X-BT-ER
DATA SHEET

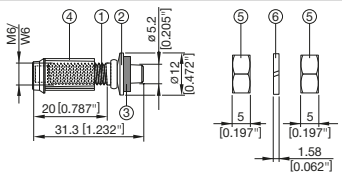
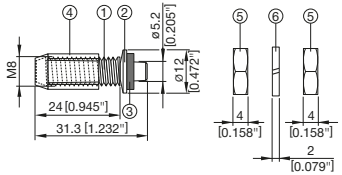
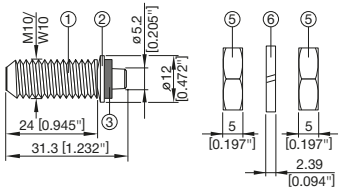
Stainless steel threaded stud for electrical connection

January 2024

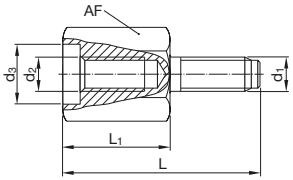
X-BT-ER Stainless steel threaded stud for electrical connection

Product data

Dimensions and material specifications

Technical drawing	Designation	Material
	X-BT-ER M6/3 SN 8 X-BT-ER W6/3 SN 8	① Shank and thread Stainless steel: EN 1.4462, AISI 318LN, UNS S31803, X2CrNiMoN22-5-3 ② SN washer Stainless steel: EN 1.4404, AISI 316L, UNS S31603, X2CrNiMo17-12-2 ③ Sealing washer: Elastomer: black, resistant to UV, salt water, water ozone, oils, etc. ④ Guiding sleeve: Plastic ⑤ Nut: Stainless steel: A4, AISI grade 316 material ⑥ Lock washer: Stainless steel: A4, AISI grade 316 material
	X-BT-ER M8/7 SN 8	
	X-BT-ER M10/7 SN 8 X-BT-ER W10/7 SN 8	

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	Copper alloy, tin coated, CuSn8
M10-HC120 100	121	100			14	23	
W10-HC4/0 50	71	50	acc. to W10	acc. to W10	14	23	
W10-HC4/0 100	121	100			14	23	

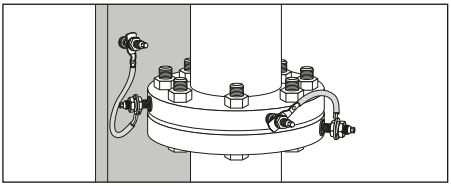
Approvals and certificates

Authority	Approval/ certificate no.	Date of issue
American Bureau of shipping (ABS)	23-2426560-PDA	17.07.2023
Bureau Veritas (BV)	54054/ BO BV	06.06.2023
Det Norske Veritas (DNV)	TAS00001 SV, Revision no. 3	07.05.2021
Lloyd's Register (LR)	19-00003-02	02.07.2020
RINA Services S.p.A.	FPE247421CS/001	15.07.2021
Underwriters Laboratories (UL)	E257069	17.01.2023

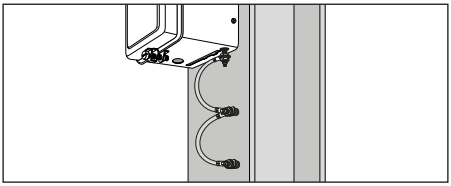
- Information presented in this product data sheet is based on Hilti Technical Data. For the specific application please refer to the corresponding approval/certificate.

