




Component Legend

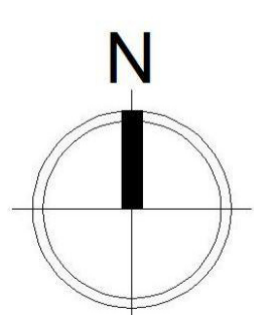
-  Solar PV Cable Tray (Shed as indicated)
-  Inverter / Distribution Board
-  PV Panel

PV Comprising of

- 372 x 415W Panels providing 154.4 kWp



PV Layout



P4	PV Layout updated to suit mansafe system and access requirements	07/12/23
P3	PV panels amended, smoke vent fans indicated for coordination and minor adjustments to the PV locations	08/11/23
P2	Roof Access Indicated and PV adjusted to suit	30/10/23
P1	Work In Progress	20/10/23
Rev	Comment	Date



Firlands Mill,
South Parade, Pudsey,
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Contract

Cricklewood
194-196 Broadway

Title

Roof Level
PV Layout

Scale @ A1	G&H No	Modelled By	Checked By
1 : 1	1380	SC	WR

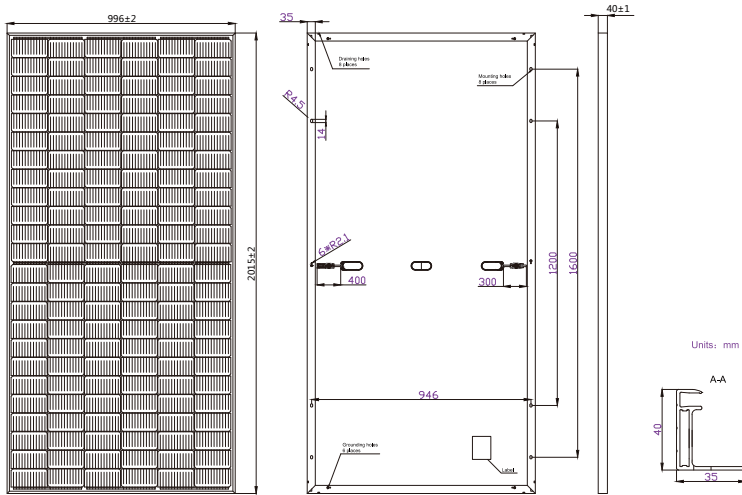
Status Code	Status Description
S0	Work in progress

Revision Code	Revision Status
P4	Preliminary

Drawing Name	Project	Originator	Volume	Level	Type	Role	Number
	CWB	GHB	XX	RF	DR	ME	SK3801

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MECHANICAL DIAGRAMS



Remark: customized frame color and cable length available upon request

SPECIFICATIONS

Cell	Mono
Weight	22.7kg±3%
Dimensions	2015±2mm×996±2mm×40±1mm
Cable Cross Section Size	4mm ²
No. of cells	144 (6×24)
Junction Box	IP68, 3 diodes
Connector	MC4 Compatible(1000V) QC 4.10-35(1500V)
Packaging Configuration	27 Per Pallet

ELECTRICAL PARAMETERS AT STC

TYPE	JAM72S10 -395/MR	JAM72S10 -400/MR	JAM72S10 -405/MR	JAM72S10 -410/MR	JAM72S10 -415/MR
Rated Maximum Power(Pmax) [W]	395	400	405	410	415
Open Circuit Voltage(Voc) [V]	49.30	49.58	49.86	50.12	50.41
Maximum Power Voltage(Vmp) [V]	41.02	41.33	41.60	41.88	42.18
Short Circuit Current(Isc) [A]	10.28	10.33	10.39	10.45	10.51
Maximum Power Current(Imp) [A]	9.63	9.68	9.74	9.79	9.84
Module Efficiency [%]	19.7	19.9	20.2	20.4	20.7
Power Tolerance	0~+5W				
Temperature Coefficient of Isc(α _{Isc})	+0.044%/°C				
Temperature Coefficient of Voc(β _{Voc})	-0.272%/°C				
Temperature Coefficient of Pmax(γ _{Pmp})	-0.354%/°C				
STC	Irradiance 1000W/m ² , cell temperature 25°C, AM1.5G				

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.

ELECTRICAL PARAMETERS AT NOCT

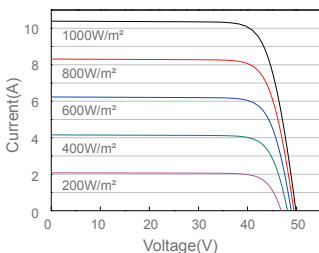
TYPE	JAM72S10 -395/MR	JAM72S10 -400/MR	JAM72S10 -405/MR	JAM72S10 -410/MR	JAM72S10 -415/MR
Rated Max Power(Pmax) [W]	298	302	306	310	314
Open Circuit Voltage(Voc) [V]	46.15	46.41	46.66	46.91	47.16
Max Power Voltage(Vmp) [V]	38.40	38.65	38.90	39.16	39.41
Short Circuit Current(Isc) [A]	8.20	8.25	8.31	8.36	8.41
Max Power Current(Imp) [A]	7.76	7.81	7.87	7.92	7.97
NOCT	Irradiance 800W/m ² , ambient temperature 20°C, wind speed 1m/s, AM1.5G				

