



## Installation Instructions for Adaptors, Reducers, Elbows, Stopping Plugs & Breather Drains

These instructions give guidance on the correct selection and installation of HLS products. HLS products should only be used in applications and environments as detailed in these instructions and other HLS literature. **HLS does not accept responsibility for any damage, injury or form of loss caused where products are not installed or used as detailed within these instructions. If in doubt, further advice can be obtained by contacting HLS at the address shown above.**

Product Specifications			
Products	Certificates	Zones IECEX/ATEX/CSA/A Ex	Divisions CSA/US
Adaptors (Types A1,A2,A4)	IECEX SIR 07.0047X Sira 07ATEX 1175X CSA(UL) 1995105	Ex db IIC Gb/ Ex eb IIC Gb ATEX 2 GD, Zones 1, 2, 21 & 22/ IP54 66 68	CL I, Div. 1 ABCD* NEMA/Type 4**
Reducers (Types R1,R2,R3,R4)	IECEX SIR 07.0046X Sira 07ATEX 1175X CSA(UL) 1995105	Ex db IIC Gb/ Ex eb IIC Gb ATEX 2 GD, Zones 1, 2, 21 & 22/ IP54 66 68	CL I, Div. 1 ABCD NEMA/Type 4**
Male x Male Adaptors (Types M1,M2,M3)	IECEX SIR 07.0047X Sira 07ATEX 1175X CSA(UL) 1995105	Ex db IIC Gb/ Ex eb IIC Gb ATEX 2 GD, Zones 1, 2, 21 & 22/ IP54 66 68	CL I, Div. 1 ABCD* NEMA/Type 4**
Female x Female Adaptors (Types F1,F2)	IECEX SIR 07.0047X Sira 07ATEX 1175X CSA(UL) 1995105	Ex db IIC Gb/ Ex eb IIC Gb ATEX 2 GD, Zones 1, 2, 21 & 22/ IP54 66 68	CL I, Div. 1 ABCD* NEMA/Type 4**
Elbows (Types N,fn)	IECEX SIR 07.0044U Sira 07ATEX 1174U CSA(UL) 1995105	Ex db IIC Gb/ Ex eb IIC Gb ATEX 2 GD, Zones 1, 2, 21 & 22/ IP54 66 68	CL I, Div. 1 ABCD NEMA/Type 4**
Stopping Plugs (Types U5,U6)	IECEX SIR 07.0048X Sira 07ATEX 1175X CSA(UL) 1995105	Ex db IIC Gb/ Ex eb IIC Gb ATEX 2 GD, Zones 1, 2, 21 & 22/ IP54 66 68	CL I, Div. 1 ABCD NEMA/Type 4**
Stopping Plugs (Types D5,D6)	IECEX SIR 07.0048X Sira 07ATEX 1175X CSA(UL) 1995105	Ex db IIC Gb/ ATEX 2 GD Zones 1, 2, 21 & 22 IP54 66 68	CL I, Div. 1 ABCD NEMA/Type 4**
Breather Drain (Type Bd)	IECEX SIR 07.0045U Sira 07ATEX 1174U CSA(UL) 1995105	Ex db IIC Gb/ ATEX 2 GD Zones 1, 2, 21 & 22 IP54 66	CL I, Div. 1 ABCD NEMA/Type 4**
Breather Drain (Type Be)	IECEX SIR 07.0045U Sira 07ATEX 1174U CSA(UL) 1995105	Ex eb IIC Gb/ ATEX 2 GD Zones 1, 2, 21 & 22 IP54 66	NEMA/Type 4**

\* For applications within the US - Adaptors Type A and Type F larger than M50 and Type M larger than M40 are suitable for Class I, Div. 1 Gas Groups C & D only.  
\*\* Stainless Steel & Nickel Plated Brass versions – NEMA/Type 4x

