
TOSVERT VF-S15

Explanation of Load reduction

**Load reduction at use condition,
ambient temperature, and installation method**

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1. Ambient temperature environment and load reduction

VF-S15 has the maximum applied load (load reduction ratio to rated current) under each condition for the use in various kinds of environments, but please note that load reduction can be required other than standard condition of use, ambient temperature, and mounting environment conditions.

2. VF-S15's rated current

VF-S15's rated current conditions are as follows;

- Carrier frequency: 4 kHz or below,
- Ambient temperature: 40 degree C or below,
- and as described in the tables 2.1, 2.2, and 2.3.

Load reduction is necessary depending on the conditions of use, mounting environment, and career frequency settings.

Display standard of inverter current (monitor display and parameter set value) is 100%=rated current (PWM carrier frequency: 4 kHz and less, ambient temperature: 40°C and less). Current value considering current reduction by PWM carrier frequency can be checked with status monitor mode. Set the following items;

Monitor	Title	Function	Set value
Standard monitor	<i>F710</i>	Initial panel display selection	40: Inverter rated current
Status monitor mode	<i>F711 - F718</i>	Status monitor 1 - 8	(Carrier frequency corrected)

Note) Overload characteristic of VF-S15 can be selected to 150%-60s or 120%-60s.

[Parameters settings]

Title	Function	Adjustment range	Default setting
<i>AVL</i>	Overload characteristic selection	0: - 1: Constant torque characteristic (150%-60s) 2: Variable torque characteristic (120%-60s)	0

*In case of *AVL = 2* setting, be sure to install the input AC reactor (ACL) between power supply and inverter.

Table 2.1 Load reduction by ambient temperature and carrier frequency [240V class]

In case of $\overline{MUL} = 1$ (Constant torque characteristic (150%-60s)) setting.

VFS15- VFS15S-	Ambient temperature	PWM carrier frequency		
		2.0k to 4.0kHz	4.1k to 12.0kHz	12.1k to 16.0kHz
2002PL-W	40°C or less	1.5 A	1.5 A	1.5 A
	40 to 50°C	1.5 A	1.2 A	1.2 A
	50 to 60°C	1.2 A	1.1 A	1.1 A
2004 PM/L-W	40°C or less	3.3 A	3.3 A	3.3 A
	40 to 50°C	3.3 A	2.6 A	2.6 A
	50 to 60°C	2.6 A	2.5 A	2.5 A
2007 PM/L-W	40°C or less	4.8 A	4.4 A	4.2 A
	40 to 50°C	4.8 A	3.5 A	3.4 A
	50 to 60°C	3.8 A	3.3 A	3.2 A
2015 PM/L-W	40°C or less	8.0 A	7.9 A	7.1 A
	40 to 50°C	8.0 A	7.9 A	7.1 A
	50 to 60°C	7.6 A	6.3 A	5.7 A
2022 PM/L-W	40°C or less	11.0 A	10.0 A	9.1 A
	40 to 50°C	11.0 A	10.0 A	9.1 A
	50 to 60°C	10.5 A	8.0 A	7.3 A
2037PM-W	40°C or less	17.5 A	16.4 A	14.6 A
	40 to 50°C	17.5 A	16.4 A	14.6 A
	50 to 60°C	16.6 A	13.1 A	11.7 A
2055PM-W	40°C or less	27.5 A	25.0 A	25.0 A
	40 to 50°C	27.5 A	25.0 A	25.0 A
	50 to 60°C	26.1 A	20.0 A	20.0 A
2075PM-W	40°C or less	33.0 A	33.0 A	29.8 A
	40 to 50°C	33.0 A	33.0 A	29.8 A
	50 to 60°C	31.4 A	26.4 A	23.8 A
2110PM-W	40°C or less	54.0 A	49.0 A	49.0 A
	40 to 50°C	54.0 A	49.0 A	49.0 A
	50 to 60°C	51.3 A	39.2 A	39.2 A
2150PM-W	40°C or less	66.0 A	60.0 A	54.0 A
	40 to 50°C	66.0 A	60.0 A	54.0 A
	50 to 60°C	62.7 A	48.0 A	43.2 A

□ : Rated current

Table 2.2 Load reduction by ambient temperature and carrier frequency [500V class (480V or less)]

In case of $\overline{I_{LL}} = I$ (constant torque characteristic (150%-60s) setting)

VFS15-	Ambient temperature	PWM carrier frequency		
		2.0k to 4.0kHz	4.1k to 12.0kHz	12.1k to 16.0kHz
4004 PL-W	40°C or less	1.5 A	1.5 A	1.5 A
	40 to 50°C	1.5 A	1.5 A	1.5 A
	50 to 60°C	1.4 A	1.2 A	1.2 A
4007 PL-W	40°C or less	2.3 A	2.1 A	2.1 A
	40 to 50°C	2.3 A	2.1 A	2.1 A
	50 to 60°C	2.2 A	1.7 A	1.7 A
4015 PL-W	40°C or less	4.1 A	3.7 A	3.3 A
	40 to 50°C	4.1 A	3.7 A	3.3 A
	50 to 60°C	3.9 A	3.0 A	2.6 A
4022 PL-W	40°C or less	5.5 A	5.0 A	4.5 A
	40 to 50°C	5.5 A	5.0 A	4.5 A
	50 to 60°C	5.2 A	4.0 A	3.6 A
4037 PL-W	40°C or less	9.5 A	8.6 A	7.5 A
	40 to 50°C	9.5 A	8.6 A	7.5 A
	50 to 60°C	9.0 A	6.9 A	6.0 A
4055 PL-W	40°C or less	14.3 A	13.0 A	13.0 A
	40 to 50°C	14.3 A	13.0 A	13.0 A
	50 to 60°C	13.6 A	10.4 A	10.4 A
4075 PL-W	40°C or less	17.0 A	17.0 A	14.8 A
	40 to 50°C	17.0 A	17.0 A	14.8 A
	50 to 60°C	16.2 A	13.6 A	11.8 A
4110 PL-W	40°C or less	27.7 A	25.0 A	25.0 A
	40 to 50°C	27.7 A	25.0 A	25.0 A
	50 to 60°C	26.3 A	20.0 A	20.0 A
4150 PL-W	40°C or less	33.0 A	30.0 A	26.0 A
	40 to 50°C	33.0 A	30.0 A	26.0 A
	50 to 60°C	31.4 A	24.0 A	20.8 A

