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Since 1945



PEOPLE. POWER. PARTNERSHIP.

## HARTING Han<sup>®</sup> S 450 Plus

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Safe and error-free connections for energy storage systems. Up to 500 A/2,000 V, IP67/IP69K as well as unlock protection.

# HARTING Han® S 450 Plus

## Solution overview and compliance to standards

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In line with market trends for energy storage systems, Han® S was developed as a front-mount solution for flexible and secure high-power transmission. This single-pole connector family can operate with rated currents of up to 500 A at a voltage of 2,000 V, while ensuring safe installation – through finger-safe contacts, visual control of the locking status and various connection types (screw or busbar). It also offers an Unlock Protection mechanism that prevents from unintended openings. In addition, the product is vibration-resistant, available in different colours and includes waterproof housing. It also features a mechanical and colour coding system that prevents incorrect insertion.

### Han® S complies with all relevant standards for energy storage systems



#### UL 1977

Standard for component connectors for use in data, signal, control and power applications



#### UL 4128

Outline of investigation for intercell and intertier connectors for use in electrochemical battery system applications

TÜV  
Rheinland

#### 2PFG 2740/01.25

Connectors for Lithium Battery Energy Storage System – Safety requirements and tests



# HARTING Han<sup>®</sup> S 450 Plus

## Key features and advantages

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Besides holding the UL 4128 certification for “Connectors for use in electrochemical battery systems”, Han<sup>®</sup> S offers important additional features that were previously unavailable in this segment. As a matter of fact, Han<sup>®</sup> S guarantees secure and error-free connections with a high degree of flexibility.



High electric power transmission in a compact design: rated currents up to 500 A (at 2,000 V) are possible due to a very low contact resistance



Safe installation through visible control of locking status, touch safe contacts, mechanical & colour coding systems as well as high shock & vibration resistance



Unlock Protection mechanism as an option preventing from unintended openings



Easy to install, as contacts are screwed into the screw mounted housing from the front; easy to connect, as the single lever can be operated with just one hand



High flexibility due to different mounting options and contact terminations as well as 360° positioning for the cable entry



Complies with all relevant energy storage standards, including UL4128 and TÜV Rheinland 2PFG 2740 2,000 VDC certification



Waterproof (IP67/IP69K)

For more information refer to our homepage:  
[www.HARTING.com](http://www.HARTING.com)

# HARTING Han® S 450 Plus

## Product overview

### Hoods & housings overview

Bulkhead mounted housing/hood*	Termination technique	Contact specifications	Front coding	Rear coding	Colours	Add. features
Hood, angled (HA)	Crimp terminal (CRT)	95 mm <sup>2</sup> 4/0 AWG 120 mm <sup>2</sup> 150 mm <sup>2</sup>	C1 C2 C3 C4 C5			
Housing, bulk-head mounted (HBM)	Screw terminal (SCT)	M10 thread (M10)		Rear coding 1 (RC1) Rear coding 2 (RC2)	Black Red Orange Blue	Unlock protection (UP)
	Busbar contact (B1)	M8 thread (M8) Elongated hole (EH) Rivet nut (RN)				
	Transfer pin (T1)					

### Bulkhead mounted housings / termination type



# HARTING Han<sup>®</sup> S 450 Plus

## Product overview

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### Accessories

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Standard locking lever



Unlock protection



Protection cap



**Notice:** Suitable for any Han<sup>®</sup> S 450 Plus bulkhead mounted housing

### Angled hoods (90°)

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Orange

95/120/150 mm<sup>2</sup>  
4/0 AWG



Red

95/120/150 mm<sup>2</sup>  
4/0 AWG



Black

95/120/150 mm<sup>2</sup>  
4/0 AWG



Blue

95/120/150 mm<sup>2</sup>  
4/0 AWG

# HARTING Han® S 450 Plus

## Technical characteristics

### Items & specifications

<b>Overvoltage category</b>	III
<b>Number of contacts</b>	1
<b>Rated current (at 25°C)</b>	350A with 95mm <sup>2</sup> / AWG 3/0 or 4/0 cable 400A with 120mm <sup>2</sup> /250 kcmil cable 500A with 150mm <sup>2</sup> /300 kcmil cable
<b>Rated voltage</b>	2,000VDC
<b>Rated impulse voltage</b>	15 kV
<b>Impulse test voltage</b>	33.7 kV*
<b>Pollution degree</b>	3**
<b>Insulation resistance</b>	> 10 <sup>9</sup> Ω (2,500VDC)
<b>Contact resistance</b>	≤ 0.3 mΩ
<b>Limiting temperatures</b>	-40...+125 °C
<b>Number of mating cycles</b>	500
<b>Degree of protection acc. to IEC / DIN EN 60529</b> (finger-safe contacts with rated voltages ≤ 1,500VDC) - mated condition - bulkhead mounted housing w. protection cap	IPXXB IP67/IP69K IP67
<b>Cable entry</b>	Angled, available rotation through 360° before and after mating
<b>Coding system</b>	Mechanical & colour
<b>Vibration &amp; shock resistance</b>	IEC 61373-2010 cat. 1, class B
<b>Locking system</b>	- Single lever (status visible) - Connector Position Assurance (CPA) - Unlock Protection (UP) as an option

**Notes:**

\* With grounded metal mounting panel

\*\* With pollution degree 3, the product is suitable for use in the macro environment of IP54 applications.

