FAST MOVING TECHNOLOGY

Rapid connection systems
Main catalog

Utilitiesline | Industrial connectors

EN

STÄUBLI ELECTRICAL CONNECTORS

Connections for Life

Stäubli, as the international technology leader, offers innovative mechatronics solutions in its four divisions: Electrical Connectors, Fluid Connectors, Robotics, and Textile. At Stäubli Electrical Connectors, we develop advanced connection solutions based on the reliable MULTILAM contact technology.

We create connections for life – and our customers are at the center of these connections. We are convinced that solid and stable partnerships directly contribute to our mutual success.

We take on the needs of our partners and deal with the most extraordinary challenges. As a result, we always create, sell and support reliable and long-lasting products for markets with the highest productivity and safety requirements in close cooperation with our customers.

Together for reliable and safe connections

We know that you entrust us with the functionality of your applications and we work hard to ensure this every single day. Thanks to our high level of expertise, our extensive experience and the multiple successful co-operation with our partners, numerous new developments have originated at Stäubli Electrical Connectors and subsequently have become worldwide standards. This includes our MC4 connector portfolio for which we are today the global market leader in photovoltaic. As the Stäubli original, the MC4 represents the result of our constant quest for innovation, quality and safety.

Further examples are the CombiTac modular connector system or the Quick Charging Connector (QCC) for automatic charging systems.

We ensure connections for life together with our long-standing customers in a wide range of industries from renewable energies, power transmission and distribution and E-mobility to industrial automation applications, railway and welding automation, test and measurement and medical devices.

Thus, developing reliable, efficient and safe solutions based on our proven MULTILAM contact technology, which guarantees a high service lifetime in addition to highly efficient power transmission.

Applications and advantages

Our FSA connector systems are used by power grid operators for connecting power generators to low-voltage installations up to 1000 V. Together with our industrial connectors, they are now considered the most flexible solution for temporary power transmission applications.

The design of our FSA rapid connection systems makes them suitable for most installations, regardless of the existing connection system and its configuration. In addition to shorter maintenance and intervention times and optimized availability of the power supply, the system also ensures greater operational reliability and lower maintenance costs.

Advantages of FSA systems:

- Safe connection to busbars
- Quick, reliable connection with low contact resistance
- Easy servicing and reduced maintenance costs
- High durability
- Suitable for use under European and Asian switchgear standards
- Optimal access to busbars
- Forces in contact area caused by cable weight are reduced
- Easy handling and use

Table of Contents

General Information

Color code

For items which are available in multiple colors, write the two-digit color code after the order number instead of the "*" character indicated in the catalog. If no color is specified in the order, black color coding will be delivered.

20	green/yellow	26	violet
21	black	27	brown
22	red	28	gray
23	blue	29	white
24	yellow	30	orange
25	green	31	pink

Changes/disclaimers

All data, illustrations and drawings in this catalog are the result of careful testing. They correspond to our experiences. Errors excepted. We also reserve the right to make changes for design and safety reasons. It is therefore advisable not to rely exclusively on the catalog data for designs that incorporate our components, but to consult us to ensure that you have access to the most recent data. We are happy to assist you.

Copyright

RoHS

European Directive 2011/65/EU incl. all related amendments (e.g. Delegated Directive (EU) 2015/863)
For further information please follow the link below
www.staubli.com/de/en/electrical-connectors/downloads/certificates/material-compliance.html

Symbols

Accessories or special tools are used with this product

Please read user information document i000 before use

Assembly instructions MA000 are available for this product

INTRODUCTION

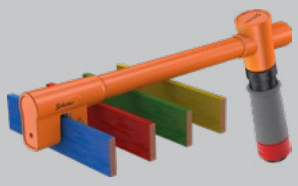
Rapid connection systems

With a high robustness and extended safety features, rapid connection systems from Stäubli are the ideal solution for connection to copper busbars.
Thanks to their clever design and ease of handling, they offer reliable performance for continuous operation under harsh conditions. A range of different versions lets you select the rated current, mounting type and connection compatibility to define the optimal solution for every application.

Properties:

- Narrow clamp dimensions
- Pluggable connections touch-protected when unmated
- Connection rotates through 360° to reduce mechanical strain on busbars
- Color coding
- Replaceable contact elements for easy servicing
- Wide range of accessories (torque wrench, transport case, protective cover, etc.)

Overview			
	Flat bar clamp FSA20S	**Flat bar clamp FSA20K**	
Primary market	Europe	Europe	
Rated voltage	1000 V	1000 V	
Rated current	200 A	450 A	
Connection compatibility	For bare or slightly oxidized vertical copper busbars	For bare vertical copper busbars	
Version/Model	Factory pre-assembled cable version with various connection options	Version available with integrated 16BL/16BV pluggable connector or crimp connection for on-site cable assembly	
Intermateability	Compatible with 10BV and 16BL connector systems	Compatible with 16BL and 16BV connector systems	
Coding	Color coding and mechanical coding	Color coding	
Maintenance	Replaceable contact pin	Exchangeable block	
Features	• Short body, exceptionally narrow head (22 mm wide, 17 mm long) • Robust design	• Short and long versions (FSA20K-K, FSA20K-L) • Narrow head (22 mm wide, 35 mm long)	



Flat bar clamp FSA10K
China
1000 V
530 A
For bare or insulated horizontal copper busbars
Version with integrated 16BL or 16BV connector
Compatible with 16BL and 16BL connector systems
Color coding
Replaceable contact claw
• Long version • Narrow head (36 mm) • Claw-type contact element to penetrate busbars insulated with powder coating, tape or heat-shrink tubing

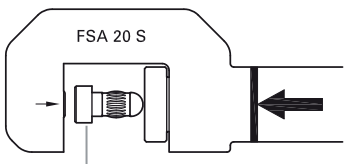
RAPID CONNECTION SYSTEM FSA20S

For applications up to 200 A

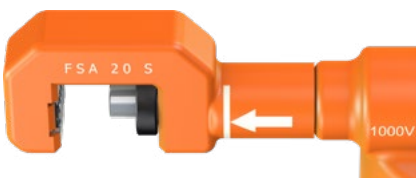
For fast, safe connection to busbars in power distribution systems.
The FSA20S is a space-saving connection solution that's manufactured with a factory pre-assembled connection cable.
This version is ideal for closed systems designed for very tight spaces and operating at a maximum of 200 A. The contact pin can be used to penetrate slightly oxidized busbars, and can be replaced on-site by the user.

