

# Connectors for robot tool changers

**DuraDock matic**

EN



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## Explanation of symbols



**The assembly instruction MA000 is available for this product**



**Surface Ag**



**Surface Au**

# Introduction DuraDock matic

Stäubli plug connectors of the DuraDock matic series are designed for use in automatic tool changers.

**Principal characteristics:**

- Low profile construction
- Small dimensions
- Uniform housing standard
- Rapid changing of contact inserts
- Wide range of applications

**Note:**

In 2023, we optimized our DuraDock matic product portfolio. The connectors are com-

patible with the products on the market. This also applies to different contact surfaces.



HTC 300

FL3-High Power and FL3-BUS are extremely service friendly due to the rapid contact carrier changing system.



HIGH POWER

# FL3...2+PE-RF-ECO

## Connectors for welding current supply

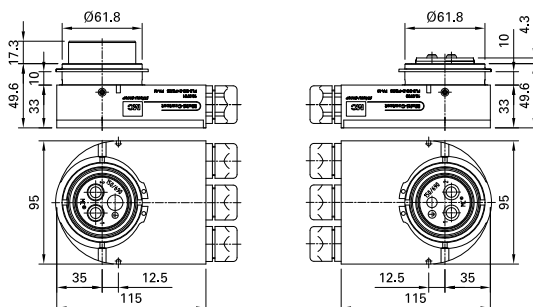
**Quick disconnect solution for minimized downtime and maintenance costs.**

- Unequaled contact reliability thanks to the Stäubli MULTILAM contact element technology

- Fast integration and easy maintenance
- Compact design with superior performance
- First mate/last break PE-contact for additional safety

- High current-carrying capacity
- Ideal in combination with single-core conductors

**FL3-BG-2+PE-RF-ECO**



**FL3-SG-2+PE-RF-ECO**



Order No.	Type	Conductor cross section		Number of poles	Nominal-Ø contact mm	Surface	Cable gland
		mm <sup>2</sup>	AWG			Ag	M20
18.0713	FL3-SG-2+PE-RF-ECO	25/35	4/2	2+PE	8		x
18.0712	FL3-BG-2+PE-RF-ECO	25/35	4/2	2+PE	8		x

RobiFix socket contacts (25 mm<sup>2</sup>/4 AWG, 35 mm<sup>2</sup>/2 AWG), see page 5

Electrical data	
Number of poles	2+PE
Rated current <sup>1)</sup>	135 A (25 mm <sup>2</sup> /4 AWG) 150 A (35 mm <sup>2</sup> )
Rated voltage	AC 690 V/CATIII
Insulation coordination	6 kV/3
Pollution degree	3
Protection, in mated condition	IP65
Type of termination	Plug-in
Shielding	No

Mechanical data	
For plate spacing	12,5 +1/0 mm
For plate thickness	10,0 0/-0,1 mm

General data	
Material housing	PA
Material contact carrier	NBR
Operating temperature	+10 °C...+40 °C
Storage temperature	-40 °C...+80 °C
Mating cycles	up to 500,000 (without load)
Rapid change system	Yes

**Note:**

To assemble the FL3...2+PE-RF-ECO, three sockets (30.0100 or 30.0101) from the RobiFix product portfolio on page 5 are required.

