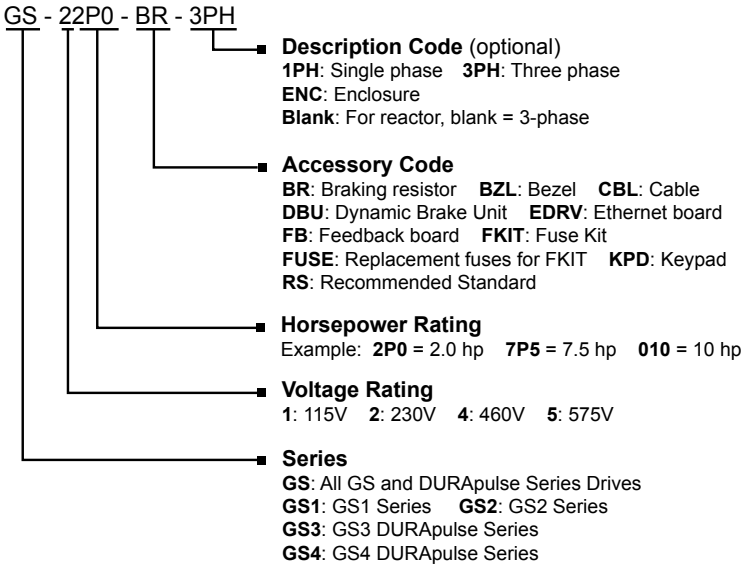
Accessories

Contents of this Appendix

Accessories Part Numbering

With the exception of EMI filters, RF filters, and LR(2) Series line reactors, each accessory part number begins with GS, followed by the AC Drive rating, and then the relevant accessory code. Following the accessory code, you will find a description code when applicable. The diagram below shows the accessory part numbering system.

GS Series-specific Part Number Explanation



Line/Load Reactors

Input line reactors protect the AC drive from transient overvoltage conditions typically caused by large motor load applications, short circuit incidents, utility capacitor switching, etc. Input line reactors also reduce the harmonics associated with AC drives, and are recommended for all installations.

Output line (load) reactors protect the motor insulation against AC drive short circuits and IGBT reflective wave damage, and also allow the motor to run cooler by "smoothing" the motor current waveform. They are recommended for operating "non-inverter-duty" motors, and for any motors where the length of wiring between the AC drive and motor is less than or equal to 100 feet. For AC drive-to-motor wiring distances over 100 feet, use of the VTF series output filter is recommended.

There are two types of AutomationDirect line reactors that can be used with DURApulse GS3 AC Drives:

1) the original GS series reactors (legacy),
2) and the newer LR(2) series reactors.

LR(2) series reactors have differing mounting options depending on the model. Some have universal mounting feet with multiple slots, while others have direct bolt on or optional accessories for mounting. Review the specific mounting for each model.

Line Reactors – LR(2) Series

Selection and Electrical Specifications

Line Reactors – LR(2) Series – Selection & Electrical Specifications								
Part Number	**Dimension Drawing #**	**Rated Amps**	**Imped -ance**	**Watt Loss**	**System Voltage**	**Phase – Use (1)**	**GS3 Drive Model**	**Drive HP**
LR-21P0-1PH (2)	1	8		15.9			**GS3-21P0**	1
LR-22P0-1PH (2)	2	12		24.3	240	1 – In	**GS3-22P0**	2
LR-23P0-1PH (2)	2	17		27.3			**GS3-23P0**	3
LR-21P0 (3)	3	4.6		11	208/240		**GS3-21P0**	1
LR2-21P0 *	17	11.6		64	240			
LR-22P0 (3)	3	7.5		21	208/240		**GS3-22P0**	2
LR2-22P0 *	17	11.6		64	240			
LR-23P0	3	10.6		38			**GS3-23P0**	3
LR-25P0	4	16.7		48			**GS3-25P0**	5
LR-27P5	4	24.2		65			**GS3-27P5**	7.5
LR-2010	5	30.8		96			**GS3-2010**	10
LR-2015	5	46.2		64	208/240		**GS3-2015**	15
LR-2020	5	59.4		85			**GS3-2020**	20
LR-2025	6	74.8		94			**GS3-2025**	25
LR-2030	7	88		135			**GS3-2030**	30
LR-2040	7	114		149			**GS3-2040**	40
LR-2050	8	143		154			**GS3-2050**	50
LR-41P0 (3)	3	2.1		10.4			**GS3-41P0**	1
LR2-41P0 *	16	2.3	3%	25.2				
LR-42P0 (3)	3	3.4		19		3 – I/O	**GS3-42P0**	2
LR2-42P0 *	16	4.2		23.5				
LR-43P0 (3)	3	4.8		23			**GS3-43P0**	3
LR2-43P0 *	16	5		30.6				
LR-45P0 (3)	3	7.6		49			**GS3-45P0**	5
LR2-45P0 *	17	8.2		49				
LR-47P5 (3)	3	11		40			**GS3-47P5**	7.5
LR2-47P5 *	17	11.6		64	480			
LR-4010	3	14		64			**GS3-4010**	10
LR-4015	4	21		65			**GS3-4015**	15
LR-4020	4	27		79			**GS3-4020**	20
LR-4025	5	34		96			**GS3-4025**	25
LR-4030	5	40		105			**GS3-4030**	30
LR-4040	6	52		114			**GS3-4040**	40
LR-4050	9	65		114			**GS3-4050**	50
LR-4060	9	77		169			**GS3-4060**	60
LR-4075	7	96		193			**GS3-4075**	75
LR-4100	10	124		225			**GS3-4100**	100

1) Use (side of drive): In = input only; Out = output only; I/O = input or output.
2) Single-phase line reactors are used only on the input side of GS3-xxxx drives with single-phase input power. Single-phase line reactors should NOT be installed on the output side of AC drives.
3) This reactor is recommended for existing installations only; product will be discontinued after existing stock is depleted.
** Optional mounting accessories are available for these models. See dimensions section for details.*

Line Reactors – LR(2) Series (continued) – Additional Specifications

Line Reactors – LR(2) Series – Additional Specifications						
Part Number	**Wire Range**	**Terminal Torque (lb·in)**	**Fasteners**	**Temperature Range**		**Environment**
				Operating	**Storage**	
LR-21P0-1PH	18–12 AWG	10	#6-32x5/16in flathead screw	-40 – 104 °F [-40 – 40 °C]	-40 – 149 °F [-40 – 65 °C]	NEMA: open IP00 no corrosive gases
LR-22P0-1PH	18–12 AWG	20	#6-32x5/16in flathead screw	-40 – 104 °F [-40 – 40 °C]		
LR-23P0-1PH	18–12 AWG	20	1/4in-28x3/8in set screw	-40 – 104 °F [-40 – 40 °C]		
LR-21P0	18–12 AWG	10	#6-32x5/16in flathead screw	-40 – 104 °F [-40 – 40 °C]		
LR2-21P0 *	22–12 AWG	9	n/a - captive	122°F [50°C] max		
LR-22P0	18–12 AWG	10	n/a - captive	-40 – 104 °F [-40 – 40 °C]		
LR2-22P0 *	22–12 AWG	9	1/4-28 x 3/8 set screw	122°F [50°C] max		
LR-23P0	18–12 AWG	10	#6-32x5/16in flathead screw	-40 – 104 °F [-40 – 40 °C]		
LR-25P0	18–4 AWG	20	1/4in-28x3/8in set screw			
LR-27P5						
LR-2010						
LR-2015						
LR-2020						
LR-2025	18–4 AWG	18–16 AWG: 25 14–6 AWG: 30 4 AWG: 35	n/a - captive			
LR-2030	2/0 – #6AWG (AL or CU)	120	7/16in-20x5/8in set screw			
LR-2040						
LR-2050	250kcmil – #6AWG (AL or CU)	275				
LR-41P0	18–12 AWG	10	#6-32x5/16in flathead screw			
LR2-41P0 *	22–12 AWG	9	n/a - captive	122°F [50°C] max		
LR-42P0	18–12 AWG	10	#6-32x5/16in flathead screw	-40 – 104 °F [-40 – 40 °C]		
LR2-42P0 *	22–12 AWG	9	n/a - captive	122°F [50°C] max		
LR-43P0	18–12 AWG	10	#6-32x5/16in flathead screw	-40 – 104 °F [-40 – 40 °C]		
LR2-43P0 *	22–12 AWG	9	n/a - captive	122°F [50°C] max		
LR-45P0	18–12 AWG	10	#6-32x5/16in flathead screw	-40 – 104 °F [-40 – 40 °C]		
LR2-45P0 *	22–12 AWG	9	n/a - captive	122°F [50°C] max		
LR-47P5	18–12 AWG	10	#6-32x5/16in flathead screw	-40 – 104 °F [-40 – 40 °C]		
LR2-47P5 *	22–12 AWG	9	n/a - captive	122°F [50°C] max		
LR-4010	18–12 AWG	10	#6-32x5/16in flathead screw	-40 – 104 °F [-40 – 40 °C]		
LR-4015	18–4 AWG	20	1/4in-28x3/8in set screw			
LR-4020						
LR-4025						
LR-4030						
LR-4040						
LR-4050	22–4 AWG	18–16 AWG: 25 14–6 AWG: 30 4 AWG: 35	n/a - captive			
LR-4060						
LR-4075	2/0 – #6AWG (AL or CU)	120	7/16in-20x5/8in set screw			
LR-4100	250kcmil – #6AWG (AL or CU)	275	5/8in-18x7/8in set screw			
** Optional mounting accessories are available for these models. See dimensions section for details.*						

Line Reactor Dimensions – LR(2) Series

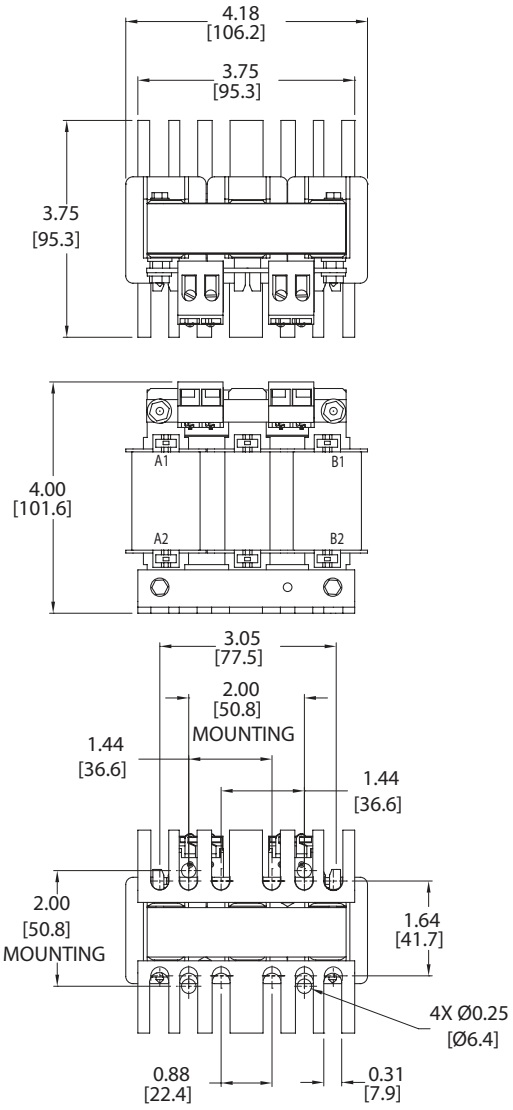
1) LR(2) Dimension Drawing #1

LR-21P0-1PH

Mounting feet with multiple mounting slots allow replacement of most other reactors using existing mounting holes. Use four bolts to mount the LR reactors.

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])



Line Reactor Dimensions – LR(2) Series (continued)

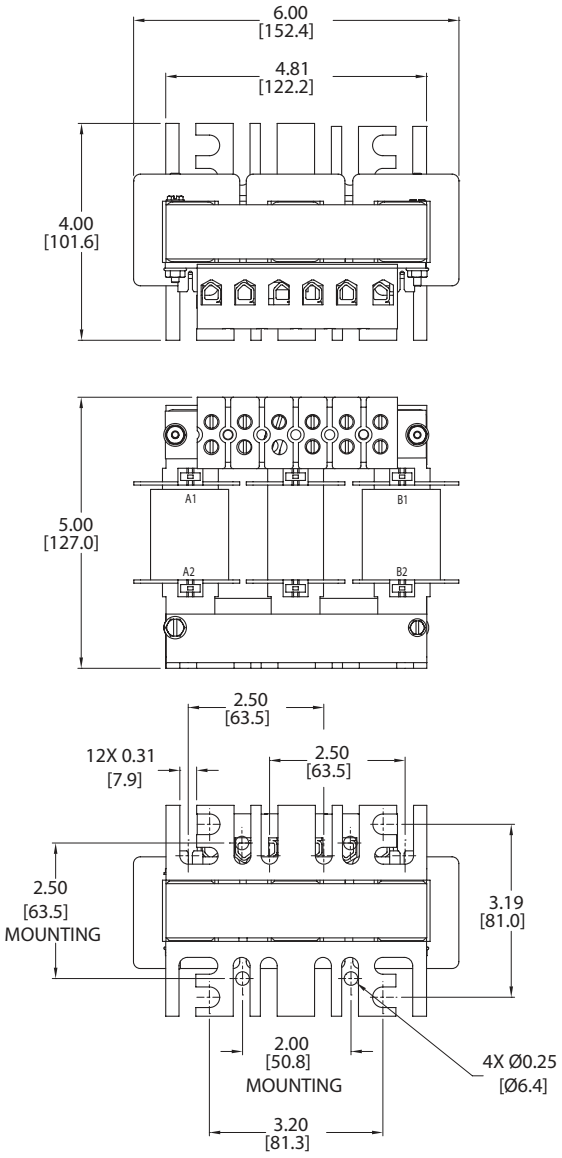
2) LR(2) Dimension Drawing #2

LR-22P0-1PH, LR-23P0-1PH

Mounting feet with multiple mounting slots allow replacement of most other reactors using existing mounting holes. Use four bolts to mount the LR reactors.

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])



Line Reactor Dimensions – LR(2) Series (continued)

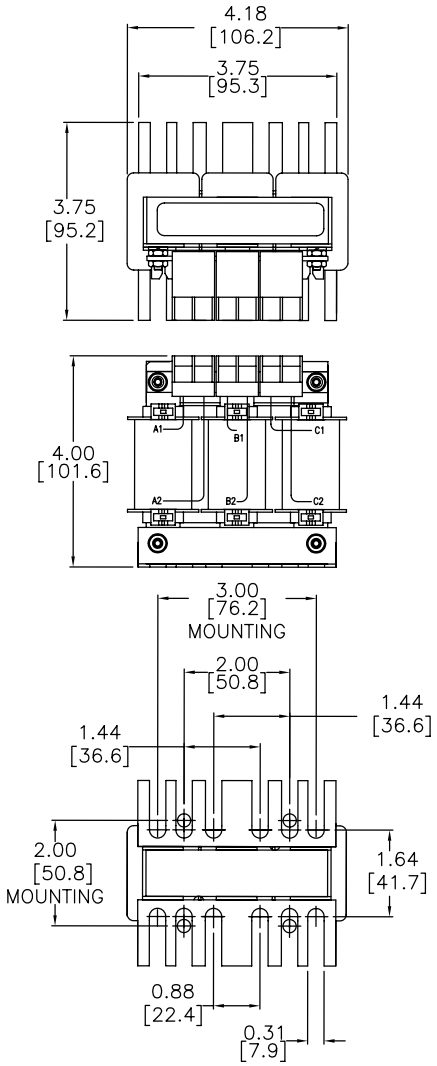
3) LR(2) Dimension Drawing #3

LR-21P0, LR-22P0, LR-23P0, LR-41P0, LR-42P0, LR-43P0, LR-45P0, LR-47P5, LR-4010

Mounting feet with multiple mounting slots allow replacement of most other reactors using existing mounting holes. Use four bolts to mount the LR reactors.

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])



Line Reactor Dimensions – LR(2) Series (continued)

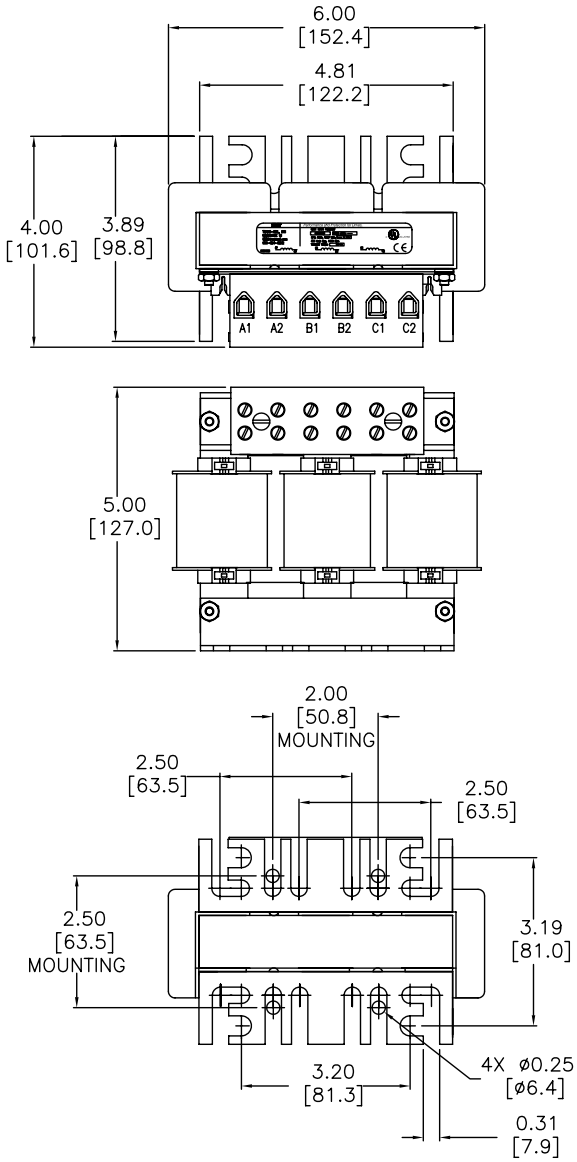
4) LR(2) Dimension Drawing #4

LR-25P0, LR-27P5, LR-4015, LR-4020

Mounting feet with multiple mounting slots allow replacement of most other reactors using existing mounting holes. Use four bolts to mount the LR reactors.

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])



Line Reactor Dimensions – LR(2) Series (continued)

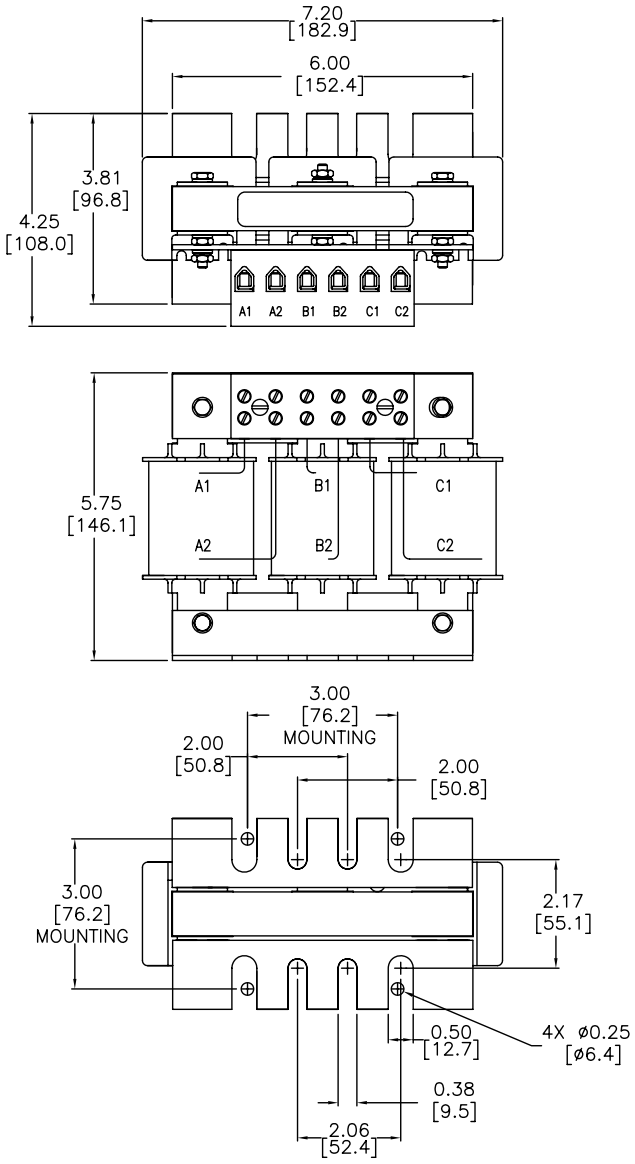
5) LR(2) Dimension Drawing #5

LR-2010, LR-2015, LR-2020, LR-4025, LR-4030

Mounting feet with multiple mounting slots allow replacement of most other reactors using existing mounting holes. Use four bolts to mount the LR reactors.

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])



Line Reactor Dimensions – LR(2) Series (continued)

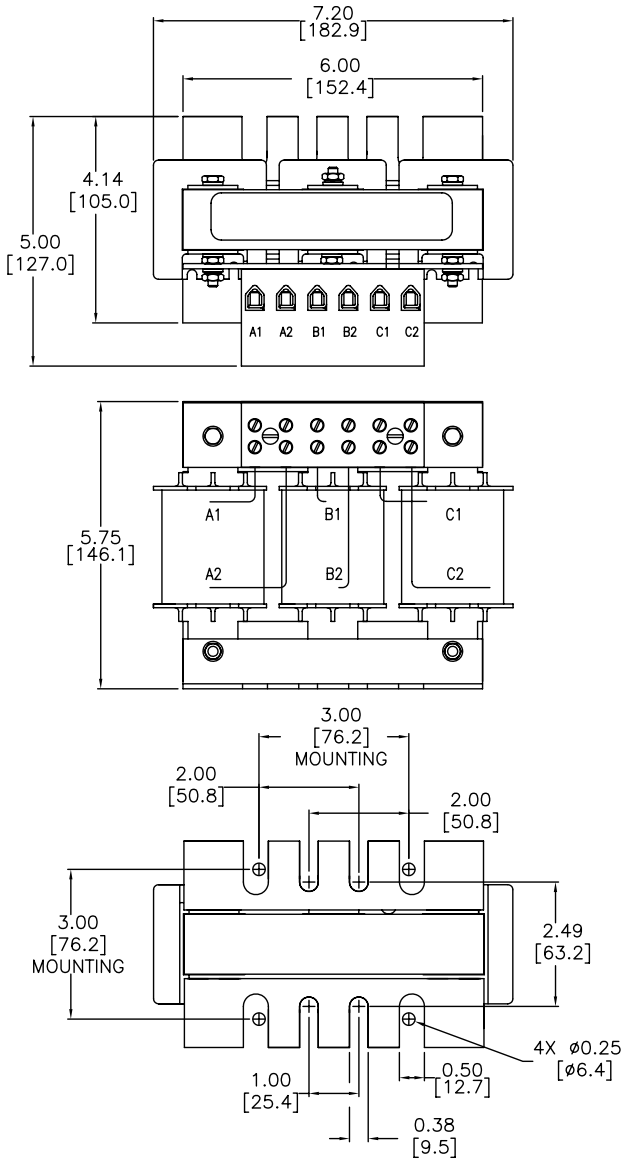
6) LR(2) Dimension Drawing #6

LR-2025, LR-4040

Mounting feet with multiple mounting slots allow replacement of most other reactors using existing mounting holes. Use four bolts to mount the LR reactors.

