

American Scientific

Inverter Catalog

美国科知
变频器选型手册



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美国科知 American Scientific:

美国科知其创建团队为一批在电气领域的科学研究人员，是一家全球性的电气投资公司，涉及电气研发、制造及运营管理。

美国科知早期服务于军工、船舶、航空、铁路等领域。科研开发人员长期深入企业现场，为用户研发、设计符合实际需求，操作简易、使用方便、功能完备的产品。

全球的生产企业、独资企业、合伙企业、代工企业以及战略合作伙伴均严格执行工程科研人员依IEC、AS-UTI（美国科知标准）标准制定的工艺流程生产、测试，以确保产品符合UL、CE、CSA等认证标准。

全球工程师和科学家设计、开发、发布新产品的方式，因美国科知切合实际的创新软件及电气技术而改变。简化开发，提高效率，极大缩短产品上市时间，美国科知不断开发着造福大众的创新技术。

American Scientific was founded and established by a group of scientific researchers in the electrical appliances domain. It is a global electrical appliances investment company and services comprising of Research & Development, Manufacturing and Operations Management.

American Scientific services early in the military, marine, aviation, railway and other domains. Our R & D team works in-depth in corporate environment to design full functional products which meet the actual needs, easy operation and easy to use for customer.

Global manufacturing enterprises, sole proprietorships, partnerships business, OEM business, as well as strategic partners strictly enforce the engineering research team to follow the IEC, AS-UTI American Scientific standard and define the production process, testing methodology to ensure that products comply with UL, CE, CSA certification standards.

With American Scientific's innovative software and technology, it changes the worldwide engineers and scientists in the design, develop and new products release process. Simplifies development process, improves efficiency significantly shorten the time to market cycle time. American Scientific continues develop innovative technologies for the benefit of the public.

产品范围:

过程控制产品: PLC、PAC.

人机对话产品: HMI、工业计算机、平板电脑、组态软件.

机器视觉产品: 工业级摄像机、控制器、镜头、光源、平板显示器.

传动控制产品: 变频器、伺服驱动及电机、高速精密主轴电机、步进控制器.

专用控制产品: 卷绕、电子称重、裁切、温度控制器、军工精密测试控制器.

工业机器人: X、Y平台，移载组立装置、机器人.

Range:

Process control series: PLC、PAC.

Person to machine: HMI、industrial computerization、plate computer、modules software.

Visual mechanism: industrial camera、controller、camera lens、light source、plate computer.

Transforming control: inverters、driver engine. high speed fine electrical machine, sure step controller.

Special control: roller twister、electronical scale、cutter, temperature controller, military precise test controller.

Industrial robot: X、Y platform, movable vertical setup、robot.

快速选型
Quick selecting

A4-22K-A

版本:
Version
A:亚洲 U:美国 E:欧盟
A: Asia U: US E: European Union

功率: 0.75-630KW
Power rate: 0.75-630KW

2:单相 220V (Uniphase 220V)
4:三相 400V (Triphase 400V)
6:三相 690V (Triphase 690V)

A:矢量型 (Vector type)
C:功能型 (Function type)
E:通用型 (Universal type)

设置方式
Set up

- ①. 面板本地设置; Operation board local set up;
 - ②. 面板远程设置; Operation board distant set up;
 - ③. 变频器多功能控制端子设定;
Multi-function inverter terminal setting;
 - ④. 多语言触摸式操作面板;
Multi-language touching model operation board;
 - ⑤. 外部模拟量给定; Outer simulation position;
 - ⑥. 触摸屏远程设置 (RS485通讯);
Touch screen distant setting (RS485 communication);
 - ⑦. 电脑 (组态软件) 与变频器远程通讯;
computer (modules status) to be connected to distant inverter;
 - ⑧. PLC远程设置 (RS485通讯)
PLC distant setting (RS485 communicating)
- ……灵活多样 Flexibility and diversity



