

EXPERT Series

Himel high performance variable speed drives for complicated machines and advanced general purpose applications

Reliable made affordable.





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.



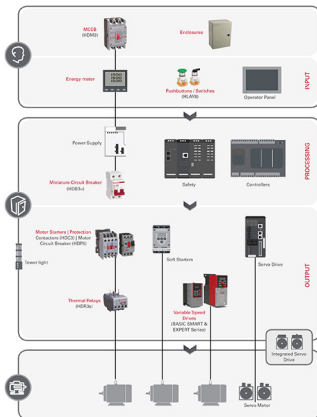
Himel. Reliable made affordable.

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OEM Architecture



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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 Stability Precision: $\pm 0.5\%$ of rated synchronous speed (SVC)

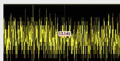
Speed Adjustment Range: 1:100 (SVC)

Torque Response: <20ms (SVC)

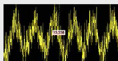
Heavy Load Overload Capacity:

- 110% - stable operation
- 150% - 1min
- 180% - 3s
- 200% - instant trip

150% output torque at 0.5Hz



1500rpm motor speed fluctuations at no-load



1500rpm motor speed fluctuations at full-load

Auto Current Limiting:

Motor current can be controlled at a certain level without affecting the output torque. Accurately identifies the motor parameters, realizing high performance vector control. Static self-learning, dynamic self-learning, and adapts to different working condition requirements.

Ensures motor parameter setting accuracy in the long cable connection.



The stable torque output can be maintained during sudden power impulse without tripping

Rich and comprehensive extensibility

Reserved 2 expansion card slots. Slots can be used to connect 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 customized cards according to user's demands.



1 Communication expansion card

2 Functional expansion cards like I/O, PG or other customized card

Standard add-on cards selection

Type	Model	Short Description	Adapted product	Specifications
EMC filter card	HAVXS-4T09705-FL	Simple EMC filter to C3	Product model: HAVXS-4T09500/0371P - HAVXS-4T09500/0509P	4T: 10 - 37kW
EMC filter card	HAVXS-4T06005-FL	Simple EMC filter to C3	HAVXS-4T04500/0509P - HAVXS-4T06000/0719P - HAVXS-4T09500/0909P	4T: 45 - 99kW
EMC filter card	HAVXS-4T18000-FL	Simple EMC filter to C3	HAVXS-4T18000/0719P - HAVXS-4T20000/0918P	4T: 75 - 200kW
I/O extension card	HAVXS-I-3DI-R	Simple I/O Extension 3 DI, 1 Relay	All	All
I/O extension card	HAVXS-I-8DI-4AR	Standard I/O Extension 8 DI, 1 DO, 1 AI, 1 Relay	All	All
EtherCAT Card	HAVXS-EtherCAT	EtherCAT communication	All	All
ProfiNet Card	HAVXS-ProfiNet-1	ProfiNet communication	All	All

Adapted for harsh environment

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

Dust preventing accessories for drives to be used in heavy dusty environment like textile machines.



Dust shield for
**EXPERT Series
Compact**



Dust shield for
**EXPERT Series
Standard**

Easiness with modularity

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.



Easy maintenance with plug-and-play fans which can easily be replaced without dismantling the product



Easy control with modular control panel that can be installed on the cabinet's external surface separately

Great adaptability to environment

Power grid: Adapted for neutral grounding power system and provides different grounding options for different grounding systems.

EMC: Enhanced interference immunity capability for the disturbances like surge, electric network noise, high frequency and high amplitude pulse, static electricity etc.



To install in an ungrounded IT system or an angular grounded TN system, remove the EMC screw and the safety gauge capacitor to suit different power grids



1. Special surge-proof design
2. The control board is completely isolated (COM-GND)
3. All inputs and outputs have optocoupler isolation,
4. Meets IEC61800-3 industrial standard

Easy and comprehensive installation

Comprehensive installation ways to fulfill all kind of applications:

- Cabinet
- Wall-mounting
- Guide rail
- Flange mounting (accessory can be provided on request)

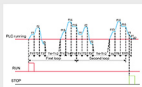


Rich and comprehensive application functions



Multi-stage speed Control.

Simple PLC with maximum 16 stages in single cycle. Running frequency, time (5500 min at most), direction and time unit (minute/sec) can be set separately for each of the stage. Standard RS485 embedded port can be used for communication.

