SPAN

SPAN® Panel

Installation Manual

Product specifications

All specifications and descriptions contained in this document are accurate at the time of publication. In the interest of product improvement, SPAN reserves the right to make product modifications at any time without advance notice.
For the latest SPAN product and installation documents, visit: www.span.io/tech-portal.
For errors or omissions, contact: support@span.io.
For complete product specifications and information on product listing and certification, refer to the Product Datasheet at www.span.io.
SPAN assumes no liability for injury or property damage due to installation or service attempted by unqualified individuals, or due to a failure of installers or service technicians to properly follow safety, installation, and service instructions.

Trademarks

The following are registered trademarks of SPAN in the United States.
SPAN, SPAN HOME, SPAN INSTALLER, SPAN DRIVE, SPAN Logo

Electronic device waste removal

Proper disposal of electronic equipment is required. Refer to local codes for disposal requirements. To arrange for proper disposal of this product, contact your local authorities or dealer for proper disposal requirements.

Warranty

To secure the full warranty term under the limited warranty for your SPAN Panel, you must complete the commissioning process in the SPAN Installer® App and create an account in the SPAN Home® App. For complete warranty information, please refer to the SPAN Panel Limited Warranty at www.span.io/panel-limited-warranty. If you would like to request a free copy of the limited warranty terms, please contact customer support at 415-286-5252.

Important safety instructions

SAVE THESE INSTRUCTIONS
Follow these instructions during installation, maintenance, and operation of the equipment. This section contains safety information that must be observed at all times when working on or using the equipment.
In case of fire or other emergency:

- If safe to do so, switch-off he main or upstream breaker for the Panel.
- Contact the fire department or other required emergency response team.
- Evacuate the area, and alert others in the area.
- In case of unusual noise, smell, or smoke:
  - Ensure nothing is in contact with the SPAN Panel or other equipment.
  - Ventilate the space.
- Contact your installer or SPAN Customer Support.

Symbols used

These symbols indicate important safety information in the documentation or on the equipment:

WARNING: Indicates a situation where failure to follow instructions or use proper materials may be a safety hazard that may result in serious injury, loss of life, or destruction of equipment. Use caution and do not proceed until the indicated conditions or required procedures are fully understood and met.

CAUTION: Indicates a situation where failure to follow instructions or use proper materials may be a safety hazard that may result in minor injury or damage to equipment. Do not proceed until the indicated conditions or required procedures are fully understood and met.

NOTE: Indicates an important step, or additional information that highlights best practices or procedures. Follow instructions carefully.

RISK OF ELECTRIC SHOCK: Indicates components that present risk of electric shock.

PROTECTIVE CONDUCTOR TERMINAL: Indicates location of grounding connection on the equipment.

REFER TO INSTRUCTIONS: Indicates that user should refer to operating or installation instructions before proceeding.

ATTENTION: Read all instructions and cautionary markings in this document and on the equipment before installing the SPAN Panel. Failure to do so may result in equipment damage, electric shock, serious injury, or loss of life. Any defect or loss of product functionality resulting from a failure to follow these instructions is excluded under the SPAN Panel Limited Warranty

All installations must conform to the laws, regulations, codes, and standards applicable in the jurisdiction of installation. Before starting an installation, consult a local building or electrical inspector for current requirements. Local codes may vary but are adopted and enforced to promote safe electrical installations. A permit may be needed to do electrical work, and some codes may require an inspection of the electrical work.

Jurisdiction	Code
United States	National Electrical Code (ANSI/NFPA 70)

General

WARNING: Risk of electric shock. Risk of fire. Only qualified electrical personnel should install, troubleshoot, service, or replace the equipment.
WARNING: Risk of electric shock. Apply appropriate personal protective equipment (PPE), and follow safe electrical work practices during installation and service. Turn off ll power supplying this equipment before working on or inside equipment. Always use a properly rated voltage sensing device to confirm power is off. Replace all devices, covers, and doors before turning on power to the equipment.
WARNING: To protect the equipment and its components from damage when transporting, handle with care. To help prevent damage, leave all equipment in its shipping packaging until it is ready to be installed.
WARNING: Inspect the equipment for damage before installing. Do not install the equipment if it has been damaged in any way.
WARNING: Do not insert foreign objects into any part of the equipment.
WARNING: Do not expose the equipment or any of its components to direct flame.
WARNING: Do not attempt to open, disassemble, repair, tamper with, or modify the equipment other than what is permitted in this manual. The equipment contains no user-serviceable parts other than field-installed circuit breakers. Contact the installer who installed the equipment for any repairs.
WARNING: Do not connect life-support systems, other medical equipment, or any other devices where product failure could lead to injury to persons, or loss of life to circuits that can be remotely switched on/off.
CAUTION: Do not use solvents to clean the equipment or expose the equipment to flammable or harsh chemicals or vapors. Do not allow petroleum-based paints, solvents, or sprays to contact nonmetallic parts of the equipment.
CAUTION: Do not use parts or accessories other than those specified for use with the equipment.

Installation and use

WARNING: Risk of electric shock. Risk of fire. Only use electrical system components approved for wet locations.
WARNING: Risk of electric shock. Risk of fire. Ensure that all wiring is correct, and that none of the wires are pinched or damaged.
WARNING: Risk of electric shock. Risk of fire. Before making any connections, verify that the circuit breaker(s) are in the 'off' position. Double-check all wiring before applying power.
WARNING: Risk of electric shock. Improper servicing of the equipment or its components may result in a risk of shock or fire. To reduce these risks, disconnect all wiring before attempting any maintenance or cleaning.
WARNING: Risk of electric shock. Always de-energize the equipment before servicing. While connectors are rated for disconnect under load, it is best practice to de-energize before disconnecting.
WARNING: Risk of electric shock. Do not use equipment in a manner not specified by the manufacturer. Doing so may cause damage to equipment, injury, or loss of life.
WARNING: Risk of electric shock. Do not modify the deadfront other than to remove filler plates as needed.
NOTE: The equipment is intended to operate with a connection to the internet. Failure to maintain an internet connection may impact performance.
NOTE: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by SPAN.IO could void the user's authority to operate the equipment.

Environmental Conditions

WARNING: This equipment is intended for operation in an environment having a minimum temperature of –30°C (–22°F) and a maximum temperature of 50°C (122°F).
WARNING: Install the equipment in a location that prevents damage from flooding. Ensure that no water sources are above or near the equipment, including downspouts, sprinklers, or faucets.

Contents

About your SPAN Panel

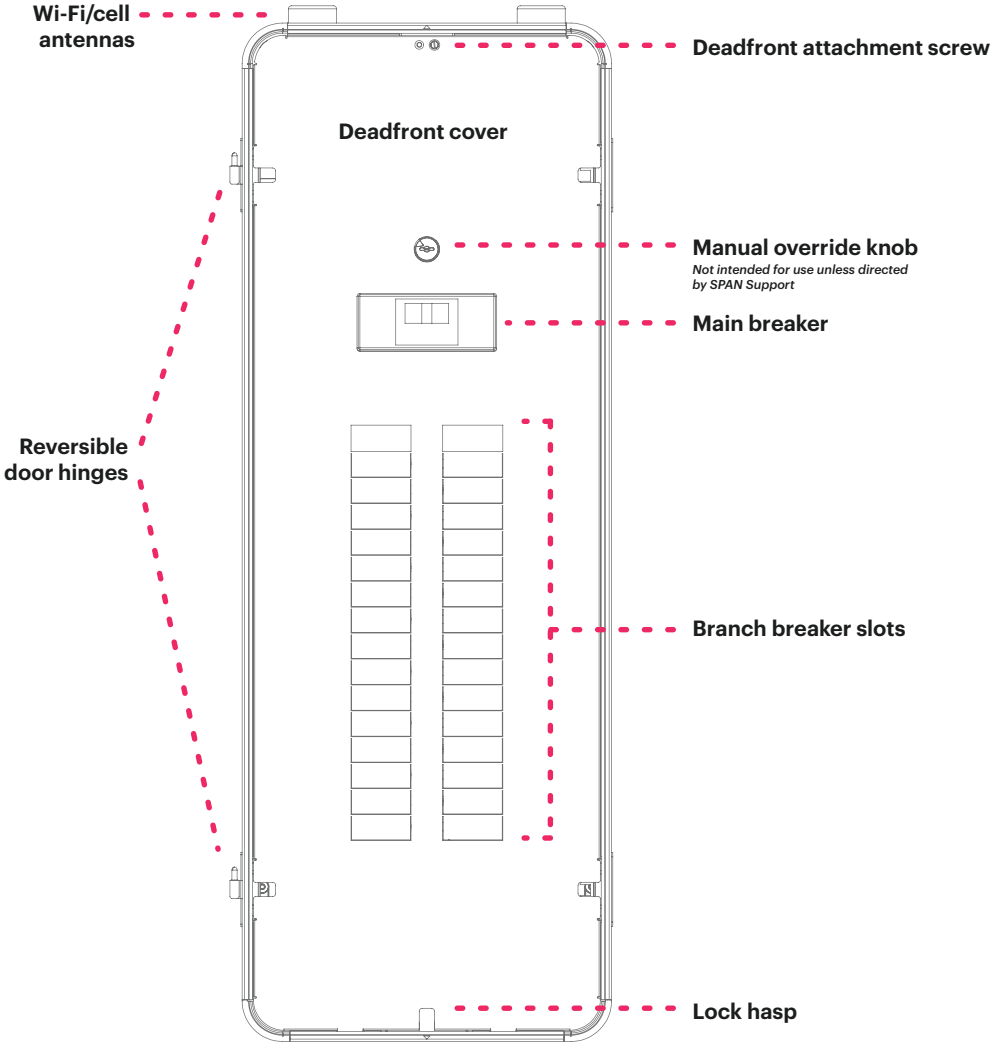
The SPAN Panel is an intelligent electrical panel with integrated connectivity, monitoring, and control for home loads, solar PV generation, energy storage, electric vehicle charging equipment, and the utility grid.

SPAN Panel is wall-mounted, and similar in size, weight, and configuration to traditional electrical panels, allowing it to be installed in place of a typical 120/240 VAC breaker panel using standard tools and materials.

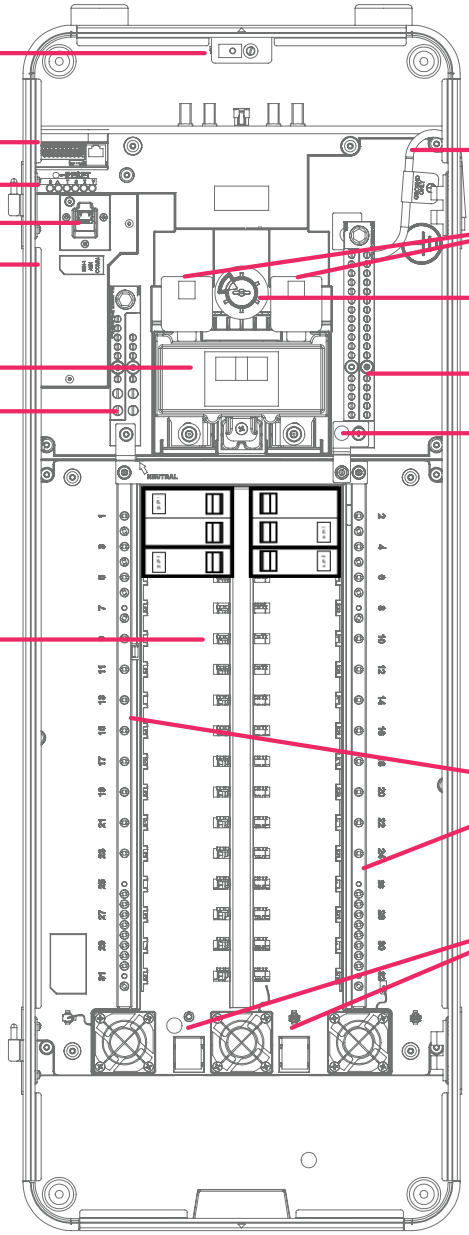
SPAN Panel installations can be designed to support the AC connections of both DC-coupled energy storage systems (where the solar generation and battery storage systems are managed by a single inverter) and AC-coupled systems (where the solar generation and battery storage systems each have their own inverter).

