

AxN Series Servo Drive

AxN系列伺服驱动器

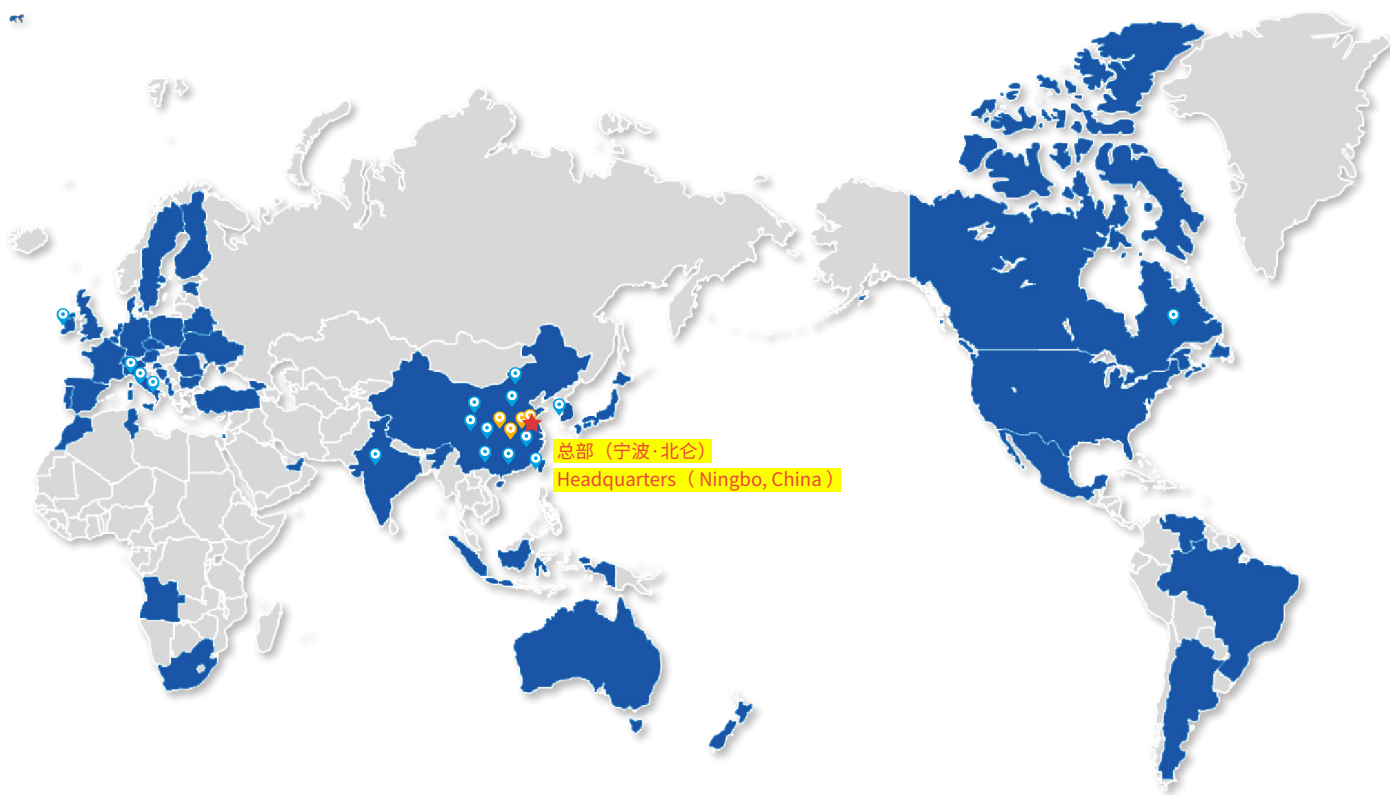




Company Profile 企业简介

宁波菲仕技术股份有限公司（简称：菲仕技术）成立于 2001 年，由民营控股、先进制造产业投资基金和宁波通商集团等战略投资人参股，公司致力于以“高效节能、精准控制”电驱动技术为核心的创新及产业化，为运动控制和能量转换领域提供系统产品和综合解决方案，经过多年品牌沉淀，菲仕已成为一家集研发、生产、销售为一体，拥有国内外多家控股子公司的集团化创新型高科技企业。

Ningbo Physis Technology Co., Ltd. (hereinafter referred to as Physis) was founded in 2001. Physis always devotes to innovation and industrialization of electrical drive technology, provides servo products and solutions for the field of motion control & energy conversion. After years of brand development and accumulation, Physis becomes a collectivized & innovative high-tech enterprise, which collects together R&D, manufacturing and sales, and has a numbers of domestic and overseas subsidiaries.



★ 总部
Headquarters

📍 5 大生产基地
Manufacturing Plant

📍 2 大研发中心
R&D center

📍 17 个海内外分支机构
Sales of subsidiaries and agency services

■ 销售产品及服务国家
Countries in which products are sold and services are served

Global presence 全球布局

立足全国 放眼全球

总部“永动谷”落户中国宁波北仑，在国内产业链完善的宁波、株洲、天津、赣州建立大型生产基地。建立国内外分子公司 17 家，合作伙伴百余家，形成覆盖全国、面向全球市场的营销服务网络，逐步落地国际化战略。

Physis has established large-scale production bases in Ningbo, Zhuzhou, Tianjin, and Guangzhou, which have a complete domestic industrial chain.

It has established 17 domestic and foreign subsidiaries and more than 100 partners, formed a marketing service network covering the whole country and facing the global market, and gradually implemented the internationalization strategy.

菲仕研发的新一代高性能伺服驱动器，其额定电流输出能力覆盖 9A ~ 200A，支持 EtherCAT、CANopen 和 Modbus 等多种现场总线，支持多种主流编码器，非常适合搭建高性能伺服系统的应用场合。搭配菲仕永磁同步伺服电机，为纺织机械、印刷机械、包装机械、塑料机械、机器人、医疗生产设备、风力发电、光伏等伺服应用市场提供个性化高性能伺服解决方案。

AxN series servo drive is the new generation of high performance servo drive with rated current output capacity of 9A~200A, supports EtherCAT, CANopen and Modbus , supports a variety of mainstream encoders, and are suitable for applications that need high performance servo systems. Physis can provide personalized high performance servo solutions for textile machinery, printing machinery, packaging machinery, rubber plastic machinery, medical production equipment, wind power, photovoltaic and other industries.

紧凑的外形尺寸

对比上一代产品，体积缩小 16% ~ 20%，重量减轻 25% ~ 35%

Compact Size

16% ~ 20% size reduction, 25% ~ 35% weight reduction, compare to predecessor

内置可编程 PLC

更智能，方便脱离上位机运行

Built in Programmable PLC

Intelligent, can run independently without controller

可编程显示模块

抛弃传统数码管显示局限，自由定制显示内容

Programmable Display Module

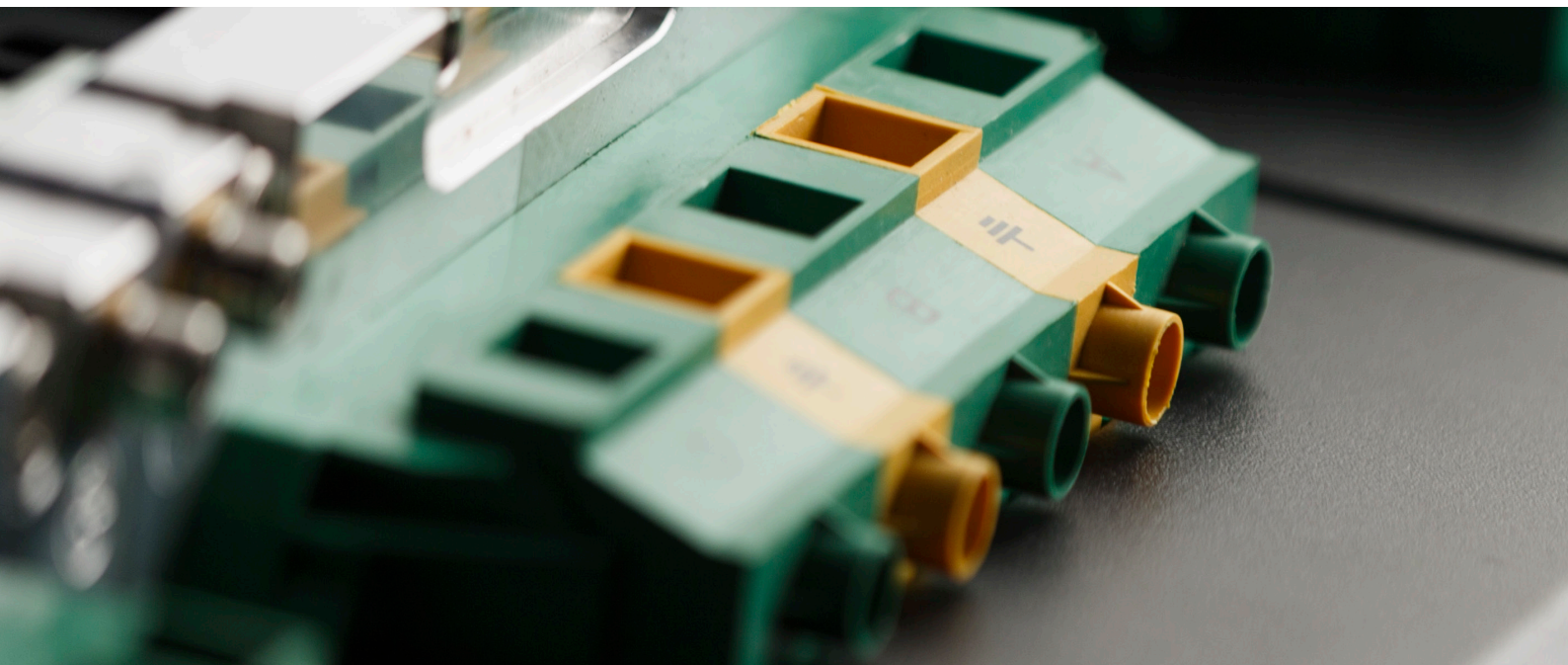
Customize display contents, abandon the limitation of traditional digital display

主流高速现场总线支持

EtherCAT、CANopen、Modbus

Main Stream High Speed Fieldbus

EtherCAT、CANopen、Modbus



高速 I/O 端口 隔离 I/O 端口 (选配)

