

Profiler B-Series AC Drive

Instruction Manual

Bardac

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WARNINGS

Read and understand these instructions completely before attempting to install or operate this product. Use only qualified personnel to install and maintain this product to ensure safe, reliable operation. Failure to follow these directions along with standard safety procedures may lead to injury or death.

RISK OF ELECTRICAL SHOCK !

Do not attempt to remove the unit cover or to otherwise access or contact the internal parts of the drive.

Wait for 10 minutes after removing power from the unit before changing external wiring connections.

Always ground motor and drive properly.

Do not connect power if there is any sign of damage to the unit.

Check the installation design and wiring before connecting power.

RISK OF BURNS!

High temperatures exist within the drive during operation and for at least 10 minutes after power is removed. Do not touch the exposed heat sink which can operate at temperatures in excess of 90°C (200°F).

RISK TO PERSONNEL AND EQUIPMENT!

Always remove power from the unit if there are any circumstances where injury or damage could arise from unexpected operation of the equipment.

Always determine that operation of the drive at its maximum speed will not exceed the safe limits of the motor and driven equipment.

Always disconnect the drive before using a megger to test the motor.

Do not connect power factor correction capacitors or RFI filters to the output of the drive.

This drive is a non-isolated product. The control circuitry is electrically connected to both the line supply and the motor voltages. Special care must be taken to ensure that all external control wiring is safely isolated from the user and all associated equipment.

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that this product is operated in a safe manner and that the installation meets all the applicable codes and safety standards.

Installation Requirements

- The drive should be mounted to a vertical steel or aluminum panel at least 1/8" thick with 2 screws. Orient the drive so that air flows vertically over the cooling fins. Allow at least 3" clear space at the sides of the drive and at least 4" above and below the drive. (See Appendix 7 for mounting dimensions)
- The drive enclosure must have adequate volume or airflow to maintain the drive ambient temperature between 0°C (32°F) and 50°C (122°F).
- Do not mount the drive near combustible materials or allow dust, wires, metal chips or other foreign bodies to drop into the drive.
- Ensure that the motor is inverter duty rated, that it is properly sized for the drive and that it is suitable for the speed and torque range required by the application.
- Motor rotation direction is determined by the M1, M2 and M3 connections. Swapping any two connections will reverse the direction of rotation. Do not use a contactor or switch to swap the motor connections.
- Motor cable lengths should be kept as short as possible. Maximum length 150 feet (50 meters).
- Ensure the supply capacity is at least 4.2x motor FLA for drives with a 115v single phase input, 2x motor FLA for drives with a 230v single phase input, and 1.5x motor FLA for drives with a 3-phase input. Use copper wire up to 12AWG rated for 75°C, 600 volts.
- The circuit feeding the input power to the drive requires branch circuit protection.
- A minimum line impedance of 1 millihenry is required to prevent potential damage to the drive. If necessary, fit a line reactor to meet this requirement.
- Please consult the factory with any questions.

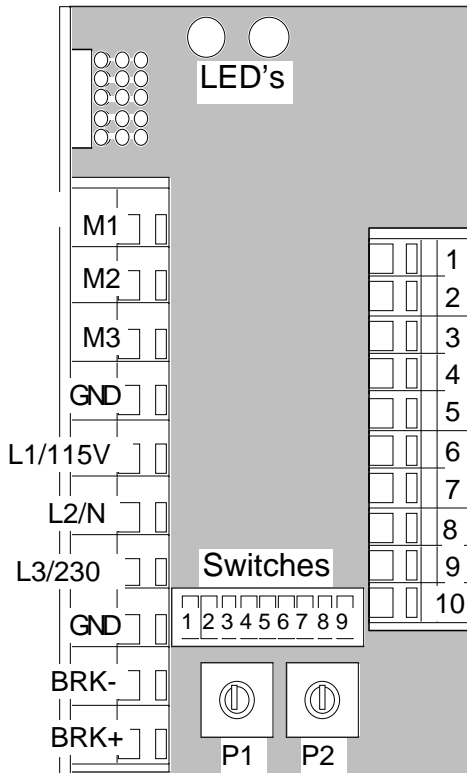
IMPORTANT USER RESPONSIBILITY

Profiler B-Series drives have been designed for use as a component in an AC motor variable speed control system. It is assumed that the installer is qualified to complete the system specification and design and will take full responsibility for ensuring

Connections

GROUNDING The drive must be properly grounded (earthed) during operation.

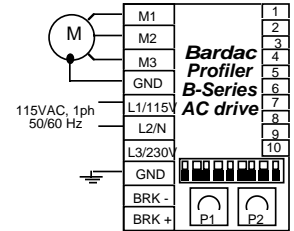
BASIC CONTROL BOARD LAYOUT POWER CONNECTIONS



B1XX MODELS

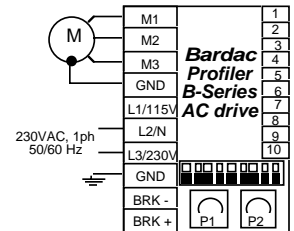
Connecting to 115V single phase power

Note: Remove protective blanking plug from L1 terminal before connecting to 115v power



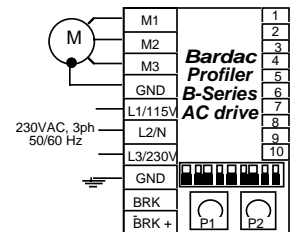
B1XX and B2XX MODELS

Connecting to 230V single phase power



B3XX MODELS

Connecting to 230V 3-phase power



Note: for Brake Option connections and resistor ratings please refer to Appendix 6

Easy 1-2-3 Set-up

During these easy 1-2-3 Set-up steps please remember:

- The drive is easily configured by setting 9 dip switches and adjusting 2 potentiometers.
- Any adjustments to the dip switches will not change the operation of the drive until power to the unit is cycled.
- Call us with any questions and special profile or configuration application requirements you encounter.

Easy 1-2-3 Set-up: Step 1

Volts-Hertz Profile

Select a **profile**. The Profiler B-Series drives offer 4 different Volts-Hertz profiles. **Set switches 1 & 2.** A review of the application will determine the Volts-Hertz profile that should be selected. See the profiles in appendix 1 for additional information or consult the factory for assistance.

Easy 1-2-3 Set-up: Step 2

Control Scheme

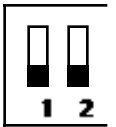


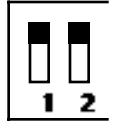
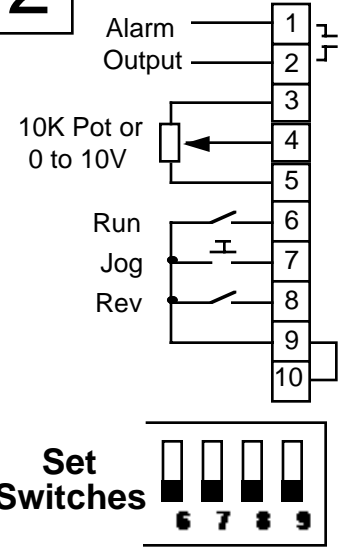
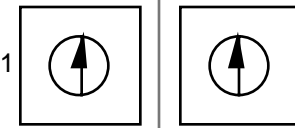
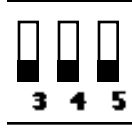




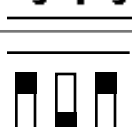
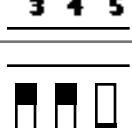
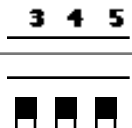
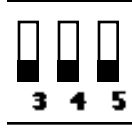




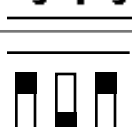
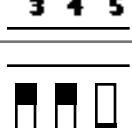
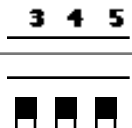
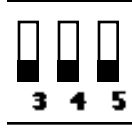




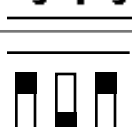
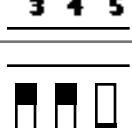
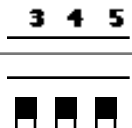
Select a **control scheme**. The Profiler B-Series drives offer 8 different wiring methods to control the operation of the drive. **Set switches 6, 7, 8 & 9.** See the following 8 pages for additional information or consult the factory for assistance.