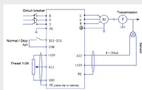


PI control:

It can be used for closed-loop control (if sensor output is used as a feedback).

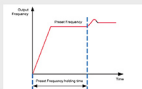
Multiple closed-loop channels can be added along with the normal input channel.

Richer selection of feedback channels such as sensor's analog feedback and different combination of the analog feedbacks.



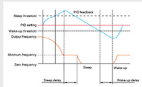
Preset for closed-loop:

The preset value can be set to a value close to zero in order to make the process-start to stabilize quickly.



Sleep/wake-up and zero frequency difference:

Sleep and wake-up function can realize energy saving. In the mean time it can avoid the frequent start-stop of inverter due to PID feedback value if zero frequency difference is set



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
	485-	RS485 communication port	RS485 differential signal negative end	Use twisted pair or shielded wire
Multifunctional output terminal	DO1	Open collector output terminal	Programmable definition for a variety of functions of the output terminal	Optical coupler isolated output Working voltage range: 0-30V Maximum output current: 50mA
	DO2	Open collector pulse output terminal	Can be extended to DO3 open collector output terminal	Working Voltage range: 0-30V Maximum output current: 50mA Maximum output frequency: 50kHz
Relay output terminal	TA, TB, TC	Programmable relay terminal output	Normal: TA-TB often closed, TA-TC often open	Contact rating AC: 3A,24VDC / 5A,250VAC NC: 3A,24VDC / 3A,250VAC
		Programmable relay terminal output	Can be extended to TA2 TB2 TC2	
Analog input	AI1, AI2	Analog input AI1 and AI2	Accepts analog current/voltage input Can be selected by the functional code (Reference: COM3) Can be extended to AI2 Supports PT100/PT1000 differential input	Input voltage range: 0-10V (input impedance 100KΩ) Input current range: 0-20mA (input impedance 160Ω) Resolution: 1/1000
Analog output	AO	Analog output	Provides analog voltage/current output through the functional code selection Can correspond to 12 different kinds of physical quantities Can be extended AO2	Output voltage range: 0-10V Output current range: 0-20mA

Control loop CN3 terminal function explanation



Category	Terminal label	Name	Terminal function explanation	Specification
Multifunctional input terminal	O11	Multifunctional input terminal 1	Programmable logic is defined as a variety of functions of the switch input terminals (common port, COM). Can be extended to DIS-O10.	Opto-coupler isolated output input impedance 3kΩ Maximum input frequency: 20kHz Input voltage range: 0-30VDC
	O12	Multifunctional input terminal 2		
	O13	Multifunctional input terminal 3		
	O14	Multifunctional input terminal 4		
	O15	Multifunctional input terminal 5		
Power Supply	15V	+15V power supply	External 15V power supply	Maximum output current: 50mA
	GN1	+15V power supply common terminal	Reference ground for analog signal and 15V power supply	COM and GN1 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	DI/DO common terminals	External short circuit with +24V as factory default
CM1	Digital output common terminal	Multifunctional output terminal DO1 common terminal	External short circuit with COM as factory default	

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Product Specification



Control mode	Open-loop vector control, V/F control
Range of speed regulation	1 ~ 100
Starting torque	150% rated torque at 0.5Hz
Speed control accuracy	$\pm 0.5\%$ rated synchronous speed
Frequency accuracy	Digital set Max. frequency $\times \pm 0.01\%$ Analog setting Max. frequency $\times \pm 0.2\%$
Frequency resolution	Digital setting: 0.01Hz; Analog set: Max. frequency $\times 0.1\%$
Torque rise	Auto torque rise, manual torque rise 0.1% ~ 20.0%
V/F curve	Four ways: 1 kind of user self-defined V/F curve, 3 kinds of slip 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 built-in 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
Auto voltage adjustment	When the voltage of network changes, the output voltage remains constant automatically.
Auto current limiting	During the operation, the current is automatically limited to prevent frequent fault trips.
Auto center adjustment	According to the load characteristics, it automatically adjusts the center frequency.
Texture saving frequency	Texture saving frequency control can realize the functionality of load and variable saving frequency
Fixed length control	Length reached stop function
Stagging 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
Braking function	Brake running command channel and frequency given channel to change at the same time.