4 路模拟输入	3 路模拟输入
2 路模拟输出	2 路模拟输出
8 路数字输入	8 路数字输入
4 路数字输出	2 路数字输出

丰富的位置传感器支持

正余弦编码器
Endat 编码器
增量编码器
旋转变压器
Hiperface 编码器
Nikon 编码器
Tamagawa 编码器

齐全的 PC 软件

在线配置软件: Cockpit 3
集成开发环境: LogicLab
软件示波器: Softscope
支持中英意三国语言

灵活安装

支持柜内安装、穿墙安装和冷却板安装, 可使用内置风冷和外置水冷

High Speed I/O Insulated I/O (Optional)

4 Analog Inputs	3 Analog Inputs
2 Analog Outputs	2 Analog Outputs
8 Digital Inputs	8 Digital Inputs
4 Digital Outputs	2 Digital Outputs

Various Position Sensor Support

Sincos Encoder
Endat Encoder
Incremental Encoder with Hall
Resolver
Hiperface Encoder
Nikon Encoder
Tamagawa Encoder

Complete PC Software

Online configure and debug software: Cockpit 3
Integrated development environment: LogicLab
Software oscilloscope: Softscope
Multi-language support: English, Chinese and Italian

Flexible Installation

Support wall mounting, feed-through mounting and cold plate mounting, can use internal air cooling and external water cooling



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Order Code

订货代码

AxN	110.250	.4	C0	0	0	F	00	00
输出电流： 09.30, 16.30, 15.30, 22.44, 35.70, 50.100, 70.140, 90.150, 110.200, 110.250, 150.300, 200.400 例： 110.250 额定 110A / 峰值 250A Output Current： 09.30, 16.30, 15.30, 22.44, 35.70, 50.100, 70.140, 90.150 110.200, 110.250, 150.300, 200.400 Example: 110.250 Rated 110A / Peak 250A	主电源电压类型： 150~380Vac 三相 Main Supply Voltage Type: 150~380Vac Three-Phase		处理器和通讯端口： F0: 120MIPS μ C + EtherCAT 通讯端口 C0: 80MIPS μ C + 无 EtherCAT 通讯端口 Processor and Communication Port: F0: 120MIPS μ C + EtherCAT Communication Port C0: 80MIPS μ C + No EtherCAT Communication Port			客户自定义： 00: 客户自定义要求预留 Customer Defined: 00: Customer Defined Requirement Reservation		
	制动单元： 0: 内置 Brake Module: 0: Built-in					应用： 00: 标准应用程序 Application: 00: Standard Applications		
						散热： F: 风扇散热 W: 水冷 H: 油冷 Dissipate Heat: F: Fan Cooling W: Water Cooling H: Oil Cooling		
						I/O 端口： 0: 标准 I/O 端口 1: 标准 I/O 端口 + 扩展的隔离 I/O 端口 I / O port: 0: Standard I / O ports 1: Standard I / O Ports + Expansion Isolated I / O Ports		

代码示例：

AxN 110.250.4C000F0000

额定输出电流 110A, 峰值输出电流 250A, 三相 400V 交流供电, 80MIPS μ C 处理器, 去除 EtherCAT 端口, 完整制动单元以及标准 I/O 端口, 风扇冷却, 搭载标准应用程序, 无客户自定义要求。

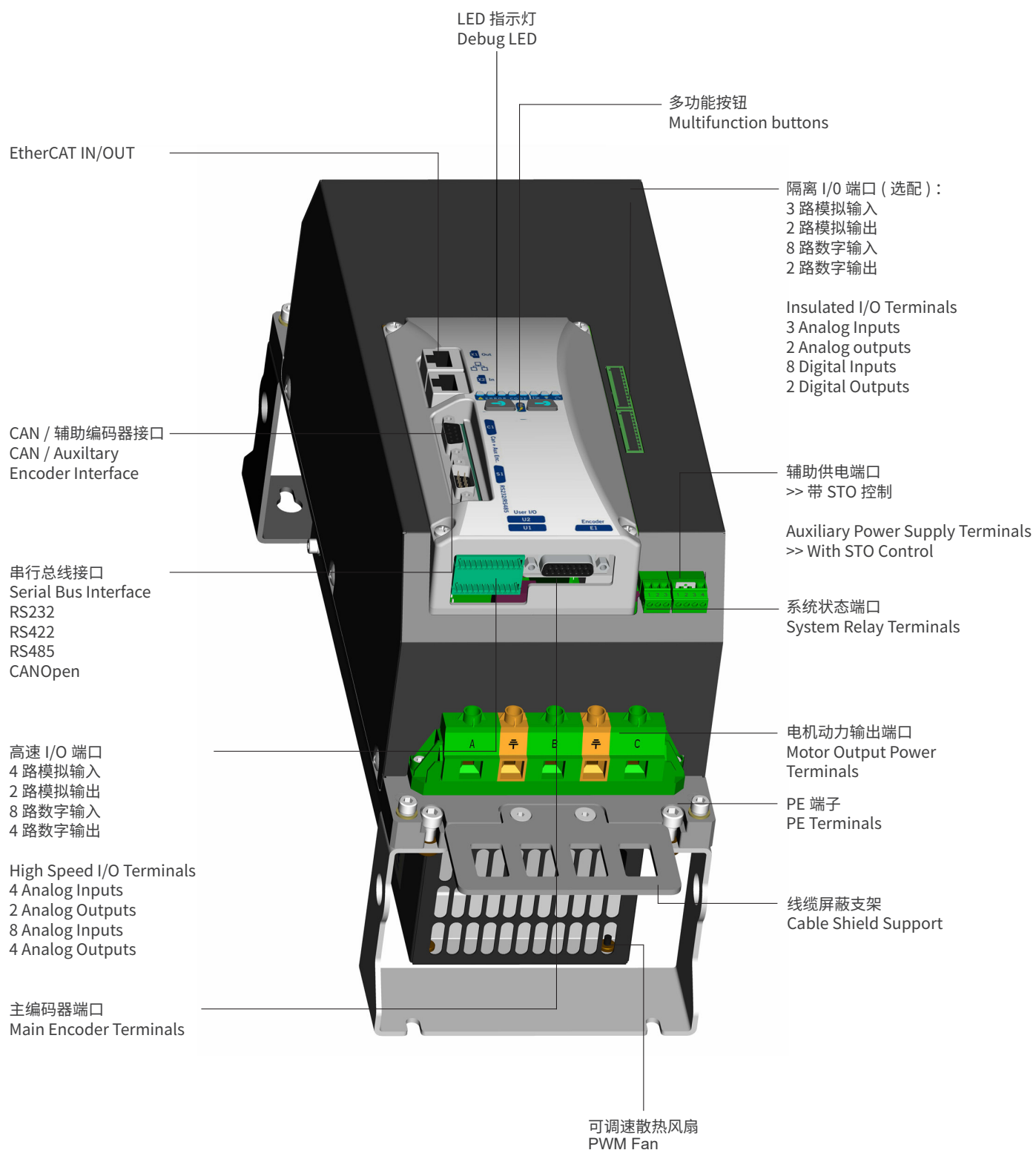
Example Code:

AxN 110.250.4C000F0000

Rated output current 110A, peak current 250A, input voltage 400Vac, CPU 80MIPS μ C, remove EtherCAT port, complete brake unit and standard I/O ports, fan cooled, standard application program, no customized requirements.

Hardware Connections

硬件接口展示



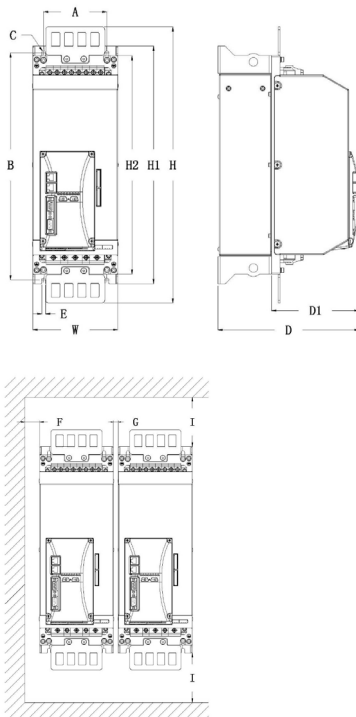
AxN Technical Data

AxN 系列参数

		Size1		Size2	Size3			Size4	Size5				Size6
		09.20.4	16.30.4	15.30.4	22.44.4	35.70.4	50.100.4	70.140.4	90.150.4	110.200.4	110.250.4	150.300.4	200.400.4
额定输出电流 Rated Current Output		09A	16A	15A	22A	35A	50A	70A	90A	110A	110A	150A	200A
峰值输出电流 Peak Current Output		20A	30A	30A	44A	70A	100A	140A	150A	200A	250A	300A	400A
主电源 Main Power Supply	交流	三相 150 ~ 500Vac, 50/60Hz 150 ~ 500 Vac Three Phase											
	直流	0 ~ 800 Vdc											
辅助电源 Auxiliary Power Supply	电压	24V ± 15%											
	电流	2A		2A	3A			6A	8A				8A
制动单元 Brake Module		内置 Built-in											
内部制动电阻（阻值 / 功率） Internal Brake Resistor		25Ω/30W	18Ω/30W	18Ω/30W	12Ω/60W	7Ω/60W	5Ω/60W	3.5Ω/60W	3.5Ω/150W	3Ω/150W	3Ω/150W	3Ω/150W	-
外部制动电阻 External Brake Resistor		25Ω	18Ω	18Ω	12Ω	7Ω	5Ω	3.5Ω	3.5Ω	3Ω	3Ω	3Ω	3Ω
通讯总线支持 Fieldbus Support		CANOpen、EtherCAT、Modbus											
位置传感器支持 Position Sensor Support		正余弦编码器（SinCos）、Endat 编码器、增量编码器（Incremental）、旋转变压器和 Hiperface 编码器 SinCos Encoder、EnDat Encoder、Digital Incremental with Hall、Resolver and Hiperface Encoder											
功能安全 Functional safety		STO：安全转矩关断 符合 SIL3 IEC EN 61800-5-2:2016 STO：Safe Torque Off Complies with SILL3 IEC EN 61800-5-2:2016											
配置软件 Management Software		Physis Tools Suite											

