INOMAX

SOFT STARTER

CATALOG

SHENZHEN INOMAX TECHNOLOGY CO.LTD

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INOMAX AST7000 integrated bypass soft starter

Product description

AST6800 series intelligent motor soft starter is a new type of starting equipment with the current international advanced level produced by power electronic technology, microprocessor technology and modern control theory technology. It is widely used in heavy-duty equipment such as fans, pumps, conveying and compressors. It is a star/delta conversion, automatic
It is an ideal replacement product for step-down starting equipment such as lotus root step-down and magnetron step-down.

Technical Feature

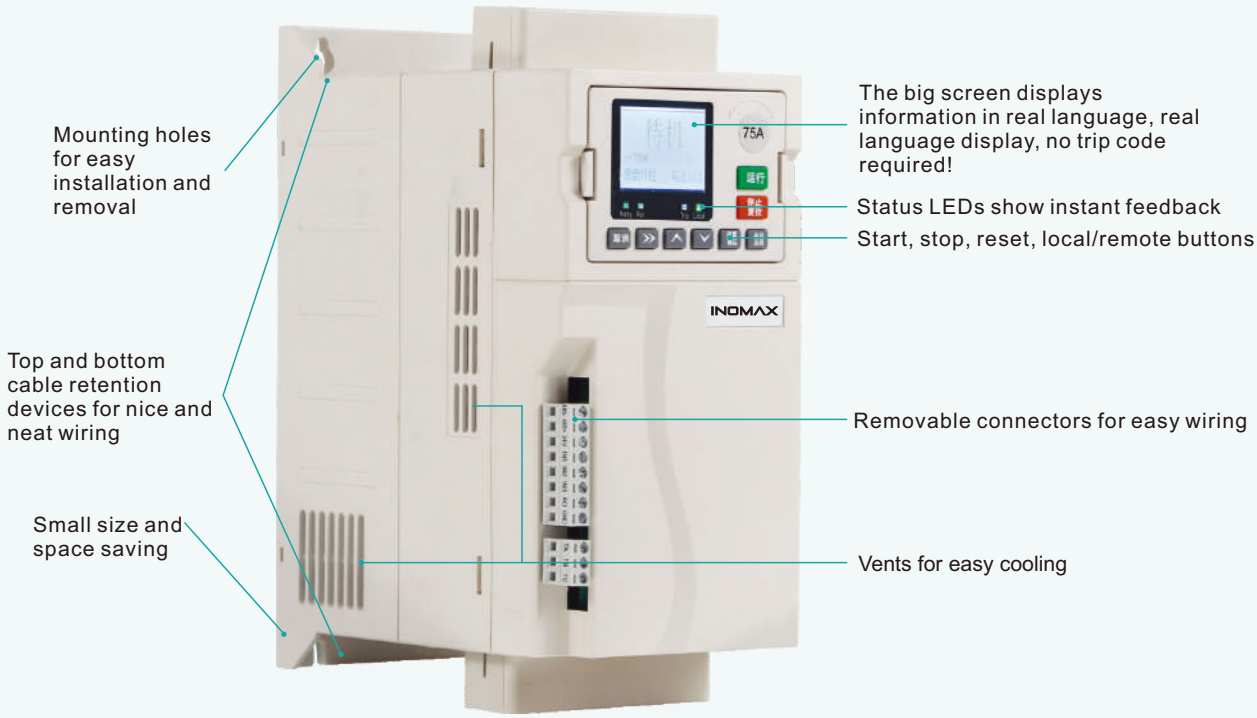
- The parameter setting menu adopts tree-level management to facilitate search and modification;
- Dynamic fault memory function, easy to find the cause of the fault;
- Comprehensive motor comprehensive protection functions such as overcurrent, overheating, phase loss, and motor overload;
- Comes with standard Modbus communication protocol;
- Compact structure design, easy to install and easy to use;
- The terminal adopts plug-in type, which is convenient for wiring;
- The driver board and the main board are two-in-one, which saves costs and facilitates operation;
- Executive standard: GB14048.6-2008 standard.

Application Area

- AST8000 series intelligent motor soft starters are widely used in electric power, metallurgy, petroleum, petrochemical, mining, chemical industry, construction, building materials, municipal, military industry, light industry,textile printing and dyeing, papermaking, pharmaceuticals and other industries.
- Water pump: Using the soft stop function, the water hammer of the pump is relieved when it stops, which saves the cost of system maintenance.
- Ball mill: start with voltage ramp, reduce wear of gear torque, reduce maintenance workload, save time and cost.
- Fan: Reduce belt wear and mechanical impact, saving maintenance costs.
- Compressor: The use of current limiting achieves smooth starting, reduces motor heating, and prolongs service life.
- Belt Conveyor: Smooth and gradual starting process with soft starting, avoiding product displacement and liquid spillage.

Basic wiring diagram

Soft starter function introduction



Selectable soft-start curve

- Voltage ramp start
- Current limit start
- Torque start

Extended input and output options

- remote control input
- relay output
- Analog output
- Rs485 communication output

Customizable Protection

- Input phase loss
- Output phase loss
- Overheating
- Phase sequence
- Running overload
- Start overcurrent
- Run over current
- Overvoltage
- Undervoltage
- Underload

Selectable soft stop

- Free parking
- Timed soft parking

Easy-to-read display shows comprehensive feedback

- Detachable operation panel
- Built-in Chinese + English display

Models for all connectivity needs

- 11A-640A (rated)
- 220VAC-380VAC
- star connection or inner delta connection

Easier Installation

If space is limited in the motor control center, using the compact AST8000 can save space and eliminate unnecessary hassles. On-board indicators, numerous controls, on-board input and output capabilities all reduce external installation space and cost, and simplify installation.

