

Standard specifications VF-PS1

Item	Specification																											
Applicable motor (kW)	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	220	250	280	315	400	500	630	
Machine type	VFPS1																											
Input voltage class	VFPS1-																											
3-phase 200V class	200PL	207PL	2015PL	2022PL	2037PL	2055PL	2075PL	2110PM	2150PM	2185PM	2220PM	2300PM	2370PM	2450PM	2550P	2750P	2800P	—										
3-phase 400V class	400PL	4015PL	4022PL	4037PL	4055PL	4075PL	4110PL	4150PL	4185PL	4220PL	4300PL	4370PL	4450PL	4550PL	4750PL	4800PL	410KPC	4132KPC	4180KPC	4220KPC	4250KPC	4280KPC	4315KPC	4400KPC	4500KPC	4630KPC	—	
Rating	Capacity(KVA)																											
Output current (A)	3-phase 200 V class																											
3-phase 200 V class	1.1	1.8	3.0/3.1	4.2/4.4	6.7/8.0	10/11	13	21	26	29/31	34/37	46/50	55/60	67/72	84/88	109/122	137/136	164	197	239	325	367	419	469	578	717	905	
3-phase 400 V class	3	4.8	8	11	17.5	27.5	33	54	66	75	88	120	144	176	221	285	359	—										
3-phase 400 V class	—	2.3	4.1	5.8	10.5	14.3	17.6	27.7	33	41	48	66	79	94	116	160	179	215	259	314	427	481	550	616	759	941	1181	
Power supply	Voltage/frequency																											
3-phase 200 to 240 V, 50/60 Hz: 200 V class 3-phase 380 to 480 V, 50/60 Hz: 400 V class 0.75 to 110kW 3-phase 380 to 440 V-50 Hz, 380 to 480 V-60 Hz: 400 V class 132 to 630kW																												
Tolerance																												
Voltage +10%,-15% (±10% during continuous 100% load) Frequency ±5%																												
Rated output voltage	3 phase 200 to 240V : 200V class, 3 phase 380 to 480V : 400V class (The maximum output voltage is same as the input source voltage)																											
Output frequency range	0.01 to 500 Hz (Default setting 0.01 to 80.0 Hz)																											
Overload current rating	120%-60 seconds, 135%-2 seconds (Anti-time limit characteristic)																											
Dynamic braking circuit	Built-in dynamic braking circuit : 0.4 to 220 kW. External option : 250 kW or more																											
Dynamic braking resistor	External option																											
Main functions	Parameter setup quick mode, Local/remote operation, Automatic energy saving mode, programmable I/O terminal block, multi-PID control, Fire control enables forced operation, My function																											
Ambient temperature/Relative humidity	-10 to 60°C (current decreases when over 50°C/5 to 95% (no condensation or steam allowed) : 200 V class 0.4 to 45 kW, 400V class 0.75 to 75 kW -10 to 60°C (current decreases when over 45°C/5 to 95% (no condensation or steam allowed) : 200V class 55 to 90 kW, 400V class 90 to 630 kW																											
Protective method	200 V class 0.4 to 45 kW, 400 class 0.75 to 75 kW: IP20, 200 V class 55 to 90 kW, 400 class 90 to 630 kW: IP00																											
Cooling method	Forced air cooling																											
Built-in filter	EN55011 class A, EN61800-3 category C2 compliant (built-in EMI noise filter) : 200 V class 0.4 to 1.5 kW, 400 V class 0.75 to 3.7 kW EN55011 class A, EN61800-3 category C3 compliant (built-in EMI noise filter) : 200 V class 2.2 to 7.5 kW, 400 V class 5.5 to 630 kW Basic noise filter (Not complies EMC standard) : 200 V class 11 to 45 kW																											
Built-in reactor	Built-in DC reactor : 200 V class 11 to 45 kW, 400V class 18.5 to 75 kW Attached DC reactor : 200 V class 55 to 90 kW, 400V class 90 to 630 kW																											

