

# 1

## Connectors

### LV Series

High Power Connectors  
for faster charging  
of industrial trucks

Catalogue A84.en



more information  
[schaltbau.com](http://schaltbau.com)

## High Power Connectors LV Series

### More Power for Faster Charging

With the LV Series Schaltbau charging connectors satisfy the requirements of EN 1175-1 and DIN VDE 0623-589 for a high current-carrying capacity. Thus an active energy and battery management system that optimizes the current flows and preserves the battery becomes possible. After use, the batteries can be quickly recharged so as to minimize downtimes.

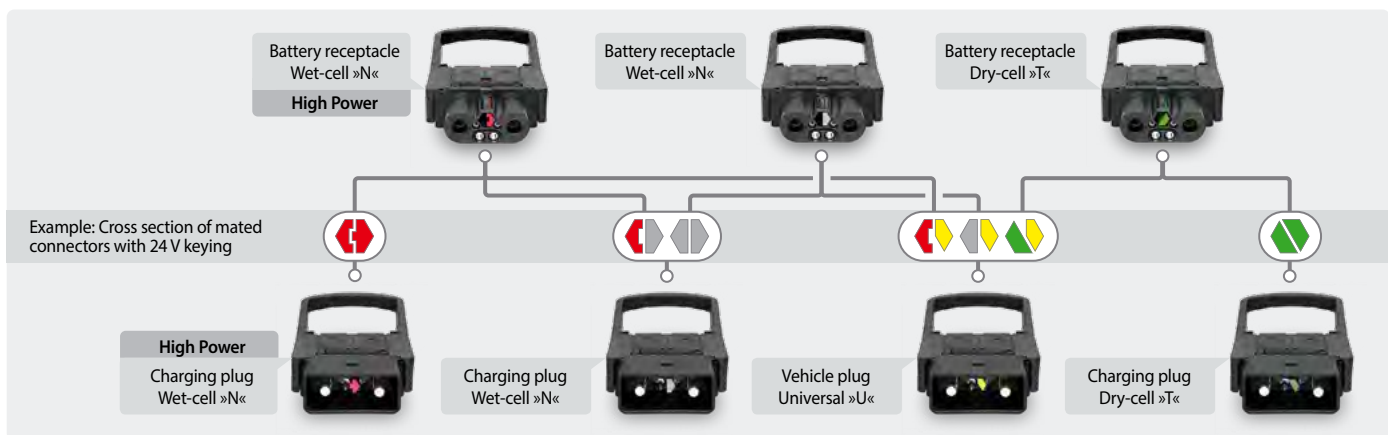
Due to its modular design, the charging connector can be adapted to customer requirements. Additional pilot contacts are available for use with battery management systems, which constantly monitor the condition of the (lithium-ion) battery, thereby guaranteeing maximum battery life.

Charging connectors must keep to the maximum temperature difference that is allowed to occur due to the charging process. The contact system of the LV Series is designed in such a way that the contacts are capable of carrying high currents with minimal self-heating.

In addition to pilot contacts, optional adapters for water top up and electrolyte circulation systems are available. For details refer to catalogue A841 "Multifunctional Adapters for Charging Connectors" or visit our website at [www.schaltbau-gmbh.com](http://www.schaltbau-gmbh.com)

## Features

Series LV



☛ Schaltbau Power Bridge – Keying according to DIN VDE 0623-589 for wet-cell and dry-cell batteries

- **Higher current-carrying capacity**

The new LV charging connectors comply with DIN VDE 0623-589 for a higher current-carrying capacity.

- **High-quality, screw-machine power contacts**

Due to an improved design, the contacts feature a higher current-carrying capacity, minimum contact heating and a continuous low contact resistance. With constant contact force over its working life, the connector is less susceptible to wear and tear while mating and unmating.

- **Modular design**

Standardized individual components can be used across the entire connector series. They allow for a customized and cost-effective realisation of your applications, and avoid unnecessary stocking of items.

- **Integrated lock function**

The mated shells of the LV Series connectors provide positive locking resistance to shock, vibration and other decoupling forces that may occur under normal conditions of use.

- **Intermateable with connectors of other manufacturers**

The LV Series is intermateable with all commercially available charging connectors to EN 1175-1 and DIN VDE 0623-589 of comparable design – even when used with air tube adapter.

- **Keying to DIN VDE 0623-589**

Colour coded keying plugs are used for keying of conventional battery voltages. The colours stand for:

- ☛ **Red:** Wet-cell battery, allowing for higher amperage
- ☛ **Grey:** Wet-cell battery
- ☛ **Green:** Dry-cell battery
- ☛ **Yellow:** Vehicle plug, universal

The diagram shows a cross section of mated LV Series charging connectors keyed to 24 V.

- **High resistance to acids and extremes of temperature**

The material used for the connector shells including strain relief is according to EN 1175-1 highly resistant to sulphuric acid of high concentration.

The proven housing material makes for the connector's ruggedness and suitability for use with temperatures ranging from -30 °C to +90 °C.

- **Optional adapters for electrolyte circulation and pilot contacts**








**Air tube adapter:** Schaltbau LV series charging connectors can be equipped with optional air tube adapters for use with batteries with electrolyte circulation system.

**Pilot contact adapter:** To be fitted with 2 optional pilot contacts which provide a data link between the battery management system and the charger.

For detailed information on adapter options refer at page 8.

**Specifications**

Series LV

Series	Standard	LV 320/400	LV160/250	LV80/120
<b>Rated operating current</b> *1 Main contacts Main contacts @ 95 mm <sup>2</sup> Pilot/aux contacts	DIN VDE 0623-589 UL / CSA DIN VDE 0623-589	320 A / 380 A*1 400 A / 260 A 20 A	160 A / 250 A*1 --- / --- 20 A	80 A / 120 A*1 --- / --- 20 A
<b>Rated voltage</b> Altitude correction factor 1	DIN VDE 0623-589, EN 60664-1 UL / CSA	150 V 150 V / 150 V	150 V --- / ---	150 V --- / ---
<b>Keying</b> Rated operating voltage Keying plug	DIN VDE 0623-589	24 / 36 / 48 / 72 / 80 / 96 V  red*1 /  grey: wet-cell battery,  green: dry-cell battery,  yellow: vehicle plug		
<b>Main contacts</b> Number of Contact diameter Wire gauge		2 10 mm ---	2 8.5 mm ---	2 6 mm ○+LVRH 25/16*2
		---	---	●*1
		○+LVRH 50/35*2	○+LVRH 50/25*2	---
		●	○+LVRH 50/35*2	---
		●*3	●*1	---
		●*1,3	---	---
		---	---	---
<b>Pilot contacts</b> Number of Contact diameter Wire gauge	DIN VDE 0623-589	2 4 mm ●	2 4 mm ●	2 2.3 mm ●
<b>Auxiliary contacts</b> Number of Contact diameter Wire gauge	DIN VDE 0623-589	2 4 mm ●	2 2.3 mm ●	2 2.3 mm ●
<b>Air tube adapter</b> Adapter for air tube size	6 mm	●	●	●
<b>Crimped connection</b> Main contacts Pilot contacts		w/ crimping*4 crimping	w/ crimping*4 crimping	w/ crimping*4 crimping
<b>Ingress protection rating (IP code)</b>	IEC 60529	IP23*5	IP23*5	IP23*5
<b>Temperature range</b>		-30 °C ... +90 °C*6	-30 °C ... +90 °C*6	-30 °C ... +90 °C*6
<b>Mating cycles</b>	EN 1175-1	5,000	5,000	5,000
<b>Shells</b> PBT GF30 (PBB and PBDE free) Integrated lock function Strain relief Flammability rating		● ● ● UL 94-V0	● ● ● UL 94-V0	● ● ● UL 94-V0
<b>Handle styles</b> Snap-on Screw-on		● ●	● ●	● ●
<b>Handle colour</b> Black Red (for emergency cutout)		● ●	● ●	● ●
<b>Approvals</b>		 File No. E242089	 File No. E242089	 File No. E242089
<b>See</b>		Page 6, 7	Page 8, 9	Page 10, 11