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])



Line Reactor Dimensions – LR(2) Series (continued)

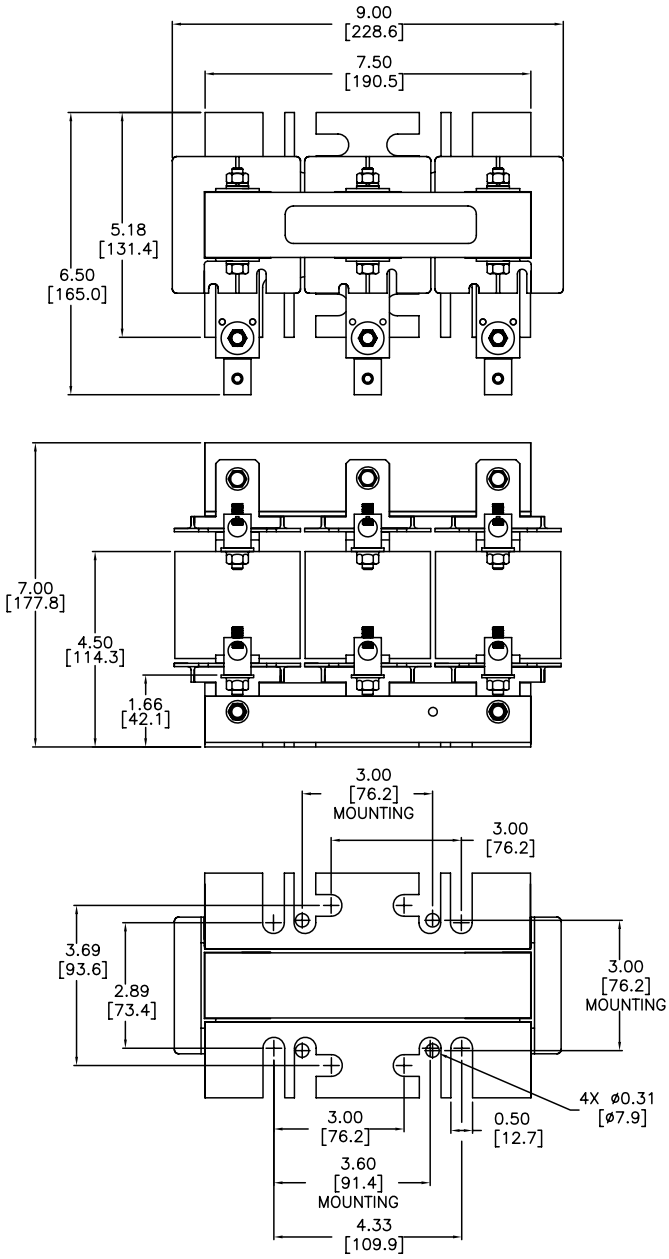
7) LR(2) Dimension Drawing #7

LR-2030, LR-2040, LR-4075

Mounting feet with multiple mounting slots allow replacement of most other reactors using existing mounting holes. Use four bolts to mount the LR reactors.

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])



Line Reactor Dimensions – LR(2) Series (continued)

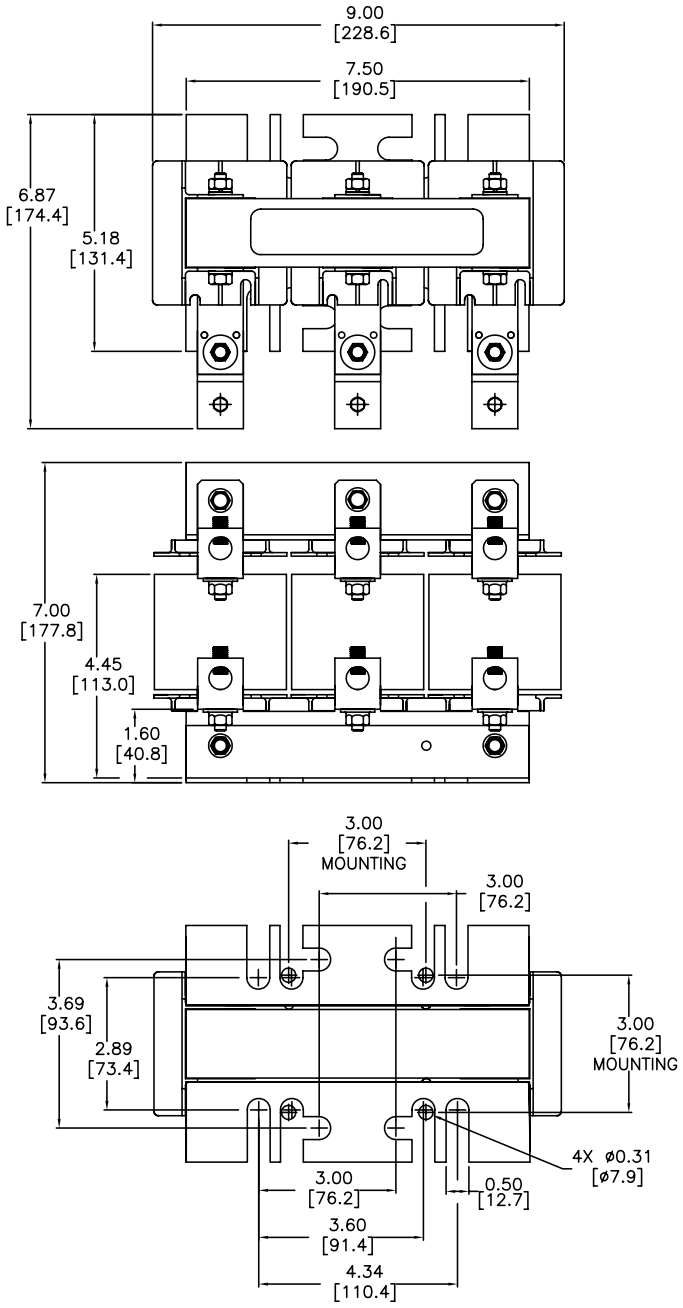
8) LR(2) Dimension Drawing #8

LR-2050

Mounting feet with multiple mounting slots allow replacement of most other reactors using existing mounting holes. Use four bolts to mount the LR reactors.

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])



Line Reactor Dimensions – LR(2) Series (continued)

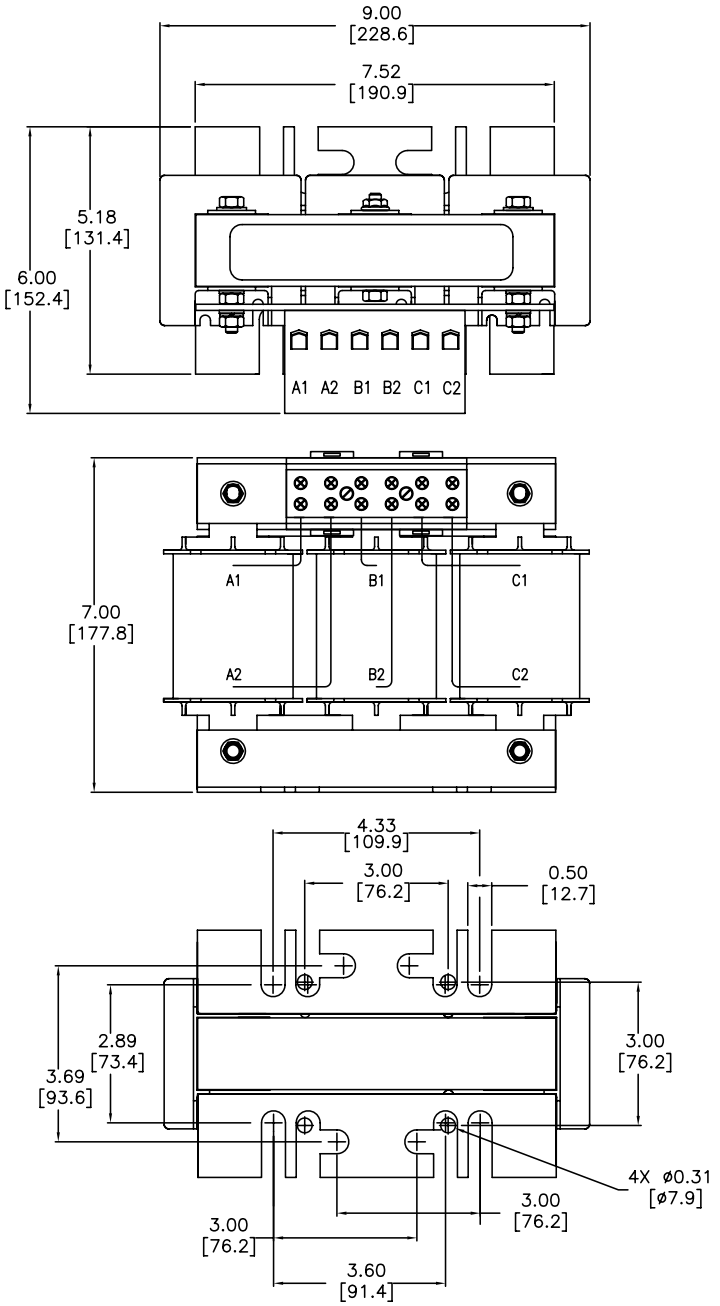
9) LR(2) Dimension Drawing #9

LR-4050, LR-4060

Mounting feet with multiple mounting slots allow replacement of most other reactors using existing mounting holes. Use four bolts to mount the LR reactors.

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])



Line Reactor Dimensions – LR(2) Series (continued)

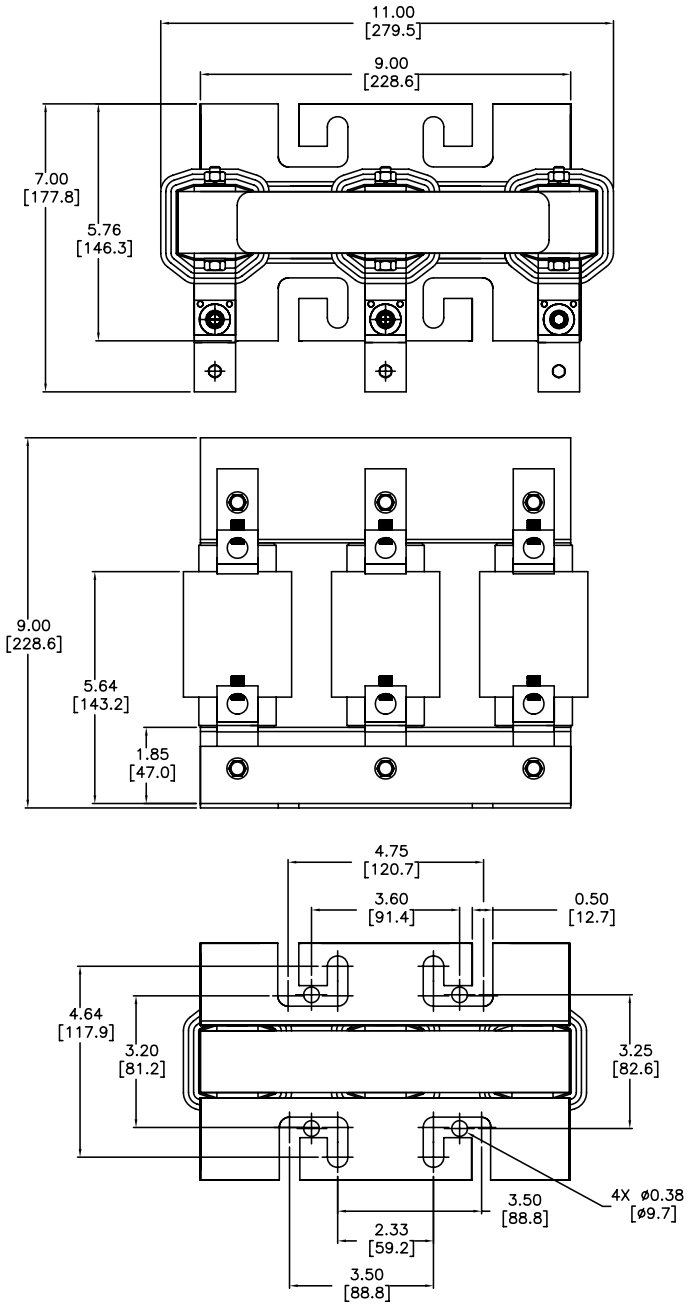
10) LR(2) Dimension Drawing #10

LR-4100

Mounting feet with multiple mounting slots allow replacement of most other reactors using existing mounting holes. Use four bolts to mount the LR reactors.

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])



Line Reactor Dimensions – LR(2) Series (continued)

11) – 15) Dimension Drawings #11 through #15 not applicable for GS3 AC drives

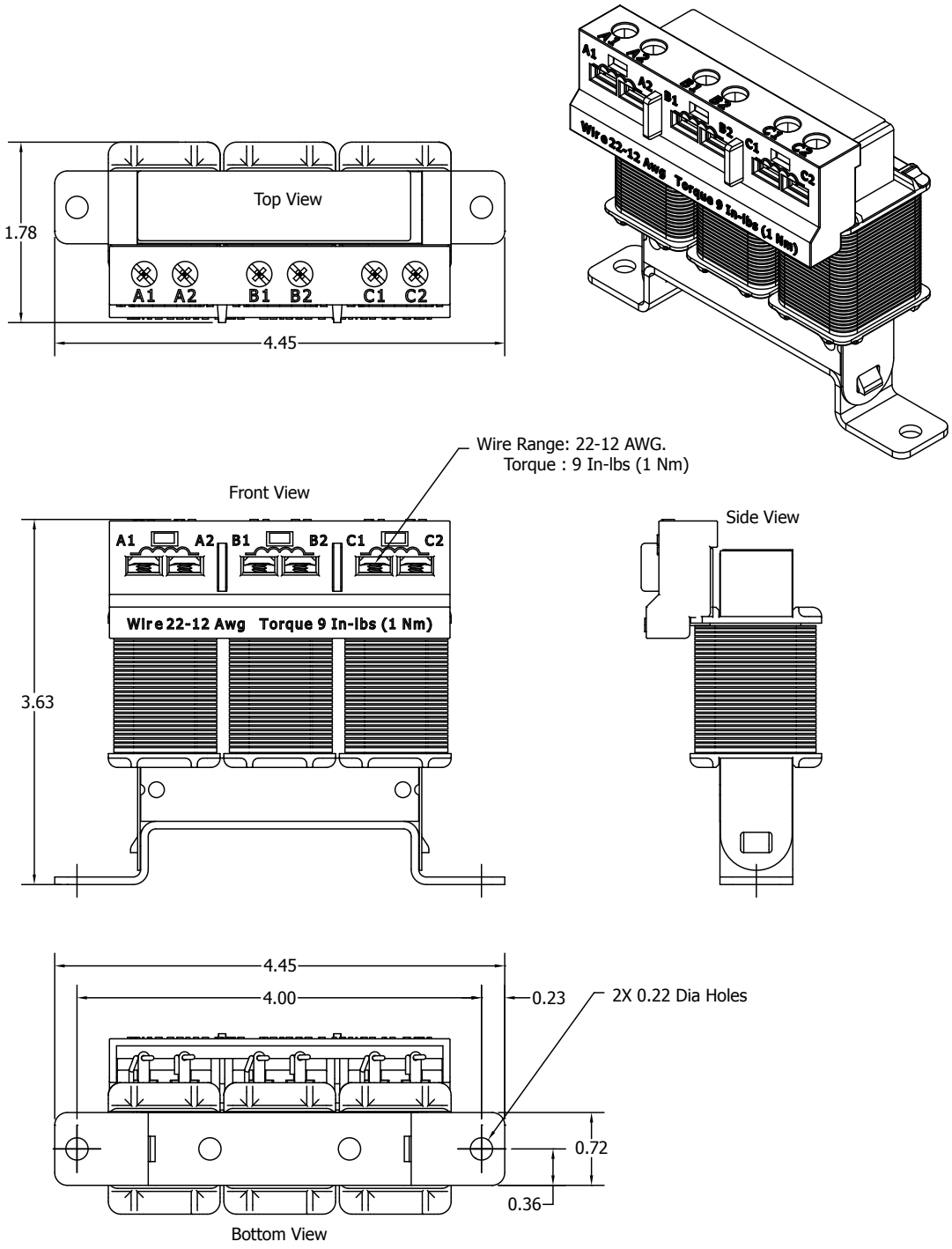
16) LR(2) Dimension Drawing #16

LR2-41P0, LR2-42P0, LR2-43P0

Adapter Plate Kits AP1 and AP2 allow for universal panel mounting with these models. DIN Rail mount kit DR1 allows DIN rail mounting with these models. See accessory dimensions below.

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches)



(drawings continued next page for optional mounting accessories)

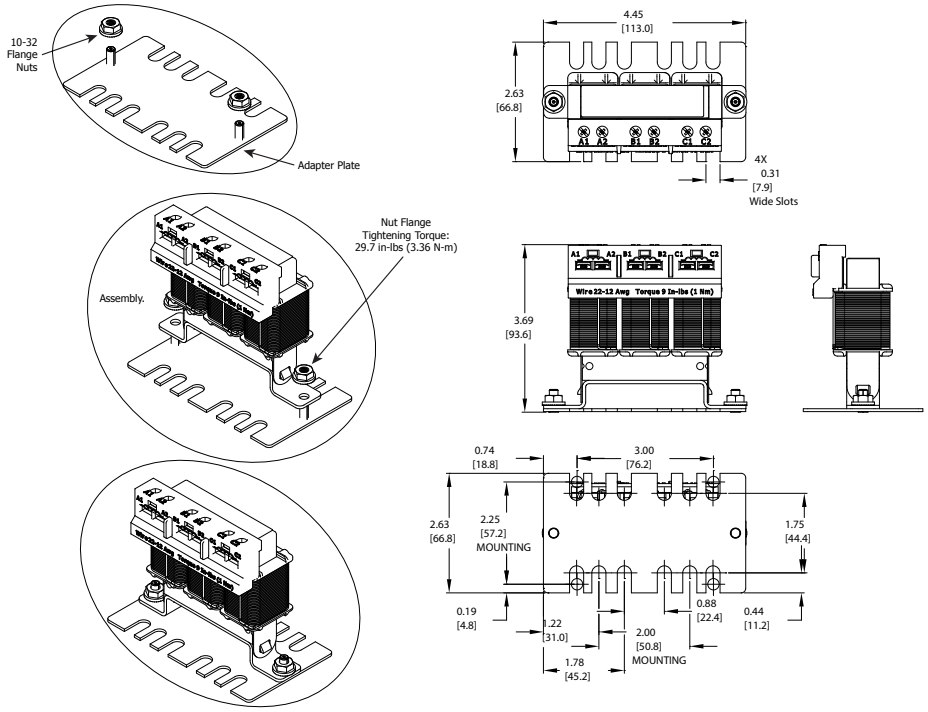
Line Reactor Dimensions – LR(2) Series (continued)

16) LR(2) Dimension Drawing #16 (continued from previous page)

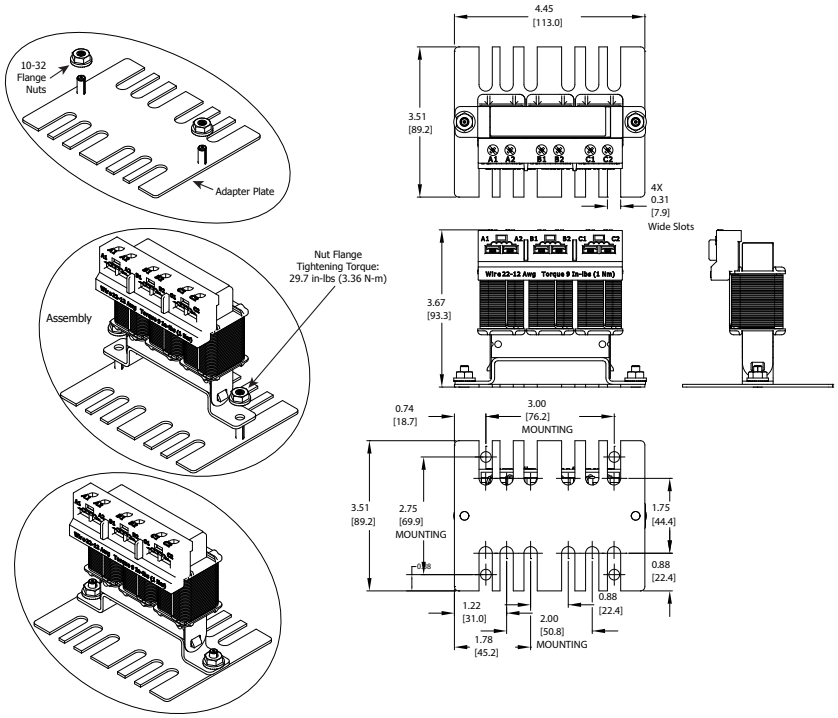
See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])

16a) LR2-AP1 Adapter Plate for Universal Mounting



16b) LR2-AP2 Adapter Plate for Universal Mounting



(drawings continued next page for optional mounting accessories)

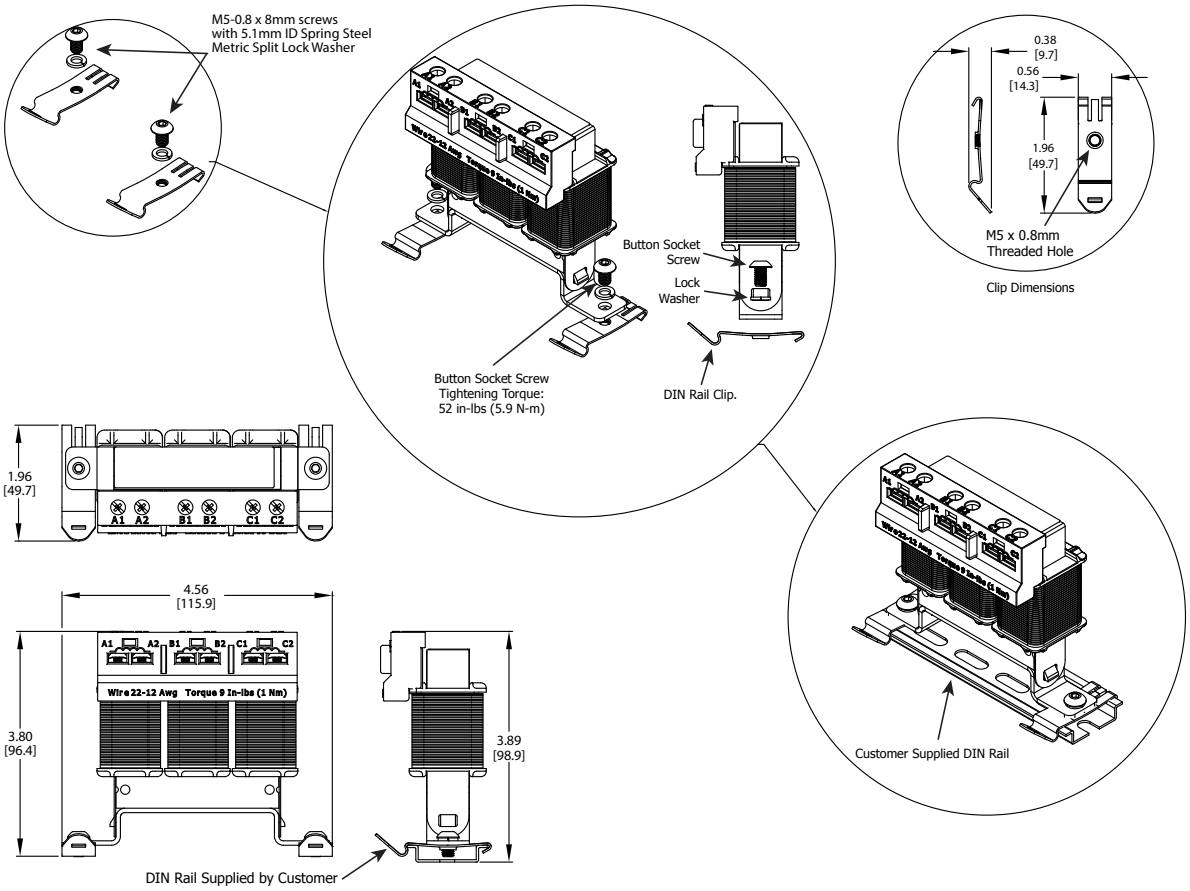
Line Reactor Dimensions – LR(2) Series (continued)

16) LR(2) Dimension Drawing #16 (continued from previous page)

See our website: www.AutomationDirect.com for complete engineering drawings.

