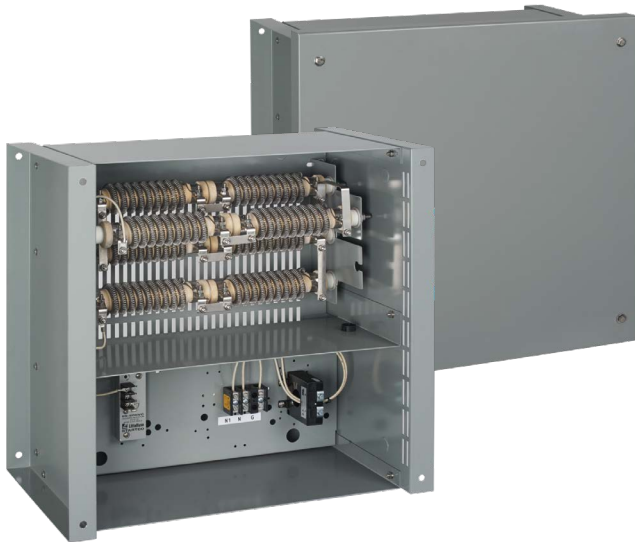
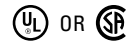


### Neutral Grounding Resistor System



### 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.

### 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.

### 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.



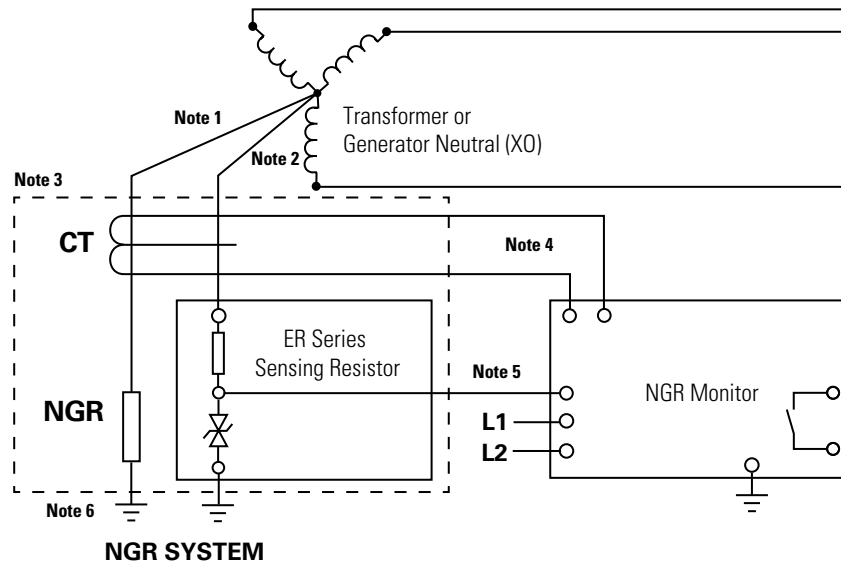
- CT200 used with the SE-325 for all applications.

- 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

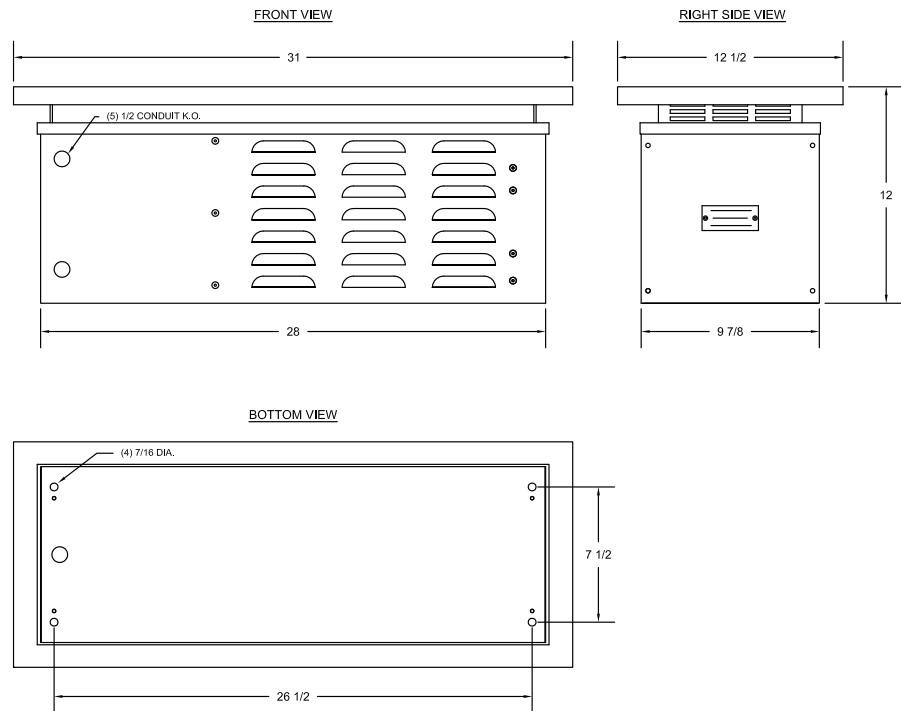
\*\* Connect to SE-330 terminals 9 and 11