\*1 For 380 A, 250 A and 120 A use corresponding red keying plug and observe the wire gauges as indicated by the DIN VDE 0623-589 standard.

See also page 14 for detailed information on maximum current carrying capacity of cables depending on wire gauge, and battery pulse charging.

\*2 Reducers: Included with contacts whose terminals are designed for a bigger AWG wire size reducing it down to a smaller size.

\*3 Drop height of 1.5 m max. for LV320/400 with wire gauge 70 mm<sup>2</sup> and 95 mm<sup>2</sup>. Reduced drop height when stretched connector cable.

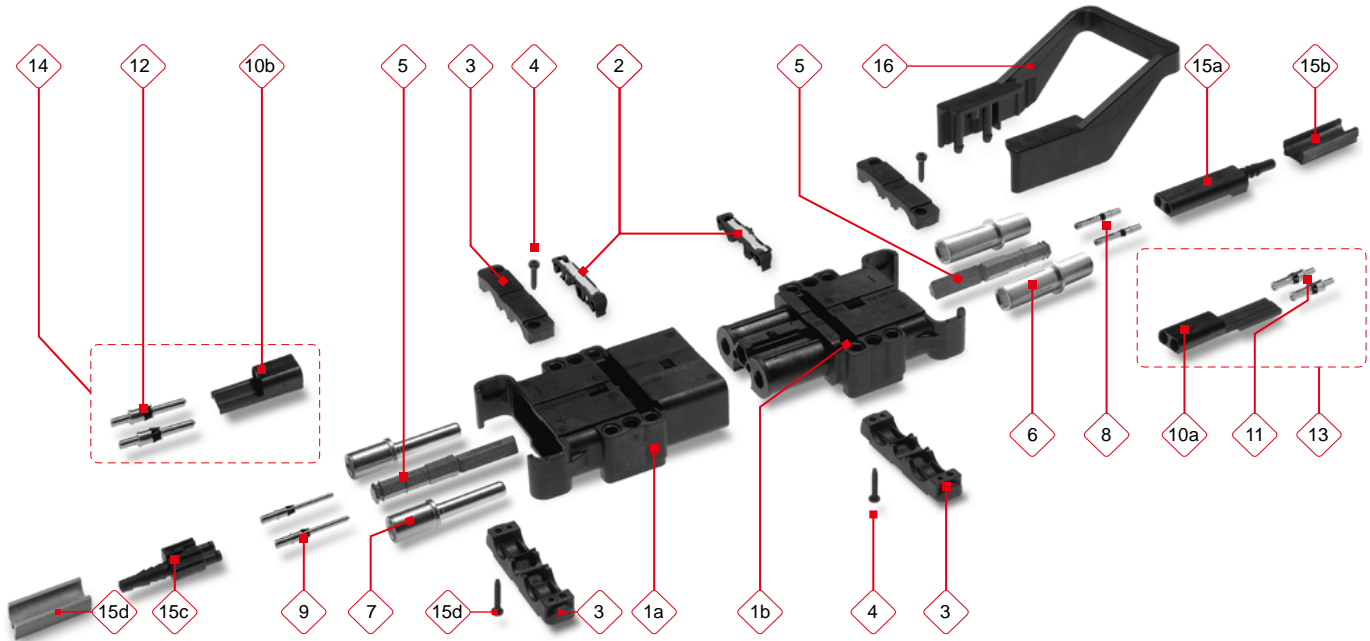
\*4 Assembly and crimping instructions, see manual [A84-M.en](#)