16c) LR2-DR1 Hardware Kit for DIN Rail Mounting

(Units = inches [mm])



Line Reactor Dimensions – LR(2) Series (continued)

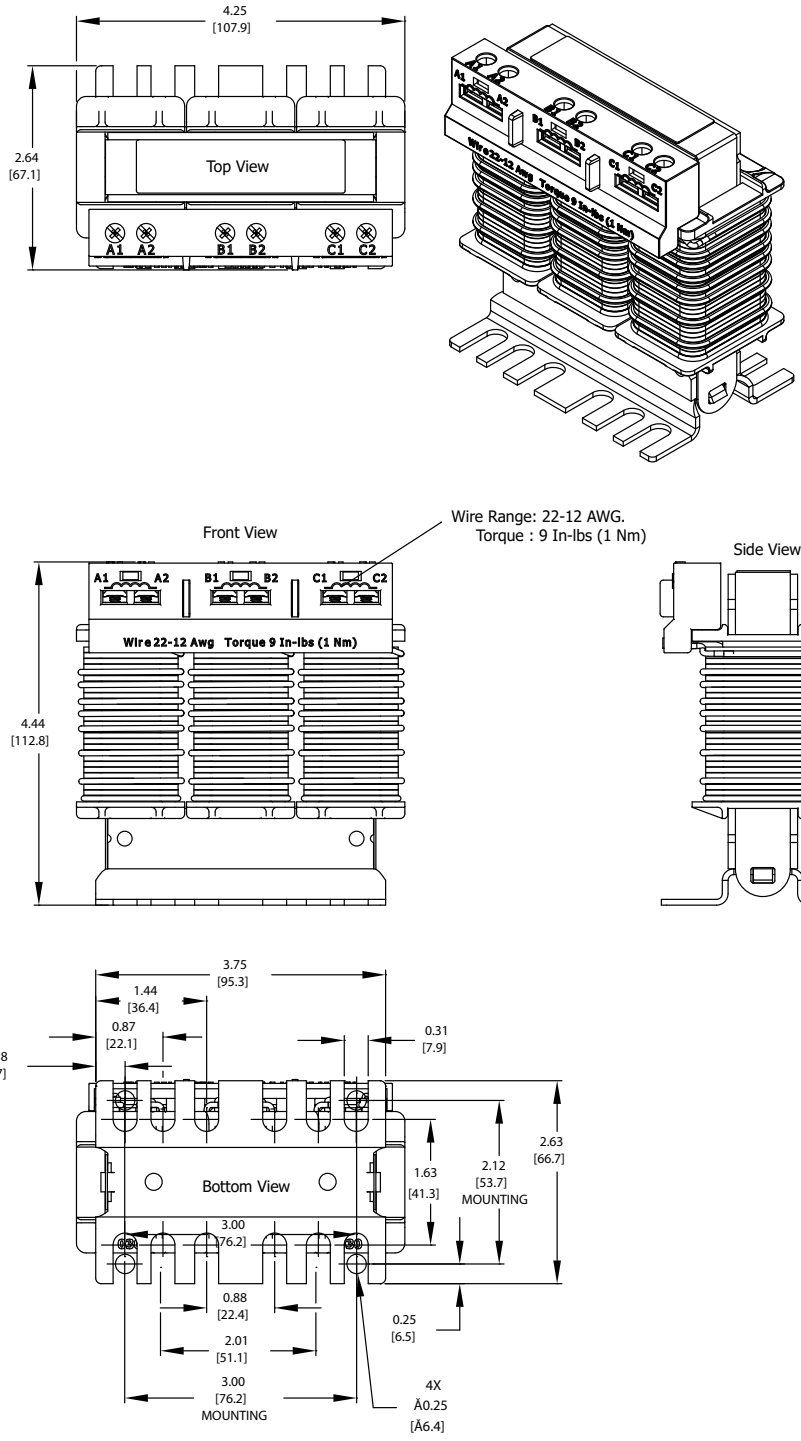
17) LR(2) Dimension Drawings #17

LR2-21P0, LR2-22P0, LR2-45P0, LR2-47P5

Mounting feet with multiple mounting slots allow replacement of most other reactors using existing mounting holes. Use four bolts to mount the LR reactors. For Din Rail mounting, use accessory LR2-DR2.

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])



(drawings continued next page for optional mounting accessory)

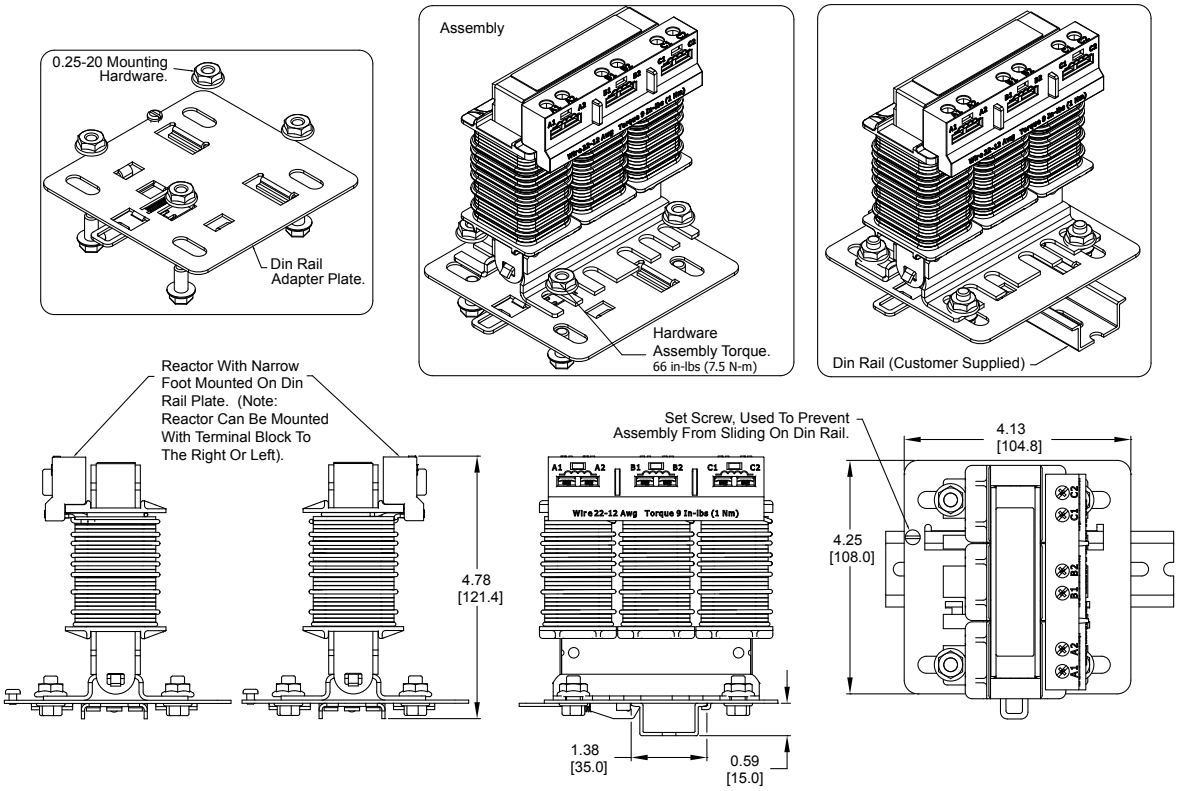
Line Reactor Dimensions – LR(2) Series (continued)

17) LR(2) Dimension Drawings #17 (continued from previous page)

17a) LR2-DR2 Hardware Kit for DIN Rail Mounting

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])

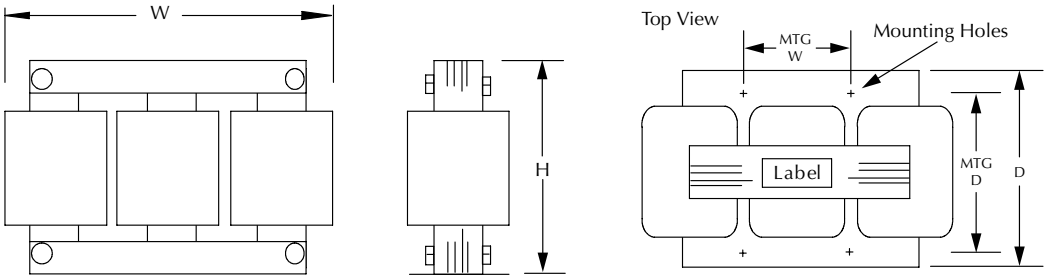


Line Reactors – Legacy GS Series (do not use for new installations)

Line Reactors – GS Series					
230 VOLT Class – Three Phase					
Part Number	***Rated HP***	***Rated Amps***	***Impedance***	***Inductance***	***Watts Loss***
GS-21P0-LR-3PH	1	5	3%	3.00 mH	7
GS-22P0-LR-3PH	2	7	3%	1.50 mH	11
GS-23P0-LR-3PH	3	11	3%	1.30 mH	23
GS-25P0-LR	5	17	3%	0.80 mH	19
GS-27P5-LR	7.5	25	3%	0.50 mH	23
GS-2010-LR	10	33	3%	0.40 mH	36
GS-2015-LR	15	49	3%	0.30 mH	33
GS-2020-LR	20	65	3%	0.25 mH	39
GS-2025-LR	25	75	3%	0.20 mH	88
GS-2030-LR	30	90	3%	0.20 mH	88
GS-2040-LR	40	120	3%	0.10 mH	95
GS-2050-LR	50	145	3%	0.10 mH	95

Line Reactors – GS Series					
460 VOLT Class – Three Phase					
Part Number	***Rated HP***	***Rated Amps***	***Impedance***	***Inductance***	***Watts Loss***
GS-41P0-LR	1	2	3%	12.0 mH	7
GS-42P0-LR	2	4	3%	6.50 mH	13
GS-43P0-LR	3	8	3%	5.00 mH	31
GS-45P0-LR	5	8	3%	3.00 mH	25
GS-47P5-LR	7.5	12	3%	2.50 mH	26
GS-4010-LR	10	18	3%	1.50 mH	29
GS-4015-LR	15	24	3%	1.20 mH	44
GS-4020-LR	22	32	3%	0.80 mH	51
GS-4025-LR	25	38	3%	0.80 mH	51
GS-4030-LR	30	45	3%	0.70 mH	64
GS-4040-LR	40	60	3%	0.50 mH	75
GS-4050-LR	50	73	3%	0.40 mH	138
GS-4060-LR	60	91	3%	0.40 mH	138
GS-4075-LR	75	105	3%	0.30 mH	123
GS-4100-LR	100	145	3%	0.20 mH	115

Line Reactor Dimensions – Legacy GS Series (not for new installations)



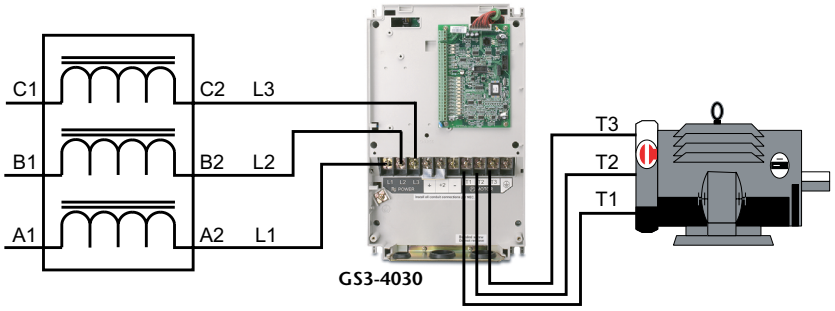
AC Line Reactor Dimensions

AC Line Reactor Dimensions – GS Series (inches)							
Part Number	***H***	***W***	***D***	***Mtg D***	***Mtg W***	***Mtg Slot Hole Size***	***Weight (lb)***
GS-21P0-LR-1PH	3.40	4.40	2.83	1.77	1.44	0.28 x 0.63	2.80
GS-21P0-LR-3PH	3.40	4.40	2.83	1.77	1.44	0.28 x 0.63	2.30
GS-22P0-LR-1PH	4.80	6.00	3.30	2.09	2.00	0.28 x 0.63	7.10
GS-22P0-LR-3PH	3.40	4.40	2.83	1.77	2.00	0.28 x 0.63	2.80
GS-23P0-LR-1PH	4.80	6.00	3.30	2.09	2.00	0.28 x 0.63	7.50
GS-23P0-LR-3PH	3.40	4.40	2.83	1.77	2.00	0.28 x 0.63	2.90
GS-25P0-LR	4.80	6.00	3.30	2.09	2.00	0.28 x 0.63	7.10
GS-27P5-LR	5.70	6.00	3.09	2.09	3.00	0.28 x 0.63	7.00
GS-2010-LR	5.70	6.00	3.34	2.34	3.00	0.28 x 0.63	9.00
GS-2015-LR	5.70	6.00	3.84	2.84	3.00	0.28 x 0.63	13..0
GS-2020-LR	5.70	6.00	3.84	2.84	3.00	0.28 x 0.63	12.0
GS-2025-LR	6.88	8.50	4.37	3.12	3.60	0.44 x 1.00	26.0
GS-2030-LR	6.88	8.50	4.37	3.12	3.60	0.44 x 1.00	26.0
GS-2040-LR	6.88	8.50	4.37	3.12	3.00	0.44 x 1.00	27.0
GS-2050-LR	6.88	8.50	4.37	3.12	3.00	0.44 x 1.00	27.0
GS-41P0-LR	3.40	4.40	2.83	1.77	1.44	0.28 x 0.63	2.30
GS-42P0-LR	3.40	4.40	2.83	1.77	1.44	0.28 x 0.63	2.80
GS-43P0-LR	3.40	4.40	3.39	2.39	2.00	0.28 x 0.63	4.30
GS-45P0-LR	3.40	4.40	2.83	1.77	2.00	0.28 x 0.63	3.10
GS-47P5-LR	4.80	6.00	3.30	2.09	2.00	0.28 x 0.63	7.50
GS-4010-LR	4.80	6.30	3.55	2.34	2.00	0.28 x 0.63	9.10
GS-4015-LR	5.70	6.00	3.34	2.34	3.00	0.28 x 0.63	10.0
GS-4020-LR	5.61	6.90	3.95	2.75	3.00	0.38 x 0.63	17.0
GS-4025-LR	5.61	6.90	3.95	2.75	3.00	0.38 x 0.63	17.0
GS-4030-LR	5.61	6.90	4.45	3.25	3.00	0.38 x 0.63	22.0
GS-4040-LR	6.88	8.50	4.37	3.12	3.00	0.44 x 1.00	26.0
GS-4050-LR	6.88	8.50	4.87	3.62	3.60	0.44 x 1.00	36.0
GS-4060-LR	6.88	8.50	4.87	3.62	3.60	0.44 x 1.00	36.0
GS-4075-LR	8.29	10.50	5.35	3.73	3.60	0.44 x 1.00	52.0
GS-4100-LR	8.29	10.50	5.35	3.73	3.60	0.44 x 1.00	41.0

Line Reactor Applications and Wiring Connections

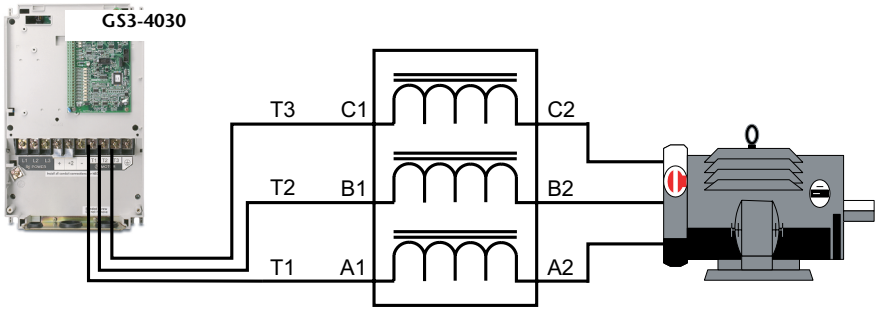
Input Side of AC Drive

When installed on the input side of the AC Drive, line reactors will reduce line notching, limit current and voltage spikes and surges from the incoming line, and reduce the available short circuit current. The line reactors will also reduce harmonic distortion from the AC Drive onto the line. Units are installed in front of the AC Drive as shown.



Output Side of AC Drive

When installed on the output side of the AC Drive, line (load) reactors protect the AC Drive from short circuits at the load. Voltage and current waveforms from the AC Drive are enhanced, reducing motor overheating and noise emissions.

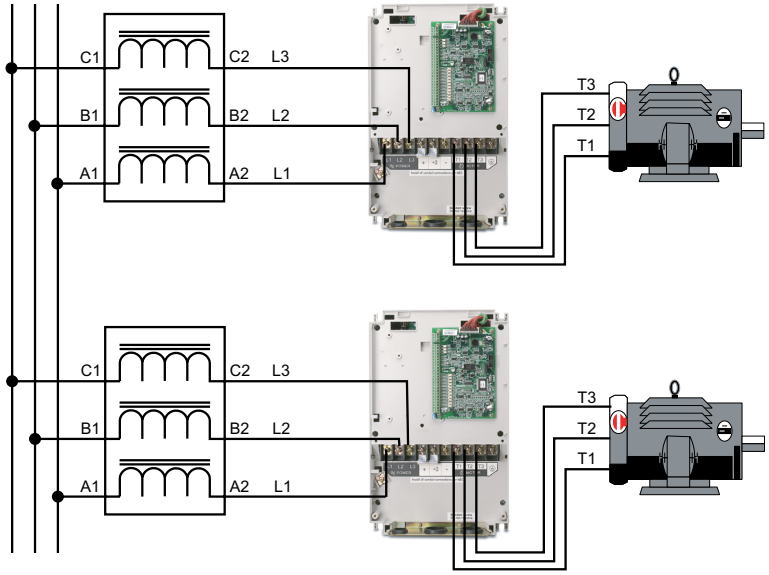


Single phase line reactors should NOT be installed on the output side of an AC Drive. Use only three-phase reactors on drive outputs, and only for three-phase motors.

If installing a line reactor on the output side of the drive, especially with motor lead lengths in excess of 75 feet, lower the drive PWM output carrier frequency to 4kHz in order to protect the line reactor from excess heating and possible damage.

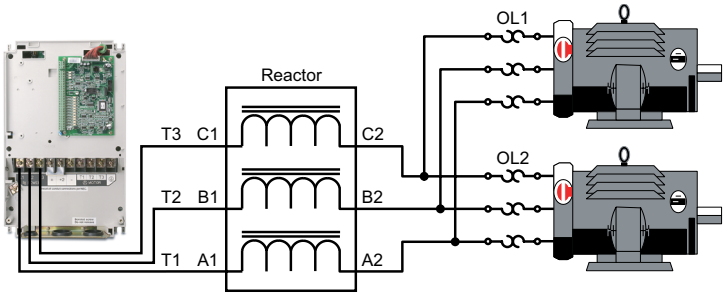
Multiple AC Drives

Individual line reactors are recommended when installing multiple AC Drives on the same power line. Individual line reactors eliminate cross-talk between multiple AC Drives and provide isolated protection for each AC Drive for its own specific load.



Multiple Motors

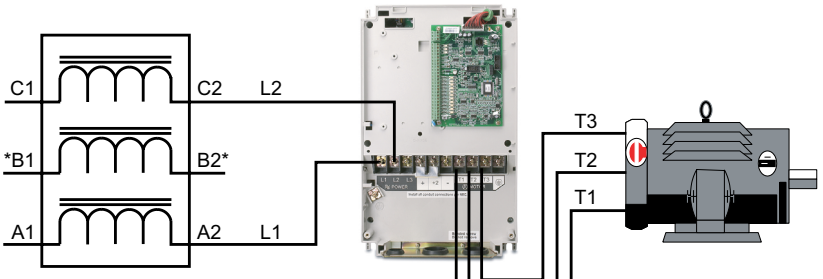
A single output (load) reactor can be used for multiple motors on the same AC Drive, but only if the motors operate simultaneously. Size the reactor based upon the total horsepower of all the motors, and select a reactor with a current rating greater than the sum of the motor full-load currents. Overload relays are recommended for use in multi-motor applications.



A single reactor should be used with multiple motors ONLY when the motors will operate simultaneously from a single AC drive. OVERLOAD RELAYS are recommended for use in multiple motor applications.

Single-Phase Applications

Some of the line reactors are listed for use with single-phase input power. Follow the connection diagram shown below. Make sure that terminals B1 and B2, if present, are properly insulated before any connections are made.



*GS series 1-phase reactors include a B-phase winding.
*LR series 1-phase reactors do not include a B-phase winding.

Warning: Ensure that you properly insulate terminals B1 and B2 before making any connections to single-phase power.

Drive Output Filters

Extend the life of your motors and cables by reducing the harmful effects of voltage spikes due to voltage wave reflection. Voltage wave reflection is a function of the voltage rise time (dV/dT) and the length of the motor cables.

AutomationDirect VTF series drive output filters protect motors and cables by combining a patented dampening circuit with a low pass filter to increase the voltage rise time (dT out of dV/dT), thereby preventing voltage spikes from exceeding 1,000V.

- *Protect cable runs and reduce motor heating, noise, and vibration.*
- *Prevent motor failure with protection against motor insulation breakdown.*
- *Reduce Common Mode by a minimum of 30%.*
- *Improve system productivity and increase bearing life and up-time.*
- *Protect long lead lengths up to 1,000 feet.*

NOTE: Install Drive Output Filters on the output side of the AC Drive only. The Output Filters are to provide a dV/dT solution for leads up to 1,000 ft. For lengths in excess of 1000 feet, please consult technical support.

VTF Part Number Explanation

VTF	–	xxx	–	xxx

HP @ corresponding Voltage:
A = 0.25
B = 0.33
C = 0.5
D = 0.75
E = 1
F = 1.5
G = 2
H = 3
J = 5
K = 7.5
L = 10
M = 15
N = 20
P = 25
Q = 30
R = 40
S = 50
T = 60
U = 75
V = 100
W = 125

VOLTAGE:
2 = 220/230/240 VAC
4 = 440/460/480 VAC
6 = 575/600 VAC

SERIES NAME:
VTF = Voltage Time Filter

For example:
Model VTF-246-SVW is a
Voltage Time Filter for a
230V/50hp, or 460V/100hp, or 575V/125hp AC Drive

VTF Specifications

Electrical Specifications & Drive Compatibility

VTF Series Drive Output Filters – Electrical Specifications & Drive Compatibility								
Part Number	Rated HP			Max Rated Amps	Max Rated Voltage	Phases	GS3 Drive *		Drive HP
	230V	460V	575V				w 1Ø Input	w 3Ø Input	
VTF-46-DE	–	0.75	1	2	600	3	–	–	–
VTF-246-CFG	0.5	1.5	2	3			–	GS3-41P0	1
VTF-246-DGH	0.75	2	3	4			–	GS3-42P0	2
VTF-24-FH	1.5	3	–	6			GS3-21P0 –	GS3-21P0 GS3-43P0	1 3
VTF-246-GJJ	2	5	5	8			GS3-22P0	GS3-22P0	2
VTF-246-HKL	3	7.5	10	12			GS3-23P0 –	GS3-23P0 GS3-45P0	3 5
VTF-24-JL	5	10	–	16			–	GS3-47P5	7.5
VTF-46-LM	–	10	15	18			–	GS3-25P0 GS3-4010	5 10
VTF-4-M	–	15	–	21			–	GS3-4015	15
VTF-246-KMN	7.5	15	20	25			–	GS3-27P5	7.5
VTF-46-NP	–	20	25	27			–	–	–
VTF-246-LPQ	10	25	30	35			–	GS3-2010 GS3-4020	10 20
VTF-246-MQR	15	30	40	45			–	GS3-4025 GS3-4030	25 30
VTF-246-NRS	20	40	50	55			–	GS3-2015 GS3-4040	15 40
VTF-246-PSU	30	60	75	80			–	GS3-2020 GS3-2025 GS3-4050 GS3-4060	20 25 50 60
VTF-246-RUV	40	75	100	110			–	GS3-2030 GS3-4075	30 75
VTF-246-SVW	50	100	125	130			–	GS3-2040	40
* VTF drive output filters are not available for GS3-2050 & GS3-4100.									

