

Fractional Horsepower DC Speed Controls for PMDC Motors

1/15 thru 1/4

115 VAC Single Phase 50/60 Hz.

Applications: Conveyors, machine tools and other applications requiring adjustable speed.

Features: Simple DC motor control with built-in circuit breaker, center lock reversing switch (center off), on/off switch, 7 foot SJO oil resistant cord, and variable voltage transformer for manual speed adjustment. NEMA 1 enclosure is standard. CSA list file # LR54532.



Max Hp	Catalog Number	List Price	Mult Sym.	Ap'x Shpg. Wgt.	Amp Capacity	Input Voltage
1/15	BC110	466	E9	5	1.0	115VAC
1/8	BC115	498	E9	6	1.5	115VAC
1/4	BC130	634	E9	10	3.0	115VAC

NEMA 1 Enclosed DC Controls for PMDC and Shunt Wound Motors

1/100 thru 2 Hp

115/230 VAC Single Phase 50/60 Hz.

Applications: General purpose industrial use with permanent magnet or shunt wound DC motors.

Features: SCR controls have a free-wheeling diode and feature adjustable accel, decel, current limit, IR comp, min. and max speed pots to match applications. The anti-demag feature protects PM motors and helps protect the SCR power bridge against direct shorts. The controls have US and Canadian UL component recognition.

A Plug-in Horsepower Resistor® and armature fuse **must** be ordered and installed in BC138, BC139, BC140, BC140-FBR, BC141 and BC142.



BC140 ENCLOSED (NEMA 1)

Hp Range	Catalog Number	List Price	Mult. Sym.	Ap'x Shpg. Wgt. Lbs.	Input Voltage
1/100-1/3	BC138	184	E9	1	115
1/50-3/4	BC139	184	E9	1	230
1/100-2 (a)	BC140	313	E9	3	115/230
1/100-2 (a)	BC140-FBR	433	E9	3	115/230

NOTE: (a) 1 Hp at 115V and 2 Hp at 230V requires BC143 heatsink kit. See page 308 for features. FBR=Forward/Brake/Reverse.

DC Control Accessories

Catalog Number	Description	List Price	Mult. Sym.	Ap'x. Shpg. Wgt.
BC24-LF	Ac Line Filter for use with CE Applications	62	E9	1
BC143	External Heatsink Kit (BC140, BC140-FBR, BC141, BC142, BC204)	60	E9	2
BC144	Forward-Brake-Reverse Switch Kit for BC140	104	E9	1
BC145	Signal Isolator Board	178	E9	1
BC146	Current Sensing Relay/Overload Protector	115	E9	1
BC147	Barrier Terminal Board (BC141 and BC142)	24	E9	1
BC148	Replacement Potentiometer Kit (5K ohm)	10	E9	1
BC149	Knob and Dial Kit	11	E9	1
BC151	Electronic Speed Potentiometer	70	E9	1
BC152	Barrier Terminal Board With Signal Isolator (BC141 and BC142)	163	E9	1
BC218	DIN-rail mounting kit for BC141, BC142 or BC204	29	E9	1

NOTE: BC24-LF is an AC line filter required for applications where CE is required if the control is not filtered elsewhere in the application. This filter may be used on most 115 or 230 VAC, single phase applications where CE is required.

HVAC Motors

Farm Duty Motors

Definite Purpose Motors

Brake Motors

200 & 575 Volt Motors

IEC Frame Motors

50 Hertz Motors

Inverter/Vector Motors & Controls

DC Motors and Controls

Soft Start & Dynamic Brakes

Chassis Mount DC Controls

1/100 thru 1.5 Hp
1/50 thru 5 Hp

115 VAC Single Phase 50/60 Hz.
230 VAC Single Phase 50/60 Hz.



BC141 / BC142

Applications: General purpose industrial use with permanent magnet or shunt wound DC motors.

Features: Chassis-mount SCR controls have a free-wheeling diode and feature adjustable accel, decel, current limit, IR comp, min and max speed pots to match applications. The anti-demag feature protects PM motors and helps protect the SCR power bride against direct shorts. The controls have US and Canadian UL component recognition.

