

## Introduction

Schneider Electric offers a complete line of products for the manual control and protection of motors. This catalog covers those devices designed to meet IEC standards for protection and control.<sup>1</sup>

The GV2 and GV3 manual starters and protectors provide manual isolation, manual motor control, and overcurrent protection in one compact unit. Schneider Electric offers four different products that make up the GV product family:

- The GV2ME manual starter controls motors with full-load currents up to 32 A.
- The GV2P high-performance manual starter offers a higher withstand rating and visible trip indication.
- The GV3P controls larger motors with full-load currents up to 65 A.
- The GV7 controls and protects motors with full-load currents up to 220 A.

These devices are UL Listed as manual motor controllers. The GV2 and GV3 manual starters and protectors are also UL Listed for group installation applications.

In many European applications, the GV devices are used as motor circuit breakers because they meet the requirements of IEC 60947-2 for motor circuit breakers. However, the GV starter does not meet North American circuit breaker standards, such as those of UL, the National Electrical Code (NEC), or CSA.

## Standard Features

The GV family standard features include the following:

- UL 508 Listed, IEC/EN 60947-1, 60947-2, 60947-4-1, CSA C 22.2 n° 14-05 type ECSA Certified, and CE Marked
- UL Listed for group motor applications (for more details, see page 9)
- Overload relay
  - Class 10, ambient-compensated, bimetallic (GV2, GV3)
  - Class 10, solid state (GV7)
- Single-phase sensitivity
- Magnetic, instantaneous short-circuit protection
- Test-trip mechanism
- Provision for padlocking in the Off position
  - Standard for GV2, GV3
  - Requires an attachment for GV7 (see Table 66 on page 53)
- Finger-safe terminals meet IP20 standards and IEC 60529
- North American and European terminal markings



<sup>1</sup> Related catalogs cover the products used in conjunction with manual motor protectors:  
*IEC Style Contactors and Starters*, catalog number 8502CT9901R9/02.  
*Wiring, Communication and Busbar System*, catalog number 8502CT0101.  
*Manual Starters and Switches*, catalog number 2510CT9701.

## GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

### Standard Features

Table 1: Standard Features

|                                                                              | <div>GV2ME</div> <div></div> <div>0.1 to 32 A<br/>Up to 20 hp @ 460 V<br/>10 kA SCCR @ 480 V<br/>Push Button Operator</div>                                                                                                                                                                                                                                                                                                                       | <div>GV2P</div> <div></div> <div>0.1 to 30 A<br/>Up to 15 hp @ 460 V<br/>50 kA SCCR @ 480 V<br/>Rotary Handle Operator<br/>Visible Trip Indication</div> | <div>GV3P</div> <div></div> <div>9 to 65 A<br/>Up to 40 hp @ 460 V<br/>GV3P13–GV3P32 rated<br/>100 kA SCCR @ 480 V<br/>GV3P40–GV3P65 rated<br/>65 kA SCCR @ 480 V<br/>Rotary Handle</div> | <div>GV7RE/GV7RS</div> <div></div> <div>25 to 220 A<br/>Up to 150 hp @ 460 V<br/>25 kA SCCR @ 480 V<br/>Toggle Operator</div> |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protection                                                                   | Thermal-magnetic (overload relays are bimetallic—Class 10)                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                             | Solid-state overload relay—magnetic short circuit (Class 10)                                                                                                                                                     |
| Mounting                                                                     | <ul style="list-style-type: none"><li>Clip-on mounting on 35 mm DIN rail. Unclips without the use of a tool.</li><li>Panel mounts using a metal adapter plate.</li></ul>                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"><li>Clip-on mounting on 35 mm DIN rail. Unclips without the use of a tool.</li><li>Panel mounts directly.</li></ul>                                                                                     | <ul style="list-style-type: none"><li>Clip-on mounting on 35 mm DIN rail. Unclips without the use of a tool.</li><li>Panel mounts directly.</li></ul>                                                                                                                       | Panel mounts directly                                                                                                                                                                                            |
| Connection                                                                   | Screw terminals using cross-head, captive screws. Cross-head screws used for connections on GV2 starters and their add-on blocks.                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                           | Uses an Allen wrench.                                                                                                                                                                                                                                                       | Clip-on connectors (sold separately)                                                                                                                                                                             |
| Marking                                                                      | Using the marker holder supplied with each unit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                  |
| Trip test                                                                    | Using a fine-blade screwdriver on the front face of the product.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                             | —                                                                                                                                                                                                                |
| Signaling on the front face                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                  |
| Manual control device                                                        | On or Off state                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"><li>On or Off state</li><li>Trip on overload, short circuit, undervoltage, or shunt trip.</li></ul>                                                                                                     | <ul style="list-style-type: none"><li>On or Off state</li><li>Trip on overload, short circuit, undervoltage, or shunt trip.</li></ul>                                                                                                                                       | On or Off state                                                                                                                                                                                                  |
| Mechanical flag indicator                                                    | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Trips on short circuit                                                                                                                                                                                                                    | Trips on short circuit                                                                                                                                                                                                                                                      | Trip on overload or short circuit                                                                                                                                                                                |
| Padlocking                                                                   | Padlocks in the Off position using the system incorporated into the manual control device. (Padlocks are supplied by the customer.)                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                             | Padlockable when used with a door-mounted rotary handle or with a separate locking device                                                                                                                        |
| Tamper-proof current dial                                                    | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | The thermal-current setting dial is covered by a transparent cover, which can be sealed.                                                                                                                                                  | —                                                                                                                                                                                                                                                                           | —                                                                                                                                                                                                                |
| Accessories                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                  |
| Front-mounting accessories                                                   | Instantaneous contact blocks—either N.C., N.O., N.O. + N.O., or N.O. + N.C.—which do not increase the width of the product.                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                             | Front accessible, internally mounted:                                                                                                                                                                            |
| Side-mounting accessories (snap onto the starters without the use of a tool) | <div>On the left side, contact blocks which provide the following:</div> <ul style="list-style-type: none"><li>N.O. + N.O. or N.O. + N.C. instantaneous contacts</li><li>N.O. or N.C. trip signaling contact incorporating a mechanical flag indicator and an N.O. or N.C. instantaneous contact</li><li>C/O magnetic trip signaling contact, associated with a mechanical flag indicator, used for reset.</li></ul> <div>On the right side:</div> <ul style="list-style-type: none"><li>Shunt trip or undervoltage trip</li></ul> |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"><li>Auxiliary contacts</li><li>Trip indication contacts</li><li>Shunt trip</li><li>Undervoltage trip</li></ul> Rotary Handles                                                  |
| Other accessories                                                            | <ul style="list-style-type: none"><li>Combination block for use with TeSys® contactor</li><li>Bus bars and connectors</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"><li>Visible isolation block, mounting on the incoming terminals of the device</li><li>Door interlock mechanism</li></ul>                                                                                | —                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                  |
| Selection                                                                    | Page 38                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Page 38                                                                                                                                                                                                                                   | Page 38                                                                                                                                                                                                                                                                     | Page 39                                                                                                                                                                                                          |

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Short-Circuit Current Ratings

### Short-Circuit Current Ratings

#### UL 508 Type E

Manual Self-Protected Combination Motor Controller, TeSys® GV

Manual Self-Protected Combination Starter Meeting UL 508 Type E, UL File E164871

**Table 2: TeSys GV2P Horsepower and SCCR Ratings**

In combination with line spacer GV2GH7 (stand-alone starters) or GV1G09 terminal and GV2G busbars (multiple starters)

| Standard Motor Ratings @ 50/60 Hz (hp) |       |       |       |       |       | Associated Cable, AWG 75 °C, Cu | Manual Self-Protected Starter | Overload Trip Range (A) | SCCR (kA) 480Y/277V |
|----------------------------------------|-------|-------|-------|-------|-------|---------------------------------|-------------------------------|-------------------------|---------------------|
| 1 Ø                                    |       | 3 Ø   |       |       |       |                                 |                               |                         |                     |
| 120 V                                  | 240 V | 200 V | 240 V | 480 V | 600 V |                                 |                               |                         |                     |
|                                        |       |       |       |       |       | 10                              | GV2P01                        | 0.1–0.16                | 100                 |
|                                        |       |       |       |       |       | 10                              | GV2P02                        | 0.16–0.25               | 100                 |
|                                        |       |       |       |       |       | 10                              | GV2P03                        | 0.25–0.4                | 100                 |
|                                        |       |       |       |       |       | 10                              | GV2P04                        | 0.4–0.63                | 100                 |
|                                        |       |       |       | 0.5   |       | 10                              | GV2P05                        | 0.63–1                  | 100                 |
|                                        |       |       |       | 0.75  |       | 10                              | GV2P06                        | 1–1.6                   | 100                 |
|                                        |       | 0.5   | 0.5   | 1     |       | 10                              | GV2P07                        | 1.6–2.5                 | 100                 |
|                                        |       | 0.75  | 1     | 2     |       | 10                              | GV2P08                        | 2.5–4                   | 100                 |
|                                        |       | 1.5   | 1.5   | 4     |       | 10                              | GV2P10                        | 4–6.3                   | 100                 |
| 0.5                                    | 1     | 2     | 3     | 5     | 7.5   | 10                              | GV2P14                        | 6–10                    | 100                 |
| 1                                      | 2     | 3     | 3     | 10    | 10    | 8                               | GV2P16                        | 9–14                    | 10                  |
| 1                                      | 3     | 5     | 5     | 10    | 15    | 8                               | GV2P20                        | 13–18                   | 10                  |
| 2                                      | 3     | 5     | 7.5   | 15    | 20    | 6                               | GV2P21                        | 17–23                   | 10                  |
| 2                                      | 3     | 5     | 7.5   | 15    | 20    | 6                               | GV2P22                        | 20–25                   | 10                  |

**Table 3: TeSys GV3P Horsepower and SCCR Ratings**

In combination with line spacer GV3G66 and magnetic trip unit GVAM11 for stand-alone starters

| Standard Motor Ratings @ 50/60 Hz (hp) |       |       |       |       |       | Associated Cable, AWG 75 °C, Cu | Manual Self-Protected Starter | Overload Trip Range (A) | SCCR (kA)  |            |
|----------------------------------------|-------|-------|-------|-------|-------|---------------------------------|-------------------------------|-------------------------|------------|------------|
| 1 Ø                                    |       | 3 Ø   |       |       |       |                                 |                               |                         | 480Y/277 V | 600Y/347 V |
| 120 V                                  | 240 V | 200 V | 240 V | 480 V | 600 V |                                 |                               |                         |            |            |
| 1                                      | 2     | 3     | 3     | 7.5   | 10    | 8                               | GV3P13                        | 9–13                    | 100        | 25         |
| 1                                      | 3     | 3     | 5     | 7.5   | 10    | 8                               | GV3P18                        | 12–18                   | 100        | 25         |
| 2                                      | 3     | 5     | 7.5   | 15    | 20    | 6                               | GV3P25                        | 17–25                   | 100        | 25         |
| 2                                      | 3     | 7.5   | 7.5   | 20    | 25    | 6                               | GV3P32                        | 23–32                   | 100        | 25         |
| 3                                      | 5     | 10    | 10    | 25    | 30    | 3                               | GV3P40                        | 30–40                   | 65         | 25         |
| 3                                      | 7.5   | 10    | 10    | 30    | 40    | 3                               | GV3P50                        | 37–50                   | 65         | 25         |
| 5                                      | 10    | 15    | 15    | 40    | 50    | 3                               | GV3P65                        | 48–65                   | 65         | 25         |

## GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

### Short-Circuit Current Ratings

#### UL 508 Type F

Combination Motor Controller, TeSys® GV

Manual Self-Protected Combination Starter Meeting UL 508 Type F, UL File E164871

**Table 4: TeSys GV2P Horsepower and SCCR Ratings**

In combination with line spacer GV2GH7 (stand-alone starters) or GV1G09 terminal and GV2G busbars (multiple starters)

| Standard Motor Ratings @ 50/60 Hz (hp) |       |       |       |       |       | Associated Cable, AWG<br>75 °C, Cu | Manual Self-Protected Starter | Overload Trip Range (A) | Type of Contactor Required | SCCR (kA)<br>480Y/277 V |
|----------------------------------------|-------|-------|-------|-------|-------|------------------------------------|-------------------------------|-------------------------|----------------------------|-------------------------|
| 1 Ø                                    |       | 3 Ø   |       |       |       |                                    |                               |                         |                            |                         |
| 120 V                                  | 240 V | 200 V | 240 V | 480 V | 600 V |                                    |                               |                         |                            |                         |
|                                        |       |       |       |       |       | 10                                 | GV2P01                        | 0.1–0.16                | LC1D09 or D12              | 100                     |
|                                        |       |       |       |       |       | 10                                 | GV2P02                        | 0.16–0.25               | LC1D09 or D12              | 100                     |
|                                        |       |       |       |       |       | 10                                 | GV2P03                        | 0.25–0.4                | LC1D09 or D12              | 100                     |
|                                        |       |       |       |       |       | 10                                 | GV2P04                        | 0.4–0.63                | LC1D09 or D12              | 100                     |
|                                        |       |       |       | 0.5   |       | 10                                 | GV2P05                        | 0.63– 1                 | LC1D09 or D12              | 100                     |
|                                        |       |       |       | 0.75  |       | 10                                 | GV2P06                        | 1–1.6                   | LC1D09 or D12              | 100                     |
|                                        |       | 0.5   | 0.5   | 1     |       | 10                                 | GV2P07                        | 1.6–2.5                 | LC1D09 or D12              | 100                     |
|                                        |       | 0.75  | 1     | 2     |       | 10                                 | GV2P08                        | 2.5– 4                  | LC1D09 or D12              | 100                     |
|                                        |       | 1.5   | 1.5   | 4     |       | 10                                 | GV2P10                        | 4–6.3                   | LC1D09 or D12              | 100                     |
| 0.5                                    | 1     | 2     | 3     | 5     | 7.5   | 10                                 | GV2P14                        | 6–10                    | LC1D09 or D12              | 100                     |
| 1                                      | 2     | 3     | 3     | 10    | 10    | 8                                  | GV2P16                        | 9–14                    | LC1D12 or D18              | 42                      |
| 1                                      | 3     | 5     | 5     | 10    | 15    | 8                                  | GV2P20                        | 13–18                   | LC1D12 or D18              | 42                      |
| 2                                      | 3     | 5     | 7.5   | 15    | 20    | 6                                  | GV2P21                        | 17–23                   | LC1D25 or D32              | 42                      |
| 2                                      | 3     | 5     | 7.5   | 15    | 20    | 6                                  | GV2P22                        | 20–25                   | LC1D25 or D32              | 42                      |

**Table 5: TeSys GV3P Horsepower and SCCR Ratings**

In combination with line spacer GV3G66 and magnetic trip unit GVAM11 for stand-alone starters

| Standard Motor Ratings @ 50/60 Hz (hp) |       |       |       |       |       | Associated Cable, AWG 75 °C, Cu | Manual Self-Protected Starter | Overload Trip Range (A) | Type of Contactor Required | SCCR (kA)   |             |
|----------------------------------------|-------|-------|-------|-------|-------|---------------------------------|-------------------------------|-------------------------|----------------------------|-------------|-------------|
| 1 Ø                                    |       | 3 Ø   |       |       |       |                                 |                               |                         |                            | 480Y/ 277 V | 600Y/ 347 V |
| 120 V                                  | 240 V | 200 V | 240 V | 480 V | 600 V |                                 |                               |                         |                            |             |             |
| 1                                      | 2     | 3     | 3     | 7.5   | 10    | 8                               | GV3P13                        | 9–13                    | LC1D18                     | 65          | 25          |
| 1                                      | 3     | 3     | 5     | 7.5   | 10    | 8                               | GV3P18                        | 12–18                   | LC1D18                     | 65          | 25          |
| 2                                      | 3     | 5     | 7.5   | 15    | 20    | 6                               | GV3P25                        | 17–25                   | LC1D25                     | 65          | 25          |
| 2                                      | 3     | 7.5   | 7.5   | 20    | 25    | 6                               | GV3P32                        | 23–32                   | LC1D32                     | 65          | 25          |
| 3                                      | 5     | 10    | 10    | 25    | 30    | 3                               | GV3P40                        | 30–40                   | LC1D40A/ 50A/65A           | 65          | 25          |
| 3                                      | 7.5   | 10    | 10    | 30    | 40    | 3                               | GV3P50                        | 37–50                   | LC1D50A/65A                | 65          | 25          |
| 5                                      | 10    | 15    | 15    | 40    | 50    | 3                               | GV3P65                        | 48–65                   | LC1D65A/80                 | 65          | 25          |

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Short-Circuit Current Ratings

### UL 508 Group Motor Installations

### Manual Combination Motor Controller, TeSys® GV

GV2ME: UL File E164864

(MC 164581, Report 1012350, Project 2152063)

**Table 6: TeSys GV2ME Horsepower and SCCR Ratings**

In association with LC1D contactors, suitable for group installation when protected by fuses or an inverse-time circuit breaker (when used with GV1G09 terminal or GV2G05 blocks plus GV2G busbars)

| Standard Motor Ratings @ 50/60 Hz (hp) |       |       |       |       |       | Associated Cable, AWG 75 °C, Cu | Manual Motor Starter | Overload Trip Range (A) | Contactor     | SCCR (kA)  |             |                          |               |                             |
|----------------------------------------|-------|-------|-------|-------|-------|---------------------------------|----------------------|-------------------------|---------------|------------|-------------|--------------------------|---------------|-----------------------------|
| 1 Ø                                    |       | 3 Ø   |       |       |       |                                 |                      |                         |               | 240/ 480 V | 600Y/ 347 V | 480 V with GV1L3 Limiter | Contactor     | 600 V with LA9LB920 Limiter |
| 120 V                                  | 240 V | 200 V | 240 V | 480 V | 600 V |                                 |                      |                         |               |            |             |                          |               |                             |
|                                        |       |       |       |       |       | 10                              | GV2ME01              | 0.1–0.16                | LC1D09 or D12 | 65         | 42          | 65                       | LC1D09 or D12 | 42                          |
|                                        |       |       |       |       |       | 10                              | GV2ME02              | 0.16–0.25               | LC1D09 or D12 | 65         | 42          | 65                       | LC1D09 or D12 | 42                          |
|                                        |       |       |       |       |       | 10                              | GV2ME03              | 0.25–0.4                | LC1D09 or D12 | 65         | 42          | 65                       | LC1D09 or D12 | 42                          |
|                                        |       |       |       |       |       | 10                              | GV2ME04              | 0.4–0.63                | LC1D09 or D12 | 65         | 42          | 65                       | LC1D09 or D12 | 42                          |
|                                        |       |       |       | 0.5   |       | 10                              | GV2ME05              | 0.63–1                  | LC1D09 or D12 | 65         | 42          | 65                       | LC1D09 or D12 | 42                          |
|                                        |       |       |       | 0.75  |       | 10                              | GV2ME06              | 1–1.6                   | LC1D09 or D12 | 65         | 42          | 65                       | LC1D09 or D12 | 42                          |
|                                        |       | 0.5   | 0.5   | 1     |       | 10                              | GV2ME07              | 1.6–2.5                 | LC1D09 or D12 | 65         | 42          | 65                       | LC1D09 or D12 | 42                          |
|                                        |       | 0.75  | 1     | 2     |       | 10                              | GV2ME08              | 2.5–4                   | LC1D09 or D12 | 65         | 42          | 65                       | LC1D09 or D12 | 42                          |
|                                        |       | 1.5   | 1.5   | 4     |       | 10                              | GV2ME10              | 4–6.3                   | LC1D09 or D12 | 65         | 42          | 65                       | LC1D09 or D12 | 42                          |
| 0.5                                    | 1     | 2     | 3     | 5     | 7.5   | 10                              | GV2ME14              | 6–10                    | LC1D09 or D12 | 65         | 42          | 65                       | LC1D09 or D12 | 42                          |
| 1                                      | 2     | 3     | 3     | 10    | 10    | 8                               | GV2ME16              | 9–14                    | LC1D12 or D18 | 22         | 10          | 65                       | LC1D32 or D38 | 42                          |
| 1                                      | 3     | 5     | 5     | 10    | 15    | 8                               | GV2ME20              | 13–18                   | LC1D12 or D18 | 22         | 10          | 65                       | LC1D32 or D38 | 42                          |
| 2                                      | 3     | 5     | 7.5   | 15    | 20    | 6                               | GV2ME21              | 17–23                   | LC1D25 or D32 | 10         | 10          | 65                       | LC1D32 or D38 | 42                          |
| 2                                      | 3     | 5     | 7.5   | 15    | 20    | 6                               | GV2ME22              | 20–25                   | LC1D25 or D32 | 10         | 10          | 65                       | LC1D32 or D38 | 42                          |
| 2                                      | 5     | 10    | 10    | 20    | 30    | 6                               | GV2ME32              | 24–32                   | LC1D25 or D32 | 5          | 5           | 65                       | LC1D32 or D38 | 42                          |

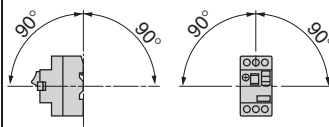
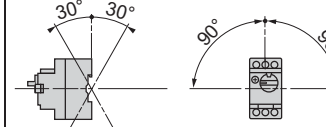
# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Specifications and Operating Curves

### Specifications and Operating Curves

#### GV2 Specifications

Table 7: Environment

| Type                                                                           | GV2ME                                                                                                                                  | GV2P                                   | LS1D30,<br>LS1D303                                                                             | LS1D32,<br>LS1D323                     |                                        |                                        |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| Conforming to standards                                                        | IEC 60947-1, 60947-2, 60947-4-1, EN 60204, BS 4752, BS 4941, UL 508, CSA C22.2 No. 14, NF C 63-650, NFC63-120, 79-130, VDE 0113, 0660. |                                        |                                                                                                |                                        |                                        |                                        |
| Product approvals                                                              | DEMKO, NEMKO, SEMKO, CSA. UL, BV, GL, LROS, DNV, PTB                                                                                   | CSA, UL, PTB                           | UL, CSA                                                                                        | BV                                     |                                        |                                        |
| UL File Number                                                                 | File E164864, CCN NLRV                                                                                                                 |                                        | File E197164<br>CCN IZLT                                                                       | File E197164<br>CCN IZLT2              |                                        |                                        |
| CSA File Number                                                                | File LR 81630, Class 3211 05                                                                                                           |                                        | File 222370, Class 6225-01                                                                     |                                        |                                        |                                        |
| Protective treatment                                                           | —                                                                                                                                      | —                                      | “TH”                                                                                           | “TH”                                   |                                        |                                        |
| Degree of protection<br>Conforming to IEC 60529                                | GV2ME01 enclosure: IP41<br>GV2ME02 enclosure: IP55                                                                                     | —                                      | —                                                                                              | —                                      |                                        |                                        |
| Shock resistance<br>Conforming to IEC 60068-2-27                               | 30 g                                                                                                                                   | 30 g                                   | —                                                                                              | —                                      |                                        |                                        |
| Vibration resistance<br>Conforming to IEC 60068-2-6                            | 5 to 150 Hz (5 g)                                                                                                                      | 5 to 150 Hz (5 g)                      | —                                                                                              | —                                      |                                        |                                        |
| Ambient air temperature                                                        |                                                                                                                                        |                                        |                                                                                                |                                        |                                        |                                        |
| Storage                                                                        | -40 to +176 °F (-40 to +80 °C)                                                                                                         | -40 to +176 °F (-40 to +80 °C)         | —                                                                                              | —                                      |                                        |                                        |
| Operation                                                                      | Open: -4 to +140 °F (-20 to +60 °C)<br>Enclosed: -4 to 104 °F (-20 to 40 °C)                                                           | -4 to +140 °F (-20 to +60 °C)          | -58 to +158 °F<br>(-50 to +70 °C)                                                              | -58 to +158 °F<br>(-50 to +70 °C)      |                                        |                                        |
| Temperature compensation                                                       | Open: -4 to +140 °F (-20 to +60 °C)<br>Enclosed: -4 to 104 °F (-20 to 40 °C)                                                           | -4 to +140 °F (-20 to +60 °C)          | —                                                                                              | —                                      |                                        |                                        |
| Flame resistance<br>Conforming to IEC 60695-2-1                                | 1760 °F (960 °C)                                                                                                                       |                                        |                                                                                                |                                        |                                        |                                        |
| Maximum operating altitude                                                     | 6562 ft (2000 m)                                                                                                                       | 6562 ft (2000 m)                       | —                                                                                              | —                                      |                                        |                                        |
| Operating positions in<br>relation to the normal<br>vertical mounting position |                                                     |                                        | <br>± 23 ° |                                        |                                        |                                        |
| Wiring<br>Number of conductors and<br>wire size                                | Maximum                                                                                                                                | Minimum                                | Maximum                                                                                        | Minimum                                | Maximum                                | Minimum                                |
| Solid cable                                                                    | 2 x 8 AWG<br>(2 x 6 mm <sup>2</sup> )                                                                                                  | 2 x 16 AWG<br>(2 x 1 mm <sup>2</sup> ) | 2 x 8 AWG<br>(2 x 6 mm <sup>2</sup> )                                                          | 2 x 16 AWG<br>(2 x 1 mm <sup>2</sup> ) | 2 x 8 AWG<br>(2 x 6 mm <sup>2</sup> )  | 2 x 16 AWG<br>(2 x 1 mm <sup>2</sup> ) |
| Flexible cable<br>without cable end                                            | 2 x 8 AWG<br>(2 x 6 mm <sup>2</sup> )                                                                                                  | 2 x 14 AWG<br>(2 x 1 mm <sup>2</sup> ) | 2 x 8 AWG<br>(2 x 6 mm <sup>2</sup> )                                                          | 2 x 14 AWG<br>(2 x 1 mm <sup>2</sup> ) | 2 x 8 AWG<br>(2 x 6 mm <sup>2</sup> )  | 2 x 14 AWG<br>(2 x 1 mm <sup>2</sup> ) |
| Flexible cable<br>with cable end                                               | 2 x 10 AWG<br>(2 x 4 mm <sup>2</sup> )                                                                                                 | 2 x 16 AWG<br>(2 x 1 mm <sup>2</sup> ) | 2 x 10 AWG<br>(2 x 4 mm <sup>2</sup> )                                                         | 2 x 16 AWG<br>(2 x 1 mm <sup>2</sup> ) | 2 x 10 AWG<br>(2 x 4 mm <sup>2</sup> ) | 2 x 16 AWG<br>(2 x 1 mm <sup>2</sup> ) |
| Suitable for isolation<br>Conforming to IEC 60947-1 /<br>60947-1-6             | Yes                                                                                                                                    |                                        | Yes                                                                                            |                                        | —                                      | —                                      |
| Tightening torque                                                              | 15 lb-in (1.7 N•m)                                                                                                                     |                                        |                                                                                                |                                        |                                        |                                        |
| Resistance to mechanical<br>impact                                             | 0.5 J                                                                                                                                  |                                        | 0.5 J                                                                                          |                                        |                                        |                                        |
| Sensitivity to phase failure                                                   | Conforming to IEC 60947-4-1, paragraph 7-2-1-5-2                                                                                       |                                        |                                                                                                | —                                      | —                                      |                                        |

## GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

### Specifications and Operating Curves

**Table 8: Technical Characteristics**

| Type                                                                       |                                           | GV2ME    | GV2P            | LS1D30,<br>LS1D303 | LS1D32,<br>LS1D323 <sup>[1]</sup> |
|----------------------------------------------------------------------------|-------------------------------------------|----------|-----------------|--------------------|-----------------------------------|
| <b>Utilization category</b>                                                | Conforming to IEC 60947-2                 | A        | A               | —                  | AC 20B#                           |
|                                                                            | Conforming to IEC 60947-4-1               | AC-3     | AC-3            |                    |                                   |
| <b>Rated operational voltage (Ue)</b>                                      | Conforming to IEC 60947-2                 | 690 V    | 690 V           | 690 V              | 690 V                             |
| <b>Rated insulation voltage (Ui)</b>                                       | Conforming to IEC 60947-2                 | 690 V    | 690 V           | —                  | 690 V                             |
|                                                                            | Conforming to CSA C22.2 No. 14 and UL 508 | 600 V    | 600 V           |                    |                                   |
| <b>Rated operational frequency</b>                                         | Conforming to IEC 60947-2                 | 50/60 Hz | 50/60 Hz        | 50/60 Hz           | 50/60 Hz                          |
| <b>Rated impulse withstand voltage (U imp)</b>                             | Conforming to IEC 60947-2                 | 6 kV     | 6 kV            | —                  | —                                 |
| <b>Total power dissipated per pole (W)</b>                                 |                                           | 2.5 W    | 2.5 W           | 3.2 W              | 3.2 W                             |
| <b>Mechanical life (close-open operations)</b><br>(varies with conditions) |                                           | 100,000  | —               | —                  | —                                 |
| <b>Electrical life (close-open operations)</b><br>(for AC-3 duty)          |                                           | 100,000  | 100,000         | —                  | —                                 |
| <b>Duty class (close-open operations/hr)</b><br>(maximum operating rate)   |                                           | 25       | 25              | —                  | —                                 |
| <b>Rated duty</b>                                                          | Conforming to IEC 60947-4-1               | —        | Continuous duty | —                  | —                                 |

<sup>1</sup> Conforming to IEC 60947-3

**Table 9: GV2 Trip Module Specifications**

| Type                                 |                                         | GV2AU                                                                                         | GV2AS                                     |
|--------------------------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------|
| <b>Rated insulation voltage (Ui)</b> | Conforming to IEC 60947-1               | 690 V                                                                                         | 690 V                                     |
| <b>Operational voltage (Ue)</b>      | Conforming to IEC 60947-1               | 0.85-1.1 V                                                                                    | 0.7-1.1 V                                 |
| <b>Drop-out voltage (Ue)</b>         |                                         | 0.35-0.7 V                                                                                    | 0.2-0.75 V                                |
| <b>Inrush consumption</b>            |                                         | 12 VA                                                                                         | 14 VA                                     |
|                                      |                                         | 8 W                                                                                           | 10.5 W                                    |
| <b>Sealed consumption</b>            |                                         | 3.5 VA                                                                                        | 5 VA                                      |
|                                      |                                         | 1.1 W                                                                                         | 1.6 W                                     |
| <b>Operating time (ms)</b>           | Conforming to IEC 60947-1               | From the moment the voltage reaches its operational value until opening of the GV2•• 10–15 ms |                                           |
| <b>On-load factor</b>                |                                         | 100%                                                                                          |                                           |
| <b>Wiring</b>                        |                                         | <b>Minimum</b>                                                                                | <b>Maximum</b>                            |
| Number of conductors and wire size   | Solid cable                             | 1 x 16–12 AWG (1-2.5 mm <sup>2</sup> )                                                        | 2 x 16–12 AWG (1–2.5 mm <sup>2</sup> )    |
|                                      | Flexible cable <i>without</i> cable end | 1 x 18–12 AWG (0.75-2.5 mm <sup>2</sup> )                                                     | 2 x 18–12 AWG (0.75–2.5 mm <sup>2</sup> ) |
|                                      | Flexible cable <i>with</i> cable end    | 1 x 18–14 AWG (0.75-1.5 mm <sup>2</sup> )                                                     | 2 x 18–14 AWG (0.75–1.5 mm <sup>2</sup> ) |
| <b>Tightening torque</b>             |                                         | 12 lb-in (1.4 N•m) maximum                                                                    |                                           |

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Specifications and Operating Curves

**Table 10: GV Auxiliary and Fault Signaling Contact Specifications**

| Type                                                                                                      | Instantaneous Auxiliary Contacts<br>GVAN, GVAD                                             |                |                |                |                      |                                           |         | Fault Signaling Contacts<br>GV2AD, GV2AM11 |        |                |                |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------------|-------------------------------------------|---------|--------------------------------------------|--------|----------------|----------------|
| <b>Rated insulation voltage (Ui)</b><br>(associated insulation coordination)<br>Conforming to IEC 60947-1 | 690 V                                                                                      |                |                |                |                      |                                           |         | 690 V                                      |        |                |                |
| Conforming to CSA C22.2 No. 14<br>and UL 508                                                              | 600 V                                                                                      |                |                |                |                      |                                           |         | 300 V                                      |        |                |                |
| <b>Conventional rated thermal current (Ith)</b><br>Conforming to IEC 60947-5-1                            | 6 A                                                                                        |                |                |                |                      |                                           |         | 2.5 A                                      |        |                |                |
| Conforming to CSA C22.2 No. 14<br>and UL 508                                                              | 5 A                                                                                        |                |                |                |                      |                                           |         | 1 A                                        |        |                |                |
| <b>Operational power and current—<br/>AC operation</b><br>Conforming to IEC 60947-5-1                     | AC-15/100,000 close–open operations                                                        |                |                |                |                      |                                           |         | AC-14/1000 close–open operations           |        |                |                |
| <b>Rated operational voltage (Ue)</b>                                                                     | 48 V                                                                                       | 110 V<br>127 V | 230 V<br>240 V | 380 V<br>415 V | 440 V                | 500 V                                     | 690 V   | 24 V                                       | 48 V   | 110 V<br>127 V | 230 V<br>240 V |
| <b>Operational power,<br/>normal conditions</b>                                                           | 300 VA                                                                                     | 500 VA         | 720 VA         | 850 VA         | 650 VA               | 500 VA                                    | 400 VA  | 36 VA                                      | 48 VA  | 72 VA          | 72 VA          |
| <b>Occasional breaking and making<br/>capacities, abnormal conditions</b>                                 | 3000 VA                                                                                    | 7000 VA        | 13,000 VA      | 15,000 VA      | 13,000 VA            | 12,000 VA                                 | 9000 VA | 220 VA                                     | 300 VA | 450 VA         | 450 VA         |
| <b>Rated operational current (Ie)</b>                                                                     | 6 A                                                                                        | 4.5 A          | 3.3 A          | 2.2 A          | 1.5 A                | 1 A                                       | 0.6 A   | 1.5 A                                      | 1 A    | 0.5 A          | 0.3 A          |
| <b>Operational power and current—<br/>DC operation</b><br>Conforming to IEC 60947-5-1                     | DC-13/100,000 close–open operations                                                        |                |                |                |                      |                                           |         | DC-13/1000 close–open operations           |        |                |                |
| <b>Rated operational voltage (Ue)</b>                                                                     | 24 V                                                                                       | 48 V           | 60 V           | 110 V          | 240 V <sup>[1]</sup> | —                                         | —       | 24 V                                       | 48 V   | 60 V           | —              |
| <b>Operational power,<br/>normal conditions</b>                                                           | 140 W                                                                                      | 240 W          | 180 W          | 140 W          | 120 W                | —                                         | —       | 24 W                                       | 15 W   | 9 W            | —              |
| <b>Occasional breaking and making<br/>capacities, abnormal conditions</b>                                 | 240 W                                                                                      | 360 W          | 240 W          | 210 W          | 180 W                | —                                         | —       | 100 W                                      | 50 W   | 50 W           | —              |
| <b>Rated operational current (Ie)</b>                                                                     | 6 A                                                                                        | 5 A            | 3 A            | 1.3 A          | 0.5 A                | —                                         | —       | 1 A                                        | 0.3 A  | 0.15 A         | —              |
| <b>Low-level switching contact<br/>reliability</b>                                                        | Number of faults for <i>n</i> million operating cycles (17 V, 5 mA): = 10 <sup>−6</sup>    |                |                |                |                      |                                           |         |                                            |        |                |                |
| <b>Short-circuit protection</b>                                                                           | GB2CB•• control circuit protector or control circuit fuse gG 10 A maximum (or equivalent). |                |                |                |                      |                                           |         |                                            |        |                |                |
| <b>Wiring (screw clamp)</b><br>Number of conductors and<br>wire size                                      | <b>Minimum</b>                                                                             |                |                |                |                      | <b>Maximum</b>                            |         |                                            |        |                |                |
| Solid cable                                                                                               | 1 x 16–12 AWG (1–2.5 mm <sup>2</sup> )                                                     |                |                |                |                      | 2 x 16–12 AWG (1–2.5 mm <sup>2</sup> )    |         |                                            |        |                |                |
| Flexible cable <i>without</i> cable end                                                                   | 1 x 18–12 AWG (0.75–2.5 mm <sup>2</sup> )                                                  |                |                |                |                      | 2 x 18–12 AWG (0.75–2.5 mm <sup>2</sup> ) |         |                                            |        |                |                |
| Flexible cable <i>with</i> cable end                                                                      | 1 x 18–14 AWG (0.75–1.5 mm <sup>2</sup> )                                                  |                |                |                |                      | 2 x 18–14 AWG (0.75–1.5 mm <sup>2</sup> ) |         |                                            |        |                |                |
| <b>Wiring (spring terminal)</b>                                                                           | <b>Minimum (GVAN only)</b>                                                                 |                |                |                |                      | <b>Maximum (GVAN only)</b>                |         |                                            |        |                |                |
| Flexible cable <i>without</i> cable end                                                                   | 1 x 18–12 AWG (0.75–2.5 mm <sup>2</sup> )                                                  |                |                |                |                      | 2 x 18–12 AWG (0.75–2.5 mm <sup>2</sup> ) |         |                                            |        |                |                |
| Tightening torque                                                                                         | 12 lb-in (1.4 N•m) maximum                                                                 |                |                |                |                      |                                           |         |                                            |        |                |                |

<sup>1</sup> Add an RC circuit, Type LA4D, to the load terminals. Consult the *Digest*.

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Specifications and Operating Curves

**Table 11: GV2AE Auxiliary Contact Specifications**

| Type                                                                         | Instantaneous Auxiliary Contacts GV2AE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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| <b>Rated insulation voltage (Ui)</b><br>(associated insulation coordination) | 250 V (690 V with respect to main circuit)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| Conforming to IEC 60947-1                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| Conforming to CSA C22.2 No. 14 and UL 508                                    | 300 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| <b>Conventional rated thermal current (Ith)</b>                              | 2.5 A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| Conforming to IEC 60947-5-1                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| Conforming to CSA C22.2 No. 14 and UL 508                                    | 1 A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| <b>Operational power and current AC operation</b>                            | AC-15/100,000 close–open operations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| Conforming to IEC 60947-5-1                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| <b>Rated operational voltage (Ue)</b>                                        | 24 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| <b>Operational power, normal conditions</b>                                  | 48 VA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| <b>Occasional breaking and making capacities, abnormal conditions</b>        | 480 VA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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| <b>Operational power and current DC operation</b>                            | DC-13/100,000 close–open operations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| Conforming to IEC 60947-5-1                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| <b>Rated operational voltage (Ue)</b>                                        | 24 V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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| <b>Rated operational current (Ie)</b>                                        | 1 A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| <b>Low-level switching contact reliability</b>                               | Number of faults for <i>n</i> million operating cycles (17 V, 5 mA): = 10 <sup>-6</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| <b>Short-circuit protection</b>                                              | GB2CB** control circuit protector or control circuit fuse gG 10 A maximum (or equivalent).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| <b>Wiring (screw clamp)</b>                                                  | <b>Minimum</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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| Solid cable                                                                  | 1 x 16–12 AWG (1–2.5 mm <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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| Flexible cable <i>without</i> cable end                                      | 1 x 18–12 AWG (0.75–2.5 mm <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| Flexible cable <i>with</i> cable end                                         | 1 x 18–14 AWG (0.75–1.5 mm <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| <b>Wiring (spring terminal)</b>                                              | <b>Minimum (GVAN only)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| Flexible cable <i>without</i> cable end                                      | 1 x 18–12 AWG (0.75–2.5 mm <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| Tightening torque                                                            | 12 lb-in (1.4 N•m) maximum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |                                           |                |
| <b>Contact operation instantaneous auxiliary contacts</b>                    | <div><div><div>01</div><div>Power Pole</div><div><div></div><div></div></div></div><div><div></div><div></div></div><div><div>0</div><div>1</div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div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|        |                                           |                |

## GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

### Specifications and Operating Curves

**Table 12: GV2 Accessory Specifications**

|                                                           |                                         |                                                                                                           |
|-----------------------------------------------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>3-Pole Busbars GV2G•</b>                               |                                         |                                                                                                           |
| Rated insulation voltage (Ui)                             | Conforming to IEC 60947-1               | 690 V                                                                                                     |
| Conventional rated thermal current (Ith)                  | Conforming to IEC 60439-1               | 63 A                                                                                                      |
| Permissible peak current (I peak)                         |                                         | 11 kA                                                                                                     |
| Permissible thermal limit (I <sup>2</sup> t)              |                                         | 104 kA <sup>2</sup> s                                                                                     |
| Degree of protection                                      | Conforming to IEC 60529                 | IP20                                                                                                      |
| <b>Terminal Blocks GV2G05 and GV1G09</b>                  |                                         |                                                                                                           |
| Rated insulation voltage (Ui)                             | Conforming to IEC 60947-1               | 690 V                                                                                                     |
| Conventional rated thermal current (Ith)                  | Conforming to IEC 60439-1               | 63 A                                                                                                      |
| Degree of protection                                      | Conforming to IEC 60529                 | IP20                                                                                                      |
| Wiring                                                    | Solid cable                             | 1 x 14–2 AWG (1.5–25 mm <sup>2</sup> ) conductor or<br>2 x 14–6 AWG (1.5–10 mm <sup>2</sup> ) conductors  |
|                                                           | Flexible cable <i>without</i> cable end | 1 x 14–2 AWG (1.5–25 mm <sup>2</sup> ) conductor or<br>2 x 12–6 AWG (2.5–10 mm <sup>2</sup> ) conductors  |
|                                                           | Flexible cable <i>with</i> cable end    | 1 x 14–4 AWG (1.5–16 mm <sup>2</sup> ) conductor or<br>2 x 14–10 AWG (1.5–4 mm <sup>2</sup> ) conductors  |
| Tightening torque                                         | Connector                               | 20 lb-in (2.2 N•m)                                                                                        |
|                                                           | Screw clamp                             | 15 lb-in (1.7 N•m)                                                                                        |
| <b>Current Limiter GV1L3 (European applications only)</b> |                                         |                                                                                                           |
| Rated insulation voltage (Ui)                             | Conforming to IEC 60947-1               | 690 V                                                                                                     |
| Conventional rated thermal current (Ith)                  | Conforming to IEC 60947-1               | 63 A                                                                                                      |
| Operating threshold                                       | rms current                             | 1500 A (non adjustable threshold)                                                                         |
| Wiring                                                    | Solid cable                             | 1 x 14–2 AWG (1.5–25 mm <sup>2</sup> ) conductor or<br>2 x 14–6 AWG (1.5–10 mm <sup>2</sup> ) conductors  |
|                                                           | Flexible cable <i>without</i> cable end | 1 x 14–2 AWG (1.5–25 mm <sup>2</sup> ) conductor or<br>2 x 12–6 AWG (2.5–10 mm <sup>2</sup> ) conductors  |
|                                                           | Flexible cable <i>with</i> cable end    | 1 x 14 –4 AWG (1.5–16 mm <sup>2</sup> ) conductor or<br>2 x 14–10 AWG (1.5–4 mm <sup>2</sup> ) conductors |
| Tightening torque                                         |                                         | 20 lb-in (2.2 N•m)                                                                                        |

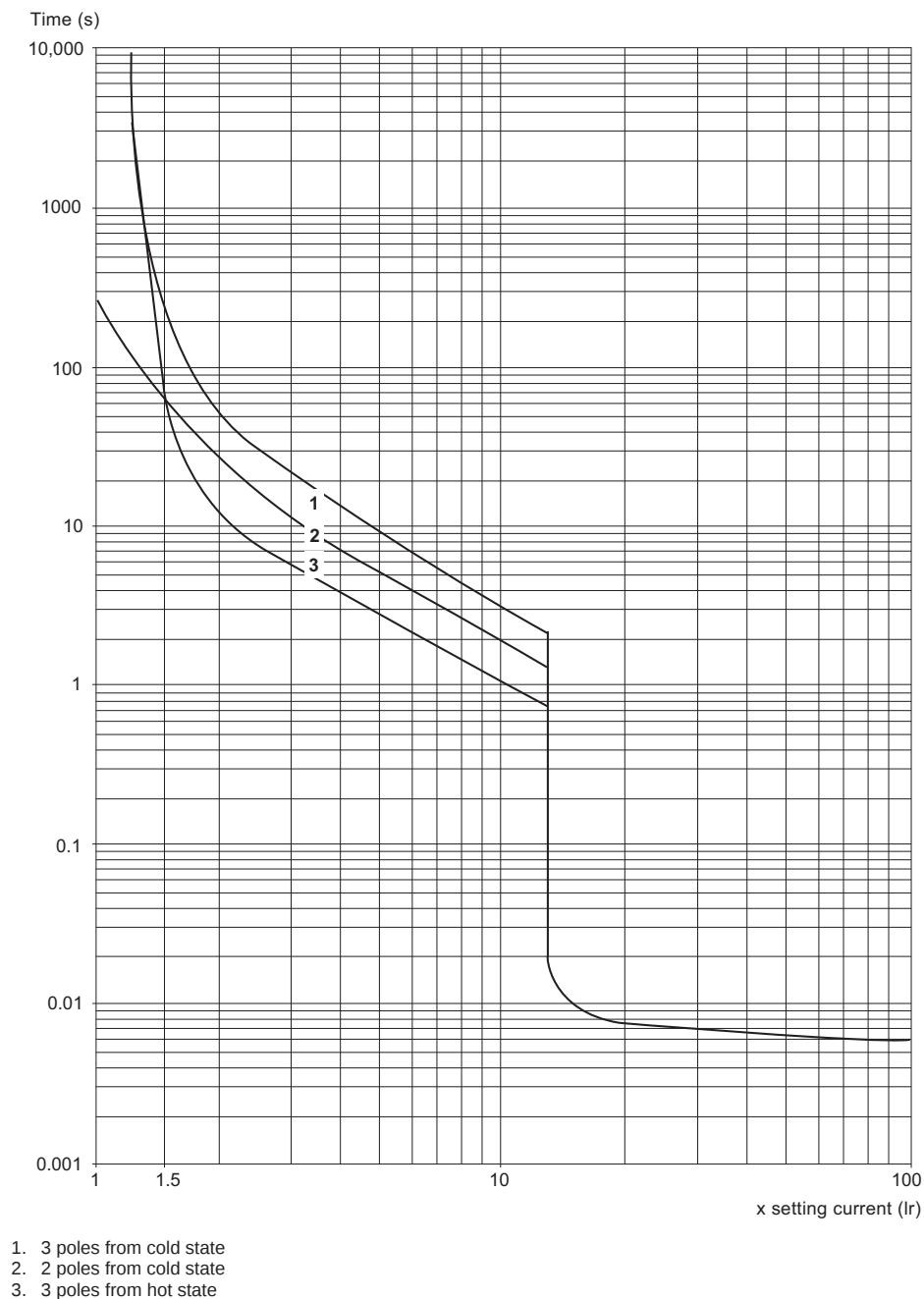
# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Specifications and Operating Curves

### GV2 Operating Curves

**Table 13: Thermal-Magnetic Trip Curves for GV2ME and GV2P**

Average operating time at 68 °F (20 °C) as a function of multiples of the setting current



GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors  
Specifications and Operating Curves

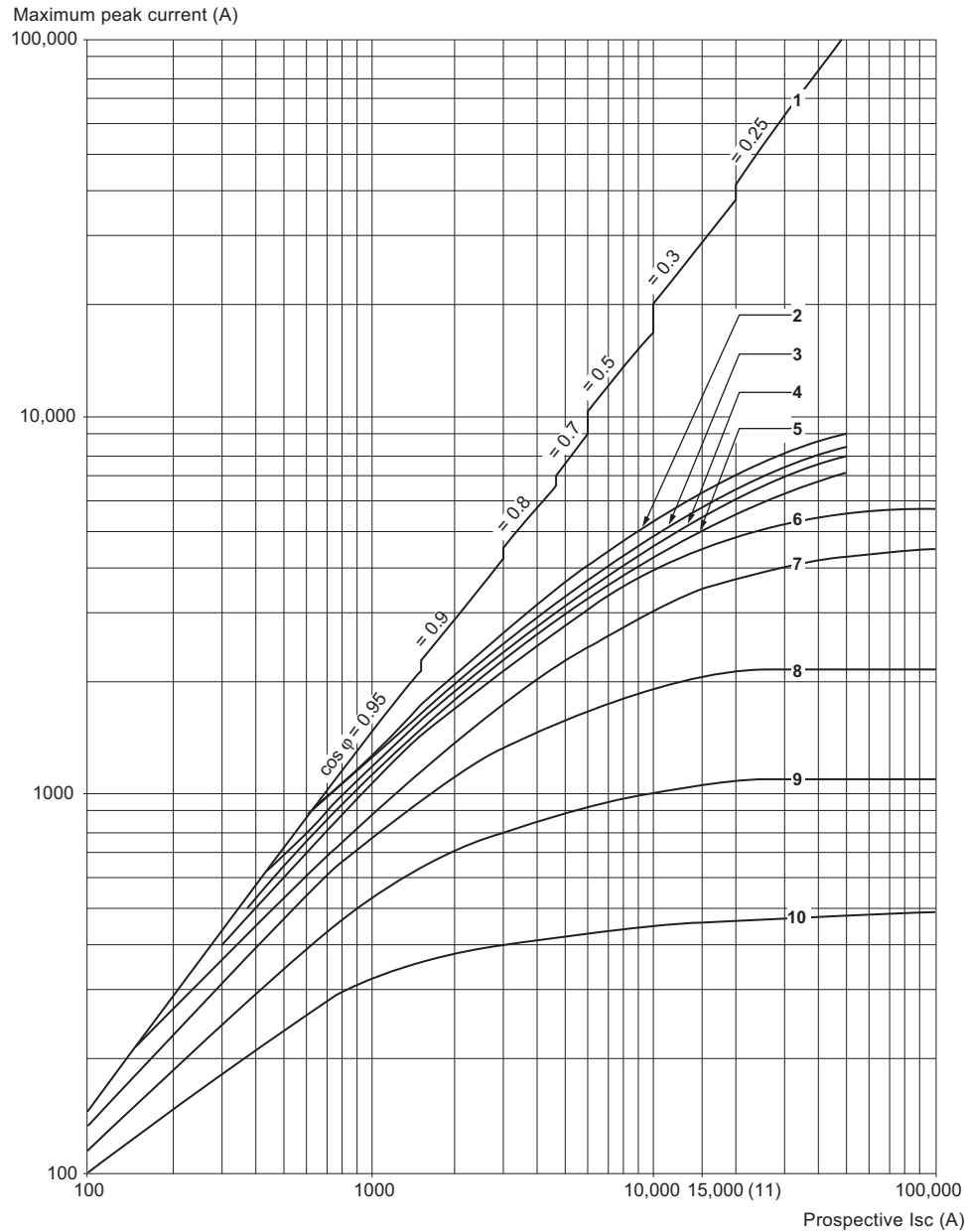
Table 14: Current Limitation on Short Circuit

For GV2M and GV2P

3Ø, 400/415 V

Dynamic stress

1 peak = f (prospective Isc) at 1.05 Ue = 435 V



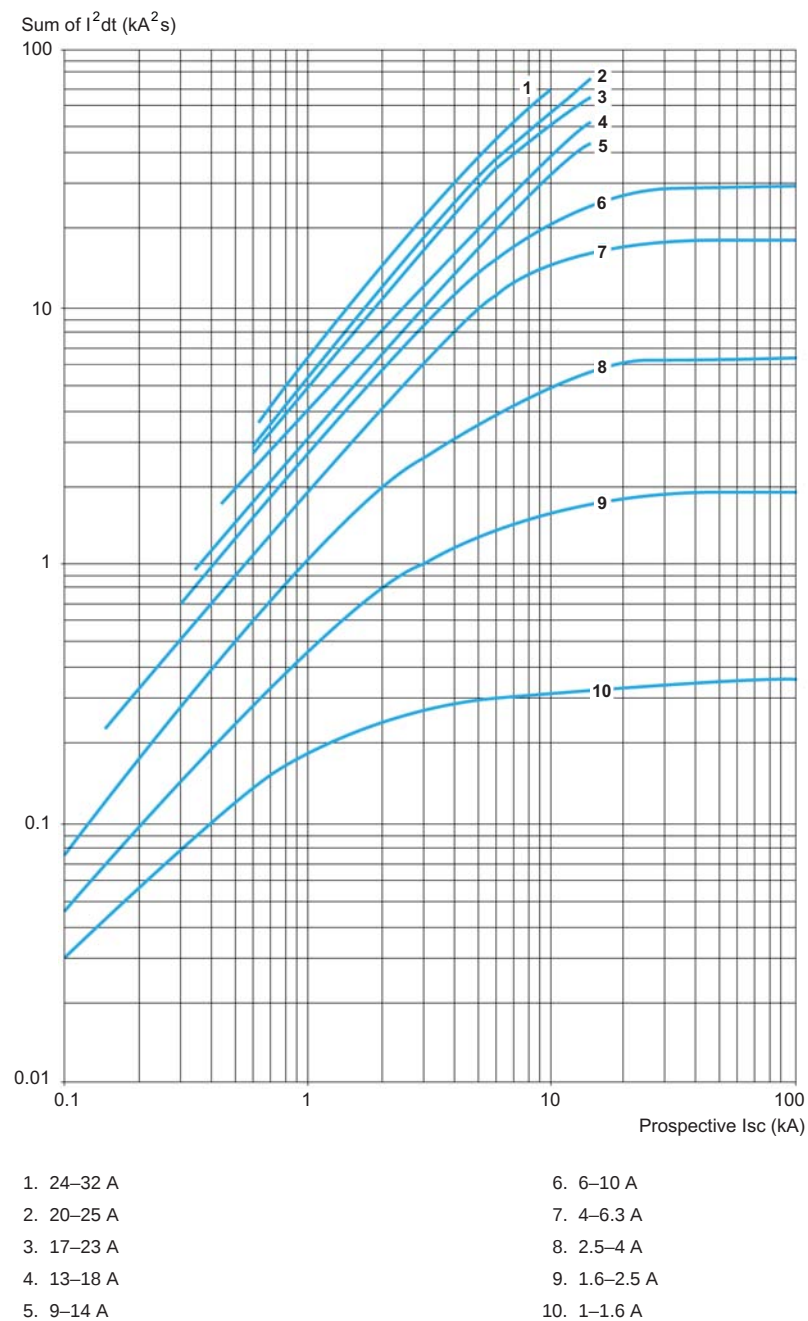
- |                   |                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------|
| 1. I peak maximum | 7. 4–6.3 A                                                                                            |
| 2. 20–25 A        | 8. 2.5–4 A                                                                                            |
| 3. 17–23 A        | 9. 1.6–2.5 A                                                                                          |
| 4. 13–18 A        | 10. 1–1.6 A                                                                                           |
| 5. 9–14 A         | 11. Limit of rated ultimate breaking capacity on short circuit of GV2M (14, 18, 23, and 25 A ratings) |
| 6. 6–10 A         |                                                                                                       |

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Specifications and Operating Curves