□ : Rated current

Table 2.1 Load reduction by ambient temperature and carrier frequency [500V class (over 480V)]

In case of $\overline{R_{LL}} = 1$ (constant torque characteristic (150%-60s) setting)

VFS15-	Ambient temperature	PWM carrier frequency		
		2.0k to 4.0kHz	4.1k to 12.0kHz	12.1k to 16.0kHz
4004 PL-W	40°C or less	1.5 A	1.5 A	1.2 A
	40 to 50°C	1.5 A	1.5 A	1.2 A
	50 to 60°C	1.4 A	1.2 A	1.0 A
4007 PL-W	40°C or less	2.1 A	1.9 A	1.9 A
	40 to 50°C	2.1 A	1.9 A	1.9 A
	50 to 60°C	2.0 A	1.5 A	1.5 A
4015 PL-W	40°C or less	3.8 A	3.4 A	3.1 A
	40 to 50°C	3.8 A	3.4 A	3.1 A
	50 to 60°C	3.6 A	2.7 A	2.5 A
4022 PL-W	40°C or less	5.1 A	4.6 A	4.2 A
	40 to 50°C	5.1 A	4.6 A	4.2 A
	50 to 60°C	4.8 A	3.7 A	3.4 A
4037 PL-W	40°C or less	8.7 A	7.9 A	6.9 A
	40 to 50°C	8.7 A	7.9 A	6.9 A
	50 to 60°C	8.3 A	6.3 A	5.5 A
4055 PL-W	40°C or less	13.2 A	12.0 A	12.0 A
	40 to 50°C	13.2 A	12.0 A	12.0 A
	50 to 60°C	12.5 A	9.6 A	9.6 A
4075 PL-W	40°C or less	15.6 A	14.2 A	12.4 A
	40 to 50°C	15.6 A	14.2 A	12.4 A
	50 to 60°C	14.8 A	11.4 A	9.9 A
4110 PL-W	40°C or less	25.5 A	23.0 A	23.0 A
	40 to 50°C	25.5 A	23.0 A	23.0 A
	50 to 60°C	24.2 A	18.4 A	18.4 A
4150 PL-W	40°C or less	30.4 A	27.6 A	24.0 A
	40 to 50°C	30.4 A	27.6 A	24.0 A
	50 to 60°C	28.9 A	22.1 A	19.2 A

3. VFS15's ambient temperature environment and load reduction ratio

3.1. Ambient temperature environment

VFS15's ambient temperature environment is –10 to +60 degree C, but load reduction ratio differs according to the following conditions;

Condition 1: Voltage class, Inverter capacity

Condition 2: Installation

1. Individual mounting with top seal label
2. Individual mounting without top seal label
3. Side by side mounting without top seal label
4. Horizontal mounting without top seal label
5. DIN rail mounting without top seal label
6. DIN rail and Side by side mounting without top seal label
7. Individual mounting with top seal label and side cover
8. Individual mounting with top seal label and EMC filter

Condition3: Ambient temperature

to 40 degree C, to 50 degree C, to 60 degree C

Condition4: Carrier frequency setting

to 4 kHz, to 12 kHz, to 16 kHz

Note: For a side-by-side mounting, remove top seal label.

3.2. Load reduction ratio

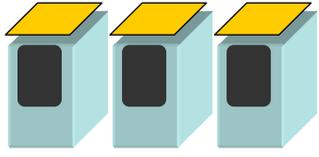
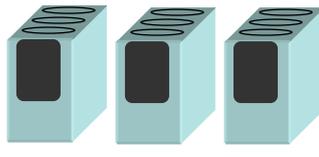
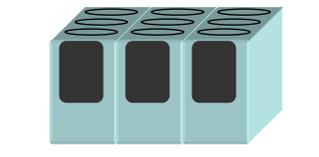
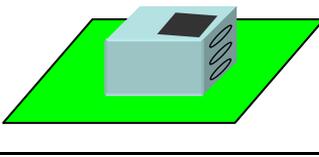
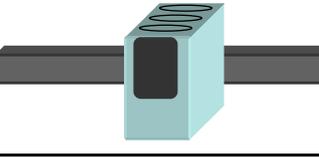
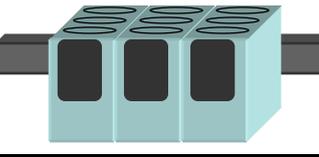
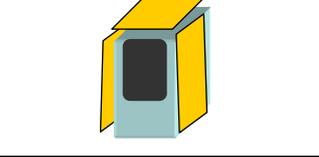
Load reduction ratio changes depending on voltage class and inverter capacity.

