

AD350 High Performance Sensorless Vector Control Inverter

AD350 high performance vector control mini frequency inverter is KEWO independently developed new generation general purpose electrical motor controller, which adopt the same software platform as same as AD800.

With a new generation of high-performance advanced vector control technology applying, high torque control even under low speed, high speed precision, quick torque response and high speed range are available for sophisticated motor control.

It is featured to have modular design, small size, small temperature rise, low noise, and reliable performance. It has built in simple PLC, PID adjusting, programmable input and output terminals function, RS458 terminals, multi function analog input and output function. ect.

Power range: 2S 0.4 to 2.2kw, 4T 0.75 to 3.7kw.

Input voltage: Single phase 220V, 3 phase 380V $\pm 15\%$

Control mode: Sensorless vector control without PG, V/f control

Protection function: Provide up to 25 kinds fault protection, over current, over voltage, under voltage, phase missing, overload protection function

Cooling method: force cooling

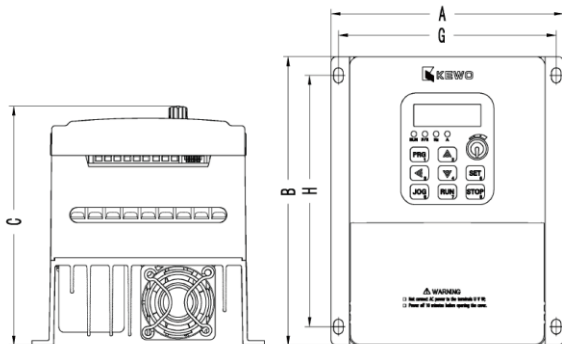
Installation method: wall mount

Infineon IGBT module



Ad350 Sensorless Vector Control Inverter

Products dimension



AC drive models	Install lot (mm)		Dimension (mm)			Bolt (mm)
	G	H	A	B	C	
AD350-2S0.4GB~ AD350-2S2.2GB	117	135	125	155	130	M4
AD350-4T0.75GB~ AD350-4T3.7GB						

Products features

AD350 inverter has the same software and same operation manual as AD800.

Only the size and I/O layout is difference.

Clear silk print of terminal mark easy for wiring



Adopting new generation IGBT module, all Kewo AC drive using IGBT module for quality guarantee.



Flanging design for easy installation



Thick PCBA coating for hard environment using



Heat sink and bottom housing together for better heat dissipation, the side anti-dust cloth is option.



Build in braking unit for full power range of AC350.

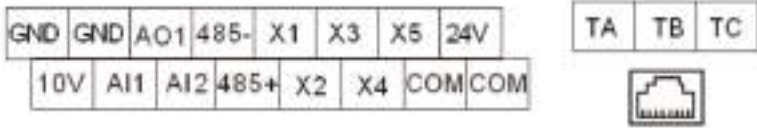


*AD350 sensorless vector control inverter can't performance close loop vector control because there are no PG connector.

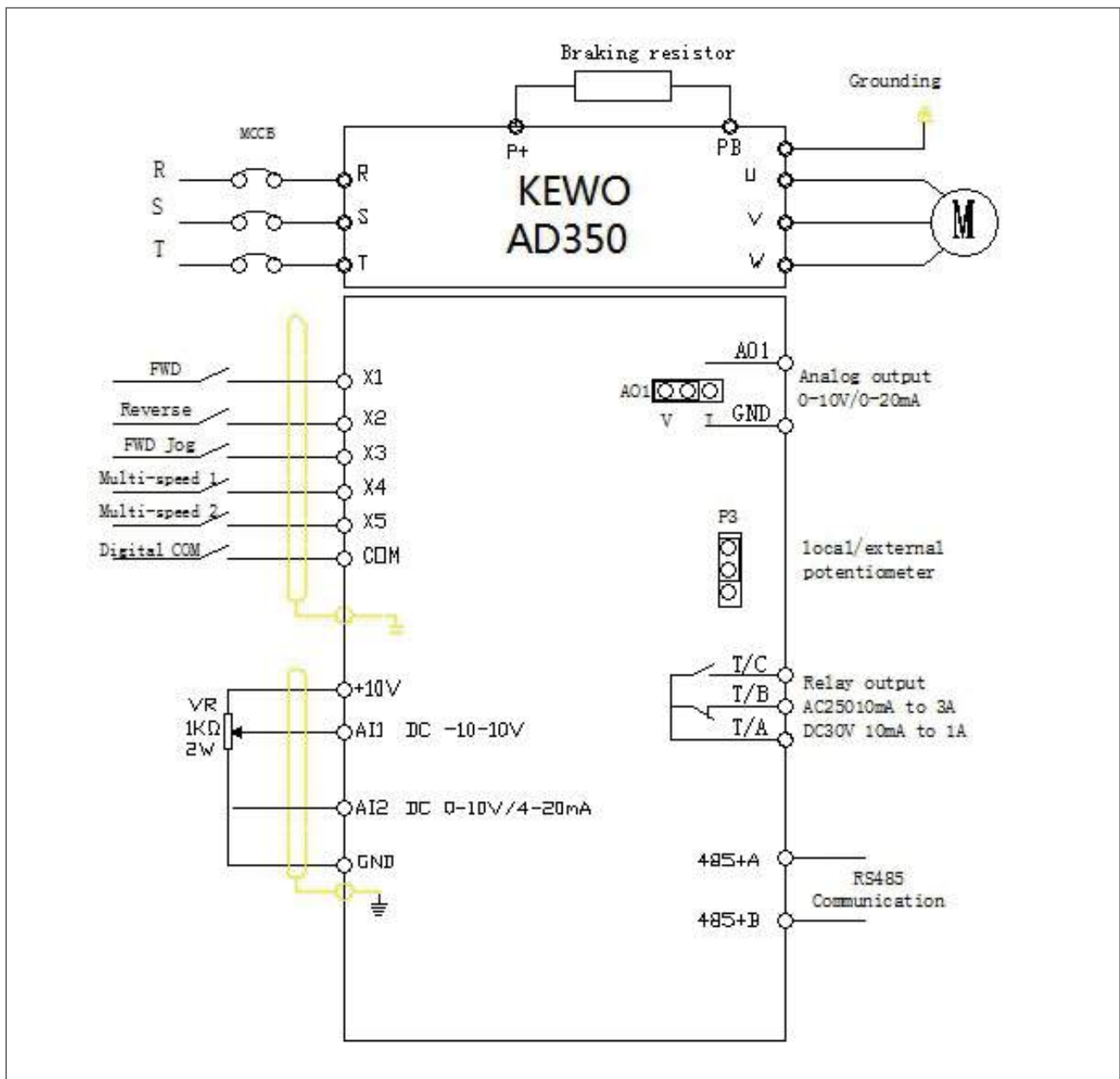
Wiring diagram

It has 5 digital input, DI5 can use for high pulse train input.
 2 analog signal input,
 1 analog output and 1 relay output.

