



HARDO.

USE AND MAINTENANCE INSTRUCTION OF EXPLOSION-PROOF ANTICORROSIVE **SOCKETS AND PLUGS HSP1P... SERIES**



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Table of contents

| | |
|--|----|
| GENERAL INFORMATION | 3 |
| Manufacturer | 3 |
| Product standards | 3 |
| PRODUCT DESCRIPTION | 3 |
| Configurations..... | 3 |
| Ex marking..... | 4 |
| Conditions of use..... | 7 |
| Other conditions for safe use..... | 7 |
| ASSEMBLY REQUIREMENTS..... | 8 |
| STRUCTURAL FEATURES | 8 |
| INSTALLATION, OPERATION AND MAINTENANCE..... | 9 |
| WIRING METHODS..... | 10 |
| TRANSPORT AND STORAGE..... | 11 |
| EXTERNAL APPERANCE, INSTALLATION DIMENSION | 11 |
| ATTACHMENTS..... | 11 |
| ORDERING INSTRUCTION..... | 11 |

GENERAL INFORMATION

Manufacturer



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Product standards

- EN IEC 60079-0:2018
- EN 60079-1:2014
- EN IEC 60079-7:2015+A1:2018
- EN IEC 60079-31:2024

All associate technical document, drawings and samples of HSP1P Series Explosion-Proof anticorrosive plug and sockets are reviewed, tested and certified by Test Center for Explosion Protected Electrical Apparatus, the ATEX certification number is: TÜV CY 25 ATEX 0207475 X.

PRODUCT DESCRIPTION

Configurations

Table 1. Available configurations of HSP1P

| HSP1P A B C D E | |
|-----------------|--|
| HSP1P | Explosion-Proof anticorrosive plug and sockets |
| A | <u>Rated current [A]:</u> 10, 16, 20, 25, 30, 32, 50, 60, 63, 100, 115, 125 |
| B | <u>Rated voltage [V]:</u> AC690: 600 ~ 690 AC AC500: 480 ~ 500 AC AC415: 380 ~ 415 AC AC250: 200 ~ 250 AC AC130: 100 ~ 130 AC AC50: 36 ~ 50 AC AC25: 20 ~ 25 AC DC250: 50 ~ 250 DC DC50: 36 ~ 50 DC DC25: 20 ~ 25 DC |
| C | <u>Number of pins:</u> 2P 3P: 2P+PE or 1P+N+PE 4P: 3P+PE 5P: 3P+N+PE |
| D | <u>Hardware style:</u> W-SET: Complete set W-SCT: Wall socket PLG: Plug C-SET: Coupler complete set C-SCT: Coupler socket P-SET: Panel complete set |

| | |
|----------|--|
| | P-SCT: Panel socket X-SET: 25° Panel complete set X-SCT: 25° Panel socket |
| E | <u>Auxiliary contact:</u> OC: only for 100A, 115A, 125A enclosure; not marked if absent |

Ex marking

ATEX marking:



II 2G Ex db eb IIC T6...T4 Gb



II 2D Ex tb IIIC T80°C Db

Certificate no.: TÜV CY 25 ATEX 0207475 X

Table 2. Model and technical parameters of HSP1P

| Model | Size | Ex marking | Ambient temperature [°C] | Wire diameter [mm ²] | IP code |
|--|--------|---|--------------------------|----------------------------------|---------|
| HSP1P 10 * 2P * HSP1P 16 * 2P * HSP1P 10 * 3P * HSP1P 16 * 3P * | Size 1 | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+50 | 2.5 | IP66 |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+65 | | |
| | | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+60 | 4.0 | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+65 | | |
| HSP1P 20 * 2P * HSP1P 20 * 3P * | Size 1 | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+53 | 2.5 | |
| | | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+50 | 4.0 | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+60 | | |
| HSP1P 10 * 4P * HSP1P 16 * 4P * HSP1P 10 * 5P * HSP1P 16 * 5P * | Size 2 | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+50 | 4.0 | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+65 | | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+50 | | |
| HSP1P 20 * 4P * HSP1P 20 * 5P * | Size 2 | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+50 | 4.0 | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+60 | | |
| HSP1P 20 *** | Size 3 | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+55 | 4.0 | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+60 | | |
| | | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+55 | 6.0 | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+65 | | |
| HSP1P 25 *** | Size 3 | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+40 | 4.0 | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+55 | | |
| | | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+50 | 6.0 | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+60 | | |
| HSP1P 30 *** HSP1P 32 *** | Size 3 | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+50 | 6.0 | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+40 | 16.0 | |
| HSP1P 50 *** HSP1P 60 *** HSP1P 63 *** | Size 4 | Ex db eb IIC T4 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+50 | | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+40 | | |
| HSP1P 100 *** HSP1P 100 *** OC | Size 5 | Ex db eb IIC T4 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+55 | 35.0 | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | -45≤T _a ≤+40 | | |

| | | | | |
|--|--------|---|-------------------------|------|
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +55$ | 50.0 |
| | | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +40$ | |
| HSP1P 115 *** HSP1P 115 *** OC | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +40$ | 35.0 |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +45$ | 50.0 |
| HSP1P 125 *** HSP1P 125 *** OC | | Ex db eb IIC T4 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +40$ | 50.0 |
| HSP1P 10 * 2P C-SET HSP1P 16 * 2P C-SET HSP1P 10 * 3P C-SET HSP1P 16 * 3P C-SET | Size 1 | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +55$ | 4.0 |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +60$ | |
| | | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +40$ | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +55$ | |
| HSP1P 10 * 4P C-SET HSP1P 16 * 4P C-SET HSP1P 10 * 5P C-SET HSP1P 16 * 5P C-SET | Size 2 | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +48$ | 4.0 |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +60$ | |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +45$ | |
| HSP1P 20 ** C-SET HSP1P 25 ** C-SET | Size 3 | Ex db eb IIC T6 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +50$ | 6.0 |
| | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +63$ | |
| HSP1P 32 ** C-SET | | Ex db eb IIC T5 Gb Ex tb IIIC T80°C Db | $-45 \leq T_a \leq +50$ | |

Table 3. The specifications of plug or socket cable entry holes

| Rated current [A] | Code of enclosure | Number of pins | Rated voltage [V] | Frequency | Inlet threads | | |
|-------------------|---------------------------|--------------------------------|-------------------|------------------------|--------------------------------------|------------------------|------------------------|
| 10 16 20 | Size 1: 335x90x159 mm | 2 pins (2P) | DC: 20 to 25 | - | Socket: 2-M20x1.5 or 2-M25x1.5 | | |
| | | | DC: 36 to 50 | | | | |
| | | | AC: 20 to 25 | | | 50/60Hz, max. 500Hz | |
| | | | AC: 36 to 50 | | | | |
| | | 3 pins (1P+N+PE) (2P+PE) | DC: 20 to 25 | - | | Socket: 2-M25x1.5 | |
| | | | DC: 36 to 50 | | | | |
| | | | DC: 50 to 250 | | | | |
| | | | AC: 20 to 25 | | | | 50/60Hz, max. 500Hz |
| AC: 36 to 50 | | | | | | | |
| AC: 100 to 130 | | | | | | | |
| AC: 200 to 250 | | | | | | | |
| 10 16 20 | Size 2: 368x110x179 mm | | 4 pins (3P+PE) | | DC: 20 to 25 | | - |
| | | DC: 36 to 50 | | | | | |
| | | AC: 20 to 25 | | 50/60Hz, max. 500Hz | | | |
| | | AC: 36 to 50 | | | | | |
| | | AC: 100 to 130 | | | | | |
| | | AC: 200 to 250 | | | | | |
| | | AC: 380 to 415 | | | | | |
| | | AC: 480 to 500 | | | | | |
| | | AC: 600 to 690 | | | | | |
| | | 5 pins (3P+N+PE) | DC: 20 to 25 | - | Socket: 2-M25x1.5 | | |
| | | | DC: 36 to 50 | | | | |
| | | | AC: 20 to 25 | | | 50/60Hz, max. 500Hz | |
| | | | AC: 36 to 50 | | | | |
| | | | AC: 100 to 130 | | | | |
| | | | AC: 200 to 250 | | | | |
| | | | AC: 380 to 415 | | | | |
| | | | AC: 480 to 500 | | | | |
| | | | AC: 600 to 690 | | | | |
| 2 pins (2P) | DC: 20 to 25 | | - | | | | Socket: 2-M32x1.5 |
| | DC: 36 to 50 | | | | | | |
| | AC: 20 to 25 | 50/60Hz, max. 500Hz | | | | | |
| | AC: 36 to 50 | | | | | | |

