RETTAR

3DPro2300 Radar Scanner

Empowering Digital Management of Industrial Production Processes

Content

Company Profile

RETTAR is a global leader in providing radar-based solutions for industrial applications. Headquartered in Beijing, our team consists of talented individuals from diverse backgrounds, bringing unique perspectives and expertise to our work.

At RETTAR, we enable informed decision-making through our innovative "Dr. Silo", which provides valuable data and visual support. By leveraging advanced technology and industrial measurement applications, we assist our customers in advancing their markets, reducing costs, and enhancing employee working conditions safety.

We are more than just a technology company. We are a passionate group of individuals committed to exceeding expectations and providing personalized attention to our valued customers. With our industrial geek spirit, we are always there, even in challenging conditions.

Qualifications

High and New Technology Enterprise

EU Trademark Certificate

Intellectual Property Pilot Demonstration Unit

Invention Patent

Software Copyright

Product Measurement Certificate

ISO Certificate

Product Explosion Proof Certificate

Product Measurement Report

CE Certificate

HART/FF Foundation Member

TÜV SIL Engineer Certificate

Measurement Principle

The 3DPRro2300 Radar Scanner is based on terahertz frequency-modulated continuous-wave (FMCW) ranging technology. It uses an internal horizontal rotation and tilt structure to rotate its radar sensor in multiple dimensions, allowing for high-resolution scanning of silos and material surfaces.

As the radar sensor moves to each predetermined angle, it emits microwave signals from its antenna. These signals reflect off the target materials and are received by the antenna. The radar then moves to the next angle, completing a full scanning cycle. During this process, it gathers material level measurements from various angles.

By combining the positional data of the radar, level measurements at each angle, and the installation position of the 3DPRro2300, advanced algorithms integrate image processing, big data analysis, AI, machine learning, and 3D point cloud conversion. This creates a 3D spatial coordinate system and generates a point cloud for a three-dimensional visual representation. Based on this data, the system calculates key parameters such as volume, mass, and material levels.

Product Advantages

360° Imaging, 16,200 Scanning Points for High-Precision Measurement

The 3DPro2300 Radar Scanner features an internal 360° horizontal and ±90° tilt rotational structure, emitting 16,200 measurement signals for precise scanning. It creates an accurate 3D representation of material surfaces inside the silo, calculating the lowest, highest, and average levels, as well as mass and volume. This data is compiled into real-time reports. Compared to traditional 3D radar systems that use only a few fixed angles, the 3DPro2300 significantly enhances resolution and measurement accuracy, providing more precise data.

Full Coverage, No Blind Spots at Any Level

For 3D radar scanners that emit measurement signals from only a few or several dozen fixed angles, challenges arise when material levels are low, as some signals may reach the silo walls, reducing the effective measurement points on the material surface. Similarly, when material levels are high, the measurement signals tend to cluster in certain areas, leaving other regions without signals, which can distort the 3D shape. In contrast, the 3D radar scanner emits signals from thousands of angles, ensuring full surface coverage regardless of high or low material levels, eliminating blind spots and ensuring accurate 3D representation.

Easy installation, low maintenance

The installation opening for the 3D radar scanner can be as small as 190mm, minimizing the impact on the silo's structural integrity. The device also features a built-in status indicator light and temperature sensor. The status light rotates with the scanner and changes color based on the operating status, allowing workers to quickly assess the system at a glance. If the temperature sensor detects excessive heat, the device automatically shuts down to prevent irreversible damage, reducing repair costs. Additionally, the upper control system alerts staff of high-temperature shutdowns, prompting timely intervention or site inspection.

Reliable, compatible, with self-correcting installation

The 3D radar scanner features dual power supply and dual network communication, providing redundancy that enhances reliability by ensuring functionality even if one system fails. If there's an assembly angle deviation or tilting after installation, the built-in inclinometer detects the angle discrepancy and automatically corrects it through software algorithms. The scanner's software is compatible with both Linux and Windows systems, offering customers the benefits of a free, open-source, secure, stable, and multi-platform Linux environment.

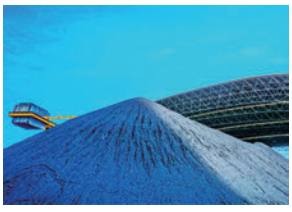
Patented technologies, multiple awards

The 3DPro2300 Radar Scanner holds a design patent, multiple utility model patents, and invention patents, ensuring clear patent rights and no infringement risks for customers. Additionally, it has received several prestigious awards, including third place in the 6th China (International) Sensor Innovation and Entrepreneurship Competition, the France FDA Design Award, and the American MUSE Award.

◆ Material Tank ◆

◆ Tank Area ◆

◆ Silo ◆



◆ Material Yard ◆

Instrument Overview

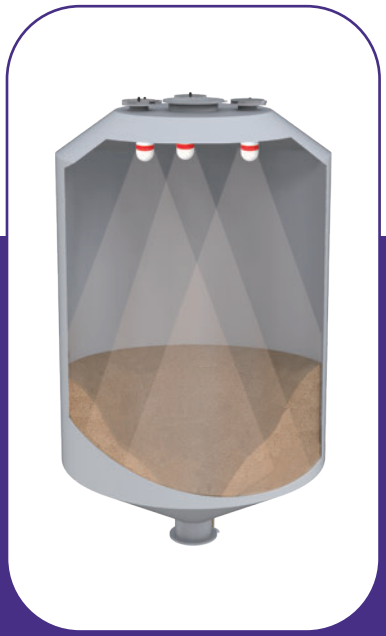
Model	3DPro2300 Radar Scanner
Frequency	120GHz~140GHz
Material Type	Granules, powders, and other bulk solids
Measuring Range	20m, 40m, 80m, 120m
Beam Angle	1.5°
Horizontal Rotation Angle Range	0…360° (configurable)
Pitch Measurement Angle	-90°…90° (configurable)
Power Supply	24 VDC
Power	8 W
Device Weight	5 kg
Communication Method	Fiber optic, 4G/5G, Ethernet
Signal Output	4…20mA, RS485, MODBUS TCP, OPC (custom), WebAPI
Operating Temperature	-40 C ~ 75 C , higher options available with cooling accessories
Environmental Temperature	-40℃~75℃ (up to 1200℃ with adapter, non-explosive conditions)
Operating Pressure	0…1bar, higher customization available
Protection Rating	IP67
Accuracy	Level measurement accuracy: ±2mm; 3D volume modeling accuracy: ±0.5% FS...±2% FS
Installation Method	≥DN200 flange
Certificates	Dust explosion-proof

Note: When the installation position and quantity are appropriate, the 3D volume modeling accuracy is based on the full silo capacity. The accuracy is defined as the absolute value of the difference between the actual inflow/outflow volume and the measured inflow/outflow volume, divided by the maximum capacity of the silo (full capacity). To achieve the specified accuracy, customers with specific volume measurement requirements are advised to strictly follow the manufacturer's recommended installation positions and quantities for installation and testing.

Installation Diagram

Material Inflow Monitoring (Single Unit)

Material Inflow Monitoring (Three Units)



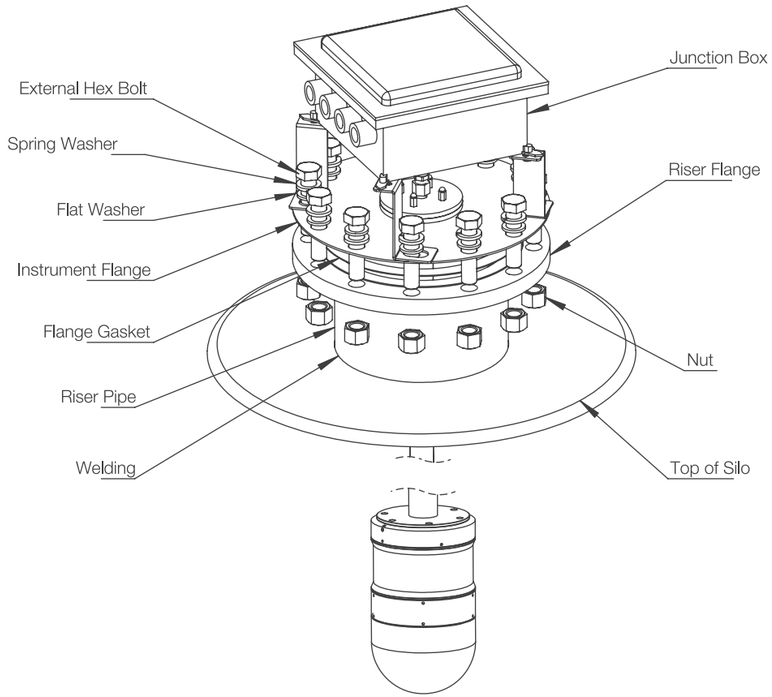
Material Inflow Monitoring (Three Units)

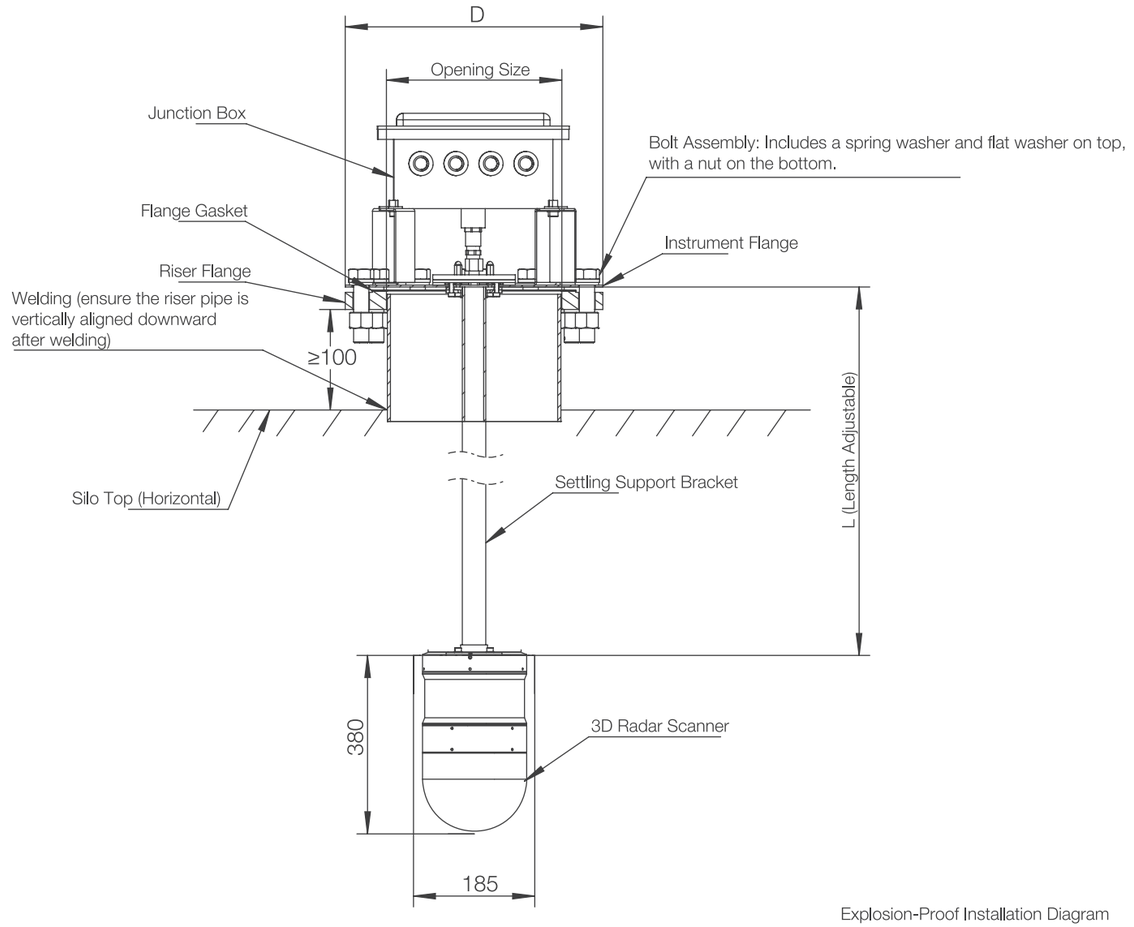
For small silos, one 3D radar scanner can be installed per silo. For large silos, multiple 3D radar scanners can be installed on a single silo, with each scanner responsible for scanning a designated area. The 3D radar visualization software features stitching and registration algorithms to combine the scanning results from each radar scanner within their detection zones, creating a comprehensive view of the entire area, ultimately presented in a single 3D visualization.

