SIEMENS

Submittal Sheet
Document No. 154-128
February 19, 2018

BT300 HVAC Drives Conventional Bypass (C-Bypass) Options

Description

The BT300 Conventional Bypass (C-Bypass) is a companion package for the family of BT300 HVAC Drives.

For information on the family of BT300 HVAC Drives, see the *BT300 HVAC Drives Submittal Sheet* (154-126) and *BT300 HVAC Drives Technical Specification Sheet* (149-711).

BT300 C-Bypass Features

- Bypass Start-up Wizard
- Diagnostic board with test points
- Control logic short circuit protection
- 100,000 AIC short circuit rating
- Country of Origin (COO) USA
- IBC 2012 Seismic Certified
- OSHPD Certified
- Compact design

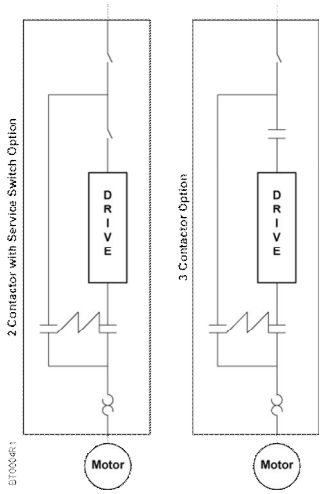
C-Bypass Power Features

2-Contactor: Output and Bypass

- Overload protection in bypass mode
- Electrically and mechanically interlocked

Drive Isolation

- Drive Service Switch allows the drive to be disconnected from power during troubleshooting without disrupting bypass operation.
- Optional 3-Contactor (Drive Input)
  - Contactors electrically interlocked.
  - Drive test function
  - Complete electrical isolation of drive



Input Device

- Disconnect with fuses.
- (*Optional*) Circuit breaker.
- All doors are interlocked and can be secured with a padlock.

5% Input Impedance

- Internal reactors lower harmonics that the drive produces.
- BT300 C-Bypass requires no additional input reactors

Reactor Options

- Line reactor (in NEMA 1 enclosure) supplied separately.
- Load reactor (in NEMA 1 enclosure) supplied separately.

C-Bypass Control Features

- Enable Input

  Generally used for safety tie-ins; the motor will not operate the drive or bypass when open.
- Common Remote Start/Stop

  Common remote start/stop can be used in both drive and bypass mode.
- Essential Services Mode
  - Typically used for smoke purge; the motor goes to bypass regardless of the selected mode.
  - No call to stop will have an effect, including open safety or stop commands.
  - Only turning the power off or opening this contact will stop the motor.

C-Bypass – Door Mounted Control Devices

- Drive-Off-Bypass selector
- Bypass pilot light
- Drive Test on/off selector (with third Contactor)

Product Numbers

Example:	*BTC*	*-*	*0*	*0*	*1*	*X*	*2*	*-*	*F*	*0*	*1*	*3*
Example:	*BTE*	*-*	*0*	*0*	*7*	*5*	*4*	*-*	*B*	*0*	*1*	*2*

Bypass Model(s)	
BTC	Conventional
BTE	Electronic
Separator	
HP	
1[1)], 1.5, 2, 3, 5, 7.5, 10, 15, 20, 25, 30, 40, 50, 60, 75[2)], 100, 125, 150[3)], 200[3)], 250[3)]	
X = no fraction, 5 = 1/2 hp	
Voltage	
2	208 Vac to 240 Vac
4	380 Vac to 500 Vac
Separator	
Disconnect	
F	Fused Disconnect
B	Circuit Breaker
NEMA	
01	NEMA Type 1 (IP 21)
Type	
2	2 contactors (output and bypass) w/service switch
3[4)]	3 contactors (input, output, and bypass)

[1)] Available only with voltage code 2.
[2)] Use with voltages equal to or greater than 230 Vac.
[3)] Available only with voltage code 4.
[4)] Available only with BTC models.

Example Product Numbers:

BTC-001X2-F013
Conventional Bypass, 1 HP, 208-240 Vac, Fused Disconnect, NEMA Type 1, with 3 contactors.

BTE-00754-B012
Electronic Bypass, 7.5 HP, 380-500 Vac, Circuit Breaker, NEMA Type 1, with 2 contactors and service switch.

Table 1. NEMA 1 C-Bypass Approximate Weights.