OPERATING CONDITIONS

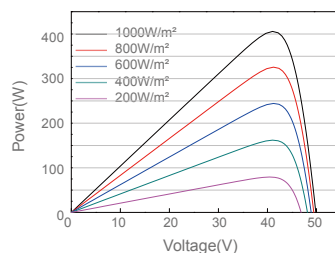
Maximum System Voltage	1000V/1500V DC(IEC)
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	20A
Maximum Static Load,Front	5400Pa
Maximum Static Load,Back	2400Pa
NOCT	45±2°C
Application Class	Class A

CHARACTERISTICS

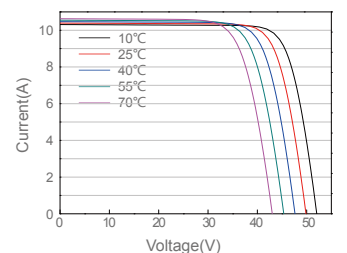
Current-Voltage Curve JAM72S10-405/MR



Power-Voltage Curve JAM72S10-405/MR

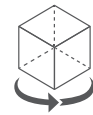


Current-Voltage Curve JAM72S10-405/MR



Solis-80K-5G

Solis Three Phase Inverters



360° View

>> Models:

Solis-80K-5G



Efficient

- 9 MPPTs, max. efficiency 98.7%
- > 150% DC/AC ratio
- Compatible with bifacial modules

Smart

- Night SVG function
- Intelligent string monitoring, smart I-V curve scan
- Remote firmware upgrade with simple operation

Safe

- IP66
- Built-in PID recovery for better module performance (optional)
- AFCI protection, proactively reduces fire risk
- Globally recognised branded componentry for longer life

Economic

- Power line communication (PLC) (optional)
- DC side supports "Y" connector
- Supports aluminium wire access to reduce cost

DATASHEET**Solis-80K-5G****Models****80K****Input DC**

Max. input voltage	1100 V
Rated voltage	600 V
Start-up voltage	195 V
MPPT voltage range	180-1000 V
Max. input current	9*26 A
Max. short circuit current	9*40 A
MPPT number/Max. input strings number	9/18

Output AC

Rated output power	80 kW
Max. apparent output power	88 kVA
Max. output power	88 kW
Rated grid voltage	3/N/PE, 220 V / 380 V, 230 V / 400 V
Rated grid frequency	50 Hz / 60 Hz
Rated grid output current	121.6 A / 115.5 A
Max. output current	133.7 A
Power factor	>0.99 (0.8 leading - 0.8 lagging)
THDi	<3%

Efficiency

Max. efficiency	98.7%
EU efficiency	98.3%

Protection

DC reverse-polarity protection	Yes
Short circuit protection	Yes
Output over current protection	Yes
Surge protection	DC Type II / AC Type II
Grid monitoring	Yes
Anti-islanding protection	Yes
Temperature protection	Yes
Strings monitoring	Yes
I/V Curve scanning	Yes
Integrated PID recovery	Optional
Integrated AFCI (DC arc-fault circuit protection)	Yes ⁽¹⁾
Integrated DC switch	Yes
Integrated AC switch	Optional

General Data

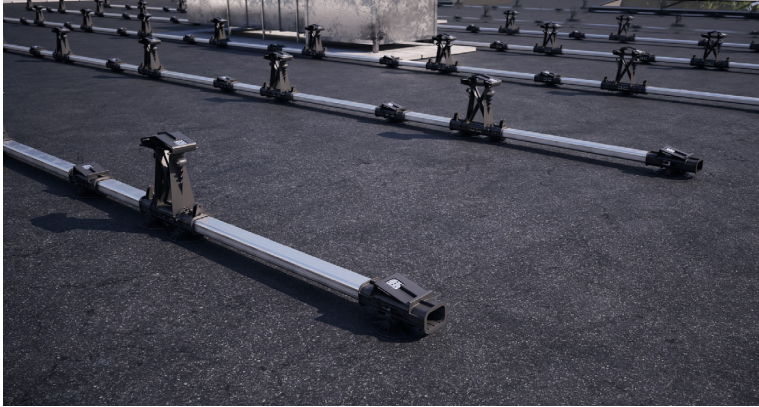
Dimensions (W*H*D)	1050*567*314.5 mm (with AC switch)
Weight	82 kg
Topology	Transformerless
Self-consumption (night)	<2 W
Operating ambient temperature range	-30 ~ +60°C
Relative humidity	0-100%
Ingress protection	IP66
Cooling concept	Intelligent redundant fan-cooling
Max. operation altitude	4000 m
Grid connection standard	G98 or G99, VDE-AR-N 4105 / VDE V 0124, EN 50549-1, VDE 0126 / UTE C 15 / VFR:2019, CEI 0-21, C10/11, NRS 097-2-1, TOR, EIFS 2018.2, IEC 62116, IEC 61727, IEC 60068, IEC 61683, EN 50530
Safety/EMC standard	IEC/EN 62109-1/-2, IEC/EN 61000-6-2/-4

