Product Manual

ABB i-bus® EIB / KNX

EIB / KNX Power Supply Units
SV/S 30.160.5
SV/S 30.320.5
SV/S 30.640.5
SU/S 30.640.1

Intelligent Installation Systems

ABB

This manual describes the functionality of EIB / KNX-Power Supply Units SV/S 30.160.5, SV/S 30.320.5, SV/S 30.640.5, SU/S 30.640.1.

Subject to changes and errors excepted.

Exclusion of liability:
Despite checking that the contents of this document match the hardware and software, deviations cannot be completely excluded. We therefore cannot accept any liability for this. Any necessary corrections will be incorporated into new versions of the manual.
Please let us know if you have any suggestions for improvements.
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1 EIB / KNX Power Supply Units

1.1 Introduction

EIB / KNX power supply units produce the EIB / KNX system voltage to supply the connected EIB / KNX components with power and over which EIB / KNX telegrams are transmitted.

To isolate the telegram traffic from the supply voltage, the EIB / KNX power supply units are decoupled from the bus line by an integrated choke. The bus line is disconnected from the supply with a reset during which all the devices connected to the bus line are returned to their initial state.

Fluctuations and failure of the bus voltage can lead to the loss of telegrams and faults in the installation. The EIB / KNX bus voltage should therefore always have a backup supply in critical applications, e.g., security functions.

1.2 The ABB product range

ABB offers a co-ordinated range of EIB / KNX power supply units and batteries to provide a professional back-up supply, whether for small systems in detached houses, for larger installations in trade and commercial applications or for sophisticated requirements in office buildings, industrial premises, hotels and hospitals.

All the EIB / KNX power supply units from ABB contain an integrated choke. The connection to the ABB i-bus® EIB / KNX is established via a bus connection terminal.

ABB offers four different EIB / KNX power supply units as DIN rail mounted devices for various applications:

1. **SV/S 30.160.5**
   EIB / KNX Power Supply, 160 mA, MDRC
2. **SV/S 30.320.5**
   EIB / KNX Power Supply, 320 mA, MDRC
3. **SV/S 30.640.5**
   EIB / KNX Power Supply, 640 mA, MDRC
4. **SU/S 30.640.1**
   Uninterruptible EIB / KNX Power Supply, 640 mA, MDRC

These four EIB / KNX power supply units are compared in the following table.

	SV/S 30.160.5	SV/S 30.320.5	SV/S 30.640.5	SU/S 30.640.1
General				
Width	4 modules	4 modules	6 modules	8 modules
Bus output				
Bus output with choke	160 mA	320 mA	640 mA	640 mA
Bus connection	Bus connection terminal	Bus connection terminal	Bus connection terminal	Bus connection terminal
Reset	Removal of bus connection terminal	Removal of bus connection terminal	Reset button	Reset button
30 V DC output (without choke)	–	–	Connection terminal	–
Back-up supply				
Mains failure back-up time	200 ms	200 ms	200 ms	Without battery: 200 ms In combination with a sealed lead acid battery, e.g.: AM/S 12.1: 10 min.* SAK 7: up to 2,5 h* (2 SAK 7 in parallel: up to 5 h*) SAK 12: up to 5,5 h* (2 SAK 12 in parallel: up to 11 h*) SAK 17: up to 8 h* (2 SAK 17 in parallel: up to 16 h*) *Times are based on a newly-charged battery at nominal load
Inputs/Outputs				
Potential-free contact for fault indication	–	–	–	Changeover contact
Functions				
Typical areas of application	• Supply of installations with only one line and a small number of bus devices (e.g., detached house, flat, shop, workshop) • Supply of main and area lines • Compensation of voltage drops in installations with large distances between the bus devices in a line or line segment • For use in equipment in mobile installations such as training benches and demonstration boards		• Supply of one line with up to 64 bus devices (e.g., detached house, office and commercial buildings) • Supply of 2 lines each with a small number of bus devices or the simultaneous supply of main and area lines via the separate 30 V DC auxiliary voltage output with additional choke	• Supply of installations with sophisticated requirements as regards the fault tolerance of the EIB / KNX installation (e.g. for security applications or fault alarm processing) • Back-up supply for the EIB / KNX voltage • Fault indication and storage of fault signals in the event of mains failure, battery fault, overload, overvoltage, voltage drop and short circuit

2 SV/S 30.160.5 EIB / KNX Power Supply, 160 mA, MDRC

2.1 General

2.1.1 Product and functional description

The EIB / KNX Power Supply produces and monitors the EIB / KNX system voltage.
The bus line is decoupled from the power supply with the integrated choke.


2CDC 071 056 F0007

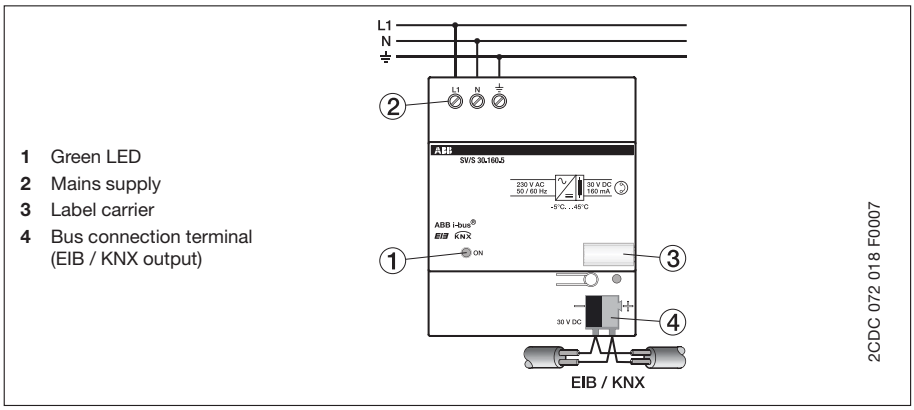
The power supply is connected to the bus line with a bus connection terminal. A reset is triggered by removing the bus connection terminal for approx. 20 seconds. The bus line is disconnected from the power supply and the bus devices connected to this bus line are returned to their initial state.

2.2 Device technology

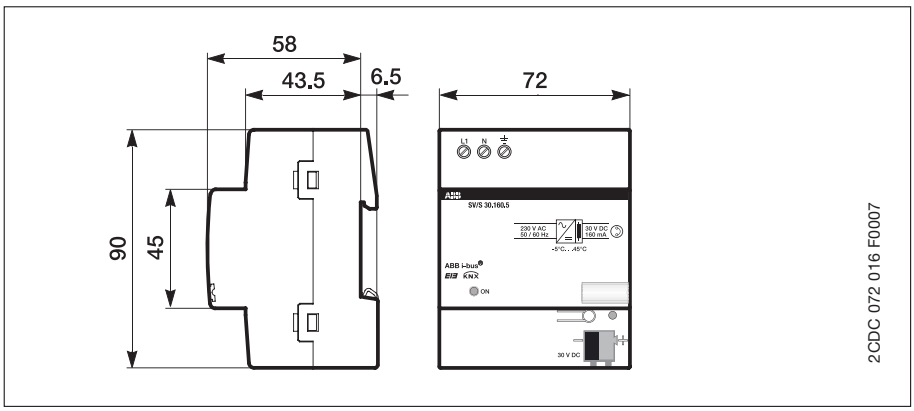
2.2.1 Technical data

Power supply	– Power supply	230 V AC +10/–15%, 45 ... 65 Hz
	– Power consumption	< 8 VA
	– Power loss	< 3 W
Outputs	– EIB / KNX output	1 line with integrated choke
	– EIB / KNX output voltage	30 V DC +1/-2 V, SELV
	– Nominal current	160 mA, short-circuit-proof
	– Sustained short-circuit current	< 450 A
	– Mains failure back-up time	200 ms
Operating and display elements	– Green LED	"ON": Device in operation
Connections	– Power supply	3 screw terminals Cable cross-section: multi-core 0.2 – 2.5 mm^2 single-core 0.2 – 4.0 mm^2
	– EIB / KNX output	Bus connection terminal (black/red)
Type of protection	– IP 20, EN 60 529	
Ambient temperature range	– Operation	– 5 °C ... + 45 °C
	– Storage	– 25 °C ... + 55 °C
	– Transport	– 25 °C ... + 70 °C
Design	– Modular installation device, pro*M*	
Housing, colour	– Plastic housing, grey	
Mounting	– On 35 mm mounting rail, DIN EN 60 715	
Dimensions	– 90 x 72 x 64.5 mm (H x W x D)	
Mounting depth/width	– 68 mm/4 modules at 18 mm	
Weight	– 0.21 kg	
Certification	– EIB / KNX-certified	
CE norm	– In accordance with the EMC guideline and the low voltage guideline	

2.2.2 Device connection



2.2.3 Dimension drawing



2.2.4 Installation and commissioning

Switch on the mains voltage after the device has been correctly installed. The “ON”-LED lights up after mains voltage was applied and the output voltage is above 20 V DC.

