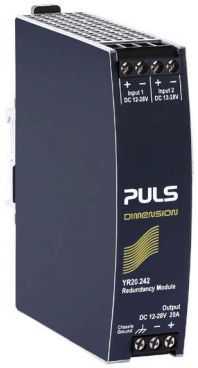
YR20.242

12-28V, 20A, DUAL REDUNDANCY MODULE



MOSFET REDUNDANCY MODULE

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

PRODUCT DESCRIPTION

The YR20.242 is a redundancy module for building redundant power supply systems. It is equipped with two input channels and one output. The two inputs are decoupled by MOSFET technology.

In addition to the YR20.242, the YR20.246 is available which is featured with an automated load sharing between the connected power supplies and functions which monitor defects in the redundancy circuit or too high output currents, which could prevent redundancy, if one power supply fails.

The YR20.242 utilizes MOSFETs instead of diodes for the decoupling of the two input channels. This 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 very slender and only requires 32mm 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 nearly every application.

SHORT-FORM DATA

Input voltage	DC 12-28V	±30%
Input voltage range	8.4-36.4Vdc	
Input current	2x 0-24A	ambient <+45°C**)
	2x 0-20A	ambient <+70°C**)
Output current	0-24A	ambient <+45°C
	0-20A	ambient <+70°C
	max. 26A	in overload*) or short circuit mode
Input to output voltage drop	60mV	input: 2x5A
	110mV	input: 2x10A
Power losses	210mW	at no load
	0.6W	input: 2x5A
	2.0W	input: 2x10A
Temperature range	-40°C to +70°C	operational
Dimensions	32x124x117mm	WxHxD
Weight	250g	

*) Currents at voltages below 6V
**) Sum of input current of both input max. 20A rsp. 24A

ORDER NUMBERS

Redundancy Module	**YR20.242**	
Accessory	ZM11.SIDE	Side mount bracket

MAIN APPROVALS

For details and the complete approval list, see chapter

UL 508 | UL 60950-1 | Class I Div 2

ATEX | IECEx

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INDEX

	Page
1. Intended Use	3
2. Installation Instructions	3
3. Input and Output Characteristics	5
4. Power Losses	6
5. Lifetime Expectancy and MTBF	6
6. Terminals and Wiring	7
7. Functional Diagram	7
8. Front Side and User Elements	8
9. EMC	9
10. Environment	10
11. Protection Features	11
12. Safety Features	11
13. Dielectric Strength	11
14. Approved, Fulfilled or Tested Standards	12
15. Regulatory Product Compliance	13
16. Physical Dimensions and Weight	14
17. Accessories	15
17.1. ZM11.SIDE - Side Mounting Bracket	15
18. Application Notes	16
18.1. Using Only One Input instead of Both Channels	16
18.2. Recommendations for Redundancy	17
18.3. Inductive and Capacitive Loads	17
18.4. Sideward Installation Clearances	17
18.5. 1+1 Redundancy up to 10A	18
18.6. N+1 Redundancy, Example with 30A	18
18.7. Mounting Orientations	19

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TERMINOLOGY AND ABREVIATIONS

DC 24V A figure displayed with the AC or DC before the value represents a nominal voltage with standard tolerances (usually ±15%) included.
E.g.: DC 12V describes a 12V battery disregarding whether it is full (13.7V) or flat (10V)

24Vdc A figure with the unit (Vdc) at the end is a momentary figure without any additional tolerances included.

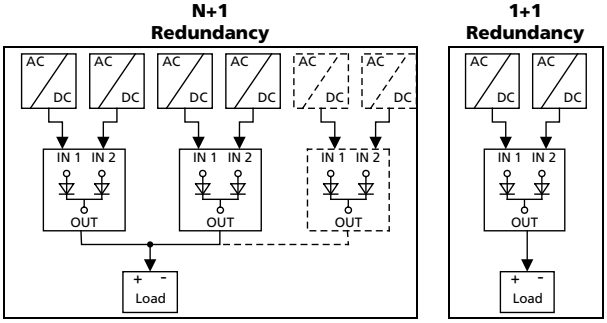
may A key word indicate flexibility of choice with no implied preference

shall A key word indicate a mandatory requirement

should A key word indicate flexibility of choice with a strongly preferred implementation

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 utilizing diodes or other switching arrangements. E.g. two 10A power supplies are needed to achieve a 10A redundant system.

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 utilizing diodes or other switching arrangements.
E.g.: To achieve a 40A redundant system, five 10A power supplies are needed in a N+1 redundant system.



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1. 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 malfunction may cause severe personal injury or threaten human life.

The redundancy module can be used with any type of power supply as long as the maximum output current ratings are not exceeded. It is suitable for power supplies with continuous overload current as well as any kind of intermittent (Hiccup) overload behavior.

2. INSTALLATION INSTRUCTIONS

⚠ WARNING Risk of electrical shock, fire, personal injury or death.

- Turn power off before working on the device and protect against inadvertent re-powering.
- Do not open, modify or repair the device.
- Use caution to prevent any foreign objects from entering into 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 surface may cause burns.

Obey the following installation instructions:

This device may only be installed and put into operation by qualified personnel.

This device does not contain serviceable parts. The tripping of an internal fuse is caused by an internal defect.

If damage or malfunction should occur during installation or operation, immediately turn power off and send unit to the factory for inspection.

Install the device in an enclosure providing protection against electrical, mechanical and fire hazards.

Do not ground or earth the positive output pole which could prevent redundancy in case of a ground failure. Ground the negative output pole, when needed.

Use only power supplies with a negligible output ripple voltage in the low frequency range between 50Hz and 10kHz when used in marine applications according to the GL regulations.

