

# 1321 Power Conditioning Products

Don't Ignore the Cost of Power Line Disturbance



| Topic                                                  | Page |
|--------------------------------------------------------|------|
| Additional Resources                                   | 2    |
| Summary of Changes                                     | 2    |
| Product Overview                                       | 2    |
| 1321-3R, 1321-3RA, and 1321-3RB Series Line Reactors   | 3    |
| 1321 Reflective Wave Reduction (RWR) Devices           | 13   |
| 1321-3TH/3TW Series Three-Phase Isolation Transformers | 17   |
| 1321-Mxxx Common Mode Chokes                           | 22   |
| 1321-DC DC Link Chokes                                 | 26   |



## Additional Resources

These documents contain additional information concerning related products from Rockwell Automation®.

| Resource                                                                                                                         | Description                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Wiring and Grounding Guidelines for Pulse Width Modulated (PWM) AC Drives, publication <a href="#">DRIVES-IN001</a>              | Basic information that is needed to properly wire and ground PWM AC drives.                   |
| Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control, publication <a href="#">SGI-1.1</a> | General guidelines for the application, installation, and maintenance of solid-state control. |

You can view or download publications at [rok.auto/literature](http://rok.auto/literature).

For Allen-Bradley® Drives Technical Support:

| Title                                  | Online at...                                                                    |
|----------------------------------------|---------------------------------------------------------------------------------|
| Allen-Bradley Drives Technical Support | <a href="http://rok.auto/support">rok.auto/support</a> or call (1) 262.512.8176 |

## Summary of Changes

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

| Topic                    | Page |
|--------------------------|------|
| Added Storage Guidelines | 5    |

## Product Overview

Allen-Bradley reactors help keep equipment running longer by absorbing many of the power line disturbances that can shut down your drive. Allen-Bradley isolation transformers can provide both voltage change and isolation for your variable speed drive. These designs are harmonic compensated and IGBT protected to help assure optimum performance in the presence of harmonics.



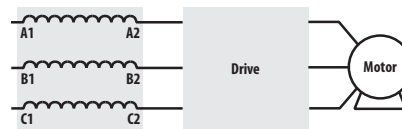
## 1321-3R, 1321-3RA, and 1321-3RB Series Line Reactors

### Applying Allen-Bradley Line Reactors

#### At the Input of the Drive

At the input of a drive, a line reactor helps protect against surges or spikes on the incoming power lines and help reduce harmonic distortion.

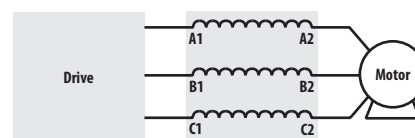
- Eliminate spurious tripping
- Improve true power factor
- Extend semiconductor life
- Reduce voltage notching
- Reduce harmonic distortion
- Meet IEEE-519 or EN-61800



#### At the Output of the Drive

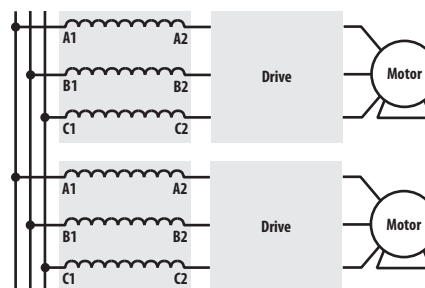
In long motor lead applications, Allen-Bradley load reactors that are located between the drive and motor help reduce  $dv/dt$  and motor terminal peak voltages. The use of a load reactor also helps protect the drive from surge currents that are caused by rapid changes in the load.

- Protect motors from long lead effects
- Reduce surge currents
- Reduce output voltage  $dv/dt$
- Reduce motor temperature
- Extend semiconductor life
- Reduce audible motor noise



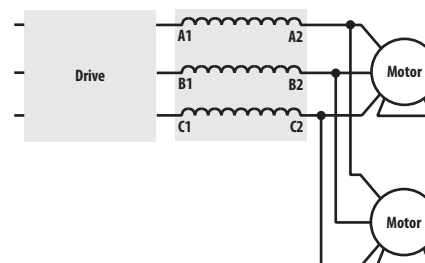
#### With Multiple Drives

Multiple drives on a common power line should each have their own line reactor. Individual line reactors provide filtering between each drive to help reduce any crosstalk while providing optimum surge protection for each drive.



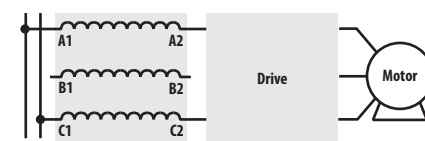
#### With Multiple Motors

When multiple motors are controlled by one drive, a line reactor can typically be used between the drive and all of the motors. Size the line reactor based on the total motor/load horsepower.



#### With Single-Phase Input

A three-phase reactor can be used for single-phase applications by routing each of the two input power conductors to the outside two coils, and leaving the center coil disconnected. The sum of the inductance of the two coils is the total inductance that is applied to the circuit. Contact Rockwell Automation Technical Support for assistance in specifying the proper reactor.



## Selecting the Correct Impedance Rating

### *Why is the Right Impedance Rating Important?*

Selecting the correct impedance rating is critical for your job. An impedance value that is too low may not limit peak current. An impedance value that is too high may reduce input voltage. Allen-Bradley line reactors offer two impedance ratings.

### *3% Impedance Rated Reactors to Reduce Spurious Trips*

Allen-Bradley line reactors that are rated at 3% are typically sufficient to absorb line spikes and motor current surges and will help prevent spurious tripping of drive and circuit breakers in most applications.

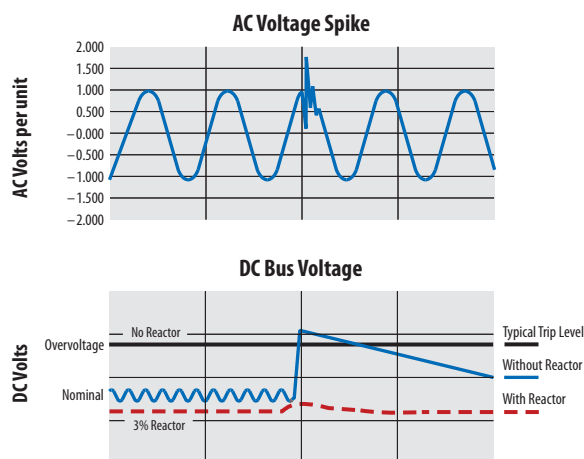
### *5% Impedance Rated Reactors to Reduce Harmonic Content*

Allen-Bradley reactors that are rated at 5% are best for reducing harmonic current and frequencies. These line reactors help comply with IEEE-519 (not normally used as load reactors).

### *Voltage Spike Protection*

Voltage spikes on AC power lines can cause elevation of the DC bus voltage, which may cause the drive to trip on an overvoltage condition.

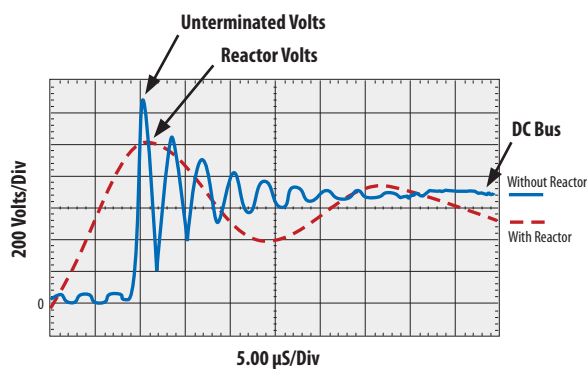
3% impedance reactors are effective at helping to protect drives against voltage spikes and spurious tripping. Allen-Bradley line reactors absorb these line spikes which help protect the drive from spurious tripping and damage.



### *Motor Protection*

Allen-Bradley load reactors can help protect motors from high peak voltages.

For IGBT drive applications with long drive-to-motor lead lengths, Allen-Bradley load reactors can help protect against fast dv/dt rise times.



## Storage Guidelines

1321 Line Reactor products that are not installed and energized immediately should follow the storage guidelines. Following these guidelines will help reduce the appearance of oxidation from forming on the laminate surface and edges.

- Do not remove the protective packaging.
- Do not store the product outdoors or in an unprotected area.
- Do not store the product in an area where it is exposed to a corrosive atmosphere.
- Do not store the product where condensation could occur.
- Store the product in a climate-controlled building with adequate air circulation.
- Store the product in a clean, dust free, and dry atmosphere.
- Maintain a relative humidity level of less than 60% non-condensing.
- Limit rate of relative humidity change to less than 10% per hour.
- Store products on a vapor barrier membrane to help prevent water vapor migration.



**ATTENTION:** The presence of oxidation does not indicate performance issues.

## Catalog Number Explanation

Position Number

|      |   |   |   |       |
|------|---|---|---|-------|
| 1-4  | 6 | 7 | 8 | 10    |
| 1321 | — | 3 | R | 4 — B |
| a    |   | b | c | d — e |

| a       |                      |
|---------|----------------------|
| Product |                      |
| Code    | Type                 |
| 1321    | 1321 Power Component |

| b      |             |
|--------|-------------|
| Phases |             |
| Code   | Description |
| 3      | Three-Phase |

| c                     |                 |
|-----------------------|-----------------|
| Device                |                 |
| Code                  | Description     |
| R, RB                 | Reactor, Open   |
| RA/RAB <sup>(1)</sup> | Reactor, NEMA 1 |

(1) RAB is only available in cabinet style 2 or 3.

| d                |      |
|------------------|------|
| Fundamental Amps |      |
| Code             | Amps |
| 1                | 1    |
| 2                | 2    |
| 4                | 4    |
| 8                | 8    |
| 12               | 12   |
| 18               | 18   |
| 25               | 25   |
| 35               | 35   |
| 45               | 45   |
| 55               | 55   |
| 80               | 80   |
| 100              | 100  |
| 130              | 130  |
| 160              | 160  |
| 200              | 200  |
| 250              | 250  |
| 320              | 320  |
| 400              | 400  |
| 500              | 500  |
| 600              | 600  |
| 750              | 750  |
| 850              | 850  |
| 1000             | 1000 |

| e                 |                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------|
| Inductance Rating |                                                                                                       |
| Code              | Description                                                                                           |
| A                 | Each reactor current rating has four inductance ratings also available. See the IP00 dimension table. |
| B                 |                                                                                                       |
| C                 |                                                                                                       |
| D                 |                                                                                                       |

## Common Specifications

| Specification         |                                                                                                                                 | Rating                                                                                                                                                                                                        |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material              | Enclosures                                                                                                                      | IP11 (NEMA/UL Type 1) – Sheet steel in accordance with UL, NEMA requirements                                                                                                                                  |
|                       |                                                                                                                                 | IP66 (Open) or IP20 (Open – with finger-safe terminals)                                                                                                                                                       |
|                       | Terminations <sup>(1)</sup>                                                                                                     | 1...45 amp (fundamental) Ratings – Finger guard IP20 terminal block                                                                                                                                           |
|                       |                                                                                                                                 | 55...160 amp (fundamental) Ratings – Solid copper box lugs                                                                                                                                                    |
|                       |                                                                                                                                 | 160...400 amp (fundamental) Ratings – Copper tab terminals <sup>(2)</sup>                                                                                                                                     |
|                       |                                                                                                                                 | 401 amps and above – Copper tab terminals <sup>(2)</sup>                                                                                                                                                      |
| Harmonic Compensation | All line reactors are compensated for the additional currents and high frequencies that are caused by the presence of harmonics |                                                                                                                                                                                                               |
| General Protection    | Impedance                                                                                                                       | 1.5%, 3%, or 5% based on the fundamental current ratings                                                                                                                                                      |
|                       | Overload Rating                                                                                                                 | 200% of fundamental current for 30 minutes<br>300% of fundamental current for 1 minute                                                                                                                        |
|                       | dv/dt Protection                                                                                                                | Meets NEMA MG-1, part 31                                                                                                                                                                                      |
| Electrical            | Maximum Rated Voltage                                                                                                           | 600V AC (units with terminal blocks)<br>690V AC (units with box lugs or tab terminals)                                                                                                                        |
|                       | Maximum Switching Freq.                                                                                                         | 20 kHz                                                                                                                                                                                                        |
|                       | Fundamental Frequency                                                                                                           | Line/Load - 50/60 Hz                                                                                                                                                                                          |
|                       | Temperature Rise                                                                                                                | 135 °C average                                                                                                                                                                                                |
|                       | Dielectric Strength                                                                                                             | 3000 Volts rms (4243 volts peaks)                                                                                                                                                                             |
|                       | Inductance Curve (Typical)                                                                                                      | 100% at 100% current<br>100% at 150% current<br>50% at 350% current (minimum)                                                                                                                                 |
|                       | Inductance Tolerance                                                                                                            | ±10%                                                                                                                                                                                                          |
|                       | Insulation System                                                                                                               | Class N (200 °C)                                                                                                                                                                                              |
|                       | Impregnation                                                                                                                    | High bond strength solventless epoxy, 200 °C, UL94HB recognized                                                                                                                                               |
| Environmental         | Ambient Temperature                                                                                                             | 50 °C Open Style Reactor (maximum)<br>40 °C Enclosed Style Reactor (maximum)                                                                                                                                  |
|                       | Altitude                                                                                                                        | 1000 meters (3280 feet)                                                                                                                                                                                       |
|                       | Storage Temperature (all const.)                                                                                                | -40...+70°C (-40...+158°F)                                                                                                                                                                                    |
|                       | Humidity                                                                                                                        | 5...95% noncondensing                                                                                                                                                                                         |
| Agency Approvals      | cULus<br>UL 508<br>CSA C22.2 Class N200C                                                                                        | File E196302 Component Listed (1...2400 amps)<br>File E196302 UL Listed NEMA Type 1 units (1...2400 amps)<br>Note: Short Circuit rating not required under Exception No.1 of UL508A SB4.2.1 effective 4/25/06 |
|                       | CE                                                                                                                              | Certified to EN61558-2-20:2011 and EN50581:2012                                                                                                                                                               |
|                       | Morocco                                                                                                                         | Compliance to NM EN 61800-5-1                                                                                                                                                                                 |
|                       | UKCA                                                                                                                            | Compliance to EN 61800-3, EN 61800-5-1, EN IEC 63000                                                                                                                                                          |

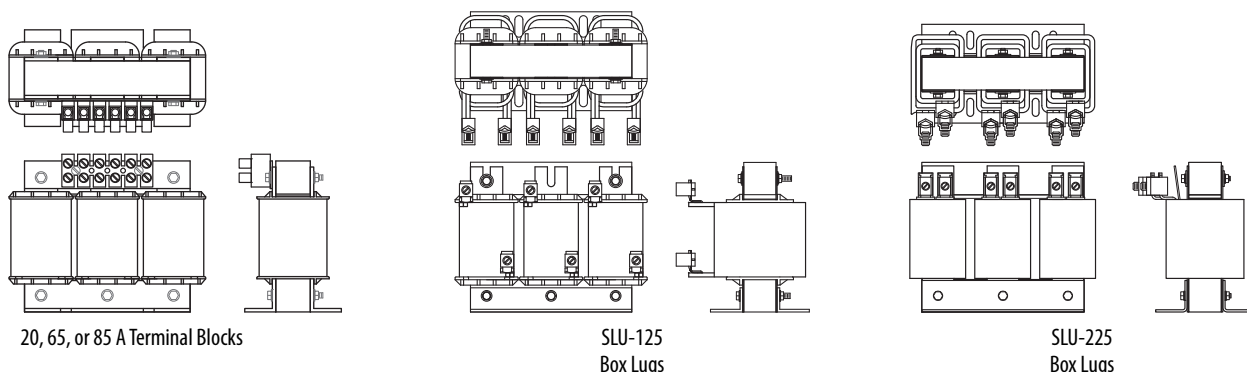
(1) For 160 amp rating, see the [Termination](#) section of this document for additional information.

