

# High torque spur gearbox

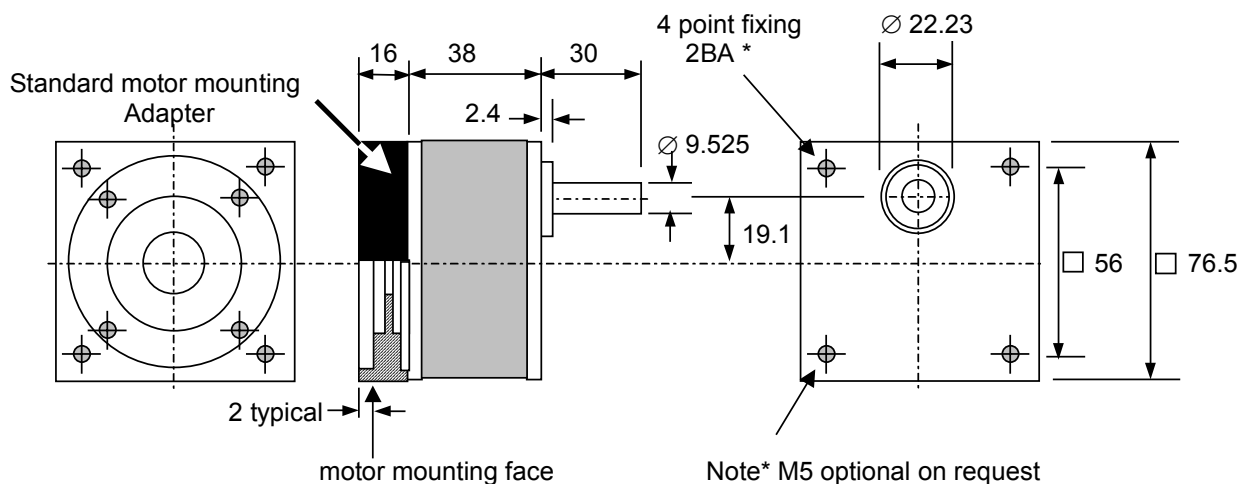
# S30 /S60 series

## General

The S30 & S60 & gearbox programme of high performance spur gearboxes are designed to provide long life when used with ac synchronous, stepper & dc servo motors. The units offer a wide choice of exact gear ratios from 5:1 to 250:1 and utilise steel gears and pinions to provide a high torque transmission capability. The units are equipped with ballrace bearings on the output to withstand high radial loadings, S60 units also being equipped with additional ball bearings on the penultimate stage for increased life under high torque conditions.



## Dimensions: mm



## Specification for standard ratios

Table 1

Order code	Ratio	Efficiency >	Direction of rotation @ output compared to input	Maximum continuous torque Nm	Maximum intermittent torque Nm
S30-G02	5:1	72%	Same	1.5	3.0
S30-G05	10:1	72%	Same	2.5	4.0
S60-G05	10:1	72%	Same	3.0	6.0
S60-G09	20:1	64%	Opposite	4.0	8.0
S60-G17	50:1	58%	Same	4.0	8.0
S60-G20	90:1	52%	Opposite	4.5	8.0
S60-G23	125:1	52%	Opposite	6.0	8.0
S60-G27	250:1	52%	Opposite	6.5	8.0

Maximum motor input speed: 3000 rpm  
 Maximum radial load on output shaft: 250N @ centre of output shaft  
 Maximum axial load on output shaft: 250N  
 Lubrication: grease

## Typical motors using standard adapter

Table 2

Description	Mclennan Part Number	Standard Adapter	Pinion bore diameter
NEMA size 23 stepper motor	23HS series	204ADT04796	6.35 mm
	23HSX-1__ & 23HSX-2__ series		
	23HSX-3__ series	204ADT04796	8.0 mm
30 Watt dc servo motor	M66 series	204ADT04796	6.0 mm
60 Watt dc servo motors	M540 & M586 series	204ADT04796 /4798	6.0 mm
90 watt dc servo motors	M543 & M589 series	204ADT04796 /4798	8.0 mm

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## Selecting a suitable gearbox & motor

- Determine the type of motor required, eg: stepper motor or servo motor
- Calculate the motor performance requirements as shown in the following example:

Example:

In many applications the total torque will consist of a continuous torque with a peak torque requirement to start and stop the load

Required continuous torque required to drive the load: = 1.4 Nm ( A )  
Total peak torque including starting & stopping load = 3.5 Nm ( B )  
Maximum continuous speed at gearbox output shaft: = 250 rpm

Select a gearhead where

- The gearhead rated continuous torque is  $\geq$  to required continuous torque
- The gearhead rated intermittent torque is  $\geq$  to the required peak torque
- The resultant motor speed is  $\leq$  3000 rpm.

Using the above criteria the gear ratio  $\leq \frac{3000}{250} = 12.5:1$

## Gearbox selection

From table 1 select the 10:1 gearhead type **S30-G05** since it's rated values exceed those required.

## motor selection

The continuous torque required at the motor shaft =  $\frac{1.4}{10 \times 0.72} = 0.19$  Nm

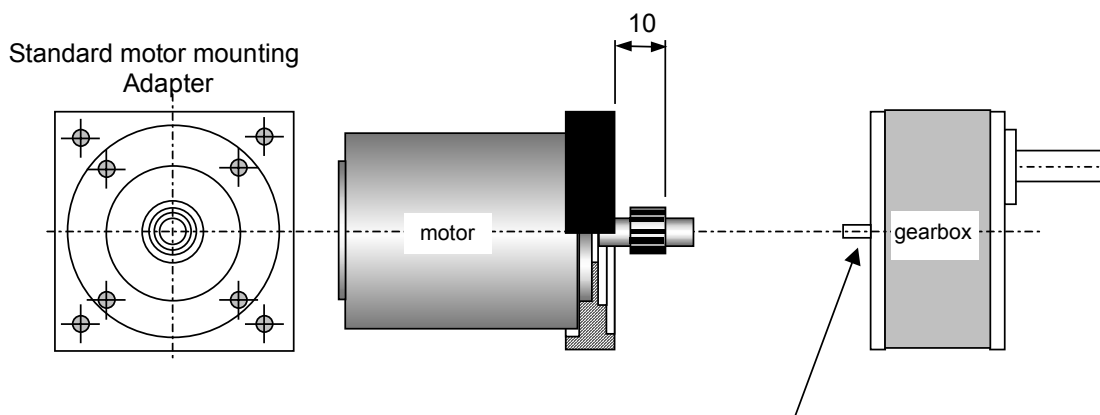
The peak torque required at the motor shaft =  $\frac{3.5}{10 \times 0.72} = 0.49$  Nm

Using the datasheet for M500 series select dc servo motor M540 or motor-tacho M586 series

## Motor mounting

The motor should be prepared as follows:

- Select suitable pinion as shown in table 2
- Mount the motor onto the motor mounting adapter
- De-grease the motor shaft and pinion bore
- Fit the pinion in the position shown below & retain using loctite 638 adhesive
- Ensure that excessive adhesive is removed



Fit motor-adaptor assembly to rear of gearbox using locating pins  
Take care to ensure that the motor pinion meshes with first stage gearwheel