Features

DC connection	MC4 connector
AC connection	OT terminal (max. 185 mm ²)
Display	LCD
Communication	RS485, Optional: Wi-Fi, GPRS, PLC

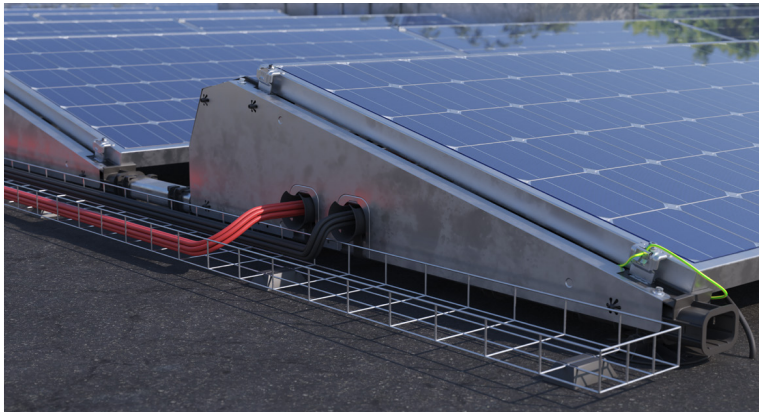
(1) Activation required.

THE ADVANTAGES OF FLATFIX FUSION



FLEXIBLE AND EASY

- Completely modular system
- Flexible installation: Easy to build around obstacles
- Aesthetic lightweight system
- Single or dual setup
- Suitable for residential and commercial projects
- Strong and durable clamping force with metal insert in high and low base
- For panels up to 1150mm wide and 2190mm long



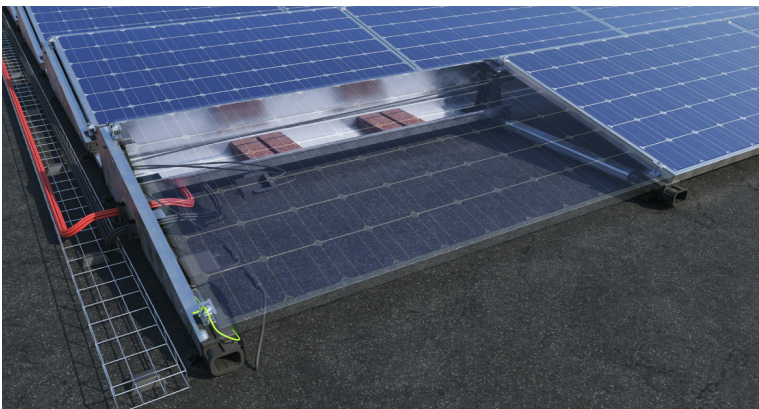
RELIABLE

- Aerodynamic design with rounded corners and smooth material finish
- Robust system thanks to connectors parallel and perpendicular to the panels
- Wind deflectors designed for maximum safety
- Tested to international standards
- 20-year warranty



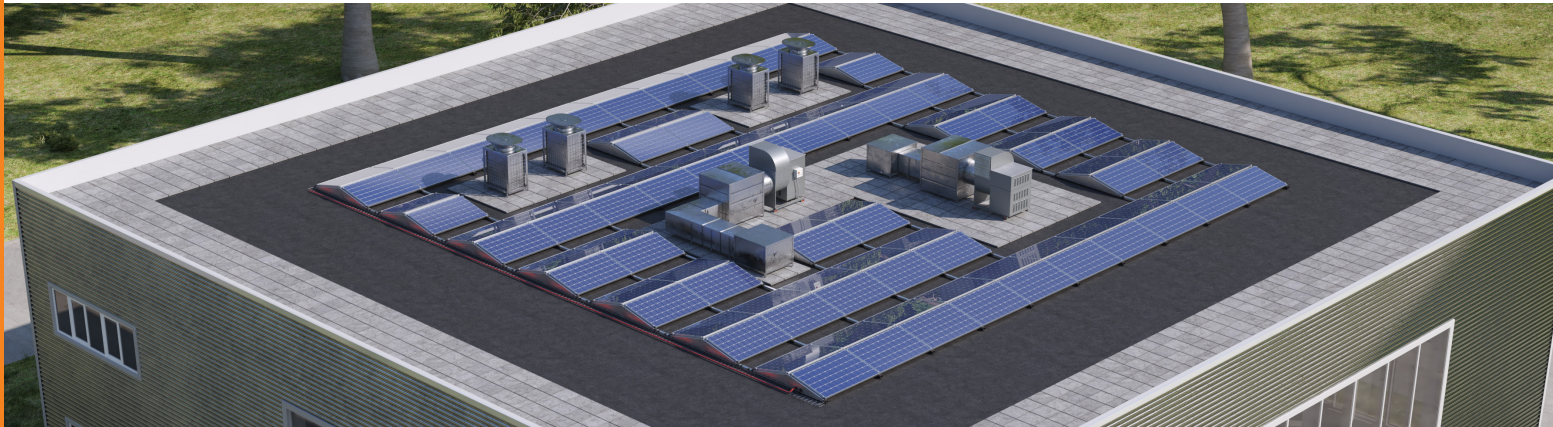
SAFETY FOR THE ROOF

- For every type of roof
- Roof support with movable connectors
- Unique thermal decoupling prevents damage to roof material
- Optimum point pressure due to distributed ballast
- Integrated grounding and bonding in high and low base in accordance with IEC 60364 series
- Cable exits and cable guides (optional) for safe cable management



