

Operating Instructions

SMARTSTEP ELECTRIC STEP



www.amf-bruns.de

Foreword

Dear Reader,

these Operating Instructions serve to provide all information required for the safe use of the fully-automatic electric Smartstep.

The Smartstep is designed and constructed in accordance with state-of-the-art technology and recognised safety standards. Persons and material assets can however still be at risk, as not all danger areas can be eliminated if the functional capability is to be maintained. Accidents caused by these risks can however be prevented by strictly observing these Operating Instructions. Over and above this, the operational efficiency of your Smartstep can be used to the full and unnecessary faults can be prevented.

These Operating Instructions only apply to the Smartstep Electric Step specified on the cover page and in the footnotes. Compare the data given on the rating plate and the supplementary plate on your electric step with the images provided in these Operating Instructions (see Section 2.5, page 17).

After reading these Operating Instructions for the first time, keep them in a safe place for future reference over the entire lifetime of the Smartstep Electric Step. If you sell the Smartstep, hand these Operating Instructions over to the new owner.

Keep these Operating Instructions in the vehicle so that they can be referred to at any time when problems or questions arise.

All details, figures and dimensions given in these Operating Instructions are non-binding. They cannot be used as the basis for any claims whatsoever.

This document must not be reproduced or duplicated, in full or in part, without the prior, written permission of the manufacturer and the distribution partner.

The Smartstep must never be converted or modified in any way, without seeking the prior, written permission of the manufacturer and distribution partner. The manufacturer and distribution partner will not be held responsible in any way whatsoever if conversions or modifications are carried out without authorisation.

Use only original spare parts or spare parts which have been approved of by the manufacturer or the distribution partner. If spare parts other than these are used, this can have a negative effect on the specified characteristics, the functionality and safety of the Smartstep. If other spare parts are used, liability for consequential damage will be rendered null and void.

Contact our customer service department to order spare parts or accessories (see Chapter 11, page 45).



NOTE

The current version of these Operating Instructions as well as the current versions of supplementary documents (e.g. the instructions for optional equipment) can be found under:

www.amf-bruns-behindertenfahrzeuge.de/service/download-portal/

Explanation of symbols and signs

To improve understanding, the following conventions should be met for these Operating Instructions:

1.

The following conventions are used to highlight important information:



DANGER

...warns of a situation of immediate danger, which can cause severe or fatal injuries if not avoided.



WARNING!

...warns of a potentially dangerous situation, which can cause severe or fatal injuries if not avoided.



CAUTION

...warns of a potentially dangerous situation, which can cause slight injuries, if not avoided

**ATTENTION**

...warns of a potentially dangerous situation, which can cause material damage, if not avoided.



...contains general notes and useful information.



...gives a reference to important information contained in other sections and documents.

2.

Some text passages serve a special purpose. These are identified as follows:

- Lists.

⇒ Instructional text, e.g. a sequence of activities.

3.

Meaning of directions:

If directions are given in the text (in front of, front, behind, rear, right, left), these directions relate to the normal direction of travel of the vehicle.

Contents

1	Safety	8
1.1	Proper Use	9
1.2	Improper Use	9
1.3	User Requirements	10
1.4	Product Monitoring	10
1.5	Danger Zone	11
1.6	Safety Devices	11
1.6.1	Obstacle detection	11
1.6.2	Status indicator lamp.....	11
1.7	Safety and Accident Prevention Regulations	12
2	Description	14
2.1	Step.....	14
2.2	Frame.....	15
2.3	Drive Unit.....	16
2.4	Controller	17
2.5	Rating Plate.....	17
2.6	Operating Controls and Indicators	19
2.7	Technical Data	21
3	Transportation	22
4	Installation and Commissioning	23
4.1	Safety Instructions for installation and Commissioning	23
4.2	Recommissioning After Decommissioning.....	24
5	Operation	25
5.1	Safety Regulations for Operation	25
5.2	Extending and Retracting the Smartstep	28
5.3	Restarting After Stopping for an Obstacle	29
5.4	Switching the Obstacle Detection ON and OFF (optional) ..	30

6 Maintenance and Repair.....	31
6.1 Safety Regulations for Maintenance and Repair.....	31
6.2 Routine Maintenance Work	32
6.2.1 Maintenance schedule.....	33
6.2.2 Maintenance record.....	33
6.3 Carrying Out Maintenance Work	34
6.3.1 Cleaning	34
6.3.2 Checking the safety devices.....	35
6.4 Maintenance and Repair Record	37
7 Decommissioning and Conservation	38
8 Disposal.....	39
9 Faults and Troubleshooting	40
9.1 Safety Regulations for Troubleshooting.....	40
9.2 Troubleshooting Table	40
9.3 Retracting using the Emergency Mode	42
10 Electrical Circuit Diagram	44
11 Customer Service	45

1 Safety



WARNING

There are a number of risks of suffering personal injury and material damage involved in the operation and maintenance of the Smartstep.

Therefore:

- It is imperative, that these Operating Instructions are read thoroughly before operating the Smartstep. Always observe the notes and information contained herein, in particular the Safety Instructions.
 - If these Operating Instructions or parts thereof are lost or become illegible, please request a new copy from the manufacturer.
-



For safety information regarding the basic vehicle, refer to the vehicle operating instructions.

Prerequisite to the safe handling and trouble-free operation of the Smartstep is a thorough knowledge of the applicable safety information and the safety regulations.

It is therefore imperative that this Chapter is read thoroughly before operating the Smartstep and that the instructions and warnings herein are strictly observed. Safety Instructions and warnings that are given at the corresponding places in the text in the following Chapter must also be strictly observed. Neither the manufacturer nor the distribution partner will be held liable if safety information and warnings are not strictly adhered to.

In addition to the information given in these Operating Instructions, local legislative regulations must be taken into consideration, in particular those regarding safety and accident prevention.

1.1 Proper Use

The Smartstep is used to assist persons when embarking or disembarking a vehicle. Only one person must stand on the step at any one time.

Proper use also includes strictly adhering to the information given in these Operating Instructions.



WARNING!

If the Smartstep is used for any other purpose than that described above, this may result in dangerous situations for persons or material damage being caused.