Installation Example

For a flat silo top:

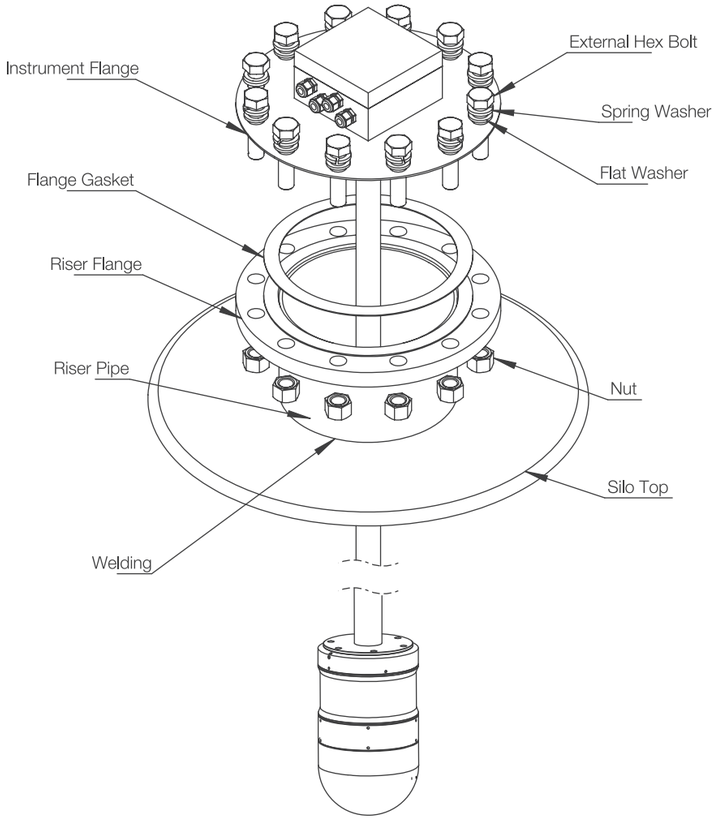
(1) For flat silo tops made of steel plates, after cutting the opening in the top of the silo, weld the riser pipe directly to the opening for a secure installation.

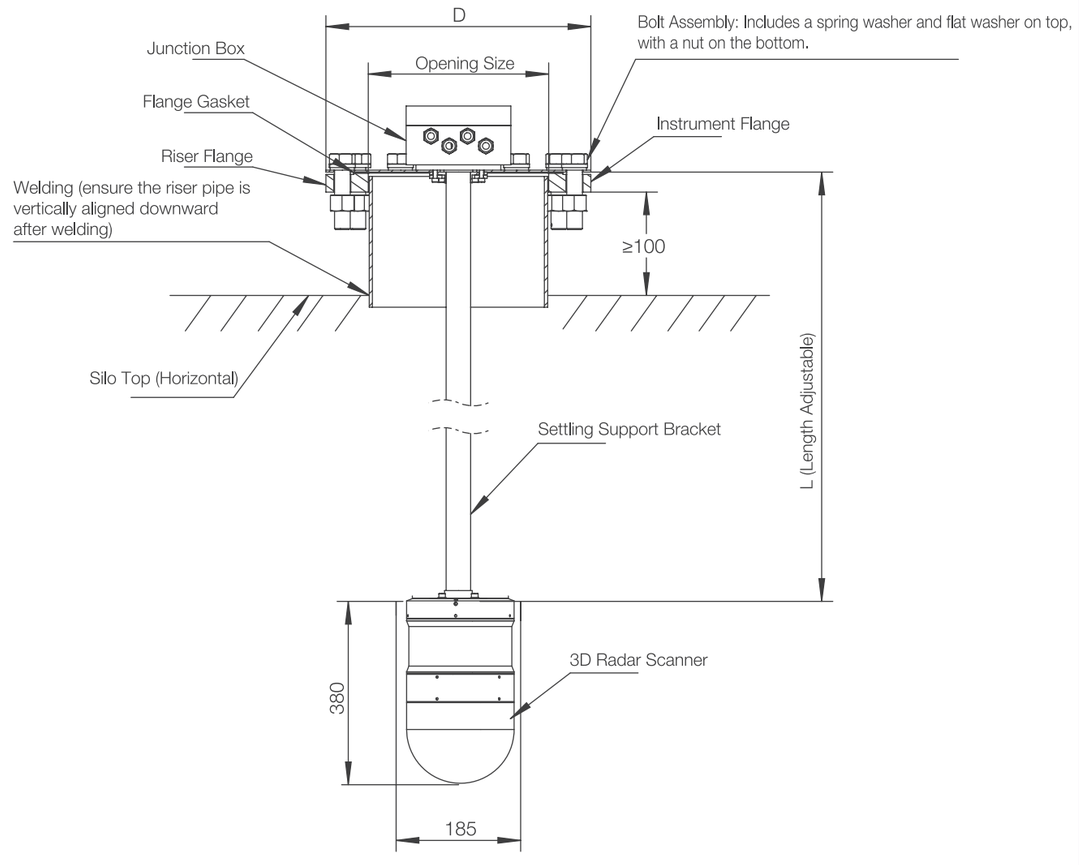




Explosion-Proof Installation Diagram

Instrument Flange Types	Flange Outer Diameter D	Exposed Riser Height	Silo Top Opening Size	Matching Bolts		Installation Steps
DN200	340mm	⩾100mm	222mm	Galvanized External Hex Bolt M20X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 12 Sets	1. Weld the flanged riser pipe to the silo top opening, ensuring the riser pipe is vertical after welding. 2. Securely fasten the riser flange, flange gasket, and instrument flange together using the bolts.
DN250	405mm	⩾100mm	276mm	Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 12 Sets	
DN300	460mm	⩾100mm	328mm	Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 12 Sets	
DN350	520mm	⩾100mm	381mm	Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 16 Sets	



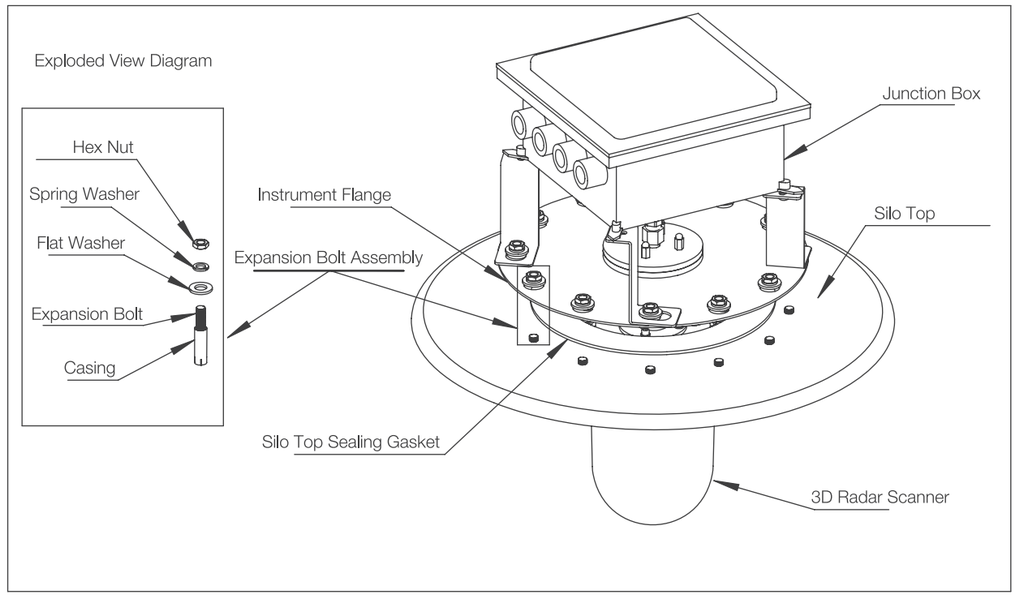


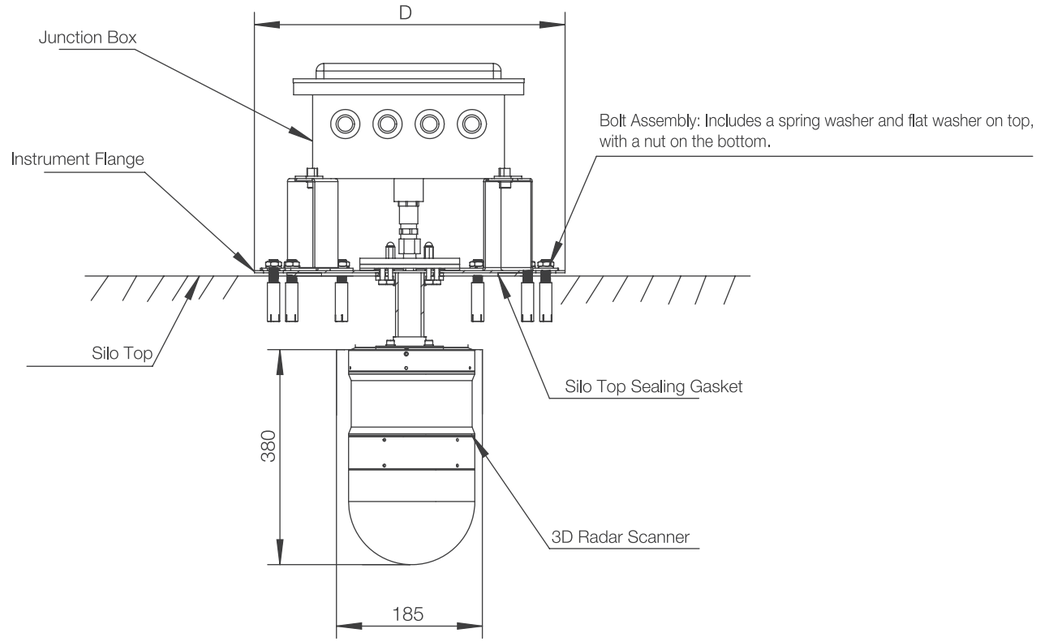
Explosion-Proof Installation Diagram for Dust

Instrument Flange Types	Flange Outer Diameter D	Exposed Riser Height	Silo Top Opening Size	Matching Bolts		Installation Steps
DN200	340mm	⩾100mm	222mm	Galvanized External Hex Bolt M20X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 12 Sets	1. Weld the flanged riser pipe to the silo top opening, ensuring the riser pipe is vertically aligned after welding. 2. Fasten the riser flange, flange gasket, and instrument flange together using the bolt assembly.
DN250	405mm	⩾100mm	276mm	Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 12 Sets	
DN300	460mm	⩾100mm	328mm	Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 12 Sets	
DN350	520mm	⩾100mm	381mm	Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 16 Sets	

(2) For flat silo tops made of steel plate or concrete structure, after cutting the opening at the top of the silo, it can be directly installed and secured to the instrument flange using bolts.

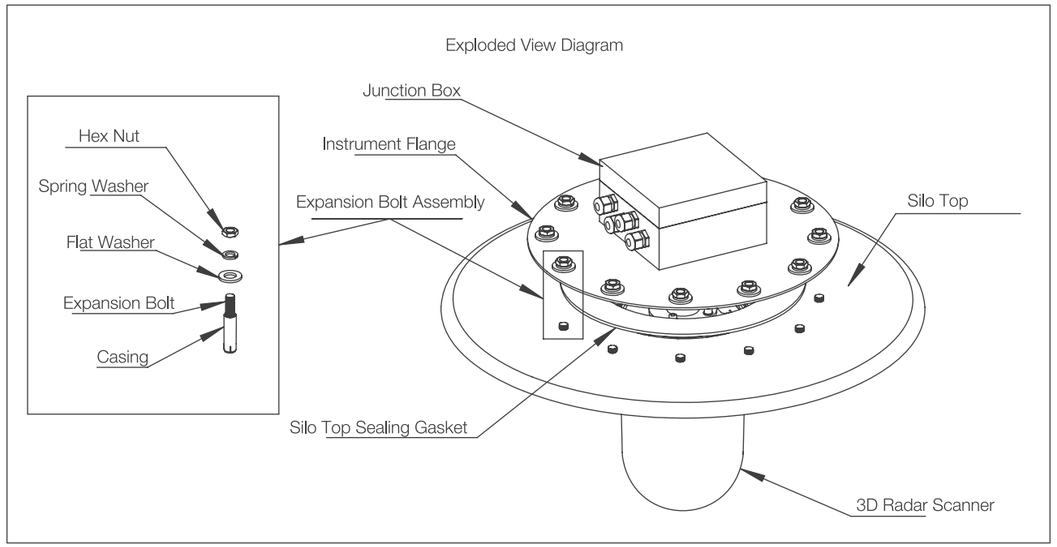
Note: This installation method requires consideration of the sealing issue between the instrument flange and the silo top.