Terminals diagram



Wiring diagram



AD100/AD350 frequency inverter application examples

1. Food processing machinery

Bakery equipment, confectionary equipment, tea-making machine, noodle-making machines, candy-wrapping machines, rice/barely milling machines, flour milling machines, food mixers, food slicers, fruit sorting machines, etc.

Advantage:●

- You can set the operating frequency according to the required work rate.
- Run and Stop keys.
- Ensures safety in the event of an instantaneous power failure.
- Low noise
- High torque from startup to the rated speed.

2. Conveyance machinery

Conveyors, automatic warehousing systems etc. Prevent the collapse of cargo on the conveyor.

The AD100/AD350 allow you to mitigate the shocks caused in starting and stopping a conveyor and change the acceleration /deceleration rates according to the conveyor characteristics and its applications.

The AD100/AD350 can slow down a high –inertia machine in a short period of time without causing an overvoltage trip by increasing the energy consumed by the motor.

The AD100/AD350 can turn on and off the braking circuitry in accordance with the inverter operating status.

It offers vector control and automatic torque boost control modes to achieve strong, stable torque from the start of a motor to the rated speed.

3. Fans & pumps

Built in fans- pumps in industrial machines, water supply and sewage systems, driers, etc.

Energy-saving mode

The variable torque and automatic energy saving modes help saving energy by passing optimal current in accordance with the load.

Automatic process control

Allows a motor to keep running and accelerate smoothly upon the recovery of power even in the event of instantaneous power failure.

Enable an uninterrupted operation without causing a trip.

4. Health, medical and nursing care equipment

Stair lifts, nursing bed, bubble baths, health care equipment, medical equipment

5. Environment and daily-life-related machinery

Commercial ironing boards, car washing machines, Garbage disposers, dust collectors, Driers, etc.

6. Packing machinery

Inner packaging machine, packing machines, output packing machines, membrane packing machines

AD800S Frequency Inverter For PMSM

AD800S is a high performance vector control frequency inverter, which used to for speed and torque control for permanent magnet synchronous motor (PMSM). It has large torque output under low speed, good dynamic responsive and strong overload capability with high performance vector control technology.

It can compatible kinds of PG cards, multiple function and perfect performance.

AD800S developed base on AD800, the performance as good as AD800.

Power Range: 0.75kw to 400kw

Input Voltage: 323 to 437VAC

Control Mode: Sensorless vector control without PG, sensor control with PG for PMSM or general induction motor.

Starting Torque: 2% rated speed with 100% rated torque (SVC), 0Hz with 180% rated torque(CVC)

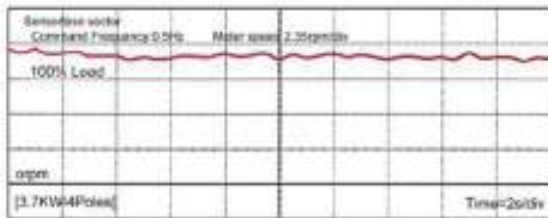
Maximum Frequency: 0 to 500Hz.Maximum frequency: 0 to 500Hz.

Installation Mode: Wall mount/ Floor standard cabinet.

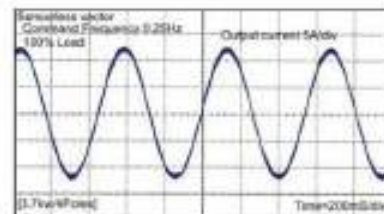
Wide speed control range:

Speed and current waveform in sensorless open loop vector control mode.

Sensorless without PG mode: 0.5 to 400Hz (1:100/50Hz)



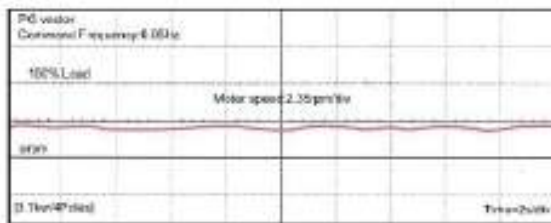
The speed waveform with 100% load under 0.25Hz.



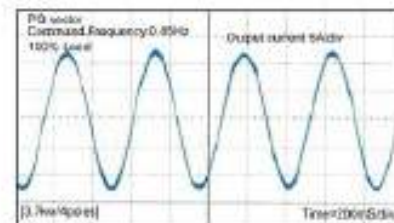
The current waveform with 100% load under 0.25Hz

Speed and current waveform in sensor close loop vector control mode

PG sensor vector control mode: 0.5 to 400Hz (1:100/50Hz datum)



Speed wave form under 0.05Hz with full load in sensor close loop mode

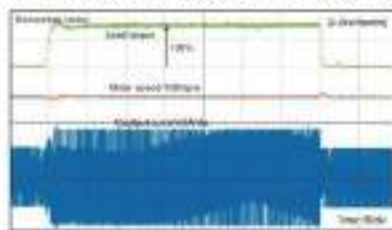


Current wave form under 0.05Hz with full load in sensor close loop mode

Enhanced the speed response with adopt 32 bit DSP

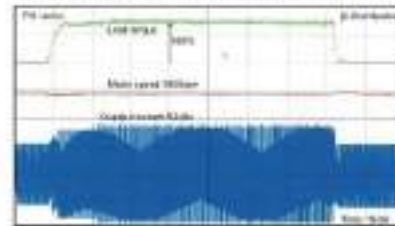
High speed data processing and calculating capability to improve the speed response of inverter.