适配电机
Adaptive motor

A2系列变频器适配电机简表

Series of A2 inverter adaptive motor summary table

功率 (KW)		0.4	0.75	1.5	2.2
适配电机功率 (KW)		0.4	0.75	1.5	2.2
输出	电压 (V)	3相0~额定输入电压			
	额定电流 (A)	2.6	4.5	7.5	10
	过载能力	150% 1分钟, 180% 10秒, 200% 0.5秒, 间隔10分钟 (反时限特性)			
输入	额定电压/频率	3相或单相200V~240V:50HZ/60HZ			
	允许电压范围	180V-260V:电压不平衡度: ≤3%; 允许频率波动: ±5%			
	额定电流 (A)	5.5	9.2	14.5	23
制动单元		标准内置			
防护等级		IP20			
冷却方式		自冷		强制风冷	

Power (KW)		0.4	0.75	1.5	2.2
Adaptive motor power (KW)		0.4	0.75	1.5	2.2
Output	Pressure (V)	Triphase 0~Rated input pressure			
	Rated current (A)	2.6	4.5	7.5	10
	Overload capacity	150% 1minute, 180% 10seconds, 200% 0.5seconds, Interval of 10 minutes (Inverse time characteristics)			
Input	Rated pressure/frequency	Triphase or Uniphase 200V~240V:50HZ/60HZ			
	Allow the pressure range	180V-260V: pressure unbalance factor : ≤ 3%, Allow the frequency fluctuations : ±5%			
	Rated current (A)	5.5	9.2	14.5	23
The braking unit		Standard built-in			
Degree of protection		IP20			
Cooling methods		Self cooling		Forced air cooling	

A4系列变频器适配电机简表:

功率 (KW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	
适配电机功率 (KW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	
输出	电压 (V)	3相0~额定输入电压														
	额定电流 (A)	2.5	3.8	5.5	9	13	17	24	30	39	45	60	75	91	112	150
	过载能力	150% 1分钟, 180% 10秒, 200% 0.5秒, 间隔 10分钟 (反时限特性)														
输入	额定电压/频率	3相380V~480V: 50HZ/60HZ														
	允许电压范围	323V~528V:电压不平衡度: ≤3%; 允许频率波动: ±5%														
	额定电流 (A)	3.5	6.2	9.2	14.9	21.5	27.9	39	50.3	60	69.3	86	104	124	150	201
制动单元	标准内置							内置可选								
防护等级	IP20															
冷却方式	自冷	强制风冷														
功率 (KW)	90	110	132	160	200	220	280	315	355	400						
适配电机功率 (KW)	90	110	132	160	200	220	280	315	355	400						
输出	电压 (V)	3相0~额定输入电压														
	额定电流 (A)	176	210	253	304	380	426	520	585	650	730					
	过载能力	150% 1分钟, 180% 10秒, 200% 0.5秒, 间隔 10分钟 (反时限特性)														
输入	额定电压/频率	3相380V~480V: 50HZ/60HZ														
	允许电压范围	323V~528V:电压不平衡度: ≤3%; 允许频率波动: ±5%														
	额定电流 (A)	160	196	232	282	352	385	491	552	624	704					
制动单元	需外置制动单元															
防护等级	IP20															
冷却方式	强制风冷															

