



# Brushless Servomotors



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LINEARMECH Brushless Servomotors BM Series are produced according to the latest state-of-the-art technology to improve the specific torque and its linear erogation.

The high efficiency servomotors BM Series by Linearmech are made using “**Segmented Lamination Stator Technology**”. This technology can pack higher torque and power density into the same-sized motor. It also allows the highest slot fill of the stator winding and the motor to run cooler, potentially extending its operational life.

Brushless servomotors BM Series have been designed for continuous working with natural convection cooling, without external cooling devices. The heat is mainly generated in the stator winding and it is dissipated through the motor external body thanks to the excellent mechanical and thermal coupling between these two parts.



## 1.1 General data

Motor type:	brushless with sinusoidal back-EMF (synchronous, permanent magnets)
Cooling:	natural convection
Mounting:	IM B5
Magnets material:	NeFeB
Insulation class:	F (overheating on windings 100 K with ambient temperature 40°C and safety margin 15°C)
Protection:	motore body IP 54 motore shaft IP 44 standard, IP 54 with lubricant seal
Operating temperature:	(0 ... + 40)°C
Ambient storage temperature:	(- 10 ... + 60)°C
Humidity:	max. 85 % without condensation
Operating altitude:	< 1000 m ASL (for higher altitude a degrading factor must be applied)
Thermal protection:	optional: PTC, PTO or KTY
Motor feedback:	optical encoder, LINE-DRIVER, 2000 ppr (standard) resolver, 1 pole pairs 7 V rms, 10 kHz (optional) BISS absolute multiturn encoder (optional)
Holding brake:	optional, 24 V dc power supply
Balance quality grade:	G 2.5 (standard) according to IEC 1940-1
Reference standards:	IEC 60034-1, IEC 60034-5, IEC 60034-6, IEC 60034-7, IEC 60034-11, ISO 1940-1
Marked:	CE

## 1.2 Construction technology

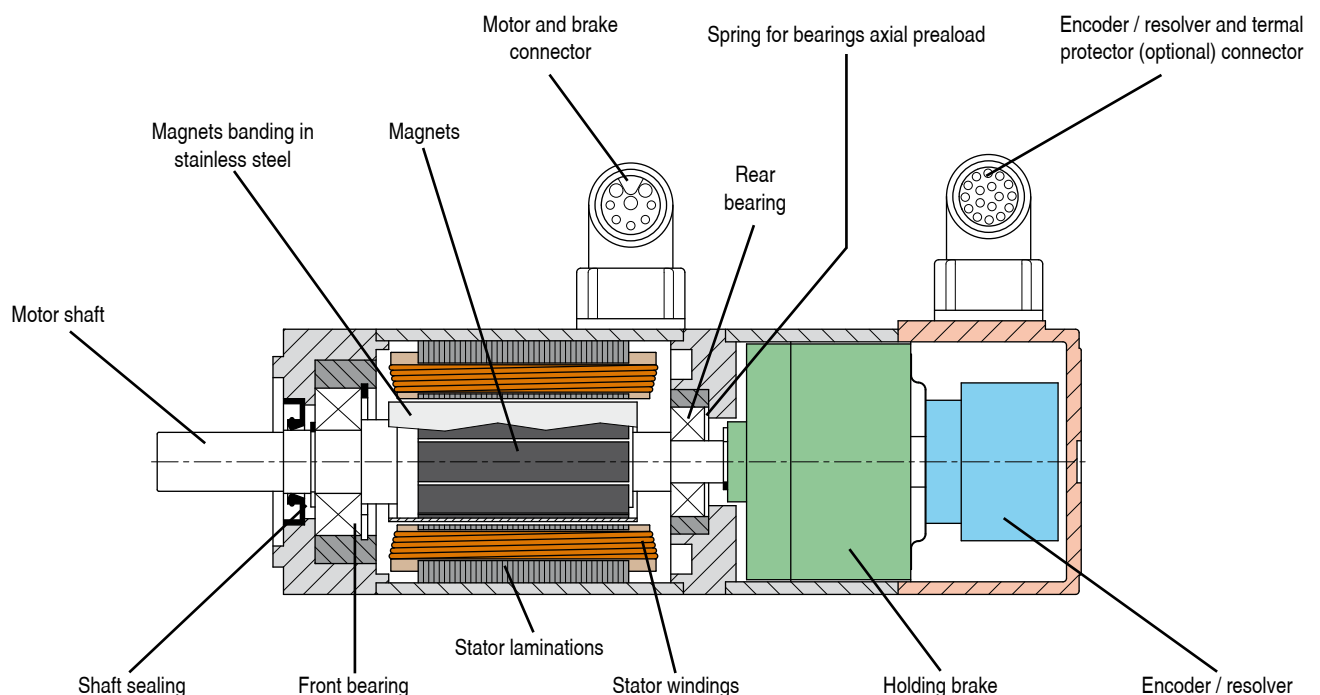
The STATOR of Linearmech brushless servomotors is made according to the **“Segmented Lamination Stator Technology”** to optimize the use of copper. In details, the advantages and benefits of this construction technology are:

- **Greater fill factor:** by winding every tooth individually, segmented lamination stator technology allow higher slot fill compared to more traditional brushless dc motor stators of equal size. With traditional windings, the slot fill is about 30% of the total space. Using the segmented lamination stator technology it's possible to reach 40% and more.
- **Reduced length of end windings:** the end windings do not provide additional power or torque. They only connect “active” electrical conductors from one slot to another. By carrying current, the end windings are naturally affected by losses of electrical power. By reducing their length, the motor efficiency increases.

The segmented lamination stator technology lead to a considerable increase of performances in servomotors, both in torque and efficiency, than motors produced with traditional technology.

Peculiar magnets geometry together with a specific magnets protection create a robust ROTOR structure, minimizing the cogging effect.

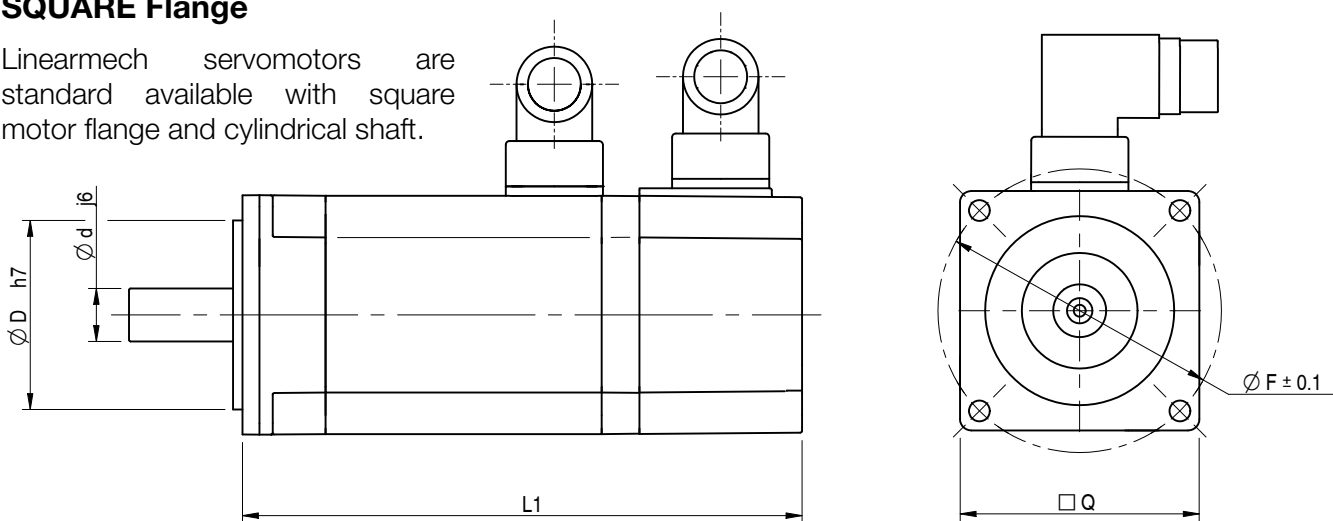
- **Magnets geometry:** through FEM software we defined the optimal magnets shape to minimize the cogging effect and the harmonic distortion of the BEMF generated by the motor. The result is a motor with very low cogging torque and a very low torque ripple.
- **Stainless steel magnets protection:** permanent magnets used in brushless servomotors are rare-earth magnets (NdFeB) with great magnetic properties in terms of “energy density”. Unfortunately they can be subject to corrosive attack if exposed to particularly aggressive environments, as they are obtained by sintering process. Magnets are also fixed on the motor shaft and they are subject to centrifugal forces and mutual attraction forces while rotating. To ensure the mechanical fixing of magnets and their insulation from the outside, a retaining system based on stainless steel bushes placed in each rotor of the BM series is applied.



## 1.3 Sizes overview

### SQUARE Flange

Linearmech servomotors are standard available with square motor flange and cylindrical shaft.



Servomotor	Continuous rated torque [Nm]	Stall torque [Nm]	Peak torque [Nm]	$\varnothing d$ [mm]	$\varnothing D$ [mm]	$\varnothing F$ [mm]	$\square Q$ [mm]	L1 [mm]
<b>BM 45 L</b>	0.32	0.35	1.05	9	40	50	45	122
<b>BM 63 S</b>	0.6	0.7	2.1	14	50	75	63	123
<b>BM 63 L</b>	1.3	1.35	4.2	14	50	75	63	148
<b>BM 82 S</b>	1.3	1.5	4.5	19	70	100	82	134
<b>BM 82 L</b>	2.5	2.9	9	19	70	100	82	159
<b>BM 102 S</b>	4.1	5.2	15	24	90	115	102	176
<b>BM 102 L6</b>	6.4	7.3	22	24	90	115	102	226
<b>BM 102 L8</b>	6.7	9	30	24	90	115	102	226

NOTE: for overall dimensions see Section 1.5 "Dimensions and performances".



**BM 45 L**

**BM 63 S**

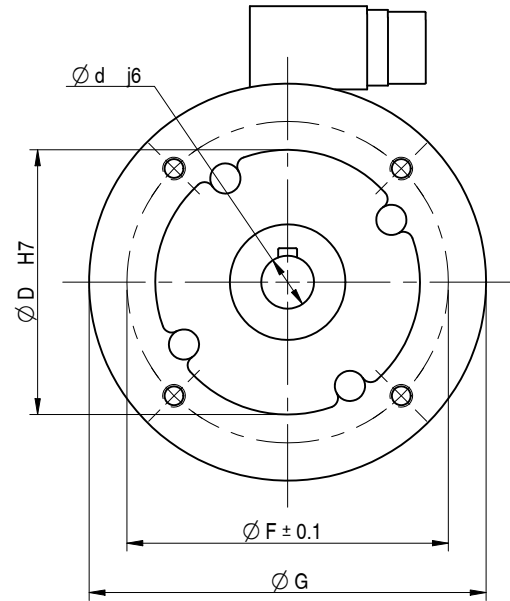
**BM 63 L**

**BM 82 S**

## 1.3 Sizes overview

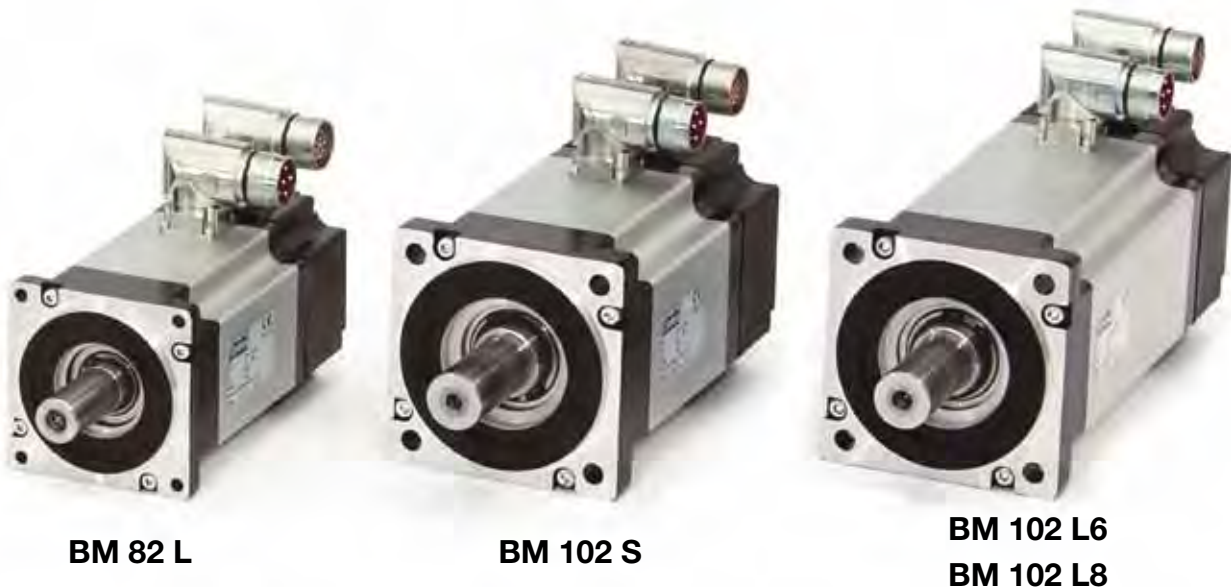
### IEC Flange

Linearmech servomotors are also available with metric flange dimensions according to IEC 34-7, UNEL 05513 regulations (IEC B14 motor flange and input shaft with key).



Servomotor	IEC Flange	Ø d [mm]	Ø D [mm]	Ø F [mm]	Ø G [mm]
<b>BM 45 L IEC</b>	56 B14	9	50	65	80
<b>BM 63 S IEC</b>	63 B14	11	60	75	90
<b>BM 63 L IEC</b>	71 B14	14	70	85	105
<b>BM 82 S IEC</b>	80 B14	19	80	100	120
<b>BM 82 L IEC</b>	80 B14	19	80	100	120
<b>BM 102 S IEC</b>	90 B14	24	95	115	140
<b>BM 102 L6 IEC</b>	90 B14	24	95	115	140
<b>BM 102 L8 IEC</b>	90 B14	24	95	115	140

NOTE: for overall dimensions see Section 1.5 “Dimensions and performances”.



## 1.4 Technical Data

Servomotor size			BM 45 L - 30		
Drive rated voltage	$U_{nom}$ [V]		24 V dc	48 V dc	230 V dc
Stall torque	$T_{0,100K}$ [Nm]		0.35		
Continuous rated torque	$T_{nom,100K}$ [Nm]		0.32		
Peak torque	$T_p$ [Nm]		1.05		
Rated speed	$n_{nom}$ [rpm]		3000		
Max. speed	$n_{max}$ [rpm]		4000		
Number of poles			8		
Stall current	$I_{0,100K}$ [A]		7.4 (!)	3.8 (!)	1.25
Peak current	$I_p$ [A]		24.4 (!)	12.5 (!)	3.95
Voltage constant	$k_E$ [V/1000 rpm]		5 (!)	8.9 (!)	17.2
Torque constant	$k_T$ [Nm/A]		0.047 (!)	0.09 (!)	0.28
Thermal time constant	$t_{th}$ [min]		12		
Winding resistance	$R_{ph}$ [ $\Omega$ ]		0.38	1.4	9.7
Winding inductance	$L_D$ [mH]		0.69	2.4	16.7
Electric time constant	$t_{el}$ [ms]		1.8	1.7	1.7
Moment of inertia (without brake)	$J_{motore}$ [kg $\times$ m <sup>2</sup> ]		0.091 $\times$ 10 <sup>-4</sup>		
Moment of inertia (with brake)	$J_{motore BR}$ [kg $\times$ m <sup>2</sup> ]		0.092 $\times$ 10 <sup>-4</sup>		
Rated braking torque	$T_{BR}$ [Nm]		0.8		
Brake supply voltage	$U_{BR}$ [V]		24 V dc <sup>+ 5 %</sup> <sub>- 10 %</sub>		
Brake power	$P_{BR}$ [W]		12.8		
Brake engagement delay time	$t_{BR}$ [ms]		40		
Brake disengagement delay time	$t_{-BR}$ [ms]		7		
Permissible radial load on motor shaft	$F_R$ [N]		150		
Permissible axial load on motor shaft	$F_N$ [N]		50		
Mass without brake / mass with brake	$m$ [kg]		0.9 / 1.2		

(!) - DC values refer to trapezoidal commutation

NOTE: Available, upon request, special windings for higher nominal rated speed up to 6000 rpm. Contact our Technical Dpt. for more information.