Sensorless vector control mode: response 300rad/s, accuracy +0.2%



Impact load response characteristic (Sensorless without PG)

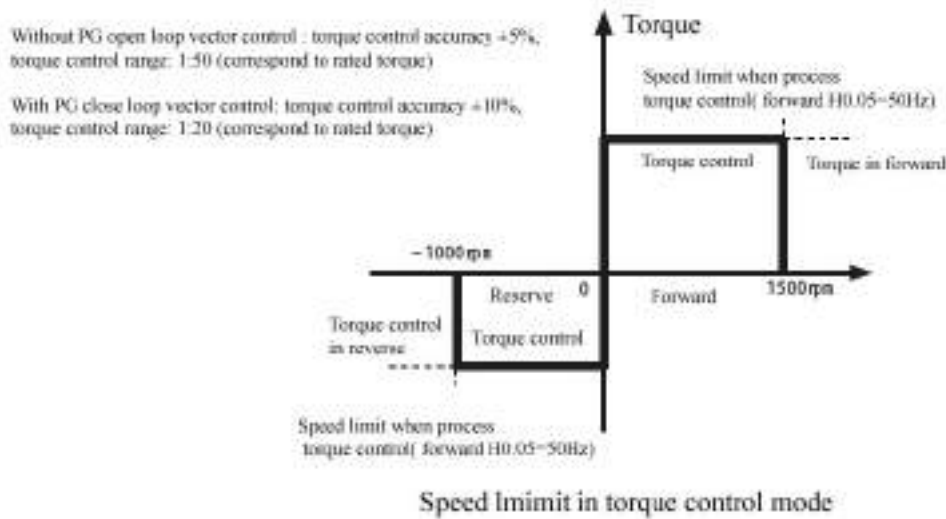
PG sensor vector control mode: response 250rad/s, accuracy +0.01%



Impact load response characteristic (Sensorless with PG)

Stand built it torque control function

The torque control, that developed based on vector control, uses to control motor torque output directly. The torque limit, limit range, speed limit can be set for preventing mechanical and transmission broken.



Technical Specification

Function describe		Specification
Input	Input voltage	323V to 528V
	Input frequency	50Hz/60Hz, allowable range 47 to 63Hz
Output	Output (V)	0 to input voltage
	Frequency (Hz)	0 to 500Hz
Technical specification	Control mode	V/F, sensorless vector control mode
	Motor type	Synchronous motor
	Speed ratio	PMSM 1:20 (SVC)
	Speed control accuracy	$\pm 0.2\%$ (sensorless vector control)
	Speed fluctuation	$\pm 0.3\%$ (sensorless vector control)
	Torque response	< 20ms (SVC)
	Torque control accuracy	<10% (SVC)
	Starting torque	Induction motor: 0.25Hz/150% (SVC) PMSM: 2.5Hz/150% (SVC)
Running specification	Overload tolerance	150% rated current 60s 180% rated current 10s 200% rated current 1s
	Frequency reference	Digital setting, analog setting, pulse setting, multiple segment, sample PLC, PID setting, Modbus, profibus, auxiliary and main combination
	Voltage auto regulation	Keep output voltage in constant value when grid fluctuation
	Fault protection function	Providing up to 30 kinds protections such as over current, over voltage, under voltage, phase missing, over load. Fault record and fault automatically reset is available
	Speed tracking	provide smooth start when motor has a same speed running

SD800 Sealed Frequency Inverter (IP54)

Brief Introduction:

This SD800 sealed frequency inverter is enhanced version of AD800 series frequency inverter, built in with IP54 protection grade. With excellent in anti-dust, water proof, anti-grease and anti-corrosion properties, the SD800 sealed inverter is widely used in printing and dyeing, textile, cement, coal, ceramics industries and other harsh industrial conditions with heavy dust, moisture and high temperature.

Specification, voltage rating, power rating

220V (single-phase power) 0.4-2.2kW

380V (three-phase power) 0.75-30kW



SD800 Sealed Frequency Inverter

Key product features

- High performance flux vector control for IM and PMSM
- Excellent quick response with vector control
- High starting torque even under low speed.
- Torque limit for machine safety protection
- Rapid current limit, up to 20 kinds protection function.
- Latest generation Infineon IGBT modules using

