INOMAX

SOFT STARTER
CATALOG

⊳ AST6800 soft starter

Inomax AST6800 Soft Starter is compact solid state starter with control of 3phase motors, built-in bypass and all the protections for the electric motor. Featuring DSP control (Digital Signal Processor), AST6800 is designed for optimal performance in motor start and stop, with excellent cost-effectiveness. In addition, they are easily set, simplifying the start-up activities and daily operations. Their compact dimensions contribute to the optimization of spaces in electrical panels.

⊳ Features

• Universal voltage (220 to 480 Vac)

• Built-in By-pass contactor

• Significant reduction of mechanical stresses through the coupling and transmission devices (gearboxes, pulleys, gears, conveyors, etc.) during the start

• Increases motor and machine mechanical equipment lifetime due to the elimination of mechanical shock

• Easy operation, setup, maintenance & installation

• Operates in environments up to 55ºC without current reduction

• Integral, electronic motor protection

• Built-in electronic thermal relay

• Avoids "Water Hammer" in pumps

• Limitation of voltage drop during start

• Switched type power supply with EMC filter for the control electronics

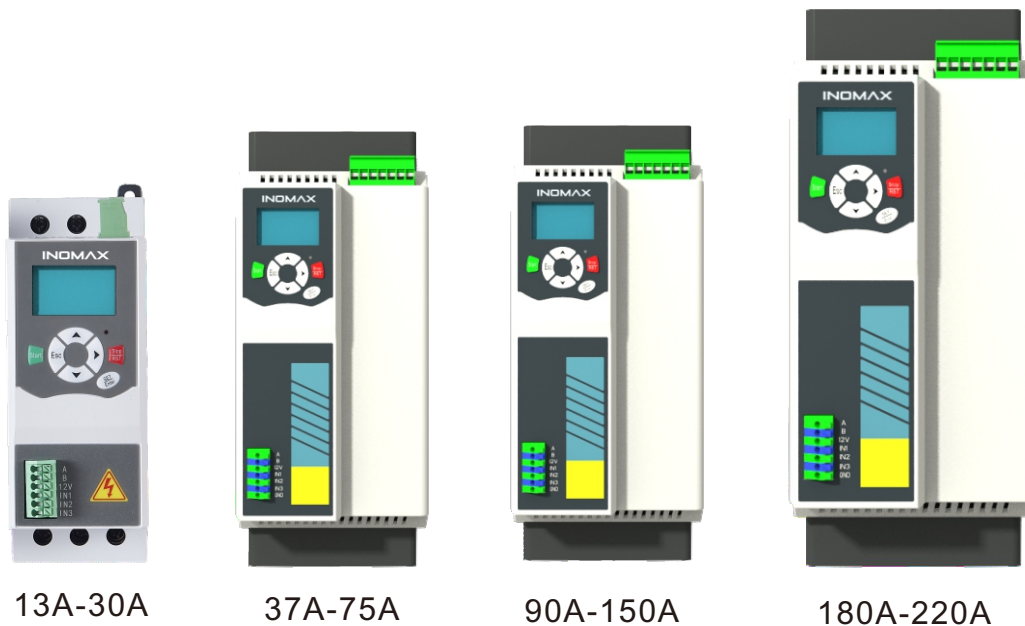•Remote operating LCD keypad

• Conformal coated circuit boards

Applications

• Chemical and Petrochemical
• Plastic and Rubber
• Pulp and Paper
• Sugar and Alcohol
• Beverages
• Cement and Mining
• Food and Beverage
• Textile
• Metallurgy
• Ceramics
• Glass
• Refrigeration
• Wood
• Sanitation
• Load Transportation
• Pumps and Fans

