

A photograph of a male worker in a red hard hat and safety glasses, wearing a grey and red work jacket. He is holding a tablet in his left hand and has his right hand on a large blue industrial valve. The background is a cloudy sky.

Himel Variable Speed Drives

Reliable made affordable



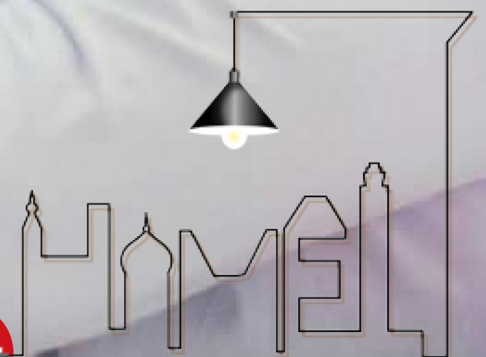


About Himel



Himel is a multinational manufacturer and provider of electrical products that successfully combines global expertise with local knowledge. We focus on long-term partnership with customers and offer products that meet real needs and ensure adequate compatibility for common usage.

Our global footprint and technology allows to provide the best combination of affordable and reliable offers for low voltage power distribution, industrial automation and home electric in over 50 countries where we are present.



Reliable made affordable.

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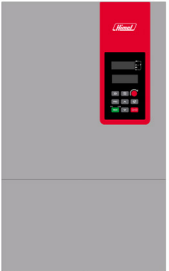
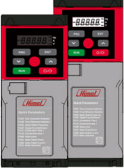

■ Himel EXPERT series VSD

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■ Comparison of SMART and EXPERT Series

■ Himel drives quick selection

Himel variable speed drives

BASIC			SMART		EXPERT	
Small & simple general purpose applications			Pumping and fan applications		Machines & advanced general purpose applications	
						
Compact 0.4...1.5kW 220V single phase	Standard 0.75...2.2kW 220V single phase; 380V-415V three phase	Universal 0.75...7.5kW 220V single phase; 380V-415V three phase	Universal 7.5...850kW 220V single phase; 380V-415V three phase		Compact 0.4...4kW 220V single phase; 380V-440V three phase	Standard 0.75...280kW 220V single phase; 380V-440V three phase

Himel variable speed drives can make your motor efficient without compromising your total cost of ownership (TCO) during your production.

Energy Savings

- Centrifugal pumps
- Fans

Improved Process Control

- Regulation of motor performance to process needs
- Speed
- Acceleration / deceleration

Reduced Maintenance Needs

- Less mechanical components
- Reduced mechanical shocks



World is changing with industrialization and automation



Himel Variable Speed Drives

Himel variable speed drives offer you a wide range of fully tested and ready-to-connect motor control possibilities. From simple pump and fan applications to complex, high-performance machines, we have a reliable affordable drive for you, no matter what you need.



Himel. Reliable made affordable.

Himel Variable Speed Drives Offer Portfolio



	BASIC series		
	Compact	Standard	Universal
Supply Voltage	220V Single Phase	220V Single Phase; 380V-415V Three Phase	220V Single Phase; 380V-415V Three Phase
Power Range	0.4 ... 1.5kW	0.75 ... 2.2kW	0.75 ... 7.5kW
Motor Type	Asynchronous Motor		
Motor Control	Open Loop		
IP	IP20		
Temperature	-10°C ~+40°C		
Add-On	-	-	-
Communication Interface	I/O; Modbus Serial Link	I/O; Modbus Serial Link	I/O; Modbus Serial Link
Target Applications	Small and simple general purpose applications		Pumping and fan applications