The “ON”-LED flashes even if there is overload and if devices should not work because of inappropriate bus topologies (very long bus lines). The installer has to ensure that nominal current of 160 mA won’t exceed permanently.

2.3 Planning and application

2.3.1 Device application

The EIB / KNX Power Supply SV/S 30.160.5 is particularly suitable for the supply of:

- lines with a small number of devices
- small EIB / KNX installations with only one line, e.g., detached houses, flats, shops, workshops
- main lines and area lines
- installations with large distances between the bus devices of a line or line segment to compensate for the voltage drop
- mobile installations, e.g., training benches, demonstration boards

2.4 Function and operation

2.4.1 Reset

To carry out a reset, remove the bus connection terminal for approx. 20 seconds from the EIB / KNX power supply.

2.4.2 Fault

If the green “ON”-LED does not light up with applied mains voltage, a fault is present. Check whether the connected EIB / KNX line has experienced a short circuit and whether the mains voltage is OK.

The “ON”-LED flashes even if there is overload and if devices should not work because of inappropriate bus topologies (very long bus lines). The installer has to ensure that nominal current of 160 mA won’t exceed permanently.

Once the fault has been rectified, carry out a reset by removing the bus connection terminal for approx. 20 seconds.

3 SV/S 30.320.5 EIB / KNX Power Supply, 320 mA, MDRC

3.1 General

3.1.1 Product and functional description


SK 0040 B 02

The EIB / KNX Power Supply produces and monitors the EIB / KNX system voltage.
The bus line is decoupled from the power supply with the integrated choke.

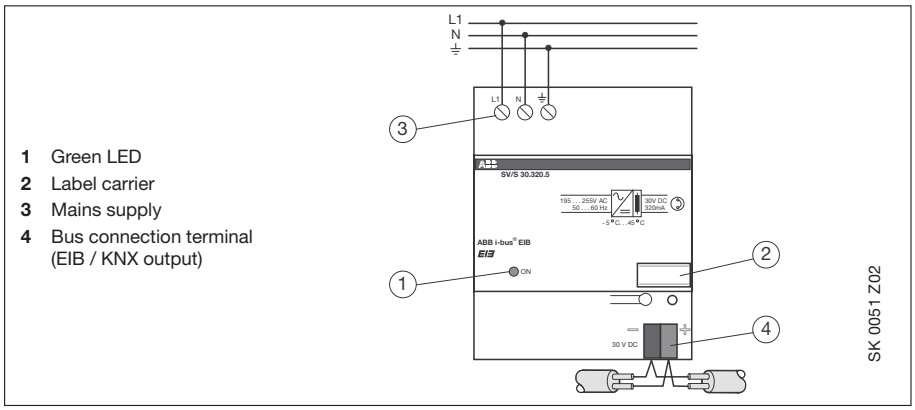
The power supply is connected to the bus line with a bus connection terminal. A reset is triggered by removing the bus connection terminal for approx. 20 seconds. The bus line is disconnected from the power supply and the bus devices connected to this bus line are returned to their initial state.

3.2 Device technology

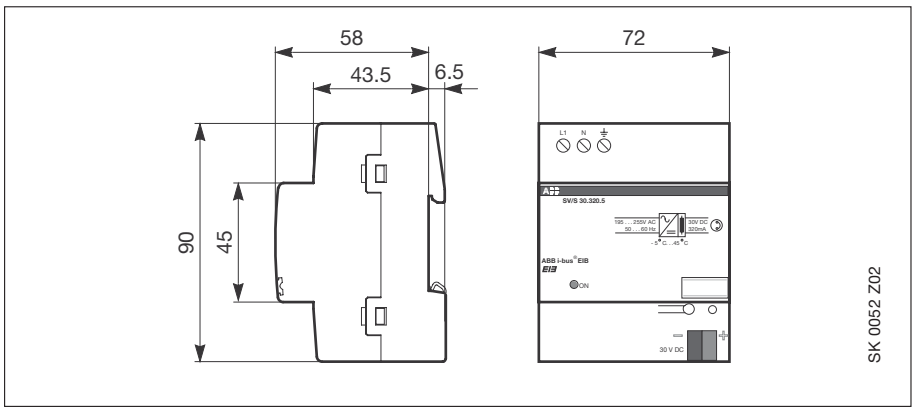
3.2.1 Technical data

Power supply	– Power supply	230 V AC +10/–15%, 45 ... 65 Hz
	– Power consumption	< 30 VA
	– Power loss	< 4 W
Outputs	– EIB / KNX output	1 line with integrated choke
	– EIB / KNX output voltage	30 V DC +1/-2 V, SELV
	– Nominal current	320 mA, short-circuit-proof
	– Sustained short-circuit current	< 1 A
	– Mains failure back-up time	200 ms
Operating and display elements	– Green LED	"ON": Device in operation
Connections	– Power supply	3 screw terminals Cable cross-section: multi-core 0.2 – 2.5 mm^2 single-core 0.2 – 4.0 mm^2
	– EIB / KNX output	Bus connection terminal (black/red)
Type of protection	– IP 20, EN 60 529	
Ambient temperature range	– Operation	– 5 °C ... + 45 °C
	– Storage	– 25 °C ... + 55 °C
	– Transport	– 25 °C ... + 70 °C
Design	– Modular installation device, pro*M*	
Housing, colour	– Plastic housing, grey	
Mounting	– On 35 mm mounting rail, DIN EN 60 715	
Dimensions	– 90 x 72 x 64.5 mm (H x W x D)	
Mounting depth/width	– 68 mm/4 modules at 18 mm	
Weight	– 0.21 kg	
Certification	– EIB-certified	
CE norm	– In accordance with the EMC guideline and the low voltage guideline	

3.2.2 Device connection



3.2.3 Dimension drawing



3.2.4 Installation and commissioning

The “ON”-LED lights up after mains voltage was applied and the output voltage is above 20 V DC.

The “ON”-LED flashes even if there is overload and if devices should not work because of inappropriate bus topologies (very long bus lines). The installer has to ensure that nominal current of 320 mA won’t exceed permanently.

3.3 Planning and application

3.3.1 Device application

The EIB / KNX Power Supply SV/S 30.320.5 is particularly suitable for the supply of:

- lines with a small number of devices
- small EIB / KNX installations with only one line, e.g., detached houses, flats, shops, workshops
- main lines and area lines
- installations with large distances between the bus devices of a line or line segment to compensate for the voltage drop
- mobile installations, e.g., training benches, demonstration boards

3.4 Function and operation

3.4.1 Reset

To carry out a reset, remove the bus connection terminal for approx. 20 seconds from the EIB / KNX power supply.

3.4.2 Fault

If the green “ON”-LED does not light up with applied mains voltage, a fault is present. Check whether the connected EIB / KNX line has experienced a short circuit and whether the mains voltage is OK.

The “ON”-LED flashes even if there is overload and if devices should not work because of inappropriate bus topologies (very long bus lines). The installer has to ensure that nominal current of 320 mA won’t exceed permanently.

