

Mounting Guidelines for Lutron DIN Rail Products

English

A DIN rail is a metal rail widely used for mounting circuit breakers and industrial control equipment inside enclosures. The term derives from the original specifications having been published by Deutsches Institut für Normung (DIN) in Germany, which have since been adopted as European (EN50022) and international (ISO) standards. In this document “DIN rail” refers specifically to a 35 mm (1.3 in) wide “top hat” rail, which is the most widely used variety. Panels with integrated DIN rails are available in many different shapes and sizes. When mounting Lutron DIN power modules, we recommend using Lutron DIN rail panels. For more information on Lutron panels, see spec submittals 369788, 369867, 3691055, and 3691106 at www.lutron.com. If not using Lutron panels, this document will assist in laying out Lutron products within a DIN rail equipped enclosure.

Enclosures come in a variety of IP ratings. The IP Code (or Ingress Protection Rating, sometimes also interpreted as International Protection Rating) consists of the letters IP followed by two digits or one digit and one letter and an optional letter. As defined in international standard IEC 60529, IP Code classifies and rates the degrees of protection provided against the intrusion of solid objects (including body parts like hands and fingers), dust, accidental contact, and water in mechanical casings and with electrical enclosures.

Each reputable enclosure manufacturer will provide data on how much power a specific size enclosure will dissipate. When attempting to lay out a DIN equipped enclosure, pay attention to certain spec points for all of the products (i.e., Heat Dissipation in BTUs/h).

Lutron DIN rail modules are designed to operate with an ambient temperature that does not allow any part of the module to exceed a set temperature (see chart on the next page). Lutron performance expectations are based on this criteria. Each module has an indicated calibration point symbol (see below). This symbol, located on each module, is the point where all temperatures must be taken. The calibration point maximum temperature specification must not be exceeded.

Calibration Point Symbol:



Critical Data:

Model Number	Heat Dissipation in BTUs/Hour †	Max. Calibration Point Temperature	Max. Ambient Temperature Inside Enclosure	DIN unit size (1 DIN = 18 mm)	Approximate Weight	Special requirements?
LQSE-4A-D	75	70 °C (158 °F)	50 °C (122 °F)	12	647 g (1.43 lb)	Yes*
LQSE-4A-120-D	75	70 °C (158 °F)	50 °C (122 °F)	12	647 g (1.43 lb)	Yes*
LQSE-4A5-120-D	75	70 °C (158 °F)	50 °C (122 °F)	12	633 g (1.40 lb)	Yes*
LQSE-4A5-230-D	75	70 °C (158 °F)	60 °C (140 °F)	12	633 g (1.40 lb)	No
QSNE-4A-D	75	70 °C (158 °F)	50 °C (122 °F)	12	647 g (1.43 lb)	Yes*
QSNE-4A5-230-D	75	70 °C (158 °F)	60 °C (140 °F)	12	633 g (1.40 lb)	No
QSN-4A5-D	75	70 °C (158 °F)	60 °C (140 °F)	12	633 g (1.40 lb)	No
LQSE-4T10-D	4	65 °C (149 °F)	55 °C (131 °F)	9	371 g (0.82 lb)	No
LQSE-4T5-120-D	4	65 °C (149 °F)	55 °C (131 °F)	9	371 g (0.82 lb)	No
QSN-4T5-120-D	4	65 °C (149 °F)	55 °C (131 °F)	9	371 g (0.82 lb)	No
QSNE-4T10-D	4	65 °C (149 °F)	50 °C (122 °F)	9	371 g (0.82 lb)	No
QSNE-4T10-230-D	4	65 °C (149 °F)	50 °C (122 °F)	9	371 g (0.82 lb)	No
LQSE-4T20-120-D	4	65 °C (149 °F)	55 °C (131 °F)	12	499 g (1.10 lb)	No
QSN-4T20-D	4	65 °C (149 °F)	55 °C (131 °F)	12	499 g (1.10 lb)	No
QSN-4S20-D	4	65 °C (149 °F)	55 °C (131 °F)	12	499 g (1.10 lb)	No
LQSE-4S10-D	4	65 °C (149 °F)	55 °C (131 °F)	9	371 g (0.82 lb)	No
QSNE-4S10-D	4	65 °C (149 °F)	50 °C (122 °F)	9	371 g (0.82 lb)	No
LQSE-2DAL-D	24	75 °C (167 °F)	55 °C (131 °F)	9	272 g (0.60 lb)	No
QSNE-2DAL-D	24	75 °C (167 °F)	55 °C (131 °F)	9	299 g (0.66 lb)	No
LQSE-2HDC-D	24	75 °C (167 °F)	55 °C (131 °F)	9	272 g (0.60 lb)	No
LQSE-1DAL2-D	24	75 °C (167 °F)	55 °C (131 °F)	9	272 g (0.60 lb)	No
LQSE-2DALUNV-D	24	75 °C (167 °F)	55 °C (131 °F)	9	272 g (0.60 lb)	No
QSN-2DALUNV-D	24	75 °C (167 °F)	55 °C (131 °F)	9	272 g (0.60 lb)	No
LQSE-4M-D	5	65 °C (149 °F)	55 °C (131 °F)	9	360 g (0.80 lb)	No
LQSE-4M-120-D	5	65 °C (149 °F)	55 °C (131 °F)	9	360 g (0.80 lb)	No
QSE-CI-4M-D	5	65 °C (149 °F)	55 °C (131 °F)	9	360 g (0.80 lb)	No
LQSE-2ECO-D	24	75 °C (167 °F)	55 °C (131 °F)	9	272 g (0.60 lb)	No
QSNE-2ECO-D	24	75 °C (167 °F)	55 °C (131 °F)	9	272 g (0.60 lb)	No
MQSE-4S1-D	24	65 °C (149 °F)	50 °C (122 °F)	9	309 g (0.68 lb)	No
MQSE-3S1-D	24	65 °C (149 °F)	50 °C (122 °F)	9	309 g (0.68 lb)	No
MQSE-2S1-D	24	65 °C (149 °F)	50 °C (122 °F)	9	309 g (0.68 lb)	No
MQSE-4A1-D	35	70 °C (158 °F)	50 °C (122 °F)	9	401 g (0.88 lb)	Yes*
MQSE-3A1-D	30	70 °C (158 °F)	50 °C (122 °F)	9	401 g (0.88 lb)	Yes*
MQSE-2A1-D	25	70 °C (158 °F)	50 °C (122 °F)	9	401 g (0.88 lb)	Yes*
LQSE-4A1-D	35	70 °C (158 °F)	50 °C (122 °F)	9	401 g (0.88 lb)	Yes*
LQSE-4S8-120-D	24	65 °C (149 °F)	50 °C (122 °F)	9	309 g (0.68 lb)	No
QSN-4S8-120-D	24	65 °C (149 °F)	50 °C (122 °F)	9	309 g (0.68 lb)	No
LQSE-4S5-230-D	24	65 °C (149 °F)	50 °C (122 °F)	9	309 g (0.68 lb)	No
LQSE-4S5-120-D	24	65 °C (149 °F)	50 °C (122 °F)	9	309 g (0.68 lb)	No
QSNE-4S5-230-D	24	65 °C (149 °F)	50 °C (122 °F)	9	309 g (0.68 lb)	No
QSNE-4S5-120-D	24	65 °C (149 °F)	50 °C (122 °F)	9	309 g (0.68 lb)	No
QSPS-DH-1-75(-H)	28	60 °C (140 °F)	55 °C (131 °F)	5	290 g (0.64 lb)	No
MQSPS-DH-1-30	12	70 °C (158 °F)	50 °C (122 °F)	1.25	148 g (0.33 lb)	Yes*

† BTU number shown assumes you are running loads at 100% of rated capacity (including low-voltage links).