| | | | | | | |
|--|---------------------------|---|----------------|------------------------|----------------------|------------------------|
| 20 25 30 32 | | 3 pins or 4 pins (1P+N+PE) (2P+PE) (3P+PE) | DC: 20 to 25 | - | Socket: 2-M40x1.5 | |
| | | | DC: 36 to 50 | | | |
| | | | AC: 20 to 25 | | | 50/60Hz, max. 500Hz |
| | | | AC: 36 to 50 | | | |
| | | 3 pins or 4 pins (1P+N+PE) (2P+PE) (3P+PE) | AC: 100 to 130 | 50/60Hz, max. 500Hz | | |
| | | | AC: 200 to 250 | | | |
| | | | AC: 380 to 415 | | | |
| | | | AC: 480 to 500 | | | |
| | | 5 pins (3P+N+PE) | DC: 20 to 25 | 50/60Hz, max. 500Hz | | |
| | | | DC: 36 to 50 | | | |
| | | | AC: 20 to 25 | | | |
| | | | AC: 36 to 50 | | | |
| AC: 100 to 130 | | | | | | |
| AC: 200 to 250 | | | | | | |
| AC: 380 to 415 | | | | | | |
| AC: 480 to 500 | | | | | | |
| 50 60 63 | Size 4: 638x200x252 mm | 3 pins or 4 pins (2P+PE) (3P+PE) | AC: 100 to 130 | 50/60Hz, max. 500Hz | Socket: 2-M50x1.5 | |
| | | | AC: 200 to 250 | | | |
| | | | AC: 380 to 415 | | | |
| | | | AC: 480 to 500 | | | |
| | | 5 pins (3P+N+PE) | AC: 600 to 690 | | | |
| | | | AC: 100 to 130 | | | |
| | | | AC: 200 to 250 | | | |
| | | | AC: 380 to 415 | | | |
| | | 5 pins (3P+N+PE) | AC: 480 to 500 | | | |
| | | | AC: 600 to 690 | | | |
| | | | AC: 100 to 130 | | | |
| | | | AC: 200 to 250 | | | |
| 3 pins or 4 pins (2P+PE) (3P+PE) | AC: 380 to 415 | 50/60Hz, max. 500Hz | | | | |
| | AC: 480 to 500 | | | | | |
| | AC: 600 to 690 | | | | | |
| | AC: 100 to 130 | | | | | |
| 3 pins or 4 pins (2P+PE) (3P+PE) | AC: 200 to 250 | 50/60Hz, max. 500Hz | | | | |
| | AC: 380 to 415 | | | | | |
| | AC: 480 to 500 | | | | | |
| | AC: 600 to 690 | | | | | |
| 5 pins (3P+N+PE) | AC: 100 to 130 | 50/60Hz, max. 500Hz | | | | |
| | AC: 200 to 250 | | | | | |
| | AC: 380 to 415 | | | | | |
| | AC: 480 to 500 | | | | | |
| 5 pins (3P+N+PE) | AC: 600 to 690 | 50/60Hz, max. 500Hz | | | | |
| | AC: 100 to 130 | | | | | |
| | AC: 200 to 250 | | | | | |
| | AC: 380 to 415 | | | | | |
| 3 pins or 4 pins (2P+PE) (3P+PE) | AC: 480 to 500 | 50/60Hz, max. 500Hz | | | | |
| | AC: 600 to 690 | | | | | |
| | AC: 100 to 130 | | | | | |
| | AC: 200 to 250 | | | | | |
| 5 pins (3P+N+PE) | AC: 380 to 415 | 50/60Hz, max. 500Hz | | | | |
| | AC: 480 to 500 | | | | | |
| | AC: 600 to 690 | | | | | |
| | AC: 100 to 130 | | | | | |

Table 4. Plug or socket tensile forces specifications

| Model | Number of pins | Outer diameter range of the plug cable (mm) | Max. tensile force of 20 times (Nm) | Max. tensile force of 5 times (Nm) | |
|--|--|---|-------------------------------------|------------------------------------|---|
| HSP1P 10 *** HSP1P 16 *** HSP1P 20 *** | 2 pins (2P) | Ø5~Ø8 | 3.5 | / | |
| | | 3 pins (1P+N+PE) (2P+PE) | Ø8.5~Ø11.5 | 3.6 | / |
| | | | Ø11~Ø15 | 4.1 | / |
| | 4 pins (3P+PE) 5 pins (3P+N+PE) | Ø8~Ø10.5 | 4.5 | / | |
| | | Ø12~Ø15 | 4.6 | / | |
| | | Ø16~Ø19.5 | 5.0 | / | |
| HSP1P 20 *** HSP1P 25 *** HSP1P 30 *** HSP1P 32 *** | 2 pins (2P) | Ø11.5~Ø15 | 5.1 | / | |
| | 3 pins (1P+N+PE) (2P+PE) | Ø16~Ø19.5 | 5.1 | / | |
| | | 4 pins (3P+PE) 5 pins (3P+N+PE) | Ø24~Ø27 | 5.0 | / |
| | 3 pins (2P+PE) 4 pins (3P+PE) | | Ø19 | 5.1 | / |
| HSP1P 50 *** HSP1P 60 *** HSP1P 63 *** | | Ø25~Ø26 | 5.1 | / | |

| | | | | |
|---|---------------------|-----------|------|------|
| | 5 pins (3P+N+PE) | Ø28 | 12.1 | / |
| HSP1P 100 *** HSP1P 115 *** HSP1P 125 *** | 3 pins (2P+PE) | Ø19~Ø28 | / | 24.5 |
| | 4 pins (3P+PE) | Ø26.5~Ø35 | / | 21.7 |
| | 5 pins (3P+N+PE) | Ø36~Ø46 | / | 21.7 |

Conditions of use

HSP1P Series Explosion-proof anticorrosive plug and sockets are designed for use:

- In Zones 1, 2 of explosion hazard of gases, vapors and mists of flammable liquids classified as explosion group IIA, IIB or IIC and temperature class T1-T6;
- In Zones 21, 22 explosion hazard of flammable fibers of explosive groups IIIA, IIIB, IIIC, whose assumed flash point is higher than 120°C and the smoldering temperature of the dust layer (5 mm) higher than 155°C;
- Service conditions:
 - Atmosphere pressure: 80÷110 kPa,
 - Environment temperature is -45°C÷+40/+45/+48/+50/+55/+60/+63/+65°C,
 - Relative humidity: ≤95%RH (+25)°C;
- In corrosive gas environment;
- No obvious shake, impact or vibration allowed;
- No water or other liquid intrusion.

