



# SMART PUMP SOLAR VSD

[www.himel.com](http://www.himel.com)

## MOTOR MANAGEMENT

# SMART Pump Variable Speed Drives



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, sensor-less flow 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.

### Online Content



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

\*4T: 380V 3 phase | \*\*2T: 220V 3 phase

### Improved Energy Savings

With many integrated control modes like ECO-mode, V<sup>2</sup>/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

### 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



# SMART Pump Variable Speed Drives



## SMART Pump Variable Speed Drive

Specialist for pump and fan



### IMPROVED ENERGY SAVINGS

- 3 integrated control modes – ECO-mode, V2/F, and PID with sleep mode



### ROBUST OPERATIONS

- Perfect for harsh environments
- Built-in category C3 EMC filter ( $\geq 11\text{kW}$ )



### SPECIAL PROGRAM FUNCTIONS

- Multi-pump control
- Energy meter
- Flow calculation
- Pump cleaning
- Fire override mode
- Dual Ramp



### PUMP SPECIFIC PROTECTION

- Dry run detection
- Frost and condensation protection
- Hammer effect protection
- Phase-loss and short-circuit protection



### PC TOOL - HIMEL STUDIO

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




### SUPPORT FOR MOST COMMUNICATION PROTOCOLS

- Supports most popular 3 protocols in the pump & fan applications
- Build in Modbus RTU/RS485 port
- Build in Modbus TCP/RJ45 port
- BACnet IP extension card

# SMART Pump Variable Speed Drives




## Specifications

Range Name		SMART Pump
Design		
Capacity range	Three phase 200V Class	AC: 200V(-15%)-240V(+10%) 2.2~45kW
	Three phase 400V Class	AC:380V(-15%)~440V(+10%) 2.2~160kW
Frequency	Input frequency	50/60Hz
	Output frequency	0-599Hz
Overload capacity		120% for 1min
Control method	V/f	√
	Sensorless vector control	√
	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
	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	
	NO: 24VDC 3A/ 250VAC 5A NC: 24VDC 3A/ 250VAC 3A	
Built-in communication (Max. speed)		RS485, ModbusTCP/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
Installation Way		Wall mounted, cabinet, flange installation
Dust Shields		√
EMC Filter	C2	—
	C3	Built-in EMC filter (≥11kW)
Braking unit		Built-in (≤22kW)
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

# SMART Pump Variable Speed Drives

## 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 <sup>1.7</sup> /F, V <sup>1.2</sup> /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: 0.00~60.00Hz; braking time: 0.0~30.0S; braking current: 0.0~100%
	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
<b>HAV</b>	<b>SP</b>	<b>4T</b>	<b>0110</b>	<b>P</b>
	↓	↓	↓	↓
HA: Himel Automation	S:SMART	2: 220V 4: 380V – 440V	0022: 2.2kW 0075: 7.5kW 0110: 11kW 0185: 18.5kW 1100: 110kW .....	P: Normal-duty
V: VSD	P: Pump	T: Three-phase		

# SMART Pump Variable Speed Drives



## References

Input Voltage	Commercial Reference	Selection			Overload Output Current	
		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%	
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%
	HAVSP4T0550P	55	75	110	132	120%
	HAVSP4T0750P	75	100	157	188.4	120%
	HAVSP4T0900P	90	125	180	216	120%
	HAVSP4T1100P	110	150	214	256.8	120%
HAVSP4T1320P	132	175	256	307.2	120%	
HAVSP4T1600P	160	200	307	368.4	120%	

# SMART Pump Variable Speed Drives

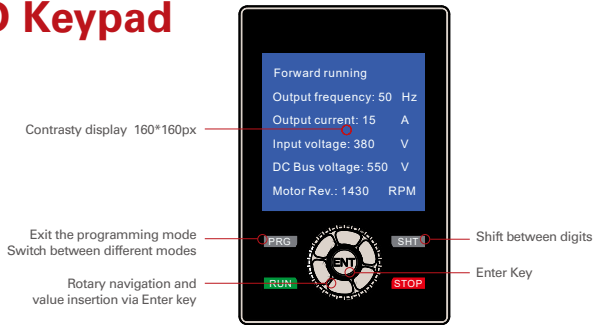


## Dimensions

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	(b)
	HAVSP2T0185P	235	370	235	218	350	200	146	7	
	HAVSP2T0220P	305	490	275	200	470	270	211	10	
	HAVSP2T0300P	305	490	275	200	470	270	211	10	
AC: 380-440V Three Phase	HAVSP2T0370P	320	560	307	197	543	302	240	10	(b)
	HAVSP2T0450P	320	560	307	197	543	302	240	10	
	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	(b)
	HAVSP4T0450P	305	490	275	200	470	270	211	10	
	HAVSP4T0550P	305	490	275	200	470	270	211	10	
	HAVSP4T0750P	320	560	307	197	543	302	240	10	
HAVSP4T0900P	320	560	307	197	543	302	240	10		
HAVSP4T1100P	320	560	307	197	543	302	240	10		
HAVSP4T1320P	355	678	319	240	659	314	261	11	(b)	
HAVSP4T1600P	355	678	319	240	659	314	261	11		

# SMART Pump Variable Speed Drives

## LCD Keypad



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

## VSD Accessories

Type	Commercial Reference	Short Description	Applicable Product		Pictures
			Applicable Commercial Reference	Specifications	
IO extension card	HAVSPIO3DI3R	IO extension card with 3 DI and 3 relay	HAVSP4T0022P ~ HAVSP4T1600P	4T*: 2.2 - 160kW	
Keypad bracket	HAVXSJPT	Keypad holder for external keypad	HAVSP4T0022P ~ HAVSP4T1600P	4T*: 2.2 - 160kW	
External Keypad	HAVSPLKD**	External keypad	HAVSP4T0022P ~ HAVSP4T1600P	4T*: 2.2 - 160kW	
	HAVSPLCD	LCD keypad	HAVSP4T0022P ~ HAVSP4T1600P	4T*: 2.2 - 160kW	
Keypad cable	HAVXSCAB2	Length 2m	HAVSP4T0022P ~ HAVSP4T1600P	4T*: 2.2 - 160kW	
	HAVXSCAB5	Length 5m	HAVSP4T0022P ~ HAVSP4T1600P	4T*: 2.2 - 160kW	
Communication card	HAVSPBACNET	Extension communication card	HAVSP4T0022P ~ HAVSP4T1600P	4T*:2.2-160kW	

\*4T: 380V 3 Phase | \*\* All VSDs have built-in removable keypad. HAVSPLKD is sold as a spare part.





## Contact us



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