

AMPHENOL INDUSTRIAL PRODUCTS GROUP

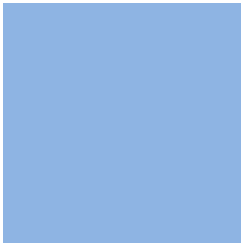
SOLAR MARKET PRODUCT SUMMARY

AMPHENOL CORPORATION

TOTAL SALES

- OVER 80 YEAR HISTORY, LISTED ON NYSE SINCE 1991

- SECOND LARGEST INTERCONNECT MANUFACTURER IN THE WORLD



- HIGH TECHNOLOGY INTERCONNECT SOLUTIONS
- LEADING POSITIONS IN DIVERSE MARKETS



- BROAD GLOBAL PRESENCE AND CAPABILITY
- OVER 90,000 EMPLOYEES WORLDWIDE
- TOTAL NET SALES 2021: US \$ 10,9 BILLION

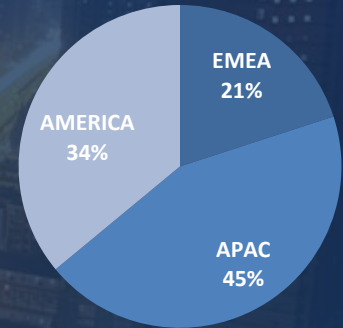


GLOBAL PRESENCE IN THE MARKET

SALES BY REGION



% SALES BY REGION



2021 SALES \$ 10,876 BIL



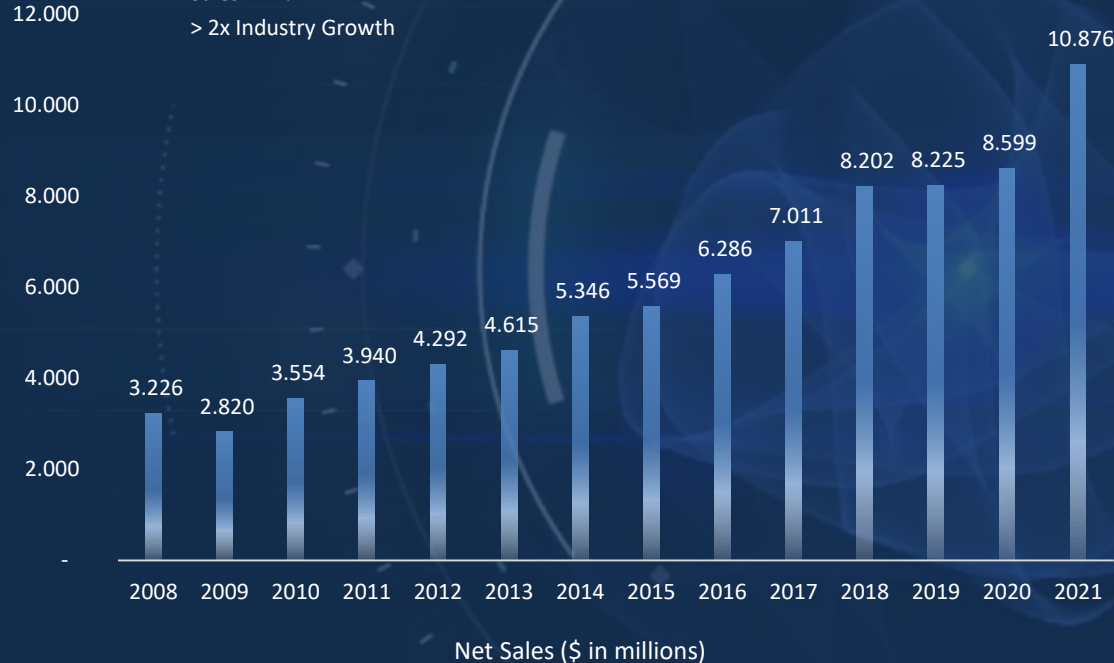
90,000 EMPLOYEES

Manufacturing Operations & Sales				Sales			
Australia	France	Italy	Morocco	Switzerland	Argentina	Russia	
Brazil	Germany	Japan	New Zealand	Taiwan	Austria	Spain	
Canada	Hungary	Korea	Poland	Tunisia	Finland	South Africa	
China	India	Macedonia	Puerto Rico	UAE	Ireland	Turkey	
Czech Republic	Indonesia	Malaysia	Singapore	United Kingdom	Saudi Arabia	Vietnam	
Estonia	Israel	Mexico	Slovakia	United States			