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

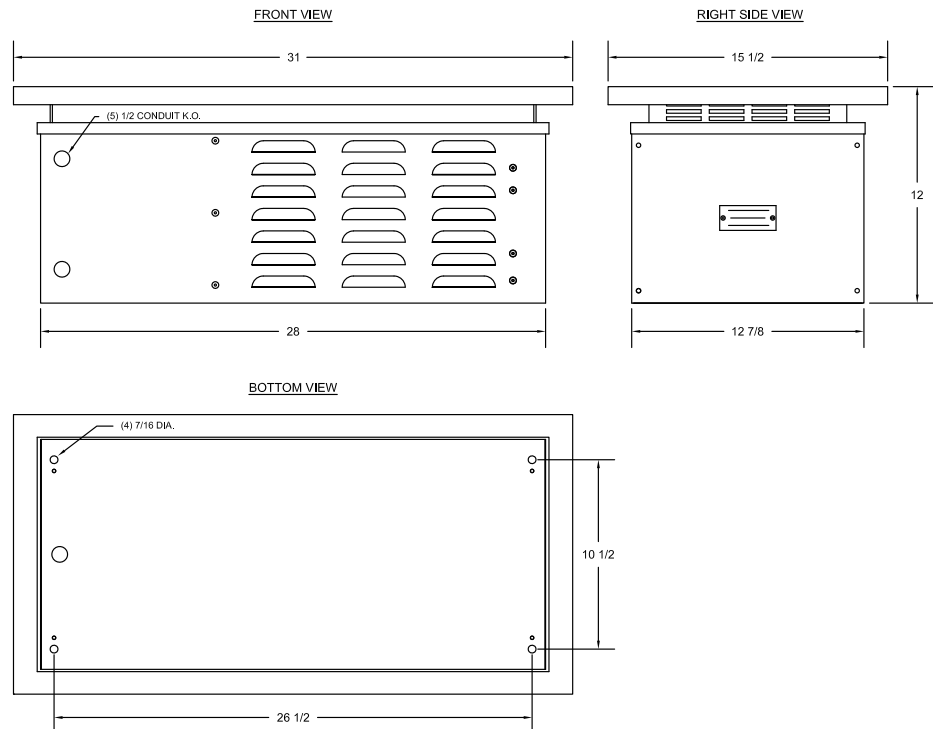
### Dimensions (in inches) and Mounting Diagrams

