

High efficiency aluminium induction motors

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## IE3/IE4 induction motors



### Cooling System

#### Fan Cover

- Better air flow distribution over frame
- Increased mechanical strength
- Provisions for encoder and drip cover

#### Fan

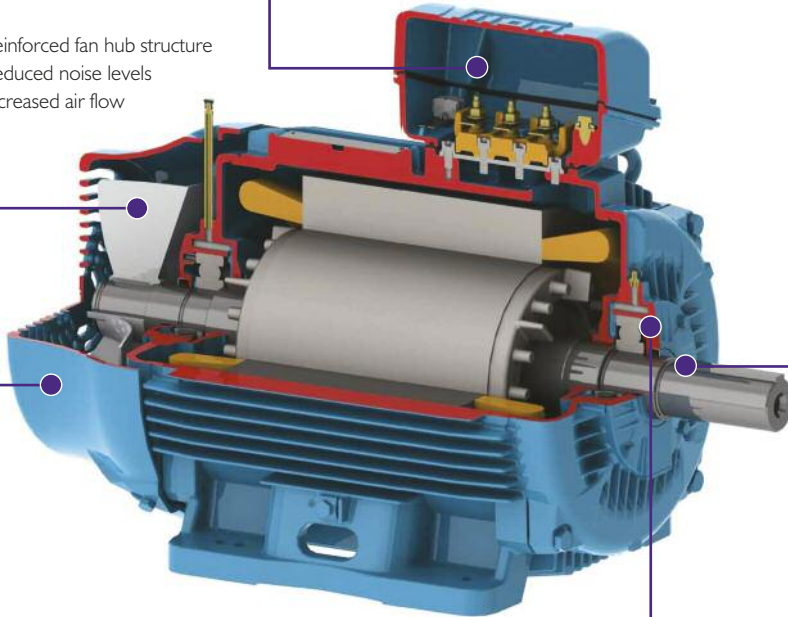
- Reinforced fan hub structure
- Reduced noise levels
- Increased air flow

### Terminal Box

- Better connection quality
- Easier cable handling during installation
- Easier maintenance

### Sealing System

- The exclusive WSeal® for frame sizes 225S/M to 355A/B
- Increased dust and moisture protection
- Increased protection to high-pressure cleaning



### Frame

- Reduced temperature on windings and bearings
- Reduced noise levels

#### Two Eyebolts

- Easier handling
- Higher mechanical resistance

#### Solid Feet

- More impact resistance
- Ideal for high vibration
- Easier installation and alignment

### Bearing Caps

#### External

- Ribbed surface for improvement of bearing heat dissipation

#### Internal

- Improved bearing lubrication
- Reduced bearing temperature extending lubrication times



# IE3 Premium efficiency aluminium induction motors



This range of motors have been designed to operate with maximum energy efficiency, high performance reliability, eliminating unplanned stops and delays in production.

The exclusive WISE insulation system increases the dielectric resistance, allowing variable speed drive operation up to 575V without further modification, which results in flexibility and extended motor life.

### Features

- IE3 High efficiency construction
- Class 'F' insulation
- WISE (Weg Insulation System Evolution) suitable for inverter duty applications
- Steel fan covers
- Metric cable entries

### Technical specification

Rated motor power ..... 0.25 to 7.5kW  
 Number of poles ..... 2, 4 or 6  
 Frame sizes ..... 63-132S/M  
 Material ..... Aluminium  
 Frequency ..... 50-60Hz  
 Voltage  
 Up 100L ..... 220-240V a.c.  
 112M to 132S/M ..... 380-415V a.c.  
 Service factor ..... 1.00  
 Ambient temperature ..... 40°C  
 Protection rating ..... IP55  
 Vibration level ..... Grade A  
 Continuous duty ..... S1

### Options available

- Encoder modules
- Brake units
- Range of mountings – Flange FF, C, C-DIN
- Thermal protection thermostats, RTD (PT100)
- Protection ratings of IP56, IP65 or IP66
- Space heaters
- Stainless steel shafts
- Vibration monitoring

