Dual Redundancy Module – 12...28V, 20 A

Catalog Number 1606-XLERED20

Allen-Bradley
by ROCKWELL AUTOMATION

Reference Manual

Original Instructions

Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

IMPORTANT Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.

SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.

BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.

ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

Table of Contents

Notes:

Terminology and Abbreviations

Terminology	Descriptions
DC 24V	A value that is displayed with the AC or DC before the value represents a nominal voltage with standard tolerances (usually ±15%) included. For example: DC 12V describes a 12V battery disregarding whether it is full (13.7V) or flat (10V).
24V DC	A value with the unit (V DC) at the end is a momentary value without any additional tolerances included.
1+1 Redundancy	Use of two identical power supplies in parallel to provide continued operation following most failures in a single power supply. The two power supply outputs should be isolated from each other by using diodes or other switching arrangements. For example, two 10 A power supplies are needed to achieve a 10 A redundant system. See Figure 1.
N+1 Redundancy	Use of three or more identical power supplies in parallel to provide continued operation following most failures in a single power supply. All power supply outputs should be isolated from each other by using diodes or other switching arrangements. For example, to achieve a 40 A redundant system, five 10 A power supplies are needed in an N+1 redundant system. See Figure 2.
nom	Indicates a nominal value.
typ	Indicates a typical value.
– (alone in table cell)	A single dash alone in a table cell indicates that there is no information to be included in that cell.

Figure 1 - 1+1 Redundancy

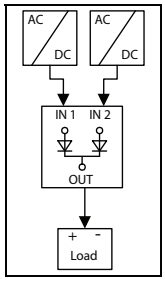
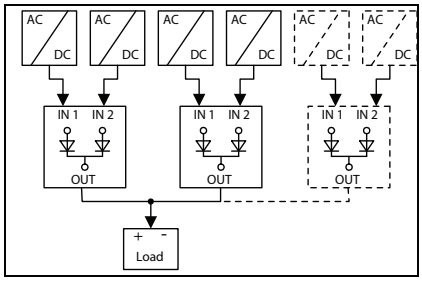


Figure 2 - N+1 Redundancy



All parameters are typical values that are specified at 24V, 20 A output current, 25 °C (77 °F) ambient and after a 5 minutes run-in time unless otherwise noted.

Product Overview

The 1606-XLERED20 is a redundancy module for building redundant power supply systems. It is equipped with two input channels and one output. MOSFET technology decouples the two inputs.

The 1606-XLERED20 uses MOSFETs instead of diodes for the decoupling of the two input channels. This design reduces the heat generation and the voltage drop between input and output. The redundancy module does not require an additional auxiliary voltage.

Due to the low power losses, the unit is slender and only requires 32 mm (1.26 in.) width on the DIN rail. Large connection terminals allow for a safe and fast installation. The large international approval package makes this unit suitable for a wide variety of applications.

Product features:

- For N+1 and 1+1 redundant systems
- Dual-input with single output
- Only 60 mV voltage drop at 10 A output current
- Only 0.6 W loss at 10 A
- 160% (32.5 A) peak load capability
- Reverse input polarity protection
- Full power from -40…+70 °C (-40…+158 °F)
- Width only 32 mm (1.26 in.)
- Rugged metal housing
- Easy wiring: distribution terminal for negative pole included

In addition to the 1606-XLERED20, there is another redundancy module available, the 1606-XLERED20Y. The 1606-XLERED20Y has the following features:

- Automated load sharing between the connected power supplies
- Monitoring for anomalies in the redundancy circuit
- Monitoring for output currents that are too high, which could help prevent redundancy if one power supply fails

For more information on the 1606-XLERED20Y, refer to Rockwell Automation Publication 1606-RM107-EN-P.

Figure 3 - 1606-XLERED20 Power Supply

Specifications

Attributes	Values	Notes
Input voltage	DC 12...28V	±30%
Input voltage range	8.4...36.4V DC	–
Input current	2 x 0...24 A	ambient < 45 °C (113 °F)(1)
	2 x 0...20 A	ambient < 70 °C (158 °F)(1)
Output current	0...24 A	ambient < 45 °C (113 °F)
	0...20 A	ambient < 70 °C (158 °F)
	26 A max	in overload(2) or short circuit mode
Input to output voltage drop	60 mV	input: 2 x 5 A
	110 mV	input: 2 x 10 A
Power losses	210 mW	at no load
	0.6 W	input: 2 x 5 A
	2.0 W	input: 2 x 10 A
Temperature range	-40...+70 °C (-40...+158 °F)	operational
Dimensions	32 x 124 x 117 mm (1.26 x 4.88 x 4.61 in.)	W x H x D
Weight	250 g (0.56 lb)	–

(1) The sum of both input currents must stay below 24 A, and 20 A, respectively.

(2) Currents at voltages below 6V.