Series of A4 inverter adaptive motor summary table

Power (KW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	
Adaptive motor power (KW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55	75	
Output	Pressure (V)	Triphase0~ Rated input pressure														
	Rated current (A)	2.5	3.8	5.5	9	13	17	24	30	39	45	60	75	91	112	150
	Overload capacity	150% 1minute 180% 10seconds, 200% 0.5seconds, Interval of 10 minutes (Inverse time characteristics)														
Input	Rated pressure/frequency	Triphase380V~480V: 50HZ/60HZ														
	Allow the pressure range	323V~528V:Pressure unbalance factor ≤3%; Allow the frequency fluctuations ±5%														
	Rated current (A)	3.5	6.2	9.2	14.9	21.5	27.9	39	50.3	60	69.3	86	104	124	150	201
The braking unit	Standard built-in							Built-in selectable								
Degree of protection	IP20															
Cooling methods	Self cooling	Forced air cooling														
Power (KW)	90	110	132	160	200	220	280	315	355	400						
Adaptive motor power(KW)	90	110	132	160	200	220	280	315	355	400						
Output	Pressure (V)	Triphase0~ Rated input pressure														
	Rated current	176	210	253	304	380	426	520	585	650	730					
	Overload capacity	150% 1minute 180% 10seconds, 200% 0.5seconds, Interval of 10 minutes (Inverse time characteristics)														
Input	Rated pressure/frequency	Triphase380V~480V: 50HZ/60HZ														
	Allow the pressure range	323V~528V:Pressure unbalance factor ≤3%; Allow the frequency fluctuations ±5%														
	Rated current (A)	160	196	232	282	352	385	491	552	624	704					
The braking unit	Need to external the brake unit															
Degree of protection	IP20															
Cooling methods	Forced air cooling															

90KW以上A4系列变频器外置直流电抗器

Above 90KW series of A4 inverter external DC reactor

产品特性 Features

① 环境适应

使用场所	垂直安装在良好通风的电控柜内。不允许水平或其它的安装方式。冷却介质为空气。安装在不受阳光直晒, 无灰尘、无腐蚀性气体、无可燃性气体、无油雾、无蒸汽、无滴水的环境
环境温度	-10~+40℃, 40~50℃之间降额使用, 每升高1℃, 额定输出电流减少1%
湿度	5~95%, 不允许凝露
海拔高度	0~2000米, 1000米以上降额使用, 每升高100米, 额定输出电流减少1%
振动	3.5mm, 2~9Hz; 10m/s ² , 9~200Hz; 15m/s ² , 200~500Hz
存储温度	-40~+70℃

Environmental adaptation

The use of premises	Installed vertically in the well-ventilated electrical cabinet. Don't allow horizontal or installation methods. The cooling medium is air. It's installed without direct sunlight, no dust, no corrosive gas, no flammable gas, no mist, no steam and no dripping environment.
The environmental temperature	Derating between -10 - 40℃, 40-50℃. Every increase of 1 ° C, the rated output current is reduced by 1%
Humidity	5~95%, Don't allow condensation
Altitude	0~2000m, Derating more than 1000 mevery increase of 100 m, the rated output current is reduced by 1%
Vibration	3.5mm, 2~9Hz; 10m/s ² , 9~200Hz; 15m/s ² , 200-500Hz
The storage temperature	-40~+70℃

② 控制特性

控制方式	闭环矢量控制	开环矢量控制	V/F控制
启动转矩	0.00Hz 180%*	0.25Hz 180%	0.50Hz 180%
调速范围	1: 1000 *	1: 200	1: 100
稳速精度	± 0.02%*	± 0.2%	± 0.5%
转矩控制 *	Y *	Y *	N
转矩精度 *	± 5%*	± 5%*	-
转矩响应时间 *	< 10 ms*	< 20 ms *	-

Control characteristics

The controlling way	Closed-loop vector control*	Open-loop vector control	V/Fcontrol
Starting torque	0.00Hz 180%*	0.25Hz 180%	0.50Hz 180%
The speed range	1: 1000 *	1: 200	1: 100
Steady speed accuracy	± 0.02%*	± 0.2%	± 0.5%
Torque Control*	Y *	Y *	N
Torque accuracy*	± 5%*	± 5%*	-
Torque response time*	< 10 ms*	< 20 ms *	-