# 1. Brushless Servomotors BM Series



## 1.4 Technical data

BM 63 S - 30			BM 63 L - 30			Servomotor size		
24 V dc	48 V dc	230 V ac	24 V dc (²)	48 V dc	230 V ac	[V]	$U_{nom}$	Drive rated voltage
0.7			1.35			[Nm]	$T_{0, 100K}$	Stall torque
0.6			1.3			[Nm]	$T_{nom, 100K}$	Continuous rated torque
2.1			4.2			[Nm]	$T_p$	Peak torque
3000			3000			[rpm]	$n_{nom}$	Rated speed
4000			4000			[rpm]	$n_{max}$	Max. speed
8			8					Number of poles
15.9 (¹)	7.7 (¹)	0.98	35 (¹)	15.7 (¹)	2.1	[A]	$I_{0, 100K}$	Stall current
50.8 (¹)	25.8 (¹)	3.7	115 (¹)	53 (¹)	7.1	[A]	$I_p$	Peak current
4.7 (¹)	9.7 (¹)	41	4.3 (¹)	9.4 (¹)	43	[V/1000 rpm]	$k_E$	Voltage constant
0.044 (¹)	0.09 (¹)	0.67	0.04 (¹)	0.089 (¹)	0.71	[Nm/A]	$k_T$	Torque constant
15			15			[min]	$t_{th}$	Thermal time constant
0.13	0.5	17.4	0.09	0.2	7.1	[Ω]	$R_{ph}$	Winding resistance
0.39	1.5	53	0.17	0.8	30	[mH]	$L_D$	Winding inductance
3	3	3	1.9	4.2	4.2	[ms]	$t_{el}$	Electric time constant
$0.156 \times 10^{-4}$			$0.272 \times 10^{-4}$			[kg × m²]	$J_{motore}$	Moment of inertia (without brake)
$0.174 \times 10^{-4}$			$0.290 \times 10^{-4}$			[kg × m²]	$J_{motore BR}$	Moment of inertia (with brake)
2.5			2.5			[Nm]	$T_{BR}$	Rated braking torque
24 V dc <sup>+ 5 %</sup> <sub>- 10 %</sub>			24 V dc <sup>+ 5 %</sup> <sub>- 10 %</sub>			[V]	$U_{BR}$	Brake supply voltage
13.3			13.3			[W]	$P_{BR}$	Brake power
40			40			[ms]	$t_{BR}$	Brake engagement delay time
7			7			[ms]	$t_{BR}$	Brake disengagement delay time
230			230			[N]	$F_R$	Permissible radial load on motor shaft
70			70			[N]	$F_N$	Permissible axial load on motor shaft
1.25 / 1.90			1.85 / 2.50			[kg]	$m$	Mass without brake / mass with brake

(¹) - DC values refer to trapezoidal commutation

(²) - only intermittent service S3 25 % over 10 min

## 1.4 Technical Data

Servomotor size			BM 82 S - 30		BM 82 L - 30	
Drive rated voltage	$U_{nom}$	[V]	230 V ac	400 V ac	230 V ac	400 V ac
Stall torque	$T_{0,100K}$	[Nm]	1.5		2.9	
Continuous rated torque	$T_{nom,100K}$	[Nm]	1.3		2.5	
Peak torque	$T_p$	[Nm]	4.5		9.0	
Rated speed	$n_{nom}$	[rpm]	3000		3000	
Max. speed	$n_{max}$	[rpm]	4000		4000	
Number of poles			8		8	
Stall current	$I_{0,100K}$	[A]	2.6	1.2	4.6	2.3
Peak current	$I_p$	[A]	7.2	3.7	14.7	7.4
Voltage constant	$k_E$	[V/1000 rpm]	39.0	76.5	39.5	78.0
Torque constant	$k_T$	[Nm/A]	0.64	1.26	0.64	1.28
Thermal time constant	$t_{th}$	[min]	16		16	
Winding resistance	$R_{ph}$	[ $\Omega$ ]	3.9	14.8	1.5	6.2
Winding inductance	$L_D$	[mH]	28	105	13.8	56
Electric time constant	$t_{el}$	[ms]	7.1	7.1	8.9	9
Moment of inertia (without brake)	$J_{motore}$	[kg $\times$ m <sup>2</sup> ]	$0.638 \times 10^{-4}$		$1.030 \times 10^{-4}$	
Moment of inertia (with brake)	$J_{motore BR}$	[kg $\times$ m <sup>2</sup> ]	$0.768 \times 10^{-4}$		$1.160 \times 10^{-4}$	
Rated braking torque	$T_{BR}$	[Nm]	6.5		6.5	
Brake supply voltage	$U_{BR}$	[V]	24 V dc <sup>+ 5%</sup> <sub>- 10%</sub>		24 V dc <sup>+ 5%</sup> <sub>- 10%</sub>	
Brake power	$P_{BR}$	[W]	23.8		23.8	
Brake engagement delay time	$t_{BR}$	[ms]	45		45	
Brake disengagement delay time	$t_{-BR}$	[ms]	10		10	
Permissible radial load on motor shaft	$F_R$	[N]	400		400	
Permissible axial load on motor shaft	$F_N$	[N]	130		130	
Mass without brake / mass with brake	$m$	[kg]	2.0 (3.7)		3.3 / 5.0	

# 1. Brushless Servomotors BM Series



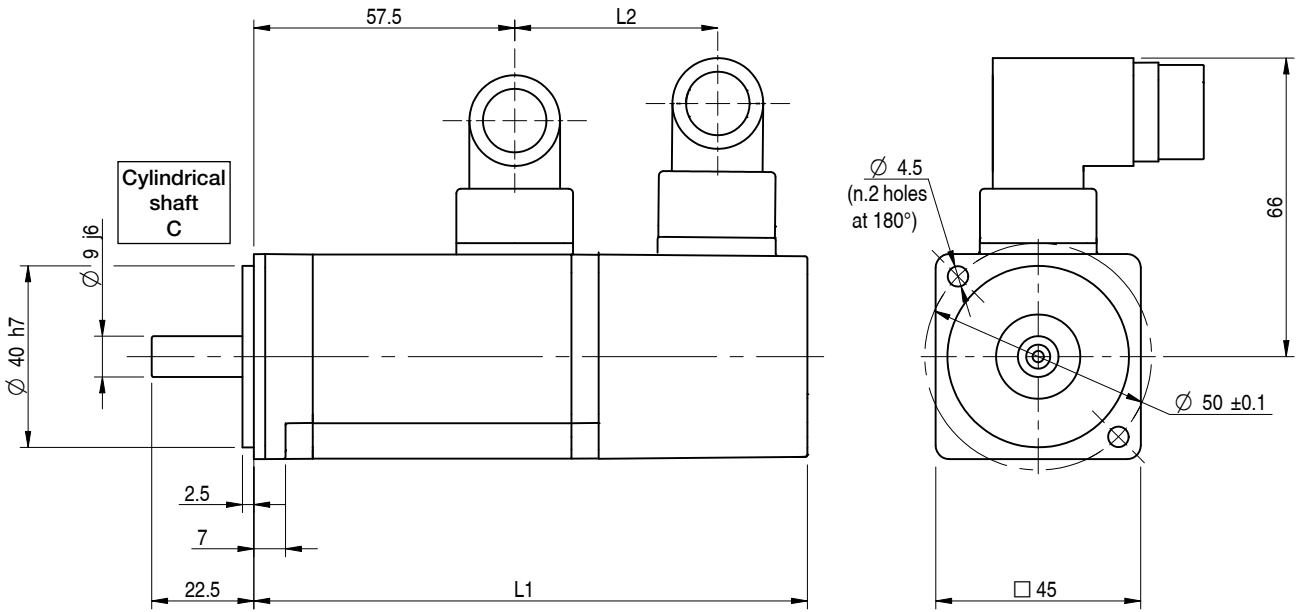
## 1.4 Technical Data

BM 102 S - 30		BM 102 L6 - 30		BM 102 L8 - 30		Servomotor size		
230 V ac	400 V ac	230 V ac	400 V ac	230 V ac	400 V ac	[V]	$U_{nom}$	Drive rated voltage
5.2		7.3		9.0		[Nm]	$T_{0, 100K}$	Stall torque
4.1		6.4		6.7		[Nm]	$T_{nom, 100K}$	Continuous rated torque
15.0		22.0		30.0		[Nm]	$T_p$	Peak torque
3000		3000		3000		[rpm]	$n_{nom}$	Rated speed
4000		4000		4000		[rpm]	$n_{max}$	Max. speed
8		6		8		Number of poles		
6.5	3.5	9.8	6.1	11.5	5.8	[A]	$I_{0, 100K}$	Stall current
26.0	14.0	35.5	22.0	47.0	25.5	[A]	$I_p$	Peak current
48.6	90.0	47.7	77.0	47.7	94.0	[V/1000 rpm]	$k_E$	Voltage constant
0.8	1.48	0.8	1.2	0.8	1.55	[Nm/A]	$k_T$	Torque constant
35		45		45		[min]	$t_{th}$	Thermal time constant
0.9	3.5	0.56	1.6	0.4	1.6	[ $\Omega$ ]	$R_{ph}$	Winding resistance
14.0	54.0	8.2	23.0	6.0	27.6	[mH]	$L_D$	Winding inductance
15.5	15.4	14.6	14.3	15.0	17.2	[ms]	$t_{el}$	Electric time constant
$2.88 \times 10^{-4}$		$4.950 \times 10^{-4}$		$4.950 \times 10^{-4}$		[kg $\times$ m <sup>2</sup> ]	$J_{motore}$	Moment of inertia (without brake)
$3.34 \times 10^{-4}$		$5.410 \times 10^{-4}$		$5.410 \times 10^{-4}$		[kg $\times$ m <sup>2</sup> ]	$J_{motore BR}$	Moment of inertia (with brake)
14		14		14		[Nm]	$T_{BR}$	Rated braking torque
24 V dc <sup>+ 5 %</sup> <sub>- 10 %</sub>		24 V dc <sup>+ 5 %</sup> <sub>- 10 %</sub>		24 V dc <sup>+ 5 %</sup> <sub>- 10 %</sub>		[V]	$U_{BR}$	Brake supply voltage
35.2		35.2		35.2		[W]	$P_{BR}$	Brake power
50		50		50		[ms]	$t_{BR}$	Brake engagement delay time
15		15		15		[ms]	$t_{BR}$	Brake disengagement delay time
500		500		500		[N]	$F_R$	Permissible radial load on motor shaft
150		150		150		[N]	$F_N$	Permissible axial load on motor shaft
5.2 / 7.4		7.8 / 10.0		7.8 / 10.0		[kg]	m	Mass without brake / mass with brake

# 1. Brushless Servomotors BM Series

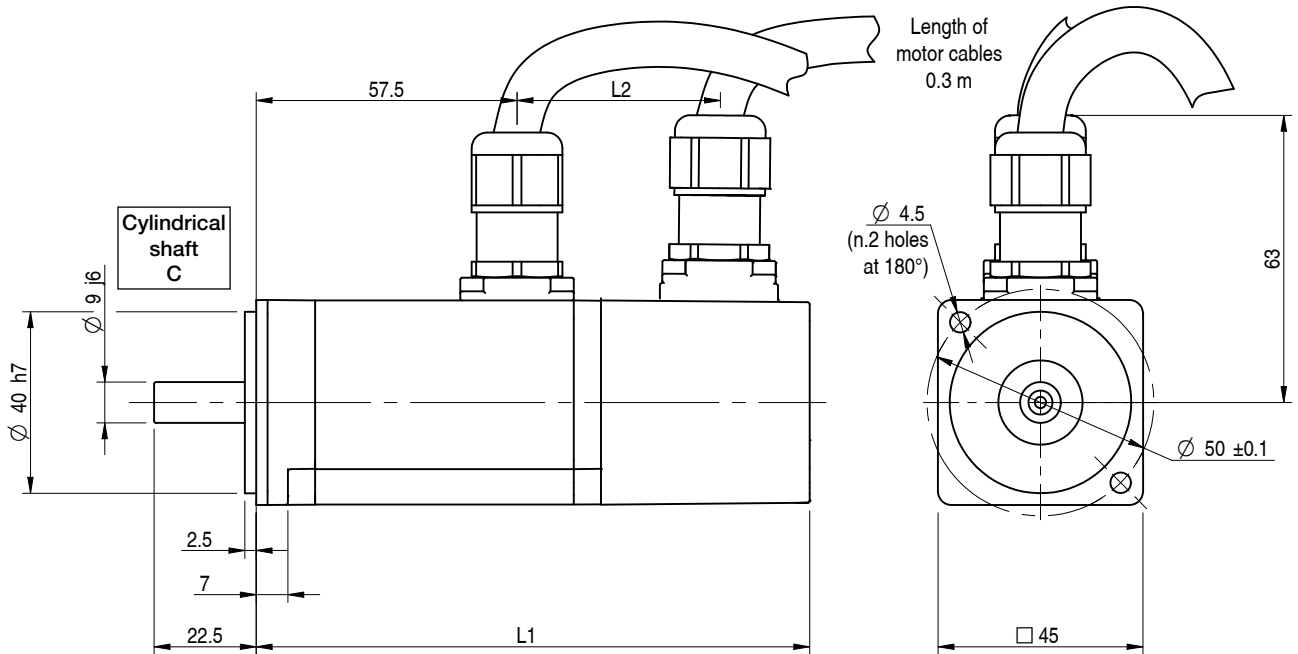
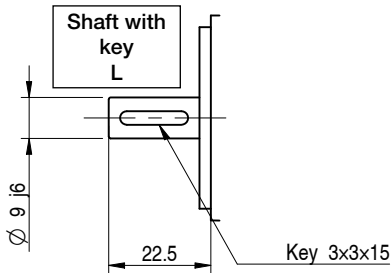
## 1.5 Dimensions and performances - SQUARE Flange Series

### 1.5.1 BM 45 L



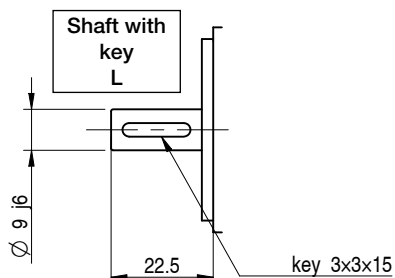
**BM 45 L CN** - Servomotor with connectors

Size	BM 45 L CN	BM 45 L B CN (with brake)
L1	122	156
L2	45	78



**BM 45 L CV** - Servomotor with cables

Size	BM 45 L CV	BM 45 L B CV (with brake)
L1	122	156
L2	45	78



# 1. Brushless Servomotors BM Series



## 1.5 Dimensions and performances - SQUARE Flange Series

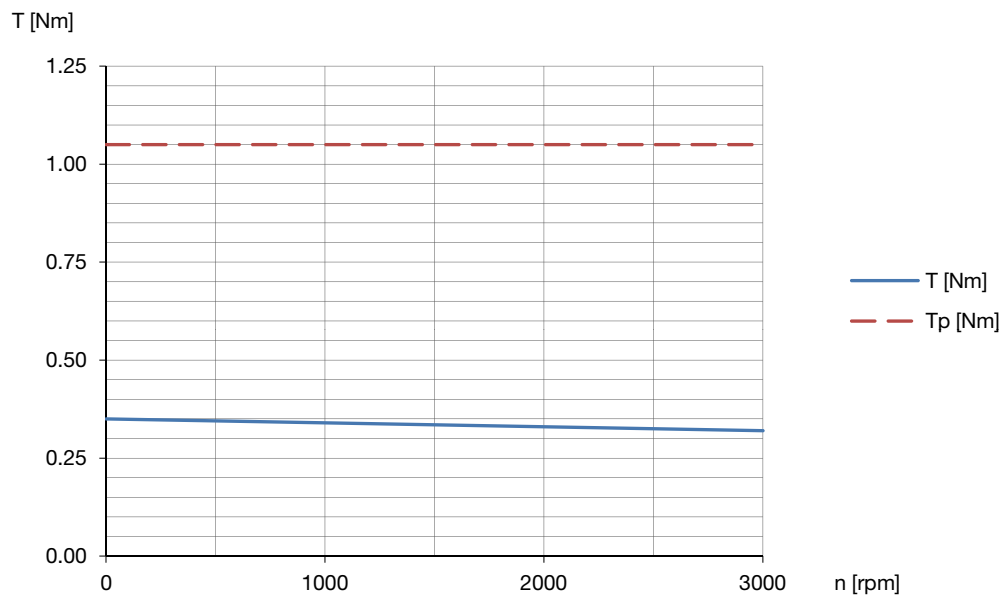
### 1.5.1 BM 45 L

Following diagram shows operating curve of servomotor, where:

- $T_{nom}$  [Nm] = continuous rated torque
- $T_p$  [Nm] = peak torque

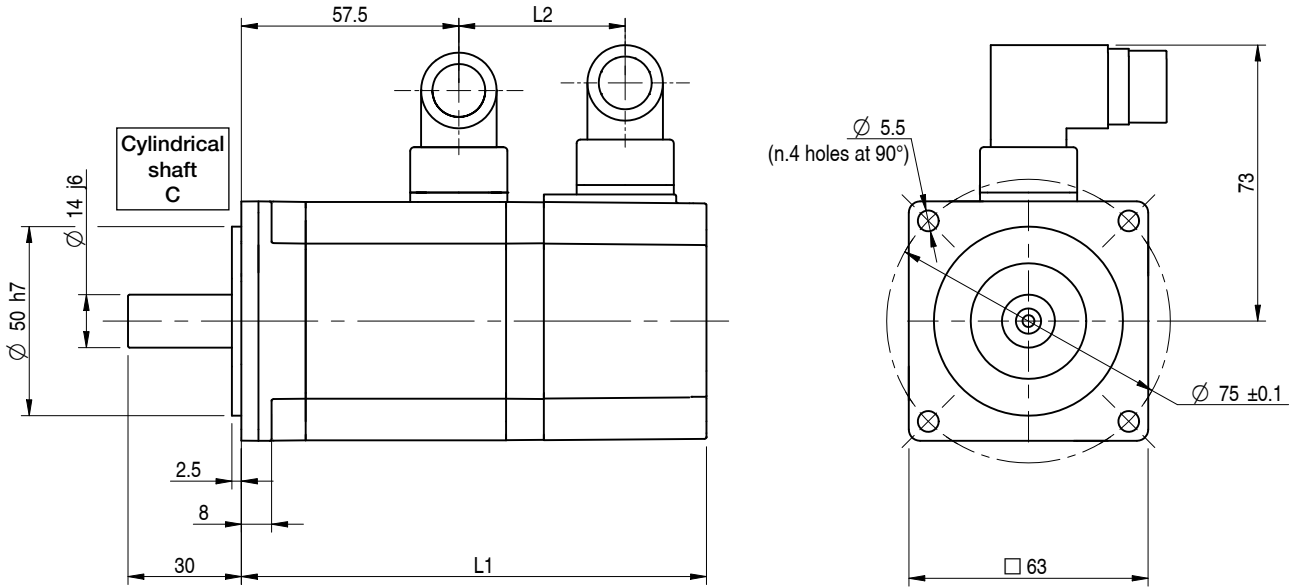
More information about the definitions above are available at Appendix A “Terms and Definitions”, page 43.

More information about the test conditions to define the operating curve of servomotor are available at Appendix B “Test conditions”, page 44.



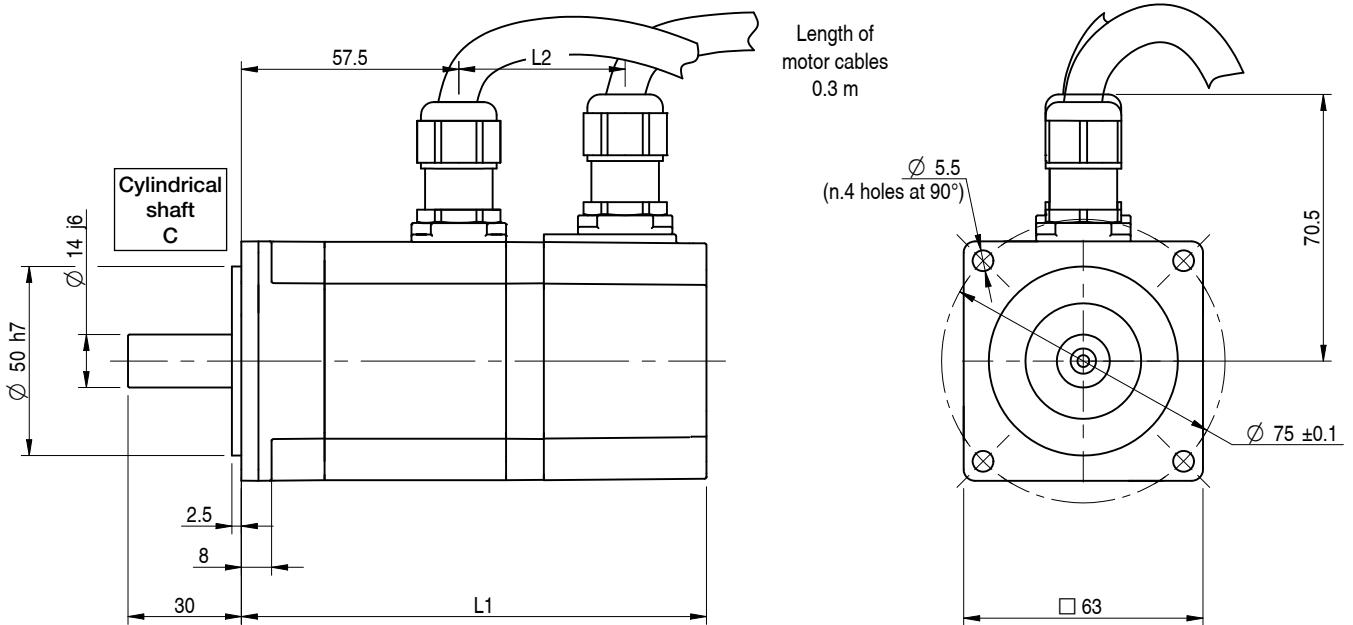
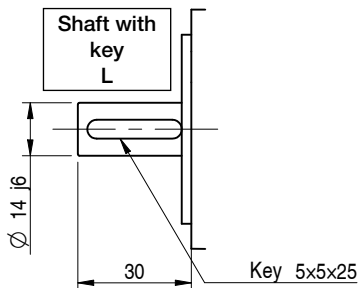
## 1.5 Dimensions and performances - SQUARE Flange Series

### 1.5.2 BM 63 S



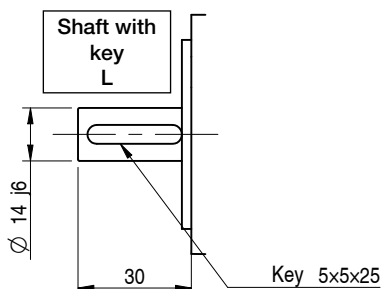
**BM 63 S CN** - Servomotor with connectors

Size	BM 63 S CN	BM 63 S B CN (with brake)
L1	123	164
L2	44	85



**BM 63 S CV** - Servomotor with cables

Size	BM 63 S CV	BM 63 S B CV (with brake)
L1	123	164
L2	44	85



## 1.5 Dimensions and performances - SQUARE Flange Series

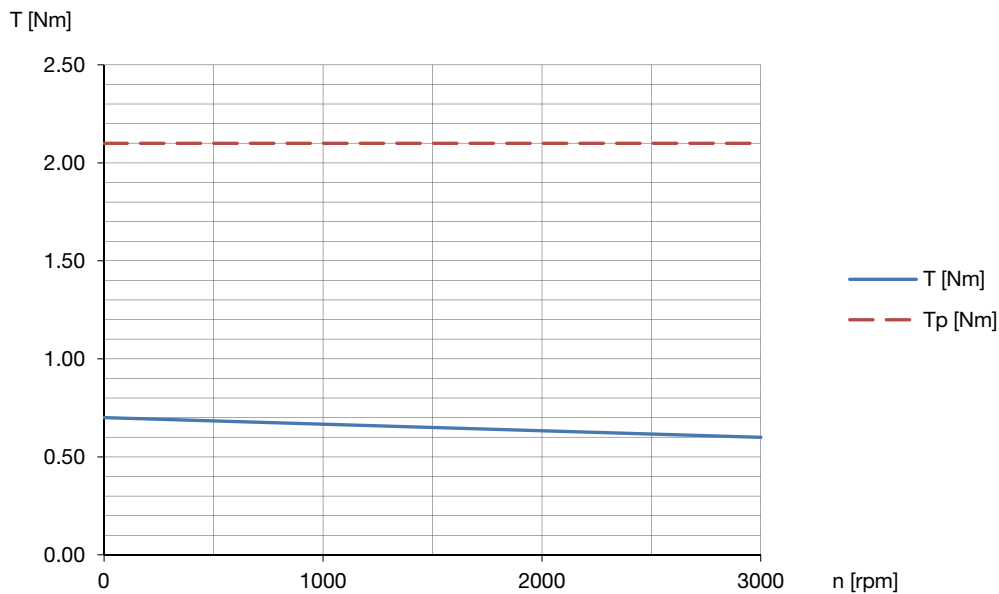
### 1.5.2 BM 63 S

Following diagram shows operating curve of servomotor, where:

- $T_{nom}$  [Nm] = continuous rated torque
- $T_p$  [Nm] = peak torque

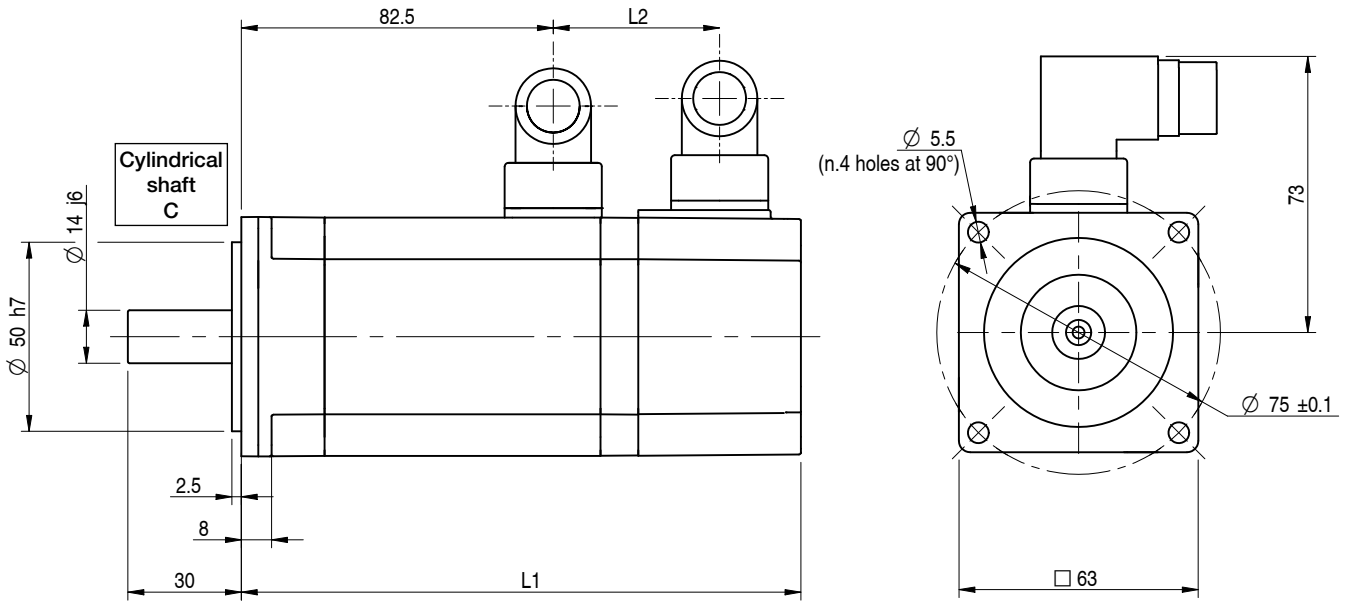
More information about the definitions above are available at Appendix A “Terms and Definitions”, page 43.

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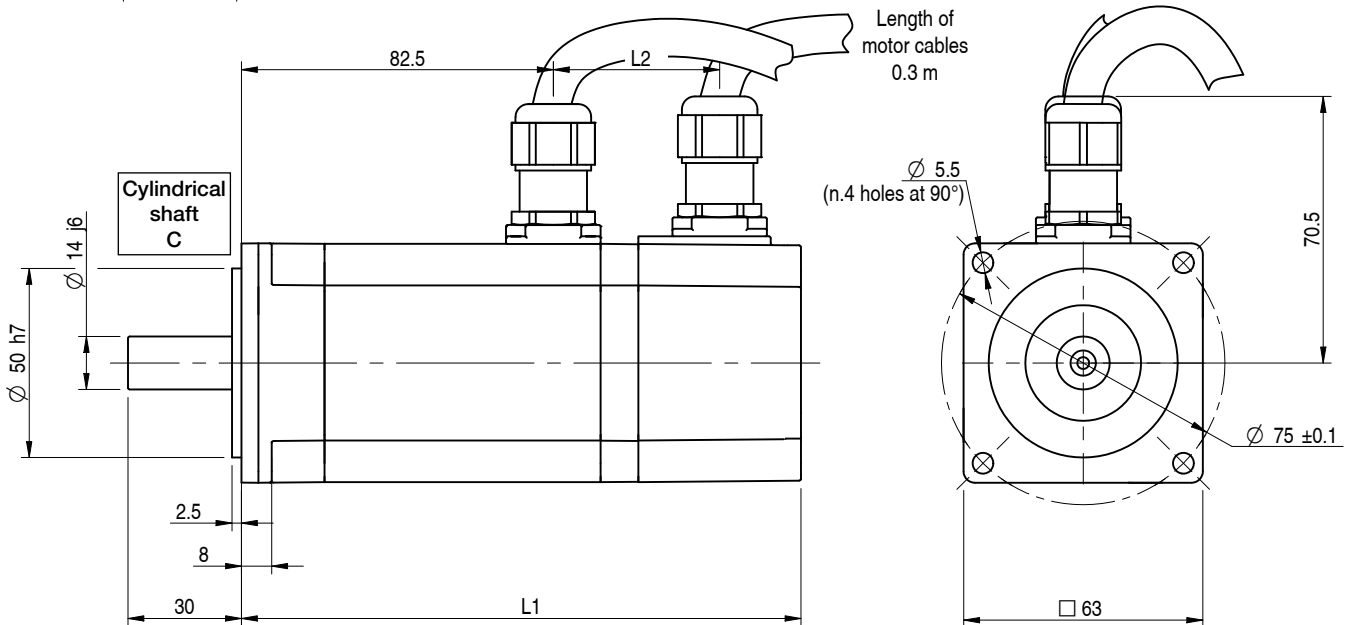
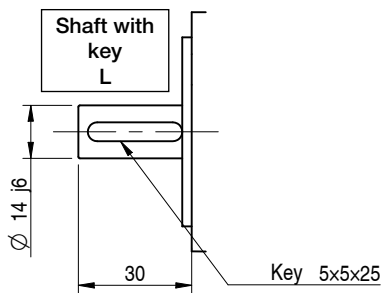
## 1.5 Dimensions and performances - SQUARE Flange Series

### 1.5.3 BM 63 L



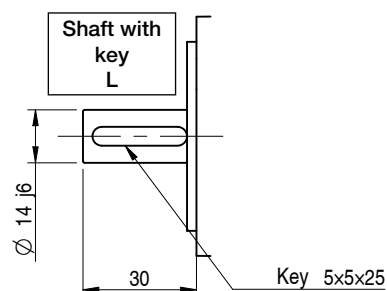
**BM 63 L CN** - Servomotor with connectors

Size	BM 63 L CN	BM 63 L B CN (with brake)
L1	148	189
L2	44	85



**BM 63 L CV** - Servomotor with cables

Size	BM 63 L CV	BM 63 L B CV (with brake)
L1	148	189
L2	44	85





## 1.5 Dimensions and performances - SQUARE Flange Series

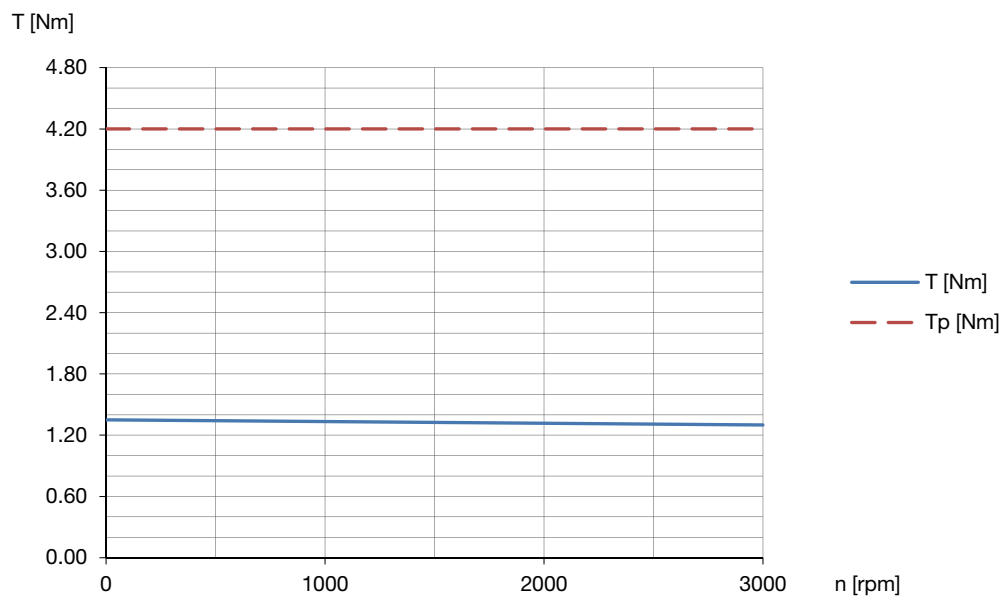
### 1.5.3 BM 63 L

Following diagram shows operating curve of servomotor, where:

- $T_{nom}$  [Nm] = continuous rated torque
- $T_p$  [Nm] = peak torque

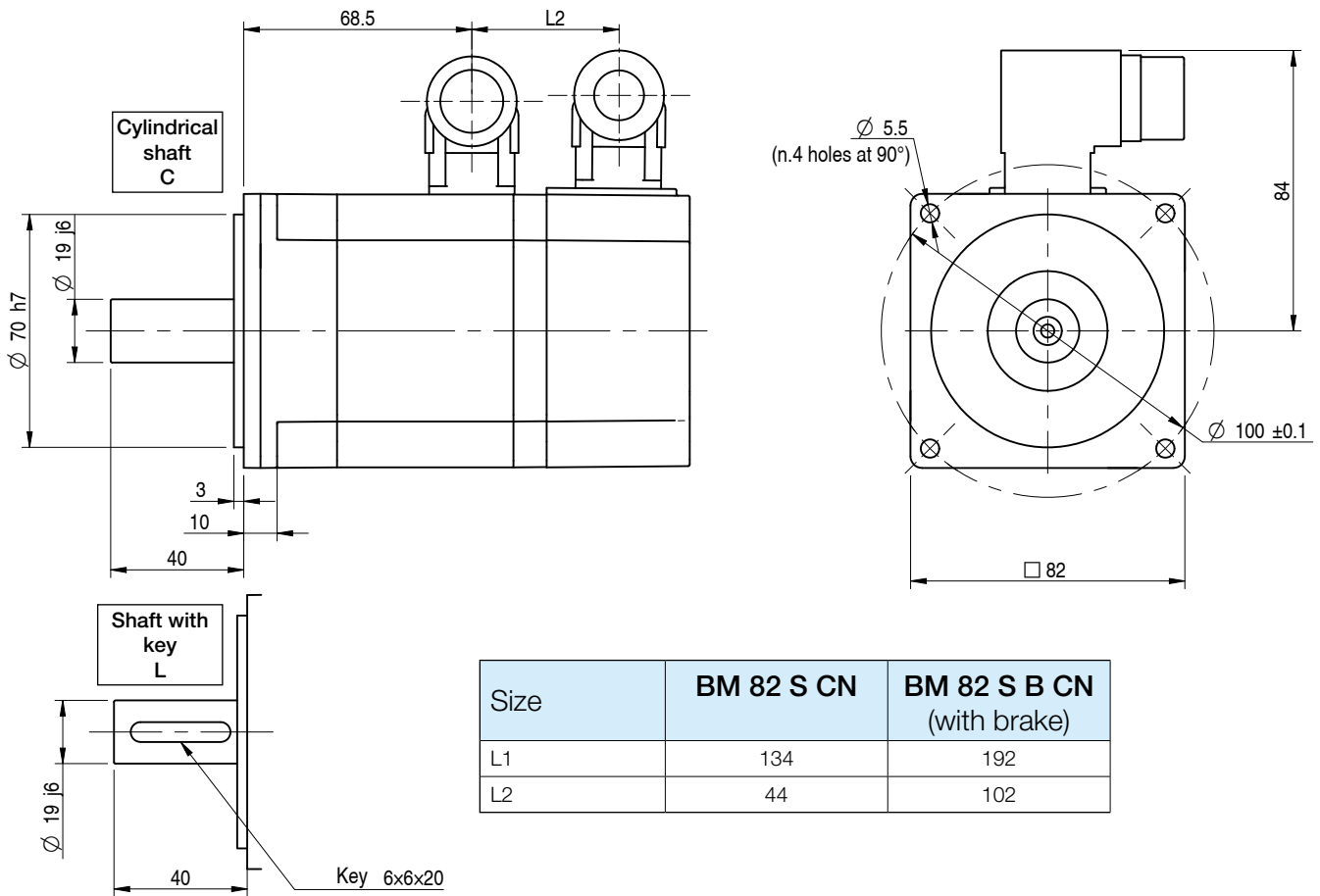
More information about the definitions above are available at Appendix A “Terms and Definitions”, page 43.

More information about the test conditions to define the operating curve of servomotor are available at Appendix B “Test conditions”, page 44.



## 1.5 Dimensions and performances - SQUARE Flange Series

### 1.5.4 BM 82 S CN - Servomotor with connectors

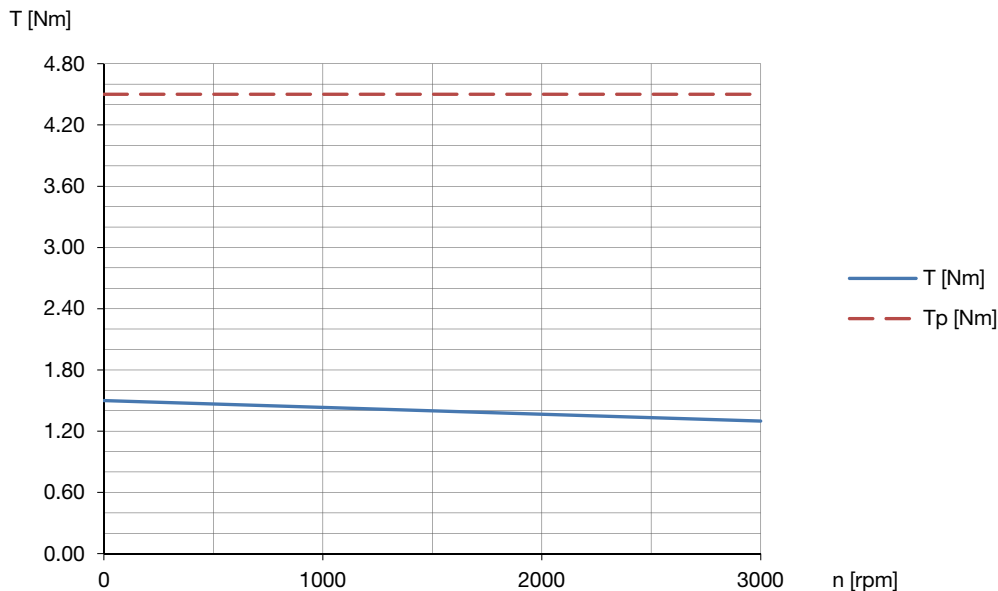


Following diagram shows operating curve of servomotor, where:

- $T_{nom}$  [Nm] = continuous rated torque
- $T_p$  [Nm] = peak torque

More information about the definitions above are available at Appendix A “Terms and Definitions”, page 43.

More information about the test conditions to define the operating curve of servomotor are available at Appendix B “Test conditions”, page 44.

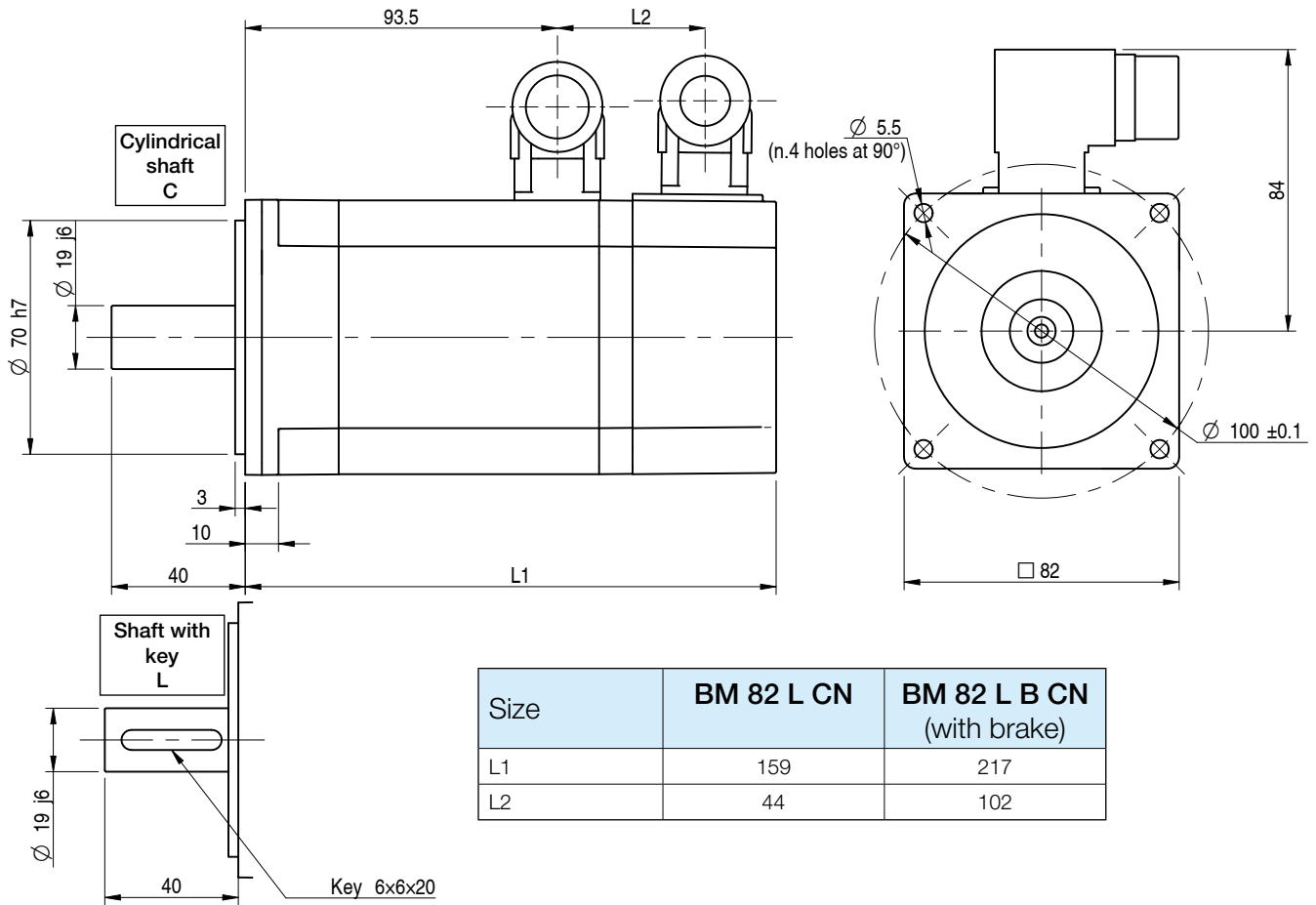


# 1. Brushless Servomotors BM Series



## 1.5 Dimensions and performances - SQUARE Flange Series

### 1.5.5 BM 82 L CN - Servomotor with connectors

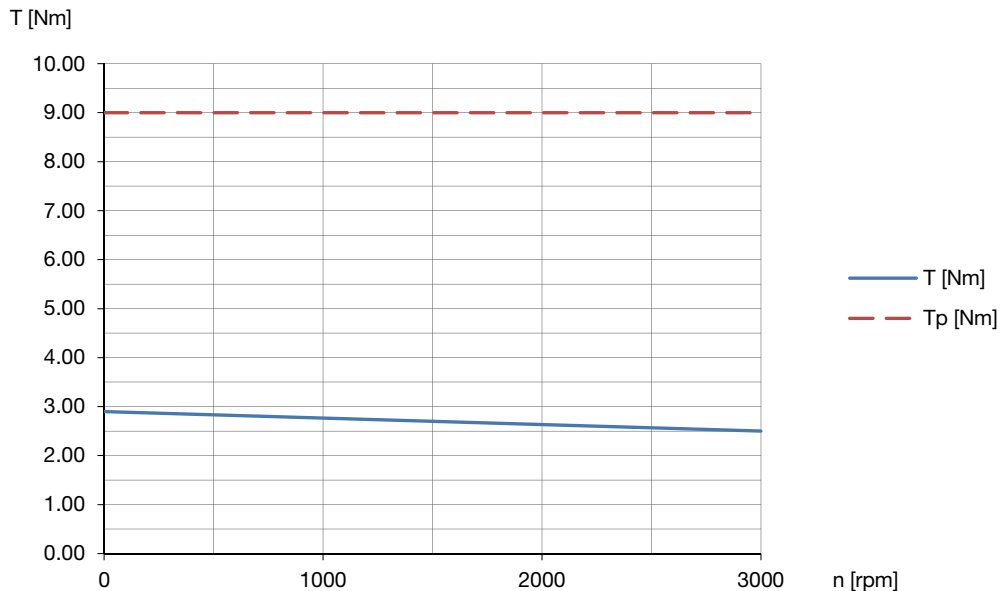


Following diagram shows operating curve of servomotor, where:

- $T_{nom}$  [Nm] = continuous rated torque
- $T_p$  [Nm] = peak torque

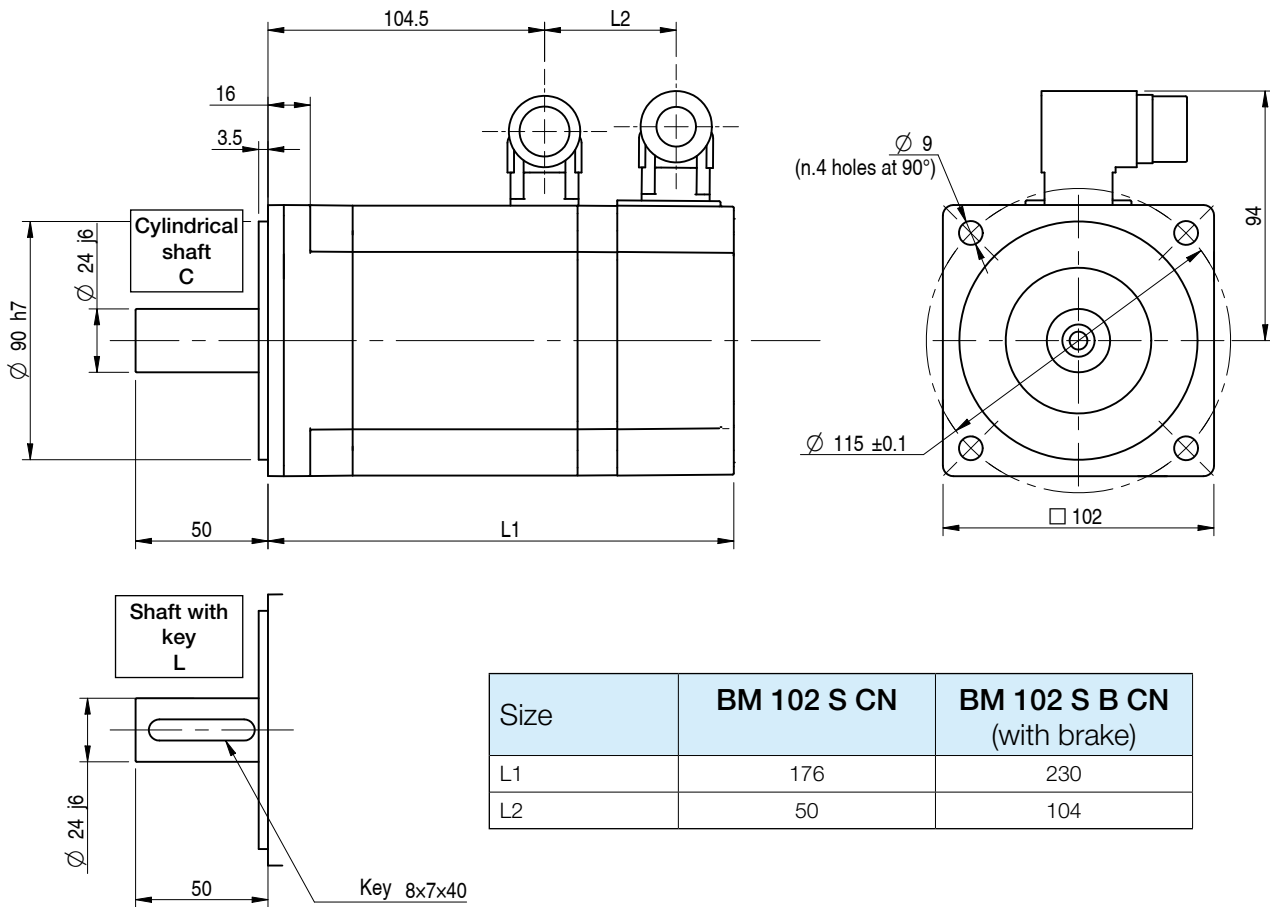
More information about the definitions above are available at Appendix A "Terms and Definitions", page 43.

