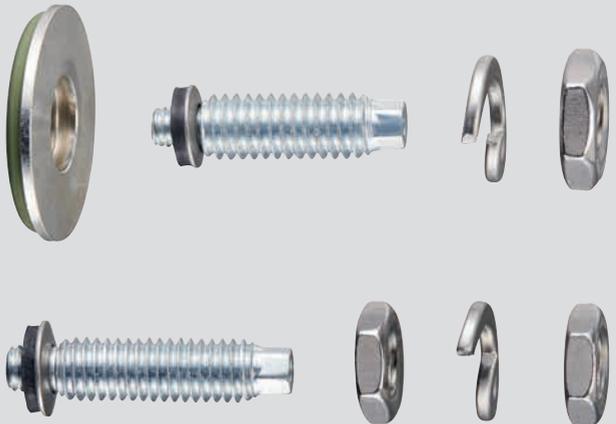




S-BT HL FOR ELECTRICAL CONNECTION DATA SHEET

**Screw-in stainless steel and
carbon steel threaded studs
for electrical connection**



S-BT HL Screw-in stainless steel and carbon steel threaded studs for electrical connection

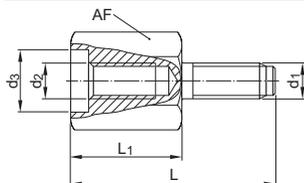
Product data

Dimensions and material specifications

Technical drawing	Designation	Material
	<p>S-BT-ER M8/15 SN 6 HL</p>	<p>① Stainless steel, zinc-coated EN 1.4462 / AISI 318LN / UNS S31803 / X2CrNiMoN22-5-3</p>
	<p>S-BT-ER M10/15 SN 6 HL S-BT-ER W10/15 SN 6 HL</p>	<p>② Stainless steel EN 1.4404 / AISI 316L / UNS S31603 / X2CrNiMo 17-12-2 with Chloroprene rubber CR 3.1107, black, resistant to UV, salt water, water, ozone, oils, etc.</p>
	<p>S-BT-ER M10 HC HL S-BT-ER W10 HC HL</p>	<p>③ Stainless steel, grade A4-70 EN 1.4401 / AISI 316 / UNS S31600 / X5CrNiMo17-12-2</p>
	<p>S-BT-ER M10 UHC HL S-BT-ER W10 UHC HL</p>	<p>④ Stainless steel EN 1.4401 / AISI 316 / UNS S31600 / X5CrNiMo17-12-2</p> <p>⑤ Copper alloy CuSn8, tin-coated with sealing ring made of FKM, resistant to UV, salt water, water, ozone, oils, etc.</p>

Technical drawing	Designation	Material
<p>Technical drawing of S-BT-EF M8/15 AN 6 HL. Dimensions: 4 [0.158"], 2 [0.079"], 27.75 [1.1"], 33.9 [1.33"], 5.8 [0.23"], 10 [0.394"], 10 [0.394"]. Callouts: 7, 8, 5, 6.</p>	<p>S-BT-EF M8/15 AN 6 HL</p>	<p>⑤ Carbon steel, duplex-coated EN 1.1150 / AISI 1038 / UNS G10380 ⑥ Aluminium EN AW-5754 with Chloroprene rubber</p>
<p>Technical drawing of S-BT-EF M10/15 AN 6 HL and S-BT-EF W10/15 AN 6 HL. Dimensions: 5 [0.197"], 2.4 [0.094"], 27.75 [1.1"], 33.9 [1.33"], 5.8 [0.23"], 10 [0.394"], 10 [0.394"]. Callouts: 7, 8, 5, 6.</p>	<p>S-BT-EF M10/15 AN 6 HL S-BT-EF W10/15 AN 6 HL</p>	<p>⑥ Aluminium EN AW-5754 with Chloroprene rubber CR 3.1107, black, resistant to UV, salt water, water, ozone, oils, etc.</p>
<p>Technical drawing of S-BT-EF M10 HC HL and S-BT-EF W10 HC HL. Dimensions: 5 [0.197"], 2.4 [0.094"], 27.75 [1.1"], 34.7 [1.36"], 5.8 [0.23"], 10 [0.394"], 10 [0.394"], 4 [0.157"], 32 [1.260"]. Callouts: 7, 8, 5, 6, 9.</p>	<p>S-BT-EF M10 HC HL S-BT-EF W10 HC HL</p>	<p>⑦ Carbon steel, grade 8, HDG ⑧ Carbon steel, HDG ⑨ Copper alloy CuSn8, tin-coated with sealing ring made of FKM, resistant to UV, salt water, water, ozone, oils, etc.</p>
<p>Technical drawing of S-BT-EF M10 UHC HL and S-BT-EF W10 UHC HL. Dimensions: 5 [0.197"], 2.4 [0.094"], 27.75 [1.1"], 34.7 [1.36"], 5.8 [0.23"], 10 [0.394"], 10 [0.394"], 4 [0.157"], 33 [1.535"]. Callouts: 7, 8, 5, 6, 9.</p>	<p>S-BT-EF M10 UHC HL S-BT-EF W10 UHC HL</p>	<p>⑨ Copper alloy CuSn8, tin-coated with sealing ring made of FKM, resistant to UV, salt water, water, ozone, oils, etc.</p>

