

MD880 Product Presentation

MD880 Product Presentation

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MD880 product development orientation

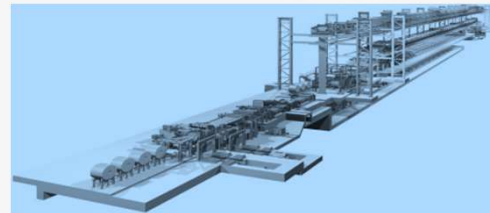
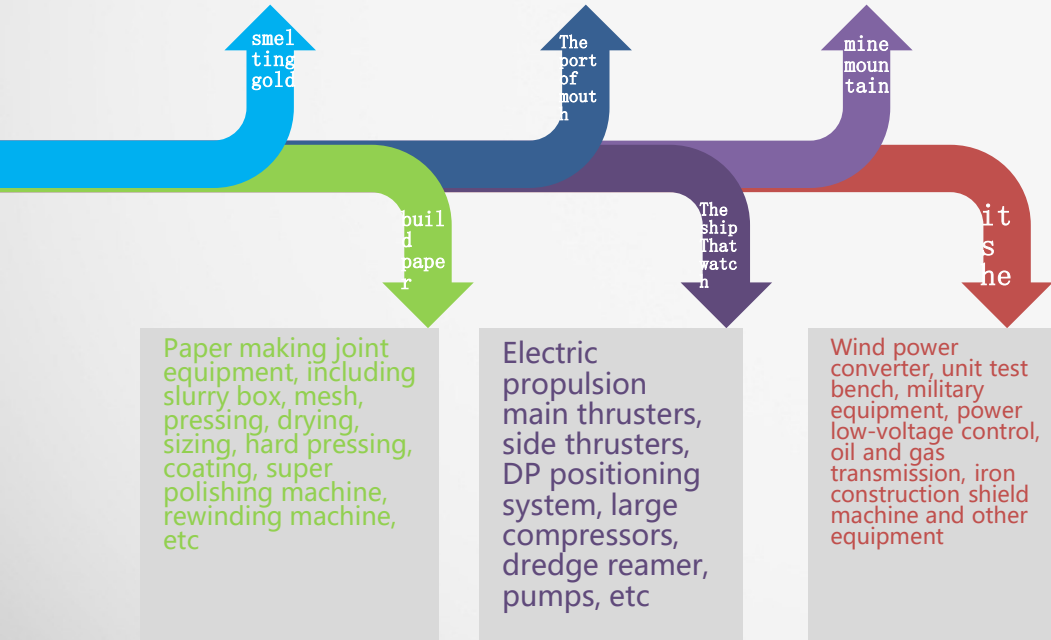


MD880 application localization

High-speed bar and wire, strip hot rolling (roller/flying shear/coiling), wide and thick plate (roller/cutting edge/fixed length/cold bed), pickling, cold rolling main and auxiliary annealing, galvanized, color coating; Non-ferrous metal alloy manufacturing equipment, non-ferrous metal calendering equipment, etc

Shore power supply, quayside container crane, bridge grab ship unloader, door seat machine, etc

Mine hoist, belt machine, pile retractor, mine transfer winch, etc



MD880 compared with competing goods of comprehensive performance

Comparison of advantages of competing products	INOVANCE	SIEMENS	SIEMENS	ABB
	MD880	6SE70	S120	ACS880
Power density	400:3.7 ~ 3200kW 690:55/75 ~ 5600kW	400:2.2 to 1300kW 690:55 to 2300kW	400:2.2 to 3200kW 690:75 to 4800kW	400:7.5 ~ 3200kW 690:55 ~ 5600kW
Software free programming	support	support	support	support
Controller Strengths and Weaknesses	HCU bus is rich and flexible Standard terminals have the most abundant resources	The controller is bulky and the flexibility is poor	Bus rich, CU320 one-to-many control	Bus rich and flexible
Inverter capacitance capacity	Full capacitance configuration	Full capacitance configuration	Half capacitance	Full capacitor configuration
Rectifier type	BLM,SLM,ALM	BLM,SLM,ALM	BLM,SLM,ALM	BLM,SLM,ALM
Structure volume dimensions	small	big	In the	small
High power current sharing control	Hpcu-fpga architecture hardware parallel current equalization control consistency is the best	The controller has a maximum of 4 parallel machines, and the consistency of software is poor	If the controller has a maximum of 4 parallel machines, the software has poor flow sharing consistency	Max R8-12 parallel, hardware topology, strong
Adaptability and compatibility with PLC	The bus adaptivity and parameter matching with PLC, motor model simulation and so on are considered	It depends on the bus and does not consider the third party	Rely on the bus without considering third parties	Rely on the bus without considering third parties
Appearance and shape design	Combining the design concept of aircraft carrier and aircraft platform (IF)	Old products are bulky and cumbersome	Full modular package independent style	Full Modular package Standalone Style

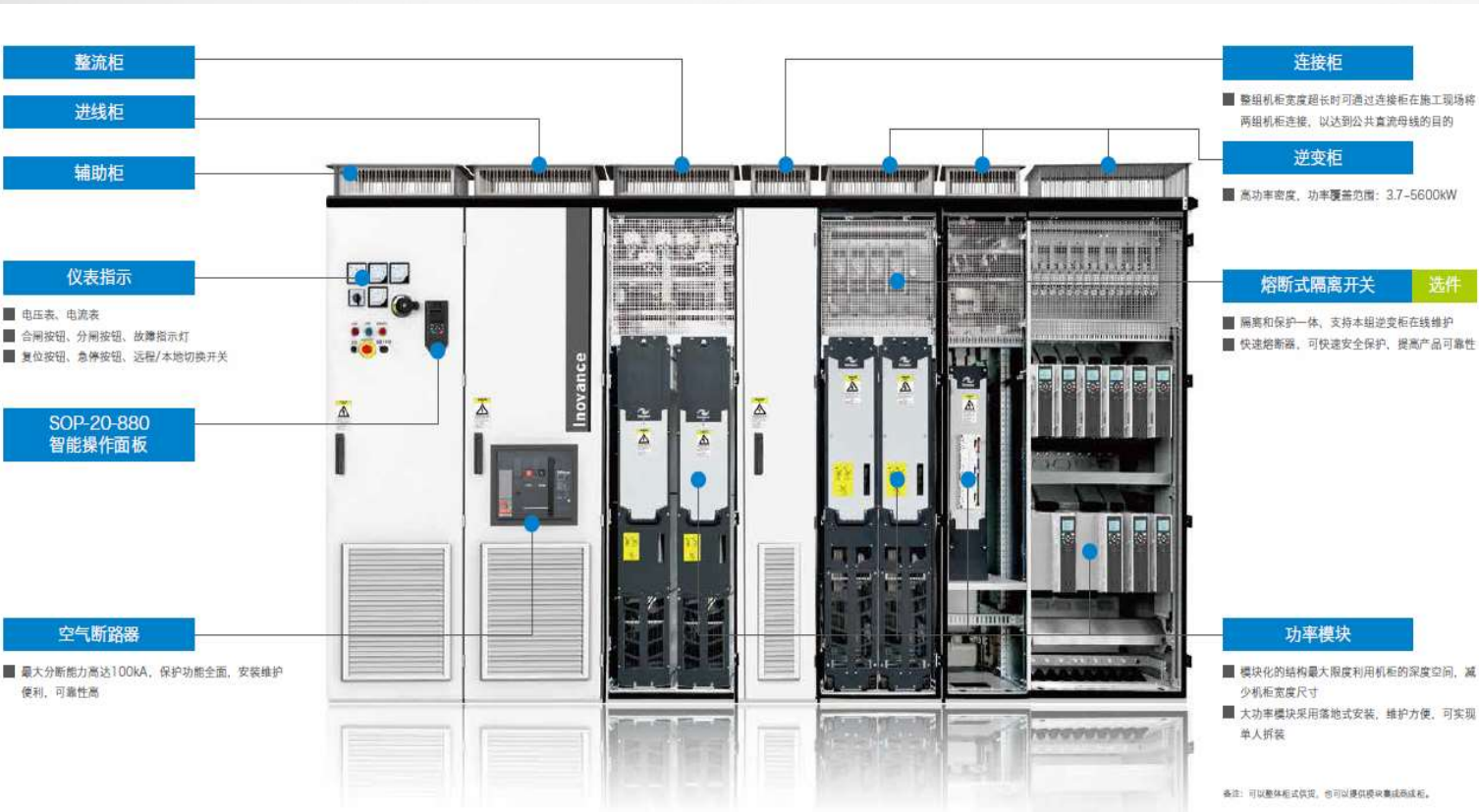
MD880 High performance multi drive inverter