Electrical Specifications & Drive Compatibility

VTF Series Drive Output Filters – Additional Specifications					
Part Number	Wire Range (AWG)	Terminal Torque (lb·in)	Fasteners	Weight (lb)	Dimension Drawing #
VTF-46-DE	12-14	10	6/40 x 5/16 flathead	8	1
VTF-246-CFG					
VTF-246-DGH					
VTF-24-FH					
VTF-246-GJJ					
VTF-246-HKL					
VTF-24-JL	4-12	20	1/4-28 x 3/8	12	2
VTF-46-LM	4-10				
VTF-4-M					
VTF-246-KMN	4-8				
VTF-46-NP				14	
VTF-246-LPQ	6-8		n/a (captive)	17	3
VTF-246-MQR	6				
VTF-246-NRS	1-4				
VTF-246-PSU	1-3	35		23	4
VTF-246-RUV	2/0 - 1/0	50	7/16-20 x 9/16	40	5
VTF-246-SVW	2/0			55	6

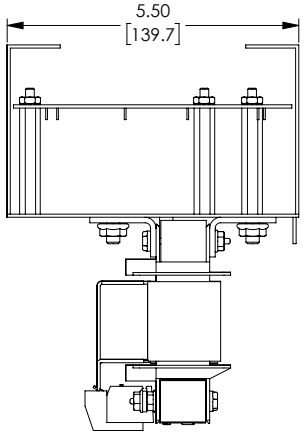
Output Filter Dimensions – VTF Series

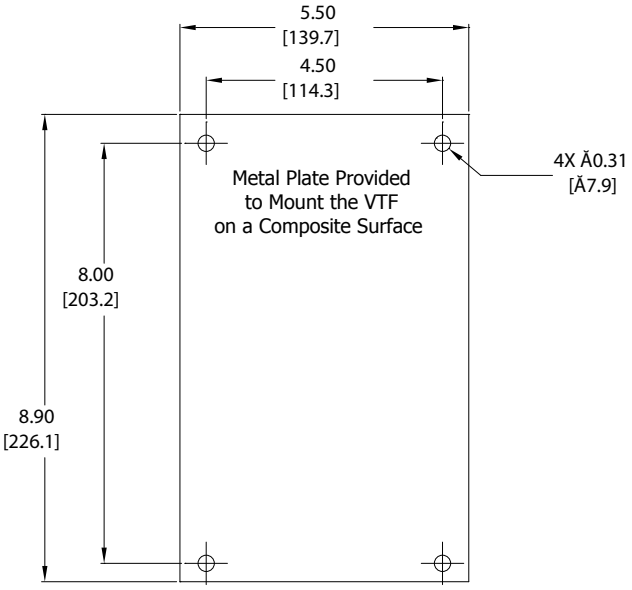
1) VTF Filters Dimension Drawing #1

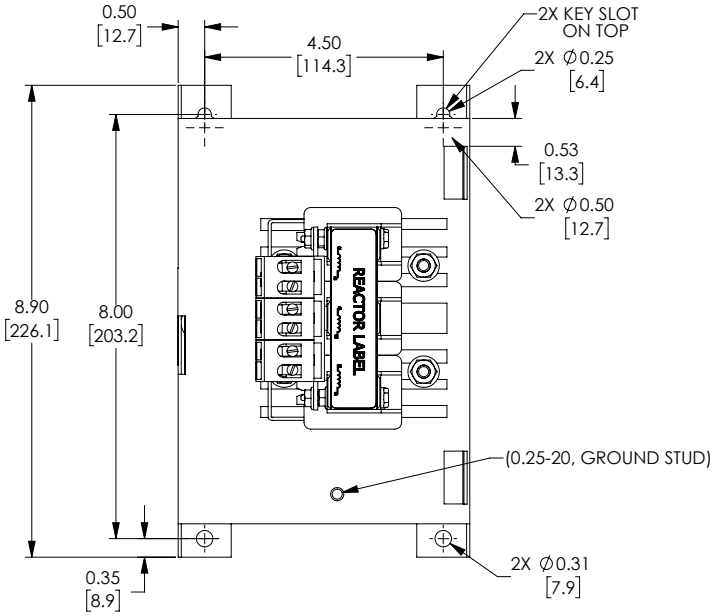
VTF-46-DE, VTF-246-CFG, VTF-246-DGH, VTF-24-FH, VTF-246-GJJ, VTF-246-HKL

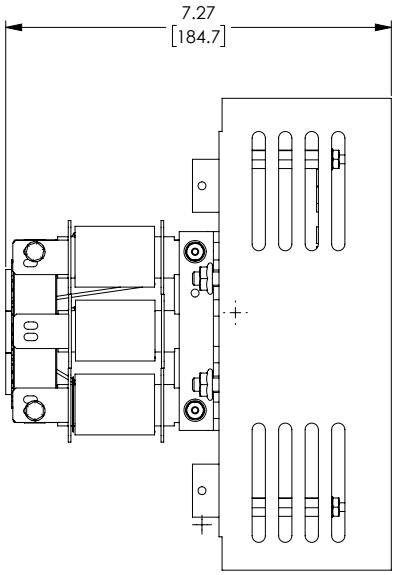
See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])







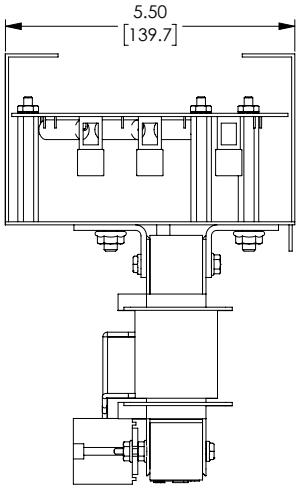


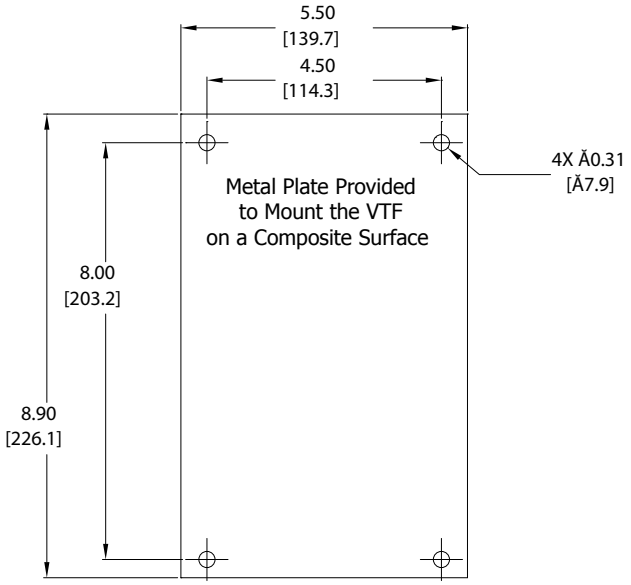
2) VTF Filters Dimension Drawing #2

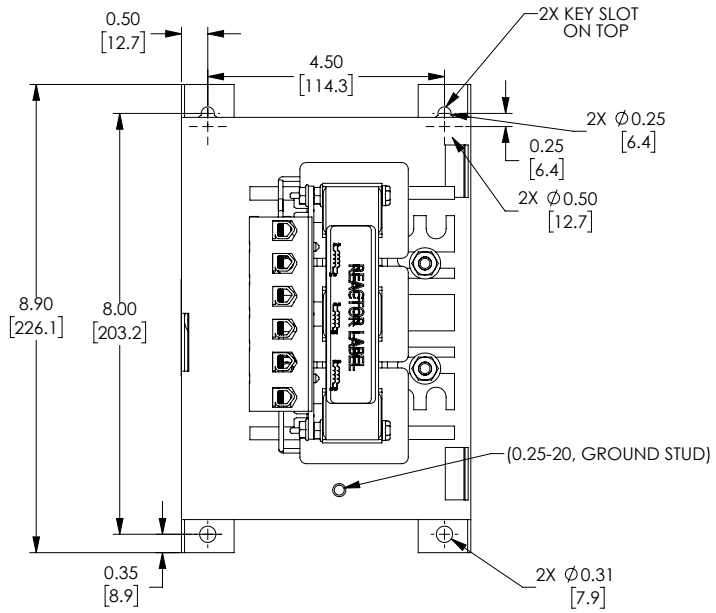
VTF-24-JL, VTF-246-KMN, VTF-46-LM, VTF-4-M, VTF-46-NP

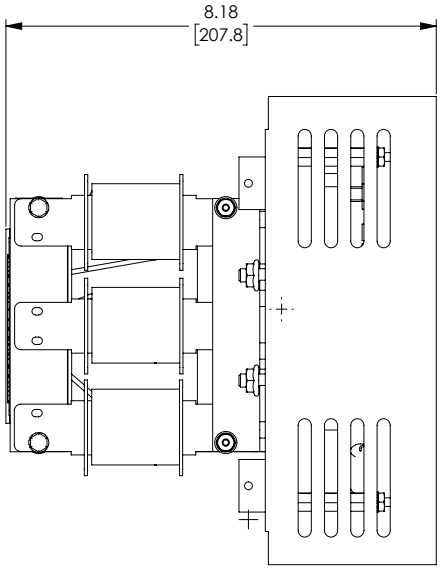
See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])







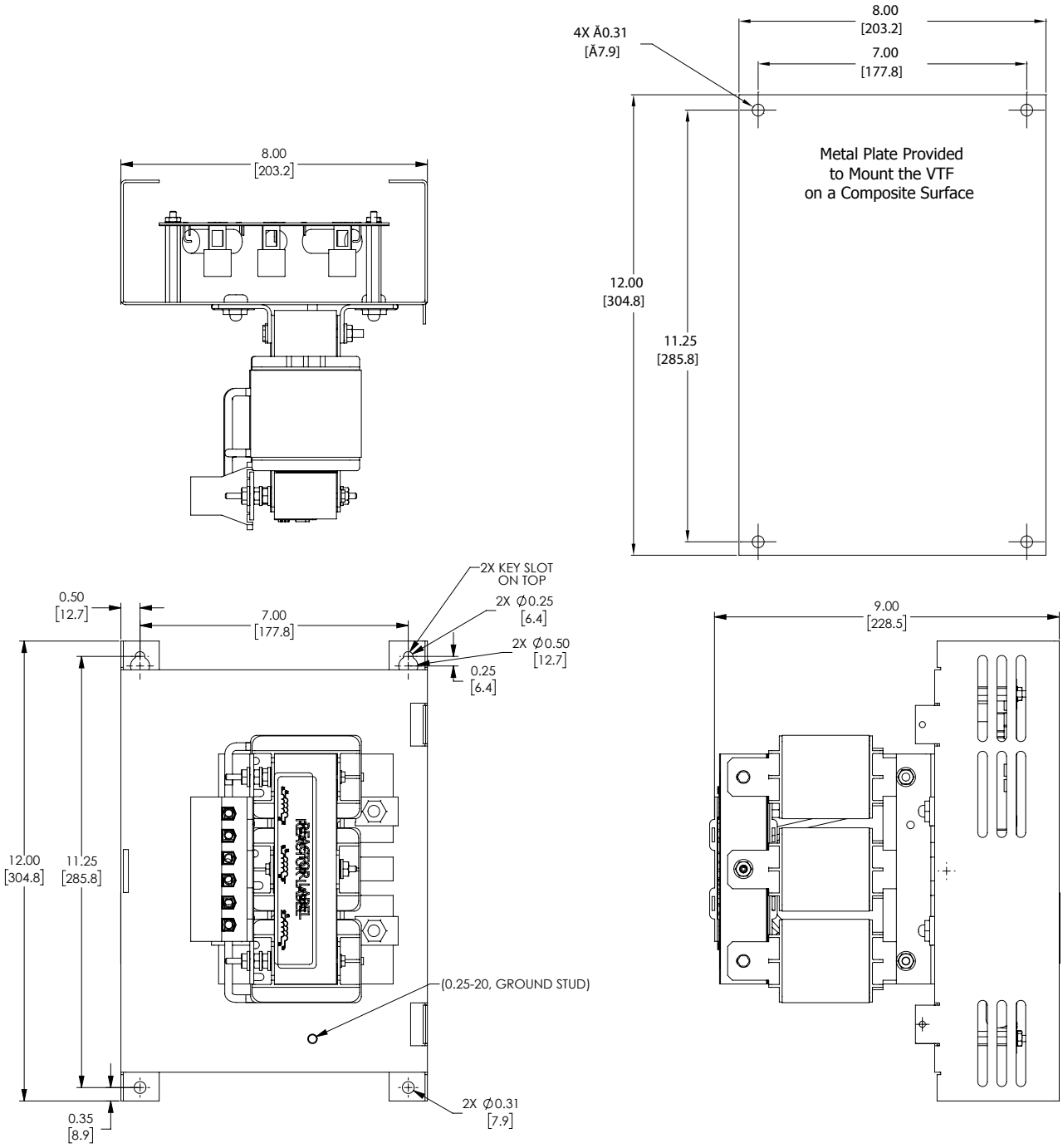


3) VTF Filters Dimension Drawing #3

VTF-246-LPQ, VTF-246-MQR, VTF-246-NRS

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])

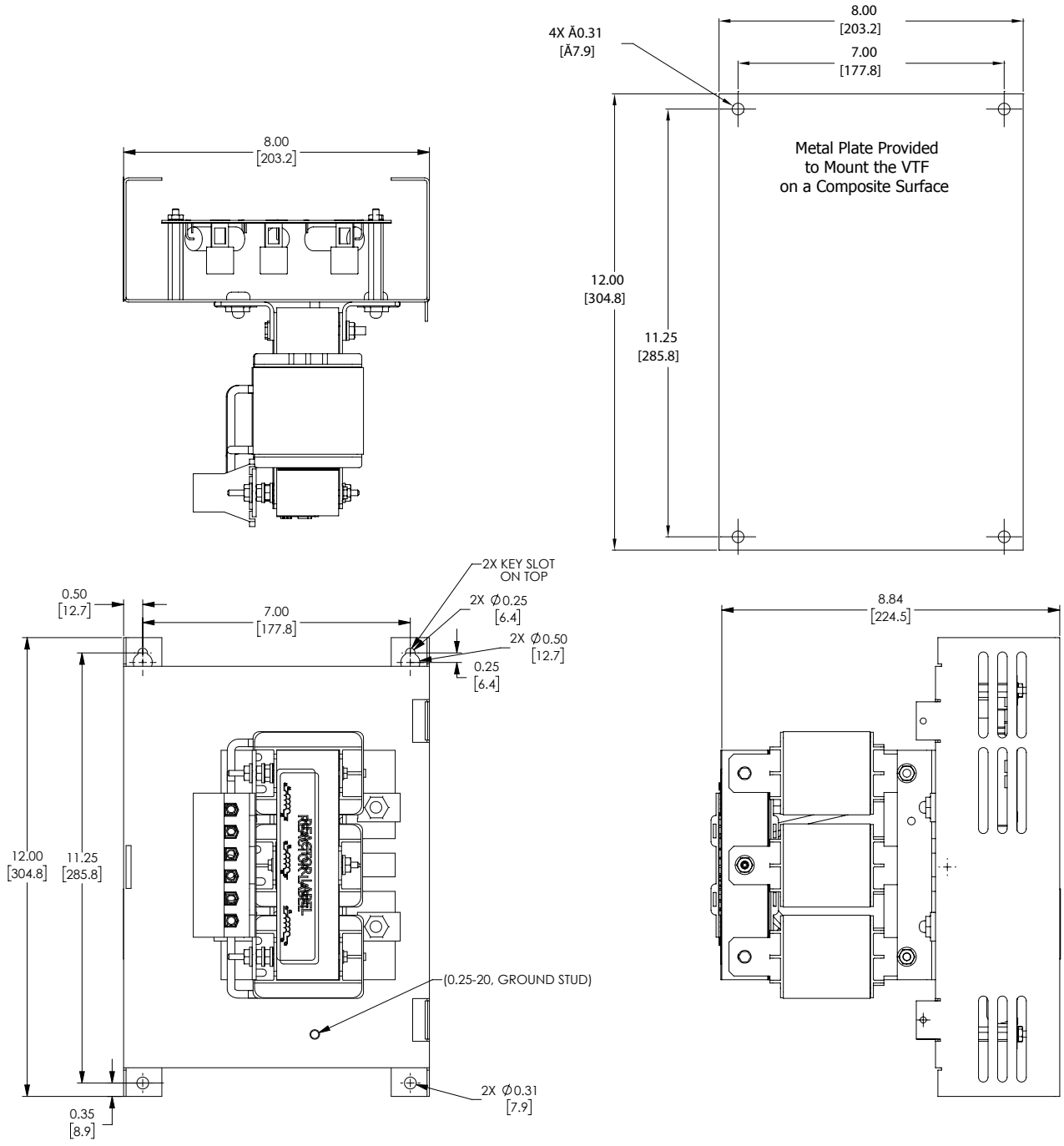


4) VTF Filters Dimension Drawing #4

VTF-246-PSU

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])

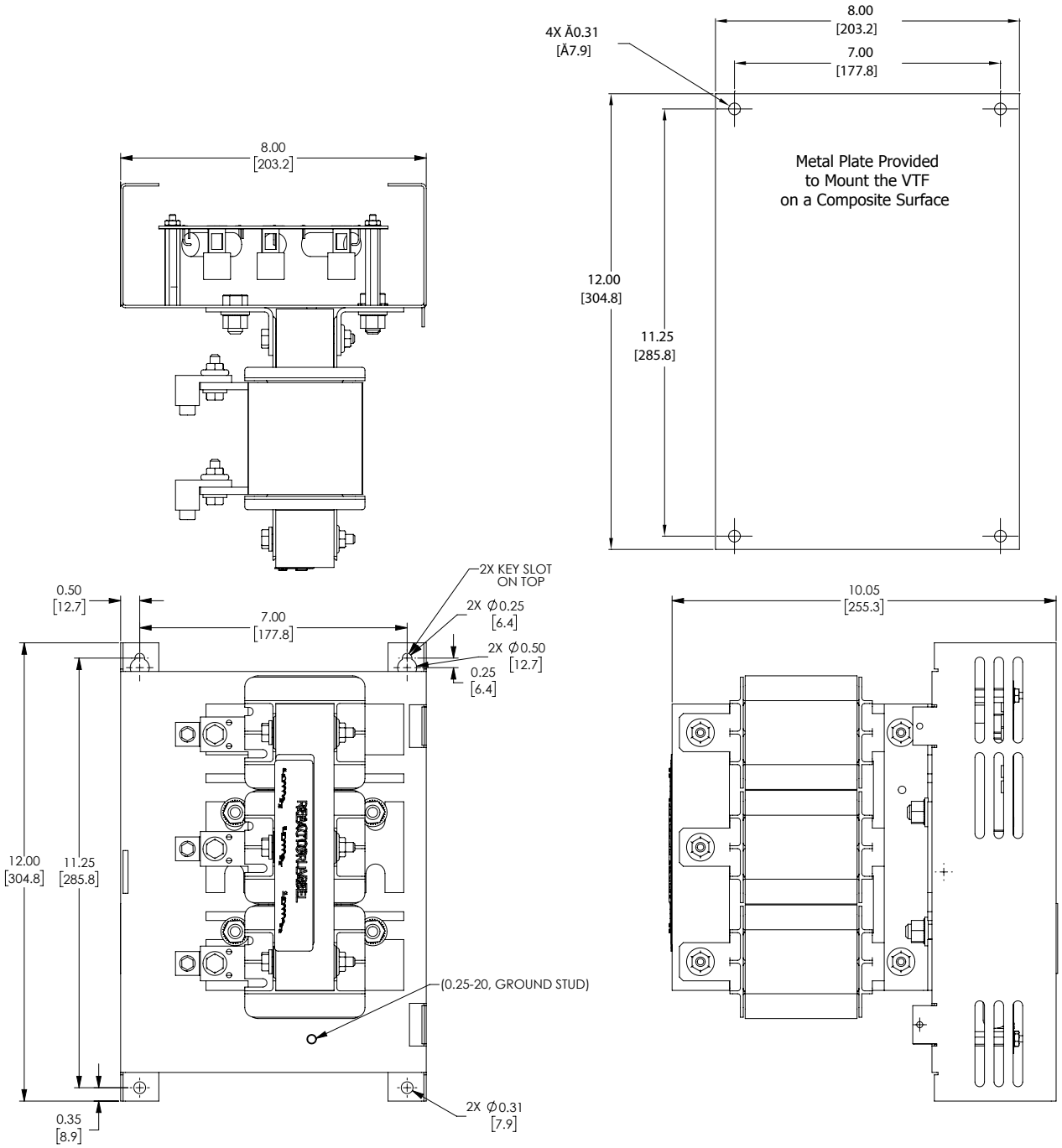


5) VTF Filters Dimension Drawing #5

VTF-246-RUV

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])

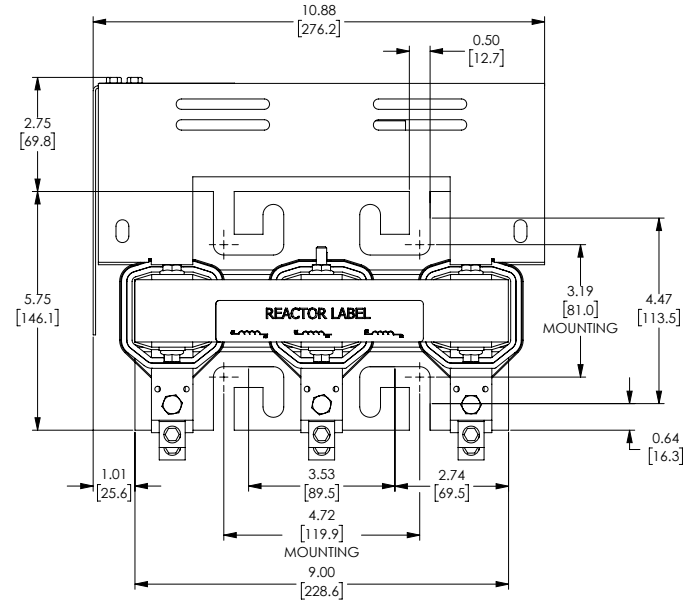


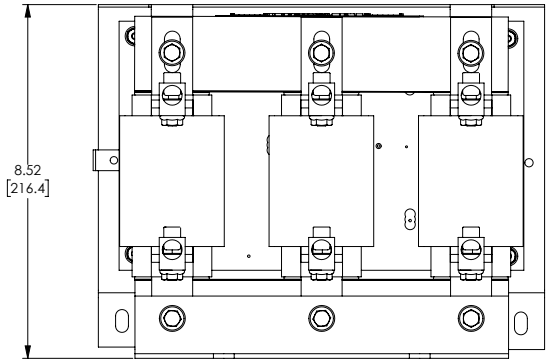
6) VTF Filters Dimension Drawing #6

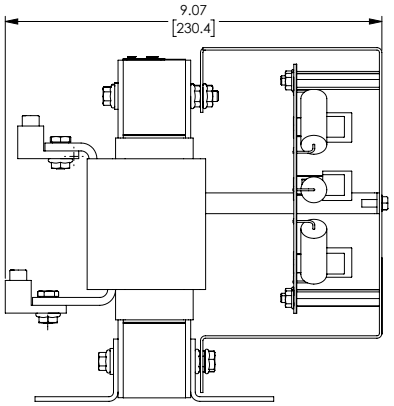
VTF-246-SVW

See our website: www.AutomationDirect.com for complete engineering drawings.

(Units = inches [mm])







Braking Units and Braking Resistors

Braking units are used to absorb the motor regeneration energy when the motor stops by deceleration. With the braking unit, the regeneration energy is dissipated by braking resistors. Our braking units are suitable for 230V and 460V DURAPULSE GS3 drives, and must be used in conjunction with GS series braking resistors to provide the best braking results.

WARNING:
To avoid possible injury, please refer to the dynamic braking manual, GS-DB_UMW, before wiring.

