

High precision instrument gearhead

P5 series

P5 series instrument gearheads conform to the international ovoid standard. The units have established a reputation for excellent running consistency, strength and reliability & have been engineered to enable a wide range of permanent magnet stepper motors, ac synchronous & instrument dc servo motors to be readily fitted.

Typical applications include:

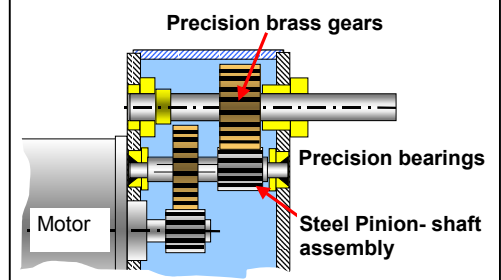
- Scientific instrument drives
- Medical instruments drives
- Laboratory & test equipment drives
- Optical equipment drives
- Valve actuators
- Process control equipment

Precision construction with built-in flexibility:

P5 series gearheads incorporate precision spur cut brass gears and steel pinions mounted on spindles running in bronze alloy bearings which feature lubrication reservoirs for extended life, control accuracy and high dynamic performance. P5 series units have been designed to readily accept a wide range of motors and offer a comprehensive programme of options including integral torque limiting clutches and freewheels. These, together with three standard shaft options and the ability to offer customised versions make the P5 series gearhead an ideal choice where precision control of a wide variety of mechanisms where high control accuracy is required.



Construction



Standard gear ratios:

Fast-track delivery of a wide range of P5 series gearheads ensures rapid response to customer demand. The wide range of stock ratios are ideal when using permanent magnet stepper motors, ac synchronous motors and high quality dc instrument motors

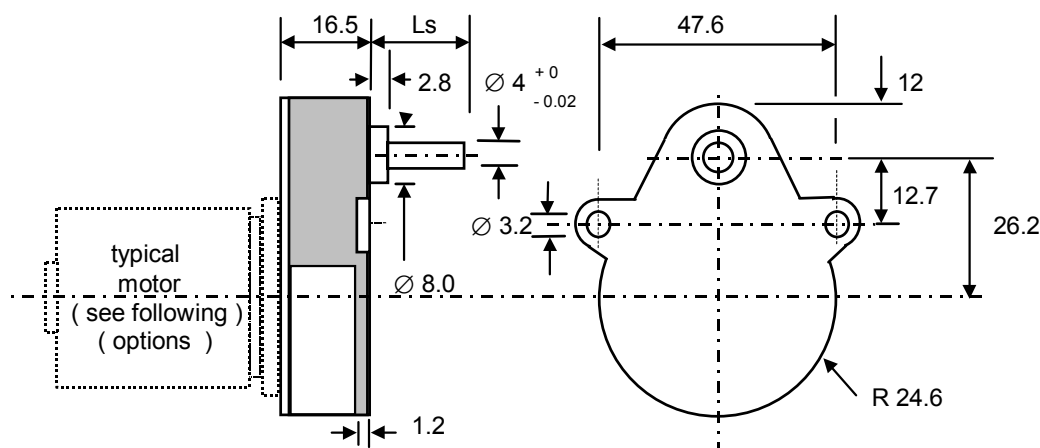
Order Code	Ratio	Efficiency (%)	Max Output Torque (Nm)	Steps per rev @ output using Stepper motor *	Output speed using synchronous motor (rpm) #	Output speed Using dc motor (rpm) **
P5-G01	25:6	80	0.20	200	60	720-1200
P5-G03	25:4	80	0.25	300	40	500-800
P5-G04	25:3	80	0.35	400	30	360-600
P5-G05	10:1	70	0.40	480	25	300-500
P5-G06	25:2	70	0.45	600	20	240-400
P5-G08	50:3	70	0.60	800	15	180-300
P5-G09	20:1	70	0.65	960	12.5	150-250
P5-G11	25:1	70	0.70	1200	10	120-200
P5-G14	100:3	70	0.75	1600	7.5	90-150
P5-G16	125:3	70	0.80	2000	6	72-120
P5-G17	50:1	70	0.80	2400	5	60-100
P5-G19	125:2	65	0.80	3000	4	48-80
P5-G21	250:3	65	0.80	4000	3	36-60
P5-G23	125:1	65	0.80	6000	2	24-40
P5-G27	250:1	65	0.80	12000	1	12-20
P5-G34	500:1	58	0.85	24000	0.5	6-10
P5-G41	1250:1	58	0.90	60000	12 revs/hour	2.4 - 4
P5-G62	15,000:1	43	1.0	720,000	1 rev / hour	0.1-0.3

