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VARIABLE FREQUENCY DRIVES

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CONTENTS



03

**ES450 GENERAL SINGLE/THREE
PHASE VFD FOR THREE PHASE
MOTOR**

06

**ES450 GENERAL SINGLE PHASE
VFD FOR SINGLE PHASE
MOTOR**

08

**ASM210 HIGH PERFORMANCE
THREE PHASE VFD**

10

**AS180 INDUSTRIAL-DUTY
THREE PHASE V/F VFD**

14

**AS450 HEAVY-DUTY THREE
PHASE VECTOR VFD**

19

**AS500 HIGH PERFORMANCE
HEAVY-DUTY VECTOR VFD**

24

OUR PROJECTS

19

OUR SERVICES

28

CONTACT

ES450 GENERAL SINGLE/THREE PHASE VFD FOR THREE PHASE MOTOR

Our general purpose vector Variable Frequency Drive (VFD) provides sensorless vector control in machining tools, ceramic machinery, hoisting cranes, air compressors, and other tools in petroleum and chemical, textile, and engineering industries. Sustainability, flexibility, and ease of use are all designed into the drive, helping you make complicated tasks simple.

PERFORMANCE FEATURES

- Advanced speed-sensor vector control which reduces the sensitivity to motor parameters for increased control.
- High performance vector control using flux linkage and velocity estimation technique.
- The sensitivity to the motor parameters is reduced, and the field adaptability is improved.
- Energy saving mode which monitors the actual load size and automatically adjusts the motor voltage and current accordingly.
- High torque capabilities using PID control technology which monitors motor speed changes and holds loads constant.
- Flexible input/output terminals with more than 60 functions and 15 optional functions for analog output for calibrating curve and precision.
- Current limiting function which enables the VFD to operate within the limited current values of the hardware before reaching overcurrent and possible damage.
- Motor overheating protection which switches the VFD into downtime when the temperature rises.
- Protects mechanical torque limit.



TECHNICAL SPECIFICATIONS

ITEM		SPECIFICATIONS
Main Input	Rated voltage and frequency	Single-phase 200V class: 200V-240V,50Hz/60Hz
		3-phase 400V class: 380V-480V , 50Hz/60Hz
	Allowable value of change	Voltage: 380V-15% ~ 480V+10%; Frequency: ±15%
Main output	Output voltage	Maximum output voltage equals to input voltage
	Output frequency	0.5 Hz to 400 Hz
	Overload capacity	150% of rated output current for 60s, 200% of rated output current for 2s
Control performance	Modulation mode	3-phase PWM, 2-phase PWM
	Control mode	V/f control for constant torque, V/f control for quadratic load, vector control without PG (open loop control),Energy-saving
	Setting method of run command	Outer terminal, keyboard panel or serial communication
	Setting method of speed command	Analog setting, keyboard, serial communication, UP/DOWN speed setting from external terminal
	Speed setting resolution	Keyboard: 0.1 Hz
		Analog setting: 0.05/50Hz (10bit)
	Speed control precision	V/f control:±2%
		vector control without PG (open loop control): ±0.2%
	Speed control range	V/f control 1:40
		vector control without PG (open loop control) 1:200
Acceleration and Deceleration Time	0-3200.0s	
switching frequency	1.5 kHz ~ 12 kHz, according to junction temperature automatically reduce the switching frequency	
Analog input	Number	2 ways: AI1、 AI2
	Type	DC voltage or DC current
	Maximum input range	AI1: 0 to 5VDC, 0 to 10VDC, 0/4 to 20mA DC receivable AI2: 0 to 10VDC or PTC probe input receivable
Analog output	Number	1 way: AO1
	Type	DC voltage or DC current
	Maximum input range	Voltage output: 0 to 10V, Current output: 0/4 to 20mA
logic input	Number	0.75kw-11kW:LI1,LI2,LI3,LI4,AI1,AI2
		15kW-500kW:LI,LI2,LI3,LI4,LI5,LI6,LI7,LI8,AI1,AI2 note:2 virtual logic input, capable of configuring AI1 and AI2 into logic input port (positive logic or negative logic)
	Type	Source or Sink
	Maximum input range	0-24VDC

