



ViX Series Digital Servo Drives

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ViX - a picture of integration

With the launch of the all-new ViX intelligent digital servo drive, Parker Hannifin's Electromechanical Division enters a new era in programmable motion control. With an output in the 250-500VA power range, ViX uses field-oriented digital control technology to give enhanced dynamic performance with improved efficiency. Housed within an extremely compact case, ViX is suitable either for direct panel mounting or for attachment to a standard DIN rail using an optional adaptor.

The ViX drive is produced in two versions having continuous current ratings of 2.5A and 5A at motor bus voltages up to 80V. A peak current capability of three times the continuous rating provides an outstanding acceleration performance. The power stage features full PWM control with sinusoidal commutation, and offers the choice of either resolver or encoder feedback (user selectable). To assist with initial commissioning, the drive can correct most motor and feedback wiring errors automatically.



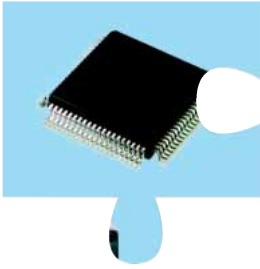
A powerful front-end software package is supplied with the drive and permits straightforward, rapid configuration and tuning. When used with Parker servo motors, only the motor type number is required for full configuration.

ViX intelligent drives incorporate a powerful controller using Parker's well-proven EASI command language. As well as carrying out all basic motion control functions, the controller performs more advanced operations such as external encoder following and registration moves. All necessary configuration is performed by software. In addition to an RS232C interface which is included in the standard drive, an optional factory-installed fieldbus module allows for both CANopen and RS485 communication. An alternative base version of the drive can be controlled by step-direction signals in addition to an analogue velocity or torque demand.

ViX forms part of a new, fully-integrated system of motion control components which includes digital servo and stepper drives, power supplies and operator panels. These components complement Parker's range of mechanical positioning systems which includes precision tables, electric cylinders and linear actuators.

- Fully digital design
- Field-oriented control for improved dynamic performance
- Panel or DIN rail mounting
- 250VA & 500VA ratings
- Up to 80V DC bus
- Built-in controller using Parker's proven EASI code
- Powerful front-end software for simple, rapid configuration
- Resolver or encoder feedback
- Encoder following & registration
- Analogue/step-direction version
- Compact package
- Compatible with Parker high performance servo motors

Bringing the elements together

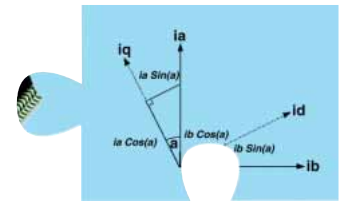


Fully digital technology

The operating core of the ViX drive is based on a powerful digital processor. Armed with information about the motor and drive parameters, the processor is able to set the operating conditions in the current loop with a high degree of precision. In this way the bandwidth of the torque amplifier can be optimised for the specific configuration, allowing a wide range of motors to be accommodated without compromising on performance. In addition, set-up is virtually instantaneous without the need to adjust multiple parameters. The relevant data for Parker high-performance servo motors is held in a database within the EASI-V software package.

Field-oriented control

In a traditional servo amplifier, low-pass filters and integrator elements are used to remove offsets and motor phase mismatch effects. As a consequence, transient torque demands can lead to an instantaneous imbalance in the motor phase currents. The result is a shift in the torque vector which degrades the response, increases motor heating and creates additional harmonics. Field-oriented control uses a special set of transforms to derive the power stage control signals. This solution ensures that the 3-phase excitation remains balanced under all conditions. The result is improved dynamic performance, higher efficiency and reduced harmonic generation.

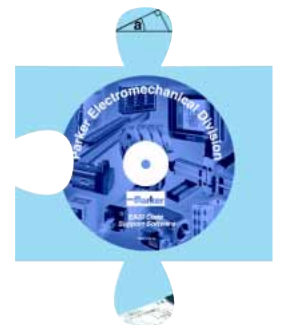


Auto-correction of motor and feedback connections

When the ViX is connected to a Parker servo motor using ready-made cables, correct motor and feedback connections are ensured automatically. When using motors from other vendors, sorting out the correct encoder or resolver connections can often present a problem. Here the intelligence of the ViX will come to your assistance; if the motor or feedback sensor is incorrectly wired, not only can the drive detect this but it is able to correct most wiring errors automatically. Although this feature is not intended to be a substitute for making the correct connections in the first place, nevertheless it can be a great time saver especially during initial commissioning.