Other conditions for safe use

- The equipment shall not be installed in a location where the dust can accumulate, and shall not be installed in a location where the external conditions are conducive to the buildup of electrostatic charge on such surfaces. In addition, only should be cleaned with a damp cloth.
- Repairs of the flameproof joints shall not be allowed.
- As the electrical parameter depended on the build-in electrical component, the operating parameters described in the instruction shall be followed.
- The 85°C high temperature-resistant cable shall be selected.
- Separated certified cable glands or blanking elements, type of d and t, with minimum Group IIC and IIIC, EPL Gb and Db, minimum IP66, shall be used during the operation.
- Observe the warning:
“WARNING - DO NOT OPEN WHEN ENERGIZED!”
“WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT!” (only for Ex t)
“WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS”
- Each HSP1P series plug shall only be used with an HSP1P series socket covered by this certificate.
- Metal cable glands or blanking element shall be incorporated with earthing connection when installation if applicable, and the installation layout shall ensure that external metallic labels are not expected to be approached by earthed objects.
- When the product is used as panel mounting, the local temperature around the socket shall not exceed corresponding maximum Ta.

ASSEMBLY REQUIREMENTS

Table 5. Tightening Torque Requirements for Fasteners

| Model | Parts | Fastener specification | Tightening torque [Nm] |
|---------------|---|------------------------|------------------------|
| HSP1P 10 *** | Switch wiring screw in socket | M3.5 | 1.8 |
| HSP1P 16 *** | Screw used for the wire clamp on the plug | M3 | 2.5 |
| HSP1P 20 *** | | | |
| | Plug core cover screw | ST2.9 | 0.8 |
| HSP1P 20 *** | Switch wiring screw in socket | M5 | 3.5 |
| HSP1P 25 *** | Screw used for the wire clamp on the plug | M4 | 3.0 |
| HSP1P 30 *** | | | |
| HSP1P 32 *** | Plug core cover screw | ST3.9 | 1.8 |
| HSP1P 50 *** | Switch wiring screw in socket | M6 | 3.7 |
| HSP1P 60 *** | Screw used for the wire clamp on the plug | M4 | 3.0 |
| HSP1P 63 *** | | | |
| | Plug core cover screw | ST3.9 | 1.8 |
| HSP1P 100 *** | Switch wiring screw in socket | M8 | 25 |
| HSP1P 115 *** | Screw used for the wire clamp on the plug | M4 | 3.0 |
| HSP1P 125 *** | | | |

STRUCTURAL FEATURES

1. The explosion-proof type of this product is flameproof increased safety type and dust explosion-proof type. It can be used not only in explosive gas environment but also in explosive dust environment.
2. The plug-in device consists of a plug and a socket. The socket consists of a socket shell assembly and a panel socket (containing a switch module). The plug consists of a shell, a contact rod, and a wire clamp. The switch module in the socket contains the main contact, the N contact and the PE terminal, and the socket shell has a PE terminal. The 25-degree socket is composed of a panel socket and a 25-degree connector.
3. The overall structure of the product is divided into two parts: the plug and the socket (with a built-in switch module). The plug is connected to the electrical equipment, and the socket is equipped with a reliable mechanical interlocking device. When the plug is inserted into the socket, rotating the plug can close or disconnect the connected circuit, and the plug cannot be unplugged when the circuit is connected. This structure can realize non-powered operation, and will not cause arcing when the plug is inserted and unplugged. The socket is equipped with a protective cover to ensure the reliability of the protection level. The contact sleeve in the socket has built-in shutter-type reeds, making the product self-cleaning.
4. The shell cover is molded with antistatic glass fiber reinforced unsaturated polyester resin BMC, which has high strength and good thermal stability.
5. The panel type and 25-degree panel type must be used with an enclosure of the corresponding explosion-proof grade, and cannot be used alone in explosive gas environments or explosive dust environments.
6. There are sealing rings between the joint surfaces of the enclosure, so that the product has good dustproof and waterproof performance, meeting the IP66 requirements, and the socket compression sleeve should meet the IP66 protection requirements of IEC60529.
7. The sealing ring is made of high and low temperature resistant and anti-aging silicone rubber material, which makes the product have better weather resistance.
8. Both the inside of the enclosure is completed with earthing.
9. The specifications of plug or socket cable entry holes are shown in Table 3. Equipped with with ATEX certified explosion-proof cable gland or plugs (Ex II 2G Ex eb IIC Gb, II 2D Ex tb IIIC Db).

INSTALLATION, OPERATION AND MAINTENANCE

EN IEC 60079-14:2025 Explosive atmospheres - Part 14: Electrical installation design, selection and installation of equipment, including initial inspection

EN IEC 60079-17:2024 Explosive atmospheres - Part 17: Electrical installations inspection and maintenance

EN IEC 60079-19:2020 Explosive atmospheres - Part 19: Equipment repair, overhaul and reclamation

In addition to strictly following the above standards, the product should also meet the following requirements:

1. Before use, check whether the basic data listed on the product nameplate meets the actual use conditions.
2. The installation, use and maintenance of the product strictly abide by "WARNING-DO NOT OPEN WHEN ENERGIZED" to ensure the safety of operators and the site.
3. Before using the product, check whether all parts are installed correctly, whether the wiring is accurate (see wiring diagram), whether the sealing strip is intact, etc.
4. The wiring of the wires should be standardized and neat, and the wire stripping should be of 11 appropriate length and neat. Select the appropriate wire according to the wire size specified in Table 1.
5. During installation and maintenance, the front power supply should be cut off before opening the cover. After opening the cover, check whether all parts are intact. Users are not allowed to replace the parts of the product on their own. They should work with the product manufacturer to solve the faults that occur during operation to prevent damage.
6. During installation and maintenance, the gasket should be adhered or fixed to the joint surface to prevent loss, damage or wrong installation. After the maintenance is completed, tighten all fasteners.
7. During maintenance, if the rubber gasket or ring is found to be aging, cracked, or lost, the rubber gasket or ring with the same material and hardness as specified in the technology should be replaced immediately (or contact the manufacturer for order) to avoid affecting the explosion-proof and protective performance of the product.
8. When replacing metal parts for maintenance, attention must be paid to the selection of materials to ensure the corrosion resistance of the product.
9. The structure of the explosion-proof joint surface should comply with the basic parameters of the flame path. Contact the original manufacturer to obtain the data on the size of the explosion-proof joint surface.
10. During the maintenance process, the explosion-proof joint surface must not be bumped or scratched, and should be treated with anti-rust treatment. It is not allowed to be painted, and anti-rust grease must be applied. The anti-rust grease should not age, harden, contain vaporized solvents, and not cause rust on the joint surface. After the maintenance is completed, tighten each fastening screw.
11. The width of flame-proof joint and flame-proof thread size are more than the minimum values specified in IEC/EN 60079-1. If needed repair of the flame-proof joints and flame-proof thread size must only be made in compliance with the structural specifications provided by the manufacturer.
12. The grounding wire inside the product should be reliably grounded. The specifications of the fixing screws are shown in Table 6.