Outstanding motor control performance

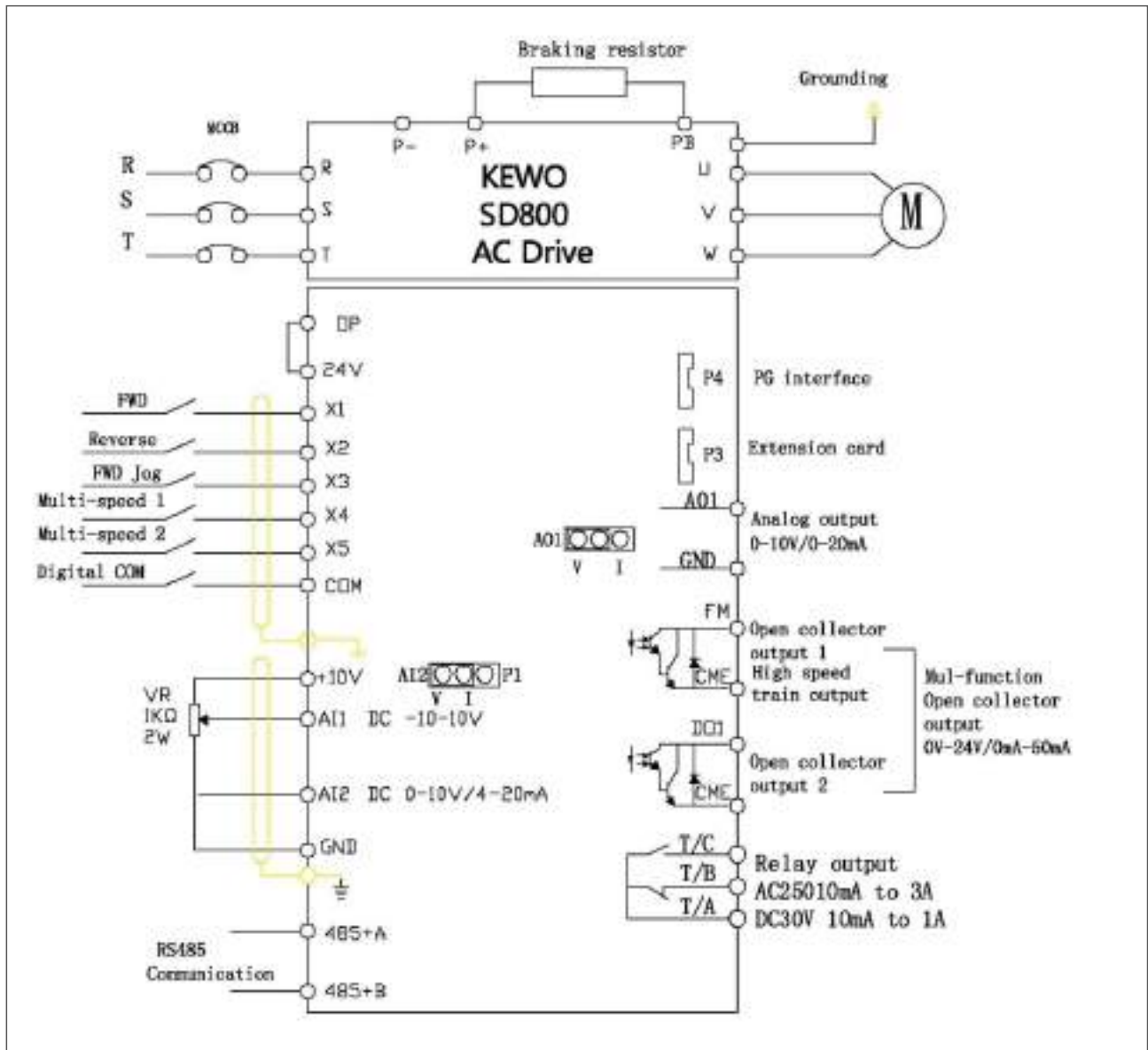
- Torque respond speed $\leq 5\text{ms}$ in OLV without PG
- Wide input voltage range, and work above 45°C is available
- Outstanding overload capacity, 150% rated current for 60s, 180% rated current for 3s, 200% rated current for instantaneous.
- Speed range 1:100 (SFVC), 1:1000 (CLVC)
- Startup torque, G type: 0.5 Hz/150% (SFVC); 0 Hz/180% (CLVC), P type: 0.5 Hz/100%
- Torque control accuracy, $\pm 5\%$ (CLVC)

Hardware enhanced features

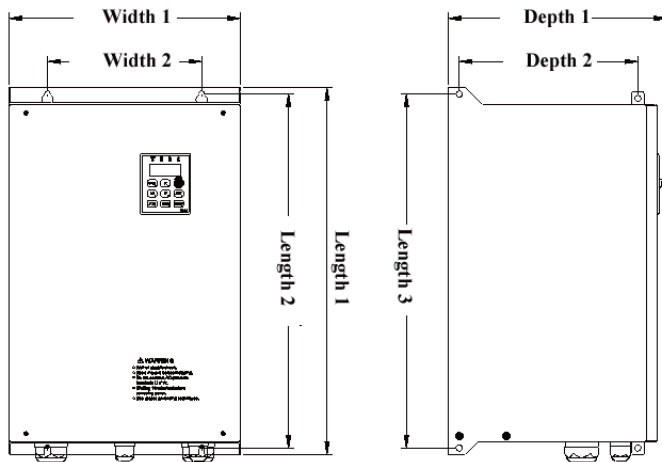
- Ti's 32 bit DSP (28034/35), Germany Infineon intelligent modules;
- Sealed cabinet, conformal coating on PCB;
- Adopt using aviation plugs that have good quality water proof, gas and oil proof. (options);
- Imported high-speed ventilation fan with 24V DC power supply, good cooling effect;
- Lower failure rate and long service lift.

Wiring diagram of SD800. (the same as AD800 series)

- It has 5 digital I/O input, compatible sink and source way.
- 2 Analog input, support -10V to 10V, 0-10V, 0/4 to 20mA.
- 1 Analog output (0-10V/0-20mA is selectable)
- 2 collector output (FM and CME support the high pulse output).
- 1 relay output.
- Extension PG, I/O card are available.



SD800 Sealed frequency inverter external and installation dimension



Models	Power	L1	W1	D1	L2	W2	L3	D2	SLOT HOLE
		External size			Install size 1		Install size 2		
SD800-4T0.7/3.7GB	0.75-3.7kw,380V	230	130	177	215	90	215	140	M5
SD800-4T5.5/7.5GB	5.5-7.5KW,380V	320	180	210	305	120	305	170	M5
SD800-4T11.0/15GB	11-15kw, 380V	390	230	225	375	160	375	180	M6
SD800-18.5/22/30G	18.5-30kw, 380V	390	230	225	375	160	375	180	M6

Applications

Metal processing, CNC tooling machine, cable drawing machine.

Boiler air blower, induced draft fan, exhaust fan.

municipal Construction , HVAC.

circulating water pump, Fill pump, fuel delivery pump.

papermaking equipment, chemical industry, pharmaceutical industry, textile industry.

AS850 Z Servo Drive For PMSM Of Injection Molding Machine

AS850Z series servo drive for permanent magnet synchronous motor (PMSM), is KEWO own developed hydraulic electric servo drive system for injection molding machine energy saving. It has following advantage, high energy saving, high power factor, quick response and high accuracy control, etc. AS850Z has powerful overload capability even under low speed, 180% rated torque for 30s under 0 speed is possible to ensure good pressure keeping ability.

Output frequency range: 0 to 400Hz.

Input voltage: 3 phase 380V±15%, 2.2kw to 90kw

Pressure signal reference: external analog 0-10V, 0-1A.

Protection function: Input phase missing, input under voltage, over voltage, over current, over load, over heat, external disturbing .