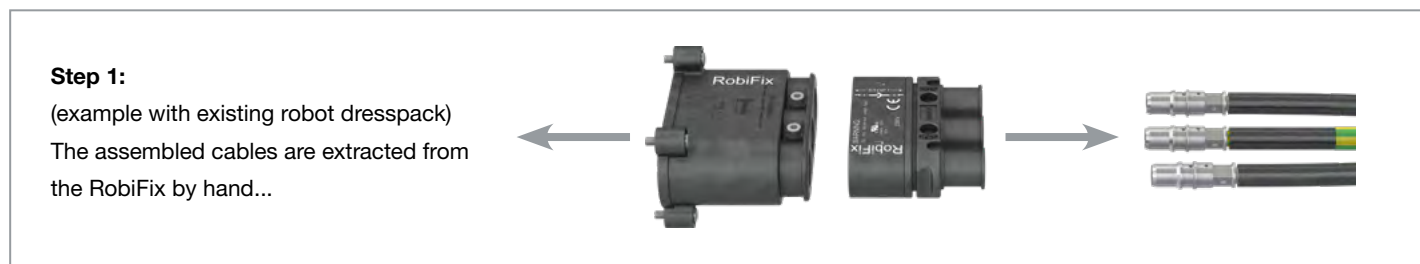
<sup>1)</sup> Derating diagrams see page 11



Assembly instructions MA307

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## Compatible with RobiFix primary circuit connector



## Contact pieces with plug termination

Order No.	Type	for conductor cross sections		Designation
		mm <sup>2</sup>	AWG	
30.0100	BP8/25	25	4	Socket
30.0101	BP8/35	35	2	Socket

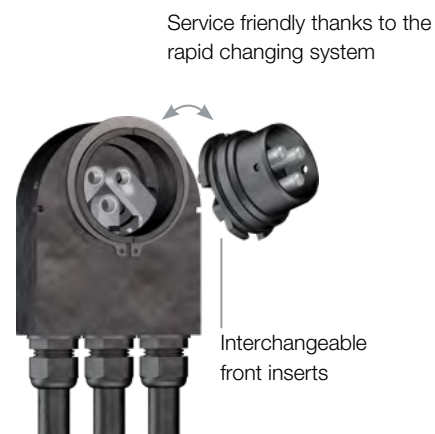
## Spare parts

### Front inserts for pin and socket housings

Order No.	Type	Designation
18.6900	FL3-VT-2+PE-SD8 PA	Male housing front part
18.6901	FL3-VT-2+PE-BS8 PA	Female housing front part

**Note:**

Special tools for replacement of the housing front parts see page 13.

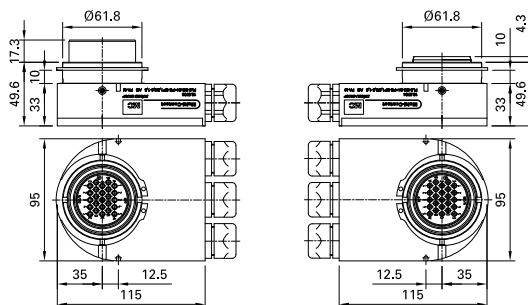


SIGNAL

# FL3...24+PE...

## Connectors for signal current transfer

FL3-BG-24+PE...



FL3-SG-24+PE...



Order No.	Type	Conductor cross section		Number of poles	Nominal-Ø contact	Surface	Cable gland
		mm <sup>2</sup>	AWG				
18.0706	FL3-SG-24+PE-SP1,5/0,5-1,5 AU PA-M	0.5 – 1.5	20 – 16	24+PE	1.5		x
18.0707	FL3-BG-24+PE-BP1,5/0,5-1,5 AU PA-M	0.5 – 1.5	20 – 16	24+PE	1.5		x

Electrical data	
Rated current	16 A
Rated voltage	AC 250 V/CATIII
Insulation coordination	4 kV/3
Pollution degree	3
Protection, in mated condition	IP65
Type of termination	Crimping
Shielding	No

Mechanical data	
For plate spacing	12,5 +1/0 mm
For plate thickness	10,0 0/-0,1 mm

General data	
Material housing	PA
Material contact carrier	NBR
Material contact	CuZn
Operating temperature	+10 °C...+40 °C
Storage temperature	-40 °C...+80 °C
Mating cycles	up to 1,000,000 (without load)
Rapid change system	No



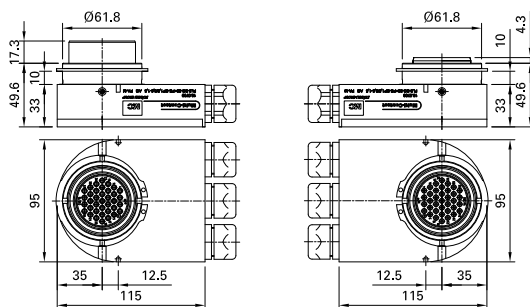
Assembly instructions MA221

[www.staubli.com/electrical](http://www.staubli.com/electrical)

# FL3...36+PE...

## Connectors for signal current transfer

FL3-BG-36+PE...