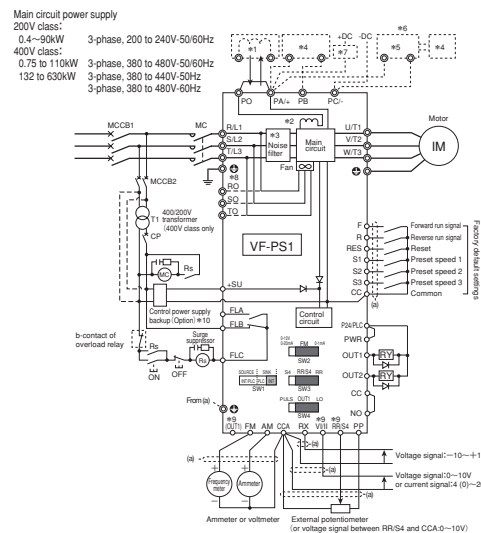
Exterior dimensions and weight

Input voltage Class	Applicable motor (kW)	Inverter model	Dimensions (mm) Note 1			Approximate Weight (kg)
			Width	Height	Depth	
3-phase 200 V	0.4	VFPS1-2004PL	130	230	152	3
	0.75	VFPS1-2007PL	130	230	152	3
	1.5	VFPS1-2015PL	130	230	152	3
	2.2	VFPS1-2022PL	155	260	164	4
	3.7	VFPS1-2037PL	155	260	164	4
	5.5	VFPS1-2055PL	175	295	164	5.5
	7.5	VFPS1-2075PL	210	295	191	7.5
	11	VFPS1-2110PM	230	400	191	14
	15	VFPS1-2150PM	230	400	191	14
	18.5	VFPS1-2185PM	240	420	212	21
	22	VFPS1-2220PM	240	420	212	21
	30	VFPS1-2300PM	320	550	242	41
	37	VFPS1-2370PM	320	550	242	41
	45	VFPS1-2450PM	320	550	242	41
3-phase 400 V	55	VFPS1-2550P	310	680(920)	370	59(87)
	75	VFPS1-2750P	310	680(920)	370	59(87)
	90	VFPS1-2900P	350	782(1022)	370	72(103)
	0.75	VFPS1-4007PL	130	230	152	3
	1.5	VFPS1-4015PL	130	230	152	3
	2.2	VFPS1-4022PL	130	230	152	3
	3.7	VFPS1-4037PL	155	260	164	4
	5.5	VFPS1-4055PL	175	295	164	5.5
	7.5	VFPS1-4075PL	175	295	164	5.5
	11	VFPS1-4110PL	210	295	191	8
	15	VFPS1-4150PL	230	400	191	13
	18.5	VFPS1-4185PL	230	400	191	16
	22	VFPS1-4220PL	240	420	212	21
	30	VFPS1-4300PL	240	550	242	29
	37	VFPS1-4370PL	240	550	242	29
	45	VFPS1-4450PL	320	630	290	48
	55	VFPS1-4550PL	320	630	290	48
	75	VFPS1-4750PL	320	630	290	48
	90	VFPS1-4900PC	310	680(920)	370	59(89)
110	VFPS1-4110KPC	310	680(920)	370	59(89)	
132	VFPS1-4132KPC	350	782(1022)	370	74(108)	
160	VFPS1-4160KPC	330	950(1190)	370	82(118)	
220	VFPS1-4220KPC	430	950(1190)	370	104(161)	
250	VFPS1-4250KPC	585	950(1190)	370	134(194)	
280	VFPS1-4280KPC	585	950(1190)	370	136(204)	
315	VFPS1-4315KPC	585	950(1190)	370	136(204)	
400	VFPS1-4400KPC	880	1150(1390)	370	215(302)	
500	VFPS1-4500KPC	880	1150(1390)	370	225(330)	
630	VFPS1-4630KPC	1108	1150(1390)	370	330(462)	

Note 1: Value in () includes attached DC reactor

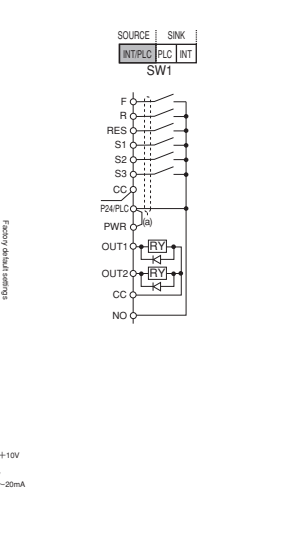
Standard connection diagram

Sink logic (common : CC)



Standard connection diagram

Source logic (common : P24)



