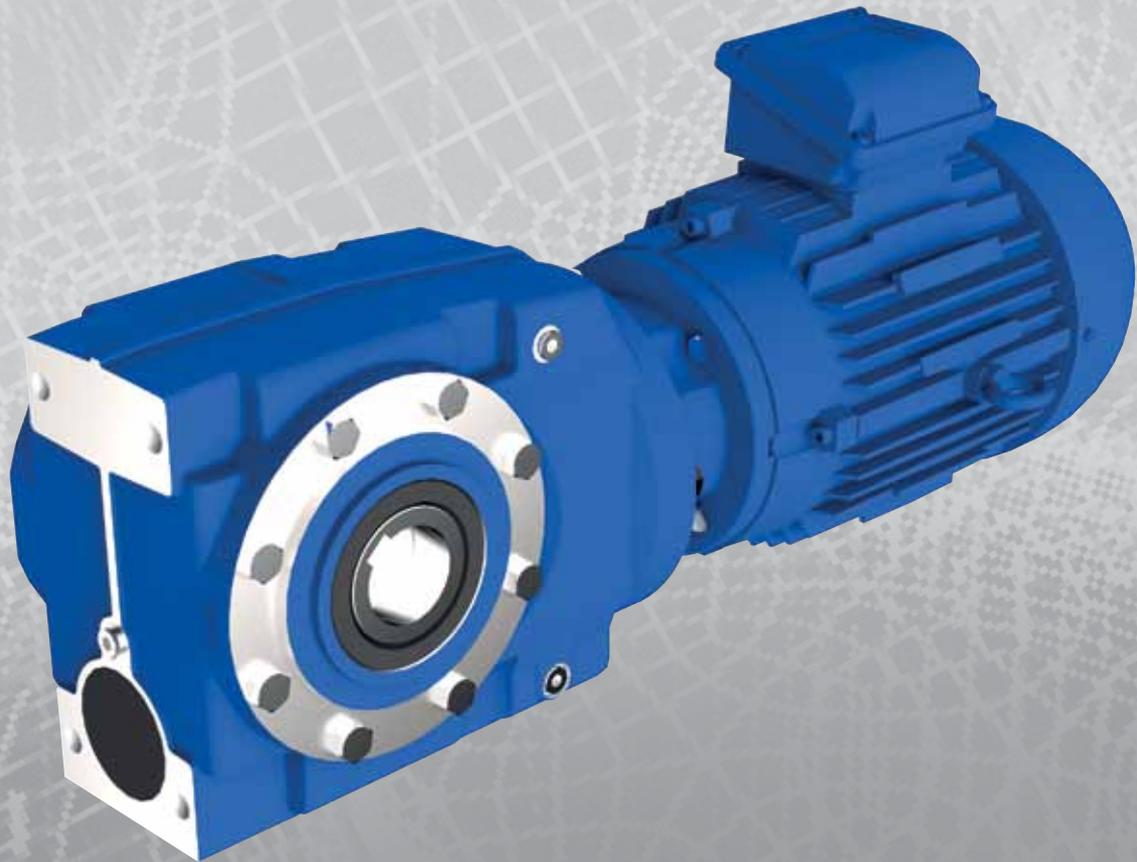


# S Series

## Helical Worm Gear Units



**RENOLD**  
Superior Gear Technology

# S SERIES

## GENERAL DESCRIPTION

### S Series

Right angle helical worm geared motors and reducers provide a highly efficient and compact solution to meet most requirements up to 45 kW with maximum output torque capacity of 10,000Nm.

Following a long line of power transmission products, this product adds to the growing family of new drives which has taken advantage of our many years of accumulated design expertise, together with the use of high quality materials and components. The end result is a series of speed reducing and geared motors offering high load carrying capacity, increased efficiency, quiet running and reliability.

#### The Range Includes

Eight sizes of units with a ratio coverage of 8:1 to 250:1 in double reduction and 16000:1 in combined units.

