Product manual | **29.08.2023**

USB power adapter insert, USB-A & USB-C

6475 U

BUSCH-JAEGER

1 Notes on the instruction manual

Please read through this manual carefully and observe the information it contains. This will assist you in preventing injuries and damage to property and ensure both reliable operation and a long service life for the device.

Please keep this manual in a safe place.

If you pass the device on, also include this manual along with it.

Busch-Jaeger accepts no liability for any failure to observe the instructions in this manual.

If you require additional information or have questions about the device, please contact Busch-Jaeger or visit our Internet site at:

www.BUSCH-JAEGER.de

2 Safety

The device has been constructed according to the latest valid regulations governing technology and is operationally reliable. It has been tested and left the factory in a technically safe and reliable state.

However, residual hazards remain. Read and adhere to the safety instructions to prevent hazards of this kind.

Busch-Jaeger accepts no liability for any failure to observe the safety instructions.

2.1 Information and symbols used

The following Instructions point to particular hazards involved in the use of the device or provide practical instructions:

Danger

Risk of death / serious damage to health

– The respective warning symbol in connection with the signal word "Danger" indicates an imminently threatening danger which leads to death or serious (irreversible) injuries.

Warning

Serious damage to health

– The respective warning symbol in connection with the signal word "Warning" indicates a threatening danger which can lead to death or serious (irreversible) injuries.

Caution

Damage to health

– The respective warning symbol in connection with the signal word "Caution" indicates a danger which can lead to minor (reversible) injuries.

Attention

Damage to property

– This symbol in connection with the signal word "Attention" indicates a situation which could cause damage to the product itself or to objects in its surroundings.

NOTE

This symbol in connection with the word "Note" indicates useful tips and recommendations for the efficient handling of the product.

The following safety symbols are used in the operating manual:

This symbol alerts to electric voltage.

2.2 Intended use

The USB power adapter inserts USB-A & USB-C serve for charging accumulators in mobile terminal devices that can be connected directly to a USB socket outlet via a charging cable (not part of the scope of delivery), (e.g. mobile phones, media player or laptops).

The following quick charging protocols are supported:

- USB-A: Apple MFi with 2.4 A, BC 1.2 DCP with 1.5 A,
- USB-C: Apple MFi with 2.4 A, BC 1.2 DCP with 1.5 A, PD 3.0, QC 4.0, QC 3.0, QC 2.0.

The device is intended for the following:

- Operation according to the listed technical data
- Installation in dry interior rooms
- Only suitable for installation in flush-mounted boxes according to DIN 49073-1, Part 1, or in suitable surface-mounted housings
- Use with the connecting options available on the device

The intended use also includes adherence to all specifications in this manual.

2.3 Improper use

Each use not listed in Chapter 2.2 “Intended use“ on page 5 is deemed improper use and can lead to personal injury and damage to property.

Busch-Jaeger is not liable for damages caused by use deemed contrary to the intended use of the device. The associated risk is borne exclusively by the user/operator.

The device is not intended for the following:

- Unauthorized structural changes
- Repairs

2.4 Target group / Qualifications of personnel

2.4.1 Operation

No special qualifications are needed to operate the device.

2.4.2 Installation, commissioning and maintenance

Installation, commissioning and maintenance of the device must only be carried out by trained and properly qualified electrical installers.

The electrical installer must have read and understood the manual and follow the instructions provided.

The electrical installer must adhere to the valid national regulations in his/her country governing the installation, functional test, repair and maintenance of electrical products.

The electrical installer must be familiar with and correctly apply the "five safety rules" (DIN VDE 0105, EN 50110):

1. Disconnect
2. Secure against being re-connected
3. Ensure there is no voltage
4. Connect to earth and short-circuit
5. Cover or barricade adjacent live parts

2.5 Safety instructions

Danger - Electric voltage!

Electric voltage! Risk of death and fire due to electric voltage of 100 … 240 V.

Dangerous currents flow through the body when coming into direct or indirect contact with live components. This can result in electric shock, burns or even death.