Braking Units

AC Drive		Brake Unit		Braking Resistor			Torque	O/L
Voltage Class	***AC Drive Part No.***	***Qty***	***Brake Unit Part No.***	***Qty***	***Resistor Part No.***	***Resistor Specification for Each Braking Unit***	***Braking Torque 10% Duty Cycle***	***Typical Thermal Overload Relay Value***
230V	**GS3-2020**	1	***GS-2DBU***	1	***GS-2020-BR-ENC***	3000W 10Ω	125%	30A
	GS3-2025	1		1	***GS-2025-BR-ENC***	4800W 8Ω	125%	35A
	GS3-2030	1		1	***GS-2030-BR-ENC***	4800W 6.8Ω	125%	40A
	GS3-2040	2		2	***GS-2040-BR-ENC***	3000W 10Ω	125%	30A
	GS3-2050	2		2	***GS-2050-BR-ENC***	4800W 8Ω	125%	30A
460V	**GS3-4020**	1	***GS-4DBU***	1	***GS-4020-BR-ENC***	1500W 40Ω	125%	15A
	GS3-4025	1		1	***GS-4025-BR-ENC***	4800W 32Ω	125%	15A
	GS3-4030	1		1	***GS-4030-BR-ENC***	4800W 27.2Ω	125%	20A
	GS3-4040	1		1	***GS-4040-BR-ENC***	6000W 20Ω	125%	30A
	GS3-4050	1		1	***GS-4050-BR-ENC***	9600W 16Ω	125%	40A
	GS3-4060	1		1	***GS-4060-BR-ENC***	9600W 13.6Ω	125%	50A
	GS3-4075	2		2	***GS-4075-BR-ENC***	6000W 20Ω	125%	30A
	GS3-4100	2		2	***GS-410 0-BR-ENC***	9600W 13.6Ω	125%	50A

Dynamic Brake Unit Terminal Specifications

Dynamic Brake Unit Terminal Specifications				
Circuit	**Terminal Mark**	**Wire Gauge AWG/mm²**	**Terminal**	**Torque**
Power Input Circuit	+ (P), – (N)	10~12AWG / 3.5~5.5mm²	M4 Screw	18 kg·cm
Braking Resistor	B1, B2			
Slave and Fault Circuit	M1, M2	20~18AWG / 0.25~0.75mm² M1, M2, S1, S2 with shielded wires	M2 Screw	4 kg·cm
	S1, S2			
	RA, RB, RC			

Dynamic Brake Unit General Specifications

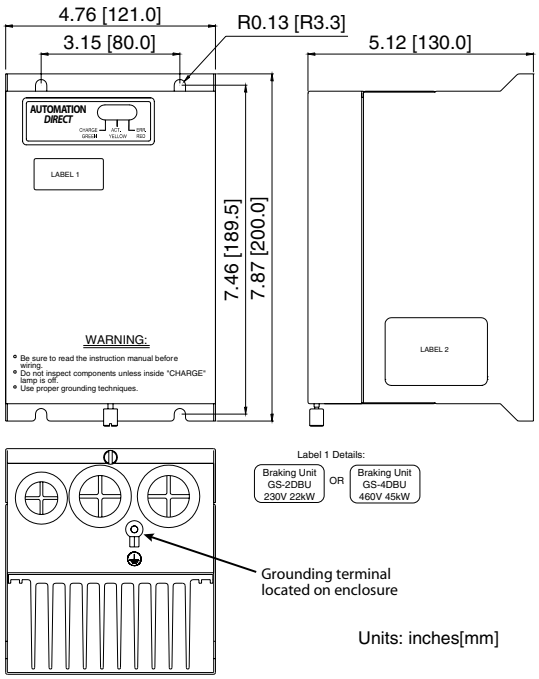
Dynamic Brake Unit Specifications			
Model		**230V Class**	**460V Class**
Part Number		GS-2DBU	GS-4DBU
Max. Motor Capacity HP (KW)		30 (22)	60 (45)
Output Rating	**Max. Peak Discharge Current (A) 10% ED (Duty Cycle)**	60	60
	Continuous Discharge Current (A)	20	18
	Braking Start-up Voltage (DC)	330/345/360/380/400/415 ±3V	660/690/720/760/800/830 ±6V
	Maximum On-Time	60 seconds	60 seconds
Input Rating	**DC Voltage**	200~400 VDC	400~800 VDC
Protection	**Heat Sink Overheat**	Temperature over +95 °C (203 °F)	
	Alarm Output	Relay contact 5A @ 120VAC/28VDC (RA, RB, RC)	
	Power CHARGE LED (Green)	ON until the bus (P-N) voltage is below 50VDC	
	Braking ACT LED (Yellow)	ON during braking	
	Fault ERR LED (Red)	ON if a fault has occurred	
Usage Environment	**Installation Location**	Indoor (no corrosive gases, metallic dust)	
	Operating Temperature	-10 °C to +50 °C (14 °F to 122 °F)	
	Storage Temperature	-20 °C to +60 °C (-4 °F to 140 °F)	
	Humidity	90% Non-condensing	
	Vibration	9.8m/s² (1G) under 20 2m/s² (0.2G) @ 20~50Hz	
Mechanical Configuration		Wall-mounted enclosed type IP50	

Braking Unit Wiring

For information on braking unit wiring, refer to the power wiring diagrams in "Chapter 2: Installation and Wiring" of this manual, and to the DURAPULSE Dynamic Braking Units User Manual GS-DB_UMW.

Braking Unit Dimensions

Part Numbers: GS-2DBU, GS-4DBU



For more information regarding brake units, please refer to the brake unit user manual GS-DB_UMW.

Braking Resistors

Braking resistors are used to increase the control torque of the AC Drive, for frequently repeated ON-OFF cycles of the AC Drive, or for decelerating a load with large inertia.

Braking Resistor Specifications

Braking Resistor Specifications								
Voltage Class	**AC Drive Model**	**Qty**	**Braking Resistor Part Number**	**Motor HP**	**Braking Torque ED 10%**	**Type (Ω)**	**Power (W)**	**Duty Cycle**
230V	GS3-21P0	1	GS-21P0-BR	1	125%	200	80	10%
	GS3-22P0	1	GS-22P0-BR	2	125%	100	300	10%
	GS3-23P0	1	GS-23P0-BR	3	125%	70	300	10%
	GS3-25P0	1	GS-25P0-BR	5	125%	40	400	10%
	GS3-27P5	1	GS-27P5-BR	7.5	125%	30	500	10%
	GS3-2010	1	GS-2010-BR-ENC	10	125%	20	1000	10%
	GS3-2015	1	GS-2015-BR-ENC	15	125%	13.6	2400	10%
	GS3-2020	1	GS-2020-BR-ENC	20	125%	10	3000	10%
	GS3-2025	1	GS-2025-BR-ENC	25	125%	8	4800	10%
	GS3-2030	1	GS-2030-BR-ENC	30	125%	6.8	4800	10%
	GS3-2040	2	GS-2040-BR-ENC	40	125%	10	3000	10%
	GS3-2050	2	GS-2050-BR-ENC	50	125%	8	4800	10%
460V	GS3-41P0	1	GS-41P0-BR	1	125%	750	80	10%
	GS3-42P0	1	GS-42P0-BR	2	125%	400	300	10%
	GS3-43P0	1	GS-43P0-BR	3	125%	250	300	10%
	GS3-45P0	1	GS-45P0-BR	5	125%	150	400	10%
	GS3-47P5	1	GS-47P5-BR	7.5	125%	100	500	10%
	GS3-4010	1	GS-4010-BR	10	125%	75	1000	10%
	GS3-4015	1	GS-4015-BR-ENC	15	125%	50	1000	10%
	GS3-4020	1	GS-4020-BR-ENC	20	125%	40	1500	10%
	GS3-4025	1	GS-4025-BR-ENC	25	125%	32	4800	10%
	GS3-4030	1	GS-4030-BR-ENC	30	125%	27.2	4800	10%
	GS3-4040	1	GS-4040-BR-ENC	40	125%	20	6000	10%
	GS3-4050	1	GS-4050-BR-ENC	50	125%	16	9600	10%
	GS3-4060	1	GS-4060-BR-ENC	60	125%	13.6	9600	10%
	GS3-4075	2	GS-4075-BR-ENC	75	125%	20	6000	10%
	GS3-4100	2	GS-4100-BR-ENC	100	125%	13.6	9600	10%

For DURAPULSE GS3 drive models 20 hp and above, a dynamic braking unit must be used in conjunction with the braking resistor, as shown in the Braking Units and Braking Resistors table earlier in this chapter. For additional information, please refer to the dynamic braking manual, GS-DB_UMW.

Braking Resistor Wiring

For information on braking resistor wiring, refer to the power wiring diagrams in "Chapter 2: Installation and Wiring".

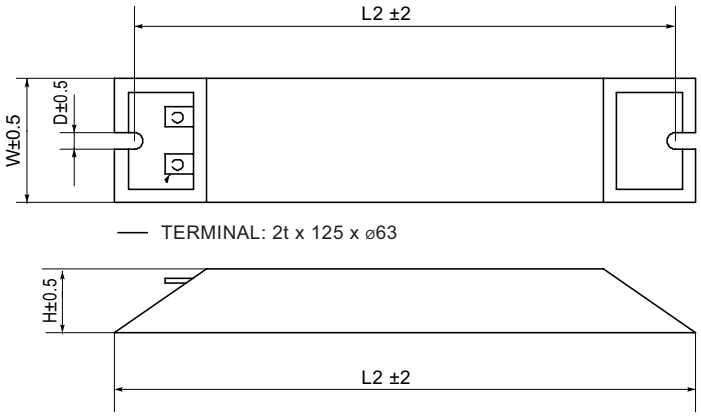
Braking Resistor Dimensions

Braking Resistor Dimensions				
Voltage Class	***AC Drive Model***	***Braking Resistor Part Number***	***Enclosure Type***	***Dimensions***
230V	**GS3-21P0**	***GS-21P0-BR***	none	Figure 1
	GS3-22P0	***GS-22P0-BR***		
	GS3-23P0	***GS-23P0-BR***		
	GS3-25P0	***GS-25P0-BR***		
	GS3-27P5	***GS-27P5-BR***	none	Figure 2
	GS3-2010	***GS-2010-BR-ENC***	GCE3	Figure 3
	GS3-2015	***GS-2015-BR-ENC***	GCE6	Figure 4
	GS3-2020	***GS-2020-BR-ENC***		
	GS3-2025	***GS-2025-BR-ENC***	GCE9	Figure 5
	GS3-2030	***GS-2030-BR-ENC***		
	GS3-2040	***GS-2040-BR-ENC***	(2) x GCE6	(2) x Figure 4
	GS3-2050	***GS-2050-BR-ENC***	(2) x GCE9	(2) x Figure 5
460V	**GS3-41P0**	***GS-41P0-BR***	none	Figure 1
	GS3-42P0	***GS-42P0-BR***		
	GS3-43P0	***GS-43P0-BR***		
	GS3-45P0	***GS-45P0-BR***		
	GS3-47P5	***GS-47P5-BR***	none	Figure 2
	GS3-4010	***GS-4010-BR***		
	GS3-4015	***GS-4015-BR-ENC***	GCE3	Figure 3
	GS3-4020	***GS-4020-BR-ENC***	GCE4	Figure 6
	GS3-4025	***GS-4025-BR-ENC***	GCE12	Figure 7
	GS3-4030	***GS-4030-BR-ENC***		
	GS3-4040	***GS-4040-BR-ENC***		
	GS3-4050	***GS-4050-BR-ENC***	GCE15	Figure 8
	GS3-4060	***GS-4060-BR-ENC***		
	GS3-4075	***GS-4075-BR-ENC***	(2) x GCE12	(2) x Figure 7
	GS3-4100	***GS-4100-BR-ENC***	(2) x GCE15	(2) x Figure 8

Braking Resistor Dimensions (continued)

Figure 1

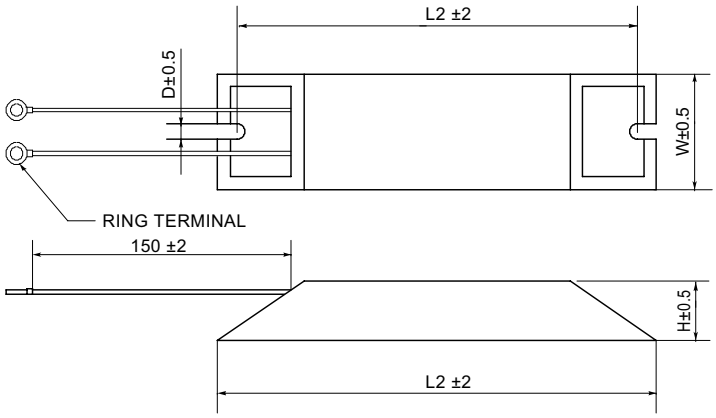
GS-21P0-BR
GS-22P0-BR
GS-23P0-BR
GS-25P0-BR
GS-41P0-BR
GS-42P0-BR
GS-43P0-BR
GS-45P0-BR



Resistor Part Number	*L1 (mm)*	*L2 (mm)*	*H (mm)*	*D (mm)*	*W (mm)*
GS-21P0-BR	140	125	20	5.3	60
GS-22P0-BR	215	200	30	5.3	60
GS-23P0-BR	215	200	30	5.3	60
GS-25P0-BR	265	250	30	5.3	60
GS-41P0-BR	140	125	20	5.3	60
GS-42P0-BR	215	200	30	5.3	60
GS-43P0-BR	215	200	30	5.3	60
GS-45P0-BR	265	250	30	5.3	60

Figure 2

GS-27P5-BR
GS-47P5-BR
GS-4010-BR



Resistor Part Number	*L1 (mm)*	*L2 (mm)*	*H (mm)*	*D (mm)*	*W (mm)*
GS-27P5-BR	335	320	30	5.3	60
GS-47P5-BR	335	320	30	5.3	60
GS-4010-BR	400	385	50	5.3	100

Braking Resistor Dimensions (continued)

Figure 3

GS-2010-BR-ENC
GS-4015-BR-ENC

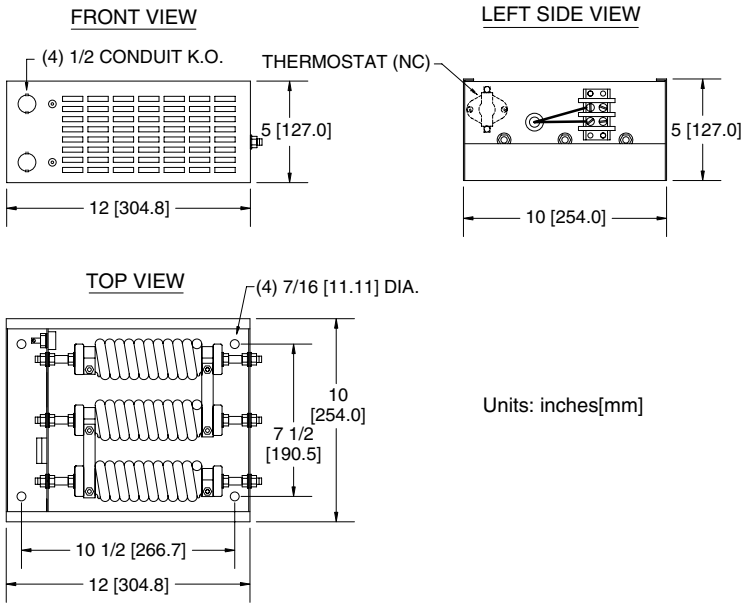
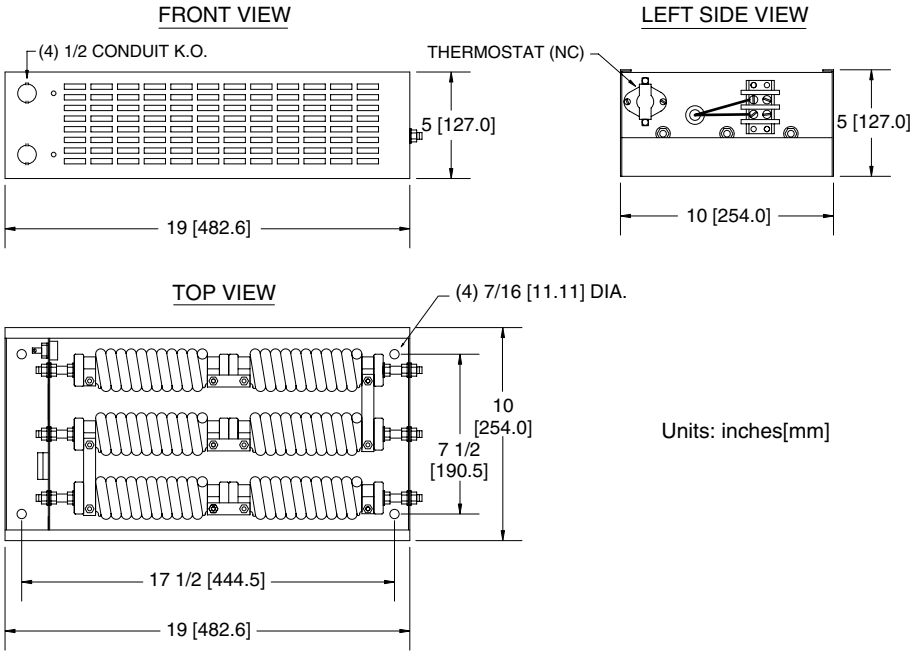


Figure 4

GS-2015-BR-ENC
GS-2020-BR-ENC
GS-2040-BR-ENC*
***** *(2) units required*



Braking Resistor Dimensions (continued)

Figure 5

GS-2025-BR-ENC
GS-2030-BR-ENC
GS-2050-BR-ENC*
***** *(2) units required*

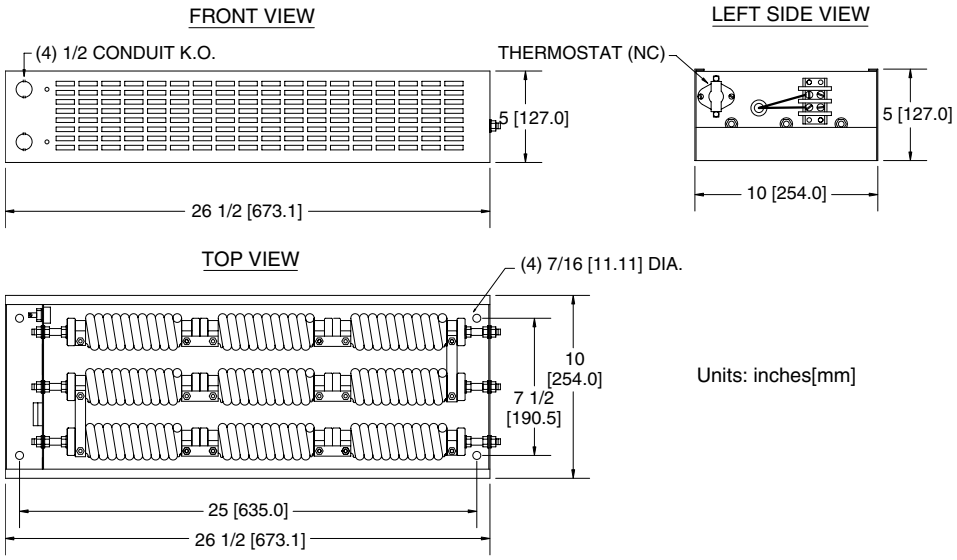
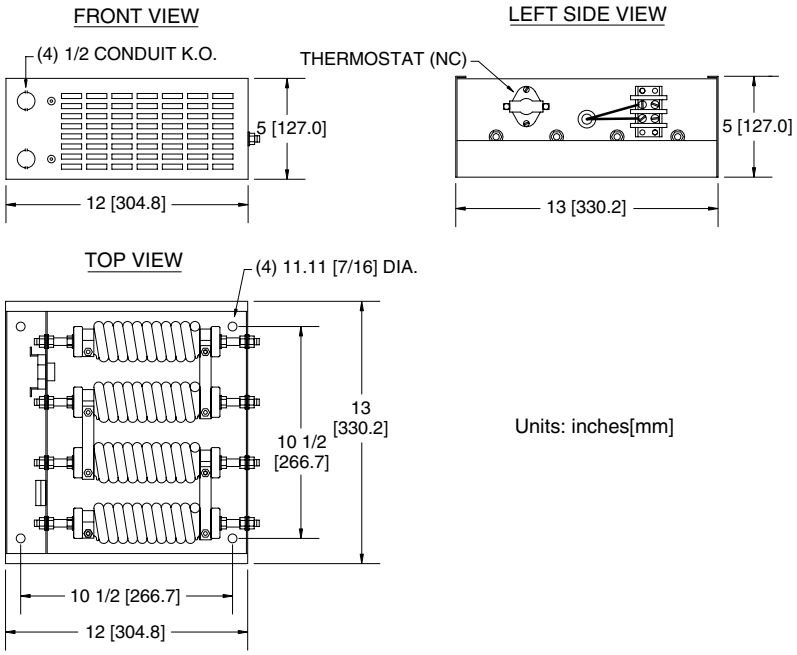


Figure 6

GS-4020-BR-ENC



Braking Resistor Dimensions (continued)

Figure 7

GS-4025-BR-ENC
GS-4030-BR-ENC
GS-4040-BR-ENC
GS-4075-BR-ENC*
***** *(2) units required*

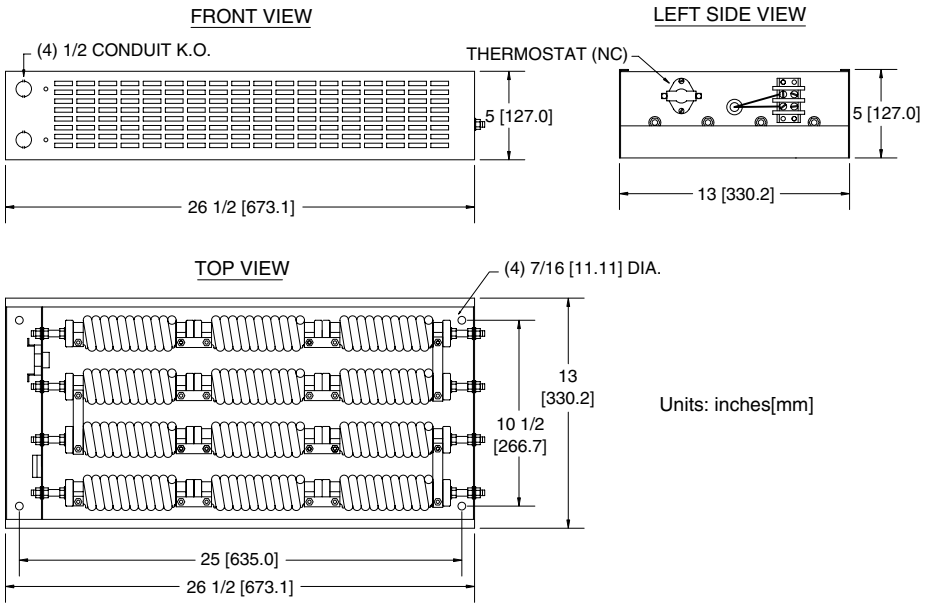
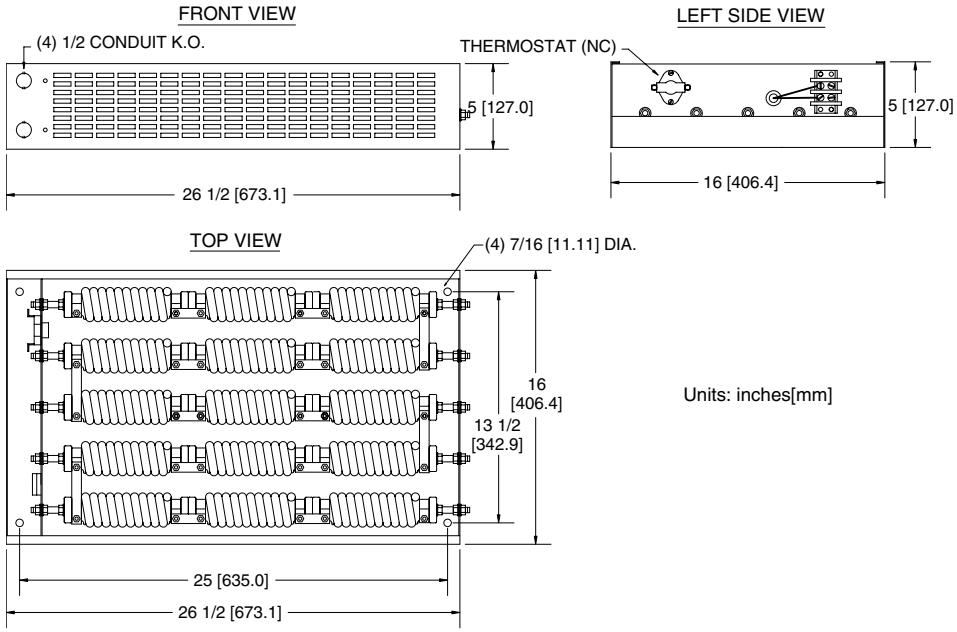


Figure 8

GS-4050-BR-ENC
GS-4060-BR-ENC
GS-4100-BR-ENC*
***** *(2) units required*



EMI Input Filters

The EC Declaration of Conformity for the DURAPULSE GS3 AC Drives was completed in conjunction with EMI Filters listed below. Use the following table to specify the corresponding EMI Filter for each AC Drive model.

