

A new member of the ViX family

The award-winning ViX intelligent digital servo drive from Parker Hannifin's Electromechanical Division has now been joined by a high-performance microstep version. Like its servo equivalent, the ViX microstep drive 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 microstep drive is produced in two versions having current ratings of 2.8A and 5.6A RMS at motor bus voltages up to 80V. User resolution is freely programmable between 400 and 51,200 steps/rev. Regardless of the programmed resolution, the motor always operates at maximum resolution for optimum smoothness over the entire speed range. The power stage features full PWM control for accurate microstepping performance.



ViX intelligent microstep drives incorporate a powerful motion controller using Parker's well-proven EASI command language. As well as carrying out all standard motion-related 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 expansion module allows for both CANopen and RS485 communication.

A comprehensive front-end software package is available which permits rapid configuration of the drive. When used with Parker stepper motors, only the motor type number is required for configuration of all relevant motor parameters.

Parker's XL-PSU and PL1100 power supplies offer a convenient way of powering ViX microstep drives. The XL-PSU is suitable for up to two axes (depending on shaft loading) and operates directly from any AC voltage between 95V and 264V. The PL1100 is transformer-fed and delivers up to 14A at 80V DC.

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

- Fully digital design
- Field-oriented control for improved low-speed performance
- Panel or DIN rail mounting
- 2.8A & 5.6A RMS ratings
- Up to 80V DC bus
- Built-in controller using Parker's proven EASI code
- Powerful front-end software
- Fully-programmable resolution up to 51,200 steps/rev
- Optional CANopen/RS485 interface
- Automatic standby current reduction
- Compact package
- Compatible with Parker high performance stepper motors

Advanced features with digital processing

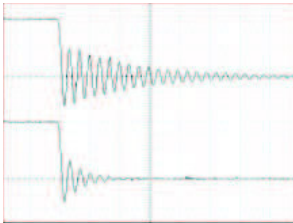
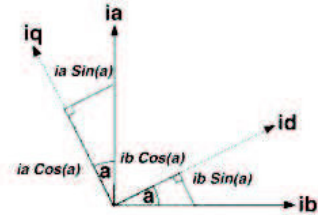


Fully digital technology

The operating core of the ViX microstepper drive is based on a powerful microprocessor. 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 output 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 exceptionally straightforward with the relevant data for Parker high-performance stepper motors being held in a database within the EASI-V software package.

Field-oriented control

Field-oriented control technology is used in Parker's ViX servo drive to give enhanced dynamic performance and higher efficiency. This same technique has been adapted for use in the microstepper version in order to improve low-speed smoothness and increase mid-range torque. Field-oriented control uses a special set of transforms to derive the power stage control signals. This solution ensures that the rotating flux vector is of constant amplitude with minimal deviation from its theoretical orientation. The result is a reduction in torque ripple leading to improved low-speed smoothness as well as increased overall efficiency.



Advanced digital control features

The ViX microstepper's outstanding processing capability has been utilised to refine the field-oriented control scheme even further. Advanced digital techniques are applied to the motor current loop to enhance the torque-speed envelope in the traditional midrange instability region. This has enabled Parker's engineers to achieve the optimum low-speed torque without the loss of high-speed performance frequently encountered in other digital microstepper solutions. Not only is the resulting torque-speed curve very close to the theoretical maximum for the particular motor, but there is also a reduction in settling time at the end of the move, typically by a factor of four.

Freely-programmable user resolution

The ViX microstepper drive is exceptionally easy to integrate into any mechanical arrangement since the user resolution may be set anywhere between 400 and 51,200 steps/rev - the choices are not restricted to a range of set values. This means you can always set distances within your program using convenient units, even if there is an odd transmission ratio or leadscrew pitch. Moreover, the drive power stage always operates at maximum resolution, so even if you choose 400 steps/rev the rotation will be equally as smooth as if you selected 51,200 steps/rev.



Powerful, user-friendly configuration software

ViX drives may be used in conjunction with Parker's EASI-V software, a comprehensive front-end tool for system configuration and setup. 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 stepper 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. The modular system also allows for future expansion to accommodate other communication protocols.



