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# Solar Line

PHOTOVOLTAIC INTERCONNECTION SYSTEM



## AMPHENOL INDUSTRIAL SOLAR TECHNOLOGIES

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## Expanding Global Presence

Amphenol Corporation is one of the world's largest interconnect manufacturers. Founded in 1932, Amphenol designs, manufactures, and markets electrical, electronic, and fiber optic connectors, interconnect systems, and coaxial and specialty cables.

Amphenol products are engineered and manufactured in the Americas, Europe, Asia, and Africa and sold by a worldwide sales and marketing organization. Amphenol has a diversified presence as a leader in high growth areas of the interconnect industry and provides solutions for customers in the automotive, broadband, industrial, information technology and data communications, military and aerospace, mobile devices, and mobile networks markets.



**Photon**  
The Photovoltaic Magazine **International**

Amphenol Industrial Operations:  
Helios H4, H4CFC4D/H4CMC4D

**good**

9/2011&9/2012

www.photon.info

## Amphenol's Helios H4 is the #1 Ranked Solar Connector in the World

Beating out 26 worldwide competing connectors, Amphenol's Helios H4 Solar connectors achieved the top two ranked positions in an independent annual test comparison of solar connectors performed by Photon lab. The test results were published in *Photon-The Solar Power Magazine* (September, 2011).

○ = MANUFACTURING OPERATIONS

△ = SALES OFFICES

☆ = HEADQUARTERS

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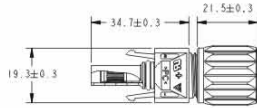
**ASIA & PACIFIC**

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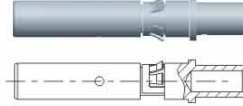
Page No	Table Of Contents
Page 1-6	 <p>Helios H4 connector</p>
Page 7-16	 <p>Junction boxes</p>
Page 17-22	 <p>Cable and cable assembly</p>
Page 23-26	 <p>Tool and accessory</p>
Page 27-28	 <p>Part</p>

## H4 PV cable connector

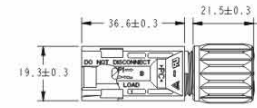
H4 Female PV cable connector



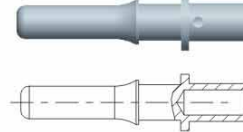
H4 Female socket contact



H4 Male PV cable connector



H4 Male pin contact



### How to order



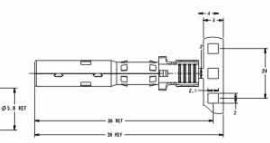
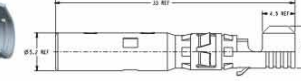
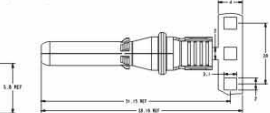
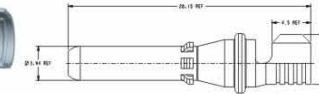
Product Family	Product	Gender	Connector type	Cable size	Approvals	Connector packaging
H4 Helios H4	C Connector	F Female +	C Cable gland	2 2.5 mm <sup>2</sup> /AWG14	D Dual	I 1 pcs/bag, 800pcs/box
		M Male -		4 4 mm <sup>2</sup> /AWG12		C 100pcs/bag, 10bags/box
				6 6 mm <sup>2</sup> /AWG10		M 500 pcs/ bag, 2bags/box
				8 10 mm <sup>2</sup> /AWG8		

### Technical Data

Rated current	32A(2.5mm <sup>2</sup> ,14AWG),40A(4.0mm <sup>2</sup> ,12AWG), 44A(6.0mm <sup>2</sup> ,10AWG), 65A(10.0mm <sup>2</sup> , 8AWG)
Rated voltage	1000V (IEC/TUV/UL)
Test voltage	6KV for 1 minute, 8KV impulse (1.2/50 μs)(IEC)
Typical contact resistance	0.30mΩ for S&F contact, 0.25mΩ for machined contact
Contact material	Copper, tin plated
Contact system	Cold formed / stamp formed contact with RADSOK® insert
Insulation material	PC
Locking mechanism	Snap-lock, special unlocking tool required to un-mate as required by NEC2011
Cable strain relief	Compression gland with ratcheting gland nut
Degree of protection	IP68
Safety class	II
Pollution degree	2
Overvoltage category	III
Flame class	UL94 V-0
Ambient temperature range	-40°C--- +85°C

## H4 Stamped and formed contact

Packaged on a reel for automatic assembly



### H4 connector with S&F contact logic code



Product Family	Product	Gender	Connector type	Cable size	Approvals	Connector packaging	Contact
H4 Helios H4	C Connector	F Female +	C Cable gland	2 2.5 mm <sup>2</sup> /AWG14	D DUAL	I 1 pcs/bag, 800pcs/box	S S&F contact
		M Male -		4 4 mm <sup>2</sup> /12AWG & 6mm <sup>2</sup> /10AWG		C 100pcs/bag, 10bags/box	
				0 Less contacts		M 500 pcs/ bag, 2bags/box	

### H4 Stamp and formed contact ordering logic

Product line	Contact type	Gender	Cable size	Packing
H4 Helios H4	F S&F contact	F Female	2 1.5mm <sup>2</sup> /16AWG & 2.5mm <sup>2</sup> /14AWG	R 2000/reel
		M Male	4 4.0mm <sup>2</sup> /12AWG & 6.0mm <sup>2</sup> /10AWG	

Note: If ordering contacts in 2000pcs/reel version, need to order contacts and plastic housing separately. Contacts is as this table, plastic house should choose as H4CFC0DM for female housing and H4CMC0DM for male housing. If choose contact picked off from reel, just choose as H4CFC4DM5 for female connector with S&F contacts, 1000pcs/box pack.

### Assembly Tool

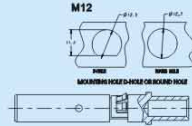
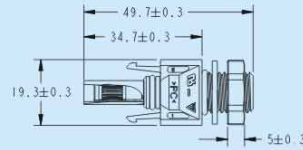


Tool-kit H4TK0000    Unlock tool H4TU0000    Wrench tool H4TW0001    Strip tool H4TS0000    Crimp tool H4TC0000

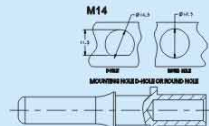
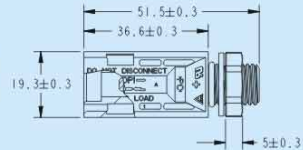


## H4 PV panel connector

### H4 Female PV panel connector



### H4 Male PV panel connector



### How to order

Product line	Product	Gender	Connector type	Cable size	Approvals	Connector packaging
H4 Helios H4	C Connector	F Female - M Male +	M bulkhead M12 N bulkhead M14	2 2.5 mm <sup>2</sup> /AWG14 4 4 mm <sup>2</sup> /AWG12 6 6 mm <sup>2</sup> /AWG10 8 10mm <sup>2</sup> /AWG8	D DUAL	I SINGLE C 1000 PCS /BOX AND 100 PCS BAGS M 1000 PCS /BOX AND 500 PCS /BAGS