(2) For applications with reactors rated 160 amps or more with copper tab terminals, cable-style connections are recommended.

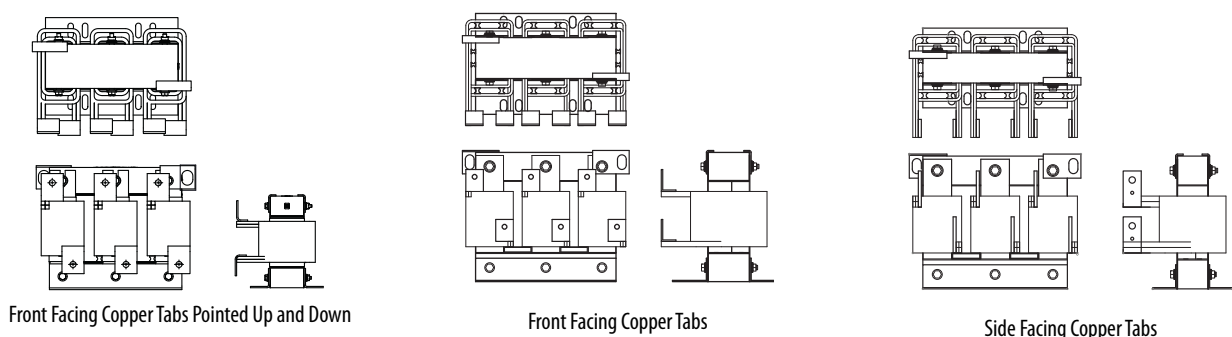
## Termination

Reactors are supplied with either an integral-mounted terminal block, box lugs, or copper tabs which are front facing or side facing. See the tables that follow and the [Catalog Number Explanation](#) for specific information. The '3R' and '3RA' designations for the 1321 line reactors indicate the following: 3R = Open Enclosure Line Reactor and 3RA = NEMA 1 Enclosure Line Reactor. The dimensions and weights that are provided on the pages that follow are for estimating purposes only. Tab orientation may vary.

### Typical Termination Types and Specifications



| Reactor Catalog Number       |                                | Termination         | Max/Min Wire Size     | Max Torque  |
|------------------------------|--------------------------------|---------------------|-----------------------|-------------|
| IP00 (Open) or IP20          | IP11 (NEMA/UL Type 1)          | Type                | mm <sup>2</sup> (AWG) | N·m (lb·in) |
| 1321-3R1-A to 1321-3R8-D     | 1321-3RA1-A to 1321-3RA8-D     | 20 A Terminal Block | 5.26 / 0.3 (10/22)    | 0.51 (4.5)  |
| 1321-3R12-A to 1321-3R35-B   | 1321-3RA12-A to 1321-3RA35-B   | 65 A Terminal Block | 16.0/0.3 (5/22)       | 1.81 (16)   |
| 1321-3R35-C to 1321-3R45-C   | 1321-3RA35-C to 1321-3RA45-C   | 85 A Terminal Block | 21.2/0.8 (4/18)       | 2.26 (20)   |
| 1321-3R55-A to 1321-3R100-C  | 1321-3RA55-A to 1321-3RA100-C  | SLU-125 Box Lug     | 50.0/10.0 (0/6)       | 5.09 (45)   |
| 1321-3R130-A to 1321-3R160-A | 1321-3RA130-A to 1321-3RA160-A | SLU-225 Box Lug     | 120.0/27.0 (0000/2)   | 16.95 (150) |

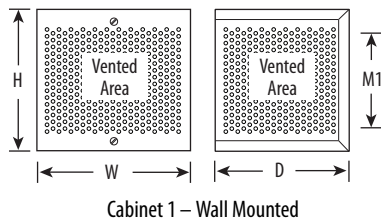


| Reactor Catalog Number         |                                  | Termination                     | Contact Surface (H x W)     | Hole Diameter                   |
|--------------------------------|----------------------------------|---------------------------------|-----------------------------|---------------------------------|
| IP00 (Open) or IP20 (R, RB)    | IP11 (NEMA/UL Type 1) (RA, RAB)  | Type                            | mm (in.)                    | mm (in.)                        |
| 1321-3R160-B to 1321-3R200-C   | 1321-3RA160-B to 1321-3RA200-C   | Front or Side Facing Copper Tab | 44.5 x 38.1 (1.75 x 1.5)    | 10.31 (0.406)                   |
| 1321-3RB250-A to 1321-3RB250-C | 1321-3RAB250-A to 1321-3RAB250-C |                                 | 47.63 x 38.10 (1.88 x 1.5)  | 10.31 (0.406)                   |
| 1321-3RB320-A to 1321-3R500-A  | 1321-3RAB320-A to 1321-3RA500-A  |                                 | 47.63 x 38.10 (1.88 x 1.5)  | 10.31 (0.406)                   |
| 1321-3R500-B to 1321-3R500-C   | 1321-3RA500-B to 1321-3RA500-C   | Side Facing Copper Tab          | 76.2 x 38.1 (3.00 x 1.5)    | 13.49 and 6.35 (0.531 and 0.25) |
| 1321-3R600-A to 1321-3R600-C   | 1321-3RA600-A to 1321-3RA-600-C  |                                 | 76.2 x 38.1 (3.00 x 1.5)    | 13.49 and 6.35 (0.531 and 0.25) |
| 1321-3R750-A to 1321-3R750-C   | 1321-3RA750-A to 1321-3RA750-C   |                                 | 76.2 x 38.1 (3.00 x 1.5)    | 13.49 and 6.35 (0.531 and 0.25) |
| 1321-3R850-A to 1321-3R1000-C  | 1321-3RA850-A to 1321-3RA1000-C  | Front Facing Copper Tab         | 95.25 x 95.25 (3.75 x 3.75) | x4 13.46 (0.53)                 |

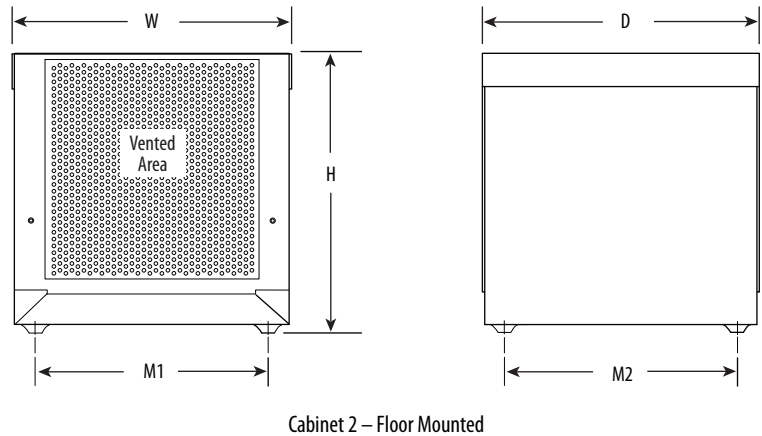
# Mounting Dimensions and Weights

**IMPORTANT** The dimensions and weights that are provided on the following pages are for estimating purposes only. Conduit entry locations for floor-mounted enclosures are the responsibility of the installer. Contact your Rockwell Automation sales office if certified drawings are required for planning and installation.

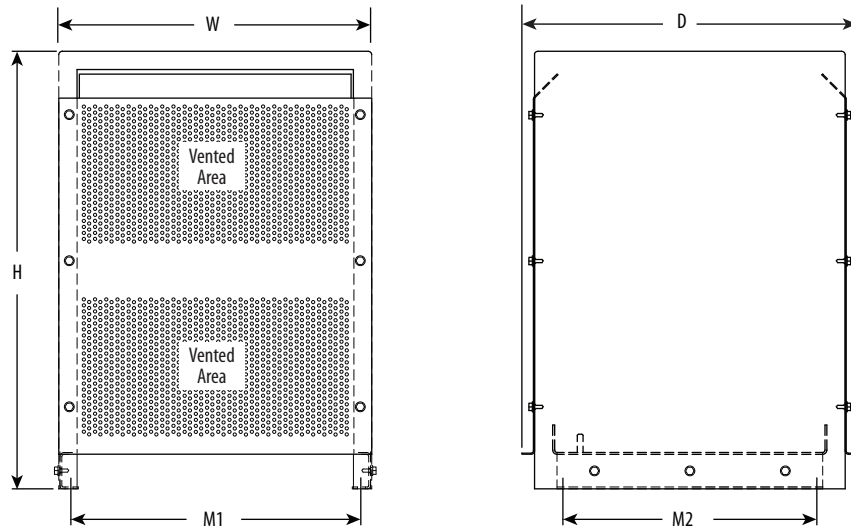
## IP11 (NEMA/UL Type 1)



| Catalog Number<br>1321- ... | Unit      | Dimensions in mm (in.) and Weights in kg (lb) |           |           |           |                       |
|-----------------------------|-----------|-----------------------------------------------|-----------|-----------|-----------|-----------------------|
|                             |           | H                                             | W         | D         | M1        | Weight (Cabinet Only) |
| 3RA1-A to 3RA18-B           | Cabinet 1 | 203 (8.0)                                     | 203 (8.2) | 152 (6.3) | 140 (5.5) | 3.2 (7)               |

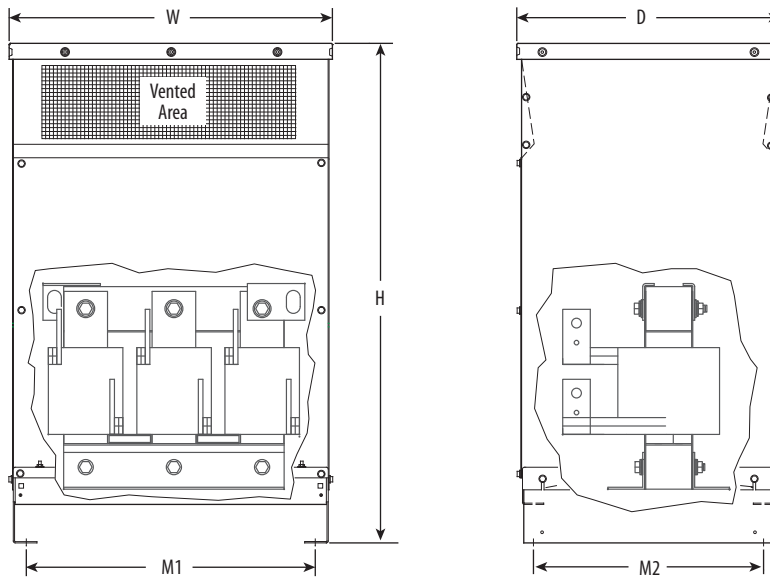


| Catalog Number<br>1321- ... | Unit      | Dimensions in mm (in.) and Weights in kg (lb) |            |            |            |            |                       |
|-----------------------------|-----------|-----------------------------------------------|------------|------------|------------|------------|-----------------------|
|                             |           | H                                             | W          | D          | Feet M1    | Feet M2    | Weight (Cabinet Only) |
| 3RA18-C to 3RAB250-A        | Cabinet 2 | 330 (13.0)                                    | 336 (13.2) | 332 (13.1) | 279 (11.0) | 279 (11.0) | 8.2 (18)              |



Cabinet 3 – Floor Mounted

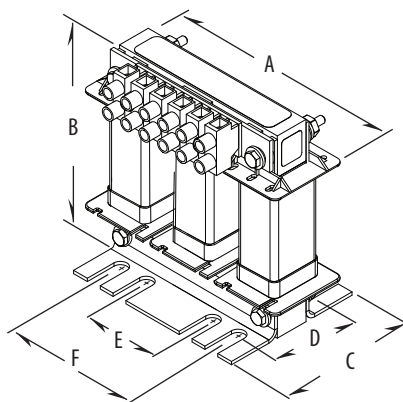
| Catalog Number<br>1321- ... | Unit      | Dimensions in mm (in.) and Weights in kg (lb) |            |            |            |            |                       |
|-----------------------------|-----------|-----------------------------------------------|------------|------------|------------|------------|-----------------------|
|                             |           | H                                             | W          | D          | Feet M1    | Feet M2    | Weight (Cabinet Only) |
| 3RAB250-B to 3RA500-A       | Cabinet 3 | 610 (24.0)                                    | 429 (16.9) | 467 (18.4) | 406 (16.0) | 343 (13.5) | 12.2 (27)             |



Cabinet 4 and Cabinet 5 – Floor Mounted

| Catalog Number<br>1321- ... | Unit      | Dimensions in mm (in.) and Weights in kg (lb) |            |            |            |            |                                      |
|-----------------------------|-----------|-----------------------------------------------|------------|------------|------------|------------|--------------------------------------|
|                             |           | H                                             | W          | D          | Feet M1    | Feet M2    | Weight <sup>(1)</sup> (Cabinet Only) |
| 3RA500-B to 3RA850-B        | Cabinet 4 | 1194 (47.0)                                   | 674 (26.6) | 633 (24.9) | 592 (23.3) | 552 (21.8) | 62.14 (137)                          |
| 3RA850-C to 3RA1000-C       | Cabinet 5 | 1829 (72.0)                                   | 674 (26.6) | 633 (24.9) | 592 (23.3) | 552 (21.8) | 75.3 (166)                           |

(1) For total weight - add enclosure weight to specific reactor weight.

*IP00/Open*

Use the reactor outline shown to reference dimensions in the Sizing Guidelines. Dimensions A, B, and C show the overall width, height, and depth, respectively. Dimensions D, E, and F show the mounting dimensions.

This diagram is for reference only - your actual product may differ in terminal location and type, as well as the number and type of mounting options.