Powerful, user-friendly configuration software

ViX series drives utilise Parker's EASI-V software package, a comprehensive front-end tool for system configuration and tuning. This Windows™-based software incorporates wizard-guided set-up procedures using simple click-entry screens. I/O, home and limit switch configuration is both simple and straightforward. Entering the data for Parker servo motors could not be easier - simply select the motor from a pull-down menu. Other motors may be used by entering the relevant parameters.

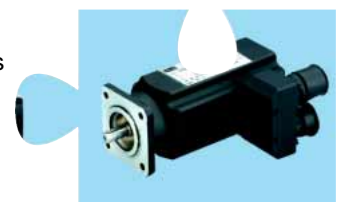


Flexible communications options

ViX is supplied as standard with an integral RS232C communication interface. To keep the wiring as simple as possible, dual RJ45 connectors on the underside of the drive provide a built in daisy-chaining facility. The last drive in the chain automatically detects that no more units are connected and creates a loop return path back to the host controller. Optional built-in modules provide both RS485 and CANopen communication to allow for integration within Fieldbus systems.

Motors for use with ViX

Parker manufactures a range of high-performance brushless servo motors suitable for use in conjunction with the ViX drive. Outline details and performance data will be found at the end of this brochure. BE series motors are eight-pole designs having a high stall torque rating in a cost-reduced package. The bridged stator design not only simplifies the motor manufacturing process but also results in lower audible noise. SMB motors use salient pole technology to achieve a high specific torque - up to 30% higher than motors using conventional technology. These motors have a smooth external finish to minimise retained contamination.



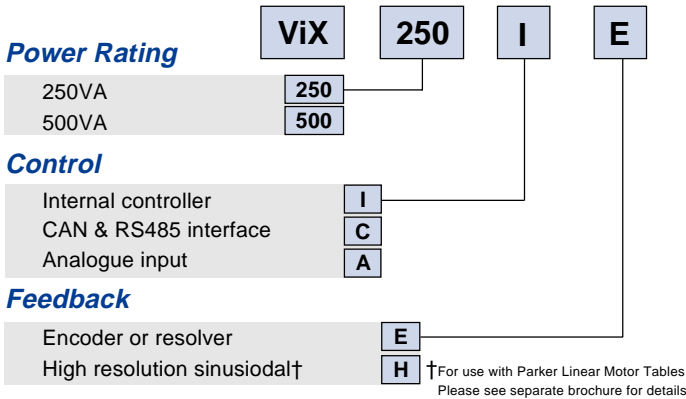
Specifications

Output current:	ViX500: 5A rms continuous, 15Arms peak* ViX250: 2.5A rms continuous, 7.5Arms peak*
Motor HV supply input:	ViX500: 48–80VDC +5% -15% ViX250: 24–80VDC +5% -15%
Controller supply input:	24V DC, 250mA (no outputs loaded)
Motor inductance range:	0.5 -10mH recommended (speed range reduced if >10mH)
Motor current limit	Selectable by software
Protection:	Short circuit (phase to phase, phase to ground), motor HV over & under-voltage trip, drive/motor overtemperature (I^2t), reverse polarity on 24V input, commutation encoder fault, resolver fault
Feedback device:	Resolver or quadrature encoder (selected by software), motor or load-mounted
Resolver feedback:	12 bit A to D input (gives 4096 counts/rev), absolute accuracy 30 arc-min
Encoder feedback:	5V differential, 400KHz max. input frequency, resolution 500-5000 lines (pre-quadrature i.e. up to 20,000 counts/rev)
Encoder supply:	5V output for feedback & following encoder, 250mA max. loading
Analogue control input:**	+/-10V differential, 12 bit resolution, velocity or torque demand
Position command input:**	Step/direction, step+/-step- or quadrature encoder input with resolution equivalent to feedback device
Following encoder input:	Compatible with feedback resolution, max. input freq. 2.0MHz Configurable also as step/direction or step+/-step- input
Digital inputs:	5, of which 4 are configurable as Home, Limits & Registration. Operating range 5V to 24V. Software-configurable 4K7 pull-up/active low or 4K7 pull-down/active high
Digital outputs:	3, one is configurable as Drive Healthy Software-configurable active-low/sinking (5V-24V) or active-high/sourcing (24V only). 50mA max. per output
Encoder output:	5V differential, resolution of feedback encoder or 4096 counts/rev for resolver
Fault output:	NPN open-collector output, normally low, active high
Analogue output:	10-bit filtered PWM monitor output, torque or velocity
Motor brake output:	24V, 2A maximum, energised to release
Communication interface:	9-way D connector for RS232 (standard); combined RS485 & CANopen option available
High-speed interface:	Dual RJ45 connectors for CANopen, RS485 etc., also provide daisy chain ports for multi-axis RS232 connections
Indicators:	LEDs for HV/feedback fault, drive fault & comms status
Temperature range:	0-50°C local environment (fan cooling required above 40°C)
Humidity:	95% non-condensing
Location:	Vertical mounting, min. clearance 50mm above & below drive, 10mm each side
Mounting:	Panel mounting standard, DIN rail adaptor available
Dimensions:	Please see diagram

