

SAVE POWER AND SAVE MONEY

The VF-PS1 has arrived! Specially engineered to meet the global demand for energy saving and harmonic regulation.

"VF-PS1" is all you need for Industrial fan and pump application.



Photo is PS1 with LCD remote keypad option.



- point 1 More energy saving**
 - Advanced energy-saving mode
Best 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 reactor*1
Best for HVAC fan and pump.
*1 Depends on the voltage and capacity range
- point 3 Built-in special softwares for fan and pump application**
 - Bumpless function, Fire control, Sleep function, Multi-PID control, etc
Best for exhaust fan, primary pump and HVAC fan.
- point 4 Simple Setup by EASY Key**
 - EASY key, and 8 basic parameters
Best for exhaust fan, dust collector, drier machine and water pump.
- point 5 For more flexibility and usefulness**
 - Built-in RS485, My function, LONWORKS® and BAC net® fieldbus options
Best for process pump and fan.

“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.

Totally enclosed box type for IP54

Variable torque Inverter TOSVERT™

VF-PS1

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

TOSVERT™ is a registered trademark of TOSHIBA CORPORATION

- Built-in thermal protection function which complies with NEC® 2005
- Comply with SEMI F47(Semiconductor Equipment and Materials International)



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)	[Bar chart showing applicable motor outputs for 200V class]																									
3-phase 400V class (IP20/IP00)	[Bar chart showing applicable motor outputs for 400V class]																									
3-phase 400V class (IP54)	[Bar chart showing applicable motor outputs for 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.

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.

CE, UL, SP, and other safety and quality marks.

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point 1 More energy saving



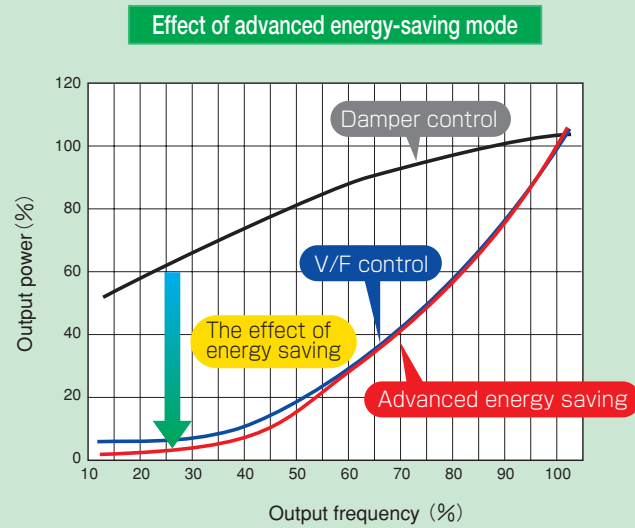
In order to meet the Kyoto protocol requirements, energy efficiency is becoming one of the top priority matters for the international organization and government.

VF-PS1 can help to achieve energy saving by the advanced energy saving mode operation.

*1:Photos of machinery are illustrative purposes only.

More energy saving

The efficiency of induction motor normally fall at the light load and low speed. The advanced energy-saving mode minimize the loss of induction motor by controlling excitation current belong to the load. Therefore, this mode increase fan and pump efficiency even in the low speed.



The Energy saved power consumption can be monitored by operation panel or through serial communication data.

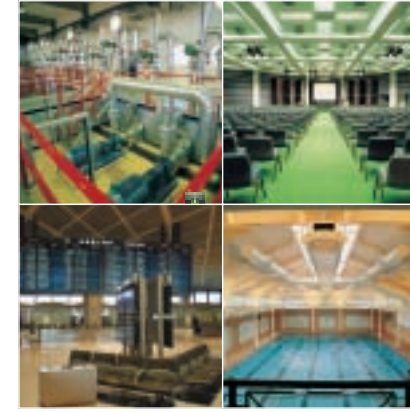


Monitor

Output power	▲	H 7.5	The inverter output power (kW) is displayed.
Integral output power	▲	H 90	The integrated amount of power (KWh) supplied from the inverter is displayed.

7.5kW motor
Output power:7.5kW
Integral output power:900kWh

point 2 High-frequency noise reduction and harmonics reduction



The integrated noise filter*2 and reactor*2 drastically reduce high-frequency noise and harmonics. The power factor and energy saving are also improved.

