euro HÜBNER benelux b.v.

Operation Manual

Switching rectifier type : SBB 6 and SBB 10

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Version ENG 1.0 05-02-2026

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1 General information

1.1 Introduction

This operating manual is an essential help for installation, commissioning and proper operation of this product.

It is intended for assemblers, maintenance personnel and the operator.

Please read this operating manual before assembling and operating the product.
It will help you to:

* prevent hazards for the operator,
* get to know the product,
* avoid malfunctions caused by incorrect operation,
* extend the service life of the product,
* use the product efficiently.
* prevent down times and prevent repair

1.2 Copyright protection

This operating manual must be treated as confidential. It may be used only by authorized persons. It may be relinquished to third persons only with the written consent of euro HÜBNER benellux b.v..
All documents are protected in the sense of copyright law. The passing and reproduction of documents,even in excerpts, and the use and disclosure of its contents are prohibited unless expressly permitted. Violations are punishable and obligate to compensation. We reserve all rights to exercise commercial trade mark rights.

1.3 Warranty and liability

This operating manual must be read carefully before assembly and commissioning of the products.

Warranty and liability claims are generally precluded.

* if the product is not used as intended,
* with inappropriate operation
* with non-compliande with the notes in this operating manual,
* with incorrect repairs,
* with lack of monitoring wear parts,
* with structural changes without the prior consent of euro HÜBNER benelux b.v.,
* with external influences.

We will not accept liability for any damage and malfunctions resulting from faulty operation or incorrect repair and maintenance.

Any liability for damage resulting from the use of non-original spare parts and accessories is precluded.
All technical information, data as well operating and maintenance instructions for product given in this operating manual correspond to the latest version all the time printing.

1.4 Conformity

The conformity assessment is based on the applicable guidelines (with their associated amending directives) in the version at the time of commissioning. Please refer to the declaration of conformity or the manufacturer's declaration for information on the individual guidelines.

The declaration of conformity or the manufacturer's declaration is included in the documentation.

1.5 Illustration of hazard warnings

The following symbols are used in this operating manual to illustrate hazards and notes:

	***DANGER!*** ***Designates a danger situation that results in severe injuries or death.***
	***WARNING!*** ***Designates a danger situation that can result in severe injuries or death.***
	***CAUTION!*** ***Designates a danger situation that can result in slight to moderate injuries.***
	***NOTE:*** ***Designates a situation that can result in material damage. Furthermore, you will find additional, important information here.***

Hazard warning symbols

	***Generic warning***
	***Dangerous electrical voltage warning***
	***Automatic start-up warning***
	***Environmental pollution warning***
	***Prohibibition sign: Do not activate***

1.6 Notes for and duties of the operator and user

The operating manual is an essential part of the product. If the product is installed within a system, the operating manual must be passed on to the system operator. The operator is responsible for ensuring that this operating manual is always available to the personnel.

To protect operating personnel from health hazards and to ensure the product's efficient operation, the operator is obligated to instruct personnel on the safe and proper use, servicing, and maintenance of the product. Supervisory and reporting responsibilities, as well as any special operational features, must be clearly communicated and observed.

Both operating and maintenance personnel must be familiar with the notes and information in this operating manual.

In addition to the operating manual, universal, legal, and other binding regulations regarding accident prevention, environmental protection, and basic safety and health requirements must be strictly followed.

1.7 Training of personnel

The personnel employed with assembly, commissioning, operation and servicing/maintenance must be qualified and trained sufficiently. The operator is solely responsible for this.

1.8 Protective equipment

Before carrying out any work on the products, take all necessary measures to protect life and health against imminent danger:

- Wear only intact, closed safety shoes with slip-resistant soles. Open sandals, damaged, or unsuitable footwear are strictly prohibited.
- Wear close-fitting, closed work clothes made of durable material. Loose jackets, sleeves, or accessories can get caught in machinery and are dangerous.
- Tie up long hair securely to prevent entanglement.
- Use appropriate personal protective equipment (PPE) such as safety gloves, safety glasses, and hearing protection as required.
- Avoid wearing jewelry or loose items that could pose a risk during operation or maintenance.
- Ensure that respiratory protection is worn if working in dusty, fume-filled, or poorly ventilated environments.
- Always follow the specific safety guidelines related to the equipment or environment.

1.9 Protective measures

The five safety rules must applied in the listed sequence before working on electrical systems. After working, they are cancelled again in reserve order.

* Relaese.
* Secure against restarting.
* Set voltage-free condition for all poles.
* Ground and short-circuit.
* Cover or fence off adjacent, energized parts.

1.10 Explanation for terms used

Term	Meaning
Half-wave rectifier	Rectifier type that rectifies only one half-wave of the applied AC voltage, The activity is also as called “halfe-wave recitification.
Full-wave rectifier	Retifier type that rectifies both half-waves of the applied AC voltage. The full-wave recitifier generates twice the voltage of the half-wave rectifier on the output. The activity is also as called “full-wave rectification”
Brake	Electromagnetically releasable spring force brake (rest current brake). The purpose of the brake is to brake the rotary motion of a connected shaft or fix the shaft in place in idle state.
Armature plate	Mechnically movable part of the brake, is moved with magnetic and spring force. The spring force presses the armature plate against the friction lining of the brake mechanism, the magnetic force counteracts the springforce.
Maganetic coil (coil body)	Coil inductance that serves to overcome the force of springs with electromagnetic induction, i.e. move the armature plate in the direction of the coil body.
Magnetic coil supply	The magnetic coil is “supplied” by applying electrical DC-voltage. The resulting current flow achieves the magnetic forces of the armature plate.
Attraction of the armature plate	Armature plate movement against the spring forces triggered by current flow in the maganetic coil. The brake is “ventilated”and the rotary motion of the shaft is thus released.
Start-up contractor	Contractor for switching on the brake. If the contact of the start-up contractor is closed, the supply voltage is applied tot he magnetic coil, the brake is “ventilated”and the rotary motion of the shaft released.
Switch-off energy of the brake	The energy contained in the nagnetic field of the magnetic coil that is released when the current is disconnected.
Cut-off voltage	The (Negative) coil voltage with which the switch-off energy of the brake is converted into heat.
Clamping voltage	The voltage with which the armature plate remains safely attracted.

