

# PositionServo Compact and Powerful Servo Controllers



Flexible, simple, economical



**Lenze**  
AC Tech

## Commitment to Price Leadership

Price leadership is serious business. It takes continuous life cycle management to make price leadership a sustainable strategy. We are always investigating techniques to improve efficiency and take advantage of the latest microprocessor and power module technology. When we achieve efficiency gains or material cost reductions, we pass those savings on to our customers. This simple philosophy has permitted us to build and maintain a very loyal customer base.

## Commitment to Quality

Design quality is meticulously managed throughout our product's life cycle. Our design engineers are continuously monitoring new technology trends that increase product performance and component reliability. We never stop thinking about process improvements through automation. In fact, we have invested millions in automating our new state-of-the-art manufacturing facility. When you open any product box you will immediately see and feel the attention to detail that goes into it.

## Commitment to Innovation

We pride ourselves on delivering products to the market that are designed to meet specific customer needs. Our broad portfolio of innovative products covers very simple variable speed applications through complex motion control. Each product is positioned so that our customers pay only for the level of technology necessary for their particular application.

## Commitment to Simplicity

One of the cornerstones of our design philosophy is to make our products simple to use. Technology only benefits the user if it can be easily understood and applied. Each product is designed to dramatically simplify installation, commissioning and operation for our customers.

## Commitment to Performance

Each Lenze/AC Tech product is in a class by itself when it comes to performance. We are not satisfied with average performance. Our products do not reach the marketplace unless they outperform our competitors and exceed our strict performance requirements. By using the most innovative components, we are able to provide that performance for a great value.

## Our Promise

At AC Tech it is not good enough to deliver part of a promise. Our products deliver the entire package: Price Leadership, Quality, Innovation, Simplicity and Performance.

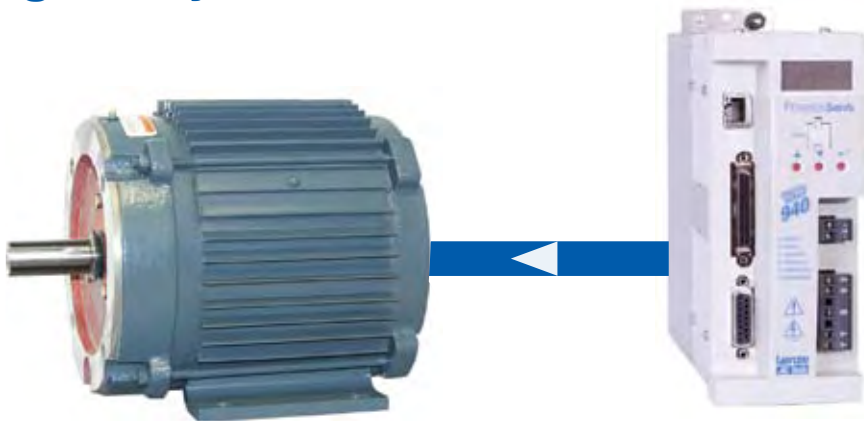


## Digital Synchronous (Brushless) Servo Motor Control




Looking to bridge that gap between sophisticated control and ease-of-use? Now you can get all of the high-end servo performance in a simple-to-use package. For centralized or decentralized servo control, look no further than the PositionServo.

## Digital Asynchronous Motor Control



Looking for more performance from your AC inverter application? Now you can have servo control for an inverter price. Pair up the PositionServo with your asynchronous motor and take advantage of the low price system, ease-of-use configuration, and high performance you get from a digital servo drive

	Power	Control	I/O	Feedback	Communications	Software
	0.4 - 3.6 kW @240VAC 0.8 - 3.6 kW @480VAC	Velocity Torque Position	12 digital inputs 5 digital outputs 2 analog inputs 1 analog output	Encoder Resolver	Ethernet TCP/IP Modbus TCP/IP Ethernet IP RS-485 MODBUS CANopen	MotionView

# PositionServo Contents

<b>Table of Contents</b>	<b>4</b>
<b>PositionServo</b>	<b>5</b>
Introduction	6
Specifications	7
MotionView Software	8
Command Sets	9
Dimensions	10
Pin Assignments	11
<b>Motors</b>	<b>12</b>
MAS Series	13
MAS Specifications	14
MAS Speed Torque Curves	15
MAS Dimensions	17
MUS Series	19
MUS Specifications	20
MUS Speed Torque Curves	25
MUS Dimensions	37
MCS Series	39
MCS Specifications	40
MCS Speed Torque Curves	41
MCS Dimensions	56
<b>Options</b>	<b>58</b>
<b>Cables</b>	<b>65</b>
<b>EMC Emissions Standards</b>	<b>77</b>



***PositionServo with  
programming capability,  
& even more features***

## PositionServo Servo drive/controller

The PositionServo is the one drive that has it all. From basic torque control to full programmability, you choose your level of control.

As a distributed drive/controller solution, avoid all of the costly cables and connections and put the power of the motion controller in the same package as the drive.

The PositionServo can perform along with the most high-level motion controllers, but with a simple-to-use interface and clean Ethernet connection.

If a centralized control scheme is preferred; the PositionServo will outperform any torque or velocity amplifier. It is also packed with more features; all this for a better price!



Model 940: Encoder-based PositionServo (E94P)  
Model 941: Resolver-based PositionServo (E94R)

## Powerful Innovation

### When do I use the PositionServo?

- For torque, velocity and step & direction control.
  - When you are sending your drive a +/- 10V or Step & Direction signal.
- If you have a ratio following application.
  - When your axis is following an encoder signal.
- For high performing distributed control.
  - When you want a motion controller and drive in one compact package.
- If you want ONE product that can do it all!
  - The PositionServo can operate as a basic drive or a stand-alone fully programmable drive/controller.



## PositionServo Features

### Motion Control Features

- 64-bit indexing (incremental, absolute, registered, or segmented)
- Linear or S-Curve accel and decel
- "Real-time" Oscilloscope
- Free DLL library and program examples

### Drive Features

- Torque, velocity and position control
- Electronic gearing
- UL, cUL, CE(LVD & EMC)
- EN954-1 safety standard (optional)
- Two-year warranty

### Inputs/Outputs

- 12 Programmable digital inputs
- 5 Programmable digital outputs
- 2 Programmable analog inputs
- 1 Programmable analog output

### Communication Features

- Free MotionView software for configuration & programming
- TCP/IP Ethernet with RJ-45 connector
- Modbus TCP/IP, Ethernet IP, CANopen and RS-485 Modbus RTU (optional)

### Power Features

#### Standard Drives

- 80 – 528 VAC input
- 2 – 18 Amps continuous rms current
- 300% peak current

#### Doubler Drives

- When operating at 120VAC, Doubler Drives can run 240VAC motors at full speed.

### Feedback Options

- Integrated Encoder
- Integrated Resolver
- Optional Second Encoder Module

### Compatible Motors

- MAS, MUS, MCS and MCA Series
- Third party AC permanent magnet synchronous (brushless) and asynchronous induction motors
- Encoder or resolver feedback



## EPM • Electronic Programming Module - Removable Memory

The EPM stores the drive's memory (programs and parameters).

The EPM saves time and money. It's as easy as 1, 2, 3...

1. Create your program and parameters in your first drive.
2. Use the EPM Programmer to make multiple copies of the EPM.
3. Insert the copied EPMs into your non-programmed drives, and they are instantly programmed.

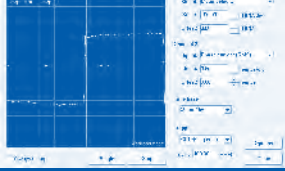
Imagine programming  
20 drives  
in less than one minute.





## Specifications

Continuous Current (rms)	2A	4A	6A	8A	9A	10A	12A	18A
<b>Drive Input Voltage</b> 80-264 VAC, 1Ø or 3Ø w/out EMC Filter*	✓	✓		✓			✓	✓
80-264 VAC, 1Ø w/integrated EMC Filter	✓	✓		✓		✓		
320-528 VAC, 3Ø w/out EMC Filter*	✓	✓	✓		✓			
45-264 VAC Input, 1Ø 240 VAC Output w/out EMC Filter*	✓	✓						
Input Frequency	48 - 62 Hz							
24V Keep Alive	24VDC +/-20%							
<b>*External Filter Options</b>	Footprint E94ZF04T4A1	Footprint E94ZF07T4A1	Sidemount E94ZF12T4A1	Footprint E94ZF15T4A1	Sidemount E94ZF12T4A		Sidemount (1Ø) E94ZF24S2A1	
<b>Drive Output</b> Continuous Power @ 240VAC Peak Current (rms) Overload**	800 Watts 6 Amps	1.7 kW 12 Amps	5.0 kW @ 480 VAC 18 Amps	3.3 kW 24 Amps	7.5 kW @ 480 VAC 27 Amps	4.2 kW 30 Amps	5.0 kW 36 Amps	7.5 kW 54 Amps
**Peak Current (rms) Capability	Adjustable up to 300% X continuous current (rms) rating @ 8 kHz for 2 sec Adjustable up to 250% X continuous current (rms) rating @ 16 kHz for 2 sec							
<b>Performance</b> Servo Output	Encoder-based Drive Accuracy: +/- 1 Encoder Count Resolver-based Drive Accuracy: +/- 1.32 Arc-Minutes (14-bit resolution) Commutation: Sinusoidal							
<b>Torque Operation Mode</b>	Reference: +/- 10VDC, 16-bit; scalable Torque Range: 100:1 Update rate: 32 µs							
<b>Velocity Operation Mode</b>	Reference: +/- 10VDC, scalable Regulation: +/- 1RPM Update rate: 255 µs Speed Range: 5000:1 with 4096 ppr encoder							
<b>Position Operation Mode</b> (Step/Direction and Electronic Gearing)	Reference: 0 to 2 MHz, PWM input, scalable Minimum Pulse Width: 500 nanoseconds Update rate: 255 µs							
<b>Inputs/Outputs</b> 12 Digital Inputs 1 Dedicated Digital Input 4 Digital Outputs 1 Dedicated Digital Output 2 Analog Inputs 1 Analog Output Encoder Input Optional Resolver Input	5-24VDC, optically isolated 5-24VDC, optically isolated 5-24VDC @ 100mA, optically isolated open collector 5-24VDC @ 100mA, optically isolated open collector +/- 10V differential, 16-bit +/- 10V single-ended, 10-bit Up to 2MHz (1 encoder input standard, 1 additional optional) 12 – bit resolution							
<b>Communications</b> Standard Optional	RJ-45 Standard Ethernet Interface TCP/IP, RS485 @ 38.4 KBPS (addressable to 32 devices) PPP or Modbus RTU Slave, CANopen 250/500/1000 KBPS, Modbus TCP/IP, Ethernet IP							
<b>Standards</b>	UL, cUL, CE(LVD & EMC) EN954-1 Safety Standard (Optional)							



## Command Sets

Below is a list of the command sets.  
Each command often has a sub-set of commands for program flexibility.

KEYWORD	Long Name
ASSIGN	Assign Input As Index Bit
DEFINE	Define name
DISABLE	Turns servo OFF
DO/UNTIL	Do/Until
ENABLE	Enables servo
END	END program
EVENT	Starts Event handler
ENDEVENT	END of Event handler
EVENT ON/OFF	Turn events on or off
EVENTS ON/OFF	Globally Enables/disables events
FAULT	User generated fault
GOTO	Go To
GOSUB	Go To subroutine
HALT	Halt the program execution
JUMP	Jump to label from Event handler
ICONTROL ON/OFF	Enables interface control
IF	If/Then/Else
MOVE	Move
MOVED	Move Distance
MOVEP	Move to Position
MOVEDR	Registered Distance Move
MOVEPR	Registered Position Move
MDV	Segment Move
MOTION SUSPEND	Suspend
MOTION RESUME	Resume Motion
ON FAULT/ENDFAULT	Resume Fault Handler
REGISTRATION ON	Registration On
RESUME	Resume Code Execution
RETURN	Return from subroutine
SEND/SEND TO	Send network variable(s) value
STOP MOTION [Quick]	Stop Motion
VELOCITY ON/OFF	Velocity Mode
WAIT	Wait
WHILE/ENDWHILE	While

## Pick and Place Program Example

```

;***** HEADER *****
;Title:          Pick and Place example program
;Author:         Product Manager
;Description:    This is a simple program that picks up a part,
;               moves it to a set position and drops it

;***** I/O List *****
;               Input A1      - not used
;               Input A2      - not used
;               Input A3      - Enabled
;               Input A4      - not used
;               Input B1      - not used
;               Input B2      - not used
;               Input B3      - not used
;               Input B4      - not used
;               Input C1      - not used
;               Input C2      - not used
;               Input C3      - not used
;               Input C4      - not used
;
;               Output 1      - Pick Arm
;               Output 2      - Gripper
;               Output 3      - not used
;               Output 4      - not used

;***** Initialize and Set Variables *****
UNITS = 1
ACCEL = 75
DECEL =75
MAXV = 10
APOS = 0
;***** Events *****
;
;               Set Events handling here

;***** Main Program *****
RESET_DRIVE:
WAIT UNTIL IN_A3 ;Wait until the Enable switch is made before continuing
ENABLE           ;Enable the Drive
PROGRAM_START:
MOVEP 0          ;Move to Pick position
OUT1 = 1        ;Turn on output 1 on to extend Pick arm
WAIT TIME 1000 ;Delay 1 sec to extend arm
OUT2 = 1        ;Turn on output 2 to Engage gripper
WAIT TIME 1000 ;Delay 1 sec to Pick part
OUT1 = 0        ;Turn off output 1 to Retract Pick arm
MOVEP 100       ;Move to Place position
OUT1 = 1        ;Turn on output 1 on to extend Pick arm
WAIT TIME 1000 ;Delay 1 sec to extend arm
OUT2 = 0        ;Turn off output 1 to Disengage gripper
WAIT TIME 1000 ;Delay 1 sec to Place part
OUT1 = 0        ;Retract Pick arm
GOTO PROGRAM_START
END

;***** Sub-Routines *****
;
;               Enter Sub-Routine code here

;***** Fault Handler Routine *****
;
;               Enter Fault Handler code here
ON FAULT
ENDFAULT

```

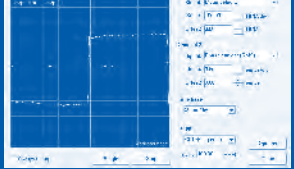
## Command Flexibility

Every resource on the drive is accessible via a variable or flag.

For Example:

- I/O
- Current
- Position
- PID Gain Sets



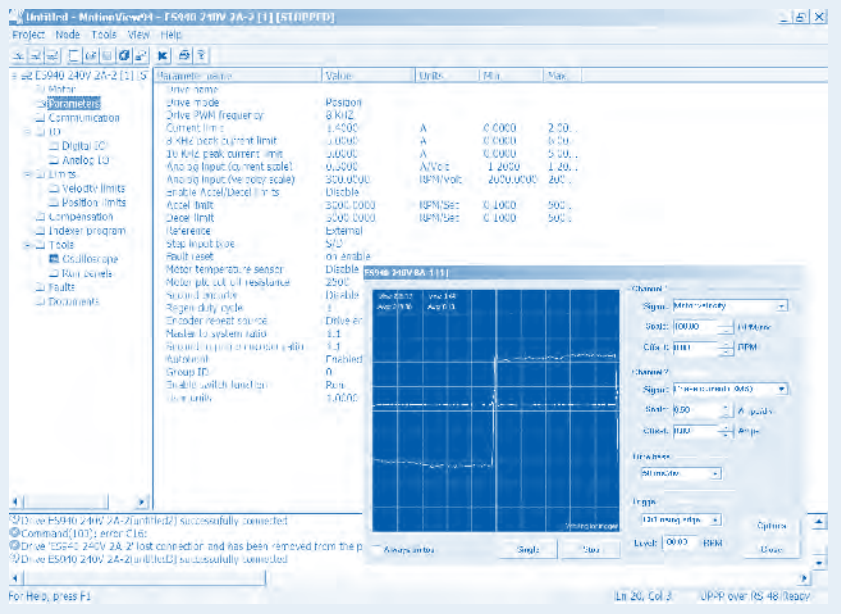


# MotionView® Studio Screenshot

MotionView is an intuitive Window-based software interface that allows you to easily set up your PositionServo.

### MotionView Features:

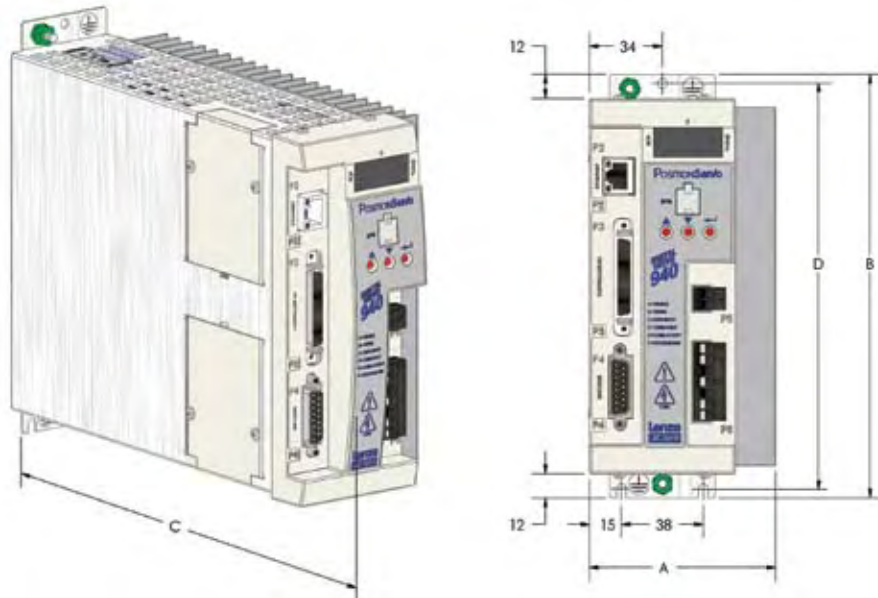
- Statement-Based language
- “Typeless” unified, 64-bit operands
- Compiled Java-style byte code execution
- BASIC-like semantic programming
- Multipass compiler
- 64-bit Arithmetic precision
- Multi-configuration real-time oscilloscope



# Drive Model Number Designation Code

	E94	P	020	S	2	F	E	X
<b>Electrical Products in the 94 Series</b>								
<b>Drive Type:</b>								
P = Encoder-based PositionServo Model 940								
R = Resolver-based PositionServo Model 941								
<b>Drive Rating in Amps:</b>								
020 = 2 Amps                      090 = 9 Amps								
040 = 4 Amps                      100 = 10 Amps								
060 = 6 Amps                      120 = 12 Amps								
080 = 8 Amps                      180 = 18 Amps								
<b>Input Phase:</b>								
S = Single Phase								
Y = Single or Three Phase								
T = Three Phase								
<b>Input Voltage:</b>								
1 = 120VAC Doubler (120V-1~ in/240V-3~ out)								
2 = 200/240 VAC								
4 = 400/480 VAC								
<b>Line Filter:</b>								
N = No Line Filter*								
F = Integrated Line Filter (1 phase only)								
<b>Feedback:</b>								
E = Incremental Encoder (must have E94P)								
R = Incremental Resolver (must have E94R)								
<b>Safety Option:</b>								
X = Standard drive								
S = EN954-1 safety compliance								

\* For 3-phase EMC installation, model 940 EMC footprint/side mount filters are required.