* In case of *AVL* (Overload characteristic selection) = *!* (constant torque characteristic (150%-60s) setting)

3.2.1. Three-phase 240V class models

1) Three-phase 240V class: 0.4-0.75kW models

Tale 3.1 Load reduction by mounting conditions [VFS15-2004PM-W to 2007PM-W]

No.	Mounting conditions	Top seal label	Figure	Ambient temperature (degree C)	PWM carrier frequency		
					4kHz	12kHz	16kHz
1	Individual mounting	With		40	100%	100%	100%
				50	100%	95%	70%
				60	70%	65%	50%
2	Individual mounting	W/O		40	100%	100%	100%
				50	100%	100%	75%
				60	80%	65%	55%
3	Side by side mounting	W/O		40	100%	100%	100%
				50	100%	85%	80%
				60	70%	60%	55%
4	Horizontal mounting	W/O		40	95%	65%	60%
				50	70%	50%	40%
				60	45%	35%	—
5	DIN rail mounting	W/O		40	100%	100%	100%
				50	95%	85%	90%
				60	65%	60%	60%
6	DIN rail and side by side mounting	W/O		40	100%	100%	100%
				50	90%	75%	80%
				60	55%	45%	50%
7	Individual mounting with side cover	With		40	100%	100%	100%
				50	90%	75%	70%
				60	65%	40%	—
8	Individual mounting with EMC filter	With		40	100%	100%	100%
				50	100%	100%	100%
				60	85%	70%	60%

 : the range available with inverter rated current

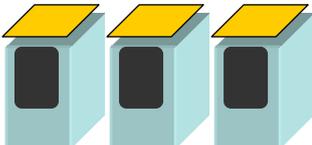
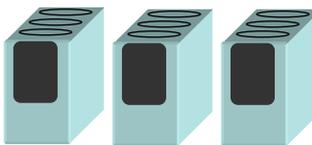
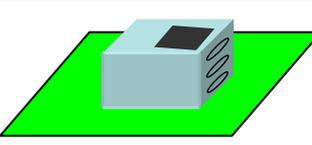
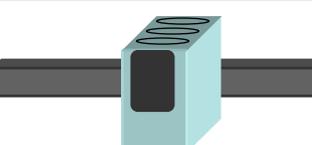
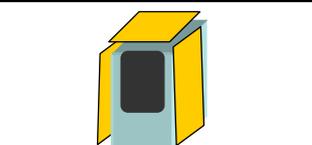
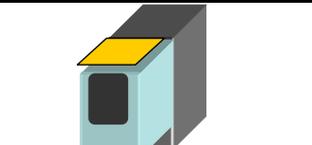
Note 1: In case of $f_{UL} = 1$ (constant torque characteristic (150%-60s) setting)

Note 2: In case of side by side mounting, be sure to remove the top seal label.

Note 3: Load reduction ratio (%) regards the value of Table 2.1, ambient temperature: 40°C and less, PWM carrier frequency: 4kHz or 12kHz as 100%.

2) Three-phase 240V class: 1.5, 2.2kW models

Table 3.2 Load reduction depending on mounting conditions [VFS15-2015PM-W, 2022PM-W]

No.	Mounting conditions	Top seal label	Figure	Ambient temperature (degree C)	PWM carrier frequency		
					4kHz	4kHz	4kHz
1	Individual mounting	With		40	100%	100%	100%
				50	100%	100%	100%
				60	90%	85%	70%
2	Individual mounting	W/O		40	100%	100%	100%
				50	100%	100%	100%
				60	100%	95%	80%
3	Side by side mounting	W/O		40	100%	100%	100%
				50	100%	100%	100%
				60	75%	55%	45%
4	Horizontal mounting	W/O		40	100%	100%	100%
				50	95%	80%	70%
				60	55%	40%	30%
5	DIN rail mounting	W/O		40	100%	100%	100%
				50	90%	90%	90%
				60	90%	85%	70%
6	DIN rail and side by side mounting	W/O		40	100%	100%	100%
				50	90%	90%	90%
				60	65%	45%	35%
7	Individual mounting with side cover	With		40	100%	100%	100%
				50	90%	80%	80%
				60	70%	50%	40%
8	Individual mounting with EMC filter	With		40	100%	100%	100%
				50	90%	90%	90%
				60	80%	75%	60%

 : the range available with inverter rated current

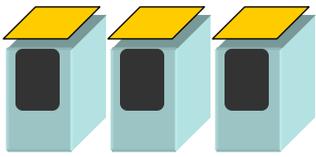
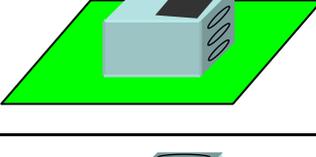
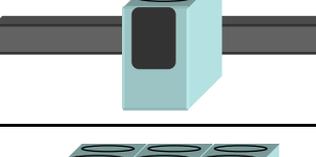
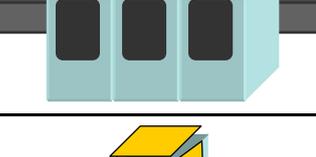
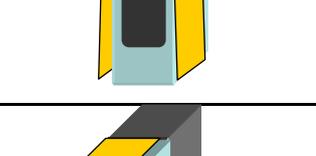
Note 1: In case of $\overline{M} = 1$ (constant torque characteristic (150%-60s) setting)

Note 2: In case of side by side mounting, be sure to remove the top seal label.

Note 3: Load reduction ratio (%) regards the value of Table 2.1, ambient temperature: 40°C and less, PWM carrier frequency: 4kHz or 12kHz as 100%.

