

PWR-TPI6020

48 V/20 A Two-Level Three-Phase Inverter Module



Included in the Delivery

- Three-Phase Inverter module installed in the Baseline real-time target machine or in the Speedgoat power enclosure
- Cables
- Test models
- Comprehensive documentation

Capabilities

The PWR-TPI6020 module is a modular two-level three-phase inverter with individual gate driver control. This module is fully compatible with Speedgoat FPGA technologies such as the IO323 or IO397 I/O modules and can easily be connected to any real-time target machine.

The module is optimized for use as a three-phase inverter. Its modular design, however, also makes it suitable as a full bridge or a high-side or low-side driver.

The PWR-TPI6020 enables you to control each single gate driver, and monitor the phase current and bus voltage of your closed-loop applications.

When used with FPGA I/O modules, the PWR-TPI6020 is ideal for closed-loop applications using MATLAB® and Simulink® with closed-loop rates of up to 20 kHz and faster using HDL Coder™.

Common Applications

- Rapid control prototyping
- Drive of PMSM, Induction machines, Synchronous generators and switched reluctance machines
- Drive of inductive loads, such as electromechanical valves and solenoids
- Building block for different power converters such as power supplies, battery chargers and AC/DC, DC/DC, or LLC resonant converters

Supported Target Machines

- Performance
- Mobile
- Baseline

Key Features

Half-bridge drivers	Monitoring	Protections
Three half-bridge phases with individual gate control	DC bus voltage	Overvoltage
12 to 48 VDC nominal DC Bus voltage	DC bus current*	Overcurrent
Up to 20 A continuous RMS current	AC phase currents	Overtemperature
Up to 50 kHz switching frequency	Temperature*	Deadband

* Not available with the IO397 I/O module

Technical Specifications

Physical	
Dimensions	170 x 85 mm
Connectors	DC Bus: 2-pin male ELCON MINI header AC Phases: 3-pin male ELCON MINI header Analog measurements: 26-pin female HDR connectors Digital control: 26-pin male HDR connectors
Weight	760 g
Environmental	
Operating temperature	5 °C to +50 °C *
Relative humidity	5 to 95 %, non-condensing
Electrical Characteristics	
Type	Two-Level Three-Phase Inverter
DC bus input voltage	12 to 48 VDC (electronic power supply self-supplied from DC bus)
DC bus continuous current	Up to 30 A
Phase continuous output current	Up to 20 A RMS
Switching frequency	Up to 50 kHz
Power switches	N-channel MOSFET
Gate drivers	Optical isolated IGBT gate driver
Measurement Characteristics	
Embedded monitoring	DC bus voltage, DC bus current, AC phase currents, temperature
Linear current measuring range	37.5 A
Voltage measuring range	110 V
Temperature measuring range	-40 to 150 °C
Protections	
Embedded protections	Overvoltage, overcurrent, overtemperature, deadband
Voltage (DC Bus)	> 70 V
Current (DC Bus)	> 30 A
Current (AC output)	> 30 A
Temperature	> 70 °C (internal sensor)

* Effective environmental temperature support depends on the application, and the performance is limited by the temperature protection. Each module benefits from passive cooling. Higher temperatures may arise inside the enclosure. Active cooling can be used to increase the performance.

Order and Contact Information

Item ID	Product Name	Components
3A6020	PWR-TPI6020 (Power Enclosure)	1x Two-Level Three-Phase Inverter
		2x 26-Pin Male HDR to 26-Pin Female HDR I/O Cable (6 ft/1.82 m)
		1x 2-Pin ELCON MINI to Underminated Cable (3.2 ft/1 m)
		1x 3-Pin ELCON MINI to Underminated Cable (3.2 ft/1 m)
		Comprehensive documentation and Simulink example models
		Installation into the Speedgoat power enclosure
3B6020	PWR-TPI6020 (Baseline)	1x Two-Level Three-Phase Inverter
		1x 2-Pin ELCON MINI to Underminated Cable (3.2 ft/1 m)
		1x 3-Pin ELCON MINI to Underminated Cable (3.2 ft/1 m)
		Comprehensive documentation and Simulink example models
		Installation into the Baseline real-time target machine
3C6020	PWR-TPI6020 (Power Enclosure with Quadrature)	1x Two-Level Three-Phase Inverter with support for quadrature encoder
		1x 2-Pin ELCON MINI to Underminated Cable (3.2 ft/1 m)
		1x 3-Pin ELCON MINI to Underminated Cable (3.2 ft/1 m)
		1x 5-Pin PTSM pluggable connector for quadrature encoder
		Comprehensive documentation and Simulink example models
		Installation into the Baseline real-time target machine
Optional Accessories		
105262	DIN Rail Clamping Set	Set of two cleats and two lockable clamps for standard 35 mm DIN rails Including M3x6 TX10 mounting screws Compatible with Baseline machines (M & S), the mounting plate for Mobile machines and the PWR-TPI6020 three-phase inverter
305156	PWR-TPI6020 Cable Kit with Stäubli K-41 Sockets	Cable kit for PWR-TPI6020 module, consisting of a: <ul style="list-style-type: none">100 mm round cable featuring a 2-pin female ELCON MINI connector to connect to two Stäubli K-41 sockets, for DC bus100 mm round cable featuring a 3-pin female ELCON MINI connector to connect to three Stäubli K-41 sockets, for AC phases
350300	Adapter Box – IO323 to 2x PWR-TPI6020	Aluminum Adapter Box to connect one IO323 I/O module to two PWR-TPI6020 modules
350301	Adapter Box – 2x IO397 to 2x PWR-TPI6020	Aluminum Adapter Box to connect up to two IO397 I/O modules to two PWR-TPI6020 modules
350302	Adapter Box – IO323 to PWR-TPI6020	Aluminum Adapter Box to connect one IO323 I/O module to one PWR-TPI6020 module

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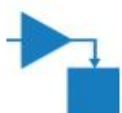
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Benefits of Speedgoat Solutions



Made for Simulink



Vast Range of I/O & Protocols



Built for Speed



Scales with Your Projects



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With Quality Services