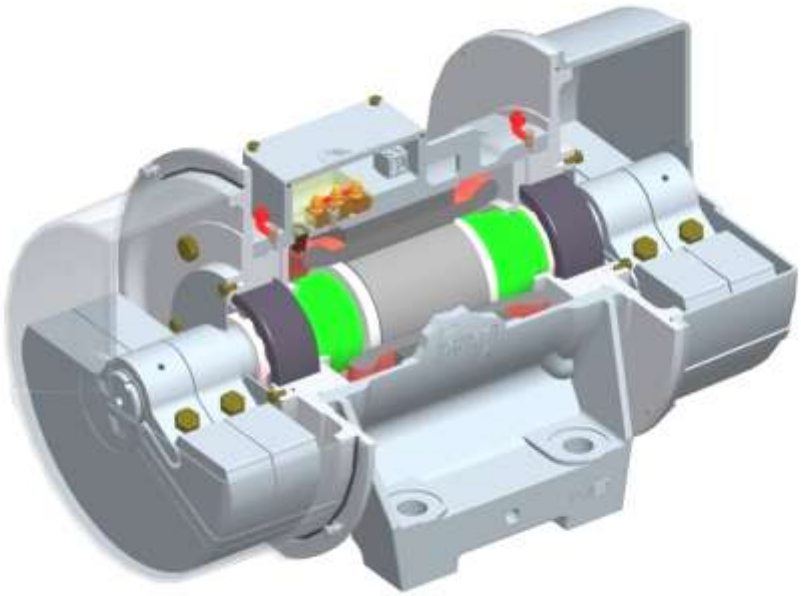
BLz03 to 80
50/60 Hz
Dust Protected to EN60079-31



Installation and Maintenance
'BLz' Series Vibrators
ENGLISH
(other European languages on request)

INVICTA VIBRATORS
A Division of Grantham Engineering Limited

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OPERATIONAL CONDITIONS

The user's attention is drawn to the following notes:

1) The vibrator is approved to the following certification:

ATEX Directive	2014/34/EU	
Certificate Numbers	CML16ATEX3122X and IECEx CML 16.0050X	
ATEX Coding/marking	 **II2D Ex tb IIIC T___° C Db IP66**	
HAZARDOUS AREA CLASSIFICATION;		
Zone of Use (Dust)	Zone 21 & 22	
Rated Temperature	Refer to tables on pages 4 & 5	
Ingression Protection (BSEN60529)	Main Enclosure	IP66
	Terminal Box	IP66

The equipment is certified for use in ambient temperatures -20°C to +40°C.

The X in our certificate number signifies a special condition of use and applies to vibrators mounted in orientations other than with a horizontal shaft and also those intended for use with variable speed drives;

i. The user is advised that this equipment is fitted with thermistors, RTDs or thermostats. Mounting the motor in any orientation, other than with the shaft horizontal, requires the thermistors, RTDs or thermostats to be connected to a suitable controlling and regulating device, as defined in article 1(b) of European Directive 2014/34/EU, and when located in hazardous area , shall be covered by an appropriate EC or EU Type Examination Certificate.

   This condition does not apply to the smaller vibrators in the Invicta range from BLz03 up to BLz25, fitted with ball bearings.

ii. The user is advised that this equipment is fitted with thermistors, RTDs or thermostats, therefore, when a vibrator mounted in any orientation is fed from a variable speed drive, it shall be connected to a suitable controlling and regulating device, as defined in article 1(b) of European Directive 2014/34/EU, and when located in hazardous areas, shall be covered by an appropriate EC or EU Type Examination Certificate.

iii. Where the vibrator is installed into a fixed installation where the installation is intended to minimise the risk from electrostatic discharge the installer must ensure the vibrator is suitably earthed. The vibrator should not be operated without a suitable earth in place. Regular checks as part of routine inspections should establish that the earth is intact.

iv. The user shall mark the vibrator with information relevant to the chosen Variable Speed Control as detailed in BS EN60079-0, clause 29.15.

2) The equipment has not been assessed as a safety related device (as referred to by directive 2014/34/EU Annex II, clause 1.5).

3) Installation of this equipment shall be carried out by suitably trained personnel in accordance with the applicable Code of Practice (EN60079-14).

4) Inspection and maintenance of this equipment shall be carried out by suitably trained personnel in accordance with the applicable Code of Practice (EN60079-17).

   Repair of this equipment shall be carried out by suitable trained personnel in accordance with the applicable Code of Practice (EN60079-19).

   The manufacturer offers a full repair service.

5) Components to be incorporated into or used as replacements in the equipment shall be fitted by suitably trained personnel in accordance with the manufacturer's documentation.

6) If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions to prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

   a) Aggressive Substances: e.g. acidic liquids or gases that may attack metals or solvents that may affect polymeric materials (such as seals)

   b) Suitable Precautions: e.g. regular checks as part of routine inspections or establishing from material data sheet that it is resistant to specific chemicals.

7) Some Invicta vibrators are provided with either an integral cast lifting point or provision for the use of eye bolts. Users are to ensure that shackles, eye bolts or any other required lifting equipment used are sufficiently rated to safely lift the weight of the vibrator. The weight of each vibrator is included in the information stamped on the vibrator nameplate. Users should also ensure that any lifting accessories or equipment is used in accordance with the manufacturer's instructions and the user's codes of practice. The lifting points should be inspected for defects prior to each lifting operation.
   Note: The lifting points are designed solely to lift the vibrator only. Users should not, under any circumstance, use the lifting point on the vibrator to lift any other plant or machinery that the vibrator may be mounted to.
   WARNING: The shaft assembly inside the vibrator contains eccentric weights and is free to rotate as the vibrator is lifted.
   This potential shifting of the weight distribution should be taken into account when lifting the vibrator into position.

Disclaimer

Invicta Vibrators are certified to comply with the European Directive 2014/34/EU (ATEX Directive) as described. It remains the responsibility of the user to ensure that the equipment is correctly selected and rated for the environment in which it is to be used in accordance with European Directive 99/92/EC (also known as ATEX 137 or the ATEX Workplace Directive) and regulations 7 and 11 of the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR).

Important Safety Note:

It is the responsibility of the intended user of the BLz vibrator to ensure that the installation and usage instructions contained in this manual are fully understood before any attempt to install or use the vibrator is made. Failure to understand and adhere to these instructions could result in fire, electric shock, explosion or serious personal injury. This manual should be retained throughout the life of the vibrator and referred to whenever necessary.

E U Declaration of Conformity

We, **Grantham Engineering Limited (Invicta Vibrators),** hereby declare that the equipment detailed below is in conformity with the relevant Union harmonisation legislation:
Directive 2014/34/EU

Invicta 'BLz','FBLz', BLTz' and 'CLz' range dustproof Ex 'D' rotary electric vibrators

EC type examination Certificate:	CML16ATEX3122X
IECEx Certificate of conformity:	IECEx CML 16.0050X
ATEX Code:	CE 2503 Ex **II2D Ex tb IIIC T °C Db IP66**
Issued by notified body:	Certification Management Limited (2503) Unit 1 Newport Business Park, New Port Road, Ellesmere Port, CH65 4LZ United Kingdom

The following harmonised standards have been applied.

EN 60034-1 : 2010
EN 60079-0 : 2012+A11 : 2013
EN 60079-31 : 2014

And also with,	Low voltage Directive 2014/35/EU/ Electromagnetic Compatibility Directive 2014/30/EU
Quality Assurance Notification number:	CML ATEX Q1144
IECEx QAR Notification:	GB/CML/QAR 16.0007/00
Issued by notified body:	Certification Management Limited (2503)
Manufacturer:	Grantham Engineering Ltd (Invicta Vibrators) Harlaxton Road, Grantham, Lincolnshire, NG31 7SF, United Kingdom Tel: +44 (0) 1476 566301 Fax: +44 (0) 1476 590145 www.invictavibrators.co.uk

Signed:

Authorised person: Huw Williams
Title: Technical Director

FULL POWER TEST DATA AND TEMPERATURE RATINGS
L SERIES VIBRATORS TO EN 60079-31

Vibrator Type	Power Output (Watts)	Surface Temperature Max in +40ºC ambient at Full Power (°C)	Temperature Rating Of Thermistors (°C)	Cable Entry Thread Size
BLz03-1/2	120	93	80	M16x1.5-6H
BLz03-0.5/4	100	106	90	M16x1.5-6H
BLz03-0.2/6	70	93	80	M16x1.5-6H
BLz03-0.3/6	70	93	80	M16x1.5-6H
BLz05-2/2	200	142	100	M20x1.5-6H
BLz05-1/4	175	106	90	M20x1.5-6H
BLz05-2/4	175	106	90	M20x1.5-6H
BLz05-0.4/6	90	119	100	M20x1.5-6H
BLz05-0.6/6	90	119	100	M20x1.5-6H
BLz05-0.9/6	90	119	100	M20x1.5-6H
BLz05-1.3/6	90	119	100	M20x1.5-6H
BLz15-3.5/2	300	131	100	M20x1.5-6H
BLz15-3/4	300	111	100	M20x1.5-6H
BLz15-1.3/6	110	121	100	M20x1.5-6H
BLz15-1.9/6	110	121	100	M20x1.5-6H
BLz20-5/2	400	130	100	M20x1.5-6H
BLz20-5/4	350	121	100	M20x1.5-6H
BLz20-2.2/6	150	112	100	M20x1.5-6H
BLz22-5/2	400	130	100	M20x1.5-6H
BLz22-5/4	350	121	100	M20x1.5-6H
BLz22-2.2/6	150	112	100	M20x1.5-6H
BLz24-8/2	500	130	120	M20x1.5-6H
BLz24-10/2	500	130	120	M20x1.5-6H
BLz24-13/2	500	130	120	M20x1.5-6H
BLz24-7.5/4	500	130	120	M20x1.5-6H
BLz24-11/4	500	130	120	M20x1.5-6H
BLz24-14/4	500	130	120	M20x1.5-6H
BLz24-4/6	510	130	120	M20x1.5-6H
BLz24-8/6	510	130	120	M20x1.5-6H
BLz24-11/6	510	130	120	M20x1.5-6H
BLz25-8/2	500	130	120	M20x1.5-6H
BLz25-10/2	500	130	120	M20x1.5-6H
BLz25-13/2	500	130	120	M20x1.5-6H
BLz25-7.5/4	500	130	120	M20x1.5-6H
BLz25-11/4	500	130	120	M20x1.5-6H
BLz25-14/4	500	130	120	M20x1.5-6H
BLz25-4/6	510	130	120	M20x1.5-6H
BLz25-8/6	510	130	120	M20x1.5-6H
BLz25-11/6	510	130	120	M20x1.5-6H
BLz30-16/2	1100	130	120	M20x1.5-6H
BLz30-20/2	1100	130	120	M20x1.5-6H
BLz30-18/4	1150	130	120	M20x1.5-6H
BLz30-25/4	1150	130	120	M20x1.5-6H
BLz30-14/6	900	135	120	M20x1.5-6H
BLz30-18/6	900	135	120	M20x1.5-6H
BLz30-23/6	900	135	120	M20x1.5-6H
BLz30-7.5/8	500	129	110	M20x1.5-6H
BLz30-10/8	500	129	110	M20x1.5-6H

FULL POWER TEST DATA AND TEMPERATURE RATINGS
L SERIES VIBRATORS TO EN 60079-31

Vibrator Type	Power Output (Watts)	Surface Temperature Max in +40ºC ambient at Full Power (°C)	Temperature Rating Of Thermistors (°C)	Cable Entry Thread Size
BLz40-30/2	1500	133	120	M20x1.5-6H
BLz40-40/2	1500	133	120	M20x1.5-6H
BLz40-35/4	1800	114	100	M20x1.5-6H
BLz40-27/6	1800	124	110	M20x1.5-6H
BLz40-35/6	1800	124	110	M20x1.5-6H
BLz40-15/8	1100	132	120	M20x1.5-6H
BLz40-17/8	1100	132	120	M20x1.5-6H
BLz45-50/2	4000	130	120	M25x1.5-6H
BLz45-45/4	2685	130	120	M25x1.5-6H
BLz45-42/6	2310	134	120	M25x1.5-6H
BLz45-50/6	2310	134	120	M25x1.5-6H
BLz45-24/8	2000	130	120	M25x1.5-6H
BLz45-35/8	2000	130	120	M25x1.5-6H
BLz50-55/4	3350	130	120	M25x1.5-6H
BLz50-65/4	4800	130	120	M25x1.5-6H
BLz50-75/4	4800	130	120	M25x1.5-6H
BLz50-60/6	4000	122	110	M25x1.5-6H
BLz50-75/6	4000	122	110	M25x1.5-6H
BLz50-35/8	3300	100	90	M25x1.5-6H
BLz50-45/8	3300	100	90	M25x1.5-6H
BLz50-55/8	3300	100	90	M25x1.5-6H
BLz50-57/8	3300	100	90	M25x1.5-6H
BLz60-95/4	7750	130	120	M32x1.5-6H
BLz60-105/4	7750	130	120	M32x1.5-6H
BLz61-105/4	7750	130	120	M32x1.5-6H
BLz60-90/6	6200	130	120	M32x1.5-6H
BLz60-105/6	6200	130	120	M32x1.5-6H
BLz61-105/6	6200	130	120	M32x1.5-6H
BLz60-125/6	10000	130	120	M32x1.5-6H
BLz61-125/6	10000	130	120	M32x1.5-6H
BLz60-65/8	4900	117	100	M32x1.5-6H
BLz60-70/8	4900	117	100	M32x1.5-6H
BLz60-90/8	4900	117	100	M32x1.5-6H
BLz75-130/4	10250	130	120	M32x1.5-6H
BLz75-150/6	10000	130	120	M32x1.5-6H
BLz78-165/6	10000	130	120	M32x1.5-6H
BLz75-185/6	10000	130	120	M32x1.5-6H
BLz77/78-185/6	10000	130	120	M32x1.5-6H
BLz77-124/8	7750	125	110	M32x1.5-6H
BLz75-150/8	7750	125	110	M32x1.5-6H
BLz75-200/8	7750	125	110	M32x1.5-6H
BLz77-200/8	7750	125	110	M32x1.5-6H
BLz80 230/6	12500	160	150	M32x1.5-6H
BLz80 270/6	12500	160	150	M32x1.5-6H
BLz80-205/8	9700	160	150	M32x1.5-6H
Note: Cable gland temperature can exceed +70°C				

BEARING REPLACEMENT – IMPORTANT NOTICE

To satisfy EN13463 Part 5 Clause 6.1 & 6.2 the bearings in this equipment shall be replaced after a period not exceeding 90% of their rated life. The user's attention is therefore drawn to the list of bearing lives shown in the table below.

L 10 BEARING FATIGUE LIFE L SERIES DUST PROTECTED VIBRATORS TO EN60079-31

Frame Size	Centrifugal Force			Fatigue life (Hours) L10			
	Kg	Newtons	Bearing Types	50 Hz	90%	60 Hz	90%
Vibrators at 2880/3456 RPM							
BLz 03-1/2	100	981	6301 2Z C3	49940	44950	41400	37260
BLz 05-2/2	200	1962	6304 2Z C3	28000	25200	23230	20900
BLz 15-3.5/2	350	3433	6306 2Z C3	25380	22840	21150	19035
BLz 20/22-5/2	500	4905	6308 2Z C3	29700	26730	24670	22200
BLz 24/25-8/2	800	7848	6309 2Z C3	15380	13840	12780	11500
BLz 24/25-10/2	1000	9810	NJ 2306E TVP2 C3	49050	44150	40720	36650
BLz 24/25-13/2	1300	12753	NJ 2307E TVP2 C3	41560	37400	34490	31040
BLz 30-16/2	1600	15695	NJ 2309E TVP2 C3	82540	74290	68500	61650
BLz 30-20/2	2000	19620	NJ 2309E TVP2 C3	39260	35330	32580	29320
BLz 40-30/2	3000	29430	NJ 2311E TVP2 C3	35500	31950	29460	26510
BLz 40-40/2	4000	39240	NJ 2313E TVP2 C3	28860	25970	23950	21550
BLz 45-50/2	5000	49050	NJ 2312E TVP2 C4	12343	11110	10286	9260
Vibrators at 1440/1728 RPM							
BLz 03-0.5/4	50	490	6301 2Z C3	>100000	90000	85470	76920
BLz 05-1/4	100	981	6304 2Z C3	>100000	90000	>100000	90000
BLz 05-2/4	200	1962	6304 2Z C3	24640	22180	20530	18480
BLz 15-3/4	300	2943	6305 2Z C3	40560	36500	33800	30420
BLz 20/22-5/4	500	4905	6307 2Z C3	28710	25840	23930	21540
BLz 24/25-7.5/4	750	7357	6309 2Z C3	37510	33760	31130	28020
BLz 24/25-11/4	1100	10790	NJ 2306E TVP2 C3	70710	63640	58670	52800
BLz 24/25-14/4	1400	13735	NJ 2307E TVP2 C3	65650	59080	53640	48280
BLz 30-18/4	1800	17658	NJ 2309E TVP2 C3	>100000	90000	91960	82760
BLz 30-25/4	2500	24525	NJ 2309E TVP2 C3	37080	33370	30770	27690
BLz 40-35/4	3500	34335	NJ 2311E TVP2 C3	42340	38100	35130	31620
BLz 45-45/4	4500	44145	NJ 2313E TVP2 C3	38390	34550	31850	28660
BLz 50-55/4	5500	53955	NJ 2315E TVP2 C3	49060	44150	40710	36640
BLz 50-65/4	6500	63765	NJ 2317E M1A C3	42800	38520	35500	31950
BLz 50-75/4	7500	73575	NJ 2317E M1A C3	32040	28830	26580	23920
BLz 60-95/4	9500	93195	NJ2320E M1A C3	52820	47540	43820	39440
BLz60/61-105/4	10500	103000	NJ2320E M1A C3	37700	33930	31410	28270
BLz 75-130/4	13000	127530	NJ 2322E M1A C3	31320	28190	25980	23380
Vibrators at 960/1152 RPM							
BLz 03-0.2/6	22	216	6301 2Z C3	> 100000	90000		
BLz 03-0.3/6	32	314	6301 2Z C3			> 100000	90000
BLz 05-0.4/6	40	392	6304 2Z C3	> 100000	90000		
BLz 05-0.6/6	60	589	6304 2Z C3			> 100000	90000
BLz 05-0.9/6	90	883	6304 2Z C3	> 100000	90000		
BLz 05-1.3/6	130	1275	6304 2Z C3			>100000	90000
BLz 15-1.3/6	130	1275	6305 2Z C3	> 100000	90000		
BLz 15-1.9/6	190	1864	6305 2Z C3			>100000	90000
BLz 20/22-2.2/6	220	2158	6307 2Z C3	> 100000	90000	>100000	90000
BLz 24/25-4/6	440	3924	6309 2Z C3	> 100000	90000	>100000	90000
BLz 24/25-8/6	800	7848	NJ 2306E TVP2 C3	> 100000	90000	>100000	90000
BLz 24/25-11/6	1100	10790	NJ 2307E TVP2 C3	> 100000	90000	>100000	90000
BLz 30-14/6	1400	13734	NJ 2309E TVP2 C3	> 100000	90000	>100000	90000
BLz 30-18/6	1800	17658	NJ 2309E TVP2 C3	> 100000	90000	>100000	90000
BLz 30-23/6	2300	22563	NJ 2309E TVP2 C3	60000	54000	50000	45000
BLz 40-27/6	2700	26487	NJ 2311E TVP2 C3	> 100000	90000	>100000	90000
BLz 40-35/6	3500	34335	NJ 2311E TVP2 C3	63300	56970	52700	47430
BLz 45-42/6	4200	41200	NJ 2313E TVP2 C3	69980	62980	58070	52260
BLz 45-50/6	5000	49050	NJ 2313E TVP2 C3	40400	36360	33670	30300
BLz 50-60/6	6000	58860	NJ 2315E TVP2 C3	55120	49610	45740	41170
BLz 50-75/6	7500	73575	NJ 2317E TVP2 C3	48200	43380	40000	36000
BLz 60-90/6	9000	88290	NJ 2320E TVP2 C3	94510	85060	78760	70880
BLz 60/61-105/6	10500	103000	NJ 2320E TVP2 C3	57430	51690	47300	42570
BLz 60/61-125/6	12500	122625	NJ 2320E TVP2 C3	29150	26235	24290	21860
BLz 75-150/6	15000	147500	NJ 2322E M1A C3	29260	26330	24280	21850
BLz 78-165/6	16500	161865	NJ 2322E M1A C3	21140	19025	17610	15850
BLz 75/77/78-185/6	18500	181485	NJ 2322E M1A C3	14440	13000	12030	10830
BLz 80-230/6	23000	225630	NJ2326E M1 C3	30190	27170	25160	22645
BLz 80-270/6	27000	264880	NJ2326E M1 C3	17700	15930	14750	13275

L 10 BEARING FATIGUE LIFE L SERIES DUST PROTECTED VIBRATORS TO EN60079-31

Frame Size	Centrifugal Force			Fatigue life (Hours) L10			
	Kg	Newtons	Bearing Types	50 Hz	90%	60 Hz	90%
Vibrators at 720/864 RPM							
BLz 30-7.5/8	750	7357	NJ 2309E TVP2 C3	>100000	90000	>100000	90000
BLz 30-10/8	1000	9810	NJ 2309E TVP2 C3	>100000	90000	>100000	90000
BLz 40-15/8	1500	14715	NJ 2311E TVP2 C3	>100000	90000	--	--
BLz 40-17/8	1700	16671	NJ 2311E TVP2 C3	--		>100000	90000
BLz 45-24/8	2430	23838	NJ 2313E TVP2 C3	>100000	90000	>100000	90000
BLz 45-35/8	3500	34335	NJ 2313E TVP2 C3	--		>100000	90000
BLz 50-35/8	3500	34335	NJ 2315E TVP2 C3	>100000	90000	--	--
BLz 50-45/8	4500	44145	NJ 2315E TVP2 C3	>100000	90000	>100000	90000
BLz 50-55/8	5500	53955	NJ 2317E TVP2 C3	>100000	90000	--	--
BLz 50-57/8	5700	55917	NJ 2317E TVP2 C3	--		>100000	90000
BLz 60-65/8	6500	63765	NJ 2320E TVP2 C3	>100000	90000	--	--
BLz 60-70/8	7000	68670	NJ 2320E TVP2 C3	--		>100000	90000
BLz 60-90/8	9000	88290	NJ 2320E TVP2 C3	>100000	90000	>100000	90000
BLz 75/77-124/8	12400	121644	NJ 2322E M1A C3	68370	61530	56970	51270
BLz 75-135/8	13500	132435	NJ 2322E M1A C3	55020	49520	--	--
BLz 75-150/8	15000	147150	NJ 2322E M1A C3	38960	35060	32330	29100
BLz 75/77-200/8	20000	196200	NJ 2322E M1A C3	--	--	12455	11210
BLz 80-205/8	20500	201105	NJ2326E M1 C3	59050	53145	49205	44285

'L' SERIES VIBRATOR INSTALLATION AND MAINTENANCE

RECEIPT AND STORAGE

Each vibrator is tested and inspected on completion. Whilst every care is taken during transit they should be inspected on receipt and any defects immediately reported to the carrier and supplier. When not for immediate use, they can be stored for up to two years if kept in a clean, dry and temperate atmosphere, free from vibration. After more than 2 years of storage the bearing grease should be replaced before the motor is used.

INSTALLATION GUIDANCE NOTES:

Mechanical: Inspect vibrator for any physical damage and check that rotor shaft rotates freely. Remove paint masking stickers from motor mounting holes. ALL mounting surfaces MUST be flat and free of paint, dirt and scale. Fixing bolts should be tightened as recommended below and tightness checked after initially running the vibrator. Bolts and nuts should not be reused. Please ensure there is at least 50mm of clearance between the vibrator and any surrounding static structure.

IMPORTANT - GAPS BETWEEN THE VIBRATOR FOOT AND MATING SURFACES AND INCORRECT BOLT TIGHTNESS WILL CAUSE BOLT BREAKAGE AND DAMAGE TO THE VIBRATOR.

Fixing bolt tightening: Use Grade 8.8 bolts with Grade 8 self locking nuts, torqued to values below. Figures below apply to un-plated dry threads.
Where capscrews are used with locking nuts, Grade 10 nuts must be fitted.
Use plain washers for BLz 03 - BLz 24 (aluminium frames) Not BLz22. If washers are used for BLz22 - BLz80 (cast iron frames) Not BLz24, hardened washers (PSN 612 to DIN 6916 or BS EN 14399-6) must be fitted.

Size	Torque (N.m)		Size	Torque (N.m)	
	Cap-Screws Grade 12.9	Setscrews/Bolts Grade 8.8		Cap-Screws Grade 12.9	Setscrews/Bolts Grade 8.8
M 5	8	-	M 16	310	242
M 6	15	11	M 20	580	473
M 8	34	27	M 24	950	818
M 10	68	56	M 30	-	1634*
M 12	127	96	M 36	-	2854*

With figures marked * a torque multiplier will be required.

Use the above figures for all screws <u>except</u> out of balance weights. (see page 29)

BLz 75 - 80: Half turn method.

In exceptional circumstances where tooling is not available, the half turn method may be used.