Install the device onto a DIN rail according to EN 60715 with the output terminals on the bottom of the device. Other mounting orientations require a reduction in output current.

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.

Unused screw terminals should be securely tightened.

The device is designed for pollution degree 2 areas in controlled environments. No condensation or frost is allowed.

The enclosure of the device provides a degree of protection of IP20.

The input must be powered from a PELV or SELV source or an “Isolated Secondary Circuit” in order to maintain a SELV or PELV output.

Check correct input polarity. The device will not operate when input voltage is reversed.

The device is designed as “Class of Protection III” equipment according to IEC 61140.

A PE (ground) connection is not required. However, connecting the chassis ground terminal to ground can be beneficial to gain a high EMI immunity.

The device is designed for convection cooling and does not require an external fan. Do not obstruct airflow and do not cover ventilation grid!

The device is designed for altitudes up to 6000m. See additional requirements in the product datasheet for use above 2000m.

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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. Under special circumstances clearances can be reduced. See details in the product datasheet.

The maximum surrounding air temperature is +70°C. 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.

Installation Instructions for Hazardous Location Areas

The device is suitable for use in Class I Division 2 Groups A, B, C, D locations and for use in Group II Category 3 (Zone 2) environments.

Hazardous Location classification: ATEX: EPS 11 ATEX 1 312 X, II 3G Ex ec IIC T4 Gc

⚠ WARNING EXPLOSION HAZARDS!

Substitution of components may impair suitability for this environment.

Do does not disconnect the device unless power has been switched off or the area is known to be non-hazardous.

A suitable enclosure must be provided for the end product which has a minimum protection of IP54 and fulfils the requirements of the EN 60079-0

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3. INPUT AND OUTPUT CHARACTERISTICS

Number of inputs		2	
Number of outputs		1	
Input voltage	nom.	DC 12-28V	±30%
Input voltage range		8.4-36.4Vdc	
Voltage drop, input to output	typ.	60mV	at 2x5A, 25°C, see Fig. 3-1
	typ.	110mV	at 2x10A, 25°C, see Fig. 3-1
	typ.	130mV	at 2x12A, 25°C, see Fig. 3-1
Input current	nom.	2x 0-24A [1)]	continuous, ambient temperature < +45°C
	nom.	2x 0-20A [1)]	continuous, ambient temperature < +70°C
	nom.	2x 32.5A [2)]	for max. 5 seconds
	max.	2x 700A	for max. 1ms
Output current	nom.	24A	continuous, ambient temperature < +45°C
	nom.	20A	continuous, ambient temperature < +70°C
	nom.	32.5A [3)]	for max. 5 seconds
	max.	26A	in overload /short-circuit (voltage < 6V). Ensure that the sum of input currents does not exceed this value.
Reverse current	max.	1mA	at 24V, per input, -40°C to +70°C
Reverse voltage	max.	40Vdc	voltage applied to the output, continuously allowed
Output capacitance	typ.	320µF	

1) Ensure that the sum of both input currents stays below 24A rsp. 20A.
2) Ensure that the sum of both input currents stays below 32.5A.
3) The average value (R.M.S. value) of the output current must not exceed the values of the continuous output current.

Fig. 3-1 **Input to output voltage drop**

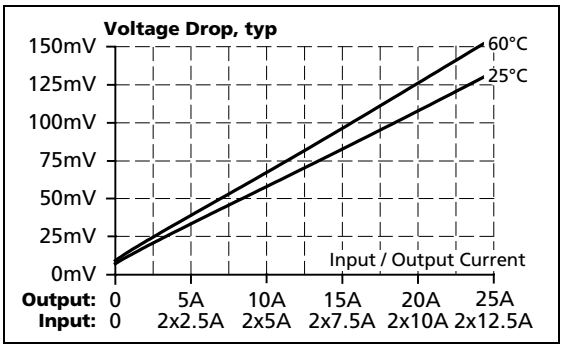
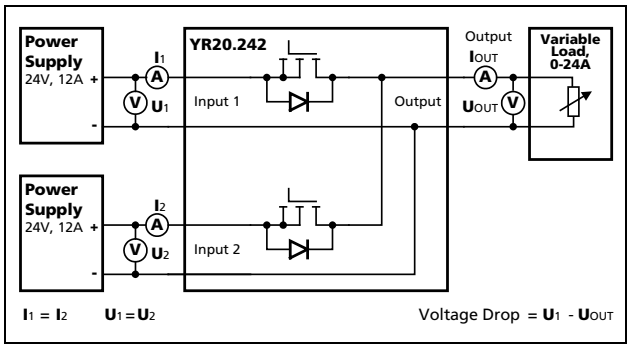


Fig. 3-2 **Test setup for voltage drop measurements**



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4. POWER LOSSES

		DC 12V	DC 24V	
Power losses	typ.	0.6W	0.6W	input: 2x5A, ambient temperature: 25°C
	typ.	2.0W	2.0W	input: 2x10A, ambient temperature: 25°C
Standby power losses	typ.	0.11W	0.21W	at no output current

