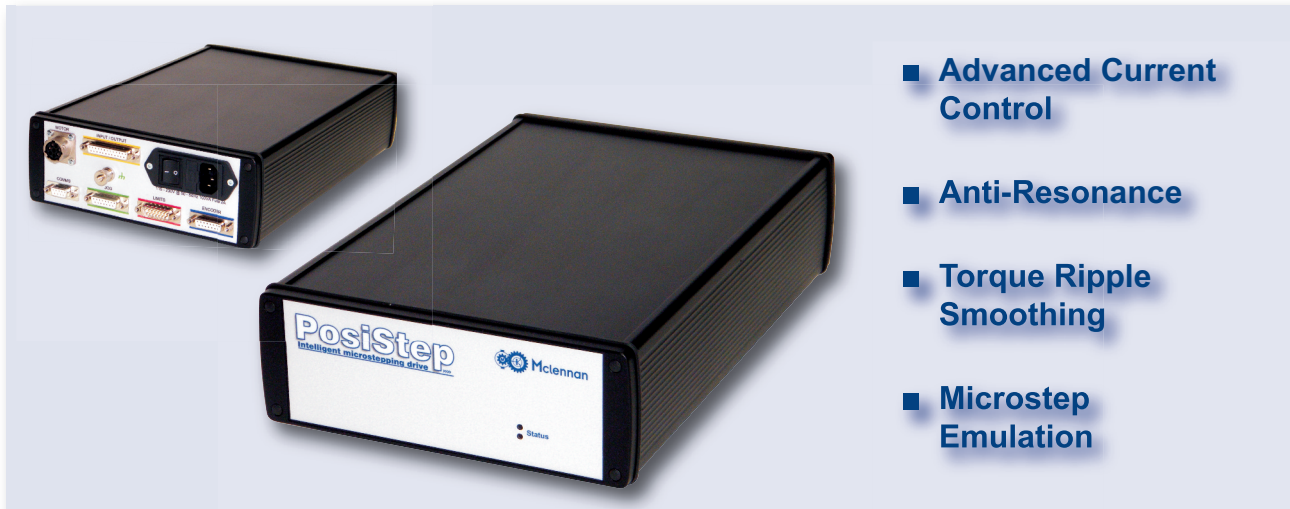


## PosiStep - Single Axis Packaged Intelligent Microstepping Drive



- **Advanced Current Control**
- **Anti-Resonance**
- **Torque Ripple Smoothing**
- **Microstep Emulation**

The PosiStep intelligent microstepping drive combines a high performance stepper motor drive, position controller and power supply as a cost effective integrated solution for a wide range of applications that require a single-axis driven mechanism. The unit is a "plug and play" package that greatly reduces installation time. Simply connect the PosiStep intelligent drive to a PC, motor, travel limits etc and an AC mains supply using the optional colour coded cables provided and the system is fully operational.

Suitable for 17 and 23 NEMA frame size motors, and available in a choice of 'Si' and 'Q' version controllers with encoder feedback option.

### Controller Options

#### Q Version

Stand-alone operation or or online control

Q is a high level ASCII command set and programming language. Sequences of commands can be stored in the drive to provide complex motion and machine control.

#### Q Programming Features

Flow control, Motion, I/O, Math functions, Registration manipulation, Multi-tasking, Host interrogation, Exception handling (faults & interrupts),

#### "On the fly" Functions:

Pulse & direction with electronic gearing, Encoder following with electronic gearing, CW and CCW pulse, Analog or digital velocity (oscillator & joystick) mode, Analog positioning

Options: Encoder feedback, RS-485 Communication

#### Si Version

Stand-alone operation

Si Programmer™ Windows software with integrated configuration (software and programming cable included).

Graphical point and click format combines motion, I/O, exception handling and operator interface functionality for simple machine sequencing.

Easily integrates with other devices on the machine (Sensors, PLCs etc).

