DC Drives

A flexible, reliable and affordable drive for 1/4 through 2 HP DC applications

DC2 VS(r) Drives combine application flexibility, compact size and reliability into an affordable adjustable speed package that delivers the performance you need for a wide range of industrial applications.

The DC2 Controller is equipped with a range of application adjustments including a single jumper reconnection to quickly and easily match the controller to incoming power. Motor horsepower selection, the choice of either armature voltage or speed feedback signals, and the choice of 7 VDC or 20.8 VDC/1000 RPM tachometer feedback is just as simple. Other application adjustments allow you to tailor controller performance to meet your requirements.

A number of standard model number controllers are available which provide features for specific applications. These specific features include reversing, run/jog, process signal input of either 4-20 mA or 0-10 volts or a torque regulator to control shaft torque or web tension.

Standard Features

- Available in either open chassis, totally enclosed NEMA Type 12K, or NEMA 4/4X construction.
- Operates from either local or remote operator controls for added mounting flexibility.
- All circuitry - sequencing, regulator and terminals - packaged on a single, accessible surface mount design printed circuit board.
- Jumper reconnections adapt standard controllers to match:
    - Line voltage, either 115 or 230 VAC, 50 or 60 Hz.
    - Motor horsepower, from 1/4 thru 2.
    - Desired feedback, either armature voltage or motor driven D-C tachometer for non-reversing models only.
    - Tachometer requirements: 7 VDC or 20.8 VDC per 1000 RPM designs.
    - "S" curve or linear acceleration
    - Zero speed operation
- Application adjustments tailor drive performance to your needs:
    - Separately adjustable maximum and minimum speeds set speed limits.
    - Adjustable current limit protects machinery, wiring and drive.
    - Adjustable IR drop compensation improves speed regulation when using armature voltage feedback.
    - Adjustable acceleration and deceleration rates for smooth starts, stops and speed changes
- Armature voltage, tachometer or armature current feedback.
- 20:1 constant torque speed range.
- 30:1 constant torque speed range with tachometer feedback.
- Power cube contains all power semi- conductors for reliability and improved maintenance time.
- Full-wave, half-control power conversion with back diode for efficient power conversion, smooth armature current waveforms and cool motor operation over wide operating speed ranges.
- Built-in half-wave field supply for operation of wound field motors.
- Built-in surge suppressor helps protect semiconductors from line transients for better reliability.
- Relay in control circuit prevents automatic restarting after power outage.
- Overload protection provided by motor thermostat - standard with every model-numbered Reliance D-C motor.
- Run/Off switching arrangement allows positive disconnect of the motor from the plant line on a "Stop" command.
- Two years from date of manufacture/one year in service full exchange warranty eliminates troubleshooting and returns you quickly to operation.
- NEMA 4 Controls are F.D.A./U.S.D.A. approved, white epoxy finish on controller and motor.

DC2 Controllers for Specific Applications

- Standard model numbered DC2 Controllers provide just the right controller for those special applications.
- Models DC2-40, DC2-50, DC2-60, DC2-70, DC2-80 and DC2-90 come with start/stop and speed input capability for basic applications.
- Model DC2-71 and DC2-91 come complete with forward-dynamic braking-reversing switch for simple reversing applications.
- Instrument Interface Models, DC2-42, DC2-52, DC2-62, DC2-72, DC2-82 and DC2-92 feature automatic/manual operation from either a grounded or ungrounded 4-20 mA or 0-10 volt D-C reference (automatic) or speed potentiometer (manual).
- Models DC2-43, DC2-53, DC2-63, DC2-73, DC2-83 and DC2-93 provide torque control using armature current feedback for applications requiring control of applied torque or tension
- Models DC2-44, DC2-54, DC2-64, DC2-74, DC2-84 and DC2-94 combine torque control with instrument interface capabilities.
- Models DC2-40, DC2-50, DC2-60, DC2-79, DC2-80 and DC2-99. feature a basic speed control with start/stop and run/jog.
- Model DC2-78 and DC2-98 combine basic speed control with start/stop, run/jog and forward-dynamic braking-reversing capability.