Therefore:

- Only use the Smartstep for the purpose for which it was intended.
- Always adhere to information given in these Operating Instructions.
- Do not use the Smartstep for any other use, particularly those given in Section 1.2. These are deemed to be improper use.

1.2 Improper Use

Any use other than that described in Section 1.1 is deemed to be improper use.

The Smartstep is deemed to be improperly used if for example:

- it is used to support goods when loading or unloading the vehicle,
- it is subject to a load in excess of 250 kg,
- if two persons stand on it at any one time (exception: load test, see Section 6.2.1, page 33),
- it is used whilst the vehicle is in motion.
- it is used when in a faulty state or with safety-relevant malfunctions,
- when unauthorised modifications have been made to the Smartstep,
- it is operated by persons who do not fulfil the necessary requirements (see Section 1.3, page 10).

1
2
3
4
5
6
7
8
9
10
11

1.3 User Requirements

The Smartstep must only be used and operated by the following persons:

- The person in charge of the vehicle who has read these Operating Instructions.
- Other persons who have read these Operating Instructions.
- Other persons who have been made aware of the Smartstep and its function by the person in charge of the vehicle.

Transportation, installation, commissioning, maintenance, repair, fault finding and disposal of the Smartstep must only be carried out by persons with the corresponding technical training and experience.

1.4 Product Monitoring

Please contact AMF-Bruns GmbH & Co. KG immediately if faults or problems are encountered when operating the Smartstep or if accidents or "near-misses" occur.

AMF-Bruns will effect a solution to the problem with your help and the knowledge gained will flow into future projects.



NOTE

Guarantee work on the Smartstep must only be carried out with the prior agreement of AMF-Bruns GmbH & Co. KG.

The costs of such work will not be accepted by AMF-Bruns without prior agreement.

1.5 Danger Zone

Persons standing within the danger zone are at risk of suffering an injury or harm their health.

The danger zone is the area in the immediate vicinity of the vehicle into which the Smartstep retracts. When the Smartstep is being extended or retracted, the area on Smartstep itself also forms part of the danger zone.



WARNING

Risk of injury through movements of the Smartstep.

There is a risk of personal injury if standing within the danger zone.

Therefore:

- Keep a safe distance from the vehicle when the Smartstep is being extended.
- If necessary, make other persons aware that the Smartstep is being extended.
- Make certain that no person is standing on the Smartstep when it is being extended or retracted.

1.6 Safety Devices

1.6.1 Obstacle detection

The supply current to the electric motor is monitored by the controller. If the Smartstep makes contact with an obstacle when it is being extended, the supply current will increase. This will be detected by the controller and the Smartstep will come to a standstill.

The risk of injury to persons in the vicinity of the Smartstep, when it is being extended, is drastically reduced through the obstacle detection feature

1.6.2 Status indicator lamp

The orange indicator lamp on the dashboard informs the driver of the status of the Smartstep during normal operation (see Section 2.6, page 19) and when a malfunction occurs (see Chapter 9, page 40).

1.7 Safety and Accident Prevention Regulations

Adhere to the following notes in order to prevent personal injuries and material damage. For commercial use, also adhere also to the relevant safety and accident prevention regulations laid down by the trade associations.

- The Smartstep must only be operated if all safety devices are installed correctly and are fully functional. Safety and protective devices (see Section 1.6, page 11) must only be deactivated or removed in order to carry out maintenance and repair work. All safety and protective devices must be replaced immediately after such work has been completed. Otherwise, there is a high risk of injury.
- The Smartstep must only be used for the purpose for which it is intended, otherwise dangerous situations, with resultant injuries, can occur (Proper use: see Section 1.1, page 9).
- The owner is responsible for ensuring that proper use is adhered to, in particular that the Smartstep is only operated by authorised persons.
- If the Smartstep is used commercially or as a public utility, the owner must ensure that operating personnel are familiar with the operation of the Smartstep under all operating conditions by giving training and familiarisation courses.
- Proper use of the Smartstep also includes adherence to the specified maintenance and repair work, in particular the strict adherence to the maintenance intervals (see Chapter 6, page 31). If such work is not carried out, trouble-free operation cannot be guaranteed. There is a risk of personal injury and material damage being caused. We recommend that maintenance a record is kept.
- After installation, the Smartstep must be inspected by a technical expert. During inspection, faults affecting the safety should be systematically identified and remedial action taken.

- An inspection must also be carried out by a technical expert if modifications are made to the construction or major repairs are carried out on load-bearing parts of the Smartstep.
- The Smartstep must never be operated in a faulty condition, as this can result in serious injuries. If faults occur, do not use the Smartstep until repairs have been effected (see Chapter 7, page 38).
- Do not place any foreign objects on the Smartstep. Persons can suffer injuries if such objects fall off the step.
- Switch the vehicle's engine OFF before carrying out maintenance or repair work, this includes cleaning work. Secure the vehicle, to prevent it from rolling away. Render the Smartstep inoperative (see Chapter 7, page 38). It is not sufficient just to switch OFF the automatic function using the deactivation switch. Take steps to ensure that the vehicle cannot be started by any other person (e.g. by removing the ignition key and keeping it in a safe place). If this is not done, there is a risk of injury.
- Do not repair or bridge defective fuses but replace them with fuses of the same Ampere rating.
- Do not open the controller. Do not modify electronic components, particularly those in the controller. This can render safety functions and protective devices inoperative.
- Use only original spare parts and accessories that have been approved of by the manufacturer. If other parts are used, liability for the consequences will be rendered null and void.

2 Description



For a description of the basic vehicle, refer to the vehicle Operating Instructions.

Persons can embark and disembark a vehicle with the aid of the Smartstep.

The main components of the Smartstep are:

- the step itself,
- the frame and
- the motor.

The aim of this Chapter is to illustrate the construction and function of the Smartstep. To this end, the individual assemblies and components are described in the sections that follow.

2.1 Step

The step is automatically extended when the side door is opened. When the vehicle is in motion, it is retracted under the vehicle. The step has a non-slip surface and a high-visibility strip on the leading edge (see Figure 1 and Figure 2, page 15). The step can be opened up by removing the cover plate underneath it.