- *1: The inverter is shipped with the terminals PO and PA+ shorted with a bar (200V-45kW or smaller, 400V-75kW or smaller). Remove this shorting bar when installing a DC reactor (DCL). For 200 V - 55 kW or more, and 400 V - 90 kW or more models, be sure to install the DC reactor.
- *2: The DC reactor is built in for models 200V-11kW-45kW and 400V-18.5kW-75kW.
- *3: The noise filter is built in for models 200V-45kW or smaller and all of 400V.
- *4: External braking resistor (option). Dynamic braking drive circuit built-in (GTR7) as standard for models 220kW or smaller.
- *5: Power generation braking Unit (option). When the external braking resistor (optional) is used on 250 kW or more models, the separate power braking unit (optional) is required.
- *6: To supply a DC power, connect the cables to the PA+ and PA- terminals.
- *7: If you want to use a DC power supply to operate the inverter (200V: 18.5kW or more, 400V: 22kW or more), be sure to contact your supplier customer support center, because an inrush current limiting circuit is required in such a case.
- *8: For models 200V-90kW and 400V-132kW or larger, three-phase power input is necessary to drive the fan if you want to use a DC power supply.
- *9: The functions assigned to terminals OUT1, VI/VII and RRS/4 can be switched by changing parameter settings.
- *10: To supply control power from an external power supply for backing up the control power supplied from the inverter, an optional control power backup device (CPS002Z) is required. In such a case, the backup device is used at the same time with the internal power supply of the inverter. The optional control power backup unit can be used with both 200V and 400V models.

To users of our inverters : Our inverters are designed to control the speeds of three-phase induction motors for general industry.

Precautions

- * Read the instruction manual before installing or operating the inverter unit and store it in a safe place for reference.
- * When using our inverters for equipment such as nuclear power control, aviation and space flight control, traffic, and safety, and there is a risk that any failure or malfunction of the inverter could directly endanger human life or cause injury, please contact our headquarters, branch, or office printed on the front and back covers of this catalogue. Special precautions must be taken and such applications must be studied carefully.
- * When using our inverters for critical equipment, even though the inverters are manufactured under strict quality control always fit your equipment with safety devices to prevent serious accident or loss should the inverter fail (such as issuing an inverter failure signal).
- * Do not use our inverters for any load other than three-phase induction motors.
- * None of Toshiba, its subsidiaries, affiliates or agents, shall be liable for any physical damages, including, without limitation, malfunction, anomaly, breakdown or any other problem that may occur to any apparatus in which the Toshiba inverter is incorporated or to any equipment that is used in combination with the Toshiba inverter. Nor shall Toshiba, its subsidiaries, affiliates or agents be liable for any compensatory damages resulting from such utilization, including compensation for special, indirect, incidental, consequential, punitive or exemplary damages, or for loss of profit, income or data, even if the user has been advised or apprised of the likelihood of the occurrence of such loss or damages.

For further information, please contact your nearest Toshiba Representative or International Operations-Producer Goods. The information in this brochure is subject to change without notice.

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TOSHIBA

Transistor Inverter



3-phase 200V class 0.4kW to 90kW
3-phase 400V class 0.75kW to 630kW

Variable torque Inverter TOSVERT™

VF-PS1

SAVE POWER AND SAVE MONEY

For the requirements of improving energy saving or reducing the high frequency noise and harmonics to the peripheral device, the "VF-PS1" which is specialized for the industrial fan and pump application is just arrived.

The optimized design by Toshiba's excellent motor control and circuit design technology support your correspondence for energy saving and environment.

Variable torque Inverter TOSVERT™

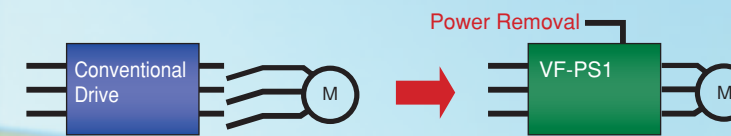
VF-PS1

3-phase 200V class 0.4kW to 90kW
3-phase 400V class 0.75kW to 630kW



"Power Removal" safety function

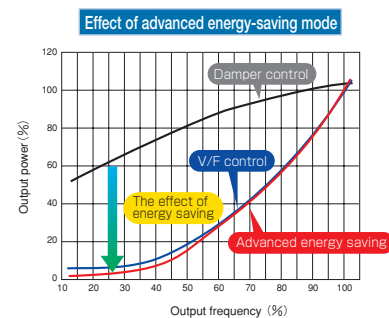
Built-in Power Removal safety function which complies with EN954-1 category 3 and IEC/EN61508-1 SIL2. It saves the installation of a line side or motor side contactor.



point 1 More energy saving



The advanced energy-saving mode optimizes fan and pump efficiency even if low speeds. The effect can be monitored by operation panel or through serial communication data. This makes it ideal for exhaust fan, primary pump, boiler and feed water pump that require energy saving.



point 3 Special softwares for fan and pump application are built-in



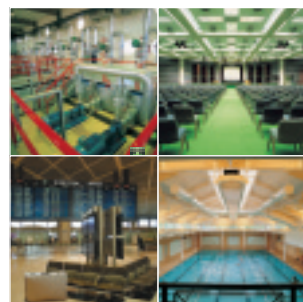
Ideal functions are built-in for fan and pump application.