Dimensions

外形尺寸



	Size1		Size2	Size3			Size4	Size5				Size6
	09.20.4	16.30.4	15.30.4	22.44.4	35.70.4	50.100.4	70.140.4	90.150.4	110.200.4	110.250.4	150.300.4	200.400.4
重量 Weight	2.5kg		6.9kg	8.8kg			13.1kg	26.8kg				30kg
H	201.8		488				725				612	
W	96		96	150			200	286				350
D	164.8		249								242.2	
H1	-		420				652				590	
H2	-		386				612				550	
D1	-		155								145	
A	66		60	111.6			158.6	210				310
B	191		401				628				566	
C	5.5		5.5	6.5			8.5				8.5	
E	5.5		5.5	6.5			8.5				8.5	
F	≥ 30											
G	≥ 10											
I	≥ 100											

备注: 所有尺寸的单位均为毫米 (mm)
Note: All dimensions are in millimeters (mm)

AxN Size 1

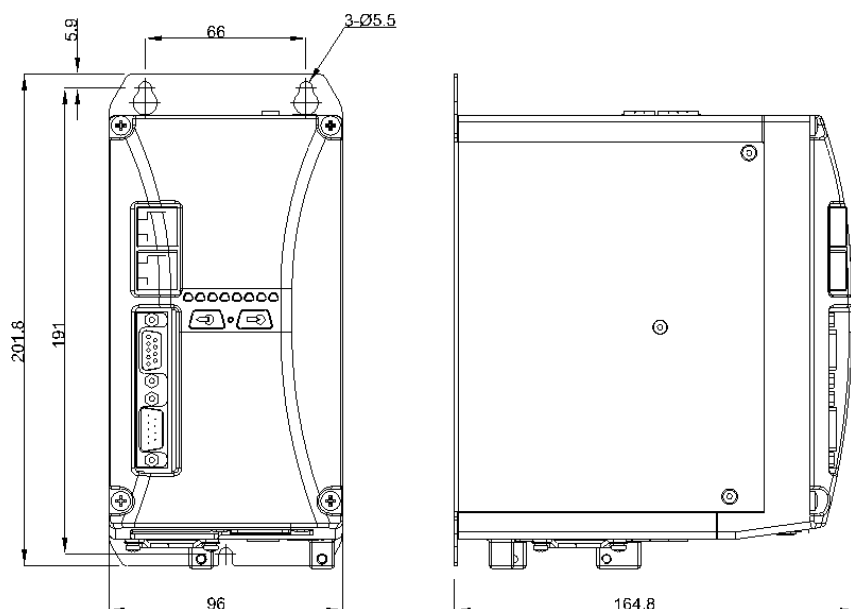
技术参数 Technical Specifications	符号 Symbol	AxN 09.20.4	AxN 16.30.4	单位 Units
主电源供电电压 Power Supply Voltage	V_{in}	150 ~ 500		Vac
		0 ~ 800		Vdc
辅助电源供电电压 Auxiliary Supply Voltage	V_{aux}	24V $\pm$ 15% / 2A	24V $\pm$ 15% / 3A	Vdc
输出频率 Output Frequency	f	0 ~ 1200		Hz
额定输出电流, $S1^{(1)}$ Current Output, $S1^{(1)}$	I_n	9	16	Arms
峰值输出电流 ⁽¹⁾ Peak Current ⁽¹⁾	I_p	20	30	Arms
总功率损耗 ⁽²⁾ Power Losses Total ⁽²⁾	P_l	200	200	W
最大输出电压 Maximum Output Voltage	V_{out}	$V_{in} \times 0.95$		Vac
PWM 频率 ⁽³⁾ PWM Frequency ⁽³⁾	f_{PWM}	4 / 8 / 16		kHz
额定输出功率时的效率 ⁽¹⁾ Efficiency at Nominal Power ⁽¹⁾	---	97.9	97.9	%
输入波形因数 (满载) Input form Factor(Full Load)	---	0.9		Vac
最大制动电流 Maximum Braking Current	---	100% 峰值电流 (I_p) 100% of I_p (Peak Current)		---
散热 Cooling	---	40 x 40 x 20 风扇 x1 1 fan 40 x 40 x 20		---
风扇流量 Flow Rate	---	25.2		m ³ / hour
尺寸 (HxDxW) Dimensions (HxDxW)	---	201.8 x 164.8 x 96		mm

⁽¹⁾ $V_{in}=380Vac$, $V_{out}=V_{in} \times 0.95$, 环境温度为 40°C, PWM 控制频率为 8kHz; / $V_{in}=380Vac$, $V_{out}=V_{in} \times 0.95$, $T_{amb}=40^\circ C$, Comm.Freq.8kHz;

⁽²⁾ 包含输入整流部分的损耗; / Including input rectifier losses;

⁽³⁾ 为了使输出电流保持在额定, 电机零速时 PWM 频率会自动降低。/ PWM frequency will automatically decrease at zero speed, in order to keep nominal current output.

外形尺寸 Overall Dimensions



电机位置反馈选项 Motor Feedback Options

主编码器 (500kHz) Main Encoder (500kHz)	5 通道正余弦编码器 (SinCos encoder), 2 个绝对值通道、2 个增量通道和 1 个零位通道 SinCos encoder 5 channels (2 absolute analog tracks/2 incremental analog tracks/index)
	增量编码器 (Incremental encoder), 1Vpp 或长线驱动 Incremental encoder (1 Vpp or Different Line Driver)
	无传感器模式 (无电机位置反馈信号) Sensorless algorithm (w/o feedback)
	EnDat 系列编码器, 支持 EnDat 1.0 - 2.2 协议 (系统默认编码器) EnDat serial encoder 1.0 to 2.2 (default)
	旋转变压器 Resolver
	Hiperface 系列编码器 Hiperface encoder
辅助编码器 Secondary Encoder	无换向信号通道的数字增量编码器 (500kHz) Incremental digital encoder without commutation tracks (500kHz)
	EnDat 系列编码器 EnDat serial encoder

可编程信号输入 Programmable Inputs Signals

2 路差分 / 4 路单端模拟信号输入 2 differential / 4 single ended analog inputs	$\pm 10V$ (1mV) / $R_{in} = 10k\Omega$
8 路数字信号输入 8 digital inputs	20 - 30V / 对地 $R_{in} = 6.6k\Omega$ 20 - 30V / $R_{in} = 6.6k\Omega$ to GND
2 路隔离的模拟信号输入 (选配) 2 insulated analog inputs (optional)	$\pm 10V$ (1mV)
8 路隔离的数字信号输入 (选配) 8 insulated analog inputs (optional)	5mA, 最大电压 24Vdc 5mA, 24Vdc max

可编程信号输出 Programmable Outputs Signals

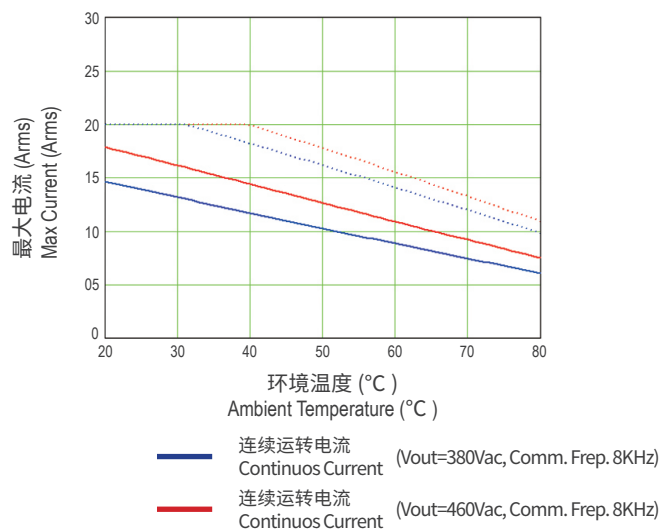
2 路模拟信号输出 2 analog outputs	0-10V (1mV) FS (30mA)
4 路数字信号输出 4 digital outputs	PNP 集电极开路 24V (100mA) PNP open collector 24V (100mA)
1 路继电器输出 1 watch dog relay	2A / 30Vdc, 0.25A / 250Vac 常开 (N.O.) / 常闭 (N.C.) 针脚 2A / 30Vdc, 0.25A / 250Vac, NO/NC contacts
2 路隔离的模拟信号输出 (选配) 2 insulated analog outputs (optional)	$\pm 10V$ (1mV) FS (30mA)
2 路隔离的数字信号输出 (选配) 2 insulated digital outputs (optional)	开关量, 9-28V / 2A On.off switch, 9-28V / 2A

硬件配置 Hardware Configuration

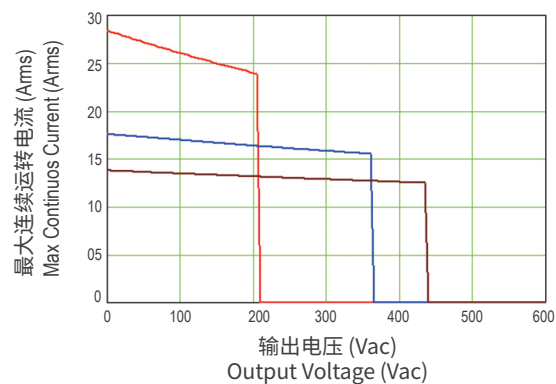
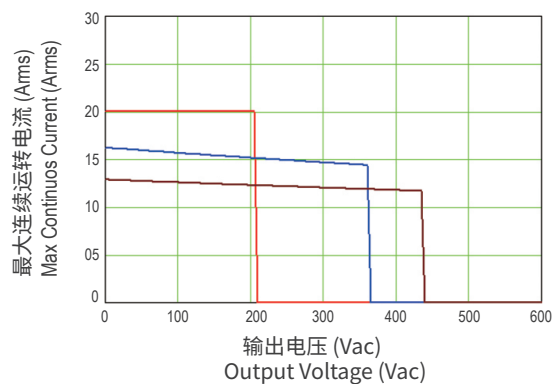
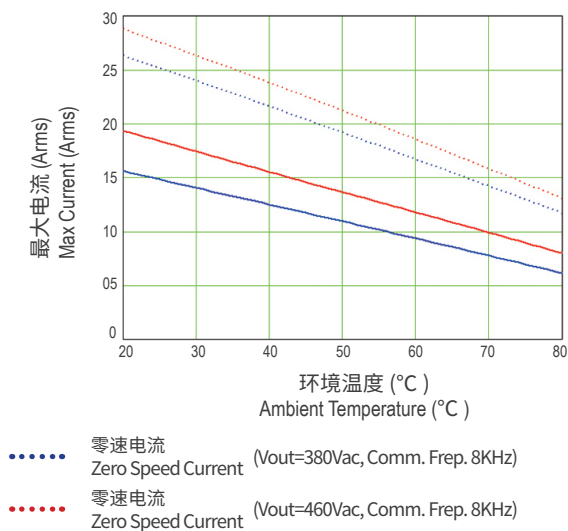
处理器 Processor Speed	80MIPS μ C + FPGA / 120MIPS μ C + FPGA 增强版 80MIPS μ C + FPGA / 120MIPS μ C + FPGA Extreme Version	可选 Optional
工作频率 Task Frequency	电流环采样频率 Current / drive monitoring	1MHz
	位置环 / 速度环频率 Position / speed loop	8kHz
	PLC 快速任务扫描频率 PLC fast task	8kHz
	PLC 慢速任务扫描频率 PLC slow task	15.625Hz to 1 kHz (可配置) 15.625 Hz to 1 kHz (user-programmable)
位置模式可用 Position Loop Mode Available	目标位置寄存器位宽 Target position register	32 or 64 bits
	全数字 Id / Iq 控制 Full digital control Id/Iq	最高可达 16kHz updated 16 kHz

