



Himel Industrial Automation Catalogue

Reliable made affordable





About Himel

Himel is a multinational manufacturer and provider of electrical products successfully combining global expertise with local knowledge.

Founded by a Spanish entrepreneur in 1958, the company pioneered in exporting quality electrical enclosures, establishing Himel brand globally. Today, our global footprint and technology enable us to provide the best combination of affordable and reliable offers for Low Voltage Power distribution, Industry Automation and Home Electric to our long-term customers and partners in over 50 countries where we are present.

Himel. Reliable made affordable





Himel Variable Speed Drives (VSD)

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.

BASIC Variable Speed Drive



BASIC

Rated voltage / frequency	Power Rating	
230V Single Phase	0.4...2.2kW	04
230V Three Phase	0.7...2.2kW	
380V-440V Three Phase	0.4...15kW	

EXPERT Standard Variable Speed Drive



Expert standard

Rated voltage / frequency	Power Rating	
230V Single Phase	0.7...2.2kW	04
230V Three Phase	0.7...160kW	
380V-440V Three Phase	0.7...850kW	

SMART Pump Variable Speed Drive



SMART Pump

Rated voltage / frequency	Power Rating	
230V Three Phase	2.2...45kW	27
380V-480V Three Phase	2.2...315kW	

Solar Variable Speed Drive



Solar

Rated voltage / frequency	Allowed voltage range	
220V Single Phase	DC: 150V-450V	58
380V-440V Three Phase	AC: 220V(15%)~240V(+10%)	
	DC: 250V-780V	
	AC: 380V(15%)~440V(+10%)	
Power Rating		
0.4...4kW		
0.7...160kW		

HASBS Soft starter



HASBS

Rated voltage / frequency	Power Rating	
380V-440V Three Phase	11...600kW	68

HASXS Soft starter



HASXS

Rated voltage / frequency	Power Rating	
380V-440V Three Phase	11...600kW	68

High Performance

Improved Energy Savings

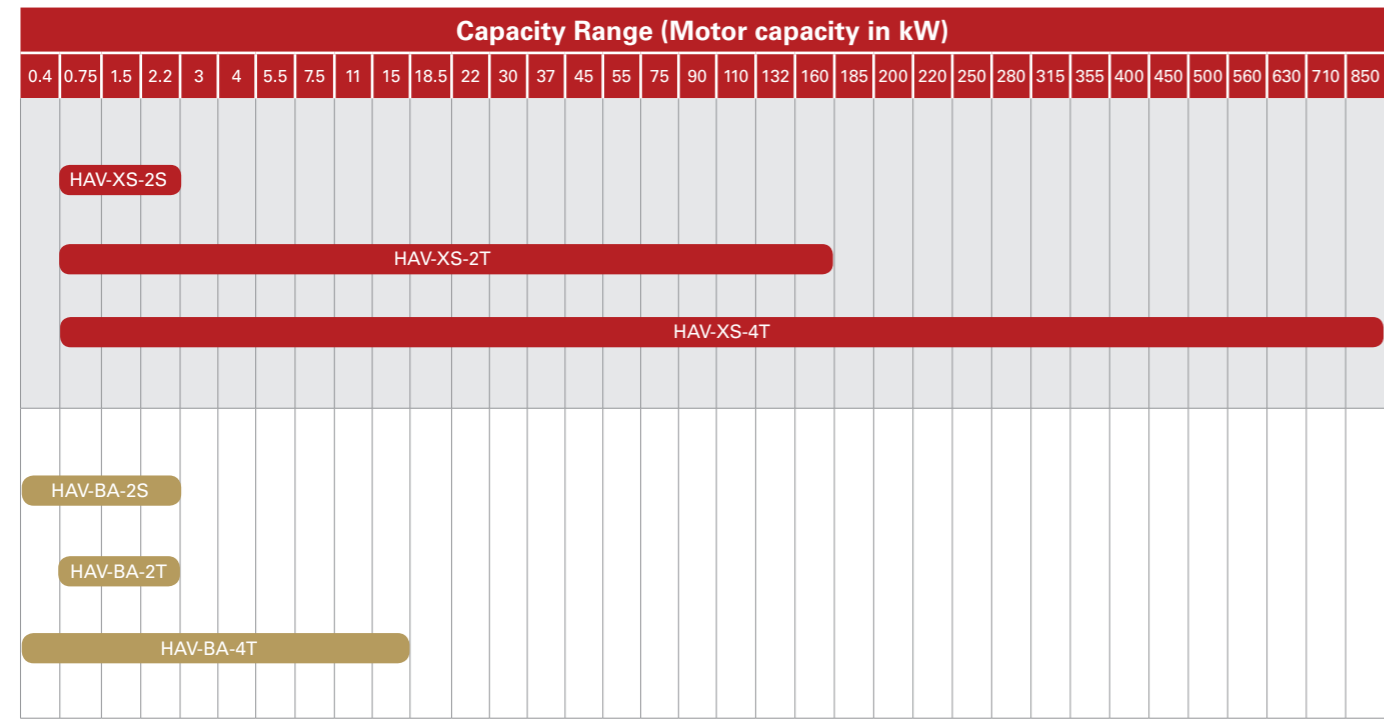
Multitude of Function

Easy to Use

Longer Lifetime



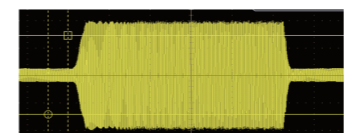




Himel Variable Speed Drives (VSD) Family



* 2S = 200-240V Single Phase, 2T = 200-240V Three Phase, 4T = 380-440V Three Phase



Your Benefits

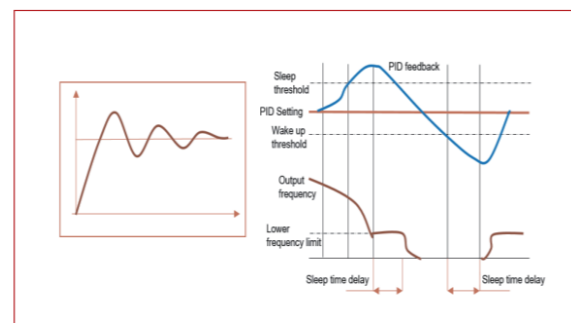
Features	Your benefits
High performance  <ul style="list-style-type: none"> ◆ Excellent overload performance: 150% 60s, 180% 3s, 200% 1s (normal test environment) ◆ High start torque performance: 0.5Hz, 150% ◆ Excellent current control capability : The inverter provides sufficient stable output torque when the load is suddenly changed to avoid trip operation 	<ul style="list-style-type: none"> ◆ Improves productivity of machine ◆ Less interruptions of the production line
Improved energy savings  <ul style="list-style-type: none"> ◆ Integrated Eco-mode for V/f and V²/f automatically adapts the motor magnetic flux to save energy. ◆ Improved special PID control with sleep mode helps to save more energy for pump application 	<ul style="list-style-type: none"> ◆ Energy savings during low dynamic load cycles such as pump and fan. ◆ Increases the potential savings by up to 70%. ◆ Greatly reduces the return time of investment.
Multitude of function  <ul style="list-style-type: none"> ◆ With a new software platform, our VSDs offer more functions such as flexible V/F curve, 16 stage multi- speed control, command binding, industry specific functions, and many more. ◆ Easy to communicate with upper controller via built-in RS485 Modbus protocol . 	<ul style="list-style-type: none"> ◆ No additional upper controller is needed for stand-alone machine, hence saving the system integration cost. ◆ Easy to do the system integration for large production line and long distance communication
Easy to use  <ul style="list-style-type: none"> ◆ Compact design and side-by-side mounting, din-rail installation. ◆ High accuracy motor parameters self-tuning function ◆ Supports pluggable keypad and extension keypad ◆ Wall-through mounting ◆ AVR (Automatic voltage regulation) technology 	<ul style="list-style-type: none"> ◆ Makes it possible to use in smaller cabinets ◆ No need to set motor parameters anymore ◆ Easy to operate and maintain
Longer lifetime  <ul style="list-style-type: none"> ◆ Stable operation under main input voltage fluctuations. Reliable operation with net tensions between 380 V and 440 V (-15%/+10 %) ◆ Fully coated PCB ◆ Dust shield cover ◆ Better cooling and removable fan design 	<ul style="list-style-type: none"> ◆ Wider voltage range, increases robustness of the drive in difficult environment ◆ Automatic adaptation in case of unstable power supply ◆ Longer life in high humid and high dust occasions ◆ Easy to maintain



SPECIAL FEATURES & BENEFITS



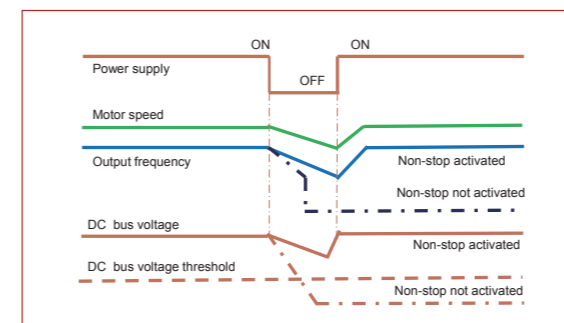
PID with sleep mode



- ◆ Water supply PID adjustment: If the feedback pressure is higher than the set pressure, start the sleep detection to save more energy.
- ◆ After the sleep time delay, if the feedback pressure is still greater than the set pressure, the VSD enters into the sleep mode and slows down to the lower frequency
- ◆ When the feedback pressure reach to the wake up threshold pressure and the wake up detection time passes, it will start automatically
- ◆ Target applications: Pump for HVAC, Water / Waste water

E B

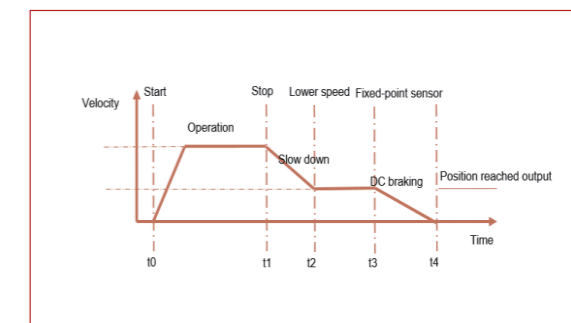
Non-stop function



- ◆ When an instant power loss occurs, the VSD guarantees the continuous operation of the production line, which meets the continuous operation process requirement in conditions like lightning, large power grid impact and unstable power supply environments.
- ◆ Target applications: Chemical fiber, textile

E B

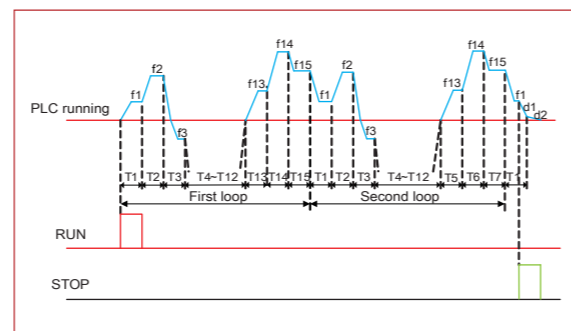
Easy to add customized function like fixed point stop control



- ◆ Always stop at fixed point
- ◆ When there is a stop command, the motor slows down to the lower speed point, searches for a fixed stop point (usually connected to DI input by a sensor), stops at this point, and triggers an output position signal.
- ◆ Target applications: Needling machine, rotating table

E

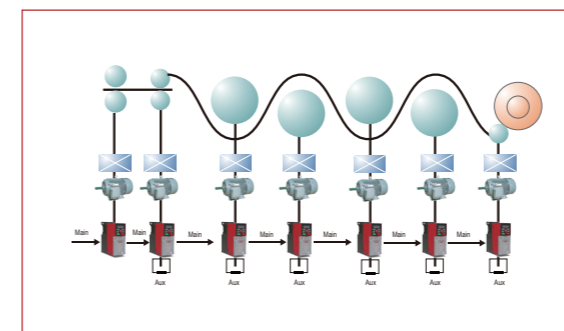
Simple PLC



- ◆ Multistage speed control for up to 16 stages. Frequency, time, timer unit and direction for each stage can be set individually.
- ◆ PLC operation mode:
 - Single cycle (After a single cycle it keeps running at final value)
 - Continuous cycle
- ◆ No need for upper controller
- ◆ Target applications: Fan, ball mill, centrifuge

E B

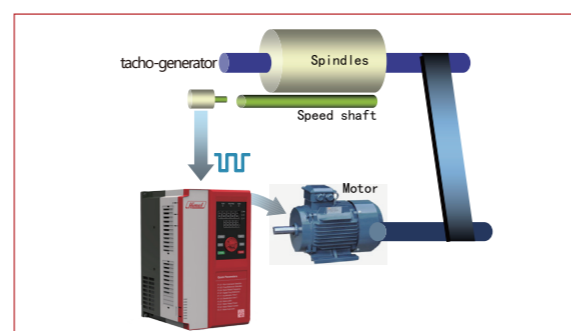
Main + auxiliary frequency set



- ◆ Receives the frequency in any state, such as I/O, simple PLC, PI closed loop, multi-speed state. It uses auxiliary frequency for super precise speed.
- ◆ Target applications: Synchronization use case

E B

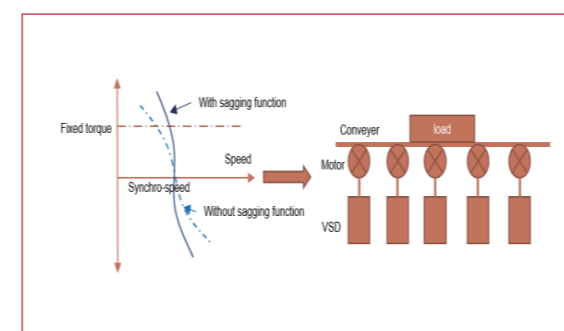
Fixed-length control



- ◆ Use DI4/DI5 (DI4/DI5 = 44) to input speed pulse for real-time length measurement. When the set length (set by FC.14) is reached, it triggers the length reached signal, and the fixed-length function is realized.
- ◆ Target applications: Textile machine, cable drawing machine

E B

Sagging function



- ◆ When more than one motor drives the same load, this function can be used to adjust the speed of the motor for uniform distribution of load.
- ◆ Target applications: Tension control in chemical industry and roll control in glass and metallurgy industry

B

E Expert
B Basic

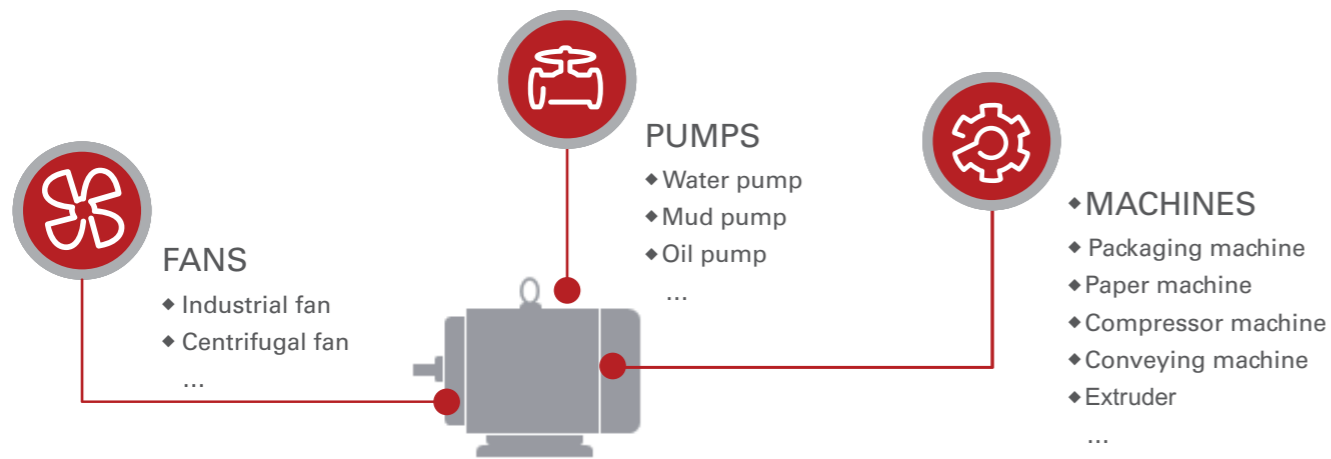


Wherever you need an efficient motor, a variable speed drive is a must...

BASIC Series: Small & Simple General Purpose Applications

EXPERT Series: Pumps, Fans & Advanced General Purpose Applications

0.4kW ~ 850kW
230V | 380V-440V



Target Applications

BASIC Series

Small machines:

- ◆ Bread machine
- ◆ Bag machine
- ◆ Carving machine

Simple applications:

- ◆ Small conveyor
- ◆ Small fan
- ...

EXPERT Series

Pumps:

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

Fans:

- ◆ Industrial fan
- ◆ Air blower
- ◆ Ventilation

Heavy & complicated machines:

- ◆ Material handling machine
- ◆ Textile machine
- ◆ Material working machine
- ◆ Industrial washing machine
- ◆ Air compressor

Advanced applications:

- ◆ Construction elevator
- ◆ Metal & mining process
- ◆ Petrochemical

Target Applications

- Irrigation
- Sewage
- Fountain
- Sand pump
- Circulating pump
- Photovoltaic pump
- Rod pump
- Drying
- Ventilation
- Dust removal
- Air blowing
- Hot surface treatment
- Air supply fan for boiler
- Industrial fan
- Punching
- Grinder
- Textile
- Carving
- Sawing machine
- Metal work
- Plastic work



KNOW YOUR MACHINE BETTER



HVAC, Water and Waste Water



Fans, Pumps, and Air Conditioning

- ◆ Integrated Eco-mode on V/f and V²/f control automatically adapts motor flux to save energy.
- ◆ Improved Special PID control with sleep mode for pump application can help to save more energy.
- ◆ Speed tracking: For smooth catching and restarting of a running fan.
- ◆ Dry pump protection, automatically detects a dry running pump to protect the equipment.

Textile and Dyeing



Heat setting stenter, twister, air-flow spinning, spinning machine, thin-film machine, chemical fiber industry, and needling machine

- ◆ Separate cooling channel: Detachable cooling fan design makes it easy to clean cotton.
- ◆ Wall-through mounting option(185kW) , dust shield cover option (22kW) and dust filter option
- ◆ Enhanced PCB coating
- ◆ Wide input voltage range, able to work for a long time under low voltage environments.
- ◆ Non-stop function to guarantee the continuous operation of production line.
- ◆ Fixed-length control and fixed-point stop control
- ◆ Main + auxiliary frequency set

Woodworking machinery



Wood and veneer cutting machines, planers, peeling machine, carving machines

- ◆ Integrated brake choppers: No need to purchase an external brake chopper.
- ◆ DIN rail mounting and quick I/O connection, quick and easy installation and maintenance.
- ◆ Multiple display options: Extendable LED/LCD display keypad. Integrated multi-stage speed control (16 steps) and simple PLC function without any additional PLC.
- ◆ High start torque, high frequency output (650Hz), accurate speed control for highly dynamic applications to improve the productivity .

Metal processing machinery



Lathe, grinder, drill, planer, boring, cold forging, and engraving machine

- ◆ Compact design
- ◆ DIN rail mounting (up to 5.5 kW) and side by side mounting (up to 22 kW).
- ◆ High start torque, high frequency output (650Hz), and accurate speed control for highly dynamic applications to improve the productivity.
- ◆ Integrated brake chopper.
- ◆ Over excitation braking can help to reduce braking times by up to 50% without any external braking resistor.
- ◆ Sagging function
- ◆ Main + auxiliary frequency set

Food and packaging



Conveyor, blow molding, blender, cutter, and labeling machines

- ◆ Compact design
- ◆ DIN rail mounting (up to 5.5 kW) and side by side mounting (up to 22 kW).
- ◆ Counter function using DI4/DI5
- ◆ Extendable LED/LCD display keypad support for convenient and safe monitoring and operation.
- ◆ Integrated multi-stage speed control (16 steps) and simple PLC function without any additional PLC.
- ◆ Fixed-length control for cutting process.
- ◆ Fixed-point stop control



Rubber and plastic machinery





Scroll extruder, pelletizer, and bagging machine

- ◆ Compact design
- ◆ DIN rail mounting (up to 5.5 kW) and side by side mounting (up to 22 kW), to save cabinet space.
- ◆ High start torque, high frequency output (650Hz), accurate speed control for highly dynamic applications to improve the productivity .
- ◆ Precise control to ensure the material thickness evenly, in order to save cost and ensure the quality of products.
- ◆ Torque limit and slip compensation, especially used for constant output torque. Minimize the torque fluctuations and improve the extrusion process quality.

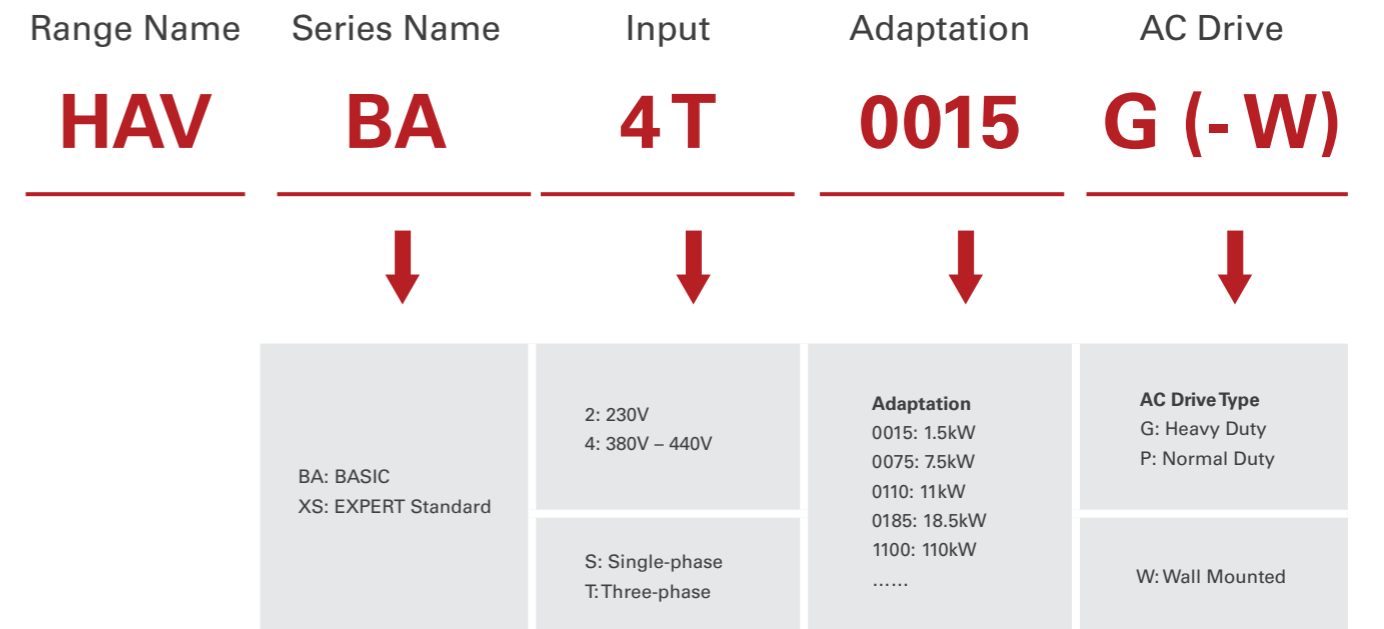
Product Specifications

Target Application		Small & Simple General Purpose Applications	P&F & Advanced General Purpose Applications
Range Name		BASIC	EXPERT XS
Design			
Capacity range	Single phase 230V Class	200V(-10%)-240V(+10%) 0.4~2.2kW	200V(-10%)-240V(+10%) 0.75~2.2kW
	Three phase 230V Class	—	200V(-10%)-240V(+10%) 0.75~160kW
	Three phase 400V Class	380V(-15%)-440V(+10%) 0.4~15kW	0.75~450kW [380V(-15%)~440V(+10%)] 500kW~850kW (380V -15% +10%)
Frequency	Input frequency	50/60Hz	
	Output frequency	0-550Hz	0 - 550Hz
Overload capacity	Normal Duty	—	120% for 1min, 150% for 1s, 180% instant protection
	Heavy Duty	150% for 1min, 180% for 1s, 200% instant protection	150% for 1min, 180% for 3s, 200% instant protection
Control method	V/f	√	√
	Sensor less vector control		√
	Eco-mode control	√	√
Start torque		0.5Hz, 150%	
Inbuilt PID		√	√
Keypad		Fixed	Pluggable
Display		Single row LED	Double row LED
Multispeed control		Up to 16 stages in one cycle	
I/O	DI1-DI4	NPN/PNP, Input: 9-30VDC	
	DI5	NPN/PNP, Input: 15-30VDC, Pulse input: max. 50kHz	
	DO1	9-30VDC, max. 50mA	
	DO2	9-30VDC, max. 50mA Pulse output max. 50kHz	
	AI1	V: 0-10V I: 0-20mA Resolution: 1/1000	V: 0-10V I: 0-20mA Resolution: 1/1000
	AI2	V: 0-10V Resolution: 1/1000	
	AO1	V:0-10V	V:0-10V I: 0-20mA
	AO2	V:0-10V I: 0-20mA	
RO(Ta, Tb, Tc)		NO: 24VDC 3A / 250VAC 5A NC: 24VDC 3A / 250VAC 3A	
Inbuilt communication (Max. speed)		RS485, Modbus RTU (38.4kbps)	
Options	Extension I/O	—	DI/DO/AI/AO/RO/PT100/PT1000
	Extension keypad	Support, cable length:2m, 5m	
	Extension Communication card	—	Profinet/BACnet(< 11kW installed independent; ≥11kW installed in VSD)
Installation Way		Wall mounted, cabinet, din-rail	Wall mounted, cabinet, flange installation
Dust Shields		—	Optional
EMC Filter		C3	External card available (≥ 30kW)
Braking unit		Built-in	Built-in (≤ 22W)
Environment	Operation temperature	-10-40 °C no capacity reduction, 40 °C -50°C capacity reduction	
	Humidity	≤95%RH	
	Altitude	≤1000m, no capacity reduction	
	IP level	IP20	
Standards		EN 61800-3: 2004 +A1: 2012 +A1: 2012, EN 55011: 2016+A1: 2017, EN 61000-6-2: 2005, EN 61000-3-2: 2014, EN 61000-3-3: 2013, EN 61000-4-2: 2009, EN 61000-4-3: 2006+A1: 2008+A2: 2010, EN 61000-4-4: 2012, EN 61000-4-5: 2014, EN 61000-4-6: 2014, EN 61000-4-8: 2010, EN 61000-4-11: 2004	
Certificates		CE	CE