Once the fault has been rectified, carry out a reset by removing the bus connection terminal for approx. 20 seconds.

4 SV/S 30.640.5 EIB / KNX Power Supply, 640 mA, MDRC

4.1 General

4.1.1 Product and functional description

SK 0036 B 02

The EIB / KNX Power Supply produces and monitors the EIB / KNX system voltage.
The bus line is decoupled from the power supply with the integrated choke.

The power supply is connected to the bus line with a bus connection terminal. A reset is triggered by pressing the reset push button and lasts for 20 seconds (regardless of the duration of the push button action).
The bus line is disconnected from the power supply and the bus devices connected to this bus line are returned to their initial state. If the line should be disconnected for a longer period, the bus connection terminal must be removed from the power supply.

A 30 V DC auxiliary voltage is made available via an additional connection terminal. This voltage can be used to supply a further bus line (in connection with a separate choke). The 30 V DC auxiliary voltage may not be used for other purposes.

4.2 Device technology

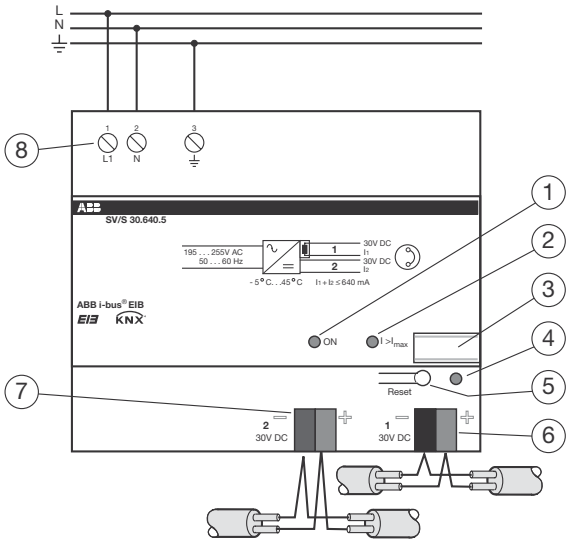
4.2.1 Technical data

Power supply	– Power supply	230 V AC +10/-15%, 45 ... 65 Hz
	– Power consumption	< 45 VA
	– Power loss	< 6 W
Outputs	– EIB / KNX output	1 line with integrated choke
	– EIB / KNX nominal voltage	30 V DC +1/-2 V, SELV
	– Auxiliary voltage output	1 (without choke)
	– Auxiliary voltage	30 V DC +/- 1 V, SELV
	– Nominal current (total of EIB / KNX and auxiliary voltage output)	640 mA, short-circuit-proof
	– Sustained short-circuit current	< 1.5 A
	– Mains failure back-up time	200 ms
Operating and display elements	– Green LED	"ON": output voltage is OK
	– Red LED	„$I>I_{max}$": overload or short circuit
	– Reset push button	Reset at the EIB / KNX output (starts when the push button is pressed and lasts 20 s)
	– Red LED	Reset at the EIB / KNX output
Connections	– Power supply	3 srew terminals Cable cross-section: multi-core 0.2 – 2.5 mm^2 single-core 0.2 – 4.0 mm^2
	– EIB / KNX output	Bus connection terminal (black/red)
	– Auxiliary voltage output	Connection terminal (yellow/grey)
Type of protection	– IP 20, EN 60 529	

EIB / KNX Power Supply, 640 mA, MDRC
SV/S 30.640.5, GH Q631 0048 R0111

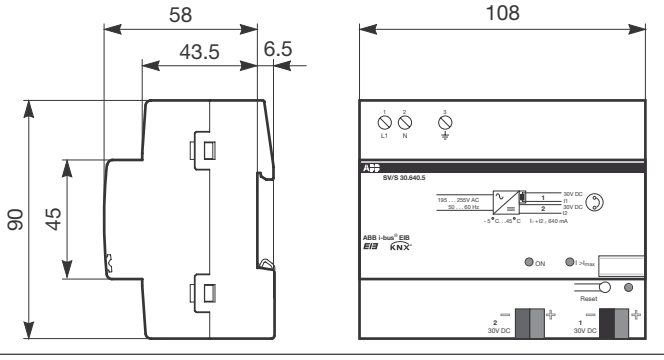
Ambient temperature range	– Operation	– 5 °C ... + 45 °C
	– Storage	– 25 °C ... + 55 °C
	– Transport	– 25 °C ... + 70 °C
Design	– Modular installation device, pro*M*	
Housing, colour	– Plastic housing, grey	
Mounting	– On 35 mm mounting rail, DIN EN 60 715	
Dimensions	– 90 x 108 x 64.5 mm (H x W x D)	
Mounting depth/width	– 68 mm/ 6 modules at 18 mm	
Weight	– 0.35 kg	
Certification	– EIB / KNX-certified	
CE norm	– In accordance with the EMC guideline and the low voltage guideline	

4.2.2 Device connection



1 Green LED (output voltage OK)
2 Red LED (overload/short circuit)
3 Label carrier
4 Red LED (reset)
5 Reset push button
6 Bus connection terminal (EIB / KNX output)
7 Connection terminal (auxiliary voltage output)
8 Mains supply

4.2.3 Dimension drawing



4.2.4 Installation and commissioning

Switch on the mains voltage once the device has been correctly installed. The green “ON” LED lights up. All the other LEDs are switched off. The device is functioning correctly.

4.3 Planning and application

4.3.1 Device application

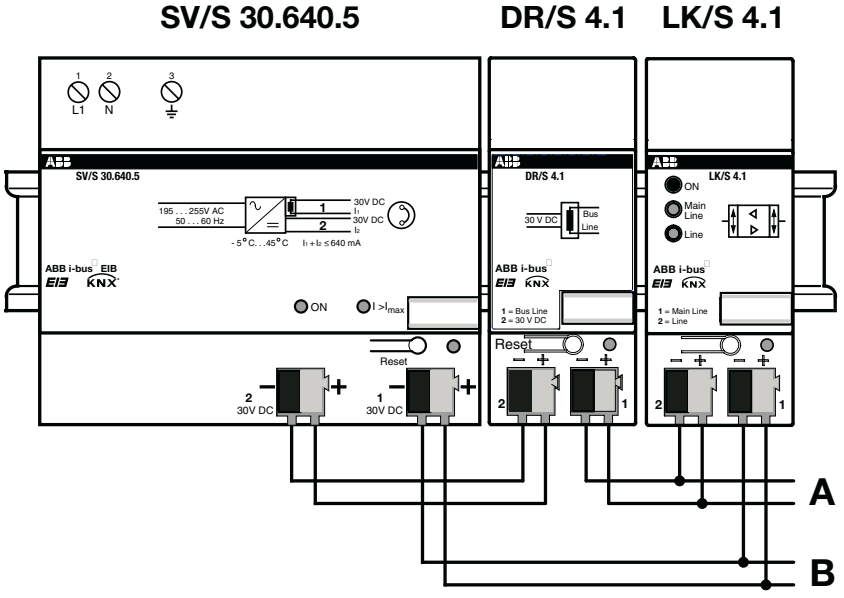
The EIB / KNX Power Supply SV/S 30.640.5 is particularly suitable for the supply of:

- lines with up to 64 bus devices, e.g., detached houses, office buildings, commercial buildings
- lines with a small number of devices and the simultaneous supply of a main line or area line via the separate 30 V DC auxiliary voltage output in combination with an additional choke

Note:
The auxiliary voltage may not be used for other purposes (e.g., to connect sensors to a binary input) as both the power supply and the connected EIB / KNX line will fail in the event of a fault at the auxiliary voltage output (e.g. a short circuit)!

4.3.2 Application example

The 30 V DC auxiliary voltage output can be used in connection with an additional choke to supply a main or area line with voltage. To do so, the devices must be installed as in the following wiring diagram.



A Line 1 **B Main line**

4.4 Function and operation

4.4.1 Reset

To carry out a reset, press the reset push button. The red “Reset” LED lights up. The reset lasts approx. 20 seconds, regardless of the duration of the push button action. The bus line is disconnected from the power supply and the bus devices connected to the bus line are returned to their initial state. The “Reset” LED extinguishs when the reset has finished.

