

## Fractional to 2 HP DC drives for both non-regenerative and regenerative applications



*The Reliance Electric DC3 family of drives provides cost-effective variable speed control and operates on both 115 and 230 VAC single-phase power. These drives offer both users and machinery-builders the right drive at the right price.*



### Standard Features

DC3 drives are available in both plate-style chassis designs, as well as NEMA 1 and NEMA 4X/12 enclosed designs, making it easy to find a model that will meet your application needs. To simplify the selection process, each model number begins with a simple letter and number combination:

### Drive Types

- **DC3N:** Simple non-regenerative drive
- **DC3E:** Non-regenerative drive with isolated 0-10 VDC and 4-20 mA inputs
- **DC3R:** Regenerative drive
- **DC3RI:** Regenerative drive with isolated  $\pm 10$  VDC and 4-20 mA inputs
- **DC3RD:** Regenerative drive with a membrane keypad and corresponding LEDs

DC3 drives incorporate a full-wave SCR bridge design for optimal AC to DC conversion. This minimizes the heat build-up at the motor and extends the motor's operating life.

All DC3 drives are designed and manufactured with surface-mounted components, allowing for compact designs as well as improved field reliability.

Every DC3 product carries UL, cUL, and CE certification labels, testifying to product quality and robustness, features rarely found in competitive DC drive products in this class.

### Enclosed Drives

Enclosed models are designed for wall or machine mounting and include provisions for direct conduit connections to the drive enclosure. Every enclosed drive comes standard with mounted operator devices as well as line input fusing, providing the customer a self-contained drive that's nearly ready to run out-of-the-box.

### Plate Drives

Plate models are designed for mounting and integration into a cabinet or some other enclosure. Each model comes with a loose 10 kOhm speed potentiometer for customer use.

### Common Set of Specifications

All DC3 drives share a common set of specifications and features, listed here. Specifications and features unique to individual models are described on the pages that follow.

### Standard Specifications

- AC line input voltage selection:
  - 115 VAC, 1-Phase, 50/60 Hz
  - 230 VAC, 1-Phase, 50/60 Hz
- AC line voltage variation:
  - $\pm 10\%$  of selected input
- AC line input frequency variation:
  - 48 Hz to 62 Hz
- Output voltage:
  - 0 to 90 VDC armature @ 115 VAC
  - 0 to 180 VDC armature @ 230 VAC
- Output voltage form factor:
  - 1.37 @ motor base speed
- Overload capacity:
  - 150% for 1 minute
- Ambient temperature:
  - 10°C to 55°C plate style
  - 10°C to 45°C enclosed
- Elevation:
  - 1,000 meters without derating
  - Derate 1% for every 90 meters above 1000 meters



## Standard Specifications

- Service factor: 1.0
- Duty: Continuous
- Speed regulation:  $\pm 1.0\%$  of motor base RPM with 95% load change
- Speed range:
  - 50:1 with 100% torque
  - 60:1 usable range
- Overload capacity: 150% for 1 minute

## Standard Adjustments

- Speed reference potentiometer: 10 kOhm, 2 Watts
- Separate potentiometers for:
  - Minimum speed: 0 to 35%
  - Maximum speed: 75 to 100%
  - Current limit:  $\leq 150\%$
  - Acceleration: 0.5 to 17 sec.
  - Deceleration: 0.5 to 17 sec.
  - IR compensation: 0 to 15%