Dimensions					
Type	A (mm)	B (mm)	C (mm)	D (mm)	Weight (kg)
E94_020S1N_X	67	190	190	182	1.1
E94_040S1N_X	69	190	190	182	1.2
E94_020S2F_X	67	190	235	182	1.3
E94_040S2F_X	69	190	235	182	1.5
E94_080S2F_X	88	190	235	182	1.9
E94_100S2F_X	103	190	235	182	2.2
E94_020Y2N_X	67	190	190	182	1.3
E94_040Y2N_X	69	190	190	182	1.5
E94_080Y2N_X	95	190	190	182	1.9
E94_120Y2N_X	67	190	235	182	1.5
E94_180T2N_X	67	242	235	233	2.0
E94_020T4N_X	69	190	190	182	1.5
E94_040T4N_X	95	190	190	182	1.9
E94_060T4N_X	67	190	235	182	1.4
E94_090T4N_X	67	242	235	233	2.0

### PART NUMBER KEY

P = Model 940 Encoder-based drive      X = Standard drive  
 R = Model 941 Resolver-based drive      S = EN954-1 safety compliant

**E94P020Y2NEX**

E = Incremental encoder (must have E94P drive)  
 R = Standard resolver (must have E94R drive)

Environment Ratings	
Vibration	2 g (10 - 2000 Hz)
Ambient Operating Temperature Range	0 to 40°C
Ambient Storage Temperature Range	-10 to 70°C
Temperature Drift	0.1% per °C rise
Humidity	5 - 90% non-condensing
Altitude	1500 m/5000 ft [derate by 1% per 300m (1000 ft) above 1500m (5000 ft)]



### P3 | Controller Interface

50-pin SCSI

Pin	Name	Function
1	MA+	Master Encoder A+ / Step+ input
2	MA-	Master Encoder A- / Step- input
3	MB+	Master Encoder B+ / Direction+ input
4	MB-	Master Encoder B- / Direction- input
5	GND	Drive Logic Common
6	+5V	+5V Output (max 100mA)
7	BA+	Buffered Encoder Output: Channel A+
8	BA-	Buffered Encoder Output: Channel A-
9	BB+	Buffered Encoder Output: Channel B+
10	BB-	Buffered Encoder Output: Channel B-
11	BZ+	Buffered Encoder Output: Channel Z+
12	BZ-	Buffered Encoder Output: Channel Z-
13-19		Empty
20	AIN2+	Positive (+) of Analog signal input
21	AIN2-	Negative (-) of Analog signal input
22	ACOM	Analog common
23	AO1	Analog output
24	AIN1+	Positive (+) of Analog signal input
25	AIN1 -	Negative (-) of Analog signal input
26	IN_A_COM	Digital input group A COM terminal
27	IN_A1	Digital input A1
28	IN_A2	Digital input A2
29	IN_A3	Digital input A3
30	IN_A4	Digital input A4
31	IN_B_COM	Digital input group B COM terminal
32	IN_B1	Digital input B1
33	IN_B2	Digital input B2
34	IN_B3	Digital input B3
35	IN_B4	Digital input B4
36	IN_C_COM	Digital input group C COM terminal
37	IN_C1	Digital input C1
38	IN_C2	Digital input C2
39	IN_C3	Digital input C3
40	IN_C4	Digital input C4
41	RDY+	Ready output Collector
42	RDY-	Ready output Emitter
43	OUT1-C	Programmable output #1 Collector
44	OUT1-E	Programmable output #1 Emitter
45	OUT2-C	Programmable output #2 Collector
46	OUT2-E	Programmable output #2 Emitter
47	OUT3-C	Programmable output #3 Collector
48	OUT3-E	Programmable output #3 Emitter
49	OUT4-C	Programmable output #4 Collector
50	OUT4-E	Programmable output #4 Emitter

### P1 | Input Power

4-pin Removable Terminal Block

Pin	Name	Standard Models	Name	Doubler Models
		Function		Function
1	PE	Protective Earth (Ground)	PE	Protective Earth (Ground)
2	L1	AC Power in	N	AC Power Neutral (120V Doubler only)
3	L2	AC Power in	L1	AC Power in
4	L3	AC Power in (3- models only)	L2/N	AC Power in (non-doubler operation)

### P2 | Communications

RJ-45 Ethernet Port

### P4 | Primary Feedback

Pin	Name	Encoder 15-pin D-shell		Resolver 9-pin D-shell	
		Function	Name	Function	
1	EA+	Channel A+	Ref+	Resolver reference connection	
2	EA-	Channel A-	Ref-	Resolver reference connection	
3	EB+	Channel B+	N/C	No connection	
4	EB-	Channel B-	Cos+	Resolver Cosine connections	
5	EZ+	Channel Z+	Cos-	Resolver Cosine connections	
6	EZ-	Channel Z-	Sin+	Resolver Sine connections	
7	GND	Ground	Sin-	Resolver Sine connections	
8	SHLD	Shield	PTC+	Thermal sensor	
9	PWR	+5VDC	PTC-		
10	HA-	Hall A-			
11	HA+	Hall A+			
12	HB+	Hall B+			
13	HC+	Hall C+			
14	HB-	Hall B-			
15	HC-	Hall C-			

### P11 | Optional Resolver

9-pin D-shell

Pin	Name	Function
1	Ref +	Resolver reference connection
2	Ref -	
3	N/C	No Connection
4	Cos+	Resolver Cosine connections
5	Cos-	
6	Sin+	Resolver Sine connections
7	Sin-	
8	PTC+	Thermal sensor
9	PTC-	

### P5 | 24VDC "Keep Alive"

2-pin Removable Terminal Block

Pin	Name	Function
1	+24 VDC	Positive 24 VDC Input
4	Return	24V power supply return

### P12 | Optional Secondary Encoder

9-pin D-shell

Pin	Name	Function
1	E2B+	Second Encoder Channel B+ Input
2	E2A-	Second Encoder Channel A- Input
3	E2A+	Second Encoder Channel A+ Input
4	+5v	Supply voltage for Second Encoder
5	COM	Supply common
6	E2Z-	Second Encoder Channel Z- Input
7	E2Z+	Second Encoder Channel Z+ Input
8	N/C	No Connection
9	E2B-	Second Encoder Channel B- Input

### P6 | Brake and DC Bus

5-pin Removable Terminal Block

Pin	Name	Function
1	B+	Positive DC Bus / Brake Resistor
2	B+	
3	BR	Brake Resistor
4	B-	Negative DC Bus
5	B-	

### P7 | Motor Power



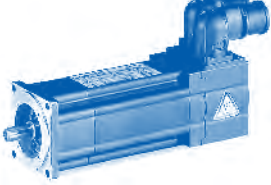
6-pin Removable Terminal Block

Pin	Name	Function
1	T1	Thermistor (PTC) Input
2	T2	Thermistor (PTC) Input
3	U	Motor Power Out
4	V	Motor Power Out
5	W	Motor Power Out
6	PE	Protective Earth (Chassis Ground)



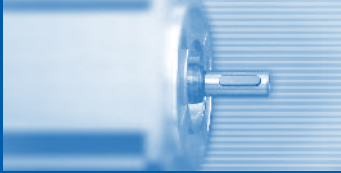
## Brushless Servo Motors

Lenze - AC Tech offers a variety of brushless servo motors to fit your application. A variety of motors means you never have to pay for more than for what you need. Use the selection chart below to get started. Each motor is paired up with the PositionServo so you can get the perfect performance.

			
	MAS	MUS	MCS
Power Range	200 W – 1 kW	380 W – 3.46 kW	250 W – 5 kW
Input Voltage	120/240VAC	120/240/480VAC	240/480 VAC
Connectors	Flying leads	Intercontec	Intercontec
Feedback	Encoder Only	Resolver or Encoder	Resolver or Encoder
Speed	Up to 4500 rpm	Up to 8000 rpm	Up to 8500 rpm
Ratings	IP55	IP65	IP54, IP65
Motor Poles	4	6, 8, 10	8

### Don't see the exact motor you want?

The MAS, MUS and MCS motors are the premiere motors to complete your PositionServo Solution. If you are looking for a different flange or cable, adding a gearbox or brake, or just want your motor painted a certain color, please contact your local AC Tech representative for additional or custom options.



The MUS Series of motors are designed to provide optimal performance while remaining compact and cost effective. The high torque to inertia ratio allows for fast acceleration and deceleration and dynamic responses. The small package size opens up opportunities to solve dynamic applications where space constraints are a concern.

## MUS Series Features

- Synchronous AC brushless servo motors
- 38W to 3.46kW Power
- 120/240/400/480 VAC
- Metric-mounting flange  
58mm, 82mm, 105mm, 142mm
- Resolver or encoder feedback (2000 ppr pre-quad)
- UL, CE
- IP65
- Insulation: Class F
- Intercontec connectors
- 6, 8 and 10-pole versions
- Optional 24VDC brake & NEMA flanges
- Two-year warranty



## MUS Type Code Designation

	MUS	05	G	42	C	M	0	M
<b>MUS Series Motor</b>								
<b>Frame Size</b>								
05 = 58mm, NEMA 23								
08 = 82mm, NEMA 34								
10 = 105mm, NEMA 56C								
14 = 142mm								
<b>Stack Length Code - A (Shortest), C, E, G, J (Longest)</b>								
<b>Vpk / kRPM</b>								
00-99 = 00-99				140-149 = E0-E9				
100-109 = A0-A9				150-159 = F0-F9				
110-119 = B0-B9				200-209 = K0-K9				
120-129 = C0-C9				210-219 = L0-L9				
130-139 = D0-D9				300-309 = U0-U9				
<b>Feedback</b>								
C = Encoder								
R = Resolver								
<b>Connector Type</b>								
M = M17 (feedback and power)								
E = M17 (feedback) & M23 (power)								
<b>Brake</b>								
0 = no brake								
1 = 24VDC Brake								
<b>Mounting</b>								
M = Metric								
N = NEMA								

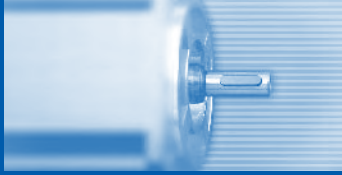


# MUS Size 58, 82 Specifications

Parameter	Units	MUS05A29	MUS05C21	MUS05C47	MUS05E40	MUS05G42
Max bus voltage	VDC	650	340	650	650	650
Rated power	kW		0.380			0.610
Rated speed	RPM	4500	4500	4500	4500	4500
Maximum speed (at 340VDC)	RPM	8000	8000	6400	7500	3700
Maximum speed (at 560VDC)	RPM	8000	NA	8000	8000	8000
Rated torque	N-m	0.46	0.8	0.8	1.1	1.3
	lb-In	4.1	7.1	7.1	9.7	11.5
Continuous stall torque	N-m	0.48	0.85	0.85	1.15	1.5
	lb-In	4.3	7.5	7.5	10.2	13.3
Peak torque	N-m	1.15	2.3	2.3	3.5	4.6
	In-lb	10.2	20.4	20.4	31.0	40.7
Rated current	Arms	1.35	3	1.48	2.3	2.7
Continuous stall current	Arms	1.4	3.5	1.5	2.5	3.1
Peak current	Arms	6	16	7.4	13.1	16
Torque constant $K_t$	N-m/Arms	0.34	0.25	0.54	0.48	0.48
	lb-In/Arms	3.0	2.2	4.8	4.3	4.3
Voltage constant $K_e$	V/KRPM	29	21	47	40	42
Inductance ( $\emptyset - \emptyset$ )	mH	23.0	5.2	26	12.2	10
Resistance ( $\emptyset - \emptyset$ )	Ohm	12.2	2.5	12.2	5.2	4.2
Rotor inertia	kg - m <sup>2</sup>	1.03E-05	1.50E-05	1.50E-05	2.00E-05	2.50E-05
	lbs-In-sec <sup>2</sup>	9.12E-05	1.33E-04	1.33E-04	1.77E-04	2.21E-04
Motor weight	kg	0.4	1.1	1.1	1.4	1.7
	lb	0.8	2.4	2.4	3.1	3.7
Motor poles		6				

Parameter	Units	MUS08C28	MUS08C63	MUS08E38	MUS08J56	MUS08J116
Max bus voltage	VDC	340	650	340	650	650
Rated power	kW			0.990	1230	
Rated speed	RPM	4500	4500	4500	4500	4500
Maximum speed (at 340VDC)	RPM	8000	4800	7800	5300	2600
Maximum speed (at 560VDC)	RPM	NA	8000	NA	8000	4800
Rated torque	N-m	1.6	1.6	2.1	2.6	2.6
	lb-In	14.2	14.2	18.6	23.0	23.0
Continuous stall torque	N-m	1.7	1.7	2.3	3.5	3.5
	lb-In	15.1	15.1	20.4	31.0	31.0
Peak torque	N-m	4.6	4.6	6.9	11.6	11.6
	In-lb	40.7	40.7	61.1	102.7	102.7
Rated current	Arms	4.8	2.1	4.7	3.9	1.9
Continuous stall current	Arms	5.2	2.3	5.2	5.3	2.6
Peak current	Arms	25	11	28	32	15
Torque constant $K_t$	N-m/Arms	0.33	0.75	0.45	0.66	1.35
	lb-In/Arms	2.9	6.6	4.0	5.8	12.0
Voltage constant $K_e$	V/KRPM	28	63	38	56	116
Inductance ( $\emptyset - \emptyset$ )	mH	6	30	6.8	8.4	37
Resistance ( $\emptyset - \emptyset$ )	Ohm	1.37	7	1.5	1.7	7.1
Rotor inertia	kg - m <sup>2</sup>	6.10E-05	6.10E-05	8.80E-05	1.40E-04	1.40E-04
	lbs-In-sec <sup>2</sup>	5.40E-04	5.40E-04	7.79E-04	1.24E-03	1.24E-03
Motor weight	kg	2.3	2.3	2.9	4.0	4.0
	lb	5.1	5.1	6.4	8.8	8.8
Motor poles		8				





# MUS Size 105, 142 Specifications

Parameter	Units	MUS10C54	MUS10C77	MUS10E51	MUS10E81	MUS10E104	MUS10G90
Max bus voltage	VDC	340	650	340	650	650	650
Rated power	kW	1.260			1.630		1790
Rated speed	RPM	3000	3000	3000	3000	3000	3000
Maximum speed (at 340VDC)	RPM	5500	3800	5800	3700	2800	3300
Maximum speed (at 560VDC)	RPM	NA	6000	NA	6000	5300	6000
Rated torque	N-m	4	4	5.2	5.2	5.2	5.7
	lb-In	35.4	35.4	46.1	46.1	46.1	50.5
Continuous stall torque	N-m	4.6	4.6	6.3	6.3	6.3	7.9
	lb-In	40.7	40.7	55.8	55.8	55.8	70.0
Peak torque	N-m	11	11	17	17	17	22
	In-lb	97.4	97.4	150.6	150.6	150.6	194.9
Rated current	Arms	6.3	4.4	8.7	5.4	4.2	5.4
Continuous stall current	Arms	7.3	5.1	10.6	6.7	5.2	7.5
Peak current	Arms	31	22	49	31	24	37
Torque constant $K_t$	N-m/Arms	0.63	0.9	0.6	0.96	1.23	1.05
	lb-In/Arms	5.6	8.0	5.3	8.5	10.9	9.3
Voltage constant $K_e$	V/KRPM	54	77	51	81	104	90
Inductance ( $\emptyset - \emptyset$ )	mH	6.0	12.2	3.6	8.8	14.0	6.0
Resistance ( $\emptyset - \emptyset$ )	Ohm	1.14	2.3	0.64	1.6	2.6	1.34
Rotor inertia	kg - m <sup>2</sup>	2.30E-04	2.30E-04	3.20E-04	3.20E-04	3.20E-04	4.10E-04
	lbs-In-sec <sup>2</sup>	2.04E-03	2.04E-03	2.83E-03	2.83E-03	2.83E-03	3.63E-03
Motor weight	kg	4.3	4.3	5.5	5.5	5.5	6.7
	lb	9.5	9.5	12.1	12.1	12.1	14.8
Motor poles		10					

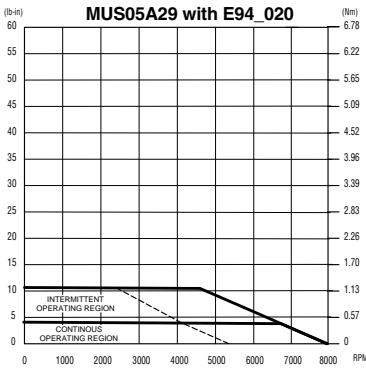
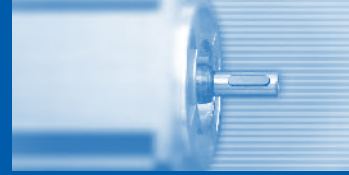
Parameter	Units	MUS14CA7
Max bus voltage	VDC	650
Rated power	kW	3.460
Rated speed	RPM	3000
Maximum speed (at 340VDC)	RPM	2800
Maximum speed (at 560VDC)	RPM	5000
Rated torque	N-m	11
	lb-In	97.4
Continuous stall torque	N-m	13
	lb-In	115.1
Peak torque	N-m	34
	In-lb	301.1
Rated current	Arms	8.7
Continuous stall current	Arms	10.4
Peak current	Arms	48
Torque constant $K_t$	N-m/Arms	1.26
	lb-In/Arms	11.2
Voltage constant $K_e$	V/KRPM	107
Inductance ( $\emptyset - \emptyset$ )	mH	11.6
Resistance ( $\emptyset - \emptyset$ )	Ohm	1.03
Rotor inertia	kg - m <sup>2</sup>	1.07E-03
	lbs-In-sec <sup>2</sup>	9.47E-03
Motor weight	kg	8.3
	lb	18.3
Motor poles		10





# Motor Speed-Torque Performance Curves

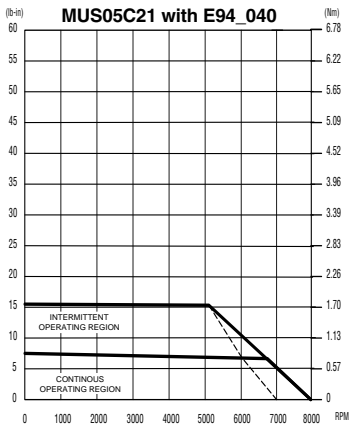
## PositionServo with MUS Series Motors - 120/240 VAC - 58mm



**MUS05A29 with E94\_020**

Motor		Connectors		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models		*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS05A29CM0M	Encoder	EWLB__FD1NA	EWLE__AD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P020S1NEX* E94P020S2FEX* E94P020Y2NEX*		
MUS05A29RM0M	Resolver	EWLB__FD1NA	EWLR__BD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R020S1NRX* E94R020S2FRX* E94R020Y2NRX*		

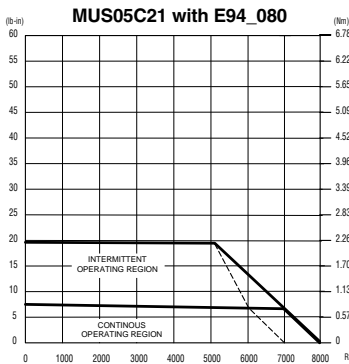
\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



**MUS05C21 with E94\_040**

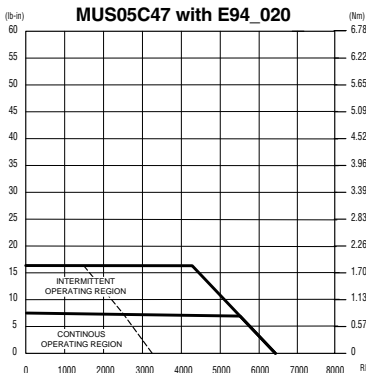
Motor		Connectors		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models		*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS05C21CM0M	Encoder	EWLB__FD1NA	EWLE__AD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*		
MUS05C21RM0M	Resolver	EWLB__FD1NA	EWLR__BD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*		

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



**MUS05C21 with E94\_080**

Motor		Connectors		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models		*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS05C21CM0M	Encoder	EWLB__FD1NA	EWLE__AD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*		
MUS05C21RM0M	Resolver	EWLB__FD1NA	EWLR__BD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*		



**MUS05C47 with E94\_020**

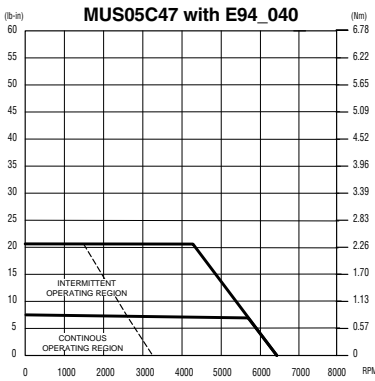
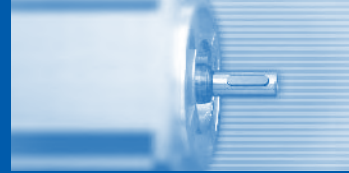
Motor		Connectors		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models		*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS05C47CM0M	Encoder	EWLB__FD1NA	EWLE__AD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P020S1NEX* E94P020S2FEX* E94P020Y2NEX*		
MUS05C47RM0M	Resolver	EWLB__FD1NA	EWLR__BD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R020S1NRX* E94R020S2FRX* E94R020Y2NRX*		

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.

**KEY:**  
 240 VAC  
 120 VAC

# Motor Speed-Torque Performance Curves

## PositionServo with MUS Series Motors - 120/240 VAC - 58mm

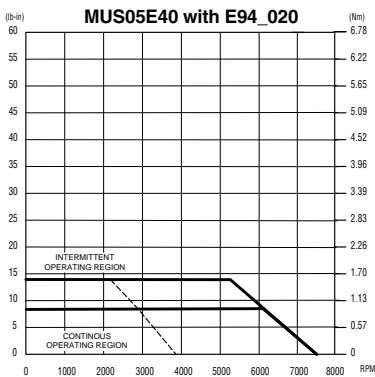


**MUS05C47 with E94\_040** \_\_\_\_\_

Motor Models	Connectors Feedback	Intermediate Cables		Drives	
		Power	Feedback	Input Voltage	Drive Models
MUS05C47CM0M	Encoder	EWLB_ _ _FD1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*
MUS05C47RM0M	Resolver	EWLB_ _ _FD1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.

\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"

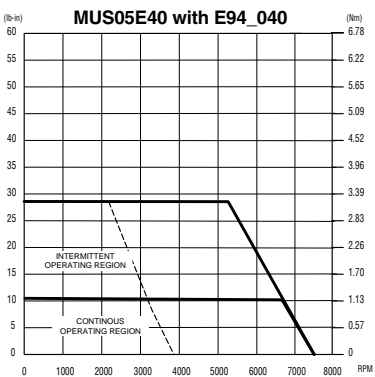


**MUS05E40 with E94\_020** \_\_\_\_\_

Motor Models	Connectors Feedback	Intermediate Cables		Drives	
		Power	Feedback	Input Voltage	Drive Models
MUS05E40CM0M	Encoder	EWLB_ _ _FD1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P020S1NEX* E94P020S2FEX* E94P020Y2NEX*
MUS05E40RM0M	Resolver	EWLB_ _ _FD1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R020S1NRX* E94R020S2FRX* E94R020Y2NRX*

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.