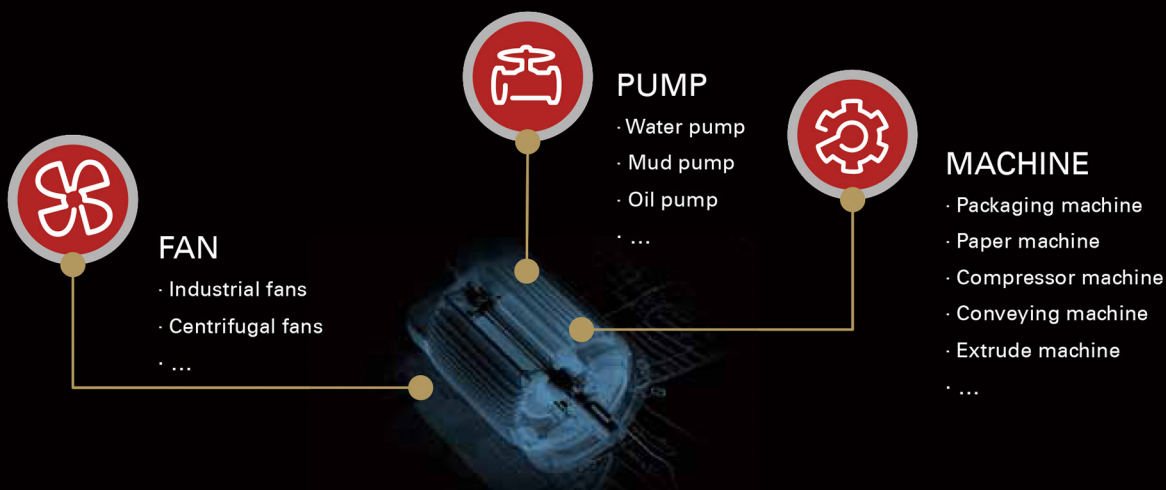


SMART series	EXPERT series	
Universal	Compact	Standard
220V Single Phase; 220V Three Phase; 380V-415V Three Phase	220V Single Phase; 380V-440V Three Phase	220V Single Phase; 380V-440V Three Phase
7.5 ... 850kW	0.4 ... 4kW	0.75 ... 315kW
Asynchronous Motor		
Open Loop		
IP20		
-10°C ~+40°C		
-	-	I/O Extension Module, Communication Module
I/O; Modbus Serial Link	I/O; Modbus Serial Link	I/O; Modbus Serial, CANopen, & Ethernet/IP, Profibus DP, Profinet, DeviceNet, EtherCAT, DeviceNet
Pumping and fan applications	Machines; Advanced general purpose applications	

Where you need an efficient motor, there you need a drive...

- **SMART Series:** Pump & Fan
- **BASIC Series:** Small machine & simple application
- **EXPERT Series:** Complicated machine & advanced application

0.4kW – 850kW
220V | 380V / 400V / 415V / 440V



Target applications

BASIC Series

Small machines:

- Bread machine
- Bag machine
- Carving machine

Simple applications:

- Small Conveyor
- Small fan
- ...

SMART Series

Pumps:

- Water pump
- Paper mill and pulp pump
- Sewage pump
- Fire patrol pump
- Rod pump

Fans:

- Industrial fan
- Air blower
- Ventilation

EXPERT Series

Heavy & complicated machines:

- Material handling machine
- Textile machine
- Material working machine
- Industrial washing machine
- Air compressor
- Construction elevator

Advanced applications:

- Metal & mining process
- Petrochemical

BASIC Series



For your small machines and simple general purpose applications

Compact: 0.4kW...1.5kW, AC 220V single phase

Standard: 0.75kW...2.2kW, AC 220V single phase / 380V-415V three phase

Universal: 0.75kW...7.5kW, AC 220V single phase / 380V-415V three phase

Lead Control

Built-in SVC vector control and V/F control model

Excellent Performance: 150% rated torque output at 1Hz

Compact Structure

High efficiency heat dissipation design

Small size, saves the design space of distribution cabinet

IPM intelligent power module integrated with the main circuit design

Rich Functions

Built-in PID, Multi-speed operation (8 stages speed operation), simple PLC

Built-in brake unit and Standard MODBUS communication protocol

High-speed pulse input and output function (compact range doesn't have pulse output)

Wide voltage range designed to meet the domestic low-voltage special applications

Many protections for over-current, over-voltage, over-load, over-heat, low-voltage etc.

Overall dimensions

Ranges	Power (kW)	Dimensions (mm)					Mounting Holes (mm)
	kW	W	H	D	W1*	H1*	R
Compact	0.75...1.5	85	155	122	74	144	2.5
Standard	0.75...1.5	98	175	152	89	166	2.5
	0.75...2.2	98	175	152	89	166	2.5
Universal	0.75...4	132	232	162	120	218	2.5
	5.5...7.5	162.5	270	188.5	147	254	3

*W1 and H1 are mounting dimensions

Product Specification

Input	Input Voltage	Single-phase 220V, three-phase 380V; 50Hz/60Hz
	Grid range	Voltage: -20% ~ +20%
Output	Rated voltage	220V ~ 380V
	Frequency range	0Hz ~ 400Hz
	Modulation mode	Space voltage vector control
	Control mode	Sensor-less vector control (SVC), V/F control
	Frequency accuracy	Digital setting: Max frequency $\times \pm 0.01\%$ Analog setting: Max frequency $\times \pm 0.2\%$
	Frequency resolution	Digital setting: 0.01Hz; Analog setting: Max frequency $\times 0.1\%$
	Torque rise	Auto torque rise, manual torque rise 1% ~ 30.0%(valid for V/F)
	V/F curve	Linear V/F curve, Square V/F curve, Customized V/F curve
	Built-in PID	Convenient to make closed-loop control system, applicable to pressure and
	Multi-speed operating	Realize multi-speed control by built-in PLC or control terminal.
	Transient Torque	150% of output torque at 1Hz; Speed stabilization accuracy 0.1%
	Sensor-less vector control	Motor parameters automatic read
Running function	Operational methods	Manual using keypad; using control terminal; serial port; three way control
	Frequency setting methods	Using keypad analog potentiometer; keypad ▲, ▼ keys; setting functional code digits; using serial port; UP/DOWN terminal digit setting; using analog voltage/current; using pulse at a terminal; using combination of both voltage and current signals; switching between any of the above using external terminal.
	Switch input methods	External forward/reverse command using terminals, using 6 input terminals
	Analog input methods	Two analog signal input terminals with 0 ~ 20mA, 0 ~ 10V options
	Analog output methods	0 ~ 10V / 0 ~ 20mA analogue output signal for setting physical quantities
	Switch output methods	Three programmable open collector outputs; one relay output signal; can be used to set different physical quantities.
Operating panel	LED display	27 different parameters like frequency, output voltage, output current etc.
Protection function		Over-current, over-voltage, under-voltage, over-heat and over-load protection.
Environment	Service location	Indoor/outdoor environments such as dusty, corrosive gas, oil fog, steam and
	Altitude	Less than 1000m (derated use at higher than 1000m)
	Environment temperature	-10°C ~ +40°C
	Humidity	Less than 90% RH, no condensation
	Vibration	Less than 5.9m/s ² (0.6M)
	Storage temperature	-20°C ~ +60°C
Structure	Protection class	IP20
	Cooling way	Air-blast cooling
Installation Way		Wall-hanging, Cabinet