Application conditions

Examples



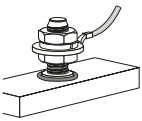
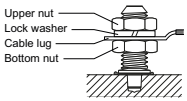
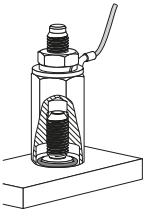
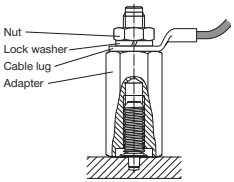
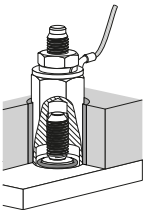
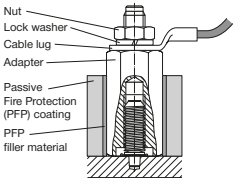
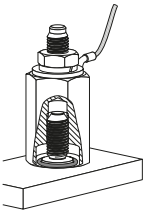
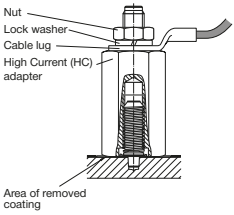
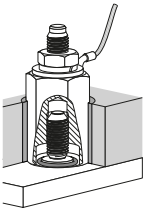
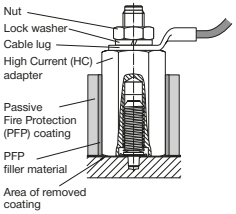
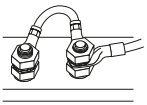
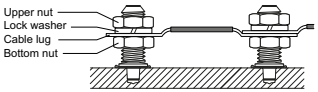
Functional and protective bonding in pipe (Outer diameter of installed surface ≥150 mm)



Protective bonding circuit - Double point connection

Fastening system

Connection type

Connection type	Fastening condition	Current flow through	Fastening description	
Single point connection	Fastening to steel	Threaded stud		
Single point connection with adapter	Fastening to steel	Threaded stud		
	Fastening to Passive Fire Protection (PFP) coated steel	Threaded stud		
Single point connection with High Current (HC) adapter	Fastening to steel	High Current (HC) adapter		
	Fastening to Passive Fire Protection (PFP) coated steel	High Current (HC) adapter		
Double point connection	Fastening to steel	Threaded stud		

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	Maximum permanent current I_{th} [A] acc. to IEC
Single point connection	X-BT-ER M6/3 SN 8 X-BT-ER W6/3 SN 8 X-BT-ER M8/7 SN 8 X-BT-ER M10/7 SN 8 X-BT-ER W10/7 SN 8	–	57
Single point connection with adapter	X-BT-ER M8/7 SN 8	M8-MR 50, M8-MR 75, M8-MR 100	57
	X-BT-ER M10/7 SN 8	M10-MR 50, M10-MR 75, M10-MR 100	
	X-BT-ER W10/7 SN 8	W10-MR 50, W10-MR 75, W10-MR 100	
	X-BT-ER M10	M10-HC120 50, M10-HC120 100	269
	X-BT-ER W10	W10-HC4/0 50, W10-HC4/0 100	

- Single point connection/single point connection with adapter:
  Recommended maximal cross section of connected cable according IEC 60947-7-2 and IEC 60947-7-1:
  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.
- Fastening of thicker cable is acceptable, if maximum permanent current I_{th} is not exceeded and provision on cable lug thickness t_{cl} is 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	X-BT-ER M6/3 SN 8 X-BT-ER W6/3 SN 8 X-BT-ER M8/7 SN 8 X-BT-ER M10/7 SN 8 X-BT-ER W10/7 SN 8	–	1.2	0.75
Single point connection with adapter	X-BT-ER M8/7 SN 8	M8-MR 50, M8-MR 75, M8-MR 100	1.2	–
	X-BT-ER M10/7 SN 8	M10-MR 50, M10-MR 75, M10-MR 100		
	X-BT-ER W10/7 SN 8	W10-MR 50, W10-MR 75, W10-MR 100		
	X-BT-ER M10/7 SN 8	M10-HC120 50, M10-HC120 100	14.4	–
	X-BT-ER W10/7 SN 8	W10-HC4/0 50, W10-HC4/0 100		
Double point connction	X-BT-ER M8/7 SN8 X-BT-ER M10/7 SN 8 X-BT-ER W10/7 SN 8	–	1.92	–

- Single point connection/ single point connection with adapter:
  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.
  Recommended maximal cross section of connected cable according to UL 467:
  10 AWG copper, tested short circuit current I_{cw} = 0.75 kA for 4 s.
- 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.
- Fastening of thicker cable is acceptable, if the maximum short circuit current I_{cw} and the exposure time is not exceeded and the provisions on cable lug thickness t_{cl} are observed.

Lightning protection

For high temporary current due to lightning.