Instruction Manual: D2-3451

## Standard Features

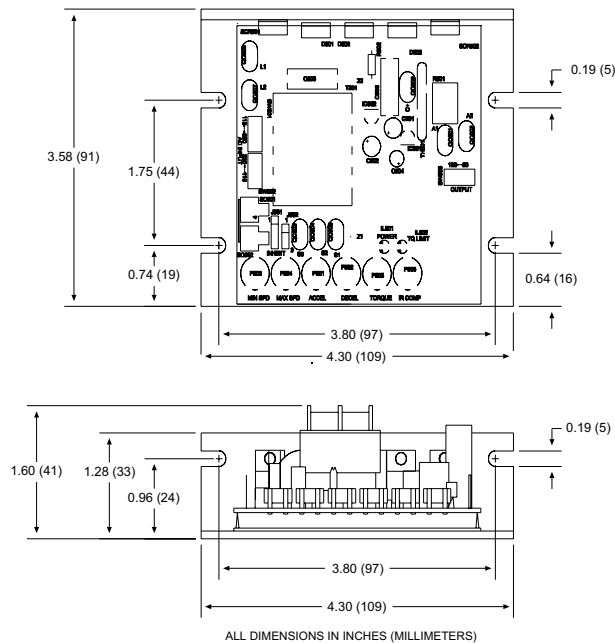
- LED indicators:
  - RED for current limit
  - GREEN for power ON
- Terminal connections: Spade type terminals
- Loose potentiometer and spade connector kit
- Inhibit circuit kit

## Selection Table

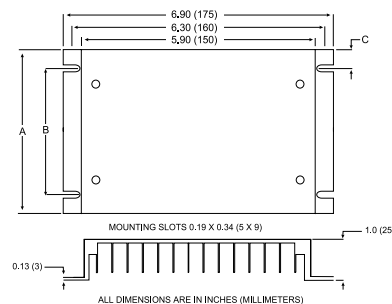
Model No.	Input Voltage	HP	Armature Amps Cont.	Armature Voltage	Enclosure Type
DC3N-12D-00-010-AN	115 VAC, 1-Phase	1/8 to 1/2	5.0	0 to 90 VDC	Plate
		1/2 to 1.0 *	10.0 *		
DC3N-12D-00-010-AN	230 VAC, 1-Phase	1/4 to 1.0	5.0	0 to 180 VDC	Plate
		1.0 to 2.0 *	10.0 *		

\*Denotes capacity with Heatsink option installed. Use Heatsink model DC3N-HS-00.

## Dimensions: DC3N-12D-00-010-AN



## Dimensions: DC3N-HS-00 and DC3N-HS-01 Heatsinks



Part Number	Dim A	Dim B	Dim C
DC3N-HS-00	4.40 (112)	3.00 (76)	0.7 (18)
DC3N-HS-01	7.78 (198)	6.00 (152)	0.89 (23)



## Standard Features

- Operator speed potentiometer
- ON/OFF toggle switch
- Power ON indicator light
- AC line input fusing: L1 & L2
- Customer terminal block
- Grounding screws
- NEMA 1 or NEMA 4X/12 design

## Selection Table

Mode No.	Input Voltage	HP	Armature Amps Cont.	Armature Voltage	Enclosure Type
DC3N-12D-01-010-AN	115 VAC, 1-Phase	1/8 to 1/2	5.0	0 to 90 VDC	NEMA 1
		1/2 to 1.0**	10.0**		
DC3N-12D-4X-010-AN	230 VAC, 1-Phase	1/4 to 1.0	5.0	0 to 180 VDC	NEMA 1
		1.0 to 2.0**	10.0**		
DC3N-12D-4X-010-AN	115 VAC, 1-Phase	1/8 to 1/2	5.0	0 to 90 VDC	NEMA 4X/12
		1/2 to 1.0**	10.0		
DC3N-12D-4X-010-AN	230 VAC, 1-Phase	1/4 to 1.0	5.0	0 to 180 VDC	NEMA 4X/12
		1.0 to 2.0**	10.0		

\*\* Denotes capacity with Heatsink option installed. Use Heatsink model DC3N-HS-01.