\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"

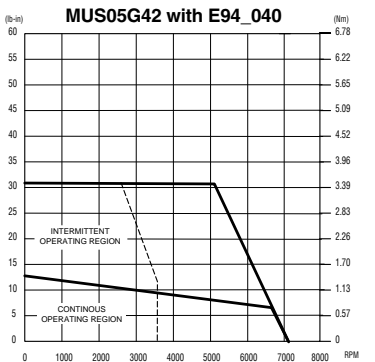


**MUS05E40 with E94\_040** \_\_\_\_\_

Motor Models	Connectors Feedback	Intermediate Cables		Drives	
		Power	Feedback	Input Voltage	Drive Models
MUS05E40CM0M	Encoder	EWLB_ _ _FD1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*
MUS05E40RM0M	Resolver	EWLB_ _ _FD1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.

\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



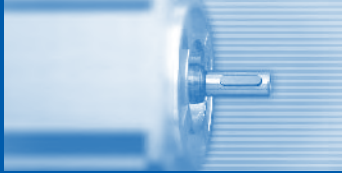
**MUS05G42 with E94\_040** \_\_\_\_\_

Motor Models	Connectors Feedback	Intermediate Cables		Drives	
		Power	Feedback	Input Voltage	Drive Models
MUS05G42CM0M	Encoder	EWLB_ _ _FD1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*
MUS05G42RM0M	Resolver	EWLB_ _ _FD1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.

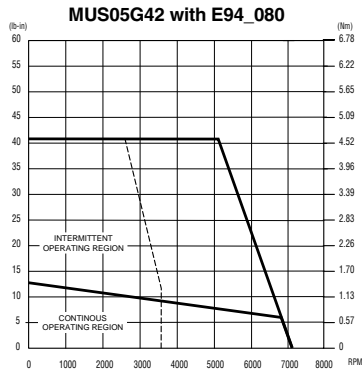
\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"

**KEY:**  
 ——— 240 VAC  
 - - - 120 VAC



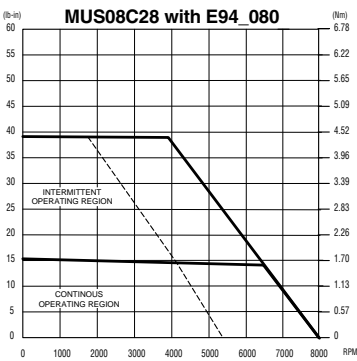
# Motor Speed-Torque Performance Curves

## PositionServo with MUS Series Motors - 120/240 VAC - 58 and 82mm



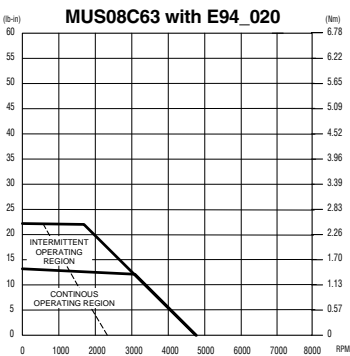
**MUS05G42 with E94\_080** \_\_\_\_\_

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MUS05G42CM0M	Encoder	EWLB__FD1NA ___ = meter length (002, 005, 010)	EWLE__AD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS05G42RM0M	Resolver	EWLB__FD1NA ___ = meter length (002, 005, 010)	EWLR__BD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*	



**MUS08C28 with E94\_080** \_\_\_\_\_

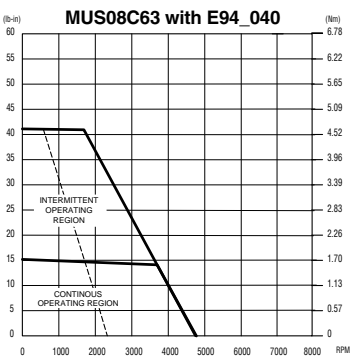
Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MUS08C28CE0M	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS08C28RE0M	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*	



**MUS08C63 with E94\_020** \_\_\_\_\_

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MUS08C63CE0M	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E92P020S1NEX* E92P020S2FEX* E92P020Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS08C63RE0M	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E92R020S1NRX* E92R020S2FRX* E92R020Y2NRX*	

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



**MUS08C63 with E94\_040** \_\_\_\_\_

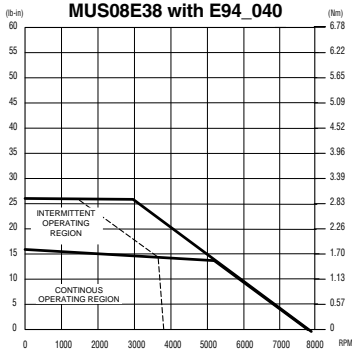
Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MUS08C63CE0M	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS08C63RE0M	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*	

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.

**KEY:**  
 ——— 240 VAC  
 - - - 120 VAC

# Motor Speed-Torque Performance Curves

## PositionServo with MUS Series Motors - 120/240 VAC - 82 mm

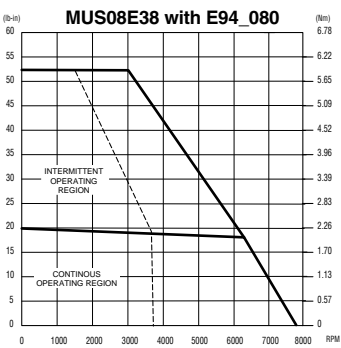


MUS08E38 with E94\_040\_ \_ \_ \_ \_

Motor	Connectors	Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS08E38CE0M	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*
MUS08E38RE0M	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.

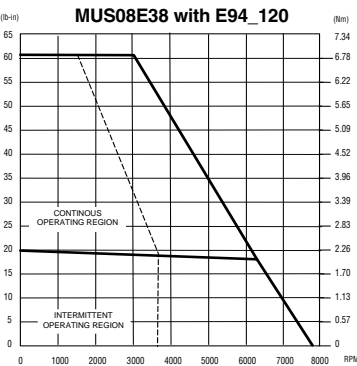
\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



MUS08E38 with E94\_080\_ \_ \_ \_ \_

Motor	Connectors	Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS08E38CE0M	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*
MUS08E38RE0M	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*

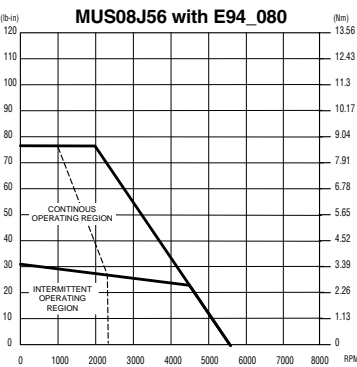
\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



MUS08E38 with E94\_120\_ \_ \_ \_ \_

Motor	Connectors	Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS08E38CE0M	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AD1NA	80...264V 1Ø, 3Ø	E94P120Y2NEX*
MUS08E38RE0M	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BD1NA	80...264V 1Ø, 3Ø	E94R120Y2NRX*

\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



MUS08J56 with E94\_080\_ \_ \_ \_ \_

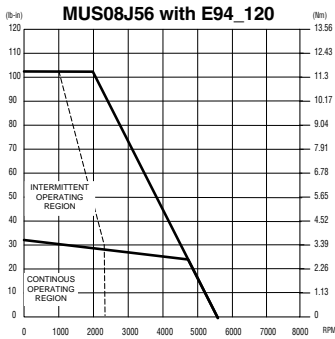
Motor	Connectors	Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS08J56CE0M	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*
MUS08J56RE0M	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*

\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"

**KEY:**  
 240 VAC  
 120 VAC

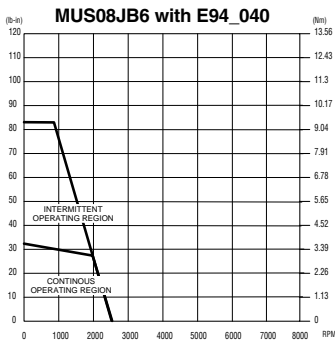
# Motor Speed-Torque Performance Curves

## PositionServo with MUS Series Motors - 120/240 VAC - 82 and 105mm



MUS08J56 with E94\_120

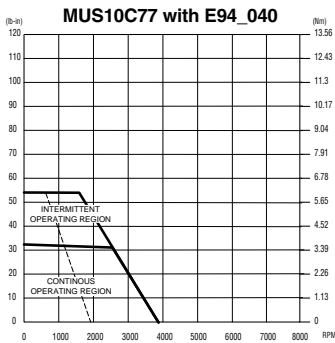
Motor		Connectors	Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models	
MUS08J56CE0M	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AD1NA	80...264V 1Ø, 3Ø	E94P120Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS08J56RE0M	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BD1NA	80...264V 1Ø, 3Ø	E94R120Y2NRX*	



MUS08JB6 with E94\_040

Motor		Connectors	Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models	
MUS08JB6CE0M	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS08JB6RE0M	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*	

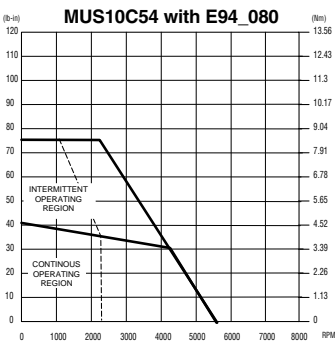
\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



MUS10C77 with E94\_040

Motor		Connectors	Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models	
MUS10C77CE0M	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS10C77RE0M	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BD1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*	

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



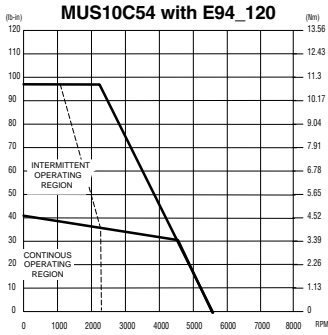
MUS10C54 with E94\_080

Motor		Connectors	Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models	
MUS10C54CE0M	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS10C54RE0M	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*	

**KEY:**  
 ——— 240 VAC  
 - - - 120 VAC

# Motor Speed-Torque Performance Curves

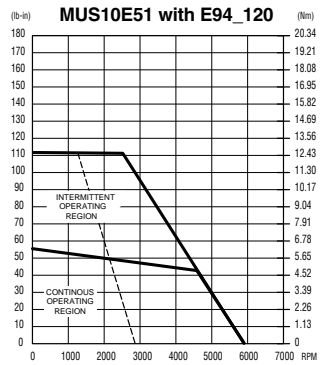
## PositionServo with MUS Series Motors - 120/240 VAC - 105mm



**MUS10C54 with E94\_120**

Motor Models	Connectors Feedback	Intermediate Cables		Drives	
		Power	Feedback	Input Voltage	Drive Models
MUS10C54CE0M	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AD1NA	80...264V 1Ø, 3Ø	E94P120Y2NEX*
MUS10C54RE0M	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BD1NA	80...264V 1Ø, 3Ø	E94R120Y2NRX*

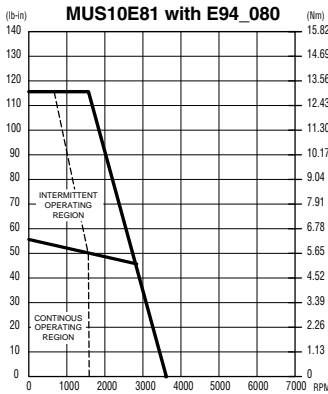
\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



**MUS10E51 with E94\_120**

Motor Models	Connectors Feedback	Intermediate Cables		Drives	
		Power	Feedback	Input Voltage	Drive Models
MUS10E51CE0M	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AD1NA	80...264V 1Ø, 3Ø	E94P120Y2NEX*
MUS10E51RE0M	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BD1NA	80...264V 1Ø, 3Ø	E94R120Y2NRX*

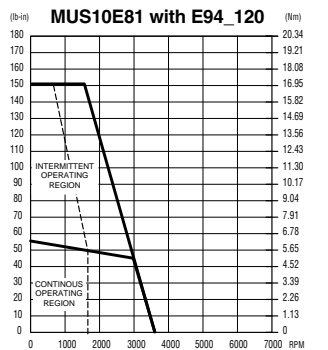
\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



**MUS10E81 with E94\_080**

Motor Models	Connectors Feedback	Intermediate Cables		Drives	
		Power	Feedback	Input Voltage	Drive Models
MUS10E81CE0M	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*
MUS10E81RE0M	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*

\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"

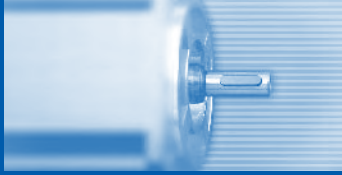


**MUS10E81 with E94\_120**

Motor Models	Connectors Feedback	Intermediate Cables		Drives	
		Power	Feedback	Input Voltage	Drive Models
MUS10E81CE0M	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AD1NA	80...264V 1Ø, 3Ø	E94P120Y2NEX*
MUS10E81RE0M	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BD1NA	80...264V 1Ø, 3Ø	E94R120Y2NRX*

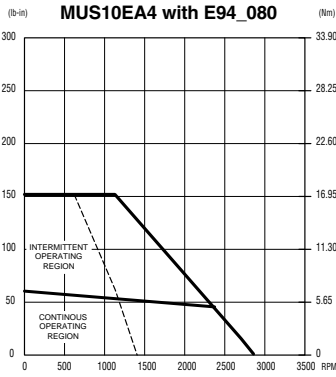
\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"

**KEY:**  
 ——— 240 VAC  
 - - - 120 VAC



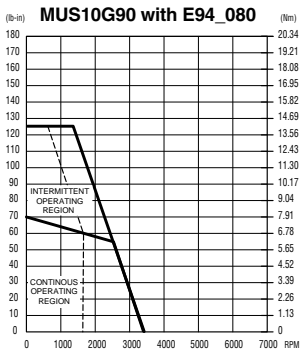
# Motor Speed-Torque Performance Curves

## PositionServo with MUS Series Motors - 120/240 VAC - 105 and 142mm



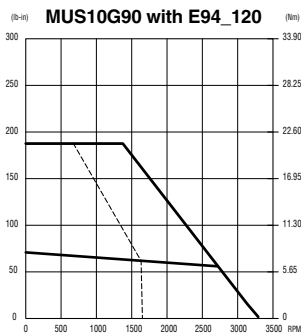
**MUS10EA4 with E94\_080** \_\_\_\_\_

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MUS10EA4CE0M	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS10EA4RE0M	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*	



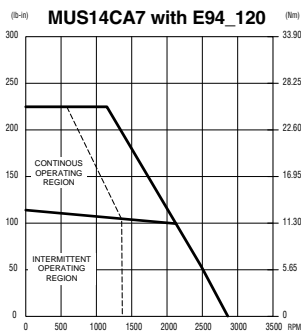
**MUS10G90 with E94\_080** \_\_\_\_\_

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MUS10G90CE0M	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS10G90RE0M	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BD1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*	



**MUS10G90 with E94\_120** \_\_\_\_\_

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MUS10G90CE0M	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AD1NA	80...264V 1Ø, 3Ø	E94P120Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS10G90RE0M	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BD1NA	80...264V 1Ø, 3Ø	E94R120Y2NRX*	



**MUS14CA7 with E94\_120** \_\_\_\_\_

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MUS14CA7CE0M	Encoder	EWLB___FE2NA ___ = meter length (002, 005, 010)	EWLE___AD1NA	80...264V 1Ø, 3Ø	E94P120Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MUS14CA7RE0M	Resolver	EWLB___FE2NA ___ = meter length (002, 005, 010)	EWLR___BD1NA	80...264V 1Ø, 3Ø	E94R120Y2NRX*	

**KEY:**  
 ——— 240 VAC  
 - - - 120 VAC

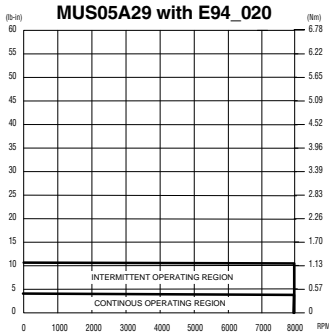




# Motor Speed-Torque Performance Curves

## PositionServo with MUS Series Motors - 400/480 VAC - 58mm

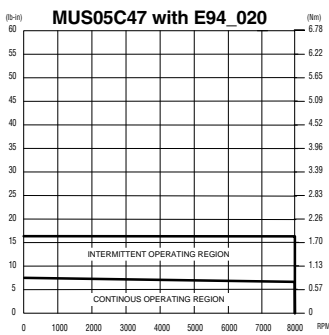
All curves represent both 400 VAC and 480 VAC unless otherwise noted.



**MUS05A29 with E94\_020T4N\_ \_**

Motor		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS05A29CM0M	Encoder	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLE_ _ _AD1NA	400...480V 3Ø	E94P020T4NEX*
MUS05A29RM0M	Resolver	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLR_ _ _BD1NA	400...480V 3Ø	E94R020T4NRX*

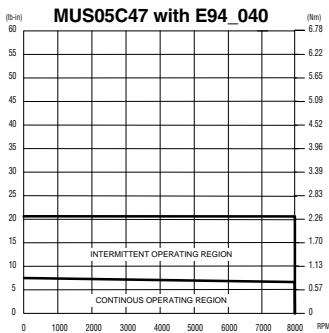
\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



**MUS05C47 with E94\_020T4N\_ \_**

Motor		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS05C47CM0M	Encoder	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLE_ _ _AD1NA	400...480V 3Ø	E94P020T4NEX*
MUS05C47RM0M	Resolver	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLR_ _ _BD1NA	400...480V 3Ø	E94R020T4NRX*

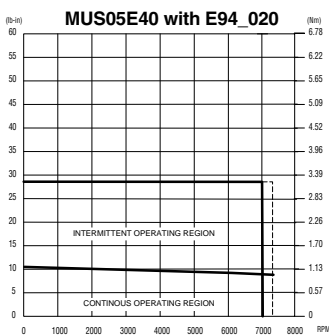
\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



**MUS05C47 with E94\_040T4N\_ \_**

Motor		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS05C47CM0M	Encoder	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLE_ _ _AD1NA	400...480V 3Ø	E94P040T4NEX*
MUS05C47RM0M	Resolver	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLR_ _ _BD1NA	400...480V 3Ø	E94R040T4NRX*

\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



**MUS05E40 with E94\_020T4N\_ \_**

Motor		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS05E40CM0M	Encoder	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLE_ _ _AD1NA	400...480V 3Ø	E94P020T4NEX*
MUS05E40RM0M	Resolver	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLR_ _ _BD1NA	400...480V 3Ø	E94R020T4NRX*

\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"

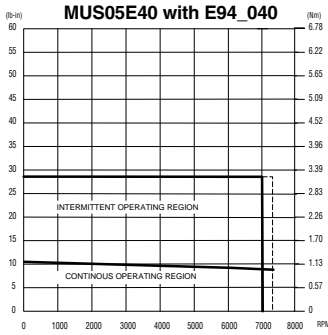
**KEY:**  
 ——— 400 VAC  
 - - - 480 VAC



# Motor Speed-Torque Performance Curves

## PositionServo with MUS Series Motors - 400/480 VAC - 58 and 82 mm

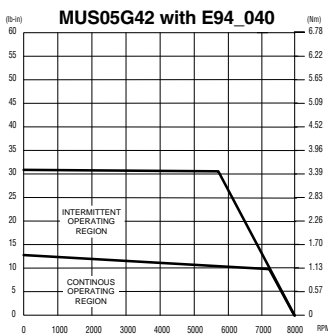
All curves represent both 400 VAC and 480 VAC unless otherwise noted.



**MUS05E40 with E94\_040T4N\_ \_**

Motor		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS05E40CM0M	Encoder	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLE_ _ _AD1NA	400...480V 3Ø	E94P040T4NEX*
MUS05E40RM0M	Resolver	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLR_ _ _BD1NA	400...480V 3Ø	E94R040T4NRX*

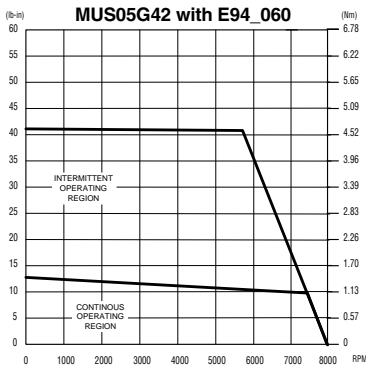
\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



**MUS05G42 with E94\_040T4N\_ \_**

Motor		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS05G42CM0M	Encoder	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLE_ _ _AD1NA	400...480V 3Ø	E94P040T4NEX*
MUS05G42RM0M	Resolver	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLR_ _ _BD1NA	400...480V 3Ø	E94R040T4NRX*

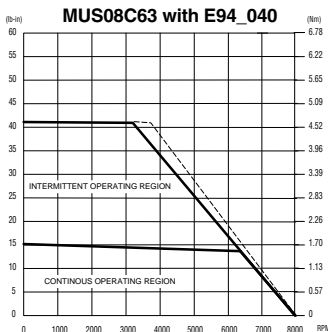
\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



**MUS05G42 with E94\_060T4N\_ \_**

Motor		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS05G42CM0M	Encoder	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLE_ _ _AD1NA	400...480V 3Ø	E94P060T4NEX*
MUS05G42RM0M	Resolver	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLR_ _ _BD1NA	400...480V 3Ø	E94R060T4NRX*

\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



**MUS08C63 with E94\_040T4N\_ \_**

Motor		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS08C63CE0M	Encoder	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLE_ _ _AD1NA	400...480V 3Ø	E94P040T4NEX*
MUS08C63RE0M	Resolver	EWLB_ _ _FD1NA* _ _ _ = METER LENGTH (002, 005, 010)	EWLR_ _ _BD1NA	400...480V 3Ø	E94R040T4NRX*

\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"

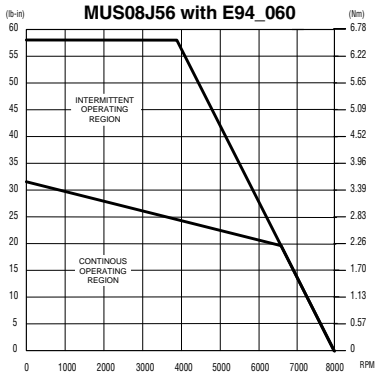
**KEY:**  
 ——— 400 VAC  
 - - - 480 VAC



# Motor Speed-Torque Performance Curves

## PositionServo with MUS Series Motors - 400/480 VAC - 82 and 105 mm

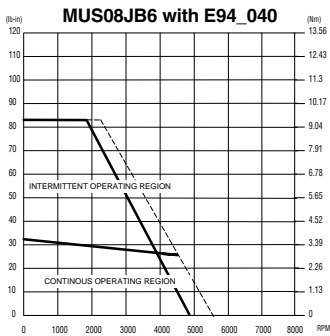
All curves represent both 400 VAC and 480 VAC unless otherwise noted.



