

# ACCESSORIES

## B.1 Non-fuse Circuit Breaker Chart

Per UL 508C, paragraph 45.8.4, part a,

For 3-phase drives, the current rating of the breaker shall be four times maximum of output current rating.

**(Note: According to our experience, we suggest to use 1.5 – 2 times maximum of output current rating.)**

3-phase			
Model	Output Current (A)	Model	Output Current (A)
VFD007V23A	5	VFD150V23A	65
VFD007V43A	3	VFD150V43A	32
VFD015V23A	7.5	VFD185V23A	75
VFD015V43A	4.2	VFD185V43A	38
VFD022V23A	11	VFD220V23A	90
VFD022V43A	6	VFD220V43A	45
VFD037V23A	17	VFD300V23A	120
VFD037V43A	8.5	VFD300V43A	60
VFD055V23A	25	VFD370V23A	146
VFD055V43A	13	VFD370V43A	73
VFD075V23A	33	VFD450V43A	91
VFD075V43A	18	VFD550V43A	110
VFD110V23A	49	VFD750V43A	150
VFD110V43A	24		

## Fuse Specification Chart (Smaller fuses than those shown in the table are permitted.)

Model	Input Current (A)	Output Current (A)	Line Fuse	
			I (A)	Bussmann P/N
VFD007V23A	6.4	5	20	JJN-20
VFD007V43A	4	3	10	JJS-10
VFD015V23A	10	7.5	30	JJN-30
VFD015V43A	5.7	4.2	15	JJS-15
VFD022V23A	14.9	11	40	JJN-40
VFD022V43A	7.3	6	20	JJS-20
VFD037V23A	21.2	17	60	JJN-60
VFD037V43A	9.9	8.5	30	JJS-30
VFD055V23A	25.2	25	100	JJN-100
VFD055V43A	12.2	13	50	JJS-50
VFD075V23A	33.2	33	125	JJN-125
VFD075V43A	17.2	18	70	JJS-70
VFD110V23A	58	49	175	JJN-175
VFD110V43A	25	24	90	JJS-90
VFD150V23A	69	65	250	JJN-250
VFD150V43A	32	32	125	JJS-125
VFD185V23A	83	75	300	JJN-300

Model	Input Current (A)	Output Current (A)	Line Fuse	
			I (A)	Bussmann P/N
VFD185V43A	39	38	150	JJS-150
VFD220V23A	100	90	350	JJN-350
VFD220V43A	49	45	175	JJS-175
VFD300V23A	120	120	450	JJN-450
VFD300V43A	60	60	225	JJS-225
VFD370V23A	146	146	500	JJN-500
VFD370V43A	73	73	250	JJS-250
VFD450V43A	91	91	350	JJS-350
VFD550V43A	130	110	400	JJS-400
VFD750V43A	175	150	600	JJS-600

## B.2 All Braking Resistors & Braking Units Use in AC Drives

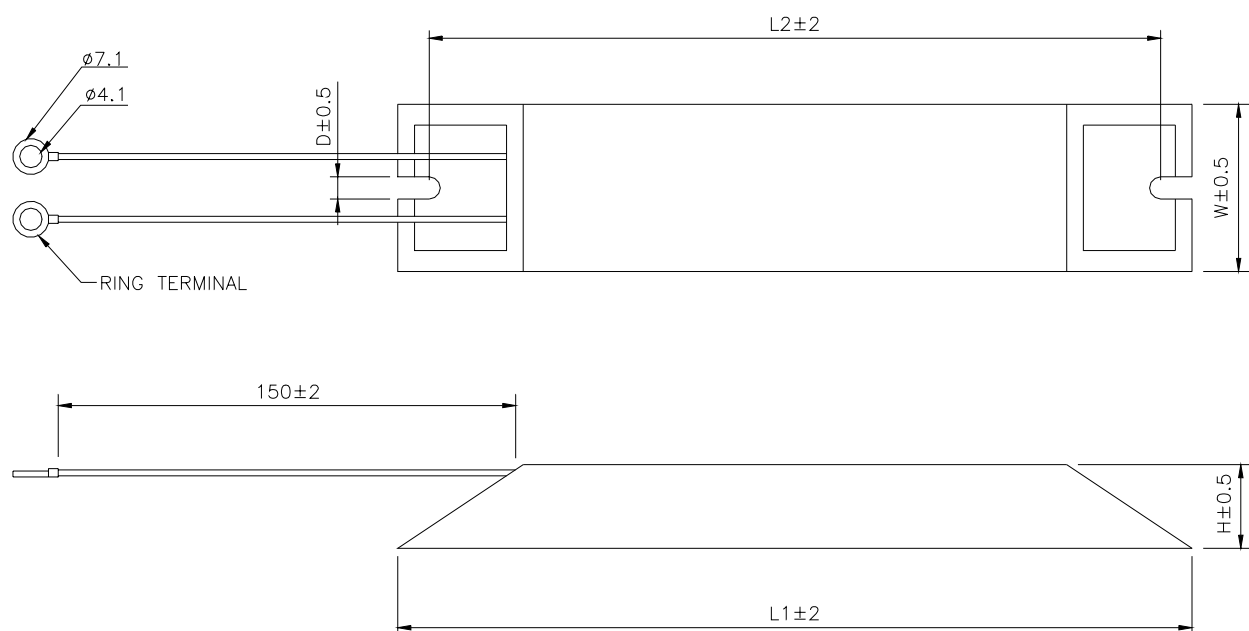
Note: Please only use DELTA resistors and recommended values. Other resistors and values will void Delta's warranty. Please contact your nearest Delta representative for use of special resistors. For instance, in 460 V series, 100 HP, AC drive has 2 braking units with total of 16 braking resistors, so each braking unit uses 8 braking resistors. There should be at least 10 cm away from AC drive to avoid possible noise. Refer to the "Braking Unit Module User Manual" for further detail.