- Version W - Standard Unit (S03 - S06 Only)
- Version B - Standard Unit with Base Mounted Feet
- Version E - Standard Unit with End Mounted Feet
- Version R - Standard Unit with Top Mounted Feet
- Version V - Standard Unit with Drywell and Output Flange for Mounting Positions 2 & 3 (sizes S07 -S10 only)
- Version F/H - Standard Unit with Output Flange
- Version G - Standard Unit with Output Flange Reduced Diameter (size R03 only)
- Version T/Q - Standard Unit with Torque Arm
- Version U - Standard Unit Torque Arm Heavy Duty (S10 only)
- Version A - Agitator (Sizes S07 - S10 only)

#### Unit Types:

- Unit type M - Motorised with IEC Standard Motor
- Unit type D - Motorised with Compact Motor
- Unit type N - Motorised with NEMA Standard Motor
- Unit type H - Motorised with High Efficiency Motor (IE3)
- Unit type E - Motorised with NEMA High Efficiency Motor (PREMIUM)
- Unit type G - Unit to Allow Fitting of Customers IEC Motor
- Unit type A - Unit to Allow Fitting of Customers NEMA Motor
- Unit type R - Reducer Unit
- Unit type S - Reducer Unit with Fan Kit
- Unit type W - Reducer Unit with Backstop CCW Rotation
- Unit type X - Reducer Unit with Backstop CW Rotation
- Unit type Y - Reducer Unit with Fan and Backstop CW Rotation
- Unit type Z - Reducer Unit with Fan and Backstop CCW Rotation

#### Design Features Include

Patented standard motor connection (IEC or NEMA).

Ability to fit double oil seals input and output as required.

All units are dimensionally interchangeable with other major manufacturers.

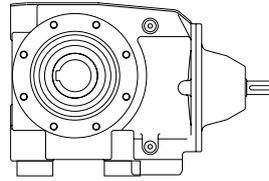
Brake geared motors are available as standard.

Sizes 03, 04, 05 and 06 are lubricated for life.

Motorised units can be fitted with a backstop module and reducer units can be fitted with a backstop and fan.

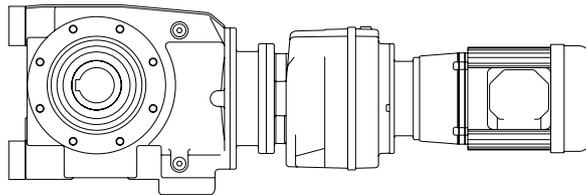
Units are manufactured and assembled from a family of modular kits for distributor friendliness minimising inventory and maximising availability.

*As improvements in design are being made continually this specification is not to be regarded as binding in detail and drawings and capacities are subject to alteration without notice. Certified drawings will be sent on request.*



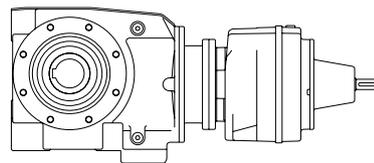
Two stage reduction unit with base mounted feet and hollow output shaft

\* S 0 4 2 1 1 8 . B R H - 1 - - - - - - - -



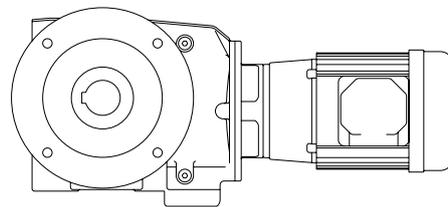
Four stage motorised unit with end mounted feet and hollow output shaft

\* S 0 4 4 1 2 8 0 E M H - 1 A . 1 8 A - -

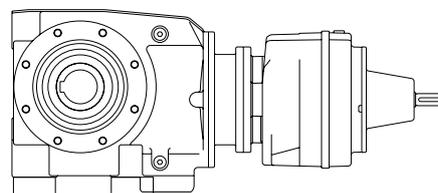


Four stage reduction unit with hollow output shaft

\* S 0 5 4 1 2 8 0 W R H - 1 - - - - - - - -

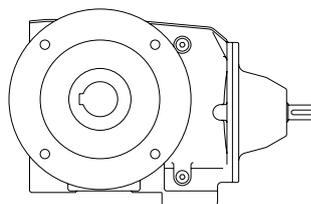


Two stage motorised unit with output flange and single extension output shaft



Four stage reduction unit with base mounted feet and hollow output shaft

\* S 0 4 4 1 2 8 0 B R H - 1 - - - - - - - -



Two stage reduction unit with output flange and single extension output shaft

\* S 0 5 2 1 1 6 0 F R C - 1 - - - - - - - -

\* Typical unit designations

# S SERIES

Gear codes													Motor codes							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
*	S																			
Example	S	0	3	2	1	5	0	.	B	M	C	-	1	D	.	1	8	A	-	-

**1 - S Series**  
Range

**2, 3 - Size of Unit**  
  Through

**4 - No of Reductions**

**5 - Revision Version**  
 For Sizes 03 to 10

**6,7,8 - Nominal Overall Ratio**  
eg.

**9 - Unit Version**

- Standard Unit (S03 - S06 Only)  
 - Standard Unit with Base Mounted Feet  
 - Standard Unit with End Mounted Feet  
 - Standard Unit with Top Mounted Feet  
 - Standard Unit with Drywell and Output Flange  
 For Mounting Position 2 & 3 (Sizes S07 - S10 only)  
 Std Unit with Output Flange  on Left  on Right  
 - Std Unit with Output Flange Reduced Dia (S03 Only)  
 Std Unit with Torque Arm  on Left  on Right  
 - Std Unit with Torque Arm - Heavy Duty (S10 Only)