See **Backup System Connection Guide** for complete details.

SPAN Panel with door removed



SPAN Panel with door and deadfront removed



Preparing to install

01. Unpacking & inspecting the Panel

Inspect the packaging and SPAN Panel for damage. Ensure you have received the following components:

- SPAN Panel (with main bonding jumper pre-installed), metal deadfront and door (packaged separately)
- 'Getting Started' card (with instructions for homeowner to download SPAN Home® App)
- Breaker label schedule sheet

Accessories:

- Two (2) Square D service entrance barrier covers (pre-installed)
- Square D 200 A main breaker (pre-installed)
- Spare fastener kit

⚠ **WARNING:** If the unit is damaged in any way, do not proceed with the installation. Contact SPAN for further instructions.

02. Installation requirements

Internet connection

The SPAN Panel requires an internet connection to enable monitoring and control features, and to receive the latest software updates.
Commission the Panel using the SPAN Installer® App to establish communication with SPAN and register the Panel. Failure to do so will affect product performance.

SPAN recommends hardwiring Ethernet between the SPAN Panel and the customer's router in addition to using a Wi-Fi connection. Installers are recommended to carry a basic cable tester for field made Ethernet wiring to ensure a stable connection between SPAN Panel and the internet or SPAN Panel and select storage systems. Cellular LTE should only be relied on as a backup internet connection.

If Wi-Fi is the primary connection, test the network connectivity strength at the proposed installation location of the SPAN Panel before installing the Panel. The desired signal strength is -60 dB and higher, measured in RSSI, for good customer experience. On sites with weak Wi-Fi signal to the SPAN Panel, the following options are available for the Installer and customer:

- Use a dedicated hardwired ethernet cable to connect the SPAN Panel to the home router
- Use a Powerline Ethernet Adapter to create an Ethernet connection between the SPAN Panel and the home router
- Upgrade the home Wi-Fi router to a multi-band AC router. Additional non-overlapping access point channels may also be added to improve signal quality. SPAN Panels have low data transmission requirements and will perform better connected to 2.4 GHz bands.

Required equipment

- Branch circuit breakers for load and generation circuits. See Selecting breakers
- Main breaker (100-175 A) of Square D type QOM2 if applicable
- Conduit and fittings suited to the installation
- Four (4) #10 lag bolts or screws, 3 inch long (depending on attachment wall) for Panel mounting, and washers (for use between fasteners and enclosure)
- Conductors rated to minimum of 75°C (see table below and markings on breakers for acceptable wire gauge)
- Cable for communication signaling between the SPAN Panel and solar inverter(s) (minimum 300 V rated, twisted-pair, copper, 22–16 AWG, shielded for RS-485 signaling)

Personal protective equipment (PPE) should be worn by all persons at the installation site and properly rated for residential applications.

Required tools

- Torquing tools capable of 20–275 in-lbs (2.3–31.1 Nm)
- Allen bits (3/8-inch and 5/16-inch)
- Phillips, slotted, and square-drive driver
- Standard installation tools: knockout drill, wire cutters/strippers, multimeter, stud finder, level, tape measure, marker, and flashlight

⚠ **CAUTION:** Install only compatible circuit breakers, conductors, and other accessories. Failure to do so may affect safety and/or product performance.

ⓘ **NOTE:** Verify that the site mechanical, electrical, and clearance requirements outlined in this document and the product datasheet are compatible at the planned installation location.

ⓘ **NOTE:** NEMA 3R rated conduit fittings are required for outdoor installations.

ⓘ **NOTE:** For 22 kA short-circuit rating, branch breakers must be series-listed with the Square D main breaker. Otherwise, the Panel short-circuit rating is 10 kA.

03. Planning the install location

Electrical, mechanical, and environmental requirements

- The SPAN Panel is service entrance rated. When used as service equipment, primary overcurrent protection for the site is required in the form of an installed main breaker not to exceed 200 A.
- Verify that the wall construction is adequate to support the weight of the Panel. The installation should conform to applicable building codes.
- Consult a structural engineer and local standards for local mounting requirements.
- Best practice is to install the SPAN Panel out of direct sunlight, especially in hot climates and on south and west facing walls.

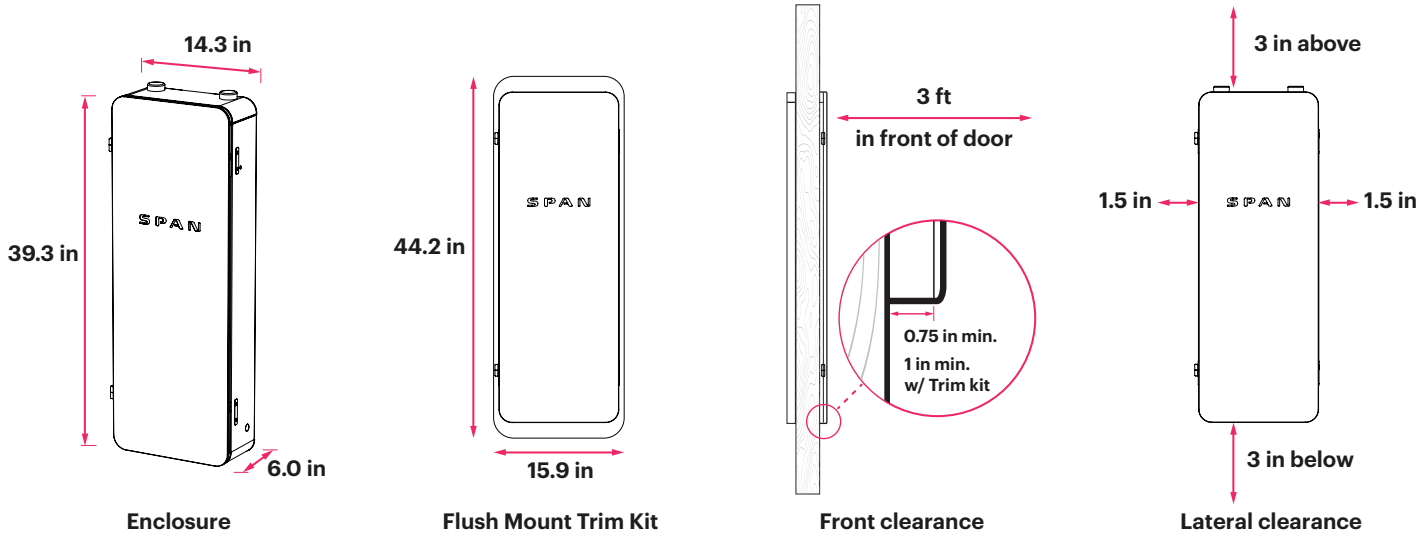
Element	Rating
Site electrical service	240/120 VAC, 60 Hz split-phase
Service feed	200 A maximum
Internal bussing	225 A maximum
Overcurrent protection (main breaker)	100 - 200 A
Location	Indoor or outdoor (NEMA 3R)
Max elevation	3000 m (9842 ft)
Ambient temperature	–22°F to 122°F (–30°C to 50°C)
Enclosure dimensions	998 x 362 x 153 mm (39.3 x 14.3 x 6.0 inch)
Flush Trim Kit dimensions (on wall)	1123 x 405 mm (44.2 x 15.9 inch)
Weight (without circuit breakers)	34 kg / 75 lbs (38 kg / 84 lbs fully populated with breakers)

⚠ **CAUTION:** Panels installed above 2000 m must be installed in ambient temperatures less than 104°F (40°C)

⚠ **CAUTION:** Follow all local codes and standards when planning for and installing the SPAN Panel.

⚠ **CAUTION:** Do not exceed Panel capacity. Ensure that the installation conforms to applicable code, and that appropriate overcurrent protection is in place.

ⓘ **NOTE:** SPAN Panel MUST NOT be installed in direct sunlight in areas exceeding 104°F (40°C).



Dimensions, clearances, and access

- Do not install the SPAN Panel near an emergency exit or other building evacuation route.
- Do not install the SPAN Panel in a location that would prevent its door from opening to 90° or place any objects near it that would restrict access to the unit.
- Do not mount objects on the wall within the minimum required clearances indicated above, with the exception of items required by the installation, such as electrical conduit or junction boxes.
- The SPAN Panel is intended to be wall-mounted between studs (2x4' or equivalent) with 16 inch spacing, using all (4) mounting points. It may be semi-flush mounted, where the Panel door face must extend at least 3/4 inch, or 1 inch if installed with Flush Mount Trim Kit, from the surface of the finished wall.
- Do not recess the SPAN Panel beyond the door hinges.

NOTE: The door may be configured to open from either direction. Ensure Panel door can swing open to 90° (minimum) per NEC.

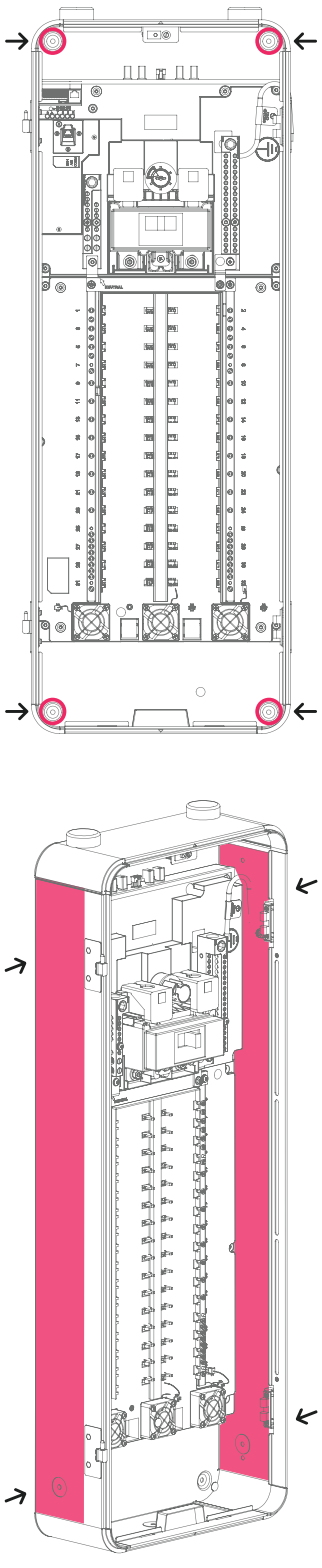
Accessories

The following accessories may be used with SPAN Panels:

See complete list at: **SPAN Recommended Accessories**

Part	Manufacturer part number
SPAN Flush Mount Trim Kit	SPAN PN: 1-01046
SPAN Networking Kit (for multi-Panel sites)	SPAN PN: 1-00921
Service entrance barrier cover	Square D PN: PKSB1HA
Filler plate for branch breaker knockouts	Square D PN: HOMFPCP
Add-on neutral / GND lugs (field-installed)	ILSCO NBST-2/0 Square D HOM100AN GE TLK20
Add-on GND bar kit (field-installed)	UL-recognized ground bars may be installed by tapping threaded holes in the SPAN Panel enclosure, according to NEC requirements.
Powerline Ethernet Adapter Kit	Recommended options: TP-Link AV2000, AV1000, AV600 or equivalent NETGEAR PLP2000 or equivalent

Installation



Wall-mounting points for surface-mount (top) and flush-mount (bottom)

01. Mounting the Panel

Remove the deadfront

- Using a flathead screwdriver, loosen the single deadfront fastener screw, and remove the deadfront cover.

