



1.1kW – 500kW / 1105 Inverter



Overview

The 1105 digital AC inverter provides flexible, efficient and cost-effective solutions to a range of control needs. It combines the latest IGBT-based PWM and digital-signal processor technologies with a revolutionary, patented digital-current regulator to deliver optimum performance, full programmability, and simplicity of operation. Compact and rugged, the inverter comes as an open chassis or in a NEMA 4 enclosure. Either type can be foot-mounted to a sub-plate or flange-mounted through a cutout, to dissipate heat outside an enclosure.

Performance Flexibility:

The 1105 offers performance capabilities to suit a broad range of applications where variable-frequency AC or conventional DC inverters are normally used. It can be configured for either constant-load, variable-load, or extended-load applications. A variety of general-purpose and application-engineered software options provide features optimized for specific customer requirements, such as blower and pump motors.

Digital Setup, Easy Operation:

The keypad and liquid crystal display provide a simple interface for setting and viewing operating parameters and diagnostics. All controller settings are made digitally through the keypad. Readouts and fault messages are displayed in plain language. A help feature provides on-line assistance at the touch of a button.

Power Quality:

The 1105 includes a built-in link choke that provides near-unity overall power factor at all motor speeds as well as low harmonic line currents.

Protection and Advanced Diagnostics:

The 1105 monitors its operating conditions and provides a comprehensive set of overload, short circuit, and other protective features. Faults are displayed in plain language along with the operating conditions at the time of occurrence. A log stores the last three faults as well as the buss voltage, motor current, output frequency, operating mode, and time of the most recent fault.

Serial Connectivity:

The 1105 features a fully-isolated EIA RS-422/485 serial interface that allows a process control computer, building automation system, or other host computer to set up, monitor, and control the drive using an ANSI standard protocol. An EIA RS-232 port is also available for direct connection to most types of personal computers. Optional DF1 and RTU protocols allow direct connection to Allen-Bradley and Modicon programmable controllers.



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Features & Benefits:

General

- All-digital control for repeatable operation
- 24-bit digital-signal processor (DSP) for fast, dynamic response
- 8 kilobyte battery backup memory for application setup data
- 48 kilobyte scratch pad memory and 1.5 megabyte firmware memory
- Clock/calendar maintains accurate time during power outage
- Sine-coded PWM or modified six-step waveform outputs for improved performance
- High-switching-frequency IGBT devices for smooth, quiet operation
- Digital current regulator for reduced fast response
- Internal control loop for maintaining output during sudden load changes
- Variable frequency control for simple applications
- Integral DC link choke for high power factor and low total harmonic distortion
- Power-loss ride-through for reducing nuisance trips
- Master-slave operation using either analog inputs or high-speed serial link
- User-programmable analog and digital inputs and outputs
- Ideal for applications requiring NEMA 4 enclosures

Ease of Installation, Setup, and Maintenance

- Automated setup features do not require chart recorders or meters
- Software calibration and adjustment eliminates tuning components
- Digital parameter adjustment for precise and repeatable settings
- Software input and output scaling eliminates potentiometers
- Complete, self-contained package requires minimal option boards
- Identical control boards across full power range reduce need for spare parts

Ease of Use

- Touch keypad for easy parameter adjustment and access to displays
- Two-line, descriptive, plain-language display
- Numerical readouts and bar graph display
- Comprehensive fault diagnostics displayed in plain language
- Real-time information and three-fault log
- Optional DriveLink™ software for managing multiple drives from a personal computer

Safe, Reliable Operation

- Extensive electronic protection circuits
- Tolerant of AC line voltage and frequency fluctuations
- Multilevel security code prevents unauthorized parameter changes
- Lockout of local operator controls, for safe remote operation

Electrical:

Input Supply

Voltage: 200 to 240 or 380 to 480 V AC, three-phase
Phase sequence insensitive
Voltage tolerance: -10% of minimum, +10% of maximum
Frequency: 47 to 63 Hz
Power factor: Displacement: 0.99 at all loads
Overall: 0.94 at rated load