Table 6. The specifications of the fixing screws

| Model | Size | Internal ground fixing screw |
|--|--------|------------------------------|
| HSP1P 10 * 2P * HSP1P 16 * 2P * HSP1P 20 * 2P * HSP1P 10 * 3P * HSP1P 16 * 3P * HSP1P 20 * 3P * | Size 1 | M4 |
| HSP1P 10 * 4P * HSP1P 16 * 4P * HSP1P 20 * 4P * HSP1P 10 * 5P * HSP1P 16 * 5P * HSP1P 20 * 5P * | Size 2 | M4 |
| HSP1P 20 * * * HSP1P 25 * * * HSP1P 30 * * * HSP1P 32 * * * | Size 3 | M5 |
| HSP1P 50 * * * HSP1P 60 * * * HSP1P 63 * * * | Size 4 | M8 |
| HSP1P 100 * * * * HSP1P 115 * * * * HSP1P 125 * * * * | Size 5 | M8 |

13. "WARNING-DO NOT OPEN WHEN ENERGIZED" "WARNING-DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT!" (only for Ex t)" "WARNING-POTENTIAL ELECTROSTATIC CHARGING HAZARD-SEE INSTRUCTIONS".
14. Only when the plug is inserted into the socket and turned to the closed position, the power can be turned on. Only when the front pole protection switch of the plug and socket device is turned to the off position, the plug can be pulled out after the power is cut off.
15.
 - a) Before inserting the plug into the socket, the power supply of the plug-in device must be disconnected;
 - b) Before use, insert the plug into the socket first, rotate the locking ring clockwise, rotate the plug clockwise to the "I" position (internal switch closed), and turn on the power supply of the plug-in device. After use, the power supply of the plug-in device must be disconnected first, and then the plug is rotated counterclockwise to the "O" position, and the locking ring is loosened counterclockwise, and then the plug is pulled out, and the dust cover on the socket is tightened;
 - c) It is strictly prohibited to open and close the isolation switch on the power supply of the plug-in device or perform plugging and unplugging when the power supply is uninterrupted or under load;
 - d) A circuit breaker with short circuit, overload and other protections must be installed at the front pole of the power supply of the plug-in device;
 - e) The socket is connected to the power side, and the plug is connected to the electrical equipment;
 - f) When the plug and socket device is not working, the dust-proof cover should be covered to prevent dust or water vapor from entering and affecting normal usage.
16. Socket outlets in areas requiring EPL "Db" and "Dc" shall be installed so that dust will not enter the socket outlet with or without a plug in place. To minimize the ingress of dust in the event of a dust cap being accidentally left off, socket outlets shall be positioned at an angle, which is not more than 60° to the vertical, and the opening facing downwards.
17. To ensure the normal operation of the product, the user must perform regular inspections according to the following regulations:
 - a) External inspection and cleaning work. If any parts are found to be damaged or the function is not normal, maintenance should be carried out in time;
 - b) Regularly take appropriate cleaning measures to prevent dust from accumulating on the surface, but compressed air should not be used for blowing;
 - c) Regularly check whether the electrical performance of the product is in good condition;
 - d) It is recommended that users perform maintenance every six months and repair once a year.

WIRING METHODS

1. Wire wiring should be standardized and tidy, and the length of wire stripping should be appropriate and tidy. After wiring, ensure that the electrical clearance and creepage distance in the wiring cavity meet the requirements of Table 6 (Material level is Class II):

Table 7. Required electrical clearances and creepage distance in the wiring cavity

| Rated voltage [V] | Creepage distance min [mm] | Electrical clearance min [mm] |
|-------------------|----------------------------|-------------------------------|
| 24, 36 DC | 6.3 | 5.0 |
| 20 - 25 AC/DC | | |
| 36 - 50 AC/DC | | |
| 100 - 130 AC | | |
| 200 - 250 AC | | |
| 50 - 250 DC | 20.0 | 12.0 |
| 380 - 415 AC | | |
| 480 - 500 AC | | |
| 600 - 690 AC | | |

2. When the built-in switch is wired, the wire and the terminal lug are mechanically crimped and then tightened with bolts and have anti-loosening measures.
3. Wiring diagram of explosion-proof anticorrosive plug and sockets:

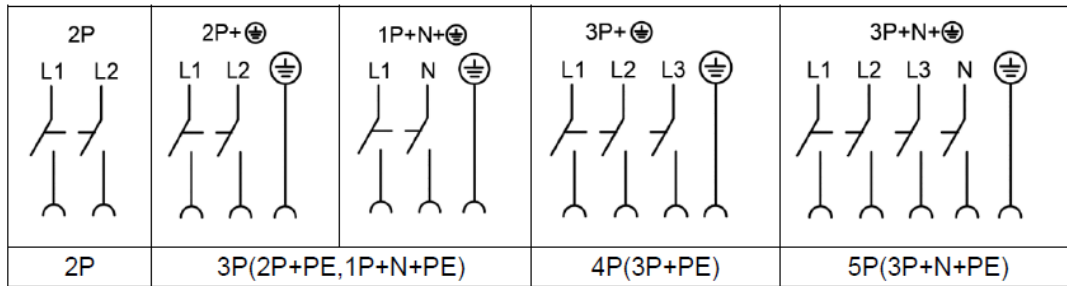


Figure 1. Wiring diagram of explosion-proof anticorrosive plug and sockets

TRANSPORT AND STORAGE

1. Explosion-Proof anticorrosive plug and sockets should prevent the impact or and strong shock, and shall have associate measures to prevent from the rain and snow in transportation;
2. Explosion-Proof anticorrosive plug and sockets shall be stored in well-ventilated warehouse without water or liquid penetration, the warehouse shall be -50°C to +70°C with humidity of 90% (+25°C);
3. No corrosive gas, vapor or dust that may affect the metal and insulation performance near the Explosion-proof anticorrosive plug and sockets.



A symbol placed on the product or on the packaging indicates that the product should not be considered normal household waste, but must be recycled for electrical and electronic equipment.

EXTERNAL APPEARANCE, INSTALLATION DIMENSION

See Figure 2-25.

ATTACHMENTS

1. Instruction Manual;
2. Conformity Certificate;
3. Accessories list see the Table 7:

Table 8. List of accessories

| Component | Maintenance requirement |
|---|--|
| Shell accessories, socket, plug, switch | Can not be replaced. |
| Fastening screw | Maintenance personnel shall have the qualification of explosion-proof maintenance. If the replacement components is needed, the specification shall be the same and strength shall not be lower than the original product. |
| Sealing strip and sealing washer | Only staff who owns explosion-proof maintenance qualification can do the maintenance, and when need replacement, please buy form original manufacture. |

ORDERING INSTRUCTION

1. Complete model and quantity;
2. Contact manufacturer in time in case of malfunction: www.hardo.tech

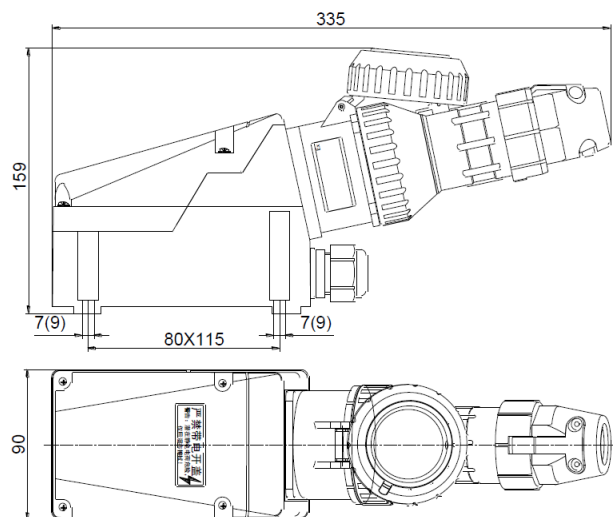


Figure 2. (Size 1) HSP1P 10 * 2P W-SET, HSP1P 10 * 3P W-SET, HSP1P 16 * 2P W-SET, HSP1P 16 * 3P W-SET, HSP1P 20 * 2P W-SET, HSP1P 20 * 3P W-SET Explosion-proof anticorrosive plug and sockets