ITEM		SPECIFICATIONS
logic output	Number	0.75kW-11kW: pulse signal output (LO-CLO) 、 relay output 1 (T1A、 T1B、 T1C) 15kW-500kW:pulse signal output (LO-CLO) 、 relay output 1、 2 (T1A-T1B-T1C、 T2A-T2B-T2C)
	pulse signal output	OC,output frequency、 current output、 ect other function
	relay output	RA-RB-RC, including a NO contact and a NC contact Maximum switch capacity: T1A,T1B: 3A at 250VAC, or 4A at 30VDC T2A,T2B: 2A at 250VAC or 30VDC
Serial communication interface		RS485 interface supports Modbus protocol.
Display	4-digit LED digital display	For display of frequency setting, output frequency, fault code and parameter setting etc.
Environment	Standard	Development of ES450 series frequency inverters follows strict international standards and relevant recommended IEC and EN standards for control devices, especially IEC/EN61800-5-1 and IEC/EN61800-3.
	Altitude	Derating unnecessary when altitude is 1000m or below (Derating necessary at altitude higher than 1000m)
	Ambient environment	0.75kW-11kW: Reliable operation at -10 ~ 50°C without derating. When top protective cover is taken off, the environment temperature can be as high as +50 °C. Above +50 °C, the current drops by 2.2% for each rise of 1 °C in temperature. 15kW-500kW: Reliable operation at -10 ~ 40°C without derating. Storage: -25 ~ 70°C
	Humidity	No condensed water or drip at 5 ~ 95%, In accordance with IEC60068-2-3
	Impact strength	15gn for continuous 11ms, In accordance with IEC/EN60068-2-27
	Maximum antipollution capacity	Class 2, in accordance with IEC/EN61800-5-1
Structure	Protection level	Top: IP41 (without removing the protective top cover). Other parts: IP20 <input checked="" type="checkbox"/>
	Cooling Method	Forced Air cooling
Installation method		Wall mounted

ES450 GENERAL SINGLE PHASE VFD FOR SINGLE PHASE MOTOR

The ES450 Drive for single phase AC motors provides the ultimate combination of power, ease of use, flexibility, and performance. With the characteristics of high start torque and high efficiency for overall unit, ES450 single phase output VFD can be widely applied to drive the single phase asynchronous motor, such as fans, pumps, power tools, etc.

PERFORMANCE FEATURES

- Advanced speed-sensor vector control which reduces the sensitivity to motor parameters for increased control.
- High performance vector control using flux linkage and velocity estimation technique.
- The sensitivity to the motor parameters is reduced, and the field adaptability is improved.
- Energy saving mode which monitors the actual load size and automatically adjusts the motor voltage and current accordingly.
- High torque capabilities using PID control technology which monitors motor speed changes and holds loads constant.
- Flexible input/output terminals with more than 60 functions and 15 optional functions for analog output for calibrating curve and precision.
- Current limiting function which enables the VFD to operate within the limited current values of the hardware before reaching overcurrent and possible damage.
- Motor overheating protection which switches the VFD into downtime when the temperature rises.
- Protects mechanical torque limit.



TECHNICAL SPECIFICATIONS

ITEM		SPECIFICATIONS
Main Input	Rated voltage and frequency	single-phase 220V class: 200-240V, 50Hz/60Hz
	Allowable value of change	Voltage: 220-10% ~ 240+10%; Frequency: 5 %
Main output	Output voltage	Maximum output voltage equals to input voltage
	Output frequency	1 Hz to 999.9 Hz
	Overload capacity	150% of rated output current for 60s,
Control performance	Control mode	V/f control for constant torque,
	Setting method of run command	Outer terminal, keyboard panel or serial communication
	Setting method of speed command	Analog setting, keyboard, serial communication, UP/DOWN speed setting from external terminal
	Speed setting resolution	Keyboard: 0.1 Hz
		Analog setting: 0.05/50Hz (10bit)
	Speed control precision	V/f control: $\pm 2\%$
	Speed control range	V/f control 1:40
	Acceleration and Deceleration Time	0-255s
switching frequency	1.5 kHz ~ 12 kHz, according to junction temperature automatically reduce the switching frequency	
Analog input	Number	2 ways: AV1, AC1
	Type	DC voltage and DC current
	Maximum input range	AV1: 0 to 10VDC AC2: 0 to 20mA or 4-20mA
Analog output	Number	1way: AO
	Type	DC voltage
	Maximum input range	Voltage output: 0 to 10V
logic input	Number	5 way: X1, X2, X3, X4, X5
	Type	Indicates positive logic or Indicates the inverse logic
logic output	Number	1 way: TC TB TA
	pulse signal output	OC, output frequency, current output, act other function
	relay output	TC-TB-TA: TC a NO contact, TB a NC contact TA a COM contact Maximum switch capacity: TC-TA/TB-TA: 5A @ 120VAC/250VAC 2.5A @ 24VDC
Serial communication interface		RS485 interface supports Modbus protocol.
Display	4-digit LED digital display	For display of frequency setting, output frequency, fault code and parameter setting etc.
Environment	Standard	Development of V6 series frequency inverter follows strict international standards and relevant recommended IEC and EN standards for control devices, especially IEC/EN61800-5-1 and IEC/EN61800-3.
	Altitude	Dreading unnecessary when altitude is 1000m or below (Dreading necessary at altitude higher than 1000m).
	Ambient environment	0.75kW-11kW: Reliable operation at -10 ~ 50°C without debating. When top protective cover is taken off, the environment temperature can be as high as +50 °C. Above +50 °C, the current drops by 2.2% for each rise of 1 °C in temperature. 15kW-500kW: Reliable operation at -10 ~ 40°C without dreading. Storage: -25 ~ 70°C
	Humidity	No condensed water or drip at 5 ~ 95%, In accordance with IEC60068-2-3
	Impact strength	15gn for continuous 11ms, In accordance with IEC/EN60068-2-27
	Maximum antipollution capacity	Class 2, in accordance with IEC/EN61800-5-1
Structure	Protection level	IP20
	Cooling Method	Forced Air cooling
Installation method		Wall mounted

