Introduction

This document defines fully-rated systems, two-tier series short circuit current protection and three-tier series short circuit current protection. It also addresses NEC® requirements and illustrates series rating labels currently provided with Square D™ multi-metering and load center equipment manufactured by Schneider Electric™. The location of series rating labels applied to Square D load centers is depicted on pages 2 and 3 of this document.

Fully Rated System

In a fully rated system, the interrupting rating of all the overcurrent protective devices must be greater than or equal to the available fault current at the line side terminals of each device.

Series Rated System

The NEC® and UL® permit assigning a short circuit current rating to a tested combination of circuit breakers or fuses that is higher than the individual rating of the downstream overcurrent protective device. Testing by the circuit breaker manufacturer demonstrates that the combination can safely interrupt the available fault current.

NEMA® defines a series rating as follows:

**Series Rating**—A short-circuit interrupting rating assigned to a combination of two or more overcurrent protective devices which are connected in a series and in which the rating of the downstream device(s) in the combination is less than the series rating.

The combination of overcurrent protective devices may be enclosed in a single piece of equipment such as a load center. Three-tier series rated systems are most commonly designed with the supply side device in a separate enclosure, such as metering equipment, that feeds a load center.

**NOTE:** The load side device is always a circuit breaker. The supply side device may be either a circuit breaker or a set of current limiting fuses.

Two-Tier Series Rating

A two-tier series rating can be used within a single enclosure (Example 1) or in separate enclosures (Example 2).

**Example 1: QO™ Main Circuit Breaker Load Center**

![Diagram of QO™ Main Circuit Breaker Load Center]

**Example 2: MP Meter-Pak™ Feeding Homeline™ Main Lug Load Center**

![Diagram of MP Meter-Pak™ Feeding Homeline™ Main Lug Load Center]
Location of Two-Tier Series Ratings Label in Schneider Electric Equipment

The permitted NEC® and UL® series ratings are found marked in the equipment. Unless the equipment is marked, one cannot be assured the circuit breaker combination will perform appropriately in the enclosure. Schneider Electric marks two-tier series ratings on the inside wall of load centers (See Figure 1). The two-tier series rating labels applied to current production convertible main QO™ and fixed main Homeline™ load centers are depicted in Figures 2 and 5, respectively.

NOTE: The information contained in this data bulletin is current at time of printing; however, ratings may change or additional ratings may be added without notice. Refer to the series-connected ratings marked on the equipment.

Figure 1: Two-Tier Series Ratings Label Application

Figure 2: QO Two-Tier Series Ratings Labels for Convertible Main Load Centers

Three-Phase QO Load Centers 125 A Max.

Single-Phase QO Load Centers 125 A Max.
Figure 2: \textit{(Continued)} QO Two-Tier Series Ratings Labels for Convertible Main Load Centers

<table>
<thead>
<tr>
<th>LUG TORQUE DATA</th>
<th>SHORT CIRCUIT CURRENT RATING</th>
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<tbody>
<tr>
<td>Branch Circuit Breaker</td>
<td>QO - VH, QOM - VH</td>
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<tr>
<td>Meter</td>
<td>QO - VH, QOM - VH</td>
</tr>
<tr>
<td>Neutral Lugs and Equipment Ground Bar</td>
<td>QO - VH, QOM - VH</td>
</tr>
<tr>
<td>Service Entrance Cable</td>
<td>QO - VH, QOM - VH</td>
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<tr>
<td>\textit{QO VH 125 A}</td>
<td>\textit{QO VH 125 A}</td>
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<td>\textit{QO VH 125 A}</td>
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</table>

Single-Phase QO Load Centers 150 A—225 A

### Three-Tier Series Rating

A three-tier series rating consists of three levels of overcurrent protection devices (the utmost load side device being a circuit breaker). Per NEC® 240.86, this three-tier combination of overcurrent protection must be marked on the end use electrical equipment (load center). See Example 3.

#### Example 3: EZM™ Fusible Main Device feeding EZM Branch Device feeding Homeline Main Lug Load Center (100 kA Three-Tier Series Rating)

![Diagram of EZM™ Fusible Main Device feeding EZM Branch Device feeding Homeline Main Lug Load Center](image)

<table>
<thead>
<tr>
<th>Class T</th>
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<tr>
<td>300 V ac</td>
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<tr>
<td>100 kA</td>
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<tr>
<td>QO VH 125 A</td>
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<tr>
<td>HOM 30 A</td>
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### Location of Three-Tier Series Ratings in Square D Equipment

For convertible main load centers, three-tier series ratings labels are applied on the backside of indoor load center covers and on outdoor load center deadfronts (See Figure 3). The information contained on this three-tier series rating label is shown in Figure 4.

For single-phase fixed main indoor and outdoor load centers, two-tier and three-tier ratings are printed on the same label. This label is located on the left side wall (See Figure 3). The information contained on the series rating label for single-phase fixed main load centers is depicted in Figure 5.

![Diagram of Convertible Main Load Centers Label Locations](image)
Figure 4: Three-Tier Series Ratings Label Applied to Convertible Main QO and Homeline Load Centers

Figure 5: Two- and Three-Tier Series Rating Label Applied to Fixed Main Homeline Load Centers

How to Read the Three-Tier Series Rating Label

Read the label from left to right. Select the appropriate short circuit current rating and then read across the row to select main disconnect,tenant circuit breaker and load center circuit breakers. See example below in Figure 6.

