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# MAVILOR

INFRANOR GROUP COMPANY



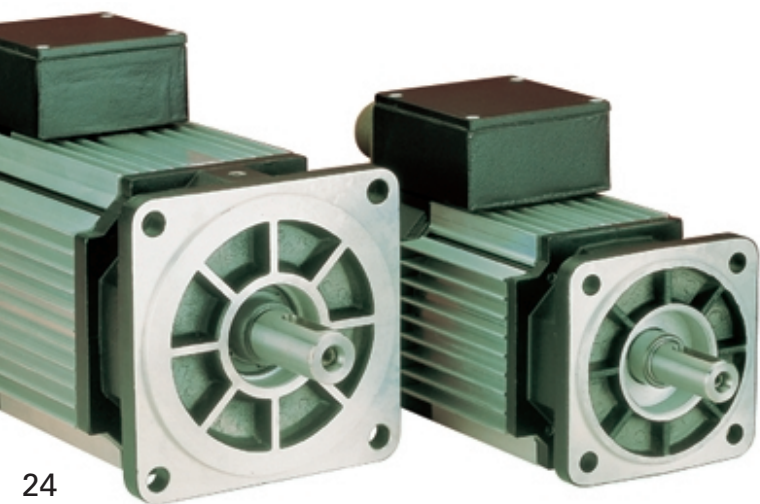
## Motors

ISSUE 2001

# AC Servo Motors BL 110/140/190 Series

The BL Series are synchronous electrical servomotors, with 3 winding phases, supplied with Sinusoidal or Trapezoidal current wave forms. The Feed-Back devices that produce the synchronization signal and speed (position, also in the Sinusoidal case), are a Resolver (BLS Series) or a Hall effect devices (BLT Series). This "BRUSHLESS" technology provides:

- High dynamic response.
- Full speed condition, not limited by the "Brush Sparking effect".
- High thermal and dynamic characteristics, because of the motor's windings which are located in the stators.
- Very low maintenance.
- Connection box with four available positions from the standard construction.



## BLS ~ Technical Specifications

ALL CHARACTERISTICS MEASURED AT 25° C AMBIENT TEMPERATURE	SYMBOLS	UNITS
MAX MECHANICAL SPEED	n	rpm
STALL TORQUE <sup>(1)</sup> ±10%	M <sub>S</sub>	Nm
STALL CURRENT	I <sub>S</sub>	A
PEAK TORQUE ±10%	M <sub>J</sub>	Nm
TORQUE-WEIGHT RATIO	T <sub>W</sub>	Nm/kg
EMF CONSTANT ±5%	K <sub>E</sub>	Vs/rad
TORQUE CONSTANT ±5%	K <sub>T</sub>	Nm/A
RELUCTANCE TORQUE <sup>(*)</sup>	T <sub>R</sub>	Nm
WINDING RESISTANCE ±5%	R	Ω
WINDING INDUCTANCE ±5%	L	mH
ROTOR INERTIA	J	kg m <sup>2</sup> 10 <sup>-3</sup>
MECHANICAL TIME CONSTANT	T <sub>M</sub>	ms
ELECTRICAL TIME CONSTANT	T <sub>E</sub>	ms
THERMAL TIME CONSTANT	T <sub>TH</sub>	s
THERMAL RESISTANCE	R <sub>TH</sub>	°C/W
MASS	M	kg
RADIAL LOAD (at mid-length of shaft)	F <sub>R</sub>	N
AXIAL LOAD	F <sub>A</sub>	N
INSULATION		
PROTECTION		

