



Power: **75; 100; 150; 200; 320; 500;
750; 1000; 2000; 2400; 3000W**
Input voltage range: **100-240VAC, 140-340VDC**
Output voltage: **5; 12; 24V**
Efficiency: **85 - 91%**

Features:

- protection against short circuit, overload, overvoltage and overheating (for all models),
- high operating temperature – up to 70°C*,
- built-in active PFC function,
- high efficiency and reliability,
- long service life,
- remote on/off function (BSP075, BSP100, BSP150, BSP500),
- passive cooling (free air circulation) BSP075–BSP200,
- active cooling (DC fan) BSP320–BSP3000.

Description:

Stabilized, industrial switching power supplies for mains voltage, intended for use in industrial automation systems. Devices in this series offer a wide range of output power and the possibility of parallel operation*, which allows for easy increase of available power resources.

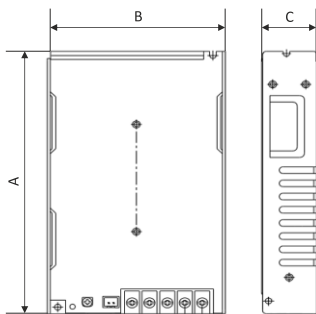
Applications:

- industrial automation and control systems,
- control and measurement equipment,
- RF applications,
- electromechanical, safety and monitoring systems,
- intelligent control systems.

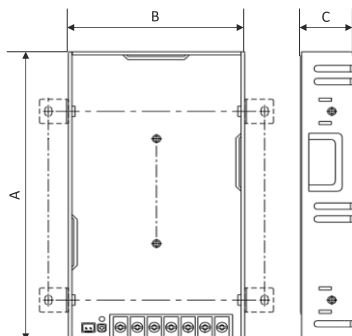
*selected models

Type	Power	Output voltage	Current	Dimensions [mm]			Weight [kg]
	[W]	[V]	[A]	A	B	C	
BSP 07505	75	5	15	159	97	30	0,44
BSP 07512	75,6	12	6,3	159	97	30	0,44
BSP 07524	76,8	24	3,2	159	97	30	0,44
BSP 10005	100	5	20	179	99	30	0,52
BSP 10012	102	12	8,5	179	99	30	0,52
BSP 10024	100,8	24	4,2	179	99	30	0,52
BSP 15005	150	5	30	199	99	30	0,6
BSP 15012	150	12	12,5	199	99	30	0,6
BSP 15024	151,2	24	6,3	199	99	30	0,6
BSP 20005	200	5	40	215	115	30	0,72
BSP 20012	200,4	12	16,7	215	115	30	0,72
BSP 20024	201,6	24	8,4	215	115	30	0,72
BSP 32005	300	5	60	215	115	30	0,9
BSP 32012	320,4	12	26,7	215	115	30	0,9
BSP 32024	321,6	24	13,4	215	115	30	0,9
BSP 50005	450	5	90	230	127	40,5	1,3
BSP 50012	500,4	12	41,7	230	127	40,5	1,3
BSP 50024	504	24	21	230	127	40,5	1,3
BSP 75012	750	12	62,5	250	127	41	1,64
BSP 75024	751,2	24	31,3	250	127	41	1,64
BSP 100012	960	12	80	295	127	41	1,95
BSP 100024	1008	24	42	295	127	41	1,95
BSP 200012	1200	12	100	295	127	41	1,95
BSP 200024	1920	24	80	295	127	41	1,95
BSP 240012	2000,4	12	166,7	278	177,8	63,5	3,3
BSP 240024	2400	24	100	278	177,8	63,5	3,3
BSP 300012	2400	12	200	278	177,8	63,5	4
BSP 300024	3000	24	125	278	177,8	63,5	4

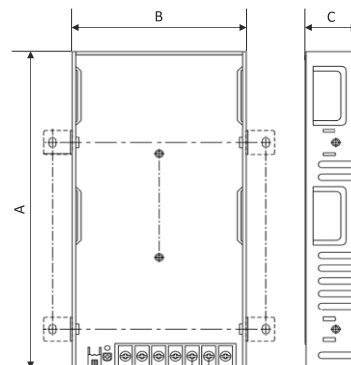
BSP 075



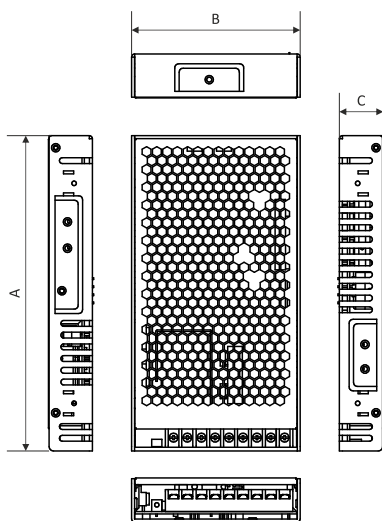
BSP 100



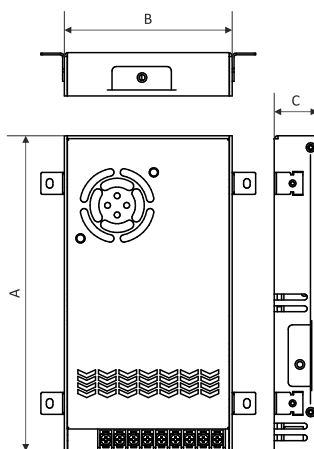
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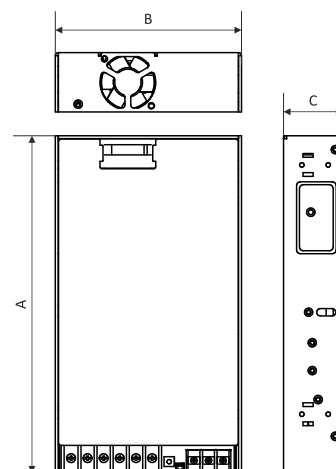
BSP 200



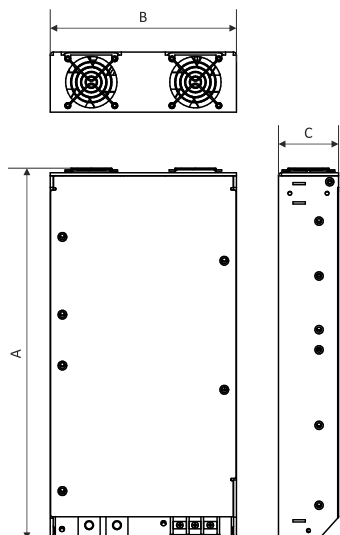
BSP 320



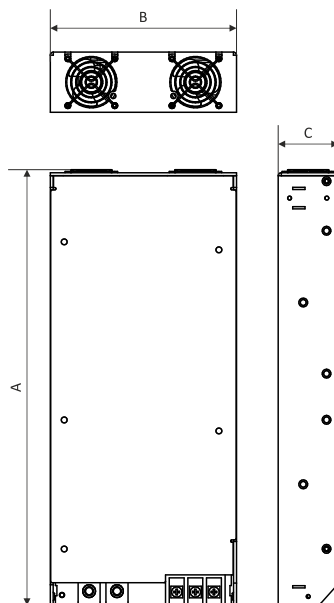
BSP 500



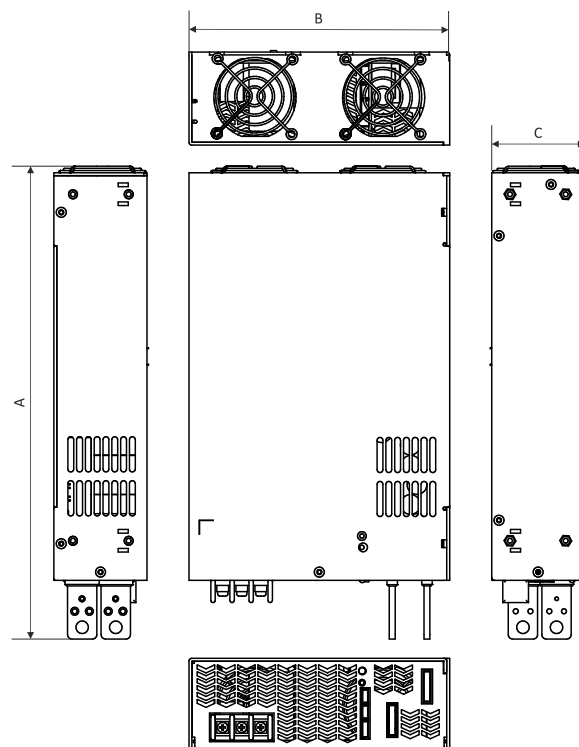
BSP 750



BSP 1000; BSP 2000



BSP 2400; BSP 3000



BSP 20005 / BSP 20012 / BSP 20024

1. Introduction:

The user manual applies to stabilized switching-mode power supplies intended for use in industrial-automation systems. The BSP series power supplies are compact devices designed for installation inside industrial-equipment enclosures. They feature a low-profile construction and high efficiency. They are equipped with an Active PFC (power-factor correction) circuit, which ensures optimal energy utilisation and minimal disturbances to the mains supply. Moreover, they include a wide range of protections: Over-Power Protection (OPP), Over-Voltage Protection (OVP), Short-Circuit Protection (SCP) and Over-Temperature Protection (OTP). Through these measures, both the power supply and the connected loads are effectively protected, ensuring safe and stable operation of the entire system.

2. Features:

- **Over-load protection:** The power supply is equipped with a hiccup-mode protection scheme, which protects the unit against output overload and short-circuit conditions. If the permissible load is exceeded, the DC output voltage is periodically switched off and on. Normal operation resumes automatically once the fault is cleared or the overload condition ceases.
- **Thermal protection:** The power supply features a thermal protection system that prevents damage from excessive internal temperatures. If the allowable operating temperature is exceeded, the DC output is automatically disabled and the LED indicator which signals correct operation is turned off. To resume operation after thermal protection has been triggered, allow the unit to return to safe temperature conditions.
- **Over-voltage protection:** The power supply incorporates an Over-Voltage Protection (OVP) circuit that safeguards both the unit and the connected loads from damage caused by excessive output voltage. If an over-voltage condition is detected, the DC output is automatically disconnected to prevent damage or failure. To restore operation after OVP activation, switch the supply off and then on again.
- **Output voltage adjustment potentiometer:** The power supply includes a user-accessible potentiometer, enabling precise adjustment of the output voltage to match the requirements of the connected equipment.

3. Chart of changes in output load rated values:

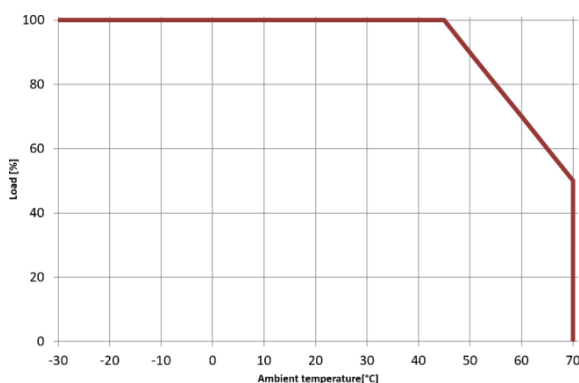


Figure 1. Derating curve of rated output load as a function of ambient temperature.

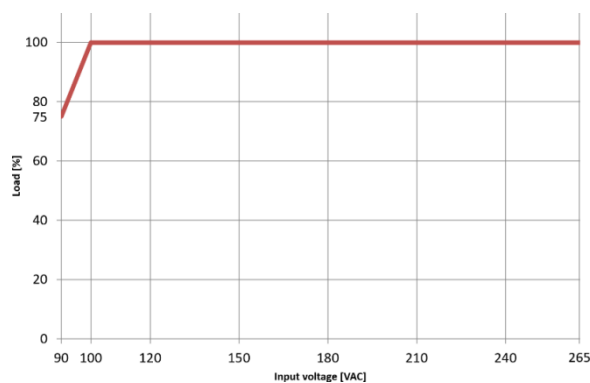
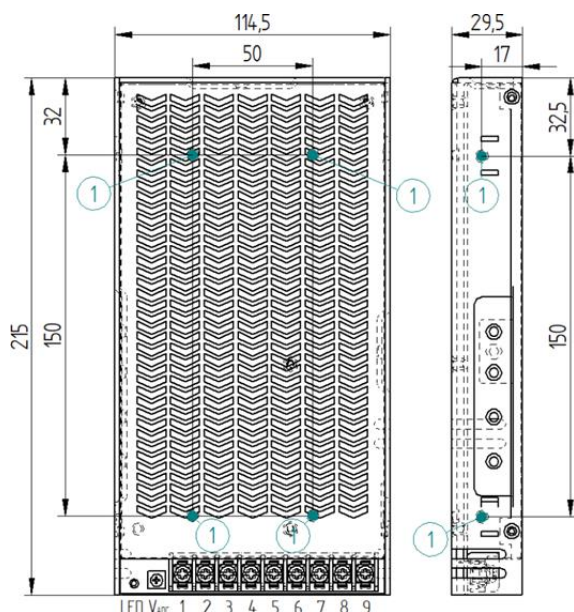


Figure 2. Derating curve of rated output load as a function of input voltage.

4. Mechanical specifications:



CONNECTOR CONFIGURATION

CONNECTOR NO.	DESCRIPTION
1	DC/V+
2	
3	
4	DC/V-
5	
6	
7	FG/PE
8	AC/N
9	AC/L

5. Installation:

- A protective device (such as a cartridge fuse or miniature circuit-breaker) and readily accessible isolating means to disconnect the power must be provided.
- Before connecting the power supply, ensure that the main power switch to which it will be connected is in the OFF position and properly secured against accidental re-activation. Failure to comply may result in contact with live components, which may cause death or serious injury.
- Connect the device to the mains supply. If flexible cables are used, ferrules must be fitted to ensure correct termination at the terminals. For flexible conductors, the cross-sectional area of the supply cable must be at least 0.5 mm².
- Maintain a sufficient insulation clearance between the mounting screws and the internal components of the power supply.
- Ensure that the mounting position of the unit allows optimal cooling performance and that the ventilation openings remain unobstructed.

6. Safety precautions:

- **Do not remove** the metal housing of the power supply while the mains power is connected.
- **Do not touch** the device with wet hands.
- **Do not touch** the housing when the device is fully loaded; high surface temperature may cause burns.
- **Do not use** the device if any metal objects, water or other foreign bodies have entered it.
- **Do not use** the device if it has been damaged, as the voltage-regulating circuitry may have failed or may be operating outside the normal control parameters. Failure to comply may result in high voltage and subsequent damage to the connected load.
- **No objects** may touch the output terminals of the device.
- If inspection of the devices interior is necessary, allow it to cool completely. In case of a fault, the high temperatures of certain components may cause burns.
- **Do not block** the air-intake vent.

7. Specifications:

	BSP 20005	BSP 20012	BSP 20024
Voltage Range	100-240VAC; 140-340VDC		
Frequency	47-63Hz~		
Full Load AC Current	2,5A/115VAC; 1,3A/230VAC		
Leakage current	< 1mA/230VAC		
Inrush Current, cold start 25°C*	20A/115VAC; 40A/230VAC		
Efficiency	85,5%	89%	89,5%

Output

Rated DC Voltage	5V	12V	24V
Voltage Adjust Range	4,5-5,5V	10-13,2V	20-26,4V
Rated Current	40A	16,7A	8,4A
Rated Power	200W	200,4W	201,6W
Ripple & Noise (peak to peak)*	≤ 150mV		
Voltage tolerance	≤ 2%	≤ 1%	≤ 1%
Line regulation	≤ 0,5%	≤ 0,3%	≤ 0,2%
Load Regulation (10% - 100%)	≤ 1%	≤ 0,5%	≤ 0,5%
Setup, Rise Time (Full Load)	3000ms 50ms/115VAC; 1500ms, 50ms/230VAC (Full Load)		
Hold-up Time (Full Load)	> 8ms/115VAC; > 8ms/230VAC (Full Load)		
Parallel Operation	Not possible		

Protection

Over load/Over Current	The power supply may operate at short-term loads in the range of 105 % to 135 % of rated power.		
	Type of protection: Hiccup-mode protection, recovers automatically after fault condition is removed.		
Over Output Voltage	5,75-7VDC	13,8-16,2VDC	27,6-32,4VDC
	Type of protection: Shut down output voltage, re-power on to recover.		
Over Temperature	Type of protection: Shut down output voltage, recovers automatically after temperature goes down.		

Safety & EMC

Safety Standards	EN IEC 62368-1		
Withstand Voltage	I/P-O/P 3kVAC; I/P-F/G 2kVAC; O/P-F/G 0,5kVAC		
Insulation Resistance	I/P-O/P, I/P-F/G, O/P-F/G 100MOhm/500VDC/25°C/70%RH		
EMI Radiation & Conduction	Compliance with EN55032(CISPR32)		
Harmonics Current	Compliance with EN61000-3-2, -3		
EMC Immunity	Compliance with EN61000-4-2, -3, -4, -5, -6, -8, -11		

Environment

Working Temperature	-30°C ~ +70°C		
Derating Temperature above 45°C	See: Derating curve		
Working Humidity	20-90% RH, non-condensing		
Storage Temperature Humidity	from -40°C to +85°C, 10-95% RH, non-condensing		
Vibration	10-500Hz, 2G 10min/1cycle, 60min each along X, Y, Z axes		

General

Case Material	Electro-galvanized steel and aluminium enclosure.		
Case Protection	IP 20		
Weight	0,72kg		
Dimensions	215 × 115 × 30mm		
Mounting	Rear or side mounting.		
Connection	Screw terminals with triple terminals for output.		