Easy 1-2-3 Set-up: Step 3





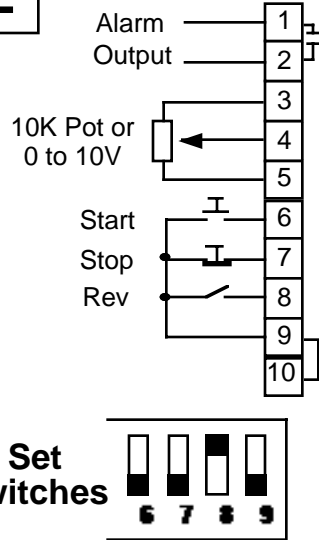
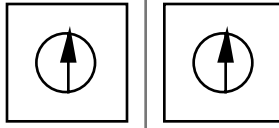
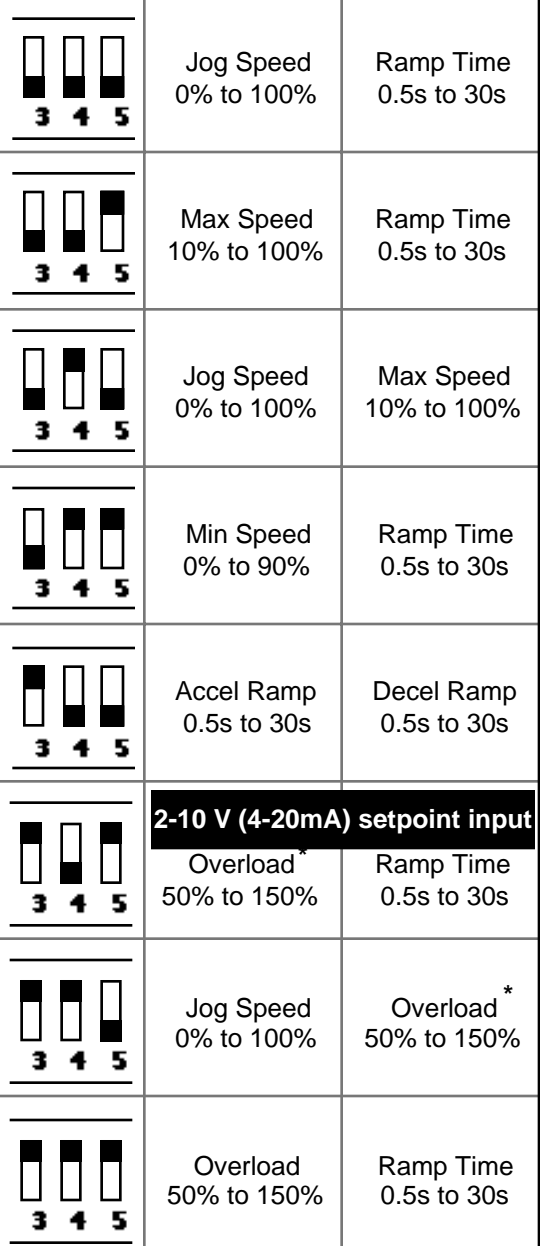
Parameter Configuration

Select the **parameter adjustments**. The Profiler B-Series drives have 2 potentiometers (P1 & P2) that enable adjustments to specific drive operating characteristics. **Set switches 3, 4 & 5.** See the following 8 pages of MODE diagrams for additional information or consult the factory for assistance.



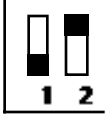

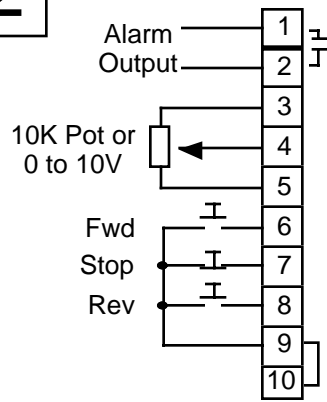
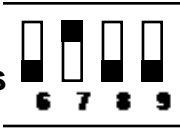
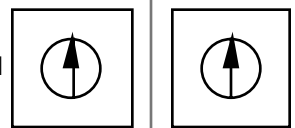
























The next 8 pages of MODE diagrams show each available control scheme with the parameter adjustment combinations possible for each scheme.

Profile	2 Control Scheme	3 Parameters																																																	
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<p style="font-size: 1.5em; font-weight: bold;">#1 Standard Switched Control</p> <p style="font-weight: bold;"><u>Maintained Run and Direction Inputs.</u></p> <p style="font-weight: bold;"><u>Momentary Jog Input.</u></p> <p>Maintained inputs for run and reverse. Pushbutton input for jog.</p> <p>Ramp Stop Mode selection applies to both Run & Jog In cases where both run and jog are closed, the first one to close is dominant.</p> <p>Note that the setpoint may be either:</p> <ol style="list-style-type: none"> 1. a 10KΩ pot as shown. 2. a 0 to 10V voltage source between terminals 4(+) & 5(-). (The input impedance in this mode is approximately 36KΩ) 3. with a 500 Ω resistor across terminals 4(+) & 5(-) the 2-10 volts setpoint mode can be used with a 4-20mA setpoint input <p>Faults are reset by cycling power to the drive. Warning - all external connections must be isolated</p>																																																			
<p style="text-align: center; font-weight: bold;">Control Truth Table</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Run</th> <th>Jog</th> <th>Rev</th> <th>State</th> <th>Action</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>X</td><td>Any</td><td>Stop</td></tr> <tr><td>1</td><td>0</td><td>0</td><td>Any</td><td>RunFwd</td></tr> <tr><td>1</td><td>0</td><td>1</td><td>Any</td><td>RunRev</td></tr> <tr><td>0</td><td>1</td><td>0</td><td>Any</td><td>JogFwd</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>Any</td><td>JogRev</td></tr> <tr><td>1</td><td>1</td><td>0</td><td>Run</td><td>RunFwd</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>Run</td><td>RunRev</td></tr> <tr><td>1</td><td>1</td><td>0</td><td>Jog</td><td>JogFwd</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>Jog</td><td>JogRev</td></tr> </tbody> </table> <p style="text-align: center;">0=OFF, 1=ON, X=Any</p>		Run	Jog	Rev	State	Action	0	0	X	Any	Stop	1	0	0	Any	RunFwd	1	0	1	Any	RunRev	0	1	0	Any	JogFwd	0	1	1	Any	JogRev	1	1	0	Run	RunFwd	1	1	1	Run	RunRev	1	1	0	Jog	JogFwd	1	1	1	Jog	JogRev
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* For models B115, B230 overload range is 50-100%