If the line should be disconnected for a longer period, remove the bus connection terminal from the EIB / KNX power supply.

4.4.2 Fault

During normal operation, the green “ON” LED lights up.

If only the red LED “$I>I_{max}$” lights up, the EIB / KNX output has experienced an overload or short circuit. Rectify the short circuit or reduce the number of bus devices if necessary until an overload is no longer present and only the green “ON” LED lights up.

If the green “ON” LED and the red LED “$I>I_{max}$” light up simultaneously, the bus line has experienced an overload and the correct function cannot be guaranteed. Reduce the number of bus devices until the overload is no longer present and only the green “ON” LED lights up.

If neither LED lights up, the mains voltage is disconnected. Connect the voltage to the system and carry out a reset.

Once the fault has been rectified, carry out a reset by pressing the reset push button.

5 SU/S 30.640.1 Uninterruptible EIB / KNX Power Supply, 640 mA, MDRC

5.1 General

5.1.1 Product and functional description

SK 0037 B 02

The Uninterruptible EIB / KNX Power Supply produces and monitors the EIB / KNX system voltage. The bus line is decoupled from the power supply with the integrated choke.

The power supply is connected to the bus line with a bus connection terminal. A reset is triggered by pressing the reset push button and lasts for 20 seconds (regardless of the duration of the push button action).
The bus line is disconnected from the power supply and the bus devices connected to this bus line are returned to their initial state. If the line should be disconnected for a longer period, the bus connection terminal must be removed from the power supply.

Up to two 12 V sealed lead acid batteries can be connected as a back-up energy supply for the EIB / KNX system voltage in the event of mains failures.
The batteries are charged via the SU/S 30.640.1 during normal operation. The charging voltage is temperature-controlled using a temperature sensor. If a mains failure occurs, the SU/S 30.640.1 is then supplied by the batteries.

The temperature sensor must always be connected to ensure that the battery is charged correctly!

A fault in the Uninterruptible EIB / KNX Power Supply is reported and stored via a potential-free changeover contact. The following faults cause a switching operation at the changeover contact: mains failure, battery fault, overvoltage and overload or short circuit.

5.2 Device technology

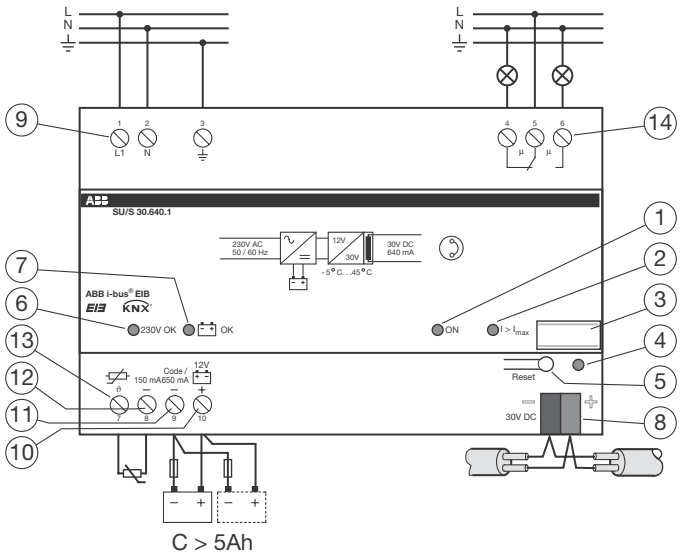
5.2.1 Technical data

Power supply	– Power supply	230 V AC +10/–15%, 45 ... 65 Hz
	– Power consumption	< 60 VA
	– Power loss	< 10 W
EIB / KNX output	– Number	1 line with integrated choke
	– Output voltage	30 V DC +1/-2 V, SELV
	– Nominal current	640 mA, short circuit proof
	– Sustained short-circuit current	< 1.5 A
	– Mains failure back-up time (without connected battery)	200 ms
Battery back-up	– Battery type	Sealed lead acid battery
	– Number	Max. 2 in parallel
	– Nominal voltage	12 V DC
	– Battery capacity	Preferably 1 Ah, 7 Ah, 12 Ah, 17 Ah
	– Mains failure back-up time	Dependent on battery capacity
	– Nominal charging current of battery	650 mA (terminals 9 + 10), for battery capacities > 5 Ah 150 mA (terminals 8 + 10) for battery capacities < 5 Ah
	– Temperature control	Temperature-controlled adjustment of charging voltage via temperature sensor

Uninterruptible EIB / KNX Power Supply, 640 mA, MDRC
SU/S 30.640.1, GH Q631 0049 R0111

Potential-free changeover contact	– Nominal voltage	230 V AC or 12/24 V AC/DC
	– Max. switching current	6 A AC or 4 A DC
	– Min. switching current	100 mA (at U < 30 V AC/DC)
Operating and display elements	– Green LED	"ON": output voltage is OK
	– Red LED	„I>I_{max}": overload or short circuit
	– Reset push button	Reset starts when the push button is pressed and lasts 20 s
	– Red LED	Reset at the EIB / KNX output
	– Green LED	Main voltage is OK
	– Green LED	Battery is OK
Connections	– Power supply	3 screw terminals
	– Battery connection	2 screw terminals
	– Temperature sensor	2 screw terminals
	– Changeover contact	3 screw terminals
	– Cable cross-section for all screw terminals	multi-core 0.2 – 2.5 mm² single-core 0.2 – 4.0 mm²
	– EIB / KNX output	Bus connection terminal (black/red)
Type of protection	– IP 20, EN 60 529	
Ambient temperature range	– Operation	– 5 °C ... + 45 °C
	– Storage	– 25 °C ... + 55 °C
	– Transport	– 25 °C ... + 70 °C
Design	– Modular installation device, pro*M*	
Housing, colour	– Plastic housing, grey	
Mounting	– On 35 mm mounting rail, DIN EN 60 715	
Dimensions	– 90 x 144 x 64.5 mm (H x W x D)	
Mounting depth/width	– 68 mm/ 8 modules at 18 mm	
Weight	– 0.5 kg	
Certification	– EIB / KNX-certified	
CE norm	– In accordance with the EMC guideline and the low voltage guideline	

5.2.2 Device connection



1 Green LED (output voltage OK)
2 Red LED (overload/short circuit)
3 Label carrier
4 Red LED (reset)
5 Reset push button
6 Green LED (mains voltage OK)
7 Green LED (battery OK)
8 Bus connection terminal
9 Mains supply
10 Battery connection "+"
11 Battery "–" 650 mA/Temp. sensor "–"
12 Battery "–" 150 mA/Temp. sensor "–"
13 Connection for temperature sensor "+"
14 Connection for potential-free changeover contact

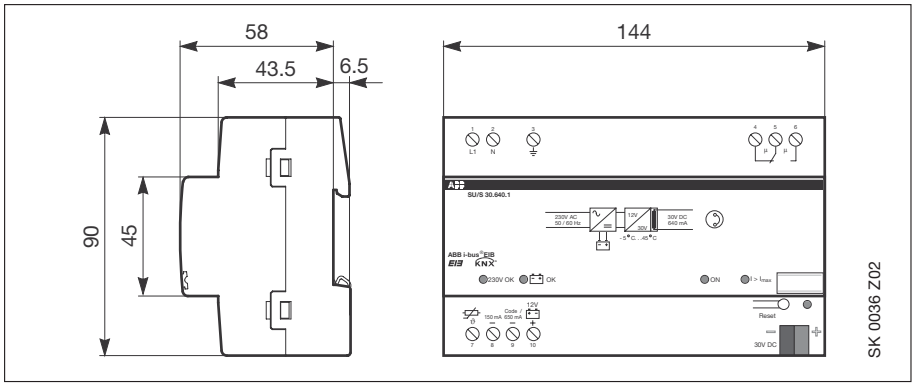
Note:
During normal operation, the potential-free changeover contact is closed between terminals 4 and 5. In case of a fault, it is closed between terminals 5 and 6.