Note

1. *The output power must be reduced (see Fig. 2) under conditions of reduced input voltage. Detailed information is provided in the chart showing the rated output load versus input voltage.*
2. *Unless otherwise specified, all technical parameters are measured at an input voltage of 230 VAC, rated load and an ambient temperature of 25 °C.*
3. *Method for measuring ripple and noise: a twisted-pair cable of approximately 30 cm in length is used, with capacitors of 0.1 μ F and 47 μ F connected in parallel at the output terminals; measurement is carried out with a bandwidth of 20 MHz.*
4. *Output voltage accuracy includes: setting error, line regulation and load regulation.*
5. *Line regulation test: performed by measuring changes in the output voltage when the input voltage is varied from minimum to maximum, while maintaining rated load.*
6. *Load regulation test: performed by varying the load from 0% to 100% of the rated value.*
7. *The power supply is treated as a component intended for installation in end-equipment. All EMC tests are conducted when the power supply is mounted on a metal plate sized 720 mm $\times$ 360 mm $\times$ 1 mm. The end-equipment must be re-verified for compliance with EMC directives after integration.*
8. *Start-up time is specified for a cold start. Frequent power-on/power-off cycles may prolong the start-up time.*
9. *For operation at altitudes above 2000 m (6500 ft) above sea level, the permissible ambient operating temperature must be reduced by 5 °C for each additional 1000 m for fan-cooled models, and by 3.5 °C per 1000 m for fan-less models.*

8. Additional information:

The latest version of the user manual is available on the website:

<https://www.brevetrafo.com/catalog/power-supplies/bsp.html>

(scan the QR code below to go directly to the website)



BSP 32005 / BSP 32012 / BSP 32024

1. Introduction:

The user manual applies to stabilized switching-mode power supplies intended for use in industrial-automation systems. The BSP series power supplies are compact devices designed for installation inside industrial-equipment enclosures. They feature a low-profile construction and high efficiency. They are equipped with an Active PFC (power-factor correction) circuit, which ensures optimal energy utilisation and minimal disturbances to the mains supply. Moreover, they include a wide range of protections: Over-Power Protection (OPP), Over-Voltage Protection (OVP), Short-Circuit Protection (SCP) and Over-Temperature Protection (OTP). Through these measures, both the power supply and the connected loads are effectively protected, ensuring safe and stable operation of the entire system.

2. Features:

- **Over-load protection:** The power supply is equipped with a hiccup-mode protection scheme, which protects the unit against output overload and short-circuit conditions. If the permissible load is exceeded, the DC output voltage is periodically switched off and on. Normal operation resumes automatically once the fault is cleared or the overload condition ceases.
- **Thermal protection:** The power supply features a thermal protection system that prevents damage from excessive internal temperatures. If the allowable operating temperature is exceeded, the DC output is automatically disabled and the LED indicator which signals correct operation is turned off. To resume operation after thermal protection has been triggered, allow the unit to return to safe temperature conditions.
- **Over-voltage protection:** The power supply incorporates an Over-Voltage Protection (OVP) circuit that safeguards both the unit and the connected loads from damage caused by excessive output voltage. If an over-voltage condition is detected, the DC output is automatically disconnected to prevent damage or failure. To restore operation after OVP activation, switch the supply off and then on again.
- **Output voltage adjustment potentiometer:** The power supply includes a user-accessible potentiometer, enabling precise adjustment of the output voltage to match the requirements of the connected equipment.

3. Chart of changes in output load rated values:

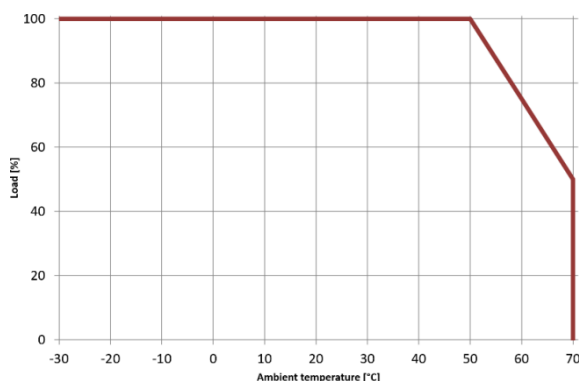


Figure 1. Derating curve of rated output load as a function of ambient temperature.

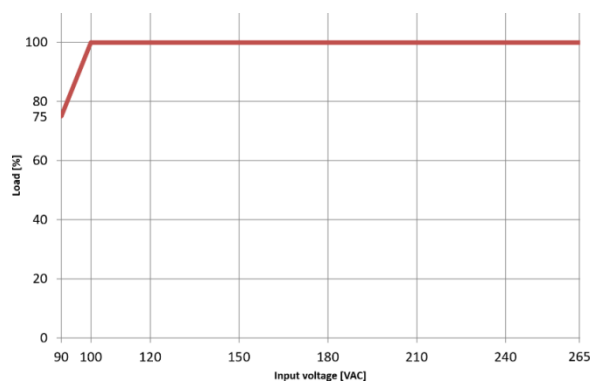
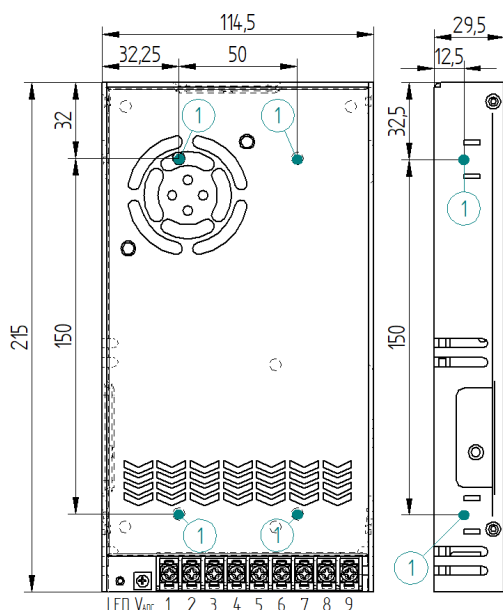


Figure 2. Derating curve of rated output load as a function of input voltage.

4. Mechanical specifications:



CONNECTOR CONFIGURATION

CONNECTOR NO.	DESCRIPTION
1	DC/V+
2	
3	
4	DC/V-
5	
6	
7	FG/PE
8	AC/N
9	AC/L

5. Installation:

- A protective device (such as a cartridge fuse or miniature circuit-breaker) and readily accessible isolating means to disconnect the power must be provided.
- Before connecting the power supply, ensure that the main power switch to which it will be connected is in the OFF position and properly secured against accidental re-activation. Failure to comply may result in contact with live components, which may cause death or serious injury.
- Connect the device to the mains supply. If flexible cables are used, ferrules must be fitted to ensure correct termination at the terminals. For flexible conductors, the cross-sectional area of the supply cable must be at least 0.5 mm².
- Maintain a sufficient insulation clearance between the mounting screws and the internal components of the power supply.
- Ensure that the mounting position of the unit allows optimal cooling performance and that the ventilation openings remain unobstructed.

6. Safety precautions:

- **Do not remove** the metal housing of the power supply while the mains power is connected.
- **Do not touch** the device with wet hands.
- **Do not touch** the housing when the device is fully loaded; high surface temperature may cause burns.
- **Do not use** the device if any metal objects, water or other foreign bodies have entered it.
- **Do not use** the device if it has been damaged, as the voltage-regulating circuitry may have failed or may be operating outside the normal control parameters. Failure to comply may result in high voltage and subsequent damage to the connected load.
- **No objects** may touch the output terminals of the device.
- If inspection of the devices interior is necessary, allow it to cool completely. In case of a fault, the high temperatures of certain components may cause burns.
- **Do not block** the air-intake vent.

7. Specifications:

	BSP 32005	BSP 32012	BSP 32024
Voltage Range	100-240VAC; 140-340VDC		
Frequency	47-63Hz~		
Full Load AC Current	4A/115VAC; 2A/230VAC		
Leakage current	< 1mA/230VAC		
Inrush Current, cold start 25°C*	20A/115VAC; 40A/230VAC		
Efficiency	83%	88%	88%

Output

Rated DC Voltage	5V	12V	24V
Voltage Adjust Range	4,5-5,5V	10-13,2V	20-26,4V
Rated Current	60A	26,7A	13,4A
Rated Power	300W	320,4W	321,6W
Ripple & Noise (peak to peak)* ²	≤ 150mV		
Voltage tolerance	≤ 2%	≤ 1%	≤ 1%
Line regulation	≤ 0,5%	≤ 0,3%	≤ 0,2%
Load Regulation (10% - 100%)	≤ 1%	≤ 0,5%	≤ 0,5%
Setup, Rise Time (Full Load)	3000ms 50ms/115VAC; 1500ms, 50ms/230VAC (Full Load)		
Hold-up Time (Full Load)	> 8ms/115VAC; > 8ms/230VAC (Full Load)		
Parallel Operation	Not possible		

Protection

Over load/Over Current	The power supply may operate at short-term loads in the range of 105 % to 135 % of rated power.		
	Type of protection: Hiccup-mode protection, recovers automatically after fault condition is removed.		
Over Output Voltage	5,75-6,75VDC	13,8-16,2VDC	27,6-32,4VDC
	Type of protection: Shut down output voltage, re-power on to recover.		
Over Temperature	Type of protection: Shut down output voltage, recovers automatically after temperature goes down.		

Safety & EMC

Safety Standards	EN IEC 62368-1		
Withstand Voltage	I/P-O/P 3kVAC; I/P-F/G 2kVAC; O/P-F/G 0,5kVAC		
Insulation Resistance	I/P-O/P, I/P-F/G, O/P-F/G 100MΩ/500VDC/25°C/70%RH		
EMI Radiation & Conduction	Compliance with EN55032(CISPR32)		
Harmonics Current	Compliance with EN61000-3-2, -3		
EMC Immunity	Compliance with EN61000-4-2, -3, -4, -5, -6, -8, -11		

Environment

Working Temperature	-30°C ~ +70°C		
Derating Temperature above 50°C	See: Derating curve		
Working Humidity	20-90% RH, non-condensing		
Storage Temperature Humidity	from -40°C to +85°C, 10-95% RH, non-condensing		
Vibration	10-500Hz, 2G 10min/1cycle, 60min each along X, Y, Z axes		

General

Case Material	Electro-galvanized steel and aluminium enclosure.		
Case Protection	IP 20		
Weight	0,9kg		
Dimensions	215 × 115 × 30mm		
Mounting	Rear or side mounting.		
Connection	Screw terminals with triple terminals for output.		

Note

1. The output power must be reduced (see Fig. 2) under conditions of reduced input voltage. Detailed information is provided in the chart showing the rated output load versus input voltage.
2. Unless otherwise specified, all technical parameters are measured at an input voltage of 230 VAC, rated load and an ambient temperature of 25 °C.
3. Method for measuring ripple and noise: a twisted-pair cable of approximately 30 cm in length is used, with capacitors of 0.1 μ F and 47 μ F connected in parallel at the output terminals; measurement is carried out with a bandwidth of 20 MHz.
4. Output voltage accuracy includes: setting error, line regulation and load regulation.
5. Line regulation test: performed by measuring changes in the output voltage when the input voltage is varied from minimum to maximum, while maintaining rated load.
6. Load regulation test: performed by varying the load from 0% to 100% of the rated value.
7. The power supply is treated as a component intended for installation in end-equipment. All EMC tests are conducted when the power supply is mounted on a metal plate sized 720 mm $\times$ 360 mm $\times$ 1 mm. The end-equipment must be re-verified for compliance with EMC directives after integration.
8. Start-up time is specified for a cold start. Frequent power-on/power-off cycles may prolong the start-up time.
9. For operation at altitudes above 2000 m (6500 ft) above sea level, the permissible ambient operating temperature must be reduced by 5 °C for each additional 1000 m for fan-cooled models, and by 3.5 °C per 1000 m for fan-less models.
10. It is not recommended to exceed a value of 5000 μ F for the external output capacitance for the BSP32005 and BSP32012 power supplies.

8. Additional information:

The latest version of the user manual is available on the website:

<https://www.brevetrafo.com/catalog/power-supplies/bsp.html>

(scan the QR code below to go directly to the website)



BSP 75012 / BSP 75024

1. Introduction:

The user manual applies to stabilized switching-mode power supplies intended for use in industrial-automation systems. The BSP series power supplies are compact devices designed for installation inside industrial-equipment enclosures. They feature a low-profile construction and high efficiency. They are equipped with an Active PFC (power-factor correction) circuit, which ensures optimal energy utilisation and minimal disturbances to the mains supply. Moreover, they include a wide range of protections: Over-Power Protection (OPP), Over-Voltage Protection (OVP), Short-Circuit Protection (SCP) and Over-Temperature Protection (OTP). Through these measures, both the power supply and the connected loads are effectively protected, ensuring safe and stable operation of the entire system.

2. Features:

- **Over-load protection:** The power supply is equipped with a constant-current limiting function to protect the unit from overload and short-circuit conditions. When the allowable load is exceeded, the output voltage is automatically reduced while the current is maintained at a safe level.
- **Thermal protection:** The power supply features an internal temperature monitoring system that prevents damage due to excessive heat. If the operating temperature exceeds the specified limit, the DC output is disabled and the status LED, normally green, turns red. To resume normal operation after activation of the thermal protection, ensure the unit has cooled to within the permitted temperature range.
- **Over-voltage protection:** The power supply incorporates an Over-Voltage Protection (OVP) circuit that safeguards both the unit and the connected loads from damage caused by excessive output voltage. If an over-voltage condition is detected, the DC output is automatically disconnected to prevent damage or failure. To restore operation after OVP activation, switch the supply off and then on again.
- **Output voltage adjustment potentiometer:** The power supply includes a user-accessible potentiometer, enabling precise adjustment of the output voltage to match the requirements of the connected equipment.
- **Status indication (LED):** The power supply is equipped with an LED indicator showing the current operational status of the unit. During normal operation the indicator is lit green. In the event of a fault or improper operation (for example triggered protection), the indicator turns red, enabling quick fault identification.

3. Chart of changes in output load rated values:

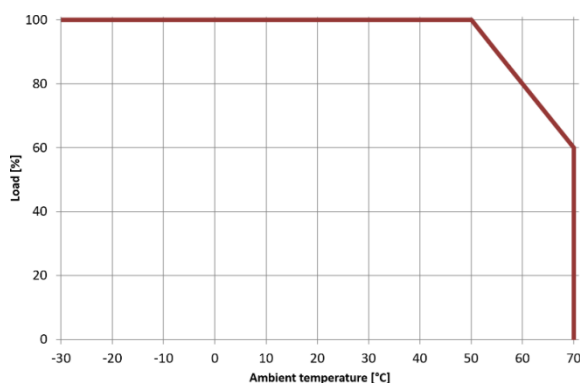


Figure 1. Derating curve of rated output load as a function of ambient temperature.

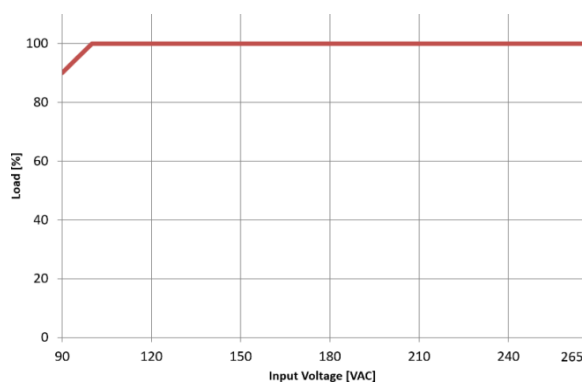
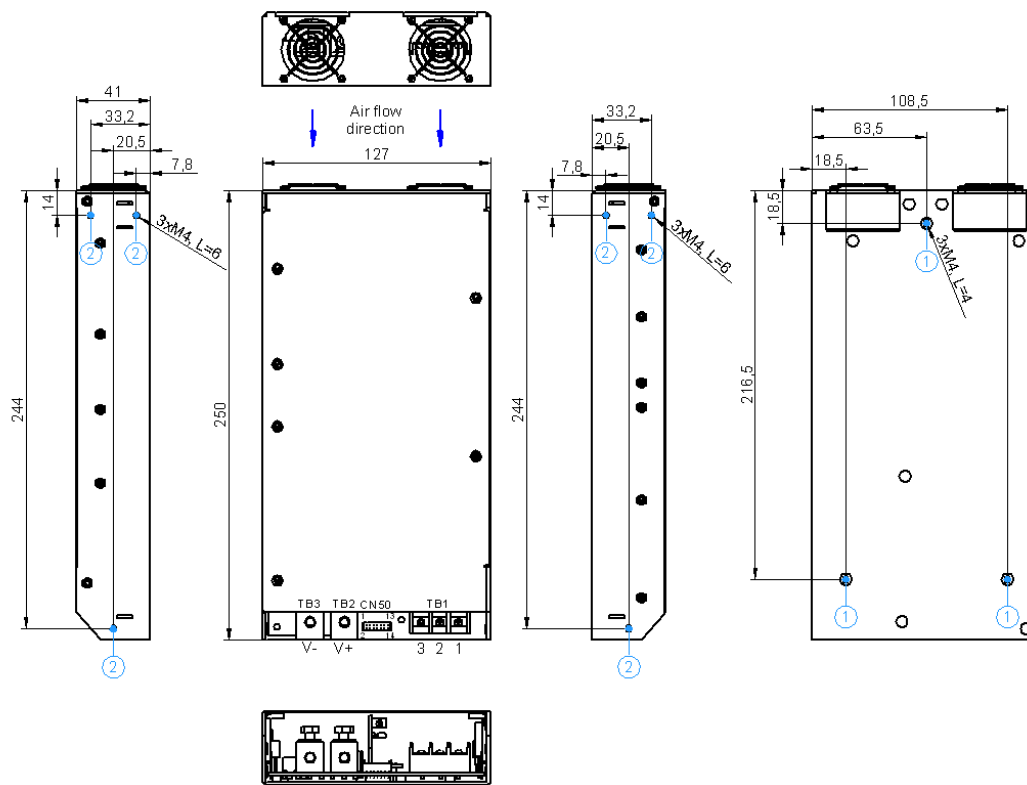


Figure 2. Derating curve of rated output load as a function of input voltage.