**MUS08J56 with E94\_060T4N \_\_**

Motor		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS08J56CE0M	Encoder	EWLB__FE1NA* ___ = METER LENGTH (002, 005, 010)	EWLE__AD1NA	400...480V 3Ø	E94P060T4NEX*
MUS08J56RE0M	Resolver	EWLB__FE1NA* ___ = METER LENGTH (002, 005, 010)	EWLR__BD1NA	400...480V 3Ø	E94R060T4NRX*

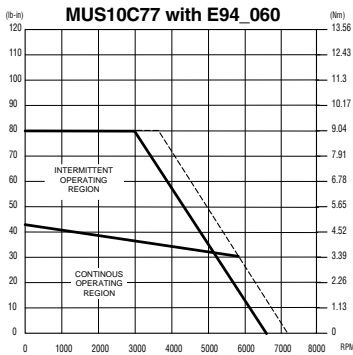
\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



**MUS08JB6 with E94\_040T4N \_\_**

Motor		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS08JB6CE0M	Encoder	EWLB__FD1NA* ___ = METER LENGTH (002, 005, 010)	EWLE__AD1NA	400...480V 3Ø	E94P040T4NEX*
MUS08JB6RE0M	Resolver	EWLB__FD1NA* ___ = METER LENGTH (002, 005, 010)	EWLR__BD1NA	400...480V 3Ø	E94R040T4NRX*

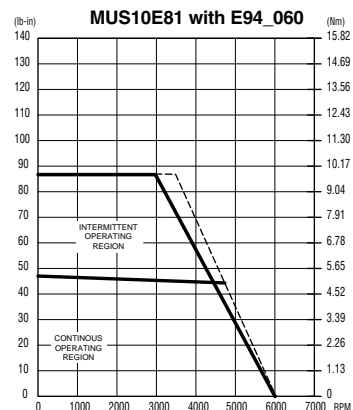
\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



**MUS10C770 with E94\_060T4N \_\_**

Motor		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS10C77CE0M	Encoder	EWLB__FE1NA* ___ = METER LENGTH (002, 005, 010)	EWLE__AD1NA	400...480V 3Ø	E94P060T4NEX*
MUS10C77RE0M	Resolver	EWLB__FE1NA* ___ = METER LENGTH (002, 005, 010)	EWLR__BD1NA	400...480V 3Ø	E94R060T4NRX*

\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"



**MUS10E81 with E94\_060T4N \_\_**

Motor		Intermediate Cables		Drives	
Models	Feedback	Power	Feedback	Input Voltage	Drive Models
MUS10E81CE0M	Encoder	EWLB__FE1NA* ___ = METER LENGTH (002, 005, 010)	EWLE__AD1NA	400...480V 3Ø	E94P060T4NEX*
MUS10E81RE0M	Resolver	EWLB__FE1NA* ___ = METER LENGTH (002, 005, 010)	EWLR__BD1NA	400...480V 3Ø	E94R060T4NRX*

\*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"

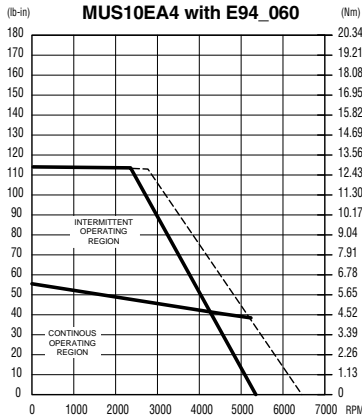
**KEY:**  
 ——— 400 VAC  
 - - - 480 VAC



# Motor Speed-Torque Performance Curves

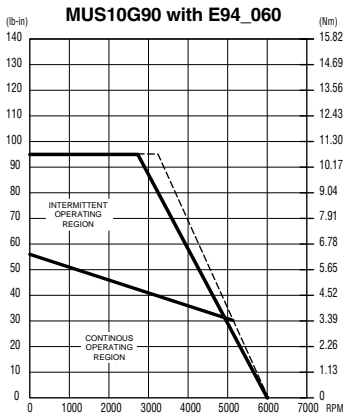
## PositionServo with MUS Series Motors - 400/480 VAC - 142mm

All curves represent both 400 VAC and 480 VAC unless otherwise noted.



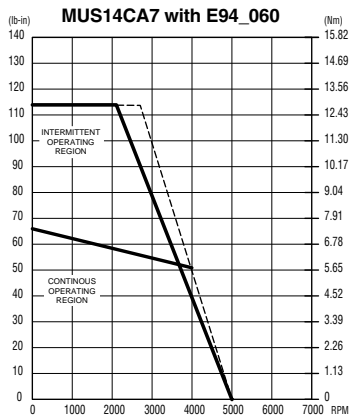
**MUS10EA4 with E94\_060T4N \_\_**

Motor		Intermediate Cables		Drives		
Models	Feedback	Power	Feedback	Input Voltage	Drive Models	
MUS10EA4CE0M	Encoder	EWLB__FE1NA*	EWLE__AD1NA	400...480V 3Ø	E94P060T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
		___ = METER LENGTH (002, 005, 010)				
MUS10EA4RE0M	Resolver	EWLB__FE1NA*	EWLR__BD1NA	400...480V 3Ø	E94R060T4NRX*	
		___ = METER LENGTH (002, 005, 010)				



**MUS10G90 with E94\_060T4N \_\_**

Motor		Intermediate Cables		Drives		
Models	Feedback	Power	Feedback	Input Voltage	Drive Models	
MUS10G90CE0M	Encoder	EWLB__FE1NA*	EWLE__AD1NA	400...480V 3Ø	E94P060T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
		___ = METER LENGTH (002, 005, 010)				
MUS10G90RE0M	Resolver	EWLB__FE1NA*	EWLR__BD1NA	400...480V 3Ø	E94R060T4NRX*	
		___ = METER LENGTH (002, 005, 010)				



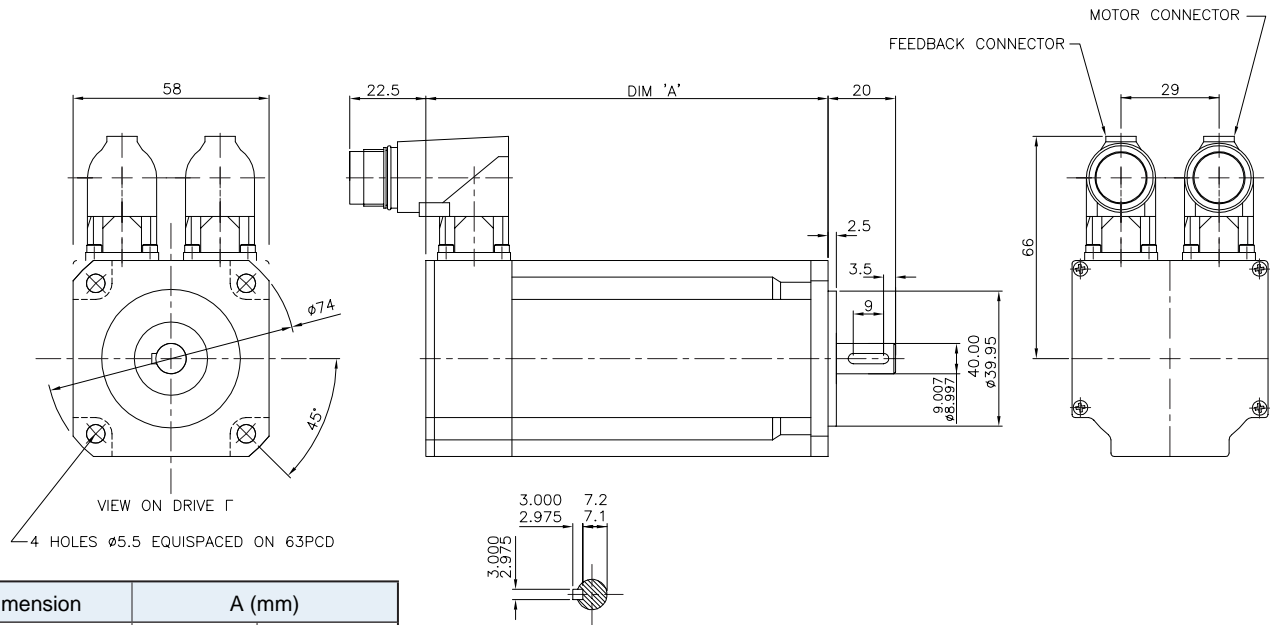
**MUS14CA7 with E94\_060T4N \_\_**

Motor		Intermediate Cables		Drives		
Models	Feedback	Power	Feedback	Input Voltage	Drive Models	
MUS14CA7CE0M	Encoder	EWLB__FE2NA*	EWLE__AD1NA	400...480V 3Ø	E94P060T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
		___ = METER LENGTH (002, 005, 010)				
MUS14CA7RE0M	Resolver	EWLB__FE2NA*	EWLR__BD1NA	400...480V 3Ø	E94R060T4NRX*	
		___ = METER LENGTH (002, 005, 010)				

**KEY:**  
 ——— 400 VAC  
 - - - - 480 VAC

## MUS Size: 58 mm

(Dimensions in mm)

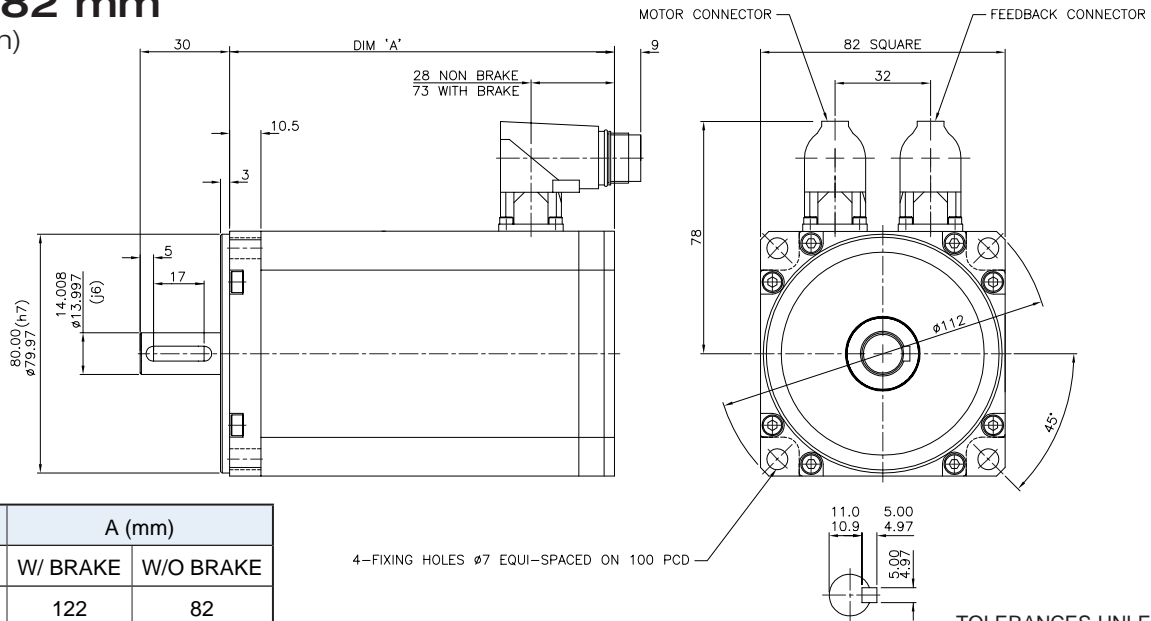


Dimension	A (mm)	
	W/ BRAKE	W/O BRAKE
MUS05A	123.5	88.5
MUS05C	141.0	106.0
MUS05E	158.5	123.5
MUS05G	176.0	141.0

TOLERANCES UNLESS OTHERWISE STATED  
ANG: ±0.5°  
DIM: ±0.25mm

## MUS Size: 82 mm

(Dimensions in mm)

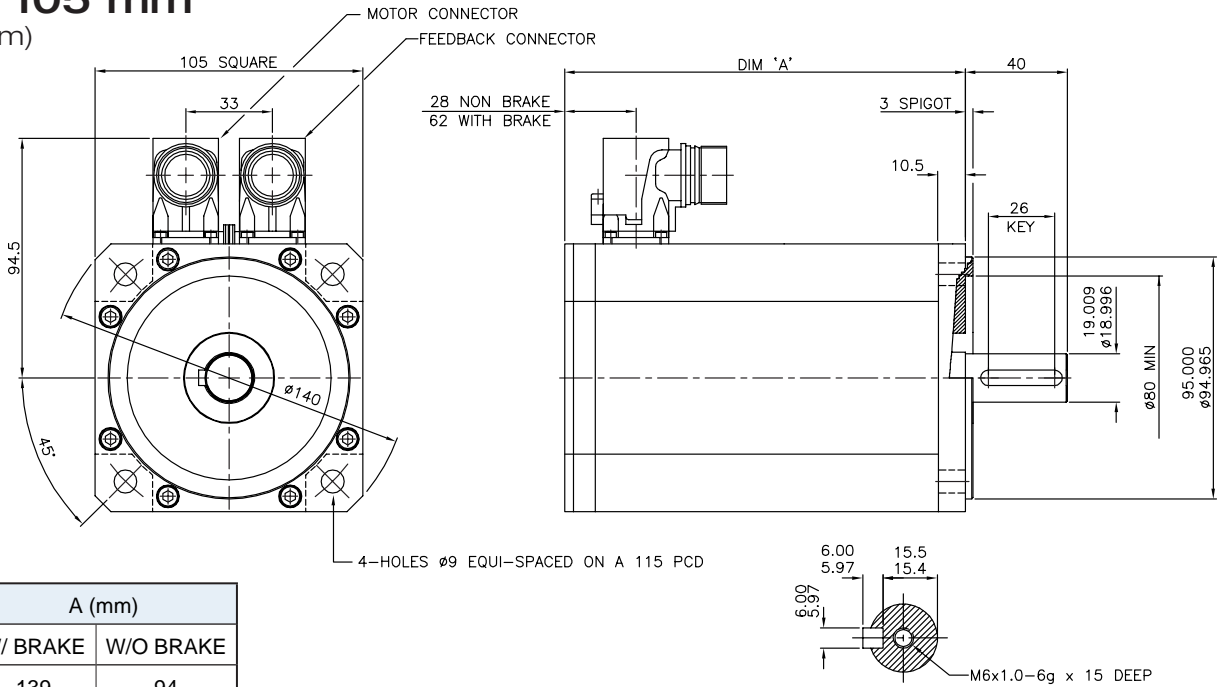


Dimension	A (mm)	
	W/ BRAKE	W/O BRAKE
MUS08A	122	82
MUS08C	140	100
MUS08E	158	118
MUS08J	194	154

TOLERANCES UNLESS OTHERWISE STATED  
ANG: ±0.5°  
DIM: ±0.25mm

## MUS Size: 105 mm

(Dimensions in mm)

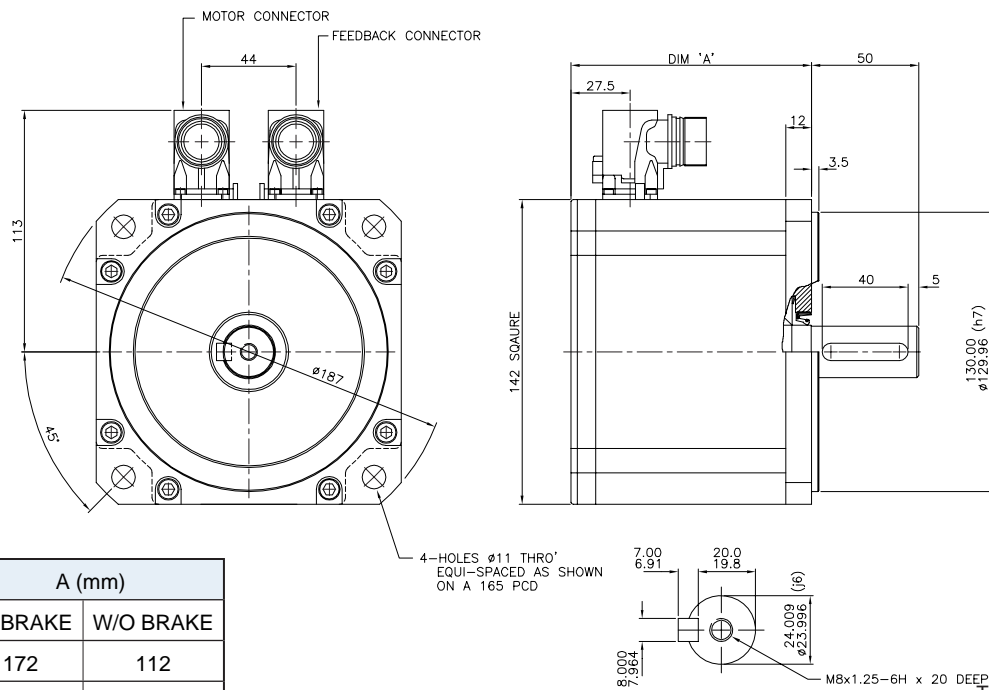


Dimension	A (mm)	
	W/ BRAKE	W/O BRAKE
MUS10A	139	94
MUS10C	165	120
MUS10E	191	146
MUS10G	217	172

TOLERANCES UNLESS OTHERWISE STATED  
ANG: ±0.5°  
DIM: ±0.25mm

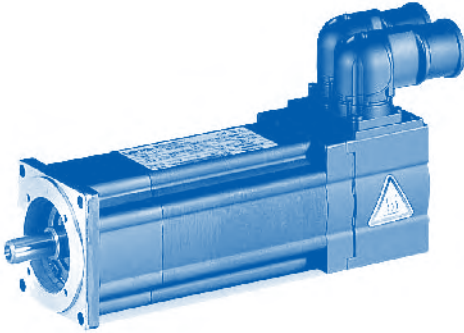
## MUS Size: 142 mm

(Dimensions in mm)



Dimension	A (mm)	
	W/ BRAKE	W/O BRAKE
MUS14A	172	112
MUS14C	192	132
MUS14E	217	157
MUS14J	267	207

TOLERANCES UNLESS OTHERWISE STATED  
ANG: ±0.5°  
DIM: ±0.25mm



## MCS Series

Low Inertia, Higher Power

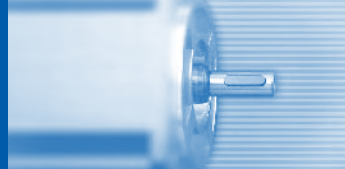
The MCS Series of motors are characterized by an extremely low moment of inertia and an incredibly high overload capacity. The motors are designed for high power and demanding applications. Choose from a variety of frame sizes, feedback choices and accessories to create the system that is right for you.