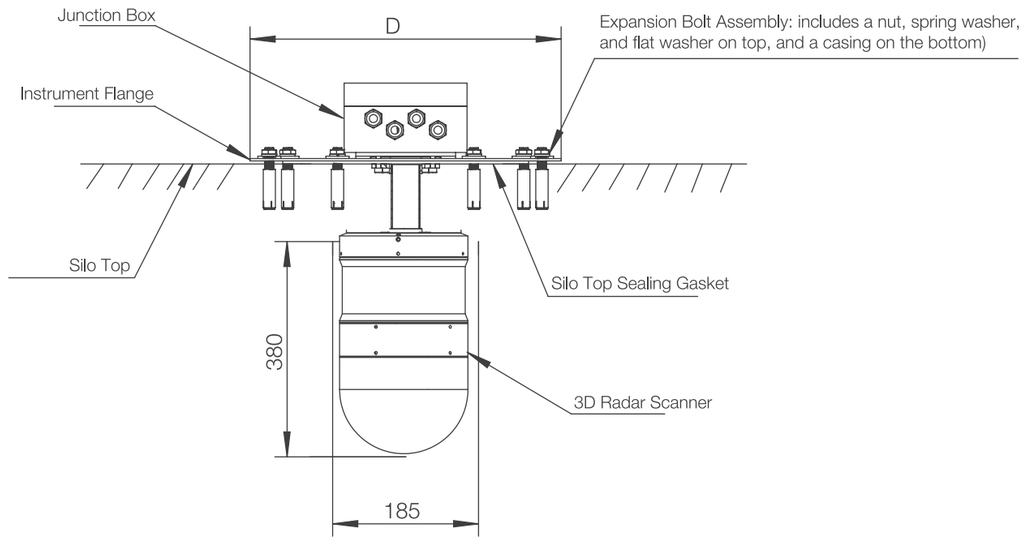




Explosion-Proof Installation Diagram

Instrument Flange Types	Flange Outer Diameter D	Silo Top Opening Size	Matching Expansion Bolts		Installation Steps
DN200	340mm	222mm	Expansion Bolt M12X80, with a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom.	Quantity: 12 Sets	1. Drilling: Use a drill bit that matches the diameter of the expansion bolt casing to create the hole. 2. Install the Expansion Bolt: Gently tap the expansion bolt assembly into the drilled hole using a small hammer. 3. Secure the Instrument Flange: Tighten the instrument flange to the silo top using the expansion bolts.
DN250	405mm	276mm	Expansion Bolt M12X80, with a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom.	Quantity: 12 Sets	
DN300	460mm	328mm	Expansion Bolt M12X80, with a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom.	Quantity: 12 Sets	
DN350	520mm	381mm	Expansion Bolt M12X80, with a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom.	Quantity: 16 Sets	



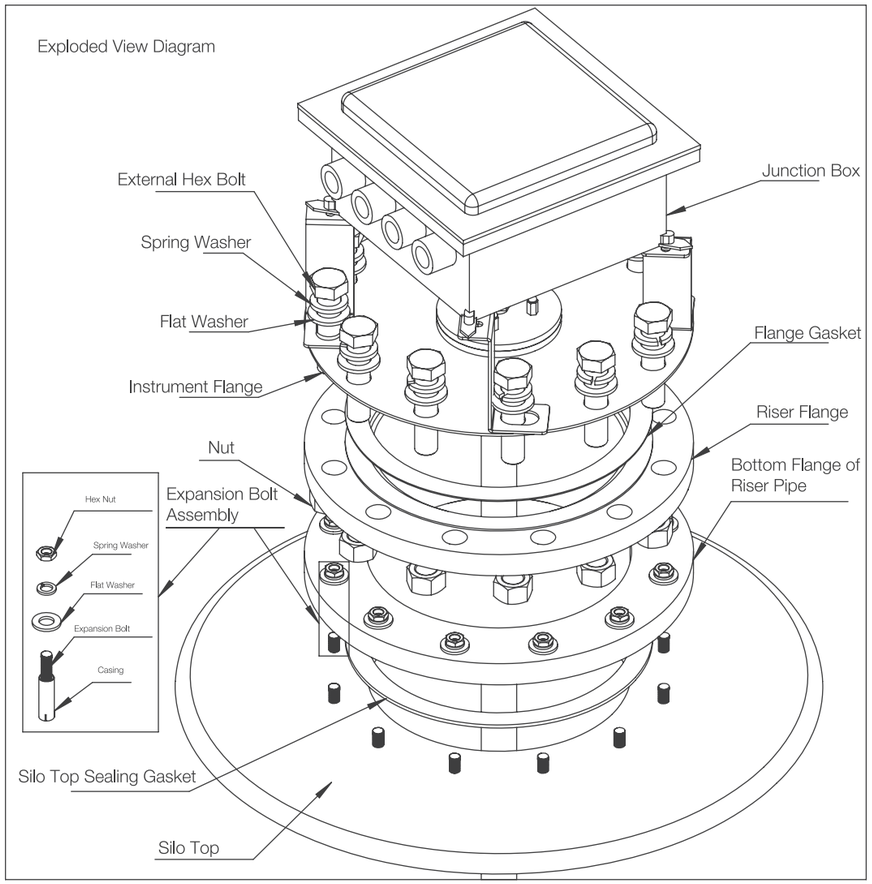


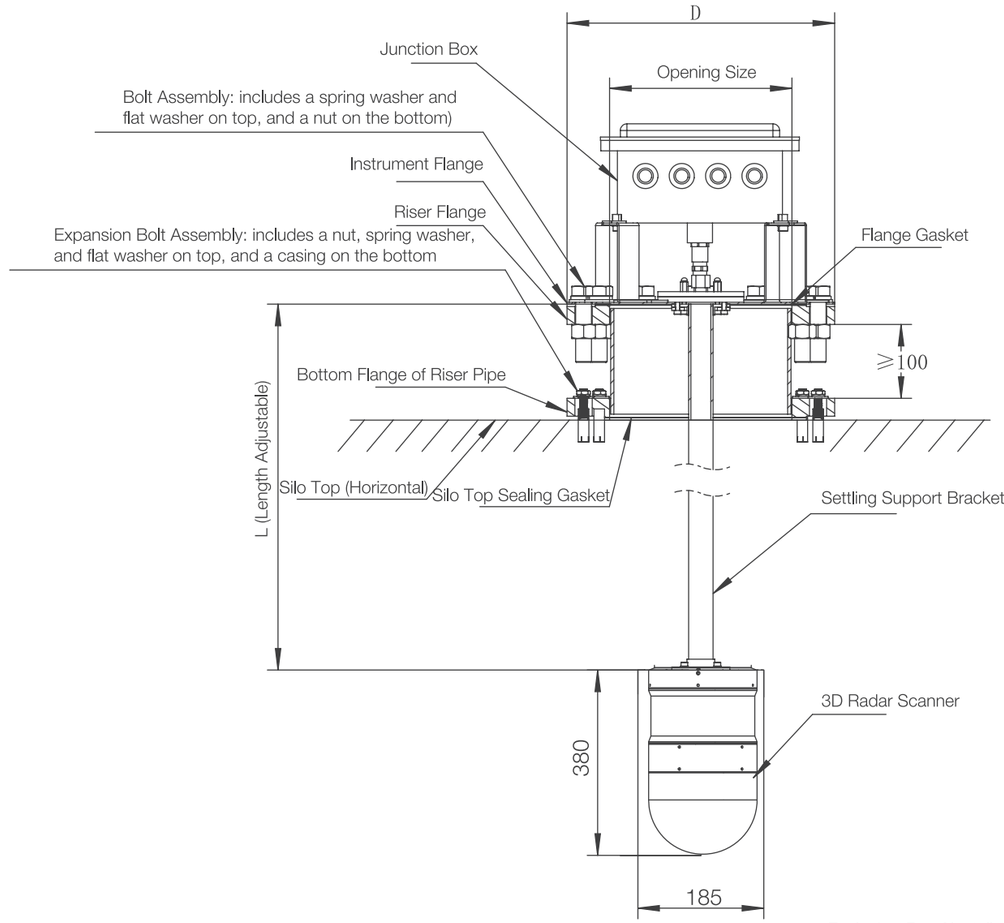
Installation Diagram for Dust Explosion Protection

Instrument Flange Types	Flange Outer Diameter D	Silo Top Opening Size	Matching Expansion Bolt		Installation Steps
DN200	340mm	222mm	Expansion Bolt M12X80, includes a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom.	Quantity: 12 Sets	1. Drilling: Use a drill bit that matches the diameter of the expansion bolt casing to create the hole. 2. Install the Expansion Bolt: Gently tap the expansion bolt assembly into the drilled hole using a small hammer. 3. Secure the Instrument Flange: Tighten the instrument flange to the silo top using the expansion bolt.
DN250	405mm	276mm	Expansion Bolt M12X80, includes a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom.	Quantity: 12 Sets	
DN300	460mm	328mm	Expansion Bolt M12X80, includes a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom.	Quantity: 12 Sets	
DN350	520mm	381mm	Expansion Bolt M12X80, includes a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom.	Quantity: 16 Sets	

(3) For flat silo tops made of steel plate or concrete, after cutting the opening in the silo top, it can be directly installed and secured to the bottom flange of the riser pipe using bolts.

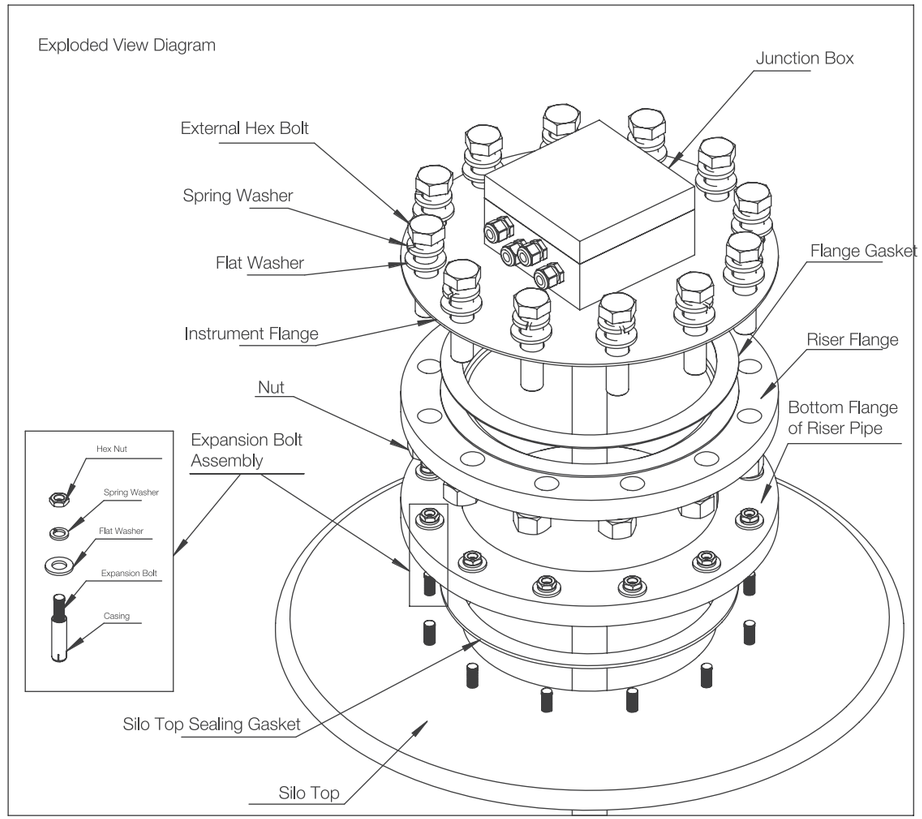
Note: This installation method requires consideration of the sealing issue between the bottom flange of the riser pipe and the silo top.

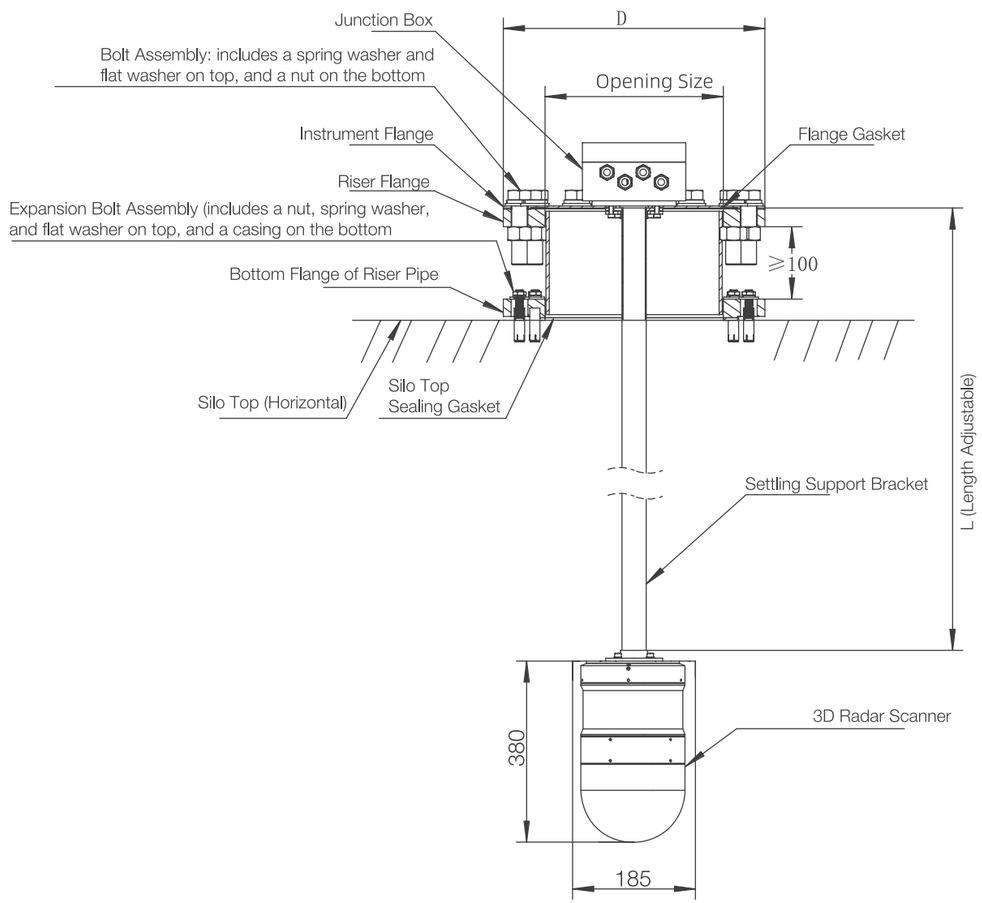




Explosion-Proof Installation Diagram

Instrument Flange Types	Flange Outer Diameter D	Exposed Riser Height	Silo Top Opening Size	Matching Bolts	Matching Expansion Bolt	Installation Steps
DN200	340mm	⩾100mm	222mm	Galvanized External Hex Bolt M20X100, with a spring washer and flat washer on top, and a nut on the bottom. Quantity: 12 sets.	Expansion Bolt M12X80, with a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom. Quantity: 12 sets.	1. Drilling: Use a drill bit that matches the diameter of the expansion bolt casing to create the hole. 2. Install the Expansion Bolt: Gently tap the expansion bolt assembly into the drilled hole using a small hammer. 3. Secure the Instrument Flange: Tighten the instrument flange to the silo top using the expansion bolt.
DN250	405mm	⩾100mm	276mm	Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom. Quantity: 12 sets.	Expansion Bolt M12X80, with a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom. Quantity: 12 sets.	
DN300	460mm	⩾100mm	328mm	Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom. Quantity: 16 sets.	Expansion Bolt M12X80, with a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom. Quantity: 16 sets.	