Mount the unit

- Ensure the wall space can accommodate the flush section without interference from pipes or conductors inside the wall space.
- Using a drill and level, mount the SPAN Panel enclosure on the wall, observing site and mechanical requirements, and applicable building codes. Secure the unit at all four (4) mounting points.
- When semi-flush mounting, drill 1/4 inch pilot holes marked by interior markings of the panel. Install fasteners through the sidewalls to secure the Panel to the studs (as shown).

WARNING: Risk of electric shock. If you are replacing an existing electrical panel, make sure power is turned off efore removing the old panel, and when installing the SPAN Panel. Always make sure all electrical equipment is safely de-energized before beginning work.

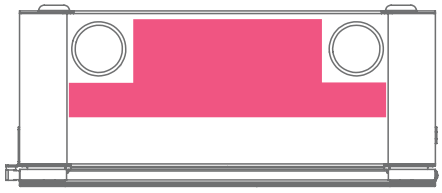
CAUTION: The unit must be installed within 10 degrees of vertical, and level from side-to-side.

CAUTION: The SPAN Panel enclosure and backplate must both be installed upright with the main breaker oriented at the top of the Panel. Do not install the unit upside down.

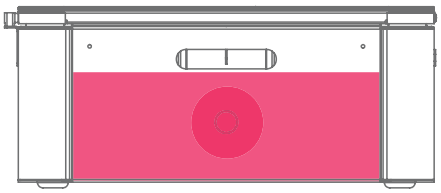
NOTE: Verify the wall's fire rating prior to mounting. Surface mount the SPAN Panel to comply with local building and fire codes where applicable.

Allowable conduit entry locations (shown in red) for part numbers 1-00800-11 and later

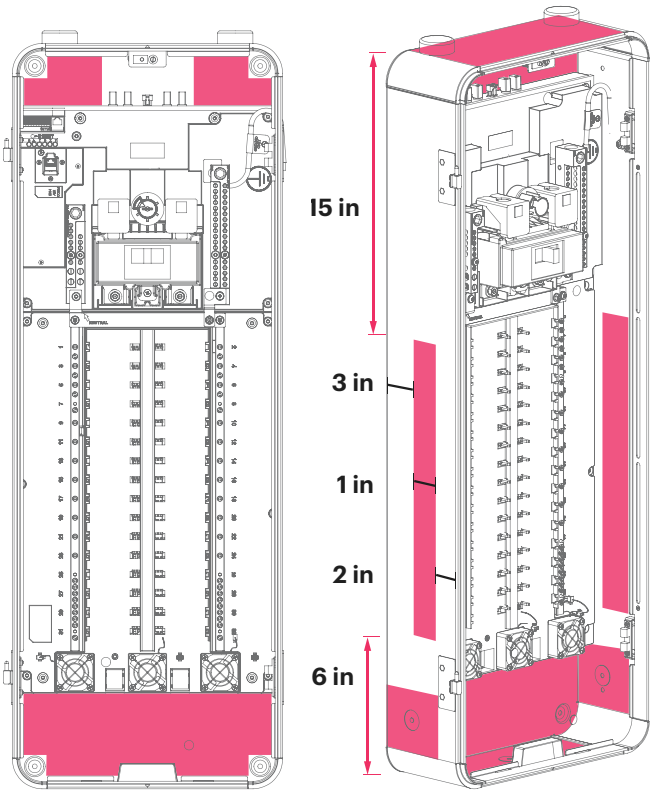
Top, surface-mount:
Myers hub recommended outdoors



Top, semi-flush mount:



Bottom: knockout expandable to 2.5”



Install conduit

- The SPAN Panel allows conduit entry through the top, bottom, lower sides, and rear section at specific locations of the Panel.
- Follow dimensioned clearance requirements on bottom of the page for enclosure side entries. Limit side entry conductor wires below the main breaker and above the backplate fans to a maximum of 10 AWG.
- Before making any conduit or cable penetrations, plan conduit routes, and corresponding knockout locations and sizes on the enclosure. The cross-sectional fill area available above the backplate is between 26.25 in^2 – 29.4 in^2.
- Refer to the **GEN2 SPAN Panel Drilling Template** for recommended knockout locations when conduit entry is through the top.

Be sure to allow adequate clearance for conduit routing and anchoring. Conduit installation must comply with applicable fill limits and electrical codes.

CAUTION: Do not make holes in any location on the enclosure that would allow moisture to enter the unit. Use proper weatherproofing conduit hubs when installing in wet/damp conditions.

CAUTION: Note the locations of antennas, backplate, enclosure interior lip, strip LEDs, and wires inside the Panel before cutting. Do not damage internal parts and wiring.

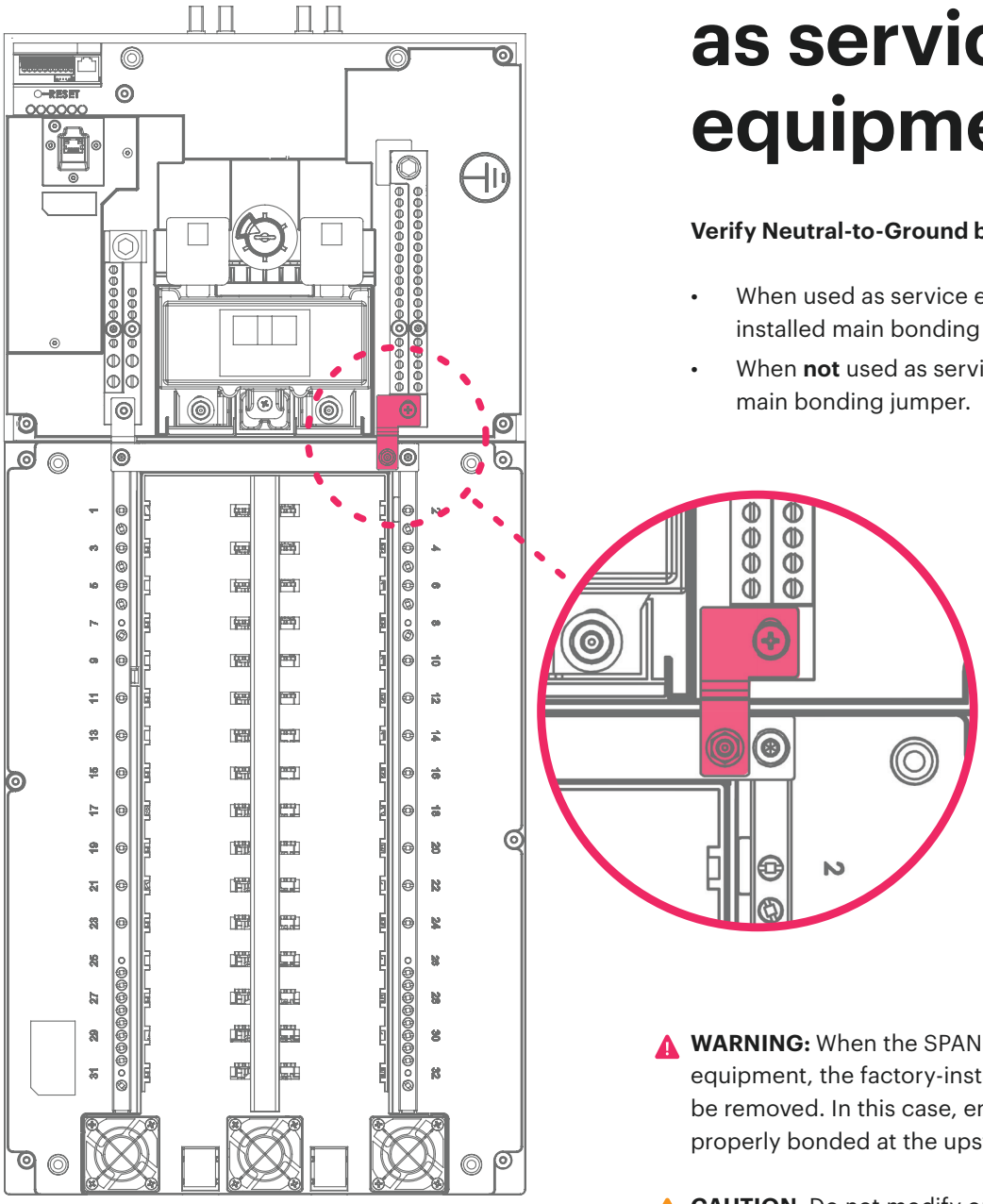
CAUTION: Follow guidance in NEC Chapter 3 and any local AHJ requirements for cable type selection. Consider exterior surface and flush-mounted installations as wet/damp conditions, and use proper wiring methods. When installed in wet/damp locations, conductors routed through the bottom face must be wet or damp rated.

NOTE: Ensure that any metal shards do not come into contact with internal parts that could be energized. Shield internal parts when drilling into the enclosure.

NOTE: Use care when drilling, and confirm that fittings are the correct size and rated for the correct installation environment for the installation location before proceeding.

NOTE: Part numbers 1-00800-10 and earlier are compatible with Square D A-Series threaded conduit hubs.

Location of bonding jumper in SPAN Panel



02. Using the Panel as service equipment

Verify Neutral-to-Ground bonding

- When used as service equipment, ensure the factory-installed main bonding jumper is securely in place.
- When **not** used as service equipment, remove the main bonding jumper.

WARNING: When the SPAN Panel is not installed as service equipment, the factory-installed main bonding jumper MUST be removed. In this case, ensure Neutral and Ground are properly bonded at the upstream service equipment.

CAUTION: Do not modify or rewire any factory-installed connections except the main bonding jumper.

NOTE: When the SPAN Panel is installed as service equipment, ensure the Panel's main breaker is appropriately labeled as "SERVICE / MAIN DISCONNECT."

03. Selecting breakers

- The SPAN Panel accepts a main breaker between 100 A and 200 A as identified below and up to 32 branch breakers in the Panel for load circuits.
- Install each branch breaker by rocking it down to seat it fully onto the busbar stab and engaging the clips that hold it in position. Ensure each breaker is firmly in place.