(1) With an aluminium heat sink plate  
 (\*) Respect to the Stall Torque

## BLT ~ Technical Specifications

ALL CHARACTERISTICS MEASURED AT 25° C AMBIENT TEMPERATURE	SYMBOLS	UNITS
MAX MECHANICAL SPEED	n	rpm
STALL TORQUE <sup>(1)</sup> ±10%	M <sub>S</sub>	Nm
STALL CURRENT	I <sub>S</sub>	A
PEAK TORQUE ±10%	M <sub>J</sub>	Nm
TORQUE-WEIGHT RATIO	T <sub>W</sub>	Nm/kg
EMF CONSTANT ±5%	K <sub>E</sub>	Vs/rad
TORQUE CONSTANT ±5%	K <sub>T</sub>	Nm/A
RELUCTANCE TORQUE <sup>(*)</sup>	T <sub>R</sub>	Nm
WINDING RESISTANCE ±5%	R	Ω
WINDING INDUCTANCE ±5%	L	mH
ROTOR INERTIA	J	kg m <sup>2</sup> 10 <sup>-3</sup>
MECHANICAL TIME CONSTANT	T <sub>M</sub>	ms
ELECTRICAL TIME CONSTANT	T <sub>E</sub>	ms
THERMAL TIME CONSTANT	T <sub>TH</sub>	s
THERMAL RESISTANCE	R <sub>TH</sub>	°C/W
MASS	M	kg
RADIAL LOAD (at mid-length of shaft)	F <sub>R</sub>	N
AXIAL LOAD	F <sub>A</sub>	N
INSULATION		
PROTECTION		

(1) With an aluminium heat sink plate  
 (\*) Respect to the Stall Torque

BLS-111		BLS-112		BLS-113		BLS-114		BLS-115	
220 VAC	400 VAC	220 VAC	400 VAC	220 VAC	400 VAC	220 VAC	400 VAC	220 VAC	400 VAC
8,500		8,500		8,500		8,500		8,500	
2.9	2.9	5.0	5.0	8.4	8.4	10.6	10.6	13.9	13.9
3.49	2.04	6.02	3.29	9.88	5.71	12.77	7.31	17.16	9.79
11.6	11.6	20.0	20.0	33.6	33.6	42.4	42.4	55.6	55.6
0.73	0.73	1.0	1.0	1.33	1.33	1.43	1.43	1.64	1.64
0.48	0.82	0.48	0.88	0.49	0.85	0.48	0.84	0.47	0.82
0.83	1.42	0.83	1.52	0.85	1.47	0.83	1.45	0.81	1.42
<3%		<3%		<3%		<3%		<3%	
7.2	20.6	2.4	7.1	1.3	3.79	0.8	2.58	0.6	1.84
10	31	4.8	13.2	2.7	8.5	1.9	5.8	1.5	5.1
0.2	0.2	0.38	0.38	0.56	0.56	0.74	0.74	0.93	0.93
3.61	3.54	2.29	2.02	1.75	1.70	1.49	1.57	1.47	1.47
1.39	1.5	2.0	1.86	2.08	2.24	2.38	2.25	2.5	2.77
2,520	2,520	1,910	1,910	2,260	2,260	2,510	2,510	3,700	3,700
0.65	0.67	0.66	0.75	0.45	0.46	0.44	0.42	0.32	0.33
4	4	5	5	6.3	6.3	7.4	7.4	8.5	8.5
515		515		515		515		515	
255		255		255		255		255	
CLASS-F		CLASS-F		CLASS-F		CLASS-F		CLASS-F	
IP-65		IP-65		IP-65		IP-65		IP-65	
400x400x10									