EASY TO INSTALL

- User-friendly click system
- Optimizer ready cable clip for easy attachment and safe cable removal
- Grounding clamp can easily be incorporated onto the end clamp
- Optimizer clip can also be used for most micro inverters
- For the most common solar panels (angle of inclination 13°)
- Renewed end clamps for even more powerful and easier installation



COMPLETE AND FLEXIBLE INSTALLATION ON EVERY ROOF

FlatFix Fusion is the modular and flexible mounting system for solar panels on small and medium-sized roofs. Its modular design enables a customized configuration to be created for every roof. Installers can, for example, easily build around obstacles – such as chimneys – with this system. FlatFix Fusion can be set up either in dual or single configuration. FlatFix Fusion is a 100% Dutch product that has proven itself for years. In 2021, the system received an update of a number of components, which not only makes installation even easier for the installer, but also further increases the safety of the roof and the PV system. It is now possible to install solar panels up to 1150mm wide and 2190mm long with FlatFix Fusion.

Easy to install

Esdec was founded by professional installers, the interest of the installer always come first when designing our products. Simplicity and flexibility were therefore the starting points in the design of our FlatFix Fusion system. Smart click connections enable the system to be assembled quickly. Handy features on the clamps and on the wind deflectors make installation even easier.

Safety for the roof

The different components are connected using fast-click connectors. The roof supports with movable connectors allow the system to move (expand and shrink) to prevent damages of the roof material. As a result, the thermal movements of the building are not transmitted to the PV system and vice versa. The 2021 upgrade includes a safe and aesthetic solution for cable management: cables are guided through the wind deflectors with a cable exit guide.

Reliability

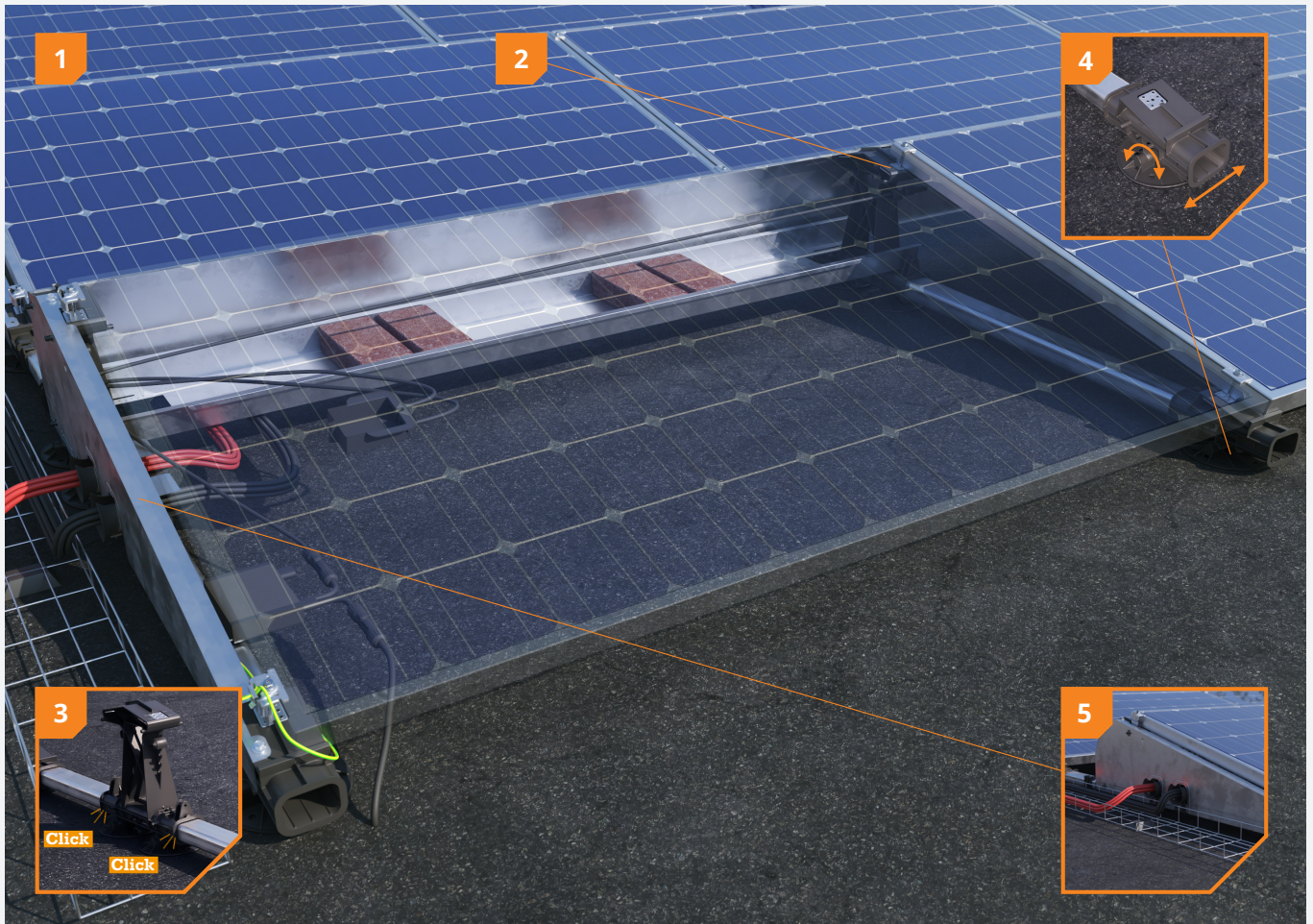
The patented FlatFix Fusion system has been extensively tested on fire safety, wind resistance and corrosion. With even stronger and durable clamping force with a metal insert in the high and low base. FlatFix Fusion is a high-quality mounting solution. It complies with the strictest international standards and comes with a 20-year warranty.