2 Safety

2.1 General information

This product has been designed and manufactured in accordance with the latest state-of-the-art technology and all recognized safety standards.

Nevertheless, the product may still present a hazard to operators or result in damage to the product itself or other assets if any of the following conditions occur:

- Operation by personnel lacking adequate training or instruction.
- Use of the product outside its intended purpose or specifications.
- Maintenance or servicing performed by unqualified or unauthorized personnel.
- Failure to comply with the safety instructions and guidelines outlined in this manual.
- Unauthorized or improper modifications, alterations, or conversions of the product.
- Neglect or improper execution of prescribed maintenance, inspections, and safety checks.

To mitigate risks and ensure safe operation, it is imperative that all users and operators strictly adhere to the instructions contained herein and that only qualified personnel undertake servicing and maintenance tasks. Regular inspections and preventative maintenance should be conducted as specified to maintain the product's safety and functionality.



NOTE

All persons operating, servicing and repairing the product must have read and understood the safety regualations. The safety regualations must be observed.

In addition, strict adherence must be ensured to the following regulations and provisions, which may be supplemented by site-specific or company-internal policies:

- Applicable industrial safety regulations;
- Generally recognized safety standards;
- Country-specific legal requirements;
- Documentation provided by third-party manufacturers accompanying the product.
- The intended and proper use of the product.

Compliance with these regulations is essential to maintain a safe working environment and to ensure the product's proper and safe operation.

2.2 Intended use

The switching rectifier SBB is a component specifically designed for installation within control cabinets.

It functions as a half-wave rectifier and is intended to supply power to various magnetic coils, provided that all specified electrical parameters are strictly observed.

The switching rectifier SBB is suitable for use with any type of electromagnetic device.

Correct and intended use requires strict compliance with all instructions and guidelines provided in the operating manual, including:

- Safety instructions
- Assembly and electrical connection
- Commissioning procedures
- Operational guidelines
- Servicing and maintenance procedures
- Technical specifications

Failure to comply with these instructions may result in damage to the equipment, improper operation, or safety hazards.

2.3 Inappropriate use

The product may pose hazards if it is operated improperly, used outside its intended purpose, or handled by personnel lacking appropriate training or instruction.

The switching rectifier is **not suitable** for use in the following applications:

- Operation within public low-voltage networks in the European Economic Area
- Environments where explosive or easily combustible gases, vapours, solids, dust, or liquids may be present
- Damp or wet rooms
- Areas where food is prepared or processed
- Hygienic zones within hospitals
- Outdoor environments
- Underground installations
- Networks that are exposed to unprotected direct lightning strikes
- Power switching stations in low-, medium-, or high-voltage energy distribution systems
- Parallel operation of two SBB switching rectifiers
- Series connection of two SBB switching rectifiers

The operator assumes full and exlusive responsibility for any damage or consequences resulting from inappropriate or non-compliant use of the product.

2.4 Residual hazards

All technical information, data, and operational instructions contained in this operating manual reflect the latest state of knowledge and development at the time of printing. They are provided to the best of our knowledge, based on our experience and technical insight.

Despite full compliance with all applicable safety regulations, residual hazards may still be present during the operation of the brake**.**

When performing any work on the brake, it is essential to ensure that:

- All hazardous movements have come to a complete stop.
- Unintentional or unexpected system start-up is reliably prevented through appropriate safety measures.
- In cases where a load is acting on controlled or monitored brakes, the braking and holding function is reliably assumed by external safety mechanisms**.**

Failure to observe these precautions may result in serious injury or equipment damage.

2.5 Safety instructions for assembly, commissioning and maintenance

Work on mechanical and electrical components must be carried out only by authorized technical personnel, in strict compliance with IEC 364 and the applicable accident prevention regulations.

All assembly and maintenance tasks described in this operating manual must be performed professionally and according to the provided instructions. This is essential to ensure the reliable and failure-free operation of the product.

WARNING!



Work on the switching rectifier must be performed only when the following safety rules are strictly observed**:**

- Disconnect from power supply (ensure voltage-free state)
- Secure the system against accidental restart
- Verify the absence of voltage
- Ground and short-circuit the system
- Cover or insulate adjacent live parts

Failure to follow these safety precautions may result in serious injury or death**.**

2.6 Disposal information

When handling or disposing of this product, all applicable national and international environmental regulations must be strictly observed. This includes compliance with the following directives:

- RoHS (Restriction of Hazardous Substances Directive): Limits the use of specific hazardous materials in electrical and electronic equipment.
- WEEE (Waste Electrical and Electronic Equipment Directive): Requires proper collection, treatment, and recycling of electronic waste.

Internal company disposal procedures must be compared with the manufacturer's guidelines and updated if necessary to ensure full compliance.