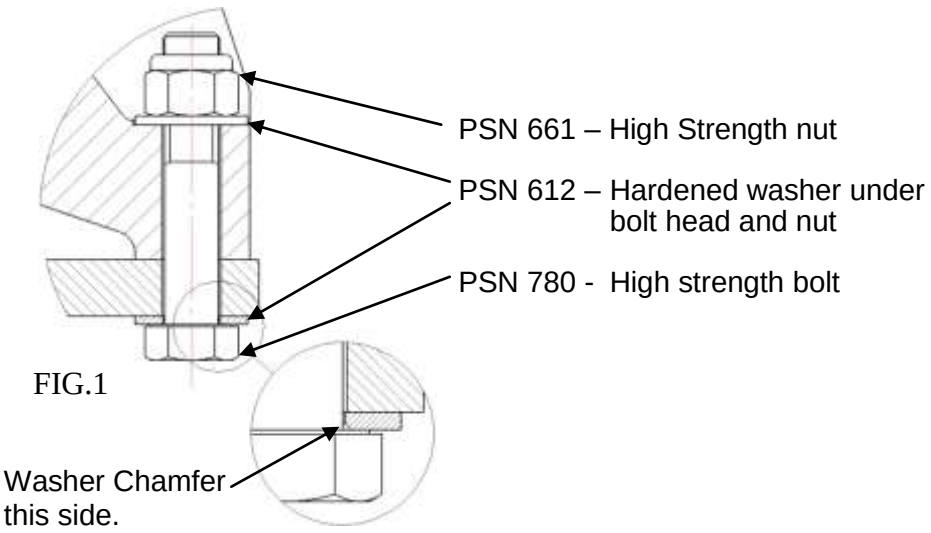
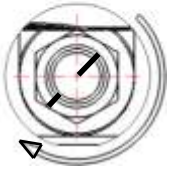


FIG.1

FIG.2

FIG.3



Remove any paint, dirt or scale from all mating surfaces.
Fit hardened washer (PSN 612) under bolt head and nut. Pre-tighten until all mating surfaces are in contact. Mark nuts and bolts as shown in fig. 2 and slog nut one half turn until marks are as shown in fig. 3.

Electrical

Check insulation resistance and if less than 1 megohm DO NOT USE, consult a qualified electrician. Perform a continuity resistance check between the external earth point and end covers, terminal box lid and nameplate, if the resistance is more than 1.0 ohms between the earth point and any of the aforementioned items, DO NOT USE, consult a qualified electrician. Note: this continuity check should be performed after each removal and re-fitting of the end cover and terminal box lid.
A flexible cable and suitable cable gland must be used to connect between the vibrator and supply junction box.

The cable gland shall comply with EN60079-0 and have an IP rating equal to or better than IP66 (see table on pages 4 & 5 for cable entry thread sizes). The supply must be suitably fuse protected. 4 core cable to be used with flexible conductors type; 24/0.20 (BLz 03); 50/0.25 (BLz 05 – BLz 40); 56/0.30 (BLz 45 – BLz 50); 80/0.40 (BLz 60/61 – BLz 75-80): BLz 24 to BLz 80 are fitted with thermistors as standard and require a 2 core cable with flexible conductors type 30/0.25. The external earth cable must have a cross sectional area of at least 4mm²

Flexible conductors must be terminated with insulated crimp on ring terminals, or ring terminals fitted with insulating sleeves for L1, L2, L3 and earth. Plain soldered ends for thermistor connections T1 and T2.
If thermistors are not required leave the blanking plug in the cable entry hole.

BLz Vibrators are suitable for a 3 phase 50Hz or 3 phase 60Hz electrical supply. BLz vibrators are rated for continuous duty. The insulation class of the winding will be either 'F' or 'H' as indicated on the nameplate. Starting can be direct on line via inverter or soft start. Each vibrator **MUST BE INDIVIDUALLY PROTECTED** against overload. Each overload should be of the delayed magnetic-circuit breaker type to prevent tripping during the high starting current requirement of vibrator starting. The overload size should be selected based on the full load current and starting current values listed on pages 11 & 12.

NOTE When operating vibrators at speeds above pole speed the out of balance force **MUST** be reduced or **DAMAGE WILL OCCUR**; see Page 30 for correct percentage reduction.

VOLTAGE RANGE
The voltage range data on pages 11 & 12 (230-690v 50Hz and 230-575v 60Hz) is served by four distinct windings* thus:

	Delta Δ	**Star Y**
Group 01	230v 50 Hz & 60 Hz	380 - 415v 50 Hz, 460 - 480v 60Hz
Group 03		500v 50Hz, 575v 60Hz
Group 07		380v 60Hz
Group 28	400v 50Hz	690v 50Hz

* Except BLz40 8 Pole which uses group 43 windings for 460-480v 60Hz.

The winding group number and Hertz appears in the vibrator designation and on the nameplate Thus a BL25-14/4 400v 50Hz machine will be designated BL25-14/4/**01/50**.

It is essential that the correct Winding (group) is used with the specified electrical supply. Non-compliance with the above instructions will result in electrical failure.

Terminal post nuts should be tightened to the values given in the table below.

Nut size	Tightening torque (Nm)
M4	1.1
M5	2.2
M6	3.7

VIBRATOR TERMINAL BOX field connection 3 Phase, 50/60 Hertz

The installer is directed to the diagram number engraved on the nameplate for the appropriate field connection diagram (below).

DIAGRAM No. 1 STAR.
DIRECT-ON-LINE
OR AUTOTRANSFORMER STARTING

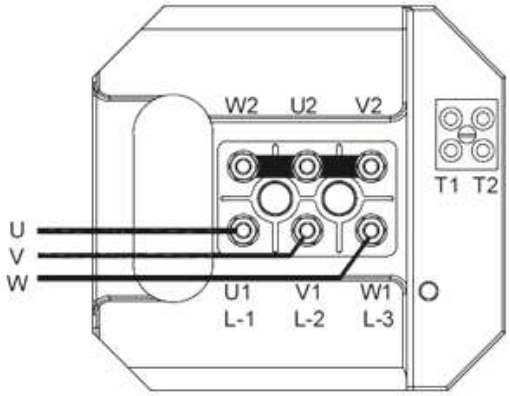


DIAGRAM No. 2 DELTA.
DIRECT-ON-LINE
OR AUTOTRANSFORMER STARTING

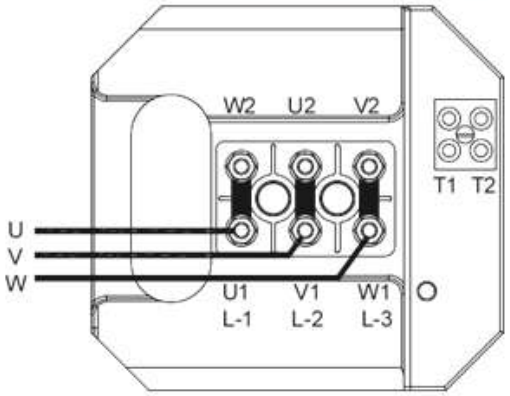


DIAGRAM No. 3 DELTA.
DIRECT-ON-LINE
OR AUTOTRANSFORMER STARTING

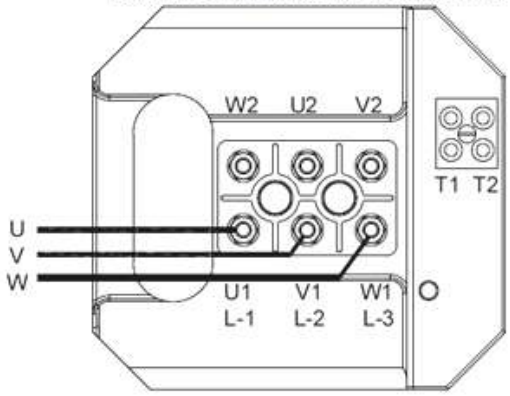


DIAGRAM No. 4 STAR DELTA STARTING

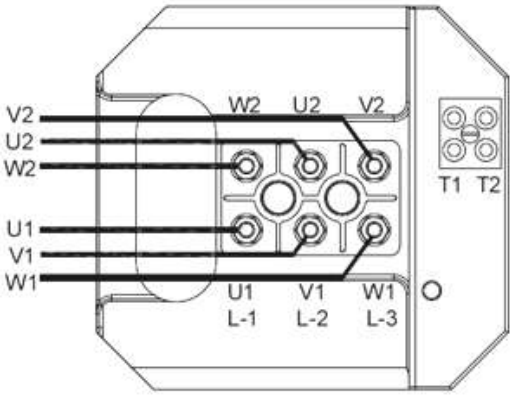
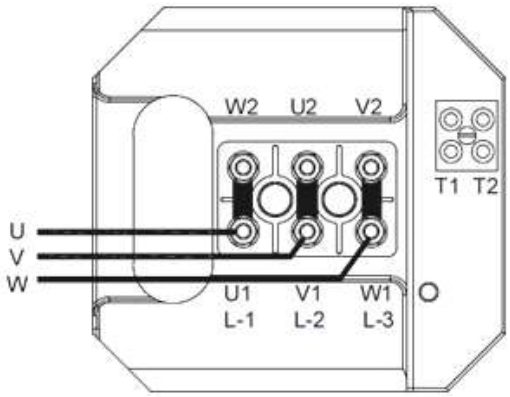
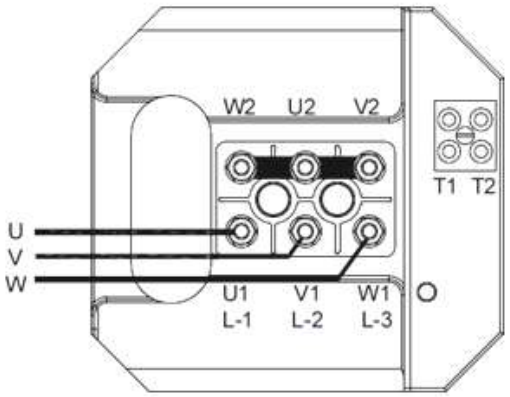


DIAGRAM No. 5 DUAL VOLTAGE

LOW VOLTAGE DELTA



HIGH VOLTAGE STAR



Refer to nameplate for required connection.
L1 - L3 are line connections. T1 & T2 are thermistor connections.

FULL LOAD AND STARTING CURRENTS IN AMPS FOR BLz SERIES VIBRATORS (Winding groups 01, 03 & 28)
Maximum Figures for +40°C Ambient

		Δ 01**		Y 01*		Y 01*		Y 03*		Δ 28**		Y 28*	
Type	**Output**	**230 Volts 50 Hz**		**380 Volts 50 Hz**		**400 Volts 50 Hz**		**500 Volts 50 Hz**		**400 Volts 50 Hz**		**690 Volts 50 Hz**	
	Watts	**FLC**	**SC**	**FLC**	**SC**	**FLC**	**SC**	**FLC**	**SC**	**FLC**	**SC**	**FLC**	**SC**
2 POLE - 2880 RPM													
BLz 03	120	0.33	2.7	0.18	1.6	0.19	1.6	0.16	1.2	0.2	1.7	0.12	1.0
BLz 05	200	0.60	5.2	0.34	3.1	0.35	3.0	0.27	2.4	0.58	5.0	0.33	2.8
BLz 15	300	0.98	5.2	0.58	3.1	0.56	3.0	0.46	2.4	0.58	5.0	0.33	2.8
BLz 20/22	400	1.35	9.8	0.79	5.9	0.78	5.6	0.64	4.5	0.81	5.8	0.47	3.4
BLz 24/25	500	2.03	17.8	1.19	10.8	1.17	10.2	0.98	8.2	1.22	10.6	0.70	7.4
BLz 30	1100	3.6	27	2.2	16	2.1	16	1.7	13				
BLz 40	1500	5.0	48	3.0	29	2.9	28	2.3	22	2.9	35	1.7	21
BLz 45	4000	12.7	89	7.6	53	7.3	51	5.8	41				
4 POLE - 1440 RPM													
BLz 03	100	0.34	1.4	0.19	0.9	0.20	0.8	0.17	0.7				
BLz 05	175	0.71	2.9	0.41	1.7	0.41	1.7	0.35	1.3				
BLz 15	300	1.24	4.0	0.71	2.4	0.71	2.3	0.60	1.9	0.75	2.4	0.44	1.4
BLz 20/22	350	1.68	6.3	0.95	3.8	0.97	3.6	0.81	2.9	1.03	3.8	0.60	2.2
BLz 24/25	500	2.28	15.1	1.34	9.2	1.32	8.7	1.14	7.0	1.43	9.4	0.83	5.5
BLz 30	1150	4.3	42	2.5	25	2.5	24	2.1	19	2.62	25	1.51	14.5
BLz 40	1800	6.4	56	3.8	34	3.7	32	3.1	26	3.86	33	2.23	19.3
BLz 45	2685	9.2	83	5.4	49	5.3	48	4.5	41	5.5	59	3.2	34.3
BLz 50-55	3350	11	109	6.5	65	6.4	64	5.3	53	6.6	66	3.8	38
BLz 50-65, 75	4800	14.9	137	8.8	81	8.6	79	7.1	65	8.8	90	5.1	52
BLz60/61	7750	22.3	241	13.4	145	12.9	140	10.4	113	13.1	193	7.6	112
BLz 75	10250	28.9	200	17.4	120	16.7	115	13.5	93				
6 POLE - 960 RPM													
BLz 03	70	0.8	0.87	0.47	0.48	0.46	0.5	0.38	0.43				
BLz 05	90	0.94	1.56	0.53	0.87	0.54	0.9	0.46	0.55				
BLz 15	110	1.03	1.55	0.59	0.85	0.6	0.9	0.5	0.78				
BLz 20/22	150	1.55	2.78	0.87	1.53	0.9	1.60	0.76	2.0				
BLz 24/25	510	2.79	12.2	1.58	7.4	1.61	7.0	1.33	5.6	1.7	7.4	0.99	4.3
BLz 30	900	5.2	26	2.9	16	3.0	15	2.5	12	3.2	16	1.85	9.3
BLz 40	1800	8.7	43	4.9	26	5.0	25	4.3	20	5.4	27	3.1	15.6
BLz 45	2310	11.0	76	6.2	46	6.3	44	5.5	35	6.9	49	4.0	28
BLz 50	4000	15.2	106	8.7	64	8.8	61	7.4	49	9.3	64	5.3	37
BLz 60/61-90,105	6200	19.4	188	11.4	114	11.2	108	9.5	86	11.6	112	6.7	64
BLz 60/61-125	10000	31.2	222	18.4	131	18.0	128	14.8	105	18.3	233	10.5	135
BLz 75/77/78	10000	31.2	222	18.4	131	18.0	128	14.8	105	18.3	233	10.5	135
BLz80	12500	44	266	26.6	161	25.3	153	20.2	122				
8 POLE - 720 RPM													
BLz 30	500	4.0	18	2.2	11	2.3	10.4	2.0	8				
BLz 40	1100	6.2	23	3.5	14	3.6	13.5	3.1	11				
BLz 45	2000	10.6	40	5.9	24	6.1	23	5.3	18				
BLz 50	3300	15.0	96	8.4	58	8.6	55	7.6	44				
BLz 60	4900	23.0	170	12.9	103	13.3	97	11.8	78	14.4	106	8.3	62
BLz 75 /77	7750	34.8	216	19.9	130	20.1	124	17.4	99	20.6	126	11.9	71
BLz80	9700	40.7	237	23.8	138	23.6	137						

See Voltage Range note & also connection diagrams on pages 9 & 10.

***STAR = Y** ****Delta = Δ**

FULL LOAD AND STARTING CURRENTS IN AMPS FOR BLz SERIES VIBRATORS (Winding groups 01, 03 & 07)
Maximum Figures for +40°C Ambient

		Δ 01**		Y 01*		Y 01*		Y 07*		Y 03*	
Type	**Output**	**230 Volts 60 Hz**		**460 Volts 60 Hz**		**480 Volts 60 Hz**		**380 Volts 60 Hz**		**575 Volts 60 Hz**	
	Watts	FLC	SC	FLC	SC	FLC	SC	FLC	SC	FLC	SC

See Voltage Range note & also connection diagrams on pages 9 & 10.

2 POLE - 3456 RPM

BLz 03	120	0.28	2.7	0.17	1.4	0.18	1.4	0.24	1.6	0.14	1.1
BLz 05	200	0.53	5.2	0.31	2.6	0.32	2.5	0.43	3.1	0.27	2.1
BLz 15	300	0.93	5.2	0.50	2.6	0.49	2.5	0.64	3.1	0.41	2.1
BLz 20/22	400	1.26	9.8	0.69	4.9	0.69	4.7	0.90	5.9	0.57	3.9
BLz 24/25	500	1.88	17.8	1.05	8.9	1.05	8.5	1.39	10.8	0.87	7.1
BLz 30	1100	3.6	27	1.8	13	1.7	13	2.2	16	1.5	11
BLz 40	1500	4.9	47	2.5	24	2.4	23	3.2	31	2.0	19
BLz 45	4000	11.2	78	6.5	46	6.3	44	8.1	57	5.1	36

See Voltage Range note & also connection diagrams on pages 9 & 10.

4 POLE - 1728 RPM

BLz 03	100	0.28	1.4	0.18	0.7	0.19	0.7	0.26	0.9	0.16	0.6
BLz 05	175	0.62	2.9	0.37	1.4	0.38	1.4	0.51	1.7	0.32	1.1
BLz 15	300	1.10	4.0	0.64	2.0	0.66	1.9	0.88	2.4	0.54	1.6
BLz 20/22	350	1.46	6.3	0.88	3.1	0.9	3.0	1.22	3.8	0.73	2.5
BLz 24/25	500	2.08	15.1	1.22	7.6	1.24	7.3	1.67	9.2	1.03	6.1
BLz 30	1150	3.9	42	2.2	21	2.3	20	3.0	25	1.9	17
BLz 40	1800	6.0	56	3.3	28	3.3	27	4.4	34	2.7	22
BLz 45	2685	8.5	77	4.8	43	4.8	43	6.4	58	4.0	36
BLz 50-55	3350	10.3	102	5.7	57	5.6	56	7.3	73	4.7	47
BLz 50-65,75	4800	14.2	131	7.6	70	7.5	69	9.7	89	6.3	58
BLz 60/61	7750	21.8	236	11.3	122	11.0	119	14.0	151	9.1	99
BLz 75	10250	28.3	195	14.6	101	14.2	98	18.3	127	11.8	82

See Voltage Range note & also connection diagrams on pages 9 & 10.

6 POLE - 1152 RPM

BLz 03	70	0.9	0.92	0.41	0.45	0.41	0.46	0.55	0.6	0.34	0.38
BLz 05	90	1.14	1.88	0.50	0.8	0.51	0.85	0.69	1.1	0.42	0.50
BLz 15	110	1.21	1.74	0.54	0.81	0.55	0.82	0.73	1.1	0.45	0.70
BLz 20/22	150	1.89	3.33	0.82	1.47	0.85	1.54	1.15	2.1	0.70	1.84
BLz 24/25	510	2.43	12.2	1.46	6.01	1.50	5.8	2.03	7.4	1.21	4.9
BLz 30	900	4.3	26	2.7	13	2.8	12	3.8	16	2.4	10
BLz 40	1800	7.5	43	4.6	22	4.7	21	6.5	26	3.9	17
BLz 45	2310	9.3	76	5.8	38	6.0	37	8.1	46	5.0	31
BLz 50	4000	13.6	106	7.9	53	8.0	51	10.5	64	6.7	42
BLz 60/61	6200	18.2	188	10.0	94	9.9	90	13.2	114	8.5	75
BLz 60/61 - 125	10000	29.4	209	16.0	114	15.8	112	19.8	141	13.2	94
BLz 75/77/78	10000	29.4	209	16.0	114	15.8	112	19.8	141	13.2	94
BLz80	12500	41	277	22.5	152	21.6	146				

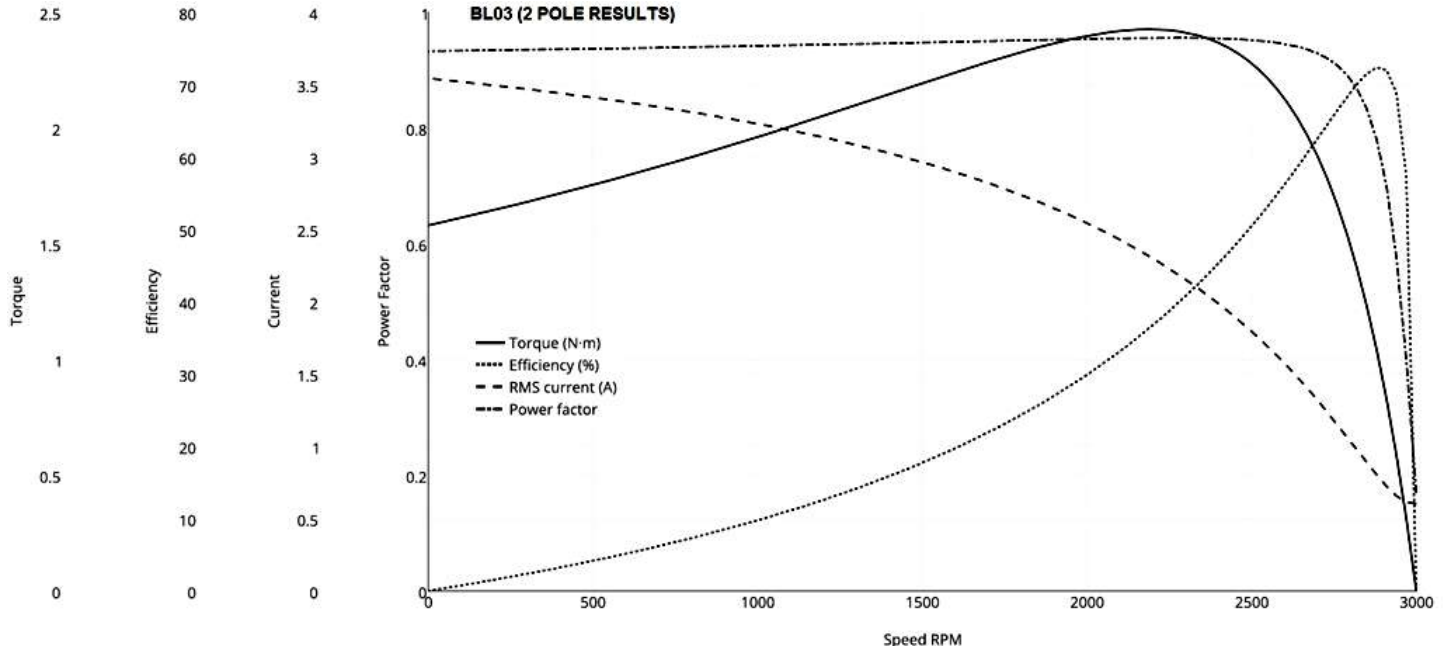
See Voltage Range note & also connection diagrams on pages 9 & 10.