③特色功能

重点功能	转矩/速度控制模式切换*、多功能输入/输出端子、欠压调节、三地切换、转速跟踪、转矩限制、多段速运行（最多至23段）、自整定、S段曲线加减速、转差补偿、PID调节、下垂控制、限流控制、手动/自动转矩提升、电流限定。
频率范围	0.00~300.00Hz 注：V/F方式0.0~3000.0Hz可根据客户需求定制。
起动频率	0.00~60.00Hz.
加减速时间	0.1~36000s.
能耗制动能力	制动单元动作电压：650~750V.
直流制动能力	直流制动起始频率：0.00~300.00Hz. 直流制动电流：恒转矩0.0~120.0%；变转矩0.0~90.0%。 直流制动时间：0.0~30.0s:无需直流制动起始等待时间，实现快速制动。
磁通制动功能	可通过增加电机磁通量的方法使电机快速减速。
参数拷贝	标准操作面板可实现参数上传、下载，有拷贝进度指示；对已经上传的参数可选择禁止上传覆盖。
共直流母线	全系列可实现多台变频器共用直流母线供电。
独立风道	全系列采用独立风道设计，支持散热器柜外安装方式。
万能扩展接口	支持客户二次开发带CPU的万能扩展板：物理接口SPI总线，软件协议Modbus。
扩展卡	PG反馈卡、通讯适配器。
上电自检	实现对内部及外围电路的上电自检，如电机接地、+10V电源输出异常、模拟输入异常、断线等。
特色保护	电源欠压、过流保护、过压保护、干扰保护、自整定故障、模块保护、散热器过热保护、变频器过载保护、电机过载保护、外设保护、电流检测异常、输出对地短路异常、运行中异常掉电、输入电源异常、输出缺相异常、EEPROM异常、继电器吸合异常、温度采样断线、编码器断线、+10V电源输出异常、模拟输入异常、电机过热（PTC）、通讯异常、版本兼容异常、拷贝异常、扩展卡连接异常、端子互斥性检查未通过、硬件过载保护。