Technical drawing



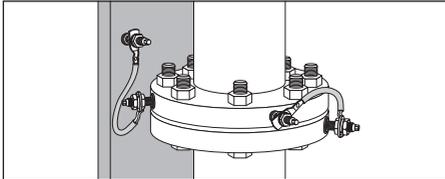
Designation	L [mm]	L ₁ [mm]	d ₁ [mm]	d ₂ [mm]	d ₃ [mm]	AF [mm]	Material
M8-MR 50	71	50	acc. to M8	acc. to M8	14	19	Stainless steel, EN 1.4401, AISI 316, UNS S31600, X5CrNiMo17-12-2
M8-MR 75	96	75			14	19	
M8-MR 100	121	100			14	19	
M10-MR 50	71	50	acc. to M10	acc. to M10	14	19	
M10-MR 75	96	75			14	19	
M10-MR 100	121	100			14	19	
W10-MR 50	71	50	acc. to W10	acc. to W10	14	19	
W10-MR 75	96	75			14	19	
W10-MR 100	121	100			14	19	
M10-HC120 50	71	50	acc. to M10	acc. to M10	14	23	
M10-HC120 100	121	100			14	23	
W10-HC4/0 50	71	50	acc. to W10	acc. to W10	14	23	EN CW453K, UNS C52100, CuSn8
W10-HC4/0 100	121	100			14	23	

Approvals and certificates

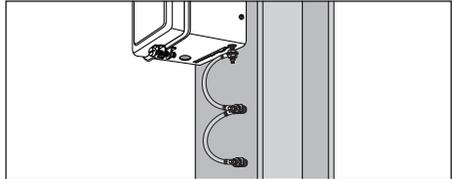
Authority	Approval/ certificate no.	Date of issue
American Bureau of shipping (ABS)	23-2361769-PDA	09.03.2023
Bureau Veritas (BV)	74271/A0 BV	27.02.2023
Det Norske Veritas (DNV)	TAS00003NW	18.04.2023
Lloyd's Register (LR)	23161857TA	21.07.2023
RINA Services S.p.A.	FPE035023CS/001	31.03.2023



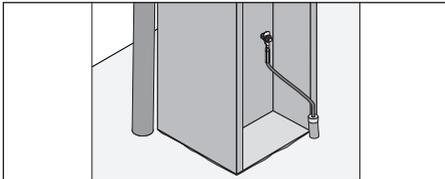
- Information presented in this product data sheet is based on Hilti Technical Data. For the specific application please refer to the corresponding approval/certificate.

Application conditions**Examples**

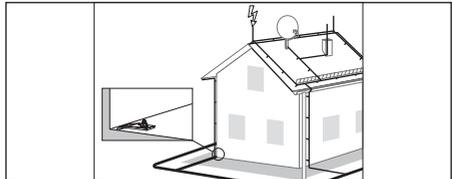
Functional and protective bonding of pipes
(outer diameter of installed surface ≥ 150 mm)



Protective bonding circuit - Double point
connection



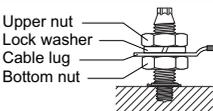
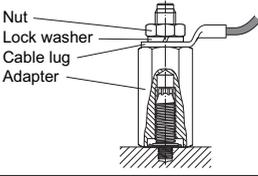
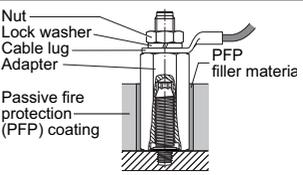
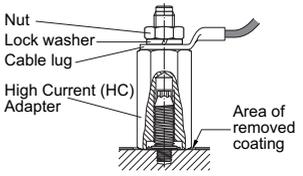
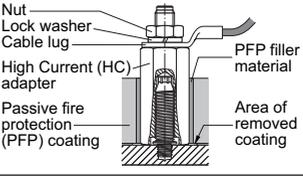
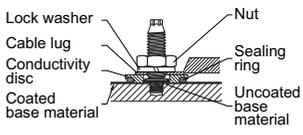
Grounding and bonding of base plates and
steel structures



Lightning protection

Fastening system

Connection type

Connection type	Base material	Current flow through	Fastening description	
Single point connection	Steel, copper, aluminium	Threaded stud		 <p>Upper nut Lock washer Cable lug Bottom nut</p>
Single point connection with adapter	Steel, copper, aluminium	Threaded stud		 <p>Nut Lock washer Cable lug Adapter</p>
	Passive Fire Protection (PFP) coated steel	Threaded stud		 <p>Nut Lock washer Cable lug Adapter PFP filler materia Passive fire protection (PFP) coating</p>
Single point connection with adapter	Steel, copper, aluminium	High Current (HC) adapter		 <p>Nut Lock washer Cable lug High Current (HC) Adapter Area of removed coating</p>
	Passive Fire Protection (PFP) coated steel	High Current (HC) adapter		 <p>Nut Lock washer Cable lug High Current (HC) adapter PFP filler material Area of removed coating Passive fire protection (PFP) coating</p>
Single point connection with conductivity disc	Steel, copper, aluminium	High Current (HC) or Ultra High Current (UHC) conductivity disc		 <p>Lock washer Cable lug Conductivity disc Coated base material Nut Sealing ring Uncoated base material</p>



For the application “Lightning protection” and the connection type “Single point connection with adapter” the adapter must be in direct contact with non-coated base material. Coating has to be removed with the coating removal drill bit.

