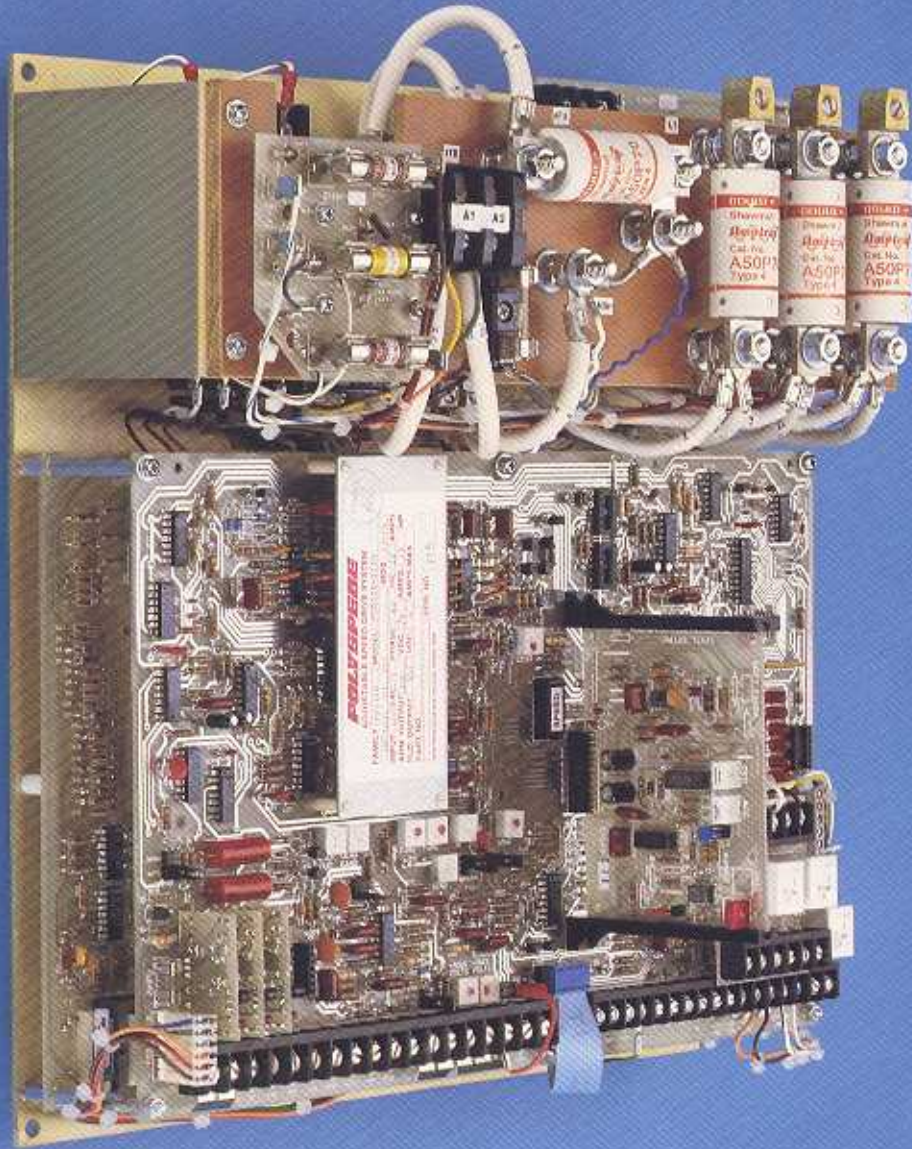


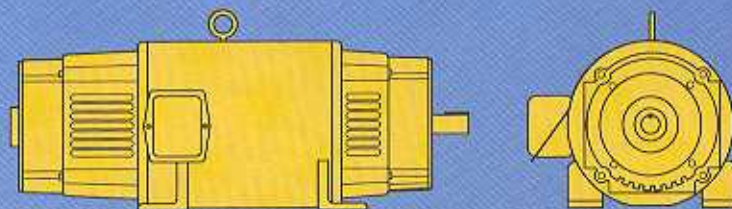
Model PRD12B • 3 Phase Input

# Regenerative DC Speed Control

3 through 100 Horsepower



**POLYSPEED**



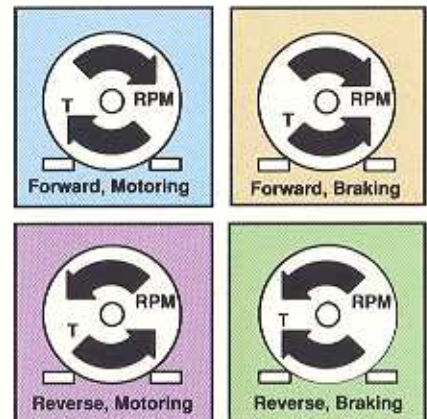
# Polyspede PRD12B gives you fast response, plus four quadrant operation\*



## \* Four Quadrant Operation

The term *four quadrant* refers to the PRD12B's ability to operate in the four different modes shown in the diagrams below.

With the PRD12B you can switch from any one of these modes directly to any other, **electronically**. There are no mechanical contactors or anti-plug circuits required. The drive is designed for rapid and continuous cycling that would rule out a contactor reversing drive because of contactor wear.



## Retrofit as well as new installations

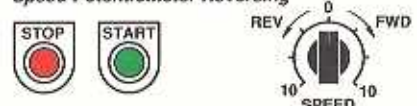
**Upgrade existing installations** that depend on contactors for reversing or dynamic braking. Use this contactorless regenerative drive for better performance and lower maintenance. The PRD12B accepts pushbutton inputs from existing operator stations with no change in motor response to the push-buttons. In one possible mode, the directional push-buttons are inactive until the motor stops — a safety feature in some applications.