Catalog Numbers

Catalog Numbers	Descriptions
1606-XLERED20	Redundancy module
1606-XLA-S37	Side-mount bracket

Input and Output Characteristics

Attributes		Values	Notes
Number of inputs	–	2	–
Number of outputs	–	1	–
Input voltage	Nom	DC 12...28V	±30%
Input voltage range	–	8.4...36.4V DC	–
Voltage drop, input to output	Typ	60 mV	at 2 x 5 A, 25 °C (77 °F), see Figure 4
	Typ	110 mV	at 2 x 10 A, 25 °C (77 °F), see Figure 4
	Typ	130 mV	at 2 x 12 A, 25 °C (77 °F), see Figure 4
Input current	Nom	2 x 0...24 A(1)	continuous, ambient temperature < 45 °C (113 °F)
	Nom	2 x 0...20 A(1)	continuous, ambient temperature < 70 °C (158 °F)
	Nom	2 x 32.5 A(2)	for 5 s max
	Max	2 x 700 A	for 1 ms max
Output current	Nom	24 A	continuous, ambient temperature < 45 °C (113 °F)
	Nom	20 A	continuous, ambient temperature < 70 °C (158 °F)
	Nom	32.5 A(3)	for 5 s max
	Max	26 A	In overload /short-circuit (voltage < 6V). Ensure that the sum of input currents does not exceed this value.
Reverse current	Max	1 mA	at 24V, per input, -40...+70 °C (-40...+158 °F)
Reverse voltage	Max	40V DC	voltage applied to the output continuously is allowed
Output capacitance	Typ	320 µF	–

(1) Ensure that the sum of both input currents stays below 24 A, and 20 A, respectively.

(2) Ensure that the sum of both input currents stays below 32.5 A.

(3) The average value (R.M.S. value) of the output current must not exceed the values of the continuous output current.

Figure 4 - Input to Output Voltage Drop

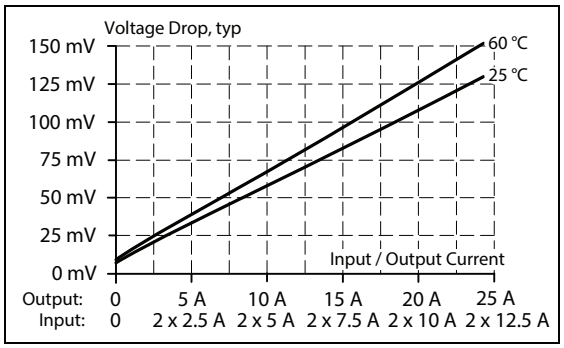
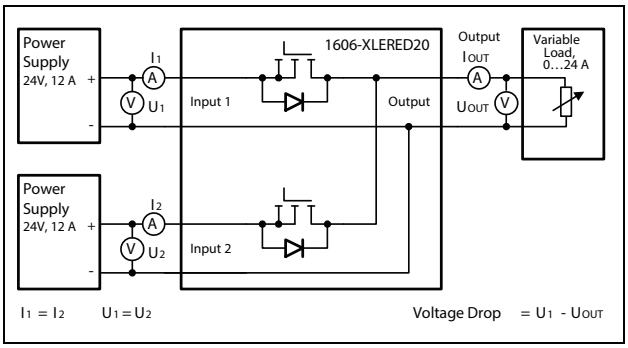


Figure 5 - Test Setup for Voltage Drop Measurements



Power Losses

Attributes		DC 12V Values	DC 24V Values	Notes
Power losses	typ	0.6 W	0.6 W	input: 2 x 5 A, ambient temperature: 25 °C (77 °F)
	typ	2.0 W	2.0 W	input: 2 x 10 A, ambient temperature: 25 °C (77 °F)
Standby power losses	typ	0.11 W	0.11 W	at no output current

Figure 6 - Power Losses

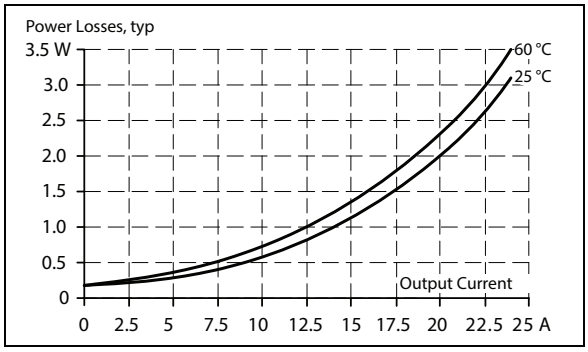
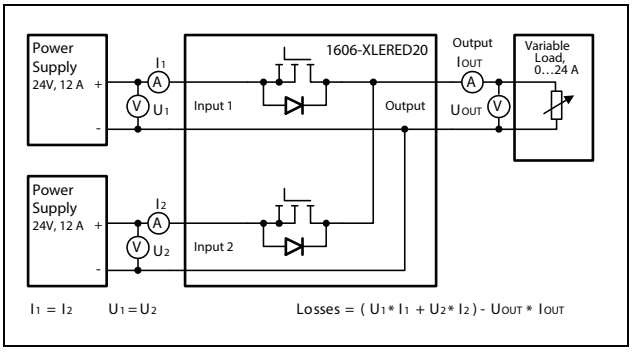


Figure 7 - Test Setup for Power Loss Measurements



Lifetime Expectancy and Mean Time Between Failure

The redundancy module has two input channels, which are completely independent from each other. Each control circuit, auxiliary voltage source, or other circuitry in the module are designed separately for each input. The dual-input redundancy module can be considered as two single redundancy modules combined in one housing. The only common point is the circuit trace that ties the two separate circuits together at the output.