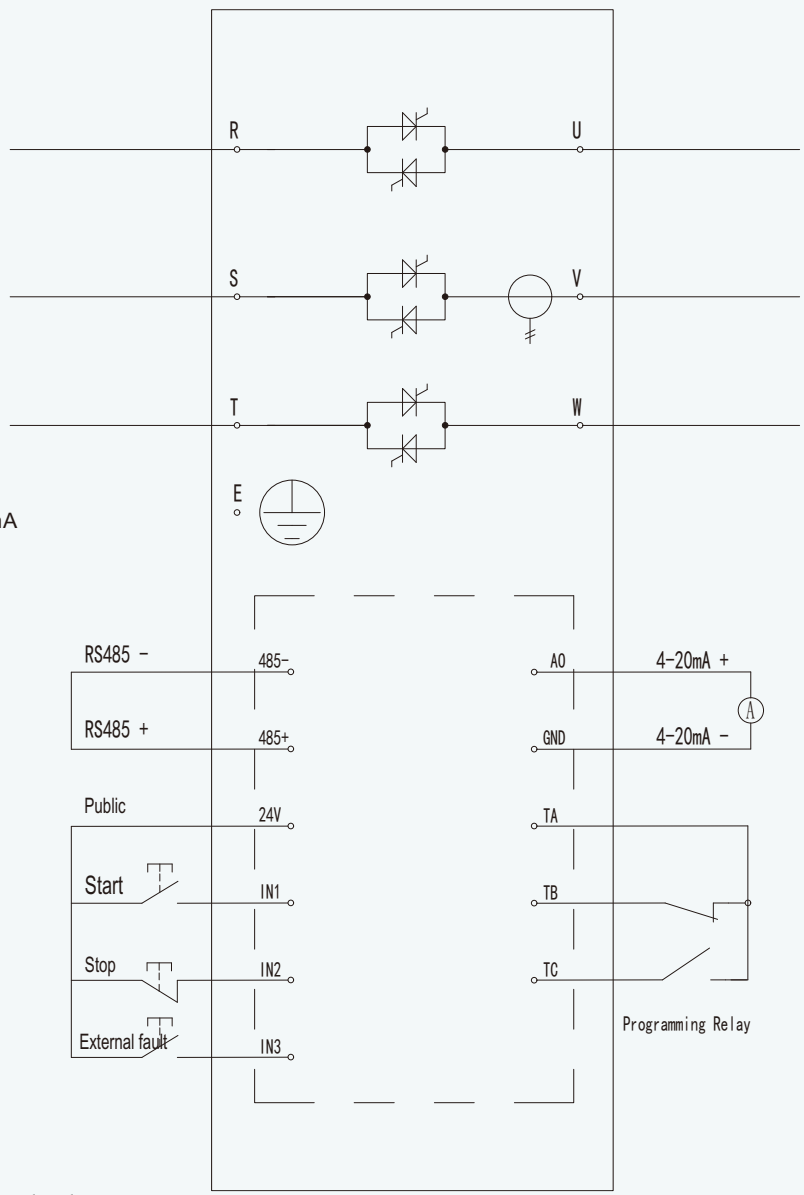
External connection diagram

Standard

Current Range ..... 11A- 640A (nominal)
Motor Connections.....Star External or Internal Delta

Power

Supply voltage (L1, L2, L3)
AST8000-S2.....220V-240V AC
AST8000-S4.....380V-480V AC
Power Frequency 30- 70Hz



Input

Input ..... Active 24VDC, about 8mA
Start .....Normally Open
Stop ..... Normally Closed
FAULT INPUT .....Normally Open

Output

Relay Output ..... 10A @ 250VAC
Resistive Circuits ..... 5A @ 250VAC
Programming Relays (TA, TB, TC) ..... Normally Open or Normally Closed

Programmable output

Analog output (AO, GND)..... 0- 20mA or 4- 20mA
Communication output (485-, 485+).....RS485 communication