**New installations:** Choose the "auto reverse" option with the PRD12B so the pushbuttons are always alive for immediate reversing. Simplifies your design in machines that cycle. Or, control **both** speed and direction from a potentiometer or from a process control signal.

### Pushbutton Reversing



### Speed Potentiometer Reversing



**In all applications** you benefit from the compact size of the PRD12B. Even with the NEMA 12 enclosure, it is 24" x 24" or smaller through 100 horsepower.

**PRD12B** is a fast responding, regenerative SCR DC speed control. With input from a three phase AC line, it is both power supply and control center for an industrial DC motor—starting, stopping, reversing, accelerating, braking or holding a predetermined speed, in either direction of rotation.

When the PRD12B is signaled to brake the mechanical load, it causes the motor to act as a generator. The braking energy is sent back into the AC power lines, eliminating costly and inefficient dynamic braking resistors. Besides simplifying the overall installation, the PRD12B also provides faster braking than is possible with non-regenerative drives.

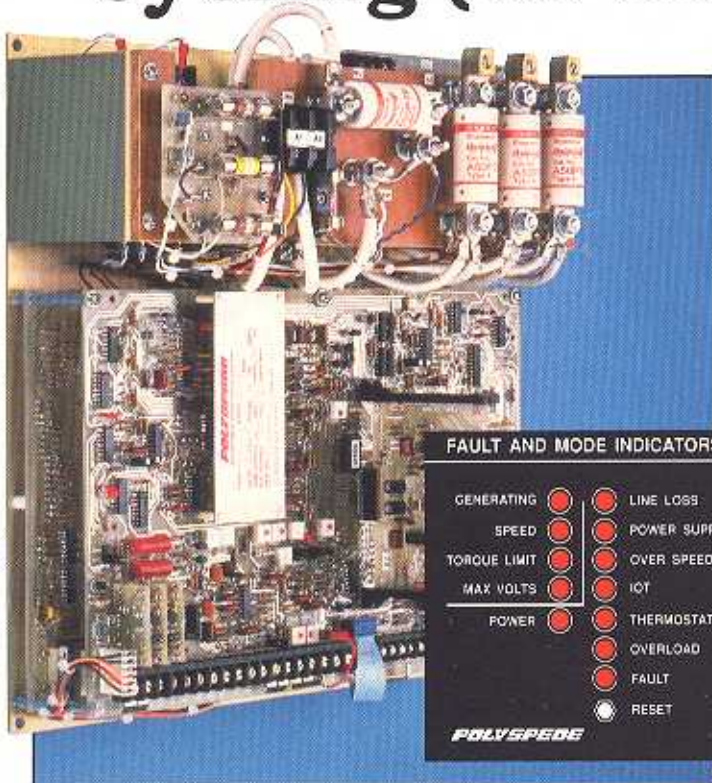
### Choose it for the most demanding jobs

