

BRUMIL 352 Remote Power Supply DC (for 230VAC in and 230VAC out)

The BRUMIL 352 is transporting power and data through the FO-Cu-hybrid-cable of SOLIFOS (e.g. BRUpowermil or BRUpowerfield) cable, a hybrid cable with copper conductors and optical fibers, to remote equipment over medium to long distances.

The BRUMIL 352 Hybrid Power and Optical Transmission Unit RPS (Remote Power Supply) feeds remote equipment with signal and power through a single hybrid cable. Application scope includes remote operation and mains supply of transmitter stations and other communication equipment. The RPS minimizes the effort for installations and operation and offers a very low volume and low weight solution.

Applications:

Typical RPS configuration: Ad-hoc connection between a mobile command unit ('supply side') and a remote operation unit ('remote side'), as sensors or actors (e.g. remote radar stations, UAV-base stations, remote microwave, or weapon systems)

Functionality

The RPS offers high data rate transmission and mains supply through a single hybrid cable. The hybrid cable comprises a high voltage power transmission cable and four single-mode optical fibers in a compact and lightweight construction. It terminates with a highly integrated, hybrid connector for simple mounting. This significantly reduces cabling complexity and installation time compared to traditional solutions where independent cables have to be installed for mains and data transmission. Furthermore, the RPS allows for replacement of remote power generators leading to improved reliability, reduced maintenance effort and no on site man power during operation, reduced emissions and thus improved target protection. Sophisticated provisions such as electronic transmission monitoring protect the equipment in cases of damage and guarantee safe and reliable operation. Four single-mode fiber connections provide high capacity data transmission channels, suited for setting up general purpose remote data networks, for feeding remote transmitter stations with signal and for remote operation of equipment.

Crucial features in the deployment

- High economic solution, due to smaller initial and operation costs
- Rapid availability of the current supply, simplest installation
- High mobility due to small dimensions and limited weight (installation of the cable with e.g. back-pack frame or vehicle winding frame)
- Maintenance- and pollution free operation (no fuel supply and no noise and heat emissions as with generators)
- High security against electrical accidents (all-insulated, CE certified)
- High reliability due to very durable and harsh-environment-suited design (high mechanical firmness, weather-proof, simple maintenance)
- High working reliability (constantly regulated supply voltage, permanent system monitoring device)

RPS-Master-Unit for near end and RPS-Remote-Unit for remote end are of the same size and type of case. Available as field case in protection bag or as 19"-6U-rack-mounting version.

There are special 19" boxes in plastic or metal to mount the RPS.

Box with 19"-frame 6U



Operational Principle:

The single-phase supply voltage (230 VAC) is transformed to the 1'500 VDC level and transmitted with low loss of voltage, via the specially designed FO-Cu-hybrid-cable (e.g. BRUpowermil or BRUpowerfield of Solifos), installed between isolated primary and secondary transformers. Two coaxial copper conductors are for power transmission and the implemented four optical fibers enable simultaneous end-to-end signal transmissions, e.g. fast Ethernet used for telephony, data transfer, video/audio, etc. via different standard interfaces.

Power interfaces:

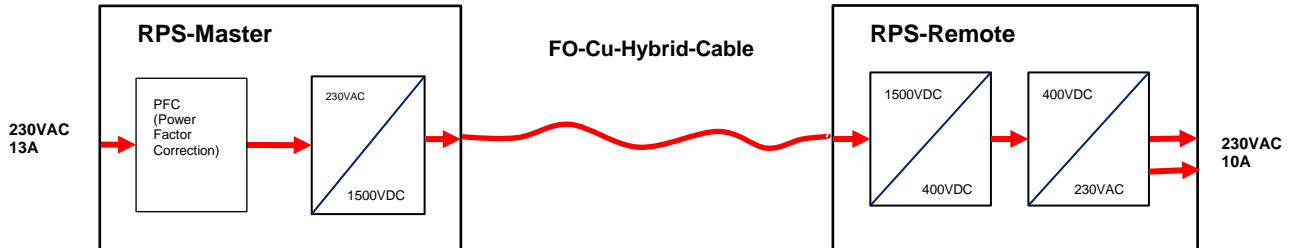
Power input	Power output
230 VAC	2x 230 VAC
13A	Tot. 10A