## 2 Pole 3000rpm @ 50Hz

Rated Motor Power	Frame Size	Foot Mounted		Flange Mounted	
		Order Code	List Price	Order Code	List Price
0.25kW	D63	0-252B3WAIE3	£171.10	0-252B5WAIE3	£183.28
0.37kW	D71	0-372B3WAIE3	£186.42	0-372B5WAIE3	£206.18
0.55kW	D71	0-552B3WAIE3	£190.83	0-552B5WAIE3	£213.07
0.75kW	D80	0-752B3WAIE3	£218.37	0-752B5WAIE3	£240.61
1.1kW	D80	1-12B3WAIE3	£234.60	1-12B5WAIE3	£256.85
1.5kW	D90S	1-52B3WAIE3	£270.68	1-52B5WAIE3	£294.79
2.2kW	D90L	2-22B3WAIE3	£306.80	2-22B5WAIE3	£330.90
3.0kW	D100L	32B3WAIE3	£400.60	32B5WAIE3	£435.83
4.0kW	D112M	42B3WAIE3	£461.97	42B5WAIE3	£504.61
5.5kW	D132S	5-52B3WAIE3	£633.43	5-52B5WAIE3	£698.32
7.5kW	D132S	7-52B3WAIE3	£721.83	7-52B5WAIE3	£786.72

## 4 Pole 1500rpm @ 50Hz

Rated Motor Power	Frame Size	Foot Mounted		Flange Mounted	
		Order Code	List Price	Order Code	List Price
0.25kW	D71	0-254B3WAIE3	£190.83	0-254B5WAIE3	£210.59
0.37kW	D71	0-374B3WAIE3	£195.23	0-374B5WAIE3	£215.00
0.55kW	D80	0-554B3WAIE3	£207.13	0-554B5WAIE3	£229.38
0.75kW	D80	0-754B3WAIE3	£220.18	0-754B5WAIE3	£242.43
1.1kW	D90	1-14B3WAIE3	£252.67	1-14B5WAIE3	£276.77
1.5kW	D90	1-54B3WAIE3	£295.97	1-54B5WAIE3	£320.08
2.2kW	D100L	2-24B3WAIE3	£369.94	2-24B5WAIE3	£405.17
3.0kW	D100L	34B3WAIE3	£445.74	34B5WAIE3	£480.97
4.0kW	D112M	44B3WAIE3	£545.00	44B5WAIE3	£587.64
5.5kW	D132S	5-54B3WAIE3	£703.80	5-54B5WAIE3	£746.44
7.5kW	D132M	7-54B3WAIE3	£842.75	7-54B5WAIE3	£907.63

## 6 Pole 1000rpm @ 50Hz

Rated Motor Power	Frame Size	Foot Mounted		Flange Mounted	
		Order Code	List Price	Order Code	List Price
0.75kW	D90SL	0-756B3WAIE3	£286.92	0-756B5WAIE3	£311.03
1.1kW	D100L	1-16B3WAIE3	£308.58	1-16B5WAIE3	£332.68
1.5kW	D100L	1-56B3WAIE3	£382.59	1-56B5WAIE3	£417.82
2.2kW	D112M	2-26B3WAIE3	£467.39	2-26B5WAIE3	£510.03
3.0kW	D132S	36B3WAIE3	£660.50	36B5WAIE3	£725.38
4.0kW	D132M	46B3WAIE3	£754.32	46B5WAIE3	£819.20

For higher kW ratings please contact sales

## IE4 Super premium efficiency cast iron induction motors



NEW



The super premium efficiency (IE4) level established in IEC 60034-30-1:2014 is considered the highest efficiency class which a squirrel cage induction motor can achieve whilst remaining economically viable.

It is also the optimum solution to increase the efficiency of an existing application through direct replacement.

### Features

- IE4 Super premium efficiency construction
- Class 'F' insulation
- WISE (Weg Insulation System Evolution) suitable for inverter duty applications
- Steel fan covers
- Metric cable entries

### Technical specification

Rated motor power . . . . . 3.0 to 55kW  
 Number of poles . . . . . 2, 4 or 6  
 Frame sizes . . . . . 132S-250S/M  
 Material . . . . . Cast iron  
 Frequency . . . . . 50Hz  
 Voltage . . . . . 220/380V a.c.  
 Service factor . . . . . 1.00  
 Ambient temperature . . . . . -20 to +40°C  
 Protection rating . . . . . IP55  
 Vibration level . . . . . Grade A and B  
 Continuous duty . . . . . S1

### Options available

- Encoder modules
- Brake units
- Range of mountings – Flange FF, C, C-DIN
- Thermal protection thermostats, RTD (PT100)
- Protection ratings of IP56, IP65 or IP66
- Space heaters
- Stainless steel shafts
- Vibration monitoring

