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BA Series

Low-Cost, Compact Modular Amplifier

Wide output power range from 10 A peak to 100 A peak at 320 VDC

No transformer required; direct connection to AC line

Capable of running brushless or single-phase DC brush motors

Velocity, torque, and dual-phase mode input command

Accepts both encoder or tachometer feedback for velocity control

Can be externally commutated

CE approval on low-power models



BA10, 20, 30 Models



BA50, 75, 100 Models

The BA series amplifiers are Aerotech's stand-alone drive for three-phase AC brushless and single-phase DC brush motors. This versatile amplifier can run in velocity mode or torque mode using a self-commutating, low ripple, modified six-step algorithm.

All BA amplifiers accept a standard ± 10 VDC as a velocity or torque (current) command from any motion controller.

Amplifier Series	BAS	BA	BL
Rotary Brushless Motors	x	x	x
DC Brush-Type Motors		x	x
Linear Brushless Motors	x	x	x
Rotary Slotless Motors	x	x	x
Power Stage	PWM	PWM	Linear

The dual-phase mode is used for external commutating controllers such as Aerotech's U100I, U500, and U600 position controllers to bypass the BA's commutation and perform sinusoidal commutation. This provides the smoothest velocity control.

The BA amplifier is based on a 20 kHz IGBT for reliable operation in a compact package. It is completely self-contained, requiring only AC line power, and the amplifier is fully protected. The DC-isolated power stage minimizes loop noise. The amplifier accepts a quadrature encoder or tachometer input for velocity feedback. The encoder signal is converted to a voltage representing speed.

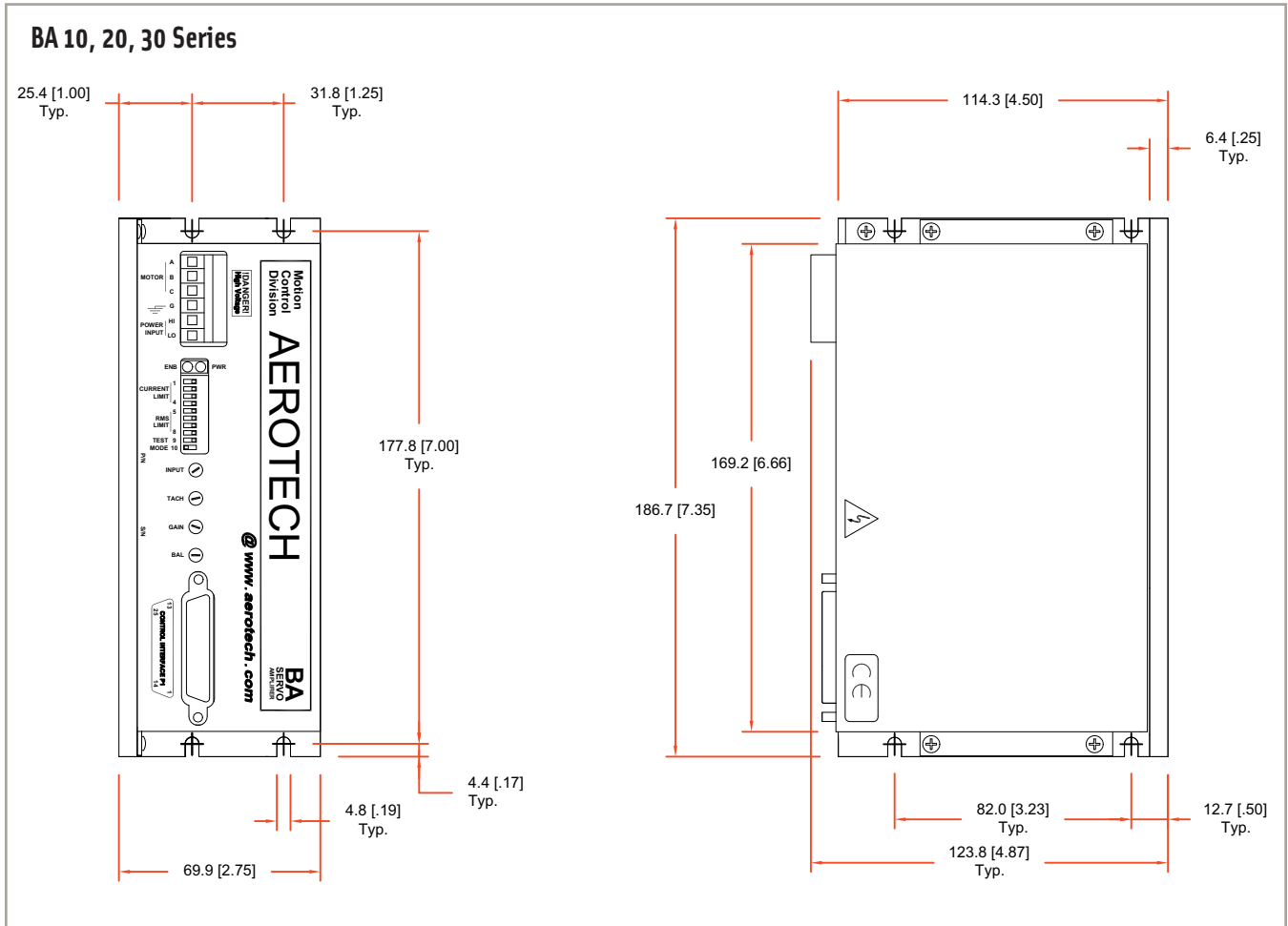
The BA is available in six models up to 100A peak to match your application power requirements. Standard models are delivered from stock, and custom versions can be engineered to your requirements in minimal lead times.

