

FSB series(10,20,30A)

FSB -30 -324 -□

① ② ③ ④



The terminal cover is retracted inside the unit

Features of FSB series

EMI/EMC Filter for motor drive system (AC servo)

- Improve saturation resistance (There is such as performance improvement type “-254-HU”)
 - Book type (Space-saving type)
 - Quick and easy push-down terminal
- Just connect the wires, push-down and tighten the screws with a screwdriver

- ① Model Name
② Rated Current
③ Line to ground capacitor code: See table 1.1.

table 1.1 Line to ground capacitor code

Code	Leakage Current *1 Upper row : Δ-connection Lower row : Y-connection	Line to ground capacitor CY1 (nominal value)	Line to ground capacitor CY2 (nominal value)
203	1.0mA/2.0mA max 0.1mA/0.2mA max	0.01μF	0.01μF
573 *2	2.5mA max/Not applicable 0.35mA max/Not applicable	0.01μF	0.047μF
693	2.5mA/5.0mA max 0.35mA/0.7mA max	0.022μF	0.047μF
104	3.5mA/7.0mA max 0.5mA/1.0mA max	0.033μF	0.068μF
254 *2	12mA max/Not applicable 1.5mA max/Not applicable	0.033μF	0.22μF
324	12mA/24mA max 1.5mA/3.0mA max	0.1μF	0.22μF
335 *2	160mA max/Not applicable 20mA max/Not applicable	0.033μF	3.3μF
355	180mA/270mA max 25mA/50mA max	0.22μF	3.3μF

* When the line to ground capacitor code is different, the attenuation characteristic is different.

*1 Input 250/500V 60Hz (Only Δ-connection of “355” is 250/400V 60Hz)
*2 Only “U” type is applied.

④ Option
H: Ultra high-attenuation type
U: Improve differential mode attenuation (Rated voltage 250V)
Only “573”, “254”, “335” is applied.

Specifications

No.	Items	FSB-10-324	FSB-20-324	FSB-30-324
1	Rated Voltage[V]	AC Three Phase 500 (voltage range: 528 max) 50/60Hz *3 *4		
2	Rated Current[A]	10	20	30
3	Test Voltage (Terminal-Mounting Plate)	2,800 VDC (Cutoff Current = 10mA), 1minute at room temperature and humidity *5		
4	Isolation Resistance (Terminal-Mounting Plate)	500 VDC 100MΩ min at room temperature and humidity *6		
5	Leakage current 250/500V 60Hz	12mA/24mA max		
6	DC resistance	100mΩ max	38mΩ max	20mΩ max
7	Safety agency approval temperatures	-25 to +85°C (Refer to Derating Curve)		
8	Operating temperature	-40 to +85°C (Refer to Derating Curve)		
9	Operating humidity	20 to 95%RH (Non condensing)		
10	Storage temperature/humidity	-40 to +85°C/20 to 95%RH (Non condensing)		
11	Vibration	10 to 55Hz, 19.6m/s ² (2G), 3min. Period, 1hour each X, Y and Z axis		
12	Impact	196.1m/s ² (20G), 11ms Once each X, Y and Z axis		
13	Safety agency approvals	UL1283, CSA C22.2 No.8 (C-UL), DIN EN60939 VDE0565 Teil 3-1, ENEC		
14	Case size (without projection)	66×100×240 mm (W×H×D) [2.60×3.94×9.45 inches] (W×H×D)		
15	Weight	1.8kg max		

*3 Only capacitor code “355”, Three Phase Δ-connection : 400 (440 max), Y-connection : 500 (528 max)

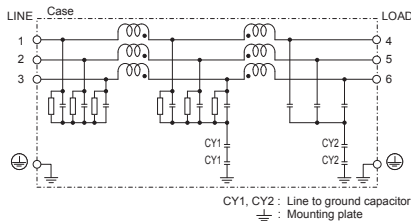
*4 Only “FSB-□□□□□□□□-U”, Three Phase 250 (275 max)

*5 Only capacitor code “203”, “573”, “693”, “104”, 2,500VAC (Cutoff Current = 100mA), 1minute at room temperature and humidity.