\*5 IPx3 when mounted horizontally

\*6 Current-carrying capacity curves on request

**Components, spare parts**

Series LV



Item	Identification	Ordering code			Description
		LV320/400	LV160/250	LV80/120	
1a 1b	Plug shell Receptacle shell	LV320/400 G-P LV320/400 G-SP LV320/400 G-SL	LV160/250 G-P LV160/250 G-SP LV160/250 G-SL	LV80/120 G-P LV80/120 G-SP LV80/120 G-SL	Shell to enclose pin contacts Receptacle with pre-assembled item 10a Receptacle with added item 15a
2	Slider	black grey green LV320/400 S	LV160/250 S	LV80 S	Locks main contacts in place (LV320/400 also auxiliary contacts)
3	Clamp	LV320 D	LV160 D	LV80 D	2x for strain relief
4	Screw for clamp	SC 3.5x19 SC 3.5x25	SC 3.5x19 ---	SC 3.5x16 ---	2x self-tapping screw for strain relief: Wire gauge AWG 1/0 max. (50 mm <sup>2</sup> ) Wire gauge AWG 3/0 / AWG 4/0 (70 mm <sup>2</sup> / 95 mm <sup>2</sup> )
5	Keying plug	red red grey green yellow	LV250/400 NrS LV250/400 NrP LV160/320 Ngr LV160/320 Tgn LV160/320 Uge	LV120 NrS LV120 NrP LV80 Ngr LV80 Tgn LV80 Uge	for battery receptacle, high amperage, wet-cell for charging plug, high amperage, wet-cell for battery receptacle/charging plug, wet-cell for battery receptacle/charging plug, dry-cell for vehicle plug
6	Main contact (socket)	AWG 4/0 (120 mm <sup>2</sup> ) 95 mm <sup>2</sup> AWG 3/0 (70 mm <sup>2</sup> ) AWG 1/0 (50 mm <sup>2</sup> ) AWG 4 (25 mm <sup>2</sup> )	LV500 S10/AWG4/0 LV320 S10/95 LV320 S10/70 LV320 S10/50 ---	---	2x for battery receptacle AWG 4/0 2x for battery receptacle 95 mm <sup>2</sup> 2x for battery receptacle AWG 3/0 2x for battery receptacle AWG 1/0 2x for battery receptacle AWG 4
7	Main contact (pin)	AWG 4/0 (95 mm <sup>2</sup> ) 95 mm <sup>2</sup> AWG 3/0 (70 mm <sup>2</sup> ) AWG 1/0 (50 mm <sup>2</sup> ) AWG 4 (25 mm <sup>2</sup> )	LV500 P10/AWG4/0 LV320 P10/95 LV320 P10/70 LV320 P10/50 ---	---	2x for charging plug/vehicle plug AWG 4/0 2x for charging plug/vehicle plug 95 mm <sup>2</sup> 2x for charging plug/vehicle plug AWG 3/0 2x for charging plug/vehicle plug AWG 1/0 2x for charging plug/vehicle plug AWG 4
---	Reducer	70/50 (AWG 3/0 to 1/0) 50/35 (AWG 1/0 to 1) 50/25 (AWG 1/0 to 3) 25/16 (AWG 4 to 5)	LV RH70/50 LV RH50/35 ---	---	Reducing AWG 3/0 down to AWG 1/0 Reducing AWG 1/0 down to AWG 1 Reducing AWG 1/0 down to AWG 4 Reducing AWG 4 down to AWG 5
8 9	Aux. contacts	Socket AWG 13 (2.5 mm <sup>2</sup> ) Pin AWG 13 (2.5 mm <sup>2</sup> )	LV320 BCC-2.5-Ag LV320 SCC-2.5-Ag	LV160 BBC-2.5-Ag LV160 SBC-2.5-Ag	2x auxiliary contact for battery receptacle 2x aux. contact for charging plug/vehicle plug
10a 10b	Pilot contact adapter	Receptacle Plug	LV160/320 PA-S LV160/320 PA-P	LV80 PA-S LV80 PA-P	Adapter for pilot contacts, sockets Adapter for pilot contacts, pins
11 12	Pilot contacts	Socket AWG 13 (2.5 mm <sup>2</sup> ) Pin AWG 13 (2.5 mm <sup>2</sup> )	BCC-2.5-Ag SCC-2.5-Ag	LV80 BBC-2.5-Ag LV80 SBC-2.5-Ag	2x pilot contact for battery receptacle 2x pilot contact for charging plug/vehicle plug
13 14	Pilot contact set	Adapter + socket contacts Adapter + pin contacts	LV160/320 P-S/S LV160/320 P-P/S	LV80 P-S/S LV80 P-P/S	Set, including items 10a, 11 Set, including items 10b, 12
15a 15b	Air tube adapter Spacer	for receptacle for receptacle	LV160/320 LV-S LV160/320 DS-LS	LV80 LV-S LV80 DS-L	for air tube with inside Ø 6 mm for securing air tube adapter (item 15a) in recep- tacle shell (item 1b)
15c 15d	Air tube adapter Spacer	for plug for plug	LV160/320 LV-P LV160/320 DS-LP	LV80 LV-P ---	for air tube with inside Ø 6 mm for securing air tube adapter (item 15c) in recep- tacle shell (item 1a)
16	Handle	Black, snap-on Red, snap-on Black, screw-on Red, screw-on	LV160/320 H3 LV160/320 H4 LV160/320 H1/S LV160/320 H2/S	LV80 H1 LV80 H2 LV80 H1/S LV80 H2/S	Snap-on handle for receptacle / plug shell Screw-on handle for receptacle/ plug shell, including screws

## Ordering code, pre-assembled cables

Series LV

### Ordering code LV Series

Example: **LV320/400-R-S95-0-2-L0-H3**

Series	Amperage		Handle
	Standard	High	
LV320/400	320 A	380 A *1	None
LV160/250	160 A	250 A *1	Black, snap on *5
LV80/120	80 A	120 A *1	Red, snap on *5

Keying plug	Air tube adapter		Aux. contacts	Pilot contacts
	None	Air tube adapter *4		
R	Red, wet-cell, high amperage	None	0	0
N	Grey, wet-cell battery	Air tube adapter *4	2	2
T	Green, dry-cell battery	None	0	0
U	Yellow, vehicle plug, Universal *2	Air tube adapter *4	2	2

Contacts, wire gauge		
• LV320/400		
AWG4/0	Pin	AWG 4/0
P95	Pin	AWG 4/0 (95 mm <sup>2</sup> )
P70	Pin	AWG 3/0 (70 mm <sup>2</sup> )
P50	Pin	AWG 1/0 (50 mm <sup>2</sup> ) *3
AWG4/0	Socket	AWG 4/0
S95	Socket	AWG 4/0 (95 mm <sup>2</sup> )
S70	Socket	AWG 3/0 (70 mm <sup>2</sup> )
S50	Socket	AWG 1/0 (50 mm <sup>2</sup> ) *3
• LV160/250		
P50	Pin	AWG 1/0 (50 mm <sup>2</sup> )
P35	Pin	AWG 1 (35 mm <sup>2</sup> ) *3
P25	Pin	AWG 4 (25 mm <sup>2</sup> ) *3
S50	Socket	AWG 1/0 (50 mm <sup>2</sup> )
S35	Socket	AWG 1 (35 mm <sup>2</sup> ) *3
S25	Socket	AWG 4 (25 mm <sup>2</sup> ) *3
• LV80/120		
P25	Pin	AWG 4 (25 mm <sup>2</sup> )
P16	Pin	AWG 5 (16 mm <sup>2</sup> ) *3
S25	Socket	AWG 4 (25 mm <sup>2</sup> )
S16	Socket	AWG 5 (16 mm <sup>2</sup> ) *3

\*1 Higher current-carrying capacity in compliance with DIN VDE 0623-589; requires red keying plug R.

\*2 Yellow keying plug only supplied with charging and vehicle plug.

\*3 Contact supplied with reducer.

\*4 Schaltbau LV charging connectors can be equipped with optional pilot contacts or air tube adapters for electrolyte circulation systems.

Do you need other optional components? You will find more information in our catalogue A841 "Multifunctional adapters for LV Series charging connectors".

\*5 Only available for LV80/120 Series

\*6 For use with LV160/250 and LV320/400 Series

### Do you need assembled connectors?

If so, do not hesitate to contact us! We supply receptacles and plugs complete with pre-assembled cables of different lengths and wire gauges and with a variety of cable terminal

#### Cables and terminal ends:

- Welding cables with rubber jackets according to DIN VDE 0282-6, e.g. H01N2-D
- Flex battery terminal conductor
- Perfect battery terminal conductor
- Battery terminal conductor with cable lug

#### Wire gauges:

- AWG 5 ... 4/0 (16 ... 95 mm<sup>2</sup>)

#### Wire connection:

- Main contacts: w/ crimping
- Pilot/aux. contacts: crimping

#### Marking of cables:

- Red shrink tube ⊕-terminal
- Blue shrink tube ⊖-terminal
- Product named on rubber jacket of cable



#### Note:

Presented in this catalogue are only stock items which can be supplied in short delivery time. For some variants minimum quantities apply. Please do not hesitate to ask for the conditions.