Product Specifications

Target Application		Small & Simple General Purpose Applications	P&F & Advanced General Purpose Applications
Range Name		BASIC	EXPERT XS
Design			
Features	Velocity ratio	1:100	
	Frequency precision	Digital setting: Max frequency X ±0.01% Analog setting: Max frequency X ±0.2%	
	Frequency resolution	Digital setting :Max frequency X ±0.01% Analog setting: Max frequency X ±0.1%	
	Torque rise	Integrated auto-torque rising function Manual- setting: 0.1%~30.0%	
	V/F control curve	Linear, Square, V ^{1.7} /F, V ^{1.2} /F	Linear V/F, user set V/F, super V/F mode
	Acceleration/Deceleration Time	4 types of ACC/DEC time selection; optional time unit selection (Min/s); setting range: 0~60hours;	
	DC braking	Start frequency: 0.00~60.00Hz; braking time: 0.0~30.0s; braking current: 0.0~100%	
	Automatic voltage regulation(AVR)	√	
	Auto current limitation	√	
	Auto PWM adjustment	√	
Protection	Prevent mis operation	√	√
	Protection function	Over-current, over-voltage, under-voltage, over-heat, over-load, short circuit.	
	Cooling	Air- cooling	
Warranty		24 months	

Reference Selection



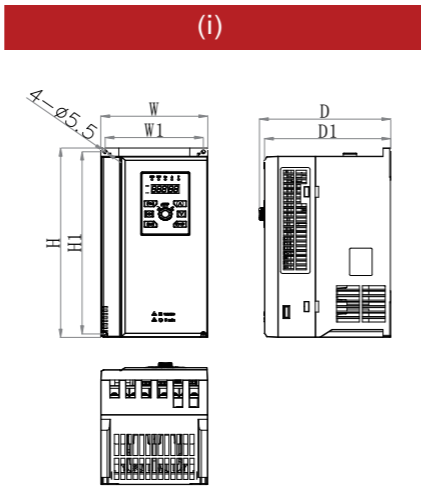
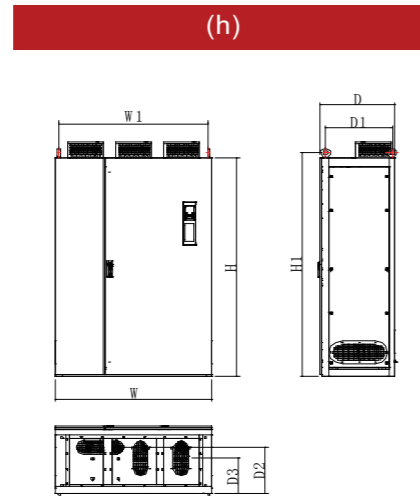
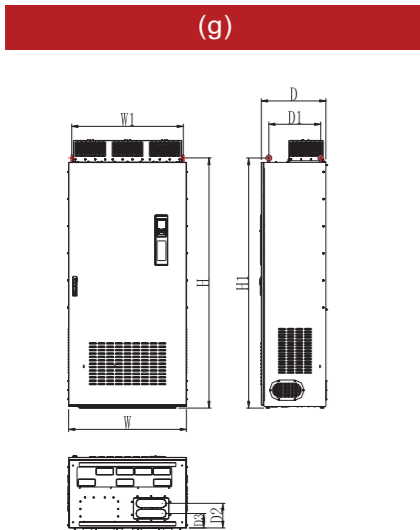
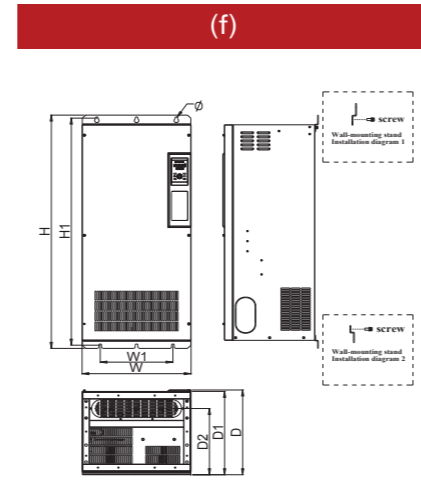
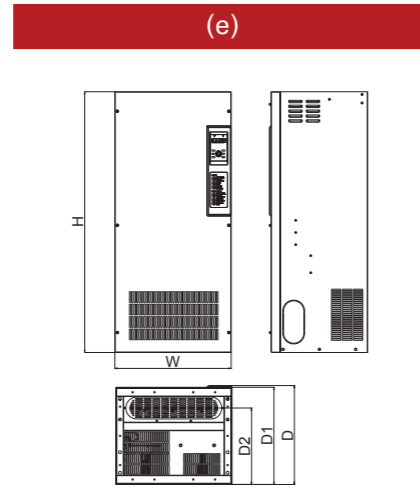
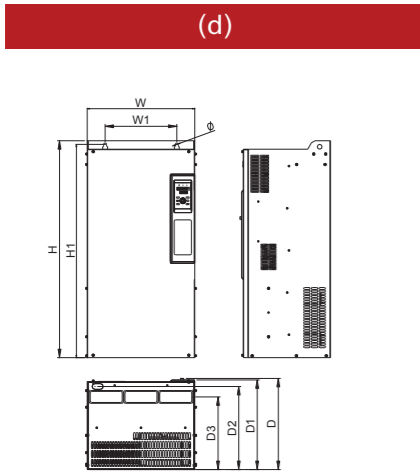
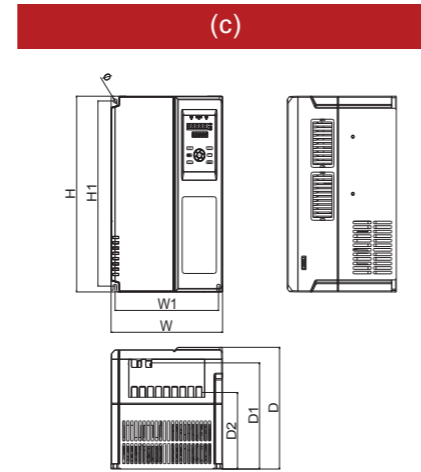
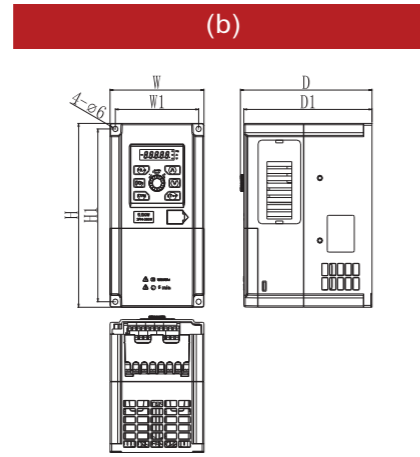
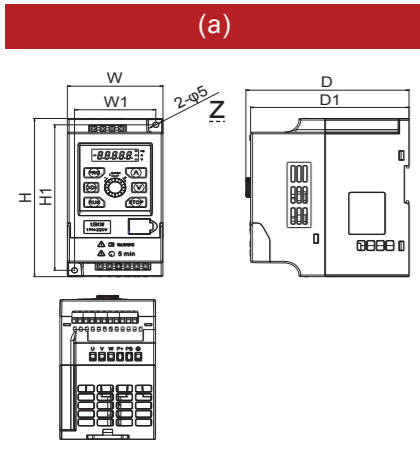
References & Mechanical Data

Range	Input Voltage	Commercial Reference	Heavy Duty G-type		Normal Duty P-Type		Dimensions(mm)			Mounting Dimensions (mm)					Mounting Hole Diameter (mm)	CAD Diagram	
			Motor Power (kW)	Continuous Output Current (A)	Motor Power (kW)	Continuous Output Current (A)	W	H	D	W1	H1	D1	D2	D3	Ø		
BASIC	200-240V Single Phase	HAV-BA-2S0004G	0.4	2.4	-	-	80	150	136.5	68	138	133	-	-	5	(a)	
		HAV-BA-2S0007G	0.75	4.5	-	-	80	150	136.5	68	138	133	-	-	5		
		HAV-BA-2S0015G	1.5	7.1	-	-	80	150	136.5	68	138	133	-	-	5		
		HAV-BA-2S0022G	2.2	9.8	-	-	106	200	148.5	94	188	144.6	-	-	5.5		(b)
	200-240V Three Phase	HAV-BA-2T-0007G	0.75	4.5	-	-	80	150	136.5	68	138	133	-	-	5	(a)	
		HAV-BA-2T-0015G	1.5	7.1	-	-	80	150	136.5	68	138	133	-	-	5		
		HAV-BA-2T-0022G	2.2	9.8	-	-	106	200	148.5	94	188	144.6	-	-	5.5	(b)	
	380-440V Three Phase	HAV-BA-4T0004G	0.4	1.5	-	-	80	150	136.5	68	138	133	-	-	5	(a)	
		HAV-BA-4T0007G	0.75	2.3	-	-	80	150	136.5	68	138	133	-	-	5		
		HAV-BA-4T0015G	1.5	3.7	-	-	80	150	136.5	68	138	133	-	-	5		
		HAV-BA-4T0022G	2.2	5	-	-	80	150	136.5	68	138	133	-	-	5		
		380-440V Three Phase	HAV-BA-4T0030G	3	7.5	-	-	106	200	148.5	94	188	144.6	-	-	5.5	(b)
			HAV-BA-4T0040G	4	8.8	-	-	106	200	148.5	94	188	144.6	-	-	5.5	
			HAV-BA-4T0055G	5.5	13	-	-	106	200	148.5	94	188	144.6	-	-	5.5	
			HAV-BA-4T0075G	7.5	17	-	-	108	217	167	96	205	163	-	-	5.5	
HAV-BA-4T0110G			11	25	-	-	145	277	178	133	267	171	-	-	5.5	(i)	
EXPERT XS	200-240V Single Phase	HAV-XS-2S0007G	0.75	5	-	-	120	215	158	109	204	136	90	-	5.5	(c)	
		HAV-XS-2S0015G	1.5	7.8	-	-	120	215	158	109	204	136	90	-	5.5		
		HAV-XS-2S0022G	2.2	10.8	-	-	120	215	158	109	204	136	90	-	5.5		
	200-240V Three Phase	HAV-XS-2T0007G	0.75	5	-	-	120	215	158	109	204	136	90	-	5.5		
		HAV-XS-2T0015G	1.5	7.8	-	-	120	215	158	109	204	136	90	-	5.5		
		HAV-XS-2T0022G	2.2	10.8	-	-	120	215	158	109	204	136	90	-	5.5		
		HAV-XS-2T0040G	3.7	16.2	-	-	150	259	176	138	247	149	104	-	5.5		
		HAV-XS-2T0055G	5.5	20.3	-	-	150	259	176	138	247	149	104	-	5.5		
		HAV-XS-2T0075G	7.5	26.7	-	-	205	322	210	188	305	176	130	-	6.5		
		HAV-XS-2T0110G	11	39	-	-	235	370	230	218	350	200	146	-	7		
		HAV-XS-2T0150G	15	52.5	-	-	235	370	230	218	350	200	146	-	7		
		HAV-XS-2T0185G	18.5	62.4	-	-	305	490	271	200	470	249	211	-	10		
		HAV-XS-2T0220G	22	73.6	-	-	305	490	271	200	470	249	211	-	10		
		HAV-XS-2T0300G	30	98.7	-	-	320	560	302	197	543	277	236	-	10		
		HAV-XS-2T0370G	37	121	-	-	320	560	302	197	543	277	236	-	10		
		HAV-XS-2T0450G	45	147	-	-	320	560	302	197	543	277	236	-	10		
		HAV-XS-2T0550G	55	188	-	-	355	678	314	240	659	293	261	-	11		
	HAV-XS-2T0750G	75	256	-	-	355	678	314	240	659	293	261	-	11			
	HAV-XS-2T0900G	90	308	-	-	450	900	372	300	875	345	302	-	12			
	HAV-XS-2T1100G	110	376	-	-	480	1070	406	-	-	399	314	-	-	(e)		
HAV-XS-2T1320G	132	451	-	-	480	1070	406	-	-	399	314	-	-				
HAV-XS-2T1600G	160	547	-	-	525	1300	432	-	-	425	335	-	-				

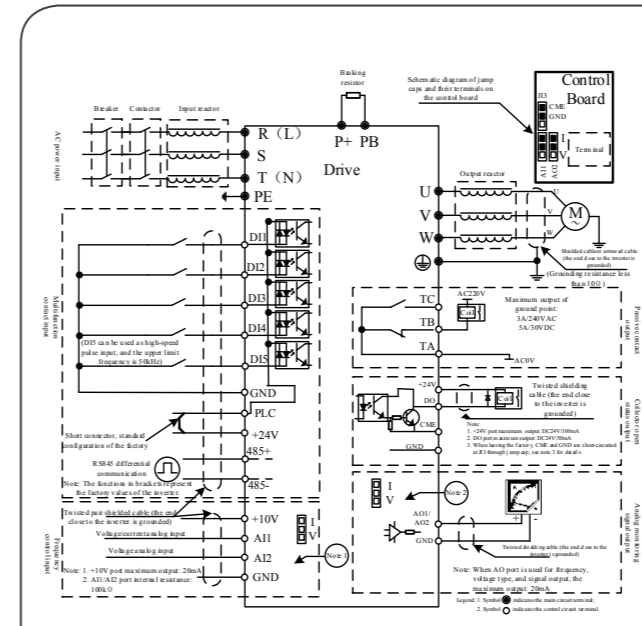
References & Mechanical Data

Range	Input Voltage	Commercial Reference	Heavy Duty G-type		Normal Duty P-Type		Dimensions(mm)			Mounting Dimensions (mm)					Mounting Hole Diameter (mm)	CAD Diagram	
			Motor Power (kW)	Continuous Output Current (A)	Motor Power (kW)	Continuous Output Current (A)	W	H	D	W1	H1	D1	D2	D3	Ø		
EXPERT XS	380-440V Three Phase	HAV-XS-4T0007G	0.75	2.5	-	-	120	215	158	109	204	136	90	-	5.5	(a)	
		HAV-XS-4T0015G	1.5	4.1	-	-	120	215	158	109	204	136	90	-	5.5		
		HAV-XS-4T0022G	2.2	5.5	-	-	120	215	158	109	204	136	90	-	5.5		
		HAV-XS-4T0040G-0055P	4	9.6	5.5	13	120	215	158	109	204	136	90	-	5.5		
		HAV-XS-4T0055G-0075P	5.5	13	7.5	17	150	259	176	138	247	149	104	-	5.5		
		HAV-XS-4T0075G-0110P	7.5	17	11	25	150	259	176	138	247	149	104	-	5.5		
		HAV-XS-4T0110G-0150P	11	25	15	32	205	322	210	188	305	176	130	-	6.5		
		HAV-XS-4T0150G-0185P	15	32	18.5	37	205	322	210	188	305	176	130	-	6.5		
		HAV-XS-4T0185G-0220P	18.5	37	22	45	235	370	230	218	350	200	146	-	7		
		HAV-XS-4T0220G-0300P	22	45	30	60	235	370	230	218	350	200	146	-	7		
		HAV-XS-4T0220G-0300P	30	60	37	75	305	490	271	200	470	249	211	-	10		
		HAV-XS-4T0370G-0450P	37	75	45	90	305	490	271	200	470	249	211	-	10		
		HAV-XS-4T0450G-0550P	45	90	55	110	320	560	302	197	543	277	236	-	10		
		HAV-XS-4T0550G-0750P	55	110	75	157	320	560	302	197	543	277	236	-	10		
		HAV-XS-4T0750G-0900P	75	157	90	180	320	560	302	197	543	277	236	-	10		
		HAV-XS-4T0900G-1100P	90	180	110	214	355	678	314	240	659	293	261	-	11		
		HAV-XS-4T1100G-1320P	110	214	132	256	355	678	314	240	659	293	261	-	11		
		HAV-XS-4T1320G-1600P	132	256	160	307	355	678	314	240	659	293	261	-	11		
		HAV-XS-4T1600G-1850P	160	307	185	340	450	900	372	300	875	345	302	-	12		
		HAV-XS-4T1850G-2000P	185	340	200	385	450	900	372	300	875	345	302	-	12		
		HAV-XS-4T2000G-2200P	200	385	220	430	480	1070	406	-	-	399	314	-	-		(c)
		HAV-XS-4T2200G-2500P	220	430	250	465	480	1070	406	-	-	399	314	-	-		
		HAV-XS-4T2500G-2800P	250	465	280	525	525	1300	432	-	-	425	335	-	-		
		HAV-XS-4T2800G-3150P	280	525	315	590	525	1300	432	-	-	425	335	-	-		
	HAVXS-4T3150G-3550P	315	600	355	645	525	1300	432	-	-	425	335	-	-			
	HAVXS-4T3550G-4000P	355	645	400	750	635	1480	467	-	-	460	356	-	-			
	HAVXS-4T4000G-4500P	400	750	450	850	635	1480	467	-	-	460	356	-	-			
	HAVXS-4T4500G-5000P	450	850	500	920	635	1480	467	-	-	460	356	-	-			
	200-240V Three Phase	HAV-XS-4T2000G-2200P-W	200	385	220	430	480	1158	406	320	1127	399	314	-	12	(d)	
		HAV-XS-4T2200G-2500P-W	220	430	250	465	480	1158	406	320	1127	399	314	-	12		
		HAV-XS-4T2500G-2800P-W	250	465	280	525	525	1387	432	400	1356	425	335	-	12		
HAV-XS-4T2800G-3150P-W		280	525	315	590	525	1387	432	400	1356	425	335	-	12			
HAVXS-4T3150G-3550P-W		315	600	355	645	525	1387	432	400	1356	425	335	-	12			
HAVXS-4T3550G-4000P-W		355	645	400	750	635	1577	467	450	1538	460	356	-	16			
HAVXS-4T4000G-4500P-W		400	750	450	850	635	1577	467	450	1538	460	356	-	16			
HAVXS-4T4500G-5000P-W		450	850	500	920	635	1577	467	450	1538	460	356	-	16			
HAVXS-4T5000G-5600P	500	920	560	1050	950	1974	521	880	-	419	-	-	10	(e)			
HAVXS-4T5600G-6300P	560	1050	630	1150	950	1974	521	880	-	419	-	-	10				
HAVXS-4T6300G-7100P	630	1150	710	1350	950	1974	521	880	-	419	-	-	10				
HAVXS-4T7100G-8500P	710	1350	850	1630	1200	2027	581	1100	-	410	-	-	18				
HAVXS-4T8500G	850	1630	-	-	1200	2027	581	1100	-	410	-	-	18	(f)			

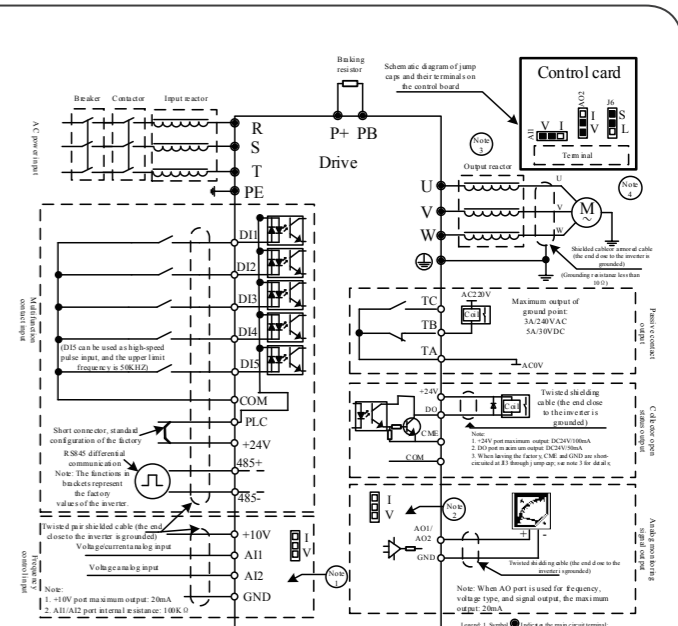
CAD Diagrams



Wiring Diagrams

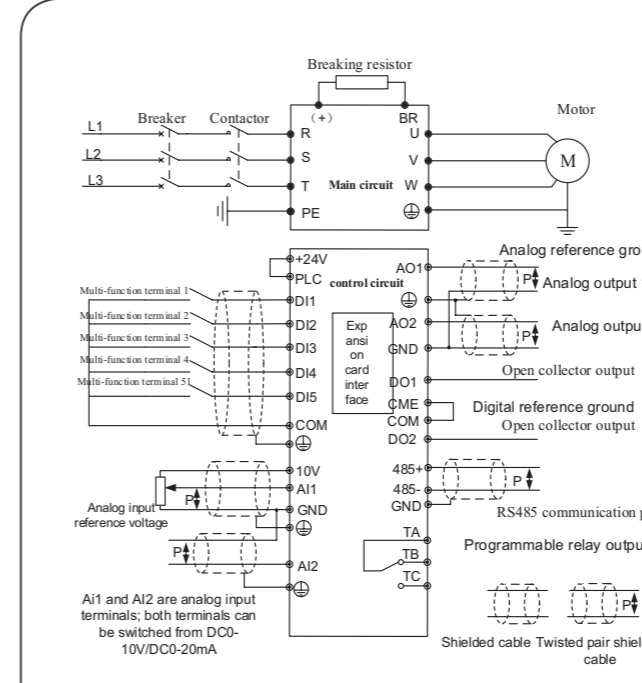


HAV-BA-4T0055G and below

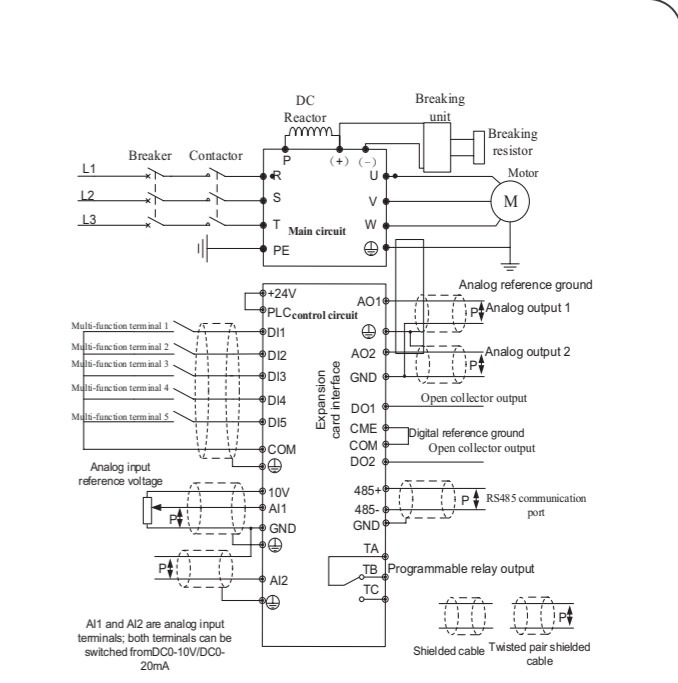


HAV-BA-4T0075G and above

BASIC Series



HAV-XS-4T0220G/0300P and below



HAV-XS-4T0300G/0370P and above

EXPERT Series

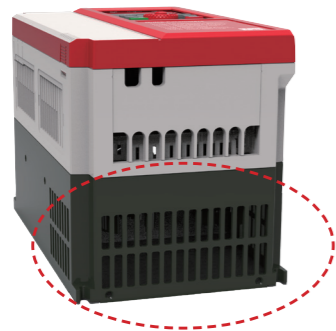
Accessories

Adapted for harsh environment

Dust-proof design: Comprehensive anti-corrosion coating and independent air duct design. Optional dust preventing accessories can also be installed to increase overall protection capabilities against high humid or excessively dusty environments.

Target Applications: Textile machines

Dust Gauze



EXPERT Series

Dust Shield



EXPERT Series
XS

Modular Design

Easy fan replacement : No need to disassemble the entire VSD for a quick fan replacement. This ease of fan change makes the VSD ideal for applications like wind machine that need regular cleaning of air ducts.

Easy Maintenance



Modular plug-and-play fan design makes it easy to replace fan without dismantling the product.

Modular Keypad Design



Operating keypad can be installed on the cabinet's door.

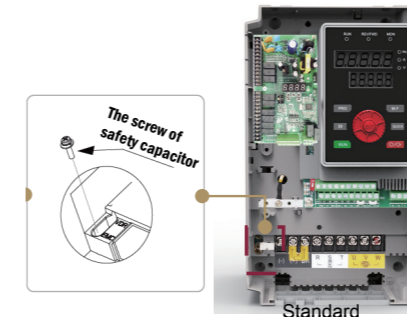
Accessories

Great adaptability to environment

Power grid: Suitable for neutral grounded power grids.

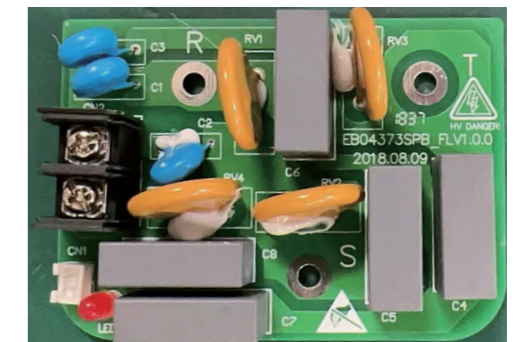
EMC: Enhanced electromagnetic interference immunity against disturbances like surge, electric noise, high frequency noise and static electricity etc.

Power grid adaptability



If installed in an IT system or an angular grounded TN system, remove the EMC screw to disconnect the safety capacitor in order to make it suitable for the grid system with neutral grounding.

