Boston Dynamics

Spot® Station Instructions for Use

Safety and Operations Manual

Version 1.1 Original Instructions
May 2025

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1. Introduction

1.1. About This Document

This document contains critical safety information for the operation and use of the Spot Station enclosure for the Spot Dock charging equipment and Spot robot.

Responsible use of Spot, the Spot Dock, and the Spot Station is crucial to prevent dangerous conditions for those in close proximity to the equipment. Read, understand, and comply with this document before initial use of the Spot Station to reduce risk of injuries or damage to yourself, the Spot robot, the Spot Dock, the Spot Station, or other property.

Keep a copy of this document in a readily accessible location. Complete user and developer documentation on the Spot robot platform, including a digital version of this document, is available at the Boston Dynamics Support Center: https://support.bostondynamics.com/s/spot

This document is valid for the following designations of the Spot Station, Spot Dock, and Spot robot:

Station hardware model (P/N):	**03-004077-001**
Dock hardware model (P/N):	04-00150139-001
Robot hardware model (P/N):	04-00143531-001 04-00143531-101 04-00143531-401 04-00143531-501 04-00143531-601 04-00143531-611 04-00143531-701 04-00143531-711
Robot software:	5.0

1.2. Manufacturer Information

The Spot Dock is manufactured by Advanced Automation on behalf of Boston Dynamics.

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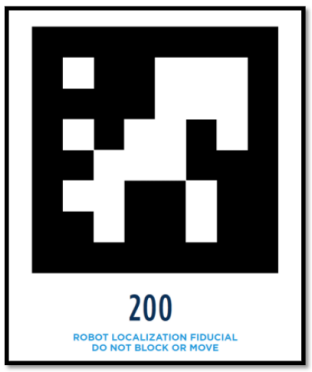
1.3. Key Terminology

Term	Definition
Spot	A legged robot capable of mobility on a variety of terrains. Spot uses multiple sensors and three motors in each leg to navigate in indoor and outdoor environments, maintain balance and attain postures. Spot is capable of carrying and powering attachments.
Spot Dock	A recharging station for compatible models of the Spot robot. The Spot Dock automatically supplies power to recharge Spot's batteries when the robot is seated correctly on the dock connectors.
Spot Station	An enclosure for compatible models of the Spot Dock and Spot robot. The Spot Station houses the dock and shelters the robot from the elements during recharging.
Operator	Any person trained and authorized to manually operate, repair, handle, or supervise the automatic operation of Spot. This definition corresponds to the terms “Qualified person” and “Authorized person” as defined in ISO/TR 22053:2021, Clause 3.4.
Bystander	Any person who can be reasonably expected to be near Spot, but is not an operator. This definition corresponds to the term “Affected person” as defined in ANSI B11.0-2020, Clause 3.4.
Task	An activity performed by a person, including manual operation of Spot.
Operation	An activity performed by Spot, whether as a result of manual or automatic operation.
Mission	A set of instructions and map data that allows Spot to navigate automatically along a known route while performing data capture actions and other operations. The features that allow Spot to record and replay missions are collectively called “Autowalk”.
Action	A predefined operation that can be performed during a mission. The Spot software includes several preset Actions, such as capturing images from robot cameras and docking with a Spot Dock. Custom Actions can be created using Spot’s software development tools.
Attachment	Any device or piece of hardware that is affixed to Spot to enhance or expand Spot’s functionality. Attachments for Spot are commonly called “payloads”.

Term	Definition	
Fiducials		Specially designed images similar to QR codes that Spot uses to match its internal map to the world around it. Fiducials are required at the beginning of every mission. Spot recognizes AprilTag fiducials that meet the following requirements: • AprilTags in the Tag36h11 set. • The default Image size: 146 mm square. • Printed on white non-glossy U.S. letter-size sheets (preferably rigid).

1.4. Legend of Hazard Labels

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

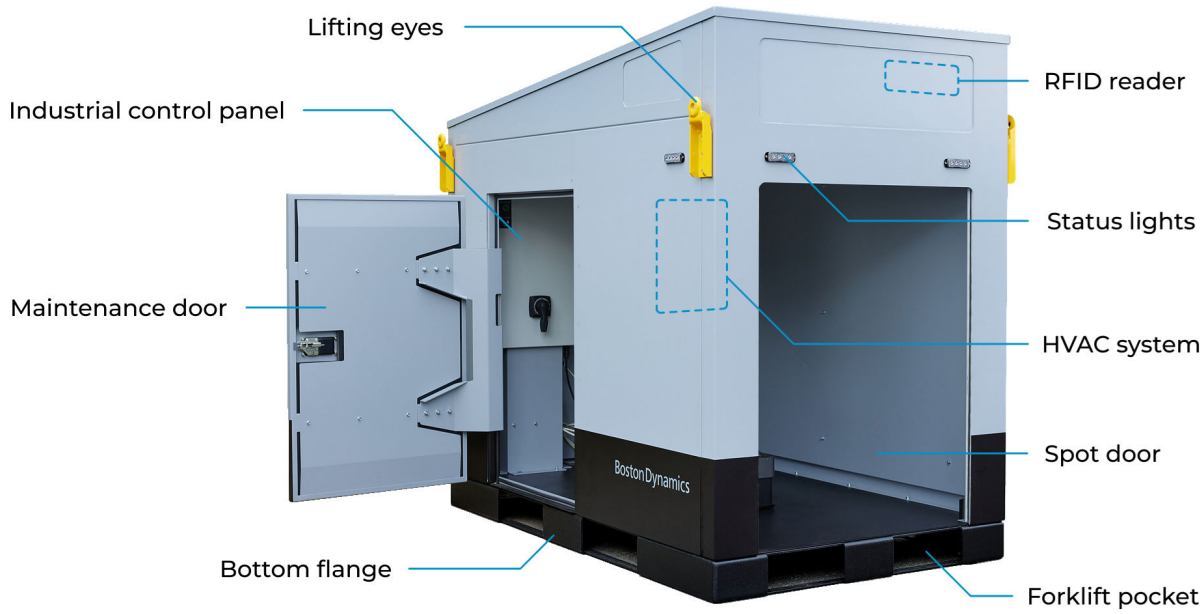
NOTICE

Indicates information considered important, but not hazard related.

REQUIRED READING

Indicates a mandatory reading of Instructions for Use or other safety-related documentation.

2. About the Spot Station



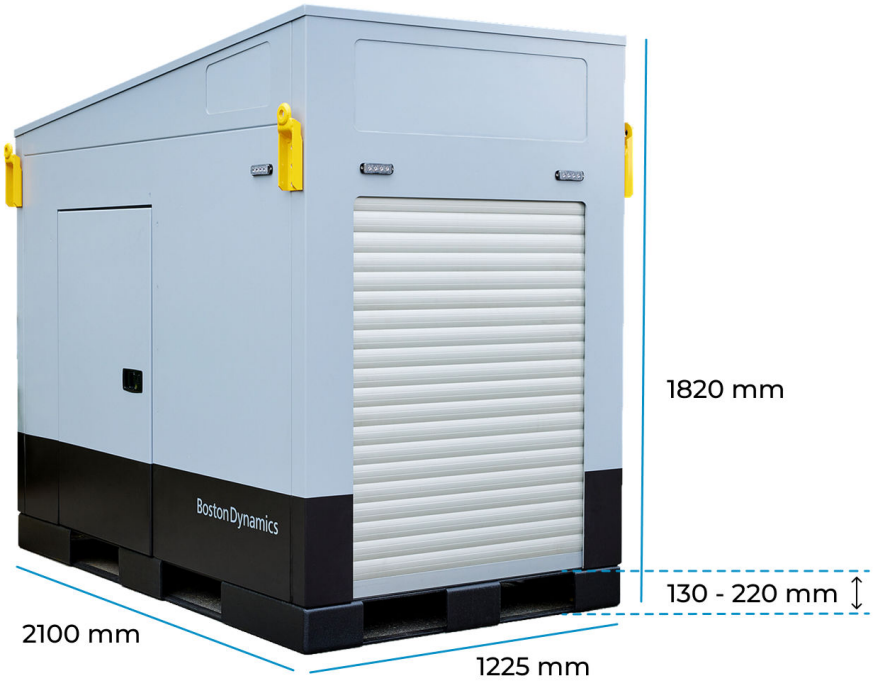
Major features of the Spot Station.