► AST6800 – Technical Data

Power Supply	Main Voltage	208... 480 Vac (+10%, -15%)
	Control Voltage	90 ...250 Vac
	Frequency	50 / 60Hz (+/- 5Hz)
Enclosure	Ip21 Protected Chassis	
Duty Cycle	300% rated current during 10 seconds, 10 starts per hour	
Control Inputs	Digital	One input for Start/Stop (90 - 250 Vac)
		One input for Fault Reset (90 - 250 Vac)
Control Outputs	Digital	One relay output for Run indication (1 Amp - 250V)
		One relay output for Ful Voltage indication (1 Amp - 250V)
Communication	Serial Interface	Modbus 485
Safety	Protection	Motor overload*
		Locked rotor*
		Over current*
		Phase sequence*
		Phase loss*
		SCR overload
Control Features	Pedestal Voltage	30 … 80% of line voltage
	Accel Ramp	1 ... 20 seconds
	Decel Ramp	Off ... 20 seconds
	Motor Current	30 ... 100% of SSW-05 rating
	Fault Reset	Manual or Automatic
Ambient	Temperature	32 ... 131ºF (0 - 55ºC)
	Humidity	0…90% Non Condensing
	Altitude	0 ... 1000m (3,300 ft) - Standard Operation at Rated Current
		Up to 4000m (13,200 ft) - With Current Derating (1%/100m (328 ft) above 1000m (13,200 ft))
Conformities	Low Voltage	UL 508 - Industrial Control Equipment
		IEC 60947-4-2
	EMC	EMC Directive 89 / 336 / EEC - Industrial Environment, Class A

13A-30A   37A-75A   90A-150A   180A-220A

INOMAX AST6800 integrated bypass soft starter

▶ Settings and Indications

Mounting holes for easy installation and removal

Top and bottom cable retention devices for nice and neat wiring

Small size and space saving

The big screen displays information in real language, real language display, no trip code required!

Status LEDs show instant feedback

Start, stop, reset, local/remote buttons

Vents for easy cooling

Removable connectors for easy wiring

▶ Product advantages

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-220A (rated)
- ➤ 220VAC-480VAC
- ➤ star connection or inner delta connection

Easier Installation

If space is limited in the motor control center, using the compact AST6800 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 .... 13A- 220A (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
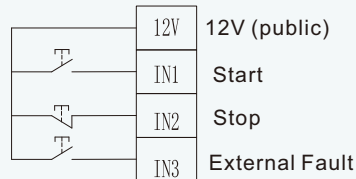Open or Normally Closed