Soft Starters Standard Parameters

NO.	Function Code	Function Description	Set Value	Default
0	F00	Soft starter rated current		
1	F01	Soft starter rated voltage		
2	F02	Motor rated current		
3	F03	Control Mode	0: Disable start and stop 1: Keyboard separate control 2: External control separate control 3: keyboard + external control 4: Communication separate control 5: keyboard + communication 6: External control + communication 7: Keyboard + external control + communication	3: keyboard + external control
4	F04	Start method	0: Voltage ramp start 1: Current limiting start 2: Torque start	0: Voltage ramp start
5	F05	Start current limit percentage	50%~600%	300%
6	F06	Starting voltage percentage	30%~80%	35%
7	F07	Start time	1s~120s	15s
8	F08	Holding voltage	60%~85%	65%
9	F09	Early acceleration time	1s~10s	5s
10	F10	Maintenance time	1s~120s	10s
11	F11	Post-acceleration time	1s~10s	3s
12	F12	Soft stop time	0s~60s	0s
13	F13	Programmable Relay	0: no action 1: Power-on action 2: Soft start and middle action 3: Bypass action 4: soft stop action 5: Run the action 6: Standby action 7: Fault action	7: Fault action
14	F14	Programmable output delay	0~600s	0s
15	F15	4-20mA upper limit current	50%~500%	200%
16	F16	Motor wiring method	0: Line type 1: Inner triangle	0: Line type
17	F17	Communication address	1~127	1
18	F18	Communication baud rate	0:2400 1:4800 2:9600 3:19200	2:9600
19	F19	Operating overload level	1~30	10
20	F20	Starting overcurrent multiple	50%-600%	500%
21	F21	Start overcurrent protection time	0s-120s	5s
22	F22	Running over current multiple	50%-600%	200%
23	F23	Running over current protection time	0s-6000s	5s
24	F24	Overvoltage protection multiple	100%~140%	120%
25	F25	Overvoltage protection time	0s~120s	5s
26	F26	Undervoltage protection multiple	50%-100%	80%
27	F27	Undervoltage protection time	0s~120s	5s
28	F28	Spare parameters		
29	F29	Spare parameters		
30	F30	Underload Protection Multiplier	10%~100%	50%

NO.	Function Code	Function Description	Setting Value	Default
31	F31	Underload protection time	1s~120s	10s
32	F32	soft start sequence	0: any phase sequence 1: Forward sequence 2: reverse phase sequence	0: any phase sequence
33	F33	Current calibration value	10%~1000%	100%
34	F34	Spare parts		
35	F35	Spare parts		
36	F36	Voltage calibration value	10%~1000%	100%
37	F37	4-20mA lower limit calibration	0%~150.0%	20.0%
38	F38	4-20mA upper limit calibration	0%~150.0%	100.0%
39	F39	Running overload protection	0: Trip to stop 1: Ignore	0: Trip to stop
40	F40	Enable overcurrent protection	0: Trip to stop 1: Ignore	0: Trip to stop
41	F41	Running overcurrent protection	0: Trip to stop 1: Ignore	0: Trip to stop
42	F42	Overvoltage protection	0: Trip to stop 1: Ignore	0: Trip to stop
43	F43	Undervoltage protection	0: Trip to stop 1: Ignore	0: Trip to stop
44	F44	Spare parameter		
45	F45	Underload protection	0: Trip to stop 1: Ignore	1 : Ignore
46	F46	Overheating protection	0: Trip to stop 1: Ignore	0: Trip to stop
47	F47	Soft start operating language	0: English 1: Chinese	1 : Chinese
48	F48	Main control software version		
49	F49	Pump matching selection	0: None 1: Float 2: Electric contact pressure gauge 3: Water supply level relay 4: Drainage level relay	0 : None
50	F50	Display software version		

Terminal type		Terminal Code	Terminal description	Description
Main circuit		R,S,T	power input	
		U,V,W	Soft start output	
Control loop	communication	485-	RS485-	
		485+	RS485+	
	Digital input	24V	public	
		IN1	start	
		IN2	stop	
		IN3	External fault	
	Analog output	AO	4-20mA output positive	
		GND	4-20mA output negative pole	
	Programming relay	TA	programming relay common	Programmable outputs, selectable from the following functions: 0. No action 1. Power-on action 2. Soft start action 3. Bypass action 4. Soft stop action 5. Runtime Actions 6. Standby action 7. Fault action
		TB	Programming relay normally closed	
		TC	Programming relay normally open	