*Sizing Guidelines*

Fundamental amps are used for sizing the reactor to be equal to or slightly higher than the total motor FLA. Sizing reactors to drive ampere ratings alone may result in mis-sizing the reactor.

| Catalog Number | Fundamental Amps | Inductance - mH<br>(Based on Fundamental Amps) | Watts Loss | Dimensions in mm (in.) and Weight in kg (lb) |             |            |                  |          |            |               |
|----------------|------------------|------------------------------------------------|------------|----------------------------------------------|-------------|------------|------------------|----------|------------|---------------|
|                |                  |                                                |            | A                                            | B           | C          | D <sup>(1)</sup> | E        | F          | Weight (apx.) |
| 1321-3R1-A     | 1                | 100                                            | 14.1       | 106.7 (4.2)                                  | 101.6 (4.0) | 76.2 (3.0) | 61 (2.4)         | 37 (1.4) | 65 (2.6)   | 1.8 (4.0)     |
| 1321-3R1-B     |                  | 50                                             | 14.8       | 111.8 (4.4)                                  | 104.1 (4.1) | 71.1 (2.8) | 50 (2.0)         | 37 (1.4) | 65 (2.6)   | 1.8 (4.0)     |
| 1321-3R1-C     |                  | 36                                             | 12         | 111.8 (4.4)                                  | 104.1 (4.1) | 71.1 (2.8) | 50 (2.0)         | 37 (1.4) | 65 (2.6)   | 1.8 (4.0)     |
| 1321-3R1-D     |                  | 18                                             | 8          | 111.8 (4.4)                                  | 104.1 (4.1) | 71.1 (2.8) | 50 (2.0)         | 37 (1.4) | 65 (2.6)   | 1.4 (3.0)     |
| 1321-3R2-A     | 2                | 12                                             | 7.5        | 106.7 (4.2)                                  | 101.6 (4.0) | 66 (2.6)   | 50 (2.0)         | 37 (1.4) | 65 (2.6)   | 1.8 (4.0)     |
| 1321-3R2-B     |                  | 20                                             | 11.3       | 106.7 (4.2)                                  | 101.6 (4.0) | 66 (2.6)   | 50 (2.0)         | 37 (1.4) | 65 (2.6)   | 1.8 (4.0)     |
| 1321-3R2-C     |                  | 32                                             | 16         | 106.7 (4.2)                                  | 101.6 (4.0) | 66 (2.6)   | 50 (2.0)         | 37 (1.4) | 65 (2.6)   | 1.8 (4.0)     |
| 1321-3R2-D     |                  | 6                                              | 10.7       | 106.7 (4.2)                                  | 101.6 (4.0) | 66 (2.6)   | 44 (1.7)         | 37 (1.4) | 65 (2.6)   | 1.4 (3.0)     |
| 1321-3R4-A     | 4                | 3                                              | 14.5       | 106.7 (4.2)                                  | 101.6 (4.0) | 66 (2.6)   | 50 (2.0)         | 37 (1.4) | 65 (2.6)   | 1.8 (4.0)     |
| 1321-3R4-B     |                  | 6.5                                            | 20         | 106.7 (4.2)                                  | 101.6 (4.0) | 66 (2.6)   | 50 (2.0)         | 37 (1.4) | 65 (2.6)   | 1.8 (4.0)     |
| 1321-3R4-C     |                  | 9                                              | 20         | 106.7 (4.2)                                  | 101.6 (4.0) | 76.2 (3.0) | 60 (2.4)         | 37 (1.4) | 65 (2.6)   | 2.3 (5.0)     |
| 1321-3R4-D     |                  | 12                                             | 21         | 106.7 (4.2)                                  | 101.6 (4.0) | 83.8 (3.3) | 66 (2.6)         | 37 (1.4) | 65 (2.6)   | 2.7 (6.0)     |
| 1321-3R8-A     | 8                | 1.5                                            | 19.5       | 149.9 (5.9)                                  | 116.8 (4.6) | 73.7 (2.9) | 53 (2.1)         | 51 (2.0) | 76.2 (3.0) | 3.2 (7.0)     |
| 1321-3R8-B     |                  | 3                                              | 29         | 149.9 (5.9)                                  | 116.8 (4.6) | 73.7 (2.9) | 53 (2.1)         | 51 (2.0) | 76.2 (3.0) | 3.6 (8.0)     |
| 1321-3R8-C     |                  | 5                                              | 25.3       | 149.9 (5.9)                                  | 119.4 (4.7) | 83.8 (3.3) | 67 (2.6)         | 51 (2.0) | 76.2 (3.0) | 5.0 (11.0)    |
| 1321-3R8-D     |                  | 7.5                                            | 28         | 149.9 (5.9)                                  | 119.4 (4.7) | 83.8 (3.3) | 63 (2.5)         | 51 (2.0) | 76.2 (3.0) | 5.9 (13.0)    |
| 1321-3R12-A    | 12               | 1.25                                           | 26         | 149.9 (5.9)                                  | 127 (5.0)   | 81.3 (3.2) | 53 (2.1)         | 51 (2.0) | 76.2 (3.0) | 4.1 (9.0)     |
| 1321-3R12-B    |                  | 2.5                                            | 31         | 149.9 (5.9)                                  | 127 (5.0)   | 81.3 (3.2) | 53 (2.1)         | 51 (2.0) | 76.2 (3.0) | 4.5 (10.0)    |
| 1321-3R12-C    |                  | 4.2                                            | 41         | 149.9 (5.9)                                  | 127 (5.0)   | 96.5 (3.8) | 70 (2.8)         | 51 (2.0) | 76.2 (3.0) | 8.2 (18.0)    |
| 1321-3R18-A    | 18               | 0.8                                            | 36         | 149.9 (5.9)                                  | 129.5 (5.1) | 81.3 (3.2) | 54 (2.1)         | 51 (2.0) | 76.2 (3.0) | 4.1 (9.0)     |
| 1321-3R18-B    |                  | 1.5                                            | 43         | 149.9 (5.9)                                  | 129.5 (5.1) | 88.9 (3.5) | 63 (2.5)         | 51 (2.0) | 76.2 (3.0) | 5.4 (12.0)    |
| 1321-3R18-C    |                  | 2.5                                            | 43         | 180.3 (7.1)                                  | 144.8 (5.7) | 94 (3.7)   | 66 (2.6)         | 76 (3.0) | 76.2 (3.0) | 7.3 (16.0)    |

| Catalog Number | Fundamental Amps | Inductance - mH<br>(Based on Fundamental Amps) | Watts Loss | Dimensions in mm (in.) and Weight in kg (lb) |              |              |                  |           |              |               |
|----------------|------------------|------------------------------------------------|------------|----------------------------------------------|--------------|--------------|------------------|-----------|--------------|---------------|
|                |                  |                                                |            | A                                            | B            | C            | D <sup>(1)</sup> | E         | F            | Weight (apx.) |
| 1321-3R25-A    | 25               | 0.5                                            | 48         | 180.3 (7.1)                                  | 144.8 (5.7)  | 86.7 (3.4)   | 60 (2.4)         | 76 (3.0)  | 76.2 (3.0)   | 5.0 (11.0)    |
| 1321-3R25-B    |                  | 1.2                                            | 52         | 180.3 (7.1)                                  | 147.3 (5.8)  | 86.7 (3.4)   | 60 (2.4)         | 76 (3.0)  | 76.2 (3.0)   | 6.4 (14.0)    |
| 1321-3R25-C    |                  | 1.8                                            | 61         | 180.3 (7.1)                                  | 147.3 (5.8)  | 106.7 (4.2)  | 79 (3.1)         | 76 (3.0)  | 76.2 (3.0)   | 9.1 (20.0)    |
| 1321-3R35-A    | 35               | 0.4                                            | 49         | 180.3 (7.1)                                  | 144.8 (5.7)  | 94 (3.7)     | 66 (2.6)         | 76 (3.0)  | 76.2 (3.0)   | 6.4 (14.0)    |
| 1321-3R35-B    |                  | 0.8                                            | 54         | 180.3 (7.1)                                  | 147.3 (5.8)  | 94 (3.7)     | 70 (2.8)         | 76 (3.0)  | 76.2 (3.0)   | 7.3 (16.0)    |
| 1321-3R35-C    |                  | 1.2                                            | 54         | 226.1 (8.9)                                  | 182.9 (7.2)  | 116.8 (4.6)  | 80 (3.2)         | 76 (3.0)  | 108 (4.3)    | 11.8 (26.0)   |
| 1321-3R45-A    | 45               | 0.3                                            | 54         | 226.1 (8.9)                                  | 180.3 (7.1)  | 116.8 (4.6)  | 80 (3.2)         | 76 (3.0)  | 108 (4.3)    | 10.0 (22.0)   |
| 1321-3R45-B    |                  | 0.7                                            | 62         | 226.1 (8.9)                                  | 182.9 (7.2)  | 116.8 (4.6)  | 80 (3.2)         | 76 (3.0)  | 108 (4.3)    | 11.8 (26.0)   |
| 1321-3R45-C    |                  | 1.2                                            | 65         | 226.1 (8.9)                                  | 185.4 (7.3)  | 129.5 (5.1)  | 93 (3.7)         | 76 (3.0)  | 108 (4.3)    | 15.4 (34.0)   |
| 1321-3R55-A    | 55               | 0.25                                           | 64         | 228.6 (9.0)                                  | 175.3 (6.9)  | 134.6 (5.3)  | 80 (3.2)         | 76 (3.0)  | 108 (4.3)    | 10.9 (24.0)   |
| 1321-3R55-B    |                  | 0.5                                            | 67         | 228.6 (9.0)                                  | 175.3 (6.9)  | 134.6 (5.3)  | 80 (3.2)         | 76 (3.0)  | 108 (4.3)    | 11.8 (26.0)   |
| 1321-3R55-C    |                  | 0.85                                           | 71         | 226.1 (8.9)                                  | 175.3 (6.9)  | 160 (6.3)    | 99 (3.9)         | 76 (3.0)  | 108 (4.3)    | 15.4 (34.0)   |
| 1321-3R80-A    | 80               | 0.2                                            | 82         | 226.1 (8.9)                                  | 175.3 (6.9)  | 144.8 (5.7)  | 88 (3.5)         | 92 (3.63) | 108 (4.3)    | 11.3 (25.0)   |
| 1321-3R80-B    |                  | 0.4                                            | 86         | 226.1 (8.9)                                  | 180.3 (7.1)  | 144.8 (5.7)  | 88 (3.5)         | 92 (3.63) | 108 (4.3)    | 15 (33.0)     |
| 1321-3R80-C    |                  | 0.7                                            | 96         | 274.3 (10.8)                                 | 215.9 (8.5)  | 167.6 (6.6)  | 106 (4.2)        | 92 (3.63) | 141.7 (5.6)  | 28.6 (63.0)   |
| 1321-3R100-A   | 100              | 0.15                                           | 94         | 226.1 (8.9)                                  | 177.8 (7.0)  | 152.4 (6.0)  | 88 (3.5)         | 92 (3.63) | 108 (4.3)    | 13.2 (29.0)   |
| 1321-3R100-B   |                  | 0.3                                            | 84         | 226.1 (8.9)                                  | 177.8 (7.0)  | 167.6 (6.6)  | 93 (3.7)         | 92 (3.63) | 108 (4.3)    | 16.8 (37.0)   |
| 1321-3R100-C   |                  | 0.45                                           | 108        | 274.3 (10.8)                                 | 213.4 (8.4)  | 198.1 (7.8)  | 106 (4.2)        | 92 (3.63) | 141.7 (5.6)  | 30.4 (67.0)   |
| 1321-3R130-A   | 130              | 0.1                                            | 108        | 243.8 (9.6)                                  | 185.4 (7.3)  | 149.9 (5.9)  | 80 (3.2)         | 76 (3.0)  | 108 (4.3)    | 13.2 (29.0)   |
| 1321-3R130-B   |                  | 0.2                                            | 180        | 243.8 (9.6)                                  | 182.9 (7.2)  | 152.4 (6.0)  | 93 (3.7)         | 92 (3.63) | 108 (4.3)    | 19.5 (43.0)   |
| 1321-3R130-C   |                  | 0.3                                            | 128        | 274.3 (10.8)                                 | 215.9 (8.5)  | 185.4 (7.3)  | 106 (4.2)        | 92 (3.63) | 141.7 (5.6)  | 29 (64.0)     |
| 1321-3R160-A   | 160              | 0.075                                          | 116        | 243.8 (9.6)                                  | 182.9 (7.2)  | 152.4 (6.0)  | 80 (3.2)         | 92 (3.63) | 108 (4.3)    | 18.6 (41.0)   |
| 1321-3R160-B   |                  | 0.15                                           | 149        | 274.3 (10.8)                                 | 213.4 (8.4)  | 170.2 (6.7)  | 88 (3.5)         | 92 (3.63) | 141.7 (5.6)  | 24.5 (54.0)   |
| 1321-3R160-C   |                  | 0.23                                           | 138        | 274.3 (10.8)                                 | 215.9 (8.5)  | 187 (7.4)    | 118 (4.7)        | 92 (3.63) | 141.7 (5.6)  | 33.6 (74.0)   |
| 1321-3R200-A   | 200              | 0.055                                          | 124        | 243.8 (9.6)                                  | 182.9 (7.2)  | 180.3 (7.1)  | 106 (4.2)        | 92 (3.63) | 108 (4.3)    | 17.2 (38.0)   |
| 1321-3R200-B   |                  | 0.11                                           | 168        | 243.8 (9.6)                                  | 182.9 (7.2)  | 200.7 (7.9)  | 112 (4.4)        | 92 (3.63) | 108 (4.3)    | 24.5 (54.0)   |
| 1321-3R200-C   |                  | 0.185                                          | 146        | 274.3 (10.8)                                 | 210.8 (8.3)  | 231.1 (9.1)  | 150 (5.9)        | 92 (3.63) | 141.7 (5.6)  | 45.4 (100.0)  |
| 1321-3RB250-A  | 250              | 0.045                                          | 154        | 243.8 (9.6)                                  | 177.8 (7.0)  | 205.7 (8.1)  | 106 (4.2)        | 92 (3.63) | 108 (4.3)    | 21.3 (47.0)   |
| 1321-3RB250-B  |                  | 0.09                                           | 231        | 274.3 (10.8)                                 | 215.9 (8.5)  | 193 (7.6)    | 131 (5.2)        | 117 (4.6) | 141.7 (5.6)  | 36.3 (80.0)   |
| 1321-3RB250-C  |                  | 0.15                                           | 588        | 363.2 (14.3)                                 | 284.5 (11.2) | 221 (8.7)    | 148 (5.8)        | 117 (4.6) | 182.89 (7.2) | 56.7 (125.0)  |
| 1321-3RB320-A  | 320              | 0.04                                           | 224        | 274.3 (10.8)                                 | 213.4 (8.4)  | 200.7 (7.9)  | 131 (5.2)        | 117 (4.6) | 141.7 (5.6)  | 36.3 (80.0)   |
| 1321-3RB320-B  |                  | 0.075                                          | 264        | 274.3 (10.8)                                 | 213.4 (8.4)  | 226.1 (8.9)  | 149 (5.9)        | 117 (4.6) | 141.7 (5.6)  | 46.3 (102.0)  |
| 1321-3RB320-C  |                  | 0.125                                          | 642        | 363.2 (14.3)                                 | 281.9 (11.1) | 238.8 (9.4)  | 181 (7.1)        | 117 (4.6) | 182.9 (7.2)  | 72.6 (160.0)  |
| 1321-3RB400-A  | 400              | 0.03                                           | 213        | 279.4 (11.0)                                 | 213.4 (8.4)  | 218.4 (8.6)  | 131 (5.2)        | 117 (4.6) | 141.7 (5.6)  | 38.1 (84.0)   |
| 1321-3RB400-B  |                  | 0.06                                           | 571        | 363.2 (14.3)                                 | 281.9 (11.1) | 238.8 (9.4)  | 172 (6.8)        | 117 (4.6) | 182.9 (7.2)  | 53.5 (118.0)  |
| 1321-3RB400-C  |                  | 0.105                                          | 293        | 363.2 (14.3)                                 | 281.9 (11.1) | 276.9 (10.9) | 184 (7.3)        | 117 (4.6) | 182.9 (7.2)  | 67.6 (149.0)  |
| 1321-3R500-A   | 500              | 0.025                                          | 226        | 274.3 (10.8)                                 | 215.9 (8.5)  | 238.8 (9.4)  | 140 (5.5)        | 117 (4.6) | 141.7 (5.6)  | 42.2 (93.0)   |
| 1321-3R500-B   |                  | 0.05                                           | 694        | 363.2 (14.3)                                 | 281.9 (11.1) | 269.2 (10.6) | 172 (6.8)        | 117 (4.6) | 182.9 (7.2)  | 72.6 (160.0)  |
| 1321-3R500-C   |                  | 0.085                                          | 985        | 363.2 (14.3)                                 | 281.9 (11.1) | 330.2 (13.0) | 248 (9.8)        | 117 (4.6) | 182.9 (7.2)  | 95.3 (210.0)  |