Notes: * Based on the use of a stepper motor with 7.5 degree step angle

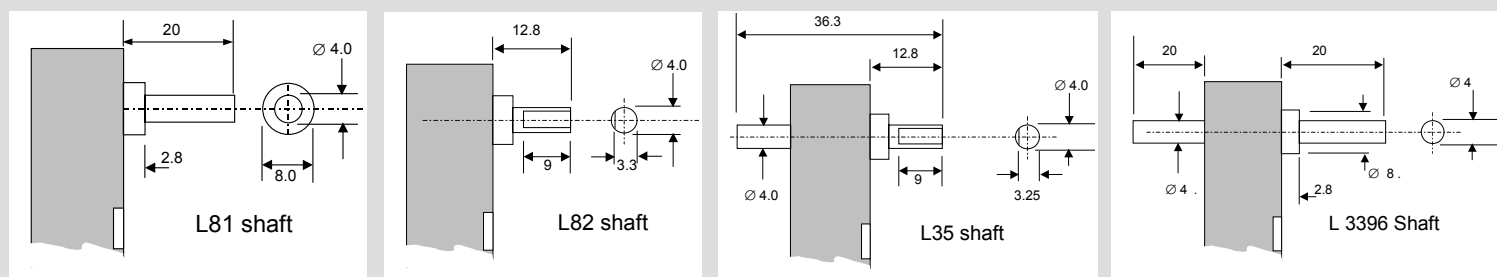
Based on the use of a 250 rpm ac synchronous motor

** Based on the use of instrument dc motors with speed ratings of 3000 & 5000 rpm.

P5 Gearbox Dimensions: mm.



Standard output shaft dimensions: mm.



L82 shaft with internal clutch & freewheel

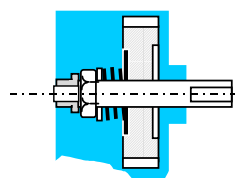
P5 series gearbox may be specified with optional internal friction clutch or freewheels.

The L82C internal clutch is set to a slip torque of 0.6 Nm and is designed to protect the gearhead against damage resulting from excessive torque in a stall condition.

The freewheel options provide a maximum torque of 0.4 Nm and provide free rotation in the direction of drive.

Typical applications include chart recorder paper feeds.

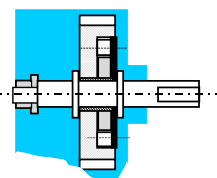
Friction Clutch Option



L82C

Output shaft dimensions as L82 standard shaft

Freewheel Option



L82F: clockwise rotation

L82R: counter-clockwise rotation

General specification:

Max recommended input speed	rpm	5000
Max Radial load	N	50 (@ 8 mm from mounting face)
Max Static Axial load	N	150 N (for press fit on shaft)
Ambient temperature range	Deg. C	-30 to +65
Max Axial shaft play	μm	250
Max radial shaft play	μm	25
Direction of rotation @ output with respect to input:		
Ratio Codes	Number of stages	Direction of rotation
P5-G01 to G04	2	Same
P5-G05 to G17	3	Opposite
P5-G19-G27	4	Same
P5-G34-G41	5	Opposite
P5-G62	7	Opposite

Positional Servodrive assembly

P5 series

The P5 positional servodrive incorporates a potentiometer which is connected to the output shaft to provide an analogue reference signal proportional to output shaft position.