# HARTING Han<sup>®</sup> S 450 Plus

## Technical characteristics

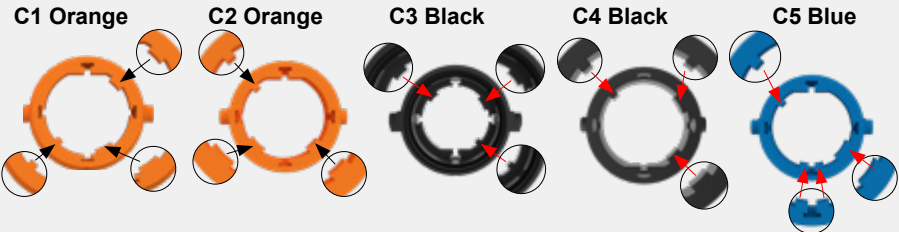
### Items & specifications

<b>Cable outer diameter</b>	15.4-23.5 mm
<b>Cable gland</b> - recommended tightening torque	Wrench size 34 (A/F 34) 5 N m
<b>Contact termination (hood)</b>	Crimp (conductor cross-section 95 mm <sup>2</sup> ... 150 mm <sup>2</sup> )
<b>Contact termination (housing)</b> - recommended tightening torque	Bolt/busbar/busbar with rivet nut Bolt M10x1.5, torque: 7.5~8.0 Nm Busbar M8x1.25, torque: 5.0~5.5 Nm - with rivet nut: 5.0~5.5 Nm - with elongated hole: 7.5~8.0 Nm
<b>Fixing screws (housing)</b> - recommended tightening torque	M4, 6-12 mm long (suggested), DIN EN ISO 4762 screw head 1.5±0.1 Nm
<b>Colours (hood, housing – RAL)</b>	RAL 9005 (black) RAL 3001 (red) RAL 5015 (blue) RAL 2003 (orange)
<b>Material (contacts)</b>	Pure copper (T1)
<b>Material flammability class acc. to UL 94</b>	V-0
<b>Railway standard</b>	EN 45545-2:2020 + A1:2023 R22/R23 (HL1/HL2/HL3)
<b>UL</b>	UL 4128 UL 1977
<b>TÜV Rheinland</b>	2Pfg 2740/01.25

# HARTING Han<sup>®</sup> S 450 Plus

## Coding options

### Front coding options



Front codings in the mating faces of bulkhead mounted housing & hood

**\* Notice:**  
For explanation of the Cx abbreviations please refer to the "Available connectors and components" table, next page. HARTING could supply the front codings in customer-specific colours.

### Rear coding options



90°  
RC\* 1, always with C1 & C2



180°  
RC\* 2, always with C3 & C4



No rear coding

\* RC = Rear coding

# HARTING Han<sup>®</sup> S 450 Plus

## Products & part numbers

### Available connectors & components

Product codes	Part number
Han S 450+_CC_Cover Plastic	97000002040
Han S 450+_CC_Flange Gasket_f.HBM	97000002064
Han S 450+_CC_RS_16.4-17.6mm	97000002065
Han S 450+_CC_RS_17.4-18.6mm	97000002067
Han S 450+_CC_RS_18.4-19.6mm	97000002066
Han S 450+_CC_RS_19.4-20.6mm	97000002070
Han S 450+_CC_RS_20.4-21.6mm	97000002068
Han S 450+_CC_RS_21.4-22.2mm	97000002071
Han S 450+_CC_RS_22.0-22.8mm	97000002115
Han S 450+_CC_RS_22.6-23.0mm	97000002069
Han S 450+_CC_HA_CRT_95mm <sup>2</sup> _C1_Red	97000002072
Han S 450+_CC_HA_CRT_120mm <sup>2</sup> _C2_Red	97000002078
Han S 450+_CC_HA_CRT_150mm <sup>2</sup> _C1_Red	97000002079
Han S 450+_CC_HA_CRT_95mm <sup>2</sup> _C2_Orange	97000002080
Han S 450+_CC_HA_CRT_120mm <sup>2</sup> _C1_Orange	97000002081
Han S 450+_CC_HA_CRT_150mm <sup>2</sup> _C2_Orange	97000002082
Han S 450+_CC_HA_CRT_95mm <sup>2</sup> _C3_Black	97000002083
Han S 450+_CC_HA_CRT_120mm <sup>2</sup> _C4_Black	97000002084
Han S 450+_CC_HA_CRT_150mm <sup>2</sup> _C3_Black	97000002085
Han S 450+_CC_HA_CRT_95mm <sup>2</sup> _C5_Blue	97000002086
Han S 450+_CC_HBM_B1_EH_C1_RC1_Red	97000002087
Han S 450+_CC_HBM_B1_EH_C2_RC1_Red	97000002088
Han S 450+_CC_HBM_B1_M8_C1_RC1_Red	97000002089
Han S 450+_CC_HBM_B1_M8_C2_RC1_Red	97000002090