**10 - Type of Unit**

- Motorized with IEC standard motor  
 - Motorized with Compact motor  
 - Motorized with NEMA standard motor  
 - Motorized with IEC high efficiency motor  
 - Motorized with NEMA high efficiency motor  
 - Unit to allow fitting of IEC motor (customer own motor)  
 - Unit to allow fitting of NEMA motor (customer own motor)  
 - Reducer unit  
 - Reducer unit with fan kit  
 - Reducer unit with backstop CCW rotation  
 - Reducer unit with backstop CW rotation  
 - Reducer unit with fan and backstop CW rotation  
 - Reducer unit with fan and backstop CCW rotation

**19 - Additional Motor Features**  
eg    
For Types Without Motor Enter

**18 - No of Motor Features**

<input type="text" value="-"/>	No motor	<u>50 Hz</u>	<u>60 Hz</u>
4 Pole (Std) 1500 rpm	<input type="text" value="A"/>	1800 rpm	<input type="text" value="B"/>
4 Pole (High) 1500 rpm	<input type="text" value="K"/>	1800 rpm	<input type="text" value="L"/>
6 Pole (Std) 1000 rpm	<input type="text" value="C"/>	1200 rpm	<input type="text" value="D"/>
6 Pole (High) 1000 rpm	<input type="text" value="M"/>	1200 rpm	<input type="text" value="N"/>
2 Pole 3000 rpm	<input type="text" value="E"/>	3600 rpm	<input type="text" value="F"/>
8 Pole 750 rpm	<input type="text" value="G"/>	900 rpm	<input type="text" value="H"/>

Dual Speed or Special Motor

**15, 16, 17 - Geared Motor Powers**  
Motor Power Required  
eg     
For Reducer or Non-Standard  
Motor Types Enter

**13, 14 - Mounting Position**  
eg

**12 - Motor Adaptor For Unit Types**  
Column 10 Entries M, N, H, E, G or A  
For All Other Types Enter

**11 - Output Shaft**

Standard Single Extension  on Left  on Right  
 Standard Double Extension

Standard Hollow Shaft   
 Unit with Hollow Shaft with Reduced Bore Dia   
 Heavy Duty Single Extension (Size S06)   
 Heavy Duty Double Extension (Size S06)

\* This page may be photocopied allowing the Customer to enter their order

# S SERIES

## EXPLANATION & USE OF RATINGS & SERVICE FACTORS

Gear unit selection is made by comparing actual loads with catalogue ratings. Catalogue ratings are based on a standard set of loading conditions, whereas actual load conditions vary according to type of application. Service Factors are therefore used to calculate an equivalent load to compare with catalogue ratings.

i.e. Equivalent Load = Actual Load x Service Factor

### Mechanical ratings and service factor Fm

Mechanical ratings measure capacity in terms of life and/or strength, assuming 10 hr/day continuous running under uniform load conditions.

Catalogue ratings allow 100% overload at starting, braking or momentarily during operation up to 10 hours per day.

The unit selected must therefore have a catalogue rating at least equal to half maximum overload.

Mechanical Service Factor Fm (Table 1) is used to modify the actual load according to daily operating time, and type of loading.

Load characteristics for a wide range of applications are detailed in Table 3 opposite, which are used in deciding the appropriate Service Factor Fm from Table 1.

If overloads can be calculated, or accurately assessed, actual loads should be used instead of Fm.

For units subjected to frequent stop/starts overloads in excess of 10 times/day multiply factor Fm x Factor Fs (table 2).