BLS-141		BLS-142		BLS-143		BLS-144		BLS-191	BLS-192
220 VAC	400 VAC	220 VAC	400 VAC	220 VAC	400 VAC	220 VAC	400 VAC	400 VAC	400 VAC
6,500		6,500		6,500		6,500		2,800	
13.6	13.6	17.4	17.4	26.8	26.8	33	33	56	82
13.6	7.01	15.4	8.02	19.14	10.19	17.55	9.38	25.11	34.60
54.4	54.4	69.6	69.6	107.2	107.2	132.0	132.0	224.0	328.0
1.3	1.3	1.41	1.41	1.63	1.63	1.64	1.64	1.9	2.1
0.58	1.12	0.65	1.25	0.81	1.52	1.09	2.03	1.29	1.37
1	1.94	1.13	2.17	1.4	2.63	1.88	3.52	2.23	2.37
<2.5%		<2.5%		<2.5%		<2.5%		<2%	
0.86	2.9	0.73	2.46	0.63	2.04	0.74	2.5	0.39	0.26
2.8	11.5	2.6	9	2.7	9.6	3.2	11	1.9	1.5
1.71	1.71	2.34	2.34	3.34	3.34	4.59	4.59	14.7	22
2.54	2.28	2.33	2.12	1.86	1.70	1.66	1.61	1.99	1.76
3.26	3.97	3.56	3.66	4.29	4.71	4.32	4.4	4.87	5.77
3,740	3,740	4,500	4,500	4,626	4,626	4,800	4,800	4,400	4,090
0.36	0.40	0.33	0.36	0.25	0.27	0.25	0.26	0.23	0.18
10.5	10.5	12.3	12.3	16.4	16.4	20.1	20.1	29.5	39
784		784		784		784		1,400	
343		343		343		343		690	
CLASS-F		CLASS-F		CLASS-F		CLASS-F		CLASS-F	
IP-65		IP-65		IP-65		IP-65		IP-65	
700x700x20									

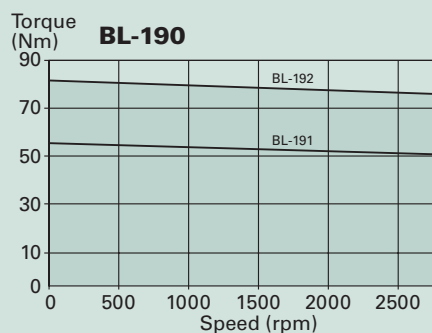
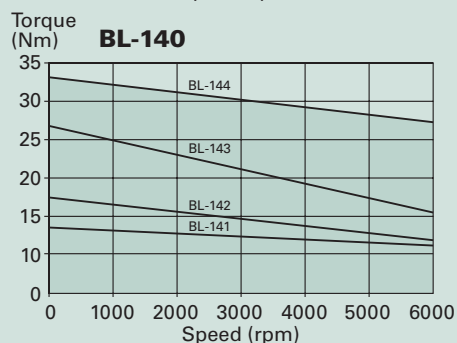
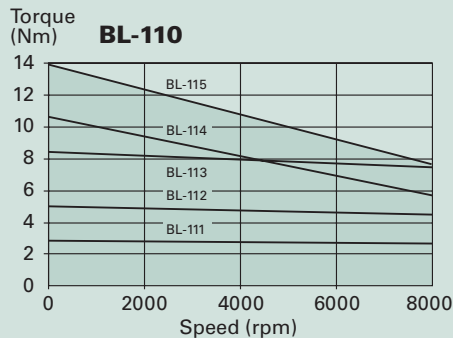
BLT-111		BLT-112		BLT-113		BLT-114		BLT-115	
220 VAC	400 VAC	220 VAC	400 VAC	220 VAC	400 VAC	220 VAC	400 VAC	220 VAC	400 VAC
8,500		8,500		8,500		8,500		8,500	
2.9	2.9	5.0	5.0	8.4	8.4	10.6	10.6	13.9	13.9
4.33	2.5	7.46	4.03	12.17	7.0	15.82	8.98	21.06	11.98
11.6	11.6	20.0	20.0	33.6	33.6	42.4	42.4	55.6	55.6
0.73	0.73	1.01	1.01	1.34	1.34	1.44	1.44	1.64	1.64
0.67	1.16	0.67	1.24	0.69	1.2	0.67	1.18	0.66	1.16
0.67	1.16	0.67	1.24	0.69	1.2	0.67	1.18	0.66	1.16
<3%		<3%		<3%		<3%		<3%	
7.2	20.6	2.4	7.1	1.3	3.79	0.8	2.58	0.6	1.84
10	31	4.8	13.2	2.7	8.5	1.9	5.8	1.5	5.1
0.2	0.2	0.38	0.38	0.56	0.56	0.74	0.74	0.93	0.93
3.21	3.06	2.03	1.75	1.53	1.47	1.32	1.37	1.28	1.27
1.39	1.5	2.0	1.86	2.08	2.24	2.38	2.25	2.5	2.77
2,520	2,520	1,910	1,910	2,260	2,260	2,510	2,510	3,700	3,700
0.64	0.67	0.64	0.75	0.45	0.46	0.43	0.41	0.32	0.33
3.97	3.97	4.97	4.97	6.27	6.27	7.37	7.37	8.47	8.47
515		515		515		515		515	
255		255		255		255		255	
CLASS-F		CLASS-F		CLASS-F		CLASS-F		CLASS-F	
IP-65		IP-65		IP-65		IP-65		IP-65	
400x400x10									