## 2 Pole 3000rpm @ 50Hz

		Foot Mounted		Flange Mounted	
Rated Motor Power	Frame Size	Order Code	List Price	Order Code	List Price
5.5kW	132S	5-52B3WFIE4	£932.00	5-52B5WFIE4	£1,004.00
7.5kW	L132S	7-52B3WFIE4	£1,064.00	7-52B5WFIE4	£1,136.00
9.2kW	L132M/L	9-22B3WFIE4	£1,336.00	9-22B5WFIE4	£1,384.00
11.0kW	160M	112B3WFIE4	£1,805.00	112B5WFIE4	£1,908.00
15.0kW	160M	152B3WFIE4	£2,000.00	152B5WFIE4	£2,104.00
18.5kW	160L	18-52B3WFIE4	£2,316.00	18-52B5WFIE4	£2,424.00
22.0kW	180M	222B3WFIE4	£3,020.00	222B5WFIE4	£3,188.00
30.0kW	200L	302B3WFIE4	£4,260.00	302B5WFIE4	£4,484.00
37.0kW	200L	372B3WFIE4	£4,504.00	372B5WFIE4	£4,728.00
45.0kW	225S/M	452B3WFIE4	£7,136.00	452B5WFIE4	£7,580.00
55.0kW	250S/M	552B3WFIE4	£8,420.00	552B5WFIE4	£8,960.00

## 4 Pole 1500rpm @ 50Hz

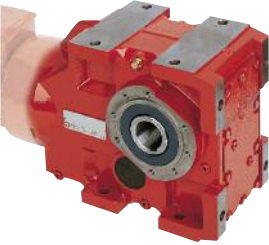
		Foot Mounted		Flange Mounted	
Rated Motor Power	Frame Size	Order Code	List Price	Order Code	List Price
5.5kW	L132S	5-54B3WFIE4	£1,040.00	5-54B5WFIE4	£1,108.00
7.5kW	L132M/L	7-54B3WFIE4	£1,240.00	7-54B5WFIE4	£1,312.00
9.2kW	160M	9-24B3WFIE4	£1,580.00	9-24B5WFIE4	£1,624.00
11.0kW	160M	114B3WFIE4	£1,920.00	114B5WFIE4	£2,020.00
15.0kW	L160L	154B3WFIE4	£2,136.00	154B5WFIE4	£2,236.00
18.5kW	L180M	18-54B3WFIE4	£3,144.00	18-54B5WFIE4	£3,308.00
22.0kW	L180L	224B3WFIE4	£3,476.00	224B5WFIE4	£3,648.00
30.0kW	200L	304B3WFIE4	£4,368.00	304B5WFIE4	£4,592.00
37.0kW	225S/M	374B3WFIE4	£5,788.00	374B5WFIE4	£6,232.00
45.0kW	225S/M	454B3WFIE4	£6,624.00	454B5WFIE4	£7,076.00
55.0kW	250S/M	554B3WFIE4	£8,116.00	554B5WFIE4	£8,660.00

## 6 Pole 1000rpm @ 50Hz

		Foot Mounted		Flange Mounted	
Rated Motor Power	Frame Size	Order Code	List Price	Order Code	List Price
3.0kW	132S	36B3WFIE4	£972.00	36B5WFIE4	£1,044.00
4.0kW	132M	46B3WFIE4	£1,112.00	46B5WFIE4	£1,184.00
5.5kW	L132M/L	5-56B3WFIE4	£1,332.00	5-56B5WFIE4	£1,400.00
7.5kW	160M	7-56B3WFIE4	£1,904.00	7-56B5WFIE4	£2,008.00
9.2kW	160L	9-26B3WFIE4	£2,624.00	9-26B5WFIE4	£2,332.00
11.0kW	160L	116B3WFIE4	£2,440.00	116B5WFIE4	£2,540.00

For higher kW ratings please contact sales

## Pujol gearboxes



Pujol produce a wide range of heavy duty geared motors, gearboxes and transmission components.

The parameters used in the design, manufacture and quality control have allowed Pujol to produce a range of high quality products with the versatility to meet most customer applications. Standardisation of product sizes permits the use of Pujol gearboxes and flanges to be used with other electrical motor manufacturer products under the IEC-20 42677/42948.

Right angle or in line gearboxes are available with worm or bevel helical mechanisms. Units are constructed in either aluminium or cast iron. Reduction ratios, speeds, torque and

shaft sizes can configured to customer requirements.