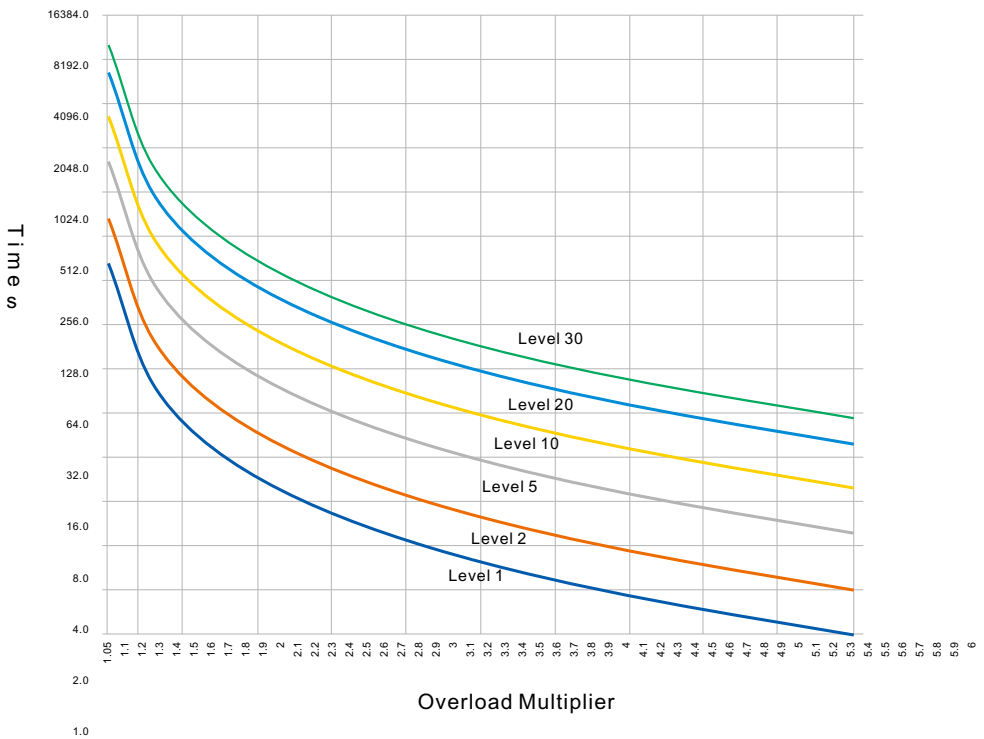
Overload protection

Overload protection adopts inverse time control

$$\text{protection time: } t = \frac{35*Tp}{(I/Ip)2-1}$$

Among them: t represents the action time, Tp represents the protection level, I represents the running current, and Ip represents the rated current of the motor

Motor overload protection characteristic curve: Figure 11-1



Motor overload protection characteristics

Overload Multiplier / Overload level	1.05Ie	1.2Ie	1.5Ie	2Ie	3Ie	4Ie	5Ie	6Ie
1	∞	79.5s	28s	11.7s	4.4s	2.3s	1.5s	1s
2	∞	159s	56s	23.3s	8.8s	4.7s	2.9s	2s
5	∞	398s	140s	58.3s	22s	11.7s	7.3s	5s
10	∞	795.5s	280s	117s	43.8s	23.3s	14.6s	10s
20	∞	1591s	560s	233s	87.5s	46.7s	29.2s	20s
30	∞	2386s	840s	350s	131s	70s	43.8s	30s

∞: Indicates no action

Pumping function selection

0 : nothing

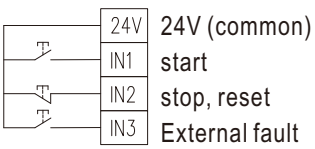


Figure 1

1 : float

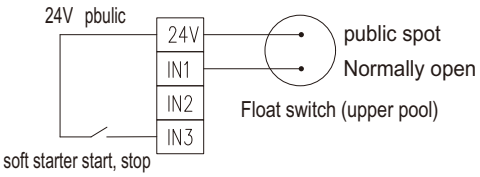


Figure 3

2 : Electric contact pressure gauge

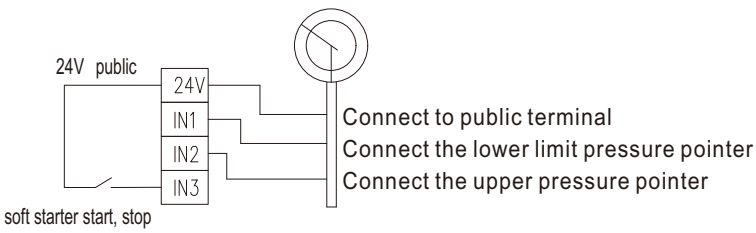


Figure 3

3 : Water supply level relay

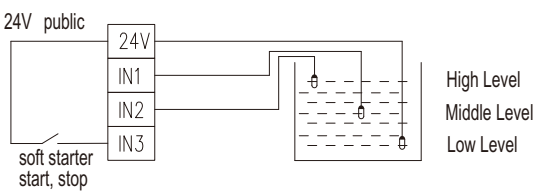


Figure 4

4 : Drain level relay

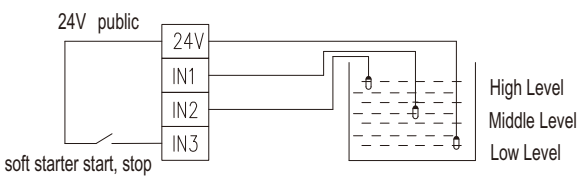


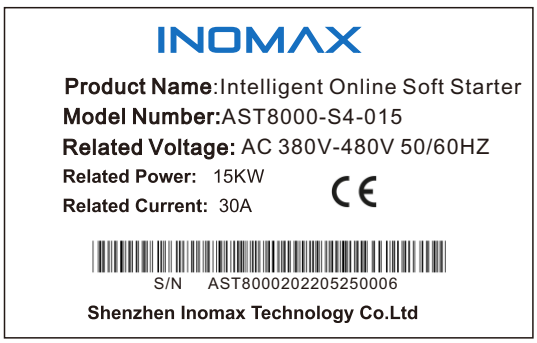
Figure 5

Pump matching function selection			
①	0: None	None: Standard soft start function.	Figure 1
②	1: Float	Float: IN1, close to start, open to stop. IN2 has no function.	Figure 2
③	2: Electric contact pressure gauge	Electric contact pressure gauge: IN1 closes once to start, IN2 closes once to stop.	Figure 3
④	3: Water supply level relay	Water supply level relay: IN1, IN2 are both open to start, IN1, IN2 are closed to stop.	Figure 4
⑤	4: Drainage level relay	Drainage level relay: both IN1 and IN2 are disconnected to stop, and both IN1 and IN2 are closed to start.	Figure 5