驱动器运行区间 Drive Operational Area

AxN 09.20.4



AxN 16.60.4



AxN Size 2

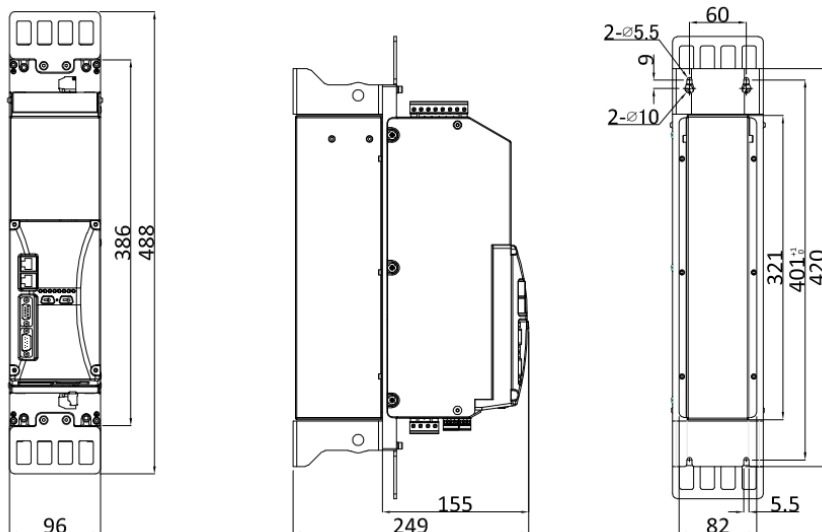
技术参数 Technical Specifications	符号 Symbol	AxN 15.30.4	单位 Units
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		0 ~ 800	Vdc
辅助电源供电电压 Auxiliary Supply Voltage	V_{aux}	24V $\pm$ 15% / 2A	Vdc
输出频率 Output Frequency	f	0 ~ 1200	Hz
额定输出电流, $S1^{(1)}$ Current Output, $S1^{(1)}$	I_n	15	Arms
峰值输出电流 ⁽¹⁾ Peak Current ⁽¹⁾	I_p	30	Arms
总功率损耗 ⁽²⁾ Power Losses Total ⁽²⁾	P_l	200	W
最大输出电压 Maximum Output Voltage	V_{out}	$V_{in} \times 0.95$	Vac
PWM 频率 ⁽³⁾ PWM Frequency ⁽³⁾	f_{PWM}	4 / 8 / 16	kHz
额定输出功率时的效率 ⁽¹⁾ Efficiency at Nominal Power ⁽¹⁾	---	97.9	%
输入波形因数 (满载) Input form Factor(Full Load)	---	0.9	Vac
最大制动电流 Maximum Braking Current	---	100% 峰值电流 (I_p) 100% of I_p (Peak Current)	---
散热 Cooling	---	60 x 60 x32 风扇 x1 1 fan 60 x 60 x32	---
风扇流量 Flow Rate	---	70	m ³ / hour
尺寸 (HxDxW) Dimensions (HxDxW)	---	420 x 249 x 96	mm

⁽¹⁾ $V_{in}=380V_{ac}$, $V_{out}=V_{in} \times 0.95$, 环境温度为 40°C, PWM 控制频率为 8kHz; / $V_{in}=380V_{ac}$, $V_{out}=V_{in} \times 0.95$, $T_{amb}=40^{\circ}C$, Comm.Freq.8kHz;

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外形尺寸 Overall Dimensions



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	无传感器模式 (无电机位置反馈信号) Sensorless algorithm (w/o feedback)
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	旋转变压器 Resolver
	Hiperface 系列编码器 Hiperface encoder
辅助编码器 Secondary Encoder	无换向信号通道的数字增量编码器 (500kHz) Incremental digital encoder without commutation tracks (500kHz)
	EnDat 系列编码器 EnDat serial encoder

可编程信号输入 Programmable Inputs Signals

2 路差分 / 4 路单端模拟信号输入 2 differential / 4 single ended analog inputs	$\pm 10V$ (1mV) / $R_{in} = 10k\Omega$
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2 路隔离的模拟信号输入 (选配) 2 insulated analog inputs (optional)	$\pm 10V$ (1mV)
8 路隔离的数字信号输入 (选配) 8 insulated analog inputs (optional)	5mA, 最大电压 24Vdc 5mA, 24Vdc max

可编程信号输出 Programmable Outputs Signals

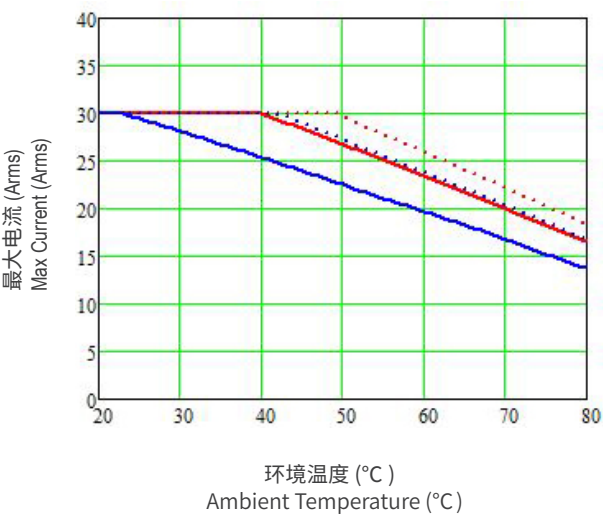
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2 路隔离的模拟信号输出 (选配) 2 insulated analog outputs (optional)	$\pm 10V$ (1mV) FS (30mA)
2 路隔离的数字信号输出 (选配) 2 insulated digital outputs (optional)	开关量, 9-28V / 2A On.off switch, 9-28V / 2A

硬件配置 Hardware Configuration

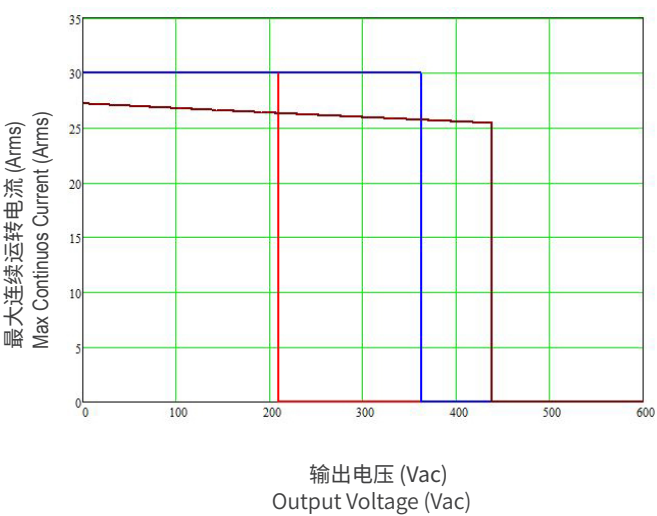
处理器 Processor Speed	80MIPS μ C + FPGA / 120MIPS μ C + FPGA 增强版 80MIPS μ C + FPGA / 120MIPS μ C + FPGA Extreme Version	可选 Optional
工作频率 Task Frequency	电流环采样频率 Current / drive monitoring	1MHz
	位置环 / 速度环频率 Position / speed loop	8kHz
	PLC 快速任务扫描频率 PLC fast task	8kHz
	PLC 慢速任务扫描频率 PLC slow task	15.625Hz to 1 kHz (可配置) 15.625 Hz to 1 kHz (user-programmable)
位置模式可用 Position Loop Mode Available	目标位置寄存器位宽 Target position register	32 or 64 bits
	全数字 Id / Iq 控制 Full digital control Id/Iq	最高可达 16kHz updated 16 kHz

驱动器运行区间
Drive Operational Area

AxN 15.30.4



- 连续运转电流 (Vout=380Vac, Comm. Freq. 8KHz)
Continuous Current
- 连续运转电流 (Vout=460Vac, Comm. Freq. 8KHz)
Continuous Current
- 零速电流 (Vout=380Vac, Comm. Freq. 8KHz)
Zero Speed Current
- 零速电流 (Vout=460Vac, Comm. Freq. 8KHz)
Zero Speed Current



- 连续运转电流 (Vout=220Vac, Comm. Freq. 8KHz)
Continuous Current
- 连续运转电流 (Vout=380Vac, Comm. Freq. 8KHz)
Continuous Current
- 连续运转电流 (Vout=460Vac, Comm. Freq. 8KHz)
Continuous Current