Voltage	Applicable Motor		Full Load Torque KG-M	Equivalent Resistors Specification for Each AC Drive	Braking Unit Model VFDB No. of Unit Used		Braking Resistors Model No. of Units Used		Braking Torque 10%ED	Minimum Equivalent Resistor Value for Each AC Drive
	HP	kW								
230V Series	1	0.75	0.427	80W 200Ω			BR080W200	1	125	80Ω
	2	1.5	0.849	300W 100Ω			BR300W100	1	125	55Ω
	3	2.2	1.262	300W 70Ω			BR300W070	1	125	35Ω
	5	3.7	2.080	400W 40Ω			BR400W040	1	125	25Ω
	7.5	5.5	3.111	500W 30Ω			BR500W030	1	125	16Ω
	10	7.5	4.148	1000W 20Ω			BR1K0W020	1	125	12Ω
	15	11	6.186	2400W 13.6Ω			BR1K2W6P8	2	125	13.6Ω
	20	15	8.248	3000W 10Ω	2015	1	BR1K5W005	2	125	10Ω
	25	18.5	10.281	4800W 8Ω	2022	1	BR1K2W008	4	125	8Ω
	30	22	12.338	4800W 6.8Ω	2022	1	BR1K2W6P8	4	125	6.8Ω
	40	30	16.497	6000W 5Ω	2015	2	BR1K5W005	4	125	5Ω
	50	37	20.6	9600W 4Ω	2015	2	BR1K2W008	8	125	4Ω
460V Series	1	0.75	0.427	80W 750Ω			BR080W750	1	125	260Ω
	2	1.5	0.849	300W 400Ω			BR300W400	1	125	190Ω
	3	2.2	1.262	300W 250Ω			BR300W250	1	125	145Ω
	5	3.7	2.080	400W 150Ω			BR400W150	1	125	95Ω
	7.5	5.5	3.111	500W 100Ω			BR500W100	1	125	60Ω
	10	7.5	4.148	1000W 75Ω			BR1K0W075	1	125	45Ω
	15	11	6.186	1000W 50Ω			BR1K0W050	1	125	50Ω
	20	15	8.248	1500W 40Ω	4030	1	BR1K5W040	1	125	40Ω
	25	18.5	10.281	4800W 32Ω	4030	1	BR1K2W008	4	125	32Ω
	30	22	12.338	4800W 27.2Ω	4030	1	BR1K2W6P8	4	125	27.2Ω
	40	30	16.497	6000W 20Ω	4030	1	BR1K5W005	4	125	20Ω
	50	37	20.6	9600W 16Ω	4045	1	BR1K2W008	8	125	16Ω
	60	45	24.745	9600W 13.6Ω	4045	1	BR1K2W6P8	8	125	13.6Ω
	75	55	31.11	12000W 10Ω	4030	2	BR1K5W005	8	125	10Ω
	100	75	42.7	19200W 6.8Ω	4045	2	BR1K2W6P8	16	125	6.8Ω

### Note:

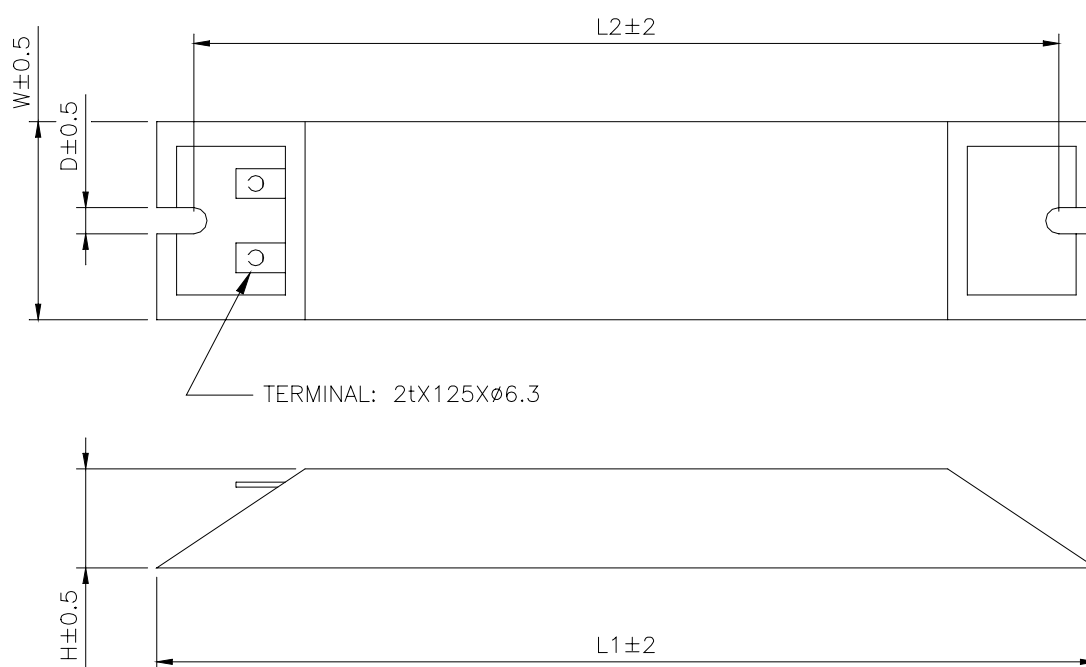
1. Please select the factory default resistance value (Watt) and the frequency value (ED%).
2. If damage resulted in the drive or other equipments due to the fact that the braking resistors and the braking modules in use are not provided by DELTA, the warranty will be void.
3. Take into consideration the safety of the environment when installing the braking resistors.
4. If the minimum resistance value is to be utilized, consult local dealers for the calculation of the Watt figures.
5. Please select thermal relay trip contact to prevent resistor over load.
6. When using more than 2 braking units, equivalent resistor value of parallel braking unit can't be less than the value in the column "Minimum Equivalent Resistor Value for Each AC Drive" (the right-most column in the table).

## Braking Resistors & Braking Units



TYPE	L1	L2	H	D	W	MAX. WEIGHT (g)
MHR200W120	165	150	20	5.3	40	240
MHR400W120	165	150	20	5.3	40	240
BR080W200	140	125	20	5.3	60	160
BR080W750	140	125	20	5.3	60	160
BR300W070	215	200	30	5.3	60	750
BR300W100	215	200	30	5.3	60	750
BR300W250	215	200	30	5.3	60	750
BR300W400	215	200	30	5.3	60	750
BR400W150	265	250	30	5.3	60	930
BR400W040	265	250	30	5.3	60	930