Type Identification:

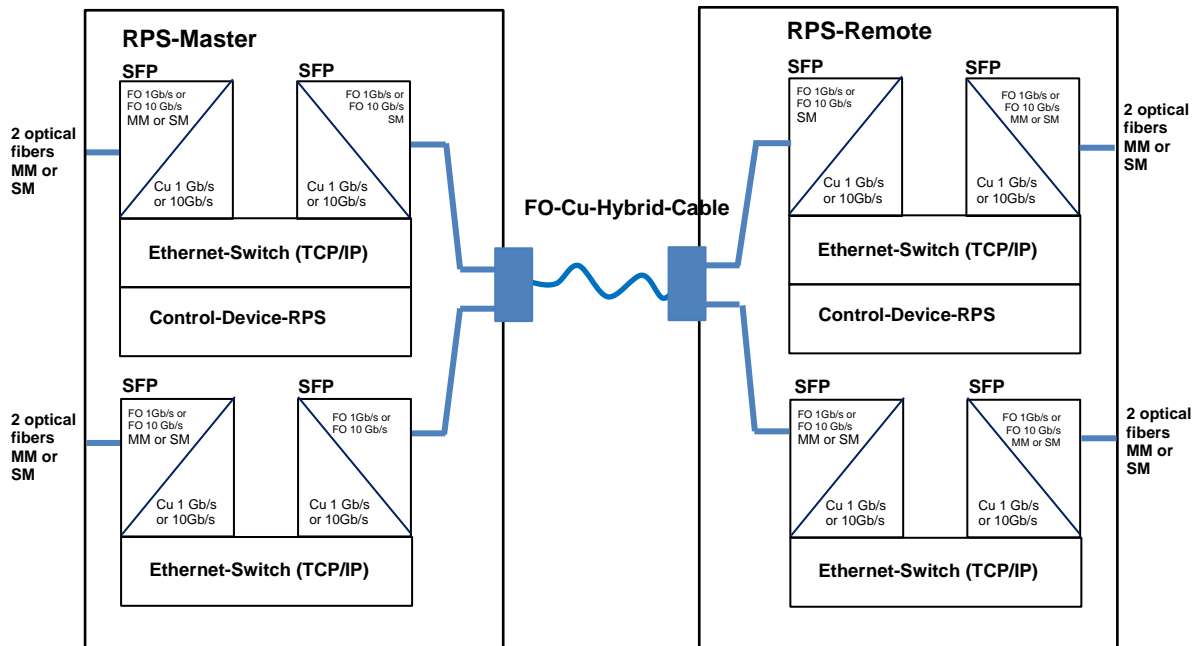
BRUMIL 352 DC 230VAC

Block Diagram:

Power:



Data:

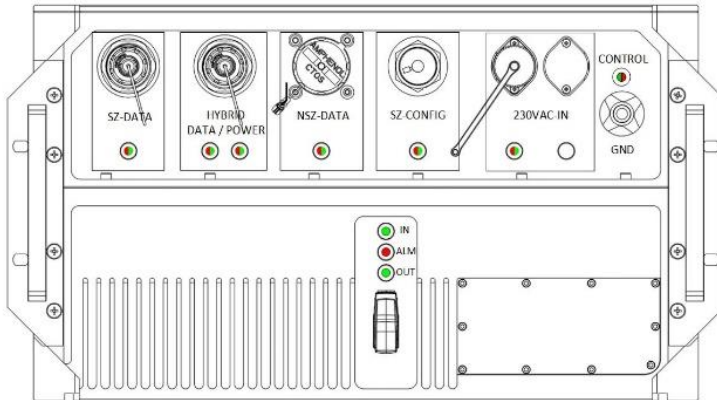


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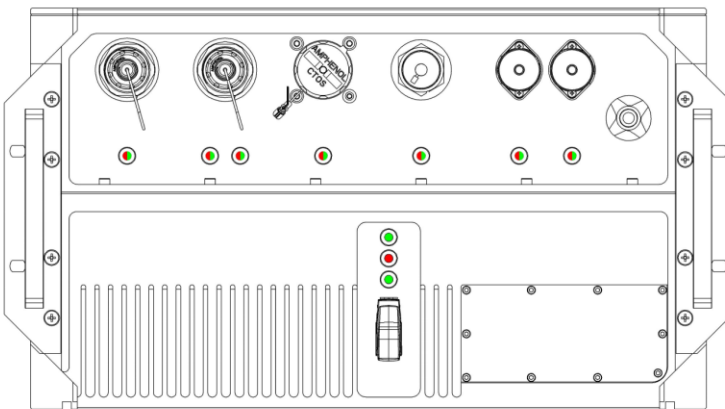
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2021/0406-1

Front View RPS-Master:



Front View RPS-Remote:



Front View in 19in-Box:



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Technical data:

Mechanical data		User Interface	
Size (WxHxD)/mm without textile bag, metal or plastic box	483x267x520	Mains switch	On/Off
Weight approx. no outer case	33kg	FO: CTOS / HMA	10 Gb/s or 1 Gb/s
Power supply		Status indication: Each Interface and function will have a clear status indication: LED green = o.k. LED red = alarm	LEDs for: <ul style="list-style-type: none"> • CTOS: data (green blinking) • CTOS: link green or red • HMA: data (green blinking) • HMA: link green or red • Hybrid: data (green blinking) • Hybrid: link green or red • Hybrid: power green or red • Ethernet: data (green blinking) • Ethernet: link green or red • 230VAC: voltage green or red • Main switch: green or off
Input voltage	230VAC/10A/50Hz ± 10%	Protection	
Output voltage	230VAC/50Hz ± 3% (regulated)	Isolation	3.5 kV
Max. output power	2.3 kVA permanent	FO Digital signal lines	Optical coupling of digital signal lines
Max. transmission length	1.5 km	Electrical data	SPD (LEMP)
Efficiency (RPS-Master, 1.5km hybrid cable and RPS-Remote)	80%	1500VDC / 230VAC	SPD (LEMP)
Environment		Power Transmission	Mains power transmission galvanically isolated and monitored with protective signal
Operation temperature	-30..+50°C MIL-STD-810, 502.4, procedure II, 501.4, procedure II	Overload protection	Electronic protection circuit
Storage temperature	-40..+70°C MIL-STD-810, 502.4, procedure I, 501.4, procedure I	Approvals	
Relative humidity (closed interfaces)	95% MIL-STD-810E, 507.3, procedure I, cycle 3	EMC emissions	MIL-STD 461E
Waterproof	IP65	EMC immunity	MIL-STD 461E, IEC 61000-4-2, IEC 61000-4-4, IEC 61000-6-2
Shock (device in transport case)	MIL-STD-810F, method 516.5, procedure I, impulse (20g, 11ms, saw tooth)	Transport	
Vibration (device in transport case)	MIL-STD-810F, method 514.5 (1.04g RMS according to 514.5C-1, 5 - 500 Hz)	Case	Shock absorbing carrying case
External I/O		FO-Cu-Hybrid cable: BRUpowermil, BRUpowerfield or BRUpowerfield slim with hybrid connector Type A	
Optical connectors	HMA (MIL-DTL-83526/21) 2F or 4F, MM or SM	Options	
Hybrid connector	CTOS (Amphenol) 2F MM or 4F MM 1 x pair copper for 1500VDC, 4 x single-mode FO (1310nm), RPS to RPS	<ul style="list-style-type: none"> • HEMP-, NEMP-, IEMI-protection • Customer specific variants are available 	
Electrical Ethernet	100/1000BaseT M38999		
230VAC In	Binder plug, series 693, 7pol pin		
230VAC Out	Binder plug, series 693, 7pol socket		

