ADAPTIVE®

Alpha® NEMA Series Sign Installation Instructions

Contents

Introduction

These instructions show how to change the serial address and how to mount Alpha® series signs with NEMA Types 2, 4, 4X, and 12 enclosures.

- Type 2 enclosures are intended for indoor use primarily to provide a degree of protection against limited amounts of falling water and dirt.
- Type 4 enclosures are intended for indoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose-directed water.
- Type 4X enclosures are intended for indoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose-directed water.
- Type 12 enclosures (in a gasketed, dust-free, sealed, spray-down resistant case) are intended for indoor use.

Changing the serial address

A serial address for an Alpha® sign is a number from 0 to 255 (00 to FF hexadecimal.) It is used to identify the sign in a network of signs. All signs leave the factory with a default address of 0.

You can use DIP switches in most Alpha® NEMA signs to set a permanent serial address:

See page 11 for Changing the serial address on Alpha® 420 signs.
See page 17 for Changing the serial address on Alpha® 7000 signs.
See page 22 for Changing the serial address on 2.1" NEMA 2 signs.
See page 27 for Changing the serial address on 3.2" NEMA 2 signs.

To change a sign's serial address on an Alpha® 4000 or to override the serial address DIP switches on an Alpha® 7000 series sign or an Alpha® 420 sign, follow these steps:

1. Point a hand-held Remote Control (shown at left) at the sign, and press **PROGRAM**.
2. Press **BACK** until *SET SERIAL ADDRESS* appears on the sign.
3. Press **ADV** and *SERIAL ADDRESS = 00* will appear.
4. Type in the new serial address using the numbered keys on the Remote Control.
5. Press **RUN** twice to set the new serial address and return the sign to normal operation.

Checkout procedure

After installing a sign according to the following section on "Mounting instructions", make sure the sign is installed properly by applying power to it. The following information should be displayed on the sign:

- fi rmware part number and version letter (e.g., 1018-4403d),
- model number of the sign (e.g., N024160C),
- amount of RAM in the sign, (e.g., 256K), and
- serial address of the sign (a number from 0 to FF or from 000 to 255).

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Temperature protection in NEMA-rated enclosures

Alpha® signs in NEMA-rated enclosures have automatic temperature controls that help to protect the sign from damage when the internal temperature of the sign is too hot to continue normal operation.

- If the internal temperature of the sign goes above the "cooling fans on" point, the cooling fans are turned on.
- If the internal temperature reaches the "dimming on" point, the LED output from the sign is forced into a 50% reduced-power mode, effectively dimming the brightness of LED output by about 50%.
- If the temperature reaches the "overheat on" point, the sign will shut down normal data display to protect from damage. It will display "OVERHEATED" in 7-high characters.
- If the temperature returns below the "overheat off" point, the overheated message ceases and normal data is displayed at 50% brightness.
- If the temperature returns below the "dimming off" point, the forced dimming is turned off and the sign returns to normal processing.
- If the temperature returns below the "cooling fans off" point, the cooling fans are turned off.

The table below shows specific temperatures for NEMA signs:

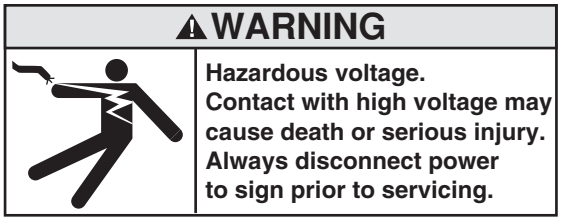
Function	4000	420	7000	2.1"	3.2"
Cooling fans on	--------- Not applicable ---------			50° 122°F	50° 122°F
Dimming on	60°C 140°F	60°C 140°F	60°C 140°F	65°C 149°F	65°C 149°F
Overheat on	70°C 158°F	70°C 158°F	70°C 158°F	70°C 158°F	70°C 158°F
Overheat off	65°C 149°F	65°C 149°F	65°C 149°F	55°C 131°F	55°C 131°F
Dimming off	55°C 131°F	55°C 131°F	55°C 131°F	50°C 122°F	50°C 122°F
Cooling fans off	--------- Not applicable ---------			30°C 86°F	30°C 86°F

NOTE: Take into account the effects of ambient temperature when evaluating mounting locations for the sign. You should always maintain recommended clearance distances around the sign and avoid poorly-ventilated mounting locations that could be subject to radiation, convection, conduction or other thermal transfer effects.

Mounting precautions

NOTE: Only qualified personnel should install the Alpha® NEMA signs.

Before mounting a sign, remove power from the sign!



NOTE: Alpha® NEMA 2, 4, 4X, and 12 signs are for *indoor use only.* Do not continuously expose to direct sunlight.

NOTE: Mounting hardware that is used to hang or suspend signs must be capable of supporting *at least 4 times* the total weight of any/all signs mounted together.

NOTE: For integrity of the case, do not drill holes in or modify the case.

Electrical warning for all NEMA enclosures

Model (weight)	Electrical instructions
All NEMA sign models	**Connecting the power wires** A readily-accessible disconnect device shall be installed in the fixed wiring supplying power to this equipment. The disconnect device shall have a contact separation of at least 3 mm. This equipment relies on protective devices in the building installation for protection for short circuit and/or overcurrent protection. Install this equipment only where these protective devices are present. The size and type of the protective devices shall be appropriate for the voltage and current ratings on this equipment. --- Un dispositif de déconnexion placé à un endroit pratique doit être installé sur le fil fixe qui alimente ce matériel. La distance des contacts de ce dispositif de déconnexion doit être de 3 mm minimum. Ce matériel s'appuie sur des dispositifs de protection dans l'installation du bâtiment pour se protéger des courts-circuits et/ou des surintensités. Installez ce matériel seulement là où de telles protections sont présentes. Le calibre et le type des protections doivent être adaptés à la tension et à l'intensité nominales du matériel. --- In der Festverdrahtung muß eine leicht zugängliche Trennvorrichtung installiert werden, die dieses Gerät mit Strom versorgt. Die Trennvorrichtung muß eine Kontakttrennung von mindestens 3 mm aufweisen. Kurzschlußschutz und/oder Überstromschutz wird in diesem Gerät durch entsprechende Schutzvorrichtungen in der Gebäudeinstallation gewährleistet. Dieses Gerät nur dort installieren, wo diese Schutzvorrichtungen vorhanden sind. Größe und Art der Schutzvorrichtungen müssen den Spannungs- und Stromnennstärken dieses Geräts entsprechen. --- Un dispositivo di sconnessione prontamente accessibile dovrà essere installato nel cablaggio fissato che fornisce corrente alla presente apparecchiatura. Il dispositivo di sconnessione dovrà avere una separazione di contatto di almeno 3 mm. La presente apparecchiatura si affida a dispositivi di protezione nell'installazione da edificio per protezione da corto circuito e/o protezione da sovracorrente. Installare l'apparecchiatura solamente in punti dove sono presenti questi dispositivi di protezione. Le dimensioni e il tipo di dispositivo di protezione dovranno essere appropriati alla tensione e ai valori di corrente della presente apparecchiatura. --- Se debe instalar en el cableado fijo que alimenta este equipo un dispositivo de desconexión fácilmente accesible. Dicho dispositivo tendrá una separación entre contactos de por lo menos 3 mm. Este equipo depende del uso de dispositivos protectores en la instalación del edificio para protección en caso de cortocircuito y/o protección contra sobreintensidad. Instale este equipo únicamente en caso de disponer de dispositivos protectores. El tipo y tamaño de los dispositivos protectores deberán ser adecuados para los valores nominales de tensión y corriente de este equipo.

Alpha® 4000 series NEMA 12 models

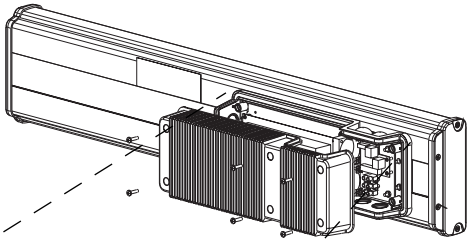
Model (weight)	Electrical instructions

Connecting the power wires

⚠WARNING

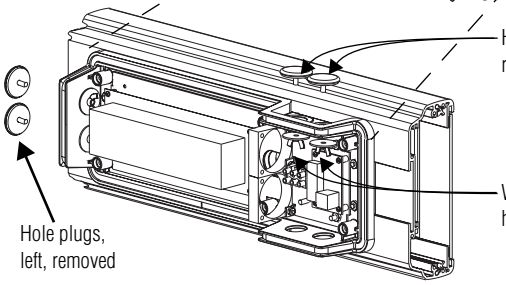
Hazardous voltage.
Contact with high voltage may cause death or serious injury.
Always disconnect power to sign prior to servicing.

1. Remove the power supply cover by unscrewing its 6 screws. Save the screws for a later step.



2. It is recommended that you install power and serial wires at the bottom of the power supply enclosure. However, to accommodate power or serial wire installation at the top of the enclosure, you may want to remove the left or right conduit hole plug from the top of the enclosure by removing its wing nut inside the enclosure. Save the hole plug for a later step.

   It is also possible, but not recommended, to install the wires in the same way on the left end.

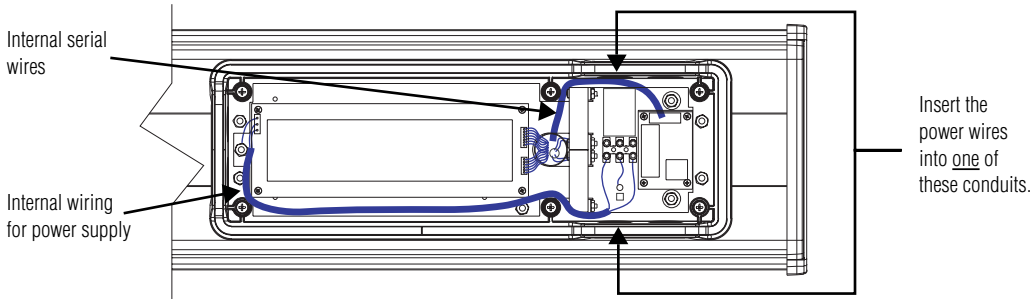


N124120x
(28 lbs, 12.7 kg)

N124240x
(50 lbs, 22.7 kg)

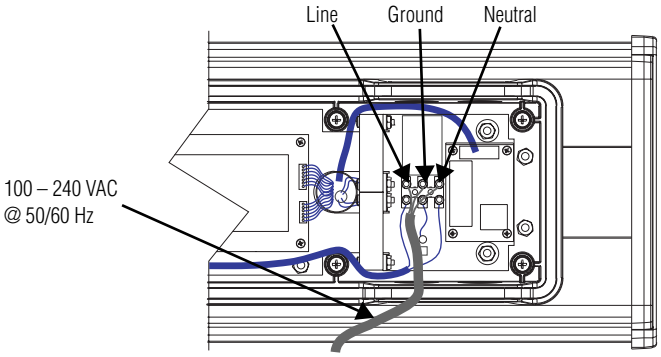
3. Insert the power wires through the left conduit on either the top or the bottom of the sign. The bottom conduit is recommended to reduce noise from power wires crossing serial wires.

   NOTE: Use watertight conduit connectors only. Flexible conduit should be used.



4. Connect the incoming electrical wires.

   Be sure to place the wires so they will not be caught by screws when replacing the power supply cover, and also so they will not interfere with fan operation.



Alpha® 4000 series NEMA 12 models

Model (weight)	Electrical instructions

N124120x
(28 lbs, 12.7 kg)

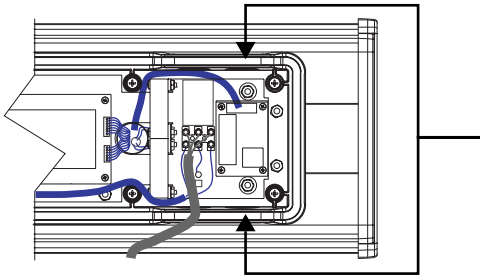
N124240x
(50 lbs, 22.7 kg)

Connecting the serial wires

⚠WARNING

**Hazardous voltage.
Contact with high voltage may cause death or serious injury.
Always disconnect power to sign prior to servicing.**

5. Insert the serial wires through the right conduit on either the top or the bottom of the sign.



NOTE: TB1 can be used for incoming bare-wire serial connection for RS232 **or** RS485, plus Auxiliary out. The full pinout diagram is:

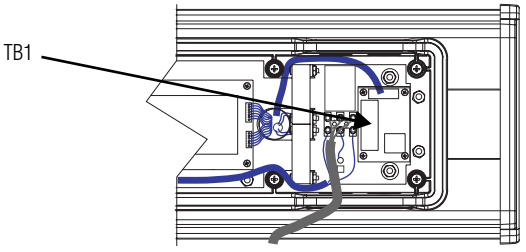
TB1 - full

1	GND	5	RS485+
2	+5V	6	RS485-
3	RS232 TX	7	AUX OUT
4	RS232 RX	8	SHIELD

6. (Optional) Connect an auxiliary device to TB1.

TB1 - Aux out

1	GND	5	NC
2	NC	6	NC
3	NC	7	AUX OUT
4	NC	8	NC



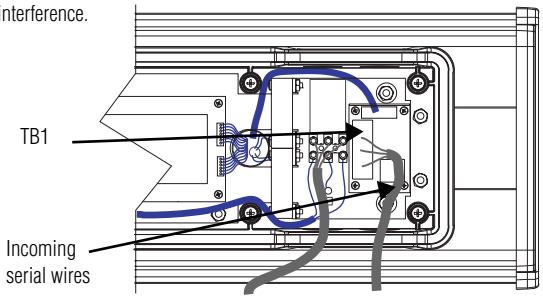
7. Connect the incoming serial wires (*bare-wire connection).*

TB1 can be used for incoming RS232 **or** RS485 serial connection, but not both.

