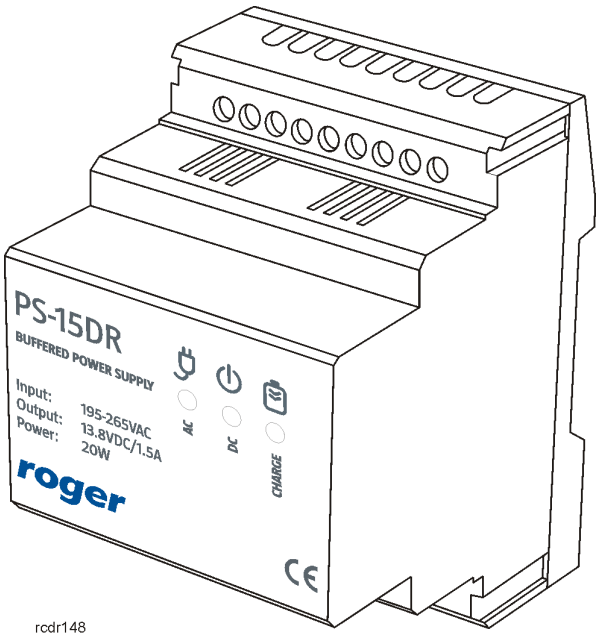
Roger Access Control System

Buffered Power Supply PS-15DR v1.0

Document version: Rev. C



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1. PRODUCT DESCRIPTION

The PS-15DR is dedicated for electronic equipment which require 12VDC buffered source of supply. At nominal condition PS-15DR can provide up to 1.5A output current with no time limit.
Although the PS-15DR was designed and tested for Roger Access Control System (RACS), anyway it can be used with any other applications requiring buffered supply source, in such cases an integrator or installer must verify that PS-15DR will operate satisfactory in given application.

2. CONSTRUCTION

PS-15DR is a switching mode power supply that can provide better efficiency then regular linear regulators. Also, due to lack of power transformer, it offers lower weight and size. Device enclosure is made from fire retardant polycarbonate plastic which protects user from high voltages existed inside the case and separates internal electronic module from unintentional penetration. For device and user safety electronic circuit employs overvoltage, overcurrent and thermal protection. Device contains screw type terminal blocs and front panel with LED indicators. PS-15DR enclosure is adapted for DIN 35mm (T35) standard rail and should be powered directly from 230VAC/50Hz AC line.

2.1 Output current

PS-15DR maximal output current is ambient temperature dependent. For nominal ambient temperature range of +5°C to +30°C device can deliver up to 1.5A with no time limit. At higher temperatures maximal output current decreases according to tradeoff characteristic as presented on Fig.1. For the highest allowed temperature +40°C device can provide 1A only.

Note: In case of overload power supply switches off and remains in this state as long as overload exists. In such a case entire load current is sourced from the reserve battery (if connected). If the overload is continued for long time enough it can lead to discharge of battery and total lack of supply on AUX output.