Fig. 4-1 **Power losses**

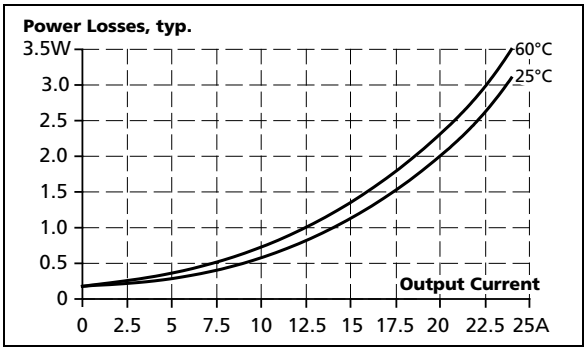
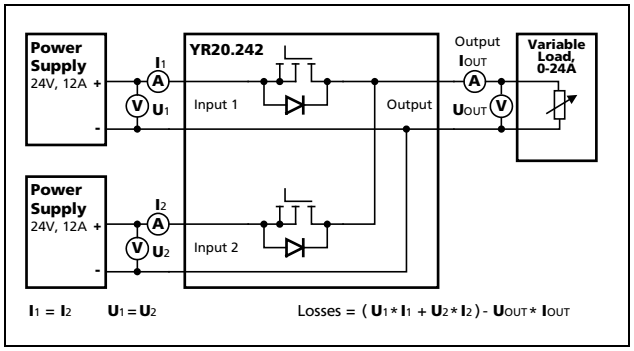


Fig. 4-2 **Test setup for power loss measurements**



5. LIFETIME EXPECTANCY AND MTBF

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 together in one housing. The only common point is the circuit trace that ties the two separate circuits together at the output.

The MTBF figures below are for the entire dual input module. If the MTBF number of only one path is needed, simply double the value from the table.

Input / output current conditions	**Input: 2x5A Output: 10A**	**Input: 2x10A Output: 20A**	
Lifetime expectancy*)	553 000h *)	355 000h *)	at 24V and 40°C
	1 563 000h *)	1 003 000h *)	at 24V and 25°C
MTBF**) SN 29500, IEC 61709	10 050 000h	7 895 000h	at 24V and 40°C
	16 777 000h	13 403 000h	at 24V and 25°C
MTBF**) MIL HDBK 217F	2 030 000h	1 890 000h	Ground Fixed GF40 (24V and 40°C)
	2 801 000h	2 588 000h	Ground Fixed GF25 (24V and 25°C)
	441 000h	404 000h	Ground Benign GB40 (24V and 40°C)
	604 000h	548 000h	Ground Benign GB25 (24V and 25°C)

*) The **Lifetime expectancy** shown in the table indicates the minimum operating hours (service life) and is 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's manufacturer specification. The manufacturer of the electrolytic capacitors only guarantees a maximum life of up to 15 years (131 400h). Any number exceeding this value is a calculated theoretical lifetime which can be used to compare devices.

) **MTBF stands for **M**ean **T**ime **B**etween **F**ailure, which 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.
The MTBF figure is a statistical representation of the likelihood of a device to fail. A MTBF figure of e.g. 1 000 000h means that statistically one unit will fail every 100 hours if 10 000 units are installed in the field. However, it can not be determined if the failed unit has been running for 50 000h or only for 100h.

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6. TERMINALS AND WIRING

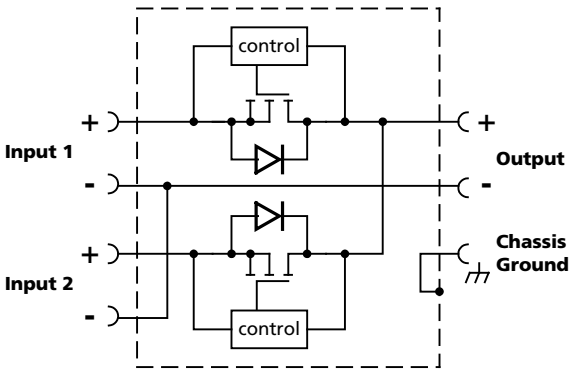
	Input and Output
Type	Screw termination, IP20 Finger safe construction. Suitable for field installation.
Solid wire	max. 6mm²
Stranded wire	max. 4mm²
American Wire Gauge	AWG 20-10
Max. wire diameter	2.8mm (including ferrule)
Wire stripping length	7mm
Screwdriver	3.5mm slotted or Pozidrive No 2
Recommended tightening torque	0.8Nm

Instructions:

a) Use appropriate copper cables that are designed for minimum operating temperatures of:
   60°C for ambient up to 45°C and
   75°C for ambient up to 60°C and
   90°C for ambient up to 70°C minimum.
b) Follow national installation codes and installation regulations!
c) Ensure that all strands of a stranded wire enter the terminal connection!
d) Screws of unused terminal compartments should be securely tightened.
e) Ferrules are allowed.

7. FUNCTIONAL DIAGRAM

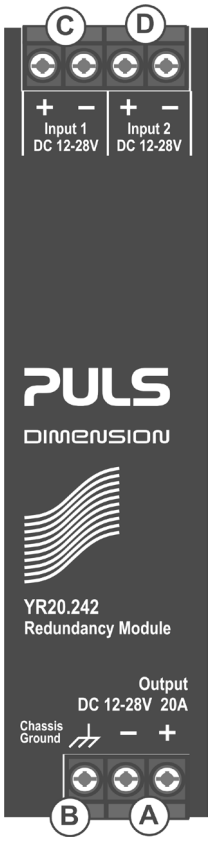
Fig. 7-1 **Functional diagram**



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8. FRONT SIDE AND USER ELEMENTS

Fig. 8-1 **Front side**



A **Output Terminals** (screw terminals)

B **Chassis Ground Terminal**
Connection of the chassis is optional and not required since the unit fulfils the requirements according to protection class III.

C **Input Terminals for Input 1** (screw terminals)

D **Input Terminals for Input 2** (screw terminals)

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9. EMC

The redundancy module is suitable for applications in industrial environment as well as in residential, commercial and light industry environment without any restrictions.