*C4系列高性能变频器具备

Extraordinary functions

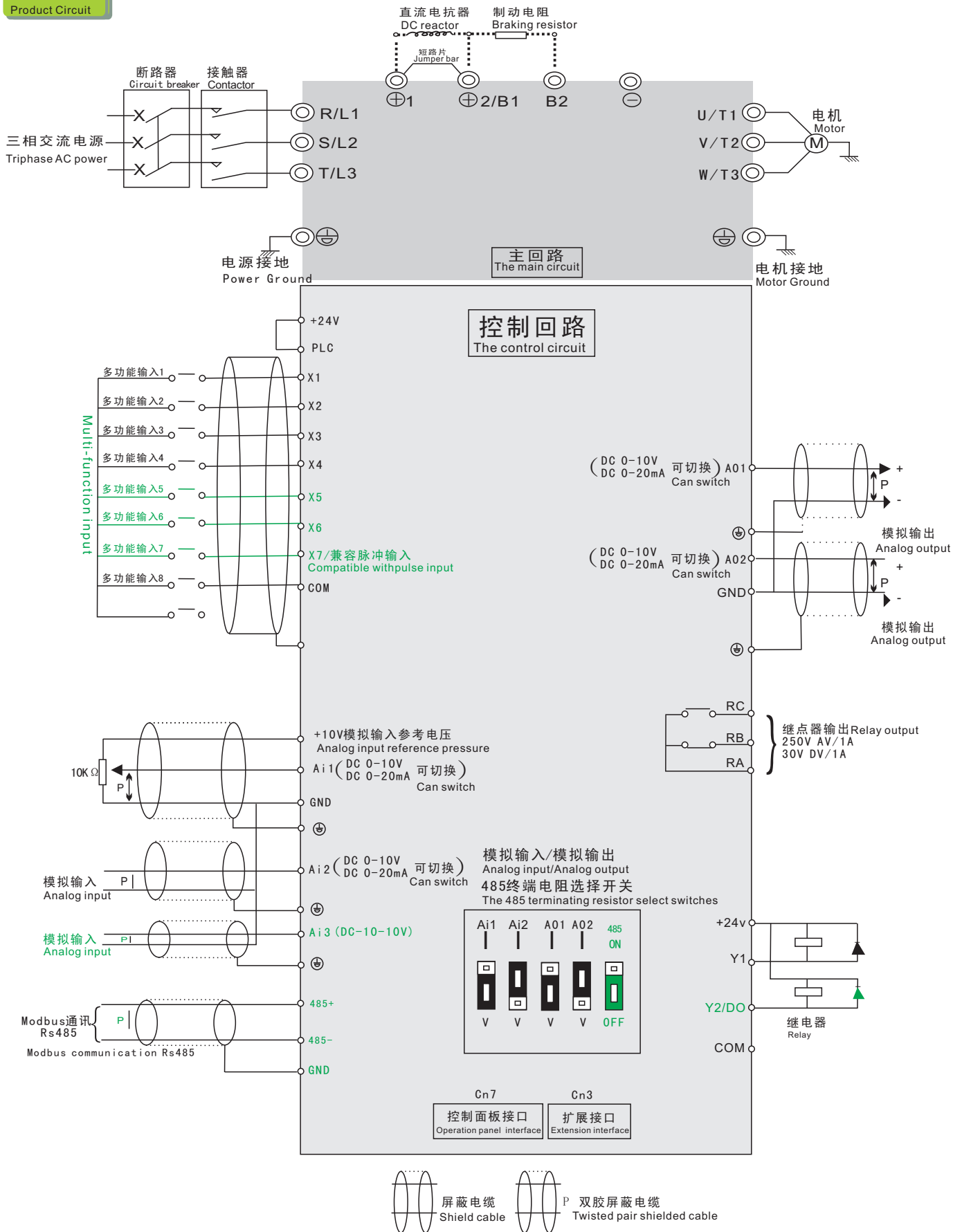
Focus function	Switch the mode of the torque or speed control*、Multi-function input / output terminal、Undervoltage adjustment、Three switchings Speed tracking、Torque limit、Multi-speed operation (Up to 23)、Self-tuning、S-curve acceleration and deceleration、Slip compensation、PID regulator、Droop control、Current limit control、Manual / automatic torque boost、current limited.
Frequency range	0.00~300.00Hz. Note: V / F way 0.0 -- 3000.0Hz can be customized according to customer demand.
Starting frequency	0.00~60.00Hz
Acceleration and deceleration time	0.1~36000s
Dynamic braking capability	Braking unit action pressure : 650~750V.
DC braking ability	DC braking starting frequency : 0.00~300.00Hz. DC braking current : DA torque 0.0 ~ 120.0% ; Variable Torque 0.0 ~ 90.0%. DC braking time : 0.0~30.0s: Without DC braking starting waiting time , to achieve rapid braking.
Flux braking function	It can quickly decelerate a motor by increasing the motor flux method
Parameter copy	The standard operation panel can make the parameter upload and download. The copy progress is indicated;The parameters which have been uploaded are option to prohibit the uploading of coverage
Common DC Bus	All series can be made multiple inverters to share the DC bus supply.
Independent wind tunnel	All series are used independent air tunnel design , and supported to install the radiator outside.
Universal extension interface	Support the customers secondary development of the universal expansion board with. CPU: Physical interface SPI bus , Software protocol Modbus.
Expansion card	PG feedback card, the communication adapter.
Power On Self Test	Achieve the power on self test of the internal and external circuit , Such as electrical grounding 、 +10V power output anomalies、 the analog input anomalies、 disconnection.
Characteristic protection	Supply undervoltage、 Overcurrent protection、 Overvoltage protection、 Interference protection、 Failure self-tuning、 Module protectio、 Radiator overheating protection、 Inverter overload protection、 Motor overload protection、 Peripheral protection、 The current detection abnormalities、 Output-to-ground short circuit abnormalities、 Run in the abnormal power-down 、 Input power anomalies、 Output phase failure abnormalities、 EEPROM abnormalities、 Relay suck abnormalities、 Temperature sampling disconnection、 Encoder disconnection、 +10V power output anomalies、 the analog input anomalies、 The motor overheating (PTC)、 Abnormal communication、 The version compatibility is abnormal、 Copy abnormalities、 Expansion card connection exception 、 The terminals mutually exclusive check isn't passed 、 Hardware overload protection.