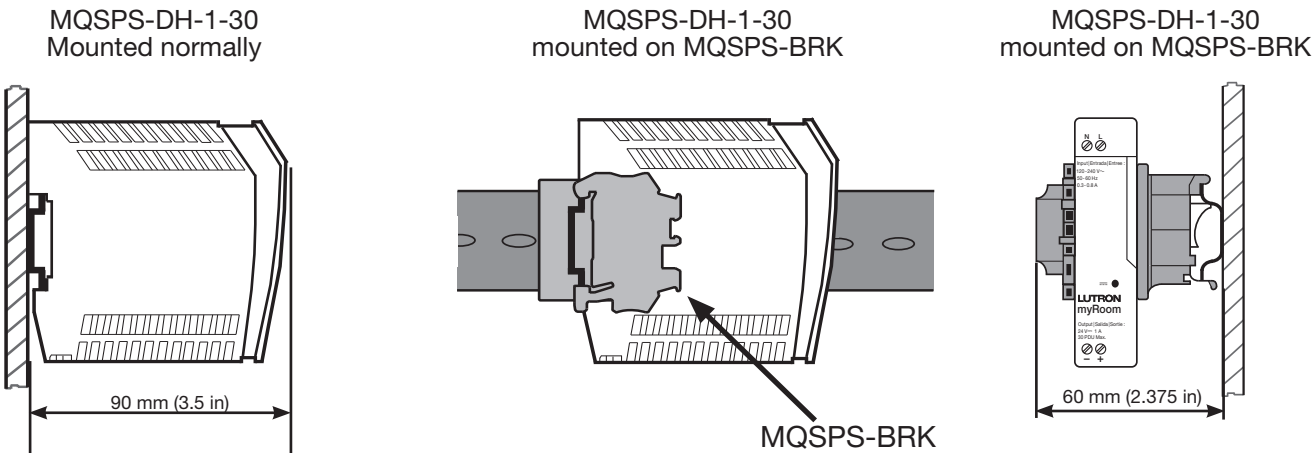
* See page 3 or 4 for more information.

General Guidelines:

- Choose a high-quality enclosure manufacturer.
- In North America, always use an enclosure evaluated and marked by a Nationally Recognized Testing Laboratory (NRTL).
- In North America, it is strongly recommended that the enclosure and module combinations be submitted to the Authority Having Jurisdiction (AHJ) for review prior to installation. The AHJ may require inspection of the finished installation by a NRTL.
- Determine what the power dissipation is for all the DIN components (power modules, breakers, power supplies, etc.).
- Determine the enclosure size based on total heat dissipation requirements and module mounting length requirements. Mount all products in an IP20 (minimum) or NEMA Type 1 (minimum) enclosure, and be sure to choose the correct IP rating that complies with local codes for your installation.
- Consult with the enclosure manufacturer to determine the amount of venting required. Some enclosure manufacturers provide design software to aid in this process.
- To achieve best performance, Lutron recommends using ventilated enclosures with natural convection cooling where possible.
- Mount DIN power modules with arrows facing up to ensure adequate cooling.
- Install heavily loaded units near the bottom of a non-ventilated enclosure or near the exhaust of a ventilated enclosure.
- Where possible, have the heat sink on phase-adaptive modules (LQSE-4A-D/LQSE-4A-120-D/ LQSE-4A5-230-D/ QSNE-4A-D/QSNE-4A5-230-D) exposed through the front cover.
- Ensure there is code-compliant separation between line-voltage and low-voltage wiring.
- DO NOT place module panels above other sources of heat.

Special Requirements for MQSPS-DH-1-30

MQSPS-BRK mounting bracket is required for installations where the enclosure is between 60 mm (2.375 in) and 100 mm (4 in) deep.



Special Requirements for Phase Adaptive Modules

Considerations must be taken when arranging any modules in a DIN enclosure, however, special requirements need to be followed for the phase adaptive power module. For multi-unit applications, choose an enclosure that allows DIN rows to be spaced a minimum of 150 mm (6.0 in) apart and allow 200 mm (7.9 in) above the top-most DIN for cooling. This may require leaving the top row of the enclosure empty.