## MCS Series Features

- Synchronous AC brushless servo motors
- 250W to 5kW Power
- 240/480 VAC
- IEC Metric-mounting flange  
62mm, 89mm, 116mm
- Resolver feedback  
Encoder optional (4096 PPR)
- UL, CE
- IP54
- Optional IP65
- Mil-Spec connectors
- 8-pole
- Optional 24VDC brake
- Two-year warranty

## MCS Servo Motor

	MCS	06	C	41	L	RSO	B0
MCS Series Servo Motor							
Motor Square Dimensions 06 = 62 mm 09 = 89 mm 12 = 116 mm							
Length of Coil C = 30 mm F = 60 mm H = 80 mm I = 50 90 mm L = 120 mm							
Rated Speed: 15 = 1500 RPM 20 = 2000 RPM 30 = 3000 RPM 38 = 3800 RPM 41 = 4100 RPM 60 = 6000 RPM							
Applied Line Voltage: L = 230V - = 400V							
Feedback: C40 = Encoder (4096PPR) RSO = Resolver							
Brake: B0 = No Brake P1 = PM Brake 24VDC							



Parameter	Units	MCS06C41L	MCS06C60L	MCS06F41L	MCS06F60L	MCS06I41L	MCS06I60L	MCS09F38L
Max mains voltage	VDC	340	340	340	340	340	340	340
Rated power	kW	0.25	0.31	0.51	0.57	0.64	0.75	1.20
Rated speed	RPM	4050	6000	4050	6000	4050	6000	3750
Maximum speed	RPM	6500	8500	6500	8500	6500	8500	6500
Rated torque	N-m	0.60	0.50	1.20	0.90	1.50	1.20	3.10
	lb-In	5.31	4.43	10.63	7.97	13.29	10.63	27.46
Continuous stall torque	N-m	0.80	0.80	1.50	1.50	2.00	2.00	4.20
	lb-In	7.09	7.09	13.29	13.29	17.71	17.71	37.20
Peak torque	N-m	2.40	2.40	4.40	4.40	6.20	6.20	15.00
	lb-In	21.26	21.26	38.97	38.97	54.91	54.91	132.86
Rated current	Arms	2.5	4.0	2.9	3.4	2.9	3.6	5.0
Continuous stall current	Arms	2.5	4.3	2.9	3.8	3.1	4.2	6.0
Peak current	Arms	10.8	19.0	10.5	16.5	11.8	16.0	30.0
Torque constant at 150°C Kt	N-m/Arms	0.31	0.19	0.52	0.32	0.59	0.45	0.70
	lbs-In/Arms	2.75	1.68	4.61	2.83	5.23	3.99	6.20
Voltage constant Ke	V/KRPM	19	11	29	19.17	32	36.7	79.8
Inductance (per phase)	mH	12.8	4.3	15.9	6.6	15.1	8.5	6.2
Resistance (per phase)	Ohm	4.0	1.6	3.7	1.5	3.1	1.7	0.9
Rotor inertia	kg - m <sup>2</sup>	1.40E-05	1.04E-05	2.20E-05	2.20E-05	3.00E-05	3.00E-05	1.50E-04
	lbs-In-sec <sup>2</sup>	1.24E-04	1.24E-04	1.95E-04	1.95E-04	2.65E-04	2.65E-04	1.33E-03
Motor weight	kg	1.8	1.8	2.2	2.2	2.9	2.9	5.2
	lb	3.97	3.97	4.85	4.85	6.39	6.39	11.47
Motor poles		8						

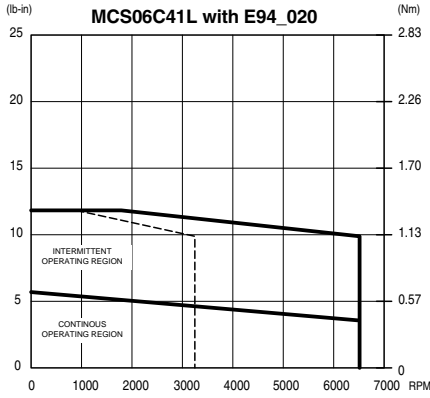
Parameter	Units	MCS09F60L	MCS09H41L	MCS09H60L	MCS12H15L	MCS12H30L	MCS12L20L
Max bus voltage	VDC	340	340	340	340	340	340
Rated power	kW	1.5	1.6	1.9	1.6	2.5	2.8
Rated speed	RPM	6000	4050	6000	1500	3000	1950
Maximum speed	RPM	8000	6500	8000	4000	6000	4000
Rated torque	N-m	2.40	3.80	3.00	10.00	8.00	13.50
	lb-In	21.26	33.66	26.57	88.57	70.86	119.57
Continuous stall torque	N-m	4.20	5.50	5.50	11.40	11.40	15.00
	lb-In	37.20	48.71	48.71	100.97	100.97	132.86
Peak torque	N-m	15.00	20.00	20.00	29.00	29.00	56.00
	lb-In	132.86	177.14	177.14	256.85	256.85	495.99
Rated current	Arms	7.9	6.8	8.0	7.6	10.5	11.8
Continuous stall current	Arms	10.5	8.5	12.0	8.2	13.5	12.4
Peak current	Arms	52.5	40.0	57.0	24.0	39.0	57.0
Torque constant at 150°C Kt	N-m/Arms	0.40	0.65	0.46	1.39	0.84	1.21
	lb-In/Arms	3.55	5.76	4.07	12.31	7.44	10.72
Voltage constant Ke	V/KRPM	39.9	75.7	37.8	172.9	86.5	149.2
Inductance (per phase)	mH	2.0	4.0	2.0	10.5	4.0	5.5
Resistance (per phase)	Ohm	0.28	0.6	0.24	1.9	0.33	0.37
Rotor inertia	kg - m <sup>2</sup>	1.50E-04	1.90E-04	1.90E-04	7.30E-04	7.30E-04	1.06E-03
	in-lbs-sec <sup>2</sup>	1.33E-03	1.68E-03	1.68E-03	6.46E-03	6.46E-03	9.38E-03
Motor weight	kg	5.2	6.1	6.1	9.5	9.5	12.6
	lb	11.47	13.45	13.45	20.95	20.95	27.78
Motor poles		8					





# Motor Speed-Torque Performance Curves

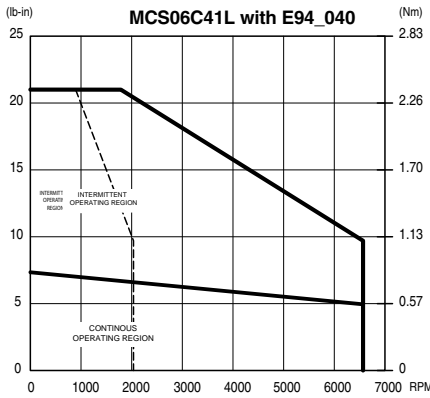
## PositionServo with MCS Series Motors - 120/240 VAC - 60mm



**MCS06C41L with E94\_020**

Motor	Connectors	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06C41LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P020S1NEX* E94P020S2FEX* E94P020Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06C41LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R020S1NRX* E94R020S2FRX* E94R020Y2NRX*	

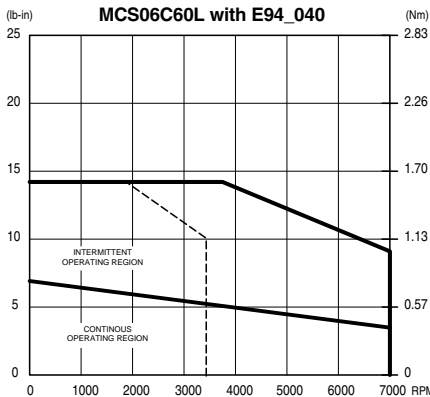
\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



**MCS06C41L with E94\_040**

Motor	Connectors	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06C41LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06C41LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*	

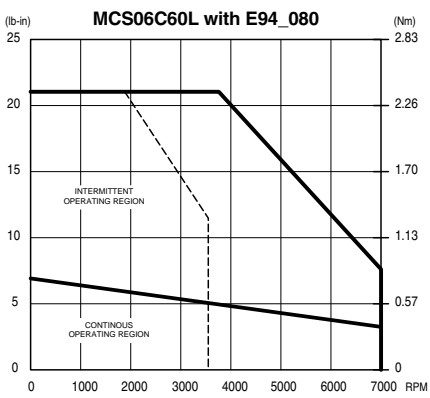
\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



**MCS06C60L with E94\_040**

Motor	Connectors	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06C60LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06C60LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*	

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



**MCS06C60L with E94\_080**

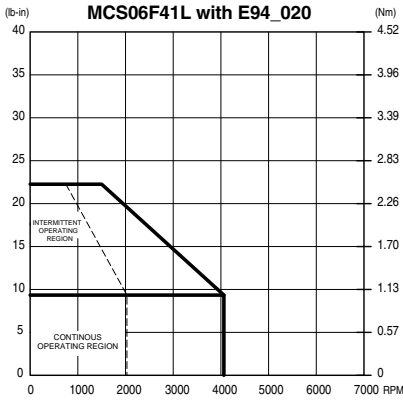
Motor	Connectors	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06C60LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06C60LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*	

**KEY:**  
 ——— 240 VAC  
 - - - 120 VAC



# Motor Speed-Torque Performance Curves

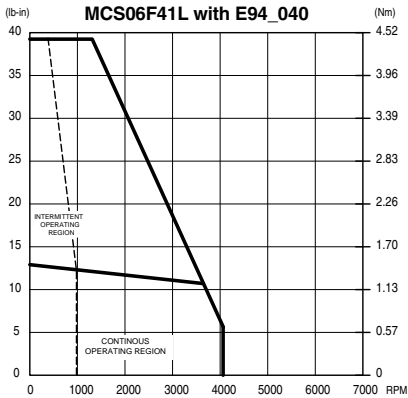
## PositionServo with MCS Series Motors - 120/240 VAC - 60mm



**MCS06F41L with E94\_020**

Motor	Connectors	Intermediate Cables		Drives	
		Power	Feedback	Input Voltage	Drive Models
MCS06F41LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P020S1NEX* E94P020S2FEX* E94P020Y2NEX*
MCS06F41LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R020S1NRX* E94R020S2FRX* E94R020Y2NRX*

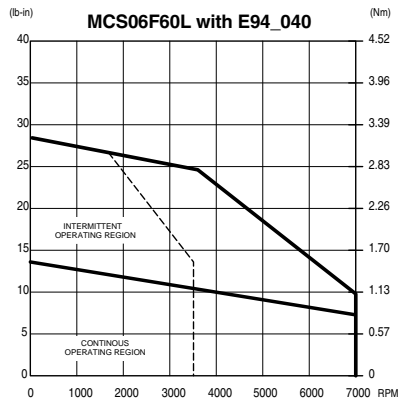
\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



**MCS06F41L with E94\_040**

Motor	Connectors	Intermediate Cables		Drives	
		Power	Feedback	Input Voltage	Drive Models
MCS06F41LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*
MCS06F41LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*

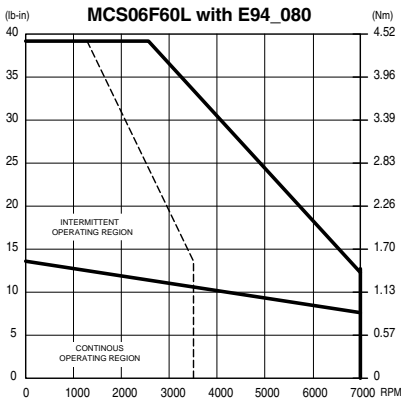
\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



**MCS06F60L with E94\_040**

Motor	Connectors	Intermediate Cables		Drives	
		Power	Feedback	Input Voltage	Drive Models
MCS06F60LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*
MCS06F60LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



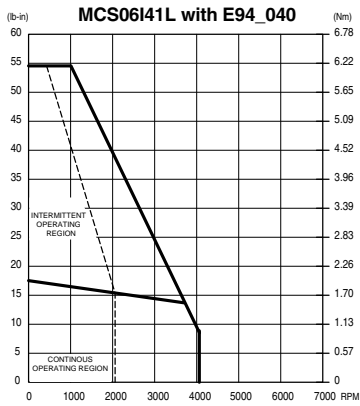
**MCS06F60L with E94\_080**

Motor	Connectors	Intermediate Cables		Drives	
		Power	Feedback	Input Voltage	Drive Models
MCS06F60LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*
MCS06F60LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*

**KEY:**  
 ——— 240 VAC  
 - - - 120 VAC

# Motor Speed-Torque Performance Curves

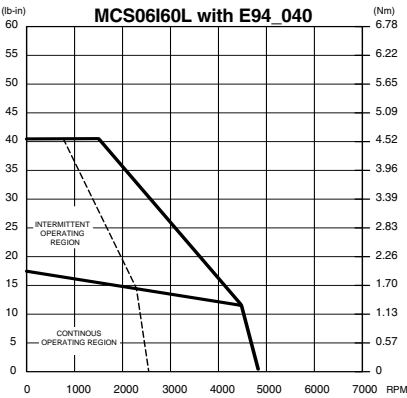
## PositionServo with MCS Series Motors - 120/240 VAC - 60mm & 90mm



**MCS06I41L with E94\_040**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06I41LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06I41LRSO	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*	

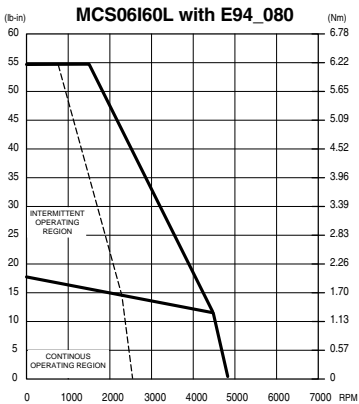
\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



**MCS06I60L with E94\_040**

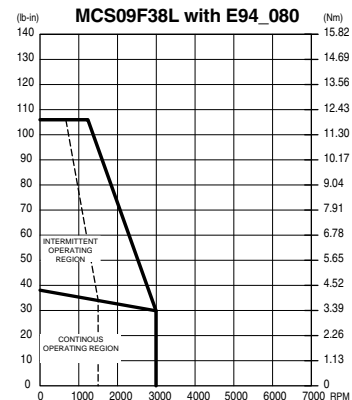
Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06I60LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94P040S1NEX* E94P040S2FEX* E94P040Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06I60LRSO	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	45...264V** 1Ø 80...264V 1Ø 80...264V 1Ø, 3Ø	E94R040S1NRX* E94R040S2FRX* E94R040Y2NRX*	

\*\* Voltage Doubler Drive offers 240VAC output when 120VAC input is applied.



**MCS06I60L with E94\_080**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06I60LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06I60LRSO	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*	



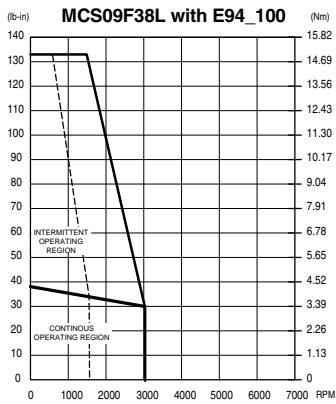
**MCS09F38L with E94\_080**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09F38LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09F38LRSO	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*	

**KEY:**  
 ——— 240 VAC  
 - - - 120 VAC

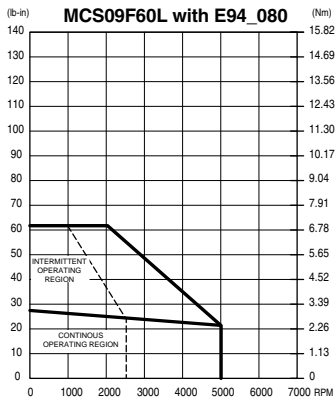
# Motor Speed-Torque Performance Curves

## PositionServo with MCS Series Motors - 120/240 VAC - 90mm



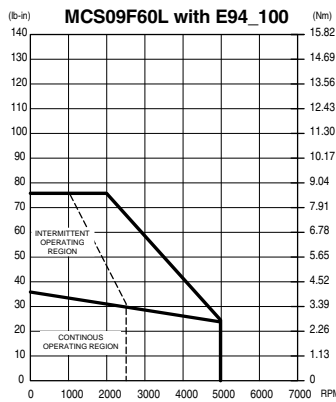
MCS09F38L with E94\_100

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09F38LC40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P100S2FEX* E94P100Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09F38LRSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R100S2FRX* E94R100Y2NRX*	



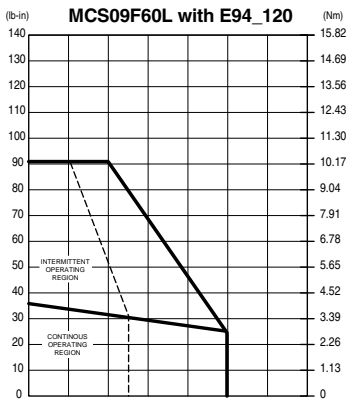
MCS09F60L with E94\_080

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09F60LC40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09F60LRSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*	



MCS09F60L with E94\_100

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09F60LC40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P100S2FEX* E94P100Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09F60LRSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R100S2FRX* E94R100Y2NRX*	



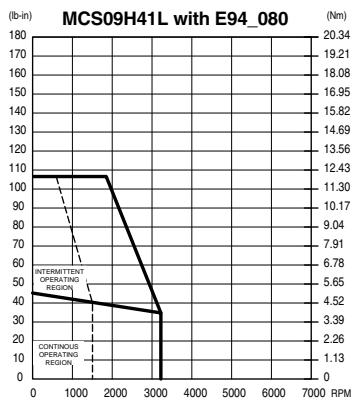
MCS09F60L with E94\_120

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09F60LC40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	80...264V 1Ø, 3Ø	E94P120Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09F60LRSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	80...264V 1Ø, 3Ø	E94R120Y2NRX*	

**KEY:**  
 ——— 240 VAC  
 - - - 120 VAC

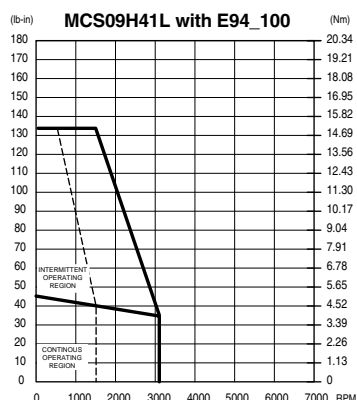
# Motor Speed-Torque Performance Curves

## PositionServo with MCS Series Motors - 120/240 VAC - 90mm



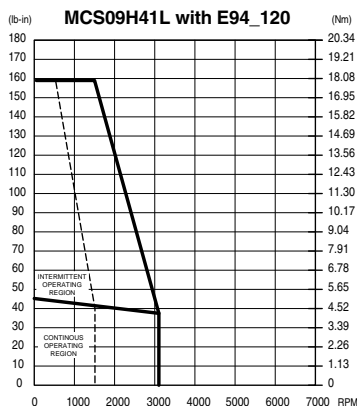
MCS09H41L with E94\_080

Motor	Connectors	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09H41LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "E"
MCS09H41LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*	



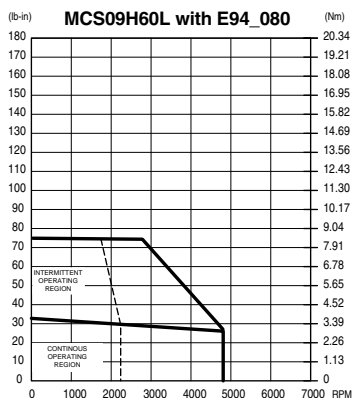
MCS09H41L with E94\_100

Motor	Connectors	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09H41LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P100S2FEX* E94P100Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09H41LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R100S2FRX* E94R100Y2NRX*	



MCS09H41L with E94\_120

Motor	Connectors	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09H41LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	80...264V 1Ø, 3Ø	E94P120Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09H41LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	80...264V 1Ø, 3Ø	E94R120Y2NRX*	



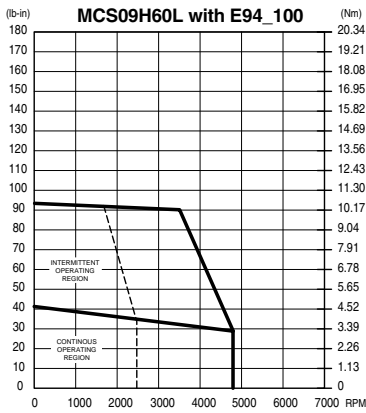
MCS09H60L with E94\_080

Motor	Connectors	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09H60LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09H60LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*	

**KEY:**  
 ——— 240 VAC  
 - - - 120 VAC

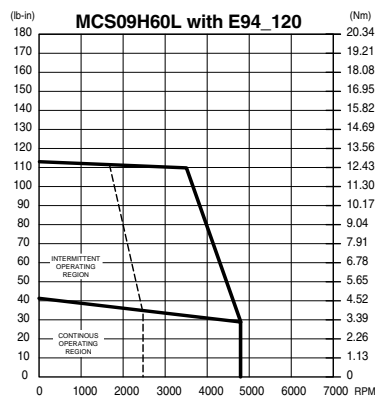
# Motor Speed-Torque Performance Curves

## PositionServo with MCS Series Motors - 120/240 VAC - 90 and 120mm



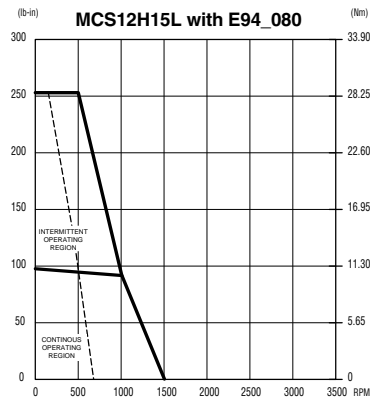
MCS09H60L with E94\_100

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09H60LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P100S2FEX* E94P100Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09H60LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R100S2FRX* E94R100Y2NRX*	



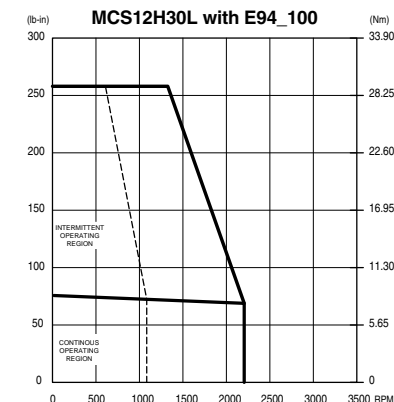
MCS09H60L with E94\_120

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09H60LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	80...264V 1Ø, 3Ø	E94P120Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09H60LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	80...264V 1Ø, 3Ø	E94R120Y2NRX*	



