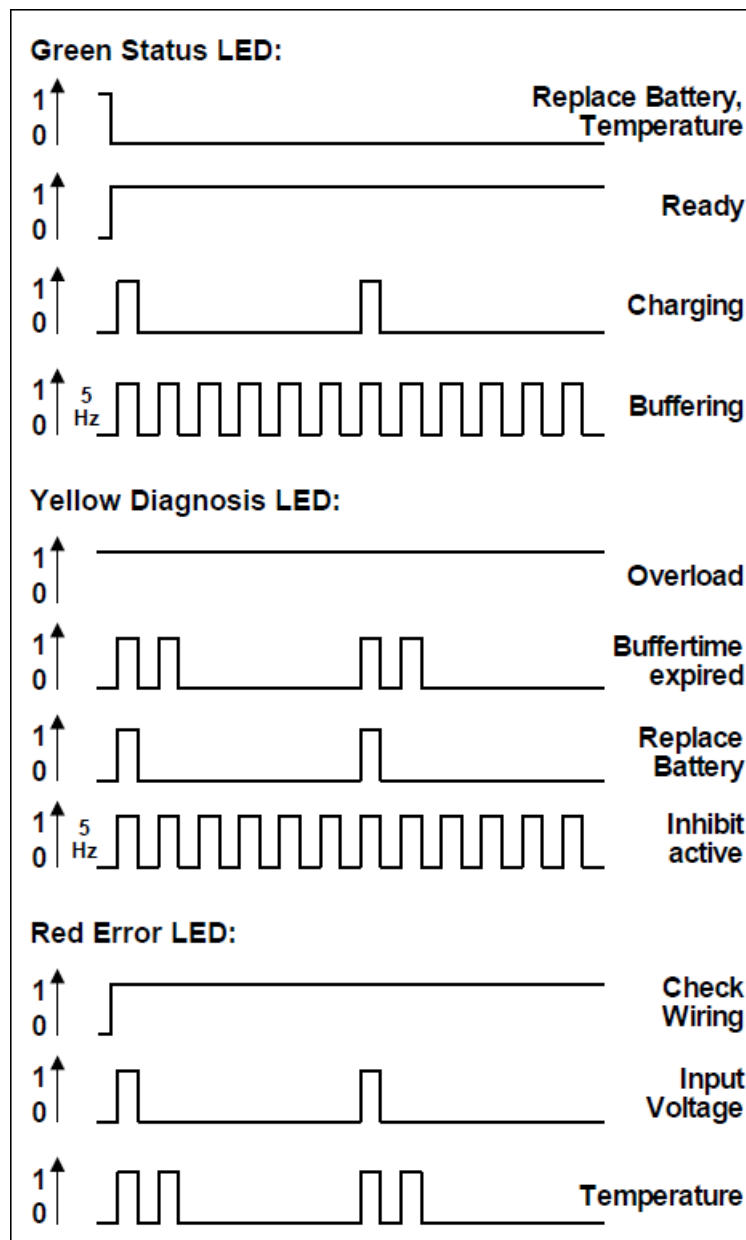
Ready, Buffering and Replace Battery Relay Contacts

- The Ready contact is closed when the battery is 85% charged and the unit is ready to buffer.
- The Buffering contact is closed when the unit is in buffer mode.
- The Replace Battery contact is closed when a battery replacement is necessary. The battery need to be replaced is indicated by the green LED which is off (input voltage required).
- Contact ratings: 30Vdc 1A, 30Vac 0.5A for resistive loads.

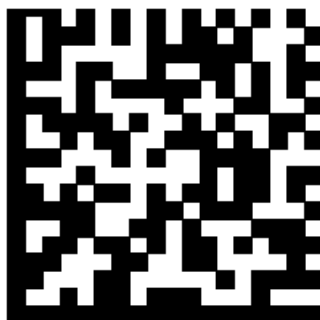
Battery-low Warning Contact

- The battery-low pre-warning contact closes shortly before the battery is discharged. Contact ratings: 30Vdc 1A, 30Vac 0.5A for resistive loads.

LED Signal Pattern



QR SCAN



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Documents / Resources



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UB40.241, DIN Rail Controller, Rail Controller, DIN Controller, Controller, UB40.241 Controller

References

- [PULS | No. 1 manufacturer of DIN rail power supplies](#)

[Manuals+.](#)