| Catalog Number | Fundamental Amps | Inductance - mH<br>(Based on Fundamental Amps) | Watts Loss | Dimensions in mm (in.) and Weight in kg (lb) |              |              |                  |           |             |               |
|----------------|------------------|------------------------------------------------|------------|----------------------------------------------|--------------|--------------|------------------|-----------|-------------|---------------|
|                |                  |                                                |            | A                                            | B            | C            | D <sup>(1)</sup> | E         | F           | Weight (apx.) |
| 1321-3R600-A   | 600              | 0.02                                           | 609        | 363.2 (14.3)                                 | 281.9 (11.1) | 223.5 (8.8)  | 134 (5.3)        | 117 (4.6) | 182.9 (7.2) | 54.4 (120.0)  |
| 1321-3R600-B   |                  | 0.04                                           | 689        | 363.2 (14.3)                                 | 281.9 (11.1) | 279.4 (11.0) | 203 (8.0)        | 117 (4.6) | 182.9 (7.2) | 79.4 (175.0)  |
| 1321-3R600-C   |                  | 0.065                                          | 406        | 363.2 (14.3)                                 | 281.9 (11.1) | 342.9 (13.5) | 235 (9.3)        | 117 (4.6) | 182.9 (7.2) | 122.5 (270.0) |
| 1321-3R750-A   | 750              | 0.015                                          | 713        | 363.2 (14.3)                                 | 284.5 (11.2) | 264.2 (10.4) | 168 (6.6)        | 183 (7.2) | 182.9 (7.2) | 63.5 (140.0)  |
| 1321-3R750-B   |                  | 0.029                                          | 630        | 363.2 (14.3)                                 | 281.9 (11.1) | 292.1 (11.5) | 204 (8.0)        | 183 (7.2) | 182.9 (7.2) | 86.2 (190.0)  |
| 1321-3R750-C   |                  | 0.048                                          | 552        | 355.6 (14.0)                                 | 358.1 (14.1) | 330.2 (13.0) | 242 (9.5)        | 183 (7.2) | 182.9 (7.2) | 120.2 (265.0) |
| 1321-3R850-A   | 850              | 0.015                                          | 798'       | 452.1 (17.8)                                 | 393.7 (15.5) | 375.9 (14.8) | 199.6 (7.9)      | 183 (7.2) | 182.9 (7.2) | 88.5 (195.0)  |
| 1321-3R850-B   |                  | 0.027                                          | 930        | 452.1 (17.8)                                 | 393.7 (15.5) | 393.7 (15.5) | —                | —         | 182.9 (7.2) | 97.5 (215.0)  |
| 1321-3R850-C   |                  | 0.042                                          | 1133       | 452.1 (17.8)                                 | 401.3 (15.8) | 444.5 (17.5) | —                | —         | 182.9 (7.2) | 142.9 (315.0) |
| 1321-3R1000-B  | 1000             | 0.022                                          | 1080       | 431.8 (17.0)                                 | 370.8 (14.6) | 373.4 (14.7) | —                | —         | 182.9 (7.2) | 97.5 (215.0)  |
| 1321-3R1000-C  |                  | 0.038                                          | 1250       | 431.8 (17.0)                                 | 370.8 (14.6) | 436.9 (17.2) | —                | —         | 182.9 (7.2) | 142.9 (315.0) |

(1) Removable lifting rings are supplied with the unit.

# 1321 Reflective Wave Reduction (RWR) Devices

## Description of Reflected Wave Phenomenon

The inverter section of a drive does not produce sinusoidal voltage, but rather a series of voltage pulses created from the DC bus. These pulses travel down the motor cables to the motor and then reflected back to the drive. The reflection is dependent on the rise time of the drive output voltage, cable characteristics, cable length, and motor impedance. If the voltage reflection is combined with another subsequent pulse, peak voltages can be at a destructive level. An IGBT drive output may have reflected wave transient voltage stresses of up to twice (2 pu or per unit) the DC bus voltage between its own output wires. Multiple drive output wires in a single conduit or wire tray further increase output wire voltage stress between multi-drive output wires that are touching. Drive #1 may have a (+) 2 pu stress while drive #2 may simultaneously have a (–) 2 pu stress.

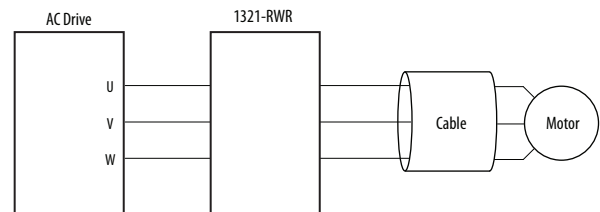
For more details, see the Wiring and Grounding Guidelines for PWM Drives, publication [DRIVES-IN001](#).

## Applying RWR Devices

### At the Output of the Drive

In long motor lead applications, an Allen-Bradley 1321 RWR located between the drive and motor helps to reduce  $dv/dt$  and motor terminal peak voltages. The use of an RWR device also helps protect the drive from surge currents that are caused by rapid changes in the load.

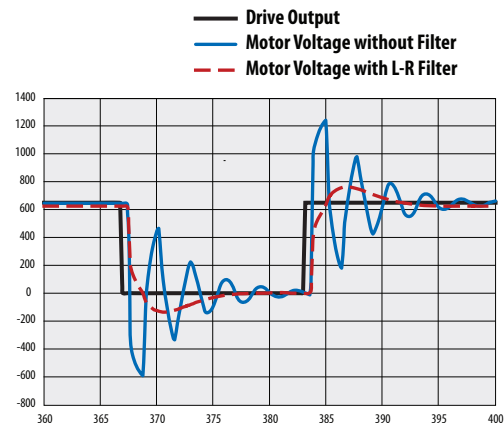
- Protect motors from long lead effects
- Reduce output voltage  $dv/dt$
- Extend semiconductor life
- Reduce surge currents
- Reduce motor temperature
- Reduce audible motor noise



### Motor Protection

Allen-Bradley Reflective Wave Reduction devices can help protect motors from high peak voltages.

For IGBT drive applications with long drive-to-motor lead lengths, Allen-Bradley RWR devices can help protect against fast  $dv/dt$  rise times.



## Catalog Number Explanation

**IMPORTANT** 1321-RWR products replace existing 1204-RWR products. However, 1204-RWRC modules (RWR and Common Mode Choke assembly) are still available.

1-8                      Position  
 1321 – RWR      8      –      D      P  
                          a                      b                      c                      d

| a        |                                  |
|----------|----------------------------------|
| Product  |                                  |
| Code     | Type                             |
| 1321-RWR | Reflective Wave Reduction Device |

| c              |             |
|----------------|-------------|
| Voltage Rating |             |
| Code           | Voltage     |
| D              | 400/480V AC |
| E              | 600V AC     |

| d         |             |
|-----------|-------------|
| Enclosure |             |
| Code      | Description |
| P         | Panel Mount |

| b1          |                  |
|-------------|------------------|
| Rating      |                  |
| 400-480V AC |                  |
| Code        | Fundamental Amps |
| 8           | 8                |
| 12          | 12               |
| 18          | 18               |
| 25          | 25               |
| 35          | 35               |
| 45          | 45               |
| 55          | 55               |
| 80          | 80               |
| 100         | 100              |
| 130         | 130              |
| 160         | 160              |
| 200         | 200              |
| 250         | 250              |
| 320         | 320              |

| b2      |                  |
|---------|------------------|
| Rating  |                  |
| 600V AC |                  |
| Code    | Fundamental Amps |
| 8       | 8                |
| 12      | 12               |
| 18      | 18               |
| 25      | 25               |
| 35      | 35               |
| 45      | 45               |
| 55      | 55               |
| 80      | 80               |
| 100     | 100              |
| 130     | 130              |
| 160     | 160              |
| 200     | 200              |
| 250     | 250              |

## Specifications

| Specification         |                                                                                                                                 | Rating                                                                              |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Material              | Enclosures                                                                                                                      | IP00 (Open)                                                                         |
|                       | Terminations                                                                                                                    | 1...45 amp (fundamental) Ratings – Finger guard IP20 terminal block                 |
|                       |                                                                                                                                 | 80...160 amp (fundamental) Ratings – Solid copper box lugs                          |
|                       |                                                                                                                                 | 200...400 amp (fundamental) Ratings – Copper tab terminals <sup>(1)</sup>           |
|                       |                                                                                                                                 | 401 amps and above – Copper tab terminals <sup>(1)</sup>                            |
| Harmonic Compensation | All line reactors are compensated for the additional currents and high frequencies that are caused by the presence of harmonics |                                                                                     |
| General Protection    | Impedance                                                                                                                       | 3%                                                                                  |
|                       | Overload Rating                                                                                                                 | 300% of fundamental current for (1) minute                                          |
| IGBT Protection       | First turn triple insulated offering protection up to 16 kV                                                                     | 16,000 Volts per microsecond dv/dt protection<br>20 kHz maximum switching frequency |
| Electrical            | Maximum Rated Voltage                                                                                                           | 600V AC, 50/60 Hz frequency                                                         |
|                       | Maximum Switching Freq.                                                                                                         | 4 kHz                                                                               |
|                       | Temperature Rise                                                                                                                | 115 °C                                                                              |
|                       | Dielectric Strength                                                                                                             | 4000 Volts rms (5600 volts peaks)                                                   |
|                       | Inductance Curve                                                                                                                | 100% at 100% current, 100% at 150% current, 50% at 350% current                     |
|                       | Insulation System                                                                                                               | Class H (180 °C or better)                                                          |
|                       | Impregnation                                                                                                                    | High bond strength epoxy impregnation, 4000V high dielectric strength               |
| Environmental         | Ambient Temperature                                                                                                             | 45 °C                                                                               |
|                       | U.L. Listed                                                                                                                     | UL-508 - IP00, IP20, and IP11                                                       |
|                       | International                                                                                                                   | Conforms to VDE 0550                                                                |
|                       | CE                                                                                                                              | Not certified                                                                       |
|                       | Storage Temperature (all const.)                                                                                                | -40...+70°C (-40...+158°F)                                                          |
|                       | Humidity                                                                                                                        | 5...95% noncondensing                                                               |

(1) For applications with Reflective Wave Reduction devices rated 200 amps or more, cable-style connections are recommended.

## Termination

Allen-Bradley 1321 RWR devices rated 45 amps (fundamental) and below are supplied with an integral mounted terminal block. Devices that are rated 55...160 amps (fundamental) are supplied with box lugs. Devices rated 200...400 amps (fundamental) can be supplied with box lugs or copper tabs. Above 400 amps (fundamental), solid copper tabs are used.

## Approximate Dimensions, Weights, Wire Size, and Terminal Blocks

The dimensions and weights that are provided on the following page is for estimating purposes only. Contact your Rockwell Automation sales office if certified drawings are required for planning and installation.

| RWR Catalog No.<br>x = D (400V), E (600V) | Fund.<br>Amps | Cont.<br>Amps | Wire Size                        | Watts Loss |      | Figure<br>(see <a href="#">page 16</a> ) | Dimensions mm (in.) |                  |                 |                |                           | Weight<br>kg (lb) |
|-------------------------------------------|---------------|---------------|----------------------------------|------------|------|------------------------------------------|---------------------|------------------|-----------------|----------------|---------------------------|-------------------|
|                                           |               |               | mm <sup>2</sup> (AWG)            | 400V       | 600V |                                          | A                   | B                | C               | D              | E                         |                   |
| 1321-RWR8-xP                              | 8             | 12            | 2.5...4.0<br>(14...12)           | 389        | 536  | 1                                        | 282.6<br>(11.13)    | 298.5<br>(11.75) | 171.5<br>(6.75) | 7.4<br>(0.29)  | 7.4 x 11.6 (0.29 x 0.46)  | 4.8 (10.5)        |
| 1321-RWR12-xP                             | 12            | 18            | 2.5...4.0<br>(14...12)           | 391        | 406  | 1                                        | 282.6<br>(11.13)    | 298.5<br>(11.75) | 174.6<br>(6.88) | 7.4<br>(0.29)  | 7.4 x 11.6 (0.29 x 0.46)  | 5.7 (12.5)        |
| 1321-RWR18-xP                             | 18            | 27            | 2.5...4.0<br>(14...12)           | 403        | 551  | 1                                        | 282.6<br>(11.13)    | 298.5<br>(11.75) | 174.6<br>(6.88) | 7.4<br>(0.29)  | 7.4 x 11.6 (0.29 x 0.46)  | 7.3 (16)          |
| 1321-RWR25-xP                             | 25            | 37.5          | 6.0 (10)                         | 412        | 562  | 1                                        | 282.6<br>(11.13)    | 298.5<br>(11.75) | 193.7<br>(7.63) | 7.4<br>(0.29)  | 7.4 x 11.6 (0.29 x 0.46)  | 7.7 (17)          |
| 1321-RWR35-xP                             | 35            | 52.5          | 10.0...16.0<br>(8...6)           | 414        | 429  | 1                                        | 282.6<br>(11.13)    | 298.5<br>(11.75) | 193.7<br>(7.63) | 7.4<br>(0.29)  | 7.4 x 11.6 (0.29 x 0.46)  | 8.8 (19.5)        |
| 1321-RWR45-xP                             | 45            | 67.5          | 16.0 (6)                         | 422        | 572  | 2                                        | 319.1<br>(12.56)    | 392.1<br>(15.44) | 158.8<br>(6.25) | 10.5<br>(0.41) | 10.3 x 17.9 (0.41 x 0.70) | 17.5 (38.5)       |
| 1321-RWR55-xP                             | 55            | 82.5          | 25.0 (4)                         | 427        | 577  | 2                                        | 320.7<br>(12.63)    | 392.1<br>(15.44) | 158.8<br>(6.25) | 10.5<br>(0.41) | 10.3 x 17.9 (0.41 x 0.70) | 18.4 (40.5)       |
| 1321-RWR80-xP                             | 80            | 120           | 35.0...50.0<br>(2...1/0)         | 446        | 341  | 2                                        | 322.3<br>(12.69)    | 395.3<br>(15.56) | 177.8<br>(7.00) | 10.5<br>(0.41) | 10.3 x 17.9 (0.41 x 0.70) | 20.4 (45)         |
| 1321-RWR100-xP                            | 100           | 150           | 50.0...70.0<br>(1/0...2/0)       | 444        | 339  | 2                                        | 320.7<br>(12.63)    | 393.7<br>(15.50) | 187.3<br>(7.38) | 10.5<br>(0.41) | 10.3 x 17.9 (0.41 x 0.70) | 22.5 (49.5)       |
| 1321-RWR130-xP                            | 130           | 195           | 70.0...120.0<br>(2/0...4/0)      | 630        | 495  | 2                                        | 317.5<br>(12.50)    | 390.5<br>(15.38) | 187.3<br>(7.38) | 10.5<br>(0.41) | 10.3 x 17.9 (0.41 x 0.70) | 24.5 (54)         |
| 1321-RWR160-xP                            | 160           | 240           | 120.0 (4/0)                      | 599        | 464  | 3                                        | 355.6<br>(14.00)    | 438.2<br>(17.25) | 250.8<br>(9.88) | 10.5<br>(0.41) | 10.3 x 25.8 (0.41 x 1.02) | 30.8 (68)         |
| 1321-RWR200-xP                            | 200           | 300           | 120.0...185.0<br>(4/0...350 MCM) | 618        | 612  | 2                                        | 317.5<br>(12.50)    | 393.7<br>(15.50) | 214.3<br>(8.44) | 10.5<br>(0.41) | 10.3 x 17.9 (0.41 x 0.70) | 29.9 (66)         |
| 1321-RWR250-xP                            | 250           | 375           | 185.0<br>(350 MCM)               | 681        | 546  | 3                                        | 358.8<br>(14.13)    | 439.8<br>(17.31) | 225.4<br>(8.88) | 10.5<br>(0.41) | 10.3 x 25.8 (0.41 x 1.02) | 41.7 (92)         |
| 1321-RWR320-DP                            | 320           | 480           | 240.0<br>(500 MCM)               | 489        | —    | 3                                        | 358.8<br>(14.13)    | 438.2<br>(17.25) | 250.8<br>(9.88) | 10.5<br>(0.41) | 10.3 x 25.8 (0.41 x 1.02) | 52.2 (115)        |