EMC



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

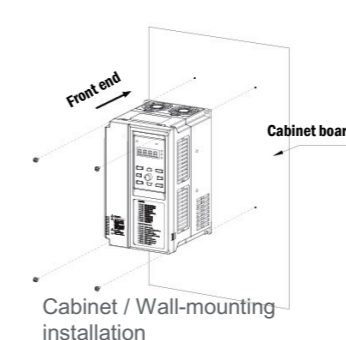
Easy and comprehensive installation

Comprehensive installation ways to fulfill all kinds of applications:

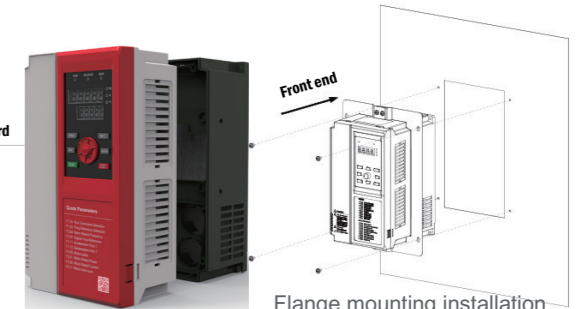
- ◆ Cabinet
- ◆ Wall-mounting
- ◆ Din rail
- ◆ Flange mounting



Wall-mounting / Din-rail installation







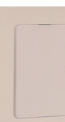
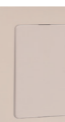




Cabinet / Wall-mounting installation










Flange mounting installation

Accessories Selection

Category	Type	Range	Commercial Reference	Short Description	Applicable Product		Pictures
					Applicable Commercial Reference	Specifications	
ADD-ON	Encoder card	Expert XS	HAVXSEC	Encoder for XS series	All XS series	All XS series	
	EMC filter card	Expert XS	HAV-XS-4T0370G-FL	Simple EMC filter	HAV-XS-4T0300G-0370P ~ HAV-XS-4T0370G-0450P	4T*: 30 - 37kW	
			HAV-XS-4T0550G-FL		HAV-XS-4T0450G-0550P ~ HAV-XS-4T0550G-0750P	4T*: 45 - 55kW	
			HAV-XS-4T1850G-FL		HAV-XS-4T0750G-0900P ~ HAV-XS-4T1850G-2000P	4T*: 75 - 185kW	
	IO extension card	Expert XS	HAV-XS-IO-3DI-R	IO extension card with 3 Di and 1 relay	All XS series	All XS series	
	Communication card	Expert XS	HAV-XS-PN	Extension communication card	All XS series	All XS series	
			HAV-SP-BN	Extension communication card	All XS series	All XS series	
		Expert XS	HAV-XS-DP	Communication bus translator	All XS series	All XS series	
			HAV-XS-FCB	Dust prevention cover	HAV-XS-2S0007 ~ HAV-XS-2S0022G HAV-XS-2T0007G ~ HAV-XS-2T0220G-0300P HAV-XS-4T0007G ~ HAV-XS-4T0220G-0300P	2S*: 0.75 - 2.2kW 2T*: 0.75 - 22kW 4T*: 0.75 - 22kW	
	Dust Preventive Accessories	Dust cover	EXPERT XS	Dust prevention cover	HAV-XS-2S0007 ~ HAV-XS-2S0022G HAV-XS-2T0007G ~ HAV-XS-2T0220G-0300P HAV-XS-4T0007G ~ HAV-XS-4T0220G-0300P	2S*: 0.75 - 2.2kW 2T*: 0.75 - 22kW 4T*: 0.75 - 22kW	
BASIC BA			HAV-BA-4T0040		HAV-BA-2T0022G HAV-BA-2S0022G HAV-BA-4T0040G HAV-BA-4T0055G	2T*:2.2kW 2S*: 2.2kW 4T*: 4kW, 5.5kW	
Dust Guaze		Expert XS	HAV-XS-4T0075-FSB	Dust guaze for Expert Series	HAV-XS-4T0055G-0075P HAV-XS-4T0075G-0110P	4T*: 5.5kW , 7.5kW	
	HAV-XS-4T0150-FSB		HAV-XS-4T0110G-0150P HAV-XS-4T0150G-0180P		4T*: 11kW, 15kW		
	HAV-XS-4T0220-FSB		HAV-XS-4T0185G-0220P HAV-XS-4T0220G-0300P		4T*: 18.5kW, 22kW		
Dust Sticker	BASIC BA	HAV-BA-4T0022 HAV-BA-4T0075 HAV-BA-4T0150	Dust sticker for BASIC Series	HAV-BA-2S0004G ~ HAV-BA02S0015G HAV-BA-4T0004G ~ HAV-BA-4T0022G HAV-BA-4T0075G HAV-BA-4T0110G, HAV-BA-4T0150G	2S*:0.4 - 1.5kW 4T*:0.4 - 2.2kW 4T*:7.5kW 4T*:11-15kW		

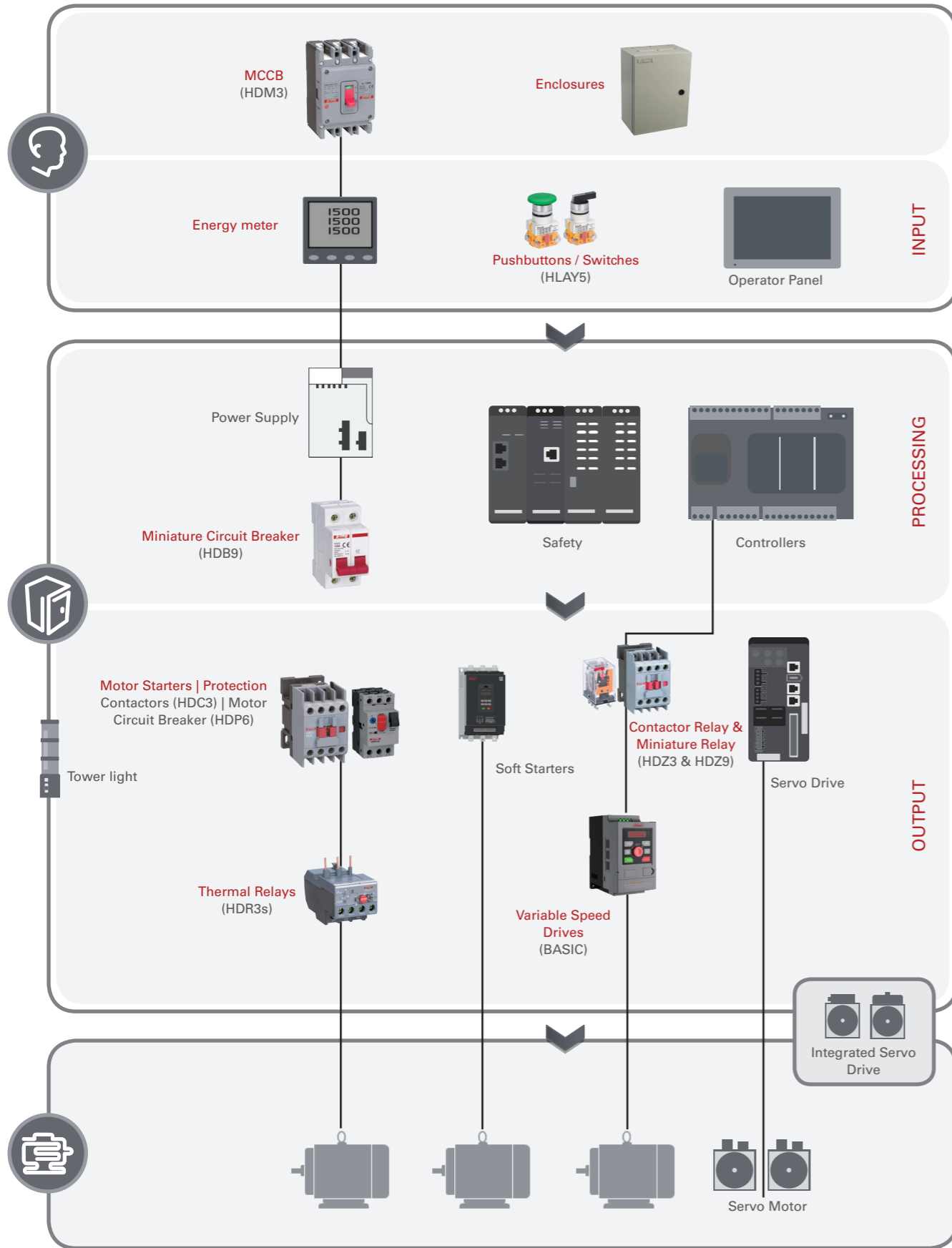
Accessories Selection

Category	Type	Range	Commercial Reference	Short Description	Applicable Product		Pictures	
					Applicable Commercial Reference	Specifications		
Installation Accessories	Flange-mounting	Expert XS	HAV-XS-4T0040-QRZJ	Embedded installation accessories	HAV-XS-4T0007G ~ HAV-XS-4T0040G-0055P HAV-XS-2T0007G ~ HAV-XS-2T1600G	4T*: 0.75 - 4kW 2S*: 0.75 - 2.2kW		
			HAV-XS-4T0075-QRZJ		HAV-XS-4T0055G-0075P ~ HAV-XS-4T0075G-0110P	4T*: 5.5 - 7.5kW		
			HAV-XS-4T0150-QRZJ		HAV-XS-4T0110G-0150P ~ HAV-XS-4T0150G-0185P	4T*: 11 - 15kW		
			HAV-XS-4T0220-QRZJ		HAV-XS-4T0185G-0220P ~ HAV-XS-4T0220G-0300P	4T*: 18.5 - 22kW		
			HAV-XS-4T0370-QRZJ		HAV-XS-4T0300G-0370P ~ HAV-XS-4T0370G-0450P	4T*: 30 - 37kW		
			HAV-XS-4T0750-QRZJ		HAV-XS-4T0450G-0550P ~ HAV-XS-4T0750G-0900P	4T*: 45 - 75kW		
			HAV-XS-4T1320-QRZJ		HAV-XS-4T0900G-1100P ~ HAV-XS-4T1320G-1600P	4T*: 90 - 132kW		
	Wall-mounting	Expert XS	HAV-XS-4T2200-BGZJ	Accessory for wall mounting installation	HAV-XS-4T2000G-2200P ~ HAV-XS-4T2200G-2500P	4T*: 200 - 220kW		
			HAV-XS-4T2800-BGZJ		HAV-XS-4T2500G-2800P ~ HAV-XS-4T4500G-5000P	4T*: 250-450kW		
			HAV-XS-4T0370-DZ		HAV-XS-4T0300G-0370P ~ HAV-XS-4T0370G-0450P	4T*: 30 - 37kW		
Floor-standing	Expert XS	HAV-XS-4T0750-DZ	Accessory for floor-standing installation	HAV-XS-4T0450G-0550P ~ HAV-XS-4T0750G-0900P	4T*: 45 - 75kW			
		HAV-XS-4T1100-DZ		HAV-XS-4T0900G-1100P ~ HAV-XS-4T1320G-1600P	4T*: 90 - 132kW			
		HAV-XS-4T1600-DZ		HAV-XS-4T1600G-1850P ~ HAV-XS-4T1850G-2000P	4T*: 160 ~ 185kW			
		HAV-XS-4T1600-DZ		HAV-XS-4T1600G-1850P ~ HAV-XS-4T1850G-2000P	4T*: 160 ~ 185kW			
Keypad & Accessories	Keypad bracket	Expert XS	HAV-XS-JPT	Keypad holder for external keypad	HAV-XS-2S0007G ~ HAV-XS-2S0022G HAV-XS-2T0007G ~ HAV-XS-2T1600G HAV-XS-4T0007G ~ HAV-XS-4T8500G	2S*: 0.75 - 2.2kW 2T*: 4 - 7.5kW 4T*: 0.75kW - 850kW		
	External Keypad	Expert XS	BASIC BA	HAV-SP-LKD	External Keypad for BASIC	HAV-BA-2S0004G ~ HAV-BA-2S0022G HAV-BA-4T0004G ~ HAV-BA-4T0150G	2S*:0.4 - 2.2kW 4T*:0.4 - 15kW	
			HAV-XS-LKD	External Keypad for EXPERT XS	HAV-XS-2S0007G ~ HAV-XS-2S0022G HAV-XS-2T0007G ~ HAV-XS-2T1600G HAV-XS-4T0007G ~ HAV-XS-4T8500G	2S*: 0.75 - 2.2 kW 2T*: 4 - 7.5kW 4T*: 0.75 ~ 850kW		
Keypad cable	BASIC Expert XS	HAV-XS-CAB2	Length 2m	HAV-BA-2S0004G ~ HAV-BA-2S0022G HAV-BA-4T0004G ~ HAV-BA-4T0150G HAV-XS-2S0007G ~ HAV-XS-2S0022G HAV-XS-2T0007G ~ HAV-XS-2T1600G HAV-XS-4T0007G ~ HAV-XS-4T8500G	2S*: 0.4 - 2.2 kW 2T*: 0.75 - 160kW 4T*:0.4 - 850kW			
HAV-XS-CAB5	Length 5m							

* 2S = 200-240V Single Phase, 2T = 200-240V Three Phase, 4T = 380-440V Three Phase

* Please note: Before August 2023, BASIC series use HAVBALKD. After August 2023, BASIC series use HAVSPLKD

System Architecture



Options for System Integration

Push Buttons (HLAY5)

- ◆ Degree of protection: IP44 (IP65 with protection cover)
- ◆ Type: Flush button / Mushroom / Selector switches / Key switches / Emergency stop / Illuminated / Double / Pilot light
- ◆ Drilling / Cut-out for mounting: Ø22mm
- ◆ Standard: IEC 60947-5-1



Push Button



Selector Switches



Push Button Switches



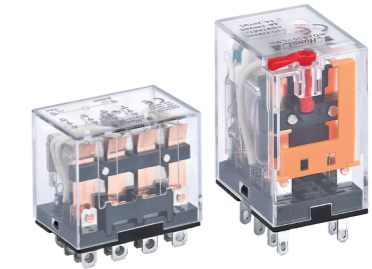
Indicator Light

Indication Light (HLD11)

- ◆ Degree of protection: IP65
- ◆ Type: Full cover head/ Half cover head/ Long terminal/ Short terminal
- ◆ Color: White/ Green/ Red/Yellow/ Blue
- ◆ Drilling or cut-out for mounting: Ø22mm
- ◆ Standard: IEC 60947-5-1

Relay (HDZ9)

- ◆ Rated Current: 3A, 5A, 10A
- ◆ Poles: 2-pole, 3-pole, 4-pole
- ◆ Maximum Rated Operating Voltage: 690V
- ◆ Rated Operating Frequency: 50/60Hz
- ◆ Coil Specification: DC: 6V~220V; AC: 6V~380V
- ◆ Additional Feature: Rotary push button
- ◆ Certificate: CB, CE



Contactor Relay (HDZ3)

- ◆ Pole: 3-pole
- ◆ Coil Voltage: 24-440V
- ◆ Coil Frequency: 50Hz, 50/60Hz
- ◆ Certificate: CE



Miniature Circuit Breaker (HDB9)

- ◆ Elegant and clear indication window
- ◆ New clip design makes it easy to install
- ◆ Square terminal and connection holes makes it more secure to connect wiring
- ◆ Specifications
- ◆ Rated Current: 1 – 63A
- ◆ Breaking Capacity: 6kA, 10kA
- ◆ Frame: 63A
- ◆ Poles: 1P, 2P, 3P, 4P



Molded Case Circuit Breaker (HDM3)

- ◆ Easy Installation
- ◆ The double-deck cover design of the HDM3 series assures easy installation and removal of accessories.
- ◆ High Performance
- ◆ The patent design in HDM3 ensures quick extinguishing of arc.
- ◆ Secured Operation
- ◆ HDM3 is trustworthy and safe for use due to the double-deck cover design.
- ◆ Specifications
- ◆ Frame: 63, 100, 160, 250, 400, 630, 800, 1250A
- ◆ Rated Voltage: 400/415V, 50/60 Hz
- ◆ Breaking Capacity: 18kA - 85kA
- ◆ Rated Current: 10A - 1250A
- ◆ Poles: 3P, 4P
- ◆ Tripping type: Thermal Magnetic, Magnetic

- ◆ Protection type: Power distribution, Motor protection
- ◆ Connection: fixed-front connection, fixed-rear connection, plug-in connection, draw-out rear connection
- ◆ Standard: IEC 60947-2
- ◆ Certificates: CE, KEMA (TUV), CB
- ◆ Operating Temp: 40°C & 50°C



Circuit Breaker Selection

Range	Input Voltage	Commercial Reference	Motor Power(kW)	Circuit Breaker	Braking Unit		Braking Resistor		DC Choke
					Max. Braking Power	Max. DC Bus Voltage	Min. Resistance value to associate (Ω)	Power (W)	
BASIC	200-240V Single Phase	HAV-BA-2S0004G	0.4	HDB9H63A2C4	Built-in braking unit		200	75	-
		HAV-BA-2S0007G	0.75	HDB9H63A2C6	Built-in braking unit		150	100	-
		HAV-BA-2S0015G	1.5	HDB9H63A2C10	Built-in braking unit		100	200	-
		HAV-BA-2S0022G	2.2	HDB9H63A2C10	Built-in braking unit		75	300	-
	200-240V Three Phase	HAV-BA-2T-0007G	0.75	HDB9H63A3D6	Built-in braking unit		200	75	-
		HAV-BA-2T-0015G	1.5	HDB9H63A3D10	Built-in braking unit		150	100	-
		HAV-BA-2T-0022G	2.2	HDB9H63A3D10	Built-in braking unit		75	300	-
	380-440V Three Phase	HAV-BA-4T0004G	0.4	HDB9H63A3D2	Built-in braking unit		750	75	-
		HAV-BA-4T0007G	0.75	HDB9H63A3D4	Built-in braking unit		500	100	-
		HAV-BA-4T0015G	1.5	HDB9H63A3D6	Built-in braking unit		300	200	-
		HAV-BA-4T0022G	2.2	HDB9H63A3D6	Built-in braking unit		200	200	-
		HAV-BA-4T0030G	3	HDB9H63A3D10	Built-in braking unit		200	300	-
		HAV-BA-4T0040G	4	HDB9H63A3D10	Built-in braking unit		200	300	-
		HAV-BA-4T0055G	5.5	HDB9H63A3D16	Built-in braking unit		80	750	-
		HAV-BA-4T0075G	7.5	HDB9H63A3D20	Built-in braking unit		50	1100	-
		HAV-BA-4T0110G	11	HDB9H63A3D25	Built-in braking unit		50	1500	-
		HAV-BA-4T0150G	15	HDB9H63A3D32	Built-in braking unit		45	1800	-
		EXPERT XS	200-240V Single Phase	HAV-XS-2S0007G	0.75	HDB9H63A2C10	Built-in braking unit		150
HAV-XS-2S0015G	1.5			HDB9H63A2C20	Built-in braking unit		100	200	-
HAV-XS-2S0022G	2.2			HDB9H63A2C20	Built-in braking unit		75	300	-
200-240V Three Phase	HAV-XS-2T0007G		0.75	HDB9H63A3D6	Built-in braking unit		150	100	-
	HAV-XS-2T0015G		1.5	HDB9H63A3D10	Built-in braking unit		100	200	-
	HAV-XS-2T0022G		2.2	HDB9H63A3D16	Built-in braking unit		75	300	-
	HAV-XS-2T0040G		4	HDB9H63A3D20	Built-in braking unit		50	400	-
	HAV-XS-2T0055G		5.5	HDB9H63A3D32	Built-in braking unit		45	750	-
	HAV-XS-2T0075G		7.5	HDB9H63A3D32	Built-in braking unit		30	1100	-
	HAV-XS-2T0110G		11	HDB9H63A3D40	Built-in braking unit		30	1100	-
	HAV-XS-2T0150G		15	HDB9H63A3D63	Built-in braking unit		18	1800	-
	HAV-XS-2T0185G		18.5	HDB9H63A3D63	18.5kW	400V	5	1300	-
	HAV-XS-2T0220G		22	HDB3w125H3D80	22kW	400V	5	1300	-
	HAV-XS-2T0300G		30	HDB3w125H3D125	30kW	400V	4	1000	-
	HAV-XS-2T0370G		37	HDB3w125H3D125	37kW	400V	2.5	1000	-
	HAV-XS-2T0450G		45	HDM3160S16032XX2	45kW	400V	2.5	1000	-
	HAV-XS-2T0550G		55	HDM3250S20032XX2	55kW	400V	1.8	15300	-
	HAV-XS-2T0750G		75	HDM3400F31532XX2	75kW	400V	1.8	15300	-
	HAV-XS-2T0900G		90	HDM3400F31532XX2	90kW	400V	1.4	20900	-
	HAV-XS-2T1100G		110	HDM3400S40032XX2	110kW	400V	10.8	8500*6	-
	HAV-XS-2T1320G		132	HDM3630F50032XX2	132kW	400V	10.8	8500*6	-
	HAV-XS-2T1600G		160	HDM3630F63032XX2	160kW	400V	10.8	8500*8	-

Circuit Breaker Selection

Range	Input Voltage	Commercial Reference	Motor Power (kW)	Circuit Breaker	Braking Unit		Braking Resistor		DC Choke
					Max. Braking Power	Max. DC Bus Voltage	Min. Resistance value to associate (Ω)	Power (W)	
EXPERT XS	380-440V Three Phase	HAV-XS-4T0007G	0.75	HDB9H63A3D4	Built-in braking unit		500	100	-
		HAV-XS-4T0015G	1.5	HDB9H63A3D6	Built-in braking unit		300	200	-
		HAV-XS-4T0022G	2.2	HDB9H63A3D6	Built-in braking unit		200	200	-
		HAV-XS-4T0040G-0055P	4	HDB9H63A3D10	Built-in braking unit		200	300	-
		HAV-XS-4T0055G-0075P	5.5	HDB9H63A3D16	Built-in braking unit		80	750	-
		HAV-XS-4T0075G-0110P	7.5	HDB9H63A3D20	Built-in braking unit		50	1100	-
		HAV-XS-4T0110G-0150P	11	HDB9H63A3D25	Built-in braking unit		50	1500	-
		HAV-XS-4T0150G-0185P	15	HDB9H63A3D32	Built-in braking unit		45	1800	-
		HAV-XS-4T0185G-0220P	18.5	HDB9H63A3D40	Built-in braking unit		45	2200	-
		HAV-XS-4T0220G-0300P	22	HDB9H63A3D50	Built-in braking unit		24	3000	-
		HAV-XS-4T0300G-0370P	30	HDB9H63A3D63	30kW	800V			HAV-DCL0300-G3
		HAV-XS-4T0370G-0450P	37	HDB3w125H3D80	37kW	800V			HAV-DCL0370-G3
		HAV-XS-4T0450G-0550P	45	HDB3w125H3D100	45KW	800V			HAV-DCL0450-G3
		HAV-XS-4T0550G-0750P	55	HDB3w125H3D125	55KW	800V			HAV-DCL0550-G3
		HAV-XS-4T0750G-0900P	75	HDM3160S16032XX2	75kW	800V			HAV-DCL0750-G3
		HAV-XS-4T0900G-1100P	90	HDM3250S20032XX2	90kW	800V			HAV-DCL0900-G3
		HAV-XS-4T1100G-1320P	110	HDM3250S25032XX2	110kW	800V			HAV-DCL1100-G3
		HAV-XS-4T1320G-1600P	132	HDM3400F31532XX2	132kW	800V			HAV-DCL1320-G3
		HAV-XS-4T1600G-1850P	160	HDM3400F31532XX2	160kW	800V			HAV-DCL1600-G3
		HAV-XS-4T1850G-2000P	185	HDM3400F35032XX2	185kW	800V			HAV-DCL1850-G3
		HAV-XS-4T2000G-2200P	200	HDM3400F40032XX2	200kW	800V			Built-in
		HAV-XS-4T2200G-2500P	220	HDM3630F50032XX2	220kW	800V			Built-in
		HAV-XS-4T2500G-2800P	250	HDM3630F50032XX2	250kW	800 V			Built-in
		HAV-XS-4T2800G-3150P	280	HDM3630F63032XX2	280kW	800 V			Built-in
		HAVXS-4T-3150G-3550P	315	HDM3630F63032XX2	315kW	800 V			Built-in
		HAVXS-4T-3550G-4000P	355	HDM3v800M80033XX	355kW	800 V			Built-in
		HAVXS-4T-4000G-4500P	400	HDM3v800M80033XX	400kW	800 V			Built-in
		HAVXS-4T-4500G-5000P	450	HDM31600N125033XX	450kW	800 V			Built-in
		HAV-XS-4T2000G-2200P-W	200	HDM3400F40032XX2	200kW	800 V			Built-in
		HAV-XS-4T2200G-2500P-W	220	HDM3630F50032XX2	220kW	800 V			Built-in
HAV-XS-4T2500G-2800P-W	250	HDM3630F50032XX2	250kW	800 V			Built-in		
HAV-XS-4T2800G-3150P-W	280	HDM3630F63032XX2	280kW	800 V			Built-in		
HAVXS-4T-3150G-3550P-W	315	HDM3630F63032XX2	315kW	800 V			Built-in		
HAVXS-4T-3550G-4000P-W	355	HDM3v800M80033XX	355kW	800 V			Built-in		
HAVXS-4T-4000G-4500P-W	400	HDM3v800M80033XX	400kW	800 V			Built-in		
HAVXS-4T-4500G-5000P-W	450	HDM31600N125033XX	450kW	800 V			Built-in		
HAVXS-4T-5000G-5600P	500	HDM31600N125033XX	500kW	800 V			Built-in		
HAVXS-4T-5600G-6300P	560	HDM31600N125033XX	560kW	800 V			Built-in		
HAVXS-4T-6300G-7100P	630	HDM31600N125033XX	630kW	800 V			Built-in		
HAVXS-4T-7100G-8500P	710	-	710kW	800 V			Built-in		
HAVXS-4T-8500G	850	-	850kW	800 V			Built-in		

SMART Pump (SP)

SMART Pump (SP) drives are full-featured dedicated drives for parabolic load applications like pumps, fans, and chillers. SP drives have a wide range of integrated features like multi-pump control, dry run protection, and energy calculation, pump cleaning, fire override mode, frost, condensation and hammer effect protections to meet the needs of pump, fans and chillers for modern buildings.

Motor Capacity (kW)																							
2.2	3	4	5.5	7.5	11	15	19	22	30	37	45	55	75	90	110	132	160	185	200	220	250	280	315
										HAV-SP-4T*													
					HAV-SP-2T**																		

*4T: 380V-480V 3phase

**2T: 230V 3 phase

Improved Energy Savings

With many integrated control modes like ECO-mode, V²/f, and PID with sleep mode.