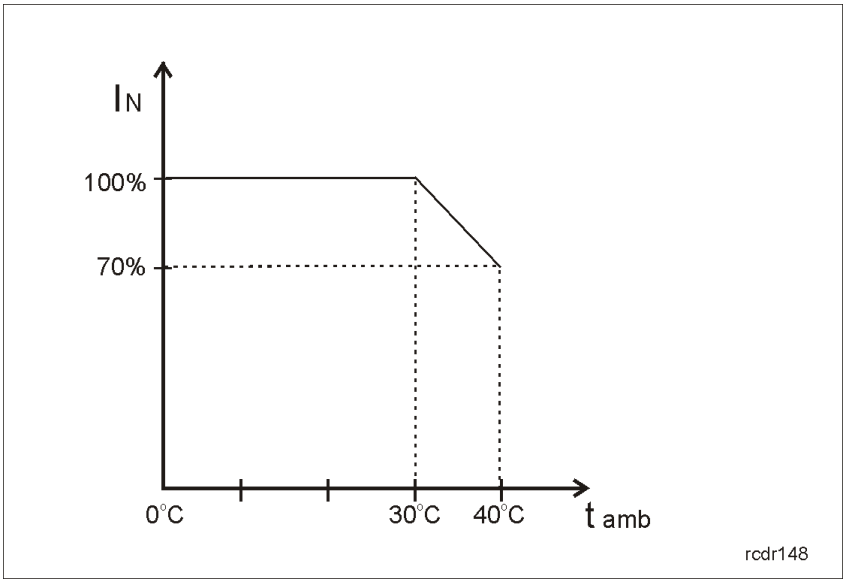


Fig.1 Tradeoff characteristic between nominal output current (I_N) and ambient temperature (t_{amb})

3. BATTERY MANAGEMENT

PS-15DR was designed to operate with a sealed lead-acid (SLA or AGM) 12V reserve battery. The reserve battery is connected to output terminals trough an ultra low-resistance MOS transistor. PS-15DR charge battery with *constant current-constant voltage* method with initial charging current set to ~0.3A. Device charges battery with initial current until the output voltage reaches 13.8V threshold, subsequently the output voltage will remain constant, whereas charge current will decrease spontaneously. This method of charging guaranties relatively quick and safe charging process.
Depending on battery charging phase the output voltage of PS-15DR may vary from ~ 11.5V up to 13.8V level. When battery voltage drops below ~10.0V internal circuit disconnects it from output load, battery is automatically reconnected when AC supply returns. Battery cut off circuit protects battery from deep discharge while the equipment connected to it from operation below 10.0V level which, in many cases can lead to undefined system behavior. Battery is protected with 2.5A resettable fuse which reduce maximum output current sourced from battery in case of battery reverse connection or output overload.

Note: When battery is charged the max output current available on AUX terminals is reduced by value equal to actual battery charging current.

4. PROTECTIONS

PS-15DR has been equipped with following protections for user and device safety:

Main protection (MP): 230VAC input is protected with glass slow blow fuse that disconnects electronic module in case when excessive current is drawn from AC line. This element isn't available for replacement and usually indicates very serious technical problem of the device.

Overcurrent (OCP) and short-circuit (SCP) protection: when output current rises above its nominal max value, device switches off and remains in this state as long as overload exists. PS-15DR resumes its operation as soon as overload disappears.

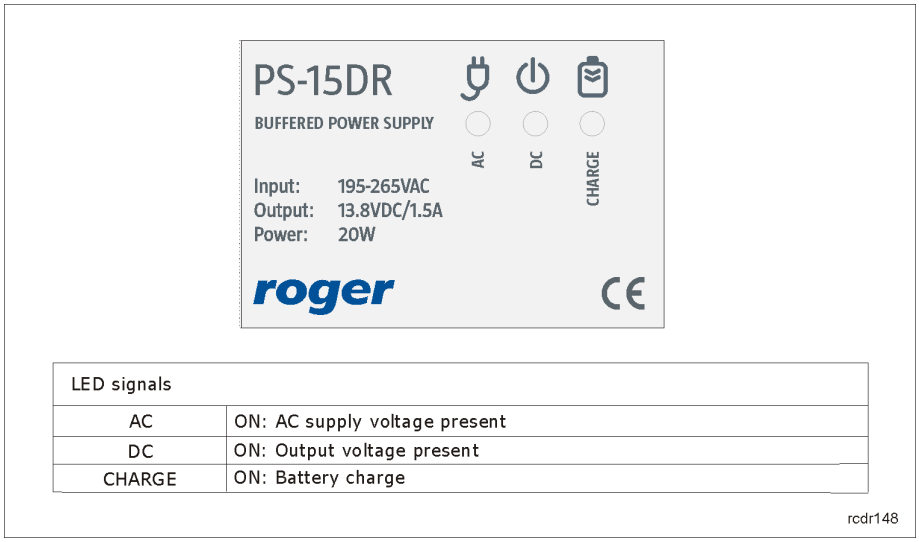
Overvoltage protection (UVP): the AUX outputs are protected with electronic components which are intended to protect device from overvoltage spikes.