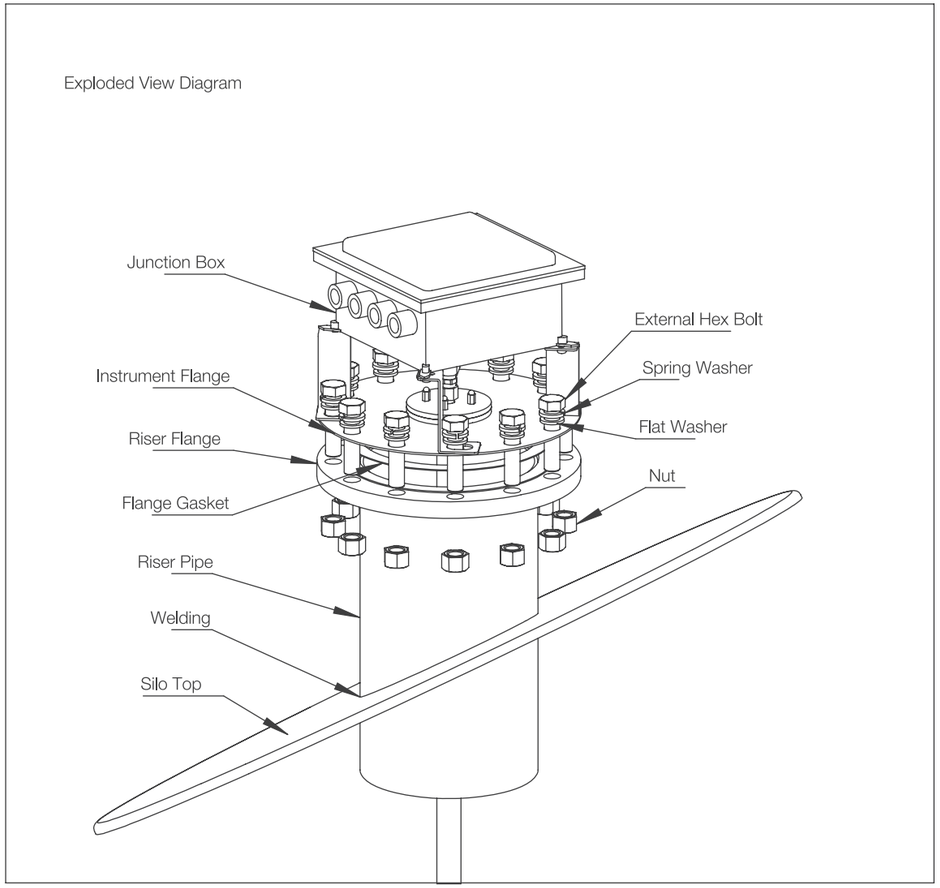


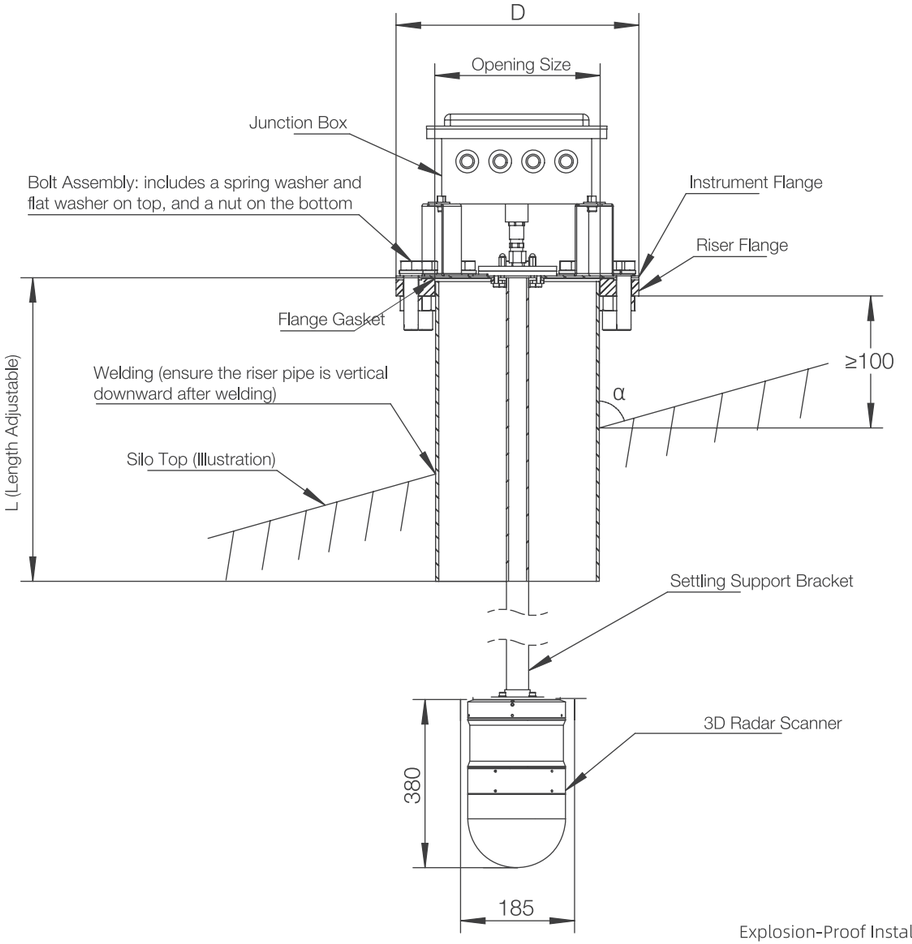
Installation Diagram for Dust Explosion Protection

Instrument Flange Types	Flange Outer Diameter D	Exposed Riser Height	Silo Top Opening Size	Matching Bolts	Matching Expansion Bolt	Installation Steps
DN200	340mm	⩾100mm	222mm	Galvanized External Hex Bolt M20X100, with a spring washer and flat washer on top, and a nut on the bottom. Quantity: 12 sets.	Expansion Bolt M12X80, with a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom. Quantity: 12 sets.	1. Drilling: Use a drill bit that matches the diameter of the expansion bolt casing to create the hole. 2. Install the Expansion Bolt: Gently tap the expansion bolt assembly into the drilled hole using a small hammer. 3. Secure the Instrument Flange: Tighten the instrument flange to the silo top using the expansion bolt.
DN250	405mm	⩾100mm	276mm	Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom. Quantity: 12 sets.	Expansion Bolt M12X80, with a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom. Quantity: 12 sets.	
DN300	460mm	⩾100mm	328mm	Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom. Quantity: 12 sets.	Expansion Bolt M12X80, with a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom. Quantity: 12 sets.	
DN350	520mm	⩾100mm	381mm	Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom. Quantity: 16 sets.	Expansion Bolt M12X80, with a hex nut, spring washer, and flat washer (M16X30X3) on top, and a casing on the bottom. Quantity: 16 sets.	

Condition of Silo Top with Sloped Surface

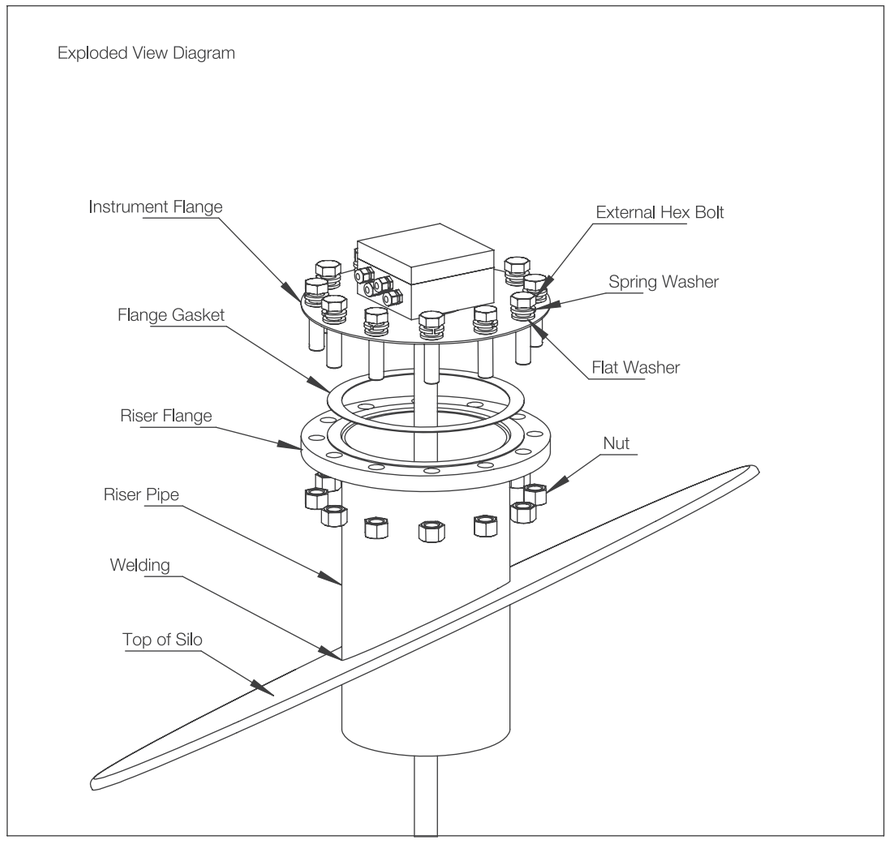
(1) The sloped Silo Top is made of steel plate. After creating an opening in the Silo Top, it is directly welded to the riser pipe for installation and fixation.

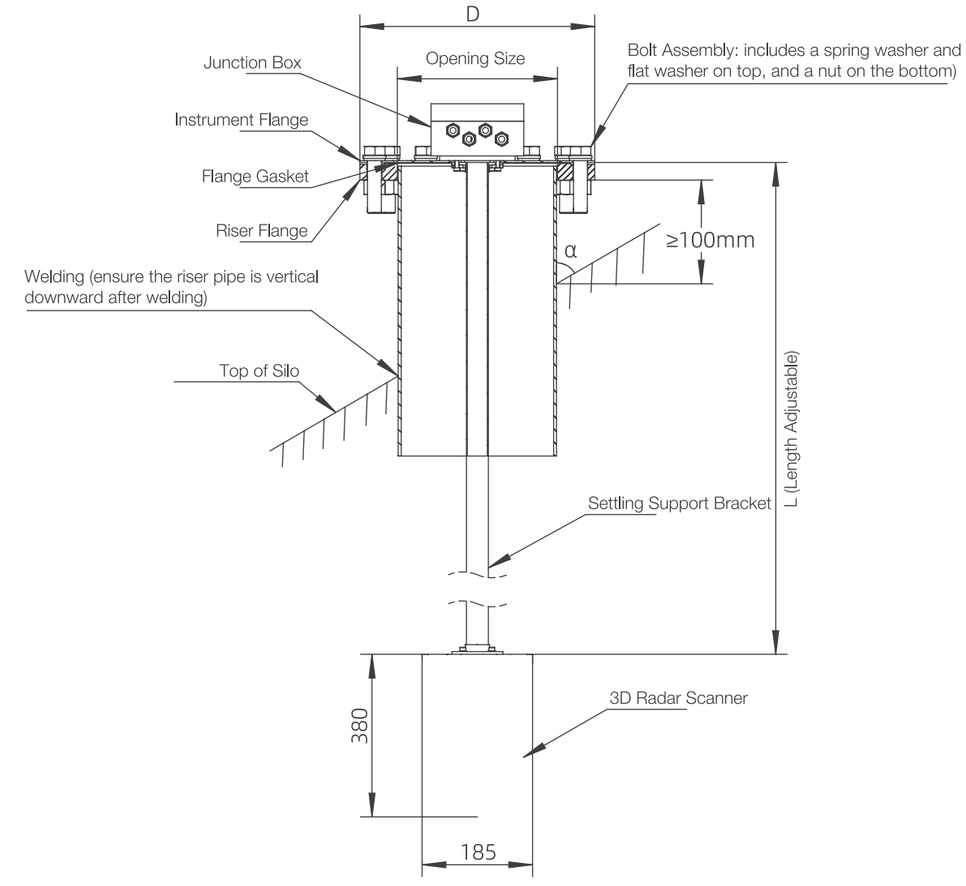




Explosion-Proof Installation Diagram

Instrument Flange Types	Flange Outer Diameter D	Exposed Riser Height	Silo Top Opening Size	α	Matching Bolts		Installation Steps
DN200	340mm	⩾100mm	222mm	Angle between Silo Top (Sloped) and Vertical Direction	Galvanized External Hex Bolt M20X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 12 Sets	1. Weld the riser pipe with flange to the opening of the Silo Top, ensuring that the riser pipe is directed vertically downward after welding. 2. Secure the riser flange, flange gasket, and instrument flange together using the bolt assembly.
DN250	405mm	⩾100mm	276mm		Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 12 Sets	
DN300	460mm	⩾100mm	328mm		Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 12 Sets	
DN350	520mm	⩾100mm	381mm		Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 16 Sets	