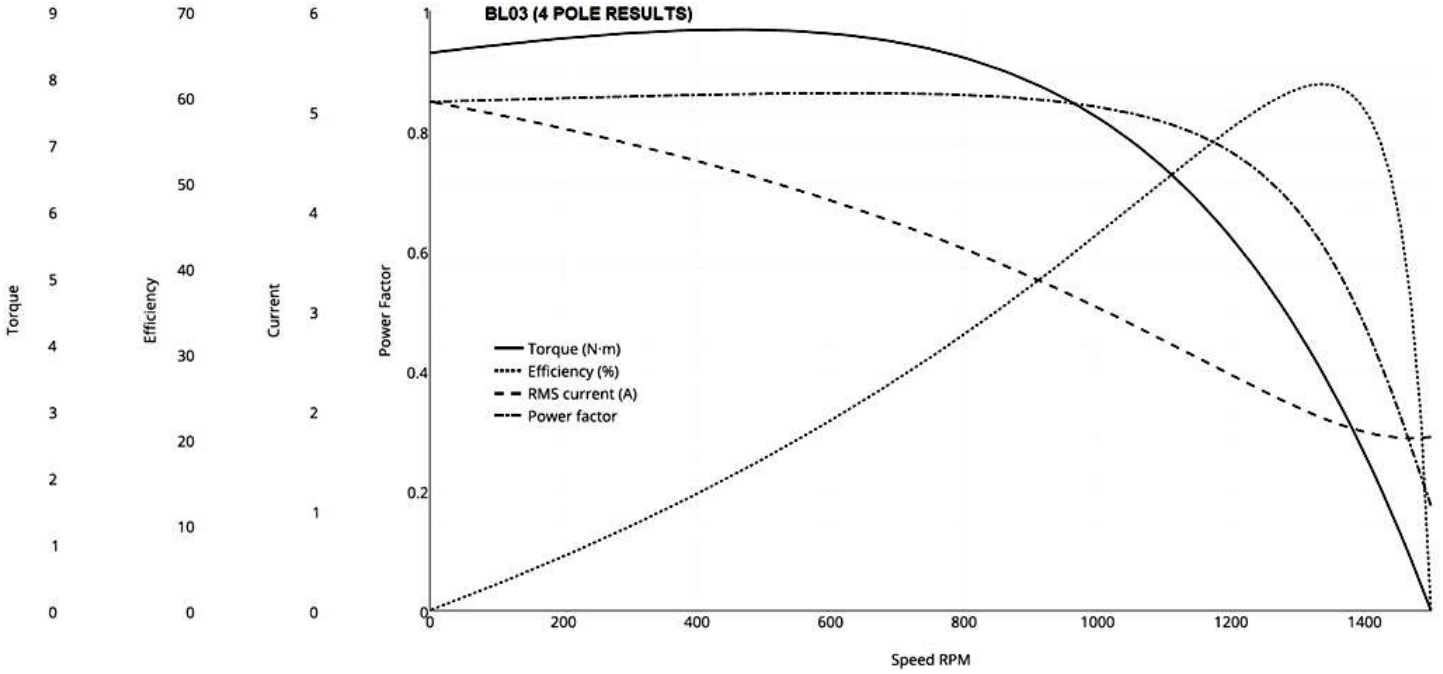
8 POLE - 864 RPM

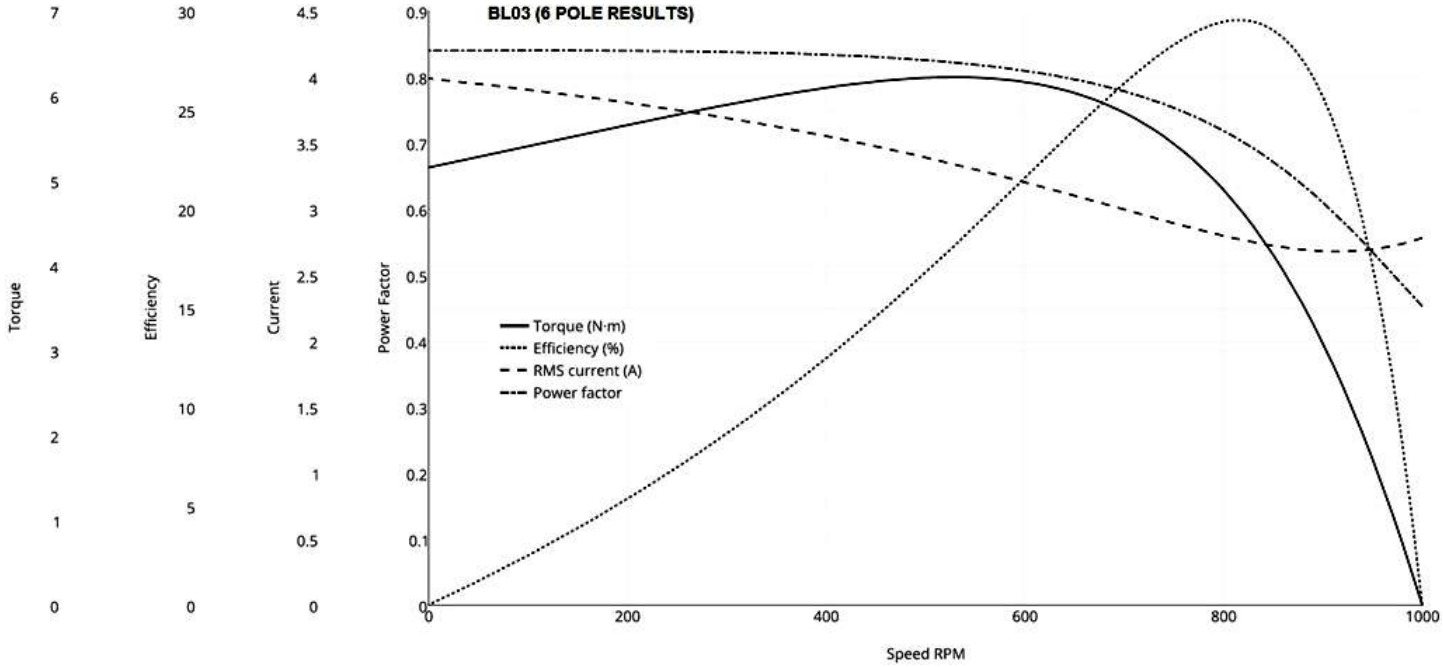
BLz 30	500	3.3	18	2.2	9	2.3	8.6	3.0	11	1.9	7
BLz 40	1100	5.3	23	3.3	12	3.4	11	4.7	14	2.8	9
BLz 45	2000	10.0	35	6.5	23	6.8	24	7.7	24	5.2	18
BLz 50	3300	12.8	96	7.8	48	8.1	46	12.0	58	6.9	38
BLz 60	4900	19.3	170	12.1	84	12.6	81	17.0	103	10.8	67
BLz 75/77	7750	31.0	216	18.1	108	18.4	103	24.7	130	15.8	86
BLz80	9700			21.8	127	21.7	126				