FL3-SG-36+PE...



Order No.	Type	Conductor cross section		Number of poles	Nominal-Ø contact	Surface	Cable gland
		mm <sup>2</sup>	AWG				
18.0710	FL3-SG-36+PE-SP1,5/0,5-1,5 AU PA-M	0.5 – 1.5	20 – 16	36+PE	1.5		x
18.0711	FL3-BG-36+PE-BP1,5/0,5-1,5 AU PA-M	0.5 – 1.5	20 – 16	36+PE	1.5		x

### Electrical data

Rated current	16 A
Rated voltage	AC 250 V/CATIII
Insulation coordination	4 kV/3
Pollution degree	3
Protection, in mated condition	IP65
Type of termination	Crimping
Shielding	No

### Mechanical data

For plate spacing	12,5 +1/0 mm
For plate thickness	10,0 0/-0,1 mm

### General data

Material housing	PA
Material contact carrier	NBR
Material contact	CuZn
Operating temperature	+10 °C...+40 °C
Storage temperature	-40 °C...+80 °C
Mating cycles	up to 1,000,000 (without load)
Rapid change system	No



Assembly instructions MA221

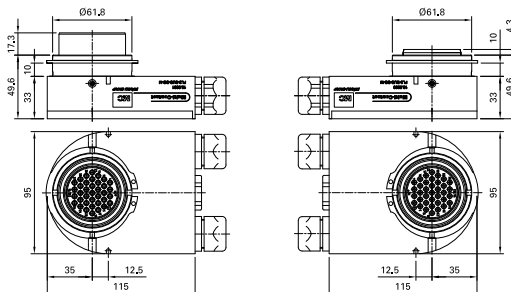
[www.staubli.com/electrical](http://www.staubli.com/electrical)

BUS

# FL3...BUS...

## Connectors for data transfer in the BUS system

### FL3...BUS-BG...



### FL3...BUS-SG...



Order No.	Type	Conductor cross section		Number of poles	Nominal-Ø contact	Surface	Cable gland	2 x 94 cm cable + 2 connectors M23	
		mm <sup>2</sup>	AWG					with	without
18.0930	FL3-BUS-SG-M	0.5 – 1.5	20 – 16	19+2PE	1.5		x		x
18.0931	FL3-BUS-BG-M	0.5 – 1.5	20 – 16	19+2PE	1.5		x		x

Electrical data	
Rated voltage	AC 33 V/DC 70 V
Insulation coordination	4 kV/3
Pollution degree	3
Protection, in mated condition	IP65
Type of termination	Screw connection on PCB
Shielding	Yes

Mechanical data	
For plate spacing	12,5 +1/0 mm
For plate thickness	10,0 0/-0,1 mm

General data	
Material housing	PA
Material contact carrier	NBR
Operating temperature	+10 °C...+35 °C
Storage temperature	-40 °C...+80 °C
Mating cycles	up to 1,000,000 (without load)
Rapid change system	Yes