Output Rating

Voltage: Zero to input supply voltage, three-phase
Frequency:
Switching frequency: Programmable from 2 to 10 kHz
Modifies six -step frequency: Programmable from 0 to 10 kHz

Service Conditions

Efficiency: 97% nominal at rated switching frequency
Overload current:

Environmental

Operating temperature: 32° to 104° F (0° to 40° C)
Storage temperature: 5° to 158° F (-15° to 70° C)
Operating humidity: 95% maximum, non-condensing
Altitude: To 3,300 ft. (1,000 m) without de-rating

Performance

Frequency Control

Range: PWM Sinewave
Six Step
Resolution: Zero to base speed at full current output
Base speed to 300 Hz at constant power
0 to 10 KHz
0.20% with analog input (10-bit)
0.1 Hz with digital input

Inputs and Outputs

Analog Inputs

20 MHz control: Three (3) 12-bit analog inputs (0 to +10 V DC, ±10 V DC, and 4 to 20 mA)
40 MHz control: Three (3) 12-bit analog inputs (±10 VDC or 4 to 20 mA)

Analog Outputs

20 MHz control: Two (2) 12-bit analog outputs (±10 VDC)
40 MHz control: Two (2) 12-bit analog outputs (±10 VDC and 4 to 20 mA)

Digital Inputs

20 MHz control: Eleven (11) digital inputs (sink of 1 mA to common)
40 MHz control: Twelve (12) digital inputs (source of 8 mA from 24 VDC)

Digital Outputs

20 MHz control: Three (3) standard digital outputs (Form C contact rated 250 VAC @ 5 A,
Form A contact rated 250 VAC @ 5 A, and open-collector driver rated 24 VDC @ 500 mA)
40 MHz logic I/O control: Three (3) digital outputs (Form A contact rated 250 VAC @ 5 A)
40 MHz contact I/O control: Six (6) alternative digital outputs (open-collector drivers rated 24 VDC @ 500 mA)

Serial Communications

Asynchronous port: EIA RS-232 and RS-422/485, isolated, 0.3 to 19.2 kbaud
ANSI-x3.28-2.5-A4 protocol standard;
Optional Allen-Bradley DF1, Modicon RTU, and
Johnson Controls N2 protocols
Synchronous port: EIA RS-485 for high-speed master/slave networking



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Typical Parameters and Displays:

Programmable Parameters

- Set point
- Set point minimum
- Set point maximum
- Set point units label,
- Scaling, precision
- Set point source
- (3) skip frequencies
- (3) skip bandwidths
- Minimum / maximum
- Current limit
- Restart retries / delay
- Analog I/O scaling / polarity
- User analog input mode
- User I/O parameter selections
- S-ramp profile smoothing
- Switching frequency
- Master / slave select / source
- Slave ratio / position phasing
- Keypad enable
- Security code

Status Displays

- Buss voltage
- Power factor
- Output current
- Output frequency
- Power consumption
- Energy consumption
- Accumulated thermal load
- Accumulated time run
- Fault log and conditions
- Input status

Protection

- Ground fault
- Output phase-to-phase short circuit
- DC buss over-voltage
- DC buss under-voltage
- Instantaneous over-current
- Output overload
- Heat sink over-temperature
- Ambient over-temperature
- Power transistor fault
- Logic power under-voltage
- Remote command signal loss
- Memory malfunction
- Processor not running fault
- Synchronous serial error

Power Range

Input Voltage	Constant-Torque Applications	Variable-Torque Applications	Extended-Torque Applications
230 VAC	11/2-15 hp (1.1-11 kW)	2-20 hp (1.5-15 kW)	—
380 VAC	11/2-25 hp (1.1-18 kW)	2-30 hp (1.5-22 kW)	—
460 VAC	11/2-25 hp (1.1-18 kW)	2-30 hp (1.5-22 kW)	25-40 hp (18-30 kW)

Consult factory for other powers. Other voltages require appropriate de-rating.

