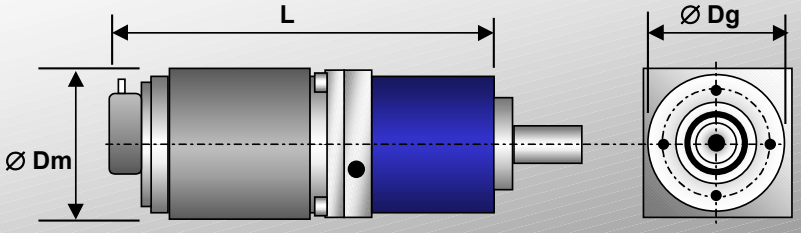
Precision Geared dc servo motors

HPE – M series

Features

- Precision servo motors with optional dc tachogenerator & or encoder for digital control
- Choice of models from 50 to 90 mm diameter
- Up to 200,000 counts per rev. resolution
- Low backlash, typically ≤ 12 arc minutes for accurate positioning
- Low cost due to advanced design and manufacturing techniques
- High peak torque capacity up to 82 Nm for rapid acceleration
- 200% overload capability for increased reliability
- Wide range of standard integer gear ratios
- *Easyfit* motor fitting for increased serviceability
- Long maintenance free life

Quick reference dimensions: mm



Model	Dimensions mm.		
	∅Dg	∅Dm	L
HPE 50 – M66	50	66	188
HPE 50- M500	50	57.5	≤ 265
HPE 70- M543	70	57.5	285
HPE 70- M600	70	83.1	≤ 317
HPE 90- M644	90	83.1	343

Note: geared motor-encoder assembly lengths

Precision Geared dc servo motors

Quick reference Guide:

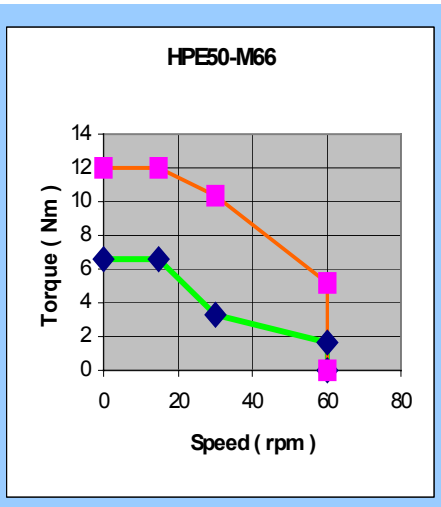
Geared M66 Servo motor

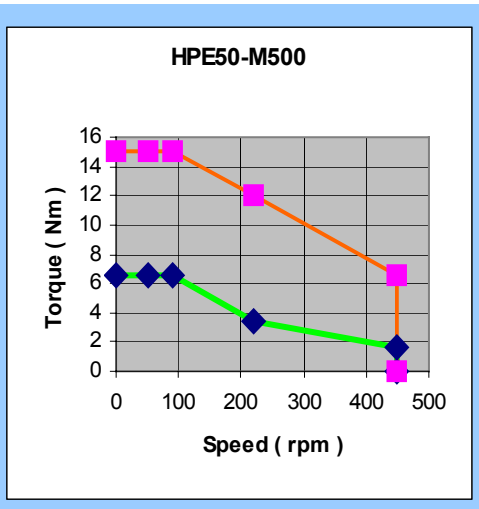
- Precision 20 Watt Geared servo motor
- Ideal for slow speed operation
- Compact 50 mm diameter planetary gearhead
- Peak torque up to 12 Nm

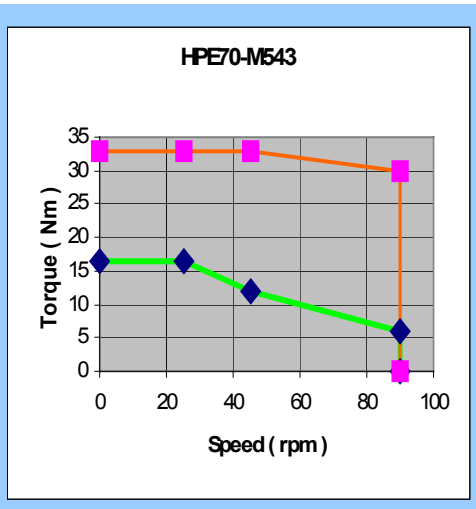
Dynamic Performance Options

Geared M500 series servo motor

- Precision Geared servo motor up to 100 watts
- High torque / volume ratio
- Compact 50 & 70 mm diameter planetary gearheads
- Optional integral dc tachogenerator for enhanced slow speed performance
- Peak torque up to 33 Nm for rapid positioning