Customized function

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 be switched 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 such as frequency etc.	
	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)
Operating panel	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 etc.
	Altitude	Less than 1000m (Densified use at altitudes higher than 1000m)
	Environment temperature	-10°C ~ +40°C (Densified use in 40° C ~ 50°C)
	Humidity	Less than 50% RH, no condensation
Vibration	Less than 5.9 ms ²	
	Storage temperature	-40°C ~ +60°C
Structure	Protection degree	IP20
Installation Way	Protection class	IP20
	Cooling way	Forced air cooling
Distribution System	Efficiency	≥93%

Overall dimensions



Ranges	Motor Power (kW)	Dimensions (mm)						Mounting Holes (mm)
		W	H	D	W1*	H1*	R	
Compact	0.4...1.5	75	188	169	55	172.5	4.5	
	2.2...4	85	210	172.8	64	198.5	4.5	
	0.75...3.7	120	215	158	109	204	5.5	
	5.5...7.5	150	259	183	138	248	5.5	
Standard	11...15	205	322	219	168	305	6.5	
	18.5...22	235	370	237	218	350	7	
	30...37	305	400	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) F type		
Product model	Motor Power (kW)	Continuous Output Current (A)	Motor Power (kW)	Continuous Output Current (A)

Compact range



Single-phase supply voltage: 200...240V				
HW-XC-25004G	0.4	3	-	-
HW-XC-25007G	0.75	4.5	-	-
HW-XC-25010G	1.5	7.1	-	-
HW-XC-25022G	2.2	9.8	-	-

Three phase supply voltage: 380...460V				
HW-XC-470607G	0.75	2.3	-	-
HW-XC-470815G	1.5	3.7	-	-
HW-XC-470822G	2.2	5	-	-
HW-XC-470940G	4	8.8	-	-

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References

Standard range



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)
Single phase supply voltage: 200...240V				
HAV-XS-2500TG	0.75	5	-	-
HAV-XS-2500TG	1.5	7.8	-	-
HAV-XS-2500TG	2.2	10.8	-	-
Three phase supply voltage: 380...480V				
HAV-XS-4700TG	0.75	3.3	-	-
HAV-XS-4700TG	1.5	3.7	-	-
HAV-XS-4700TG	2.2	5	-	-
HAV-XS-4700TG-01SEF	3.7	8.8	5.5	13
HAV-XS-4700TG-01SEF	5.5	13	35	17
HAV-XS-4700TG-01SEF	7.5	17	11	26
HAV-XS-4700TG-01SEF	11	25	15	32
HAV-XS-4700TG-01SEF	15	32	18.5	37
HAV-XS-4700TG-01SEF	18.5	37	22	45
HAV-XS-4700TG-01SEF	22	45	30	49
HAV-XS-4700TG-01SEF	30	60	37	75
HAV-XS-4700TG-04SEF	37	75	45	90
HAV-XS-4700TG-05SEF	45	90	55	110
HAV-XS-4700TG-07SEF	55	110	75	152
HAV-XS-4700TG-09SEF	75	152	90	186
HAV-XS-4700TG-11SEF	90	180	110	214
HAV-XS-471800-02SEF	180	314	132	256
HAV-XS-471200-04SEF	132	256	160	307
HAV-XS-471600-08SEF	160	307	195	348
HAV-XS-471600-20SEF	195	348	220	385
HAV-XS-472000-22SEF	220	385	220	420
HAV-XS-472500-30SEF	220	420	250	465
HAV-XS-472500-30SEF	250	465	280	520
HAV-XS-472800-31SEF	280	525	315	585

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Target Applications

High performance with great adaptability and extensibility

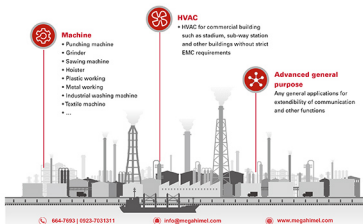
Excellent expandability: Reserved 2 slots for I/O expansion card, communication expansion card, other process expansion cards (such as air compressor adapter card, water-supply card, plastic injection card etc.) or even customized cards can be connected according to user's demands.

Abundant functions

Built-in PID
Simple PLC function with upto 16 speed stages in one cycle
Savings frequency operation
Fixed length control and speed tracking
Drop control and instant stop non-stop
Automatic energy-saving operation
Multiple protection and overload warning
Built-in braking unit below 22kW

Environment adaptability

Humidity-proof, dust-proof and oil-proof PCBA boards
Dust preventing accessories for heavy dusty environment, very good for textile machines



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