## Braking Resistors & Braking Units

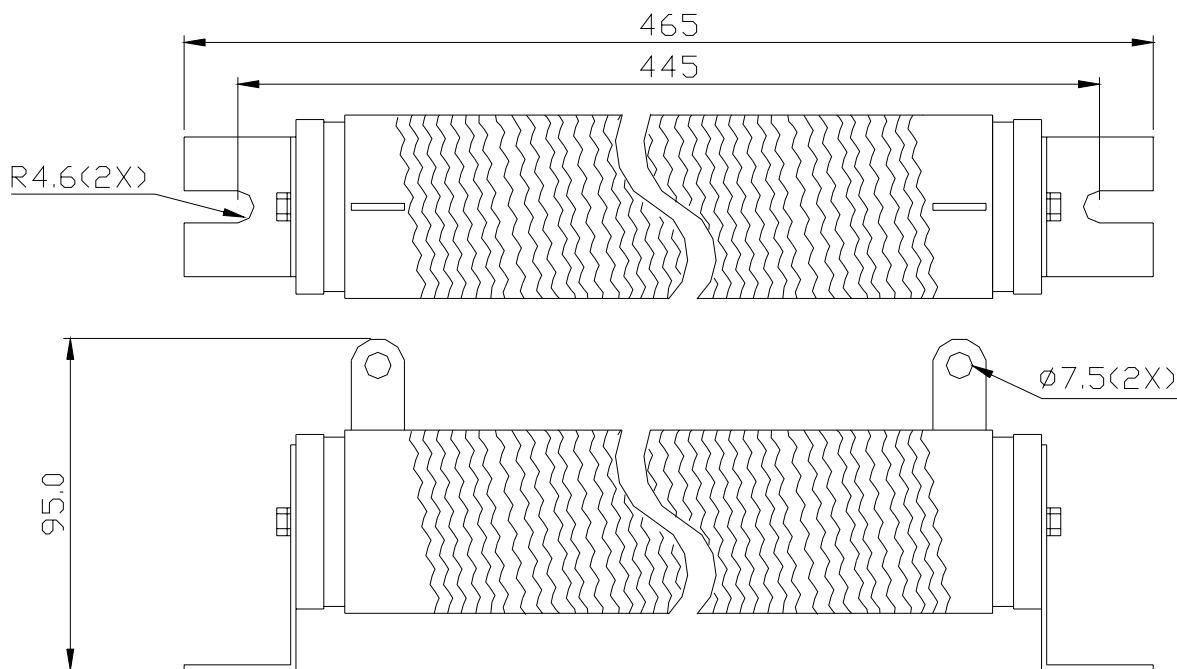


TYPE	L1	L2	H	D	W	MAX. WEIGHT (g)
MHR025W500	335	320	30	5.3	60	1100
MHR050W500	335	320	30	5.3	60	1100
MHR100W500	335	320	30	5.3	60	1100
BR500W030	335	320	30	5.3	60	1100
BR500W100	335	320	30	5.3	60	1100
BR1K0W020	400	385	50	5.3	100	2800
BR1K0W075	400	385	50	5.3	100	2800

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## Braking Resistors & Braking Units

Braking resistors model no.: BR1K0W050, BR1K2W008, BR1K2W6P8, BR1K5W005,  
BR1K5W040