4. Mechanical specifications:



CONNECTOR CONFIGURATION TB1		CONNECTOR CONFIGURATION TB2/TB3		CONNECTOR CONFIGURATION CN50 (HRS DF11-14DS-2C)
CONNECTOR NO.	DESCRIPTION	CONNECTOR NO.	DESCRIPTION	The connector described in the section ADDITIONAL FUNCTIONS
1	AC/N	TB2	DC/V+	
2	AC/L	TB3	DC/V-	
3	FG/PE			

Maximum tightening torque: 1,8Nm

Maximum tightening torque: 1,0 Nm

5. Installation:

- A protective device (such as a cartridge fuse or miniature circuit-breaker) and readily accessible isolating means to disconnect the power must be provided.
- Before connecting the power supply, ensure that the main power switch to which it will be connected is in the OFF position and properly secured against accidental re-activation. Failure to comply may result in contact with live components, which may cause death or serious injury.
- Connect the device to the mains supply. If flexible cables are used, ferrules must be fitted to ensure correct termination at the terminals. For flexible conductors, the cross-sectional area of the supply cable must be at least 1,0 mm².
- Maintain a sufficient insulation clearance between the mounting screws and the internal components of the power supply.
- Ensure that the mounting position of the unit allows optimal cooling performance and that the ventilation openings remain unobstructed.

6. Safety precautions:

- **Do not remove** the metal housing of the power supply while the mains power is connected.
- **Do not touch** the device with wet hands.
- **Do not touch** the housing when the device is fully loaded; high surface temperature may cause burns.
- **Do not use** the device if any metal objects, water or other foreign bodies have entered it.
- **Do not use** the device if it has been damaged, as the voltage-regulating circuitry may have failed or may be operating outside the normal control parameters. Failure to comply may result in high voltage and subsequent damage to the connected load.
- **No objects** may touch the output terminals of the device.
- If inspection of the devices interior is necessary, allow it to cool completely. In case of a fault, the high temperatures of certain components may cause burns.
- **Do not block** the air-intake vent.

7. Specifications:

	BSP 75012	BSP 75024
Voltage Range	90-264VAC; 127-370VDC	
Frequency	47-63Hz~	
Full Load AC Current	8,2A/115VAC; 3,9A/230VAC	
Leakage current	< 2mA/230VAC	
Inrush Current, cold start 25°C*	25A/115VAC; 40A/230VAC	
Efficiency	87%	87%

Output

Rated DC Voltage	12V	24V
Voltage Adjust Range	10-13,5V	20-26,4V
Rated Current	62,5A	31,3A
Rated Power	750W	751,2W
Ripple & Noise (peak to peak)*	≤ 150mV	
Voltage tolerance	≤ 1%	
Line regulation	≤ 0,5%	
Load Regulation (10% - 100%)	≤ 0,5%	
Setup, Rise Time (Full Load)	1000ms, 50ms (Full Load)	
Hold-up Time (Full Load)	> 16ms/230VAC (Full Load)	
Parallel Operation	Niemożliwa	

Protection

Over load/Over Current	The power supply may operate at short-term loads in the range of 105 % to 125 % of rated power.	
	Type of protection: Constant current limiting, recovers automatically after fault condition is removed.	
Over Output Voltage	13,8-16,8VDC	13,8-16,8VDC
	Type of protection: Shut down output voltage, re-power on to recover.	
Over Temperature	Type of protection: Shut down output voltage, recovers automatically after temperature goes down.	

Additional functions

Remote ON/OFF Control*	ON: Short the Remote ON/OFF pin [13] to the 12V-AUX pin [14] on connector CN50. OFF: Open the connection between the Remote ON/OFF pin [13] and the 12V-AUX pin [14] on connector CN50.
Voltage Drop Compensation (Remote sense)*	Voltage drop compensation on load wires up to 0,5 V.

OPERATING MANUAL

BSP 200, BSP 320, BSP 750, BSP 2000,
BSP 2400, BSP 3000

Programmable Output Voltage (PV)*	The output voltage can be adjusted within 40–110% of the rated value.
Programmable Output Current Level (PC)*	The output current level can be adjusted within 40–110% of the rated value.
Auxiliary Supply*	12V/0,1A (±10%)
DC-OK Signal*	Output voltage OK: 0–1 V ; Output voltage not OK: 3,3-5,6V
*A detailed description is provided in the ADDITIONAL FUNCTIONS section.	

Safety & EMC

Safety Standards	EN IEC 62368-1
Withstand Voltage	I/P-O/P 3kVAC; I/P-F/G 2kVAC; O/P-F/G 0,5kVAC
Insulation Resistance	I/P-O/P, I/P-F/G, O/P-F/G 100MΩ/500VDC/25°C/70%RH
EMI Radiation & Conduction	Compliance with EN55032(CISPR32)
Harmonics Current	Compliance with EN61000-3-2, -3
EMC Immunity	Compliance with EN61000-4-2, -3, -4, -5, -6, -8, -11

Environment

Working Temperature	-30°C ~ +70°C
Derating Temperature above 50°C	See: Derating curve
Working Humidity	20-90% RH, non-condensing
Storage Temperature Humidity	from -40°C to +85°C, 10-95% RH, non-condensing
Vibration	10-500Hz, 2G 10min/1cycle, 60min each along X, Y, Z axes

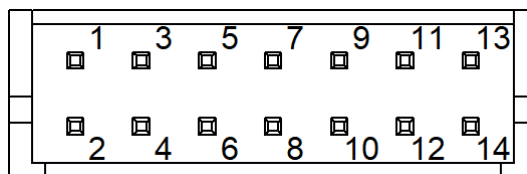
General

Case Material	Electro-galvanized steel and aluminium enclosure.
Case Protection	IP 20
Weight	1,64kg
Dimensions	250 × 127 × 41mm
Mounting	Rear or side mounting.
Connection	Screw-terminal connectors with single output terminal.

Note

1. The output power must be reduced (see Fig. 2) under conditions of reduced input voltage. Detailed information is provided in the chart showing the rated output load versus input voltage.
2. Unless otherwise specified, all technical parameters are measured at an input voltage of 230 VAC, rated load and an ambient temperature of 25 °C.
3. Method for measuring ripple and noise: a twisted-pair cable of approximately 30 cm in length is used, with capacitors of 0.1 μF and 47 μF connected in parallel at the output terminals; measurement is carried out with a bandwidth of 20 MHz.
4. Output voltage accuracy includes: setting error, line regulation and load regulation.
5. Line regulation test: performed by measuring changes in the output voltage when the input voltage is varied from minimum to maximum, while maintaining rated load.
6. Load regulation test: performed by varying the load from 0% to 100% of the rated value.
7. The power supply is treated as a component intended for installation in end-equipment. All EMC tests are conducted when the power supply is mounted on a metal plate sized 720 mm × 360 mm × 1 mm. The end-equipment must be re-verified for compliance with EMC directives after integration.
8. Start-up time is specified for a cold start. Frequent power-on/power-off cycles may prolong the start-up time.
9. For operation at altitudes above 2000 m (6500 ft) above sea level, the permissible ambient operating temperature must be reduced by 5 °C for each additional 1000 m for fan-cooled models, and by 3.5 °C per 1000 m for fan-less models.

8. ADDITIONAL FUNCTIONS:



Drawing 1. HRS DF11-14DP-2DS connector used for the power supply's auxiliary control and signal functions.

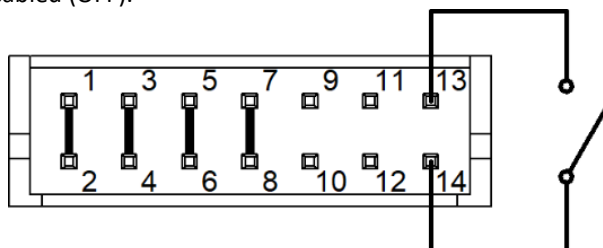
Pin Number	Pin Name	Description
1	S+	Positive remote-sense pin for output voltage sensing (REMOTE SENSE).
2	VS+	Output voltage V+. This signal should be connected to S+[1] to reduce noise when the PV (output voltage programming) function is active.
3	S-	Negative remote-sense pin for output voltage sensing (REMOTE SENSE).
4	VS-	Output voltage V-. This signal should be connected to S-[3] to reduce noise when the PV (output voltage programming) function is active.
5	PV	DC input from an external voltage source for the PV function (output voltage programming); reference: GND pins [10], [11].
6	PS	Reference pin for the PV output voltage programming function.
7	PC	DC input from an external voltage source for the PC function (output current programming); reference: GND pins [10], [11].
8	PO	Reference pin for the PC output current programming function.
9	DC-OK	Open-collector output; reference: GND pins [10], [11].
10, 11	GND	Ground connected to the negative output terminal V-.
12	G-AUX	Auxiliary output ground. Signal isolated from the main output terminals.
13	REMOTE ON/OFF	Remote control of the power supply output via a volt-free (dry-contact) switch between REMOTE ON/OFF[13] and 12V-AUX[14].
14	12V-AUX	Auxiliary 12 V output; reference: G-AUX[12]. Not affected by the REMOTE ON/OFF function. Maximum load current: 0,1 A .

REMOTE ON/OFF CONTROL:

The power supply output can be switched ON or OFF using the Remote ON/OFF control function.

Connection between the Remote ON/OFF pin [13] and the 12V-AUX pin [14]:

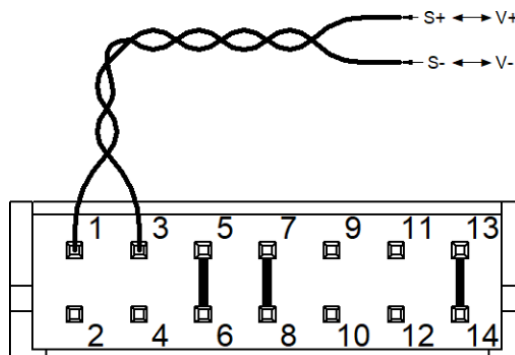
- Short-circuit – Output enabled (ON),
- Open-circuit – Output disabled (OFF).



If multiple power supplies are to be controlled simultaneously using the Remote ON/OFF function, the following terminals on connector **CN50** must be connected accordingly: S+ [1] to VS+ [2], and S- [3] to VS- [4].

VOLTAGE DROP COMPENSATION (REMOTE SENSE):

The **Remote Sense** function is used to compensate for voltage drop across the load wires by up to 0,5 V. The **S+ [1]** signal should be connected to the positive load terminal, and the **S- [3]** signal to the negative load terminal.



Factory defaults on connector **CN50** include the following pin pairs being shorted: **S+ [1] to VS+ [2]**; **S- [3] to VS- [4]**; **PV [5] to PS [6]**; **PC [7] to PO [8]**. The power supply will not enable its output voltage if these jumpers are not installed, unless the corresponding function is intended to be active.

PROGRAMMABLE OUTPUT VOLTAGE (PV):

The output voltage can be adjusted within the range of **40–110% of the rated value** by applying an external voltage to pin **PV [5]**.

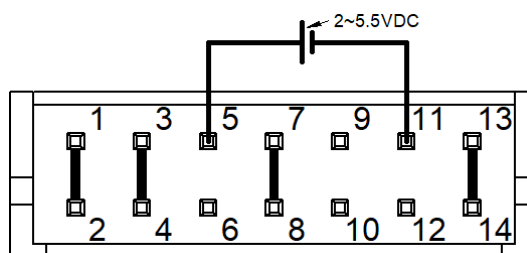
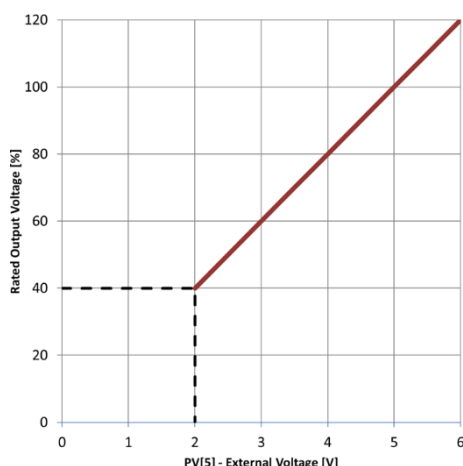


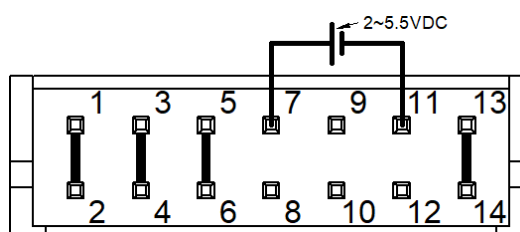
Figure 1. Rated output voltage vs. external PV [5] control voltage.

If the external control voltage drops below 0,5 V, the power supply may enter a protection mode. Restoring normal operation requires cycling the input power.

The programmable output voltage function is disabled by default — pins **PV[5]** and **PS[6]** are shorted by a jumper. If output-voltage programming is not required, the **PV[5]** and **PS[6]** pins must remain shorted; otherwise, the power supply will not enable its output voltage.

PROGRAMMABLE OUTPUT CURRENT LEVEL (PC):

The output current level can be adjusted within **40–110% of the rated value** by applying an external voltage to pin **PC [7]**. This function allows setting the current level at which the power supply enters **constant current limiting** mode.



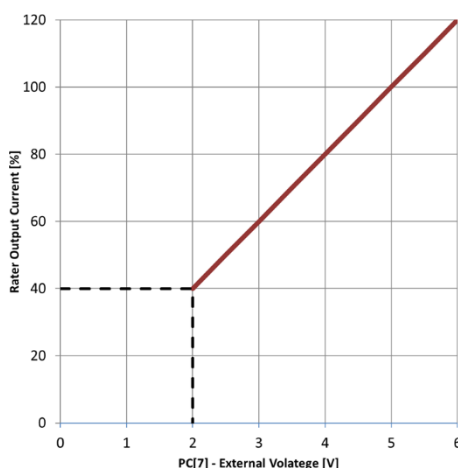


Figure 2. Rated output current vs. external PC [7] control voltage.

The programmable output current function is disabled by default — pins PC [7] and PO [8] are shorted by a jumper. If output-current programming is not required, the **PC [7]** and **PO [8]** pins must remain shorted; otherwise, the power supply will not enable its output voltage.

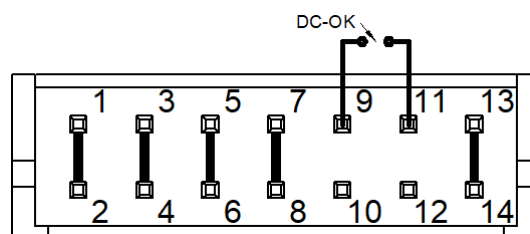
AUXILIARY SUPPLY:

The power supply is equipped with an additional **12V / 0,1A auxiliary output**, available between pins **12V-AUX [14]** (positive terminal) and **G-AUX [12]** (ground).

DC-OK SIGNAL:

The DC-OK signal, indicating the status of the power supply's output voltage, is an **open-collector** type signal.

DC-OK Signal Status Table	
Voltage [V]	Output state
0 ~ 1	Output voltage OK
3,3 ~ 5,6	Output voltage not OK



9. Additional information:

The latest version of the user manual is available on the website:
<https://www.brevetrafo.com/catalog/power-supplies/bsp.html>

(scan the QR code below to go directly to the website)



BSP 200012 / BSP 200024

1. Introduction:

The user manual applies to stabilized switching-mode power supplies intended for use in industrial-automation systems. The BSP series power supplies are compact devices designed for installation inside industrial-equipment enclosures. They feature a low-profile construction and high efficiency. They are equipped with an Active PFC (power-factor correction) circuit, which ensures optimal energy utilisation and minimal disturbances to the mains supply. Moreover, they include a wide range of protections: Over-Power Protection (OPP), Over-Voltage Protection (OVP), Short-Circuit Protection (SCP) and Over-Temperature Protection (OTP). Through these measures, both the power supply and the connected loads are effectively protected, ensuring safe and stable operation of the entire system.