Cooling method: force cooling

Mount: Wall mount

Function features

Energy saving: up to 60% energy saving compare to traditional fixed pump system. 75% is possible be achieved according to difference injection condition.

Lower oil temperature: reduce 5-10 degrees

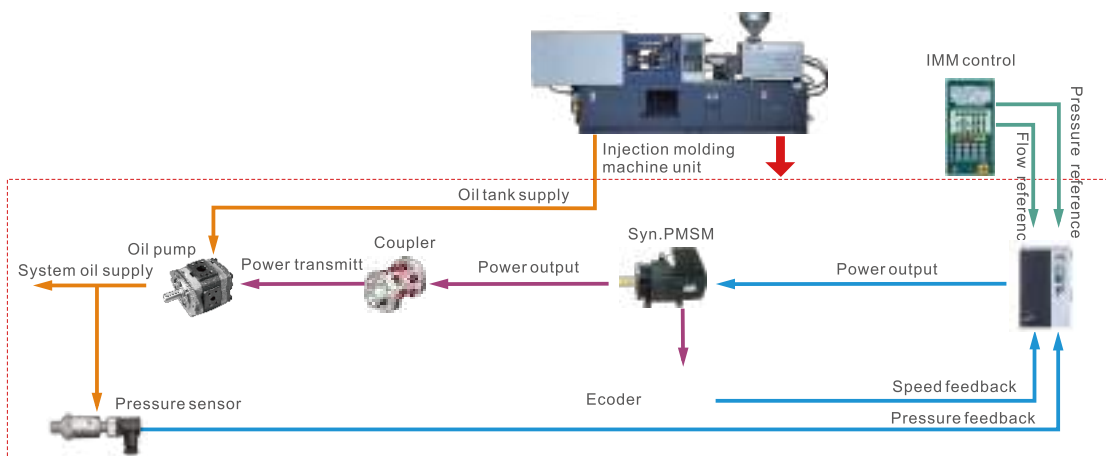
High repeated accuracy: To achieve high accuracy flow and pressure control

Long pressure holding time: It is favorable for big wall thickness.

Quick response: frequency response up to 50ms.

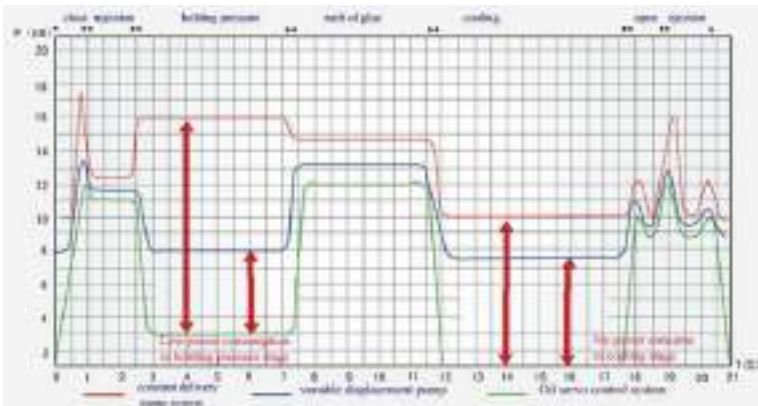
Enhanced features

- 1.Design the signal correction algorithm and match to work high performance under low speed characteristic to solve the creep problem of IMM. Because his given signal reference is nonlinearity characteristic.
- 2.Due to switching frequently in flow control mode, so we adopt fuzzy control to realize smooth switch of flow and pressure control.
- 3.Adopt flow control with pressure compensation to eliminate effect of flow estimate accuracy.
- 4.Adopt noise control method to reduce the fluctuation of output pressure of oil pump.
- 5.Monitoring temperature of motor and drive in whole journey, parameters adjusting in real time.



Energy saving with AS850Z for IMM system

Energy saving principle



The injection molding machine power consume take up 75% of system total in traditional constant flow of IMM.

It need difference flow and pressure during difference working stage of IMM such as mold close, injection, pressure holding, molding open. When the required over the setting pressure and flow, the flow and pressure will be adjusted by relief valve or proportional valve. this process call high pressure throttling. Up to 40-75% energy wasting during this stage.