EMC Immunity	According to generic standards: EN 61000-6-1 and EN 61000-6-2			
Electrostatic discharge	EN 61000-4-2	Contact discharge Air discharge	8kV 15kV	Criterion A Criterion A
Electromagnetic RF field	EN 61000-4-3	80MHz-2.7GHz	20V/m	Criterion A
Fast transients (Burst)	EN 61000-4-4	Input lines Output lines	2kV 2kV	Criterion A Criterion A
Surge voltage on input lines	EN 61000-4-5	+ → - +/- → Chassis ground	500V 1kV	Criterion A Criterion A
Surge voltage on output lines	EN 61000-4-5	+ → - +/- → Chassis ground	500V 1kV	Criterion A Criterion A
Conducted disturbance	EN 61000-4-6	0.15-80MHz	20V	Criterion A
Power-frequency magnetic field [1]	EN 61000-4-8	50Hz	30A/m	Criterion A

Criterions:

A: Redundancy module shows normal operation behavior within the defined limits.

Notes:

1) A test is not applicable according to EN 61000-6-2, since the device does not contain components susceptible to magnetic fields, e.g. hall elements, electrodynamic microphones, etc.

EMC Emission	According to generic standards: EN 61000-6-3 and EN 61000-6-4	
Conducted emission input lines	IEC/CISPR 16-1-2, IEC/CISPR 16-2-1	limits for DC power ports according EN 61000-6-3 fulfilled [2) 3)]
Conducted emission output lines	IEC/CISPR 16-1-2, IEC/CISPR 16-2-1	limits for DC power ports according EN 61000-6-3 fulfilled [2) 3)]
Radiated emission	EN 55011, EN 55032	Class B [3)]

This device complies with FCC Part 15 rules.
Operation is subjected to following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Notes:

2) For information only, not mandatory for EN 61000-6-3.
3) Provided, that power sources 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 140kHz to 500kHz depending on the input voltage.

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10. ENVIRONMENT

Operational temperature *)	-40°C to +70°C	
Storage temperature	-40 to +85°C	for storage and transportation
Humidity **)	5 to 95% r.H.	IEC 60068-2-30
Vibration sinusoidal***)	2-17.8Hz: ±1.6mm; 17.8-500Hz: 2g 2 hours / axis	IEC 60068-2-6
Shock***)	30g 6ms, 20g 11ms 3 bumps / direction, 18 bumps in total	IEC 60068-2-27
Altitude	0 to 2000m	without any restrictions
	2000 to 6000m	reduce output power or ambient temperature, see Fig. 10-2
Altitude de-rating	1.25A/1000m or 5°C/1000m	> 2000m, see Fig. 10-2
Over-voltage category	not applicable	The concept of the overvoltage category is used for equipment energized directly from the low voltage mains (IEC 60664-1 §4.3.3.2.1).
Degree of pollution	2	EN 62477-1, not conductive

*) Operational temperature is the same as the ambient temperature and is defined as the air temperature 2cm below the unit.
**) Do not energize while condensation is present
***) Tested in combination with DIN rails according to EN 60715 with a height of 15mm and a thickness of 1.3mm and standard mounting orientation.

Fig. 10-1 **Output current vs. ambient temp.**

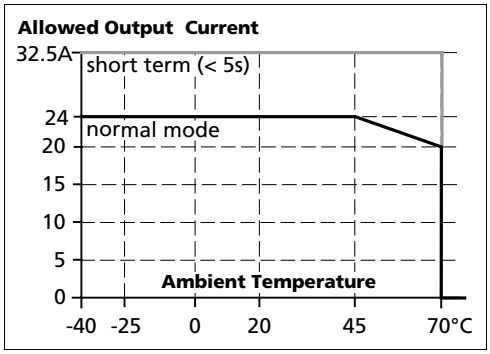
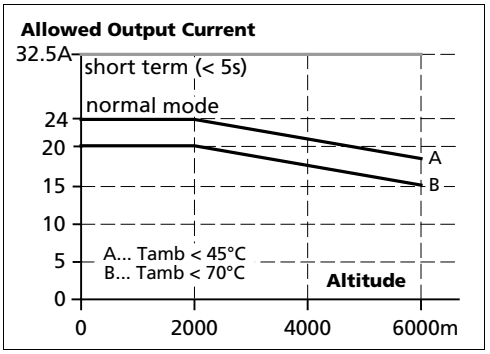


Fig. 10-2 **Output current vs. altitude**



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11. PROTECTION FEATURES

Output over-current protection	not included	
Reverse input polarity protection	included	unit does not start when input voltage is reversed
Degree of protection	IP20	EN/IEC 60529
Penetration protection	> 3.6mm	e.g. screws, small parts
Over-temperature protection	not included	
Input transient protection	included	see EMC section
Output transient protection	included	see EMC section
Internal input fuse	not included	

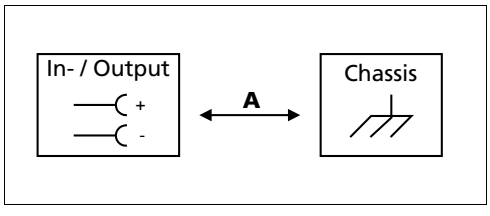
12. SAFETY FEATURES

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 fulfils the requirements for a SELV source or PELV source.	
Class of protection	III	PE (Protective Earth) or chassis connection not required
PE resistance	< 0.1Ohm	between housing and chassis-ground terminal

13. DIELECTRIC STRENGTH

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

Fig. 13-1 **Dielectric strength**



		A
Type test	60s	500Vac
Factory test	5s	500Vac
Field test	5s	500Vac
Cut-off current setting		> 2mA

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14. APPROVED, FULFILLED OR TESTED STANDARDS

