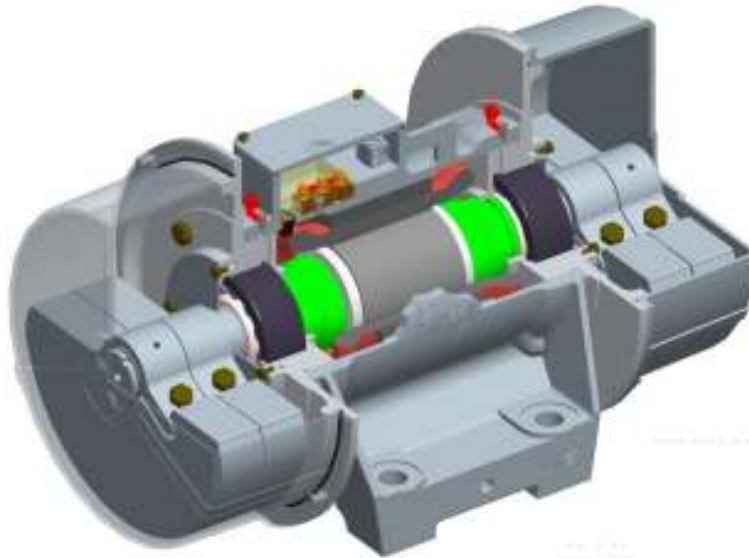


BLz03 TO 75/77

50/60 Hz

DUST PROTECTED TO EN50281



INSTALLATION AND MAINTENANCE

'BLz' SERIES VIBRATORS

ENGLISH

(other European languages on request)

INVICTA VIBRATORS

A Division of Grantham Engineering Limited

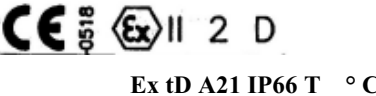
Harlaxton Road, Grantham,
Lincolnshire, ENGLAND NG31 7SF

Telephone: +44 (0) 1476 566301
Fax: +44 (0) 1476 590145
E-mail: sales@invictavibrators.co.uk
Web: www.invictavibrators.co.uk

OPERATIONAL CONDITIONS

The users attention is drawn to the following notes:

- 1) The vibrator is approved to the following certification:

Atex Directive	94/9/EC (Atex 95)
Certificate Numbers	SIRA 04 ATEX 9054X and IECEX SIR 04.0007X
Atex Coding/marketing	

HAZARDOUS AREA CLASSIFICATION:

Zone of Use (Dust)	Zone 21 & 22
Temperature Class	Refer to tables on pages 3 & 4
Ingression Protection (BSEN60529) Main Enclosure	IP66
Terminal Box	IP66

The equipment is certified for use in ambient temperatures minus 20°C to plus 40°C.

The X in our certificate number signifies a special condition of use. This applies to vibrators intended for use with variable speed drives, and draws the users attention to the fact that the certificate related thermistor beads – special fit, shall be connected to a suitable control device to disconnect the electrical supply in the event of over temperature occurring.

- 2) The equipment has not been assessed as a safety related device (as referred to by directive 94/9/EC 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.

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

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

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

E C Declaration of Conformity

Manufacturer:

Grantham Engineering Ltd

(InvictaVibrators)

Harlaxton Road, Grantham, phone: +44 (0) 1476 566301
Lincolnshire, NG31 7SF, fax: +44 (0) 1476 590145
United Kingdom www.invictavibrators.co.uk

Hereby declares that the equipment detailed below conforms with the provisions of ATEX directive 94/9/EC

Invicta 'BLZ' and 'FBLZ' range dustproof Eex 'D' rotary electric vibrators

EC type examination Certificate: SIRA 04ATEX 9054X
IECEX Certificate of conformity: IECEX SIR 04.0007X
Issued by notified body: Sira Certification Service (0518)
Rake Lane, Eccleston, Chester, CH4 9JN
United Kingdom

The following harmonised standards have been applied,

EN 50281-1:1998
IEC 61241-1:1999

And also with, Low voltage Directive 2006/95/EC

Quality Assurance Notification number: SIRA 02 ATEX M164
IECEX QAR Notification: GB/SIR/QAR 06.0043/00

Issued by notified body: Sira Certification Service (0518)

Authorised person: P C Turley Date of issue: August 30, 2006
Title: Technical Director Issue A



Signature:

**FULL POWER TEST DATA AND TEMPERATURE RATINGS
L SERIES VIBRATORS TO EN 50281**

Vibrator Type	Watts Output	Surface Temperature Max in 40°C ambient at Full Power	Temperature Class (IEC60079)	Temperature Rating Of Thermistors under VSD Conditions °C
BLz03-1/2	120	93	T5	90
BLz03-0.5/4	100	106	T4	90
BLz03-0.2/6	70	93	T5	90
BLz03-0.3/6	70	93	T5	90
BLz05-2/2	200	142	T3	100
BLz05-1/4	175	106	T4	100
BLz05-2/4	175	106	T4	100
BLz05-0.4/6	90	119	T4	100
BLz05-0.6/6	90	119	T4	100
BLz05-0.9/6	90	119	T4	100
BLz05-1.3/6	90	119	T4	100
BLz15-3.5/2	300	131	T4	100
BLz15-3/4	300	111	T4	100
BLz15-1.3/6	110	121	T4	100
BLz15-1.9/6	110	121	T4	100
BLz20-5/2	400	130	T4	100
BLz20-5/4	350	121	T4	100
BLz20-2.2/6	150	112	T4	100
BLz22-5/2	400	130	T4	100
BLz22-5/4	350	121	T4	100
BLz22-2.2/6	150	112	T4	100
BLz24-8/2	500	130	T4	120
BLz24-10/2	500	130	T4	120
BLz24-13/2	500	130	T4	120
BLz24-7.5/4	500	130	T4	120
BLz24-11/4	500	130	T4	120
BLz24-14/4	500	130	T4	120
BLz24-4/6	510	130	T4	120
BLz24-8/6	510	130	T4	120
BLz24-11/6	510	130	T4	120
BLz25-8/2	500	130	T4	120
BLz25-10/2	500	130	T4	120
BLz25-13/2	500	130	T4	120
BLz25-7.5/4	500	130	T4	120
BLz25-11/4	500	130	T4	120
BLz25-14/4	500	130	T4	120
BLz25-4/6	510	130	T4	120
BLz25-8/6	510	130	T4	120
BLz25-11/6	510	130	T4	120
BLz30-16/2	1100	130	T4	120
BLz30-20/2	1100	130	T4	120
BLz30-18/4	1150	130	T4	120
BLz30-25/4	1150	130	T4	120
BLz30-14/6	900	135	T4	120
BLz30-18/6	900	135	T4	120
BLz30-23/6	900	135	T4	120
BLz30-7.5/8	500	129	T4	120
BLz30-10/8	500	129	T4	120

**FULL POWER TEST DATA AND TEMPERATURE RATINGS
L SERIES VIBRATORS TO EN 50281**

Vibrator Type	Watts Output	Surface Temperature Max in 40°C ambient at Full Power	Temperature Class (IEC60079)	Temperature Rating Of Thermistors under VSD Conditions °C
BLz40-30/2	1500	133	T4	120
BLz40-40/2	1500	133	T4	120
BLz40-35/4	1800	114	T4	120
BLz40-27/6	1800	124	T4	120
BLz40-35/6	1800	124	T4	120
BLz40-15/8	1100	132	T4	120
BLz40-17/8	1100	132	T4	120
BLz45-50/2	4000	130	T4	120
BLz45-45/4	2685	130	T4	120
BLz45-42/6	2310	134	T4	120
BLz45-50/6	2310	134	T4	120
BLz45-24/8	2000	130	T4	120
BLz45-35/8	2000	130	T4	120
BLz50-55/4	3350	130	T4	120
BLz50-65/4	4800	130	T4	120
BLz50-75/4	4800	130	T4	120
BLz50-60/6	4000	122	T4	120
BLz50-75/6	4000	122	T4	120
BLz50-35/8	3300	100	T5	100
BLz50-45/8	3300	100	T5	100
BLz50-55/8	3300	100	T5	100
BLz50-57/8	3300	100	T5	100
BLz60-95/4	7750	130	T4	120
BLz60-105/4	7750	130	T4	120
BLz61-105/4	7750	130	T4	120
BLz60-90/6	6200	130	T4	120
BLz60-105/6	6200	130	T4	120
BLz61-105/6	6200	130	T4	120
BLz60-125/6	10000	130	T4	120
BLz61-125/6	10000	130	T4	120
BLz60-65/8	4900	117	T4	110
BLz60-70/8	4900	117	T4	110
BLz60-90/8	4900	117	T4	110
BLz75-130/4	10250	130	T4	120
BLz75-150/6	10000	130	T4	120
BLz75-185/6	10000	130	T4	120
BLz77-185/6	10000	130	T4	120
BLz77-124/8	7750	125	T4	120
BLz75-150/8	7750	125	T4	120
BLz75-200/8	7750	125	T4	120
BLz77-200/8	7750	125	T4	120

NB:

1) Maximum surface temperature based on supply of 415V 3Ph 50Hz.

BEARING REPLACEMENT – IMPORTANT NOTICE

To satisfy EN13463 Part 5 Clause 6.2 the bearings in this equipment shall be replaced after a period not exceeding 90% of their rated life. The users 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 EN50281

Frame Size	Centrifugal Force		Bearing Types	Fatigue life (Hours)			
	Kg	Newtons		L10			
				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 2313E TVP2 C3	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 MIA C3	42800	38520	35500	31950
BLz 50-75/4	7500	73575	NJ 2317E MIA C3	32040	28830	26580	23920
BLz 60-95/4	9500	93195	NJ2320E MIA C3	52820	47540	43820	39440
BLz60-105/4	10500	103000	NJ2320E MIA C3	37700	33930	31410	28270
BLz61-105/4	10500	103000	NJ2320E MIA C3	37700	33930	31410	28270
BLz 75-130/4	13000	127530	NJ 2322E MIA 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 MIA C3	29260	26330	24280	21850
BLz 75/77-185/6	18500	181485	NJ 2322E MIA C3	14440	13000	12030	10830
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 MIA C3	68370	61530	56970	51270
BLz 75-135/8	13500	132435	NJ 2322E MIA C3	55020	49520	--	--
BLz 75-150/8	15000	147150	NJ 2322E MIA C3	38960	35060	32330	29100
BLz 75/77-200/8	20000	196200	NJ 2322E MIA C3	--	--	12455	11210

'L' SERIES VIBRATOR INSTALLATION AND MAINTENANCE

RECEIPT AND STORAGE

Every 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. Grease should be renewed after long storage.

INSTALLATION GUIDANCE NOTES:

Mechanical: Inspect vibrator for any physical damage and check that rotor shaft rotates freely. ALL mounting surfaces **MUST** be flat and be 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.