## Standard Specifications

- Service factor: 1.0
- Duty: Continuous
- Speed regulation:  $\pm 1.0\%$  of motor base RPM with 95% load change
- Speed range:
  - 50:1 with 100% Torque
  - 60:1 usable range
- Overload capacity: 150% for 1 minute

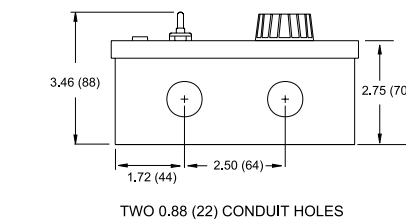
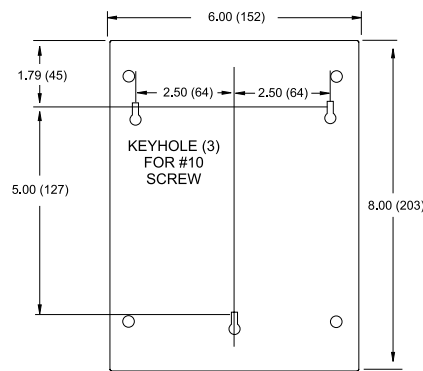
## Standard Adjustments

- Speed reference potentiometer: 10 kOhm, 2 Watts
- Separate potentiometers for:
  - Minimum speed: 0 to 35%
  - Maximum speed: 75 to 100%
  - Current limit:  $\leq 150\%$
  - Acceleration: 0.5 to 17 sec.
  - Deceleration: 0.5 to 17 sec.
  - IR compensation: 0 to 15%

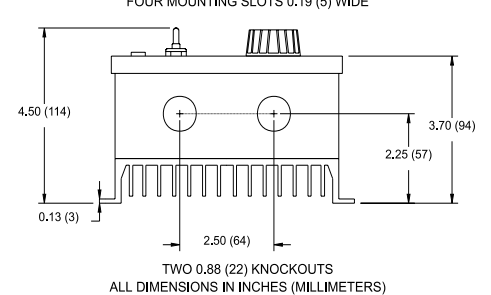
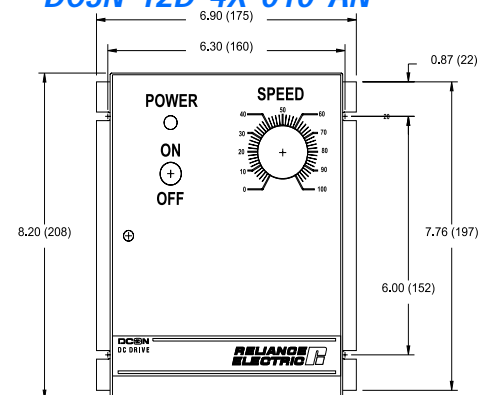
Instruction Manual: D2-3451

## Dimensions:

### DC3N-12D-01-010-AN



### DC3N-12D-4X-010-AN





## Standard Specifications

- Service factor: 1.0
- Duty: Continuous
- Speed regulation:
  - 1.0% with arm. volt. feedback
  - 0.1% with tach. feedback
- Speed range:
  - 50:1 with 100% torque
  - 60:1 usable range
- Overload capacity: 150% for 1 min.
- Field supply rating:
  - 1 Amp DC
  - 50/100 VDC (115 VAC)
  - 100/200 VDC (230 VAC)
- Tachometer feedback range: 7 to 50 VDC/1000 RPM
- Isolated reference input:
  - 0-10 VDC
  - 4-20 mA

## Standard Adjustments

- Speed reference potentiometer: 10 kOhm, 2 Watts
- Separate potentiometers for:
  - Minimum speed: 0 to 50%
  - Maximum speed: 0 to 100%
  - Current Limit:  $\leq 200\%$
  - Accel: 0.5 to 10 sec.
  - Decel: 0.5 to 10 sec.
  - IR compensation: 0 to 15%
  - Tachometer feedback adj.