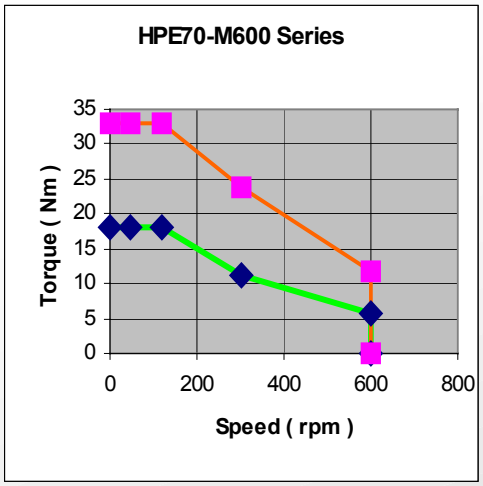


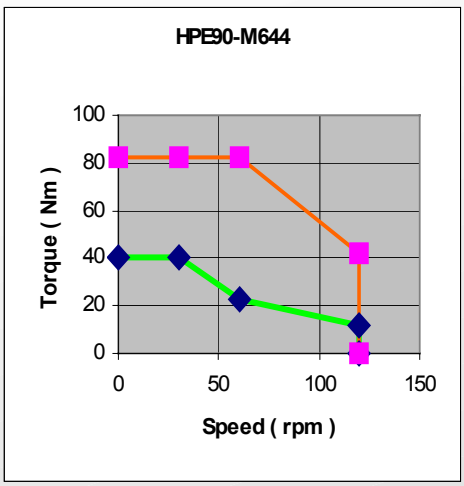




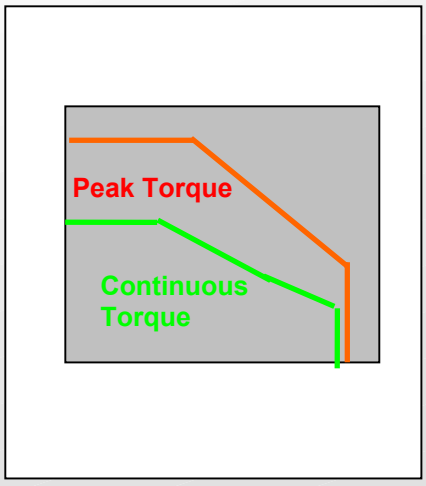
Geared M600 series Servo motors

- Precision Geared servo motor up to 400 watts
- High torque / volume ratio
- Compact 70 & 90 mm diameter planetary gearheads
- Optional integral dc tachogenerator for enhanced slow speed performance
- Peak torque up to 82 Nm for rapid positioning





Legend



Full data on the HPE – M series geared servo motors follow

Precision Geared dc servo motors HPE – M series

Description

The HPE / M series geared dc servo motors utilise high strength precision planetary gearheads that are ideally suited to industrial, scientific and measuring control systems that require accurate positioning and long life.

Features:

- Low backlash for accurate positioning
- Low cost due to advanced design and manufacturing techniques
- High continuous and peak torque capacity
- 200% overload capability for increased reliability
- Wide range of motor options with integral encoder and optional tacho feedback
- Wide range of standard integer gear ratios
- *Easyfit* motor fitting for increased serviceability
- Long maintenance free life

20 Watt Geared servo motor encoder

HPE50-M66 series

The unit utilises a low inertia ironless rotor servo motor with an integral 500 ppr. encoder. Encoder options include a dual track TTL output or 5V differential outputs with index marker. This precision assembly is designed for use in low speed positioning applications where positioning accuracy and repeatability is required. Typical applications include scientific instrumentation, measuring equipment & light-weight tracker heads for military & nautical surveillance.