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<h2 style="margin: 0;">2-3-Wire Pushbutton Control</h2> <p><u>Momentary Start and Stop Inputs.</u> <u>Maintained Direction Input.</u></p> <p>Pushbutton inputs for start and stop. Maintained input for reverse. If the stop input is open, the start input works as a jog input.</p> <p>Note that the setpoint may be either:</p> <ol style="list-style-type: none"> a 10KΩ pot as shown. a 0 to 10V voltage source between terminals 4(+) & 5(-). (The input impedance in this mode is approximately 36KΩ) with a 500 Ω resistor across terminals 4(+) & 5(-) the 2-10 volts setpoint mode can be used with a 4-20mA setpoint input <p>Faults are reset by cycling power to the drive. Warning - all external connections must be isolated</p>																																																		
<h3 style="margin: 0;">Control Truth Table</h3> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th>Start</th> <th>Stop</th> <th>Rev</th> <th>State</th> <th>Action</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>X</td><td>Any</td><td>Stop</td></tr> <tr><td>1</td><td>0</td><td>0</td><td>Any</td><td>JogFwd</td></tr> <tr><td>1</td><td>0</td><td>1</td><td>Any</td><td>JogRev</td></tr> <tr><td>1</td><td>1</td><td>0</td><td>Any</td><td>RunFwd</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>Any</td><td>RunRev</td></tr> <tr><td>0</td><td>1</td><td>X</td><td>Stop</td><td>Stop</td></tr> <tr><td>0</td><td>1</td><td>0</td><td>Run</td><td>RunFwd</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>Run</td><td>RunRev</td></tr> </tbody> </table> <p style="margin-top: 5px;">0=OFF, 1=ON, X=Any</p>				Start	Stop	Rev	State	Action	0	0	X	Any	Stop	1	0	0	Any	JogFwd	1	0	1	Any	JogRev	1	1	0	Any	RunFwd	1	1	1	Any	RunRev	0	1	X	Stop	Stop	0	1	0	Run	RunFwd	0	1	1	Run	RunRev		
Start	Stop	Rev	State	Action																																														
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1	0	0	Any	JogFwd																																														
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1	1	0	Any	RunFwd																																														
1	1	1	Any	RunRev																																														
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0	1	1	Run	RunRev																																														

* For models B115, B230 overload range is 50-100%

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	Overload * 50% to 150%	Ramp Time 0.5s to 30s																								

#3 Traverse Control

Momentary Direction and Stop Inputs.
Pushbutton inputs for start fwd, start rev, and stop. If the stop input is open, the start inputs work as a jog inputs.

Notes:
The setpoint may be a 10KΩ pot as shown. Alternately, a 0 to 10V voltage source may be connected between terminals 4(+) & 5(-). The input impedance of the drive in this mode is approximately 36KΩ.



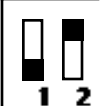

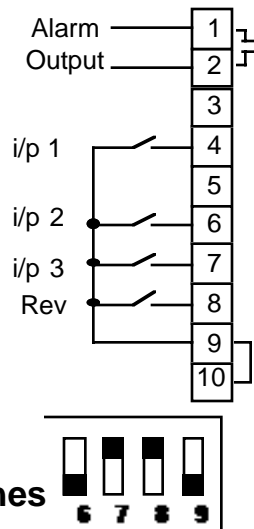

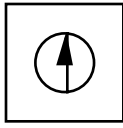
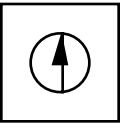
Faults are reset by cycling power to the drive.
Warning - all external connections must be isolated

Control Truth Table



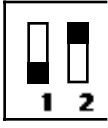

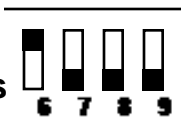
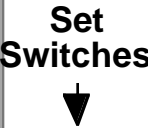
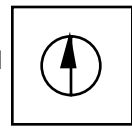
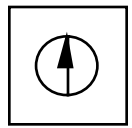



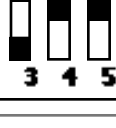


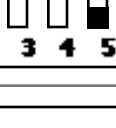
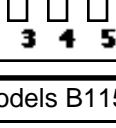



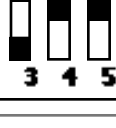


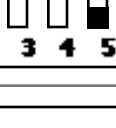
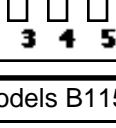



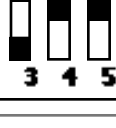


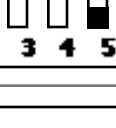
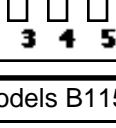
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1	0	0	Any	JogFwd
0	0	1	Any	JogRev
1	0	1	Stop	JogFwd
1	0	1	Run or Jog Fwd	JogFwd
1	0	1	Run or Jog Rev	JogRev
1	1	0	Any	RunFwd
0	1	1	Any	RunRev
0	1	0	Stop	Stop
0	1	0	Run or Jog Fwd	RunFwd
0	1	0	Run or Jog Rev	RunRev
1	1	1	Stop	RunFwd
1	1	1	Run or Jog Fwd	RunFwd
1	1	1	Run or Jog Rev	RunRev

0=Off, 1=On

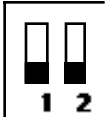
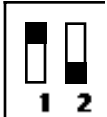
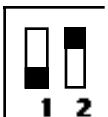
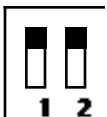
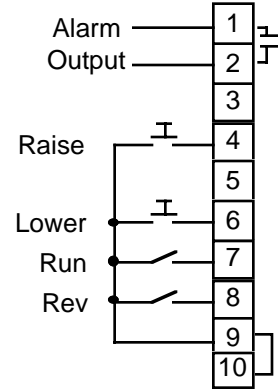
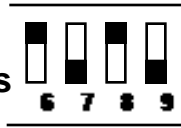
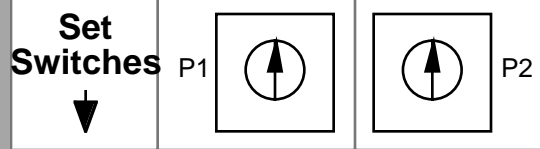
* For models B115, B230 overload range is 50-100%