➤ Programmable output

Analog output (AO, GND)....... 0- 20mA or 4- 20mA
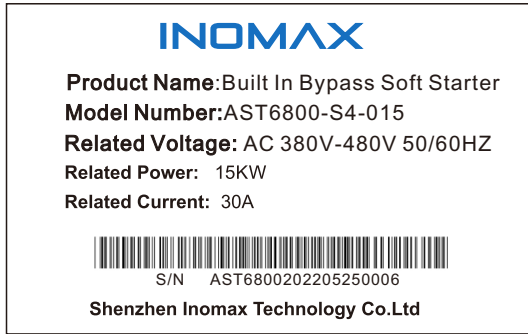Communication output (485-, 485+)......RS485 communication
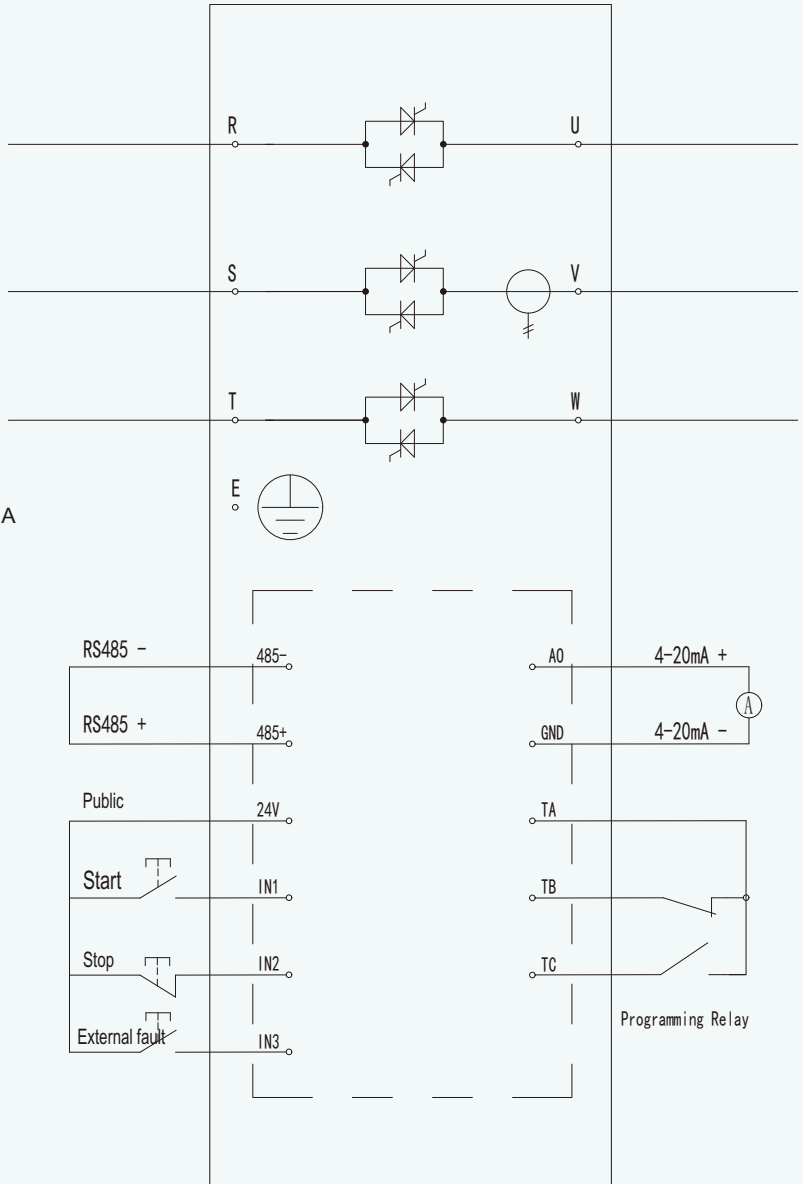
Two-wire system
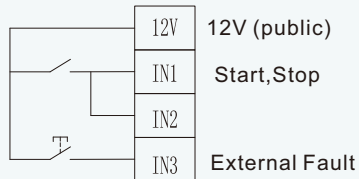
Three-wire system
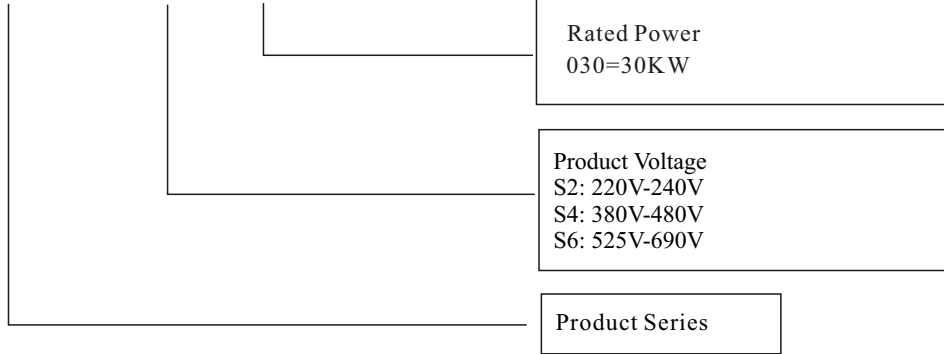
INOMAX AST6800 integrated bypass soft starter

▶ General technical data

Name Plate

INOMAX

Product Name: Built In Bypass Soft Starter
Model Number: AST6800-S4-015
Related Voltage: AC 380V-480V 50/60HZ
Related Power: 15KW
Related Current: 30A

S/N   AST6800202205250006

Shenzhen Inomax Technology Co.Ltd

Model code

AST6800 - S4 - 030

| Rated Power |
| 030=30KW |

| Product Voltage |
| S2: 220V-240V |
| S4: 380V-480V |
| S6: 525V-690V |

| Product Series |

▶ 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							
AST6800-S2-7.5	220V-240V	7.5KW	32A	55	157	162	3.5 kg
AST6800-S2-011	220V-240V	11KW	45A	105	160	250	3.5kg
AST6800-S2-015	220V-240V	15KW	60A	105	160	250	3.5kg
AST6800-S2-18.5	220V-240V	18.5KW	75A	105	160	250	3.5kg
AST6800-S2-022	220V-240V	22KW	90A	136	180	300	6.2kg
AST6800-S2-030	220V-240V	30KW	110A	136	180	300	6.3kg
AST6800-S2-037	220V-240V	37KW	150A	136	180	300	6.4kg
AST6800-S2-045	220V-240V	45KW	180A	211	215	390	10kg
AST6800-S2-055	220V-240V	55KW	220A	211	215	390	10kg