References



BASIC Series	Heavy duty (constant torque) G-type		Light overload (variable torque)P-type	
	Product model	Motor Power (kW)	Continuous Output Current (A)	Motor Power (kW)

Compact range



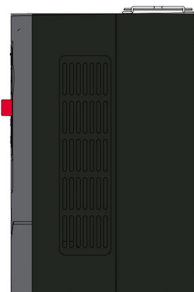
Single-phase supply voltage: 200...240 V				
HAV-BC-2S0004G	0.4	3	-	-
HAV-BC-2S0007G	0.75	5	-	-
HAV-BC-2S0015G	1.5	7.5	-	-

Standard range



Single-phase supply voltage: 200...240 V				
HAV-BS-2S0007G	0.75	5	-	-
HAV-BS-2S0015G	1.5	7.5	-	-
Three-phase supply voltage: 380...415 V				
HAV-BS-4T0007G	0.75	2.3	-	-
HAV-BS-4T0015G	1.5	3.7	-	-
HAV-BS-4T0022G	2.2	5.5	-	-

Universal range



Single-phase supply voltage: 200...240 V				
HAV-BU-2S0007G	0.75	5	-	-
HAV-BU-2S0015G	1.5	7.5	-	-
HAV-BU-2S0022G	2.2	10	-	-
Three-phase supply voltage: 200...240 V				
HAV-BU-2T0040G	4	16	-	-
HAV-BU-2T0055G-0075P	5.5	20.3	7.5	26.67
Three-phase supply voltage: 380...415 V				
HAV-BU-4T0007G	0.75	2.3	-	-
HAV-BU-4T0015G	1.5	3.7	-	-
HAV-BU-4T0022G	2.2	5.5	-	-
HAV-BU-4T0040G-0055P	4	8.8	5.5	13
HAV-BU-4T0055G-0075P	5.5	13	7.5	17
HAV-BU-4T0075G	7.5	17	-	-

SMART Series



For your pumping and fan applications

Universal: 7.5kW...45kW, AC 220V single phase
11kW...850kW, AC 380V-415V three phase

Excellent performance

Optimized space voltage vector control algorithm: 150% starting torque output at 1Hz

Abundant Functions and Flexible Configuration

Built-in PID; Multi-speed (8 stages speed at most); Simple PLC

High speed Impulse input and output function

Built-in braking unit including and below 18.5kW, built-in standard MODBUS communication protocol

Optional double analog (AO) output

Excellent adaptability

All boards are coated with "comprehensive anti-corrosion paint" to make frequency inverter humidity-proof, dust-proof and oil-proof.

Rich protection functions in order to adapt to different environments such as over-voltage, under-voltage, input phase-loss, over-load, over-heat, over-current etc.

Overall dimensions

Power(kW)	Dimensions(mm)					Mounting Holes(mm)	Installation
	W	H	D	W1*	H1*		
11...18.5	249	352	229	200	334	4.5	Wall mounting
22...30	320	506	289	200	482	4.5	
37...45	342	561	292	200	529	5.5	
55...75	394	669	315	200	645	6	
93...110	573	776	298	400	748	5	
132...160	575	956	333	400	928	5	
185...200	625	1101	358	480	1073	5	
220...280	700	1100	446.5	500	1070	8	Cabinet mounting
160...200	563	1265	481				
220...280	700	1566	407				
315...400	850	1974	470.5				
500...630	950	1974	490.5				

* W1 and H1 are mounting dimensions

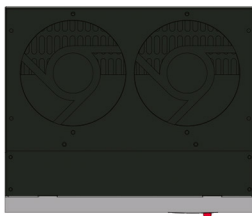
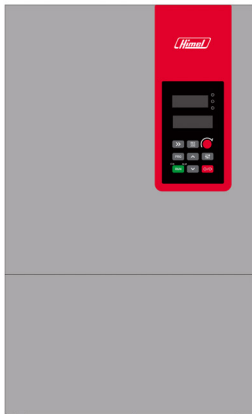
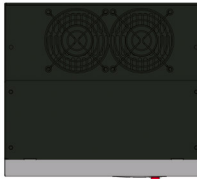
Product Specification