The Spot Station is an outdoor enclosure that shelters the Boston Dynamics Spot robot while charging at a Spot Dock installed inside the station. The station is equipped with an automatic door and an RFID-based proximity detection system to allow Spot to enter and leave the enclosure as needed during operation.

REQUIRED READING

Before setting up or using the Spot Station with a Spot robot or Spot Dock, review *Spot Instructions for Use* and *Spot Dock Instructions for Use*, available in the Boston Dynamics Support Center at https://support.bostondynamics.com/s/spot/product-safety

2.1. Specifications



Dimensions of the Spot Station.

External dimensions

- Length – 2100 mm
- Width – 1225 mm (1300 mm including lifting features)
- Height – 1820 mm
- Step height – 130 to 220 mm (adjustable)
- Mass – Up to 680 kg (not including dock or robot)

Internal dimensions

- Length – 1810 mm
- Width – 1115 mm
- Height – 1355 mm (with retractable door open)

Power and network

- NEMA L14-30R – 250VAC and up to 30A
- Ethernet – RJ45 (pass-through)
- Wireless comms – WiFi-transparent panels in front and side walls

Environment

- Ambient operating temperature – -30°C to 55°C
- Solar irradiance – 1100 W/m^2
- Relative humidity range – Up to 100%
- Enclosure type – NEMA 4
- Exterior coating – Polyester hybrid electrostatic
- Floor material – Carbon steel with two-part polyurea/polyurethane high-grip coating
- Roof support weight – 544 kg distributed load (0.7 psi)
- Sustained wind speed – 257 km/h when anchored to ground, 179 km/h freestanding
- Standing water – Up to 153 mm
- Driven rain – No leakage up to 210 km/h winds
- Earthquakes – Withstands up to magnitude 5.5
- Lightning – NFPA 780

2.2. Accessories

The Spot Station ships with an accessory case which includes several required and optional components necessary for proper installation and use of the equipment.

The accessory case is a black portable waterproof protective hard case measuring 56 cm x 40.5 cm x 21.5 cm. It is secured inside the enclosure during shipping with disposable brackets.

NOTICE

Do not discard the bolts used to secure the brackets. These bolts are required to install the Spot Dock inside the station.

Required components

- 1 ESD bag storage bag for RFID tags
- 5 RFID tags (in ESD bag)
- 5 Adhesive-backed dock fiducials

Optional components

- 1 Power cord cap
- 4 Ground anchors
- 4 Webbed straps for ground anchors
- 1 key for electrical panel locking bolts

2.3. Ingress and Egress

Doors on the Spot Station.

The Spot Station has two doors:

- **Spot door** – A mechanically-driven overhead door at the front of the enclosure that can be raised and lowered manually or automatically. This door is designed for the use of the Spot robot.
- **Maintenance door** – A hinged door on one side of the station that is designed for people to access the interior of the enclosure. This door can be locked from the outside with a key, and can be opened from the inside without the key even when locked. A locking pin is provided to secure the door in the fully open position.

Spot door specifications

- Time to open – 12 sec
- Time to close – 14 sec
- Force exerting when closing – 9 kg

WARNING

Do not enter the enclosure during docking or undocking. If a robot attempts to enter the Spot Station while you are inside, leave immediately through the maintenance door.

Ensure Spot is powered off or that the motor lockout is set whenever anyone is inside the enclosure with the robot present.

Set the station's mode switch to **HAND** to ensure that approaching robots cannot activate the Spot door and prevent them from attempting to enter the station while anyone is inside.

The Spot Station is not designed for prolonged human occupancy. People should be inside only when necessary to manually operate the Spot door or perform maintenance.

2.4. Electrical System

Specifications

- Input Voltage Range – 208 to 250 VAC
- Input Frequency – 59.4 to 60.6 Hz
- System FLC – 22.5 A
- Largest Motor – 66W RMS
- SCCR – 5 kA
- Main OCPD – 30A MCCB
- Conductors – 75°C Cu conductors only
- Power Conductors – 10 AWG (minimum)
- Grounded conductors – 10 AWG (minimum)
- Grounding Conductors – 10 AWG (minimum)

Circuit Guide

CB ID	Description	Rating	Nom. Voltage
CB0200	Main Disconnect	30 A	190-250 VAC
CB0201	Charging Dock	15 A, Trip Curve C	100-140 VAC
CB0202	Heating/Cooling	15 A, Trip Curve D	190-250 VAC
CB0203	Service Power/Accessories	15 A, Trip Curve C	100-140 VAC
CB0204	Front SPOT Door	5 A, Trip Curve D	100-140 VAC
CB0205	Control Power	5 A, Trip Curve D	190-250 VAC

2.5. HVAC System

Specifications

- Cooling capacity – 3500 BTU/hr (1.05 kW)
- Heating capacity – 2700 BTU/hr (800W)

2.5.1. Temperature Settings

The cooling thermostat is adjustable, and comes factory-set to 95°F. It is not recommended to set this thermostat below 70°F. To adjust the cooling temperature, turn the knob on top of the HVAC unit inside the station. The HVAC system will run until the set point temperature is reached, and then the hot side fans and thermoelectric cooling modules will shut down. The cool side fans will remain running.

The heating thermostat is not adjustable. It is factory-set to 45°F.

2.6. Spot Charging Dock

The Spot Station is designed to have a Spot Dock installed inside it. During operation, Spot will automatically dock and undock as it enters and leaves the Spot Station.

REQUIRED READING

For instructions on installing and using Spot Dock, refer to *Spot Dock Instructions for Use* which is available for download from the Boston Dynamics Support Center at https://support.bostondynamics.com/s/spot/product-safety

WARNING

Spot Station and the Spot Dock are for use only with the Boston Dynamics Spot robot.

Do not attempt to use Spot Dock with any battery or product other than the Spot robot.

Do not attempt to manually align the Spot robot with the Spot Dock.

2.7. RFID Proximity Detection System

The Spot Station includes a U4GO A6U49 RFID reader, and ships with several pre-paired RFID tags that can be affixed to Spot robots. The reader broadcasts a mid-range UHF signal (902-928 MHz) with an operating distance of up to 6 meters. The signal is AES128 encrypted, providing secure access to the Spot Station.

NOTICE

The RFID reader makes beeping or chirping noises whenever it recognizes a nearby RFID tag, including tags that are not paired with the Spot station. These sounds cannot be muted.

2.8. Exterior Lights and Sounds

The Spot Station includes several amber LED status lights on the outside of the enclosure, as well as a buzzer that is factory-set to produce sounds at a volume of 80 to 85 dB at 5 meters.

Condition	Light pattern	Buzzer signal
Station occupied, robot charging	Solid on	Off
Spot door operating[1]	Rapid blink[2]	Sounds repeatedly[3]
Station system fault	Slow blink[4]	Off

[1]In **AUTO** mode, lights and sounds will activate 3 seconds before the door begins to move.

[2]Alternate on/off at 2 Hz

[3]Alternate on/off at 1 Hz

[4]On for 2 seconds at 0.33 Hz

NOTICE

If multiple conditions occur simultaneously, the patterns display in this order of priority: **System fault > Station occupied > Door operating**

2.9. Interior Lighting

The interior of the enclosure is lit by two LED lamps. These lamps are illuminated at all times while the station is powered on.