Frame	Weight lb (kg)
FS4	50 (23)
FS5	69 (31)
FS6	112 (51)
FS7	187 (85)
FS8	400 (181)
FS9	900 (408)

NOTE: Exact weight will be affected by actual horsepower/voltage and selected power options.

Typical Specifications

BT300 C-Bypass Options shall send the motor to bypass mode based on an easily accessible door-mounted selector or based on the drive's programmable relay. A bypass pilot light shall provide indication of the bypass mode. The bypass mode shall provide overload protection. Contactors shall be electrically and mechanically interlocked. An essential services mode shall send the motor to bypass regardless of the selected mode.

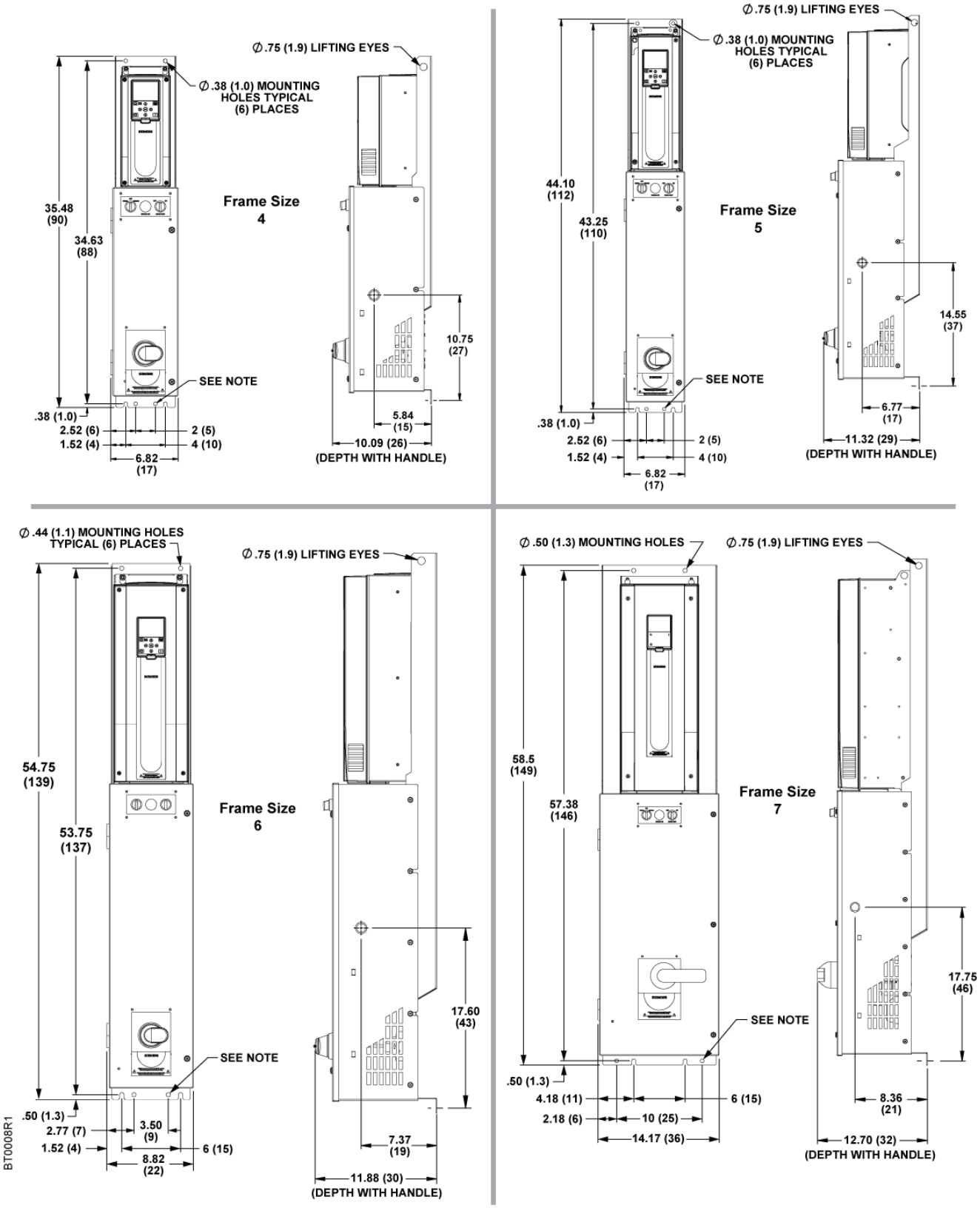
Table 2. C-Bypass Frame Sizes and Power Ranges per NEC Motor Tables.