The Mean Time Between Failure (MTBF) figures that are shown are for the entire dual-input module. If the MTBF number of only one path is needed, double the value from the table.

Attributes	Values Based on Input and Output Current Conditions		Notes
	Input: 2 x 5 A Output: 10 A	Input: 2 x 10 A Output: 20 A	
Lifetime expectancy(1)	553,000 hr	355,000 hr	at 24V and 40 °C (104 °F)
	1,563,000 hr	1,003,000 hr	at 24V and 25 °C (77 °F)
MTBF(2) SN 29500, IEC 61709	10,050,000 hr	7,895,000 hr	at 24V and 40 °C (104 °F)
	16,777,000 hr	13,403,000 hr	at 24V and 25 °C (77 °F)
MTBF(2) MIL HDBK 217F	2,030,000 hr	1,890,000 hr	Ground Fixed GF40: 24V, and 40 °C (104 °F)
	2,801,000 hr	2,588,000 hr	Ground Fixed GF25: 24V, and 25 °C (77 °F)
	441,000 hr	404,000 hr	Ground Benign GB40: 24V, and 40 °C (104 °F)
	604,000 hr	548,000 hr	Ground Benign GB25: 24V, and 25 °C (77 °F)

(1) The lifetime expectancies that are shown in the table indicate the minimum operating hours (service life) and are determined by the lifetime expectancy of the built-in electrolytic capacitors. Lifetime expectancy is specified in operational hours and is calculated according to the capacitor specification of the manufacturer. The manufacturer of the electrolytic capacitors only states a maximum life of up to 15 years (131,400 hr). Any number exceeding this value is a calculated theoretical lifetime, which can be used to compare devices.

(2) Mean Time Between Failure (MTBF) is calculated according to statistical device failures, and indicates reliability of a device. It is the statistical representation of the likelihood of a unit to fail and does not necessarily represent the life of a product. An MTBF figure is a statistical representation of the likelihood of a device to fail. An MTBF figure of for example 1,000,000 hr means that statistically one unit fails every 100 hours if 10,000 units are installed in the field. However, it cannot be determined if the failed unit has been running for 50,000 hr or only for 100 h.

Terminals and Wiring

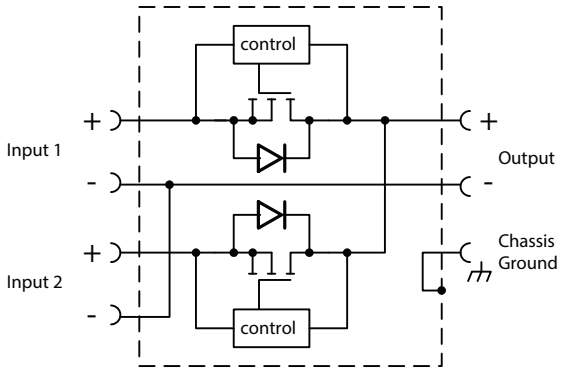
Input and Output Attributes	Values
Type	Screw termination, IP20 fingersafe construction. Suitable for field installation.
Solid wire	6 mm^2 max (0.0093 in^2 max)
Stranded wire	4 mm^2 max (0.0062 in^2 max)
American Wire Gauge	AWG 20...10
Wire diameter max	2.8 mm (0.11 in.) (including ferrule)
Wire stripping length	7 mm (0.28 in.)
Screwdriver	3.5 mm (0.14 in.) slotted or Pozidriv No 2
Recommended tightening torque	0.8 N•m (7 lb•in)

When wiring, be aware of the following:

- Use appropriate copper cables that are designed for minimum operating temperatures of:
  - 60 °C (140 °F) for ambient up to 45 °C (113 °F)
  - 75 °C (167 °F) for ambient up to 60 °C (140 °F)
  - 90 °C (194 °F) for ambient up to 70 °C (158 °F)
- Follow national installation codes and installation regulations.
- Ensure that all strands of a stranded wire enter the terminal connection.
- Screws of unused terminal compartments should be securely tightened.
- Ferrules are allowed.

Functional Diagram

Figure 8 - Functional Diagram



Front Side and User Elements

Figure 9 - Front Side

User Elements	
1	**Input Terminals for Input 1** (screw terminals)
2	**Input Terminals for Input 2** (screw terminals)
3	**Output Terminals** (screw terminals)
4	**Chassis Ground Terminal** Connection of the chassis is optional and not required since the unit fulfills the requirements according to protection class III.

Electromagnetic Compatibility

The redundancy module is suitable for applications in industrial, residential, commercial, and light industrial environments without any restrictions.

The following table shows EMC immunity according to generic standards EN 61000-6-1 and EN 61000-6-2.

Attributes	Standards	Values		Criteria
Electrostatic discharge	EN 61000-4-2	Contact discharge	8 kV	Criterion A(1)
		Air discharge	15 kV	Criterion A
Electromagnetic RF field	EN 61000-4-3	80 MHz...2.7 GHz	20V/m	Criterion A
Fast transients (Burst)	EN 61000-4-4	Input lines	2 kV	Criterion A
		Output lines	2 kV	Criterion A
Surge voltage on input lines	EN 61000-4-5	+ → -	500V	Criterion A
		+/- → Chassis ground	1 kV	Criterion A
Surge voltage on output lines	EN 61000-4-5	+ → -	500V	Criterion A
		+/- → Chassis ground	1 kV	Criterion A
Conducted disturbance	EN 61000-4-6	0.15...80 MHz	20V	Criterion A
Power-frequency magnetic field(2)	EN 61000-4-8	50 Hz	30 A/m	Criterion A

(1) Redundancy module shows normal operation behavior within the defined limits.

