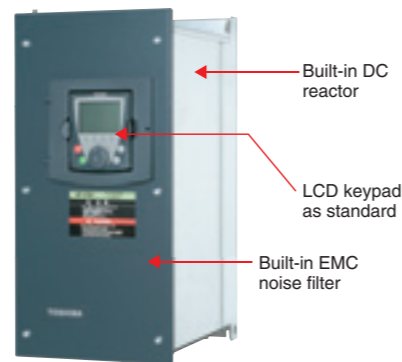


Totally enclosed box type for IP54/UL type 12

- point 1** **Totally enclosed box type for IP54/UL type 12**
 - IP54 protection for direct mounting on a wall
- point 2** **High-frequency noise reduction**
 - IP54 product with EN 55011 class A or class B (IEC/EN 61800-3) built-in EMC filters
- point 3** **Harmonics reduction**
 - New types of compact and space-saving DC reactor is built-in for all models
- point 4** **LCD keypad as standard**
 - Possible for palm top operation



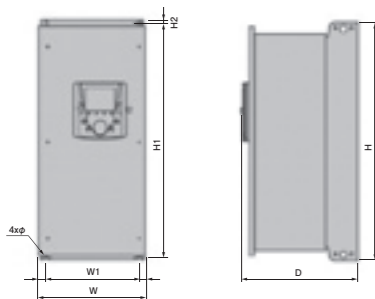
Standard specifications

Item	Specification															
Applicable motor (kW)	0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90
Type	VFPS1-															
Type Form	VFPS1-															
Capacity(KVA)Note 1)	1.8	3.1	3.9	6.9	9.1	12.0	17.0	23.0	28.0	33.0	45.0	54.0	65.0	78.0	104.0	124.0
Output current(A) Note 2)	2.3	4.1	5.1	9.1	12	16	22.5	30.5	37	43.5	58.5	71.5	85	103	137	163
Power supply	3-phase 380 to 480V, 50/60 Hz															
Allowable fluctuation	Voltage +10%, -15% (±10% during continuous 100% load) Frequency ±5%															
Rated output voltage	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 60.0/50.0 Hz)															
Overload current rating	110%-60 seconds(Inverse time-lag characteristic)															
Dynamic breaking circuit	Built-in dynamic breaking circuit															
Dynamic breaking 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	-10 to 50°C (current decreases when over 40°C)															
Relative humidity	5 to 95% (free from condensation and vapor)															
Protective method	IP54/UL type 12															
Cooling method	Forced air cooling															
Built-in filter	EN55011 class A, EN61800-3 category C2 compliant (built-in EMI noise filter) :PLE type 0.75 to 5.5kW EN55011 class A, EN61800-3 category C3 compliant (built-in EMI noise filter) :PLE type 7.5 to 90kW EN55011 class B, EN61800-3 category C1 compliant (built-in EMI noise filter) :PDE type															
Reactor	Built-in DC reactor															

Note 1) Capacity is calculated at 440V

Note 2) Rated output current when the PWM carrier frequency(parameter CF) is 8kHz or less.

External dimensions



Input voltage Class	Applicable motor (kW)	Inverter type Note 1)	Dimensions (mm)							Approximate Weight(kg) Note 1)
			W	H	D	W1	H1	H2	ø	
3-phase 400 V	0.75	VFPS1-4007PLE(PDE)								
	1.5	VFPS1-4015PLE(PDE)	240	490	261	200	476	6	6	13(15)
	2.2	VFPS1-4022PLE(PDE)								
	4.0	VFPS1-4037PLE(PDE)	240	490	275	200	476	6	6	16(18)
	5.5	VFPS1-4055PLE(PDE)								
	7.5	VFPS1-4075PLE(PDE)	260	525	275	220	511	6	6	20(23)
	11	VFPS1-4110PLE(PDE)								
	15	VFPS1-4150PLE(PDE)	296	560	304	250	544	8	6	25(29)
	18.5	VFPS1-4185PLE(PDE)								
	22	VFPS1-4220PLE(PDE)	315	665	305	270	647	10	6	36(41)
	30	VFPS1-4300PLE(PDE)	285	720	301	245	700	10	7	34(39)
	37	VFPS1-4370PLE(PDE)								
45	VFPS1-4450PLE(PDE)	285	880	332	245	860	10	7	43(49)	
55	VFPS1-4550PLE(PDE)									
75	VFPS1-4750PLE(PDE)	362	1000	353	300	975	10	9	69(80)	
90	VFPS1-4900PLE(PDE)									

Note 1) The values in parentheses refer to PDE type.
VFPS1-****PLE:Built-in class A EMC filter, VFPS1-****PDE:Built-in class B EMC filter

Standard connection diagram

See the Standard connection diagram for Standard type.