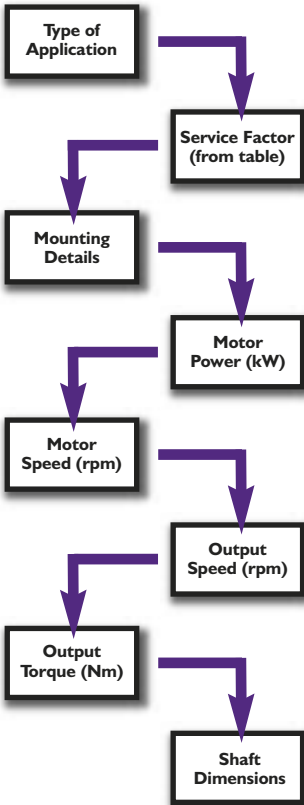
With such a diverse range of products it is not possible to list all options and configurations in this catalogue.

The following information can only provide an overview of the Pujol range. To determine an accurate specification or discuss an application please contact our Head Office Sales Department on 01254 685900.

Our sales advisors will be able to assist you with your enquiry or arrange for site visit to help specify the correct unit for your application.



## Your guide to selecting the right Pujol gearbox



In order to specify the right gearbox, you need to find the answers to these questions;

### Application:

- Where will the gearbox be used?
- Find the load service factor for your application (see the table on page 166)
- Gearbox mounting details

### Inputs:

- Motor power (kW)
- Motor speed (rpm)

### Outputs:

- Output speed (rpm)
- Output torque (Nm)
- Shaft dimensions

### What happens next . . .

You now have most of the information you need to select the correct Pujol gearbox. Take a note of all the information above and call the LC Automation Head Office Sales Department on 01254 685900, they will run through all the different options available, make sure you have chosen the right unit and provide an accurate quote for your gearbox.

### Calculating motor power, torque and output speed

Motor power - P (kW), torque - T (Nm) and output speed - N (rpm) are important variables in selecting gearbox. But if you have two, it is easy to work out the third variable using the following equations;

$$\text{Power (P)} = \frac{N \times T}{9550}$$

$$\text{Torque (T)} = \frac{9550 \times P}{N}$$

$$\text{Speed (N)} = \frac{9550 \times P}{T}$$

## Types of load and their service factors

The service factor shows the workload placed on the gearbox in everyday usage. The colour on this selection table relates to our service factor information booklet.

### Fans

Centrifugal (balanced) . . . . . Uniform Load  
 For cooling towers . . . . . Moderate Load  
 For forced air flow . . . . . Moderate Load  
 For mines . . . . . Moderate Load

### Cranes

Derrick . . . . . Uniform Load  
 Slewing . . . . . Uniform Load  
 Transfer movement . . . . . Moderate Load  
 Drum movement . . . . . Heavy Load

### Metal industry

Drawing benches . . . . . Heavy Load  
 Stamping presses . . . . . Heavy Load  
 Cutting machines . . . . . Heavy Load  
 Small rolling machines . . . . . Heavy Load

### Mixers

Constant density . . . . . Uniform Load  
 Irregular density . . . . . Moderate Load  
 Concrete . . . . . Moderate Load

### Transmissions for industrial;

Equipment machines . . . . . Moderate Load  
 Sub-group movement . . . . . Moderate Load  
 Secondary transmissions . . . . . Uniform Load

### Crushers

Mineral . . . . . Moderate Load  
 Stone . . . . . Moderate Load

### Mills (rotary type)

Ball . . . . . Heavy Load  
 Ring roll . . . . . Heavy Load  
 For cement . . . . . Moderate Load

### Washing machines

Washing machines/pumps . . . . . Moderate Load

### Service factors

Operating Time Per Day	Type of Load		
	Uniform Load	Moderate Load	Heavy Load
0.5 hours	0.5	0.8	1.25
3 hours	0.8	1.0	1.5
8 - 10 hours	1.0	1.25	1.75
24 hours	1.25	1.5	2.0

- Service factor of less than one
- Service factor of between one & two
- Service factor of more than two

## Your guide to selecting the right Pujol gearbox



### Download the service factor information booklet from [www.lcautomation.com](http://www.lcautomation.com)

The table here is taken from the service factor information booklet available to download from the Pujol PDF download page of our website.

Each model in the Pujol range has its own section, to help you select the right size unit for your requirements.

First find the service factor for your application from the table above, which will give the colour of the column you need to look at.

Then find the correct model type, select the power of your motor and the closest output speed to your requirements. This will show which size of gearbox you need.