* Maximum duration at peak current 2 seconds, maximum duty cycle 10%. The time limit is set by an I^2t circuit, and will be reduced if the motor is stationary.

** Analogue input version only.

Order Codes



Accessories

Parker offers a range of accessories for ViX stepper drives including mating connector sets, motor cables and a DIN rail mounting kit. The range will be extended to include operator panels and I/O expansion modules.

Power supply requirements

ViX drives operate from an external DC supply providing a high-voltage motor supply and a 24V logic supply. The following specifications apply:

HV supply for 500VA models:

48*-80V +5% -15%. Minimum 6600µF capacitance per axis at peak power. Typical maximum current 4-5A per axis. (* recommended).

HV supply for 250VA models:

24-80V +5% -15%. Minimum 3300µF capacitance per axis at peak power. Typical maximum current 2-2.5A per axis.

Logic supply (all types):

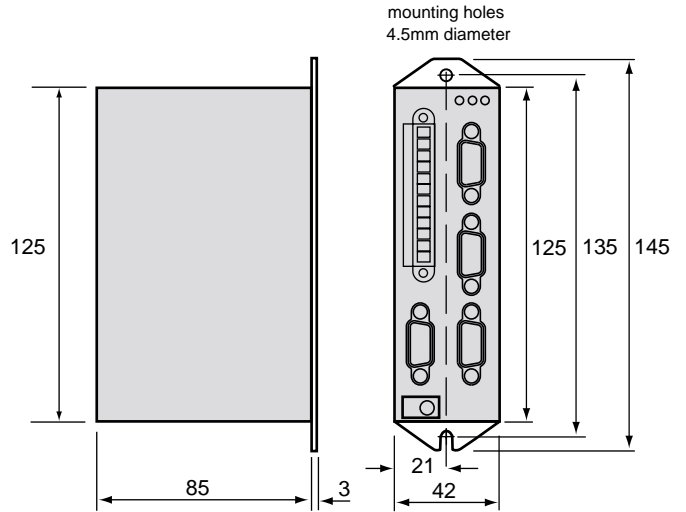
24V nominal, 21-27V absolute limits. Nominal drive current 250mA per axis (extra for encoder and loaded digital outputs).

XL-PSU & PL1100 power supply modules

The Parker XL-PSU power supply offers a convenient way of powering a single ViX servo drive. The continuous rated output is 250W at 230VAC input. It supplies both the 80V main DC rail and the 24VDC logic voltage, and operates directly from all AC supplies between 95V and 264V. No external EMC filters are required unless the motor leads are exceptionally long (e.g. greater than 30m).

The transformer-fed PL1100 supply has a 1kW rating and is suitable for powering up to six ViX servo drives in applications with typical duty cycles. Separate mains transformers may be used for the main 80VDC rail and the 24V logic supply, allowing communication to be retained during shutdown. To minimise cost, EMC filters are not included so that where appropriate a common filter system may be used.

Dimensions



XL-PSU power supply specification

AC input voltage, nominal	115V to 230V AC, 1 phase
absolute limits	95 to 264V AC
Main DC output	80V DC, 3.1A max. cont.
Logic supply output	24V DC, 1.8A max.
Rated total output power	250W cont. @ 230VAC in
Power factor at full load	0.9
Power dump resistor (if required)	10R, 100W
Dimensions (h x w x d)	195 x 50 x 130mm
Weight	1kg