The PRD12B is designed specifically for high duty cycle indexing and reversing. Also, where controlled hold-back torque is required, as in braking high inertia loads, hoisting and unwinding, the PRD12B is your best choice.

Additionally, with the optional plug-in interface, the PRD12B is ideal for high resolution positioning in servo systems.

The unique circuit design delivers a velocity and torque loop response that is typically 8 Hertz. There is negligible overshoot during acceleration, deceleration or reversing.

# New POLYSPEDE<sup>®</sup> regenerative DC drive thrives on forward-reverse cycling (no contactors)



Input is 3 phase, 230/460 VAC, readily field modifiable. Horsepower rating is proportional to input voltage. Example: 10 hp at 230 VAC or 20 hp at 460 VAC. Capacities 3 through 500 hp.

**C**ontactor wear can be chronic. It will repeatedly shut down an SCR speed control when reversing contactors are used for rapid, forward-reverse cycling.

But now with the Polyspede PRD12B you can start, stop, reverse and brake all day long with no contactor wear, *because there are no contactors*. All switching is done electronically.

#### Choose it for the most demanding jobs

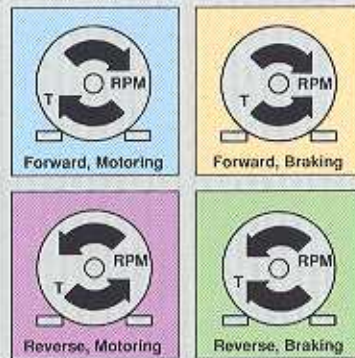
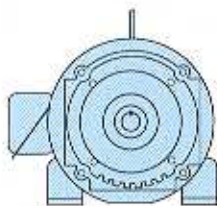
The PRD12B is also your best choice where controlled hold-back torque is required, as in braking high inertia loads, hoisting and unwinding.

And with the optional plug-in interface, the PRD12B is ideal for high resolution positioning in servo systems.

Braking is regenerative. The motor becomes a generator to send the braking energy back to the AC power lines, eliminating costly, energy-wasting resistors.

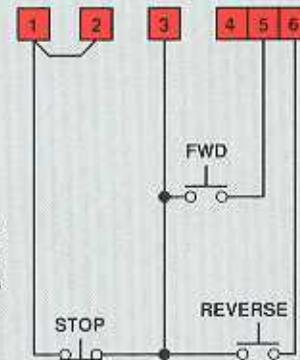
You save space, too. Even with the optional, *sealed* NEMA 12 enclosure, the dimensions are only 42" x 36" for 200 hp, much less for the smaller models.

**Call us for detailed specifications and application data.**



**Left:**  
Four quadrant operation. All switching is electronic.

**Right:**  
115 VAC control circuit. Allows use of standard (not dry circuit) pushbuttons for forward, reverse and stop. Eliminates noise and voltage drop problems over distances.