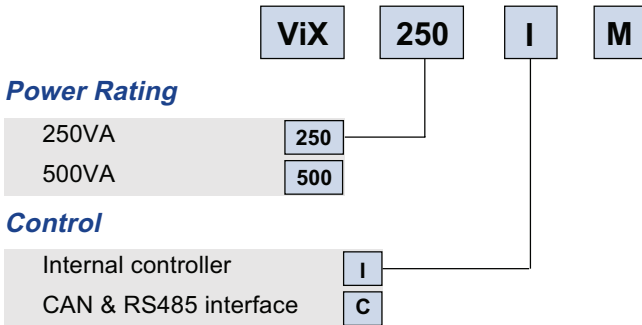
Motors for use with ViX

Parker offers a range of high-performance stepper motors suitable for use in conjunction with the ViX drive. Both 56mm and 87mm (NEMA 23 and 34) frame sizes are available with one, two or three stack lengths in each frame size. As well as the standard versions, motors are available to special order with a double shaft, encoder, brake, higher IP rating or alternative windings. Outline details and performance data may be found on pages 6 and 7 of this brochure.

Specifications

Rated current:	ViX500: 5.6A rms (8A peak) ViX250: 2.8A rms (4A peak)
Motor HV supply input:	ViX500: 48–80VDC +5% -15% ViX250: 24–80VDC +5% -15%
Controller supply input:	24V DC, 250mA (no outputs loaded, no encoder fitted) Fieldbus expansion module requires additional 50mA
Motor inductance range:	0.5 -20mH recommended
Internal motor resolution:	51,200 steps/rev (fixed)
User resolution:	Freely programmable between 400 and 51,200 steps/rev
Motor current:	Programmable by software down to 50% of rated current
Standby current:	50% to 100% of programmed current, software-selectable (including delay)
Protection:	Short circuit (phase to phase, phase to ground), 24V & motor HV over & under-voltage trip, drive overtemperature, reverse polarity on 24V input, encoder fault
Optional feedback encoder:	Standard quadrature encoder, 5V differential, 200KHz max. channel frequency, resolution between 500 and 5,000 lines (i.e. up to 20,000 counts/rev)
Encoder supply:	5V output, 350mA maximum loading
Analogue control input:	+/-10V differential, 12 bit resolution, for velocity demand and feed rate override function
Position command/following encoder input:	Step/direction, step+/step- or encoder channels with resolution equivalent to motor resolution
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, software-configurable active-low/sinking (5V-24V) or active-high/sourcing (24V only). 50mA max. per output
Encoder output:	Step/direction, step+/step- or quadrature, mirrors the feedback encoder
Fault output:	NPN open-collector output, normally low, active high
Communication interface:	9-way D connector for RS232 (standard); combined RS485 & CANopen option available
High-speed interface:	Dual RJ45 connectors for CANopen, RS485 etc.; these also provide daisy chain ports for multi-axis RS232 connections
Indicators:	LEDs for motor supply HV fault, drive fault & comms status
Temperature range:	0-50°C local environment (airflow >0.5m/s 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

Order Codes



Note: the 'M' code indicates a microstep drive

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. Please refer to the current price list for availability and order codes.

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 5.6A models:

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

HV supply for 2.8A 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):

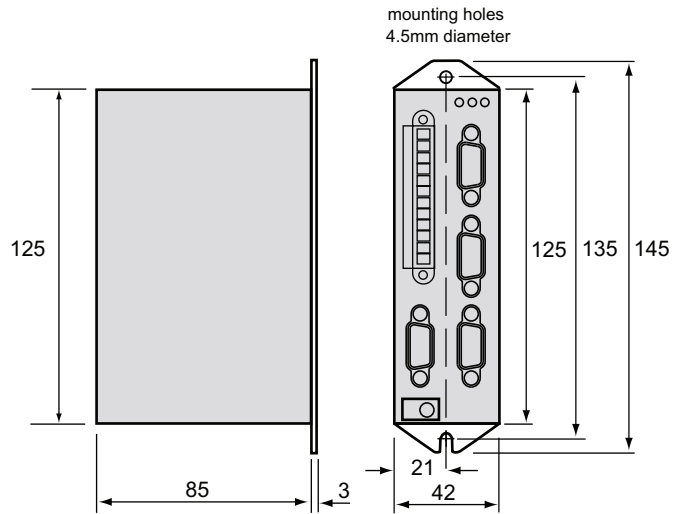
24V nominal, 21-27V absolute limits. Nominal drive current 250mA per axis (extra for encoder and loaded digital outputs).

