

## SPECIFICATIONS

### AC LINE VOLTAGE

Three phase 230V AC or 460V AC  
(+ 10%, - 5%)

### AC LINE FREQUENCY

50 or 60 Hz

### ARMATURE POWER SUPPLY

3 phase, full wave (6 pulse)

### ARMATURE CURRENT LIMIT RANGE

0% to 100% rated current for continuous operation; to  
150% current for 1 minute.

### MOTOR FIELD SUPPLY RATING

3 phase, rectified power at 150 or 300V DC  
(10 Amperes maximum)

### MODULE HP RANGE

105 Amp Module —  
7½ to 30 HP at 240V DC  
7½ to 60 HP at 500V DC

250 Amp Module —  
40 to 75 HP at 240V DC  
75 to 150 HP at 500V DC

345 Amp Module —  
100 HP at 240V DC  
200 HP at 500V DC

### REGULATION TYPES

Armature Voltage

Speed

### SPEED REGULATION (% OF BASE SPEED)

Feedback Source	Operating Deviation	Service Deviation
Armature Voltage	2%	5%
AC Tachometer (Type AN)	1%	2%
DC Tachometer (Type PY)	1%	1%
DC Tachometer (Type 42)	0.5%	0.5%
DC Tachometer (Type 46)	0.1%	0.15%

### CURRENT LIMIT

Adjustable 0 to 150%

### IR COMPENSATION

Adjustable from 0 to 10% of maximum armature terminal voltage

### ADJUSTABLE MAXIMUM SPEED

80 to 110% of motor base speed

### ADJUSTABLE MINIMUM SPEED

0 to 33% of maximum speed

### ADJUSTABLE JOG SPEED

0 to 50% of maximum speed

### ADJUSTABLE PRESET SPEED

0 to 100% of maximum speed

### LINEAR ACCEL/DECEL RATES

Separately adjustable/Dual Range  
0.4 to 15 seconds  
3.0 to 60 seconds

### DC MOTOR POWER SUPPLY CODE

NEMA Design "C"

### AMBIENT TEMPERATURE RANGE

0°C (32°F) to 40°C (104°F) - Operating  
0°C (32°F) to 60°C (140°F) - Storage

### RELATIVE HUMIDITY

5 to 95% (non-condensing)

### OPERATIONAL ALTITUDE

3300 ft. (1000 m)

### APPROXIMATE SHIPPING WEIGHT

105 Amp Module — 60 lbs. (27.18 kg)  
250/345 Amp Module — 87 lbs. (39.41 kg)

# IMPORTANT: SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE.

## 1.0 INTRODUCTION

**1.1 GENERAL** — This manual contains information needed to install, start up and maintain the Allen-Bradley Bulletin 1379 Series B Non-Regenerative DC Drive Module.

### WARNING:

The National Electrical Code (NEC) and local codes outline provisions for safely installing electrical equipment. Installation must comply with specifications regarding wire types, conductor sizes, branch circuit protection, and disconnect devices. Failure to do so may result in personal injury and/or equipment damage.

### CAUTION:

An incorrectly applied or installed Drive Module can result in component damage or a reduction in product life. Wiring or application errors, such as, undersizing the motor, incorrect or inadequate AC supply, or ambient temperatures above or below specified temperature range may result in malfunction of drive.

## 1.2 MODULE COMPONENTS —

### THYRISTOR CONVERSION UNIT —

- 6-thyristor full wave armature power conversion unit.
- Incoming AC power is converted into adjustable DC voltage. This DC power is then typically delivered to the DC motor armature through the contacts of an optionally supplied DC loop contactor. The speed and armature current of the DC motor are controlled by regulating the output voltage of the armature power conversion unit.
- Armature power conversion unit assembly can be conveniently removed from the module to facilitate quick replacement and/or repair.

### MAIN REGULATOR BOARD —

- Regulator — The regulator incorporates high gain operational amplifiers to provide a wide range of motor speed control. A major integrating speed loop is combined with an “inner” armature current loop to provide precise “no overshoot” current limit control.
- Digital Gating Circuit — Precise gating of the SCRs is accomplished by digitally combining the phase control signal and line sync signals at optimum time and energy levels to gate the thyristors while maintaining excellent electrical noise immunity characteristics.
- Protective Circuits With Light Emitting Diode (LED) Fault Indication simultaneously activates the fault relay and provides memory-type indication of Overload, Field Loss, Phase Loss, and Thyristor Overtemperature conditions.
- Digital Static Overload Circuit — Armature current level controls the counting rate of a digital counter to provide an inverse time versus current trip characteristic.
- Isolated Armature Voltage and Armature Current Feedback Signals.

**POTENTIOMETER ADJUSTMENT BOARD** — All the necessary set-up adjustments are located on this board, which permits replacement of Main Regulator Board without recalibration.

**RELAY BOARD** — Provides mounting and wiring of four “plug-in” relays for AC Logic functions of Run, Reference, Preset Speed, and Jog.

**FIELD LOSS BOARD** — Field current is sensed with an isolated current transformer to actuate a relay mounted on the Main Regulator Board. Loss of field current causes the relay to de-energize and shut down the DC Drive Module output and drop out the DC loop contactor.

**1.3 OPERATION** — The Allen-Bradley Bulletin 1379 Series B DC Drive Module converts incoming three-phase AC power into the controlled DC voltage and current used by a DC motor.

In general the Drive Module provides a means of regulating Armature Voltage or Speed within the following limits.

**1.3.1 SPEED RANGE** — The normal range in speed for these drives is from base speed to 1/20 of base speed, although they may be operated over a greater range. Operating motors continuously at or above rated full load torque at reduced speeds may cause an above normal temperature rise and derating of motor may be necessary to achieve a greater speed range.

**1.3.2 SPEED REGULATION** — Speed regulating performance of DC SCR drives is specified in two ways: **operating deviation** and **service deviation**.

**Operating deviation** defines speed change due to load change and typically assumes:

1. A change from one steady state load value to another. (Not transient).
2. A 95% maximum load change.

**Service deviation** defines speed change due to changes in ambient conditions with typical variations as follows:

Condition	Change
AC line voltage	+ 10% – 5%
AC line frequency	+ 1% – 1%
Ambient temperature	15°C

The speed regulating performance is specified as **operating/service** band. For example:

**Basic** — 2%/5% of base speed  
(Voltage Regulated)

**Modified** — 1%/2% of base speed  
(AC Tachometer)  
1%/1% of base speed  
(DC Tachometer)  
0.5%/0.5% of base speed  
(DC Tachometer)  
to 0.1%/0.15 % of base  
speed (DC Tachometer)

**1.3.3 STARTING** — A smooth cushioned start is provided by proper adjustment of the acceleration time control. The starting or acceleration time may be adjusted over a range of 0.4 to 15 seconds or 3.0 to 60 seconds. If the speed control device is set lower than base speed, the total acceleration time is reduced in proportion. The acceleration is constant over this interval unless the load and its moment of inertia are too great for the available torque. This torque and the corresponding armature current are limited by the setting of the adjustable current limit control and the motor rating.