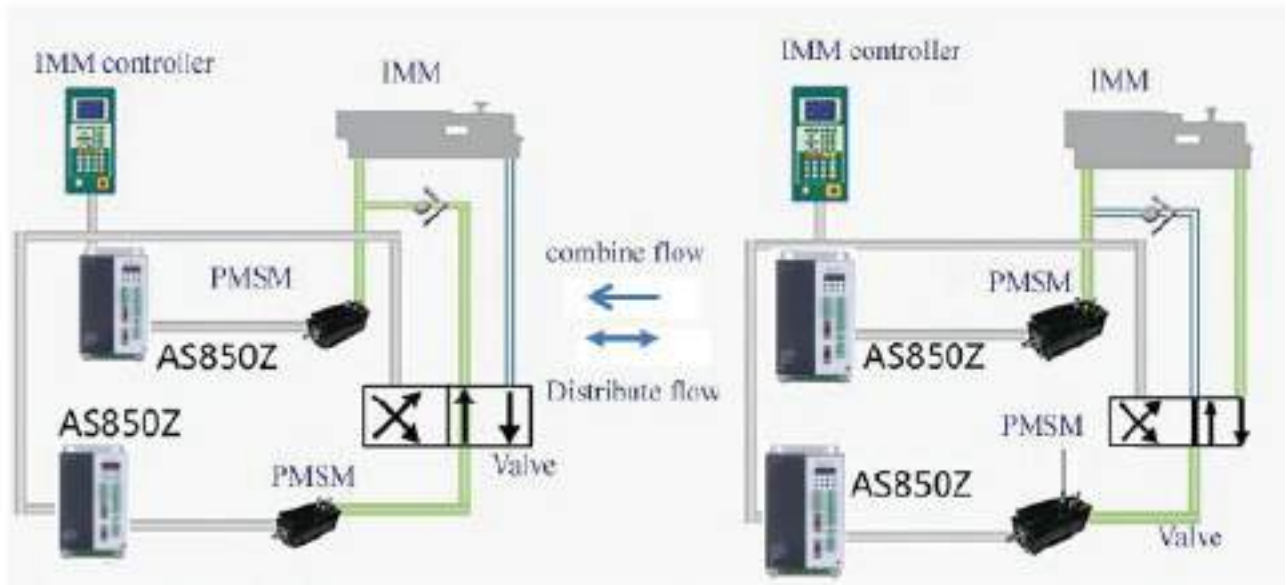
System connection diagram



Multiple pumps combine flow control diagram

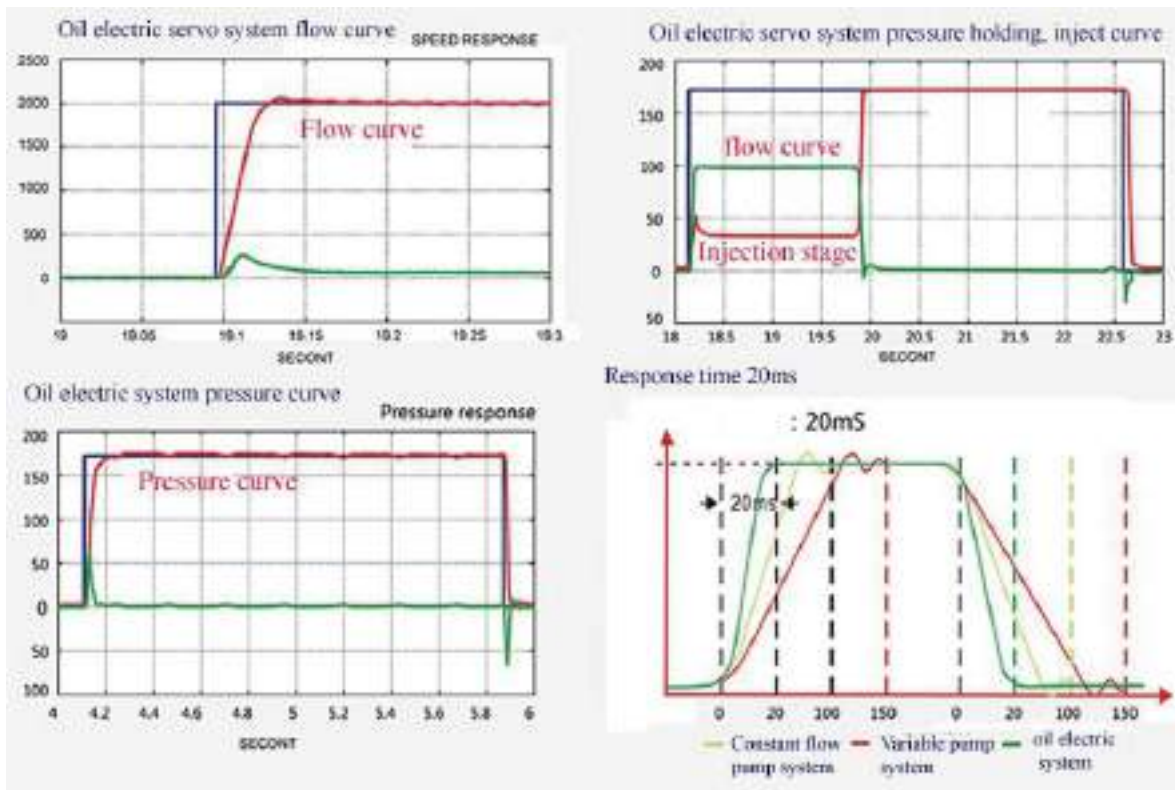


Multiple pumps compound control compound control



Oil servo drive system performance

System curve of Kewo AD850Z servo drive in IMM application



Technical data

	Items	Description
Input	Rated voltage range	3 phase 380V±15%
	Rated frequency	50/60Hz
Output	Rated voltage range	Output 0 to 380V
	Rated frequency	0.00 to 400.00Hz
Mounting	Wall mounting with IP20	
Cooling method	Force cooling	
Encoder	Rotary transformer	
	Pressure reference	External analog signal (0-10V)
	Flow reference	External analog signal (0-10V)
	Pressure feedback	External analog (0-10V or 4-20mA)
	Control input	9 channel insulation input
	Control output	3 channel insulation input
	Analog output	1 channel output
Protection function	Phase missing input, under voltage input, over voltage input, over current, overload of drive, overheat of motor, external interference encoder fault.	
Display	Current output display, current rotation, current output current, output voltage, fault alarm, operation parameters, running status.	
	Using place	Indoor, no sunlight exposure, no dusty, corrosive atmosphere, no flammable gas, no water dip and not salt.
	Environment temperature	-10 ℃ to 50℃
	Environment humidity	90% below(no condensation)
	Shock intensive	0.5g(acceleration) below
	Altitude	1000 below.
	Items	Description
Input	Rated voltage range	3 phase 380V±15%
	Rated frequency	50/60Hz
Output	Rated voltage range	output 0 to 380V
	Rated frequency	0.00 to 400.00Hz
Mounting	Wall mounting with IP20	
Cooling method	Force cooling, fans control is available	
Encoder	Rotary transformer	
	Pressure reference	External analog signal (0-10V)
	Flow reference	External analog signal (0-10V)
	Pressure feedback	External analog (0-10V or 4-20mA)
	Control input	9 channel insulation input
	Control output	3 channel insulation input
	Analog output	1 channel output
Protection function	Phase missing input, under voltage input, over voltage input, over current, overload of drive, overheat of motor, external interference, encoder fault.	
Display	Current output display, current rotation, current output current, output voltage, fault alarm, operation parameters, running status.	
	Using place	Indoor, no sunlight exposure, no dusty, corrosive atmosphere, no flammable gas, no water dip and not salt.
	Environment temperature	-10 ℃ to 50℃
	Environment humidity	90% below(no condensation)
	Shock intensive	0.5g(acceleration) below
	Altitude	1000 below.

