AGA155

Central-i 240 VAC Power Amplifier

Datasheet

Rev.2.0

agito

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Product Description

The AGA155 series is a family of 220 VAC remote power amplifiers.

AGA155 amplifiers are controlled by an AGM series Central-i master controller, which reads encoder values and current samples from amplifiers, performs control loops calculation, and generates PWM commands for each amplifier.

Communication between AGA amplifiers and AGM master is through a fast Central-i fieldbus, which supports 16 kHz sample rate motion profiler and all servo loops.

AGA155 amplifiers can power motors up to 10 A_{rms} continuous and 20 A_{rms} peak current.

The AGA155 amplifier is equipped with digital and analog I/Os suitable for typical actuators and applications. The digital outputs are capable of sourcing up to 300 mA or sinking up 500 mA, which is sufficient for driving most external devices and end effectors, and eliminates the need for an external relay circuit.

Part Numbering

Product Description	Part Number Format
Remote amplifier	AGA155-CI-2Axx[-02E]

CI: Central-i communication

2A: 240 VAC power supply

xx: Continuous and peak current options

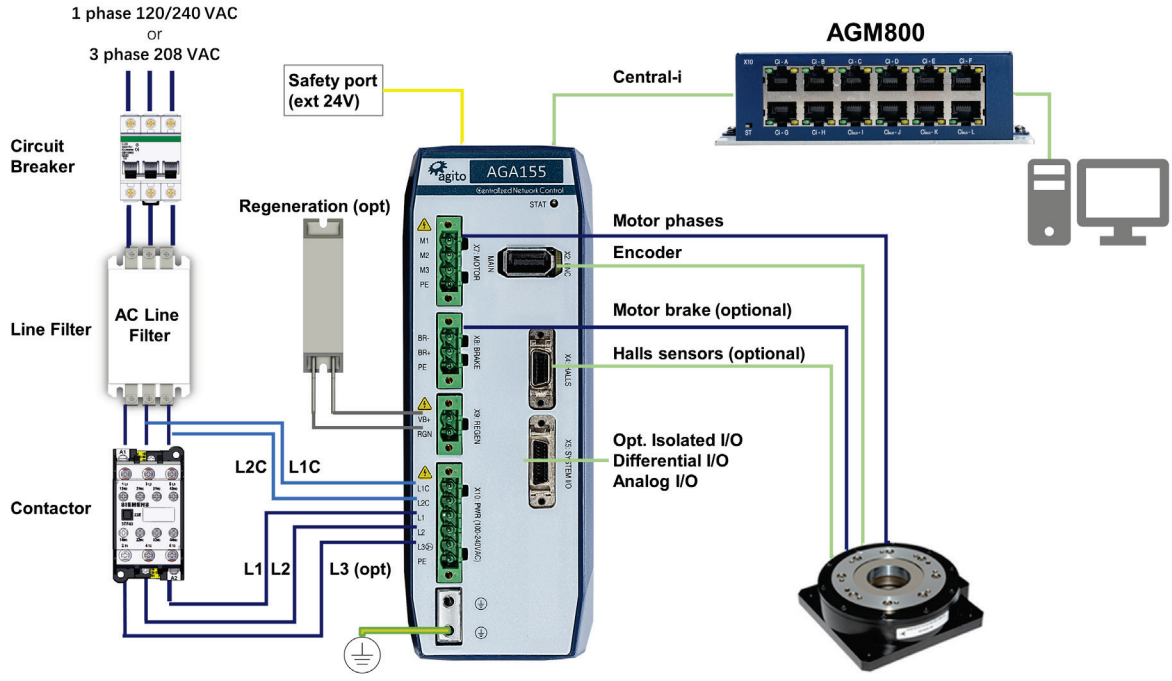
- 06: 6 A_{rms} continuous, 18 A_{rms} peak
- 10: 10 A_{rms} continuous, 20 A_{rms} peak

yyy: Continuous and peak current options

02E: Second (auxiliary) encoder port

Example: AGA155-CI-2A06 indicates 6 A_{rms} continuous, 18 A_{rms} peak current

System Design



One-phase wiring: AC connects to L1 and L2
Option: 100/300 VDC instead of 120/240 VAC