TB1 and RS485 are recommended to reduce undesirable electrical interference.

Aux Out can be used at the same time.

NOTE: Be sure to place the wires so they will not be caught by screws when replacing the power supply cover, and also so they will not interfere with fan operation.



TB1 - RS232

1	GND	5	NC
2	NC	6	NC
3	RS232 TX	7	NC
4	RS232 RX	8	NC

TB1 - RS485

1	NC	5	RS485+
2	NC	6	RS485-
3	NC	7	NC
4	NC	8	SHIELD

Alpha® 4000 series NEMA 12 models

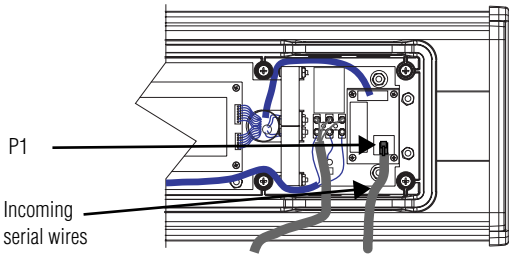
Model (weight)	Electrical instructions
N124120x (28 lbs, 12.7 kg) N124240x (50 lbs, 22.7 kg)	

Connecting the serial wires, continued

8. Connect the incoming serial wires *(RJ11/RJ12 connection for RS232 only)*

   P1 can be used for incoming RS232, although it is not recommended.

   NOTE: Be sure to place the wires so they will not be caught by screws when replacing the power supply cover, and also so they will not interfere with fan operation.



9. To maintain NEMA compliance and to prevent EMI emissions, install hole plugs in any open conduit holes in the power supply enclosure. If needed, there is an extra hole plug supplied in addition to any hole plugs removed in Step 2 on page 4.

10. Replace the power supply cover using the 6 screws from when the cover was removed. (Refer to Step 1 on page 4.) Torque the screws to 24 lb-in.

11. Plug the power cable into a power source.

Alpha® 4000 series NEMA 12 models

Mounting instructions

Model (weight)

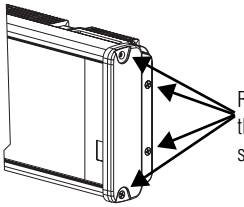
N124120x (28 lbs, 12.7 kg)

N124240x (50 lbs, 22.7 kg)

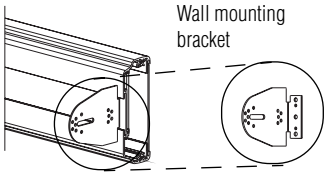
Wall

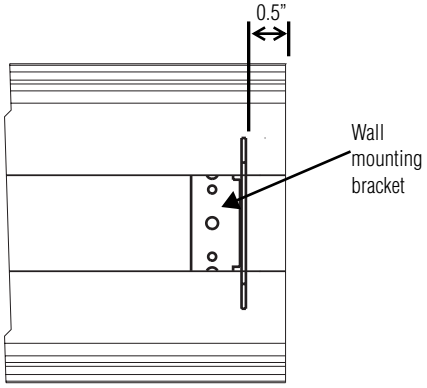
NOTE: Remove only one end cap at a time.

1. Remove the 4 screws and the end cap from one end of the sign.

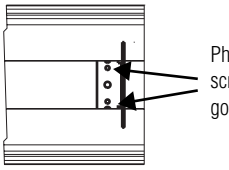


2. Slide one of the wall mounting brackets onto the back of the sign until it is approximately 0.5 in. away from the end of the sign.

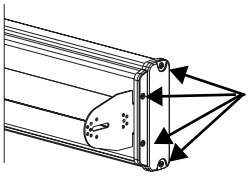




3. Use two 10-32 x 1/4 Phillips screws (supplied) to secure the wall mounting bracket to the back of the sign. Torque the screws to 24 lb-in.

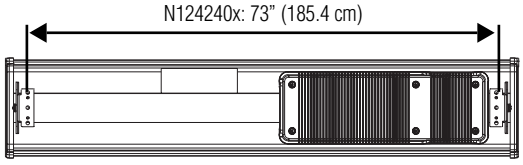


4. Replace the end cap using the 4 screws removed in Step 1. Torque the screws to 24 lb-in.



5. Repeat Steps 1 - 4 for the other end of the sign. Distances between the bracket holes, center-to-center, should be approximately:

N124120x: 37" (94 cm)
N124240x: 73" (185.4 cm)



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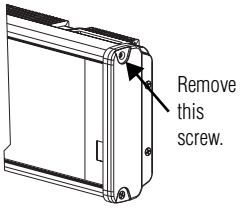
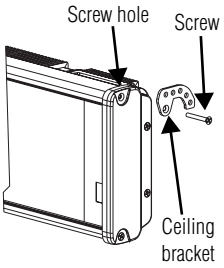
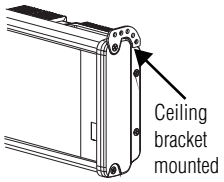
Ceiling

1. Remove one screw from the top of the end cap.



2. Line up a ceiling bracket with the top hole on the sign's end cap so the bracket fits in the indentation. There are left and right ceiling brackets. Use the one that fits with the screw hole's countersunk side facing out. Secure the ceiling bracket with the screw removed in Step 1. Torque the screws to 24 lb-in.





3. Repeat steps 1 - 2 for the other end of the sign.

4. Use chains (not supplied) to hang the sign from a ceiling.

   NOTE: Use chains capable of supporting 4 times the total weight of the sign(s).

   NOTE: The hole you select in the ceiling bracket for the chain determines the angle at which the sign hangs.

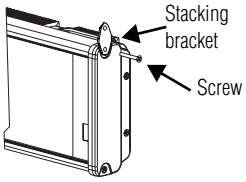
Stacking

NOTE: Up to 4 signs can be hung together vertically ("stacked"). Mounting system for stack mounting must support a minimum of four times the total weight of all signs being stacked.

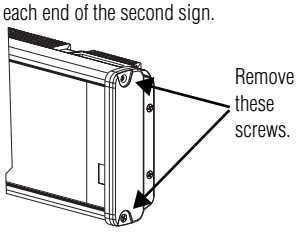
⚠WARNING

Possible crush hazard. Do not stack more than 4 signs. Otherwise signs may fall causing serious injury or death.

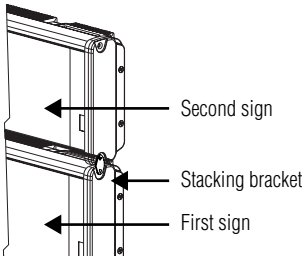
1. Remove the top screw from each end cap of the first sign, as shown in Step 1 of the Ceiling mounting instructions.
2. Using the screw removed in Step 1, screw a stacking bracket to each end cap, countersunk side out. Torque to 24 lb-in.



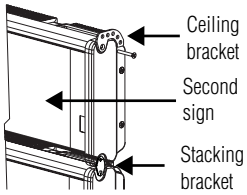
3. Remove the top and bottom screws from each end of the second sign.



4. For each end of the signs, secure the stacking bracket from the first sign to the second sign using one of the screws removed in Step 3. Torque to 24 lb-in.



5. Secure a ceiling bracket to the top of each end cap on the second sign, using Step 2 of the Ceiling mounting instructions.



6. Use a chain (not supplied) to hang the signs from the ceiling, following the notes in Step 4 of Ceiling mounting instructions.

Alpha® 4000 series NEMA 12 models

Model (weight)

N124120x (28 lbs, 12.7 kg)

N124240x (50 lbs, 22.7 kg)

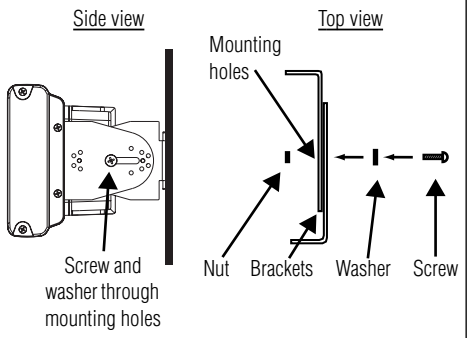
Mounting instructions

Wall (continued)

6. Attach the two remaining wall mounting brackets to a wall so that they align with the brackets on the sign.

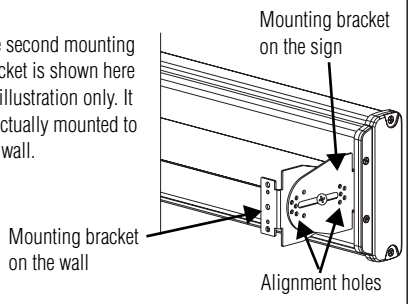
   NOTE: Do NOT install the sign directly to drywall or plasterboard. The sign must be fastened to a wall capable of supporting at least four times the weight of the sign.

7. Connect the mounting brackets on each end of the sign together using a 5/16 Phillips screw and a 5/16 washer through the mounting holes, as shown below, securing with a 5/16 nut. *Do not tighten the nut at this time.*

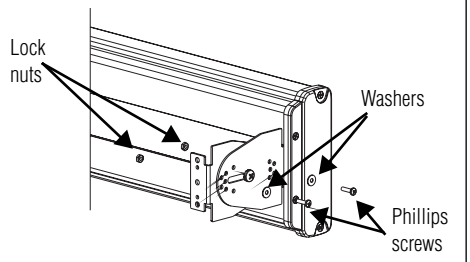


8. Match the alignment holes of the brackets on the sign with the alignment holes of the brackets on the wall so that the sign is at the desired viewing angle.

NOTE: The second mounting bracket is shown here for illustration only. It is actually mounted to the wall.



9. Fasten the mounting brackets together using two 10-32 x 3/4 Phillips screws, two 10-32 washers, and two 10-32 lock nuts through selected alignment holes on each end of the sign. Torque to 24 lb-in.



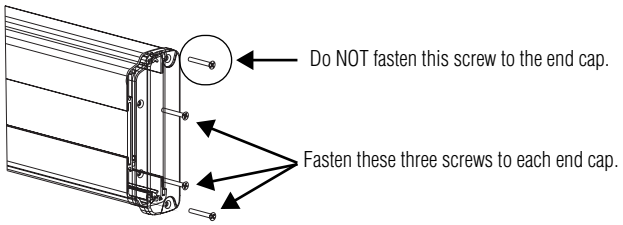
10. Tighten the 5/16 nuts in the mounting holes. (See Step 7). Torque to 24 lb-in.

Back-to-Back

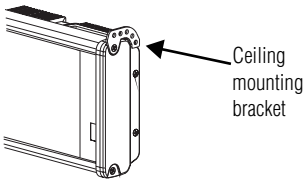
NOTE: Remove only one end cap at a time for each sign.

1. Attach a mounting bracket on each end of the signs and replace the end caps, following Steps 1 - 4 of the Wall mounting instructions. However, *replace only the bottom three screws* for each end cap. Torque the screws to 24 lb-in. Do this step for each end of both signs.

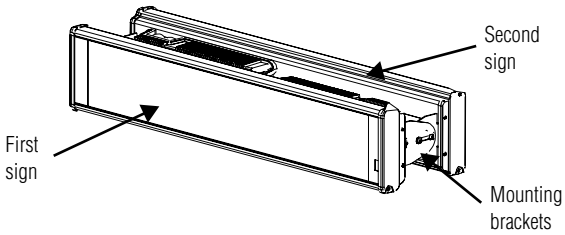
   NOTE: Do NOT fasten the *top* screws to the end caps. The top screws will be used to fasten the ceiling mounting brackets to the end caps in the next step.

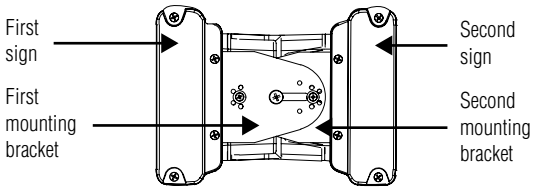


2. Attach ceiling mounting brackets to all the end caps following Step 2 of the Ceiling mounting instructions. Torque the screws to 24 lb-in.



3. Match the signs together back-to-back. Connect them together following Steps 7 - 9 of the Wall mounting instructions. Torque to 24 lb-in.





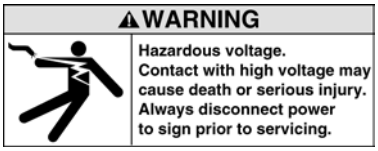
4. Use chains (not supplied) to hang the signs from the ceiling.

   NOTE: Use chains capable of supporting 4 times the total weight of the signs.

