

MinPak™ Plus Three-Phase 3-40 HP



The stock answer for three-phase D-C adjustable speed drive applications.

This medium horsepower V*S Drive package combines the latest technological advances in drive design with versatility for a wide variety of industrial applications.

We took all the key features of the MinPak Plus, teamed them up with the RPM™ III D-C Motor and extended the horsepower rating to 40 HP. You get all the standard features you need and all the options and modification kits necessary to answer your specific application requirements. What's more, you get them from stock, in a product listed and approved for use virtually anywhere in the world. That's adaptability - PLUS!

MinPak Plus Drives feature proven electronic components which significantly improve drive functions, reliability and overall performance. These include custom circuits and a modular Power Cube that's doubly protected by a circuit breaker and a MOV surge suppressor. A relay prevents uncontrolled restarts after power outages.

MinPak Plus controllers are available immediately from the largest stock of adjustable speed drives in the industry. A variety of modification kits to tailor these drives to your specific application requirements can be installed quickly by your Reliance Authorized Distributor, your own personnel or at the factory.

Standard enclosures are designed to accommodate any combination of kits - one, two or all of them - using only a screwdriver. Optional operator control station in a single NEMA rated types 1, 3R, 4, 4X and 12 enclosure is available for remote operation.

Every MinPak Plus Drive package comes complete with a Reliance Electric RPM III D-C Motor. Choose from a broad selection of designs with the right base speed and enclosure to meet your requirements.



Standard Features

- NEMA 12 enclosure minimizes entry of dust, oil and liquids for added drive reliability.
- Enclosures can be wall mounted.
- Application versatility with optional kit selection. Kits plug into controller quickly and easily.
- Increased performance capabilities
- Easy installation and service
- 50/60 Hz for worldwide application
- Full-wave, full-control conversion for smooth, efficient operation and high performance.
- Isolated voltage and current feedbacks for drive reliability and versatility.
- Power matched with Reliance® RPM III D-C motors for optimum performance.
- Field potential supply for motor shunt field excitation.
- Minimum and maximum speed, acceleration rate, deceleration rate, current limit and IR compensation are easily adjustable for increased application flexibility.
- Power semi-conductors are contained in easily replaceable power cubes to speed service and maintenance.
- Built-in surge suppressor helps protect semi-conductors from line transients for higher reliability.

MinPak Plus Means Maximum Versatility

More Standard Features

- Relay in control circuit prevents automatic restarting after power outage.
- Current limit control protects the drive and driven machine from damaging current or torque levels for improved reliability.
- Auxillary panel provides A-C line protection and motor armature contactor to disconnect power to the drive motor.
- Remote Operator Adapter kit for buffering and filtering of external signals when drive is operated by remote control.
- Insensitive to A-C line phase rotation
- Line loss protection.
- Circuit breaker eliminates fuse replacement for reduced service and maintenance requirements.
- Field excitation and current loss protection.

Easy Installation and Service

MinPak Plus Drives are designed for easy installation to save time and money and provide years of dependable service. Wire entry is made directly to incoming power terminations. Sufficient space has been allowed around all power terminals to assure working room and fast, easy installation of plug-in kits.

Keeping these drives operating reliably and long is simplicity itself. Modular construction makes troubleshooting easy, so components can be removed for repair or replacement in minutes. All leads disconnect quickly and simply by means of plug connectors. All replaceable components are easily accessible without groping around or fighting other components.



RPM III D-C Motor for power matched performance.