Overheating protection (OHP): if temperature of the electronic module increases beyond safe limits devices switches off and remains in this state until devices is cooled.

Battery protection (BP): battery input is protected with resettable fuse which limits maximum output current sourced from battery in case of reverse polarity connection or output overload. Once the resettable fuse is triggered it is necessary to remove entire load from the battery before fuse restores.

5. FRONT PANEL

PS-15DR front panel is equipped with LED indicators described in Fig.2.



LED signals	
AC	ON: AC supply voltage present
DC	ON: Output voltage present
CHARGE	ON: Battery charge

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Fig.2 Front panel LED indicators

6. INSTALLATION

PS-15DR have to be mounted on DIN 35mm rail and in a vertical position as presented on Fig.3.

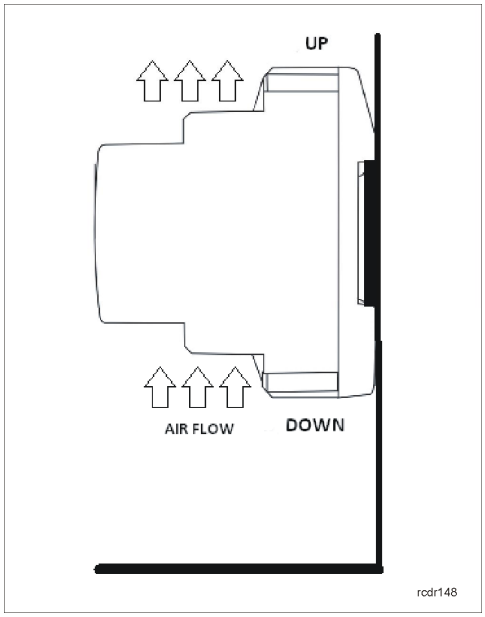


Fig.3 General installation principle

Power supply should be installed far enough from heat and moisture sources, device ventilation holes shall not be obstructed and free air convection or forced air flow must be provided to ensure proper exploitation. Without air circulation the power supply temperature can increase beyond permitted limits, device can overheat and switch off.

All electrical connection should be carried out with AC supply off. The AC supply double coated cable should be fixed to 230VAC input terminals.
Output voltage is available on two paralleled terminals AUX1 and AUX2 and supervised by common overcurrent and overvoltage protection.

Note: PS-15DR will not start operation on reserve battery, the AC supply must exists in order to start device operation.

7. SAFETY PRECAUTIONS

The electric installation must be carried out by qualified person. For safety precautions make wiring so that the mains power supply switch and safety fuse are placed between PS-15DR and AC source and will be available for user (i.e. designate for that purpose a standalone automatic circuit breaker inside local distribution box).