Product features

Rotating connection



Contact pin



Benefits for customers:

Easy servicing, saves time and money:
- Users can replace the contact pin themselves
- Lower maintenance costs
- Long lifespan of the FSA20S

Optimized handling and safety:
- Compact design, narrow head
- Rotates through 360°
- Easy access in confined spaces
- Special tool ensures safe installation and removal of flat bar clamps

Compatibility and flexibility:
- 10BV and 16BV plug connections
- Cable lug connection
- Special versions as per customer specifications

Technical data[1)]	
Rated current	200 A Derating diagram page 32
Rated voltage	1000 V
Short-circuit current	1.75 kA, 1 s
Peak withstand current	4.5 kA, 10 ms
Rated impulse voltage	8 kV
Overvoltage category/Pollution degree (n)	CAT III/3
Insulation coordination	8 kV/3
Insulation material	PVC/POM
Clamping range/max. thickness of busbar	3 mm – 20 mm
Connection type	Fixed cable connection with multiple termination options (see page 10)
Mating cycles	1000–5000 depending on application – further use possible after contact pin replacement
Ambient temperature	-15...+80 °C
Color marking	with colored tape
Based on standards	BG: GS-ET-28 IEC 60664-1:2007, IEC 60529:2013, IEC 61984:2008, IEC 60512-5-2:2002

[1)] Technical data applies only to the flat bar clamp. General specifications may be restricted depending on choice of cable, see derating diagrams on page 32

Connection variants for FSA20S

	Plug combination		
Connection type	**FSA20S/CS10...** **KBT10BV-AX/M...** 	**FSA20S/CS16...** **KBT16BV-NS/M40-50...** 	**FSA20S/CP16...** **KST16BV-NS/M40-50...** 
Intermateable with	 KST10BV-AX... ID/S10BV-C... IS10BV-C	 KST16BV-NS/M... ID/S16BV-NS IS16BV-NS	 KBT16BV-NS/M... ID/B16BV-NS-A IB16BV-NS-A
	FSA20S/CL... **K-SCH...** 	**FSA20S/C...** 	
	Cable lug[1)]	As per customer specifications[1)] see request/order form, page 23	

Note:

- Standard length 150 cm, other lengths by request
- For more information about the “KST” connection type, see catalog “Round connectors, single-pole, insulated, Ø 10 – 21 mm”

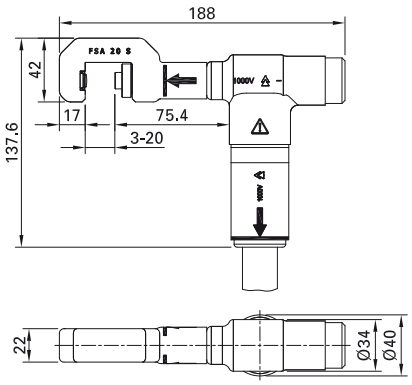
[1)] Safety must be ensured by the final product

FSA20S/C...

With pre-assembled cable up to 200 A

The FSA20S offers multiple connection options for a high degree of flexibility in configuring it to the needs of each application. Standard versions come with 1.5 m cable length; special versions can also be manufactured according to customer specifications (see order form on page 23).

FSA20S



Order No.	Type	Connection type	Cable	Conductor cross-section	Rated voltage	* Color
				mm²	V	
12.0317C...-150* [1]	FSA20S/CS10-H35	KBT10BV-AX/M25/25-35-C...	H07RN-F	35	450	
12.0314C...-150* [1]	FSA20S/CS10-P50	KBT10BV-AX/M25/50-70-C...	Purwil	50	1000	
12.0315C...-150* [1]	FSA20S/CS10-H50	KBT10BV-AX/M32/50-70-C...	H07RN-F	50	450	
12.0318-150*	FSA20S/CS16-P50	KBT16BV-NS/M40-50	Purwil	50	1000	
12.0319-150*	FSA20S/CP16-P50	KST16BV-NS/M40-50	Purwil	50	1000	
12.0320-150*	FSA20S/CS16-H50	KBT16BV-NS/M40-50H	H07RN-F	50	450	
12.0321-150*	FSA20S/CP16-H50	KST16BV-NS/M40-50H	H07RN-F	50	450	
12.0322-150*	FSA20S/CL-P50	K-SCH50-12	Purwil	50	1000[2]	
12.0323-150*	FSA20S/CL-H50	K-SCH50-12/H	H07RN-F	50	450[2]	
12.0325-150*	FSA20S/CL-H35	K-SCH35-10/H	H07RN-F	35	450[2]	
12.0313-150*	FSA20S/C-H35		H07RN-F	35	450[2]	
12.0310-150*	FSA20S/C-P50		Purwil	50	1000[2]	
12.0311-150*	FSA20S/C-H50		H07RN-F	50	450[2]	

20 21 22 23 24
25 26 27 28 29

Accessories

12.0301	FSA20S-WZ	Tool (required)	Page 12
12.0340	FSA20S-KB-10,8-M MT	Contact bolt	Page 12
12.0300	FSA20S-KO/C20	Transport case	Page 13

* Please specify the color code
[1] Add code number (C1 – C5). Standard code is C1
[2] Safety must be ensured by the final product

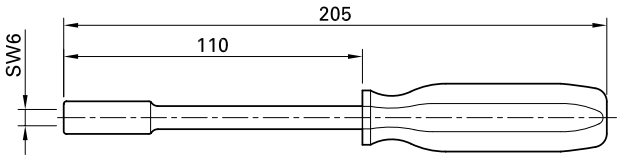
User information i204

www.staubli.com/electrical

ACCESSORIES FOR FSA20S

Tool

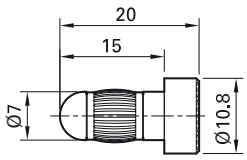
Safety regulations for working on live equipment must be observed when clamping the FSA onto busbars. To ensure a reliable contact, only the special tool FSA20S-WZ may be used to tighten the FSA.



Order No.	Type	Suitable for
12.0301	FSA20S-WZ	FSA20S

Replaceable contact element

The FSA20S has a contact bolt that can penetrate light to moderate oxide layers on busbars.
The contact bolt is therefore subject to a certain degree of wear and must be replaced from time to time. (Users can do this replacement themselves.)
Please note: The FSA must be completely disconnected from the power supply before replacing the contact bolt!
Grasp the head of the contact bolt and pull it out with a slight twisting motion. Insert new contact bolt and push it into place.



Order No.	Type	Description
12.0340	FSA20S-KB-10,8-M MT	Contact bolt

Transport case

Stable and convenient case for transport and compact storage of FSA20S and accessories. Space for 4 FSA20S units with standard cable and other useful test accessories.

Note:

- Case is delivered with no contents

Order No.	Type	Dimensions
		mm
12.0300	FSA20S-KO/C20	475 × 240 × 190

RAPID CONNECTION SYSTEMS FSA20K

For applications up to 450 A

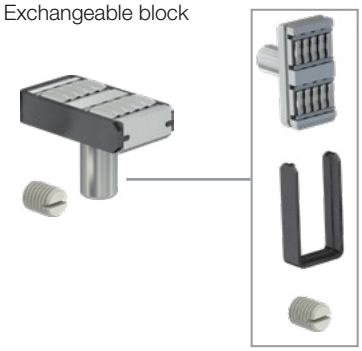
The FSA20K rapid connection system is a robust model that is suitable for frequent use up to 450 A. FSA20K is used for fast, safe connection to copper busbars in power distribution systems.
The compact clamp design allows for connection even to connection points in tight spaces, making it the ideal solution for EU systems.
In the event of wear or damage, users can replace the insulated exchangeable block with integrated Stäubli MULTILAM louver technology very easily by themselves.
The FSA20K is available with a range of connection options (16BL, 16BV, crimp connection), depending on the system configuration.

FSA20K/16BL

Rapid, easy connection with 16BL round connector system

16BL-CS

Product features



Rapid, safe connection of busbars

Benefits for customers:

Service-friendly, saves time and money

- Users can replace exchangeable block themselves
- Easy replacement of insulation on exchangeable block and guide block
- Lower maintenance costs
- Long lifespan of the FSA20K

Optimized handling and safety

- Compact design, narrow head
- 360° rotation reduces strain caused by cable weight
- Easy access in confined spaces
- Perfectly tailored tapping right away
- Special tool ensures safe installation and removal of FSA20K/16BL
- Short and long versions for all connection types

Simple, compatible, and practical

- Connects with 16BL and 16BV connector systems
- Compatible with all mechanical codings (C1 – C7) of the 16BL
- Convenient transport case available for a complete set (space for four FSAs and one tool).