⚠ **CAUTION:** SPAN recommends the use of new circuit breakers in the SPAN Panel. Used circuit breakers may have wear or damage invisible to the installer that could cause failures during normal operation, such as a failure to safely interrupt a circuit under overload or damage to the SPAN Panel. Such damage is not covered under the SPAN Panel Limited Warranty.

⚠ **CAUTION:** Install only listed and labeled circuit breakers compatible with the SPAN Panel. Branch circuits must not exceed the load limits specified below.

Breakers Listed for Use

SPAN is multi-listed for use with 1-inch (2.54 cm) standard, tandem, AFCI, and GFCI branch circuit breakers from Siemens/Murray, Eaton, and Square D types listed in table below. See Appendix A for complete details on breaker compatibility and Short-Circuit Current Rating (SCCR).

⚠ **CAUTION:** Use only appropriately sized, compatible circuit breakers according to the type of load. Ensure breaker selection is in accordance with NEC, CEC, and local code articles for any field modifications. Additional or replacement breakers should be of the same manufacturer, type designation, and equal or greater interrupting rating.

⚠ **CAUTION:** Refer to the specific breaker location instructions for each grid-forming multimode inverter in the **Backup System Connection Guide**. Multimode inverter breaker(s) must be connected to the position(s) indicated for the system to operate as intended.

Load type	Maximum load
General use	90 A
Full load inductive / motor amps	60 A
Locked rotor inductive / motor amps	270 A

Branch circuit breakers (including AFCI/GFCI)	Main circuit breaker
• Square D type HOM, HOMT • Eaton type BR, BD, BQ • Siemens/Murray type QP, QT	Square D QOM2 type: • 100 A QOM2100VH • 125 A QOM2125VH • 150 A QOM2150VH • 175 A QOM2175VH • 200 A QOM2200VH

ⓘ **NOTE:** SPAN Panels manufactured with Serial Number (SN) xx-2223-xxxxx (middle 4 digits) and higher are not compatible with any plug-on neutral style branch circuit breakers. When AFCI/GFCI branch breakers are required, a pigtail neutral breaker style must be installed with the neutral pigtail wire connected to the Panel's neutral wiring terminal bar.

Installing a main breaker

The SPAN Panel must have a main breaker installed (see above list of compatible main breakers). Main breakers may be field-installed according to this manual.

To remove:

- Remove the two (2) L1/L2 fastening nuts using a 7/16-inch hex socket.
- Remove the fastening screw using a #2 Philips bit.
- Slide the main breaker downwards.

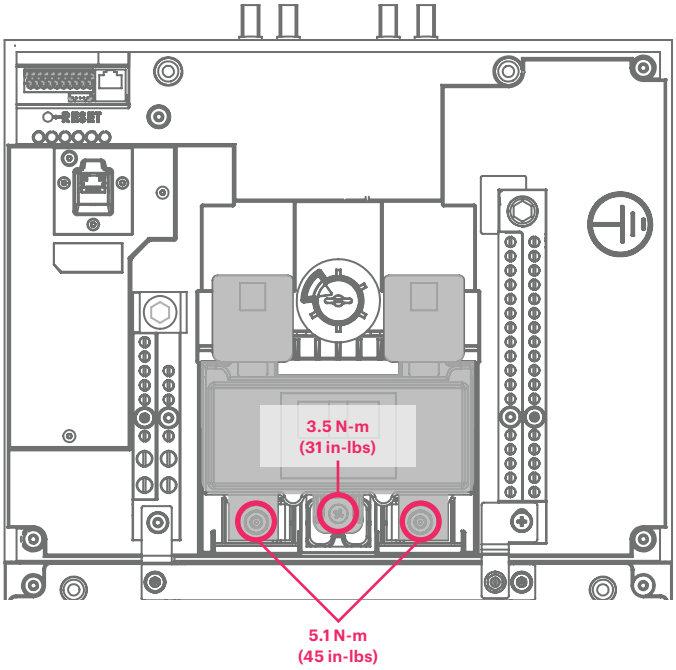
To install:

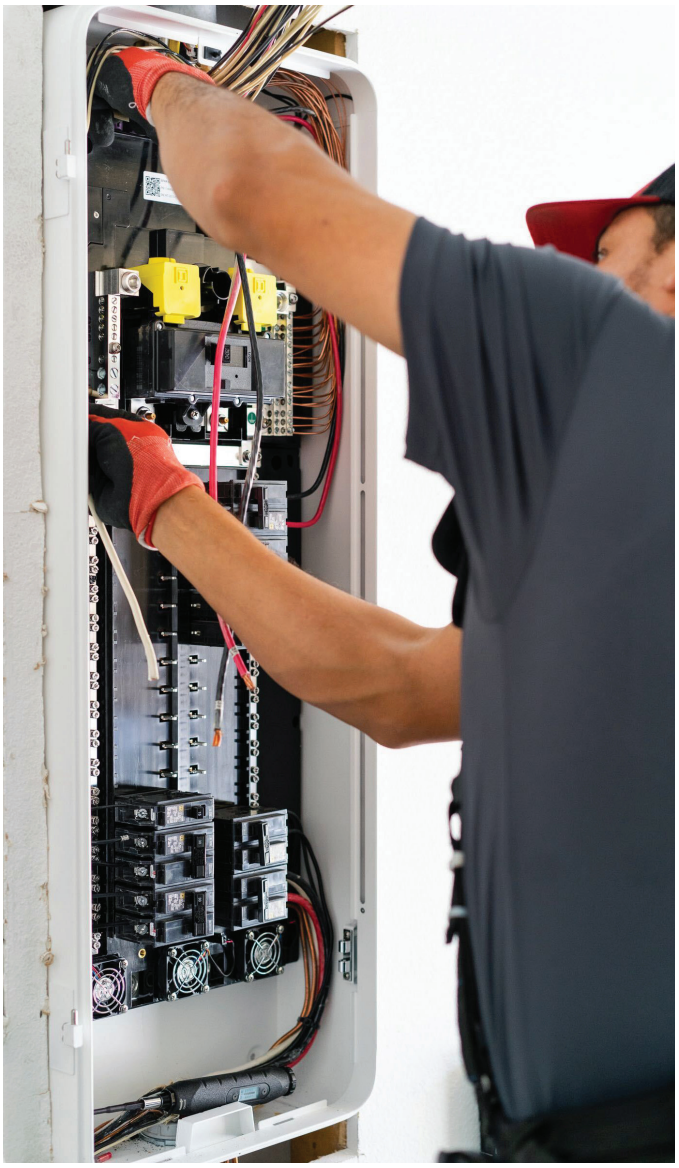
- Insert the main breaker as shown to right.
- Install the one (1) Phillips #2 fastening screw, torquing to 31 in-lbs (3.5 N-m).
- Install the two (2) fastening nuts and washers, torquing to 45 in-lbs (5.1 N-m) using a 7/16-inch hex socket.

CAUTION: Maximum current rating of the main breaker and main lug configuration is 200 A. Bussing is rated to 225 A.

NOTE: Use a torque tool to avoid over-torquing the main breaker fasteners.

Fastener torques for main breaker





04.
Wiring the Panel

Size all conductors with reference to the overcurrent protection device, ampacity, and voltage drop requirements in accordance with all local electrical codes.

- Use conductors rated to a minimum of 75°C.
- Connect supply-side Line 1 and Line 2 conductors to the main breaker terminals.
- Connect supply Neutral and Ground conductors to their respective terminal blocks.
- Refer to the next page for suitable conductor gauges and torque requirements.
- SPAN feed-through lugs are rated to 200 A max.

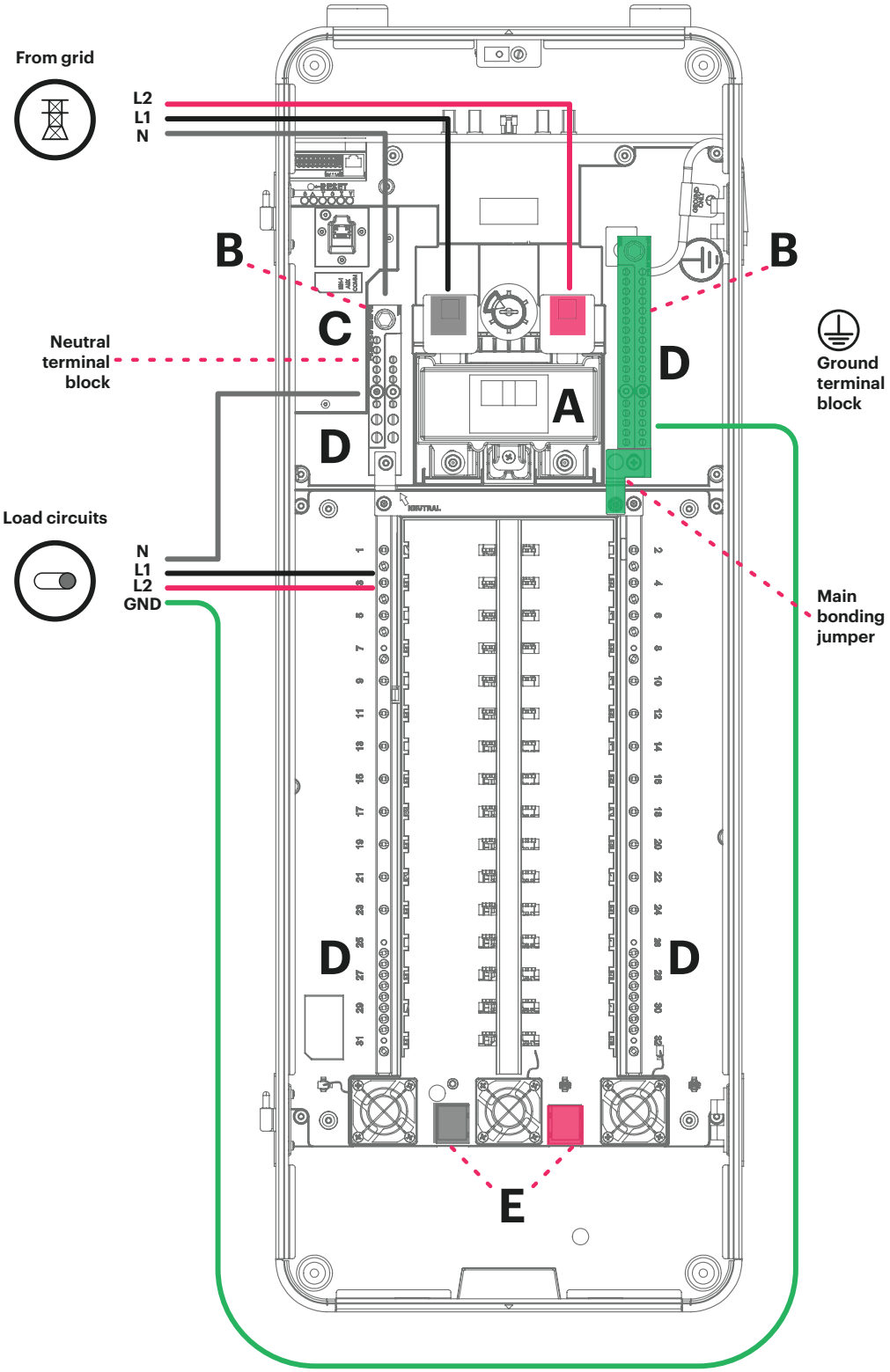
WARNING: Risk of electric shock. Check that all circuits are de-energized before making any connections, including generation equipment such as solar inverters and storage batteries.