- Work on the 100 … 240 V supply system may only be performed by authorised and qualified electricians.
- Disconnect the mains power supply before installation / disassembly.
- Never use the device with damaged connecting cables.
- Do not open covers firmly bolted to the housing of the device.
- Use the device only in a technically faultless state.
- Do not make changes to or perform repairs on the device, on its components or its accessories.
- Keep the device away from water and wet surroundings.

Caution! - Risk of damaging the device due to external factors!

Moisture and contamination can damage the device.

- Protect the device against humidity, dirt and damage during transport, storage and operation.

3 Information on protection of the environment

3.1 Environment

Consider the protection of the environment!

Used electric and electronic devices must not be disposed of with domestic waste.

– The device contains valuable raw materials which can be recycled. Therefore, dispose of the device at the appropriate collecting depot.

All packaging materials and devices bear the markings and test seals for proper disposal. Always dispose of the packaging material and electric devices and their components via the authorized collecting depots and disposal companies.

The products meet the legal requirements, in particular the laws governing electronic and electrical devices and the REACH ordinance.

(EU Directive 2012/19/EU WEEE and 2011/65/EU RoHS)

(EU REACH ordinance and law for the implementation of the ordinance (EC) No.1907/2006).

4 Setup and function

4.1 Functions

The USB power adapter inserts USB-A & USB-C serve for charging accumulators in mobile terminal devices that can be connected directly to a USB socket outlet via a charging cable (not part of the scope of delivery), (e.g. mobile phones, media player or laptops).

The following quick charging protocols are supported:

- USB-A: Apple MFi with 2.4 A, BC 1.2 DCP with 1.5 A,
- USB-C: Apple MFi with 2.4 A, BC 1.2 DCP with 1.5 A, PD 3.0, QC 4.0, QC 3.0, QC 2.0.

5 Technical data

5.1 Technical data

Designation	Value
Outputs:	1 x USB type A, 1 x USB type C
Input voltage:	230 V AC, 50/60 Hz
Input current:	Maximum 275 mA
Output power	18 W maximum
Output voltage USB A:	5 V DC / 2.4 A maximum
Output voltage USB C:	5 V DC / 3 A maximum 9 V DC / 2 A maximum 12 V DC / 1.5 A maximum
Efficiency (average):	85%
Efficiency (at 10% load)	79%
Power loss:	< 75 mW
Line type:	2 x 1.5 to 2.5 mm^2 (rigid, multi-wire, flexible)
Protection type:	IP20
Protection class:	II
Operating temperature:	0 °C - +35 °C
Storage temperature:	-20 °C - +70 °C

Table 1: Technical data

5.2 Dimensional drawings

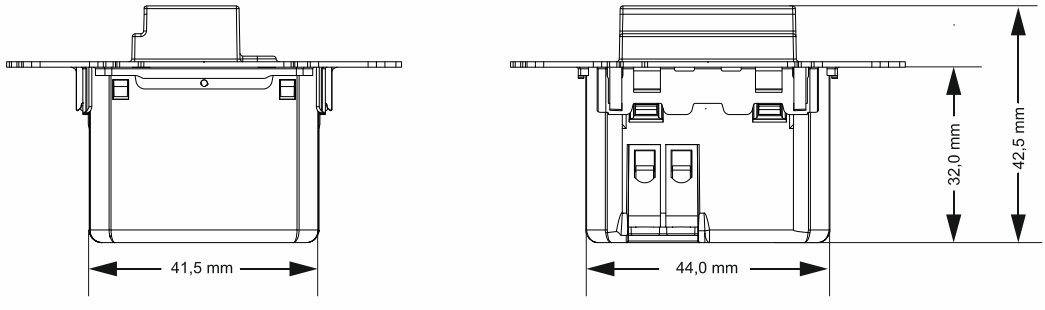

Fig. 1: Dimensions

Notice
All specifications are in mm.

6 Connection, installation / mounting

6.1 Requirements for the electrician

Danger - Electric voltage!

Install the device only if you have the necessary electrical engineering knowledge and experience.

- Incorrect installation endangers your life and that of the user of the electrical system.
- Incorrect installation can cause serious damage to property, e.g. due to fire.