**Table 1. Mechanical Service Factor (Fm)**

Prime Mover	Duration of service hrs Per day	Load classification- driven machine		
		Uniform mass acceleration factor < 0.2	Moderate mass acceleration factor < 0.3	Heavy acceleration factor < 10
Electric Motor, Steam Turbine, or Hydraulic Motor	< 3	0.80	1.00	1.50
	3 - 10	1.00	1.25	1.75
	> 10	1.25	1.50	2.00
Multi-cylinder internal combustion engine	< 3	1.00	1.25	1.75
	3 - 10	1.25	1.50	2.00
	> 10	1.50	1.75	2.25
single cylinder internal combustion engine	< 3	1.25	1.50	2.00
	3 - 10	1.50	1.75	2.25
	> 10	1.75	2.00	2.50

Mass acceleration factor =  $\frac{\text{all external moments of inertia}^*}{\text{moment of inertia of driving motor}}$

\* calculated with reference to the motor speed

**Table 2. Number of Starts Factor (Fs)**

Starts/ stops per hour	< 1	5	10	40	60	> 200
Factor FS	1.00	1.03	1.06	1.10	1.15	1.20

Note: (1) Intermediate values are obtained by linear interpolation

### Thermal Rating (For In-line Reducers)

The Thermal Rating is the gearboxes ability to dissipate heat. If exceeded, may cause the lubricant to break down resulting in premature gear failure. A thermal check should be made in accordance with the Thermal Rating Procedure

# S SERIES

## LOAD CLASSIFICATION BY APPLICATION

**Load Classifications -** U =Uniform Load M =Moderate Shock Load H =Heavy Shock Load † =Consult our Engineers

<b>Agitators</b>		<b>Elevators</b>		<b>Machine Tools</b>		<b>Pumps</b>	
Pure liquids	U	Bucket - Uniform load	U	Bending roll	M	Centrifugal proportioning	U
Liquids and solids	M	Bucket - Heavy load	M	Punch press	H	Proportioning	M
Liquids variable density	M	Bucket - Continuous	U	Notching press	H	Reciprocating	
		Centrifugal discharge	U	Plate planer	H	Single acting 3+ cylinders	M
<b>Blowers</b>		Escalators	U	Other machine tools		Double acting 2+ cylinders	M
Centrifugal	U	Freight	M	Main drive	M	Single acting 1 & 2 cylinders	†
Lobe	M	Gravity discharge	U	Aux drive	U	Double acting 1 cylinder	†
Vane	U	Passenger lifts	†			Rotary- gear type	U
				<b>Metal mills</b>		Rotary- lobe type/ vane	U
<b>Brewing &amp; distilling</b>		<b>Fans</b>		Carriage/main drive	M	<b>Sand muller</b>	M
Bottling machinery	M	Centrifugal	U	Draw bench	M		
Brew Kettles	M	Cooling towers		Dryer	M	<b>Sewage treatment</b>	
Cookers	M	Induced draft	†	Flattening machinery	M	Bar screen	U
Mash tubs	M	Forced draft	†	Pinch drive	M	Chemical feeder	U
Scale hopper	M	Fan - Large diameter induced draft	M	Reversing slitters	M	Collector	U
		Fan - Light, small diameter	M	Scrubber rolls	M	Dewatering screw	M
<b>Can filling machinery</b>	M	<b>Feeders</b>		Table conveyors		Mixers	M
		Apron	M	Group drives	H	Scum breaker	M
<b>Crane knife</b>	M	Belt	M	Individual drives	H	Thickness	M
		Disc	U	Table conveyors- reversing	H	Vacuum filters	M
<b>Car dumper</b>	M	Reciprocating	H	Wire draw	M		
		Screw	M	Wire roll	M	<b>Screens</b>	
<b>Car puller</b>	M					Air washing	U
<b>Clarifier</b>	U	<b>Food industry</b>		<b>Mills</b>		Rotary, stone or gravel	M
		Cereal cooker	U	Cement kiln	H	Traveling water intake	U
<b>Classifier</b>	M	Dough mixer	M	Dryer, Cooler	H		
		Meat grinder	M	Kiln (other)	H	<b>Slab pushers</b>	M
<b>Clay wokring machinery</b>		Meat slicer	M	Rod plain	H		
Brick press	H	<b>Generators - not welding</b>	U	Rod wedge bar	H	<b>Slewing</b>	H
Briquette machine	H			Rotary/ Ball	H		
Clay working machinery	M	<b>Hammer mills</b>	H	Tumbling barrel	H	<b>Steering gear</b>	†
Plug mill	M					<b>Stokers</b>	U
<b>Compressors</b>		<b>Hoists</b>		<b>Mixers</b>		<b>Sugar industry</b>	
Centrifugal	U	Heavy duty	H	Concrete	M	Can knife	M
Lobe	M	Medium duty	M	Cons density	U	Crusher	M
Reciprocating		Skip hoist	M	Variable density	M	Mills	M
Multi cylinder	M	<b>Laundry</b>		<b>Oil industry</b>			
Single cylinder	H	Tumbler	M	Chiller's	M	<b>Textile industry</b>	
<b>Conveyors- Light duty uniform load</b>		Washer	M	Oil well pump	M	Batchers	
Apron	U	<b>Line shafts</b>		Filter press	M	Calenders	M
Assembly	U	Heavy duty	M	Rotary kiln	M	Cards	M
Belt	U	Light duty	U	<b>Paper industry</b>		Dry cans	M
Bucket	U			Agitator (mixer)	M	Dryers	M
Chain	U	<b>Lumber industry</b>		Barker (hydraulic)	M	Dyeing machinery	M
Flight	U	Barkers	M	Barker (mechanical)	H	Knitting machinery	M
Oven	U	Burner conveyor	H	Barking drum	H	Looms	M
Screw	U	Chain/ Drag saw	H	Beater & Pulper	M	Mangles	M
		Chain transfer	H	Bleacher	U	Nappers	M
<b>Conveyors - Heavy duty uniform load</b>		Chain way transfer	H	Calednders	M	Pads	M
Apron	M	De- barking drum	H	Calenders- super	H	Range drive	M
Assembly	M	Edger feed	M	Converting machine	M	Slashers	M
Belt	M	Gang feed	M	Conveyors	U	Soapers	M
Bucket	M	Green chain	M	Couch	M	Spinners	M
Chain	M	Live roll	H	Cutters - plates	H	Tenter frame	M
Flight	M	Log deck	H	Cylinders	M	Washers	M
Live roll	†	Log haul	H	Dryers	M	Winders	M
Oven	M	Log turning	H	Felt stretcher	M		
Reciprocating	M	Log haul	H	Felt whipper	H	<b>Windlass</b>	†
Screw	M	Log turning	H	Jordans	M		
Shaker	M	Log conveyoyr	H	Log haul	H		
		Of bearing roll	M	Machine real	M		
<b>Cranes</b>	†	Planer feed chaines	M	Presses	M		
		Planer hoist	M	Stock chest	M		
<b>Crusher</b>		Re-saw conveyor	M	Suction roll	M		
Ore	H	Roll cases	H	Washers & thickeners	M		
Stone	H	Slab conveyor	H	Winders	M		
Sugar	H	Sorting table - triple hoist	M				
		Triple hoist - Drive /conveyor	M	<b>Printing presses</b>	†		
<b>Dredger</b>		Transfer conveyor	M				
Cable reals	M	Transfer roll	M	<b>Pullers</b>			
Conveyors	M	Tray drive	M	Barge haul	H		
Cutter head drive	H	Trimmer feed	M				
Pumps	M	Waster conveyor	M				
Screen drive	H	Small waste conveyor (belt)	U				
Stackers	M	Small waste conveyor (chain)	U				
Winches	M						

