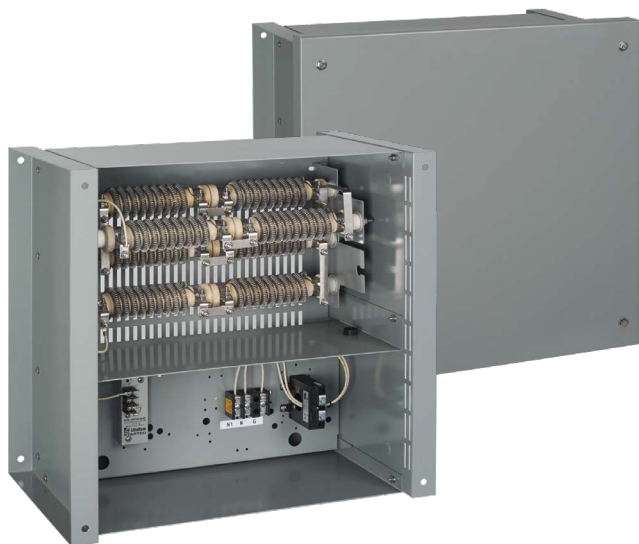


Protection Relays & Controls

NGR SERIES – US

Neutral Grounding Resistor System



Description

High-resistance grounding prevents many of the problems that are associated with ungrounded and solidly grounded electrical distribution and utilization systems. High-resistance grounding can limit point-of-fault damage, eliminate transient overvoltages, reduce the arc-flash hazards, limit voltage exposure to personnel, and provide adequate tripping levels for selective current-based ground-fault detection and coordination.

The Littelfuse Neutral Grounding Resistor System is a neutral grounding resistor (NGR), current transformer, and sensing resistor installed in a NEMA 3R enclosure used to high-resistance ground transformers and generators. The NGR system is designed for use with Littelfuse Neutral Grounding Resistor Monitors for complete system grounding and grounding protection.

The NGR series – US systems are designed for use in US applications and all other parts of the world, not including Canada. For applications in Canada, please use the NGR series – Canada.

Applications

High-resistance grounding is applied on transformers and generators where safety and continuity of service are important. A faulted feeder may remain in operation until it is safe to repair the fault, where allowed by the local electrical code.

Features



Enclosure

The NGR Series – US comes pre-installed in a ventilated NEMA 3R galvanized steel enclosure and components are pre-wired to terminals for ease of installation. Back view shown on left.

ER Series Sensing Resistor

Use with the SE-325 or the SE-330 to continuously monitor the continuity of a neutral-grounding resistor and eliminate hazardous voltage levels at the relay.



- ER-600VC is designed for use on systems up to 600 V for indoor applications. Available in optional moisture-proof enclosure (shown on left) for outdoor applications.



- ER-5KV for use on systems up to 4160 V for indoor applications.



- ER-5WP is designed for use on systems up to 4160 V and comes with weather-protected terminals for outdoor installations.

Earth-Fault Current Transformer

Used with the SE-325 or the SE-330 to measure ac current flowing through the NGR for use with the continuity monitoring circuit and to detect ground faults.



- ELCT5-31 used with SE-330 for 5 A and 10 A NGRs.



- SE-CS10-2.5 used with SE-330 for 10 A and 15 A NGRs.



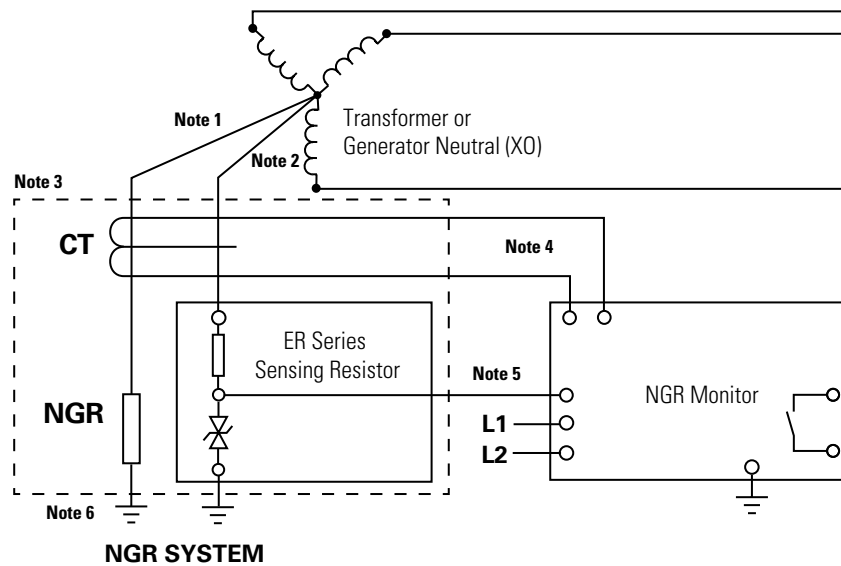
- CT200 used with the SE-325 for all applications.