CAUTION: The SPAN Panel is only intended for use on 120/240 VAC split-phase electrical service.

- Incoming supply-side Line 1 and Line 2 conductors must be connected to the main breaker lugs. Do not power the Panel through its branch breakers or feed-through lugs.
- Connect Line conductors for all circuits to the respective breaker.
- Connect Neutral and Ground conductors to their respective wire terminals.
- Once all conductors are connected and secured, check that there are no exposed conductors or stray wires.
- Clean up conductor routing to ensure no wires will be pinched when re-assembling deadfront assembly.

NOTE: Keep track of circuit labeling. This information will be required during commissioning.

Terminal wire gauge, strip lengths, and torque values



A

Main breaker

See instructions on breaker
#6 AWG - 250 kcmil
1.25 inch (32 mm)
3/8-inch hex
250 in-lbs (28.2 nm)

B

Main Neutral & Main GND terminal

#6 AWG - 250 kcmil
1.25 inch (32 mm)
3/8-inch hex
250 in-lbs (28.2 nm)

C

Larger Neutral terminals

#14 AWG - 1/0
0.75 inch (20 mm)
5 mm slotted
35 (4.0) for #14-10 AWG 40 (4.5) for #8 AWG
45 (5.1) for #6-4 AWG
50 (5.6) for #3-1/0 AWG

D

Smaller Neutral terminals & GND terminal block

#14 AWG - 4
0.5 inch (12 mm)
5 mm slotted
20 (2.3) for #14-10 AWG 25 (2.8) for #8 AWG
35 (4.0) for #6-4 AWG

E

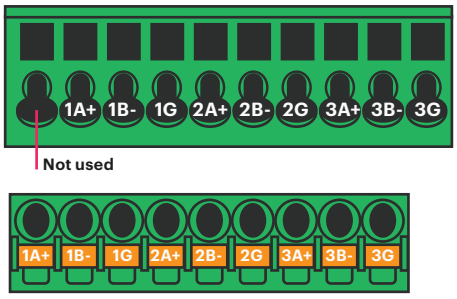
Feed-through lugs (L1/L2)

#6 AWG - 250 kcmil
1.25 inch (32 mm)
5/16-inch hex
250 - 275 in-lbs (28.2 - 31.1 nm)

NOTE: Torque circuit breaker terminals to values specified on the breakers.

NOTE: Terminals integral to the SPAN Panel are suitable for 60/75ºC AL/CU wire. Refer to circuit breaker markings for breaker terminals' temperature rating.

05. Communication wiring



RS-485

24–16 AWG
Strip 0.28 in (7 mm)
Max 328 ft (100 m)

ETH-0

Ethernet

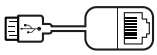
CAT5 / CAT6
Max 328 ft (100 m)

Located to the right of RS-485 ports

ETH-1

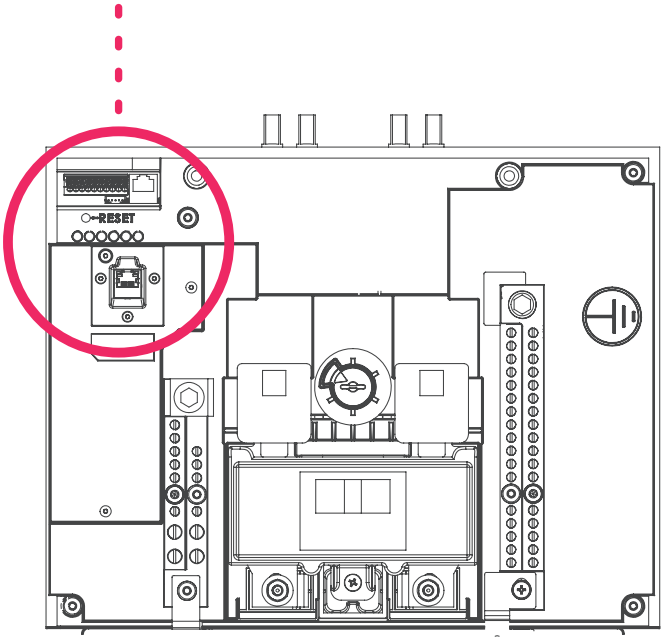
Aux Comms

RJ45 Port for CAT5 / CAT6 on SPAN Panels
PN 1-00800-09 and higher



for micro-USB to RJ45 dongle on SPAN Panels
PN 1-00800-08 and lower

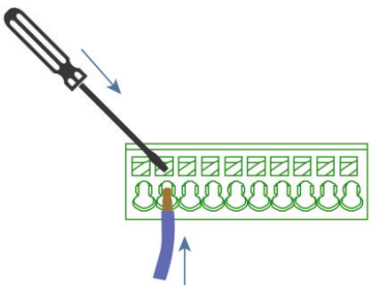
Located below RS-485 and ETH-0 ports



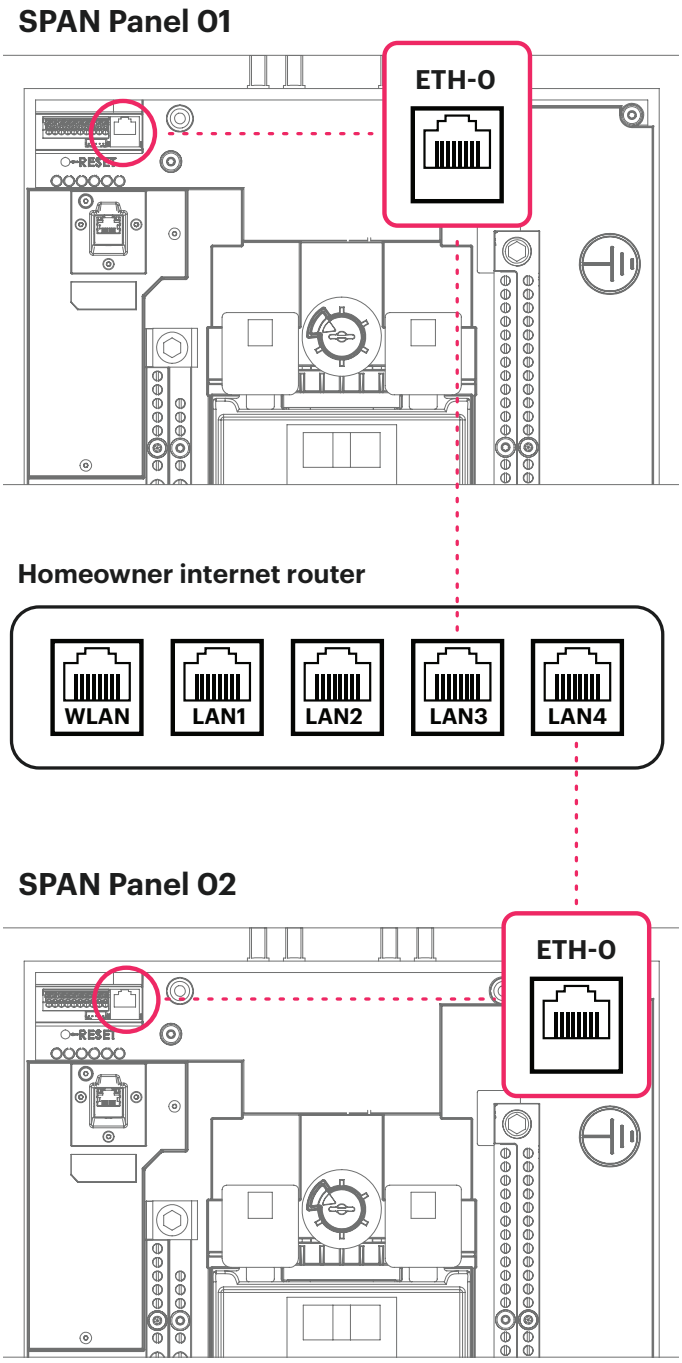
- Use minimum 300 V rated, twisted-pair, copper conductors only for inter-devices signal wiring. Use shielded cables for RS-485 signaling.
- Connecting the SPAN Panel to the internet with a wired Ethernet cable is strongly recommended.
- There are two variations of the RS-485 terminal: a 10-position fixed version, and a 9-position pluggable version. See below for wiring details.

To insert wiring into the fixed RS-485 terminal, use a 2 mm flathead driver to depress the green tab while inserting the stripped wire (see image below for reference).

To insert wiring into the pluggable RS-485 terminal, remove the connector and use a 2 mm flathead driver or a wire stripper to depress the orange tab while inserting the stripped wire.



NOTE: SPAN Panels P/N 01-00800-09 and higher have a dedicated Ethernet port (ETH-1) for Aux Comms. A USB-Ethernet dongle (P/N: 3-01008) for Aux Comms is only required for SPAN Panels P/N 01-00800-08 and lower.



NOTE: For best homeowner experience, dedicate an Ethernet hardwire between each SPAN Panel ETH-0 port and the homeowner's internet router.

NOTE: The homeowner's email address will need to be inputted for every SPAN Panel that is commissioned.

NOTE: Homeowners will only receive one email to access the SPAN Home App.

Linking multiple SPAN Panels

SPAN recommends hardwiring Ethernet between each SPAN Panel's ETH-0 port and the customer's router in addition to using a Wi-Fi signal.

Series Panels:

- Each Panel must be commissioned independently by scanning the Panels' QR codes in the SPAN Installer App.
- Record in the SPAN Installer App any Panels which are installed downstream of another SPAN Panel, and note the upstream Panel serial number.
- Battery backup must be connected only to the primary SPAN Panel; not to downstream SPAN sub-Panels.
- SPAN sub-Panels must be commissioned in the "Panel Only" configuration.