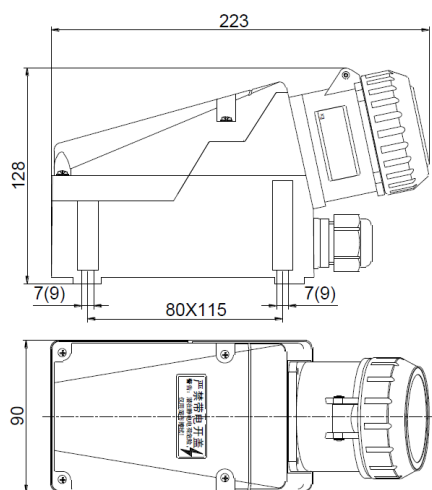


Figure 3. (Size 1) HSP1P 10 * 2PZ, HSP1P 10 * 3P W-SCT, HSP1P 16 * 2P W-SCT, HSP1P 16 * 3P W-SCT, HSP1P 20 * 2P W-SCT, HSP1P 20 * 3P W-SCT Explosion-proof anticorrosive plug and sockets (socket)

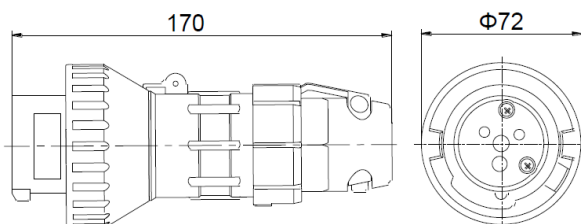


Figure 4. (Size 1) HSP1P 10 * 2P PLG, HSP1P 10 * 3P PLG, HSP1P 16 * 2P PLG, HSP1P 16 * 3P PLG, HSP1P 20 * 2P PLG, HSP1P 20 * 3P PLG Explosion-proof anticorrosive plug and sockets (plug)

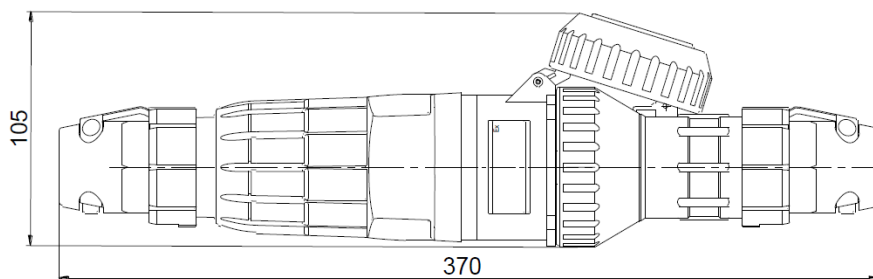


Figure 5. (Size 1) HSP1P 10 * 2P C-SET, HSP1P 10 * 3P C-SET, HSP1P 16 * 2P C-SET, HSP1P 16 * 3P C-SET, HSP1P 20 * 2P C-SET, HSP1P 20 * 3P C-SET Explosion-proof anticorrosive plug and sockets (coupler)

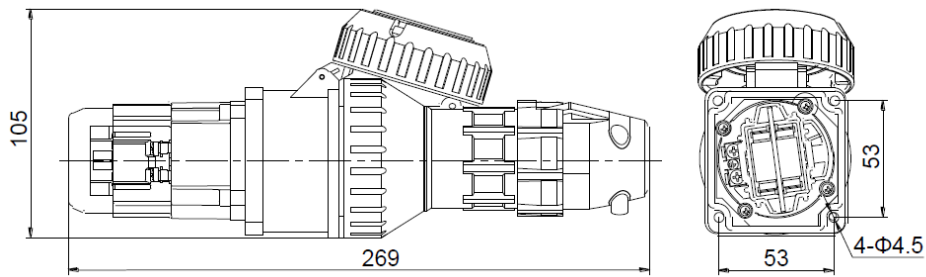


Figure 6. (Size 1) HSP1P 10 * 2P P-SET, HSP1P 10 * 3P P-SET, HSP1P 16 * 2P P-SET, HSP1P 16 * 3P P-SET, HSP1P 20 * 2PM, HSP1P 20 * 3P P-SET Explosion-proof anticorrosive plug and sockets (socket without enclosure)

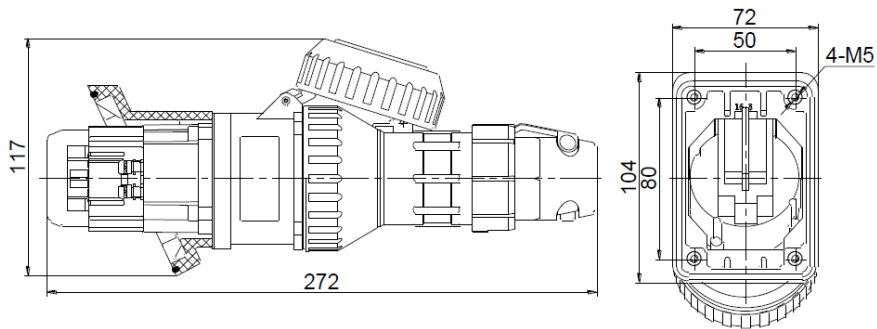


Figure 7. (Size 1) HSP1P 10 * 2P X-SET, HSP1P 10 * 3P X-SET, HSP1P 16 * 2P X-SET, HSP1P 16 * 3P X-SET, HSP1P 20 * 2PX, HSP1P 20 * 3P X-SET Explosion-proof anticorrosive plug and sockets (25° socket without enclosure)

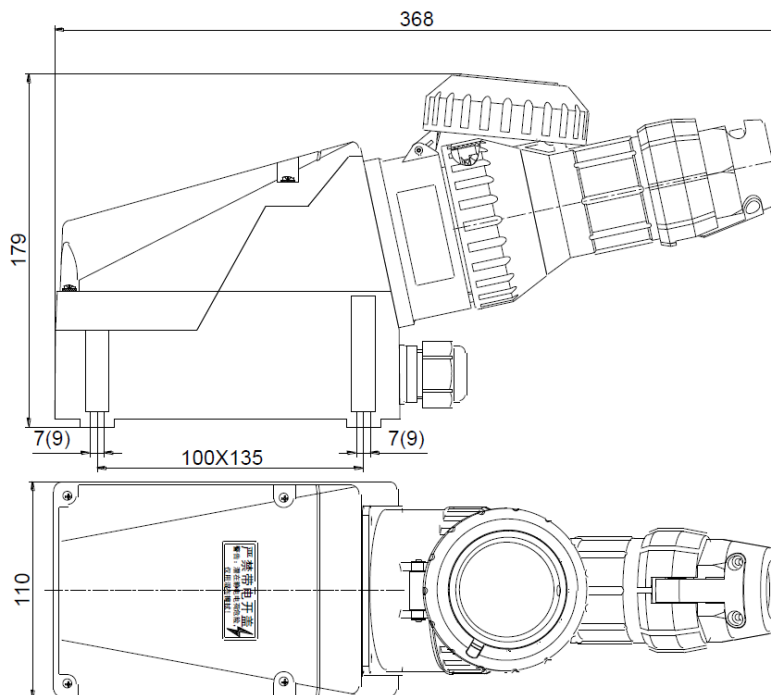


Figure 8. (Size 2) HSP1P 10 * 4P W-SET, HSP1P 10 * 5P W-SET, HSP1P 16 * 4P W-SET, HSP1P 16 * 5P W-SET, HSP1P 20 * 4P W-SET, HSP1P 20 * 5P W-SET Explosion-proof anticorrosive plug and sockets