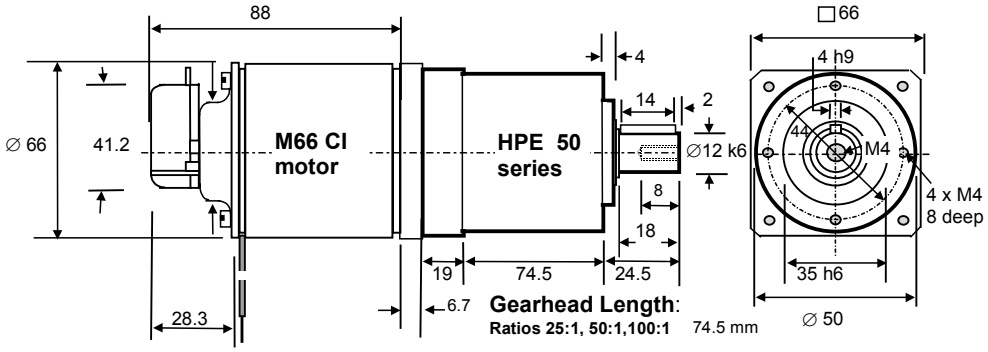
Motor encoder options:

Motor Encoder	Nominal Voltage	Encoder Resolution	Output signal
M66 CI 500T-12	12 Vdc	500 ppr	Dual Track TTL
M66 CI 500T-24	24 Vdc		
M66 CI 500L-12	12 Vdc	500 ppr + Index	Dual track 5V Differential
M66 CI 500L-24	12 Vdc		

Note: Where digital control is not required the encoder may be deleted

Dimensions: mm

Geared motor encoder HPE50-M66 series



Typical performance

Gearbox Model	Gear Ratio n:1	Motor Model	Rated Speed (rpm)	Rated Torque (Nm)	Peak Torque (Nm)	Positioning Resolution (counts / rev.)	Max. Backlash (arc. min.)
HPE 50 D	**25**	M66 CI 500	60	1.65	5.2	50,000	≤ 15
	50		30	3.3	10.4	100,000	
	100		15	6.6	12	200,000	

General HPE 50 D Gearhead data

Construction:	Dual stage low backlash planetary with precision cut gears
Bearings:	Planet gears supported by needle bearings, Output shaft, high grade ball bearings
Maximum output shaft radial load:	850 N
Maximum output shaft axial load:	700N
Torsional Rigidity :	1 Nm / Arc min.
Gearhead Inertia (at motor)	0.052 Kgcm^2

50 – 100 Watt Geared servo motor encoder HPE50-M500 series

The unit utilises the M500 series low inertia servo motor with optional dual track encoder. The motor is designed to provide long life in arduous industrial applications & utilises replaceable brushes for increased serviceability. Encoder options include a dual track TTL output or 5V differential outputs with index marker. This precision assembly is designed for use in positioning applications where positioning accuracy and repeatability is required. Typical applications include industrial pick & place machinery, scientific instrumentation, measuring equipment & medium duty tracker heads for military & nautical surveillance.

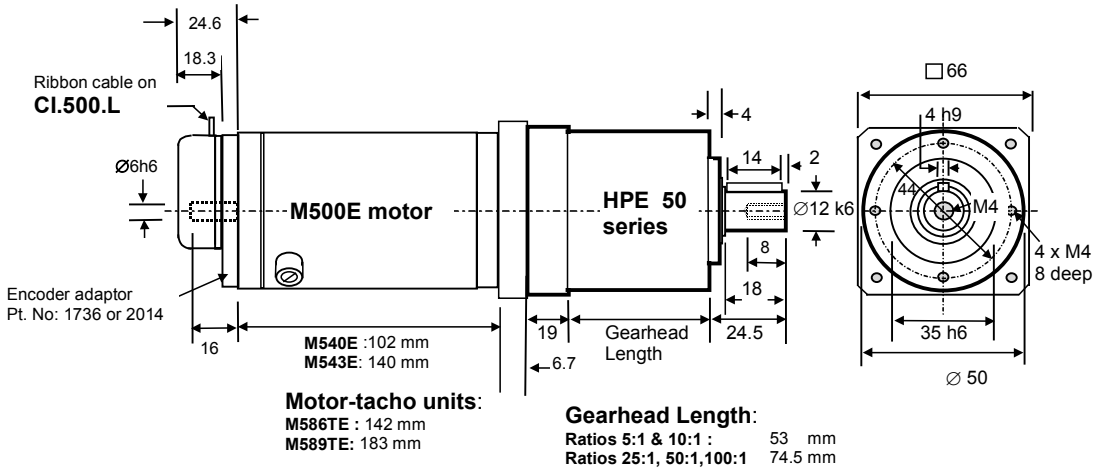
Motor encoder options:

Motor Encoder	Nominal Voltage	Encoder Resolution	Output signal
M540 CI 500T	24 Vdc	500 ppr	Dual Track TTL
M543 CI 500T	36 Vdc		
M540 CI 500L	24 Vdc	500 ppr + Index	Dual track 5V Differential
M543 CI 500L	36 Vdc		
Motor-tacho-encoder assemblies			
M586T-500T	24 Vdc	500 ppr	Dual Track TTL
M589T-500T	36 Vdc		
M586T-500L	24 Vdc	500 ppr + Index	Dual track 5V Differential
M589T-500L	36 Vdc		

Note: Where digital control is not required the encoder may be deleted

Dimensions: mm

Geared motor encoder HPE50-M500 series



Typical performance

Gearbox Model	Gear Ratio n:1	Motor Model	Rated Speed (rpm)	Rated Torque (Nm)	Peak Torque (Nm)	Positioning Resolution (counts / rev.)	Max. Backlash (arc. min.)
HPE 50 S	**5**	**M543 CI 500 ****	450	1.7	6.5	10,000	≤ 12
	10	**M540 CI 500 ***	250	1.45	9.7	20,000	
	10	**M543 CI 500 ****	220	3.4	12	20,000	
HPE 50 D	**25**	**M540 CI 500 ***	100	3.5	15	50,000	≤ 15
	25	**M543 CI 500 ****	90	6.5	15	50,000	
	50	**M540 CI 500 ***	50	6.5	15	100,000	

Note *: Geared Motor-tacho-encoder versions may be substituted by specifying M586T CI 500 units when an increase in operation speed of 20% is obtained.

Note **: Geared Motor-tacho-encoder versions may be substituted by specifying M589T CI 500 units.

General HPE 50 Gearhead data

Construction:	Single & Dual stage low backlash planetary with precision cut gears
Bearings:	Planet gears supported by needle bearings, Output shaft, high grade ball bearings
Maximum output shaft radial load:	850 N
Maximum output shaft axial load:	700N
Torsional Rigidity :	1 Nm / Arc min.
Gearhead Inertia (at motor)	Single stage: 0.063 Kgcm^2 Dual stage: 0.052 Kgcm^2

50 – 100 Watt Geared servo motor encoder HPE70-M500 series

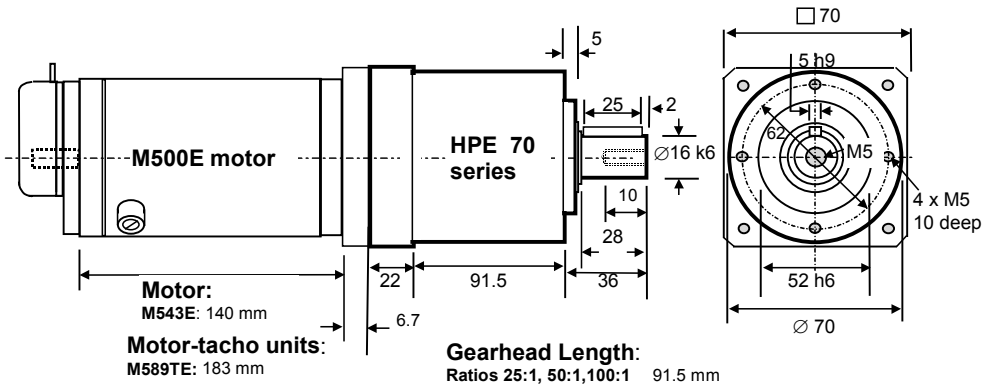
The unit utilises the M500 series servo motor with all the benefits that these units confer. These precision iron-core servo motors utilise skewed rotor technology for improved smoothness over a wide speed range. The range includes a choice of servo motor-encoder or motor-tacho-encoder units.
The use of the HPE70 gearhead enables increased torque to be obtained, the units therefore being ideal for use in low speed applications that require a combination of long life, increased torque and accurate positioning.

Motor encoder options:

Motor Encoder	Nominal Voltage	Encoder Resolution	Output signal
M543 CI 500T	36 Vdc	500 ppr	TTL
M543 CI 500L	36 Vdc		5V Differential
Motor-tacho-encoder assemblies			
M589 CI 500T	36 Vdc	500 ppr	TTL
M589 CI 500L	36 Vdc		5V Differential

Note: Where digital control is not required the encoder may be deleted

Dimensions: mm Geared motor encoder HPE70-M500 series



Typical performance

Gearbox Model	Gear Ratio n:1	Motor Model	Rated Speed (rpm)	Rated Torque (Nm)	Peak Torque (Nm)	Positioning Resolution (counts / rev.)	Max. Backlash (arc. min.)
HPE 70 D	**25**	M543 CI 500 **	90	6.1	30	50,000	≤15
	50		45	12	33	100,000	
	100		25	16.5	33	200,000	

Note **: Geared Motor-tacho-encoder versions may be substituted by specifying M589T CI 500 units.