# S SERIES

## SELECTION PROCEDURE FOR MOTORISED UNITS

### EXAMPLE APPLICATION DETAILS

Absorbed power of driven machine = 0.7 kW  
 Output speed of gearbox or Input speed of machine = 68 rev/min  
 Application = Uniformly loaded belt conveyor  
 Duration of service (hours per day) = 24hrs  
 Mounting position = 1  
 Ambient temperature = 20°C  
 Running time (%) = 100%

### Note!

If you select a S Series Reducer for use without TEFC motor, A thermal check must be made.

### 1 DETERMINE MECHANICAL SERVICE FACTOR (Fm)

Refer to Load Classification by Application, table 3, page 6

Application = Uniformly loaded belt conveyor

#### Conveyors-uniformly loaded or fed

apron	U	U = Uniform load
assembly	U	
belt	U	
bucket	U	
chain	U	

Refer to mechanical service factor (Fm)

Duration of service (hours per day) = 24hrs

Prime mover	Duration of services per day	Load classification	
		Uniform	Moderate
Electric motor, steam turbine or hydraulic motor	< 3	0.80	1.00
	3 - 10	1.00	1.25
	> 10	1.25	1.50

Therefore mechanical service factor (Fm) = 1.25

If the unit is subject to frequent start/stops Fm must be multiplied by factor Fs

### 2 DETERMINE REQUIRED OUTPUT TORQUE AT GEARBOX OUTPUT SHAFT

Absorbed output torque =  $\frac{\text{Absorbed power} \times 9550}{\text{Gearbox output speed}}$

$$\frac{0.7 \times 9550}{68} = 98 \text{ Nm}$$

### 3 SELECT GEARED MOTOR

Refer to selection table one motor size larger than absorbed power.

Absorbed power = 0.7 kW, therefore refer to 0.75 kW selection table.

Always select from 4 POLE selection table in the first instance as this offers a more economical solution.