<div style="text-align: center; font-weight: bold; font-size: 2em;">1</div> <div style="text-align: center; font-weight: bold; margin-top: 10px;">Profile</div> <div style="text-align: center; font-weight: bold; margin-top: 20px;">Set Switches</div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>Standard Profile</p> </div> <div style="text-align: center;">  <p>Fan Profile</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>Extended Profile</p> </div> <div style="text-align: center;">  <p>Massflow Profile</p> </div> </div>	<div style="text-align: center; font-weight: bold; font-size: 2em;">2</div> <div style="text-align: center; font-weight: bold; margin-top: 10px;">Control Scheme</div> <div style="margin-top: 10px;">  </div>	<div style="text-align: center; font-weight: bold; font-size: 2em;">3</div> <div style="text-align: center; font-weight: bold; margin-top: 10px;">Parameters</div> <div style="margin-top: 10px;"> <p>Overload defaults to 100% Max speed defaults to 100% Ramp times default to 3s Min speed defaults to 0% Preset 1 defaults to 85% Preset 2 defaults to 15%</p> </div> <div style="margin-top: 10px;"> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <div style="font-weight: bold; margin-bottom: 5px;">Set Switches</div>  </div> <div style="display: flex; justify-content: space-around; width: 100%;"> <div style="text-align: center;">  <p>P1</p> </div> <div style="text-align: center;">  <p>P2</p> </div> </div> </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="text-align: center; width: 20%;"></td> <td style="width: 40%;">Preset Speed 1 0% to 100%</td> <td style="width: 40%;">Preset Speed 2 0% to 100%</td> </tr> <tr> <td style="text-align: center;"></td> <td>Preset Speed 1 0% to 100%</td> <td>Ramp Time 0.5s to 30s</td> </tr> <tr> <td style="text-align: center;"></td> <td>Preset Speed 1 0% to 100%</td> <td>Max Speed 10% to 100%</td> </tr> <tr> <td style="text-align: center;"></td> <td>Fwd MaxSpeed 10% to 100%</td> <td>Rev MaxSpeed 10% to 100%</td> </tr> <tr> <td style="text-align: center;"></td> <td>Accel Ramp 0.5s to 30s</td> <td>Decel Ramp 0.5s to 30s</td> </tr> <tr> <td style="text-align: center;"></td> <td>Ramp Time 0.5s to 30s</td> <td>Overload* 50% to 150%</td> </tr> <tr> <td style="text-align: center;"></td> <td>Max Speed 10% to 100%</td> <td>Overload* 50% to 150%</td> </tr> <tr> <td style="text-align: center;"></td> <td>Preset Speed 1 0% to 100%</td> <td>Overload 50% to 150%</td> </tr> </table> </div>		Preset Speed 1 0% to 100%	Preset Speed 2 0% to 100%		Preset Speed 1 0% to 100%	Ramp Time 0.5s to 30s		Preset Speed 1 0% to 100%	Max Speed 10% to 100%		Fwd MaxSpeed 10% to 100%	Rev MaxSpeed 10% to 100%		Accel Ramp 0.5s to 30s	Decel Ramp 0.5s to 30s		Ramp Time 0.5s to 30s	Overload* 50% to 150%		Max Speed 10% to 100%	Overload* 50% to 150%		Preset Speed 1 0% to 100%	Overload 50% to 150%																																																								
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<div style="font-weight: bold; font-size: 1.5em;">#4 14 Preset Speed Control</div> <div style="font-weight: bold; font-size: 1.2em; margin-top: 5px;"><u>Maintained Speed Selection Inputs.</u></div> <p>The drive runs at one of 7 preset speeds (plus stop) as determined by three logic inputs.</p> <p>A fourth logic input determines direction, thus 14 total preset speeds are available.</p> <p>Notes: Faults are reset by cycling power to the drive. Warning - all external connections must be isolated</p>																																																																																		
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i/p 1	i/p 2	i/p 3	Rev	Action																																																																														
0	0	0	X	Stop																																																																														
1	0	0	0	Run Fwd @ preset1																																																																														
1	0	0	1	Run Rev @ preset1																																																																														
0	1	0	0	Run Fwd @ preset2																																																																														
0	1	0	1	Run Rev @ preset2																																																																														
0	0	1	0	Run Fwd @ 100%																																																																														
0	0	1	1	Run Rev @ 100%																																																																														
1	1	0	0	Run Fwd @ 50%																																																																														
1	1	0	1	Run Rev @ 50%																																																																														
1	0	1	0	Run Fwd @ 75%																																																																														
1	0	1	1	Run Rev @ 75%																																																																														
0	1	1	0	Run Fwd @ 30%																																																																														
0	1	1	1	Run Rev @ 30%																																																																														
1	1	1	0	Run Fwd @ 65%																																																																														
1	1	1	1	Run Rev @ 65%																																																																														

For models B115, B230 overload range is 50-100%

Profile	Control Scheme	Parameters																																																		
<p style="text-align: center;">Set Switches</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Standard Profile</p> </div> <div style="text-align: center;">  <p>an profile</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>Extended Profile</p> </div> <div style="text-align: center;">  <p>assflow profile</p> </div> </div>	<p style="text-align: center;">Control Scheme</p> <div style="display: flex; flex-direction: column; align-items: flex-end;"> <div style="margin-bottom: 20px;"> <p>Alarm — 1</p> <p>Output — 2</p> <p>3</p> <p>i/p 1 — 4</p> <p>5</p> <p>i/p 2 — 6</p> <p>7</p> <p>En — 8</p> <p>Rev — 9</p> <p>10</p> </div> <div style="text-align: center;"> <p>Set Switches</p>  <p>6 7 8 9</p> </div> </div>	<p>overload defaults to 100%</p> <p>max speed defaults to 100%</p> <p>amp times default to 3s</p> <p>in speed defaults to 0%</p> <p>reset 1 defaults to 50%</p> <p>reset 2 defaults to 15%</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> <p>Set Switches</p>  </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>1</p> </div> <div style="text-align: center;">  <p>2</p> </div> </div> </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="text-align: center;"></td> <td>Preset Speed 1 0% to 100%</td> <td>reset Speed 2 0% to 100%</td> </tr> <tr> <td style="text-align: center;"></td> <td>Preset Speed 1 0% to 100%</td> <td>Ramp Time 0.5s to 30s</td> </tr> <tr> <td style="text-align: center;"></td> <td>Preset Speed 1 0% to 100%</td> <td>Max Speed 0% to 100%</td> </tr> <tr> <td style="text-align: center;"></td> <td>Fwd MaxSpeed 10% to 100%</td> <td>Rev MaxSpeed 10% to 100%</td> </tr> <tr> <td style="text-align: center;"></td> <td>accel Ramp 0.5s to 30s</td> <td>Decel Ramp 0.5s to 30s</td> </tr> <tr> <td style="text-align: center;"></td> <td>Ramp Time 0.5s to 30s</td> <td>Overload 0% to 150%</td> </tr> <tr> <td style="text-align: center;"></td> <td>Max Speed 10% to 100%</td> <td>Overload 0% to 150%</td> </tr> <tr> <td style="text-align: center;"></td> <td>Preset Speed 1 0% to 100%</td> <td>Overload 50% to 150%</td> </tr> </table>		Preset Speed 1 0% to 100%	reset Speed 2 0% to 100%		Preset Speed 1 0% to 100%	Ramp Time 0.5s to 30s		Preset Speed 1 0% to 100%	Max Speed 0% to 100%		Fwd MaxSpeed 10% to 100%	Rev MaxSpeed 10% to 100%		accel Ramp 0.5s to 30s	Decel Ramp 0.5s to 30s		Ramp Time 0.5s to 30s	Overload 0% to 150%		Max Speed 10% to 100%	Overload 0% to 150%		Preset Speed 1 0% to 100%	Overload 50% to 150%																										
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<p>#5 8 Preset Speed Control <u>Maintained Speed Selection Inputs.</u> <u>Maintained Enable Input.</u></p> <p>The drive runs at one of 4 preset speeds as determined by two logic inputs.</p> <p>A third logic input enables the drive to run.</p> <p>A fourth logic input determines direction.</p> <p>This gives a total of 8 preset speeds.</p> <p>Notes: Defaults are reset by cycling power to the drive.</p> <p>Warning - all external connections must be isolated</p>																																																				
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For models B115, B230 overload range is 50-100%