To users : This inverter is 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.

TOSHIBA

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TOSHIBA

Transistor Inverter



3-phase 200V class 0.4kW to 90kW
3-phase 400V class 0.75kW to 630kW
3-phase 690V class 3.0kW to 630kW

Variable torque Inverter TOSVERT™

VF-PS1

**Totally enclosed
box type for IP54**



ISO 9001 Certification Acquired
This product is designed and manufactured in factories that have acquired certification of "ISO 9001," the international quality assurance standard.

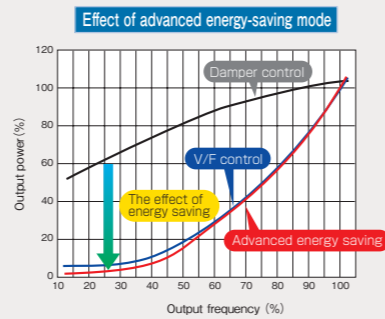
ISO 14001 Certification Acquired
The factories manufacturing this product are ISO-14001, environmental management system, registered factories.



point 1 More energy saving



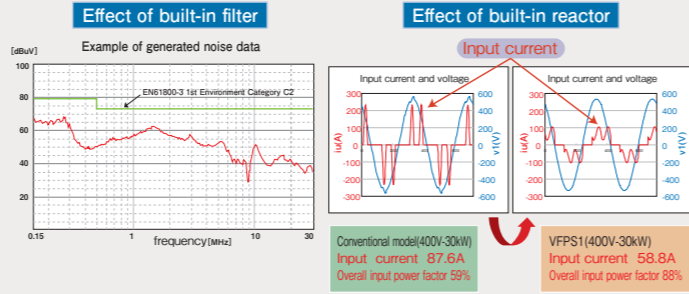
The advanced energy-saving mode optimizes fan and pump efficiency even if low speeds. The effect can be monitored by operation panel or through serial communication data. This makes it ideal for exhaust fan, primary pump, boiler and feed water pump that require energy saving.



point 2 High-frequency noise reduction and harmonics reduction



The integrated noise filter*1 and DC reactor*1 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. *1 Refer to Standard Specifications.



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

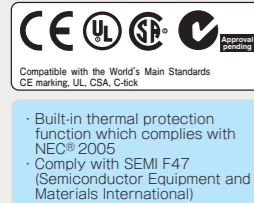
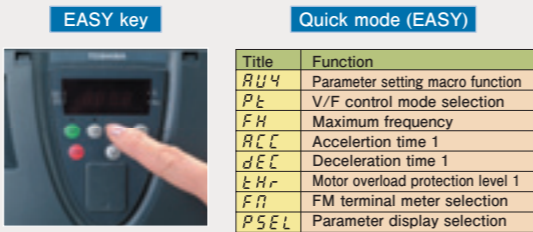
RS485(TOSHIBA/Modbus protocol)communications is equipped as standard, DeviceNet*2, PROFIBUS, CC-Link*2, LonWorks*2, BACnet*2, Metasys*2, and APOGEE*2 fieldbuses are supported as options.



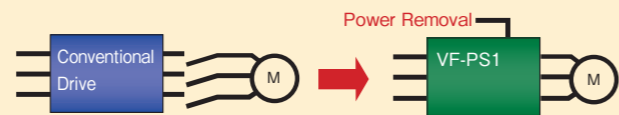
point 4 Simple Setup by EASY Key and Easy Maintenance



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.



"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.



Voltage class	Applicable Motor Output(kW)																											
	0.4	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200	220	250	280	315	400	500
3-phase 200V class (IP20/IP00)	[Bar chart showing applicable motor outputs]																											
3-phase 400V class (IP20/IP00)	[Bar chart showing applicable motor outputs]																											
3-phase 400V class (IP54)	[Bar chart showing applicable motor outputs]																											
3-phase 690V class (IP20/IP00)	[Bar chart showing applicable motor outputs]																											