- ◆Bumpless function realize seamless operation between local and remote
 - ◆Fire control enables forced operation in emergency
 - ◆Speed reference can manage on/off operation(sleep function)
 - ◆Multi-PID control with direct and reverse operation
 - ◆Low torque detection can notice a broken belt
 - ◆PTC thermistor input
 - ◆The MY function allows you to program logic and internal data operations
- RS485(TOSHIBA/Modbus protocol)communications is equipped as standard, DeviceNet[®]*3, PROFIBUS, CC-Link[®]*3, LonWorks[®]*3, BAC net[®]*3, Metasys[®]N2*3, and APOGEE[®]FLN*3 fieldbuses are supported as options.

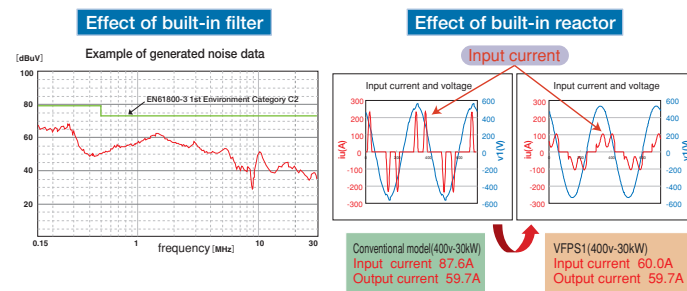
Fieldbus Option



point 2 High-frequency noise reduction and harmonics reduction



The integrated noise filter*1 and reactor*2 drastically reduce high-frequency noise and harmonics which are generated from an inverter, and the power factor also improved. This reactor limits the input current within 110% of the rated output current. It saves power and reduces running cost of power supply system. This makes it ideal for HVAC fan and pump.



point 4 Simple Setup by EASY Key



In the Quick mode, pressing the EASY key on the panel allows you to operate the inverter by eight basic parameters.

You can customize the Quick mode display, maximum of 32 target parameters are displayed to suit your specific setup requirements. An alarm warns when the main circuit capacitors, circuit boards capacitors, or cooling fan needs to be replaced. This makes it ideal for exhaust fan, dust collector, drier machine and water pump.

EASY key



Quick mode (EASY)

Title	Function
R U Y	Parameter setting macro function
P L	V/F control mode selection
F H	Maximum frequency
R C C	Acceleration time 1
d E C	Deceleration time 1
L H F	Motor overload protection level 1
F N	FM terminal meter selection
P S E L	Parameter display selection

Voltage class	Applicable Motor Output (kW)																									
	0.4	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	220	250	280	315	400	500
3-phase 200V class (IP20/IP00)																										
3-phase 400V class (IP20/IP00)																										
3-phase 400V class (IP54)																										

Up to 5.5kW, 3-phase 200V class can be applied to 1-phase input power supply by using 1 size-up rating.

Totally enclosed box type for IP54



Compatible with the World's Main Standards CE marking, UL, CSA, C-lick

Built-in thermal protection function which complies with NEC2005®
Comply with SEMI F47(Semiconductor Equipment and Materials International)



ISO 9001 accreditation acquired
This product has been designed and manufactured at a factory accredited with ISO 9001, the international quality assurance standard.

ISO 14001 accreditation acquired
The factory that manufactures this product is registered for ISO 14001, the environment management system standard.

- *1 200 V class models, 0.4 to 7.5 kW : EMI noise filter (complies with the European EMC Directive) built-in standard
- 200 V class models, 11 to 45 kW : Basic noise filter (Not complies with the European EMC Directive) built-in standard
- 400 V class models, 0.75 to 75 kW : EMI noise filter (complies with the European EMC Directive) built-in standard
- 400 V class models, 90 to 630 kW : EMI noise filter (complies with the European EMC Directive) built-in standard.
- *2 200 V class models, 11 to 45 kW : DC reactor built-in standard
- 400 V class models, 18.5 to 75 kW : DC reactor built-in standard
- 90 to 630 kW : DC reactor attached.

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