<div style="text-align: center; font-weight: bold; font-size: 2em;">1</div> <div style="text-align: center; font-weight: bold; margin-bottom: 10px;">Profile</div> <div style="text-align: center; font-weight: bold; margin-bottom: 10px;">Set Switches</div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Standard Profile</p> </div> <div style="text-align: center;">  <p>Fan Profile</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>Extended Profile</p> </div> <div style="text-align: center;">  <p>Massflow Profile</p> </div> </div>	<div style="text-align: center; font-weight: bold; font-size: 2em;">2</div> <div style="text-align: center; font-weight: bold; margin-bottom: 10px;">Control Scheme</div> <div style="text-align: center;">  </div> <div style="text-align: center; margin-top: 10px;"> <div style="font-weight: bold; margin-bottom: 5px;">Set Switches</div>  </div>	<div style="text-align: center; font-weight: bold; font-size: 2em;">3</div> <div style="text-align: center; font-weight: bold; margin-bottom: 10px;">Parameters</div> <p style="text-align: center;">Overload defaults to 100% Max speed defaults to 100% Ramp times default to 3s Min speed defaults to 0% Preset 1 defaults to 15%</p> <div style="text-align: center; margin-bottom: 10px;"> <div style="font-weight: bold; margin-bottom: 5px;">Set Switches</div>  </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 15%;"></td> <td style="width: 35%;">Preset Speed 1 0% to 100%</td> <td style="width: 35%;">Ramp Time 0.5s to 30s</td> </tr> <tr> <td style="text-align: center;"></td> <td>Preset Speed 1 0% to 100%</td> <td>Max Speed 10% to 100%</td> </tr> <tr> <td style="text-align: center;"></td> <td>Fwd Ramp 0.5s to 30s</td> <td>Rev Ramp 0.5s to 30s</td> </tr> <tr> <td style="text-align: center;"></td> <td>Max Speed 10% to 100%</td> <td>Ramp Time 0.5s to 30s</td> </tr> <tr> <td style="text-align: center;"></td> <td>Accel Ramp 0.5s to 30s</td> <td>Decel Ramp 0.5s to 30s</td> </tr> <tr> <td style="text-align: center;"></td> <td>Fwd MaxSpeed 10% to 100%</td> <td>Rev MaxSpeed 10% to 100%</td> </tr> <tr> <td style="text-align: center;"></td> <td>Preset Speed 1 0% to 100%</td> <td>Overload* 50% to 150%</td> </tr> <tr> <td style="text-align: center;"></td> <td>Overload* 50% to 150%</td> <td>Ramp Time 0.5s to 30s</td> </tr> </table>		Preset Speed 1 0% to 100%	Ramp Time 0.5s to 30s		Preset Speed 1 0% to 100%	Max Speed 10% to 100%		Fwd Ramp 0.5s to 30s	Rev Ramp 0.5s to 30s		Max Speed 10% to 100%	Ramp Time 0.5s to 30s		Accel Ramp 0.5s to 30s	Decel Ramp 0.5s to 30s		Fwd MaxSpeed 10% to 100%	Rev MaxSpeed 10% to 100%		Preset Speed 1 0% to 100%	Overload* 50% to 150%		Overload* 50% to 150%	Ramp Time 0.5s to 30s
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#6 Motorized Potentiometer Control

Maintained Direction and Run Inputs.
Momentary Raise and Lower Inputs.

The drive speed setpoint function simulates a motorized potentiometer via raise and lower logic inputs.

The third logic input enables the drive to run.

The fourth logic input determines direction.

Notes:

- Raise and Lower independently control the setpoint. The setpoint changes only when the drive is running. The setpoint changes at the ramp rate or at a 2.5s rate, whichever is slower.
- On power-up, the setpoint is set to Preset Speed 1.
- Defaults are reset by cycling power to the drive.

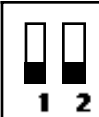


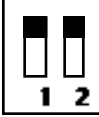
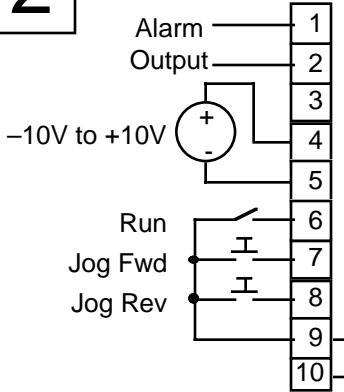


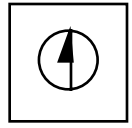
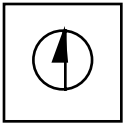
























Warning - all external connections must be isolated

Control Truth Table





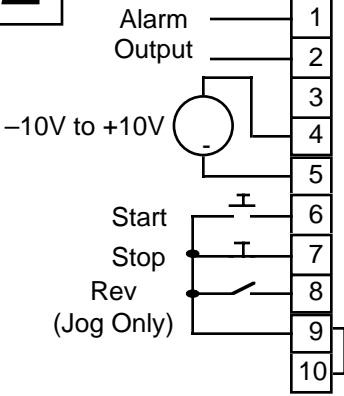


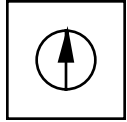
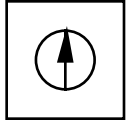


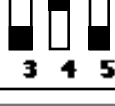



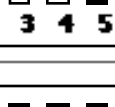
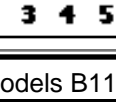


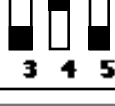



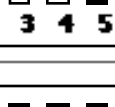
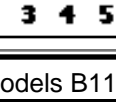


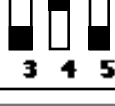



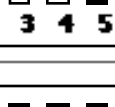
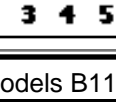
Run	Rev	Action
0	X	Stop
1	0	Run Fwd
1	1	Run Rev

0=Off, 1=On, X=Any

For models B115, B230 overload range is 50-100%

1	2	3																																			
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<p>#7 +/- 10 Volts Follower Control</p> <p><u>Maintained Run Input.</u> <u>Momentary Jog Fwd and Jog Rev Inputs.</u></p> <p>Maintained input for run. Pushbutton input for jog forward and jog reverse.</p> <p>The run input is dominant over the jog inputs. In cases where jog forward and jog reverse are closed, the first one to close is dominant.</p> <p>Notes: The setpoint may be a -10V to +10V voltage source as shown. The input impedance of the drive in this mode is approximately 24KΩ.</p> <p>Alternately, a 10KΩ potentiometer may be used if switch 9 is off. The potentiometer is connected between terminals 3(+), 4(wiper) & 5(-). In this mode, the pot is center-zero.</p> <p>Faults are reset by cycling power to the drive. Warning - all external connections must be isolated</p>																																					
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0	1	1	Run Fwd	JogFwd																																	
0	1	1	Run Rev	JogRev																																	
1	X	X	Any	Run																																	