(2) A test is not applicable according to EN 61000-6-2, since the device does not contain components susceptible to magnetic fields, for example hall elements, and electrodynamic microphones.

The following table shows EMC Emission according to generic standards EN 61000-6-3 and EN 61000-6-4.

Attributes	Standards	Notes
Conducted emission input lines	IEC/CISPR 16-1-2, IEC/CISPR 16-2-1	limits for DC power ports according to EN 61000-6-3 fulfilled(1)(2)
Conducted emission output lines	IEC/CISPR 16-1-2, IEC/CISPR 16-2-1	limits for DC power ports according to EN 61000-6-3 fulfilled(1)(2)
Radiated emission	EN 55011, EN 55022	Class B(2)
This device complies with FCC Part 15 rules. Operation is subjected to following two conditions: 1. This device may not cause harmful interference. 2. This device must accept any interference received, including interference that may cause undesired operation.		

(1) For information only, not mandatory for EN 61000-6-3.

(2) Provided that power sources that are connected on the inputs fulfill the requirements too.

Switching frequency:

- The internal auxiliary supply is generated with a boost converter.
- The switching frequency varies from 140...500 kHz depending on the input voltage.

Environment

Attributes	Values	Notes
Operational temperature[1]	-40...+70 °C (-40...+158°F)	–
Storage temperature	-40...+85 °C (-40...+185°F)	for storage and transportation
Humidity[2]	5...95% r.H.	IEC 60068-2-30
Vibration sinusoidal[3]	2...17.8 Hz: ±1.6 mm (0.06 in.); 17.8...500 Hz: 2 g 2 hours / axis	IEC 60068-2-6
Shock[3]	30 g 6 ms, 20 g 11 ms 3 bumps / direction, 18 bumps in total	IEC 60068-2-27
Altitude	0...2000 m (0...6560 ft)	without any restrictions
	2000...6000 m (6560...20,000 ft)	reduce output power or ambient temperature, see Figure 11
Altitude derating	1.25 A/1000 m (1.25 A/3281 ft) or 5 °C/1000 m (9 °F/3281 ft)	> 2000 m (6500 ft), see Figure 11
Overvoltage category	not applicable	The concept of the overvoltage category is used for equipment that is energized directly from the low voltage mains (IEC 60664-1 §4.3.3.2.1).
Degree of pollution	2	EN 62477-1, not conductive
LABS compatibility	The unit does not release any silicone or other LABS-critical substances and is suitable for use in paint shops.	

(1) Operational temperature is the same as the ambient temperature and is defined as the air temperature 2 cm (0.79 in.) below the unit.

(2) Do not energize while condensation is present.

(3) Tested in combination with DIN rails according to EN 60715 with a height of 15 mm (0.59 in.) and a thickness of 1.3 mm (0.05 in.) and standard mounting orientation.

Figure 10 - Output Current Versus Ambient Temperature

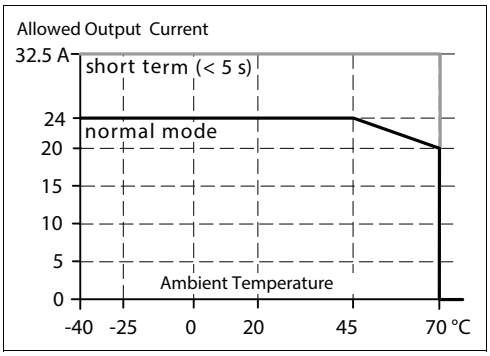
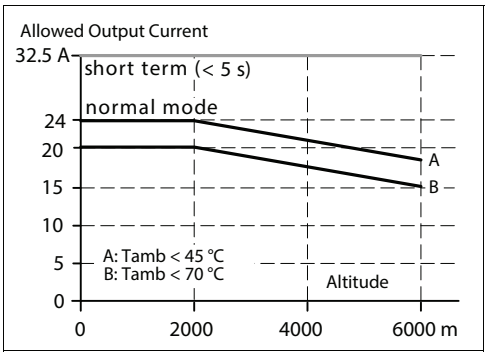


Figure 11 - Output Current Versus Altitude



Protection Features

Attributes	Values	Notes
Output overcurrent protection	not included	–
Reverse input polarity protection	included	unit does not start when input voltage is reversed
Degree of protection	IP 20	EN/IEC 60529
Penetration protection	> 3.6 mm (0.14 in.)	screws, small parts
Over-temperature protection	not included	–
Input transient protection	included	see Electromagnetic Compatibility on page 13
Output transient protection	included	see Electromagnetic Compatibility on page 13
Internal input fuse	not included	–