Hp Range	Catalog Number	List Price	Mult. Sym.	Ap'x Shpg. Wgt. Lbs.	Input Voltage (1Ph,50/60 Hz)
1/100-1 1/2 (a)	BC141	171	E9	1	115
1/100-3 (a)	BC142	171	E9	2	230
1/100-1 1/2 (a)	BC142-6	189	E9	1	115/230
1/50-3 (a)					
5	BC155	560	E9	5	230

NOTE: Above controls include 5k speed potentiometer.

(a) 1-1.5 Hp at 115 Volts and 2-3 Hp at 230 Volts, requires BC143 Heatsink kit.

BC155 Includes integral heatsink. Please refer to page 309 for features.

Plug-in Horsepower Resistor and Fuse Kit



A Plug-in Horsepower Resistor® and armature fuse **must** be ordered and installed in BC138, BC139, BC140, BC140-FBR, BC141 and BC142.

These should be selected based on the motor's **rated current**. The price of the Hp resistor and fuse is included in the BC138, BC139, BC140, BC140-FBR, BC141 and BC142 list price.

See selection below for catalog number.

Spare resistor kits are available for \$8.00 list, **E9** multiplier.

Motor Hp Armature Voltage		Plug-In Hp Resistor Resistance Value (Ohms)	Catalog Number	Ap'x DC Current (Amps)	DC Fuse Rating For Armature
90-130V	180V				
1/100	1/50	1.0	BR1000	0.20	0.5
1/50	1/25	0.51	BR0510	0.30	0.5
1/30	1/15	0.35	BR0350	0.33	0.5
1/20	1/10	0.25	BR0250	0.5	0.75
1/15	1/8	0.25	BR0251	0.8	1.0
1/12	1/6	0.18	BR0180	0.85	1.25
1/8	1/4	0.1	BR0100	1.3	2.0
1/6	1/3	0.1	BR0101	2.0	2.5
1/4	1/2	0.05	BR0050	2.5	4.0
1/3	3/4	0.035	BR0035	3.3	5.0
1/2	1	0.025	BR0025	5.0	8.0
3/4	1 1/2	0.015	BR0015SP	7.5	12.0
1 (a)	2 (a)	0.01	BR0010SP	10	15.0
1 1/2 (a)	3 (a)	0.006	BR0006	15	25.0 (b)

NOTE: (a) External Heatsink required. (b) Also used with AC Line Fuse. For AC line fuse rating see manual.

NEMA 4X DC Control and Accessories

1/4 thru 2 Hp 115/230 VAC Single Phase 50/60 Hz.
3 Hp 230 VAC Single Phase 50/60 Hz.

Applications: Constant torque, new or replacement.

Features: BC154, BCWD140 and BC160 are non-regen controls with reversal by means of switching the armature leads (BCWD140 has a forward/brake/reverse switch mounted). BC254 is a line regenerative SCR control that can drive the motor to a timed stop. BC354 is a PWM control that provides low-ripple DC power to the motor allowing more Hp when used with a 140 or 280 VDC motor. All offer a choice of armature or tachometer feedback and a speed or torque mode. No Hp resistors are needed for these controls, current is jumper selectable. BC154, BC160, BC254 and BC354 are painted black and come with a start-stop switch. BCWD140 comes with white epoxy paint and also forward/brake/reverse and run-jog switches. See page 308 for features.



Hp Range	Catalog Number	Description Input Voltage / Max. Hp	List Price	Mult. Sym.	Ap'x. Shpg. Wgt.	Input Voltage
NEMA 4X SCR (black) (c)						
1/4-2	BC154	120V - 1 Hp, 230V - 2 Hp	396	E9	5	115/230
1/4-2	BC164	120V - 1 Hp, 230V - 2 Hp	425	E9	5	115/230
3	BC160	230V - 3 Hp	456	E9	3	230
NEMA 4X Washdown Duty SCR (white)						
1/4-2	BCWD140	120V - 1 Hp, 230V - 2 Hp	530	E9	6	115/230
NEMA 4X Washdown Duty Line Regen SCR (black)						
1/8-2	BC254	120V - 1 Hp, 230V - 2 Hp (a)	571	E9	5	115/230
NEMA 4X Washdown Duty PWM DC (black) (b)						
1/4-2	BC354	120V - 1 Hp, 230V - 2 Hp	614	E9	5	115/230

NOTE: (a) See page 307 for BC254 accessories.
 (b) Output current is 7.5 amps; Output voltage is 140VDC for 115VAC input - 280VDC for 230VAC input. Motors designed for these voltages will give the best performance.
 (c) BC164 is unpainted.