Technical data[1)]			
	FSA20K/16BL	FSA20K/16BV	Crimp connection
Rated current	450 A Derating diagram page 32		
Rated voltage	1000 V		
Short-circuit current	7.5 kA, 1 s		
Peak withstand current	22 kA, 10 ms		
Rated impulse voltage	12 kV	8 kV	
Overvoltage category/Pollution degree (n)	CAT III/3		
Insulation coordination	12 kV/3	8 kV/3	
Insulation material	PVC/POM		
Clamping range/max. thickness of busbar	Up to 20 mm		
Length options: short...-K-WB/... long ...-L-WB/...	257.5 mm 330 mm		
Connection type	16BL connector	16BV connector	Crimp connection
Mating cycles	1000 – 5000 depending on application – Further use possible after replacement of exchangeable block		
Ambient temperature	-15...+80 °C		-15...+80°C
Color coding	integrated in plug		Black
Based on standards	BG: GS-ET-28 IEC 60664:2007, IEC 60529:2013, IEC 61984:2008, IEC 60512-5-2:2002		

[1)] Technical data applies only to the flat bar clamp. General specifications may be restricted depending on choice of cable, see derating diagrams on page 32

Connection variants for FSA20K

Plug combination		
FSA20K-...-WB/16BL-CP 	**FSA20K-...-WB/IS16BV-NS** 	**FSA20K-...-WB/IB16BV-NS** 
16BL-CS 	**KBT16BV-NS/M...** 	**KST16BV-NS/M...** 
FSA20K-...-WB/P... 	**FSA20K-...-WB/P...H** 	
For Class 6 cables (e.g. Purwil)	For Class 5 cables (e.g. H07RN-F)	

Note:

For more information about the “KST” connection type, see catalog “Round connectors, single-pole, insulated, Ø 10 – 21 mm”

FSA20K-...-WB/...

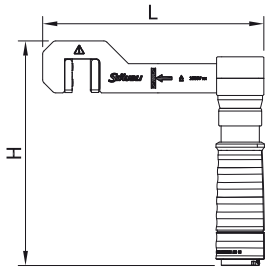
With integrated connector

FSA20K-...-WB/... rapid connection systems come standard with an integrated color-coded plug connection and ready for immediate use, so they're easy and intuitive to use with an existing 16BL or 16BV connector system.

Benefits:

- Ready for immediate use
- Space-saving design
- Excellent safety features
- Compatible with 16BL and 16BV connector systems

FSA20K-...-WB/16BL-CP



Order No.	Type	Suitable for	Height H	Length L	* Color
Short version					
12.1332-*	FSA20K-K-WB/16BL-CP	16BL-CS	243 mm	257.5 mm	20 21 24 25 26
12.1327-*	FSA20K-K-WB/IS16BV-NS	KBT16BV-NS/M...	178 mm		
12.1326-*	FSA20K-K-WB/IB16BV-NS	KST16BV-NS/M...	187 mm		
Long version					
12.1333-*	FSA20K-L-WB/16BL-CP	16BL-CS	243 mm	330 mm	20 21 24 25 26
12.1329-*	FSA20K-L-WB/IS16BV-NS	KBT16BV-NS/M...	178 mm		
12.1328-*	FSA20K-L-WB/IB16BV-NS	KST16BV-NS/M...	187 mm		

Accessories

12.0501	FSA20-WZ	Torque wrench	Page 20
12.0521	FSA20K-TK	Transport case (empty)	Page 20
12.0502	FSA20-SHZ-KP	Protective cover	Page 21
15.5882	16BL-CP/PC	Protective cover	Page 21
15.5268	DBT-KBT16-NS	Protective cover	Page 21
15.5272	DST16-NS	Protective cover	Page 21
12.1330	FSA20K-WB SET	Exchangeable block set (including insulation and M8x100 set screw)	Page 22
12.1331	FSA20/I-WB SET	Insulation (10-piece set)	Page 22

Available by request 22 23 27 28 29 30 31

MA **Assembly instructions MA090**
www.staubli.com/electrical

User information i400
www.staubli.com/electrical

* Please specify the color code

FSA20K-...-WB/P...

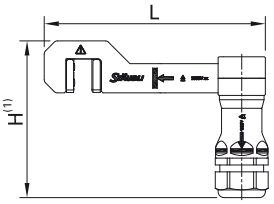
With crimp connection

FSA20K-...-WB/P rapid connection systems are designed for connection to a cable with an appropriate crimping sleeve. Installation can be done at the user's site. For improved safety and convenience, customer-specific pre-assembled solutions can also be manufactured at our factory (see request form, page 23).

Benefits for customers:

- Flexibility
- Optimal price/performance ratio

FSA20K-...-WB/P...



Short version			Long version				
Order No.	Type	Length L	Order No.	Type	Length L	Conductor cross-section	Color
		mm			mm	mm²	
For Class 6 cables (e.g. Purwil)							
12.1300	FSA20K-K-WB/P50	257.5	**12.1306**	FSA20K-L-WB/P50	330	50	21
12.1301	FSA20K-K-WB/P70		**12.1307**	FSA20K-L-WB/P70		70	
12.1302	FSA20K-K-WB/P95		**12.1308**	FSA20K-L-WB/P95		95	
12.1303	FSA20K-K-WB/P120		**12.1309**	FSA20K-L-WB/P120		120	
12.1304	FSA20K-K-WB/P150		**12.1310**	FSA20K-L-WB/P150		150	
12.1305	FSA20K-K-WB/P185		**12.1311**	FSA20K-L-WB/P185		185	
For Class 5 cables (e.g. H07RN-F)							
12.1312	FSA20K-K-WB/P50H	257.5	**12.1319**	FSA20K-L-WB/P50H	330	50	21
12.1313	FSA20K-K-WB/P70H		**12.1320**	FSA20K-L-WB/P70H		70	
12.1314	FSA20K-K-WB/P95H		**12.1321**	FSA20K-L-WB/P95H		95	
12.1315	FSA20K-K-WB/P120H		**12.1322**	FSA20K-L-WB/P120H		120	
12.1316	FSA20K-K-WB/P150H		**12.1323**	FSA20K-L-WB/P150H		150	
12.1317	FSA20K-K-WB/P185H		**12.1324**	FSA20K-L-WB/P185H		185	
12.1318	FSA20K-K-WB/P240H		**12.1325**	FSA20K-L-WB/P240H		240	
Accessories							
12.0501	FSA20-WZ	Torque wrench					Page 20
12.0521	FSA20K-TK	Transport case (empty)					Page 20
12.0502	FSA20-SHZ-KP	Protective cover					Page 21
12.1330	FSA20K-WB SET	Exchangeable block set (including insulation and M8x100 set screw)					Page 22
12.1331	FSA20/I-WB SET	Insulation (10-piece set)					Page 22

MA

Montageanleitung MA090, MA093

www.staubli.com/electrical

User information i400

www.staubli.com/electrical

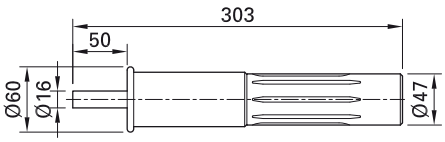
[1] 152 mm to 164 mm, depending on version

ACCESSORIES FOR FSA20K

Torque wrench

The tool meets the requirements of the EN 60900 standard, and comes standard with the appropriate preset torque value to ensure safe and accurate installation and removal of flat bar clamps.