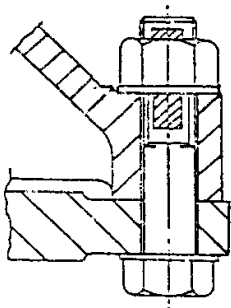
NOTE – Gaps between the vibrator foot and mating surfaces and incorrect bolt tightness will cause bolt breakage and damage to the vibrator.

BLz 03 – 77: Use Grade 8.8 bolts with Grade 8 self locking nuts, torqued to values below. Figures apply with lightly oiled threads. Use plain washers for BLz 03- BLz 24. (Not BLz22)

Size	Torque (N.m)		Size	Torque (N.m)	
	Capscrews	Setscrews /Bolts		Capscrews	Setscrews /Bolts
M 5	8	-	M16	310	242
M 6	15	11	M20	-	473
M 8	34	27	M24	-	818
M 10	68	56	M30	-	1634*
M12	127	96	M36	-	2854*

Use the above figures for all screws except out of balance weights

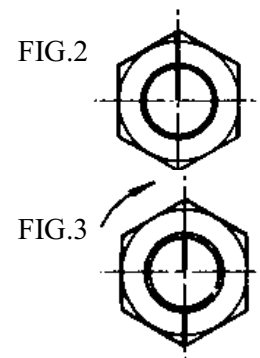
BLz 75 and 77: Half turn method.



PSN 661 – High Strength nut

PSN 612 – Hardened washer under bolt head and nut

PSN 780 - High strength bolt



Remove any paint, dirt or scale from all mating surfaces.

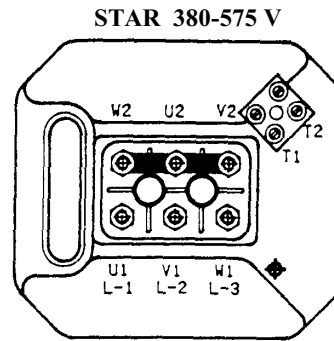
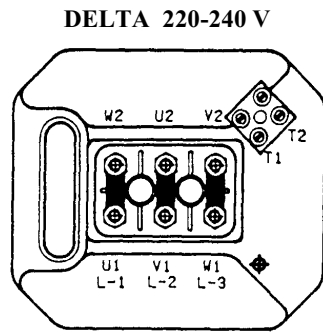
Fit hardened washer (PSN 612) under bolt head and nut. Pre-tighten until all mating surfaces are in contact. Mark nuts and bolts as shown in fig. 2 and slog nut one half turn until marks are as shown in fig. 3. Alternatively, bolts can be torqued to values indicated. *A torque multiplier will be required.

Electrical: Check insulation resistance and if less than 1 megohm DO NOT USE, consult a qualified electrician. Flexible cable and suitable cable gland must be used to connect between vibrator and supply junction box. Cable gland shall comply with EN50014 and have an IP rating equal to or better than IP66. 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 75/77): BLz 24/25 to BLz 75/77 are fitted with thermistors as standard and require a 2 core cable with flexible conductors type 30/0.25. (Standard fit thermistor beads are not suitable for variable drive use.)

Flexible conductors must be terminated with an 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.

Starting can be direct on line via inverter or soft start. Each vibrator **MUST BE INDIVIDUALLY PROTECTED** against overload.

NOTE When operating vibrators at speeds above pole speed the out of balance force **MUST** be reduced or **DAMAGE WILL OCCUR**, see Page 9 for correct percentage reduction.



**FULL LOAD AND STARTING CURRENT IN AMPS FOR BLz SERIES VIBRATORS
220-500 VOLTS, 3 PHASE, 50 HERTZ
Maximum Figures for 40°C Ambient**