DC SCR NEMA 4X DC Control Accessories

Catalog Number	Description	List Price	Mult. Sym.	Ap'x. Shpg. Wgt.
BC153	Electronic Forward-Dynamic Brake-Reverse Kit for BC154, BC354	188	E9	1
BC156	Mechanical Forward-Dynamic Brake-Reverse Switch for BC154, BC354	121	E9	1
BC157	Run/Jog switch for BC154 & BC160, BC354	21	E9	1
BC158	Auto/Manual Installation Kit for BC145 signal isolator for BC154, BC160, BC354	50	E9	1
BC159	AC Line Switch Kit for BC154, BCWD140, BC254, BC354	26	E9	1
BC145	Signal Isolator Board	178	E9	1

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Line Regenerative DC Controls and Accessories



**1/4 thru 3 Hp
5 Hp**

**115/230 VAC
230 VAC**

**Single Phase 50/60 Hz.
Single Phase 50/60 Hz.**

Applications: Frequent start/stop/reverse applications or where controlled braking is required.

Features: Single phase line regenerative open chassis control to operate permanent magnet or wound field DC motors. These line regen controls are ideal for applications with overhauling loads. In torque mode, it can be used for tensioning applications. Several accessory boards are available to further customize the control. Includes 5k speed potentiometer. See page 309 for features. Jumper selectable current settings.

Hp Range	Catalog Number	Description Input Voltage / Max. Hp	List Price	Mult. Sym.	Ap'x. Shpg. Wgt.	Input Voltage
Line Regen SCR						
1/4-1-1/2	BC202	120V 3/4 Hp, 230V 1-1/2 Hp	420	E9	1	115/230
1/8-2 (a)	BC204	120V 1 Hp, 230V 2 Hp	320	E9	3	115/230
1/4-2	BC200	120V 1Hp, 230V 2 Hp	598	E9	4	115/230
1/4-3	BC201	120V 1-1/2 Hp, 230V 3 Hp	710	E9	1	115/230
5	BC203	230V 5Hp	894	E9	1	230
NEMA 4X Washdown Duty Line Regen SCR						
1/8-2	BC254	120V - 1Hp, 230V - 2Hp	571	E9	5	115/230

NOTE: (a) 1 Hp at 115 volts and 2 Hp at 230 volts requires BC143 heatsink kit.

Line Regenerative DC Control Accessories

Catalog Number	Description	List Price	Mult. Sym.	Ap'x. Shpg. Wgt.
Accessories for BC200, BC201 and BC203				
BC211	4 quadrant accel/decel board	136	E9	1
BC212	Bipolar signal isolator board	182	E9	1
BC214	BC202 expansion board kit. Required to add BC211 or BC212 to BC202	8	E9	1
Accessories for BC204				
BC143	External Heatsink Kit	60	E9	2
BC215	Bipolar signal isolator board	84	E9	3
BC216	Multispeed board for BC204	64	E9	1
BC218	DIN rail mounting kit	29	E9	1
Accessories for BC254				
BC245	Bipolar signal isolator for BC254	180	E9	1
BC253	Forward-Stop-Brake-Reverse Switch for BC254	21	E9	1
BC258	Auto-manual Switch for BC254	50	E9	1
BC259	AC Line Switch for BC254	21	E9	5

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NEMA Enclosed DC Control Specifications