		208-240	380-500	208-240	380-500
HP	**kW**	**Frame Size**		**Output Current**	
1	0.75	**4**		4.8	
1.5	1.1		**4**	6.7	3.4
2	1.5			8.0	4.8
3	2.2			11.0	5.6
5	4	**5**		18.0	9.6
7.5	5.5			24.2	12.0
10	7.5		**5**	31.0	16.0
15	11	**6**		48.0	23.0
20	15			62.0	31.0
25	18.5	**7**	**6**	75.0	38.0
30	22			88.0	46.0
40	30			105.0	61.0
50	37	**8**	**7**	143.0	72.0
60	45			170.0	87.0
75*	55			208.0	105.0
100*	75	**9**	**8**	261.0	140.0
125*	90			310.0	170.0
150	110				205.0
200	132		**9**		261.0
250	160				310.0

*Available for 230 Vac and above.

NOTE: Drives are current (amperage) rated devices. Verify that the listed ratings are ≥ the motor full load current rating.

Dimensions



NOTE: USE MOUNTING HOLES INSTEAD OF SLOTS IN INSTALLATIONS THAT ARE PRONE TO SEISMIC ACTIVITY.

Figure 1. Dimensions in Inches (cm) for UL (NEMA) Type 1 FS4 through FS7.

Dimensions, Continued

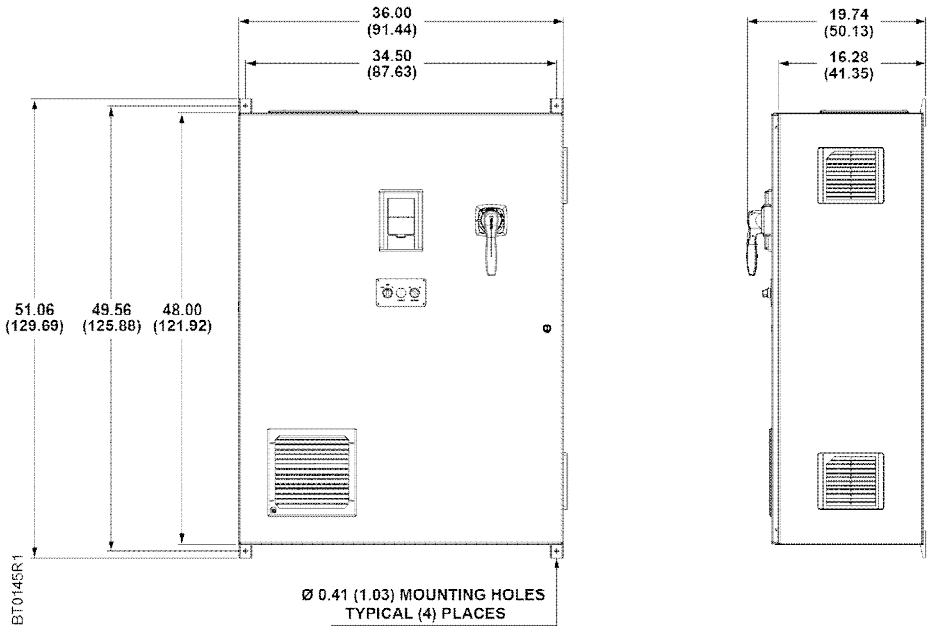


Figure 2. Dimensions in Inches (cm) for UL (NEMA) Type 1 FS8.