To select the right gearbox, first look at the tables on page xxx and decide on the service factor for your application. Then, in the tables here, find the correct size of motor and the nearest output speed to your requirements. This will decide whether you need a LAC40, LAC49 or LAC61 version.

- Service factor of less than one
- Service factor of between one & two
- Service factor of more than two

1. Select your motor power..
2. .. and the output speed..
3. ... to give the unit you need

### Example application

A washing machine, used for 8 hours a day, with a 0.55kW motor and an output speed of 35rpm.

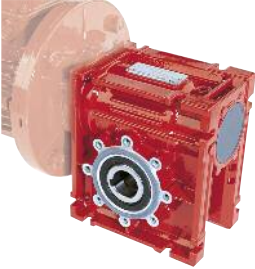
The service factor table (above), gives the service factor for this application as 1.25 (i.e. between one and two - which relates to the white columns).

The motor being used is 0.55kW and the application requires a gearbox with an output speed of 35rpm. Looking at the service factor tables, the LAC61 version is the only one which will connect a 0.55kW motor to give an output speed of 35rpm.

## LAC – Aluminum right angle worm gearboxes for low power applications (up to 1.5kW)



SEE SELECTION GUIDE ON PAGES 165-166



LAC is the smallest series of Pujol worm gear units – making them ideal for low power applications (up to 1.5kW), where size, weight and cost are all equally important.

Although the LAC is housed in a lightweight aluminium casing, the use of quality components and hard wearing two-part baked epoxy coating ensure that the LAC is hard wearing and durable.

The cubic design and a range of output flange and reaction arm configurations also offer a variety of potential mounting options. In fact, because it has been lubricated for life, it can be mounted in any position.

The modular design offers many assembly configurations, with a wide range of output speeds and mounting operations, as well as the option to fit both standard B5 or B14 motors.

### Features

- Ideal for low power applications such as small powered conveyors
- Lightweight aluminium case
- Hollow shaft outputs (plug-in shaft available)
- Output shaft diameters of 18, 25 and 30mm

### Technical specification

- For motors from 0.09kW to 1.5kW
- Available in 3 sizes; 40, 49 & 61 (size 40 available as speed reducer)
- Ratios; 5, 10, 15, 19, 29, 40, 50, 65, 80 and 100:1
- Accepts standard B5 and B14 (flange) IEC frame motors

*Call us on 01254 685900 for help selecting the correct unit and an accurate quote*

## LXC – Cast iron right angle worm gearboxes for heavy duty applications (up to 18.5kW)



SEE SELECTION GUIDE ON PAGES 165-166



Cast-iron LXC worm gear units are ideal for arduous applications which require total reliability over the long life of the gearbox, but where competitive price is still important.

Rigid unibox construction, protected by a two-part baked epoxy coating helps ensure long product life.

The cubic design and a range of output flange and reaction arm configurations also offer a variety of potential mounting options. Just like the LAC above, it has also been lubricated for life, allowing it to be mounted in any position.

Modular design affords many assembly configurations, giving a wide range of output speeds and mounting operations, as well as the facility to fit standard B5 or B14 motors.

### Features

- Ideal for heavy duty applications
- Extremely strong cast iron unibox construction
- Hollow shaft outputs (plug-in shaft available)
- Output shaft diameters of 18, 25 and 30mm

### Technical specification

- For motors from 0.09kW to 18.5kW
- Available in 3 sizes; 87, 110 & 130
- Ratios; 5, 10, 15, 19, 29, 40, 50, 65, 80 and 100:1
- Accepts standard B5 and B14 (flange) IEC frame motors

*Call us on 01254 685900 for help selecting the correct unit and an accurate quote*

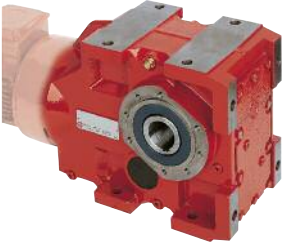
📖 Go to pages 165-166 for our guide on selecting the correct gearbox



## KXC - High efficiency right angle bevel helical gearboxes (up to 45kW)



SEE SELECTION GUIDE ON PAGES 165-166



This range of Pujol cast-iron bevel-helical gear units are tough, efficient and reliable.

Constructed in stiff unibox design, and protected with a durable two-part baked epoxy coating.

When fitting the latest generation of high efficiency motors, it is important to also consider the efficiency of the gear unit employed. Typically over 95% efficient, the KX series with its helical gear train is the logical choice for your right-angle drive solution.