The minimum necessary expert knowledge and requirements for the installation are as follows:

- Apply the "five safety rules" (DIN VDE 0105, EN 50110):
  1. Disconnect
  2. Secure against being re-connected
  3. Ensure there is no voltage
  4. Connect to earth and short-circuit
  5. Cover or barricade adjacent live parts.
- Use suitable personal protective clothing.
- Use only suitable tools and measuring devices.
- Check the type of supply network (TN system, IT system, TT system) to secure the following power supply conditions (classic connection to ground, protective earthing, necessary additional measures, etc.).

6.2 Mounting / dismantling

Caution! The device can sustain damage when coming into contact with hard objects!

The plastic parts of the device are sensitive.

– Pull the attachment off only with your hands.
– Do not lever parts off with screwdrivers or similar hard objects.

Notice

Not suitable for surface mounting.

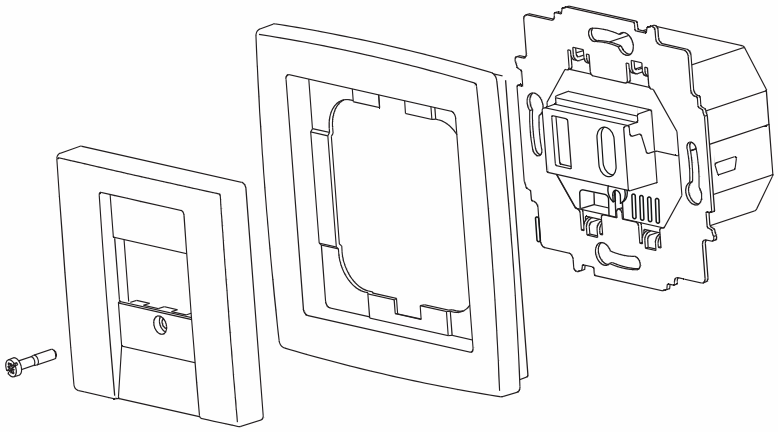

Fig. 2: Installation

The flush-mounted insert (FM) must only be installed in flush-mounted boxes according to DIN 49073 or suitable surface-mounted housings.

6.3 Electrical connection

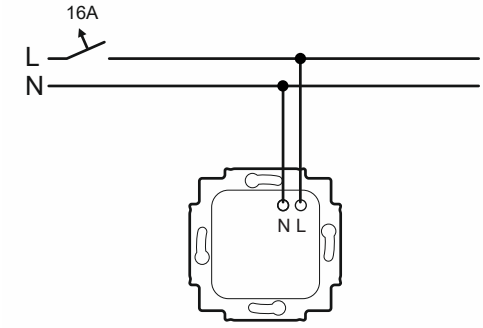

Fig. 3: Electrical connection

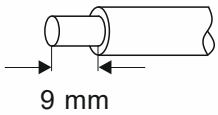

Fig. 4: Skinning length

Notice
The skinning length should be 9 mm.

7 Operation

7.1 Safety

Warning! - Reduction of service life

Do not connect a device to the battery charger that requires more charging load than is available from the charger. This can reduce the service life of the battery charger.

7.2 Charging behaviour

7.2.1 Introduction

Communication between the battery charger and the connected device is possible via the USB connection. This allows the charging current to be adjusted to the connected device. If several devices are connected, they adjust the respective charging current among themselves. This achieves an optimal charging result. If several devices are charged, this means that a certain device is charged very fast and slower on another occasion. This depends on the device it is charged with together.

Overviews about the charging capacity and the charging behaviour in different situations is available in the following.

For an overview about the many designations in the USB technology, see chapter 7.3 “USB glossary“ on page 17.

7.2.2 Overview of charging behaviour

The 6475 U has two charging sockets.

- USB connection type A
- USB connection type C

The 6475 U supports Qualcomm Quick charge 2.0, 3.0 and 4.0 on the USB-C connection.

18 watt charger 6475 U			
Charging at a connection		Simultaneous charging at both connections	
USB-A	USB-C	USB-A	USB-C
5 V / 3 A	5 V / 3 A 9 V / 2 A 12 V / 1.5 A	5 V / 1.5 A 5 V / < 0.25 A 5 V / 3 A	5 V / 1.5 A 5 V / 3 A 5 V / < 0.25 A

Table 2: Charging behaviour6475 U

Notice - Simultaneous charging at both connections

If the connected device does not respond to the protocols for the reduction of the charging current, this can, due to the integrated overload detection, lead to a cyclic restart of one or both USB connections.