BLT-141		BLT-142		BLT-143		BLT-144		BLT-191	BLT-192
220 VAC	400 VAC	220 VAC	400 VAC	220 VAC	400 VAC	220 VAC	400 VAC	400 VAC	400 VAC
6,500		6,500		6,500		6,500		2,800	
13.6	13.6	17.4	17.4	26.8	26.8	33	33	56	82
16.59	8.61	18.91	9.89	23.51	12.47	21.43	11.5	30.43	42.49
54.4	54.4	69.6	69.6	107.2	107.2	132.0	132.0	224.0	328.0
1.3	1.3	1.42	1.42	1.64	1.64	1.64	1.64	1.9	2.1
0.82	1.58	0.92	1.76	1.14	2.15	1.54	2.87	1.84	1.93
0.82	1.58	0.92	1.76	1.14	2.15	1.54	2.87	1.84	1.93
<2.5%		<2.5%		<2.5%		<2.5%		<2%	
0.86	2.9	0.73	2.46	0.63	2.04	0.74	2.5	0.39	0.26
2.8	11.5	2.6	9	2.7	9.6	3.2	11	1.9	1.5
1.71	1.71	2.34	2.34	3.34	3.34	4.59	4.59	14.7	22
2.19	1.99	2.02	1.86	1.62	1.47	1.43	1.39	1.69	1.54
3.26	3.97	3.56	3.66	4.29	4.71	4.32	4.4	4.87	5.77
3,740	3,740	4,500	4,500	4,626	4,626	4,800	4,800	4,400	4,090
0.36	0.4	0.33	0.36	0.25	0.27	0.25	0.26	0.24	0.18
10.47	10.47	12.27	12.27	16.37	16.37	20.7	20.7	29.47	38.97
784		784		784		784		1,400	
343		343		343		343		690	
CLASS-F		CLASS-F		CLASS-F		CLASS-F		CLASS-F	
IP-65		IP-65		IP-65		IP-65		IP-65	
700x700x20									