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							
AST6800-S4-7.5	380V-480V	7.5KW	15A	55	157	162	3.5kg
AST6800-S4-011	380V-480V	11KW	23A	55	157	162	3.5kg
AST6800-S4-015	380V-480V	15KW	30A	55	157	162	3.5kg
AST6800-S4-18.5	380V-480V	18.5KW	37A	105	160	250	3.5kg
AST6800-S4-022	380V-480V	22KW	45A	105	160	250	3.5kg
AST6800-S4-030	380V-480V	30KW	60A	105	160	250	3.5kg
AST6800-S4-037	380V-480V	37KW	75A	105	160	250	3.5kg
AST6800-S4-045	380V-480V	45KW	90A	136	180	300	6.2kg
AST6800-S4-055	380V-480V	55KW	110A	136	180	300	6.3kg
AST6800-S4-075	380V-480V	75KW	150A	136	180	300	6.4kg
AST6800-S4-090	380V-480V	90KW	180A	211	215	390	10kg
AST6800-S4-115	380V-480V	115KW	220A	211	215	390	10kg

▶ Keypad operation guide

| key	function
Start	starter
STOP/RST	1. In case of fault tripping, reset 2. Stop the motor while starting it
ESC	Exit menu/submenu
△	1. In the starting state, the up key will call out the display interface for the current values of each phase 2. Move option up in menu state
▽	1. Display interface for each phase current value, move down key to turn off each phase current display 2. Move option up in menu state
≫	1. In menu mode, the displacement key moves the menudown by 10 items 2. In the submenu state, the displacement key moves themenu selection bit to the right in sequence 3. Long press and hold the displacement in standby mode to call out the factory reset and clear the fault record interface
SET/Enter	1. Call out menu during standby 2. Enter the next level menu within the main menu 3. Confirm adjustments
Fault light	1. Lights up when starting/running the motor 2. Flashing during malfunction

Starter status LED

| name	Light	flicker
run	The motor is in a starting, running, soft stop, and DC braking state.	
tripping operation		The starter is in a warning/tripping state