- If the ambient room temperature is between 0 °C and 30 °C (32 °F and 86 °F), no derating is required.
- If the ambient room temperature is between 30 °C and 40 °C (86 °F and 104 °F), for a single module, in a single non-ventilated enclosure, each zone should be derated as follows:
 - LQSE-4A-D/LQSE-4A5-120-D/QSNE-4A-D - derate by 100 W
 - LQSE-4A1-D/MQSE-xA1-D - derate by 25 W (at 120 V~) or 50 W (at 240 V~)
 - LQSE-4A-120-D - derate by 50 W
- If the ambient room temperature is between 30 °C and 40 °C (86 °F and 104 °F) for a multiple row, non-ventilated enclosure, each zone should be derated as follows:
 - LQSE-4A-D/LQSE-4A5-120-D/QSNE-4A-D - derate by 200 W
 - LQSE-4A1D/MQSE-xA1-D - derate by 50 W (at 120 V~) or 100 W (at 240 V~)
 - LQSE-4A-120-D - derate by 100 W

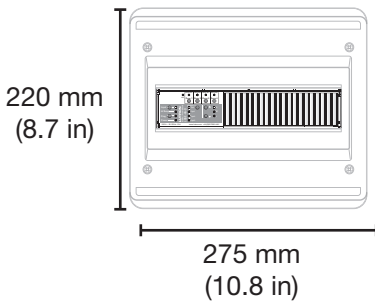
Sample Layouts for Non-Ventilated Enclosure Applications (using only phase-adaptive modules)

The sample layouts below show examples of different non-ventilated enclosures that have taken room ambient temperatures into consideration for module layout. Lutron, however, recommends using a ventilated enclosure for best performance. Enclosure sizes are shown for reference only.

For single module applications in non-ventilated enclosures:

If ambient room temperature is 0 °C to 30 °C (32 °F to 86 °F): No derating required

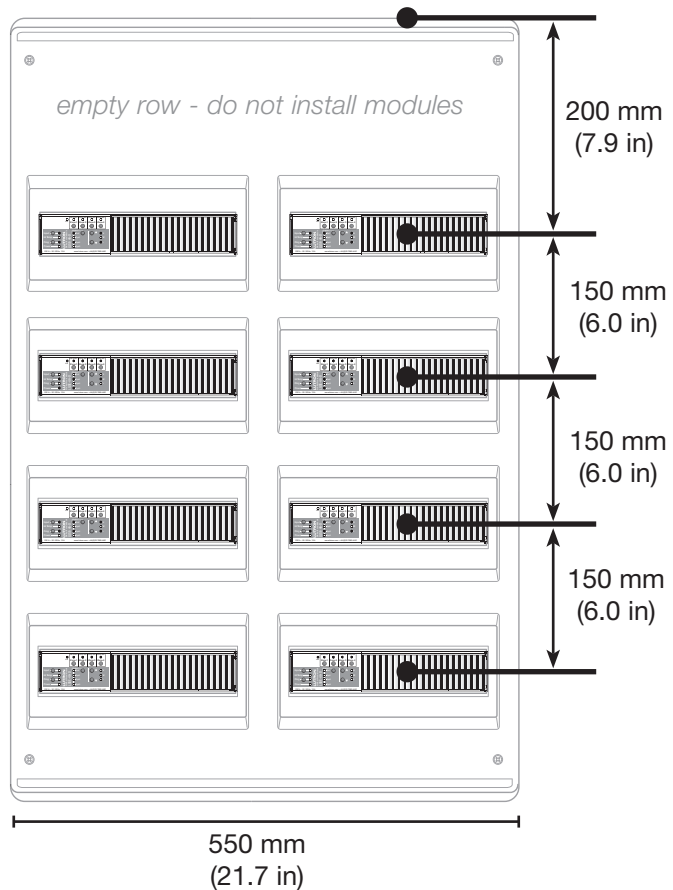
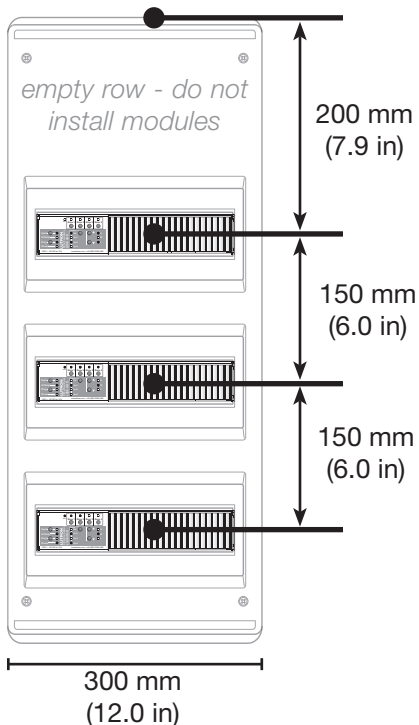
If ambient room temperature is 30 °C to 40 °C (86 °F to 104 °F): See Special Requirements for Phase Adaptive Modules