## 1321-RWR Assembly Components

| 400/480V      |          |       |                 |
|---------------|----------|-------|-----------------|
| Reactor       | Resistor |       | Wire Size (AWG) |
|               | Ohms     | Watts |                 |
| 1321-3R8-B    | 50       | 250   | 14...12         |
| 1321-3R12-B   | 50       | 250   | 14...12         |
| 1321-3R18-B   | 50       | 250   | 14...12         |
| 1321-3R25-B   | 50       | 250   | 10              |
| 1321-3R35-B   | 50       | 250   | 8...6           |
| 1321-3R45-B   | 50       | 250   | 6               |
| 1321-3R55-B   | 50       | 250   | 4               |
| 1321-3R80-B   | 50       | 250   | 2...1/0         |
| 1321-3R100-B  | 50       | 250   | 1/0...2/0       |
| 1321-3R130-B  | 50       | 300   | 2/0...4/0       |
| 1321-3R160-B  | 50       | 300   | 4/0             |
| 1321-3R200-B  | 50       | 300   | 4/0...350 MCM   |
| 1321-3RB250-B | 50       | 300   | 350 MCM         |
| 1321-3R320-B  | 50       | 300   | 500 MCM         |

| 600V          |          |       |                 |
|---------------|----------|-------|-----------------|
| Reactor       | Resistor |       | Wire Size (AWG) |
|               | Ohms     | Watts |                 |
| 1321-3R8-B    | 50       | 375   | 14...12         |
| 1321-3R12-B   | 50       | 375   | 14...12         |
| 1321-3R18-B   | 50       | 375   | 14...12         |
| 1321-3R25-B   | 50       | 375   | 10              |
| 1321-3R35-B   | 50       | 375   | 8...6           |
| 1321-3R45-B   | 50       | 375   | 6               |
| 1321-3R55-B   | 50       | 375   | 4               |
| 1321-3R80-B   | 50       | 375   | 2...1/0         |
| 1321-3R100-B  | 50       | 375   | 1/0...2/0       |
| 1321-3R130-B  | 50       | 420   | 2/0...4/0       |
| 1321-3R160-B  | 50       | 420   | 4/0             |
| 1321-3R200-B  | 50       | 420   | 4/0...350 MCM   |
| 1321-3RB250-B | 50       | 420   | 350 MCM         |

Dimension Reference

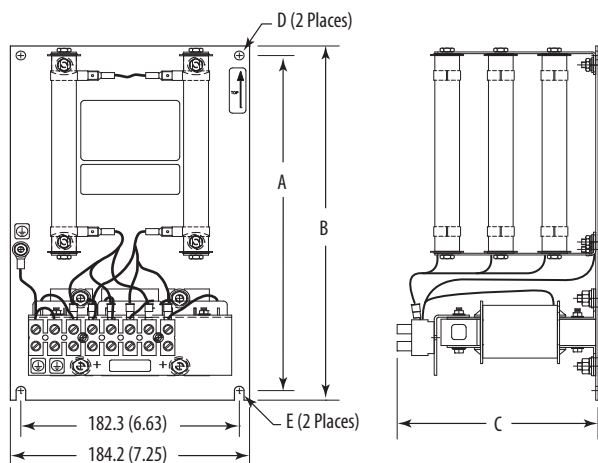


Figure 1

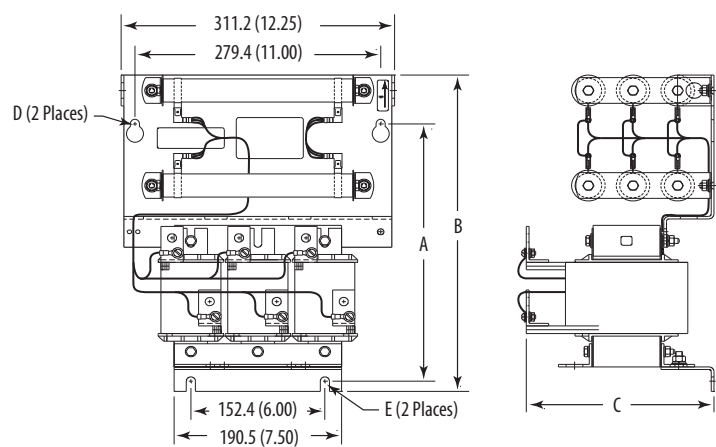


Figure 2

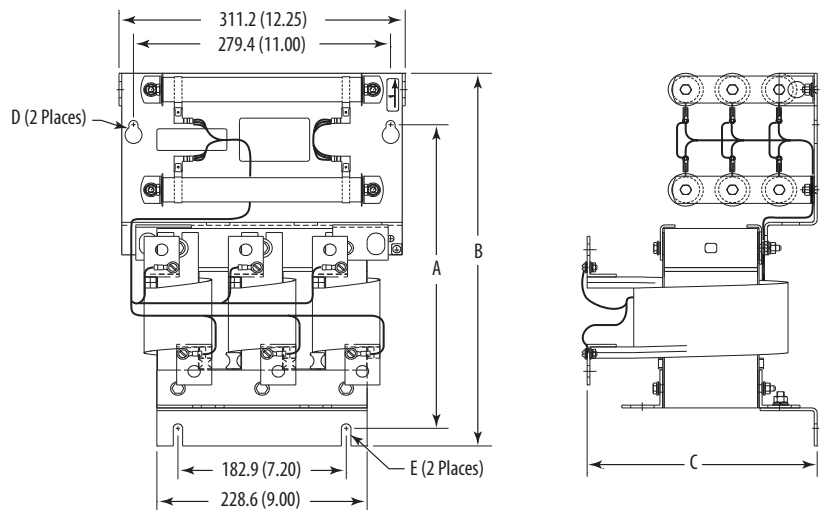
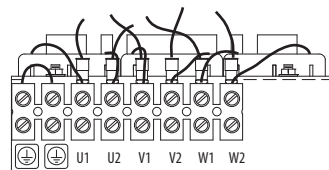
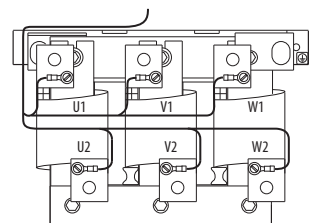


Figure 3

Terminal Block Details



Details for Figure 1



Details for Figure 2 and Figure 3

## 1321-3TH/3TW Series Three-Phase Isolation Transformers

Allen-Bradley 1321 Isolation Transformers are designed to meet the standard horsepower, voltage ratings, and harmonics of the Allen-Bradley variable speed drives.

### Catalog Number Explanation

<sup>1-4</sup> 1321 – <sup>6</sup> 3 <sup>7</sup> T <sup>8</sup> W <sup>9</sup> 005 – <sup>11</sup> A <sup>12</sup> A  
<sub>a</sub>                      <sub>b</sub>                      <sub>c</sub>                      <sub>d</sub>                      <sub>e</sub>                      <sub>f</sub>                      <sub>g</sub>

*a*

| Product |                 |
|---------|-----------------|
| Code    | Type            |
| 1321    | Power Component |

*b*

| Phases |             |
|--------|-------------|
| Code   | Description |
| 3      | Three-Phase |

*c*

| Device |             |
|--------|-------------|
| Code   | Description |
| T      | Transformer |

*d*

| Mounting |             |
|----------|-------------|
| Code     | Description |
| W        | Wall        |
| H        | Floor       |

*e*

| Rating |     |
|--------|-----|
| Code   | kVA |
| 005    | 5   |
| 007    | 7.5 |
| 011    | 11  |
| 014    | 14  |
| 020    | 20  |
| 027    | 27  |
| 034    | 34  |
| 040    | 40  |
| 051    | 51  |
| 063    | 63  |
| 075    | 75  |
| 093    | 93  |
| 118    | 118 |
| 145    | 145 |
| 175    | 175 |
| 220    | 220 |
| 275    | 275 |
| 330    | 330 |
| 440    | 440 |
| 550    | 550 |
| 660    | 660 |
| 770    | 770 |
| 880    | 880 |

*f*

| Primary Voltage |         |
|-----------------|---------|
| Code            | Voltage |
| A               | 230V AC |
| B               | 460V AC |
| C               | 575V AC |
| X               | 208V AC |

*g*

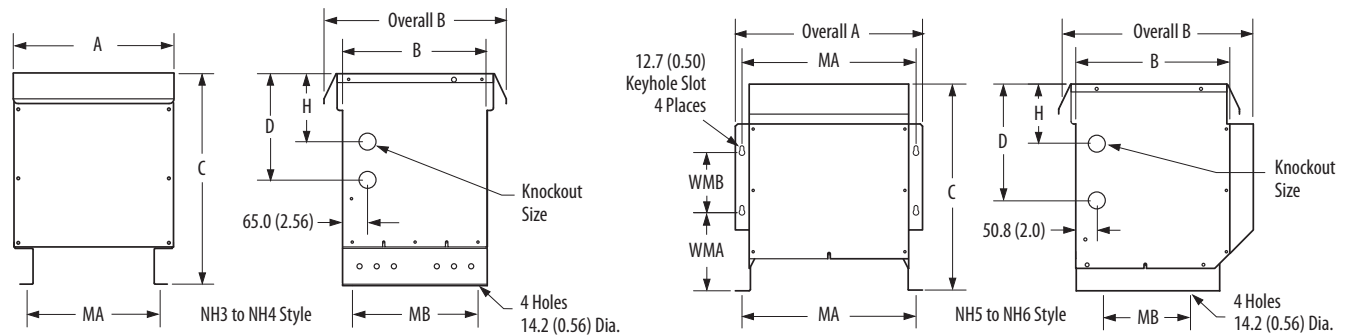
| Secondary Voltage |         |
|-------------------|---------|
| Code              | Voltage |
| A                 | 230V AC |
| B                 | 460V AC |
| C                 | 575V AC |
| X                 | 208V AC |

## Specifications

| Specification |                                  | Rating                                                                                                                                                                                                   |
|---------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrical    | General                          | Delta primary, wye secondary, 60 Hz, aluminum wound, neutral terminal available for customer use                                                                                                         |
|               | Standard Voltage Taps            | 5.0...175 kVA, 1...5.0% FCAN and FCBN                                                                                                                                                                    |
|               |                                  | 220...880 kVA, 1...2.5% FCAN and FCBN                                                                                                                                                                    |
|               | Insulation System                | Class 220                                                                                                                                                                                                |
|               |                                  | 150 °C rise over 40 °C ambient                                                                                                                                                                           |
|               |                                  | Peak 40 °C ambient with 30 °C 24-hour average                                                                                                                                                            |
|               | Efficiency                       | 98% (2% losses)                                                                                                                                                                                          |
| Environmental | Elevation                        | Up to 1000 meters. Above 1000 meters, consult factory for derating                                                                                                                                       |
|               | U.L. Listed                      | File E112313                                                                                                                                                                                             |
|               | Storage Temperature (all const.) | -40...+70°C (-40...+158°F)                                                                                                                                                                               |
|               | Humidity                         | 5...95% noncondensing                                                                                                                                                                                    |
| Construction  | Enclosure                        | NEMA/UL Type 3R (IP32)                                                                                                                                                                                   |
|               |                                  | Heavy duty ventilated enclosure with metal screens that help protect all vents and finished in ANSI 61 grey                                                                                              |
|               | Termination                      | Transformers up to 75 kVA have integral high and low voltage lugs that are installed, suitable for copper or aluminum cable installation                                                                 |
|               | Conduit Entry                    | Standard knockouts on all enclosures                                                                                                                                                                     |
|               | Mounting                         | 5...51 kVA units suitable for either floor or wall mounting. 63...75 kVA units suitable for floor, wall, or ceiling mounting with mounting kit 1321-3TWM2 (Style NH3). Larger units are floor mount only |
| General       | Impedance                        | 4...6% impedance (nominal)                                                                                                                                                                               |
|               | Short Circuit Capability         | Meets UL short circuit withstand capability                                                                                                                                                              |
|               | Overload Rating                  | Windings that are designed to withstand overcurrent of 150% of rated load for 60 Seconds or 200% of rated load for 30 Seconds                                                                            |
|               | Duty Cycle                       | (1) start every (2) hours                                                                                                                                                                                |
|               | Thermostats                      | Thermostats with 1 N.C. contact in each coil, which are wired in series and integral on all units                                                                                                        |
|               | K-factor                         | 4                                                                                                                                                                                                        |

## Approximate Mounting Dimensions

### IP32, NEMA/UL Type 3R - Styles NH3 Through NH4

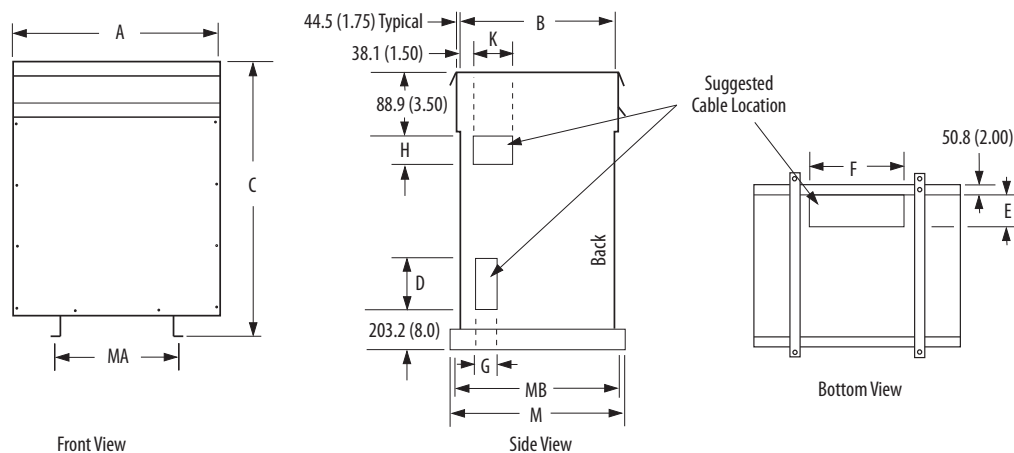


Dimensions in mm (in.)

| Style              | A                | Overall A        | B                | Overall B        | C                | D                | H                | K                         | MA               | MB               | WMB             | WMA             |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---------------------------|------------------|------------------|-----------------|-----------------|
| NH3                | 660.4<br>(26.00) | —                | 533.4<br>(21.00) | 635.0<br>(25.00) | 66.0<br>(38.00)  | 609.6<br>(24.00) | 355.6<br>(14.00) | 50.8 x 76.2 (2.00 x 3.00) | 546.1<br>(21.50) | 482.6<br>(19.00) | —               | —               |
| NH4                | 812.8<br>(32.00) | —                | 647.7<br>(25.50) | 749.3<br>(29.50) | 68.0<br>(41.00)  | 609.6<br>(24.00) | 304.8<br>(12.00) | 50.8 x 76.2 (2.00 x 3.00) | 596.9<br>(23.50) | 596.9<br>(23.50) | —               | —               |
| NH5 <sup>(1)</sup> | 425.5<br>(16.75) | 492.8<br>(19.40) | 381.0<br>(15.00) | 513.1<br>(20.20) | 546.1<br>(21.50) | 304.8<br>(12.00) | 152.4<br>(6.00)  | 35.1 x 44.4 (1.38 x 1.75) | 457.2<br>(18.00) | 228.6<br>(9.00)  | 177.8<br>(7.00) | 184.4<br>(7.26) |
| NH6 <sup>(1)</sup> | 546.1<br>(21.50) | 607.1<br>(23.90) | 495.3<br>(19.50) | 730.3<br>(28.75) | 730.3<br>(28.75) | 431.8<br>(17.00) | 215.9<br>(8.50)  | 35.1 x 44.4 (1.38 x 1.75) | 577.9<br>(22.75) | 228.6<br>(9.00)  | 203.2<br>(8.00) | 247.1<br>(9.73) |

(1) Enclosure Styles NH1 and NH2 are replaced by NH5 and NH6 for 1321-3TH005 through 1321-3TH051 transformer ratings.