FSA20-WZ



Order No.	Type	Suitable for
12.0501	FSA20-WZ	FSA10K, FSA20K

Transport case

Case with pre-cut foam insert for transport and storage of 4 FSA20... pluggable flat bar clamps. The case also contains a plastic box for test accessories.

Note:

- Case is delivered with no contents

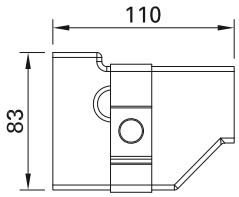
FSA20K-TK

Order No.	Type
12.0521	FSA20K-TK

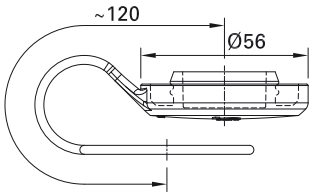
Protective cover

To protect the FSA20K from dust, moisture penetration, etc., the use of protective covers for the clamp and connectors is recommended. This helps to further extend the system's lifespan.

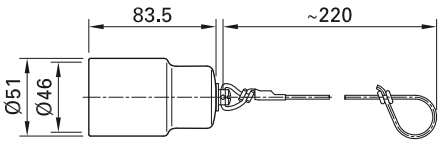
FSA20-SHZ-KP



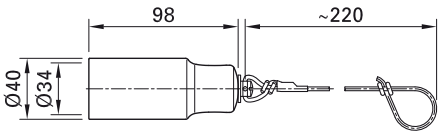
16BL-CP/PC



DBT-KBT16-NS



DST16-NS



Order No.	Type	Suitable for	Page
12.0502	FSA20-SHZ-KP	Clamp, FSA20K...	18
15.5882	16BL-CP/PC	FSA20K.../16BL-CP	18
15.5268	DBT-KBT16-NS	FSA20K-K-WB/IB16BV-NS	18
15.5272	DST16-NS	FSA20K-K-WB/IS16BV-NS	18

Exchangeable block set

For on-site replacement by user. The exchangeable block helps to lower maintenance costs and ensure continued use of the overall system.

FSA20K-WB SET

FSA20/I-WB SET

Order No.	Type	Description
12.1330	FSA20K-WB SET	Exchangeable block set (including insulation and M8 x100 set screw)
12.1331	FSA20/I-WB SET	Insulation set (10-piece set)

MA

Assembly instructions MA090

www.staubli.com/electrical

Related Stäubli catalog

Single-pole round connectors, insulated, up to 1,000 A

Ideal for high-voltage test equipment and emergency power supply

Request/Order form

☐	Quantity	☐ Order	☐ Price inquiry	Reference

		FSA20S	FSA20K...-WB/P	
			☐ short version	☐ long version
	**Length**	☐ 150 cm ☐ other	☐ 150 cm	☐ other
	Conductor cross-section	☐ 35 mm² ☐ 50 mm²	☐ 50 mm² ☐ 70 mm² ☐ 95 mm² ☐ 120 mm²	☐ 150 mm² ☐ 185 mm² ☐ 240 mm²
	Insulation material	☐ H07RN-F ☐ Purwil ☐ other	☐ H07RN-F ☐ Purwil	☐ other
	**Connection**	☐ KBT10BV... ☐ KST10BV... ☐ KBT16BV-NS/M... ☐ KST16BV-NS/M... ☐ cable lug Ø ☐ mm ☐ free cable end	☐ KBT10BV... (up to 70 mm²) ☐ KST10BV... (up to 70 mm²) ☐ 16BL-CS (from 70 mm²) ☐ 16BL-CP (from 70 mm²) ☐ KBT16BV-NS/M.. ☐ KST16BV-NS/M... ☐ cable lug Ø ☐ mm ☐ free cable end	
	Color coding	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ 20 21 22 23 24 25 26 27 28 29 30 31	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ 20 21 22 23 24 25 26 27 28 29 30 31	
	Mechanical coding	☐ 10BV: ☐ C1 ☐ C2 ☐ C3 ☐ C4 ☐ C5 ☐ 16BV: ☐ C1 ☐ C2 ☐ C3 ☐ C4 ☐ C5 ☐ C6	☐ 10BV: ☐ C1 ☐ C2 ☐ C3 ☐ C4 ☐ C5 ☐ 16BL: ☐ C1 ☐ C2 ☐ C3 ☐ C4 ☐ C5 ☐ C6 ☐ C7	
	Protective cover	☐ Yes ☐ no	☐ Yes	☐ no

Sender

Company _____ Tel. _____

Name _____ Fax _____

Department _____ E-Mail _____

Address _____ Date _____

_____ Signature _____

_____ Miscellaneous _____

www

Interactive form: www.staubli.com/electrical > Downloads > Online Forms

RAPID CONNECTION SYSTEM FSA10K

For parallel and insulated busbars up to 530 A

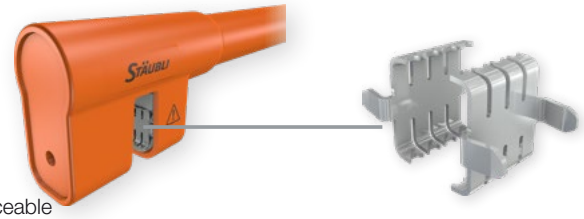
The FSA10K was developed especially for the Asian market. Its optimal design and small clamp dimensions allow for use between parallel busbars. These flat bar clamps have contact claws that can penetrate busbars' outer insulation. The claws can be replaced by the user on-site, reducing maintenance costs. The integrated plug is compatible with 16B... plug connector systems for excellent safety and easy handling.

Specific solution for:

- Parallel busbars
- Busbars insulated with powder coating, tape or heat-shrink tubing

FSA10K/16BL

Product features:



Patented replaceable contact claw

Extra-narrow head and long construction.
Connects with 16BL or 16BV systems.

360° handle rotation.

Benefits for customers:

Easy servicing and time savings

- Penetrates insulated or powder-coated busbars
- Contact elements are easy to replace in case of damage or wear

Maximum flexibility

- For connecting multiple busbars
- Easy access in confined spaces
- Suitable for use with single-pole high-current connectors

Easy handling:

- Allows for optimal access
- Reduces forces at contact area

Compatibility with 16BL system offers increased user safety:

- Color coding
- 45° bayonet lock
- Locking pin prevents accidental unplugging

Rapid, safe mounting on busbars

A torque limiter is used to safely install the FSA10K and remove it from busbars.