Alpha® 420 NEMA 12 models

Model (weight)	Electrical instructions
N12420x (36.5 lbs, 16.6 kg)	

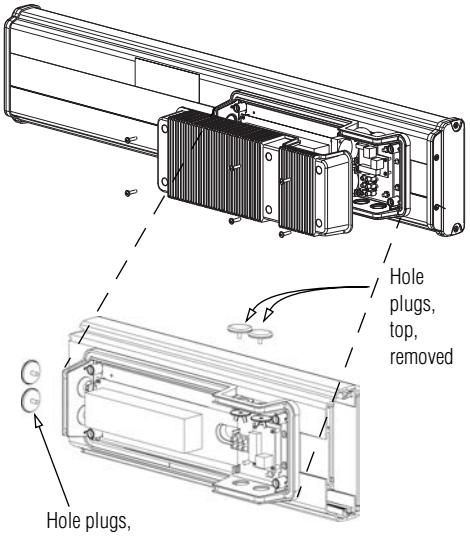
Connecting the power wires

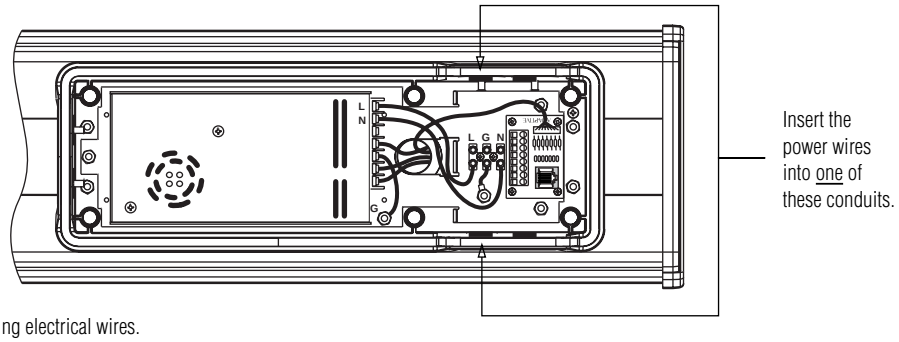


1. Refer to the electrical warning on page 3 for information on required short circuit and over-current protective devices, as well as on the required disconnect device that must be installed between the sign and power supply.
2. Remove power from the circuit to eliminate safety risk.
3. Remove the power supply cover by unscrewing its 6 screws. Save the screws for a later step.
4. It is recommended that you install power and serial wires at the bottom of the power supply enclosure. However, to accommodate power or serial wire installation at the top of the enclosure, you may want to remove the left or right conduit hole plug from the top of the enclosure by removing its wing nut inside the enclosure. Save the hole plug for a later step.

   It is also possible, but not recommended, to install the wires in the same way on the left end.
5. Insert the power wires through the left conduit hole on either the top or the bottom of the sign. The bottom conduit hole is recommended to reduce noise from power wires crossing serial wires.

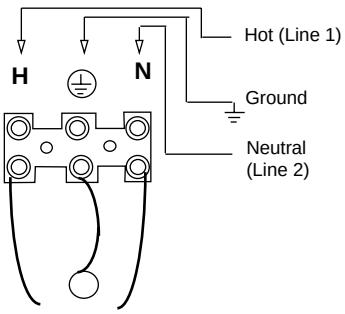
   NOTE: Use watertight conduit connectors and flexible conduit.

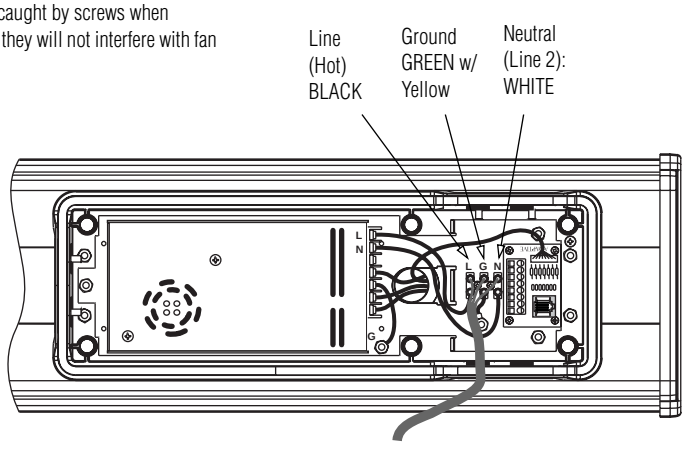




6. Connect the incoming electrical wires.

   Be sure to place the wires so they will not be caught by screws when replacing the power supply cover, and also so they will not interfere with fan operation.





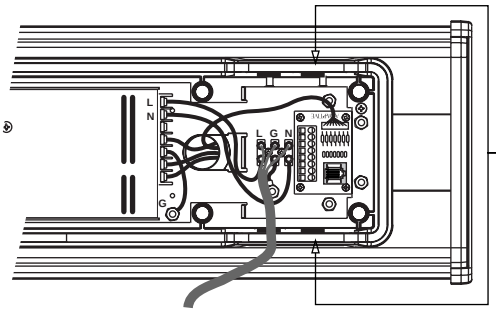
Input Voltage: 100-240 VAC @50/60 Hz

Alpha® 420 NEMA 12 models

Model (weight)	Electrical instructions
N12420x (36.5 lbs, 16.6 kg)	

Connecting the serial wires

7. Insert the serial wires through the <u>right</u> conduit hole on either the top or the bottom of the sign.



Insert the serial wires into <u>one</u> of these conduit holes.

NOTE: TB1 can be used for incoming bare-wire serial connection for RS232 **or** RS485, plus Auxiliary Out. The full pinout diagram is:

TB1 - full			
1	GND	5	RS485+
2	+5V	6	RS485-
3	RS232 TX	7	AUX OUT
4	RS232 RX	8	SHIELD

8. Connect the incoming serial wires (*bare-wire connection).*

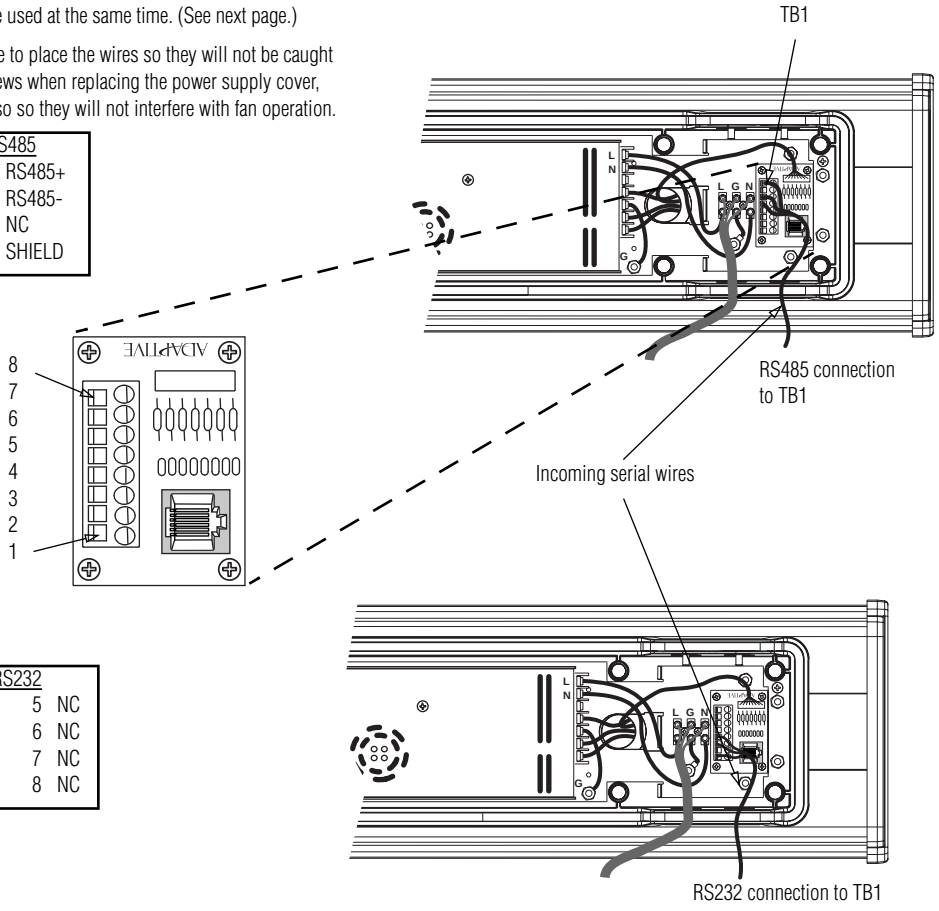
TB1 can be used for incoming RS485 **or** RS232 serial connection, but not both.

TB1 and RS485 are recommended to reduce undesirable electrical interference.

Aux Out can be used at the same time. (See next page.)

NOTE: Be sure to place the wires so they will not be caught by screws when replacing the power supply cover, and also so they will not interfere with fan operation.

TB1 - RS485			
1	NC	5	RS485+
2	NC	6	RS485-
3	NC	7	NC
4	NC	8	SHIELD



TB1 - RS232			
1	GND	5	NC
2	NC	6	NC
3	RS232 TX	7	NC
4	RS232 RX	8	NC

Alpha® 420 NEMA 12 models

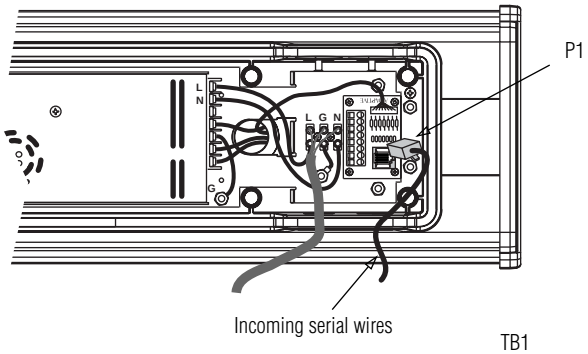
Model (weight)	Electrical instructions

Connecting the serial wires (continued)

9. Connect the incoming serial wires *(RJ11/RJ12 connection for RS232 only)*

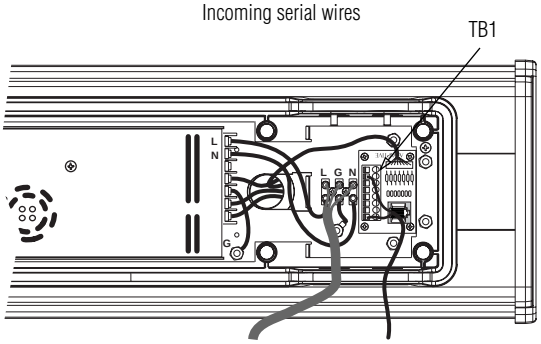
   P1 can be used for incoming RS232, although it is not recommended.

   NOTE: Be sure to place the wires so they will not be caught by screws when replacing the power supply cover, and also so they will not interfere with fan operation.



10. (Optional) Connect an auxiliary device to TB1.

TB1 - Aux out			
1	GND	5	NC
2	NC	6	NC
3	NC	7	AUX OUT
4	NC	8	NC



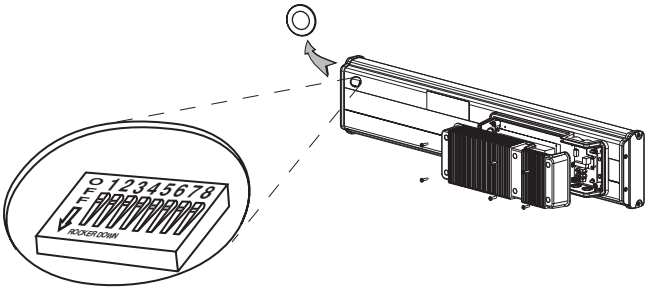
11. To maintain NEMA compliance and to prevent EMI emissions, install hole plugs in any open conduit holes in the power supply enclosure. If needed, there is an extra hole plug supplied in addition to any hole plugs removed in Step 4 on page 9.

N12420x
(36.5 lbs, 16.6 kg)

12. Replace the power supply cover using the 6 screws from when the cover was removed. (Refer to Step 3 on page 9.) Torque the screws to 24 lb-in.

13. Plug the power cable into a power source.

Changing the serial address on Alpha® 420 signs



All signs leave the factory with a serial address of 00 (all DIP switches set to OFF), to allow sending the same message to all signs on a network simultaneously.

There are two ways to change a sign's serial address:

1. Use a hand-held infrared Remote Control, as described in "Changing the serial address" on page 1.
2. Set a permanent address by accessing the bank of DIP switches located behind the rubber plug on the back of the case, as shown above. This method will survive lengthy power supply interruptions, or other conditions that could cause a software-set address to reset. (Replace the plug after address has been reset.)

Serial address (in decimal)	DIP switch (1 = ON, 0 = OFF)							
	8	7	6	5	4	3	2	1
00	0	0	0	0	0	0	0	0
01	0	0	0	0	0	0	0	1
02	0	0	0	0	0	0	1	0
03	0	0	0	0	0	0	1	1
04	0	0	0	0	0	1	0	0
05	0	0	0	0	0	1	0	1
06	0	0	0	0	0	1	1	0
07	0	0	0	0	0	1	1	1
08	0	0	0	0	1	0	0	0
09	0	0	0	0	1	0	0	1
10	0	0	0	0	1	0	1	0
11	0	0	0	0	1	0	1	1

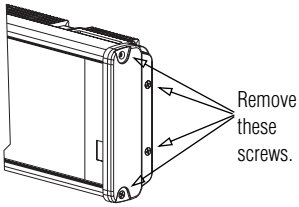
Alpha® 420 NEMA 12 models

Mounting instructions

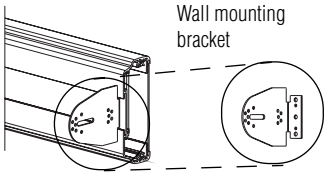
Wall

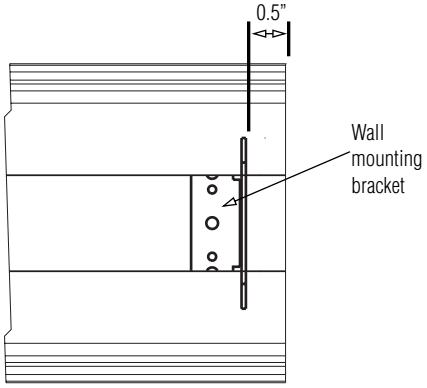
NOTE: Remove only one end cap at a time.