3) Three-phase 240V class: 4.0kW

Table 3.3 Load reduction depending on mounting conditions [VFS15-2037PM-W]

No.	Mounting conditions	Top seal label	Figure	Ambient temperature (degree C)	PWM carrier frequency		
					4kHz	4kHz	4kHz
1	Individual mounting	With		40	100%	100%	100%
				50	100%	100%	100%
				60	90%	85%	75%
2	Individual mounting	W/O		40	100%	100%	100%
				50	100%	100%	100%
				60	85%	85%	85%
3	Side by side mounting	W/O		40	100%	100%	100%
				50	100%	100%	100%
				60	100%	95%	90%
4	Horizontal mounting	W/O		40	100%	100%	100%
				50	100%	100%	100%
				60	—	—	—
5	DIN rail mounting	W/O		40	100%	100%	100%
				50	90%	90%	90%
				60	75%	75%	75%
6	DIN rail and side by side mounting	W/O		40	100%	100%	100%
				50	90%	90%	90%
				60	90%	85%	80%
7	Individual mounting with side cover	With		40	100%	100%	100%
				50	100%	100%	95%
				60	65%	60%	55%
8	Individual mounting with EMC filter	With		40	100%	100%	100%
				50	90%	90%	90%
				60	80%	75%	65%

 : the range available with inverter rated current

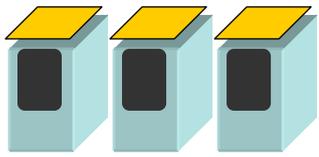
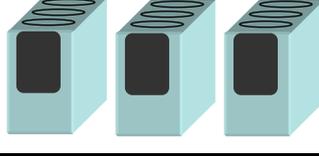
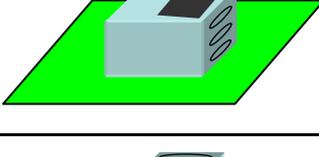
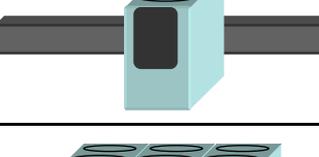
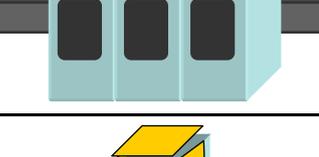
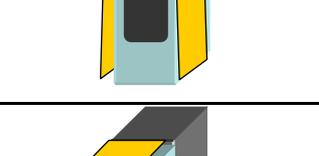
Note 1: In case of $f_{UL} = 1$ (constant torque characteristic (150%-60s) setting)

Note 2: In case of side by side mounting, be sure to remove the top seal label.

Note 3: Load reduction ratio (%) regards the value of Table 2.1, ambient temperature: 40°C and less, PWM carrier frequency: 4kHz or 12kHz as 100%.

4) Three-phase 240V class: 5.5, 7.5kW models

Table 3.4 Load reduction depending on mounting conditions [VFS15-2055PM-W, 2075PM-W]

No.	Mounting conditions	Top seal label	Figure	Ambient temperature (degree C)	PWM carrier frequency		
					4kHz	4kHz	4kHz
1	Individual mounting	With		40	100%	100%	100%
				50	100%	100%	70%
				60	70%	45%	40%
2	Individual mounting	W/O		40	100%	100%	100%
				50	100%	100%	90%
				60	80%	75%	70%
3	Side by side mounting	W/O		40	100%	100%	100%
				50	90%	90%	90%
				60	70%	70%	65%
4	Horizontal mounting	W/O		40	100%	100%	100%
				50	90%	85%	85%
				60	35%	35%	35%
5	DIN rail mounting	W/O		40	100%	100%	100%
				50	100%	100%	90%
				60	80%	75%	70%
6	DIN rail and side by side mounting	W/O		40	100%	100%	100%
				50	90%	90%	90%
				60	70%	70%	65%
7	Individual mounting with side cover	With		40	100%	100%	100%
				50	85%	85%	65%
				60	65%	40%	35%
8	Individual mounting with EMC filter	With		40	100%	100%	100%
				50	100%	100%	70%
				60	70%	45%	40%

 : the range available with inverter rated current

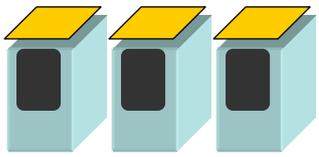
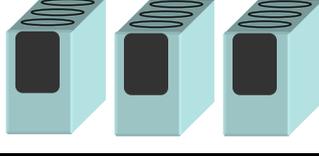
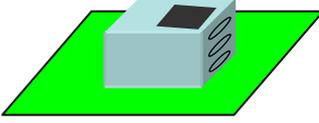
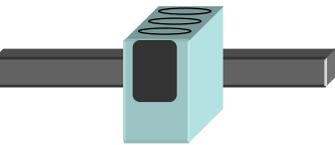
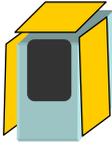
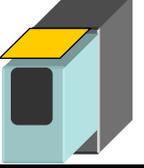
Note 1: In case of $RUL = 1$ (constant torque characteristic (150%-60s) setting)

Note 2: In case of side by side mounting, be sure to remove the top seal label.

Note 3: Load reduction ratio (%) regards the value of Table 2.1, ambient temperature: 40°C and less, PWM carrier frequency: 4kHz or 12kHz as 100%.