### Technical Data

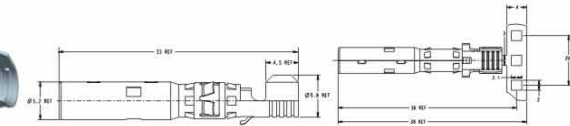
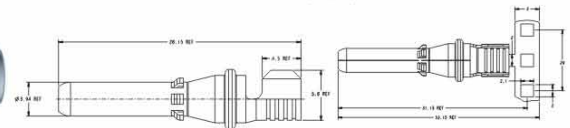
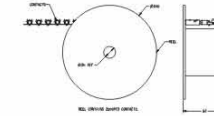
Rated current	32A(2.5mm <sup>2</sup> ,14AWG),40A(4.0mm <sup>2</sup> ,12AWG), 44A(6.0mm <sup>2</sup> ,10AWG), 65A(10.0mm <sup>2</sup> , 8AWG)
Rated voltage	1000V (IEC/TUV/UL)
Test voltage	6KV for 1 minute, 8KV impulse (1.2/50 μ S)(IEC)
Typical contact resistance	0.30mΩ for S&F contact, 0.25mΩ for machined contact
Contact material	Copper, tin plated
Contact system	Machined/cold formed or S&F contact with RADSOK® insert
Insulation material	PC
Locking mechanism	Snap-lock, special unlocking tool required to un-mate as required by NEC2008
Cable strain relief	Compression gland with ratcheting gland nut
Degree of protection	IP68 (1 meter, 1 hour) mated
Safety class	II
Pollution degree	2
Overvoltage category	III
Flame class	UL94 V-0
Ambient temperature range	-40°C--- +85°C

### Ordering example:

■ H4 PV connector	H4 C	■ 6.0mm <sup>2</sup> /10AWG cable size	6
■ Female part	F	■ Dual approvals	D
■ M12 panel connector	M	■ 1000pcs per package	M

## H4 Stamped and formed contact

Packaged on a reel for automatic assembly



### H4 connector with S&F contact logic code

Product Family	Product	Gender	Connector type	Cable size	Approvals	Connector packaging	Contact
H4 Helios H4	C Connector	F Female + M Male -	M Bulkhead M12 N Bulkhead M14	2 2.5 mm <sup>2</sup> /AWG12 4 Cable gauge:4 mm <sup>2</sup> /12AWG 86mm <sup>2</sup> /10AWG 0 Less contacts	D Dual	I 1pcs/bag, 800pcs/box C 100pcs/bag, 10bags/box M 500pcs/bag, 2 bags/box	S S&F contact

### H4 Stamp and formed contact ordering logic

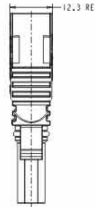
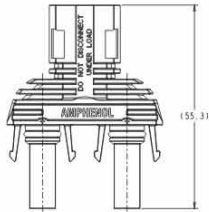
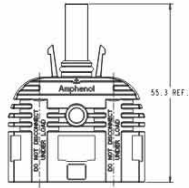
Product lin	Contact type	Gender	Cable size	Packing
H4 Helios H4	F S&F contact	F Female M Male	2 1.5mm <sup>2</sup> /16AWG & 2.5mm <sup>2</sup> /14AWG 4 4.0mm <sup>2</sup> /12AWG & 6.0mm <sup>2</sup> /10AWG	R 2000pcs/reel

Note: If ordering contacts in 2000pcs/reel version, need to order contacts and plastic housing separately. Contacts is as this table, plastic house should choose as H4CFCCDM for female housing and H4CMCCDM for male housing. If choose contact picked off from reel, just choose as H4CFC4DMS for female connector with S&F contacts, 1000pcs/box pack.

### Assembly Tool



■ Tool-kit H4TK0000 ■ Unlock tool H4TU0000 ■ Wrench tool H4TW0001 ■ Strip tool H4TS0000 ■ Crimp tool H4TC0000



### How to order

Product line	Product type	Gender
H4 Helios H4	Y Branch connector	X FFM (branch 2 female/1 male)
		Y MMF (branch 2 male/1 female)

### Cable Assy and Diversity Junctions



T Junction



Y Junction



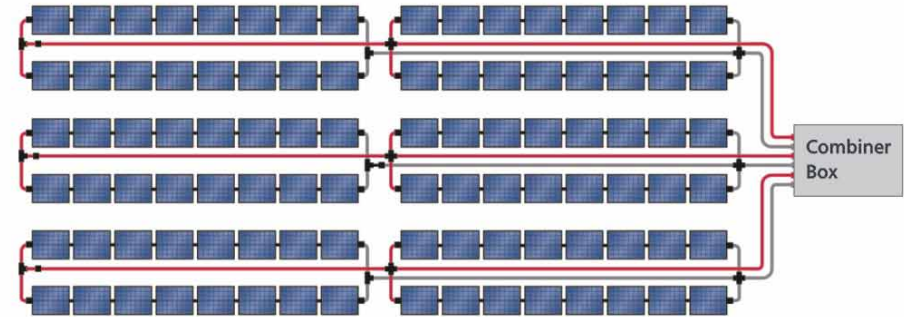
R Junction



X Junction

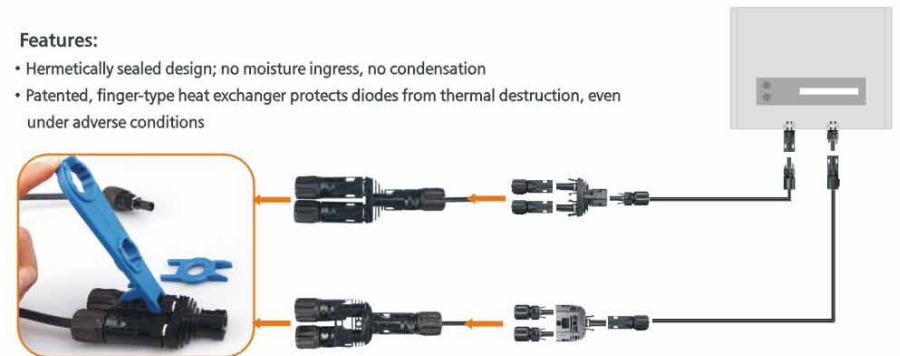
### Technical Information

Ambient Temperature Rating : -40°C---+70°C  
 Cable Range (Cable Version): 14AWG (2.5mm<sup>2</sup>) To 8AWG (10mm<sup>2</sup>)  
 Degree of protection :IP68

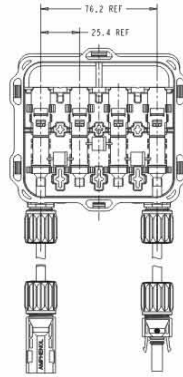


### Features:

- Hermetically sealed design; no moisture ingress, no condensation
- Patented, finger-type heat exchanger protects diodes from thermal destruction, even under adverse conditions