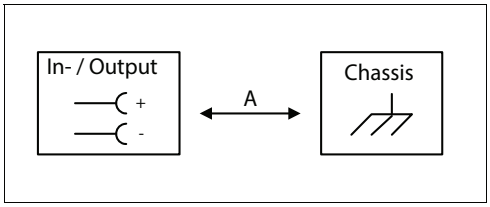
Safety Features

Attributes	Values	Notes
Input / output separation	no galvanic separation	MOSFET between input and output
Safety level of output voltage	The output voltage is regarded to be SELV (EN 60950-1) or PELV (EN 60204-1, EN 62477-1, IEC 60364-4-41) if the input voltage fulfills the requirements for a SELV source or PELV source.	
Class of protection	III	PE (Protective Earth) or chassis connection not required
PE resistance	< 0.1 Ohms	between housing and chassis-ground terminal

Dielectric Strength

The input and output voltages have the same reference, are floating and have no ohmic connection to ground. The manufacturer conducts the type and factory tests. Field tests may be conducted in the field using the appropriate test equipment, which applies the voltage with a slow ramp (2 s up and 2 s down). Connect input/output terminals together before conducting the test. When testing, set the cutoff current settings to the value in the table below.

Figure 12 - Dielectric Strength



Test/Setting	Time	A in Figure 12
Type test	60 s	500V AC
Factory test	5 s	500V AC
Field test	5 s	500V AC
Cutoff current setting	–	> 2 mA

Approvals

Approval Name	Approval Symbol	Notes
EU Declaration of Conformity	CE	The CE marking indicates conformance with the following: - EMC Directive - ATEX directive
IEC 60950-1	IECEE CB SCHEME	CB Scheme, Information Technology Equipment
UL 508	c UL US LISTED IND. CONT. EQ.	Listed for use as Industrial Control Equipment; U.S.A. (UL 508) and Canada (C22.2 No. 107-1-01); E-File: NMTR(7).E56639
UL 60950-1	c UL us	Recognized for use as Information Technology Equipment, Level 5; U.S.A. (UL 60950-1) and Canada (C22.2 No. 60950); E-File: QQGQ(2,8). E168663
ANSI / ISA 12.12.01-2007 Class I Div 2, planned	C SP US	LISTED for use in Hazardous Location Class I Div 2 T4 Groups A,B,C,D systems; U.S.A. (ANSI / ISA 12.12.01-2007) and Canada (C22.2 No. 213-M1987)
ATEX EN 60079-0, EN 60079-7	Ex II 3G Ex ec IIC T4 Gc	Suitable for use in Category 3 Zone 2 locations. Number of ATEX certificate: EPS 11 ATEX 1 312 X The redundancy module must be built in, in an IP54 enclosure.
IECEx IEC 60079-0, IEC 60079-7	IECEx Ex ec IIC T4 Gc	Suitable for use in Category 3 Zone 2 locations. Number of IECEx certificate: IECEx EPS 12.0032X
Marine, planned	GL	GL (Germanischer Lloyd) classified Environmental category: C, EMC1 Marine and offshore applications
EAC TR Registration	EAC	Registration for the Eurasian Customs Union market (Russia, Kazakhstan, Belarus)

Standards Compliance

Standard Name	Standard Symbol	Notes
RoHS Directive	RoHS ✓	Directive 2011/65/EU of the European Parliament and the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
REACH Directive	REACH ✓	Directive 1907/2006/EU of the European Parliament and the Council of Authorization, and regarding the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

Approximate Dimensions and Weight

Attributes	Values and Notes
Width	32 mm (1.26 in.)
Height	124 mm (4.88 in.)
Depth	117 mm (4.61 in.) The DIN rail height must be added to the unit depth to calculate the total required installation depth.
Weight	250 g (0.56 lb)
DIN rail	Use 35 mm (1.38 in.) DIN rails according to EN 60715 or EN 50022 with a height of 7.5 mm (0.30 in.) or 15 mm (0.59 in.).
Housing material	Body: Aluminum alloy, Cover: Zinc-plated steel
Installation clearances	Keep the following installation clearances when the device is loaded permanently with more than 50% of the rated power: 40 mm (1.57 in.) on top, 20 mm (0.79 in.) on the bottom, 5 mm (0.20 in.) on the left and right sides. Increase the left and right side clearances to 15 mm (0.59 in.) if the adjacent device is a heat source (for example, another power supply).

Figure 13 - Front View

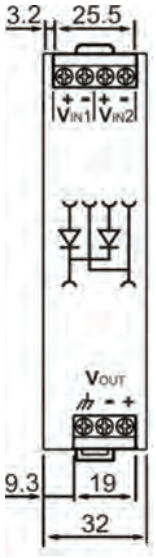
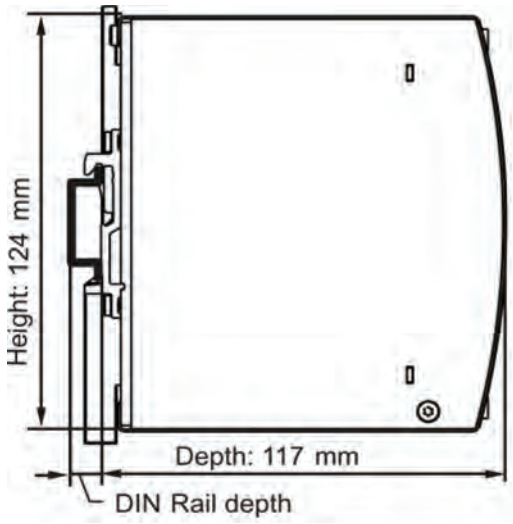


Figure 14 - Side View



All dimensions in mm

Side Mounting Bracket

The side mounting bracket is used to mount the redundancy module sideways with or without using a DIN rail. The two aluminum brackets and the black plastic slider of the unit have to be detached, so that the steel brackets can be mounted. For sideways DIN rail mounting, the removed aluminum brackets and the black plastic slider must be mounted on the steel bracket. All dimensions in Figure 17 are in millimeters.