Product Designation						
Example - A1.20.½.N.NT						
• Adaptor with hexagon body						
• M20 Male Thread						
• ½" NPT Female Thread						
• Nickel Plated Brass						
• Nitrile 'O' Ring						
<b>Important Note - Always state the Male Thread first</b>						
Product	Body Style					
A	Adaptors	1 Hexagonal Body				
R	Reducers	2 Diameter Body				
N	90° Elbows (fn Female x Female)	3 Diameter Body With Milled Flats				
M	Male x Male Adaptors	4 Diameter Body With Milled Hex				
F	Female x Female Adaptors	5 External Socket Stopping Plug				
U	Exd/Exe Stopping Plug	6 Internal Socket Stopping Plug				
D	Exd Stopping Plug					
Bd	Exd Breather/ Drain Plug					
Be	Exe Breather/ Drain Plug					
Thread Designation						
Metric IEC 60423:1993 (Bore dia)	NPT ANSI/ASME B1.20.1 1983 (R2001) (Bore dia)	NPS ANSI/ASME B1.20.1 1983 (R2001)	ISO ISO 72:1998 - UNI 6125 Parallel	ISO ISO 72:1998 - UNI 6125 Taper	ET BS31	PG DIN 40430
16 (8.5)	½ (14.5)	½S	½P	½T	½E	7
20 (14.5)	¾ (19.5)	¾S	¾P	¾T	¾E	9
25 (19.5)	1 (25.0)	1S	1P	1T	1E	11
32 (26.0)	1 ¼ (33.0)	1 ¼S	1 ¼P	1 ¼T	1 ¼E	13
40 (32.6)	1 ½ (40.0)	1 ½S	1 ½P	1 ½T	1 ½E	16P
50 (43.0)	2 (50.5)	2S	2P	2T	2E	21
63 (54.5)	2 ½ (60.5)	2 ½S	2 ½P	2 ½T	2 ½E	29
75 (65.0)	3 (74.5)	3S	3P	3T	3E	36
80 (69.0)	3 ½	3 ½S	3 ½P	3 ½T	3 ½E	42
85 (73.5)	4	4S	4P	4T	4E	48
90 (78.0)						
95						
100						
Notes: Metric sizes M80 and larger are 2.0mm pitch as standard, for 1.5mm pitch add *						
NPS Bore sizes as NPT						
ISO, ET & PG Thread forms not suitable for Class I, Div. 1 applications						
Material			O-ring			
N	Nickel Plated Brass		NT	Nitrile		
S	316 Stainless Steel		SC	Silicone		
B	Raw Brass					
A	Aluminum					
M	Zinc Plated Mild Steel					

Product Approval Standards					
Product Standard	Description	Product Standard	Description	Product Standard	Description
Zones: IECEX/ATEX/CSA/A Ex					
IEC 60079-0: 2017 Edition 7	Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements	IEC 60079-1:2014 Edition 7	Electrical Apparatus for Explosive Gas Atmospheres - Part 1: Flameproof Enclosures "d"	EN IEC 60079-7:2015+A1:2018	Electrical Apparatus for Explosive Gas Atmospheres -Part 7: Increased Safety "e"
IEC 60079-31: 2013 Edition 2	Explosive Atmospheres Part 31:Equipment dust ignition protection by enclosure "t"	EN 60079-1:2014	Electrical Apparatus for Explosive Gas Atmospheres - Part 1: Flameproof Enclosures "d"	IEC 60529	Degrees of Protection Provided by Enclosures (IP Code)
EN IEC 60079-0: 2018	Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements	IEC 60079-7:2017 Edition 5.1	Electrical Apparatus for Explosive Gas Atmospheres - Part 7: Increased Safety "e"		
EN 60079-31: 2014	Explosive Atmospheres Part 31:Equipment dust ignition protection by enclosure "t"				
CAN/CSA-E60079-0-02 (R2006)	Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements	CAN/CSA-E600791-02 (R2006)	Electrical Apparatus for Explosive Gas Atmospheres - Part 1: Flameproof Enclosures "d"	CAN/CSA-E60079-703	Electrical Apparatus for Explosive Gas Atmospheres - Part 7: Increased Safety "e"
CSA E61241-0 Edition 1	Electrical Apparatus for use in the presence of Combustible Dust - Part 0: General Requirements	CSA E61241-1 Edition 1	Electrical Apparatus for use in the presence of Combustible Dust Part 1: Protection by Enclosures "tD"		
UL 60079-0:2005	Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements	UL 60079-1:2005	Electrical Apparatus for Explosive Gas Atmospheres - Part 1: Flameproof Enclosures "d"	UL 60079-7:2002	Electrical Apparatus for Explosive Gas Atmospheres - Part 7: Increased Safety "e"
Divisions: CSA/US					
CSA C22.2 No. 0-M91 July 1991	General Requirements - Canadian Electrical Code, Part II	CSA C22.2 NO. 30-M1986 (R2003)	Explosion-Proof Enclosures for Use in Class I Hazardous Locations	CSA C22.2 NO. 18.3-04	Conduit, Tubing, and Cable Fittings
CSA C22.2 94-M91-M1986	Special Purpose Enclosures				
UL 1203:2006 Edition 4	Standard for Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations	UL 50:2003 Edition 11	Standard for Enclosures for Electrical Equipment	UL 514B:2004 Edition 5	Conduit, Tubing, and Cable Fittings