## **POLYSPEDE<sup>®</sup>**

Polyspede Electronics Corporation • 6770 Twin Hills Avenue • Dallas, Texas 75231  
Telephone 214-363-7245 • FAX 214-363-6361

## Standard Features

- Contactorless braking and reversing.
- 115 VAC pushbutton or selector switch logic.
- Subcycle fuses protect the power semi-conductors against short circuits in the wiring and motor. All three legs of the AC line, plus the DC armature loop, are fused. RC snubber networks and MOV suppressors guard against voltage transients.
- All signal inputs and outputs are isolated from the AC input lines and also from the armature voltage. This feature not only makes the drive safer to use, but it also allows direct accommodation of multiple drive options and process instrument inputs.
- Monitoring terminals are provided for reading both motor load and motor speed with commonly available test meters. 2 volts = 100% rated load. 5 volts = 100% base speed.
- Unique design allows starting into a rotating motor without faulting.
- Tachometer feedback. Accommodates a 50 V/1000 rpm tachometer on a 1750 rpm motor. (Standard circuitry.) Other characteristics are available (see **Options** at right).

## Flexible in application

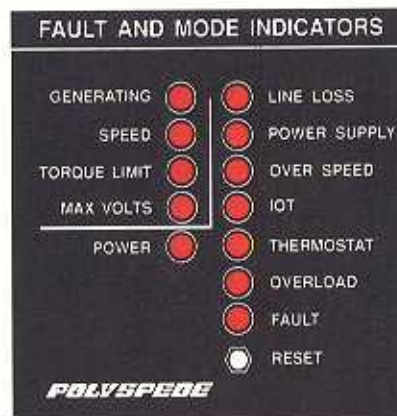
- Multiple PRD12B drives may be operated in parallel from a master reference source or from a computer generated input signal, without the need for input isolation transformers or signal isolation.
- Zero creep deadband. Adjustable from 0 to 1% of full scale input signal, with no degradation in performance. No motoring or generating torques are developed until the input signal exceeds the deadband.
- Positive and negative torque limits are preset at 150% of rated full load motor torque. Terminals are provided for an external torque limit potentiometer.
- Provision for acceleration/deceleration option card. For factory installation or easy field installation. Available in either linear or S-curve (see **Options** at right).
- Dual voltage, 230/460 VAC input. Readily field modifiable. The horsepower rating of the drive is proportional to the input voltage. For example, a drive rated 10 hp at 230 VAC is rated 20 hp at 460 VAC.
- Directly accepts 4-20 ma input in lieu of a speed potentiometer. Jumper-selected circuitry offers a choice of unidirectional or bidirectional operation.

## Fault Protection

- Drive shutdown occurs when potentially damaging conditions exist. The fault which caused the shutdown is displayed by an LED. Also, the mode of operation prior to shutdown is displayed. The LEDs are circuit board mounted in open-chassis units. In enclosed units, a door mounted fault and mode indicator panel is included (illustration below).
- The PRD12B is started normally after a fault shutdown; the fault indicators do not require manual resetting. An automatic restart option is available.

## Options

- DC loop contactor.
- 240 volt field supply (230 VAC input only). Field convertible.
- 50 Hertz input. Field or factory convertible from 60 Hertz.



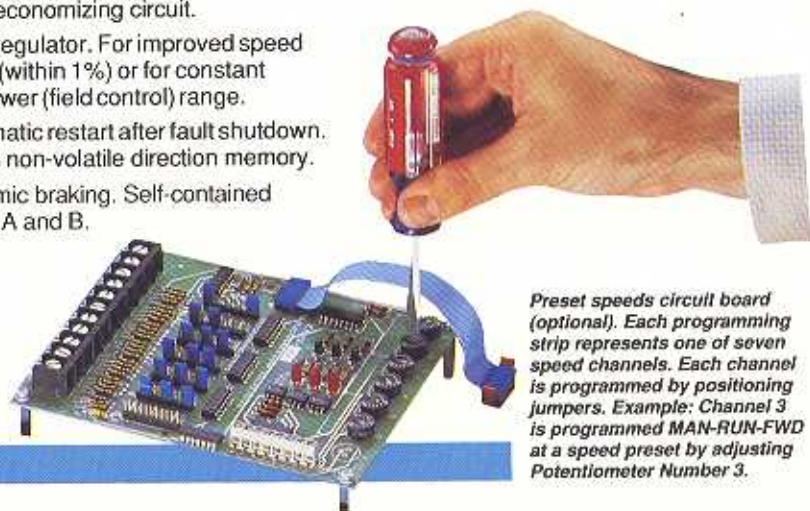
Fault and mode indicator panel.