Technical data[1]		
	FSA10K/16BL	**FSA10K/16BV**
Rated current	530 A	
Rated voltage	1000 V	
Short-circuit current	12 kA, 1 s; 10 kA, 3 s; 9 kA, 4 s	12 kA, 1 s; 10 kA, 3 s
Rated peak withstand current	30 kA, 10 ms	22 kA
Rated impulse voltage	12 kV	8 kV
Overvoltage category/Pollution degree	CAT III/3	
Ambient temperature range	-40°C...+80°C	
Clamping range	2 mm – 10 mm	
Thickness of busbar	5 mm[2] – 10 mm	
Required contact area on each side of the busbar	40 mm x 35 mm	
Type of termination	Plug connection 16BL	Socket connection 16BV
Length	500 mm	
For bare or insulated busbars Max. busbar insulation: – Powder-coating thickness – Insulating tape – Heat-shrink tubing	 0.15 mm 0.2 mm 1 mm	
Operating cycles	>1000, depending on conditions (replaceable contact claw)	

MA

Montageanleitung MA400, MA407

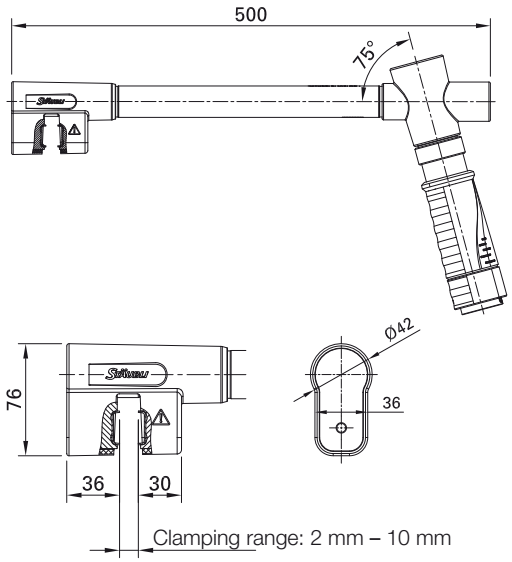
www.staubli.com/electrical

[1] Technical data applies only to the connector. General specifications may be restricted depending on choice of cable, see derating diagrams on page 46

[2] The busbars need to be supported adequately to prevent twisting.

For parallel and insulated busbars

FSA10K/... rapid connection systems are designed for safe connection to parallel busbars, specifically in the Asian market. FSA10K/... rapid connection systems come standard with an integrated color-coded plug connection and ready for immediate use, so they're easy and intuitive to use with an existing 16BL or 16BV connector system.



Order No.	Type	Description	Suitable for	*Colors
12.1278-*	FSA10K/16BL-CP-SET	Rapid connection system with integrated 16BL plug	16BL-CS	22 23 24 25 [1]
12.1274-*	FSA10K/IB16BV-SET	Rapid connection system with integrated 16BV socket	KST16BV	21 22 23 24 25 [1]

Accessories

			Suitable for
12.0501	FSA20-WZ	Torque wrench tool, 10 N m	FSA10K/16B...
12.1275	K-F-FSA10K CONTACT CLAW AG-SET	Contact claw set (1 pair)	FSA10K/16B...
15.5882	16BL-CP/PC	Protective cover to protect the connectors from dust and water when unmated	FSA10K/16BL...
15.5268	DBT-KBT16NS	Protective cover to protect the connectors from dust and water when unmated	FSA10K/16BV...
12.1279	FSA10K/16BL-TC	Transport case with trolley, empty, suited for 4 × FSA10K/16BL + 1 × FSA20-WZ	FSA10K/16BL...
12.1276	FSA10K-TC	Transport case, empty suited for 4 x FSA10K/16BV + 1 x FSA20-WZ	FSA10K/16BV...

MA

Montageanleitung MA400, MA407

www.staubli.com/electrical

* Add the desired color code

[1] Additional colors upon request

CRIMPING

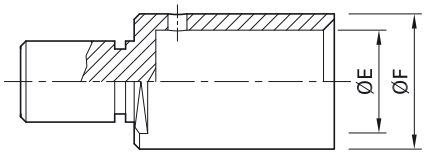
Tips for crimping with crimping sleeves

Stäubli recommends ELPRESS hexagonal crimping. The dimensions of the crimping sleeves, and the crimping inserts supplied by ELPRESS, are designed for crimping Class 6[1] flexible conductors (Purwil).

In response to the increased use of Class 5[1] conductors with reduced flexibility and therefore a smaller conductor diameter (e.g. H07RN-F), a new range of connectors with a crimping sleeve designed for use with these conductors has been added to our product range. The new crimping sleeves guarantee a perfect connection in terms of both contact resistance and pull-out strength.

Crimping sleeve

Material: CU-ETP, Ag



Order No.	Plug type	Conductor cross-section	Inside Ø E	Outside Ø F	Crimping pliers	Order No. – Crimping pliers	Crimping insert	Order No. – Crimping insert	MA Assembly instructions
		mm²	mm	mm					
For flexible Class 6[1] cables (e.g. Purwil)									
12.1300	FSA20K-K-WB/P50	50	11	14.5	M-PZ-T2600	**18.3710**	TB11-14,5	**18.3713**	MA226
12.1301	FSA20K-K-WB/P70	70	13	17	M-PZ-T2600	**18.3710**	TB8-17[3]	**18.3711**	
12.1302	FSA20K-K-WB/P95	95	15	20	M-PZ-T2600	**18.3710**	TB7-20[3]	**18.3714**	
12.1303	FSA20K-K-WB/P120	120	17	22	V1311C[2]		B22 (V1330)		MA069
12.1304	FSA20K-K-WB/P150	150	19	25	V1311C[2]		B25 (V1330)		
12.1305	FSA20K-K-WB/P185	185	21	27	V1311C[2]		13CB27[3]		
For flexible Class 5[1] cables (e.g. H07RN-F)									
12.1312	FSA20K-K-WB/P50H	50	10	14	M-PZ-T2600	**18.3710**	TB12-14	[2]	MA226
12.1313	FSA20K-K-WB/P70H	70	12	16	M-PZ-T2600	**18.3710**	TB10-16	[2]	
12.1314	FSA20K-K-WB/P95H	95	13.5	18	M-PZ-T2600	**18.3710**	TB8-18	[2]	
12.1315	FSA20K-K-WB/P120H	120	15	19	V1311C[2]		B19		
12.1316	FSA20K-K-WB/P150H	150	17	22	V1311C[2]		B22 (V1330)		MA069
12.1317	FSA20K-K-WB/P185H	185	19	24	V1311C[2]		13CB24[3]		
12.1318	FSA20K-K-WB/P240H	240	21	26	V1311C[2]		13CB26		

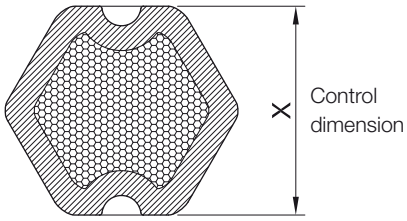
M-PZ-T2600

V1311C

[1] In accordance with IEC 60228:2004
[2] Not delivered by Stäubli
[3] 2 crimps required

Evaluating crimping results

The deformation of the crimping sleeve can be used to evaluate whether crimping was performed correctly with the tool. Use a caliper to measure the dimension X across the hex flats where the crimp die has made an impression (see diagram below). The measured dimension X should match the control dimension in the table.