Power: 3.7 ~ 5600 kw

- Modular hardware design, complete rectifier module types: basic rectifier, feedback rectifier and active rectifier
- Support software and hardware modules freely set up, no need to change the code can meet your various personalized needs
- Ten years of long-term stability of hardware device configuration, multiple fault handling mechanisms to ensure that the field average 30 minutes of rapid recovery of production
- Without changing the original PLC program, can be targeted to achieve the perfect compatibility of all kinds of upper computer
- Professional level configuration design background application build configuration InoDriveStudio background PC tool and LCD keyboard

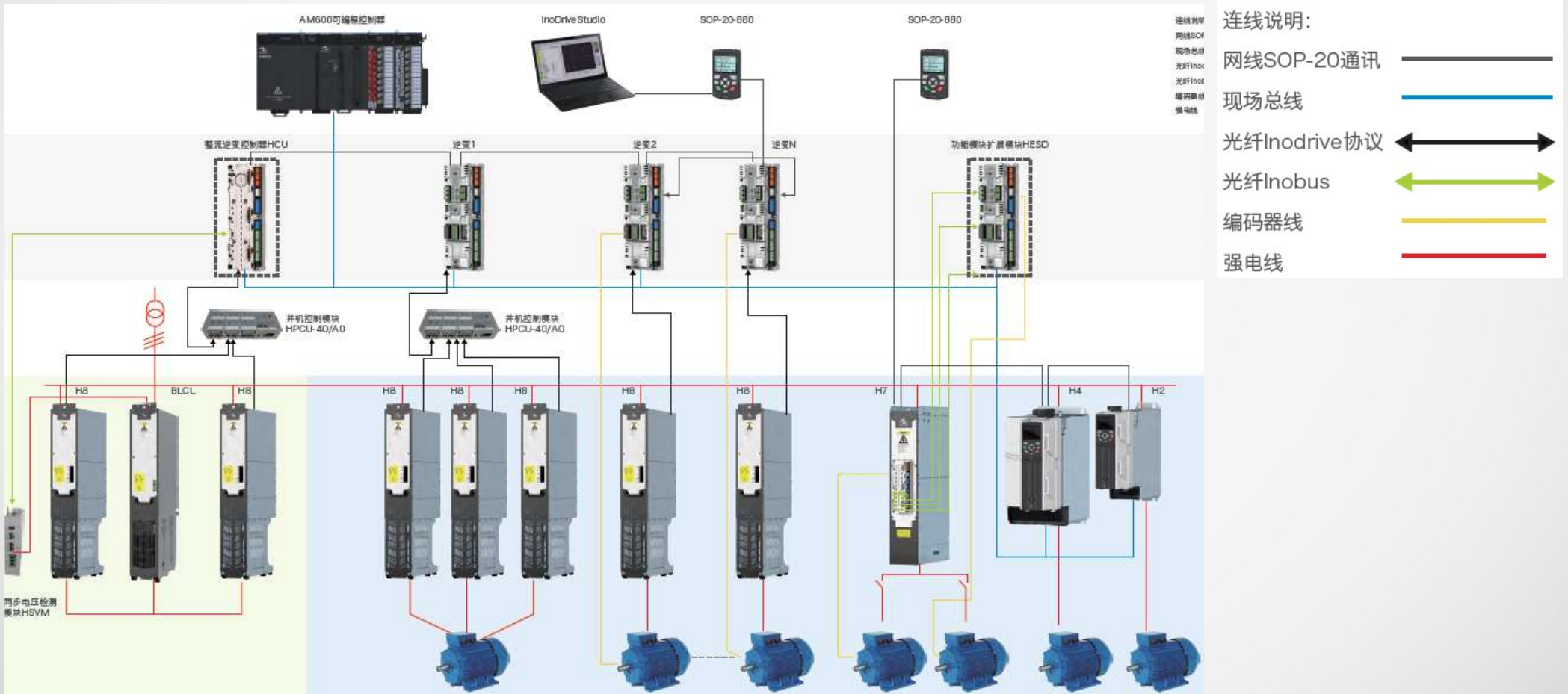


MD880 system introduction



- Unified unit in line
- Unified rectifying unit
- Common DC bus
 - Effectively reduce rectifier capacity
 - Energy flow inside potential energy load;
- Modular structure design; Improve the utilization rate of cabinet, reduce the number of cabinets, save floor area by 30%~60%.
- It provides two options: components and cabinet machines to meet the diverse needs of integrators and end users.

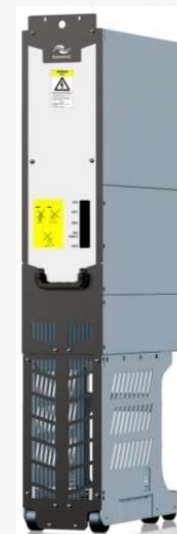
MD880 system introduction



MD880 module is introduced

Inverter as well as active rectifier
Inverter Unit and/or Active Front End Rectifier Unit

Basic rectifier
Basic Rectifier Unit



FrameSize:H1 ~ H3

FrameSize:H4

FrameSize:H6

FrameSize:H7

FrameSize:H8

FrameSize:T2

- 380 v:
H1: 3.7 to 11 kW
H2: 15 ~ 30 kW
H3: 37 ~ 45 kW

- 380V :
55 ~ 90 kW

- 380V :
110 ~ 132 kW
- 690V :
90 ~ 160 kW

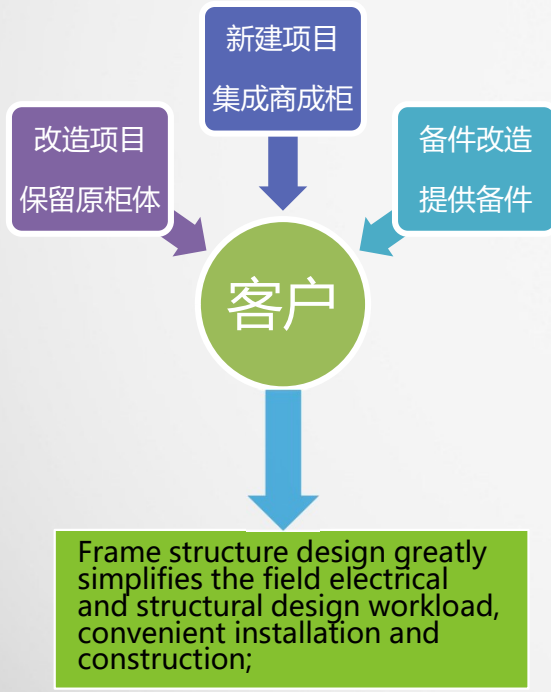
- 380V :
160 ~ 200 kW
- 690V :
200 ~ 250 kW