**Table 15: Thermal Limit on Short Circuit for GV2ME**

**Thermal limit in  $\text{kA}^2\text{s}$  in the magnetic operating zone**

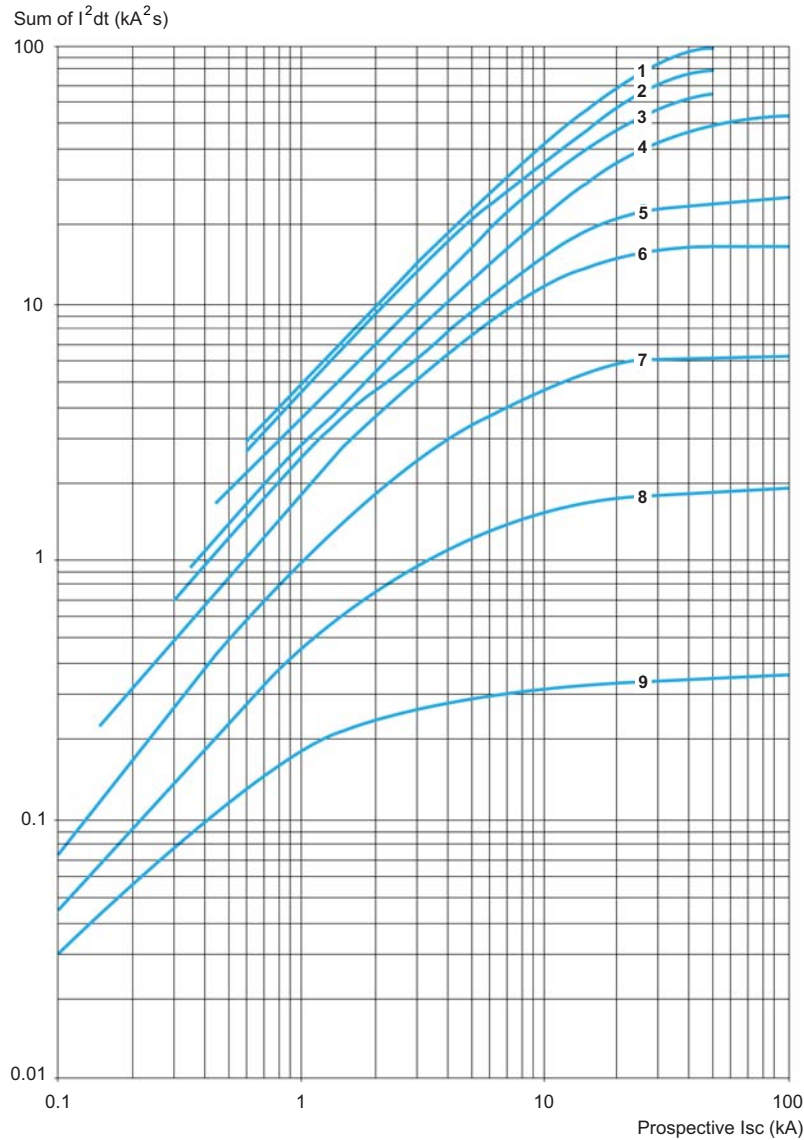
Sum of  $I^2dt = f(\text{prospective } I_{sc})$  at  $1.05 U_e = 435 \text{ V}$



GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors  
Specifications and Operating Curves

Table 16: Thermal Limit on Short Circuit for GV2P

Thermal limit in  $\text{kA}^2\text{s}$  in the magnetic operating zone  
Sum of  $I^2dt = f(\text{prospective } I_{sc})$  at  $1.05 U_e = 435 \text{ V}$



- |            |              |
|------------|--------------|
| 1. 24–32 A | 6. 6–10 A    |
| 2. 20–25 A | 7. 4–6.3 A   |
| 3. 17–23 A | 8. 2.5–4 A   |
| 4. 13–18 A | 9. 1.6–2.5 A |
| 5. 9–14 A  | 10. 1–1.6 A  |

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Specifications and Operating Curves

**Table 17: GV2ME Breaking Capacity for European Applications**

| Type                                                                                                                  |           |     | Units | Catalog Number Suffix (GV2ME) |     |    |     |     |     |    |     |     |     |
|-----------------------------------------------------------------------------------------------------------------------|-----------|-----|-------|-------------------------------|-----|----|-----|-----|-----|----|-----|-----|-----|
| Rating <sup>[1]</sup>                                                                                                 |           |     |       | 01-06                         | 07  | 08 | 10  | 14  | 16  | 20 | 21  | 22  |     |
|                                                                                                                       |           |     | A     | 0.1–1.6                       | 2.5 | 4  | 6.3 | 10  | 14  | 18 | 23  | 25  |     |
| Breaking capacity<br>conforming to IEC 60947-2                                                                        | 230/240 V | Icu | kA    | >100 kA                       |     |    |     |     |     |    | 50  | 50  |     |
|                                                                                                                       |           |     | %     |                               |     |    |     |     |     |    | 100 | 100 |     |
|                                                                                                                       | 400/415 V |     | kA    | >100 kA                       |     |    |     |     |     | 15 | 15  | 15  | 15  |
|                                                                                                                       |           |     | %     |                               |     |    |     |     |     | 50 | 50  | 40  | 40  |
|                                                                                                                       | 440 V     |     | kA    | >100 kA                       |     |    |     | 50  | 15  | 8  | 8   | 6   | 6   |
|                                                                                                                       |           |     | %     |                               |     |    |     | 100 | 100 | 50 | 50  | 50  | 50  |
|                                                                                                                       | 500 V     |     | kA    |                               |     |    |     | 50  | 10  | 6  | 6   | 4   | 4   |
|                                                                                                                       |           |     | %     |                               |     |    |     | 100 | 100 | 75 | 75  | 75  | 75  |
|                                                                                                                       | 690 V     |     | kA    | >100 kA                       | 3   | 3  | 3   | 3   | 3   | 3  | 3   | 3   |     |
|                                                                                                                       |           |     | %     | >100 kA                       | 75  | 75 | 75  | 75  | 75  | 75 | 75  | 75  |     |
| Associated fuses (if required)<br>if I <sub>sc</sub> > breaking capacity I <sub>cu</sub><br>conforming to IEC 60947-2 | 230/240 V | A   | aM    | >100 kA                       |     |    |     |     |     |    | 80  | 80  |     |
|                                                                                                                       |           |     | gL    |                               |     |    |     |     |     |    | 100 | 100 |     |
|                                                                                                                       | 400/415 V |     | aM    | >100 kA                       |     |    |     |     |     | 63 | 63  | 80  | 80  |
|                                                                                                                       |           |     | gL    |                               |     |    |     |     |     | 80 | 80  | 100 | 100 |
|                                                                                                                       | 440 V     |     | aM    | >100 kA                       |     |    |     | 50  | 50  | 50 | 50  | 63  | 63  |
|                                                                                                                       |           |     | gL    |                               |     |    |     | 63  | 63  | 63 | 63  | 80  | 80  |
|                                                                                                                       | 500 V     |     | aM    |                               |     |    |     | 50  | 50  | 50 | 50  | 50  | 50  |
|                                                                                                                       |           |     | gL    |                               |     |    |     | 63  | 63  | 63 | 63  | 63  | 63  |
|                                                                                                                       | 690 V     |     | aM    | >100 kA                       | 16  | 25 | 32  | 32  | 40  | 40 | 40  | 40  |     |
|                                                                                                                       |           |     | gL    | >100 kA                       | 20  | 32 | 40  | 40  | 50  | 50 | 50  | 50  |     |

<sup>1</sup> I<sub>cs</sub> = % of I<sub>cu</sub>.

**Table 18: GV2P Breaking Capacity for European Applications**

| Type                                                                                          |           |     | Units   | Catalog Number Suffix (GV2P) |     |     |     |     |     |     |         |     |     |
|-----------------------------------------------------------------------------------------------|-----------|-----|---------|------------------------------|-----|-----|-----|-----|-----|-----|---------|-----|-----|
| Rating <sup>[1]</sup>                                                                         |           |     |         | 01–06                        | 07  | 08  | 10  | 14  | 16  | 20  | 21 & 22 | 32  |     |
|                                                                                               |           |     | A       | 0.1–1.6                      | 2.5 | 4   | 6.3 | 10  | 14  | 18  | 23 & 25 | 32  |     |
| Breaking capacity<br>conforming to IEC 60947-2                                                | 230/240 V | Ics | kA      | >100 kA                      |     |     |     |     |     |     |         |     |     |
|                                                                                               |           |     | %       |                              |     |     |     |     |     |     |         |     |     |
|                                                                                               | 400/415 V |     | kA      | >100 kA                      |     |     |     |     |     |     | 50      | 50  | 50  |
|                                                                                               |           |     | %       |                              |     |     |     |     |     |     | 50      | 50  | 50  |
|                                                                                               | 440 V     |     | kA      | >100 kA                      |     |     |     |     |     | 50  | 20      | 20  | 20  |
|                                                                                               |           |     | %       |                              |     |     |     |     |     | 75  | 75      | 75  | 75  |
|                                                                                               | 500 V     |     | kA      | >100 kA                      |     |     |     | 50  | 42  | 10  | 10      | 10  |     |
|                                                                                               |           |     | %       |                              |     |     |     | 100 | 75  | 75  | 75      | 75  |     |
|                                                                                               | 690 V     |     | kA      | >100 kA                      | 8   | 8   | 6   | 6   | 6   | 4   | 4       | 4   |     |
|                                                                                               |           |     | %       | >100 kA                      | 100 | 100 | 100 | 100 | 100 | 100 | 100     | 100 |     |
| Associated fuses (if required)<br>if Isc > breaking capacity Icu<br>conforming to IEC 60947-2 | 230/240 V | A   | >100 kA |                              |     |     |     |     |     |     |         |     |     |
|                                                                                               |           |     |         |                              |     |     |     |     |     |     |         |     | gL  |
|                                                                                               | 400/415 V |     | aM      | >100 kA                      |     |     |     |     |     |     | 100     | 100 | 100 |
|                                                                                               |           |     | gL      |                              |     |     |     |     |     |     | 125     | 125 | 125 |
|                                                                                               | 440 V     |     | aM      | >100 kA                      |     |     |     |     |     | 50  | 63      | 80  | 80  |
|                                                                                               |           |     | gL      |                              |     |     |     |     |     | 63  | 80      | 100 | 100 |
|                                                                                               | 500 V     |     | aM      | >100 kA                      |     |     |     | 50  | 50  | 50  | 50      | 50  |     |
|                                                                                               |           |     | gL      |                              |     |     |     | 63  | 63  | 63  | 63      | 63  |     |
|                                                                                               | 690 V     |     | aM      | >100 kA                      | 20  | 25  | 40  | 40  | 50  | 50  | 50      | 50  |     |
|                                                                                               |           |     | gL      | >100 kA                      | 25  | 32  | 50  | 50  | 63  | 63  | 63      | 63  |     |

<sup>1</sup> I<sub>cs</sub> = % of I<sub>cu</sub>.

## GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

### Specifications and Operating Curves

**Table 19: GV2P•• Breaking Capacity for European Applications When Used with Current Limiter GV1L3**

| Type                                           |           | Units | Catalog Number Suffix (GV2P••) |         |    |     |    |     |    |         |    |
|------------------------------------------------|-----------|-------|--------------------------------|---------|----|-----|----|-----|----|---------|----|
|                                                |           |       | 01–06                          | 07      | 08 | 10  | 14 | 16  | 20 | 21 & 25 | 32 |
| Rating <sup>[1]</sup>                          |           | A     | 0.1–1.6                        | 2.5     | 4  | 6.3 | 10 | 14  | 18 | 21 & 23 | 32 |
| Breaking capacity<br>conforming to IEC 60947-2 | 230/240 V | Ics   | kA                             | >100 kA |    |     |    |     |    |         |    |
|                                                |           |       | %                              |         |    |     |    |     |    |         |    |
|                                                | 400/415 V |       | kA                             |         |    |     |    |     |    |         |    |
|                                                |           |       | %                              |         |    |     |    |     |    |         |    |
|                                                | 440 V     |       | kA                             | >100 kA |    |     |    | 100 |    |         |    |
|                                                |           |       | %                              |         |    |     |    | 50  |    |         |    |
|                                                | 500 V     |       | kA                             | >100 kA |    |     |    | 100 |    |         |    |
|                                                |           |       | %                              |         |    |     |    | 50  |    |         |    |

<sup>1</sup> Ics = % of Icu.

**Table 20: GV2ME•• Breaking Capacity for European Applications When Used with Current Limiter GV1L3**

| Type                                           |           | Units | Catalog Number Suffix (GV2ME••) |         |    |     |     |     |     |     |     |
|------------------------------------------------|-----------|-------|---------------------------------|---------|----|-----|-----|-----|-----|-----|-----|
|                                                |           |       | 01 to 06                        | 07      | 08 | 10  | 14  | 16  | 20  | 21  | 22  |
| Rating <sup>[1]</sup>                          |           | A     | 0.1–1.6                         | 2.5     | 4  | 6.3 | 10  | 14  | 18  | 23  | 25  |
| Breaking capacity<br>conforming to IEC 60947-2 | 230/240 V | Ics   | kA                              | >100 kA |    |     |     |     |     |     |     |
|                                                |           |       | %                               |         |    |     |     |     |     |     |     |
|                                                | 400/415 V |       | kA                              | >100 kA |    |     |     | 100 | 100 | 100 | 100 |
|                                                |           |       | %                               |         |    |     |     | 50  | 50  | 40  | 40  |
|                                                | 440 V     |       | kA                              |         |    |     |     | 50  | 20  | 20  | 20  |
|                                                |           |       | %                               |         |    |     |     | 75  | 75  | 75  | 75  |
|                                                | 500 V     |       | kA                              | >100 kA |    |     | 50  | 42  | 10  | 10  | 10  |
|                                                |           |       | %                               |         |    |     | 100 | 100 | 75  | 75  | 75  |
| Rating                                         |           | A     | 0.1–1.6                         | 2.5     | 4  | 6.3 | 10  | 14  | 18  | 23  | 25  |

<sup>1</sup> Ics = % of Icu.

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

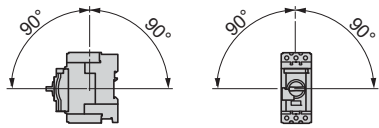
## Specifications and Operating Curves

### GV3 Specifications

**Table 21: Environment**

|                            |                             |                                                                                            |
|----------------------------|-----------------------------|--------------------------------------------------------------------------------------------|
| Conforming to standards    |                             | IEC, NF C, BS, IEC, VDE                                                                    |
| Approvals                  |                             | ASE, CSA, UL, LROS, ÖVE                                                                    |
| UL File Number             |                             | File E164864, CCN NLRV                                                                     |
| CSA File Number            |                             | File LR 81630, Class 3211 05                                                               |
| Protective treatment       |                             | "TC"                                                                                       |
| Degree of protection       | Conforming to IEC 60529     | <b>Open GV3P:</b> IP20                                                                     |
| Shock resistance           | Conforming to IEC 68-2-27   | On: 15 gn - 11 ms<br>Off: 30 gn - 11 ms                                                    |
| Vibration resistance       | Conforming to IEC 68-2-6    | 4 gn (5...300 Hz)                                                                          |
| Ambient air temperature    | Storage                     | -40 to +176 °F (-40 to +80 °C)                                                             |
|                            | Operation                   | <b>Open:</b> -4 to +140 °F (-20 to +60 °C); <b>Enclosed:</b> -4 to +104 °F (-20 to +40 °C) |
| Temperature compensation   | Conforming to IEC 60157-1   | <b>Open:</b> -4 to +140 °F (-20 to +60 °C); <b>Enclosed:</b> -4 to +104 °F (-20 to +40 °C) |
| Flame resistance           | Conforming to IEC 60695-2-1 | Conforms for 1760 °F (960 °C)                                                              |
| Maximum operating altitude | Without derating            | 9843 ft. (3000 m)                                                                          |

**Table 22: Technical Characteristics, GV3P13–65**

| Type                                      | GV3P13–65                                                                          |                       |                                                                          |                                                              |
|-------------------------------------------|------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------|--------------------------------------------------------------|
| Operating position                        |  |                       |                                                                          |                                                              |
| Wiring<br>Number of conductors and c.s.a. | Minimum                                                                            |                       | Maximum                                                                  |                                                              |
| Solid cable                               | 1 x 16–2 AWG                                                                       | 2 x 1 mm <sup>2</sup> | 1 x 16–4 AWG + 1 x 2 AWG                                                 | 1 x 25 mm <sup>2</sup> and 1 x 35 mm <sup>2</sup>            |
| Flexible cable <i>without</i> cable end   |                                                                                    |                       |                                                                          |                                                              |
| Flexible cable <i>with</i> cable end      |                                                                                    |                       |                                                                          |                                                              |
| Tightening torque                         | 44.25 lb-in                                                                        | 5 N•m                 | 44.25 lb-in for 25 mm <sup>2</sup><br>70.81 lb-in for 35 mm <sup>2</sup> | 5 N•m for 25 mm <sup>2</sup><br>8 N•m for 35 mm <sup>2</sup> |

**Table 23: Technical Characteristics, GV3P13–P65**

| Type                                             | GV3P13–P65                                 |                                           |
|--------------------------------------------------|--------------------------------------------|-------------------------------------------|
| Rated insulation voltage (UI)                    | Conforming to IEC 60947-2                  | 690 V                                     |
|                                                  | Conforming to CSA C 22.2 No. 14 and UL 508 | 600 (B600) V                              |
| Maximum conventional rated thermal current (Ith) | Conforming to IEC 60947-4-1                | 65 A                                      |
| Mechanical life (varies with conditions)         |                                            | 50,000 close–open operations              |
| Electrical life                                  | AC-3 duty                                  | 50,000 operating cycles                   |
| Maximum operating rate                           |                                            | 25 operating cycles/h                     |
| Sensitivity to phase failure                     |                                            | Conforming to IEC 60947-4-1 Sec 7-2-1-5-2 |

## GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Specifications and Operating Curves

Table 24: Characteristics of Electrical Trip Units

| Manual Starter and Protector Type                                                                       |                                         | GV2ME, GV2P, and GV3P    |             | GV2ME only          | GV7R                |             |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------------|-------------|---------------------|---------------------|-------------|
| Catalog number suffix                                                                                   |                                         | GVAU                     | GVAS        | GVAX <sup>[1]</sup> | GV7AU               | GV7AS       |
| Rated insulation voltage (Ui)                                                                           | Conforming to IEC 60947-1               | 690 V                    | 690 V       | 500 V               | 690 V               | 690 V       |
|                                                                                                         | Conforming to CSA C22-2 n° 14, UL 508   | 600 V                    | 600 V       | —                   | 600 V               | 600 V       |
| Operational voltage (Un)                                                                                | Conforming to IEC 60947-1               | 0.85–1.1 V               | 0.7–1.1 V   | 0.85–1.1 V          | 0.85–1.1 V          | 0.7–1.1 V   |
| Drop-out voltage (V)                                                                                    |                                         | 0.7–0.35 Un              | 0.75–0.2 Un | 0.7–0.35 Un         | 0.35–0.7 Ue         | 0.2–0.75 Ue |
| Inrush consumption                                                                                      | AC                                      | 12 VA                    | 14 VA       | 12 VA               | < 10 VA             |             |
|                                                                                                         | DC                                      | 8 W                      | 10.5 W      | 8 W                 | < 5 W               |             |
| Sealed consumption                                                                                      | AC                                      | 3.5 VA                   | 5 VA        | 3.5 VA              | < 5 VA              |             |
|                                                                                                         | DC                                      | 1.1 W                    | 1.6 W       | 1.1 W               | < 5 W               |             |
| Operating time                                                                                          | Conforming to IEC 60947-1               | 10–15 ms                 |             |                     | < 50 ms             |             |
| From the moment the voltage reaches its operational value until the manual starter and protector opens. |                                         |                          |             |                     |                     |             |
| On-load factor                                                                                          |                                         | 100%                     |             |                     | 100%                |             |
| Cabling                                                                                                 | Number of conductors                    | 2 or 4                   |             |                     | 1                   |             |
|                                                                                                         | Solid cable                             | 1–2.5 mm <sup>2</sup>    |             |                     | 1.5 mm <sup>2</sup> |             |
|                                                                                                         | Flexible cable <i>without</i> cable end | 0.75–2.5 mm <sup>2</sup> |             |                     | 1.5 mm <sup>2</sup> |             |
|                                                                                                         | Flexible cable <i>with</i> cable end    | 0.75–1.5 mm <sup>2</sup> |             |                     | 1 mm <sup>2</sup>   |             |
| Tightening torque                                                                                       |                                         | 1.4 maximum N•m          |             |                     | 1.2 N•m             |             |

<sup>1</sup> For the wiring diagram of the undervoltage trip unit for dangerous machines (conforming to INRS) on **GV2ME** only, see page 62

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Specifications and Operating Curves

### GV3 Auxiliary Contact Specifications

**Table 25: Auxiliary Contacts for GV2 and GV3P Manual Motor Starters, Controllers, and Protectors**

| Type of contacts                                                                                            |                                                                | Units                                        | Instantaneous auxiliary<br>GVAN, GVAD                                                                       |          |     |             |          |     |     | Fault signaling<br>GVAD, GVAM11                    |     |      |                                 | Instantaneous<br>auxiliary GVAE                       |      |      |     |  |
|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------|-----|-------------|----------|-----|-----|----------------------------------------------------|-----|------|---------------------------------|-------------------------------------------------------|------|------|-----|--|
| <b>Rated insulation voltage (Ui)</b><br>(associated insulation coordination)                                | Conforming to IEC 60947-1                                      | V                                            | 690                                                                                                         |          |     |             |          |     |     | 690                                                |     |      |                                 | 250 (690 in relation to main circuit)                 |      |      |     |  |
|                                                                                                             | Conforming to CSA C22-2 n° 14 and UL 508                       | V                                            | 600                                                                                                         |          |     |             |          |     |     | 300                                                |     |      |                                 | 300                                                   |      |      |     |  |
| <b>Conventional thermal current (Ith)</b>                                                                   | Conforming to IEC 60947-5-1                                    | A                                            | 6                                                                                                           |          |     |             |          |     |     | 2.5                                                |     |      |                                 | 2.5                                                   |      |      |     |  |
|                                                                                                             | Conforming to CSA C22-2 n° 14 and UL 508                       | A                                            | 5                                                                                                           |          |     |             |          |     |     | 1                                                  |     |      |                                 | 1                                                     |      |      |     |  |
| <b>Operational power and current—<br/>AC operation</b><br>Conforming to IEC 60947-5-1                       | Rated operational voltage (Ue)                                 | V                                            | AC-15/100,000 C.O. <sup>[1]</sup><br>48110127230240380415440500690                                          |          |     |             |          |     |     | AC-14/1000 C.O. <sup>[1]</sup><br>2448110127230240 |     |      |                                 | AC-15/100,000 C.O. <sup>[1]</sup><br>2448110127230240 |      |      |     |  |
|                                                                                                             | Operational power, normal conditions                           | VA                                           | 300                                                                                                         | 500      | 720 | 850         | 650      | 500 | 400 | 36                                                 | 48  | 72   | 72                              | 48                                                    | 60   | 120  | 120 |  |
|                                                                                                             | Occasional breaking and making capacities, abnormal conditions | kVA                                          | 3                                                                                                           | 7        | 13  | 15          | 13       | 12  | 9   | 0.22                                               | 0.3 | 0.45 | 0.45                            | 0.48                                                  | 0.6  | 1.27 | 2.4 |  |
|                                                                                                             | Rated operational current (Ie)                                 | A                                            | 6                                                                                                           | 4.5      | 3.3 | 2.2         | 1.5      | 1   | 0.6 | 1.5                                                | 1   | 0.5  | 0.3                             | 2                                                     | 1.25 | 1    | 0.5 |  |
| <b>Operational power and current—<br/>DC operation</b><br>Conforming to IEC 60947-5-1                       | Rated operational voltage (Ue)                                 | V                                            | DC-13/100,000 C.O. <sup>[1]</sup><br>244860110240[2]— —                                                     |          |     |             |          |     |     | DC-13/1000 C.O. <sup>[1]</sup><br>244860—          |     |      |                                 | DC-13/100,000 C.O. <sup>[1]</sup><br>244860—          |      |      |     |  |
|                                                                                                             | Operational power, normal conditions                           | W                                            | 140                                                                                                         | 240      | 180 | 140         | 120      | —   | —   | 24                                                 | 15  | 9    | —                               | 24                                                    | 15   | 9    | —   |  |
|                                                                                                             | Occasional breaking and making capacities, abnormal conditions | W                                            | 240                                                                                                         | 360      | 240 | 210         | 180      | —   | —   | 100                                                | 50  | 50   | —                               | 100                                                   | 50   | 50   | —   |  |
|                                                                                                             | Rated operational current (Ie)                                 | A                                            | 6                                                                                                           | 5        | 3   | 1.3         | 0.5      | —   | —   | 1                                                  | 0.3 | 0.15 | —                               | 1                                                     | 0.3  | 0.15 | —   |  |
| <b>Low power switching reliability of contact</b><br>(varies with conditions)                               |                                                                |                                              | GVAE: Number of failures for <i>n</i> million operating cycles (17 V, 5 mA): = 10 <sup>-6</sup>             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
| <b>Minimum operational conditions—<br/>DC operation</b>                                                     |                                                                | V                                            | 17                                                                                                          |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             |                                                                | mA                                           | 5                                                                                                           |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
| <b>Short-circuit protection</b>                                                                             |                                                                |                                              | GB2CB** circuit breaker (rated according to operational current for Ue < 415 V) or via gG fuse 10 A maximum |          |     |             |          |     |     |                                                    |     |      | GB2CB06 or gG fuse 10 A maximum |                                                       |      |      |     |  |
| <b>Cabling, screw clamp terminals</b>                                                                       | Number of conductors                                           |                                              | 1                                                                                                           |          |     | 2           |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             | Solid cable                                                    | mm <sup>2</sup>                              | 1–2.5                                                                                                       |          |     | 1–2.5       |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             | Flexible cable <i>without</i> cable end                        | mm <sup>2</sup>                              | 0.75–2.5                                                                                                    |          |     | 0.75–2.5    |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             | Flexible cable <i>with</i> cable end                           | mm <sup>2</sup>                              | 0.75–1.5                                                                                                    |          |     | 0.75–1.5    |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             | Tightening torque                                              | N•m                                          | 1.4 maximum                                                                                                 |          |     | 1.4 maximum |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
| <b>Cabling, spring terminal connections</b>                                                                 |                                                                |                                              | GVAN only                                                                                                   |          |     | —           |          |     | —   |                                                    |     | —    |                                 |                                                       |      |      |     |  |
|                                                                                                             |                                                                | Flexible cable <i>without</i> cable end      | mm <sup>2</sup>                                                                                             | 0.75–2.5 |     |             | 0.75–2.5 |     |     | —                                                  |     |      | 0.75–1.5                        |                                                       |      |      |     |  |
| <b>Operation of instantaneous auxiliary contacts</b>                                                        |                                                                | Power poles: 01                              |                                                                                                             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             |                                                                |                                              |                                                                                                             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             |                                                                |                                              |                                                                                                             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             |                                                                |                                              |                                                                                                             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             |                                                                |                                              |                                                                                                             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             |                                                                |                                              |                                                                                                             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             |                                                                |                                              |                                                                                                             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             |                                                                |                                              |                                                                                                             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             |                                                                |                                              |                                                                                                             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
|                                                                                                             |                                                                | <b>Operation of fault signaling contacts</b> |                                                                                                             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
| <b>GVAM11</b><br>Change of state following trip on short circuit.                                           |                                                                |                                              |                                                                                                             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |
| <b>GVAD10** and GVAD01**</b><br>Change of state following trip on short circuit, overload, or undervoltage. |                                                                |                                              |                                                                                                             |          |     |             |          |     |     |                                                    |     |      |                                 |                                                       |      |      |     |  |

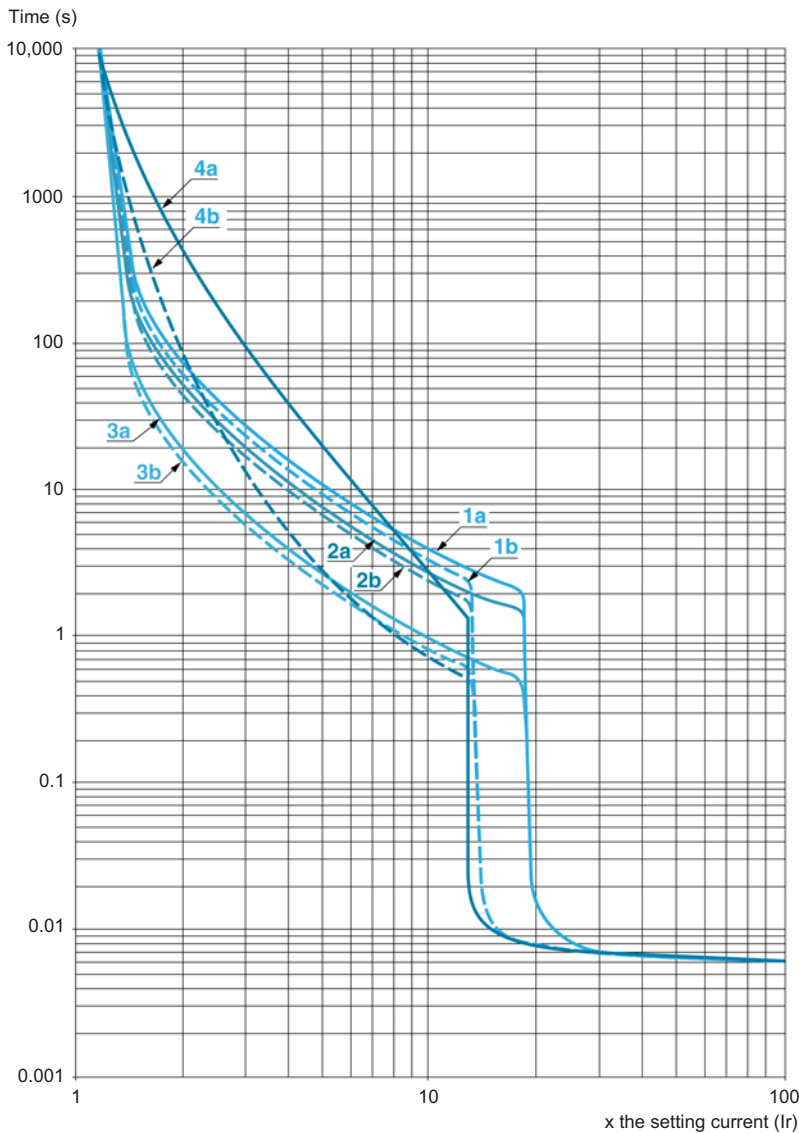
<sup>1</sup> C.O. = close–open operations.