2. Features:

- **Over-load protection:** The power supply is equipped with a constant-current limiting function to protect the unit from overload and short-circuit conditions. When the allowable load is exceeded, the output voltage is automatically reduced while the current is maintained at a safe level.
- **Thermal protection:** The power supply features an internal temperature monitoring system that prevents damage due to excessive heat. If the operating temperature exceeds the specified limit, the DC output is disabled and the status LED, normally green, turns red. To resume normal operation after activation of the thermal protection, ensure the unit has cooled to within the permitted temperature range.
- **Over-voltage protection:** The power supply incorporates an Over-Voltage Protection (OVP) circuit that safeguards both the unit and the connected loads from damage caused by excessive output voltage. If an over-voltage condition is detected, the DC output is automatically disconnected to prevent damage or failure. To restore operation after OVP activation, switch the supply off and then on again.
- **Output voltage adjustment potentiometer:** The power supply includes a user-accessible potentiometer, enabling precise adjustment of the output voltage to match the requirements of the connected equipment.
- **Status indication (LED):** The power supply is equipped with an LED indicator showing the current operational status of the unit. During normal operation the indicator is lit green. In the event of a fault or improper operation (for example triggered protection), the indicator turns red, enabling quick fault identification.

3. Chart of changes in output load rated values:

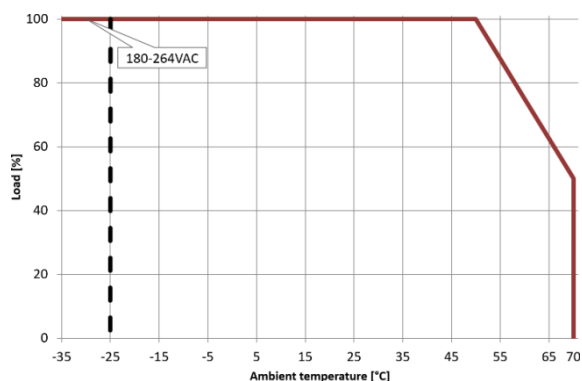


Figure 3. Derating curve of rated output load as a function of ambient temperature.

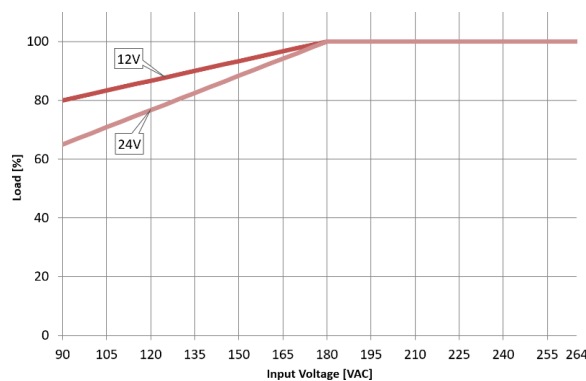
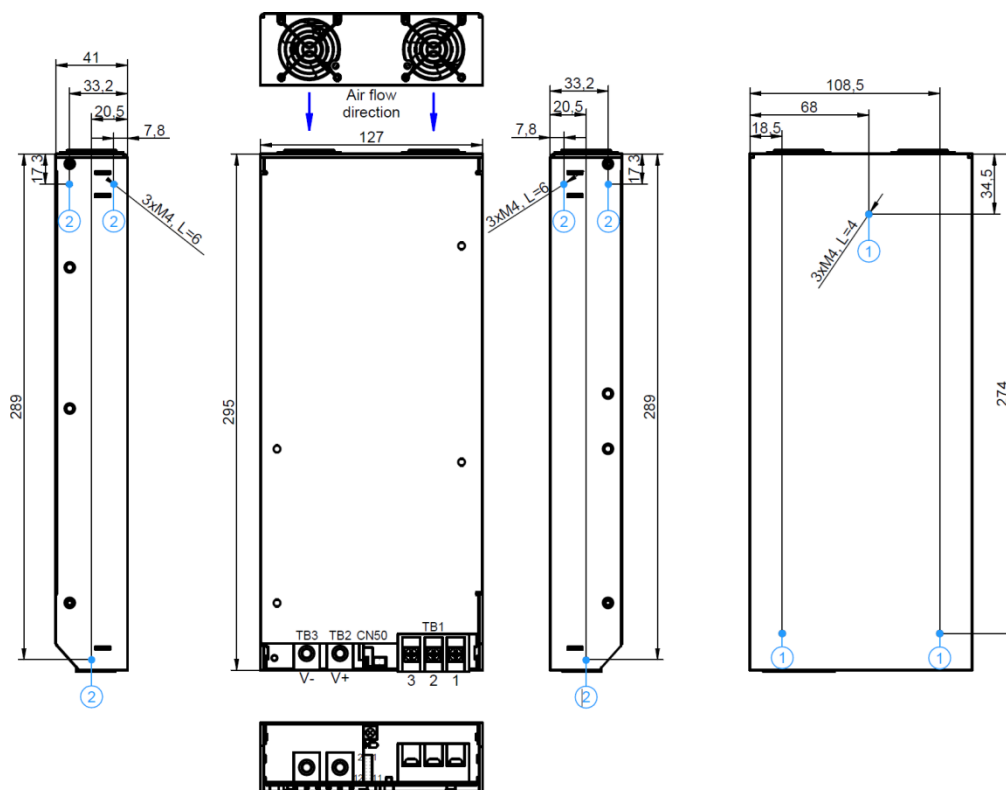


Figure 4. Derating curve of rated output load as a function of input voltage.

4. Mechanical specifications:



Hole No.	Hole size	Maximum screw insertion depth	Maximum tightening torque
1	M4	4mm	0,7~1,1Nm
2	M4	6mm	0,7~1,1Nm

Connector configuration TB1		Connector configuration TB2/TB3		Connector configuration CN501 (HRS DF11-12DS-2C):
Connector No.	Description	Connector No.	Description	The connector described in the section: ADDITIONAL FUNCTIONS
1	AC/N	TB2	DC/V+	
2	AC/L	TB3	DC/V-	
3	FG/PE			

Maximum tightening torque:
1,8Nm

Maximum tightening torque:
1,0Nm

5. Installation:

- A protective device (such as a cartridge fuse or miniature circuit-breaker) and readily accessible isolating means to disconnect the power must be provided.
- Before connecting the power supply, ensure that the main power switch to which it will be connected is in the **OFF** position and properly secured against accidental re-activation. Failure to comply may result in contact with live components, which may cause death or serious injury.
- Connect the device to the mains supply. If flexible cables are used, ferrules must be fitted to ensure correct termination at the terminals. For flexible conductors, the cross-sectional area of the supply cable must be at least 1,5 mm².
- Maintain a sufficient insulation clearance between the mounting screws and the internal components of the power supply.
- Ensure that the mounting position of the unit allows optimal cooling performance and that the ventilation openings remain unobstructed.

6. Safety precautions:

- **Do not remove** the metal housing of the power supply while the mains power is connected.
- **Do not touch** the device with wet hands.
- **Do not touch** the housing when the device is fully loaded; high surface temperature may cause burns.
- **Do not use** the device if any metal objects, water or other foreign bodies have entered it.
- **Do not use** the device if it has been damaged, as the voltage-regulating circuitry may have failed or may be operating outside the normal control parameters. Failure to comply may result in high voltage and subsequent damage to the connected load.
- **No objects** may touch the output terminals of the device.
- If inspection of the devices interior is necessary, allow it to cool completely. In case of a fault, the high temperatures of certain components may cause burns.
- **Do not block** the air-intake vent.

7. Specifications:

	BSP 200012	BSP 200024
Voltage Range	90-264VAC; 250-320VDC	
Frequency	47-63Hz~	
Full Load AC Current	13A/115VAC; 7A/230VAC	13A/115VAC; 7A/230VAC
Leakage current	< 2mA/230VAC	
Inrush Current, cold start 25°C	50A/230VAC	
Efficiency	87%	87%

Output

Rated DC Voltage	12V	24V
Voltage Adjust Range	10,5-14V	21-28V
Rated Current	100A	80A
Rated Power	1200W	1920W
Ripple & Noise (peak to peak)*2	≤ 150mV	≤ 200mV
Voltage tolerance	≤ 2%	≤ 1%
Line regulation	≤ 1%	≤ 0,5%
Load Regulation (10% - 100%)	≤ 1%	≤ 0,5%
Setup, Rise Time (Full Load)	1500ms, 60ms (pełne obciążenie)	
Hold-up Time (Full Load)	> 16ms/230VAC (75% Full Load); > 10ms/230VAC	

Protection

Over load/Over Current	The power supply may operate at short-term loads in the range of 105 % to 125 % of rated power.	
	Type of protection: Constant current limiting, re-power on to recover after the fault condition is removed.	
Over Output Voltage	14,7-17,5VDC	14,7-17,5VDC
	Type of protection: Shut down output voltage, re-power on to recover.	
Over Temperature	Type of protection: Shut down output voltage, recovers automatically after temperature goes down.	

Additional functions

Parallel Operation*	Supports parallel operation up to 8000 W (3+1).
Remote ON/OFF*	ON: Open between Remote ON/OFF pin[7] and 5V-AUX pin[11] (CN501) . OFF: Short Remote ON/OFF pin[7] to 5V-AUX pin[11] (CN501) .
Voltage Drop Compensation (Remote sense)*	Voltage drop compensation on load wires up to 0,5 V.
Programmable Output Voltage (PV)*	The output voltage can be adjusted within 40–115% of the rated value.

OPERATING MANUAL

BSP 200, BSP 320, BSP 750, BSP 2000,
BSP 2400, BSP 3000

Auxiliary Supply*	5V/0,3A (±10%); 12V/0,8A (±10%)
DC-OK Signal*	Output voltage OK: 0–1 V ; Output voltage not OK: 3,3–5,6V
TEMP-ALARM Signal*	Temperature OK (below threshold): 0–1 V ; Temperature high (above threshold): 3.3–5.6 V
*A detailed description is provided in the ADDITIONAL FUNCTIONS section.	

Safety & EMC

Safety Standards	EN IEC 62368-1
Withstand Voltage	I/P-O/P 3kVAC; I/P-F/G 2kVAC; O/P-F/G 0,5kVAC
Insulation Resistance	I/P-O/P, I/P-F/G, O/P-F/G 100MΩ/500VDC/25°C/70%RH
EMI Radiation & Conduction	Compliance with EN55032(CISPR32)
Harmonics Current	Compliance with EN61000-3-2, -3
EMC Immunity	Compliance with EN61000-4-2, -3, -4, -5, -6, -8, -11

Environment

Working Temperature	-35°C ~ +70°C
Derating Temperature above 50°C	See: Derating curve.
Working Humidity	20-90% RH, non-condensing
Storage Temperature Humidity	from -40°C to +85°C, 10-95% RH, non-condensing
Vibration	10-500Hz, 2G 10min/1cycle, 60min each along X, Y, Z axes

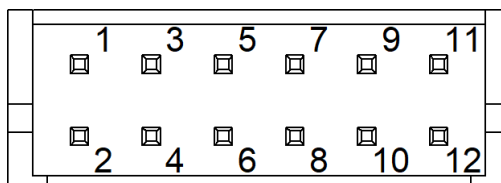
General

Case Material	Electro-galvanized steel and aluminium enclosure.
Case Protection	IP 20
Weight	1,95kg
Dimensions	295 × 127 × 41mm
Mounting	Rear or side mounting.
Connection	Screw-terminal connectors with single output terminal.

Note

1. The output power must be reduced (see Fig. 2) under conditions of reduced input voltage. Detailed information is provided in the chart showing the rated output load versus input voltage.
2. Unless otherwise specified, all technical parameters are measured at an input voltage of 230 VAC, rated load and an ambient temperature of 25°C.
3. Method for measuring ripple and noise: a twisted-pair cable of approximately 30 cm in length is used, with capacitors of 0,1 µF and 47 µF connected in parallel at the output terminals; measurement is carried out with a bandwidth of 20 MHz.
4. Output voltage accuracy includes: setting error, line regulation and load regulation.
5. Line regulation test: performed by measuring changes in the output voltage when the input voltage is varied from minimum to maximum, while maintaining rated load.
6. Load regulation test: performed by varying the load from 0% to 100% of the rated value.
7. The power supply is treated as a component intended for installation in end-equipment. All EMC tests are conducted when the power supply is mounted on a metal plate sized 720 mm × 360 mm × 1 mm. The end-equipment must be re-verified for compliance with EMC directives after integration.
8. Start-up time is specified for a cold start. Frequent power-on/power-off cycles may prolong the start-up time.
9. For operation at altitudes above 2000 m (6500 ft) above sea level, the permissible ambient operating temperature must be reduced by 5 °C for each additional 1000 m for fan-cooled models, and by 3.5°C per 1000 m for fan-less models.

8. ADDITIONAL FUNCTIONS:



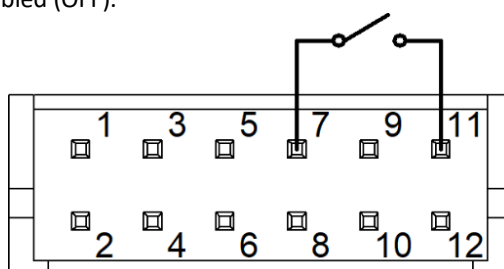
Drawing 1. HRS DF11-12DP-2DS connector used for the power supply's auxiliary control and signal functions.

Pin No.	Pin Name	Description
1	S+	Positive remote-sense pin for output voltage sensing (REMOTE SENSE).
2	S-	Negative remote-sense pin for output voltage sensing (REMOTE SENSE).
3	PV	DC input from an external voltage source for the PV function (output voltage programming); reference: S-[4].
4	GND	Ground connected to the negative output terminal V-.
5	DC-OK	Open-collector output; reference: G-AUX pins [8, 9, 10].
6	TEMP-ALARM	Open-collector output; reference: G-AUX pins [8, 9, 10].
7	REMOTE ON/OFF	Remote control of the power supply output using either a 5V control signal or a volt-free (dry-contact) switch between the REMOTE ON/OFF pin [7] and the 5V-AUX pin [11] .
8, 9, 10	G-AUX	Auxiliary output ground. Signal isolated from the main output terminals.
11	5V-AUX	Auxiliary 5 V output, referenced to the G-AUX pins [8, 9, 10]. This output is not controlled by the REMOTE ON/OFF function. Maximum load current: 0,3A.
12	12V-AUX	Auxiliary 12 V output, referenced to the G-AUX pins [8, 9, 10]. This output is not controlled by the REMOTE ON/OFF function. Maximum load current: 0,8A.

REMOTE ON/OFF CONTROL:

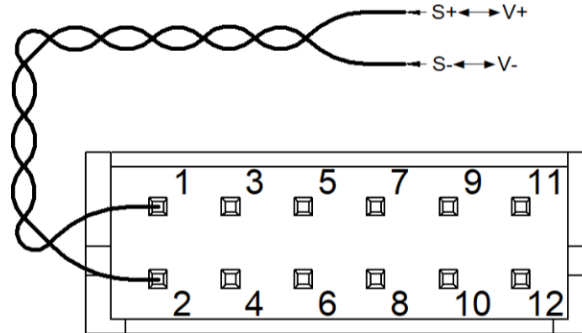
The power supply output can be switched ON or OFF using the Remote ON/OFF control function.
Connection between the Remote ON/OFF pin [7] and the 5V-AUX pin [11]:

- Short-circuit – Output enabled (ON),
- Open-circuit – Output disabled (OFF).



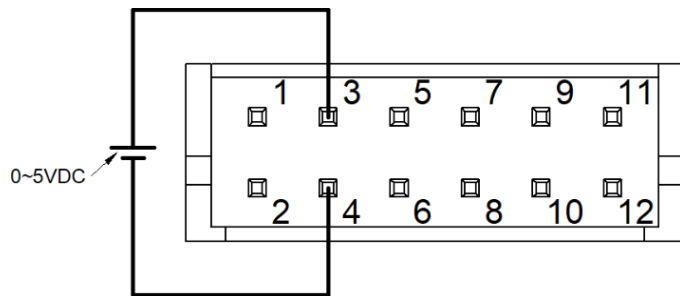
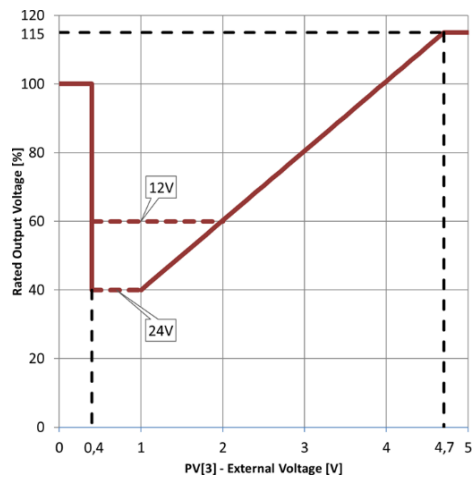
VOLTAGE DROP COMPENSATION (REMOTE SENSE):

The **Remote Sense** function is used to compensate for voltage drop across the load wires by up to 0,5V. The **S+[1]** signal should be connected to the positive load terminal, and the **S-[2]** signal to the negative load terminal.