- 380V :
250 ~ 500 kW
- 690V :
315 ~ 560 kW

- 380V :
475 ~ 649 kW
- 690V :
650 ~ 929 kW

MD880 module introduction

Rectifier framework components



框架组件	有源整流框架组件		回馈整流框架组件	
图片				
	FrameSize: BLCL+H8	FrameSize: BLCL+2×H8	FrameSize: L+H8	FrameSize: L+2×H8
功率等级	380-415V: 394-556kW 525-690V: 437-639kW	380-415V: 749-1056kW 525-690V: 829-1214kW	380-415V: 423-595kW 525-690V: 684-1026kW	380-415V: 787-1106kW 525-690V: 1272-1909kW
最大重量 (kg)	460	650	320	480
结构尺寸 (WxDxH) mm	631x624x1450	874x624x1450	631x624x1450	874x624x1450

MD880 module introduction

Inverter framework components

6SE70 inverter/inverter for Siemens products in the 1990s, the current 12 years to upgrade to S120, new and old products are incompatible with each other, old products bulky, large volume, high failure rate, and the stock market is huge;

This kind of replacement framework is mainly used in the customer site 6SE70 transformation project, and the interface size of Siemens 6SE70 framework is the same, so as to realize the seamless replacement of software and hardware of Siemens old products.



MD880 Inverter frame G



MD880 inverter frame J



MD880 inverter frame K



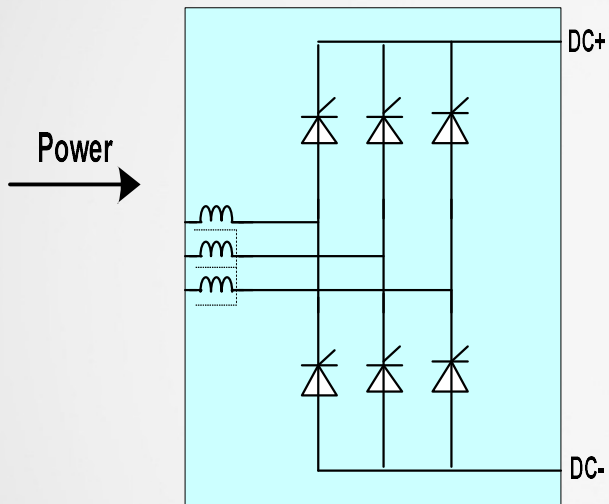
MD880 inverter frame L

Replace 6 se70 MD880

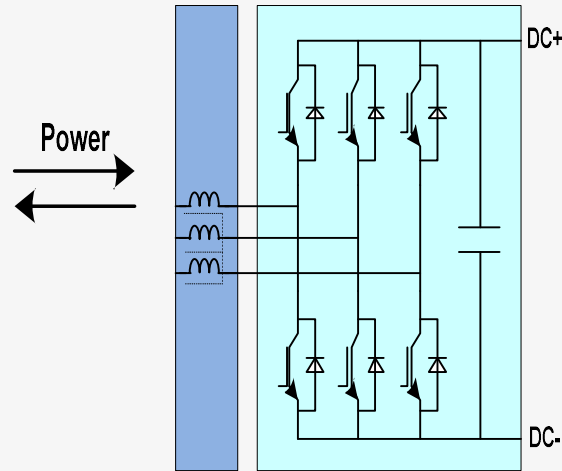


Siemens 6SE70 inverter frame

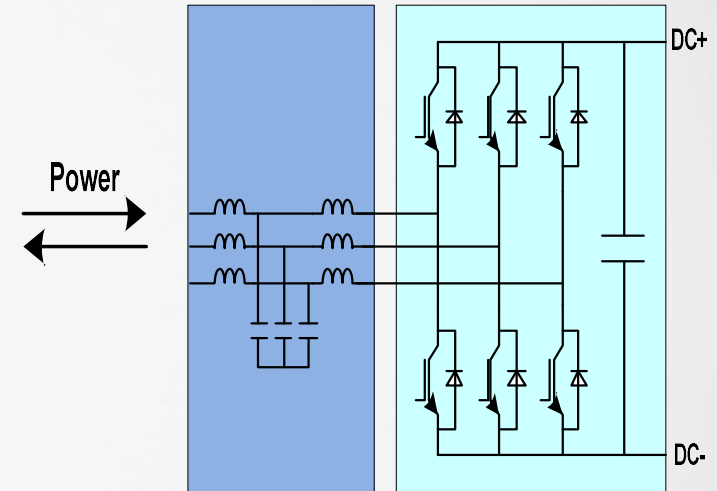
Introduction to the MD880 module



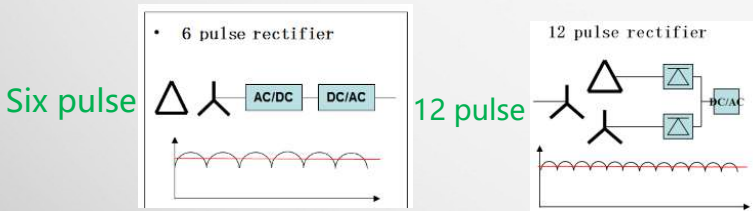
Basic rectifier power supply system



Feedback rectifier power supply system



Active rectifying power supply system

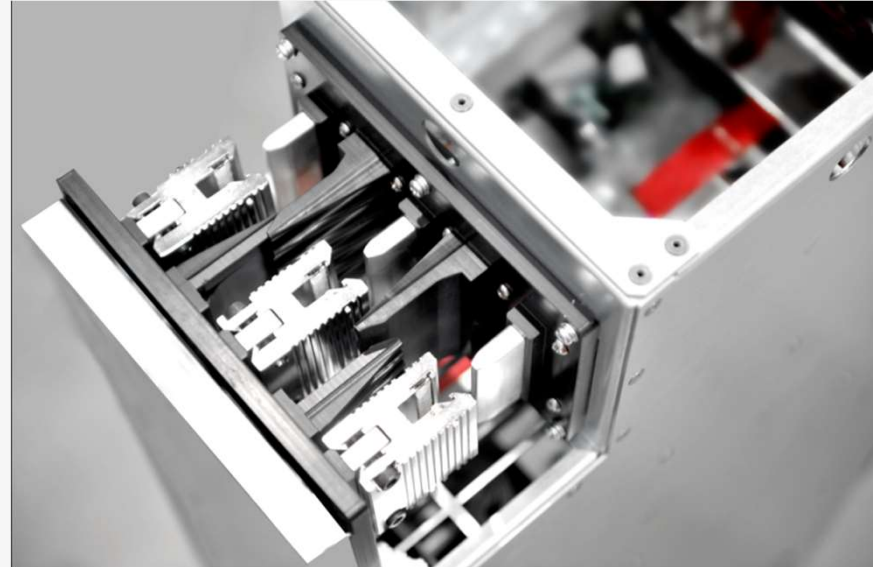
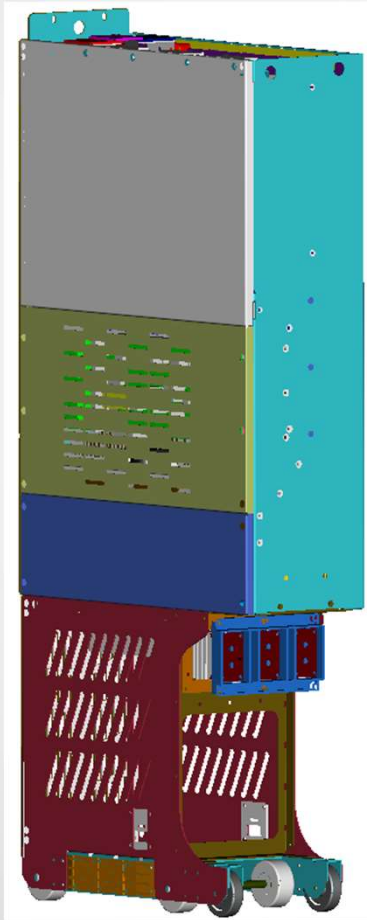