Type	Output Watts	220 Volts 50 Hz		230 Volts 50 Hz		240 Volts 50 Hz		380 Volts 50 Hz		400 Volts 50 Hz		415 Volts 50 Hz		500 Volts 50 Hz	
		FLC	SC	FLC	SC	FLC	SC	FLC	SC	FLC	SC	FLC	SC	FLC	SC
2 POLE - 2880 RPM															
BLz 03	120	0.32	2.8	0.33	2.7	0.33	2.6	0.18	1.6	0.19	1.6	0.19	1.5	0.16	1.2
BLz 05	200	0.59	5.4	0.60	5.2	0.61	4.9	0.34	3.1	0.35	3.0	0.35	2.9	0.27	2.4
BLz 15	300	1.00	5.4	0.98	5.2	0.96	4.9	0.58	3.1	0.56	3.0	0.55	2.9	0.46	2.4
BLz 20/22	400	1.37	10.3	1.35	9.8	1.34	9.4	0.79	5.9	0.78	5.6	0.77	5.4	0.64	4.5
BLz 24/25	500	2.06	18.6	2.03	17.8	2.03	17.1	1.19	10.8	1.17	10.2	1.17	9.9	0.98	8.2
BLz 30	1100	3.8	42	3.6	40	3.5	38	2.2	24	2.1	23	2.0	22	1.7	18
BLz 40	1500	5.2	64	5.0	61	4.8	58	3.0	37	2.9	35	2.8	34	2.3	28
BLz 45	4000	TBA		12.6	161	TBA		7.5	97	7.3	93	7.1	92	TBA	
4 POLE - 1440 RPM															
BLz 03	100	0.31	1.5	0.34	1.4	0.35	1.4	0.19	0.9	0.20	0.8	0.20	0.8	0.17	0.7
BLz 05	175	0.70	3.0	0.71	2.9	0.73	2.8	0.41	1.7	0.41	1.7	0.42	1.6	0.35	1.3
BLz 15	300	1.23	4.2	1.24	4.0	1.25	3.9	0.71	2.4	0.71	2.3	0.72	2.2	0.60	1.9
BLz 20/22	350	1.65	6.5	1.68	6.3	1.71	6.0	0.95	3.8	0.97	3.6	0.99	3.5	0.81	2.9
BLz 24/25	500	2.33	15.8	2.28	15.1	2.38	14.5	1.34	9.2	1.32	8.7	1.37	8.4	1.14	7.0
BLz 30	1150	4.3	44	4.3	42	4.4	40	2.5	25	2.5	24	2.5	23	2.1	19
BLz 40	1800	6.5	58	6.4	56	6.4	53	3.8	34	3.7	32	3.7	31	3.1	26
BLz 45	2685	9.3	104	9.2	99	9.2	95	5.4	60	5.3	57	5.3	55	4.5	46
BLz 50-55	3350	11.2	134	11	128	11.0	123	6.5	78	6.4	74	6.3	71	5.3	59
BLz 50-65, 75	4800	15.3	160	14.9	153	14.6	147	8.8	93	8.6	88	8.5	85	7.1	71
BLz60/61	7750	23.2	345	22.3	330	21.8	316	13.4	200	12.9	190	12.6	183	10.4	152
BLz 75	10250	30.1	406	28.9	388	28.1	372	17.4	235	16.7	223	16.2	215	13.5	178
6 POLE - 960 RPM															
BLz 03	70	0.81	0.82	0.8	0.87	0.8	0.90	0.47	0.48	0.46	0.5	0.46	0.52	0.38	0.43
BLz 05	90	0.91	1.5	0.94	1.56	0.97	2.0	0.53	0.87	0.54	0.9	0.56	0.93	0.46	0.55
BLz 15	110	1.02	1.47	1.03	1.55	1.05	1.6	0.59	0.85	0.6	0.9	0.6	0.93	0.5	0.78
BLz 20/22	150	1.5	2.65	1.55	2.78	1.59	2.9	0.87	1.53	0.9	1.60	0.92	1.67	0.76	2.0
BLz 24/25	510	2.74	12.7	2.79	12.2	2.84	11.7	1.58	7.4	1.61	7.0	1.64	6.7	1.33	5.6
BLz 30	900	5.0	27	5.2	26	5.3	25	2.9	16	3.0	15	3.1	14	2.5	12
BLz 40	1800	8.5	45	8.7	43	8.9	41	4.9	26	5.0	25	5.1	24	4.3	20
BLz 45	2310	10.7	88	11.0	76	11.3	73	6.2	46	6.3	44	6.5	42	5.5	35
BLz 50	4000	15.1	111	15.2	106	15.3	102	8.7	64	8.8	61	8.8	59	7.4	49
BLz 60/ 61-90,105	6200	19.8	196	19.4	188	19.3	180	11.4	114	11.2	108	11.1	104	9.5	86
BLz 60 /61-125	10000	31.9	419	31.2	400	30.8	384	18.4	242	18.0	230	17.8	222	14.8	184
BLz 75/77	10000	31.9	419	31.2	400	30.8	384	18.4	242	18.0	230	17.8	222	14.8	184
8 POLE - 720 RPM															
BLz 30	500	3.8	19	4.0	18	4.2	17	2.2	11	2.3	10.4	2.4	10	2.0	8
BLz 40	1100	6.1	25	6.2	23	6.4	22	3.5	14	3.6	13.5	3.7	13	3.1	11
BLz 45	2000	10.3	42	10.6	40	10.9	38	5.9	24	6.1	23	6.3	22	5.3	18
BLz 50	3300	14.6	100	15.0	96	15.3	92	8.4	58	8.6	55	8.8	53	7.6	44
BLz 60	4900	22.3	176	23.0	170	23.7	162	12.9	103	13.3	97	13.7	94	11.8	78
BLz 75 /77	7750	34.5	225	34.8	216	35.1	207	19.9	130	20.1	124	20.3	119	17.4	99

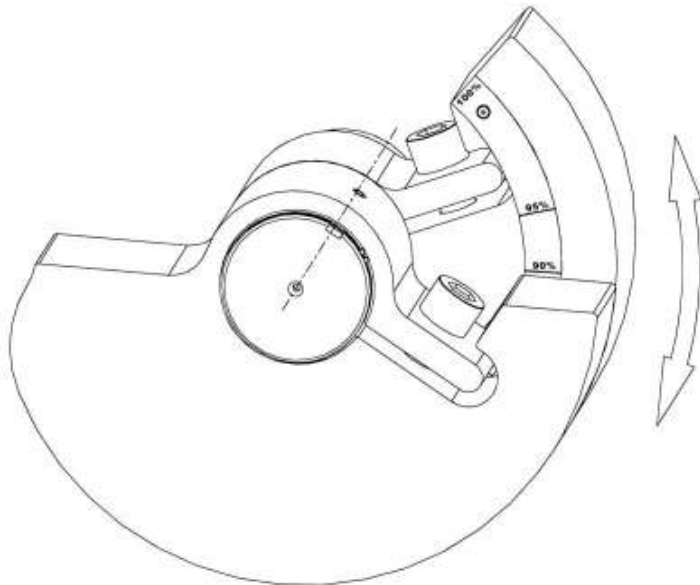
**FULL LOAD AND STARTING CURRENTS IN AMPS FOR BLz SERIES VIBRATORS
230-575 VOLTS, 3 PHASE, 60 HERTZ
Maximum Figures for 40°C Ambient**