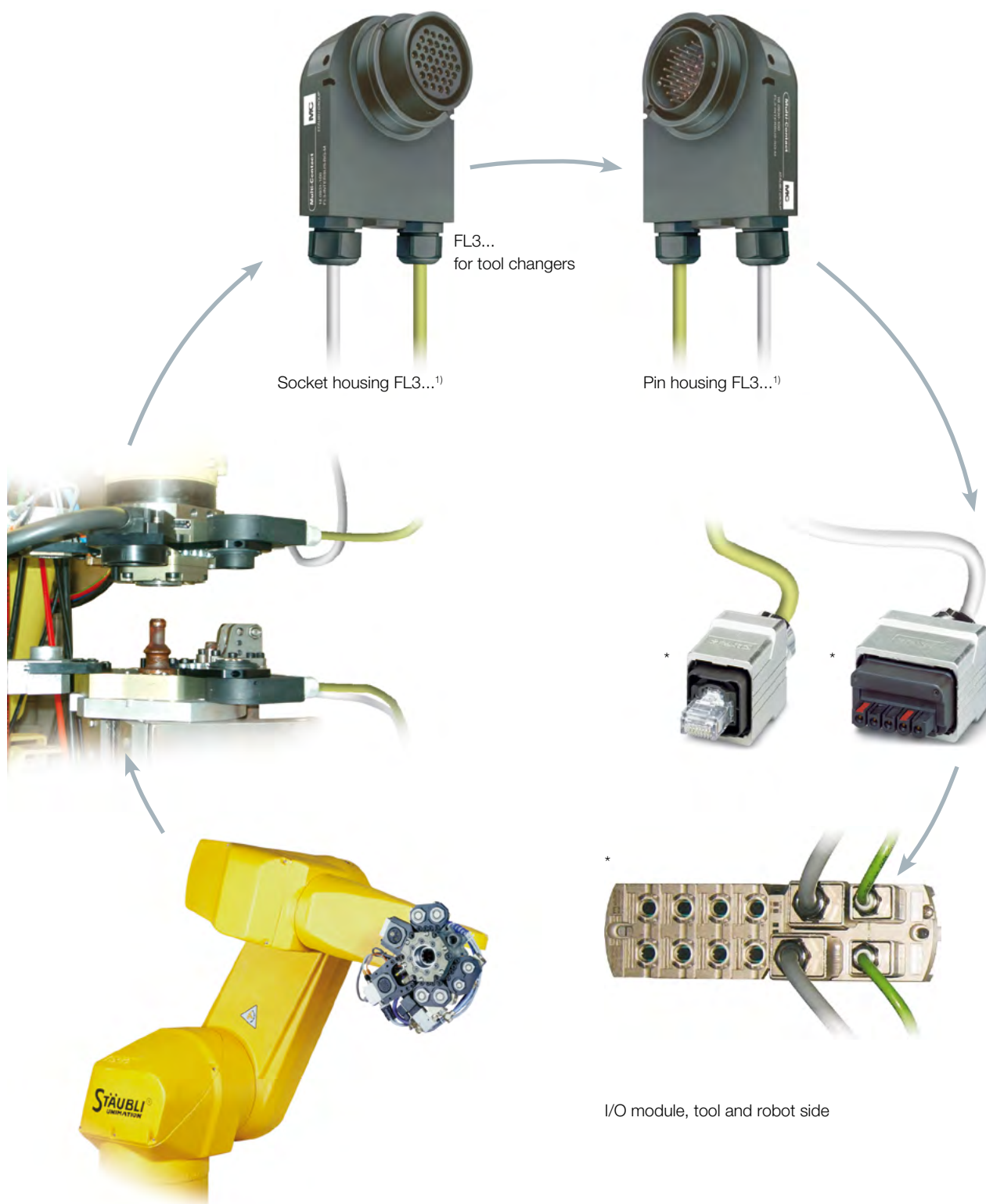
Assembly instructions MA235

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# BUS signal transmission in Cu technology

Combinable with Rugged line and Profinet with RJ45 (Variosub)