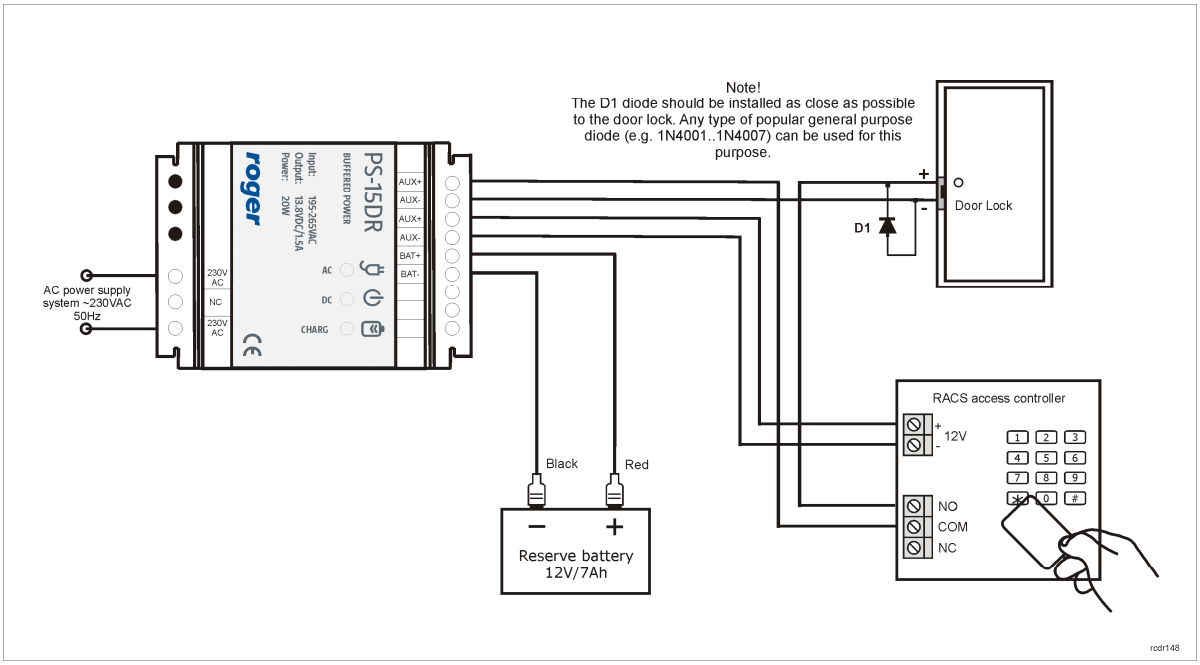


Fig.4 Access control application example

8. TERMINAL DESCRIPTION

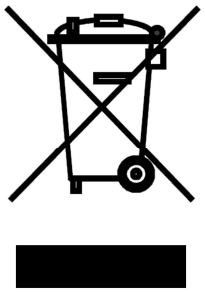
Terminal	Function
230VAC	230VAC line inputs, terminal N (NEUTRAL) and L (LINE)
BAT+	Battery positive terminal
BAT-	Battery negative terminal
AUX1+	Power supply AUX1 positive terminal
AUX1 -	Power supply AUX1 negative terminal
AUX2+	Power supply AUX2 positive terminal
AUX2 -	Power supply AUX2 negative terminal

9. TECHNICAL DATA

Parameter	Value/Description
Supply voltage	Nominal 230VAC, permitted 195..265VAC, root mean square value (RMS)
Supply current	0.15A, root mean square value (RMS)
Supply line frequency	50Hz
Environmental class (wg EN 50131-1)	Class I, indoor general conditions, temperature. +5°C - +40°C, relative humidity: 10..95% (no condensation)
Output voltage	13.8VDC, depending on battery charging phase, may vary from ~11.5V up to 13.8V level
Max. output current (without battery)	1.5A, maximum output current is guaranteed for unlimited time for ambient temp. range of +5°C to +30°C. For temperatures between +30°C and +40°C output current must be externally limited according tradeoff characteristic from Fig.1. During battery charging process output current will be reduced by value equal to battery charge current
Max. battery output current (momentary)	~2.5A
Initial battery charging current	~0.3A
Battery cut off voltage	~10.0V, battery will be reconnected when AC supply returns
Battery type	12V sealed lead-acid battery (SLA or AGM)
Enclosure material	Polycarbonate plastic, UL94V0 flammability class
Dimensions W x S x G	85 x 62 x 73mm
Weight	~150 g
Certificate	CE

10. PRODUCT HISTORY

Name	Date o publication	Description
PS-15DR v1.0	01/2013	First commercial release

	Such symbol on the product or its package means that the product should not be disposed together with other wastes, because it may cause negative effects to environment and humans health. User is responsible for delivering used equipment to the allotted locations for gathering used electrical and electronic devices. Detailed information on recycling can be found at relevant local authorities, in a disposing company or in a place, where the product was bought. Separate gathering and recycling of such wastes contributes to natural resources protection and is safe for humans health and for natural environment. The equipment's weight is shown in the guide.

Contact
Roger sp. z o. o. sp. k.
82-400 Sztum
Gosciszewo 59
Tel.: +48 55 272 01 32 Fax: +48 55 272 01 33
Technical support PSTN: +48 55 267 01 26
e-mail: biuro@roger.pl
Web: www.roger.pl