Features	Catalog Number										
	BC138	BC139	BC140 or BC140-FBR		BC154	BC160	BC164		BCWD140		
Enclosure	NEMA 1	NEMA 1	NEMA 1		NEMA 4X	NEMA 4X	NEMA 4X		NEMA 4X Washdown		
Control Type	NEMA K	NEMA K	NEMA K		NEMA K	NEMA K	NEMA K		NEMA K		
AC Line Input	115	230	115	230	115	230	230	115	230	115	230
DC Armature Voltage Nominal	90	180	90	180	90	180	180	90	180	90	180
Shunt Field Power Supply											
Voltage - DC	50/100	100/200	50/100	100/200	50/100	100/200	100/200	50/100	100/200	50/100	100/200
Rated Horsepower Range	1/100 - 1/3	1/50-3/4	1/100-1	1/50-2	1/50-1	1/25-2	3	1/50-1	1/25-2	1/50-1	1/25-2
External Heat Sink (BC143) Required	No	No	1 Hp	2Hp	Required	Required	Required	Required	Required	Required	Required
Speed Range (Motor May Be 20: 1 Constant Torque)	50:1	50:1	50:1		50:1	50:1		50:1		50:1	
Adjustable Acceleration Time	Yes	Yes	Yes		Yes	Yes		Yes		Yes	
Adjustable Deceleration Time	Yes	Yes	Yes		Yes	Yes		Yes		Yes	
Minimum Speed Adjustable	Yes	Yes	Yes		Yes	Yes		Yes		Yes	
Maximum Speed Adjustable	Yes	Yes	Yes		Yes	Yes		Yes		Yes	
Current Limit Adjustable	Yes	Yes	Yes		Yes	Yes		Yes		Yes	
Adjustable Current Limit and Trip Out Type	No	No	No		Timed or Non-Timed	Timed or Non-Timed		Timed or Non-Timed		Timed or Non-Timed	
Control Of Speed or Torque	Speed	Speed	Speed		Speed or Torque	Speed or Torque		Speed or Torque		Speed or Torque	
IR Compensation Adjustable	Yes	Yes	Yes		Yes	Yes		Yes		Yes	
Tachometer Feedback Input	No	No	No		Yes	Yes		Yes		Yes	
Plug-In Horsepower Resistor ®	Required	Required	Required		N/A	N/A		N/A		N/A	
UL & cUL Listing, CE	Yes	Yes	Yes		Yes	Yes		Yes		Yes	
AC Line Fuse	Included	Included	Included		External	External		External		External	
DC Armature Fuse	Included with Hp Resistor	Included with Hp Resistor	Included with Hp Resistor		Not Supplied with Control			Not Supplied with Control		Not Supplied with Control	
Options											
AC Line Switch	Standard	Standard	Standard		Opt - BC159	No		Opt - BC159		Standard	
Forward/Brake/Reverse Switch											
Mechanical	No	No	Opt-BC144		Opt-BC156	No		Opt-BC156		Standard	
Electronic	No	No	No		Opt-BC153	No		Opt-BC153		Opt-BC153	
Run/Jog Switch	No	No	No		Opt-BC157	Opt-BC157		Opt-BC157		Standard	
Input Signal					Internal Mount	Internal Mount		Internal Mount		External Mount	
Following Mode Capability											
Current (1-5, 4-20, 20-50mA)	No	No	Opt-BC145		Opt-BC145	Opt-BC145		Opt-BC145		Opt-BC145	
Voltage (0-25,0-120, VDC)			Opt-BC145		Standard (0-5,0-10 VDC)	Standard (0-5,0-10 VDC)		Standard (0-5,0-10 VDC)		Standard (0-5,0-10 VDC)	
Electrical Connection To Control Barrier Terminal Block	Standard	Standard	Standard		Standard	Standard		Standard		Standard	
Current Sensing Relay/Overload Protector	No	No	Opt - BC146		Standard	Standard		Standard		Standard	
Electronic Speed Potentiometer	No	No	Opt-BC151		Opt-BC151	Opt-BC151		Opt-BC151		Opt-BC151	
AC Line Filter for CE	Opt-BC24-LF	Opt-BC24-LF	Opt-BC24-LF		Opt-BC24-LF	Opt-BC24-LF		Opt-BC24-LF		Opt-BC24-LF	

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Chassis Mount DC Control Specifications