<sup>1)</sup> Please observe the respective BUS-specifications

\* Not supplied by Stäubli

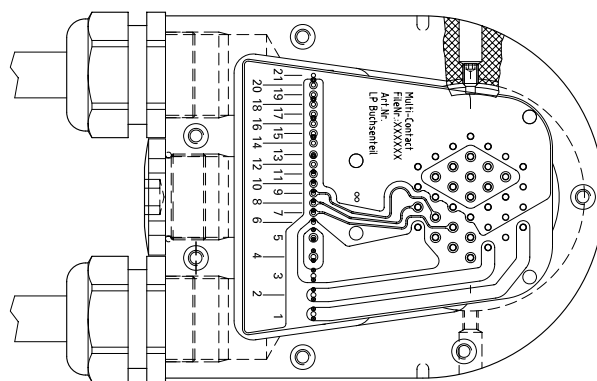
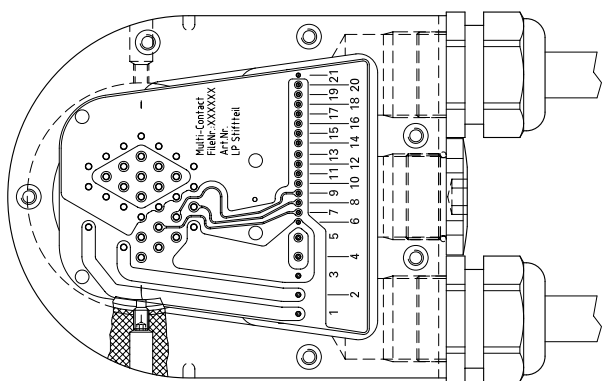
## Connection assignment plan for FL3-BUS...

The contact possibilities are shown in the assignment plan. In addition to the BUS and shielding contacts, further 9 vacant

contacts are provided in the connector e.g. for secondary circuit monitoring or constant current regulation etc. Tested for immunity to

electrical noise, according to EN 50082-1/2 and emissions to EN 50081-1/2. Technical design according to IEC, EN 61984.

Clamp No.	Contact chamber No.	Interbus Cu	Profibus Cu	Ethernet/Profinet	Fire Wire	Rated current
						A
1	34	+24V Aktor	+24V Aktor	+24V US2	L <sup>1)</sup>	16
2	23	GND Aktor	GND Aktor	GND US2	L <sup>1)</sup>	16
3	PE	PE	PE	PE	PE	16
4	10	+24V Sensor	+24V Sensor	+24V US1	+12V US1	10
5	5	GND Sensor	GND Sensor	GND US1	GND US1	10
6	PE	PE	PE	PE	PE	10
7	11	L <sup>1)</sup>	L <sup>1)</sup>	L <sup>1)</sup>	L <sup>1)</sup>	1
8	2	L <sup>1)</sup>	L <sup>1)</sup>	L <sup>1)</sup>	L <sup>1)</sup>	1
9	6	L <sup>1)</sup>	L <sup>1)</sup>	L <sup>1)</sup>	L <sup>1)</sup>	1
10	17	L <sup>1)</sup>	L <sup>1)</sup>	L <sup>1)</sup>	L <sup>1)</sup>	1
11	16	L <sup>1)</sup>	L <sup>1)</sup>	L <sup>1)</sup>	L <sup>1)</sup>	1
12	19	L/S <sup>2)</sup> (SKÜ 1)	L/S <sup>2)</sup>	L/S <sup>2)</sup>	<sup>4)</sup>	1
13	13	L/S <sup>2)</sup> (SKÜ 2)	L/S <sup>2)</sup>	L/S <sup>2)</sup>	L/S <sup>2)</sup>	1
14	8	L/S <sup>2)</sup> (KSR 1)	+5V	Rx-	TPA	1
15	14	L/S <sup>2)</sup> (KSR 2)	Line A	Rx+	TPAx	1
16	20	D0	L/S <sup>2)</sup>	L/S <sup>2)</sup>	(Power)	1
17	21	/D0	L/S <sup>2)</sup>	L/S <sup>2)</sup>	(Ground)	1
18	27	DI	Line B	Tx-	TPB	1
19	26	/DI	L/S <sup>2)</sup>	Tx+	TPBx	1
20	32	COM	GND	L/S <sup>2)</sup>	L/S <sup>2)</sup>	1
21	18/12/7/4/9/ 15/22/28/33/ 37/3/25/31/36	<sup>3)</sup>	<sup>3)</sup>	<sup>3)</sup>	<sup>5)</sup>	1