XL-PSU & PL1100 power supply modules

The Parker XL-PSU power supply offers a convenient way of powering a single ViX stepper 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 stepper 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 (hwxwd)	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 (hwxwd)	145 x 119 x 143mm
Weight	1.25kg

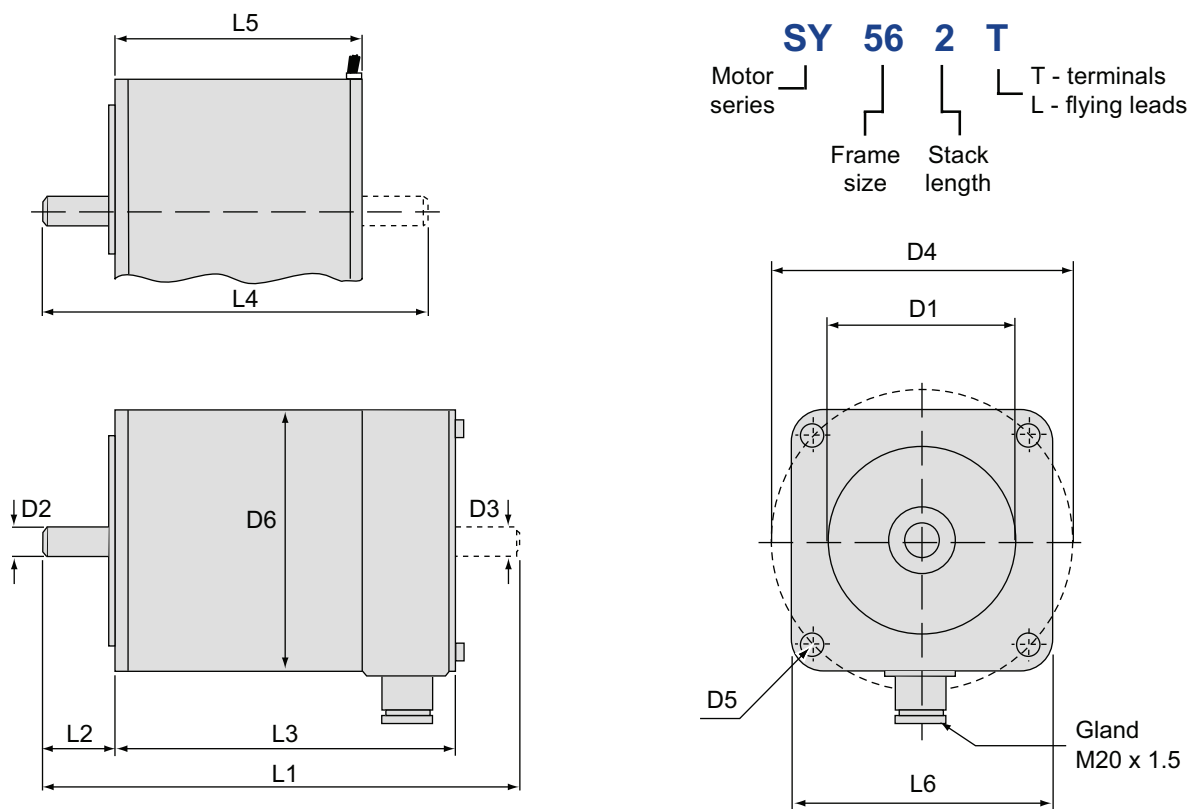
*For motor leads up to 30m long

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.

Motor dimensions



Dimensions (mm)

Series	Type	D1	D2	D3	D4	D5	D6	L1	L2	L3	L4	L5	L6
56	SY561	38.1	6.35	6.35	66.5	5.3	56.5	108	21	76	90	50	56.5
	SY562	38.1	6.35	6.35	66.5	5.3	56.5	134	21	102	116	76	56.5
	SY563	38.1	6.35	6.35	66.5	5.3	56.5	162	21	130	144	104	56.5
87	SY871	73	9.52	9.52	99	6.5	86	137	31.5	85.5	137	60.5	86
	SY872	73	9.52	9.52	99	6.5	86	169	31.5	117.5	169	92.5	86
	SY873	73	9.52	9.52	99	6.5	86	201	31.5	149.5	201	124.5	86

Electrical & mechanical data

Part number	Maximum Holding Torque Nm	Current per phase (parallel) A (RMS)	Inductance per phase mH	Rotor inertia kgcm ²	Weight kg	Axial bearing loading N	Radial bearing loading N
SY561	0.45	4.2	1	0.125	0.6	80	150
SY562	0.85	4.2	2.6	0.25	1	80	150
SY563	1.25	6.5	1.2	0.375	1.35	80	150
SY871	1.8	4.2	1.6	0.65	1.7	180	280
SY872	3.6	6.5	1.5	1.3	2.65	180	280
SY873	5.4	8.4	1.7	1.95	3.65	180	280

Standard IP ratings are IP55 for screw terminal version (T) and IP41 for flying leads (L).

Information on additional variants including double shaft, encoder, brake, higher IP rating and alternative windings is available on request.

Performance Data