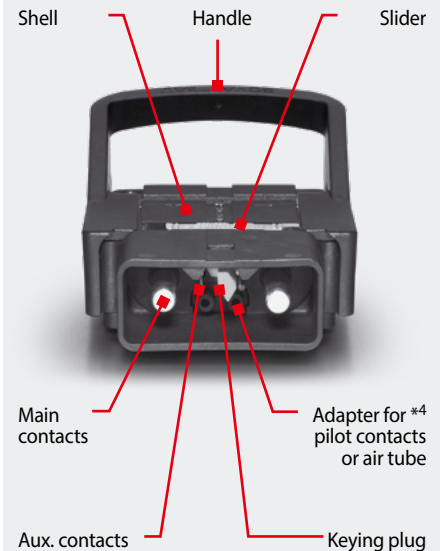


#### Special Variants:

If you need a special variant, please do not hesitate to contact us. Maybe the type of charging connector you are looking for is among our many special designs. If not, we can also supply customized designs. In this case, however, minimum ordering quantities apply.

### Schaltbau Power Bridge

Modular design for scalable solutions between vehicle, battery and charger. The LV Series connectors guarantee a current-carrying capacity of 380 A.



LV: Charging plug/vehicle plug, front view

### Pre-assembled cables

Schaltbau supplies connectors complete with pre-assembled battery terminal conductors to suit your application.



Flex battery terminal conductor



Perfect battery terminal conductor

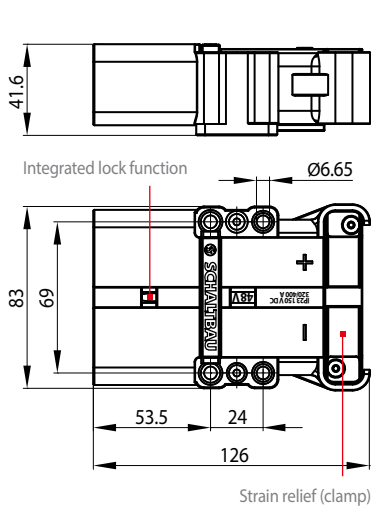


Battery terminal conductor with cable lug

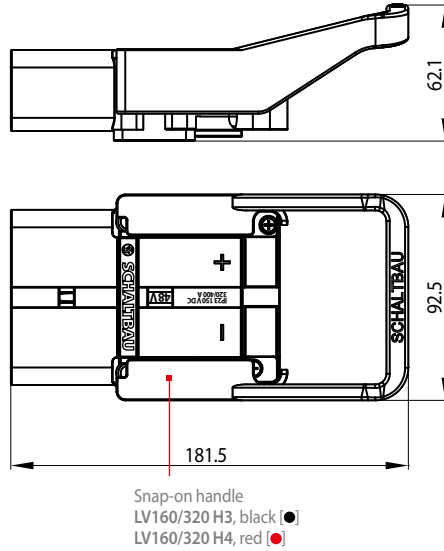
**LV320/400 Series** Dimension diagrams, Contacts

Series LV

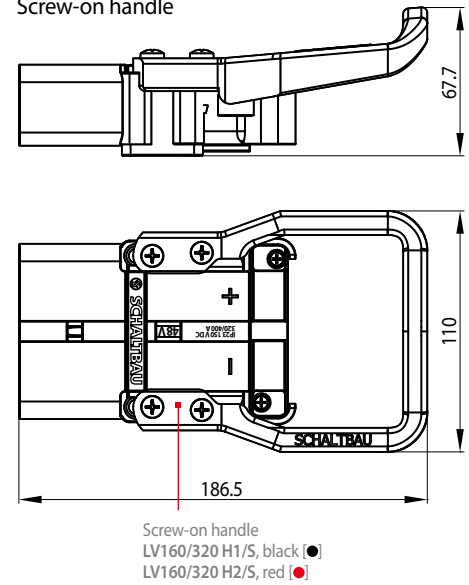
• Charging plug / vehicle plug LV320/400



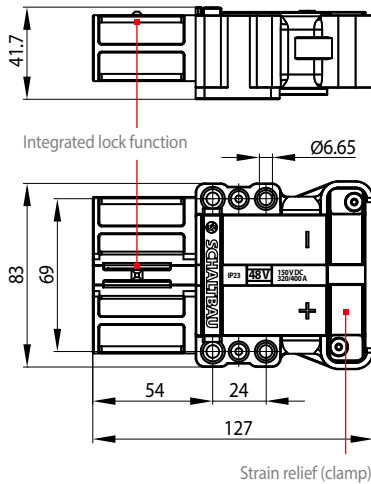
Snap-on handle



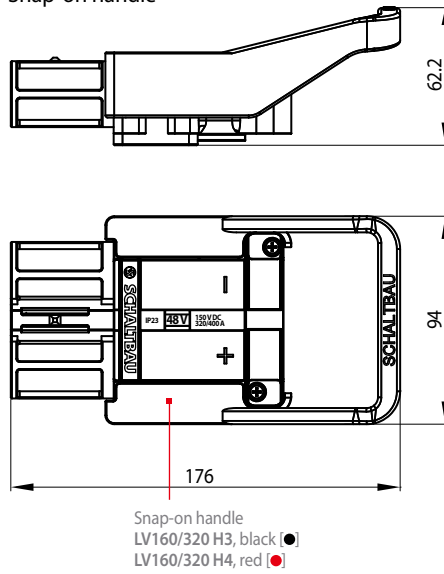
Screw-on handle



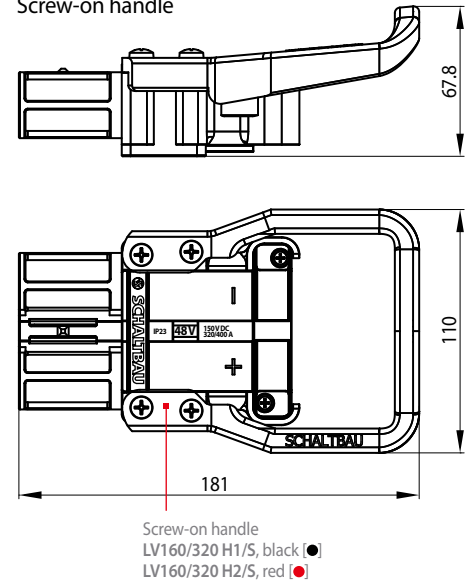
• Battery receptacle LV320/400



Snap-on handle



Screw-on handle



• Main contacts, aux. contacts

Main contacts Ordering code	Type	Wire gauge		Rated current	
		HPC*	Standard	HPC*1	Standard
LV320/400 S10/95 replaces LV320 S10/95*2	Socket	AWG 4/0 (95 mm <sup>2</sup> )	AWG 4/0 (95 mm <sup>2</sup> )	380 A	320 A
LV320/400 P10/95 replaces LV320 P10/95*2	Pin	AWG 4/0 (95 mm <sup>2</sup> )	AWG 4/0 (95 mm <sup>2</sup> )	380 A	320 A