General HPE 70 Gearhead data

Construction:	Dual stage low backlash planetary with precision cut gears
Bearings:	Planet gears supported by needle bearings, Output shaft, high grade ball bearings
Maximum output shaft radial load:	1650 N
Maximum output shaft axial load:	1600N
Torsional Rigidity :	2 Nm / Arc min.
Gearhead Inertia (at motor)	Double stage: 0.25 Kgcm^2

150 – 400 Watt Geared servo motor encoder HPE70-M600 series

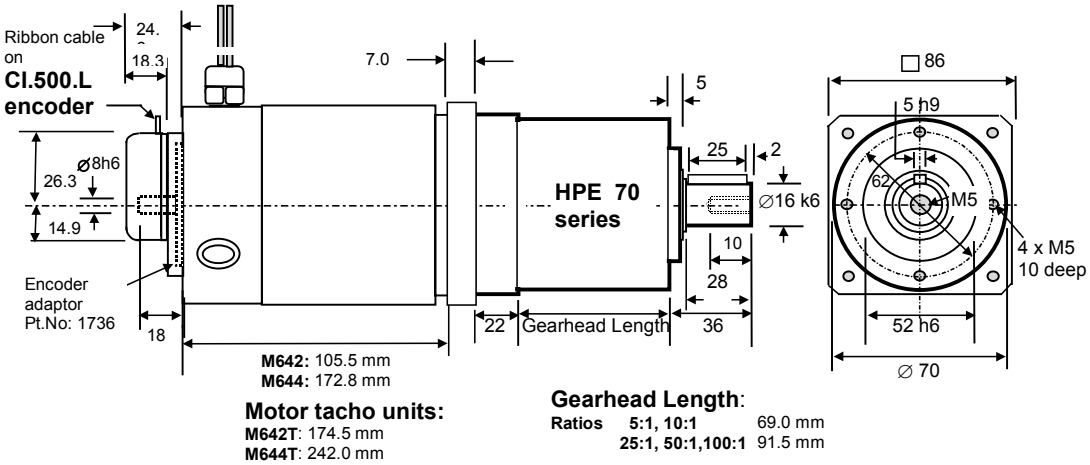
The unit utilises the M600 series servo motor –encoder assemblies with low inertia skewed rotor technology for ultra smooth performance over a wide speed range The optional dual track encoder provides positioning resolution of 2000 cpr at the motor shaft. The motor is designed to provide long life in arduous industrial applications & utilises replaceable brushes for increased serviceability. This precision assembly is designed for use in positioning applications where positioning accuracy and repeatability is required. Typical applications include industrial pick & place machinery, scientific instrumentation, measuring equipment & medium duty tracker heads for military & nautical surveillance.

Motor encoder options:

Motor Encoder	Nominal Voltage	Encoder Resolution	Output signal
M642 CI 500T	24 Vdc	500 ppr	5V Differential
M644 CI 500L	48 Vdc		
Motor-tacho-encoder assemblies			
M642T CI 500T	24 Vdc	500 ppr	TTL
M644T CI 500L	48 Vdc		5V Differential

Note: Where digital control is not required the encoder may be deleted

Dimensions: mm Geared motor encoder HPE70-M600 series



Motor tacho units:
M642T: 174.5 mm
M644T: 242.0 mm

Gearhead Length:
Ratios 5:1, 10:1 69.0 mm
25:1, 50:1,100:1 91.5 mm

Typical performance

Gearbox Model	Gear Ratio n:1	Motor Model	Rated Speed (rpm)	Rated Torque (Nm)	Peak Torque (Nm)	Positioning Resolution (counts / rev.)	Max. Backlash (arc. min.)
HPE 70 S	**5**	**M644 CI 500L**	600	5.6	11.9	10,000	≤ 12
	10	**M644 CI 500L**	300	11.3	23.8	20,000	
	10	**M642 CI 500L**	225	5	14	20,000	
HPE 70 D	**25**	**M644 CI 500L**	120	18	33	50,000	≤ 15
	25	**M642 CI 500L**	90	12	33	50,000	
	50	**M642 CI 500L**	45	18	33	100,000	