UL 508	c UL US LISTED	UL Certificate Listed equipment for category NMTR - Industrial Control Equipment Applicable for US and Canada E-File: E198865
IEC 60950-1	CB Report	CB Scheme Certificate General safety requirements for Information Technology Equipment (ITE)
UL 60950-1	c RU US	UL Certificate Recognized component for category QQGQ - Information Technology Equipment (ITE) Applicable for US and Canada E-File: E137006
ATEX	Ex	Agency Certificate (Bureau Veritas) EN 60079-0 Explosive atmospheres - General requirements EN 60079-7 Equipment protection by type of protection "e" EN 60079-15 Equipment protection by type of protection "n" Certificate: EPS 11 ATEX 1 312 X Temperature Code: T4 Type of Protection: ec
IECEx	IECEx	IECEx Certificate IEC 60079-0 Explosive atmospheres - General requirements IEC 60079-7 Equipment protection by type of protection "e" IEC 60079-15 Equipment protection by type of protection "n" Certificate: IECEx EPS 12.0032 X Temperature Code: T4 Type of Protection: ec
Class I Div 2	c UL US LISTED	UL Certificate Listed equipment for category NRAD - Listed equipment Industrial Control Equipment for Use in Hazardous Locations Applicable for US and Canada E-File: E327416 Temperature Code: T4A Groups: A, B, C and D
IEC 60068-2-60	Corrosion IEC 60068-2-60 Method 4	Manufacturer's Declaration (Online Document) Environmental Tests, Flowing Mixed Gas Corrosion Test Test Ke - Method 4 H2S: 10ppb NO2: 200ppb Cl2: 10ppb SO2: 200ppb Test Duration: 3 weeks, which simulates a service life of 10 years.
ISA-71.04 G3	Corrosion G3-ISA-71.04	Manufacturer's Declaration (Online Document) Airborne Contaminants Corrosion Test Severity Level: G3 Harsh H2S: 100ppb NOx: 1250ppb Cl2: 20ppb SO2: 300ppb Test Duration: 3 weeks, which simulates a service life of 10 years
VDMA 24364	LABS VDMA 24364-C1-L/W	Paint Wetting Impairment Substances Test (or LABS-Test) Tested for Zone 2 and test class C1 according to VDMA 24364-C1-L/W for solvents and water-based paints

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15. REGULATORY PRODUCT COMPLIANCE

EU Declaration of Conformity	CE	The CE mark indicates conformance with the - EMC directive - ATEX directive - RoHS directive
REACH Regulation (EU)	REACH COMPLIANT	Manufacturer's Statement EU regulation regarding the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) fulfilled.
WEEE Regulation		Manufacturer's Declaration EU Regulation on Waste Electrical and Electronic Equipment Registered as business to business (B2B) products. EU Regulation 2012/19/EU
CCC	CCC	CCC Certificate China Compulsory Certification (CNCA-C23-01:2019) Certificate for devices made in Suzhou/China (PULS Electronics): 2021122303114925 Certificate for devices made in Chomutov/Czech Republic (PULS investiční): 2021122303114924 CCC-Ex

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16. PHYSICAL DIMENSIONS AND WEIGHT

Width	32mm
Height	124mm
Depth	117mm The DIN rail depth must be added to the unit depth to calculate the total required installation depth.
Weight	250g
DIN rail	Use 35mm DIN rails according to EN 60715 or EN 50022 with a height of 7.5 or 15mm.
Housing material	Body: Aluminium alloy Cover: Zinc-plated steel
Installation clearances	See chapter 2

Fig. 16-1 **Front view**

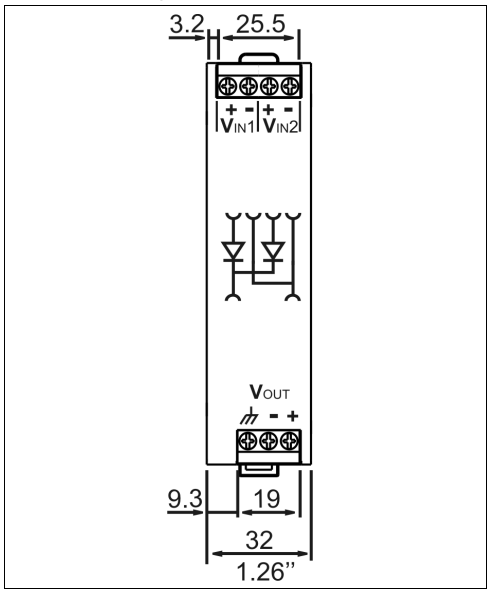
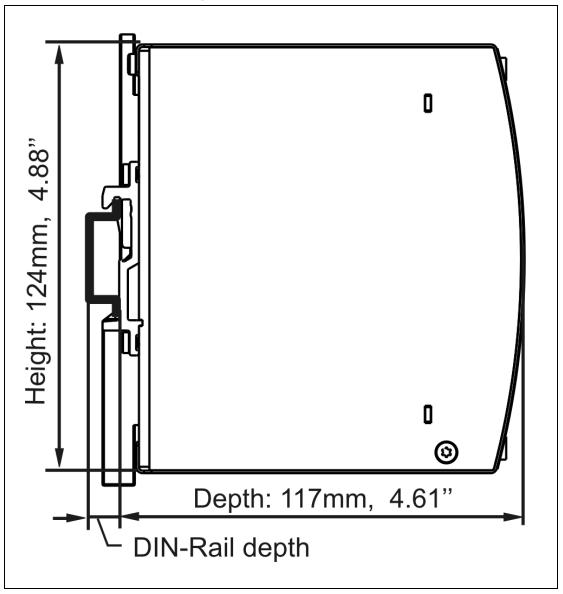


Fig. 16-2 **Side view**



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17. ACCESSORIES

17.1. ZM11.SIDE - SIDE MOUNTING BRACKET

This bracket is used to mount the YR20.242 redundancy module sideways with or without utilizing 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 sideway DIN rail mounting, the removed aluminum brackets and the black plastic slider need to be mounted on the steel bracket.