- > More than 6 pulse multi-phase shift transformer
- > Two sets of rectifying are required
- > Harmonics can be reduced
- > Non-energy feedback

Introduction to the MD880 module

project	Basic rectifier	Feedback rectification	Active rectifier
Power device	thyristor	IGBT	IGBT
Filter is a	L	L	LCL
Pre-filtered function	There are	There is no	There is no
Net side current harmonics	30% ~ 35%	30% ~ 35%	< 5%
Fundamental power factor	0.95	0.95	1
Bus voltage is adjustable	Does not support	Does not support	support
The output voltage	540~590VDC	540~590VDC	570~720VDC
	740~975VDC	740~975VDC	790~1035VDC
Applicable occasions	Free parking, no energy feedback, emergency parking needs to be configured with braking unit	Test bench, lifting class has energy feedback occasions, or emergency braking occasions	Emergency braking, energy feedback, small power grid capacity, high power grid quality requirements

MD880 module introduction



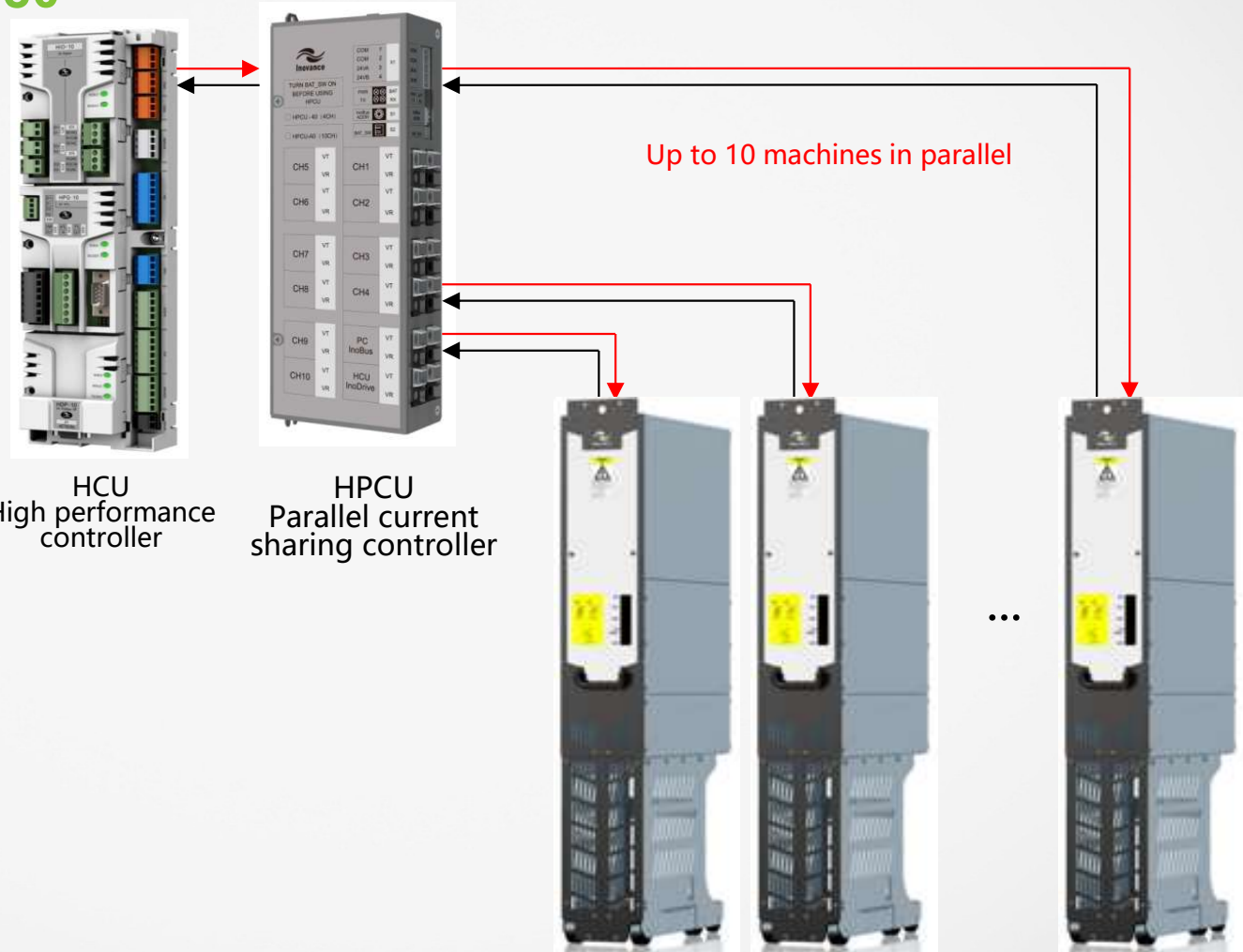
Quick-c Quick connector

- H8/21 dated at the bottom of the module with roller, back with Quick - C Quick connector
- H8 can be directly pushed into the cabinet body, removing and installing H8 module without removing the motor cable, easy installation and maintenance

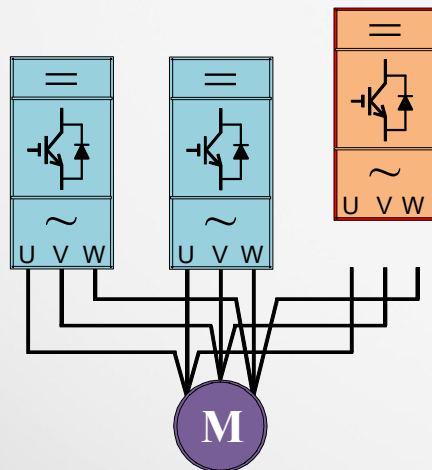
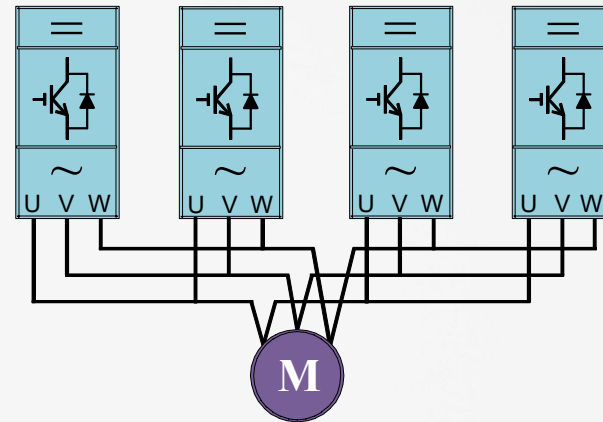
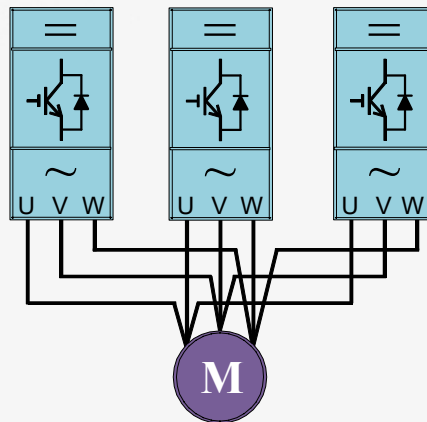
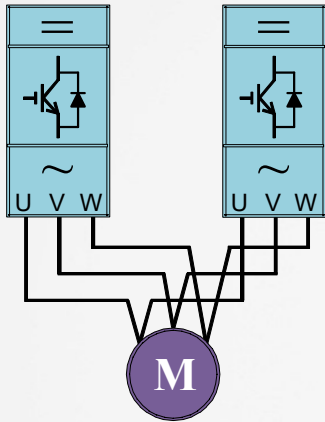
Introduction to the MD880 module