## Hercules™ PV Junction Box



### Features:

- Same dimensions, multi variations
- IP67 rated
- Breathing film for air exchange



### Technical data

Rated voltage	UL 600V/1000V DC IEC/TUV: 1000V DC
Rated current	Up to 30A
Terminal quantity	3 rails or 4rails
Diode quantity option	2, 3, 4, 6
Ribbon connection	Clamping, Soldering or Spot welding
Breathing film	With or Without
Degree of protection	IP67
Cable size	12AWG/4.0mm <sup>2</sup> or 10AWG/6.0mm <sup>2</sup>
Size	117x107x22mm
Flame class	UL94 V-0; 5VA
Connector type	Helios H4
Temperature range	-40°C to +90°C

### How to order

Product line	Product type	Terminals and Diodes	Terminal style	Diode rating		
HB Helios JB	H Hercules Junction box	A 4 contacts/3 diodes	A Clamp contacts	A 12A 200V		
		B 3 contacts(2 left/1 right)/2 diodes	B Solder contacts	B 12A 40V		
		C 3 contacts(1 left/2 right)/2 diodes	C Solder contacts left&right opening	C 15A 40V		
		D 4 contacts/6 diodes	D Solder contacts left opening	D 30A 40V		
		E 3 contacts(2 left/1 right)/4 diodes	E Solder contacts right opening	E 20A 40V		
		F 3 contacts(1 left/2 right)/4 diodes	F Spot weld contacts	F 15A 45V		
Sealing type	Breathing hole	Cable size	Adhesive	Cable length (Ln)*	Cable length (Lp)*	Variations
A Potting	Y Yes	A 6.0 mm <sup>2</sup> /10AWG	Y Yes	A 1000mm	A 1000mm	H Upgraded to UL 1000V
B O-ring	N No	B 4.0mm <sup>2</sup> /12AWG	N No	B 900mm	B 900mm	

\* Ln: cable length on negative end; Lp: cable length on positive end

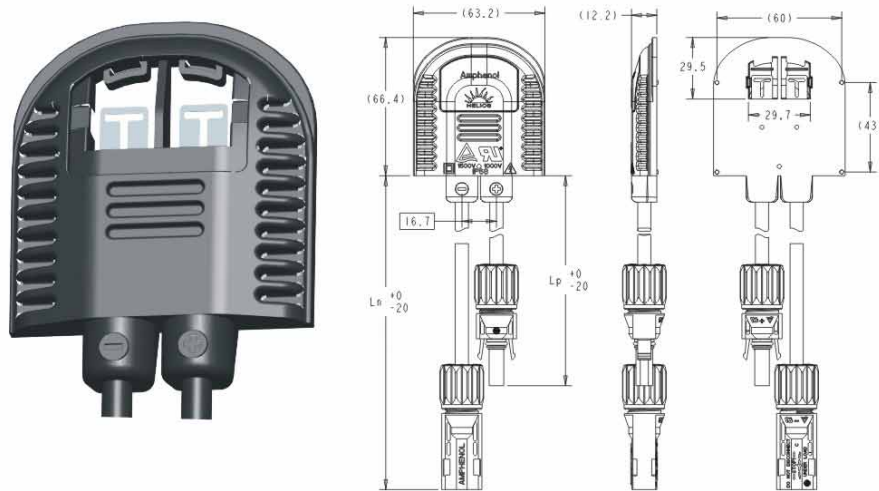
- Please contact us for additional variations

### Ordering example:

■ HelioLink PV junction box	HB H	■ Potting seal	A
■ 4 contacts/3 diodes	A	■ With breathing hole	Y
■ Soldering connection	B	■ 6.0mm <sup>2</sup> /10AWG cable size	A
■ Diode rated 15A/40V	C	■ Without adhesive tape	N
		■ 1000mm cable length from both negative and positive end	AA



## Thin-film PV junction box



### Features:

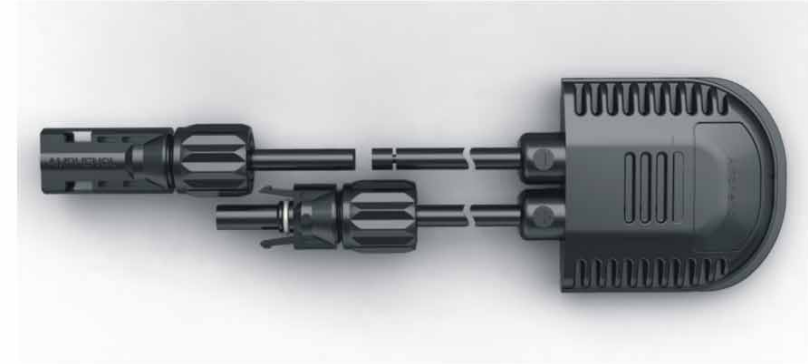
- Low profile
- Over-molded design for better sealing
- SMD for efficient heat dissipation



### Technical Data

Rated voltage	1500V DC (TUV) , 1000V(UL)
Rated current	Up to 20A
Termination type	Soldering
Protection degree	IP 67
Operation temperature	-40° C --- +90° C
Sealing type	Potting
Flame class	UL94 5V
Diode quantity option	None/ 1

## Thin-film PV junction box



Product line	Product type	Terminals and Diodes		Terminal style	Diode rating
HB Helios JB	T Thin film junction box	G 2 contacts/1 diode		B Solder contacts	G 5A 1000V H 10A 1000V J 8A 1000V K 15A 1000V P 20A 100V Q 20A 45V N N/A
Sealing type	Breath Hole	Cable size	Adhesive	Cable length (Ln)*	Cable length (Lp)*
A Potting	Y N	B 4.0 mm <sup>2</sup> /12AWG C 2.5mm <sup>2</sup> /14AWG	Y Yes N No	A 1000mm B 900mm	A 1000mm B 900mm

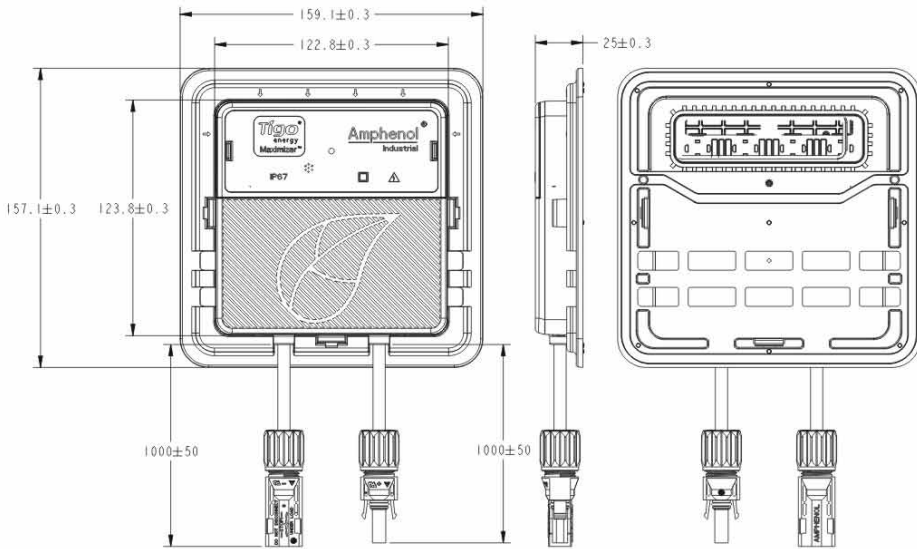
\* Ln: cable length on negative end; Lp: cable length on positive end