Connection type	Base material	Current flow through	Fastening description	
Double point connection with adapter	Steel, copper, aluminium	Threaded stud		<p>Nut Lock washer Cable lug Adapter</p>
	Passive Fire Protection (PFP) coated steel	Threaded stud		<p>Nut Lock washer Cable lug Adapter PFP filler material Passive fire protection (PFP) coating</p>
Double point connection with adapter	Steel, copper, aluminium	High Current (HC) adapter		<p>Nut Lock washer Cable lug High Current (HC) Adapter Area of removed coating</p>
	Passive Fire Protection (PFP) coated steel	High Current (HC) adapter		<p>Nut Lock washer Cable lug High Current (HC) adapter PFP filler material Passive fire protection (PFP) coating Area of removed coating</p>
Double point connection with conductivity disc	Steel, copper, aluminium	High Current (HC) or Ultra High Current (UHC) conductivity disc		<p>Lock washer Cable lug Conductivity disc Coated base material Nut Sealing ring Uncoated base material</p>
Double point connection	Steel, copper, aluminium	Threaded stud	 	<p>Upper nut Lock washer Cable lug Bottom nut</p>

Performance data

Functional bonding and terminal connection in a circuit

For permanent current (leakage current) due to static charge built up in pipes or when closing an electrical circuit.

Connection type	Electrical connector	Adapter	Max. permanent current I_{th} [A] acc. to IEC
Single point connection	S-BT-ER M8/15 SN 6 HL	-	57
	S-BT-ER M10/15 SN 6 HL		
	S-BT-ER W10/15 SN 6 HL		
	S-BT-EF M8/15 AN 6 HL		
	S-BT-EF M10/15 AN 6 HL		
	S-BT-EF W10/15 AN 6 HL		
Single point connection with adapter	S-BT-ER M8/15 SN 6 HL	M8-MR 50, M8-MR 75, M8-MR 100	57
	S-BT-ER M10/15 SN 6 HL	M10-MR 50, M10-MR 75, M10-MR 100	
	S-BT-ER W10/15 SN 6 HL	W10-MR 50, W10-MR 75, W10-MR 100	
Single point connection with High Current (HC) adapter	S-BT-ER M10/15 SN 6 HL	M10-HC120 50, M10-HC120 100	269
	S-BT-ER W10/15 SN 6 HL	W10-HC4/0 50, W10-HC4/0 100	
Single point connection with High Current (HC) conductivity disc	S-BT-ER M10 HC HL S-BT-ER W10 HC HL S-BT-EF M10 HC HL S-BT-EF W10 HC HL	-	269
Single point connection with Ultra High Current (UHC) conductivity disc	S-BT-ER M10 UHC HL	-	415
	S-BT-ER W10 UHC HL		
	S-BT-EF M10 UHC HL		
	S-BT-EF W10 UHC HL		
Double point Connection with High Current (HC) conductivity disc	S-BT-ER M10 HC HL	-	415
	S-BT-ER W10 HC HL		
	S-BT-EF M10 HC HL		
	S-BT-EF W10 HC HL		



- Recommended maximal cross section of connected cable according to IEC 60947-7-1 and IEC 60947-7-2: 10 mm² (8 AWG) copper, tested permanent current $I_{th} = 57$ A. 120 mm² (4/0 AWG) copper, tested permanent current $I_{th} = 269$ A. 240 mm² (500 AWG) copper, tested permanent current $I_{th} = 415$ A.
- Fastening of thicker cable is acceptable, if the maximum allowable permanent current I_{th} is not exceeded and the provision on cable lug thickness t_{cl} are observed.

Protective bonding circuit

For discharging short circuit current while protecting electrical equipment or earth/ground cable trays and ladders.

Connection type	Electrical connector	Adapter	Maximum short circuit current I_{cw} [kA]	
			acc. to IEC	acc. to UL
Single point connection	S-BT-ER M8/15 SN 6 HL	–	1.20	0.75
	S-BT-ER M10/15 SN 6 HL			
	S-BT-ER W10/15 SN 6 HL			
	S-BT-EF M8/15 AN 6 HL			
	S-BT-EF M10/15 AN 6 HL			
	S-BT-EF W10/15 AN 6 HL			
Single point connection with adapter	S-BT-ER M8/15 SN 6 HL	M8-MR 50, M8-MR 75, M8-MR 100	1.20	0.75
	S-BT-ER M10/15 SN 6 HL	M10-MR 50, M10-MR 75, M10-MR 100		
	S-BT-ER W10/15 SN 6 HL	W10-MR 50, W10-MR 75, W10-MR 100		
Single point connection with High Current (HC) adapter	S-BT-ER M10/15 SN 6 HL	M10-HC120 50, M10-HC120 100	14.40	10.10
	S-BT-ER W10/15 SN 6 HL	W10-HC4/0 50, W10-HC4/0 100		
Single point connection with High Current (HC) conductivity disc	S-BT-ER M10 HC HL S-BT-ER W10 HC HL S-BT-EF M10 HC HL S-BT-EF W10 HC HL	–	14.40	10.10
Single point connection with Ultra High Current (UHC) conductivity disc	S-BT-ER M10 UHC HL S-BT-ER W10 UHC HL S-BT-EF M10 UHC HL S-BT-EF W10 UHC HL	–	28.80	23.90*

