

### Series 19H Digital DC Controls

**5 thru 75Hp  
5 thru 300 Hp**

**180-264 VAC - 50/60 Hz  
340-528 VAC - 50/60 Hz**



**Applications:** Constant torque applications. New installations, replacements and original equipment manufacturers (OEM).

**Features:** Chassis mounting, built-in armature or encoder feedback, high peak currents.

#### Design Specifications

- Three phase, full wave SCR armature control
- High peak overload, 250-300% (depending on rating)
- Selectable operating modes: Keypad; Standard Run, 15 Speed, Bipolar speed/torque; Serial; Process follower mode.
- Analog meter outputs
- Buffered encoder output
- 9 isolated inputs
- Chassis mounting

#### Operator Keypad

- Digital Speed Control
- Forward/Reverse Command
- Motor RUN and JOG
- Local/Remote Key
- Stop Command (coast or external DB to stop)
- 32 Character alpha-numeric display
- Remote mount to 100 feet from control
- NEMA 4X enclosure on keypad

#### Environmental and Operating Conditions

- Input Frequency - 50 or 60 Hz  $\pm$  5%
- Service factor - 1.0
- Duty - continuous
- Humidity - 90% max RH non-condensing
- Altitude - 3300 feet max without derate

#### Protective Features

- Control Input over and under voltage
- Encoder, tach or resolver loss
- Torque proving
- Selectable manual or automatic restart at power loss
- Digital display for fault conditions

#### Motor Feedback

- 1024 PPR standard (with quadrature)
- Power output: +5VDC, 300 mA max
- Max frequency: 1 MHz
- Optional feedback: tachometer or resolver through expansion board

<b>Output Ratings</b>	Voltage	DC - 0-1.3 times VAC input	
	<b>Input Ratings</b>	Frequency	50 or 60 Hz $\pm$ 5%
		Voltage	200-240 VAC $\pm$ 10%; 380-480 VAC $\pm$ 10%
<b>Control Spec.</b>	Phase	Three phase	
	Impedance	5% maximum	
	Control Method	Full wave-uni-directional DC control, NEMA type C	
	Speed Setting	0-5VDC, 0-10VDC, 4-20 mA, digital via keypad, optional RS232/422/485	
	Accel/Decel	0-3600 seconds (decel-coast or controlled by external DB resistors) - no S-curve decel	
	Minimum Speed	0-maximum speed	
	Maximum Speed	0-5000 RPM	
<b>Field Power Supply</b>	Motor Matching	Automatic tuning to motor with manual override	
	Type	Voltage limited, current regulated full wave single phase	
	Voltage	0 to 10-85% of AC line Input in DC volts	
	Current	0.1-15 Amps maximum-standard, 0.1-40 amps maximum-optional	
	Field Economy Level	OFF, 25-100%	
<b>Motor Feedback</b>	Field Forcing Level	100-125% (hoist modes only)	
	Feedback Type	Armature or incremental encoder coupled to motor shaft	
	Pulses/Rev	60-65535 selectable, 1024 standard	
	Voltage Output	2 channel in quadrature, 5VDC differential	
	Marker Pulse	Required for position orientation	
	Power Input	5VDC, 300 mA maximum	
<b>Protective Functions</b>	Maximum Frequency	1 MHz	
	Optional Feedback	Tachometer or resolver via expansion board	
	Control Trip	Missing control power, over current armature over voltage, motor overspeed over temperature (motor & control), field loss, encoder tach or resolver loss, phase loss, motor overload and overcurrent	
	Fusing	Standard input line, armature and field power supply fuses	
<b>LCD Display</b>	External Output	LED indicator for trip conditions, 4 assignable logic outputs - 30VDC Max, 2 assignable analog outputs 0-5VDC	
	Running	Motor RPM, output current, voltage (selectable)	
	Setting	Parameter values for setup and review	
<b>Ambient Conditions</b>	Trip	Separate message for each trip, last 31 trips retained in memory	
	Temperature	0-40°C for UL listing	
	Cooling	Forced air included when required	

**NOTE:** Use of DC tach for feedback requires DC Tachometer Interface Board, catalog number EXB006A01. Other expansion boards are available, see pages 275-276.