Required output speed of gearbox = 68 rev/min

**0.75 kW**

**4 POLE**

N2 R/MIN	i	M2 Nm	Fm	N	UNIT DESIGNATION	Kg	
Output Speed	Ratio	Output Torque	Service Factor	Overhung Load	Column Entry <input type="text" value="1"/> Through <input type="text" value="20"/> Spaces to be filled when entering order	Weight of Base Mount Unit	Motor Frame Size
165	8.59	36	2.24	2841	S 0 3 2 1 8 . 0 _ M _ _ _ . 7 5 A - -	19.5	80A
122	11.61	48	1.81	2837	1 1 .		
107	13.20	54	1.65	2832	1 2 .		
95	14.95	62	1.51	2832	1 4 .		
86	16.36	60	1.44	2827	1 6 .		
74	19.12	78	1.27	2821	1 8 .		
69	20.61	84	1.2	2821	2 0 .		
64	22.11	80	1.18	2821	2 2 .		
56	25.14	90	1.08	2810	2 5 .		
50	28.48	101	1	2810	2 8 .		

Go to point 4

# S SERIES

## SELECTION PROCEDURE FOR MOTORISED UNITS

### 4 CHECK OUTPUT TORQUE

Output torque (M2) of selected unit must be equal or more than required output torque at gearbox outputshaft.

Required output torque at gearbox outputshaft = 98 Nm.

0.75 kW 4 POLE	N2 R/MIN	i	M2 Nm	Fm	N	UNIT DESIGNATION	Kg	
	Output SPEED	Ratio	Output Torque	Service Factor	Overhung Load	Column Entry <input type="text" value="1"/> Through <input type="text" value="20"/> Spaces to be filled when entering order	Weight of Base Mount Unit	Motor Frame Size
	74	19.12	78	1.27	2821	S 0 3 2 1 1 8 . _ M _ _ _ . 7 5 A _ _	19.5	80A
69	20.61	84	1.2	2821	2 0 .			
64	22.11	80	1.18	2821	2 2 .			

However the output torque is only 84 against the requirement of 98 Nm, hence a unit fitted with a 1.1 kW motor is required

1.1 kW 4 POLE	N2 R/MIN	i	M2 Nm	Fm	N	UNIT DESIGNATION	Kg	
	Output SPEED	Ratio	Output Torque	Service Factor	Overhung Load	Column Entry <input type="text" value="1"/> Through <input type="text" value="20"/> Spaces to be filled when entering order	Weight of Base Mount Unit	Motor Frame Size
	74	19.12	115	0.86	2800	S 0 3 2 1 1 8 . _ M _ _ _ . 1 - 1 A _ _	24.5	90S
68	20.61	123	0.82	2800	2 0 .			
64	22.11	117	1.8	2800	2 2 .			

Selected unit's output torque (M2) = 123 Nm, therefore the torque from a 1.1 kW motor is acceptable.

### 5 CHECK SERVICE FACTOR

Service factor (Fm) of selected unit must be equal or more than required service factor.

Required service factor of gearbox = 1.25

1.1 kW 4 POLE	N2 R/MIN	i	M2 Nm	Fm	N	UNIT DESIGNATION	Kg	
	Output SPEED	Ratio	Output Torque	Service Factor	Overhung Load	Column Entry <input type="text" value="1"/> Through <input type="text" value="20"/> Spaces to be filled when entering order	Weight of Base Mount Unit	Motor Frame Size
	74	19.12	115	0.86	2800	S 0 3 2 1 1 8 . _ M _ _ _ . 1 - 1 A _ _	24.5	90S
68	20.61	123	0.82	2800	2 0 .			
64	22.11	117	0.8	2800	2 2 .			
86	16.36	91	1.57	5275	S 0 4 2 1 1 6 . 0 _ M _ _ _ . 1 - 1 A _ _	26.5	90S	
74	19.12	117	1.43	5275	S 0 4 2 1 1 8 . 0			
68	20.61	125	1.36	5275	S 0 4 2 1 2 0 . 0			
64	22.11	121	1.28	5275	S 0 4 2 1 2 2 . 0			

The service factor (Fm) is only 0.82, therefore this unit is not acceptable and a larger S0421 unit must be selected with a service factor (Fm) of 1.36

### 5 CHECK OVERHUNG LOADS

If sprocket, gear, etc is mounted on the outputshaft then refer to Overhung Loads Procedure, and compare with allowable overhung load (N) of selected unit

Allowable overhung load (N) must be equal or more than calculated overhung load (P)