EXCELLENT RECORD OF ACHIEVEMENTS

AMPHENOL 10 Year CAGR

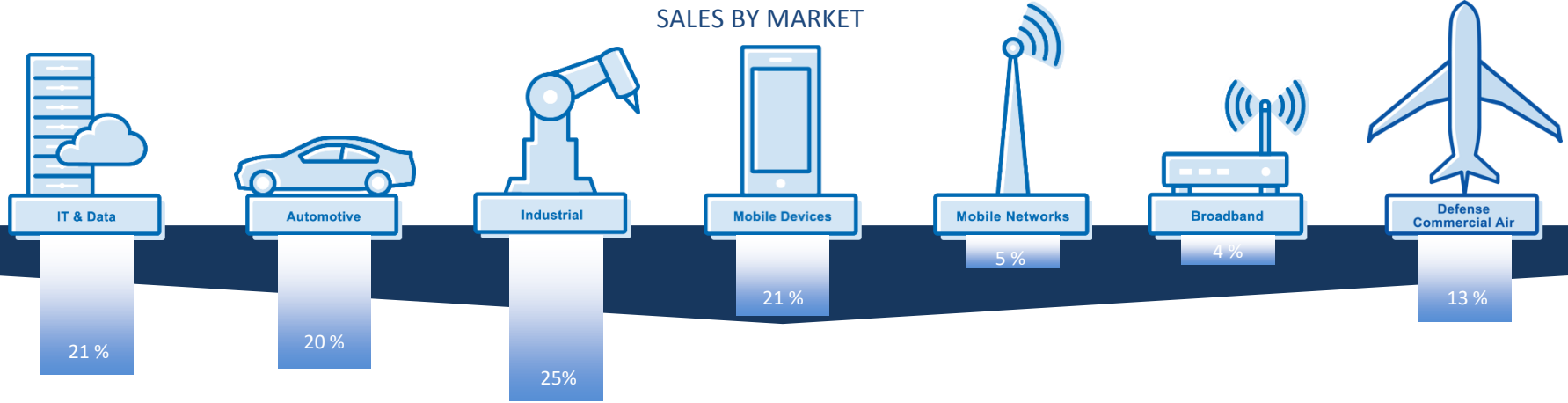
Sales 11 %
> 2x Industry Growth



- INDUSTRY LEADING GROWTH FOR OVER A DECADE
- INDUSTRY LEADING OPERATING PROFIT MARGINS IN ALL BUSINESS CYCLES
- STRONG CASH FLOW GENERATION
- SUCCESSFUL ACQUISITION PROGRAM IN CONSOLIDATING INDUSTRY