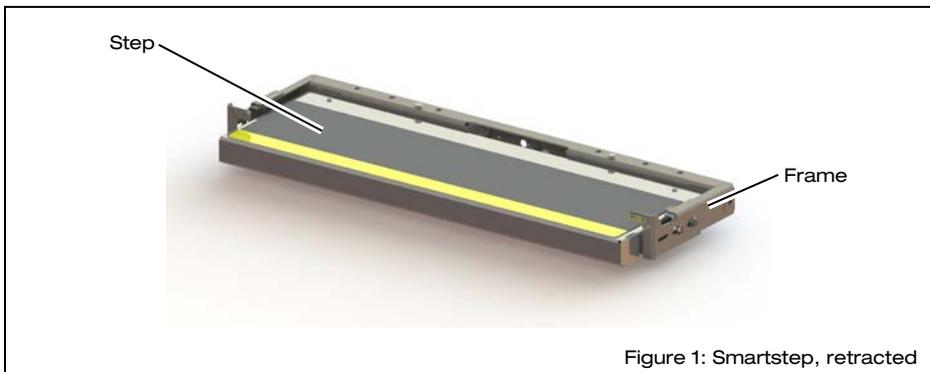
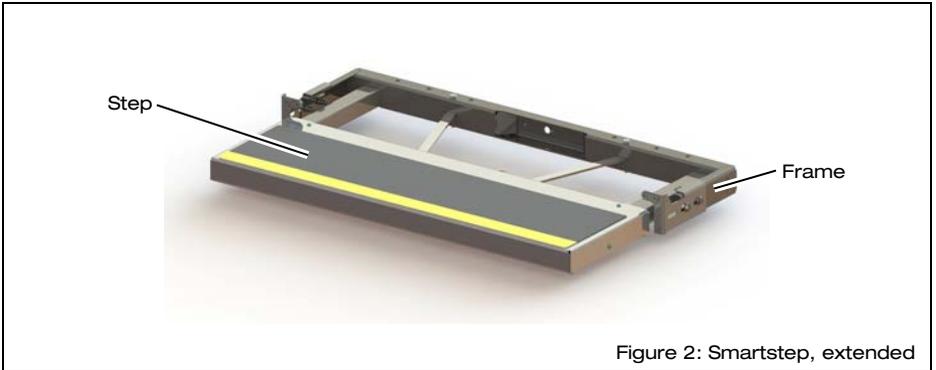
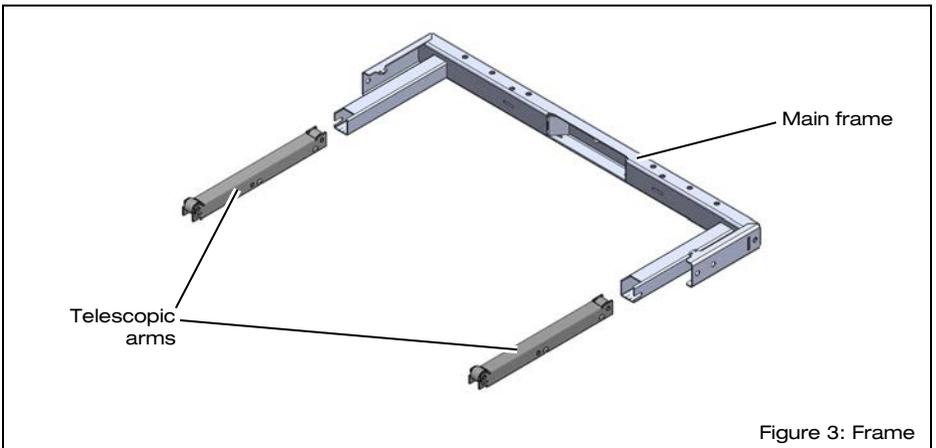


Figure 1: Smartstep, retracted



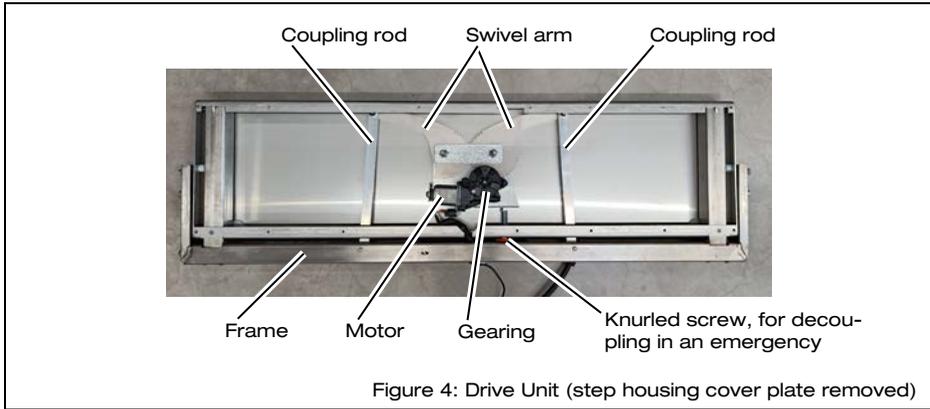
2.2 Frame

The frame is a steel construction that is bolted to the underside of the vehicle. It comprised a main frame that is firmly attached to the vehicle and two telescopic arms that form a flexible connection between the main frame and the step (see Figure 3).



2.3 Drive Unit

The Smartstep drive unit has a 12 V direct current (DC) motor. This drives the gearing that moves the swivel arms. The swivel arms are connected to the step by connecting rods. The drive components are contained within the step's housing (see Figure 4).



2.4 Controller

The controller is connected to the step's electrical components and controls movements of the Smartstep as well as the indicator lamp (see Figure 5). The controller effectively brakes the movement of the step before it reaches the end limit positions. It includes the obstacle detection feature and fault diagnostics. The controller is supplied by the vehicle's electrical supply and is installed in the interior of the vehicle (normally underneath the passenger seat).

