



## SMART Series

Himel variable speed drive for pumps and fans

Reliable made affordable.



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## TARGET APPLICATIONS

### Wide range for wide applications

Supporting up to 850kW AC motors, 220V to 440V power input, SMART series can meet most of your applications.

### Abundant functions

Built-in PID  
Simple PLC function  
Built-in braking unit under 18.8kW

### Environment adaptability

Humidity-proof, dust-proof and oil-proof PCBA boards  
Dust preventing film accessory for heavy dusty environment



### PUMP

Irrigation  
Paper mill and pulp pump  
Fountain  
Sewage pump  
Sand pump  
Fire patrol pump  
Rod pump  
Circulation pump  
Photovoltaic pump  
...



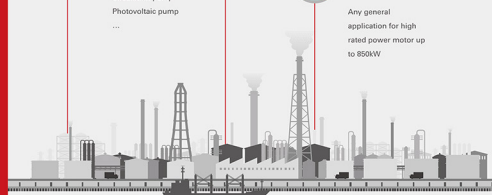
### FAN

- Drying
- Ventilation
- Dust removing
- Industrial fan
- Air blowing
- Hot surface treatment
- Air supply fan for boiler
- ...



### High rating general purpose

Any general application for high rated power motor up to 850kW





Sensor-less vector control variable speed drives designed for your pumps and fans

**Universal:** 1kW...45kW, 220V, single phase AC  
11kW...850kW, 380V – 440V, three phase AC

### Excellent performance

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

### Abundant Functions and Flexible Configuration

Built-in PID; Multi-speed (8 stages speed at most); Simple PLC  
High speed impulse input and output function  
Built-in braking unit including and below 18.5KW; Built-in standard MODBUS communication protocol  
Optional double analog (AO) output

### Excellent adaptability

All boards are coated with "Comprehensive anti-corrosion paint" to make frequency inverter humidity-proof, dust-proof and oil-proof.  
Rich protection functions in order to adapt to different environments such as over-voltage, under-voltage, input phase-loss, over-load, over-heat, over-current etc.

## OVERALL DIMENSIONS

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

\* W1 and H1 are mounting dimensions

## PRODUCT SPECIFICATION

|                            |  |  |
|----------------------------|--|--|
| Main control function      | Modulation mode  | Space voltage vector control   |
|                            | Control mode   | Sensorless vector control (SVC)  |
|                            | Frequency accuracy   | Digital setting: Max frequency $\pm 0.01\%$<br>Analog setting: Max frequency $\pm 0.2\%$   |
|                            | Frequency resolution   | Digital setting: 0.01Hz<br>Analog setting: Max frequency $\times 0.1\%$  |
|                            | Starting Frequency   | 0.0Hz – 10.00Hz  |
|                            | Torque rise  | Auto torque rise, manual torque rise 1% – 30.0% (valid for V/f)  |
|                            | V/f curve  | Three ways: Linear V/f curve, square V/f curve, user self-defined V/f curve  |
|                            | Accelerator/deceleration time  | Optional time unit (Min/s). Max time: 3600s (settable in the range of 0.1 – 3600s)   |
|                            | DC braking   | Optional for both starting and stopping, operating frequency: 0 – 20Hz, operating time: 0 – 30s  |
|                            | Jogging  | Jogging frequency range: 0.3Hz – 50.00Hz;<br>Jogging acceleration and deceleration time: 0.1 – 3600s.  |
| Built-in PID               | Convenient for closed loop control system, applicable for course control like pressure and flow etc.         |  |
| Multi-speed operation      | Realize multi-speed operation by built-in PLC or control terminal.   |  |
| Weaving wobble frequency   | Can get wobble frequency of adjustable central frequency   |  |
| Auto voltage adjustment    | When input voltage changes, the output voltage can be kept constant by adjusting PWM output (AVR function).  |  |
| Auto energy-saving         | According to load condition, V/f curve can be optimized for automatic energy-saving.                         |  |
| Auto current limiting      | Limit in-service current automatically, so as to avoid tripping for a fault caused by frequent over current. |  |
| Sensor-less vector control | Transient torque   | 150% output torque at 1Hz, rev accuracy: 0.1%  |
|                            | Motor parameters automatic read  | Can automatically read motor parameters, in order to achieve optimal control.  |
|                            | Operational methods  | Manual, using control terminal; using serial port; three way control using output collector terminals.   |
| Running function           | Frequency setting methods  | Using keypad analog potentiometer, keypad ▲, ▼ keys; setting functional code digits; using serial port; UP/DOWN terminal digit setting; using analog voltage/current signal; using pulse at a terminal; using combination of both voltage and current signals; switching between any of the above methods using external terminal. |
|                            | Switch input methods   | External forward/reverse command using terminals, using 8 input terminals to select 30 different functions.  |
|                            | Analog input methods   | Two analog signal input terminals with 0 – 20mA, 0 – 10V options available.  |
| Operating panel            | Analog output methods  | 0 – 10V / 0 – 20mA analogue output signal for setting physical quantities such as frequency etc.   |
|                            | Switch output methods  | Three programmable open collector outputs; One relay output signal; can be used to set different physical quantities.  |
|                            | LED display  | 27 different parameters like frequency, output voltage, output current etc. can be displayed on LED.   |
| Protection function        | Display external instrument  | Display output frequency, output current, and output voltage and so on.  |
|                            | Optional   | Overcurrent, overvoltage, undervoltage, overheat and over-load protection.   |
| Environment                | Service location   | Indoor/outdoor environments such as dusty, corrosive gas, oil fog, steam and so on.  |
|                            | Altitude   | Lower than 1000m (rated use at higher than 1000m)  |
|                            | Environment temperature  | -10°C – +40°C  |
| Structure                  | Humidity   | Less than 90% RH, no condensation  |
|                            | Vibration  | Less than 5.3m/s <sup>2</sup> (0.6M)   |
|                            | Storage temperature  | -20°C – +60°C  |
| Installation Way           | Protection class   | IP20   |
|                            | Cooling way  | Airblast cooling<br>Wall-hanging, cabinet  |