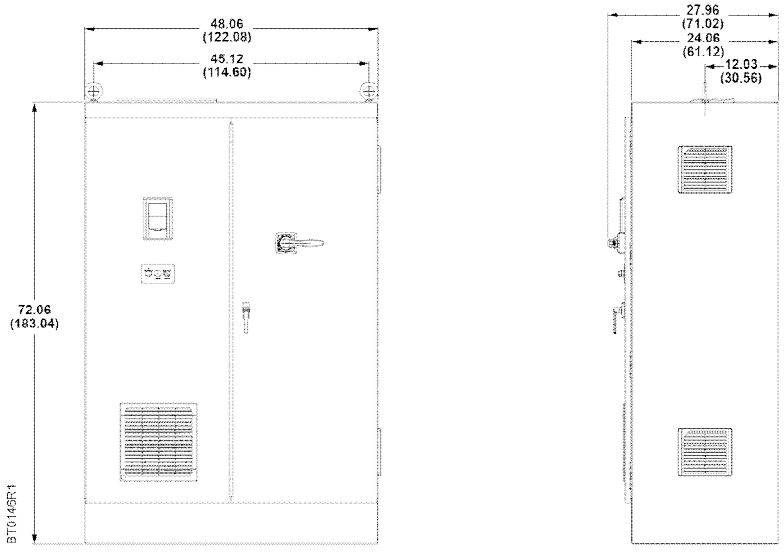
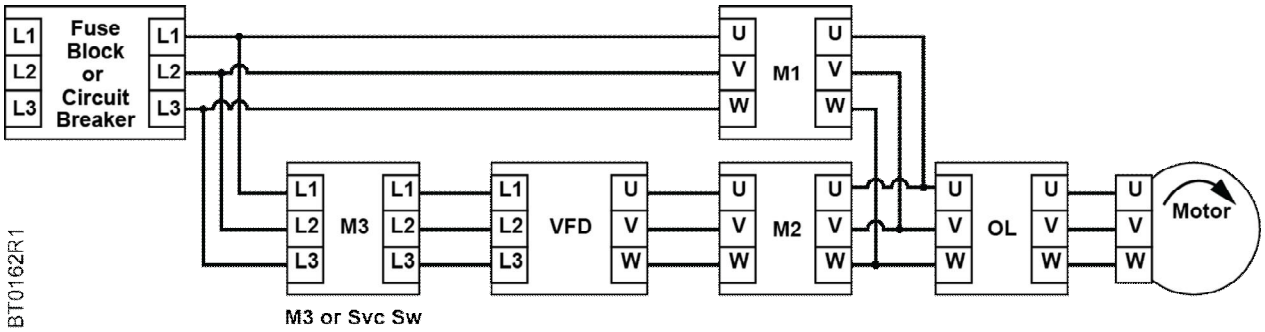


Figure 3. Dimensions in Inches (cm) for UL (NEMA) Type 1 FS9.

Wiring Diagrams



NOTES:

1. Branch circuit protection to be provided by installer, per UL508A, if not provided with drive.
2. Control and communication wiring should be 300V UL minimum.
3. Communication wiring should be run with maximum separation possible from all other wiring.
4. Essential service mode operates the motor full speed (bypass) with no protection for the motor or system.
5. Ensure that automatic bypass will not damage the system before activating.
6. See *Siemens BT300 Bypass Operator's Manual* (DPD01391) for proper fuse and wire sizes.
7. See *Siemens BT300 Operator's Manual* (DPD01149) for BT300 input/output control signal wiring details.

Figure 4. Factory As-Built of Power Wiring.

Motor Rotation Correction Wiring

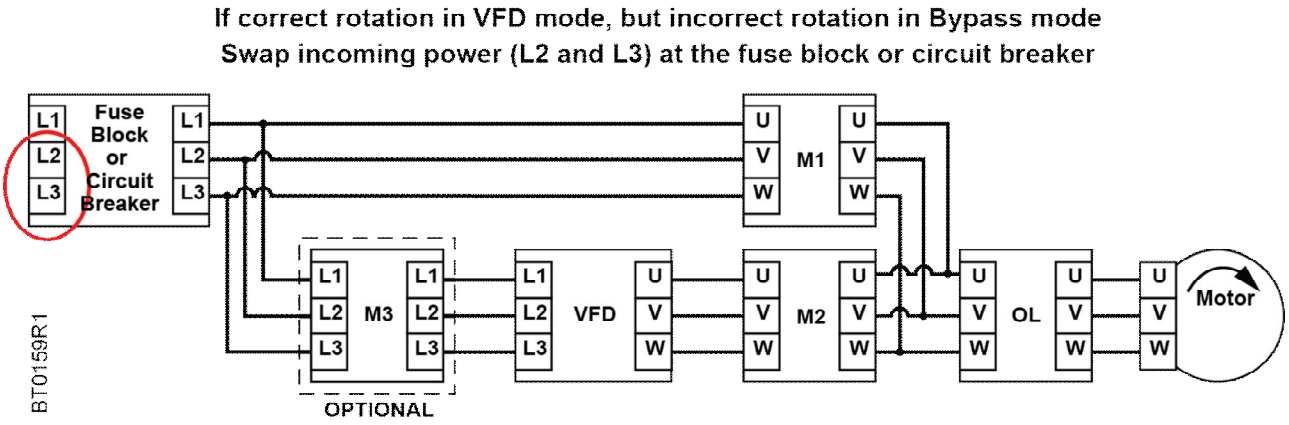


Figure 5. Rotation Correction – VFD Correct, Bypass Reversed.