Correct disposal supports environmental protection and the sustainable use of resources. Products marked with the WEEE symbol (a crossed-out wheeled bin) must not be disposed of with household waste.



WARNING !

Danger of environmental pullution

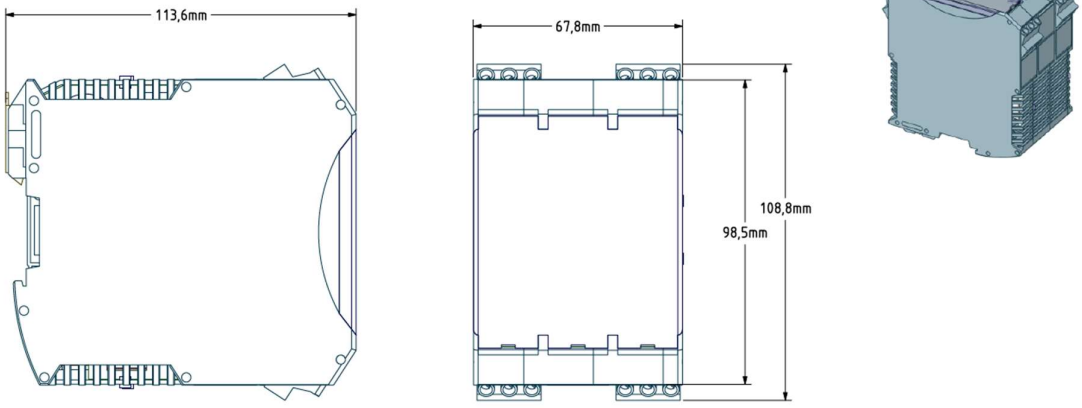
Enviromentally friendly disposal of operation supplies, lubricants and auxiliary suppliers as well as oily components must be observed.

Electrical waste must be collected separately and recycled.

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3 Product description

3.1 View of the product



3.2 Functionality

The switching rectifier is used as half-wave rectifier to supply magnetic coils.
The switching rectifier SBB works as a full-wave rectifier for an adjustable time after the contactor has been switched on. This provides twice the nominal voltage for a short time, which accelerates the attraction of the armature plate.
This function is particulary usefull for the magnetic coils of brakes where fast reponse is critical.

Alternatively, the magnetic coils can be designed so that initial switching occurs with full-wave rectification at nominal voltage, and the system then automatically switches to a reduced clamping (holding) voltage. This has the advantage that—again, using the brake example—the armature plate is de-energized more rapidly, allowing quicker braking action.

This principle also applies to other electromagnetically actuated devices, such as solenoid valves, magnetic clutches, and similar components.

A critical feature of this system is the use of a thyristor as the controllable element within the rectifier. The thyristor is responsible for switching one half of the bridge rectifier on or off, depending on the required operating mode. The control electronics ensure precise switching times.

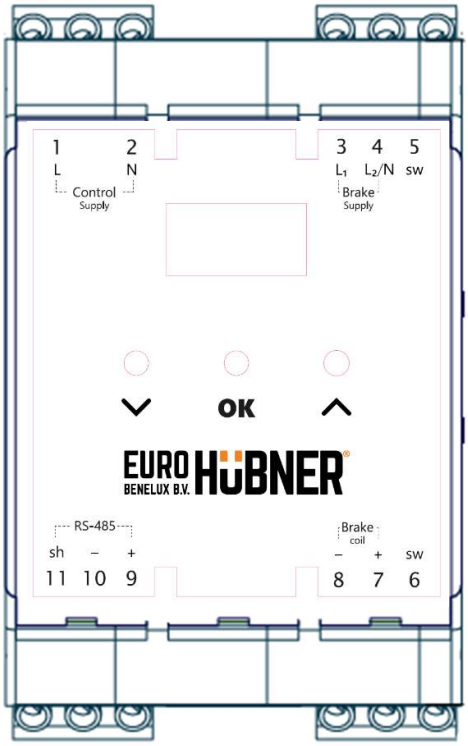
When switching off electromagnetically actuated devices, the energy stored in the magnetic field must be dissipated. To achieve this, the switching rectifier includes varistors, which:

- Convert the switch-off energy into heat, and
- Limit the cut-off voltage to a high level, ensuring the energy is dissipated quickly.

This reduces the deactivation time of the device and improves overall system performance.

Therefore it is not allowed to switch-off control supply (clamp 1 and 2), otherwise this can damage the switching rectifier.

3.3 Terminal clamps



Clamp No.	Allocation	Designation	Comment
1	Control supply	L	
2	Control supply	N	
3	Brake supply	L1	
4	Brake supply	L2/N	
5	Switch		contactor
6	Switch		contactor
7	Brake coil supply	+	
8	Brake coil supply	-	
9	RS485		
10	RS485		
11	Sh.		

3.4 Description communcation and function control panel

The SBB module is equipped with a 2-wire RS-485 serial communication interface via terminals 9 and 10.

To monitor the module's status, simply connect it to a computer using an RS-485 to USB converter:

- A = RS485+
- B = RS485-

Once connected, you can use any standard terminal program (e.g., PuTTY), to read data from the SBB module.