- 5SHT-101-E (not shown) used with SE-330 for 25 A NGRs.

Benefits

- Eliminate phase-to-ground arc-flash incidents
- Eliminate transient overvoltages
- Reduce point-of-fault damage
- Can provide continuity of service during a ground fault
- Includes current transformer and ER series sensing resistor for use with Littelfuse monitoring relay and for ease of installation.

Simplified Circuit Diagram with Littelfuse Neutral-Grounding-Resistor Monitor



- Note 1:** Use minimum #8 AWG white or grey conductor insulated to system voltage to connect NGR to neutral.
- Note 2:** Use conductor insulated to system voltage (#14 AWG is typically used) and a separate lug at the X0 point to connect ER Series Sensing Resistor to neutral.
- Note 3:** Locate NGR system near transformer or generator.
- Note 4:** Two-conductor twisted cable required, shielded recommended.
- Note 5:** Voltage between ER Series Sensing Resistor terminals R and G is limited to 100 V by internal clamp.
- Note 6:** Use minimum #8 AWG green or bare conductor to connect NGR to ground.

Protection Relays & Controls

NGR SERIES – US

Ordering Information

| PART NUMBER | LINE-LINE VOLTAGE (V) | LET-THROUGH CURRENT (A) | IMPEDANCE (OHMS) | TIME RATING | CURRENT TRANSFORMER | CT PRIMARY RATING (A) | CT SECONDARY RATING (A) | SENSING RESISTOR | ENCLOSURE |
|-------------|-----------------------|-------------------------|------------------|-------------|---------------------|-----------------------|-------------------------|------------------|---|
| NGRUS138 | 480 | 2 | 138 | Continuous | CT200 | 200*** | 5.0 | ER-600VC | NEMA 3R |
| NGRUS278 | 480 | 2 | 138 | Continuous | CT200 | 200*** | 5.0 | ER-600VC | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS314 | 480 | 2 | 138 | Continuous | ELCT5-31 | 5* | 0.05 | ER-600VC | NEMA 3R |
| NGRUS315 | 480 | 2 | 138 | Continuous | ELCT5-31 | 5* | 0.05 | ER-600VC | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS003 | 480 | 5 | 55.4 | Continuous | CT200 | 200*** | 5.0 | ER-600VC | NEMA 3R |
| NGRUS194 | 480 | 5 | 55.4 | Continuous | CT200 | 200*** | 5.0 | ER-600VC | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS316 | 480 | 5 | 55.4 | Continuous | ELCT5-31 | 5* | 0.05 | ER-600VC | NEMA 3R |
| NGRUS317 | 480 | 5 | 55.4 | Continuous | ELCT5-31 | 5* | 0.05 | ER-600VC | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS318 | 600 | 2 | 173.5 | Continuous | ELCT5-31 | 5* | 0.05 | ER-600VC | NEMA 3R |
| NGRUS319 | 600 | 2 | 173.5 | Continuous | ELCT5-31 | 5* | 0.05 | ER-600VC | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS354 | 600 | 2 | 173.5 | Continuous | CT200 | 200*** | 5.0 | ER-600VC | NEMA 3R |
| NGRUS355 | 600 | 2 | 173.5 | Continuous | CT200 | 200*** | 5.0 | ER-600VC | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS169 | 600 | 5 | 69.4 | Continuous | CT200 | 200*** | 5.0 | ER-600VC | NEMA 3R |
| NGRUS170 | 600 | 5 | 69.4 | Continuous | CT200 | 200*** | 5.0 | ER-600VC | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS320 | 600 | 5 | 69.4 | Continuous | ELCT5-31 | 5* | 0.05 | ER-600VC | NEMA 3R |
| NGRUS321 | 600 | 5 | 69.4 | Continuous | ELCT5-31 | 5* | 0.05 | ER-600VC | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS114 | 4160 | 5 | 480.9 | Continuous | CT200 | 200*** | 5.0 | ER-5KV | NEMA 3R |
| NGRUS115 | 4160 | 5 | 480.9 | Continuous | CT200 | 200*** | 5.0 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS322 | 4160 | 5 | 480.9 | 10 s | ELCT5-31 | 5* | 0.05 | ER-5KV | NEMA 3R |
| NGRUS323 | 4160 | 5 | 480.9 | 10 s | ELCT5-31 | 5* | 0.05 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS324 | 4160 | 5 | 480.9 | Continuous | ELCT5-31 | 5* | 0.05 | ER-5KV | NEMA 3R |
| NGRUS325 | 4160 | 5 | 480.9 | Continuous | ELCT5-31 | 5* | 0.05 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS356 | 4160 | 5 | 480.9 | 10s | CT200 | 200*** | 5.0 | ER-5KV | NEMA 3R |
| NGRUS357 | 4160 | 5 | 480.9 | 10s | CT200 | 200*** | 5.0 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS326 | 4160 | 10 | 240.5 | 10 s | SE-CS10-2.5 | 10* | 0.05 | ER-5KV | NEMA 3R |
| NGRUS327 | 4160 | 10 | 240.5 | 10 s | SE-CS10-2.5 | 10* | 0.05 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |

Protection Relays & Controls

NGR SERIES – US

Ordering Information

| PART NUMBER | LINE-LINE VOLTAGE (V) | LET-THROUGH CURRENT (A) | IMPEDANCE (OHMS) | TIME RATING | CURRENT TRANSFORMER | CT PRIMARY RATING (A) | CT SECONDARY RATING (A) | SENSING RESISTOR | ENCLOSURE |
|-------------|-----------------------|-------------------------|------------------|-------------|---------------------|-----------------------|-------------------------|------------------|---|
| NGRUS328 | 4160 | 10 | 240.5 | Continuous | SE-CS10-2.5 | 10* | 0.05 | ER-5KV | NEMA 3R |
| NGRUS329 | 4160 | 10 | 240.5 | Continuous | SE-CS10-2.5 | 10* | 0.05 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS358 | 4160 | 10 | 240.5 | 10s | CT200 | 200*** | 5.0 | ER-5KV | NEMA 3R |
| NGRUS359 | 4160 | 10 | 240.5 | 10s | CT200 | 200*** | 5.0 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS360 | 4160 | 10 | 240.5 | Continuous | CT200 | 200*** | 5.0 | ER-5KV | NEMA 3R |
| NGRUS361 | 4160 | 10 | 240.5 | Continuous | CT200 | 200*** | 5.0 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS330 | 4160 | 15 | 160.3 | 10 s | SE-CS10-2.5 | 10* | 0.05 | ER-5KV | NEMA 3R |
| NGRUS331 | 4160 | 15 | 160.3 | 10 s | SE-CS10-2.5 | 10* | 0.05 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS332 | 4160 | 15 | 160.3 | Continuous | SE-CS10-2.5 | 10* | 0.05 | ER-5KV | NEMA 3R |
| NGRUS333 | 4160 | 15 | 160.3 | Continuous | SE-CS10-2.5 | 10* | 0.05 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS362 | 4160 | 15 | 160.3 | 10s | CT200 | 200*** | 5.0 | ER-5KV | NEMA 3R |
| NGRUS363 | 4160 | 15 | 160.3 | 10s | CT200 | 200*** | 5.0 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS364 | 4160 | 15 | 160.3 | Continuous | CT200 | 200*** | 5.0 | ER-5KV | NEMA 3R |
| NGRUS365 | 4160 | 15 | 160.3 | Continuous | CT200 | 200*** | 5.0 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS244 | 4160 | 25 | 96.2 | 10s | CT200 | 200*** | 5.0 | ER-5KV | NEMA 3R |
| NGRUS334 | 4160 | 25 | 96.2 | 10 s | 5SHT-101-E | 20** | 1 | ER-5KV | NEMA 3R |
| NGRUS335 | 4160 | 25 | 96.2 | 10 s | 5SHT-101-E | 20** | 1 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS336 | 4160 | 25 | 96.2 | Continuous | 5SHT-101-E | 20** | 1 | ER-5KV | NEMA 3R |
| NGRUS337 | 4160 | 25 | 96.2 | Continuous | 5SHT-101-E | 20** | 1 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS366 | 4160 | 25 | 96.2 | 10s | CT200 | 200*** | 5.0 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |
| NGRUS367 | 4160 | 25 | 96.2 | Continuous | CT200 | 200*** | 5.0 | ER-5KV | NEMA 3R |
| NGRUS368 | 4160 | 25 | 96.2 | Continuous | CT200 | 200*** | 5.0 | ER-5WP | NEMA 3R; Weather Protected Sensing Resistor |