<sup>2</sup> Add an RC circuit type LA4 D to the load terminals. Consult the *Digest*.

GV3 Operating Curves

Table 26: Thermal-Magnetic Trip Curves for GV3P

Average operating times at 68 °F (20 °C) related to multiples of the setting current  
NOTE: GV3ME is not available in the USA.



- 1a. 3 poles from cold state ( $I_r$  minimum): GV3 P
- 1b. 3 poles from cold state ( $I_r$  maximum): GV3 P
- 2a. 2 poles from cold state ( $I_r$  minimum): GV3 P
- 2b. 2 poles from cold state ( $I_r$  maximum): GV3 P
- 3a. 3 poles from hot state ( $I_r$  minimum): GV3 P
- 3b. 3 poles from hot state ( $I_r$  maximum): GV3 P
- 4a. 3 poles from hot state ( $I_r$  minimum): GV3 ME80
- 4b. 3 poles from hot state ( $I_r$  maximum): GV3 ME80

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Specifications and Operating Curves

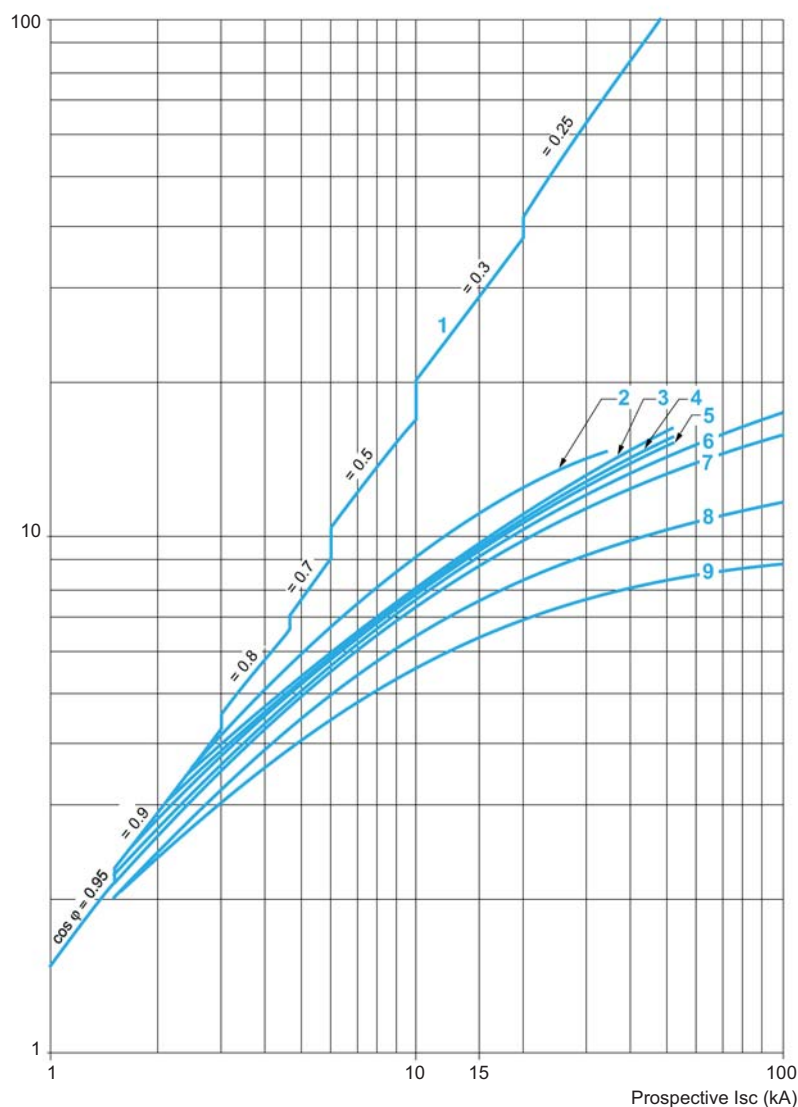
**Table 27: Current Limitation on Short Circuit for GV3P**

## Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

**NOTE:** GV3ME is not available in the USA.

Limited peak current (kA)



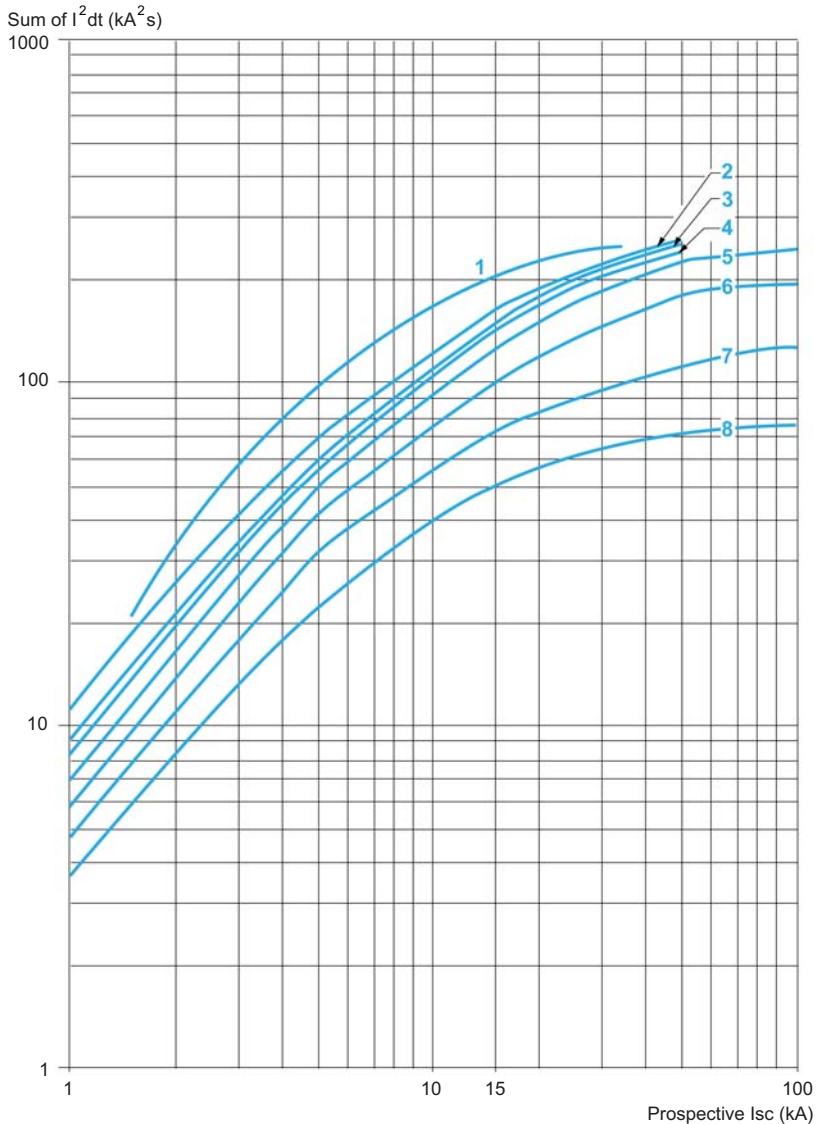
- |                         |            |
|-------------------------|------------|
| 1. Maximum peak current | 6. 23–32 A |
| 2. 56–80 A              | 7. 17–25 A |
| 3. 48–65 A              | 8. 12–18 A |
| 4. 37–50 A              | 9. 9–13 A  |
| 5. 30–40 A              |            |

GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors  
Specifications and Operating Curves

Table 28: Thermal Limit on Short Circuit for GV3P

Thermal limit in  $\text{kA}^2\text{s}$  in the magnetic operating zone

Sum of  $I^2dt = f(\text{prospective } I_{sc})$  at  $1.05 U_e = 435 \text{ V}$   
GV3ME is not available in the USA.



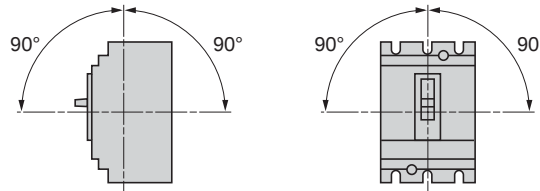
- |                       |                      |
|-----------------------|----------------------|
| 1. 56–80 A (GV3 ME80) | 5. 23–32 A (GV3 P32) |
| 2. 48–65 A (GV3 P65)  | 6. 17–25 A (GV3 P25) |
| 3. 37–50 A (GV3 P50)  | 7. 12–18 A (GV3 P18) |
| 4. 30–40 V (GV3 P40)  | 8. 9–13 A (GV3 P13)  |

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

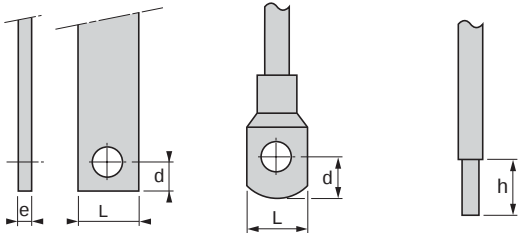
## Specifications and Operating Curves

### GV7 Specifications

**Table 29: Environment**

|                                                                     |                  |                                                                                                                                 |
|---------------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Conforming to standards</b>                                      |                  | IEC 60947-1, 60947-2, 60947-4-1, EN 60947-1, 60947-2, 60947-4-1, NF C 63-650, 63-120, 79-130, VDE 0113, UL 508, CSA C22.2 No.14 |
| <b>Approvals</b>                                                    |                  | UL File E 164864 CCN NLRV<br>CSA File LR 81630 Class 3211 05                                                                    |
| <b>Protective treatment</b>                                         |                  | "TC"                                                                                                                            |
| <b>Degree of protection</b><br>Conforming to IEC 60529              |                  | IP405 with terminal shields                                                                                                     |
| <b>Ambient air temperature</b>                                      | <b>Storage</b>   | -68 °F to +203 °F (-55 °C to +95 °C)                                                                                            |
|                                                                     | <b>Operation</b> | -13 °F to +158 °F (-25 °C to +70 °C)                                                                                            |
| <b>Temperature compensation</b>                                     |                  | -13 °F to +130 °F (-25 °C to +55 °C)<br>For use up to +158 °F (70 °C), consult your local sales office.                         |
| <b>Maximum operating altitude</b>                                   |                  | 6562 ft. (2000 m)                                                                                                               |
| <b>Operating position</b>                                           |                  |                                               |
| <b>Suitability for isolation</b><br>Conforming to IEC 60947-1 7-1-6 |                  | Yes                                                                                                                             |
| <b>Vibration resistance</b>                                         |                  | 2.5 g <sub>n</sub> at 25 Hz                                                                                                     |
| <b>Phase loss sensitivity</b>                                       |                  | Conforming to IEC 60947-4-1, 7-2-1-5-2                                                                                          |

**Table 30: Cabling Characteristics**

| Type                                             |                   | Connection by bars or cables                                                         |                                      |                                           |
|--------------------------------------------------|-------------------|--------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------------|
|                                                  |                   | GV7R•40–R•100                                                                        | GV7R•150                             | GV7R•220                                  |
|                                                  |                   |  |                                      |                                           |
| Pitch                                            | Without spreaders | 1.4 in. (35 mm)                                                                      |                                      |                                           |
|                                                  | With spreaders    | 1.8 in. (45 mm)                                                                      |                                      |                                           |
| Bars or cables with lugs                         | e                 | 0.24 in. (≤6 mm)                                                                     |                                      |                                           |
|                                                  | L                 | 1 in. (≤25 mm)                                                                       |                                      |                                           |
|                                                  | d                 | 0.39 in. (≤10mm)                                                                     |                                      |                                           |
| Screws                                           | Size              | M6                                                                                   | M8                                   |                                           |
|                                                  | Tightening torque | 7.5 lb-ft (10 N•m)                                                                   | 11.3 lb-ft (15 N•m)                  |                                           |
| Bare cables (copper or aluminum) with connectors | Height            | 0.78 in. (20 mm)                                                                     |                                      |                                           |
|                                                  | Wire size         | 16 AWG (1.5 mm <sup>2</sup> )                                                        | 16–3/0 AWG (1.5–95 mm <sup>2</sup> ) | 16 AWG–350 mcm (1.5–185 mm <sup>2</sup> ) |
|                                                  | Tightening torque | 11.3 lb-ft (15 N•m)                                                                  |                                      |                                           |

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Specifications and Operating Curves

**Table 31: Technical Characteristics**

| Type                                                                 |                             |                     | GV7                 |        |                 |          |                 |           |
|----------------------------------------------------------------------|-----------------------------|---------------------|---------------------|--------|-----------------|----------|-----------------|-----------|
|                                                                      |                             |                     | RE20–RE100          |        | RS40–RS100      | RE150    | RS150           | RE220     |
| Utilization category                                                 | Conforming to IEC 60947-2   |                     | A                   |        | A               |          | A               |           |
|                                                                      | Conforming to IEC 60947-4-1 |                     | AC-3                |        | AC-3            |          | AC-3            |           |
| Rated operational voltage (Ue) conforming to IEC 60947-2             |                             |                     | 690 V               |        | 690 V           |          | 690 V           |           |
| Rated insulation voltage (Ui) conforming to IEC 60947-2              |                             |                     | 750 V               |        | 750 V           |          | 750 V           |           |
| Rated voltage conforming to CSA C22.2 No. 14, UL 508                 |                             |                     | 600 V               |        | 600 V           |          | 600 V           |           |
| Rated operational frequency <sup>[1]</sup> conforming to IEC 60947-2 |                             |                     | 50/60 Hz            |        | 50/60 Hz        |          | 50/60 Hz        |           |
| Rated impulse withstand voltage (U imp) conforming to IEC 60947-2    |                             |                     | 8 kV                |        | 8 kV            |          | 8 kV            |           |
| Total power dissipated per pole                                      |                             |                     | 5 W                 |        | 8.7 W           |          | 14.5 W          |           |
| Electrical durability<br>(C.O. = close-open cycles)                  | 440 V                       | In/2                | 50,000 C.O.         |        | 40,000 C.O.     |          | 20,000 C.O.     |           |
|                                                                      | 440 V                       | In                  | 30,000 C.O.         |        | 20,000 C.O.     |          | 10,000 C.O.     |           |
| Rated duty, conforming to IEC 60947-4-1                              |                             |                     | Continuous duty     |        | Continuous duty |          | Continuous duty |           |
| Type                                                                 |                             |                     | GV7                 |        |                 |          |                 |           |
|                                                                      |                             |                     | RE40–RE100          |        | RS40–RS100      | RE150    | RS150           | RE220     |
| Rating                                                               |                             |                     | 25–40 A to 60–100 A |        | 90–150 A        | 90–150 A | 132–220 A       | 132–220 A |
| Breaking capacity<br>conforming to IEC 60947-2                       | 230/240 V                   | Icu <sup>[2]</sup>  | 85 kA               | 100 kA | 85 kA           | 100 kA   | 85 kA           | 100 kA    |
|                                                                      |                             | Ics% <sup>[3]</sup> | 100%                | 100%   | 100%            | 100%     | 100%            | 100%      |
|                                                                      | 400/415 V                   | Icu <sup>[2]</sup>  | 25 kA               | 70 kA  | 35 kA           | 70 kA    | 35 kA           | 70 kA     |
|                                                                      |                             | Ics% <sup>[3]</sup> | 100%                | 100%   | 100%            | 100%     | 100%            | 100%      |
|                                                                      | 440 V                       | Icu <sup>[2]</sup>  | 25 kA               | 65 kA  | 35 kA           | 65 kA    | 35 kA           | 65 kA     |
|                                                                      |                             | Ics% <sup>[3]</sup> | 100%                | 100%   | 100%            | 100%     | 100%            | 100%      |
|                                                                      | 500 V                       | Icu <sup>[2]</sup>  | 18 kA               | 50 kA  | 30 kA           | 50 kA    | 30 kA           | 50 kA     |
|                                                                      |                             | Ics% <sup>[3]</sup> | 100%                | 100%   | 100%            | 100%     | 100%            | 100%      |
|                                                                      | 690 V                       | Icu <sup>[2]</sup>  | 8 kA                | 10 kA  | 8 kA            | 10 kA    | 8 kA            | 10 kA     |
|                                                                      |                             | Ics% <sup>[3]</sup> | 100%                | 100%   | 100%            | 100%     | 100%            | 100%      |

<sup>1</sup> GV7R motor controllers and protectors are not recommended for use with variable speed controllers or soft start units in applications under 40 Hz.

<sup>2</sup> Icu = interrupting capacity at full voltage.

<sup>3</sup> Ics = short-circuit interrupting capacity as a percentage of Icu.

**Table 32: UL Maximum SCCR (rms) (kA) <sup>[1, 2]</sup>**

| Type     | Range     | SCCR                 |                      |                      |
|----------|-----------|----------------------|----------------------|----------------------|
|          |           | 240 V <sup>[3]</sup> | 480 V <sup>[3]</sup> | 600 V <sup>[3]</sup> |
| GV7RE40  | 25–40 A   | 25                   | 25                   | 10                   |
| GV7RE50  | 30–50 A   | 25                   | 25                   | 10                   |
| GV7RE80  | 48–80 A   | 25                   | 25                   | 10                   |
| GV7RE100 | 60–100 A  | 25                   | 25                   | 10                   |
| GV7RE150 | 90–150 A  | 25                   | 25                   | 10                   |
| GV7RE220 | 132–220 A | 25                   | 25                   | 10                   |
| GV7RS40  | 25–40 A   | 65                   | 65                   | 10                   |
| GV7RS50  | 30–50 A   | 65                   | 65                   | 10                   |
| GV7RS80  | 48–80 A   | 65                   | 65                   | 10                   |
| GV7RS100 | 60–100 A  | 65                   | 65                   | 10                   |
| GV7RS150 | 90–150 A  | 65                   | 65                   | 10                   |
| GV7RS220 | 132–220 A | 65                   | 65                   | 10                   |

<sup>1</sup> Group Installation: Maximum NTD fuse size: 1200 A. Maximum manual starter and protector rating: 1200 A.

<sup>2</sup> Suitable for use on a circuit with an available SCCR no greater than the SCCR of the manual motor controller or manual starter and protector, whichever is less.

<sup>3</sup> Nominal system voltage.

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Specifications and Operating Curves

## GV7 Auxiliary Contact Specifications

**Table 33: Auxiliary Contact Characteristics**

| Type of contacts                                                             |                                         |                                                              |                 | GV7AE11                                                                                                    |     |         |         |     |     |      |     | GV7AB11                        |         |         |     |      |     |   |   |
|------------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------|-----|---------|---------|-----|-----|------|-----|--------------------------------|---------|---------|-----|------|-----|---|---|
| <b>Rated insulation voltage (Ui)</b><br>(associated insulation coordination) |                                         | Conforming to IEC 60947-1 from CSA C22.2 No. 14 and UL 508   | V               | 690                                                                                                        |     |         |         |     |     |      |     | 690                            |         |         |     |      |     |   |   |
| <b>Conventional thermal current (Ith)</b>                                    |                                         | Conforming to IEC 60947-5-1 from CSA C22.2 No. 14 and UL 508 | A               | 6                                                                                                          |     |         |         |     |     |      |     | 6                              |         |         |     |      |     |   |   |
| <b>Mechanical durability</b><br>(C.O.: Close - Open)                         |                                         |                                                              | C.O.            | 50 000                                                                                                     |     |         |         |     |     |      |     | 50 000                         |         |         |     |      |     |   |   |
| <b>Operational current—AC operation</b><br><br>Conforming to IEC 60947-5-1   | Rated operational voltage (Ue)          |                                                              | V               | AC-12 or AC-15. 50,000 C.O.                                                                                |     |         |         |     |     |      |     | AC-12 or AC-15. 50,000 C.O.    |         |         |     |      |     |   |   |
|                                                                              |                                         |                                                              | 24              | 48                                                                                                         | 110 | 230/240 | 380/415 | 440 | 690 | 24   | 48  | 110                            | 230/240 | 380/415 | 440 | 690  |     |   |   |
|                                                                              |                                         | Rated operational current (Ie)                               | AC-12           | A                                                                                                          | 6   | 6       | 6       | 6   | 6   | 6    | 6   | 5                              | 5       | 5       | 5   | 5    | 5   |   |   |
|                                                                              |                                         | AC-15                                                        | A               | 6                                                                                                          | 6   | 5       | 4       | 3   | 3   | 0.1  | 5   | 5                              | 4       | 3       | 2.5 | 2.5  | 0.1 |   |   |
| <b>Operational current—DC operation</b><br><br>Conforming to IEC 60947-5-1   | Rated operational voltage (Ue)          |                                                              | V               | DC-12 or DC-14. 50,000 C.O.                                                                                |     |         |         |     |     |      |     | DC-12 or DC-14. 50,000 C.O.    |         |         |     |      |     |   |   |
|                                                                              |                                         |                                                              | 24              | 48                                                                                                         |     | 110     |         | 250 |     | 24   | 48  |                                | 110     |         | 250 |      |     |   |   |
|                                                                              |                                         | Rated operational current (Ie)                               | DC-12           | A                                                                                                          | 2.5 |         | 2.5     |     | 0.8 |      | 0.3 |                                | 2       |         | 2   |      | 0.5 |   | — |
|                                                                              |                                         | DC-14                                                        | A               | 1                                                                                                          |     | 0.2     |         | 0.5 |     | 0.03 |     | 0.5                            |         | 0.1     |     | 0.25 |     | — |   |
| <b>Minimum operational conditions—DC operation</b>                           |                                         |                                                              | V               | 17                                                                                                         |     |         |         |     |     |      |     | 12                             |         |         |     |      |     |   |   |
|                                                                              |                                         |                                                              | mA              | 5                                                                                                          |     |         |         |     |     |      |     | 5                              |         |         |     |      |     |   |   |
| <b>Short-circuit protection</b>                                              |                                         |                                                              |                 | GB2CB** circuit breaker (rating according to operational current for Ue ≤ 415 V) or gG fuse, 10 A maximum. |     |         |         |     |     |      |     |                                |         |         |     |      |     |   |   |
| <b>Cabling</b>                                                               | Solid cable                             |                                                              | mm <sup>2</sup> | 1 x 1.5 conductor (1 x 16 AWG)                                                                             |     |         |         |     |     |      |     | 1 x 1.5 conductor (1 x 16 AWG) |         |         |     |      |     |   |   |
|                                                                              | Flexible cable <i>without</i> cable end |                                                              | mm <sup>2</sup> | 1 x 1.5 conductor (1 x 16 AWG)                                                                             |     |         |         |     |     |      |     | 1 x 1.5 conductor (1 x 16 AWG) |         |         |     |      |     |   |   |
|                                                                              | Flexible cable <i>with</i> cable end    |                                                              | mm <sup>2</sup> | 1 x 1.5 conductor (1 x 16 AWG)                                                                             |     |         |         |     |     |      |     | 1 x 1.5 conductor (1 x 16 AWG) |         |         |     |      |     |   |   |

**Table 34: Electrical Characteristics**

| Type                                                           | GV7AU or GV7AS                                |
|----------------------------------------------------------------|-----------------------------------------------|
| <b>Rated insulation voltage (Ui) conforming to IEC 60947-1</b> | 690 V                                         |
| <b>Operational voltage conforming to IEC 60947-1</b>           | 0.85–1.1 Ue (V)                               |
| <b>Drop-out voltage</b>                                        | 0.35–0.7 Ue (V)                               |
| <b>Inrush consumption</b>                                      | <10 VA                                        |
|                                                                | <5 W                                          |
| <b>Sealed consumption</b>                                      | <5 VA                                         |
|                                                                | <5 W                                          |
| <b>Operating time conforming to IEC 60947-1</b>                | <50 ms                                        |
| <b>On-load factor</b>                                          | 100%                                          |
| <b>Cabling, solid or flexible cable</b>                        | 2 x 16 AWG (2 x 1.5 mm <sup>2</sup> ) maximum |

## GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

### Specifications and Operating Curves

#### GV7 Operating Curves

The current limiting capacity of the motor starter and protector is expressed by two curves that illustrate the following, as a function of the prospective short-circuit current (the current that would flow if no protection devices were installed):

- The actual peak current (limited)
- The thermal stress (in  $A^2s$ ), that is, the energy dissipated by the short-circuit in a conductor with a resistance of  $1 \Omega$

**Example**—The actual peak value of a 70 kA prospective short-circuit current limited by a **GV7RS220** is 20 kA. See page 32.