### Power Specifications

**Amplifier Type:** MOSFET , Dual H-Bridge, 4 Quadrant

**Current Control:** 4 state PWM at 20 Khz

**Output Current:** 0.1 - 5.0 amps in 0.01 amp increments

**AC Power:** 120 - 240 VAC, 50 - 60 Hz

**Protection:** Over-Voltage, Under voltage Over-Temp, External Output Shorts (Phase to-Phase, Phase-to-Ground), Inter Amplifier Shorts

**Idle Current Reduction:** Reduction to 0 to 90% of full current after delay selectable in milliseconds

## Controller Specifications

### Non-Volatile Memory:

Configurations are saved in FLASH memory on-board the DSP

**Microstep Resolution:** Software selectable from 200 to 51200 steps/rev in increments of 2 steps/rev

**Anti-Resonance** (Electronic Damping): Raises the system damping ratio to eliminate midrange instability and allow stable operation throughout the speed range and improves settling time

### Torque Ripple Smoothing:

Allows for fine adjustment of phase current waveform harmonic content to reduce low-speed torque ripple in the range 0.25 to 1.5 rps

**Self Test:** Checks Internal & External Power supply voltages. Detects open motor phases. Detects encoder wiring and signal faults (differential encoder only)

**Microstep Emulation:** Performs high resolution stepping by synthesizing fine microsteps from coarse steps (Step & Direction Mode Only)

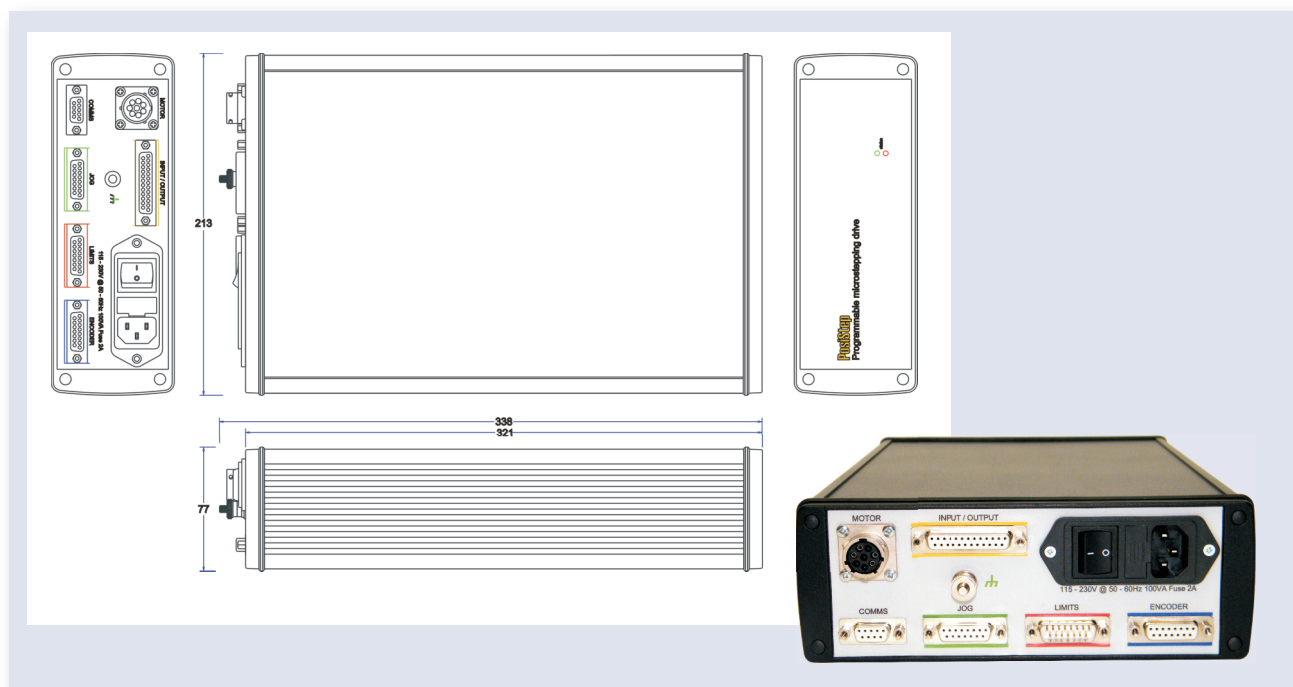
### Command Signal Smoothing:

Software configurable filtering reduces jerk and excitation of extraneous system resonances (Step & Direction Mode Only)