* For models B115, B230 overload range is 50-100%

Profile	2 Control Scheme	3 Parameters																																						
<p style="text-align: center;">Set Switches</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Standard profile</p> </div> <div style="text-align: center;">  <p>Fan Profile</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>Extended profile</p> </div> <div style="text-align: center;">  <p>Massflow Profile</p> </div> </div>	<p style="text-align: center;">2</p> <div style="text-align: center;">  </div> <p style="text-align: center; margin-top: 10px;">Set Switches</p> <div style="text-align: center;">  </div>	<p style="text-align: center;">3</p> <p style="text-align: center;">Parameters</p> <p style="text-align: center;">Overload defaults to 100% Max speed defaults to 100% Ramp times default to 3s Min speed defaults to 0% Jog defaults to 15%</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> <p>Set Switches</p>  </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>P1</p> </div> <div style="text-align: center;">  <p>P2</p> </div> </div> </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">Jog Speed 0% to 100%</td> <td style="text-align: center;">Ramp Time 0.5s to 30s</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">Max Speed 10% to 100%</td> <td style="text-align: center;">Ramp Time 0.5s to 30s</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">Jog Speed 0% to 100%</td> <td style="text-align: center;">Max Speed 10% to 100%</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">Min Speed 0% to 90%</td> <td style="text-align: center;">Max Speed 10% to 100%</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">Fwd Jog Speed 0% to 100%</td> <td style="text-align: center;">Rev Jog Speed 0% to 100%</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">Fwd Max Speed 10% to 100%</td> <td style="text-align: center;">Rev Max Speed 10% to 100%</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">Jog Speed 0% to 100%</td> <td style="text-align: center;">Overload* 50% to 150%</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">Overload* 50% to 150%</td> <td style="text-align: center;">Max Speed 10% to 100%</td> </tr> </table>		Jog Speed 0% to 100%	Ramp Time 0.5s to 30s		Max Speed 10% to 100%	Ramp Time 0.5s to 30s		Jog Speed 0% to 100%	Max Speed 10% to 100%		Min Speed 0% to 90%	Max Speed 10% to 100%		Fwd Jog Speed 0% to 100%	Rev Jog Speed 0% to 100%		Fwd Max Speed 10% to 100%	Rev Max Speed 10% to 100%		Jog Speed 0% to 100%	Overload* 50% to 150%		Overload* 50% to 150%	Max Speed 10% to 100%														
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<p>#8 +/- 10 Volts Follower Control <u>Momentary Start and Stop Inputs.</u> <u>Maintained Jog Direction Input.</u></p> <p>ushbutton inputs for start and stop. aintained input for direction selection during jog. f the stop input is open, the start input works as a og input.</p> <p>otes: he setpoint may be a -10V to +10V voltage source s shown. The input impedance of the drive in this ode is approximately 24KΩ.</p> <p>ternately, a 10KΩ potentiometer may be used if witch 9 is off. The potentiometer is connected etween terminals 3(+), 4(wiper) & 5(-). In this ode, the pot is center-zero.</p> <p>aults are reset by cycling power to the drive. arning - all external connections must be isolated</p>																																								
<p style="text-align: center;">Control Truth Table</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="3" style="text-align: center;">(Jog)</th> <th rowspan="2" style="text-align: center;">State</th> <th rowspan="2" style="text-align: center;">Action</th> </tr> <tr> <th style="text-align: center;">Start</th> <th style="text-align: center;">Stop</th> <th style="text-align: center;">Rev</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">X</td> <td style="text-align: center;">Any</td> <td style="text-align: center;">Stop</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">Any</td> <td style="text-align: center;">Jog Fwd</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">Any</td> <td style="text-align: center;">Jog Rev</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">X</td> <td style="text-align: center;">Any</td> <td style="text-align: center;">Run</td> </tr> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">X</td> <td style="text-align: center;">Stop</td> <td style="text-align: center;">Stop</td> </tr> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;">X</td> <td style="text-align: center;">Run</td> <td style="text-align: center;">Run</td> </tr> </tbody> </table> <p style="text-align: center; margin-top: 10px;">0=Off, 1=On, X=Any</p>		(Jog)			State	Action	Start	Stop	Rev	0	0	X	Any	Stop	1	0	0	Any	Jog Fwd	1	0	1	Any	Jog Rev	1	1	X	Any	Run	0	1	X	Stop	Stop	0	1	X	Run	Run	
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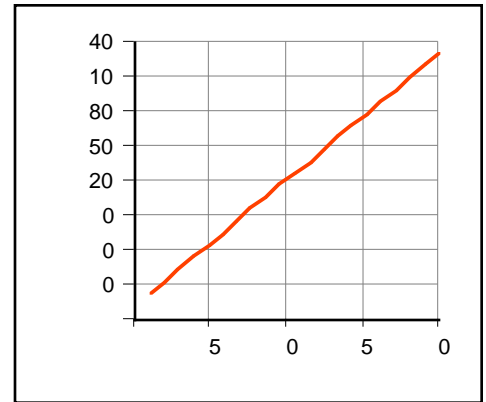
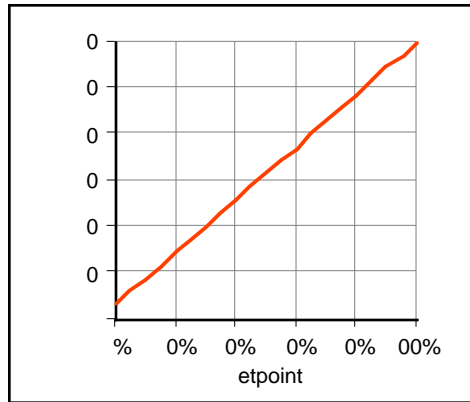
* For models B115, B230 overload range is 50-100%

Appendix 1 - Profiles

Standard Profile

Characteristic: Constant torque
 Max Speed: 60Hz
 Voltage Boost: 5%

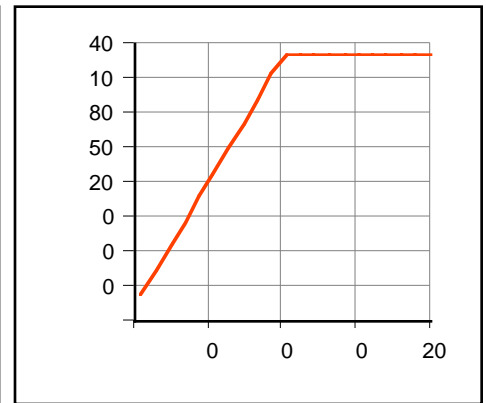
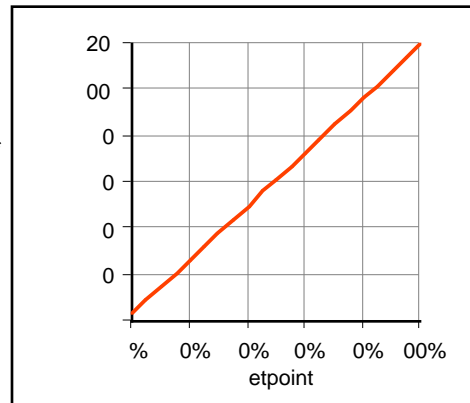
Applications include conveyors and
 urntables.