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

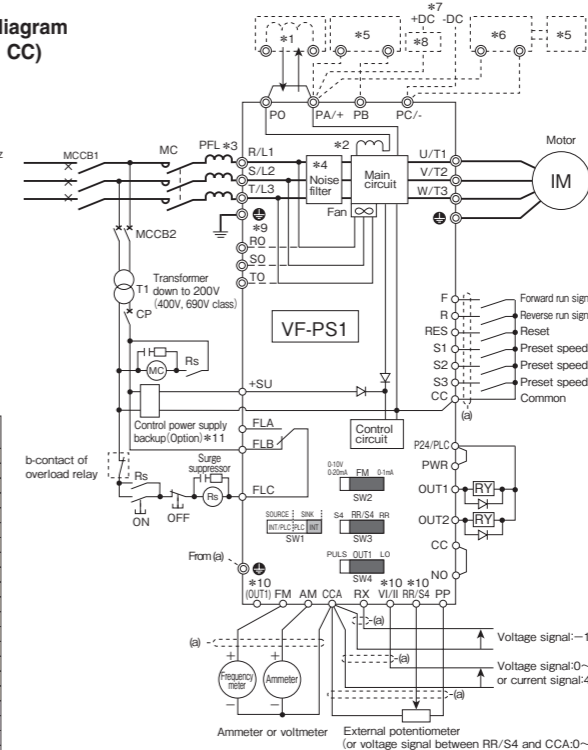
Standard type

Standard specifications VF-PS1

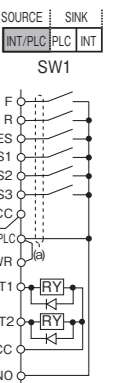
Item	Specification																													
	0.4	0.75	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18.5	22	30	37	45	55	75	90	110	132	160	200	220	250	280	315	400	500	630	
Applicable motor(kW)	VFPS1																													
Type Form	3-phase 200V class, 3-phase 400V class, 3-phase 690V class																													
Rating	Capacity (kVA), Output current (A), Voltage / frequency																													
Power supply	Voltage fluctuation, Rated output voltage, Output frequency range, Overload current rating, Dynamic braking circuit, Dynamic braking resistor, Main functions, Ambient temperature, Relative humidity, Protected method, Cooling method, Built-in filter, Built-in reactor																													

Note1) Capacity is calculated at 220V for the 200V class, at 440V for the 400V class and at 690V for the 690V class.
Note2) Rated output current when the PWM carrier frequency (parameter CF) is following. 200V/400V class : 4kHz or less, 690V class : 2.5kHz

Standard connection diagram : Sink logic (common : CC)



Standard connection diagram : Source logic (common : P24)