CAUTION

Do not turn off or tamper with the interior lighting. The Spot robot requires illumination to recognize the Spot Dock fiducial and navigate inside the enclosure. Lack of adequate illumination can lead to unexpected behaviors and sudden unstable motion of the robot.

3. Product Safety Overview

3.1. General Principles

The Spot Station is an enclosure for the Spot Dock charging equipment and Spot robot. The station includes a retractable garage-style door that operates automatically to allow the robot to enter and leave the enclosure, and an HVAC system to keep the interior of the enclosure within nominal operating temperatures for the robot and dock.

3.2. Intended Use

The Spot Station is intended for use as a protective enclosure for the Spot Dock and Spot robot. No manual intervention with the equipment is required during operation.

The Spot Station is intended to be used in outdoor areas within Spot's operating environment, where access is restricted to trained operators.

REQUIRED READING

For an overview of generic environmental conditions specified for the Spot robot and Spot Dock, review *Spot Instructions for Use* and *Spot Dock Instructions for Use*, available in the Boston Dynamics Support Center at https://support.bostondynamics.com/s/spot/product-safety

The Spot Station must only be used with compatible models of the Spot Dock and Spot robot.

Explicitly prohibited uses include:

- Tampering with the electrical or HVAC system.
- Tampering with the automatic door mechanism.
- Tampering with the locking mechanism, egress latch, or hinges of the maintenance door.
- Use as a dwelling or for prolonged human occupancy.
- Any use other than housing a Spot Dock and sheltering a Spot robot during recharging.

3.3. Noise

The Spot Station includes a buzzer that is factory-set to produce sounds at a volume of 80 to 85 dB at 5 meters. The maximum buzzer volume is 105 dB at 1 meter.

CAUTION

Use hearing protection if operating the station with the buzzer above the factory configured volume.

3.4. Fire, Explosion, and Hazardous Materials

There are no known significant risks associated with Spot's lubricants.

The Spot battery pack contains cells that have electrolytes. All cells are fully enclosed in a sealed enclosure that has passed UN 38.3 transportation testing. In addition, the pack has CB Certification to IEC 62133 and has passed drop testing with no leakage of electrolyte.

DANGER

In the unlikely event of damage with visible breakage of any part of Spot or its batteries, **DO NOT** touch or attempt any recovery.

It is extremely unlikely that the battery generates fire under normal conditions of use and environment. If the battery catches fire, do not try to put it out. Evacuate to a safe area and call the fire department. Battery fires create toxic fumes and cannot be put out with conventional fire extinguishers or water.

3.5. Pinch Points

Pinch points are present on the Spot Station at these locations:

- *Maintenance door* – This door is unpowered and swings freely on its hinges. To avoid sudden closing of the door due to wind or contact with a moving object while a person is accessing the interior of the station, use the attached locking pin to secure the door in the fully open position.
- *Junction of the Spot door and the floor of the enclosure* – The Spot door exerts approximately 9 kg of force during closing. This force may fluctuate slightly depending on factors such as wear and ambient temperature. If the door is obstructed during closing before reaching the fully closed position, the door motor will fault and immediately de-energize. If the door closes on any part of a person's body, the pinching force will be experienced only briefly. While the motor is de-energized, the door can be moved up or down by hand.
- *Automatic door mechanism* – This mechanism includes moving parts that are accessible from the inside of the enclosure and could ensnare fingers, hair, jewelry, or clothing.

During normal operation, there is no foreseeable use that would require access or physical intervention with these components. They should be accessed only during maintenance, cleaning, or troubleshooting of the station.

To avoid pinch points, observe the following precautions:

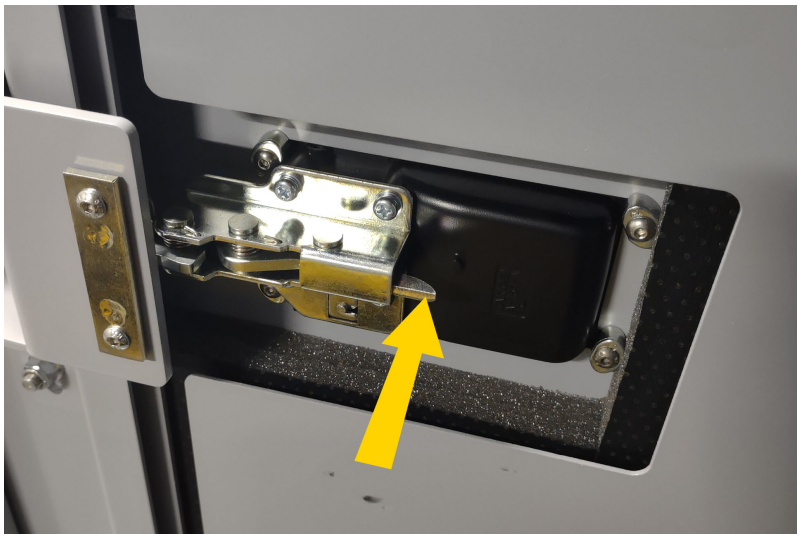
- Move slowly and keep body parts clear when closing the maintenance door.
- Use the attached locking pin to secure the maintenance door in the fully open position when accessing the enclosure.
- Set the station's mode switch to **HAND** when accessing the enclosure.
- Keep body parts clear of the Spot door during closing.
- Keep fingers, hair, jewelry, and clothing clear of the automatic door mechanism during door operation.

CAUTION

The Spot door is similar to a garage door opener and there is a risk of being exposed to pinch point if fingers are placed in the path of the door while it is opening and closing. Access to the door during operation should be limited only to users who are properly trained on your site's Environmental, Health and Safety policies.

3.6. Entrapment

There is a latch on the inside of the maintenance door that opens the door even when it is locked from the outside. If you become entrapped within the enclosure, push the latch toward the door to open the maintenance door and exit the station.



Egress latch on the inside of the maintenance door.

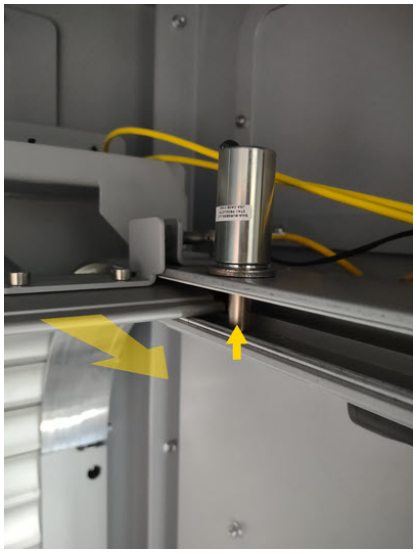
The maintenance door can be secured in the fully open position using the provided locking pin. The locking pin is attached on a short chain to the door near the bottom hinge. To secure the door, fully open the door to expose the locking tab, then insert the locking pin fully into the hole in the tab.

Locking tab and pin for the maintenance door.

It is also possible, but not recommended, to exit the station via the Spot door. Do this only if it is impossible to escape via the maintenance door. Ensure the door is fully open before exiting.

To escape via the Spot door:

- If power is available to the station, use the controls on the Industrial Control Panel to manually operate the Spot door.
- If power is unavailable to the station, a solenoid pin in the Spot door track will fall into place as a security measure to prevent outside entry. Push this pin up while simultaneously pulling the Spot door up into its track. Once the pin is resting on top of the door slats, the door will move freely and can be raised fully into its track.



Locking pin for the Spot door.

To reduce the risk of full entrapment:

- Use the provided locking pin to secure the maintenance door in the fully open position when accessing the enclosure.
- Ensure that the area outside the station near the maintenance door remains free of obstructions that would prevent the door from fully opening.
- Do not intentionally close the maintenance door while any person is inside the enclosure.