If a total battery capacity of less than 5 Ah is connected to the Uninterruptible EIB / KNX Power Supply SU/S 30.640.1, the battery is connected to terminals 8 (“150 mA –”) and 10 (“12 V +”) while the temperature sensor is connected to terminals 7 (“ϑ”) and 9 (“Code/650 mA –”).

If a total battery capacity of more than 5 Ah is used, the battery is connected to terminals 9 (“Code/650 mA –”) and 10 (“12 V +”) while the temperature sensor is connected to terminals 7 (“ϑ”) and 8 (“150 mA”) (see also chapters 4.3.3 and 4.3.4).

If a battery is used, the temperature sensor must always be connected!

5.2.3 Dimension drawing



5.2.4 Installation and commissioning

Switch on the mains voltage once the device has been correctly installed. The green “ON” LED and the green “230 V OK” LED light up. If a battery is connected, the green “Battery OK” LED also lights up. All the other LEDs are switched off. The device is functioning correctly.

The battery test is carried out automatically at 15 minute intervals. It can take up to 15 minutes after switching on the mains voltage until a possible battery fault is indicated. It can also take 15 minutes for the “Battery OK” LED to relight up once the cause of the fault has been rectified.

A battery test can be triggered manually by pressing the reset push button. In this case, a reset is always carried out simultaneously.

If a faulty battery is connected or the polarity of the battery connection is reversed, the green “ON” LED for the battery flashes.

5.3 Planning and application

5.3.1 Device application

The Uninterruptible EIB / KNX Power Supply SU/S 30.640.1 is particularly suitable for the supply of:

- installations with sophisticated requirements as regards the functional reliability of the EIB / KNX installation (e.g., for security applications or fault monitoring)
- installations requiring a back-up supply for the EIB / KNX voltage for up to 16 hours
- installations with fault reporting and storage of fault signals in the event of mains failure, battery fault, overload, short circuit, overvoltage and voltage drop

5.3.2 Back-up supply

The SU/S 30.640.1 can buffer the connected EIB / KNX line for at least 200 ms without a connected battery in the event of a mains failure.

To bridge longer periods of mains failure, the SU/S 30.640.1 can be provided with a back-up supply using a 12 V DC battery. The mains failure back-up time is dependent on the load connected to the EIB / KNX line and the battery capacity.

ABB offers four different batteries with various capacity. The battery module AM/S 12.1 is a DIN rail mounted device, while the sealed lead acid batteries SAK7, SAK12 and SAK17 can be installed in a separate, universal distribution board.

When the Uninterruptible EIB / KNX Power Supply SU/S 30.640.1 is used at full capacity (64 bus devices), the sealed lead acid batteries buffer the EIB / KNX system voltage for the following mains failure back-up times:

Battery Module, 12 V DC, MDRC, AM/S 12.1

Battery capacity:	1 Ah
Mains failure back-up time:	10 min.*

Sealed Lead Acid Battery, SAK7

Battery capacity:	7 Ah
Mains failure back-up time:	up to 2.5 h* (1 x SAK7) up to 5 h* (2 x SAK7 in parallel)

Sealed Lead Acid Battery, SAK12

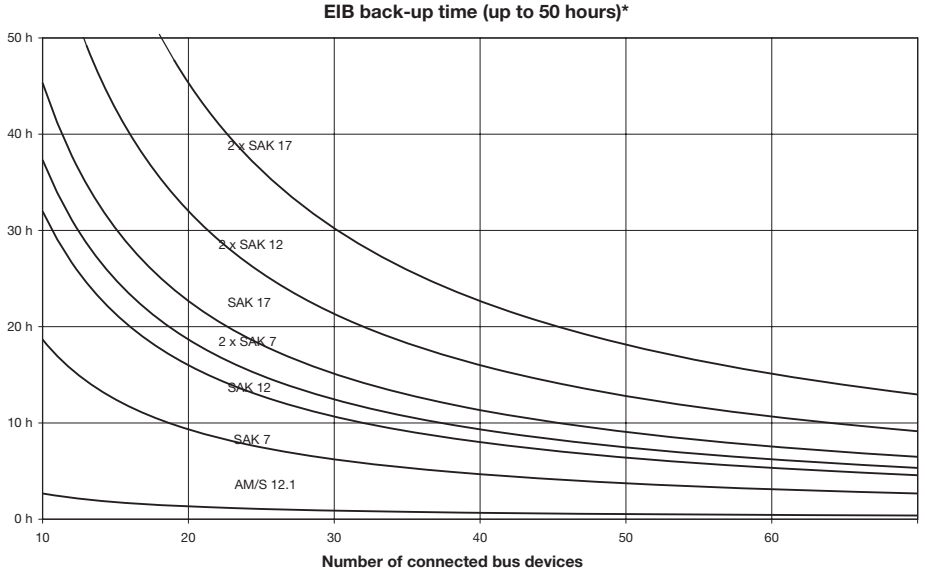
Battery capacity:	12 Ah
Mains failure back-up time:	up to 5.5 h* (1 x SAK12) up to 11 h* (2 x SAK12 in parallel)

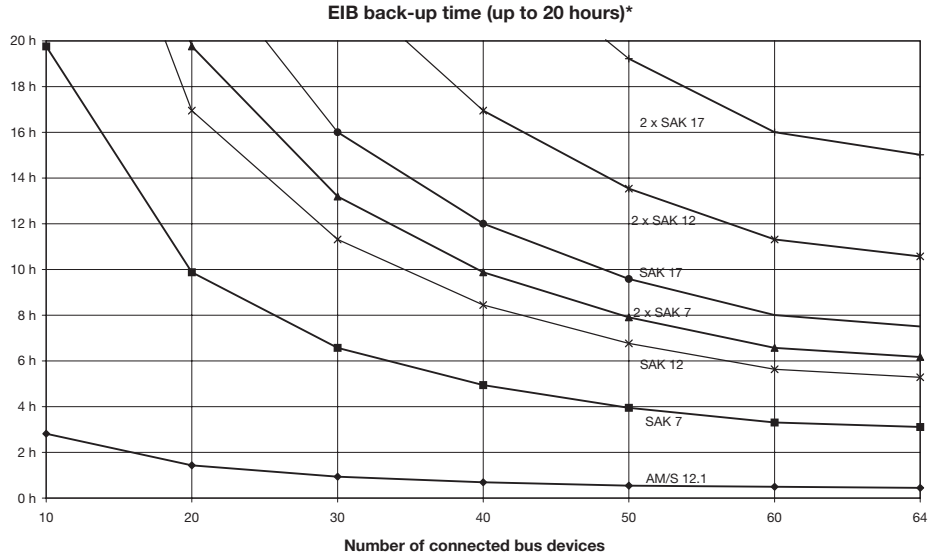
Sealed Lead Acid Battery, SAK17

Battery capacity:	17 Ah
Mains failure back-up time:	up to 8 h* (1 x SAK17) up to 16 h* (2 x SAK17 in parallel)

* The periods are based on a newly-charged batteries at full capacity utilisation of the Uninterruptible EIB / KNX Power Supply SU/S 30.640.1

The minimum back-up times are displayed in the following diagrams dependent on the number of supplied EIB / KNX devices. The first diagram shows back-up times on a large scale (back-up supply for up to 50 hours). The second diagram shows back-up times on a smaller scale (up to 20 hours).