Connection type	Electrical connector	Adapter	Maximum short circuit current I_{cw} [kA]	
			acc. to IEC	acc. to UL
Double point connection	S-BT-ER M8/15 SN 6 HL	-	1.92	-
	S-BT-ER M10/15 SN 6 HL			
	S-BT-ER W10/15 SN 6 HL			
	S-BT-EF M8/15 AN 6 HL			
	S-BT-EF M10/15 AN 6 HL			
	S-BT-EF W10/15 AN 6 HL			
Double point connection with High Current (HC) conductivity disc	S-BT-ER M10 HC HL	-	28.80	23.90*
	S-BT-ER W10 HC HL			
	S-BT-EF M10 HC HL			
	S-BT-EF W10 HC HL			



- Single point connection:

Recommended maximal cross section of connected cable according to IEC 60947-7-1 and 60947-7-2:

10 mm² (8 AWG) copper, tested short circuit current $I_{cw} = 1.2$ kA for 1 s.

120 mm² (4/0 AWG) copper, tested short circuit current $I_{cw} = 14.40$ kA for 1 s.

240 mm² (500 AWG) copper, tested short circuit current $I_{cw} = 28.80$ kA for 1 s.

Recommended maximal cross section of connected cable according to UL:

10 AWG copper, tested short circuit current $I_{cw} = 0.75$ kA for 4 s.

4/0 AWG copper, tested short circuit current $I_{cw} = 10.10$ kA for 9 s.

500 AWG copper, tested short circuit current $I_{cw} = 23.90$ kA for 9 s.

* Only tested and released for copper base material.

- Double point connection:

Recommended maximal cross section of connected cable according to IEC 60947-7-1 and 60947-7-2:

16 mm² (6 AWG) copper, tested short circuit current $I_{cw} = 1.92$ kA for 1 s.

120 mm² (4/0 AWG) copper, tested short circuit current $I_{cw} = 14.40$ kA for 1 s.

Recommended maximal cross section of connected cable according to UL:

500 AWG copper, tested short circuit current $I_{cw} = 23.90$ kA for 9 s.

* Only tested and released for copper base material.

- Fastening of thicker cable is acceptable, if the maximum short circuit current I_{cw} is not exceeded and the provisions on cable lug thickness t_{cl} are observed.

Lightning protection

For high temporary current due to lightning.

Connection type	Electrical connector	Adapter	Classification acc. to IEC 62561-1	Maximum lightning current I_{imp} [kA] acc. to IEC 62561-1
Single point connection	S-BT-ER M8/15 SN 6 HL S-BT-ER M10/15 SN 6 HL S-BT-ER W10/15 SN 6 HL S-BT-EF M8/15 AN 6 HL S-BT-EF M10/15 AN 6 HL S-BT-EF W10/15 AN 6 HL	–	Class N for normal duty	50 for ≤ 5 ms
Single point connection with adapter	S-BT-ER M8/15 SN 6 HL	M8-MR 50, M8-MR 75, M8-MR 100	Class N for normal duty	50 for ≤ 5 ms
	S-BT-ER M10/15 SN 6 HL	M10-MR 50, M10-MR 75, M10-MR 100		
	S-BT-ER W10/15 SN 6 HL	W10-MR 50, W10-MR 75, W10-MR 100		
Single point connection with High Current (HC) adapter	S-BT-ER M10/15 SN 6 HL	M10-HC120 50, M10-HC120 100	Class H for heavy duty	100 for ≤ 5 ms
	S-BT-ER W10/15 SN 6 HL	W10-HC4/0 50, W10-HC4/0 100		
Single point connection with High Current (HC) conductivity disc	S-BT-ER M10 HC HL S-BT-ER W10 HC HL S-BT-EF M10 HC HL S-BT-EF W10 HC HL	–	Class H for heavy duty	100 for ≤ 5 ms

Connection type	Electrical connector	Adapter	Classification acc. to IEC 62561-1	Maximum lightning current I_{imp} [kA] acc. to IEC 62561-1
Single point connection with Ultra High Current (UHC) conductivity disc	S-BT-ER M10 UHC HL S-BT-ER W10 UHC HL S-BT-EF M10 UHC HL S-BT-EF W10 UHC HL	–	Class H for heavy duty	100 for ≤ 5 ms



Classification according to IEC 62561-1:2023-03:

- Installation location: a) outdoors, b) indoors, c) buried in ground, d) embedded in concrete, e) embedded in materials with thermal insulation
S-BT-ER: a, b, c, d, e; S-BT-EF: b, d, e
- Not intended to withstand a static mechanical stress.
- Including permanent and non-permanent connections.
- Connection configuration: B4-T connector.