Conductor cross-section	Crimping pliers	Order No. – Crimping pliers	Crimping insert	Order No. – Crimping insert	Control dimension X
mm^2					mm
For flexible Class 6[1] cables					
50	M-PZ-T2600	**18.3710**	TB11-14,5	**18.3713**	11.4
70	M-PZ-T2600	**18.3710**	TB8-17	**18.3711**	13.4
95	M-PZ-T2600	**18.3710**	TB7-20	**18.3714**	15.8
120	V1311C[2]		B22 (V1330)		16.3
150	V1311C[2]		B25 (V1330)		20.3
185	V1311C[2]		13CB27[3]		20.5
For flexible Class 5[1] cables					
50	M-PZ-T2600	**18.3710**	TB12-14	[2]	11.6
70	M-PZ-T2600	**18.3710**	TB10-16	[2]	13.2
95	M-PZ-T2600	**18.3710**	TB8-18	[2]	14.0
120	V1311C[2]		B19		15.4
150	V1311C[2]		B22 (V1330)		16.3
185	V1311C[2]		13CB24[3]		17.7
240	V1311C[2]		13CB26		19.5

[1] In accordance with IEC 60228:2004
[2] Not delivered by Stäubli
[3] 2 crimps required

MA

Assembly instructions MA077

www.staubli.com/electrical

ANHANG

Technical notes

MULTILAM

For a technical description of electrical contacts with MULTILAM, see our catalog “MULTILAM – Technical overview”.

Rated current (IEC 61984:2008)

Current value determined by Stäubli that the connector can conduct continuously and simultaneously through all its contacts connected to the largest specified conductors, at an ambient temperature of 40 °C, without exceeding the upper temperature limit.

Rated voltage (IEC 61984:2008)

For connectors, the voltage determined by Stäubli to which operating and performance characteristics refer.

Note: A connector may have more than one rated voltage value.

Contact resistance

is the resistance occurring at the point where two contact surfaces touch. Its value is calculated using the measured voltage drop at the rated current.

The value specified in the catalog refers to contact resistance in new condition.

Test voltage

The voltage that a connector can withstand under the determined conditions without breakdown or flashover.

Peak withstand current

As defined by IEC 60909:2016.

Insulation coordination

according to IEC 60664-1:2007. The values in the tables indicate the rated impulse voltage in kV and the degree of pollution.

Used plastics

Initials	Material designation	Temperature °C
PA	Polyamide	–40...+80
POM	Polyoxymethylene	–40...+100
PVC	Polyvinyl chloride	–15...+80
PC	Polycarbonate	–15...+80

Lubricants

Stäubli recommends the following lubricants:

Grease (general elec. contacts):

Klübertemp GR UT 18 – 100 g (73.1059)

Kontasynth BA100 Spray (73.1051)*

Grease in SF6 gas:

Barrierta I EL-102*

Assembly and sealing grease:

Barrierta I S-402 or Barrierta I MI-202*

Mating cycles

The max. mating frequency of the standard connector is 1000 to 5000 connections, depending on use conditions. This requires a thin lubricant film on the contacts before the first mating. Higher mating cycles put stress on the surface, the guide and the lubrication, and always necessitate special clarifications and special versions.

Crimp connection

For conductor connections, we recommend hexagonal crimping for our crimping sleeves. Our crimping sleeves are designed for highly flexible Cu conductors. For other types of conductors, special crimping sleeves are required. Stäubli recommends Elpress or similar brands for all highly-flexible Cu conductors.

Note: Stäubli also manufactures fully pre-assembled leads and cables!

* from Klüber Lubrication, Munich

Safety instructions

Basic protection against electric shock (IEC 61140:2016)

Hazardous live parts shall not be accessible, and accessible conductive parts shall not be dangerous when live:

- either under normal conditions (operation in intended use and in the absence of a fault),
- or under single-fault conditions, e.g. faulty basic insulation.

IEC 61984:2008 “Connectors – Safety requirements and tests”

This international standard applies to connectors with rated voltages from 50 V to 1000 V and rated currents up to 125 A per contact, for which either no detailed specification (DS) exists or for which the DS refers to this standard for safety aspects.

BG: GS-ET-28

Hand tools for working on live parts up to 1 kV AC and 1.5 kV DC.

IEC 60529:2013

Degrees of protection provided by enclosures (IP code)

Extracts from IEC 61984:2008 and remarks

1) Plug connectors

Contacts are not under voltage or under load/current when connecting or disconnecting. An electrical or mechanical interlock can prevent contacts from becoming live before the connector is plugged in or pulled out. An interlock can be obtained with a microswitch.

Protection against electric shock for unenclosed connectors

Protection is ensured by the customer in the final product in which the connectors are installed, or a safety extra-low voltage (SELV) shall be applied.

Protection against electric shock for enclosed connectors

- Mated condition: clearance and creepage distances are measured between live parts and the IEC probe with a test force of 20 N.
- Unmated condition, contact openings: clearance and creepage distances are considered.

For a plug connector with breaking capacity, clearance and creepage distances are measured through the openings between the live parts and the plane of the mating face.

2) Plug-in devices

When connecting or disconnecting, contacts are under voltage only; however, contacts are not under load, and carry no current. Plug-in devices must have the stated breaking capacity or must be so designed that they can only be connected and disconnected in the absence of load (current). This can be achieved by means of an interlock, e.g. a microswitch. A microswitch can be installed on the fixed part of the plug connector.

- Mated condition: clearance and creepage distances are measured between live parts and the IEC probe.
- Unmated condition: contact openings: clearance and creepage distances are measured between live parts and the plane of the mating face. Does not apply to the male part of the connector.

3) Connector with breaking capacity

(CBC). Contacts are under voltage and current (load) flows through the contacts when connecting or disconnecting. Stäubli connectors are not suitable for connection or disconnection under load. No breaking capacity can be specified.