Product codes	Part number
Han S 450+_CC_HBM_SCT_M10_C1_RC1_Red	97000002091
Han S 450+_CC_HBM_B1_EH_C1_RC1_Orange	97000002098
Han S 450+_CC_HBM_B1_EH_C2_RC1_Orange	97000002100
Han S 450+_CC_HBM_B1_M8_C1_RC1_Orange	97000002101
Han S 450+_CC_HBM_B1_M8_C2_RC1_Orange	97000002102
Han S 450+_CC_HBM_SCT_M10_C2_RC1_Orange	97000002103
Han S 450+_CC_HBM_B1_RN_C2_RC1_Orange	97000002104
Han S 450+_CC_HBM_B1_EH_C3_RC2_Black	97000002105
Han S 450+_CC_HBM_B1_EH_C4_RC2_Black	97000002106
Han S 450+_CC_HBM_B1_M8_C3_RC2_Black	97000002107
Han S 450+_CC_HBM_B1_M8_C4_RC2_Black	97000002108
Han S 450+_CC_HBM_SCT_M10_C4_RC2_Black	97000002109
Han S 450+_CC_HBM_B1_RN_C3_RC2_Black	97000002110
Han S 450+_CC_HBM_B1_M8_C5_Blue	97000002111
Han S 450+_CC_HBM_B1_EH_C1_RC1_Red_UP	97000002112
Han S 450+_CC_HBM_B1_EH_C2_RC1_Orange_UP	97000002113
Han S 450+_CC_HBM_B1_EH_C3_RC2_Black_UP	97000002114

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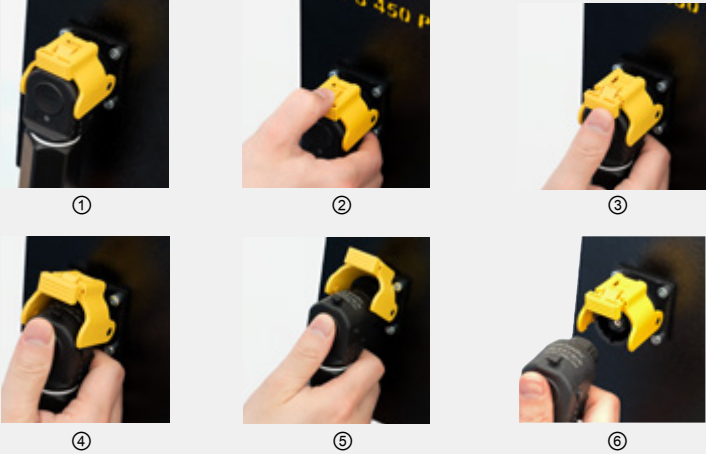
## Ease of use

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### Handling of standard locking lever

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Opening process (with one hand)



### Handling of UP locking lever

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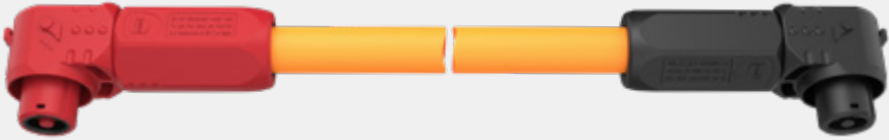
Opening process (using a flat head screwdriver)



# HARTING Han<sup>®</sup> S 450 Plus

## High-precision pre-assembly

### Cable harnesses



### Features / Benefits



High power transmission, rated current up to 500A/2,000V



Safe installation due to vision control of locking status and finger safe design



Fast installation and setup times even for big batch sizes



Cable resistant against heat, cold, oil, ozone, acid and alkali



Lower total cost of ownership as no tools or stock are required and labour costs are reduced

### Cables – technical specifications

Cable: HV 125°C 1500V XLPE orange cable  
Loading plan: 1:1  
Protection level: IP67  
Temperature range: -40°C ~ +125°C

Conductor cross-section	Rubber sleeve packed with plug
95 mm <sup>2</sup> or 3/0 AWG	Han <sup>®</sup> S 450 Plus RS 17.4 - 18.6 mm
4/0 AWG	Han <sup>®</sup> S 450 Plus RS 18.4 - 19.6 mm
120 mm <sup>2</sup> or 250 kcmil	Han <sup>®</sup> S 450 Plus RS 20.4 - 21.6 mm
150 mm <sup>2</sup> or 300 kcmil	Han <sup>®</sup> S 450 Plus RS 22.6 - 23.5 mm

**Notice:** If the customer uses a cable with different outer diameter, the suitable rubber sleeve must be ordered separately.



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