Type	Output Watts	230 Volts 60 Hz		380 Volts 60 Hz		460 Volts 60 Hz		480 volts 60 Hz		575 Volts 60 Hz	
		FLC	SC	FLC	SC	FLC	SC	FLC	SC	FLC	SC
2 POLE - 3456 RPM											
BLz 03	120	0.28	2.7	0.24	1.6	0.17	1.4	0.18	1.4	0.14	1.1
BLz 05	200	0.53	5.2	0.43	3.1	0.31	2.6	0.32	2.5	0.27	2.1
BLz 15	300	0.93	5.2	0.64	3.1	0.50	2.6	0.49	2.5	0.41	2.1
BLz 20/22	400	1.26	9.8	0.90	5.9	0.69	4.9	0.69	4.7	0.57	3.9
BLz 24/25	500	1.88	17.8	1.39	10.8	1.05	8.9	1.05	8.5	0.87	7.1
BLz 30	1100	3.6	40	2.2	24	1.8	20	1.7	19	1.5	16
BLz 40	1500	4.9	61	3.2	37	2.5	30	2.4	29	2.0	24
BLz 45	4000	11.1	144	8.1	105	6.4	83	6.2	81	5.1	66
4 POLE - 1728 RPM											
BLz 03	100	0.28	1.4	0.26	0.9	0.18	0.7	0.19	0.7	0.16	0.6
BLz 05	175	0.62	2.9	0.51	1.7	0.37	1.4	0.38	1.4	0.32	1.1
BLz 15	300	1.10	4.0	0.88	2.4	0.64	2.0	0.66	1.9	0.54	1.6
BLz 20/22	350	1.46	6.3	1.22	3.8	0.88	3.1	0.9	3.0	0.73	2.5
BLz 24/25	500	2.08	15.1	1.67	9.2	1.22	7.6	1.24	7.3	1.03	6.1
BLz 30	1150	3.9	42	3.0	25	2.2	21	2.3	20	1.9	17
BLz 40	1800	6.0	56	4.4	34	3.3	28	3.3	27	2.7	22
BLz 45	2685	8.5	99	6.4	60	4.8	50	4.8	48	4.0	40
BLz 50-55	3350	10.3	128	7.3	78	5.7	64	5.6	61	4.7	51
BLz 50-65,75	4800	14.2	153	9.7	93	7.6	77	7.5	73	6.3	61
BLz 60/61	7750	21.8	330	14.0	200	11.3	165	11.0	158	9.1	132
BLz 75	10250	28.3	388	18.3	235	14.6	194	14.2	186	11.8	155
6 POLE - 1152 RPM											
BLz 03	70	0.9	0.92	0.55	0.6	0.41	0.45	0.41	0.46	0.34	0.38
BLz 05	90	1.14	1.88	0.69	1.1	0.50	0.8	0.51	0.85	0.42	0.50
BLz 15	110	1.21	1.74	0.73	1.1	0.54	0.81	0.55	0.82	0.45	0.70
BLz 20/22	150	1.89	3.33	1.15	2.1	0.82	1.47	0.85	1.54	0.70	1.84
BLz 24/25	510	2.43	12.2	2.03	7.4	1.46	6.01	1.50	5.8	1.21	4.9
BLz 30	900	4.3	26	3.8	16	2.7	13	2.8	12	2.4	10
BLz 40	1800	7.5	43	6.5	26	4.6	22	4.7	21	3.9	17
BLz 45	2310	9.3	76	8.1	46	5.8	38	6.0	37	5.0	31
BLz 50	4000	13.6	106	10.5	64	7.9	53	8.0	51	6.7	42
BLz 60/61	6200	18.2	188	13.2	114	10.0	94	9.9	90	8.5	75
BLz 60/61 - 125	10000	29.4	401	19.8	242	16.0	200	15.8	192	13.2	160
BLz 75/77	10000	29.4	401	19.8	242	16.0	200	15.8	192	13.2	160
8 POLE - 864 RPM											
BLz 30	500	3.3	18	3.0	11	2.2	9	2.3	8.6	1.9	7
BLz 40	1100	5.3	23	4.7	14	3.3	12	3.4	11	2.8	9
BLz 45	2000	8.9	40	7.7	24	5.6	20	5.8	19	4.9	16
BLz 50	3300	12.8	96	12.0	58	7.8	48	8.1	46	6.9	38
BLz 60	4900	19.3	170	17.0	103	12.1	84	12.6	81	10.8	67
BLz 75/77	7750	31.0	216	24.7	130	18.1	108	18.4	103	15.8	86

OUT OF BALANCE WEIGHT ADJUSTMENT

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

BLz 24/25-77 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. **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.



Size	Torque (N.m) Capscrews/ Setscrews	Size	Torque (N.m) Capscrews/ Setscrews
M5	6.5	M12	96
M6	11	M16	176
M8	27	M20	340
M10	56	M24	490

Use the above figures for out of balance weight crews only

USE OF VIBRATORS ABOVE POLE SPEEDS

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

**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	84.8	4073	4887	2036	2444	1358	1629	1018	1215
40	79	94.8	4554	5464	2277	2732	1518	1821	1138	1365
30	91.3	109.5	5258	6310	2629	3155	1753	2103	1315	1576
20	112	134	6440	7728	3220	3864	2147	2576	1613	1930
10	158	190	9107	10930	4554	5464	3036	3643	2275	2736

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 11. Consult our Technical Department.