1. Remove the 4 screws and the end cap from one end of the sign.

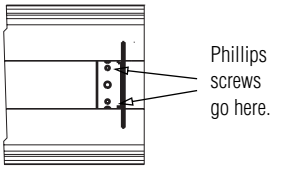


2. Slide one of the wall mounting brackets onto the back of the sign until it is approximately 0.5 in. away from the end of the sign.

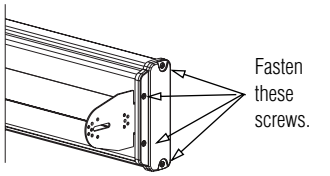




3. Use two 10-32 x 1/4 Phillips screws (supplied) to secure the wall mounting bracket to the back of the sign. Torque the screws to 24 lb-in.

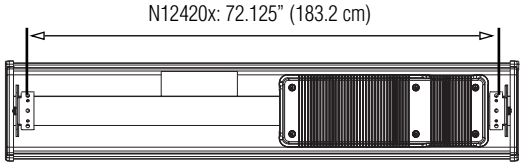


4. Replace the end cap using the 4 screws removed in Step 1. Torque the screws to 24 lb-in.



5. Repeat Steps 1 - 4 for the other end of the sign. Distances between the bracket holes, center-to-center, should be approximately:

N12420x: 72.125" (183.2 cm)

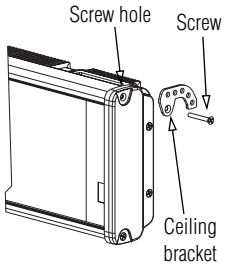


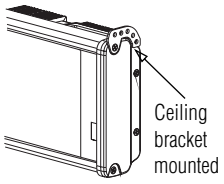
Continued on next page

Ceiling

1. Remove one screw from the top of the end cap.

2. Line up a ceiling bracket with the top hole on the sign's end cap so the bracket fits in the indentation. There are left and right ceiling brackets. Use the one that fits with the screw hole's countersunk side facing out. Secure the ceiling bracket with the screw removed in Step 1. Torque the screws to 24 lb-in.





3. Repeat steps 1 - 2 for the other end of the sign.

4. Use chains (not supplied) to hang the sign from a ceiling.

   NOTE: Use chains capable of supporting 4 times the total weight of the sign(s).

   NOTE: The hole you select in the ceiling bracket for the chain determines the angle at which the sign hangs.

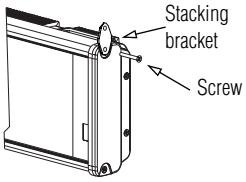
Stacking

NOTE: Up to 4 signs can be hung together vertically ("stacked"). Mounting system for stack mounting must support a minimum of four times the total weight of all signs being stacked.

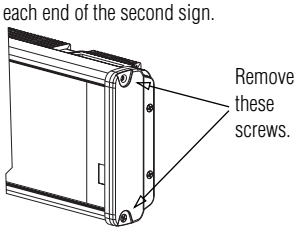
⚠WARNING

Possible crush hazard. Do not stack more than 4 signs. Otherwise signs may fall causing serious injury or death.

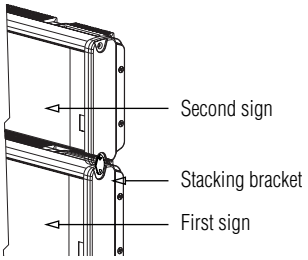
1. Remove the top screw from each end cap of the first sign, as shown in Step 1 of the Ceiling mounting instructions.
2. Using the screw removed in Step 1, screw a stacking bracket to each end cap, countersunk side out. Torque to 24 lb-in.



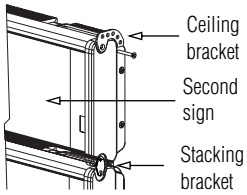
3. Remove the top and bottom screws from each end of the second sign.



4. For each end of the signs, secure the stacking bracket from the first sign to the second sign using one of the screws removed in Step 3. Torque to 24 lb-in.



5. Secure a ceiling bracket to the top of each end cap on the second sign, using Step 2 of the Ceiling mounting instructions.



6. Use a chain (not supplied) to hang the signs from the ceiling, following the notes in Step 4 of Ceiling mounting instructions.

Model (weight)
N12420x (36.5 lbs, 16.6 kg)

Alpha® 420 NEMA 12 models

Mounting instructions

Model (weight)

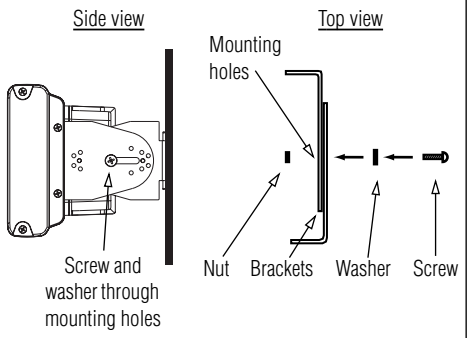
N12420x
(36.5 lbs, 16.6 kg)

Wall (continued)

6. Attach the two remaining wall mounting brackets to a wall so that they align with the brackets on the sign.

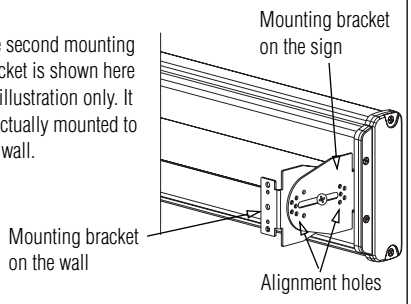
   NOTE: Do NOT install the sign directly to drywall or plasterboard. The sign must be fastened to a wall capable of supporting at least four times the weight of the sign.

7. Connect the mounting brackets on each end of the sign together using a 5/16 Phillips screw and a 5/16 washer through the mounting holes, as shown below, securing with a 5/16 nut. *Do not tighten the nut at this time.*

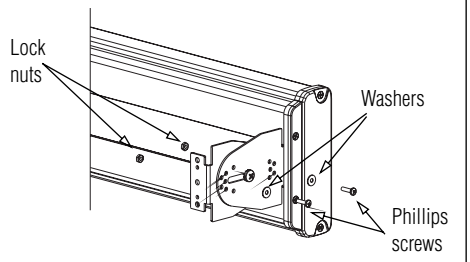


8. Match the alignment holes of the brackets on the sign with the alignment holes of the brackets on the wall so that the sign is at the desired viewing angle.

NOTE: The second mounting bracket is shown here for illustration only. It is actually mounted to the wall.



9. Fasten the mounting brackets together using two 10-32 x 3/4 Phillips screws, two 10-32 washers, and two 10-32 lock nuts through selected alignment holes on each end of the sign. Torque to 24 lb-in.



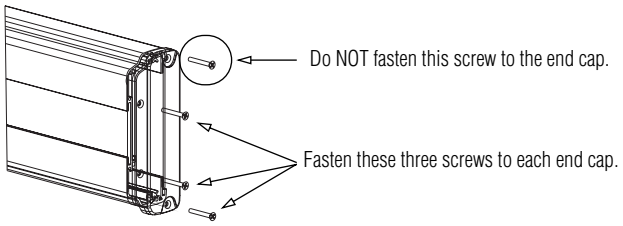
10. Tighten the 5/16 nuts in the mounting holes. (See Step 7). Torque to 24 lb-in.

Back-to-Back

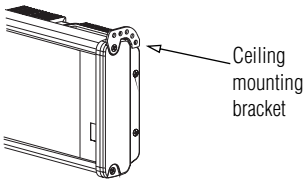
NOTE: Remove only one end cap at a time for each sign.

1. Attach a mounting bracket on each end of the signs and replace the end caps, following Steps 1 - 4 of the Wall mounting instructions. However, *replace only the bottom three screws* for each end cap. Torque the screws to 24 lb-in. Do this step for each end of both signs.

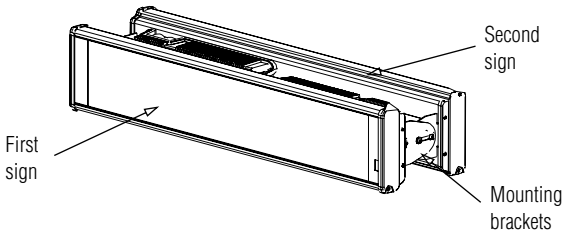
   NOTE: Do NOT fasten the *top* screws to the end caps. The top screws will be used to fasten the ceiling mounting brackets to the end caps in the next step.

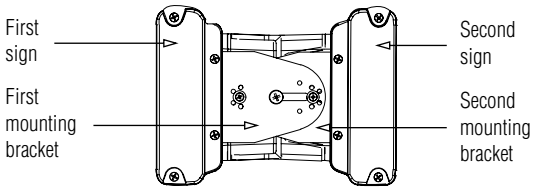


2. Attach ceiling mounting brackets to all the end caps following Step 2 of the Ceiling mounting instructions. Torque the screws to 24 lb-in.



3. Match the signs together back-to-back. Connect them together following Steps 7 - 9 of the Wall mounting instructions. Torque to 24 lb-in.





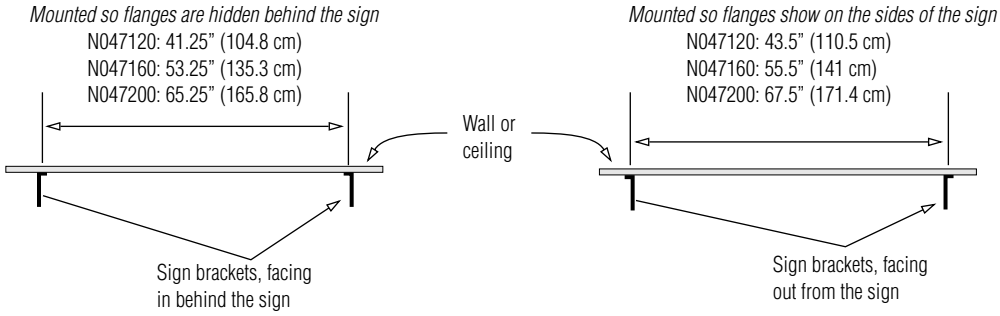
4. Use chains (not supplied) to hang the signs from the ceiling.

   NOTE: Use chains capable of supporting 4 times the total weight of the signs.

Alpha® 7000 series NEMA 4 and 4x models

Model (weight)	Mounting instructions

1. Attach the two sign brackets to a wall, ceiling, or other surface. Be sure to place the brackets so the bracket flanges face appropriately as shown below. Mount the brackets the following distance apart (measured from the center of the mounting holes in each bracket):

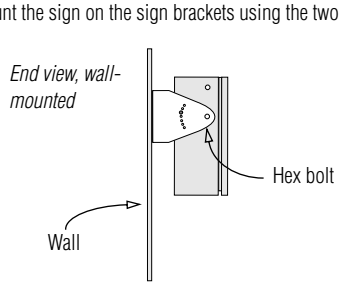


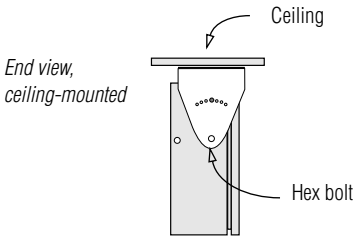
NOTE: Do NOT install the sign directly to drywall or plasterboard. The sign must be fastened to a surface capable of supporting at least four times the weight of the sign.

2. Mount the sign on the sign brackets using the two large hex bolts supplied.

N047120C (60 lbs, 27.2 kg)

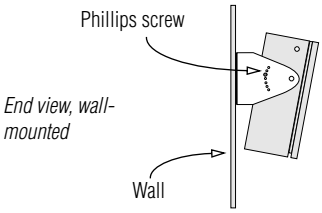
N047160C (70 lbs, 31.8 kg)

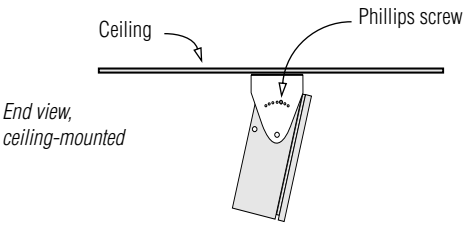




3. Tilt the sign to select a viewing angle. To hold the sign in place, screw a Phillips screw (supplied) through one of the small holes on each bracket into the screw hole in the sign case.

N047200C (80 lbs, 36.3 kg)





NOTE: Keep a minimum 1.0-inch (2.54 cm) clearance on all sides of the sign for adequate ventilation.

Alpha® 7000 series NEMA 4 and 4x models

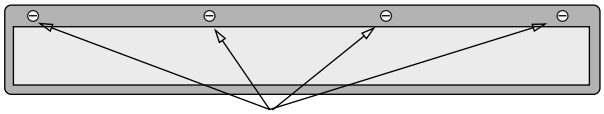
Model (weight)	Electrical instructions–power supply

⚠WARNING

Hazardous voltage.
Contact with high voltage may cause death or serious injury.
Always disconnect power to sign prior to servicing.