5) Three-phase 240V class: 11, 15kW models

Table 3.5 Load reduction depending on mounting conditions [VFS15-2110PM-W, 2150PM-W]

No.	Mounting conditions	Top seal label	Figure	Ambient temperature (degree C)	PWM carrier frequency		
					4kHz	4kHz	4kHz
1	Individual mounting	With		40	100%	100%	100%
				50	95%	85%	75%
				60	—	—	—
2	Individual mounting	W/O		40	100%	100%	100%
				50	100%	100%	85%
				60	80%	75%	65%
3	Side by side mounting	W/O		40	100%	100%	100%
				50	100%	90%	80%
				60	80%	70%	60%
4	Horizontal mounting	W/O		40	100%	100%	100%
				50	80%	55%	50%
				60	—	—	—
5	DIN rail mounting	W/O		40	100%	100%	100%
				50	100%	100%	85%
				60	80%	75%	65%
6	DIN rail and side by side mounting	W/O		40	100%	100%	100%
				50	100%	90%	80%
				60	80%	70%	60%
7	Individual mounting with side cover	With		40	100%	100%	100%
				50	90%	80%	70%
				60	—	—	—
8	Individual mounting with EMC filter	With		40	100%	100%	100%
				50	95%	85%	75%
				60	—	—	—

 : the range available with inverter rated current

Note 1: In case of $RUL = 1$ (constant torque characteristic (150%-60s) setting)

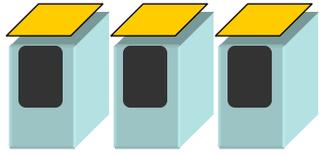
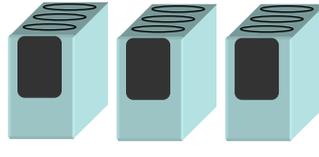
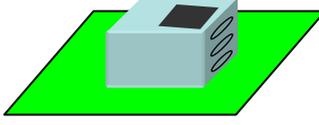
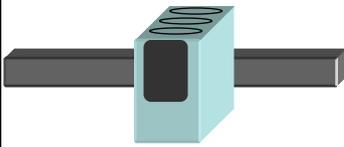
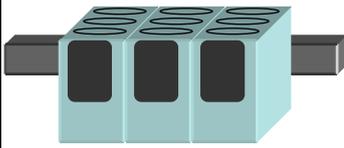
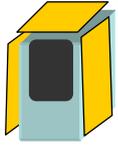
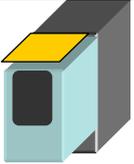
Note 2: In case of side by side mounting, be sure to remove the top seal label.

Note 3: Load reduction ratio (%) regards the value of Table 2.1, ambient temperature: 40°C and less, PWM carrier frequency: 4kHz or 12kHz as 100%.

3.2.2 Single-phase 240V class models

1) Single-phase 240V class: 0.2 - 0.75kW models

Table 3.6 Load reduction depending on mounting conditions [VFS15S-2002PL-W to 2007PL-W]

No.	Mounting conditions	Top seal label	Figure	Ambient temperature (degree C)	PWM carrier frequency		
					4kHz	4kHz	4kHz
1	Individual mounting	With		40	100%	100%	100%
				50	100%	100%	85%
				60	70%	75%	60%
2	Individual mounting	W/O		40	100%	100%	100%
				50	100%	100%	100%
				60	85%	75%	70%
3	Side by side mounting	W/O		40	100%	100%	100%
				50	100%	85%	80%
				60	70%	55%	45%
4	Horizontal mounting	W/O		40	85%	75%	70%
				50	65%	60%	55%
				60	45%	40%	35%
5	DIN rail mounting	W/O		40	100%	100%	100%
				50	100%	90%	90%
				60	80%	75%	70%
6	DIN rail and side by side mounting	W/O		40	100%	100%	100%
				50	100%	85%	80%
				60	70%	55%	45%
7	Individual mounting with side cover	With		40	100%	95%	90%
				50	85%	75%	70%
				60	65%	60%	50%
8	Individual mounting with EMC filter	With		40	100%	100%	100%
				50	95%	90%	85%
				60	75%	65%	60%

 : the range available with inverter rated current

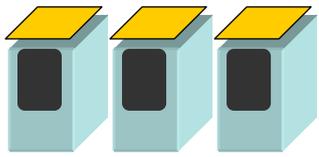
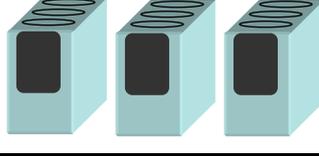
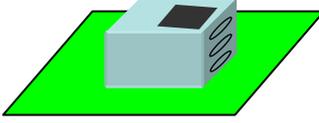
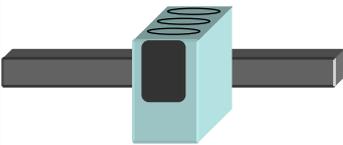
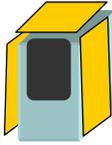
Note 1: In case of $R_{UL} = 1$ (constant torque characteristic (150%-60s) setting)

Note 2: In case of side by side mounting, be sure to remove the top seal label.

Note 3: Load reduction ratio (%) regards the value of Table 2.1, ambient temperature: 40°C and less, PWM carrier frequency: 4kHz or 12kHz as 100%.