Series of C4 highly functional inverters are provide with these.

产品接线

Product Circuit

接线图 Circuit Figure



E系列不包含绿色部分功能

Series of E inverters don't contain the green part of function

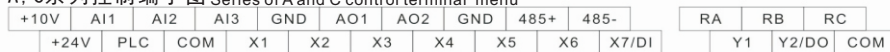
控制端子功能表

分类	端子符号	端子功能说明	技术规格
端子485	485+	485差分信号正端	速率: 4800/9600/19200/38400/57600bps, 最多并联32台, 超过32台, 需使用中继电器最长距离500m(采用标准的双绞屏蔽电缆).
	485-	485差分信号负端	
	GND	485通讯的屏蔽接地	
操作面板485	CN7	操作面板485接口	上位机通讯连接时同端子485. 操作面板通讯连接时最长距离15m(采用标准的双绞屏蔽电缆).
数字输入	+24V	+24V	24V±10% 最大负载200mA, 有过载和短路保护.
	PLC	多功能输入端子的公共端	出厂与+24V 短接.
	X1~X6	多功能输入端子1~6	输入规格: 24VDC, 5mA; 频率范围: 0~200Hz; 电压范围: 24V±20%.
	X7/D1	多功能输入或脉冲输入	多功能输入: 同X1~X6; 脉冲输入: 0.1Hz~50kHz; 电压范围: 24V±20%.
	COM	+24V 地	内部与GND隔离.
数字输出	Y1	开路集电极输出	电压范围: 24V±20%, 最大输入电流50mA.
	Y2/DO	开路集电极或脉冲输出	开路集电极: 同Y1 脉冲输出: 0~50kHz; 电压范围: 24V±20%.
	COM	开路集电极输出公共端	内部与GND隔离.
模拟输入	+10V	模拟输入参考电压	10V±3%, 内部与COM隔离; 最大输出电流10mA, 有短路和过载保护.
	A11	模拟输入通道1	0~20mA: 输入阻抗500Ω, 最大输入电流30mA, 0~10V: 输入阻抗20kΩ, 最大输入电压15V 分辨率为12位 (0.025%).
	A12	模拟输入通道2	
	A13	模拟输入通道3	-10V~10V: 输入阻抗20kΩ; 分辨率为12位 (0.025%), 最大输入电压±15V.
	GND	模拟地	内部与COM隔离.
模拟输出	A01	模拟输出通道1	0~20mA: 输出允许阻抗200~500Ω, 0~10V: 输出允许阻抗≥10kΩ, 输出精度2%, 分辨率为10位 (0.1%), 有短路保护功能.
	A02	模拟输出通道2	
	GND	模拟地	内部与COM隔离.
继电器输出	RA/RB/RC	继电器输出	RA-RB: 常闭 RA-RC: 常开, 触点容量: 250VAC/1A, 30VDC/1A.