Model selection

Servo drive model	Input voltage	Rated output power (KW)	Rated input power (A)	Rated output current (A)	Braking resistor power selecting	Braking resistor (Ω)	Braking unit
AS850Z4T017	3 phase 380V	7.5	20.5	17	1000	>90	built in
AS850Z4T025		11	26	25	1000	>40	
AS850Z4T032		15	35	32	1000	>32	
AS850Z4T037		18.5	38.5	37	2500	>32	
AS850Z4T45		22	46.5	45	2500	>16	external connect
AS850Z4T60		30	62	60	2500	>16	
AS850Z4T75		37	76	75	5000	>8	
AS850Z4T91		45	92	91	5000	>8	
AS850Z4T112		55	113	110	5000	>8	
AS850Z4T150		75	157	150	5000	>8	
AS850Z4T175		93	180	175	5000*2	>8*2	
AS850Z4T210		110	214	210	5000*2	>8*2	
AS850Z4T250		132	256	250	5000*2	>8*2	
AS850Z4T300		160	307	300	5000*2	>8*2	

Application

1. Injection molding machine
2. pressure die casting machine
- 3 . brick machine
4. shoes machinery
5. Pressing machine
6. Aluminum extrusion machine
7. Hydraulic, CNC punching machine
8. Civil engineering machine
9. Other hydraulic machinery



AS850T Spindle Servo Drive (Spindle Frequency Inverter)

AS850T is a new tailor made spindle controlling frequency inverter (servo drive) for CNC, machining center, packing, textile, etc. It can achieve to high accuracy speed, torque and position control through close loop servo control, which based on brand new hard ware and soft ware platform.

Perfect performance and powerful function is your machine best selection.

Production Name: AS850T Spindle Servo Drive (Spindle Servo Frequency Inverter)

Output Frequency Range: 0 To 1000Hz.

Input Voltage: 3 Phase 380V±15%, 2.2kw To 75kw.

Control Mode: Current/Flux Vector Control, Close Loop Vector Control

Protection Function: Over Current, Over Voltage, Power Module Overheat, Under Voltage, Over Load, Input/Output Phase Missing, Motor Short Circuit Protection.

Cooling Way: Force Cooling.

Mounting Way: Wall Mounting.

Function features

Rigid Tapping	C Axis Function	Accuracy Stop	0 Speed Lock
Electronic CAM	Pulse Synch.	Index Plate	Low torque output under low speed

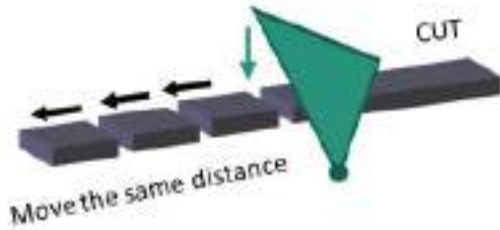


Software function

Function	Application	Purpose	Function describe
Points positioning	Mechanical transmission	Auto process control	The servo motor will run when receiving a command, and move to setting point. When arriving the set point, it will stop and sent a signal back
Reciprocating position running	Mechanical transmission	Auto process control	Perform reciprocating movement between two points, the speed can be set
Multiple points positioning	Mechanical transmission	Auto process control	Up to 256 points can be set. When corresponding input signal is valid, motor will move to that point
synchronous driving	Mechanical transmission	Synchronous speed control	The motor speed swill synchronize with the input pulses, the synchronize ratio can be set. Used in print and textile. Etc filed
Torque control	Pressing machine	Output torque adjustable	The motor torque can be adjusted by analog input or communication method. Ensure every motor has the same torque
Cut to length	Transverse cutter	Auto to realize fixed length cutting	The drive will measure the cutting length by external encoder, and calculate the initial point, it will activate cutting when arriving the cutting length
Parallel drive	Roller rail	To realize same output	To achieve the same output for every motor when multiple drives serving a load by communication mode

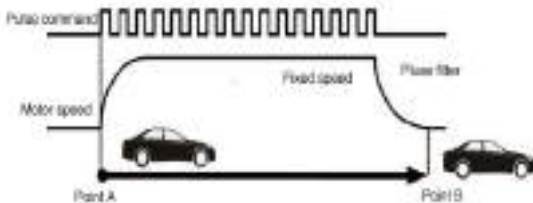
Main features of products Points positioning control

The pulse can be set by functional code, even no pulse command, the position control of fix route can set by external terminal as well.

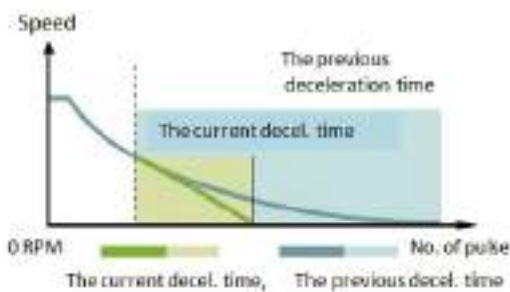


Pulse synchronization position control

To achieve high accuracy continuous route control by pulse train, also can realized multiple motor synchronous speed control by pulse train.



Reduce the speed response effectively by variable gain control. Compare to previous products, the deceleration time reduce sharply



Zero speed servo control

It will automatically go to 0 speed servo control status and keep still when motor speed low to 0 value. AS850T can output 180% rated torque output with PG connection.

Electric gear

Through gear ratio of electric gear setting, can set motor movement value that equivalent to input pulse freely. Configure 4 groups electric gear, it can be set freely by terminal configuring.



Good spray paint for all PCBA to ensure can work in hard environment



Pluggable terminals for easy wiring



Control mode of AS850 AC Servo Drive

Speed Control Mode

Speed control range: 1:5000
 Speed control precision: $\pm 0.1\%$
 Frequency resolution: 0.01Hz
 Constant torque output

Positioning control mode

Positioning control accuracy: ± 1 pulse.
 Positioning control range: 4 Byte pulse,
 starting, braking, stop curve can be adjustable

Torque Control

Constant torque output under basic frequency
 Torque control range 0 ~300% rated torque,
 Torque control precision: $\pm 5\%$
 Torque keeping under 0 speed