ADVANTAGES FOR THE INSTALLER

- ✓ Modular mounting solution with click connection
- ✓ Flexible installation on any roof
- ✓ Integrated grounding and equipotential bonding
- ✓ Ease of installation with optimizer clip with integrated cable clip

ADVANTAGES FOR THE END USER

- ✓ Roof-specific configuration
- ✓ Safe and reliable
- ✓ No damage of the roof material
- ✓ 20-year warranty



1 Strong, lightweight system

The different components enable flexible row lengths. This makes it possible to create a roof-specific setup and, for example, to build around obstacles.

2 Easy maintenance

FlatFix Fusion is made of strong, lightweight materials. With the high and low base, with a metal insert, the clamping force remains optimal after removal and reinstallation of panels.

3 Unique click connection

The revolutionary, unique click connection makes the FlatFix Fusion a very quick and easy-to-install mounting solution.

4 With thermal decoupling

The roof supports with movable connectors give the system space to expand thermally without damaging the roof material.

5 With integrated cable management

The cables and plugs of the solar panels can be safely and easily attached to the mounting solution. With the cable exits in the wind deflectors and with the cable exit guides, cables can be stowed and guided in a safe way.



SYSTEM COMPONENTS



FlatFix Fusion roof support
1007012



FlatFix Fusion low base
1007022
1007022-S (with bonding)



FlatFix Fusion high base
1007031
1007031-S (with bonding)



FlatFix Fusion cable-clip optimizer ready***
1007041



FlatFix Fusion wind deflector rear*/**
1007201



FlatFix Fusion wind deflector left**
1007224 with base profile 940mm
1007226 with base profile 1030mm or 1077mm



FlatFix Fusion wind deflector right**
1007225 with base profile 940mm
1007227 with base profile 1030mm or 1077mm



FlatFix Fusion ballast container*/**
1007202



FlatFix Fusion stabilizer*/**
1007203



FlatFix Fusion base profile
210mm 1007121**
370mm 1007137**
550mm 1007155**
750mm 1007175**
940mm 1007194**
1030mm 1007195
1077mm 1007196

* Also available in 1200, 1500, 1600, 1700, 1900, 2000 & 2100

** Also available in black

*** Also suitable for most micro inverters

FASTENERS



Esdec mounting screw*/**
6 x 55mm 1000655
6 x 70mm 1000670
6 x 12mm 1000612



Esdec screw
6,0 x 25mm (self tapping) 1008085
6.3 x 42 mm SW10/T30 (self drilling) 1003016

* Depending on panel thickness and related end clamp

** Also available in black

CLAMPS



FlatFix Fusion universal module clamp with bonding**
1003022



FlatFix end clamp 30-50mm*/**
10043_
10044_ (black)

* Depending on panel thickness (in mm)

** Also available in black

ACCESSORIES



FlatFix Fusion grounding spring
1007502*



FlatFix Fusion grounding clamp (6mm²)
1007505



FlatFix Fusion grounding bracket
1007503



FlatFix Fusion TPO Mat
1007015



FlatFix Fusion roof support adapter
1007011



FlatFix Fusion low base extension
1007022-WP



FlatFix Fusion Cable exit guide
1005570

* Also available ready-assembled, see SYSTEM COMPONENTS

Calculator

In the Esdec calculator you can manage and calculate all your projects, for both pitched and flat roofs. Flat roofs: our user-friendly tool lets you perform technical calculations for roof heights of up to 20 metres.