High Robustness

- Stable operation in difficult environments
- Built-in category C3 EMC filter (≥ 11kW)

Special program functions

- Multi-pump control
- Energy meter
- Flow calculation
- Pump cleaning
- Fire Override mode
- Dual Ramp
- Master-Slave function
- Bypass function

Pump-specific protections

- Dry run detection
- Frost and condensation protection
- Hammer effect protection
- Undervoltage, overvoltage, overcurrent, overload protection
- Phase-loss protection
- Short-circuit protection

PC Tool-Himel studio



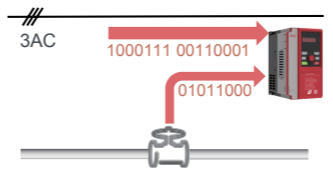

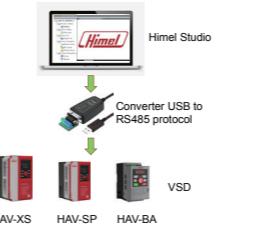
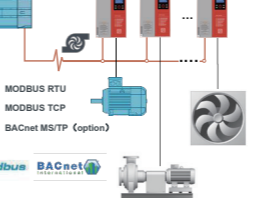
- Parameters setting and copy
- Monitoring drive status
- Monitoring IO terminal status and test
- Drive debugging and trial run
- Fault record and measurement
- Firmware upgrade

Support most communication protocols for the pump and fan

- One drive support most popular 3 protocols in the pump and fan applications
- Build in Modbus RTU/RS485 port
- Build in Modbus TCP/RJ45 port
- Provide BACnet IP extension card



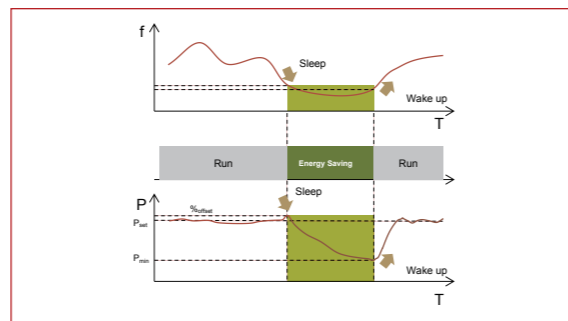
Reliable made affordable

Features	Your benefits
Improved energy savings	
 <ul style="list-style-type: none"> ◆ Integrated Eco-mode for V/f and V²/f automatically adapts the motor magnetic flux to save energy ◆ Improved special PID control with sleep mode helps to save more energy for pump application 	<ul style="list-style-type: none"> ◆ Energy savings during low dynamic load cycles such as pump and Fan ◆ Increase the potential savings by up to 70% ◆ Greatly reduces the return time of investment
High Robustness	
 <ul style="list-style-type: none"> ◆ Stable operation under main input voltage fluctuations. Reliable operation with net tensions between 380V and 440V (-15%/+10%) ◆ Equipped with built-in category C3 standard EMC filter (≥11kW) 	<ul style="list-style-type: none"> ◆ Wider voltage range, increases robustness of the drive in difficult environment ◆ Automatic adaptation in case of unstable power supply ◆ Better electromagnetic immunity against signal noises. ◆ Supports longer connection cables.
Special pump functions	
 <ul style="list-style-type: none"> ◆ Multi-pump control ◆ Built-in energy and flow meter ◆ Pump cleaning ◆ Fire Override mode ◆ Dual Ramp ◆ Master slave function ◆ Bypass function 	<ul style="list-style-type: none"> ◆ Control 4 pumps (with external I/O card) ◆ Measure energy and flow without an external sensor ◆ Clears the blockage in the pump ◆ Reduces the maintenance requirements ◆ Keeps the critical fans and pumps running in case of fire in a building ◆ Separate initial and final ramp ratio optimizes the motor start and stop ◆ Controls multiple inverters with an inverter ◆ The external contactor can be controlled by relay to achieve power conversion switching and reduce energy consumption
Pump-specific protections	
 <ul style="list-style-type: none"> ◆ Dry run detection ◆ Frost and condensation protection ◆ Hammer effect protection. ◆ Overvoltage, overcurrent, overload protection ◆ Phase-loss protection ◆ Short-circuit protection 	<ul style="list-style-type: none"> ◆ Protects the impeller and rear housing against dry run. ◆ Protects the pump against moisture and water freezing inside pump. ◆ Controls the water flow when pipe is empty hence eliminating the hammer effect at the starting phase. ◆ Long lifecycle running in high humidity and high dust occasions ◆ Easy to maintain
PC Tool- Himel Studio	
 <ul style="list-style-type: none"> ◆ Parameters setting and copy ◆ Monitoring drive status ◆ Monitoring IO terminal status and test ◆ Drive debugging and trial run ◆ Fault record and measurement ◆ Firmware upgrade 	<ul style="list-style-type: none"> ◆ Easy to commission
Support most communication protocols for the pump and fan	
 <ul style="list-style-type: none"> ◆ One drive support most popular 3 protocols in the pump and fan applications ◆ Build in Modbus RTU/RS485 port ◆ Build in Modbus TCP/RJ45 port ◆ Provide BACnet IP extension card 	<ul style="list-style-type: none"> ◆ Easy system configuration with PLC,HMI and upper controller. ◆ Full flexibility to configure the baud rate, parity / stop bit and address by parameterization. ◆ Suitable for HVAC application



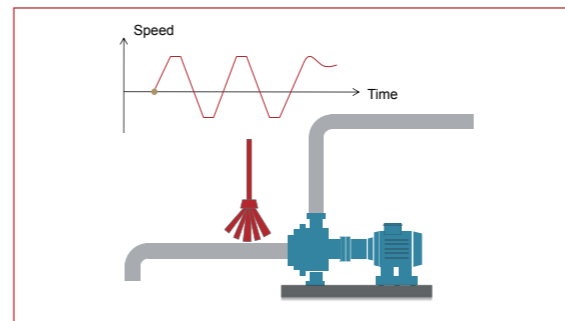
SPECIAL FEATURES AND BENEFITS

PID with Sleep mode



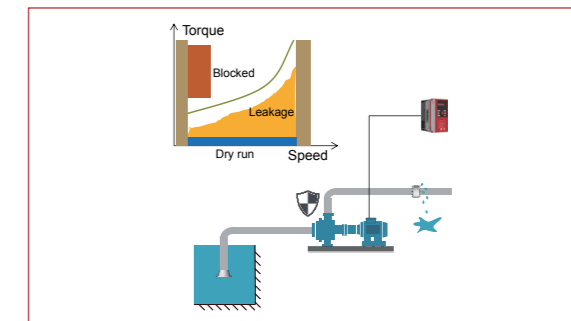
- ◆ Frequent start/stop of the pump wastes energy and causes wear and tear in the pump.
- ◆ PID with sleep mode switches the pump to sleep mode if the pressure increases by a fixed value above the set point.
- ◆ It will wake up the pump if the pressure inside the pipe falls below the lowest required pressure set by the user.
- ◆ PID with sleep mode helps save more energy and enhances pump life

Pump-cleaning function



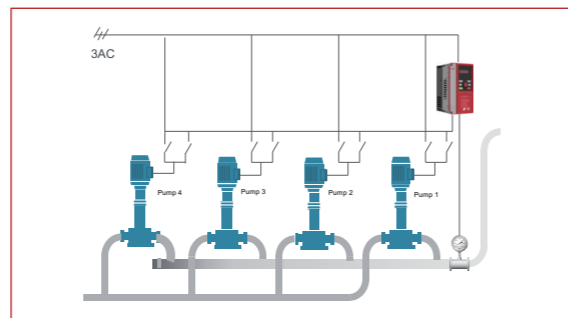
- ◆ In the sewage water processing, the blockage in the pump will reduce the efficiency of the system and make the starting phase very difficult.
- ◆ With pump-cleaning function, the blockage can be swept automatically before the normal operation.
- ◆ It reduces the maintenance requirements

Special Pump Protections



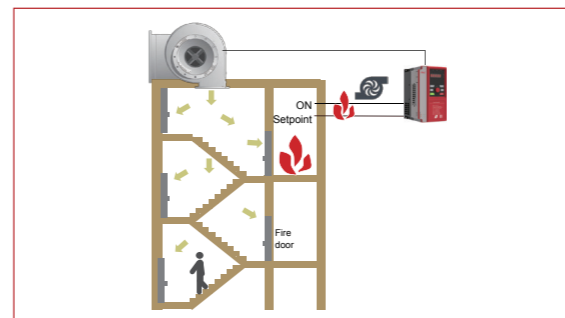
- ◆ The drive can track the load and protect against
 - Dry pump run.
 - Leakage or pipe breakage
 - Blockage in the pipe.
- ◆ Protect the pump against abnormal loads.
- ◆ Protect impeller and rear housing against dry run.
- ◆ Extends pumps life.

Multi-pump Control function



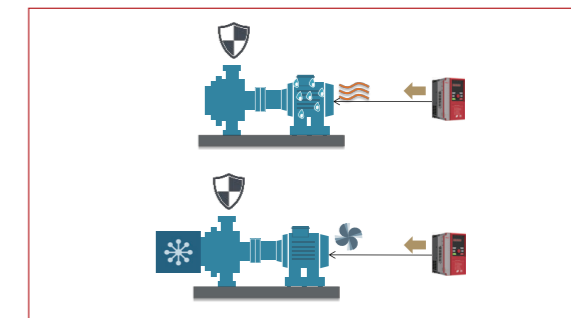
- ◆ Control up to 4 pumps with I/O card for start, stop and switchover by integrated PID controller.
- ◆ Fixed Type: Motor connected to the drive's output is fixed. VSD increases/decreases the number of motors run by the power grid depending on PID feedback. In fixed mode, can control 8 pumps.
- ◆ Floating Type: Motor connected to the drive is not fixed. Drive switches to the next motor and hands over the previous pump to the power grid.
- ◆ Smooth start and stop of each pump to ensure best performance
- ◆ Reduces the total cost of ownership

Fire Override mode



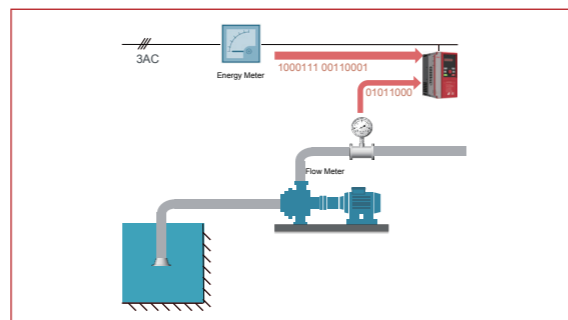
- ◆ The control system or wiring may be damaged in the fire disaster situation, which may disconnect the setpoint or run command of the critical fans in the stair well, tunnel, subway such important space.
- ◆ Fire override mode will keep the fans working without controller in critical situations and help maintain the air-supply and keep fireproof door closed.
- ◆ It keeps fans working to give the pressure in the stair well to force the fireproof door close to reduce the spread of fire and smoke

Frost and Condensation Protection



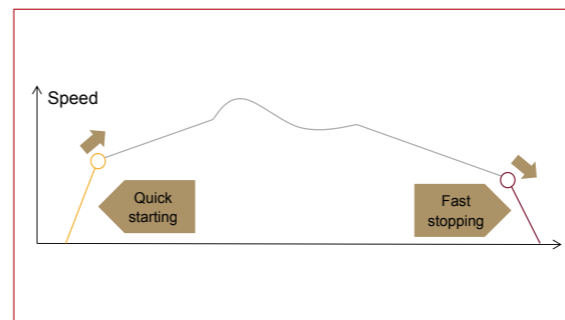
- ◆ Water frozen inside pump damages the pump. Frost protection keeps the motor slowly moving to avoid water freezing inside pump.
- ◆ In humid and cold environments, condensation can cause motor failure. Condensation protection keeps motor warm to get rid of moisture.

Energy and flow calculator



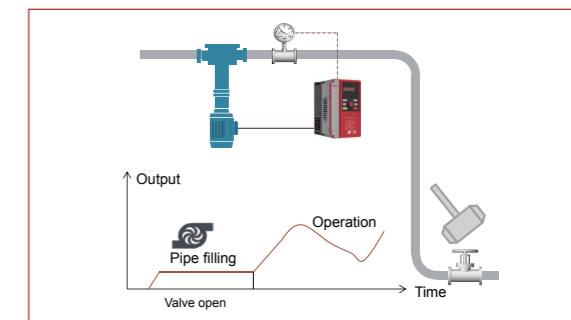
- ◆ Data will be more and more important for the energy audit to continuously improve the system performance.
- ◆ The water volume or flow data will indicate the real-time status. With the Energy and Flow meter, SMART Pump will estimate the energy consumption to explain the status of running pump or fan system to optimize the system

Dual Ramp



- ◆ Separate initial and final ramp ratio optimizes the motor start and stop. During start phase, pumps (esp. submersible pumps) are more prone to wear and tear if the ramp up is slow. A quick ramp up at start phase protects the pump from wear and tear.
- ◆ Slow ramp up after the initial phase improves the control accuracy.

Hammer Effect protection



- ◆ In pumping applications, during start phase high speed inrush water can hit the pump very hard which is known as "hammer effect".
- ◆ Smart Pump drive can fill the pipe smoothly at the start phase to avoid pump damage.

Target Applications



■ Irrigation



■ Sewage



■ Fountain



■ Sand pump



■ Circulating pump



■ Rod pump



■ Drying



■ Ventilation



■ Dust removal



■ Hot surface treatment



■ Air supply fan for boiler



■ Industrial fan



■ Centrifugal chillers




■ Reciprocating chillers



■ Scroll chillers



Specifications

Range Name		SMART Pump	
Design			
Capacity range	Three phase 230V Class	AC: 200V(-10%)-240V(+10%) 2.2~45kW	
	Three phase 400V Class	AC:380V(-15%)~480V(+10%) 2.2~315kW	
Frequency	Input frequency	50/60Hz	
	Output frequency	0-599Hz	
Overload capacity		120% for 1min	
Control method	V/f	√	
	Eco mode control	√	
Start torque		0.5Hz, 120%	
Built-in PID		√	
Keypad		Pluggable	
Display		LED/LCD	
Multispeed control		16 stages in one cycle	
I/O	DI1-DI4	NPN/PNP, Input: 9-30VDC	
	DI5	NPN/PNP, Input: 15-30VDC	
	DO1	Pulse input: max. 50kHz 9-30VDC, max. 50mA	
	DO2	9-30VDC, max.50mA Pulse output max.50kHz	
	AI1	V: 0-10V I:0-20mA	
	AI2	Resolution:1/1000	
	AO1	V: 0-10V I:0-20mA	
	AO2	Resolution:1/1000	
	RO(TA, TB, TC/RA, RB, RC)		NO: 24VDC 3A/ 250VAC 5A NC: 24VDC 3A/ 250VAC 3A
	Built-in communication (Max. speed)		RS485, Modbus TCP/RTU (38.4kbps)
Options	Extension I/O	DI/DO/RO	
	Extension Keypad	Support, cable length:2m, 5m	
	Extension Communication Card	BACnet (<18.5kW installed independent; ≥18.5kW installed in VSD)	
Functionality		Multi-pump control	
		Dry run protection	
		Energy/ flow calculator	
		Frost and condensation protection	
		Pump cleaning	
		Fire override mode	
		Eco-mode/PID with sleep mode/Special pump protections	
		Master slave function	
Installation Way		Bypass function	
		Wall mounted, cabinet, flange installation	
Dust Shields		√	
EMC Filter	C2	—	
	C3	Built-in EMC filter (≥11kW)	
Braking unit		Built-in (4T ≤37kW; 2T ≤18.5kW)	
Environment	Operation temperature	-10-40 °C no capacity reduction, 40 °C -50 °C capacity reduction	
	Humidity	≤95%RH	
	Altitude	≤1000m, no capacity reduction	
	IP level	IP20	
Global certificates		CE	



Specifications

Range Name		SMART Pump	
Design			
Features	Velocity ratio	1:100	
	Frequency precision	Digital setting: Max frequency X ±0.01%	
		Analog setting: Max frequency X ±0.2%	
	Frequency resolution	Digital setting: Max frequency X ±0.01%	
		Analog setting: Max frequency X ±0.1%	
	Torque rise	Integrated auto-torque raising function; with manual- setting: 0.1%~30.0%	
	V/F control curve definition	Linear, Square, $V^{1.7}/F$, $V^{1.2}/F$	
	Acceleration/Deceleration Time	4 types of ACC/DEC time selection; optional time unit selection(Min/s); setting range: 0~60hours;	
	DC braking	Start frequency: 0.20~60.00Hz; braking time: 0.0~10.0S;	
		braking current: 0.0~150%	
	Automatic voltage regulation(AVR)	√	
	Auto current limitation	√	
	Auto PMW adjustment	√	
	Protections	Special pump protection	Voltage limit, dry run, pump load monitor, frost and condensation protections
VSD protection function		Over-current, over-voltage, under-voltage, over-heat, over-load, short circuit.	
Cooling		Air-cooling	
Warranty	24 months		

Reference Selection

Range Name	Series Name	Input	Adaptation	Drive
HAV	SP	4T	0110	P
HA: Himel Automation	S:SMART	2: 230V 4: 380~440V	0022: 2.2kW 0075: 7.5kW 0110: 11kW 0185: 18.5kW 1100: 110kW	P: Normal-duty
V: VSD M: Motion H: HMI P: PLC	P: Pump	T: Three-phase		

References

Input Voltage	Commercial Reference	Selection			Overload Output Current		DC Choke	
		Motor Power (kW)	Motor Power (HP)	Continuous Output Current (A)	A	%		
AC: 200 - 240V Three Phase	HAVSP2T0022P	2.2	3	10.08	12.1	120%	-	
	HAVSP2T0030P	3	4	11.5	13.8	120%	-	
	HAVSP2T0040P	4	5	16.2	19.4	120%	-	
	HAVSP2T0055P	5.5	7.5	20.3	24.4	120%	-	
	HAVSP2T0075P	7.5	10	26.7	32	120%	-	
	HAVSP2T0110P	11	15	39	46.8	120%	-	
	HAVSP2T0150P	15	20	52.5	63	120%	-	
	HAVSP2T0185P	18.5	25	62.4	74.9	120%	-	
	HAVSP2T0220P	22	30	73.6	88.3	120%	-	
	HAVSP2T0300P	30	40	98.7	118.4	120%	-	
	HAVSP2T0370P	37	50	121	145.2	120%	-	
	HAVSP2T0450P	45	60	147	176.4	120%	HAV-DCL0450-G3	
	AC: 380 - 440V Three Phase	HAVSP4T0022P	2.2	3	5	6	120%	-
		HAVSP4T0030P	3	4	7.5	9	120%	-
HAVSP4T0040P		4	5	8.8	10.6	120%	-	
HAVSP4T0055P		5.5	7.5	13	15.6	120%	-	
HAVSP4T0075P		7.5	10	17	20.4	120%	-	
HAVSP4T0110P		11	15	25	30	120%	-	
HAVSP4T0150P		15	20	32	38.4	120%	-	
HAVSP4T0185P		18.5	25	37	44.4	120%	-	
HAVSP4T0220P		22	30	45	54	120%	-	
HAVSP4T0300P		30	40	60	72	120%	-	
HAVSP4T0370P		37	50	75	90	120%	-	
HAVSP4T0450P		45	60	90	108	120%	HAV-DCL0450-G3	
HAVSP4T0550P		55	75	110	132	120%	HAV-DCL0550-G3	
HAVSP4T0750P		75	100	157	188.4	120%	HAV-DCL0750-G3	
HAVSP4T0900P		90	125	180	216	120%	HAV-DCL0900-G3	
HAVSP4T1100P		110	150	214	256.8	120%	HAV-DCL1100-G3	
HAVSP4T1320P		132	175	256	307.2	120%	HAV-DCL1320-G3	
HAVSP4T1600P		160	200	307	368.4	120%	HAV-DCL1600-G3	
HAVSP4T1850P		185	230	350	420	120%	HAV-DCL-1850-G3	
HAVSP4T2000P		200	250	380	456	120%	HAV-DCL-2000-G3	
HAVSP4T2200P	220	280	456	547.2	120%	Build-in		
HAVSP4T2500P	250	317	497	596.4	120%	Build-in		
HAVSP4T2800P	280	355	556	667.2	120%	Build-in		
HAVSP4T3150P	315	450	626	751.2	120%	Build-in		

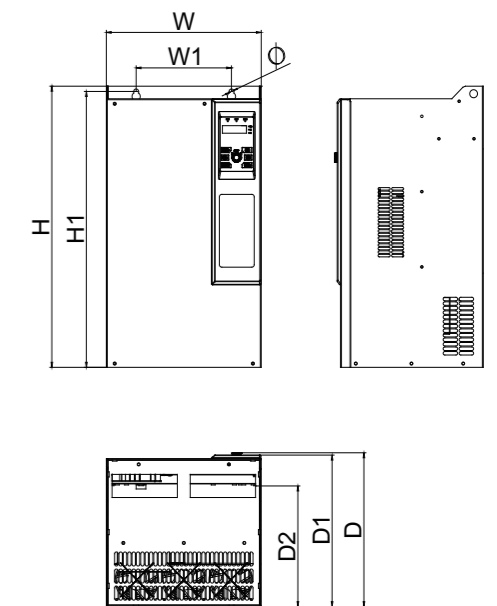
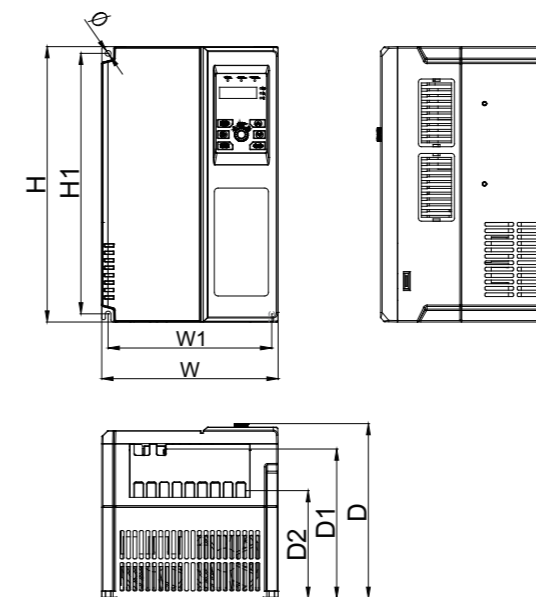
Dimensions

Input Voltage	Commercial Reference	Dimensions(mm)			Mounting Dimensions (mm)				Mounting Hole Diameter (mm)	CAD Diagram		
		W	H	D	W1	H1	D1	D2				
AC: 200-240V Three Phase	HAVSP2T0022P	120	215	163	109	204	133	85	5.5	(a)		
	HAVSP2T0030P	120	215	163	109	204	133	85	5.5			
	HAVSP2T0040P	120	215	163	109	204	133	85	5.5			
	HAVSP2T0055P	150	259	181	138	248	150	104	5.5			
	HAVSP2T0075P	150	259	181	138	248	150	104	5.5			
	HAVSP2T0110P	205	322	215	188	305	176	130	6.5			
	HAVSP2T0150P	235	370	235	218	350	200	146	7			
	HAVSP2T0185P	235	370	235	218	350	200	146	7			
	HAVSP2T0220P	305	490	275	200	470	264	211	10			
	HAVSP2T0300P	305	490	275	200	470	264	211	10			
	HAVSP2T0370P	320	560	307	197	543	295	241	10			
	HAVSP2T0450P	320	560	307	197	543	295	241	10			
	AC: 380-440V Three Phase	HAVSP4T0022P	120	215	163	109	204	133	85		5.5	(a)
		HAVSP4T0030P	120	215	163	109	204	133	85		5.5	
HAVSP4T0040P		120	215	163	109	204	133	85	5.5			
HAVSP4T0055P		120	215	163	109	204	133	85	5.5			
HAVSP4T0075P		120	215	163	109	204	133	85	5.5			
HAVSP4T0110P		150	259	181	138	248	150	104	5.5			
HAVSP4T0150P		150	259	181	138	248	150	104	5.5			
HAVSP4T0185P		205	322	215	188	305	176	130	6.5			
HAVSP4T0220P		205	322	215	188	305	176	130	6.5			
HAVSP4T0300P		235	370	235	218	350	200	146	7			
HAVSP4T0370P		235	370	235	218	350	200	146	7			
HAVSP4T0450P		305	490	275	200	470	270	211	10			
HAVSP4T0550P		305	490	275	200	470	270	211	10			
HAVSP4T0750P		320	560	307	197	543	295	241	10			
HAVSP4T0900P		320	560	307	197	543	295	241	10			
HAVSP4T1100P		320	560	307	197	543	295	241	10			
HAVSP4T1320P		355	678	319	240	659	307	261	11			
HAVSP4T1600P		355	678	319	240	659	314	261	11			

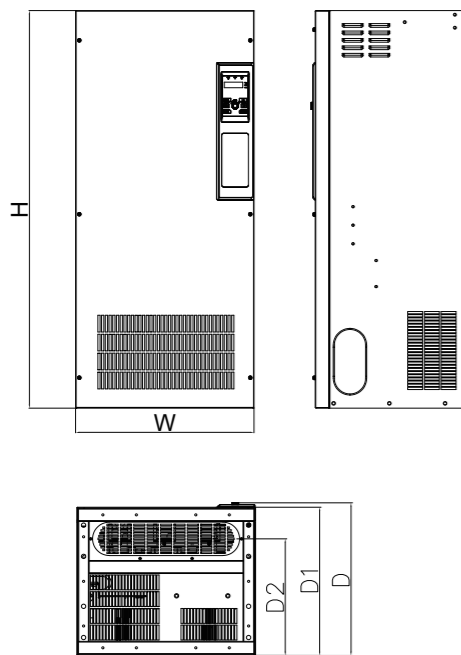
Dimensions

Input Voltage	Commercial Reference	Dimensions(mm)			Mounting Dimensions (mm)				Mounting Hole Diameter (mm)	CAD Diagram
		W	H	D	W1	H1	D1	D2		
AC: 380-440V Three Phase	HAV-SP-4T1850P	450	900	377	300	875	365	302	12	(b)
	HAV-SP-4T2000P	450	900	377	300	875	365	302	12	
	HAVSP4T2200P	480	1070	411	-	-	399	314	-	(c)
	HAVSP4T2500P	480	1070	411	-	-	399	314	-	
	HAVSP4T2800P	525	1300	437	-	-	425	335	-	
	HAVSP4T3150P	525	1300	437	-	-	425	335	-	
	HAVSP4T2200P (Wall-mounting)	480	1158	426	320	1127	414	329	12	(d)
	HAVSP4T2500P (Wall-mounting)	480	1158	426	320	1127	414	329	12	
	HAVSP4T2800P (Wall-mounting)	525	1387	452	400	1356	440	350	12	
	HAVSP4T3150P (Wall-mounting)	525	1387	452	400	1356	440	350	12	

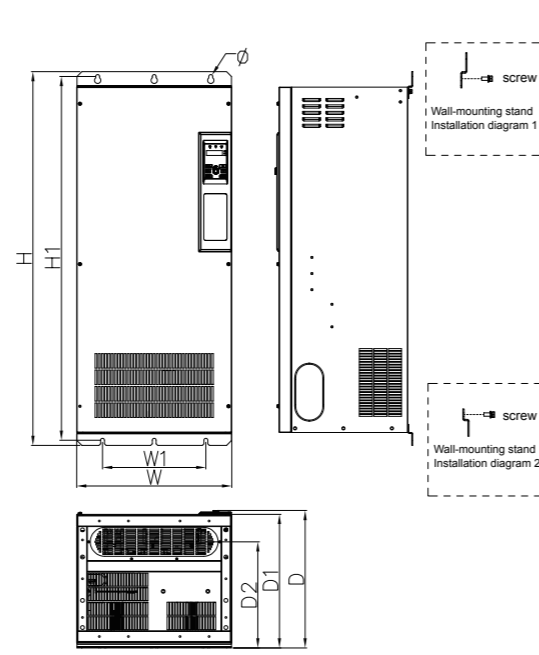
CAD Diagrams



(c)



(d)