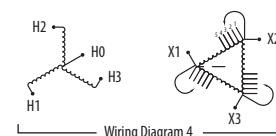
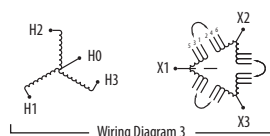
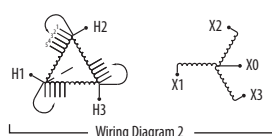
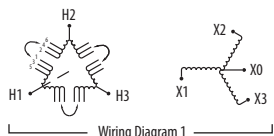
### IP32, NEMA/UL Type 3R - Styles NJ1 Through NJ6



Dimensions in mm (in.)

| Style | A                 | B                 | C                 | D                | E                | F                | G                | H                | K                | M                 | MA                | MB                |
|-------|-------------------|-------------------|-------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|-------------------|-------------------|
| NJ1   | 1003.3<br>(39.50) | 762.0<br>(30.00)  | 1308.1<br>(51.50) | 254.0<br>(10.00) | 190.5<br>(7.50)  | 546.1<br>(21.50) | 203.2<br>(8.00)  | 165.1<br>(6.50)  | 342.9<br>(13.50) | 863.6<br>(34.00)  | 609.6<br>(24.00)  | 812.8<br>(32.00)  |
| NJ2   | 1239.1<br>(48.50) | 836.6<br>(34.00)  | 1498.6<br>(59.00) | 330.2<br>(13.00) | 215.9<br>(8.50)  | 635.0<br>(25.00) | 228.6<br>(9.00)  | 215.9<br>(8.50)  | 393.7<br>(15.50) | 965.2<br>(38.00)  | 698.5<br>(27.50)  | 914.4<br>(36.00)  |
| NJ3   | 1308.1<br>(51.50) | 990.6<br>(39.00)  | 1676.4<br>(66.00) | 406.4<br>(16.00) | 241.3<br>(9.50)  | 800.1<br>(31.50) | 254.0<br>(10.00) | 292.1<br>(11.50) | 457.2<br>(18.00) | 1092.2<br>(43.00) | 863.6<br>(34.00)  | 1041.4<br>(41.00) |
| NJ6   | 1625.6<br>(64.00) | 1016.0<br>(40.00) | 1727.2<br>(68.00) | 406.4<br>(16.00) | 266.7<br>(10.50) | 952.5<br>(37.50) | 279.4<br>(11.00) | 292.1<br>(11.50) | 457.2<br>(18.00) | 1117.6<br>(44.00) | 1016.0<br>(40.00) | 1066.8<br>(42.00) |

## Wiring Diagrams, Ratings, and Weights



| kVA | Catalog Number | Style | Primary Voltage | Secondary Voltage | Wiring Diagram | Weight<br>kg (lb) |
|-----|----------------|-------|-----------------|-------------------|----------------|-------------------|
| 5   | 1321-3TW005-AB | NH5   | 230             | 460               | 3              | 63.5 (140)        |
|     | 1321-3TW005-AC | NH5   | 230             | 575               | 3              | 63.5 (140)        |
|     | 1321-3TW005-BA | NH5   | 460             | 230               | 1              | 63.5 (140)        |
|     | 1321-3TW005-BB | NH5   | 460             | 460               | 1              | 63.5 (140)        |
|     | 1321-3TW005-BC | NH5   | 460             | 575               | 3              | 63.5 (140)        |
|     | 1321-3TW005-CA | NH5   | 575             | 230               | 1              | 63.5 (140)        |
|     | 1321-3TW005-CB | NH5   | 575             | 460               | 1              | 63.5 (140)        |
|     | 1321-3TW005-CC | NH5   | 575             | 575               | 1              | 63.5 (140)        |
|     | 1321-3TW005-XX | NH5   | 208             | 208               | 1              | 63.5 (140)        |
| 40  | 1321-3TW040-AA | NH6   | 230             | 230               | 2              | 145.2 (320)       |
|     | 1321-3TW040-AB | NH6   | 230             | 460               | 4              | 145.2 (320)       |
|     | 1321-3TW040-AC | NH6   | 230             | 575               | 4              | 145.2 (320)       |
|     | 1321-3TW040-BA | NH6   | 460             | 230               | 2              | 145.2 (320)       |
|     | 1321-3TW040-BB | NH6   | 460             | 460               | 2              | 145.2 (320)       |
|     | 1321-3TW040-BC | NH6   | 460             | 575               | 4              | 145.2 (320)       |
|     | 1321-3TW040-CA | NH6   | 575             | 230               | 2              | 145.2 (320)       |
|     | 1321-3TW040-CB | NH6   | 575             | 460               | 2              | 145.2 (320)       |
|     | 1321-3TW040-CC | NH6   | 575             | 575               | 2              | 145.2 (320)       |
| 51  | 1321-3TW051-AA | NH6   | 230             | 230               | 2              | 190.5 (420)       |
|     | 1321-3TW051-AB | NH6   | 230             | 460               | 4              | 190.5 (420)       |
|     | 1321-3TW051-AC | NH6   | 230             | 575               | 4              | 190.5 (420)       |
|     | 1321-3TW051-BA | NH6   | 460             | 230               | 2              | 190.5 (420)       |
|     | 1321-3TW051-BB | NH6   | 460             | 460               | 2              | 190.5 (420)       |
|     | 1321-3TW051-BC | NH6   | 460             | 575               | 4              | 190.5 (420)       |
|     | 1321-3TW051-CA | NH6   | 575             | 230               | 2              | 190.5 (420)       |
|     | 1321-3TW051-CB | NH6   | 575             | 460               | 2              | 190.5 (420)       |
|     | 1321-3TW051-CC | NH6   | 575             | 575               | 2              | 190.5 (420)       |
| 63  | 1321-3TH063-AA | NH3   | 230             | 230               | 2              | 244.9 (540)       |
|     | 1321-3TH063-AB | NH3   | 230             | 460               | 4              | 244.9 (540)       |
|     | 1321-3TH063-AC | NH3   | 230             | 575               | 4              | 244.9 (540)       |
|     | 1321-3TH063-BA | NH3   | 460             | 230               | 2              | 244.9 (540)       |
|     | 1321-3TH063-BB | NH3   | 460             | 460               | 2              | 244.9 (540)       |
|     | 1321-3TH063-BC | NH3   | 460             | 575               | 4              | 244.9 (540)       |
|     | 1321-3TH063-CA | NH3   | 575             | 230               | 2              | 244.9 (540)       |
|     | 1321-3TH063-CB | NH3   | 575             | 460               | 2              | 244.9 (540)       |
|     | 1321-3TH063-CC | NH3   | 575             | 575               | 2              | 244.9 (540)       |

| kVA | Catalog Number | Style | Primary Voltage | Secondary Voltage | Wiring Diagram | Weight<br>kg (lb) |
|-----|----------------|-------|-----------------|-------------------|----------------|-------------------|
| 75  | 1321-3TH075-AA | NH3   | 230             | 230               | 2              | 263.1 (580)       |
|     | 1321-3TH075-AB | NH3   | 230             | 460               | 4              | 263.1 (580)       |
|     | 1321-3TH075-AC | NH3   | 230             | 575               | 4              | 263.1 (580)       |
|     | 1321-3TH075-BA | NH3   | 460             | 230               | 2              | 263.1 (580)       |
|     | 1321-3TH075-BB | NH3   | 460             | 460               | 2              | 263.1 (580)       |
|     | 1321-3TH075-BC | NH3   | 460             | 575               | 4              | 263.1 (580)       |
|     | 1321-3TH075-CA | NH3   | 575             | 230               | 2              | 263.1 (580)       |
|     | 1321-3TH075-CB | NH3   | 575             | 460               | 2              | 263.1 (580)       |
|     | 1321-3TH075-CC | NH3   | 575             | 575               | 2              | 263.1 (580)       |
| 93  | 1321-3TH093-AA | NH3   | 230             | 230               | 2              | 285.8 (630)       |
|     | 1321-3TH093-AB | NH3   | 230             | 460               | 4              | 285.8 (630)       |
|     | 1321-3TH093-AC | NH3   | 230             | 575               | 4              | 285.8 (630)       |
|     | 1321-3TH093-BA | NH3   | 460             | 230               | 2              | 285.8 (630)       |
|     | 1321-3TH093-BB | NH3   | 460             | 460               | 2              | 285.8 (630)       |
|     | 1321-3TH093-BC | NH3   | 460             | 575               | 4              | 285.8 (630)       |
|     | 1321-3TH093-CA | NH3   | 575             | 230               | 2              | 285.8 (630)       |
|     | 1321-3TH093-CB | NH3   | 575             | 460               | 2              | 285.8 (630)       |
|     | 1321-3TH093-CC | NH3   | 575             | 575               | 2              | 285.8 (630)       |
| 118 | 1321-3TH118-AA | NH3   | 230             | 230               | 2              | 328.9 (725)       |
|     | 1321-3TH118-AB | NH3   | 230             | 460               | 4              | 328.9 (725)       |
|     | 1321-3TH118-AC | NH3   | 230             | 575               | 4              | 328.9 (725)       |
|     | 1321-3TH118-BA | NH3   | 460             | 230               | 2              | 328.9 (725)       |
|     | 1321-3TH118-BB | NH3   | 460             | 460               | 2              | 328.9 (725)       |
|     | 1321-3TH118-BC | NH3   | 460             | 575               | 4              | 328.9 (725)       |
|     | 1321-3TH118-CA | NH3   | 575             | 230               | 2              | 328.9 (725)       |
|     | 1321-3TH118-CB | NH3   | 575             | 460               | 2              | 328.9 (725)       |
|     | 1321-3TH118-CC | NH3   | 575             | 575               | 2              | 328.9 (725)       |
| 145 | 1321-3TH145-AA | NH4   | 230             | 230               | 2              | 408.2 (900)       |
|     | 1321-3TH145-AB | NH4   | 230             | 460               | 4              | 408.2 (900)       |
|     | 1321-3TH145-AC | NH4   | 230             | 575               | 4              | 408.2 (900)       |
|     | 1321-3TH145-BA | NH4   | 460             | 230               | 2              | 408.2 (900)       |
|     | 1321-3TH145-BB | NH4   | 460             | 460               | 2              | 408.2 (900)       |
|     | 1321-3TH145-BC | NH4   | 460             | 575               | 4              | 408.2 (900)       |
|     | 1321-3TH145-CA | NH4   | 575             | 230               | 2              | 408.2 (900)       |
|     | 1321-3TH145-CB | NH4   | 575             | 460               | 2              | 408.2 (900)       |
|     | 1321-3TH145-CC | NH4   | 575             | 575               | 2              | 408.2 (900)       |

Table continued on next page.

| kVA | Catalog Number | Style | Primary Voltage | Secondary Voltage | Wiring Diagram | Weight<br>kg (lb) |
|-----|----------------|-------|-----------------|-------------------|----------------|-------------------|
| 175 | 1321-3TH175-AA | NH4   | 230             | 230               | 2              | 453.6 (1000)      |
|     | 1321-3TH175-AB | NH4   | 230             | 460               | 4              | 453.6 (1000)      |
|     | 1321-3TH175-AC | NH4   | 230             | 575               | 4              | 453.6 (1000)      |
|     | 1321-3TH175-BA | NH4   | 460             | 230               | 2              | 453.6 (1000)      |
|     | 1321-3TH175-BB | NH4   | 460             | 460               | 2              | 453.6 (1000)      |
|     | 1321-3TH175-BC | NH4   | 460             | 575               | 4              | 453.6 (1000)      |
|     | 1321-3TH175-CA | NH4   | 575             | 230               | 2              | 453.6 (1000)      |
|     | 1321-3TH175-CB | NH4   | 575             | 460               | 2              | 453.6 (1000)      |
|     | 1321-3TH175-CC | NH4   | 575             | 575               | 2              | 453.6 (1000)      |
| 220 | 1321-3TH220-AA | NJ1   | 230             | 230               | 2              | 589.7 (1300)      |
|     | 1321-3TH220-AB | NJ1   | 230             | 460               | 4              | 589.7 (1300)      |
|     | 1321-3TH220-AC | NJ1   | 230             | 575               | 4              | 589.7 (1300)      |
|     | 1321-3TH220-BA | NJ1   | 460             | 230               | 2              | 589.7 (1300)      |
|     | 1321-3TH220-BB | NJ1   | 460             | 460               | 2              | 589.7 (1300)      |
|     | 1321-3TH220-BC | NJ1   | 460             | 575               | 4              | 589.7 (1300)      |
|     | 1321-3TH220-CA | NJ1   | 575             | 230               | 2              | 589.7 (1300)      |
|     | 1321-3TH220-CB | NJ1   | 575             | 460               | 2              | 589.7 (1300)      |
|     | 1321-3TH220-CC | NJ1   | 575             | 575               | 2              | 589.7 (1300)      |
| 275 | 1321-3TH275-AA | NJ1   | 230             | 230               | 2              | 680.4 (1500)      |
|     | 1321-3TH275-AB | NJ1   | 230             | 460               | 4              | 680.4 (1500)      |
|     | 1321-3TH275-AC | NJ1   | 230             | 575               | 4              | 680.4 (1500)      |
|     | 1321-3TH275-BA | NJ1   | 460             | 230               | 2              | 680.4 (1500)      |
|     | 1321-3TH275-BB | NJ1   | 460             | 460               | 2              | 680.4 (1500)      |
|     | 1321-3TH275-BC | NJ1   | 460             | 575               | 4              | 680.4 (1500)      |
|     | 1321-3TH275-CA | NJ1   | 575             | 230               | 2              | 680.4 (1500)      |
|     | 1321-3TH275-CB | NJ1   | 575             | 460               | 2              | 680.4 (1500)      |
|     | 1321-3TH275-CC | NJ1   | 575             | 575               | 2              | 680.4 (1500)      |
| 330 | 1321-3TH330-AA | NJ1   | 230             | 230               | 2              | 771.1 (1700)      |
|     | 1321-3TH330-AB | NJ1   | 230             | 460               | 4              | 771.1 (1700)      |
|     | 1321-3TH330-AC | NJ1   | 230             | 575               | 4              | 771.1 (1700)      |
|     | 1321-3TH330-BA | NJ1   | 460             | 230               | 2              | 771.1 (1700)      |
|     | 1321-3TH330-BB | NJ1   | 460             | 460               | 2              | 771.1 (1700)      |
|     | 1321-3TH330-BC | NJ1   | 460             | 575               | 4              | 771.1 (1700)      |
|     | 1321-3TH330-CA | NJ1   | 575             | 230               | 2              | 771.1 (1700)      |
|     | 1321-3TH330-CB | NJ1   | 575             | 460               | 2              | 771.1 (1700)      |
|     | 1321-3TH330-CC | NJ1   | 575             | 575               | 2              | 771.1 (1700)      |
| 440 | 1321-3TH440-AA | NJ2   | 230             | 230               | 1              | 907.2 (2000)      |
|     | 1321-3TH440-AB | NJ2   | 230             | 460               | 3              | 907.2 (2000)      |
|     | 1321-3TH440-AC | NJ2   | 230             | 575               | 3              | 907.2 (2000)      |
|     | 1321-3TH440-BA | NJ2   | 460             | 230               | 1              | 907.2 (2000)      |
|     | 1321-3TH440-BB | NJ2   | 460             | 460               | 1              | 907.2 (2000)      |