Figure 15 - Side Mounting Without DIN Rail Brackets

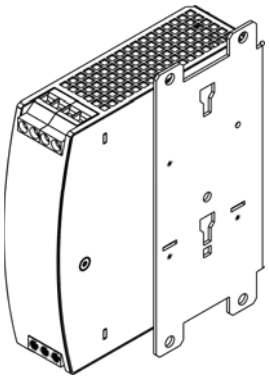


Figure 16 - Side Mounting With DIN Rail Brackets

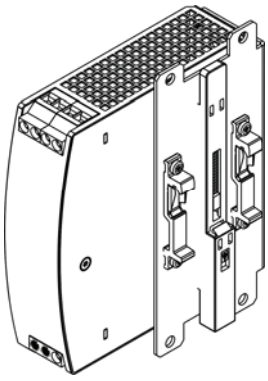
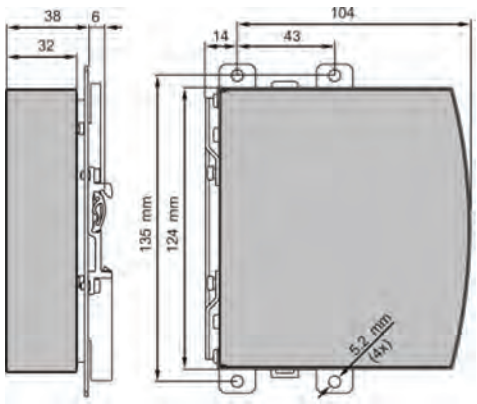


Figure 17 - Dimensions of Redundancy Module With Side Mounting Bracket Attached



Using Only One Input Instead of Both Channels

Using only one input instead of both is allowed up to a nominal input current of:

- 24 A at 45 °C (113 °F) ambient temperature max
- 20 A at 70 °C (158 °F) ambient temperature max

However, it is always recommended to connect both input paths in parallel for reduced power losses and voltage drop. If only one input paths is used, the following values can be expected:

Attributes		Values	Notes
Voltage drop, input to output	Typ	80 mV	at 1 x 10 A, 25 °C (77 °F), see Figure 18
	Typ	150 mV	at 1 x 20 A, 25 °C (77 °F), see Figure 18
Power losses	Typ	0.75 W	at 1 x 10 A, 25 °C (77 °F), see Figure 20
	Typ	3.0 W	at 1 x 20 A, 25 °C (77 °F), see Figure 20
Standby power losses	Typ	0.07 W	at 12V operation
	Typ	0.14 W	at 24V operation

Figure 18 - Input to Output Voltage Drop when Only One Input is Used

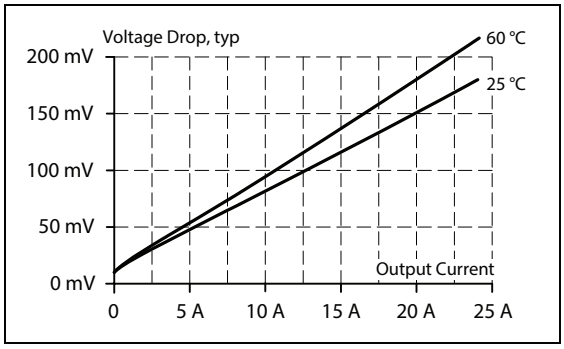


Figure 19 - Test Setup for Voltage Drop Measurements

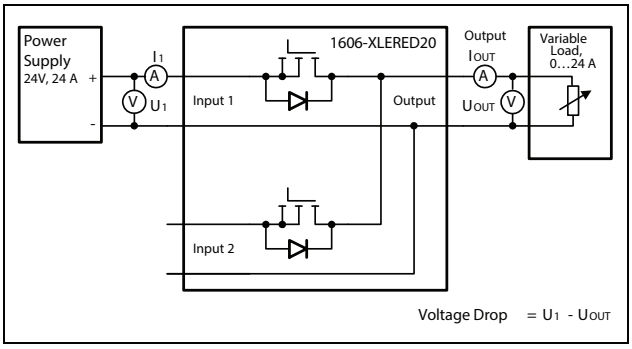


Figure 20 - Power Losses when Only One Input is Used

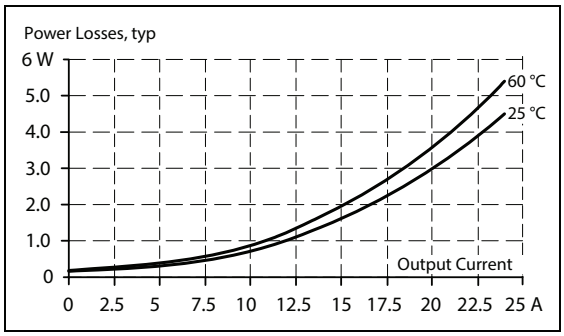
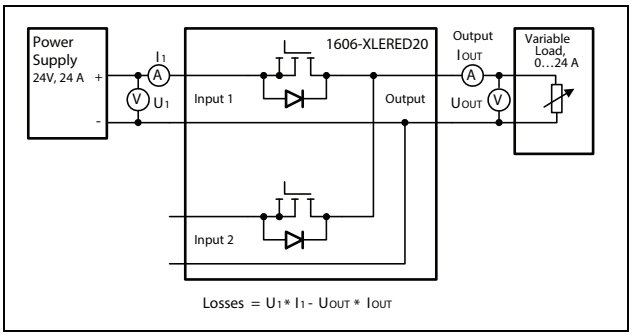