**Ingress Protection:** IP54, IP66, IP68, TYPE 4, Nickel Plated Brass & Stainless Steel, Type 4X, IP66 68 (TYPE 4, 4x) Is achieved with the use of 'O' ring seals, or Thread Sealant for parallel threads and Thread Sealant for taper threads. IP68 is to 2bar for 30 minutes. Thread sealant used must be suitable for use in Hazardous Locations (e.g. Hylomar -50°C to 230°C), the temperature range at the point of mounting, does not contain evaporating solvent and does not cause corrosion between the threaded entry and product when they are manufactured from dissimilar materials.

**Impact:** 7J

**Materials/Operating Temperatures:** The products are approved for a temperature ranges at their point of mounting based upon the minimum upper and lower temperatures of their constituent parts of construction:

Type 'Bd' & Type 'Be' Breather Drain (porous disc)	-50°C to 80°C
Products fitted with Nitrile O-rings	-30°C to 90°C
Products fitted with Silicone O-rings	-50°C to 230°C
Products manufactured from Brass	-100°C to 150°C
Products manufactured from Aluminum (stopping plugs only)	-100°C to 150°C
Products manufactured from Stainless steel	-100°C to 450°C
Products manufactured from Steel	-20°C to 230°C

**Surface Coating (Plating):** The products may additionally be metallic plated to suit the application.

**Threadforms:** In addition other thread forms that comply with the requirements of IEC 60079-1 tables 3 to 4 and clause C.2.2 (as applicable) are available upon request (**Not CSA/UL Class/Div applications**)

**Selection:** All products should be selected in accordance with all relevant Standards and Codes of Practice.

- Ensure that the product is certified to the same method of protection as the equipment into which it is to be installed.
- Ensure that the correct threadform and size is selected for the cable and/or entry hole of the enclosure.
- Ensure that the material the product is manufactured from is suitable for the enclosure material and cable gland or cable termination device, and for the surrounding environmental conditions ensuring the type of protection is not compromised.
- Ensure that surrounding conditions do not exceed the Operating Temperatures of the materials.
- Ensure that the product can maintain the same Ingress Protection levels as the equipment into which it is to be installed.
- Ensure that the impact resistance of the product is suitable to that of the equipment to which it is to be installed.

**Installation Guide:** All products should be installed in accordance with all relevant Installation Standards and Codes of Practice e.g. EN/IEC 60079-14, NEC/CEC.