AS-M210 SERIES HIGH PERFORMANCE THREE-PHASE VFD

The AS-M210 drive provides the ultimate combination of power, ease of use, flexibility, and performance. In addition to its exceptional torque production and precise control, you'll enjoy effortless setup with AS-M210's high-resolution display to control anything from simple fans and pumps to complex machines.

Whether you need simple control, functional safety, or a single robust solution look no further than AS-M210 for all your variable speed needs.

PERFORMANCE FEATURES

- Efficient and energy-saving operating mode

The efficiency-driven energy-saving operating mode and new PWM dead-time compensation technology may effectively reduce motor loss, thereby minimizing the power consumption.

- Rapid dynamic response

Controlled with advanced motor model, it can rapidly respond to sudden changes in load even without a PG.

- Smooth tracing starting

It can realize impact-free and smooth starting of rotating motor at any time.

- Strong grid adaptability

Automatic voltage regulation: In case of change in grid voltage, it can automatically keep the output voltage constant.

- Considerate application

PID control: The special menu is used for setting PID parameters and for calculating inside the VFD, eliminating the need of an independent external regulator option.

DC braking before operation: When the rotational direction of the motor is uncertain in free slide, it adopts DC braking and automatically restarts the motor after stopping.



TECHNICAL SPECIFICATIONS

Power input	Input voltage	380~440V (-15%~+10%), 3 phase power supply
	Input frequency	45~65Hz
	Instantaneous electrical drop	Under voltage protection after 15ms when the input voltage < AC300v for three-phase AC380 ~ 440V power supply
Power output	Voltage	0VAC~ input voltage
	Overload level	Stable operation 40 °C, heavy load 150%, 1min / 10min (type G), light load 120%, 1min / 10min (type P)
	Efficiency (full load)	≥0.94
	Output frequency accuracy	± 0.01% (digital command-10~+45 °C) ; ± 0.1% (Analog command 25±10°C)
Control features	Carrier frequency	1.1~8KHz
	Frequency setting resolution	0.01Hz (digital command) , ±0.06Hz/120Hz (analog 11bit+ Unsigned)
	Run command channel	Operation panel, control terminal, communication
	Frequency setting channel	Operation panel, digital quantity / analog quantity, communication, function, multi-stage speed
	Torque increase	Automatic torque lifting, manual torque lifting
	V/F curve	User defined V / F curve, linear V / F curve and three kinds of torque reduction characteristic curves
	Automatic voltage regulation (AVR)	According to the fluctuation of bus voltage, the duty cycle of output PWM signal is automatically adjusted, so as to reduce the influence of power grid voltage fluctuation on output voltage fluctuation
	Instant stop processing	In case of instantaneous power failure, uninterrupted operation is realized through bus voltage control
	DC braking capacity	Brake current: 0.0~120.0% rated current
Feature functions	Parameter copy	The standard panel can upload and download parameters
	Process PID	Closed loop control for process quantity
Motor protection	blocked rotor	
	Motor overload	
	Speed limit	
VFD protection	Output current limiting	
	VFD overload	
	IGBT I ² t overload	
	Input power short voltage/over voltage	
	IGBT overheated	
	Radiator over heated	
	Power supply fault	
	Analog input model missing	
	Abnormal communication	
	Self setting fault	

AS180 INDUSTRIAL-DUTY THREE-PHASE V/F VFD

The AS180 series of general-purpose VFDs adopt the world-leading technology of motor control, featuring the same excellent control performance as international high-end frequency inverters as well as enhanced product reliability, environmental adaptability and customized and industrialized design.

Application: With industrial standard load, the VFD holds 1.2 x overload capacity, supports three-phase AC asynchronous motors with a capacity of 2.2-400kW, and are widely applicable to various kinds of light-load devices, such as fans, water pumps and oil pumps.