Motor Rotation Correction Wiring, Continued

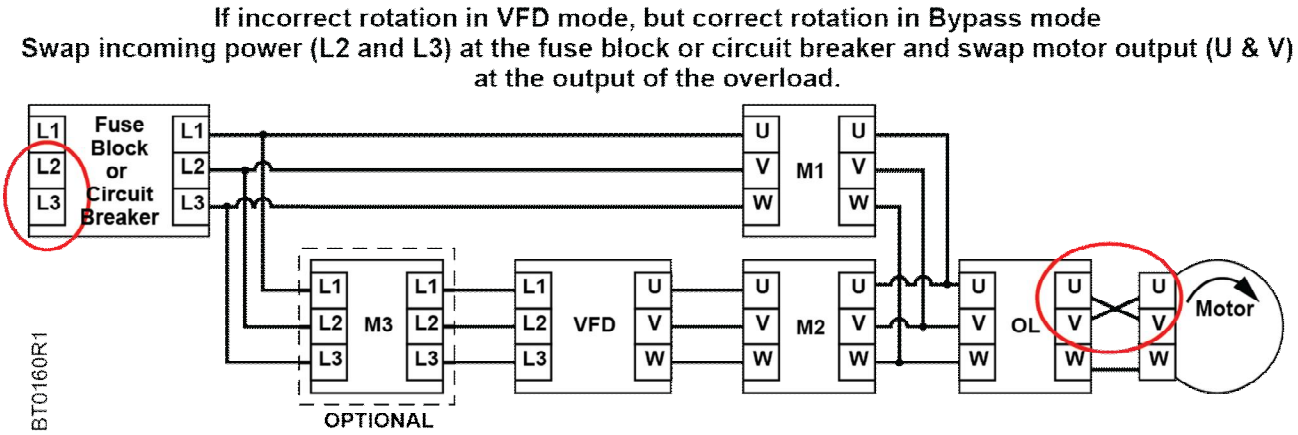


Figure 6. Rotation Correction – VFD Reversed, Bypass Correct.

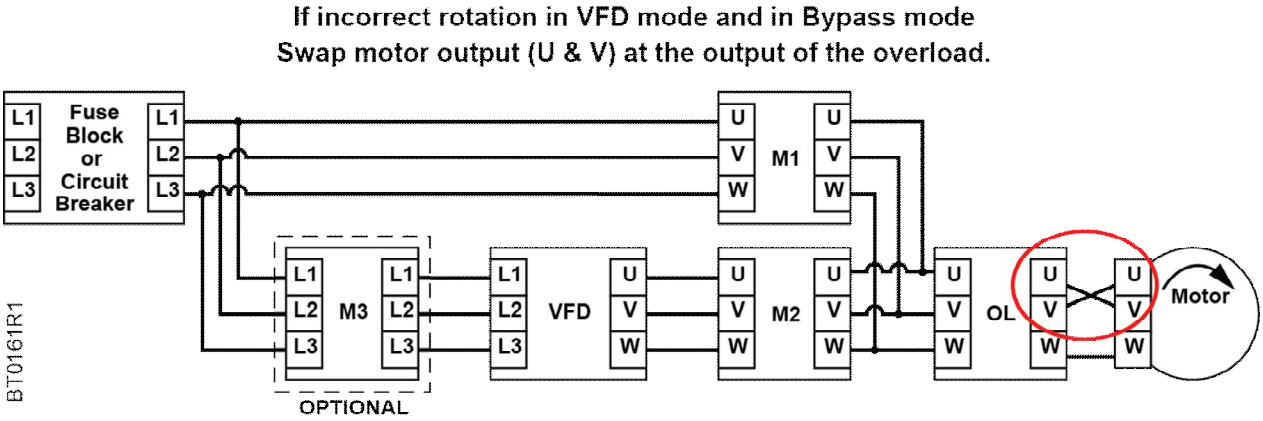


Figure 7. Rotation Correction – VFD Reversed, Bypass Reversed.

Table 3. C-Bypass Specifications.