Go to eu.esdec.com/en/calculator



Warranty

- Use of premium materials
- Thoroughly tested
- 20-year warranty



INTRODUCTION

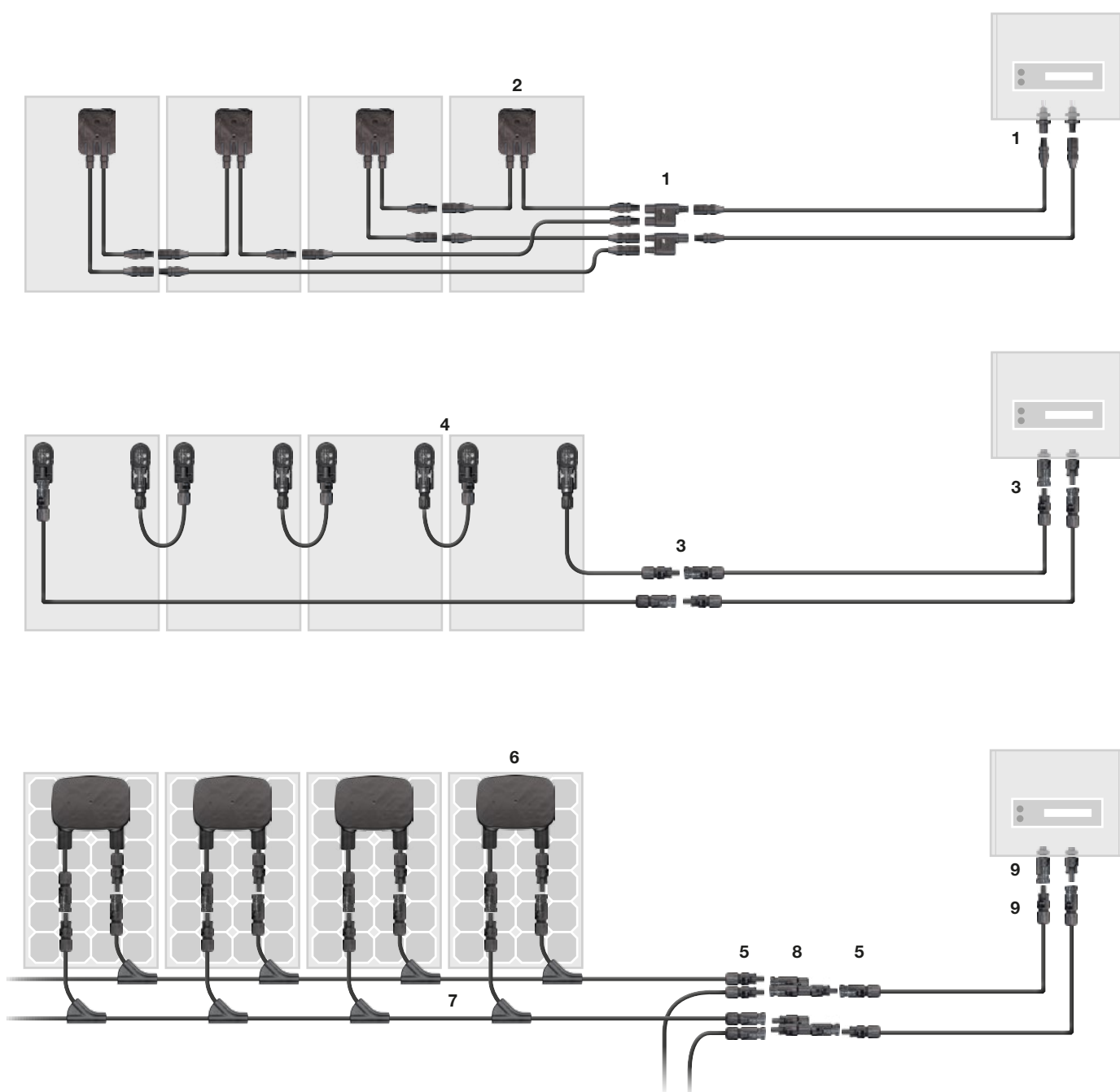
Application possibilities of the Stäubli product portfolio

Examples of a PV field installation

The upper example shows the MC3 plug connector system (1) and the two-pole PV-JB-LC (2).

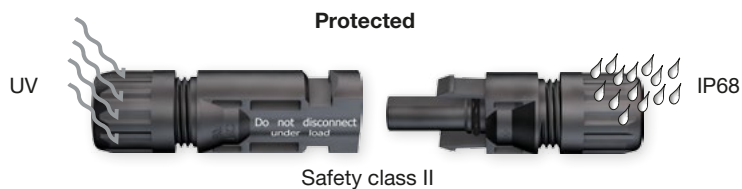
The illustration in the middle shows the MC4 plug connector system (3) and the single-pole PV-JB/TB (4).

At the bottom an example of a PV roof installation with MC4 plug connector system (5), PV-JB/WL-... junction box (6) branch cable (7), branch socket/plug (8) and MC4 panel receptacles (9).