1. Open the front of the sign case by turning the quarter-turn latches counter-clockwise with a large screwdriver. (On the N047120, there are 3 quarter-turn latches; on the N047160 and the N047200, there are 4.) Carefully let the front of the case drop forward.

Front view, closed



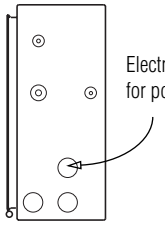
Quarter-turn latches on an N047200 sign

2. Feed electrical cable through 1" water-tight conduit, the outside end of the connector (supplied), the electrical opening in the sign case, and then through the inside end of the connector. Screw the inside and outside ends of the connector together until water-tight.

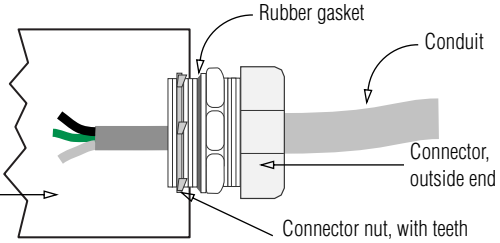
N047120C (60 lbs, 27.2 kg)

N047160C (70 lbs, 31.8 kg)

Right-end view

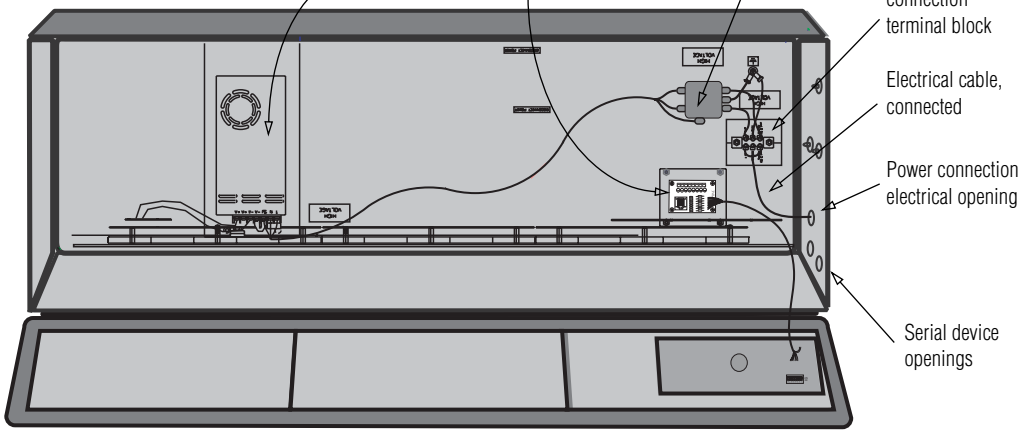


Front view



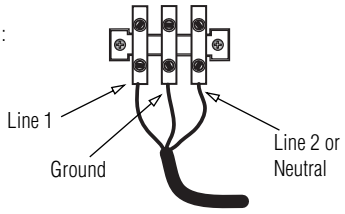
N047200C (80 lbs, 36.3 kg)

Front view, open



3. Strip the electrical wires back 1/4". Connect the wires by screwing the end of each wire into the power connection.

Power connection:

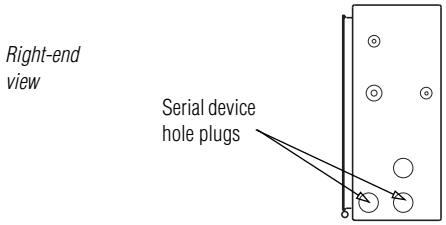


Alpha® 7000 series NEMA 4 and 4x models

Model (weight)

Electrical instructions – serial communication

4. For serial communications, remove one of the hole plugs from the lowest holes on the right end of the sign case.
5. Feed the serial cable from the PC through the serial opening in the sign case.



6. Connect the incoming serial wires (*bare-wire connection).*

   TB1 can be used for incoming RS485 **or** RS232 serial connection, but not both.

   TB1 and RS485 are recommended to reduce undesirable electrical interference.

   Aux Out can be used at the same time. (See next page.)

   NOTE: Be sure to place the wires so they will not be caught when the front of the sign is closed.

   NOTE: TB1 can be used for incoming bare-wire serial connection for RS232 **or** RS485, plus Auxiliary Out. The full pinout diagram is:

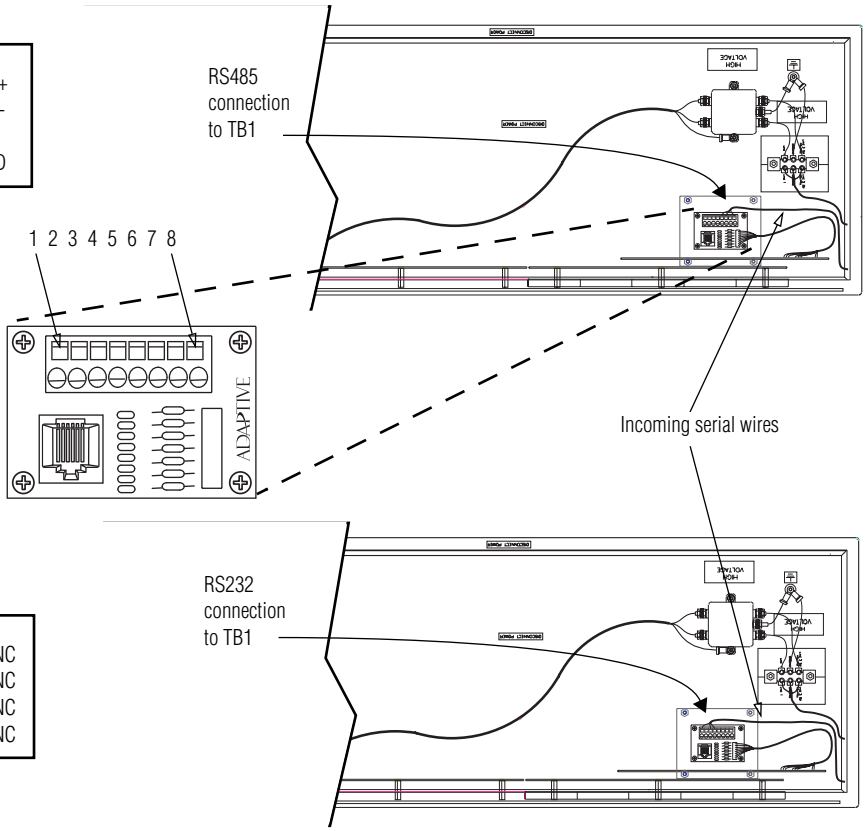
TB1 - full			
1	GND	5	RS485+
2	+5V	6	RS485-
3	RS232 TX	7	AUX OUT
4	RS232 RX	8	SHIELD

N047120C
(60 lbs, 27.2 kg)

N047160C
(70 lbs, 31.8 kg)

N047200C
(80 lbs, 36.3 kg)

TB1 - RS485			
1	NC	5	RS485+
2	NC	6	RS485-
3	NC	7	NC
4	NC	8	SHIELD



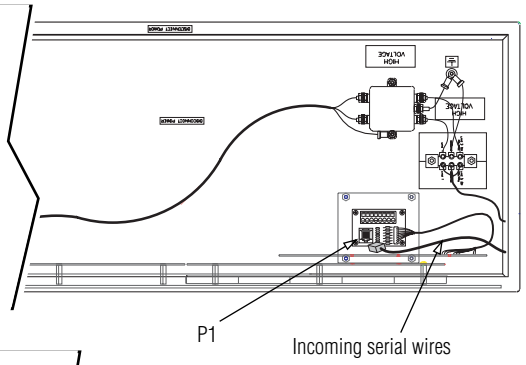
TB1 - RS232			
1	GND	5	NC
2	NC	6	NC
3	RS232 TX	7	NC
4	RS232 RX	8	NC

Connecting the serial wires (continued)

7. Connect the incoming serial wires *(RJ11/RJ12 connection for RS232 only)*

   P1 can be used for incoming RS232, although it is not recommended.

   NOTE: Be sure to place the wires so they will not be caught when the front of the sign is closed.



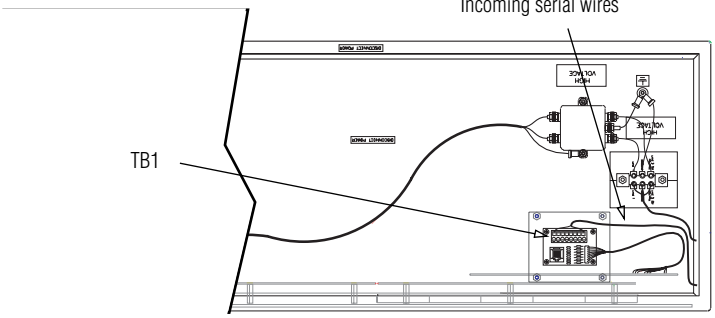
N047120C
(60 lbs, 27.2 kg)

8. (Optional) Connect an auxiliary device to TB1.

N047160C
(70 lbs, 31.8 kg)

TB1 - Aux out			
1	GND	5	NC
2	NC	6	NC
3	NC	7	AUX OUT
4	NC	8	NC

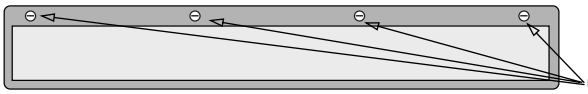
N047200C
(80 lbs, 36.3 kg)



9. To maintain NEMA compliance and to prevent EMI emissions, install hole plugs in any open conduit holes in the power supply enclosure. If needed, there is an extra hole plug supplied in addition to any hole plugs removed in Step 4 on page 9.

10. Carefully close the front of the sign case and turn the quarter-turn latches clockwise with a large screwdriver.

Front view, closed



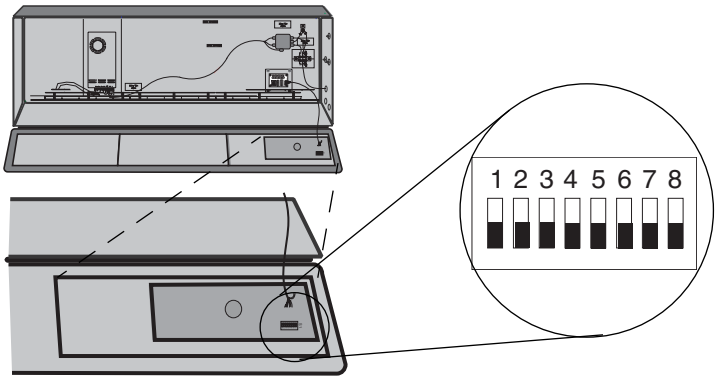
11. Plug the power cable into a power source.

Changing the serial address on Alpha® 7000 signs

N047120C
(60 lbs, 27.2 kg)

N047160C
(70 lbs, 31.8 kg)

N047200C
(80 lbs, 36.3 kg)



All signs leave the factory with a serial address of 00 (all DIP switches set to OFF), to allow sending the same message to all signs on a network simultaneously.

There are two ways to change a sign's serial address:

1. Use a hand-held infrared Remote Control, as described on page 1.
2. Set a permanent address by accessing the bank of DIP switches located on the micro controller board inside the sign as shown above. (This method will survive power supply interruptions or other conditions that could cause a software-set address to reset.) Close the sign after the address has been reset.

Serial address (in decimal)	DIP switch (1 = ON, 0 = OFF)							
	8	7	6	5	4	3	2	1
00	0	0	0	0	0	0	0	0
01	0	0	0	0	0	0	0	1
02	0	0	0	0	0	0	1	0
03	0	0	0	0	0	0	1	1
04	0	0	0	0	0	1	0	0
05	0	0	0	0	0	1	0	1
06	0	0	0	0	0	1	1	0
07	0	0	0	0	0	1	1	1
08	0	0	0	0	1	0	0	0
09	0	0	0	0	1	0	0	1
10	0	0	0	0	1	0	1	0
11	0	0	0	0	1	0	1	1

2.1" NEMA 2 character matrix signs

Model (weight)

Wall mounting instructions

1. **Note: chain hanging is not recommended.**
2. **After unpacking the unit, select wall and mounting hardware that is capable of supporting at least four times the weight of the sign, and use 16 bolts to mount the sign.**
3. Use the following table to determine mounting distances for the various models:

Mounting dimensions in inches (centimeters)			
Dimension	**Model**		
	N02CM040008P03TRI	**N02CM040012P03TRI**	**N02CM040016P03TRI**
A	86.45 (219.5)	86.45 (219.5)	86.43 (219.5)
B	82.06 (208.4)	82.06 (208.4)	82.05 (208.4)
C	78.06 (198.3)	78.06 (198.3)	78.05 (198.2)
D	7.64 (19.4)	7.64 (19.4)	7.64 (19.4)
E	46.02 (116.9)	59.22 (150.4)	72.32 (183.7)
F	41.63 (105.7)	54.83 (139.3)	67.94 (172.6)
G	37.63 (95.6)	50.83 (129.1)	63.94 (162.4)