***STAR = Y** ****Delta = Δ**

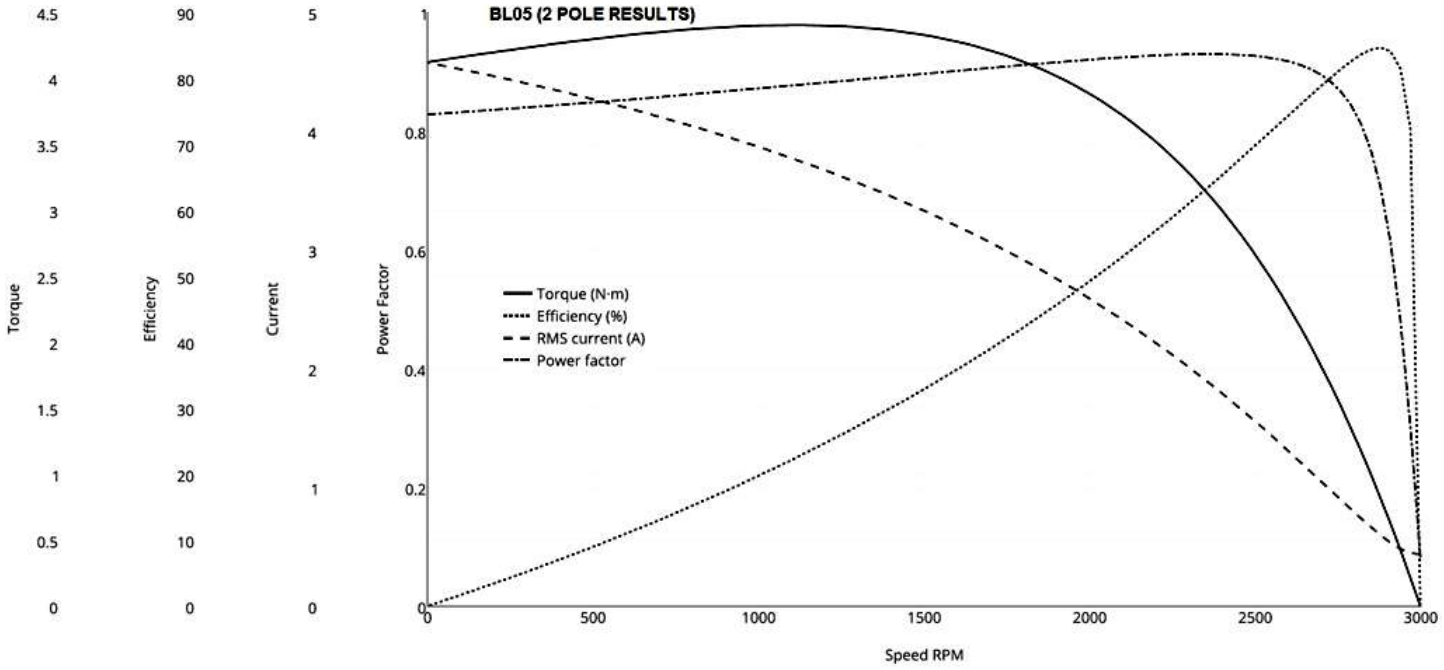
BL03 TORQUE CURVES

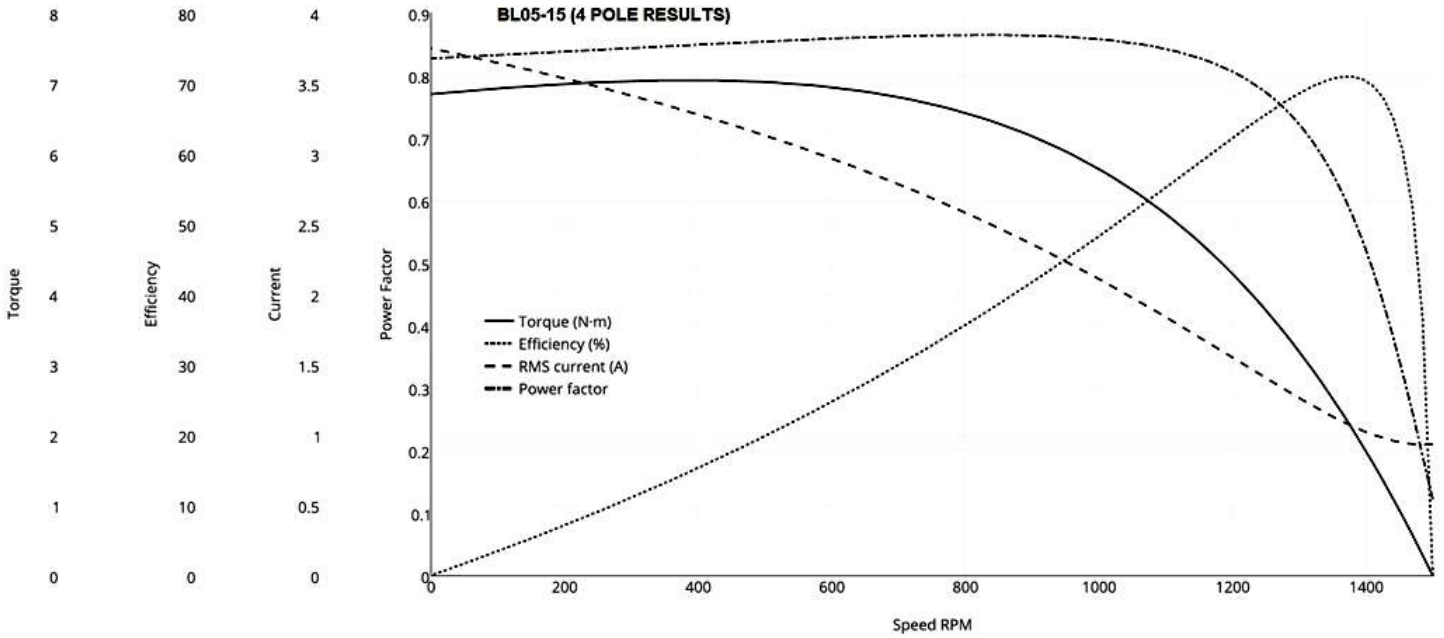


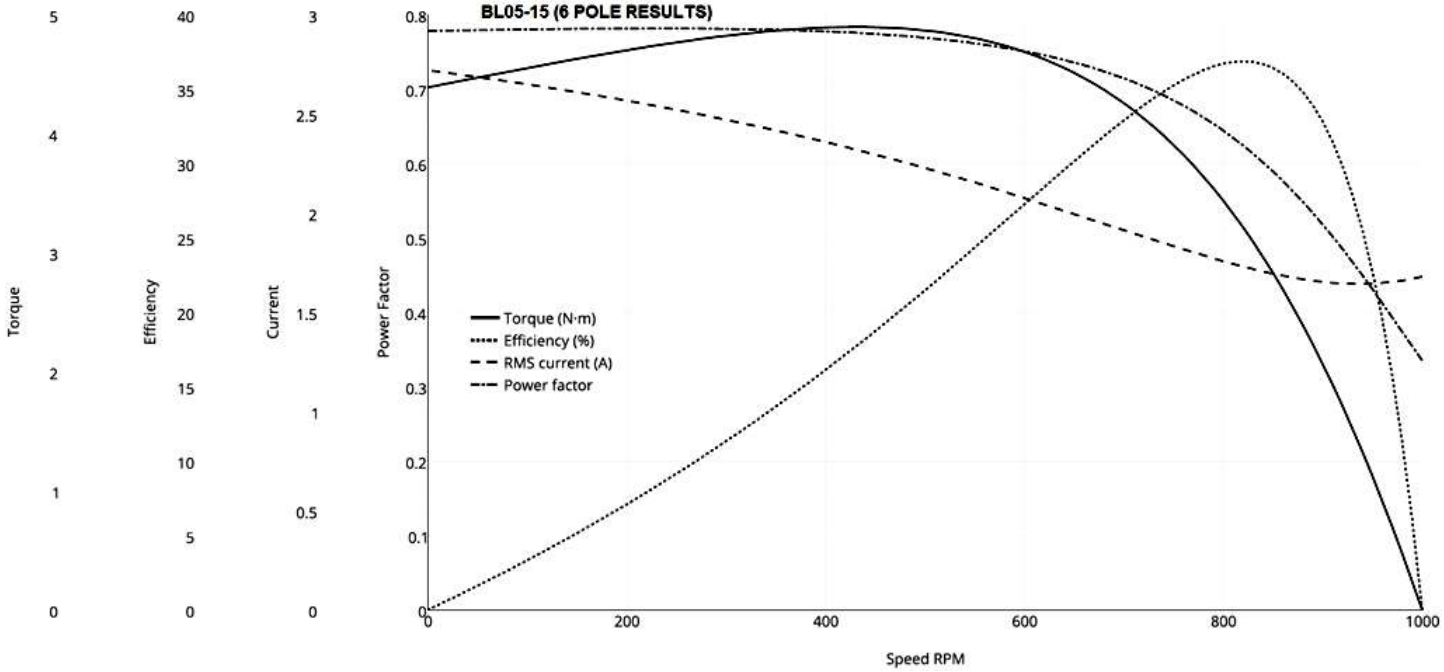




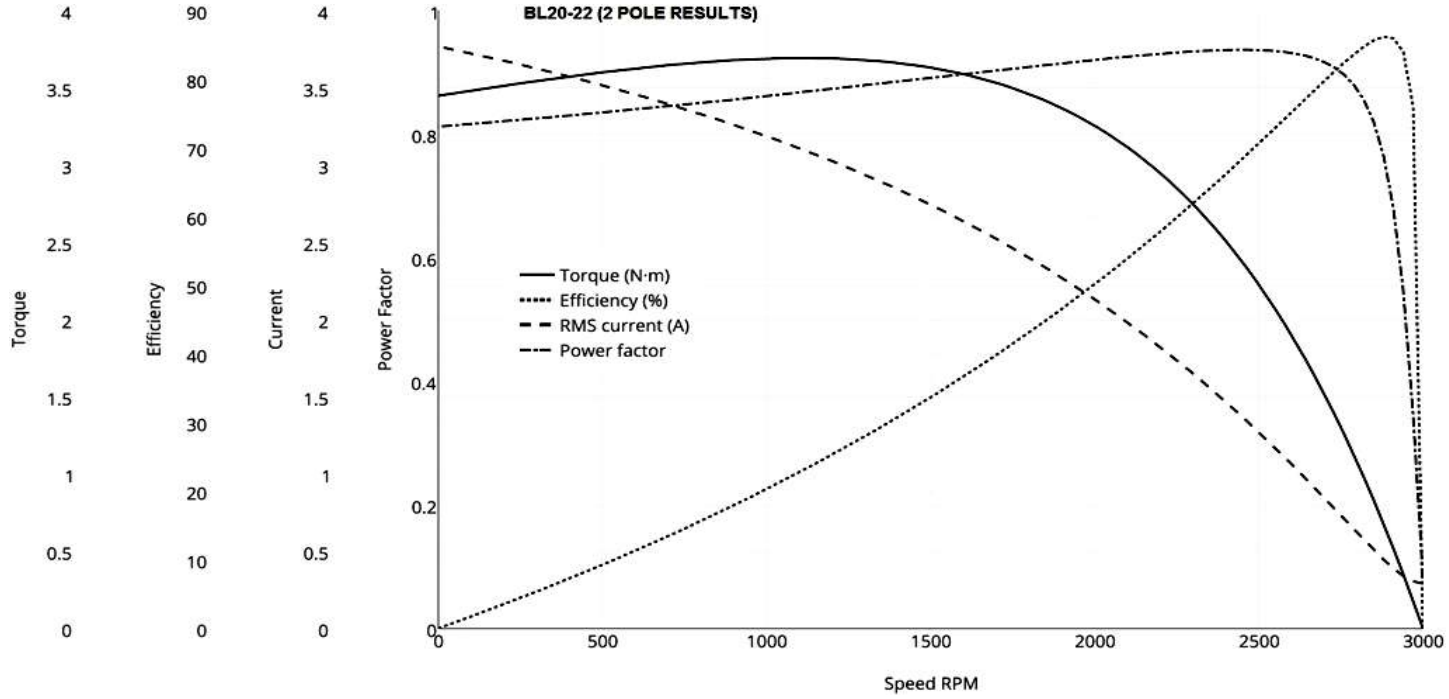
BL05-15 TORQUE CURVES

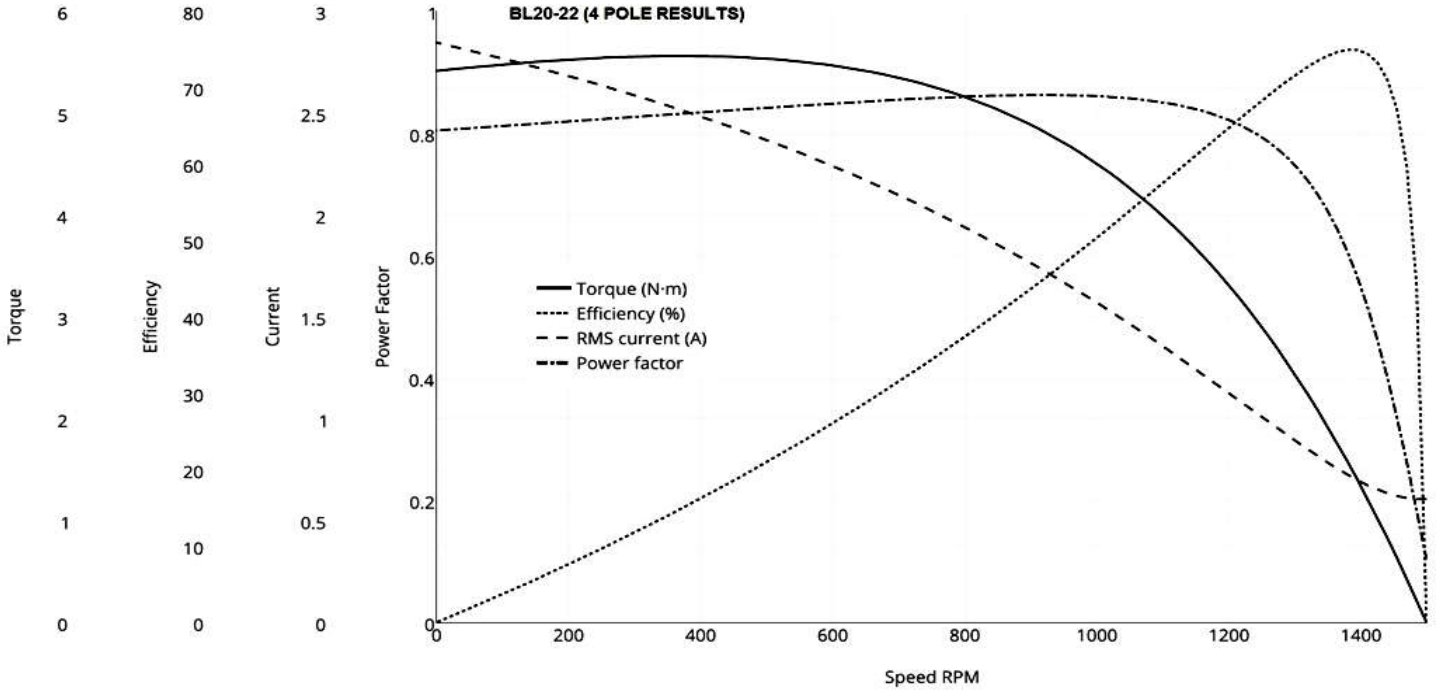


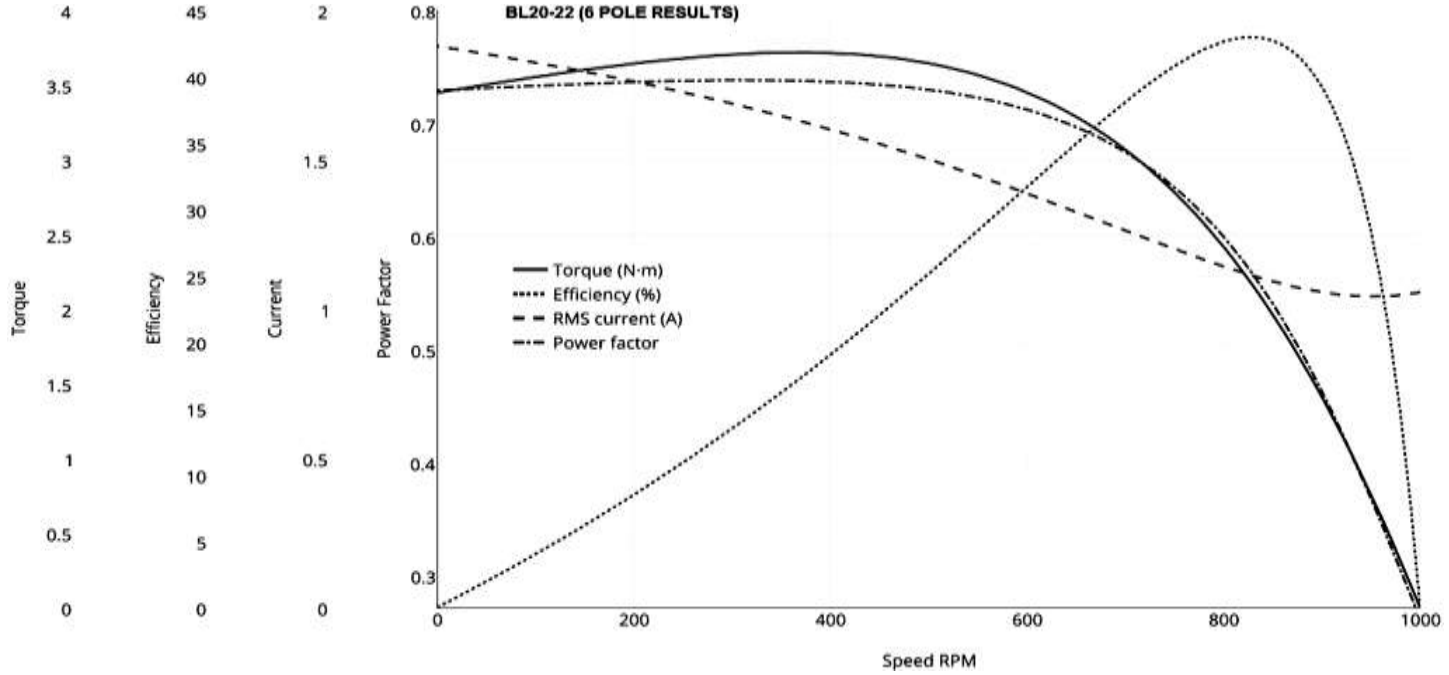




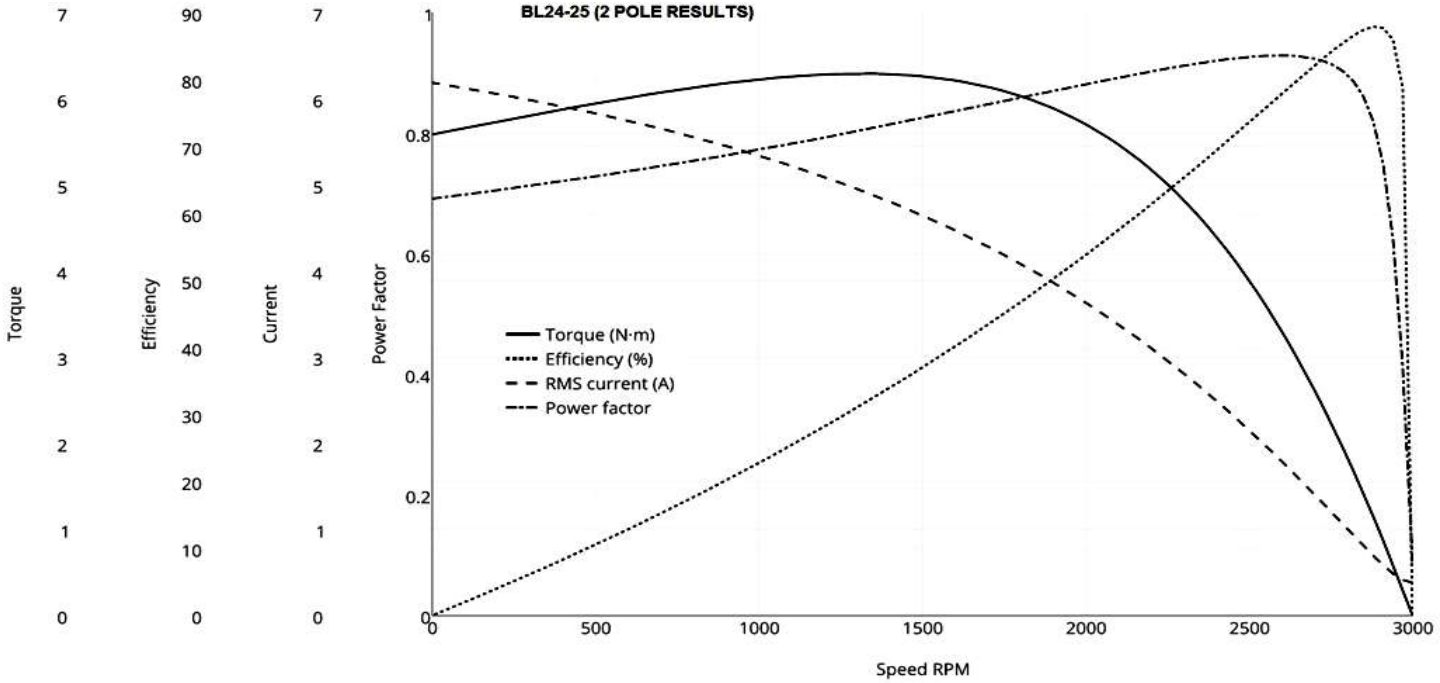
BL20-22 TORQUE CURVES

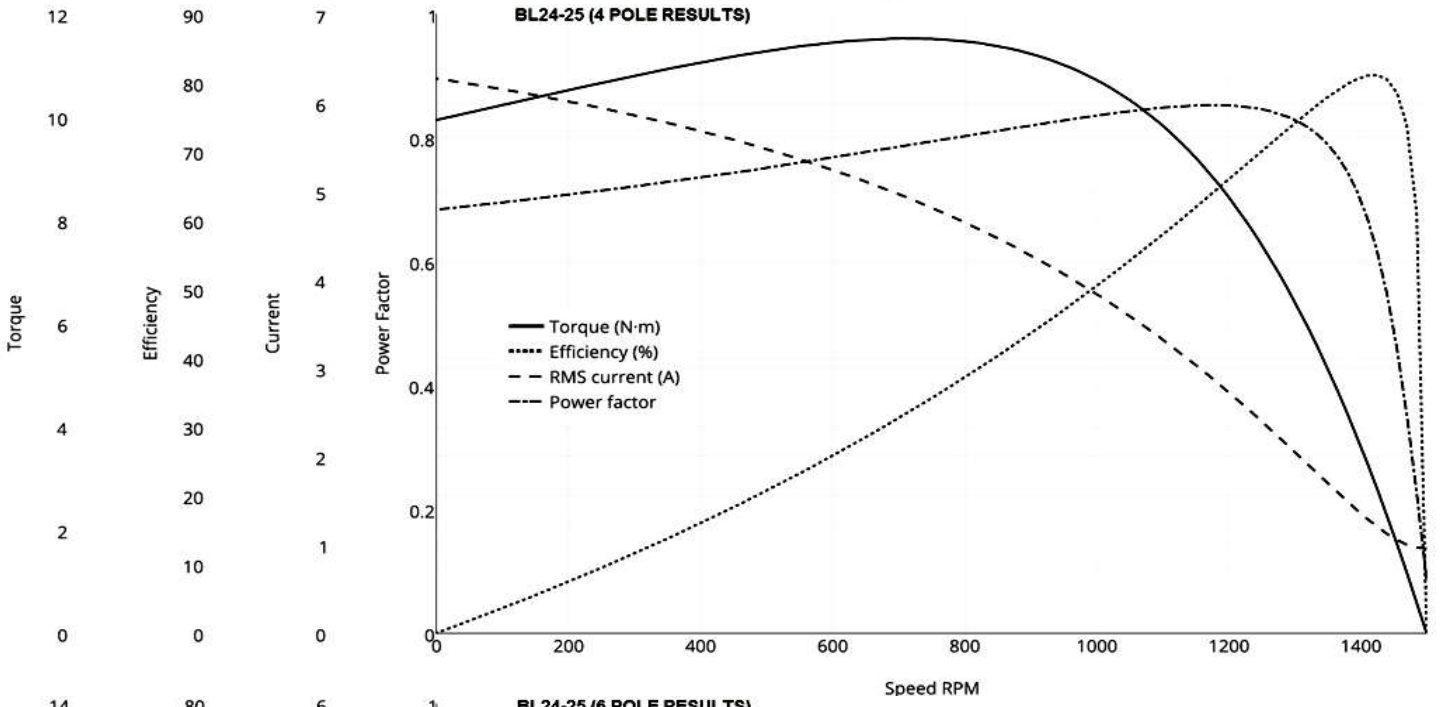


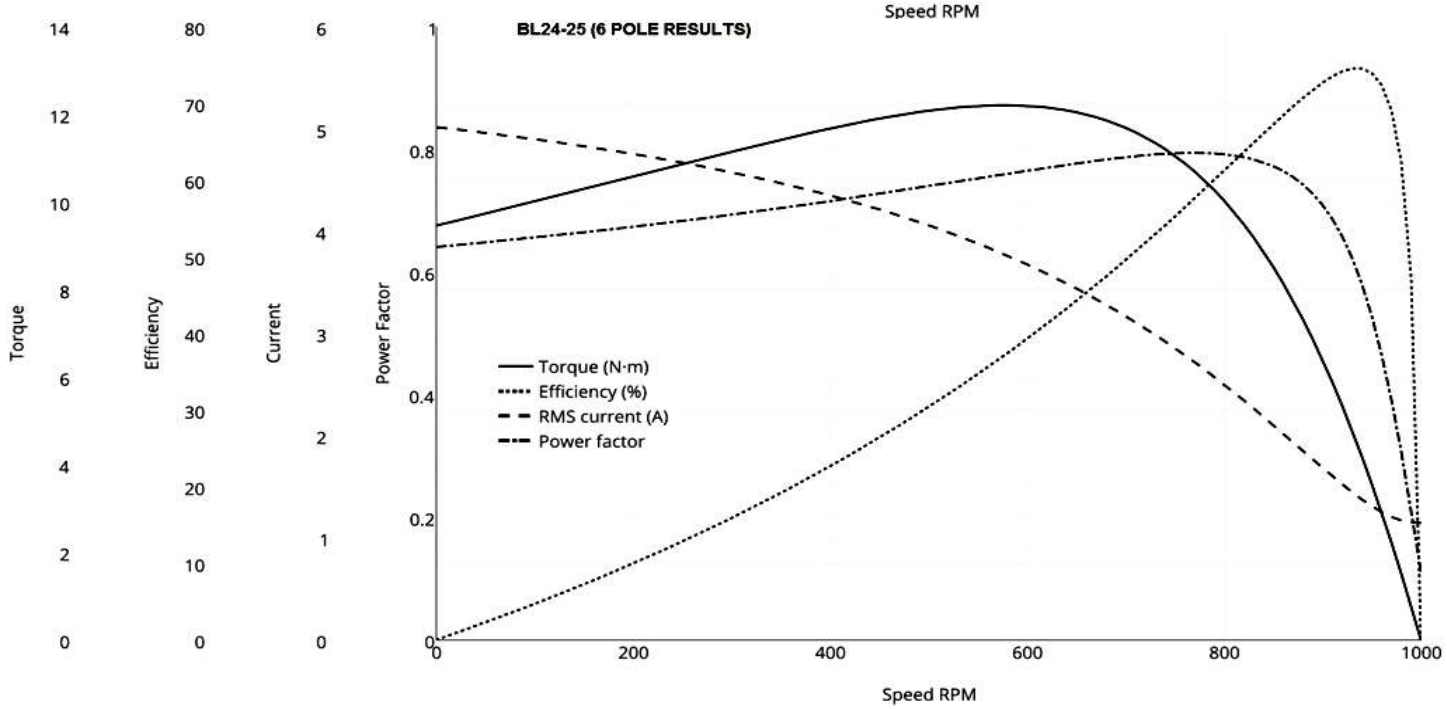




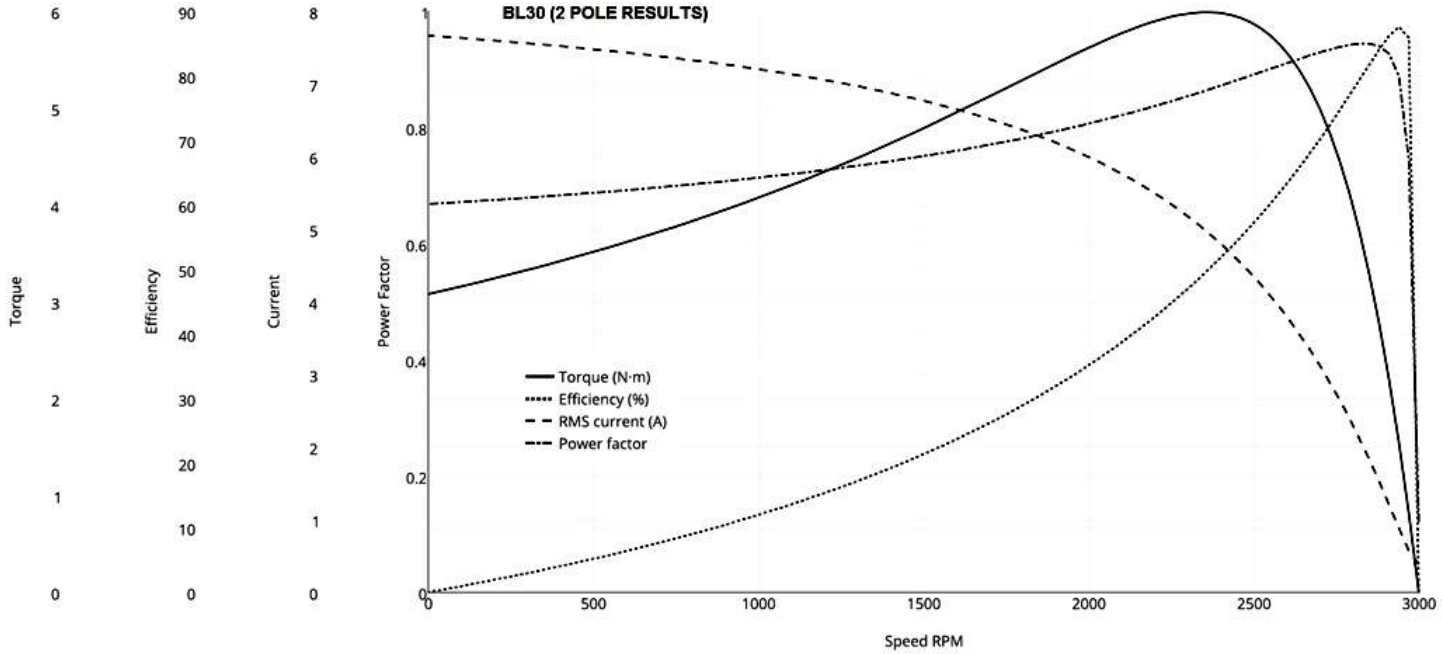
BL24/25 TORQUE CURVES

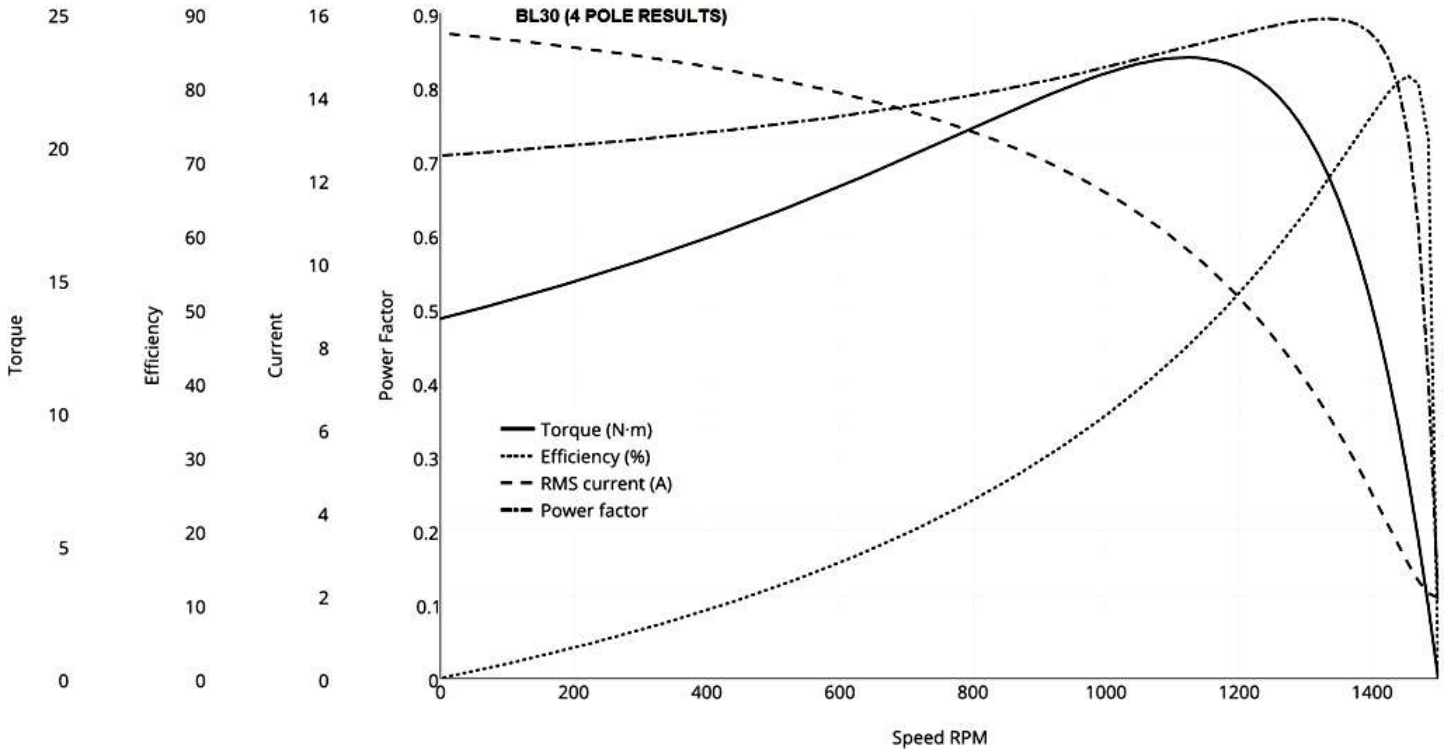




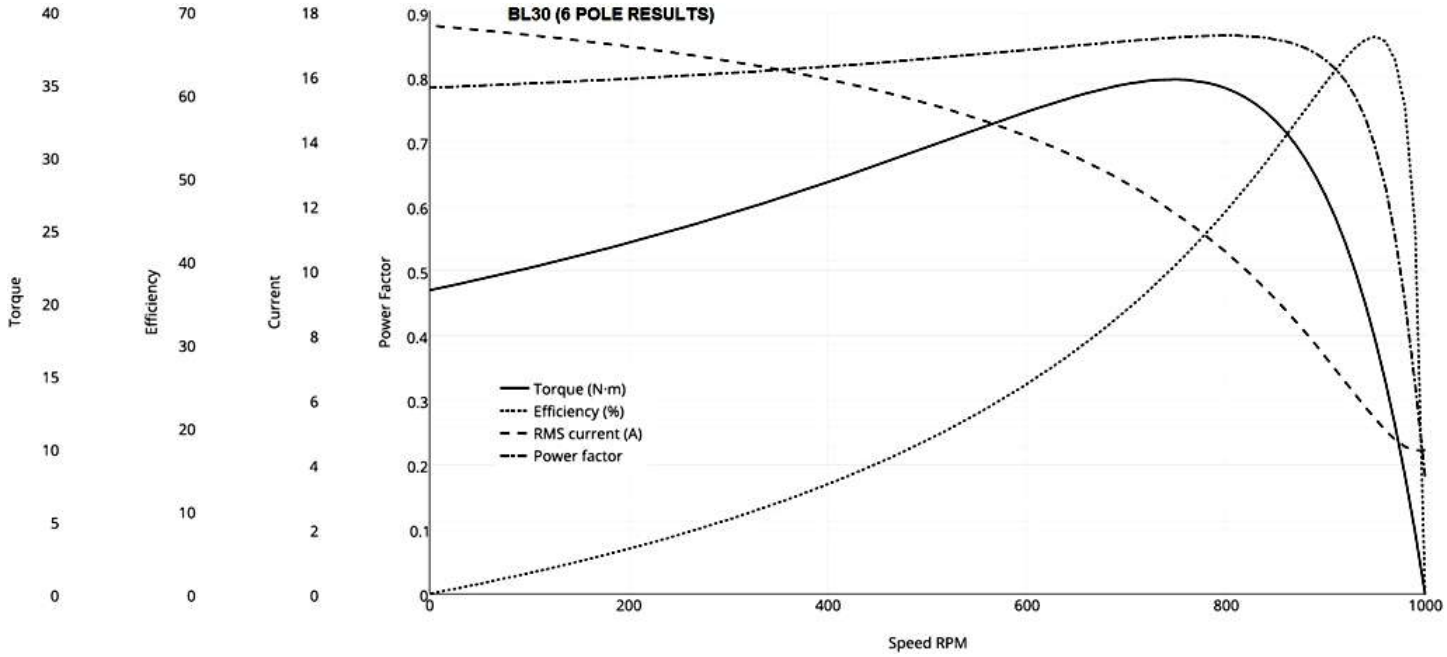


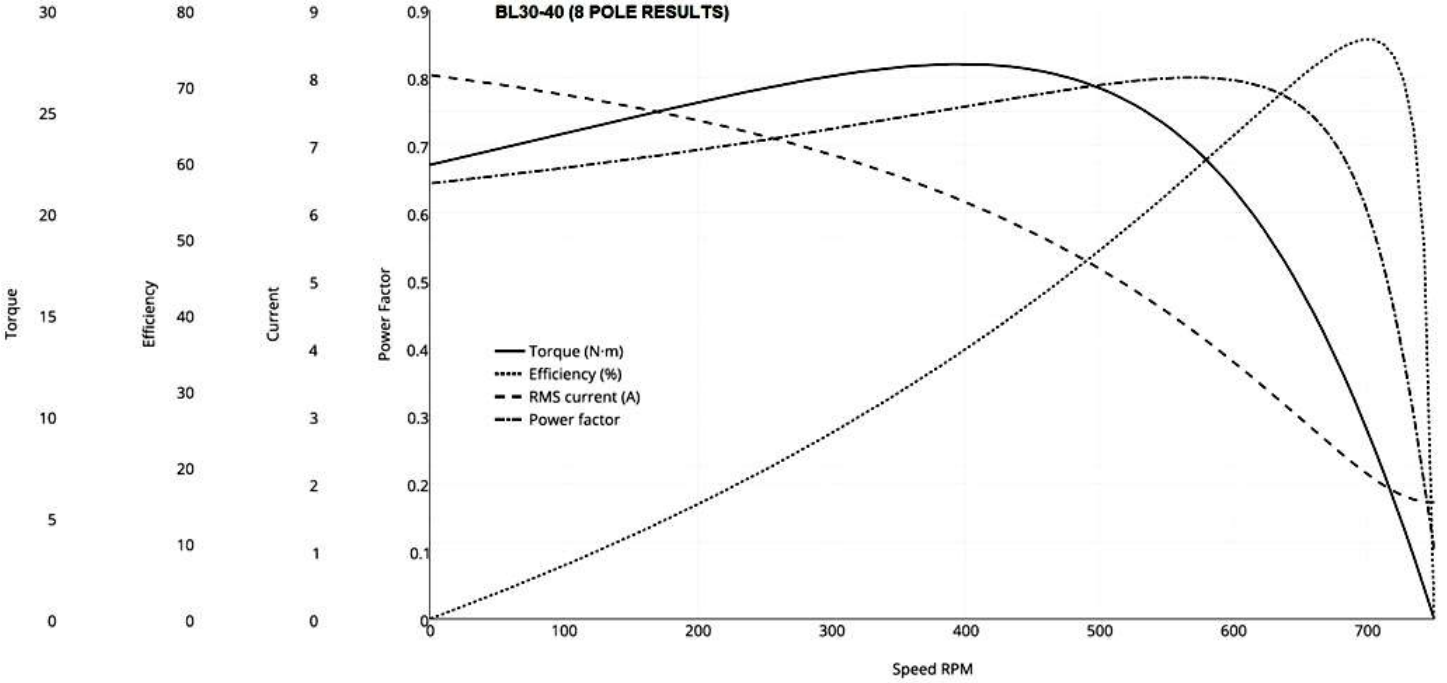
BL30 TORQUE CURVES (2 & 4 POLE)



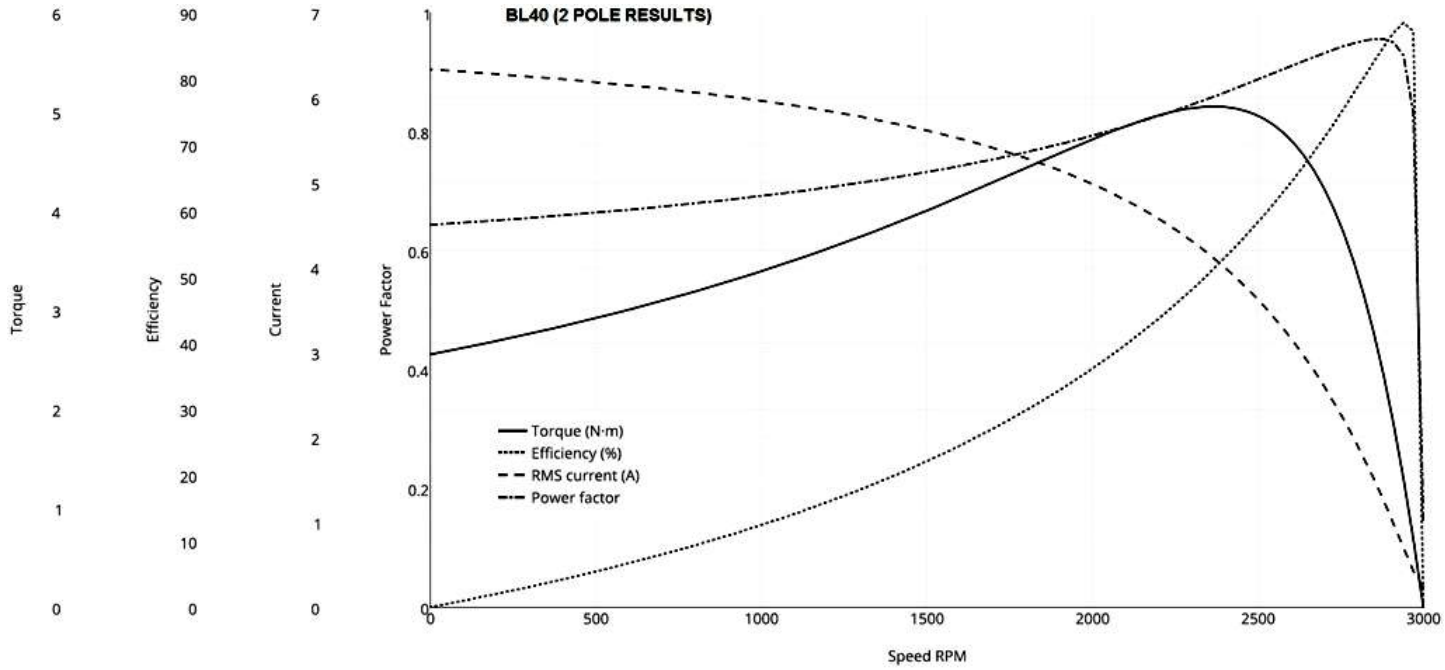


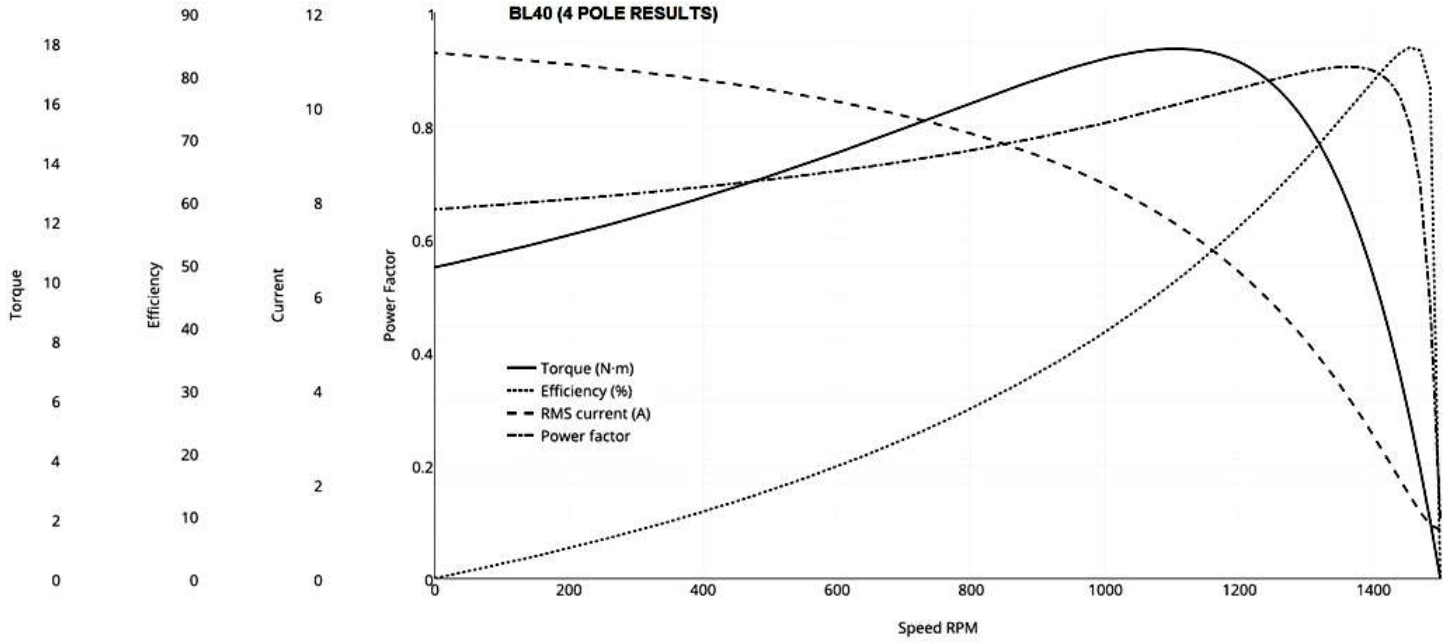
BL30 6 POLE, BL30-40 8 POLE TORQUE CURVES