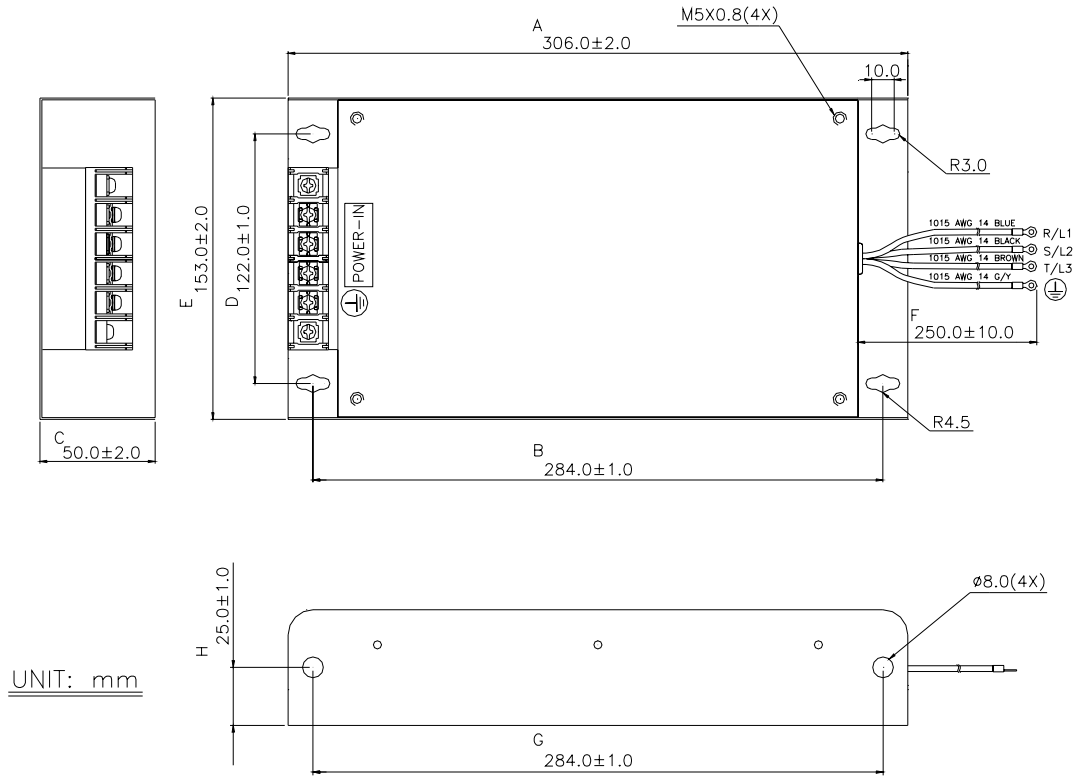


### B.3 AMD - EMI Filter Cross Reference

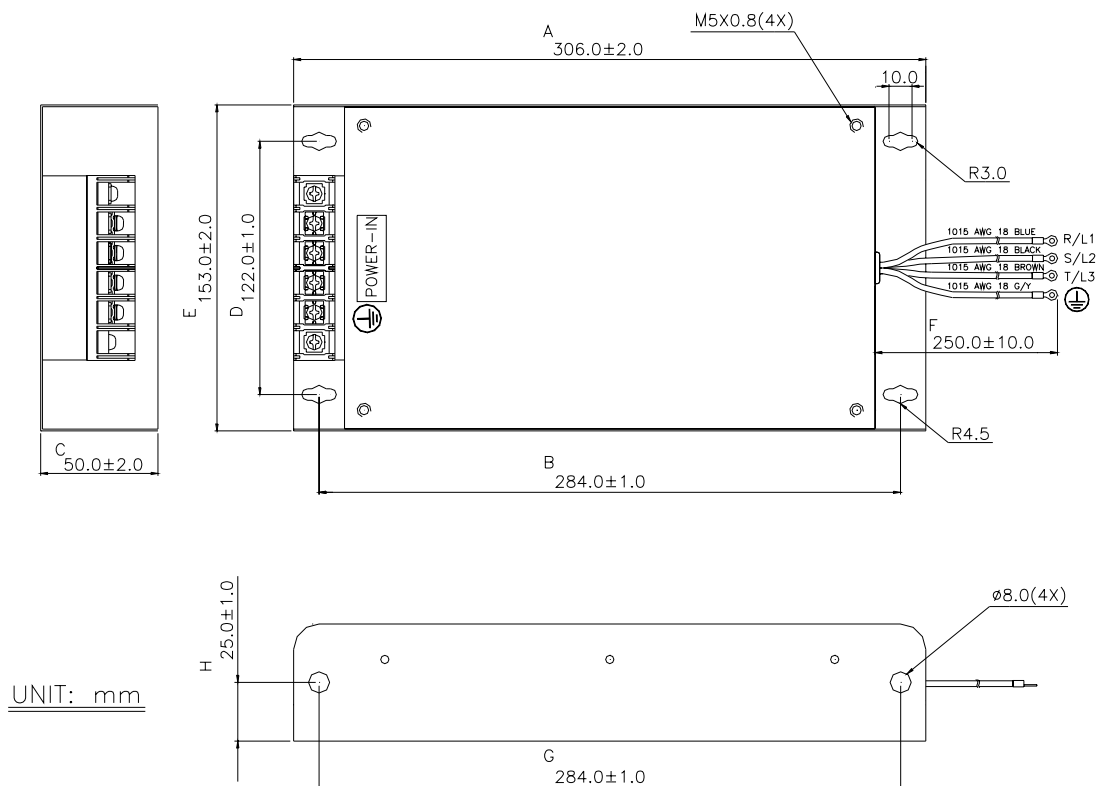
Model of AC Motor Drive	EMI Filter with choke				EMI Filter w/o choke
	Filter	Output chock	QTY	Turn	
VFD007V23A, VFD015V23A, VFD022V23A, VFD037V23A	--	--	--	--	26TDT1W4C
VFD007V43A, VFD015V43A, VFD022V43A, VFD037V43A	--	--	--	--	15TDT1W44
VFD055V23A, VFD075V23A, VFD110V43A	--	--	--	--	50TDS4W4V4
VFD110V43B	--	--	--	--	26TDT1W4B4
VFD150V43A, VFD185V43A	--	--	--	--	50TDS4W4C
VFD110V23A, VFD150V23A, VFD220V43A, VFD300V43A, VFD370V43A	--	--	--	--	100TDS84C
VFD185V23A, VFD220V23A, VFD300V23A, VFD450V43A	--	--	--	--	150TDS84C
VFD370V23A, VFD550V43A	--	--	--	--	180TDS84C
VFD750V43A	--	--	--	--	200TDDS84C

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## EMI Filters (26TDT1W4C) Use on 1-5 HP, 230V, Three phase Models