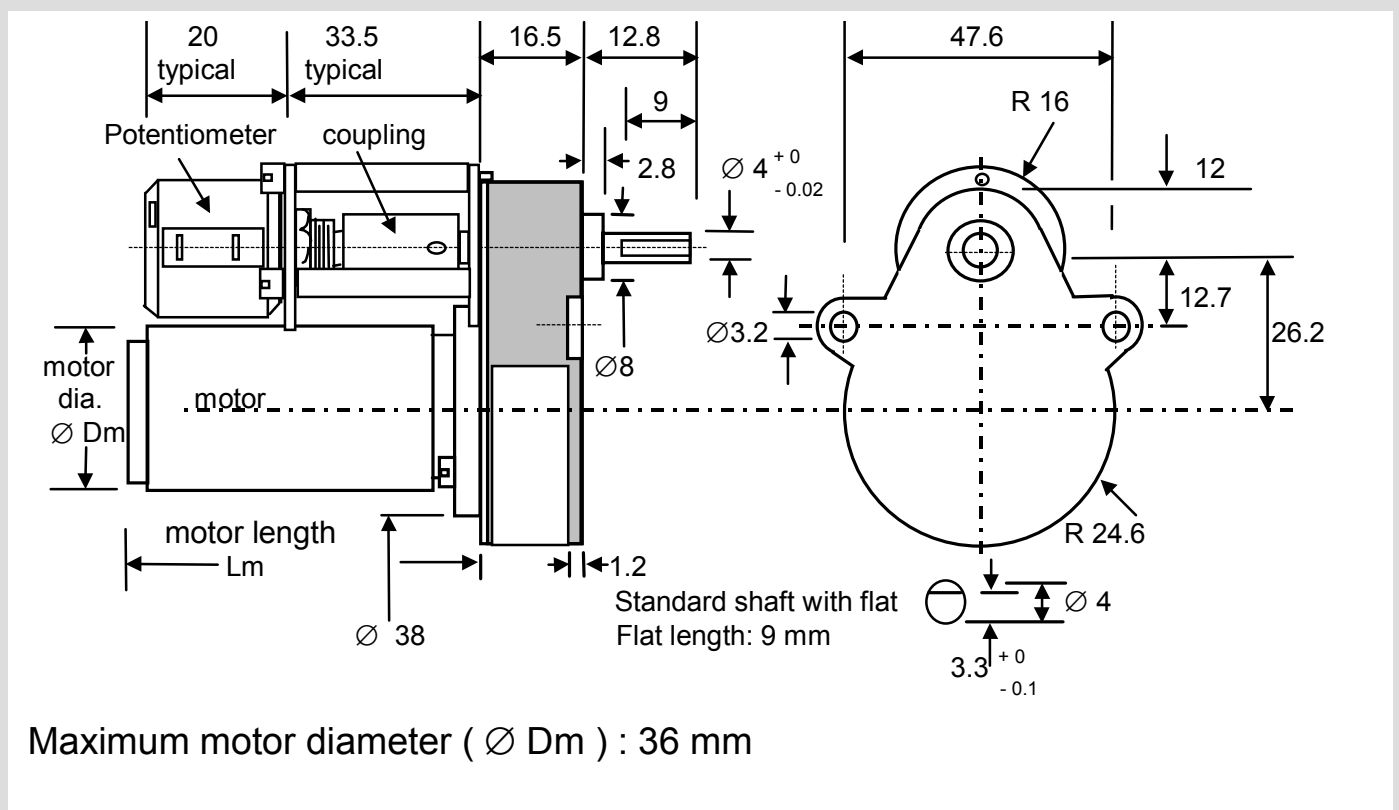
A variety of potentiometer options are available to provide the choice of single or multi-turn operation. Although conforming to the standard panel mount design, the feedback potentiometers utilised in P5 positional servodrives have a reinforced internal construction to provide long life in motor driven applications.

The feedback potentiometer is coupled directly to the servodrive's output shaft via a backlash-free coupling which incorporates a friction clutch to protect the potentiometer against an overtravel condition when an option fitted with end stops is specified.