Input	Rated voltage and frequency	Single-phase 220V, three-phase 220V, three-phase 380V; 50Hz/60Hz	
	Grid range	Voltage: -20% ~ +20%	
Output	Rated voltage	220V / 380V	
	Frequency range	0Hz ~ 400Hz	
Main control function	Overload capability	G:150% for 1 min, 180% for 1s, 200% instant protection P: 120% for 1 min, 150% for 1s, 180% instant protection	
	Modulation mode	Space voltage vector control	
	Control mode	Sensor-less vector control (SVC)	
	Frequency accuracy	Digital setting: Max frequency × ±0.01% Analog setting: Max frequency × ±0.2%	
	Frequency resolution	Digital setting: 0.01Hz Analog setting: Max frequency × 0.1%	
	Starting Frequency	0.0Hz ~ 10.00 Hz	
	Torque rise	Auto torque rise, manual torque rise 1% ~ 30.0% (valid for V/F)	
	V/F curve	Three ways: Linear V/F curve, square V/F curve, user self-defining V/F	
	Acceleration/deceleration time	Optional time unit (Min/s), the longest: 3600s (settable in the range of 0.1 ~ 3600s).	
	DC braking	Optional for both starting and stopping, operating frequency: 0 ~ 20Hz, operating time: 0 ~ 30s	
	Jogging	Jogging frequency range: 0.1Hz ~ 50.00Hz, Jogging acceleration and deceleration time: 0.1 ~ 3600s.	
	Built-in PID	Convenient for closed loop control system, applicable for course control like	
	Multi-speed operation	Realize multi-speed operation by built-in PLC or control terminal.	
	Weaving wobble frequency	Can get wobble frequency of adjustable central frequency	
	Auto voltage adjustment	When main voltage changes, the output voltage can be kept constant by adjusting PWM output (AVR function).	
	Auto energy-saving	According to load condition, V/F curve can be optimized for automatic energy-saving.	
	Auto current limiting	Limit in-service current automatically, so as to avoid tripping for a fault caused by frequent over current.	
	Sensor-less vector control	Transient Torque	150% output of torque at 1Hz, rev accuracy: 0.1%
		Motor parameters automatic read	Can automatically read motor parameters, in order to achieve optimal control.
	Running function	Operational methods	Manual; using control terminal; using serial port; three way control using
Frequency setting methods		Using keypad analog potentiometer; keypad ▲, ▼ keys; setting functional code digits; using serial port; UP/DOWN terminal digit setting; using analog voltage/current signal, using pulse at a terminal; using combination of both voltage and current signals; switching between any of the above methods using external terminal.	
Switch input methods		External forward/reverse command using terminals, using 6 input terminals	

Product Specification

Running function	Analog input methods	Two analog signal input terminals with 0 ~ 20mA, 0 ~ 10V options
	Analog output methods	0 ~ 10V / 0 ~ 20mA analogue output signal for setting physical quantities such as frequency etc.
	Switch output methods	Three programmable open collector outputs; One relay output signal; can be used to set different physical quantities.
Operating panel	LED display	27 different parameters like frequency, output voltage, output current etc. can be displayed on LED.
	Display external instrument	Display output frequency, output current, and output voltage and so on.
Protection function		Over-current, over-voltage, under-voltage, over-heat and over-load protection.
Optional		Braking unit, remote operating panel, remote cable and keypad tray.
Environment	Service location	Indoor/outdoor environments such as dusty, corrosive gas, oil fog, steam and so on.
	Altitude	Less than 1000m (derated use at higher than 1000m)
	Environment temperature	-10°C ~ +40°C
	Humidity	Less than 90% RH, no condensation
	Vibration	Less than 5.9m/s ² (0.6M)
	Storage temperature	-20°C ~ +60°C
Structure	Protection class	IP20
	Cooling way	Air-blast cooling
Installation Way		Wall-hanging, Cabinet

References



SMART Series	Heavy duty (constant torque) G-type		Light overload (variable torque) P-type	
	Motor Power (kW)	Continuous Output Current (A)	Motor Power (kW)	Continuous Output Current (A)
Three-phase supply voltage: 200...240 V				
HAV-SU-2T0075G-0110P	7.5	26.67	11	39
HAV-SU-2T0110G-0150P	11	39	15	52.5
HAV-SU-2T0150G-0185P	15	52.5	18.5	62.35
HAV-SU-2T0185G-0220P	18.5	62.35	22	73.6
HAV-SU-2T0220G-0300P	22	73.6	30	98.7
HAV-SU-2T0300G-0370P	30	98.7	37	121
HAV-SU-2T0370G-0450P	37	121	45	146.7
HAV-SU-2T0450G-0550P	45	146.7	55	188.8
Three-phase supply voltage: 380...415 V				
HAV-SU-4T0110G-0150P	11	25	15	33
HAV-SU-4T0150G-0185P	15	33	18.5	39
HAV-SU-4T0185G-0220P	18.5	39	22	45
HAV-SU-4T0220G-0300P	22	45	30	60
HAV-SU-4T0300G-0370P	30	60	37	75
HAV-SU-4T0370G-0450P	37	75	45	91
HAV-SU-4T0450G-0550P	45	91	55	112
HAV-SU-4T0550G-0750P	55	112	75	150
HAV-SU-4T0750G-0930P	75	150	93	176
HAV-SU-4T0930G-1100P	93	176	110	210
HAV-SU-4T1100G-1320P	110	210	132	260
HAV-SU-4T1320G-1600P	132	260	160	310
HAV-SU-4T1600G-1850P	160	310	185	340
HAV-SU-4T1600G-1850P-S	160	310	185	340
HAV-SU-4T1850G-2000P	185	340	200	385
HAV-SU-4T1850G-2000P-S	185	340	200	385
HAV-SU-4T2000G-2200P	200	385	220	430
HAV-SU-4T2000G-2200P-S	200	385	220	430
HAV-SU-4T2200G-2500P	220	430	250	475
HAV-SU-4T2200G-2500P-S	220	430	250	475
HAV-SU-4T2500G-2800P	250	475	280	535
HAV-SU-4T2500G-2800P-S	250	475	280	535
HAV-SU-4T2800G-3150P	280	535	315	600
HAV-SU-4T2800G-3150P-S	280	535	315	600
HAV-SU-4T3150G-3550P-S	315	600	355	645
HAV-SU-4T3550G-4000P-S	355	645	400	750
HAV-SU-4T4000G-S	400	750	-	-
HAV-SU-4T4500G-5000P-S	450	875	500	920
HAV-SU-4T5000G-S	500	920	-	-
HAV-SU-4T5600G-S	560	1050	-	-
HAV-SU-4T6300G-S	630	1150	-	-
HAV-SU-4T8500G-S	850	1630	-	-