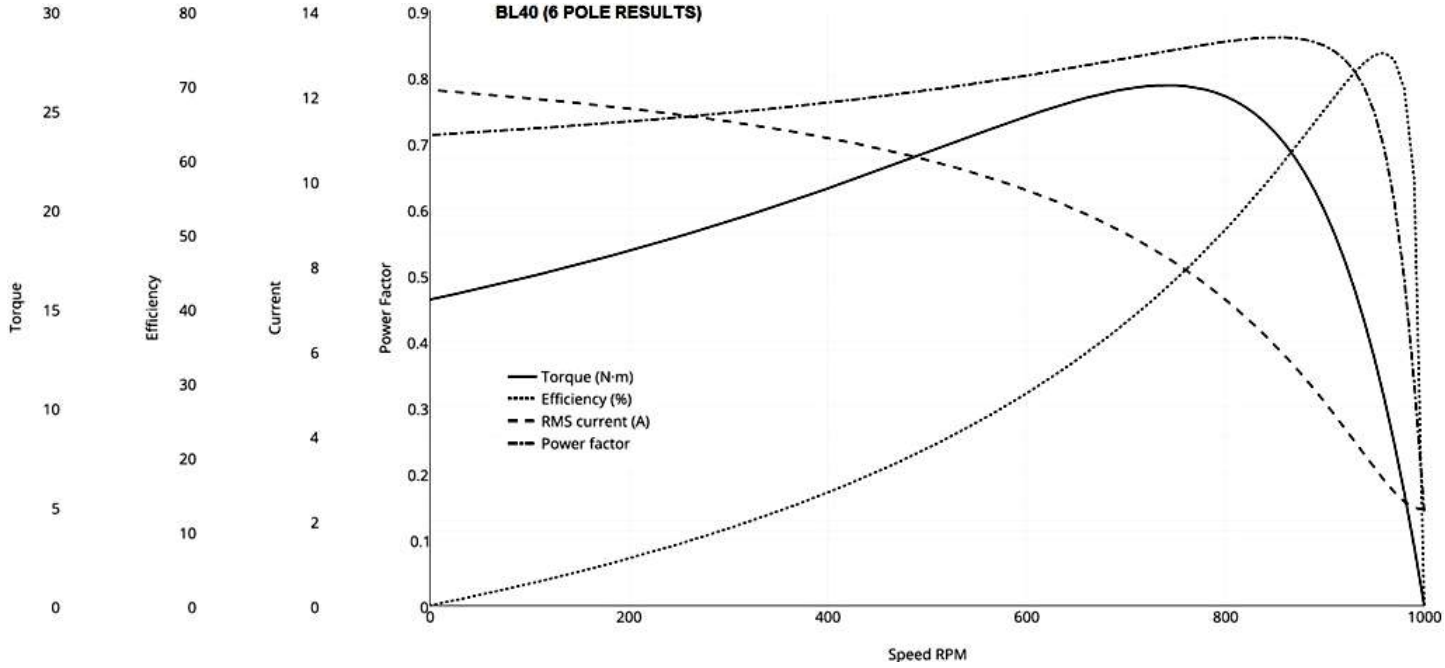


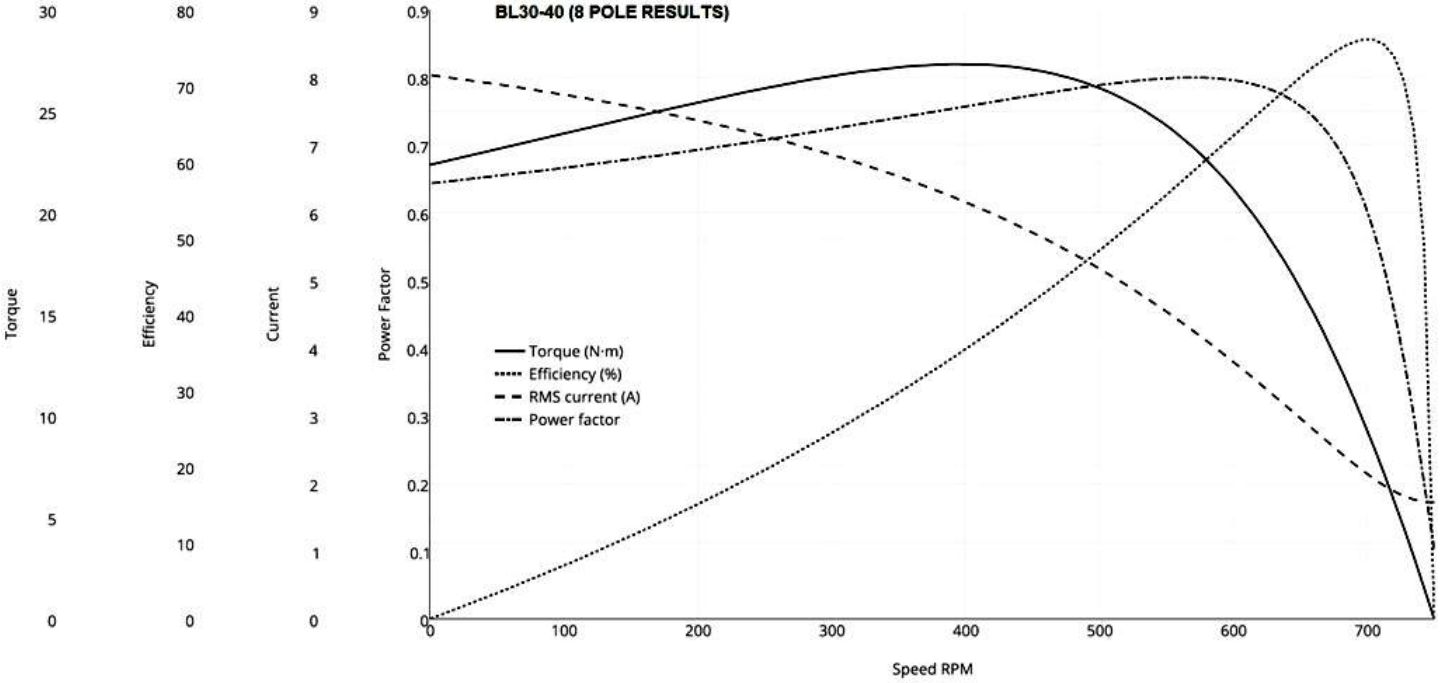
BL40 TORQUE CURVES (2 & 4 POLE)



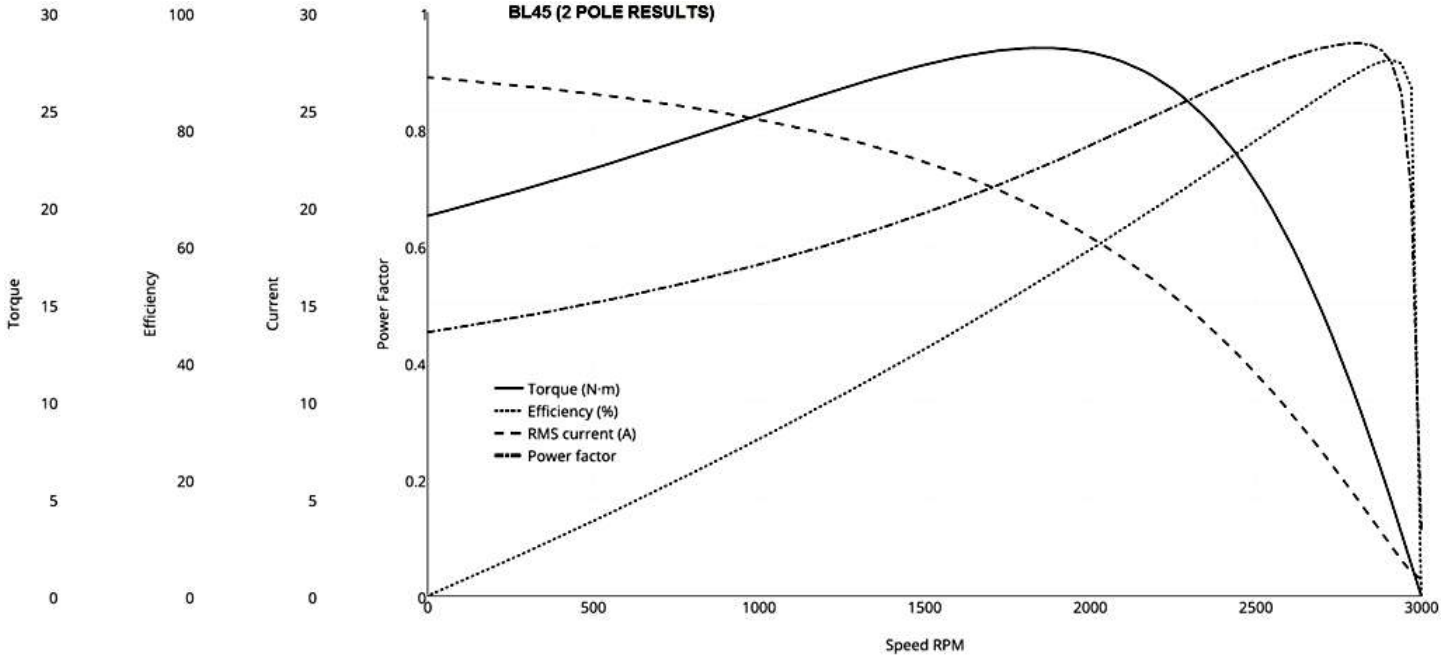


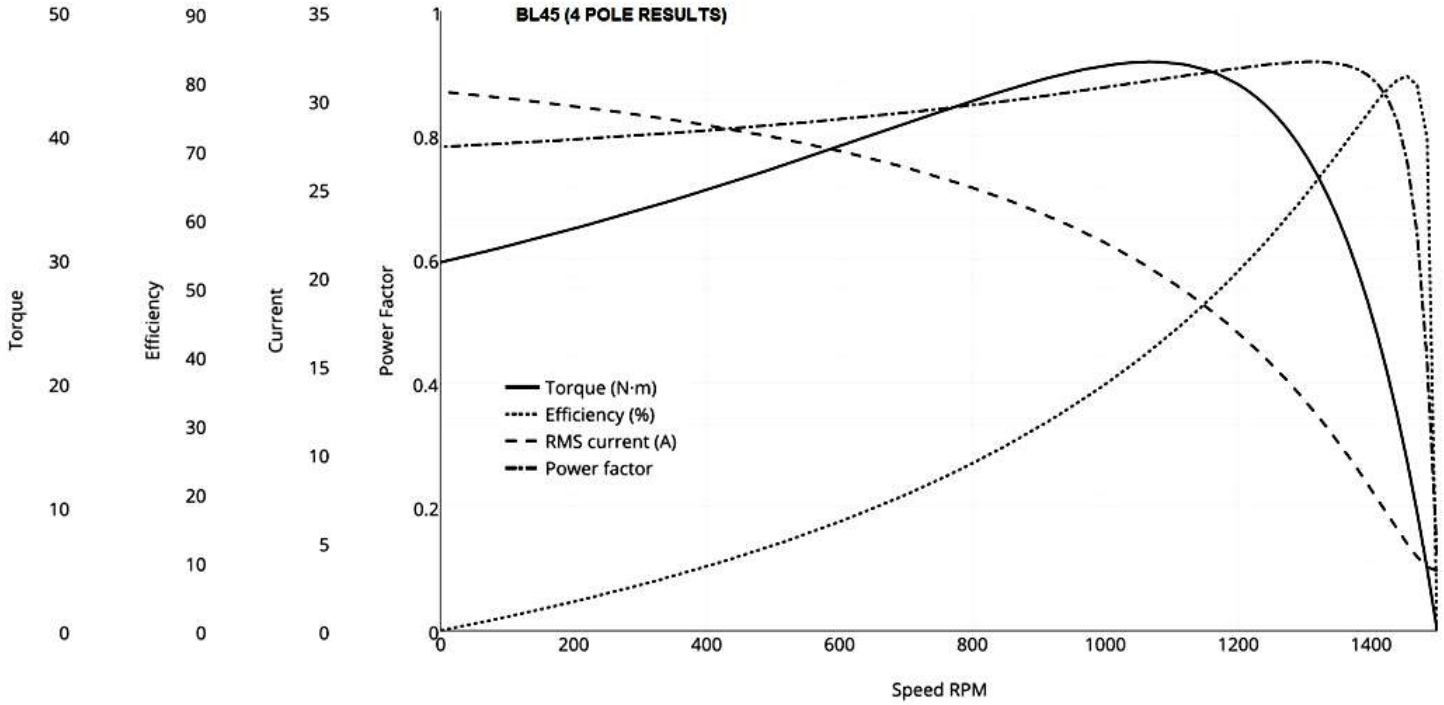
BL40 TORQUE CURVES (6 & 8 POLE)



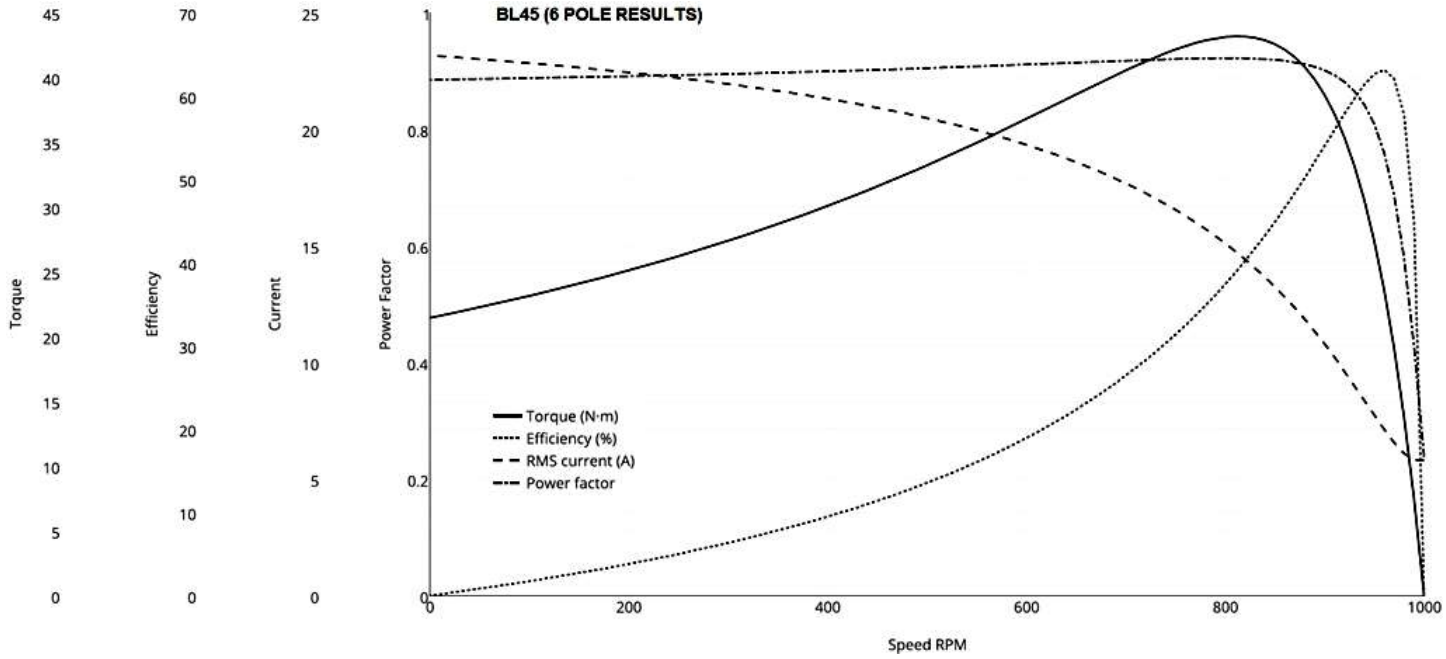


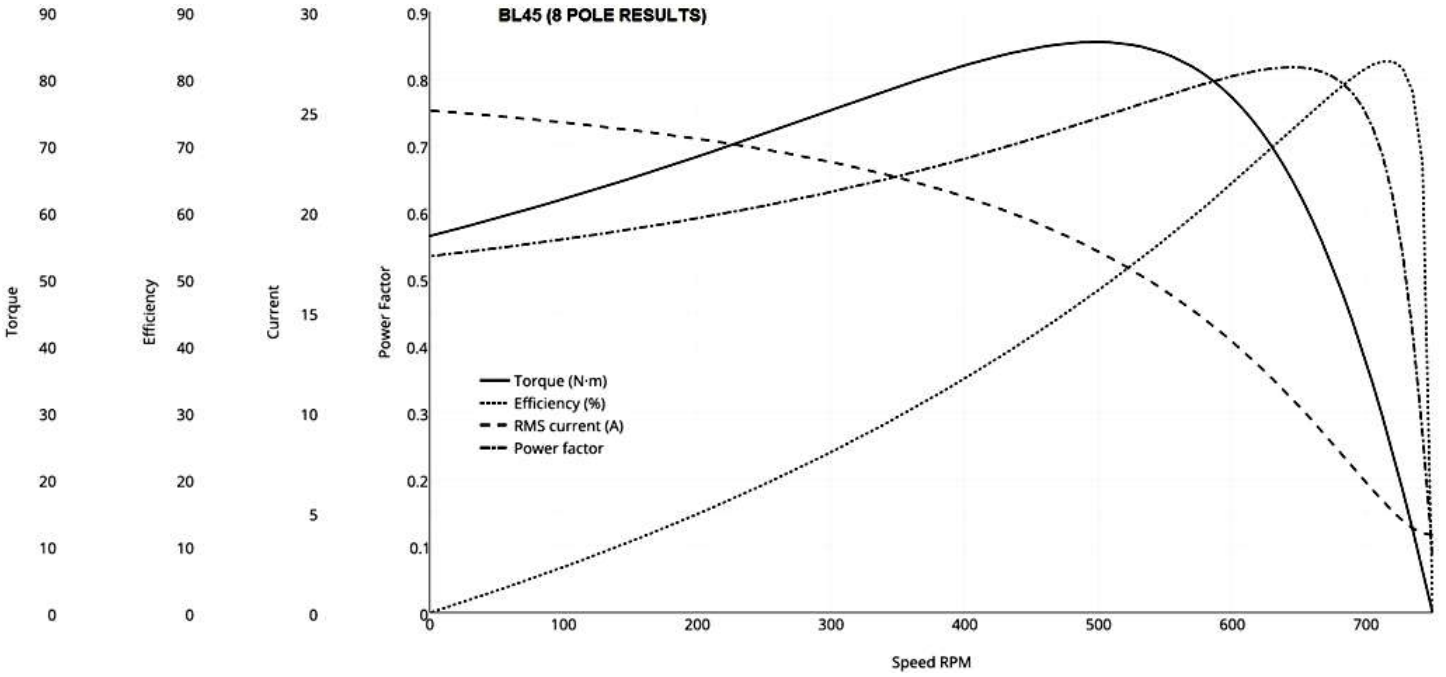
BL45 TORQUE CURVES (2 & 4 POLE)



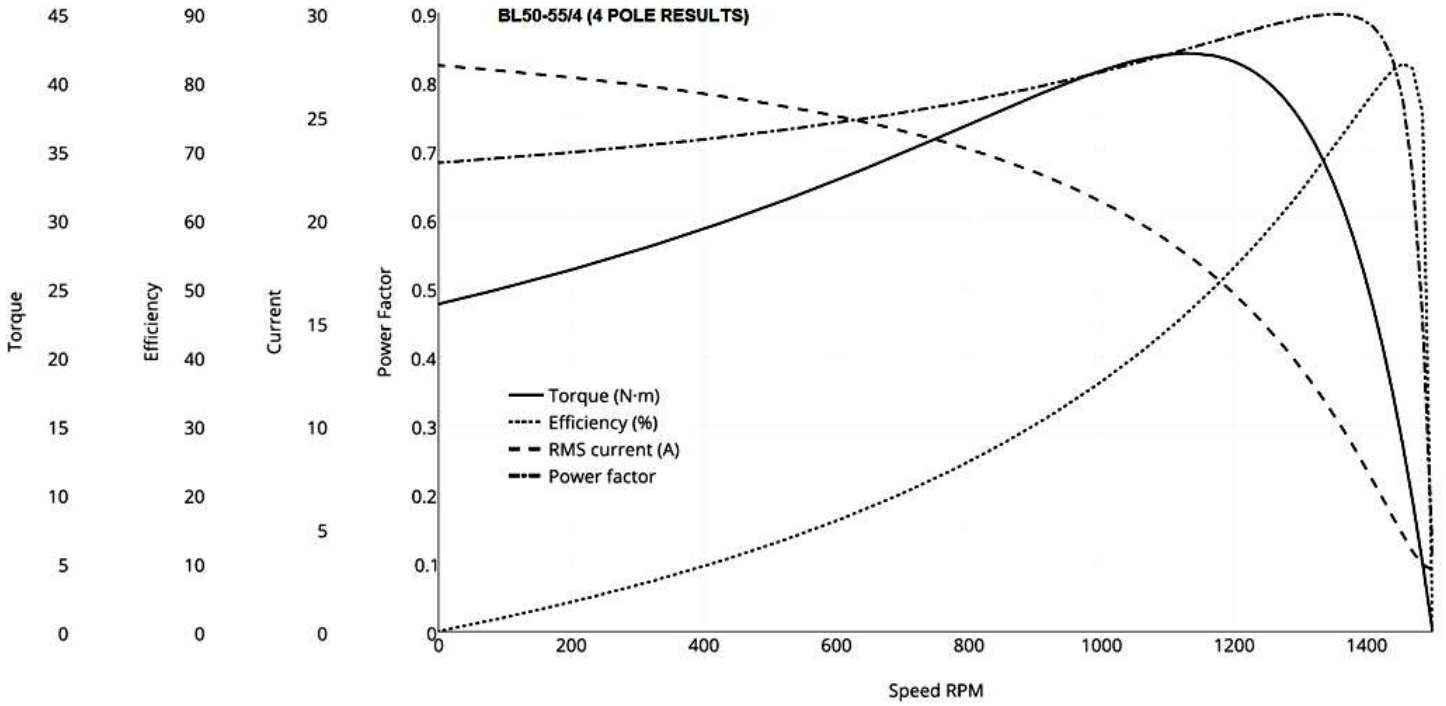


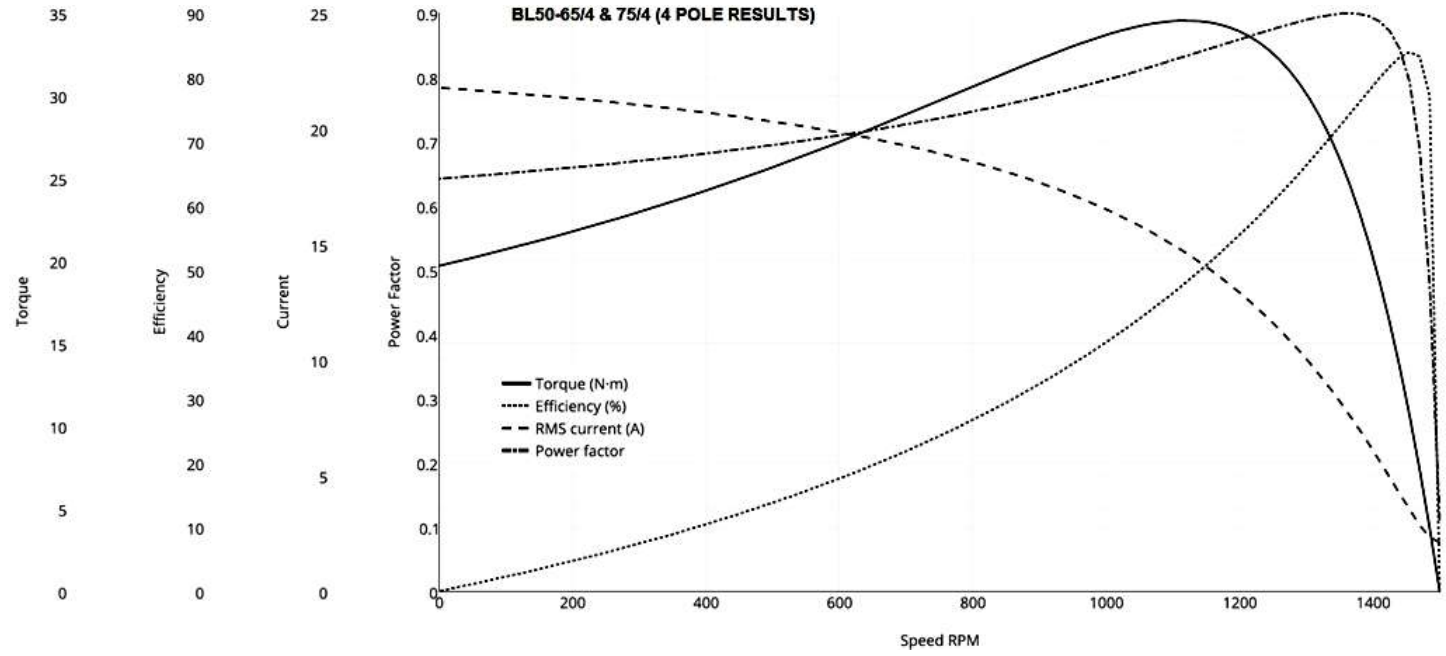
BL45 TORQUE CURVES (6 & 8 POLE)