#### 480 V & 600 V NGR Systems:

- NGRUS314
- NGRUS316
- NGRUS318
- NGRUS320



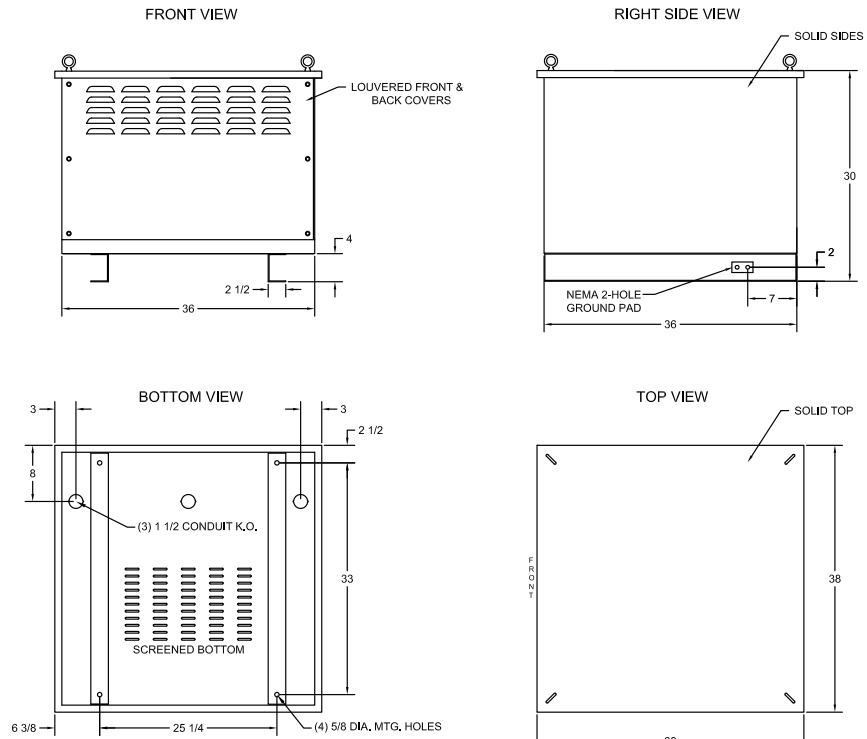
- NGRUS315
- NGRUS317
- NGRUS319
- NGRUS321



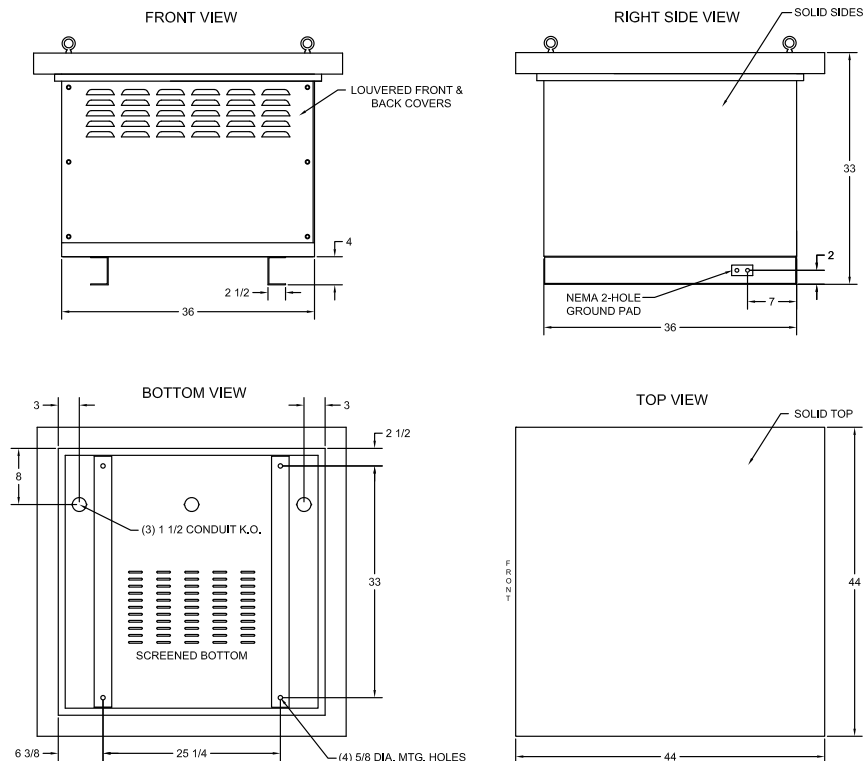
### Dimensions (in inches) and Mounting Diagrams