The output will include:

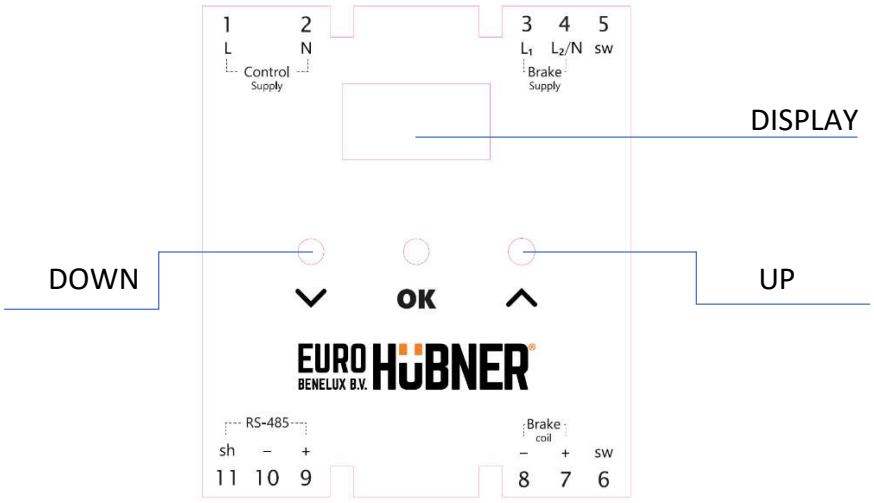
- Live status information, as displayed on the device
- "OK" status if all operating conditions match the configured settings
- Warnings or alerts if there are deviations in minimum or maximum current, along with the actual measured current values

Factory Setting

Category	Serial connection
Speed Baud	115200
Data bits	8
Stop bits	1
Parity	None
Flow Control	XON/XOFF

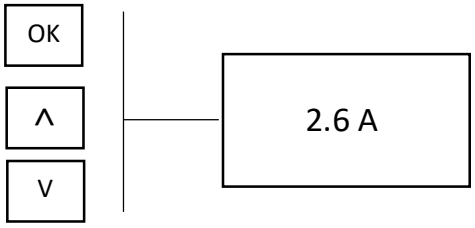
Serial line to connect with COM-port for your USB converter

Then you can start session, as remote display of value and status

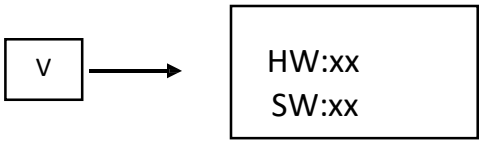


The interface consists of 3 buttons and one OLED display. Functionality UP, DOWN and OK.

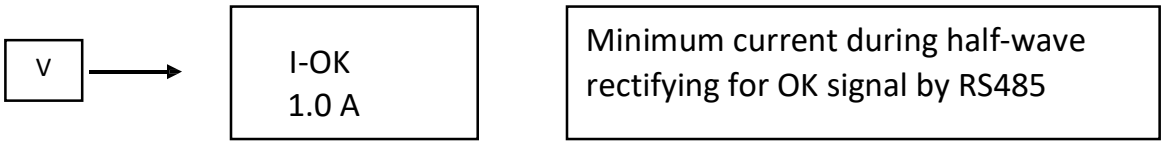
- Standard is display in “Off “function to prolong life-time display.
- To switch on display, just push one of the buttons, and last measured current (half-wave) will be displayed.



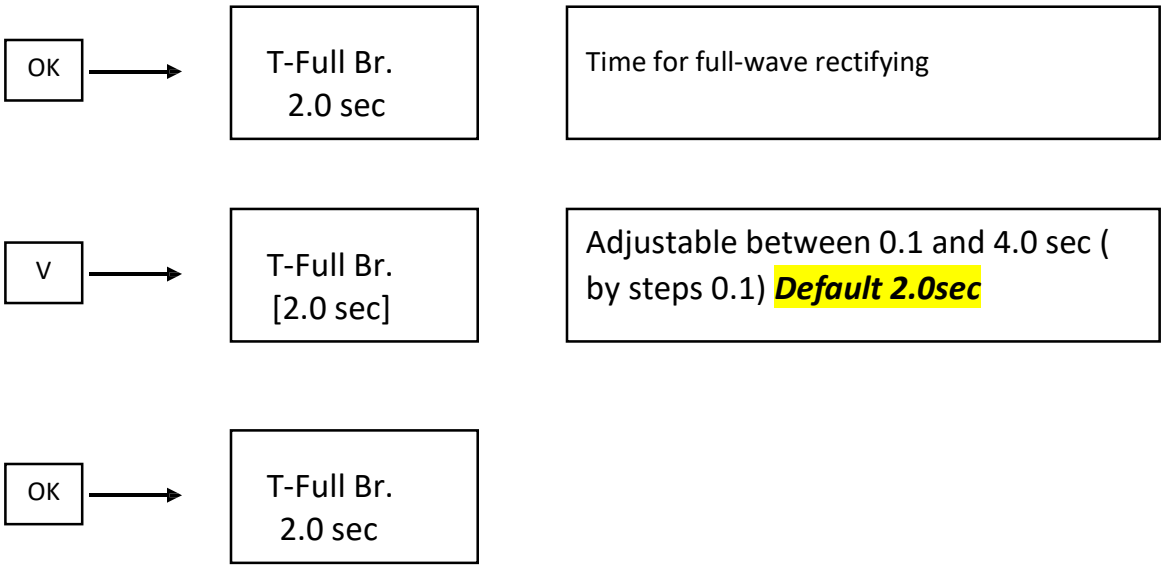
- If button “Down” is pushed, the hardware and software version is displayed



- If “Down” button is again pushed, the “OK” current is displayed (only adjustable in serve level!)