# AC Servo Motors BL 110/140/190 Series

## Performance Curves



## Resolver Specifications

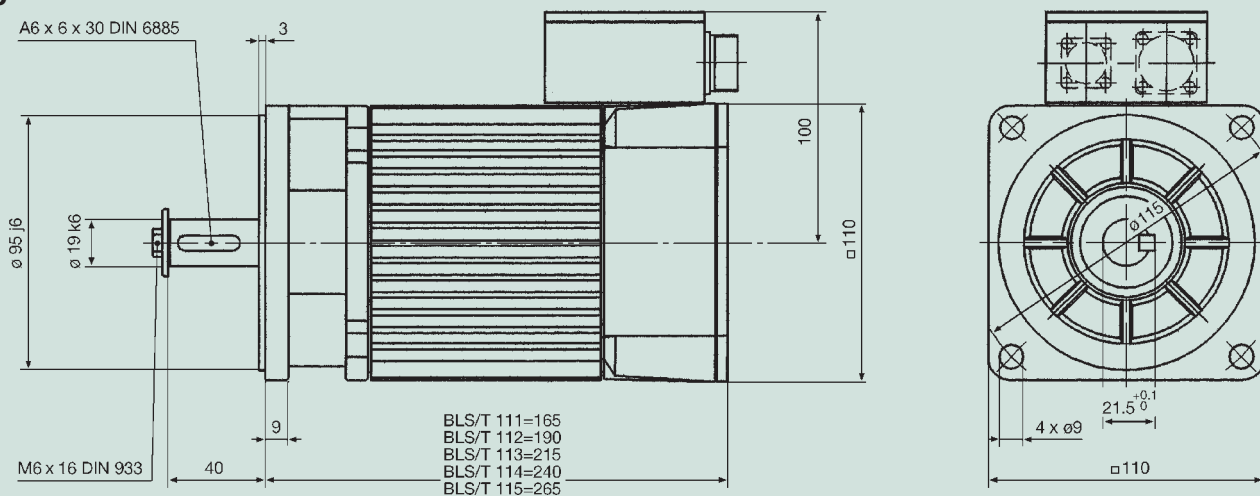
	UNITS	2T8 (Transmitter Speed 1)
Input Voltage/Frecuency	V/kHz	10/4.5
Primary Element		Rotor
Number of Speed		1X
Transformation Ratio		0.5 ± 5%
Electrical Error	minutes	±10 max.
Dielectric Strength	VAC/1 minute	500
Mass	kg	0.230
Rotor Moment of Inertia	kg m <sup>2</sup> 10 <sup>-3</sup>	0.0123
Operating Temperature Range	°C	-55 ~ +155

## Brake Specifications

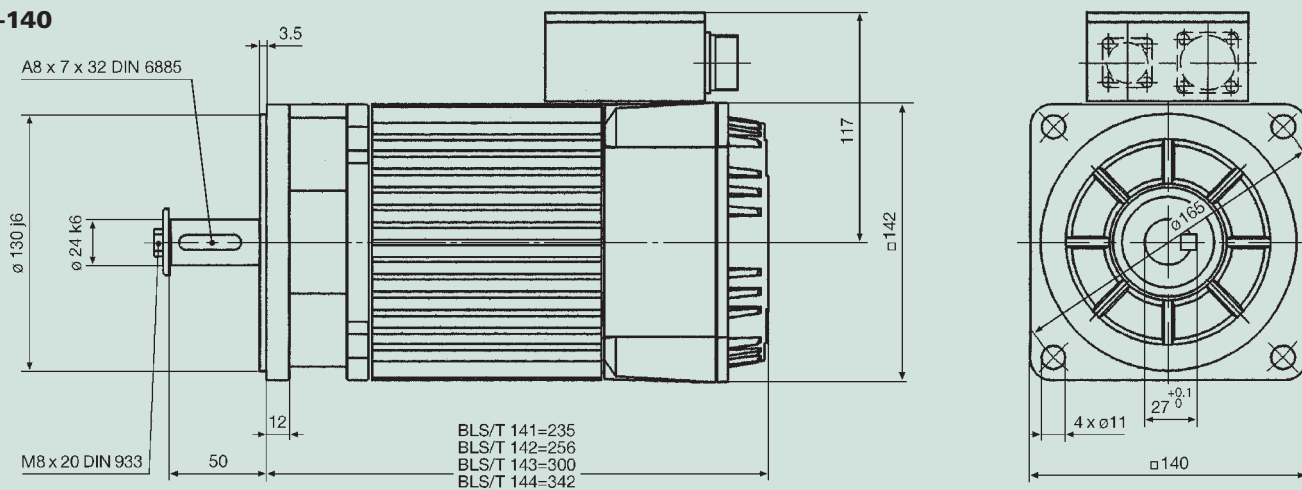
	SIZE	TORQUE Nm	INERTIA kg cm <sup>2</sup>	MASS kg
<b>BL-111 / 112</b>	10	8	0.30	0.8
<b>BL-113 / 114 / 115</b>	10	12	0.30	0.8
<b>BL-141 / 142 / 143 / 144</b>	11	20	9.5	1.9
<b>BL-191 / 192</b>	09	72	16	2.85

The BL Series incorporates the option of a fail-safe holding brake within the structure of the motor.