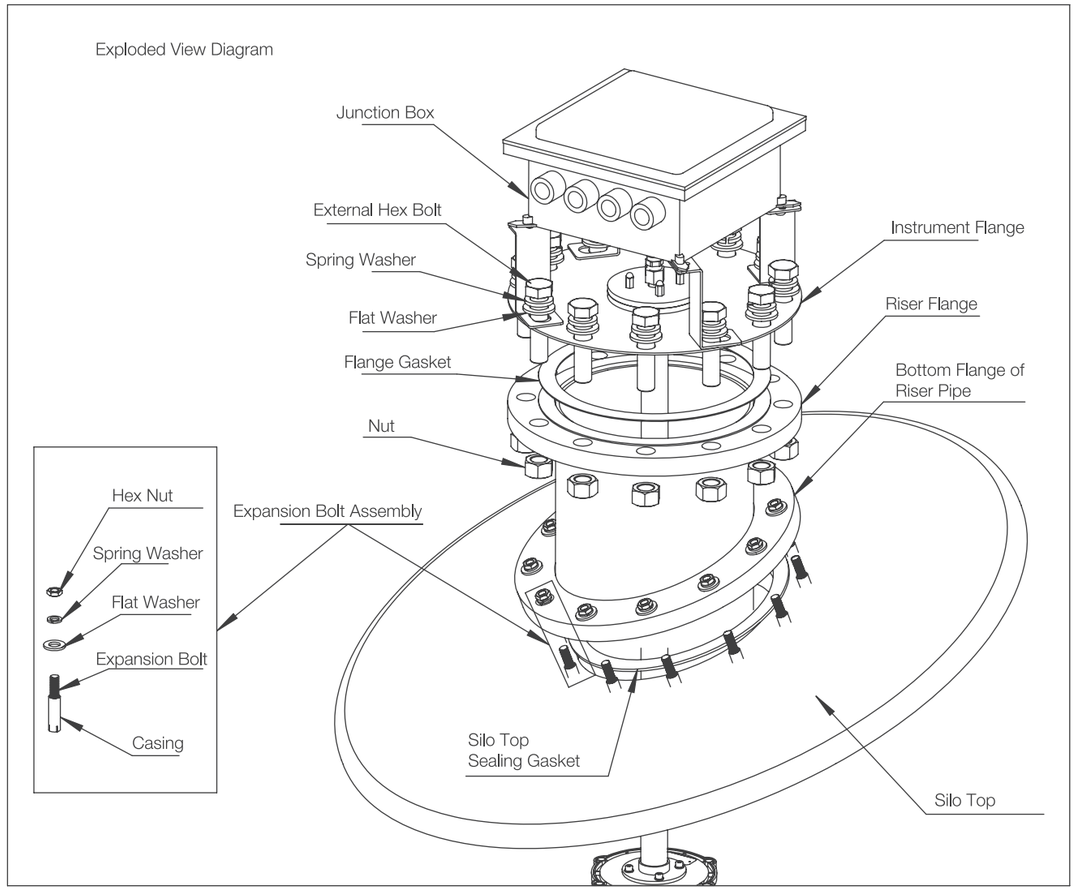


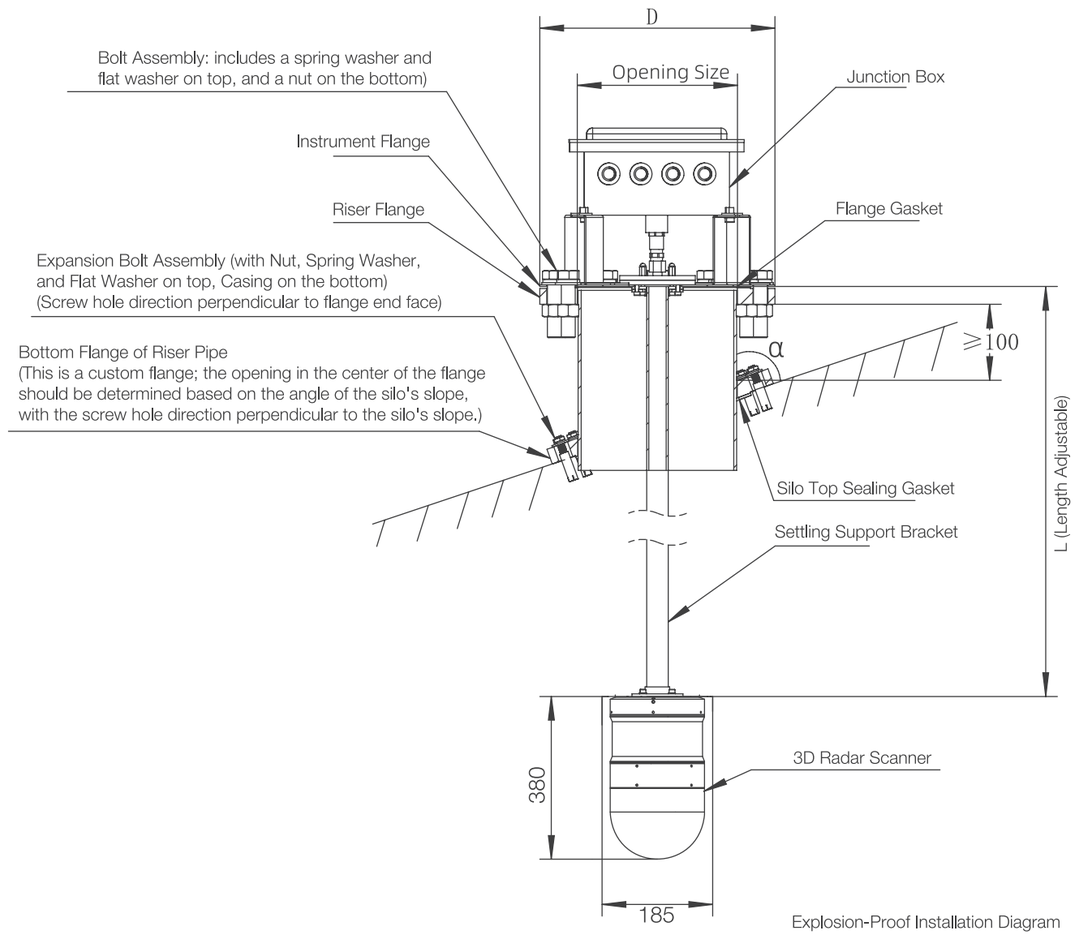
Installation Diagram for Dust Explosion Protection

Instrument Flange Types	Flange Outer Diameter D	Exposed Riser Height	Silo Top Opening Size	α	Matching Bolts		Installation Steps
DN200	340mm	⩾100mm	222mm	Angle between Sloped Silo Top and Vertical Direction	Galvanized External Hex Bolt M20X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 12 Sets	1. Weld the flanged riser pipe to the opening of the Silo Top, ensuring the riser is oriented vertically downward after welding. 2. Secure the Riser Flange, Flange Gasket, and Instrument Flange together using the Bolt Assembly.
DN250	405mm	⩾100mm	276mm		Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 12 Sets	
DN300	460mm	⩾100mm	328mm		Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 12 Sets	
DN350	520mm	⩾100mm	381mm		Galvanized External Hex Bolt M24X100, with a spring washer and flat washer on top, and a nut on the bottom.	Quantity: 16 Sets	

(2) The sloped Silo Top is made of steel plate or concrete. After creating an opening in the Silo Top, it is directly fixed to the Bottom Flange of the Riser Pipe using bolts.

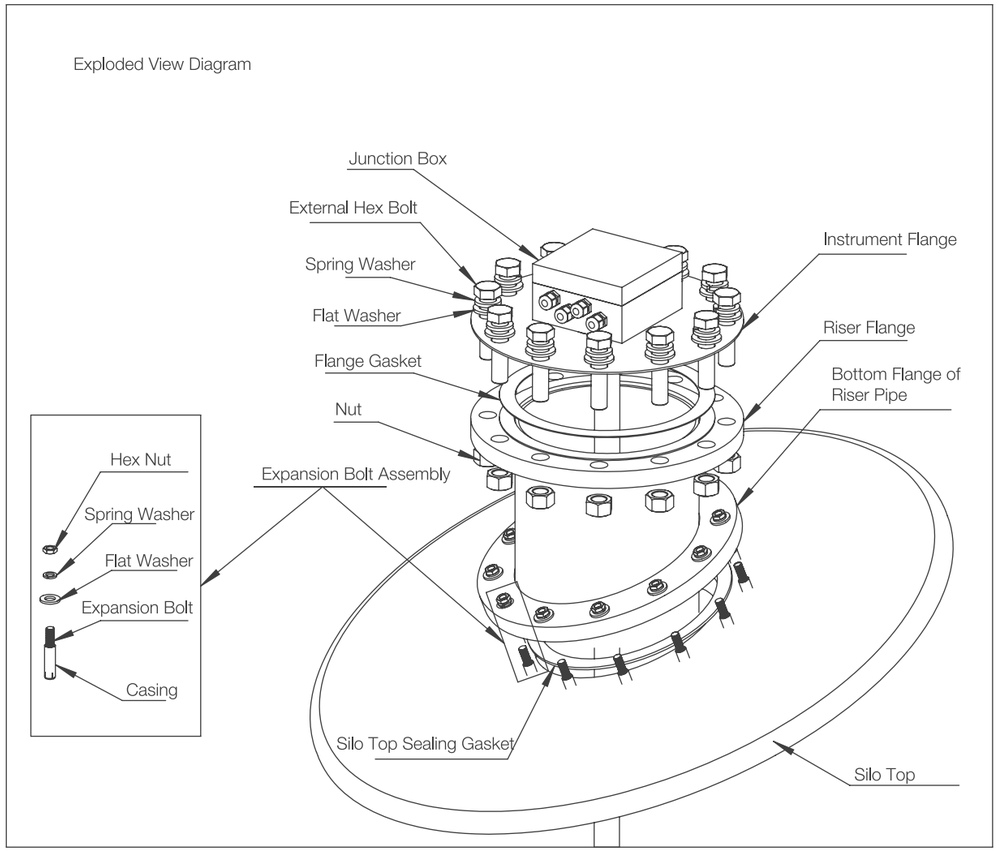
Note: This installation method requires consideration of the sealing between the Bottom Flange of the Riser Pipe and the Silo Top.

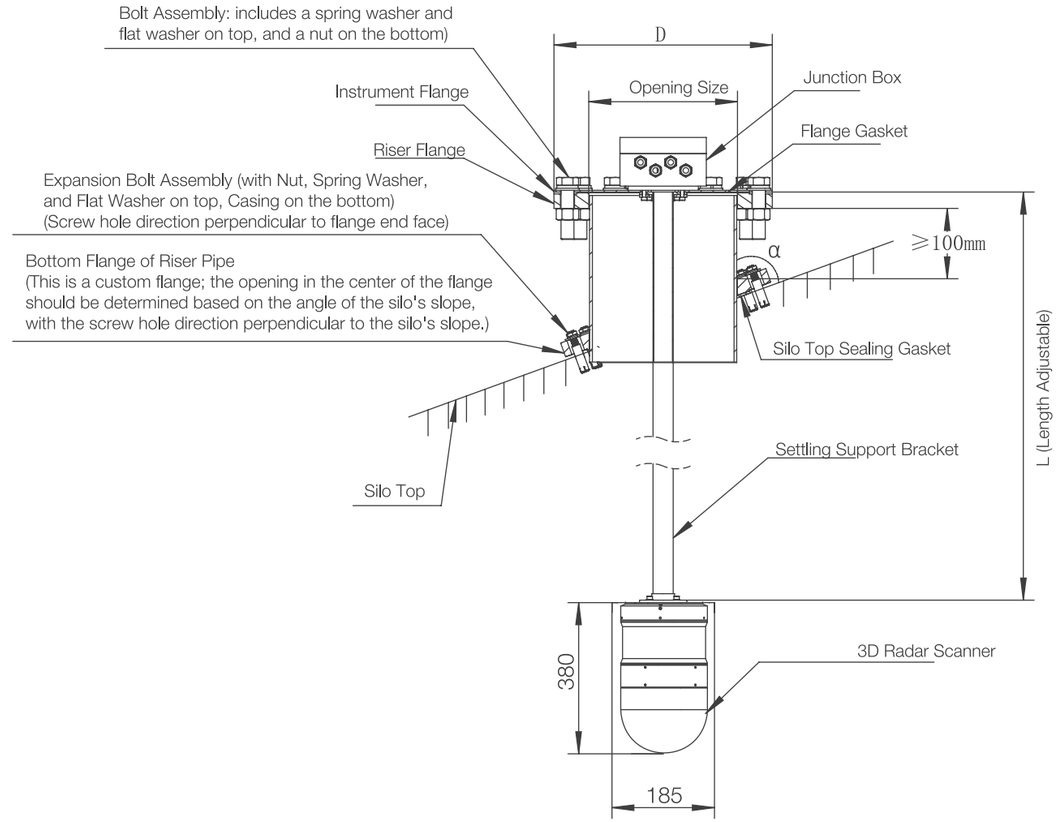




Explosion-Proof Installation Diagram

Instrument Flange Types	Flange Outer Diameter D	Exposed Riser Height	Silo Top Opening Size	α	Matching Bolts	Matching Expansion Bolt	Installation Steps
DN200	340mm	⩾100mm	222mm	Silo Top (sloped) angle relative to the vertical direction.	Galvanized External Hex Bolt M20X100, with Spring Washer, Flat Washer, and Nut, quantity: 12 sets.	Expansion Bolt M12X80, with Hex Nut, Spring Washer, Flat Washer (M16X30X3), and Casing, quantity: 12 sets.	1. Drilling: Use a drill bit that matches the diameter of the Expansion Bolt Casing to create the hole. 2. Install Expansion Bolt: Gently tap the Expansion Bolt Assembly into the drilled hole with a small hammer. 3. Secure Instrument Flange: Tighten the Instrument Flange to the Silo Top using the Expansion Bolt.
DN250	405mm	⩾100mm	276mm		Galvanized External Hex Bolt M24X100, with Spring Washer, Flat Washer, and Nut, quantity: 12 sets.	Expansion Bolt M12X80, with Hex Nut, Spring Washer, Flat Washer (M16X30X3), and Casing, quantity: 12 sets.	
DN300	460mm	⩾100mm	328mm		Galvanized External Hex Bolt M24X100, with Spring Washer, Flat Washer, and Nut, quantity: 12 sets.	Expansion Bolt M12X80, with Hex Nut, Spring Washer, Flat Washer (M16X30X3), and Casing, quantity: 12 sets.	
DN350	520mm	⩾100mm	381mm		Galvanized External Hex Bolt M24X100, with Spring Washer, Flat Washer, and Nut, quantity: 16 sets.	Expansion Bolt M12X80, with Hex Nut, Spring Washer, Flat Washer (M16X30X3), and Casing, quantity: 16 sets.	