PERFORMANCE FEATURES

- Efficient and energy-saving operating mode

The efficiency-driven energy-saving operating mode and new PWM dead-time compensation technology may effectively reduce motor loss, thereby minimizing the power consumption.

- Rapid dynamic response

Controlled with advanced motor model, it can rapidly respond to sudden changes in load even without a PG.

- Smooth tracing starting

It can realize impact-free and smooth starting of rotating motor at any time.

- Considerate application

PID control: The special menu is used for setting PID parameters and for calculating inside the VFD, eliminating the need of an independent external regulator option.

·DC braking before operation: When the rotational direction of the motor is uncertain in free slide, it adopts DC braking and automatically restarts the motor after stopping.

·Multi-speed operation: Based on signal combinations, operating at the internally-set frequency (15-speed instructions at most) can realize continuous sequential control, and achieve low-precision position control via the limit switch.



TECHNICAL SPECIFICATIONS

Power input	Input voltage	380V ~ 460V (-15% ~ +10%), 3-phase power supply
	Input frequency	45 ~ 65Hz
	Permissible voltage variation	Voltage unbalance < 3%
	Current harmonic	Built-in DC reactor for 30kW and above, with current harmonic < 40% (full load) Externally installed DC reactor for 30kW and below (optional)
	Transient voltage sag	3-phase AC380V ~ 460V, input voltage < AC300V, under-voltage protection 15ms later.

Power output	Voltage	0VAC ~ input voltage
	Output frequency	0.00 ~ 300.00Hz
	Overload grade	120%, 1min
	Output frequency precision	±0.01% (digital command -10 ~ +45 °C) ±0.1% (analog command 25±10 °C)

Digital I/O	Optoelectronic isolated input	7 optoelectronic isolated inputs, 24V, either high or low level is effective, which is settable. Input functions can be defined.
	Open collector output	2 open collector outputs, output functions can be defined
	Relay output	2 relay outputs with normally open contact, contact capacity: inductive, 1.5A/250VAC, output functions can be defined. 2 relay outputs with normally open and close double contact, contact capacity: resistive, 4.5A/250VAC or 4.5A/30VDC; inductive: 0.4A/250VAC or 0.4A/30VDC; output functions can be defined.

Analog I/O	Analog input	2 analog inputs, precision 0.1%: Voltage: -10V ~ +10VDC or current: 0~20mA optional signal
	Analog output	2 analog outputs, precision 0.1%: Voltage: -10V ~ +10VDC or current: 0~20mA optional signal

Control characteristics	Control mode	V/F control	High-Performance V/F control
	Starting torque	2.50Hz 150%	0.5Hz, 120%
	Speed regulation range	1:50	1:200
	Speed stabilizing precision	± 2%	± 0.5%
	Carrier frequency	1.1~8kHz; automatically adjust the carrier frequency according to load characteristic	
	Frequency set resolution	0.01Hz (digital command)	

		±0.06Hz/120Hz (analog command 11 bit + unsigned)
	Run command channel	Operation panel reference, control terminal reference and communication reference
	Frequency reference channel	Operation panel reference, digital/analog reference, communication reference and functional function reference
	Torque lifting	Automatic and manual torque lifting
	V/F curve	The user defines V/F curve, linear V/F curve and 3 reduced torque characteristic curves.
	Automatic voltage regulation	Automatically regulate the duty cycle of output PWM signal according to fluctuation of bus voltage, so as to relieve the influence of the voltage fluctuation of grid on the output voltage fluctuation.
	Continuous operation under transient outage	Realize continuous operation by controlling the bus voltage during instantaneous power failure.
	Dynamic braking capacity	Built-in braking unit for 22kW and below, with braking resistor externally (optional) Externally installed braking unit for 22kW and above (optional)
	DC braking capacity	Braking current: 0.0 ~ 100.0% rated current

Special functions	Parameter copy	The standard operation panel could upload, download the parameters, and indicate copy progress.
	Process PID	Closed loop control for quantity of process.
	Common DC bus	Realize the common DC bus power supply for several inverters

Motor protection	Blocked rotor	
	Motor overload	
	Motor overheat (PTC)	
	Speed limitation	

Inverter protection	Output current amplitude limiting	
	Inverter overload	
	IGBT I _t overload	
	Input power undervoltage/overvoltage	
	DC bus undervoltage/overvoltage	
	IGBT overheat	
	Radiator overheat	
	Power failure	
	Abnormal +10V power output	
	Analog input signal loss (speed reference value loss)	
	Abnormal communication	
	Connecting failure for encoder	
	Self-tuning failure	