Key Industries and Applications

- Packaging Equipment
- Conveyors
- Metering Pumps
- Take-Ups
- Mixers
- Material Handling Machines
- Exercise Equipment
- Feeders
- Printing Presses
- Indexers
- Tapping Machines
- Robotics

Additional Industries for NEMA 4/NEMA 4X EasyClean Plus DC2 Controllers

- Baking
- Beverage and Dairy
- Chemical Processing
- Food Processing and Handling
- Marine
- Meat and Poultry Processing
- Pharmaceutical
- Waste Water Treatment
- Other Processing Applications

All dimensions in inches (mm)

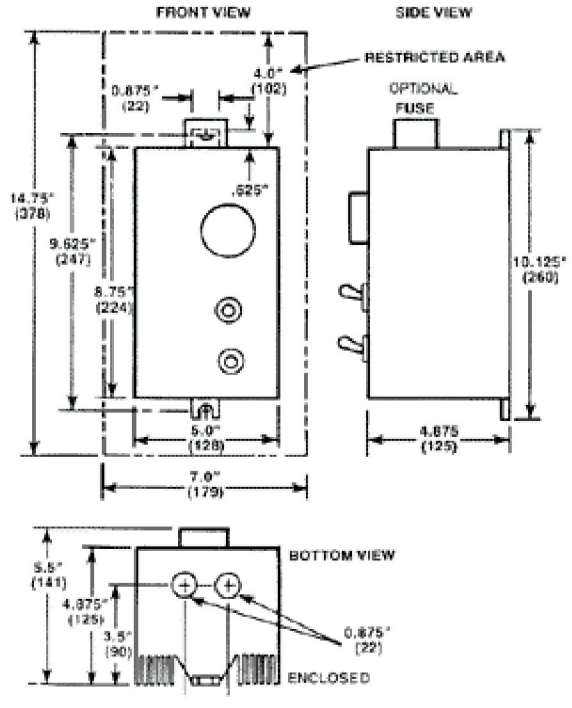
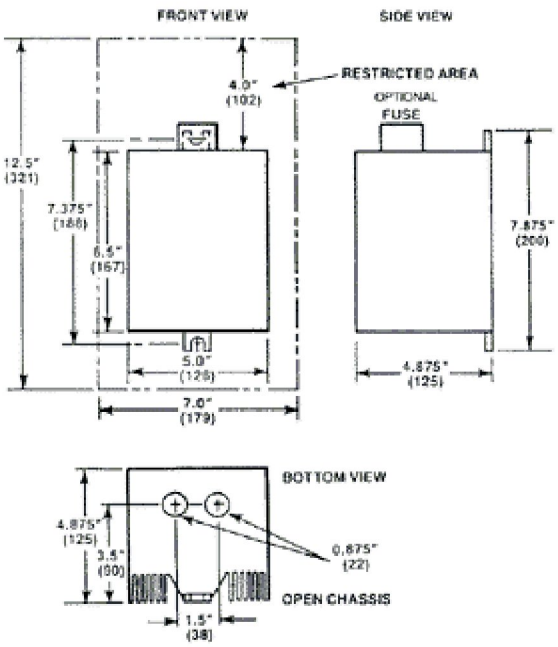
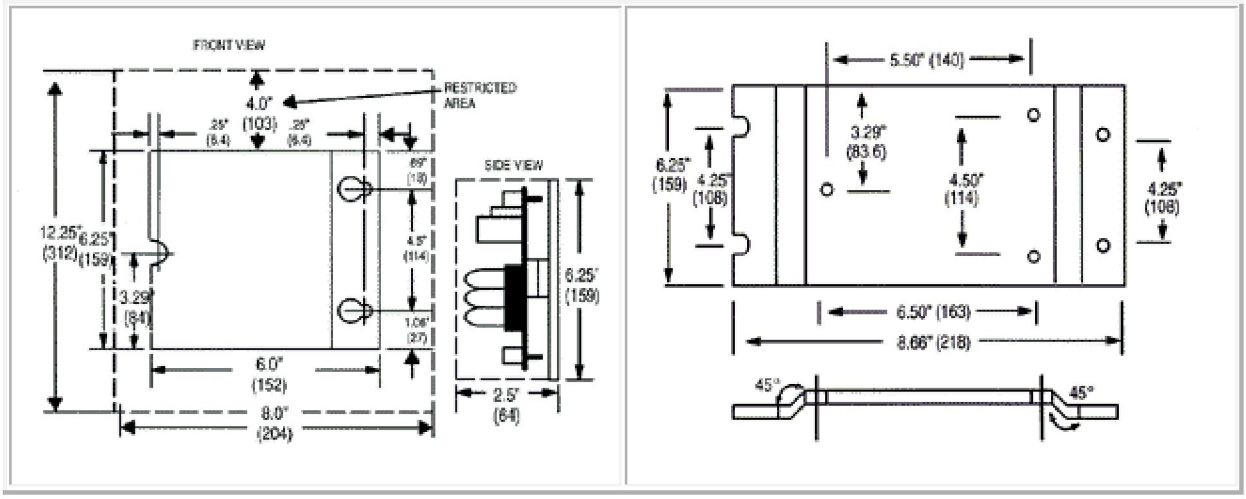
Enclosed Design (DC2 Series 60, 70, 80 and 90)	**Open Chassis Design** (DC2 Series 40)
	