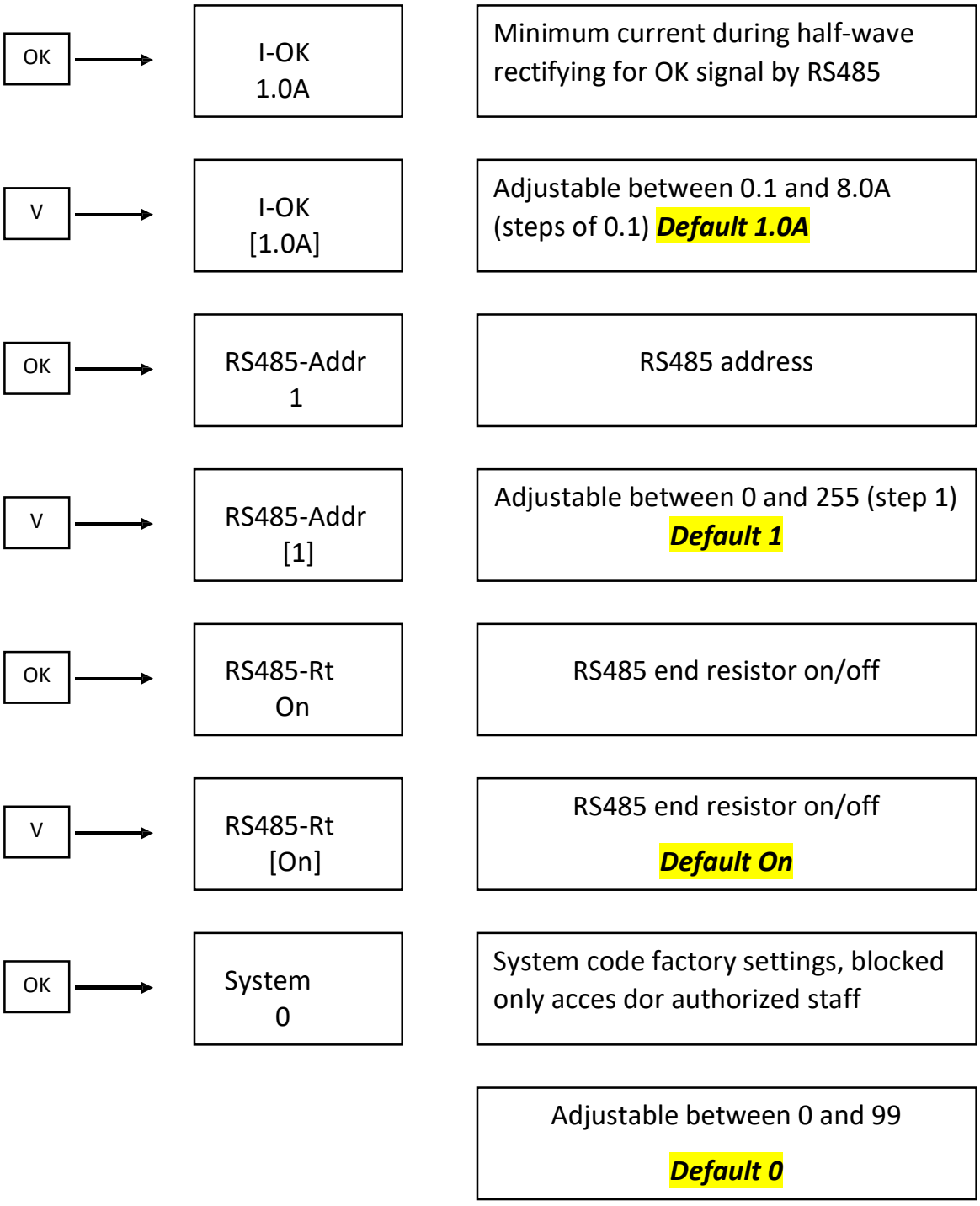
Access to service-level is achieved by pushing buttons [^] and [v] simultaneously for 5 seconds In service-level , first option is displayed: T-Full Bridge). With buttons “Up” and “Down” you can scroll to next option.



- Press “OK” to adjust option, value is displayed between [ ] and can be adjusted with “up” and “down” buttons.
- When ready, press “OK” to confirm, display will show now the new value.

If buttons are not activated for 10 sec, display will return to start position of display.

After 5 min. Display will go to standby function


OK
I-OK
1.0A
Minimum current during half-wave rectifying for OK signal by RS485
V
I-OK
[1.0A]
Adjustable between 0.1 and 8.0A (steps of 0.1) Default 1.0A
OK
RS485-Addr
1
RS485 address
V
RS485-Addr
[1]
Adjustable between 0 and 255 (step 1) Default 1
OK
RS485-Rt
On
RS485 end resistor on/off
V
RS485-Rt
[On]
RS485 end resistor on/off
Default On
OK
System
0
System code factory settings, blocked only acces dor authorized staff
Adjustable between 0 and 99
Default 0

- symbol on display, when I-OK level is not reached during operating brakes.



- Symbol on display when current is higher than 2 times I-Max, during switching on of brake. The full-wave rectifying will be stopped inmediately.



3.5 Technical specifications

Technical specifications	SBB6/SBB10	
Dimensions	Length	108,8mm
	With	67,8mm
	Height	118mm
AC line coltage in for brake coil		230V….484VAC
Line voltage in for control circuit		Max. 230VAC/DC
Maximum brake current for 4 s for SBB6		12A
Maximum brake current for 4 s for SBB10		20A
Maximum continuous output of the internal protective circuit		8W
Permanent brake current SBB 6		Max. 6A
Permanent brake current SBB 10		Max. 10A
Time settings by programming		0.1-4s, adjustable steps of 0.1s
Ambient Temperature		-40...50°C
Protection rating		IP30
Protection class		II
Weight		Approx. 400g
MTBF		

3.7 Condition on delivery

The electronics of the switching recitifier SBB are in plastic casing.