PL1100 power supply specification

AC input voltage, nominal	55V AC, 1φ or 3φ
absolute maximum	61V AC
Main DC output, nominal	75V DC, 12A max. (on 1φ), 14A max (on 3φ)
Logic supply output	24V DC, 3A max.
Rated output power	800W (on 1φ), 1kW (on 3φ)
Power factor at full load	0.9
Power dump resistor (if required)	5R, 100W
Main EMC filter*	Corcom 12FC10 (for 1φ), Corcom 12FCD10 (for 3φ)
24V EMC filter	Corcom 3VK1
Dimensions (h x w x d)	145 x 119 x 143mm
Weight	1.25kg

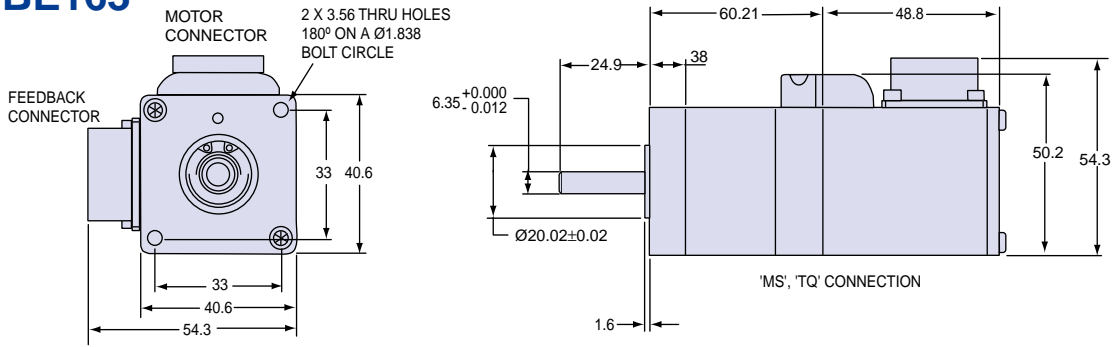
*For motor leads up to 30m long

UL Recognised

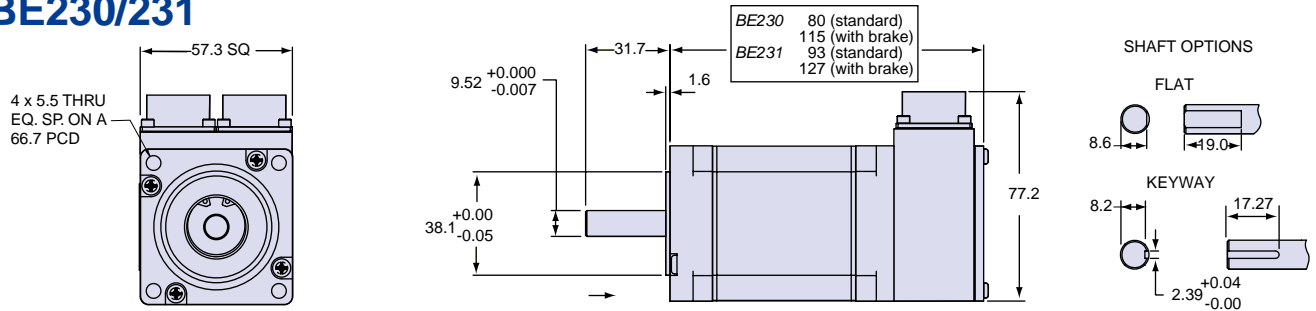


The ViX drive system is CE approved and UL-Recognised under file E194158. This means it may be incorporated into end-user products that may be eligible for UL Listing, Classification or Certification.