Plate-style Open Chassis (DC2 Series 50)	**HS1-50 Heat Sink** (For DC2 Series 50 Controllers)



Service Conditions

Elevation	Up to 3300 feet (1000 meters)
Ambient Temperature	
Enclosed Models	32エ to 104エ
	(0イ to 40イ)
Chassis Models	32エ to 131エ
	(0イ to 55イ)
A-C Line Voltage Variation	±10% rated voltage
A-C Frequency	48 to 62 Hz
Atmosphere	Non-Condensing Relative
	Humidity 5 to 95%Application Data

Application Data

Service Factor	1.0
Maximum Load	150% for 1 minute
Speed Regulation:	
Voltage Feedback	2-5% (95% load change)

Tachometer Feedback	1% (95% load change)
Speed Range	20:1 with armature voltage feedback
	30:1 with tachometer feedback

Feedback and reference potentiometer circuits are not isolated from main power. Isolation transformers are mandatory for tachometer feedback operation using a type RE020 20.8 VDC/1000 RPM tachometer (Model R20E8000). Consult instruction manual D2-3231 for other recommended or mandatory uses of isolation transformers and complete application information.

Adjustments

Maximum Speed (Percent of rated)	under 50 to 100%
Minimum Speed (Percent of rated)	under 5 to 50%
Current Limit (Percent of rated)	adjustable to 150%
Acceleration Rate	0.3 to 40 seconds linear
Deceleration Rate	0.3 to 40 seconds linear
IR Drop Compensation	5 to 10%

Controller Ratings

	115 VAC INPUT					
	230 VAC INPUT					
Motor HP	Rated A-C Line (Amps)(1)	Input KVA	D-C Armature Voltage	Rated Armature Current (Amps)	Available Field Voltage	Rated Field Current (Amps)
1/4	3.1	.36	90	2.5	50	2.0
1/4	-	-	-	-	-	-
1/3	4.2	.48	90	3.7	50	2.0
1/3	-	-	-	-	-	-
1/2	6.2	.71	90	5.0	50	2.0
1/2	3.1	.71	180	2.5	100	2.0
3/4	9.4	1.00	90	7.5	50	2.0

3/4	4.7	1.00	180	3.7	100	2.0
1(2)	12.5	1.40	90	10.0	50	2.0
1(2)	6.2	1.40	180	5.0	100	2.0
1 1/2	-	-	-	-	-	-
1 1/2	9.4	2.20	180	7.5	100	2.0
2(2)	-	-	-	-	-	-
2(2)	12.5	2.90	180	10.0	100	2.0

(1) Includes motor field current

(2) DC2 Series 50 designs must be mounted to a metal plate 18" x 18" to meet 1 HP @ 115 VAC and 2 HP @ 230 VAC or an optional heat sink (HS1-50) can be purchased.

Application Matrix

Here are some basic guidelines for selecting an appropriate DC2 controller based on the type of application involved.

Application	**Enclosure**		
	Chassis	**NEMA 12**	**NEMA 4/4X/12**
Agitators			*
Bottling Machines		*	*
Conveyors	*	*	*
Exercise Machines	*		
Extruders	*		*
Feeders	*	*	*
Indexers	*	*	
Material Handling	*	*	*
Metering Pumps	*	*	*
Mixers		*	*
Ovens			*
Packaging Machines	*	*	*
Printing Presses	*	*	*
Processing Machines			*
Pumps		*	*

Robotics	*	*	
Screen Presses	*	*	
Take-Ups	*	*	
Tapping Machines	*	*	
Welding Positioners	*		

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