* Connect to SE-330 terminals 8 and 11

** Connect to SE-330 terminals 9 and 11

*** Connect to SE-325 terminals CT1 and CT2

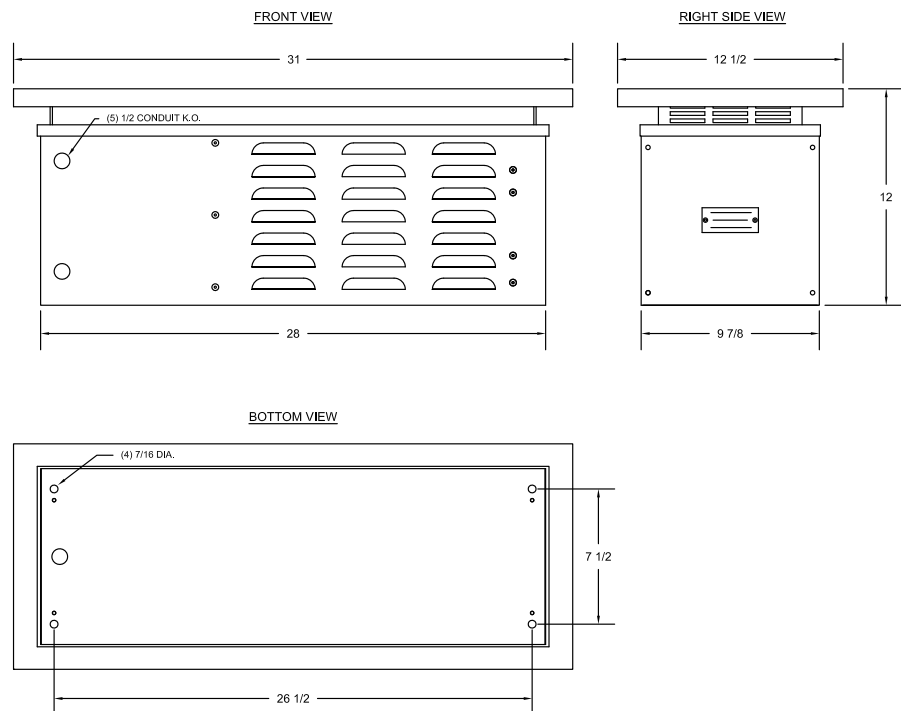
Protection Relays & Controls

NGR SERIES – US

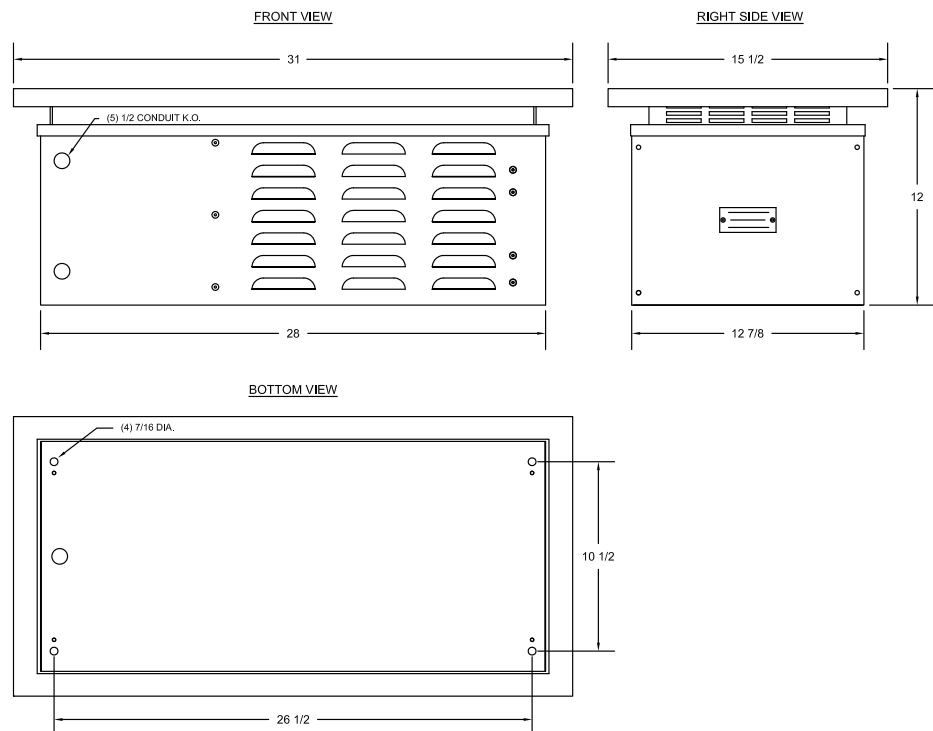
Dimensions (in inches) and Mounting Diagrams