Parallel and multi-home Panels:

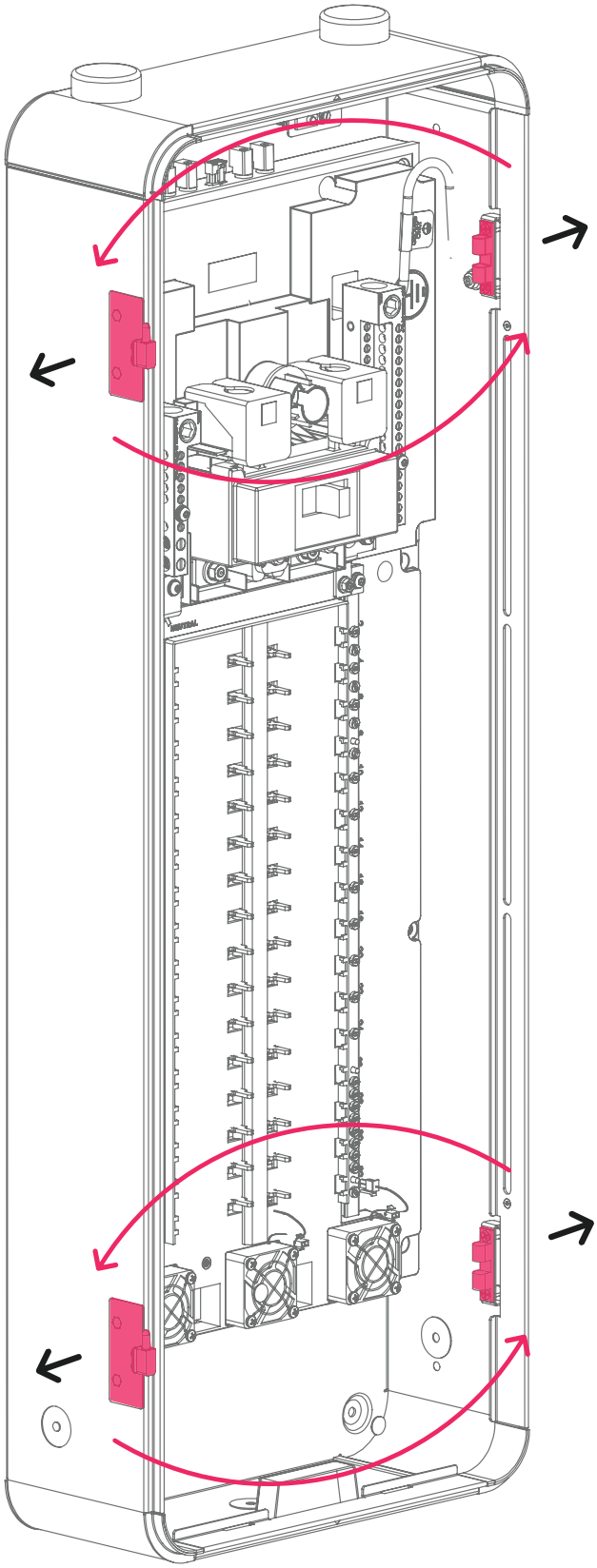
- Each Panel must be commissioned independently by scanning the Panels' QR codes in the Installer App.
- A single battery backup system can be connected to only one SPAN Panel.
- Power and energy cannot be shared in Off-grid Mode in this configuration.

Optional SPAN Networking Kit

A SPAN Networking Kit (see **SPAN Accessories**) may be installed to connect multiple SPAN Panels together.

- The SPAN Networking Kit can simply running multiple Ethernet connections for each SPAN Panel to the homeowner's router.
- Refer to the **Networking Kit Application Note** for installation guidance and best use cases.
- Up to four (4) SPAN Panels can be linked with one SPAN Networking Kit.

Swapping door-mounting hardware



06. Configuring the door-swing direction

To configure the door to open from the other direction:

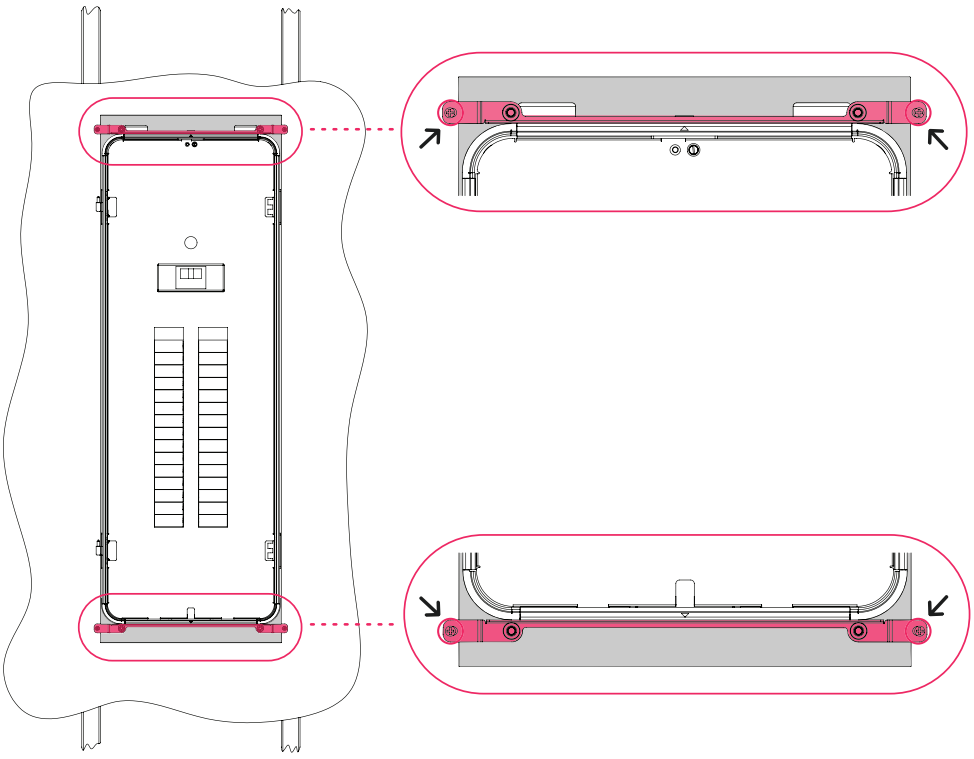
- Using a #2 Phillips driver, remove the two (2) hinge brackets and two (2) latch brackets from the enclosure.
- Re-install the hinge and latch brackets on the desired side, tightening each screw (two per bracket) and torque to 26.5 in-lbs (3 Nm).
- On the inside of the door, remove and swap the mating hinge and latch hardware, and re-install and torque to 26.5 in-lbs (3 Nm).

07. Installing the Flush Mount Trim Kit

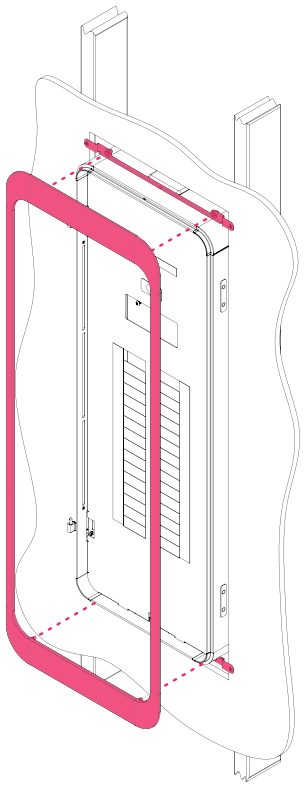
The Flush Mount Trim Kit (PN: 1-01046) is used for indoor SPAN Panel installs to easily cover square holes cut into the wall during installation. The overall dimensions when mounted are 1123 x 405 mm (44.2 x 15.9 in).

- Place the two (2) metal Trim Mounting Brackets directly against the SPAN Panel's top and bottom faces, using the triangular decals to center.
- Affix the upper and lower Trim Mounting Brackets to the wall or stud using four (4) mounting screws.
- Snap the Trim Piece in place, ensuring all four mounting sockets are fully engaged.

Installing trim mounting brackets



Snapping trim piece in place



08. Finishing installation & closing the unit

- Confirm that all connections are correct, properly grounded, and secure.
- Replace the deadfront and secure using the flathead screw.
- Install the door by sliding down onto the hinges.
- Only after fully replacing the deadfront assembly, restore power.
- Lock the Panel closed with the hasp at the bottom of the Panel door using a lock provided by the homeowner.

WARNING: Risk of electric shock. Do not modify the deadfront other than to configure the door hinges, or to remove or replace breaker filler plates, as needed.

09. Commissioning

The Panel must be configured with the SPAN Installer App prior to use. Download the SPAN Installer App from **www.span.io/span-apps**

Follow the on-screen instructions. When prompted to connect to the Panel, refer to the Panel Serial Number located on the product label inside of the door.

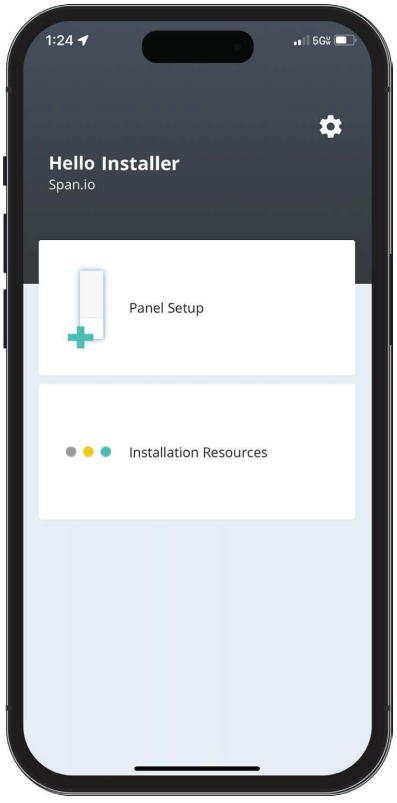
NOTE: When SPAN's relays open/close, they will sound like a digital camera taking a photo. When SPAN transitions on or off-grid, several relays may open/close at once, which sounds like a digital camera taking multiple photos; this is normal.

NOTE: Ensure the labeled Serial Number inside of the Panel door matches the Serial Number on the Panel backplate without the deadfront on.

SPAN Installer App

Download on the App Store

GET IT ON Google Play



Troubleshooting & servicing

For additional troubleshooting and support, visit **support.span.io**

Communication with the SPAN Panel

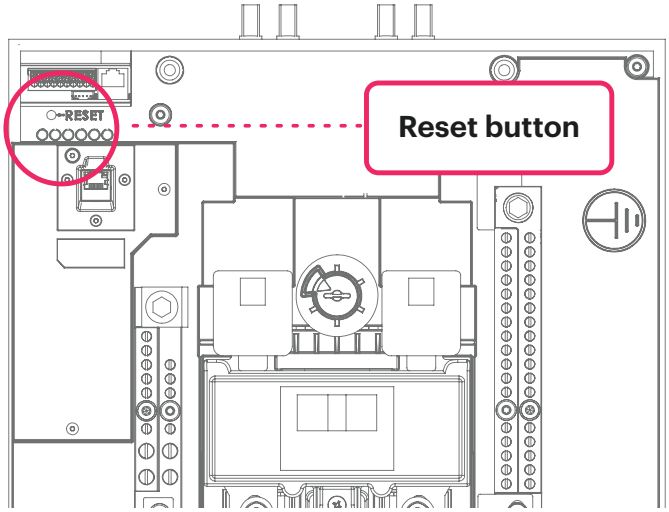
Follow these troubleshooting steps to establish communication and verify operation of the SPAN Installer App:

- Wait at least three (3) minutes after powering-on before attempting to connect to the Panel.
- Ensure the Panel is connected to the internet using the SPAN Installer App.
- Ensure external hardware systems such as battery backup, SPAN Drive®, SPAN Remote Meter™ Kit are communicating with the SPAN Panel using the SPAN Installer App, if applicable.
- Ensure all circuits and circuit locations are correctly identified in the SPAN Installer App.
- To restart the system, press and hold the Reset button for 10 seconds (see "Resetting the system" below).

⚠ **WARNING:** Do not attempt to open, disassemble, repair, tamper with, or modify the equipment. The equipment contains no user-serviceable parts other than field-installed breakers. Contact the installer who installed the equipment for any repairs. Only qualified electrical personnel should remove the deadfront panel.

Status LEDs

Indication	Label	LED Color	LED State	Note
Main power	U_{M}	Green	Solid	Main PCBA powered
		Off	Off	No AC power to Panel
Warning	⚠	Green	Solid	Fault: Hybrid inverter automatically disconnected from main bussing.
		Off	Off	Normal operation
Grid status		Green	Solid	Grid voltage detected
		Off	Off	Grid voltage not detected
Gateway power	U_{G}	Green	Solid	Gateway PCBA powered
		Off	Off	No power to Gateway PCBA
Future use	**X**			—
Future use	**Y**			—



Resetting the system

If it becomes necessary to restart the system, use a small tool to press the Reset button, located below the communication terminals. Hold the button for 10 full seconds before releasing.