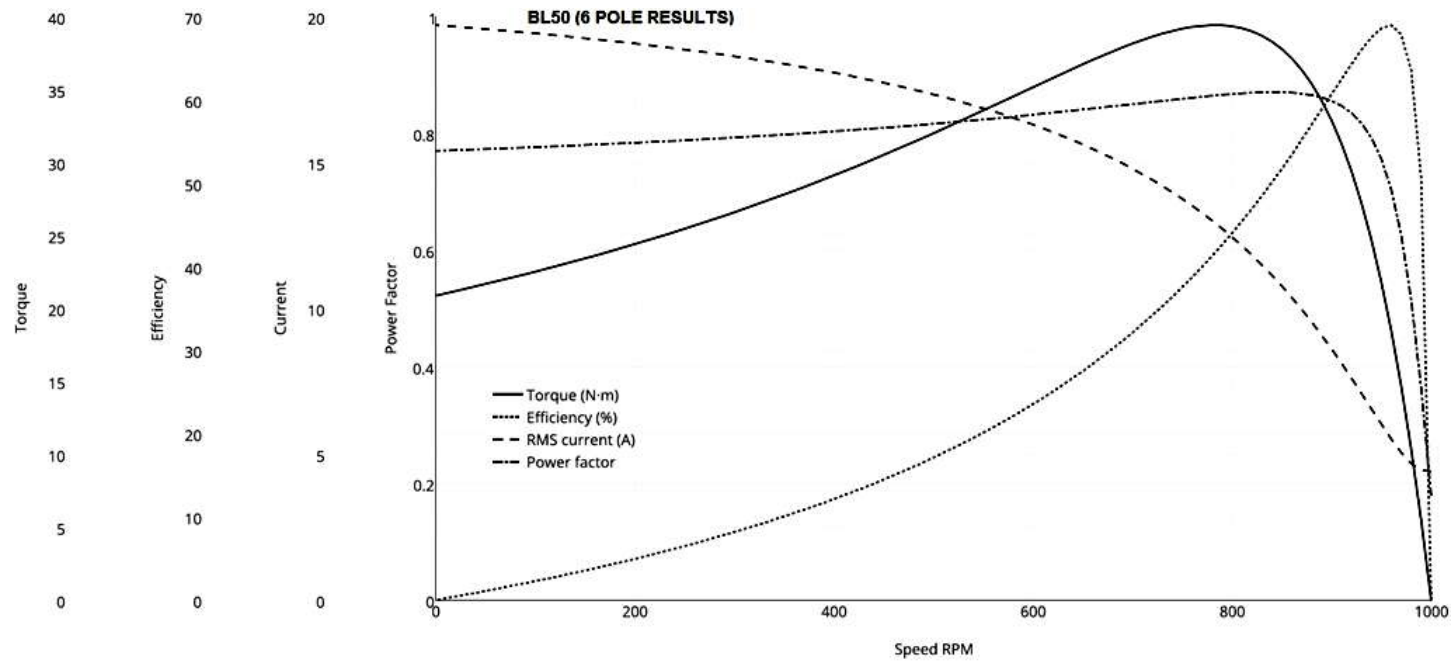


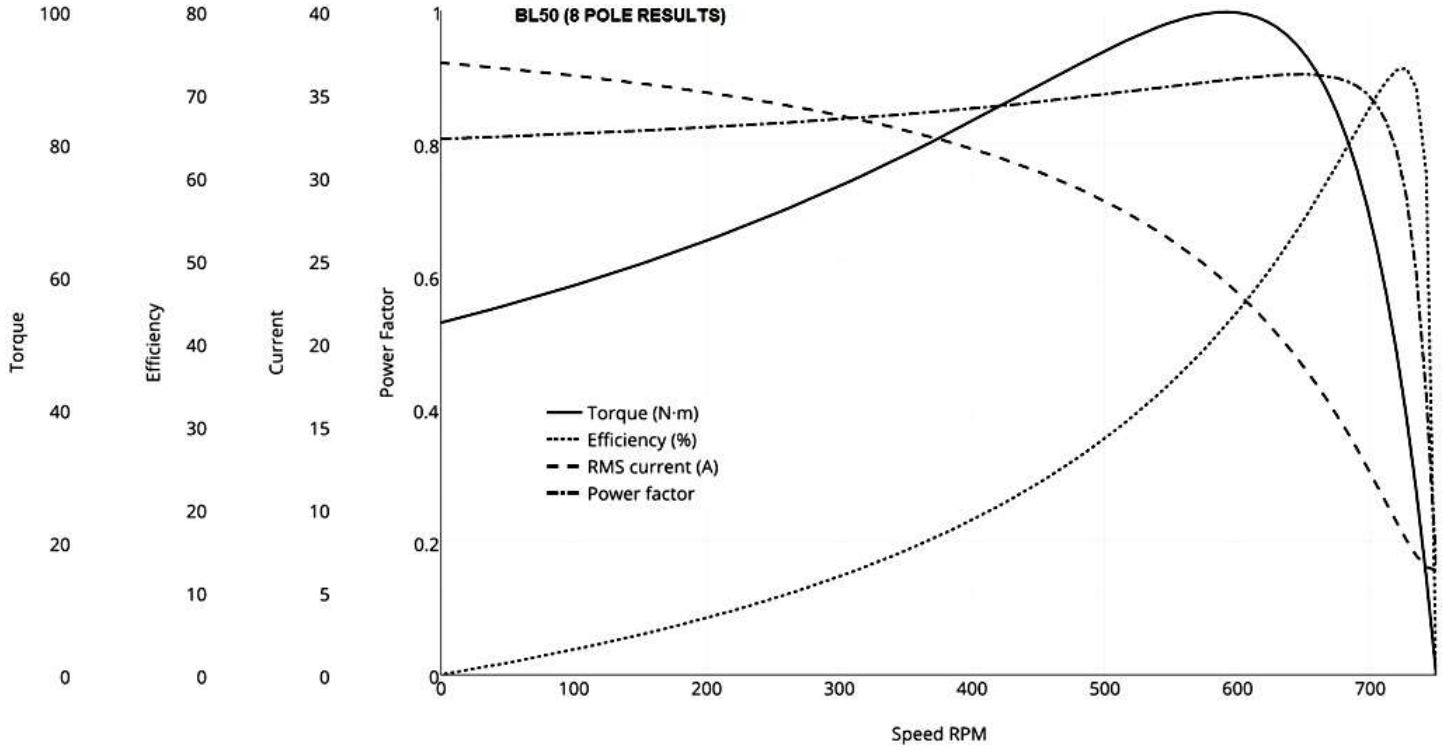
BL50 TORQUE CURVES (4 POLE)



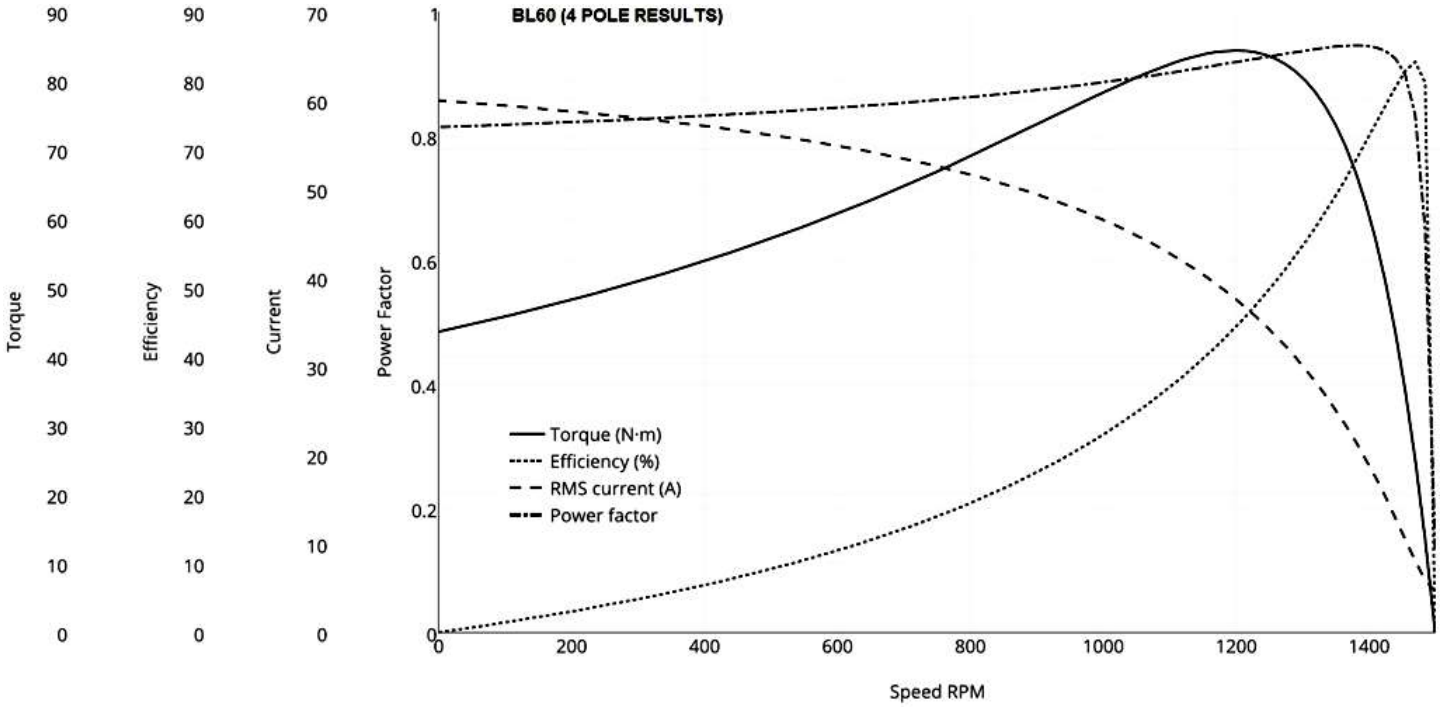


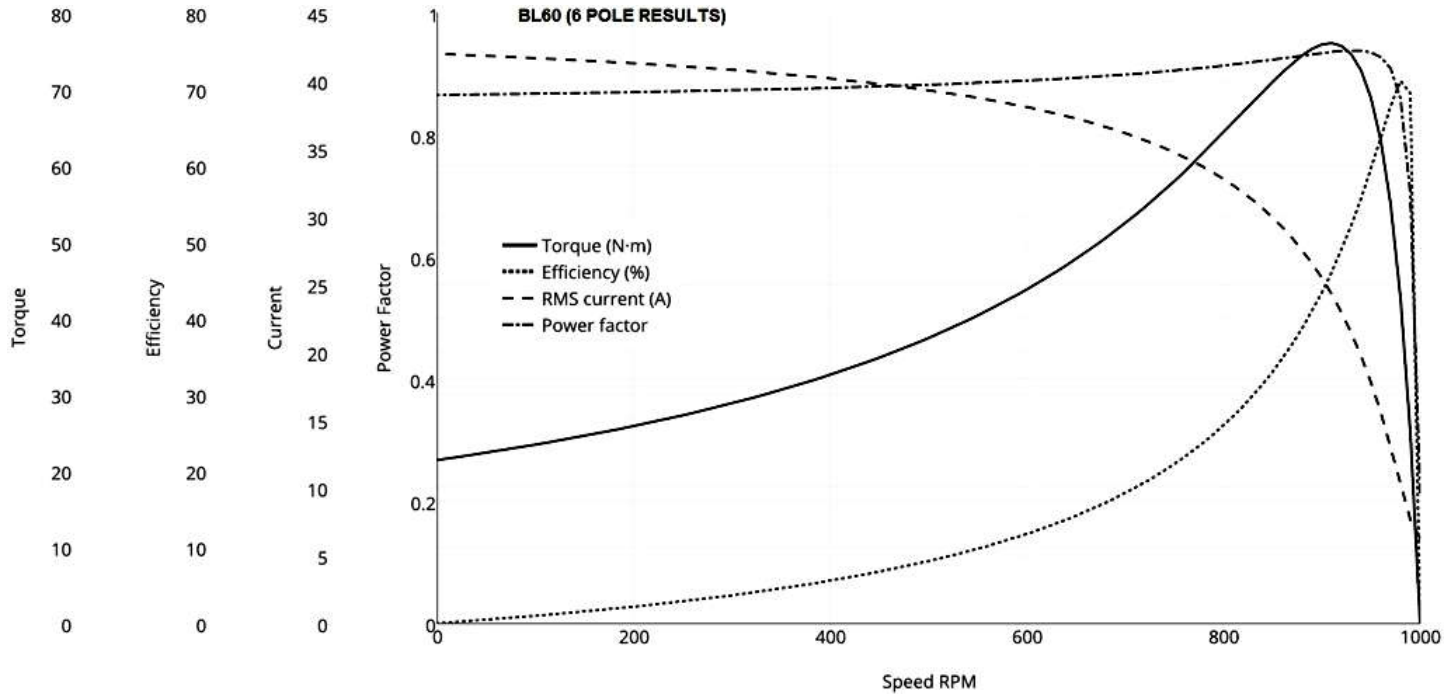
BL50 TORQUE CURVES (6 & 8 POLE)



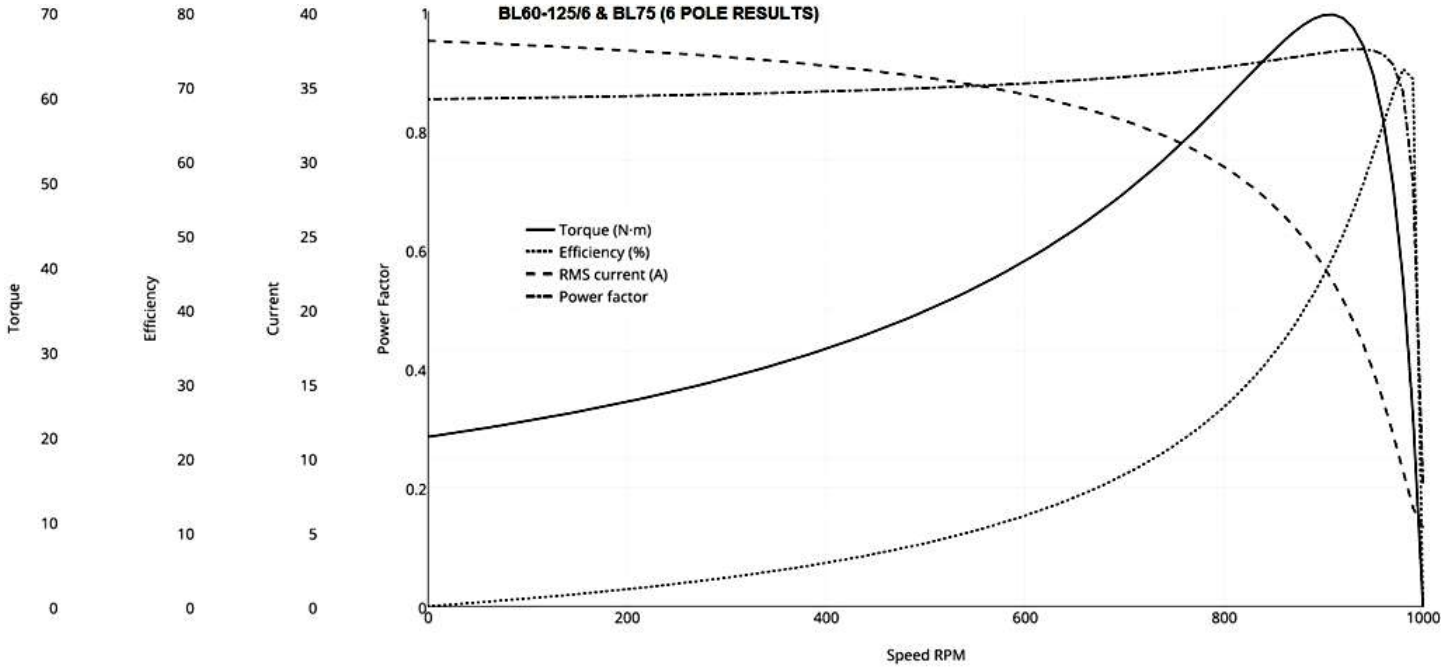


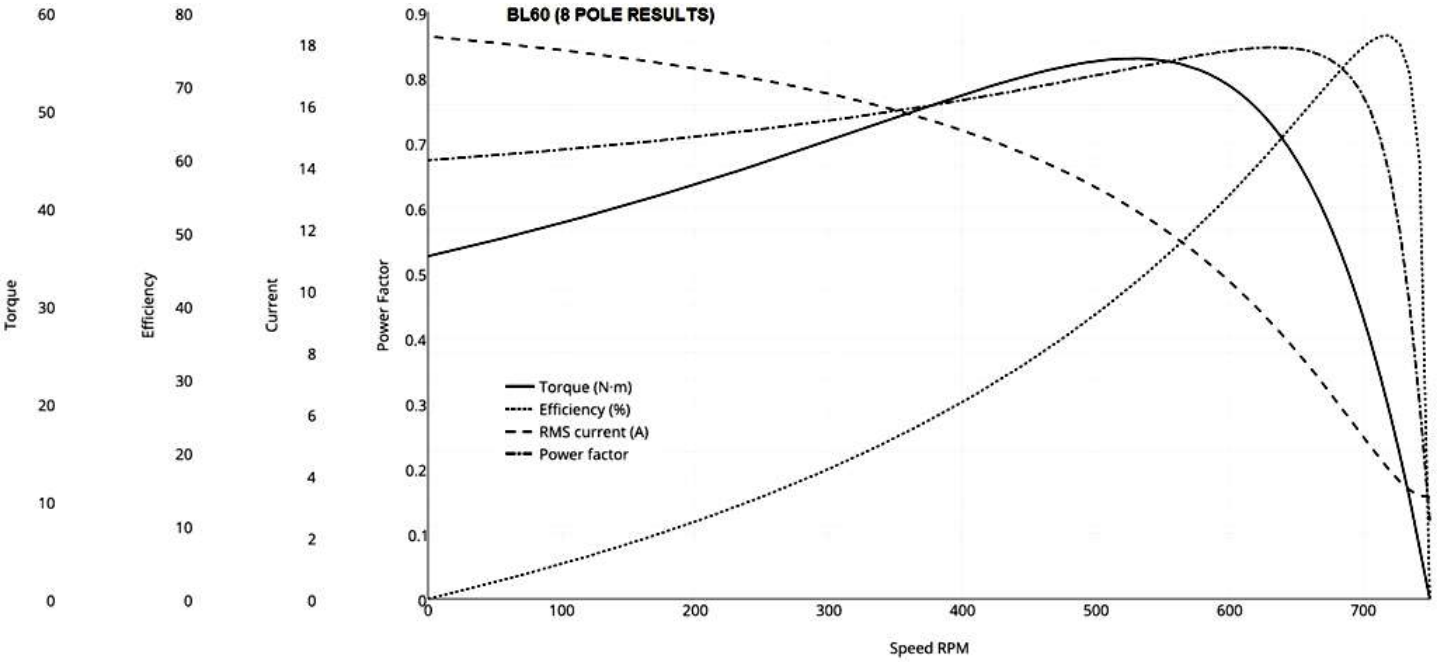
BL60 TORQUE CURVES (4 & 6 POLE)



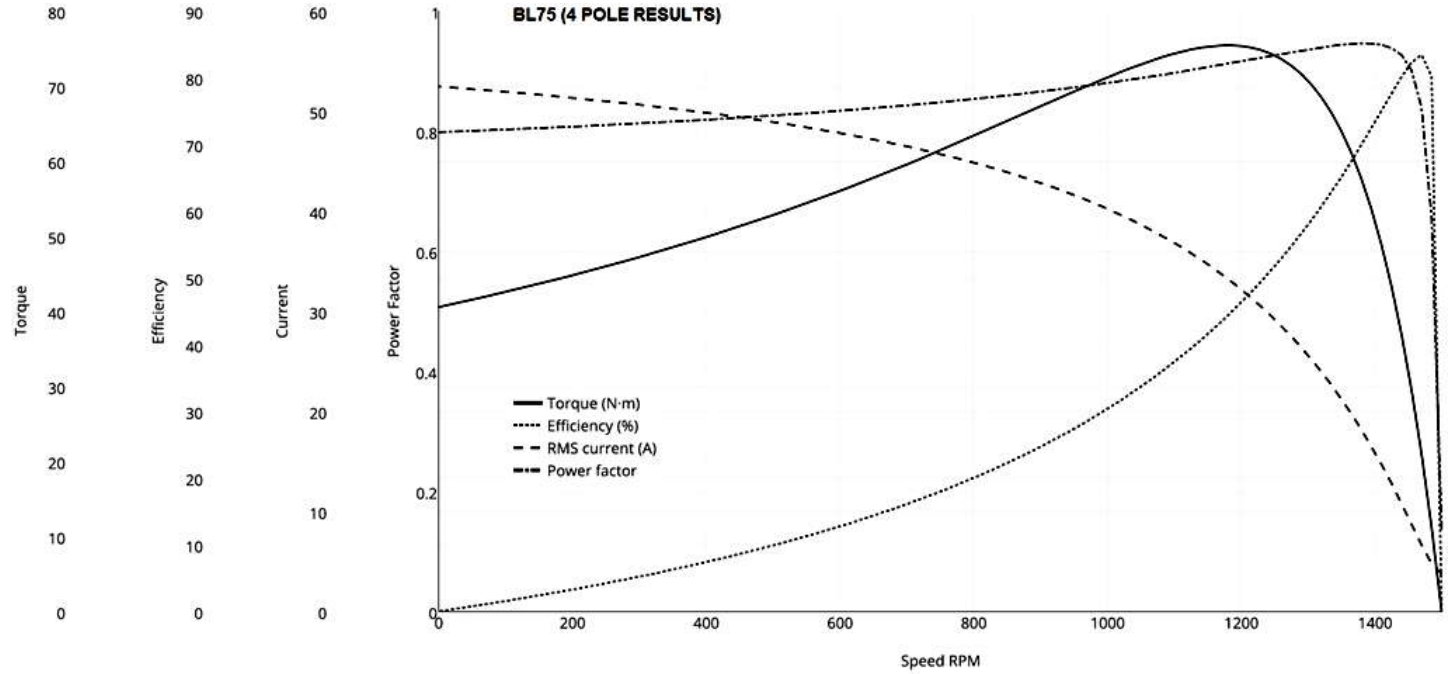


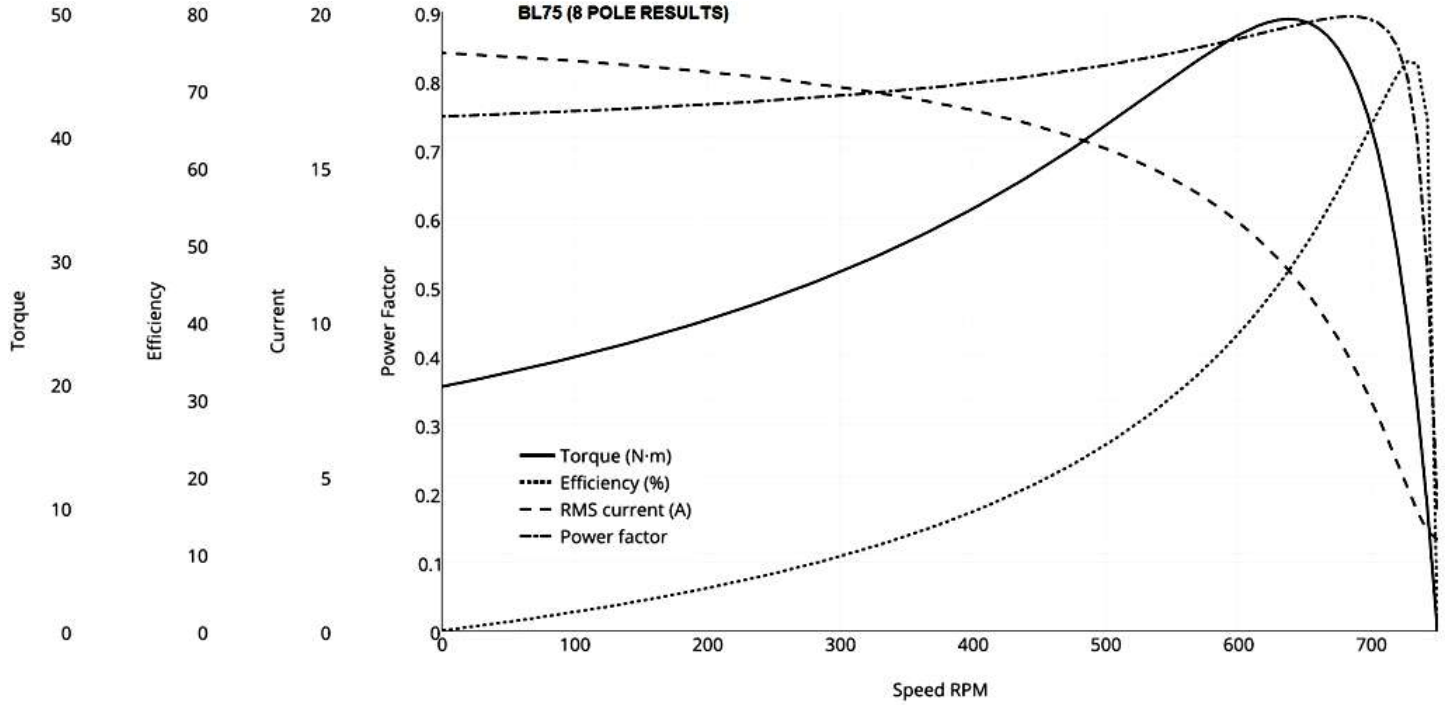
BL60-125/6, BL75 6 POLE & BL60 8 POLE TORQUE CURVES