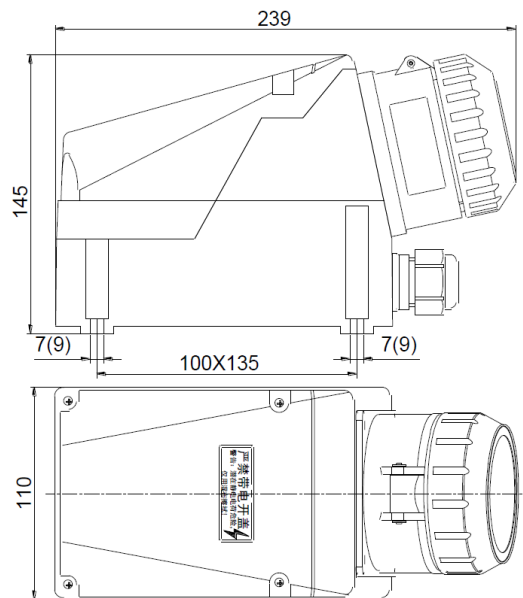


Figure 9. (Size 2) HSP1P 10 * 4P W-SCT, HSP1P 10 * 5P W-SCT, HSP1P 16 * 4P W-SCT, HSP1P 16 * 5P W-SCT, HSP1P 20 * 4P W-SCT, HSP1P 20 * 5P W-SCT Explosion-proof anticorrosive plug and sockets (socket)

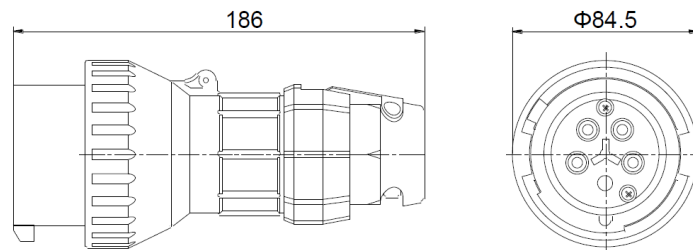


Figure 10. (Size 2) HSP1P 10 * 4P PLG, HSP1P 10 * 5P PLG, HSP1P 16 * 4P PLG, HSP1P 16 * 5P PLG, HSP1P 20 * 4P PLG, HSP1P 20 * 5P PLG Explosion-proof anticorrosive plug and sockets (plug)

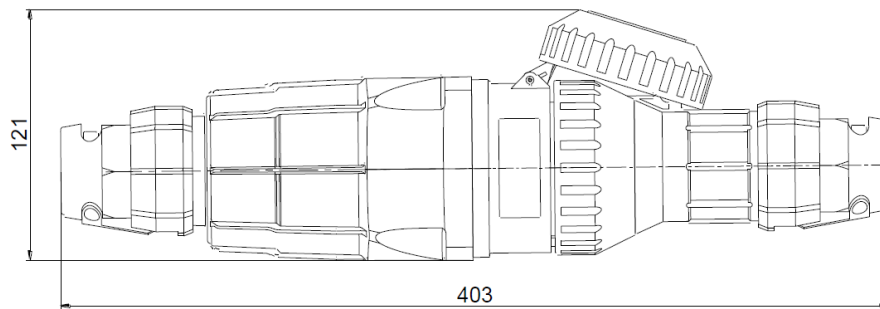


Figure 11. (Size 2) HSP1P 10 * 4P C-SET, HSP1P 10 * 5P C-SET, HSP1P 16 * 4P C-SET, HSP1P 16 * 5P C-SET, HSP1P 20 * 4P C-SET, HSP1P 20 * 5P C-SET Explosion-proof anticorrosive plug and sockets (coupler)

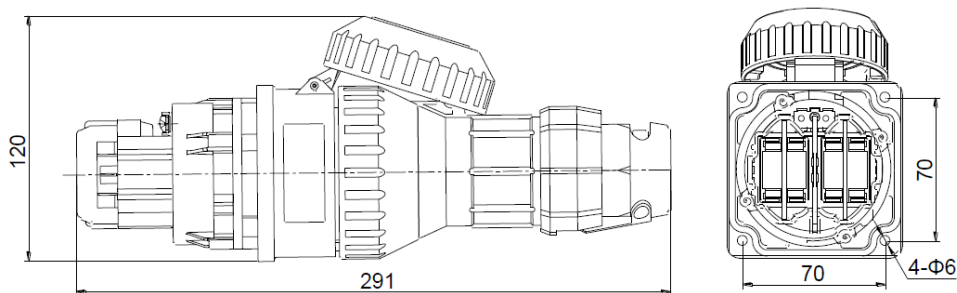


Figure 12. (Size 2) HSP1P 10 * 4P P-SET, HSP1P 10 * 5P P-SET, HSP1P 16 * 4P P-SET, HSP1P 16 * 5P P-SET, HSP1P 20 * 4P P-SET, HSP1P 20 * 5P P-SET Explosion-proof anticorrosive plug and sockets (socket without enclosure)

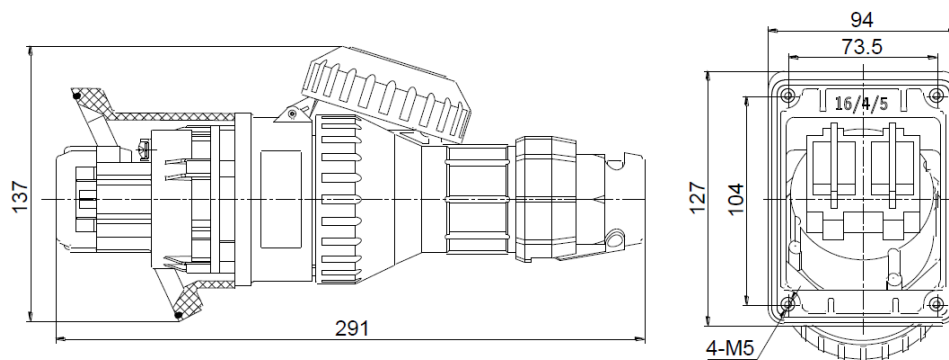


Figure 13. (Size 2) HSP1P 10 * 4P X-SET, HSP1P 10 * 5P X-SET, HSP1P 16 * 4P X-SET, HSP1P 16 * 5P X-SET, HSP1P 20 * 4P X-SET, HSP1P 20 * 5P X-SET Explosion-proof anticorrosive plug and sockets (25° socket without enclosure)

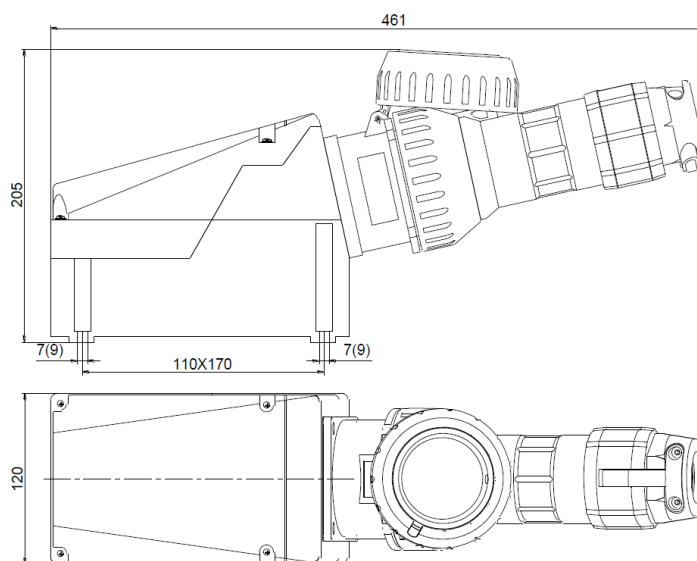


Figure 14. (Size 3) HSP1P 20 ** W-SET, HSP1P 25 ** W-SET, HSP1P 30 ** W-SET, HSP1P 32 ** W-SET Explosion-proof anticorrosive plug and sockets