▶ Dimensions and Specifications
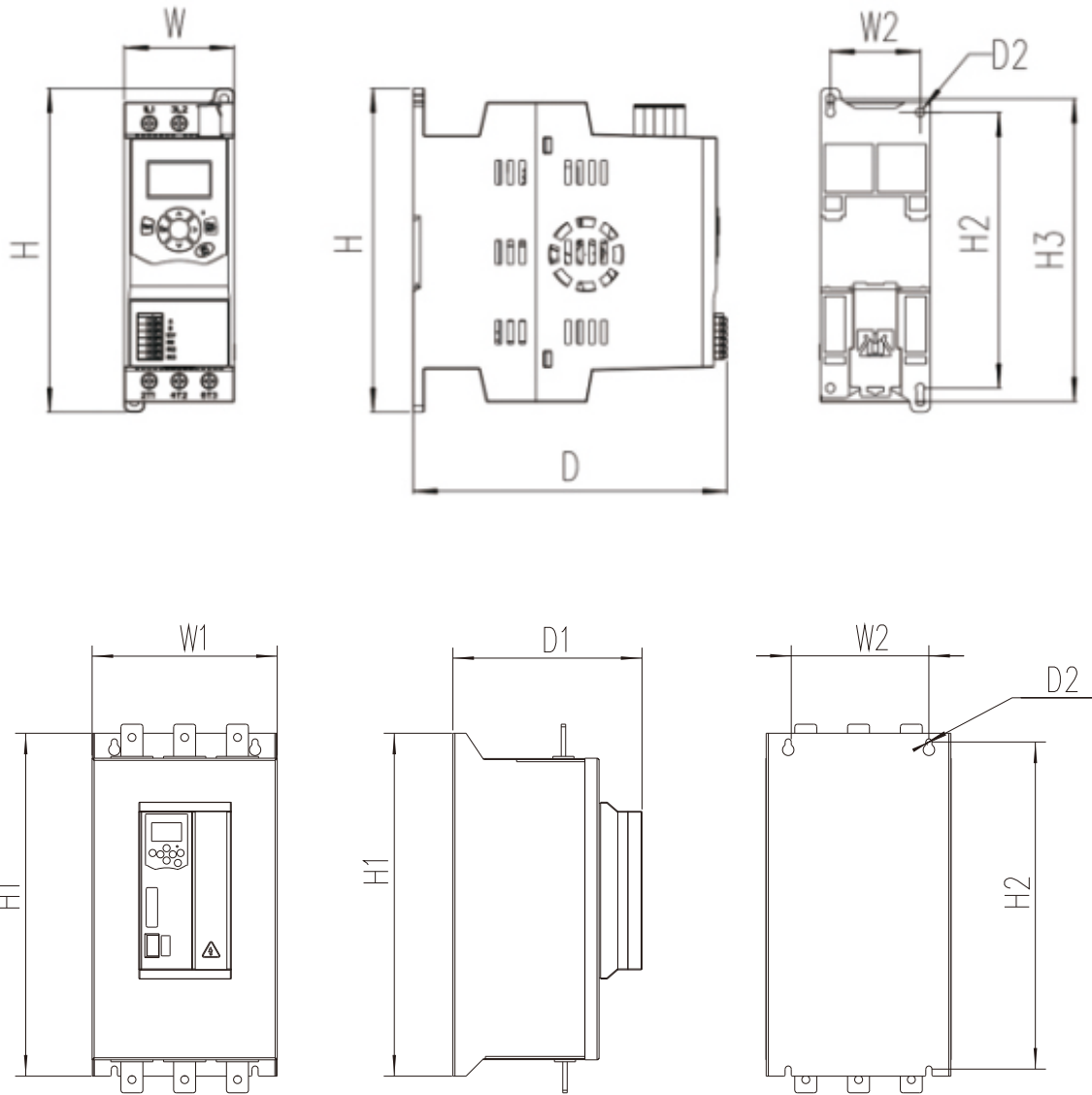
| Specification model	Dimensions (mm)			Installation size (mm)			
	W1	H1	D	W2	H2	H3	D2
13A-30A	55	162	157	45	138	151.5	M4
37A-75A	105	250	160	80	236		M6
90A-150A	136	300	180	95	281		M6
180A-220A	210.5	390	215	156.5	372		M6