P5 series Servodrives may be specified with any of the gear ratios shown on earlier pages to provide a wide choice of speed options.



P5 series Positional Servodrive assembly Dimensions: mm



Standard Potentiometer options

Gearhead ratio code	Potentiometer code	Description	Electrical rotation
P5-G01 to G62-	L100	Single turn , continuous rotation	≥ 340 degrees
	L101	Single turn with end stops	≥ 300 degrees
	L102	Three turn with end stops	≥ 1080 degrees
	L103	Ten turn with end stops	≥ 3600 degrees

Motor options

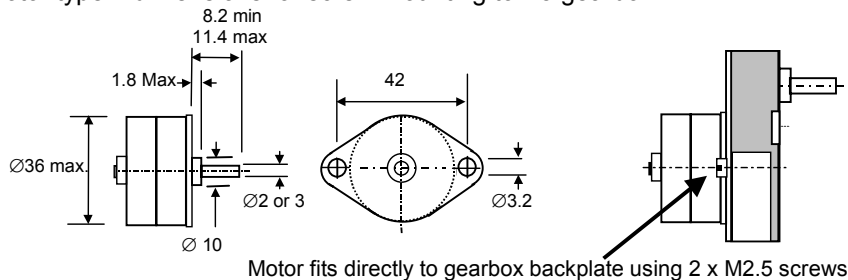
A wide range of permanent magnet stepper motors, instrument dc motors and ac synchronous motors may be fitted to the P5 gearhead using standard mounting kits.

A wide variety of motors may be factory-fitted to meet a wide range of performance requirements. If alternative motors are to be fitted to the P5 gearhead the following details can be components

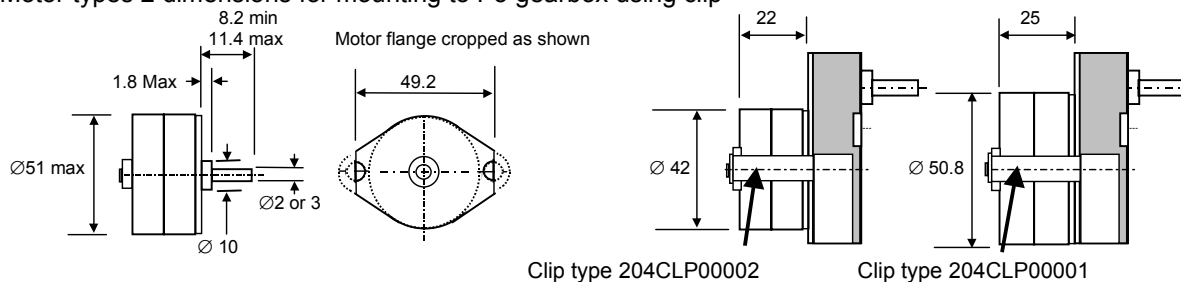
Standard Motor mounting kits:



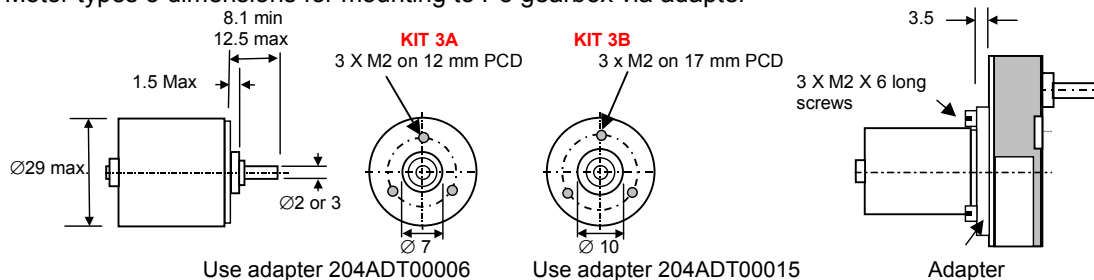
Motor type 1 dimensions for screw mounting to P5 gearbox