Aux. contacts Ordering code	Type	Wire gauge	Rated current
LV320 BCC-2.5-Ag	Socket	AWG 13 (2.5 mm <sup>2</sup> )	20 A
LV320 SCC-2.5-Ag	Pin	AWG 13 (2.5 mm <sup>2</sup> )	20 A



**Note:**

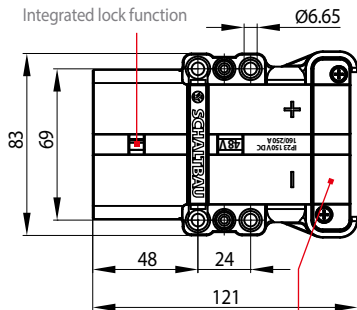
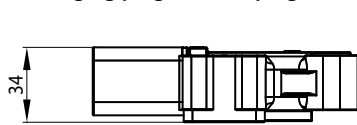
- **Wire gauge:** Reducers also reduce the current rating.
- **High Power Connectors:** Connectors with high current-carrying capacity require a wire gauge of AWG 4/0 (95 mm<sup>2</sup>). The use of reducers is not allowed.
- **Maximum current-carrying capacity curves:** Determined solely by the wire gauge – the use of reducers has no bearing on the maximum current-carrying capacity curve. The values are only valid for the main contacts with w/ crimping.

\*1 High Power Connector, to be used with red keying plug

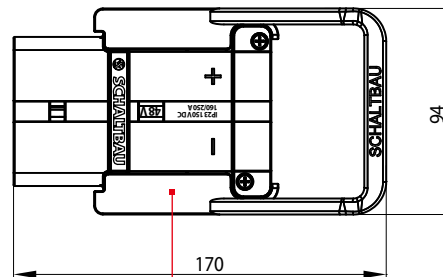
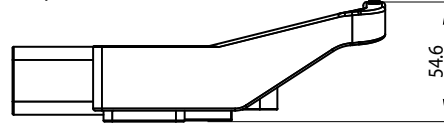
\*2 Still available

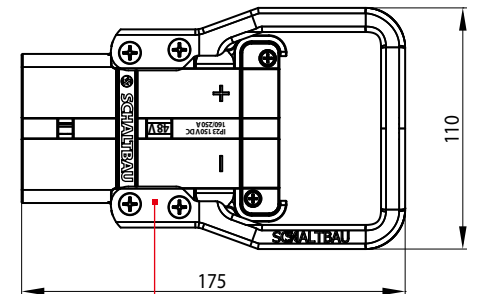
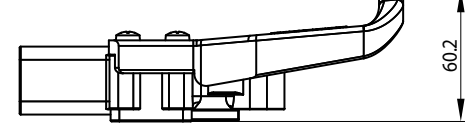
**LV160/250 Series** Dimension diagrams, Contacts

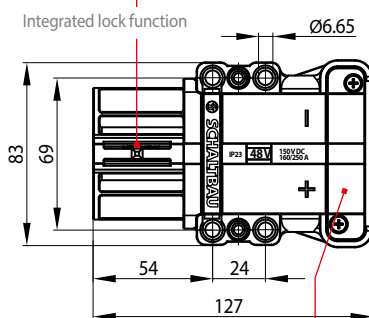
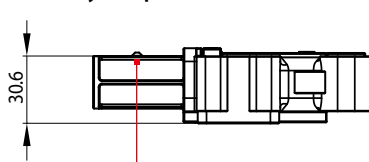
Series LV

**• Charging plug / vehicle plug LV160/250**


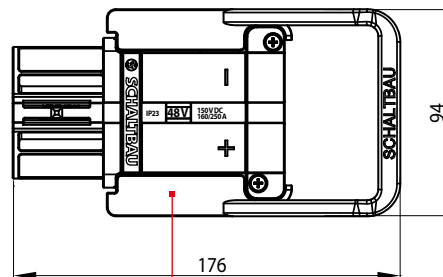
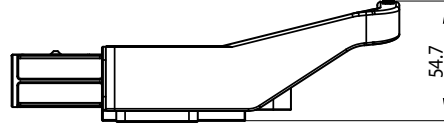
Strain relief (clamp)

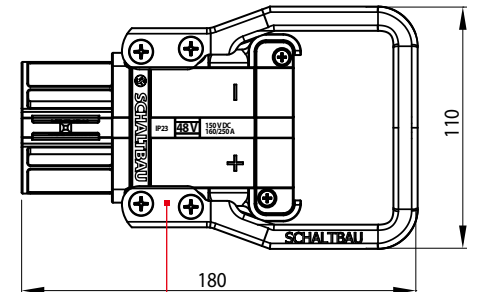
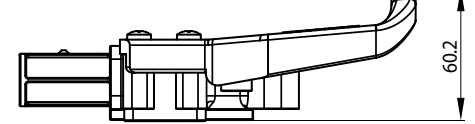
**Snap-on handle**

 Snap-on handle  
 LV160/320 H3, black [●]  
 LV160/320 H4, red [●]

**Screw-on handle**

 Screw-on handle  
 LV160/320 H1/S, black [●]  
 LV160/320 H2/S, red [●]

**• Battery receptacle LV160/250**


Strain relief (clamp)

**Snap-on handle**

 Snap-on handle  
 LV160/320 H3, black [●]  
 LV160/320 H4, red [●]

**Screw-on handle**

 Screw-on handle  
 LV160/320 H1/S, black [●]  
 LV160/320 H2/S, red [●]

**• Main contacts, aux. contacts**

Main contacts Ordering code	Type	Wire gauge		Rated current	
		HPC*	Standard	HPC*	Standard
LV160/250 S8.5/50	Socket	AWG 1/0 (50 mm <sup>2</sup> )	AWG 1/0 (50 mm <sup>2</sup> )	250 A	160 A
LV160 P8.5/50	Pin	AWG 1/0 (50 mm <sup>2</sup> )	AWG 1/0 (50 mm <sup>2</sup> )	250 A	160 A

Aux. contacts Ordering code	Type	Wire gauge	Rated current
LV160 BBC-2.5-Ag	Socket	AWG 13 (2.5 mm <sup>2</sup> )	20 A
LV160 SBC-2.5-Ag	Pin	AWG 13 (2.5 mm <sup>2</sup> )	20 A

**i Note:**

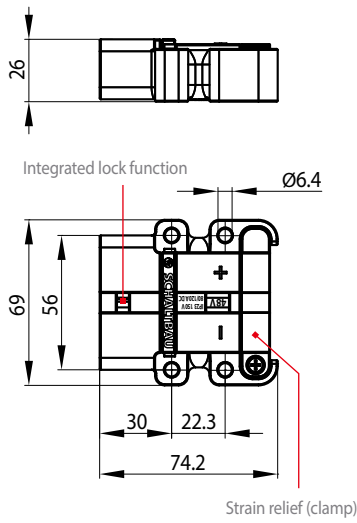
- **Wire gauge:** Reducers also reduce the current rating.
- **High Power Connectors:** They feature a high current-carrying capacity and require AWG 1/0 (50 mm<sup>2</sup>) for termination. The use of reducers is not allowed.
- **Maximum current-carrying capacity curves:** Determined solely by the wire gauge – the use of reducers has no bearing on the maximum current-carrying capacity curve. The values are only valid for the main contacts with w/ crimping.