EXPERT Series



High performance system type frequency inverter for your advanced machines and general purpose applications

Compact: 0.4kW... 4kW, 220V single phase / 380V-440V three phase

Standard: 0.75kW... 280kW, 220V single phase / 380V-440V three phase

Excellent performance

Speed Stable Precision: +/-0.5% rated synchronous speed (SVC)

Speed Adjustment Range: 1:100(SVC)

Torque Response: <20ms (SVC)

Heavy Load Overload Capacity: 110% rated load stable operation, 150% rated load 1min, 180% rated load 3s

Low frequency large torque, under the open-loop vector model, can realize 0.5Hz stable load (150% rated load) operation.

The drive can keep enough torque output capacity without tripping if there is an instant mutation load.

Auto Current Limiting: Motor current can be controlled at a certain level without affecting the output torque.

Can accurately identify the motor parameters, realizing high performance vector control.

Can realize static self-learning, dynamic self-learning, and adapt to different working condition requirements.

Can detect motor parameters accurately even if a long cable is attached.

Rich and comprehensive application functions

Flexible Multi-stage V/F Curve; Multi-stage speed Control; Simple PLC application; Standard RS485 Communication

Selection of Frequency Source and Command Source; Frequency Binding and Switching; Frequency master and auxiliary;

Pulse frequency input and output

Built-in PI control; Preset for closed-loop; Zero frequency difference;

Swing frequency operation; Fixed length control; Speed tracking; Drop control; Instant stop non-stop; Automatic energy-saving operation;

Multiple protection and overload warning

Built-in braking unit below 22kw;

Excellent adaptability

Working voltage range: rated voltage 380~440V with automatic voltage regulation technology (AVR);

Analog output terminal: 2~10V / 0~10V / 4~20mA / 0~20mA options. It can output physical quantity, convenient for connecting external instrument.

Operating time remembered automatically, set the time to issue instructions to facilitate the equipment maintenance.

User password settings: the user's parameters can be kept secret to prevent unauthorized personnel from modifying user's parameters.

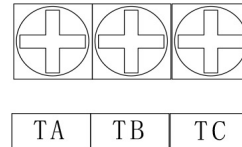
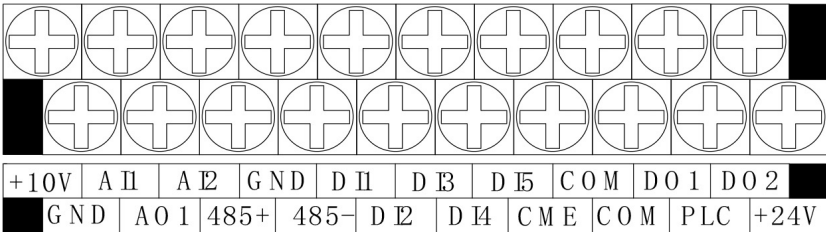
Built in braking unit: Below 22kW no external braking unit needed, hence reducing the overall cost of the customer system.

Excellent expandability: Reserved 2 slots for I/O expansion card, communication expansion card, other process expansion cards (such as air compressor adapter card, water-supply card, plastic injection card etc.) or even customized cards can be connected according to user's demands.

Dust-proof design: Comprehensive anti-corrosion coating, independent air duct design, optional dust accessories can be installed to increase overall protection capabilities against high humidity or excessively dusty environments.

Easily replaceable fan: No need to disassemble for a quick fan replacement, good for some special applications like wind machine that needs regular cleaning of air ducts.

Control circuit



Control loop CN3 terminal function explanation

Category	Terminal label	Name	Terminal function explanation	Specification
Communication	485+	RS485 communication port	RS485 differential signal positive end	Standard RS485 Communication port; use twisted pair or shielded wire
	485-		RS485 differential signal negative end	
Multifunctional output terminal	D01	Open collector output terminal	Programmable definition for a variety of functions of the output terminal, see the terminal function parameters F6.11 & F6.12, can be extended to DO3 open collector output terminal.	Optical coupler isolated output. Working Voltage range:9-30V; Maximum output current:50mA
	D02	Open collector pulse output terminal		Working Voltage range:9-30V; Maximum output current:50mA Maximum output frequency:50KHz (Due to F6.20)
Relay output terminal	TATBTC	Programmable relay terminal output	Normal:TA-TB often closed;TA-TC often open; Relay output terminals Programmable defined as a variety of functions of the relay output terminals, can be extendedTB2TC2 TA2 (see the parameters of the F6.13 function	Contact rating NO: 3A 24VDC; 5A 250VAC NC: 3A 24VDC; 3A 250VAC
Analog input	AI1 / AI2	Analog input AI1 and AI2	Accepts analog current/voltage input, can be selected by the functional code (Reference: GND), can be extended to AI3, support PT100/PT1000 differential input	Input voltage range:0-10V(Input impedance100KΩ) Input current range:0-20mA(Input impedance:165Ω) Resolution:1/1000
Analog output	AO	Analog output	To provide analog voltage/current output through the functional code selection, can correspond to 12 kinds of physical quantities, the factory default output frequency, can be extended AO2 (see the parameters of the F6.24/F6.25 function description)	Output voltage range: 0-10V Output current range: 0-20mA