PROGRAMMABLE OUTPUT VOLTAGE (PV):

The output voltage can be adjusted within the range of **40–115% of the rated value** by applying an external voltage to pin **PV[3]**.



Correct operation of the output-voltage programming function requires connecting **S+[1]** to **V+** and **S-[2]** to **V-** on connector CN501.

Figure 3. Rated output voltage vs. external PV [3] control voltage.

AUXILIARY SUPPLY:

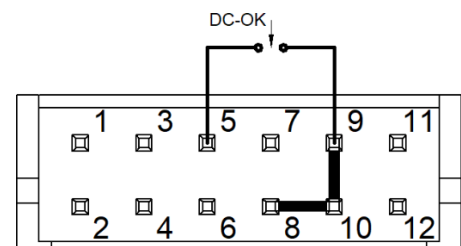
The power supply is equipped with additional auxiliary outputs:

- **5V/0,3A**, available between pins **5V-AUX [11]** (positive terminal) and **G-AUX [8, 9, 10]** (ground),
- **12V/0,8A**, available between pins **12V-AUX [12]** (positive terminal) and **G-AUX [8, 9, 10]** (ground).

DC-OK SIGNAL:

The DC-OK signal, indicating the status of the power supply's output voltage, is an open-collector type signal.

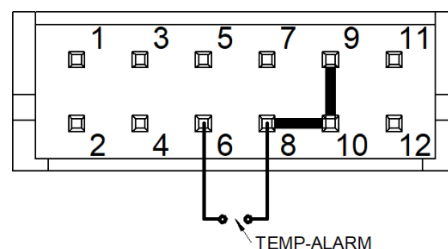
DC-OK Signal Status Table	
Voltage [V]	Output state
0 ~ 1	Output voltage OK
3,3 ~ 5,6	Output voltage not OK



TEMP-ALARM SIGNAL:

TEMP-ALARM signal indicating an over-temperature condition.

TEMP-ALARM Signal Status Table	
Voltage [V]	Output state
0 ~ 1	Temperature below limit.
3,3 ~ 5,6	Temperature above limit.



PARALLEL OPERATION:

The power supply supports parallel operation — up to four units of the same model can be connected in parallel. To connect power supplies in parallel, the following requirements must be fulfilled:

- The voltage difference between individual units must not exceed 0,2 V. To minimize variations in voltage drop, short and sufficiently thick output wiring should be used.
- The minimum load in parallel operation must exceed 5% of the rated current of a single unit.
- The maximum load in parallel operation must not exceed:

$$I_{MAX} < I_{NOM} * N * 0,9$$

where:

I_{MAX} — Maximum current in parallel operation.

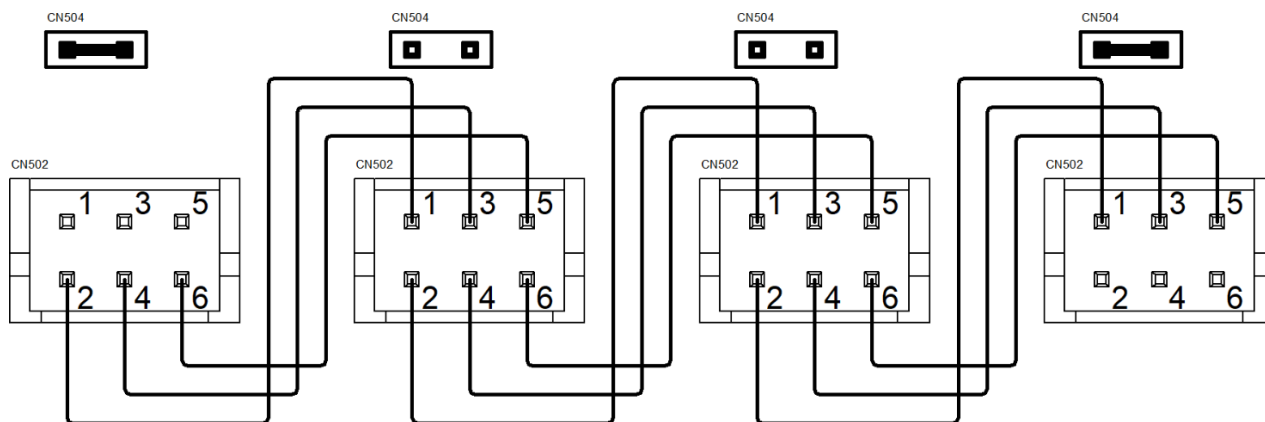
I_{NOM} — Rated maximum current of a single power supply unit.

N — Number of units connected in parallel.

- Each power supply must have its **REMOTE SENSE** lines connected to the same sensing point at the load to ensure proper compensation of the wiring voltage drops.
- A decrease of the total output current below 5% of the rated value may result in inaccurate or ineffective current sharing between the units.
- The resistance of the connection paths should be kept as similar as possible — avoid differences in wire length and cross-section.
- All power wires and REMOTE SENSE voltage-compensation wires must be routed in a way that minimizes electromagnetic interference (e.g. by twisting the sense-wire pairs, using shielding, and avoiding wiring loops).
- All CN502/CN504 connectors must be wired according to the table below:

Number of power supplies	Unit 1		Unit 2		Unit 3		Unit 4	
	CN502	CN504	CN502	CN504	CN502	CN504	CN502	CN504
1	X	V	-	-	-	-	-	-
2	V	V	V	V	-	-	-	-
3	V	V	V	X	V	V	-	-
4	V	V	V	X	V	X	V	V

Connection of CN502/CN504 connectors in a four-power-supply configuration:



9. Additional information:

The latest version of the user manual is available on the website:

<https://www.brevetrafo.com/catalog/power-supplies/bsp.html>

(scan the QR code below to go directly to the website)



BSP 240012 / BSP 240024

1. Introduction:

The user manual applies to stabilized switching-mode power supplies intended for use in industrial-automation systems. The BSP series power supplies are compact devices designed for installation inside industrial-equipment enclosures. They feature a low-profile construction and high efficiency. They are equipped with an Active PFC (power-factor correction) circuit, which ensures optimal energy utilisation and minimal disturbances to the mains supply. Moreover, they include a wide range of protections: Over-Power Protection (OPP), Over-Voltage Protection (OVP), Short-Circuit Protection (SCP) and Over-Temperature Protection (OTP). Through these measures, both the power supply and the connected loads are effectively protected, ensuring safe and stable operation of the entire system. The BSP series power supplies are designed to operate in parallel (up to three units), allowing the total output power to be increased.

2. Features:

- **Over-load protection:** The power supply is equipped with a constant-current limiting function to protect the unit from overload and short-circuit conditions. When the allowable load is exceeded, the output voltage is automatically reduced while the current is maintained at a safe level.
- **Thermal protection:** The power supply features an internal temperature monitoring system that prevents damage due to excessive heat. If the operating temperature exceeds the specified limit, the DC output is disabled and the status LED, normally green, turns red. To resume normal operation after activation of the thermal protection, ensure the unit has cooled to within the permitted temperature range.
- **Over-voltage protection:** The power supply incorporates an Over-Voltage Protection (OVP) circuit that safeguards both the unit and the connected loads from damage caused by excessive output voltage. If an over-voltage condition is detected, the DC output is automatically disconnected to prevent damage or failure. To restore operation after OVP activation, switch the supply off and then on again.
- **Output voltage adjustment potentiometer:** The power supply includes a user-accessible potentiometer, enabling precise adjustment of the output voltage to match the requirements of the connected equipment.
- **Status indication (LED):** The power supply is equipped with an LED indicator showing the current operational status of the unit. During normal operation the indicator is lit green. In the event of a fault or improper operation (for example triggered protection), the indicator turns red, enabling quick fault identification.

3. Chart of changes in output load rated values:

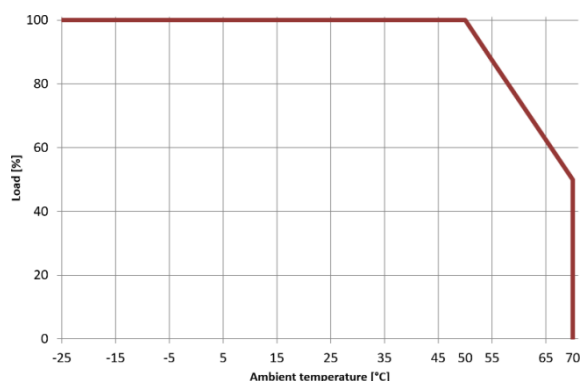


Figure 1. Derating curve of rated output load as a function of ambient temperature.

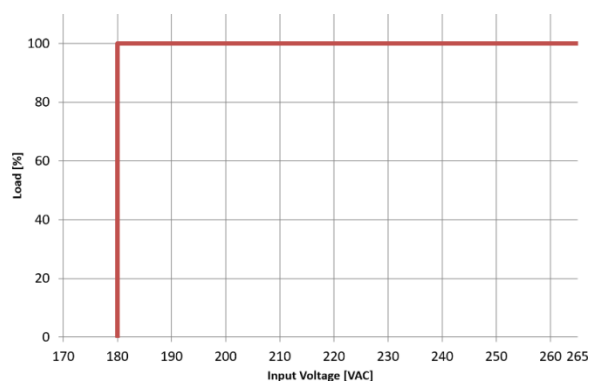
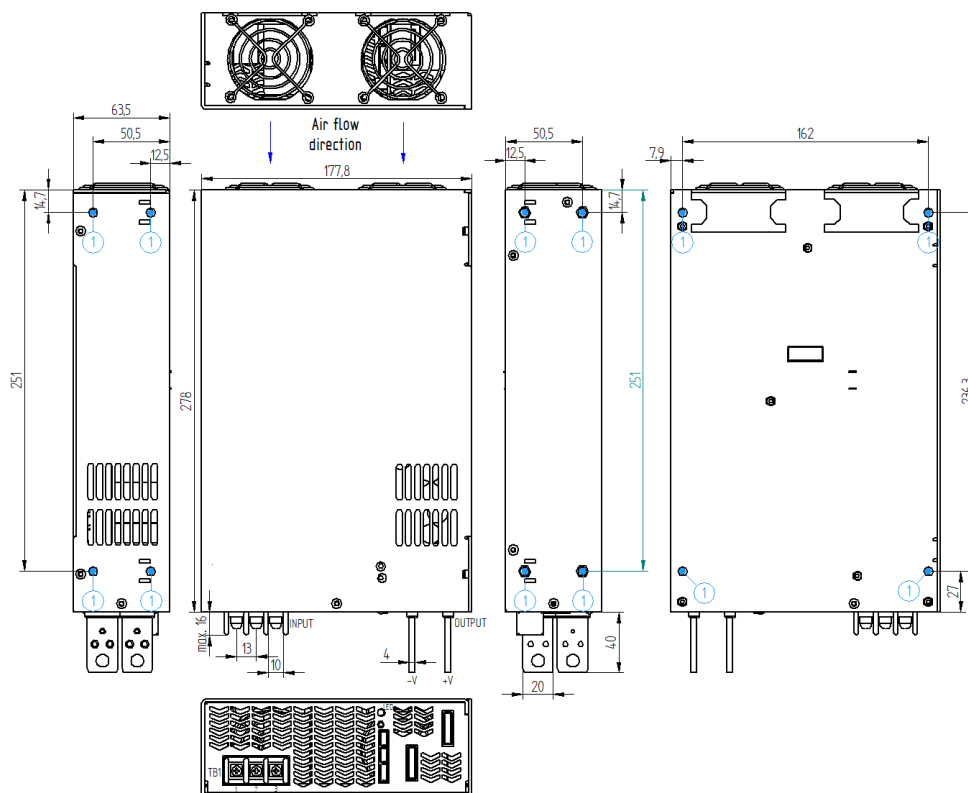


Figure 2. Derating curve of rated output load as a function of input voltage.

4. Mechanical specifications:



Hole No.	Hole size	Maximum screw insertion depth	Maximum tightening torque
1	M4	5mm	0,7~1,1Nm

Connector configuration TB1		Connector configuration CN1/CN2 (HRS DF11-8DS-2C) CN3 (HRS DF11-10DS-2C): The connector described in the section: ADDITIONAL FUNCTIONS
Connector No.	Description	
1	AC/L	
2	AC/N	
3	FG/PE	

Maximum tightening torque:
1,8Nm

5. Installation:

- A protective device (such as a cartridge fuse or miniature circuit-breaker) and readily accessible isolating means to disconnect the power must be provided.
- Before connecting the power supply, ensure that the main power switch to which it will be connected is in the OFF position and properly secured against accidental re-activation. Failure to comply may result in contact with live components, which may cause death or serious injury.
- Connect the device to the mains supply. If flexible cables are used, ferrules must be fitted to ensure correct termination at the terminals. For flexible conductors, the cross-sectional area of the supply cable must be at least 2,5 mm².
- Maintain a sufficient insulation clearance between the mounting screws and the internal components of the power supply.
- Ensure that the mounting position of the unit allows optimal cooling performance and that the ventilation openings remain unobstructed.

6. Safety precautions:

- **Do not remove** the metal housing of the power supply while the mains power is connected.
- **Do not touch** the device with wet hands.
- **Do not touch** the housing when the device is fully loaded; high surface temperature may cause burns.
- **Do not use** the device if any metal objects, water or other foreign bodies have entered it.
- **Do not use** the device if it has been damaged, as the voltage-regulating circuitry may have failed or may be operating outside the normal control parameters. Failure to comply may result in high voltage and subsequent damage to the connected load.
- **No objects** may touch the output terminals of the device.
- If inspection of the devices interior is necessary, allow it to cool completely. In case of a fault, the high temperatures of certain components may cause burns.
- **Do not block** the air-intake vent.

7. Specifications:

	BSP 240012	BSP 240024
Voltage Range	200-240VAC; 280-340VDC	
Frequency	47-63Hz~	
Full Load AC Current	16A/200VAC; 12A/230VAC	
Inrush Current, cold start 25°C*	60A/230VAC	
Efficiency	88%	88%

Output

Rated DC Voltage	12V	24V
Voltage Adjust Range	10,8-13,2V	22-28V
Rated Current	166,7A	100A
Rated Power	2000,4W	2400W
Ripple & Noise (peak to peak)*	≤ 150mV	
Voltage tolerance	≤ 1%	
Line regulation	≤ 0,5%	
Load Regulation (10% - 100%)	≤ 0,5%	
Setup, Rise Time (Full Load)	1000ms, 80ms (Full Load)	
Hold-up Time (Full Load)	> 12ms/230VAC (Full Load)	

Protection

Over load/Over Current	The power supply may operate at short-term loads in the range of 105% to 112% of rated power.	
	Type of protection: Constant current limiting, re-power on to recover after the fault condition is removed.	
Over Output Voltage	13,8-16,8VDC	13,8-16,8VDC
	Type of protection: Shut down output voltage, re-power on to recover.	
Over Temperature	Type of protection: Shut down output voltage, recovers automatically after temperature goes down.	

Additional functions

Parallel Operation*	Supports parallel operation up to 7200W (2+1).
Remote ON/OFF*	Possible with the auxiliary 12 V supply or an external 12 V source.
Voltage Drop Compensation (Remote sense)*	Voltage drop compensation on load wires up to 0,25 V.
Programmable Output Voltage (PV)*	The output voltage can be adjusted within 20–120% of the rated value.
Auxiliary Supply*	12V/0,1A ±10% (For powering the Remote ON/OFF control function)
Power-OK Signal*	Power-OK signal (relay contact and open-collector type output)

* A detailed description is provided in the **ADDITIONAL FUNCTIONS** section.

Safety & EMC

Safety Standards	EN IEC 62368-1
Withstand Voltage	I/P-O/P 3kVAC; I/P-F/G 2kVAC; O/P-F/G 0,5kVAC
Insulation Resistance	I/P-O/P, I/P-F/G, O/P-F/G 100MΩ/500VDC/25°C/70%RH
EMI Radiation & Conduction	Compliance with EN55032(CISPR32)
Harmonics Current	Compliance with EN61000-3-2, -3
EMC Immunity	Compliance with EN61000-4-2, -3, -4, -5, -6, -8, -11

Environment

Working Temperature	-20°C ~ +70°C
Derating Temperature above 50°C	See: Derating curve.
Working Humidity	20-90% RH, non-condensing
Storage Temperature Humidity	from -40°C to +85°C, 10-95% RH, non-condensing
Vibration	10-500Hz, 2G 10min/1cycle, 60min each along X, Y, Z axes

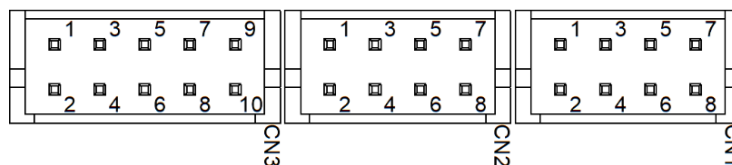
General

Case Material	Electro-galvanized steel and aluminium enclosure.
Case Protection	IP 20
Weight	3,6kg
Dimensions	278 × 177,8 × 63,5mm
Mounting	Rear or side mounting.
Connection	Screw-terminal connectors with single output terminal.