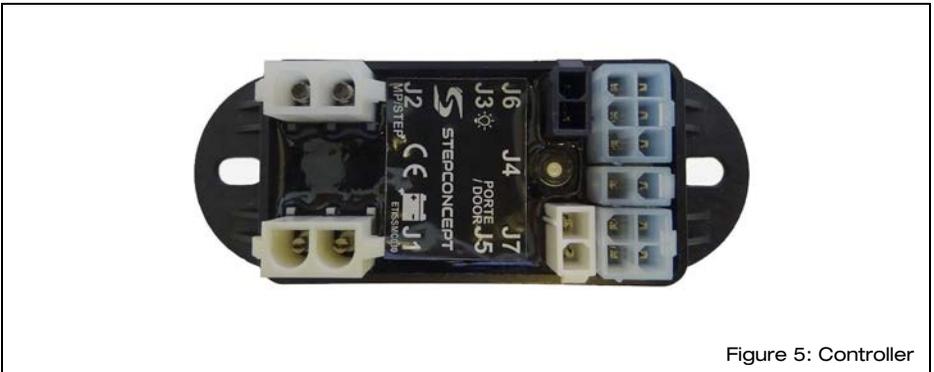


Figure 5: Controller

2.5 Rating Plate

A rating plate, containing the fundamental data, is attached to the Smartstep (see Figure 6, page 18). A supplementary plate shows the contact details for the distribution partner - AMF-BRUNS (see Figure 7, page 18, detailed contact data: see Chapter 11, page 45). Both the rating plate and supplementary plate are located on the inside of the main frame (see Figure 8, page 18).

1
2
3
4
5
6
7
8
9
10
11

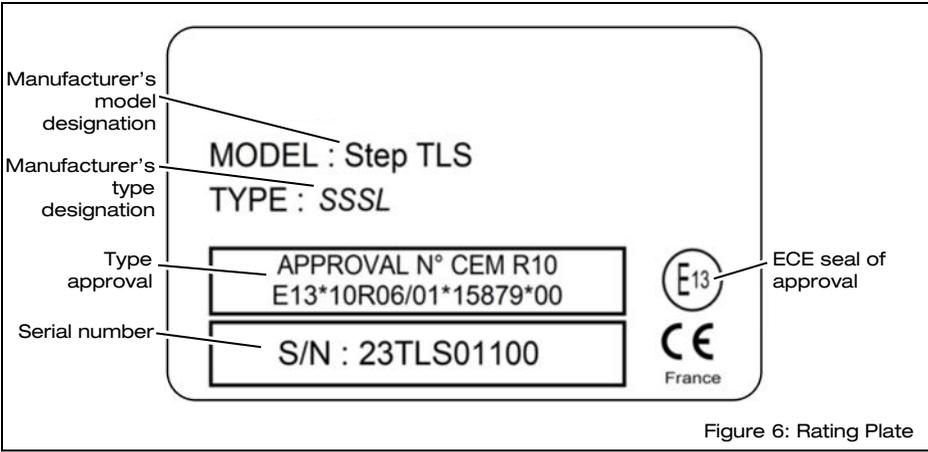


Figure 6: Rating Plate

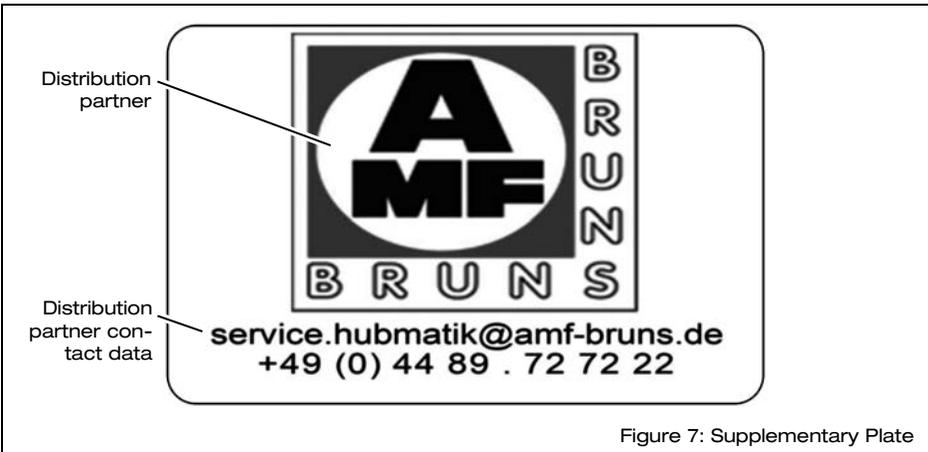


Figure 7: Supplementary Plate



Figure 8: Positions of Rating Plate and Supplementary Plate

2.6 Operating Controls and Indicators

Door contact switch

The Smartstep is fully automatic and is controlled by a door contact switch, which is operated by opening and closing the side door immediately above it. The door contact switch is operated magnetically and is located in the side door pillar. The door contact switch is triggered by a contact installed in the side door at the same height as the switch (see Figure 9).



Figure 9: Door Contact Switch and Trigger Contact

Status indicator lamp

The Smartstep status indicator is an orange LED fitted to the dashboard. It is identified by a symbol representing a foot on a step (see Figure 10, page 20). The indicator lamp blinks twice per second when the step is being extended or retracted. The indicator lamp lights continuously when the Smartstep is fully extended and does out when the Smartstep is fully retracted.

The indicator lamp signals faults by blinking (see Chapter 9, page 40).

1
2
3
4
5
6
7
8
9
10
11



Figure 10: Status indicator lamp

Deactivation switch (optional)

An optional deactivation switch can be installed next to the indicator lamp. The automatic function of the Smartstep can be switched ON and OFF by the deactivation switch. If the automatic function is switched OFF, the Smartstep will not extend when the side door is opened. The indicator lamp in the deactivation switch lights up when the automatic function is switched ON.



Figure 11: Deactivation Switch next to the Indicator Lamp

2.7 Technical Data

Designation	Smartstep		
Total width	656 mm	956 mm	1156 mm
Width of the step	600 mm	900 mm	1100 mm
Weight	20 kg	25 kg	29 kg
Depth of the step	280 mm		
Height of the step	50 mm		
Distance of travel	235 mm		
Permissible number of persons on the step	max. 1 person		
Maximum load capacity	250 kg		
Time to extend	approx. 2 seconds		
Time to retract	approx. 2 seconds		
Extend, Retract drive	Swivel arm drive 12 V DC		
Motor protection class	IP66		
Sound pressure emission	< 50 dB(A)		
Equipment suitable for use	outdoors		
Rated voltage	12 V DC		
Rated current	8 A		
Electrical rating	0.1 kW		
Standby current consumption	<1 mA		



NOTE

Remember to take the weight of the installation materials into consideration for the max. permissible gross weight of your vehicle.