Figure 21 - Test Setup for Power Loss Measurements



Recommendations for Redundancy

Recommendations for the configuration of redundant power systems:

- Use separate input fuses for each power supply.
- Use three-phase power supplies to gain additional safety if one phase fails.
- When single-phase power supplies are used, connect them to different phases or mains circuits if possible.
- Set the power supply in “Parallel-Use” mode if this feature is available.
- It is desirable to set the output voltages of all power supplies to the same value.

Inductive and Capacitive Loads

The unit is designed to supply any kind of loads, including unlimited capacitive and inductive loads.

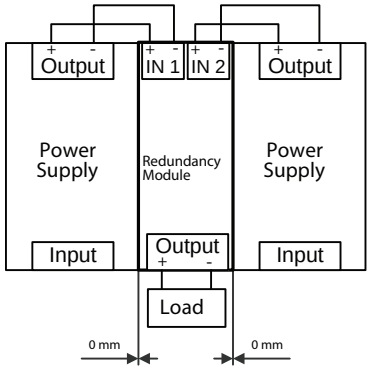
Applications that Allow Reduced Side Clearances

Normally, when the device is loaded permanently with more than 50% of the rated power, the left and right side installation clearances are 5 mm (0.20 in.). The left and right side clearances are increased to 15 mm (0.59 in.) if the adjacent device is a heat source (for example, another power supply).

Under certain conditions, the left and right side clearances between the power supplies and the redundancy module can be reduced to zero. Conditions for zero side clearance include:

- 1+1 redundancy application with maximum 12 A output current.
- The power supplies are from the 1606-XLE series.
- The redundancy module is placed between the two power supplies.
- The output voltage is set to the same level on both power supplies.

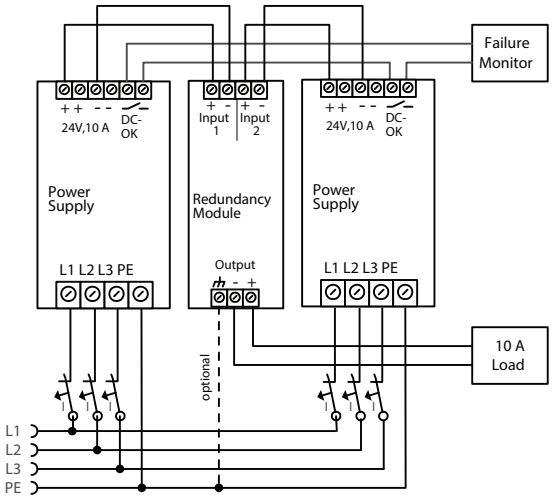
Figure 22 - Application with Reduced Side Clearances



1+1 Redundancy Up to 10 A

1+1 Redundancy up to 10 A requires two 10 A power supplies and one 1606-XLERED20 redundancy module.

Figure 23 - Wiring Diagram, 1+1 Redundancy, 10 A Output Current

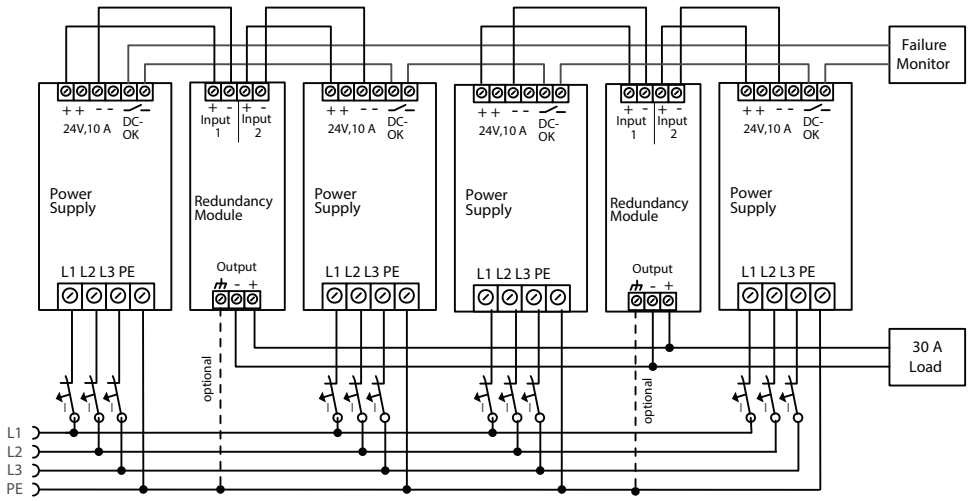


IMPORTANT Use separate mains systems for each power supply whenever it is possible.