RPM III D-C Motors for Optimum Package Performance

RPM III D-C Motors combine the best features of the Reliance RPM and SUPER RPM D-C Motors with advances in design and construction. Overall, they provide more power, reliability and easier serviceability in a smaller package. This third-generation motor design is "performance matched" specifically for adjustable speed applications utilizing rectified power. Here's why this enhanced product is ideal for the most demanding industrial requirements:

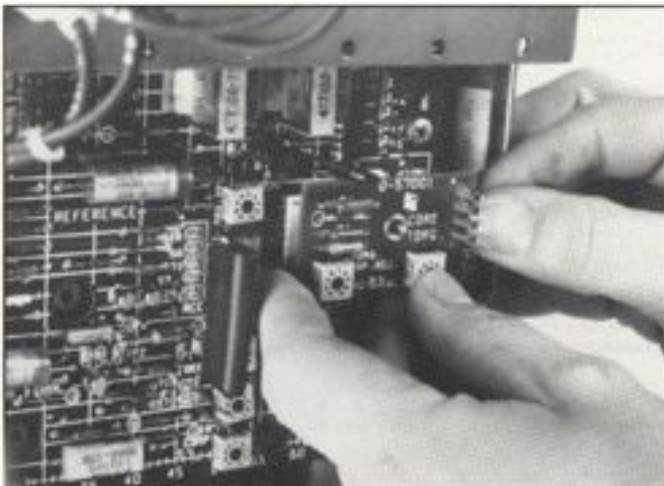
- Larger armature diameters provide a significant increase in rating per frame size and improved torque-to-inertia ratios for quick response. Skewed armature designs also improve operation at low speeds.
- Four-pole configuration extends speed ranges, improves linear torque-per-amp relationship and contributes to smoother, quicker response.
- Field-proven square laminated frame construction improves commutation and heat dissipation with less mounting space.
- Mechanically kept commutator provides dynamic stability to eliminate high or low bars and undesirable thermal stress.
- Frames and brackets, based on advanced computer designs, assure low vibration at any speed within the motor operating range. They also minimize motor excitation by harmonics in the rectified power supply. Cast iron end brackets with integral mounting feet provide a rigid, vibration-resistant mechanical enclosure.
- Radial brush holders with a unique pivoting brush finger and a constant-tension coiled spring provide positive, continuous contact of the brush with the commutator surface. This results in optimum commutation and better utilization of the brush length for up to twice the brush life.
- PLS® lubrication system uses open bearings that run cooler for long life. The unique configuration of the bearing cavity allows proper bearing lubrication regardless of mounting position. It also minimizes the possibility of damage to the motor or bearings from overgreasing.
- Other RPM III features include provisions for an integral A-C or D-C tachometer or an integral pulse generator which will add only 1.56 inches (4 cm) to overall motor length.

Plug-In Kit Flexibility

Optional Features

All modification kits and accessories are UL listed and available as CSA certified.

- External Dynamic Braking Kit for applications requiring quick motor stops.
- Reversing Contactor Kit provides fast change of motor rotation by selector switch.
- Tachometer Feedback Kit for applications requiring accuracy of speed regulation to 0.5% with 95% load change with specified tachometer.
- Voltage Follower Kit allows the drive to follow an external D-C voltage signal.
- Instrument Interface/Preset Speed Kit for applications where drive speed is controlled by a process controller over a speed range, or when an adjustable preset speed is desired.
- Test Meter Adapter Kit for measuring controller and regulator signal voltages with a voltmeter.
- Auxiliary Contact Kit for applications where an interconnection with external signaling devices is required or desired.
- Dancer Follower Kit for applications where drive speed is controlled by a process line dancer potentiometer.
- Remote Operator Adapter Kit for buffering and filtering of external signals when drive is operated by remote control.
- Series Field Kit.
- Blower Motor Starter Kit provides a fused A-C starter and interlocking for control of the three-phase blower motor used to cool the D-C motor.
- Test Meter Adaptor Kit.
- Operator Control Stations in NEMA enclosure rated types 1, 3R, 4, 4X and 12 for remote operation of the drive.
- Controller available as CSA certified.



Sufficient work room around all power terminals allows fast, easy installation of plug-in kits.