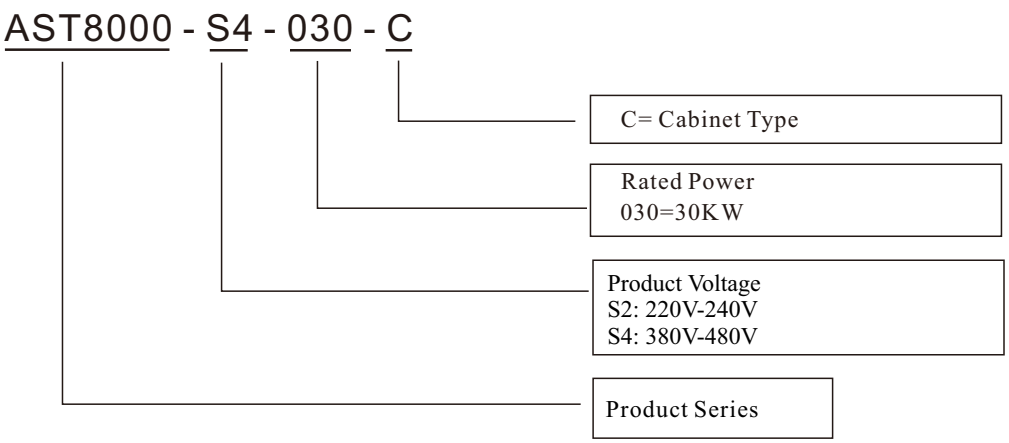
Note: The water supply function starts and stops the IN3 control, the standard soft start IN3 is an external fault, and the water supply type is used to control the start and stop. IN3 is the starting end, the above operation can be performed only when it is closed, and it is stopped when it is disconnected.

General technical data

Name Plate



Model code



Model List

Model No.	Voltage	Power	Current (A)	Product Size (mm)			Weight
	(V)	(KW)	(A)	W	D	H	Kg
220V-240V 3phase input 3 phase output 50/60HZ							
AST8000-S2-7.5	220V-240V	7.5KW	32A	105	168.5	240	3.5 kg
AST8000-S2-011	220V-240V	11KW	45A	105	168.5	240	3.5kg
AST8000-S2-015	220V-240V	15KW	60A	105	168.5	240	3.5kg
AST8000-S2-18.5	220V-240V	18.5KW	75A	105	168.5	240	3.5kg
AST8000-S2-022	220V-240V	22KW	90A	135	184.5	282.5	6.2kg
AST8000-S2-030	220V-240V	30KW	110A	135	184.5	282.5	6.3kg
AST8000-S2-037	220V-240V	37KW	150A	135	184.5	282.5	6.4kg
AST8000-S2-045	220V-240V	45KW	180A	190	224.5	370.5	10kg
AST8000-S2-055	220V-240V	55KW	220A	190	224.5	370.5	10kg
AST8000-S2-075	220V-240V	75KW	320A	225	243	393	13kg

Model No.	Voltage	Power	Current (A)	Product Size (mm)			Weight
	(V)	(KW)	(A)	W	D	H	Kg
380V-480V 3phase input 3 phase output 50/60HZ							
AST8000-S4-7.5	380V-480V	7.5KW	15A	105	168.5	240	3.5kg
AST8000-S4-011	380V-480V	11KW	23A	105	168.5	240	3.5kg
AST8000-S4-015	380V-480V	15KW	30A	105	168.5	240	3.5kg
AST8000-S4-18.5	380V-480V	18.5KW	37A	105	168.5	240	3.5kg
AST8000-S4-022	380V-480V	22KW	45A	105	168.5	240	3.5kg
AST8000-S4-030	380V-480V	30KW	60A	105	168.5	240	3.5kg
AST8000-S4-037	380V-480V	37KW	75A	105	168.5	240	3.5kg
AST8000-S4-045	380V-480V	45KW	90A	135	184.5	282.5	6.2kg
AST8000-S4-055	380V-480V	55KW	110A	135	184.5	282.5	6.3kg
AST8000-S4-075	380V-480V	75KW	150A	135	184.5	282.5	6.4kg
AST8000-S4-090	380V-480V	90KW	180A	190	224.5	370.5	10kg
AST8000-S4-115	380V-480V	115KW	230A	190	224.5	370.5	10kg
AST8000-S4-132	380V-480V	132KW	264A	225	243	393	10kg
AST8000-S4-160	380V-480V	160KW	320A	225	243	393	13kg
AST8000-S4-185	380V-480V	185KW	370A	225	243	393	13kg
AST8000-S4-200	380V-480V	200KW	400A	225	243	393	13kg
AST8000-S4-220	380V-480V	220KW	425A	390	294	677	39kg
AST8000-S4-250	380V-480V	250KW	500A	390	294	677	39kg
AST8000-S4-280	380V-480V	280KW	560A	390	294	677	39kg
AST8000-S4-320	380V-480V	320KW	630A	390	294	677	45kg