480 V & 600 V NGR Systems:

- NGRUS314
- NGRUS316
- NGRUS318
- NGRUS320



- NGRUS315
- NGRUS317
- NGRUS319
- NGRUS321

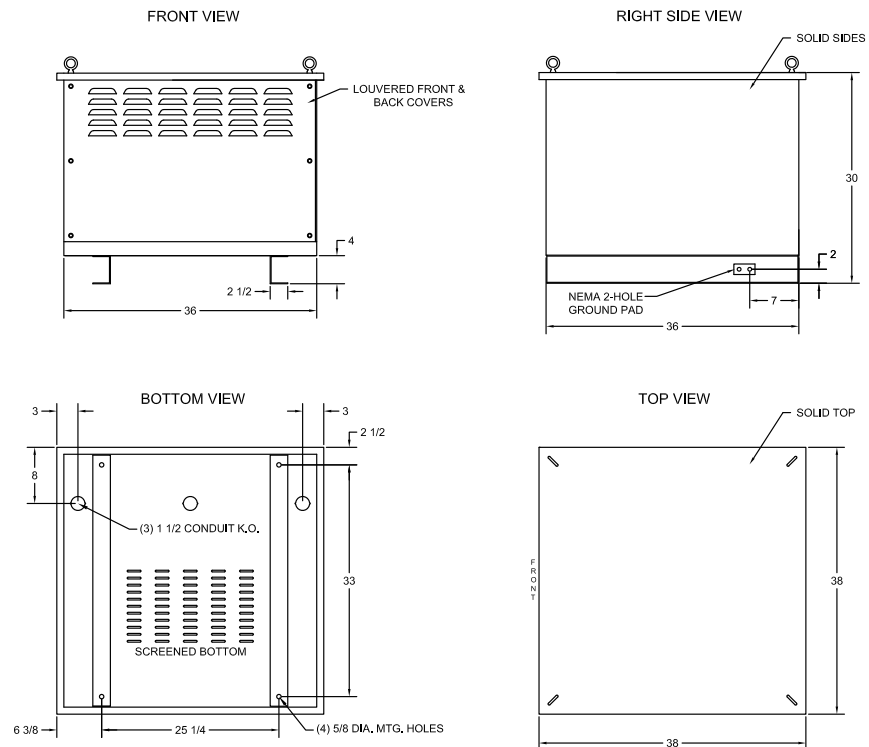


NGR SERIES – US

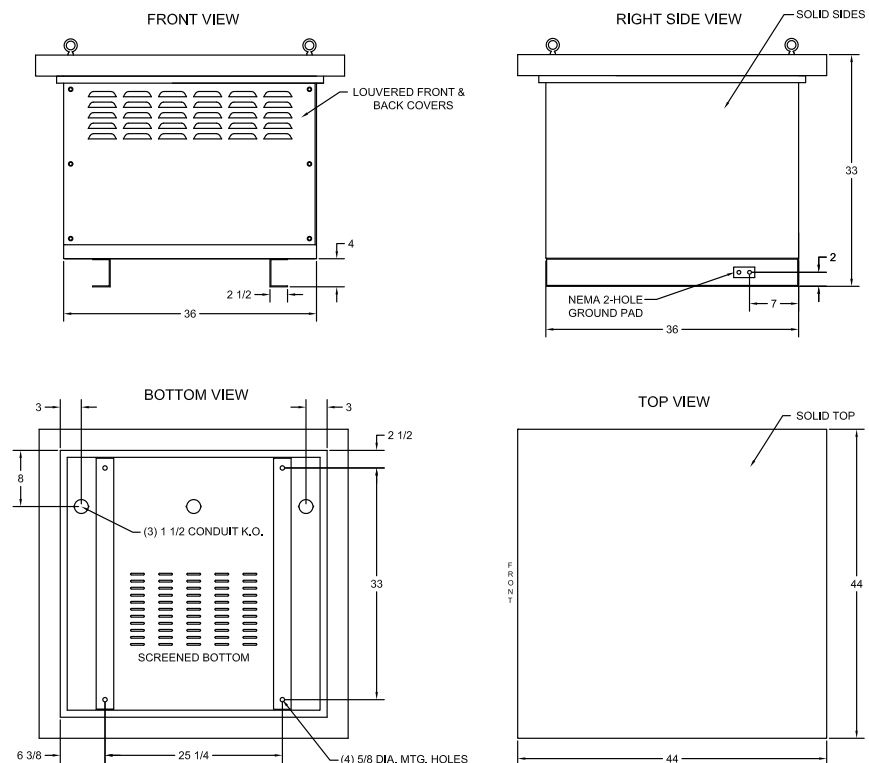
Dimensions (in inches) and Mounting Diagrams