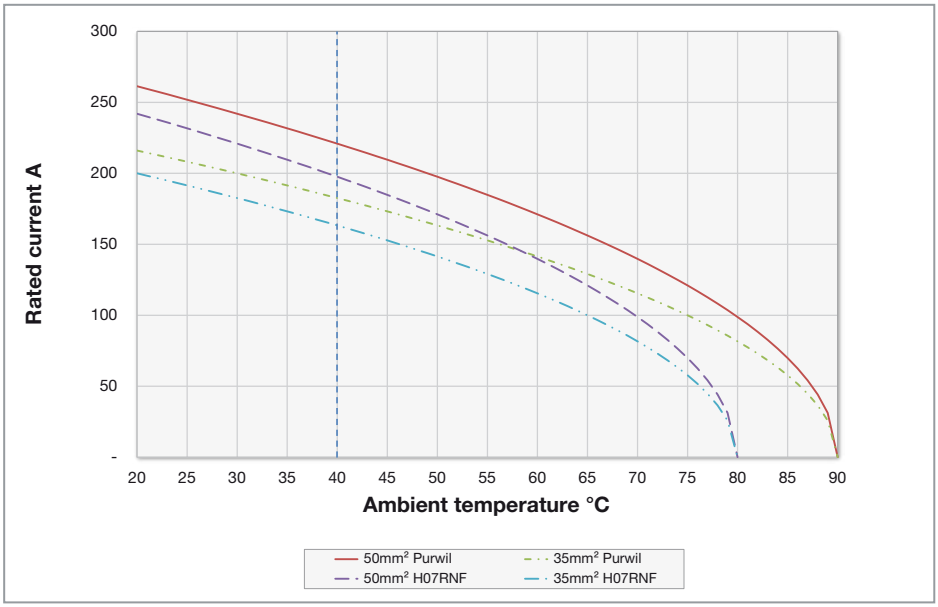
Derating diagrams

Per IEC 60512-5-2:2002

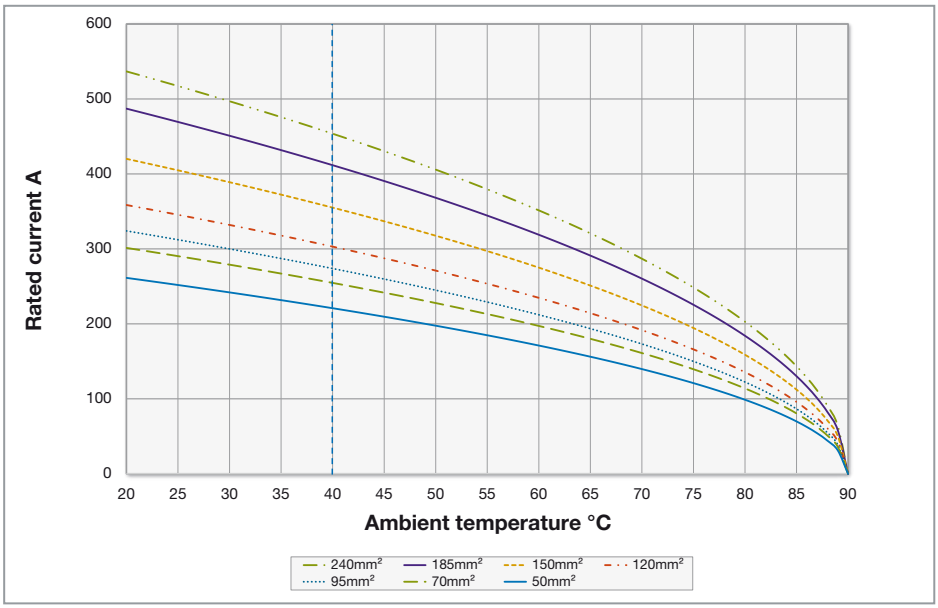
The diagrams show the current-carrying capacity values applicable for use at different ambient temperatures. A reduction factor of 0.9 was used as a basis.

Note:
The indicated values apply for cables with a defined max. operating temperature (e.g. 90°C for FSA20S and FSA20K). If cables with a lower operating temperature are used, the currents must be reduced accordingly.