General HPE 70 Gearhead data

Construction:	Dual stage low backlash planetary with precision cut gears
Bearings:	Planet gears supported by needle bearings, Output shaft, high grade ball bearings
Maximum output shaft radial load:	1650 N
Maximum output shaft axial load:	1600N
Torsional Rigidity :	2 Nm / Arc min.
Gearhead Inertia (at motor)	Single stage: 0.31 Kgcm^2 Double stage: 0.25 Kgcm^2

150 – 400 Watt Geared servo motor encoder HPE90-M600 series

The unit utilises the M644 servo motor with all the benefits that this unit confers. These precision iron-core servo motors utilise skewed rotor technology for improved smoothness over a wide speed range. The range includes a choice of servo motor-encoder or motor-tacho-encoder units.
The use of the HPE90 gearhead enables increased torque to be obtained, the units therefore being ideal for use in low speed applications that require a combination of long life, increased torque and accurate positioning.

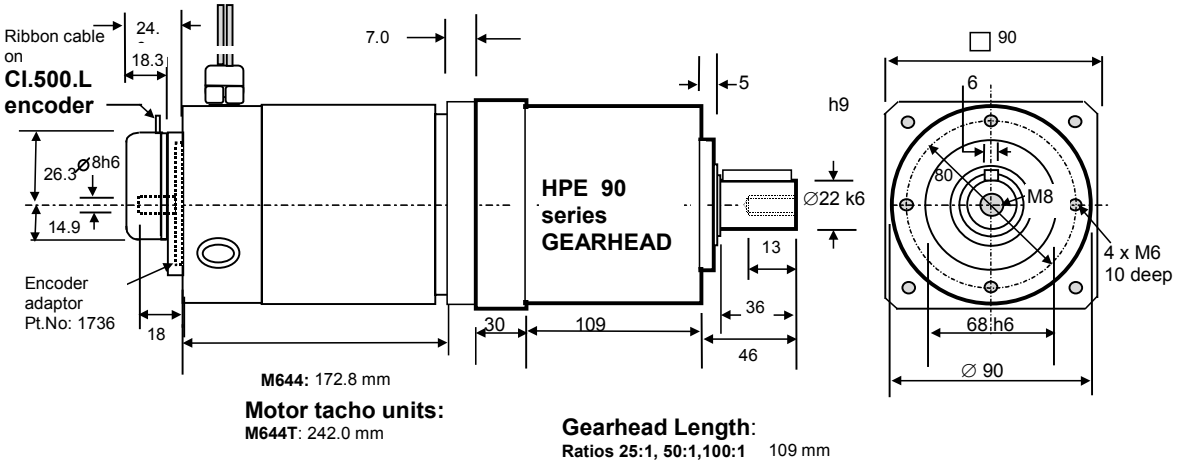
Motor encoder options:

Motor Encoder	Nominal Voltage	Encoder Resolution	Output signal
M644 CI 500L	48 Vdc	500 ppr	5V Differential
Motor-tacho-encoder assemblies			
M644T CI 500L	48 Vdc	500 ppr	5V Differential

Note: Where digital control is not required the encoder may be deleted

Dimensions: mm

Geared motor encoder HPE90-M644 series



M644: 172.8 mm

Motor tacho units:
M644T: 242.0 mm

Gearhead Length:
Ratios 25:1, 50:1,100:1 109 mm

Typical performance

Gearbox Model	Gear Ratio n:1	Motor Model	Rated Speed (rpm)	Rated Torque (Nm)	Peak Torque (Nm)	Positioning Resolution (counts / rev.)	Max. Backlash (arc. min.)
HPE 90 D	**25**	**M644 CI 500L***	120	12	42	50,000	≤ 15
	50		60	23	82	100,000	
	100		30	40	72	200,000	

Note *: Geared Motor-tacho-encoder versions may be substituted by specifying M644T CI 500 units

General HPE 90 Gearhead data

Construction:	Dual stage low backlash planetary with precision cut gears
Bearings:	Planet gears supported by needle bearings, Output shaft, high grade ball bearings
Maximum output shaft radial load:	2600 N
Maximum output shaft axial load:	2000N
Torsional Rigidity :	6 Nm / Arc min.
Gearhead Inertia (at motor)	Double stage: 1.47 Kgcm^2