4160 V NGR Systems:

- NGRUS322
- NGRUS323
- NGRUS326
- NGRUS327
- NGRUS330
- NGRUS331
- NGRUS344
- NGRUS345



- NGRUS324
- NGRUS325



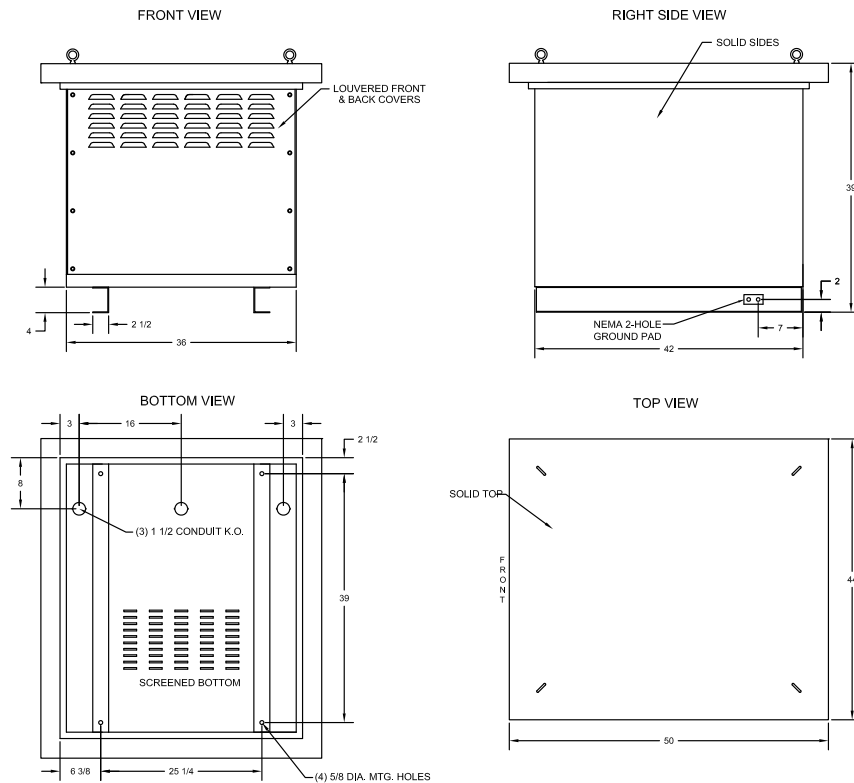
Protection Relays & Controls

NGR SERIES – US

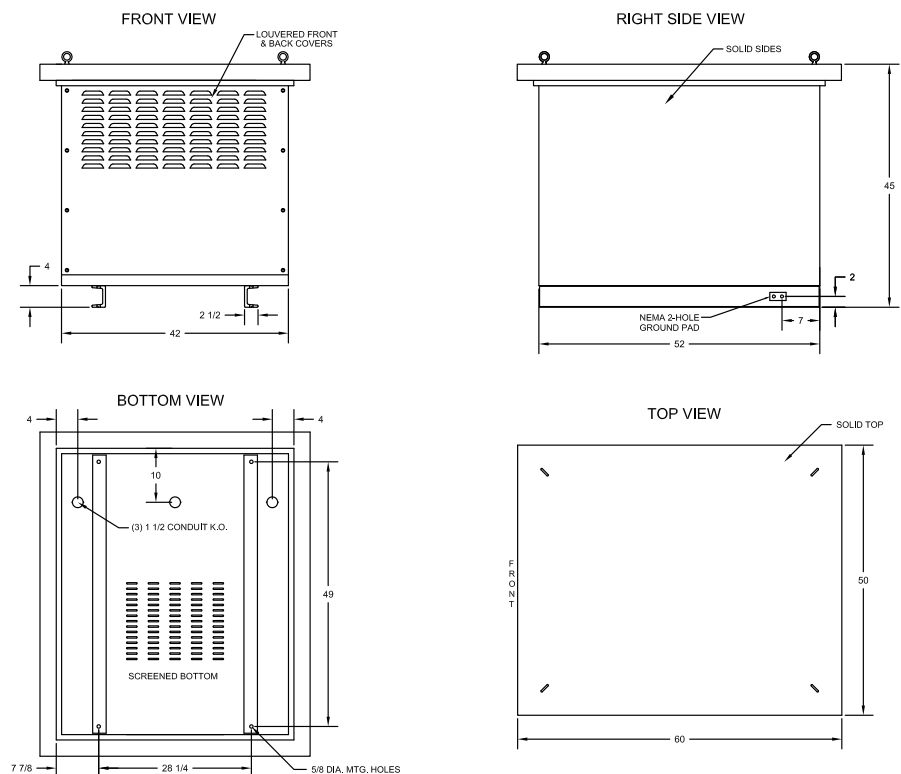
Dimensions (in inches) and Mounting Diagrams