Note

1. Unless otherwise specified, all technical parameters are measured at an input voltage of 230 VAC, rated load and an ambient temperature of 25°C.
2. Method for measuring ripple and noise: a twisted-pair cable of approximately 30 cm in length is used, with capacitors of 0,1 µF and 47 µF connected in parallel at the output terminals; measurement is carried out with a bandwidth of 20 MHz.
3. Output voltage accuracy includes: setting error, line regulation and load regulation.
4. Line regulation test: performed by measuring changes in the output voltage when the input voltage is varied from minimum to maximum, while maintaining rated load.
5. Load regulation test: performed by varying the load from 0% to 100% of the rated value.
6. The power supply is treated as a component intended for installation in end-equipment. All EMC tests are conducted when the power supply is mounted on a metal plate sized 720 mm × 360 mm × 1 mm. The end-equipment must be re-verified for compliance with EMC directives after integration.
7. Start-up time is specified for a cold start. Frequent power-on/power-off cycles may prolong the start-up time.
8. For operation at altitudes above 2000 m (6500 ft) above sea level, the permissible ambient operating temperature must be reduced by 5°C for each additional 1000 m for fan-cooled models, and by 3.5°C per 1000 m for fan-less models.

8. ADDITIONAL FUNCTIONS:



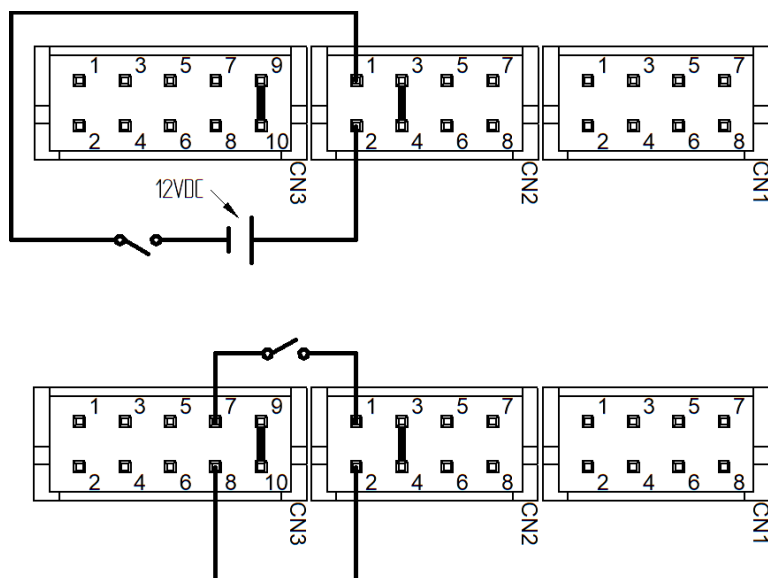
Drawing 2. HRS DF11-8DP-2DS and HRS DF11-10DP-2DS connectors used for the power supply's auxiliary control and signal functions.

Connector	Pin No.	Pin Name	Description
CN1/CN2	1	REMOTE ON/OFF-GND	Ground reference for the Remote ON/OFF control signal.
	2	REMOTE ON/OFF	Remote control of the power supply output using a 12V electrical signal between the REMOTE ON/OFF pin [2] and the REMOTE ON/OFF-GND pin [1].
	3	PV	DC input from an external voltage source for the PV function (output voltage programming); reference: S-[5, 7].
	4	VREF	Reference voltage connector.
	5	S-	Negative remote-sense pin for output voltage sensing (REMOTE SENSE).
	6	PC	Parallel operation connector (used for connecting power supplies in parallel).
	7	S-	Negative remote-sense pin for output voltage sensing (REMOTE SENSE).
	8	S+	Positive remote-sense pin for output voltage sensing (REMOTE SENSE).
CN3	1	Power-OK-GND	Ground reference for the Power-OK signal.
	2	Power-OK	Power-OK signal (relay).
	3	Power-OK-GND	Ground reference for the Power-OK signal.
	4	Power-OK	Power-OK signal (open-collector type).
	5	REMOTE ON/OFF-GND	Ground reference for the Remote ON/OFF control signal.
	6	REMOTE ON/OFF	Ground reference for the Remote ON/OFF control signal.
	7	G-AUX	Auxiliary output ground. The signal is isolated from the main output terminal.
	8	12V-AUX	Auxiliary 12V output, referenced to the G-AUX pin [7]. This output is not controlled by the REMOTE ON/OFF function. Maximum load current: 0,1 A.
	9	OPM	Protection-type selection connector.
	10	OPM-SD	

REMOTE ON/OFF CONTROL:

The power supply output can be switched ON or OFF using the Remote ON/OFF control function. The connections between the pins must be made according to one of the diagrams below, using either an external 12 VDC supply or the internal 12V-AUX signal:

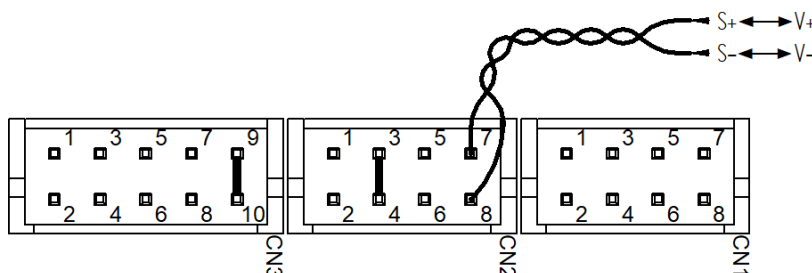
- Open-circuit – Output enabled (ON),
- Short-circuit – Output disabled (OFF).



Drawing 1. Examples of connector wiring for the Remote ON/OFF control function.

VOLTAGE DROP COMPENSATION (REMOTE SENSE):

The **Remote Sense** function is used to compensate for voltage drop across the load wires by up to 0,25V. The **S+[8]** signal should be connected to the positive load terminal, and the **S-[5, 7]** signal to the negative load terminal.

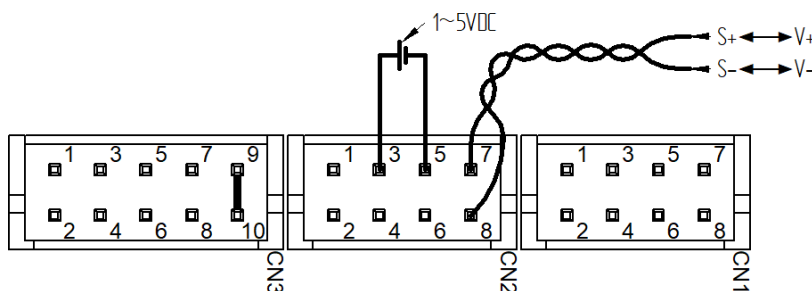


Drawing 2. Example of connector wiring for the VOLTAGE DROP COMPENSATION (REMOTE SENSE) function.

* The factory-default configuration of the power supply includes jumpers between pins **S-[5]** and **V-**, and between pins **S+[8]** and **V+** on connector **CN2**. After the Remote Sense function is activated, the **S+[8]** wire must be connected to the positive load terminal, and the **S-[5, 7]** wires to the negative load terminal.

PROGRAMMABLE OUTPUT VOLTAGE (PV):

The output voltage can be adjusted within the range of **20–110% of the rated value** by applying an external voltage to pin **PV[3]**.



Drawing 3. Example of connector wiring for the PV output-voltage programming function.

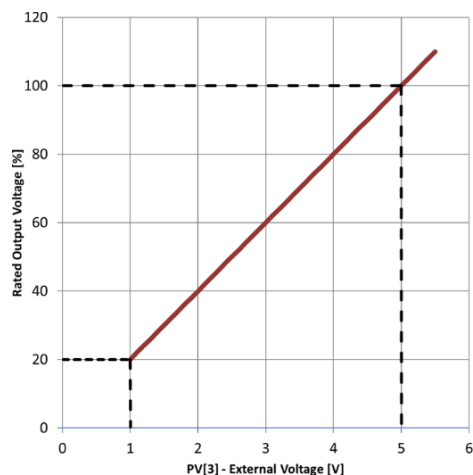


Figure 6. Rated output voltage vs. external **PV[3]** control voltage.

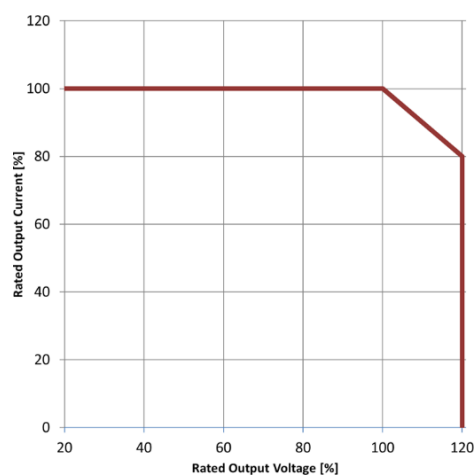


Figure 5. Rated output current vs. rated output voltage.

Correct operation of the output-voltage programming function requires connecting the **S+[8]** pin to **V+**, and the **S-[5, 7]** pins to **V-**.

AUXILARY SUPPLY:

The power supply is equipped with additional auxiliary outputs:

- 12V/0,1A, available between pins **12V-AUX[8]** (positive terminal) and **G-AUX [7]** (ground).

POWER-OK SIGNAL:

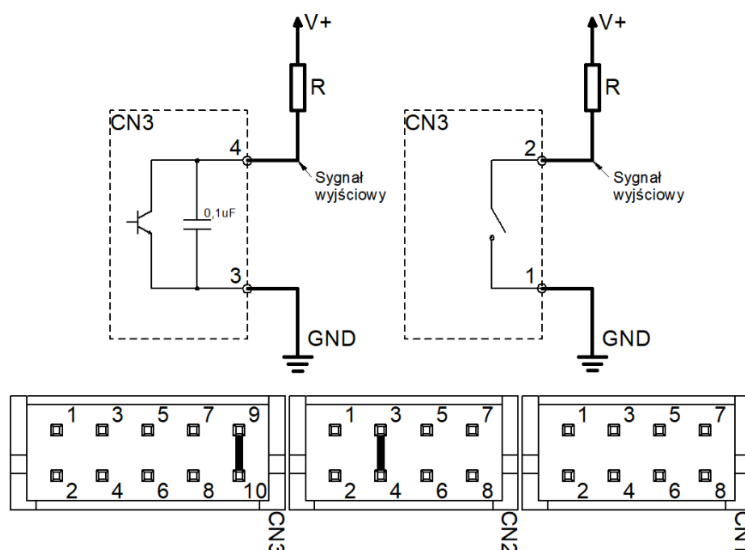
The power supply is equipped with a **Power-OK** signal indicating the status of the output voltage. This signal is available in two versions:

- Relay output – pins **Power-OK[2]** and **Power-OK-GND[1]**,
- Open-collector output – pins **Power-OK[4]** and **Power-OK-GND[3]**.

The **Power-OK** signal is closed (relay output) or active (open-collector output) when the output voltage reaches **at least 80% of its nominal value** or when the power supply is operating normally. The status LED lights green.

If the output voltage drops **below 80% of the nominal value** or a fault occurs, the **Power-OK** signal becomes open (relay output) or inactive (open-collector output), and the status LED changes to red.

Power-OK Signal Status Table		
Description	Relay Output	Open-Collector Output
Normal operation, output voltage above 80%	Closed contacts	Active
Fault condition, output voltage below 80% or a failure occurs	Open contacts	Inactive



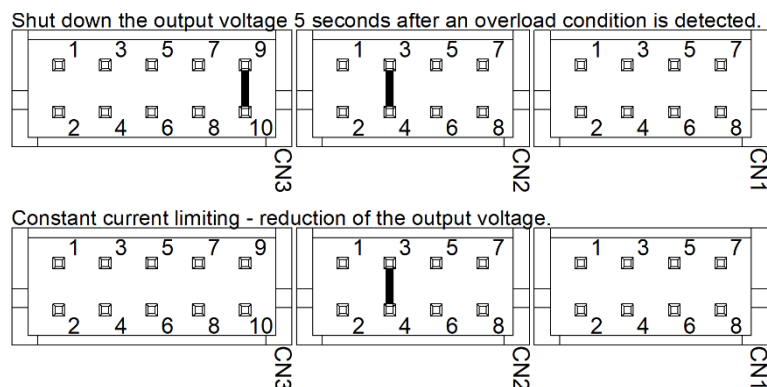
Drawing 4. Example of connector wiring for the Power-OK signal function.

OVERLOAD PROTECTION MODE:

The power supply allows selection of the overload protection mode by shorting or opening pins **OPM [9]** and **OPM-SD [10]** on connector **CN3**.

- **Shorted** – when an overload occurs, the power supply limits the current and then switches off the output voltage after **5 seconds**. Recovery requires cycling the input power.
- **Open** – the power supply limits the output power by reducing the output voltage while maintaining the current at a safe level.

Below are two wiring diagrams illustrating both overload protection modes.



Drawing 5. Examples of connector wiring for the overload protection selection function.

PARALLEL OPERATION:

The power supply supports parallel operation — up to three units of the same model can be connected in parallel. To connect power supplies in parallel, the following requirements must be fulfilled:

- Parallel connection should be made using short, thick wires before connecting to the load.
- The voltage difference between individual units must not exceed 0,2 V. To minimize variations in voltage drop, short and sufficiently thick output wiring should be used.
- The minimum load in parallel operation must exceed 3% of the rated current of a single unit.

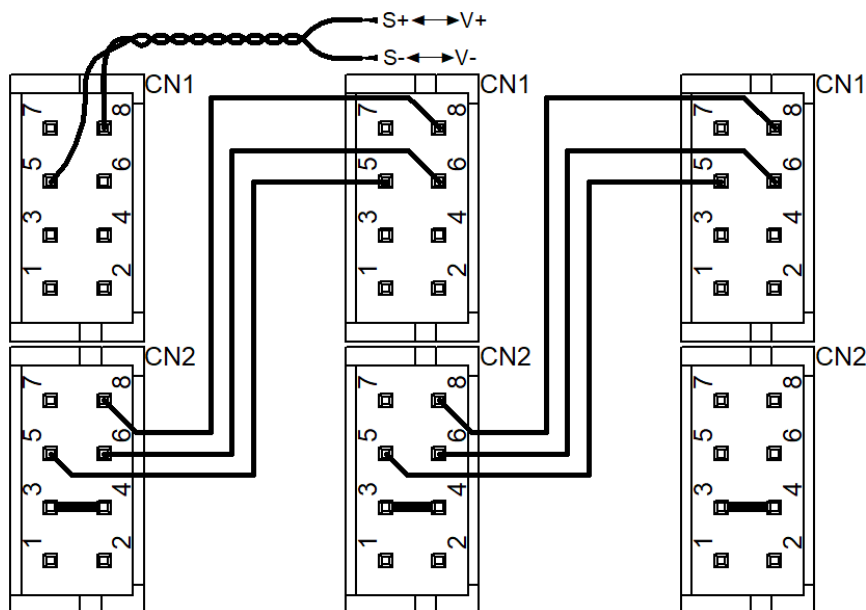
- $$I_{MAX} < I_{NOM} * N * 0,9$$

I_{MAX} – Maximum current in parallel operation.

I_{NOM} – Rated maximum current of a single power supply unit.

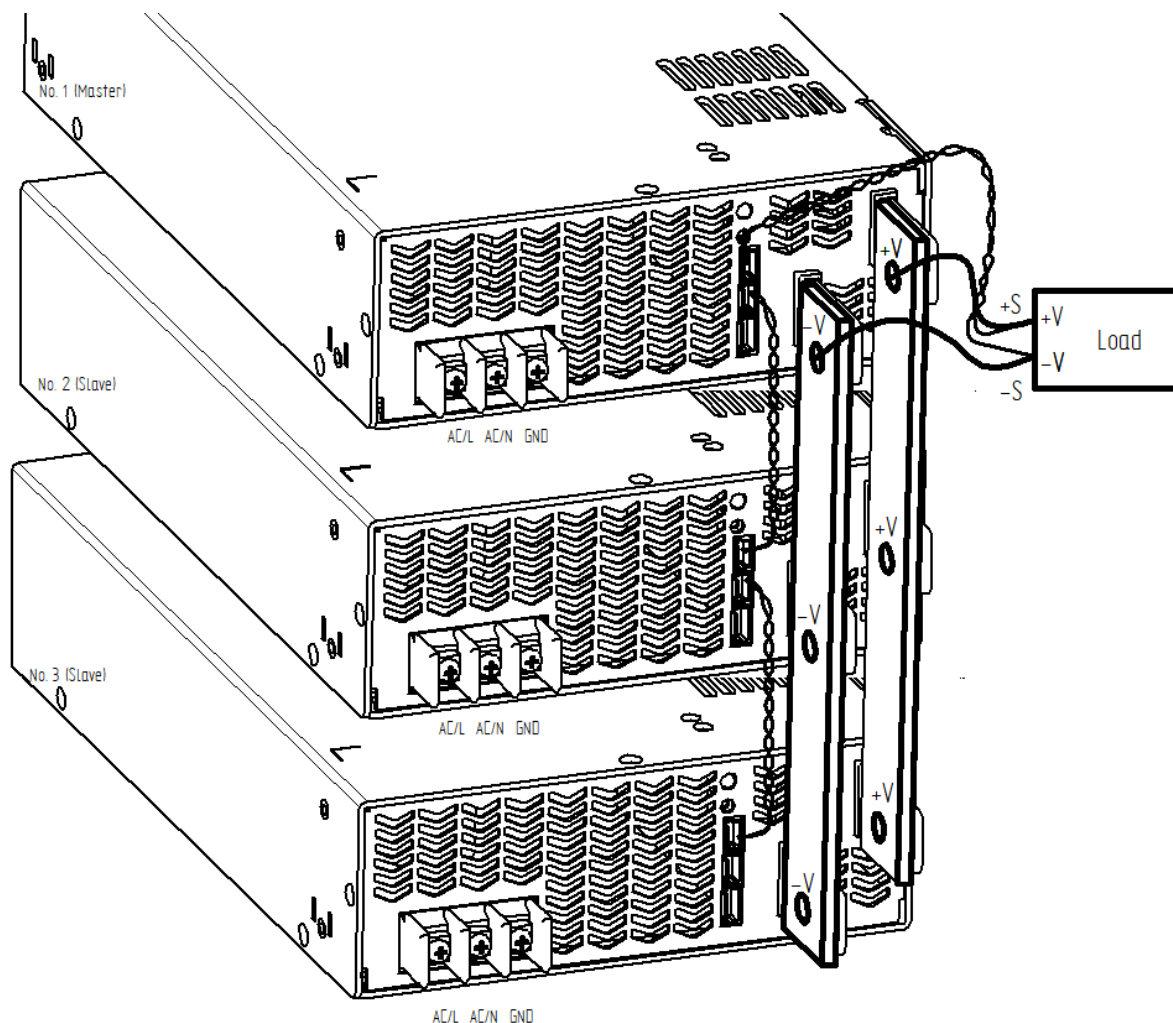
N – Number of units connected in parallel.