1.1 kW 4 POLE	N2 R/MIN	i	M2 Nm	Fm	N	UNIT DESIGNATION	Kg	
	Output Speed	Ratio	Output Torque	Service Factor	Overhung Load	Column Entry <input type="text" value="1"/> Through <input type="text" value="20"/> Spaces to be filled when entering order	Weight of Base Mount Unit	Motor Frame Size
	164	8.59	54	2.51	5286	S 0 4 2 1 8 . 0 _ M _ _ _ . 1 - 1 A _ _	24.5	90S
121	11.61	72	2.04	5279	1 1 .			
107	13.20	82	1.87	5280	1 2 .			
94	14.95	92	1.71	5275	1 4 .			
86	16.36	91	1.57	5275	1 6 .			
74	19.12	117	1.43	5275	1 8 .			
68	20.61	125	1.36	5275	2 0 .			
64	22.11	121	1.28	5275	2 2 .			

NOTE: If any of the following conditions occur then consult our Application Engineers:-

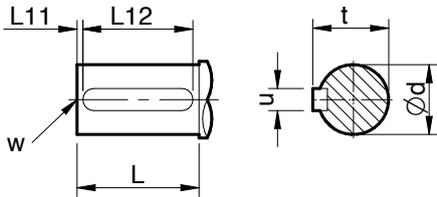
a) Inertia of the Driven Machine (Referred to motor speed) >10  
Inertia of Gear Unit plus the Motor

b) Ambient temperature is above 40°C

# S SERIES

## OUTPUT OPTIONS

### OUTPUTSHAFT OPTIONS. COLUMN 11 ENTRY



\* Inch shafts have open ended keyways, therefore no 'L11' dimension is required

### Column 11 Entry

Standard Single Extension C on Left E on Right

Standard Double Extension D

Std Heavy Duty Single Extension (Size S06) J

Std Heavy Duty Double Extension (Size S06) K

Inch Single Extension N on Left B on Right

Inch Double Extension P

Inch Heavy Duty Single Extension (Size S06) L

Size	Type of Output Shaft	Column 11 Entry	Dimensions in mm (Inch shaft in inches)						
			ød	L	L11	L12	t	u	w
S03	Metric - Standard	C, E, D	20.015 / 20.002	35	3	31.2	2.5	6	M6 x 1.0 x 16
	Inch	N, B, P	0.7500" / 0.7495"	1.38"	*	1.28"	0.83"	0.19"	1/4 UNF x 0.63"
S04	Metric - Standard	C, E, D	25.015 / 25.002	46	3	42	28	8	M10 x 1.5 x 22
	Inch	N, B, P	1.0000" / 0.9995"	1.81"	*	1.69"	1.10"	0.25"	1/4 UNF x 0.63"
S05	Metric - Standard	C, E, D	30.015 / 30.002	60	3	53	33	8	M10 x 1.5 x 22
	Inch	N, B, P	1.2500" / 1.2494"	2.36"	*	2.125"	1.36"	0.25"	3/8 UNF x 0.87"
S06	Metric - Standard	C, E, D	35.018 / 35.002	63	3	55	38	10	M12 x 1.75 x 22
	Metric - Heavy Duty	J, K	45.018 / 45.002	98	5	80	48.5	14	M16 x 2.0 x 36
	Inch	N, B, P	1.3750" / 1.3744"	2.48"	*	2.34"	1.51"	0.313"	1/2 UNF x 1.125"
	Inch - Heavy Duty	L	1.7500" / 1.7494"	3.86"	*	3.75"	1.92"	0.375"	5/8 UNF x 1.44"
S07	Metric - Standard	C, E, D	45.018 / 45.002	76	3	70	48.5	14	M16 x 2.0 x 36
	Inch	N, B, P	1.7500" / 1.7494"	2.99"	*	2.625"	1.917"	0.375"	5/8 UNF x 1.44"
S08	Metric - Standard	C, E, D	60.030 / 60.011	120	3	110	64	18	M20 x 2.5 x 42
	Inch	N, B	2.3750" / 2.3744"	4.72"	*	4.125"	2.646"	0.625"	3/4 UNF x 1.75"
	Inch - Double Ext	P	2.3125" / 2.3115"	4.72"	*	4.125"	2.582"	0.625"	3/4 UNF x 1.75"
S09	Metric - Standard	C, E, D	70.030 / 70.011	135	3	125	74.5	20	M20 x 2.5 x 42
	Inch	N, B	2.8750" / 2.8740"	5.12"	*	4.5"	3.20"	0.75"	3/4 UNF x 1.75"
	Inch - Double Ext	P	2.6875" / 2.6865"	5.12"	*	4.5"	2.963"	0.625"	3/4 UNF x 1.75"
S10	Metric - Standard	C, E, D	90.035 / 90.013	170	3	160	95	25	M24 x 3.0 x 50
	Inch	N, B	3.6250" / 3.6240"	6.69"	*	5.875"	4.009"	0.875"	1 UNF x 2.25"
	Inch - Double Ext	P	3.1875" / 3.1865"	6.69"	*	5.875"	3.518"	0.750"	1 UNF x 2.25"