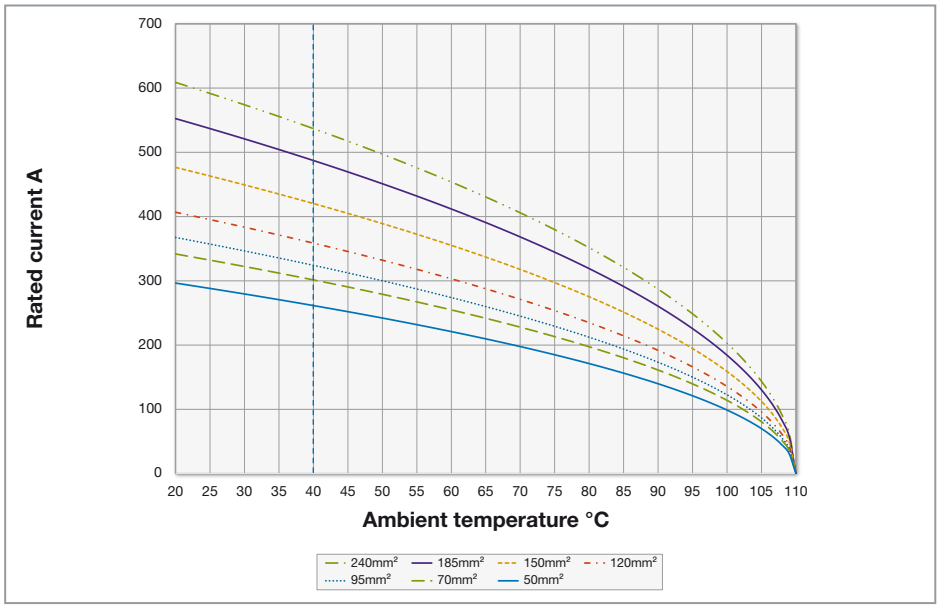
Rapid connection system FSA20S



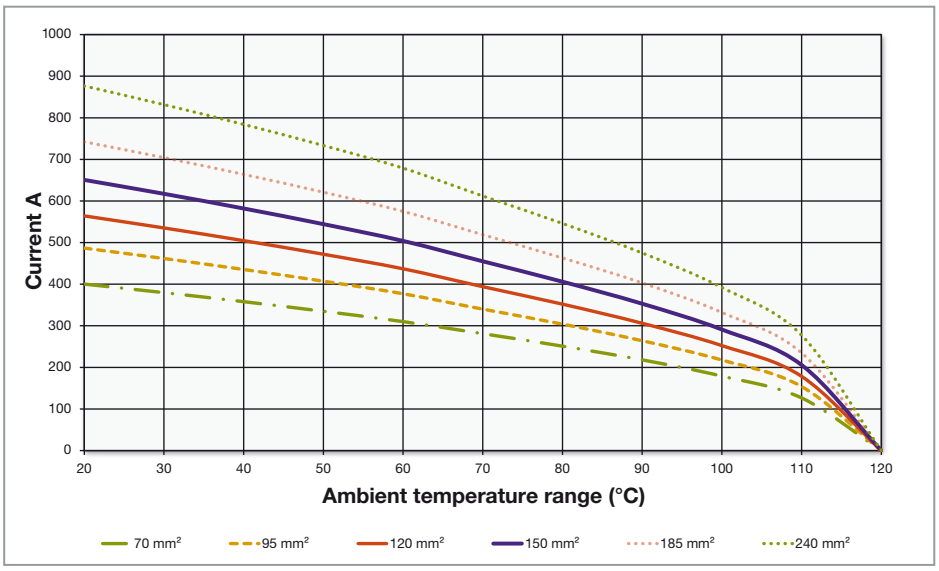
Rapid connection system FSA20K



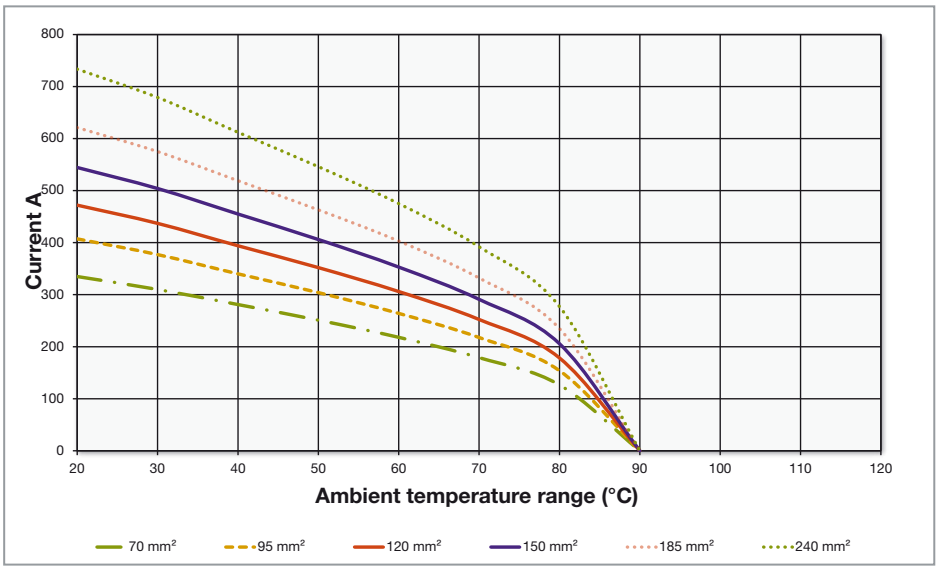
Rapid connection system FSA10K



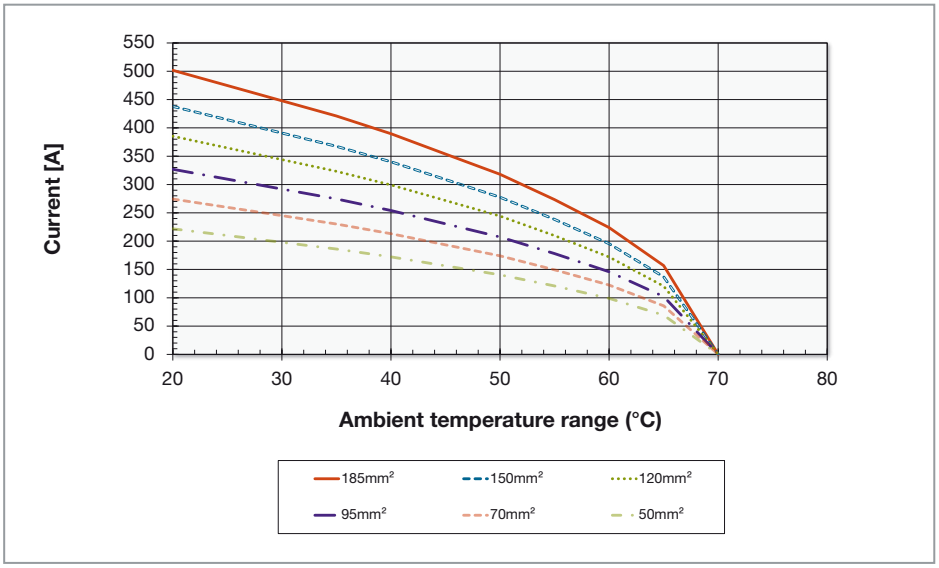
Derating for insulated copper cables (IEC 60364-5-52), max. 120 °C (e.g. RADOX®)



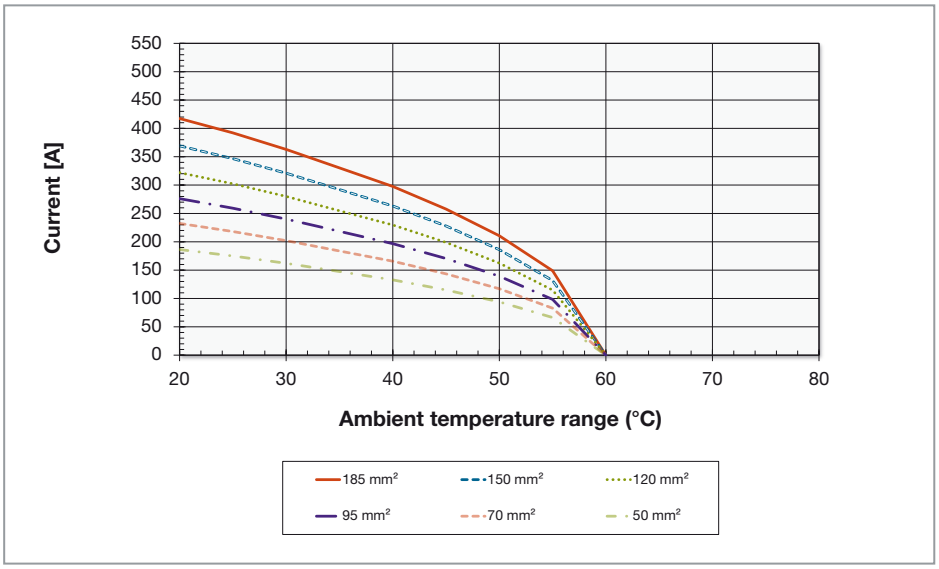
Derating for insulated copper cables (IEC 60364-5-52), max. 90 °C (e.g. PUR)



For insulated Cu cables, max. 70 °C (e.g. PVC)



For insulated Cu cables, max. 60°C (e.g. H07RN-F)



Derating for electrical machinery

The IEC 60204-1 standard “Safety of machinery” applies in place of the IEC 60364-5-52 for the use of electrical equipment with machinery.

This standard specifies the current-carrying capacity of PVC-insulated copper cables for continuous operation in machinery applications at an ambient temperature of 40°C.

For bundled cables and leads, additional reduction factors apply under these conditions.

Index

Sorted by type

Sorted by order no.

Order No.	Type	Page
12.0300	FSA20S-KO/C20	11, 13
12.0301	FSA20S-WZ	11, 12
12.0310-150*	FSA20S/C-P50	11
12.0311-150*	FSA20S/C-H50	11
12.0313-150*	FSA20S/C-H35	11
12.0314C...-150*	FSA20S/CS10-P50	11
12.0315C...-150*	FSA20S/CS10-H50	11
12.0317C...-150*	FSA20S/CS10-H35	11
12.0318-150*	FSA20S/CS16-P50	11
12.0319-150*	FSA20S/CP16-P50	11
12.0320-150*	FSA20S/CS16-H50	11
12.0321-150*	FSA20S/CP16-H50	11
12.0322-150*	FSA20S/CL-P50	11
12.0323-150*	FSA20S/CL-H50	11
12.0325-150*	FSA20S/CL-H35	11
12.0340	FSA20S-KB-10,8-M MT	11, 12
12.0501	FSA20-WZ	18, 19, 20, 27
12.0502	FSA20-SHZ-KP	18, 19, 21
12.0521	FSA20K-TK	18, 19, 20
12.1274-*	FSA10K/IB16BV-SET	27
12.1275	K-F-FSA10K CONTACT CLAW AG-SET	27
12.1276	FSA10K-TC	27
12.1278-*	FSA10K/16BL-CP-SET	27
12.1279	FSA10K/16BL-TC	27
12.1300	FSA20K-K-WB/P50	19, 28

Order No.	Type	Page
12.1301	FSA20K-K-WB/P70	19, 28
12.1302	FSA20K-K-WB/P95	19, 28
12.1303	FSA20K-K-WB/P120	19, 28
12.1304	FSA20K-K-WB/P150	19, 28
12.1305	FSA20K-K-WB/P185	19, 28
12.1312	FSA20K-K-WB/P50H	19, 28
12.1313	FSA20K-K-WB/P70H	19, 28
12.1314	FSA20K-K-WB/P95H	19, 28
12.1315	FSA20K-K-WB/P120H	19, 28
12.1316	FSA20K-K-WB/P150H	19, 28
12.1317	FSA20K-K-WB/P185H	19, 28
12.1318	FSA20K-K-WB/P240H	19
12.1326-*	FSA20K-K-WB/IB16BV-NS	18
12.1327-*	FSA20K-K-WB/IS16BV-NS	18
12.1328-*	FSA20K-L-WB/IB16BV-NS	18
12.1329-*	FSA20K-L-WB/IS16BV-NS	18
12.1330	FSA20K-WB SET	18, 19, 22
12.1331	FSA20/I-WB SET	18, 19, 22
12.1332-*	FSA20K-K-WB/16BL-CP	18
12.1333-*	FSA20K-L-WB/16BL-CP	18
15.5268	DBT-KBT16-NS	18, 21
15.5268	DBT-KBT16NS	27
15.5272	DST16-NS	18, 21
15.5882	16BL-CP/PC	18, 21, 27

IS UT Main 11013992-en B 08.2024

● Stäubli Units ○ Representatives / Agents

Global presence of the Stäubli Group

www.staubli.com

STÄUBLI