◉ 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.
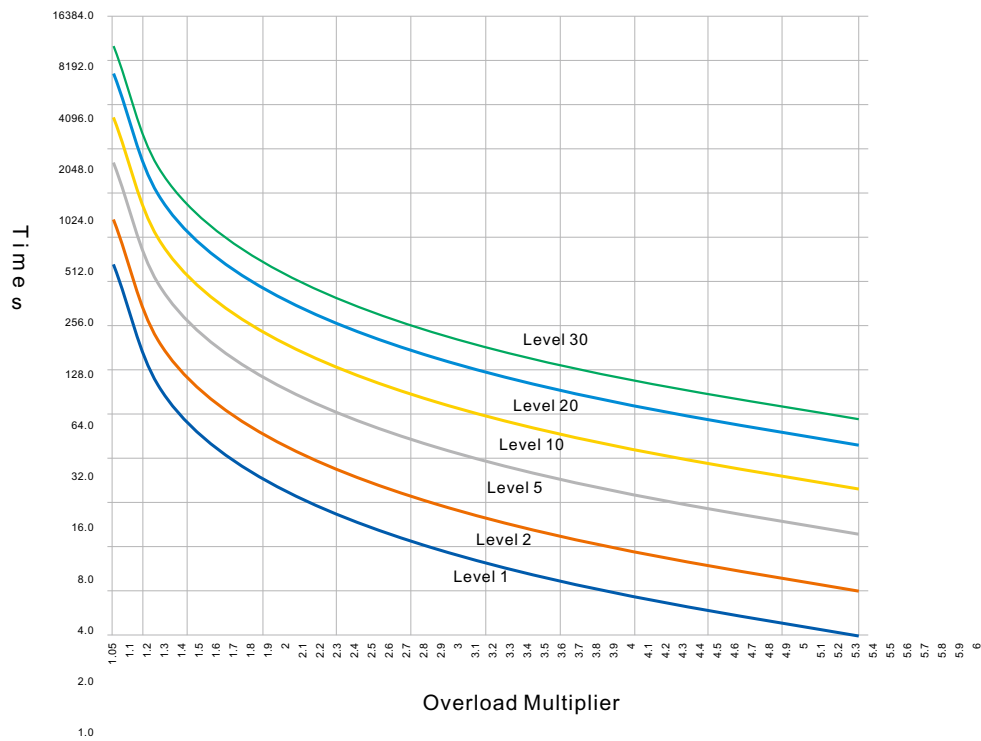
Star connection
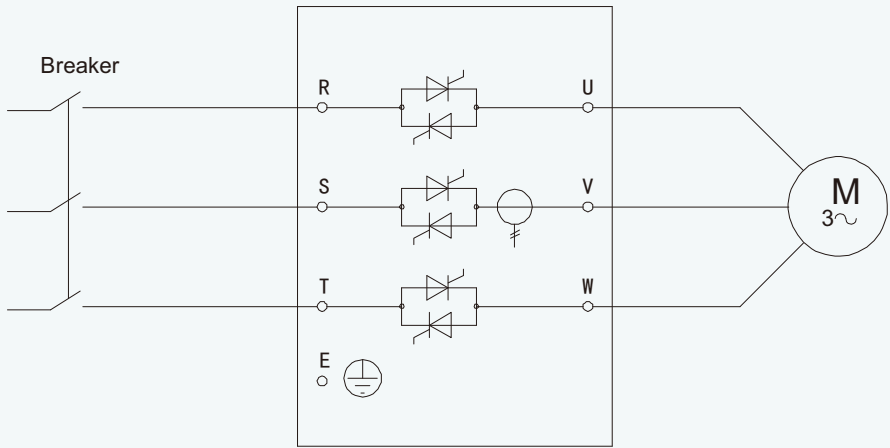
Inner delta connection
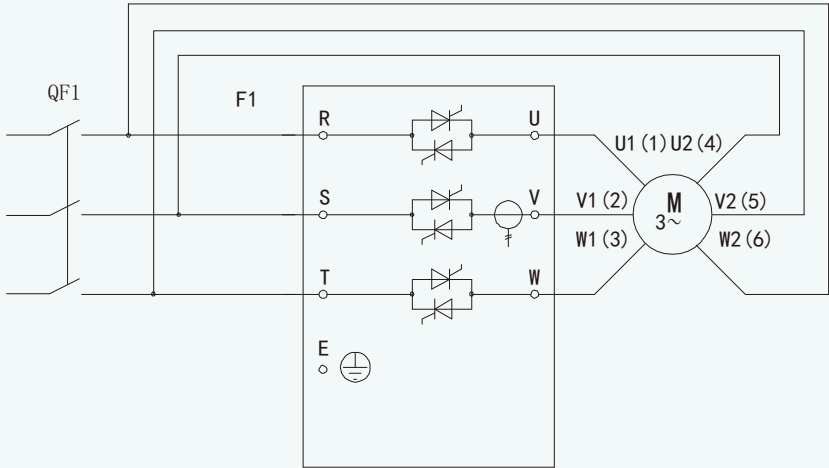
▶ Overload protection

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

24V	24V (common)
IN1	start
IN2	stop, reset
IN3	External fault

Figure 1

1 : float

24V (pbulic)

24V	public spot
IN1	Normally open
IN2	Float switch (upper pool)
IN3	

soft starter start, stop

Figure 3

2 : Electric contact pressure gauge

24V (public)

24V	Connect to public terminal
IN1	Connect the lower limit pressure pointer
IN2	Connect the upper pressure pointer
IN3	

soft starter start, stop
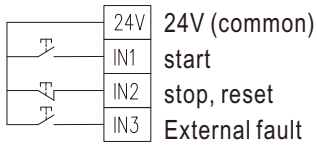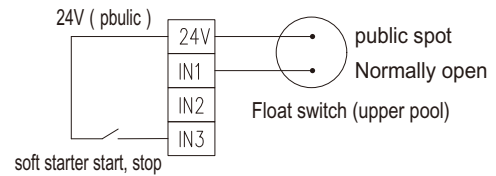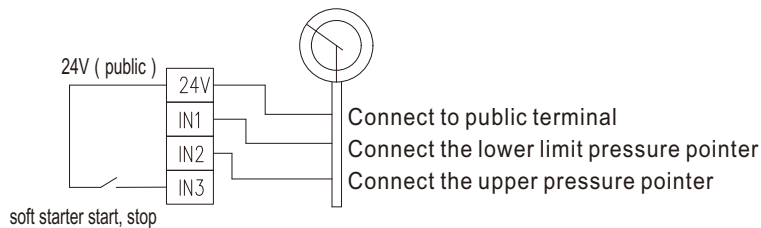
Figure 3