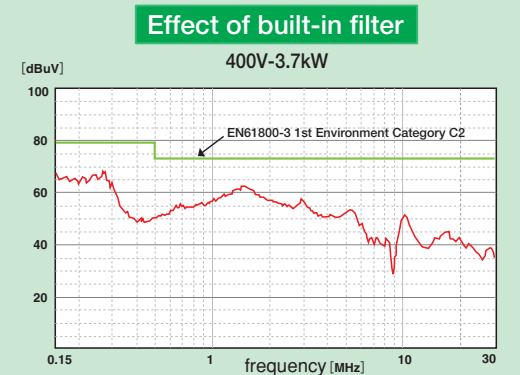
*1:Photos of machinery are illustrative purposes only.

*2:Depends on the voltage and capacity.

High-frequency Noise Reduction

Built-in noise filters are ideal for site such as commercial facilities and offices where attention must be paid to peripheral devices. Compared to filter not integrated models, space and wiring can be saved by incorporating filter in the panel. Models with built-in EMC noise filter comply with the European EMC Directive as individual inverter units.

European EMC Directive : IEC/EN61800-3, 1st Environment, C2 (200V-0.4~2.2kW)
or
400V-0.75~3.7kW
IEC/EN61800-3, 2nd Environment, C3



200V class models, 0.4 to 7.5kW : EMI noise filter (complies with the European EMC Directive) built-in standard
200V class models, 11 to 45kW : Basic noise filter (not complies with the European EMC Directive) built-in standard
400V class models, 0.75 to 75kW : EMI noise filter (complies with the European EMC Directive) built-in standard
400V class models, 90 to 630kW : EMI noise filter (complies with the European EMC Directive) built-in standard

Built-in EMC filter



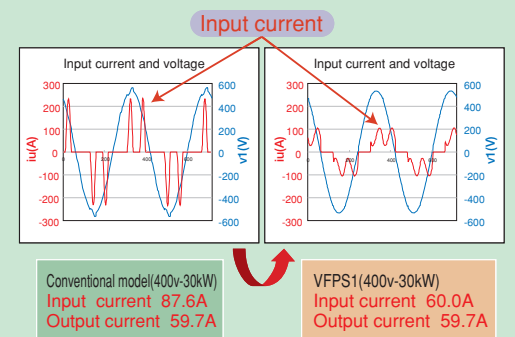
Harmonics Reduction, Power Factor Improvement

New types of compact and space-saving DC reactor is built-in for 200 V class 11 to 45 kW and 400 V 18.5 to 75 kW models.

In addition to reducing harmonics, this reactor limits the input current to 110% of the rated output current, and it has been designed to be compatible with power supply systems containing transformers, molded-case circuit breakers, and power lines.

Optional DC reactor meets IEC harmonics standards.

Effect of built-in reactor



point 3 Built-in special softwares for fan and pump application



The following functions are available for fan and pump application.

- Bumpless function and Local/Remote mode
- Fire control
- Multi-PID control
- Sleep function
- Low torque detection

*1:Photos of machinery are illustrative purposes only.

point 4 Simple set up by EASY key



Installation, maintenance, and parameter setting are easier by EASY key.

You can choose, customize and display maximum of 32 parameters.

*1:Photos of machinery are illustrative purposes only.

Built-in software for fan and pump application

Local/Remote mode

You can simply switch between Local and Remote by EASY key. By switching from Remote to Local (Bumpless function), the operating frequency and status are shifted to Local mode. It is easier for operation and adjustment.

Fire control

Fire control keeps operation with specified speed even if light fault occurs.

Multi-PID function

The PID operation can be changed at direct and inverse proportion by pressure, flow and temperature.