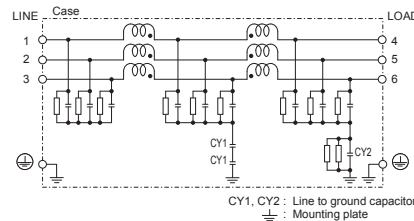
*6 Only capacitor code “335”, “355”, Isolation resistance specification is deleted.

Circuit Diagram

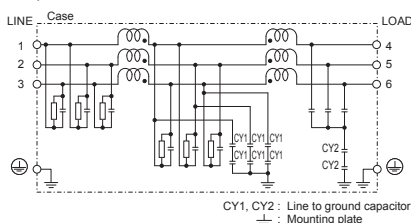
(1) Line to ground capacitor code : 203, 693, 104, 324



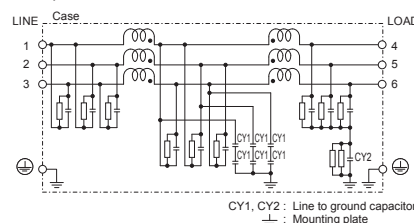
(2) Line to ground capacitor code : 355



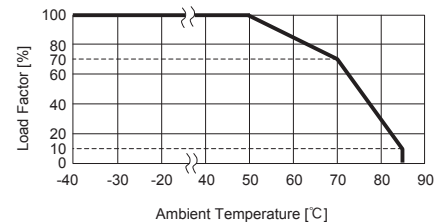
(3) Line to ground capacitor code : 573, 254
Option : U