The modular design offers many assembly configurations, giving a wide range of output speeds and mounting operations, as well as the facility to fit standard B5 motors.

### Features

- Ideal for applications that use new high efficiency motors
- Typically over 95% efficient
- Extremely strong cast iron unibox construction
- Also available as a speed reducer
- Wide range of mounting options

### Technical specification

- For motors from 0.09kW to 45kW
- Available in sizes from 30 to 90
- Ratios from 6.1 to 174.82:1
- Accepts standard IEC frame motors (B5 flange)

*Call us on 01254 685900 for help selecting the correct unit and an accurate quote*

## DXC - High efficiency parallel helical gearboxes (up to 55kW)



SEE SELECTION GUIDE ON PAGES 165-166



Manufactured with the same technology as the KX series above, this range of gear units provides all the benefits but with a parallel configuration.

The DX series therefore compliments the range, in order to ensure our customers have drive solutions to suit the widest possible spectrum of applications.

### Features

- Ideal for applications that use new high efficiency motors
- Typically over 95% efficient
- Extremely strong cast iron unibox construction
- Also available as a speed reducer
- Wide range of mounting options

### Technical specification

- For motors from 0.09kW to 55kW
- Available in sizes from 30 to 90
- Ratios from 4.2 to 273.41:1
- Accepts standard IEC frame motors (B5 flange)

*Call us on 01254 685900 for help selecting the correct unit and an accurate quote*

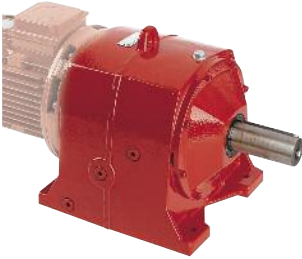
◀ Go to pages 165-166 for our guide on selecting the correct gearbox



## I series/S series - Coaxial with in-line helical gearboxes for heavy duty applications (up to 55kW)



SEE SELECTION GUIDE ON PAGES 165-166



The I Series and S Series comprise a range of helical in-line gear units which are constructed in tough cast iron for longevity, further enhanced with Pujols two-part baked epoxy coating.

Their modular design lends itself to multiple configuration options, giving a wide range of output speeds and motor fitment options.

The smaller I Series is available in sizes from 84 to 162 with the S Series accommodating larger applications in sizes from 160 to 360.

### Common features

- Ideal for applications that use new high efficiency motors
- Typically over 95% efficient
- Tough cast iron construction
- Foot or flange mounting

### I Series specification

- For motors from 0.09kW to 55kW
- Available in sizes from 84 to 162
- Ratios from 4.8 to 379.5:1
- Accepts standard IEC frame motors (B5 flange)

### S Series specification

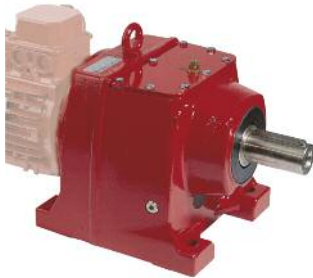
- For motors from 0.09kW to 55kW
- Available in sizes from 160 to 360
- Ratios from 4.8 to 379.5:1
- Accepts standard IEC frame motors (B5 flange)

Call us on 01254 685900 for help selecting the correct unit and an accurate quote

## SXC series - High performance coaxial in-line helical gearboxes (up to 9.2kW)



SEE SELECTION GUIDE ON PAGES 165-166



Pujol's latest generation of helical in-line gear units. Constructed with the same tough unibox design, together with the latest technology gear manufacturing techniques ensure that this range of gear units affords the highest performance for size in the current marketplace.

Many available input flange options will accept a larger range of electric motors, including square-frame servo motors.

Designed with industry norm shaft and footprint dimensions, this range of gear units will fit easily into existing applications where replacement is required.

### Technical specification

- For motors 0.12kW to 9.2kW
- Available in sizes from 202 to 403
- Available in ratios of 3.8:1 to 210:1
- Accepts standard B5 flange motors

### Features

- Extremely strong cast iron unibox construction
- High transmitted torque per volume unit
- Interchangeable standard fitting dimensions
- Elastic coupling integrated to input shaft
- Input shaft and flange interchangeable without disassembly
- Housing ready for different output flange adaptors
- Input flanges compatible with some servo motors

Call us on 01254 685900 for help selecting the correct unit and an accurate quote

◀ Go to pages 165-166 for our guide on selecting the correct gearbox



We supply high quality products from these world leading suppliers . . .



www.lcautomation.com