Figure 6: Selecting Short Circuit Current Rating
For Three-Phase QO Load Centers

For Single-Phase Convertible Main QO Load Centers Protected with QD or QG Tenant Circuit Breakers

For Homeline Convertible Main Load Centers Protected with QO-VH Tenant Circuit Breaker

For Homeline Convertible Main Load Centers Protected with Two-Pole QD or QG Tenant Circuit Breakers
How to Read the Series Rating

Label for RB devices

**DANGER**

Hazard of Electric Shock, Explosion or Arc Flash
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E and other electrical safety standards.
- This equipment must be installed and serviced only by qualified electrical personnel.
- Turn off all 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 doors, covers, and covers before turning on power to this equipment. Failure to follow these instructions will result in death or serious injury.

**PELIGRO**

Peligro de Descarga Eléctrica, Explosión o Destello por Arqueo
- Utilice equipo de protección personal (EPP) apropiado y siga las prácticas de seguridad eléctrica establecidas por su Compañía (consulte la norma NFPA 70E).
- El equipo eléctrico que no se especialice deberá instalar y prestar servicio de mantenimiento a este equipo.
- Desenchufe el equipo antes de realizar cualquier trabajo en él.
- Siempre utilice un dispositivo detector de tensión nominal adecuado para confirmar la desenergización del equipo.
- Vuelva a colocar todos los dispositivos, las puertas y las cubiertas antes de volver a energizar el equipo.
- El incumplimiento de estas instrucciones podrá causar la muerte o lesiones serias.

**WARNING**

This equipment is designed and tested by Square D to performance levels which exceed Underwriters Laboratories Standards. Use of Other than Square D Circuit Breakers May Adversely Affect User Safety and Impair Reliability. Square D disclaims all liability for damage, injury or non-performance caused by use or failure of non-Square D circuit breakers.

**ADVERTENCIA**

Este equipo ha sido diseñado y probado por Square D y supera las normas de nivel de rendimiento establecidas por Underwriters Laboratories (UL). El uso de interruptores automáticos que no sean de Square D pueden afectar negativamente la seguridad del usuario y deteriorar la confiabilidad del equipo. Square D no asume responsabilidad alguna por daños, lesiones o funcionamiento inadecuado que sean de los interruptores automáticos que no sean de Square D.

### HOMELINE-SHORT CIRCUIT CURRENT RATING / Corriente nominal de cortocircuito- HOMELINE

<table>
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<tr>
<th>Interrupting Rating (A)</th>
<th>Main ( \text{Nominal} ) ( \text{I}_{\text{C}} ) ( \text{Integral} ) ( \text{VH (125)} )</th>
<th>( \text{Main} ) ( \text{I}_{\text{C}} ) ( \text{Integral} ) ( \text{VH (125)} )</th>
<th>( \text{Main} ) ( \text{I}_{\text{C}} ) ( \text{T} ) ( \text{Derivado} ) ( \text{SQUARE D} )</th>
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<tr>
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### QO-SHORT CIRCUIT CURRENT RATING / Corriente nominal de cortocircuito- QO

<table>
<thead>
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<th>Interrupting Rating (A)</th>
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<th>( \text{Main} ) ( \text{I}_{\text{C}} ) ( \text{Integral} ) ( \text{VH (125)} )</th>
<th>( \text{Main} ) ( \text{I}_{\text{C}} ) ( \text{T} ) ( \text{Derivado} ) ( \text{SQUARE D} )</th>
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<td>42,000</td>
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<td>100,000</td>
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</tr>
</tbody>
</table>

* See circuit breaker for voltage and interrupting rating. / Consulte los datos del interruptor automático para obtener los valores nominales de tensión e interrupción.

See box label for additional short circuit current ratings and restrictions. / Consulte la etiqueta de la caja para obtener información adicional sobre la corriente nominal de cortocircuito y restricciones.

§ HOM includes suffixes AFI, BB, EPE & GFI / HOM incluye los sufijos AFI, BB, EPE y GFI.

† QOT includes suffixes AFI, EPD, EPE, GFI & PL / QOT incluye los sufijos AFI, EPD, EPE, GFI y PL.

‡ 100 A Max. in load centers with 125 A Max. mains rating / 100 A máx. para centros de carga con valor nominal en la línea principal de 125 A máx.
NEC Requirements

Two sections of the NEC address markings of series ratings: Section 110.22 and Section 240.86(b).

Per Section 110.22, the equipment must be legibly marked in the field to indicate the equipment has been applied with a series combination rating. The intent of this section is to alert the installer that the circuit breakers were installed based on a series rating, and to mark the equipment with the short circuit current rating being applied in the series combination.

Schneider Electric provides a label for this purpose with all MP Meter-Pak™ Meter Centers and EZ Meter-Pak™ Meter Center Branch Devices. The label is not applied by Schneider Electric, but is provided loose in these devices for application when series ratings are applied by the installer.

Section 240.86(b) requires that the series combination of overcurrent protective devices be tested and marked on the end use equipment. This marking is applied by the manufacturers of switchboards, panelboards, load centers, etc. Schneider Electric marks load center enclosures and covers with series ratings per Figures 1 and 3.

A series rated system is an affordable, viable alternative to a fully rated system. Series ratings can be two-tiered or multi-tiered, depending on the levels of overcurrent protection, tested and certified. Series ratings include circuit breaker/circuit breaker combinations and also fuse/circuit breaker combinations, but the furthest load side overcurrent protective device is always a circuit breaker. Overcurrent protective device combinations used in series rated systems should be marked on the end use equipment by the electrical distribution product manufacturer. Equipment installed as part of a series rated system must be marked in the field to indicate the short circuit current rating being applied in the series combination.