**Table 35: Permissible Thermal Stresses for Cables ( $A^2s$ )**

| S (mm²)            |    | 1.5                    | 2.5                    | 4                      | 6                      | 10                     | 16                     | 25                     | 35                     | 50                     |
|--------------------|----|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| AWG                |    | 16                     | 14                     | 12                     | 10                     | 8                      | 6                      | 4                      | 2                      | 1                      |
| PVC Insulation     | Cu | 2.97 x 10 <sup>4</sup> | 8.26 x 10 <sup>4</sup> | 2.12 x 10 <sup>5</sup> | 4.76 x 10 <sup>5</sup> | 1.32 x 10 <sup>6</sup> | 3.4 x 10 <sup>6</sup>  | 8.26 x 10 <sup>6</sup> | 1.62 x 10 <sup>7</sup> | 3.31 x 10 <sup>7</sup> |
|                    | Al | —                      | —                      | 5.41 x 10 <sup>5</sup> | 1.39 x 10 <sup>6</sup> | 3.38 x 10 <sup>6</sup> | 6.64 x 10 <sup>6</sup> | 1.35 x 10 <sup>7</sup> | —                      | —                      |
| PRC <sup>[1]</sup> | Cu | 4.10 x 10 <sup>4</sup> | 1.39 x 10 <sup>5</sup> | 2.92 x 10 <sup>5</sup> | 6.56 x 10 <sup>5</sup> | 1.82 x 10 <sup>6</sup> | 4.69 x 10 <sup>6</sup> | 1.39 x 10 <sup>7</sup> | 2.23 x 10 <sup>7</sup> | 4.56 x 10 <sup>7</sup> |
|                    | Al | —                      | —                      | 7.52 x 10 <sup>5</sup> | 1.93 x 10 <sup>6</sup> | 4.70 x 10 <sup>6</sup> | 9.23 x 10 <sup>6</sup> | 1.88 x 10 <sup>7</sup> | —                      | —                      |

<sup>1</sup> PRC = Cross-linked polyethylene

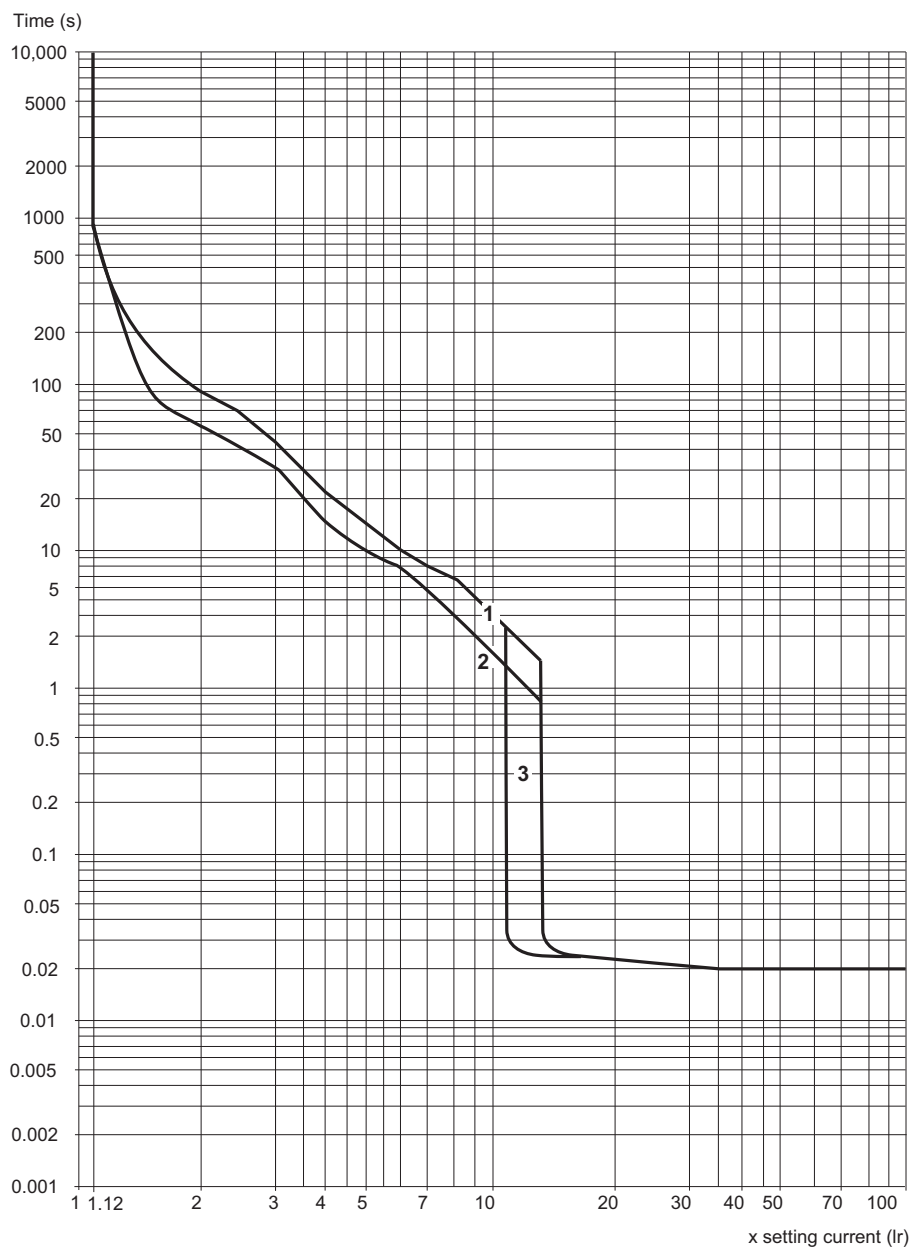
**Example**—For a **GV7RS220**, the peak value is limited to 20 kA for a prospective  $I_{sc}$  of 40 kA.

**Example**—For a **GV7RS220**, and with a prospective  $I_{sc}$  of 40 kA, an  $I^2t$  of  $7.5 \times 10^5 A^2s$  is obtained, which requires the use of a PVC insulated copper cable with a wire size of 10 mm<sup>2</sup> (8 AWG).

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Specifications and Operating Curves

**Table 36: Thermal-Magnetic Trip Curves for GV7R**

Average operating time at 68 °F (20 °C) as a function of multiples of the setting current



1. Curve from cold state
2. Curve from hot state
3. 12–14 Ir  
In the event of total phase failure, trip occurs after 4 s ± 20%

GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors  
Specifications and Operating Curves

Table 37: Current Limitation on Short Circuit for GV7R

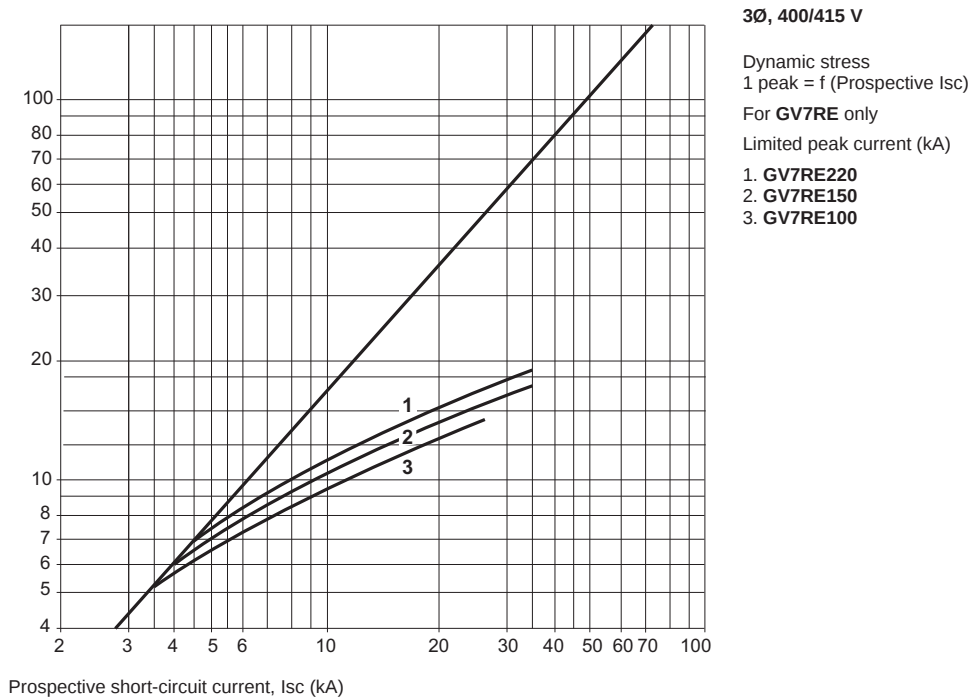
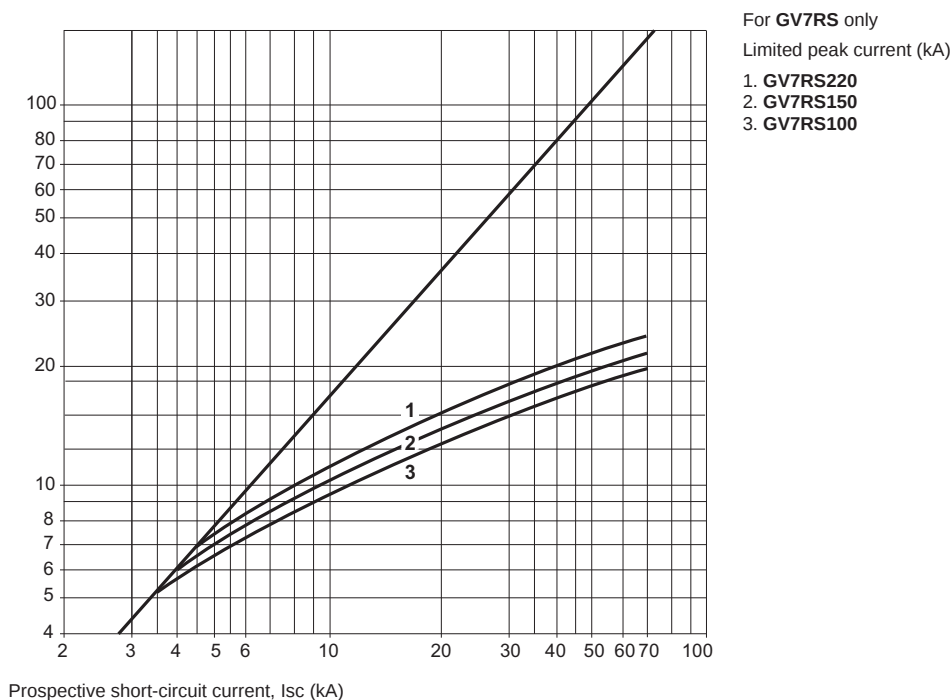


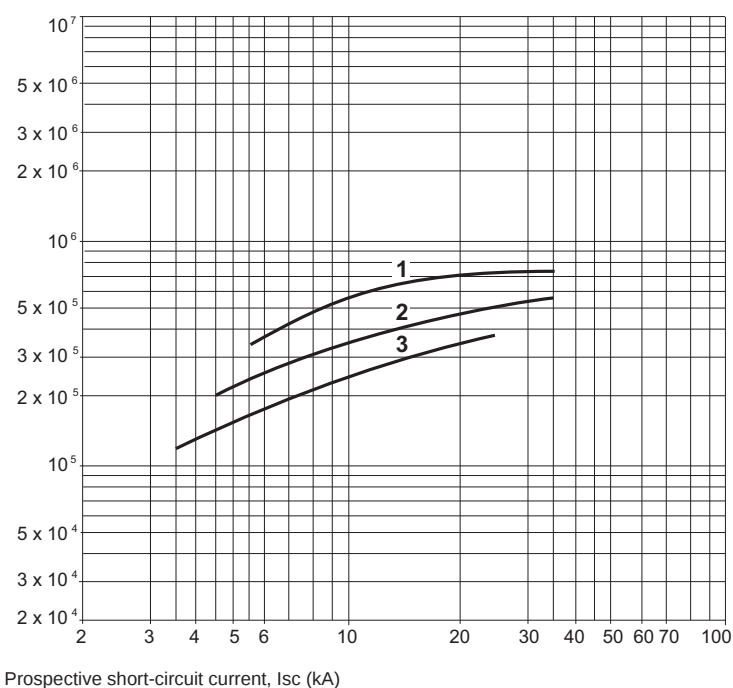
Table 38: Current Limitation on Short Circuit for GV7RS



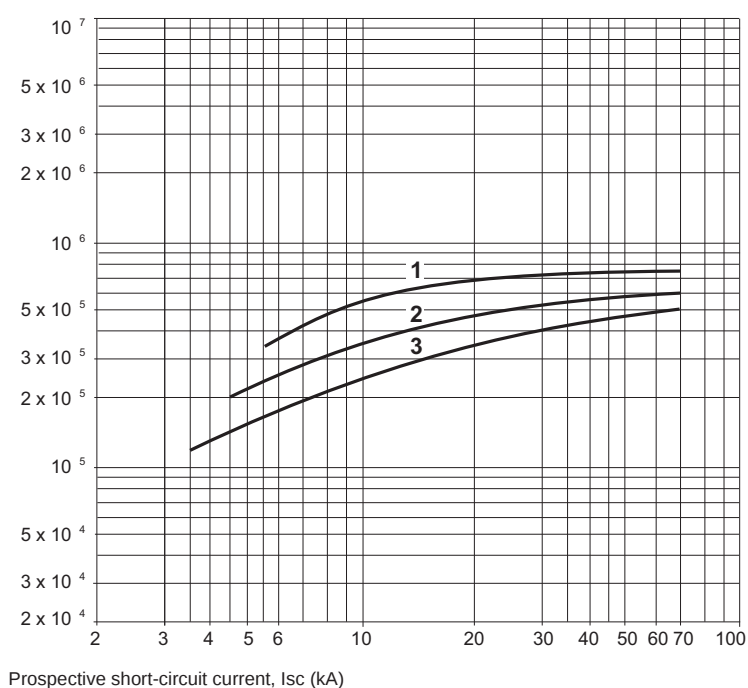
# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Specifications and Operating Curves

**Table 39: Thermal Limit on Short Circuit for GV7R**

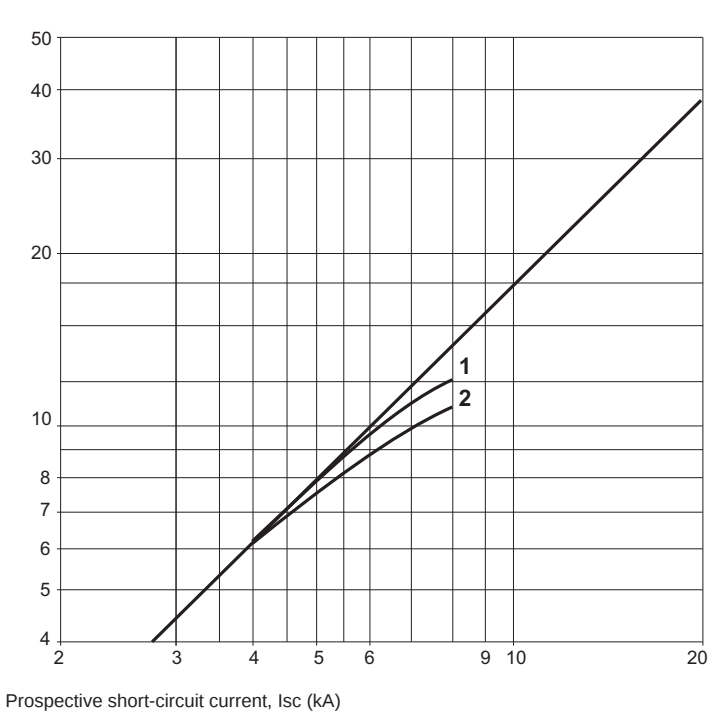


**Table 40: Thermal Limit on Short Circuit for GV7RS**



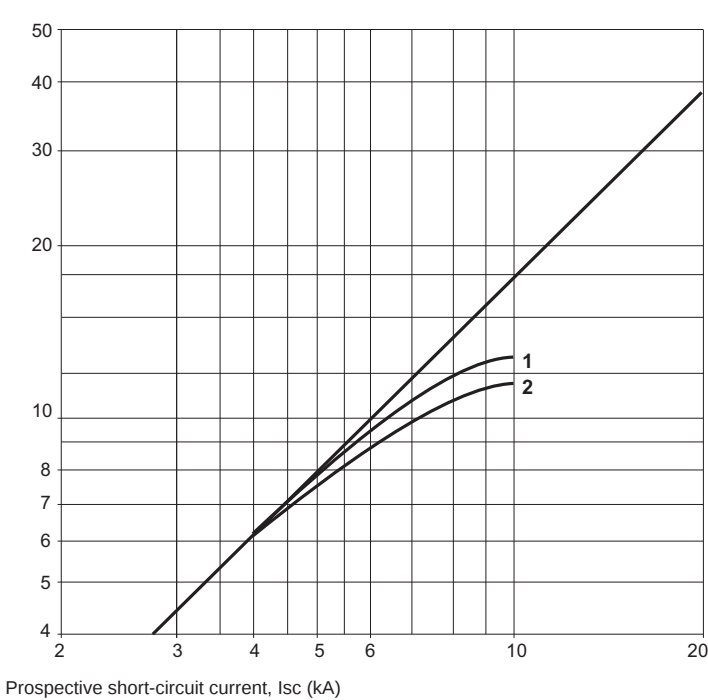
GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors  
Specifications and Operating Curves

Table 41: Current Limitation on Short Circuit for GV7R



3Ø, 690 V  
Dynamic stress  
1 peak = f (Prospective I<sub>sc</sub>)  
For GV7RE only  
Limited peak current (kA)  
1. GV7RE220  
2. GV7RE150 and GV7RE100

Table 42: Current Limitation on Short Circuit for GV7RS

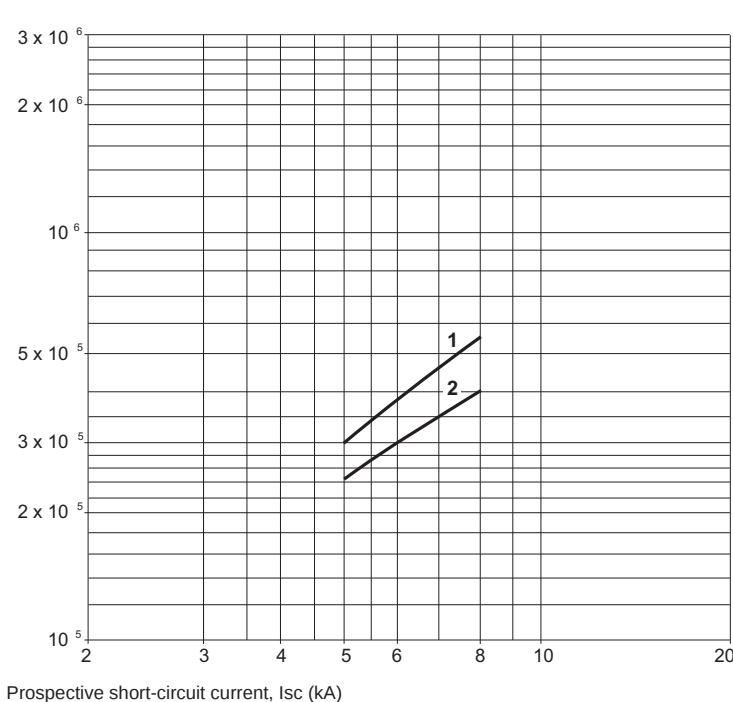


For GV7RS only  
Limited peak current (kA)  
1. GV7RS220  
2. GV7RS150 and GV7RS100

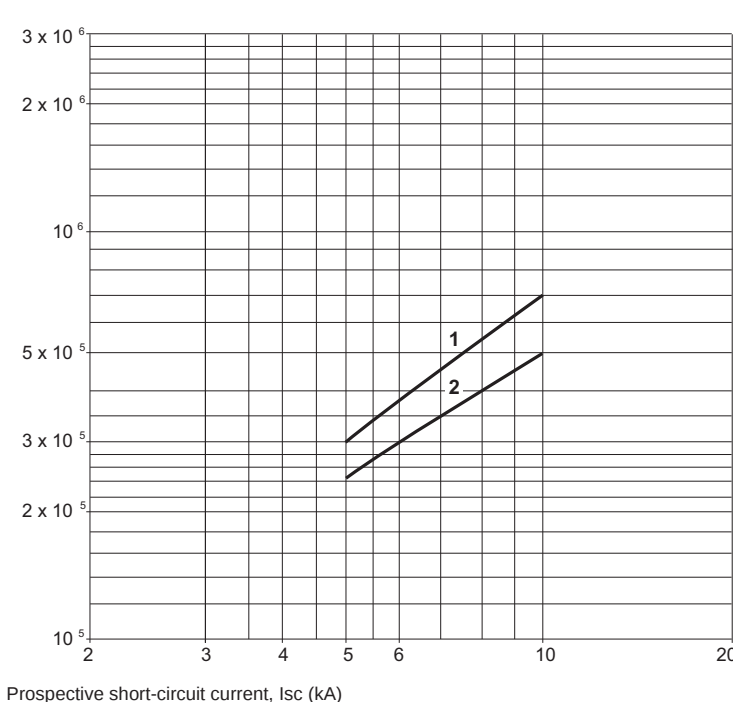
# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Specifications and Operating Curves

**Table 43: Thermal Limit on Short Circuit for GV7R**

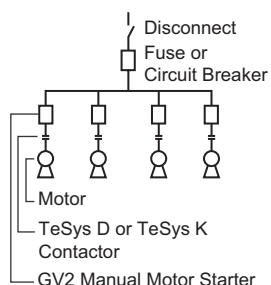


**Table 44: Thermal Limit on Short Circuit for GV7RS**



## GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Specifications and Operating Curves

## Selection



### Fuse and Circuit Breaker Selection

When selecting the proper upstream short circuit protection for Group Motor installations, you must apply the specific rules of the National Electrical Code (NEC) for Group Motor installations. To help clarify this process, below are examples of how to choose the correct GV manual starter and the proper size short circuit protection for an application. These examples illustrate the most common applications of GV manual starters with upstream short circuit protection in a Group Motor installation. Refer to **NEC section 430-53C** and **section 430-53D** for proper conductor ampacity selection.

**NOTE:** The examples below show full-load ampere (FLA) ratings that may not be typical. Use the motor nameplate data to determine actual values.

**Example 1:** Eight motors with the sizes shown in Table 45 are installed on a conveying system. Time-delay fuses are used.

**Table 45: Example 1—Motor Sizes**

| Motor Quantity | Rating (hp) | Voltage | FLA | Starter Selected |
|----------------|-------------|---------|-----|------------------|
| 1              | 5           | 460     | 7.6 | GV2ME14          |
| 2              | 3           | 460     | 4.8 | GV2ME10          |
| 5              | 2           | 460     | 3.4 | GV2ME08          |

In accordance with NEC section 430-52, section 430-53, and table 430-152, the time-delay fuse must be sized as follows:

$$\text{175\% FLA for largest motor + sum of FLAs for all other motors} \\ \Rightarrow (1.75 \times 7.6) + (2 \times 4.8) + (5 \times 3.4) = 39.9 \text{ A}$$

NEC 430-52 allows use of the next largest standard-size fuse—which in this case is 40 A. If nuisance tripping is a problem with this fuse selection, NEC does allow 225% of the largest motor FLA to be used in lieu of 175% when calculating the size. In this case, the calculation is as follows (the next largest standard fuse size in this case is 45 A):

$$(2.25 \times 7.6) + (2 \times 4.8) + (5 \times 3.4) = 43.7 \text{ A}$$

**Example 2:** Ten motors with the sizes shown in Table 46 are installed on a packaging machine. Choose the proper size inverse-time circuit breaker for this application.

**Table 46: Example 2—Motor Sizes**

| Motor Quantity | Rating (hp) | Voltage | FLA |
|----------------|-------------|---------|-----|
| 2              | 10          | 460     | 14  |
| 1              | 5           | 460     | 7.6 |
| 2              | 3           | 460     | 4.8 |
| 5              | 2           | 460     | 3.4 |

In accordance with NEC section 430-52, section 430-53, and NEC table 430-152, the inverse-time circuit breaker must be sized as follows (the next largest standard-size inverse-time circuit breaker is 90 A):

$$\text{250\% FLA for largest motor + sum of FLAs for all other motors} \\ \Rightarrow (2.5 \times 14) + 7.6 + (2 \times 4.8) + (5 \times 3.4) = 83.2 \text{ A}$$

If nuisance tripping is a problem, the NEC allows for inverse-time circuit breaker sizes that “shall in no case exceed 400% for full-load currents of 100 amps or less, or 300% for full-load current greater than 100 amps.” In this case, the calculation is as follows (the next largest standard inverse-time circuit breaker size in this case is 110 A):

$$(4.0 \times 14) + 7.6 + (2 \times 4.8) + (5 \times 3.4) = 104.2 \text{ A}$$

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Selection

## GV2 and GV3 Selection

Table 47: GV2 Manual Motor Controller and Protector Horsepower Ratings

| Catalog Number         |               | Thermal Trip<br>Setting Range<br>(A) | Maximum Horsepower Ratings |       |       |       |       |       |                      |
|------------------------|---------------|--------------------------------------|----------------------------|-------|-------|-------|-------|-------|----------------------|
| Push Button            | Rotary Handle |                                      | 1 Ø                        |       |       | 3 Ø   |       |       |                      |
| GV2ME <sup>[1]</sup>   | GV2P          |                                      | 120 V                      | 208 V | 240 V | 208 V | 240 V | 480 V | 600 V <sup>[2]</sup> |
| GV2ME01                | GV2P01        | 0.11–0.16                            | —                          | —     | —     | —     | —     | —     | —                    |
| GV2ME02                | GV2P02        | 0.016–0.25                           | —                          | —     | —     | —     | —     | —     | —                    |
| GV2ME03                | GV2P03        | 0.25–0.40                            | —                          | —     | —     | —     | —     | —     | —                    |
| GV2ME04                | GV2P04        | 0.40–0.63                            | —                          | —     | —     | —     | —     | —     | —                    |
| GV2ME05                | GV2P05        | 0.63–1                               | —                          | —     | —     | —     | —     | —     | —                    |
| GV2ME06                | GV2P06        | 1–1.6                                | —                          | —     | 0.1   | —     | —     | 0.75  | 0.75                 |
| GV2ME07                | GV2P07        | 1.6–2.5                              | —                          | 0.16  | 0.16  | 0.5   | 0.5   | 1     | 1.5                  |
| GV2ME08                | GV2P08        | 2.5–4                                | 0.125                      | 0.25  | 0.33  | 0.75  | 0.75  | 2     | 3                    |
| GV2ME10                | GV2P10        | 4–6.3                                | 0.25                       | 0.5   | 0.5   | 1     | 1.5   | 3     | 5                    |
| GV2ME14                | GV2P14        | 6–10                                 | 0.5                        | 1     | 1.5   | 2     | 3     | 5     | 7.5                  |
| GV2ME16                | GV2P16        | 9–14                                 | 0.75                       | 2     | 2     | 3     | 3     | 10    | 10                   |
| GV2ME20                | GV2P20        | 13–18                                | 1                          | 2     | 3     | 5     | 5     | 10    | 15                   |
| GV2ME21                | GV2P21        | 17–23                                | 1.5                        | 3     | 3     | 5     | 7.5   | 15    | 20                   |
| GV2ME22                | GV2P22        | 20–25                                | 2                          | 3     | —     | 7.5   | —     | 15    | 20                   |
| GV2ME32 <sup>[3]</sup> | GV2P32        | 24–32                                | 2                          | 5     | 5     | 7.5   | 10    | 20    | 25                   |

<sup>1</sup> For spring terminals, add the numeral 3 to the end of the catalog number. Example: GV2ME013.

<sup>2</sup> GV2P•• is not Type E or Type F.

<sup>3</sup> GV2ME32 is not available with spring terminals.



File E164864  
CCN NLRV



File LR 81630  
Class 3211 05

Table 48: GV3P Manual Motor Controller and Protector Horsepower Ratings

| Catalog Number | Thermal Trip Setting Range (A) | Maximum Horsepower Ratings |       |       |       |       |       |
|----------------|--------------------------------|----------------------------|-------|-------|-------|-------|-------|
|                |                                | 1 Ø                        |       | 3 Ø   |       |       |       |
|                |                                | 120 V                      | 240 V | 208 V | 240 V | 480 V | 600 V |
| GV3P13         | 9–13                           | 0.5                        | 1.5   | 3     | 3     | 7.5   | 10    |
| GV3P18         | 12–18                          | 0.75                       | 2     | 3     | 5     | 7.5   | 10    |
| GV3P25         | 17–25                          | 1.5                        | 3     | 5     | 7.5   | 15    | 20    |
| GV3P32         | 23–32                          | 2                          | 3     | 7.5   | 7.5   | 20    | 25    |
| GV3P40         | 30–40                          | 3                          | 5     | 10    | 10    | 25    | 30    |
| GV3P50         | 37–50                          | 3                          | 7.5   | 10    | 10    | 30    | 40    |
| GV3P65         | 48–65                          | 3                          | 10    | 15    | 15    | 40    | 50    |



GV2ME



GV2ME••3



GV2P



GV3P

**NOTE:** For GV2 and GV3 accessories and enclosures, see pages 40–47.

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Selection

## GV7 Selection



Standard manual controllers and protectors include terminal and device mounting hardware. Cable clamps and accessories are listed on page 49.

**Table 49: GV7R••• Manual Motor Controller and Protector Horsepower Ratings**

| Thermal Trip<br>Setting Range<br>(A) | IEC Breaking<br>Capacity at<br>415 V <sup>[1]</sup> | Maximum Horsepower Ratings<br>3 Ø |       |       | Catalog<br>Number | Weight,<br>lb (kg) |
|--------------------------------------|-----------------------------------------------------|-----------------------------------|-------|-------|-------------------|--------------------|
|                                      |                                                     | 230 V                             | 460 V | 575 V |                   |                    |
| 12–20                                | 25 kA                                               | 5                                 | 10    | 15    | GV7RE20           | 4.43 (2.01)        |
| 15–25                                |                                                     | 7.5                               | 15    | 20    | GV7RE25           |                    |
| 25–40                                |                                                     | 10                                | 30    | 30    | GV7RE40           |                    |
| 30–50                                |                                                     | 15                                | 30    | 40    | GV7RE50           | 4.44 (2.02)        |
| 48–80                                |                                                     | 30                                | 60    | 75    | GV7RE80           | 4.50 (2.04)        |
| 60–100                               |                                                     | 30                                | 75    | 100   | GV7RE100          |                    |
| 90–150                               | 35 kA                                               | 50                                | 100   | 150   | GV7RE150          | 4.45 (2.02)        |
| 132–220                              |                                                     | 75                                | 150   | 200   | GV7RE220          | 5.20 (2.35)        |
| 12–20                                | 65 kA                                               | 5                                 | 10    | 15    | GV7RS20           | 4.43 (2.01)        |
| 15–25                                |                                                     | 7.5                               | 15    | 20    | GV7RS25           |                    |
| 25–40                                |                                                     | 10                                | 30    | 30    | GV7RS40           |                    |
| 30–50                                |                                                     | 15                                | 30    | 40    | GV7RS50           | 4.44 (2.02)        |
| 48–80                                |                                                     | 30                                | 60    | 75    | GV7RS80           | 4.50 (2.04)        |
| 60–100                               |                                                     | 30                                | 75    | 100   | GV7RS100          |                    |
| 90–150                               |                                                     | 50                                | 100   | 150   | GV7RS150          | 4.45 (2.02)        |
| 132–220                              |                                                     | 75                                | 150   | 200   | GV7RS220          | 5.20 (2.35)        |

<sup>1</sup> Refer to Table 31 on page 28 for ratings at other voltages.