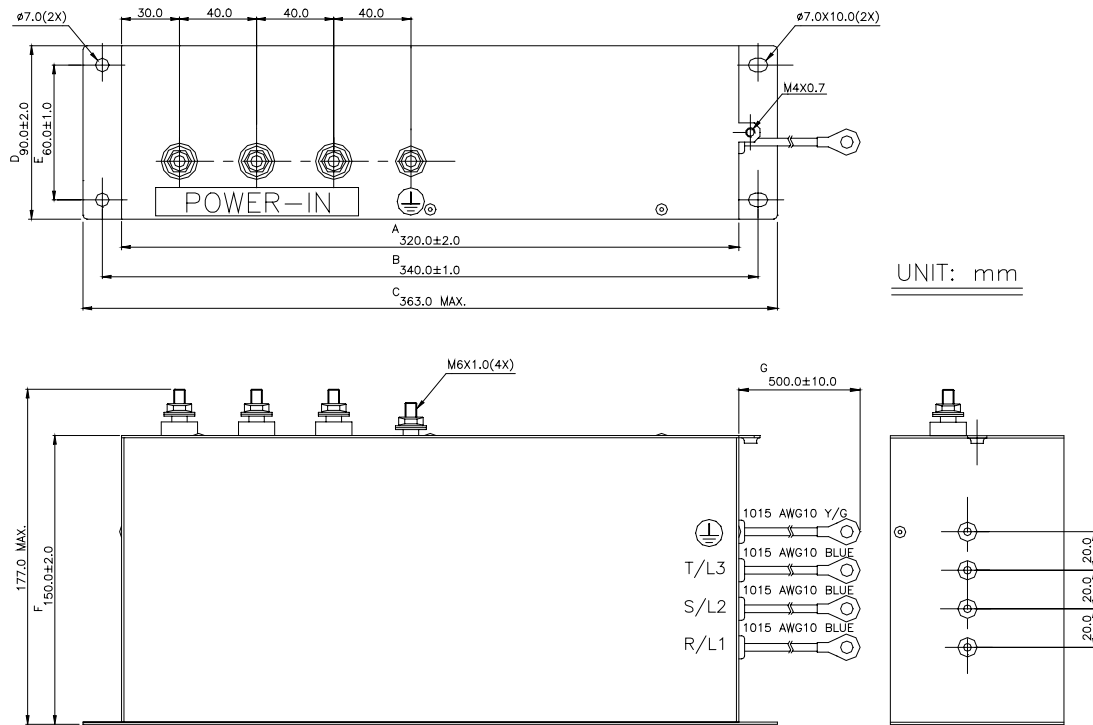


## EMI Filters (15TDT1W44) Use on 1-5 HP, 460V, Three phase Models

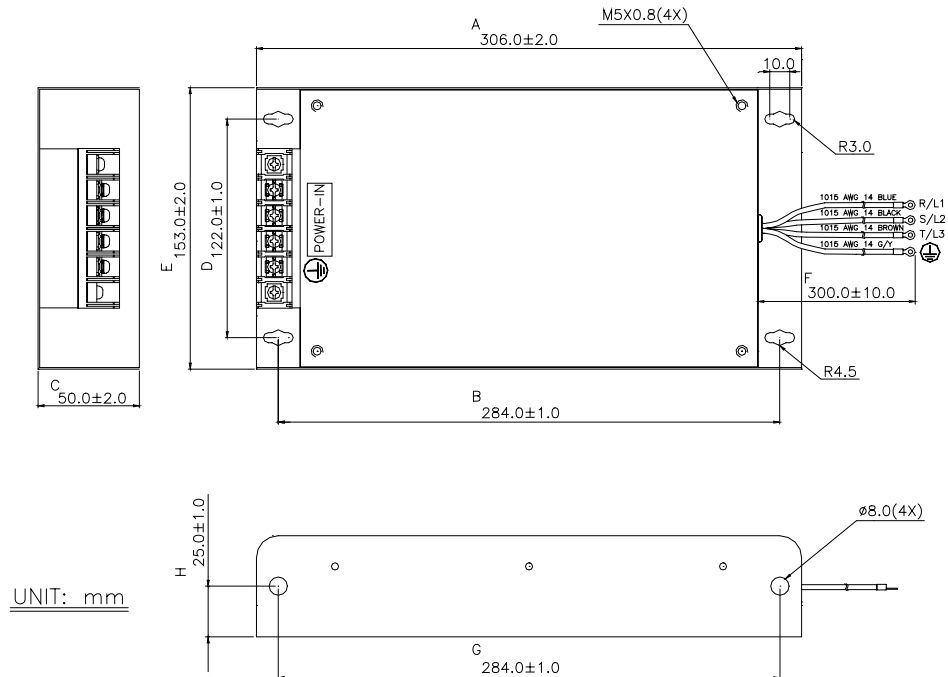




## EMI Filters (50TDS4W4V4) Use on 7.5-10HP/230V, VFD110V43A, Three phase Models

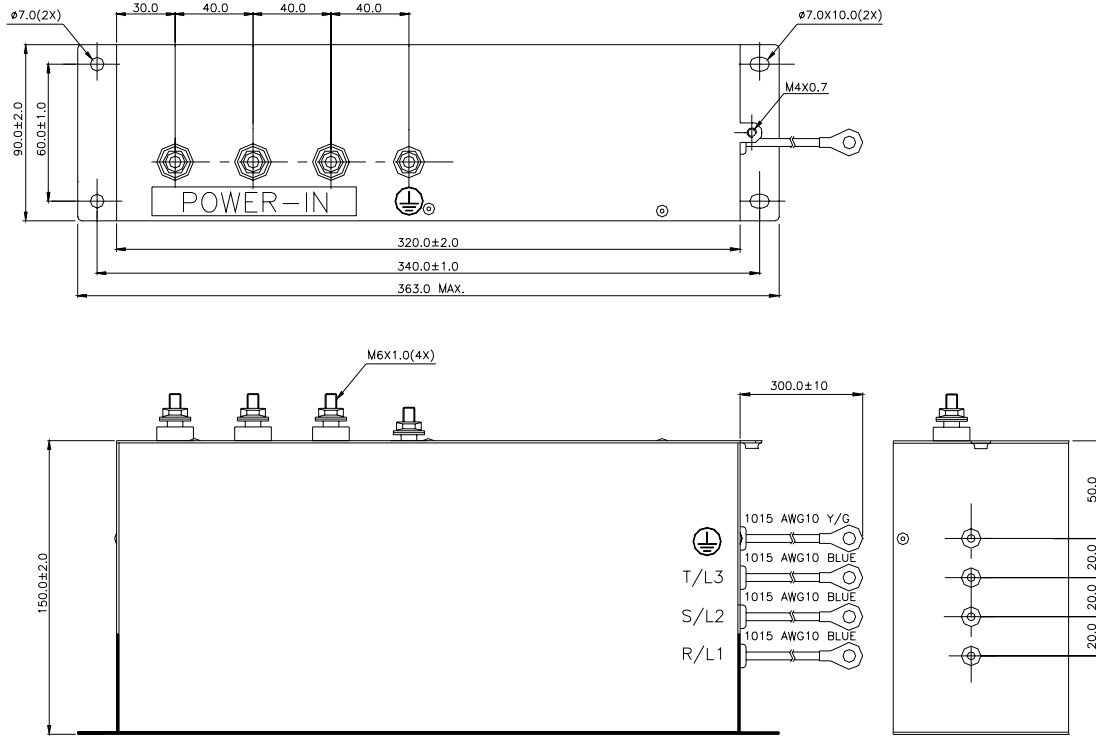


## EMI Filters (26TDT1W4B4) Use on VFD110V43B

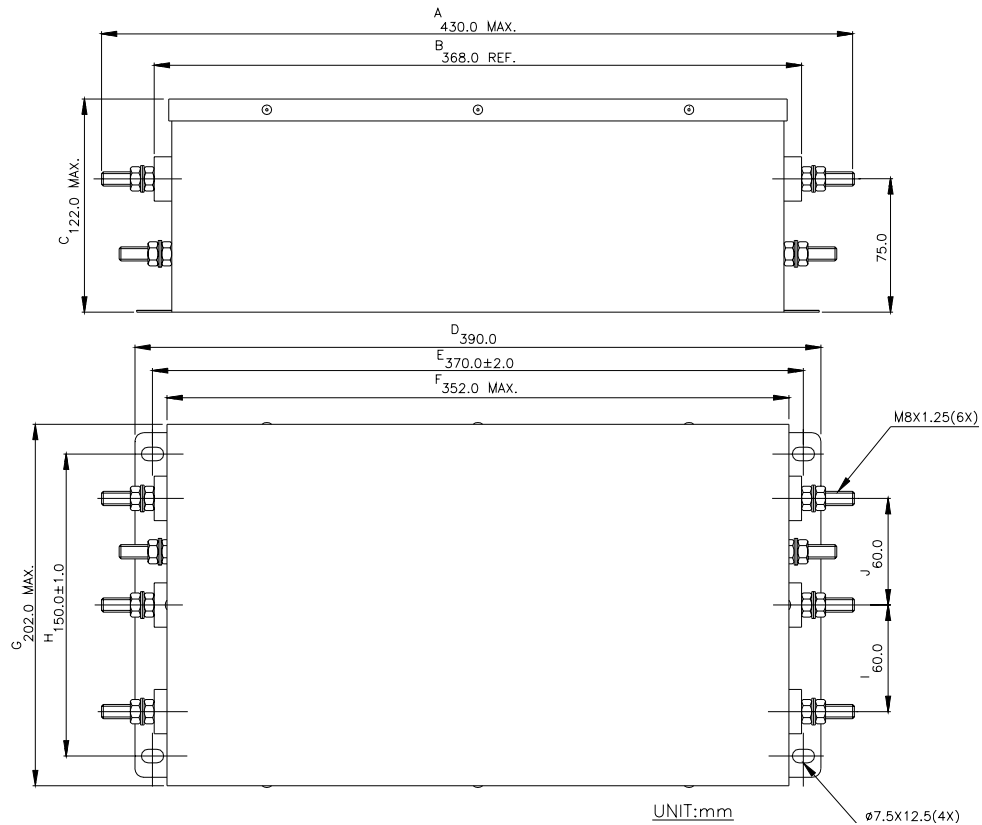