### Series 19H Digital DC Controls continued...

Hp	Input Volt	Armature Output Current		Catalog Number	List Price	Mult. Sym.	Chassis Size
		Amps Cont	Amps Peak				
<b>230 Volt Input - 240 VDC Output</b>							
5	230	20	40	BC19H205-CO	5005	E1	A
10	230	40	80	BC19H210-CO	5005	E1	A
15	230	60	120	BC19H215-CO	5378	E1	A
20	230	75	150	BC19H220-CO	5814	E1	B
25	230	100	200	BC19H225-CO	6124	E1	B
40	230	140	280	BC19H240-CO	7853	E1	C
50	230	180	360	BC19H250-CO	8444	E1	C
60	230	210	420	BC19H260-CO	9330	E1	C
75	230	270	540	BC19H275-CO	10117	E1	C
<b>460 Volt Input - 500 VDC Output</b>							
10	460	20	40	BC19H410-CO	5097	E1	A
20	460	40	80	BC19H420-CO	5097	E1	A
30	460	60	120	BC19H430-CO	5503	E1	A
40	460	75	150	BC19H440-CO	5950	E1	B
50	460	100	200	BC19H450-CO	6262	E1	B
75	460	140	280	BC19H475-CO	8257	E1	C
100	460	180	360	BC19H4100-CO	8818	E1	C
125	460	210	419	BC19H4125-CO	9701	E1	C
150	460	270	540	BC19H4150-CO	10502	E1	C
200	460	350	875	BC19H4200-CO	12876	E1	D
300	460	500	1000	BC19H4300-CO	17256	E1	D

**OPTIONS:** See pages 275-276 for optional Expansion Boards including Tachometer Feedback, RS-232, RS-422, RS-485, Resolver, Interface, etc. 40 Amp field power supply. FPS40BC1920

### Dimensions in/(mm)

Size	Hp	Outside			Mounting		Ap'x Shpg. Wgt.
		Height	Width	Depth	Height	Width	
<b>A</b>	ALL	20.60/(523.2)	11.00/(279.4)	9.87/(250.7)	18.00/(457.2)	10.25/(260.4)	39
<b>B 230V</b>	ALL	25.70/(652.8)	11.00/(279.4)	9.84/(249.9)	23.87/(606.3)	10.25/(260.4)	67
<b>B 460V</b>	ALL	26.75/(679.5)	11.00/(279.4)	9.84/(249.9)	24.94/(633.5)	10.25/(260.4)	69
<b>C 230V</b>	40-60	26.50/(673.1)	11.75/(298.5)	10.63/(270.0)	23.90/(607.0)	10.25/(260.4)	80
<b>C 460V</b>	75-100	27.25/(692.2)	11.75/(298.5)	10.63/(270.0)	24.65/(626.1)	10.25/(260.4)	84
<b>C 230V</b>	75	33.00/(838.2)	11.75/(298.5)	10.63/(270.0)	23.90/(607.6)	10.25/(260.4)	94
<b>C 460V</b>	125-200	33.75/(857.3)	11.75/(298.5)	10.63/(270.0)	24.65/(626.1)	10.25/(260.4)	97
<b>D</b>	ALL	43.80/(1112.5)	16.87/(428.5)	12.43/(315.7)	39.25/(997.0)	13.75/(349.3)	272

HVAC Motors

Farm Duty Motors

Definite Purpose Motors

Brake Motors

200 &amp; 575 Volt Motors

IEC Frame Motors

50 Hertz Motors

Inverter/Vector Motors &amp; Controls

DC Motors and Controls

Soft Start &amp; Dynamic Brakes

### Series 20H Line Regenerative Digital DC Controls



**5 thru 75Hp  
5 thru 300 Hp**

**180-264 VAC - 50/60 Hz  
340-528 VAC - 50/60 Hz**

**Applications:** Constant torque applications. New installations, replacements and original equipment manufacturers (OEM).

**Features:** Chassis mounting, built-in armature or encoder feedback. High peak current.

#### Design Specifications

- Three phase, full wave, four quadrant SCR armature control.
- Peak overload capacity of 250-300% (depending on rating)
- Selectable operating modes: Keypad, Standard Run, 15 Speed, Bipolar speed/torque, Serial, Bipolar Hoist, 7 Speed Hoist, process follower
- Motor shaft orient to encoder marker or external switch closure (encoder feedback)
- 15 preset speeds (7 in Hoist Mode.)