Extended Profile

Characteristic: Constant torque*
 Max Speed: 120Hz
 Voltage Boost: 5%

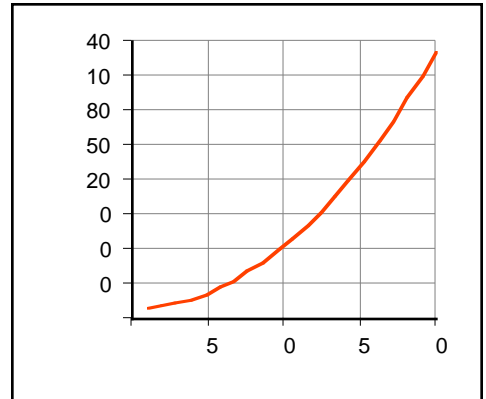
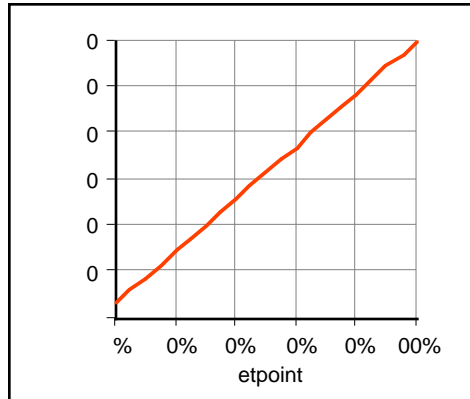
Applications include cutting tools
 * Constant torque to 60Hz Only



Fan Profile

Characteristic: Variable torque
 Max Speed: 60Hz
 Voltage Boost: 3%

Applications include fans, pumps
 and blowers.

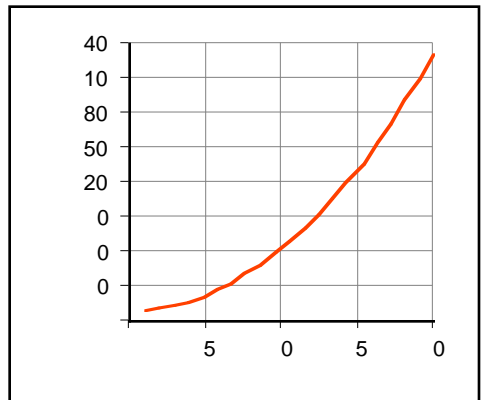
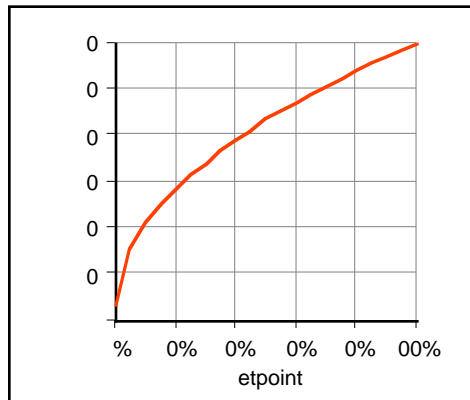


Mass Profile

Characteristic: Variable torque
 Max Speed: 60Hz
 Voltage Boost: 3%

The input is compensated to
 approximate a linear output.

Applications include fans, pumps
 and blowers.



Appendix 2 - Model Numbers & Basic Build Standards

The Profiler model number groups define the voltage & phases, horsepower, operating mode configuration and installed options. Please check that your drive model is correct.

Input/Output Phases/Frequency

B1 = Single phase 115/230V in, 3-phase 230V out
 B2 = Single phase 230V in, 3-phase 230V out
 B3 = 3-phase 230V in, 3-phase 230V out

Power

-01 = 0.10hp
 -02 = 0.25hp
 -03 = 0.33hp
 -05 = 0.50hp
 -07 = 0.75hp
 -10 = 1.00hp
 -15 = 1.50hp
 -20 = 2.00hp
 -30 = 3.00hp

Configuration

-001 = basic non isolated

Options

-C = Open Chassis or -E = Enclosed
 -B = Brake Output (needs external resistor)

HP	Full Load Output (a)	Full Load Input (a)		H x W x D inches (mm)	Chassis Model No.	Braked Model No.	Weight Lbs (Kg)
Input: 1ph, 115/230V Output: 3ph, 230V							
.25	1.4	5.8	3.3	4.6x2.6x5.6(117x66x142)	B102-001-C	B102-001-C-B	1.5 Lbs(.7 Kg)
.33	1.7	6.9	4.0	4.6x2.6x5.6(117x66x142)	B103-001-C	B103-001-C-B	1.5 Lbs(.7 Kg)
.50	2.2	8.7	5.0	4.6x2.6x5.6(117x66x142)	B105-001-C	B105-001-C-B	1.5 Lbs(.7 Kg)
.75	3.2	11.6	6.8	4.6x3.1x5.6(117x79x142)	B107-001-C	B107-001-C-B	2.1 Lbs(.9 Kg)
1.0	4.2	14.5	8.7	4.6x3.1x5.6(117x79x142)	B110-001-C	B110-001-C-B	2.1 Lbs(.9 Kg)
1.5	6.0	20.0	11.8	5.7x6.2x5.6(145x157x142)		B115-001-E-B	4.8 Lbs(2.2 Kg)
Input: 1ph, 230V Output: 3ph, 230V							
1.5	6.0		11.6	4.6x4x5.6(117x102x142)		B215-001-C-B	4.8 Lbs(2.2Kg)
2.0	6.8		13.2	4.6x4x5.6(117x102x142)		B220-001-E-B	4.8 Lbs(2.2 Kg)
3.0	9.6		17.4	5.7x6.2x5.6(145x157x142)		B230-001-E-B	6.0Lbs(2.7Kg)
Input: 3ph, 230V Output: 3ph, 230V							
.25	1.4		1.7	4.6x2.6x5.6(117x66x135)	B302-001-C	B302-001-C-B	1.5 Lbs(.7 Kg)
.33	1.8		2.0	4.6x2.6x5.6(117x66x135)	B303-001-C	B303-001-C-B	1.5 Lbs(.7 Kg)
.50	2.2		2.5	4.6x2.6x5.6(117x66x135)	B305-001-C	B305-001-C-B	1.5 Lbs(.7 Kg)
.75	3.2		3.4	4.6x3.1x5.6(117x79x135)	B307-001-C	B307-001-C-B	2.1 Lbs(.9 Kg)
1.0	4.2		4.4	4.6x3.1x5.6(117x79x135)	B310-001-C	B310-001-C-B	2.1 Lbs(.9 Kg)
1.5	6.0		5.8	4.6x4x5.6(117x102x142)		B315-001-C-B	4.8 Lbs(2.2 Kg)
2.0	6.8		6.4	4.6x4x5.6(117x102x142)		B320-001-C-B	4.8 Lbs(2.2 Kg)
3.0	9.6		8.4	4.6x4x5.6(117x102x142)		B330-001-C-B	4.8 Lbs(2.2 Kg)

Appendix 3 - Specifications

Input Power Supply

B1XX Models Single Phase 100-125 Volts or 200-250 Volts, 50/60Hz
 B2XX Models Single Phase, 200-250 Volts, 50/60Hz
 B3XX Models 3-Phase, 200-250 Volts, 50/60Hz

Alarm Output Normally open contact, rated up to 5A at up to 230 volts AC or 30 volts DC.
 Closes for Drive Healthy

Output Profiles Selectable Volts - Hertz Profiles
 - Standard: 3 to 60 Hz (Constant Torque)
 - Extended: 3 to 120 Hz (Constant Torque To 60 Hz)
 - Fan: 3 to 60 Hz (Variable Torque)
 - Mass Flow: 3 to 60 Hz (Input Linearized For Output)

Ramp Time 0.5 to 30 seconds (Specials up to 1000 seconds)

Ambient Temp Operation: 0°C to 50°C
 Short term storage: -20°C to 60°C

Environment

Protected, clean, dry, non-hazardous, pollution degree 2

Humidity

Max. 90% RH non-condensing

Altitude

Max. 3300 feet (1000M) above sea level, derate 1% per 330 feet (100M) above 3300 feet (1000M)

Control Input

Non-isolated configurable control terminals

Protection

Drive trips and shows alarm indication for:
 - DC link under voltage
 - DC link over voltage
 - Drive over temperature
 - Motor overload
 - Output short circuit
 - Output ground fault

Appendix 4 - Overload & Motor Protection

The Profiler™ B-Series drives provide modified i^2t overload protection which ensures protection of the motor yet allows the application to benefit from the extremes of the motor rating characteristics.