GLOBAL LEADER IN THE MARKET

SALES BY MARKET





AMPHENOL INDUSTRIAL PRODUCTS GROUP

24 OPERATIONS GLOBALLY IN EMEA, AMERICA AND APAC

LEADING POSITIONS IN DIVERSE INDUSTRIAL SUB MARKETS

TOTAL NET SALES INDUSTRIAL MARKET FOR AMPHENOL 2021: US \$ 2.725 BILLION

AMPHENOL INDUSTRIAL MANUFACTURING OPERATIONS



Amphenol Bernd Richter
Wipperfurth, Germany



Amphenol TPI
Winnipeg, Canada



Amphenol Tuchel Industrial
Heilbronn, Germany/Ostrov, CZ



Amphenol NeLson Dunn
Houston TX, USA



Amphenol Industrial Operations
Nogales, Mexico/Endicott-NY



Amphenol Alden
Brockton-MA, USA



Amphenol Sine
Nogales, Mexico/Clinton Twp-MI



Amphenol Middle East
UnitedArab Emirates



Amphenol EEC
Chicago-IL, USA



Amphenol Sincere Industrial
Pecs, Hungary



Amphenol DC Electronics
San Jose-CA, USA



Amphenol Australia
Carrum Downs,Australia



Amphenol MPI
Morgan Hill CA, USA



Amphenol Conec
Lippstadt, Germany



Amphenol Sincere
Guangzhou, China



Amphenol PCD
Shenzhen, China



Amphenol Goldstar
Baicheng / Yulin, China



Amphenol Daeshin
Bucheon-City, South Korea



Amphenol Onaon
Milpitas, USA



Amphenol GEC
Changzhou, China



Amphenol Technology SZ
Shenzhen, China



Amphenol Anytek
Shenzhen, China



Amphenol Technology Zh
Zuhai, China



Amphenol LTW
Taipei ,TW/ Kunshan, China



Cable Assemblies

Connectors

Testing

Flex Circuits

AMPHENOL INDUSTRIAL VERTICAL FOCUS MARKETS

HEAVY
EQUIPMENT



RENEWABLE
ENERGY



AUTOMATION &
ROBOTICS



HYBRID &
ELECTRIC VEHICLES



MARINE



TEST, MEASUREMENT &
INSTRUMENTATION



LIGHTING &
ENTERTAINMENT



OIL & GAS



MEDICAL



RAIL MASS
TRANSIT



VERTICAL MARKET
**RENEWABLE
ENERGY**

- Waterproof IP67, IP68 & IP69K
- TUV and UL approval
- UV resistant
- Power up to 2000A
- Cables size from 0,25mm² to 400mm²
- Signal & hybrid arrangements

Amphenol®
Industrial Solar Technologies



Helios H4[®] Cable Connectors Solid Contacts



Key Features

- ✓ UL6703 1500VDC & TUV IEC 62852 1000VDC
- ✓ Low and stable Contact Resistance , $\leq 0.2m\Omega$
- ✓ Cable size 2.5mm²/14AWG to 6.0mm²/10AWG
- ✓ Cable OD range: $\varnothing 4.5mm \sim \varnothing 7.8mm$
- ✓ Protection of degree IP68 (1m, 1H) mated
- ✓ Ambient Temperature range: $-40^{\circ}C \sim +85^{\circ}C$
- ✓ Upper limiting temperature : $120^{\circ}C$
- ✓ Flame class : UL94-V0
- ✓ Insulation material : PC/PA
- ✓ Contact material: Copper, tin-Plated

Ordering code example:

H4CFC4DM, female, for 4.0sqmm/12AWG PV wire

H4CMC4DM, male, for 4.0sqmm/12AWG PV wire



R50388083



E339277

Helios H4[®] Cable Connectors S&F contacts

Key Features

- ✓ UL6703 1500VDC& TUV IEC 62852 1000VDC
- ✓ Low and stable Contact Resistance , $\leq 0.3\text{m}\Omega$ TYP
- ✓ Cable size 2.5mm²/14AWG to 6.0mm²/10AWG
- ✓ Cable OD range: $\varnothing 4.5\text{mm} \sim \varnothing 7.8\text{mm}$
- ✓ Protection of degree IP68 (1m,1H) mated
- ✓ Ambient Temperature range: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- ✓ Upper limiting temperature : 120°C
- ✓ Flame class : UL94-V0
- ✓ Insulation material : PC/PA
- ✓ Contact material: Copper, tin-Plated



Ordering code example:

H4CFC4DMS, female, for 4.0sqmm/12AWG PV wire

H4CMC4DMS,male, for 4.0sqmm/12AWG PV wire



R50388083



E339277

Helios H4[®] Panel Connectors solid contacts



Key Features

- ✓ UL6703 1500VDC & TUV IEC 62852 1500VDC
- ✓ Low and stable Contact Resistance , $\leq 0.2\text{m}\Omega$ TYP
- ✓ Protection of degree IP68 (1m,1H) mated
- ✓ Ambient Temperature range: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- ✓ Upper limiting temperature : 120°C
- ✓ Flame class : UL94-V0
- ✓ Insulation material : PC/PA
- ✓ Contact material: Copper, tin-Plated

Ordering code example:

H4CFM4DM, female, for 4.0sqmm/12AWG PV wire

H4CMM4DM, male, for 4.0sqmm/12AWG PV wire



R50388083



E339277

Helios H4[®] Panel Connectors S&F contacts

Key Features

- ✓ UL6703 1500VDC& TUV IEC 62852 1500VDC
- ✓ Low and stable Contact Resistance , $\leq 0.3m\Omega$ TYP
- ✓ Protection of degree IP68 (1m,1H) mated
- ✓ Ambient Temperature range: -40°C ~ +85°C
- ✓ Upper limiting temperature : 120°C
- ✓ Flame class : UL94-V0
- ✓ Insulation material : PC/PA
- ✓ Contact material: Copper, tin-Plated



Ordering code example:

H4CFM4DMS, female, for 4.0sqmm/12AWG PV wire

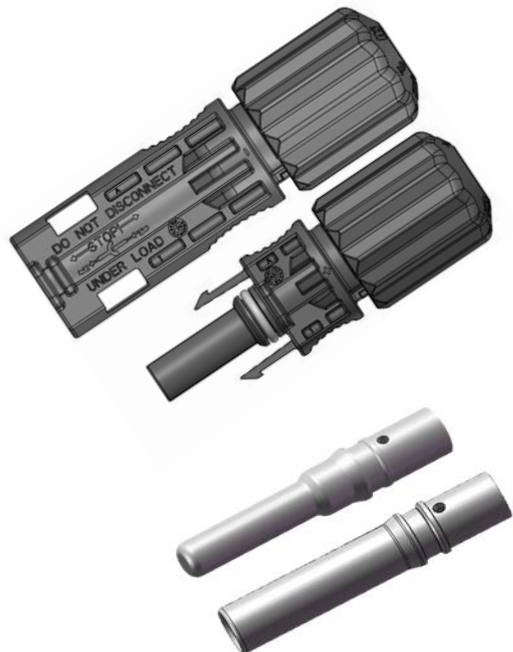
H4CMM4DMS,male, for 4.0sqmm/12AWG PV wire



R50388083

E339277

H4[®] Plus cable Connectors Solid contacts



Key Features

- ✓ UL6703 1500VDC & **TUV IEC 62852(am 1), 1500VDC**
- ✓ Rated current @IEC 85°C: 25A (2.5mm²/14AWG), 35A(4.0mm²/12AWG), 45A(6.0 mm²/10AWG), 65A(10.0mm²/8AWG)
- ✓ Low and stable Contact Resistance , **$\leq 0.20\text{m}\Omega \text{ TYP}$**
- ✓ Cable size: 2.5mm²/14AWG to 10.0mm²/8AWG
- ✓ Cable OD range: $\varnothing 5.0\text{mm} \sim \varnothing 8.8\text{mm}$
- ✓ Protection of degree **IP68 (1m,24H)**
- ✓ **Anti-reverse structure**
- ✓ Ambient Temperature range: -40°C ~ +85°C
- ✓ Upper limiting temperature : 120°C
- ✓ Flame class : UL94-V0
- ✓ Insulation material : PC/PA
- ✓ Contact material: Copper, tin-Plated

Ordering code example:

H4SFC4DM, female, for 4.0sqmm/12AWG PV wire

H4SCMC4DM,male, for 4.0sqmm/12AWG PV wire



Catalog



Presentation



B 107201



E339277

H4[®] Plus cable Connectors S&F contacts

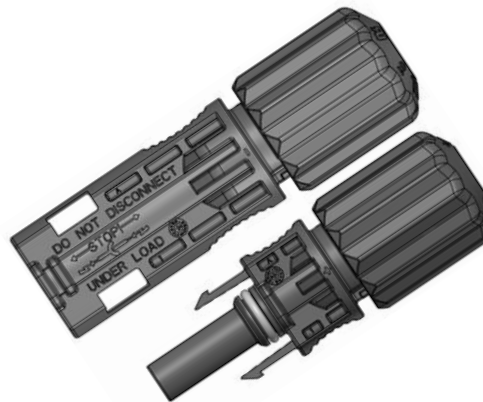
Key Features

- ✓ **UL6703 1500VDC & TUV IEC 62852(amd 1), 1500VDC**
- ✓ Low and stable Contact Resistance , **≤0. 25mΩ TYP**
- ✓ Cable size 2.5mm²/14AWG to 6.0mm²/10AWG
- ✓ Cable OD range: Ø5.0mm~Ø7.8mm
- ✓ Protection of degree **IP68 (1m,24H)**
- ✓ **Anti-reverse structure**
- ✓ Ambient Temperature range: -40°C ~ +85°C
- ✓ Upper limiting temperature : 120°C
- ✓ Flame class : UL94-V0
- ✓ Insulation material : PC/PA
- ✓ Contact material: Copper, tin-Plated

Ordering code example:

H4SFC4DMS, female, for 4.0sqmm/12AWG PV wire

H4SCMC4DMS,male, for 4.0sqmm/12AWG PV wire



Catalog



Presentation



B 107201



E339277

H4[®] Plus Panel Connectors solid contacts



Key Features

- ✓ **UL6703 1500VDC & TUV IEC 62852 (am 1), 1500VDC**
- ✓ Rated current @IEC 85°C: 25A (2.5mm²/14AWG), 35A(4.0mm²/12AWG), 45A(6.0 mm²/10AWG), 65A(10.0mm²/8AWG)
- ✓ Low and stable Contact Resistance , **≤0.20mΩ TYP**
- ✓ Protection of degree IP68 (**1m,24H**) mated
- ✓ Ambient Temperature range: -40°C ~ +85°C
- ✓ Upper limiting temperature : 120°C
- ✓ Flame class : UL94-V0
- ✓ Insulation material : PC/PA
- ✓ Contact material: Copper, tin-Plated

Ordering code example:

H4SFM4DM, female, for 4.0sqmm/12AWG PV wire

H4SMM4DM,male, for 4.0sqmm/12AWG PV wire



B 107201



E339277

H4[®] Plus Panel Connectors S&F contacts

Key Features

- ✓ **UL6703 1500VDC & TUV IEC 62852 1500VDC**
- ✓ Low and stable Contact Resistance , **≤0.25mΩ TYP**
- ✓ Protection of degree IP68 (**1m,24H**) mated
- ✓ Ambient Temperature range: -40°C ~ +85°C
- ✓ Upper limiting temperature : 120°C
- ✓ Flame class : UL94-V0
- ✓ Insulation material : PC/PA
- ✓ Contact material: Copper, tin-Plated

Ordering code example:

H4SFM4DMS, female, for 4.0sqmm/12AWG PV wire

H4SMM4DMS, male, for 4.0sqmm/12AWG PV wire



Catalog



Presentation

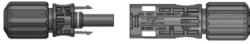




B 107201

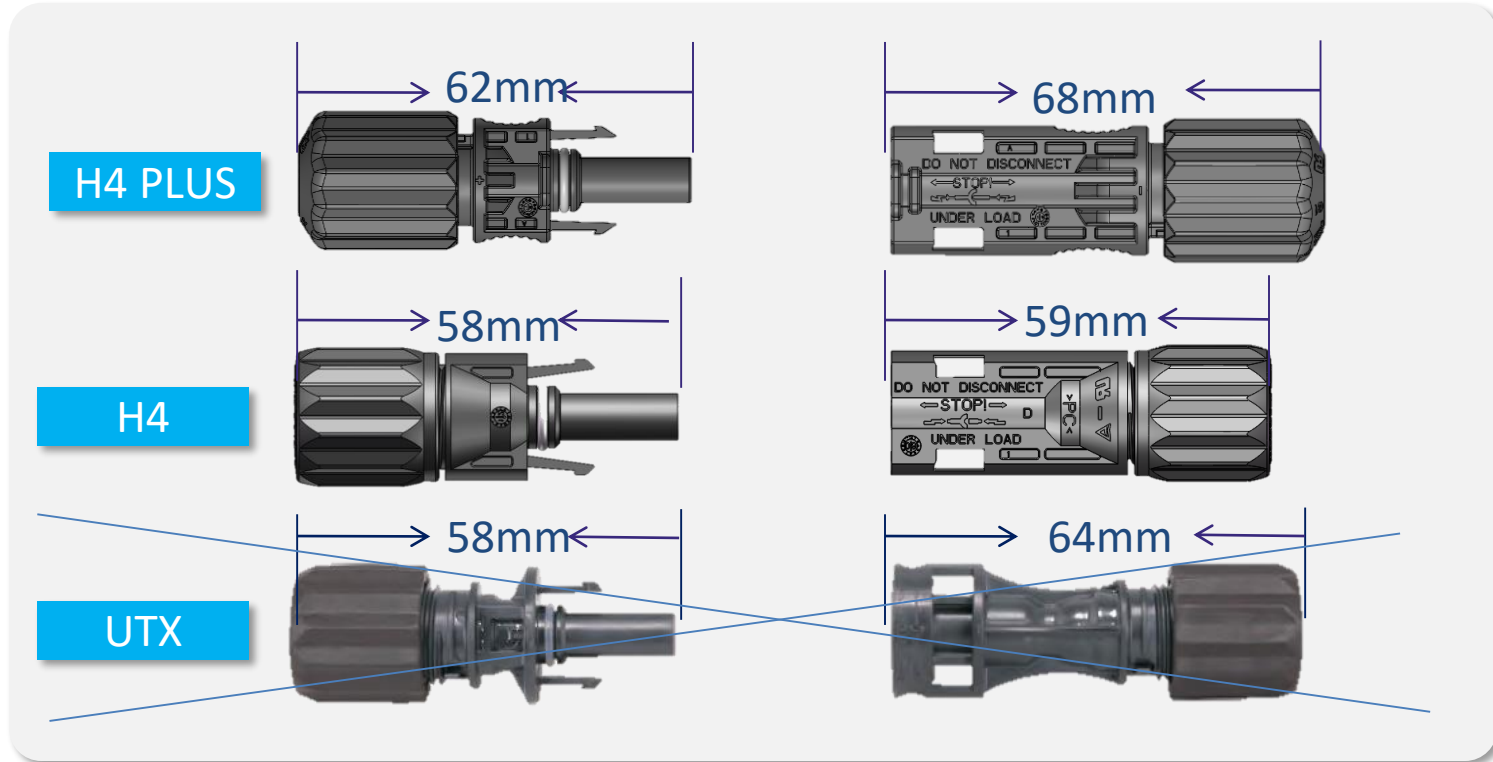


E339277

H4[®] Plus vs Helios H4[®] and UTX as reference only

TECHNICAL SPECIFICATION	H4 [®] PLUS	UTX [®]	H4 [®]
PRODUCT IMAGE			
APPROVALS	1500V DC (IEC 62852)	1500V DC (IEC 62852)	1000VDC IEC62852
	1500V DC (UL6703)	1500V DC (UL6703)	1500V DC (UL 6703)
		1500V DC (JET)	
RATED CURRENT IEC @85	25A (2.5mm2/14AWG)	25A (2.5mm2/14AWG)	25A (2.5mm2/14AWG)
	35A (4.0mm2/12 AWG)	35A (4.0mm2/12 AWG)	35A (4.0mm2/12 AWG)
	45A (6.0mm2/10AWG)	45A (6.0mm2/10AWG)	45A (6.0mm2/10AWG)
CONTACT RESISTANCE	≤ 0.3mΩ	≤ 0.3mΩ	≤ 0.3mΩ
INSULATION MATERIAL	PC/PA	PPE/PA	PC/PA
CABLE SIZE (MM2)	2.5 to 6.0mm	2.5 to 6.0mm	2.5 to 6.0mm
VALUE FOR CABLE CLAMP (MM)	5.0 to 7.8	5.3 to 7.65	4.5 to 7.8
AMBIENT TEMP (IEC)	-40°C ~ +85°C	-40°C ~ +85°C	-40°C ~ +85°C
PROTECTION DEGREE(UNMATED)	IP2X	IP2X	IP2X
PROTECTION DEGREE(MATED)	IP68 (24h/1m)	IP68 (1h/1m)	IP68 (1h/1m)
SAFETY CLASS	1500V DC: II	1500V DC: II	1000V DC : II
UPPER LIMITED TEMPERATURE	120°C	105°C	120°C

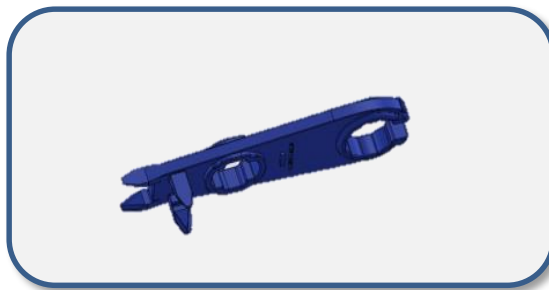
H4[®] Plus vs Helios H4[®] and UTX as reference only



H4[®] Accessories and Tools



Protect cap



Unlock and Wrench tool



Inspection tool



Crimping tool



Strip tool



Unlock ring tool



Thin Film PV Junction Box



- ✓ UL approved 1000V
- ✓ Up to 1 diode, optional
- ✓ IP67 rated
- ✓ Small and flat profile



Catalog



E346053

Helios Grounding – Helio-Lug®



- ✓ According to NEC2011
- ✓ Certified according to UL2703
- ✓ AWG12-AWG4 (4mm²-16mm²)
- ✓ Quick installability