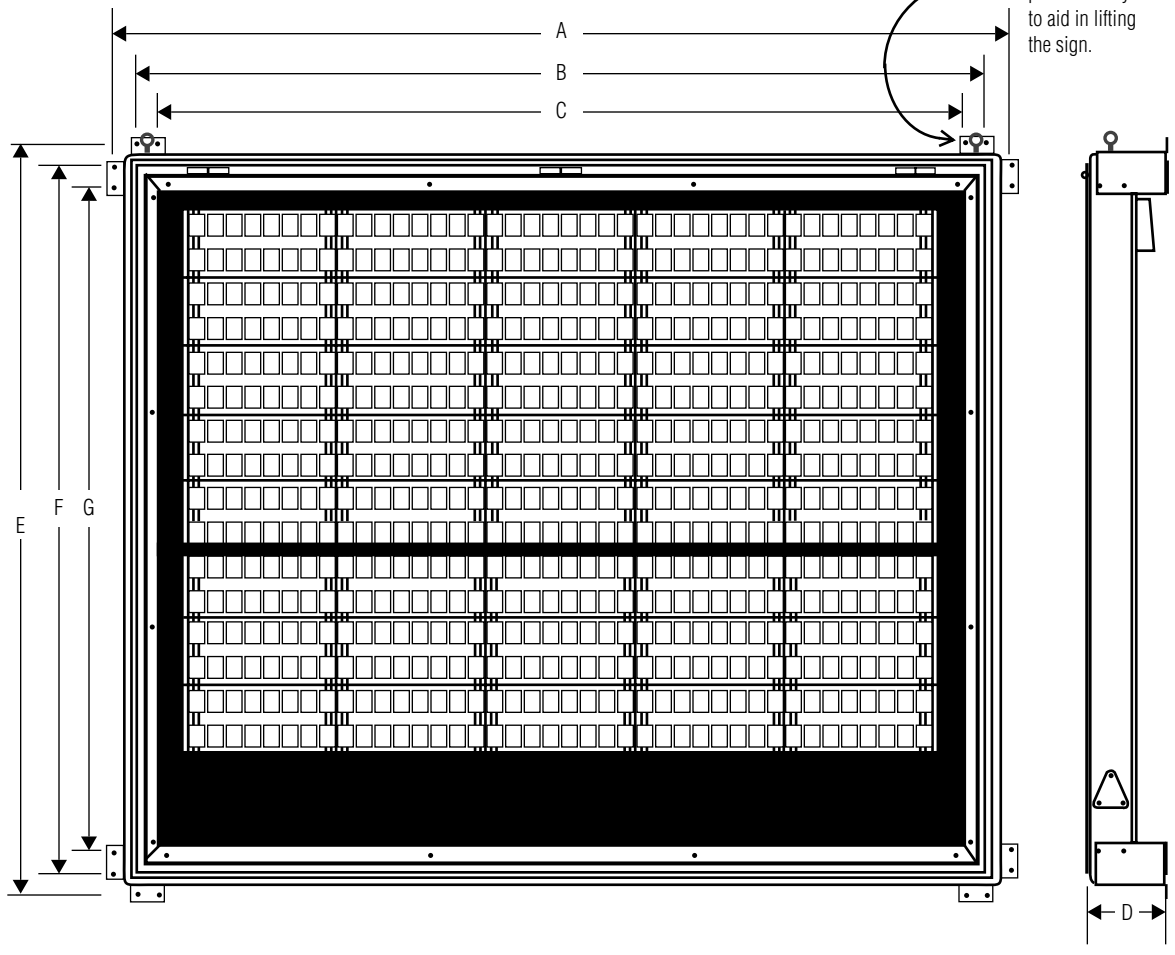
N02CM040008P03TRI (256 lbs, 116 kg)

N02CM040012P03TRI (288 lbs, 130.5 kg)

N02CM040016P03TRI (320 lbs, 145 kg)

NOTE: The sign shown below is a N02CM040016P03TRI model.

NOTE: Eyebolts are provided only to aid in lifting the sign.



2.1" NEMA 2 character matrix signs

Model (weight)	Electrical installation instructions

N02CM040008 P03TRI (256 lbs, 116 kg)

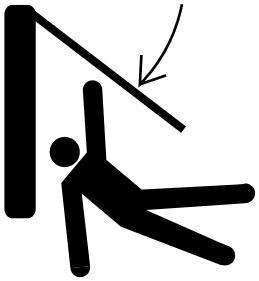
N02CM040012 P03TRI (288 lbs, 130.5 kg)

N02CM040016 P03TRI (320 lbs, 145 kg)

⚠WARNING

Hazardous voltage. Contact with high voltage may cause death or serious injury. Always disconnect power to sign prior to servicing.

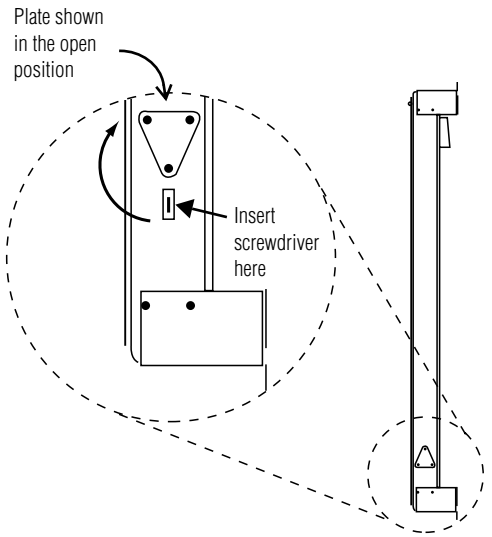
⚠WARNING



Possible crush hazard. Engage safety bar while access door is opened. Otherwise, door may close unexpectedly, possibly causing serious injury.

1. After wall mounting the unit as previously described, remove the two lower screws from the triangular plate on each side of the sign. Swing each plate up. Then use a screwdriver to push up the lever on each side of the sign to unlock the latches for the front access door.

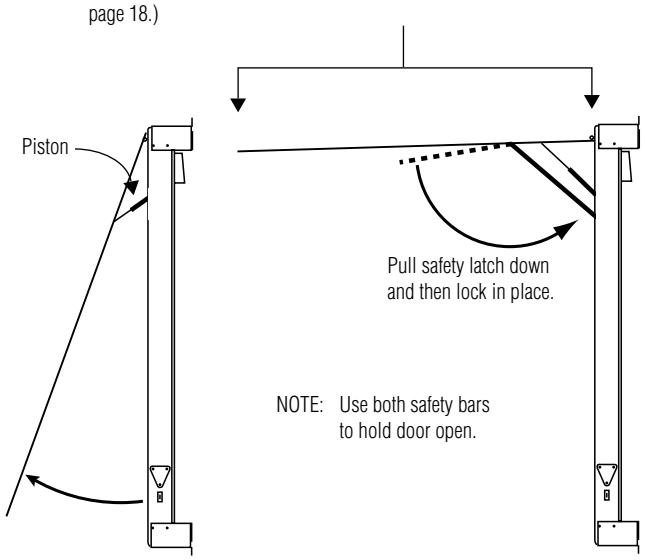
NOTE: To close the access door, push the door down until each latch clicks twice.



2. Pull the access door up. There will be moderate resistance in lifting the door until the pistons engage. Then pull down and lock the safety latch on each side of the door.

NOTE: Use two people (for maneuverability) to open the access door, and use both safety bars to hold the door open.

Make sure there is adequate clearance in front of the sign to open the access door. (Use dimension **E** from the "Wall mounting instructions" on page 18.)



NOTE: Use both safety bars to hold door open.

2.1" NEMA 2 character matrix signs

Model (weight)

Electrical installation instructions (continued)

N02CM040008 P03TRI (256 lbs, 116 kg)

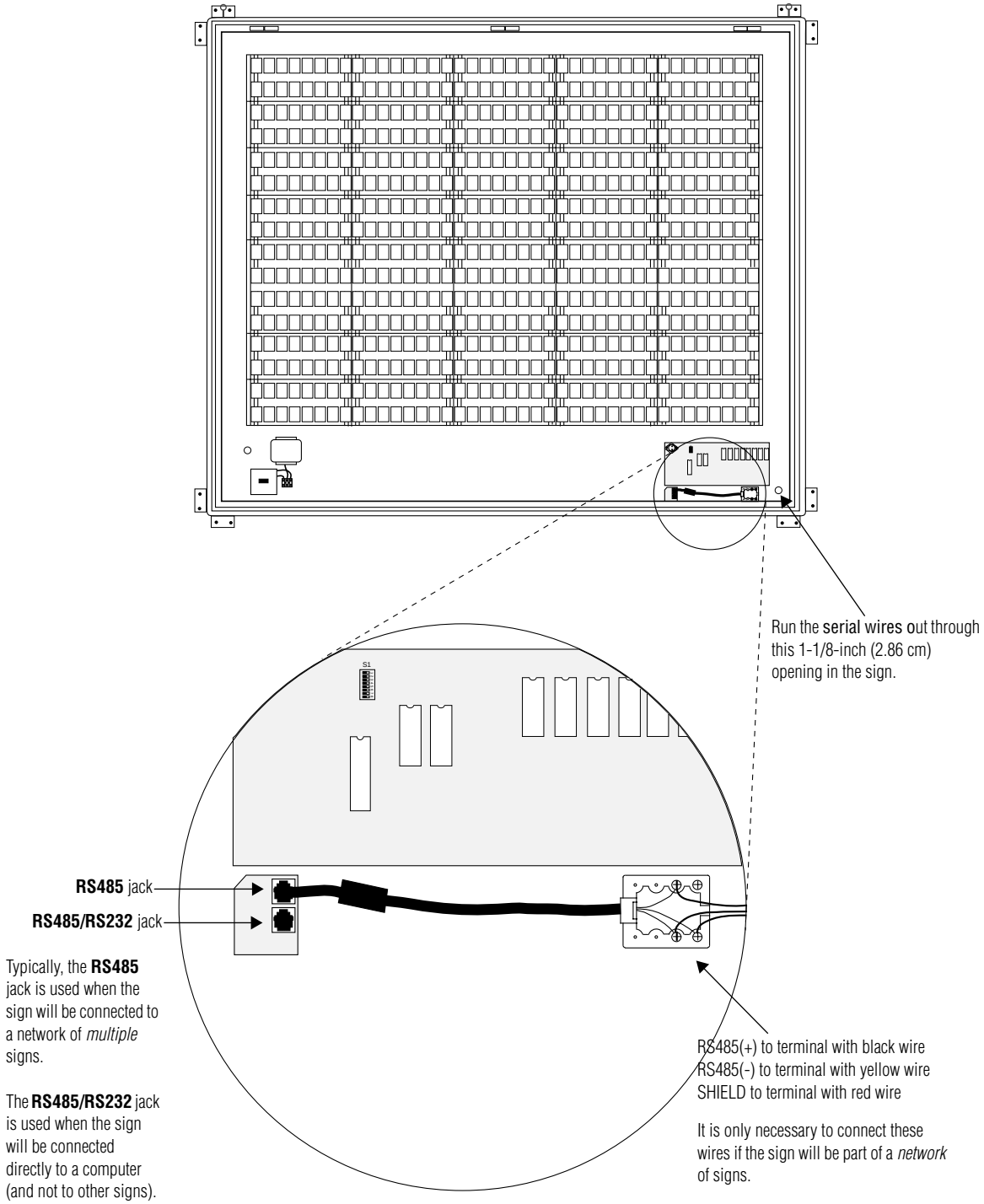
N02CM040012 P03TRI (288 lbs, 130.5 kg)

N02CM040016 P03TRI (320 lbs, 145 kg)

3. Connect the serial data lines as shown below.

   NOTE: For further information on connecting a sign to a computer, see the **Network Configurations** manual (pn 9708-8046).

   NOTE: Use separate conduits for the signal and power wires. Use watertight connectors for the conduit.



2.1" NEMA 2 character matrix signs

Model (weight)

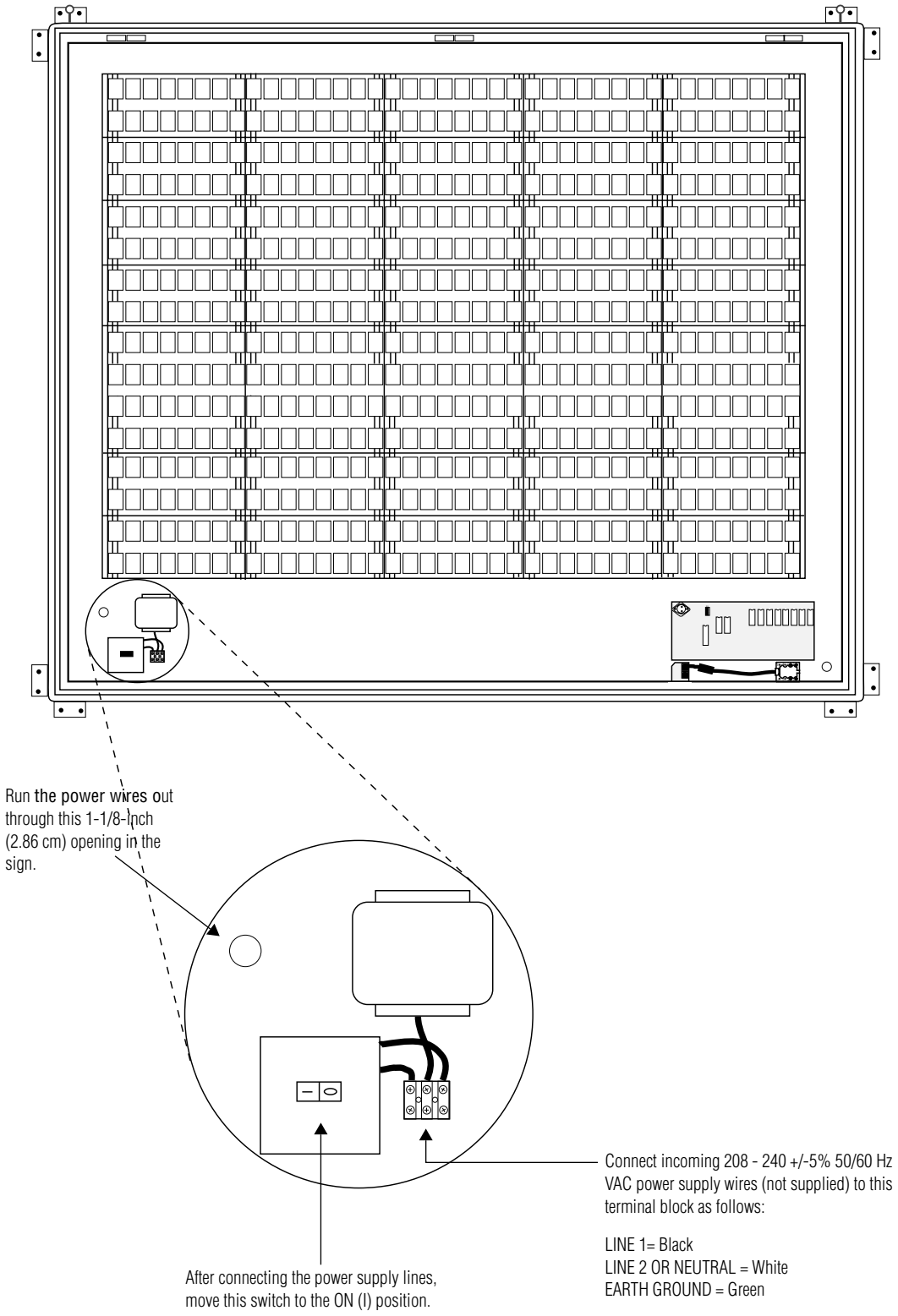
Electrical installation instructions (continued)