CE compliance requires the use of EMI filters.

EMI Input Filter Specifications

EMI Input Filter Specifications					
AC Drive Model / Input Phase		***EMI Filter***	***Input Power Max Rating***	***Dimension Drawing***	***Terminal Screw Max Torque***
230V	***460V***				***kg·cm [lb·in]***
GS3-21P0 / 1ph GS3-22P0 / 1ph	–	***20DRT1W3S***	250V, 1-phase, 20A	Figure 1-1	18 [16]
GS3-23P0 / 1ph	–	***32DRT1W3C***	250V, 1-phase, 32A	Figure 1-2	
GS3-21P0 / 3ph GS3-22P0 / 3ph	–	***10TDT1W4C***	250V, 3-phase, 10A	Figure 3-1	
GS3-23P0 / 3ph GS3-25P0 / 3ph	–	***26TDT1W4C***	250V, 3-phase, 26A	Figure 3-2	
GS3-27P5 / 3ph GS3-2010 / 3ph	GS3-4020 / 3ph GS3-4025 / 3ph	***50TDS4W4C***	250/480V, 3-phase, 50A	Figure 3-3	30 [26]
GS3-2015 / 3ph GS3-2020 / 3ph	GS3-4030 / 3ph GS3-4040 / 3ph GS3-4050 / 3ph	***100TDS84C***	250/480V, 3-phase, 100A	Figure 3-4	65 [56]
GS3-2025 / 3ph GS3-2030 / 3ph GS3-2040 / 3ph	GS3-4060 / 3ph	***150TDS84C***	250/480V, 3-phase, 150A	Figure 3-5	
GS3-2050 / 3ph	–	***180TDS84C***	250V, 3-phase, 180A	Figure 3-6	
–	GS3-41P0 / 3ph GS3-42P0 / 3ph GS3-43P0 / 3ph	***RF022B43AA***	480V, 3-phase, 5.9A	Figure 3-7	n/a
–	GS3-45P0 / 3ph	***RF037B43BA***	480V, 3-phase, 11.2A	Figure 3-8	
–	GS3-47P5 / 3ph GS3-4010 / 3ph GS3-4015 / 3ph	***RF110B43CA***	480V, 3-phase, 25A	Figure 3-9	
–	GS3-4075 / 3ph GS3-4100 / 3ph	***200TDDS84C***	480V, 3-phase, 200A	Figure 3-10	65 [56]

EMI Filter Dimensions

Figure 1-1
[units = mm]
20DRT1W3S

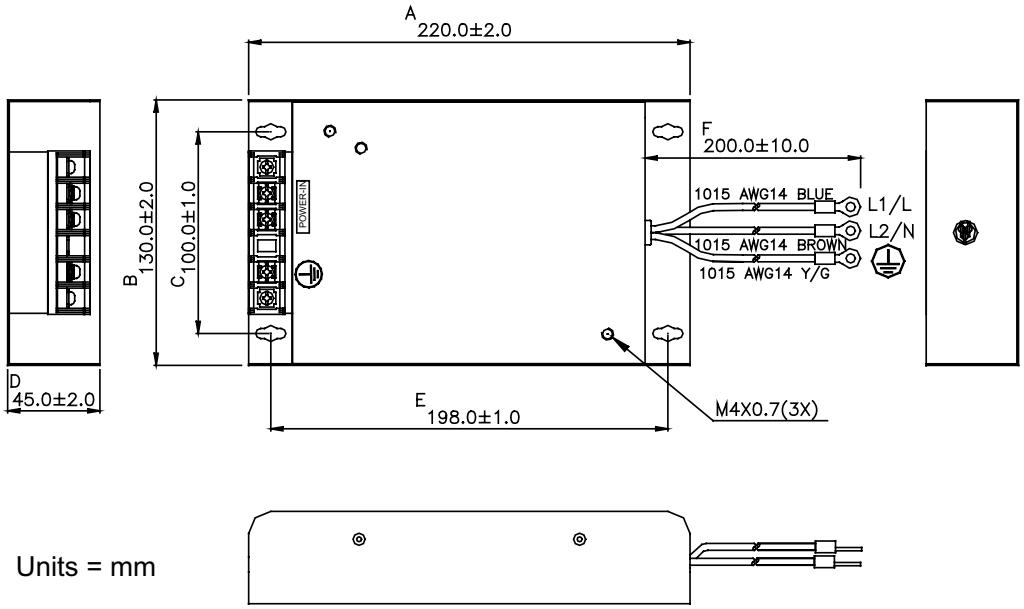
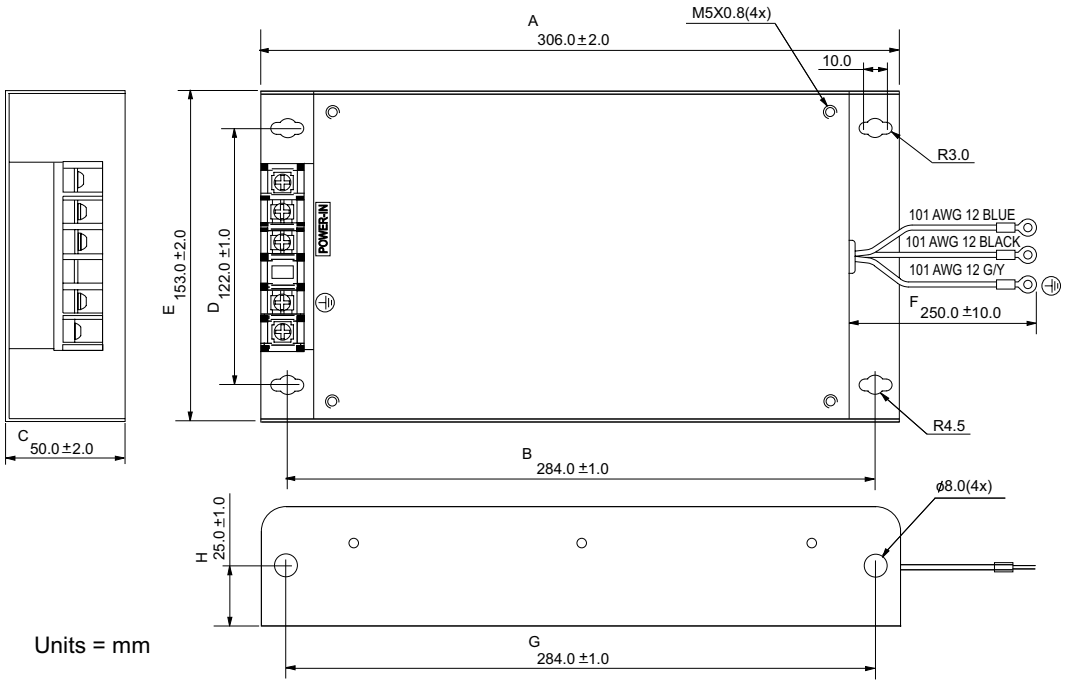


Figure 1-2
[units = mm]
32DRT1W3C



EMI Filter Dimensions (continued)

Figure 3-1
[units = mm (in)]
10TDT1W4C

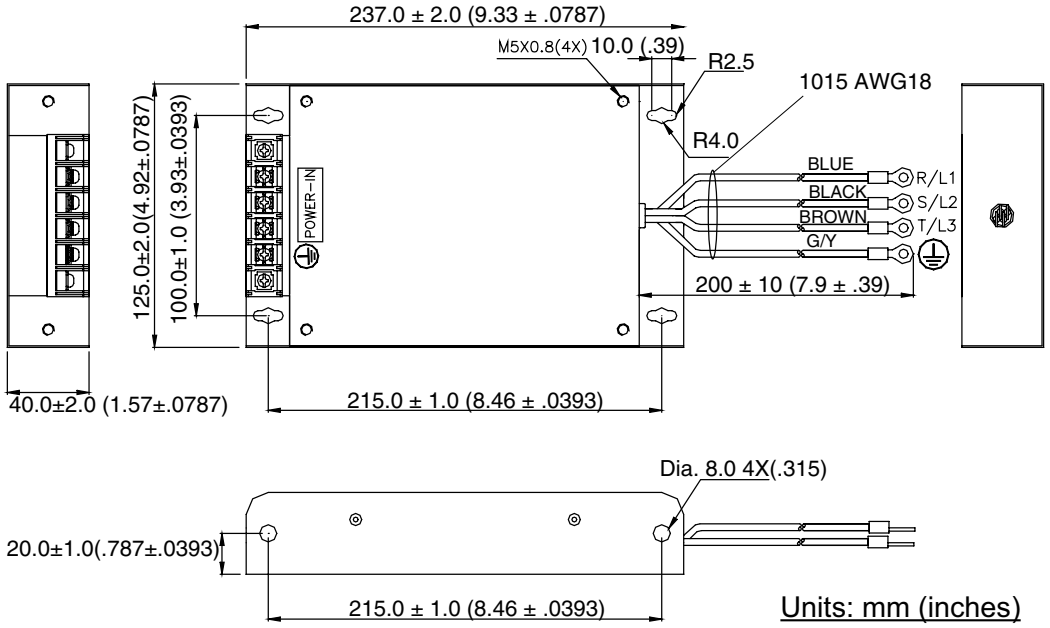
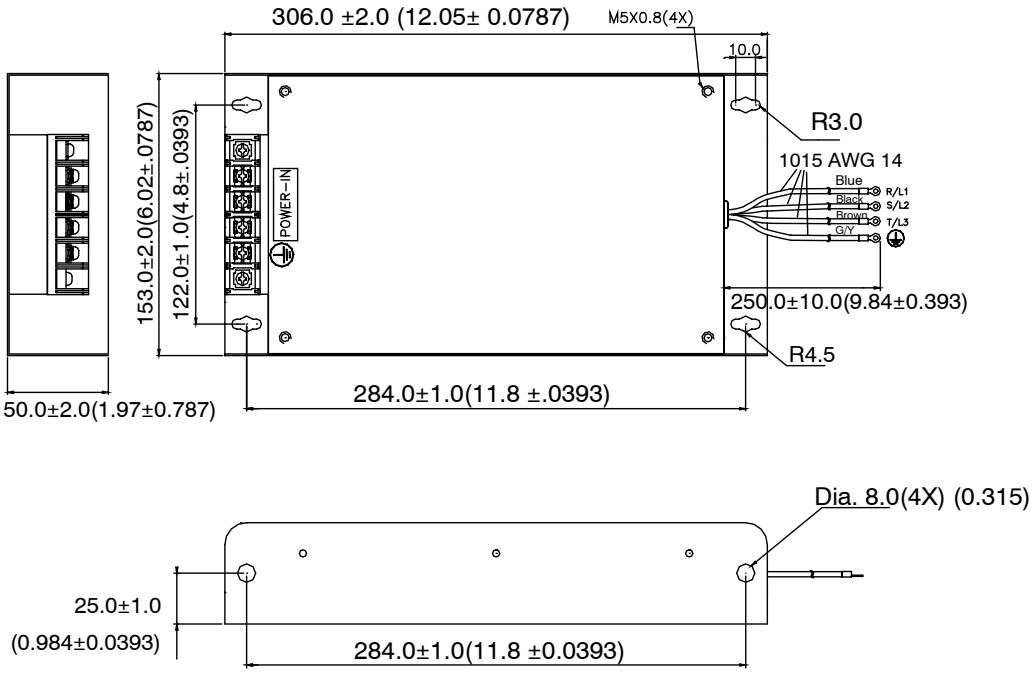


Figure 3-2
[units = mm (in)]
26TDT1W4C



EMI Filter Dimensions (continued)

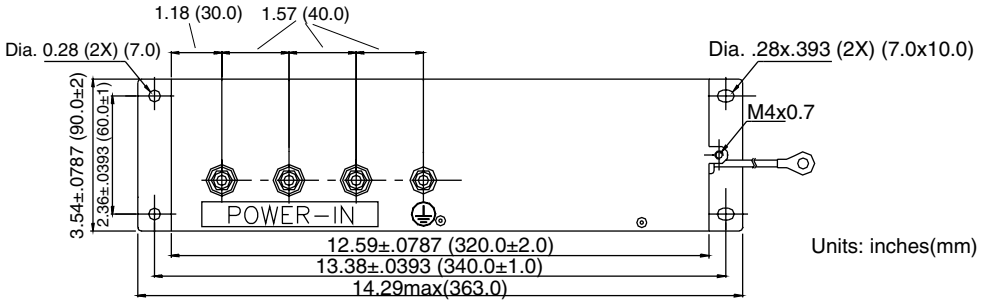
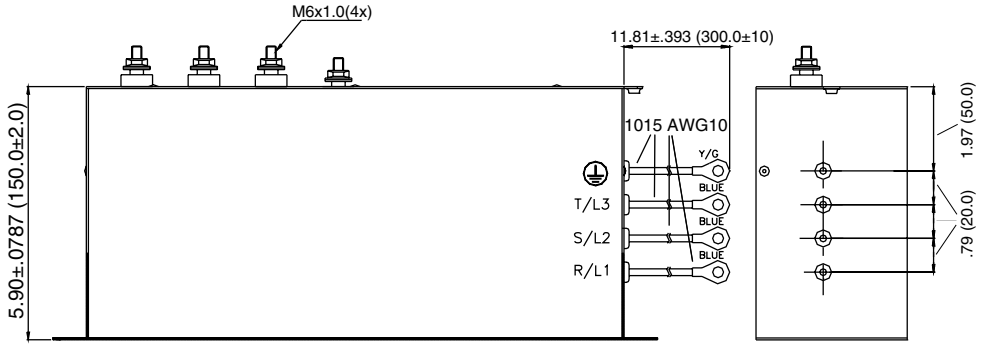


Figure 3-3
[units = in (mm)]
50TDS4W4C



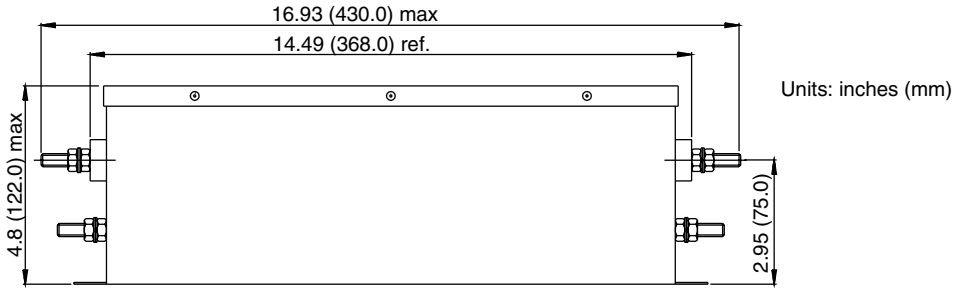
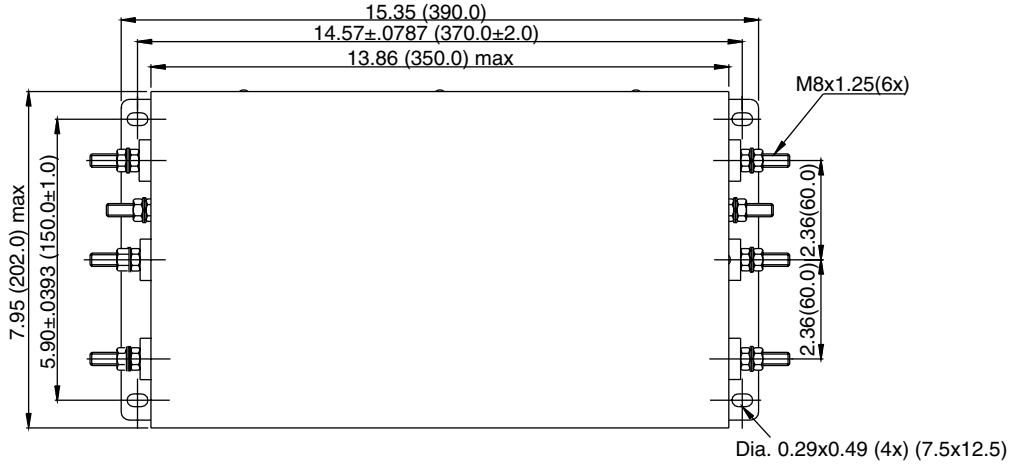


Figure 3-4
[units = in (mm)]
100TDS84C



EMI Filter Dimensions (continued)

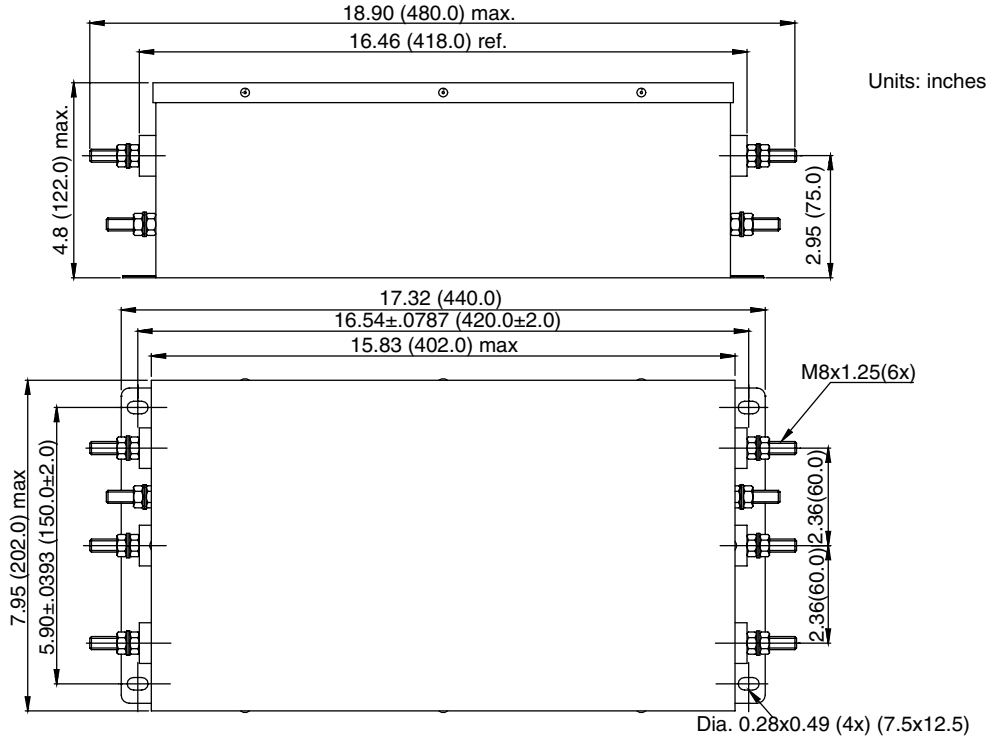


Figure 3-5
[units = in (mm)]
150TDS84C

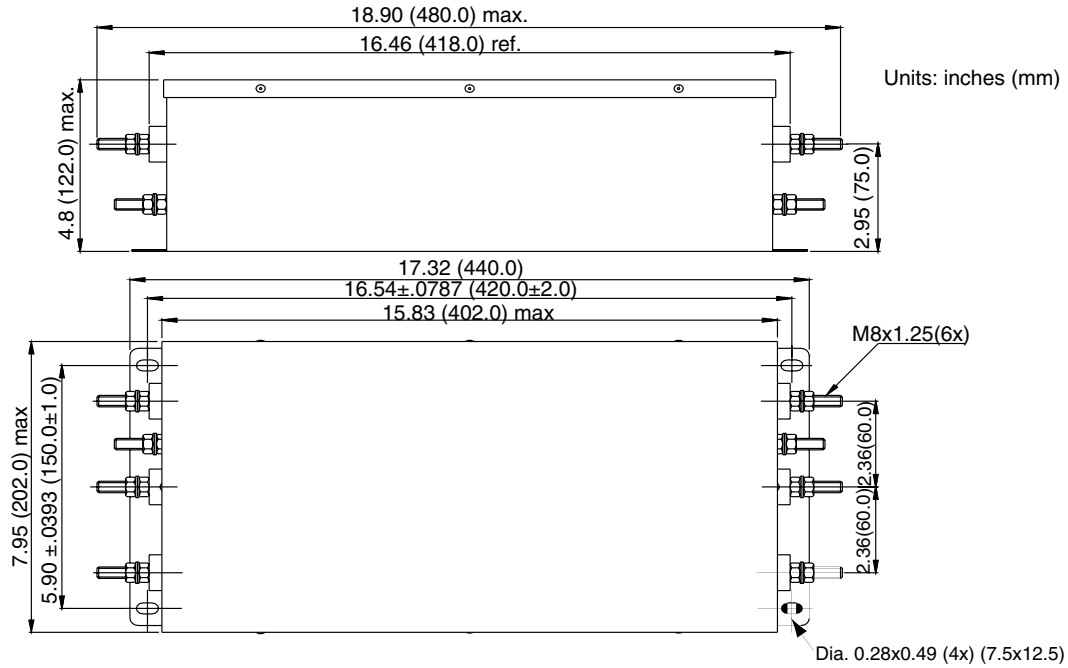
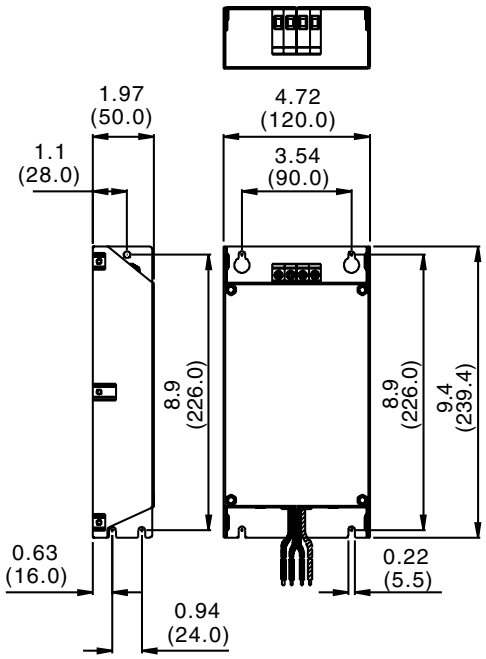


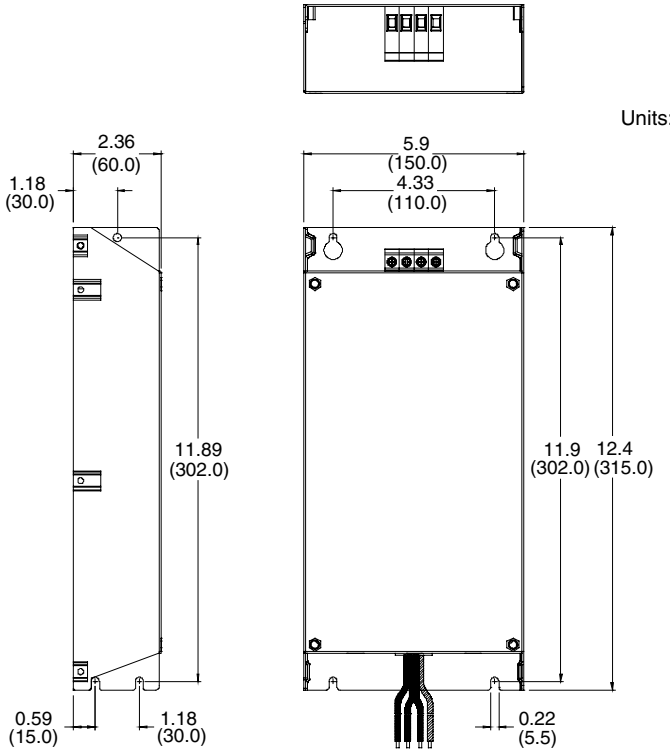
Figure 3-6
[units = in (mm)]
180TDS84C

EMI Filter Dimensions (continued)



Units: inches (mm)

Figure 3-7
[units = in (mm)]
RF022B43AA



Units: inches (mm)

Figure 3-8
[units = in (mm)]
RF037B43AA

EMI Filter Dimensions (continued)