Sleep function (automatic stop function)

Additional energy saving can be realized by stopping at lower limit setting

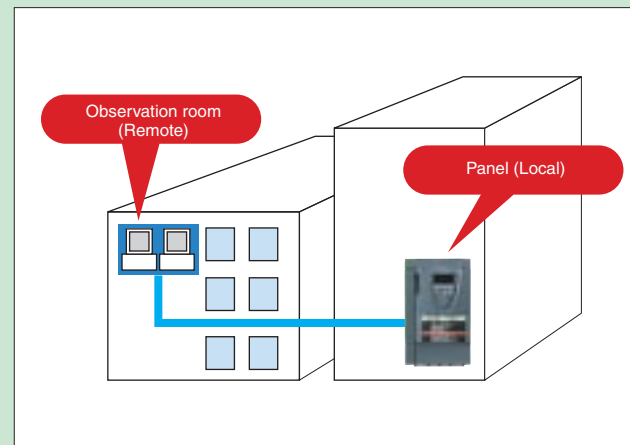
Low torque detection function

Low torque detection can notice a broken belt of AHU or low load to avoid pump trouble.

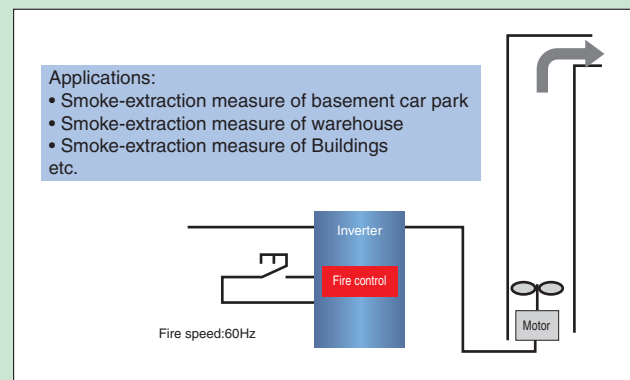
PTC thermistor input

This function is used to protect motor from overheating using the signal of PTC built-in motor.

For example:Local/Remote mode



For example:Fire control enables forced operation



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. When setting each functions, press the EASY key to switch to the standard mode by one-touch operation. In this mode, you can access all parameters.

You can customize the Quick mode display, maximum of 32target parameters are displayed to suit your specific setup requirements.

You can also use the EASY key as a Local/Remote key to switch between Local and Remote operation, and as a shortcut key to directly access any specific setup or display screen.

EASY key



Quick mode (EASY)

Title	Function
RU4	Parameter setting macro function
PE	V/F control mode selection
FH	Maximum frequency
ACC	Acceleration time 1
DEC	Deceleration time 1
OLr	Motor overload protection level 1
FR	FM terminal meter selection
PSEL	Parameter display selection

Easy Installation, Easy Commissioning, Easy Maintenance

Side-by-side installation

Side-by-side installation is possible for all VF-PS1 models. You can save and optimize space inside of control panel. Heat sink can be installed outside of the panel as an option.

Removable control terminal board

A removable terminal board allows you to use the control wiring when replacing the inverter, which also makes maintenance easier.

ON/OFF control of cooling fan

Temperature-based cooling fan ON/OFF control reduces sound noise, saves energy, and extends the cooling fan's life.

Monitoring of serviceable service parts/alarm output

The expected replacement cycle of main circuit capacitors, capacitors on control board, and cooling fan is monitored. And alarm is raise when the cycle is reached to the expected replacement time

Side-by-side installation



Removable control terminal board



point 5

For more flexibility and usefulness

Communications and Network

RS-485 communications

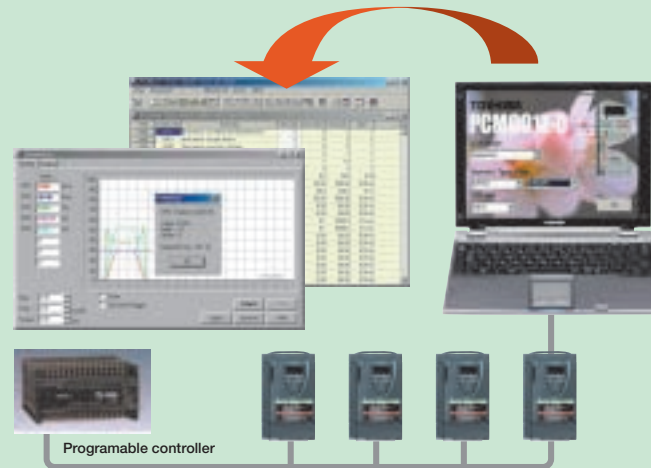
RS-485 communications is equipped as standard. Modbus-RTU protocol and TOSHIBA protocol is also supported.