WARNING

Ensure Spot is powered off or that the motor lockout is set whenever anyone is inside the enclosure with the robot present.

Set the mode switch to **HAND** to ensure that approaching robots cannot activate the Spot door and prevent them from attempting to enter the station while anyone is inside.

3.7. General Warnings

- Do not tamper with the electrical or HVAC system. Only trained service personnel should access the electrical cabinet.
- Ensure Spot is powered off or that the motor lockout is set whenever anyone is inside the enclosure with the robot present.
- The Spot Station is not designed for prolonged human occupancy. People should be inside only when necessary to manually operate the Spot door or perform maintenance.
- Stay at least 2 meters away while the robot is entering and leaving the station.

4. Transport, Handling, and Storage

4.1. Lifting Methods

The Spot Station can be lifted by a forklift or pallet jack from all four sides of the base, or from above by a crane or other overhead lifting method using the lifting eyes bolted to the exterior corners.

Lifting options for the Spot Station.

Before lifting or moving the Spot Station:

- Ensure that the Spot door is in the fully closed position, and that the mode switch is set to **HAND**.
- Turn the station off and disconnect it from power.
- Remove the Spot Dock and Spot robot from the enclosure.
- Remove any external accessories that could interfere with moving the station.
- Ensure that no personnel are inside the station and that the maintenance door is fully latched. Locking this door is recommended but not required.
- Clear the area around the station of obstacles and personnel.
- Ensure that the transport path is clear of obstacles and personnel.
- Ensure that the lifting equipment has sufficient capacity for the station's weight.

- Ensure that operators and technicians wear appropriate personal protective equipment (PPE), such as safety shoes, gloves, and a hard hat when handling lifting equipment.

WARNING

Disconnect the Spot Station from power and remove the Spot Dock and Spot robot before lifting or moving the station.

Only trained personnel should operate the lifting equipment.

Ensure that the area around the station is clear of personnel before lifting. Never stand underneath or near the station while it is suspended.

Do not lift or move the station while any person is inside.

4.1.1. Forklift or Pallet Jack

To lift the Spot Station with a forklift or pallet jack:

1. Use a pallet jack only inside a building or on a flat concrete surface.
2. Insert the forks fully into the pockets on any side of the station and ensure the forks are centered before lifting.
3. Lift the station slowly and ensure that it is stable on the forks before moving.
4. Keep the load low, move slowly, and avoid sudden stops while transporting to prevent tipping.

4.1.2. Crane or Hoist

To lift the Spot Station with a crane or hoist:

1. Check that the four lifting eyes are correctly installed at the four upper corners of the station. The bolts holding the eyes in place must be tightened to at least 57 N·m.
2. Attach 3/4-inch lifting shackles to each of the four lifting eyes, ensuring the shackles are securely fastened.
3. Lift the station slowly and steadily, ensuring that it remains level during the entire lifting process.
4. Ensure no part of your lifting harness or strapping is rubbing on the station.

NOTICE

The lifting eyes can be removed when not in use, but the bolts holding them to the station are structural and must be reinstalled.

4.2. RFID Tag Storage

Store unused RFID tags in the provided electrostatic discharge (ESD) shielded zip-top bag. This protects the tags from electrostatic damage and prevents them from being unexpectedly activated by the RFID gateway on the Spot Station. Ensure the bag is properly sealed to prevent dust or contaminants from entering.

Place the sealed ESD bag inside the provided storage case to protect the tags from physical damage, moisture, and temperature variations. Store the case in a cool, dry environment away from direct sunlight and extreme temperatures to maintain the tags' adhesive quality and electronic integrity.

5. Setup

5.1. Spot Station Placement

The Spot Station must be placed on dry and level ground, with sufficient clearances and access to power. Ensure there is a clear path for personnel and equipment to safely approach the installation site.

When selecting a location, follow general guidelines for placing the Spot Dock and ensure Spot can reliably navigate to and from the location. In particular:

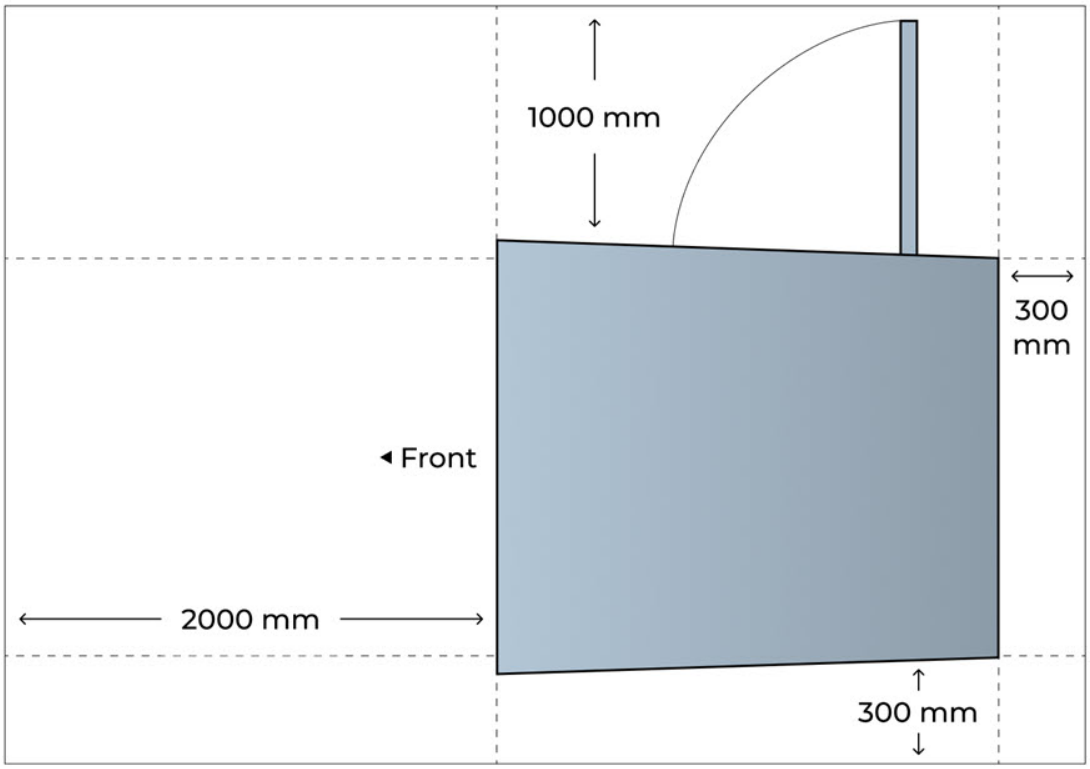
- The walking surface around the station must be suitable for Spot.
- The area extending for 2 meters directly in front of the Spot door must be flat and level with the surface under the station.
- The step height to enter the station must be no more than 22 cm. The only acceptable way to raise the station off the ground surface is with the station's leveling feet.
- If the station is placed on an elevated structure or concrete pad with a dropoff of more than 30 cm to the surrounding terrain, appropriate barriers must be used to prevent falls.

REQUIRED READING

To learn more about dock placement and the limits of Spot's navigation system, refer to *Spot Instructions for Use* and *Spot Dock Instructions for Use*, available in the Boston Dynamics Support Center at https://support.bostondynamics.com/s/spot/product-safety

Required clearances

- Front – 2000 mm
- Right side (with maintenance door) – 1000 mm
- Left side – 300 mm
- Rear – 300 mm



Spot Station clearances.