- Jog at separate speed setting.
- Automatic reversing. Pushbutton reversing without a mandatory stop at zero speed.
- Tachometer feedback for use with tachometers and motors *other than* the 50 V/1000 rpm tachometer and 1750 rpm motor combination mentioned under **Standard Features** at left.
- Field economizing circuit.
- Field regulator. For improved speed stability (within 1%) or for constant horsepower (field control) range.
- Automatic restart after fault shutdown. Includes non-volatile direction memory.
- Dynamic braking. Self-contained in Sizes A and B.

## Options (Continued)

- Linear acceleration/deceleration control. Independently adjustable, 0.12 to 27 seconds in two ranges.
- S-curve acceleration/deceleration control. Independently adjustable, 0.12 to 18 seconds in two ranges.
- Extended acceleration and deceleration ranges. Extends linear option to 84 seconds, or S-curve to 35 seconds.
- Torque programmed drive. Controls torque in lieu of speed. Field convertible. Applicable to winders, unwinders and web handlers.
- Preset speeds circuit board. Seven channels. Programming jumper and potentiometer for each speed.
- External signal control. Ranges are 1-5 ma, 4-20 ma, 10-50 ma, 0-10 VDC and 0-6 VDC.\*
- DC tachometer follower. 6 VDC thru 100 VDC in three ranges.\*
- Armature voltage follower. 50 VDC to 500 VDC ranges. Allows PRD12B to follow the speed of another motor without requiring a tachometer.\*
- Position interface. Adapts PRD12B for controlling position rather than speed. For use with valve positioners and related applications.\*
- Enclosure. Gasketed and sealed. Outside air is circulated over the heat sink only—not through the electronic compartment. Includes a door mounted fault and mode indicator panel.
- Door mounted disconnect switch. Ordered with optional enclosure.
- Fault and mode indicator panel. Standard on enclosed controls. Shipped loose as an option with open-chassis controls. Installs in a standard analog meter cutout. Specify cable length.
- Standard or custom remote operator station is available.

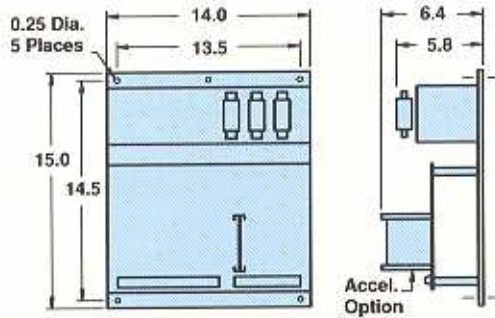
\* Each of these options includes a manual/auto selection relay.



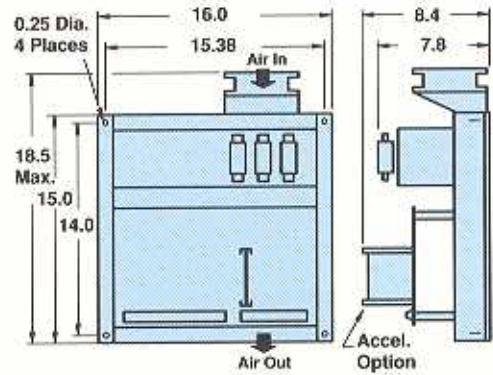
Preset speeds circuit board (optional). Each programming strip represents one of seven speed channels. Each channel is programmed by positioning jumpers. Example: Channel 3 is programmed MAN-RUN-FWD at a speed preset by adjusting Potentiometer Number 3.