Application recommendation

Base material

Technical drawing	Base material thickness t_{II} [mm]	Penetration type	Base material strength R_m [N/mm ²]	Coating thickness t_c [mm]
	≥ 6	No through penetration	Steel: $360 \leq R_m \leq 760$	$\leq 1.0 \text{ mm}^*$
			Copper	
			Aluminium:*** $R_m \geq 270$	
	$3 \text{ mm} \leq t_{II} < 6 \text{ mm}^{**}$	Through penetration	Steel: $360 \leq R_m \leq 760$	$\leq 1.0 \text{ mm}^*$
Copper				

i * For single point connection with High Current (HC) adapter, single point connection with High Current (HC) or Ultra High Current (UHC) conductivity disc the High Current (HC) adapter, High Current (HC) or Ultra High Current (UHC) conductivity disc must be in direct contact with non-coated base material.

** For the application “Lightning protection” and “Protective bonding circuit” with Ultra High Current (UHC) conductivity disc the base material thickness t_{II} must be $\geq 5 \text{ mm}$ for steel and copper.
 For base material thickness $3 \text{ mm} \leq t_{II} < 6 \text{ mm}$, rework of the coating on the back side of the plate/profile may be needed.

*** Hilti recommends using only the S-BT-ER (HC) HL made of stainless steel in aluminium base material.

Cable lug characteristics

Technical drawing	Electrical connector	Adapter	Total cable lug thickness t_{cl} [mm]	Inner hole diameter d [mm]
	S-BT-ER M8/15 SN 6 HL	-	≤ 7	8.5
	S-BT-ER M10/15 SN 6 HL	-	≤ 7	10.5
	S-BT-ER W10/15 SN 6 HL	-	≤ 7	10.5
	S-BT-EF M8/15 AN 6 HL	-	≤ 7	8.5
	S-BT-EF M10/15 AN 6 HL	-	≤ 7	10.5
	S-BT-EF W10/15 AN 6 HL	-	≤ 7	10.5
	S-BT-ER M8/15 SN 6 HL	M8-MR 50, M8-MR 75, M8-MR 100	≤ 12	8.5
	S-BT-ER M10/15 SN 6 HL	M10-MR 50, M10-MR 75, M10-MR 100	≤ 12	10.5
	S-BT-ER W10/15 SN 6 HL	W10-MR 50, W10-MR 75, W10-MR 100	≤ 12	10.5
	S-BT-ER M10/15 SN 6 HL	M10-HC120 50, M10-HC120 100	≤ 12	10.5
	S-BT-ER W10/15 SN 6 HL	W10-HC4/0 50, W10-HC4/0 100	≤ 12	10.5
	S-BT-ER M10 HC HL S-BT-ER W10 HC HL S-BT-EF M10 HC HL S-BT-EF W10 HC HL	-	≤ 12	10.5
	S-BT-ER M10 UHC HL S-BT-ER W10 UHC HL S-BT-EF M10 UHC HL S-BT-EF W10 UHC HL	-	≤ 12	10.5

Fastener positioning in base material

Technical drawing	Electrical connector	Adapter	Edge distance c [mm]	Spacing s [mm]
	S-BT-ER M8/15 SN 6 HL	-	≥ 6	≥ 22
	S-BT-ER M10/15 SN 6 HL	-	≥ 6	≥ 22
	S-BT-ER W10/15 SN 6 HL	-	≥ 6	≥ 22
	S-BT-EF M8/15 AN 6 HL	-	≥ 6	≥ 22
	S-BT-EF M10/15 AN 6 HL	-	≥ 6	≥ 22
	S-BT-EF W10/15 AN 6 HL	-	≥ 6	≥ 22
	S-BT-ER M8/15 SN 6 HL	M8-MR 50, M8-MR 75, M8-MR 100	≥ 15	≥ 30
	S-BT-ER M10/15 SN 6 HL	M10-MR 50, M10-MR 75, M10-MR 100	≥ 15	≥ 30
	S-BT-ER W10/15 SN 6 HL	W10-MR 50, W10-MR 75, W10-MR 100	≥ 15	≥ 30
	S-BT-ER M10/15 SN 6 HL	M10-HC120 50, M10-HC120 100	≥ 15	≥ 30
	S-BT-ER W10/15 SN 6 HL	W10-HC4/0 50, W10-HC4/0 100	≥ 15	≥ 30
	S-BT-ER M10 HC HL S-BT-ER W10 HC HL S-BT-EF M10 HC HL S-BT-EF W10 HC HL	-	≥ 20	≥ 40
	S-BT-ER M10 UHC HL S-BT-ER W10 UHC HL S-BT-EF M10 UHC HL S-BT-EF W10 UHC HL	-	≥ 25	≥ 50

Installation temperature and service temperature

The installation temperature is the temperature at which the electrical connectors and adapters are installed. A distinction is made between the temperature of the base material and the temperature of the electrical connectors, adapters, drilling and installation tools and accessories. The installation temperature range can be found in the table below.

The service temperature is the temperature at which the electrical connectors and adapters operate. The electrical connectors and adapters will operate effectively and without any loss in performance (loads, sealing function, etc.) within the specified service temperature range. Outside this temperature range the electrical connectors and adapters may fail.