Control terminal menu

Classification	Terminal symbol	Terminal Function	Technical specifications
Terminal 485	485+	485 differential signal positive terminal	Rate: 4800/9600/19200/38400/57600bps Up to parallel 32, more than 32 units, need to use the repeater The longest distance is 500m(Use the standard twisted pair shielded cable).
	485-	485 differential signal negative terminal	
	GND	485 communication shield grounding	
The operator panel 485	CN7	Operation panel 485 interface	Upper Machine Communication connecting as the terminal 485.
			The most long-distance is 15m when the operator panel communication is connected.
Digital input	+24V	+24V	24V±10% The maximum load is 200mA, there are overload and short circuit protection.
	PLC	Public side of the multi-function input terminals	Manufactured and 24V shortconnected.
	X1~X6	Multi-function input terminals 1 to 6	Input specifications: 24VDC, 5mA; The frequency range: 0~200Hz; The pressure range: 24V±20%.
	X7/D1	Multi-function input or pulse input	Multi-function input: the same as X1~X6; Pulse input: 0.1Hz~50kHz; The pressure range: 24V±20%.
	COM	+24V ground	Isolate the internal from COM.
Digital output	Y1	Open electrode output	The pressure range: 24V±20%, The maximum input current is 50mA.
	Y2/DO	Open electrode or pulse output	Open electrode: the same as Y1; Pulse input: 0~50kHz; The pressure range: 24V±20%.
	COM	Open electrode output public terminal	Isolate the internal from COM.
Analog input	+10V	Analog input reference pressure	10V±3%, Isolate the internal and COM ; The maximum input current is 10mA, there are overload and short circuit protection.
	A11	Analog input channel 1	0~20mA: The input impedance is 500Ω, The maximum input current is 30mA. 0~10V: The input impedance is 20kΩ, The maximum input pressure is 15V. The resolution is 12 (0.025%).
	A12	Analog input channel 2	
	A13	Analog input channel 3	-10V~10V: The input impedance is 20kΩ; The resolution is 12 (0.025%). The maximum input pressure is ±15V.
	GND	Analog ground	Isolate the internal from COM.
Analog output	AO1	Analog output channel 1	0~20mA: The output allowed impedance is 200~500Ω. 0~10V: The output allowed impedance ≥10kΩ. The output accuracy is 2%. The resolution is (0.1%), there is short circuit protection.
	AO2	Analog output channel 2	
	GND	Analog ground	Isolate the internal from COM.
Relay Output	RA/RB/RC	Relay output	RA-RB: Closed normally RA-RC: Open normally , The contact capacitance: 250VAC/1A, 30VDC/1A.

A, C系列控制端子图 Series of A and C control terminal menu



E系列控制端子图 Series of E control terminal menu



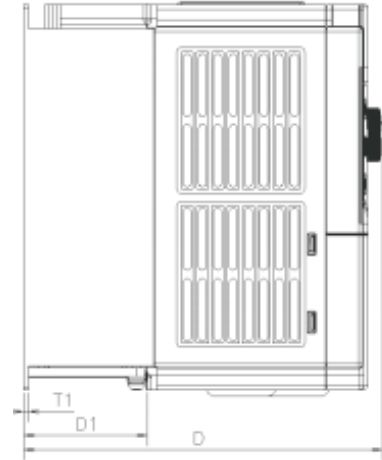
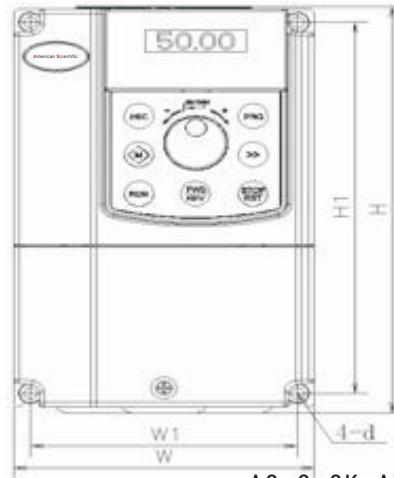
尺寸规格
Detailed Specification

产品的外形和安装尺寸及大概重量
The appearance、installation dimensions and about weight of products