MCS12H15L with E94\_080

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS12H15LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P080S2FEX* E94P080Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS12H15LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R080S2FRX* E94R080Y2NRX*	



MCS12H30L with E94\_100

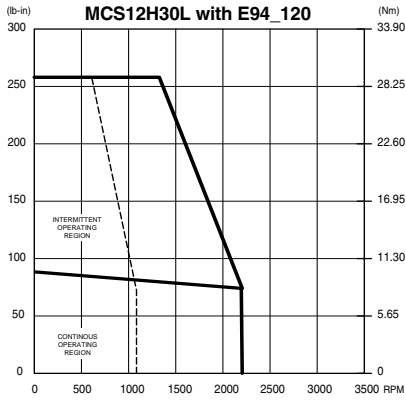
Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS12H30LC40	Encoder	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLE___AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P100S2FEX* E94P100Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS12H30LR50	Resolver	EWLB___FE1NA ___ = meter length (002, 005, 010)	EWLR___BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R100S2FRX* E94R100Y2NRX*	

**KEY:**  
 ——— 240 VAC  
 - - - 120 VAC



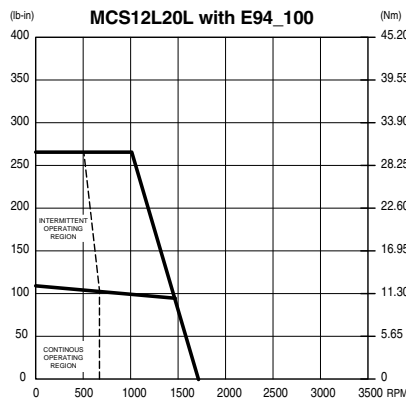
# Motor Speed-Torque Performance Curves

## PositionServo with MCS Series Motors - 120/240 VAC - 120mm



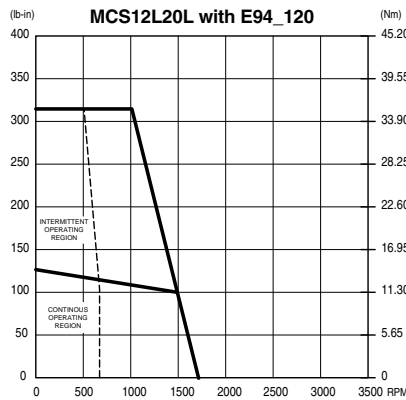
**MCS12H30L with E94\_120**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS12H30LC40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	80...264V 1Ø, 3Ø	E94P120Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS12H30LRSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	80...264V 1Ø, 3Ø	E94R120Y2NRX*	



**MCS12L20L with E94\_100**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS12L20LC40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94P100S2FEX* E94P100Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS12L20LRSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	80...264V 1Ø 80...264V 1Ø, 3Ø	E94R100S2FRX* E94R100Y2NRX*	



**MCS12L20L with E94\_120**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS12L20LC40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	80...264V 1Ø, 3Ø	E94P120Y2NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS12L20LRSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	80...264V 1Ø, 3Ø	E94R120Y2NRX*	

**KEY:**  
 ——— 240 VAC  
 - - - 120 VAC

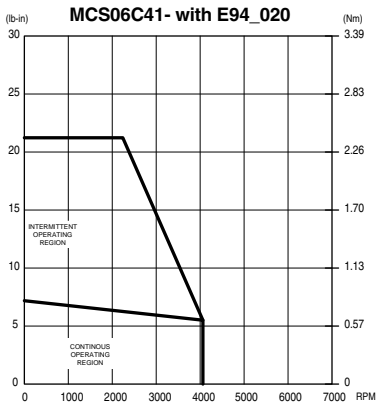
Parameter	Units	MCS06C41-	MCS06C60-	MCS06F41-	MCS06F60-	MCS06I41-	MCS06I60-	MCS09F38-
Max mains voltage	VDC	680	680	680	680	680	680	680
Rated power	kW	0.250	0.310	0.510	0.570	0.640	0.750	1.2
Rated speed	RPM	4050	6000	4050	6000	4050	6000	3750
Maximum speed	RPM	8000	8000	8000	8000	8000	8000	7000
Rated torque	N-m	0.60	0.50	1.20	0.90	1.50	1.20	3.10
	lb-In	5.31	4.43	10.63	7.97	13.29	10.63	27.46
Continuous stall torque	N-m	0.80	0.80	1.50	1.50	2.00	2.00	4.20
	lb-In	7.09	7.09	13.29	13.29	17.71	17.71	37.20
Peak torque	N-m	2.40	2.40	4.40	4.40	6.20	6.20	15.00
	lb-In	21.26	21.26	38.97	38.97	54.91	54.91	132.86
Rated current	Arms	1.3	2.4	1.5	2.5	1.6	2.9	2.5
Continuous stall current	Arms	1.3	2.5	1.5	2.9	1.7	3.4	3
Peak current	Arms	5.4	10.8	5.3	10.5	5.9	11.8	15
Torque constant at 150°C	N-m/Arms	0.66	0.33	1.05	0.53	1.21	0.6	1.4
	lb-In/Arms	5.85	2.92	9.30	4.69	10.72	5.31	12.40
Voltage constant	V/KRPM	36.6	18.3	60.1	30	73.4	36.7	79.8
Rotor inertia	kg - m <sup>2</sup>	1.40E-05	1.40E-05	2.20E-05	2.20E-05	3.00E-05	3.00E-05	1.50E-04
	lbs-In-sec <sup>2</sup>	1.24E-04	1.24E-04	1.95E-04	1.95E-04	2.65E-04	2.65E-04	1.33E-03
Motor weight	kg	1.8	1.8	2.2	2.2	2.9	2.9	5.2
	lb	3.97	3.97	4.85	4.85	6.39	6.39	11.47

Parameter	Units	MCS09F60-	MCS09H41-	MCS09H60-	MCS12H15-	MCS12H35-	MCS12L20-	MCS12L41-
Max bus power	VDC	680	680	680	680	680	680	680
Rated power	kW	1.5	1.6	1.9	1.9	2.8	2.8	4.7
Rated speed	RPM	6000	4050	6000	1500	3525	1950	4050
Maximum speed	RPM	7000	7000	7000	6000	6000	6000	6000
Rated torque	N-m	2.40	3.80	3.00	10.00	7.50	13.50	11.00
	lb-In	21.26	33.66	26.57	88.57	66.43	119.57	97.43
Continuous stall torque	N-m	4.20	5.50	5.50	11.40	11.40	15.00	15.00
	lb-In	37.20	48.71	48.71	100.97	100.97	132.86	132.86
Peak torque	N-m	15.00	20.00	20.00	29.00	29.00	56.00	56.00
	lb-In	132.86	177.14	177.14	256.85	256.85	495.99	495.99
Rated current	Arms	4.5	3.4	6	3.8	5.7	5.9	10.2
Continuous stall current	Arms	6	4.3	8.5	4.1	8.2	6.2	12.4
Peak current	Arms	30	20	40	12	24	28	57
Torque constant at 150°C	N-m/Arms	0.7	1.29	0.64	2.79	1.4	2.42	1.21
	lb-In/Arms	6.2	11.43	5.67	24.71	12.40	21.43	10.72
Voltage constant	V/KRPM	39.9	75.7	37.8	172.9	86.5	149.2	74.6
Rotor inertia	kg - m <sup>2</sup>	1.50E-04	1.90E-04	1.90E-04	7.30E-04	7.30E-04	1.06E-03	1.06E-03
	lbs-In-sec <sup>2</sup>	1.33E-03	1.68E-03	1.68E-03	6.46E-03	6.46E-03	9.38E-03	9.38E-03
Motor weight	kg	5.2	6.1	6.1	9.5	9.5	12.6	12.6
	lb	11.47	13.45	13.45	20.95	20.95	27.78	27.78



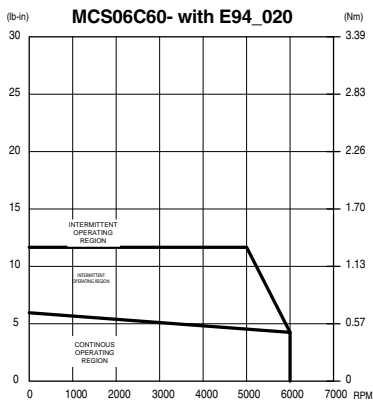
# Motor Speed-Torque Performance Curves

## PositionServo with MCS Series Motors - 480 VAC - 60mm



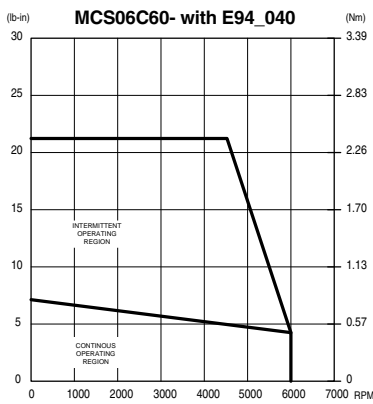
**MCS06C41- with E94\_020T4N \_\_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06C41-C40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	400...480V 3Ø	E94P020T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06C41-RSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	400...480V 3Ø	E94R020T4NRX*	



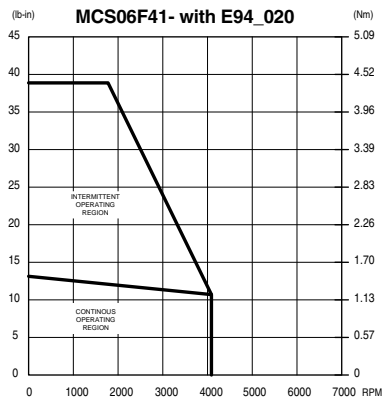
**MCS06C60- with E94\_020T4N \_\_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06C60-C40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	400...480V 3Ø	E94P020T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06C60-RSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	400...480V 3Ø	E94R020T4NRX*	



**MCS06C60- with E94\_040T4N \_\_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06C60-C40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	400...480V 3Ø	E94P040T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06C60-RSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	400...480V 3Ø	E94R040T4NRX*	

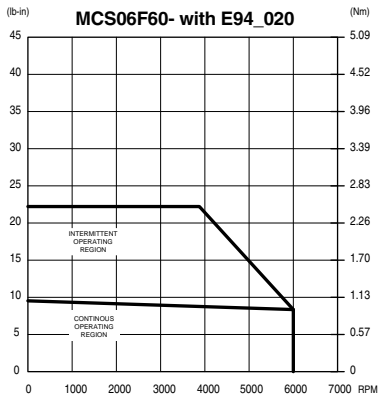


**MCS06F41- with E94\_020T4N \_\_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06F41-C40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	400...480V 3Ø	E94P020T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06F41-RSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	400...480V 3Ø	E94R020T4NRX*	

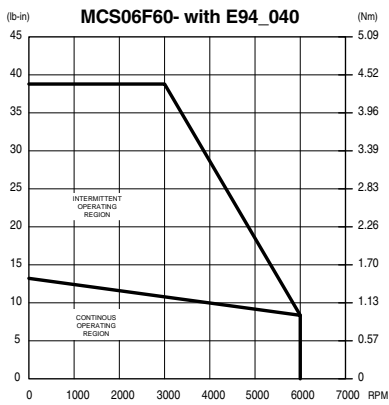
# Motor Speed-Torque Performance Curves

## PositionServo with MCS Series Motors - 480 VAC - 60mm



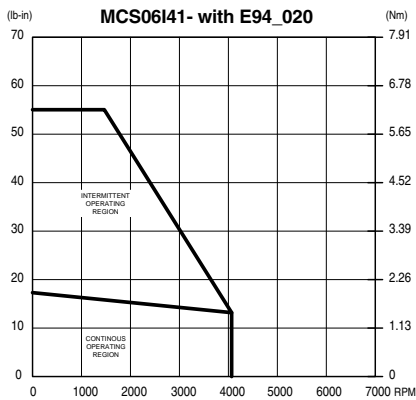
**MCS06F60- with E94\_020T4N \_\_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06F60-C40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	400...480V 3Ø	E94P020T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06F60-RSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	400...480V 3Ø	E94R020T4NRX*	



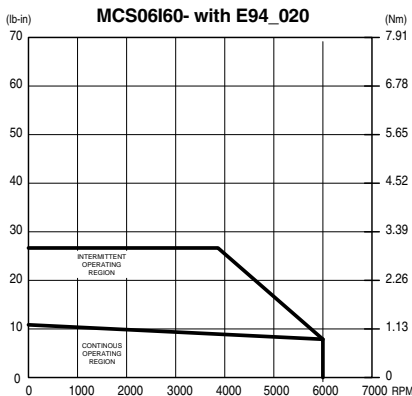
**MCS06F60- with E94\_040T4N \_\_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06F60-C40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	400...480V 3Ø	E94P040T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06F60-RSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	400...480V 3Ø	E94R040T4NRX*	



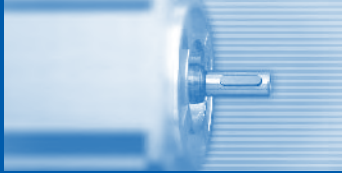
**MCS06F60- with E94\_020T4N \_\_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06I41-C40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	400...480V 3Ø	E94P020T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06I41-RSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	400...480V 3Ø	E94R020T4NRX*	



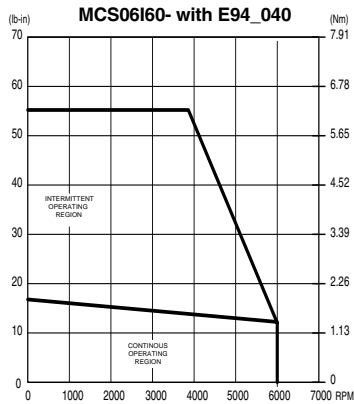
**MCS06F60- with E94\_020T4N \_\_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06I60-C40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	400...480V 3Ø	E94P020T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06I60-RSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	400...480V 3Ø	E94R020T4NRX*	



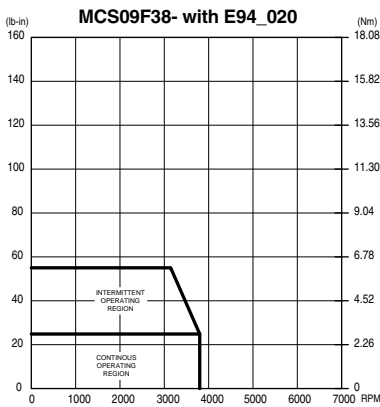
# Motor Speed-Torque Performance Curves

## PositionServo with MCS Series Motors - 480 VAC - 60 and 90mm



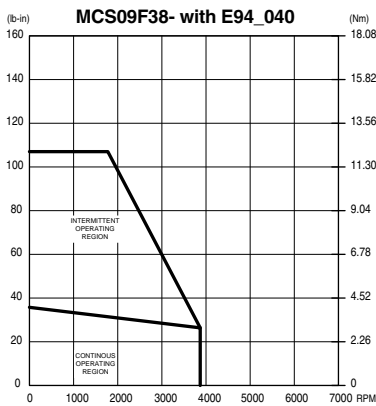
**MCS06I60- with E94\_040T4N\_ \_**

Motor	Connectors	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS06I60-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P040T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS06I60-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R040T4NRX*	



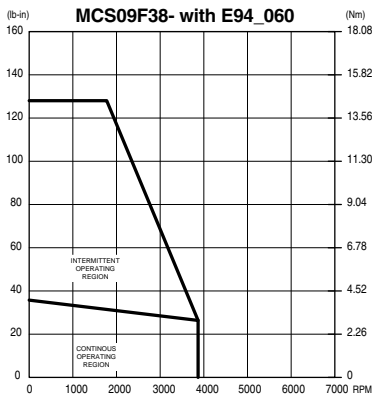
**MCS09F38- with E94\_020T4N\_ \_**

Motor	Connectors	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09F38-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P020T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09F38-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R020T4NRX*	



**MCS09F38- with E94\_040T4N\_ \_**

Motor	Connectors	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09F38-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P040T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09F38-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R040T4NRX*	

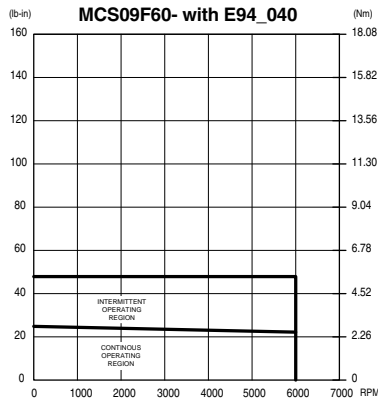


**MCS09F38- with E94\_060T4N\_ \_**

Motor	Connectors	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09F38-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P060T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09F38-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R060T4NRX*	

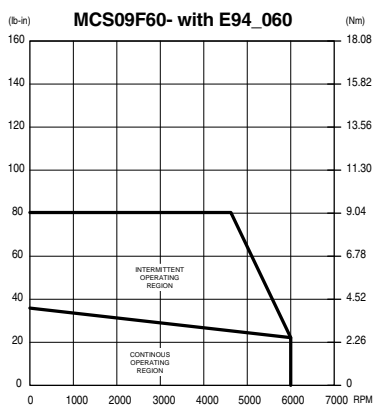
# Motor Speed - Torque Performance Curves

## PositionServo with MCS Series Motors - 480 VAC - 90mm



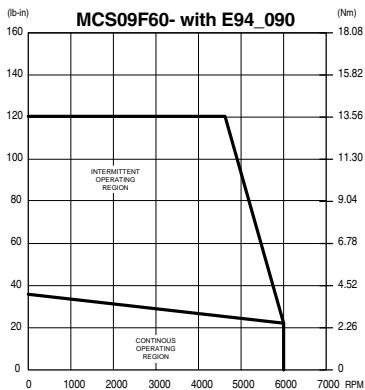
**MCS09F60- with E94\_040T4N\_ \_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09F60-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P040T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09F60-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R040T4NRX*	



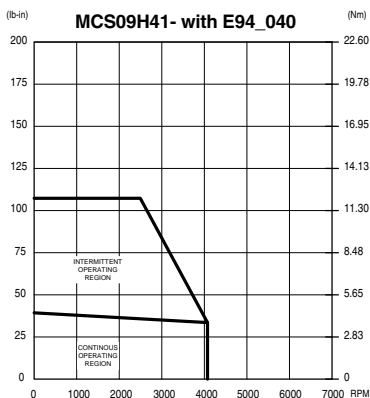
**MCS09F60- with E94\_060T4N\_ \_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09F60-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P060T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09F60-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R060T4NRX*	



**MCS09F60- with E94\_090T4N\_ \_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09F60-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P090T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09F60-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R090T4NRX*	

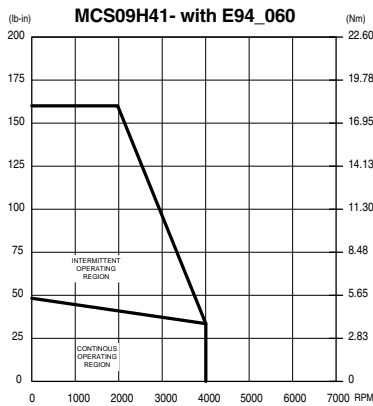
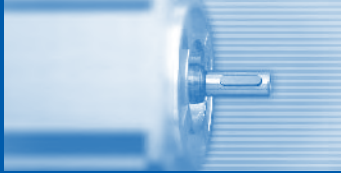


**MCS09H41- with E94\_040T4N\_ \_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09H41-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P040T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09H41-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R040T4NRX*	

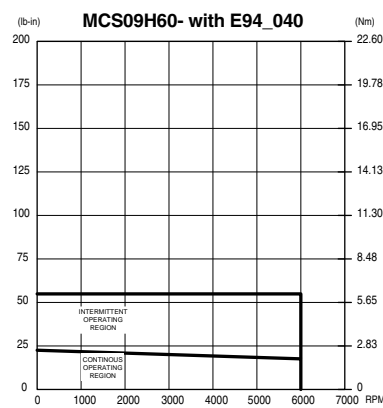
# Motor Speed-Torque Performance Curves

## PositionServo with MCS Series Motors - 480 VAC - 90mm



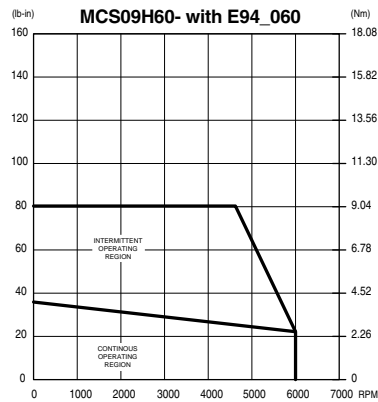
**MCS09H41- with E94\_060T4N\_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09H41-C40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	400...480V 3Ø	E94P060T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09H41-RSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	400...480V 3Ø	E94R060T4NRX*	



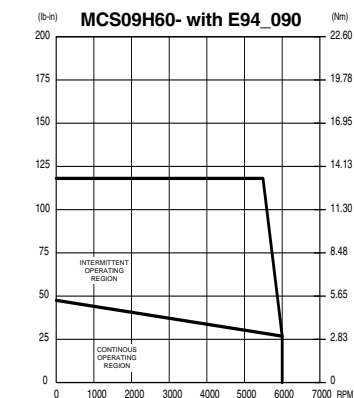
**MCS09H60- with E94\_040T4N\_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09H60-C40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	400...480V 3Ø	E94P040T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09H60-RSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	400...480V 3Ø	E94R040T4NRX*	