Designation	Installation temperature		Service temperature	
	min	max	min	max
Base material	-40 °C	+60 °C	-40 °C	+60 °C
Electrical connectors	-10 °C	+60 °C	-40 °C	+60 °C
Adapters	-10 °C	+60 °C	-40 °C	+60 °C
Drilling & installation tools and accessories	-10 °C	+60 °C	n.a.	n.a.



- The service temperature range of the connected cable lugs and cables has to be observed. For details, please contact the supplier of the cable lugs and cables.

Corrosion information

The S-BT-ER HL stainless steel electrical connectors are made from the duplex stainless steel type 1.4462, which is equivalent to AISI 318LN (A4) steel grade. This grade of stainless steel is classified in the corrosion resistance class IV according to DIN EN 1993-1-4:2015, which makes the material suitable for aggressive environments like in coastal and offshore applications.

The microstructures of duplex stainless steels consist of a mixture of austenite and ferrite phases. Compared to the austenitic stainless steel grades, duplex stainless steels are magnetic. The surface of the S-BT-ER HL stainless steel electrical connectors is zinc-coated (anti-friction coating) in order to reduce the thread forming torque when the stud is screwed in into the base material.

The coating of the carbon steel S-BT-EF HL electrical connectors consists of an electroplated Zn-alloy for cathodic protection and a top coat for chemical resistance (Duplex-coating). This product is designed for use in corrosive categories C1, C2 and C3 according the standard EN ISO 9223. For higher corrosion categories stainless steel fasteners should be used.

The stainless steel adapters are made from the stainless steel type 1.4401 (AISI 316). This grade of stainless steel is classified in the corrosion resistance class III according to DIN EN 1993-1-4:2015, which makes the material suitable for outdoor applications and atmospheres containing chloride ions, i.e. coastal areas and areas near roads treated with de-icing salts.

The conductivity disc of the S-BT-ER HC HL/S-BT-EF HC HL, S-BT-ER UHC HL/S-BT-EF UHC HL and the High Current (HC) adapters M10-HC120 and W10-HC4/0 are made from copper alloy CuSn8 with a tin-coating on the surface. The copper alloy is classified as largely insensitive to stress corrosion cracking and pitting corrosion. The conductivity discs and the High Current (HC) adapters are designed for use in corrosion categories C1–C5 according to EN ISO 9223. They are therefore suitable for use in aggressive environments like coastal and offshore applications.

In case of a drill through hole or a pilot hole in thin base material, rework of the coating on the back side of the plate/profile may be needed.

	S-BT-EF HL S-BT-EF HC HL S-BT-EF UHC HL		S-BT-ER HL S-BT-ER HC HL S-BT-ER UHC HL	
Corrosivity category C	C3 medium corrosive		C5 very high corrosive	
Drill hole type and base material thickness t_{II} ¹⁾	Topside protection	Backside protection	Topside protection	Backside protection
Drill through pilot hole 3 mm [0.12"] ≤ t_{II} < 6 mm [0.24"]	✓	✗ ²⁾	✓	✗ ²⁾
Blind pilot hole t_{II} ≥ 6 mm [0.24"]	✓	✓	✓	✓

¹⁾ Real base material thickness, not nominal material thickness or material thickness with coating.

²⁾ Damage of the coating on the back side of the plate/profile require a rework of the coating.

System recommendation

Installation preparation

Connection type	Base material	Drill Bit	Installation preparation	Drilling tool
Single point connection	Steel, Copper	TS-BT 5.3 65 S, TS-BT 5.3 HEX	Drilling pilot hole	SBT 6-22 w/ drill assist
	Aluminum	TS-BT 5.5-74 AL		
Single point connection with adapter	Steel, Copper	TS-BT 5.3 65 S, TS-BT 5.3 HEX	Drilling pilot hole	
	Aluminum	TS-BT 5.5-74 AL		
	Passive Fire Protection (PFP) coated steel	TS-BT 31-95 PFP	Removing PFP coating and drilling pilot hole	
Single point connection with High Current (HC) adapter	Steel, Copper	TS-BT 5.3 65 S, TS-BT 5.3 HEX	Drilling pilot hole	
		TS-BT 5.3 HC 95	Removing steel coating or surface layer	
	Aluminum	TS-BT 5.5-74 AL		
	Passive Fire Protection (PFP) coated steel	TS-BT 31-95 PFP	Removing PFP coating and drilling pilot hole	
TS-BT 5.3 HC 95		Removing steel coating or surface layer		
Single point connection with High Current (HC) conductivity disc	Steel, Copper	TS-BT 5.3 HC-26	Removing steel coating or surface layer and drilling into steel, copper	
Single point connection with High Current (HC) conductivity disc	Steel, Copper	TS-BT 5.3 65 S, TS-BT 5.3 HEX	Drilling pilot hole	
		TS-BT 5.3 HC	Removing steel coating or surface layer	
	Aluminium	TS-BT 5.5-74 AL	Drilling pilot hole	
		TS-BT 5.3 HC	Removing surface layer	