Installation Diagram for Dust Explosion Protection

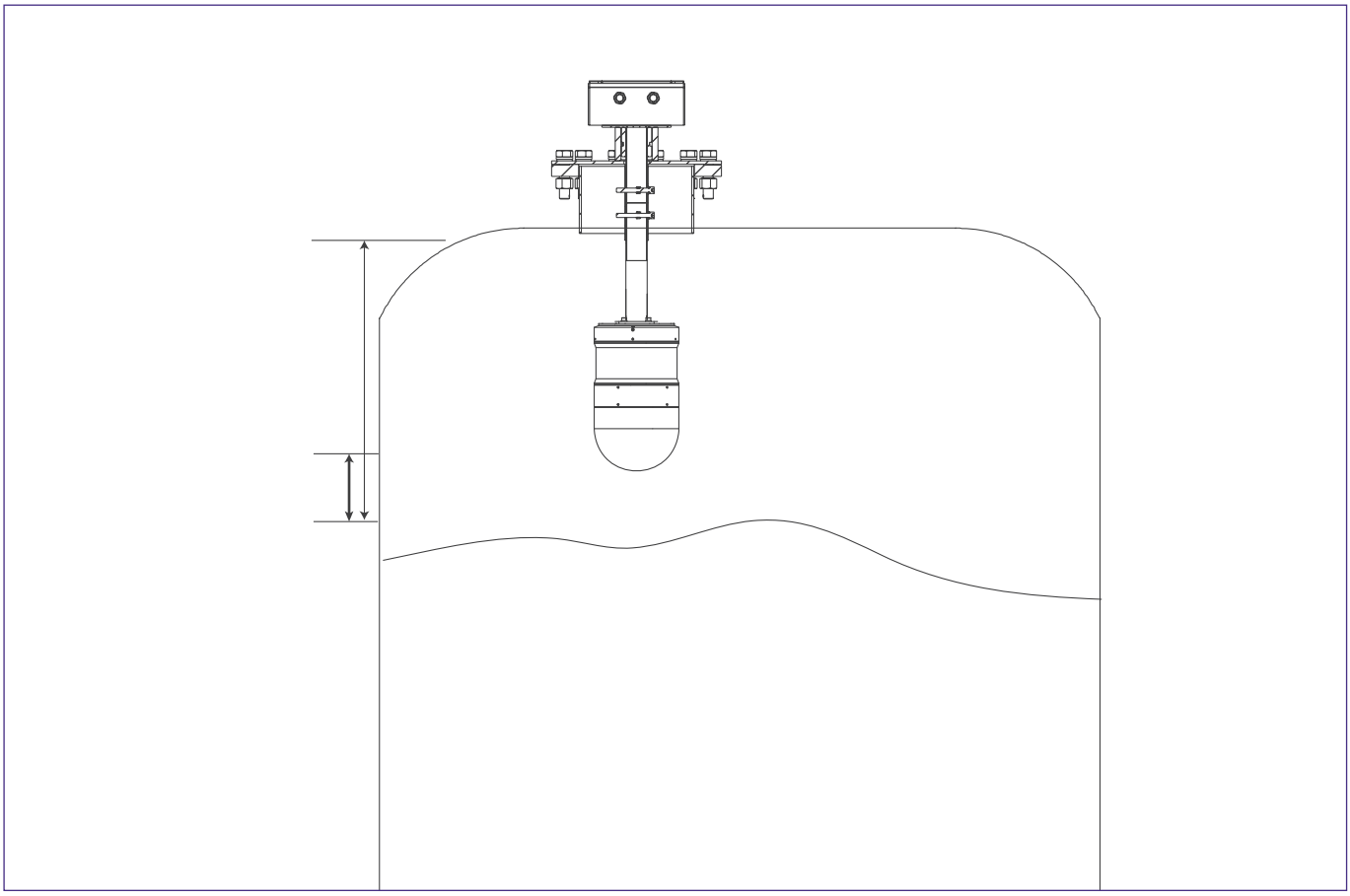
Instrument Flange Types	Flange Outer Diameter D	Exposed Riser Height	Silo Top Opening Size	α	Matching Bolts	Matching Expansion Bolt	Installation Steps
DN200	340mm	⩾100mm	222mm	Silo Top (sloped) angle relative to the vertical direction.	Galvanized External Hex Bolt M20X100, with Spring Washer and Flat Washer on top, and Nut on the bottom, quantity: 12 sets.	Expansion Bolt M12X80, with Hex Nut, Spring Washer, and Flat Washer (M16X30X3) on top, and Casing on the bottom, quantity: 12 sets.	1. Drilling: Use a drill bit that matches the diameter of the Expansion Bolt Casing to make a hole. 2. Installing Expansion Bolt: Gently tap the Expansion Bolt Assembly into the prepared hole using a small hammer. 3. Securing the Instrument Flange: Tighten the Instrument Flange to the Silo Top using the Expansion Bolt.
DN250	405mm	⩾100mm	276mm		Galvanized External Hex Bolt M24X100, with Spring Washer and Flat Washer on top, and Nut on the bottom, quantity: 12 sets.	Expansion Bolt M12X80, with Hex Nut, Spring Washer, and Flat Washer (M16X30X3) on top, and Casing on the bottom, quantity: 12 sets.	
DN300	460mm	⩾100mm	328mm		Galvanized External Hex Bolt M24X100, with Spring Washer and Flat Washer on top, and Nut on the bottom, quantity: 12 sets.	Expansion Bolt M12X80, with Hex Nut, Spring Washer, and Flat Washer (M16X30X3) on top, and Casing on the bottom, quantity: 12 sets.	
DN350	520mm	⩾100mm	381mm		Galvanized External Hex Bolt M24X100, with Spring Washer and Flat Washer on top, and Nut on the bottom, quantity: 16 sets.	Expansion Bolt M12X80, with Hex Nut, Spring Washer, and Flat Washer (M16X30X3) on top, and Casing on the bottom, quantity: 16 sets.	

Installation Instructions

- The section "Installation Diagram" lists standard sizes and installation methods. If these methods and dimensions are not suitable for the site, customers should communicate with the manufacturer's technical personnel to obtain a confirmed installation plan.

  Whether to use the Settling Support Bracket and the length of the bracket depend on the structure of the silo and the installation position.
- If there are obstructions such as beams within the silo, the 3D Radar Scanner should be lowered into the silo to avoid interference with the measurement signal, enhancing the reliability and accuracy of detection. Conversely, if there are no obstructions and the bottom end of the 3D Radar Scanner can be positioned at least 20 cm above the silo bottom, the Settling Support Bracket may not be necessary.

  The 3D Radar Scanner has a measurement blind zone where materials cannot be detected. In severe cases, materials may submerge the scanning radar, potentially causing spillage. Therefore, after installation, the highest material level during the feeding process (usually directly
- below the feed inlet) must remain below the bottom end of the 3D Radar Scanner. Additionally, if the scanning angle of the 3D Radar Scanner exceeds 45°, the echo signals reflected from the material surface may not be adequately received, reducing measurement accuracy or even preventing measurement. Thus, the scanning angle is typically set between -45° and +45°. Based on the installation position of the 3D Radar Scanner relative to the feed inlet, and considering the repose angle of solid materials, it is recommended that the distance from the highest material level to the bottom end of the 3D Radar Scanner be greater than 1 meter. The closer the feed inlet is to the installation position of the 3D Radar Scanner, the greater this distance needs to be to ensure stable and reliable measurement.