**MCS09H60- with E94\_060T4N\_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09H60-C40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	400...480V 3Ø	E94P060T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09H60-RSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	400...480V 3Ø	E94R060T4NRX*	

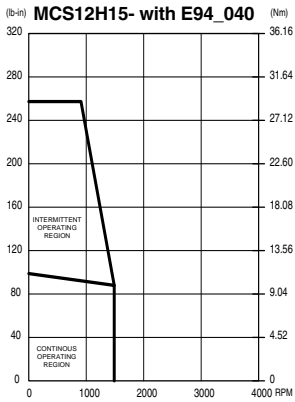


**MCS09H60- with E94\_090T4N\_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS09H60-C40	Encoder	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLE__AE1NA	400...480V 3Ø	E94P090T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS09H60-RSO	Resolver	EWLB__FE1NA ___ = meter length (002, 005, 010)	EWLR__BE1NA	400...480V 3Ø	E94R090T4NRX*	

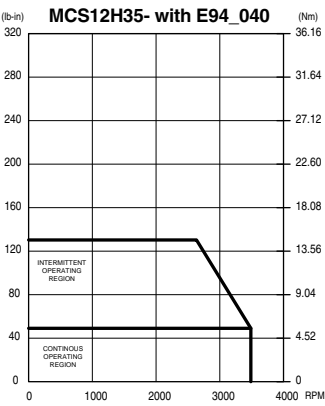
# Motor Speed - Torque Performance Curves

## PositionServo with MCS Series Motors - 480 VAC - 120mm



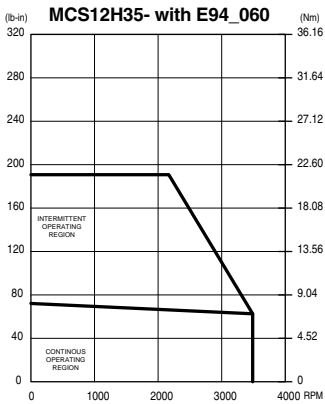
**MCS12H15- with E94\_040T4N\_ \_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS12H15-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P040T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS12H15-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R040T4NRX*	



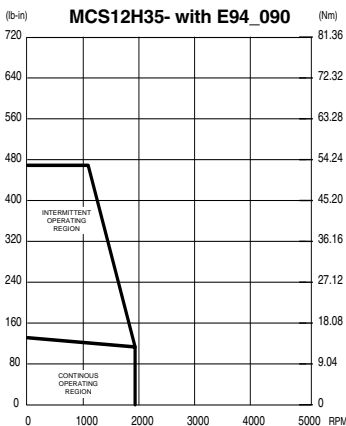
**MCS12H35- with E94\_040T4N\_ \_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS12H35-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P040T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS12H35-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R040T4NRX*	



**MCS12H35- with E94\_060T4N\_ \_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS2H35-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P060T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS2H35-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R060T4NRX*	

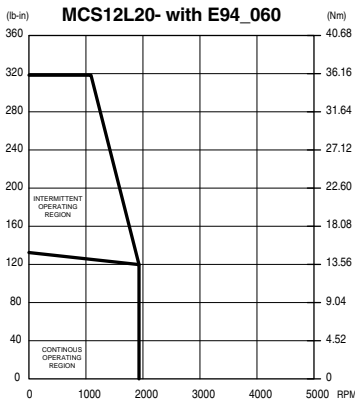
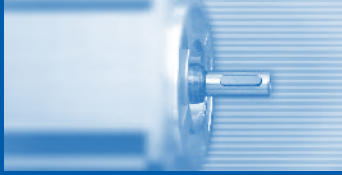


**MCS12H35- with E94\_090T4N\_ \_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS2H35-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P090T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS2H35-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R090T4NRX*	

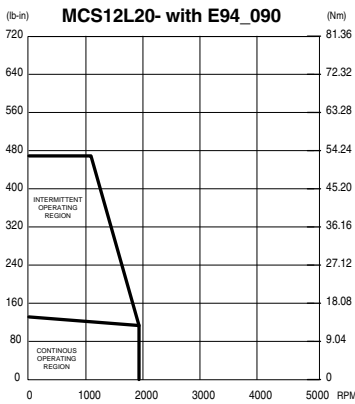
# Motor Speed - Torque Performance Curves

## PositionServo with MCS Series Motors - 480 VAC - 120mm



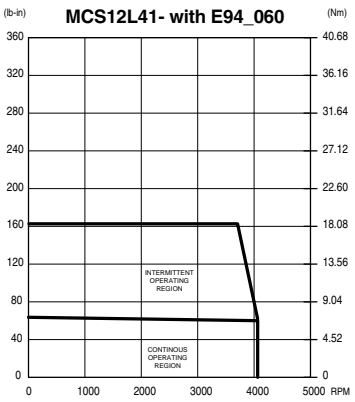
**MCS12L20- with E94\_060T4N\_ \_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS12L20-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P060T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS12L20-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R060T4NRX*	



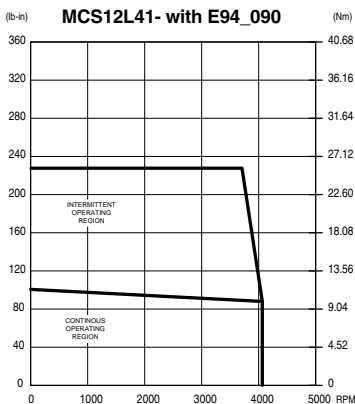
**MCS12L20- with E94\_090T4N\_ \_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS12L20-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P090T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS12L20-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R090T4NRX*	



**MCS12L41- with E94\_060T4N\_ \_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS12L41-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P060T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS12L41-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R060T4NRX*	

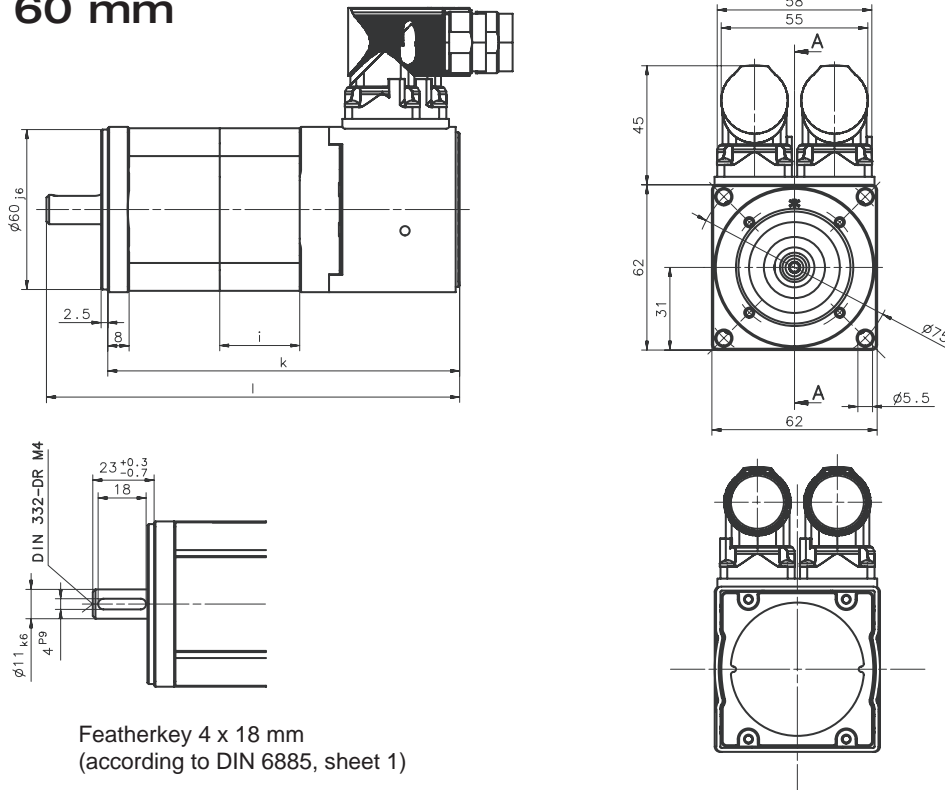


**MCS12L41- with E94\_090T4N\_ \_**

Motor Models	Connectors Feedback	Intermediate Cables		Drives		
		Power	Feedback	Input Voltage	Drive Models	
MCS12L41-C40	Encoder	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLE_ _ _AE1NA	400...480V 3Ø	E94P090T4NEX*	*To order a drive that meets the EN954-1 safety standard replace the "X" in the part number with an "S"
MCS12L41-RSO	Resolver	EWLB_ _ _FE1NA _ _ _ = meter length (002, 005, 010)	EWLR_ _ _BE1NA	400...480V 3Ø	E94R090T4NRX*	

## MCS Size: 60 mm

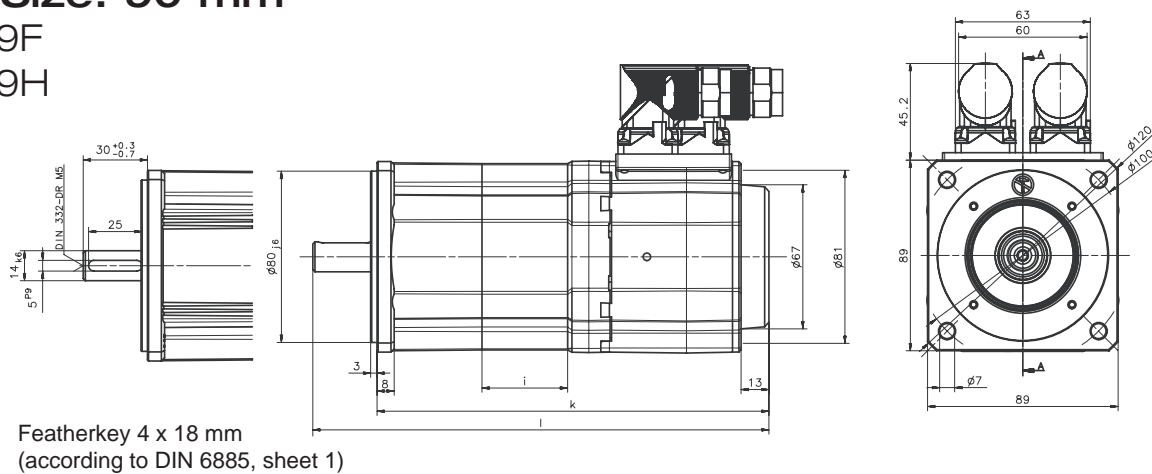
MCS06C  
MCS06F  
MC06I



Dimension	Motor <b>without</b> holding brakes			Motor <b>with</b> holding brakes		
	i	k	l	i	k	l
MCS 06C	30	132	132	30	150.5	173.5
MCS 06F	60	162	185	60	180.5	203.5
MCS 06I	90	192	215	90	210.5	233.5

## MCS Size: 90 mm

MCS09F  
MCS09H



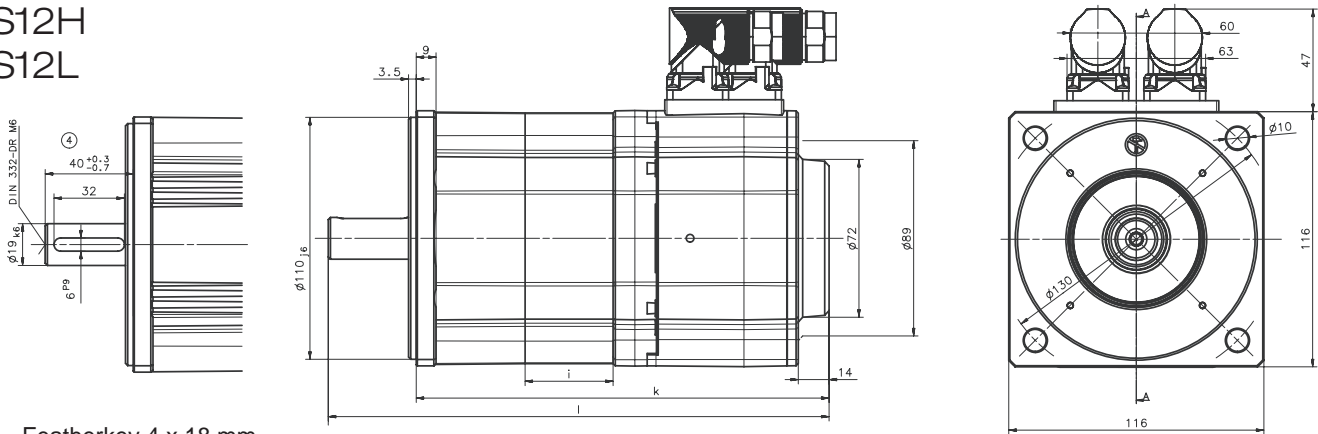
Dimension	Motor <b>without</b> holding brakes			Motor <b>with</b> holding brakes		
	i	k	l	i	k	l
MCS 09F	60	203	233	60	223	253
MCS 09H	80	223	253	80	243	273



## MCS Size: 120 mm

MCS12H

MCS12L



Featherkey 4 x 18 mm  
(according to DIN 6885, sheet 1)

Dimension	Motor <b>without</b> holding brakes			Motor <b>with</b> holding brakes		
	i	k	l	i	k	l
MCS 12H	80	228	268	80	248	288
MCS 12L	120	268	308	120	288	328



The PositionServo offers numerous accessories to complete your motion control system. The following pages describe all of the options available to you:

- Communication Modules
- Feedback Modules
- Breakout Modules
- EMC Filters
- Dynamic Braking Resistors

## Communication, Feedback and Breakout Modules

Communication Modules	
Item Number	Description
E94ZACAN1	CANopen Communication Module
E94ZARS41	RS-485 Communication Module

Feedback Modules	
Item Number	Description
E94ZAENC1	Second Encoder Feedback Module
E94ZARSV2	Resolver Feedback Module (Scalable)
E94ZARSV3	Resolver Feedback Module (Standard)

Breakout Modules	
Item Number	Description
E94ZAHBK2	Motor Brake Terminal Block & SCSI [F] I/O Module
E94ZATBO2	Terminal Block I/O Module
E94ZASCA2	Panel Saver SCSI [F] I/O Module



CANopen Communication Module



RS-485 Communication Module



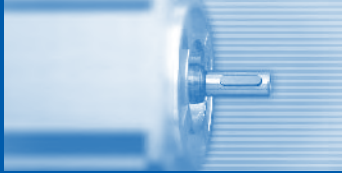
Optional Resolver Module



Second Encoder Feedback Module

## Designation Codes:

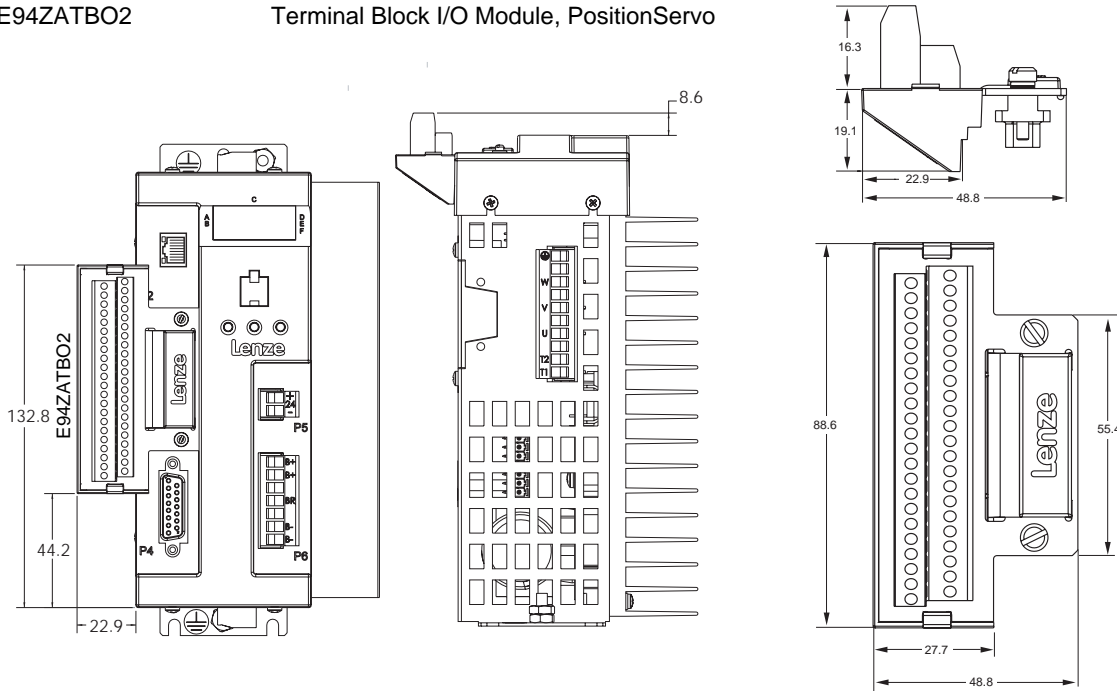
	<b>E94Z</b>	<b>A</b>	<b>CAN</b>	<b>1</b>
<b>Electrical Option in the PositionServo</b>				
<b>Option Type</b>				
A = Communication, Feedback or Breakout Module				
<b>Option Type (Option Type A):</b>				
CAN = CANopen Communication Module				
RS4 = RS-485 Communication Module				
ETH = Ethernet Communication Module				
ENC = 2nd Encoder Feedback Module				
RSV = Resolver Feedback Module				
HBK = Motor Brake Terminal Block I/O Module				
TBO = Terminal Block I/O Module				
SCA = Panel Saver I/O Module				
<b>Variations:</b>				
1 = 1st Variation 2 = 2nd Variation 3 = 3				



## Breakout Module

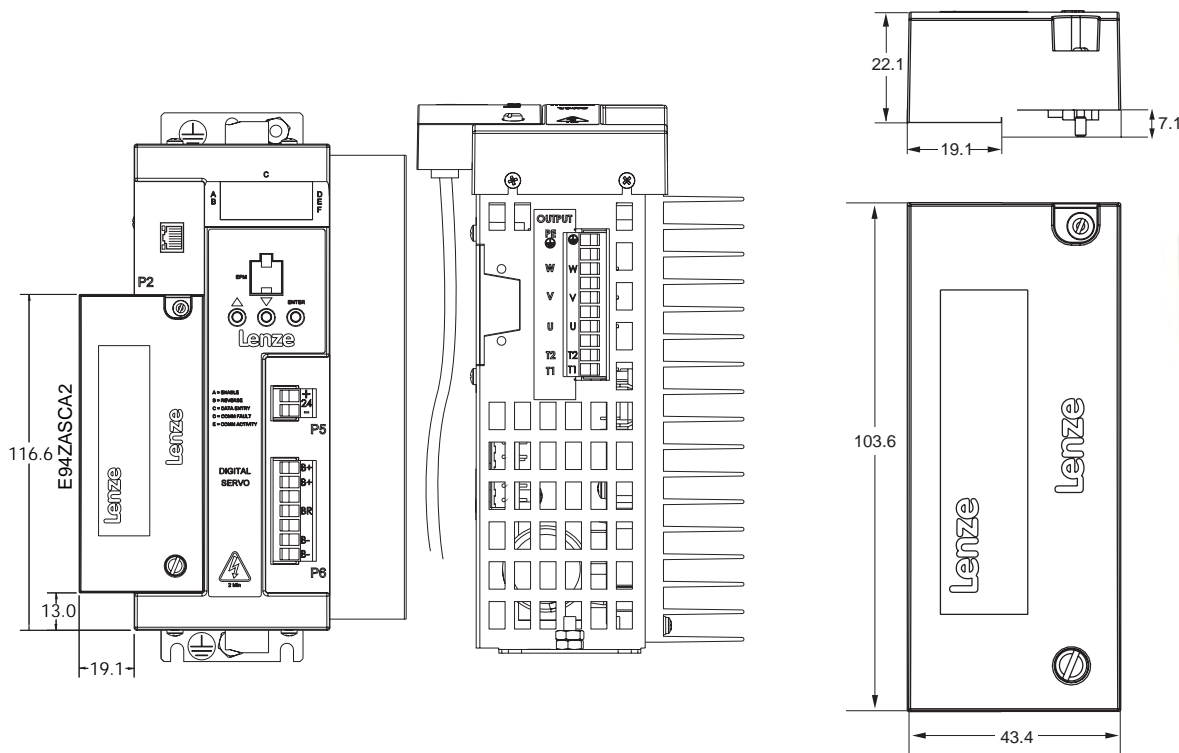
Item Number	Description
E94ZATBO2	Terminal Block I/O Module, PositionServo