Connection type	Base material	Drill Bit	Installation preparation	Drilling tool
Single point connection with Ultra High Current (UHC) conductivity disc	Steel, Copper	TS-BT 5.3 UHC-32	Removing steel coating and drilling into steel, copper	SBT 6-22 w/ drill assist
Single point connection with Ultra High Current (UHC) conductivity disc	Steel, Copper	TS-BT 5.3 65 S, TS-BT 5.3 HEX	Drilling pilot hole	
		TS-BT 5.3 UHC	Removing steel coating or surface layer	
	Aluminum	TS-BT 5.5-74 AL	Drilling pilot hole	
		TS-BT 5.3 HC	Removing surface layer	
Double point connection	Steel, Copper	TS-BT 5.3 65 S, TS-BT 5.3 HEX	Drilling pilot hole	
	Aluminum	TS-BT 5.5-74 AL		

Setting tool recommendation

Connection type	Electrical connector	Setting tool	Accessory
Single point connection	S-BT-ER M8/15 SN 6 HL	SBT 6-22	S-SH BT M8, S-SH BT M8-95
	S-BT-EF M8/15 AN 6 HL		
	S-BT-ER M10/15 SN 6 HL	SBT 6-22	S-SH BT M10/W10, S-SH BT M10/W10-95
	S-BT-ER W10/15 SN 6 HL		
S-BT-EF M10/15 AN 6 HL S-BT-EF W10/15 AN 6 HL			
Single point connection with adapter	S-BT-ER M8/15 SN 6 HL	SBT 6-22	S-SH BT M8, S-SH BT M8-95
	S-BT-ER M10/15 SN 6 HL S-BT-ER W10/15 SN 6 HL	SBT 6-22	S-SH BT M10/W10, S-SH BT M10/W10-95
Single point connection with High Current (HC) adapter	S-BT-ER M10/15 SN 6 HL S-BT-ER W10/15 SN 6 HL	SBT 6-22	S-SH BT M10/W10, S-SH BT M10/W10-95
Single point connection with High Current (HC) conductivity disc	S-BT-ER M10 HC HL S-BT-ER W10 HC HL S-BT-EF M10 HC HL S-BT-EF W10 HC HL	SBT 6-22	S-SH BT M10/W10, S-SH BT M10/W10-95
Single point connection with Ultra High Current (UHC) conductivity disc	S-BT-ER M10 UHC HL S-BT-ER W10 UHC HL S-BT-EF M10 UHC HL S-BT-EF W10 UHC HL	SBT 6-22	S-SH BT M10/W10, S-SH BT M10/W10-95
Double point connection	S-BT-ER M8/15 SN 6 HL	SBT 6-22	S-SH BT M8, S-SH BT M8-95
	S-BT-EF M8/15 AN 6 HL		
	S-BT-ER M10/15 SN 6 HL	SBT 6-22	S-SH BT M10/W10, S-SH BT M10/W10-95
	S-BT-ER W10/15 SN 6 HL		
S-BT-EF M10/15 AN 6 HL S-BT-EF W10/15 AN 6 HL			
Double point connection with High Current (HC) conductivity disc	S-BT-ER M10 HC HL S-BT-ER W10 HC HL S-BT-EF M10 HC HL S-BT-EF W10 HC HL	SBT 6-22	S-SH BT M10/W10, S-SH BT M10/W10-95

Quality assurance

 Verification of stud standoff h_{NHS}

Technical drawing	Electrical connector	Stand-off h_{NHS} [mm]	Accessory
	S-BT-ER M8/15 SN 6 HL S-BT-EF M8/15 AN 6 HL S-BT-ER M10/15 SN 6 HL S-BT-ER W10/15 SN 6 HL S-BT-EF M10/15 AN 6 HL S-BT-EF W10/15 AN 6 HL	29.3–29.8	S-IC BT
	S-BT-ER M10 HC HL S-BT-ER W10 HC HL S-BT-EF M10 HC HL S-BT-EF W10 HC HL S-BT-ER M10 UHC HL S-BT-ER W10 UHC HL S-BT-EF M10 UHC HL S-BT-EF W10 UHC HL	26.1–26.6	S-CG BT HC



- The installer is responsible for the correct setting of the electrical connectors.
- For the periodical verification of the correct stud standoff the S-CG BT check gauge or S-IC BT inspection card can be used.
- ALWAYS review/follow the instructions for use (IFU) accompanying the product.

Specification for installation
Tightening torque

Technical drawing	Tightening condition	Tightening torque T_{inst} [Nm]	Comment
	Nut to nut	8–20	Hold the bottom nut with a spanner while tightening the upper nut.
	Step 1: Adapter to base material	5	Copper base material thickness: 3 mm to 5 mm
		8	Copper and aluminium base material thickness: ≥ 5 mm
		8	Steel base material
	Step 2: Nut to adapter	8–16	Hold the adapter with a spanner while tightening the upper nut.
			Nut to High Current (HC) and Ultra High Current (UHC) conductivity disc
Steel: 16			

- Tighten the nut using torque tool S-BT 1/4" (5 Nm), X-BT 1/4" (8 Nm) or S-BT 1/4" (16 Nm), torque wrench or Hilti screw driver SBT 6-22 with socket S-NS.
- These are abbreviated instructions which may vary by application.
- ALWAYS review/follow the instructions for use (IFU) accompanying the product.