BA Series SPECIFICATIONS and DIMENSIONS

Model	Units	BA10	BA20	BA30	BA50	BA75	BA100
Output Voltage ⁽¹⁾	VDC	40-320 ⁽²⁾					
Peak Output Current	A _{pk}	10	20	30	50	75	100
Continuous Output Current	A _{pk}	5	10	15	25	37	50
Peak Output Power	W	2,720	5,440	8,160	13,600	20,160	28,800
Continuous Output Power	W	1,360	2,720	4,080	6,800	10,080	14,400
Power Amplifier Bandwidth	kHz	2					
PWM Switching Frequency	kHz	20					
Minimum Load Inductance	mH	0.8 @ 160 VDC (1 mH @ 320 VDC)					
Operating Temperature	°C	0 to 50					
Storage Temperature	°C	-30 to 85					
Weight	kg (lb)	1.1 (2.5)			3.9 (8.5)	5.7 (12.5)	
Maximum Shunt Regulator Dissipation	W	40 (optional)	40 (optional)	40	100 (10 A Ext.)		
Brushless Operation		Torque (Current), Velocity, Dual Phase					
Brush-Type Operation		Torque, Velocity					
Power Input		28-230 VAC, Single Phase, 50-60 Hz			28-230 VAC, 50-60 Hz, 1-3 Phase		
Protection		Output Short Circuit (Phase-to-Phase and Phase-to-Ground); Peak Overcurrent, RMS Overcurrent; DC Bus Overvoltage; Overtemp; Control or Power Stage Bias Power Supply Undervoltage; Galvanic Isolation Between Signal and Power Stages					
Indicators		Drive Enable LED Indicator, Power-On LED.			Drive Enable LED Indicator, Power-On LED. Fault & Overload LEDs		

Notes:

1. Depends on AC input voltage
2. 40-80 VDC bus requires external transformer, 110 VAC auxiliary input for control input power



BA Series ORDERING INFORMATION

Ordering Example

BA	20	-160	-S
Series	Output Current, Peak	Operating Bus Voltage	Internal Shunt Power Resistor
	10, 20, 30, 50, 75, 100	40 80 160 320	S

BA Series Amplifiers

BA10-x	5 A cont., 10 A peak servo amplifier/power supply
BA20-x	10 A cont., 20 A peak servo amplifier/power supply
BA30-320-S	15 A cont., 30 A peak servo amplifier/power supply, w/shunt regulator
BA50-320-S	25 A cont., 50 A peak servo amplifier/power supply, w/shunt regulator 230 VAC, 1 phase input
BA75-320-S	37 A cont., 75 A peak servo amplifier/power supply, w/shunt regulator 230 VAC, 3 phase input
BA100-320-S	50 A cont., 100 A peak servo amplifier/power supply, w/shunt regulator 230 VAC, 3 phase input

Bus Voltage

-40*	40 VDC bus; 28 VAC input required (use TV0.3-28)
-80*	80 VDC bus; 56 VAC input required (use TV0.3-56)
-160	160 VDC bus; 100-115 VAC input, direct line operation (for 80 VDC bus use TV0.3-56 transformer)
-320	320 VDC bus; 230 VAC input, direct line operation (includes shunt regulator)

Note: Requires transformer such as TV0.3-28 OR TV0.3-56 for 56VAC input voltage.

BA Series Amplifier Options

-S	Add shunt resistor network for BA10 or BA20 (standard on the BA30, BA50, BA75, BA100) EX: BA20-160-S
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BA Accessories

TV0.3-28	0.3 kVA autotransformer; 28 or 56 VAC out for 40 or 80 VDC bus, 115/230 VAC, 50/60 Hz input
TV0.3-56	0.3 kVA autotransformer; 56 or 115 VAC out for 80 or 160 VDC bus, 115/230 VAC, 50/60 Hz input
TV1.5	1.5 kVA isolation transformer, 115/230 VAC input; 28, 43, 56, 70, 115 VAC output
TV2.5	2.5 kVA isolation transformer, 115/230 VAC input; 28, 43, 56, 70, 115 VAC output
TV5	5 kVA isolation transformer, 115/230 VAC input; 28, 43, 56, 70, 115 VAC output
TB	Screw terminal block for BA DB25 control connector
LF	AC line filter, general noise suppression (not for CE Compliance)
UFM	AC line filter module (required for BA amplifiers to meet CE compliance)

Motor Feedback Cables (Brushless)

C15291-50	Feedback cable, BM series brushless motor to controller, 15 ft., MS, DB25
PFC-15	Feedback cable, BM series brushless motor to controller, 15 ft., MS, FL
C18391-50	Feedback cable, BMS series slotless motor to controller, 15 ft., DB25, DB25

Motor Power Cables (Brushless)

C15801-50	Motor power cable, BA amplifier to: BM75, BM130, BM200, BM250, 15 ft.
C15811-50	Motor power cable, BA amplifier to: BM500, BM800, BM1400, 15 ft.
PMC2-15	Motor power cable, BA amplifier to: BM2000, BM3400, BM4500, 15 ft.
C17891-50	Motor power cable, BA amplifier to BMS series motors, 15 ft.

Motor Feedback & Power Cables (DC brush-type)

BADC-MSO-15	Integral cable, BAS to 1017, 1035, 1050, 1075, 1135, 1210, 1410 DC motor with MSO1, 15 ft, MS -> DB25, FL
BAMS-O-15	Integral cable, BAS to 1580, 1960 DC motor with MSO1, 15 ft, MS -> DB25, FL

Control Cables

BAC2-3	Amplifier cable, BA amplifier to control for brushless series motors, 3 ft.
BAC6-3	Amplifier cable, BA amplifier to control for DC brush series motors, 3 ft.



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