Environmental considerations

- If possible, select a location that is shaded or out of full sunlight to reduce heat exposure and minimize solar load on the HVAC system. This will significantly reduce energy consumption and reduce UV exposure on external coatings.
- Avoid locations with overhead hazards such as tree branches and utility lines.
- If possible, choose a location that is protected from extreme weather conditions such as heavy rain, flooding, and excessive heat load.
- If possible, choose a location that is sheltered from prevailing winds or orient the station so prevailing winds are directed at the corners instead of the sides.
- Avoid placing the station directly on ground surfaces that are consistently moist, such as shaded grassy soil. Over time, excess moisture may cause corrosion to the underside of the station.
- Avoid low-lying areas prone to water pooling or flooding. Choose a site with adequate drainage to prevent standing water around the station, including runoff from the HVAC drainage line which is plumbed through the floor of the enclosure at the corner nearest the HVAC system.

Power considerations

- Ensure the installation site is within reach of a suitable power source, or arrange for temporary power generation.
- Plan a route for power cables that minimizes tripping hazards and excessive exposure to weather. Use cable protectors if cables need to cross walking paths.

- In locations prone to electrical storms, ensure system grounding.

Security considerations

- If the station is installed in a public or unsecured area, consider using security measures such as barriers or surveillance to prevent unauthorized access.
- Place appropriate warning signs to indicate potential hazards. For example, that the system operates automatically, contains pinch points, or contains mobile surveillance or security equipment.

5.1.1. Site Preparation

Clear the area of debris, vegetation, and objects before installation.

The installation site must be leveled to within +/- 2 degrees front-to-back and +/- 4 degrees side-to-side. For uneven ground, it is recommended to use a compacted base of gravel or concrete to create a level foundation. Gravel and crushed stone around the station also facilitates drainage and prevents erosion.

There are four leveling feet at the corners of the station that can be adjusted up to 90 mm to compensate for minor variations in the ground surface by turning the leveling bolts inside the enclosure with a 30 mm socket wrench. The leveling bolts are covered by removable caps that prevent small animals from entering the enclosure. Reseat the caps after making adjustments.

5.1.2. Ground Anchors

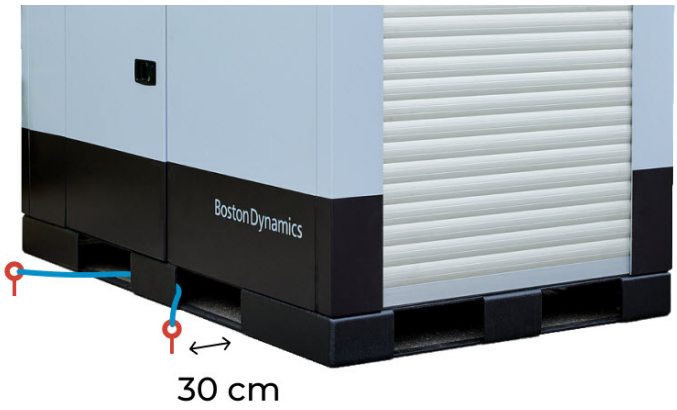
The Spot Station can be secured to the ground to prevent unwanted movement.

For soft ground, use the four provided ground anchors and webbed straps. For concrete surfaces, use the eight ground anchor points in the bottom flange.

To anchor the Spot Station in soft ground:

1. Ensure the soil is suitable for anchoring. In loose or sandy soil, additional stabilization may be needed.
2. Place the station at the desired location. If necessary, adjust the leveling feet to compensate for uneven ground.
3. Insert the ground anchors into the soil on either side of the station, about 30 cm away from the base and parallel with the holes drilled in the bottom flange.
4. Turn each ground anchor with a large wrench or lever until it is fully seated in the soil. Ensure each ground anchor is secure before continuing.

5. Using one webbed strap per ground anchor, feed the loose end of the strap through the eyelet in the anchor and wrap it around the middle section of the bottom flange. Ensure the strap lays flat and is not twisted.



6. Feed the loose end of the strap through the buckle. Pull each strap taut, but do not fully tighten yet.
7. Tighten all four straps progressively, ensuring that all ground anchors remain firmly seated in the soil.

To anchor the Spot Station to a concrete surface:

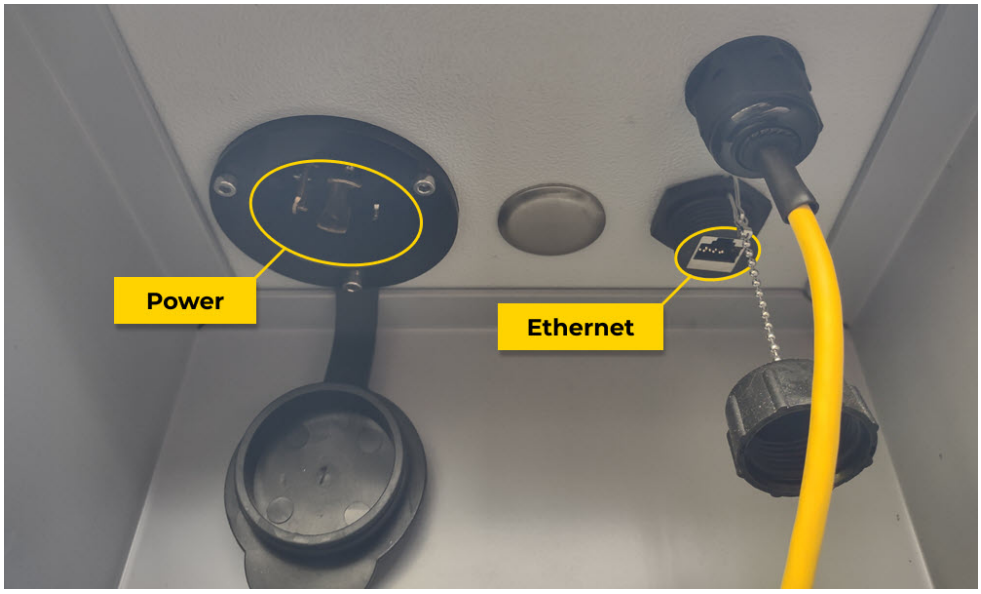
1. Select appropriate concrete anchors to ensure firm installation. Ensure the anchors are sized correctly for the ground anchor points in the bottom flange of the station.
2. Place the station at the desired location. Ensure the station sits flat and level with the leveling feet fully retracted.

> **NOTICE**
> If drainage on flat concrete is a concern, use the leveling feet to raise the station 1 cm off the concrete pad. This will prevent corrosion from water pooling underneath the station, including runoff from the HVAC drainage line which is plumbed through the floor of the enclosure at the corner nearest the HVAC system.

3. Mark the locations of the eight ground anchor points in the bottom flange.

4. Move the station away, then drill holes at the marked points.
5. Re-align the station with the drilled holes, insert concrete anchors, and tighten to ensure the station is fully secured to the concrete pad. If the station's leveling feet are used, avoid over-tightening that could stress or warp the bottom flange.

5.2. Connect Electrical Power to the Spot Station



Power and Ethernet ports on the rear exterior of the Spot Station.

A NEMA L14-30P male receptacle is located on the rear of the Spot Station for providing power to the Industrial Control Panel located inside the enclosure. This is the only way to bring power to the product.

A female NEMA L14-30R cord cap is provided to connect the power supply to the station. An appropriate power supply cord must be used. The power cord must have a service rating suitable for the product use location and the power cord must be UL listed. A neutral connector is required.

You are responsible for following all local wiring codes when connecting the Spot Station to the electrical service.

5.3. Connect the Spot Station to Your Ethernet Network

The Spot Station can provide a pass-through connection Ethernet for the Spot Dock, which in turn provides a pass-through connection for Spot's Ethernet port.

The station itself is not an endpoint on your network, and an Ethernet connection is not required for the station to operate. Connect it to Ethernet only if you want Spot to have a wired network connection while docked inside the station. The station has WiFi-transparent panels above the Spot door and in each side wall to allow Spot to maintain a wireless connection to your network while inside the enclosure.