* The periods are based on an newly-charged battery at an ambient temperature of 25 °C

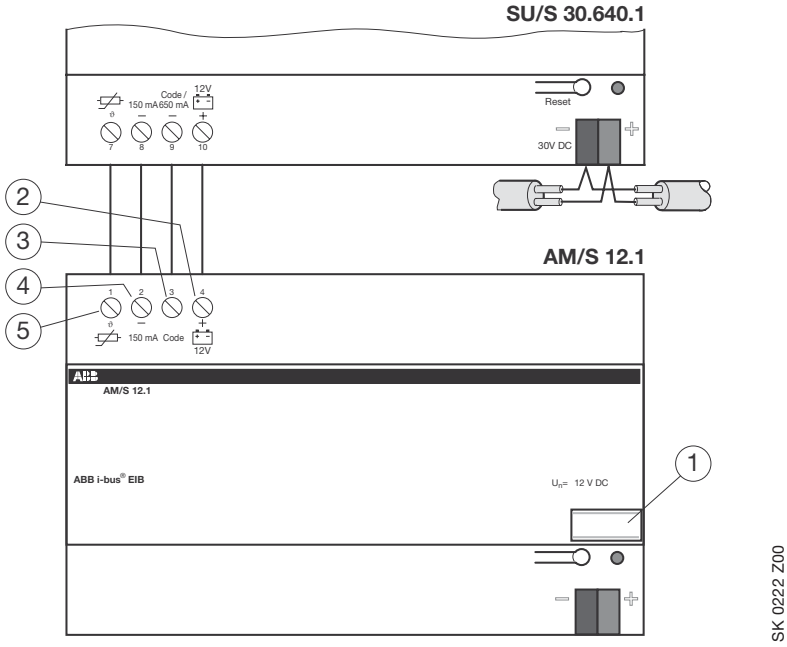
5.3.3 Installation and connection of the Battery Module AM/S 12.1

The Battery Module AM/S 12.1 is a DIN rail mounted device and can simply be snapped onto the mounting rail under the Uninterruptible EIB / KNX Power Supply SU/S 30.640.1 in the distribution board. The connection of the Battery Module to the SU/S 30.640.1 is shown in the following wiring diagram.
The connection of more then one Battery Module to the SU/S 30.640.1 is not permitted.

The Battery Module is connected to the SU/S 30.640.1 using standard cable (single-core or multi-core, recommended cable cross-section: 0.75 – 1.5 mm^2). A four-core cable is required – two cores for charging/discharging and two cores for the temperature-controlled adjustment of the charging voltage (the temperature sensor is integrated in the AM/S 12.1).

The temperature sensor must always be connected to ensure that the battery is charged correctly!

The maximum time required to charge the Battery Module is 10 hours. Only after the maximum charging time, the maximum back-up time can be guaranteed.



1 Label carrier
2 Battery connection "+"
3 Code (temperature sensor "–")
4 Battery „–" 150 mA
5 Connection for temperature sensor

5.3.4 Installation and connection of the sealed lead acid batteries SAK7, SAK12, SAK17

Up to 2 batteries of the same capacity can be connected in parallel to the Uninterruptible EIB / KNX Power Supply SU/S 30.640.1.

The sealed lead acid batteries must be connected to the SU/S 30.640.1 with the Cable Sets KS/K 4.1 and KS/K 2.1. If only one sealed lead acid battery is connected, the Cable Set Basic KS/K 4.1 must be used. If two sealed lead acid batteries are connected in parallel, the second battery must be connected using the Cable Set Extension KS/K 2.1.

A replaceable fuse and a temperature sensor for the temperature-controlled adjustment of the charging voltage are integrated in Cable Set Basic KS/K 4.1; Cable Set Extension KS/K 2.1 contains a replaceable fuse.

When connecting the batteries SAK7, SAK12 and SAK17 with the Cable Sets KS/K 4.1 and KS/K 2.1, it should be ensured that the coloured cable cores are wired to the terminals as follows (see also the wiring diagram on page 17):

Terminal 7:	white	Terminal 9:	black
Terminal 8:	yellow	Terminal 10:	red

The maximum required charging time of the sealed lead acid batteries is:

SAK7:	16 h (1 x SAK7) or 32 h (2 x SAK7 in parallel)
SAK12:	28 h (1 x SAK12) or 56 h (2 x SAK12 in parallel)
SAK17:	39 h (1 x SAK17) or 78 h (2 x SAK17 in parallel)

Only after the maximum charging time, the maximum back-up time can be guaranteed.

5.3.5 Connection of the potential-free changeover contact

Both the normally open (NO) or normally closed (NC) contact of the potential-free changeover contact can be used to route fault signals. It is therefore possible to indicate via an indicator lamp, for example, whether the line is functioning correctly or a fault has occurred. The signal can also be routed automatically to a service technician via a telephone dialling device, for example.

5.4 Function and operation

5.4.1 Reset

Press the reset pushbutton to carry out a reset. The red “Reset” LED lights up. The reset lasts approx. 20 seconds, regardless of the duration of the push button action. The bus line is disconnected from the power supply and the bus devices connected to the bus line are returned to their initial state. The “Reset” LED is extinguished when the reset has finished.

5.4.2 Battery life span

Due to the service life of the batteries, they should be replaced approx. every four years to guarantee the minimum specified mains failure back-up time.

5.4.3 Fault

The Uninterruptible EIB / KNX Power Supply permanently monitors the bus line, the mains power supply and the battery voltage. The green “ON” LED is extinguished when a fault occurs. The cause of the fault is indicated by the LEDs directly on the device and routed via the potential-free changeover contact.

In the event of an overload that endures more than 10 seconds or a short-time overvoltage at the EIB / KNX output, the fault signal is stored, i.e., the potential-free changeover contact and the corresponding LED remain in the fault state, even if the cause for the fault signal is no longer present and the EIB / KNX line is again supplied with voltage. In this case, the installation will continue to function correctly but a service technician must eliminate the problem as otherwise faults may continue to occur in the future.

If the fault is rectified, the stored alarm can be acknowledged and deleted by pressing the reset pushbutton once. The potential-free contact returns to the normal position and the LED lights for normal operation. A bus reset is carried out when the reset push button is pressed a second time.

If the fault is not rectified, pressing the reset push button will indeed carry out a bus reset, however the fault remains stored and the potential-free changeover contact and the LED remain in the fault state.

Monitoring the bus line

Overload/short circuit: In the event of an overload of the bus line, the red LED “$I>I_{max}$” lights up. If the overload generates bus currents of more than 1.2 A (e.g. during a short circuit), the output voltage is automatically limited and the green “ON” LED is extinguished. A transient overload generally does not lead to problems in the installation. If the bus line experiences an overload or short circuit for longer than 10 seconds, the potential-free changeover contact also switches to the fault state. The fault signal is stored.

Overvoltage: If an overvoltage occurs on the bus line, the red LED “$I>I_{max}$” starts to flash. The potential-free changeover contact goes into the fault state. The Uninterruptible EIB / KNX Power Supply automatically carrys out a bus reset. The red “Reset” LED lights up during the reset. The fault signal is stored.

If an overload and overvoltage occur simultaneously, the signal for overvoltage has higher priority, i.e., the LED “$I>I_{max}$” flashes and a bus reset is carried out automatically. The fault signal is stored.

Monitoring the power supply

During a mains failure, the bus line is supplied by the connected battery, i.e., no faults occur in the installation. If the mains voltage fails, the potential-free changeover contact switches to the fault state and the LED “230 V AC OK” extinguishes. If the mains voltage recovers, the potential-free changeover contact reverts to the normal position and the LED lights up green. The fault signal is not stored.

Monitoring the battery voltage

A battery test is carried out automatically at 15 minute intervals. It is also possible to manually trigger a battery test by pressing the reset push button. If a battery fault is present, the potential-free changeover contact switches to the fault state and the “Battery OK” LED for the battery is extinguished. If the polarity of the battery connection is reversed, the “Battery OK” LED flashes. Once the cause of the fault is rectified, the potential-free changeover contact reverts to the normal position and the LED lights up green. The fault signal is not stored.

If no batteries are connected, the “OK” LED for the battery does not light.

Note:
It can take up to 15 minutes after the connection of the mains supply before a possible battery fault is indicated. Once the fault has been rectified, it can also take 15 minutes for the potential-free changeover contact to revert to the normal position and the LED to extinguish.

5.4.4 Diagnostics table

Using the LEDs and the potential-free changeover contact, it is possible to diagnose the status of the SU/S 30.640.1. The following table indicates the state of the SU/S 30.640.1 and the action that must be taken to restore normal operation.