7.2.3 Charging behaviour of several devices

Adding device

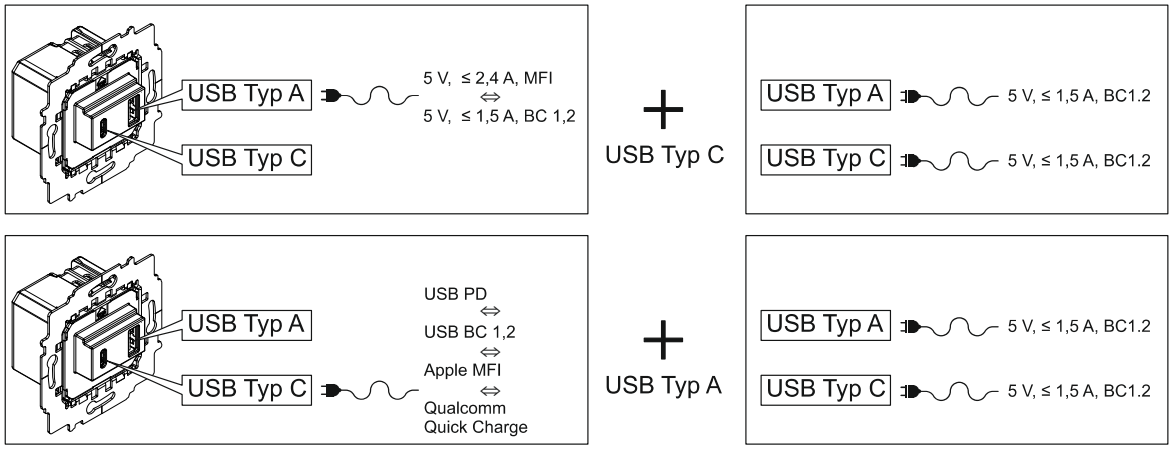

Fig. 5: A device is being charged. A second device is added.

Removing the device

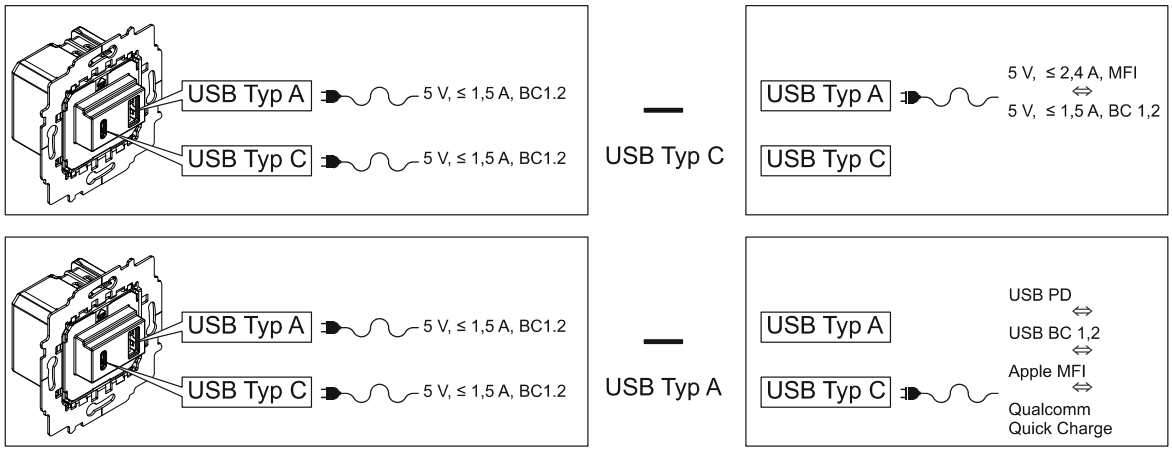

Fig. 6: Two devices are being charged. A device is removed.