4160 V NGR Systems:

- NGRUS328
- NGRUS329
- NGRUS332
- NGRUS333



- NGRUS336
- NGRUS337



Protection Relays & Controls

NGR SERIES – US

Specifications: 480 V NGR Systems

| | |
|----------------------------|---|
| Voltage | 480 V line-to-line, 277 V line-to-neutral |
| Let-Through Current | 2 A or 5 A |
| Resistance | 138.5 Ω (2 A) or 55.4 Ω (5 A) |
| Tolerance | +/- 10 % resistance |
| Duty Cycle | Continuous rated |
| Current Transformer | ELCT5-31: For use with SE-330 NGR Monitor Turns Ratio: 100:1 Current Rating: 5:0.05 A Primary Rating with SE-330: 5 A when connected to terminals 8 and 11 GF Trip Range: 100 mA to 5 A Window Diameter: 31 mm (1.22") CT200: For use with SE-325 NGR Monitor Turns Ratio: 200:5 Current Rating: 200:5 A GF Trip Range: 0.5, 2.0, 4.0 A Window Diameter: 56 mm (2.2") |
| Sensing Resistor | ER-600VC; Optional installation in NEMA 4 enclosure for outdoor applications |
| Insulation Level | 11 KV BIL |
| Temperature Rise | 385 °C (725 °F) |
| Resistor Type | Stainless steel wire wound |
| Dimensions | Refer to dimensions drawings |
| Weight | 23 kg (50 lbs) |
| Altitude | 0–2000 masl |
| Enclosure Style | NEMA 3R, galvanized steel |
| Finish | Powder coated |
| Color | ANSI 61 grey |
| Mounting | Floor mount |
| Siesmic Bracing | Included |
| Approvals | cULus or CSA at customer request |
| Warranty | 12 months in service or 18 months from the date of shipment whichever occurs first |

Specifications: 600 V NGR Systems

| | |
|----------------------------|---|
| Voltage | 600 V line-to-line, 347 V line-to-neutral |
| Let-Through Current | 2 A or 5 A |
| Resistance | 174 Ω (2 A) or 69 Ω (5 A) |
| Tolerance | +/- 10 % resistance |
| Duty Cycle | Continuous rated |
| Frequency | 50–60 Hz |
| Current Transformer | ELCT5-31: For use with SE-330 NGR Monitor Turns Ratio: 100:1 Current Rating: 5:0.05 A Primary Rating with SE-330: 5 A when connected to terminals 8 and 11 GF Trip Range: 100 mA to 5 A Window Diameter: 31 mm (1.22") CT200: For use with SE-325 NGR Monitor Turns Ratio: 200:5 Current Rating: 200:5 A GF Trip Range: 0.5, 2.0, 4.0 A Window Diameter: 56 mm (2.2") |
| Sensing Resistor | ER-600VC; Optional installation in NEMA 4 enclosure for outdoor applications |
| Insulation Level | 11 KV BIL |
| Temperature Rise | 385 °C (725 °F) |
| Resistor Type | Stainless steel wire wound |
| Dimensions | Refer to dimensions drawings |
| Weight | 23 kg (50 lbs) |
| Altitude | 0–2000 masl |
| Enclosure Style | NEMA 3R, galvanized steel |
| Finish | Powder coated |
| Color | ANSI 61 grey |
| Mounting | Floor mount |
| Siesmic Bracing | Included |
| Approvals | cULus or CSA at customer request |
| Warranty | 12 months in service or 18 months from the date of shipment whichever occurs first |