3 : Water supply level relay

24V (public)

24V	High Level
IN1	Middle Level
IN2	Low Level
IN3	

soft starter start, stop
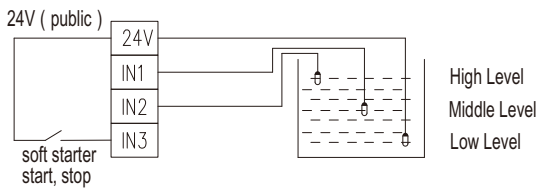
Figure 4

4 : Drain level relay

24V (public)

24V	High Level
IN1	Middle Level
IN2	Low Level
IN3	

soft starter start, stop
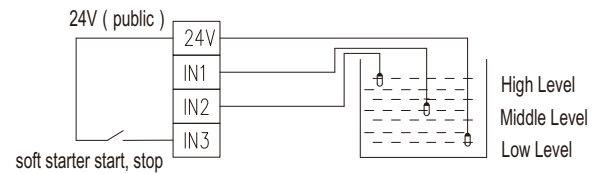
Figure 5

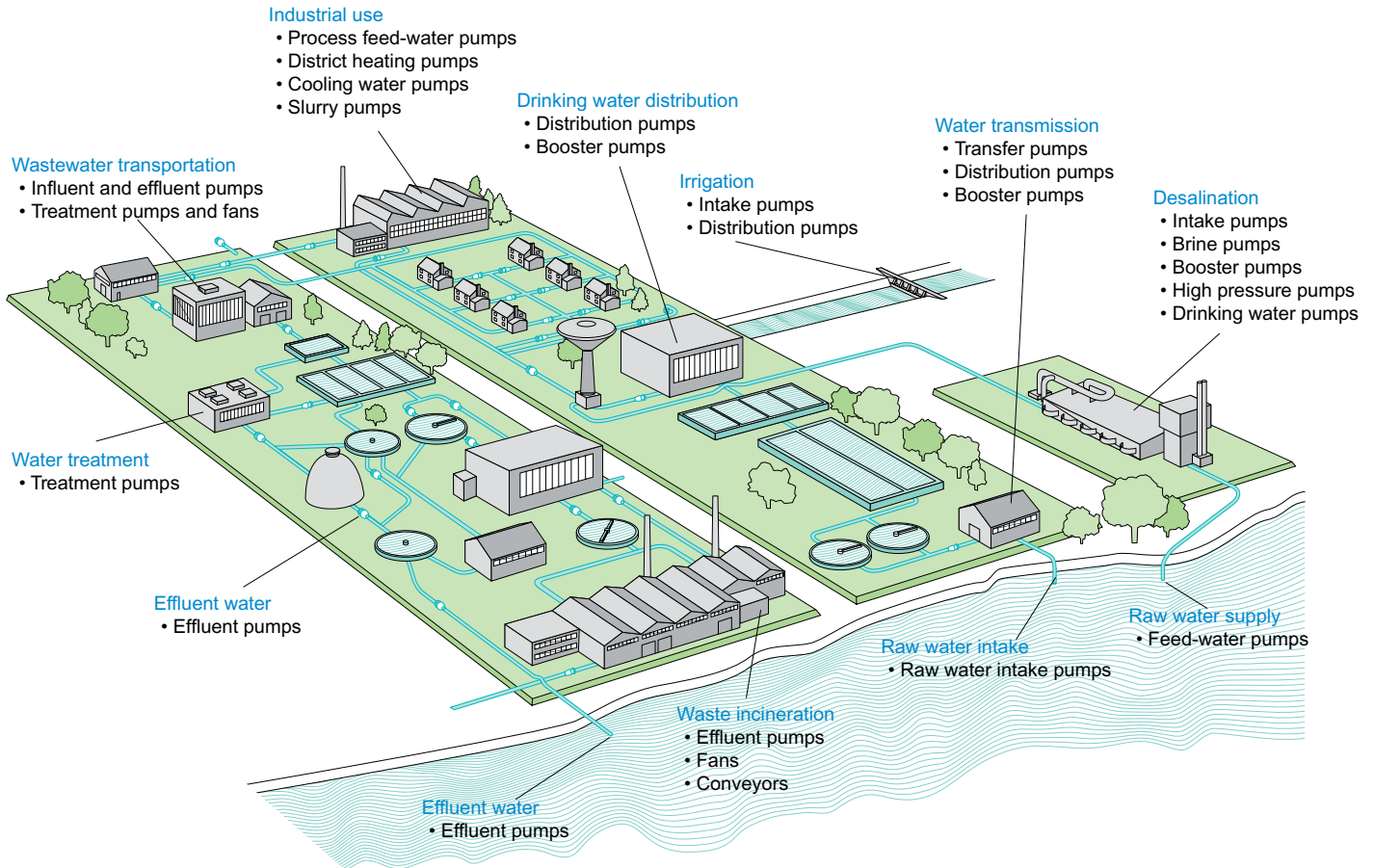|	Pump matching function selection		
①	0: None	None: Standard soft start function.	Figure 1
②	1: Float	Float: IN1, close to start, open to stop. IN2 has no function.	Figure 2
③	2: Electric contact pressure gauge	Electric contact pressure gauge: IN1 closes once to start, IN2 closes once to stop.	Figure 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.