NOTE

The housing of the switching rectifier SBB must not be opened.
There is a seal on the device. This seal must not be demaged. All claims against the manufacturer will be void if the seal is damaged.

3.8 Storage

The switching rectifier SBB must be stored in a dry place at the specified ambient temperatures.

4 Assembly

4.1 Installation of the product



DANGER !

Hazard from electric power.

Assembly must be carried out only by a certified electrician all safety measures.

Before installing the switching rectifier SBB, it must be ensured that the system it is built into is stopped and secured against accidental recommissioning.

The following must be observed for assembly:

- The switching rectifier must be assembled on a 35-mm support rail (e.g. to EN 50022/50035).

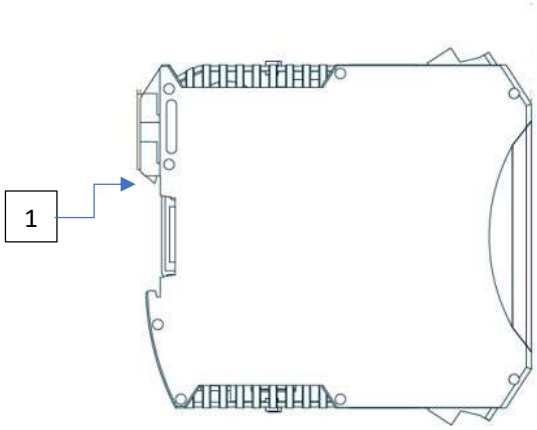
- The switching rectifier SBB operates with an integrated fan for air cooling.
  Assembly must take place so as not to obstruct air circulation.
  Ensure that the 100 mm area above and below the vent slots must not be blocked by other cables, devices, etc.

- If several rectifiers are intended to be placed in the control cabinet, it must be ensured that a temperature of 50°C is not exceeded through suitable dimensioning of the ventilation system or similar.

- A support rail spring clip (1) is attached on the rear of the module. This enables assembly on a 35 mm support rail:

- Hook the top edge of the spring clip (1) to the top edge of the support rail.

- Press the module down and insert it in the bottom edge of the support rail.



4.2 Electrical connection

DANGER !



Hazard from electric power.

Electrical connection must only be established by a certified e carried out only by a certified electrician all safety measures.

The electric power supply must be interrupted before you connect the switching rectifier. Secure the electric power supply against restarting with the sign “Do not activate”.

NOTE

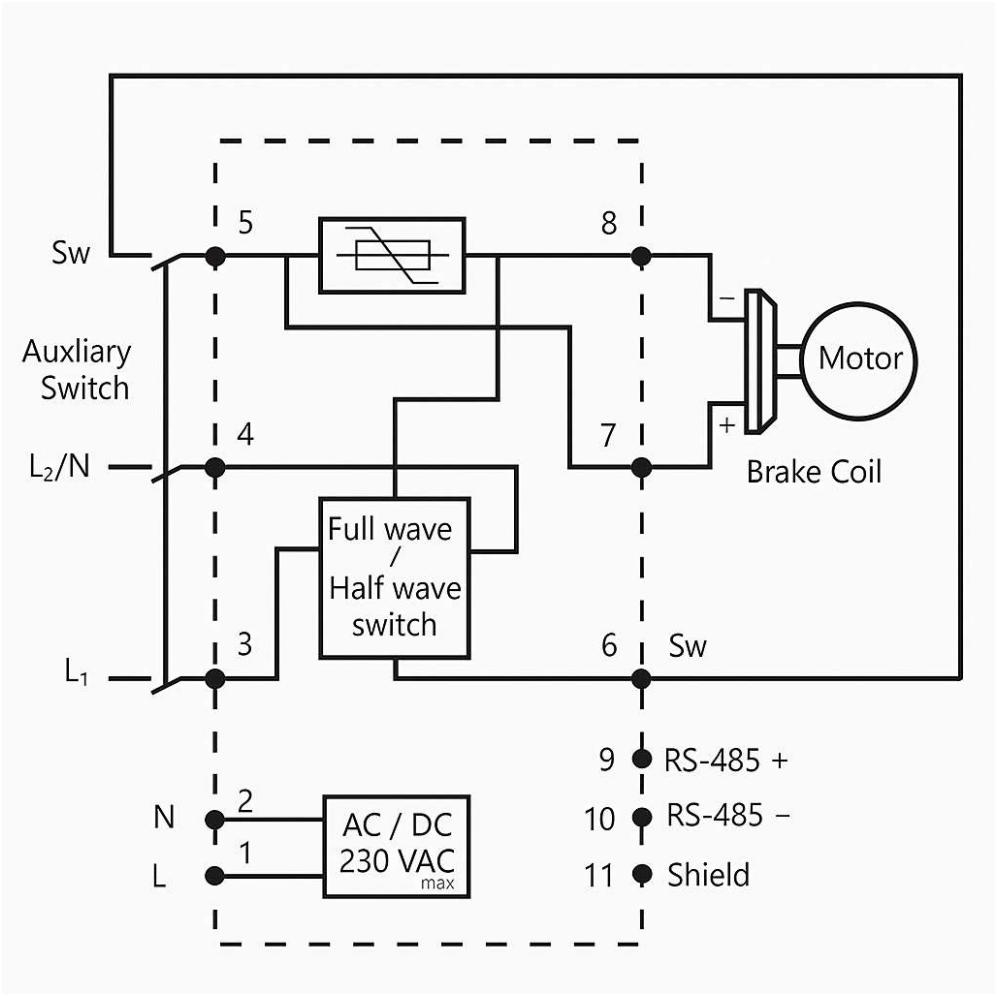


Because the use of the switching rectifiers causes feedback to the supplying network, the brake system must be fed from energy supply networks with an individual feed transformer to the medium- or high-voltage network if it is used in the European Economic Area. In non-European countries, the respective valid regulations must be observed.