### I/O

Two - 5V high speed digital inputs,  
Six - 12-24V configurable inputs,  
Two - 12-bit analog inputs,  
Four - 30V/100mA digital outputs

## Dimensions



## Ordering Information

### PosiStep Units

<b>PST5-Q-NN-24</b>	Q Controller no options
<b>PST5-Q-RN-24</b>	Q Controller + RS485 comms module
<b>PST5-Q-NE-24</b>	Q Controller + Encoder module
<b>PST5-Q-RE-24</b>	Q Controller + RS485 comms module + Encoder module
<b>PST5-Si-NN-24</b>	Si Controller no options
<b>PST5-Si-RN-24</b>	Si Controller + RS485 comms module
<b>PST5-Si-NE-24</b>	Si Controller + Encoder module
<b>PST5-Si-RE-24</b>	Si Controller + RS485 comms module + Encoder module

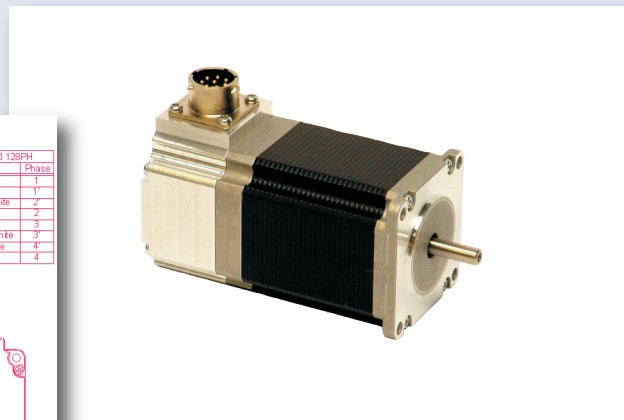
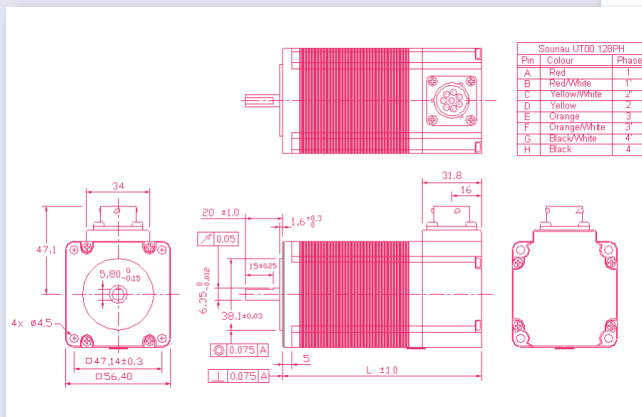
### Accessories

<b>JC101</b>	Jog box with rocker switch
<b>PSTCAB-MOTP-HTC-xx</b>	Motor cable (parallel connections) with 8 way UTO at motor end for 23/34HT series motors
<b>PSTCAB-MOTS-HTC-xx</b>	Motor cable (series connections) with 8 way UTO at motor end for 23/34HT series motors
<b>PSTCAB-ENC-HTC-xx</b>	Encoder cable with right-angle D at motor end for 23/34HT series motors
<b>PSTCAB-LID-BE-xx</b>	Limits and datum signals - bare ends

## Stepper Motors for PosiStep

- Excellent EMC Characteristics
- Simple connection via 8-way connector
- Unipolar, Bipolar Parallel or Series
- High Torque
- Low Vibration
- High Quality
- Special versions available on request
- 8-way UTO motor connector