HCU+HPCU physical photo



Introduction to the MD880 module



- H8 for three-phase module, the single-phase module, number of parallel without being limited by the multiples of 3 and 3
- Maximum number of H8 parallel connections: 10PCs
- The faulty module can be quickly removed and derated to $(n-1)/N$ operation; Single-phase modules need to be derated $(N-3)/N$, and N must be a multiple of 3, which is more restricted

Introduction to the MD880 module

Basic rectifier

T2 maximum number of parallel machines: 6Pcs



HCU High performance controller



HCU High performance controller



HPCU Parallel current sharing controller



Maximum 6 machines in parallel
(Simultaneous bus limit)

MD880 HCU High performance controller

Control platform

HCU adopts DSP+FPGA dual-chip control architecture, IO, bus, encoder and other external signals, unified real-time processing by FPGA;

DSP and FPGA exchange data in real time through parallel bus, which can realize high-speed and high-precision loop control operation, and ensure the excellent dynamic response and control performance of the drive system.



1	Torque step response time	<5mS, open loop, rated torque; <5mS, closed loop, rated torque
2	Torque nonlinearity	±4%, open loop, rated torque; ±3%, closed loop, rated torque
3	Static speed accuracy	Motor slip 10%, open loop; 0.01% of rated motor speed, closed loop
4	Dynamic speed accuracy	0.3%*S~0.4%*S, 100% torque step, open loop; 0.1%*S~0.2%*S, 100% torque step, closed loop
5	Overload capacity	Light load mode: 110% 1min/5mins Heavy load mode: 150% 1min/5mins
6	The output frequency	SVC: 0 ~ 300 hz; FVC: 0~300Hz
7	Netside power factor	AFE active front-end rectification: fundamental power factor =1;
8	Net side harmonic content	AFE active front-end rectification: THDI <5%

MD880 HCU high performance controller

Flexible expansion for seamless access

HCU is standard equipped with rich IO resources, including 3-way RO, 2-way AI, 2-way AO, 2-way HDI, 2-way HDO, and 7-way DI. The terminals with different pin number and color system are used to completely prevent wrong insertion and removal.

HCU integrates 3 expansion slots, which can be expanded to a maximum of 7 expansion slots externally. Fieldbus and industrial Ethernet adapters, encoder interfaces and IO expansion modules can be installed, which can easily realize the interconnection of industrial equipment.

Encoder Interface card:

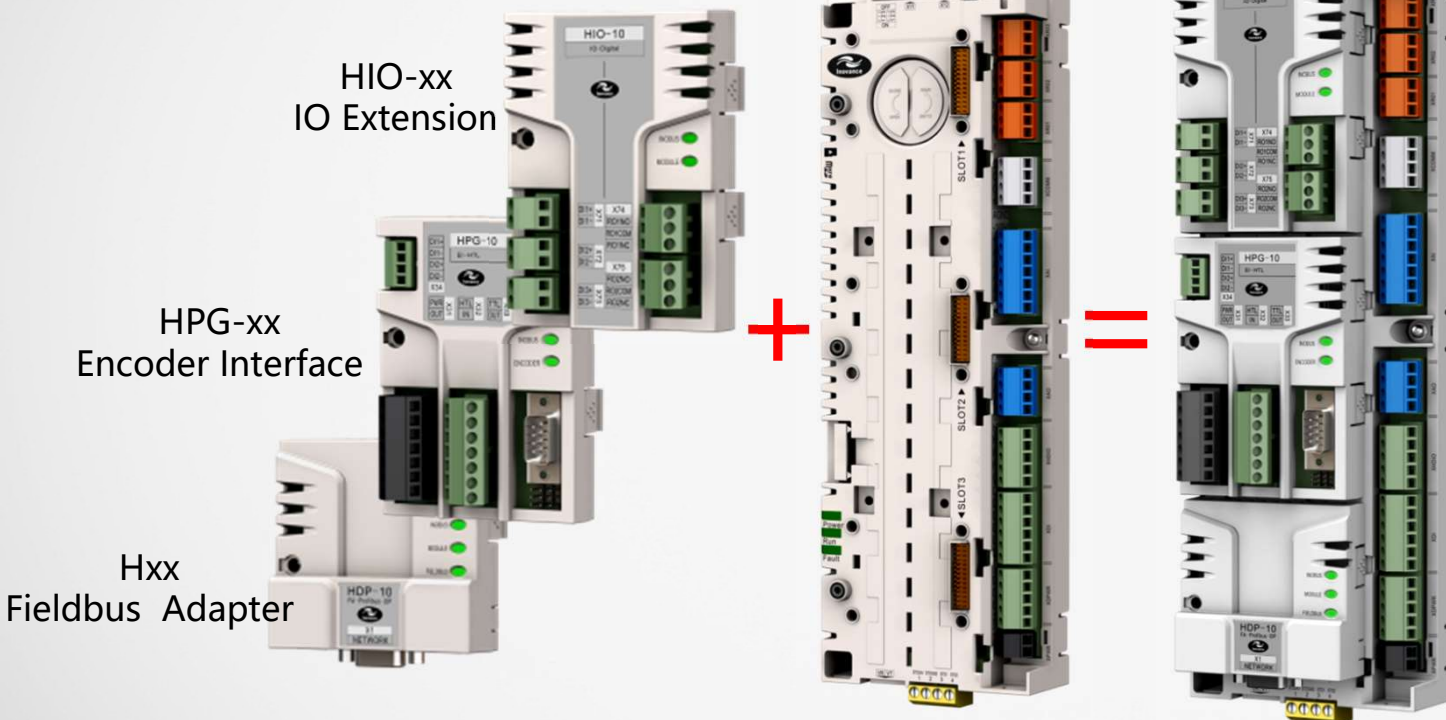
TTL, HTL, UVW, Sin/Cos, Resolver

Fieldbus adapter:

PROFIBUS DP, CANopen, ModBUS-RTU

Industrial Ethernet adapters:

PROFINET IO, PowerLink, ModBUS-TCP, EtherNet /IP



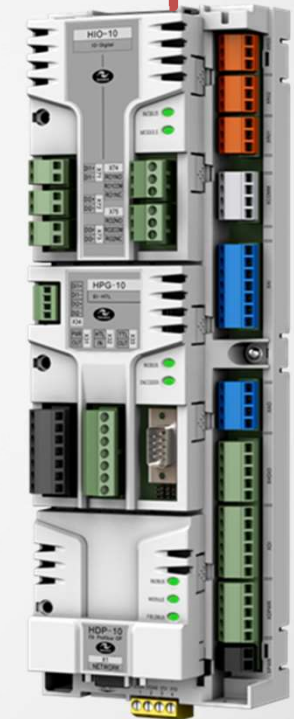
Installed the IO extension module, encoder interface extension module and bus adapter quill extension module of HCU controller

MD880 SOP-20 Smart keyboard

- LCD display
- 240mmx160mm
- Through the USB port of the SOP-20,
PC debugging tool to access the system
- Software upgrade
- Supported languages: Chinese and English
- 8 lines of text display
- Trend chart can be rendered
- Parameter copy and restore