Wiring Diagrams

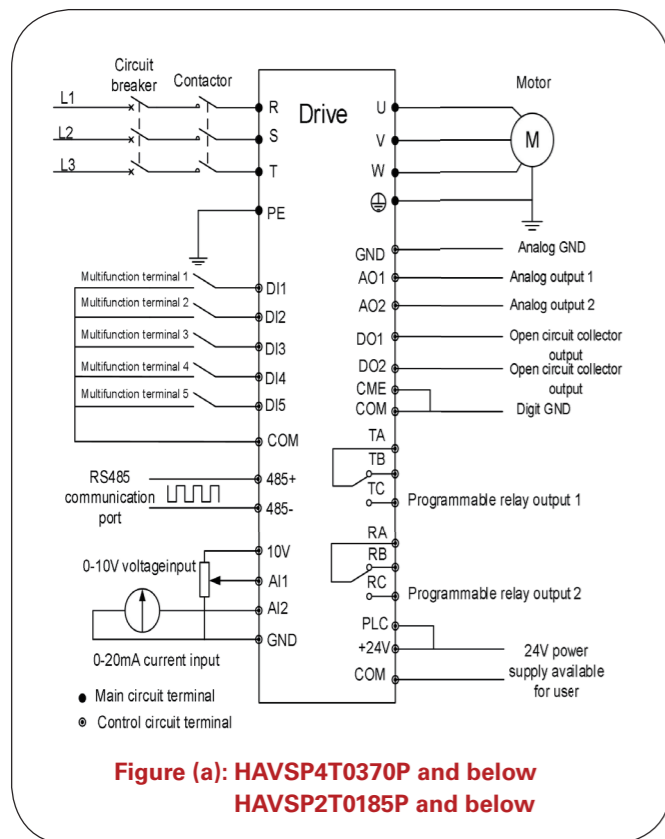


Figure (a): HAVSP4T0370P and below
HAVSP2T0185P and below

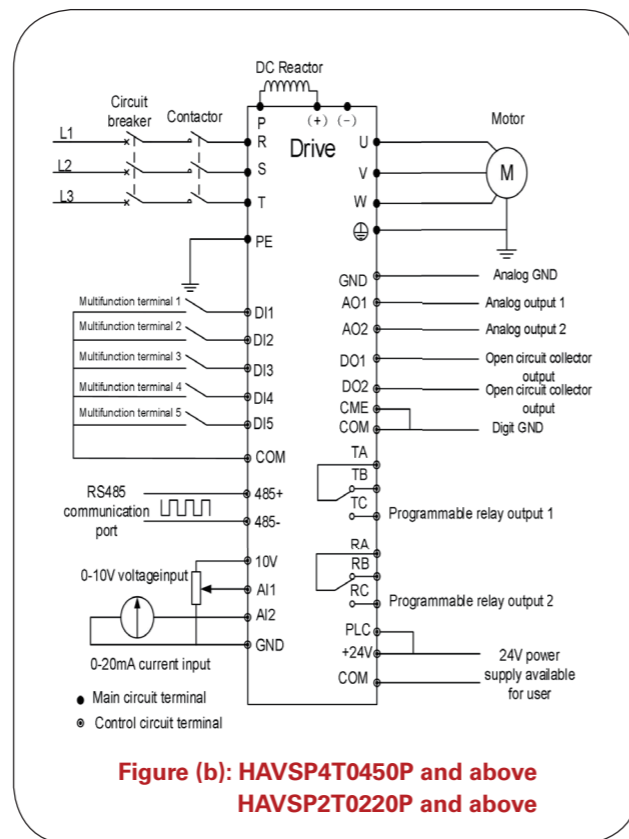
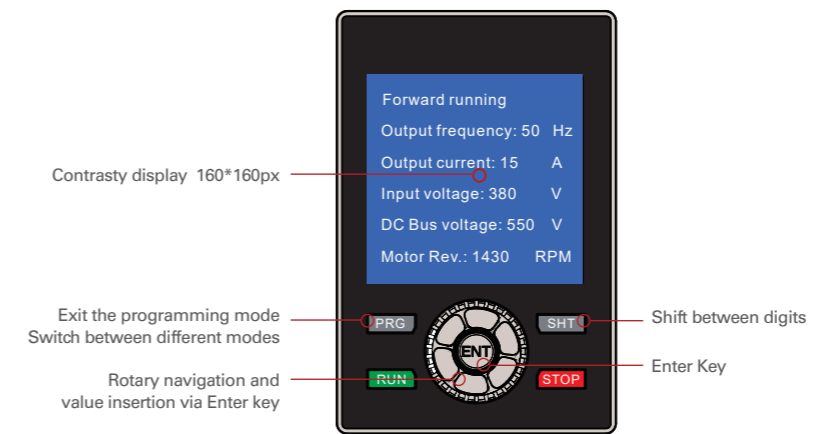


Figure (b): HAVSP4T0450P and above
HAVSP2T0220P and above

Note: The drive of 220kW to 315kW have built-in DC reactor.

LCD Keypad



Features	Benefits
Display	<ul style="list-style-type: none"> ◆ More visible status information ◆ Intuitive operation ◆ Short commissioning times ◆ User-friendly interface
Rotary navigation	<ul style="list-style-type: none"> ◆ Quick navigation and input of values
Quick commissioning	<ul style="list-style-type: none"> ◆ Visible parameter names ◆ Possible to commission without documentation ◆ Easily copy parameters between multiple drives

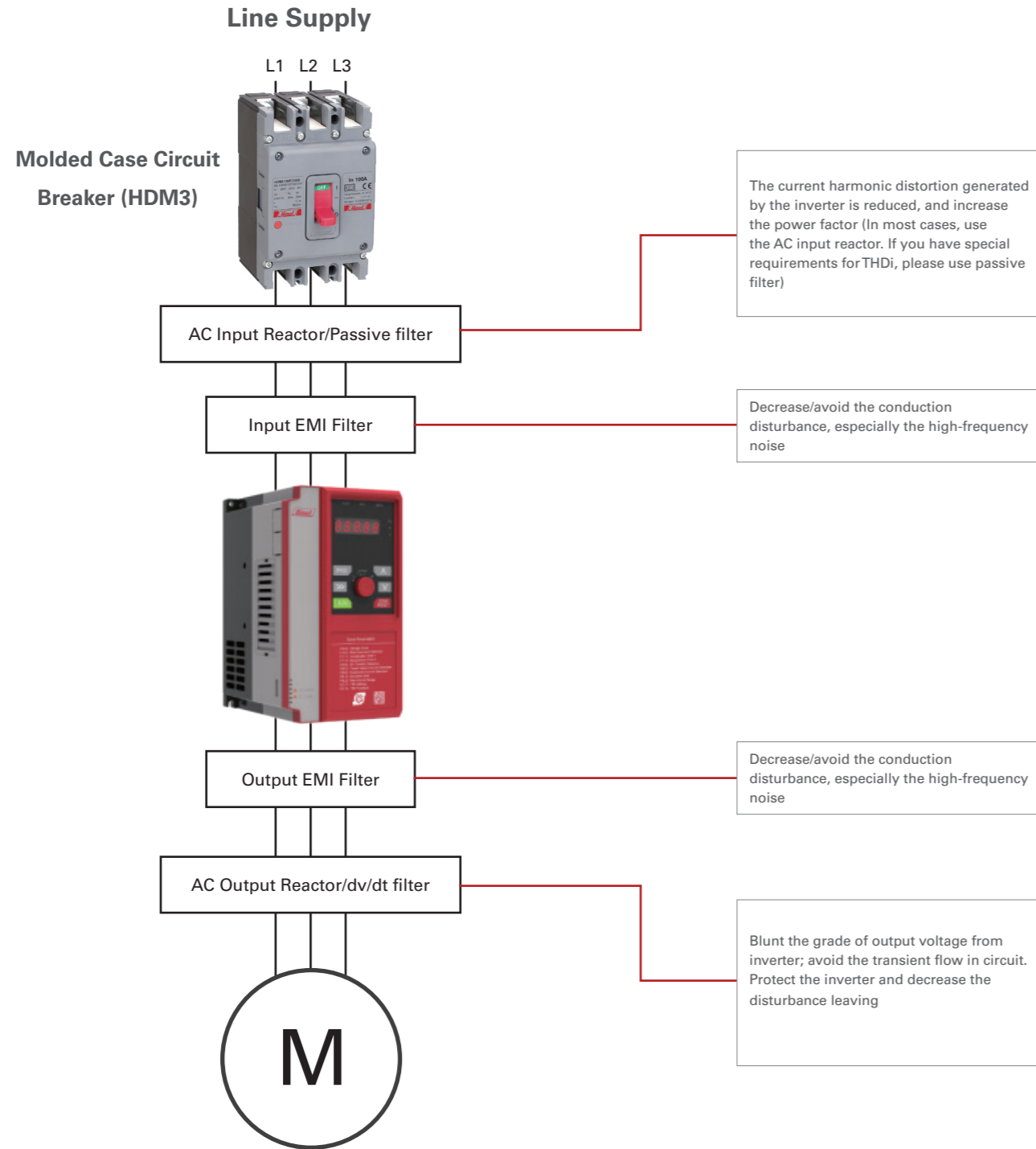
VSD Accessories

Type	Commercial Reference	Short Description	Applicable product		Pictures
			Applicable Commercial Reference	Specifications	
IO extension card	HAVSPIO4DI8R	IO extension card with 4DI and 8 relay	All SP series	All SP series	
Keypad bracket	HAVXSJPT	Keypad holder for external keypad	All SP series	All SP series	
External Keypad	HAVSPLKD**	External keypad	All SP series	All SP series	
	HAVSPLCD	LCD keypad	All SP series	All SP series	
Keypad cable	HAVXSCAB2	Length 2m	All SP series	All SP series	
	HAVXSCAB5	Length 5m	All SP series	All SP series	
Communication card	HAVSPBN	Extension communication card	All SP series	All SP series	

** All VSDs have built-in removable keypad. HAVSPLKD is sold as a spare part.

Power quality improvement

You can also select any option to improve the power by different use case.



Notes : When the wire connecting drive to motor is greater than 50m and less than 100m, you had better add AC output reactor.
When the wire connecting drive to motor is greater than 100m and less than 300m, you had better add DV/DT filter.

Passive filter



Features

- When connected to the front end of the VSD, the total harmonic current after filtering by the passive filter is less than 10% of the fundamental current at full load
- The efficiency is greater than 98%, the power can reach 250KW, and the passive harmonic filter provides a cost-effective, stable and reliable harmonic solution

Technical Specifications

- Rated voltage: 400V
- Operating frequency: 50Hz
- Overload capacity: 1.6 times, 60s
- Full load efficiency: more than 98%
- Cooling mode: AN AF
- Harmonic filtering effect: the total harmonic current distortion rate THDi<10% at the input of the filter under full load conditions (background voltage THDu <2%)
- No-load current: less than 25% of rated current

Application

- Passive filter is used when you have requirements for THDi. It can decrease the harmonic component.

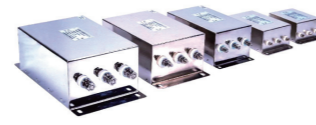
Selection table

Range	Commercial reference	Power (kW)	Rated current (A)	Harmonic currentd ≤10%	BASIC	EXPERT Standard	Smart Pump	Diagrams
Passive filter	HAVHFL0015KWA10	1.5	5	10%	HAVBA4T0015G	HAVXS4T0015G	/	O
	HAVHFL0022KWA10	2.2	7	10%	HAVBA4T0022G	HAVXS4T0022G	HAVSP4T0022P	
	HAVHFL0037KWA10	3.7	8	10%	HAVBA4T0030G		HAVSP4T0030P	
	HAVHFL0037KWA10	3.7	8	10%	HAVBA4T0040G	HAVXS4T0040G0055P	HAVSP4T0040P	
	HAVHFL0055KWA10	5.5	12	10%	HAVBA4T0055G	HAVXS4T0055G0075P	HAVSP4T0055P	
	HAVHFL0075KWA10	7.5	15	10%	HAVBA4T0075G	HAVXS4T0075G0110P	HAVSP4T0075P	
	HAVHFL0110KWA10	11	25	10%	HAVBA4T0110G	HAVXS4T0110G0150P	HAVSP4T0110P	
	HAVHFL0150KWA10	15	30	10%	HAVBA4T0150G	HAVXS4T0150G0185P	HAVSP4T0150P	
	HAVHFL0185KWA10	18.5	40	10%		HAVXS4T0185G0220P	HAVSP4T0185P	
	HAVHFL0220KWA10	22	50	10%		HAVXS4T0220G0300P	HAVSP4T0220P	
	HAVHFL0300KWA10	30	60	10%		HAVXS4T0300G0370P	HAVSP4T0300P	
	HAVHFL0370KWA10	37	75	10%		HAVXS4T0370G0450P	HAVSP4T0370P	
	HAVHFL0450KWA10	45	90	10%		HAVXS4T0450G0550P	HAVSP4T0450P	
	HAVHFL0550KWA10	55	110	10%		HAVXS4T0550G0750P	HAVSP4T0550P	
	HAVHFL0750KWA10	75	160	10%		HAVXS4T0750G0900P	HAVSP4T0750P	
	HAVHFL0900KWA10	90	180	10%		HAVXS4T0900G1100P	HAVSP4T0900P	
	HAVHFL1100KWA10	110	220	10%		HAVXS4T1100G1320P	HAVSP4T1100P	
	HAVHFL1320KWA10	132	260	10%		HAVXS4T1320G1600P	HAVSP4T1320P	
	HAVHFL1600KWA10	160	330	10%		HAVXS4T1600G1850P	HAVSP4T1600P	
	HAVHFL1850KWA10	185	390	10%		HAVXS4T1850G2000P	HAVSP4T1850P	
HAVHFL2000KWA10	200	400	10%		HAVXS4T2000G2200P	HAVSP4T2000P		
HAVHFL2200KWA10	220	450	10%		HAVXS4T2200G2500P	HAVSP4T2200P		
HAVHFL2500KWA10	250	500	10%		HAVXS4T2500G2800P	HAVSP4T2500P		

Note:

- If 60Hz is required, please note 60Hz when placing an order.
- Below (including) 55KW is AN natural cooling, 75KW and above is AF, with its own cooling fan

EMC C2 filter



Features

- This product has good interference suppression capacity, and can be used in equipment that requires strong interference suppression such as data processing systems, telecommunication systems, frequency converters and power purification.
- Prevent the electromagnetic interference generated by the device itself from entering the power line, and at the same time prevent the interference generated by the power line from entering the equipment; it can effectively suppress the radio interference from the audio equipment. Applicable wavelength range is 100K to 30MHz

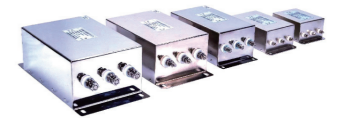
Technical Specifications

- Rated voltage: 230V/400V
- Operating frequency: 50/60Hz
- Insulation resistance: line to ground: 300A and below: $\geq 1500\text{M}\Omega$
- Line to ground: 1500VAC/2500VDC
- Leakage current (440VAC/50Hz): $\leq 36\text{A}$ $< 2\text{mA}$
 $\leq 80\text{A}$ $< 3\text{mA}$
 $\leq 200\text{A}$ $< 6\text{mA}$
 $\leq 1200\text{A}$ $< 35\text{mA}$

Application

- Power line filters are required for devices that can generate strong interference and for devices that are sensitive to external interference

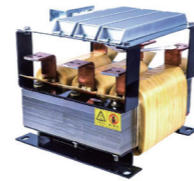
EMC C2 filter



Selection table

Range	Commercial reference	Power (kW)	Rated current (A)	BASIC	EXPERT Standard	Smart Pump	Diagrams
EMC C2 filter	HAVRFI3C01002D	0.75	10	HAVBA2S0007G	HAVXS2S0007G	/	q
	HAVRFI3C01002D	1.5	10	HAVBA2S0015G	HAVXS2S0015G	/	
	HAVRFI3C02002D	2.2	20	HAVBA2S0022G	HAVXS2S0022G	/	
	HAVRFI3C005	0.75	5	HAVBA4T0007G	HAVXS4T0007G	/	a
	HAVRFI3C005	1.5	5	HAVBA4T0015G	HAVXS4T0015G	/	
	HAVRFI3C007	2.2	7	HAVBA4T0022G	HAVXS4T0022G	HAVSP4T0022P	
	HAVRFI3C010	3	10	HAVBA4T0030G		HAVSP4T0030P	
	HAVRFI3C010	4	10	HAVBA4T0040G	HAVXS4T0040G0055P	HAVSP4T0040P	
	HAVRFI3C015	5.5	15	HAVBA4T0055G	HAVXS4T0055G0075P	HAVSP4T0055P	
	HAVRFI3C020	7.5	20	HAVBA4T0075G	HAVXS4T0075G0110P	HAVSP4T0075P	
	HAVRFI3C030	11	30	HAVBA4T0110G	HAVXS4T0110G0150P	HAVSP4T0110P	
	HAVRFI3C040	15	40	HAVBA4T0150G	HAVXS4T0150G0185P	HAVSP4T0150P	
	HAVRFI3C050	18.5	50		HAVXS4T0185G0220P	HAVSP4T0185P	
	HAVRFI3C060	22	60		HAVXS4T0220G0300P	HAVSP4T0220P	
	HAVRFI3C080	30	80		HAVXS4T0300G0370P	HAVSP4T0300P	
	HAVRFI3C090	37	90		HAVXS4T0370G0450P	HAVSP4T0370P	
	HAVRFI3C120	45	120		HAVXS4T0450G0550P	HAVSP4T0450P	
	HAVRFI3C150	55	150		HAVXS4T0550G0750P	HAVSP4T0550P	
	HAVRFI3C200	75	200		HAVXS4T0750G0900P	HAVSP4T0750P	
	HAVRFI3C250	90	250		HAVXS4T0900G1100P	HAVSP4T0900P	
	HAVRFI3C250	110	250		HAVXS4T1100G1320P	HAVSP4T1100P	
	HAVRFI3C290	132	290		HAVXS4T1320G1600P	HAVSP4T1320P	
	HAVRFI3C330	160	330		HAVXS4T1600G1850P	HAVSP4T1600P	
	HAVRFI3C390	185	390		HAVXS4T1850G2000P	HAVSP4T1850P	
	HAVRFI3C490	200	490		HAVXS4T2000G2200P	HAVSP4T2000P	
	HAVRFI3C490	220	490		HAVXS4T2200G2500P	HAVSP4T2200P	
HAVRFI3C530	250	530		HAVXS4T2500G2800P	HAVSP4T2500P		
HAVRFI3C600	280	600		HAVXS4T2800G3150P	HAVSP4T2800P		
HAVRFI3C660	315	660		HAVXS4T3150G3550P	HAVSP4T3150P		

DV/DT filter



Features

- When the DV/DT filter is used, the voltage at the motor end is still a pulse voltage, but the energy rise time will be reduced, greatly reducing the insulation pressure on the motor to prevent the motor insulation from breakdown.

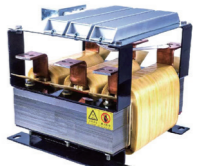
Technical Specifications

- Rated voltage: 400V
- Operating frequency: 50/60Hz
- Insulation class: class F, H
- Max. current: 1.5xrated current, continued for 60s
- Protection grade: IP00-IP22

Application

- DV/DT filter is designed to protect the motor. When the distance between the inverter and the motor is too large, the peak voltage applied on the motor will exceed the rating of the motor insulation series. In this case, a DV/DT filter is required to prevent the destructive effect on the peak voltage of motor.
- When the wire connecting drive to motor is greater than 100m and less than 300m, you had better add DV/DT filter.

DV/DT filter



Selection table

Range	Commercial reference	Power (kW)	Rated current (A)	BASIC	EXPERT Standard	Smart Pump	Diagrams
DV/DT filter	HAVVTR00054SC	0.75	5	HAVBA4T0007G	HAVXS4T0007G	/	k
	HAVVTR00054SC	1.5	5	HAVBA4T0015G	HAVXS4T0015G	/	
	HAVVTR00074SC	2.2	7	HAVBA4T0022G	HAVXS4T0022G	HAVSP4T0022P	
	HAVVTR00104SC	3	10	HAVBA4T0030G		HAVSP4T0030P	
	HAVVTR00104SC	4	10	HAVBA4T0040G	HAVXS4T0040G0055P	HAVSP4T0040P	
	HAVVTR00154SC	5.5	15	HAVBA4T0055G	HAVXS4T0055G0075P	HAVSP4T0055P	
	HAVVTR00204SC	7.5	20	HAVBA4T0075G	HAVXS4T0075G0110P	HAVSP4T0075P	
	HAVVTR00304SC	11	30	HAVBA4T0110G	HAVXS4T0110G0150P	HAVSP4T0110P	
	HAVVTR00404SC	15	40	HAVBA4T0150G	HAVXS4T0150G0185P	HAVSP4T0150P	
	HAVVTR00504SC	18.5	50		HAVXS4T0185G0220P	HAVSP4T0185P	
	HAVVTR00604SC	22	60		HAVXS4T0220G0300P	HAVSP4T0220P	
	HAVVTR00804SC	30	80		HAVXS4T0300G0370P	HAVSP4T0300P	
	HAVVTR00904SC	37	90		HAVXS4T0370G0450P	HAVSP4T0370P	
	HAVVTR01204SA	45	120		HAVXS4T0450G0550P	HAVSP4T0450P	l
	HAVVTR01504SA	55	150		HAVXS4T0550G0750P	HAVSP4T0550P	
	HAVVTR02004SA	75	200		HAVXS4T0750G0900P	HAVSP4T0750P	m
	HAVVTR02504SA	90	250		HAVXS4T0900G1100P	HAVSP4T0900P	
	HAVVTR02504SA	110	250		HAVXS4T1100G1320P	HAVSP4T1100P	
	HAVVTR02904SA	132	290		HAVXS4T1320G1600P	HAVSP4T1320P	
	HAVVTR03304SA	160	330		HAVXS4T1600G1850P	HAVSP4T1600P	
	HAVVTR03904SA	185	390		HAVXS4T1850G2000P	HAVSP4T1850P	
	HAVVTR04904SA	200	490		HAVXS4T2000G2200P	HAVSP4T2000P	n
	HAVVTR04904SA	220	490		HAVXS4T2200G2500P	HAVSP4T2200P	
	HAVVTR06004SA	250	600		HAVXS4T2500G2800P	HAVSP4T2500P	
HAVVTR06004SA	280	600		HAVXS4T2800G3150P	HAVSP4T2800P		
HAVVTR06604SA	315	660		HAVXS4T3150G3550P	HAVSP4T3150P		
HAVVTR08004SA	355	800		HAVXS4T3550G4000P			
HAVVTR08004SA	400	800		HAVXS4T4000G4500P			
HAVVTR10004SA	450	1000		HAVXS4T4500G5000P			
HAVVTR12004SA	500	1200		HAVXS4T5000G5600P			

AC input reactor



Features

- Provide improved overload protection to line power
- Reduce current harmonic distortion generated by the VSD
- Improve the power factor of the input power supply
- Suppress the surge of the VSD on the power supply equipment

Technical Specifications

- Rated voltage: 230V/400V
- Operating frequency: 50/60Hz
- Max. current: 1.5×rated current, continued for 60s
- Protection grade: IP00-IP22
- Temperature rise: ≤85K
- Pressure drop: 2%

Application

AC input reactors are especially recommended in the following environments:

- Several converters are connected in parallel and tightly
- The line power supply has obvious disturbances (interference, overvoltage) from other equipment
- There is a voltage imbalance between the phases of the line power supply, and it exceeds 1.8% of the rated voltage
- A large number of frequency converters installed on the same line
- Reduce the overload on the COS ϕ correction capacitor if the device contains a power coefficients correction equipment
- The power supply capacity is 600 kVA and above, and the converter is installed within 10 m from the large-capacity power supply
- The converter is powered by a line with very low impedance (the transformer capacity is 10 times higher than the rated value of the converter)

AC input reactor



Selection table

Range	Commercial reference	Power (kW)	Rated current (A)	Inductance (mH)	BASIC	EXPERT Standard	Smart Pump	Diagrams
AC input reactor	HAVACL00054SC	0.75	5	2.8	HAVBA4T0007G	HAVXS4T0007G	/	c
	HAVACL00054SC	1.5	5	2.8	HAVBA4T0015G	HAVXS4T0015G	/	
	HAVACL00074SC	2.2	7	2	HAVBA4T0022G	HAVXS4T0022G	HAVSP4T0022P	
	HAVACL00104SC	3	10	1.4	HAVBA4T0030G		HAVSP4T0030P	
	HAVACL00104SC	4	10	1.4	HAVBA4T0040G	HAVXS4T0040G0055P	HAVSP4T0040P	
	HAVACL00154SC	5.5	15	0.94	HAVBA4T0055G	HAVXS4T0055G0075P	HAVSP4T0055P	
	HAVACL00204SC	7.5	20	0.7	HAVBA4T0075G	HAVXS4T0075G0110P	HAVSP4T0075P	
	HAVACL00304SA	11	30	0.47	HAVBA4T0110G	HAVXS4T0110G0150P	HAVSP4T0110P	d
	HAVACL00404SA	15	40	0.36	HAVBA4T0150G	HAVXS4T0150G0185P	HAVSP4T0150P	
	HAVACL00504SA	18.5	50	0.28		HAVXS4T0185G0220P	HAVSP4T0185P	
	HAVACL00604SA	22	60	0.24		HAVXS4T0220G0300P	HAVSP4T0220P	
	HAVACL00804SA	30	80	0.18		HAVXS4T0300G0370P	HAVSP4T0300P	
	HAVACL00904SA	37	90	0.156		HAVXS4T0370G0450P	HAVSP4T0370P	
	HAVACL01204SA	45	120	0.117		HAVXS4T0450G0550P	HAVSP4T0450P	
	HAVACL01504SA	55	150	0.094		HAVXS4T0550G0750P	HAVSP4T0550P	e
	HAVACL02004SA	75	200	0.07		HAVXS4T0750G0900P	HAVSP4T0750P	
	HAVACL02504SA	90	250	0.056		HAVXS4T0900G1100P	HAVSP4T0900P	
	HAVACL02504SA	110	250	0.056		HAVXS4T1100G1320P	HAVSP4T1100P	
	HAVACL02904SA	132	290	0.048		HAVXS4T1320G1600P	HAVSP4T1320P	
	HAVACL03304SA	160	330	0.042		HAVXS4T1600G1850P	HAVSP4T1600P	
	HAVACL03904SA	185	390	0.036		HAVXS4T1850G2000P	HAVSP4T1850P	
	HAVACL04904SA	200	490	0.028		HAVXS4T2000G2200P	HAVSP4T2000P	f
	HAVACL04904SA	220	490	0.028		HAVXS4T2200G2500P	HAVSP4T2200P	
	HAVACL06004SA	250	600	0.024		HAVXS4T2500G2800P	HAVSP4T2500P	
	HAVACL06004SA	280	600	0.024		HAVXS4T2800G3150P	HAVSP4T2800P	
	HAVACL06604SA	315	660	0.022		HAVXS4T3150G3550P	HAVSP4T3150P	
	HAVACL08004SA	355	800	0.0175		HAVXS4T3550G4000P		
	HAVACL08004SA	400	800	0.0175		HAVXS4T4000G4500P		
	HAVACL10004SA	450	1000	0.014		HAVXS4T4500G5000P		
	HAVACL12004SA	500	1200	0.0117		HAVXS4T5000G5600P		
HAVACL16004SA	560	1600	0.0086		HAVXS4T5600G6300P			
HAVACL16004SA	630	1600	0.0086		HAVXS4T6300G7100P			

AC input reactor



Selection table

Range	Commercial reference	Power (kW)	Rated current A	Inductance (mH)	BASIC	EXPERT Standard	Smart Pump	Diagrams
AC input reactor	HAVACL00052SC	0.75	5	2.8	HAVBA2T0007G	HAVXS2T0007G	/	c
	HAVACL00102SC	1.5	10	1.4	HAVBA2T0015G	HAVXS2T0015G	/	
	HAVACL00152SC	2.2	15	0.94	HAVBA2T0022G	HAVXS2T0022G	HAVSP2T0022P	
	HAVACL00202SC	3	20	0.7			HAVSP2T0030P	
	HAVACL00202SC	4	20	0.7		HAVXS2T0040G	HAVSP2T0040P	
	HAVACL00302SA	5.5	30	0.47		HAVXS2T0055G	HAVSP2T0055P	d
	HAVACL00402SA	7.5	40	0.36		HAVXS2T0075G	HAVSP2T0075P	
	HAVACL00502SA	11	50	0.28		HAVXS2T0110G	HAVSP2T0110P	
	HAVACL00802SA	15	80	0.18		HAVXS2T0150G	HAVSP2T0150P	
	HAVACL00802SA	18.5	80	0.18		HAVXS2T0185G	HAVSP2T0185P	
	HAVACL01202SA	22	120	0.117		HAVXS2T0220G	HAVSP2T0220P	e
	HAVACL01502SA	30	150	0.094		HAVXS2T0300G	HAVSP2T0300P	
	HAVACL02002SA	37	200	0.07		HAVXS2T0370G	HAVSP2T0370P	
	HAVACL02002SA	45	200	0.07		HAVXS2T0450G	HAVSP2T0450P	
	HAVACL02502SA	55	250	0.056		HAVXS2T0550G		
	HAVACL03302SA	75	330	0.042		HAVXS2T0750G		
	HAVACL03902SA	90	390	0.036		HAVXS2T0900G		
	HAVACL04902SA	110	490	0.028		HAVXS2T1100G		
HAVACL06002SA	132	600	0.024		HAVXS2T1320G			
HAVACL06602SA	160	660	0.022		HAVXS2T1600G			

AC output reactor



Features

- Limit the capacitive charging current of the connecting cable between the VSD and the motor and to passivate the voltage rise rate of the PWM wave output by the VSD.