Overriding the grid disconnect relay

If it is necessary to manually reconnect your home to the grid, SPAN Support may direct you to operate the manual override in the SPAN Panel.

- To reconnect to the grid manually, peel away the protective label, insert a large flathead screwdriver, and turn counterclockwise until you hear a click.

⚠ **CAUTION:** Do not remove the protective label or operate the manual override unless directed to do so by SPAN Support. Improper operation of the manual override may damage the unit.

Adding, removing, or changing branch circuit breakers

Branch circuit position numbers are labeled adjacent to the breaker. A specific space location can be associated with the physical circuit position in the SPAN Panel by viewing the space in either the SPAN Installer App or SPAN Home App. To add, remove, or change branch circuit breakers:

- Follow instructions in this manual to select, install, and wire circuit breakers.
- Use the SPAN Installer App to make changes to the branch breakers, following on screen instructions.

Homeowners should be instructed to contact SPAN Support for any future branch breaker additions, removals, or changes.

⚠ **CAUTION:** To perform routine service or maintenance on circuits, confirm that the corresponding circuit breakers are switched off. Powering-down circuits using the SPAN internal relays should not be considered a suitable ‘off’ position for servicing equipment.

Appendix A
Circuit breaker compatibility

SPAN has been evaluated per the UL Standard for Panelboards for use with the branch breaker types below in Table A.1.

Informational notes:

- National Electric Code (NFPA 70) does not prohibit the use of different branch circuit breakers in panelboards provided it does not violate the listing of any equipment. NEC article 110.3(B) states "Equipment that is listed, labeled, or both shall be installed and used in accordance with any instructions included in the listing or labeling."
- The Standard for Molded-Case Circuit Breakers (UL 489) does not require listing circuit breakers for use in specific panels, nor does this standard cover panelboards. Such testing is covered by the UL Standard for Panelboards (UL 67), which does require the panelboard to be listed with specific breaker types. SPAN is certified to the UL 67 Standard via a Nationally Recognized Testing Lab (NRTL) for use with the branch circuit breakers below. This is reflected in this installation information as well as marked on the product itself.

For more information, visit
support.span.io

Specified main breaker

Interrupt amps rating	Amp ratings	Manufacturer	Catalog Numbers
22,000	100 to 200	Square D	QOM2100VH, QOM2125VH, QOM2150VH, QOM2175VH, QOM2200VH

Compatible branch breakers are listed on following pages

Specified branch breakers

Manufacturer	Style	Type	Poles	Max amp	Catalog numbers
Eaton	General	Br	1, 2	90	BR or BRH followed by 110 to 290
	Duplex (tandem)	BD	1	50	BD followed by 1010 to 5050
	Quadplex (tandem)	BQ and BQC	1, 2	50	BQ followed by 215215 to 2502120
	Combination arc fault circuit interrupter (AFCI)	BR	1, 2	20	BRN, BRC, or BRL followed by 110 to 120; followed by AF or CAF
	Ground fault circuit interrupter (GFCI)	GFTCB and GFEP	1, 2	60	BRN, GFTCB, BRHN, or GFTCBH followed by 110 to 260; may be followed by GF
	Ground fault equipment protection	GFEP	1, 2	50	BRN or GFEP followed by 115 to 250; may be followed by EP
	Dual function combination ground fault and arc-fault protection	BR	1	20	BRN or BRAFGF followed by 110 to 120; may be followed by DF
Murray	General	MP-T	1, 2	90	MP or MPH followed by 110 to 290; may be followed by KH
	Duplex (tandem)	MH-T	1	30	MP followed by 1010 to 3030; may be followed by N
	Triplex (tandem)	MH-T	1, 2	30	MP followed by 21010 to 25020
	Quadplex (tandem)	MH-T	2	40	MP followed by 21515 to 24040; followed by CT2
	Branch-feeder arc fault circuit interrupter	MP-AT2	1, 2	20	MPA followed by 115 to 120; followed by AF; may be followed by H
	Combination arc fault circuit interrupter (AFCI)	MP-AT2	1, 2	20	MP or MPA followed by 110 to 220; followed by AFC; may be followed by H
	Ground fault circuit interrupter (GFCI)	MP-GT	1, 2	60	MP followed by 110 to 260; followed by GFA; may be followed by H
	Dual function combination ground fault and arc-fault protection	MP-GAT2	1	20	MP followed by 110 to 220; followed by DF; may be followed by H

Specified branch breakers

Manufacturer	Style	Type	Poles	Max amp	Catalog numbers
Siemens	General	QP	1, 2	90	Q followed by 110 to 290; may be followed by H
	Duplex (tandem)	QT	1	30	Q followed by 1010 to 3030 may be followed by NC
	Triplex (tandem)	QT	1, 2	30	Q followed by 21010 to 23030; followed by CT
	Quadplex (tandem)	QT	2	40	Q followed by 21515 to 24040; followed by CT2
	Branch-feeder arc fault circuit interrupter	QAF2	1, 2	20	QA followed by 115 to 120; followed by AF; may be followed by H
	Combination arc fault circuit interrupter (AFCI)	QAF and QAF2	1, 2	20	Q or QA followed by 110 to 220; followed by AFC; may be followed by H
	Tandem combination arc-fault circuit interrupter (AFCI)	CAFCI	1	20	Q followed by 1010 to 2020; followed by AFC
	Ground fault circuit interrupter (GFCI)	QPF and QPF2	1, 2	60	QF followed by 110 to 260; followed by A; may be followed by H
	Ground fault equipment protection	QE	1, 2	60	QE followed by 115 to 260; may be followed by H
	Dual function combination ground fault and arc-fault protection	QFGA2	1	20	Q followed by 110 to 120; followed by DF; may be followed by H
Square D (Homeline)*	General	HOM	1, 2	90	HOM followed by 110 to 290
	Tandem (duplex)	HOMT	1	30	HOMT followed by 1010 to 3020
	Quad (tandem)	HOMT	1, 2 2	50 50	HOMT followed by 1515215 to 2020250 HOMT followed by 215215 to 230250
	Combination arc fault circuit interrupter (AFCI)*	HOM-CAFI	2	50	HOM followed by 110 to 220; followed by CAFI
	Ground fault circuit interrupter (GFCI)*	HOM-GFI	1, 2	20	HOM followed by 110 to 250; followed by GFI
	Ground fault equipment protection	HOM-EPD	1, 2	50	HOM followed by 115 to 250; followed by EPD
	Dual function combination ground fault and arc-fault protection*	HOM-DF	1	20	HOM followed by 110 to 120; followed by DF

* SPAN Panels manufactured with Serial Number (SN) xx-2223-xxxxx (middle 4 digits) and higher are not compatible with plug-on neutral style branch circuit breakers, and pigtail neutral breaker styles must be installed. SPAN Panels with Serial Number (SN) xx-2222-xxxxx (middle 4 digits) and lower are compatible with SquareD Homeline plug-on neutral, as indicated by catalog numbers:

- HOM followed by 110 to 220; followed by P; followed by CAFI.
- HOM followed by 110 to 250; followed by P; followed by GFI.
- HOM followed by 110 to 120; followed by P; followed by DF.

Appendix B
Surge protective device compatibility

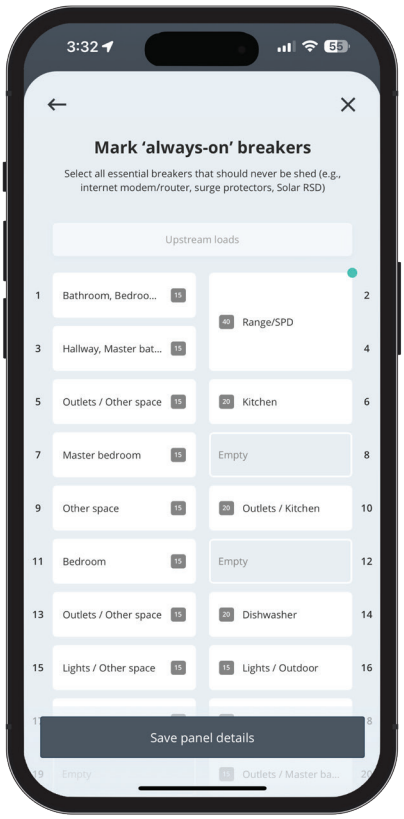
Per 2020 NEC 230.67 Surge Protection

- A surge protective device (SPD) shall be installed in all new and replacement services supplying dwelling units.
- Shall be Type 1 or Type 2 SPD.
- Shall be attached to the service equipment or immediately adjacent. Exception: The SPD shall not be required to be in the service equipment if located at each next level distribution equipment downstream toward the load.

SPAN is compatible with virtually any standard SPD connected to a 2-pole breaker or installed on a 2-space slot in equivalent Square D HOM, Eaton BR, or Siemens/Murray QP/MP panelboards.

- When installing an SPD, mark it as an always-on breaker in the SPAN Installer App under Circuit Labeling, depicted to right.
- If using an SPD with usable circuits, be sure to only have essential items on those circuits (e.g., internet router, alarms, fire detection). Homeowners will not be able to turn this circuit off ia the SPAN Home App.

Setting to follow when using an SPD in SPAN



When using an SPD with usable circuits, the two circuits should be used for something essential (e.g. internet router, alarms, fire detection, etc.). Homeowners will not be able to turn this circuit off ia the SPAN Home App.

Appendix C
SPAN PowerUp™

SPAN PowerUp™ prevents the Panel's over-current protection device from tripping during high current events.

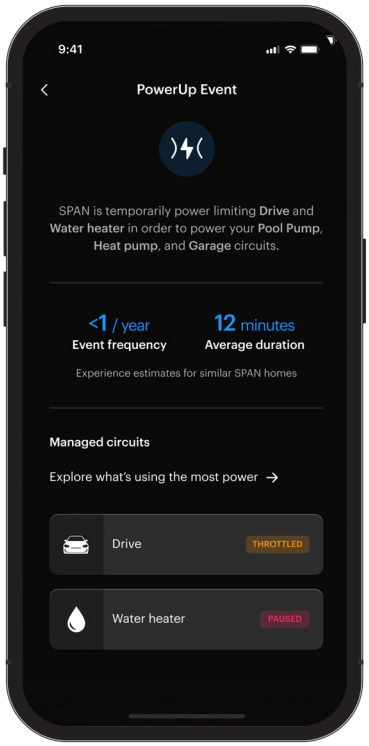
Each SPAN Panel contains factory-installed, revenue accurate energy metering at the mains, and load control with metering on each branch circuit. SPAN Panel can monitor energy consumption and implement control actions that prevent the Panel's feeder conductors from being overloaded.