Units: inches (mm)

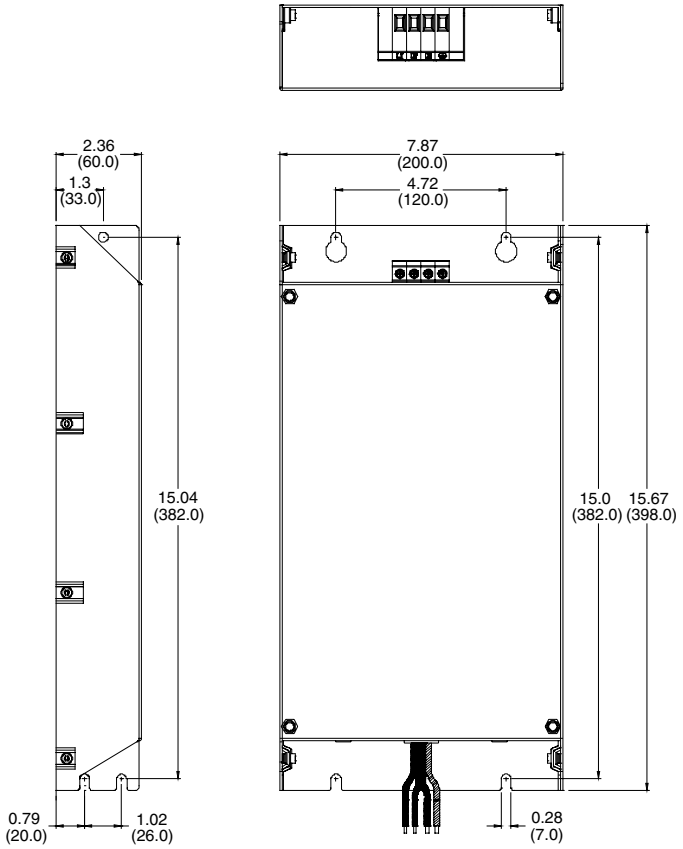


Figure 3-9
[units = in (mm)]
RF110B43CA

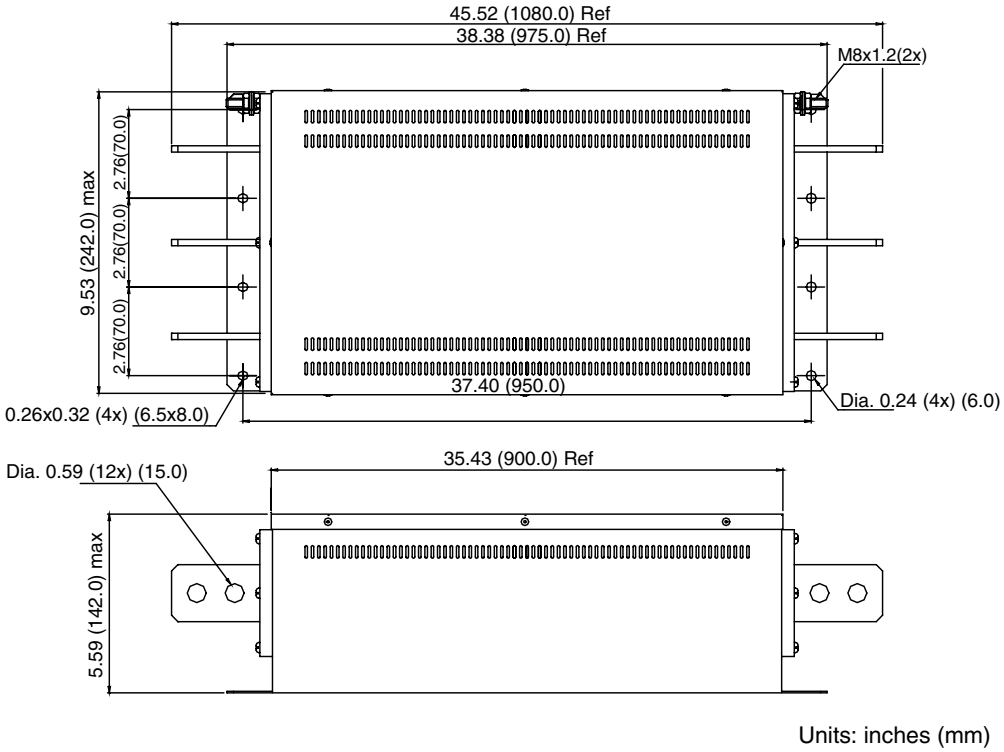
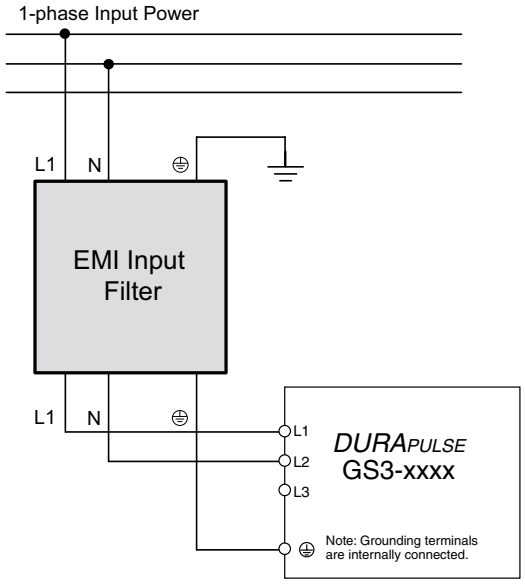


Figure 3-10
[units = in (mm)]
200TDDS84C

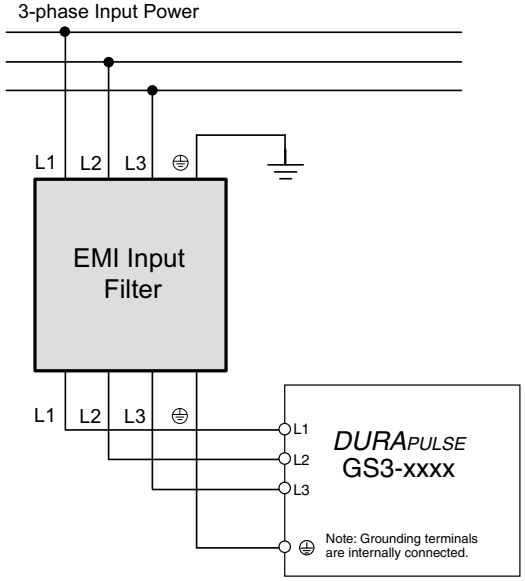
Units: inches (mm)

EMI Filter Wiring Connections

Single-Phase Input Connections



Triple-Phase Input Connections



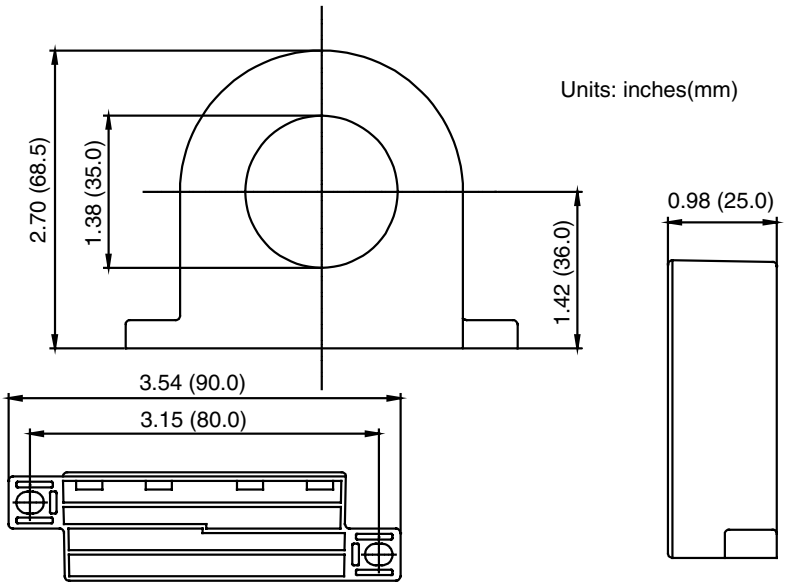
Distance of wires from filter to drive should be as short as possible.

RF Filter

RF Filter Part #: RF220X00A

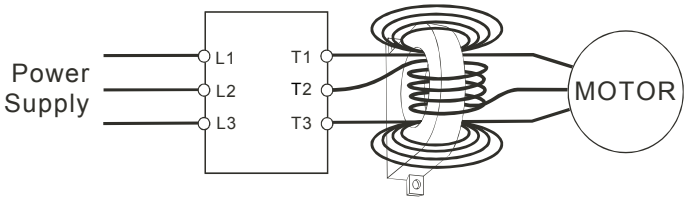
RF Filters are used to reduce the radio frequency interference or noise on the input or output side of the inverter. RF220X00A can be used with all GS model drives.

RF Filter Dimensions

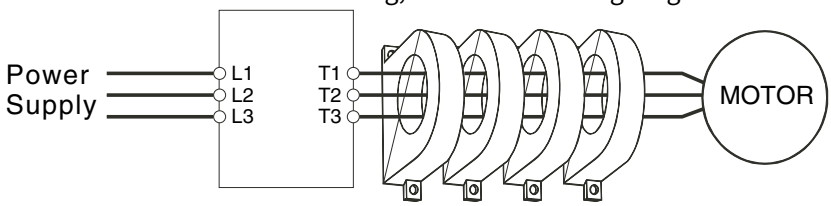


RF Filter Wiring

Wind each wire four times around the core. The RF filter must be located as close as possible to the output side of the inverter.



If you are unable to wire as shown above due to wire size, or another aspect of your application, put all wires through four cores in series without winding, as in the following diagram.



Fuses and Fuse Kits

Short-circuit and ground-fault protection devices are essential to prevent costly damage to your AC Drive application equipment. Fuse kits are available from AutomationDirect for the GS3 DURApulse GS3 AC Drives.

Warning: The fuse kits provide protection only for the semiconductor components inside the AC drive. Motor branch circuit overcurrent protection should be separately provided using applicable local codes.

The following fuse kits consist of one fuse block and fuses sized to match each GS3 DURApulse GS3 AC Drive. Replacement fuses are also available, as shown below.

Fuse Kit Specifications for GS3 AC Drives

Part Number	Drive Model / Phase	Fuse Block Type	Fuse Type	Fuse Rating	Fuse Block Dimensions	Wire Connector Torque (lb·in)	Fuse Bolt Torque (lb·in)	Wire Range	Replacement Fuses
GS-21P0-FKIT-1P*	GS3-21P0 / 1	2-pole	A3T	300V @ 30A	Figure 1	20	spring clips	Al/Cu #2-14	GS-21P0-FUSE-1P
GS-22P0-FKIT-1P*	GS3-22P0 / 1			300V @ 45A		45			GS-22P0-FUSE-1P
GS-23P0-FKIT-1P*	GS3-23P0 / 1			300V @ 60A		45			GS-23P0-FUSE-1P
GS-21P0-FKIT-3P	GS3-21P0 / 3	3-pole		300V @ 20A	Figure 2	20			GS-21P0-FUSE-3P
GS-22P0-FKIT-3P	GS3-22P0 / 3			300V @ 25A		20			GS-22P0-FUSE-3P
GS-23P0-FKIT-3P	GS3-23P0 / 3			300V @ 40A		45			GS-23P0-FUSE-3P
GS-25P0-FKIT	GS3-25P0 / 3			300V @ 60A		45			GS-25P0-FUSE
GS-27P5-FKIT	GS3-27P5 / 3			300V @ 100A	Figure 3	50	72	Al/Cu 2/0-#6	GS-27P5-FUSE
GS-2010-FKIT**	GS3-2010 / 3			300V @ 125A					GS-2010-FUSE
GS-2015-FKIT**	GS3-2015 / 3			300V @ 175A					GS-2015-FUSE
GS-2020-FKIT	GS3-2020 / 3			300V @ 250A	Figure 5	600	228		GS-2020-FUSE
GS-2025-FKIT	GS3-2025 / 3			300V @ 300A		600	228		GS-2025-FUSE
GS-2030-FKIT	GS3-2030 / 3			300V @ 350A		600	228		GS-2030-FUSE
GS-2040-FKIT***	GS3-2040 / 3			300V @ 450A	Figure 6	600	360		GS-2040-FUSE
GS-2050-FKIT***	GS3-2050 / 3			300V @ 500A		600	360		GS-2050-FUSE
GS-41P0-FKIT	GS3-41P0 / 3		A6T	600V @ 10A	Figure 7	20	spring clips	Al/Cu #2-14	GS-41P0-FUSE
GS-42P0-FKIT	GS3-42P0 / 3			600V @ 15A		20			GS-42P0-FUSE
GS-43P0-FKIT	GS3-43P0 / 3			600V @ 20A		20			GS-43P0-FUSE
GS-45P0-FKIT	GS3-45P0 / 3			600V @ 30A		20			GS-45P0-FUSE
GS-47P5-FKIT	GS3-47P5 / 3			600V @ 50A	Figure 8	45			GS-47P5-FUSE
GS-4010-FKIT	GS3-4010 / 3			600V @ 70A	Figure 9	120	72	Cu 2/0-#12	GS-4010-FUSE
GS-4015-FKIT	GS3-4015 / 3			600V @ 90A		120	72		GS-4015-FUSE
GS-4020-FKIT	GS3-4020 / 3			600V @ 125A	Figure 10	275	132	Al/Cu 2/0-#6	GS-4020-FUSE
GS-4025-FKIT	GS3-4025 / 3			600V @ 150A		275	132		GS-4025-FUSE
GS-4030-FKIT	GS3-4030 / 3			600V @ 175A		275	132		GS-4030-FUSE
GS-4040-FKIT***	GS3-4040 / 3			600V @ 225A	Figure 11	600	228		GS-4040-FUSE
GS-4050-FKIT***	GS3-4050 / 3			600V @ 250A		600	228		GS-4050-FUSE
GS-4060-FKIT***	GS3-4060 / 3			600V @ 350A		600	228		GS-4060-FUSE
GS-4075-FKIT***	GS3-4075 / 3			600V @ 400A		600	228		GS-4075-FUSE
GS-4100-FKIT***	GS3-4100 / 3			600V @ 600A	Figure 12	600	360		GS-4100-FUSE

Short Circuit Current Rating (SCCR) = 200 kA

* *Single-phase fuse kits contain a 2-pole fuseblock. Per NEC 240.22, fusing is correct only for the hot leg of a source; not for an intentionally grounded source conductor. The hot leg of a grounded 115VAC supply is the only supply line that should be fused.*

** *GS-2010-FKIT and GS-2015-FKIT are no longer available. Please use GS-27P5-FKIT instead.*

*** *Three units required.*

Fuse Block Dimensions

[Units = inches]

Figure 1

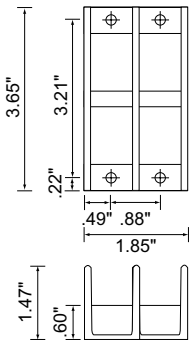


Figure 2

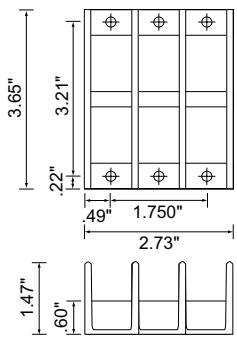


Figure 3

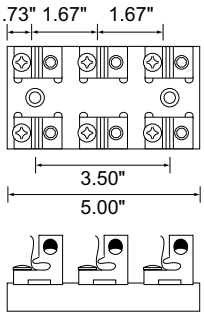
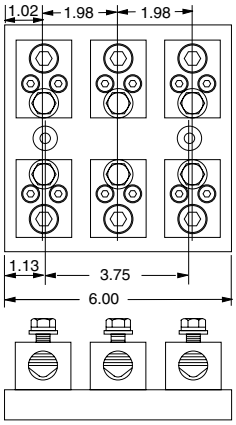


Figure 4



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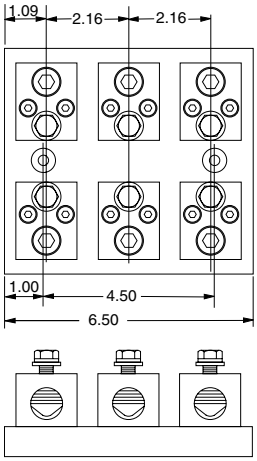
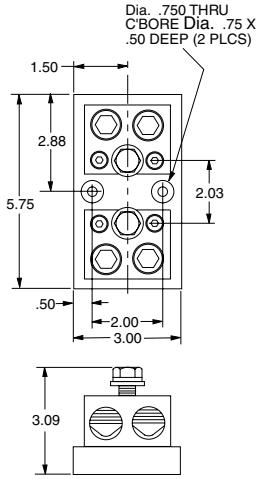


Figure 6



Fuse Block Dimensions (continued)

[Units = inches]

Figure 7

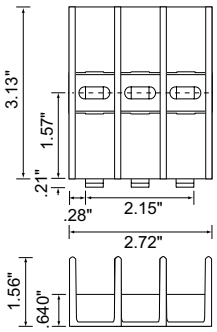


Figure 8

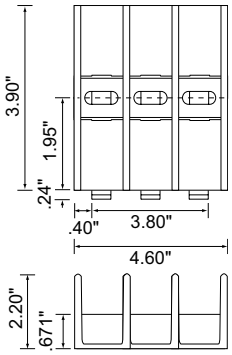


Figure 9

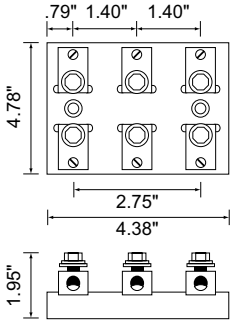


Figure 10

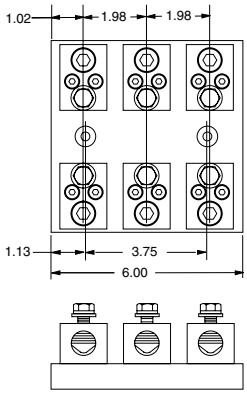


Figure 11

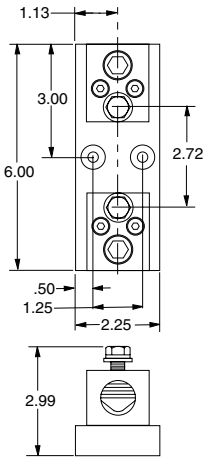
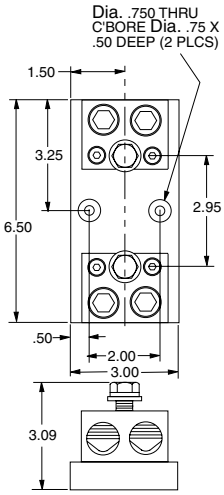


Figure 12

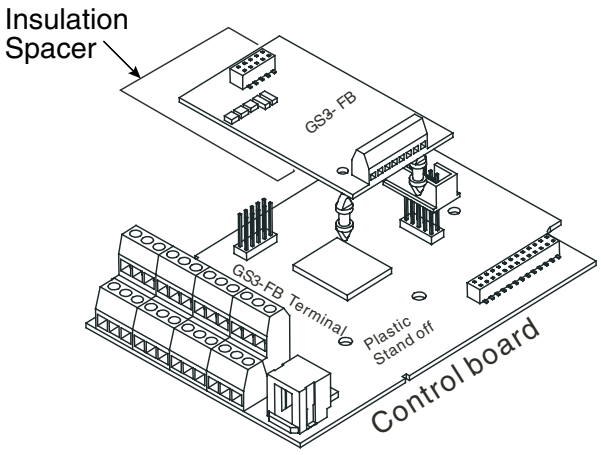


GS3-FB Feedback Card

INSTALLATION

For **1 to 2hp** (0.75kW to 1.5kW) drives

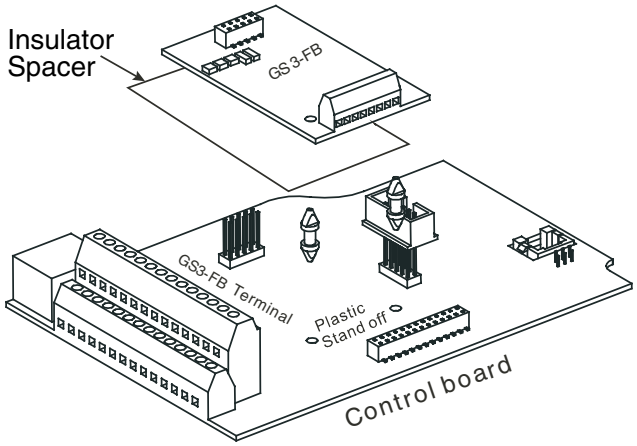
1 to 2HP (0.75kW to 1.5kW)



INSTALLATION

For **3 to 5hp** (2.2kW to 3.7kW) drives

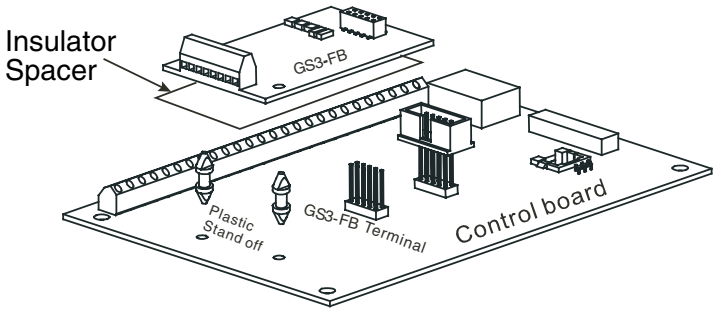
3 to 5HP (2.2kW to 3.7kW)



INSTALLATION

For drives **7.5hp (5.5kW) and above**

7.5HP (5.5kW) and above



Make sure GS3-FB card snaps firmly into board. If it is not properly installed, LEDs will not light upon power-up.

GS3-FB Terminal Descriptions Wiring Notes

Terminal Symbols	Descriptions
VP	Power source of GS3-FB (SW1 can be switched to 12V or 5V) Output Voltage: (+12VDC ±5% 200mA) or (+5VDC ±2% 400mA)
DCM	Power source (VP) and input signal (A, B) common
A, NOT A, B, NOT B	Input signal from Encoder; Input type is selected by SW2; Maximum 500kP/Sec
A/O, B/O	GS3-FB output signal for use with RPM Meter (Open Collector) Maximum DC24V 100mA
COM	GS3-FB output signal (A/O, B/O) common
PG	Pulse generator or Encoder
IM 3~	3-Phase motor

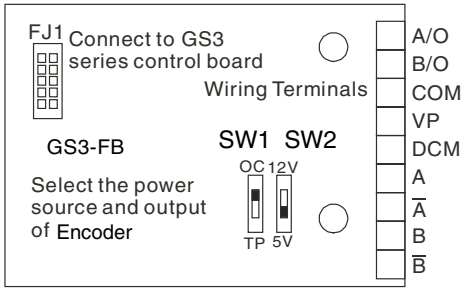
The control, power supply and motor leads must be laid separately. They must not be fed through the same cable conduit / trunking.