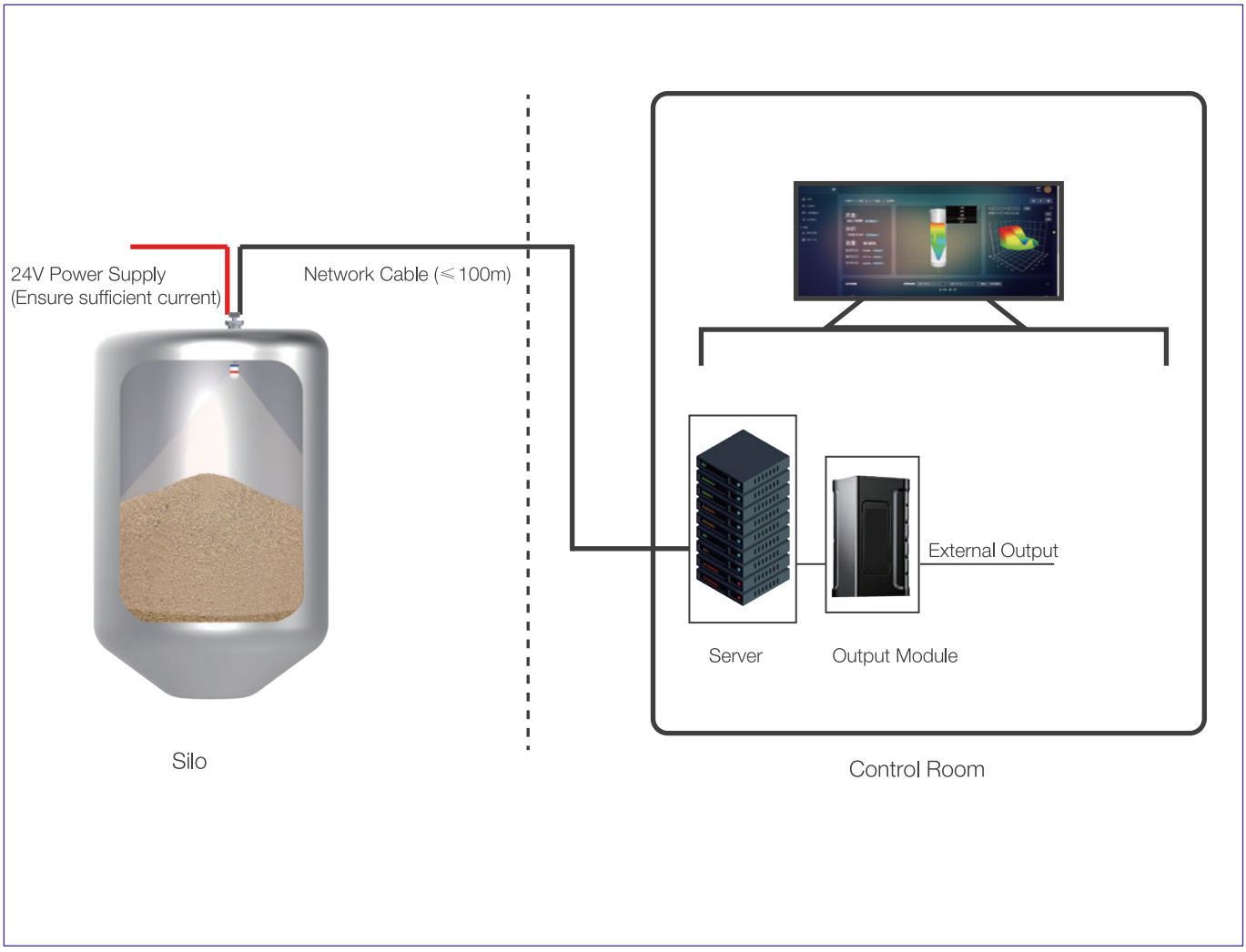


System Framework

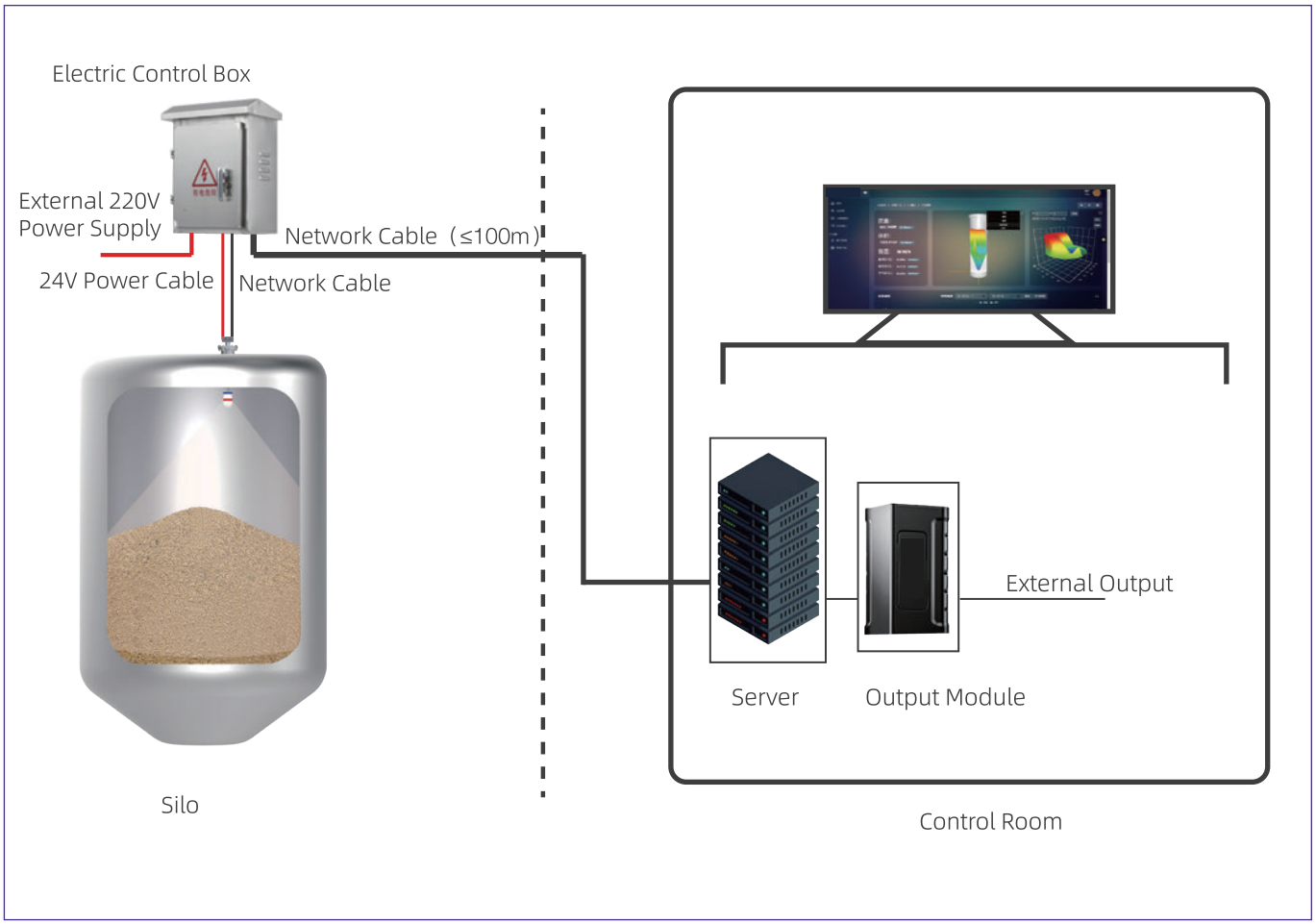
Select the appropriate system framework based on different site conditions.

The system block diagrams are listed as follows:

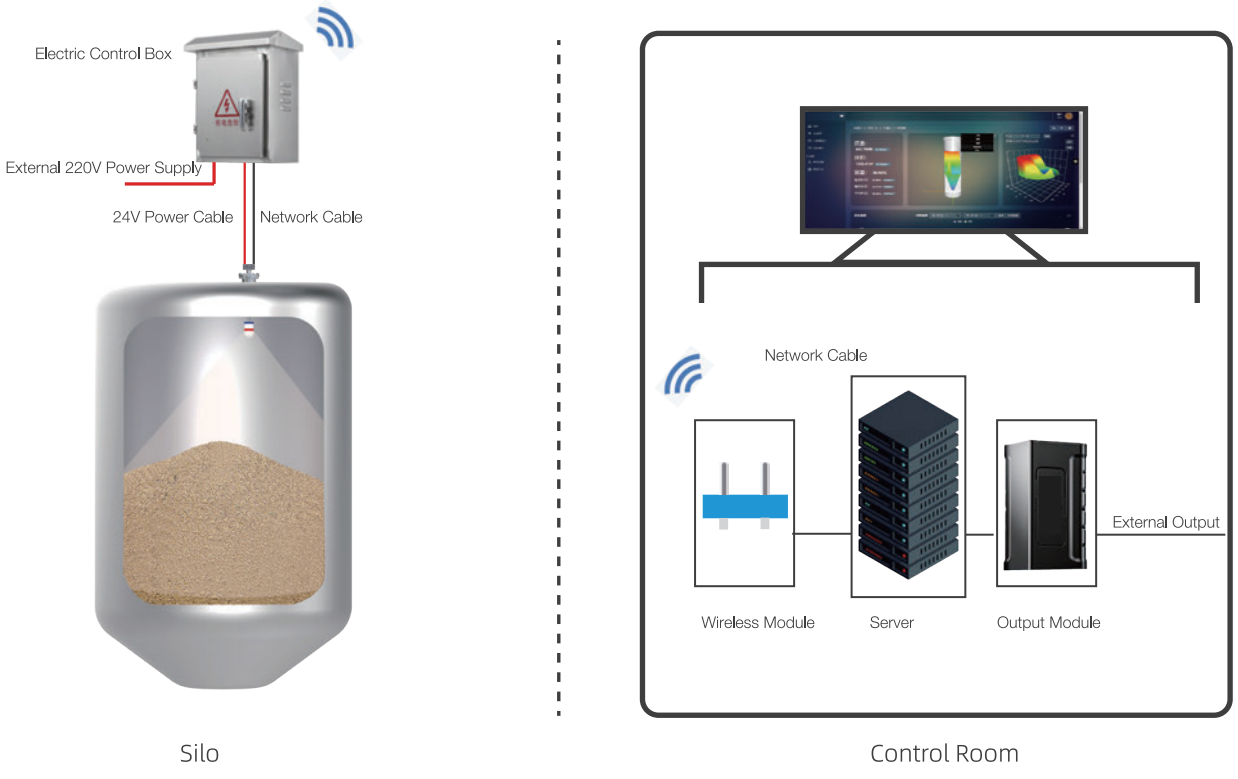
1. When the customer site provides a 24V DC power supply, ensure that the current is sufficiently large. The current value for each 24V DC line depends on how many 3D radar scanner robots the cable powers, with each 3D radar scanner requiring 0.5A. Additionally, if the installation distance between the 3D radar scanner at the silo top and the central control room server is less than 100 meters, the system block diagram shown below can be selected.



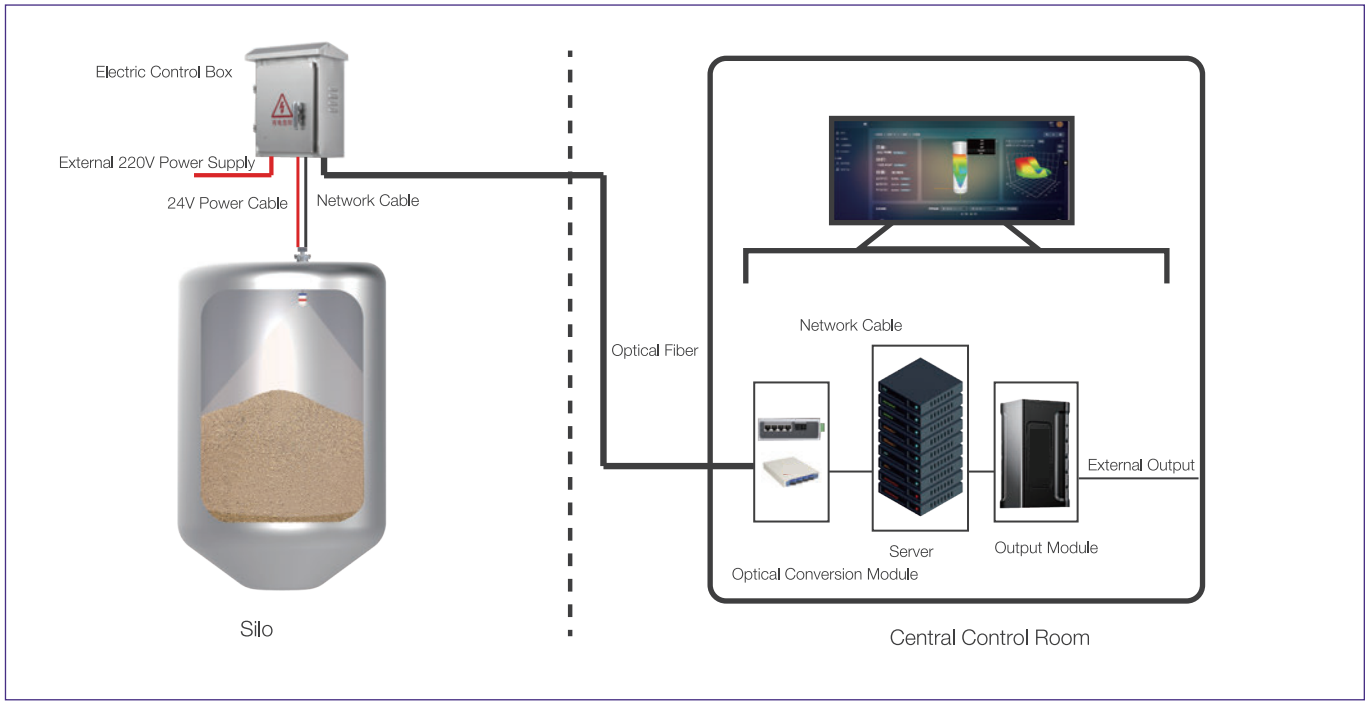
2. When a 220VAC power supply is available at the customer site, an electric control box must be installed at the silo top. The control box should include a 220VAC to 24VDC power conversion module to provide power for the 3D radar scanner. Additionally, if the installation distance between the 3D radar scanner at the silo top and the control room server is less than 100 meters, the system block diagram shown below can be selected.

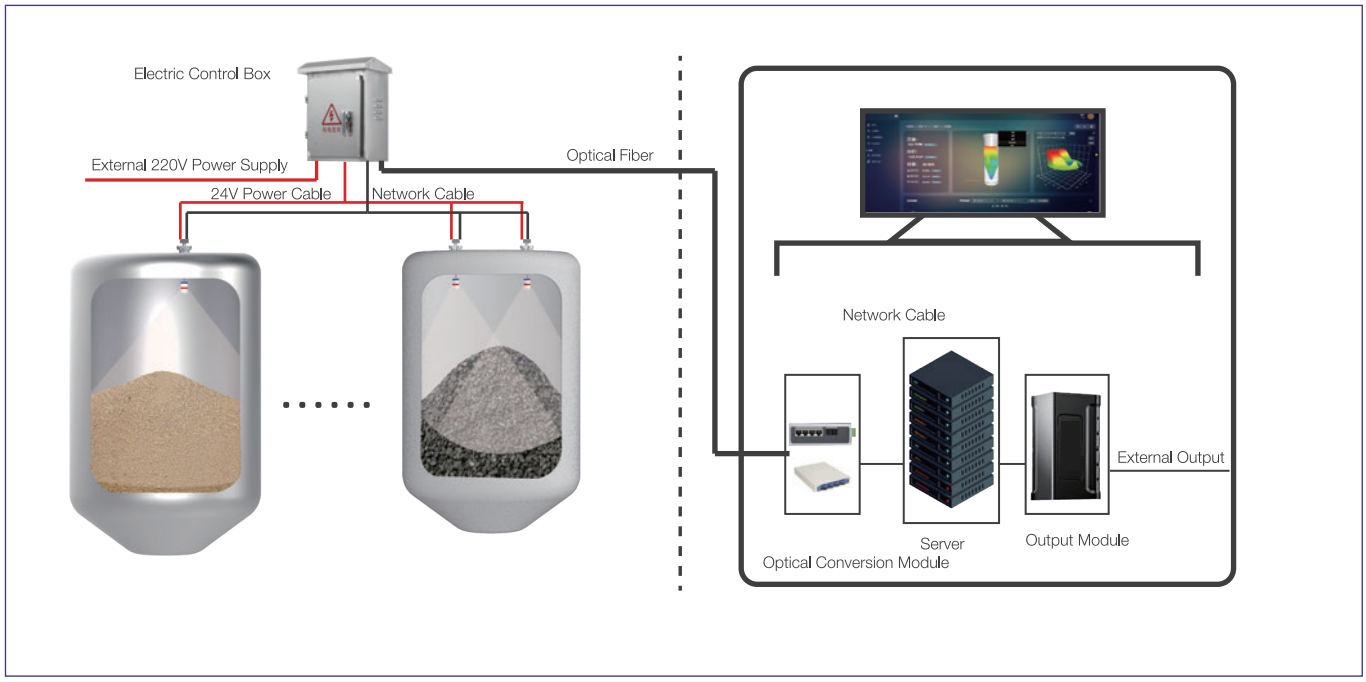


3. When a 220VAC power supply is available at the customer site, an electric control box must be installed at the silo top. The electric control box should include a 220VAC to 24VDC power conversion module to provide power for the 3D radar scanner robots. The 3D radar scanner robots transmit the detected information via a network cable to the electric control box. If communication cables are not laid between the silo top and the control room, the electric control box will be equipped with a wireless module. This wireless module will transmit the received detection information wirelessly (4G/5G) to the control room. Additionally, a wireless module is also installed next to the server in the control room, which receives the detection information transmitted wirelessly (4G/5G) and connects to the server via a network cable for data transmission, as shown in the diagram below.