3 Transportation



CAUTION

Dangers when transporting the Smartstep.

The Smartstep can fall over or drop when being transported. There is a risk of personal injury and material damage.

Therefore:

- Exercise caution when transporting the Smartstep.
-



NOTE

The AMF-Bruns GmbH will accept no liability whatsoever for damage or injury caused by incorrect transportation.

4 Installation and Commissioning

4.1 Safety Instructions for installation and Commissioning



The Smartstep must be installed in accordance with the AMF-Brunns Installation Instructions applicable to the vehicle in question.



DANGER

Danger through incorrect installation work.

A number of risks of personal injury and material damage can be caused if the Smartstep is incorrectly installed in the vehicle.

Such risks of danger cannot only occur during installation but also as a result of installation not being carried out correctly.

Therefore:

- The Smartstep must only be installed by trained, specialist personnel.
- The vehicle manufacturer's body fitting guidelines must be adhered to.
- A technical expert must be called in to inspect that installation has been carried out correctly and that the protective devices are effective.
- The Smartstep must not be used until this has been done.

4.2 Recommissioning After Decommissioning

Initial commissioning is carried out by the company who installed the Smartstep.

The owner must recommission the Smartstep after it has been decommissioned for a period of time (see Chapter 7, page 38). The Smartstep initialisation described here is necessary after every power failure to the controller (e.g. after removing the fuse or disconnecting the vehicle battery).

Proceed with commissioning as follows:

- ⇒ Close the side door, if necessary.
- ⇒ Fit the Smartstep fuse (15A) to the fuse-holder.



NOTE

The fuse (15 A) is located in the immediate vicinity of the vehicle battery.

Initialisation

- ⇒ Open the side door.
- ⇒ Wait until the Smartstep is fully extended.
- ⇒ Close the side door.
- ⇒ Wait until the Smartstep is fully retracted.
- ⇒ Open the side door.
- ⇒ Wait until the Smartstep is fully extended.
- ⇒ Close the side door.
- ⇒ Wait until the Smartstep is fully retracted.
- ⇒ Check the function of the indicator lamp (see Section 6.3.2, page 35).

5 Operation



For information regarding the basic functions of the base vehicle, refer to the vehicle user manual.

5.1 Safety Regulations for Operation



The safety information given in the Safety chapter must have been read prior to operation (see Chapter 1, page 8).



WARNING

Risk of injury and of material damage when the vehicle is in motion.

If the Smartstep is extended when the vehicle is in motion there is a risk of other road users or pedestrians being seriously injured. Material damage can be caused.

Therefore:

- Only operate and use the Smartstep when the vehicle is parked safely.
 - Before starting a journey, make certain that the Smartstep is fully retracted and that the indicator lamp is OFF.
-



WARNING

Risk of injury if the Smartstep is defective.

Accidents can be caused if the Smartstep shows signs of damage or if the fastenings become loose.

Therefore:

- Inspect the Smartstep for signs of damage and loose fastenings at regular intervals.
 - Never place a load in excess of 250 kg on the Smartstep.
-



WARNING

Risk of injury on the Smartstep when it is in motion.

If persons are standing on the Smartstep when it is being extended or retracted, there is a risk of injury through falling or being crushed between the vehicle and the step.

Therefore:

- Make certain that nobody is standing on the Smartstep when it is being extended or retracted.
-



WARNING

Risk of accident through falling.

If the Smartstep is not fully extended (e.g. because an obstacle has been detected), the full surface area of the step is not available. There is a risk of falling if the step is used.

Therefore:

- Never attempt to stand on the Smartstep when it is not fully extended.
-



WARNING

Risk of injury through slipping.

If the Smartstep becomes slippery due to dirt, there is a risk of falling when stepping onto the step.

Therefore:

- Remove any slippery dirt from the step before using it.
-



WARNING!

Risk of injury and material damage if the Smartstep is operated by unauthorised persons.

Hazardous operating conditions may be caused if the Smartstep is operated by unauthorised persons.

Therefore:

- The Smartstep must only be operated by persons who are familiar with operating the Smartstep.
 - The Smartstep must never be operated by a passenger.
 - Lock the vehicle's doors when the Smartstep is not in use.
-



WARNING!

Risk of falling if more than one person steps onto the Smartstep

If more than one person is standing on the Smartstep at any given time, there is a risk of falling as these persons may bump into one other and there are insufficient handrails available. The Smartstep could also become overloaded and give way under the load. There is a risk of injury.

Therefore:

- Only step onto the Smartstep one person at a time.
 - Use the handrails, provided in the area of the entry, for assistance.
 - Provide assistance and support to any person in need.
-



WARNING

Risk of injury if safety devices are removed or are defective.

If safety devices are modified, bypassed or removed, they will no longer fulfil their function.

Therefore:

- Never modify, bypass or remove safety devices.
 - Always make certain that safety devices are refitted if they have been removed (e.g. for maintenance or repair purposes).
-



CAUTION

Risk of injury through impact or crushing.

The controller will detect any obstacle that it meets when the step is being extended and will stop automatically. If persons are standing too close to the vehicle when the Smartstep is being extended, there is a risk of minor injuries by being hit or crushed before the obstacle detection responds.

Therefore:

- Keep a safe distance from the vehicle.
 - Keep the danger zone under observation when operating the Smartstep.
 - If necessary, make other persons aware that the Smartstep is being extended.
-

5.2 Extending and Retracting the Smartstep

- ⇒ Park the vehicle at a suitable location.
- ⇒ Apply the vehicle's handbrake.
- ⇒ Switch the vehicle's engine OFF.
- ⇒ Remove the ignition key.
- ⇒ Make certain that the automatic function is enabled (only applies if an optional deactivation switch is fitted).
- ⇒ Open the side door of the vehicle.

When the side door is opened, the Smartstep automatically extends (see Figure 12). The indicator lamp on the dashboard blinks twice per second when the Smartstep is being extended. The indicator lamp lights continuously when the Smartstep is fully extended.

- ⇒ Allow the passengers to disembark the vehicle one at a time, using the Smartstep.
- ⇒ Close the vehicle's side door.

When the side door is closed, the Smartstep automatically retracts (see Figure 12). The indicator lamp on the dashboard blinks twice per second when the step is being retracted and goes out when the Smartstep is fully retracted.