## REFERENCES



| SMART Series                           | Heavy duty (constant torque) G-type |                               | Light overload (variable torque) P-type |                               |
|--|-------------------------------------|-------------------------------|---|-------------------------------|
|  | Motor Power (kW)                    | Continuous Output Current (A) | Motor Power (kW)                        | Continuous Output Current (A) |
| Three-phase supply voltage: 200...240V |                                     |                               |   |                               |
| HAV-SU-2T0075G-0110P                   | 7.5                                 | 26.67                         | 11                                      | 39                            |
| HAV-SU-2T0110G-0150P                   | 11                                  | 39                            | 15                                      | 52.5                          |
| HAV-SU-2T0150G-0185P                   | 15                                  | 52.5                          | 18.5                                    | 62.35                         |
| HAV-SU-2T0185G-0220P                   | 18.5                                | 62.35                         | 22                                      | 73.6                          |
| HAV-SU-2T0220G-0300P                   | 22                                  | 73.6                          | 30                                      | 98.7                          |
| HAV-SU-2T0300G-0370P                   | 30                                  | 98.7                          | 37                                      | 121                           |
| HAV-SU-2T0370G-0450P                   | 37                                  | 121                           | 45                                      | 146.7                         |
| HAV-SU-2T0450G-0550P                   | 45                                  | 146.7                         | 55                                      | 188.8                         |
| Three-phase supply voltage: 380...415V |                                     |                               |   |                               |
| HAV-SU-4T0110G-0150P                   | 11                                  | 25                            | 15                                      | 33                            |
| HAV-SU-4T0150G-0185P                   | 15                                  | 33                            | 18.5                                    | 39                            |
| HAV-SU-4T0185G-0220P                   | 18.5                                | 39                            | 22                                      | 45                            |
| HAV-SU-4T0220G-0300P                   | 22                                  | 45                            | 30                                      | 60                            |
| HAV-SU-4T0300G-0370P                   | 30                                  | 60                            | 37                                      | 75                            |
| HAV-SU-4T0370G-0450P                   | 37                                  | 75                            | 45                                      | 91                            |
| HAV-SU-4T0450G-0550P                   | 45                                  | 91                            | 55                                      | 112                           |
| HAV-SU-4T0550G-0750P                   | 55                                  | 112                           | 75                                      | 150                           |
| HAV-SU-4T0750G-0930P                   | 75                                  | 150                           | 93                                      | 176                           |
| HAV-SU-4T0930G-1100P                   | 93                                  | 176                           | 110                                     | 210                           |
| HAV-SU-4T1100G-1320P                   | 110                                 | 210                           | 132                                     | 260                           |
| HAV-SU-4T1320G-1600P                   | 132                                 | 260                           | 160                                     | 310                           |
| HAV-SU-4T1600G-1850P-S                 | 160                                 | 310                           | 185                                     | 340                           |
| HAV-SU-4T1850G-1850P-S                 | 160                                 | 310                           | 185                                     | 340                           |
| HAV-SU-4T1850G-2000P-S                 | 185                                 | 340                           | 200                                     | 385                           |
| HAV-SU-4T1850G-2000P-S                 | 185                                 | 340                           | 200                                     | 385                           |
| HAV-SU-4T2000G-2200P-S                 | 200                                 | 385                           | 220                                     | 430                           |
| HAV-SU-4T2000G-2200P-S                 | 200                                 | 385                           | 220                                     | 430                           |
| HAV-SU-4T2200G-2500P-S                 | 220                                 | 430                           | 250                                     | 475                           |
| HAV-SU-4T2200G-2500P-S                 | 220                                 | 430                           | 250                                     | 475                           |
| HAV-SU-4T2500G-2800P-S                 | 250                                 | 475                           | 280                                     | 535                           |
| HAV-SU-4T2500G-2800P-S                 | 250                                 | 475                           | 280                                     | 535                           |
| HAV-SU-4T2800G-3150P-S                 | 280                                 | 535                           | 315                                     | 600                           |
| HAV-SU-4T2800G-3150P-S                 | 280                                 | 535                           | 315                                     | 600                           |
| HAV-SU-4T3150G-3550P-S                 | 315                                 | 600                           | 355                                     | 645                           |
| HAV-SU-4T3550G-4000P-S                 | 355                                 | 645                           | 400                                     | 750                           |
| HAV-SU-4T4000G-S                       | 400                                 | 750                           | -                                       | -                             |
| HAV-SU-4T4500G-5000P-S                 | 450                                 | 875                           | 500                                     | 920                           |
| HAV-SU-4T5000G-S                       | 500                                 | 920                           | -                                       | -                             |
| HAV-SU-4T5600G-S                       | 560                                 | 1050                          | -                                       | -                             |
| HAV-SU-4T5600G-S                       | 630                                 | 1150                          | -                                       | -                             |
| HAV-SU-4T8500G-S                       | 650                                 | 1630                          | -                                       | -                             |