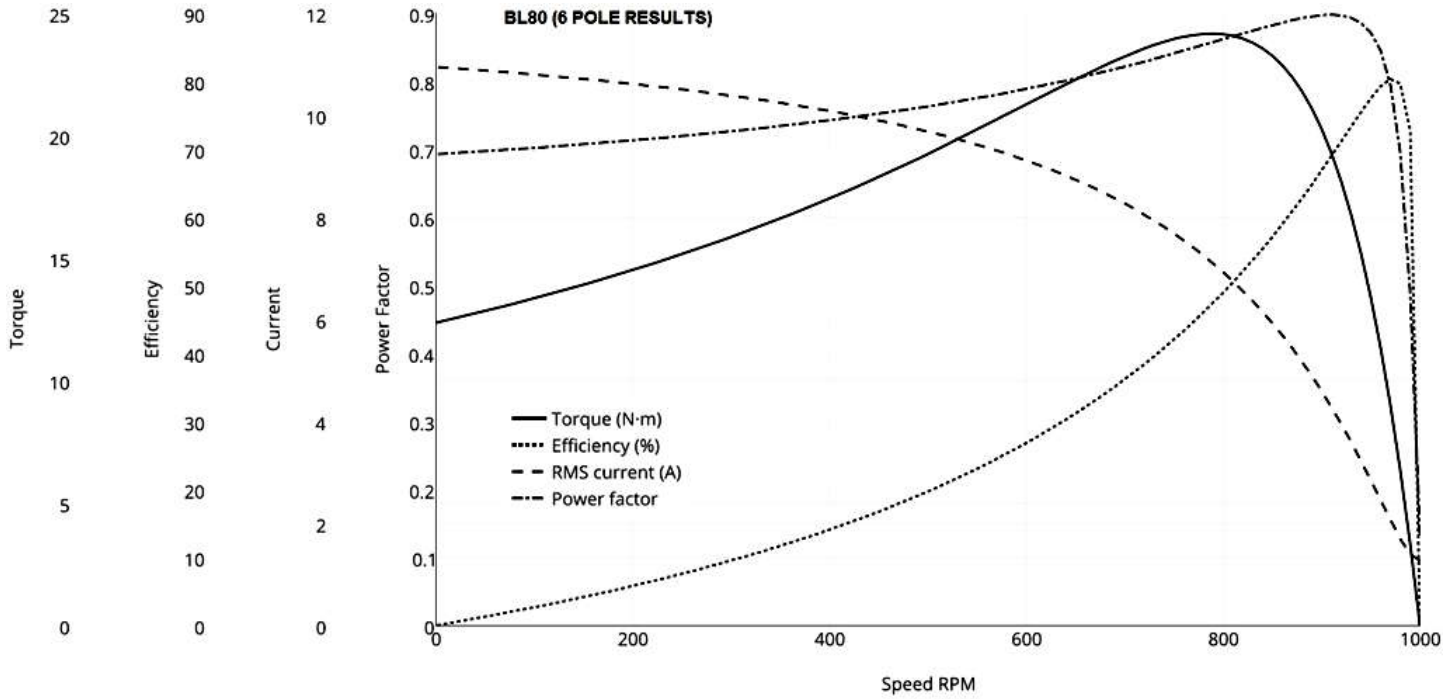


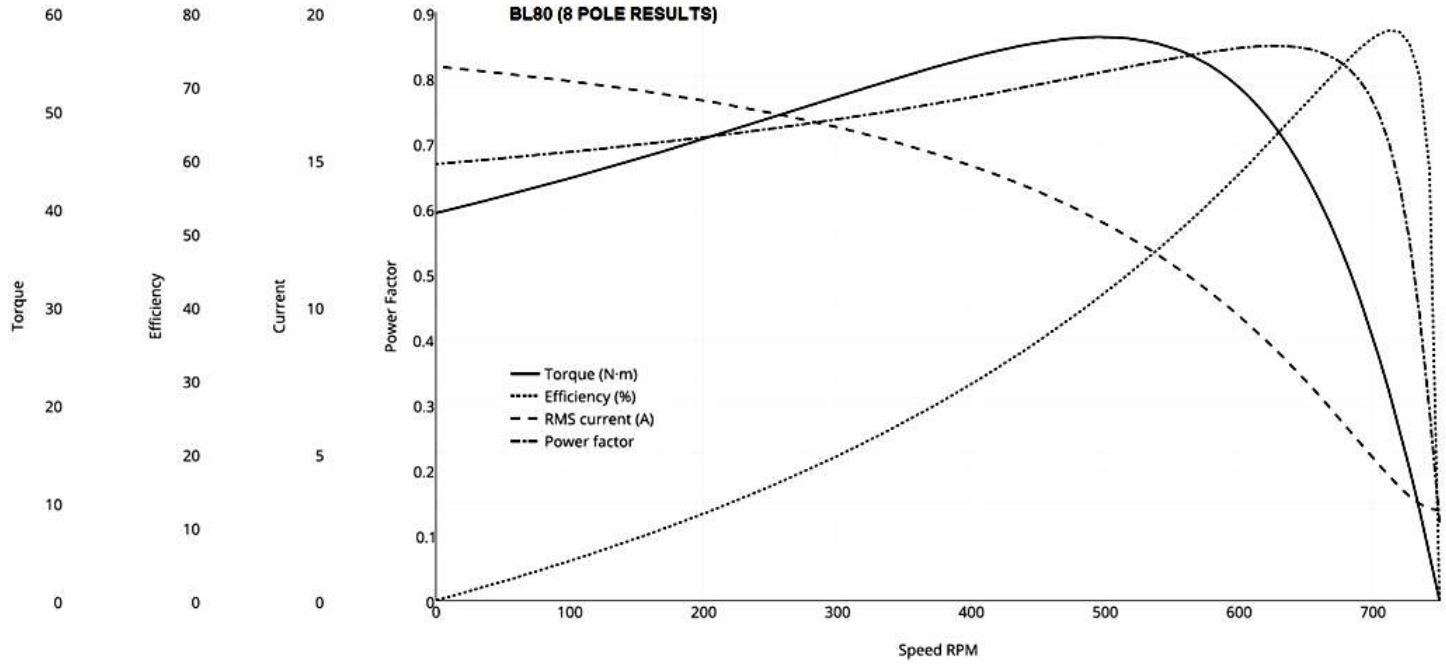
BL75 TORQUE CURVES (4 & 8 POLE)





BL80 TORQUE CURVES (6 & 8 POLE)





OUT OF BALANCE WEIGHT ADJUSTMENT

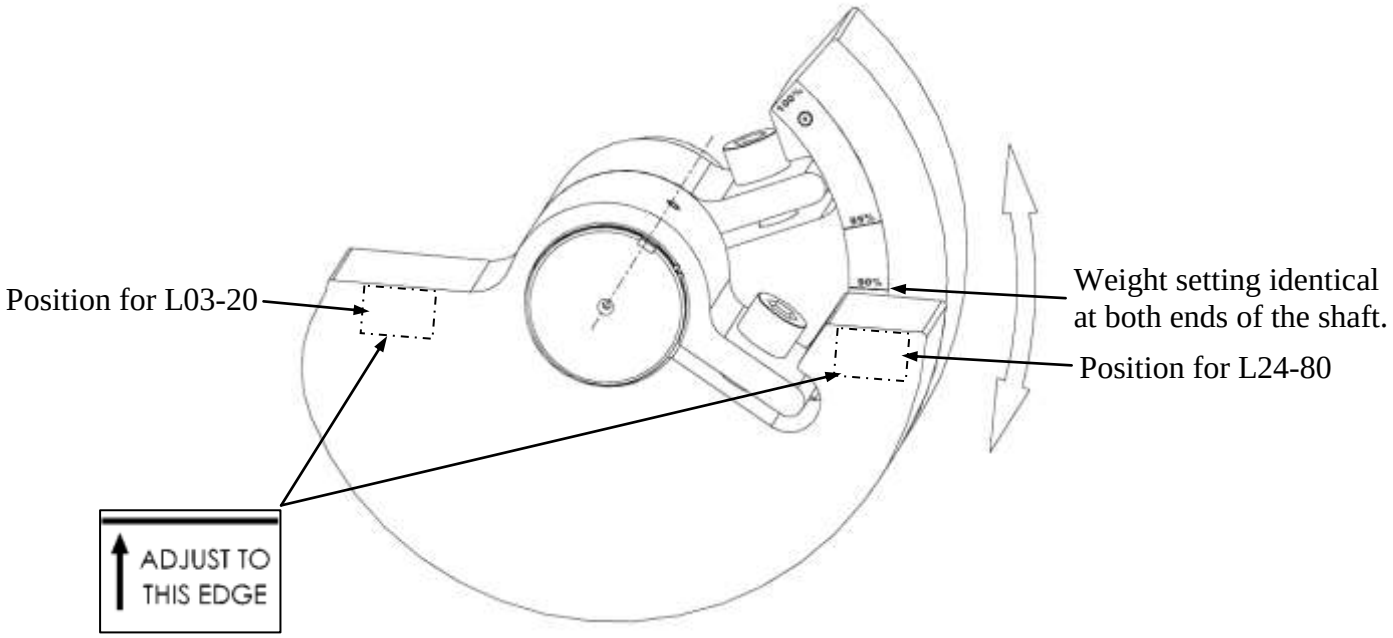
WARNING: Out of balance weight adjustment should only be attempted once the vibrator shaft has stopped rotating, the power supply has been disconnected and the temperature of the body is less than +50°C. Consideration should be given to the position and orientation of the end covers before removal to minimise the risk of trapping, crushing and dropping of the end covers.

BLz 03-22 can be adjusted by either inner or outer weights provided both ends are the same.

BLz 24-80 When adjusting O/B weights slacken screw in INNER weight only. Adjust inner weight to required force on percentage scale and retighten screw. Adjust opposite end to the same percentage.

Care should be taken when adjusting weights as unexpected shaft rotations can occur as clamp screws are loosened. We recommend securing the outer weights with wedges to lock the shaft before adjustment is attempted.

IT IS IMPORTANT THAT BOTH ENDS ARE THE SAME AND IN LINE – Clamping screws MUST always be on the same side of the vibrator. Use a minimum, Property Class Grade 8.8 bolts, see table below for torque settings. (Clamp screws not lubricated)



Label fitted in one of the two positions above.

Size	Torque (N.m) Capscrews/ Setscrews	Size	Torque (N.m) Capscrews/ Setscrews
M 5	6.5	M12	96
M 6	11	M16	176
M 8	27	M20	340
M10	56	M24	490

Use the above figures for out of balance weight screws only.

USE OF VIBRATORS WITH VARIABLE SPEED CONTROLS

Force must be reduced by setting the out of balance weights back. The tables below give the maximum allowed speed for various percentages of full centrifugal force. Refer to thermistor connection note on page 1 and page 9 for use with variable speed drives.
The vibrator shall be limited to operation in the 25Hz to 80Hz range. 80Hz is the maximum attainable speed due to winding flux saturation.

Weights setting at % of full CF	Max. Speed/50-60 Hz. Vibrators									
	Hertz		2 Pole		4 Pole		6 Pole		8 Pole	
	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
100	50	60	2880	3456	1440	1728	960	1152	720	864
90	52.7	63.2	3036	3643	1518	1821	1012	1214	759	910
80	55.9	67	3220	3864	1610	1932	1073	1288	805	965
70	59.8	71.7	3442	4130	1721	2065	1147	1377	861	1032
60	64.5	77.4	3718	4462	1859	2231	1239	1487	923	1115
50	70.7	80	4073	4608	2036	2304	1358	1536	1018	1152
40	79	80	4554	4608	2277	2304	1518	1536	1138	1152
30	80	80	4608	4608	2304	2304	1536	1536	1152	1152
20	80	80	4608	4608	2304	2304	1536	1536	1152	1152
10	80	80	4608	4608	2304	2304	1536	1536	1152	1152

Guideline values for maximum speeds are grease limiting speed x 3 for ball bearings & 2.2 for roller bearings. Grease limiting speeds are given on Page 32.
Consult our Technical Department for further information.

MAINTENANCE

NOTE: Any maintenance carried out to the vibrator must be performed within a safe area.

Inspection and maintenance of this equipment shall be carried out by suitably trained personnel in accordance with the applicable Code of Practice (EN60079-17 Explosive atmospheres. Electrical installations, inspection and maintenance.) Repair of this equipment shall be carried out by suitable trained personnel in accordance with the applicable Code of Practice (EN60079-19 Explosive atmospheres. Equipment repair, overhaul and reclamation.)

The manufacturer offers a full repair service.

Before carrying out any maintenance on the vibrator ensure that the vibrator is switched off and the power supply is disconnected. Ensure the external temperature of the vibrator body does not exceed +50°C before any disassembly is attempted.

Re-Lubrication

BLz 03 to BLz 22 plus BLz 24/25-8/2, -7.5/4 and -4/6 are fitted with shielded ball bearings and are greased for life.

BLz 24/25 (except above)**:** New motors have grease nipples fitted as standard. Ensure that they are clean prior to re-lubrication to prevent contamination.
On older motors without grease nipples; remove end covers, circlips and out of balance weights (noting position of weights to keep the same force output on re-assembly). Remove bearing housing with bearing outer race. The inner race remains on the rotor shaft. Provided the bearing and grease are in good condition add new grease by lightly smearing it onto the rollers and re-assemble.

BLz 30 to BLz80 have grease nipples fitted as standard. Ensure that they are clean prior to re-lubrication to prevent contamination.

Recommended grease is Esso Unirex N3. If an equivalent grease is to be used it must have an auto ignition temperature of +250ºC or more. If mixing of grease is unavoidable use only Lithium complex alternatives of consistency 3. Be sure to take full account of any safety precautions specified in the specific grease safety datasheet before use. Overgreasing causes overheating of the bearings and must be avoided. Grease cavities should never be filled above one third of their capacity and bearing caps should be removed occasionally to clean out excess grease. Old grease should periodically be removed and the bearings cleaned and repacked with new grease.

Relubrication intervals are based on continuous operation in ambient temperature up to +20ºC and should be reduced as follows for increases in ambient temperature +25ºC x 0.8, +30ºC x 0.65, +35ºC x 0.5, +40ºC x 0.4. Above +40ºC consult our Technical Department.

Data is provided as a guide only and intervals should be shortened/lengthened based on service experience with the particular application.

ASSEMBLY AND DISMANTLING

BLz series vibrator motors do not contain any user serviceable parts. If repairs or replacement parts are required, the user is directed to instruction (5) under 'operational conditions' on page 1.

REMOVAL AND FITTING OF BEARINGS:

Bearings should only be removed when absolutely necessary. A press & / or appropriate extractor tools should be used to remove the outer race, cage and rollers from the bearing housing and the inner race from the shaft. If the same bearings are to be used again, wash them thoroughly in a mixture of petrol and light machine oil. Replacement bearings must have the special features recommended in the following table. Since some of the interference fit can be lost by removing and fitting new bearings they should always be re-fitted using Loctite 638 or equivalent. Refit each bearing into the bearing housing using a press. Lightly pack the outer race and rollers with grease, forcing some well into the working parts.

The inner race of the bearing should be placed in a bath of clean mineral oil and heated to a temperature of +80°C (180°)F. The inner race should be pushed into place in the correct orientation, then held against the shaft shoulder until it contracts sufficiently to grip the shaft. Smear the inner race with grease & place the shaft/rotor assembly carefully inside the stator bore within the main housing and fit the bearing housings, outer grease retainers, weights & end covers. Use Loctite 242 (or equivalent) on screws when refitting bearing housing. Check that the shaft has the correct end float.

BLz 03, 05, 15, 20, 22, 24/25-8/2, -7.5/4 and 4/6 have shielded ball bearings and should be replaced if damaged.

GREASING INSTRUCTIONS – RELUBRICATION CHART – PER BEARING

	Relube Interval (Hours)		Relube Amount	Initial Fill
Type	50 Hz	60 Hz	gms	gms
BLz24/25-10/2	1900	1600	5	12
BLz24/25-13/2	1700	1400	7	17
BLz30-16/2, -20/2	800	700	11	25
BLz40-30/2	750	650	15	35
BLz40-40/2	700	600	20	55
BLz45-50/2	500	450	5	35
BLz24/25-11/4	4100	3500	5	12
BLz24/25-14/4	3900	3300	7	17
BLz30-18/4, -25/4	3500	3100	13	30
BLz40-35/4	3000	2700	18	40
BLz45-45/4	2500	2200	22	60
BLz50-55/4	2200	1800	30	90
BLz50-65/4, -75/4	2000	1600	38	110
BLz60-95/4	900	800	47	160
BLz60/61-105/4	900	800	47	160
BLz75-130/4	400	350	38	200

	Relube Interval (Hours)		Relube Amount	Initial Fill
Type	50 Hz	60 Hz	gms	gms
BLz24/25-8/6	6800	5800	5	12
BLz24/25-11/6	5800	4800	7	17
BLz30-14/6	6000	5000	15	30
BLz30-18/6, -23/6	6000	5000	15	30
BLz40-27/6, -35/6	5000	4300	20	40
BLz45-42/6, -50/6	4800	4100	26	60
BLz50-60/6	4200	3800	30	90
BLz50-75/6	3800	3400	38	110
BLz60-90/6	3000	2600	54	160
BLz60/61-105/6	3000	2600	54	160
BLz60/61-125/6	3000	2600	54	160
BLz75-150/6,BLz78-165/6	2000	1800	66	200
BLz75/77/78-185/6	2000	1800	66	200
BLz80 6 pole	1500	1300	100	320
BLz30-7.5/8, -10/8	8000	7000	15	30
BLz40-15/8, -17/8	7000	6500	20	40
BLz45-24/8, -35/8	6500	6000	26	60
BLz50-35/8, -45/8	6000	5500	30	90
BLz50-55/8, -57/8	5500	5000	38	110
BLz60-65/8,-70/8,-90/8	5000	4500	60	160
BLz75-135/8, -150/8	3500	3000	66	200
BLz75/77-200/8	-----	2500	66	200
BLz80 8 pole	2400	1500	100	320

BEARING TYPES: It is important that full designation is quoted to ensure that all special features are incorporated.

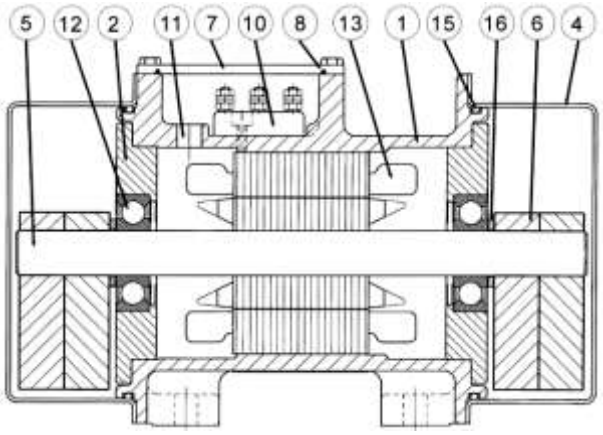
		Bearing Refs		
Type	**Bearing Prefix (All Types)**	**FAG Suffix**	**SKF Suffix**	**Grease Limiting Speed (RPM)**
BLz 03-1/2,-0.5/4,0.2/6, 0.3/6	6301 2Z C3			19,000
BLz 05-2/2, -1/4, -2/4, 0.4/6, 0.6/6, 0.9/6, 1.3/6	6304 2Z C3			13,000
BLz 15-3.5/2	6306 2Z C3			9,000
BLz 15-3/4, 1.3/6, 1.9/6	6305 2Z C3			11,000
BLz 20/22-5/2	6308 2Z C3			7,500
BLz 20/22-5/4 & 2.2/6	6307 2Z C3			8,500
BLz 24/25-8/2, -7.5/4, -4/6	6309 2Z C3			6,700
BLz 24/25-10/2, -11/4, -8/6	NJ 2306E	TVP2 C3	CP C3	8,000
BLz 24/25-13/2, -14/4, -11/6	NJ 2307E	TVP2 C3	CP C3	7,000
BLz 30 ALL	NJ 2309E	TVP2 C3	CP C3	5,600
BLz 40-30/2, -35/4, -27/6, -35/6, -15/8, -17/8	NJ 2311E	TVP2 C3	CP C3	4,800
BLz 40-40/2	NJ 2313E	TVP2 C3	CP C3	4,000
BLz 45-45/4, -42/6, -50/6, -24/8, -35/8	NJ 2313E	TVP2 C3	CP C3	4,000
BLz 45-50/2	NJ 2312E	TVP2 C4	CP C4	4,300
BLz 50-55/4, -60/6, -35/8, -45/8	NJ 2315E	TVP2 C3	CP C3	3,400
BLz 50-65/4, -75/4	NJ 2317E	M1A C3	CMA C3	3,000
BLz 50-75/6, -55/8, -57/8	NJ 2317E	TVP2 C3	CP C3	3,000
BLz 60-95/4	NJ 2320E	M1A C3	CMA C3	2,400
BLz 60/61 –105/4	NJ 2320E	M1A C3	CMA C3	2,400
BLz 60-90/6, -65/8, -70/8, -90/8	NJ 2320E	TVP2 C3	CP C3	2,400
BLz 60/61-105/6, 61-125/6	NJ 2320E	TVP2 C3	CP C3	2,400
BLz 75/77/78 ALL	NJ 2322E	M1A C3	CMA C3	2,000
BLz80 6 & 8 pole	NJ 2326E	M1 C3		1,900

DISPOSAL OF VIBRATORS

The vibrator must be disposed of in compliance with environmental legislation, and the various materials used in its manufacture must be delivered to an authorised disposal/recycling centre.
The vibrator must only be taken out of service by operators trained in the observance of applicable laws on health and safety at work.
Do not dump non-bio-degradable products, lubricants and non-ferrous materials (rubber, PVC, resins, etc) into the environment. Dispose of all such materials as stipulated by current environmental protection laws.
Do not re-use parts or components that appear to be in good condition after they have been checked and/or replaced by qualified personnel and declared unsuitable for use.

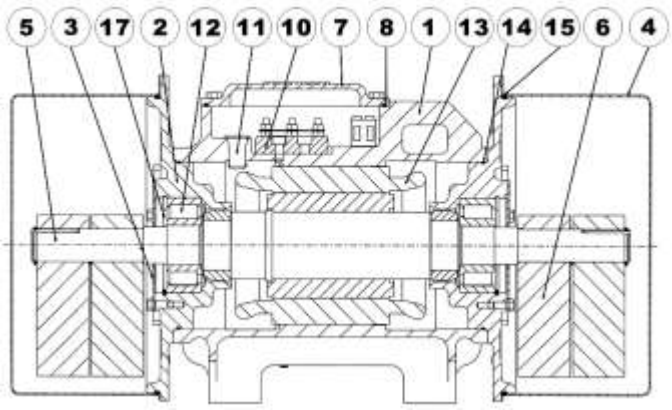
ARRANGEMENT OF STANDARD L SERIES VIBRATORS SHOWING BREAKDOWN OF MAJOR COMPONENTS FOR SPARES

SECTION THROUGH BLz 03 - BLz 22 PLUS BLz 24/25 -8/2, -7.5/4, -4/6



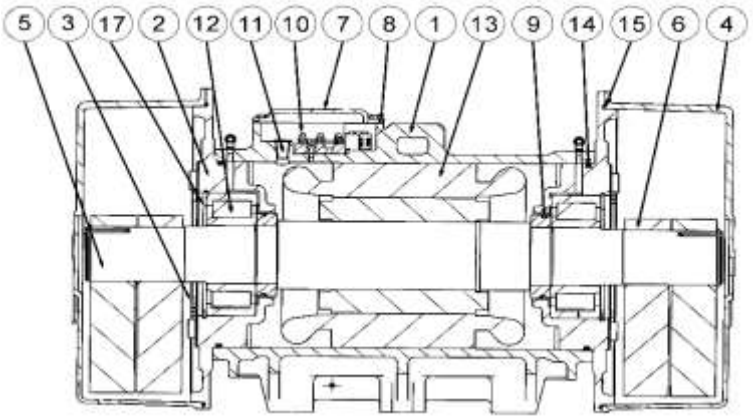
1	Stator Frame	1
2	Bearing Housing	2
3	Outer Grease Retainer	2
4	End Cover	2
5	Rotor Shaft Assy	1
6	O/B Weight Assy	1 SET
7	Terminal Box Lid	1
8	Sealing Ring (Terminal Box)	1
8	Gasket (Terminal Box)	1
9	Grease Retaining Seal	2
10	Terminal Block	1
11	Rubber Conduit Bush	1
12	Bearing	2
13	Stator Unit 3 Phase	1
14	Sealing Ring (Bearing Hsg)	2
15	Sealing Ring (End Cover)	2
16	Washer (BL 05)	2
17	Circlip	2
18	V Ring Seal (BL 78/80)	2

SECTION THROUGH BLz 24 & 25 EXCLUDING BLz 24/25, -8/2, -7.5/4, -4/6

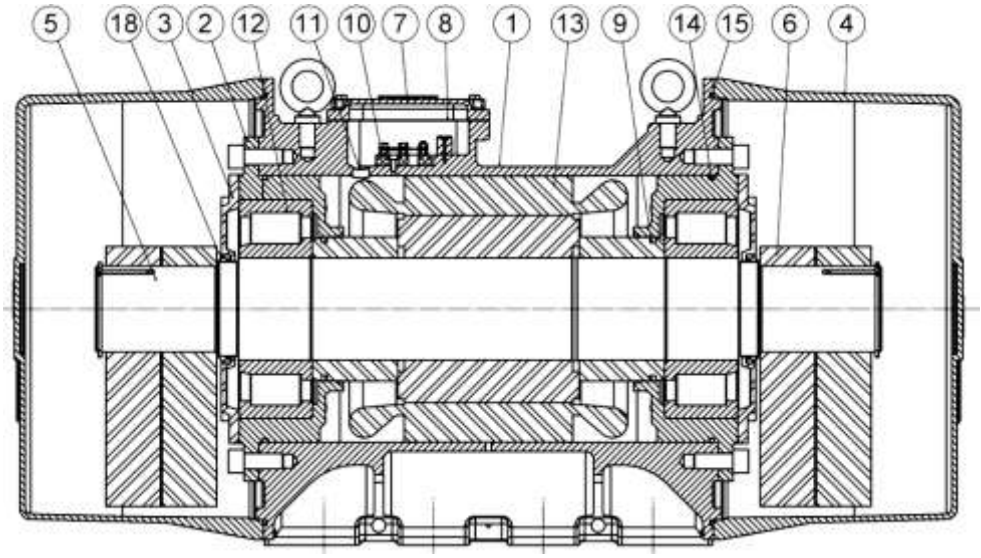


NOTE, Grease nipples not fitted to BLz03 to 25 models

SECTION THROUGH BLz30, - BLz 75/77



SECTION THROUGH BLz78/80



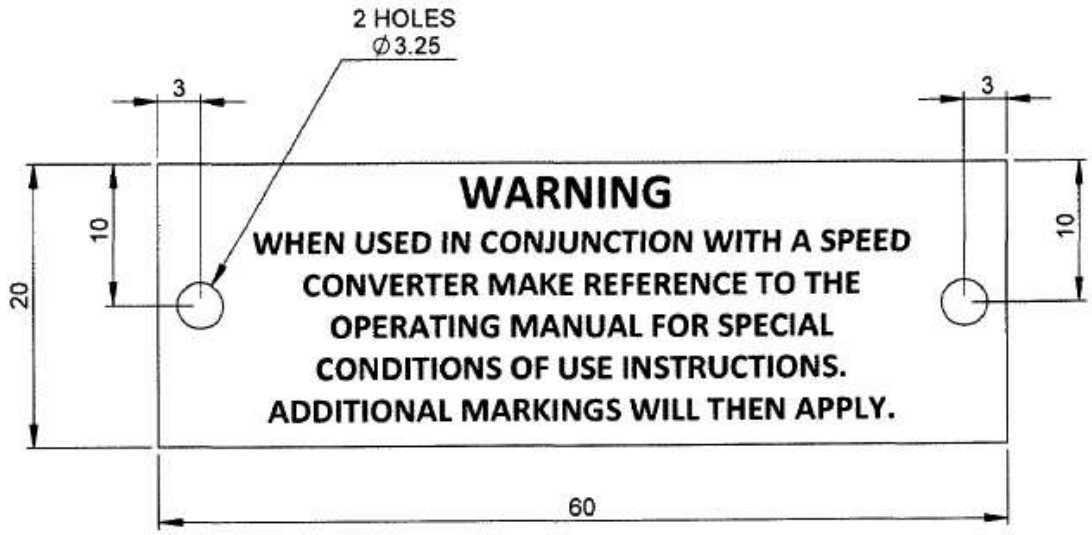
All Hex-head screws are grade 8.8 and socket screws grade 12.9

Quote vibrator type, serial number, voltage, together with parts description when ordering spares.