There is no switch available for manual operation.

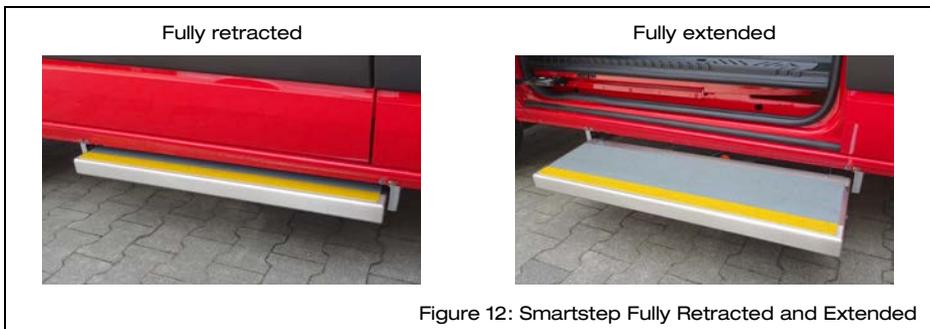


Figure 12: Smartstep Fully Retracted and Extended

5.3 Restarting After Stopping for an Obstacle

If the Smartstep makes contact with an obstacle when it is being extended, the obstacle detection function will bring it to an immediate standstill and the Smartstep remains in this position. The indicator lamp will then blink four times per second.



CAUTION

Risk of injury through impact or crushing.

When restarting the Smartstep after an interruption caused by the obstacle detection function, there is a risk of personal injury and material damage if persons are still in the danger zone or if there are obstacles in the danger zone.

Therefore:

- First make certain that the area, into which the Smartstep extends, is clear of obstacles and that no persons are standing within the danger zone.
- Do not operate the Smartstep again until this has been done.

Carry out the following procedure to restart the Smartstep after it has been stopped by the obstacle detection function:

⇒ Close the side door.

The Smartstep initially retracts.

⇒ Open the side door once again.

When the side door is opened, the Smartstep will once again fully extend.

5.4 Switching the Obstacle Detection ON and OFF (optional)



WARNING

Risk of falling if the Smartstep is deactivated.

If the automatic function is deactivated, persons disembarking can stumble because they expect the step to be extended, as it would normally be. There is a risk of falling.

Therefore:

- Make all persons embarking and disembarking aware that the Smartstep has been deactivated.
-

Switching the automatic function OFF:

- ⇒ Operate the deactivation switch, so that the light in the switch goes out.

Switching the automatic function ON:

- ⇒ Operate the deactivation switch, so that the light in the switch lights up.

6 Maintenance and Repair



Refer to the manufacturer's Operating Instructions and service documents for information regarding the fundamental maintenance of the basic vehicle.

6.1 Safety Regulations for Maintenance and Repair



Read the safety information before carrying out maintenance and repair work (see Chapter 1, page 8).



DANGER

Risk of fatal injury if the vehicle is unsecured.

If the vehicle is not secured to prevent it from moving, or to prevent unauthorised use, there is a risk of being run over when carrying out maintenance and repair work.

Therefore:

- Secure the vehicle to prevent it from moving when carrying out maintenance and repair work.
- Remove the ignition key.



WARNING

Risk of injury if safety devices are removed or are defective.

If safety devices are modified, bypassed or removed, they will no longer fulfil their function.

Therefore:

- Never modify, bypass or remove safety devices.
- Always make certain that safety devices are refitted if they have been removed (e.g. for maintenance or repair purposes).



WARNING

Risk of injury and material damage if maintenance and repair work is not carried out correctly.

Therefore:

- Only allow specialist personnel to carry out maintenance and repair work.
 - If repair work has been carried out on load bearing parts, this must be inspected by a technical expert.
-
-



WARNING

Personal injury and material damage can be caused if spare parts of inferior quality are used.

Neither the manufacturer nor the distribution partner will accept any liability whatsoever for any consequential damage or injury caused by the use of non-original spare parts or spare parts that have not been approved of by them.

Therefore:

- Use only original spare parts or spare parts that have been approved of by the manufacturer.
-
-



WARNING

Risk of crushing when carrying out maintenance and repair work.

If the Smartstep is operated inadvertently when carrying out maintenance and repair work, there is a risk of crushing, for the hands in particular.

Therefore:

- Secure the Smartstep against being operated inadvertently when carrying out maintenance work by rendering it inoperative (see Chapter 7, page 38) or through a supervisory person).
 - Do not secure the Smartstep by switching the automatic function OFF (optional deactivation switch). The automatic function could be inadvertently switched back ON.
-

6.2 Routine Maintenance Work

The maintenance schedule below lists the maintenance work that must be carried out on the Smartstep at regular intervals.

Contact the customer service department for maintenance work that must only be carried out by a specialist (see Chapter 11, page 45).

6.2.1 Maintenance schedule

Interval	Activity	see
Every time used	Check that no fastenings are loose and that the Smartstep extends and retracts smoothly and makes no unusual noises. Initiate repairs if necessary.	
Three monthly or as required	Clean the Smartstep.	Section 6.3.1, page 34
	Check that the non-slip property of the surface is intact. Check that the high-visibility strip is in good condition. Initiate repairs if necessary.	
Six monthly	Functionally test the safety devices.	Section 6.3.2, page 35
	Inspect all fastening components for damage and tightness.	
	Check that all screwed connections are in place and are undamaged and tight.	
	Inspect the cabling for damage.	
	Carry out a load test on the extended step with a weight of 180 kg (e.g with two persons). It must not bend noticeably.	

6.2.2 Maintenance record

Enter maintenance and repair work that has been carried out into the maintenance record provided for this purpose (see Section 6.3). This provides a traceable record of maintenance work.

For a record of maintenance work over and above this, it is recommended that you keep your own lists.

6.3 Carrying Out Maintenance Work

ATTENTION

Risk of material damage through incorrect greasing.

The Smartstep is designed such that does not require greasing during its lifetime. Oils and greases can have a negative effect on the service life of the Smartstep, can collect dirt and cause material damage.

Therefore:

- Do not use oils and greases on the Smartstep.

6.3.1 Cleaning

ATTENTION

Risk of material damage through incorrect cleaning.