- Please contact us for additional variations

### Ordering example:

■ Thin-film PV junction box	HB T	■ Potting seal	A
■ 2 contacts/1 diode	G	■ 2.5mm <sup>2</sup> /14AWG cable size	C
■ Soldering connection	B	■ Without a adhesive tape	N
■ Diode rated 20A/45V	Q	■ 1000mm cable length from both negative and positive end	AA

Tigo-Amphenol Optimizer



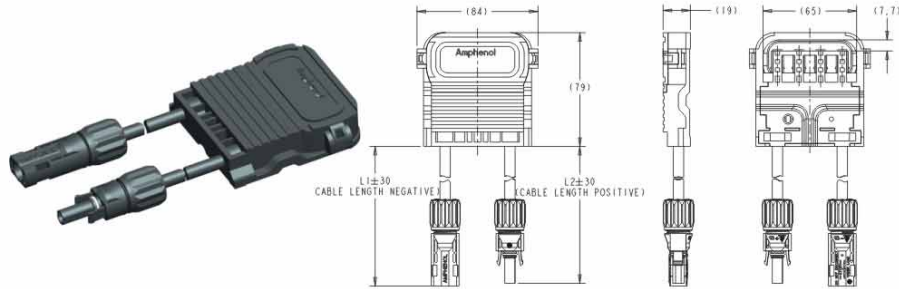
Technical data				
<b>Input data</b>		<b>MMJ-ES50</b>	<b>Diode rating</b>	
Maximum power		300W	350W	
Maximum input DC voltage (Voc)		52V	75V	
Vmp range *		16-48V	30-65V	
Maximum continuous current (Imp)		9.5A	6.5A	
Maximum input current (Isc)		10A	7.5A	
Output Data (DC)		300W	350W	
Maximum output power		9.5A	6.5A	
Maximum continuous current		variable	variable	
Nominal Voltage/range				
<b>Mechanical Data</b>				
Operating temperature range		-30° C ---70° C		
Cooling		Natural Convection		
<b>Sealing type</b>	<b>Product</b>	<b>Technical specification</b>	<b>Cable length*+*</b>	<b>Cable length* -*</b>
HB Helios JB	F Tigo Removable junction box	5 MMJ-ES50	A 1000mm	A 1000mm
		7 MMJ-ES75	B 900mm	B 900mm

For residential, commercial and utility scale photovoltaic solar arrays, the Optimizer™ system optimizes the power output of each module (solar panel); delivers module level data for operational management and performance monitoring; and provides the ability to deactivate the high voltage DC bus for safer installation, maintenance or fire fighting. Optimizers are key components of the system as an integrated part of modules provided by leading solar module OEMs. The Module Optimizer provides data acquisition, communication to the Optimizer™ Management Unit, and energy harvesting control. The very small electronics footprint has been designed to minimize cost and maximize reliability. Solar modules with an integrated Energy Optimizer MMJ-ES are ideal for new installations worldwide.

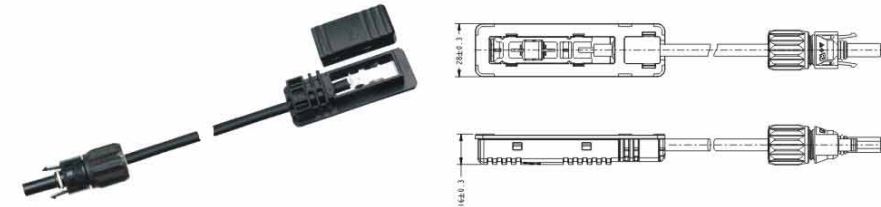
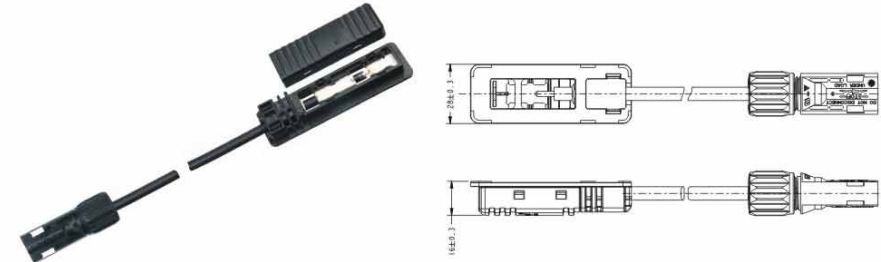
The Optimizer output optimization starts with dynamic module balancing – a Module Optimizer (patented) integrated within each module manages the energy harvest and send information to the Optimizer Management Unit for reporting and control. Modules with the integrated Optimizer are connected in a normal series topology.

MMJ-ES maintains best-in-class system conversion efficiencies at statistically 99.5%. The Optimizer includes a unique technology which greatly enhances the safety of a PV solar installation. As part of the Optimizer system, this function can be activated with a safety button or via a remote management console. The system can be installed, maintained or approached by fire personnel without the exposure to voltage levels typically in excess of 400 volts.





Product family	Product	Terminals and diodes	Terminal style	Diode rated current	Sealing type
HB Helios JB	C Hercules 2 Junction box	A 4 contacts/3 diodes	A Clamping contacts	Y YJ 20A45V M 25A45V HY D <sup>2</sup> PAK	A Potting
Breathing hole	Cable size	Adhesive	Cable length positive	Cable length negative	
N No	A 4 mm <sup>2</sup> /AWG12	N No	A 1000MM B 900MM	A 1000MM B 900MM	



## Amphenol Hercules II Junction box

Amphenol Hercules II Junction box	Specification
Rated voltage	TUV 1500V UL 1000V
Rated current	Up to 10A
Contact resistance	15mΩ max
Number of terminals	4
Sealing type for ribbon connection	O-ring
Diode quantity	3diode
Option of ribbon connection	Soldering, Spot welding, Clamping
Box size (LxWxT)	76*84*18.5 mm
IP degree	IP68
Inflammability	UL94 V-0, 5VA, Safety class II
TUV certification No.	In process
UL certification Number	In process