Specification	Description
Input Voltages and Power Ranges (3-phase)	208 to 240 Vac (-10% to +10%): 1 HP to 125 HP (0.75 kW to 90 kW) 4.2 amps to 301 amps 380 to 500 Vac (-10% to +10%): 1.5 HP to 250 HP (1.1 kW to 160 kW) 3.4 amps to 303 amps
Short circuit withstand rating	Disconnect with Fuses- 100,000 AIC Circuit Breaker - 65,000 AIC @ 208/240 Vac 18,000 AIC @ 480 Vac
Frequency Reference Analog Input Keypad	 Resolution 0.01 - 0.1% (10 bit), accuracy ±1% Resolution 0.01 Hz
Ambient Operating Temperature	14°F (-10°C) (no frost) to 104°F (40°C) up to 122°F (50°C) with derating
Storage Temperature	-40°F (-40°C) (no frost) to 158°F (70°C)
Relative Humidity	0 to 95% rh, non-condensing, non-corrosive
Air quality Chemical vapors Mechanical particles	IEC 60068-2-60 (H_2S [hydrogen sulfide] and SO_2 [sulfur dioxide]). IEC 60721-3-3, unit in operation, class 3C2 IEC 60721-3-3, unit in operation, class 3S3.
Altitude	100% load capacity (no-derating) up to 3,280 ft (1,000 m) -1% derating for each 328 ft (100 m) above 3,280 ft (1,000 m) ***Maximum altitude:*** 208 to 240 Vac: 13,123 ft (4,000 m) 380 to 500 Vac: 13,123 ft (4,000 m) ***Voltage for relay outputs:*** 240 Vac: ≤9,842 ft (3,000 m) 120 Vac: ≤ 13,123 ft (4,000 m) ***Corner-grounding (380 to 500 Vac systems only):*** ≤ 6,562 ft (2,000 m)
Vibration	EN61800-5-1 EN60068-2-6
Seismic	2012 International Building Code (IBC); OSHPD
Shock	EN61800-5-1 EN60068-2-27
Enclosure Class	UL Type 1/IP 21 standard in entire HP/kW range.
Agency Approvals/Conformity	UL 508C (FS4 through FS7); UL-508A (FS8 and FS9); UL; cUL; CE; RoHS compliant; EN61800-5-1 (2007); BTL and OSHPD
Country Of Origin (COO)	United States of America
Control I/O: (Programmable) Analog Inputs Analog Outputs Digital Inputs Relay Outputs	 2 - voltage (0/2 to 10 Vdc) or current (0/4 to 20 mA) Resolution 0.1%; Accuracy ±1% 1 - voltage (0/2 to 10 Vdc) or current (0/4 to 20 mA) < 500 W; Resolution 0.1%; Accuracy ±1% 6 - programmable and isolated Positive or Negative logic; 5 kW; 0 to 5 Vdc = **0**; 15 to 30 Vdc = **1** 2 - Form C and 1 Normally Open (programmable) 24 Vdc @ 8A; 250 Vac @ 8A; 125 Vac @ 0.4A
Auxiliary input	24 Vdc ±10%, 250 mA

Specification	Description
Auxiliary output	10 Vdc ±3%, 10 mA (short-circuit protected) 24 Vdc ±10%, 250 mA (short-circuit protected)
Embedded Protocols	RS-485: APOGEE P1, BACnet MS/TP, Modbus RTU, Metasys N2 Ethernet: BACnet IP, Modbus TCP
Protection features	Under-voltage trip limit Over-voltage trip limit Ground fault protection Input (mains) supervision Motor phase supervision Over-current protection Unit over-temperature protection Motor overload protection Motor stall protection Motor underload protection Short-circuit protection of 10 Vdc and 24 Vdc reference voltages

Table 4. Accessories.

Accessory Description	Frame Size		
	4	5	6
EMC Filter Kit	BT300-EMCKIT-FS4	BT300-EMCKIT-FS5	BT300-EMCKIT-FS6

Accessory Description	Frame Size		
	7	8	9
EMC Filter Kit	BT300-EMCKIT-FS7	N/A	BT300-EMCKIT-FS9

Part Number	Description
BT300-DIAGBD-BTC	Conventional Bypass Diagnostic Board

Table 5. Dimensions in Inches (Millimeters).

Frame Size	Height	Width	Depth
FS4	35 (901)	7 (173)	10 (256)
FS5	44 (1,120)		11 (288)
FS6	55 (1,391)	9 (224)	12 (302)
FS7	59 (1,486)	14 (368)	13 (323)
FS8	48 (1,219)	36 (914)	17 (426)
FS9	72 (1,830)	48 (1,221)	25 (640)

Table 6. Order Worksheet.

Item	Qty.	Designation	Part Number	Description