SOP-20
Smart Operation
Panel



MD880 system application debugging is convenient

The unit debugging and monitoring network

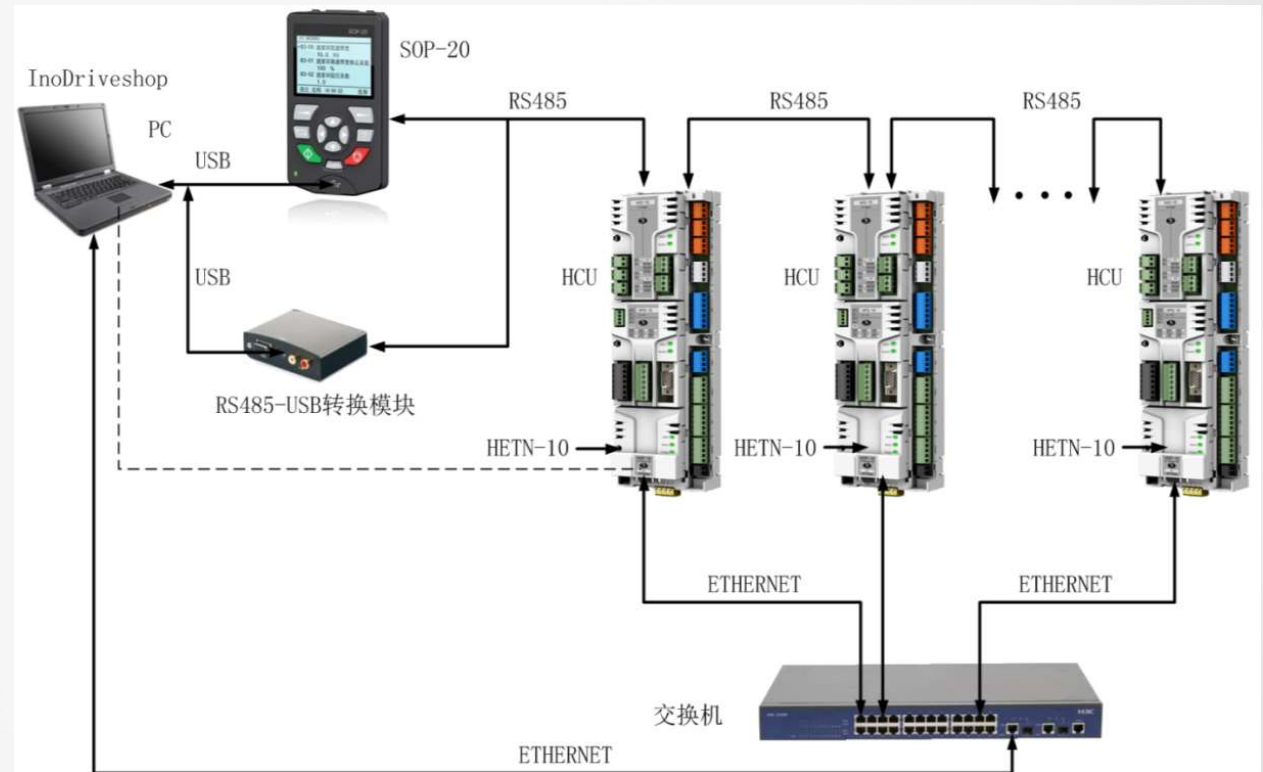
RS 485

Local area network (LAN)

RS485 is standard interface, the fastest communication rate is 4Mbps, master/slave communication, support up to 32 nodes; Use general network cable connection, can be connected through two RJ45 stages;

Can be directly connected with the PC through the keyboard front USB interface, can also be connected to the PC through RS485-USB converter HCU, system PC HCU debugging or monitoring function;

The use of Ethernet debugging mode, need to have HETN-10 Ethernet adapter module; It is installed in any SLOT of HCU. You can directly connect the PC to the Ethernet adapter module of the HCU control unit, or connect multiple HCU networks through the switch. Can also be connected to the Internet through other devices to achieve remote debugging or monitoring;



MD880-- Customer value embodiment



Flexible connections - free of non-standard

Ultra-high reliability - maintenance free

Seamless replacement - Configuration free



MD880-- Customer value embodiment

High reliability, free maintenance

Ten years of device selection, hardware ultra-high reliability

1. The choice of automotive components 10 years of life

器件信息			预计工作寿命	
器件种类	位号	编码	预计连续工作寿命	预计连续工作寿命
	RD	Code	L_r (H)	L_r (年)
非固态铝电解电容 (大)	MD880-50M-0600-7 母线电容	05010021	118292.93	13.50
非固态铝电解电容 (大)	MD880-50M-0530-7 母线电容	05010098	149730.06	15.00
非固态铝电解电容 (大)	MD880-50M-0410-7 母线电容	05010098	123270.48	14.07
非固态铝电解电容 (大)	MD880-50M-0340-7 母线电容	05010098	127246.66	14.53
非固态铝电解电容 (大)	MD880-50M-0900-4 母线电容	05010021	115512.86	13.19
非固态铝电解电容 (大)	MD880-50M-0757-4 母线电容	05010098	171788.79	15.00
非固态铝电解电容 (大)	MD880-50M-0639-4 母线电容	05010021	121460.44	13.87
非固态铝电解电容 (大)	MD880-50M-0516-4 母线电容	05010098	162231.45	15.00



MD880-- Customer value embodiment

High reliability, free maintenance

All solutions have no worries for on-site maintenance

2.HCU parameters are built in, and the problem site can be quickly resumed

- No need to replace the HCU controller, no need to remove the communication, control and encoder cables, no need to burn backup parameters and system software, fast recovery of production line operation, reduce operational losses.
- The swappable SD card of HCU controller can store parameters and system software to realize the rapid replacement of HCU.
- The system clock, powered by battery, is not affected by power outages, ensuring the timestamp of the HCU event recorder is safe and reliable.



MD880-- Customer value embodiment

High reliability, free maintenance

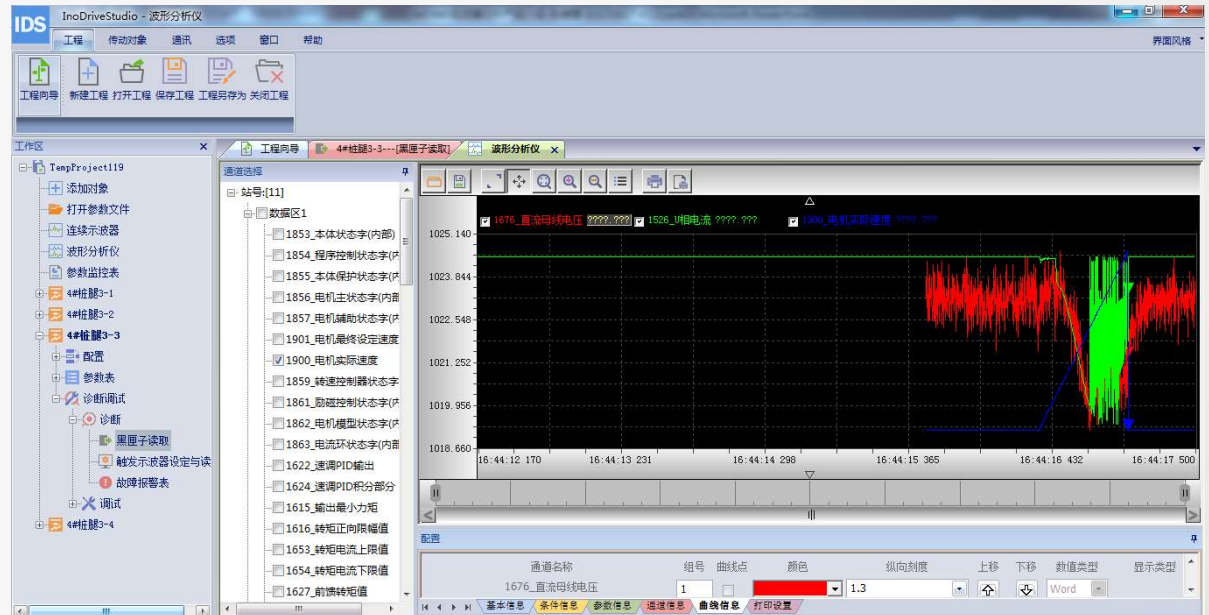
There is no need to wait for the second fault to recur on site