- During parallel operation, the REMOTE SENSE voltage-compensation lines must be connected only to the master unit.
- Each power supply must have its REMOTE SENSE lines connected to the same sensing point at the load to ensure proper compensation of the wiring voltage drops.
- A decrease of the total output current below 3% of the rated value may result in inaccurate or ineffective current sharing between the units.
- The resistance of the connection paths should be kept as similar as possible — avoid differences in wire length and cross-section.
- All power wires and REMOTE SENSE voltage-compensation wires must be routed in a way that minimizes electromagnetic interference (e.g., by twisting the sense-wire pairs, using shielding, and avoiding wiring loops).
- The S+ [8], S– [5, 7], and PC [6] connectors on CN1 or CN2 are connected in parallel.
- The connection of the CN1/CN2 connectors in a three-power-supply configuration is shown in Drawing 8 and 9.



Drawing 6. Example of CN1/CN2 connector wiring for the power supplies' parallel operation function.

Example of power supply connections for parallel operation:



9. Additional information:

The latest version of the user manual is available on the website:

<https://www.brevetrafo.com/catalog/power-supplies/bsp.html>

(scan the QR code below to go directly to the website)



BSP 300012 / BSP 300024

1. Introduction:

The user manual applies to stabilized switching-mode power supplies intended for use in industrial-automation systems. The BSP series power supplies are compact devices designed for installation inside industrial-equipment enclosures. They feature a low-profile construction and high efficiency. They are equipped with an Active PFC (power-factor correction) circuit, which ensures optimal energy utilisation and minimal disturbances to the mains supply. Moreover, they include a wide range of protections: Over-Power Protection (OPP), Over-Voltage Protection (OVP), Short-Circuit Protection (SCP) and Over-Temperature Protection (OTP). Through these measures, both the power supply and the connected loads are effectively protected, ensuring safe and stable operation of the entire system. The BSP series power supplies are designed to operate in parallel (up to three units), allowing the total output power to be increased.

2. Features:

- **Over-load protection:** The power supply is equipped with a constant-current limiting function to protect the unit from overload and short-circuit conditions. When the allowable load is exceeded, the output voltage is automatically reduced while the current is maintained at a safe level.
- **Thermal protection:** The power supply features an internal temperature monitoring system that prevents damage due to excessive heat. If the operating temperature exceeds the specified limit, the DC output is disabled and the status LED, normally green, turns red. To resume normal operation after activation of the thermal protection, ensure the unit has cooled to within the permitted temperature range.
- **Over-voltage protection:** The power supply incorporates an Over-Voltage Protection (OVP) circuit that safeguards both the unit and the connected loads from damage caused by excessive output voltage. If an over-voltage condition is detected, the DC output is automatically disconnected to prevent damage or failure. To restore operation after OVP activation, switch the supply off and then on again.
- **Output voltage adjustment potentiometer:** The power supply includes a user-accessible potentiometer, enabling precise adjustment of the output voltage to match the requirements of the connected equipment.
- **Status indication (LED):** The power supply is equipped with an LED indicator showing the current operational status of the unit. During normal operation the indicator is lit green. In the event of a fault or improper operation (for example triggered protection), the indicator turns red, enabling quick fault identification.

3. Chart of changes in output load rated values:

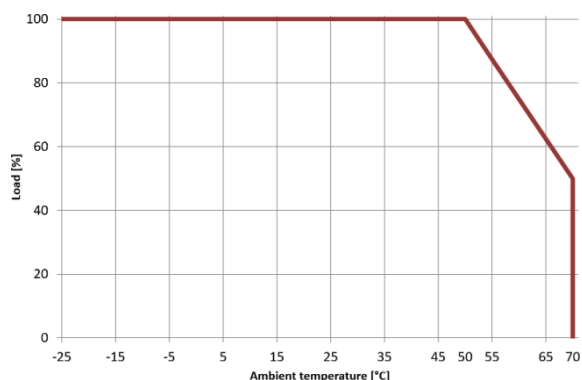


Figure 7. Derating curve of rated output load as a function of ambient temperature.

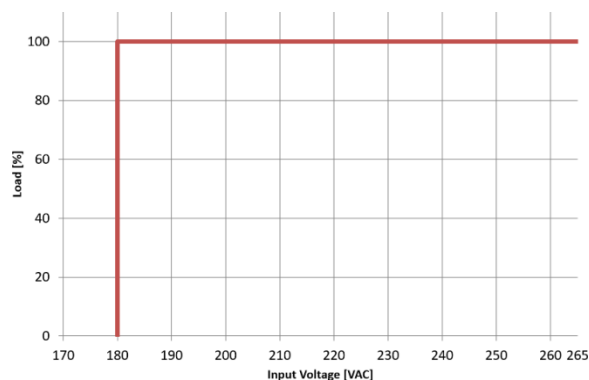
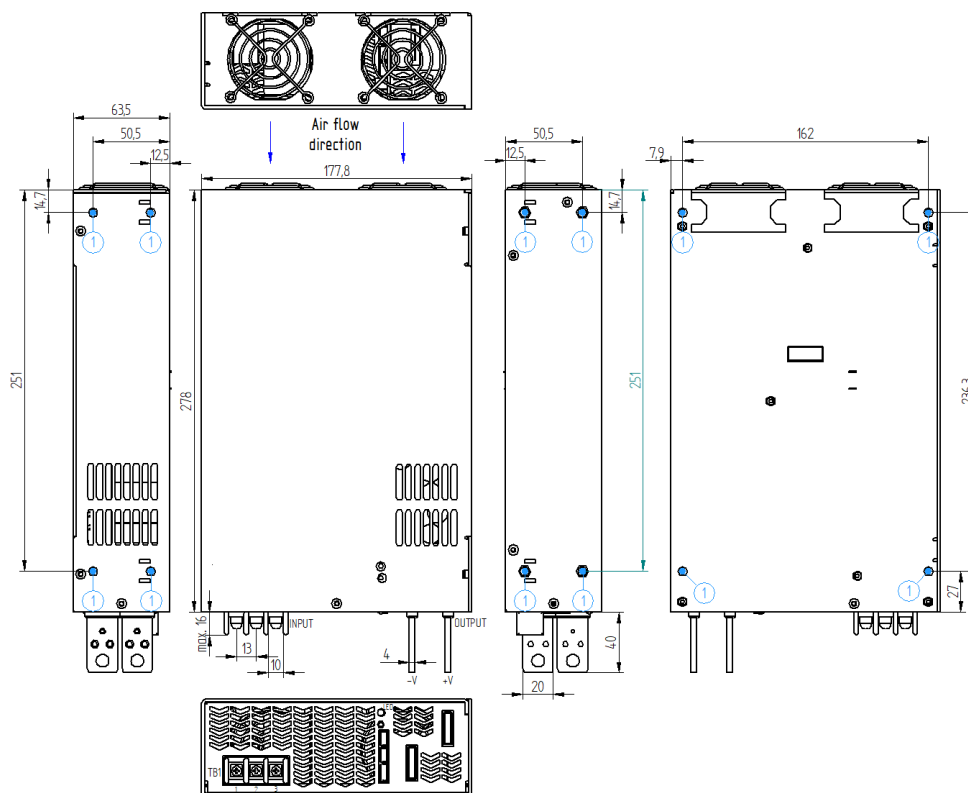


Figure 8. Derating curve of rated output load as a function of input voltage.

4. Parametry mechaniczne:



Hole No.	Hole size	Maximum screw insertion depth	Maximum tightening torque
1	M4	5mm	0,7~1,1Nm

Connector configuration TB1		Connector configuration CN1/CN2 (HRS DF11-8DS-2C) CN3 (HRS DF11-10DS-2C): The connector described in the section ADDITIONAL FUNCTIONS
Connector No.	Description	
1	AC/L	
2	AC/N	
3	FG/PE	

Maximum tightening torque:
1,8Nm

5. Installation:

- A protective device (such as a cartridge fuse or miniature circuit-breaker) and readily accessible isolating means to disconnect the power must be provided.
- Before connecting the power supply, ensure that the main power switch to which it will be connected is in the OFF position and properly secured against accidental re-activation. Failure to comply may result in contact with live components, which may cause death or serious injury.
- Connect the device to the mains supply. If flexible cables are used, ferrules must be fitted to ensure correct termination at the terminals. For flexible conductors, the cross-sectional area of the supply cable must be at least 2,5 mm².
- Maintain a sufficient insulation clearance between the mounting screws and the internal components of the power supply.
- Ensure that the mounting position of the unit allows optimal cooling performance and that the ventilation openings remain unobstructed.

6. Safety precautions:

- **Do not remove** the metal housing of the power supply while the mains power is connected.
- **Do not touch** the device with wet hands.
- **Do not touch** the housing when the device is fully loaded; high surface temperature may cause burns.
- **Do not use** the device if any metal objects, water or other foreign bodies have entered it.
- **Do not use** the device if it has been damaged, as the voltage-regulating circuitry may have failed or may be operating outside the normal control parameters. Failure to comply may result in high voltage and subsequent damage to the connected load.
- **No objects** may touch the output terminals of the device.
- If inspection of the devices interior is necessary, allow it to cool completely. In case of a fault, the high temperatures of certain components may cause burns.
- **Do not block** the air-intake vent.

7. Specifications:

	BSP 300012	BSP 300024
Voltage Range	200-240VAC; 280-340VDC	
Frequency	47-63Hz~	
Full Load AC Current	20A/200VAC; 16A/230VAC	
Inrush Current, cold start 25°C*	60A/230VAC	
Efficiency	87,5%	87,5%

Output

Rated DC Voltage	12V	24V
Voltage Adjust Range	10,8-13,2V	22-28V
Rated Current	200A	125A
Rated Power	2400W	3000W
Ripple & Noise (peak to peak)*2	≤ 150mV	
Voltage tolerance	≤ 1%	
Line regulation	≤ 0,5%	
Load Regulation (10% - 100%)	≤ 0,5%	
Setup, Rise Time (Full Load)	1000ms, 80ms	
Hold-up Time (Full Load)	> 10ms/230VAC	

Protection

Over load/Over Current	The power supply may operate at short-term loads in the range of 100 % to 112 % of rated power.	
	Type of protection: Constant current limiting, re-power on to recover after the fault condition is removed.	
Over Output Voltage	13,8-16,8VDC	13,8-16,8VDC
	Type of protection: Shut down output voltage, re-power on to recover.	
Over Temperature	Type of protection: Shut down output voltage, recovers automatically after temperature goes down.	

Additional functions

Parallel Operation*	Supports parallel operation up to 9000W (2+1).
Remote ON/OFF*	Possible with the auxiliary 12 V supply or an external 12 V source.
Voltage Drop Compensation (Remote sense)*	Voltage drop compensation on load wires up to 0,25 V.
Programmable Output Voltage (PV)*	The output voltage can be adjusted within 20–120% of the rated value.
Auxiliary Supply*	12V/0,1A ±10% (For powering the Remote ON/OFF control function)
Power-OK Signal*	Power-OK signal (relay contact and open-collector type output)
* A detailed description is provided in the ADDITIONAL FUNCTIONS section.	

Safety & EMC

Safety Standards	EN IEC 62368-1
Withstand Voltage	I/P-O/P 3kVAC; I/P-F/G 2kVAC; O/P-F/G 0,5kVAC
Insulation Resistance	I/P-O/P, I/P-F/G, O/P-F/G 100MΩ/500VDC/25°C/70%RH
EMI Radiation & Conduction	Compliance with EN55032(CISPR32)
Harmonics Current	Compliance with EN61000-3-2, -3
EMC Immunity	Compliance with EN61000-4-2, -3, -4, -5, -6, -8, -11

Environment

Working Temperature	-20°C ~ +70°C
Derating Temperature above 50°C	See: Derating curve.
Working Humidity	20-90% RH, non-condensing
Storage Temperature Humidity	from -40°C to +85°C, 10-95% RH, non-condensing
Vibration	10-500Hz, 2G 10min/1cycle, 60min each along X, Y, Z axes

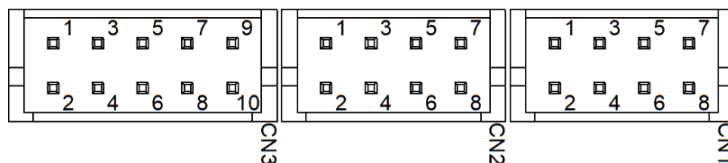
General

Case Material	Electro-galvanized steel and aluminium enclosure.
Case Protection	IP 20
Weight	4kg
Dimensions	278 × 177,8 × 63,5mm
Mounting	Rear or side mounting.
Connection	Screw-terminal connectors with single output terminal.

Note

1. Unless otherwise specified, all technical parameters are measured at an input voltage of 230 VAC, rated load and an ambient temperature of 25°C.
2. Method for measuring ripple and noise: a twisted-pair cable of approximately 30 cm in length is used, with capacitors of 0,1 µF and 47 µF connected in parallel at the output terminals; measurement is carried out with a bandwidth of 20 MHz.
3. Output voltage accuracy includes: setting error, line regulation and load regulation.
4. Line regulation test: performed by measuring changes in the output voltage when the input voltage is varied from minimum to maximum, while maintaining rated load.
5. Load regulation test: performed by varying the load from 0% to 100% of the rated value.
6. The power supply is treated as a component intended for installation in end-equipment. All EMC tests are conducted when the power supply is mounted on a metal plate sized 720 mm × 360 mm × 1 mm. The end-equipment must be re-verified for compliance with EMC directives after integration.
7. Start-up time is specified for a cold start. Frequent power-on/power-off cycles may prolong the start-up time.
8. For operation at altitudes above 2000 m (6500 ft) above sea level, the permissible ambient operating temperature must be reduced by 5°C for each additional 1000 m for fan-cooled models, and by 3.5°C per 1000 m for fan-less models.

8. ADDITIONAL FUNCTIONS:



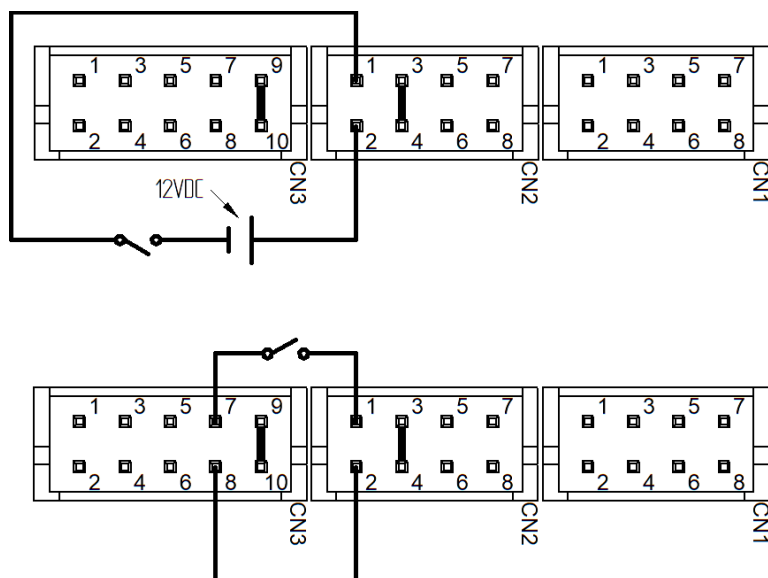
Drawing 7. HRS DF11-8DP-2DS and HRS DF11-10DP-2DS connectors used for the power supply's auxiliary control and signal functions.