Charging current of USB-A drops below 0.25 A

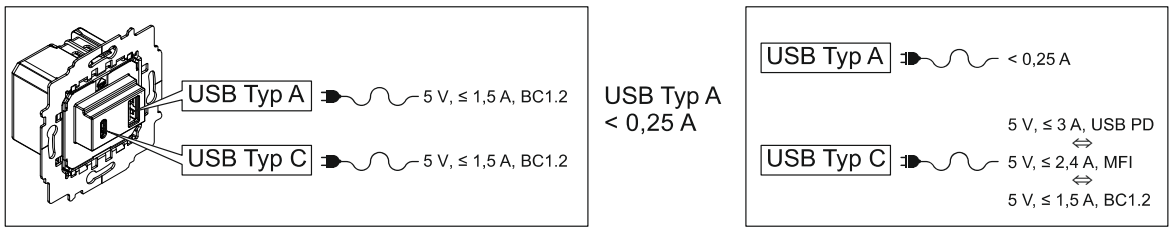

Fig. 7:Charging current of USB-A drops below 0.25 A

7.3 USB glossary

The collection of designations in the USB area has in the meantime become very extensive and can be confusing at first glance. In the following you will see a small simplified overview related to charging device 6475 U.

Type (plug design)	
The plug type describes the look of the plug and the technical options that can be implemented with it.	
USB-A	
USB-C	

Table 3: Type (plug design)

Plug standard with connection assignments (technology within the plug)	
The plug standard describes the maximum possible amperage.	
USB 1.0	Possible for type USB-A and USB-C. Charging current maximum of 0.1 A (0.5 W)
USB 2.0	Possible for type USB-A and USB-C. Charging current maximum of 0.5 A (2.5 W)
USB 3.0	Possible for type USB-A and USB-C. Charging current maximum of 0.9 A (4.5 W)
USB 3.1	Possible for type USB-A and USB-C. Charging current maximum of 0.9 A (4.5 W) without additional protocols

Table 4: Plug standard with connection assignments

Protocols/charging technology	
USB-BC 1.2	The battery charging technology can charge mobile devices with a higher current in contrast to the standard of 0.9 A. Charging currents of up to 1.5 W (7.5 W) are possible. Devices that are to be charged via this technology also require USB 3.1.
Power Delivery	With the PD charging technology the terminal device can be charged even faster and the charger supplies greater capacity for larger devices, e.g. for tablets. PD operates only in teamwork with USB type-C cables and USB type-C connections. The participating devices exchange information about the charging voltage and the amount of current that is to flow via the connection. This how the device to be charged is supplied with the ideal amount of current. This may require special cables with integrated chip. PD comprises five charging profiles for different applications. ▪ Profile1 – 5 / 2 – Corresponds to to the normal 10-watt chargers for smartphones and mobile phones – Conventional cable is sufficient ▪ Profile2 – Maximum 12 V, 18 W – Intended for power-hungry mobile phones and tablets – Special charging cable necessary

	▪ Profile 3, 4 and 5 (are not supported with this charger) – Maximum 20 V, 5 A (100 W) – Intended for notebooks and docking stations
Power Delivery 3.0	PD 3.0 has extended functions in contrast to PD 2.0, e.g. request of charging status. The capacity made available and the type of negotiation is the same for PD 3.0 and PD 2.0. Older mobile phones can therefore also be operated with modern chargers.
Qualcomm Quick Charge	Charging voltage and charging current adjust themselves to the battery to be charged. This makes the charging process especially efficient. The charging time is reduced.
Qualcomm Quick Charge 4.0	From version 4.0 compatible with USB-PD. The charging capacity made available is getting larger from version to version. The versions are downward compatible. Depending on which version the device to be loaded supports, the capacity of the corresponding Quick Charge Version is made available.

Table 5: Protocols/charging technology

Certifications	
MFi (Made for iPod/iPhone/iPad)	MFi designates a certification of accessories that is compatible with mobile Apple devices. ▪ Only MFi-conforming products guarantee faultless function of your devices.

Table 6: Certifications

8 Maintenance

8.1 Cleaning

Caution! - Risk of damaging the device!

- When spraying on cleaning agents, these can enter the device through crevices.
  - Do not spray cleaning agents directly onto the device.
- Aggressive cleaning agents can damage the surface of the device.
  - Never use caustic agents, abrasive agents or solvents.

Clean dirty devices with a soft dry cloth.

– If this is insufficient, the cloth can be moistened slightly with a soap solution.

9 Notes

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