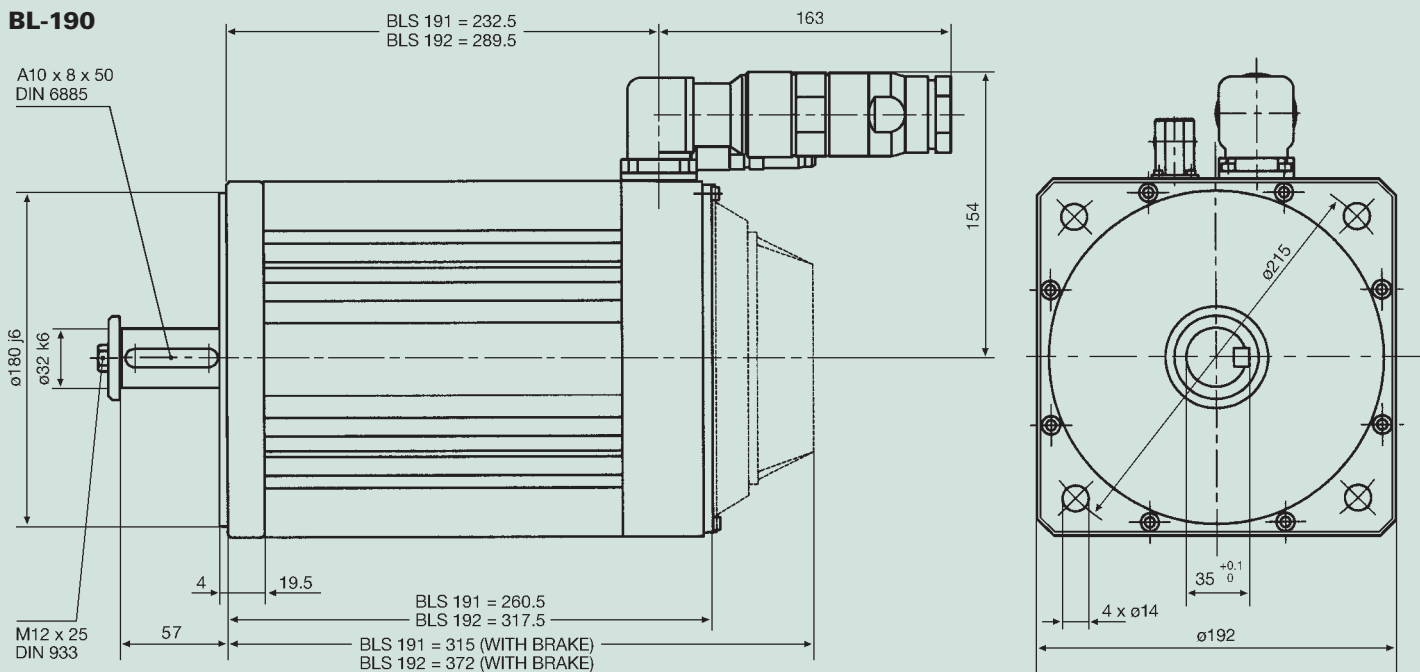
### BL-110



### BL-140



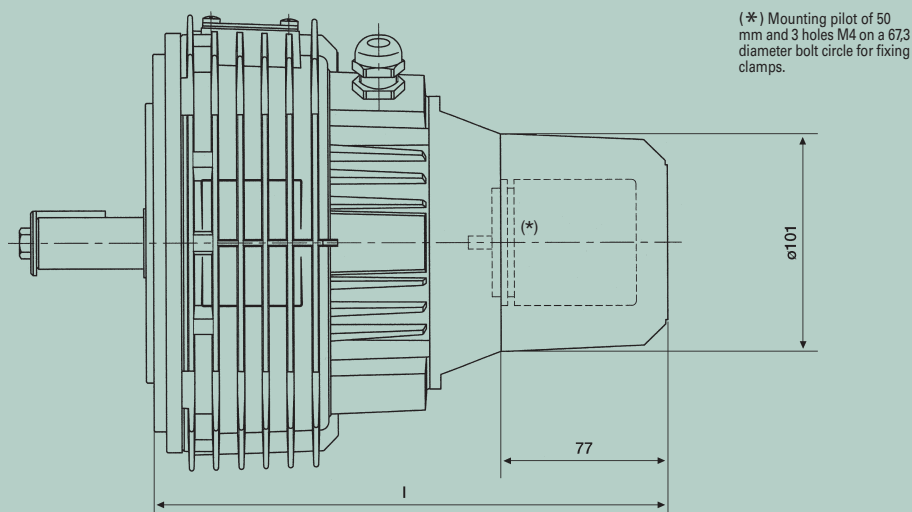
### BL-190



# Optional Accessories

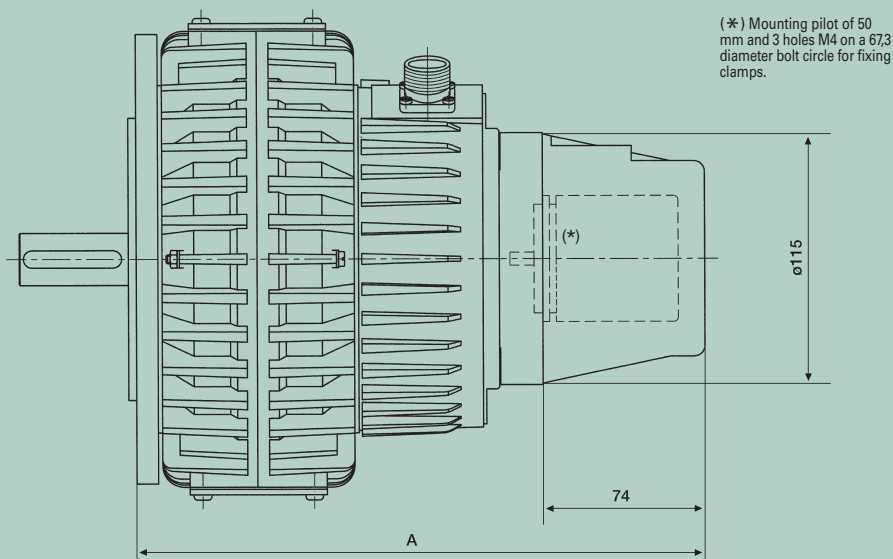
## MSS Encoder Kit (no encoder)

	I
<b>MSS-2</b>	235
<b>MSS-4</b>	233
<b>MSS-6</b>	233
<b>MSS-8</b>	243.5
<b>MSS-12</b>	237.5
<b>MSS-22</b>	265.5
<b>MSS-35</b>	291
<b>MSS-45</b>	291



## MA Encoder Kit (no encoder)

	A
<b>MA-6</b>	237.5
<b>MA-10</b>	237.5
<b>MA-20</b>	252.5
<b>MA-30</b>	261.5
<b>MA-45</b>	274
<b>MA-55</b>	274



## BL 110/140 Encoder Kit (no encoder)

	A
<b>BL-111</b>	282
<b>BL-112</b>	307
<b>BL-113</b>	332
<b>BL-114</b>	357
<b>BL-115</b>	382
<b>BL-141</b>	346
<b>BL-142</b>	367
<b>BL-143</b>	411
<b>BL-144</b>	453