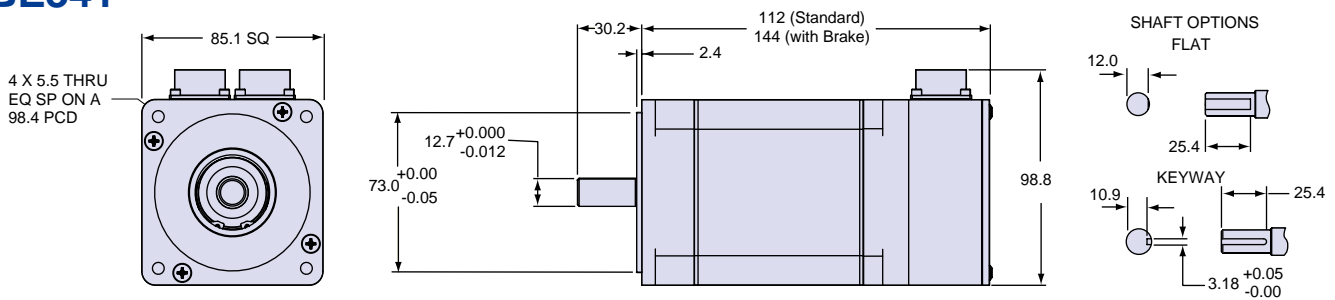
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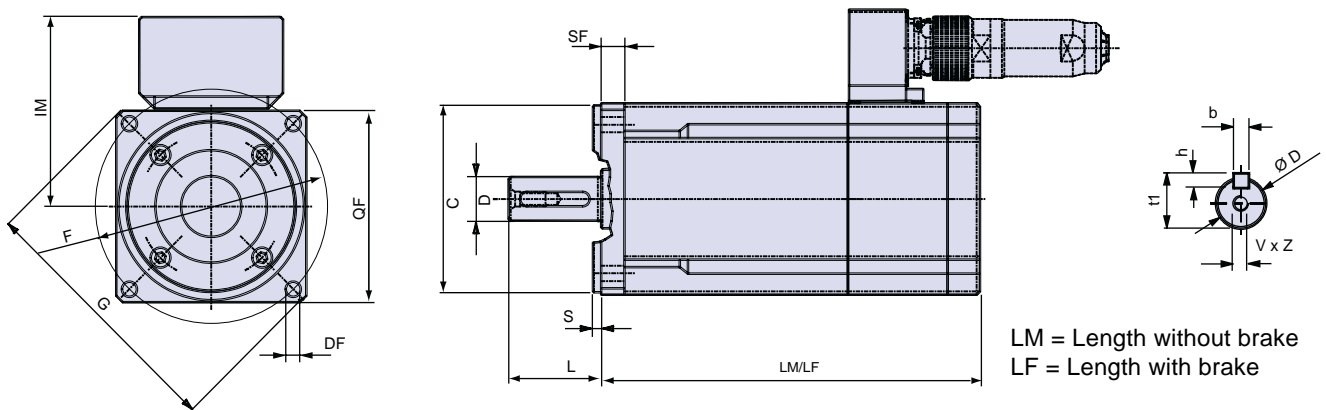
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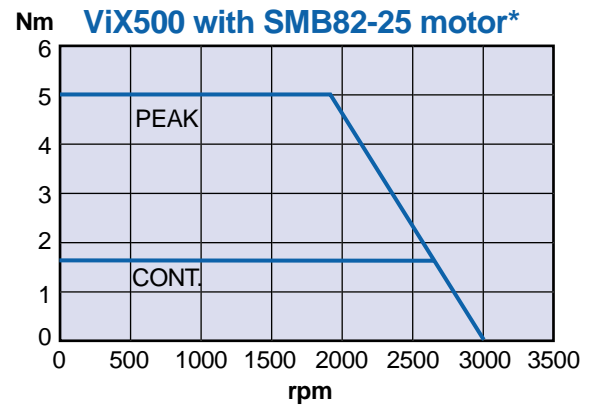
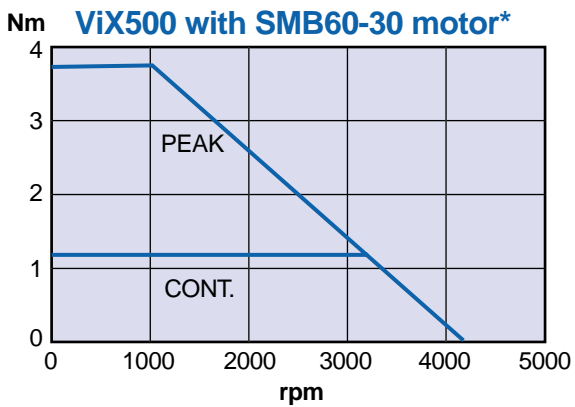
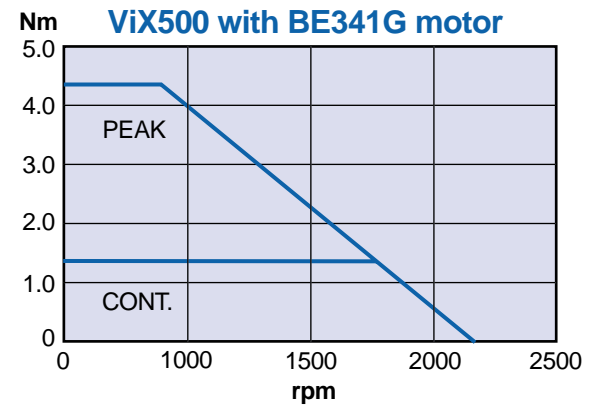
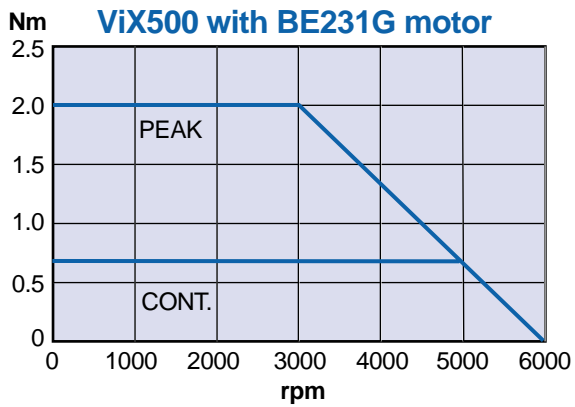
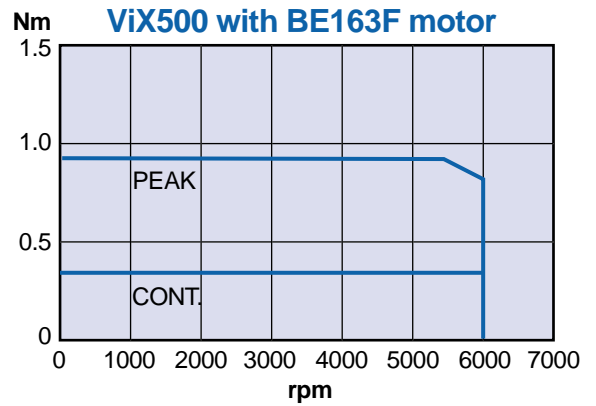
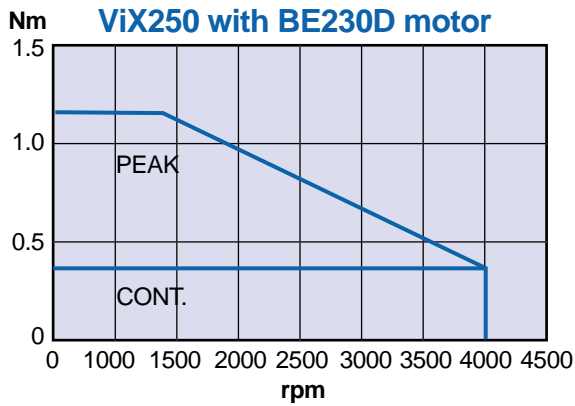