| kVA | Catalog Number | Style | Primary Voltage | Secondary Voltage | Wiring Diagram | Weight<br>kg (lb) |
|-----|----------------|-------|-----------------|-------------------|----------------|-------------------|
| 440 | 1321-3TH440-BC | NJ2   | 460             | 575               | 3              | 907.2 (2000)      |
|     | 1321-3TH440-CA | NJ2   | 575             | 230               | 1              | 907.2 (2000)      |
|     | 1321-3TH440-CB | NJ2   | 575             | 460               | 1              | 907.2 (2000)      |
|     | 1321-3TH440-CC | NJ2   | 575             | 575               | 1              | 907.2 (2000)      |
| 550 | 1321-3TH550-AA | NJ2   | 230             | 230               | 1              | 1134.0 (2500)     |
|     | 1321-3TH550-AB | NJ2   | 230             | 460               | 3              | 1134.0 (2500)     |
|     | 1321-3TH550-AC | NJ2   | 230             | 575               | 3              | 1134.0 (2500)     |
|     | 1321-3TH550-BA | NJ2   | 460             | 230               | 1              | 1134.0 (2500)     |
|     | 1321-3TH550-BB | NJ2   | 460             | 460               | 1              | 1134.0 (2500)     |
|     | 1321-3TH550-BC | NJ2   | 460             | 575               | 3              | 1134.0 (2500)     |
|     | 1321-3TH550-CA | NJ2   | 575             | 230               | 1              | 1134.0 (2500)     |
|     | 1321-3TH550-CB | NJ2   | 575             | 460               | 1              | 1134.0 (2500)     |
|     | 1321-3TH550-CC | NJ2   | 575             | 575               | 1              | 1134.0 (2500)     |
| 660 | 1321-3TH660-AA | NJ3   | 230             | 230               | 1              | 1360.8 (3000)     |
|     | 1321-3TH660-AB | NJ3   | 230             | 460               | 3              | 1360.8 (3000)     |
|     | 1321-3TH660-AC | NJ3   | 230             | 575               | 3              | 1360.8 (3000)     |
|     | 1321-3TH660-BA | NJ3   | 460             | 230               | 1              | 1360.8 (3000)     |
|     | 1321-3TH660-BB | NJ3   | 460             | 460               | 1              | 1360.8 (3000)     |
|     | 1321-3TH660-BC | NJ3   | 460             | 575               | 3              | 1360.8 (3000)     |
|     | 1321-3TH660-CA | NJ3   | 575             | 230               | 1              | 1360.8 (3000)     |
|     | 1321-3TH660-CB | NJ3   | 575             | 460               | 1              | 1360.8 (3000)     |
|     | 1321-3TH660-CC | NJ3   | 575             | 575               | 1              | 1360.8 (3000)     |
| 770 | 1321-3TH770-AA | NJ3   | 230             | 230               | 1              | 1587.6 (3500)     |
|     | 1321-3TH770-AB | NJ3   | 230             | 460               | 3              | 1587.6 (3500)     |
|     | 1321-3TH770-AC | NJ3   | 230             | 575               | 3              | 1587.6 (3500)     |
|     | 1321-3TH770-BA | NJ3   | 460             | 230               | 1              | 1587.6 (3500)     |
|     | 1321-3TH770-BB | NJ3   | 460             | 460               | 1              | 1587.6 (3500)     |
|     | 1321-3TH770-BC | NJ3   | 460             | 575               | 3              | 1587.6 (3500)     |
|     | 1321-3TH770-CA | NJ3   | 575             | 230               | 1              | 1587.6 (3500)     |
|     | 1321-3TH770-CB | NJ3   | 575             | 460               | 1              | 1587.6 (3500)     |
|     | 1321-3TH770-CC | NJ3   | 575             | 575               | 1              | 1587.6 (3500)     |
| 880 | 1321-3TH880-AA | NJ6   | 230             | 230               | 1              | 1678.3 (3700)     |
|     | 1321-3TH880-AB | NJ6   | 230             | 460               | 3              | 1678.3 (3700)     |
|     | 1321-3TH880-AC | NJ6   | 230             | 575               | 3              | 1678.3 (3700)     |
|     | 1321-3TH880-BA | NJ6   | 460             | 230               | 1              | 1678.3 (3700)     |
|     | 1321-3TH880-BB | NJ6   | 460             | 460               | 1              | 1678.3 (3700)     |
|     | 1321-3TH880-BC | NJ6   | 460             | 575               | 3              | 1678.3 (3700)     |
|     | 1321-3TH880-CA | NJ6   | 575             | 230               | 1              | 1678.3 (3700)     |
|     | 1321-3TH880-CB | NJ6   | 575             | 460               | 1              | 1678.3 (3700)     |
|     | 1321-3TH880-CC | NJ6   | 575             | 575               | 1              | 1678.3 (3700)     |

## 1321-Mxxx Common Mode Chokes

1321-Mxxx Common Mode Chokes can be installed with the following Allen-Bradley AC drives.

- PowerFlex® 4-Class
- PowerFlex 520-Series
- PowerFlex 7-Class
- PowerFlex 750-Series
- 1305
- 1336 PLUS™
- 1336 PLUS™ II
- 1336 IMPACT™
- 1336 FORCE™

When installed at the drive output the common mode choke helps to guard against interference with other electrical equipment (Programmable Controllers, sensors, analog circuits, and so forth). In addition, reducing the PWM carrier frequency reduces the effects and lowers the risk of common mode noise interference.

### Catalog Number Explanation

|          |   |     |
|----------|---|-----|
| Position |   |     |
| 1-4      | 6 | 7   |
| 1321     | M | 009 |
| a        | b | c   |

| a       |                 |
|---------|-----------------|
| Product |                 |
| Code    | Type            |
| 1321    | Power Component |

| b      |                   |
|--------|-------------------|
| Device |                   |
| Code   | Description       |
| M      | Common Mode Choke |

| c              |      |
|----------------|------|
| Current Rating |      |
| Code           | Amps |
| 001 *          | 1    |
| 009            | 9    |
| 048            | 48   |
| 055            | 55   |
| 180            | 180  |
| 670            | 670  |

\* Same core as 1321-M009. Can be used in place of the M009, M048, or M180 if the terminal block and windings typical of those ratings are not desired.

## Ratings

### PowerFlex AC Drives

| Choke Type                              | Used With             | Ratings                                                                                                                     | Catalog Number |
|-----------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------|
| Open Style, 1A                          | All PowerFlex Drives  | Communication Cables, Analog Signal Cables, and so forth                                                                    | 1321-M001      |
| Open Style, 9A<br>(with terminal strip) | PowerFlex 4M/4/40/40P | 0.2...1.1 kW (0.25...2 HP), 100...115V<br>0.2...1.5 kW (0.25...2 HP), 200...240V<br>0.4...2.2 kW (0.5...3 HP), 380...480V   | 1321-M009      |
|                                         | PowerFlex 400         | 2.2 kW (3 HP) 400...480V                                                                                                    |                |
|                                         | PowerFlex 520-Series  | 0.2...1.1 kW (0.25...1.5 HP), 100...120V<br>0.2...1.1 kW (0.25...2 HP), 208...240V<br>0.4...2.2 kW (0.5...3 HP), 400...480V |                |
|                                         | PowerFlex 7-Class     | 0.3...2.2 kW (0.5...3 HP), 208...230V<br>0.4...4 kW (0.5...5 HP), 400...480V                                                |                |
|                                         | PowerFlex 750-Series  | 0.75...4 kW (0.5...5 HP), 400...480V                                                                                        |                |
| Open Style, 48A                         | PowerFlex 4M/4/40/40P | 2.2...7.5 kW (3...10 HP), 200...240V<br>2.2...11 kW (3...15 HP), 380...480V<br>2.2...11 kW (3...15 HP), 600V                | 1321-M048      |
|                                         | PowerFlex 400         | 2.2...11 kW (3...15 HP), 200...240V<br>4...22 kW (5...30 HP), 380...480V                                                    |                |
|                                         | PowerFlex 520-Series  | 0.2...14 kW (3...20 HP), 200...240V<br>4...22 kW (5...30 HP), 400...480V<br>5.5...22 kW (7.5...30 HP), 600V                 |                |
|                                         | PowerFlex 7-Class     | 2.2...11 kW (3...15 HP), 208...240V<br>4...22 kW (5...30 HP), 400...480V<br>5.5...37 kW (10...40 HP), 600V                  |                |
|                                         | PowerFlex 750-Series  | 5.5...22 kW (7.5...30 HP), 400...480V<br>5.5...37 kW (7.5...40 HP), 600...690V                                              |                |

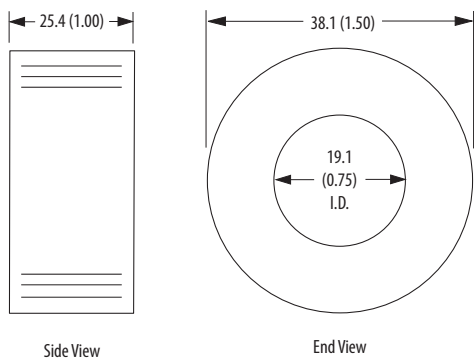
| Choke Type       | Used With            | Ratings                                                                                                              | Catalog Number |
|------------------|----------------------|----------------------------------------------------------------------------------------------------------------------|----------------|
| Open Style, 55A  | PowerFlex 7-Class    | 14 kW (20 HP), 208...240V<br>22...30 kW (30...40 HP), 400...480V<br>45 kW (50 HP), 600V                              | 1321-M055      |
|                  | PowerFlex 750-Series | 22...30 kW (30...40 HP), 400...480V<br>45 kW (50 HP), 600...690V                                                     |                |
| Open Style, 180A | PowerFlex 7-Class    | 14...44 kW (20...60 HP), 208...240V<br>30...110 kW (40...150 HP), 400...480V<br>45...132 kW (50...150 HP), 600V      | 1321-M180      |
|                  | PowerFlex 750-Series | 30...90 kW (40...125 HP), 400...480V<br>45...132 kW (50...150 HP), 600...690V                                        |                |
| Open Style, 670A | PowerFlex 7-Class    | 55...75 kW (75...100 HP), 208...240V<br>149...373 kW (200...500 HP), 400...480V<br>149...522 kW (200...700 HP), 600V | 1321-M670      |
|                  | PowerFlex 750-Series | 110...447 kW (150...600 HP), 400...480V<br>149...597 kW (200...800 HP), 600...690V                                   |                |

### Allen-Bradley Legacy AC Drives

| Choke Type                              | Used With                            | Ratings                                                                                                  | Catalog Number |
|-----------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------|----------------|
| Open Style, 1A                          | All Legacy Drives                    | Communication Cables, Analog Signal Cables, and so forth                                                 | 1321-M001      |
| Open Style, 9A<br>(with terminal strip) | 1305, 1336 PLUS, and<br>1336 PLUS II | 0.37...2.2 kW (0.5...2 HP), 230V<br>0.37...3.7 kW (0.5...5 HP), 480V                                     | 1321-M009      |
|                                         | 1336 IMPACT                          | 0.37...3.7 kW (0.5...5 HP), 480V                                                                         |                |
|                                         | 1336 FORCE                           | 0.75 kW (1 HP), 230V<br>0.75...2.2 kW (1...3 HP), 480V and 600V                                          |                |
|                                         |                                      |                                                                                                          |                |
| Open Style, 48A                         | 1336 PLUS and 1336 PLUS II           | 2.2...11 kW (3...15 HP), 230V<br>5.5...22 kW (7.5...30 HP), 480V<br>0.75...30 kW (1...40 HP), 600V       | 1321-M048      |
|                                         | 1336 IMPACT                          | 5.5...22 kW (7.5...30 HP), 480V<br>5.5...30 kW (7.5...40 HP), 600V                                       |                |
|                                         | 1336 FORCE                           | 2.2...11 kW (3...15 HP), 230V<br>2.2...22 kW (3...30 HP), 480V<br>0.75...30 kW (1...40 HP), 600V         |                |
|                                         |                                      |                                                                                                          |                |
| Open Style, 55A                         | 1336 PLUS II                         | 14 kW (20 HP), 230V<br>22...30 kW (30...40 HP), 480V<br>45 kW (50 HP), 600V                              | 1321-M055      |
|                                         | 1336 IMPACT                          | 22...30 kW (30...40 HP), 480V<br>45 kW (50 HP), 600V                                                     |                |
| Open Style, 180A                        | 1336 PLUS and 1336 PLUS II           | 15...45 kW (20...60 HP), 230V<br>30...112 kW (40...150 HP), 480V<br>37...112 kW (50...150 HP), 600V      | 1321-M180      |
|                                         | 1336 IMPACT                          | 30...112 kW (40...150 HP), 480V<br>37...93 kW (50...125 HP), 600V                                        |                |
|                                         | 1336 FORCE                           | 15...45 kW (20...60 HP), 230V<br>30...112 kW (40...150 HP), 480V<br>37...112 kW (50...150 HP), 600V      |                |
|                                         |                                      |                                                                                                          |                |
| Open Style, 670A                        | 1336 PLUS and 1336 PLUS II           | 56...93 kW (75...125 HP), 230V<br>112...448 kW (150...600 HP), 480V<br>149...448 kW (200...600 HP), 600V | 1321-M670      |
|                                         | 1336 IMPACT                          | 112...448 kW (150...600 HP), 480V<br>149...448 kW (200...600 HP), 600V                                   |                |
|                                         | 1336 FORCE                           | 56...93 kW (75...125 HP), 230V<br>112...448 kW (150...600 HP), 480V<br>149...448 kW (200...600 HP), 600V |                |
|                                         |                                      |                                                                                                          |                |