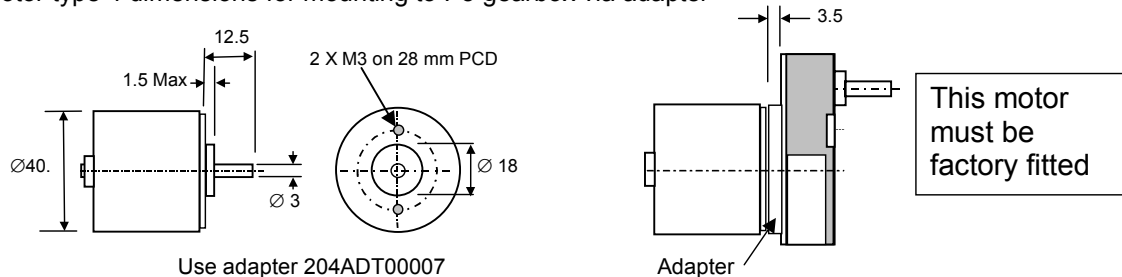
Motor types 2 dimensions for mounting to P5 gearbox using clip



Motor types 3 dimensions for mounting to P5 gearbox via adapter



Motor type 4 dimensions for mounting to P5 gearbox via adapter



High precision instrument gearhead

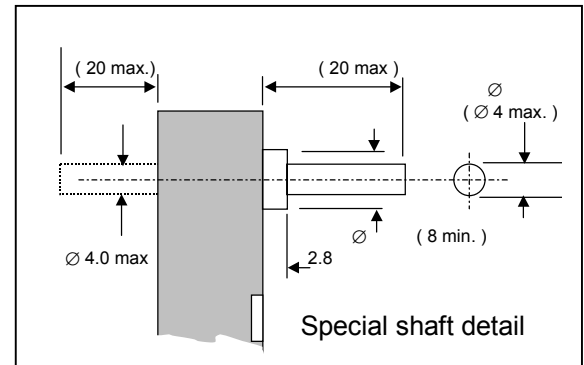
P5 series

Ordering code

Example: **P5-G17 L82**

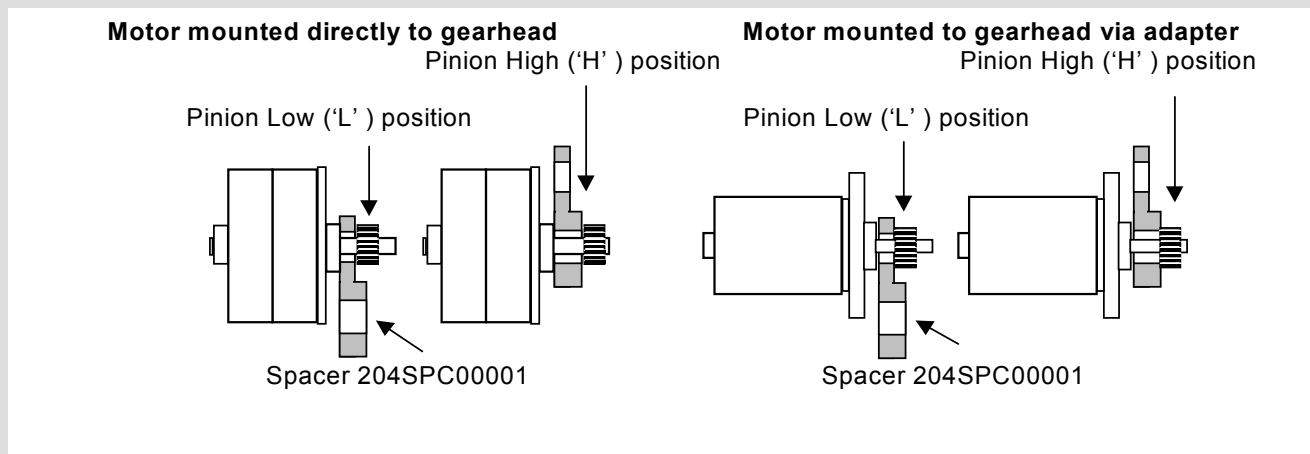
Gearbox Code
Ratio Code
Shaft or Potentiometer code