GV2 and GV3 Accessories

Figure 1: GV2 Accessories

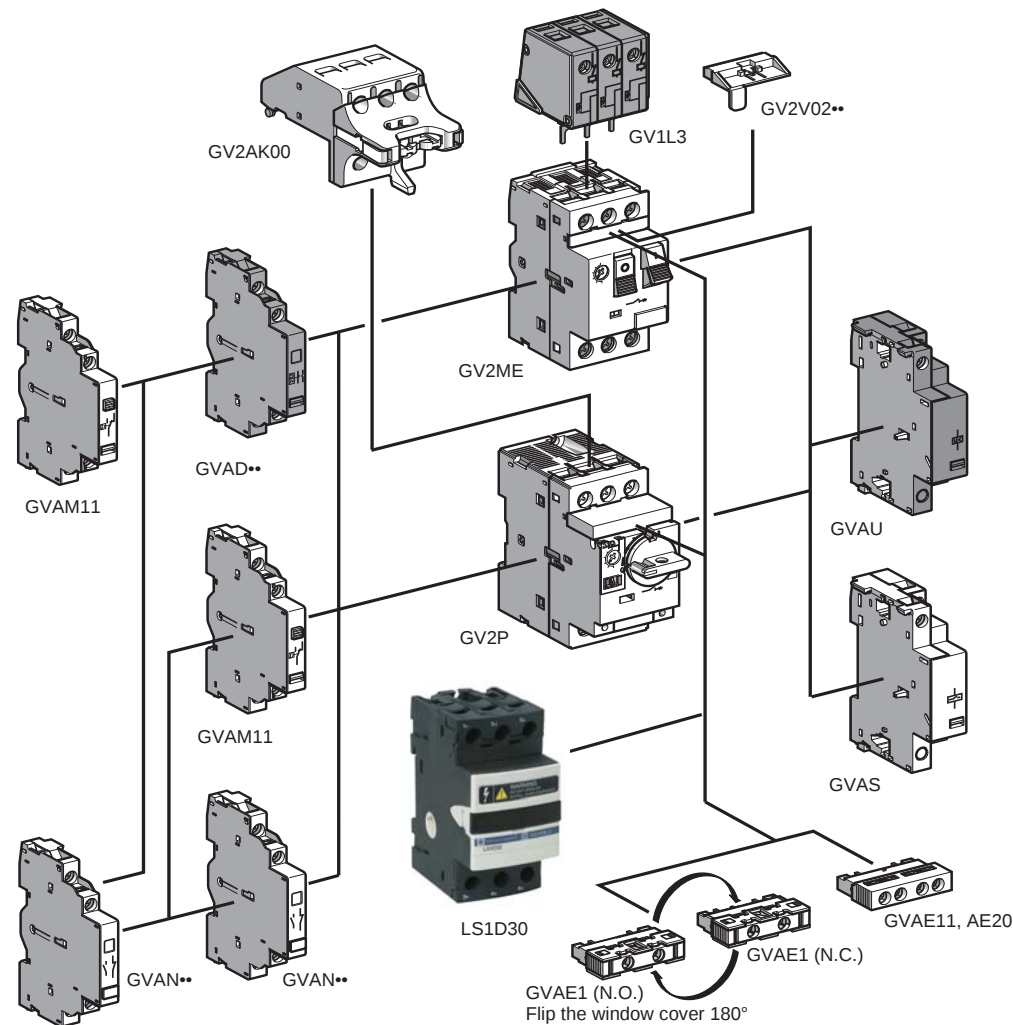


Table 50: GV2 and GV3 Auxiliary Contact Blocks

| Description                                                 | Mounting Location        | Max. No. of Blocks | Contact Type                | Sold in Lots of | Catalog Number               | Weight lb (kg) |
|-------------------------------------------------------------|--------------------------|--------------------|-----------------------------|-----------------|------------------------------|----------------|
| Instantaneous auxiliary contacts                            | Front <sup>[1]</sup>     | 1                  | N.O. or N.C. <sup>[2]</sup> | 1               | <b>GVAE1</b>                 | 0.03 (0.015)   |
|                                                             |                          |                    | N.O. + N.C.                 | 1               | <b>GVAE11</b> <sup>[3]</sup> | 0.04 (0.02)    |
|                                                             |                          |                    | N.O. + N.O.                 | 1               | <b>GVAE20</b> <sup>[3]</sup> | 0.04 (0.02)    |
|                                                             | Left side                | 2                  | N.O. + N.C.                 | 1               | <b>GVAN11</b> <sup>[3]</sup> | 0.11 (0.05)    |
| Fault signaling contact and instantaneous auxiliary contact | Left side <sup>[4]</sup> | 1                  | N.O. (fault) + N.O.         | 1               | <b>GVAD1010</b>              | 0.12 (0.06)    |
|                                                             |                          |                    | N.O. (fault) + N.C.         | 1               | <b>GVAD1001</b>              |                |
|                                                             |                          |                    | N.C. (fault) + N.O.         | 1               | <b>GVAD0110</b>              |                |
|                                                             |                          |                    | N.C. (fault) + N.C.         | 1               | <b>GVAD0101</b>              |                |
| Short-circuit signaling contact                             | Left side                | 1                  | SPDT                        | 1               | <b>GV2AM11</b>               | 0.10 (0.04)    |

<sup>1</sup> Mounting of a **GVAE** contact block or a **GV2AK00** visible isolation block on **GV2P**.  
<sup>2</sup> Field convertible for N.C. or N.O. contact operation, depending on the direction in which the reversible block is mounted; flip the window cover 180° to change from N.O. to N.C. or vice versa.  
<sup>3</sup> For spring terminals, add the numeral 3 to the end of the catalog number. Example: GV2ME013.  
<sup>4</sup> The **GVAD** contact block is always mounted next to the circuit protector.

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Selection

Figure 2: GV3 Accessories

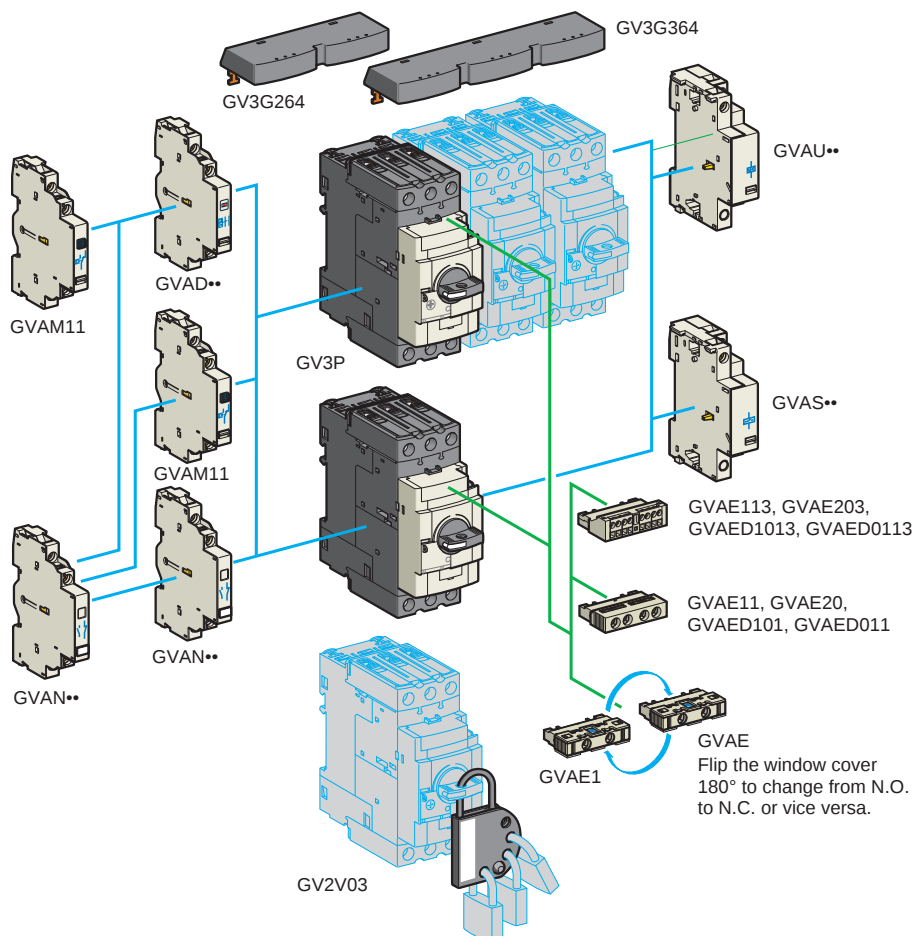


Table 51: GV3 Auxiliary Contact Blocks

| Description                                               | Mounting Location        | Max. No. of Blocks | Contact Type                | Sold in Lots of   | Catalog Number          | Weight lb (kg) |
|-----------------------------------------------------------|--------------------------|--------------------|-----------------------------|-------------------|-------------------------|----------------|
| Instantaneous auxiliary contacts                          | Front <sup>[1]</sup>     | 1                  | N.O. or N.C. <sup>[2]</sup> | 10 <sup>[3]</sup> | GVAE1                   | 0.03 (0.015)   |
|                                                           |                          |                    | N.O. + N.C.                 | 10                | GVAE11 <sup>[4]</sup>   | 0.04 (0.02)    |
|                                                           |                          |                    | N.O. + N.O.                 | 10 <sup>[3]</sup> | GVAE20 <sup>[4]</sup>   |                |
|                                                           | Left side                | 2                  | N.O. + N.C.                 | 1                 | GVAN11 <sup>[4]</sup>   | 0.11 (0.05)    |
|                                                           |                          |                    | N.O. + N.O.                 | 1                 | GVAN20 <sup>[4]</sup>   |                |
| Fault signaling contact + instantaneous auxiliary contact | Front                    | 1                  | N.O. (fault)                | + N.O. 1          | GVAED101 <sup>[4]</sup> | 0.12 (0.06)    |
|                                                           |                          |                    |                             | + N.C. 1          | GVAED011 <sup>[4]</sup> |                |
|                                                           | Left side <sup>[3]</sup> | 1                  | N.O. (fault)                | + N.O. 1          | GVAD1010                |                |
|                                                           |                          |                    |                             | + N.C. 1          | GVAD1001                |                |
|                                                           |                          |                    | N.C. (fault)                | + N.O. 1          | GVAD0110                |                |
|                                                           |                          |                    |                             | + N.C. 1          | GVAD0101                |                |
| Short-circuit signaling contact                           | Left side                | 1                  | C/O common point            | 1                 | GVAM11                  | 0.10 (0.04)    |

<sup>1</sup> Mounting of a GVAE contact block or a GV2AK00 visible isolation block on GV2P.

<sup>2</sup> Field convertible for N.C. or N.O. contact operation, depending on the direction in which the reversible block is mounted; flip the window cover 180° to change from N.O. to N.C. or vice versa.

<sup>3</sup> The GVAD contact block is always mounted next to the circuit protector.

<sup>4</sup> For spring terminals, add the numeral 3 to the end of the catalog number. Example: GV2ME013.

## GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Selection

**Table 52: Electrical Trip Units**

| Description                                                               | Voltage | Hz | Catalog No. <sup>[1]</sup> | Weight, lb (kg) |
|---------------------------------------------------------------------------|---------|----|----------------------------|-----------------|
| Undervoltage or shunt trip units                                          |         |    |                            |                 |
| Side<br>1 block on right<br>of GV2 or GV3 controllers                     | 24      | 50 | GVA•025                    | 0.23 (0.105)    |
|                                                                           |         | 60 | GVA•026                    |                 |
|                                                                           | 48      | 50 | GVA•055                    |                 |
|                                                                           |         | 60 | GVA•056                    |                 |
|                                                                           | 100     | 50 | GVA•107                    |                 |
|                                                                           | 100–110 | 60 | GVA•107                    |                 |
|                                                                           | 110–115 | 50 | GVA•115                    |                 |
|                                                                           |         | 60 | GVA•116                    |                 |
|                                                                           | 120–127 | 50 | GVA•125                    |                 |
|                                                                           | 127     | 60 | GVA•115                    |                 |
|                                                                           | 200     | 50 | GVA•207                    |                 |
|                                                                           | 200–220 | 60 | GVA•207                    |                 |
|                                                                           | 220–240 | 50 | GVA•225                    |                 |
|                                                                           |         | 60 | GVA•226                    |                 |
|                                                                           | 380–400 | 50 | GVA•385                    |                 |
|                                                                           |         | 60 | GVA•386                    |                 |
|                                                                           | 415–440 | 50 | GVA•415                    |                 |
|                                                                           | 415     | 60 | GVA•416                    |                 |
|                                                                           | 440     | 60 | GVA•385                    |                 |
|                                                                           | 480     | 60 | GVA•415                    |                 |
|                                                                           | 500     | 50 | GVA•505                    |                 |
|                                                                           | 600     | 60 | GVA•505                    |                 |
| Undervoltage trip unit, conforming to INRS (can only be mounted on GV2ME) |         |    |                            |                 |
| Safety device for dangerous machines, conforming to INRS and VDE 0113     |         |    |                            |                 |
| Side<br>1 block on right<br>GV2ME controllers                             | 110–115 | 50 | GVAX115                    | 0.24 (0.11)     |
|                                                                           |         | 60 | GVAX116                    |                 |
|                                                                           | 127     | 60 | GVAX115                    |                 |
|                                                                           | 220–240 | 50 | GVAX225                    |                 |
|                                                                           |         | 60 | GVAX226                    |                 |
|                                                                           | 380–400 | 50 | GVAX385                    |                 |
|                                                                           |         | 60 | GVAX386                    |                 |
|                                                                           | 415–440 | 50 | GVAX415                    |                 |
|                                                                           | 440     | 60 | GVAX385                    |                 |

- <sup>1</sup> To order an undervoltage trip unit: replace the bullet (•) with a **U**, for example: **GVAU025**.  
To order a shunt trip unit: replace the bullet (•) with an **S**, for example: **GVAS025**.

**Table 53: Add-on Contact Blocks**

| Description                                   | Mounting Location       | Max. No. of Blocks | Catalog No. | Weight, lb (kg) |
|-----------------------------------------------|-------------------------|--------------------|-------------|-----------------|
| <b>Visible isolation block</b> <sup>[1]</sup> | Front <sup>[2]</sup>    | 1                  | GV2AK00     | 0.33 (0.150)    |
| <b>Limiters</b>                               | At top (GV2ME and GV2P) | 1                  | GV1L3       | 0.29 (0.130)    |
|                                               | Independent             | 1                  | LA9LB920    | 0.70 (0.320)    |

- <sup>1</sup> Provides visible isolation of the 3 poles upstream of the **GV2P** controller.

- <sup>2</sup> The mounting location of a **GV2AK00** visible isolation block on a **GV2P** controller (refer to Figure 1 on page 40).

**Table 54: Fuse Holder, 30 A Maximum**

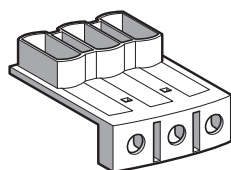
| For Use In       | Terminal Description | For Fuse Type                       | Sold in Lots of | Catalog Number | Weight, lb (kg) |
|------------------|----------------------|-------------------------------------|-----------------|----------------|-----------------|
| US Markets       | Screw clamp, 3-pole  | CC, KTK-R 0.41 x 1.5 (10.3 x 38 mm) | 1               | LS1D30         | 0.23 (0.50)     |
|                  | Spring, 3-pole       | CC, KTK-R 0.41 x 1.5 (10.3 x 38 mm) | 1               | LS1D303        |                 |
| European Markets | Screw clamp, 3-pole  | aM, gG 0.39 x 1.5 (10 x 38 mm)      | 1               | LS1D32         |                 |
|                  | Spring, 3-pole       | aM, gG 0.39 x 1.5 (10 x 38 mm)      | 1               | LS1D323        |                 |

## GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Selection

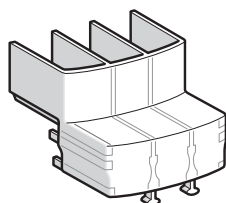
**Table 55: Accessories for GV3P**

| Description                                                                             |           | For Manual Motor Controllers              | Catalog Number         | Weight lb (kg) |
|-----------------------------------------------------------------------------------------|-----------|-------------------------------------------|------------------------|----------------|
| 3-pole, 115 A busbars<br>Pitch 64 mm                                                    | 2 tap-off | GV3P..                                    | GV3G264 <sup>[1]</sup> | 0.33 (0.15)    |
|                                                                                         | 3 tap-off | GV3P..                                    | GV3G364 <sup>[1]</sup> | 0.55 (0.25)    |
| Cover, large spacing, UL 508 Type E<br>(only one cover is required on the supply side)  |           | GV3P..                                    | GV3G66 <sup>[1]</sup>  | 0.44 (0.02)    |
| IP20 cover (two covers are required for each manual starter and protector)              |           | GV3P..6                                   | LAD96570               | 0.46 (0.021)   |
| IP20 cover for use when mounted with circuit breakers                                   |           | GV3P..6                                   | LAD96575               | 0.22 (0.01)    |
| Padlocking device, for use with up to 4 padlocks (not supplied)<br>Maximum shank Ø 6 mm |           | GV3P..<br>GV3P..6                         | GV2V03                 | 0.20 (0.09)    |
| Retrofit plate for screw mounting                                                       |           | To replace GV3ME with<br>GV3P.. or GV2P.. | LAD7X3                 | 0.33 (0.15)    |

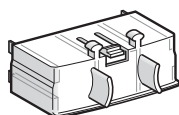
<sup>1</sup> If the **GV3G66** add-on line terminal shroud is installed, the **GV3G** busbars cannot be installed.



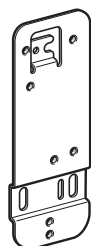
**GV3G66**



**LAD96570**



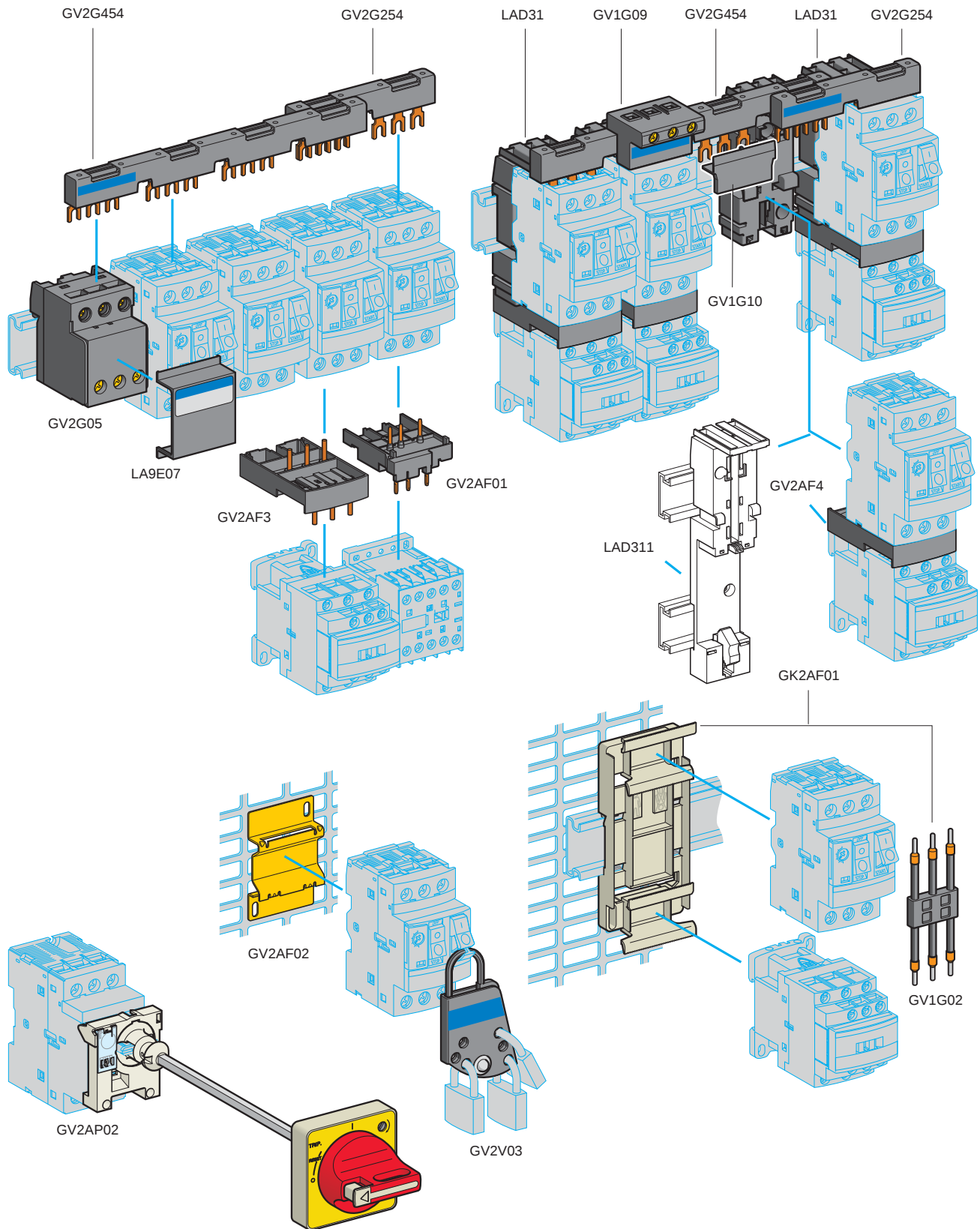
**LAD96575**



**LAD7X3**

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Selection

Figure 3: GV2 Accessories



# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Selection

**Table 56: GV2 Accessories**



**GV2GH7**



**LAD31**



**LAD311**



**GV2AF3 / GV2AF4**

## Busbars

| Description                  | No. of GV Starters | No. of Side-Mounted Auxiliary Blocks on Each GV Starter | Busbar Pitch (mm) | Sold in Lots of | Catalog Number | Weight, lb (kg) |
|------------------------------|--------------------|---------------------------------------------------------|-------------------|-----------------|----------------|-----------------|
| Sets of 3-pole, 63 A busbars | 2                  | none                                                    | 45                | 1               | <b>GV2G245</b> | 0.08 (0.036)    |
|                              |                    | 1 GV2AN, AM, AD                                         | 54                | 1               | <b>GV2G254</b> | 0.084 (0.038)   |
|                              |                    | 1 or 2 GV2AN, AM, AD; or 1 GV2AS, AU                    | 72                | 1               | <b>GV2G272</b> | 0.09 (0.042)    |
|                              | 3                  | None                                                    | 45                | 1               | <b>GV2G345</b> | 0.12 (0.058)    |
|                              |                    | 1 GV2AN, AM, AD                                         | 54                | 1               | <b>GV2G354</b> | 0.13 (0.060)    |
|                              | 4                  | None                                                    | 45                | 1               | <b>GV2G445</b> | 0.17 (0.077)    |
|                              |                    | 1 GV2AN, AM, AD                                         | 54                | 1               | <b>GV2G454</b> | 0.19 (0.085)    |
|                              |                    | 1 or 2 GV2AN, AM, AD; or 1 GV2AS, AU                    | 72                | 1               | <b>GV2G472</b> | 0.21 (0.094)    |
|                              | 5                  | 1 GV2AN, AM, AD                                         | 54                | 1               | <b>GV2G554</b> | 0.22 (0.100)    |

## Additional GV2 Wiring Accessories

| Description                                                 | Application                                                                         | Sold in Lots of | Catalog Number | Weight, lb (kg) |
|-------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------|----------------|-----------------|
| Protective end cover                                        | For unused busbar outlets                                                           | 5               | <b>GV1G10</b>  | 0.01 (0.005)    |
| Terminal blocks for supply to one or more GV2G+ busbar sets | Connects from the top                                                               | 1               | <b>GV1G09</b>  | 0.09 (0.040)    |
|                                                             | Connects from the bottom. The connector can be fitted with a GV1L3 current limiter. | 1               | <b>GV2G05</b>  | 0.25 (0.115)    |
| Cover for terminal block                                    | For mounting in modular panels                                                      | 10              | <b>LA9E07</b>  | 0.01 (0.005)    |
| Flexible 3-pole connector                                   | For connecting a GV2 / LS1D30 to an LC1D09–D25 AC contactor                         | 10              | <b>GV1G02</b>  | 0.03 (0.013)    |
| Clip-in marker holders (provided with each motor starter)   | For GV2P, 0.31 x 0.87 in. (8 x 22 mm)                                               | 100             | <b>LA9D92</b>  | 0.02 (0.001)    |
| Incoming line insulator                                     | For GV2P when used in UL 508 Type E applications                                    | 10              | <b>GV2GH7</b>  | 0.09 (0.040)    |