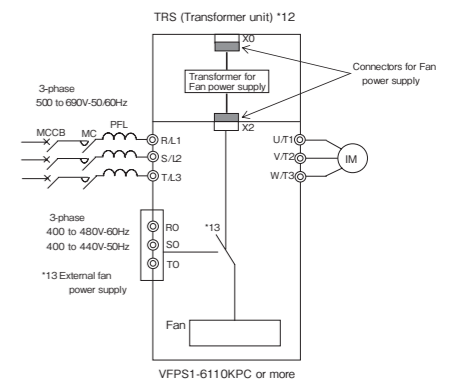


External dimensions and weight

Input voltage Class	Applicable motor (kW)	Inverter type	Dimensions (mm)	Note	Approximate Weight(kg)
3-phase 200 V	0.4	VFPS1-2004PL	130 230 152	3	3
	0.75	VFPS1-2007PL	130 230 152	3	3
	1.5	VFPS1-2015PL	130 230 152	3	3
	2.2	VFPS1-2022PL	155 260 164	4	4
	4.0	VFPS1-2037PL	155 260 164	4	4
	5.5	VFPS1-2055PL	175 295 164	5	5
	7.5	VFPS1-2075PL	210 295 191	7.5	7.5
	11	VFPS1-2110PM	230 400 191	14	14
	15	VFPS1-2150PM	230 400 191	14	14
	18.5	VFPS1-2185PM	240 420 212	21	21
	22	VFPS1-2220PM	240 420 212	21	21
	30	VFPS1-2300PM	320 550 242	41	41
	37	VFPS1-2370PM	320 550 242	41	41
	45	VFPS1-2450PM	320 550 242	41	41
	55	VFPS1-2550PL	310 680(920) 370 59(87)	59(87)	59(87)
75	VFPS1-2750P	310 680(920) 370 59(87)	59(87)	59(87)	
90	VFPS1-2900P	350 782(1022) 370 72(107)	72(107)	72(107)	
3-phase 400 V	0.75	VFPS1-4007PL	130 230 152	3	3
	1.5	VFPS1-4015PL	130 230 152	3	3
	2.2	VFPS1-4022PL	130 230 152	3	3
	4.0	VFPS1-4037PL	155 260 164	4	4
	5.5	VFPS1-4055PL	175 295 164	5	5
	7.5	VFPS1-4075PL	210 295 191	8	8
	11	VFPS1-4110PL	210 295 191	8	8
	15	VFPS1-4150PL	230 400 191	13	13
	18.5	VFPS1-4185PL	230 400 191	16	16
	22	VFPS1-4220PL	240 420 212	21	21
	30	VFPS1-4300PL	240 550 242	29	29
	37	VFPS1-4370PL	240 550 242	29	29
	45	VFPS1-4450PL	320 630 290	48	48
	55	VFPS1-4550PL	320 630 290	48	48
	75	VFPS1-4750PL	320 630 290	48	48
90	VFPS1-4900PC	310 680(920) 370 59(87)	59(87)	59(87)	
110	VFPS1-4110KPC	310 680(920) 370 59(87)	59(87)	59(87)	
132	VFPS1-4132KPC	350 782(1022) 370 74(108)	74(108)	74(108)	
160	VFPS1-4160KPC	330 950(1190) 370 82(118)	82(118)	82(118)	
200	VFPS1-4200KPC	430 950(1190) 370 104(161)	104(161)	104(161)	
250	VFPS1-4250KPC	585 950(1190) 370 134(194)	134(194)	134(194)	
280	VFPS1-4280KPC	585 950(1190) 370 136(204)	136(204)	136(204)	
315	VFPS1-4315KPC	585 950(1190) 370 136(204)	136(204)	136(204)	
400	VFPS1-4400KPC	880 1150(1390) 370 215(302)	215(302)	215(302)	
500	VFPS1-4500KPC	880 1150(1390) 370 225(330)	225(330)	225(330)	
630	VFPS1-4630KPC	1108 1150(1390) 370 330(462)	330(462)	330(462)	
3-phase 690 V	3.0	VFPS1-6030PL	240 420 212	21	21
	5.5	VFPS1-6055PL	240 420 212	21	21
	7.5	VFPS1-6075PL	240 420 212	21	21
	11	VFPS1-6110PL	240 420 212	21	21
	15	VFPS1-6150PL	240 420 212	21	21
	18.5	VFPS1-6185PL	240 420 212	21	21
	22	VFPS1-6220PL	240 420 212	21	21
	30	VFPS1-6300PL	320 550 242	41	41
	37	VFPS1-6370PL	320 550 242	41	41
	45	VFPS1-6450PL	320 630 290	48	48
	55	VFPS1-6550PL	320 630 290	48	48
	75	VFPS1-6750PL	320 630 290	48	48
	90	VFPS1-6900PL	320 630 290	48	48
	110	VFPS1-6110KPC	310 680(920) 370 59(87)	59(87)	59(87)
	132	VFPS1-6132KPC	350 782(1022) 370 74(108)	74(108)	74(108)

Note : Value in () includes attached DC reactor for the 200V/400V class and attached TRS (Transformer) for the 690V class.

- *1 : The inverter is shipped with the terminals P0 and PA/+ shorted with a bar (200V-45kW or less, 400V-75kW or less and 690V-90kW or less). 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, 400V-18.5kW~75kW and 690V-3.0~90kW.
- *3 : For 690V-110kW or more, be sure to install the AC reactor (option).
- *4 : The noise filter is built in for models 200V-45kW or less, all of 400V and all of 690V.
- *5 : External braking resistor (option). Dynamic braking drive circuit built-in (IGTR) as standard for models 220kW (200kW for 690V) or less.
- *6 : Power generation braking Unit (option). When the external braking resistor (option) is used on 200kW or more models, the separate power braking unit (option) is required.
- *7 : To supply a DC power, connect the cables to the PA/+ and PC/- terminals (Except 690V models).
- *8 : 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.
- *9 : For models 200V-75kW and 400V-110kW or more, three-phase power input is necessary to drive the fan if you want to use a DC power supply.
- *10 : The functions assigned to terminals OUT1, V/I1 and RR/S4 can be switched by changing parameter settings. The internal impedance between V/I1 terminal and CCA is high when the inverter control power cut off. Please put a resistor (1/2W-470 ohms) between V/I1 and CCA to avoid mis-detecting the current input signal error.
- *11 : 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 (CPS02Z) 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 convert 200V~480Vac to 24Vdc.



- *12 : 690V-110kW or more models are necessary to supply operation power for cooling fans, TRS (Transformer for fan power supply) connect to cooling fans as follows.
- *13 : In case of using external fan power supply instead of TRS, it is necessary to change the connection of the fan power supply inside of the inverter.