Synchronous control

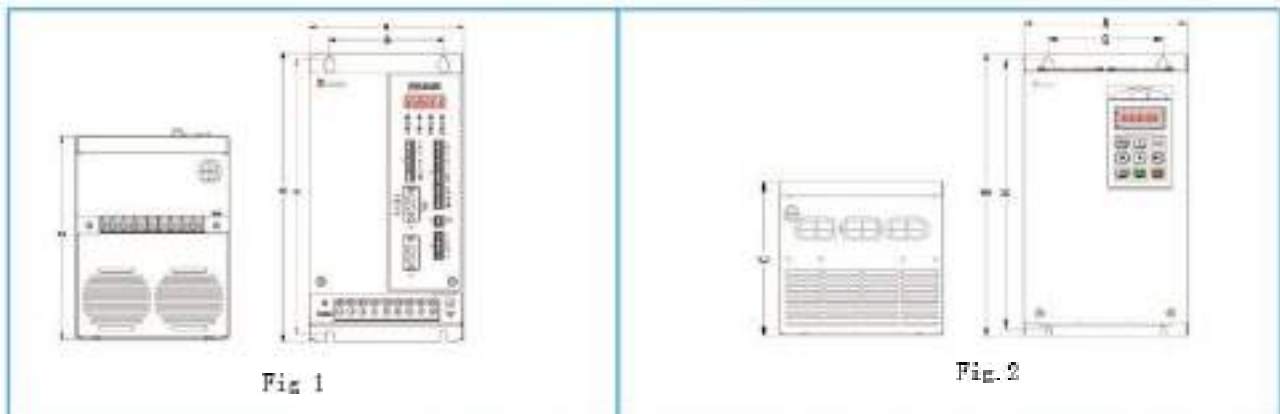
Master and slave control, or control multiple servo motors by external PG card to realized same speed control,
 Electronic gear, following speed accuracy ± 1 pulse.



Technical specification

Input	Rate voltage	380V+ 10% -15%
	Rated frequency	50/60Hz
Output	Output voltage	0-380V
	Output frequency range	0-1000Hz
Control feature	Control mode	Current/flux, close loop vector control
	Starting torque	0.0Hz 180%
	Torque limit	0-200% rated motor torque
	Torque control accuracy	$\pm 5\%$
	Speed control ratio	1:5000
	Speed control accuracy	$\pm 0.1\%$
	Position accuracy	\pm pulse no.s
	Accel./decel. control	0.05 to 3000Hz
	Braking mode	Dynamic braking, built it braking unit
	Over load capability	150% rated load for 3 min, 200% for 3s
	Analog input	3 ways, -10V to 10V, 0-10V/4-20mA
	Analog output	0-10V/4-20mA
	Programmable digital input	9 ways digital input, NPN/PNP acceptable
	Programmable external pulse input	Pulse+ director, quadrature pulse
Protection function	Over current, over voltage, overheat, under voltage, phase missing, motor short circuit.	
Environment	Temperature	-25°C to 45°C
	Humidity	< 90% RH, Non-condensate
	Vibration	Below 20Hz, 1G, 20 to 5Hz, 0.2G
	Heat dissipation	Force cooling
	Protection grade	IP20

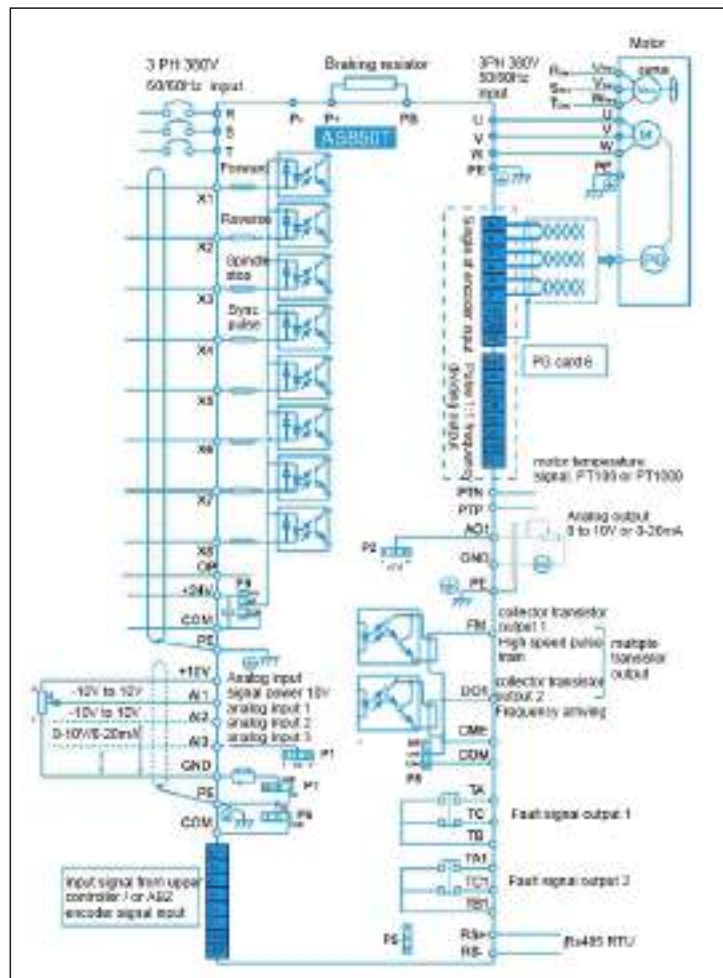
Dimension and selecting



Models	G	H	A	B	C	Screw hole	Fig.
AS850-4T2.2GB-5.5GB	100	240	135	250	180	M5	Fig. 1
AS850-4T7.5GB-11GB	140	325	200	340	185	M5	Fig. 1
AS850-4T15GB	120	290	160	300	187	M5	Fig. 2
AS850-4T18.5GB-30GB	200	435	270	450	245	M6	Fig. 2
AS850-4T37GB-45GB	220	500	300	520	265	M6	Fig. 2
AS850-4T55GB-75GB	280	560	350	580	275	M8	Fig. 2

Wiring diagram

- 1.8 programmable digital input terminals.
- 2. Built in Can Bus, Rs485 Modbus, built in PG card.
- 3.3 analog input (0-10V, -10V to -10V, 0-20mA), 2 collector output, 2 relay output, 1 analog output. PT100 output.



Kewo products has been using in more than 50 countries.



If you interested more products of Kewo, please feel free contact us