SMB60/82



Motor Type	Type	LM	SF	IM	LF	Flange type	DF	F	D x L	b x h	t1	V x Z	QF	C x S	G
SMB60	1.4	129.5	7	70	161	8 5	5.5 6	63 75	9x20 11x23	3x3 4x4	10.2 12.5	----- M4x10	60 70	Ø40 h6X2.5	74 90
SMB82	03	163.5	10	81	206.5	8 5	6.5 9	100 115	14x30 19x40	5x5 6x6	16 21.5	M5x12.5 M6x16	82 100	Ø80 h6x3.5	112 135

Performance Data



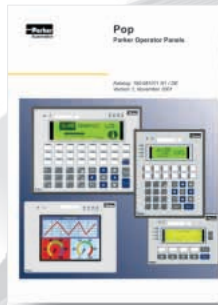
* 80V windings



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Parker
Electromechanical Automation



Parker Hannifin GmbH & Co.KG
Electromechanical Automation
Robert-Bosch-Str. 22
D-77656 Offenburg,
Germany
☎ +49 (0)781 509 0
☎ +49 (0)781 509 98176
Website: www.parker-eme.com
e-mail: sales.hauser@parker.com

Parker Hannifin S. p. A
Electromechanical Automation
Via Gounod 1
I-20092 Cinisello Balsamo (MI),
Italy
☎ +39 0266012459
☎ +39 0266012808
Website: www.parker-eme.com
e-mail: sales.sbc@parker.com

Parker Hannifin plc
Electromechanical Automation
Arena Business Centre
Holy Rood Close, Poole, Dorset.
BH17 7BA UK
☎ +44 (0)1202 606300
☎ +44 (0)1202 606301
Website: www.parker-eme.com
e-mail: sales.digiplan@parker.com

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