## GV2 Mounting Accessories

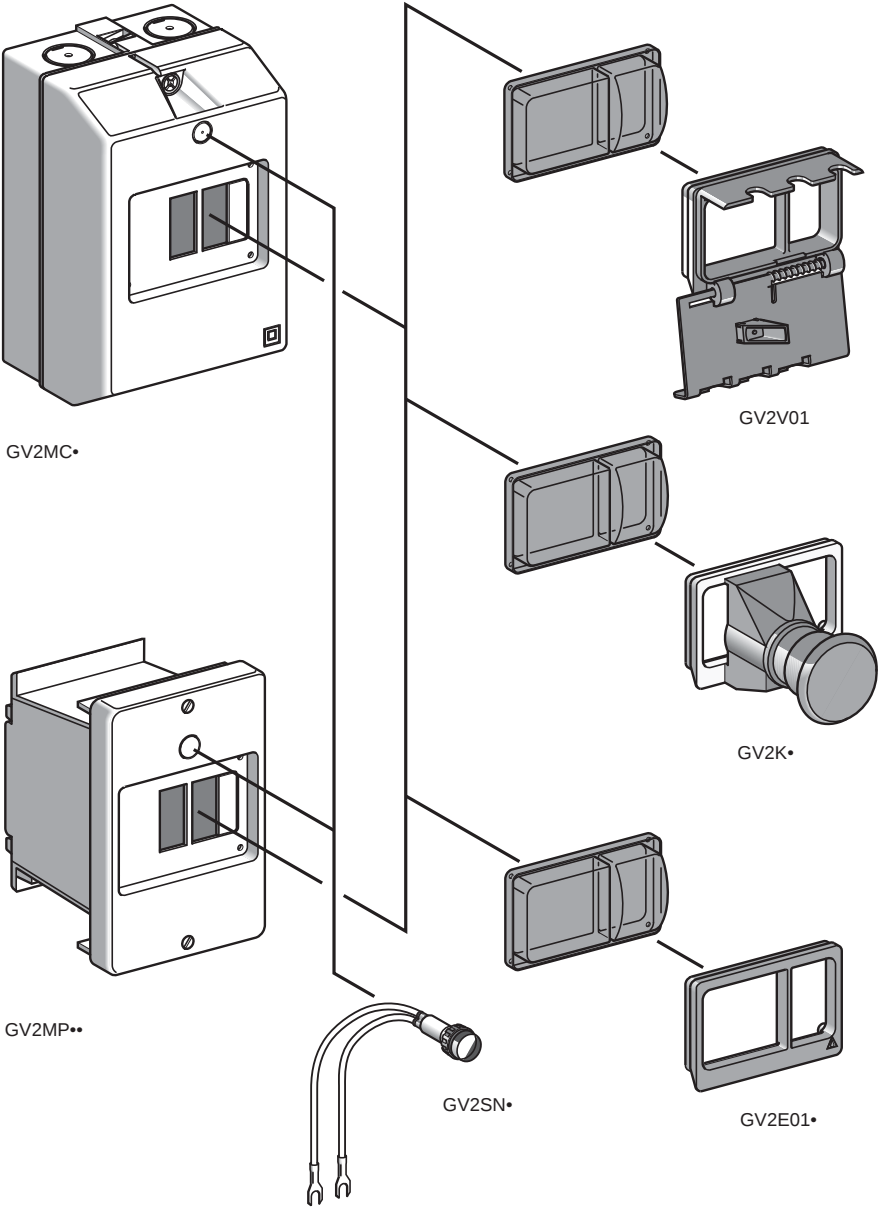
| Description                      | Application                                                                                                      | Sold in Lots of | Catalog Number | Weight, lb (kg) |
|----------------------------------|------------------------------------------------------------------------------------------------------------------|-----------------|----------------|-----------------|
| Motor starter adapter plate      | With a 3-pole connector for mounting a GV2 controller to an LC1D09–D25 contactor                                 | 10              | <b>GK2AF01</b> | 0.26 (0.120)    |
| Adapter plate                    | For screw mounting a GV2ME controller or an LS1D30 fuse holder                                                   | 10              | <b>GV2AF02</b> | 0.05 (0.021)    |
|                                  | For mounting a GV2ME or GV2P controller to an LC1D09–LC1D32 contactor with front faces aligned                   | 1               | <b>LAD31</b>   | 0.09 (0.040)    |
| Mounting bracket                 | For mounting a GV2ME or GV2P controller to an LC1D09–D38 contactor on a common base using 2 DIN rails            | 1               | <b>LAD311</b>  | 0.09 (0.040)    |
| 7.5 mm height compensation plate | For mounting a GV2ME or GV2P controller on a common busbar                                                       | 10              | <b>GV1F03</b>  | 0.007 (0.003)   |
| Combination block                | Between a GV2ME controller or an LS1D30 fuse holder and a LC1K or LP1K contactor                                 | 10              | <b>GV2AF01</b> | 0.04 (0.021)    |
|                                  | Between a GV2 controller or an LS1D30 fuse holder and a LC1D09–D38 contactor                                     | 10              | <b>GV2AF3</b>  | 0.03 (0.016)    |
|                                  | Between a GV2 controller or an LS1D30 fuse holder mounted on an LAD31 mounting plate and an LC1D09–D38 contactor | 10              | <b>GV2AF4</b>  | 0.03 (0.016)    |

## GV2 Padlocking Options

| Description                          |                                                                                                 | Catalog Number | Weight, lb (kg) |
|--------------------------------------|-------------------------------------------------------------------------------------------------|----------------|-----------------|
| <b>Padlockable External Operator</b> | Black handle, blue legend plate IP54                                                            | <b>GV2AP01</b> | 0.44 (0.200)    |
|                                      | For GV2P controllers 6.0–11.4 in. (150–290 mm)<br>Red handle, yellow legend plate IP54          | <b>GV2AP02</b> |                 |
| <b>Padlocking Device</b>             | Accommodates up to 6 padlocks (not supplied)<br>For all GV2 controllers<br>Maximum shank Ø 6 mm | <b>GV2V03</b>  | 0.20 (0.092)    |

GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors  
Selection

Figure 4: GV2M Enclosures



## GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Selection

**Table 57: GV2ME Enclosures**

| Application                                                                                                                                                                                                                           | Type                                                                | Degree of Protection of Enclosure   | Catalog Number | Weight, lb (kg) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------|----------------|-----------------|
| For GV2ME manual starters and protectors, with or without accessories<br><b>GV2MC, GV2MP01, and GV2MP02:</b><br>Maximum of 1 accessory on the right and 1 on the left<br><b>GV2MP03 and GV2MP04:</b><br>1 accessory on the right only | Surface mounting, double insulated with protective (sealable) cover | IP41                                | <b>GV2MC01</b> | 0.64 (0.290)    |
|                                                                                                                                                                                                                                       |                                                                     | IP55                                | <b>GV2MC02</b> | 0.66 (0.300)    |
|                                                                                                                                                                                                                                       |                                                                     | IP55 for temperature < 5 °C (41 °F) | <b>GV2MC03</b> |                 |
|                                                                                                                                                                                                                                       | Flush, with protective cover                                        | IP41 (full size) mounting           | <b>GV2MP01</b> | 0.25 (0.115)    |
|                                                                                                                                                                                                                                       |                                                                     | IP41 (reduced size)                 | <b>GV2MP03</b> | 0.29 (0.130)    |
|                                                                                                                                                                                                                                       |                                                                     | IP55 (full size)                    | <b>GV2MP02</b> |                 |
|                                                                                                                                                                                                                                       |                                                                     | IP55 (reduced size)                 | <b>GV2MP04</b> |                 |

**Table 58: GV2M Front Plate**

| Application                                                                                          |                                 | Sold in Lots of                     | Catalog Number | Weight, lb (kg) |
|------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------------|----------------|-----------------|
| Padlocking device <sup>[1]</sup> for GV2M operator (padlocking is possible only in the Off position) |                                 | 1                                   | <b>GV2V01</b>  | 0.17 (0.075)    |
| Stop push button, mushroom head <sup>[1]</sup><br>Ø 40 mm, red                                       | Spring return                   | 1                                   | <b>GV2K011</b> | 0.11 (0.052)    |
|                                                                                                      | Latching                        | Key release (key #455)              | 1              | <b>GV2K021</b>  |
|                                                                                                      |                                 | Turn to release                     | 1              | <b>GV2K031</b>  |
|                                                                                                      | Latching/padlockable            | Turn to release                     | 1              | <b>GV2K04</b>   |
| Sealing kit                                                                                          | For enclosures and front plates | IP55                                | 10             | <b>GV2E01</b>   |
|                                                                                                      |                                 | IP55 for temperature < 5 °C (41 °F) | 10             | <b>GV2E02</b>   |
| Neutral link                                                                                         |                                 | 10                                  | <b>GV2N01</b>  | 0.07 (0.030)    |

| Description                         | Voltage   | Color  | Sold in Lots of | Catalog Number | Weight, lb (kg) |
|-------------------------------------|-----------|--------|-----------------|----------------|-----------------|
| Neon indicator light <sup>[2]</sup> | 110 V     | Green  | 10              | <b>GV2SN13</b> | 0.02 (0.01)     |
|                                     |           | Red    | 10              | <b>GV2SN14</b> |                 |
|                                     |           | Orange | 10              | <b>GV2SN15</b> |                 |
|                                     | 220/240 V | Green  | 10              | <b>GV2SN23</b> |                 |
|                                     |           | Red    | 10              | <b>GV2SN24</b> |                 |
|                                     |           | Orange | 10              | <b>GV2SN25</b> |                 |
|                                     | 380/440 V | Green  | 10              | <b>GV2SN33</b> |                 |
|                                     |           | Red    | 10              | <b>GV2SN34</b> |                 |
|                                     |           | Orange | 10              | <b>GV2SN35</b> |                 |

<sup>1</sup> Includes the IP55 sealing kit.

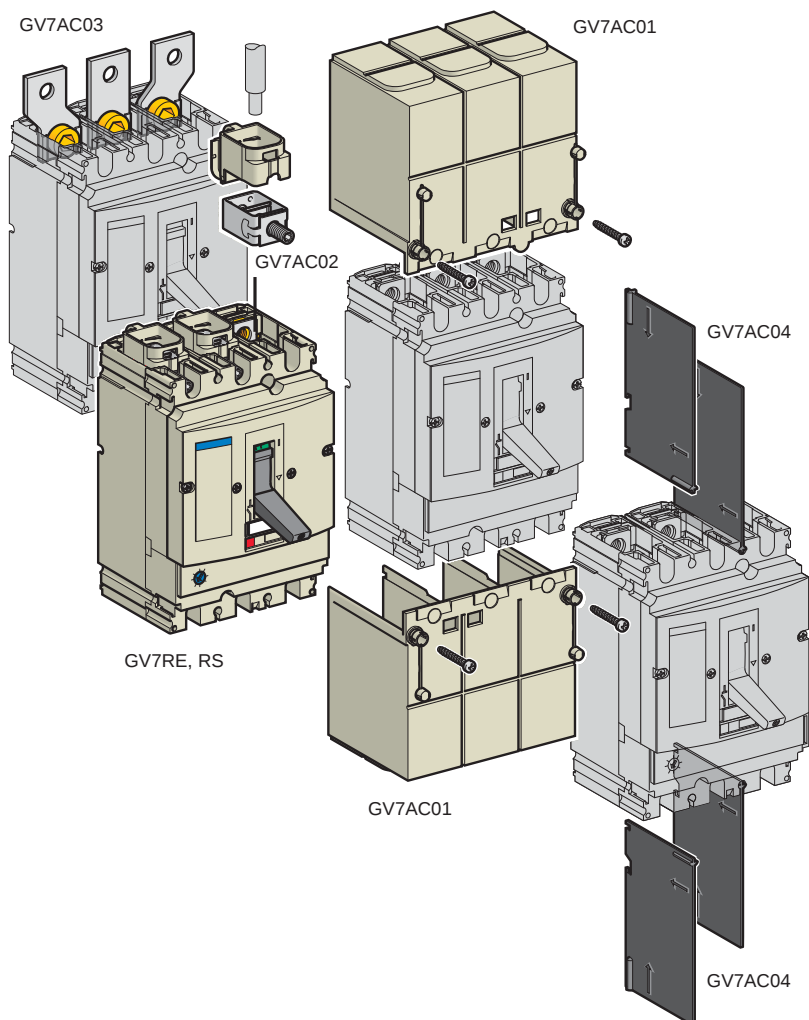
<sup>2</sup> Leads are approximately 9.5 in. (260 mm).

## GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Selection

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Selection

## GV7 Accessories

Standard manual controllers and protectors include terminal- and device-mounting hardware. Select cable clamps and accessories from Table 59.



**Table 59: Cabling Accessories**

| Description                          | Application                                                                                                                      | Sold in Lots of | For Contactor    | Catalog Number | Weight, lb (kg) |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|----------------|-----------------|
| Box lugs                             | GV7R•40 through GV7R•150: 14–3/0 AWG (1.5–95 mm <sup>2</sup> )                                                                   | 3               | —                | GV7AC021       | 0.66 (0.300)    |
|                                      | GV7R•220: 14 AWG–350 mcm (1.5–185 mm <sup>2</sup> )                                                                              | 3               | —                | GV7AC022       | 0.77 (0.350)    |
| Phase Barriers, Busbars, and Shrouds |                                                                                                                                  |                 |                  |                |                 |
| Terminal extension kit               | Increases the centerline distance between phases to 45 mm                                                                        | 3               | —                | GV7AC03        | 0.40 (0.180)    |
| Terminal shroud kit <sup>[1]</sup>   | Covers the terminal connections; is finger safe per IEC 60529                                                                    | 1               | —                | GV7AC01        | 0.28 (0.125)    |
| Phase barriers <sup>[1]</sup>        | Provides maximum phase separation at the connection points                                                                       | 2               | —                | GV7AC04        | 0.17 (0.075)    |
| Insulating barriers                  | Provides insulation between the connections and the backplate                                                                    | 2               | —                | GV7AC05        |                 |
| Busbars and covers <sup>[2]</sup>    | Provides a direct link between the GV7 manual motor starter and the contactor. The cover protects against direct finger contact. |                 |                  |                |                 |
|                                      | Connect to LC1F115–185 contactor                                                                                                 | 1               | LC1F115 to F185  | GV7AC06        | 1.21 (0.550)    |
|                                      | Connect to LC1F225–265 contactor                                                                                                 | 1               | LC1F225 and F265 | GV7AC07        |                 |
|                                      | Connect to LC1D115–150 contactor                                                                                                 | 1               | LC1D115 and D150 | GV7AC08        |                 |

<sup>1</sup> Terminal shields cannot be used together with phase barriers.

<sup>2</sup> The kit contains links, a protective shield, and an adjustable-depth metal bracket for the protector.

GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors  
Selection

Auxiliary Contacts

Auxiliary contacts remotely indicate the state of the contacts in the starter. The auxiliary contacts can be used for signaling, electrical locking, or relaying. Standard and low-level versions are available. The auxiliary contacts include a terminal block. A hole is provided for wiring exit.

An auxiliary contact can perform any of the functions listed in Table 60, depending on where the contact is located in the starter.

Figure 5: Auxiliary Contact Locations

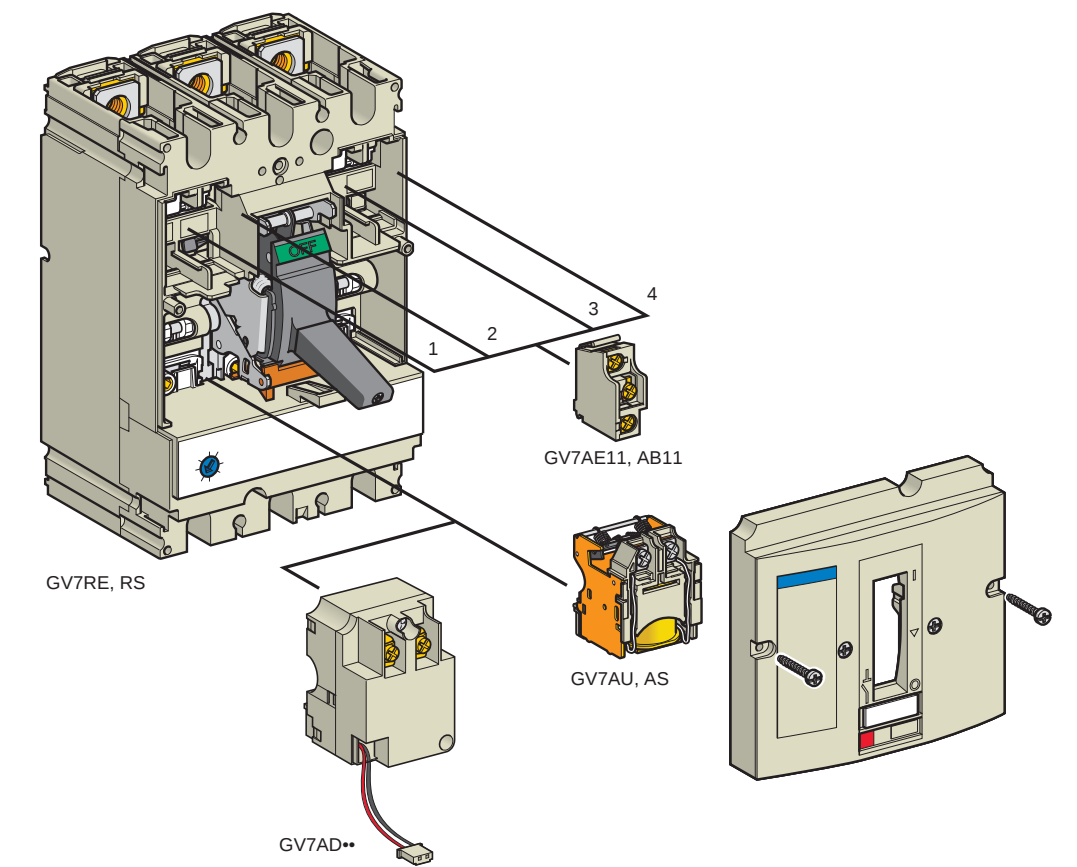


Table 60: Auxiliary Contact Location and Function

| Location | Function                   | Application                                                                                                                                                                                                                                                                |
|----------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | N.O./N.C. contact          | Indicates the position of the starter poles.                                                                                                                                                                                                                               |
| 2        | Trip indicator             | Indicates that the starter has tripped due to an overload, short circuit, differential fault condition, the operation of a voltage release (undervoltage or shunt release), or from pressing the push-to-trip button. The trip indicator resets when the starter is reset. |
| 3        | Electrical fault indicator | Indicates that the starter has tripped due to an overload, short circuit, or differential fault. The electrical fault indicator resets when the starter is reset.                                                                                                          |
| 4        | N.O./N.C. contact          | Indicates the position of the starter poles.                                                                                                                                                                                                                               |

Table 61: Auxiliary Contacts

| Type      | Voltage | Catalog Number | Weight, lb (kg) |
|-----------|---------|----------------|-----------------|
| Standard  | —       | GV7AE11        | 0.03 (0.015)    |
| Low level | —       | GV7AB11        |                 |

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Selection

## Magnetic Fault Indicators

The magnetic fault indicator does one of the following:

- differentiates a thermal fault from a magnetic fault
- opens the contactor only in the event of a thermal fault (see page 50)

**Table 62: Magnetic Fault Indicators**

| Voltage               | Catalog Number | Weight, lb (kg) |
|-----------------------|----------------|-----------------|
| 24–48 Vac / 24–72 Vdc | GV7AD111       | 0.22 (0.100)    |
| 110–240 Vac/Vdc       | GV7AD112       |                 |

## Undervoltage Trip Units, GV7AU

The undervoltage trip opens the motor starter when the control voltage drops below the trip threshold of 0.35–0.7 times the rated voltage. The starter contacts close again when the control voltage rises above 0.85 times the rated voltage. The GV7AU undervoltage trip unit meets the requirements of IEC 60947-2. For the location of the undervoltage trip unit, see Figure 5 on page 50.

## Shunt Trip Units, GV7AS

The shunt trip opens the motor starter when the control voltage rises above 0.7 times the rated voltage. For location of the shunt trip unit, see Figure 5 on page 50.

## Trip Unit Operation, GV7AU or GV7AS

When the motor starter has been tripped by a GV7AU or AS trip unit, it must be reset either locally or by remote control. For information on remote control, consult your local sales office.

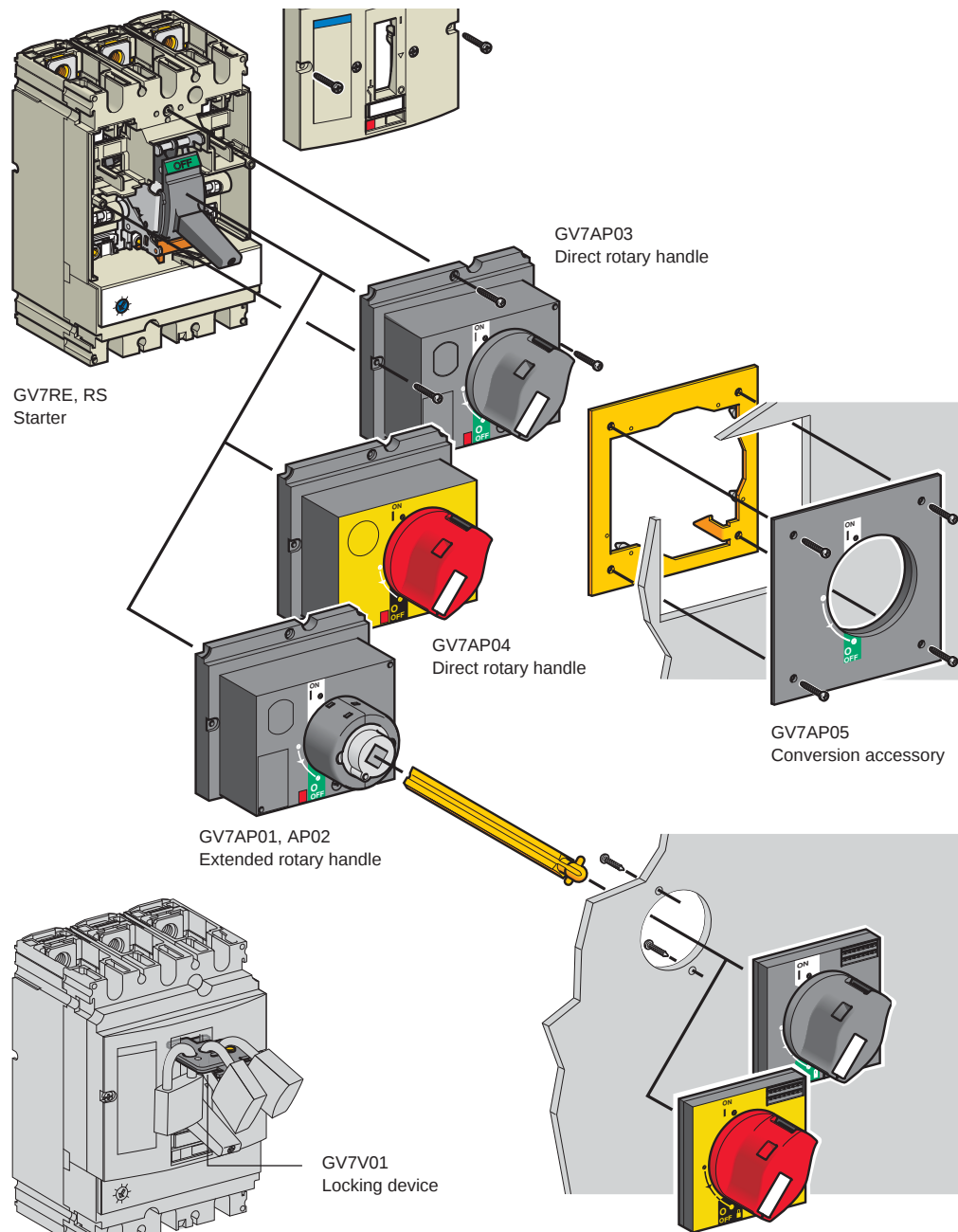
Tripping has priority over manual closing. When a trip condition is present, manual action does not close the contacts, even temporarily.

**Table 63: Undervoltage Trip and Shunt Trip Devices**

| Type              | Voltage             | Catalog Number | Weight, lb (kg) |
|-------------------|---------------------|----------------|-----------------|
| Undervoltage trip | 48 V, 50 Hz         | GV7AU055       | 0.23 (0.105)    |
|                   | 110–130 V, 50/60 Hz | GV7AU107       | 0.24 (0.110)    |
|                   | 200–240 V, 50/60 Hz | GV7AU207       |                 |
|                   | 380–440 V, 50/60 Hz | GV7AU387       | 0.23 (0.105)    |
|                   | 525 V, 50 Hz        | GV7AU525       | 0.22 (0.100)    |
| Shunt trip        | 48 V, 50 Hz         | GV7AS055       | 0.23 (0.105)    |
|                   | 110–130 V, 50/60 Hz | GV7AS107       | 0.24 (0.110)    |
|                   | 200–240 V, 50/60 Hz | GV7AS207       |                 |
|                   | 380–440 V, 50/60 Hz | GV7AS387       | 0.23 (0.105)    |
|                   | 525 V, 50 Hz        | GV7AS525       | 0.22 (0.100)    |

GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors  
Selection

Figure 6: GV7R Starter with Options and Accessories



# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Selection

### Direct Rotary Handle

The direct rotary handle accessory replaces the front cover of the starter and is secured by screws. Refer to Figure 6 on page 52. The handle includes a device for padlocking the starter in the Off (O) position. As many as three padlocks with a shank diameter of 5–8 mm (0.2–0.3 in.) can be used. The padlocks are not supplied. The conversion accessory allows the direct rotary handle to be mounted on an enclosure door. This accessory is designed to prevent the opening of the door when the manual motor starter is in the ON position.

**Table 64: Direct Rotary Handle**

| Description          | Type                                                          | Catalog Number | Weight, lb (kg) |
|----------------------|---------------------------------------------------------------|----------------|-----------------|
| Direct rotary handle | Black handle, black legend plate                              | GV7AP03        | 0.45 (0.205)    |
|                      | Red handle, yellow legend plate                               | GV7AP04        |                 |
| Conversion accessory | For mounting the direct rotary handle onto the enclosure door | GV7AP05        | 0.22 (0.100)    |

### Extended Rotary Handle

The extended rotary handle makes it possible for a door-mounted rotary handle to operate controllers installed on the inside back panel of an enclosure. Refer to Figure 6 on page 52. The extended rotary handle consists of the following:

- a unit that screws onto the front cover of the starter
- an assembly (handle and front plate) that fits on the enclosure door
- an extension shaft which must be adjusted according to the distance between the mounting surface and the door: 185 mm (7.28 in.) minimum, 600 mm (23.62 in.) maximum

The extended rotary handle includes a device for padlocking the starter in the Off (O) position. As many as three padlocks with a shank diameter of 5–8 mm (0.2–0.3 in.) can be used. The padlocks are not supplied. Using the padlocks prevents the enclosure door from being opened.

**Table 65: Extended Rotary Handle**

| Description            | Type                             | Catalog Number | Weight, lb (kg) |
|------------------------|----------------------------------|----------------|-----------------|
| Extended rotary handle | Black handle, black legend plate | GV7AP01        | 1.71 (0.775)    |
|                        | Red handle, yellow legend plate  | GV7AP02        |                 |

### Locking Device

The locking device allows controllers with no rotary handle installed to be padlocked in the Off (O) position. As many as three padlocks with a shank diameter of 5–8 mm (0.2–0.3 in.) can be used. The padlocks are not supplied. Refer to Figure 6 on page 52.