2) Single-phase 240V class: 1.5, 2.2kW models

Table 3.7 Load reduction depending on mounting conditions [VFS15S-2015PL-W, 2022PL-W]

No.	Mounting conditions	Top seal label	Figure	Ambient temperature (degree C)	PWM carrier frequency		
					4kHz	4kHz	4kHz
1	Individual mounting	With		40	100%	100%	100%
				50	100%	100%	90%
				60	85%	85%	75%
2	Individual mounting	W/O		40	100%	100%	100%
				50	100%	100%	90%
				60	85%	85%	75%
3	Side by side mounting	W/O		40	100%	100%	95%
				50	100%	95%	85%
				60	85%	80%	75%
4	Horizontal mounting	W/O		40	100%	100%	100%
				50	100%	100%	90%
				60	90%	85%	75%
5	DIN rail mounting	W/O		40	100%	100%	100%
				50	90%	90%	80%
				60	75%	75%	65%
6	DIN rail and side by side mounting	W/O		40	100%	100%	95%
				50	90%	85%	75%
				60	75%	70%	65%
7	Individual mounting with side cover	With		40	100%	100%	100%
				50	100%	95%	85%
				60	85%	80%	75%
8	Individual mounting with EMC filter	With		40	100%	100%	100%
				50	90%	90%	80%
				60	75%	75%	65%

 : the range available with inverter rated current

Note 1: In case of $RUL = 1$ (constant torque characteristic (150%-60s) setting)

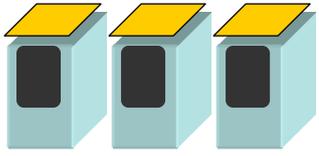
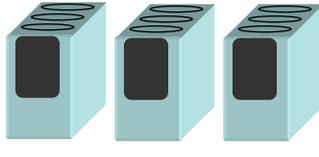
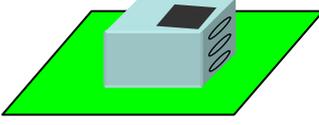
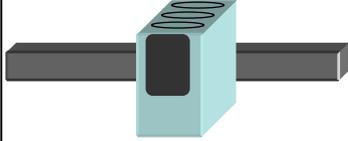
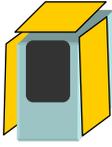
Note 2: In case of side by side mounting, be sure to remove the top seal label.

Note 3: Load reduction ratio (%) regards the value of Table 2.1, ambient temperature: 40°C and less, PWM carrier frequency: 4kHz or 12kHz as 100%.

3.2.3 Three-phase 500V class models

1) Three-phase 500V class: 0.4 - 1.5kW

Table 3.8 Load reduction depending on mounting conditions [VFS15-4004PL-W to 4015PL-W]

No.	Mounting conditions	Top seal label	Figure	Ambient temperature (degree C)	PWM carrier frequency		
					4kHz	4kHz	4kHz
1	Individual mounting	With		40	100%	100%	100%
				50	100%	100%	100%
				60	100%	50%	45%
2	Individual mounting	W/O		40	100%	100%	100%
				50	100%	100%	100%
				60	90%	60%	60%
3	Side by side mounting	W/O		40	100%	100%	100%
				50	100%	100%	100%
				60	100%	70%	65%
4	Horizontal mounting	W/O		40	100%	100%	100%
				50	100%	100%	100%
				60	100%	75%	70%
5	DIN rail mounting	W/O		40	100%	100%	95%
				50	95%	95%	90%
				60	80%	75%	70%
6	DIN rail and side by side mounting	W/O		40	100%	100%	95%
				50	95%	90%	85%
				60	60%	50%	40%
7	Individual mounting with side cover	With		40	100%	100%	100%
				50	100%	100%	100%
				60	100%	45%	45%
8	Individual mounting with EMC filter	With		40	100%	100%	100%
				50	100%	90%	80%
				60	80%	-	-

 : the range available with inverter rated current

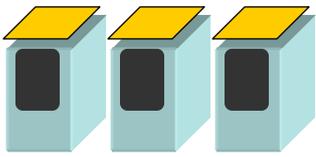
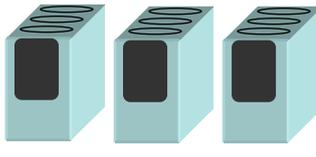
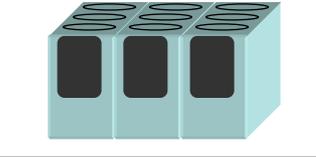
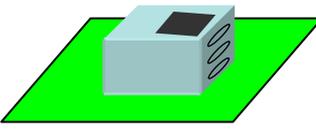
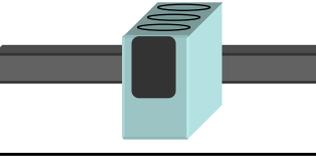
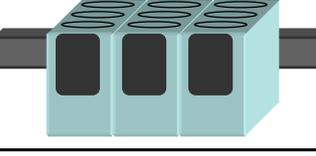
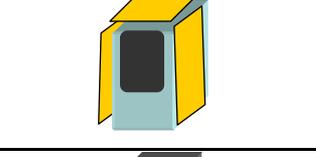
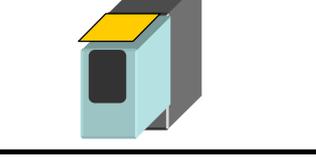
Note 1: In case of $RUL = 1$ (constant torque characteristic (150%-60s) setting)

Note 2: In case of side by side mounting, be sure to remove the top seal label.

Note 3: Load reduction ratio (%) regards the value of Table 2.1, ambient temperature: 40°C and less, PWM carrier frequency: 4kHz or 12kHz as 100%.