(4) Line to ground capacitor code : 335
Option : U



Derating Curve

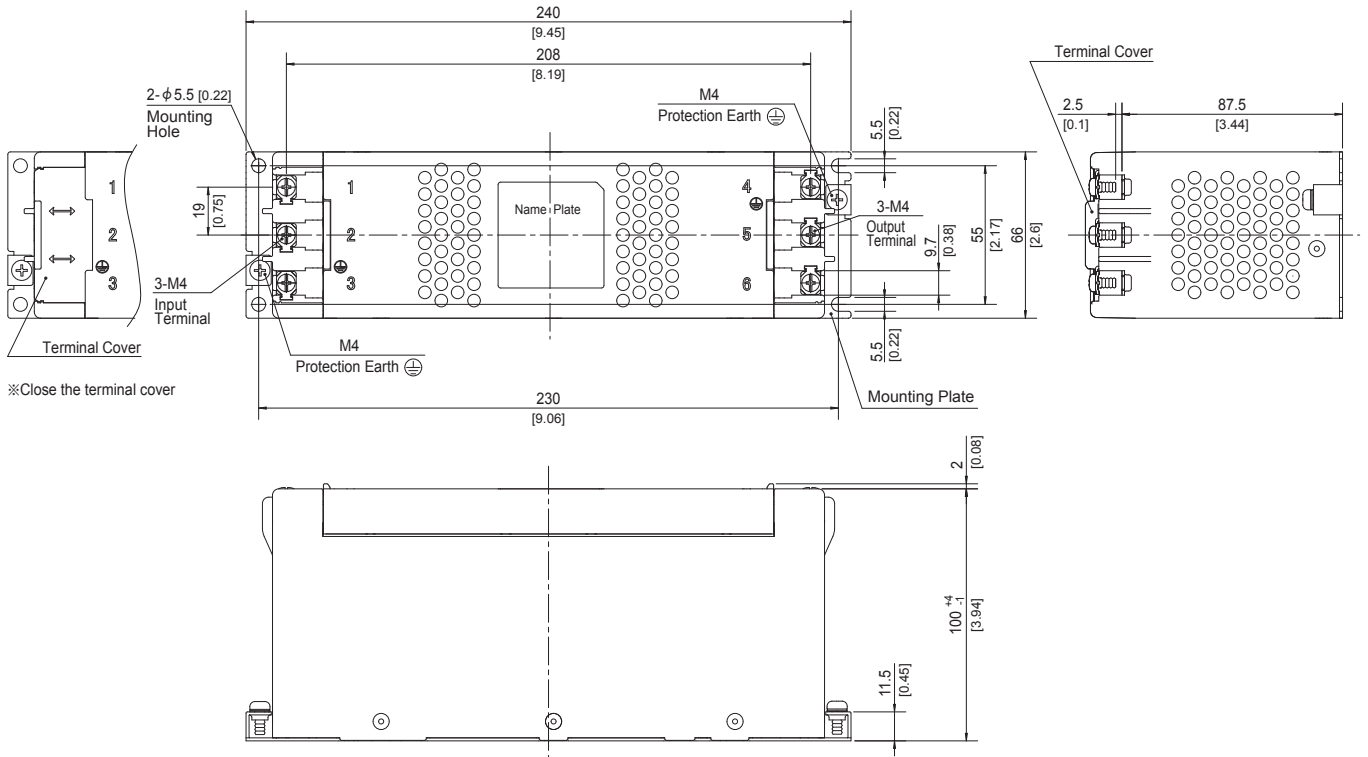


* Keep free ventilation holes for cooling.

External view

This product is shipped in the following condition, because it is equipped with push-down terminals.

- ①The terminal cover is retracted inside the unit.
- ②The screws for connecting the terminals are held in the up right position.



※Close the terminal cover

- ※ Tolerance : ± 1 [± 0.04]
- ※ Weight : 1.8kg max
- ※ Mounting Plate : Hot-dip Galvanized Steel board $t=1.2$ [0.05]
- ※ Case : PBT
- ※ Dimensions in mm, []=inches
- ※ Terminal block screw tightening torque M4 : $1.6\text{N} \cdot \text{m}$ (16.9kgf·cm)max
- ※ Can not be mounted upside-down (mounted the top surface)
- ※ Keep free ventilation holes for cooling

FSB series(40,50,60A)

FSB -60 -324 -□

① ② ③ ④



- ① Model Name
② Rated Current
③ Line to ground capacitor code: See table 1.1.

table 1.1 Line to ground capacitor code

Code	Leakage Current *1 Upper row : Δ-connection Lower row : Y-connection	Line to ground capacitor CY1 (nominal value)	Line to ground capacitor CY2 (nominal value)
203	1.0mA/2.0mA max 0.1mA/0.2mA max	0.01μF	0.01μF
693	2.5mA/5.0mA max 0.35mA/0.7mA max	0.022μF	0.047μF
104	3.5mA/7.0mA max 0.5mA/1.0mA max	0.033μF	0.068μF
324	12mA/24mA max 1.5mA/3.0mA max	0.1μF	0.22μF
355	180mA/270mA max 25mA/50mA max	0.22μF	3.3μF

* When the line to ground capacitor code is different, the attenuation characteristic is different.

*1 Input 250/500V 60Hz (Only Δ-connection of "355" is 250/400V 60Hz)

- ④ Option
H : Ultra high-attenuation type
"355" is not applied.
U : Improve differential mode attenuation
(Rated voltage 250V)

Features of FSB series

EMI/EMC Filter for motor drive system (AC servo)

- Improve saturation resistance (There is such as performance improvement type "-324-HU")
- Book type (Space-saving type)