"230 V AC OK" LED	"Battery OK" LED	"ON" LED	"$I>I_{max}$" LED	Changeover contakt	"Reset" LED	Status of SU/S 30.640.1	Action
green	green	green	OFF	Neutral	OFF	Normal operation	
green	green	green	OFF	Neutral	red	Reset is active	Wait 20 s
green	green	green	flashes red	Fault	red	Overvoltage, automatic reset is active	Wait 20 s, rectify cause of overvoltage, acknowledge fault, carry out reset
green	green	green	flashes red	Fault	OFF	Overvoltage fault signal is stored, error is rectified	Acknowledge fault, carry out reset
OFF	green	green	OFF	Fault	OFF	Mains failure, battery operation	Check mains voltage
green	OFF	green	OFF	Fault	OFF	No battery, battery fault or discharged battery	Check battery connection, replace fuse or battery if necessary
OFF	OFF	OFF	OFF	Fault	OFF	Mains failure without battery, battery fault or discharged battery	Check mains voltage, charge battery (check connection or replace battery if necessary)
green	green	green/ OFF	red	Fault	OFF	Overload or short circuit	In the event of a short circuit, rectify the cause of the short circuit. In the event of overload, reduce the number of bus devices, acknowledge fault, carry out reset
OFF	green	green/ OFF	red	Fault	OFF	Overload or short circuit and mains failure, battery operation	In the event of a short circuit, rectify the cause of the short circuit. In the event of overload, reduce the number of bus devices, check mains voltage, acknowledge fault, carry out reset
green	OFF	green/ OFF	red	Fault	OFF	Overload or short circuit, no battery, battery fault or discharged battery	In the event of a short circuit, rectify the cause of short circuit. In the event of overload, reduce the number of bus devices, acknowledge fault, carry out reset, check battery connection, replace fuse or battery if necessary
green	green	green/ OFF	flashes red	Fault	OFF	Overvoltage	Rectify cause of overvoltage, acknowledge fault, carry out reset
OFF	green	green/ OFF	flashes red	Fault	OFF	Overvoltage and mains failure, battery operation	Rectify cause of overvoltage, check mains voltage, acknowledge fault, carry out reset
green	OFF	green/ OFF	flashes red	Fault	OFF	Overvoltage and no battery, battery fault or discharged battery	Rectify cause of overvoltage, acknowledge fault, carry out reset, check battery connection, replace fuse or battery if necessary
green	green	green	red	Fault	OFF	Overload, output voltage OK	Reduce number of bus devices, acknowledge fault, carry out reset
OFF	green	green	red	Fault	OFF	Overload, output voltage OK, mains failure, battery operation	Reduce number of bus devices, check mains voltage, acknowledge fault, carry out reset
green	OFF	green	red	Fault	OFF	Overload, output voltage OK, mains operation, no battery, battery fault or discharged battery	Reduce number of bus devices, check battery connection, replace fuse or battery if necessary, acknowledge fault, carry out reset
–	flashes green	–	–	Fault	OFF	Battery defective or polarity of battery connection is reversed	Check battery connection, replace battery if necessary, carry out reset

6 AM/S 12.1 Battery Module, 12 V DC, MDRC

6.1 General

6.1.1 Product description


SK 0038 B 02

The Battery Module is a sealed lead acid battery which acts as a back-up energy source for the ABB i-bus® EIB / KNX system voltage during mains failures.
The Battery Module can only be used in combination with the Uninterruptible EIB / KNX Power Supply SU/S 30.640.1. The Battery Module is a DIN rail mounted device and can simply be snapped onto the mounting rail under the SU/S 30.640.1 in the distribution board.

The back-up time is dependent on the bus load, however, a minimum of 10 minutes is guaranted when the EIB / KNX line is at capacity (64 bus devices). It is not permitted to connect several Battery Modules in parallel to the SU/S 30.640.1 or to connect the Battery Module in combination with other batteries.
A temperature sensor for a temperature-controlled adjustment of the charging voltage is integrated in the battery module. An integrated fuse protects the Battery Module from short circuits.

The temperature sensor must always be connected to ensure that the battery is charged correctly!

6.2 Device technology

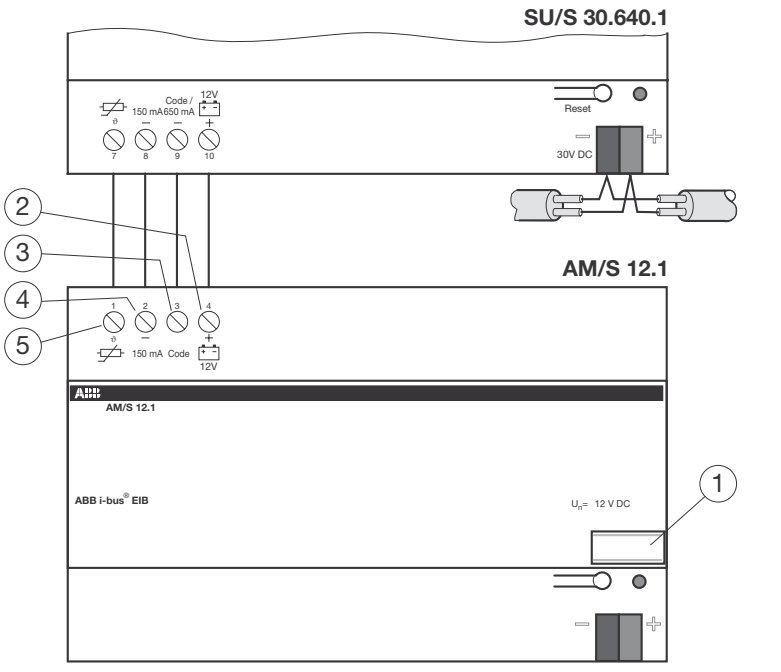
6.2.1 Technical data

Power supply	– Power supply	May only be connected to the Uninterruptible EIB / KNX Power Supply SU/S 30.640.1
	– Nominal voltage	12 V DC
	– Battery capacity	1 Ah
	– Charging current	150 mA
	– Charging time	max. 10 h
	– Mains failure back-up time	min. 10 minutes (dependent on bus load; the back-up time can be reduced due to aging of the battery module)
Safety	– Temperature sensor	Integrated
	– Fuse	Self-healing (integrated)
Operating and display elements	– None	
Connections	– Power supply	2 screw terminals
	– Temperature sensor	2 screw terminals Cable cross-section: multi-core 0.2 – 2.5 mm² single-core 0.2 – 4.0 mm²
Type of protection	– IP 20, EN 60 529	
Ambient temperature range	– Operation	+ 5 °C ... + 45 °C
	– Storage	– 25 °C ... + 20 °C
	– Transport	– 25 °C ... + 50 °C
Design	– Modular installation device, pro*M*	

Battery Module, 12 V DC, MDRC
AM/S 12.1, GH Q631 0062 R0111

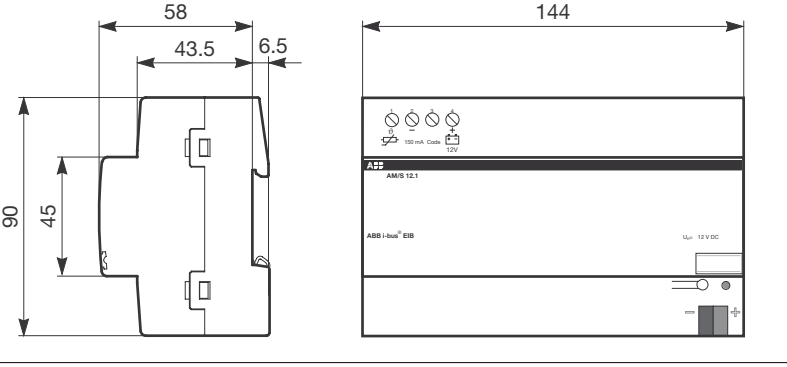
Housing, colour	– Plastic housing, grey
Mounting	– On 35 mm mounting rail, DIN EN 60 715
Dimensions	– 90 x 144 x 64.5 mm (H x W x D)
Mounting depth/width	– 68 mm/8 modules at 18 mm
Weight	– 0.72 kg
CE norm	– In accordance with the EMC guideline and the low voltage guideline