EXPERT series

Control loop CN3 terminal function explanation

Category	Terminal label	Name	Terminal function explanation	Specification
Multifunctional input terminal	D I1	Multifunctional input terminal 1	Programmable logic is defined as a variety of functions of the switch input terminals, refer to sixth chapter about terminal function parameters (Switch input and output). (common port: COM) (see parameter function F6.00-F6.04 in description), can be extended to DI6-DI10	Optical coupler isolated output Input impedance:3.3KΩ Maximum input frequency:200Hz Input voltage range:DC9-30V
	D I2	Multifunctional input terminal 2		
	D I3	Multifunctional input terminal 3		
	D I4	Multifunctional input terminal 4		
	D I5	Multifunctional input terminal 5		
Power Supply	10V	+10V power supply	External 10V power supply	Maximum output current:50mA
	GND	+10V power supply common terminal	Reference ground for analog signal and 10V power supply	COM and GND are internally separated from each other.
	COM	+24V power supply common terminal	Digital signal input and output common terminal	
	+24V	+24V power supply	Digital signal power supply	Maximum output current:200mA
	PLC	Multifunctional input common terminal	DI1-DI5 common terminal	External short circuit with +24V as factory default
	CME	Digital output common terminal	Multifunctional output terminal DO1 common terminal	External short circuit with COM as factory default

EXPERT series

Product Specification

Input	Rated voltage/ Frequency	Three-phase, 380~440, 50Hz/60Hz
	Allowed voltage range	Voltage: 380V ~ 440V (+10%); Voltage unbalance rate: < 3%; Frequency: ±5%
Output	Rated voltage (V)	380Vac ~ 440Vac
	Frequency	0Hz ~ 550Hz
	Overload capacity	G type: 150% rated current for 60s; P type: 120% rated current for 60s
Main control function	Control mode	Open-loop vector control, V/F control
	Range of speed regulation	1: 100
	Transient Torque	150% rated torque at 0.5Hz
	Speed control accuracy	≤ ±0.5% rated synchronous speed
	Frequency accuracy	Digital set: Max. frequency×±0.01% Analog setting: Max. frequency×±0.2%
	Frequency resolution	Digital setting: 0.01Hz; Analogue setting: Max. frequency×0.1%
	Torque rise	Auto torque rise, manual torque rise 0.1% ~ 30.0%
	V/F curve	Four ways: 1 kind of user self-defined V/F curve, 3 kinds of drop torque characteristic curve (2.0 times power; 1.7 times power; 1.2 times power)
	Acceleration/deceleration curve	Two ways: linear acceleration/deceleration; S curve acceleration/deceleration; Four acceleration/deceleration times with selectable unit of time (minute/second factory default: second), max. time that can be set: 60 hours
	DC braking	DC braking start frequency: 0.00Hz ~ 60.00Hz; braking time: 0.0 ~ 30.0s; braking current: 0.0 ~ 100.0%
	Jogging	Jog frequency range: 0.10Hz ~ 50.0Hz
	Multi-speed operation	It can be realized using internal-PLC or control terminal
	Built-in PID	Convenient to make closed-loop control system
	Auto energy-saving	According to load condition, V/F curve can be optimized for automatic energy-saving.
	Customized function	Auto voltage adjustment
Auto current limiting		During the operation, the current is automatically limited to prevent frequent fault trips.
Auto carrier adjustment		According to the load characteristics, it automatically adjusts the carrier frequency.
Textile swing frequency		Textile swing frequency control can realize the functionality of fixed and variable swing frequency.
Fixed length control		Length reached stop function
Customized function	Sagging function	Applicable to multiple inverters drive one load
	Instant stop/non-stop control	When power-supply cuts off instantly, it keeps running through control bus voltage.
	Binding function	Bind running command channel and frequency given channel to change at the same time.

Product Specification

Running function	Operational methods	Keypad , control terminal and communication port can be switched in many ways
	Frequency setting methods	Digital / analog voltage / current input, pulse input, communication port Can switch between above methods using external terminals
	Auxiliary frequency input channel	Realize flexible auxiliary frequency fine-tuning and frequency combination operation
	Pulse output terminal	0 ~ 50kHz square wave output for setting frequency etc.
	Analog output terminal	0 ~ 10V / 0 ~ 20mA analogue signal output for setting physical quantities
Operating panel	Double row LED display	38 different parameters can be displayed such as output frequency, output voltage, output current etc. (Refer to the manual for complete list of parameters)
	Key Lock and function choose	Parameter read-in protection so that only authorized personnel can change parameters
Protection function		Phase-loss (optional), over-current, over-voltage, under-voltage, over-heat and over-load protection
Environment	Service location	Indoor / outdoor environments such as dusty, corrosive, oil fog, steam
	Altitude	Less than 1000m (Derated use at altitudes higher than 1000m)
	Environment temperature	-10°C ~ +40°C (Derated use in 40°C ~ 50°C)
	Humidity	Less than 90% RH, no condensation
	Vibration	Less than 5.9 m/s ²
	Storage temperature	-20°C ~ +60°C
	Pollution degree	PD2
Structure	Protection class	IP20
	Cooling way	Forced air cooling
Installation Way		Wall-hanging, cabinet, flange installation
Distribution System		TN, TT
Efficiency		≥ 93%