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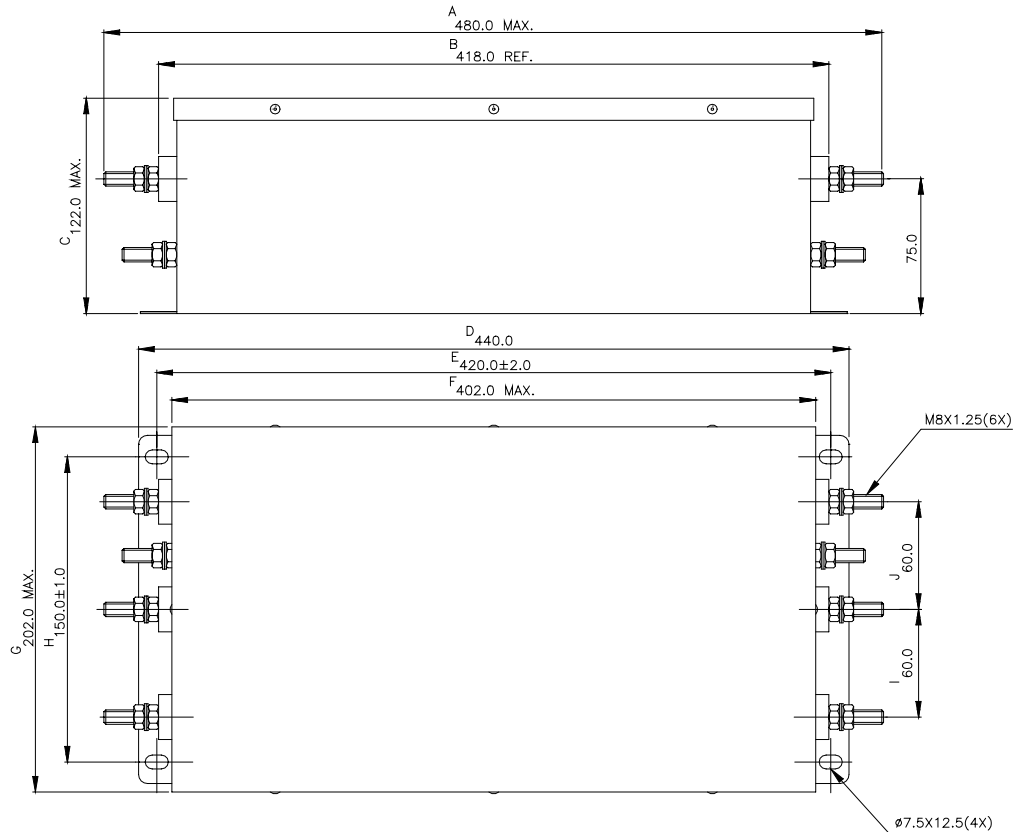
## EMI Filters (50TDS4W4C) Use on 20-25 HP, 430V, Three phase Models



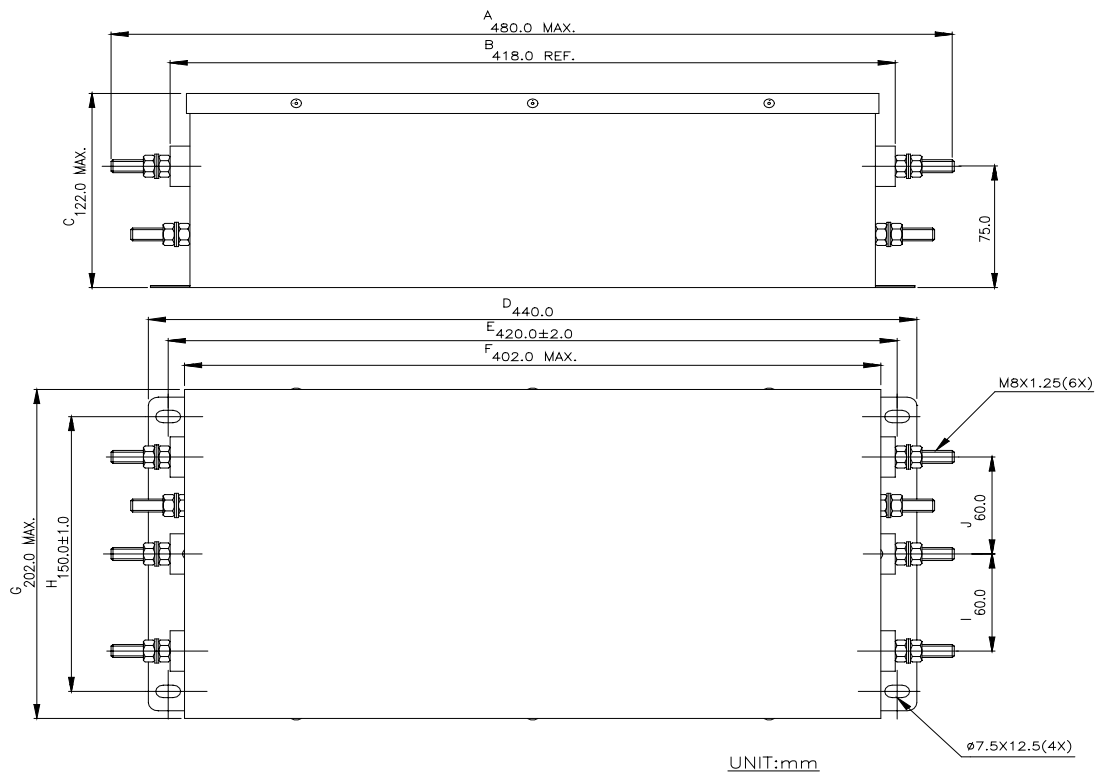
## EMI Filters (100TDS84C) Use on 15-20 HP, 230V & 30-50 HP, 430V, Three phase Models