电压等级 Pressure levels	变频器型号 The Inverte model	外形和安装尺寸 (mm) Appearance and installation dimensions								大概重量 Weight (kg)
		W	H	D	W1	H1	D1	T1	d	
200V	A2-0.4K-A	118	190	155	105	173	40.8	3	5.5	1.5
	A2-0.75K-A			175			60.5	4		2.2
	A2-1.5K-A			155			40.8	3		1.5
	A2-2.2K-A			175			60.5	4		2.2
400V	A4-0.75K-A	118	190	155	105	173	40.8	3	5.5	1.5
	A4-1.5K-A	118	190	175	105	173	60.5	4	5.5	2.6
	A4-2.2K-A									
	A4-3.7K-A									
	A4-5.5K-A	155	249	185	136	232	69	8	5.5	4.5
	A4-7.5K-A									
	A4-11K-A	210	337	200	150	324	88	2	7	8.5
	A4-15K-A									
	A4-18.5K-A	289	440	215	200	425	88	2.5	7	17
	A4-22K-A									
	A4-30K-A									
	A4-37K-A	319	575	212	220	553	90.5	2.5	10	25
	A4-45K-A									
	A4-55K-A	404	615	250	270	590	86.5	3	10	35
	A4-75K-A									
	A4-90K-A	465	660	310	343	715	151.5	3	12	45
	A4-110K-A									
	A4-132K-A	560	880	350	449	930	155	4	12	88
	A4-160K-A									
	A4-200K-A	750	1000	380	420	1060	155	5	14	150
A4-220K-A										
A4-280K-A										
A4-315K-A	960	1290	400	520	1360	180	5	14	220	
A4-355K-A										
A4-400K-A										
690V	A6-450K-A	810	1358	425	520	1300	210	4	14	215
	A6-500K-A									
	A6-560K-A									
	A6-630K-A									

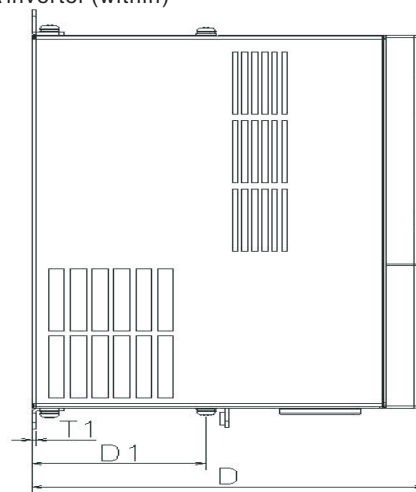
产品外形和安装尺寸

The appearance of products and installation dimensions



A2-2. 2K-A以下变频器 (含)
Below the A2-2.2K-A inverter (within)

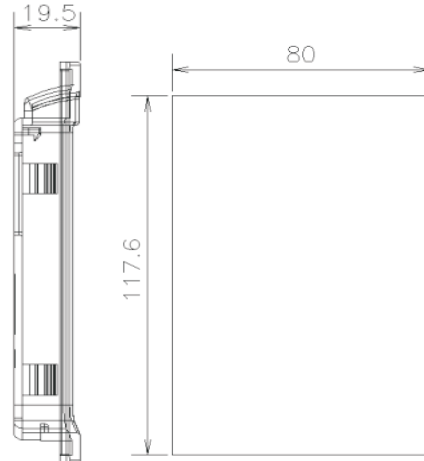
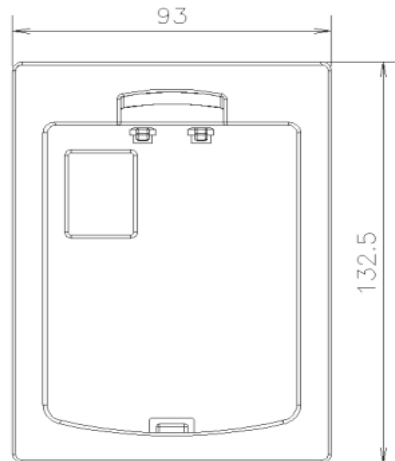
A4-7. 5K-A以下变频器 (含)
Below the A4-7.5K-A inverter (within)



A4-11K-A以上变频器 (含)
Above the A4-11K-A inverter (within)

操作面板安装支架外形及安装尺寸

The appearance and dimensions of installing the bracket of operation board



安装支架A4-B
Install the bracket A4-B

安装支架开孔尺寸
The drilling size of installing the bracket

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