\* High Power Connector, to be used with red keying plug

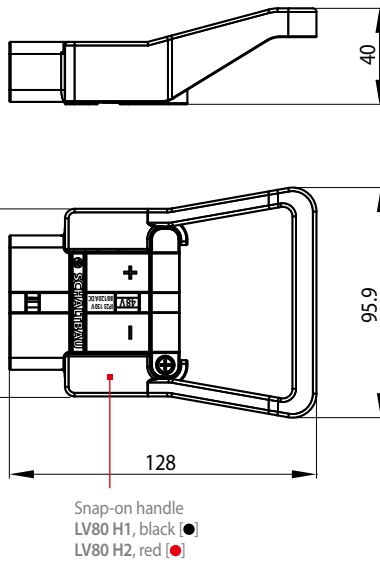
**LV80/120 Series** Dimension diagrams, Contacts

Series LV

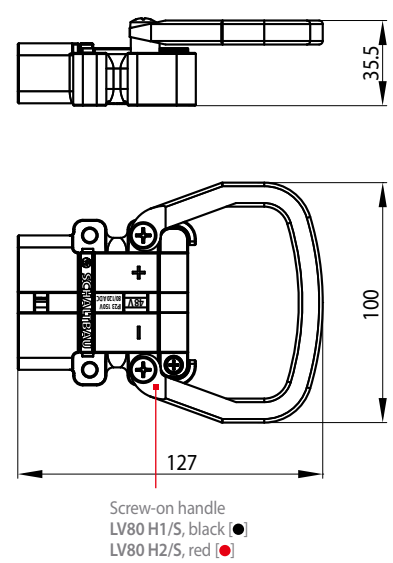
• Charging plug / vehicle plug LV80/120



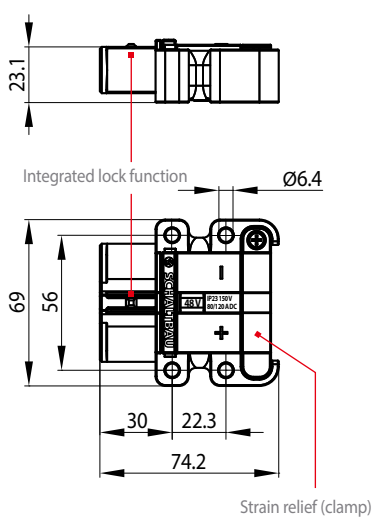
Snap-on handle



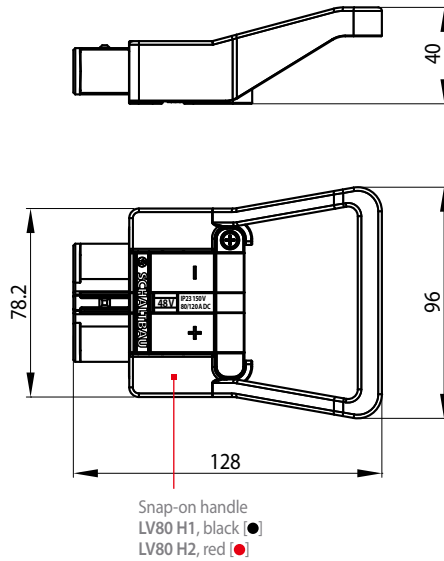
Screw-on handle



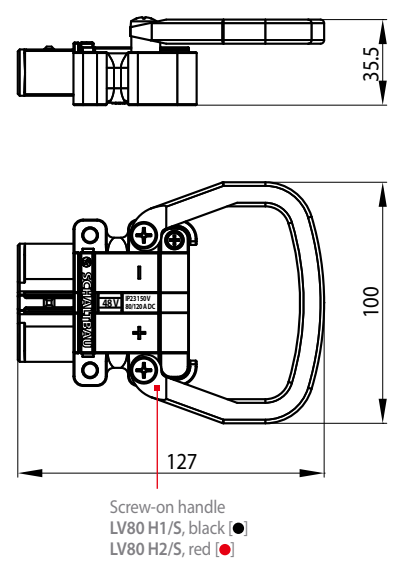
• Battery receptacle LV80/120



Snap-on handle



Screw-on handle



• Main contacts, aux. contacts

Main contacts Ordering code	Type	Wire gauge		Rated current	
		HPC*	Standard	HPC*	Standard
LV80/120 S6/25	Socket	AWG 4 (25 mm <sup>2</sup> )	AWG 4 (25 mm <sup>2</sup> )	120 A	80 A
LV80 P6/25	Pin	AWG 4 (25 mm <sup>2</sup> )	AWG 4 (25 mm <sup>2</sup> )	120 A	80 A

Aux. contacts Ordering code	Type	Wire gauge	Rated current
LV80 BBC-2.5-Ag	Socket	AWG 13 (2.5 mm <sup>2</sup> )	20 A
LV80 SBC-2.5-Ag	Pin	AWG 13 (2.5 mm <sup>2</sup> )	20 A



- **Note:**
- **Wire gauge:** Reducers also reduce the current rating.
- **High Power Connectors:** They feature a high current-carrying capacity and require AWG 4 (25 mm<sup>2</sup>) for termination. The use of reducers is not allowed.
- **Maximum current-carrying capacity curves:** Determined solely by the wire gauge – the use of reducers has no bearing on the maximum current-carrying capacity curve. The values are only valid for the main contacts with w/ crimping.

\* High Power Connector, to be used with red keying plug



**Adapters** Pilot contact adapter, Air tube adapter, Multifunctional adapter

Series LV

Adapter options for customizing your LV Series charging connector:

**• Pilot contact adapter**

Adapter to be fitted with 2 additional pilot contacts for monitoring the battery state and other control functions.