**Table 66: Locking Device**

| Description    | Application                          | Catalog Number | Weight, lb (kg) |
|----------------|--------------------------------------|----------------|-----------------|
| Locking device | GV7 starters without a rotary handle | GV7V01         | 0.22 (0.100)    |

### Environment

**Table 67: IP Ratings for Manual Motor Starters**

| Type                                 | GV2ME | GV2P | GV3P | GV3ME80 | GV7R                        |
|--------------------------------------|-------|------|------|---------|-----------------------------|
| Degree of protection                 |       |      |      |         |                             |
| Conforming to IEC 60529 open mounted | IP20  | IP20 | IP20 | IP20    | IP405 with terminal shrouds |



# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

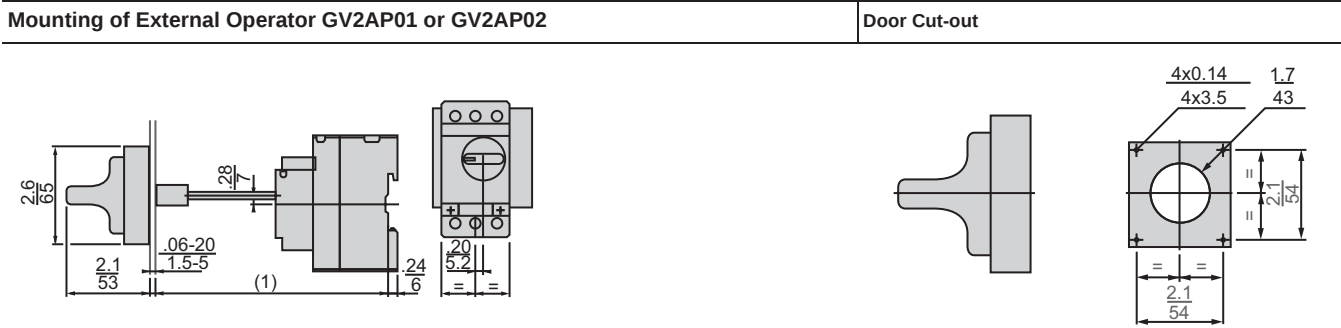
## Mounting Dimensions and Wiring Diagrams

| Mounting of GV2P                                                                                         |          |                                      |                           |
|----------------------------------------------------------------------------------------------------------|----------|--------------------------------------|---------------------------|
| On 35 mm (1.4 in.) Rail                                                                                  | On Panel | On Pre-Slotted Mounting Plate, AM1PA | On Adapter Plate, GK2AF01 |
|                                                                                                          |          |                                      |                           |
| C = 3.09 in. (78.5 mm) on AM1DP200 (35 x 7.5 mm)<br>C = 3.39 in. (86 mm) on AM1DE200, ED200 (35 x 15 mm) |          |                                      |                           |

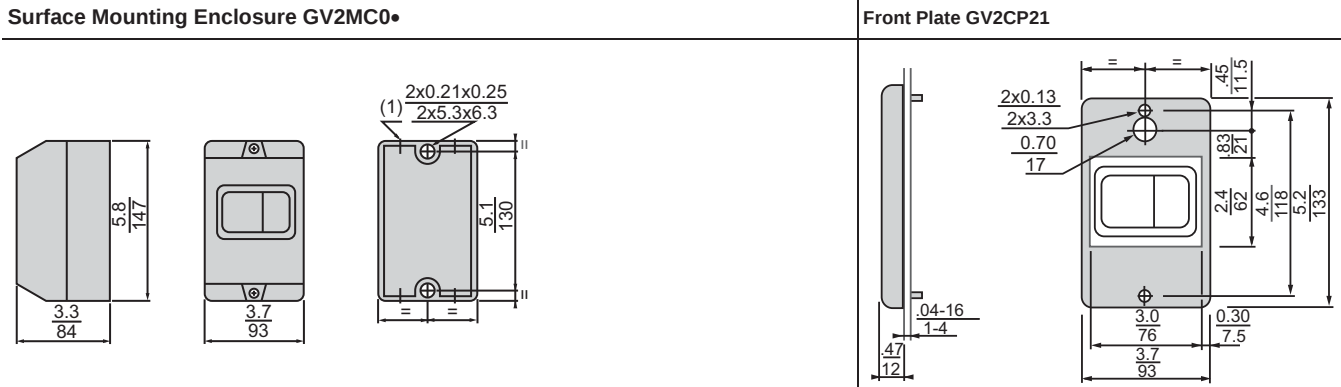
| GV2AF01<br>GV2M + K contactor combination                                      | GV2M and GV1L3<br>current limiter | GV1F03<br>7.5 mm height compensation plate |
|--------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------|
|                                                                                |                                   |                                            |
| X1 = 0.40 in. (10 mm) for Ue = 230 V or 1.2 in. (30 mm) for 230 V < Ue ≤ 690 V |                                   |                                            |

| GV2AF4 and LAD31                           |               |                |                                            |               |                |
|--------------------------------------------|---------------|----------------|--------------------------------------------|---------------|----------------|
| Combination GV2ME and D range contactor    |               |                | Combination GV2P and D range contactor     |               |                |
|                                            |               |                |                                            |               |                |
| Dimensions: $\frac{\text{in.}}{\text{mm}}$ |               |                | Dimensions: $\frac{\text{in.}}{\text{mm}}$ |               |                |
| GV2ME +                                    | LC2D09 to D18 | LC2D25 and D32 | GV2P +                                     | LC2D09 to D18 | LC2D25 and D32 |
| b                                          | 7.4 (188.6)   | 7.8 (199)      | b                                          | 6.61 (169.1)  | 7.9 (199.5)    |
| c1                                         | 3.6 (92.7)    | 3.9 (99)       | c1                                         | 4.6 (116.8)   | 4.6 (116.8)    |
| c                                          | 3.9 (98.2)    | 4.11 (104.5)   | c                                          | 4.8 (122.3)   | 4.8 (122.3)    |
| d1                                         | 3.9 (98.3)    | 3.9 (98.3)     |                                            |               |                |
| d                                          | 4.1 (103.8)   | 1.4 (103.8)    |                                            |               |                |

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Mounting Dimensions and Wiring Diagrams

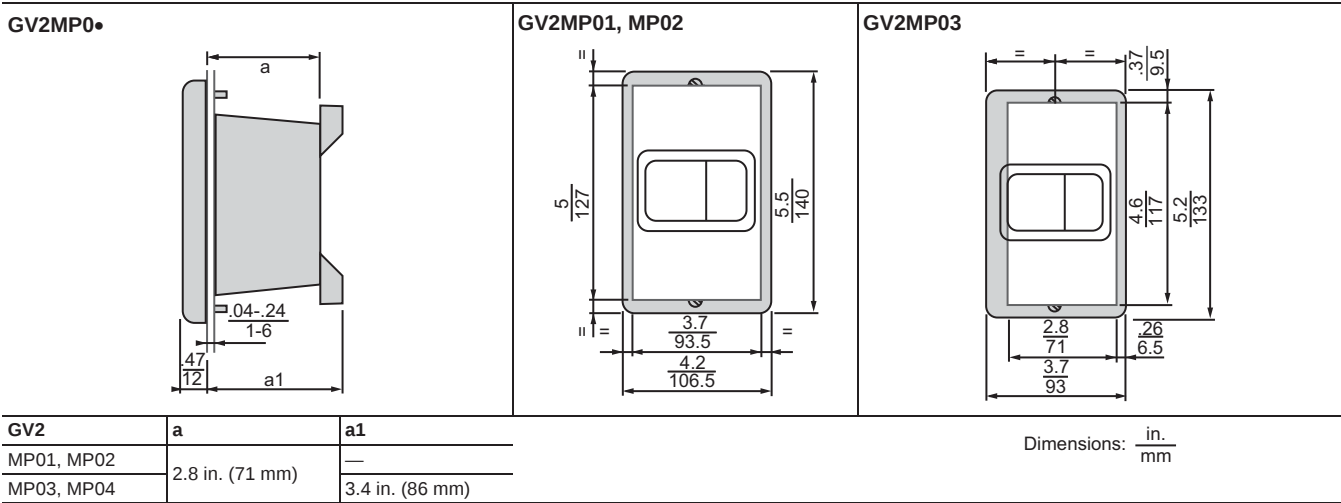


1. 135 mm minimum, 284 mm maximum with operating rod uncut, 88 with operating rod cut.



1. 4 knock-outs for 0.63 in. (16 mm) plastic cable entries or n° 16 conduit

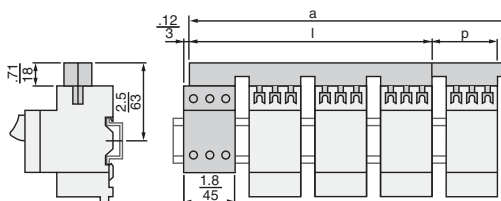
Flush Mounting Enclosure GV2MP0• (bracket cut-out dimensions)



# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Mounting Dimensions and Wiring Diagrams

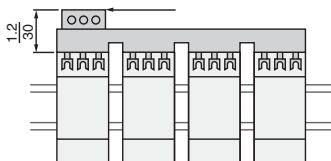
### Sets of Busbars GV2G445, GV2G454, and GV2G472 with Terminal Block GV2G05



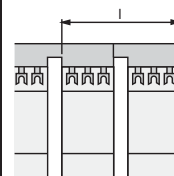
|                |                            | <b>l</b>          | <b>p</b>        |
|----------------|----------------------------|-------------------|-----------------|
| <b>GV2G454</b> | 0.16 x 2.1 in. (4 x 54 mm) | 8.1 in. (206 mm)  | 2.1 in. (54 mm) |
| <b>GV2G445</b> | 0.16 x 1.8 in. (4 x 45 mm) | 7.0 in. (179 mm)  | 1.8 in. (45 mm) |
| <b>GV2G472</b> | 0.16 x 2.8 in. (4 x 72 mm) | 10.2 in. (260 mm) | 2.8 in. (72 mm) |

|                    | <b>a</b>          |                   |                   |                   |
|--------------------|-------------------|-------------------|-------------------|-------------------|
| <b>No. of Taps</b> | <b>5</b>          | <b>6</b>          | <b>7</b>          | <b>8</b>          |
| <b>GV2G454</b>     | 10.2 in. (260 mm) | 12.4 in. (314 mm) | 14.5 in. (368 mm) | 16.6 in. (422 mm) |
| <b>GV2G445</b>     | 8.8 in. (224 mm)  | 10.6 in. (269 mm) | 12.4 in. (314 mm) | 14.1 in. (359 mm) |
| <b>GV2G472</b>     | 13.1 in. (332 mm) | 15.9 in. (404 mm) | 18.7 in. (476 mm) | 21.6 in. (548 mm) |

### Sets of Busbars with Terminal Block GV1G09

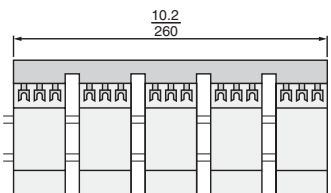


### Sets of Busbars GV2G245, GV2G254, and GV2G272

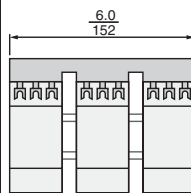


|                | <b>l</b>                   |                  |
|----------------|----------------------------|------------------|
| <b>GV2G254</b> | 0.08 x 2.1 in. (2 x 54 mm) | 3.9 in. (98 mm)  |
| <b>GV2G245</b> | 0.08 x 1.8 in. (2 x 45 mm) | 3.5 in. (89 mm)  |
| <b>GV2G272</b> | 0.08 x 2.8 in. (2 x 72 mm) | 4.6 in. (116 mm) |

### Set of Busbars GV2G554



### Set of Busbars GV2G354

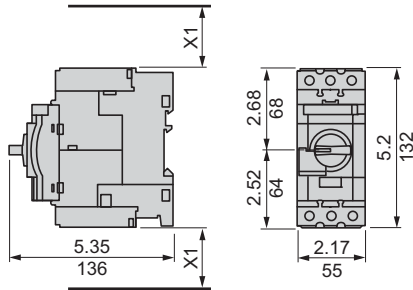


# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

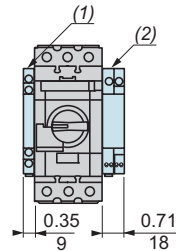
## Mounting Dimensions and Wiring Diagrams

### GV3 Mounting Dimensions

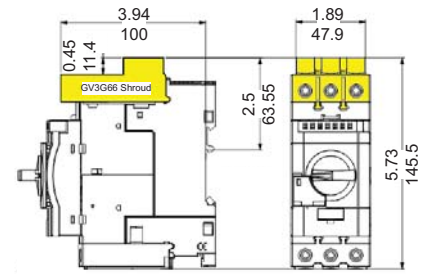
#### Dimensions



X1 = Electrical clearance (ISC max)  
40 mm for Ue < 500 V, 50 mm for Ue < 690 V



1. Blocks GVAN●●, GVAD●● and GVAM11
2. Blocks GV3AU●● and GV3AS●●



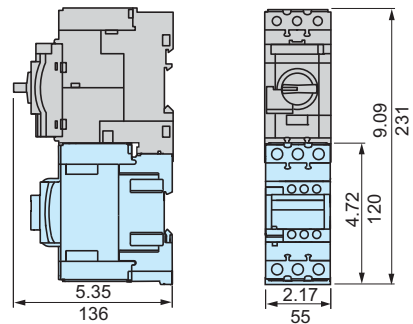
The GV3G66 add-on line terminal shroud must be installed on the GV3P for it to meet UL 508 Type E requirements for standalone applications. The shield snaps into place on the line side of the GV3P.

**NOTE:** Between two manual motor starters, leave a 9 mm gap, either an empty space or side-mounting add-on contact blocks.  
Horizontal mounting is possible up to 40 °C.

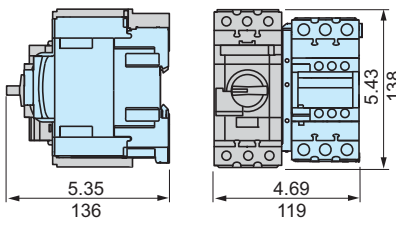
**NOTE:** If the GV3G66 add-on line terminal shroud is installed, the GV3G busbars **cannot** be installed.

#### Mounting

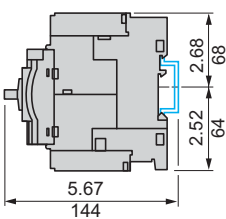
##### Mounting with TeSys Contactor LC1D40A–D65A



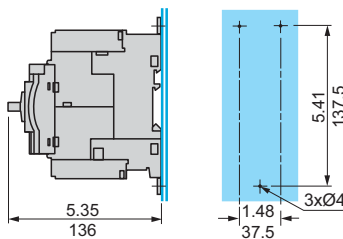
##### Side-by-Side Mounting (S-shape Busbar System GV3S)



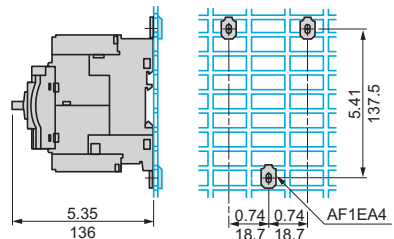
##### Mounting on Rail AM1DE200 or AM1ED201



##### Panel Mounting, using M4 Screws

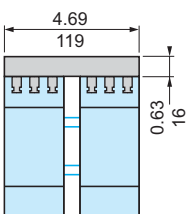


##### Mounting on Pre-Slotted Plate AM1 PA

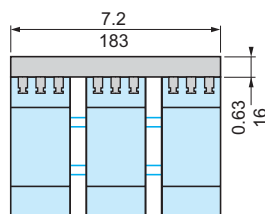


#### Busbar Systems

##### Set of Busbars GV3G264



##### Set of Busbars GV3 G364



Dimensions:  $\frac{\text{in.}}{\text{mm}}$

**NOTE:** Between two manual motor starters, leave a 9 mm gap, either an empty space or side-mounting add-on contact blocks. Horizontal mounting is possible up to 40 °C.

**NOTE:** If the GV3G66 add-on line terminal shroud is installed, the GV3G busbars **cannot** be installed.

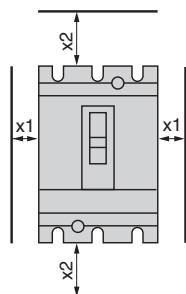
# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Mounting Dimensions and Wiring Diagrams

### GV7 Mounting Dimensions

| Motor Controllers<br>GV7R | Motor Controllers with Terminal Shields and Phase Barriers<br>GV7R + GV7AC01 + GV7AC04 |
|---------------------------|----------------------------------------------------------------------------------------|
|                           |                                                                                        |
| 1. 126 for GV7R• 220      | 2. Phase barriers—GV7AC04<br>3. Terminal shields—GV7AC01                               |

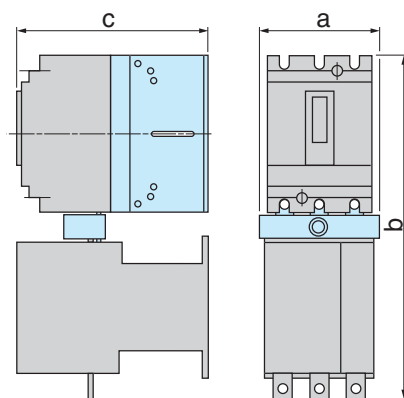
#### Safety Clearance



|                                                                |                   | x1        | x2        |
|----------------------------------------------------------------|-------------------|-----------|-----------|
|                                                                |                   | in. (mm)  | in. (mm)  |
| Painted or insulated metal plate, insulation, or insulated bar |                   | 0 (0)     | 1.18 (30) |
| Bare metal plate                                               | U ≤ 440 V         | 0.20 (5)  | 1.38 (35) |
|                                                                | 440 V < U < 600 V | 0.39 (10) | 1.38 (35) |
|                                                                | U ≥ 600 V         | 0.79 (20) | 1.38 (35) |

Minimum distance between two manual motor starters mounted side by side = 0.

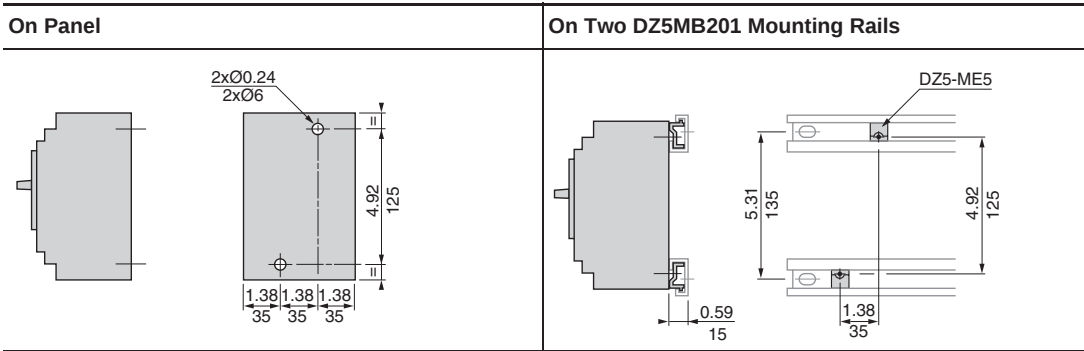
#### Combination of GV7 and LC1F with Kit GV7AC0•



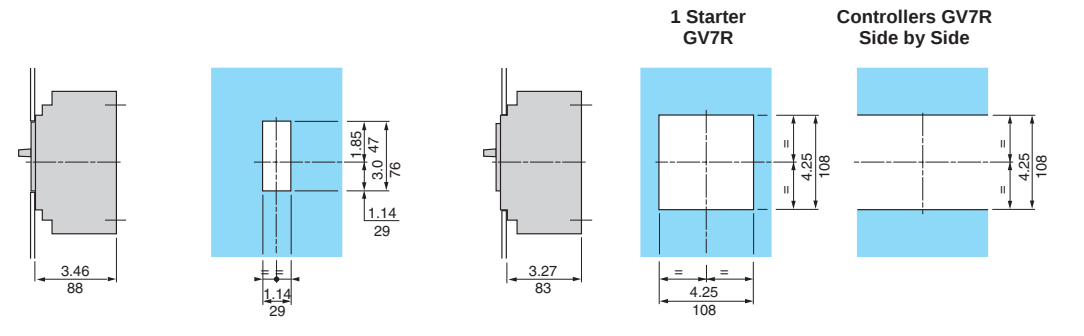
|                                  | in. (mm)   |             |            |
|----------------------------------|------------|-------------|------------|
|                                  | a          | b           | c          |
| GV7R + LC1F115 or F150 + GV7AC06 | 4.69 (119) | 13.15 (334) | 7.13 (181) |
| GV7R + LC1F185 + GV7AC06         | 4.69 (119) | 13.31 (338) | 7.40 (188) |
| GV7R + LC1F225 + GV7AC07         | 5.16 (131) | 14.09 (358) | 7.40 (188) |
| GV7R + LC1F265 + GV7AC07         | 5.12 (130) | 14.33 (364) | 8.46 (215) |

Dimensions:  $\frac{\text{in.}}{\text{mm}}$

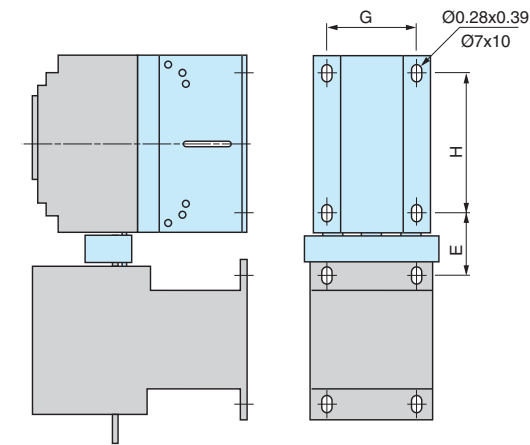
# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Mounting Dimensions and Wiring Diagrams



## Flush Mounting



## Combination of GV7R and LC1F with Kit GV7AC0•

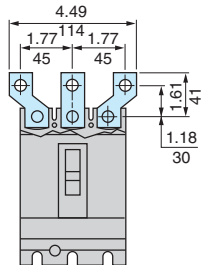
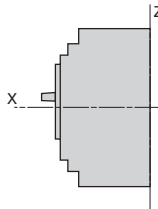
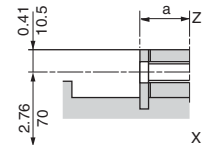
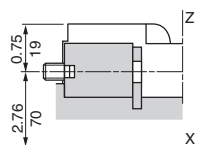


|                          | in. (mm)  |           |            |
|--------------------------|-----------|-----------|------------|
|                          | E         | G         | H          |
| GV7R + LC1F115 + GV7AC06 | 1.73 (44) | 3.35 (85) | 4.72 (120) |
| GV7R + LC1F150 + GV7AC06 | 1.81 (46) | 3.35 (85) | 4.72 (120) |
| GV7R + LC1F165 + GV7AC06 | 1.89 (48) | 3.35 (85) | 4.72 (120) |
| GV7R + LC1F225 + GV7AC07 | 2.24 (57) | 3.35 (85) | 4.72 (120) |
| GV7R + LC1F265 + GV7AC07 | 2.36 (60) | 3.35 (85) | 4.72 (120) |

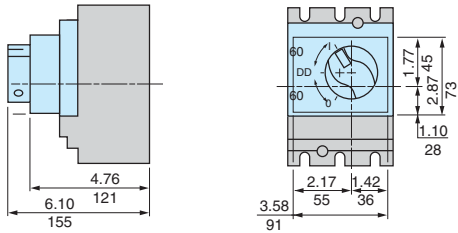
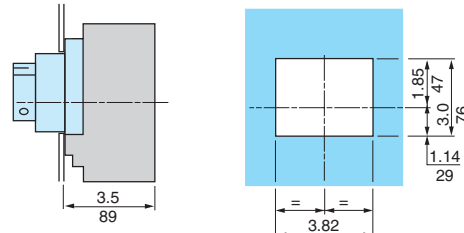
Dimensions:  $\frac{\text{in.}}{\text{mm}}$

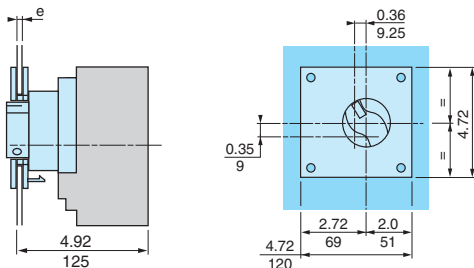
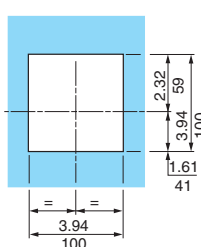
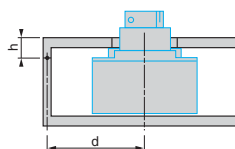
# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Mounting Dimensions and Wiring Diagrams

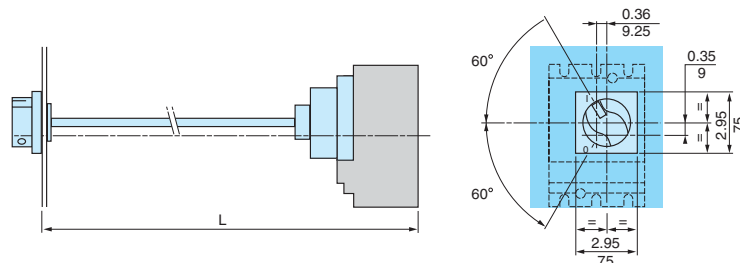
| Spreaders GV7AC03                                                                 | Cabling                                                                           | Smooth Terminals                                                                   | Connectors                                                                          |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |

|          | a                  |
|----------|--------------------|
| GV7R•    | 0.77 in. (19.5 mm) |
| GV7R•220 | 0.85 in. (21.5 mm) |

| Direct Rotary Handle GV7AP03, GV7AP04                                              | Flush Mounting                                                                       |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |

| Direct Rotary Handle GV7AP03 or GV7AP04 with conversion accessory GV7AP05           | Front Fuse Center                                                                    | Enclosure viewed from Top                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  |  <p>Door cutouts require a minimum distance between the center of the manual motor starter and the door hinge point:<br/> <math>d \geq 3.94 \text{ in. (100 mm)} + (h \times 5)</math>.</p> |

### Extended Rotary Handle GV7AP01, GV7AP02



L: 7.28 in. (185 mm) minimum, 23.62 in. (600 mm) maximum.

Dimensions:  $\frac{\text{in.}}{\text{mm}}$

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Mounting Dimensions and Wiring Diagrams

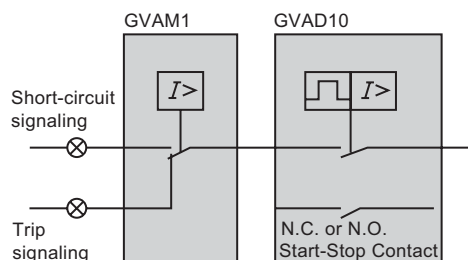
## GV2 Wiring Diagrams

|                                                                                                                   |                     |                                  |                     |
|-------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------|---------------------|
| <b>GV2ME</b><br>                                                                                                  | <b>GV2P</b><br>     | <b>Current Limiter GV1L3</b><br> |                     |
| <b>Front Mounting Add-on Contact Blocks</b><br><b>Instantaneous Auxiliary Contacts</b>                            |                     |                                  |                     |
| <b>GVAE1</b><br>                                                                                                  | <b>GVAE11</b><br>   | <b>GVAE20</b><br>                |                     |
| <b>Side Mounting Add-on Contact Blocks</b><br><b>Instantaneous Auxiliary Contact and Fault Signaling Contacts</b> |                     |                                  |                     |
| <b>GVAD0110</b><br>                                                                                               | <b>GVAD0101</b><br> | <b>GVAD1010</b><br>              | <b>GVAD1001</b><br> |
| <b>Instantaneous Auxiliary Contacts</b>                                                                           |                     |                                  |                     |
| <b>GVAN11</b><br>                                                                                                 | <b>GVAN20</b><br>   | <b>GVAM11</b><br>                |                     |
| <b>Voltage Trip Units</b>                                                                                         |                     |                                  |                     |
| <b>GVAU</b><br>                                                                                                   | <b>GVAS</b><br>     | <b>GVAX...</b><br>               |                     |

# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors

## Mounting Dimensions and Wiring Diagrams

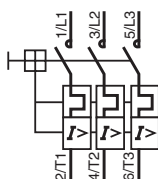
### Use of Fault Signaling Contact and Short-Circuit Signaling Contact



**Table 68: GV3 Wiring Diagrams**

### Manual Motor Starter

#### GV3P



### Auxiliary Contact Blocks

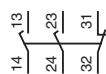
#### GV3A01



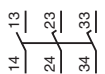
#### GV3A02



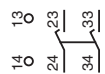
#### GV3A03



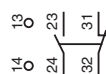
#### GV3A05



#### GV3A06

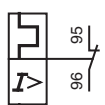


#### GV3A07

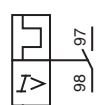


### Fault Signaling Contacts

#### GV3A08



#### GV3A09



### Voltage Trip Units

#### GV3B••

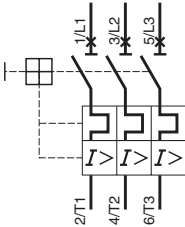
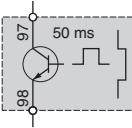
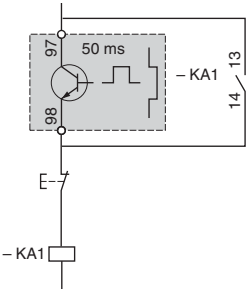
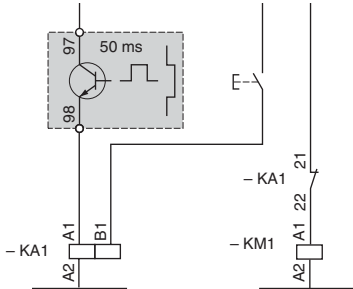


#### GV3D••



# GV2, GV3, and GV7 Manual Motor Starters, Controllers, and Protectors Mounting Dimensions and Wiring Diagrams

Table 69: GV7 Wiring Diagrams

| Motor Controllers GV7R                                                                                                                                                    | Add-on Auxiliary Contacts GV7AE11, GV7AB11                                                                                                                                                                                |                                                                                    |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--|
|                                                                                          | <div><div><div>14</div><div>12</div></div><div>11</div></div> <div><div>94</div><div>92</div></div> <div>91</div> <div><div>84</div><div>82</div></div> <div>81</div> <div><div>24</div><div>22</div></div> <div>21</div> |                                                                                    |  |
| A self-adhesive label, supplied with the contact, can be affixed to the front face of the starter to allow personalized marking as a function of the contact or contacts. |                                                                                                                                                                                                                           |                                                                                    |  |
| Electrical Trip Units<br>GV7AU...                                                                                                                                         | GV7AS...                                                                                                                                                                                                                  | GV7AD111, AD112                                                                    |  |
|                                                                                          |                                                                                                                                          |  |  |
|                                                                                         |                                                                                                                                        |                                                                                    |  |