MAINTENANCE

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 greased for life.

BLz 24/25 (except above) and **BLz 30**: 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 40 to BLz75/77 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 mixing of grease is unavoidable use only Lithium complex alternatives of consistency 3. 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 20°C and should be reduced as follows for increases in ambient temperature 25°C x 0.8, 30°C x 0.65, 35°C x 0.5, 40°C x 0.4. Above 40°C 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.

REMOVAL AND FITTING OF BEARINGS:

Bearings should only be removed when absolutely necessary. Extractor tools should be used to remove the outer race, cage and rollers from the bearing housing and the inner race from the rotor 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 – see above. When refitting bearings, smear inside recess in housing with grease, lightly pack the outer race and rollers with grease, forcing some well into the working parts. Refit into the housing using either a small press or a soft metal drift and hammer.

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. 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 race should be pushed into place and held against the shaft shoulder until it contracts sufficiently to grip the shaft. Place the rotor carefully inside the stator bore and fit bearing housings, outer grease retainer, weights & end covers. Use Loctite 242 (or equivalent) on screws when refitting bearing housing. Check that the rotor shaft has correct 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

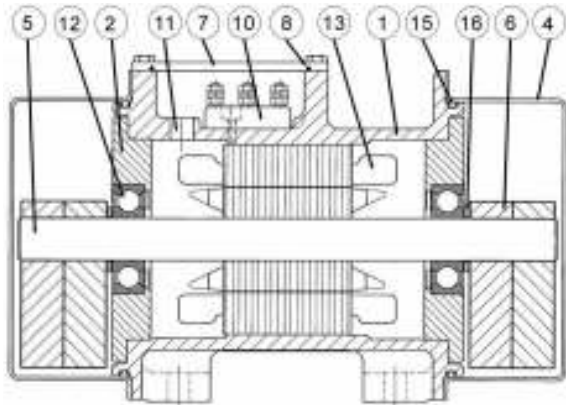
Type	Relube Interval (Hours)		Relube Amount gms	Initial Fill gms	Type	Relube Interval (Hours)		Relube Amount gms	Initial Fill gms
	50 Hz	60 Hz				50 Hz	60 Hz		
BLz24/25-10/2	1900	1600	5	12	BLz24/25-8/6	6800	5800	5	12
BLz24/25-13/2	1700	1400	7	17	BLz24/25-11/6	5800	4800	7	17
BLz30-16/2, -20/2	800	700	11	25	BLz30-14/6	6000	5000	15	30
BLz40-30/2	750	650	15	35	BLz30-18/6, -23/6	6000	5000	15	30
BLz40-40/2	700	600	20	55	BLz40-27/6, -35/6	5000	4300	20	40
BLz45-50/2	500	450	5	35	BLz45-42/6, -50/6	4800	4100	26	60
					BLz50-60/6	4200	3800	30	90
BLz24/25-11/4	4100	3500	5	12	BLz50-75/6	3800	3400	38	110
BLz24/25-14/4	3900	3300	7	17	BLz60-90/6	3000	2600	54	160
BLz30-18/4, -25/4	3500	3100	13	30	BLz60/61-105/6	3000	2600	54	160
BLz40-35/4	3000	2700	18	40	BLz60/61-125/6	3000	2600	54	160
BLz45-45/4	2500	2200	22	60	BLz75-150/6	2000	1800	66	200
BLz50-55/4	2200	1800	30	90	BLz75/77-185/6	2000	1800	66	200
BLz50-65/4, -75/4	2000	1600	38	110					
BLz60-95/4	900	800	47	160	BLz30-7.5/8, -10/8	8000	7000	15	30
BLz60/61-105/4	900	800	47	160	BLz40-15/8, -17/8	7000	6500	20	40
BLz75-130/4	400	350	38	200	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

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

	Bearing Prefix All Types	BEARING REFS.		Grease Limiting Speed RPM
		FAG Suffix	SKF Suffix	
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 20-5/2	6308 2Z C3			7,500
BLz 20-5/4 & 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	TVP2 C3	CP 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 ALL	NJ 2322E	M1A C3	CMA C3	2,000

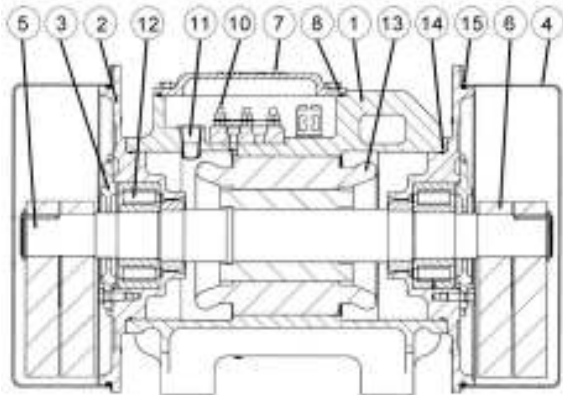
**ARRANGEMENT OF STANDARD L SERIES VIBRATORS SHOWING
BREAKDOWN OF MAJOR COMPONENTS FOR SPARES**

**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
(Item 14 applies to BLz25 – BLz 75/77 Only)		
15	Sealing Ring (End Cover)	2
16	Washer (BL 05)	2
17	Circlip	2