Technical Specifications

- Rated voltage: 230V/400V
- Operating frequency: 50/60Hz
- Insulation class: class F, H
- Protection grade: IP00-IP22
- Voltage drop: <4%, if larger than this range, torque loss will occur
- Max. current: 1.5×rated current, continued for 60s
- Temperature rise: ≤85K
- Insulation resistance: 1000VDC

Application

- Limit dv/dt to 500V/us
- Limit the overvoltage on the motor terminals to: 1000V to 400V~ (rms value)
1150V to 460V~(rms value)
- Filter interference caused by opening the contactor between the filter and the motor
- Reduce the ground leakage current motor

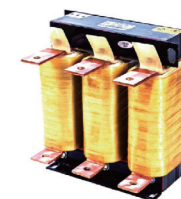
AC output reactor



Selection table

Range	Commercial reference	Power (kW)	Rated current A	Inductance (mH)	BASIC	EXPERT Standard	Smart Pump	Diagrams	
AC output reactor	HAVOCL00054SC	0.75	5	1.4	HAVBA4T0007G	HAVXS4T0007G	/	g	
	HAVOCL00054SC	1.5	5	1.4	HAVBA4T0015G	HAVXS4T0015G	/		
	HAVOCL00074SC	2.2	7	1	HAVBA4T0022G	HAVXS4T0022G	HAVSP4T0022P		
	HAVOCL00104SC	3	10	0.7	HAVBA4T0030G		HAVSP4T0030P		
	HAVOCL00104SC	4	10	0.7	HAVBA4T0040G	HAVXS4T0040G0055P	HAVSP4T0040P		
	HAVOCL00154SC	5.5	15	0.47	HAVBA4T0055G	HAVXS4T0055G0075P	HAVSP4T0055P		
	HAVOCL00204SC	7.5	20	0.35	HAVBA4T0075G	HAVXS4T0075G0110P	HAVSP4T0075P		
	HAVOCL00304SA	11	30	0.23	HAVBA4T0110G	HAVXS4T0110G0150P	HAVSP4T0110P		h
	HAVOCL00404SA	15	40	0.18	HAVBA4T0150G	HAVXS4T0150G0185P	HAVSP4T0150P		
	HAVOCL00504SA	18.5	50	0.14		HAVXS4T0185G0220P	HAVSP4T0185P		
	HAVOCL00604SA	22	60	0.12		HAVXS4T0220G0300P	HAVSP4T0220P		
	HAVOCL00804SA	30	80	0.087		HAVXS4T0300G0370P	HAVSP4T0300P		
	HAVOCL00904SA	37	90	0.078		HAVXS4T0370G0450P	HAVSP4T0370P		
	HAVOCL01204SA	45	120	0.058		HAVXS4T0450G0550P	HAVSP4T0450P		
	HAVOCL01504SA	55	150	0.047		HAVXS4T0550G0750P	HAVSP4T0550P		
	HAVOCL02004SA	75	200	0.028		HAVXS4T0750G0900P	HAVSP4T0750P		
	HAVOCL02504SA	90	250	0.028		HAVXS4T0900G1100P	HAVSP4T0900P		
	HAVOCL02504SA	110	250	0.028		HAVXS4T1100G1320P	HAVSP4T1100P	i	
	HAVOCL02904SA	132	290	0.024		HAVXS4T1320G1600P	HAVSP4T1320P		
	HAVOCL03304SA	160	330	0.021		HAVXS4T1600G1850P	HAVSP4T1600P		
	HAVOCL03904SA	185	390	0.018		HAVXS4T1850G2000P	HAVSP4T1850P		
	HAVOCL04904SA	200	490	0.014		HAVXS4T2000G2200P	HAVSP4T2000P		
	HAVOCL04904SA	220	490	0.014		HAVXS4T2200G2500P	HAVSP4T2200P		
	HAVOCL06004SA	250	600	0.012		HAVXS4T2500G2800P	HAVSP4T2500P		
	HAVOCL06004SA	280	600	0.012		HAVXS4T2800G3150P	HAVSP4T2800P		
	HAVOCL06604SA	315	660	0.011		HAVXS4T3150G3550P	HAVSP4T3150P		
	HAVOCL08004SA	355	800	0.0087		HAVXS4T3550G4000P			
	HAVOCL08004SA	400	800	0.0087		HAVXS4T4000G4500P		j	
	HAVOCL10004SA	450	1000	0.007		HAVXS4T4500G5000P			
	HAVOCL12004SA	500	1200	0.0058		HAVXS4T5000G5600P			
HAVOCL16004SA	560	1600	0.0043		HAVXS4T5600G6300P				
HAVOCL16004SA	630	1600	0.0043		HAVXS4T6300G7100P				

AC output reactor



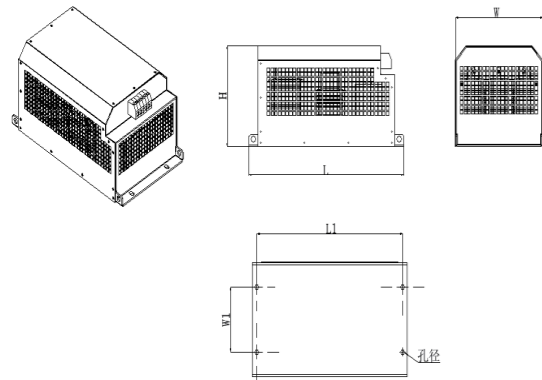
Selection table

Range	Commercial reference	Power (kW)	Rated current A	Inductance (mH)	BASIC	EXPERT Standard	Smart Pump	Diagrams
AC output reactor	HAVOCL00052SC	0.75	5	1.4	HAVBA2T0007G	HAVXS2T0007G		g
	HAVOCL00102SC	1.5	10	0.7	HAVBA2T0015G	HAVXS2T0015G		
	HAVOCL00152SC	2.2	15	0.47	HAVBA2T0022G	HAVXS2T0022G	HAVSP2T0022P	
	HAVOCL00202SC	3	20	0.35			HAVSP2T0030P	
	HAVOCL00202SC	4	20	0.35		HAVXS2T0040G	HAVSP2T0040P	
	HAVOCL00302SA	5.5	30	0.23		HAVXS2T0055G	HAVSP2T0055P	
	HAVOCL00402SA	7.5	40	0.18		HAVXS2T0075G	HAVSP2T0075P	
	HAVOCL00502SA	11	50	0.14		HAVXS2T0110G	HAVSP2T0110P	
	HAVOCL00802SA	15	80	0.087		HAVXS2T0150G	HAVSP2T0150P	
	HAVOCL00802SA	18.5	80	0.087		HAVXS2T0185G	HAVSP2T0185P	i
	HAVOCL01202SA	22	120	0.058		HAVXS2T0220G	HAVSP2T0220P	
	HAVOCL01502SA	30	150	0.047		HAVXS2T0300G	HAVSP2T0300P	
	HAVOCL02002SA	37	200	0.035		HAVXS2T0370G	HAVSP2T0370P	
	HAVOCL02002SA	45	200	0.035		HAVXS2T0450G	HAVSP2T0450P	
	HAVOCL02502SA	55	250	0.028		HAVXS2T0550G		
	HAVOCL03302SA	75	330	0.021		HAVXS2T0750G		
	HAVOCL03902SA	90	390	0.018		HAVXS2T0900G		
	HAVOCL04902SA	110	490	0.014		HAVXS2T1100G		
	HAVOCL06002SA	132	600	0.012		HAVXS2T1320G		
	HAVOCL06602SA	160	660	0.011		HAVXS2T1600G		

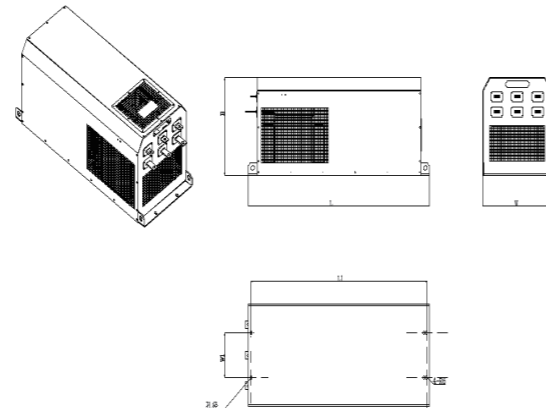
Installation table

Range	Commercial reference	Diagrams	Dimensions(mm)					
			L(max)	W(max)	H(max)	L1	W1	AxB
Passive filter	HAVHFL0015KWA10	o	350	260	220	325	120	9*16
	HAVHFL0022KWA10		350	260	220	325	120	
	HAVHFL0037KWA10		350	260	220	325	120	
	HAVHFL0055KWA10		350	260	220	325	120	
	HAVHFL0075KWA10		350	260	220	325	120	
	HAVHFL0110KWA10		420	280	245	395	120	
	HAVHFL0150KWA10		420	280	245	395	120	
	HAVHFL0185KWA10		500	285	250	470	160	11*18
	HAVHFL0220KWA10		500	285	250	470	160	
	HAVHFL0300KWA10		560	315	300	525	175	12*20
	HAVHFL0370KWA10		560	315	300	525	175	
	HAVHFL0450KWA10		590	355	300	560	175	12*20
	HAVHFL0550KWA10		590	355	300	560	175	
	HAVHFL0750KWA10		950	405	365	900	175	12*20
	HAVHFL0900KWA10	950	405	365	900	175		
	HAVHFL1100KWA10	950	405	365	900	175		
	HAVHFL1320KWA10	950	405	365	900	175		
	HAVHFL1600KWA10	1060	405	385	1030	175	12*20	
	HAVHFL1850KWA10	1060	405	385	1030	175		
	HAVHFL2000KWA10	1060	405	385	1030	175	12*20	
HAVHFL2200KWA10	1060	405	385	1030	175			
HAVHFL2500KWA10	1060	405	385	1030	175			

(o)



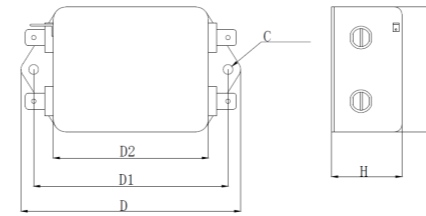
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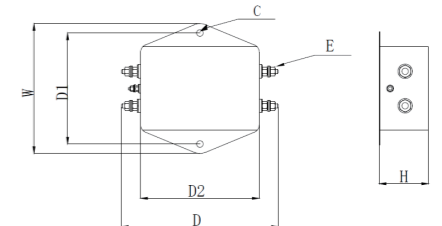
Installation table

Range	Commercial reference	Diagrams	Dimensions(mm)							
			D	D1	D2	W	W1	H	C	E
EMC C2 filter	HAVRFI3C01002D	q	85	75	64	51	/	29	2-φ4.5	/
	HAVRFI3C02002D	r	87	61	51	74	/	29	2-φ4.5	M4
	HAVRFI3C005	a	140	125	110	93	70	58	5.3*7	M4
	HAVRFI3C007		140	125	110	93	70	58	5.3*7	M4
	HAVRFI3C010		140	125	110	93	70	58	5.3*7	M4
	HAVRFI3C015		185	165	145	105	85	70	6.5*9.5	M6
	HAVRFI3C020		185	165	145	105	85	70	6.5*9.5	M6
	HAVRFI3C030		185	165	145	105	85	70	6.5*9.5	M6
	HAVRFI3C040		185	165	145	105	85	70	6.5*9.5	M6
	HAVRFI3C050		240	220	200	120	100	85	6.5*9.5	M6
	HAVRFI3C060		240	220	200	120	100	85	6.5*9.5	M6
	HAVRFI3C080		280	250	220	150	120	95	8.0*15	M8
	HAVRFI3C090		280	250	220	150	120	95	8.0*15	M8
	HAVRFI3C120		320	285	250	170	140	105	8.0*15	M10
	HAVRFI3C150		320	285	250	170	140	105	8.0*15	M10
	HAVRFI3C200		325	250	200	216	190	115	6.5*9.5	25*5
	HAVRFI3C250	325	250	200	216	190	115	6.5*9.5	25*5	
	HAVRFI3C290	395	300	240	260	235	115	6.5*9.5	25*5	
	HAVRFI3C330	395	300	240	260	235	115	6.5*9.5	25*5	
	HAVRFI3C390	395	300	240	260	235	115	6.5*9.5	25*5	
	HAVRFI3C490	445	350	290	250	230	128	6.5*9.5	30*5	
	HAVRFI3C530	445	350	290	250	230	128	6.5*9.5	30*5	
	HAVRFI3C600	445	350	290	250	230	128	6.5*9.5	30*5	
	HAVRFI3C660	445	350	290	250	230	128	6.5*9.5	30*5	

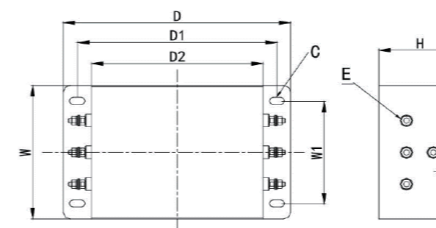
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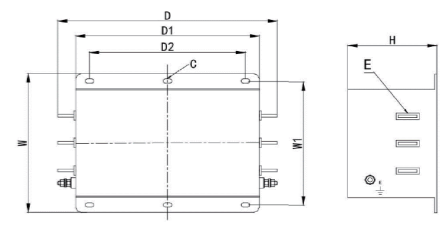
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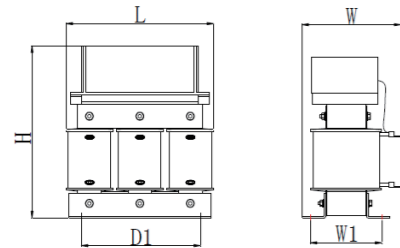
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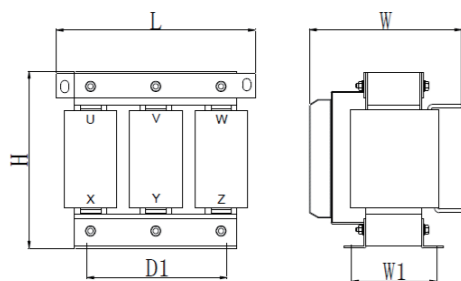
Installation table

Range	Commercial reference	Diagrams	Dimensions(mm)				
			L(max)	W(max)	H(max)	D1±2	W1±2
DV/DT filter	HAVVTR00054SC	k	155	130	200	95	76
	HAVVTR00074SC		155	130	200	95	76
	HAVVTR00104SC		155	130	200	95	76
	HAVVTR00154SC		155	130	200	95	76
	HAVVTR00204SC		195	150	220	120	92
	HAVVTR00304SC		195	150	220	120	92
	HAVVTR00404SC		195	165	220	120	92
	HAVVTR00504SC		195	180	220	120	110
	HAVVTR00604SC		195	175	270	120	105
	HAVVTR00804SC		195	175	270	120	105
	HAVVTR00904SC		195	175	270	120	105
	HAVVTR01204SA		l	250	195	320	182
	HAVVTR01504SA	250		210	320	182	118
	HAVVTR02004SA	m	290	300	265	214	112
	HAVVTR02504SA		290	300	265	214	122
	HAVVTR02904SA		290	300	265	214	132
	HAVVTR03304SA		320	350	340	243	135
	HAVVTR03904SA		320	350	340	243	135
	HAVVTR04904SA		320	350	360	243	150
	HAVVTR06004SA		380	380	450	315	320
HAVVTR06604SA	380		380	450	315	320	
HAVVTR08004SA	380		380	450	315	320	
HAVVTR10004SA	380		380	450	315	320	
HAVVTR12004SA	450	380	520	370	320		

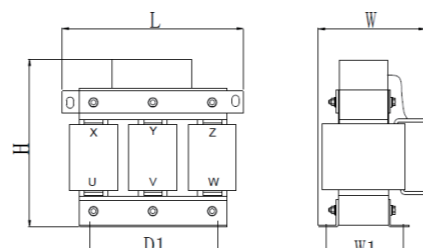
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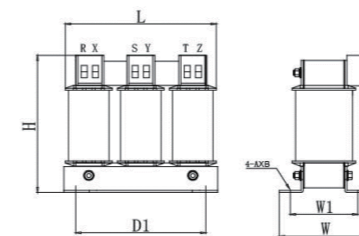
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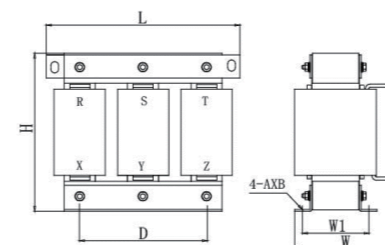
Installation table

Range	Commercial reference	Diagrams	Dimensions(mm)						
			L(max)	W(max)	H(max)	D1±2	D2±2	W1±3	AxB
AC input reactor	HAVACL00054SC	c	125	70	115	100		47	6x12
	HAVACL00074SC		125	70	115	100		47	6x12
	HAVACL00104SC		125	80	115	100		57	6x12
	HAVACL00154SC		125	80	115	100		57	6x12
	HAVACL00204SC		125	80	115	100		57	6x12
	HAVACL00304SA		d	155	150	140	95	55	75
	HAVACL00404SA	155		150	140	95	55	75	6x15
	HAVACL00504SA	195		150	165	120	64	80	8.5x20
	HAVACL00604SA	195		150	165	120	64	92	8.5x20
	HAVACL00804SA	195		160	165	120	64	92	8.5x20
	HAVACL00904SA	195		160	165	120	64	92	8.5x20
	HAVACL01204SA	e	230	175	230	150		93	11*18
	HAVACL01504SA		230	175	230	150		93	11*18
	HAVACL02004SA		250	190	240	182		98	11x18
	HAVACL02504SA		250	190	240	182		98	11x18
	HAVACL02904SA		250	200	240	182		108	11x18
	HAVACL03304SA		290	200	260	214		102	11x18
	HAVACL03904SA		290	210	260	214		112	11x18
	HAVACL04904SA		290	230	300	214		112	11x18
	HAVACL06004SA		320	260	310	243		135	12x20
HAVACL06604SA	320		260	310	243		135	12x20	
HAVACL08004SA	320		280	310	243		150	12x20	
HAVACL10004SA	f		320	280	340	243		150	12x20
HAVACL12004SA			365	300	435	260		160	15x25
HAVACL160064SA			365	320	435	260		160	15x25

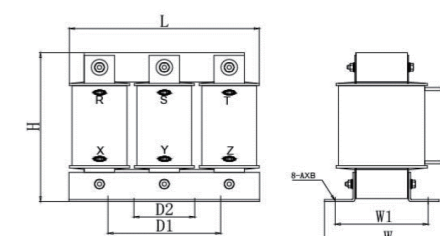
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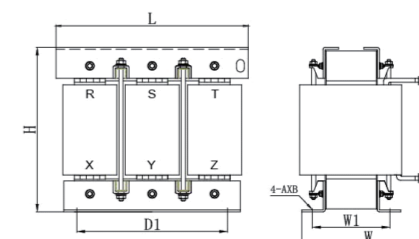
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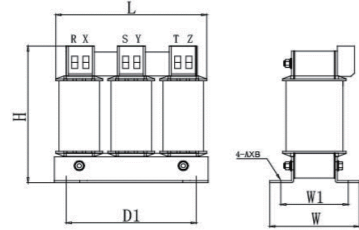
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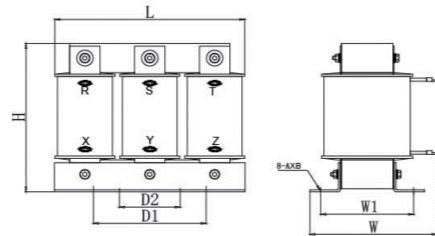
Installation table

Range	Commercial reference	Diagrams	Dimensions(mm)						
			L(max)	W(max)	H(max)	D1±2	D2±2	W1±3	AxB
AC input reactor	HAVACL00052SC	c	125	70	115	100		47	6x12
	HAVACL00102SC		125	80	115	100		57	6x12
	HAVACL00152SC		125	80	115	100		57	6x12
	HAVACL00202SC	d	125	80	115	100		57	6x12
	HAVACL00302SA		155	150	140	95	55	75	6x15
	HAVACL00402SA		155	150	140	95	55	75	6x15
	HAVACL00502SA		195	150	165	120	64	80	8.5x20
	HAVACL00802SA	e	195	160	165	120	64	92	8.5x20
	HAVACL01202SA		230	175	230	150		93	11*18
	HAVACL01502SA		230	175	230	150		93	11*18
	HAVACL02002SA		250	190	240	182		98	11x18
	HAVACL02502SA		250	190	240	182		98	11x18
	HAVACL03302SA		290	200	260	214		102	11x18
	HAVACL03902SA		290	210	260	214		112	11x18
	HAVACL04902SA		290	230	300	214		112	11x18
	HAVACL06002SA		320	260	310	243		135	12x20
HAVACL06602SA		320	260	310	243		135	12x20	

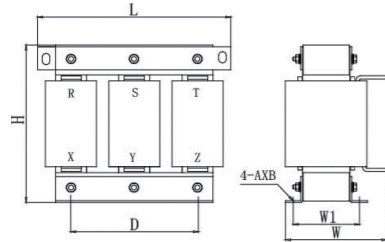
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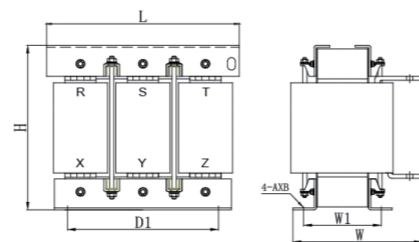
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(e)



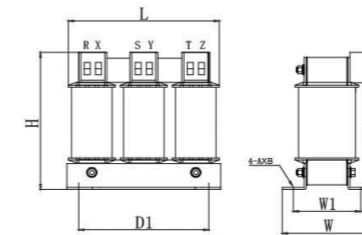
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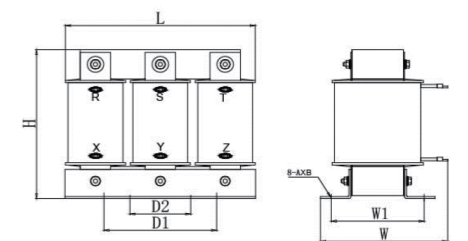
Installation table

Range	Commercial reference	Diagrams	Dimensions(mm)						
			L(max)	W(max)	H(max)	D1±2	D2±2	W1±3	AxB
AC output reactor	HAVOCL00054SC	g	125	70	125	100		47	6x12
	HAVOCL00074SC		125	70	125	100		47	6x12
	HAVOCL00104SC		125	80	125	100		57	6x12
	HAVOCL00154SC		125	80	125	100		57	6x12
	HAVOCL00204SC		125	80	125	100		57	6x12
	HAVOCL00304SA	h	155	130	140	95	55	63	6x15
	HAVOCL00404SA		155	150	140	95	55	76	6x15
	HAVOCL00504SA		195	150	165	120	64	80	8.5x20
	HAVOCL00604SA		195	150	165	120	64	80	8.5x20
	HAVOCL00804SA		195	150	165	120	64	92	8.5x20
	HAVOCL00904SA		195	150	165	120	64	92	8.5x20
	HAVOCL01204SA		230	175	220	150		93	11x18
	HAVOCL01504SA		230	175	220	150		93	11x18
	HAVOCL02004SA		250	190	240	182		93	11x18
	HAVOCL02504SA		250	200	240	182		98	11x18
	HAVOCL02904SA	i	250	200	240	182		98	11x18
	HAVOCL03304SA		290	210	260	214		102	11x18
	HAVOCL03904SA		290	210	260	214		112	11x18
	HAVOCL04904SA		290	230	300	214		112	11x18
	HAVOCL06004SA		320	260	310	243		135	12x20
HAVOCL06604SA	320		260	310	243		135	12x20	
HAVOCL08004SA	320		260	310	243		140	12x20	
HAVOCL10004SA	320		290	350	243		140	12x20	
HAVOCL12004SA	j		365	310	430	260		145	15x25
HAVOCL16004SA			365	320	435	260		175	15x25

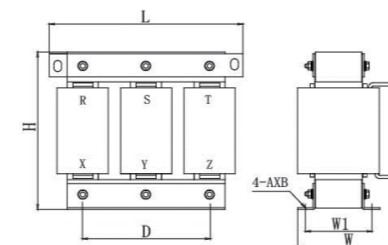
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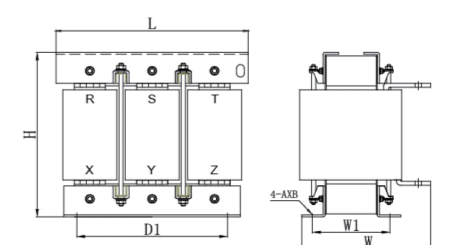
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(i)



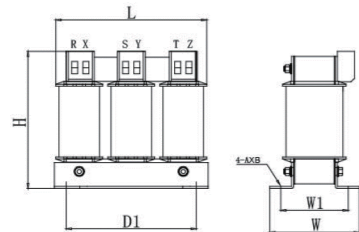
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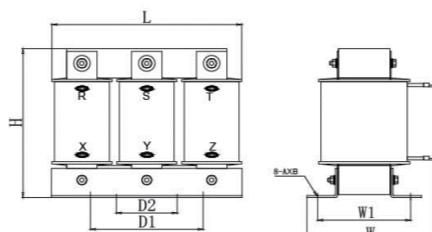
Installation table

Range	Commercial reference	Diagrams	Dimensions(mm)						
			L(max)	W(max)	H(max)	D1±2	D2±2	W1±3	A×B
AC output reactor	HAVOCL00052SC	g	125	70	125	100		47	6×12
	HAVOCL00102SC		125	80	125	100		57	6×12
	HAVOCL00152SC		125	80	125	100		57	6×12
	HAVOCL00202SC		125	80	125	100		57	6×12
	HAVOCL00302SA	h	155	130	140	95	55	63	6×15
	HAVOCL00402SA		155	150	140	95	55	76	6×15
	HAVOCL00502SA		195	150	165	120	64	80	8.5×20
	HAVOCL00802SA		195	150	165	120	64	92	8.5×20
	HAVOCL01202SA	i	230	175	220	150		93	11×18
	HAVOCL01502SA		230	175	220	150		93	11×18
	HAVOCL02002SA		250	190	240	182		93	11×18
	HAVOCL02502SA		250	200	240	182		98	11×18
	HAVOCL03302SA		290	210	260	214		102	11×18
	HAVOCL03902SA		290	210	260	214		112	11×18
	HAVOCL04902SA		290	230	300	214		112	11×18
	HAVOCL06002SA		320	260	310	243		135	12×20
HAVOCL06602SA	320		260	310	243		135	12×20	

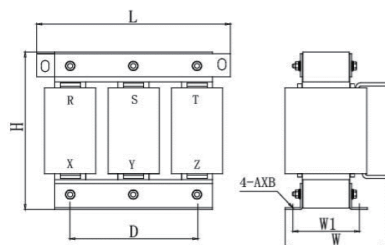
(g)



(h)



(i)



Solar series VSD

Himel Solar VSD is an innovative solution that uses solar power as a reliable energy source for pumping water. It is to maximum solar energy to run the pump for maximum duration in a day by controlling the speed of the motor based on the power available from the solar panel.