Protection Relays & Controls

NGR SERIES – US

Specifications: 4160 V NGR Systems

| | |
|----------------------------|---|
| Voltage | 4160 V line-to-line, 2400 V line-to-neutral |
| Let-Through Current | 5 A, 10 A, 15 A, or 25 A |
| Resistance | 480 Ω (5 A), 240 Ω (10 A), 160 Ω (15 A), or 96 Ω (25 A) |
| Tolerance | +/- 10 % resistance |
| Duty Cycle | Continuous-duty or 10-second-duty rating |
| Frequency | 50-60 Hz |
| Current Transformer | ELCT5-31: For use with SE-330 NGR Monitor Turns Ratio: 100:1 Current Rating: 5:0.05 A Primary Rating with SE-330: 5 A when connected to terminals 8 and 11 GF Trip Range: 100 mA to 5 A Window Diameter: 31 mm (1.22") SE-CS10-2.5: For use with SE-330 NGR Monitor Turns Ratio: 200:1 Current Rating: 12.5:0.0625 A Primary Rating with SE-330: 10 A when connected to terminals 8 and 11 GF Trip Range: 200 mA to 10 A Window Diameter: 63.5 mm (2.5") Turns Ratio: 100:5 Current Rating: 100:5 A Primary Rating with SE-330: 20 A when connected to terminals 9 and 11 GF Trip Range: 400 mA to 20 A Window Diameter: 40 mm (1.56") CT200: For use with SE-325 NGR Monitor Turns Ratio: 200:5 Current Rating: 200:5 A GF Trip Range: 0.5, 2.0, 4.0 A Window Diameter: 56 mm (2.2") Sensing Resistor ER-5KV Optional ER-5WP for outdoor applications Insulation Level 75 KV BIL Temperature Rise Continuous-duty rated: 385 °C (725 °F) 10-second-duty rated: 760 °C (1400 °F) Resistor Type Stainless Steel Wire Wound Dimensions Refer to dimensions drawings |

| | |
|-------------------------------------|------------------|
| Weights | |
| 5 A, continuous-duty rated: | 192 kg (424 lbs) |
| 10 A, continuous-duty rated: | 235 kg (519 lbs) |
| 15 A, continuous-duty rated: | 258 kg (568 lbs) |
| 25 A, continuous-duty rated: | 320 kg (705 lbs) |

| | |
|------------------------------------|---|
| 5 A, 10-second-duty rated: | 136 kg (300 lbs) |
| 10 A, 10-second-duty rated: | 136 kg (300 lbs) |
| 15 A, 10-second-duty rated: | 136 kg (300 lbs) |
| 25 A, 10-second-duty rated: | 136 kg (300 lbs) |
| Altitude | 0-1000 masl |
| Enclosure Style | NEMA 3R, galvanized steel |
| Finish | Powder coated |
| Color | ANSI 61 grey |
| Mounting | Floor mount |
| Siesmic Bracing | Included |
| Approvals | cULus or CSA at customer request |
| Warranty | 12 months in service or 18 months from the date of shipment, whichever occurs first |

Accessories



SE-325 Neutral Grounding Resistor Monitor

Basic ground-fault and neutral-grounding resistor monitoring relay that measures neutral current, neutral-to-ground voltage, and neutral-to-ground continuity.



SE-330 Neutral Grounding Resistor Monitor

Advanced ground-fault and neutral-grounding resistor monitoring relay that measures neutral current, neutral-to-ground voltage, and neutral-to-ground resistance.



NGRM-ENC Enclosed Neutral Grounding Resistor (NGR) Monitor

Type 4X enclosure housing a Littelfuse Startco SE-325 or SE-330 Neutral Grounding Resistor Monitor and optional accessories that include a 480/600 V control power transformer (CPT), faulted-phase indication (FPI; implemented with an EL3100 Ground-Fault & Phase-Voltage Indicator), earth-leakage panel meter, pulse-enable control, and mounting options. Appropriate fusing is included and field wiring is to terminal blocks.

Custom NGR Systems

Additional custom NGR systems are also available from Littelfuse. For NGR systems not listed on this sheet please contact Littelfuse by emailing NGRquotes@Littelfuse.com

Disclaimer Notice – Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/product-disclaimer.