Specifications

No.	Items	FSB-40-324	FSB-50-324	FSB-60-324
1	Rated Voltage[V]	AC Three Phase 500 (voltage range: 528 max) 50/60Hz *2 *3		
2	Rated Current[A]	40	50	60
3	Test Voltage (Terminal-Mounting Plate)	2,800 VDC (Cutoff Current = 10mA), 1minute at room temperature and humidity *4		
4	Isolation Resistance (Terminal-Mounting Plate)	500 VDC 100MΩ min at room temperature and humidity *5		
5	Leakage current 250/500V 60Hz	12mA/24mA max		
6	DC resistance	17mΩ max	14mΩ max	10mΩ max
7	Safety agency approval temperatures	-25 to +85°C (Refer to Derating Curve)		
8	Operating temperature	-40 to +85°C (Refer to Derating Curve)		
9	Operating humidity	20 to 95%RH (Non condensing)		
10	Storage temperature/humidity	-40 to +85°C/20 to 95%RH (Non condensing)		
11	Vibration	10 to 55Hz, 19.6m/s ² (2G), 3min. Period, 1hour each X, Y and Z axis		
12	Impact	196.1m/s ² (20G), 11ms Once each X, Y and Z axis		
13	Safety agency approvals	UL1283, CSA C22.2 No.8 (C-UL), DIN EN60939 VDE0565 Teil 3-1, ENEC		
14	Case size (without projection)	90 X 125 X 290 mm (W X H X D) [3.54 X 4.92 X 11.42 inches] (W X H X D)		
15	Weight	3.3kg max		

*2 Only capacitor code "355", Three Phase Δ-connection : 400 (440 max), Y-connection : 500 (528 max)

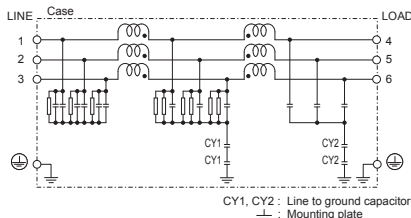
*3 Only "FSB-□□□□□□-U", Three Phase 250 (275 max)

*4 Only capacitor code "203", "693", "104", 2,500VAC (Cutoff Current = 100mA), 1minute at room temperature and humidity.

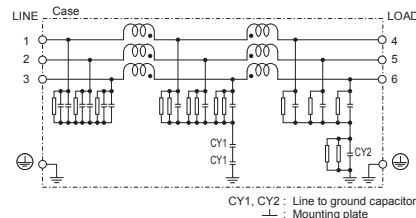
*5 Only capacitor code "355", Isolation resistance specification is deleted.

Circuit Diagram

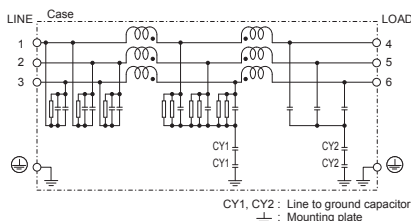
(1) Line to ground capacitor code : 203, 693, 104, 324



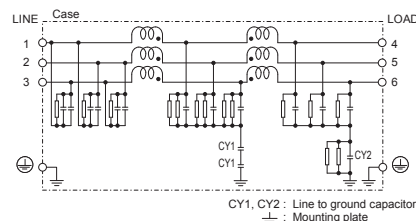
(2) Line to ground capacitor code : 355



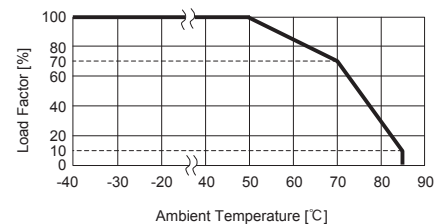
(3) Line to ground capacitor code : 203, 693, 104, 324
Option : U