Ambient conditions	Place of service	Vertically installed inside the electrical control cubicle with good ventilation. Horizontal or other installation is not permitted. Cooling medium is air. It is installed in the environment free from direct sunshine, dust, corrosive gas, combustible gas, oily mist, steam and dripping water.
	Ambient temperature	-10 ~ +40℃
	Temperature derating use	>40℃, the rated output current decreases by 2% if the temperature increases every 1℃ (maximum 50℃)
	Altitude	<1000m
	Altitude derating use	>1000m, the rated output current decreases by 1% if the altitude increases every 100m (maximum 3000m)
	Ambient humidity	5 ~ 95%, without condensation
	Vibration (transportation)	$2 \leq f < 9\text{Hz}$ 3.5mm; $9 \leq f < 200\text{Hz}$, 10 m/s ² ; $200 \leq f < 500\text{Hz}$, 15 m/s ²
	Vibration (installation)	$2 \leq f < 9$ 0.3mm; $9 \leq f < 200\text{Hz}$, 1m/s ²
	Storage temperature	-40 ~ +70℃
	Protection degree	IP20

Control panel	Type	Movable
	Length	1m (it can be customized, maximum 5m)
	Connection	RJ45
	Text display	4 lines
	LED display	4-bit
	Visual LED indicator	4
	Key	9

Others	Cooling mode	Forced air cooling
	Installation way	Inside the cubicle
	Certification	CE

AS450 SERIES HEAVY-DUTY THREE PHASE VECTOR VFD

AS450 series general frequency vector VFD's adopt not only the technology of VF control but also speed sensorless vector control technology, closed-loop vector control technology and torque control technology as well as enhanced product reliability, environmental adaptability and customized and industrialized design.

Application: Heavy-duty with 1.5 times overload capacity, supports AC induction motors and permanent magnet synchronous motors with a capacity of 1.1~355kW, and are widely applicable to various kinds of heavy-load devices, such as extruders, compressors, mixers, belt machines and so on.

PERFORMANCE FEATURES

- Efficient and energy-saving operating mode

The efficiency-driven energy-saving operating mode and new PWM dead-time compensation technology may effectively reduce motor loss, thereby minimizing the power consumption.

- Rapid dynamic response

Controlled with advanced motor model, it can rapidly respond to sudden changes in load even without a PG.

- Smooth tracing starting

It can realize impact-free and smooth starting of rotating motor at any time.

- Considerate application

PID control: The special menu is used for setting PID parameters and for calculating inside the VFD, eliminating the need of an independent external regulator option.

·DC braking before operation: When the rotational direction of the motor is uncertain in free slide, it adopts DC braking and automatically restarts the motor after stopping.

·Multi-speed operation: Based on signal combinations, operating at the internally-set frequency (15-speed instructions at most) can realize continuous sequential control, and achieve low-precision position control via the limit switch.



- Master-Slave connection

Flexible connection

The main drive and the subordinate drive is speed control.

The speed signal from the drive receives the main drive for follow-up is used in conjunction with the droop function (Droop).

- Rigid connection

The main drive is speed control, the subordinate drive is torque control, there can't be any difference between the main drive and the subordinate drive.

The high-speed and accurate transmission of the main drive torque signal is transmitted to the slave drive by:

Profibus_DP communication connection, to achieve master-slave control (for high-precision master-slave control).

Analog input and output connection, to achieve master and slave control (for low speed, low accuracy control requirements of the master and slave control).

TECHNICAL SPECIFICATIONS

Power input	Input voltage	380V ~ 460V (-15% ~ +10%), 3-phase power supply
	Input frequency	45 ~ 65Hz
	Permissible voltage variation	Voltage unbalance < 3%
	Current harmonic	Built-in DC reactor for 30kW and above, with current harmonic < 40% (full load) Externally installed DC reactor for 30kW and below (optional)
	Transient voltage sag	3-phase AC380V ~ 460V, input voltage < AC300V, under-voltage protection 15ms later.

Power output	Voltage	0VAC ~ input voltage
	Output frequency	V/F control: 0.00 ~ 300.00Hz Vector control: 0.00 ~ 120.00Hz
	Overload grade	Stable operation under 40°C, heavy load 150%, 1min
	Efficiency (full load)	≥ 0.94
	Output frequency precision	± 0.01% (digital command -10 ~ +45°C) ± 0.1% (analog command 25 ± 10°C)

Digital I/O	Optoelectronic isolated input	7 optoelectronic isolated inputs, 24V, either high or low level is effective, which is settable. Input functions can be defined.
	Open collector output	2 open collector outputs, output functions can be defined
	Relay output	2 relay outputs with normally open contact, contact capacity: inductive, 1.5A/250VAC, output functions can be defined. 2 relay outputs with normally open and close double contact, contact capacity: resistive, 4.5A/250VAC or 4.5A/30VDC; inductive: 0.4A/250VAC or 0.4A/30VDC; output functions can be defined.