PLUG CONNECTORS

Advantages of the MC4 connector range



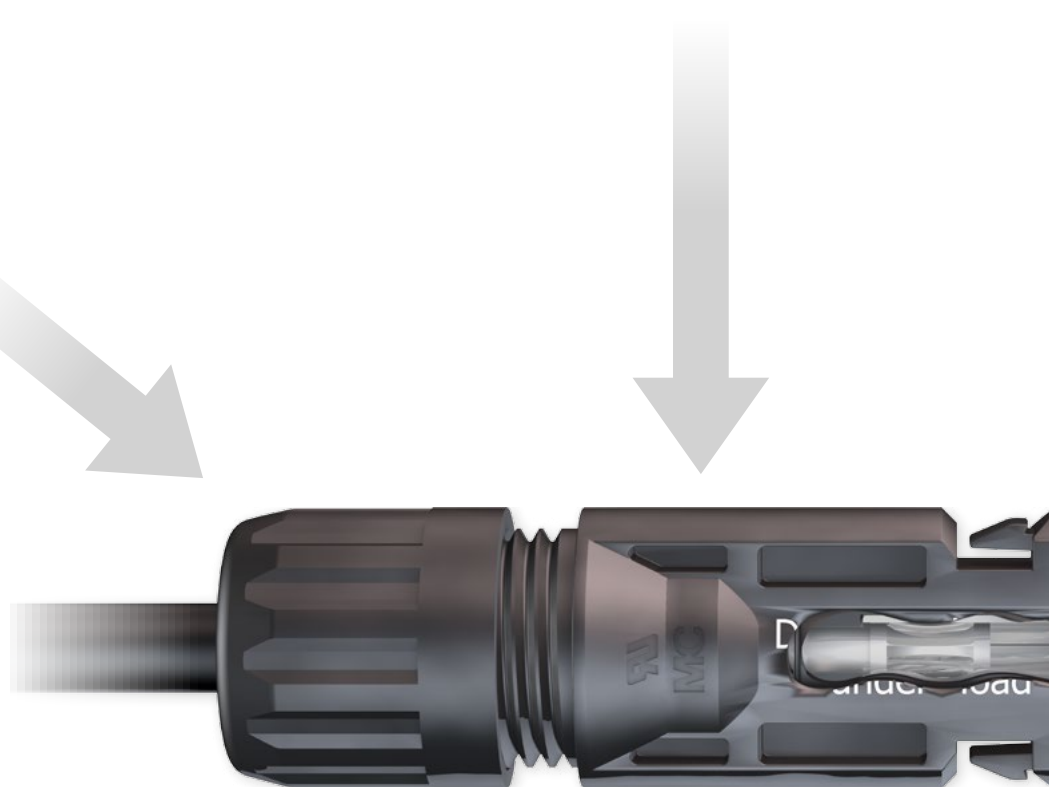
Proven MULTILAM technology with high long-term stability



More than 50 years of experience and core competence

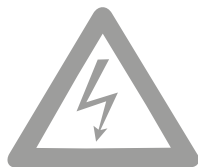
Range of cable cross-sections

- | | | | |
|---------------------|---|---|--------|
| 10 mm ² | ○ | ○ | 8 AWG |
| 6 mm ² | ○ | ○ | 10 AWG |
| 4 mm ² | ○ | ○ | 12 AWG |
| 2.5 mm ² | ○ | ○ | 14 AWG |
| 1.5 mm ² | ○ | | |



Locking system

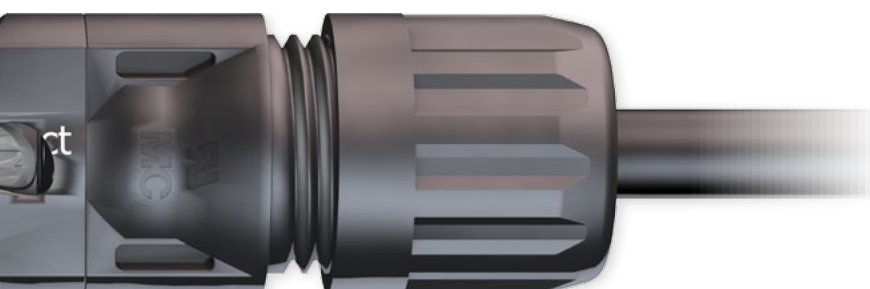
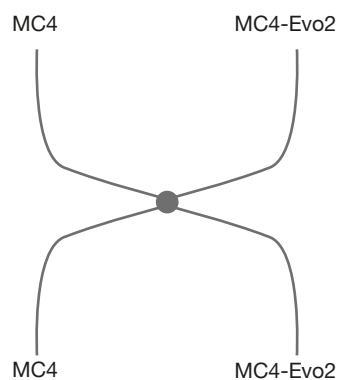




Voltage level

TÜV 1000 V/1500 V
UL 1000 V/1500 V

Compatibility



Certificates

TÜV

These products are certified by TÜV Rheinland LGA GmbH



cTÜVus



UL recognized



GOST-R



CSA



JET



CQC

Safety locking device

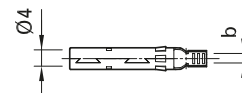
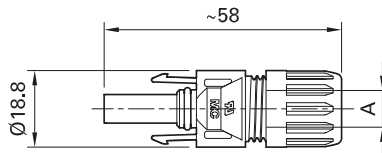
NEC 2014



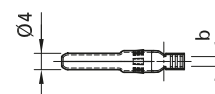
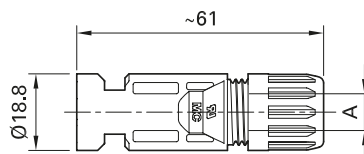
Female and male cable coupler MC4

Female and male cable coupler as individual part (including insulating part)

PV-KBT4...