Connector	Pin No.	Pin Name	Description
CN1/CN2	1	REMOTE ON/OFF-GND	Ground reference for the Remote ON/OFF control signal.
	2	REMOTE ON/OFF	Remote control of the power supply output using a 12 V electrical signal between the REMOTE ON/OFF pin [2] and the REMOTE ON/OFF-GND pin [1] .
	3	PV	DC input from an external voltage source for the PV function (output voltage programming); reference: S-[5, 7].
	4	VREF	Reference voltage connector.
	5	S-	Negative remote-sense pin for output voltage sensing (REMOTE SENSE).
	6	PC	Parallel operation connector (used for connecting power supplies in parallel).
	7	S-	Negative remote-sense pin for output voltage sensing (REMOTE SENSE).
	8	S+	Positive remote-sense pin for output voltage sensing (REMOTE SENSE).
CN3	1	Power-OK-GND	Ground reference for the Power-OK signal.
	2	Power-OK	Power-OK signal (relay).
	3	Power-OK-GND	Ground reference for the Power-OK signal.
	4	Power-OK	Power-OK signal (open-collector type).
	5	REMOTE ON/OFF-GND	Ground reference for the Remote ON/OFF control signal.
	6	REMOTE ON/OFF	Ground reference for the Remote ON/OFF control signal.
	7	G-AUX	Auxiliary output ground. The signal is isolated from the main output terminal.
	8	12V-AUX	Auxiliary 12 V output, referenced to the G-AUX pin [7]. This output is not controlled by the REMOTE ON/OFF function. Maximum load current: 0,1 A.
	9	OPM	Protection-type selection connector.
	10	OPM-SD	

REMOTE ON/OFF CONTROL:

The power supply output can be switched ON or OFF using the Remote ON/OFF control function. The connections between the pins must be made according to one of the diagrams below, using either an external 12 VDC supply or the internal 12V-AUX signal:

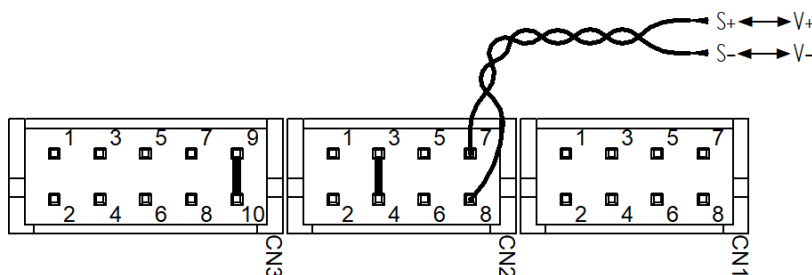
- Open-circuit – Output enabled (ON),
- Short-circuit – Output disabled (OFF).



Drawing 8. Examples of connector wiring for the Remote ON/OFF control function.

VOLTAGE DROP COMPENSATION (REMOTE SENSE):

The **Remote Sense** function is used to compensate for voltage drop across the load wires by up to 0,25V. The **S+[8]** signal should be connected to the positive load terminal, and the **S-[5, 7]** signal to the negative load terminal.

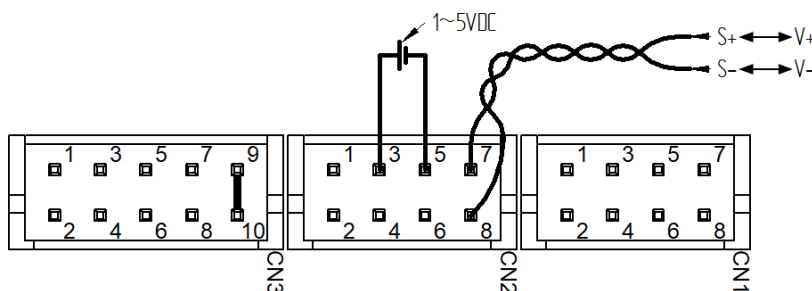


Drawing 9. Example of connector wiring for the VOLTAGE DROP COMPENSATION (REMOTE SENSE) function.

* The factory-default configuration of the power supply includes jumpers between pins **S-[5]** and **V-**, and between pins **S+[8]** and **V+** on connector **CN2**. After the Remote Sense function is activated, the **S+[8]** wire must be connected to the positive load terminal, and the **S-[5, 7]** wires to the negative load terminal.

PROGRAMMABLE OUTPUT VOLTAGE (PV):

The output voltage can be adjusted within the range of **20–110% of the rated value** by applying an external voltage to pin **PV[3]**.



Drawing 5. Example of connector wiring for the PV output-voltage programming function.

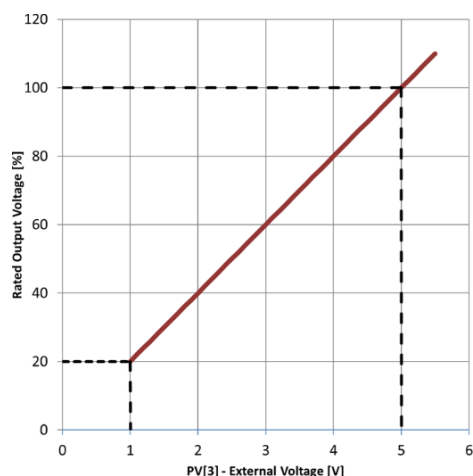


Figure 9. Rated output voltage vs. external **PV[3]** control voltage.

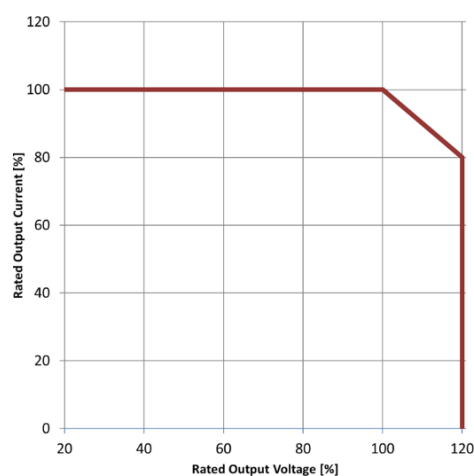


Figure 10. Rated output current vs. rated output voltage.

Correct operation of the output-voltage programming function requires connecting the **S+[8]** pin to V+, and the **S-[5, 7]** pins to V-.

AUXILIARY SUPPLY:

The power supply is equipped with additional auxiliary outputs:

- 12V/0,1A, available between pins **12V-AUX[8]** (positive terminal) and **G-AUX [7]** (ground).

POWER-OK SIGNAL:

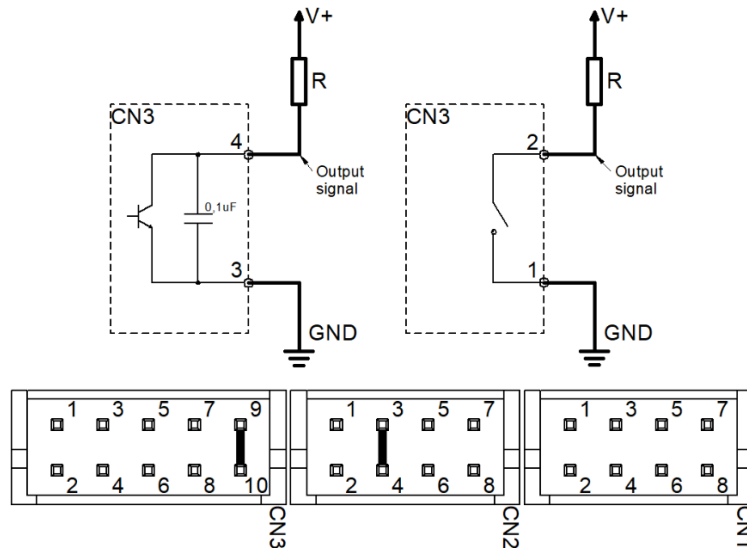
The power supply is equipped with a Power-OK signal indicating the status of the output voltage. This signal is available in two versions:

- Relay output – pins **Power-OK[2]** and **Power-OK-GND[1]**,
- Open-collector output – pins **Power-OK[4]** and **Power-OK-GND[3]**.

The **Power-OK** signal is closed (relay output) or active (open-collector output) when the output voltage reaches **at least 80% of its nominal value** or when the power supply is operating normally. The status LED lights green.

If the output voltage drops **below 80% of the nominal value** or a fault occurs, the **Power-OK** signal becomes open (relay output) or inactive (open-collector output), and the status LED changes to red.

Power-OK Signal Status Table		
Description	Relay Output	Open-Collector Output
Normal operation, output voltage above 80%	Closed contacts	Active
Fault condition, output voltage below 80% or a failure occurs	Open contacts	Inactive



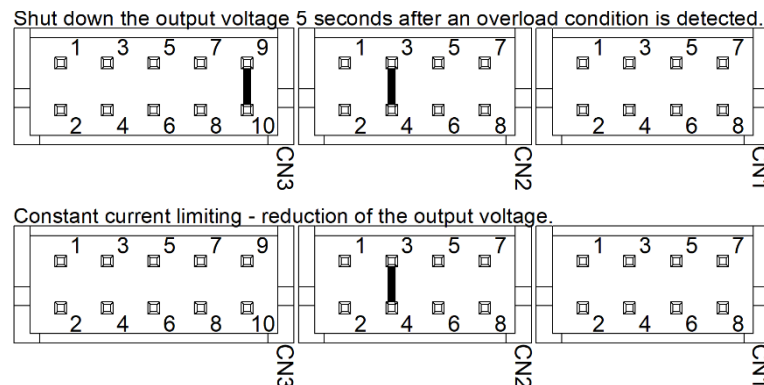
Drawing 10. Example of connector wiring for the Power-OK signal function.

OVERLOAD PROTECTION MODE:

The power supply allows selection of the overload protection mode by shorting or opening pins **OPM** [9] and **OPM-SD** [10] on connector **CN3**.

- **Shorted** – when an overload occurs, the power supply limits the current and then switches off the output voltage after **5 seconds**. Recovery requires cycling the input power.
- **Open** – the power supply limits the output power by reducing the output voltage while maintaining the current at a safe level.

Below are two wiring diagrams illustrating both overload protection modes.



Drawing 11. Examples of connector wiring for the overload protection selection function.

PARALLEL OPERATION:

The power supply supports parallel operation — up to three units of the same model can be connected in parallel. To connect power supplies in parallel, the following requirements must be fulfilled:

- Parallel connection should be made using short, thick wires before connecting to the load.
- The voltage difference between individual units must not exceed 0,2 V. To minimize variations in voltage drop, short and sufficiently thick output wiring should be used.
- The minimum load in parallel operation must exceed 3% of the rated current of a single unit.

- The maximum load in parallel operation must not exceed:

$$I_{MAX} < I_{NOM} * N * 0,9$$

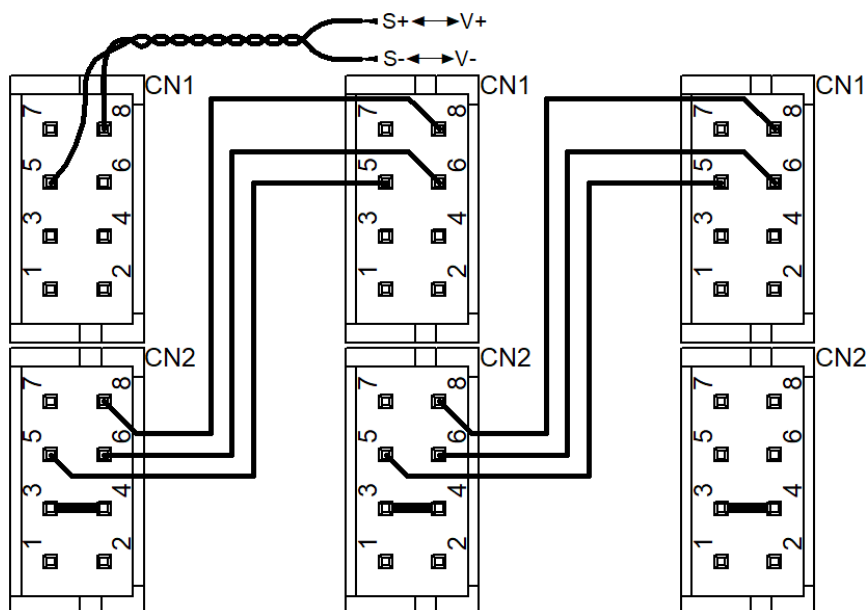
where:

I_{MAX} – Maximum current in parallel operation.

I_{NOM} – Rated maximum current of a single power supply unit.

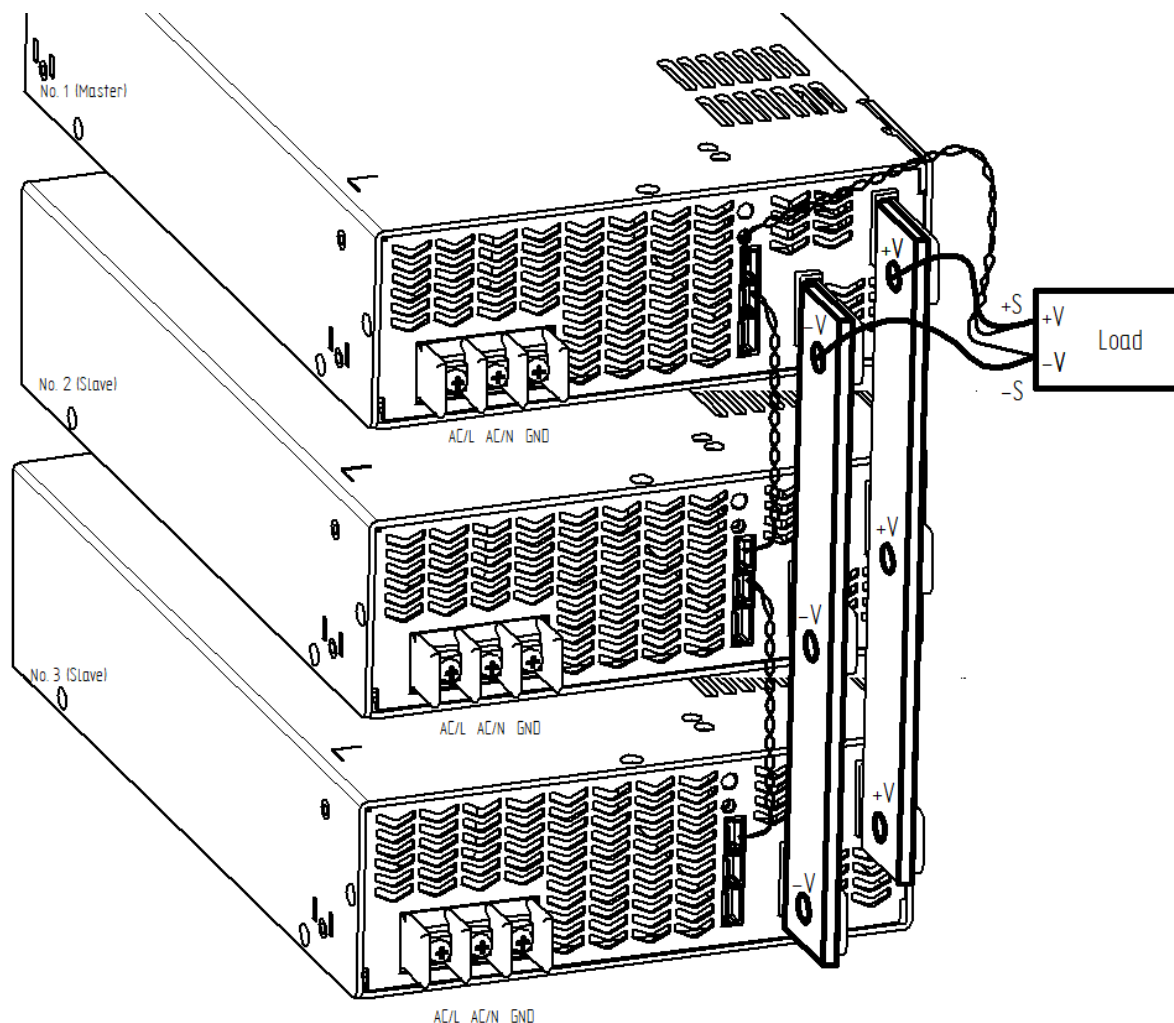
N – Number of units connected in parallel.

- During parallel operation, the **REMOTE SENSE** voltage-compensation lines must be connected only to the master unit.
- Each power supply must have its **REMOTE SENSE** lines connected to the same sensing point at the load to ensure proper compensation of the wiring voltage drops.
- A decrease of the total output current below 3% of the rated value may result in inaccurate or ineffective current sharing between the units.
- The resistance of the connection paths should be kept as similar as possible — avoid differences in wire length and cross-section.
- All power wires and **REMOTE SENSE** voltage-compensation wires must be routed in a way that minimizes electromagnetic interference (e.g., by twisting the sense-wire pairs, using shielding, and avoiding wiring loops).
- The S+ [8], S– [5, 7], and PC [6] connectors on CN1 or CN2 are connected in parallel.
- The connection of the CN1/CN2 connectors in a three-power-supply configuration is shown in Drawing 8 and 9.



Drawing 8. Example of CN1/CN2 connector wiring for the power supplies' parallel operation function.

Example of power supply connections for parallel operation:



9. Additional information:

The latest version of the user manual is available on the website:

<https://www.brevetrafo.com/catalog/power-supplies/bsp.html>

(scan the QR code below to go directly to the website)