2) Three-phase 500V class: 2.2kW

Table 3.9 Load reduction depending on mounting conditions [VFS15-4022PL-W]

No.	Mounting conditions	Top seal label	Figure	Ambient temperature (degree C)	PWM carrier frequency		
					4kHz	4kHz	4kHz
1	Individual mounting	With		40	100%	100%	100%
				50	100%	100%	100%
				60	100%	100%	60%
2	Individual mounting	W/O		40	100%	100%	100%
				50	100%	100%	100%
				60	100%	95%	60%
3	Side by side mounting	W/O		40	100%	100%	100%
				50	100%	100%	100%
				60	100%	95%	60%
4	Horizontal mounting	W/O		40	100%	100%	100%
				50	100%	100%	60%
				60	100%	95%	55%
5	DIN rail mounting	W/O		40	100%	100%	95%
				50	95%	95%	90%
				60	80%	75%	30%
6	DIN rail and side by side mounting	W/O		40	100%	100%	95%
				50	95%	90%	85%
				60	60%	50%	-
7	Individual mounting with side cover	With		40	100%	100%	100%
				50	100%	100%	100%
				60	100%	95%	60%
8	Individual mounting with EMC filter	With		40	100%	100%	100%
				50	100%	100%	100%
				60	100%	100%	60%

 : the range available with inverter rated current

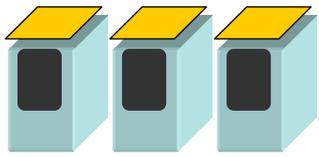
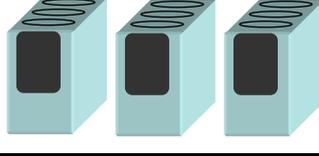
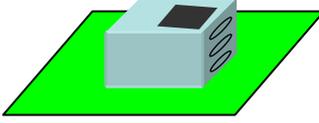
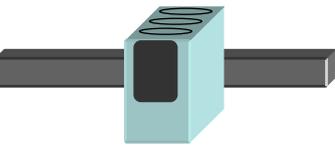
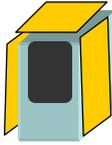
Note 1: In case of $\overline{MUL} = 1$ (constant torque characteristic (150%-60s) setting)

Note 2: In case of side by side mounting, be sure to remove the top seal label.

Note 3: Load reduction ratio (%) regards the value of Table 2.1, ambient temperature: 40°C and less, PWM carrier frequency: 4kHz or 12kHz as 100%.

3) Three-phase 500V class:4.0kW

Table 3.10 Load reduction depending on mounting conditions [VFS15-4037PL-W]

No.	Mounting conditions	Top seal label	Figure	Ambient temperature (degree C)	PWM carrier frequency		
					4kHz	4kHz	4kHz
1	Individual mounting	With		40	100%	100%	100%
				50	100%	100%	85%
				60	90%	80%	65%
2	Individual mounting	W/O		40	100%	100%	100%
				50	100%	100%	85%
				60	100%	80%	65%
3	Side by side mounting	W/O		40	100%	100%	100%
				50	100%	100%	90%
				60	100%	80%	65%
4	Horizontal mounting	W/O		40	100%	100%	100%
				50	100%	100%	100%
				60	100%	75%	-
5	DIN rail mounting	W/O		40	100%	100%	95%
				50	95%	95%	75%
				60	80%	75%	55%
6	DIN rail and side by side mounting	W/O		40	100%	100%	95%
				50	95%	90%	75%
				60	60%	50%	30%
7	Individual mounting with side cover	With		40	100%	100%	100%
				50	100%	100%	75%
				60	90%	70%	-
8	Individual mounting with EMC filter	With		40	100%	100%	100%
				50	100%	100%	85%
				60	100%	80%	60%

 : the range available with inverter rated current

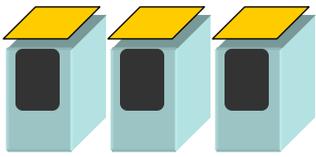
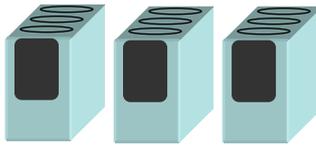
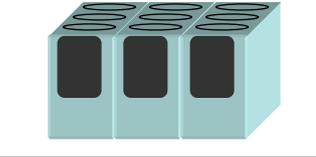
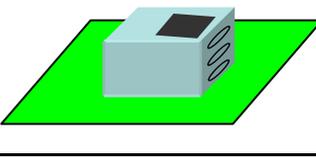
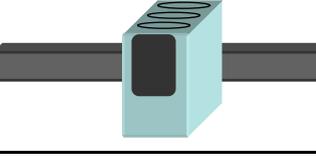
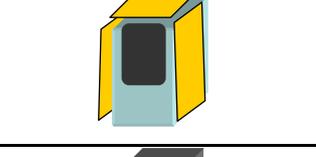
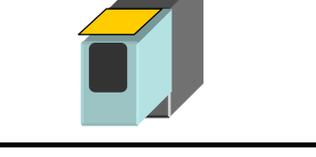
Note 1: In case of $RUL = 1$ (constant torque characteristic (150%-60s) setting)

Note 2: In case of side by side mounting, be sure to remove the top seal label.

Note 3: Load reduction ratio (%) regards the value of Table 2.1, ambient temperature: 40°C and less, PWM carrier frequency: 4kHz or 12kHz as 100%.