Series	Voltage Class	Motor Capacity Table																							
		0.4	0.75	1.5	2.2	4	5.5	7.5	11	15	19	22	30	37	45	55	75	90	110	132	160	185	200	220	250
Solar	Single-phase 200 - 240V																								
	Three-phase 380 - 440V																								

• 2S = 200-240V Single Phase; 4T = 380-440V Three Phase;

Build-in MPPT

Maximum power point tracking ensures that you get the most power output possible from your solar panel and maximizes the performance of your pump throughout the day.

Hybrid mode - Dual supply (AC&DC) capability

The VSD is customized to operate in dual supply mode, so the grid connected supply is used in the absence of energy from PV cells.

Automatic start-run-stop through out the day

With water level detection in the tank and pump overload and under-load protection.

Easy to use

- Compact design
- Easy to install with Din rail
- Can run with default setting, no parameter set need
- One-key recovery function

Special program function

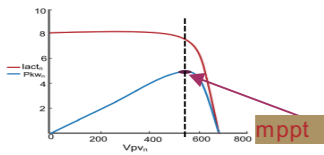

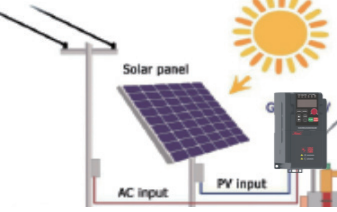
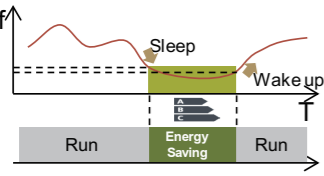
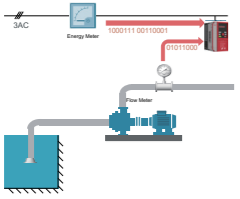

- Energy meter
- Flow calculation

Pump-specific protection

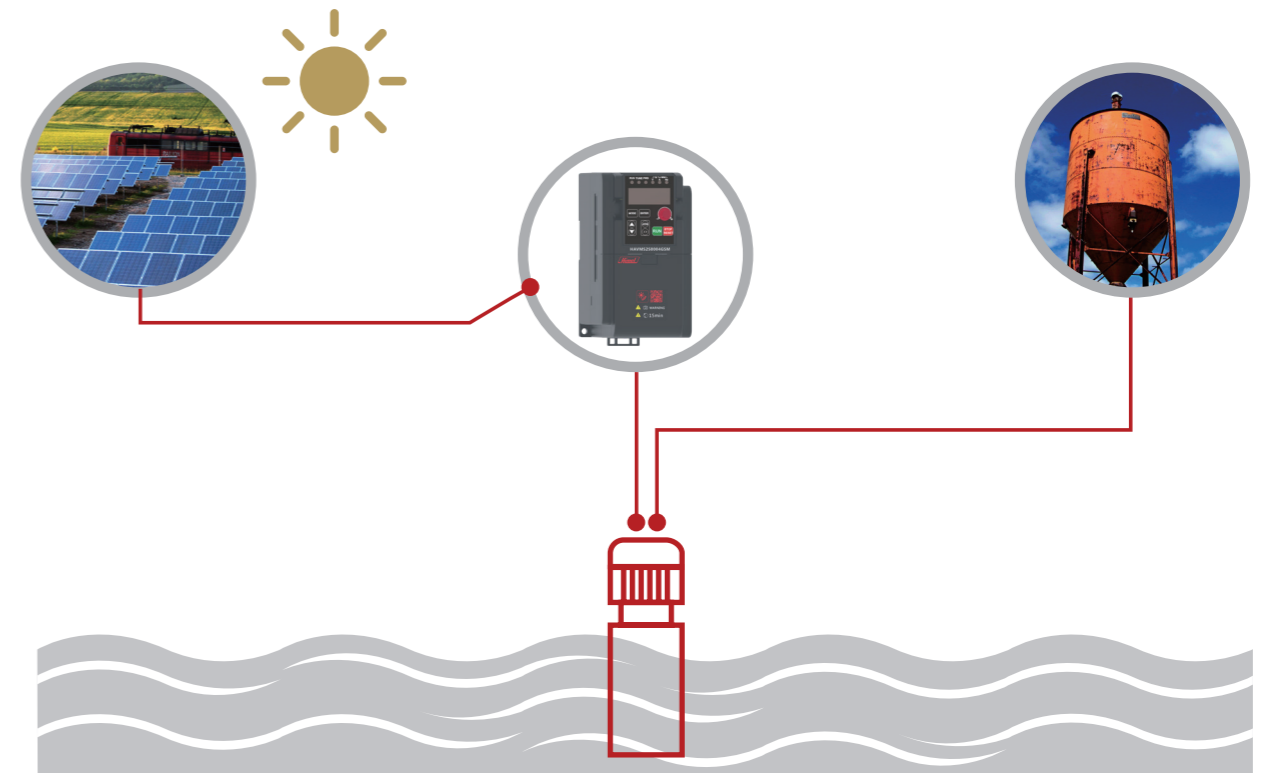
- Dry run detection.
- Voltage limit
- Overvoltage , overcurrent, overload protection
- Phase-loss protection
- Short-circuit protection



General Highlights

Features	Your benefits
Build-in MPPT	
	<ul style="list-style-type: none"> ◆ Maximum power point tracking ensures that you get the most power output possible from your solar panel ◆ maximizes the performance of your pump throughout the day
Easy to use	
	<ul style="list-style-type: none"> ◆ Compact design ◆ Easy to install with Din rail ◆ Can run with default setting ◆ One-key recovery function ◆ Makes it possible to use in smaller cabinets ◆ No need to set additional parameters anymore ◆ Easy to operate and maintain
Dual supply (AC & DC) capability	
	<ul style="list-style-type: none"> ◆ The VSD is customized to operate in dual supply mode ◆ The grid connected supply is used in the absence of energy from PV cells
Automatic start-run-stop	
	<ul style="list-style-type: none"> ◆ Automatic start and stop according to the power of solar cell ◆ With water level detection in the tank and pump overload and under-load protection ◆ No need to operate ◆ Save more time and maintain cost
Special program function	
	<ul style="list-style-type: none"> ◆ AVR function ◆ Energy meter ◆ Flow calculation ◆ Automatic adaptation in case of unstable power supply ◆ Visible energy savings and flow ◆ Easy system upgrade
Pump-specific protection	
	<ul style="list-style-type: none"> ◆ Dry run detection ◆ Voltage limit ◆ Overvoltage , overcurrent, overload protection ◆ Phase-loss protection ◆ Short-circuit protection ◆ Automatic adaptation in case of unstable power supply ◆ Long lifecycle running in high humidity and high dust occasions ◆ Easy to maintain

Target Application



Target Application



Successful Applications



Swimming Pool



Livestock



Fountain



Fish Farming





Irrigation





Domestic Water Supply

Specification

Range Name		Solar VSD	
Range type		*2S	*4T*
Design			
Capacity range	AC input voltage(V)	220(±15%)(1PH)	380(±15%)(3PH)
	Power rating	0.4~4kW	0.75~160kW
	Mix. DC voltage(V)	440	800
	Start voltage(V)	200	300
	Min. DC voltage(V)	150	250
	DC input range(V)	200~400	300~750
	MPPT working voltage(V)	330	550
Frequency	Input frequency	50/60Hz	50/60Hz
	Output frequency	0-400Hz	0-400Hz
Overload capacity	Capacity	150% for 1min, 180% for 3s	G Type:150% for 1 min, 180% for 3s P Type:120% for 1 min, 150% for 3s
Control method	V/f	√	√
	Sensorless vector control	√	√
	Eco mode control	-	-
Start torque		0.5Hz, 150%	G Type: 0.5Hz, 150% P Type: 0.5Hz, 100%
Built-in PID		√	√
Keypad		Removable Keyboard	Removable Keyboard
Display		LED	
Multispeed Sequence		-	
I/O	DI1-DI4	NPN/PNP, Input: 9-30VDC	
	AI1	V: 0-10V I: 0-20mA	
	AO1	V: 0-10V I: 0-20mA	
	RO(Ta, Tb, Tc)	NO: AC 250V below 3A/DC30V below 3A NC: AC 250V below 3A/DC30V below 3A	
Built-in communication (Max. speed)		0.4~22kW: extension card; ≥30kW: Build in	
Option	Communication	RS485, Modbus RTU (38.4kbps)	
	Extension operation panel	Support, cable length: 2m, 5m	
Functionality		MPPT function	
		Support AC/DC supply	
		Auto start-run-stop	
		Energy/ flow calculator	
		Low Light protection	
		Eco-mode/PID with sleep mode/Special pump protection	
Installation Way		Wall mounted, Din-rail	
Environment and certificate	Operation temperature	The ambient temperature of inverter is -10°C~50°C while air temperature change should be less than 0.5°C per minute. The inverter will be derated once ambient temperature exceeds 40°C. It is not recommended to use the inverter if ambient temperature is above 50°C	
	Humidity	≤95%RH	
	Altitude	≤1000m, no capacity reduction	
	IP level	IP20	
	Global certificates	CE	

Specification

Range Name		Solar VSD	
Range type		*2S/2S*	*4T*
Design			
Features	Velocity ratio	1:200	
	Velocity precision at steady state	≤±0.2%	
	Frequency precision	±0.01Hz	
	Frequency resolution	±0.01%	
	Torque rise	Integrated auto-torque raising function; with manual- setting: 0.1%~10.0%	
	V/F control curve definition	1: Straight line V/F curve; applying to the constant torque load2: Multi-dots V/F curve3: Torque-stepdown characteristic curve (1.3 order)4: Torque-stepdown characteristic curve (1.7 order)5: Torque-stepdown characteristic curve (2.0 order)6: Customized V/F(V/F separation)	
	Acceleration/Deceleration Time	four groups of ACC/DEC time which can be selected by F28	
	DC braking	Start frequency: 0.00~Max. output frequency; braking time: 0.0~50.0Sbraking current: 0.0~100%	
	Automatic voltage regulation(AVR)	The output voltage of the inverter is automatically adjusted to eliminate the influence of bus voltage fluctuations on the output voltage of the inverter	
	Auto current limitation	Limit current automatically to avoid tripping from frequent over current.	
Auto PMW adjustment	Can adjust the PWM frequency automatically according to the load characteristic		
Protection	Special pump protection	Voltage limit, dry run,pump load monitor,Motor overload	
	VSD protection function	Over-current, over-voltage, under-voltage, over-heat, over-load, short circuit,phase loss	
	Cooling	Air- cooling, Forced air cooling	

Reference Selection

Range Name	Series Name	Input	Adaptation	Inverter
HAV	SO	2S	0015	G
HA: Himel Automation		2: 220V 4: 380V – 440V	Adaptation 0004: 0.4kW 0007: 0.75kW 0015: 1.5kW 0022: 2.2kW 0040: 4kW	Torque Type G: Heavy-duty P: Normal-duty
V: VSD M: Motion H: HMI P: PLC	SO: Solar	S: Single-phase T: Three-phase		

Selection

• G type

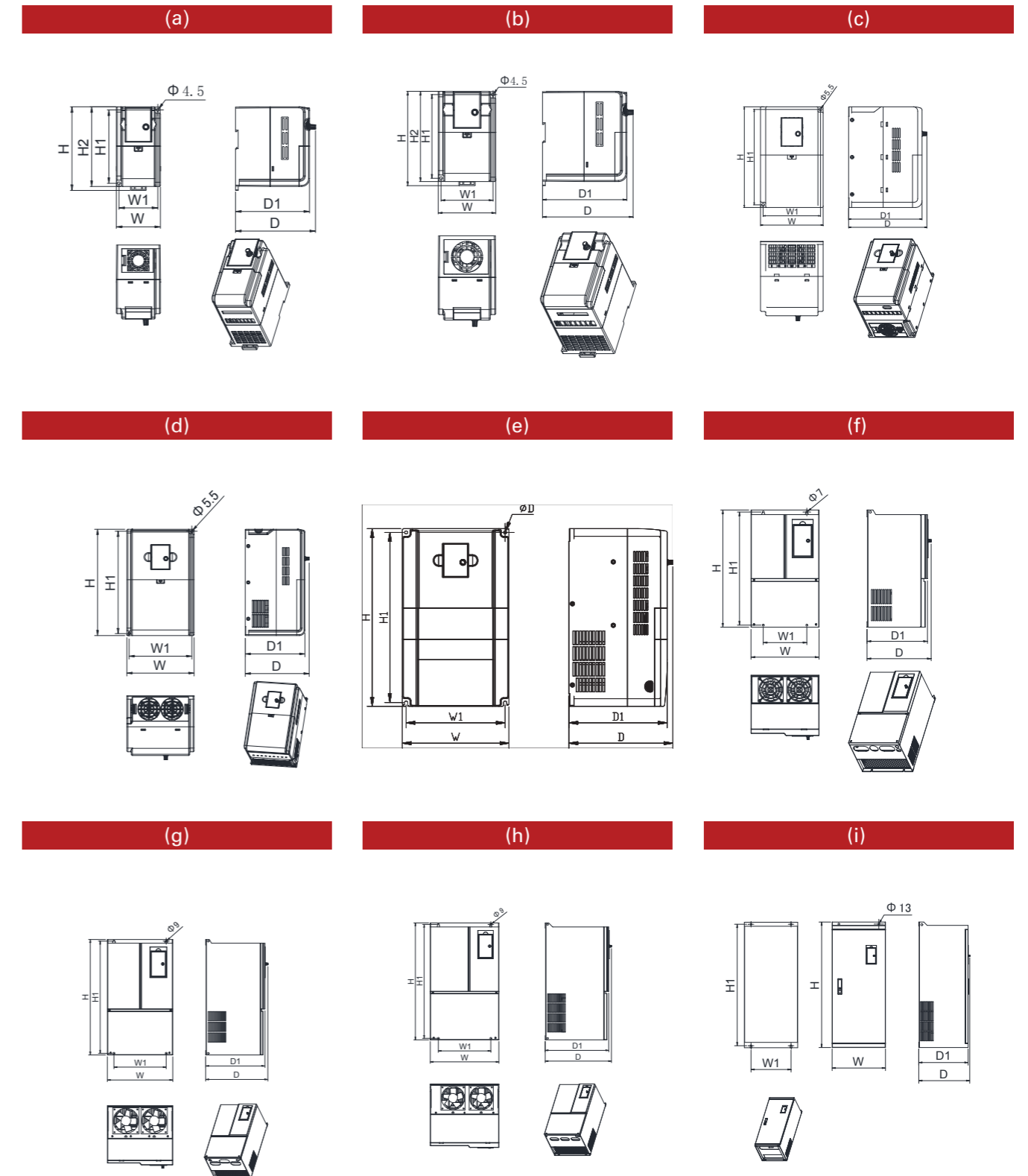
Range	Input Voltage	HIMEL-reference	Rated input current (A)	Heavy duty(constant torque) G-type			Dimensions (mm)			Mounting Dimensions (mm)			CAD No.
				Motor Power (kW)	Motor Power (HP)	Continuous Output Current (A)	W	H	D	W1	H1	D1	
AC:220V(±15%) Single Phase DC:150V-440V		HAVSO2S0004G	6.5	0.4	0.5	3	84	152	148.4	74	140	141	(a)
		HAVSO2S0007G	9.5	0.75	1.0	5	84	152	148.4	74	140	141	(a)
		HAVSO2S0015G	15.7	1.5	2.0	7	105	165	161.4	95	153	154	(b)
		HAVSO2S0022G	27	2.2	3.0	10	105	165	161.4	95	153	154	(b)
		HAVSO2S0040G	32.8	4	5.0	17	145	230	177.4	133	218	170	(c)
		HAVSO4T0007G	3.4	0.75	1.0	3	84	152	148.4	77	144	141	(a)
		HAVSO4T0015G	5	1.5	2.0	4.5	84	152	148.4	77	144	141	(a)
		HAVSO4T0022G	6.8	2.2	3.0	6	105	165	161.4	95	153	154	(b)
		HAVSO4T0040G	10.5	4	5.0	9.5	105	165	161.4	95	153	154	(b)
		HAVSO4T0055G	15.5	5.5	7.5	13	145	230	177.4	133	218	170	(c)
AC:380V(±15%) Three Phase DC:250V-800V		HAVSO4T0075G	20.5	7.5	10.0	17	145	230	177.4	133	218	170	(c)
		HAVSO4T0110G	26	11	15.0	25	180	285	167.4	168	273	160	(d)
		HAVSO4T0150G	35	15	20.0	32	180	285	167.4	168	273	160	(d)
		HAVSO4T0185G	38.5	18.5	25.0	37	210	350	205	198	335	193.5	(e)
		HAVSO4T0220G	46.5	22	30.0	45	210	350	205	198	335	193.5	(e)
		HAVSO4T0300G	62	30	40.0	60	250	430	235.5	160	415	220	(f)
		HAVSO4T0370G	76	37	50.0	75	250	430	235.5	160	415	220	(f)
		HAVSO4T0450G	92	45	60.0	90	300	530	285.5	240	515	270	(g)
		HAVSO4T0550G	113	55	75.0	110	300	530	285.5	240	515	270	(g)
		HAVSO4T0750G	157	75	100.0	152	340	580	328.5	260	565	313	(h)
HAVSO4T0900G	180	90	120.0	176	340	580	328.5	260	565	313	(h)		
HAVSO4T1100G	214	110	150.0	210	340	580	328.5	260	565	313	(h)		
HAVSO4T1320G	256	132	180.0	253	400	940	367	300/365	910	336	(i)		
HAVSO4T1600G	305	160	200.0	300	400	940	367	300/365	910	336	(i)		

Selection

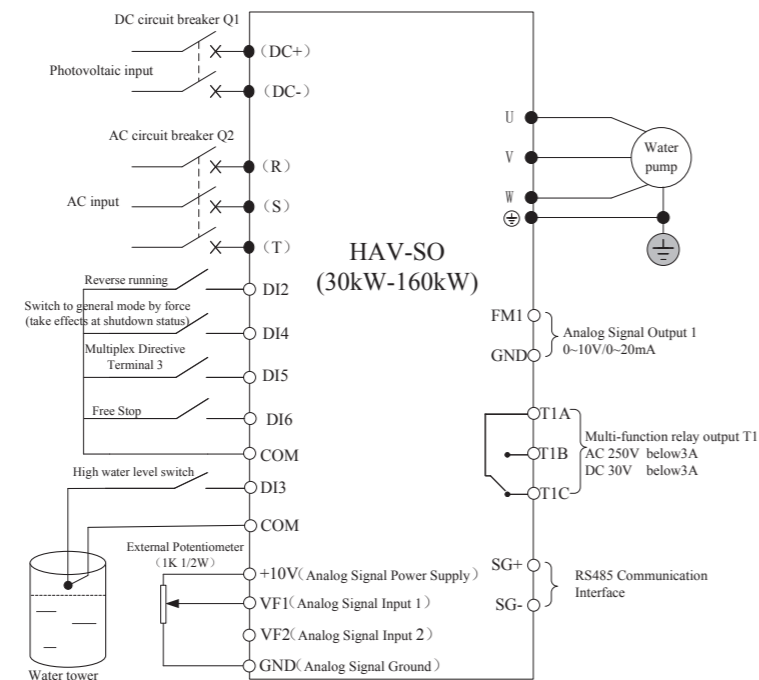
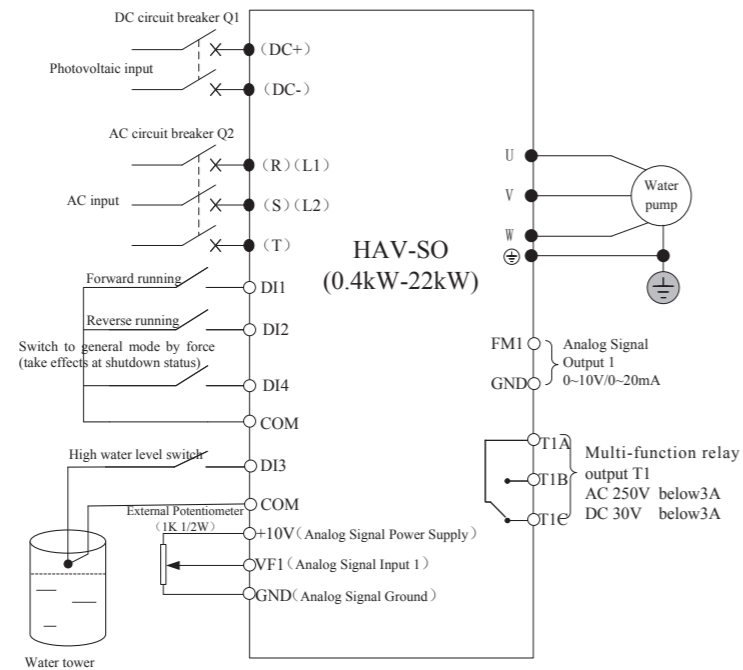
• P type

Range	Input Voltage	HIMEL-reference	Rated input current	Normal duty(Variable torque) P-type			Dimensions (mm)			Mounting Dimensions (mm)			CAD
				(A)	Motor Power (kW)	Motor Power (HP)	Continuous Output Current (A)	W	H	D	W1	H1	
Solar	AC: 380V(±15%) Three Phase DC: 250V-800V	HAVSO4T0015P	3.4	1.5	2	3	84	152	148.4	77	144	141	(a)
		HAVSO4T0022P	5	2.2	3	4.5	84	152	148.4	77	144	141	(a)
		HAVSO4T0040P	6.8	4	5	6	105	165	161.4	95	155	154	(b)
		HAVSO4T0055P	10.5	5.5	7.5	9.5	105	165	161.4	95	155	154	(b)
		HAVSO4T0075P	15.5	7.5	10	13	145	230	177.4	133	218	170	(c)
		HAVSO4T0110P	20.5	11	15	17	145	230	177.4	133	218	170	(c)
		HAVSO4T0150P	26	15	20	25	180	285	167.4	168	273	160	(d)
		HAVSO4T0185P	35	18.5	25	32	180	285	167.4	168	273	160	(d)
		HAVSO4T0220P	38.5	22	30	37	210	350	205	198	335	193.5	(e)
		HAVSO4T0300P	46.5	30	40	45	210	350	205	198	335	193.5	(e)
		HAVSO4T0370P	62	37	50	60	250	430	235.5	160	415	222	(f)
		HAVSO4T0450P	76	45	60	75	250	430	235.5	160	415	222	(f)
		HAVSO4T0550P	92	55	75	90	300	530	285.5	240	515	272	(g)
		HAVSO4T0750P	113	75	100	110	300	530	285.5	240	515	272	(g)
		HAVSO4T0900P	157	90	120	152	340	580	328.5	260	565	315	(h)
		HAVSO4T1100P	180	110	150	176	340	580	328.5	260	565	315	(h)
		HAVSO4T1320P	214	132	180	210	340	580	328.5	260	565	315	(h)
		HAVSO4T1600P	256	160	200	253	400	940	367	300/365	910	336	(i)
HAVSO4T1850P	305	185	245	300	400	940	367	300/365	910	336	(i)		