WARNING NAMEPLATE PSN 2255

LABEL SHOWN FULL SIZE

WARNING
WHEN USED IN CONJUNCTION WITH A SPEED CONVERTER MAKE REFERENCE TO THE OPERATING MANUAL FOR SPECIAL CONDITIONS OF USE INSTRUCTIONS. ADDITIONAL MARKINGS WILL THEN APPLY.



INVICTA VIBRATORS

VIBRATORS AND ELECTRICAL CONTROLS. A DIVISION OF GRANTHAM ENGINEERING LTD.

HARLAXTON ROAD - GRANTHAM - LINCOLNSHIRE - NG31-7SF - ENGLAND. TEL:- 01476 566301 FAX:- 01476 590145

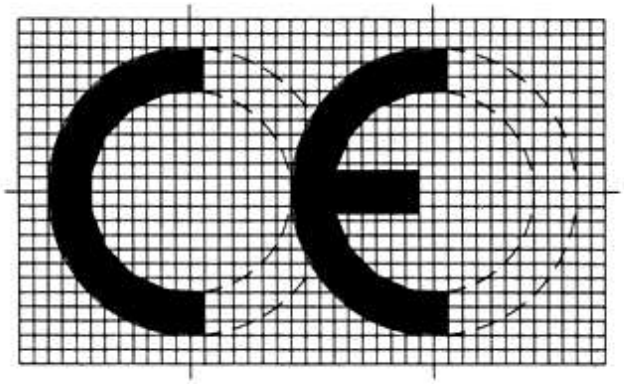
MATERIAL: 20 SWG ALUMINIUM	EXTERNAL THREADS TO CLASS 6g INTERNAL THREADS TO CLASS 6H NOTE - ALL THREADS TO BS3643	SCALE: 2:1	DRN: JW	B	MOD No. M 2430	27.06.16
TOLERANCES UNLESS STATED UNMACHINED DIMS ± 1.0mm MACHINED DIMS ± 0.25mm	THIS DRAWING REMAINS OUR PROPERTY & MAY NOT BE COPIED OR PASSED ON TO A THIRD PARTY WITHOUT OUR WRITTEN CONSENT	CHKD: 27-06-16	DATE: 16.02.15	A	NEW DRAWING ISSUE	11.02.15
				ISSUE	MODIFICATION	DATE
FINISH: BLACK LETTERS & FIGURES ON NATURAL METAL REMOVE SHARP CORNERS	TITLE: WARNING NAMEPLATE (ALL EBK & Lz MOTORS	THIRD ANGLE PROJECTION	DRG.NO. PSN 2255			SHEET 1 OF 1

FORM.0195 /A4 ISSUE : 1 DATE:26.01.95 A4

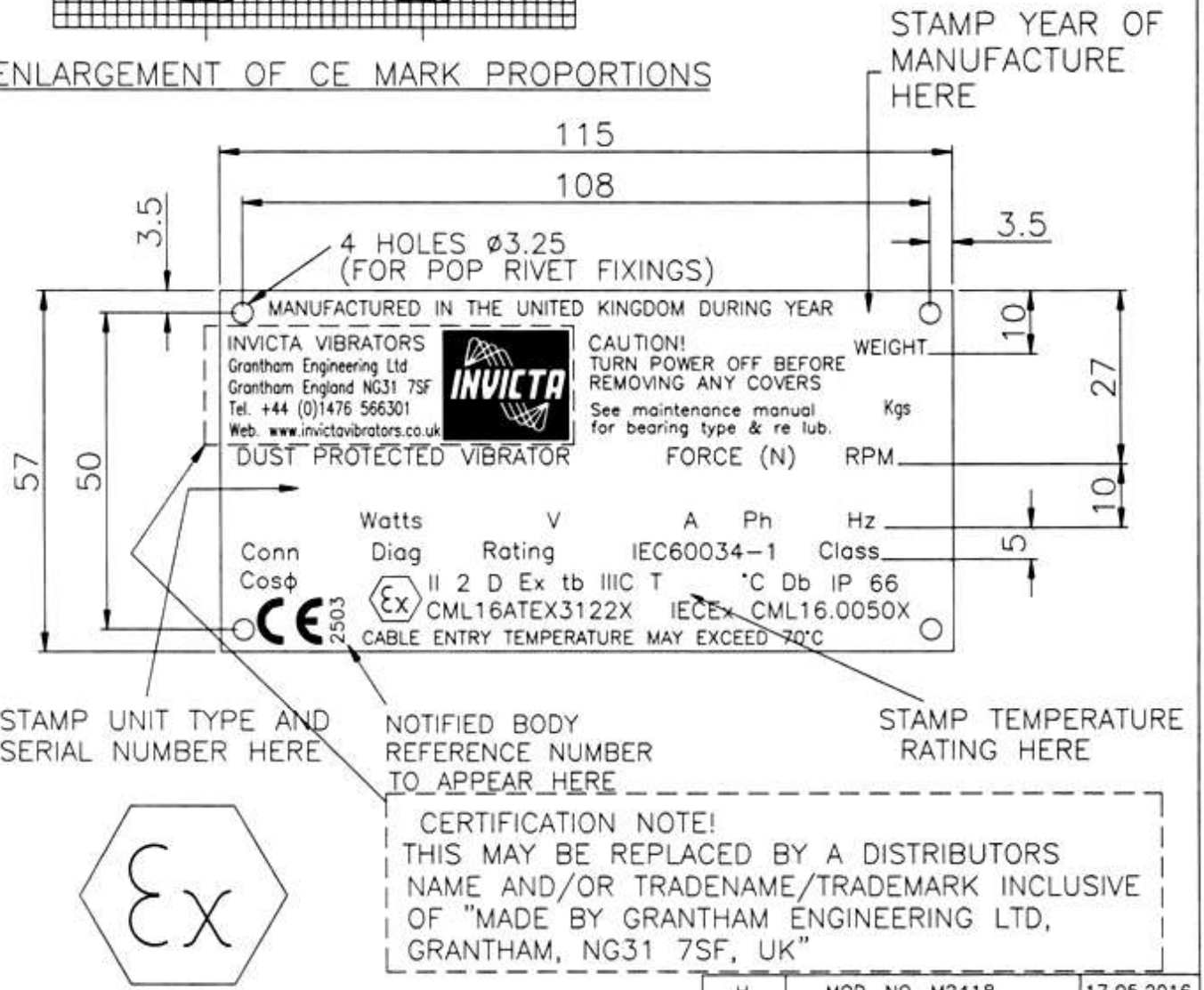
EXAMPLE OF STANDARD VIBRATOR NAME PLATE (Lz24 - 80)

PART NO.	MATERIAL
PSN1889/1.	22SWG.ALUMINIUM.
PSN1889/2.	22SWG.STAINLESS STEEL.

NOTE: ALUMINIUM BY WEIGHT HAS <7.5% IN TOTAL OF MAGNESIUM, TITANIUM AND ZIRCONIUM.



ENLARGEMENT OF CE MARK PROPORTIONS



CERTIFICATION NOTE!
THIS MAY BE REPLACED BY A DISTRIBUTORS NAME AND/OR TRADENAME/TRADEMARK INCLUSIVE OF "MADE BY GRANTHAM ENGINEERING LTD, GRANTHAM, NG31 7SF, UK"

ENLARGED DETAIL OF EU EXPLOSIVE ATMOSPHERE SYMBOL

H	MOD. NO. M2418	17.05.2016
G	MOD. NO. M2358	16.06.2015
F	NOW TO SUIT BLz80 BUT NO CHANGE TO LABEL DESIGN	29.04.2014

INVICTA VIBRATORS

VIBRATORS AND ELECTRICAL CONTROLS. A DIVISION OF GRANTHAM ENGINEERING LTD.
HARLAXTON ROAD - GRANTHAM - LINCOLNSHIRE - NG31-7SF - ENGLAND. TEL:- 01476 566301 FAX:- 01476 590145

MATERIAL: SEE ABOVE.	EXTERNAL THREADS TO CLASS 6g INTERNAL THREADS TO CLASS 6H NOTE - ALL THREADS TO BS3643	SCALE: 1=1	DRN: D.J.W.	E	MOD. NO. M2128	09.10.2008
				D	MOD. NO. M2030	09.05.2006
				C	MOD. NO. M2003	09.06.2005
				B	PRE-PROD MODS	07-01-05
TOLERANCES UNLESS STATED UNMACHINED DIMS ± 1.0mm MACHINED DIMS ± 0.25mm	THIS DRAWING REMAINS OUR PROPERTY & MAY NOT BE COPIED OR PASSED ON TO A THIRD PARTY WITHOUT OUR WRITTEN CONSENT	CHKD 8/6/16	DATE: 06.02.03	A	NEW DRAWING ISSUE	06.02.2003
				ISSUE	MODIFICATION	DATE
THIRD ANGLE PROJECTION	TITLE: Lz24-80 VIBRATOR NAMEPLATES.(FOR ATEX/IEC DUST PROTECTED VIBRATORS)			DRG.NO. PSN 1889.		SHEET 1 OF 1
FINISH: BLACK LETTERS & FIGURES ON NATURAL METAL REMOVE SHARP CORNERS						

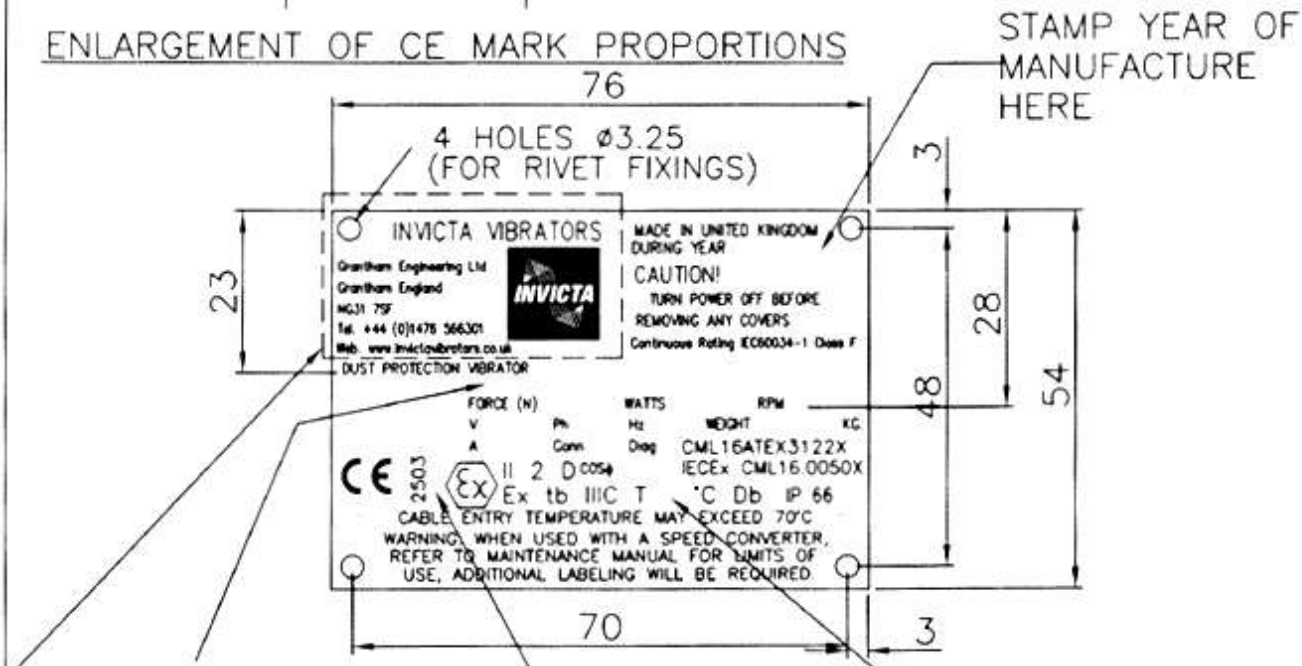
FORM.0195 /A4 ISSUE : 1 DATE:26.01.95 A4

EXAMPLE OF STANDARD VIBRATOR NAME PLATE (Lz03 - 22)

PART NO.	MATERIAL
PSN1890/1.	25SWG.ALUMINIUM.
PSN1890/2.	25SWG.STAINLESS STEEL.

NOTE: ALUMINIUM BY WEIGHT HAS <7.5% IN TOTAL OF MAGNESIUM, TITANIUM AND ZIRCONIUM.

ENLARGEMENT OF CE MARK PROPORTIONS



CERTIFICATION NOTE!
THIS MAY BE REPLACED BY A DISTRIBUTORS NAME AND/OR TRADENAME/TRADEMARK INCLUSIVE OF "MADE BY GRANTHAM ENGINEERING LTD, GRANTHAM, NG31 7SF, UK"

ENLARGED DETAIL OF EU EXPLOSIVE ATMOSPHERE SYMBOL

H	MOD. NO. M2418	18.05.2016
G	MOD. NO. M2358	16.06.2015

INVICTA VIBRATORS

VIBRATORS AND ELECTRICAL CONTROLS. A DIVISION OF GRANTHAM ENGINEERING LTD.
HARLAXTON ROAD - GRANTHAM - LINCOLNSHIRE - NG31-7SF - ENGLAND TEL:- 01476 566301 FAX:- 01476 590145

F	MOD. NO. M2328	13.01.2015
E	MOD. NO. M2128	09.10.2008
D	MOD. NO. M2030	09.05.2006
C	MOD. NO. M2003	09.06.2005
B	PRE-PROD MODS	07.01.2005
A	NEW DRAWING ISSUE	06.02.2003
ISSUE	MODIFICATION	DATE

MATERIAL: SEE ABOVE.

EXTERNAL THREADS TO CLASS 6g
INTERNAL THREADS TO CLASS 6H
NOTE - ALL THREADS TO BS3643

SCALE: 1=1

DRN: D.J.W.

CHKD: PCS 27/7/16

DATE: 06.02.03

TOLERANCES UNLESS STATED
UNMACHINED DIMS ± 1.0mm
MACHINED DIMS ± 0.25mm

THIRD ANGLE PROJECTION

FINISH: BLACK LETTERS & FIGURES ON NATURAL METAL
REMOVE SHARP CORNERS

TITLE: Lz03-L20/22 VIBRATOR NAMEPLATES. (FOR ATEX/IEC DUST PROTECTED VIBRATORS)

DRG.NO. PSN 1890.

SHEET 1 OF 1

FORM.0195 /A4 ISSUE : 1 DATE:26.01.95 A4

VIBRATOR NOISE LEVELS

Vibrator Type		Noise Level	Vibrator Type		Noise Level
03	2 Pole	66.4	30	2 Pole	77.4
	4 Pole	60.4		4 Pole	72.8
	6 Pole	61.2		6 Pole	65.5
				8 Pole	60.2
05	2 Pole	66.8	40	2 Pole	83.0
	4 Pole	66.5		4 Pole	63.4
	6 Pole	63.5		6 Pole	65.9
				8 Pole	68.7
15	2 Pole	78.1	45	2 Pole	84.1
	4 Pole	69.8		4 Pole	84.7
	6 Pole	63.5		6 Pole	68.0
				8 Pole	64.9
20	2 Pole	76.2	50-55	4 Pole	84.4
	4 Pole	76.0	50-75	4 Pole	87.3
	6 Pole	69.5		6 Pole	69.6
				8 Pole	70.8
22	2 Pole	76.7	60	4 Pole	89.2
	4 Pole	68.0		6 Pole	76.1
	6 Pole	66.0		8 Pole	72.0
24	2 Pole	73.8	75	4 Pole	86.8
	4 Pole	66.2		6 Pole	85.6
	6 Pole	60.8		8 Pole	82.0
25	2 Pole	67.9	80	6 Pole	<90.0
	4 Pole	61.9		8 Pole	<90.0
	6 Pole	62.8			

Notes: Noise levels measured with CEL573 sound level analyser at 1 metre distance.
Noise levels recorded in **dB A**

Under the Invicta Vibrators EC Declaration of Incorporation, an Invicta rotary out of balance electric vibrator must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of The Supply of Machinery (Safety) Regulations 2008 (SI 2008/1597). Sound pressure readings should be supplied by the manufacturer or supplier responsible for the machinery into which the vibrator is incorporated.

FAULT FINDING – VIBRATORS

1. Vibrator does not start or fails to run.

Provided that supply voltage is present at the vibrator terminal box check the following:

a) Supply voltage is correct and starter is operating correctly.
b) All three phases of supply voltage are connected and the brass links in the vibrator terminal box are present and in correct position for supply voltage.
c) Vibrator is clear of “earth” faults and the stator winding is not open circuit in any one phase and no short circuits exist between adjacent turns.
d) Vibrator is not overloaded electrically or mechanically (See 2).

2. Vibratory current exceeds rated full load current or overheats

Check:

a) That vibrator fixing bolts are correctly tightened and there is no damage to end covers preventing weights rotating.
b) Bearings are not partially seized or over greased.
c) Out of balance weights are not set at too great force output, particularly on hopper applications.

3. Vibrator Noisy

NOTE Due to the increased radial clearance in the bearings it is normal for vibrators to emit a certain amount of noise and they should not be compared with standard electric motors.

Check:

a) That there are no loose parts on the vibrator.
b) End covers are not damaged and fouling out of balance weights.
c) Noise is not due to bearing failure.

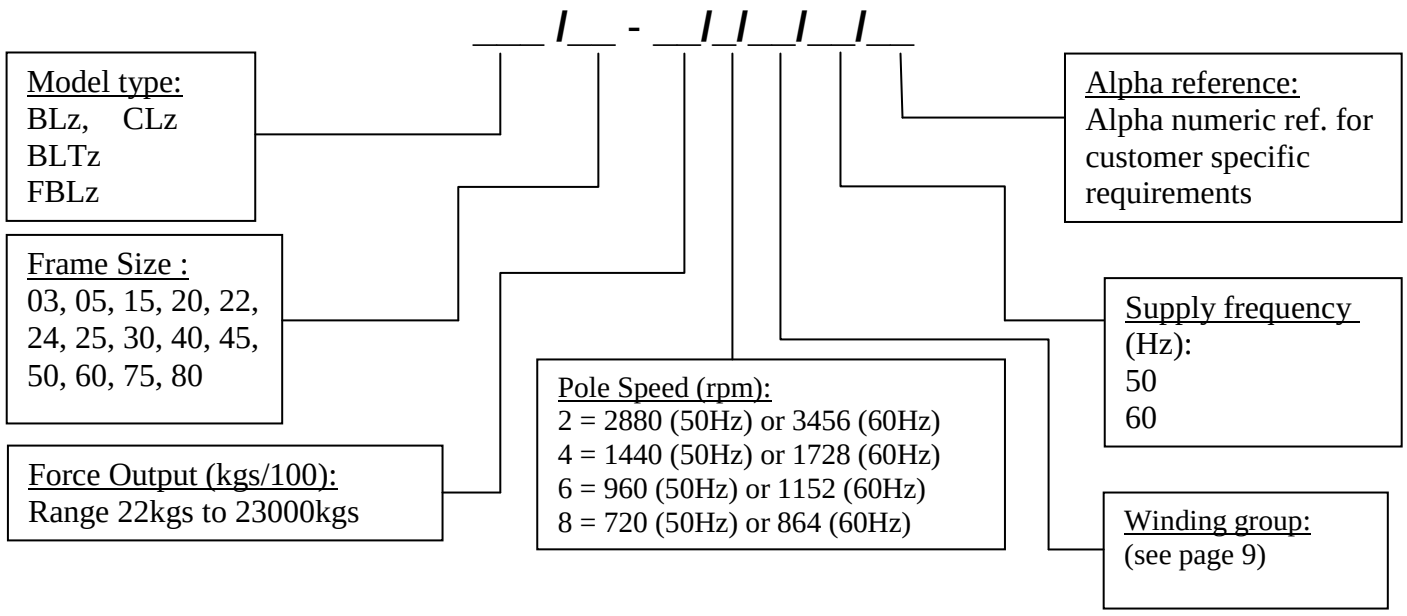
4. Vibrator(s) does(do) not attain synchronous speed

Check:

a) That the vibrator is not wrongly connected (star instead of delta)
b) Supply voltage and supply frequency are not too low.
c) Vibrator is not overloaded or partially seized.

Grantham Engineering Ltd (Invicta Vibrators),
Harlaxton Road, Grantham, Lincolnshire, NG31 7SF, United Kingdom

Invicta Vibrators declare under our sole responsibility that the Invicta range of rotary out of balance electric vibrators:



Serial Number: (six digit unique numerical unit identifier – refer to vibrator nameplate)

Comply to the following directive listed in the following declaration.

EC DECLARATION OF INCORPORATION

The Invicta range of rotary out of balance electric vibrators must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of, THE SUPPLY OF MACHINERY (SAFETY) REGULATIONS 2008 (SI 2008/1597).
The Invicta range of rotary electric vibrators are manufactured in accordance with THE SUPPLY OF MACHINERY (SAFETY) REGULATIONS 2008 (SI 2008/1597) (transposed from Machine Directive 2006/42/EC) and identified as 'partly completed machinery'.

The protection requirements of the Low Voltage Directive 2014/35/EU have been observed in accordance with Annex I 1.5.1 of Machine Directive 2006/42/EC.

As per Annex II part B of 2006/42/EC, the following essential health and safety requirements have been observed: 1.1.1, 1.1.2, 1.1.3, 1.1.5, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.7, 1.3.8, 1.3.9, 1.4.1, 1.5.1, 1.5.2, 1.5.4, 1.5.5, 1.5.6, 1.5.7, 1.5.8, 1.6.1, 1.6.2, 1.6.4, 1.7.1, 1.7.2, 1.7.3, 1.7.4.

Huw Williams
Technical Director

Grantham, July 2016

Manufacturer: Grantham Engineering Ltd (Invicta Vibrators), Harlaxton road, Grantham, Lincolnshire, NG31 7SF, United Kingdom

Grantham Engineering Ltd agree to communicate by mail or e-mail the technical document compiled in accordance with part B of Annex VII of directive 2006/42/EC upon a reasoned request by the national authorities.

The information contained in this booklet is issued as a guide and is not intended to be definitive. No legal liability shall attach to Grantham Engineering Limited in connection with the use of this Guide.
Users of the machine are reminded that all work must comply with existing regulations imposed by statute or by regulatory authorities, and it is the user's responsibility to ensure compliance with such Regulations.

P 2047, Issue N, 07/2016