Ordering information

Item no. and description

Designation	Item no.	Description	Comment
S-BT-EF M8/15 AN 6 HL	2346070	Threaded stud	Package includes nuts and lock washers
S-BT-EF M10/15 AN 6 HL	2346071	Threaded stud	
S-BT-EF W10/15 AN 6 HL	2346072	Threaded stud	
S-BT-ER M8/15 SN 6 HL	2346073	Threaded stud	
S-BT-ER M10/15 SN 6 HL	2346074	Threaded stud	
S-BT-ER W10/15 SN 6 HL	2346075	Threaded stud	
S-BT-ER M10 HC HL	2468865	Threaded stud	Package includes nuts, lock washers and conductor discs
S-BT-ER W10 HC HL	2468886	Threaded stud	
S-BT-EF M10 HC HL	2468887	Threaded stud	
S-BT-EF W10 HC HL	2486674	Threaded stud	
S-BT-ER M10 UHC HL	2468888	Threaded stud	Package includes nuts, lock washers and conductor discs
S-BT-ER W10 UHC HL	2468889	Threaded stud	
S-BT-EF M10 UHC HL	2468658	Threaded stud	
S-BT-EF W10 UHC HL	2469750	Threaded stud	
Adapter M8-MR 50	2268523	Standoff adapter	for combination with
Adapter M8-MR 75	2268524	Standoff adapter	S-BT-ER M8/15 SN 6 HL
Adapter M8-MR 100	2268525	Standoff adapter	
Adapter M10-MR 50	2281193	Standoff adapter	for combination with
Adapter M10-MR 75	2394867	Standoff adapter	S-BT-ER M10/15 SN 6 HL
Adapter M10-MR 100	2394868	Standoff adapter	
Adapter W10-MR 50	2281191	Standoff adapter	for combination with
Adapter W10-MR 75	2394869	Standoff adapter	S-BT-ER W10/15 SN 6 HL
Adapter W10-MR 100	2395330	Standoff adapter	
Adapter M10-HC120 50	2407049	Standoff adapter	for combination with
Adapter M10-HC120 100	2407820	Standoff adapter	S-BT-ER M10/15 SN 6 HL
Adapter W10-HC4/0 50	2407821	Standoff adapter	for combination with
Adapter W10-HC4/0 100	2407822	Standoff adapter	S-BT-ER W10/15 SN 6 HL
TS-BT 5.5-74 AL	2143138	Stepped drill bit	for drilling in aluminium base material
TS-BT 5.3-65 S	2346083	Stepped drill bit	for drilling in steel,
TS-BT 5.3-95 S	2346084	Stepped drill bit	copper base material
TS-BT 5.3 M8 HEX	2468899	Stepped drill bit	for drilling in steel,
			copper base material
TS-BT 5.3 M10/W10 HEX	2469898	Stepped drill bit	for drilling in steel,
			copper base material
TS-BT 5.3 HC-26	2468894	Stepped drill bit	for removing steel coating and drilling into steel, copper

Designation	Item no.	Description	Comment
TS-BT 5.3 HC	2348154	Stepped drill bit	for removal of the coating from the base material
TS-BT 5.3 HC 95	2407824	Stepped drill bit	for removal of the coating from the base material
TS-BT 5.3 UHC	2477294	Stepped drill bit	for removal of the coating from the base material
TS-BT 5.3 UHC-32	2468875	Stepped drill bit	for removing steel coating and drilling into steel, copper
TS-BT 31-95 PFP	2394865	Stepped drill bit	for drilling in steel base material and removal of the PFP-coating from the base material
S-CG BT HC	2208475	Check gauge	for verification of the stud standoff
S-IC BT	2383883	Inspection card	
S-SH BT M8	2361441	Stud holder	for S-BT studs M8 and stepped drill bit TS-BT 5.3 M8 HEX
S-SH BT M10/W10	2361442	Stud holder	for S-BT studs M10 and W10 and stepped drill bit TS-BT 5.3 M10/W10 HEX
S-SH BT M8-95	2435861	Stud holder	for S-BT studs M8 and stepped drill bit TS-BT 5.3 M8 HEX
S-SH BT M10/W10-95	2435857	Stud holder	for S-BT studs M10 and W10 and stepped drill bit TS-BT 5.3 M10/W10 HEX
S-NS 13 C 95/3 1/4"	2149244	Nut setter	for nut M8
S-NSD 1/4" HKH 17	376703	Nut setter	for nut M10
S-NS 9/16" C 95/3 1/4"	2149246	Nut setter	for nut W10
S-NS 19 C 95/3 1/4"	2268521	Nut setter	for adapters M8 and M10
S-NS 23 C 95/3 1/4"	2407823	Nut setter	for adapters M10-HC120 and W10-HC4/0
S-BT 1/4" - 5 Nm	2143271	Torque tool	manual torque tool (5 Nm)
X-BT 1/4" - 8 Nm	2119272	Torque tool	manual torque tool (8 Nm)
S-BT 1/4" - 16 Nm	2346085	Torque tool	manual torque tool (16 Nm)