(4) Line to ground capacitor code : 355
Option : U

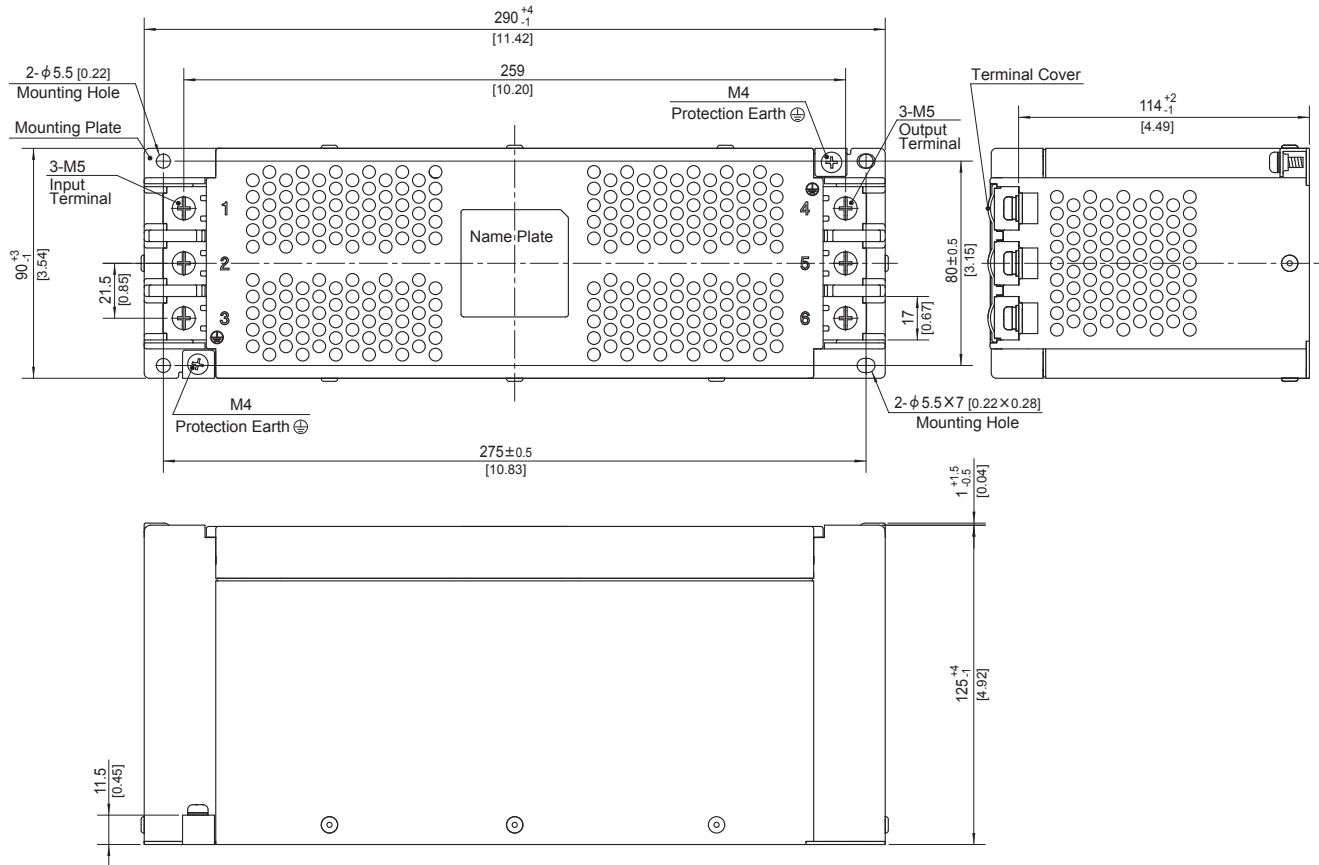


Derating Curve



* Keep free ventilation holes for cooling.