N+1 Redundancy, Example with 30 A

N+1 Redundancy up to 30 A requires four 10 A power supplies and two 1606-XLERED20 redundancy modules.

Figure 24 - Wiring Diagram, N+1 Redundancy, 30 A Output Current



IMPORTANT Use separate mains systems for each power supply whenever it is possible.

Mounting Orientations

Mounting orientations other than mounting orientations A (Figure 25) and B (Figure 26) require a reduction in continuous output power or a limitation in the maximum allowed ambient temperature. The amount of reduction influences the lifetime expectancy of the power supply. Therefore, mounting orientations C, D, and E are displayed with two different derating curves for continuous operation:

- **Curve A1:** Recommended output current.
- **Curve A2:** Max allowed output current (results in approximately half the lifetime expectancy of A1).

Figure 25 - Mounting Orientation A: Standard Orientation

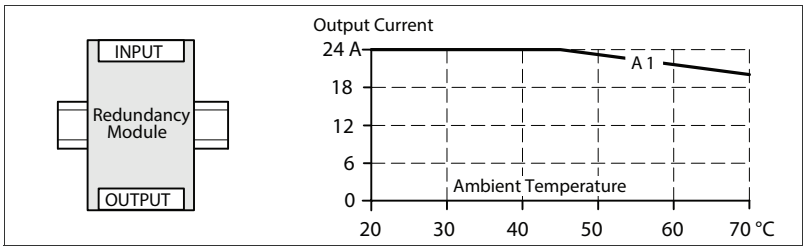


Figure 26 - Mounting Orientation B: Upside Down

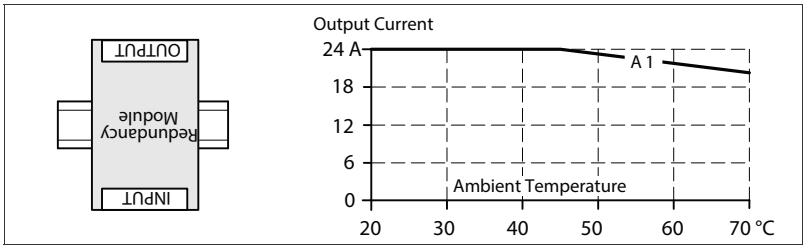


Figure 27 - Mounting Orientation C: Table-top Mounting

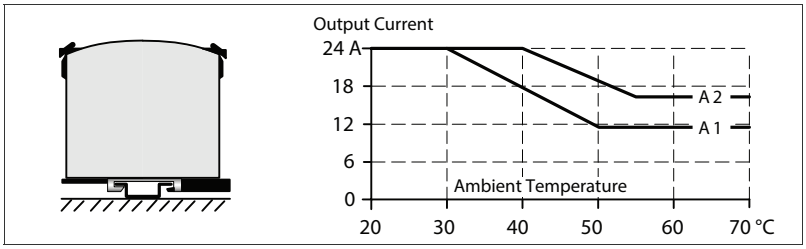


Figure 28 - Mounting Orientation D: Horizontal with Input on the Right

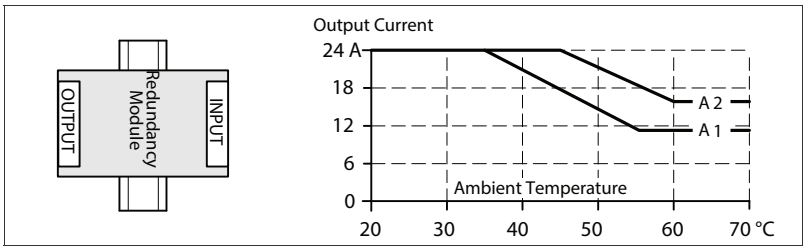
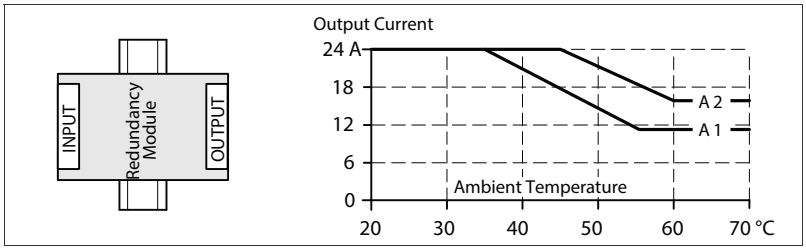


Figure 29 - Mounting Orientation E: Horizontal with Input on the Left



Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Switched Mode Power Supply Specifications Technical Data, publication 1606-TD002	Provides specifications for Bulletin 1606-XL, -XLE, -XLP, and -XLS products and applications.
Industrial Components Preventive Maintenance, Enclosures, and Contact Ratings Specifications, publication IC-TD002	Provides a quick reference tool for Allen-Bradley industrial automation controls and assemblies.
Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control, publication SGI-1.1	Designed to harmonize with NEMA Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications.	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at rok.auto/literature.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	rok.auto/support
Knowledgebase	Access Knowledgebase articles.	rok.auto/knowledgebase
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	rok.auto/pcdc

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Waste Electrical and Electronic Equipment (WEEE)

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental information on its website at rok.auto/pec.

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