#### 4160 V NGR Systems:

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



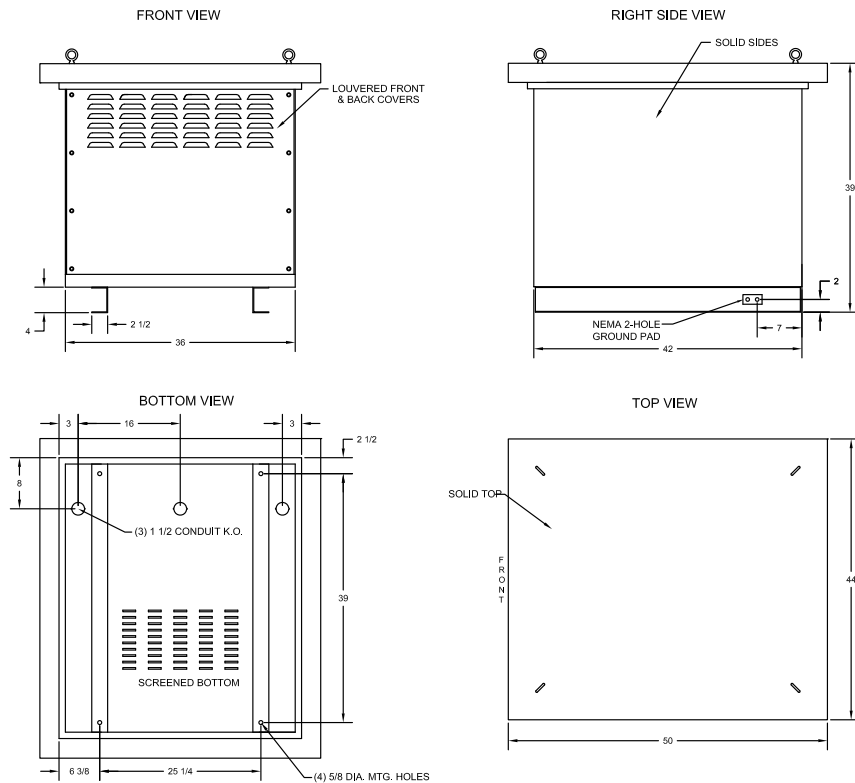
- NGRUS324
- NGRUS325



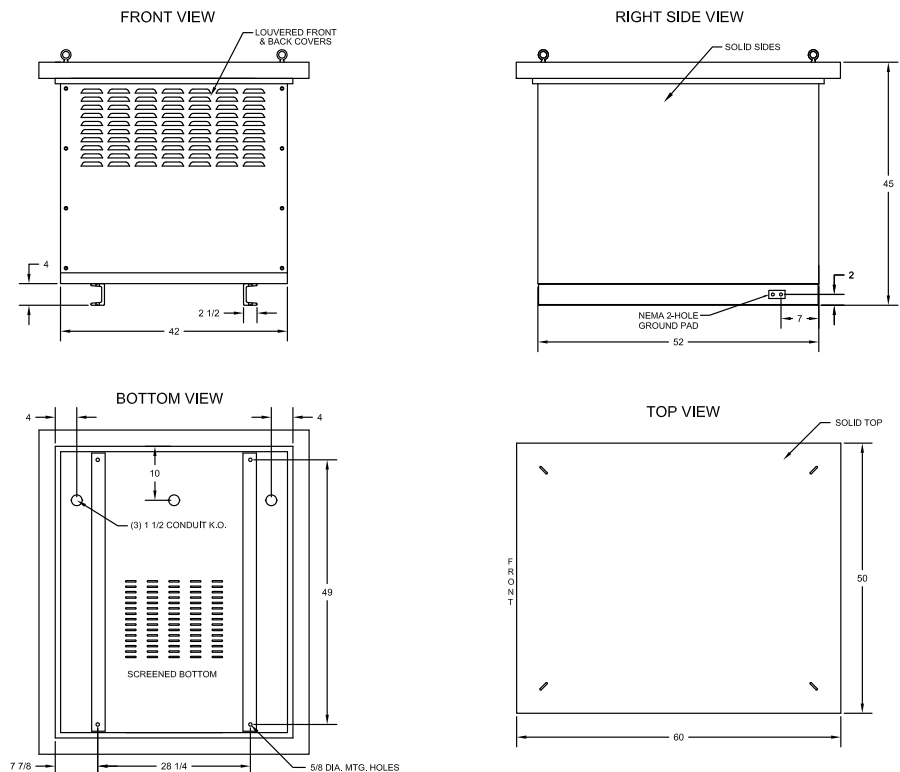
### Dimensions (in inches) and Mounting Diagrams