Instruction Manual: D2-3452

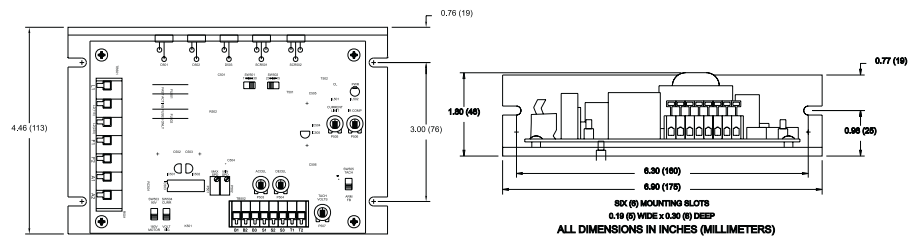
## Standard Features

- LED indicators:
  - RED for current limit
  - GREEN for power ON
- On-board fusing: AC line input (L1 & L2)
- Unidirectional
- Cage-clamp terminal blocks
- Loose potentiometer kit
- Inhibit circuit kit
- Isolated input
- Enclosed model
  - NEMA 4X/12
  - Operator speed potentiometer
  - Power ON indicator light
  - AUTO/MAN selector switch
  - Customer terminal block
  - Grounding screws

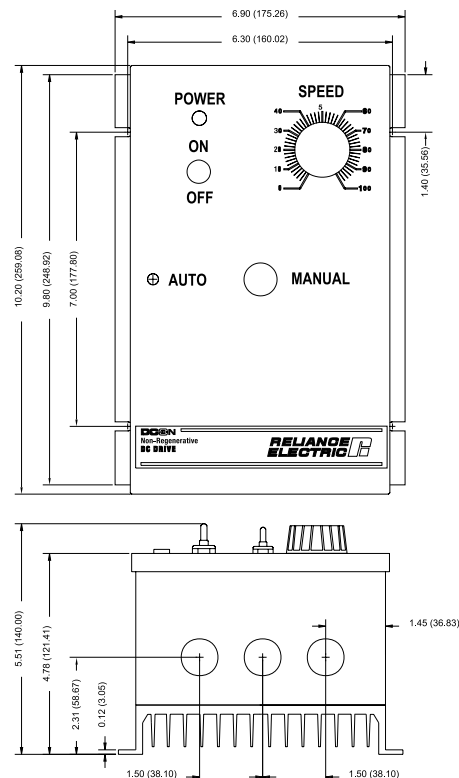
## Selection Table

Model No.	Input Voltage	HP	Armature Amps Cont.	Armature Voltage	Enclosure Type
DC3N-12D-00-010-AI	115 VAC, 1-Phase	1/4 to 1.0	10.0	0 to 90 VDC	Plate
	230 VAC, 1-Phase	1/2 to 2.0	10.0	0 to 180 VDC	Plate
DC3N-12D-4X-010-AI	115 VAC, 1-Phase	1/4 to 1.0	10.0	0 to 90 VDC	NEMA 4X/12
	230 VAC, 1-Phase	1/2 to 2.0	10.0	0 to 180 VDC	NEMA 4X/12

## Dimensions: DC3N-12D-00-010-AI



## Dimensions: DC3N-12D-4X-010-AI





## Standard Specifications

- Service Factor: 1.0
- Duty: Continuous
- Speed regulation:
  - 1.0% with arm. volt. feedback
  - 0.1% with tach. feedback
- Speed range:
  - 50:1 with 100% torque
  - 60:1 usable range
- Overload capacity: 150% for 1 min.
- Field supply rating:
  - 1 Amp DC
  - 50/100 VDC (115 VAC)
  - 100/200 VDC (230 VAC)
- Tachometer feedback range: 7 to 50 VDC/1000 RPM
- Non-isolated reference input for DC3R-12D-00-010-AN:  $\pm 0-10$  VDC

## Standard Adjustments

- Speed reference potentiometer: 10 kOhm, 2 Watts
- Separate potentiometers for:
  - Minimum speed: 0 to 35%
  - Maximum speed: 0 to 100%
  - Forward torque:  $\leq 200\%$
  - Reverse torque:  $\leq 200\%$
  - Forward accel: 0.5 to 6 sec.
  - Reverse accel: 0.5 to 6 sec.
  - IR compensation: 0 to 15%
  - Deadband compensation adj.
  - Tachometer feedback adj.