Features	Catalog Number								
	BC141	BC142	BC142-6	BC155	BC202	BC204	BC200	BC201	BC203
Enclosure	Chassis	Chassis	Chassis	Chassis	Chassis	Chassis	Chassis	Chassis	Chassis
Control Type	NEMA K	NEMA K	NEMA K	NEMA K	Regenerative	Regenerative	Regenerative	Regenerative	Regenerative
AC Line Input	115	230	115 230	230	115 230	115 230	115 230	115 230	230
DC Armature Voltage Nominal	90	180	90 180	180	90 180	90 180	90 180	90 180	180
Shunt Field Power Supply Voltage - DC	50/100	100/200	50/100 100/200	50/100 100/200	50/100 100/200	50/100 100/200	50/100 100/200	50/100 100/200	100/200
Rated Horsepower Range	1/100-1.5	1/50-3	1/100-1 1/2 1/50-3	5	1/4-3/4 1/2-1 1/2	1/8-1 1/4-2	1/4-1 1/2-2	1/4-1-1/2 1/2-3	5
External Heat Sink (BC143) Required	1 Hp-Up	2 Hp-Up	1/2 Hp-Up 1 Hp-Up	Not Required	Not Required	90V-1Hp 180V-2Hp	Not Required	Not Required	Not Required
Speed Range (Motor may be 20:1 Constant Torque)	50:1	50:1	50:1	50:1	50:1	50:1	50:1	50:1	50:1
Adjustable Acceleration	Yes	Yes	Yes	Yes	Yes Fwd & Rev	Yes Fwd & Rev	Yes Fwd & Rev	Yes Fwd & Rev	Yes Fwd & Rev
Adjustable Deceleration	Yes	Yes	Yes	Yes	Regen	Regen	Regen	Regen	Regen
Min.. Speed Adjustable	Yes	Yes	Yes	Yes	No	No	No	No	No
Max. Speed Adjustable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjustable Current	Non	Non	Non	Non		Non			
Limit and Tripout Type	Timed	Timed	Timed	Timed	Timed	Timed	Timed	Timed	Timed
Control of Speed or Torque	Speed	Speed	Speed	Speed Torque	Speed or Torque	Speed or Torque	Speed or Torque	Speed or Torque	Speed
IR Compensation Adjustment	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tachometer Feedback Input	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plug-in Horsepower Resistor®	Required	Required	Required	N/A	N/A	N/A	N/A	N/A	N/A
UL & cUL Listing, CE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AC Line Fuse	Included	Included	Included	External	External	External	Included	Included	External
DC Armature Fuse	Included with Hp Resistor	Included with Hp Resistor	Included with Hp Resistor	Included with Hp Resistor	Included with Hp Resistor	External	Included with Hp Resistor	Included with Hp Resistor	External
Options									
Input Signal									
Following Mode Capability						No	No	No	No
Current (1-5,4-20,50 mA)	Opt-BC145	Opt-BC145	Opt-BC145	Opt-BC145	No	Std	No	No	Std 0-±10VDC
Voltage (0-25, 0-120, VDC)	Opt-BC145	Opt-BC145	Opt-BC145	Std 0-10 VDC	Std 0-±10 VDC	Opt BC215 with BC214	Std 0-±10 VDC	Std 0-±10 VDC	Opt-BC212
0-25, 0-120, VDC)	No	No	No	No	Opt-BC212		Opt-BC212	Opt-BC212	
Electrical Connection									
To Control									No
Push-On Quick Connects	Standard	Standard	Standard	No	No	Standard	No	No	Standard
Barrier Terminal Block	Opt-BC147	Opt-BC147	Opt-BC147	Standard	Standard	N/A	Standard	Standard	
Current Sensing Relay/									
Overload Protector	Opt-BC146	Opt-BC146	Opt-BC146	Opt-BC146	Standard	N/A	Standard	Standard	Standard
Regenerative						Opt BC211 with BC214	Opt	Opt	Opt
Accel / Decel Board	No	No	No	No		No	BC211	BC211	BC211
Electronic Speed	Opt	Opt	Opt	Opt	Opt	Opt	Opt	Opt	Opt
Potentiometer	BC151	BC151	BC151	BC151	BC151	BC151	BC151	BC151	BC151
AC Line Filter for CE	Opt-BC24-LF	Opt-BC24-LF	Opt-BC24-LF	Opt-BC24-LF	Opt-BC24-LF	Opt-BC24-LF	Opt-BC24-LF	Opt-BC24-LF	Opt-BC24-LF

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