▶ Application area

Pumps

Water is the most important resource in the world and water facilities can be found everywhere. Examples of water applications are freshwater and wastewater systems, circulating water for heating, cooling and irrigation.

Industrial use
• Process feed-water pumps
• District heating pumps
• Cooling water pumps
• Slurry pumps

Drinking water distribution
• Distribution pumps
• Booster pumps

Water transmission
• Transfer pumps
• Distribution pumps
• Booster pumps

Irrigation
• Intake pumps
• Distribution pumps

Desalination
• Intake pumps
• Brine pumps
• Booster pumps
• High pressure pumps
• Drinking water pumps

Wastewater transportation
• Influent and effluent pumps
• Treatment pumps and fans

Water treatment
• Treatment pumps

Effluent water
• Effluent pumps

Waste incineration
• Effluent pumps
• Fans
• Conveyors

Raw water intake
• Raw water intake pumps

Raw water supply
• Feed-water pumps

Effluent water
• Effluent pumps

Common questions:

– How to avoid voltage drops when starting?
– INOMAX's softstarter will reduce the starting current and thereby avoid the voltage drops.

– How to avoid water hammering when stopping?
– Use our softstarters equipped with an optimized stop ramp. Or even better, with torque control.

– How to ensure high reliability in harsh environments?
– Use our softstarters equipped with coated circuit boards to better withstand those environments.

– How to protect my pumping equipment in the best possible way?
– Use INOMAX's softstarters equipped with our special designed protections such as overload, underload, and locked rotor protection.

Fans

Common questions:

- How to avoid extended voltage drops due to long starting time?
- Use INOMAX's softstarter equipped with current limit to keep control of the starting current.

- How to extend the life of the driving belts?
- Our softstarters will reduce the mechanical stress during start, thus avoiding slipping belts.

- How to ensure the operation of the fan?
- A softstarter with underload protection will detect broken belts, making the operator immediately aware of the problem.

Compressors

Common questions:

- How to ensure a long life of the compressor?
- Using a softstarter for starting will reduce the accelerating torque, thereby minimizing the mechanical stress.

- How to build a compact compressor unit?
- Using a compact softstarter like AST6800 will allow a much more compact starting equipment than for instance a Star-Delta starter.

Conveyor belts

Common questions:

- How to reduce the need for service and repair of the conveyor belt?
- A softstarter from INOMAX will ensure starts with minimal mechanical stress on the conveyor belt.

- How to avoid that the conveyor belt is running in the wrong direction?
- Use a softstarter with phase reversal protection.

- How to improve the efficiency of the conveyor belt?
- Using softstarters with high and low current warnings allow you to load on and off the conveyor belt.

- How to ensure a successful start even after longer times without operation?
- A softstarter with kick start function will provide sufficient torque to be able to overcome the initial high friction from a temporary jammed belt.

INOMAX

Build your trust of technology from China

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