More information about the test conditions to define the operating curve of servomotor are available at Appendix B "Test conditions", page 44.



## 1.5 Dimensions and performances - SQUARE Flange Series

### 1.5.6 BM 102 S CN - Servomotor with connectors

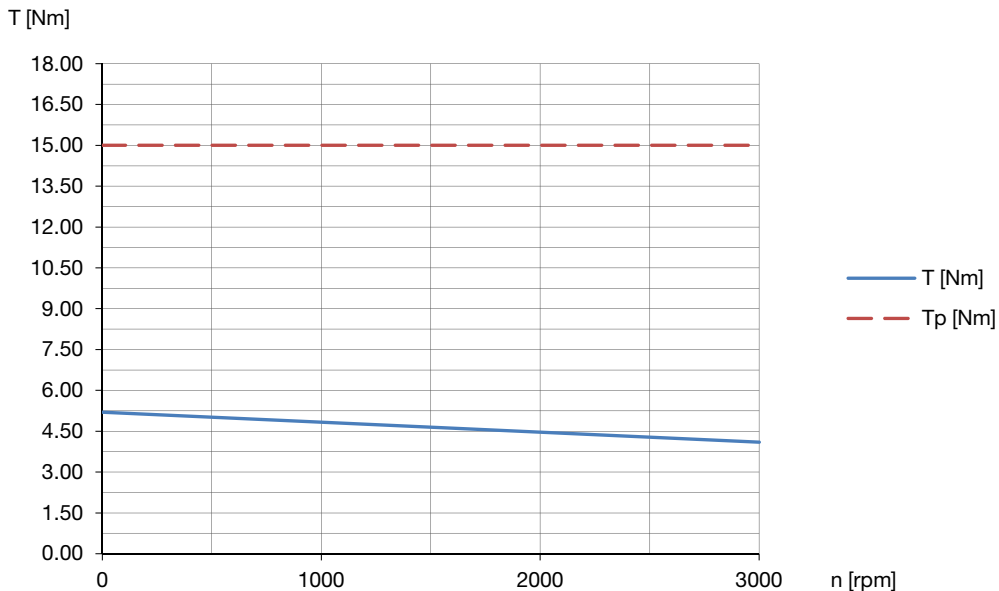


Following diagram shows operating curve of servomotor, where:

- $T_{nom}$  [Nm] = continuous rated torque
- $T_p$  [Nm] = peak torque

More information about the definitions above are available at Appendix A "Terms and Definitions", page 43.

More information about the test conditions to define the operating curve of servomotor are available at Appendix B "Test conditions", page 44.

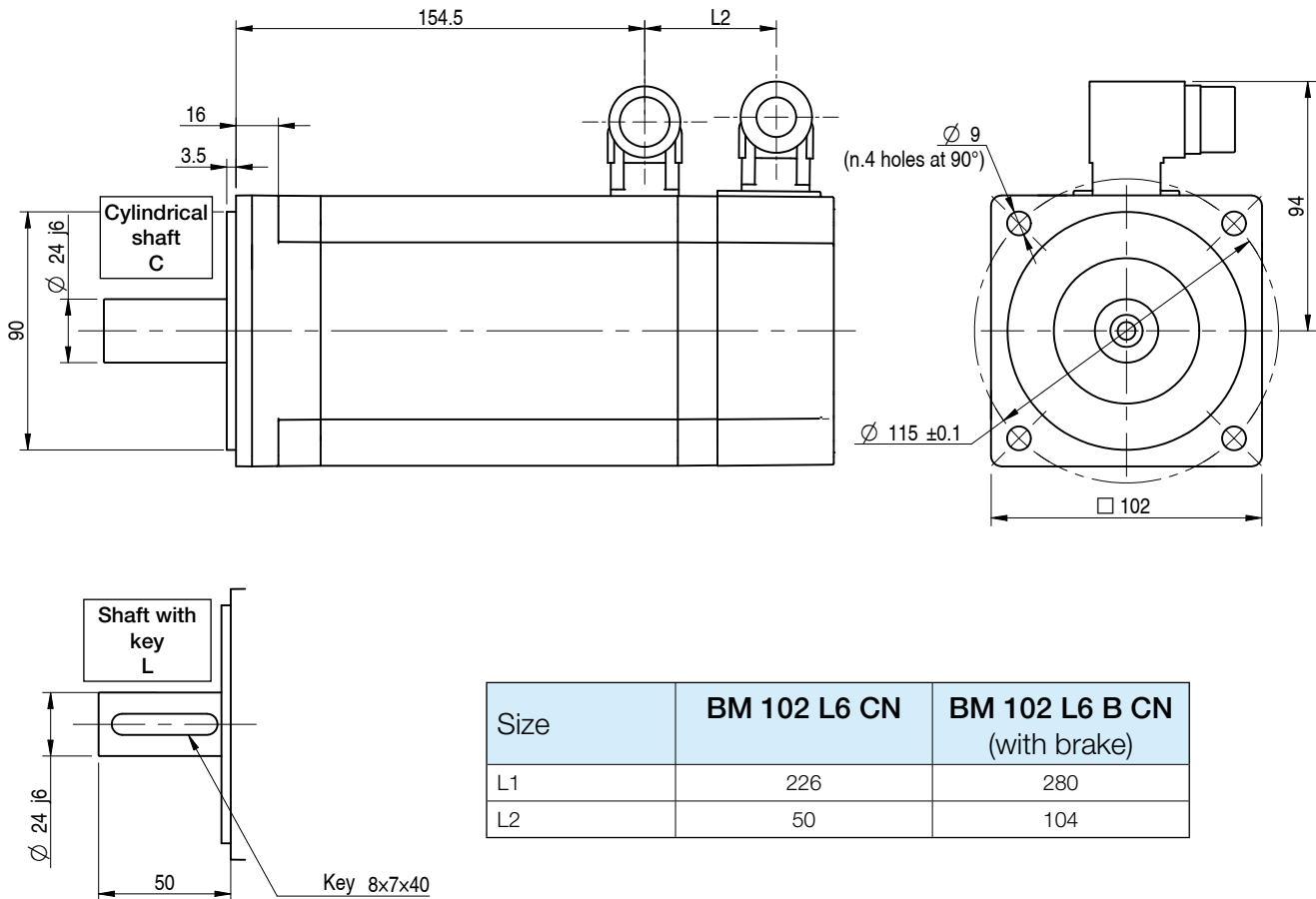


# 1. Brushless Servomotors BM Series



## 1.5 Dimensions and performances - SQUARE Flange Series

### 1.5.7 BM 102 L6 CN - Servomotor with connectors

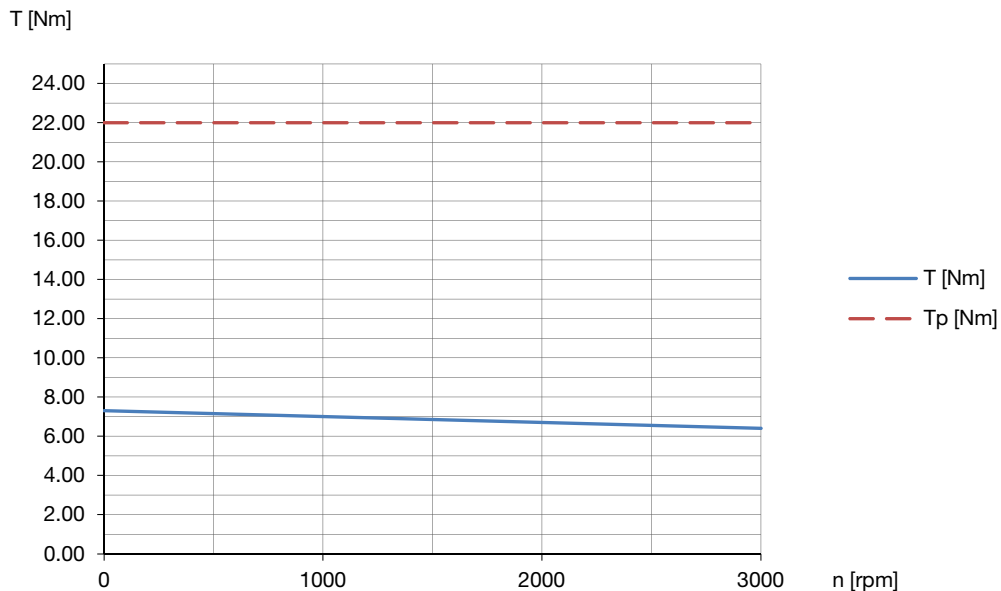


Following diagram shows operating curve of servomotor, where:

- $T_{nom}$  [Nm] = continuous rated torque
- $T_p$  [Nm] = peak torque

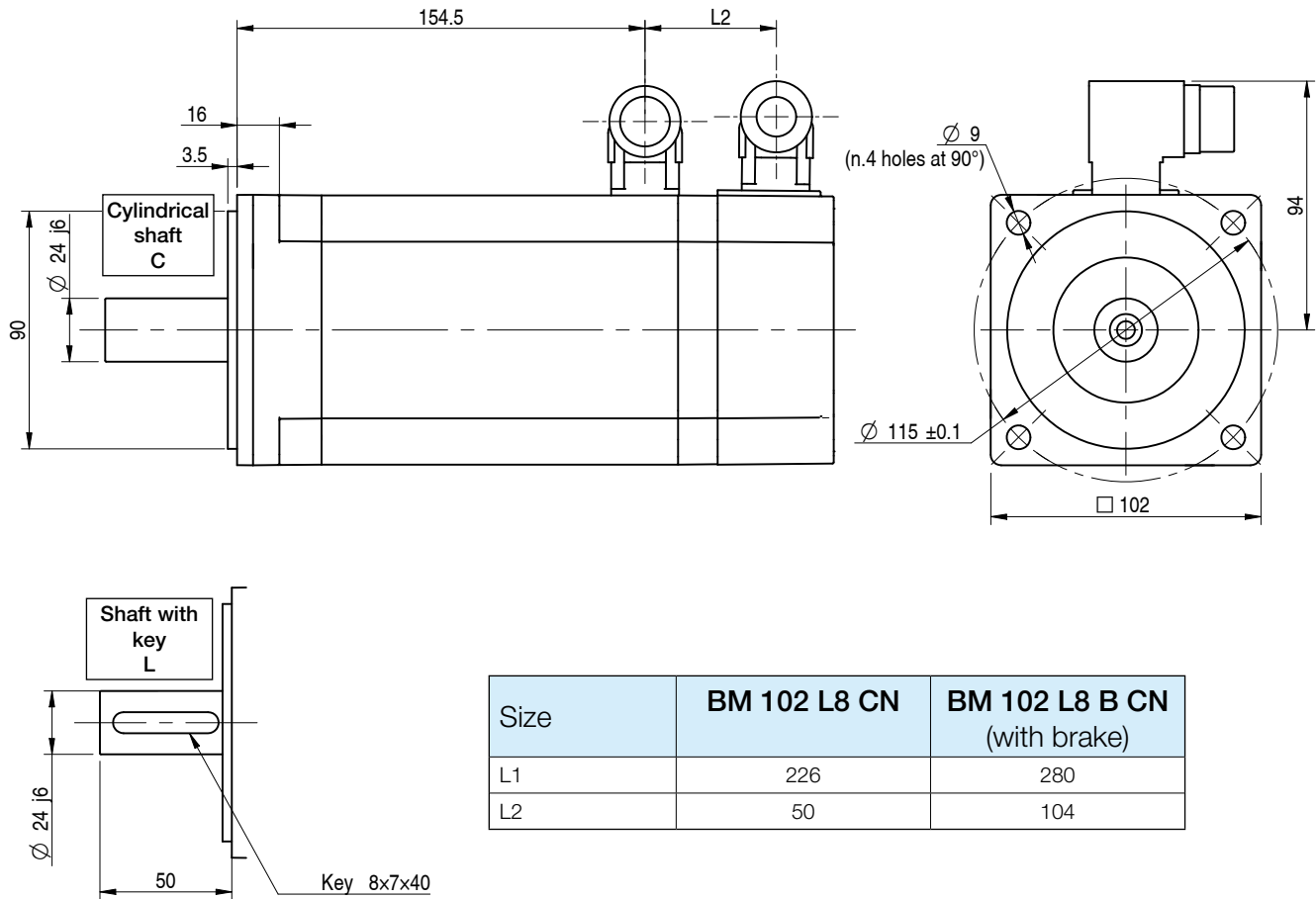
More information about the definitions above are available at Appendix A “Terms and Definitions”, page 43.

More information about the test conditions to define the operating curve of servomotor are available at Appendix B “Test conditions”, page 44.



## 1.5 Dimensions and performances - SQUARE Flange Series

### 1.5.8 BM 102 L8 CN - Servomotor with connectors

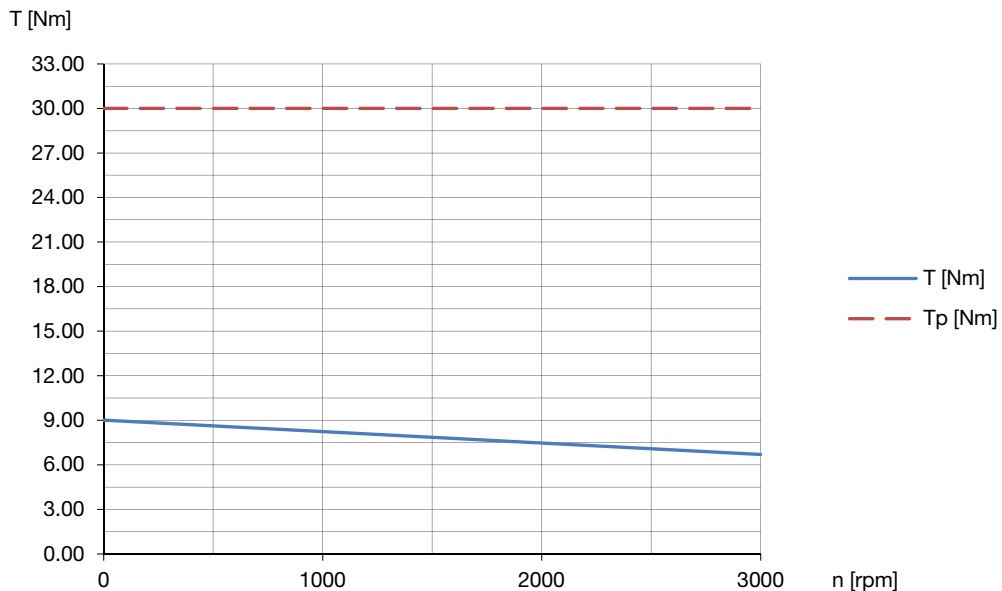


Following diagram shows operating curve of servomotor, where:

- $T_{nom}$  [Nm] = continuous rated torque
- $T_p$  [Nm] = peak torque

More information about the definitions above are available at Appendix A “Terms and Definitions”, page 43.

More information about the test conditions to define the operating curve of servomotor are available at Appendix B “Test conditions”, page 44.