DC3R-12D-00-010-AI adds isolated analog reference inputs:

- $\pm 25$  &  $\pm 250$  VDC
- 1 - 5, 4 - 20 & 10 - 50 mA

Instruction Manual: DC3R: D2-3453

## Standard Features

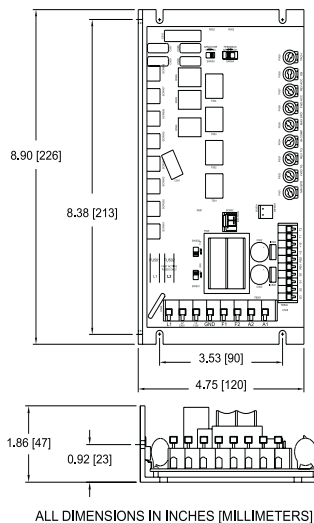
- On-board AC input line fusing (L1 & L2)
- Cage-clamp terminal blocks
- Loose potentiometer kit
- Inhibit circuit kit

## Selection Table

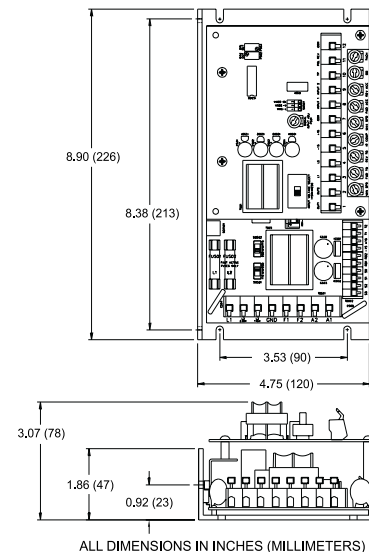
Model No.	Input Voltage	HP	Armature Amps Cont.	Armature Voltage	Enclosure Type
DC3R-12D-00-010-AN	115 VAC, 1-Phase	1/4 to 1/2	7.0	0 to 90 VDC	Plate
		1/2 to 1.0 ***	10.0 ***		
DC3R-12D-00-010-AI	230 VAC, 1-Phase	1/2 to 1.0	7.0	0 to 180 VDC	Plate
		1.0 to 2.0 ***	10.0 ***		
DC3R-12D-00-010-AI	115 VAC, 1-Phase	1/4 to 1/2	7.0	0 to 90 VDC	Plate
		1/2 to 1.0 ***	10.0 ***		
DC3R-12D-00-010-AI	230 VAC, 1-Phase	1/2 to 1.0	7.0	0 to 180 VDC	Plate
		1.0 to 2.0 ***	10.0 ***		

\*\*\* Denotes capacity with Heatsink option installed. Use Heatsink model DC3R-HS-00.