### 23HT18C series stepper motors with 8-way connector



### Motor Specification

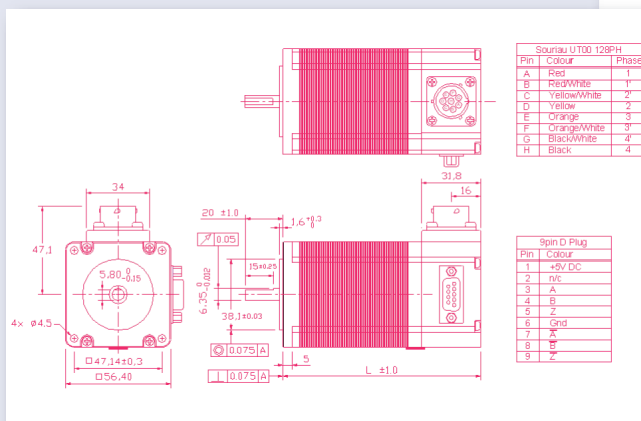
Part Number	Step Angle	Body Length "L"	Unipolar Phase Current	Unipolar Phase Voltage	Unipolar Resistance	Unipolar Inductance	Holding Torque (2 ph on)	Rotor Inertia	Mass
23HT18C130	1.8°	69.5 mm	3A	1.9V	0.63Ω	0.6mH	0.39Nm	120kgcm <sup>2</sup>	0.65kg
23HT18C230	1.8°	84.5 mm	3A	2.3V	0.75Ω	1.2mH	0.90Nm	0.260kgcm <sup>2</sup>	0.95kg
23HT18C330	1.8°	106.5mm	3A	3.0V	1.00Ω	1.6mH	1.35Nm	0.430kgcm <sup>2</sup>	1.2kg
23HT18C435	1.8°	114.5 mm	3.5A	2.8V	0.8Ω	1.4mH	1.4Nm	0.520kgcm <sup>2</sup>	1.5kg

UNIPOLAR Values shown - For Bipolar Parallel connection multiply I x √2, V x 1, R x 0.5, L x 1

## Stepper Motors for PosiStep

- Excellent EMC Characteristics
- Simple connection via 8-way connector
- Unipolar, Bipolar Parallel or Series
- High Torque
- Low Vibration
- High Quality
- Special versions available on request
- 8-way UTO motor connector and 9 way "D" encoder connector

### 23HT18C-L series stepper motor/encoders with connectors



### Motor Specification

Part Number	Step Angle	Body Length "L"	Unipolar Phase Current	Unipolar Phase Voltage	Unipolar Resistance	Unipolar Inductance	Holding Torque (2 ph on)	Rotor Inertia	Mass
23HT18C230 L500	1.8°	84.5 mm	3A	2.3V	0.75Ω	1.2mH	0.90Nm	0.260kgcm <sup>2</sup>	0.95kg
23HT18C435 L500	1.8°	114.5 mm	3.5A	2.8V	0.8Ω	1.4mH	1.4Nm	0.520 kgcm <sup>2</sup>	1.5kg

UNIPOLAR Values shown - For Bipolar Parallel connection multiply I x √2, V x 1, R x 0.5, L x 1

### Encoder Specification

Counts/turn	Line driver	Operating Voltage	Supply current	Max frequency	Output signal	Output Current
500AB + 1Z	AM26C31	DC 5V +/- 5%	100mA max	100kHz	H min 2.4Vdc L max 0.4Vdc	+/- 20mA max sinking

## IP57 Series Industrial planetary gearheads for PosiStep

- Planetary construction for high torque and compact dimensions
- NEMA23 frame size, IP43 for NEMA17 and IP86 for NEMA35 are also available.
- Suitable for use with both servo and stepper motors
- Wide range of standard ratios with additional options also available
- Exact gear ratios simplify calibration in positional control systems
- mounting kit options to fit most motors
- Standard options available from stock

The IP57 gear box is designed to provide long life in industrial automation, industrial, scientific and process control applications that require repetitive cycling featuring high dynamics, accurate velocity or positional control. Advanced manufacturing techniques, combined with a design focused on the needs of state of the art motion control has resulted in a combination of optimised performance characteristics combined with economic prices.



### Construction

The IP57 is based on an all metal planetary design for high strength. The materials and the treatment processes employed have been carefully selected to achieve high strength and long life. The output shaft / carrier assembly is machined from solid for optimum strength and torsional rigidity. The IP57 may be constructed with up to 4 stages to provide a gear ratio of up to 10,000:1.

Unlike some multi-stage designs this is achieved using a single part annular to improve unit sealing and torsional stiffness. Each gear stage may be provided with a number of alternative ratios. IP57 series gearheads utilise precision gears to provide a controlled backlash and are therefore ideal for use in positioning systems. The design is based on the use of exact gear ratios to make the calibration of digital positioning systems easier.