Analog I/O	Analog input	2 analog inputs, precision 0.1%: Voltage: -10V ~ +10VDC or current: 0~20mA optional signal
	Analog output	2 analog outputs, precision 0.1%: Voltage: -10V ~ +10VDC or current: 0~20mA optional signal

Encoder input	PG power	5V, 12V, 300mA
	PG signal	Open collector, push-pull, differential, SIN/COS increment type, Endat absolute value type and Resolver type
	PG frequency dividing output	Quadrature open collector output, frequency dividing factor 2/4/8/16/32/64/128 is settable (optional)

Control characteristics	Control mode	V/F control	Open loop vector control	Closed loop vector
	Starting torque	2.50Hz, 150%	0.5Hz, 150%	0.00Hz, 150%
	Speed regulation range	1:50	1:200	1:1000
	Speed stabilizing precision	± 2%	± 0.2%	± 0.02%
	Torque precision	±5% (closed loop control)		
	Carrier frequency	1.1~8kHz; automatically adjust the carrier frequency according to load characteristic		
	Frequency set resolution	0.01Hz (digital command) ±0.06Hz/120Hz (analog command 11 bit + unsigned)		
	Run command channel	Operation panel reference, control terminal reference and communication reference		

	Frequency reference channel	Operation panel reference, digital/analog reference, communication reference and functional function reference
	Torque lifting	Automatic and manual torque lifting
	V/F curve	The user defines V/F curve, linear V/F curve and 3 reduced torque characteristic curves.
	Automatic voltage regulation	Automatically regulate the duty cycle of output PWM signal according to fluctuation of bus voltage, so as to relieve the influence of the voltage fluctuation of grid on the output voltage fluctuation.
	Continuous operation under transient outage	Realize continuous operation by controlling the bus voltage during instantaneous power failure.
	Dynamic braking capacity	Built-in braking unit for 22kW and below, with braking resistor externally (optional) Externally installed braking unit for 22kW and above (optional)
	DC braking capacity	Braking current: 0.0 ~ 120.0% rated current

Special functions	Parameter copy	The standard operation panel could upload, download the parameters, and indicate copy progress.
	Process PID	Closed loop control for quantity of process.
	Torque control function	Realize torque/speed control by terminal switching, multi-torque given way
	Zero servo function	Lock the zero-speed position, accurately positioning and position control
	Common DC bus	Realize the common DC bus power supply for several inverters

Motor protection	Blocked rotor
	Motor overload
	Motor overheat (PTC)
	Speed limitation
	Torque limitation

Inverter protection	Output current amplitude limiting
	Torque limitation
	Inverter overload
	IGBT I ² t overload
	Input power undervoltage/overvoltage
	DC bus undervoltage/overvoltage
	IGBT overheat
	Radiator overheat
	Power failure
	Abnormal +10V power output
	Analog input signal loss (speed reference value loss)
	Abnormal communication
	Connecting failure for encoder

Ambient conditions	Place of service	Vertically installed inside the electrical control cubicle with good ventilation. Horizontal or other installation is not permitted. Cooling medium is air. It is installed in the environment free from direct sunshine, dust, corrosive gas, combustible gas, oily mist, steam and dripping water.
	Ambient temperature	-10 ~ +40°C
	Temperature derating use	>40°C, the rated output current decreases by 2% if the temperature increases every 1°C (maximum 50°C)
	Altitude	<1000m
	Altitude derating use	>1000m, the rated output current decreases by 1% if the altitude increases every 100m (maximum 3000m)
	Ambient humidity	5 ~ 95%, without condensation
	Vibration (transportation)	$2 \leq f < 9\text{Hz}$ 3.5mm; $9 \leq f < 200\text{Hz}$, 10 m/s ² ; $200 \leq f < 500\text{Hz}$, 15 m/s ²
	Vibration (installation)	$2 \leq f < 9$ 0.3mm; $9 \leq f < 200\text{Hz}$, 1m/s ²
	Storage temperature	-40 ~ +70°C
	Protection degree	IP20

Control panel	Type	Movable
	Length	1m (it can be customized, maximum 5m)
	Connection	RJ45
	Text display	4 lines
	LED display	4-bit
	Visual LED indicator	4
	Key	9

Others	Cooling mode	Forced air cooling
	Installation way	Inside the cubicle
	Certification	CE

AS500 SERIES HIGH-PERFORMANCE HEAVY-DUTY VECTOR VFD

AS500 series high-performance vector VFD supports AC induction motors and permanent magnet synchronous motors with a capacity of 1.1~355kW as well as enhanced product reliability, environmental adaptability and customized and industrialized design.