## Double pole J-Box

Rated voltage	TUV 1000V UL 1000V
Rated current	12A
Contact resistance	1.0mΩ Max
Sealing type for ribbon connection	Potting
Option of diode type	Spot welding
Degree of protection	IP68
Inflammability	UL94 V-0, 5VA Safety Class II

## ModLink Junction Box



### Features:

- Modular concept; only add what you need, when you need it
- “Future proof” : Ready to accept future smart modules
- Base unit is a complete junction box
- Base unit thermally separated from panel
- Uses industry standard connections
- Plug-and-play; no additional components needed
- No wasted materials when upgrading
- Smart module snaps into base; no drilling, no additional cabling.
- Cost effective on every level: For panel OEM, distributor, installer, Owner/operator
- Can be upgraded at any time



## Helios ModLink Modular Junction Box

The ModLink Modular Junction Box provides PV panel manufacturers an advanced junction box that enables cutting edge smart technology at no additional cost. Built-in industry standard connectors mate directly to Amphenol Industrial Helios H4 connectors or to a wide range of “Smart” modules. These include DC/DC converters/optimizers, performance monitoring and DC/AC microinverters.

The ModLink Junction Box consists of a base unit that is firmly attached to the back sheet of the panel. The base unit already contains protective diodes and built-in connectors; ready to be used as a basic junction box from the start. When it's time to upgrade just disconnect the connectors, snap-in the smart module, reconnect the connectors and you're done.

This modular technology provides instant plug-and-play versatility. Smart modules can be added (or removed) at any time without any additional materials needed or wasted.

The base module retains the basic junction box functionality and protection, no matter if there are smart modules attached or not. This allows for exchange or removal of smart modules if repairs or upgrades are needed, without losing the basic function of the PV module.

There is no longer a need for “pigtailed” attached to the photovoltaic module, making manufacturing and handling easier.

The Helios ModLink Modular Junction Box is just one of the many solar solutions Amphenol Industrial has to offer.

## Technical Data

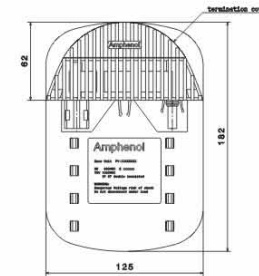
Terminals	4
Termination	Spot Weld
Termination seal	Potting or Lipseal(optional)
Bypass diodes	3 low Vf Schottky
Rated current	15A
Rated voltage	UL:600V IEC:1000V
DC output connection	Built-in Helios H4 Solar Connectors
Operating temperature	-40°C-90°C
Protection degree	IP67
Attachment to backsheet	PSA foam tape or RTV silicon adhesive
Enclosure material	PPE

### Ordering logic code:

Modlink	Product family	Product	Diode rated current	PCB
	HB Helios JB	0 ModLink Junction box	A FFM (branch 2 female/1 male) B MMF (branch 2 male/1 female)	A V40-X B V50-X C V100-X

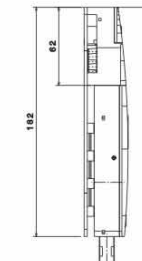
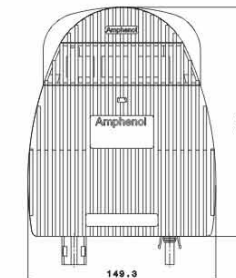
## For ampt Optimizer Smart Module (DC/DC Converter) please refer to IDS-5

### Base Unit Dimensions



Module Installation

### Installed Module Dimensions



Module Installed



## PowerLink solar cable

Halogen free photovoltaic cables are used as the interconnection wiring for photovoltaic power systems.

### Features:

- Flexibility at low temperature
- Thermoset-insulated conductor
- Thermoplastic jacket
- Long-term insulation resistance to moisture
- Range from 1.5mm<sup>2</sup> to 25mm<sup>2</sup>



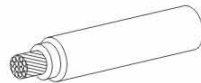
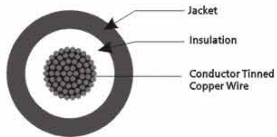
### Certificate:

TÜV and UL certified according to the latest regulations

### Structure:

- Conductor: Stranded bare or tinned copper
- Insulation: XLPE material (white and black)
- Jacket: XLPE material (Black, Red and Blue)

Temperature range:  
-40 °C to +125°C  
Environmental influence resistance:  
Acid, alkalinity, UV, ozone and hydrolysis-resistant.

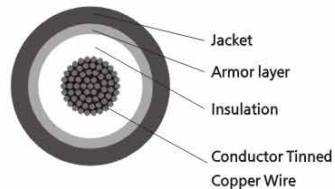


## ArmorLink Solar Cable



### Advantages:

- Rodent resistant
- Extra protection layer



In process In process Made using UL4703 and 2Pfg 1169 as guidelines.  
TÜV

## PowerLink solar cable application:

Used in heavy-duty and harsh environment interconnection wiring, can be easily combined with our Helios H4 PV connector and junction box series for photovoltaic system applications.



Cold  
Snow  
Low temperature



Sun  
Drought  
High temperature



Rain  
Moisture

## How to order

Product line	Product	Cable color	Cable type	Cable size	Approvals
HC Helios cable	P PowerLink-Standard	B Black - Standard	L VDE 0295 - CLASS 2 7 STRANDS (USE-2)	1 1.5 mm <sup>2</sup> /16AWG	T TÜV
	A ArmorLink-Rodent Proof	R Red	M MULTI WIRE 19 STRANDS (UL only)	2 2.5 mm <sup>2</sup> /14AWG	U UL
	U PowerLink-USE-2	L Blue	H VDE 0295 - CLASS 5 (UL, TÜV and Dual)	4 4 mm <sup>2</sup> /12AWG	U1 UL 1000V
		G Grey		5 25mm <sup>2</sup> /3AWG	D Dual 600V
		O Brown		6 6 mm <sup>2</sup> /10AWG 8 10mm <sup>2</sup> /8AWG 9 16mm <sup>2</sup> /4AWG	D1 Dual 1000V N None

### Notes:

UL cable comes in AWG only  
TUV cable comes in mm<sup>2</sup> only  
Dual cable comes marked with AWG and mm<sup>2</sup>

VDE 2095-CLASS 2 is 7 strands cable  
Multi wire stranding is 19 strands cable  
VDE 2095-CLASS 5 is high stranded cable with extra flexibility



## Inline and Over-molded Diode and Fuse



Inline diode connector

Over-molded inline diode cable assembly

Inline fuse connector

Over-molded inline fuse cable assembly

■ Protection degree:IP68  
 Cable range:2.5mm<sup>2</sup>/14AWG -10.0mm<sup>2</sup>/8AWG  
 Temperature range: -40 °C - +90 °C  
 Withstand rating:10kA  
 Voltage rating:1500V max  
 Amperage rating:30A max  
 Connector options: M-M,M-F,F-F