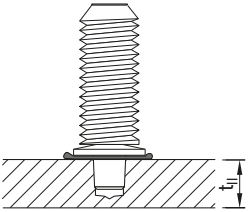
Connection type	Electrical connector	Adapter	Classification acc. to IEC 62561-1	Maximum lightning current I_{imp} [kA] acc. to IEC 62561-1
Single point connection	X-BT-ER M6/3 SN 8, X-BT-ER W6/3 SN 8, X-BT-ER M8/7 SN 8, X-BT-ER M10/7 SN 8, X-BT-ER W10/7 SN 8	–	Class N for normal duty	50 for ≤ 5 ms
Single point connection with adapter	X-BT-ER M8/7 SN 8	M8-MR 50, M8-MR 75, M8-MR 100	Class N for normal duty	50 for ≤ 5 ms
	X-BT-ER M10/7 SN 8	M10-MR 50, M10-MR 75, M10-MR 100		
	X-BT-ER W10/7 SN 8	W10-MR 50, W10-MR 75, W10-MR 100		
	X-BT-ER M10/7 SN 8	M10-HC120 50, M10-HC120 100	Class H for heavy duty	100 for ≤ 5 ms
	X-BT-ER W10/7 SN 8	W10-HC4/0 50, W10-HC4/0 100		

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

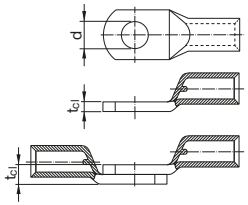
- Installation location: a, b, c, d, e
  a) outdoors; b) indoors; c) buried in ground; d) embedded in concrete; e) embedded in materials with thermal insulation
- Not intended to withstand a static mechanical stress.
- Including permanent and non-permanent connections.
- Connection configuration: BT-4 connector.

Application recommendation

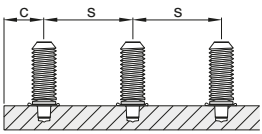
Base material

Technical drawing	Base material thickness t_{II} [mm]	Penetration type	Base material strength R_m [N/mm²]	Coating thickness t_c [mm]
	≥ 8	No through penetration	unlimited	≤ 0.5 mm

Cable lug characteristics

Technical drawing	Electrical connector	Adapter	Total cable lug thickness t_{cl} [mm]	Inner hole diameter d [mm]
	X-BT-ER M6/3 SN 8	–	≤ 3	6.5
	X-BT-ER W6/3 SN 8	–	≤ 3	6.5
	X-BT-ER M8/7 SN 8	–	≤ 7	8.5
	X-BT-ER M10/7 SN 8	–	≤ 7	10.5
	X-BT-ER W10/7 SN 8	–	≤ 7	10.5
	X-BT-ER M8/7 SN 8	M8-MR 50, M8-MR 75, M8-MR 100	≤ 12	8.5
	X-BT-ER M10/7 SN 8	M10-MR 50, M10-MR 75, M10-MR 100	≤ 12	10.5
	X-BT-ER W10/7 SN 8	W10-MR 50, W10-MR 75, W10-MR 100	≤ 12	10.5
	X-BT-ER M10/7 SN 8	M10-HC120 50, M10-HC120 100	≤ 12	10.5
	X-BT-ER W10/7 SN 8	W10-HC4/0 50, W10-HC4/0 100	≤ 12	10.5

Fastener positioning in base material

Technical drawing	Electrical connector	Adapter	Edge distance c [mm]	Spacing s [mm]
	X-BT-ER M6/3 SN 8	–	≥ 6	≥ 15
	X-BT-ER W6/3 SN 8	–	≥ 6	≥ 15
	X-BT-ER M8/7 SN 8	–	≥ 6	≥ 15
	X-BT-ER M10/7 SN 8	–	≥ 6	≥ 22
	X-BT-ER W10/7 SN 8	–	≥ 6	≥ 22
	X-BT-ER M8/7 SN 8	M8-MR 50, M8-MR 75, M8-MR 100	≥ 15	≥ 30
	X-BT-ER M10/7 SN 8	M10-MR 50, M10-MR 75, M10-MR 100	≥ 15	≥ 30
	X-BT-ER W10/7 SN 8	W10-MR 50, W10-MR 75, W10-MR 100	≥ 15	≥ 30
	X-BT-ER M10/7 SN 8	M10-HC120 50, M10-HC120 100	≥ 15	≥ 30
	X-BT-ER W10/7 SN 8	W10-HC4/0 50, W10-HC4/0 100	≥ 15	≥ 30