Application: Heavy industry, engineering machinery load with 1.5 times overload capacity and more suitable for low-frequency large torque characteristics of the load such as ball mill, bending machine, mixer and so on.

PERFORMANCE FEATURES

- Efficient and energy-saving operating mode

The efficiency-driven energy-saving operating mode and new PWM dead-time compensation technology may effectively reduce motor loss, thereby minimizing the power consumption.

- Rapid dynamic response

Controlled with advanced motor model, it can rapidly respond to sudden changes in load even without a PG.

- Considerate application

PID control: The special menu is used for setting PID parameters and for calculating inside the VFD, eliminating the need of an independent external regulator option.

·DC braking before operation: When the rotational direction of the motor is uncertain in free slide, it adopts DC braking and automatically restarts the motor after stopping.

·Multi-speed operation: Based on signal combinations, operating at the internally-set frequency (15-speed instructions at most) can realize continuous sequential control, and achieve low-precision position control via the limit switch.



- Smooth tracing starting

It can realize impact-free and smooth starting of rotating motor at any time.

- Strong grid adaptability

Automatic voltage regulation: In case of change in grid voltage, it can automatically keep the output voltage constant.

Uninterruptible operation: In case of sudden power failure, it can maintain uninterruptible operation of the converter.

- Reliable protection

Motor Protection :

- Motor over-temperature protection (PTC)
- Locked rotor protection
- Motor overload protection
- Open-phase protection for motor
- Speed limit
 - Converter Protection
- Output current limit
- Converter overload protection
- I²t protection
- Radiator over-temperature protection
- Power failure protection
- IGBT over-temperature protection
- Analog input signal loss (speed reference loss) protection
- Abnormal communication protection

TECHNICAL SPECIFICATIONS

Power input	Input voltage	380V ~ 460V (-15% ~ +10%), 3-phase power supply
	Input frequency	45 ~ 65Hz
	Permissible voltage variation	Voltage unbalance<3%
	Current harmonic	Built-in DC reactor for 30kW and above, with current harmonic <40% (full load) Externally installed DC reactor for 30kW and below (optional)
	Transient voltage sag	3-phase AC380V ~ 460V, input voltage<AC300V, under-voltage protection 15ms later.

Power output	Voltage	0VAC ~ input voltage
	Output frequency	V/F control: 0.00 ~ 300.00Hz Vector control: 0.00 ~ 120.00Hz
	Overload grade	Stable operation under 40°C, heavy load 150%, 1min
	Efficiency (full load)	≥0.94
	Output frequency precision	±0.01% (digital command-10 ~ +45°C) ±0.1% (analog command 25±10°C)

Digital I/O	Optoelectronic isolated input	7 optoelectronic isolated inputs, 24V, either high or low level is effective, which is settable. Input functions can be defined.
	Open collector output	2 open collector outputs, output functions can be defined
	Relay output	2 relay outputs with normally open contact, contact capacity: inductive, 1.5A/250VAC, output functions can be defined. 2 relay outputs with normally open and close double contact, contact capacity: resistive, 4.5A/250VAC or 4.5A/30VDC; inductive: 0.4A/250VAC or 0.4A/30VDC; output functions can be defined.

Analog I/O	Analog input	2 analog inputs, precision 0.1%: Voltage: -10V ~ +10VDC or current: 0~20mA optional signal
	Analog output	2 analog outputs, precision 0.1%: Voltage: -10V ~ +10VDC or current: 0~20mA optional signal

Encoder input	PG power	5V, 12V, 300mA
	PG signal	Open collector, push-pull, differential, SIN/COS increment type, Endat absolute value type and Resolver type
	PG frequency dividing output	Quadrature open collector output, frequency dividing factor 2/4/8/16/32/64/128 is settable (optional)

Special functions	Parameter copy	The standard operation panel could upload, download the parameters, and indicate copy progress.
	Process PID	Closed loop control for quantity of process.
	Torque control function	Realize torque/speed control by terminal switching, multi-torque given way
	Zero servo function	Lock the zero-speed position, accurately positioning and position control
	Common DC bus	Realize the common DC bus power supply for several inverters