AxN Size 3

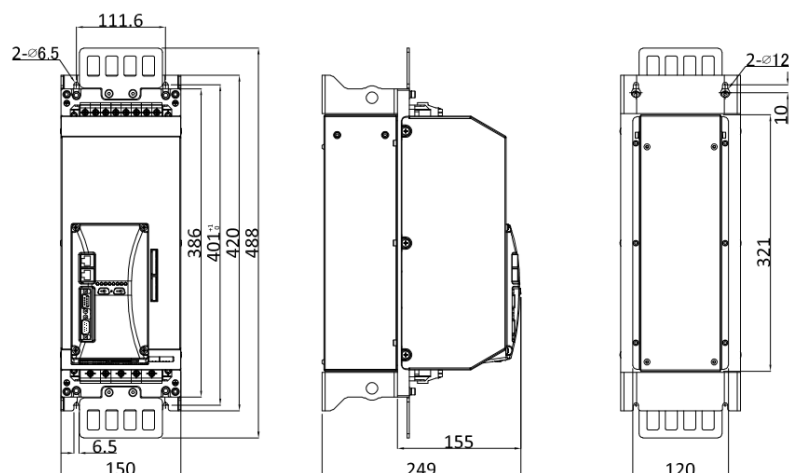
技术参数 Technical Specifications	符号 Symbol	AxN 22.44.4	AxN 35.70.4	AxN 50.100.4	单位 Units
主电源供电电压 Power Supply Voltage	V_{in}	150 ~ 500			Vac
		0 ~ 800			Vdc
辅助电源供电电压 Auxiliary Supply Voltage	V_{aux}	24V $\pm$ 15% / 3A			Vdc
输出频率 Output Frequency	f	0 ~ 1200			Hz
额定输出电流, $S1^{(1)}$ Current Output, $S1^{(1)}$	I_n	22	35	50	Arms
峰值输出电流 ⁽¹⁾ Peak Current ⁽¹⁾	I_p	44	70	100	Arms
总功率损耗 ⁽²⁾ Power Losses Total ⁽²⁾	P_l	280	400	590	W
最大输出电压 Maximum Output Voltage	V_{out}	$V_{in} \times 0.95$			Vac
PWM 频率 ⁽³⁾ PWM Frequency ⁽³⁾	fpw _m	4 / 8 / 16			kHz
额定输出功率时的效率 ⁽¹⁾ Efficiency at Nominal Power ⁽¹⁾	—	98	98.2	98.1	%
输入波形因数 (满载) Input form Factor(Full Load)	—	0.9			Vac
最大制动电流 Maximum Braking Current	—	100% 峰值电流 (I_p) 100% of I_p (Peak Current)			—
散热 Cooling	—	80 x 80 x38 可调速风扇 x1 1 PWM fan 80 x 80 x38			—
风扇流量 Flow Rate	—	136			m ³ / hour
尺寸 (HxDxW) Dimensions (HxDxW)	—	488 x 249 x 150			mm

⁽¹⁾ $V_{in}=380V_{ac}$, $V_{out}=V_{in} \times 0.95$, 环境温度为 40°C, PWM 控制频率为 8kHz; / $V_{in}=380V_{ac}$, $V_{out}=V_{in} \times 0.95$, $T_{amb}=40^{\circ}C$, Comm.Freq.8kHz;

⁽²⁾ 包含输入整流部分的损耗; / Including input rectifier losses;

⁽³⁾ 为了使输出电流保持在额定, 电机零速时 PWM 频率会自动降低。/ PWM frequency will automatically decrease at zero speed, in order to keep nominal current output.

外形尺寸 Overall Dimensions



电机位置反馈选项 Motor Feedback Options

主编码器 (500kHz) Main Encoder (500kHz)	5 通道正余弦编码器 (SinCos encoder), 2 个绝对值通道、2 个增量通道和 1 个零位通道 SinCos encoder 5 channels (2 absolute analog tracks/2 incremental analog tracks/index)
	增量编码器 (Incremental encoder), 1Vpp 或长线驱动 Incremental encoder (1 Vpp or Different Line Driver)
	无传感器模式 (无电机位置反馈信号) Sensorless algorithm (w/o feedback)
	EnDat 系列编码器, 支持 EnDat 1.0 - 2.2 协议 (系统默认编码器) EnDat serial encoder 1.0 to 2.2 (default)
	旋转变压器 Resolver
辅助编码器 Secondary Encoder	Hiperface 系列编码器 Hiperface encoder
	无换向信号通道的数字增量编码器 (500kHz) Incremental digital encoder without commutation tracks (500kHz)
	EnDat 系列编码器 EnDat serial encoder

可编程信号输入 Programmable Inputs Signals

2 路差分 / 4 路单端模拟信号输入 2 differential / 4 single ended analog inputs	$\pm 10V$ (1mV) / $R_{in} = 10k\Omega$
8 路数字信号输入 8 digital inputs	20 - 30V / 对地 $R_{in} = 6.6k\Omega$ 20 - 30V / $R_{in} = 6.6k\Omega$ to GND
2 路隔离的模拟信号输入 (选配) 2 insulated analog inputs (optional)	$\pm 10V$ (1mV)
8 路隔离的数字信号输入 (选配) 8 insulated analog inputs (optional)	5mA, 最大电压 24Vdc 5mA, 24Vdc max

可编程信号输出 Programmable Outputs Signals

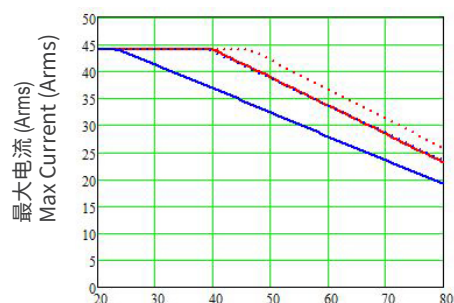
2 路模拟信号输出 2 analog outputs	0-10V (1mV) FS (30mA)
4 路数字信号输出 4 digital outputs	PNP 集电极开路 24V (100mA) PNP open collector 24V (100mA)
1 路继电器输出 1 watch dog relay	2A / 30Vdc, 0.25A / 250Vac 常开 (N.O.) / 常闭 (N.C.) 针脚 2A / 30Vdc, 0.25A / 250Vac, NO/NC contacts
2 路隔离的模拟信号输出 (选配) 2 insulated analog outputs (optional)	$\pm 10V$ (1mV) FS (30mA)
2 路隔离的数字信号输出 (选配) 2 insulated digital outputs (optional)	开关量, 9-28V / 2A On.off switch, 9-28V / 2A

硬件配置 Hardware Configuration

处理器 Processor Speed	80MIPS μ C + FPGA / 120MIPS μ C + FPGA 增强版 80MIPS μ C + FPGA / 120MIPS μ C + FPGA Extreme Version	可选 Optional
工作频率 Task Frequency	电流环采样频率 Current / drive monitoring	1MHz
	位置环 / 速度环频率 Position / speed loop	8kHz
	PLC 快速任务扫描频率 PLC fast task	8kHz
	PLC 慢速任务扫描频率 PLC slow task	15.625Hz to 1 kHz (可配置) 15.625 Hz to 1 kHz (user-programmable)
位置模式可用 Position Loop Mode Available	目标位置寄存器位宽 Target position register	32 or 64 bits
	全数字 Id / Iq 控制 Full digital control Id/Iq	最高可达 16kHz updated 16 kHz

驱动器运行区间 Drive Operational Area

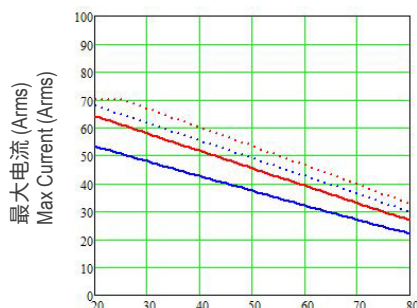
AxN 22.44.4



环境温度 (°C)
Ambient Temperature (°C)

— 连续运转电流 (Vout=380Vac, Comm. Freq. 8KHz)
Continuos Current
— 连续运转电流 (Vout=460Vac, Comm. Freq. 8KHz)
Continuos Current

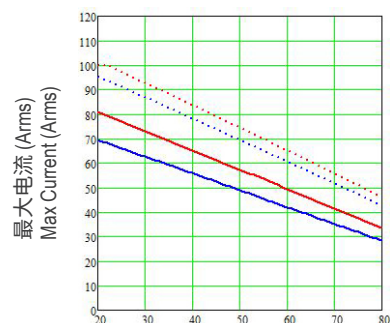
AxN 35.70.4



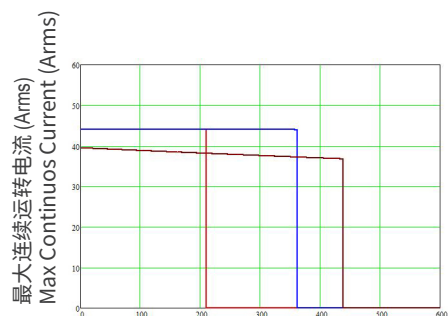
环境温度 (°C)
Ambient Temperature (°C)

... 零速电流 (Vout=380Vac, Comm. Freq. 8KHz)
Zero Speed Current
... 零速电流 (Vout=460Vac, Comm. Freq. 8KHz)
Zero Speed Current

AxN 50.100.4

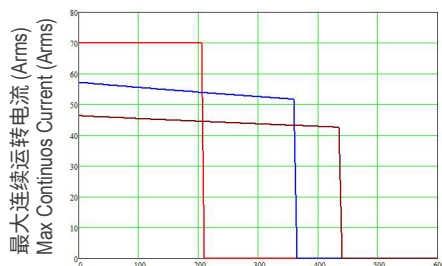


环境温度 (°C)
Ambient Temperature (°C)



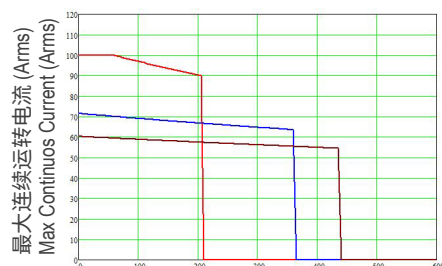
输出电压 (Vac)
Output Voltage (Vac)

— 连续运转电流 (Vout=220Vac, Comm. Freq. 8KHz)
Continuos Current



输出电压 (Vac)
Output Voltage (Vac)

— 连续运转电流 (Vout=380Vac, Comm. Freq. 8KHz)
Continuos Current



输出电压 (Vac)
Output Voltage (Vac)