Fig. 17-1
Side mounting without DIN rail brackets

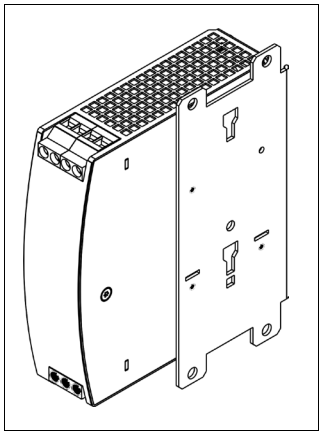


Fig. 17-2
Side mounting with DIN rail brackets

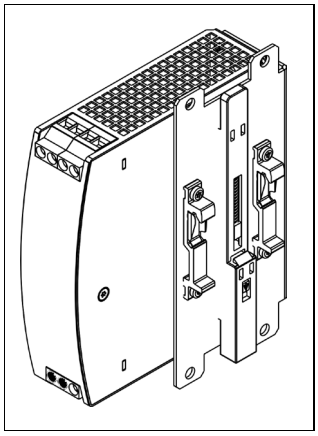
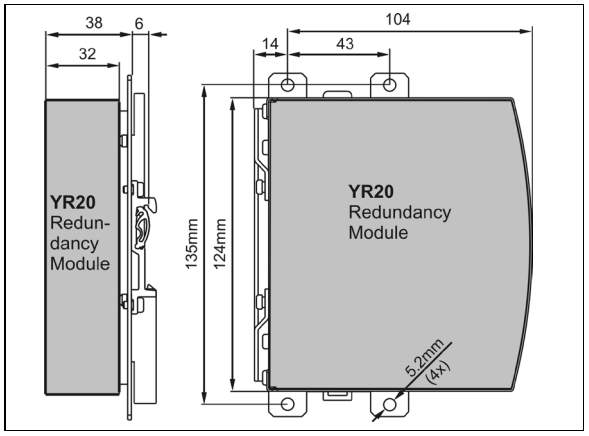


Fig. 17-3
Mounting Dimensions Side mounting bracket



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18. APPLICATION NOTES

18.1. USING ONLY ONE INPUT INSTEAD OF BOTH CHANNELS

Using only one input instead of both is allowed up to a nominal input current of 24A (at max. +45°C ambient temperature) or 20A (at max. +70°C ambient temperature).

However, it is always recommended to connect both input path in parallel for reduced power losses and voltage drop. In cases when this is not possible, the following values can be expected:

Voltage drop, input to output	typ.	80mV	at 1x10A, 25°C, see Fig. 18-1
	typ.	150mV	at 1x20A, 25°C, see Fig. 18-1
Power losses	typ.	0.75W	at 1x10A, 25°C, see Fig. 18-3
	typ.	3.0W	at 1x20A, 25°C, see Fig. 18-3
Standby power losses	typ.	0.07W	at 12V operation
	typ.	0.14W	at 24V operation

Fig. 18-1 **Input to output voltage drop when only one input is used**

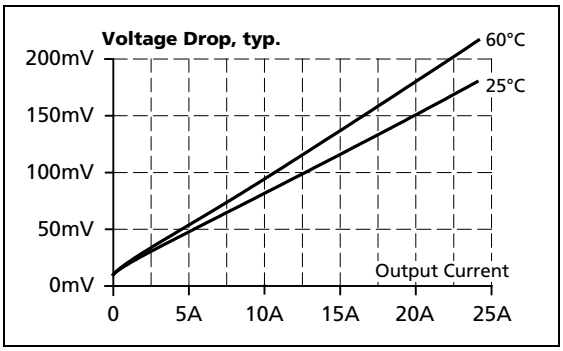


Fig. 18-2 **Test setup for voltage drop measurements**

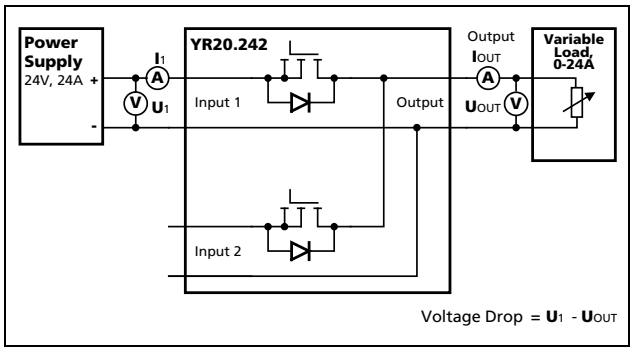


Fig. 18-3 **Power losses when only one input is used**

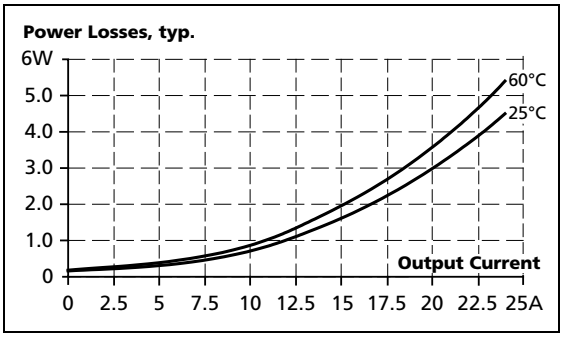
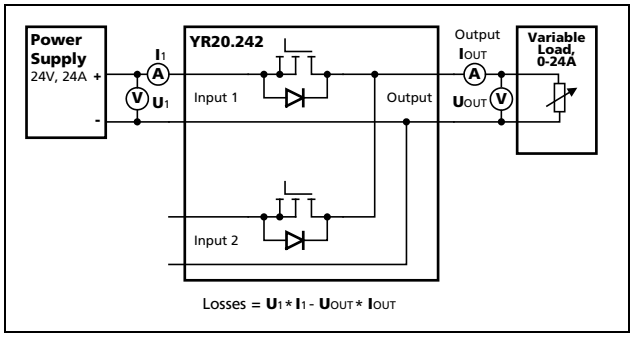


Fig. 18-4 **Test setup for power loss measurements**



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18.2. 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 utilized 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.