4. The black box self-reoccurs

- Store 50 waveform data within a specified period before and after a black box fault occurs
- 1000 groups of data cycle cover the storage
- 16 ADCs interrupt internal data acquisition
- 48 internal data acquisition cycles of 2ms
- 16 pieces of 2ms cycle custom data collection

5 Trigger the oscilloscope

- 1 80K word数据记录空间
- 2 50条件自定义数据曲线
- 3 记录周期基值可选(2ms\载频),倍频可设
- 4 多元化触发条件
 两组之间3条件(与、或、异或)
 单组5条件(>、=、<、>=、<=)



MD880-- Customer value embodiment

High reliability, free maintenance

Refuse traffic jam, bus redundancy, strong information reliability

- 5. Bus software redundancy design to improve bus reliability
- 6. Fault handling is graded, and no random fault report/stop/fault stop is provided for guidance



MD880-- Customer value embodiment

Flexible interconnection - free of non-standard

Can not change the software code to achieve customized customer's non-standard requirements

1. Free programming

- ❑ Control word free configuration (virtual B connector) (expansion card input terminal state, control board input terminal state, driver status word, driver running status data)
- ❑ Software modular free configuration (virtual K connector) call resource pool (each software block variable data, bus process data, speed channel, torque channel, oblique wave function generator, etc.)

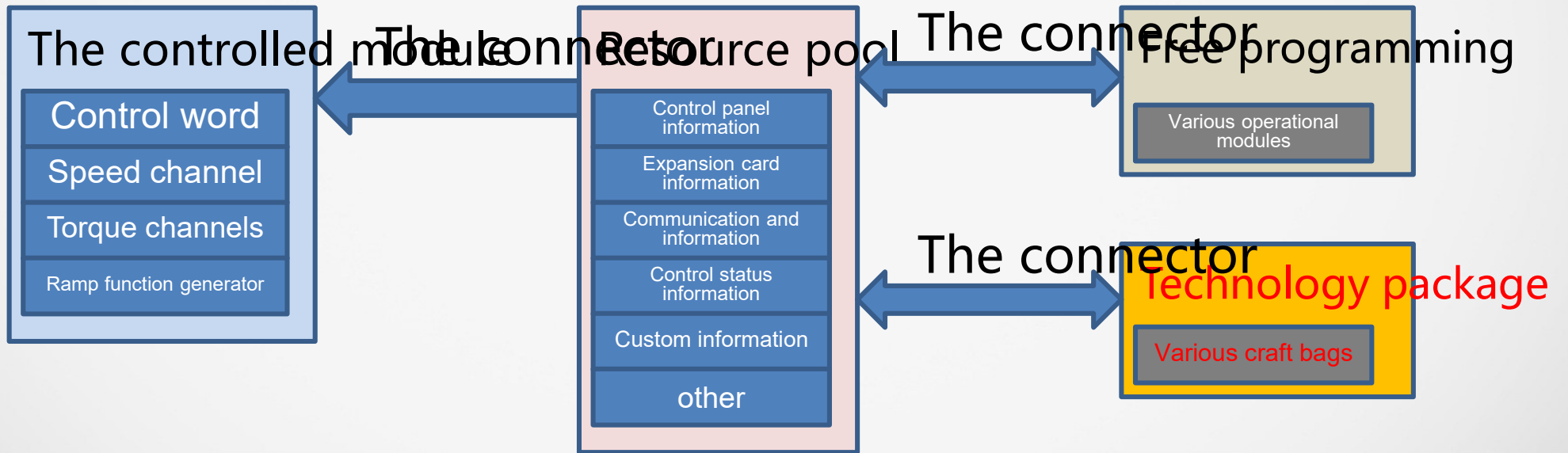


MD880-- Customer value embodiment

Flexible interconnection - free of non-standard

Can not change the software code to achieve customized customer's non-standard requirements

On-site secondary development



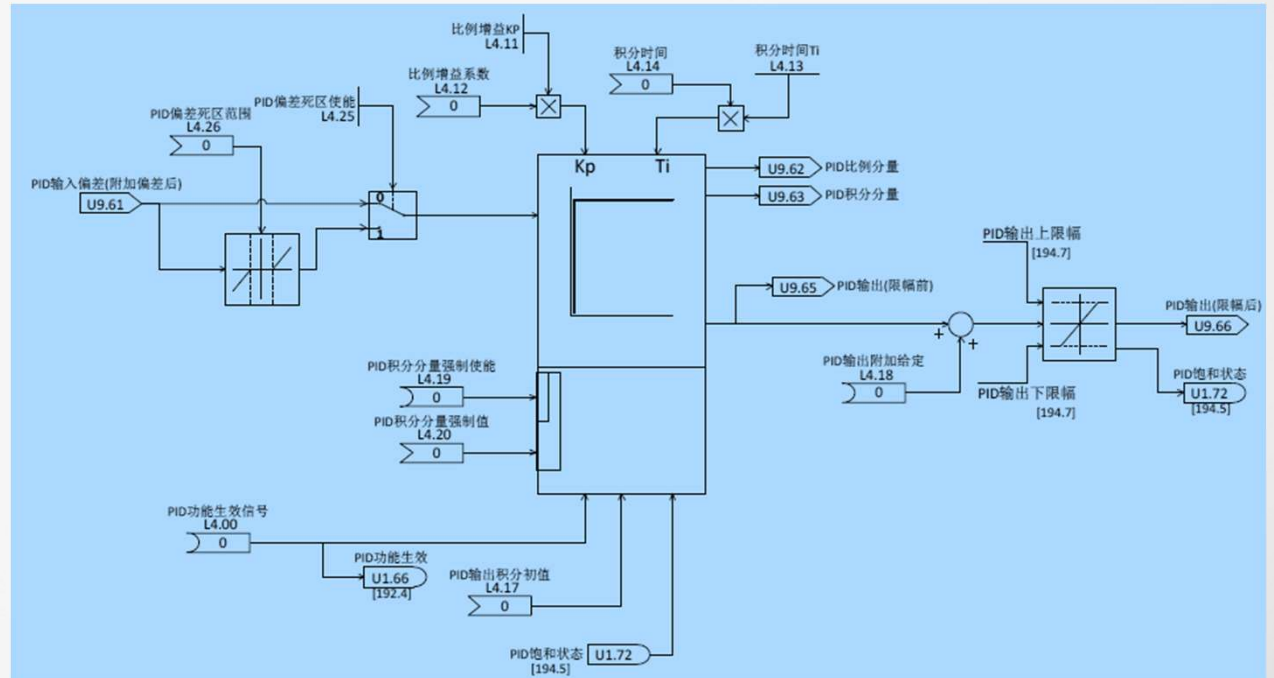
MD880-- Customer value embodiment

Flexible interconnection - freedom of non-standard

Can not change the software code to achieve customized customer's non-standard requirements

2. Open data flow graph flexible configuration

- ❑ Transparent control scheme
- ❑ Autonomy in problem location
- ❑ Clarity of function definition
- ❑ Control flow is graphically defined