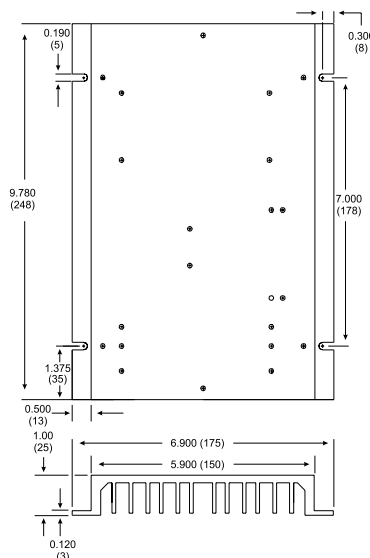
## Dimensions: DC3R-12D-00-010-AN



## Dimensions: DC3R-12D-00-010-AI



## Dimensions: DC3R-HS-00 Heatsink





## Standard Specifications

- Service factor: 1.0
- Duty: Continuous
- Speed regulation:
  - 1.0% with arm. volt. feedback
  - 0.1% with tach. feedback
- Speed range:
  - 50:1 with 100% torque
  - 60:1 usable range
- Overload capacity: 150% for 1 min.
- Field supply rating:
  - 1 Amp DC
  - 50/100 VDC (115 VAC)
  - 100/200 VDC (230 VAC)
- Tachometer feedback range: 7 to 50 VDC/1000 RPM
- Non-isolated reference input:  $\pm 0$ -10 VDC

## Standard Adjustments

- Speed reference potentiometer: 10 kOhm, 2 Watts
- Separate potentiometers for:
  - Minimum speed: 0 to 35%
  - Maximum speed: 0 to 100%
  - Forward torque:  $\leq 200\%$
  - Reverse torque:  $\leq 200\%$
  - Forward accel: 0.5 to 6 sec.
  - Reverse accel: 0.5 to 6 sec.
  - IR compensation: 0 to 15%
  - Deadband compensation adj.
  - Tachometer feedback adj.

Instruction Manual: D2-3453

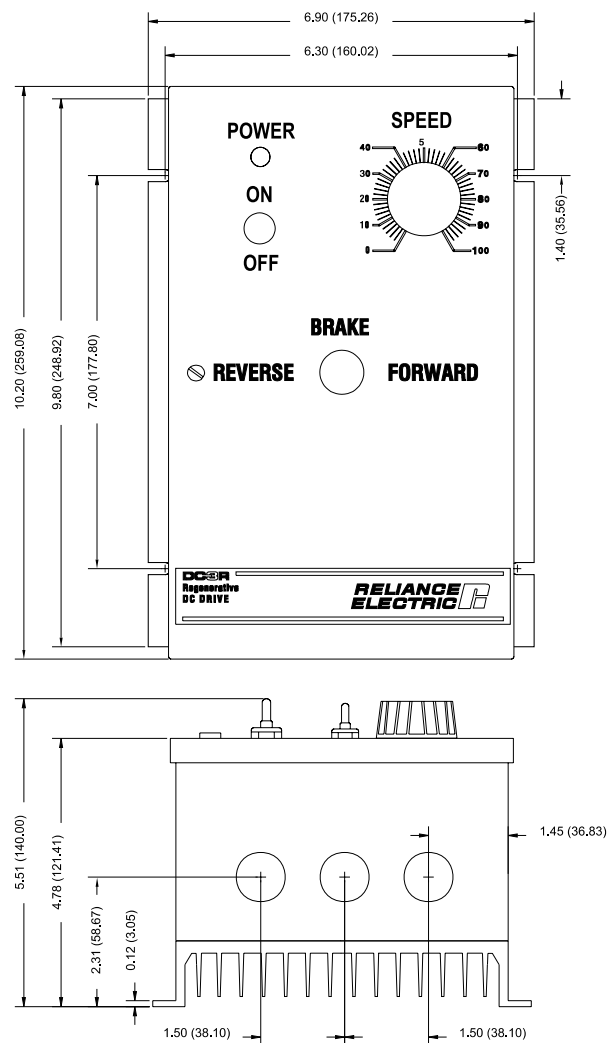
## Standard Features

- On-board fusing: AC line input (L1 & L2)
- Cage-clamp terminal blocks
- Operator speed potentiometer
- ON/OFF toggle switch
- Power ON indicator light
- Grounding screws

## Selection Table

Model No.	Input Voltage	HP	Armature Amps Cont.	Armature Voltage	Enclosure Type
DC3R-12D-4X-010-AN	115 VAC, 1-Phase	1/4 to 1.0	10.0	0 to 90 VDC	NEMA 4X/12
	230 VAC, 1-Phase	1/2 to 2.0	10.0	0 to 180 VDC	NEMA 4X/12