The following must be observed for the electrical connection:

- The switching rectifier does not contain internal fuses.
- The electric circuit must be secured with suitable protective devices according to the respective valid installation guidelines.
- Protective devices should comply with national and international installation guidelines**,** such as IEC, NEC, or local standards.- The output voltage must be adjusted to the brake current.
- Do not route cables through locations prone to mechanical stress or risk of breakage**.**
- Avoid cable loops or rings which may cause signal interference or mechanical strain.
- Attach good earth connections on the brake’s metal body.
- Separate brake cables from power lines or strongly radiating supply lines.
- Ensure EMC-suitable installation of the frequency inverter for operation with a frequency inverter.

Wiring diagram



The wiring diagram shows the usual or recommended connection of mains voltage, contactor contact, brake and serial communication.
According to this wiring diagram, the brake is switched on or off with a commercially available three-phase contactor whereby switching takes places sumultaneously



NOTE

The contactor contacts must be capable of switching 2.5 times the DC-Current. The arc effect on the contactor contact will otherwise leave to fast ageing which will ultimately result in the destruction.



NOTE

Switching elements between terminals 7 and 8 an the brake are not permissible.

High induced voltages that could destroy the isolation of the coil occur when the current shut down.

Connecting several brakes

You can also connect several brakes of the same size to one switching rectifier if the electrical limit values are adhered to.

4.3 Commissioning

The commissioning personnel must ensure that all essential information regarding the brake system and the SBB rectifier is available and understood. The following checks must be completed:

- Verify the correct connection of the switching rectifier.
- Confirm that all connection lines are securely seated in the terminal clamps.
- Ensure that the SBB rectifier is properly configured for the intended application.

5 Operation

Even though the SBB switching rectifier can be used for any electromagnetic device, reference will be made to example of the “Brake” in the following.

5.1 Operation on the 230V network

During the switch on of the brake with the contactor contact, the switching rectifier initially works as a full-wave rectifier, i.e. the full rectified input AC voltage is applied to the brake. This voltage has approx. twice the value of the nominal voltage of the brake’s magnetic coil. This leads to the current rising faster in the magnetic coil than when the nominal voltage is applied and the armature plate is thus attracted faster.

After the time set in parameter “T-Full Br.” switch has elapsed, the switching rectifier is automatically switched to half-wave rectification. Switching to half-wave rectification is absolutely necessary.

- Full-wave ± 0.9 x AC_{in}
- Half-wave ± 0.45 x AC_{in}



NOTE

Without switching, too much voltage is applied to the magnetic coil and the coil temperature rises to inadmissibly high values. This will result in the destruction of the magnetic coil.

After switching to half-wave rectification, the switching rectifier works in an operating mode in which the brake’s magnetic coil is effectively operated with nominal voltage.
An input voltage of 230 V AC with half-wave rectification results in a DC current of about 104 V. The nominal voltage of most magnetic coils is 110 VDC or 207VDC.

Brakes with 207VDC coils

When the brake is switched on with the contactor contact, the full rectified input AC voltage is applied to the brake. This voltage has approx. the value of the nominal voltage of the brake's magnetic coil. After switching to half-wave rectification, the brake's magnetic coil is essentially operated with half the nominal voltage so that you can also call it brake operation with "clamping voltage".

The advantage here is that the armature plate is deenergized faster during the shut-down because less energy is stored in the magnetic field. Another advantage is that the coil does not heat up as much and can thus be operated at higher ambient temperatures.

5.2 Operation on the 440V network

If brakes with 207VDC coils are used, the same conditions as with the combination of 230VAC network and 110VDC coil occur, i.e. fast attraction of the armature plate with full-wave rectification and operation at nominal voltage with half-wave rectification.



NOTE

Brakes with 110VDC coils cannot be operated on the 440VAC network.

The current is too high and the coil is destroyed thermally.

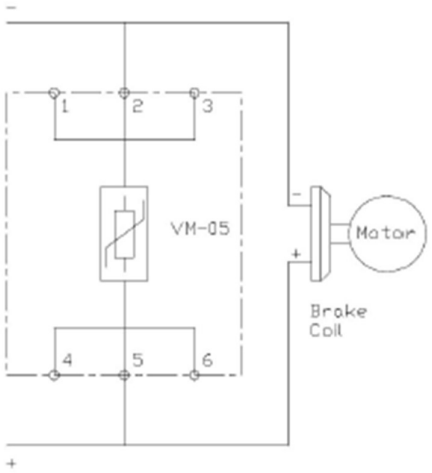
5.3 Discharge of the brakes switch-off energy

Conversion of the brakes switch-off energy into heat

The pulsed energy released during the shut-down of the magnetic coil must be converted into heat in the switching rectifier. Varistors that are specifically suited for pulsed energy consumption ensure conversion of the brake's switch-off energy. The switch-off energy differs depending on the brake and essentially depends on the current with which shut-off occurs.