Model List for cabinet type soft starters

Model No.	Voltage	Power	Current (A)	Product Size (mm)			Weight
	(V)	(KW)	(A)	W	D	H	Kg
380V-480V cabinet soft starters 3phase input 3 phase output 50/60HZ							
AST8000-S4-7.5-C	380V-480V	7.5KW	15A	312	320	681	14.5kg
AST8000-S4-011-C	380V-480V	11KW	23A	312	320	681	14.5kg
AST8000-S4-015-C	380V-480V	15KW	30A	312	320	681	14.5kg
AST8000-S4-18.5-C	380V-480V	18.5KW	37A	312	320	681	14.5kg
AST8000-S4-022-C	380V-480V	22KW	45A	312	320	681	14.5kg
AST8000-S4-030-C	380V-480V	30KW	60A	312	320	681	14.5kg
AST8000-S4-037-C	380V-480V	37KW	75A	312	320	681	16.6kg
AST8000-S4-045-C	380V-480V	45KW	90A	312	320	681	16.6kg
AST8000-S4-055-C	380V-480V	55KW	110A	312	320	681	16.6kg
AST8000-S4-075-C	380V-480V	75KW	150A	312	320	681	16.6kg
AST8000-S4-090-C	380V-480V	90KW	180A	400	380	850	28kg
AST8000-S4-115-C	380V-480V	115KW	230A	400	380	850	28kg
AST8000-S4-132-C	380V-480V	132KW	264A	500	400	1200	28kg
AST8000-S4-160-C	380V-480V	160KW	320A	500	400	1200	41.5kg
AST8000-S4-185-C	380V-480V	185KW	370A	500	400	1200	41.5kg
AST8000-S4-200-C	380V-480V	200KW	400A	500	400	1200	41.5kg
AST8000-S4-220-C	380V-480V	220KW	425A	680	420	1400	87kg
AST8000-S4-250-C	380V-480V	250KW	500A	680	420	1400	87kg
AST8000-S4-280-C	380V-480V	280KW	560A	680	420	1400	87kg
AST8000-S4-320-C	380V-480V	320KW	630A	680	420	1400	87kg

Dimensions and Specifications

Voltage	Related Current	Related Power	Language	Parameters	Protection functions	Input & Output terminals	Overload Ability
220V	11A- 640A	5.5kW- 185kW	Chinese/English LCD keypad	49	10	11	Adjustable
380V	11A- 640A	5.5kW- 320kW					

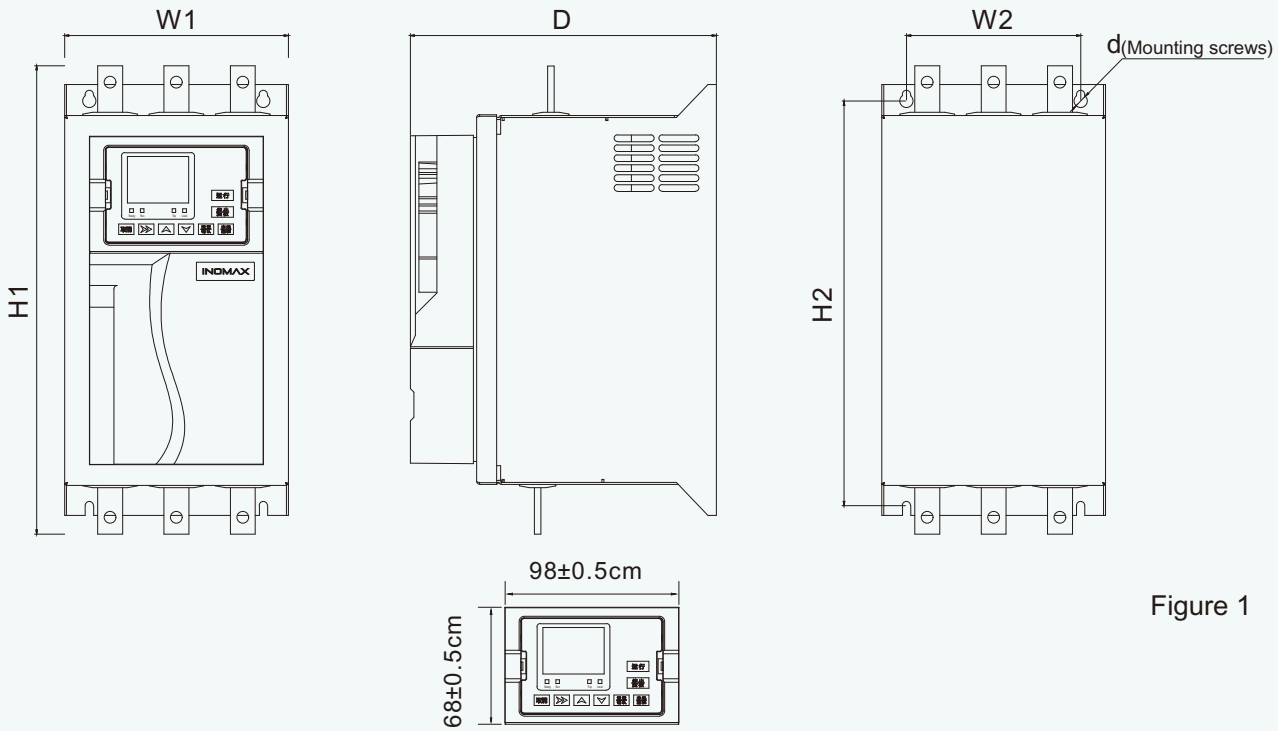


Figure 1

Power Range	Dimensions (mm)			Installation size (mm)			Outline
	W1	H1	D	W2	H2	d	
5.5kW-37kW	105	240	168.5	75	211	M6	Figure 1
45kW-75kW	135	282.5	184.5	105	244	M6	
90kW-115kW	190	370.5	224.5	150	322	M8	
132kW-200kW	225	393	243	170	333	M8	
220kW-320kW	390	677	294	260	601	M8	