Technical Specifications

Electrical/Mechanical Specifications

Feature	AGA155-CI-2A06	AGA155-CI-2A10
Number of axes	1	
Nominal supply voltage	1-phase: 110–240 VAC L-N, 50–60 Hz 3-phase: 120 VAC L-L, 50–60 Hz	
Minimum supply voltage	1-phase: 71 VAC L-N 3-phase: 41 VAC L-L	
Maximum supply voltage	1-phase: 276 VAC L-N 3-phase, 160 VAC L-L	
Continuous output current (Internally limited by firmware)	6 A_{rms}	10 A_{rms}
Peak output current (Internally limited by firmware)	18 A_{rms}	20 A_{rms}
Output power @ 110 VAC	0.66 kVA	1.1 kVA
Output power @ 240 VAC	1.44 kVA	2.4 kVA
Input current @ 1-phase 110-240 VAC	9 A_{rms}	15 A_{rms}
Input current @ 3-phase 208 VAC	6 A_{rms}	10 A_{rms}
Peak current time	1.5 sec	
Output Frequency	0 – 599 Hz	
Short-circuit rating	Rated short-circuit breaking capacity: 5 kA*	
Isolated digital inputs	8	
Isolated digital outputs	2	
Bi-directional differential I/Os	1	
Analog inputs	1 (12-bit optional 16-bit)	
Analog outputs	N/A	
PT100/PT1000 inputs	1	
Brake outputs	1	
Regeneration outputs	1	
Encoder ports	1	
Motor types	Voice coil, brushed or brushless linear or rotary motor. 2-phase steppers (open and closed loop, micro-stepping)	
Communication	Central-i	
PWM Frequency	16 kHz	

Feature	AGA155-CI-2A06	AGA155-CI-2A10
Power supply to external devices	Voltage: 5V Overall max. current: 1.5A	
Maximum leakage current	6 mA	
AC logic power inrush current	Max current: 2A Max duration: 1 ms	
AC main power inrush current	Max current: 7.8A Max duration: 20 ms (controlled by soft start)	

* During compliance testing, the short-circuit current was 200A

Encoder Ports Specifications

Feature	Specification
Encoder types	Incremental AqB, Sin/Cos Absolute: EnDat 2.2, BiSS-C
Power supply to encoder	0.5 A per encoder port
Max. cable length	40 m
Incremental encoder	Hardware: Differential RS422/RS485 Max. input frequency: 6.25 MHz Termination: 120 Ω Commutation: Auto-phasing, Hall sensors
Sin/Cos encoder	Hardware: Differential RS422/RS485, 1V pk-pk @2.5V Max. input frequency: 250 kHz Termination: 120 Ω Max interpolation: 13 bits (x 8192) Commutation: Auto-phasing, Hall sensors
Absolute BiSS-C	Hardware: Differential RS422/RS485, clock (MA), data (SLO) Clock frequency: 1 MHz Max. position bits: 32 bits Commutation: Auto-phasing, by absolute offset
Absolute EnDat 2.2	Hardware: Differential RS422/RS485, clock, data Clock frequency: 1 MHz Max. position bits: 32 bits Commutation: Auto-phasing, by absolute offset
Hall sensors	Opto-isolated 5V with internal or external power supply

I/O Specifications

Feature	Specification
Power supply for optically isolated I/Os	Voltage: 5–28 VDC
Optically isolated digital inputs	Type: PNP/NPN Propagation delay: 10 µs Max. frequency: 100 kHz Functionality: limit switches, home, captures, start motion, gain scheduling, and others
Optically isolated digital outputs	Type: PNP/NPN Max current: 0.5A (for NPN type), 0.3A (for PNP type) Propagation delay: 10 µs Max. frequency: 100 kHz Functionality: alarm, in-position, event (PEG), and others
Differential digital inputs	Hardware: Differential RS422 Propagation delay: 100 ns Max. frequency: 2 MHz Functionality: lock (capture), pulse and direction, handwheel
Analog inputs	Operational voltage: ±10V Resolution: 12 bit
Analog outputs	N/A
Safety inputs	2 independent inputs Voltage: 5–28 VDC
Static brake output	Operational voltage: 24V Maximum current: 3A

Central-i Specifications

Feature	Specification
Topology	Star (peer to peer)
Cycle time	61 µs
Connector type	RJ-45 (Cat5e cable)
Cable length	Up to 100m
Physical layer	Dual channel RS485 full duplex
Baud rate	20 Mbps (per channel)
Synchronization between nodes	8 nanosecond

Environmental Specifications

Feature	Specification
Operating temperature*	AGA155-CI-2A06: 0°C to 50°C AGA155-CI-2A10: 0°C to 40°C
Storage temperature	-20°C to 70°C
Operating humidity	< 90%
Storage humidity	< 40%
Pollution degree	2
Vibration	1G @ 150 Hz per IEC 60068-2-6
Operating conditions	Protection class: IP20

* The operational range may be additionally limited by the internal temperature protection of the product.

Dimensions and Weight

Feature	Specification
Unit dimensions (max)	H=196.97 W=65.80 D=158.60 mm
Package dimensions	244 x 92 x 198 mm
Unit weight	1.29 kg
Shipping weight	1.44 kg