Multi-tiered Diagnostic Capability



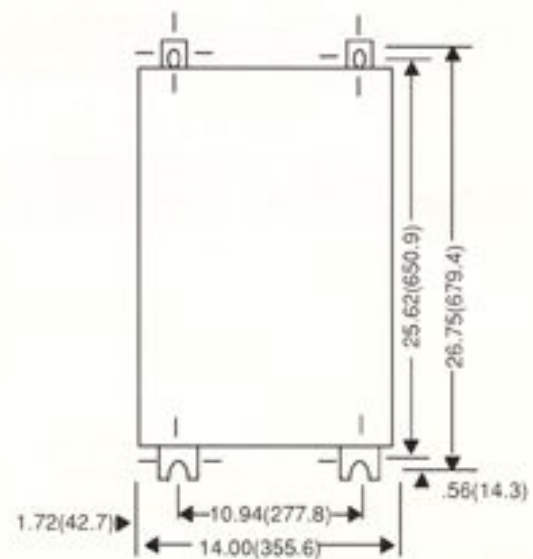
Two levels of diagnostic capability are available with the MinPak Plus Controller:

Level One: Standard with all power modules, provides a Green LED to indicate power on/off status and indicates fault condition.

Level Two: Optional Status/Diagnostic Module Indicator Kit utilizes an LCD array to visually announce the status of thirteen critical drive functions, and to indicate drive shutdown resulting from protective circuit action.

Engineering Data

Dimensions in Inches and Millimeters



Maximum Projection 13.00 (330.2)

For Maximum Swing Projection add 14.00 (355.6)

MinPak Plus D-C Drives

Controller Selection

Drive Rating		Controller Model Number
HP	A-C Input (Volts)	
3-10	230 VAC	14C310
15-20	230 VAC	14C311
3-10	460 VAC	14C312
15-20	460 VAC	14C315
25-40	460 VAC	14C313

Controller Ratings

Motor HP	230 Volt A-C Input					
	460 Volt A-C Input					
	Rated A-C Line Amperes	Input KVA	D-C Armature Voltage	Rated Armature Current (Amperes)	Available Field Voltage	Available Field Current (Amperes)
3	13	5 ⁽¹⁾	240	12.0	150	10.0
	10	6 ⁽¹⁾	500	6.0	300	10.0
5	20	8 ⁽¹⁾	240	20.0	150	10.0
	12	9 ⁽¹⁾	500	10.0	300	10.0
7 ^{1/2}	28	12 ⁽¹⁾	240	29.0	150	10.0
	15	12 ⁽¹⁾	500	14.0	300	10.0
10	37	15	240	38.0	150	10.0
	18	15	500	18.0	300	10.0
15	51	21	240	55.0	150	10.0
	26	21	500	27.0	300	10.0
20	66	27	240	72.0	150	10.0
	34	28	500	36.0	300	10.0
25	-	-	-	-	-	-
	40	32	500	43.0	300	10.0
30	-	-	-	-	-	-
	47	38	500	51.0	300	10.0
40	-	-	-	-	-	-
	63	51	500	69.0	300	10.0

(1) Minimum isolation transformer size is 15 KVA.

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Service Conditions

Elevation Up to 3300 feet (1000 meters)
 Ambient Temperatures 32°F to 131° (0°C to 55°C)
 Atmosphere Non-condensing relative humidity 5% to 95%
 A-C Line Voltage Variation ±10% of rated voltage
 A-C Frequency 48 to 62 Hz

Application Data

Service Factor 1.0
 Maximum Load 150% for 1 minute
 Speed Regulation (95% load change):
 Voltage Feedback 1-2%
 Tachometer Feedback 1% or 0.5%
 Speed Range
 Voltage Feedback 20:1
 Tachometer Feedback 30:1

Adjustments

Acceleration Rate 0.5 to 30 seconds linear
 Deceleration Rate 0.5 to 30 seconds linear
 Speed (Percent of rated) Up to 50%
 Maximum Speed (Percent of rated) 50 to 100%
 Current Limit (Percent of rated) 10 to 150%
 IR Drop Compensation 0 to 12%

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.