## Dimensions: DC3R-12D-4X-010-AN





## Standard Specifications

- Service factor: 1.0
- Duty: Continuous
- Speed regulation:
  - 1.0% with arm. volt. feedback
  - 0.1% with tach. feedback
- Speed range:
  - 50:1 with 100% Torque
  - 60:1 usable range
- Overload capacity: 150% for 1 min.
- Field supply rating:
  - 1 Amp DC
  - 50/100 VDC (115 VAC)
  - 100/200 VDC (230 VAC)
- Tachometer feedback range: 7 to 50 VDC/1000 RPM
- Non-isolated reference input:  $\pm 0-10$  VDC

## Standard Adjustments

- Speed reference potentiometer: 10 kOhm, 2 Watts
- Separate potentiometers for:
  - Minimum speed: 0 to 35%
  - Maximum speed: 0 to 100%
  - Forward torque:  $\leq 200\%$
  - Reverse torque:  $\leq 200\%$
  - Forward accel: 0.5 to 15 sec.
  - Reverse accel: 0.5 to 15 sec.
  - IR compensation: 0 to 15%
  - Deadband compensation adj.
  - Tachometer feedback adj.
  - Cycle dwell time: 0.1 to 1 sec. (adjusts in 0.1 sec. increments)

Instruction Manual: D2-3455

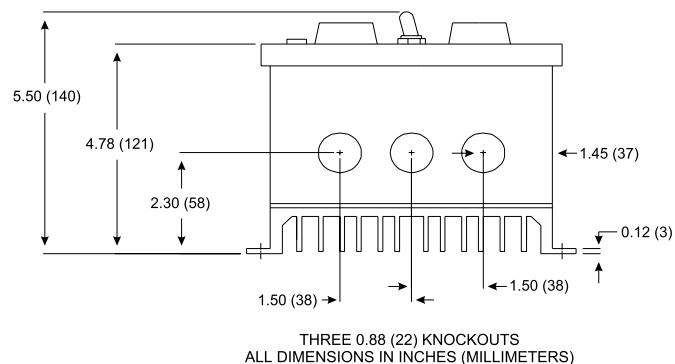
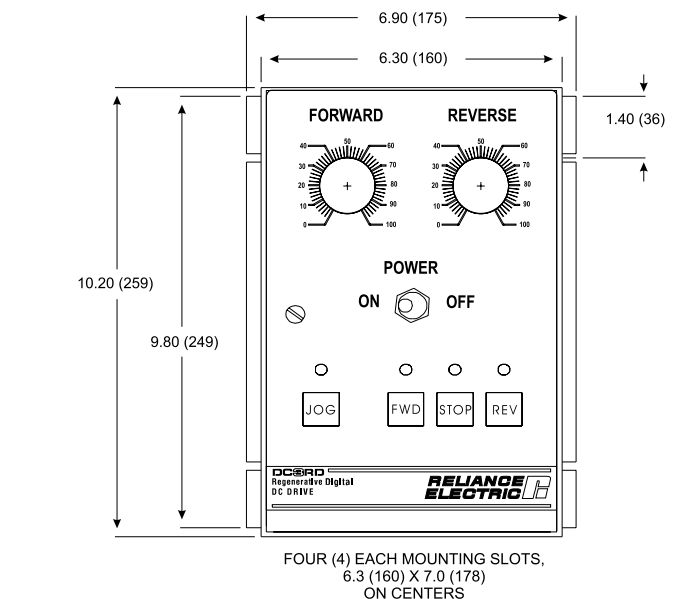
## Standard Features

- Dual operator speed potentiometers with independent forward & reverse setpoints
- ON/BRAKE/OFF toggle switch
- Jog, forward, stop, reverse operator membrane keys
- Jog, forward, stop, reverse indicator lights
- 4 modes of limit switch selection for cyclic reversing & adjustable dwell time
- On-board fusing: AC line input (L1 & L2)
- Cage-clamp terminal blocks
- Grounding screws