PV-KST4...



Order No.	Type	Female cable coupler	Male cable coupler	Ø range of cable gland	Conductor cross section			Approvals			
					A (mm)	mm ²	AWG	b (mm)	TÜV	UL	SA
32.0010P0001-UR	PV-KBT4/2,5I-UR	x		5-6	2.5	14	3				
32.0011P0001-UR	PV-KST4/2,5I-UR		x	5-6	2.5	14	3				
32.0140P0001-UR	PV-KBT4/2,5X-UR	x		5.5-7.4	2.5	14	3				
32.0141P0001-UR	PV-KST4/2,5X-UR		x	5.5-7.4	2.5	14	3				
32.0012P0001-UR	PV-KBT4/2,5II-UR	x		5.9-8.8	2.5	14	3				
32.0013P0001-UR	PV-KST4/2,5II-UR		x	5.9-8.8	2.5	14	3	x	x	x	x
32.0014P0001-UR	PV-KBT4/6I-UR	x		5-6	4; 6	12; 10	5				
32.0015P0001-UR	PV-KST4/6I-UR		x	5-6	4; 6	12; 10	5				
32.0142P0001-UR	PV-KBT4/6X-UR	x		5.5-7.4	4; 6	12; 10	5				
32.0143P0001-UR	PV-KST4/6X-UR		x	5.5-7.4	4; 6	12; 10	5				
32.0016P0001-UR	PV-KBT4/6II-UR	x		5.9-8.8	4; 6	12; 10	5				
32.0017P0001-UR	PV-KST4/6II-UR		x	5.9-8.8	4; 6	12; 10	5				
32.0080-UR	PV-KBT4/8II-UR	x		6.05-8.56	-	8	4.4		x	x	
32.0081-UR	PV-KST4/8II-UR		x	6.05-8.56	-	8	4.4				
32.0034P0001	PV-KBT4/10II	x		5.9-8.8	10	-	7.2	x			x
32.0035P0001	PV-KST4/10II		x	5.9-8.8	10	-	7.2				

Note:

For more detailed information concerning the suitable cable gland range, please consult MA231



Assembly Instructions MA231

www.staubli.com/electrical



Sealing caps page 62

Assembly tools page 69

- Snap-in lock
- In accordance with NEC 2014, requires a tool to open
- Proven MULTILAM technology with high long-term stability, which ensures consistently low performance loss through-

out the entire service life of the plug connector

- Tried and tested plug connectors, over 15 years of experience in the field
- Available for assembly with cross-sections of 10 mm²

- Also available as ready made leads
- Leads made to customer's specifications, see page 74

Technical data	
Connector system	Ø 4 mm
Rated voltage	1000 V DC (IEC 62852) 1500 V DC (2Pfg2330) ¹⁾ 600 V DC / 1000 V DC / 1500 V DC (UL) ²⁾
Rated current TÜV (85 °C)	17 A (1,5 mm ²) 22,5 A (2,5 mm ²) 39 A (4 mm ² /6 mm ²) 45 A (10 mm ²)
Rated current UL	22,5 A (14 AWG) 30 A (12 AWG/10 AWG) 50 A (8 AWG)
Rated impulse voltage	12 kV (1000 V DC (TÜV)) 16 kV (1500 V DC (TÜV))
Ambient temperature range	-40 °C...+85 °C (TÜV) -40 °C...+75 °C (UL)
Upper limiting temperature	105 °C (TÜV)
Degree of protection, mated unmated	IP65, IP68 (1 h/1 m) IP2X
Overvoltage category/Pollution degree	CATIII/3
Contact resistance of plug connectors	≤0.25 mΩ
Safety class	1000 V DC: II 1500 V DC: 0
Contact system	MULTILAM
Type of termination	Crimping
Contact material	Copper, tin plated
Insulation material	PC/PA
Locking system (UL)	Locking type
Flame class	UL94-V0
Ammonia resistance (acc. to DLG)	1500 h, 70 °C/70% RH, 750 ppm
Salt mist spray test, degree of severity 6	IEC 60068-2-52
TÜV-Rheinland certified, in accordance with IEC 62852	R60111354 ³⁾
TÜV-Rheinland certified, in accordance with 2Pfg2330	R60087448
UL recognized component, in accordance with UL 6703	E343181
CSA certified, in accordance with UL 6703	250725
CQC certified according CNCA/CTS0002-2012	CQC16024138286

¹⁾ 2Pfg2330: only approved for locations with restricted access

²⁾ for selected configurations; see assembly instructions MA231 for details

³⁾ For PV junction boxes in accordance with IEC62790, lines in accordance with EN50618 must be used