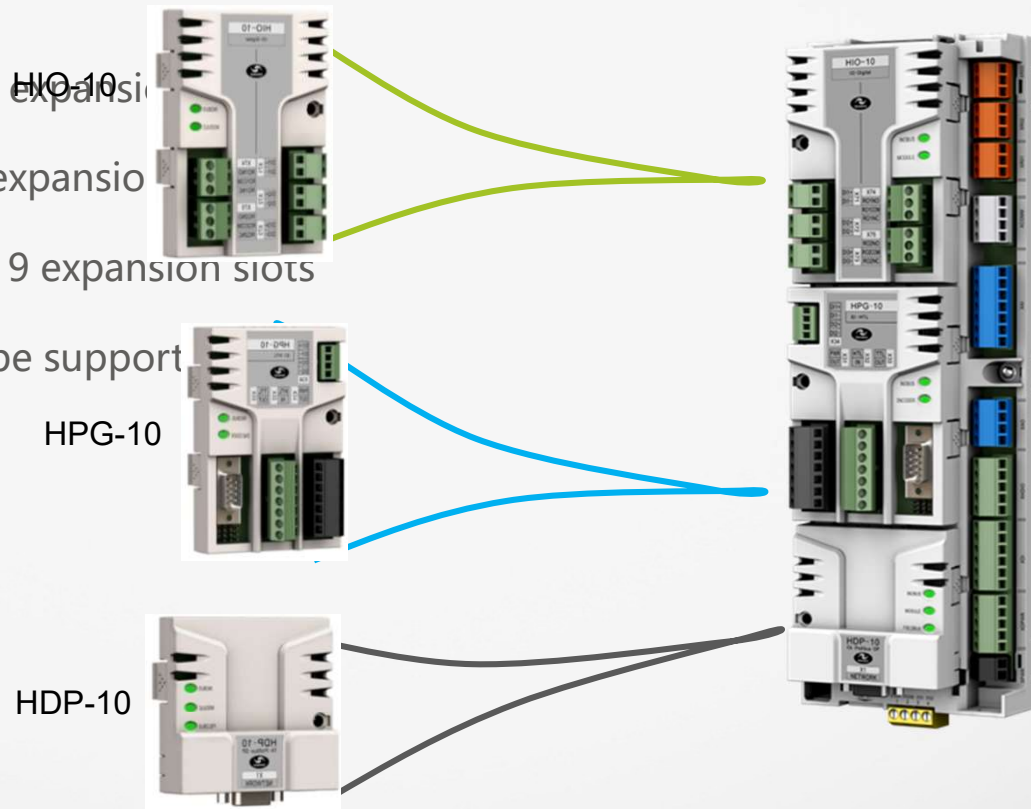
MD880-- Customer value embodiment

Flexible interconnection - free of non-standard

Can not change the software code to achieve customized customer's non-standard requirements

3. Flexible configuration of each type of expansion

- ❑ The HCU controller supports three expansion
- ❑ The exterior can be expanded up to 9 expansion slots
- ❑ Multiple PC and PG card types can be supported

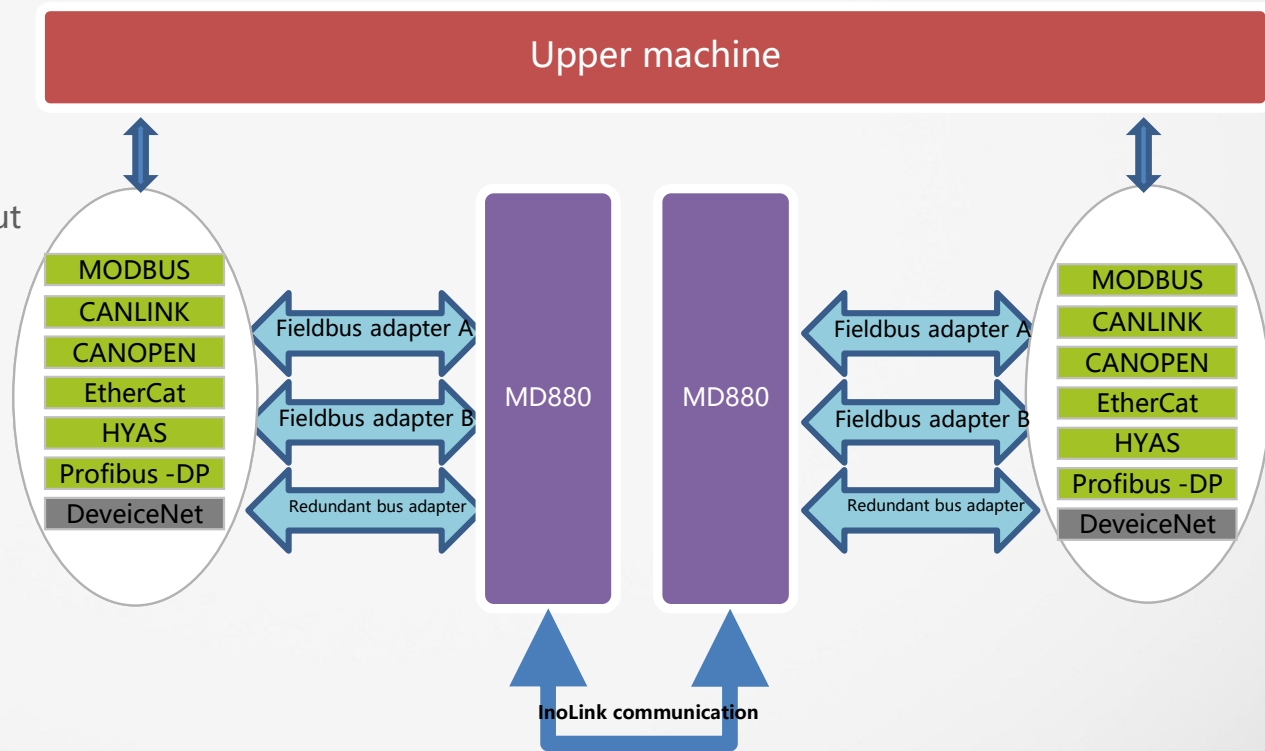


MD880-- Customer value embodiment

Seamless replace - free configuration

Seamless connection to host computer, replacement of foreign applications

- Digital conversion tool + parameter interconnection + bus adaptation
 - Replace Siemens 6SE70 multi-pass seamless connection to the upper without changing the PLC program
 - GSD file needs to be changed for S120



MD880-- Customer value embodiment

Seamless replace - free configuration

Seamless connection to host computer, replacement of foreign applications

2. Optional structure mounting bracket

Design the installation frame based on 6SE70, similar structural interface, quick replacement on site (S120 must be replaced by cabinet body)



MD880-- Customer value embodiment

Seamless replace - free configuration

Seamless connection to host computer, replacement of foreign applications

3. Inverter full capacitance configuration, low rectifier limit; (S120 has capacitance limit on the rectifier, can not match with his home rectifier casually)

- ❑ MD880 inverter: 400 v p 45 uf/Kw; 690 v 15 or more uf/Kw
- ❑ S120 inverter: capacitance configuration is about 50% ~60%



AC/AC 单机传动		DC/AC 多机传动		
				
模块型功率模块	装置型功率模块	书本型	装置型	柜机
230 V, 0.12 ~ 0.75 kW 400 V, 0.37 ~ 90 kW	400 V, 110 ~ 250 kW	400 V, 1.6 ~ 107 kW	400 V, 110 ~ 800 kW 690 V, 75 ~ 1200 kW	400 V, 1.6 ~ 3000 kW 690V, 75 ~ 4500 kW

SINAMICS S120

Inverter PLC servo system | | | | rail transit robot of new energy

Forward

Always Progressing

enterprising

Never stop

 汇川技术
Inovance