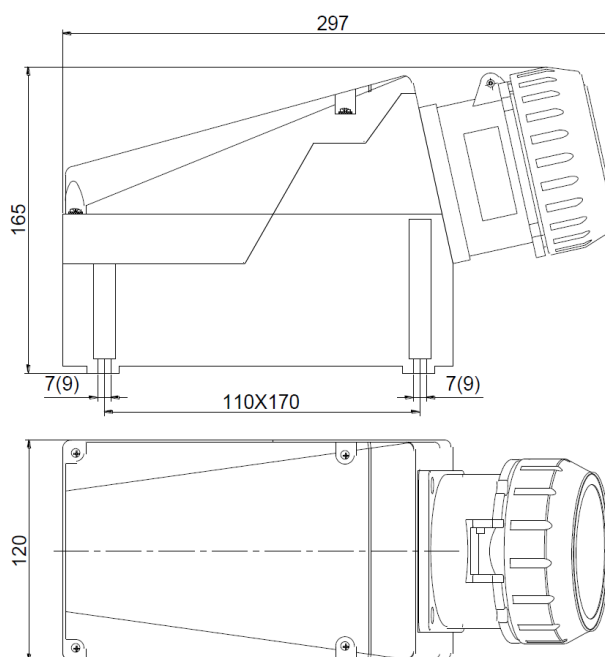


Figure 15. (Size 3) HSP1P 20 ** W-SCT, HSP1P 25 ** W-SCT, HSP1P 30 ** W-SCT, HSP1P 32 ** W-SCT Explosion-proof anticorrosive plug and sockets (socket)

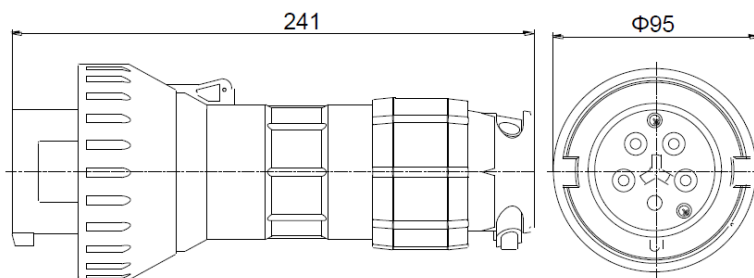


Figure 16. (Size 3) HSP1P 20 ** PLG, HSP1P 25 ** PLG, HSP1P 30 ** PLG, HSP1P 32 ** PLG Explosion-proof anticorrosive plug and sockets (plug)

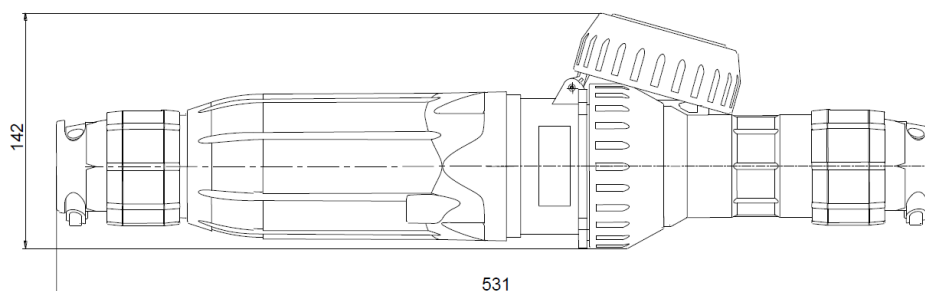


Figure 17. (Size 3) HSP1P 20 ** C-SET, HSP1P 25 ** C-SET, HSP1P 30 ** C-SET, HSP1P 32 ** C-SET Explosion-proof anticorrosive plug and sockets (coupler)

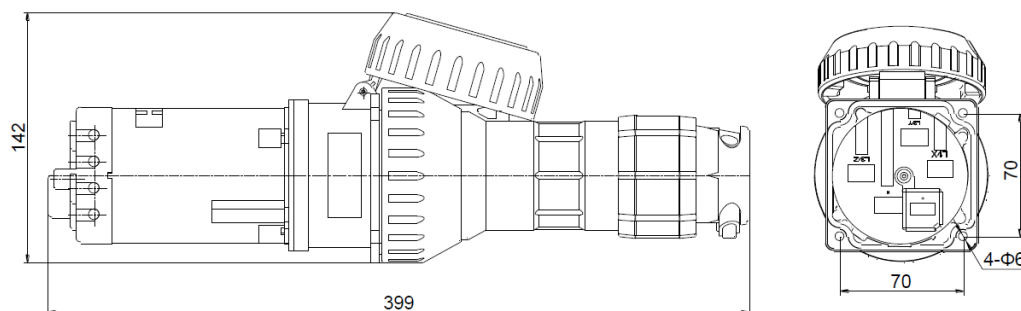


Figure 18. (Size 3) HSP1P 20 ** P-SET, HSP1P 25 ** P-SET, HSP1P 30 ** P-SET, HSP1P 32 ** P-SET Explosion-proof anticorrosive plug and sockets (socket without enclosure)

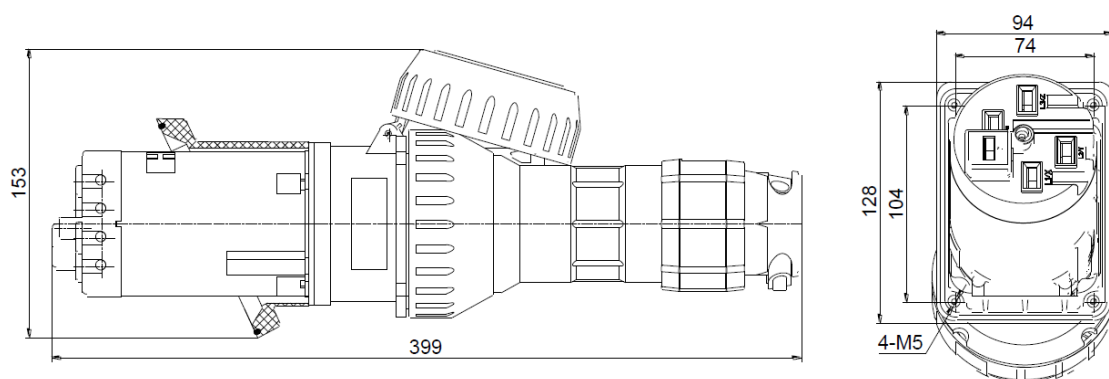


Figure 19. (Size 3) HSP1P 20 ** X-SET, HSP1P 25 ** X-SET, HSP1P 30 ** X-SET, HSP1P 32 ** X-SET Explosion-proof anticorrosive plug and sockets (25° socket without enclosure)

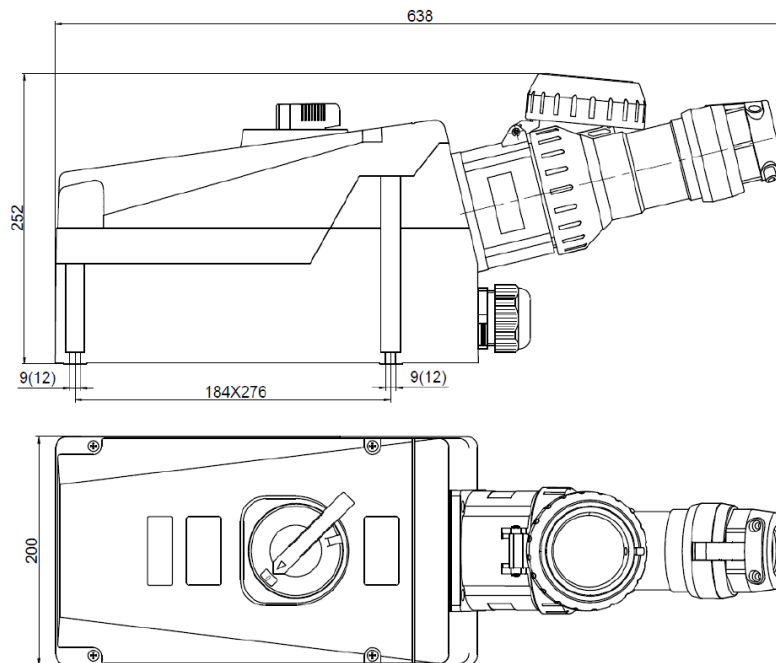


Figure 20. (Size 4) HSP1P 50 ** W-SET, HSP1P 60 ** W-SET, HSP1P 63 ** W-SET, HSP1P 63 ** W-SET Explosion-proof anticorrosive plug and sockets