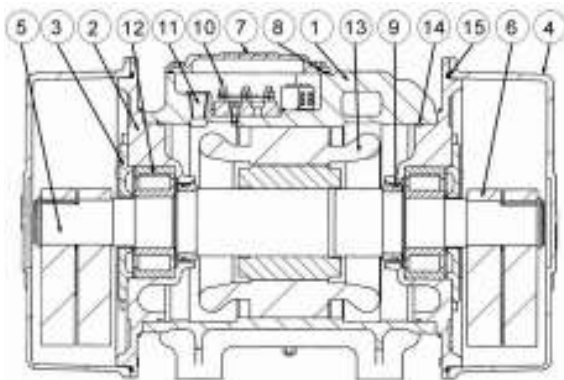
**SECTION THROUGH BLz 24 & 25 EXCLUDING
BLz 24/25, -8/2, -7.5/4, -4/6**



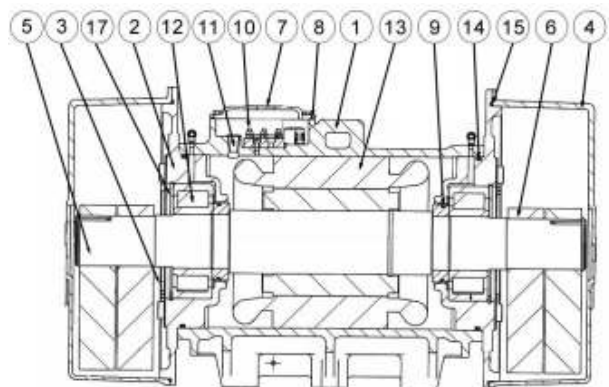
All Hex, head screws are grade 8.8 and socket screws grade 12.9

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

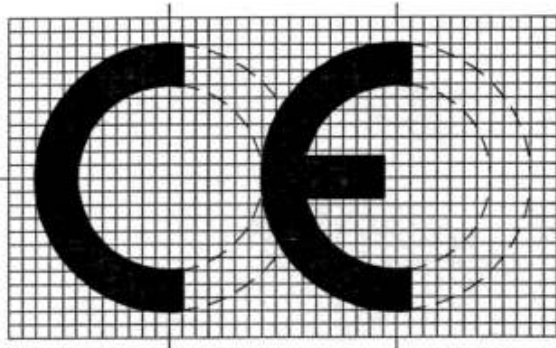
SECTION THROUGH BLz 30



SECTION THROUGH BLz 40 - BLz 75/77



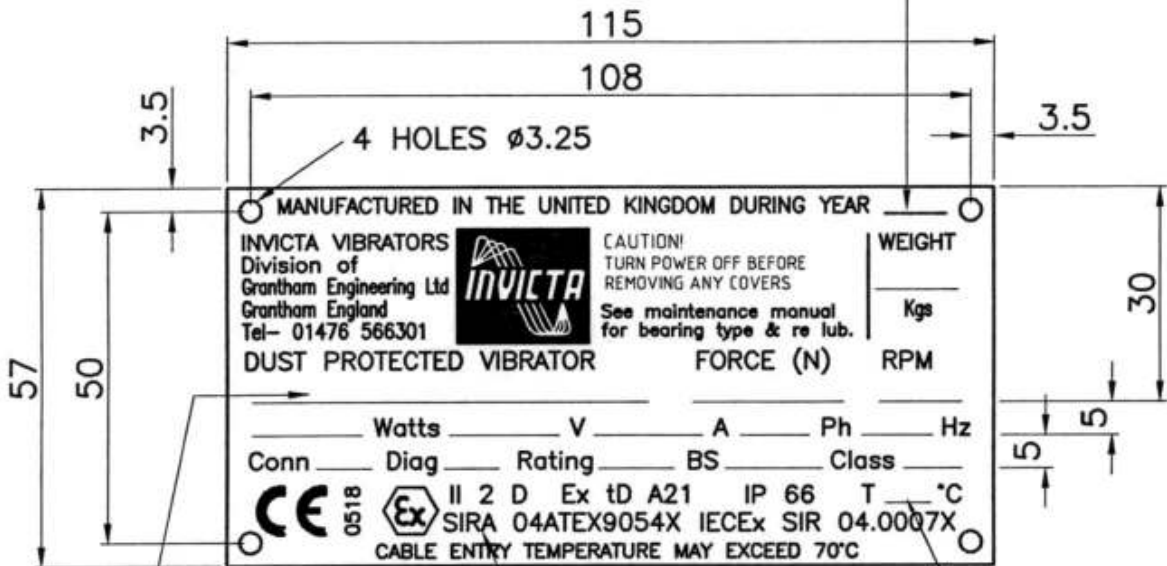
Note: 4 Hole fixing only on BLz40 and BLz45



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

ENLARGEMENT OF CE MARK PROPORTIONS

STAMP YEAR OF MANUFACTURE HERE



STAMP UNIT TYPE AND SERIAL NUMBER HERE

NOTIFIED BODY REFERENCE NUMBER TO APPEAR HERE

STAMP TEMPERATURE RATING HERE



ENLARGED DETAIL OF EU EXPLOSIVE ATMOSPHERE SYMBOL

CERTIFICATION NOTE!
THIS FORMAT MAY ALSO BE USED FOR DISTRIBUTERS NAMEPLATES WHERE THE WORDING "MADE BY GRANTHAM ENGINEERING LTD, GRANTHAM ENGLAND" WILL BE RETAINED.

