bepat GmbH & Co. KG

rotabench® 6P 120/30E

Inverter Power Stage

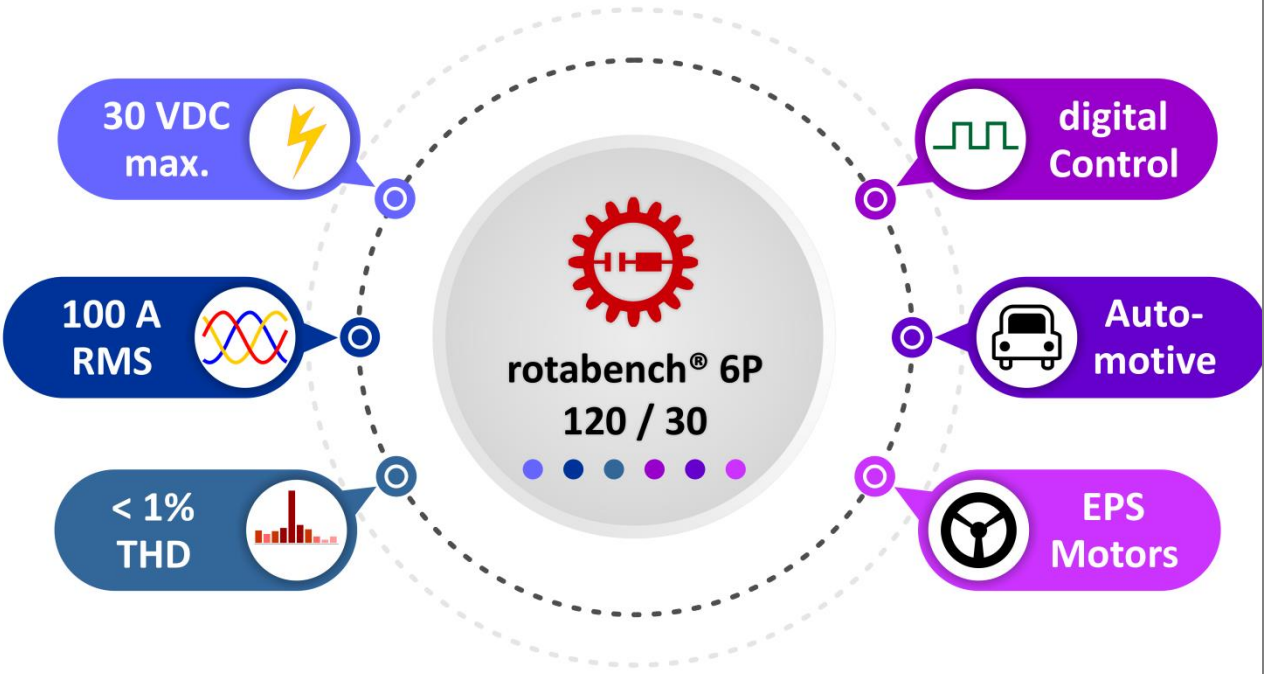
100A RMS (continuous) phase current – max. 30 Volt DC-Link Voltage,
120 A RMS phase current max.

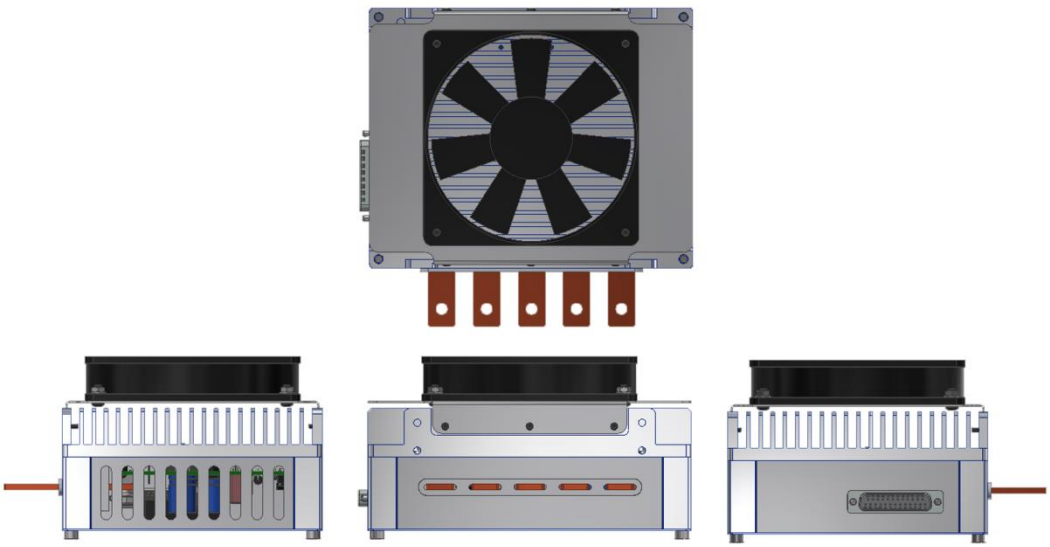
rotabench® 6P 120/30E HARDWARE

OVERVIEW

rotabench® 6P 120/30E is an inverter power stage for 3 phased automotive electric motors with low DC-Link voltage but high phase currents. The typical application is as a high current power stage in combination with a DSP System (e.g. dSPACE, LabVIEW or an Microcontroller) to control e.g. an EPS-motor.