- Installation should only be carried out by a suitably trained person.
- Under no circumstances should installation be carried out under live conditions.
- The installer should ensure that no damage occurs to any thread or form of seal during installation. Where component is plated care should be taken to prevent damage or chipping.
- The clearance holes for metric male threaded products, suitable for clearance hole applications of Increased safety enclosures are to have a diameter of 0.3 to 0.5 mm larger than the major diameter of the male thread and appropriately sized HLS Ex locknuts are to be utilized. Tapered threads should not be secured with a locknut.
- Where serrated washers or earth tags are used they should not be installed in such a way that it may impair any IP Rating.
- The male thread of Type 'Bd' Breather Drains and Type 'Be' Breather Drains without a drain hole in the thread must not protrude within the enclosure to prevent pooling of water within the enclosure.

**Type 'L1' Hexagonal Lock Nuts:** Products marked Ex e II in the following metric male thread sizes can be supplied with the manufacturers own manufactured brass locknuts for clearance hole applications. Size Range: M20, M25, M32, M40, M50, M63, M75 (1.5mm pitch).M80, M85, M90, M100 (2.0mm pitch)

**Installation:**

- **Parallel Threads**  
Products should be installed hand tight and then tightened a further ¼ to 1 full turn making them tool secure. (Sizes up to and including M50 - 5Nm; sizes over M50 - 25Nm)
- **Tapered Threads**  
Products should be installed hand tight and then tightened a further 1 to 2 full turns, wrench tight or tool secure.
- **Ensure that the torque values are applied and do not exceed the maximum torque that can be applied to the enclosure to achieve IP ratings.**

**Routine Checking and Maintenance:** All products should be checked during routine maintenance of the equipment by a suitably trained person in accordance with the applicable code of practice e.g. EN/IEC 60079-17.

- For type 'Bd' Breather Drain ensure internal plug is fully engaged and toolsecure (5Nm).

**Conditions/ Limitations/ Safety Usage:**

- Exe equipment cannot be used with Exd equipment.
- Two Adaptors installed in series is not permitted under certification.
- Only one Adaptor or Reducer or Elbow is to be used with any single cable entry on the associated equipment.
- Adaptors, Reducers and Elbows are not to be used for the direct inter-connection of enclosures.
- A blanking device (Stopping Plug) must not be utilized in conjunction with an adaptor, reducer or elbow.
- The ranges of Stopping Plugs are not to be used in conjunction with any other cable entry device.
- The interfaces between the male thread of the products and an associated enclosure and female thread of the products and the cable entry device cannot be defined. Therefore it is the user's responsibility to ensure that the appropriate ingress protection level is maintained at these interfaces.
- Product marked with an environmental Type 4X or Type 4 designation must be supplied and fitted with either the manufacturer's silicone or nitrile O-ring seals or a non-setting thread sealant to be applied liberally by the end user. E.g. Hylomar.
- For CEC Class I conduit installations female threads must be NPT. For NEC Class I conduit installations female threads must be NPT, or NPS. (Groups C & D only)
- Sizes smaller than ½"NPT (or its equivalent size) are not approved for CEC or NEC applications.
- NPT thread female products to be used in connection with conduit are only suitable with enclosures having not less than three full threads or those with a metric male thread in a clearance holes when used in conjunction with the manufactures Type L1 locknuts.
- 'Be' Breather Drains must utilize the castellated locknut provided when installed within clearance holes.
- Type 'Be' Breather Drains are only suitable for bottom entry within associated increased safety enclosures having a wall thickness within the range 1 mm to 3mm.
- The threaded spigots of Type 'Bd' Breather Drains & taper threaded Type 'Be' Breather Drains shall not protrude into the associated enclosure to maintain their ingress protection ratings.
- For Type 'Bd' Breather Drains the internal plug must be fully engaged and tool secure (5Nm) when installed.
- Flame paths for all products are not intended to be repaired.
- Type 'Bd' breather/drains shall only be used for bottom entry.
- The threads of the internal plug of the Type 'Bd' Breather Drains shall be fully tightened within the main body and not protrude above the body surface.