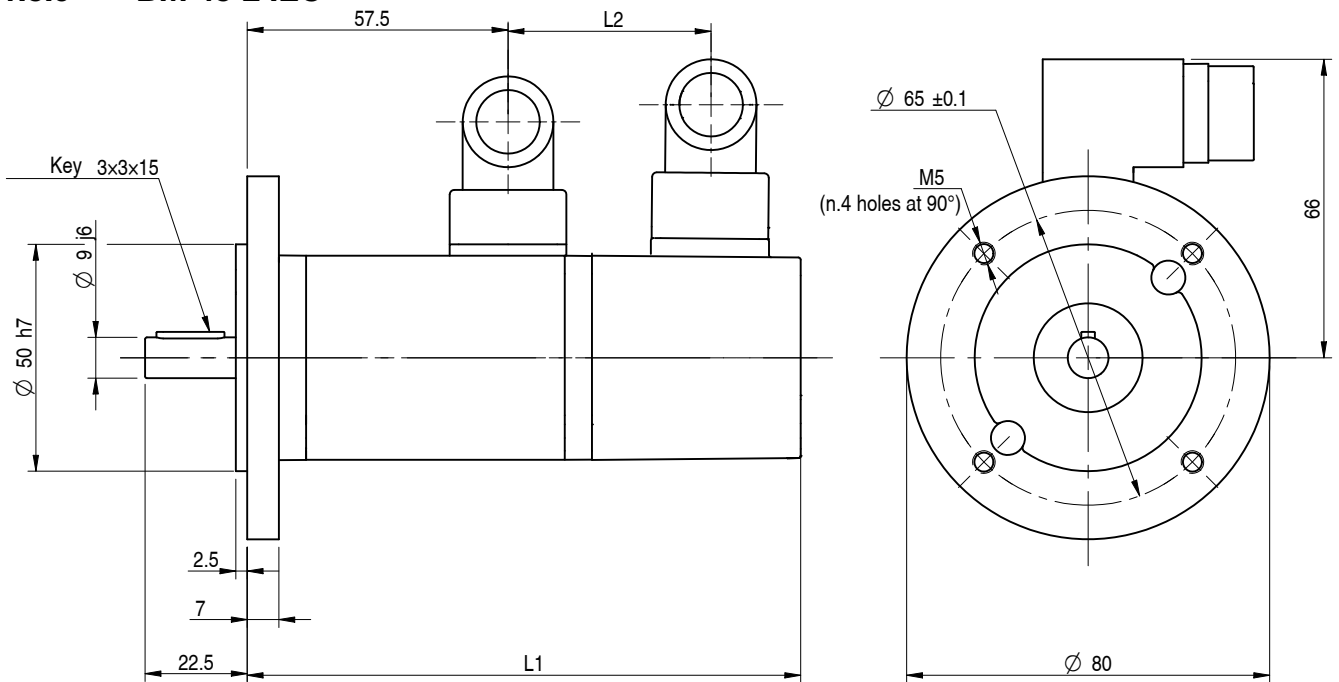


# 1. Brushless Servomotors BM Series



## 1.5 Dimensions and performances - IEC Flange Series

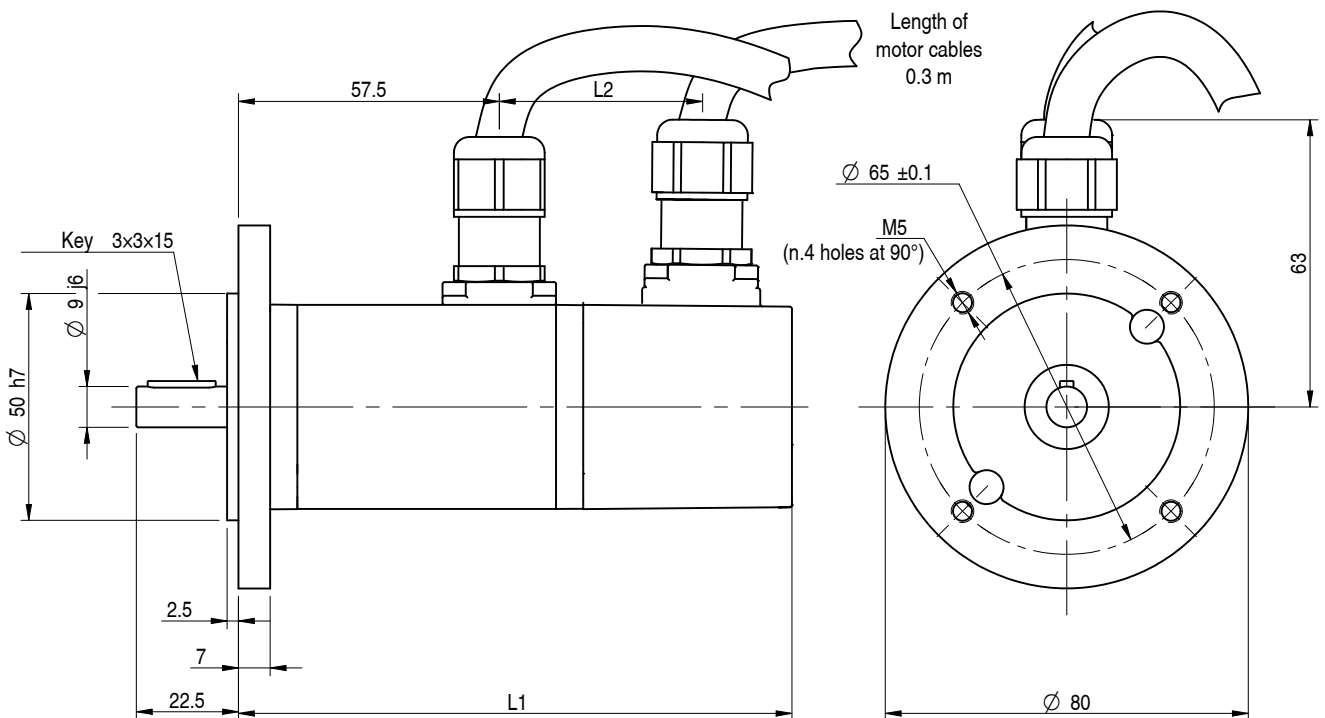
### 1.5.9 BM 45 L IEC



**BM 45 L IEC CN** - Servomotor with connectors

NOTE: operating curve of servomotor at Section 1.5.1 page 11

Size	BM 45 L IEC CN	BM 45 L IEC B CN (with brake)
L1	122	156
L2	45	78



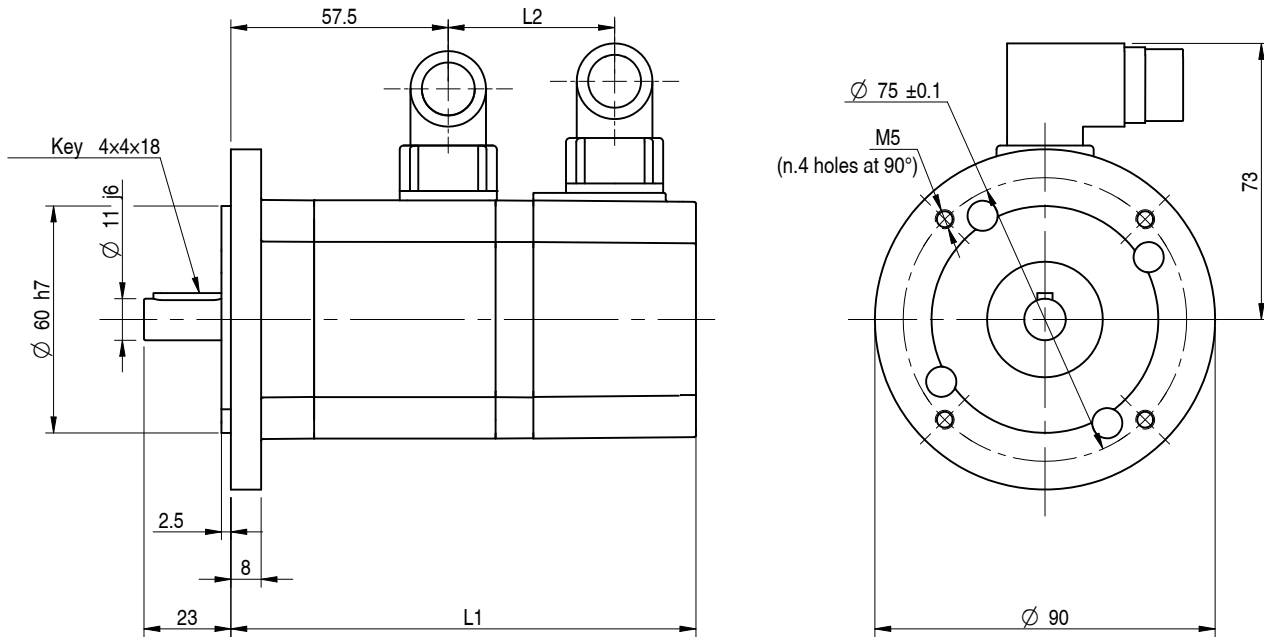
**BM 45 L IEC CV** - Servomotor with cables