## EMI Filters (150TDS84C) Use on 25-40 HP, 230V & 60HP, 430V, Three phase Models

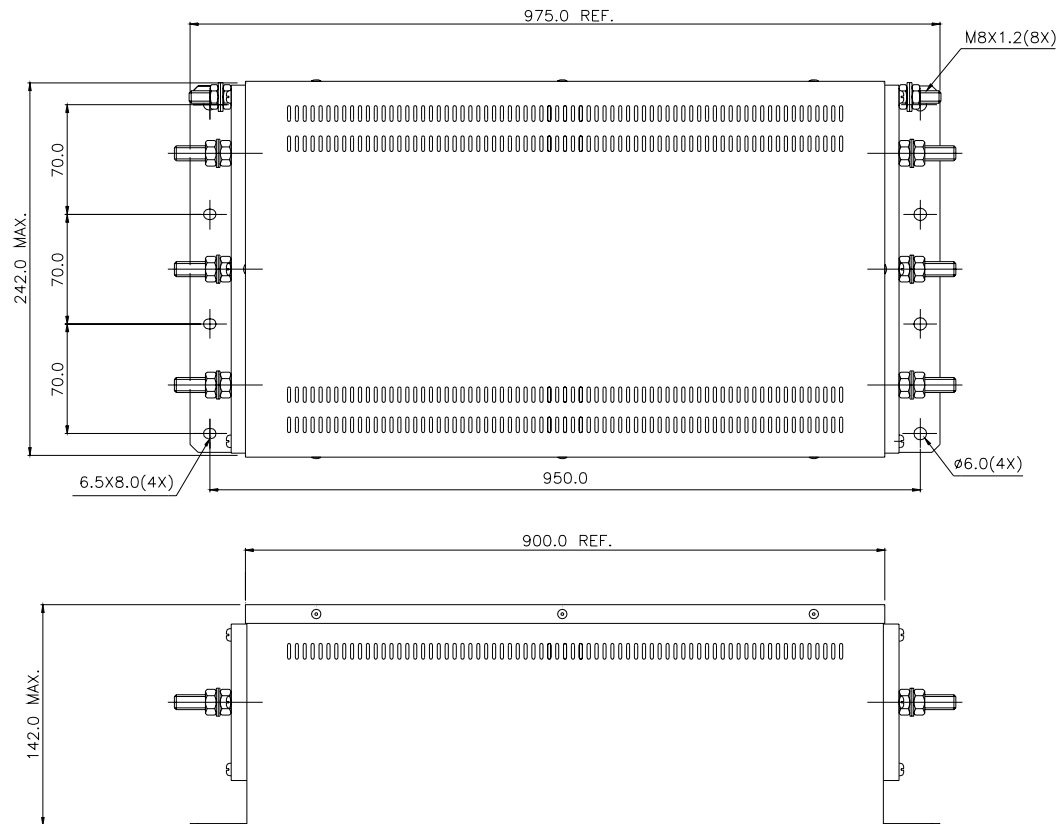


## EMI Filters (180TDS84C) Use on 50 HP, 230V & 60 HP, 430V, Three phase Models



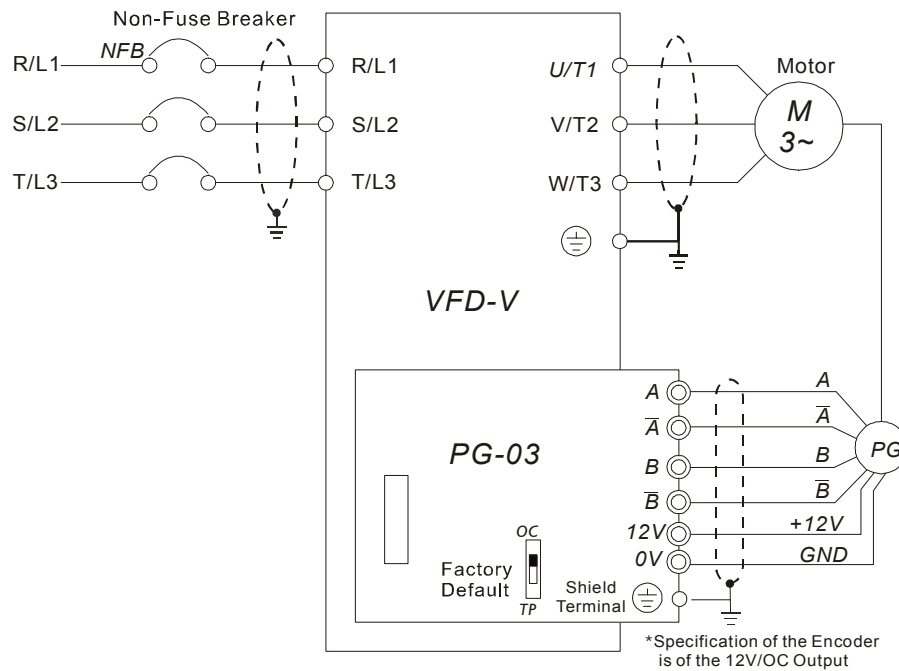
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## EMI Filters (200TDDS84C) Use on 100 HP, 430V, Three phase Models



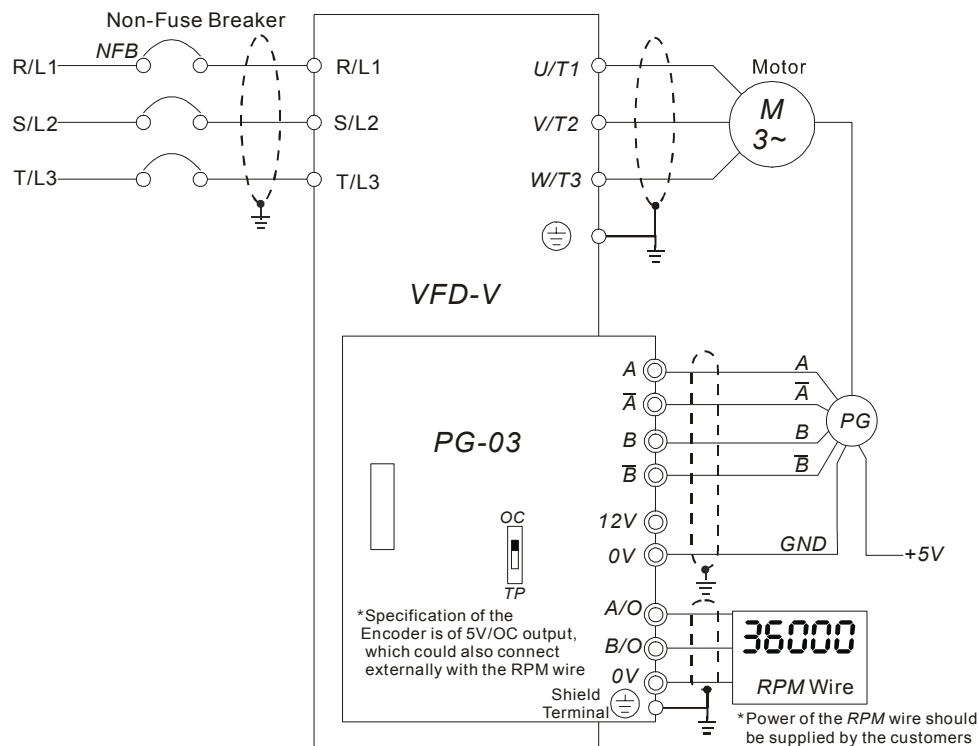
## B.4 PG Card

### Wiring Diagram



Connection between PG-03 and the Encoder


Connect Externally with the Encoder of 5V Power Supply and Output Signals to Additional Tachometer