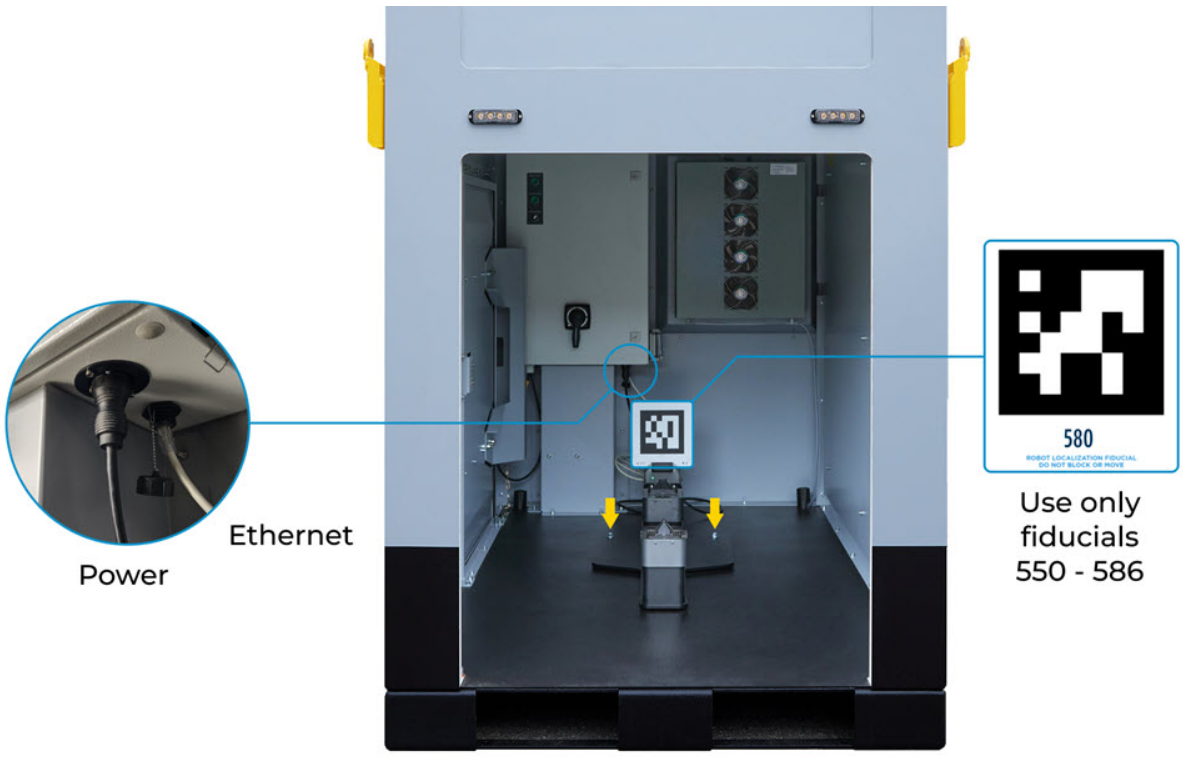
To connect the Spot Station to your Ethernet network:

- Connect one end of an Ethernet cable to the port on the rear of the station, and then connect the other end to an Ethernet outlet for your network.

5.4. Install the Spot Dock Inside the Spot Station

REQUIRED READING

For general instructions on installing Spot Dock, refer to *Spot Dock Instructions for Use* which is available for download from the Boston Dynamics Support Center at https://support.bostondynamics.com/s/spot/product-safety



A correctly installed Spot Dock.

To install the Spot Dock inside the Spot Station:

1. If you have not already done so, remove the bolts and brackets holding the accessory case to the floor of the enclosure. The brackets can be discarded, but retain the bolts.
2. Align the Spot Dock base plate with the two threaded holes in the floor of the enclosure. These holes are placed to provide all necessary clearances for the dock. Ensure the front of the dock faces the Spot door.
3. Use the bolts retained from Step 1 to secure the dock base plate to the floor.
4. Mount the fiducial plate to the bracket on top of the dock's electrical cabinet using the included fasteners, then apply one of the fiducial stickers included with the Spot Station.
5. Connect the Spot Dock to power and optional Ethernet using the receptacles on the bottom of the Spot Station electrical cabinet.

CAUTION

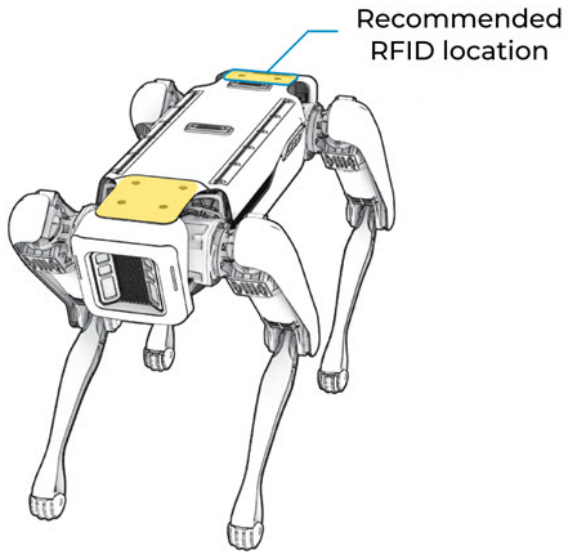
Dock fiducials 550 through 586 are reserved for use with the Spot Station. Spot relies on these fiducials to modify its docking behaviors to account for the tight clearances within the enclosure. Use of any fiducial outside this range could result in unexpected behaviors or sudden unstable motion while entering or leaving the enclosure or while docking or undocking inside the enclosure.

NOTICE

To ensure the proper automatic operation of the Spot door, only power the Spot Dock using the receptacle on the bottom of the electrical cabinet. The additional receptacles on the side of the cabinet are provided as a convenience should you decide to use other wired electrical devices inside the enclosure.

5.5. Affix an RFID Tag to the Spot Robot

The Spot Station ships with several paired RFID tags that can be affixed to Spot robots. Use one tag per robot. Place the tag on Spot's top panel at either the front or rear of the robot. Rear placement is recommended.



Possible RFID tag locations on Spot.

To affix an RFID tag to Spot:

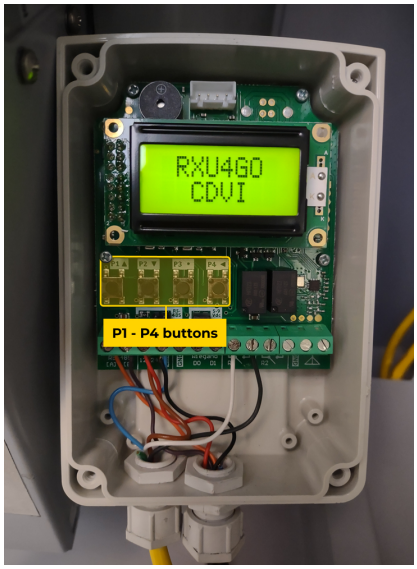
1. Clean the mounting surface with a dry or slightly damp cloth to remove dust, dirt, or oil. Allow the surface to dry completely before applying the RFID tag.
2. Carefully peel off the protective backing from the adhesive side of the RFID tag. Avoid touching the adhesive side with your fingers to maintain its sticking strength.
3. Press the tag firmly onto the prepared surface for several seconds to ensure full adhesion.

5.6. Add or Remove Paired RFID Tags

The RFID gateway controller is mounted on the ceiling at the rear of the enclosure, near the HVAC unit. Slide the controller away from the wall to remove it from the bracket for easier access.

Detaching the RFID reader from the ceiling.