Overall dimensions

Ranges	Motor Power (kW)	Dimensions(mm)					Mounting Holes(mm)
		W	H	D	W1*	H1*	
Compact	0.4...1.5	75	188	169	55	177.5	4.5
	2.2...4	85	210	172.8	64	198.5	4.5
Standard	0.75...3.7	120	215	158	109	204	5.5
	5.5...7.5	150	259	183	138	248	5.5
	11...15	205	322	219	188	305	6.5
	18.5...22	235	370	237	218	350	7
	30...37	305	490	278	200	470	10
	45...75	320	560	308	197	535	10
	90...132	355	678	320	240	659	11
	160...185	450	900	378	300	875	12
	200...220	480	1070	424			
250...280	520	1300	438				

* W1 and H1 are mounting dimensions

References

EXPERT Series	Heavy duty (constant torque) G-type		Light overload (variable torque) P-type	
	Motor Power (kW)	Continuous Output Current (A)	Motor Power (kW)	Continuous Output Current (A)

Compact range



Single-phase supply voltage: 200...240 V				
HAV-XC-2S0004G	0.4	3	-	-
HAV-XC-2S0007G	0.75	4.5	-	-
HAV-XC-2S0015G	1.5	7.1	-	-
HAV-XC-2S0022G	2.2	9.8	-	-
Three-phase supply voltage: 380...440 V				
HAV-XC-4T0007G	0.75	2.3	-	-
HAV-XC-4T0015G	1.5	3.7	-	-
HAV-XC-4T0022G	2.2	5	-	-
HAV-XC-4T0040G	4	8.8	-	-

References

EXPERT Series	Heavy duty (constant torque) G-type		Light overload (variable torque) P-type	
Product model	Motor Power (kW)	Continuous Output Current (A)	Motor Power (kW)	Continuous Output Current (A)

Standard range



Single-phase supply voltage: 200...240 V

HAV-XS-2S0007G	0.75	5	-	-
HAV-XS-2S0015G	1.5	7.8	-	-
HAV-XS-2S0022G	2.2	10.8	-	-

Three-phase supply voltage: 380...440 V

HAV-XS-4T0007G	0.75	2.3	-	-
HAV-XS-4T0015G	1.5	3.7	-	-
HAV-XS-4T0022G	2.2	5	-	-
HAV-XS-4T0040G-0055P	3.7	8.8	5.5	13
HAV-XS-4T0055G-0075P	5.5	13	7.5	17
HAV-XS-4T0075G-0110P	7.5	17	11	25
HAV-XS-4T0110G-0150P	11	25	15	32
HAV-XS-4T0150G-0185P	15	32	18.5	37
HAV-XS-4T0185G-0220P	18.5	37	22	45
HAV-XS-4T0220G-0300P	22	45	30	60
HAV-XS-4T0300G-0370P	30	60	37	75
HAV-XS-4T0370G-0450P	37	75	45	90
HAV-XS-4T0450G-0550P	45	90	55	110
HAV-XS-4T0550G-0750P	55	110	75	157
HAV-XS-4T0750G-0900P	75	157	90	180
HAV-XS-4T0900G-1100P	90	180	110	214
HAV-XS-4T1100G-1320P	110	214	132	256
HAV-XS-4T1320G-1600P	132	256	160	307
HAV-XS-4T1600G-1850P	160	307	185	340
HAV-XS-4T1850G-2000P	185	340	200	385
HAV-XS-4T2000G-2200P	200	385	220	430
HAV-XS-4T2200G-2500P	220	430	250	465
HAV-XS-4T2500G-2800P	250	465	280	525
HAV-XS-4T2800G-3150P	280	525	315	590

Comparison of SMART and EXPERT Series

Structure	SMART	EXPERT
Installation way	Separate Cabinet and Wall-hanging	<ol style="list-style-type: none"> 1. Combined design of cabinet and wall hanging machine 2. 30-185kW standard machine is a wall hanging machine, but the cabinet installation is valid after the installation of the base 3. 200-280kW standard machine is a cabinet machine (wall hanging installation is valid by adding accessories)
Cable connection way	Above 90-132kW up in down out, for others down in and down out	Above 90-132kW up in down out, for others down in and down out
Built-in braking	Built-in for below 18.5kW	<ol style="list-style-type: none"> 1. Built-in braking for below 22kW 2. Reserved brake unit interface for above 22kW
Built-in reactance	Built-in DC choke in cabinet inverter	Built-in reactor for above 200kW ; Above 18.5kW, it can be selected, for 30-185kW, cabinet base can be selected to install DC reactor.
Through-wall mounted	NO	All series provide through-wall mounting accessories
Dustproof accessories	NO	Provide dust-proof cover, and add dustproof cover for below 22kW
Protective cover	NO	It can provide protective cover according to special occasions such as cotton wool.
Vulnerable device	<ol style="list-style-type: none"> 1. It is difficult to replace fans. 2. Has AC contactor 	<ol style="list-style-type: none"> 1. Easily replaceable fan design 2. Uses DC contactor and is dust proof, doesn't get damaged by dust easily.
Keyboard and extend	<ol style="list-style-type: none"> 1. Two size keyboard 2. Extend 8PIN cable+keyboard base 	<ol style="list-style-type: none"> 1. One size keyboard 2. Two types of external keyboard, two kinds of pallets (EXPERT Standard compatible with small external keyboard), and standard ethernet cable connection.
System compatibility	NO	For below 22kW, it is compatible with different power systems, such as ungrounded IT system, high impedance grounding system, etc.