— 连续运转电流 (Vout=460Vac, Comm. Freq. 8KHz)
Continuos Current



AxN Size 4

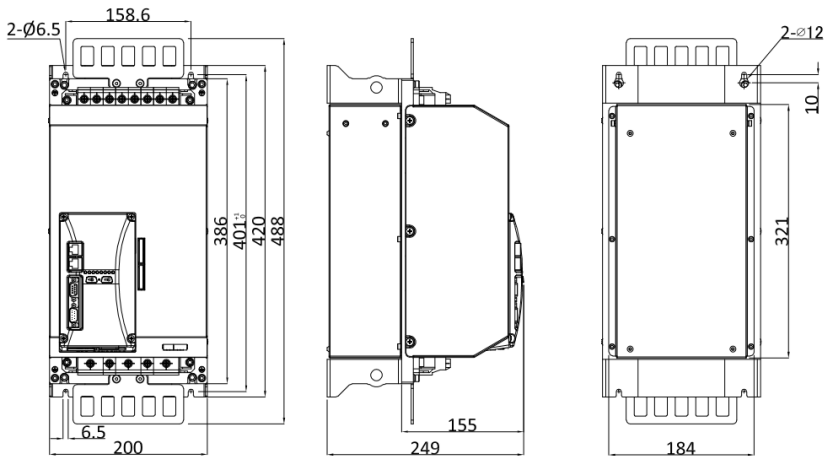
技术参数 Technical Specifications	符号 Symbol	AxN 70.140.4	单位 Units
主电源供电电压 Power Supply Voltage	V_{in}	150 ~ 500	Vac
		0 ~ 800	Vdc
辅助电源供电电压 Auxiliary Supply Voltage	V_{aux}	24V $\pm$ 15% / 2A	Vdc
输出频率 Output Frequency	f	0 ~ 1200	Hz
额定输出电流, $S1^{(1)}$ Current Output, $S1^{(1)}$	I_n	70	Arms
峰值输出电流 ⁽¹⁾ Peak Current ⁽¹⁾	I_p	140	Arms
总功率损耗 ⁽²⁾ Power Losses Total ⁽²⁾	P_l	870	W
最大输出电压 Maximum Output Voltage	V_{out}	$V_{in} \times 0.95$	Vac
PWM 频率 ⁽³⁾ PWM Frequency ⁽³⁾	f_{PWM}	4 / 8 / 16	kHz
额定输出功率时的效率 ⁽¹⁾ Efficiency at Nominal Power ⁽¹⁾	---	98.1	%
输入波形因数 (满载) Input form Factor(Full Load)	---	0.9	Vac
最大制动电流 Maximum Braking Current	---	100% 峰值电流 (I_p) 100% of I_p (Peak Current)	---
散热 Cooling	---	80 x 80 x38 可调速风扇 x2 2 PWM fan 80 x 80 x38	---
风扇流量 Flow Rate	---	110 x2	m ³ / hour
尺寸 (HxDxW) Dimensions (HxDxW)	---	420 x 249 x 200	mm

⁽¹⁾ $V_{in}=380Vac$, $V_{out}=V_{in} \times 0.95$, 环境温度为 40°C, PWM 控制频率为 8kHz; / $V_{in}=380Vac$, $V_{out}=V_{in} \times 0.95$, $T_{amb}=40^\circ C$, Comm.Freq.8kHz;

⁽²⁾ 包含输入整流部分的损耗; / Including input rectifier losses;

⁽³⁾ 为了使输出电流保持在额定, 电机零速时 PWM 频率会自动降低。/ PWM frequency will automatically decrease at zero speed, in order to keep nominal current output.

外形尺寸 Overall Dimensions



电机位置反馈选项 Motor Feedback Options

主编码器 (500kHz) Main Encoder (500kHz)	5 通道正余弦编码器 (SinCos encoder), 2 个绝对值通道、2 个增量通道和 1 个零位通道 SinCos encoder 5 channels (2 absolute analog tracks/2 incremental analog tracks/index)
	增量编码器 (Incremental encoder), 1Vpp 或长线驱动 Incremental encoder (1 Vpp or Different Line Driver)
	无传感器模式 (无电机位置反馈信号) Sensorless algorithm (w/o feedback)
	EnDat 系列编码器, 支持 EnDat 1.0 - 2.2 协议 (系统默认编码器) EnDat serial encoder 1.0 to 2.2 (default)
	旋转变压器 Resolver
	Hiperface 系列编码器 Hiperface encoder
辅助编码器 Secondary Encoder	无换向信号通道的数字增量编码器 (500kHz) Incremental digital encoder without commutation tracks (500kHz)
	EnDat 系列编码器 EnDat serial encoder

可编程信号输入 Programmable Inputs Signals

2 路差分 / 4 路单端模拟信号输入 2 differential / 4 single ended analog inputs	$\pm 10V$ (1mV) / $R_{in} = 10k\Omega$
8 路数字信号输入 8 digital inputs	20 - 30V / 对地 $R_{in} = 6.6k\Omega$ 20 - 30V / $R_{in} = 6.6k\Omega$ to GND
2 路隔离的模拟信号输入 (选配) 2 insulated analog inputs (optional)	$\pm 10V$ (1mV)
8 路隔离的数字信号输入 (选配) 8 insulated analog inputs (optional)	5mA, 最大电压 24Vdc 5mA, 24Vdc max

可编程信号输出 Programmable Outputs Signals

2 路模拟信号输出 2 analog outputs	0-10V (1mV) FS (30mA)
4 路数字信号输出 4 digital outputs	PNP 集电极开路 24V (100mA) PNP open collector 24V (100mA)
1 路继电器输出 1 watch dog relay	2A / 30Vdc, 0.25A / 250Vac 常开 (N.O.) / 常闭 (N.C.) 针脚 2A / 30Vdc, 0.25A / 250Vac, NO/NC contacts
2 路隔离的模拟信号输出 (选配) 2 insulated analog outputs (optional)	$\pm 10V$ (1mV) FS (30mA)
2 路隔离的数字信号输出 (选配) 2 insulated digital outputs (optional)	开关量, 9-28V / 2A On.off switch, 9-28V / 2A

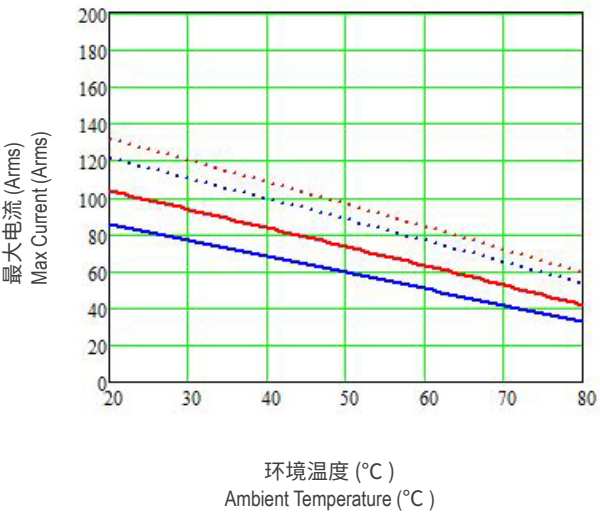
硬件配置
Hardware Configuration

处理器 Processor Speed	80MIPS μ C + FPGA / 120MIPS μ C + FPGA 增强版 80MIPS μ C + FPGA / 120MIPS μ C + FPGA Extreme Version	可选 Optional
工作频率 Task Frequency	电流环采样频率 Current / drive monitoring	1MHz
	位置环 / 速度环频率 Position / speed loop	8kHz
	PLC 快速任务扫描频率 PLC fast task	8kHz
	PLC 慢速任务扫描频率 PLC slow task	15.625Hz to 1 kHz (可配置) 15.625 Hz to 1 kHz (user-programmable)
位置模式可用 Position Loop Mode Available	目标位置寄存器位宽 Target position register	32 or 64 bits
	全数字 Id / Iq 控制 Full digital control Id/Iq	最高可达 16kHz updated 16 kHz

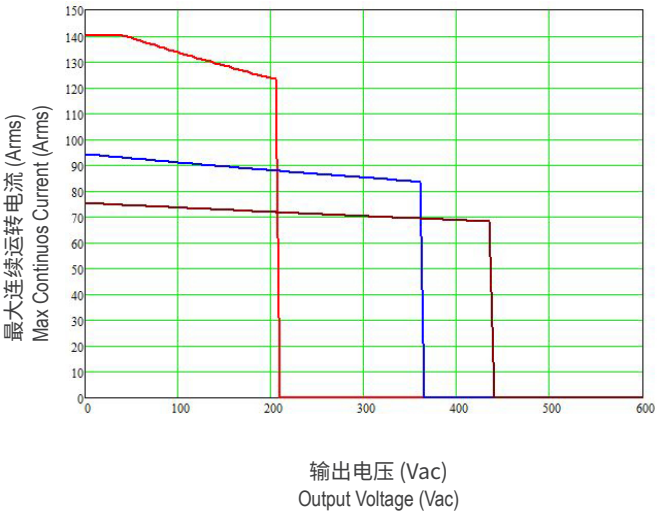


驱动器运行区间
Drive Operational Area

AxN 70.140.4



- 连续运转电流 (Vout=380Vac, Comm. Freq. 8KHz)
Continuous Current
- 连续运转电流 (Vout=460Vac, Comm. Freq. 8KHz)
Continuous Current
- 零速电流 (Vout=380Vac, Comm. Freq. 8KHz)
Zero Speed Current
- 零速电流 (Vout=460Vac, Comm. Freq. 8KHz)
Zero Speed Current



- 连续运转电流 (Vout=220Vac, Comm. Freq. 8KHz)
Continuous Current
- 连续运转电流 (Vout=380Vac, Comm. Freq. 8KHz)
Continuous Current
- 连续运转电流 (Vout=460Vac, Comm. Freq. 8KHz)
Continuous Current
- 连续运转电流 (Vout=380Vac, Comm. Freq. 8KHz)
Continuous Current