Pilot contact adapter	Ordering code		
	LV320/400 Series	LV160/250 Series	LV80/120 Series
Set*: 1x Adapter + 2x socket contact		LV160/320 P-S/S	LV80 P-S/S
Set*: 1x Adapter + 2x pin contact		LV160/320 P-P/S	LV80 P-P/S

\* See also table on page 4, wire gauge AWG 13 (2.5 mm<sup>2</sup>)

**• Air tube adapter**

Air supply for batteries with electrolyte circulation system. Electrolyte circulation ensures that the electrolyte is gently mixed by an airstream while the battery is being recharged and prevents the battery acid from becoming layered in the individual cells. This results in a shorter charging time and in reduced energy and water consumption.

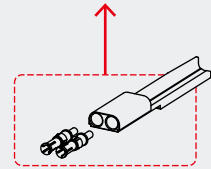
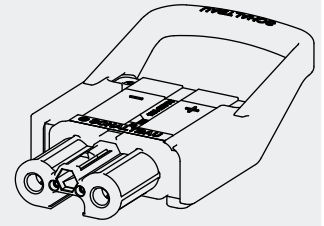
Air tube adapter	Ordering code		
	LV320/400 Series	LV160/250 Series	LV80/120 Series
1x Adapter for receptacle shell* + 1x Spacer*		LV160/320 LV-S LV160/320 DS-L	LV80 LV-S LV80 DS-L
1x Adapter for plug shell* + 1x Spacer*		LV160/320 LV-P LV160/320 DS-LP	LV80 LV-P ---

\* See also table on page 4, connection for air tubes with inside diameter Ø 6 mm

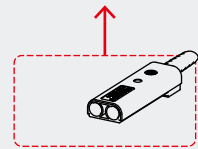
**• Multifunctional adapter**

Multipurpose adapter for water top up and electrolyte circulation systems. The new feature that the flow of air and/or water is shut off when the connector is unmated. For more information, especially on the multifunctional adapter:

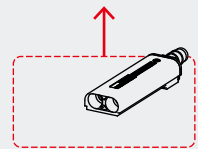
- [www.schaltbau-gmbh.com](http://www.schaltbau-gmbh.com) ➔ [schaltbau.info/lv-adapter-en](http://schaltbau.info/lv-adapter-en)
- Catalogue A841: ➔ [schaltbau.info/download1en](http://schaltbau.info/download1en)



**Pilot contact adapter**  
Adapter fitted with 2 pilot contacts  
for additional control functions



**Air tube adapter**  
Air supply for batteries with electrolyte  
circulation system




**Multifunctional adapter**  
Adapter for water top up or air supply  
of batteries with electrolyte circulation  
system


## Installation and safety instructions

Series LV

The circular industrial connectors dealt with in this catalogue are intended for use with low-voltage systems and special installations. They are designed and tested in compliance with the generally recognised state of the art. However, the improper use, operation, handling, maintenance of or tampering with electric equipment can cause serious or fatal injury to the user or others, and the appliance or other property can be damaged.

 Due to our continuous improvement programme, the design of our products can be modified at any time. So some features may differ from the descriptions, specifications and drawings in the catalogue.

You can download the latest update of the catalogue at [schaltbau.info/download1.en](https://schaltbau.info/download1.en). The updated catalogue renders the previous issue invalid.

 **Electrical hazards: Any exposure to the connector's live parts. Risk of electrical shock!**

Observe all applicable national provisions, all safety, accident prevention and environmental regulations as well as the recognized technical rules for safe and proper working.

### Installation instructions

- Work on electric equipment may only be performed by a qualified electrician or trained personnel working under the direction and supervision of a qualified electrician according to the applicable rules of electrical engineering.
- The connectors supply power and signals. They are intended for plug-in and detachable connections of components, devices and systems only.
- In order to comply with IEC 61984 make sure that always the current-carrying part of the connector – no matter whether plug or receptacle – is fitted with socket contacts.
- For optimum protection of the cable connection make sure the connector is supplied with a strain relief.
- According to IEC 60352-2 – “Solderless connections” – crimp contacts are required.
- Make sure that there is no undue strain, pressure, flexing and torsion on the cable connection.


### Installation and maintenance instructions LV Series

 For a detailed list of all safety, installation and maintenance instructions, download our manual [A84-M.en!](https://schaltbau.info/A84-M.en)

### Inverse-polarity protection

In order to guarantee inverse-polarity protection the LV Series must always be fitted with a pilot contact adapter or an air tube adapter when intended for intermating with existing connectors of comparable design made by other manufacturers.

Schaltbau, therefore, delivers LV Series connectors generally with a pilot contact adapter pre-assembled in the receptacle shell or an added air tube adapter with connectors for electrolyte circulation systems!


 Inverse-polarity protection guaranteed when engaging connectors of the same LV Series

### Safety instructions

- Carry out regular inspections of all protection and safety devices to see if they work properly.
- According to IEC 61984 connectors used as intended must not be engaged or disengaged when live or under load.
- A connector that does not engage easily requires special attention: Check for the correct orientation or if its contacts got bent or polluted. Never use force! The connector should always engage easily.
- To prevent dust and moisture from entering, make sure that the connector, when not mated, is covered by the protective cap.
- When disengaging a connector, pull the plug and never the cable.
- Use the connector only according to its intended use. Replace or repair damaged parts exclusively with original parts. Any other usage of or tampering with the connector is considered contrary to its intended use. No liability is assumed for damages and accidents caused due to non-compliance with the instructions or improper use of the connector.
- The connectors are designed for special environmental conditions as defined by “Specifications” on page 3 of this catalogue. Any use which goes beyond the limits of these specifications is not regarded as the intended use of the connector.

### Visual inspections


Be sure to make visual inspections regularly. Improper handling of the connector, e.g. when hitting the floor with some impact, can result in breakage, visible cracks and deformation.

 Defective and/or leaky parts must be replaced instantaneously!

### Disconnecting when live or under load

Disconnecting the connector when live or under load is generally only permitted under exceptional circumstances or in the case of imminent danger to operational safety according to EN 1175-1.

If the charging connector is used without auxiliary contacts the life of the main contacts can be considerably shortened because of contact welding when engaging or disengaging the connector.

 When unmating the connector when live or under load, an arc is generated. That is why disconnecting under load is prohibited in the neighbourhood of explosives and other ignition sources.

**Keying** Voltage keying, Application keying

Series LV

Schaltbau charging connectors feature keying to DIN VDE 0623-589. Keying plugs of different colours make it easy to identify the right connector visually.