System recommendation

Installation preparation

Connection type	Fastening condition	Drill Bit	Installation preparation
Single point connection	Fastening to steel	TX-BT 4.7/7	Drilling pilot hole
Single point connection with adapter	Fastening to steel	TX-BT 4.7/7	Drilling pilot hole
	Fastening to Passive Fire Protection (PFP) coated steel	TX-BT 31-95 PFP	Removing PFP coating Drilling pilot hole
Single point connection with High Current (HC) adapter	Fastening to steel	TX-BT 4.7/7	Drilling pilot hole
		TX-BT 4.7 HC 95	Removing steel coating
	Fastening to Passive Fire Protection (PFP) coated steel	TX-BT 31-95 PFP	Removing PFP coating Drilling pilot hole
		TX-BT 4.7 HC 95	Removing steel coating
Double point connection	Fastening to steel	TX-BT 4.7/7	Drilling pilot hole

Tool recommendation

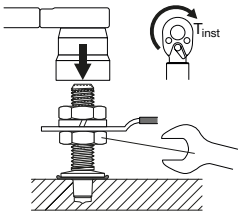
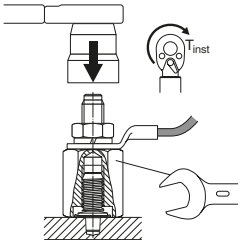
Electrical connector	Tool type	Tool	Fastener guide
X-BT-ER M6/3 SN 8	Battery-actuated tool	BX 3-BT	X-FG B3-BT M
X-BT-ER M8/7 SN 8			
X-BT-ER M10/7 SN 8			
X-BT-ER W6/3 SN 8			X-FG B3-BT W
X-BT-ER W10/7 SN 8			

Electrical connector	Tool type	Tool	Fastener guide	Cartridge
X-BT-ER M6/3 SN 8	Powder-actuated tool	DX 351-BT	BT FG M1024	6.8/11 M10, brown
X-BT-ER M8/7 SN 8				
X-BT-ER M10/7 SN 8				
X-BT-ER W6/3 SN 8			BT FG W1024	6.8/11 M10, brown
X-BT-ER W10/7 SN 8				

- Tool power level adjustment by setting tests on site.
- Start tool energy selection with recommended tool power level.
- Correct according requirement from chapter quality assurance.
- For more details, please refer to the chapter Accessories and consumables compatibility in the Direct Fastening Technology Manual (DFTM).

Specification for installation

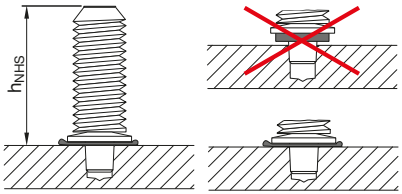
Tightening torque

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	8	
	Step 2: Nut to Adapter	8–16	Hold the stand-off with a spanner while tightening the upper nut

- These are abbreviated instructions which may vary by application.
- ALWAYS review/follow the instructions for use (IFU) accompanying the product.

Quality assurance

Tightening torque

Technical drawing	Electrical connector	Fastener stand-off h_{NHS} [mm]
	X-BT-ER M6/3 SN 8 X-BT-ER W6/3 SN 8 X-BT-ER M8/7 SN 8 X-BT-ER M10/7 SN 8 X-BT-ER W10/7 SN 8	25.7–26.8

Ordering information

Item no. and description

Designation	Item no.	Description
X-BT-ER M6/3 SN 8	2252195	Stainless threaded stud
X-BT-ER M8/7 SN 8	2194351	
X-BT-ER M10/7 SN 8	2194352	
X-BT-ER W6/3 SN 8	2252198	
X-BT-ER W10/7 SN 8	2194353	
Adapter M8-MR 50	2268523	Stainless adapter
Adapter M8-MR 75	2268524	
Adapter M8-MR 100	2268525	
Adapter M10-MR 50	2281193	
Adapter M10-MR 75	2394867	
Adapter M10-MR 100	2394868	
Adapter W10-MR 50	2281191	
Adapter W10-MR 75	2394869	
Adapter W10-MR 100	2395330	
Adapter M10-HC120 50	2407049	Copper alloy
Adapter M10-HC120 100	2407820	High Current (HC) adapter
Adapter W10-HC4/0 50	2407821	
Adapter W10-HC4/0 100	2407822	