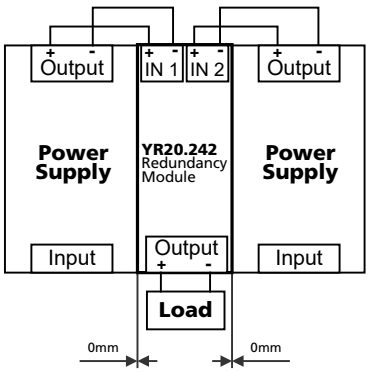
18.3. INDUCTIVE AND CAPACITIVE LOADS

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

18.4. SIDEWARD INSTALLATION CLEARANCES

The minimum clearance recommendations are defined in chapter 2.

Normally, the following installation clearance are recommended: 40mm on top, 20mm on the bottom, 5mm on the left and right sides when the device is loaded permanently with more than 50% of the rated power. Increase this clearance to 15mm in case the adjacent device is a heat source (e.g. another power supply).



The clearance between the power supplies and the redundancy module can be reduced to zero under the following conditions:

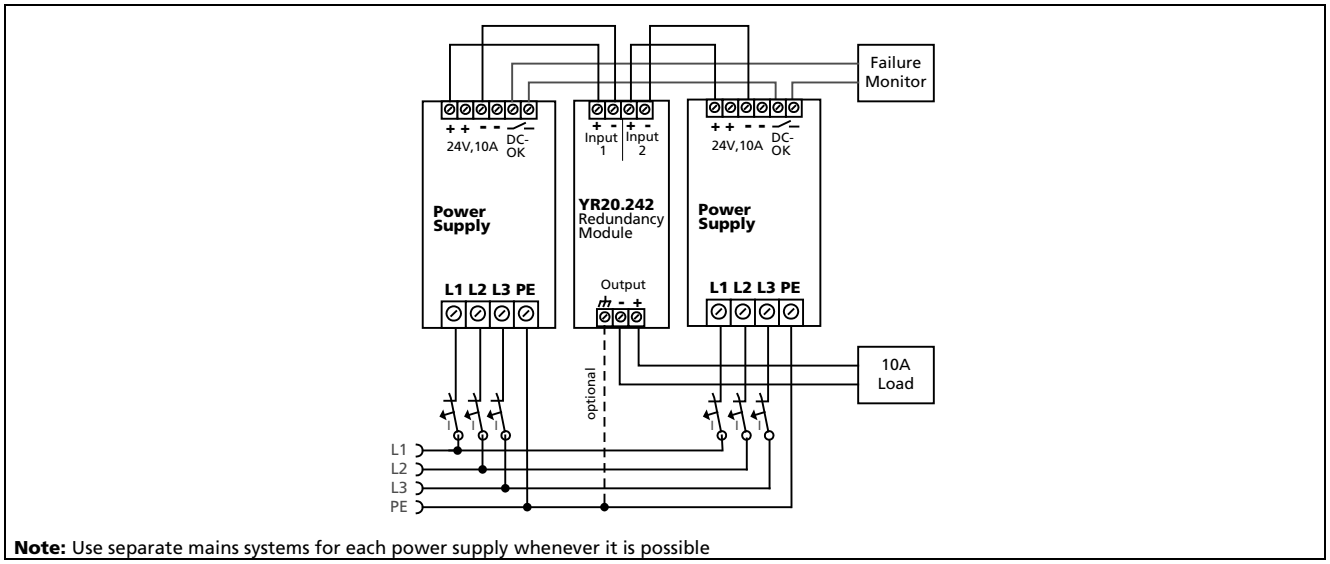
- 1+1 redundancy application with maximum 12A output current.
- The power supplies are from the PULS DIMENSION series.
- The redundancy module is placed between the two power supplies.
- The output voltage is set to the same level on both power supplies.

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18.5. 1+1 REDUNDANCY UP TO 10A

1+1 Redundancy up to 10A requires two 10A power supplies and one YR20.242 redundancy module.