Network options

DeviceNet[®]*1, PROFIBUS, CC-Link*1, LONWORKS[®]*1, BACnet[®]*1, Metasys[®]N2*1 and APOGEE[®]FLN*1 are also available.

Data tracing

The PCM001Z communication software allows you to edit, monitor, and trace parameter data on a PC, enabling easier data management from inverter



*1 DeviceNet is a registered trademarks of ODVA (Open DeviceNet Vendor Association). CC-Link is a registered trademarks of Mitsubishi Electric Corporation. LONWORKS is a registered trademark of Echelon Corporation. BACnet is a registered trademark of American Society of Heating, Refrigerating and Air-Conditioning Engineers, Incorporated. Metasys N2 is a registered trademark of Johnson Controls, Incorporated. APOGEE FLN is a registered trademark of Siemens Building Technologies, Incorporated.

Customizing by "My Function"

Using "My function", you can create programs up to 28 steps. This achieves logic operations and internal data operations. Parameters can also be set by analog input and minimum-peak hold of analog outputs.

For example:

- (Ex.1) Inverter is automatically switched to commercial operation without external sequence when the inverter is tripped.
 (Ex.2) A signal is output when torque reaches 120% and frequency is 5 Hz.
 (Ex.3) "Forward rotation operation," "preset-speed operation frequency 3" and "No.2 acceleration/deceleration" are simultaneously turned ON by input on a single terminal.
 (Ex.4) The acceleration/deceleration time is changed dynamically by a voltage within the range 0 to 10 V.

My function

Number of program steps	: 28
Internal relays	: 8
Internal counters	: 2
Logic commands	: ST, STN, AND, ANDN, OR, ORN, SET, RSET, HOLD
Data commands	: EQ, NE, GT, GE, LT, LE, ASUB

Safety Environmental Compatibility

Ambient temperature 60°C

The VF-PS1 can be used at a rating up to an ambient temperature of 50°C or 45°C and in environments up to 60°C at a reduced current.

Eco Design

88% materials used on the VF-PS1 are recyclable, which was designed more than meets of the European WEEE (Waste Electrical and Electronic Equipment) Directive of 70%.

Power section IP54 all sizes

Complete isolation frame outer atmosphere. Option kit can be used to mount the power part of the drive outside the enclosure. (IP 54 degree of protection)

12-pulse input connections

The 500~630kW class can suppress the harmonic current substantially by 12-pulses input connections.
 *12-pulse input requires a special transformer

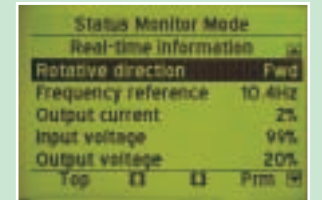
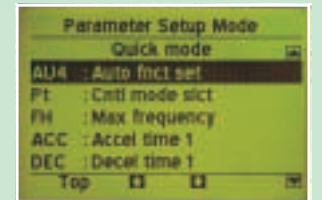
Useful Options

LCD Remote Keypad Option



This panel indicates 8-line of 23 letters and can be used for simple setup and monitoring by selection of parameters using the jog dial.

Type:RKP004Z

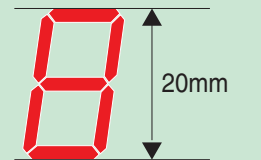


LED Remote Keypad Option



20 mm LEDs, ensure outstanding visibility even in the darkness. It is designed to be mounted on the panels as extension display or remote keypad. In addition, parameter copy and storing function is also available

Type:RKP002Z

Expanded Terminal Block Option
Fieldbus Option

I/O terminal block can be added for more complicated operation and wide range of systems:

- Contact inputs (4)
- Contact outputs (2)
- Analog inputs (2)
- Analog outputs (2)
- PTC input (1)
- Relay output (1 circuit)
- Pulse train input (1)

For more information, refer to page23.

Type:ETB003Z, ETB004Z

Main fieldbuses as built-in option card are supported for space saving and centralized control systems.

- DeviceNet[®] Type:DEV002Z
- LONWORKS[®] Type:LIU006Z
- APOGEE[®]FLN Type:APG001Z
- PROFIBUS Type:PDP002Z
- BAC net[®] Type:BCN001Z
- CC-Link Type:CCL001Z
- Metasys[®]N2 Type:MTS001Z