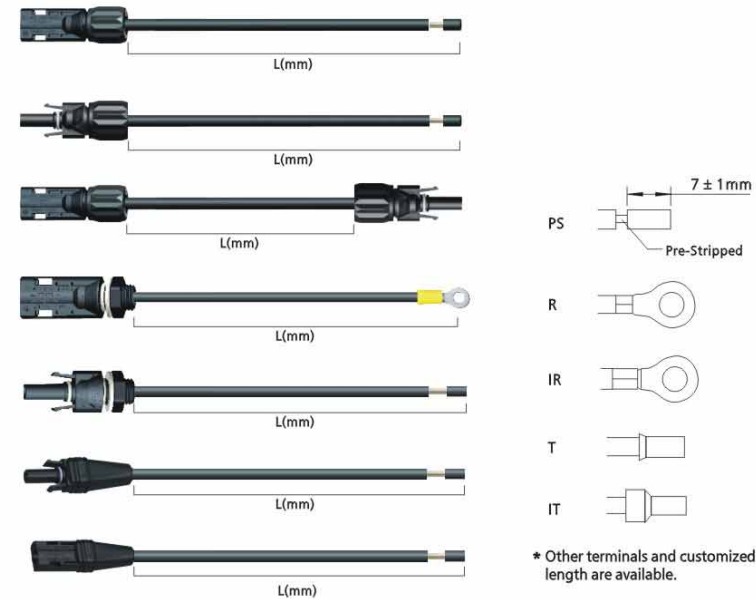
■ Protection degree:IP68  
 Cable range:2.5mm<sup>2</sup>/14AWG -10.0mm<sup>2</sup>/8AWG  
 Temperature range: -40 °C - +90 °C  
 Surge rating:600V max  
 Blocking voltage: customer specified

How to order				
Product line	Product type	Connector type	Volatage	Current rating
H4 Helios H4	F Molded fuse	FM Female/male	1 600V	01 1A
	D Molded diode	MM Male/male	2 1000V	02 2A
		FF Female/female		03 3A
				* up to 10A

## PV cable assemblies

How to order					
Product family	Product	Gender	Connector type	Cable size	Approvals
H4 Helios H4	C Connector	F female+	C Cable gland	2 2.5 mm <sup>2</sup> /AWG14	T TÜV
		M male-	M Panel M12	4 4 mm <sup>2</sup> /AWG12	U UL 600V
		P Mated pair	N Panel M14	6 6 mm <sup>2</sup> /AWG10	U1 UL 1000V
			O Over-mold	8 10mm <sup>2</sup> /AWG8	D DUAL 600V (UL)
Cable length(mm)	Cable color	Cable length(mm)	Variations		
	B Black - standard R Red L Blue G Grey O Brown	PS Pre-stripped wire R Ring terminal IR Isolated ring terminal T Tube terminal IT Isolated tube terminal			

### Examples of cable assemblies and definition of cable length:



\* Other terminals and customized strip length are available.

## T/X-Junction cable assembly ordering configuration

**Cable properties:**

Voltage:  
 600V  DC1000V  DC2000V DC

**Main cable size:**

8AWG(10.0mm<sup>2</sup>)  
 10AWG(6.0mm<sup>2</sup>)  
 12AWG(4.0mm<sup>2</sup>)  
 14AWG(2.5mm<sup>2</sup>)

**Main cable approval:**

UL  TUV  Dual

**Branch cable size:**

8AWG(10.0mm<sup>2</sup>)  
 10AWG(6.0mm<sup>2</sup>)  
 12AWG(4.0mm<sup>2</sup>)  
 14AWG(2.5mm<sup>2</sup>)

**Branch cable approval:**

UL  TUV  Dual

**Length of main cable (cm):**

A1 \_\_\_\_\_  
 A2 \_\_\_\_\_  
 ...  
 AN \_\_\_\_\_

**Length of branch cable:**

B1(Beginning of main cable) \_\_\_\_\_  
 ...  
 BN(End of branch cable) \_\_\_\_\_

**Terminations:**

A1(Beginning of main cable) \_\_\_\_\_  
 AN (End of main cable) \_\_\_\_\_  
 B1 (Beginning of branch cable) \_\_\_\_\_  
 BN (End of branch cable) \_\_\_\_\_

**H4F, H4M, H4OF, H4OM,**

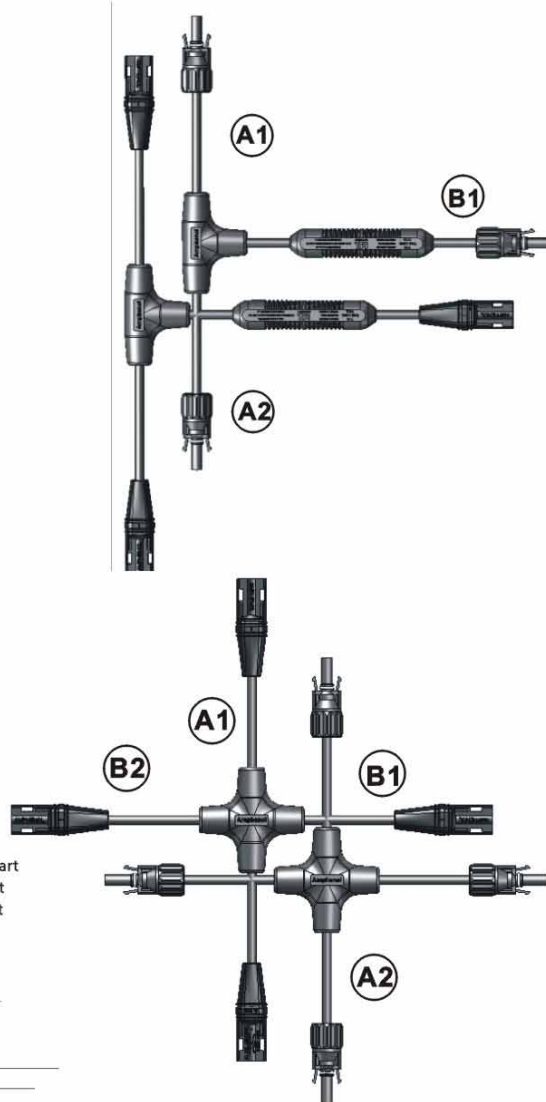
\*H4F: H4 standard cable connector female part  
 H4M: H4 standard cable connector male part  
 H4OF: H4 overmolded connector female part  
 H4OM: H4 overmolded connector male part

**Fuses:**

Location of fuse \_\_\_\_\_  
 Rating of fuse \_\_\_\_\_ A \_\_\_\_\_ V

**Labels:**

Label location \_\_\_\_\_  
 Label Text \_\_\_\_\_



## R-Junction cable assembly ordering configuration

**Cable properties:**

Voltage:  
 600V  DC1000V  DC2000V DC

**Main cable size:**

8AWG(10.0mm<sup>2</sup>)  
 10AWG(6.0mm<sup>2</sup>)  
 12AWG(4.0mm<sup>2</sup>)  
 14AWG(2.5mm<sup>2</sup>)