It must be noted that the brakes are periodically switched on and off thus resulting in a power loss whose value depends on the switching frequency.

The protective circuit of the switching rectifier is designed for a medium power loss of max. 8 W. The power loss to be discharged can be increased by 5 W each per protection element by interposing one or several protection elements (VM-05) between output clamps 2 and 5 and magnetic coil.



Limiting the cut-off voltage

During the conversion of the switch-off energy, the voltage with which the conversion takes place must be limited. This prevents damage or destruction of components from voltages that are too high. This is ensured with the use of varistors. But you generally want to have a preferably high cut-off voltage, because the switch-off energy is then reduced as quickly as possible (the current is not increased during the switch-off process) and the brake action thus also occurs as quickly as possible.

Supply transformer load from half-wave rectification

After switching from full-wave rectification to half-wave rectification, the connected consumers are permanently supplied through half-wave rectification. The direct current generated by the half-wave rectification is an additional load on the supply transformer. The additional load must therefore be taken into consideration for the dimensions of the supply transformer in order to not ultimately force the transformer into saturation.

5.4 Handling during operation

There are no operating elements.

5.5 Maintenaince

The SBB switching rectifier is maintenance free.

6 Troubleshooting



WARNING!

Electrical voltage hazard.

Troubleshooting and fault clearance must be carried out only by appropriately trained technical staff.



NOTE

In case of complaints regarding the switching rectifier SBB, please notify euro HÜBNER benelux b.v. customer service immediately specifying**.**

- type designation
- serial number
- reason for complaint
- period of application
- ambient conditions
- operating mode

Error	Cause	Remedy
No DC current applied to the connected brakes	Loose connection lines	Check firm seat of terminal clamps
	Defective switching rectifier	Have a certified electrian replace the rectifier.
The brake is not switching	No connection terminal between 5 and 6	Check if 5-6 are properly connetected
	No voltage present on the rectifier SBB	Have a certified electrian check whether there is voltage present on the retifier SBB

7 Decommissioning

7.1 Decommissioning



DANGER!

Danger caused by hazardours electrical voltage.

All electrical work must be carried out by electrically qualified personnel only.



NOTE

The housing of the switching rectifier SBB must not be opened.
There is a seal on the device. This seal must not be demaged. All claims against the manufacturer will be void if the seal is damaged.

Decommisioning must be carried out by speciality trained and approprately instruced personnel only.

Compliance with all effective guidelines and regualtions is mandatory.

7.2 Disposal



WARNING!

Danger from environmental pollution
Environmentally friendly disposal of operating supplies, lubricants and auxilary supplies as well as oily compments must be observed.

Electrical waste must be collected separately and recycled in accordance with applicable regulations.

Alle effective guidelines and regulations must be complied with when disposing of products.

8 Appendix

8.1 Time setting and switching frequency for SFB brakes with SBB6 and SBB 10.

Type SBB 6		**Input voltage 230 VAC, Coil voltage 110 VDC Input voltage 440 VAC, Coil voltage 207 VDC**		**Input voltage 230 VAC, Coil voltage 207 VDC**	
Brake type	Time s	Switching frequency at 230ACV/110VDC (1/h)	Switching frequency at 440ACV/207V DC (1/h)	Time s	Switching frequency at 230ACV/207VDC (1/h)
SFB 6.3	0,5	2000	2000	0,5	2000
SFB 10	0,5	1400	1400	0,5	2000
SFB 16	0,5	1100	1100	0,5	2000
SFB 25	0,5	800	800	0,5	1600
SFB 40	1,0	700	700	1,0	1500
SFB 63	1,0	500	500	1,0	1000
SFB 100 (TS 200)	1,5	400	400	1,5	750
SFB 160 (TS 320)	1,5	250	250	1,5	550
SFB 250 (TS 500)	2	200	200	2	400
SFB 400 (TS 800)	2	150	150	2	300
SFB 630 (TS 1250)	2,5	Not permissible	100	2,5	200
SFB 1000 (TS 2000)	2,5	Not permissible	60	2,5	120

Type SBB 10		**Input voltage 230 VAC, Coil voltage 110 VDC Input voltage 440 VAC, Coil voltage 207 VDC**		**Input voltage 230 VAC, Coil voltage 207 VDC**	
Brake type	Time s	Switching frequency at 230ACV/110VDC (1/h)	Switching frequency at 440ACV/207V DC (1/h)	Time s	Switching frequency at 230ACV/207VDC (1/h)
SFB 6.3	0,5	2000	2000	0,5	2000
SFB 10	0,5	1400	1400	0,5	2000
SFB 16	0,5	1100	1100	0,5	2000
SFB 25	0,5	800	800	0,5	1600
SFB 40	1,0	700	700	1,0	1500
SFB 63	1,0	500	500	1,0	1000
SFB 100 (TS 200)	1,5	400	400	1,5	750
SFB 160 (TS 320)	1,5	250	250	1,5	550
SFB 250 (TS 500)	2	200	200	2	400
SFB 400 (TS 800)	2	150	150	2	300
SFB 630 (TS 1250)	2,5	100	100	2,5	200
SFB 1000 (TS 2000)	2,5	60	60	2,5	120

8.2 Customer service

Our customer service will provide technicall information on the products of euro HÜBNER benelux b.v. and their system applications.

Please contact our customer service in case of any further enquiries. If you have any enquiries, please always provide the article code and year of manifacture (see rating plate). Providing this data ensures that you will recieve the correct information or the required spare parts.

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