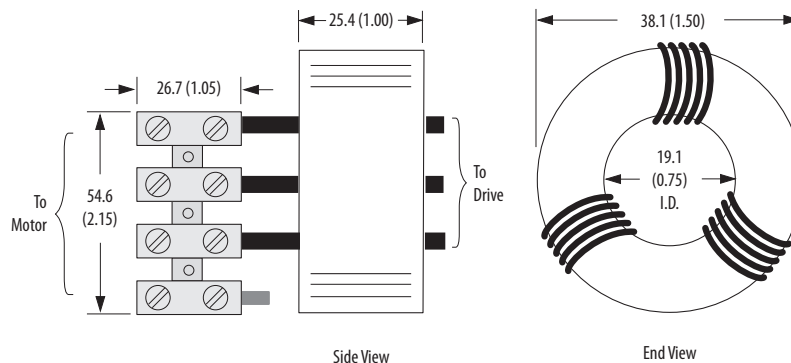
## Approximate Mounting Dimensions

1321-M001 Choke Assembly



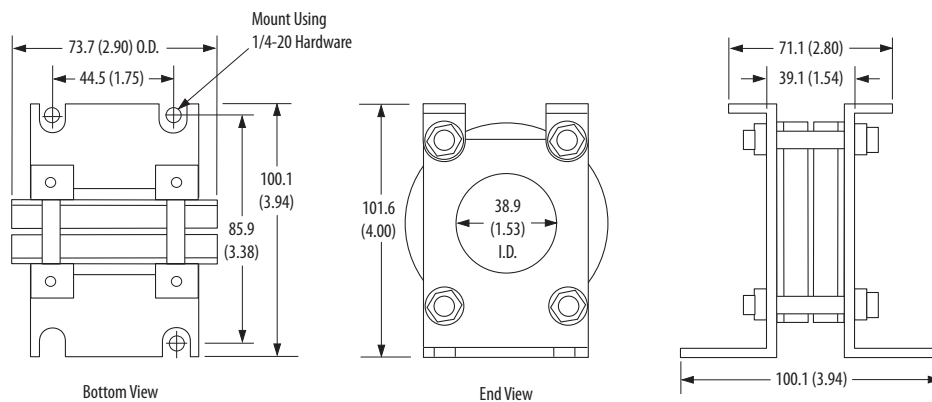
Dimensions in mm (inches)

1321-M009 Choke Assembly



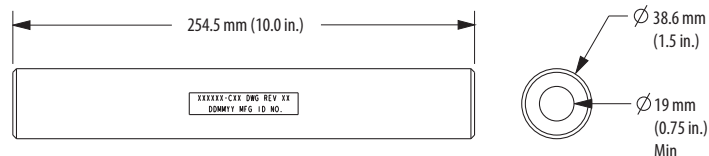
Dimensions in inches (mm)

1321-M048 Choke Assembly



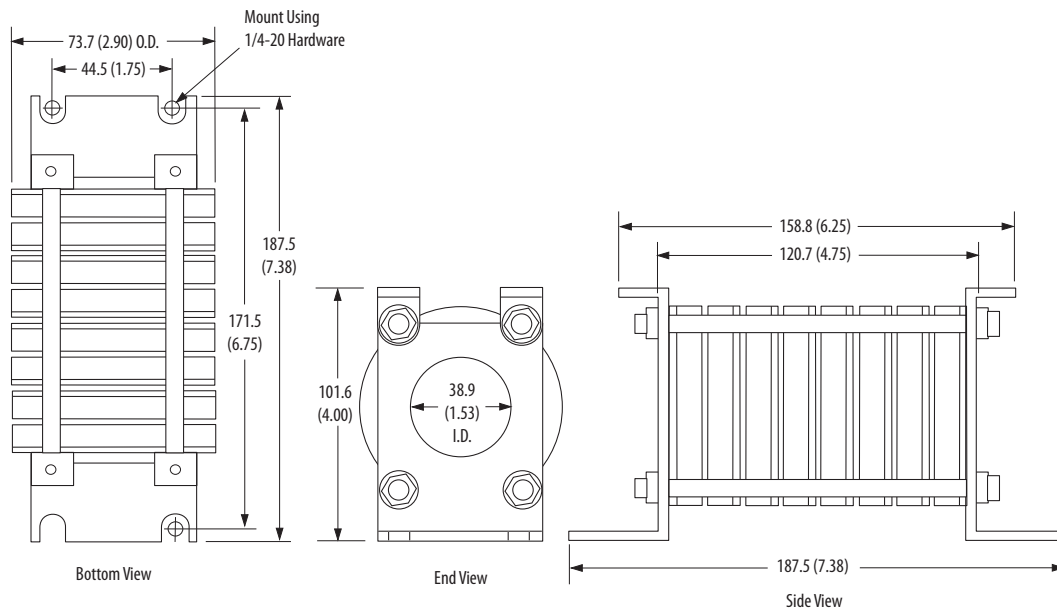
Dimensions are in mm (in.)

1321-M055 Choke Assembly

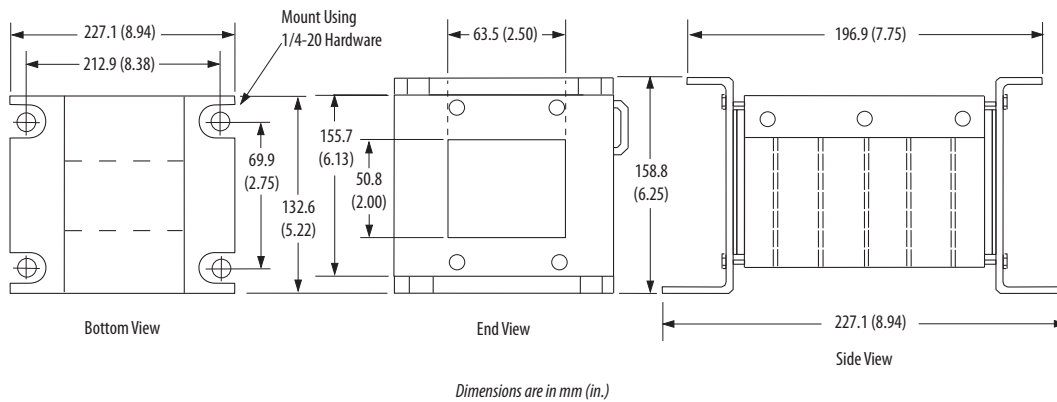


Dimensions in mm (inches)

## 1321-M180 Choke Assembly



## 1321-M670 Choke Assembly



## 1321-DC DC Link Chokes

1321-DC DC Link Chokes can be installed with Frame C PowerFlex 40 and all PowerFlex 400 drives. Add DC Link Chokes in series with the internal DC Bus to:

- Reduce AC input line harmonics
- Help meet IEEE-519 limits
- Absorb voltage/current spikes
- Reduce AC ripple on DC bus
- Reduce dv/dt and dI/dT rates
- Solve spurious overvoltage tripping
- Reduce DC bus transient overvoltage

### Catalog Number Explanation

|                 |          |          |          |
|-----------------|----------|----------|----------|
| <i>Position</i> |          |          |          |
| 1-4             | 6        | 7        | 9        |
| 1321            | —        | DC       | —        |
| <i>a</i>        | <i>b</i> | 12       | —        |
|                 |          | <i>c</i> | 1        |
|                 |          |          | <i>d</i> |

| <i>a</i> |                 |
|----------|-----------------|
| Product  |                 |
| Code     | Type            |
| 1321     | Power Component |

| <i>b</i> |               |
|----------|---------------|
| Device   |               |
| Code     | Description   |
| DC       | DC Link Choke |

| <i>c</i>       |      |
|----------------|------|
| Current Rating |      |
| Code           | Amps |
| 9              | 9    |
| 12             | 12   |
| 18             | 18   |
| 25             | 25   |
| 32             | 32   |
| 40             | 40   |

| <i>d</i>          |                                                                                                                                     |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Inductance Rating |                                                                                                                                     |
| Code              | Description                                                                                                                         |
| 1                 | Each DC Link Choke current rating may have more than one inductance rating. Refer to <i>Ratings</i> on page 26 for specific values. |
| 2                 |                                                                                                                                     |
| 3                 |                                                                                                                                     |
| 4                 |                                                                                                                                     |

### Specifications

| Specification                    | Rating                                             |
|----------------------------------|----------------------------------------------------|
| General                          | UL-508 component that is recognized (File E196302) |
|                                  | 1000 Volts DC maximum                              |
|                                  | For ripple frequency of 300 Hz or 360 Hz           |
|                                  | 50 °C temperature rise                             |
|                                  | Suitable for 40 °C ambient temperature             |
|                                  | Class B insulation system (130 °C)                 |
|                                  | Suitable for ripple current of 10% peak-to-peak    |
|                                  | Touch-safe terminals in many ratings               |
| Storage Temperature (all const.) | -40...+70°C (-40...+158°F)                         |
| Humidity                         | 5...95% noncondensing                              |

## Special Features

- Solid copper box lug type terminals on most sizes
- Specially constructed and epoxy impregnated for low noise
- Customized ratings also available - contact the factory for custom mounting, inductance, current or ripple requirements

## Ratings

| Catalog Number | Type       | DC Amps | mH   | Watts | Lug Size | Torque N-m (lb-in) |
|----------------|------------|---------|------|-------|----------|--------------------|
| 1321-DC9-2     | Open Style | 9       | 3.22 | 7     | 22-14    | 4.5 (39.8)         |
| 1321-DC12-1    | Open Style | 12      | 1    | 5     | 22-14    | 4.5 (39.8)         |
| 1321-DC12-2    | Open Style | 12      | 2.1  | 7     | 18-4     | 20 (177.02)        |
| 1321-DC18-1    | Open Style | 18      | 0.65 | 5     | 18-4     | 20 (177.02)        |
| 1321-DC18-4    | Open Style | 18      | 3.75 | 17    | 18-4     | 20 (177.02)        |
| 1321-DC25-4    | Open Style | 25      | 1.75 | 13    | 18-4     | 20 (177.02)        |
| 1321-DC32-1    | Open Style | 32      | 0.85 | 11    | 18-4     | 20 (177.02)        |
| 1321-DC32-2    | Open Style | 32      | 1.62 | 14    | 18-4     | 20 (177.02)        |
| 1321-DC32-3    | Open Style | 32      | 2.68 | 21    | 18-4     | 20 (177.02)        |
| 1321-DC40-2    | Open Style | 40      | 0.75 | 15    | 18-4     | 20 (177.02)        |
| 1321-DC40-4    | Open Style | 40      | 2    | 29    | 18-4     | 20 (177.02)        |

## Approximate Mounting Dimensions

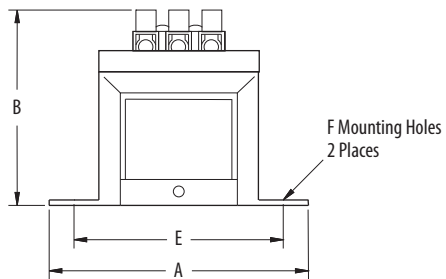


Figure 1

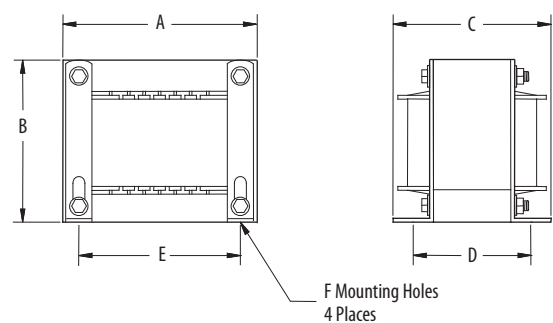
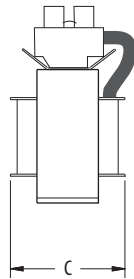


Figure 2

| Catalog Number | Figure | Dimensions in mm (in.) |              |              |             |              |                           |
|----------------|--------|------------------------|--------------|--------------|-------------|--------------|---------------------------|
|                |        | A                      | B            | C            | D           | E            | F                         |
| 1321-DC9-2     | 1      | 95.3 (3.75)            | 82.6 (3.25)  | 50.8 (2)     | (—)         | 79.5 (3.13)  | 47.5 DIA. (0.187 DIA.)    |
| 1321-DC12-1    | 1      | 95.3 (3.75)            | 82.6 (3.25)  | 44.5 (1.75)  | (—)         | 79.5 (3.13)  | 47.5 DIA. (0.187 DIA.)    |
| 1321-DC12-2    | 2      | 96.8 (3.81)            | 114.3 (4.5)  | 71.6 (2.82)  | 50.8 (2)    | 79.5 (3.13)  | 5.2 x 8.3 (0.203 x 0.328) |
| 1321-DC18-1    | 1      | 95.3 (3.75)            | 82.6 (3.25)  | 50.8 (2)     | (—)         | 79.5 (3.13)  | 47.5 DIA. (0.187 DIA.)    |
| 1321-DC18-4    | 2      | 117.6 (4.63)           | 133.4 (5.25) | 101.6 (4)    | 63.5 (2.5)  | 95.3 (3.75)  | 5.2 x 8.3 (0.203 x 0.328) |
| 1321-DC25-4    | 2      | 96.8 (3.81)            | 114.3 (4.5)  | 76.2 (3)     | 63.5 (2.5)  | 79.5 (3.13)  | 5.2 x 8.3 (0.203 x 0.328) |
| 1321-DC32-1    | 2      | 96.8 (3.81)            | 114.3 (4.5)  | 84.3 (3.32)  | 63.5 (2.5)  | 79.5 (3.13)  | 5.2 x 8.3 (0.203 x 0.328) |
| 1321-DC32-2    | 2      | 117.6 (4.63)           | 133.4 (5.25) | 108.0 (4.25) | 76.2 (3)    | 95.3 (3.75)  | 5.2 x 8.3 (0.203 x 0.328) |
| 1321-DC32-3    | 2      | 117.6 (4.63)           | 133.4 (5.25) | 133.4 (5.25) | 101.6 (4)   | 95.3 (3.75)  | 5.2 x 8.3 (0.203 x 0.328) |
| 1321-DC40-2    | 2      | 96.8 (3.81)            | 114.3 (4.5)  | 95.3 (3.75)  | 76.2 (3)    | 79.5 (3.13)  | 5.2 x 8.3 (0.203 x 0.328) |
| 1321-DC40-4    | 2      | 165.1 (6.5)            | 166.4 (6.55) | 152.4 (6)    | 85.9 (3.38) | 134.9 (5.31) | 7.1 x 13.2 (0.28 x 0.52)  |

# Important User Information

Solid-state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (publication [SGI-1.1](#) available from your local Rockwell Automation sales office or online at [rok.auto/literature](#)) describes some important differences between solid-state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid-state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this publication are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

Reproduction of the contents of this manual, in whole or in part, without written permission of Rockwell Automation, Inc., is prohibited.

## Waste Electrical and Electronic Equipment (WEEE)



At the end of life, this equipment should be collected separately from any unsorted municipal waste.

# Rockwell Automation Support

Use the following resources to access support information.

|                                                         |                                                                                                    |                                        |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------|
| <b>Technical Support Center</b>                         | Find help with how-to videos, FAQs, chat, user forums, and product notification updates.           | <a href="#">rok.auto/support</a>       |
| <b>Technical Documentation Center</b>                   | Quickly access and download technical specifications, installation instructions, and user manuals. | <a href="#">rok.auto/techdocs</a>      |
| <b>Knowledgebase</b>                                    | Access Knowledgebase articles.                                                                     | <a href="#">rok.auto/knowledgebase</a> |
| <b>Local Technical Support Phone Numbers</b>            | Locate the telephone number for your country.                                                      | <a href="#">rok.auto/phonesupport</a>  |
| <b>Literature Library</b>                               | Find installation instructions, manuals, brochures, and technical data publications.               | <a href="#">rok.auto/literature</a>    |
| <b>Product Compatibility and Download Center (PCDC)</b> | Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes. | <a href="#">rok.auto/pcdc</a>          |

# Documentation Feedback

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at [rok.auto/docfeedback](#).

Rockwell Automation maintains current product environmental information on its website at [rok.auto/pec](#).

Allen-Bradley, PowerFlex, Rockwell Automation, and Rockwell Software are trademarks of Rockwell Automation, Inc.  
Trademarks not belonging to Rockwell Automation are property of their respective companies.

Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

**[www.rockwellautomation.com](#)**

## Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444  
Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640  
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication 1321-TD001S-EN-P - October 2022

Supersedes Publication 1321-TD001R-EN-P - May 2021

Copyright © 2022 Rockwell Automation, Inc. All rights reserved. Printed in the U.S.A.