4) Three-phase 500V class: 5.5, 7.5kW

Table 3.11 Load reduction depending on mounting conditions [VFS15-4055PL-W, 4075PL-W]

No.	Mounting conditions	Top seal label	Figure	Ambient temperature (degree C)	PWM carrier frequency		
					4kHz	4kHz	4kHz
1	Individual mounting	With		40	100%	100%	100%
				50	100%	100%	95%
				60	50%	40%	40%
2	Individual mounting	W/O		40	100%	100%	100%
				50	100%	100%	85%
				60	90%	75%	60%
3	Side by side mounting	W/O		40	100%	100%	100%
				50	100%	100%	80%
				60	90%	60%	55%
4	Horizontal mounting	W/O		40	100%	100%	100%
				50	100%	100%	85%
				60	90%	60%	55%
5	DIN rail mounting	W/O		40	100%	100%	100%
				50	100%	100%	85%
				60	90%	75%	60%
6	DIN rail and side by side mounting	W/O		40	100%	100%	100%
				50	100%	100%	80%
				60	90%	60%	55%
7	Individual mounting with side cover	With		40	100%	100%	100%
				50	100%	90%	75%
				60	75%	55%	-
8	Individual mounting with EMC filter	With		40	100%	100%	100%
				50	100%	100%	95%
				60	50%	40%	40%

 : the range available with inverter rated current

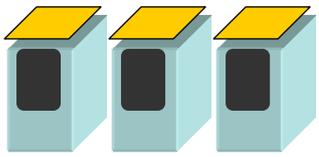
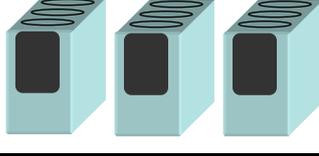
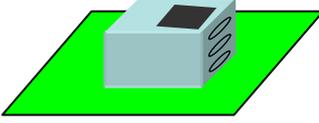
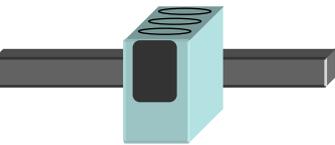
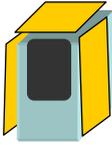
Note 1: In case of $\overline{MUL} = 1$ (constant torque characteristic (150%-60s) setting)

Note 2: In case of side by side mounting, be sure to remove the top seal label.

Note 3: Load reduction ratio (%) regards the value of Table 2.1, ambient temperature: 40°C and less, PWM carrier frequency: 4kHz or 12kHz as 100%.

5 Three-phase 500V class: 11, 15kW

Table 3.12 Load reduction depending on mounting conditions [VFS15-4110PL-W, 4150PL-W]

No.	Mounting conditions	Top seal label	Figure	Ambient temperature (degree C)	PWM carrier frequency		
					4kHz	4kHz	4kHz
1	Individual mounting	With		40	100%	100%	100%
				50	90%	90%	75%
				60	-	-	-
2	Individual mounting	W/O		40	100%	100%	100%
				50	100%	100%	85%
				60	80%	85%	60%
3	Side by side mounting	W/O		40	100%	100%	100%
				50	90%	90%	75%
				60	-	-	-
4	Horizontal mounting	W/O		40	100%	100%	100%
				50	85%	85%	75%
				60	40%	-	-
5	DIN rail mounting	W/O		40	100%	100%	100%
				50	100%	100%	85%
				60	80%	85%	60%
6	DIN rail and side by side mounting	W/O		40	100%	100%	100%
				50	90%	90%	75%
				60	-	-	-
7	Individual mounting with side cover	With		40	95%	95%	95%
				50	80%	80%	65%
				60	-	-	-
8	Individual mounting with EMC filter	With		40	100%	100%	100%
				50	90%	90%	75%
				60	-	-	-

 : the range available with inverter rated current

Note 1: In case of $RUL = 1$ (constant torque characteristic (150%-60s) setting)

Note 2: In case of side by side mounting, be sure to remove the top seal label.

Note 3: Load reduction ratio (%) regards the value of Table 2.1, ambient temperature: 40°C and less, PWM carrier frequency: 4kHz or 12kHz as 100%.

4. Variable torque characteristic ($RUL = 2$)

In case of RUL (Overload characteristic selection) = 2 (Variable torque characteristic (120% - 60s) setting) setting, be sure to install the input AC reactor (ACL) between power supply and inverter and use at ambient temperature 40°C or less. Set $F300$ to 4.0 kHz or less.

Table 4.1 Load reduction in case of $RUL = 2$ [Three-phase 240V class]

VFS15-	Ambient temperature	PWM carrier frequency
		2.0k to 4.0kHz
2004 PM-W	40°C or less	3.5 A
2007 PM-W	40°C or less	6.0 A
2015 PM-W	40°C or less	9.6A
2022 PM-W	40°C or less	12.0 A
2037PM-W	40°C or less	19.6 A
2055PM-W	40°C or less	30 .0A
2075PM-W	40°C or less	38.6 A
2110PM-W	40°C or less	56.0 A
2150PM-W	40°C or less	69.0A

Table 4.2 Load reduction in case of $RUL = 2$ [Single-phase 240V class]

VFS15S-	Ambient temperature	PWM carrier frequency
		2.0k to 4.0kHz
2002 PL-W	40°C or less	1.9A
2004 PL-W	40°C or less	4.1 A
2007 PL-W	40°C or less	5.5A
2015 PL-W	40°C or less	10.0 A
2022 PL-W	40°C or less	12.0A

Table 4.3 Load reduction in case of $R_{UL} = 2$ [500V class]

VFS15-	Ambient temperature	PWM carrier frequency
		2.0k to 4.0kHz
4004 PL-W	40°C or less	2.1 A
4007 PL-W	40°C or less	3.0 A
4015 PL-W	40°C or less	5.4A
4022 PL-W	40°C or less	6.9 A
4037 PL-W	40°C or less	11.1 A
4055 PL-W	40°C or less	17.0A
4075 PL-W	40°C or less	23.0 A
4110 PL-W	40°C or less	31.0A
4150 PL-W	40°C or less	38.0A