4. When a 220VAC power supply is available at the customer site, an electric control box must be installed at the silo top. The electric control box should include a 220VAC to 24VDC power conversion module to provide power for the 3D radar scanner. The 3D radar scanner transmit the detected information via a network cable to the electric control box. Inside the electric control box, an optical conversion module converts the network signal into an electrical signal, which is then transmitted to the control room via optical fiber. Additionally, an optical conversion module is also installed next to the server in the control room to receive the optical signals transmitted through the fiber and convert them back into network signals. This signal is then sent to the server via a network cable for data transmission, as shown in the diagram below.

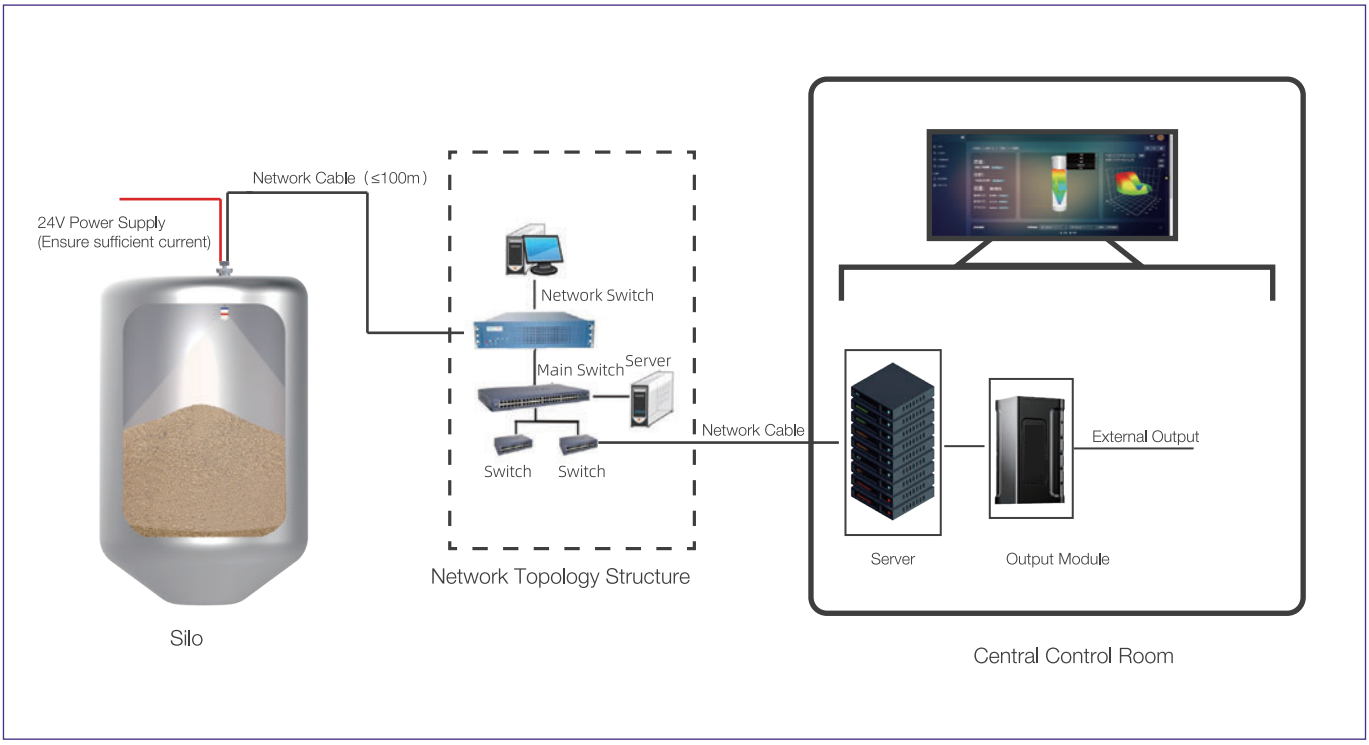




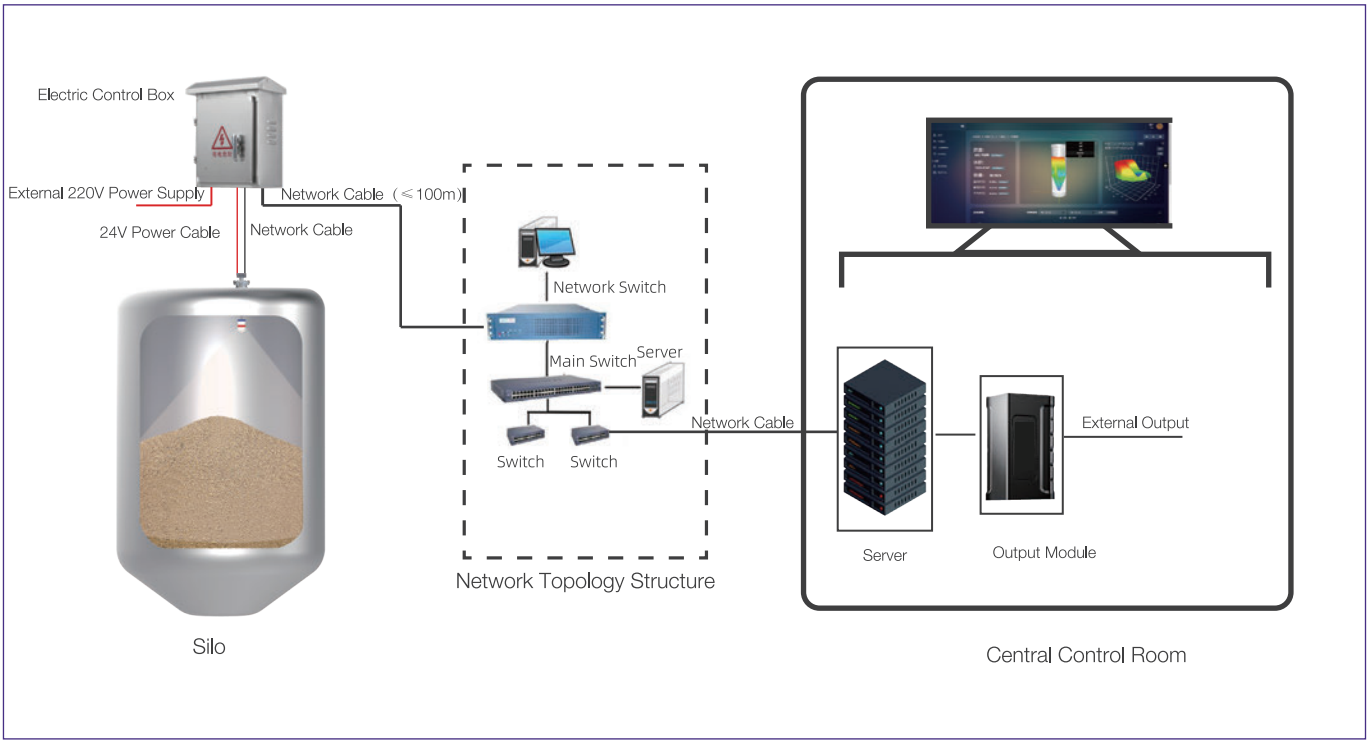
Note: Under certain conditions (when the installation distance from multiple 3D radar scanner robots mounted on silos to the electric control box is less than 100 meters), a single electric control box can be shared among multiple silos. Detection information can be transmitted to the control room via one shared optical fiber.

5. The customer has already designed and laid out a network topology between the silo top and the control room for transmitting detection information. Both ends of the network topology have RJ45 network interfaces.

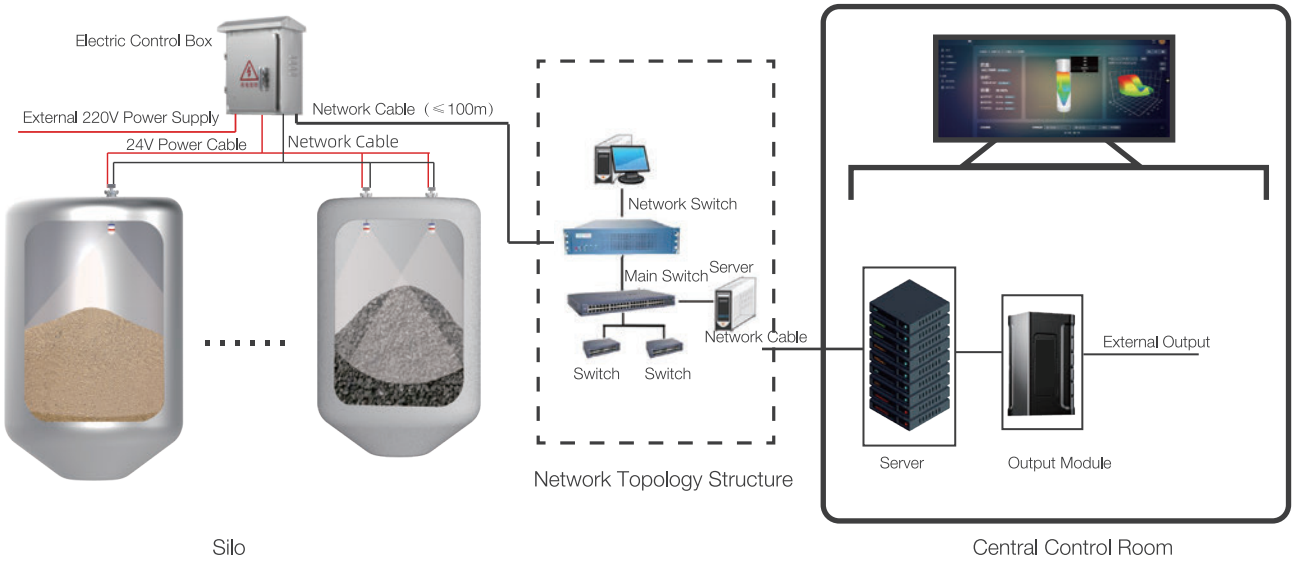
① When powered by 24V DC (with sufficient current), as shown in the diagram below.



② When powered by 220V AC, as shown in the diagram below.



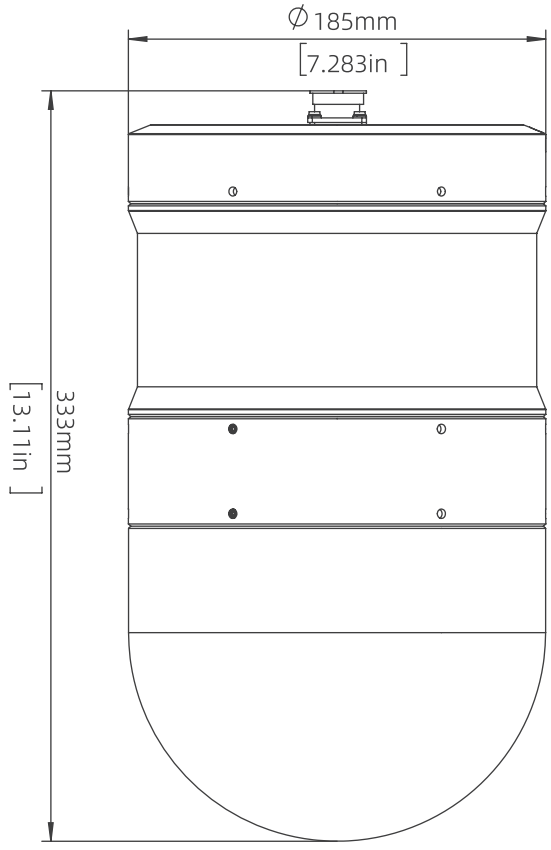
③ When powered by 220V AC, as shown in the diagram below

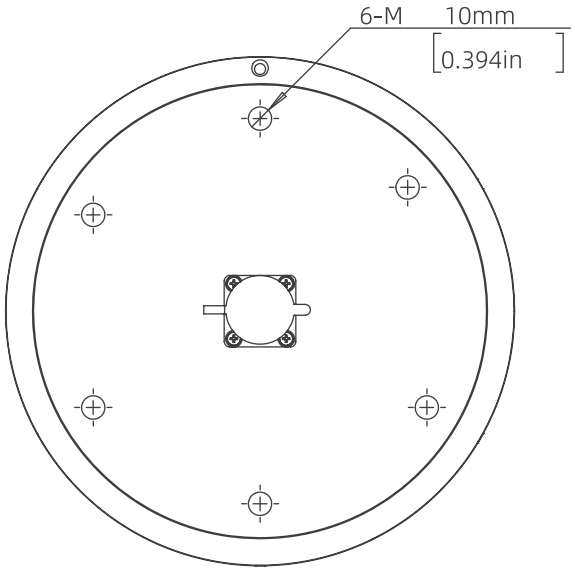


Output Module Description: The 3DPro2300 radar scanner transmits detected information to the server, where it is calculated, processed, and analyzed. The results are then presented on the Pro Inventory host interface, displaying three-dimensional images and material parameters. If the customer's site has other control systems that require receiving specific data for interactive control or information integration, the output module, as indicated in the above system block diagram, can be selected. The type and quantity of the output module depend on the communication methods and material parameters required by the customer's other control systems. Customers must provide the necessary communication methods and material parameters for their control systems to the manufacturer, who will adapt the appropriate output module.

Dimensions

3DPro2300 Product Structure Dimensions (Note: Values in [ ] are in inches; others are in millimeters)





Weight: 5.6 kg

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