6.2.2 Device connection



1 Label carrier
2 Battery connection "+"
3 Code (temperature sensor "–")
4 Battery „–" 150 mA
5 Connection for temperature sensor

6.2.3 Dimension drawing



6.3 Planning and application

6.3.1 Device implementation

The following guidelines should be noted when using the Battery Module AM/S 12.1:

1. The Battery Module may only be connected to the Uninterruptible EIB / KNX Power Supply SU/S 30.640.1
2. The Battery Module may only be installed on a horizontal mounting rail (35 mm, EN 50 022) in a wall-mounted distribution board.
3. The Battery Module may not be connected in series or in parallel to other Battery Modules or other sealed lead acid batteries.
4. In the supplied state, the Battery Module is charged or partially charged. The Battery Module must not be stored in a discharged state. If the Battery Module is stored for longer periods without connection to the SU/S 30.640.1, it must be fully charged at least every 6 months. The Battery Module can be stored for max. 2 years at a storage temperature of 20°C.
5. Once the Battery Module has been discharged during normal operation, it must be recharged as soon as possible.
6. Due to the life span of the sealed lead acid battery, it is advisable to replace the Battery Module with a new device approx. every four years. Used Battery Modules can be returned to your EIB / KNX representive for disposal.

7 SAK7, SAK12, SAK17 Sealed Lead Acid Batteries

7.1 General

7.1.1 Product and functional description

SK 0252 B 02

The sealed lead acid batteries SAK7, SAK12 and SAK17 are used to buffer the EIB / KNX system voltage in combination with the Uninterruptible EIB / KNX Power Supply SU/S 30.640.1. A maximum of two sealed lead acid batteries can be connected in parallel to the SU/S 30.640.1.
In this case, two identical sealed lead acid batteries must be used.

When connecting a sealed lead acid battery to the SU/S 30.640.1, the Cable Set Basic KS/K 4.1 must be used. When connecting two sealed lead acid batteries, the Cable Set Basic KS/K 4.1 must be used for the first battery while the Cable Set Extension KS/K 2.1 must be used for the second battery.

The service life of the sealed lead acid batteries is 5 years.

7.2 Device technology

7.2.1 Technical data for SAK7

Nominal voltage	– 12 V DC	
Capacity	– 7 Ah	
Dimensions	– 94 x 151 x 65 (H x W x D)	
Weight	– 2.6 kg	
Service life	– 5 years	
Ambient temperature range	– Operation	– 20 °C ... + 50 °C
	– Storage	– 20 °C ... + 50 °C
	– Transport	– 20 °C ... + 50 °C

7.2.2 Technical data for SAK12

Nominal voltage	– 12 V DC	
Capacity	– 12 Ah	
Dimensions	– 94 x 151 x 98 (H x W x D)	
Weight	– 4.2 kg	
Service life	– 5 years	
Ambient temperature range	– Operation	– 20 °C ... + 50 °C
	– Storage	– 20 °C ... + 50 °C
	– Transport	– 20 °C ... + 50 °C

7.2.3 Technical data for SAK17

Nominal voltage	– 12 V DC	
Capacity	– 17 Ah	
Dimensions	– 167 x 181 x 76 (H x W x D)	
Weight	– 6.8 kg	
Service life	– 5 years	
Ambient temperature range	– Operation	– 20 °C ... + 50 °C
	– Storage	– 20 °C ... + 50 °C
	– Transport	– 20 °C ... + 50 °C

8 KS/K 4.1 and KS/K 2.1 Cable Sets

8.1 General

8.1.1 Product and functional description

The Cable Set Basic KS/K 4.1 (for one battery) or both Cable Sets Basic KS/K 4.1 and Extension KS/K 2.1 (for two batteries in parallel) must be used for the connection of a sealed lead acid battery to the Uninterruptible EIB / KNX Power Supply SU/S 30.640.1. The Battery Module AM/S 12.1 can be wired using a standard cable.
A replaceable fuse and a temperature sensor for the temperature-controlled adjustment of the charging voltage are integrated in the Cable Set Basic KS/K 4.1. Only one replaceable fuse is integrated in the Cable Set Extension KS/K 2.1.

8.2 Device technology

8.2.1 Technical data for KS/K 4.1

Cable	– Cables	4-core cable
	– Cross-section	0.75 mm²
	– Length	2 m
Colour	– Battery connection	red: “+” (12 V battery)
		black: “–” (GND battery)
	– Temperature sensor	yellow: “–” (GND temp. sensor)
		white: “+” (12 V temp. sensor)
Connections	– Battery connection	For connection to the SU/S 30.640.1: Connector sleeves For connection to the battery: FASTON sockets and pole shoes
	– Temperature sensor	Connector sleeves
Fuse	– Type	Replaceable fuse with in-line fuse carrier and bayonet lock
	– Features	5 x 20 mm slow fuse; T 6.3 H 250 V Breaking capacity: 1500 A
Weight	– 0.1 kg	

8.2.2 Technical data for KS/K 2.1

Cable	– Cables	2-core cable
	– Cross-section	0.75 mm²
	– Length	2 m
Colour	– Battery connection	red: “+” (12 V battery)
		black: “–” (GND battery)
Connections	– Battery connection	For connection to the SU/S 30.640.1: Connector sleeves. For connection to the battery: FASTON sockets and pole shoes.
Fuse	– Type	Replaceable fuse with in-line fuse carrier and bayonet lock
	– Features	5 x 20 mm slow fuse; T 6.3 H 250 V Breaking capacity: 1500 A
Weight	– 0.1 kg	

9 Appendix

9.1 Ordering information

9.1.1 EIB / KNX Power Supply Units

Description	**Ordering information** **Short code**	Order no.	**bbn 40 16779 EAN**	Price group	Unit weight [kg]	Pack unit [pc.]
EIB / KNX Power Supply, 160 mA, MDRC	**SV/S 30.160.5**	2CDG 110 085 R0011	**66206 2**	26	0.2	1
EIB / KNX Power Supply, 320 mA, MDRC	**SV/S 30.320.5**	GH Q631 0038 R0111	**49090 0**	26	0.2	1
EIB / KNX Power Supply, 640 mA, MDRC	**SV/S 30.640.5**	GH Q631 0048 R0111	**51474 3**	26	0.35	1
Uninterruptible EIB / KNX Power Supply, 640 mA, MDRC	**SU/S 30.640.1**	GH Q631 0049 R0111	**51477 4**	26	0.5	1

9.1.2 Batteries and accessories

Description	**Ordering information** **Short code**	Order no.	**bbn 40 16779 EAN**	Price group	Unit weight [kg]	Pack unit [pc.]
Battery Module, 12 VDC, MDRC	**AM/S 12.1**	GH Q631 0062 R0111	**51481 1**	26	0.7	1
Sealed Lead Acid Battery 12 V, 7 Ah	**SAK7**	GH V924 0001 V0011	**74493 8***	50	2.6	1
Sealed Lead Acid Battery 12 V, 12 Ah	**SAK12**	GH V924 0001 V0012	**74494 5***	50	4.1	1
Sealed Lead Acid Battery 12 V, 17 Ah	**SAK17**	GH V927 0001 V0013	**74495 2***	50	6.8	1
Cable Set Basic	**KS/K 4.1**	GH Q630 1910 R0001	**51725 6**	26	0.1	1
Cable Set Extension	**KS/K 2.1**	GH Q630 1910 R0011	**52893 1**	26	0.1	1

*** bbn no.: 40 13232**

The information in this leaflet is subject to change without further notice.

Pub. No. 2CDC 501 002 D0203
replace 2CDC 501 002 D0202

Your EIB-Partner