The plastic cover of the gateway is held on with 4 screws. Remove the screws to access the control buttons. These buttons are finger-safe.



Exposed RFID gateway buttons.

Button controls

- P1 – Scroll up or increase digit
- P2 – Scroll down or decrease digit
- P3 – Select or move right
- P4 – Go back or move left

NOTICE

Before adding or removing a tag, ensure all other RFID tags are at least 10 meters away from the reader or stored in an RFID-blocking bag to prevent accidentally reading the wrong tag during the registration process. This includes tags already known by the system, such as tags already in use and affixed to a robot.

To add or remove RFID tags:

1. Press and hold P3 for 4 seconds to enter programming mode.
2. Scroll through the menu and select **Add Tag** or **Delete Tag**.

3. Scroll and select a method to add or delete tag:
    a. **Add/Delete Tag** – Add or delete a single tag by presenting it to the RFID reader.
    b. **Add/Delete Tag Block** – Add or delete multiple tags with consecutive serial numbers, starting with the tag presented to the RFID reader.

> **NOTICE**
> Adding a tag block will fail if any tag in the block is already in the system. Deleting a tag block will fail if any tag in the block is not currently in the system.

    c. **Delete By List** – Scroll through all known tags and delete one-by-one.
    d. **Delete All Tags** – Clears all tags at once.

> **NOTICE**
> When using **Add/Delete Tag** or **Add/Delete Tag Block**, it is possible to enter the serial number manually. However, if the RFID reader detects any tag it will reset the digits to the serial number detected. Use this method only when no readable tags are in range.
>
> For best results when adding tags, either ensure that the tag you are adding is the only tag in range or enter the serial number manually.
>
> For best results when deleting tags, use **Delete By List**.

4. Return to the main menu, then scroll and select **Info** > **Tag List**. Scroll through the list to confirm that your tags were added or deleted correctly.

> **NOTICE**
> Returning to the main menu is required to save your changes. Reviewing the tag list is optional but recommended.

6. Use of the Machine

6.1. Turn Spot Station On and Off

Power to the Spot Station is controlled by the rotary disconnect handle located on the front of the Industrial Control Panel inside the enclosure.

Power switch for the Spot Station.

To power on the Spot Station, turn the rotary disconnect handle to the **ON** position.

To power off the Spot Station, turn the rotary disconnect handle to the **OFF** position.

NOTICE

It is not recommended to disconnect power from the Spot Station by unplugging the system under load.

The Spot Dock can be disconnected without turning off power to the Spot Station as a whole. Unplug the dock power cord from either the C13/C14 connector located on the back of the dock, or the NEMA receptacle located on the bottom of the Industrial Control Panel.

6.2. Spot Door Operation

The Spot door is capable of automatic or manual operation. The operating mode is determined by the mode switch on the Industrial Control Panel inside the enclosure.

Spot door operating controls on the Industrial Control Panel.

6.2.1. Automatic Operation

To operate the door in automatic mode, turn the mode switch to **AUTO**.

In automatic mode, the Spot door is controlled by proximity detection of any paired RFID tag and by differences in the voltage drawn by the Spot Dock when Spot docks or undocks.

The door will open when:

- The Spot Station's RFID reader detects a paired tag nearby, indicating that a Spot robot is approaching.
- Spot undocks from the Spot Dock, indicating that the robot is preparing to leave the station.

The door will close when:

- Spot docks at the Spot Dock and begins charging.
- No door-open command has been received for five minutes.

If a door-open command is received while the door is closing, the door will reverse direction and return to the fully open position.

NOTICE

The Spot Station does not communicate directly with Spot or modify Spot's normal behaviors for docking, navigation, or obstacle avoidance. Interactions between robots and the Spot Station are determined by Spot's normal behaviors as it attempts to navigate to and dock with a Spot Dock, and by the Spot Station's detection of the RFID tag affixed to the robot or the voltage drawn by the Spot Dock.

6.2.2. Manual Operation

To operate the Spot door manually, turn the mode switch to **HAND**. Then press and hold the **DOOR OPEN** or **DOOR CLOSE** button.

6.3. Troubleshooting

Troubleshooting may be required in the course of routine operation of the Spot Station.

Occasional interventions should be expected in order to clear faults with the Spot door (for example, in the rare event that the Spot robot falls while entering or exiting the station and blocks the door from closing) or to reset circuit breakers that have been tripped (for example, due to an electrical storm that affected the station).

6.3.1. Spot Door Faults

Spot door faults are caused by obstructions to the door or mechanical issues with the door-opening mechanism. These faults can usually be addressed without specialized tools or expertise.

6.3.1.1. Door Blocked

If the Spot door hits an obstruction while moving, the door will immediately stop moving and power will be removed from the door-opening mechanism. While the motor is de-energized, the door can be moved freely by hand.

- In **HAND** mode: The motor will remain de-energized until you reset it. Simultaneously press the **OPEN DOOR** and **CLOSE DOOR** buttons for 1 second to reset the door motor. You can also reset the door motor by turning the system off for 30 seconds.
- In **AUTO** mode: After a 2-second delay, the door motor will reset automatically and the door will move to the fully open position.

Once the door is open and has stopped moving, clear the obstruction and check for any damage to the door or the affected object.

6.3.1.2. Door Stuck

If the door-opening mechanism becomes stuck in a way that prevents operation, or the door motor fails to reset automatically after hitting an obstruction:

1. Power off the Spot Station.

2. Check the door mechanism for obstructions or damage.
3. After attempting to resolve the issue, switch the system to **HAND** mode and simultaneously press the **OPEN DOOR** and **CLOSE DOOR** buttons for 1 second to reset the door motor. You can also reset the door motor by switching the system to **HAND** mode and turning the system off for 30 seconds.

6.3.1.3. Door Fails to Respond to Docking Or Undocking

If the Spot door does not respond to Spot docking or undocking with the Spot dock, check that the dock power cable is connected to the receptacle on the bottom of the Spot Station electrical cabinet. The Spot Station can only detect voltage changes from this receptacle.

6.3.2. Circuit Breaker Faults

Circuit breaker faults are caused by issues with the station's electrical system and should be addressed by a qualified electrician.

6.3.2.1. Main Disconnect Trip

If the main disconnect CB0200 trips due to overload, short circuit, or any other reason, confirm with a qualified technician that it is safe to reset the main disconnect. If safe, turn the rotary disconnect handle to the **OFF** position, followed by the **ON** position.

WARNING

If the disconnect continues to trip, disconnect the power cord from the Spot Station and contact Boston Dynamics Support immediately. Do not attempt to use the Spot Station until it has been repaired.

6.3.2.2. Main Disconnect Instantaneous Trip

The Spot Station is equipped with ground fault protection. If the main disconnect CB0200 trips immediately after turning the rotary disconnect handle to the **ON** position there may be a ground fault condition present. Have a qualified technician resolve the ground fault condition and confirm that it is safe to reset the main disconnect. If safe, turn the rotary disconnect handle to the **OFF** position, followed by the **ON** position.

WARNING

If the disconnect continues to trip, disconnect the power cord from the Spot Station and contact Boston Dynamics Support immediately. Do not attempt to use the Spot Station until it has been repaired.

6.3.2.3. Miniature Circuit Breaker Trip

If any of the individual miniature circuit breakers located inside the Industrial Control Panel trip, confirm with a qualified technician that it is safe to reset the circuit breaker in question. If safe, re-enable the circuit by switching the circuit breaker to the **OFF** position, followed by the **ON** position.

WARNING

If the circuit breaker continues to trip, disconnect the power cord from the Spot Station and contact Boston Dynamics Support immediately. Do not attempt to use the Spot Station until it has been repaired.