Dimensions and Specifications

Voltage	Related Current	Related Power	Language	Parameters	Protection functions	Input & Output terminals	Overload Ability
220V	11A- 640A	5.5kW- 185kW	Chinese/English LCD keypad	49	10	11	Adjustable
380V	11A- 640A	5.5kW- 320kW					

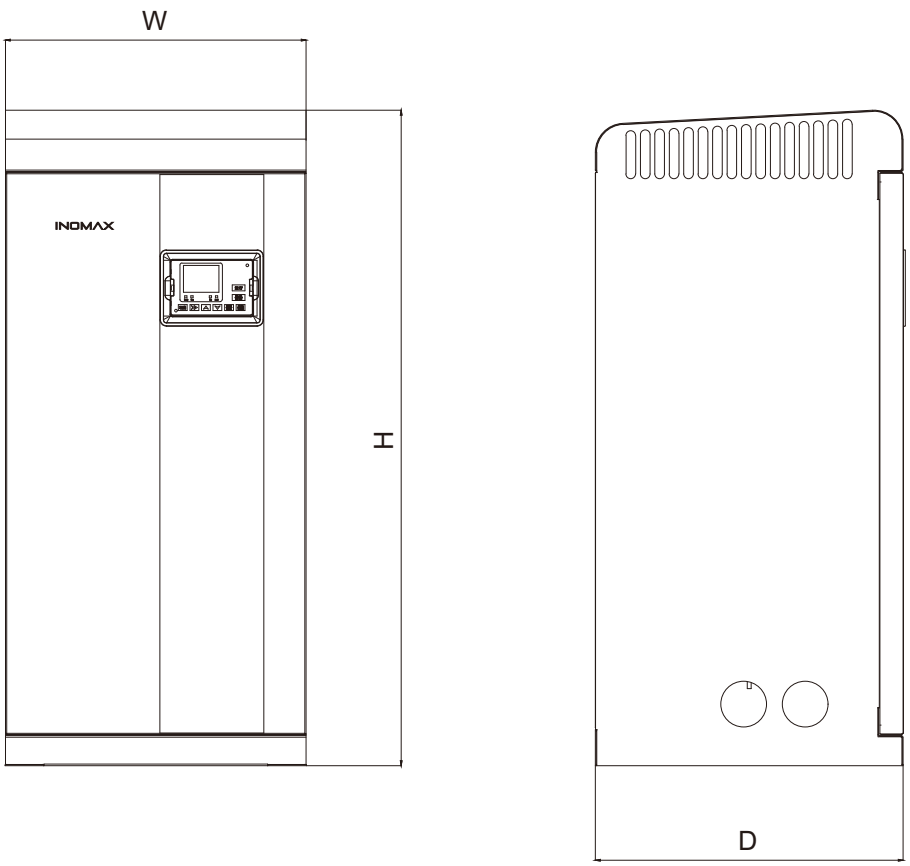


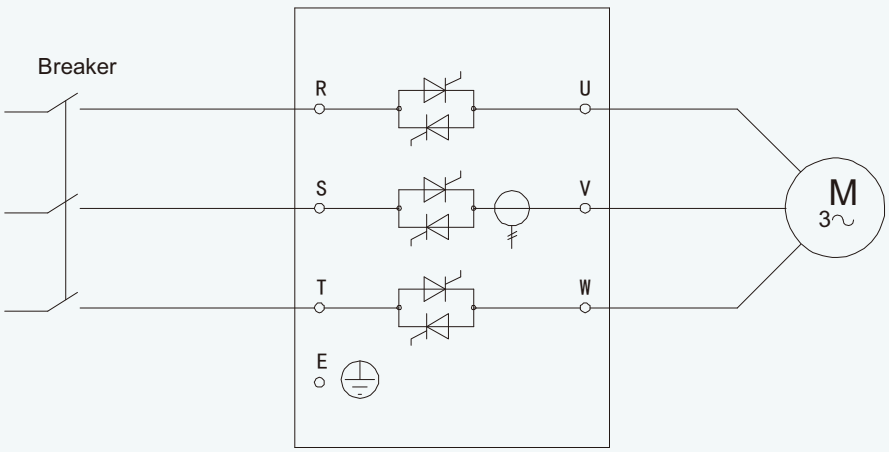
Figure 2

Power Range	Dimensions (mm)			Outline
	W	H	D	
5.5KW-75KW	312	681	320	Figure 2
90KW-115KW	400	850	380	
132KW-200KW	500	1200	400	
220KW-320KW	680	1400	420	

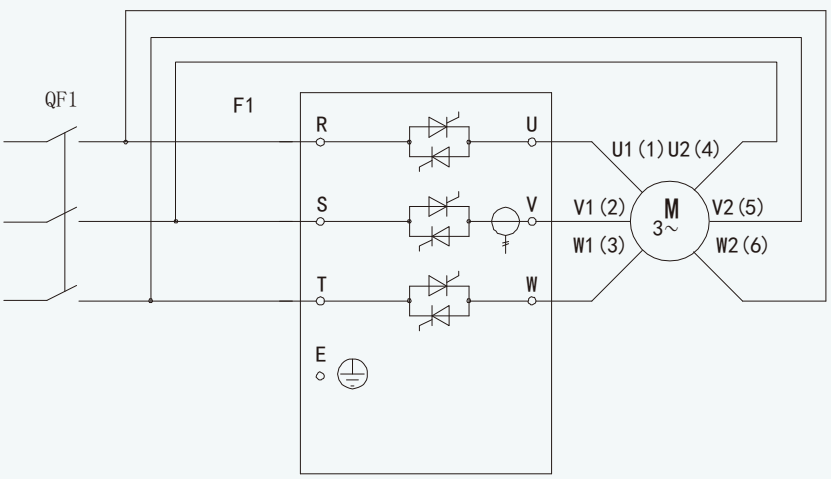
Motor connection

The soft starter can use star connection method or inner delta connection method (also called three-wire connection method and six-wire connection method) to connect the motor. If the inner delta connection method is adopted, use parameter F00 to input the rated current of the motor.