NOTE: operating curve of servomotor at Section 1.5.1 page 11

Size	BM 45 L IEC CV	BM 45 L IEC B CV (with brake)
L1	122	156
L2	45	78

## 1.5 Dimensions and performances - IEC Flange Series

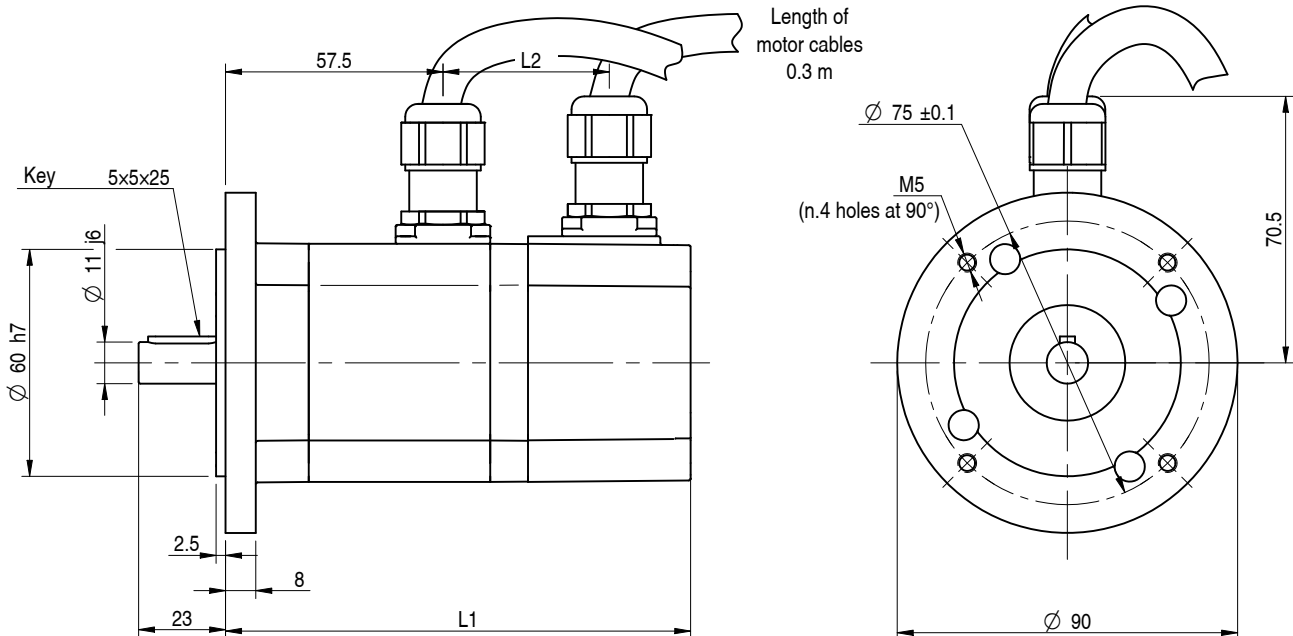
### 1.5.10 BM 63 S IEC



**BM 63 S IEC CN** - Servomotor with connectors

NOTE: operating curve of servomotor at Section 1.5.2 page 13

Size	BM 63 S IEC CN	BM 63 S IEC B CN (with brake)
L1	123	164
L2	44	85



**BM 63 S IEC CV** - Servomotor with cables

NOTE: operating curve of servomotor at Section 1.5.2 page 13

Size	BM 63 S IEC CV	BM 63 S IEC B CV (with brake)
L1	123	164
L2	44	85

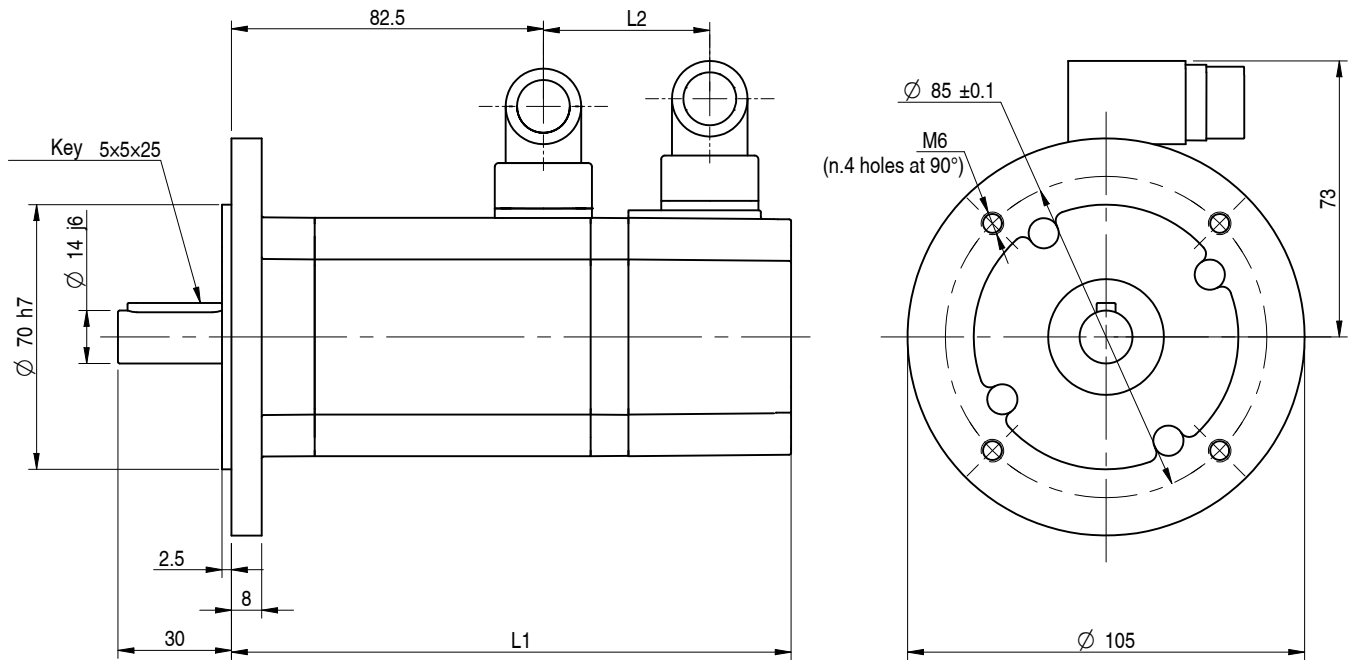


# 1. Brushless Servomotors BM Series



## 1.5 Dimensions and performances - IEC Flange Series

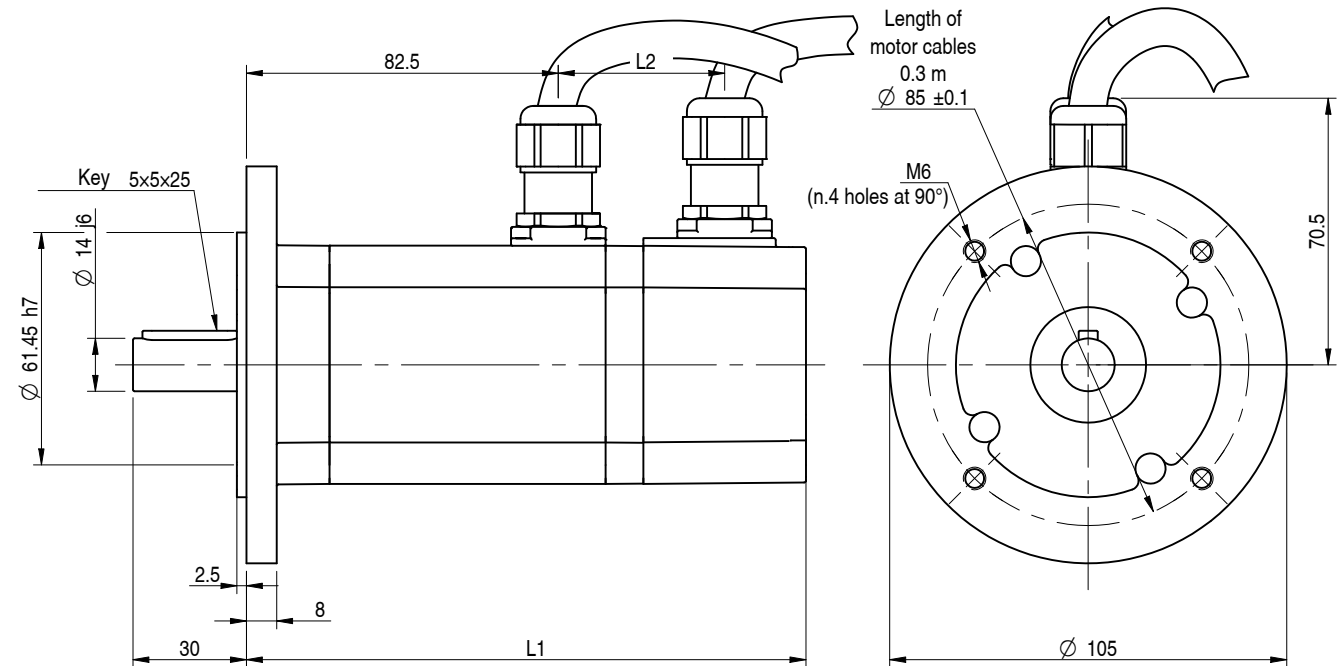
### 1.5.11 BM 63 L IEC



**BM 63 L IEC CN** - Servomotor with connectors

NOTE: operating curve of servomotor at Section 1.5.3 page 15

Size	BM 63 L IEC CN	BM 63 L IEC B CN (with brake)
L1	148	189
L2	44	85



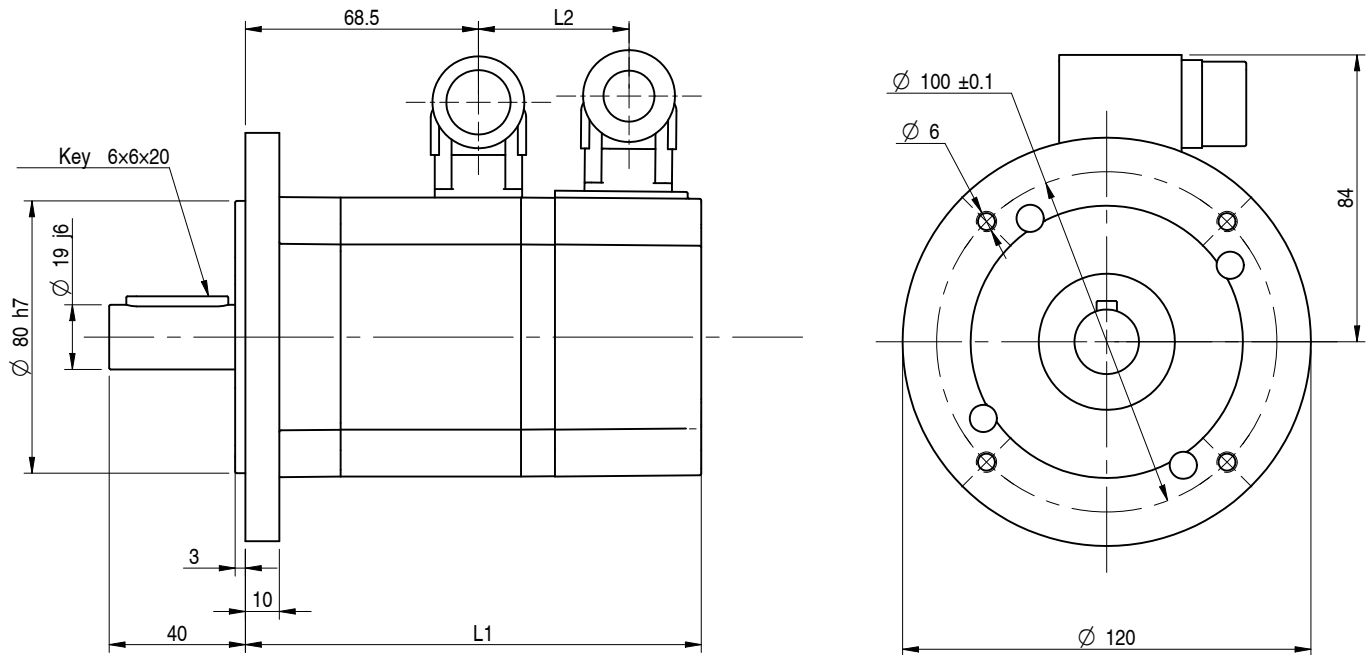
**BM 63 L IEC CV** - Servomotor with cables

NOTE: operating curve of servomotor at Section 1.5.3 page 15

Size	BM 63 L IEC CV	BM 63 L IEC B CV (with brake)
L1	148	189
L2	44	85

## 1.5 Dimensions and performances - IEC Flange Series

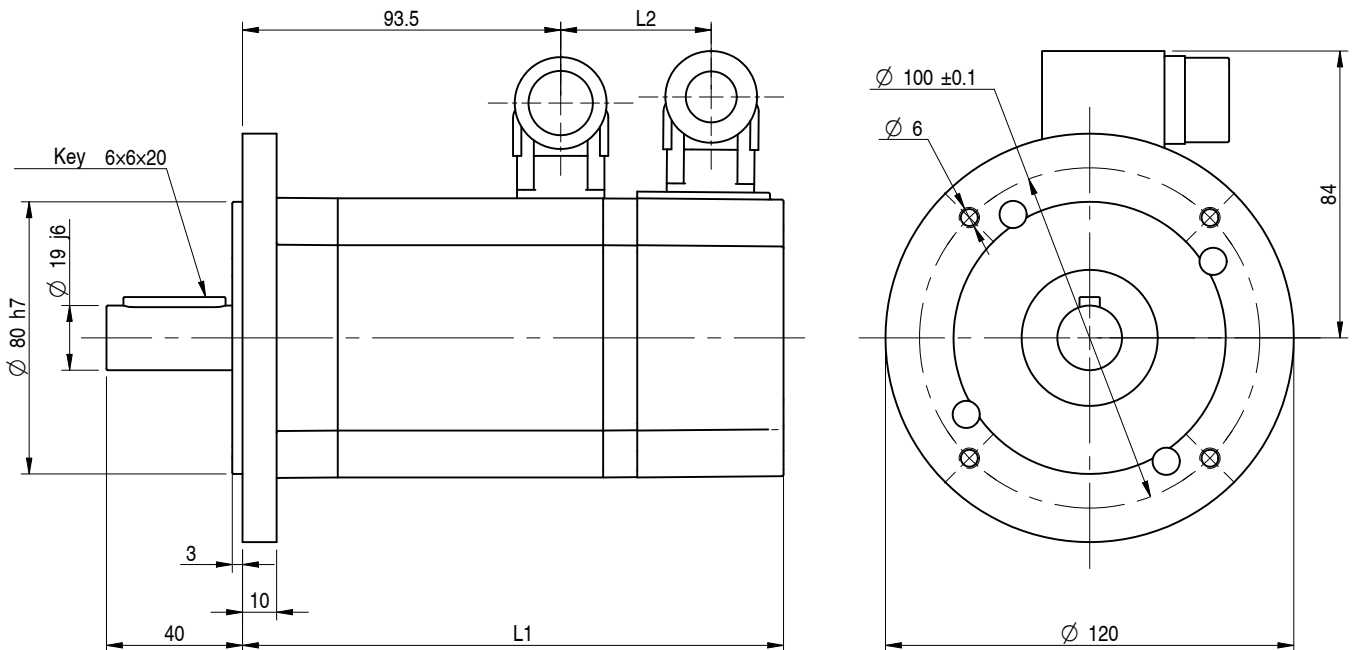
### 1.5.12 BM 82 S IEC CN



NOTE: operating curve of servomotor at Section 1.5.4 page 16

Size	BM 82 S IEC CN	BM 82 S IEC B CN (with brake)
L1	134	192
L2	44	102

### 1.5.13 BM 82 L IEC CN



NOTE: operating curve of servomotor at Section 1.5.5 page 17

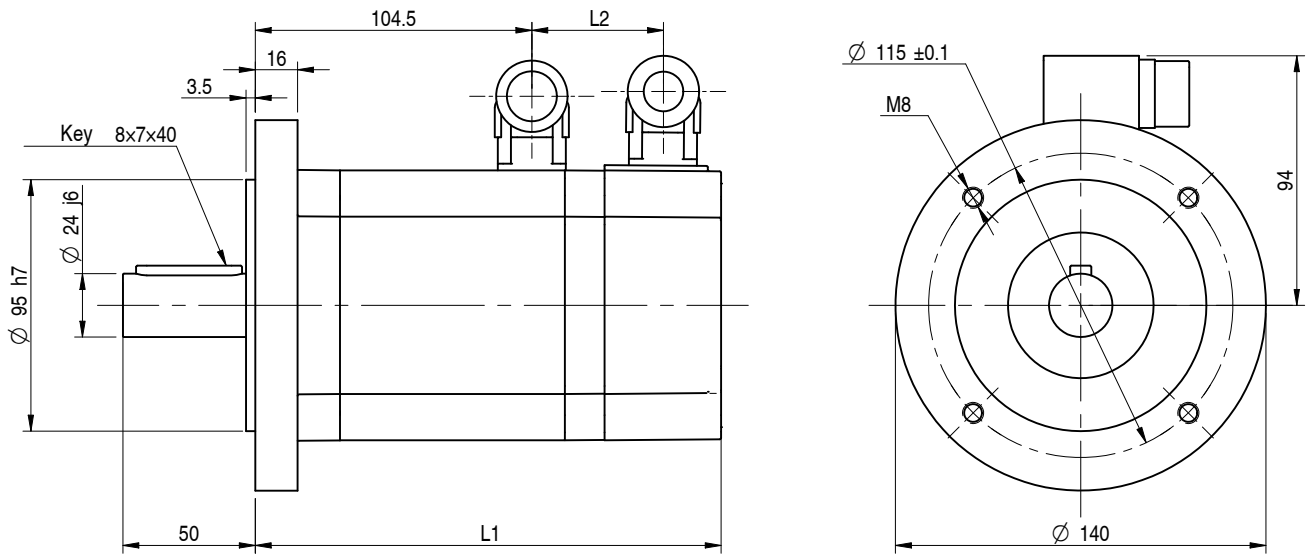
Size	BM 82 L IEC CN	BM 82 L IEC B CN (with brake)
L1	159	217
L2	44	102

# 1. Brushless Servomotors BM Series



## 1.5 Dimensions and performances - IEC Flange Series

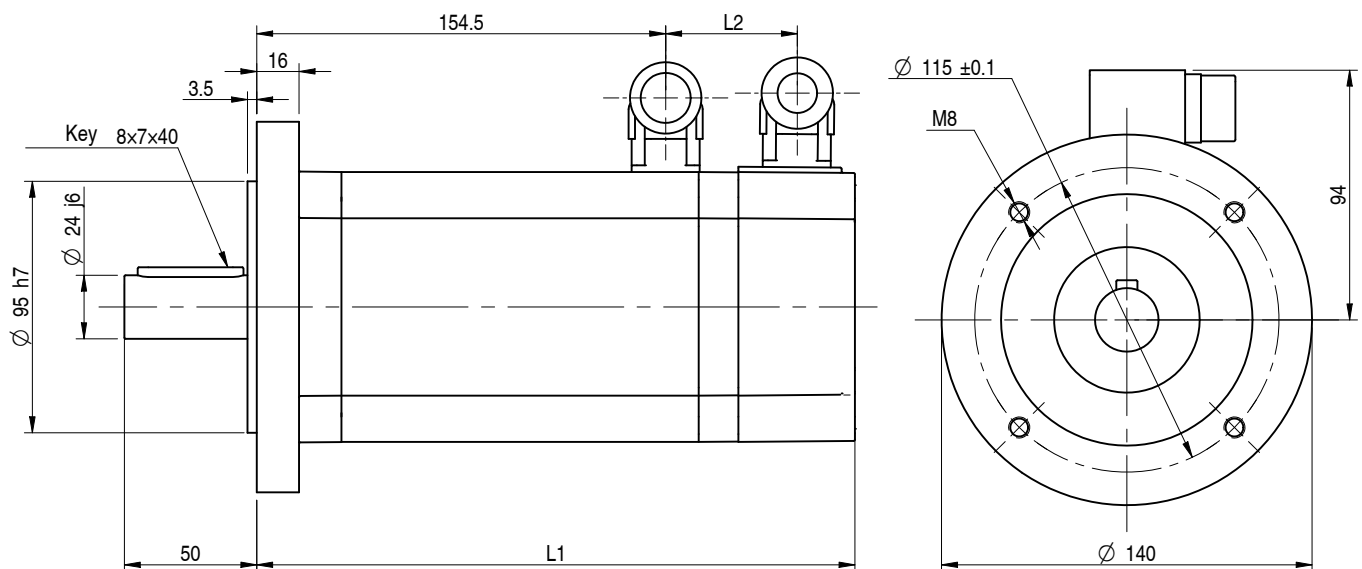
### 1.5.14 BM 102 S IEC CN



NOTE: operating curve of servomotor at Section 1.5.6 page 18

Size	BM 102 S IEC CN	BM 102 S IEC B CN (with brake)
L1	176	230
L2	50	104

### 1.5.15 BM 102 L6 IEC CN BM 102 L8 IEC CN



NOTE: operating curves of servomotors at Section 1.5.7 page 19 and 1.5.8 page 20

Size	BM 102 L6 IEC CN BM 102 L8 IEC CN	BM 102 L6 IEC B CN BM 102 L8 IEC B CN (with brake)
L1	226	280
L2	50	104

## 1.6 Motor feedback

E01: Optical incremental encoder		
Supply voltage	[V dc]	5V ± 5%
Max. supply current	[mA]	200
Standard resolution	[pulses / turn]	2000
Electronics type	[ - ]	Line Driver
Max. frequency	[kHz]	200
Incremental signals (Line Driver)	[ - ]	A,A/ - B,B/ - Z,Z/
Switching signals (Line Driver)	[ - ]	HU,HU/ - HV,HV/ - HW,HW/
Operating temperature	[°C]	-20 ... +85
Max. speed	[rpm]	6000

R01: Resolver		
Supply voltage	[V rms]	7 @ 10KHz
Transformation ratio	[ - ]	0.5 ± 5%
Number of pole-pairs	[ - ]	1
Electrical error	[ - ]	± 10' max
Operating temperature	[°C]	-55 ... +155
Max. speed	[rpm]	10000

A01: BISS absolute multiturn encoder		
Supply voltage	[V dc]	5V <sup>+ 10%</sup> <sub>- 5%</sub>
Current consumption	[mA]	150
Single turn resolution	[ - ]	12-19 bit
Multiturn resolution	[ - ]	12 bit
Serial interface	[ - ]	BISS
Connection	[ - ]	Clock and Data RS422
Incremental signals	[ - ]	Sin Cos 1Vpp
Resolution	[ pulses / turn ]	2048
Operating temperature	[°C]	-40 ... +120
Max. speed	[rpm]	10000

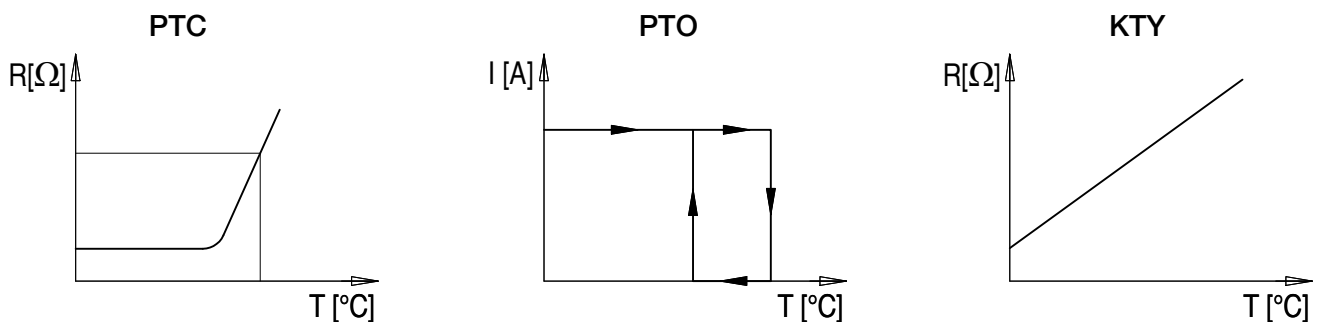
## 1.7 Thermal protectors

01: Thermistore PTC		
Suitable for fast overloads, no temperature monitoring		
Signal type	[ - ]	Non linear resistance
Rated voltage	[V dc]	7,5
Max. voltage	[V dc]	30
Insulation voltage	[kV]	2,5
Switching temperature (standard)	[°C]	140
Resistance @ 135°C	[Ω]	≤ 550
Resistance @ 145°C	[Ω]	≥ 1330
Resistance @ 155°C	[Ω]	≥ 4000

02: Bimetallic thermal protectors PTO		
Suitable for long time overloads, no temperature monitoring		
Signal type	[ - ]	NC - normally closed
Switching temperature	[°C]	140
Reactivation temperature	[°C]	110 ± 15
Supply voltage	[V]	250
Rated current	[A]	2,5
Insulation current	[kV]	2

03: KTY84-130		
Temperature monitoring		
Temperature monitoring		YES
Signal type	[ - ]	Linear resistance
Continuous current	[mA]	2
Operating temperature	[°C]	-40 ... +300
Resistance @ 100°C, 2mA	[Ω]	min 970 max 1030
Resistance rate R100°C/R25°C	[ - ]	min 0.595 max 0.611
Resistance rate R250°C/R100°C		min 2.111 max 2.221

NOTE: ECO Series drives supplied with Linearmech servomotors support 02 (PTO) protection only.