The main components are: the housing, milled from an aluminum alloy with high thermal conductivity and integrated cooing fins, the PCB with the NXV04V120DB1 (On Semiconductor) MOSFET-Module and the driver and protection circuit. Each of the six MOSFET in the 3 half-bridges can be controlled by a digital IO with 3.3 Volt LVTTL or 5 Volt TTL signal levels.





SPECIFICATION

GENERAL	
Device name:	rotabench® 6P 120/30E
Housing:	milled aluminum housing with cooling fins
Weight:	ca. 3 kg
Dimensions:	ca. 33 x 23,5 x 18,5 cm (L x B x H)
PCB power supply:	12 VDC (ca. 1 A)
PWM base frequency[1]:	8 to 25 kHz
Temperature Sensor:	Integrated (NTC 10k)
Max. DC-Link voltage:	30 Volt DC
Max. AC-phase currents:	100 A RMS phase current continuous, 120 A RMS short time max. phase current (20 seconds)

CONNECTORS	
X1:	25-pol Sub-D connector(male)
DC In, Gnd:	Copper rail, 3 x 15mm /w M6 drill hole (Ø 6.5mm)
L1 – L3:	Copper rail, 3 x 15mm /w M6 drill hole (Ø 6.5mm)
L1:	Copper rail, 3 x 15mm /w M6 drill hole (Ø 6.5mm)
L2:	Copper rail, 3 x 15mm /w M6 drill hole (Ø 6.5mm)
L3:	Copper rail, 3 x 15mm /w M6 drill hole (Ø 6.5mm)

SIGNAL GENERATION	
MOSFET-control:	Digital IO, 3.3 Volt LVTTL or 5 Volt TTL signal levels
Deadband:	400 ns typ. @ 30 VDC DC-Link voltage
Max. MOSFET-temperature:	120°C (continuous)
Max. ambient temperature:	10 - 40 °C
Max. humidity:	10 to 80% rel. humidity, non-condensing
Max. chassis temperature:	65 °C
THD (phase currents)[2]:	< 1%
MOSFET-module:	On Semiconductor FTCO3V455A1
MOSFET gate driver ICs:	IRF2011S
Typ. application:	3-phased electric motors, like EPS motors, pump motors, drives, etc. up 1 kW
DC-Shunt:	~0,5 mOhm

[1] Tested, different settings may also work.
[2] Measured with a Tramag inductor at 100 A RMS (cont.) and 30 Volt DC-link voltage, with a deadband of 400 ns and 3.3 Volt LVTTL control signal level

APPLICATIONS

OVERVIEW

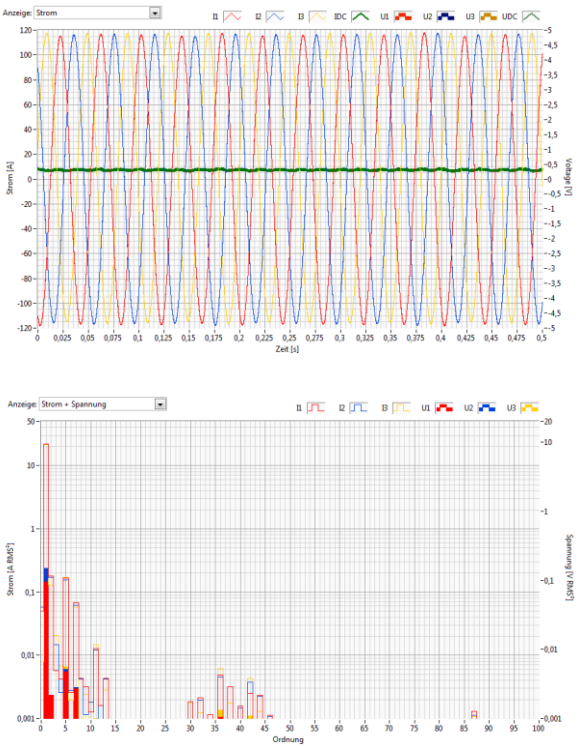
The inverter power stages of the rotabench® 6P series are made for developers of 3-phased automotive electric motors. With this flexible and versatile device, engineers get the right tool to get power to their motor quickly. A single Sub-D connector (25 pole, male) for control and DAQ makes it easy to create a test bench or lab setup within minutes. Any DPS system (e.g. dSPACE, LabVIEW, microcontrollers, MATLAB), capable of creating TTL or LVTTL PWM signals, can act as the control system.

MULTIPLE APPLICATION POSSIBILITIES

The inverters and inverter power stages of the rotabench® 6P series are not developed for one single motor type. They are designed as a power stage platform for many types of motors, like EC motors, asynchronous motors, PSM motors, BLDC motors or even DC motors. The application focus is on 3 phased automotive electric motors, where high currents at low DC-Link voltages are needed.

rotabench® 6P inverter power stages are an open platform and are designed to be compatible with virtually any DSP system, that is capable of creating PWM signals at a 3.3 Volt LVTTL or 5 Volt TTL signal level.

rotabench® 6P is designed as a tool for laboratory and testbench use. As developers we know how how much you “like” it to work with super sensitive and sensible expensive equipment, which is irreparably damaged with the first little mistake. This is why we made this device as robust and fault tolerant as we could – we use it ourselves in the lab and we don’t want to work with such delicate equipment either.



CUSTOM SOLUTIONS

rotabench® 6P goes in the right direction, but does not meet your actual requirements? Talk to us! If needed, we offer custom solutions based on our experience and knowhow.

+49 211 416 6441 sales@rotabench.com http://www.rotabench.com