**Main cable approval:**

UL  TUV  Dual

**Branch cable size:**

8AWG(10.0mm<sup>2</sup>)  
 10AWG(6.0mm<sup>2</sup>)  
 12AWG(4.0mm<sup>2</sup>)  
 14AWG(2.5mm<sup>2</sup>)

**Branch cable approval:**

UL  TUV  Dual

**Length of main cable (cm):**

A1 \_\_\_\_\_  
 B1 \_\_\_\_\_  
 C1 \_\_\_\_\_

**Terminations:**

A1 \_\_\_\_\_  
 B1 \_\_\_\_\_  
 C1 \_\_\_\_\_

**H4F, H4M, H4OF, H4OM,**

\*H4F: H4 standard cable connector female part  
 H4M: H4 standard cable connector male part  
 H4OF: H4 overmolded connector female part  
 H4OM: H4 overmolded connector male part

**Fuses:**

Location of fuse \_\_\_\_\_  
 Rating of fuse \_\_\_\_\_ A \_\_\_\_\_ V

**Labels:**

Label location \_\_\_\_\_  
 Label Text \_\_\_\_\_



## Tool Kit. P/N: H4TK0000

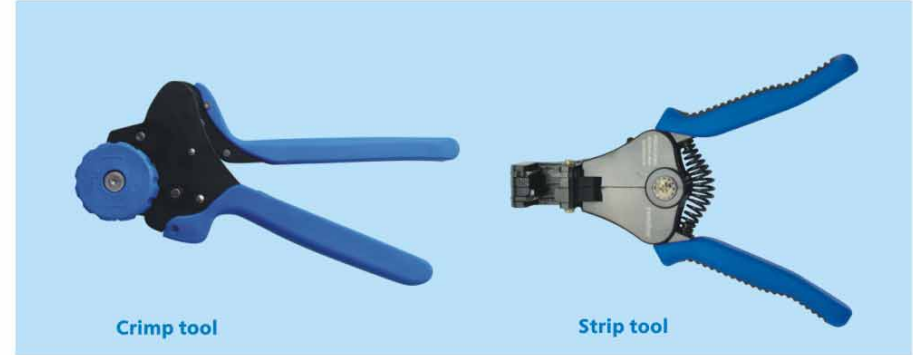
Water proof with foam insert and assembly tool. The listed parts are included.



Crimp tool



Strip tool



Crimp tool

Strip tool

Crimp tool, P/N: H4TC0001 for machined contact, H4TC0002 for stamp & formed contact. Amphenol crimp tool is has the capability to crimp both machined contact and stamp&formed contact, the only difference is the insert die. If you need to crimp 2 kinds of contact when install connector, you could change the insert die and locator. The machined insert die could crimp 14-8awg contact, 10awg and 8awg share the same die position. The stamp&formed insert die could crimp 14awg-10awg contact.

Amphenol cable strip tool, P/N:H4TS0000.

Strip tool has a locator to set striped cable length, strip capacity from 14awg to 10awg.

Amphenol strip tool advantage: Save strip force; Will not cut sopper core; Consistent strip length.

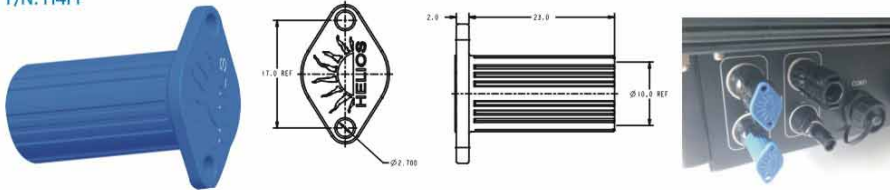


### Parts list

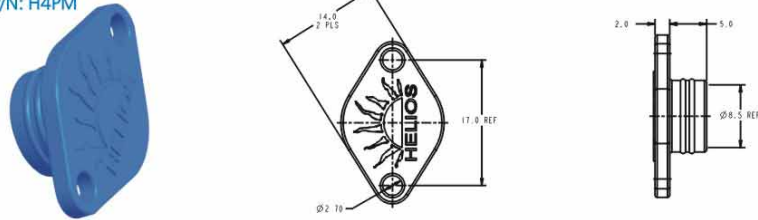
P/N	Description	Quantity
H4TTW100	Socket for cable gland	1
H4TM1200	Socket for bulkhead m12	1
H4TC0001	Crimper tool for machined contact	1
H4TU0000	Unlock tool	1
H4TS0000	Cable strip tool	1
H4TCT000	Cable cutter	1
H4TW0001	Wrench tool	2
PV-692208-000	S&F crimp tool die-set	1
PV-692209-001	S&F crimp tool locator	1
PV-090508-M25	2.5mm2 male contact	5
PV-090508-M04	4.0mm2 male contact	5
PV-090508-M06	6.0mm2 male contact	5
PV-090507-F03	2.5mm2 female contact	5
PV-090508-F03	4.0mm2 female contact	5
PV-090506-F03	6.0mm2 female contact	5



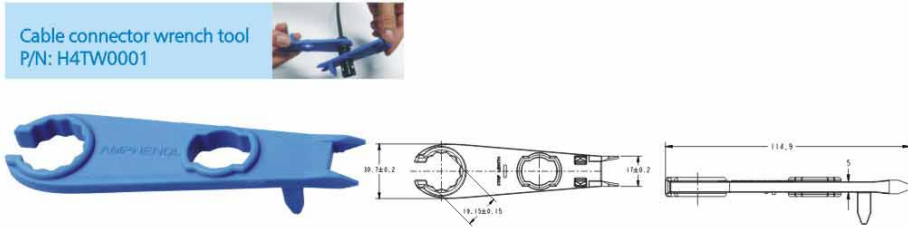
Sealing cap for female connector.  
P/N: H4PF



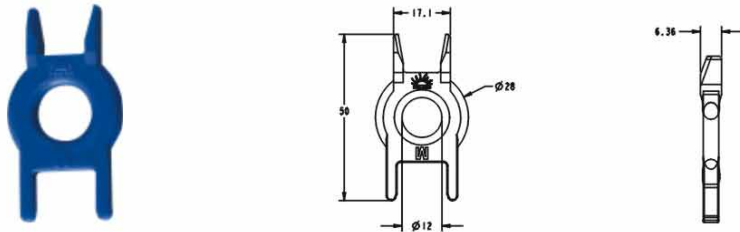
Sealing cap for female connector.  
P/N: H4PM



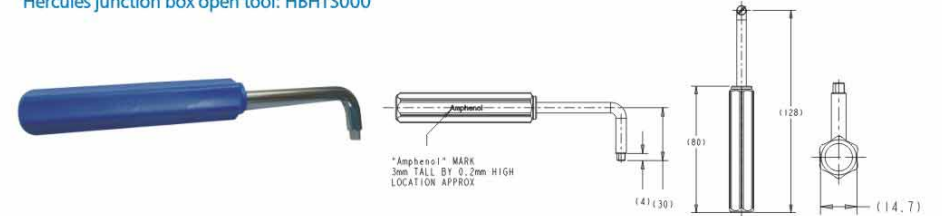
Cable connector wrench tool  
P/N: H4TW0001