Comparison of SMART and EXPERT Series

Function	SMART	EXPERT
V/F curve	<ol style="list-style-type: none"> 1. Customizable 2. 1.7x power 3. 2.0x power 	<ol style="list-style-type: none"> 1. Customizable 2. 1.2x power 3. 1.7x power 4. 2.0x power
Multi-speed	8 speeds	16 speeds
Simple PLC	Most 8 stages per cycle. Frequency, time, time unit and direction of each stage can be set. Can use terminal or other switching operation to pause, reset in case of a failure.	Most 16 stages per cycle. Frequency, time, time unit and direction of each stage can be set. Can use terminal or other switching operation to pause, reset in case of a failure.
Communication	485 communication, can be a host	<ol style="list-style-type: none"> 1. 485 communication, can be a host 2. EtherCAT / PROFINET and etc communication extension cards
PID	<ol style="list-style-type: none"> 1. Built-in PI 2. Analog closed loop 3. Limited use of reaction characteristics 	<ol style="list-style-type: none"> 1. Built-in PI 2. Analog closed loop and pulse closed loop 3. Multi segment closed loop input 4. Both positive and negative reactions can be used 5. Single phase or biphas pulse closed loop feedback can be used
Speed tracking	NO	YES
Fixed length control	NO	YES
Droop control	NO	YES
Instant stop non-stop	NO	YES
AO output selection	Use jumper to switch between voltage or current mode	Current or voltage mode can be selected programatically

EXPERT series

Comparison of SMART and EXPERT Series

Function	SMART	EXPERT
Permission setting	<ol style="list-style-type: none"> 1. User password 2. Timing password 	<ol style="list-style-type: none"> 1. User password 2. Timing password
Extended capability	<p>1 Standard 2 analogue inputs (AI1~AI2), 1 analogue output (AO1), 8 digital inputs (DI1~DI6, FWD, REV), 1 relay</p>	<ol style="list-style-type: none"> 1. Standard 2 analogue inputs (AI1~AI2), 1 analogue output (AO1), 7 digital inputs (DI1~DI5, FWD, REV), 2 digital outputs (DO1~DO2) and 1 relay 2. Can add 1 analogue input (AI3), 1 analogue output (AO2), 5 digital inputs (DI6~DI10), 1 digital output (DO2) and 1 relay using the extension card. 3. According to customer demand, customized I/O extend card, PG card, technology and function control card etc. can be added.
Rated voltage range	220V/380V (Fluctuation range-15%~10%)	220-240V/380-440V (Fluctuation range-15%~10%)
Carrier frequency	Maximum 12kHz	Maximum 15kHz
Output frequency	Maximum 400Hz	Maximum 550Hz
Keyboard potentiometer	Analog potentiometer	Digital encoder
Double row display	No, Four digit tube	<ol style="list-style-type: none"> 1. Double row display, according to customer choice, set the corresponding operation and stop display parameters. 2. Five digit tube
Keyboard potentiometer	Analog potentiometer	Digital encoder



Comparison of SMART and EXPERT Series

Function	SMART	EXPERT
Parameter copy	Special LCD keyboard	The keyboard can upload and download parameters.
Binding and switching	NO	It can realize the binding of running command and frequency given channels. And it can bind three kinds of command channels and six kinds of frequency channels, realizing local and remote switching conveniently.
High speed impulse	DI6	DI4/DI5 can realize single-phase or dual phase.
Virtual terminal	NO	Virtual terminal function reduce customer wire connection trouble
Software function adding	NO	Autonomous software, according to the requirements of customers or industry, it can realize special technology and function increase.
Extension Cards	NO	I/O extension card ,communication card Can customize technology card according to customer demand

EXPERT series

Quick selection



Select the right drives by following these steps:

- 1 Applications where you need a variable speed drive
- 2 Type of motor with constant torque or variable torque
- 3 Input and output power specifications

Applications

- **SMART Series:** Pump & Fan applications and high rating general purpose applications up to 850kW heavy duty motors
- **BASIC Series:** Small machines & simple applications, the compact size is suitable for small machines such as bread machine, bag machine etc.
- **EXPERT Series:** Complicated machines & advanced applications with extendibility of 2 reserved expansion card slots for communications and other functions like embedded simple EMC filter for HVAC applications for stadium, subway stations, commercial buildings etc., dust proof accessories for heavy dusty environments such as textile machines.

Type-code structure

Range Name Series Name Input Adaptation Inverter

HAV - BC - 4 T 0015 G(-S)

1 2

1 2

1 2

1 2

HA: Himel Automation 1

V: VSD 2
M: Motion
H: HMI
P: PLC

B: BASIC 1
S: SMART
X: EXPERT

C: Compact 2
S: Standard
U: Universal

2: 220V 1
4: 380V – 440V

S: Single-phase
T: Three-phase 2

Adaptation
0015: 1.5kW
0075: 7.5kW
0110: 11kW
0185: 18.5kW
1100: 110kW
...

Inverter Type 1
G: Constant
(Heavy-duty)
P: Variable torque
(Light-overload)

-S: Floor standing 2



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