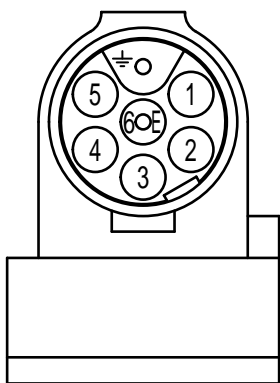


## 1.8 Motor connections

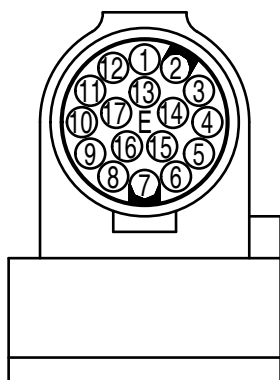
### 1.8.1 BM 45 / 63 CN - M17 Connectors

POWER M17 7-POLE	
Pin	Function
1	Phase U
2	Phase V
3	-
	PE
4	Brake +
5	Brake -
6	Phase W

SIGNAL M17 17-POLE			
Pin	E01: Incremental encoder	R01: Resolver	A01: BISS absolute encoder
1	CHB	Sin+	DATA
2	CHB/	Sin-	DATA/
3	Z	-	A+
4	HU	-	B+
5	HW	-	DC 5V
6	-	-	-
7	OV enc	R2	OV sensor
8	PT (optional)	PT (optional)	PT (optional)
9	PT (optional)	PT (optional)	PT (optional)
10	5 V enc	R1	5V sensor
11	CHA/	Cos-	CLOCK/
12	CHA	Cos+	CLOCK
13	Z/	-	A-
14	HU/	-	B-
15	HV/	-	-
16	HV	-	-
17	HW/	-	OV Un



**POWER**

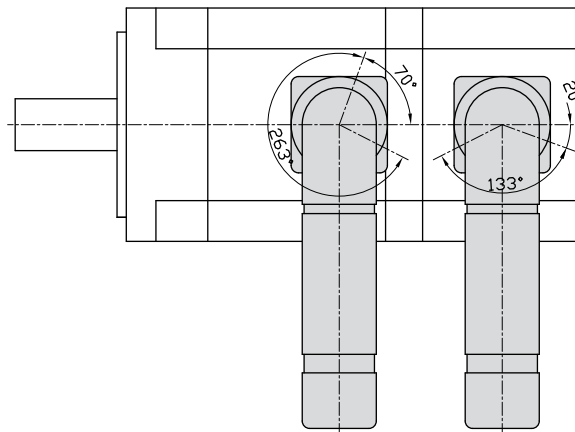


**SIGNAL**

### Connectors orientation

Connectors may rotate to be properly oriented.

The drawing shows the angular range of orientation.




# 1. Brushless Servomotors BM Series



## 1.8 Motor connections

### 1.8.2 BM 45 / 63 CV - Cables, no connectors

POWER	
Wire color	Function
White	Phase U
Black	Phase V
Yellow - Green	
Red 0,5 mm <sup>2</sup>	Brake +
Black 0,5 mm <sup>2</sup>	Brake -
Red	Phase W

SIGNAL			
E01: Incremental encoder		R01: Resolver	
Wire color	Function	Wire color	Function
Green	CHB	Yellow	Sin+
Green / Black	CHB/	Blue	Sin-
Yellow	Z	-	-
Brown	HU	-	-
White	HW	-	-
-	-	-	-
Black	0V ENC	Yellow/White or Black/White	R2
-	-	-	-
-	-	-	-
Red	+5V ENC	White/Red	R1
Blue	CHA/	Black	Cos-
Blue / Black	CHA	Red	Cos+
Yellow / Black	Z/	-	-
Brown / Black	HU/	-	-
Grey / Black	HV/	-	-
Grey	HV	-	-
White / Black	HW/	-	-

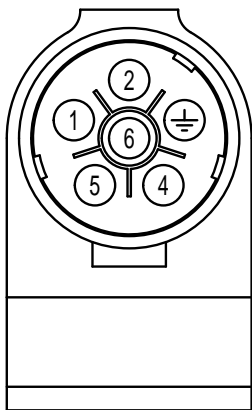
NOTE: Connections with cables (no connectors) are only available with 24/48 V dc supply.

## 1.8 Motor connections

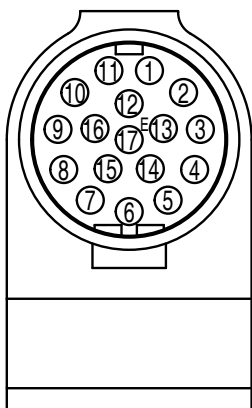
### 1.8.3 BM 82 / 102 CN - M23 Connectors

POWER M23 6-POLE	
Pin	Function
1	Phase U
2	Phase V
	PE
4	Brake +
5	Brake -
6	Phase W
6	Phase W

SIGNAL M23 17-POLE			
Pin	E01: Incremental encoder	R01: Resolver	A01: BISS absolute encoder
1	CHB	Sin+	DATA
2	CHB/	Sin-	DATA/
3	Z	-	A+
4	HU	-	B+
5	HW	-	DC5V / 7-30V
6	-	-	-
7	OV enc	R2	0V sensor
8	PT (optional)	PT (optional)	PT (optional)
9	PT (optional)	PT (optional)	PT (optional)
10	5 V enc	R1	5V sensor
11	CHA/	Cos-	CLOCK/
12	CHA	Cos+	CLOCK
13	Z/	-	A-
14	HU/	-	B-
15	HV/	-	-
16	HV	-	-
17	HW/	-	0V Un



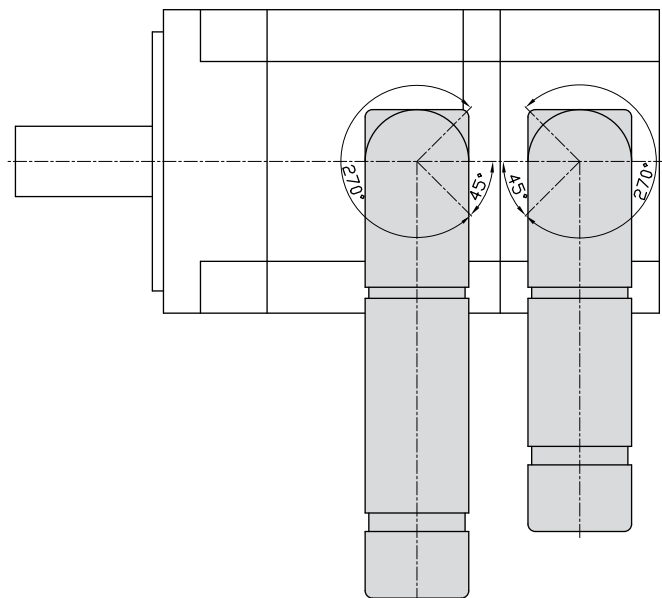
**POWER**



**SIGNAL**

### Connectors orientation

Connectors may rotate to be properly oriented. The drawing shows the angular range of orientation.





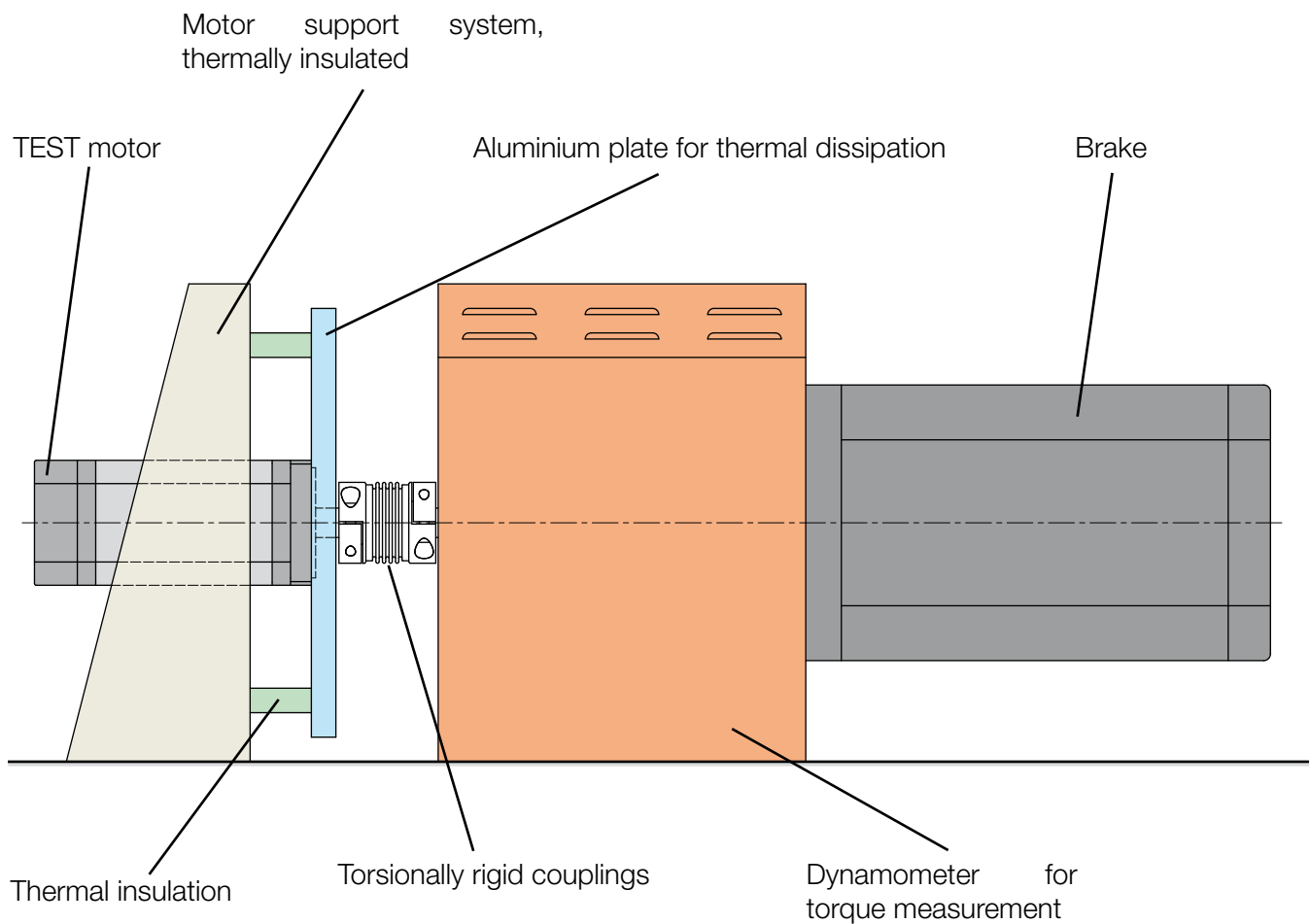
## B. Test conditions

All electrical and mechanical performances of **Linearmech BM Series servomotors** are obtained during test run, where the servomotor has been fixed horizontally, supported by an aluminium plate thermally insulated from the base of the test bench, and coupled by dynamometer to the brake.

The dimensions of aluminium plates used is related to the servomotor size:

- BM 45, BM 63, BM 82: 250×250×6 mm
- BM 102: 350×350×20 mm

During thermal test for the definition of stall torque ( $T_{0, 100K}$ ) and continuous rated torque ( $T_{nom, 100K}$ ) the motor, in thermal balance conditions, run to a windings temperature increment of 100 K, without exceeding temperature limits related to the F insulation class.









# Servomech and Linearmech products

with Linearmech Brushless Servomotors BM Series

## Linear Servoactuators

Ball screw linear drive

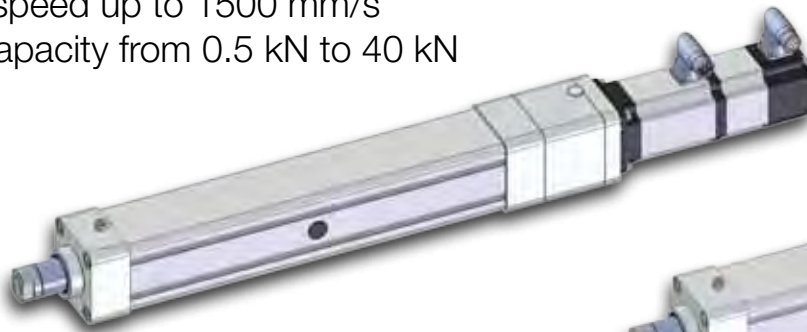
7 sizes available

Attachments according to ISO 15552

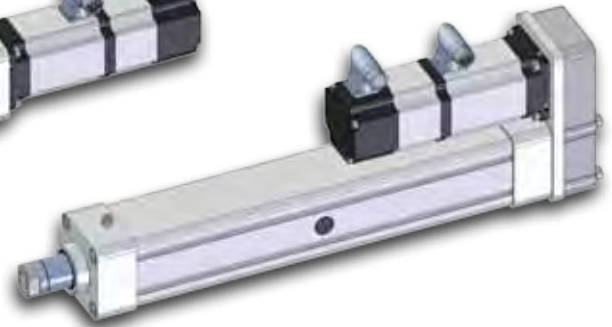
Linear speed up to 1500 mm/s

Load capacity from 0.5 kN to 40 kN

**SA IL Series**  
In Line Design



**SA PD Series**  
Parallel Design



## Ball screw jacks

### MA BS Series

Worm gearbox

Load capacity from 5 kN to 350 kN

8 sizes available

Ball screw diameter from 16 mm to 100 mm

Linear speed up to 285 mm/s

**Travelling nut**



**Travelling screw**



## Ball screw jacks

### HS Series

Gleason bevel gear

Load capacity from 10 kN to 200 kN

6 sizes available

Bull screw diameter from 25 mm to 80 mm

Linear speed up to 2000 mm/s

# Servomech and Linearmech products

with Linearmech Brushless Servomotors BM Series

## Linear Actuators



### ATL Series

Acme screw linear drive

7 sizes available

Load capacity from 4 kN to 80 kN

Linear speed up to 150 mm/s

### BSA Series

Ball screw linear drive

7 sizes available

Load capacity from 4 kN to 60 kN

Linear speed up to 120 mm/s

### Serie UAL

Acme screw linear drive

5 sizes available

Load capacity from 2 kN to 15 kN

Linear speed up to 500 mm/s

### UBA Series

Ball screw linear drive

5 sizes available

Load capacity from 2 kN to 15 kN

Linear speed up to 500 mm/s



For further information check out our catalogues:



## In this catalogue:

### Brushless Servomotors BM Series

High efficiency and performances

Segmented lamination stator technology

7 sizes available

Nominal torque up to 10 Nm

Available with brake

Standard optical encoder, optional resolver or multi-turn absolute encoder

### Drives Eco Series

Engineered focusing on linear performances for Automation Industry and Linear Motion Positioning Control

(SAP - Stand Alone Positioning, MSQ - Motion Sequencing, Electrical axis),

Torque control, Speed control

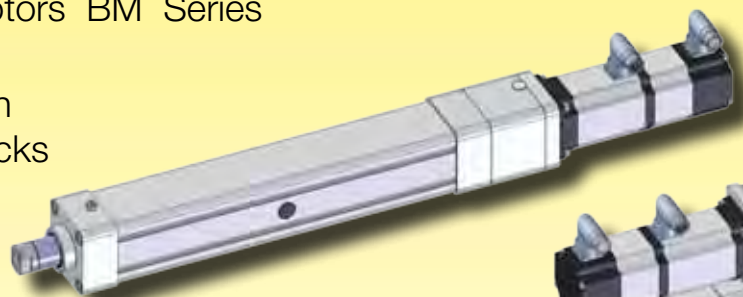
Ethercat, CANopen, RS422/485, MODBUS RTU

### Servomech and Linearmech products

with Linearmech Brushless Servomotors BM Series



Servomech  
Ball screw jacks



Linearmech  
Linear Servoactuators



Servomech  
Linear Actuators



**Linearmech S.r.l.**

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