Fig. 18-5 **Wiring diagram, 1+1 Redundancy, 10A output current**

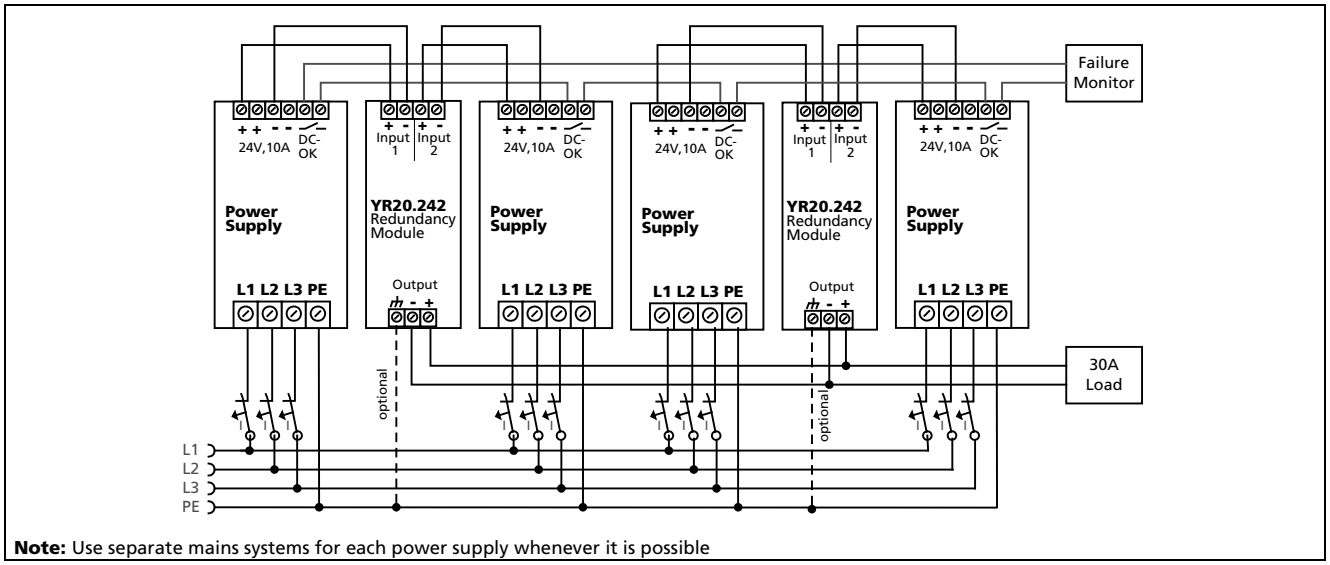


Note: Use separate mains systems for each power supply whenever it is possible

18.6. N+1 REDUNDANCY, EXAMPLE WITH 30A

N+1 Redundancy up to 30A requires four 10A power supplies and two YR20.242 redundancy modules.

Fig. 18-6 **Wiring diagram, n+1 Redundancy, 30A output current**



Note: Use separate mains systems for each power supply whenever it is possible

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18.7. MOUNTING ORIENTATIONS

Mounting orientations other than input terminals on the bottom and output on the top 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, two different derating curves for continuous operation can be found below:

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

Fig. 18-7
Mounting Orientation A
(Standard orientation)

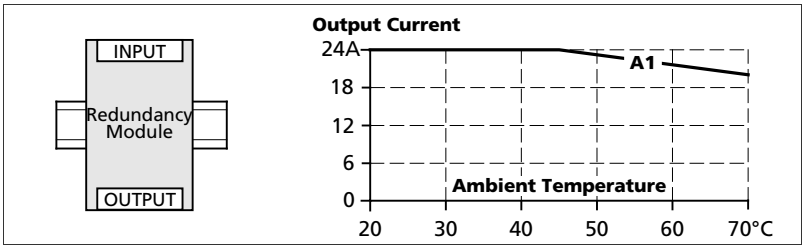


Fig. 18-8
Mounting Orientation B
(Upside down)

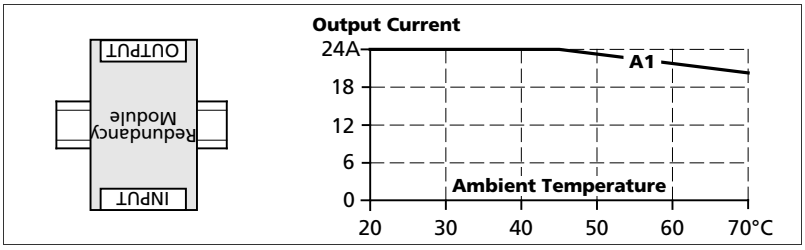


Fig. 18-9
Mounting Orientation C
(Table-top mounting)

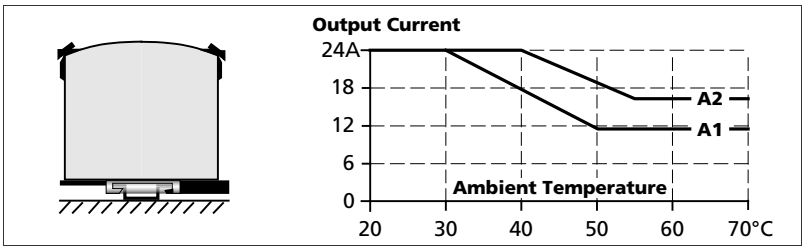


Fig. 18-10
Mounting Orientation D
(Horizontal cw)

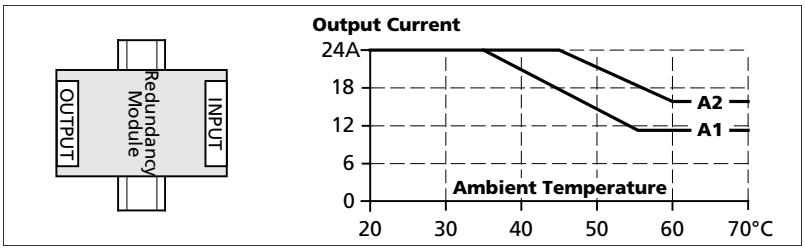
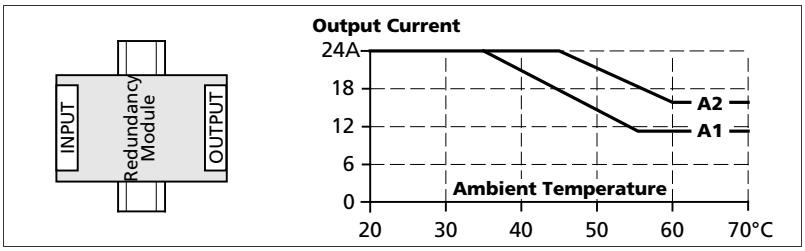


Fig. 18-11
Mounting Orientation E
(Horizontal ccw)



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