### IP57 Series Specification

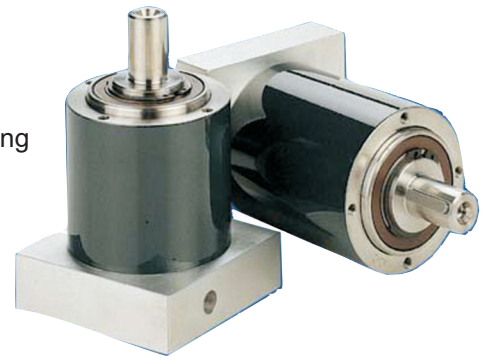
Gearhead Part Number	Diameter mm	Number of Stages	Gear Ratio N:1	Max Cont' Torque (Nm)	Max. Peak Torque (Nm)	Typical Backlash (Arc-Min)	Efficiency %	Typical Inertia at Input (Kg cm <sup>2</sup> )	Mass (Kg)
IP57-MO1	57	1	5	6	12	20	97	0.027	0.7
			10	5.4	10.5			0.018	0.8
			25	15	24			0.024	0.9
IP57-MO2	57	2	50	13.5	21.5	30	84	0.017	1.0
			100	20	40			0.017	1.0
			125	20	40			0.024	1.1
IP57-MO3	57	3	250	18	36	40	78	0.017	1.2
			500	18	36			0.017	1.2
			1000	25	40			0.017	1.2
			10,000	25	40			0.017	1.2

For detailed specifications and drawings, see IP57 series Data Sheet

## HPE Series Economy Precision Planetary Gearheads for PosiStep

- Standard integer gear ratios from 5:1 to 100:1
- Low backlash of typically < 12 arc minutes for high positioning repeatability
- Choice of industrial standard frame sizes from 50 to 120 mm diameter
- High torque capacity from 12 to 210 Nm suitable for rapid positioning systems
- 200% Emergency overload capacity for increased protection
- Pure planetary design for smooth operation & reduced vibration
- Improved Easyfit motor mounting for a wide range of motors
- Rapid delivery
- Low cost

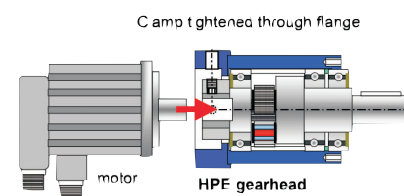
The HPE series planetary gearheads are designed to meet the demanding dynamic requirements of high performance servo systems at highly competitive pricing levels. This is achieved by a commitment to manufacturing efficiency combined with optimum design that maintains high reliability & quality. The units are suitable for fitting to a wide range of stepper, dc servo or brushless servo motors using a comprehensive range of standard motor mounting flanges and an Easyfit shaft clamp design.



HPE gearheads are the ideal choice in industrial automation, packaging, laser cutting, Test and & measurement machinery as well as scientific apparatus.

### Easyfit Motor Mounting

The motor is mounted via a precision flange that provides an accurate register for the motor. The input pinion is mounted in it's own sealed bearing and incorporates a clamp, the bolts of which are tightened through the input flange. The advantage of the design is easy motor mounting in both horizontal and vertical positions providing improved serviceability. The clamping force of the system is sufficient to transmit the peak torque capacity of the most powerful motor that can be fitted to each gearhead



### HPE Series Specification

Gearhead Part Number	Diameter mm	Number of Stages	Gear Ratio N:1	Max Cont' Torque (Nm)	Max. Peak Torque (Nm)	Typical Backlash (Arc-Min)	Efficiency %	Typical Inertia at Input (Kg cm <sup>2</sup> )	Mass (Kg)
HPE 50	50	1	5,10	6.5	15	12	97	0.063	0.8
		2	25,50,100	5.5	12	15	95	0.052	1.0
HPE 70	70	1	5,10	18	33	12	97	0.31	2.0
		2	25,50,100	16.5	30	15	95	0.25	2.5
HPE 90	90	1	5,10	45	82	12	97	1.72	4.3
		2	25,50,100	40	72	15	95	1.47	5.3
HPE120	120	1	5,10	120	210	12	97	5.5	9.2
		2	25,50,100	100	180	15	95	4.45	11.4

For detailed specifications and drawings, see HPE Series Data Sheet