# Dimensions (Inches)

## Open Chassis Size A



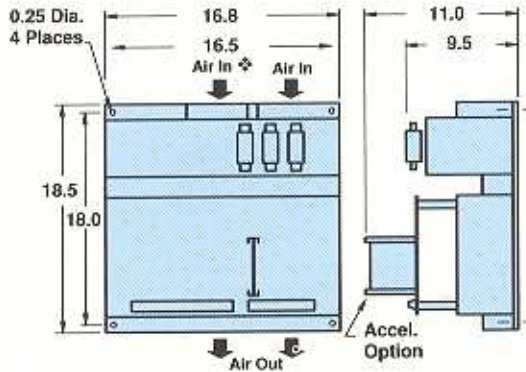
## Open Chassis Size B



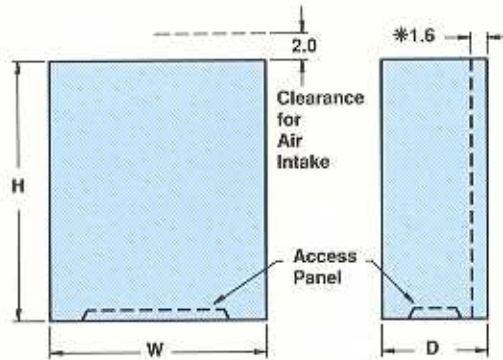
All Dimensions shown on this page are for reference only. Not certified for construction.

Addition of dynamic braking to sizes A and B alters mounting centers.

## Open Chassis Sizes C and D



## Enclosed Unit (Sizes A, B, C and D)



## Enclosure Dimensions

Dimension	Size	
	A, B	C, D
H	20.0	24.0
W	20.0	24.0
D	13.4	15.4

## Ordering Information

Part Number:

PRD12B-■■■■■■■

Horsepower/Size Coding Digits			Size Coding Digit A, B, C or D
HP	Line VAC		
	230	460	
3	-30A	-31A	
5	-50A	-51A	
7.5	-75A	-76A	
10	-100A	-101A	
15	-150B	-151A	
20	-200B	-201A	
25	-250C	-251B	
30	-300C	-301B	
40	-400D	-401B	
50	-500D <sup>†</sup>	-501C	
60	-	-601C	
75	-	-751D	
100	-	-1001D <sup>†</sup>	

Enclosure Coding Digits	
Code	Description
---	Open Chassis
-N2	NEMA 12
-D2	NEMA 12 with Disconnect
-XX	Replacement Control Unit

Example: A 15 hp, 460 VAC drive with a NEMA 12 enclosure. The part number is PRD12B-151A-N2

<sup>†</sup> These sizes have 130% torque limit settings in open-chassis units, 150% in enclosed units.

- \* This dimension (for air exhaust) is provided by factory installed spacers. The space may also be used for wire passage from above the enclosure down to the bottom access panel.
- ◇ Second cooling assembly in Size D units only.

## Ratings

Input (3 Phase)	Output
230 VAC ± 10%, 60 Hz 220 VAC ± 10%, 50 Hz (Optional)	Armature: 0 - 240 VDC Field: 150 VDC Field; (Optional) 240 VDC
460 VAC ± 10%, 60 Hz 440 VAC ± 10%, 50 Hz (Optional)	Armature: 0 - 500 VDC Field: 300 VDC
Ambient temperature, enclosed units ..... 40 C maximum Enclosure air temperature, open-chassis units ..... 55 C maximum	

## Speed Regulation

- ± 1% with standard armature feedback. Does not include long term drift.
- ± 0.1% with optional DC tachometer feedback. (± 0.2% including long term drift.)

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