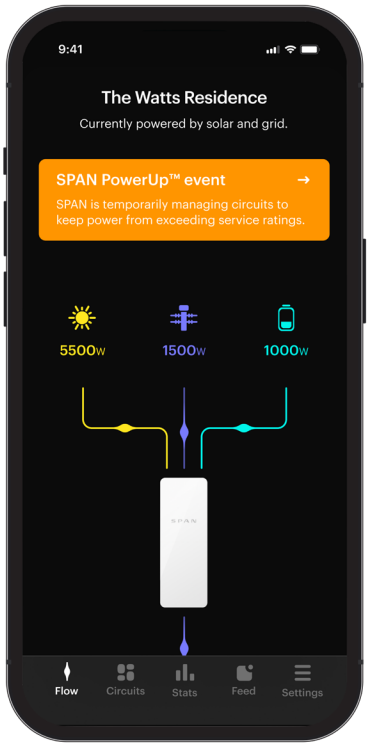
In the event that electricity consumption approaches the current limit identified by the installer, PowerUp will begin throttling or completely turning off certain electrical loads. The homeowner will be notified when PowerUp events happen and informed how long the event lasted, and what loads were affected.

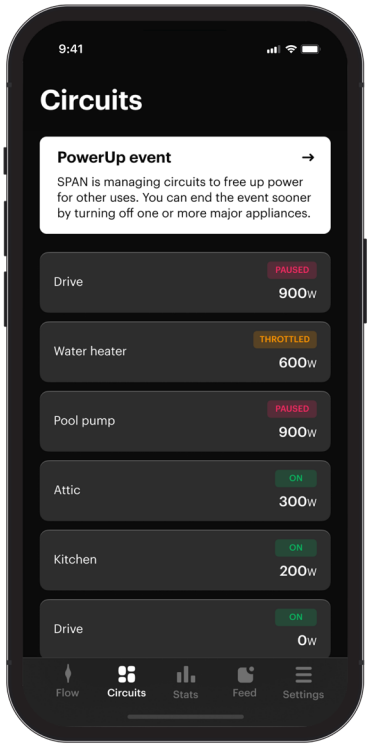
In the case where a homeowner would like a specific load turned back on that PowerUp is controlling, it will be necessary to manually reduce other loads using the app to identify which loads are still using the most power.

Circuits shed by PowerUp will be automatically restored after the home load has reduced enough, a short cool-down period has passed, and minimum off imes for appliances have been met.

Homeowners can control which appliances get turned off first during load management, as well as request that certain appliances and circuits are never turned off.







SPAN PowerUp™ prerequisites

- Only SPAN Authorized Installers may install SPAN Panel and enable the PowerUp feature. PowerUp must only be enabled in accordance with SPAN specifications.
- Before enabling PowerUp on any Panel, the load configuration should receive a PowerUp recommendation from SPAN after being analyzed in the Project Planner tool on the SPAN Tech Portal. It is strongly recommended that all appliances set to be controlled by PowerUp in the Project Planner land on dedicated, standard (non-tandem/quad) circuit breakers.
- To add loads to an existing SPAN Panel, installers should first evaluate the updated configuration using the PowerUp Project Planner.
- All SPAN Panel and PowerUp installations must meet all applicable electrical codes and standards.

Compliance info

SPAN Panel is listed both as a Panelboard to UL 67 and as Energy Management Equipment to UL 916. Additionally, SPAN Panel has been evaluated to UL 1741 CRD for PCS. SPAN Panel installations must meet applicable requirements in NFPA-70 The National Electrical Code (NEC) and the installation instructions provided by SPAN. All commissioning processes and settings, including PowerUp settings, must be performed by a SPAN Authorized Installer as described by SPAN in the installation instructions and in the SPAN Installer App. Proper operation of SPAN's PowerUp energy management functions are dependent upon the Panel being commissioned with the correct setpoint, including the rating of the main overcurrent protection device(s) supplying SPAN Panel.

SPAN PowerUp™ & PCS

The SPAN Panel with PowerUp is equipped with a power control system (PCS) to prevent the overloading of its mains conductors. The PCS functions are enabled by default whenever SPAN PowerUp is turned on by the SPAN Authorized Installer and cannot be modified or deleted by a user once set. SPAN PowerUp is enabled during installation commissioning using the SPAN Installer App. Note that modifications, including disabling the PCS function, can only be done by an SPAN Authorized Installer after requesting a password from SPAN to unlock the PowerUp settings in the SPAN Installer App. The PCS function operates independent of other SPAN PowerUp features, such as appliance prioritization. Where the main breaker in the SPAN Panel is used on the service or feeder overcurrent protective device, the SPAN PCS is suitably rated to provide branch circuit overcurrent protection for the feeders or service conductors connected to the integral main breaker. The controlled current setting's (the PCS Setpoint's) continuous current rating shall not exceed the rating of conductor ampacity terminated to the main lugs of the SPAN Panel. The SPAN Panel PCS does not include any additional PCS operating modes (such as ESS operating modes) other than those outlined in this manual. However, the SPAN Panel PCS does not restrict the PCS operation of any other device which is connected to the SPAN Panel or service.

Warning: Configuration of SPAN's PowerUp PCS settings, or changes to these settings, shall be made by qualified personnel only. Incorrect configuration or setting of the power control settings may result in unsafe conditions. All sensors used for PCS are integrated into the panel and are not user serviceable.

PCS Requirements

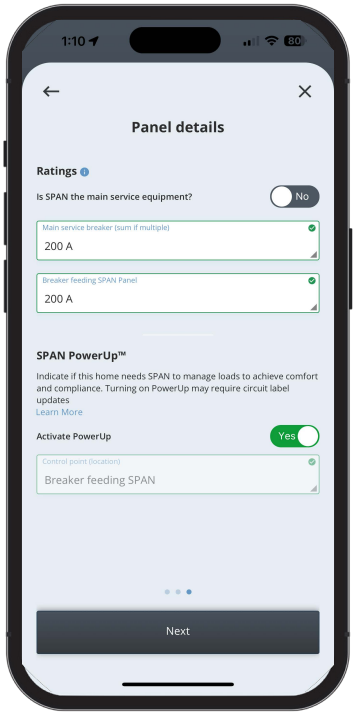
- Where the SPAN Panel EMS/PCS functions have been enabled, in no cases shall the PCS setpoint exceed the rating of the overcurrent protection device, protecting the conductors connected to the main lugs of the SPAN Panel.
- Where PCS functions are enabled for the SPAN Panel, the sum of the maximum currents from all power sources connected to the SPAN Panel's busbars shall be less than or equal to the PCS continuous current rating.
- Where the SPAN Panel EMS/PCS functions have not been enabled, and the Panel supplies continuous loads or any combination of continuous and noncontinuous loads, the rating of the overcurrent device supplying the panel shall not be less than the noncontinuous load plus 125 percent of the continuous load.

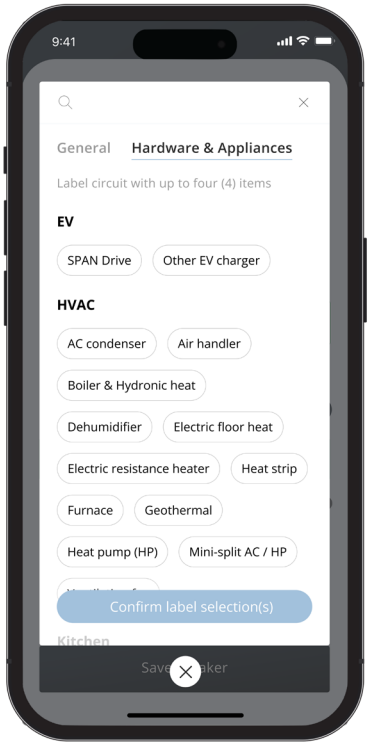
Ratings

PCS Setpoint (A) *(Circuit breaker rating)*	Continuous Current Rating (A)	Max Power Source Current (A)
100	80	80
125	100	100
150	120	120
175	140	140
200	160	160

Notice: Where the SPAN Panel EMS/PCS functions have been enabled, the maximum operating currents in controlled busbars or conductors are limited by the settings of the power control system (PCS) and may be lower than the sum of the currents of the connected controlled loads or power sources. The settings of the PCS controlled currents may be used for calculation of the design currents used in the relevant sections of NEC Article 690, 705 and 220.

Installer setup & Commissioning





The installation and commissioning of SPAN PowerUp™ is simple.

PowerUp energy management is enabled via the “panel details” screen (top left image) before proceeding to label circuits and appliances using SPAN’s latest breaker details workflow (below left image). Installers must complete labeling of each circuit and any items on the feed-through lugs in order to activate PowerUp.

IMPORTANT:
After enabling SPAN PowerUp™ or installing and commissioning SPAN Drive, fill in the required information on the PCS settings label and adhere it to the inside of the SPAN Panel door. This label can be found in a sleeve on the exterior of the SPAN Panel box or inside the SPAN Panel door. If the SPAN Panel did not come with a PCS settings label, contact support@span.io to request one.

This equipment has **SPAN PowerUp™** EMS enabled. The maximum operating current of this system is controlled electronically. All circuits within this equipment are current limited and prioritized by a power control system (PCS) providing overload control. Settings are password protected and only accessible to qualified personnel.

The current setpoints shall not be bypassed without authorization by SPAN. Refer to the SPAN Panel instructions for more information.

Mains PCS controlled current setting: _____ Amps

Continuous current rating of SPAN EMS is 80% of the PCS current setting

Installer: _____ **Date:** _____

IMPORTANT:
SPAN Authorized Installers will start by entering in the size of the circuit breaker feeding SPAN Panel. PowerUp will begin to manage circuits when current rises above 80% of the value of the breaker feeding SPAN.

SPAN Authorized Installers will enter basic information about appliances by choosing from a list of options (shown above). PowerUp will select and prioritize appliances appropriate for load management based on appliance types chosen.

Complete PowerUp installation instructions are contained within the SPAN Installer App

Revision log

Version	Note
2024-07-29	• Updated allowable conduit entry locations into SPAN Panel
2024-07-02	• Added Appendix for SPAN PowerUp™
2024-02-28	• Design refresh - updated images to match latest Panel hardware and Installer App screens • Updated installation guidance for Panel mounting locations, altitude, and signal wiring • Removed Main Lug Part compatibility
2023-03-31	• Updated conduit entry drawings, dimensions and compatible/recommended fittings to reflect removal of the top hub • Removed Main Lug Part Number
2023-02-21	• Minor updates installation recommendations • Migrated Multi-Panel comms wiring from Multi-Panel Application Note • Updated Panel comms image for ETH-1
2022-09-29	• Updated communication wiring documentation to include the 9 position RS485 pluggable connector
2022-08-30	• Minor updates installation recommendations
2022-06-24	• Minor updates to Main Lug Part (Appendix C) and Installing a Main Breaker section
2022-05-30	• Updated format of Appendix A • Added information for Main Lug Part (Appendix C)
2022-04-19	• Updated breaker compatibility list
2022-01-28	• Updated image and information under section “Dimensions, Clearances, and Access” • Minor updates to “Preparing to Install” section
2022-01-21	• Added Appendix B: Surge Protective Device Compatibility • Updated figure in Install Conduit section to include Conduit Entry Location dimensions • Updated Wiring the Panel section to include sub-feed lug rating
2021-12-04	• Added Appendix A: Circuit Breaker Compatibility
2021-06-21	• Added main breaker replacement details • Added Flush Mount Trim Kit installation instructions

Version	Note
2021-06-04	• Corrected product weight in spec table • Added Networking Kit and Trim Kit to accessory list • Added Servicing instructions regarding breaker replacement or additions
2021-05-15	• First revision