BRUMIL Systems

Norms and Standards:

Safety measures:

- Startup procedure with safe voltage limited to 100 VDC
- Integrated current leakage measurement for the master to slave power interface
- integrated open circuit protection for master to slave power interface
- Isolation monitoring
- No touchable electrical parts along the high voltage link
- GND pole

Environmental specs

Temperature*:	MIL-STD-810H (2019), Method 501 (high) and Method 502 (low) <ul style="list-style-type: none">• Operating -30°C to +50°C• Non-operating -40°C to +70°C
Altitude*:	MIL-STD-810H (2019), Method 500 (altitude) <ul style="list-style-type: none">• Operating 3500 m.a.s.l.• Non-Operating 4500 m.a.s.l.
Humidity*:	MIL-STD810H Natural (Operating) Cycle B1...B3, Induced (Storage and Transit) Cycle B1...B3, humidity up to 95%, 10 cycles. <ul style="list-style-type: none">• Operating, condensing, up to 50°C up to 95%• Non-Operating, condensing, up to 70°C up to 95%
Mechanical Shock*:	MIL-STD-810H Method 516.8 Procedure I <ul style="list-style-type: none">• 18 shocks, 3 in both directions of the three orthogonal axes. Each shock shall have time duration of 6-9 milliseconds, half-sine wave shape, with an acceleration peak value of 20g IAW
Drop*:	MIL-STD-810H Method 516.8 Procedure IV <ul style="list-style-type: none">• Single drop on critical axis, 0.5 m high over sand
Fungus*:	MIL-STD-810H <ul style="list-style-type: none">• Fungus inert material only
Transportation*:	MIL-STD810H Method 514.8 Category 4 Truck/Trailer Secured Cargo
Splash and heavy rain*:	MIL-STD-108E (splash proof) and rain of 100mm/h and wind of 18 m/s
Water and Dust*:	IP65 EN60529 (Option: IP67 is possible)
Sand and Dust*:	MIL-STD-810F Method 510.4.with 10.6 gr/m ³ dust and 1.1gr/m ³
Acceleration*:	<ul style="list-style-type: none">• Vertical (Y) direction: 2.5g• Transversal (X) direction: 1.0g• Longitudinal (Z) direction: 3.0g
Contamination (Fluid Susceptibility)*:	<ul style="list-style-type: none">• Water based automotive cleaning sprays• Fuels, diesel (gasoil) and gasoline• Automotive Hydraulic Fluids• Oils automotive.• Coolants Glycol derivatives
Solar Radiation*:	MIL-STD 210E (for Switzerland Region) 1'120 Watt/m ²
Icing, freezing rain, glaze ice*:	ice load of 20mm Mil-STD-810E, Meth. 521.1, Proc. I
Snow load*:	350 Kg/m ²

EMC and lightning protection

EMC as required by European EMC-Directive (CE-mark) including conformity declaration*:

- EN 61000-3-2; 3-3+A1; 4-2; 4-3 +A1 + A2; 4-4; 4-5; 4-6; 4-8; 4-11
- EN 55011:2016 + A11:2020 Tabelle 2 + 6
- AECTP NCE 04; NCE05; NCS01; NCS02; NCS07; NCS08; NCS09; NCS12.2; NRE01; NRE02; NRS01; NRS02; NCE02
- VG 96903-76/EN 62305-4

All the electrical ports are protected against the effects of lightning (LEMP and Surge)*

- armasuisse regulation 60042 Version 02
- The ground connection is possible with the official M8 Grounding Screw of the Swiss Forces.

Safety requirements

- Electrical Safety as per European Low-Voltage Directive, including conformity declaration (2014/35/EU)
- Electrical Safety requirements as per armasuisse Regulation 60035 Version 05 "Regulations for electrical low-voltage products within the army's field of application"
- IEC 62368-1:2018, Audio/video, information and communication technology equipment - Part 1: Safety requirements
- Operating altitude: 3500 m.a.s.l

* All certifications and approvals are pending