• **Voltage keying:**

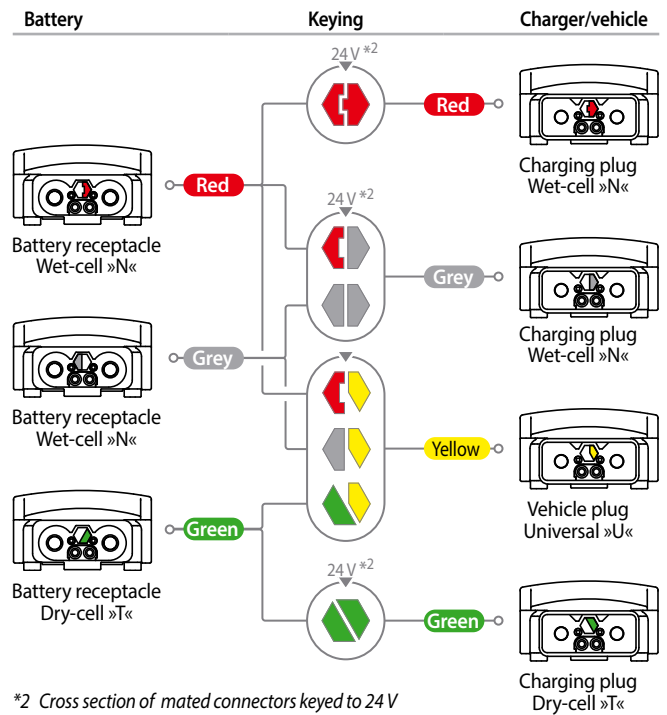
There are six standard battery voltages to choose from: 24, 36, 48, 72, 80, 96 V. The voltages are marked on the sides of the hexagonal keying plug. The keyed voltage shows in the inspection hole of the plug and receptacle shell.

• **Application keying:**

This type of keying only allows for mating of connector halves for the same battery type. Thus a battery receptacle for dry-cell batteries is only intermateable with the charging plug for dry-cell batteries.

Keying plug	Identification	Assembled in
	<ul style="list-style-type: none"> <li>For high amperage</li> <li>Used for <b>battery</b></li> <li>Features tongue</li> <li>Colour RED</li> </ul>	Battery receptacle [●]*1 Wet-cell »N«
	<ul style="list-style-type: none"> <li>For high amperage</li> <li>Used for <b>charger</b></li> <li>Features groove</li> <li>Colour RED</li> </ul>	Charging plug [●]*1 Wet-cell »N«
	<ul style="list-style-type: none"> <li>Used for <b>Battery / charger</b></li> <li>Colour GREY</li> </ul>	Battery receptacle [●]*1 Wet-cell »N« Charging plug [●]*1 Wet-cell »N«
	<ul style="list-style-type: none"> <li>Used for <b>Battery / charger</b></li> <li>Colour GREEN</li> </ul>	Battery receptacle [●]*1 Dry-cell »T« Charging plug [●]*1 Dry-cell »T«
	<ul style="list-style-type: none"> <li>Used for <b>Vehicle</b></li> <li>Colour YELLOW</li> </ul>	Vehicle plug [●]*1 Universal »U«

\*1 Keyed voltage, shows in inspection hole: [●] = receptacle, [●] = plug



\*2 Cross section of mated connectors keyed to 24 V

**Tools** Crimp tools, Extraction tools

Accessories



Hydraulic crimping tool Stocko WHPH 10 for the main contacts

• **w/ crimping of main contacts**

The applicable standard for crimping the main contacts is IEC 60352-2 – Solderless crimped connections. Schaltbau requires w/ crimping of main contacts. For that purpose Schaltbau recommends the use of the hand tool WHPH 10 and for major quantities the hydraulic crimping heads WHK 8S, WHK 8 and WHK 9 respectively of the company Stocko.

Order from: Stocko ([www.stocko.de](http://www.stocko.de)) or retailer  
Ordering code: Stocko WHPH 10 or comparable tool of other manufacturers



Crimp tool CWZ-600-1 for both pilot and auxiliary contacts

• **Crimping of pilot and auxiliary contacts**

The applicable standard for crimping of pilot and auxiliary contacts is IEC 60352-2 – Solderless crimped connections. Schaltbau recommends the use of crimp tool CWZ-600-1 for wire sizes AWG 25 ... 9 (0.14 ... 6.00 mm<sup>2</sup>).

Order from: Schaltbau GmbH  
Ordering code: Crimp tool CWZ-600-1



Extraction tool AWZ-C/H for pilot contacts of the LV160/250 and LV320/400 series



Extraction tool LV160 AWZ-B for aux. contacts of the LV160/250 series extraction tool LV80 AWZ-B for both pilot and aux. contacts of the LV80/120 series

**AWZ-C/H Extraction tool for pilot and aux. contacts**

The tools are designed for the removal of pilot and auxiliary contacts from the assembled connector.

Series	Type of contact	Pin	Socket	Ordering code
LV320/400	Pilot contact Aux. contact	SCC-2.5-Ag LV320 SCC-2.5-Ag	BCC-2.5-Ag LV320 BCC-2.5-Ag	AWZ-C/H ---*
LV160/250	Pilot contact Aux. contact	SCC-2.5-Ag LV160 SBC-2.5-Ag	BCC-2.5-A LV160 BBC-2.5-Ag	AWZ-C/H LV160 AWZ-B
LV80/120	Pilot contact Aux. contact	LV80 SBC-2.5-Ag LV80 SBC-2.5-Ag	LV80 BBC-2.5-Ag LV80 BBC-2.5-Ag	LV80 AWZ-B LV80 AWZ-B

\* Aux. contacts of the LV320/400 Series are secured from falling out of the shell by means of the slider.

# Schaltbau GmbH

For detailed information on our products and services visit our website – or give us a call!

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with compliments:



Schaltbau GmbH manufactures in compliance with RoHS.



The production facilities of Schaltbau GmbH have been IRIS certified since 2008.



Certified to DIN EN ISO 14001 since 2002. For the most recent certificate visit our website.



Certified to DIN EN ISO 9001 since 1994. For the most recent certificate visit our website.

## Electrical Components and Systems for Railway Engineering and Industrial Applications

### Connectors

- Connectors manufactured to industry standards
- Connectors to suit the special requirements of communications engineering (MIL connectors)
- Charging connectors for battery-powered machines and systems
- Connectors for railway engineering, including UIC connectors
- Special connectors to suit customer requirements

### Snap-action switches

- Snap-action switches with positive opening operation
- Snap-action switches with self-cleaning contacts
- Enabling switches
- Special switches to suit customer requirements

### Contactors

- Single and multi-pole DC contactors
- High-voltage AC/DC contactors
- Contactors for battery powered vehicles and power supplies
- Contactors for railway applications
- Terminal bolts and fuse holders
- DC emergency disconnect switches
- Special contactors to suit customer requirements

### Electrics for rolling stock

- Equipment for driver's cab
- Equipment for passenger use
- High-voltage switchgear
- High-voltage heaters
- High-voltage roof equipment
- Equipment for electric brakes
- Design and engineering of train electrics to customer requirements

We reserve the right to make technical alterations without prior notice.

For updated product information visit [www.schaltbau-gmbh.de](http://www.schaltbau-gmbh.de).

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