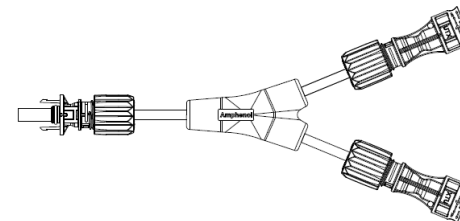
Catalog



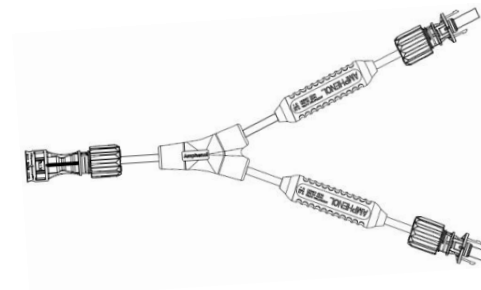
Molded assemblies and fuses

- ✓ Short cable to distribute heat
- ✓ Improved long term reliability
- ✓ IP67 (1m/0.5H)
- ✓ 1000V/1500V optional
- ✓ Cable/ connector optional
- ✓ Fuse rating and brand optional

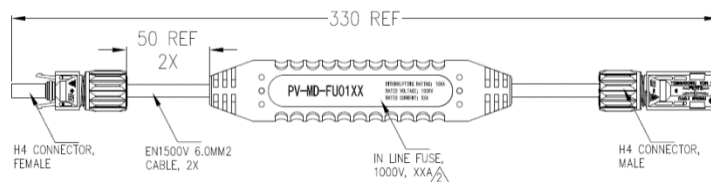
Y Branch cable harness



Y branch cable harness with inline fuse



Inline fuse connector



Molded assemblies and fuses



PV Module With H4[®] Assemblies



PV String Inverter with H4[®] Connectors



PV Optimizer/Micro Inverter with H4® Assemblies



Combiner Box with H4® Assemblies



Pre-assembled Homerun Cable Assemblies



~70% Labor Savings
Minimize Errors/Maximize Safety
Factory Pull Strength And Seal Testing

Project name : GOTHA
Installed Capacity : 11,7 MW
Technology : Thin Film
Country : Gotha - Germany
Customer : Masdar - Enviromena
SOW : Integrated preassembled cabling with inline protections



Project name : SHEIKH ZAYED SOLAR POWER
Installed Capacity : 15 MW
Technology : Thin Film
Country : Mauritania
Customer : Masdar - Enviromena
SOW : Integrated preassembled cabling with inline protections



Project name : COPPER MOUNTAIN SOLAR 3
Installed Capacity : 344 MW
Technology : Thin Film
Country : Nevada - USA
Customer : Sempra
SOW : Integrated preassembled cabling with inline protections



Project name : ST. ISIDORE A + B
Installed Capacity : 11,8 + 12,5 MW
Technology : Thin Film
Country : Canada
Customer : EDF
SOW : Integrated preassembled cabling with inline protections



Project name : ALPAUGH I&II
Installed Capacity : 70MW
Technology : c-Si
Country : California – USA
Customer : QPG
SOW : Integrated preassembled cabling with inline protections



Project name : WHITE RIVER SOLAR
Installed Capacity : 25MW
Technology : c-Si
Country : California – USA
Customer : QPG
SOW : Integrated preassembled cabling with inline protections



Project name : CATALINA SOLAR
Installed Capacity : 143 MW
Technology : Thin Film
Country : California – USA
Customer : EDF
SOW : Integrated preassembled cabling with inline protections



Project name : ARLINGTON VALLEY
Installed Capacity : 127 MW
Technology : c-Si
Country : Arizona - USA
Customer : LS Power
SOW : Integrated preassembled cabling with inline protections



Project name : GILA BEND
Installed Capacity : 32 MW
Technology : c-Si (+ single axis tracker)
Country : Arizona – USA
Customer : APS - Black & Veatch
SOW : Integrated preassembled cabling with inline protections



Project name : COCORAN
Installed Capacity : 25 MW
Technology : c-Si (single axis tracker)
Country : California - USA
Customer : QPG
SOW : Integrated preassembled cabling with inline protections



Project name : CENTINELA SOLAR I&II
Installed Capacity : 170 MW
Technology : c-Si
Country : California – USA
Customer : LS Power
SOW : Integrated preassembled cabling with inline protections



Helios H4® global availability



Helios H4[®] globally recognized



The image features two white and gold robotic hands, one on the left and one on the right, each holding a silver interconnect cable. The hands are positioned as if they are about to connect the cables. The background is a dark blue gradient with several blurred interconnect components scattered throughout. The central text is in a large, bold, white sans-serif font.

YOUR PARTNER FOR INTERCONNECT SOLUTIONS