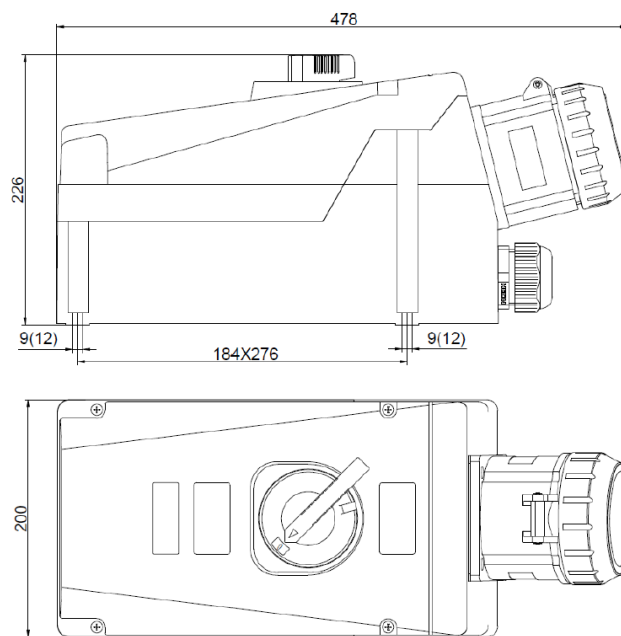


Figure 21. (Size 4) HSP1P 50 ** W-SCT, HSP1P 60 ** W-SCT, HSP1P 63 ** W-SCT, HSP1P 63 ** W-SCT Explosion-proof anticorrosive plug and sockets (socket)

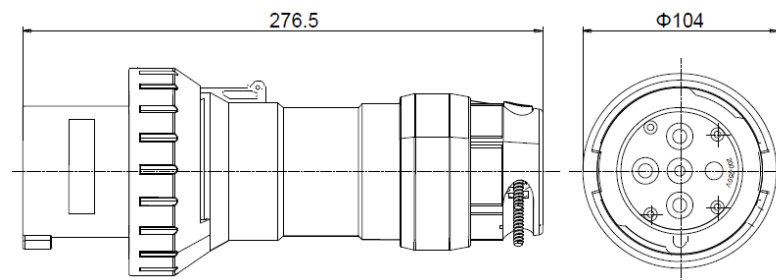


Figure 22. (Size 4) HSP1P 50 ** PLG, HSP1P 60 ** PLG, HSP1P 63 ** PLG, HSP1P 63 ** PLG Explosion-proof anticorrosive plug and sockets (plug)

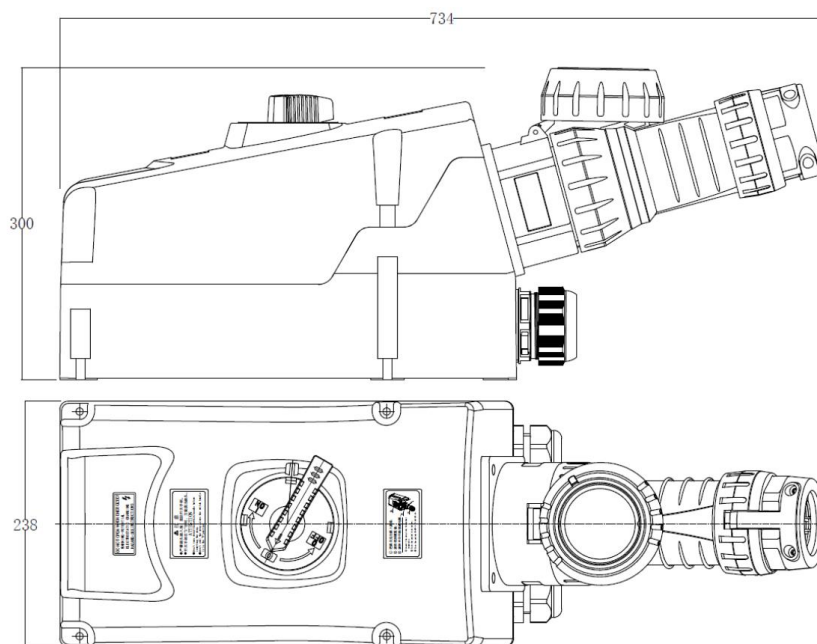


Figure 23. (Size 5) HSP1P 100 ** W-SET, HSP1P 125 ** W-SET Explosion-proof anticorrosive plug and sockets

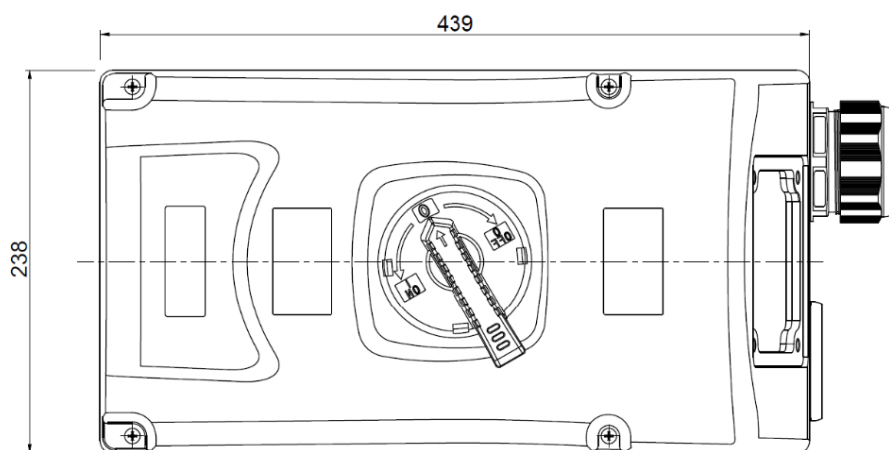


Figure 24. (Size 5) HSP1P 100 ** W-SCT, HSP1P 125 ** W-SCT Explosion-proof anticorrosive plug and sockets

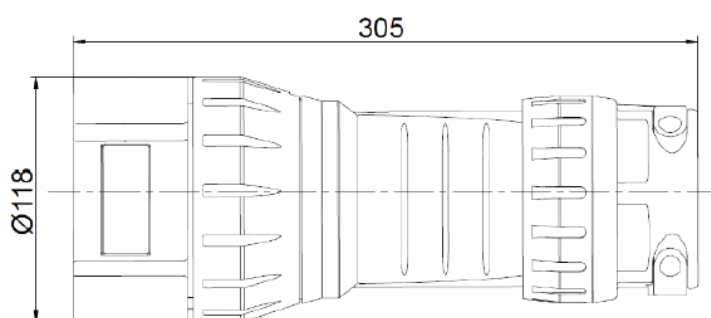


Figure 25. (Size 5) HSP1P 100 ** PLG, HSP1P 125 ** PLG Explosion-proof anticorrosive plug and sockets