The use of aggressive cleaning agents, pressurised or hot water can cause damage to the Smartstep.

Therefore:

- Never use aggressive cleaning agents.
- Never use a high-pressure cleaner.
- Use warm water.

Clean the Smartstep at three monthly intervals, depending on the degree of uncleanliness, or whenever necessary.

- ⇒ Extend the Smartstep.
- ⇒ Remove the Smartstep fuse (15 A) from the fuse-holder.

NOTE

The fuse (15 A) is located in the immediate vicinity of the vehicle battery.

- ⇒ Clean the Smartstep using warm water and a mild detergent.
- ⇒ Clean the frame components and coupling rods using a lint-free cloth.
- ⇒ Make certain that the side door is open.

- ⇒ Fit the Smartstep fuse (15 A) to the fuse-holder.
- ⇒ Carry out the initialisation procedure (see Section 4.2, page 24).

6.3.2 Checking the safety devices

Obstacle detection

Test the Smartstep obstacle detection function at six monthly intervals:

- ⇒ Fully retract Smartstep, if necessary.
- ⇒ Take up a position in front of the Smartstep but outside the danger zone.
- ⇒ Open the side door.
- ⇒ When the Smartstep starts to extend, press against the step with one hand to activate the obstacle detection and stop the step from extending any further. Stop pressing against the step, if it does not stop extending.

If the obstacle detection reacts and stops the step:

- ⇒ Check that the indicator lamp on the dashboard blinks four times per second.
- ⇒ Close the side door.

The Smartstep retracts.

- ⇒ Open the side door once again.

The Smartstep fully extends once again.

If the obstacle detection does not react or if it only reacts when greater pressure is applied, if the indicator lamp does not indicate that the obstacle detection has reacted or if the Smartstep reacts in any way other than expected:

- ⇒ Render the Smartstep inoperative (see Chapter 7, page 38).
- ⇒ Initiate repairs.

1
2
3
4
6
7
8
9
10
11

Status indicator lamp

Test the Smartstep indicator lamp at six monthly intervals:

- ⇒ Check that the indicator lamp is not lit when the side door is closed.
- ⇒ Open the side door.
- ⇒ Check that the indicator lamp blinks twice per second while the step is extending.
- ⇒ Check that the indicator lamp lights continuously when the step is fully extended.
- ⇒ Close the side door.
- ⇒ Check that the indicator lamp blinks twice per second while the step is retracting.
- ⇒ Check that the indicator lamp has gone out again when the step is fully retracted.

If the indicator lamp behaves in any other way than described here:

- ⇒ Render the Smartstep inoperative (see Chapter 7, page 38).
- ⇒ Initiate repairs.

7 Decommissioning and Conservation



WARNING

Risk of falling after decommissioning.

If the Smartstep has been decommissioned but the vehicle remains in use, persons embarking and disembarking can stumble because they expect the step to be extended, as it would normally be. There is a risk of falling.

Therefore, after decommissioning:

- Make all persons embarking and disembarking aware that the Smartstep has been decommissioned.
- If necessary, attach a notice to this effect to the side door, which is visible from the inside and outside.

If the Smartstep is not required or if it is faulty, it can be rendered inoperative by temporarily decommissioning it.

- ⇒ Clean the Smartstep, if it is going to be decommissioned for a longer period of time (see Section 6.3.1, page 34).
- ⇒ Close the side door, so that the Smartstep is fully retracted.
- ⇒ Remove the Smartstep fuse (15 A) from the fuse-holder.

NOTE



The fuse (15 A) is located in the immediate vicinity of the vehicle battery.

- ⇒ Keep the fuse in a safe place for further use at a later point in time (see Section 4.2, page 24).

For further queries regarding decommissioning and conservation, contact our customer service department (see Chapter 11, page 45).



8 Disposal

When the Smartstep's useful life has expired, it must only be disposed of by qualified specialists. Neither the manufacturer nor the distribution partner will accept liability for damage caused by incorrect disposal.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8**
- 9
- 10
- 11

9 Faults and Troubleshooting



For fundamental information regarding faults on the basic vehicle, refer to the vehicle operating instructions.

9.1 Safety Regulations for Troubleshooting



WARNING

Risk of injury through improper decommissioning in the event of a permanent fault.

If the Smartstep is in a permanently faulty condition, the step itself or the entire Smartstep can move uncontrollably when driving. Further operation of the Smartstep can cause hazardous situations.

Therefore, if a permanent fault exists:

- Bring the Smartstep to a safe, retracted position with the help of the emergency mode (see Section 9.3, page 42).
- Decommission the Smartstep immediately (see Chapter 7, page 38), when the step is fully retracted and firmly seated.
- Take the vehicle out of service immediately if the step cannot be fully retracted.
- Take the vehicle out of service immediately if the step is mechanically loose and can be moved by hand.
- Take the vehicle out of service immediately if the Smartstep is not fastened sufficiently.

9.2 Troubleshooting Table

If faults occur when operating the Smartstep, proceed as described in the following troubleshooting table. Contact the customer service department if faults are encountered which cannot be remedied using the information and measures given in the table.

Faults and Troubleshooting



1
2
3
4
6
7
8
9
10
11

Fault	Possible Cause	Remedial Measures
The Smartstep does not move, the indicator lamp blinks four times per second.	The obstacle detection has been triggered.	If the obstacle detection was not triggered by an obstacle, clean the Smartstep (see Section 6.3.1, page 34). Commission the Smartstep once again (see Section 5.3, page 29).
The Smartstep does not move, the indicator lamp blinks twice times per second.	The power supply to the motor is faulty.	Bring the Smartstep to a safe state with the help of the emergency mode (see Section 9.3, page 42). Take the vehicle out of service if the Smartstep cannot be brought to a safe state. Initiate repairs.
	The motor runs but the step does not move. The drive mechanism is defective.	Check the emergency release and screw the knurled screw in, if necessary (see Section 9.3, page 42). Take the vehicle out of service if this measure does not help. Initiate repairs.
The Smartstep does not move, the indicator lamp does not light up.	The automatic function has been switched OFF using the optional deactivation switch.	Switch the automatic function ON (see Section 5.4, page 30).
	The vehicle battery is discharged.	Charge the vehicle battery.
	The Smartstep fuse is defective.	Fit a new fuse with the same ampere rating.
The Smartstep does not move.	The door contact switch is defective.	Bring the Smartstep to a safe state with the help of the emergency mode (see Section 9.3, page 42). Take the vehicle out of service if the Smartstep cannot be brought to a safe state. Initiate repairs.
	The cabling is defective.	
	The motor is defective.	
	The drive mechanism is defective.	
	The controller is defective.	