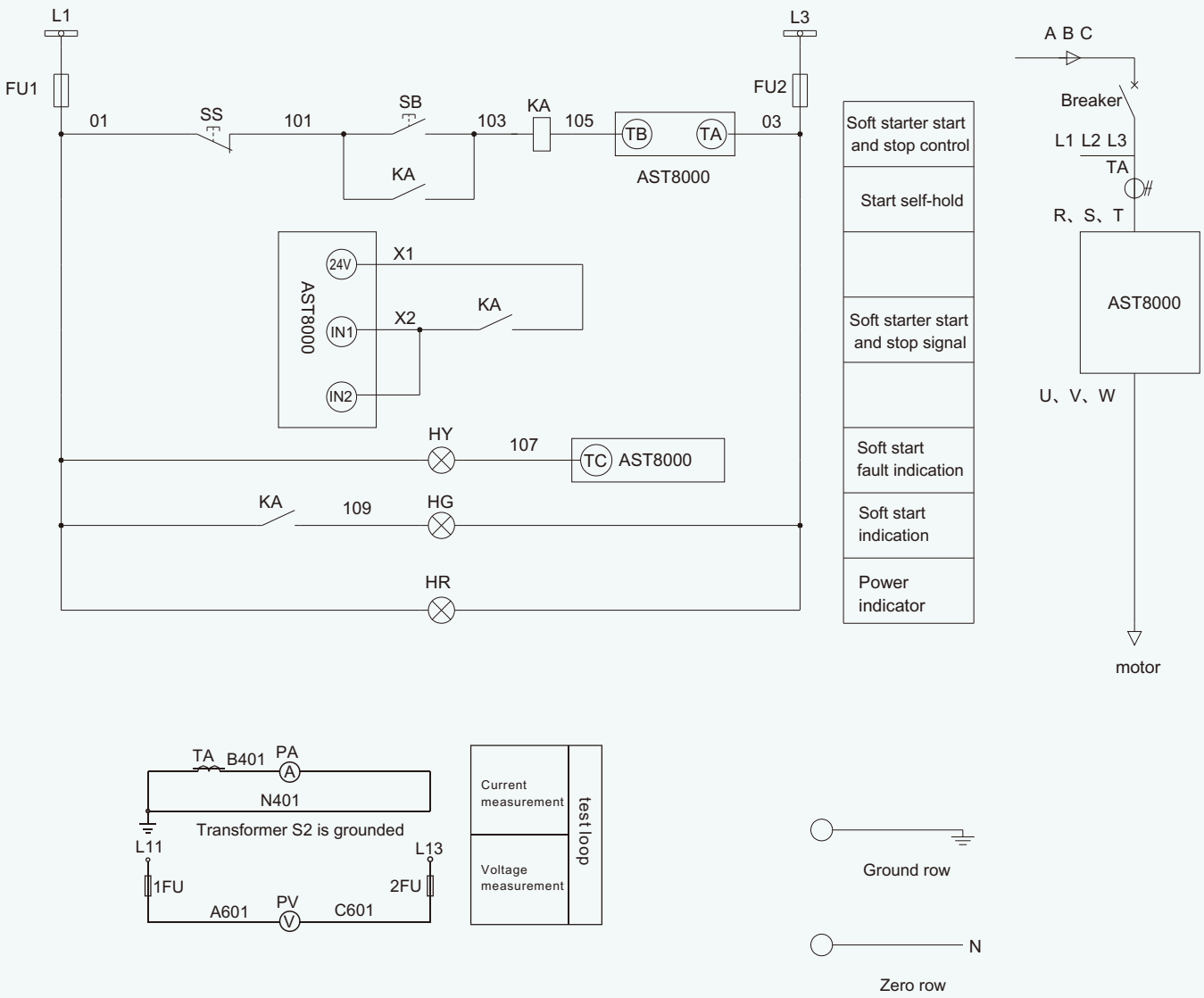
Star connection



Inner delta connection



AST8000 Wiring diagram



1. This picture is the electrical schematic diagram of the AST8000 series on-line one-drive-one standard motor control cabinet.

2. The R, S, and T terminals of the six-inlet line of the soft starter are connected to the circuit breaker, and the U, V, and W of the soft starter are connected to the three-phase asynchronous motor.

3. The control loop path is 1.5BVR, and the transformer loop path is 2.5BVR; PA and 1PA must use an overload ammeter.

4. There are 2 meter heads (PA, PV), 2 buttons (SB, SS) and 3 indicator lights (HG, HR, HY) on the control cabinet.

INOMAX

Build your trust of technology from China

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