External view



- ※ Tolerance : ± 1 [± 0.04]
- ※ Weight : 3.3kg max
- ※ Mounting Plate : Hot-dip Galvanized Steel board $t=1.2$ [0.05]
- ※ Case Material : PBT
- ※ Dimensions in mm, []=inches
- ※ Terminal block screw tightening torque M5 : $3.0\text{N} \cdot \text{m}$ ($30.7\text{kgf} \cdot \text{cm}$)max
- ※ Protection Earth(PE) screw tightening torque M4 : $1.6\text{N} \cdot \text{m}$ ($16.9\text{kgf} \cdot \text{cm}$)max
- ※ Can not be mounted upside-down(mounted the top surface)
- ※ Keep free ventilation holes for cooling

FSB series(80,100,150A)

FSB -150 -324 -□

① ② ③ ④

- ① Model Name
② Rated Current
③ Line to ground capacitor code: See table 1.1.

table 1.1 Line to ground capacitor code

Code	Leakage Current *1 Upper row : Δ-connection Lower row : Y-connection	Line to ground capacitor CY1 (nominal value)	Line to ground capacitor CY2 (nominal value)
203	1.0mA/2.0mA max 0.1mA/0.2mA max	0.01μF	0.01μF
693	2.5mA/5.0mA max 0.35mA/0.7mA max	0.022μF	0.047μF
104	3.5mA/7.0mA max 0.5mA/1.0mA max	0.033μF	0.068μF
324	12mA/24mA max 1.5mA/3.0mA max	0.1μF	0.22μF
355	330mA/515mA max 40mA/80mA max	0.22μF	3.3μF

* When the line to ground capacitor code is different, the attenuation characteristic is different.

*1 Input 250/500V 60Hz (Only Δ-connection of "355" is 250/400V 60Hz)

- ④ Option
H : Ultra high-attenuation type
"355" is not applied.
S : Hexagon socket head cap screw
(Standard type is Hexagon head screw)
U : Improve differential mode attenuation
(Rated voltage 250V)

Features of FSB series

EMI/EMC Filter for motor drive system (AC servo)

- Improve saturation resistance (There is such as performance improvement type "-324-HU")
- Book type (Space-saving type)

Specifications

No.	Items	FSB-80-324	FSB-100-324	FSB-150-324
1	Rated Voltage[V]	AC Three Phase 500 (voltage range: 528 max) 50/60Hz *2 *3		
2	Rated Current[A]	80	100	150
3	Test Voltage (Terminal-Mounting Plate)	2,800 VDC (Cutoff Current = 10mA), 1minute at room temperature and humidity *4		
4	Isolation Resistance (Terminal-Mounting Plate)	500 VDC 100MΩ min at room temperature and humidity *5		
5	Leakage current 250/500V 60Hz	12mA/24mA max		
6	DC resistance	10mΩ max	8mΩ max	6mΩ max
7	Safety agency approval temperatures	-25 to +85°C (Refer to Derating Curve)		
8	Operating temperature	-40 to +85°C (Refer to Derating Curve)		
9	Operating humidity	20 to 95%RH (Non condensing)		
10	Storage temperature/humidity	-40 to +85°C/20 to 95%RH (Non condensing)		
11	Vibration	10 to 55Hz, 19.6m/s ² (2G), 3min. Period, 1hour each X, Y and Z axis		
12	Impact	196.1m/s ² (20G), 11ms Once each X, Y and Z axis		
13	Safety agency approvals	UL1283, CSA C22.2 No.8 (C-UL), DIN EN60939 VDE0565 Teil 3-1, ENEC		
14	Case size (without projection)	100×170×350 mm (W×H×D)		100×210×400 mm (W×H×D)
		[3.94×6.69×13.78 inches] (W×H×D)		[3.94×8.27×15.75 inches] (W×H×D)
15	Weight	6.3kg max		8.8kg max

*2 Only capacitor code "355", Three Phase Δ-connection : 400 (440 max), Y-connection : 500 (528 max)

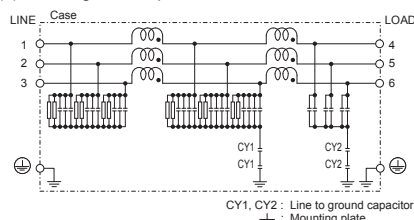
*3 Only "FSB-□□□□□□-U", Three Phase 250 (275 max)

*4 Only capacitor code "203", "693", "104", 2,500VAC (Cutoff Current = 100mA), 1minute at room temperature and humidity.