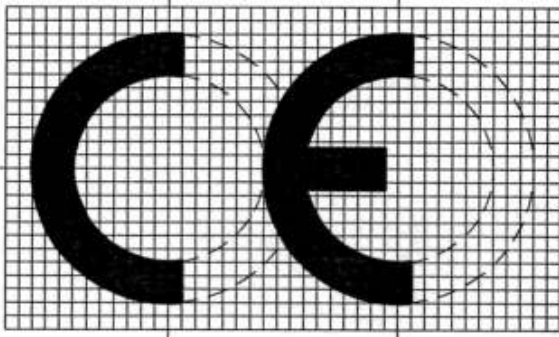
INVICTA VIBRATORS						
VIBRATORS AND ELECTRICAL CONTROLS. A DIVISION OF GRANTHAM ENGINEERING LTD.						
HARLAXTON ROAD - GRANTHAM - LINCOLNSHIRE - NG31-7SF - ENGLAND. TEL:- 01476 566301 FAX:- 01476 590145						
MATERIAL	EXTERNAL THREADS TO CLASS 6g INTERNAL THREADS TO CLASS 6H NOTE - ALL THREADS TO BS3643	SCALE 1=1	DRN D. J. W.	D C B A	MOD. NO. M2030 MOD. NO. M2003 PRE-PROD MODS NEW DRAWING ISSUE	09.05.2006 09.06.2005 07-01-05 06.02.2003
SEE ABOVE.	THIS DRAWING REMAINS OUR PROPERTY & MAY NOT BE COPIED OR PASSED ON TO A THIRD PARTY WITHOUT OUR WRITTEN CONSENT	CHKD PCT 13/7/06	DATE 06.02.03	ISSUE	MODIFICATION	DATE
TOLERANCES UNLESS STATED UNMACHINED DIMS ± 1.0mm MACHINED DIMS ± 0.25mm		TITLE L24/25-L75/77 VIBRATOR NAMEPLATES.(FOR ATEX/IEC DUST PROTECTED VIBRATORS)	DRG.NO. PSN 1889.	SHEET 1 OF 1		
THIRD ANGLE PROJECTION FINISH BLACK LETTERS & FIGURES ON NATURAL METAL REMOVE SHARP CORNERS						

FORM.0195 /A4

ISSUE : 1 DATE:26.01.95

A4

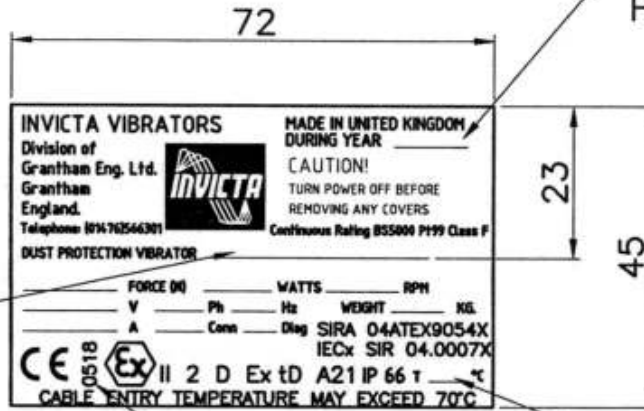
EXAMPLE OF STANDARD VIBRATOR NAME PLATE (24/25-75/77)



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

ENLARGEMENT OF CE MARK PROPORTIONS

STAMP YEAR OF MANUFACTURE HERE



STAMP UNIT TYPE AND SERIAL NUMBER HERE

NOTIFIED BODY REFERENCE NUMBER TO APPEAR HERE

STAMP TEMPERATURE RATING HERE

CERTIFICATION NOTE!
THIS FORMAT MAY ALSO BE USED FOR DISTRIBUTERS NAMEPLATES WHERE THE WORDING "MADE BY GRANTHAM ENGINEERING LTD, GRANTHAM ENGLAND" WILL BE RETAINED.



ENLARGED DETAIL OF EU EXPLOSIVE ATMOSPHERE SYMBOL

ADHESIVE SPEC:-

FOAM ADHESIVE (USE S300 ACRYLIC DOUBLE SIDED) TO SUIT TEMPERATURE RANGE: 32°C TO 150°C. APPLY TO SURFACE AT 15°C (SURFACE MUST BE DRY)

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	EXTERNAL THREADS TO CLASS 6g INTERNAL THREADS TO CLASS 6H NOTE - ALL THREADS TO BS3643	SCALE 1=1	DRN D. J. W.	D C B A	MOD. NO. M2030 MOD. NO. M2003 PRE-PROD MODS NEW DRAWING ISSUE	09.05.2006 09.06.2005 07-01-05 06.02.2003
SEE ABOVE.	THIS DRAWING REMAINS OUR PROPERTY & MAY NOT BE COPIED OR PASSED ON TO A THIRD PARTY WITHOUT OUR WRITTEN CONSENT	CHKD P.C.G.	DATE	ISSUE	MODIFICATION	DATE
TOLERANCES UNLESS STATED UNMACHINED DIMS ± 1.0mm MACHINED DIMS ± 0.25mm		13/7/06.	06.02.03			
THIRD ANGLE PROJECTION FINISH	TITLE L03-L20/22 VIBRATOR NAMEPLATES. (FOR ATEX/IEC DUST PROTECTED VIBRATORS)			DRG.NO. PSN 1890.		SHEET 1 OF 1
BLACK LETTERS & FIGURES ON NATURAL METAL REMOVE SHARP CORNERS						

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EXAMPLE OF STANDARD VIBRATOR NAME PLATE (03-20/22)

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.

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 1992 (S1 1992/3073)



P Turley – Technical Director.

Invicta electric rotary vibrators are exempt from the requirements of the E.M.C. Directive

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 users responsibility to ensure compliance with such Regulations.

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