1) Please use a shield cable to prevent interference. Do not run control wire parallel to any high voltage AC power line (220V and up).
2) Connect shielded wire to Ground only.
3) Recommended wire size for shielded cable: AWG24 to AWG18 (0.21 to 0.81mm^2)
4) Wire length:

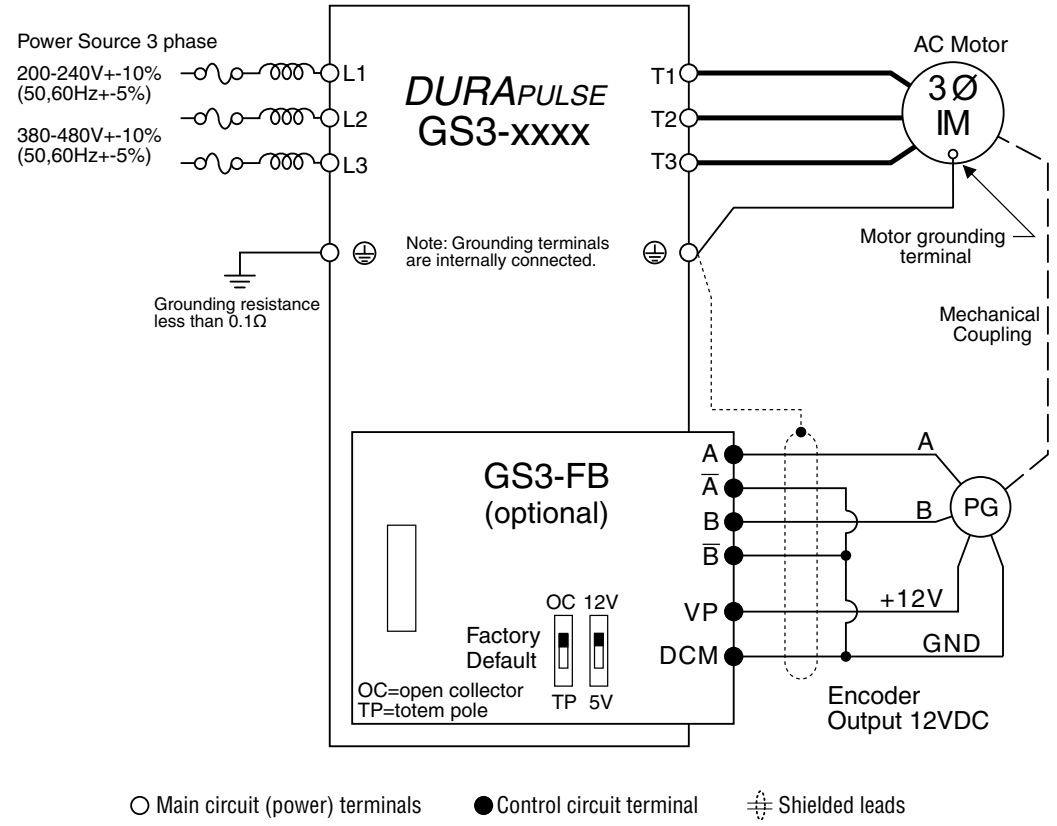
Types of Encoders	Maximum Wire Length	Wire Gauge at Maximum Wire Length
Output Voltage	165 ft (50m)	AWG16 (1.25mm^2) or larger
Open Collector	165 ft (50m)	
Line Driver	1000 ft (300m)	
Complimentary	230 ft (70m)	

Please refer to instructions supplied with product for additional installation information.

Control Terminals Block Designations

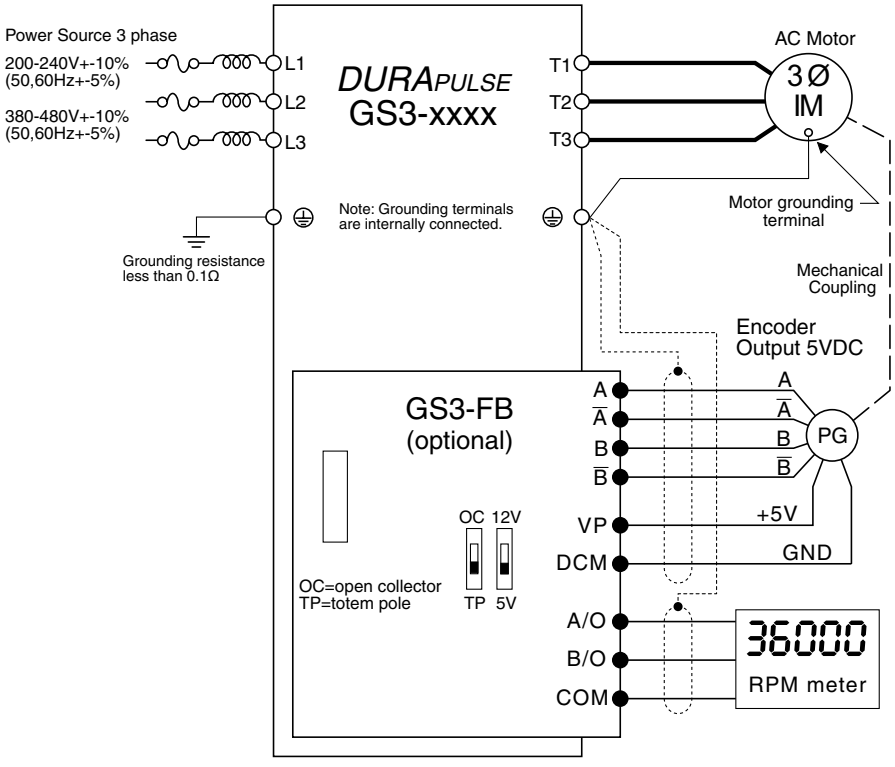


GS3-FB Basic Wiring Diagram – Open Collector type Encoder



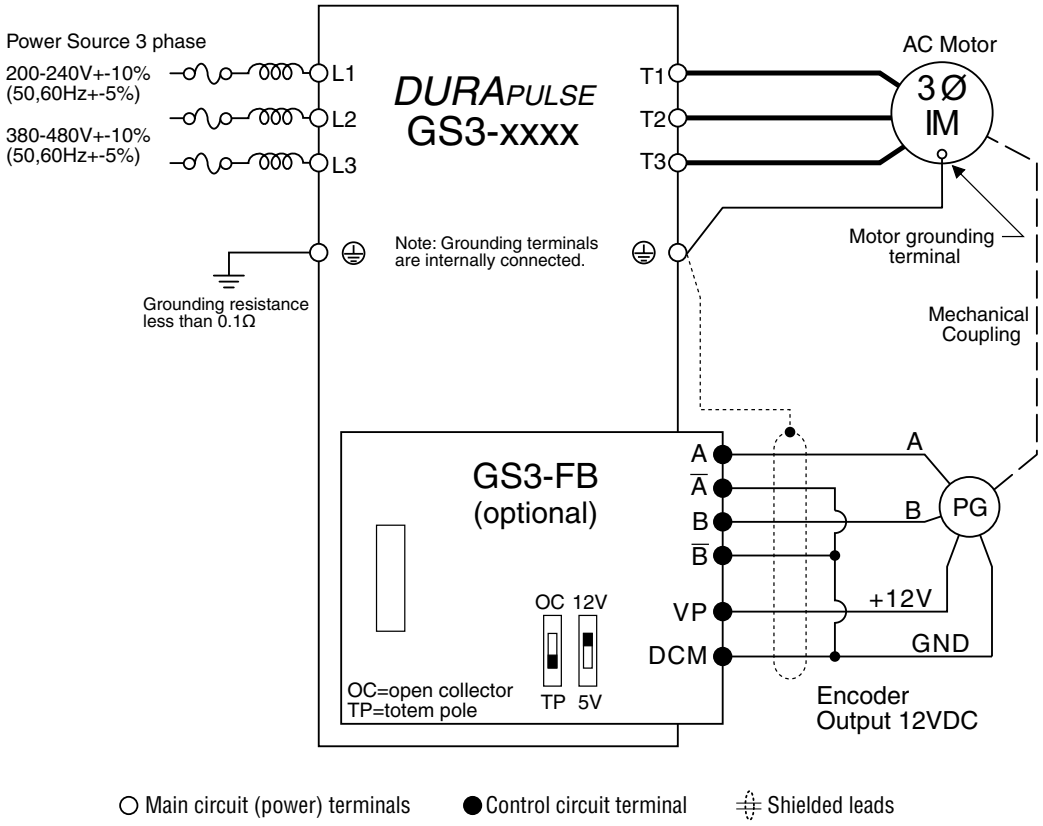
○ Main circuit (power) terminals ● Control circuit terminal ⫩ Shielded leads

GS3-FB Basic Wiring Diagram – Line Driver type Encoder with RPM Meter

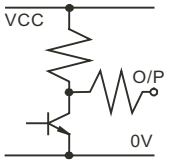
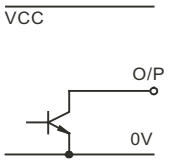
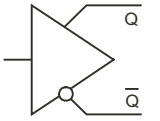
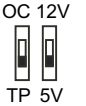
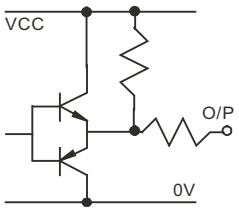


○ Main circuit (power) terminals ● Control circuit terminal ⫩ Shielded leads

GS3-FB Basic Wiring Diagram – Output Voltage or Complementary type Encoder



Types of Encoders and Dip Switch Settings

Types of Encoders		Switches SW1 and SW2	
		5V	12V
Output Voltage			
Open Collector			
Line Driver			
Complementary			

Ethernet Interface GS-EDRV(xxx)

GS-EDRV(xxx) Specifications			
Part Number	***Input Voltage***	***Input Current***	***Ethernet Communiation***
GS-EDRV	10-33 VDC	90-135 mA	10BaseT
GS-EDRV100	10-36 VDC	50-220 mA	10/100Mbps
Can be used with all DURApulse and other GS AC drives.			

GS-EDRV(xxx) Ethernet Interfaces provide low-cost, high-performance Ethernet links between control systems and any DURApulse or other GS-series AC Drives. With the appropriate cable connections and, if needed, Ethernet switches or hubs, the GS-EDRV(xxx) allows you to communicate with your AC drives over qualified Ethernet networks.

The control systems can be any of the following:

- *DL205 CPU, DL405 CPU, or a WinPLC, with the appropriate Ethernet Remote Master module (H2-ERM or H4-ERM).*
- *Productivity CPUs with Remote I/O Ethernet port.*
- *A PC running Entivity's ThinknDo software, a PC using a custom device driver that was developed using our Ethernet SDK, or a PC running KEPDirect EBC or OPC Server.*
- *Any independent I/O controller with a Modbus TCP/IP driver.*

The control function is performed by one of the control systems mentioned above. The I/O mapping function is performed by an H2(4)-ERM module (purchased separately). The H2(4)-ERM module is configured with the ERM Workbench Utility which is part of the DirectSOFT PLC programming software.

The functions of the GS-EDRV(xxx) interface are as follows:

- *process input signals from the AC drive.*
- *format these signals to conform to the Ethernet standard.*
- *transmit converted signals to the control system.*
- *receive and translate output signals from the control system.*
- *distribute the output signals to the appropriate drive.*
- *DIN-rail mounting.*
- *built-in web browser allows users to configure and control the drive from any web browser via the IP address of the GS-EDRV(xxx).*

The GS-EDRV(xxx) requires an external 24 VDC power supply.

The GS series drives have a provision for shutting down control or power to the drive in the event of a communications time-out. This function can be set up through the drive parameter group 9.

Refer to the "GS Series AC Drive Ethernet Interface User Manual" or www.AutomationDirect.com for detailed information.

*ZIP*Link™ Cables for RS-485 Modbus RTU

ZIPLink communication cables make it very easy to set up RS-485 Modbus RTU control of a single *DURA*PULSE GS3 AC drive from a DirectLOGIC DL06 or D2-260 PLC.

GS-485HD15-CBL-2

PLC Connections for RS-485 Modbus RTU Control of *DURA*PULSE GS3 Drives					
Drive	***PLC * or Device***	***PLC Port ****	***Communication***	***Direct Cable***	***Length***
*DURA*PULSE (GS3)	CLICK	3	RS-485	***ZL-RJ12-CBL-2P ******	2m [6.6 ft] ***
	DL05	2 **	RS-232 – RS-485 **	N/A **	
	DL06 D0-DCM	2	RS-485	***GS-485HD15-CBL-2 ******	2m [6.6 ft] ***
	D2-DCM D2-250(-1)	2 **	RS-232 – RS-485 **	N/A **	
	D2-260	2	RS-485	***GS-485HD15-CBL-2 ******	2m [6.6 ft] ***
	D4-450	3 **	RS-232 – RS-485 **	N/A **	
	FA-ISOCON		RS-485	***GS-ISOCON-CBL-2***	2m [6.6 ft] ***
	GS-EDRV100		RS-485	***GS-EDRV-CBL-2***	2m [6.6 ft] ***
	ZL-CDM-RJ12Xxx		RS-485	***GS-485RJ12-CBL-2***	2m [6.6 ft] ***

** If a PLC type or port is not listed in this chart, it cannot function as a Modbus RTU master.*
*** Requires RS-232–RS-485 converter & generic cabling options described in Ch5 "Modbus Communications".*
**** Termination resistors not required due to short cable length.*

In addition to these GS-specific cables, the ZIPLink product line also includes other components which can be useful for Modbus wiring, including distribution modules for wiring connections to multiple drives. For more information, refer to Ch5 "Modbus Communications" or to www.automationdirect.com/static/specs/fzipselection.pdf.

GS Drive Configuration Software

GSoft is the configuration software for the Automation Direct GS family of drives. It is designed to allow you to connect a personal computer to drives in the GS family, and perform a variety of functions:

- *Upload/download drive configurations*
- *Create new drive configurations using Quick Start, Detailed, or Schematic Views*
- *Edit drive configurations*
- *Archive/store multiple drive configurations on your PC*
- *Trend drive operation parameters*
- *Tune the drive PID loop*
- *View real time key operating parameters*
- *Start/Stop drive and switch directions, provided drive is set up for remote operation*
- *View drive faults*
- *Print a schematic representation of the drive configuration*
- *Print a tabular report of the current drive configuration.*

GSoft includes an integral help file with software instructions.

System Requirements

GSoft will run on PCs that meet the following requirements:

- *Windows 7 (32-bit, 64-bit), 8 (32-bit, 64-bit), 8.1 (32-bit, 64-bit), 10*
- *Internet Explorer 4.0 or higher (for HTML help support)*
- *24 Mb of available memory*
- *8Mb hard drive space*
- *Available RS-232 serial port*

GSoft requires use of a configuration cable, GS-232CBL, which is sold separately.
RS-485 communication from an RS-232 PC port requires an FA-ISOCON or compatible converter, which is sold separately.

Miscellaneous Accessories

Configuration Cable

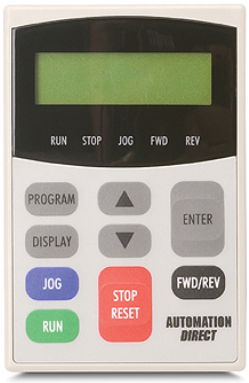
GS-232CBL

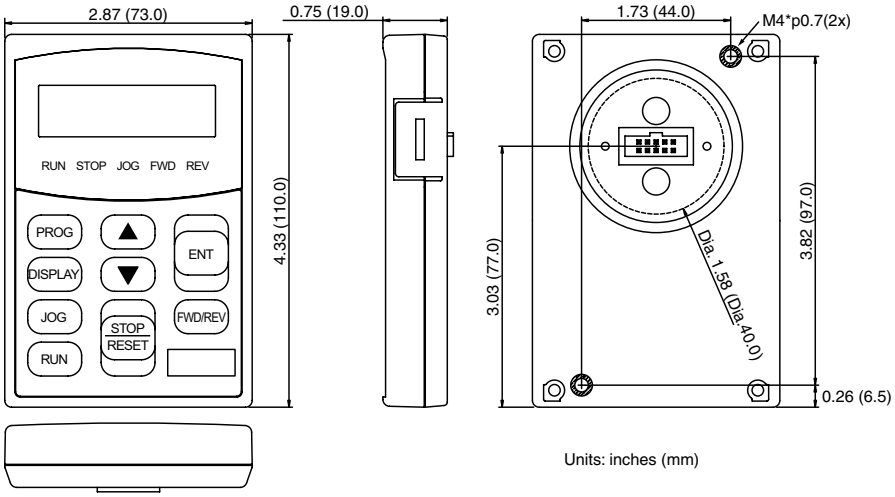
Required programming cable for GSOFT software.

Spare Keypad

GS3-KPD

Spare or replacement keypad for *DURAPULSE* GS3 AC drives.





Keypad Cables

GS-CBL2-1L, GS-CBL2-3L, GS-CBL2-3L

GS-CBL2-1L
1 meter keypad cable
(installation screws included)

GS-CBL2-3L
3 meter keypad cable
(installation screws included)

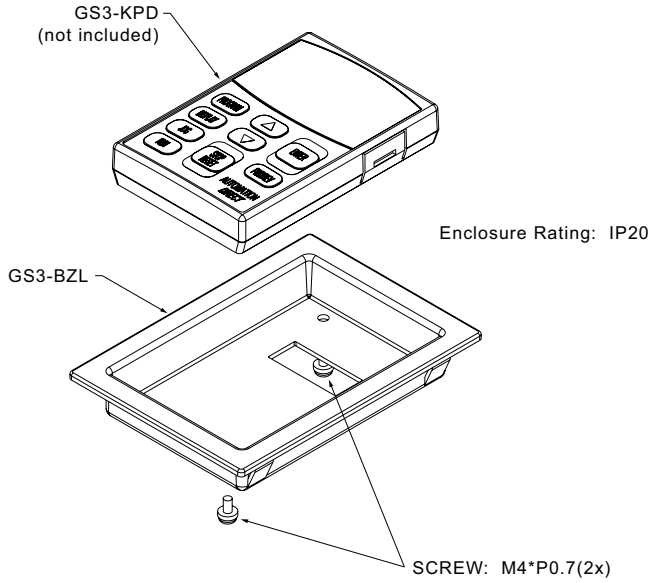
GS-CBL2-5L
5 meter keypad cable
(installation screws included)

Remote Panel Adapter

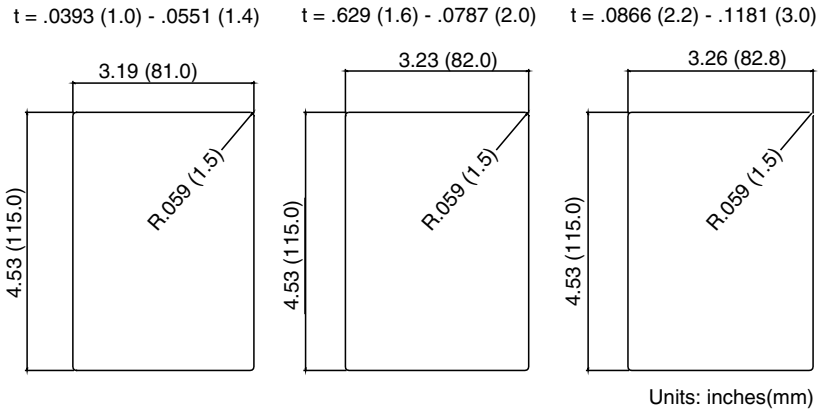
GS3-BZL

For remote mounting of *DURAPULSE* GS3 removable keypad.

Mounting Instructions



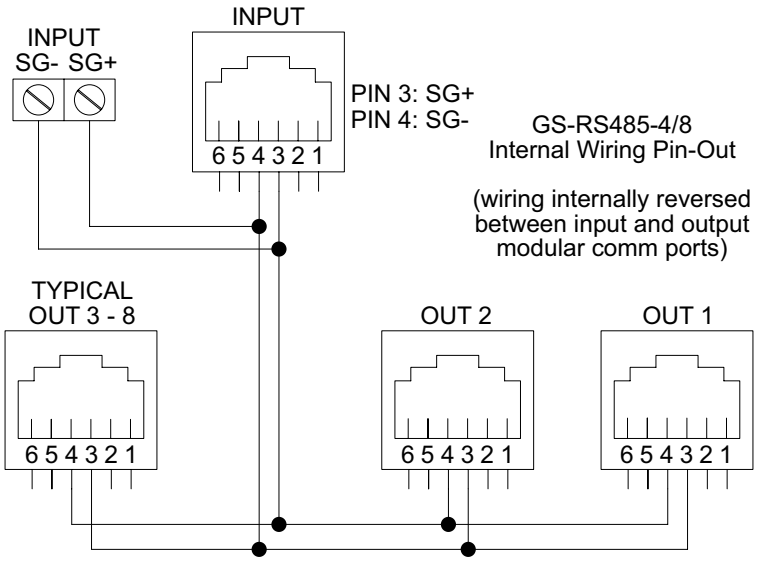
The thickness of the panel will determine required screw hole dimensions:



Communication Distribution Blocks – Legacy GS Series

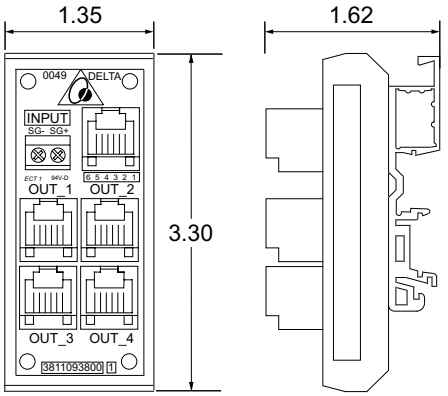
(Do not use for new installations. For new installations, please consider AutomationDirect ZIPLink ZL-CDM-RJ12Xxx distribution modules.)

Using the RS-485 communication board (GS-RS485-4 or GS-RS485-8) provides an easy means to break out the RS-485 signal to several drives at one location. This is a star configuration, but the transmission errors are negligible, so this configuration is acceptable for proper operation of the VFDs.



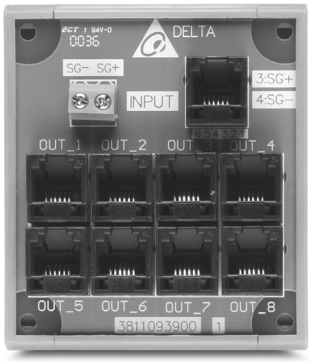
GS-RS485-4

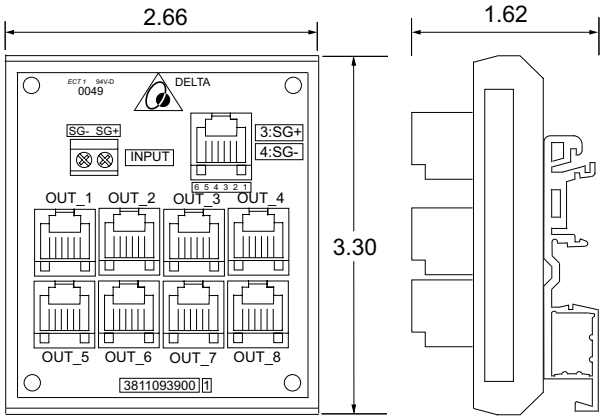
4-port RS485 Communication Distribution Board



GS-RS485-8

8-port RS485 Communication Distribution Board





Replacement Accessories – Cooling Fans

All *DURAPULSE* GS3 AC drives have built-in cooling fans, and replacement fans are also available. These fans are direct replacements for the internal factory-installed fans.

Installation instructions are included with the fans.

FAN REPLACEMENT SHOULD ONLY BE PERFORMED BY PERSONNEL SKILLED IN THE DISASSEMBLY AND REPAIR OF VARIABLE FREQUENCY AC DRIVES.

Replacement Fans for *DURAPULSE* (GS3 Series) AC Drives				
Part Number (1)	***Specifications*** (2)	***Fans / Drive*** (3)	***GS3 Drive Model*** (4)	***Drive V / HP***
GS-FAN-1	50 mm, 12 VDC, 0.25A	1	GS3-43P0	460 / 3
GS-FAN-2	60 mm, 12 VDC, 0.25A	1	GS3-23P0 GS3-25P0 GS3-45P0	230 / 3 230 / 5 460 / 5
GS-FAN-3	80 mm, 12 VDC, 0.42A	2	GS3-27P5 GS3-2010 GS3-2015 GS3-47P5 GS3-4010 GS3-4015	230 / 7.5 230 / 10 230 / 15 460 / 7.5 460 / 10 460 / 15
GS-FAN-4	92 mm, 24 VDC, 0.30A	2	GS3-2020 GS3-2025 GS3-2030 GS3-4020 GS3-4025 GS3-4030	230 / 20 230 / 25 230 / 30 460 / 20 460 / 25 460 / 30
GS-FAN-5	120 mm, 24 VDC, 1.2A	2	GS3-2040 GS3-2050 GS3-4040 GS3-4050 GS3-4060 GS3-4075 GS3-4100	230 / 40 230 / 50 460 / 40 460 / 50 460 / 60 460 / 75 460 / 100

1) One fan per part number. Includes connectorized electrical cable and installation instructions.
2) Fans are replacements for the internal fans in GS3 drives, are dimensionally and electrically equivalent to the originals, and are not intended for other use. Fan electrical loading is included in the input amperage ratings of the drives, and DC voltage is internally provided by the drives.
3) Some drives require multiple fans.
4) Can be used only with applicable DURAPULSE GS3 AC Drive.

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