Fault	Possible Cause	Remedial Measures
The Smartstep makes noises when driving.	The Smartstep fastenings have become loose.	Check tighten all fastening screws. Inspect fastening components for damage. Take the vehicle out of service if the Smartstep cannot be brought to a safe state. Initiate repairs.
The Smartstep makes unusual noises when being extended or retracted.	The Smartstep is heavily soiled.	Clean the Smartstep (see Section 6.3.1, page 34).
	The motor is defective. The drive mechanism is defective.	Render the Smartstep inoperative (see Chapter 7, page 38). Initiate repairs.
The Smartstep moves jerkily when being extended or retracted.	The drive mechanism is defective.	Render the Smartstep inoperative (see Chapter 7, page 38). Initiate repairs.

9.3 Retracting using the Emergency Mode

The emergency mode allows the step to be moved manually if a fault occurs. This allows the Smartstep to be brought to a secure, retracted state, to allow further use of the vehicle.

- ⇒ Remove the Smartstep fuse (15 A) from the fuse-holder.



NOTE

The fuse (15 A) is located in the immediate vicinity of the vehicle battery.

- ⇒ Make certain that the Smartstep is properly attached to the vehicle.
- ⇒ Loosen the emergency release knurled screw on the inside of the step and screw it out by several turns (see Figure 13, left, page 43).
- ⇒ Push the step to the fully retracted position by hand.
- ⇒ Turn the emergency release knurled screw all the way in and tighten it by hand (see Figure 13, right, page 43).

- ⇒ Make certain that the step is mechanically locked in the frame by jerking it vigorously.
- ⇒ Do not fit the fuse to the fuse-holder but keep it in a safe place until repairs have been carried out.

The vehicle is once again operational when the step is locked and the Smartstep is properly attached to the vehicle. Have the Smartstep repaired.

Knurled screw, screwed out



Knurled screw, screwed in



Figure 13: Knurled screw, for releasing in an emergency

1
2
3
4
6
7
8
9
10
11

10 Electrical Circuit Diagram

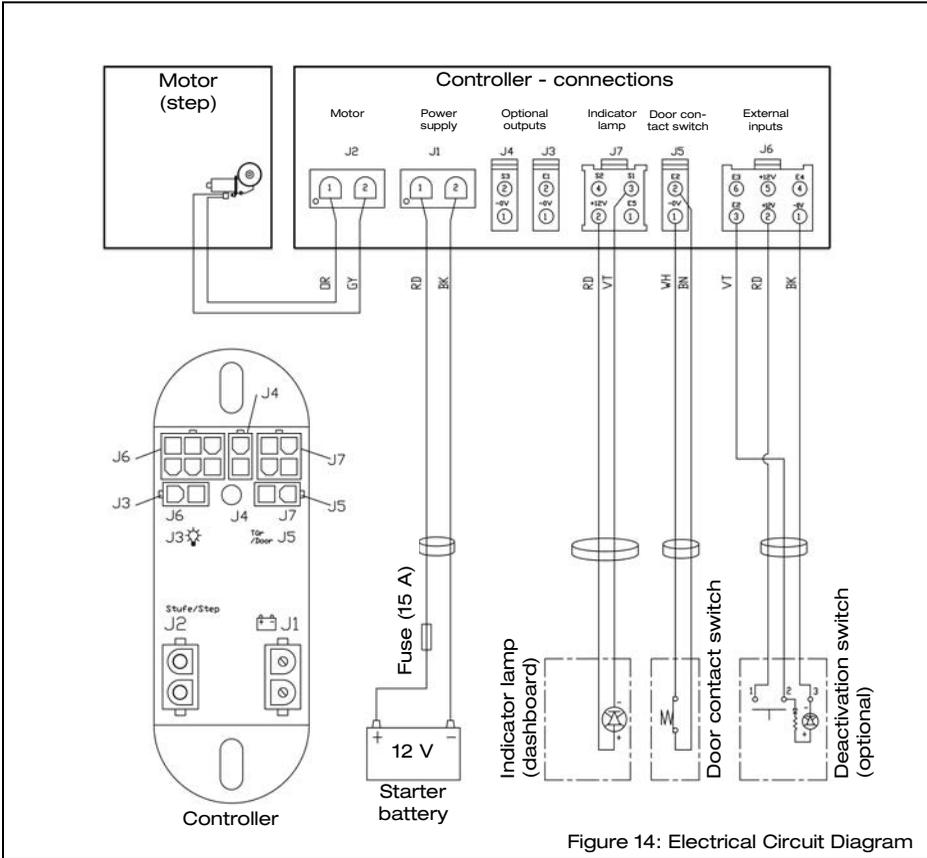


Figure 14: Electrical Circuit Diagram

Colour	Abbreviation (acc. to IEC 60757)
orange	OR
Grey	GY
Red	RD
Black	BK
Violet	VT
White	WH
Brown	BN

11 Customer Service

The AMF-Brunns customer service department will be more than pleased to assist in ordering spare parts, maintenance and repair work and help with general problems or queries.

The address is:

AMF-Brunns GmbH & Co. KG

Hauptstraße 101

D – 26689 Apen

Tel.: +49 (0) 44 89 / 72 72-22

Fax: +49 (0) 44 89 / 62 45

service.hubmatik@amf-bruns.de

www.amf-bruns.de



NOTE

Guarantee work on the Smartstep must only be carried out with the prior agreement of AMF-Brunns GmbH & Co. KG.

The costs of such work will not be accepted by AMF-Brunns without prior agreement.



AMF-Brunns GmbH & Co. KG
Hauptstraße 101 | D-26689 Apen
Telephone +49 (0) 44 89 / 72 72 22
Fax +49 (0) 44 89 / 62 45
service.hubmatik@amf-bruns.de

www.amf-bruns.de



DIN EN ISO 9001
REG.-NR. 01 0105027