The basic overload trip level is either preset to the drive full load rated current or it is set by one of the potentiometers on the front of the drive depending on the drive set up (see Parameter selection). If potentiometer operation is selected, it allows the basic overload trip level to be adjusted linearly between 50% and 150% of the drive nominal full load current.

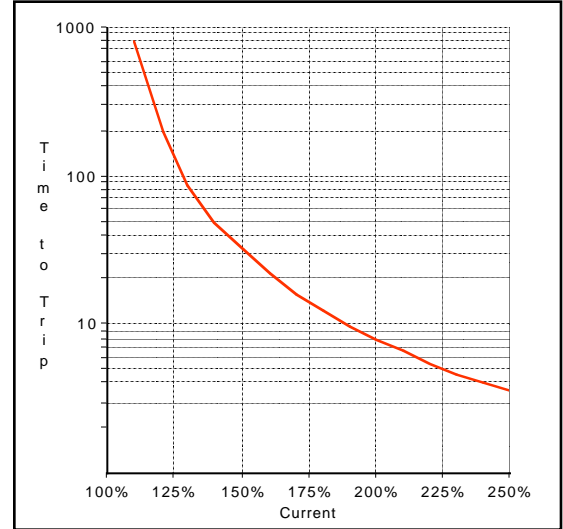
The graph to the right shows the overload trip characteristics relative to the set level. Thus, by permitting small overloads for long durations and high overloads for short durations the drive minimizes the potential for nuisance tripping.

Typically the drive will allow the motor to run up to:

- 110% of set level for 14 minutes or to the thermal limit of the drive.
- 150% of set level for 30 seconds or to the thermal limit of the drive.
- 200% of set level for 8 seconds or to the thermal limit of the drive.

The drive trips instantly on output ground faults or short circuits:

- Over 18 amps drives up to 0.75 hp & 1.0 hp drives with brake
- Over 30 amps 1.0 hp to 2.0 hp drives
- Over 54 amps 3.0 hp drives



Appendix 5 - Alarms & Troubleshooting

The drive has two LED's located on the front of the drive. The green LED indicates that power is applied to the drive and the red LED indicates a fault conditions as follows:

	OFF	Drive OK
	ON	Severe Under Voltage. The DC link voltage is below the level at which drive operation can be guaranteed. The outputs are shutdown and the microprocessor is reset.
	CONTINUOUS FLASH	Under Voltage. The drive has detected a low voltage condition on the DC Link and has shut down to protect itself. This fault is latched. See mode set up diagrams for reset conditions.
	ON/OFF	Motor Protection. The drive has detected a persistent overload condition and has shut down to protect the motor. This fault is latched. See MODE diagrams for reset conditions.
	OFF/ON/FLASH	Over Temperature. The drive has detected an internal over temperature condition and has shutdown to protect itself. This fault is latched. See MODE diagrams for reset conditions.
	ON/FLASH	Over Voltage. The drive has detected a high voltage on the DC Link and has shutdown to protect itself. This fault is latched. See mode set up diagrams for reset conditions.
	ON/OFF/FLASH	Over Current / Ground Fault. The drive has detected a severe over current, short circuit or ground fault and has shutdown to protect itself. This fault is latched. See MODE set up diagrams for reset conditions.

NOTE: A fault or power off condition will set the Drive Alarm Relay output contact (terminals 1 & 2) to the normally open state.

Appendix 5 - Alarms & Troubleshooting (Continued)

No LED's are "On."

Verify line voltage is connected and present at the line terminals.

No output.

1. Verify motor is connected to the motor terminals.
2. Recheck control wiring and dip switch settings.
3. Verify that the proper control circuits are closed.
4. Verify that the drive is getting a speed setpoint.

No torque at low speeds.

1. Verify profile setting is correct for the application.
2. Select a higher starting speed setpoint.

Changing dip switch settings does not change the drive operation.

Cycle power off for at least 1 minute to reset the drive.

The drive trips due to a persistent overload condition.

1. The motor may not be sized to handle the load.

2. Try one of the parameter settings that allow overload adjustment.

The drive trips on over temperature.

Ambient conditions around the drive have exceeded 50°C. Ensure the drive is properly ventilated.

The drive trips on over voltage.

1. Verify incoming line voltage
2. The ramps may be set too fast for the application.
3. A drive with a brake option may be required.

The drive trips on over current/ground fault.

1. Check motor wiring for a short circuit or ground fault condition.
2. The ramps may be set too fast for the application.
3. A drive with a brake option may be required.

Consult factory for additional assistance.

Phone: 410-604-3400
 Fax: 410-604-3500
 email: info@bardac.com
 www: bardac.com

Appendix 6 - Brake Output Option (Option -B in model code)

The Brake Output option (if installed) allows regenerated braking energy from the motor to be dissipated in an external resistor (supplied separately) connected to the BRK- and BRK+ terminals.

The brake resistor should be rated for 450 volts DC and rated for both the peak and average power to be absorbed. In most cases, the brake resistor is used to dissipate the energy stored in the load inertia during deceleration. This energy is dissipated over the braking time, yielding a brake power:

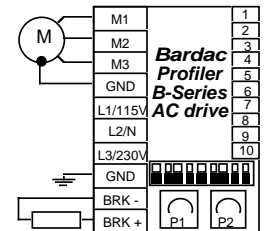
$$P_{brake} \approx \frac{I_0(\eta_i^2 - \eta_f^2)}{182t_{brake}}$$

T is the kinetic energy to be dissipated (W)

I_0 is the inertia (kg m2)

η_i is the initial speed (rpm)

η_f is the final speed (rpm)



The resistor must be able to dissipate this amount of power for the braking time and this is usually constrained by the overload rating of the resistor. In addition, the resistor must be able to dissipate the average power which is determined by the braking power and the time spent braking in a cycle:

$$P_{avg} = P_{brake} \frac{t_{brake}}{t_{cycle}}$$

The resistor must be able to continuously dissipate this amount of power in the ambient temperature where it will be located.

Resistor Selection If the cycle time is greater than 10 times the braking time AND the braking time is less than 5 seconds, you may use a wirewound resistor rated for 10 times rated power for 5 seconds, subject to the ambient limits of the resistor as follows:

Resistor			Resistor		
hp	Ohms	Watts	hp	Ohms	Watts
0.50	500	50	1.5	100	200
0.75	250	75	2.0	75	225
1.0	125	100	3.0	50	400