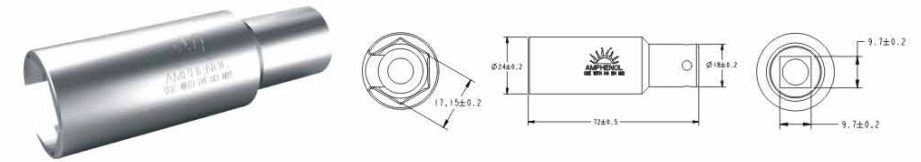
Unlock tool  
P/N: H4TU0000



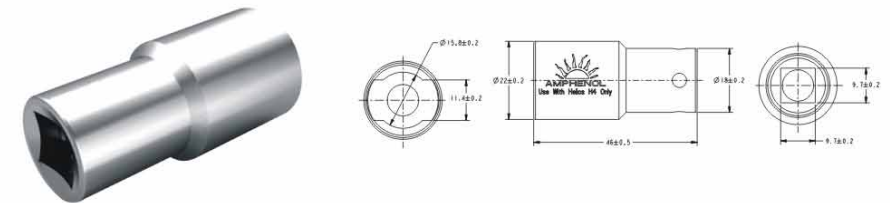
Hercules junction box open tool: HBHTS000



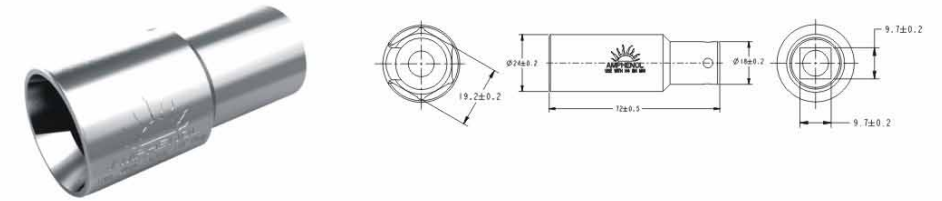
Torch wrench:P/N: H4TTW100



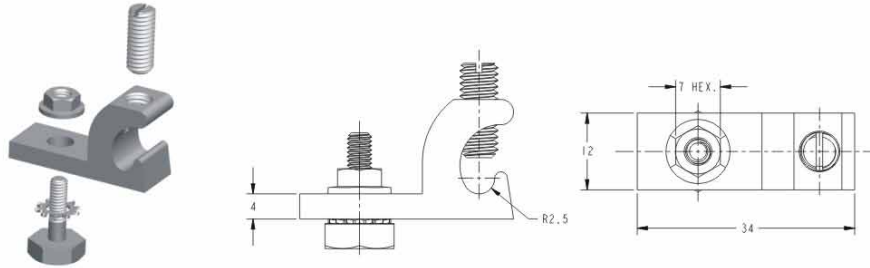
Connector hold tool:P/N: H4TH0000



TBulkhead wrench tool:  
P/N for M12:H4TM1200; P/N for M14:H4TM1400



## HelioLug



### INSTALLATION INSTRUCTIONS:

- Place the lug to the designated module grounding hole with the star washer between the grounding lug and the module frame in order to break through the anodizing and establish electrical contact with the aluminum. Torque the bolt and nut to 30 in-lbs. NOTE: These instructions provide guidelines for general use. If available, the specific module manufacturer's instructions for the location of the star washer are to be followed.

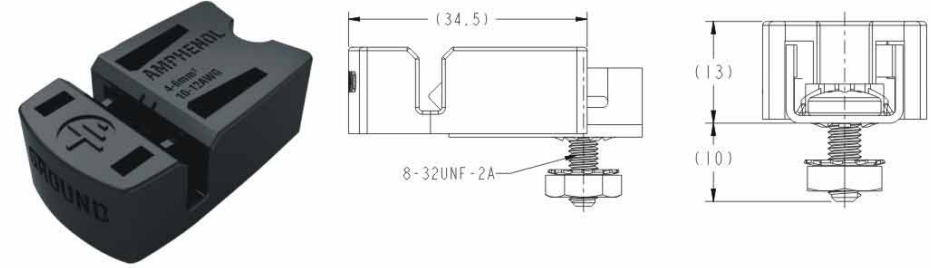
- For the attachment to the racking, slide the bolt into the mounting channel of the extrusion or into a 1/4" hole drilled through the extrusion. Place the star washer between the racking and lug and secure the nut and bolt to 30 in-lbs. NOTE:

- Insert a 4 to 12 AWG copper wire into the lug and tighten the lug set screw to the copper wire to the torque based on the wire size. (4-6 AWG at 35 in-lbs and 8-12 AWG at 30 in-lbs). Do not exceed the maximum rated overcurrent protection, 20 A (12 AWG), 40 A (10 AWG), 90 A (8 AWG), 150 A (6 AWG), and 200 A (4 AWG).

### Certified for UL2703-PV Racking and Grounding

How to order			
1	2	3	4
HG	L	U	I
Product line	Product type	Approvals	Packaging
HG Helios Grounding Products	L HelioLug (Wire Range 4-12 AWG)	U UL	I Individual M 1000pcs

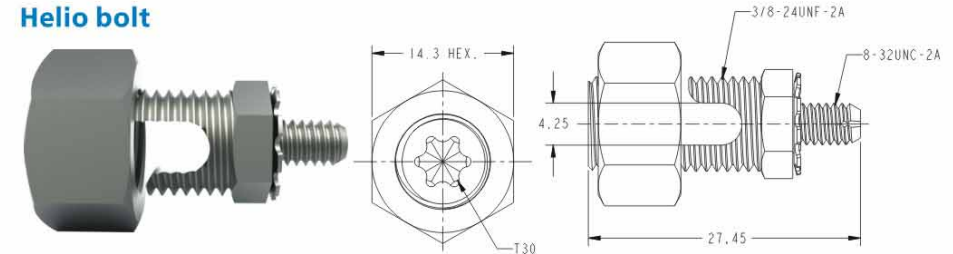
## Helio clip



### Designed for UL2703-PV Racking and Grounding

How to order			
Product Family	Product	Certification	Packaging
HG Helios Grounding	B Helios Grounding Clip Selftapping D Helios Grounding Clip Mounting	UL U IUV I DUAL D	I Individual packaging B Bulk packed

## Helio bolt



### Designed for UL2703-PV Racking and Grounding

How to order			
Product Family	Product	Certification	Packaging
HG Helios Grounding	B HelioBolt Selftapping D HelioBolt Mounting	UL U IUV I DUAL D	I Individual packaging B Bulk packed