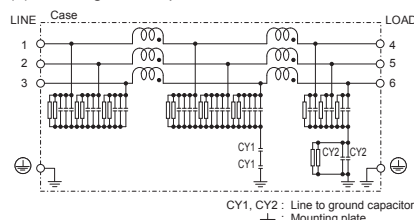
*5 Only capacitor code "355", Isolation resistance specification is deleted.

Circuit Diagram

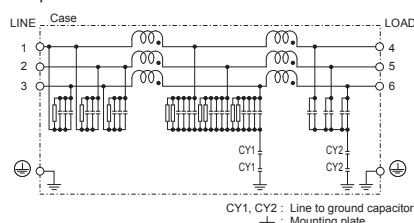
(1) Line to ground capacitor code : 203, 693, 104, 324



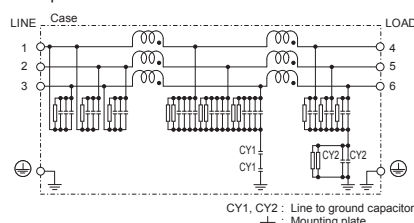
(2) Line to ground capacitor code : 355



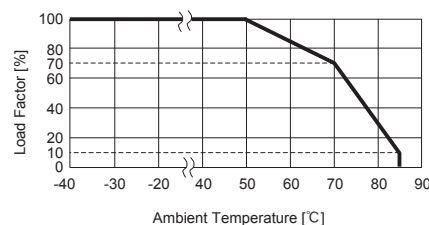
(3) Line to ground capacitor code : 203, 693, 104, 324
Option : U



(4) Line to ground capacitor code : 355
Option : U



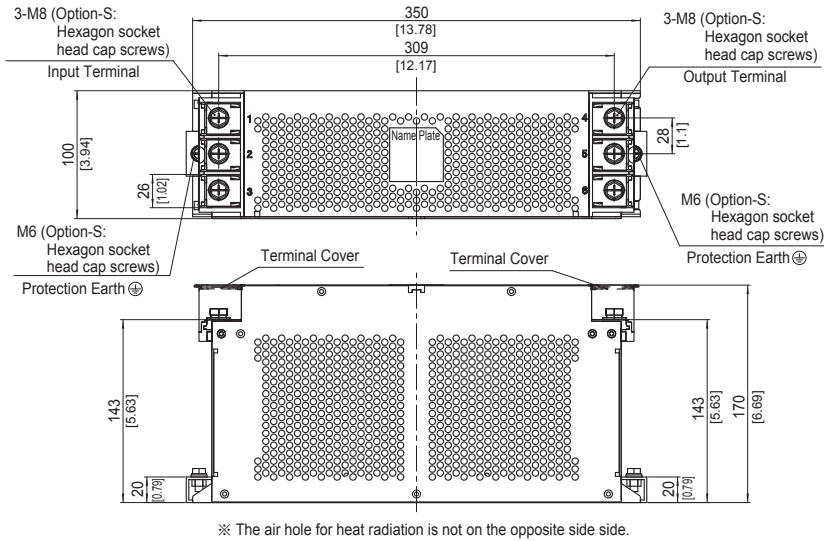
Derating Curve



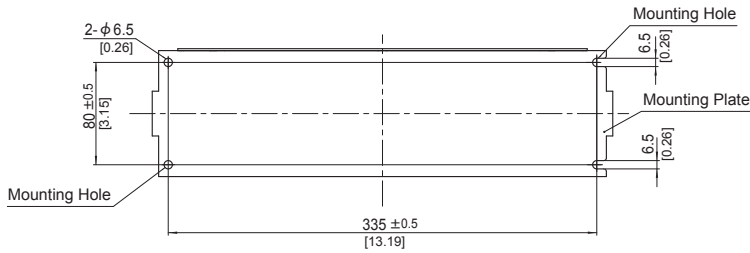
* Keep free ventilation holes for cooling.