#### Operator Keypad

- Digital Speed Control
- Forward/Reverse Command
- Motor RUN and JOG
- Local/Remote Key
- Stop Command
- 32 Character alpha-numeric display
- Remote mount to 100 feet from control
- NEMA 4X enclosure on keypad

#### Environmental and Operating Conditions

- Input frequency - 50 or 60Hz  $\pm 5\%$
- Service factor - 1.0
- Duty - continuous
- Humidity - 90% max RH non-condensing
- Altitude - 3300 feet max without derate

#### Protective Features

- Torque proving
- Selectable manual or automatic restart at power loss
- Digital display for fault conditions

#### Motor Feedback

- Power output: +5VDC, 300 mA max
- Positioning: Buffered encoder pulse train output for position loop control
- Optional feedback: tachometer or resolver through expansion board

<b>Output Ratings</b>	Voltage	DC 0-1.13 times VAC input
<b>Input Ratings</b>	Frequency	50 or 60 Hz $\pm 5\%$
	Voltage	200-240 VAC $\pm 10\%$ ; 380-480 VAC $\pm 10\%$
	Phase	Three phase
<b>Control Spec.</b>	Impedance	5% maximum
	Control Method	Full wave-bi-directional regenerative DC control, NEMA type C
	Speed Setting	$\pm 5\text{VDC}$ , 0-5VDC, $\pm 10\text{VDC}$ , 0-10VDC, 4-20 mA, digital via keypad, optional RS232/422/485
	Accel/Decel	0-3600 seconds or s-curve
	Minimum Speed	0-maximum speed
	Maximum Speed	0-5000 RPM
	Motor Matching	Automatic tuning to motor with manual override
<b>Field Power Supply</b>	Type	Voltage limited, current regulated full wave single phase
	Voltage	0 to 10-85% of AC line Input in DC volts
	Current	0.1-15 Amps maximum-standard, 0.1-40 amps maximum-optional
	Field Economy Level	OFF, 25-100%
	Field Forcing Level	100-125% (hoist modes only)
<b>Motor Feedback</b>	Feedback Type	Armature or incremental encoder coupled to motor shaft
	Pulses/Rev	60-65535 selectable, 1024 standard
	Voltage Output	2 channel in quadrature, 5VDC differential
	Marker Pulse	Required for position orientation
	Power Input	5VDC, 300 mA maximum
	Maximum Frequency	1 MHz
	Positioning	Optional buffered encoder pulse train output for position loop controller
	Optional Feedback	Tachometer or resolver via expansion board
	<b>Protective Functions</b>	Control Trip
Fusing		Standard input line, armature and field power supply fuses
External Output		LED indicator for trip conditions, 4 assignable logic outputs - 30VDC Max, 2 assignable analog outputs 0-5VDC
<b>LCD Display</b>	Running	Motor RPM, output current, voltage (selectable)
	Setting	Parameter values for setup and review
	Trip	Separate message for each trip, last 31 trips retained in memory
<b>Ambient Conditions</b>	Temperature	0-40°C for UL listing
	Cooling	Forced air included when required

**NOTE:** Use of DC tach for feedback requires DC Tachometer Interface Board, catalog number EXB006A01. Other expansion boards are available, see pages 275-276.

### Series 20H Line Regenerative Digital DC Controls

Hp	Input Volt	Armature Output Current		Catalog Number	List Price	Mult. Sym.	Chassis Size
		Amps Cont	Amps Peak				
<b>230 Volt Input - 240 VDC Output</b>							
5	230	20	60	BC20H205-CL	5832	E1	A
10	230	40	120	BC20H210-CL	5832	E1	A
15	230	60	150	BC20H215-CL	5832	E1	A
20	230	75	190	BC20H220-CL	6112	E1	B
25	230	100	250	BC20H225-CL	6883	E1	B
40	230	140	420	BC20H240-CL	8928	E1	C
50	230	180	480	BC20H250-CL	9660	E1	C
60	230	210	540	BC20H260-CL	10215	E1	C
75	230	270	680	BC20H275-CL	12531	E1	C
<b>460 Volt Input - 500 VDC Output</b>							
5, 7.5, 10	460	20	60	BC20H410-CL	6137	E1	A
15, 20	460	40	120	BC20H420-CL	6137	E1	A
25, 30	460	60	150	BC20H430-CL	6335	E1	A
40	460	75	190	BC20H440-CL	6615	E1	B
50	460	100	250	BC20H450-CL	7336	E1	B
60, 75	460	140	420	BC20H475-CL	10150	E1	C
100	460	180	480	BC20H4100-CL	10953	E1	C
125	460	210	530	BC20H4125-CL	12214	E1	C
150	460	270	680	BC20H4150-CL	13359	E1	C
200	460	350	875	BC20H4200-CL	16061	E1	D
250	460	420	1050	BC20H4250-CL	20114	E1	D
300	460	510	1250	BC20H4300-CL	22034	E1	D

**OPTIONS:** See pages 275-276 for optional expansion Boards including Tachometer Feedback, RS-232, RS-422, RS-485, Resolver, Interface, etc.  
40 Amp field power supply. FPS40BC1920

### Dimensions in/(mm)

Size	Hp	Outside Height	Width	Depth	Mounting		Ap'x Shpg. Wgt.
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