	Control mode	V/F control	Open loop vector control		Closed loop vector	
			Asynchrony-zation	Synchroniz-ation	Asynchrony-zation	Synchroniz-ation
	Starting torque	2.50Hz 150%	0.5Hz 150%	5% Speed 100%	0.00Hz 150%	0.00Hz 200%
	Speed regulation range	1:50	1:200		1:1000	
	Speed stabilizing precision	± 2%	± 0.2%		± 0.02%	
	Torque precision	±5% (closed loop control)				
	Carrier frequency	1.1~8kHz; automatically adjust the carrier frequency according to load characteristic				
	Frequency set resolution	0.01Hz (digital command) ±0.06Hz/120Hz (analog command 11 bit + unsigned)				
Control characteristics	Run command channel	Operation panel reference, control terminal reference and communication reference				
	Frequency reference channel	Operation panel reference, digital/analog reference, communication reference and functional function reference				
	Torque lifting	Automatic and manual torque lifting				
	V/F curve	The user defines V/F curve, linear V/F curve and 3 reduced torque characteristic curves.				
	Automatic voltage regulation	Automatically regulate the duty cycle of output PWM signal according to fluctuation of bus voltage, so as to relieve the influence of the voltage fluctuation of grid on the output voltage fluctuation.				
	Continuous operation under transient outage	Realize continuous operation by controlling the bus voltage during instantaneous power failure.				
	Dynamic braking capacity	Built-in braking unit for 22kW and below, with braking resistor externally (optional) Externally installed braking unit for 22kW and above (optional)				
	DC braking capacity	Braking current: 0.0 ~ 120.0% rated current				

Motor protection	Blocked rotor
	Motor overload
	Motor overheat (PTC)
	Speed limitation

Others	Cooling mode	Forced air cooling
	Installation way	Inside the cubicle
	Certification	CE

Inverter protection	Output current amplitude limiting
	Torque limitation
	Inverter overload
	IGBT I ² t overload
	Input power undervoltage/overvoltage
	DC bus undervoltage/overvoltage
	IGBT overheat
	Radiator overheat
	Power failure
	Abnormal +10V power output
	Analog input signal loss (speed reference value loss)
	Abnormal communication
	Connecting failure for encoder
Self-tuning failure	

Ambient conditions	Place of service	Vertically installed inside the electrical control cubicle with good ventilation. Horizontal or other installation is not permitted. Cooling medium is air. It is installed in the environment free from direct sunshine, dust, corrosive gas, combustible gas, oily mist, steam and dripping water.
	Ambient temperature	-10 ~ +40°C
	Temperature derating use	>40°C, the rated output current decreases by 2% if the temperature increases every 1°C (maximum 50°C)
	Altitude	<1000m
	Altitude derating use	>1000m, the rated output current decreases by 1% if the altitude increases every 100m (maximum 3000m)
	Ambient humidity	5 ~ 95%, without condensation
	Vibration (transportation)	2≤f<9Hz 3.5mm; 9≤f<200Hz, 10 m/s ² ; 200≤f<500Hz, 15 m/s ²
	Vibration (installation)	2≤f<9 0.3mm; 9≤f<200Hz, 1m/s ²
	Storage temperature	-40 ~ +70°C
	Protection degree	IP20

Control panel	Type	Movable
	Length	1m (it can be customized, maximum 5m)
	Connection	RJ45
	Text display	4 lines
	LED display	4-bit
	Visual LED indicator	4
	Key	9



OUR PROJECTS

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120HP AS180 series VFD installation for a water supply and treatment plant, replacing the original soft-starter system. PID control was programmed for automatic speed regulation, excellent control performance and to make the pump system operate efficiently with minimal manual intervention.



AS450 Drive installation for a water pump control system to provide maximum flow at optimal efficiency. The drives provide extensive diagnostics with regards to maintenance of water pressure and simplifies the complexity of the entire flow control system via the built-in PID controllers.



OUR PROJECTS
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This installation is for one of our customers in the construction industry to effectively reduce the KVA rating of the existing power system during periods of peak demand using our AS series VFDs. The customer is a leader in Metal Quarrying, Crushing, Manufacturing and Civil engineering constructions.



Jaaris Automation assisted with integrating a 7.5HP drive into an industrial control panel for a blower motor application for one of our customers who was in quite a predicament when his production was halted.



A customer's ABB VFD was down due to a hardware fault - halting production in one of their lines. The JAARIS team quickly reviewed the customer's requirements, engineered a solution with our iAStar drive unit, and had it installed within a day!



A 22KW VFD control panel upgrade for a customer whose previous VFD tripped continuously due to overcurrent faults. Our AS450 heavy-duty drive was programmed for multi-speed operation along with additional functionality such as the activation of relay outputs when the drive frequency reaches a set value and emergency stop controls.

OUR SERVICES



Our store policy is customers come first. We are here to provide you with technical education, product support, and after-sales service.



With over 100's of drives in stock, our team is committed to deliver the VFD you need. You can count on us going out of our way to get you what you need fast!



Hassle-Free Warranty Claims. We Help Process Warranty Replacement & Repair Claims.



SOLE AGENT FOR IASTAR VFD IN SRILANKA

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