AxN Size 5

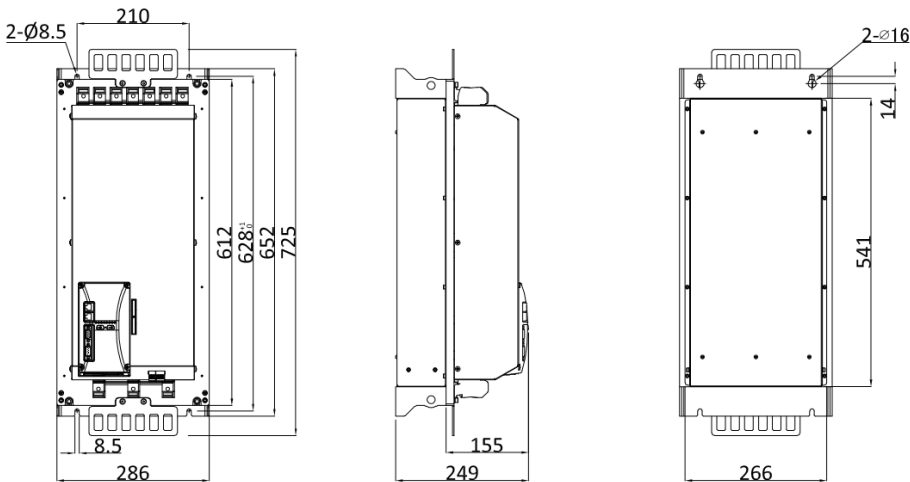
技术参数 Technical Specifications	符号 Symbol	AxN 90.150.4	AxN 110.200.4	AxN 110.250.4	AxN 150.300.4	单位 Units
主电源供电电压 Power Supply Voltage	V_{in}	150 ~ 500				Vac
		0 ~ 800				Vdc
辅助电源供电电压 Auxiliary Supply Voltage	V_{aux}	24V $\pm$ 15% / 3A				Vdc
输出频率 Output Frequency	f	0 ~ 1200				Hz
额定输出电流, $S1^{(1)}$ Current Output, $S1^{(1)}$	I_n	90	110	110	150	Arms
峰值输出电流 ⁽¹⁾ Peak Current ⁽¹⁾	I_p	150	200	250	300	Arms
总功率损耗 ⁽²⁾ Power Losses Total ⁽²⁾	P_l	1050	1280	1300	1772	W
最大输出电压 Maximum Output Voltage	V_{out}	$V_{in} \times 0.95$				Vac
PWM 频率 ⁽³⁾ PWM Frequency ⁽³⁾	f _{pw_m}	4 / 8 / 16				kHz
额定输出功率时的效率 ⁽¹⁾ Efficiency at Nominal Power ⁽¹⁾	—	98.2	98.2	97.1	97.1	%
输入波形因数 (满载) Input form Factor(Full Load)	—	0.9				Vac
最大制动电流 Maximum Braking Current	—	100% 峰值电流 (I_p) 100% of I_p (Peak Current)				—
散热 Cooling	—	80 x 80 x38 可调速风扇 x3 3 PWM fan 80 x 80 x38				—
风扇流量 Flow Rate	—	110 x3				m ³ / hour
尺寸 (HxDxW) Dimensions (HxDxW)	—	725 x 249 x 286				mm

⁽¹⁾ $V_{in}=380Vac$, $V_{out}=V_{in} \times 0.95$, 环境温度为 40°C, PWM 控制频率为 8kHz; / $V_{in}=380Vac$, $V_{out}=V_{in} \times 0.95$, $T_{amb}=40^{\circ}C$, Comm.Freq.8kHz;

⁽²⁾ 包含输入整流部分的损耗; / Including input rectifier losses;

⁽³⁾ 为了使输出电流保持在额定, 电机零速时 PWM 频率会自动降低。/ PWM frequency will aytormatically decrease at zero speed, in order to keep nominal current output.

外形尺寸 Overall Dimensions



电机位置反馈选项 Motor Feedback Options

主编码器 (500kHz) Main Encoder (500kHz)	5 通道正余弦编码器 (SinCos encoder), 2 个绝对值通道、2 个增量通道和 1 个零位通道 SinCos encoder 5 channels (2 absolute analog tracks/2 incremental analog tracks/index)
	增量编码器 (Incremental encoder), 1Vpp 或长线驱动 Incremental encoder (1 Vpp or Different Line Driver)
	无传感器模式 (无电机位置反馈信号) Sensorless algorithm (w/o feedback)
	EnDat 系列编码器, 支持 EnDat 1.0 - 2.2 协议 (系统默认编码器) EnDat serial encoder 1.0 to 2.2 (default)
	旋转变压器 Resolver
	Hiperface 系列编码器 Hiperface encoder
辅助编码器 Secondary Encoder	无换向信号通道的数字增量编码器 (500kHz) Incremental digital encoder without commutation tracks (500kHz)
	EnDat 系列编码器 EnDat serial encoder

可编程信号输入 Programmable Inputs Signals

2 路差分 / 4 路单端模拟信号输入 2 differential / 4 single ended analog inputs	$\pm 10V$ (1mV) / $R_{in} = 10k\Omega$
8 路数字信号输入 8 digital inputs	20 - 30V / 对地 $R_{in} = 6.6k\Omega$ 20 - 30V / $R_{in} = 6.6k\Omega$ to GND
2 路隔离的模拟信号输入 (选配) 2 insulated analog inputs (optional)	$\pm 10V$ (1mV)
8 路隔离的数字信号输入 (选配) 8 insulated analog inputs (optional)	5mA, 最大电压 24Vdc 5mA, 24Vdc max

可编程信号输出 Programmable Outputs Signals

2 路模拟信号输出 2 analog outputs	0-10V (1mV) FS (30mA)
4 路数字信号输出 4 digital outputs	PNP 集电极开路 24V (100mA) PNP open collector 24V (100mA)
1 路继电器输出 1 watch dog relay	2A / 30Vdc, 0.25A / 250Vac 常开 (N.O.) / 常闭 (N.C.) 针脚 2A / 30Vdc, 0.25A / 250Vac, NO/NC contacts
2 路隔离的模拟信号输出 (选配) 2 insulated analog outputs (optional)	$\pm 10V$ (1mV) FS (30mA)
2 路隔离的数字信号输出 (选配) 2 insulated digital outputs (optional)	开关量, 9-28V / 2A On.off switch, 9-28V / 2A

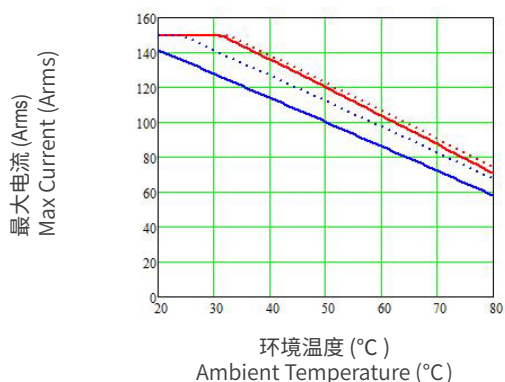
硬件配置
Hardware Configuration

处理器 Processor Speed	80MIPS μ C + FPGA / 120MIPS μ C + FPGA 增强版 80MIPS μ C + FPGA / 120MIPS μ C + FPGA Extreme Version	可选 Optional
工作频率 Task Frequency	电流环采样频率 Current / drive monitoring	1MHz
	位置环 / 速度环频率 Position / speed loop	8kHz
	PLC 快速任务扫描频率 PLC fast task	8kHz
	PLC 慢速任务扫描频率 PLC slow task	15.625Hz to 1 kHz (可配置) 15.625 Hz to 1 kHz (user-programmable)
位置模式可用 Position Loop Mode Available	目标位置寄存器位宽 Target position register	32 or 64 bits
	全数字 Id / Iq 控制 Full digital control Id/Iq	最高可达 16kHz updated 16 kHz



驱动器运行区间 Drive Operational Area

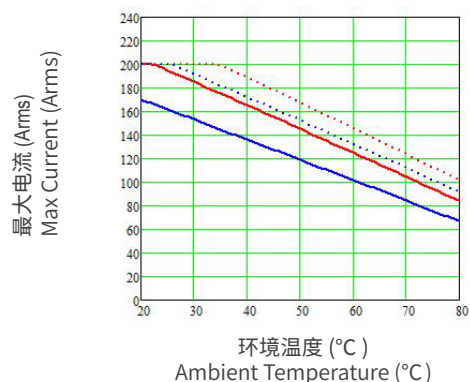
AxN 90.150.4



— 连续运转电流 (Vout=380Vac, Comm. Freq. 8KHz)
Continuos Current

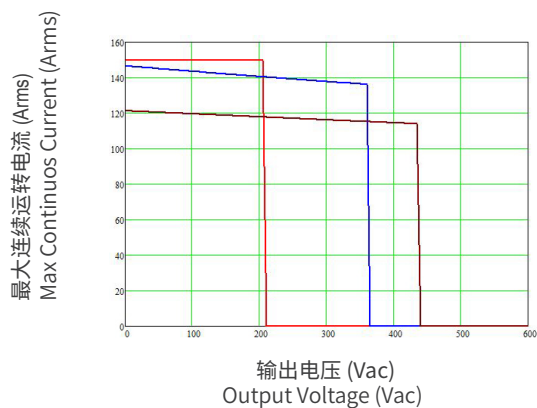
— 连续运转电流 (Vout=460Vac, Comm. Freq. 8KHz)
Continuos Current

AxN 110.200.4



.... 零速电流 (Vout=380Vac, Comm. Freq. 8KHz)
Zero Speed Current

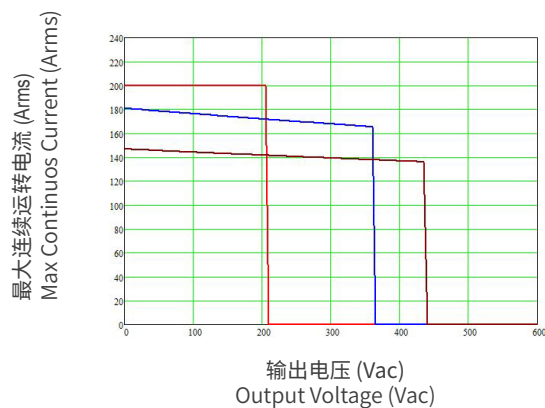
.... 零速电流 (Vout=460Vac, Comm. Freq. 8KHz)
Zero Speed Current