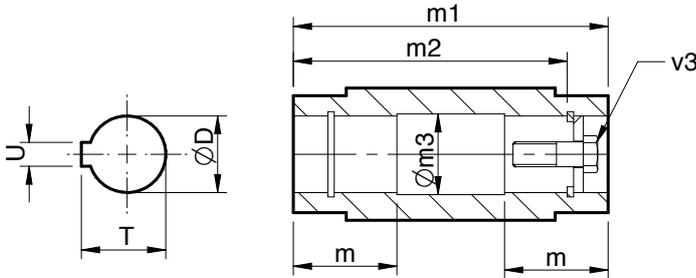
# S SERIES

## OUTPUTBORE OPTIONS

**OUTPUT BORE OPTIONS,  
COLUMN 11 ENTRY**

**Column 11 Entry**

- Metric Hollow Shaft H
- Inch Hollow Shaft A
- Metric Hollow Shaft with reduced bore diameter Z



Size	Type of Bore	Column 11 Entry	Dimensions in mm (Inch shaft in inches)							
			øD	m	m1	m2	øm3	T	U	v3
S03	Standard	H	20.021/20.000	52	124	104	20.2	22.9	6	M6 x 1.0 x 40
	Inch	A	0.7508"/0.7500"	2.05"	4.88"	4.13"	0.76"	0.84"	0.188"	1/4" UNF x 1 1/2"
S04	Standard	H	30.021/30.000	54	130	122	30.2	33.5	8	M10 x 1.5 x 50
	Reduced Dia	Z	25.021/25.000	54	130	125	25.2	28.5	8	M10 x 1.5 x 50
	Inch	A	1.2510"/1.2500"	2.13"	5.12"	4.81"	1.26"	1.37"	0.25"	3/8 UNF x 2"
S05	Standard	H	35.025/35.000	56	140	127	35.3	38.5	10	M12 x 1.75 x 55
	Reduced Dia	Z	30.021/30.000	56	140	127	30.3	33.5	8	M10 x 1.5 x 45
	Inch	A	1.3760"/1.3750"	2.20"	5.52"	5.00"	1.39"	1.53"	0.313"	1/2" UNF x 2"
S06	Standard	H	45.025/45.000	70	180	156	45.3	49	14	M16 x 2.0 x 70
	Reduced Dia	Z	40.025/40.000	70	180	156	40.3	43.5	12	M16 x 2.0 x 70
	Inch	A	1.5010"/1.5000"	2.76"	7.08"	6.14"	1.51"	1.67"	0.375"	5/8" UNF x 2 3/4"
S07	Standard	H	60.030/60.000	79	218	188	60.5	64.6	18	M20 x 2.5 x 80
	Reduced Dia	Z	50.030/50.000	79	218	191	50.5	54	14	M16 x 2.0, x 70
	Inch	A	2.0010"/2.0000"	3.11"	8.58"	7.41"	2.02"	2.23"	0.50"	5/8" UNF x 3"
S08	Standard	H	70.030/70.000	90	250	220	70.5	75.1	20	M20 x 2.5 x 80
	Reduced Dia	Z	60.030/60.000	90	250	220	60.5	64.6	18	M20 x 2.5 x 80
	Inch	A	2.3760"/2.3750"	3.54"	9.84"	8.68"	2.40"	2.66"	0.625"	3/4" UNF x 3"
S09	Standard	H	90.035/90.000	107.5	300	265	90.5	95.6	25	M24 x 3.0 x 110
	Reduced Dia	Z	70.030/70.000	107.5	300	270	70.5	75.1	20	M20 x 2.5, x100
	Inch	A	2.7510"/2.7500"	4.23"	11.82"	10.65"	2.76"	3.04"	0.625"	3/4" UNF x 4 1/4"
S10	Standard	H	100.035/100.000	132.5	350	313	100.5	106.6	28	M24 x 3.0 x 110
	Reduced Dia	Z	80.030/80.000	132.5	350	313	80.5	85.6	22	M20 x 2.5 x 100
	Inch	A	3.2510"/3.2500"	5.22"	13.78"	12.32"	3.26"	3.59"	0.75"	1" UNF x 4 1/4"