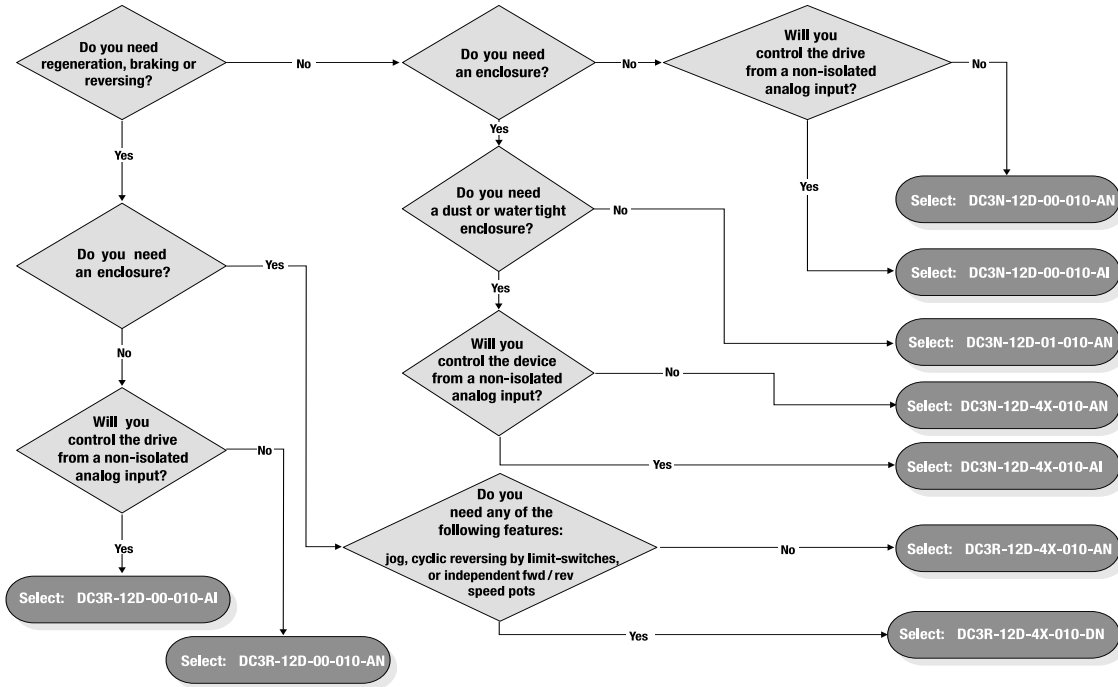
## Selection Table

Model No.	Input Voltage	HP	Armature Amps Cont.	Armature Voltage	Enclosure Type
DC3R-12D-4X-010-DN	115 VAC, 1-Phase	1/4 to 1.0	10.0	0 to 90 VDC	NEMA 4X/12
	230 VAC, 1-Phase	1/2 to 2.0	10.0	0 to 180 VDC	NEMA 4X/12

## Dimensions: DC3R-12D-4X-010-DN



## Selection Flow Chart



## Typical DC3 Power Ratings

Motor HP	AC Input Amps	DC Armature Voltage	DC Armature Amps	Motor Field Voltage
1/4	4.2	90/100	2.7	50/100
1/3	5.5	90/100	3.5	50/100
1/2	7.5	90	5.0	50/100
3/4	3.8	180	2.5	100/200
1.0	10.9	90	7.6	50/100
1.5	5.9	180	3.8	100/200
2.0	12.1	90	10.0	50/100
	6.7	180	5.0	100/200
	9.8	180	7.0	50/100
	11.7	180	9.2	100/200

**NOTE:** This material is not intended to provide operational instructions. Appropriate Reliance Electric Drives instruction manuals precautions should be studied prior to installation, operation, or maintenance of equipment.

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<http://www.reliance.com>

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