— 连续运转电流 (Vout=220Vac, Comm. Freq. 8KHz)
Continuos Current

— 连续运转电流 (Vout=380Vac, Comm. Freq. 8KHz)
Continuos Current

— 连续运转电流 (Vout=460Vac, Comm. Freq. 8KHz)
Continuos Current



AxN Size 6

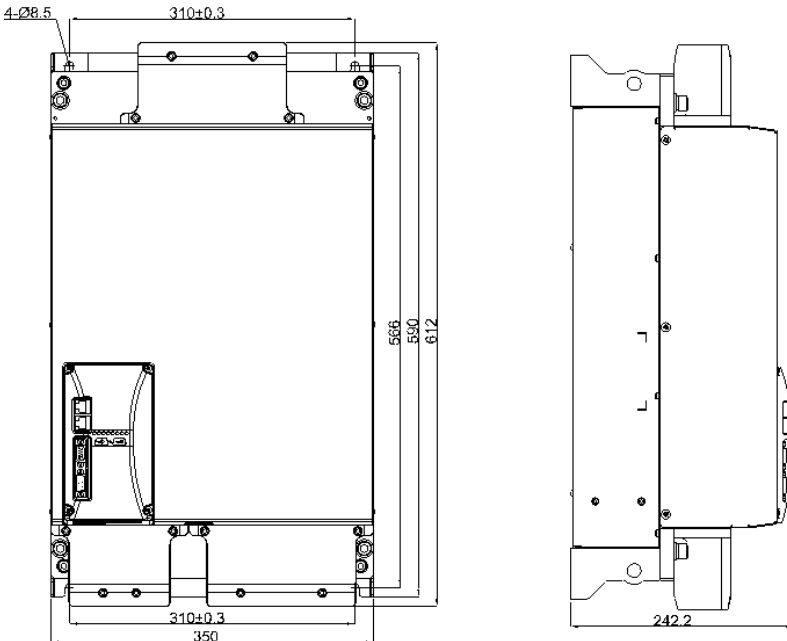
技术参数 Technical Specifications	符号 Symbol	AxN 200.400.4	单位 Units
主电源供电电压 Power Supply Voltage	V_{in}	150 ~ 500	Vac
		0 ~ 800	Vdc
辅助电源供电电压 Auxiliary Supply Voltage	V_{aux}	24V $\pm$ 15% / 8A	Vdc
输出频率 Output Frequency	f	0 ~ 1200	Hz
额定输出电流, $S1^{(1)}$ Current Output, $S1^{(1)}$	I_n	200	Arms
峰值输出电流 ⁽¹⁾ Peak Current ⁽¹⁾	I_p	400	Arms
总功率损耗 ⁽²⁾ Power Losses Total ⁽²⁾	P_l	3280	W
最大输出电压 Maximum Output Voltage	V_{out}	$V_{in} \times 0.95$	Vac
PWM 频率 ⁽³⁾ PWM Frequency ⁽³⁾	fpw _m	4 / 8 / 16	kHz
额定输出功率时的效率 ⁽¹⁾ Efficiency at Nominal Power ⁽¹⁾	---	97.1	%
输入波形因数 (满载) Input form Factor(Full Load)	---	0.9	Vac
最大制动电流 Maximum Braking Current	---	100% 峰值电流 (I_p) 100% of I_p (Peak Current)	---
散热 Cooling	---	80 x 80 x 38 风扇 x3 3 fan 80 x 80 x 38	---
风扇流量 Flow Rate	---	234 x 3	m ³ / hour
尺寸 (HxDxW) Dimensions (HxDxW)	---	612 x 350 x 242.2	mm

⁽¹⁾ $V_{in}=380Vac$, $V_{out}=V_{in} \times 0.95$, 环境温度为 40°C, PWM 控制频率为 8kHz; / $V_{in}=380Vac$, $V_{out}=V_{in} \times 0.95$, $T_{amb}=40^{\circ}C$, Comm.Freq.8kHz;

⁽²⁾ 包含输入整流部分的损耗; / Including input rectifier losses;

⁽³⁾ 为了使输出电流保持在额定, 电机零速时 PWM 频率会自动降低。/ PWM frequency will aytormatically decrease at zero speed, in order to keep nominal current output.

外形尺寸 Overall Dimensions



电机位置反馈选项 Motor Feedback Options

主编码器 (500kHz) Main Encoder (500kHz)	5 通道正余弦编码器 (SinCos encoder), 2 个绝对值通道、2 个增量通道和 1 个零位通道 SinCos encoder 5 channels (2 absolute analog tracks/2 incremental analog tracks/index)
	增量编码器 (Incremental encoder), 1Vpp 或长线驱动 Incremental encoder (1 Vpp or Different Line Driver)
	无传感器模式 (无电机位置反馈信号) Sensorless algorithm (w/o feedback)
	EnDat 系列编码器, 支持 EnDat 1.0 - 2.2 协议 (系统默认编码器) EnDat serial encoder 1.0 to 2.2 (default)
	旋转变压器 Resolver
	Hiperface 系列编码器 Hiperface encoder
辅助编码器 Secondary Encoder	无换向信号通道的数字增量编码器 (500kHz) Incremental digital encoder without commutation tracks (500kHz)
	EnDat 系列编码器 EnDat serial encoder

可编程信号输入 Programmable Inputs Signals

2 路差分 / 4 路单端模拟信号输入 2 differential / 4 single ended analog inputs	$\pm 10V$ (1mV) / $R_{in} = 10k\Omega$
8 路数字信号输入 8 digital inputs	20 - 30V / 对地 $R_{in} = 6.6k\Omega$ 20 - 30V / $R_{in} = 6.6k\Omega$ to GND
2 路隔离的模拟信号输入 (选配) 2 insulated analog inputs (optional)	$\pm 10V$ (1mV)
8 路隔离的数字信号输入 (选配) 8 insulated analog inputs (optional)	5mA, 最大电压 24Vdc 5mA, 24Vdc max

可编程信号输出 Programmable Outputs Signals

2 路模拟信号输出 2 analog outputs	0-10V (1mV) FS (30mA)
4 路数字信号输出 4 digital outputs	PNP 集电极开路 24V (100mA) PNP open collector 24V (100mA)
1 路继电器输出 1 watch dog relay	2A / 30Vdc, 0.25A / 250Vac 常开 (N.O.) / 常闭 (N.C.) 针脚 2A / 30Vdc, 0.25A / 250Vac, NO/NC contacts
2 路隔离的模拟信号输出 (选配) 2 insulated analog outputs (optional)	$\pm 10V$ (1mV) FS (30mA)
2 路隔离的数字信号输出 (选配) 2 insulated digital outputs (optional)	开关量, 9-28V / 2A On.off switch, 9-28V / 2A

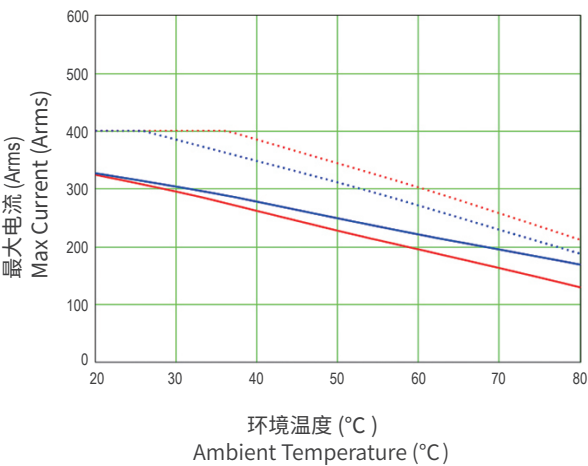
硬件配置 Hardware Configuration

处理器 Processor Speed	80MIPS μ C + FPGA / 120MIPS μ C + FPGA 增强版 80MIPS μ C + FPGA / 120MIPS μ C + FPGA Extreme Version	可选 Optional
工作频率 Task Frequency	电流环采样频率 Current / drive monitoring	1MHz
	位置环 / 速度环频率 Position / speed loop	8kHz
	PLC 快速任务扫描频率 PLC fast task	8kHz
	PLC 慢速任务扫描频率 PLC slow task	15.625Hz to 1 kHz (可配置) 15.625 Hz to 1 kHz (user-programmable)
位置模式可用 Position Loop Mode Available	目标位置寄存器位宽 Target position register	32 or 64 bits
	全数字 Id / Iq 控制 Full digital control Id/Iq	最高可达 16kHz updated 16 kHz

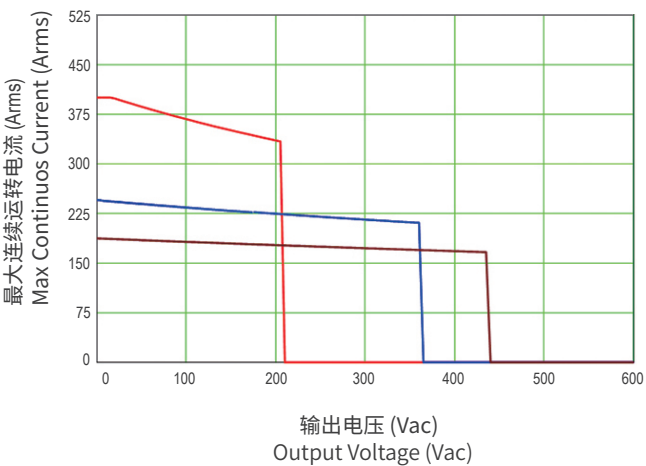


驱动器运行区间
Drive Operational Area

AxN 200.400.4



- 连续运转电流 (Vout=380Vac, Comm. Freq. 8KHz)
Continuos Current
- 连续运转电流 (Vout=460Vac, Comm. Freq. 8KHz)
Continuos Current
- 零速电流 (Vout=380Vac, Comm. Freq. 8KHz)
Zero Speed Current
- 零速电流 (Vout=460Vac, Comm. Freq. 8KHz)
Zero Speed Current



- 连续运转电流 (Vout=220Vac, Comm. Freq. 8KHz)
Continuos Current
- 连续运转电流 (Vout=380Vac, Comm. Freq. 8KHz)
Continuos Current
- 连续运转电流 (Vout=380Vac, Comm. Freq. 8KHz)
Continuos Current
- 连续运转电流 (Vout=460Vac, Comm. Freq. 8KHz)
Continuos Current



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版本编号: PHASD2512-V08

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