External view

FSB-80 / FSB-100

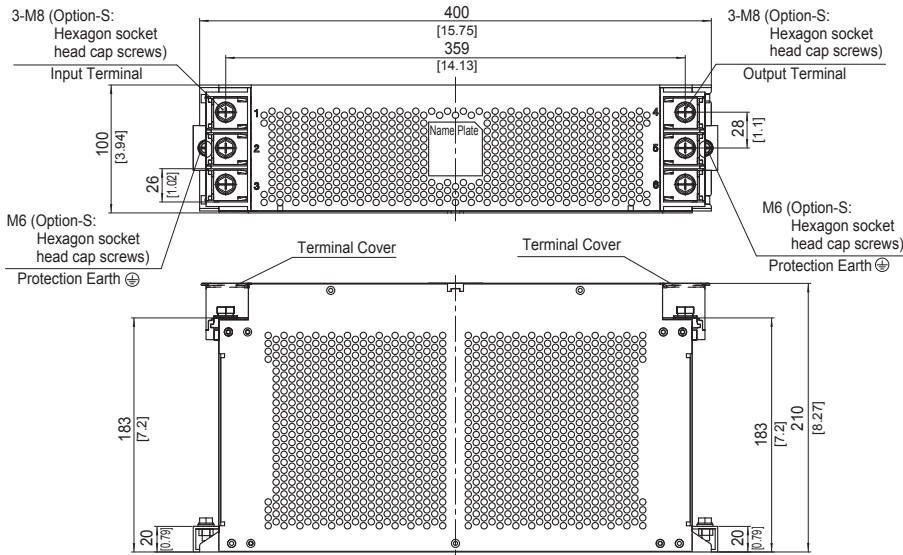


※ The air hole for heat radiation is not on the opposite side side.

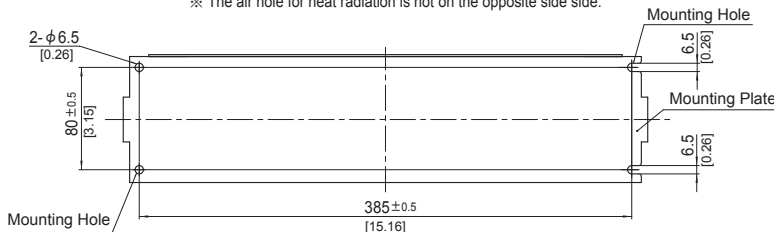


- ※ Tolerance : ± 1 [± 0.04]
- ※ Weight : 6.3kg max
- ※ Mounting Plate : Aluminum $t = 2.0$ [0.08]
- ※ Dimensions in mm, []=inches
- ※ Terminal block screw tightening torque
M8 : $9.2N \cdot m$ (93.9kgf · cm)max
- ※ Protection Earth (PE) screw tightening torque
M6 : $5.8N \cdot m$ (59.2kgf · cm)max
- ※ Can not be mounted upside-down
(mounted the top surface)
- ※ Keep free ventilation holes for cooling

FSB-150



※ The air hole for heat radiation is not on the opposite side side.



- ※ Tolerance : ± 1 [± 0.04]
- ※ Weight : 8.8kg max
- ※ Mounting Plate : Aluminum $t = 2.0$ [0.08]
- ※ Dimensions in mm, []=inches
- ※ Terminal block screw tightening torque
M8 : $9.2N \cdot m$ (93.9kgf · cm)max
- ※ Protection Earth (PE) screw tightening torque
M6 : $5.8N \cdot m$ (59.2kgf · cm)max
- ※ Can not be mounted upside-down
(mounted the top surface)
- ※ Keep free ventilation holes for cooling