- Specify motor shaft diameter so correct pinion bore is provided
- Specify fitting components such as adapter or fixing clip
- If in doubt please contact your local sales office
- If a special output shaft is required enter details in drawing provided:



Fitting the motor to P5 gearheads:

The pinion is either fitted to the motor shaft by means of high strength Loctite 638 adhesive or it is press fitted when the motor rear shaft can be supported. The pinion can be accurately located, in one of two positions, using the pinion fitting tool 204SPC00001 as shown below:



Pinion Positions

Order Code	Ratio	Pinion Position	Standard Pinion bores (motor shaft diameters)			Maximum Pinion bore (max. motor shaft diameter)
P5-G01	25:6	H	1.8 mm	2.0 mm	3.0 mm	3 mm
P5-G03	25:4	H	1.8 mm	2.0 mm	3.0 mm	4 mm
P5-G04	25:3	H	1.8 mm	2.0 mm	3.0 mm	3 mm
P5-G05	10:1	L	1.8 mm	2.0 mm	3.0 mm	5 mm
P5-G06	25:2		1.8 mm	2.0 mm	3.0 mm	
P5-G08	50:3		1.8 mm	2.0 mm	3.0 mm	
P5-G09	20:1		1.8 mm	2.0 mm	3.0 mm	
P5-G11	25:1		1.8 mm	2.0 mm	3.0 mm	
P5-G14	100:3		1.8 mm	2.0 mm	3.0 mm	
P5-G16	125:3	H	1.8 mm	2.0 mm	3.0 mm	3 mm
P5-G17	50:1		1.8 mm	2.0 mm	3.0 mm	
P5-G19	125:2		1.8 mm	2.0 mm	3.0 mm	
P5-G21	250:3		1.8 mm	2.0 mm	3.0 mm	
P5-G23	125:1		1.8 mm	2.0 mm	3.0 mm	
P5-G27	250:1		1.8 mm	2.0 mm	3.0 mm	
P5-G34	500:1	L	1.8 mm	2.0 mm	3.0 mm	5 mm
P5-G41	1250:1		1.8 mm	2.0 mm	3.0 mm	3 mm
P5-G62	15,000:1		1.8 mm	2.0 mm	3.0 mm	3 mm

Complete geared motor assemblies

A wide range of complete assemblies with factory fitted motors can be provided, data on which is available on request.

When supplied as a complete assembly the motor part number is inserted in the geared motor order code

Examples:

Dc servo motor 9904 120 18 105

```

      |   |   |
      v   v   v
  
```

Geared motor code: **P5 18 DC 105-G17 L82**

Stepper motor 9904 112 32 101

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      |   |   |
      v   v   v
  
```

P5 32 ST 101-G17 L82

Typical factory fitted geared motor assemblies



Reversible geared ac synchronous motors

- Reversible fixed speed operation
- Choice of two motor power options
- Choice of output speeds from 1 rev/second to 1 rev/ hour
- Choice of 24, 110 or 230 Vac – 50 Hz operation

P532 & P531 SP series

Geared reversible ac synchronous motors

Geared permanent magnet stepper motors

- High precision 7.5 degree stepper motors
- Choice of 5V or 12 V windings
- Choice of four power options
- Optional positional feedback potentiometer assembly



P531 ST series

Geared stepper motors



P532 ST & P535 series

Geared stepper motors



P542 series

Geared stepper motors

Geared ironless rotor dc servo motors

- High precision coreless servo motors
- Choice of 6, 12 or 24 Vdc windings
- Standard speed options from 1200 – 0.1 rpm
- Choice of 6 power options from 22 –40 mm diameter
- Optional dc tachogenerator or encoder feedback
- Optional positional feedback potentiometer assembly



P522 DC series

Geared dc motors



P528 DC Series

Geared dc motors



P518 DC series

Geared dc motors with position feedback