CAD Diagrams



Wiring Diagrams



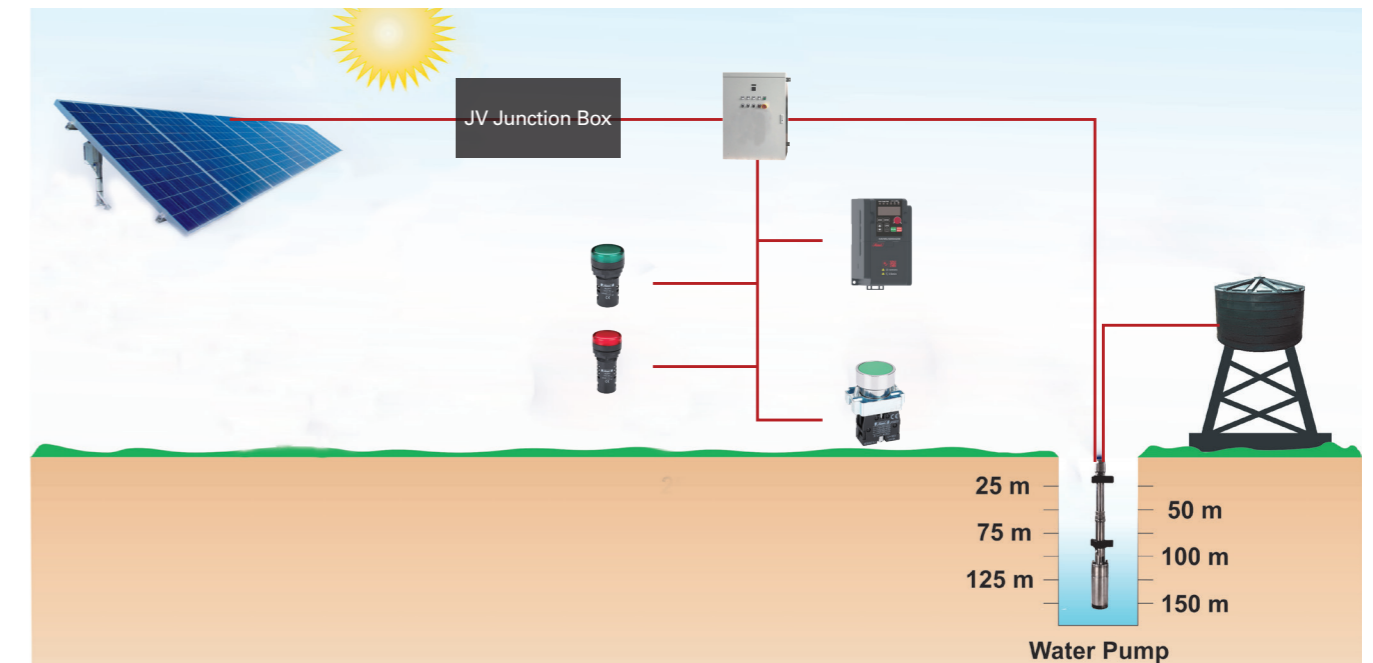
Accessories

Type	Commercial Reference	Short Description	Applicable Product		Pictures
			Applicable Commercial Reference	Specifications	
External Keypad	HAV-SO-ELCD	External keypad	All Solar series	All Solar series	
Keypad cable	HAV-SO-CAB	Keyboard extension cable, Length: 2m, 5m	HAVSO Series(0.4~160kW)	2S:0.4-4.0kW 4T:0.7-160kW	
GPRS module	HAV-SO-GT90	GPRS module remote monitoring	All Solar serie	All Solar series	
RS485 Communication Extension card	HAV-SO-485	Support MODBUS-RTU protocol	HAV-SO Series(0.4~22kW)	2S:0.4-4.0kW 4T:0.7-22kW	
Power frequency & PV switching solution	HAV-SO-AS055-2	Size: W×H×D:240×90×125 W1×H1×D:229×65×1254×Ø6	HAV-SO Series	2S:0.4-4.0kW	
	HAV-SO-AS055-4	Size: W×H×D:240×90×125 W1×H1×D:229×65×1254×Ø6	HAV-SO Series	4T:0.7-15kW	
	HAV-SO-AS110-4	Size: W×H×D:240×90×125 W1×H1×D:229×65×1254×Ø6	HAV-SO Series	4T:18.5-37kW	

* 2S = 200-240V Single Phase, 2T = 200-240V Three Phase, 4T = 380-440V Three Phase

* If you need an external LCD keypad, please remark that you need a Solar LCD keypad when ordering drive

Solar Pump Solution



Solar Array Selection

Range	Input Voltage	Commercial Reference	Solar panel selection			
			37±1V		45±1V	
			Cell panel power±5Wp	Panel per array*arraies	Panel power±5Wp	Panel per array*arraies
AC:220V(±15%) Single Phase DC:150V-440V		HAVSO2S0004G	250	11*1	300	9*1
		HAVSO2S0007G	250	11*1	300	9*1
		HAVSO2S0015G	250	11*1	300	9*1
		HAVSO2S0022G	250	11*1	300	9*1
		HAVSO2S0040G	250	11*2	300	9*2
		HAVSO4T0007G	250	18*1	300	15*1
		HAVSO4T0015G	250	18*1	300	15*1
		HAVSO4T0022G	250	18*1	300	15*1
		HAVSO4T0040G	250	18*2	300	15*2
		HAVSO4T0055G	250	18*2	300	15*2
AC:380V(±15%) Three Phase DC:250V-800V		HAVSO4T0075G	250	18*2	300	15*2
		HAVSO4T0110G	250	18*3	300	15*3
		HAVSO4T0150G	250	18*4	300	15*4
		HAVSO4T0185G	250	18*5	300	15*5
		HAVSO4T0220G	250	18*6	300	15*6
		HAVSO4T0300G	250	18*8	300	15*8
		HAVSO4T0370G	250	18*10	300	15*10
		HAVSO4T0450G	250	18*12	300	15*12
		HAVSO4T0550G	250	18*15	300	15*15
		HAVSO4T0750G	250	18*20	300	15*20
		HAVSO4T0900G	250	18*25	300	15*25
		HAVSO4T1100G	250	18*30	300	15*30
		HAVSO4T1320G	250	18*36	300	15*36
		HAVSO4T1600G	250	18*43	300	15*43

Electric Device Selection

Range	Input Voltage	Commercial Reference	AC Circuit Breaker	DC Circuit Breaker	AC contactor	SPD	Fuse
AC:220V(±15%) Single Phase DC:150V-440V		HAVSO2S0004G	16	16A/1000VDC	16	Type II 1000VDC	30A Fast fuse
		HAVSO2S0007G	16		16		
		HAVSO2S0015G	25	25A/1000VDC	25		
		HAVSO2S0022G	40		40		
		HAVSO2S0040G	50		50		
AC:380V(±15%) Three Phase DC:250V-800V		HAVSO4T0007G	10	16A/1000VDC	12		
		HAVSO4T0015G	10		12		
		HAVSO4T0022G	10		12		
		HAVSO4T0040G	25		25		
		HAVSO4T0055G	25	25A/1000VDC	25		
		HAVSO4T0075G	40		40		
		HAVSO4T0110G	50	63A/1000VDC	50		
		HAVSO4T0150G	63		63		
		HAVSO4T0185G	63	100A/1000VDC	63		
		HAVSO4T0220G	100		95		
		HAVSO4T0300G	100		95		
HAVSO4T0370G	125	125A/1000VDC	115				

Himel Soft Staters

Himel Basic (HASBS) is a full-digital intelligent soft-starter for asynchronous motors to effectively control the starting current for asynchronous motors. It is a desired alternative to reduced-voltage motor starters like star-delta, resistance/reactance or auto transformer methods.



Himel Expert (HASXS) is an advanced soft-starter with a built-in bypass contactor that can control the starting inrush current of asynchronous motors. The integrated contactor reduces the total number of external components (wiring and contactor etc.)



Capacity Range (Motor capacity in kW)																			
11	15	19	22	30	37	45	55	75	90	110	132	160	200	250	320	400	450	500	600
HAS-XS-4T																			
HAS-BS-4T																			

Multiple start methods

- Current limit soft start
- Ramp voltage soft start
- Ramp voltage + current limit soft start

High robustness

- High anti-interference capability
- Compact design

Motor protections

- Overcurrent, overload protection
- Phase-loss protection
- Over-heating protection
- 3-phase imbalance

Easy to use

- 24 hour monitoring
- Quick diagnosis

Highlights

Features		Your benefits
Multiple start methods		
	<ul style="list-style-type: none"> ◆ Current limit soft start ◆ Ramp voltage soft start ◆ Ramp voltage + current limit soft start 	<ul style="list-style-type: none"> ◆ Provides multiple starting methods to meet different application needs
High Robustness		
	<ul style="list-style-type: none"> ◆ High anti-interference capability ◆ Compact design ◆ 3 sets of thyristors to control start/stop voltage 	<ul style="list-style-type: none"> ◆ Better electromagnetic immunity against signal noises ◆ Supports longer connection cables. ◆ Unique compact design with double-layer shell consisting of plastic upper layer and metal lower layer makes it durable and nice looking ◆ 3 sets of thyristors provides better performance, safety and reliability
Motor protections		
	<ul style="list-style-type: none"> ◆ Overcurrent, overload protection ◆ Phase-loss protection ◆ Over-heating protection ◆ 3-phase imbalance 	<ul style="list-style-type: none"> ◆ Protect your motor against different abnormalities
Easy to use		
	<ul style="list-style-type: none"> ◆ Easy tuning ◆ 24-hour monitoring ◆ Quick diagnosis 	<ul style="list-style-type: none"> ◆ 8 segment LED display to monitor different parameters and troubleshooting. ◆ Easy to maintain

Himel Soft Starters

Range		HASBS	HASXS
Applications		Controlled acceleration/deceleration of simple and complex machines	
Design			
Power Range	Three Phase 380...440V	11...600kW	
Drive	Control Type	Current limit, voltage ramp, voltage ramp + current limit	
Functions	Bypass	Need to install externally	Integrated
	Operation control mode	Keypad/external terminals/RS485 Modbus communication	
	Start mode	Current limit/voltage limit/current + voltage limit	
	Adjustable Acceleration/Deceleration time	√	√
	Start delay	√	√
	Emergency stop	√	√
	Current Limit function	√	√
	Initial voltage setting	√	√
	No/Light load detection	Protects against accidents such as belt tripping	
	Auto-restart	√	√
	Fault signal	Relay output - AC 250V 5A, DC 30V 5A	
	Multifunction relay output	Start delay, start, running, stop, complete stop, restart	
	Analog output	0~20mA / 4~20mA, optional	
	Protections	Overcurrent, overload, overheat, phase imbalance, phase-loss, light load, external fault	
Alarms	Emergency shutdown, light load and restart		
Keypad		Pluggable	
Working Conditions	Rated insulation voltage	660V	
	Rated impulse withstand voltage	4kV	
IP rating	IP20	11 to 55kW	-
	IP00	75 to 600kW	11 to 600kW
Environment	Operation frequency	≤ 12 times/h	
	Ambient temperature	-10°C~ 40°C(Derating above 40°C)	
	Storage temperature	-20 °C ~ 65 °C	
	Ambient humidity	Max. 90 % RH (no condensation)	
	Altitude	< 1,000 m (Deration above 1,000 m)	
	Vibration	< 5.9m/s² (=0.6g)	
Type	No corrosive/inflammable gas, oil mist, dust or others		
Cooling Method	Natural air cooling	11 to 600kW	11 to 75kW
	Forced air cooling	-	93 to 600kW

BASIC Series (HASBS)

Presentation

Himel BASIC soft-starter(HASBS) is an intelligent soft-starter featuring latest electronic, micro-processing and control technology. It offers effective control for the starting current of asynchronous motors via voltage control. It is an ideal alternative to the reduced voltage starters like star-delta, resistance/reactance or auto-transformer methods.

It can cover motors from 11kW to 600kW.

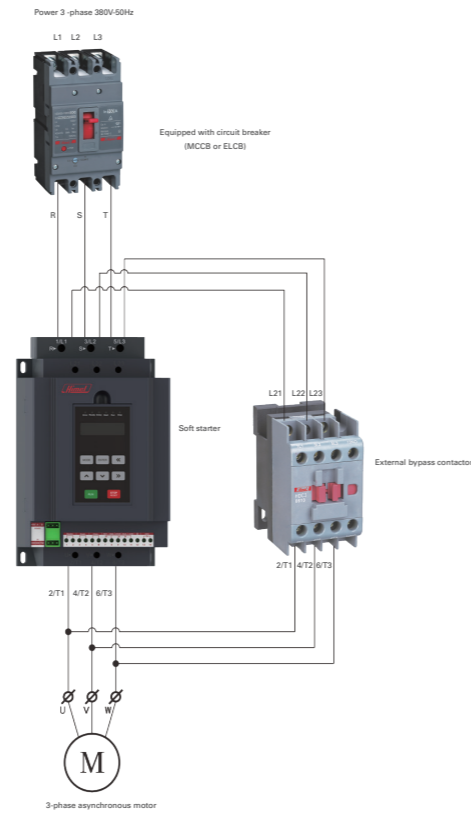
Applications

With its unique, compact design it can be used in harsh environments with the focus on human and other equipment safety. It can be used in typical building or industrial applications:

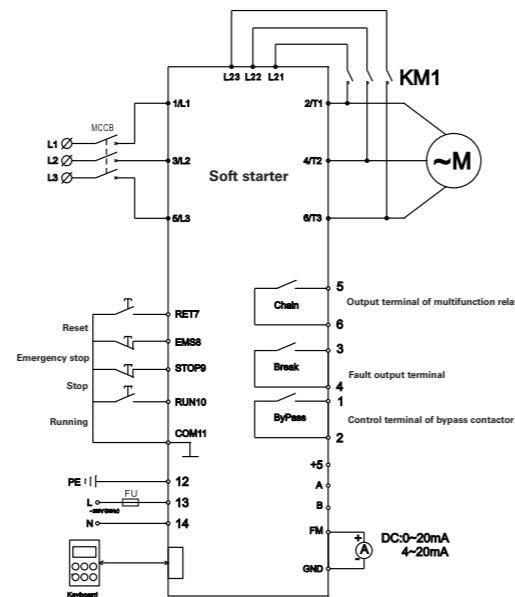
- Pumps
- Fans
- Compressors
- Conveyers
- Complex and advanced machines

Features

- HASBS has 3 starting modes: current-limit, voltage ramp and current limit + voltage ramp.
- Built-in protections include overcurrent, phase loss, short circuit and overheat.
- Multiple control ways like keypad, I/O terminals and Modbus communication.
- Multifunctional output relays provide different signals based on application requirements.



Connection diagram



Wiring diagram

EXPERT Series (HASXS)

Presentation

Himel Expert Soft-starter(HASXS) is an advance soft-starter to control the starting and stopping of asynchronous motors via voltage control. It can cover motors from 11kW to 600kW. HASXS comes with a built-in bypass contactor hence reducing the total number of external components required by the system.

The starting inrush current to the motor is controlled by managing the voltage to the motor. Silicon-controlled rectifiers (SCRs) are used to control the voltage. These SCRs are bypassed at the end of starting phase using built-in contactor.

Integrated keypad allows user to program the soft-starter and monitor different parameters according to the customer requirements.

Applications

Himel Expert soft-starter (HASXS) is designed for rugged applications with the focus on safety and reduced commissioning times. It can be used in typical building or industrial applications:

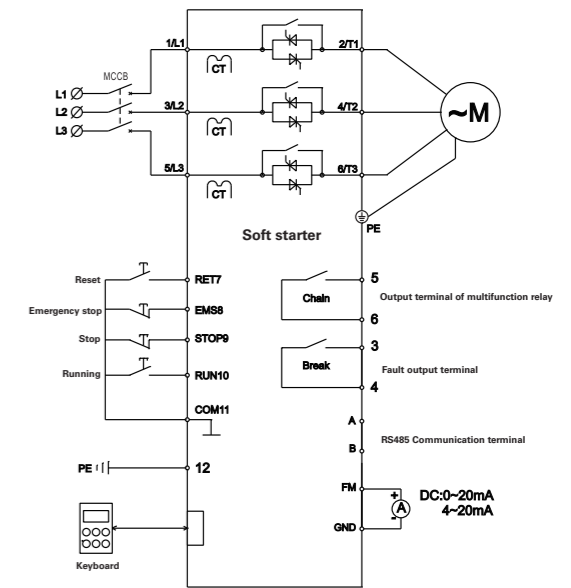
- Pumps
- Fans
- Compressors
- Conveyers
- Complex and advanced machines

Features

- Integrated bypass contactor.
- HASXS has 3 starting modes: current-limit, voltage ramp and current limit + voltage ramp.
- High performance microprocessor makes it highly reliable.
- Opto-electronic isolation provides high anti-interference performance.
- New optimized and compact design
- Built-in protections include overcurrent, phase loss, short circuit and overheat.
- User can monitor different system parameters hence making it easy to maintain



Connection diagram



Wiring diagram

Reference rules

Range name	Series Name	Input	Adaptation	Type
HAS	BS	4T	0015	G
HA: Himel Automation	BS: Basic XS: Expert	4: 380V – 440V	0110: 11kW 0185: 18.5kW 1100: 110kW	P: Normal-Duty G: Heavy Duty
V: VSD S: Soft Starter M: Motion H: HMI P: PLC		T: Three-phase		

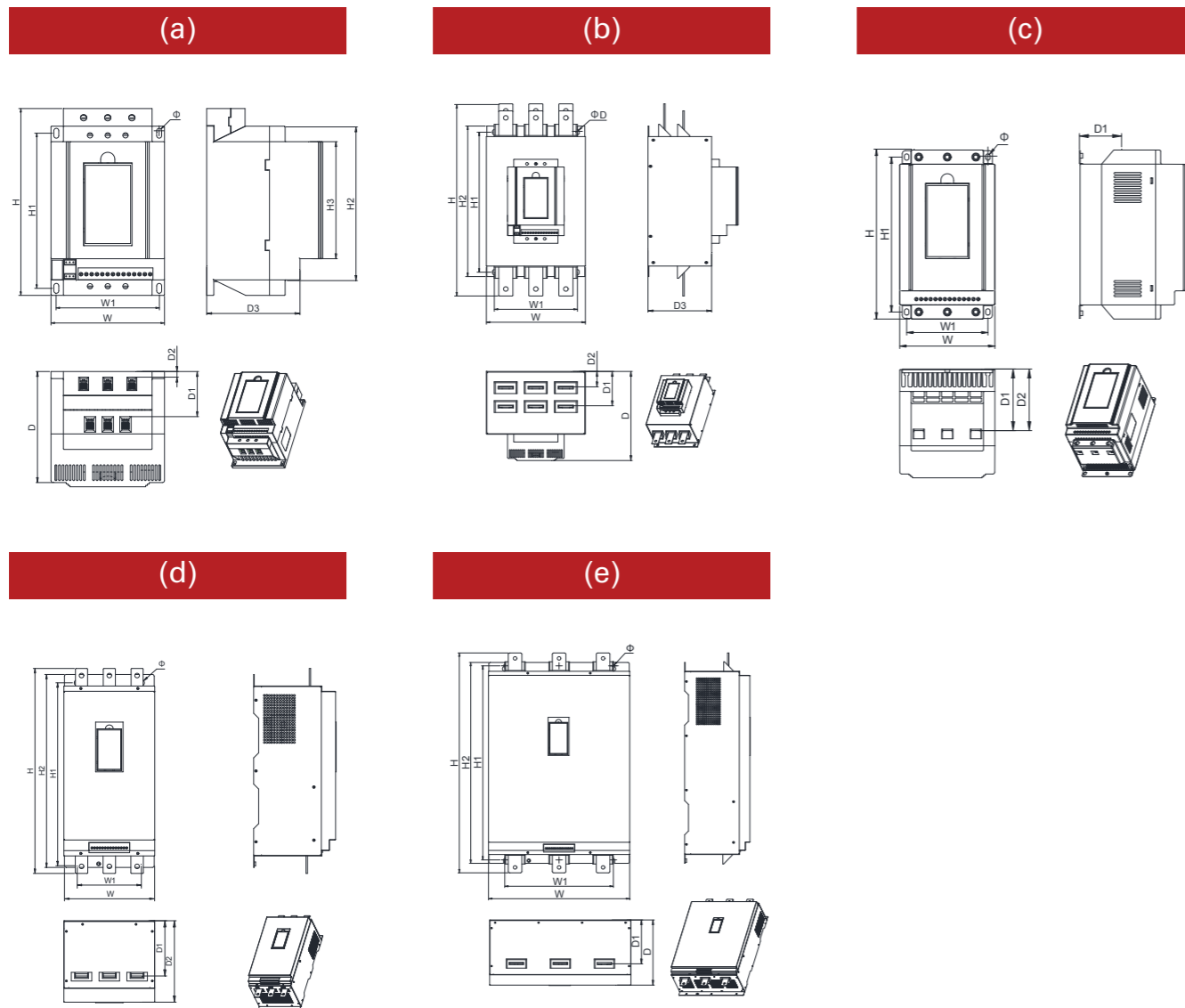
References and Dimensions

Range	Input Voltage	Himel reference	Motor Power (kW)	Motor Power (HP)	Rated Output Current (A)	Dimensions(mm)			Mounting Dimensions (mm)					Contactor	Mounting Hole Diameter (mm)	CAD Diagram
						W	H	D	W1	H1	D1	D2	D3			
HASBS	380-440V Three Phase	HASBS4T0110G	11	15	25	160	265	164	145	220	67	10	111	HDC32511	8	(a)
		HASBS4T0150G	15	20	32	160	265	164	145	220	67	10	111	HDC33211	8	
		HASBS4T0185G	18.5	25	37	160	265	164	145	220	67	10	111	HDC33811	8	
		HASBS4T0220G	22	30	45	160	265	164	145	220	67	10	111	HDC35011	8	
		HASBS4T0300G	30	41	60	160	265	164	145	220	67	10	111	HDC36511	8	
		HASBS4T0370G	37	50	75	160	265	164	145	220	67	10	111	HDC38011	8	
		HASBS4T0450G	45	61	90	160	265	164	145	220	67	10	111	HDC39511	8	
		HASBS4T0550G	55	75	110	160	265	164	145	220	67	10	111	HDC3S120	8	
		HASBS4T0750G	75	102	152	280	534	255	230	430	98	44	180	HDC3S150	10	
		HASBS4T0900G	93	127	176	280	534	255	230	430	98	44	180	HDC3S185	10	
		HASBS4T1100G	110	150	210	280	534	255	230	430	98	44	180	HDC3S225	10	(b)
		HASBS4T1320G	132	180	253	280	534	255	230	430	98	44	180	HDC3S250	10	
		HASBS4T1600G	160	218	300	280	534	255	230	430	98	44	180	HDC3S330	10	
		HASBS4T2000G	200	272	380	310	594	255	265	475	98	44	180	HDC3S400	10	
		HASBS4T2500G	250	340	480	310	594	255	265	475	98	44	180	HDC3500	10	
		HASBS4T3200G	320	435	600	310	594	255	265	475	98	44	180	HDC3630	10	
		HASBS4T4000G	400	544	750	416	740	275	375	555	106	44	200	-	10	
		HASBS4T4500G	450	612	892	416	740	275	375	555	106	44	200	-	10	
		HASBS4T5000G	500	680	930	416	740	275	375	555	106	44	200	-	10	
		HASBS4T6000G	600	816	1100	416	740	275	375	555	106	44	200	-	10	




References and Dimensions

Range	Input Voltage	Himel reference	Motor Power (kW)	Motor Power (HP)	Rated Output Current (A)	Dimensions(mm)			Mounting Dimensions (mm)					Contactor	Mounting Hole Diameter (mm)	CAD Diagram
						W	H	D	W1	H1	D1	D2	D3			
HASXS	380-440V Three Phase	HASXS4T0110G	11	15	25	150	264	170	128	262	242	96	96	HDC32511	7	(c)
		HASXS4T0150G	15	20	32	150	264	170	128	262	242	96	96	HDC33211	7	
		HASXS4T0185G	18.5	25	37	150	264	170	128	262	242	96	96	HDC33811	7	
		HASXS4T0220G	22	30	45	150	264	170	128	262	242	96	96	HDC35011	7	
		HASXS4T0300G	30	41	60	150	264	170	128	262	242	96	96	HDC36511	7	
		HASXS4T0370G	37	50	75	150	264	170	128	262	242	96	96	HDC38011	7	
		HASXS4T0450G	45	61	90	150	264	170	128	262	242	96	96	HDC39511	7	
		HASXS4T0550G	55	75	110	200	384	226	165	345	360	137.5	137.5	HDC3S120	7	
		HASXS4T0750G	75	102	152	200	384	226	165	345	360	137.5	137.5	HDC3S150	7	
		HASXS4T0900G	93	127	176	255	579	230	180	520	545	160	151	HDC3S185	9	
		HASXS4T1100G	110	150	210	255	579	230	180	520	545	160	151	HDC3S225	9	
		HASXS4T1320G	132	180	253	255	579	230	180	520	545	160	151	HDC3S250	9	
		HASXS4T1600G	160	218	300	255	579	230	180	520	545	160	151	HDC3S330	9	
		HASXS4T2000G	200	272	380	300	684	235	235	620	650	159	154	HDC3S400	9	
		HASXS4T2500G	250	340	480	300	684	235	235	620	650	159	154	HDC3500	9	
		HASXS4T3200G	320	435	600	300	684	235	235	620	650	159	154	HDC3630	9	
		HASXS4T4000G	400	544	750	520	810	240	400	715	740	166	163	-	9	
		HASXS4T4500G	450	612	892	520	810	240	400	715	740	166	163	-	9	
		HASXS4T5000G	500	680	930	520	810	240	400	715	740	166	163	-	9	(e)
		HASXS4T6000G	600	816	1100	520	810	240	400	715	740	166	163	-	9	

CAD Diagrams



Accessories

Type	Commercial Reference	Short Description	Applicable Product		Pictures
			Applicable Commercial Reference	Specifications	
External keypad	HASLKD	External keypad	All basic and Expert series	All basic and Expert series	
Keypad cable	HASCAB01	Keypad cable length 1m	All basic and Expert series	All basic and Expert series	
	HASCAB02	Keypad cable length 2m	All basic and Expert series	All basic and Expert series	
Keypad bracket	HASJPT	Keypad holder for external keypad	All basic and Expert series	All basic and Expert series	

Selection Reference

Machine Type	Load Type	Start Mode			Value Setting		Start Time
		Voltage	Current	Heavy Load	Voltage (%)	Current (%)	
Centrifugal pump	Standard load(ND)		√	√		250	5
Fan	Standard load(ND)		√			250	5
Compressor (pistol)	Standard load(ND)		√			300	10
Compressor (centrifugal)	Standard load(ND)	√			30		20
Conveyor	Standard load(ND)		√	√		250	10
Mixer	Standard load(ND)		√	√		350	5
Ball mill	Heavy load(HD)		√		70	400	50
Crusher	Heavy load(HD)	√			60		45

Notes

Global sales, global service



Support and Consulting Services

Illustration of five customer service representatives wearing headsets and working at computers.

Training Services

Illustration of a woman in a business suit presenting at a whiteboard with charts.

Spare Parts Services

Illustration of three interlocking gears.

Repair Services

Illustration of a wrench and a screwdriver crossed.



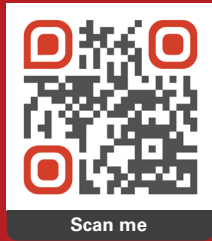
Contact Himel team

support@himel.com



Contact local distributor

- Company name:
- Contact:
- Tel:
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- Address:



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