<sup>1)</sup> L = Vacant

<sup>2)</sup> L/S = Vacant (shielded)



<sup>3)</sup> Shield (if required, connect with PE contact)

<sup>4)</sup> 2 pairs of shields



<sup>5)</sup> Fully shielded

## Spare parts

For FL3...24+PE... and FL3...36+PE...

Order No.	Type	Designation	Contact material	suitable for	
18.9005	SP1,5/0,5-1,5 AU	Pin	CuZn, Au	FL3-SG-24+PE... FL3-SG-36+PE...	
18.8005	BP1,5/0,5-1,5 AU	Sockets	CuZn, Au	FL3-BG-24+PE... FL3-BG-36+PE...	

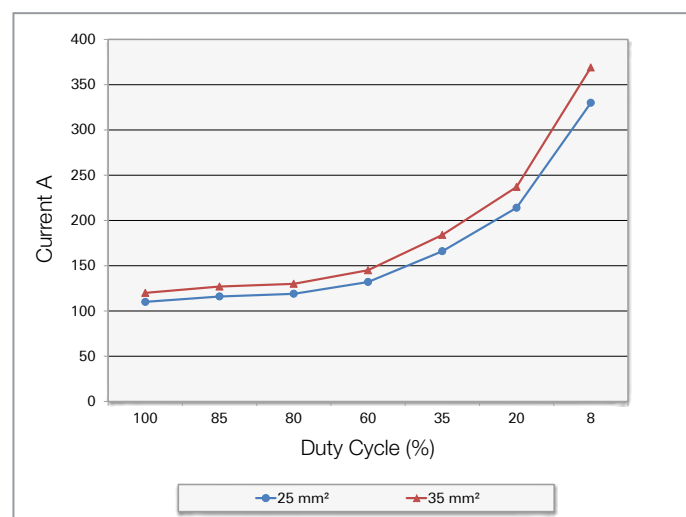
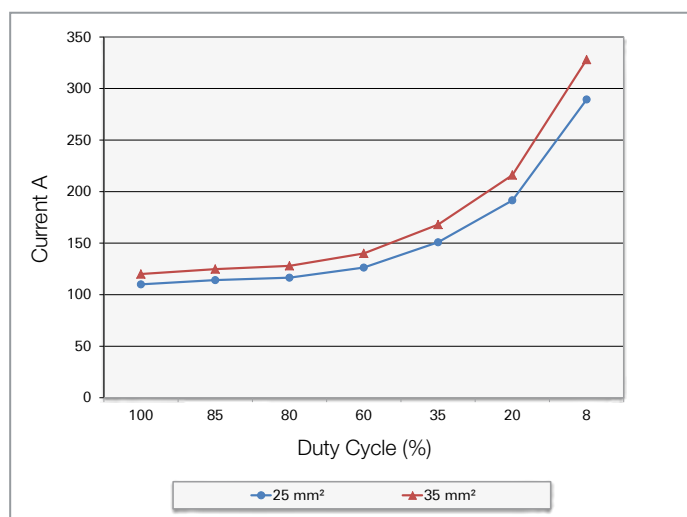
For FL3-BUS

Order No.	Type	Designation	suitable for	Page	
18.6920	FL3-BUS-VT-36+PE-S	Pin housing front part	FL3-BUS	8 – 10	
18.6921	FL3-BUS-VT-36+PE-B	Socket housing front part	FL3-BUS	8 – 10	

## Derating diagrams

Current at duty cycle, time cycle basis 10 Min  
FL3...2+PE..., FL3-...2+PE-RF-ECO

Current at duty cycle, time cycle basis 5 Min  
FL3...2+PE..., FL3-...2+PE-RF-ECO



## ASSEMBLY TOOLS

# Crimping pliers

For assembly of leads between 0.5 mm<sup>2</sup> to 2.5 mm<sup>2</sup> Stäubli recommends crimping pliers M-CZ. For leads of 25 mm<sup>2</sup> and 35 mm<sup>2</sup> we recommend either crimping pliers

M-PZ13 (small volumes) or our assembly case (CZK2-...) for series assembly.