N02CM040008 P03TRI (256 lbs, 116 kg)

N02CM040012 P03TRI (288 lbs, 130.5 kg)

N02CM040016 P03TRI (320 lbs, 145 kg)

4. Connect the sign to a power supply as shown below:



2.1" NEMA 2 character matrix signs

Model (weight)

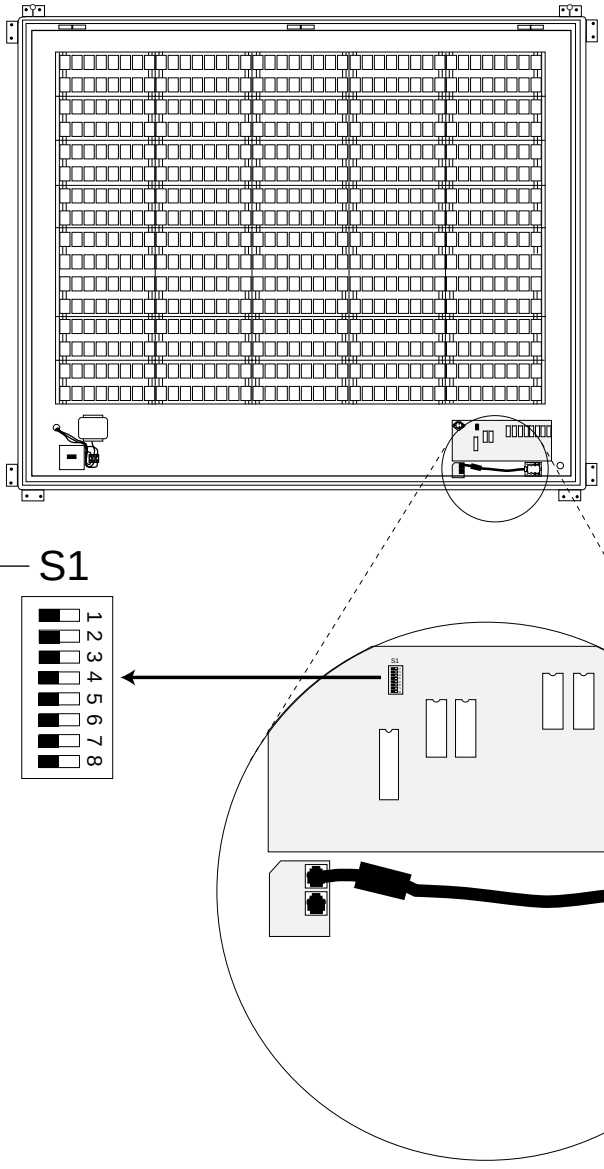
N02CM040008 P03TRI (256 lbs, 116 kg)

N02CM040012 P03TRI (288 lbs, 130.5 kg)

N02CM040016 P03TRI (320 lbs, 145 kg)

Changing the serial address on 2.1" NEMA 2 signs

1. Remove power from the sign.
2. Open the sign's access door as described on page 19.
3. Then set DIP switch S1 to the desired serial address (see below), a number from 0 to 63 in hexadecimal (00 to 3F), in binary representation. (DIP switch **1** = least significant bit, **6** = most significant bit).
4. After setting the address, apply power to the sign, and the new serial address should appear. (See "Checkout procedure" on page 1.)



DIP switch S1 sets the sign's serial address.
Here are some example serial addresses:

Serial address in decimal (hexadecimal in parentheses)	**DIP switch (1 = ON, 0 = OFF)**							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
0 (00)	0	0	0	0	0	0	Do not use	
1 (01)	1	0	0	0	0	0		
2 (02)	0	1	0	0	0	0		
3 (03)	1	1	0	0	0	0		
4 (04)	0	0	1	0	0	0		
5 (05)	1	0	1	0	0	0		
6 (06)	0	1	1	0	0	0		
7 (07)	1	1	1	0	0	0		
8 (08)	0	0	0	1	0	0		
9 (09)	1	0	0	1	0	0		
10 (0A)	0	1	0	1	0	0		
11 (0B)	1	1	0	1	0	0		

3.2" NEMA 2 character matrix signs

Model (weight)

Wall mounting instructions

1. Note: chain hanging is not recommended.

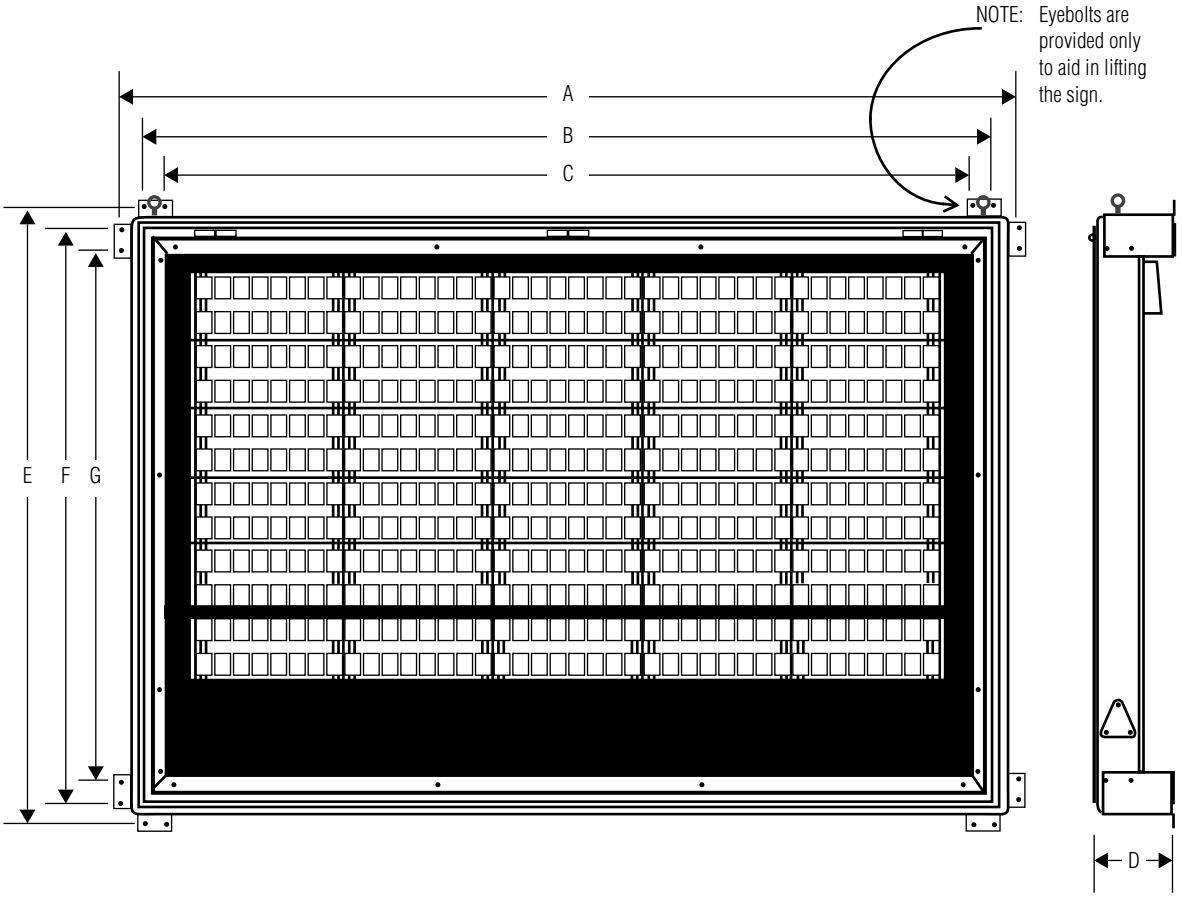
2. After unpacking the unit, select wall and mounting hardware that is capable of supporting at least four times the weight of the sign, and use 16 bolts to mount the sign.

3. Use the following table to determine mounting distances for the various models:

Mounting dimensions in inches (centimeters)		
Dimension	**Model**	
	N02CM040008P045TRI	**N02CM040012P045TRI**
A	127.66 (324.3)	127.66 (324.3)
B	123.27 (313.1)	123.27 (313.1)
C	119.27 (302.9)	119.27 (302.9)
D	7.64 (19.4)	7.64 (19.4)
E	59.22 (150.4)	79.02 (200.7)
F	54.83 (139.3)	74.63 (189.6)
G	50.83 (129.1)	70.63 (179.4)

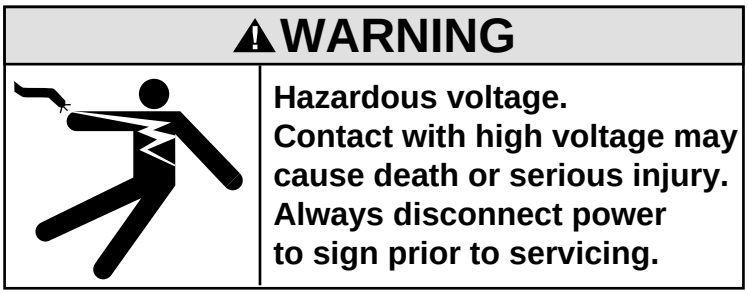
N02CM040008P045TRI
(380 lbs, 172.5 kg)

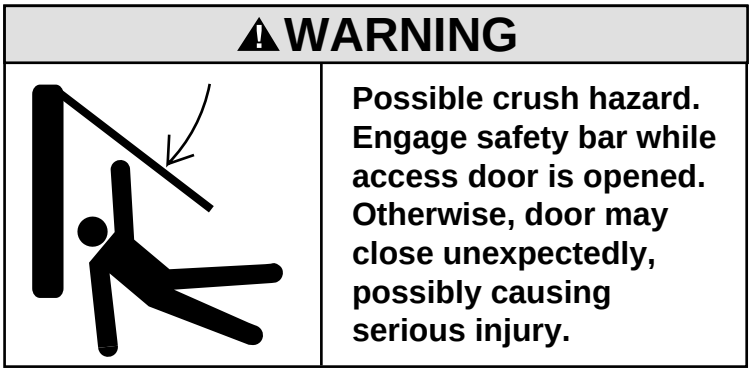
N02CM040012P045TRI
(430 lbs, 195.2 kg)



3.2" NEMA 2 character matrix signs

Model (weight)	Electrical installation instructions



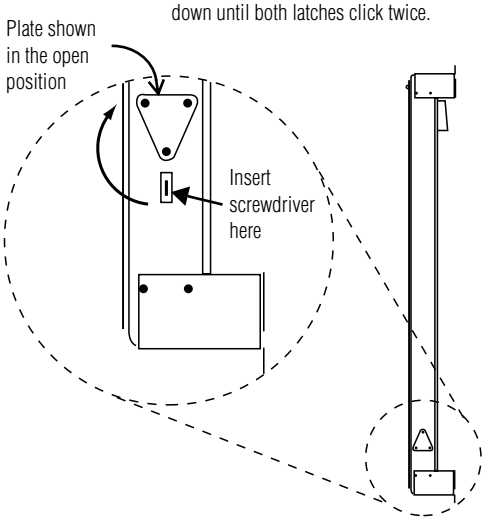


N02CM040008
P045TRI
(380 lbs, 172.5 kg)

N02CM040012
P045TRI
(430 lbs, 195.2 kg)

1. Remove the two lower screws from the triangular plate on each side of the sign. Swing each plate up. Then use a screwdriver to push up the lever on each side of the sign to unlock the latches for the front access door. There is a third lever in the middle of the bottom of the sign. This needs to be opened and unlocked similarly.