#### 4160 V NGR Systems:

- NGRUS328
- NGRUS329
- NGRUS332
- NGRUS333



- NGRUS336
- NGRUS337



# Protection Relays & Controls

## NGR SERIES – US

### Specifications: 480 V NGR Systems

<b>Voltage</b>	480 V line-to-line, 277 V line-to-neutral
<b>Let-Through Current</b>	2 A or 5 A
<b>Resistance</b>	138.5 $\Omega$ (2 A) or 55.4 $\Omega$ (5 A)
<b>Tolerance</b>	+/- 10 % resistance
<b>Duty Cycle</b>	Continuous rated
<b>Current Transformer</b>	<b>ELCT5-31:</b> 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") <b>CT200:</b> 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")
<b>Sensing Resistor</b>	ER-600VC; Optional installation in NEMA 4 enclosure for outdoor applications
<b>Insulation Level</b>	11 KV BIL
<b>Temperature Rise</b>	385 °C (725 °F)
<b>Resistor Type</b>	Stainless steel wire wound
<b>Dimensions</b>	Refer to dimensions drawings
<b>Weight</b>	23 kg (50 lbs)
<b>Altitude</b>	0–2000 masl
<b>Enclosure Style</b>	NEMA 3R, galvanized steel
<b>Finish</b>	Powder coated
<b>Color</b>	ANSI 61 grey
<b>Mounting</b>	Floor mount
<b>Siesmic Bracing</b>	Included
<b>Approvals</b>	cULus or CSA at customer request
<b>Warranty</b>	12 months in service or 18 months from the date of shipment whichever occurs first

### Specifications: 600 V NGR Systems

<b>Voltage</b>	600 V line-to-line, 347 V line-to-neutral
<b>Let-Through Current</b>	2 A or 5 A
<b>Resistance</b>	174 $\Omega$ (2 A) or 69 $\Omega$ (5 A)
<b>Tolerance</b>	+/- 10 % resistance
<b>Duty Cycle</b>	Continuous rated
<b>Frequency</b>	50–60 Hz
<b>Current Transformer</b>	<b>ELCT5-31:</b> 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") <b>CT200:</b> 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")
<b>Sensing Resistor</b>	ER-600VC; Optional installation in NEMA 4 enclosure for outdoor applications
<b>Insulation Level</b>	11 KV BIL
<b>Temperature Rise</b>	385 °C (725 °F)
<b>Resistor Type</b>	Stainless steel wire wound
<b>Dimensions</b>	Refer to dimensions drawings
<b>Weight</b>	23 kg (50 lbs)
<b>Altitude</b>	0–2000 masl
<b>Enclosure Style</b>	NEMA 3R, galvanized steel
<b>Finish</b>	Powder coated
<b>Color</b>	ANSI 61 grey
<b>Mounting</b>	Floor mount
<b>Siesmic Bracing</b>	Included
<b>Approvals</b>	cULus or CSA at customer request
<b>Warranty</b>	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

<b>Voltage</b>	4160 V line-to-line, 2400 V line-to-neutral
<b>Let-Through Current</b>	5 A, 10 A, 15 A, or 25 A
<b>Resistance</b>	480 Ω (5 A), 240 Ω (10 A), 160 Ω (15 A), or 96 Ω (25 A)
<b>Tolerance</b>	+/- 10 % resistance
<b>Duty Cycle</b>	Continuous-duty or 10-second-duty rating
<b>Frequency</b>	50-60 Hz
<b>Current Transformer</b>	<b>ELCT5-31:</b>

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")  
ER-5KV  
Optional ER-5WP for outdoor applications

#### **Sensing Resistor**

75 KV BIL

#### **Insulation Level**

#### **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**

<b>5 A, continuous-duty rated:</b>	192 kg (424 lbs)
<b>10 A, continuous-duty rated:</b>	235 kg (519 lbs)
<b>15 A, continuous-duty rated:</b>	258 kg (568 lbs)
<b>25 A, continuous-duty rated:</b>	320 kg (705 lbs)

<b>5 A, 10-second-duty rated:</b>	136 kg (300 lbs)
<b>10 A, 10-second-duty rated:</b>	136 kg (300 lbs)
<b>15 A, 10-second-duty rated:</b>	136 kg (300 lbs)
<b>25 A, 10-second-duty rated:</b>	136 kg (300 lbs)
<b>Altitude</b>	0-1000 masl
<b>Enclosure Style</b>	NEMA 3R, galvanized steel
<b>Finish</b>	Powder coated
<b>Color</b>	ANSI 61 grey
<b>Mounting</b>	Floor mount
<b>Siesmic Bracing</b>	Included
<b>Approvals</b>	cULus or CSA at customer request
<b>Warranty</b>	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](mailto:NGRquotes@Littelfuse.com)

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