Order No.	Type	Conductor cross section		Designation	
		mm <sup>2</sup>	AWG		

### For power contacts

18.3111	CZK2-230	25/35	4/2	Crimping tool case (Battery charger AC 230 V) see Flyer „Crimping tool case CZK2“	MA306
18.3112	CZK2-110	25/35	4/2	Crimping tool case (Battery charger 110/AC 120 V) see Flyer „Crimping tool case CZK2“	
18.3700	M-PZ13			Manual crimping tool	MA224
18.3704	MES-PZ-TB11/25	25	4	Crimping die for M-PZ13	
18.3705	MES-PZ-TB13/35	35	2	Crimping die for M-PZ13	

### For signal contacts

18.3800	M-CZ			Manual crimping tool	MA085
18.3802	MES-CZ1,5/2	0.5 – 1.5	20 – 16	Locator to M-CZ	

# Insertion tool/Extraction tools

Specific insertion tools are required to insert the pins or sockets in the contact carriers.


Specific extraction tools are required for removing the pins or sockets as well.

Order No.	Type	Tool	Nominal-Ø contact	Designation	
			mm		
18.3003	ME-WZ1,5/2		1.5	Insertion tool	MA221
18.3005	MSA-WZ1,5		1.5	Extraction tool (pin)	
18.3004	MBA-WZ1,5		1.5	Extraction tool (socket)	

ACCESSORIES

# Blind plugs


Vacant contact cavities must be fitted with blind plugs in order to ensure longitudinal watertightness and mechanical stability.

Order No.	Type	Nominal-Ø contact	Color
		mm	
18.5500	MVS-1,5/2 	1.5	blue

SPECIAL TOOL

# Special tool/Assembly Gauge

For replacement of the housing front parts

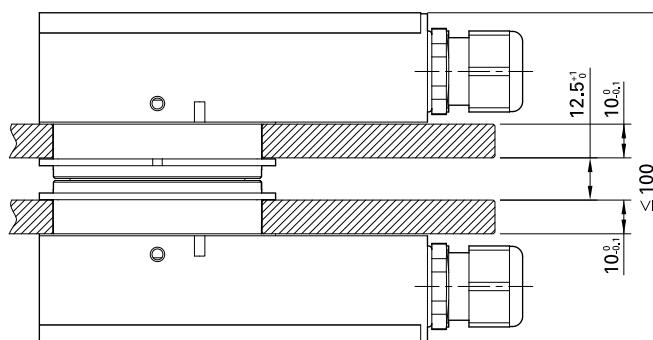
Order No.	Type	Designation	required for	
18.0947	FL3-MSR BS	Support ring	FL3...2+PE..., FL3-BUS FL3...6+PE	MA308
18.0948	FL3-M-RG	Assembly ring	FL3...2+PE..., FL3...24+PE..., FL3...36+PE..., FL3-BUS FL3...6+PE	
18.0946	FL3-WZ	Extracting tool	FL3...2+PE..., FL3-BUS FL3...6+PE	
18.6940	FL3-TAG	Testing and assembly gauge	FL3...2+PE..., FL3...24+PE..., FL3...36+PE..., FL3-BUS FL3...6+PE	
18.0937	FL3-MK	Tool case		

INSTALLATION CONDITIONS

# Installation in tool-changer

(mated condition)

For further details, please refer to the corresponding assembly instructions.









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