For multiple module applications in non-ventilated enclosures:

If ambient room temperature is 0 °C to 30 °C (32 °F to 86 °F): No derating required

If ambient room temperature is 30 °C to 40 °C (86 °F to 104 °F): See Special Requirements for Phase Adaptive Modules

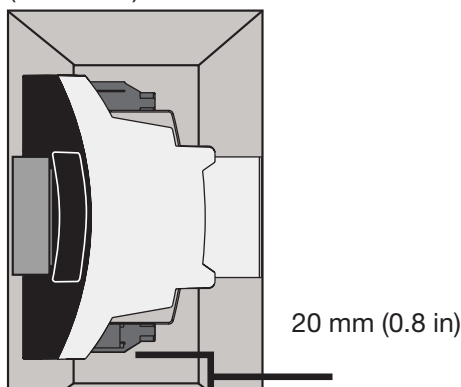


Temperature Measurements

Calibration Point Measurement: To measure temperature at the calibration point, affix a small temperature probe firmly to the  with a clip or small amount of tape, ensuring good thermal contact. Mount the readout portion of the meter outside the panel and close the lid as normal. Turn on all devices to 100% to ensure maximum heat generation. Run all installed DIN rail modules for approximately 2 to 3 hours until temperatures have stabilized. (Temperature stabilization is achieved when the temperature measurement is within 1 °C or 1.8 °F on two consecutive readings 20 minutes apart.)

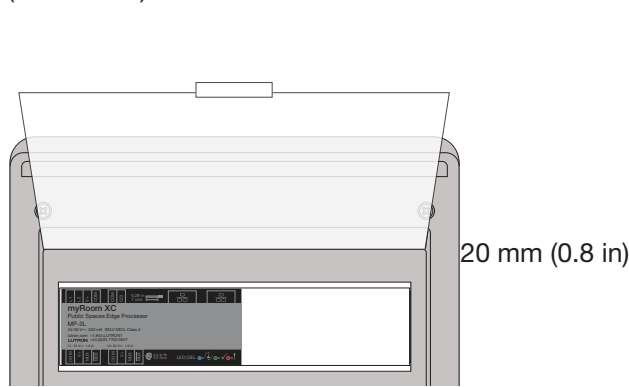
Internal Enclosure Ambient Temperature Measurement: To measure internal enclosure ambient temperature, affix a small temperature probe 20 mm (0.8 in) below the top-most module (see examples below). If the enclosure has a false front or cover to allow access to the front of a unit while covering live electrical wiring, this area must be measured as well. This measurement can be taken with any suitable temperature meter that can be placed as directed.

Internal Measurement Point
(Side View)



Measurement reading taken
inside DIN equipped enclosure

Measurement Point Between Cover and False Front
(Front View)



Measurement reading taken outside DIN equipped
enclosure underneath plastic cover

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