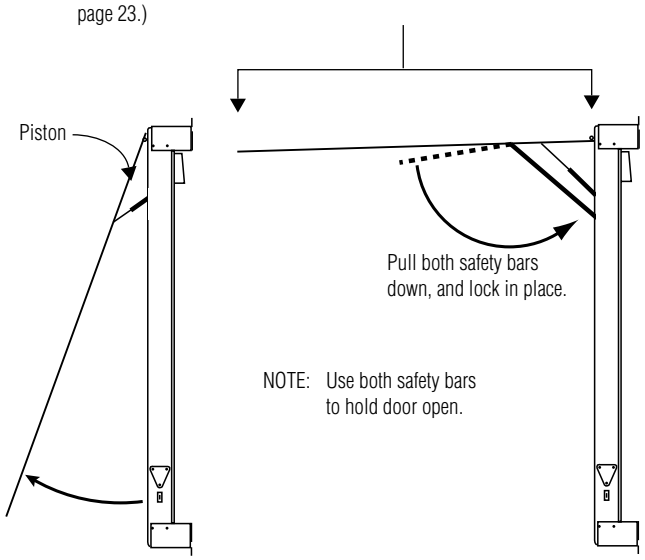
NOTE: To close the access door, push the door down until both latches click twice.



2. Pull the access door up. There will be moderate resistance in lifting the door until the pistons engage. Then pull down and lock the safety bar on each side of the door.

NOTE: Use two people (for maneuverability) to open the access door, and use both safety bars to hold the door open.

Make sure there is adequate clearance in front of the sign to open the access door. (Use dimension **E** from the "Wall mounting instructions" on page 23.)



3.2" NEMA 2 character matrix signs

Model (weight)

Electrical installation instructions (continued)

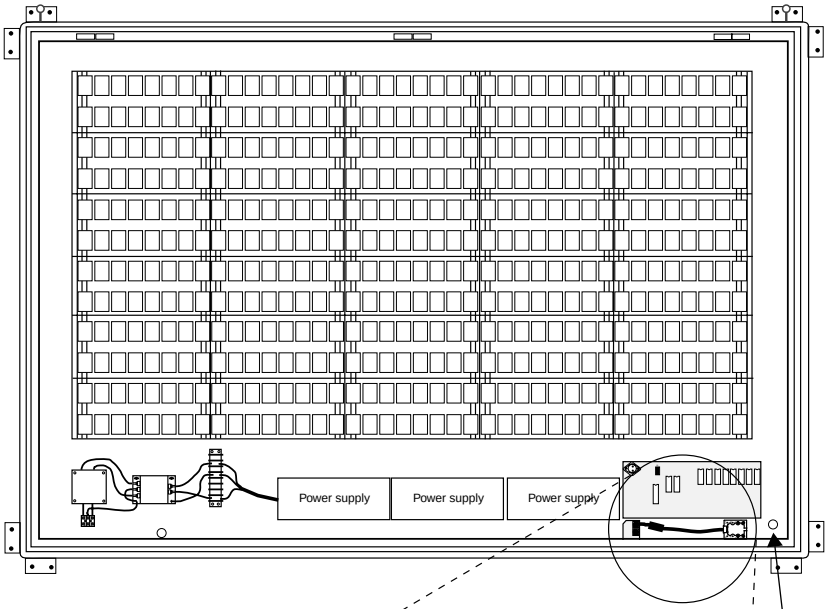
N02CM040008
P045TRI
(380 lbs, 172.5 kg)

N02CM040012
P045TRI
(430 lbs, 195.2 kg)

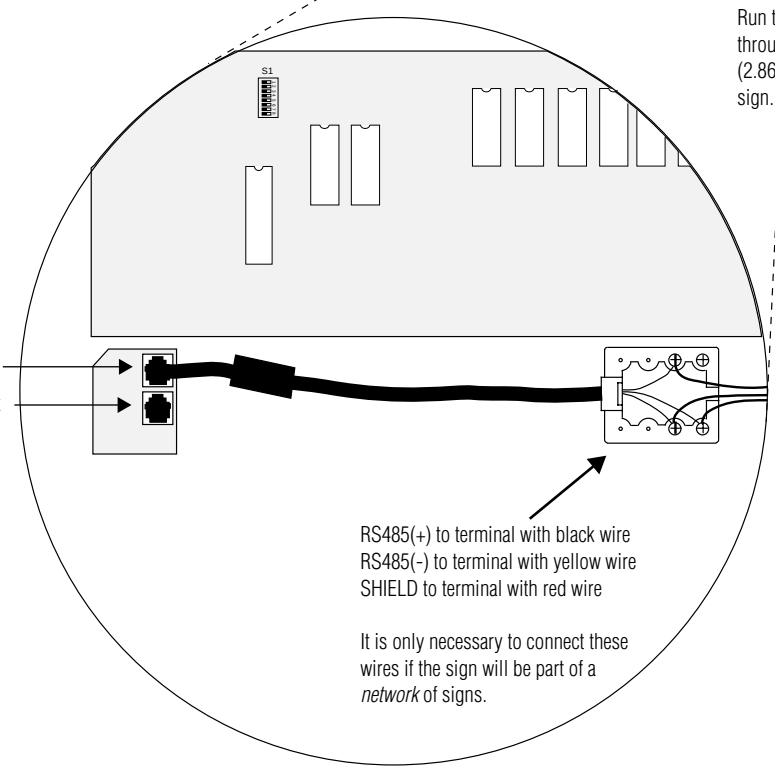
3. Connect the serial data lines as shown below:

NOTE: For further information on connecting a sign to a computer, see the **Network Configurations** manual (pn 9708-8046.)

NOTE: Use separate conduits for the signal and power wires. Use watertight connectors for the conduit.



Run the serial wires out through this 1-1/8-inch (2.86 cm) opening in the sign.



RS485 jack

RS485/RS232 jack

Typically, the **RS485** jack is used when the sign will be connected to a network of *multiple* signs.

The **RS485/RS232** jack is used when the sign will be connected directly to a computer (and not to other signs).

RS485(+) to terminal with black wire
RS485(-) to terminal with yellow wire
SHIELD to terminal with red wire

It is only necessary to connect these wires if the sign will be part of a *network* of signs.

3.2" NEMA 2 character matrix signs

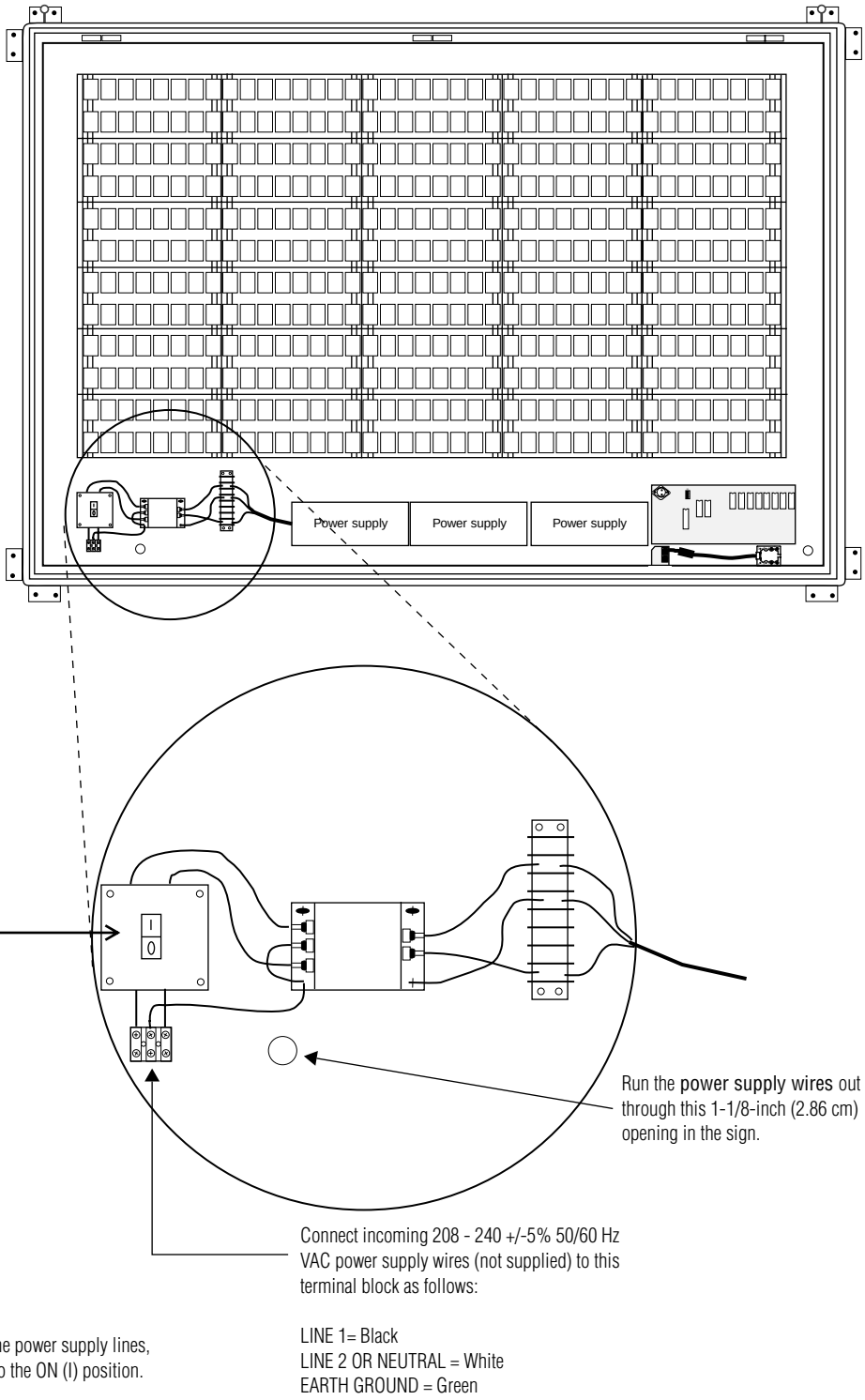
Model (weight)

Electrical installation instructions (continued)

N02CM040008
P045TRI
(380 lbs, 172.5 kg)

N02CM040012
P045TRI
(430 lbs, 195.2 kg)

4. Connect the sign to a power supply as shown below:



3.2" NEMA 2 character matrix signs

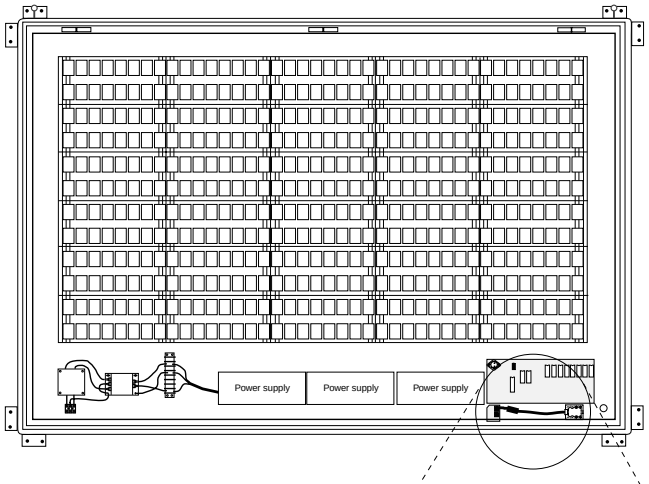
Model (weight)

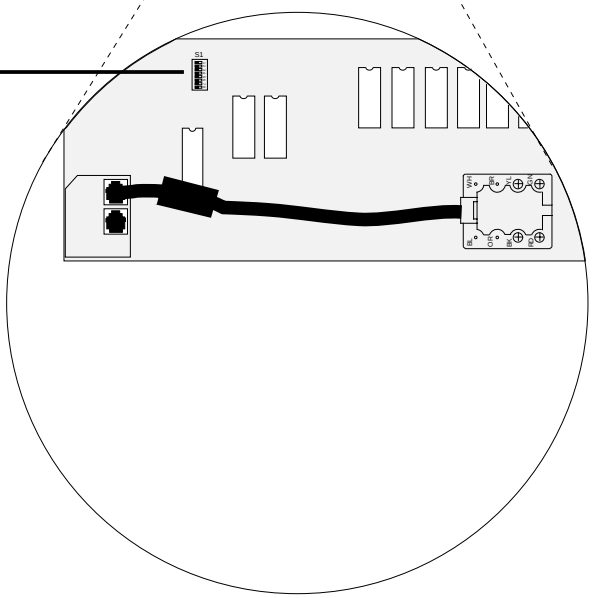
Changing the serial address on 3.2" NEMA 2 signs

1. Remove power from the sign.
2. Open the sign's access door as described in "Electrical installation instructions" on page 24.
3. Then set DIP switch S1 to the desired serial address (see below), a number from 0 to 63, in binary representation. (DIP switch **1** = least significant bit, **6** = most significant bit).
4. After setting the address, apply power to the sign, and the new serial address should appear. (See "Checkout procedure" on page 1.)

N02CM040008
P045TRI
(380 lbs, 172.5 kg)

N02CM040012
P045TRI
(430 lbs, 195.2 kg)





DIP switch S1 sets the sign's serial address. Here are some example serial addresses:

Serial address	DIP switch (1 = ON, 0 = OFF)							
	1	2	3	4	5	6	7	8
0	0	0	0	0	0	0	Do not use.	
1	1	0	0	0	0	0		
2	0	1	0	0	0	0		
3	1	1	0	0	0	0		
4	0	0	1	0	0	0		
5	1	0	1	0	0	0		
6	0	1	1	0	0	0		
7	1	1	1	0	0	0		
8	0	0	0	1	0	0		
9	1	0	0	1	0	0		
10	0	1	0	1	0	0		