7. Maintenance

7.1. Service and Repair

Do not attempt to service or repair Spot, the Spot Dock, or the Spot Station yourself. If errors or other issues persist during use of the station, your equipment may need attention from Boston Dynamics Support engineers. Include the following information when contacting Support:

- Spot serial number
- Spot Dock serial number
- Spot Station serial number
- Description of the issue

To contact Boston Dynamics Support, visit: https://support.bostondynamics.com/s/contactsupport

7.2. Clean and Maintain the Enclosure

To ensure safe and reliable operation of Spot and Spot Dock within the Spot Station, keep the interior of the enclosure free of excess dirt and debris. Take care not to dislodge power cords and HVAC tubing when sweeping or vacuuming.

7.3. Clean and Maintain the Spot Dock

REQUIRED READING

For instructions on cleaning and maintaining the Spot Dock, refer to *Spot Dock Instructions for Use* which is available for download from the Boston Dynamics Support Center at https://support.bostondynamics.com/s/spot/product-safety

7.4. Clean and Maintain the HVAC System

The HVAC system generally does not require maintenance unless the Spot Station is installed in an extremely dirty environment. In this case, the hot side heat sinks (outside the station) should be inspected regularly for build-up of dust or dirt. If a build-up is present, it can be removed using compressed air and a low-pressure stream of water.

WARNING

Always turn off power to the Spot Station and disconnect any power cords before performing cleaning or maintenance on the HVAC system.

To remove dust or dirt from the hot side heat sinks:

1. Turn off the main system disconnect located inside the Spot Station on the front of the Industrial Control Panel.
2. Unplug the Spot Station from power if a plug is present. Re-install any covers that may be present when the system is unplugged and move any disconnected cables away from the enclosure.
3. Dry dust and dirt can be removed using compressed air to blow out the heat sinks. Do not direct any high-pressure air at the fins.
4. The HVAC system is designed to allow for water to wash down the front of the hot side of the unit (outside the station). Never use water to clean the cold side (inside the station). A low-pressure stream of water can be used to carefully clean the hot side heat sink fins. Never direct high-pressure water at the fans or the join formed by the mounting flange, gasket, and enclosure. Never allow the cold side of the air conditioner to get wet.

Keeping the hot side heat sink fins free from any insulating build-up of dirt or dust will ensure long, trouble-free operation of the HVAC system.

7.5. Electrical Panel Access

To access the electrical panel:

1. Using the key provided in the accessory case or a flathead screwdriver, rotate the two locking bolts in the panel door a quarter turn counterclockwise.

2. Turn the rotary disconnect handle on the front of the Industrial Control Panel to the **OFF** position.
3. Pull gently on the rotary disconnect handle to open the panel door.

WARNING

Only a qualified electrician should access or modify the electrical panel. The only service a qualified electrician should perform is the resetting of miniature breakers.

If the Spot Station is not working properly, disconnect the power cord from the Spot Station and contact Boston Dynamics Support immediately. Do not attempt to use the Spot Station until it has been repaired.

8. Compliance Information

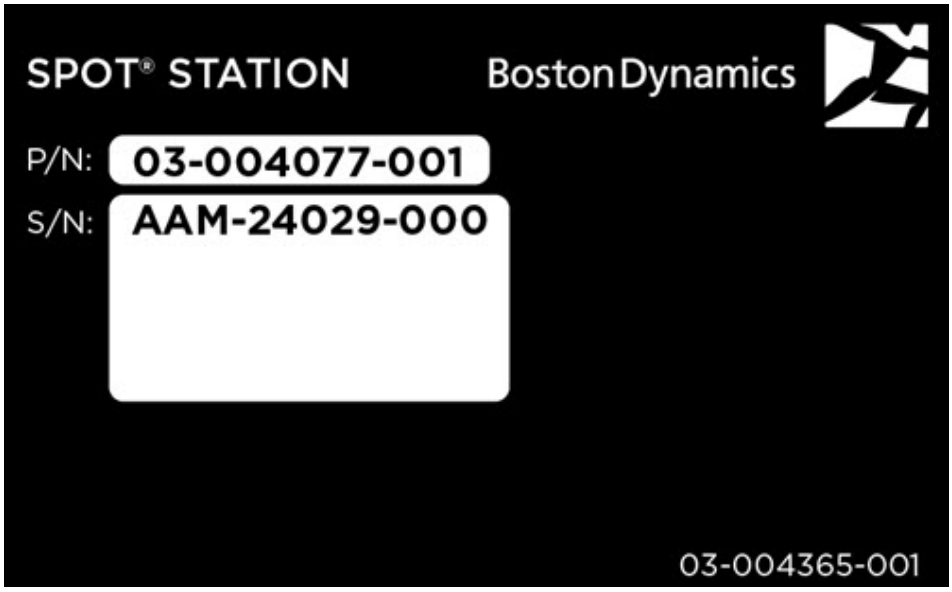
The Spot Station includes the following components, all of which are located inside the enclosure:

- UL Listed Electrical Control Panel
- FCC Part 68 Certified RFID reader system (FCC ID: 2AUVK-SLR12)

8.1. Labels

The following labels and nameplates appear on the Spot Station:

- *Product label* – Located on the electrical panel and on the rear exterior of the station near the power receptacle.
- *Manufacturer label* – Located on the inside of the maintenance door.
- *UL Listing label* – Located on the inside of the maintenance door.



Spot Station product label.

BostonDynamics

MANUFACTURED BY:
Advanced Automation LLC
27 Production Drive
Dover, NH 03820
UL File No. NITW.E517988
1 (844) 754-3292 / info@advautomation.us

SPOT DOCKING ENCLOSURE

Project	J24029	**Power**	200-240/120 VAC, 60Hz, NEMA L14-30
Customer	Boston Dynamics	**FLA (FLC)**	22 A
Issued	Dec-31-2024	**Largest Mtr. FLC**	1.8 A @ 75 VDC
PO		**SCCR**	5 kA
Serial No.	AAM-24029-000	**Main Disconnect**	CB0200 (30A MCCB)
Schematic	24029-400-000	**Type Rating**	Type 4
UL Listed	UL-508a Enclosed Industrial Control Panel	**Control Circuit**	18-20 AWG, MTW (<14 AWG, 2.1mm^2)
Operating Temp.	5°C - 40°C (41°F - 104°F) – Enclosure -30°C - 55°C (-22°F - 131°F) – System	**Field Wire**	75°C Cu Conductors Only

CIRCUIT SCHEDULE

MARK	DESCRIPTION	RATING	PN	VOLTAGE	PHASE		
CB0200	**MAIN DISCONNECT**	**30 A**	**GCB100S**	**240 VAC**	**X**	**X**	
CB0201	CHARGING DOCK	15 A, TRIP C	FAZ-C15	120 VAC		X	
CB0202	THERMO-ELECTRIC HEATING/COOLING	15 A, TRIP D	FAC-D15	240 VAC	X	X	
CB0203	SERVICE POWER	15 A, TRIP C	FAC-C15	120 VAC	X		
CB0204	DOOR CONTROL	5 A, TRIP D	FAZ-5D	120 VAC		X	
CB0205	CONTROL POWER	5A, TRIP D	FAZ-5D	240 VAC	X	X	

REMOTE CONTROL (COMMAND)		REMOTE MONITORING (STATUS)	
		TB 1 13.2/13.3	DOOR IS CURRENTLY DOWN
		TB 1 14.2/14.3	SPOT IS CURRENTLY DOCKED
		TB 1 15.2/15.3	CURRENT DOOR MODE

FIELD CONNECTIONS		TERMINAL TORQUE GUIDE	
J0204	SPOT CHARGER (C13/C14)	CB0200 (LINE)	6.0 N-M (53 IN-LBF)
J0403	SPOT CHARGER (RJ45)	OTHER	Ref. UL508A Table 54.1

Spot Station manufacturer label.