Connection between PG-03 and the Encoder

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### B.4.1 Explanations on the PG Card Terminals

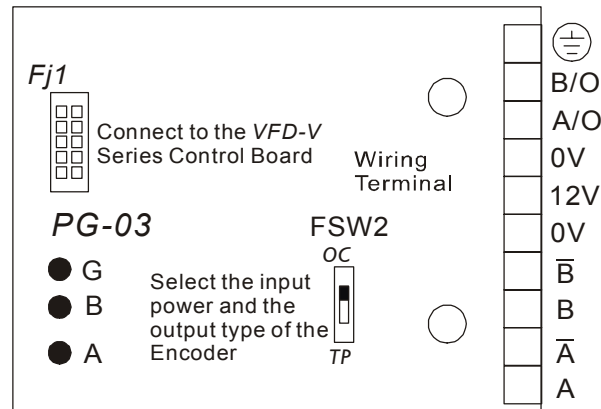
Terminals	Explanation
12V	Power Supply of the Encoder: +12V Output Voltage: +12V±5% 200mA
0V	Common point for the power supply and the signal
A- $\overline{A}$ , B- $\overline{B}$	Encoder signal input (select the output type of the Encoder from FSW2) Both single-phase input and two-phase input available Maximum: 500KP/Sec
A/O, B/O	The Encoder signal output Maximum: DC24V 300mA
	Common point for signal grounding

### B.4.2 Wiring Notes

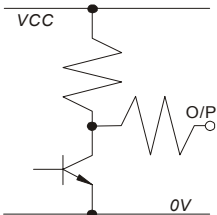

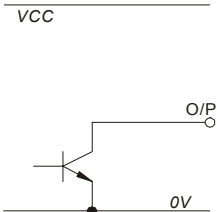

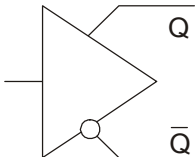

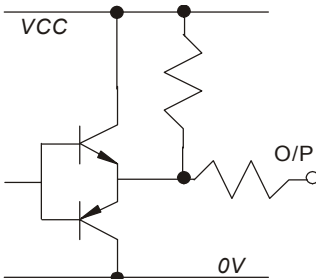

1. Use the shielded isolated wire to prevent interference, and do not line up in parallel with circuits of AC200V or above.
2. The shielded end of the isolated wire should connect to the “DCM” terminal.
3. Recommended wire size: 0.21~0.81mm<sup>2</sup>(AWG24~AWG18).
4. Wire length:

The Output Types of the Encoder	Maximum Wire Length	Wire Gauge
Voltage	50m	1.25mm <sup>2</sup> (AWG18) or above
Open Collector	50m	
Line Driver	300m	
Complementary	70m	

### B.4.3 Exterior of PG-03



### B.4.4 The Output Types to Accommodate the Encoder

Output Types of the Encoder		FSW2 Switch
Voltage		
Open collector		
Line driver		
Complementary		

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### B.4.5 VFD-V & VFD-B Series Speed Regulation Comparison

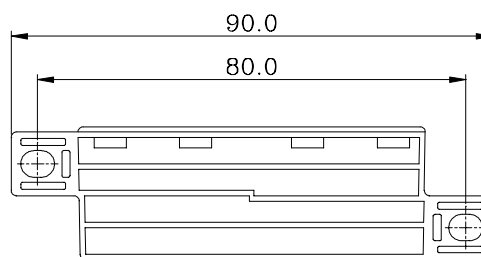
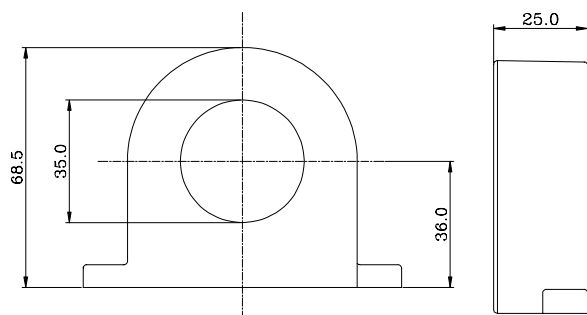
Char. \ Series	VFD-V		VFD-B	
	Sensorless-Vector Mode (without PG)	Flux Vector Mode (with PG)	Without PG	With PG
Speed Control Range	1:100	1:1000	1:40	1:40
Speed Regulation	$\pm 0.2\%$	$\pm 0.02\%$	$\pm 3\%$	$\pm 0.05\%$
Initial Speed	150% at 1Hz	150% at 0 RPM	150% at 3Hz	

Note: The speed regulation is based on rated speed.



## B.5 Zero Phase Reactor (RF220X00A)

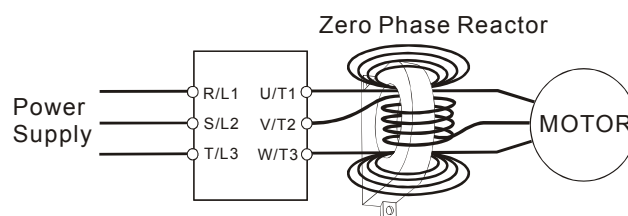
### Dimension



	Motor		Qty.	Recommended Wire Size (mm <sup>2</sup> )	Wiring Method
	HP	kW			
230 V Series	1/4	0.2	1	0.5 - 5.5	Diagram A
	1/2	0.5			
	1	0.75			
	2	1.5			
	3	2.2			
	5	3.7	4	5.5	Diagram B
	7.5	5.5			
	10	7.5			
	15	11			
	20	15			
25	18.5				
30	22				
40	30				
50	37	38 - 100			
460 V Series	1/4	0.2	1	0.5 - 5.5	Diagram A
	1/2	0.5			
	1	0.75			
	2	1.5			
	3	2.2			
	5	3.7	4	5.5	Diagram B
	7.5	5.5			
	10	7.5			
	15	11			
	20	15			
	25	18.5			
	30	22			
	40	30			
	50	37			
	60	45			
75	55				
100	75	38 - 100			

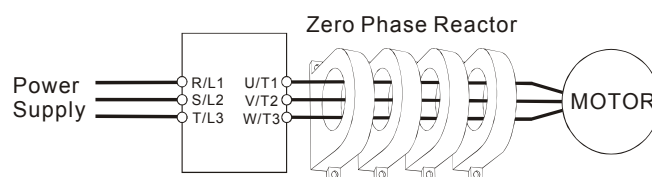
### Diagram A

Please wind each wire **4 times** around the core. The reactor must be put at inverter side as close as possible.



### Diagram B

Please put all wires through 4 cores in series without winding.



**B**