Dimensions are in mm



## Breakout Module

Item Number	Description
E94ZASCA2	Panel Saver SCSI [F] I/O Module, PositionServo

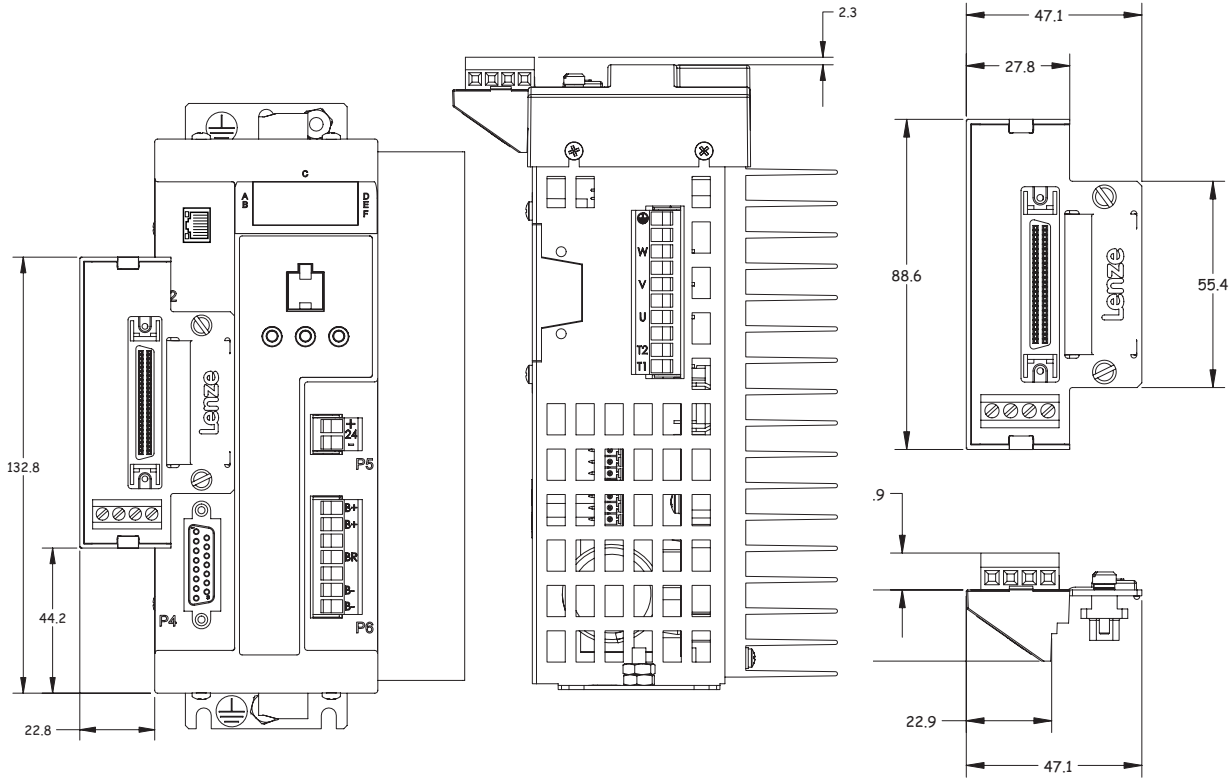


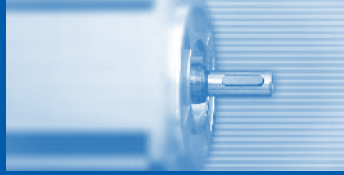


# Breakout Module

**Item Number**  
E94ZAHBK2

**Description**  
Terminal Block with Brake I/O Module, PositionServo





## PositionServo EMC Filters:

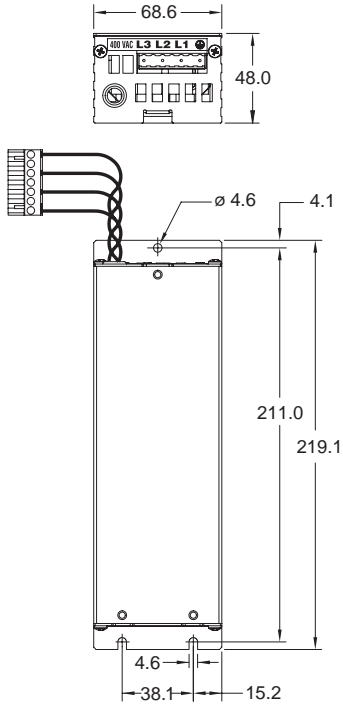
EMC Filters				
Mounting	Item Number	Compatible Drives	Phase	Filter Output Current [In]
Footprint	E94ZF04T4A1	E94_020Y2N, E94_020T4N	3Ø Only	4.4
Footprint	E94ZF07T4A1	E94_040Y2N, E94_040T4N	3Ø Only	6.9
Footprint	E94ZF15T4A1	E94_080Y2N	3Ø Only	15
Footprint	E94ZF15T4A2	E94_100Y2N	3Ø Only	15
Side Mount	E94ZF12T4A1	E94_060T4N	3Ø Only	12.0
Side Mount	E94ZF24S2A1	E94_120Y2N	1Ø Only	24.0

## EMC Filters Designation Code:

	<b>E94Z</b>	<b>F</b>	<b>04</b>	<b>T</b>	<b>4</b>	<b>A1</b>
<b>Electrical Option in the PositionServo</b>						
<b>Filter Type:</b> F = EMC Filter						
<b>Filter Current Rating in Amps</b> 04 = 4.4 Amps    07 = 6.9 Amps    12 = 12 Amps    15 = 15 Amps    24 = 24 Amps						
<b>Input Phase</b> S = Single Phase T = Three Phase						
<b>Max. Voltage:</b> 2 = 240 VAC 4 = 400/480 VAC						
<b>Degree of Filtering/Variation</b> A1 = Industrial/1st Variation A2 = Industrial/2nd Variation						

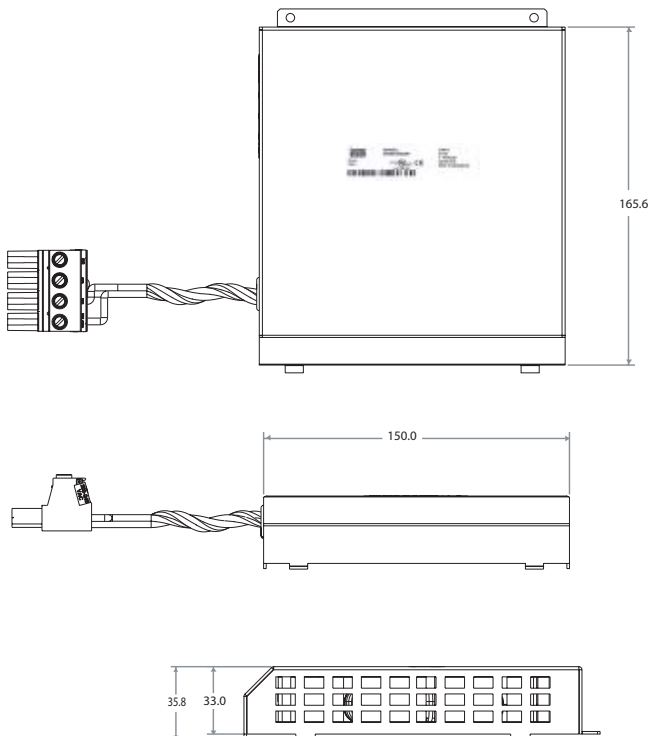
## Footprint Filter

Dimensions are in mm



Model Number	Drive Compatibility	I <sub>n</sub> (A)	m (kg)
E94ZF04T4A1	E94_020Y2N, E94_020T4N, E94_020S1N	4.4	0.8
E94ZF07T4A1	E94_040T2N, E94_040T4N, E94_040S1N	6.9	
E94ZF15T4A1	E94_080Y2N	15.0	
E94ZF15T4A2	E94_100Y2N	15.0	

## Sidemount Filter



Model Number	Drive Compatibility	I <sub>n</sub> (A)	m (kg)
E94ZF24S2A1	E94_120Y2N (1Ø)	24.0	0.6
E94ZF12T4A1	E94_060T4N	12.0	



The E94ZB series of dynamic braking resistors can be used to keep the bus voltage rise below the shutdown level of the over voltage protection. Bus voltage rise may happen when a rotating load is decelerated or a load is descending vertically. In this situation, the mechanical energy stored in the load is converted back to electrical energy in the motor. This process is called regeneration.

### Dynamic Braking Resistors:

Resistor Model	R, Ohm	Rated Continuous Power on Heat Sink, Watts
E94ZB20A150A	20	150
E94ZB30A150A	30	150
E94ZB40A080A	40	80
E94ZB75A150A	75	150
E94ZBF0A080A	150	80

**Note:**

- 1.) The rated continuous power with heat sink is measured when the resistor is mounted vertically on an aluminum plate (200x200x3mm) at the room temperature 25°C. Derate the continuous power for the following conditions:

Ambient Temperature	Derate the Rated Power	
	With aluminum plate (200X200X3mm)	Without aluminum plate (i.e., Free Air)
25 °C	No derating	Derate by 20%
40 °C	Derate by 5%	Derate by 25%

- 2.) The continuous power supplied to the resistor shall not exceed the continuous power rating of the resistor.
- 3.) The surface temperature can reach up to 200°C.

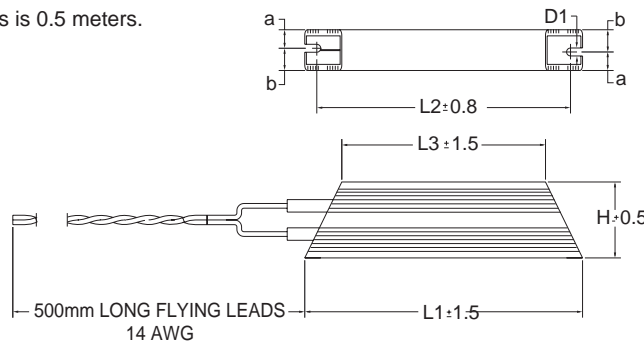
**WARNING!** Do not put any flammable material close to the resistor.

- 4.) Resistors must be vertically mounted on heat sink or metal plate for adequate cooling and safe operation.

### Dynamic Brake Resistor Dimensions:

Model Number	Dimensions (mm)							Weight (kg)
	L1	L2	L3	H	D1±0.3	W = a + b		
						a	b	
E94ZB20A150A	210	197	170	41	4.3	10	12	0.29
E94ZB30A150A	210	197	170	41	4.3	10	12	0.29
E94ZB40A080A	150	137	110	41	4.3	10	12	0.19
E94ZB75A150A	210	197	170	41	4.3	10	12	0.29
E94ZBF0A080A	150	137	110	41	4.3	10	12	0.19

\*The length of the flying leads is 0.5 meters.



### PositionServo Drive Compatibility Between Resistors

Resistor Model	Compatible 940 Drive Models
E94ZB40A080A	E94_020S1N, E94_040S1N E94_020S2F, E94_040S2F E94_020Y2N, E94_040Y2N
E94ZB30A150A	E94_120Y2N
E94ZB20A150A	E94_080S2F, E94_100S2F E94_080Y2N, E94_100Y2N
E94ZBF0A080A	E94_020T4N
E94ZB75A150A	E94_040T4N, E94_050T4N E94_060T4N

Putting your system together is now simple. The following pages give details and specifications for all of the PositionServo and motor system cables. Refer to the tables below as a quick reference guide.

## Motor System Cables

Motor Family	Motor Power Cables	Encoder Cables	Resolver Cables
MAS	EWLM___FC1NA	EWLE___AB1NA EWLE___AD1NA	NA
MUS05	EWLB___FD1NA	EWLE___AD1NA	EWLR___BD1NA
MUS08 MUS10 MUS14	EWLB___FE1NA	EWLE___AD1NA	EWLR___BD1NA
MCS	EWLB___FE1NA	EWLE___AE1NA	EWLR___BE1NA

## Additional System Cables

Cable	Description
EWLE___CF1NA	2nd Encoder Feedback Cable
EWLN002SF1NA	2 meter I/O Expansion Cable

## Cable Model Number Designation Code

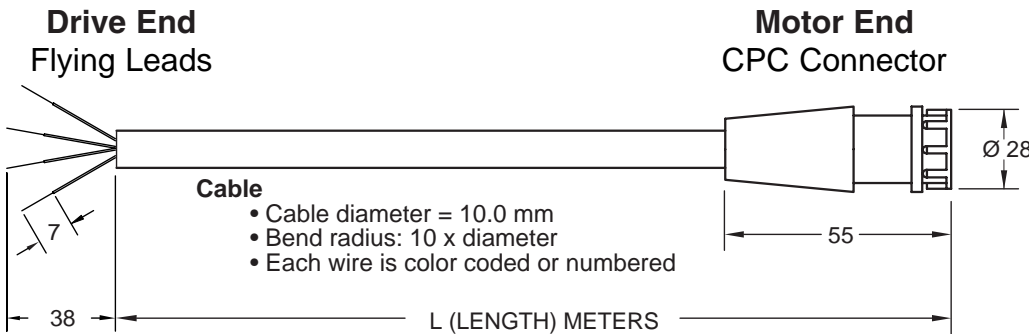
EWL	M	005	F	D	1NA
<b>Electrical Cable</b>					
<b>Cable Configuration:</b>					
M = Power Cable for Servo Motor					
B = Power Cable for Servo Motor with Mechanical Brake					
E = Control Cable for Encoder Feedback					
R = Control Cable for Resolver Feedback					
N = Control: I/O Expansion Cable					
<b>Cable Length [meters]:</b>					
002 = 2.5 meters					
005 = 5 meters					
010 = 10 meters					
<b>Connector Type [Drive End]:</b>					
A = DB-15 [M]					
B = DB-9 [M]					
C = DB-9 [F]					
F = Flying Leads					
S = SCSI (50-pin)					
<b>Connector Type [Feedback/Motor End]:</b>					
B = DB-15 [F]					
C = CPC Connector					
D = IP65 M17 Plug [F]					
E = IP65 M23 Plug [F]					
F = Flying leads					
<b>Variations/Cable Construction:</b>					
1NA = 1st Variation/Normal Construction					
2NA = 2nd Variation/Normal Construction					



## Power Cables – CPC Connector

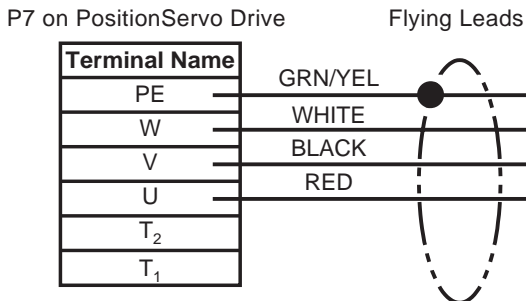
Model #	Specifications	Length
EWLM002FC1NA:	1.3 mm <sup>2</sup> /16 AWG power cable, <= 12 amps drive output current	L = 2.5 meters
EWLM005FC1NA:	1.3 mm <sup>2</sup> /16 AWG power cable, <= 12 amps drive output current	L = 5.0 meters
EWLM010FC1NA:	1.3 mm <sup>2</sup> /16 AWG power cable, <= 12 amps drive output current	L = 10.0 meters

Dimensions are in millimeters.



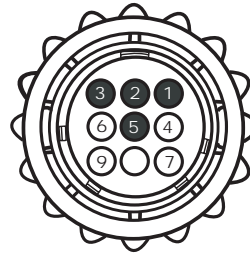
COMPATIBLE MOTORS
MAS_-----CB0

## Flying Leads - wiring to Position Servo Drive



## CPC Connector

401-227 conn., plug, CPC 13-9 round Tyco #206708-1



**WARNING:** Do not connect U, V, W wires to PTC Input! Severe damage to the drive will result.

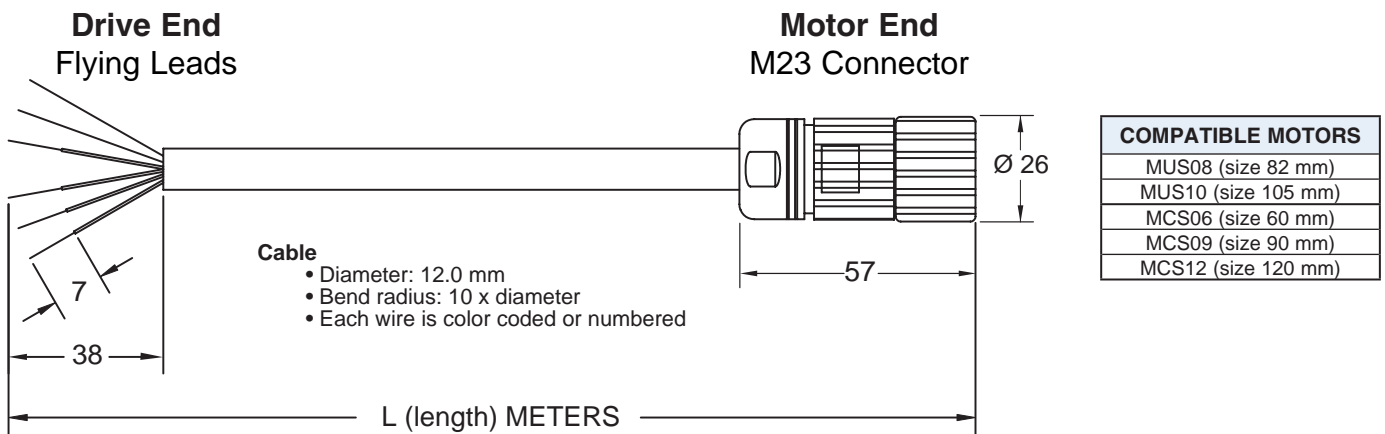
PIN	WIRE COLOR/NUMBER	TERMINAL NAME
1	RED	U (R)
2	BLACK	V (S)
3	WHITE	W (T)
4		
5	GRN/YEL	PE
6		
7		
8		
9		

## Power Cables – M23 Connector [Motor] to flying leads [Drive]

Model #	Specifications	Length
EWLB002FE1NA:	1.5 mm <sup>2</sup> /16 AWG power cable, <= 12 amps drive output current	*L = 2.5 meters
EWLB005FE1NA:	1.5 mm <sup>2</sup> /16 AWG power cable, <= 12 amps drive output current	*L = 5.0 meters
EWLB010FE1NA:	1.5 mm <sup>2</sup> /16 AWG power cable, <= 12 amps drive output current	*L = 10.0 meters

\*Length includes brake leads. These cables can be used for both brake and non-brake motors.

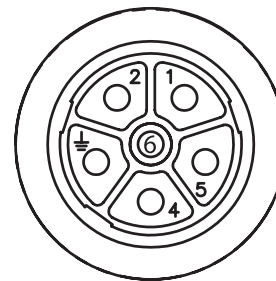
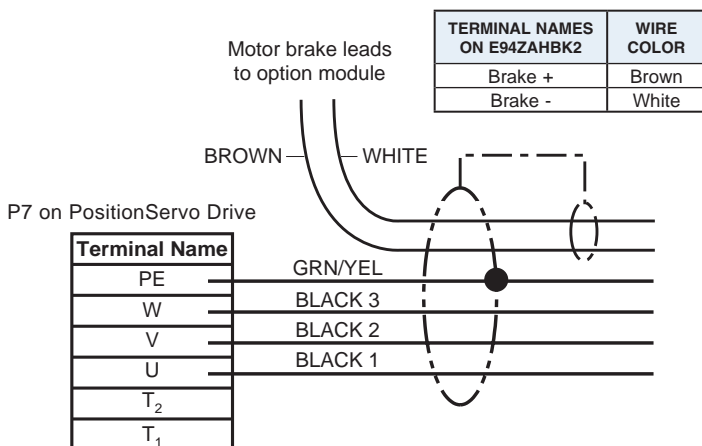
Dimensions are in millimeters.



### Flying Leads - wiring to PositionServo Drive

### M23 Connector

401-231 Intercontec #BSTA107FR03580036000



PIN	WIRE COLOR/NUMBER	TERMINAL NAME
1	WHITE	MOTOR BRAKE -
2	BROWN	MOTOR BRAKE +
3	GRN/YEL	PE
4	BLACK 1	U (R)
5	BLACK 2	V (S)
6	BLACK 3	W (T)

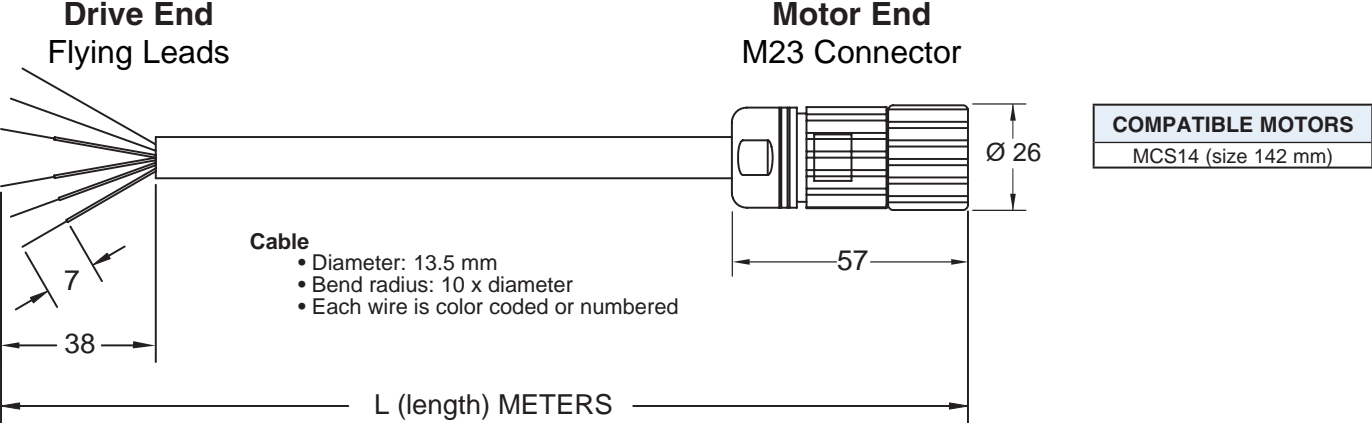


**WARNING:** Do not connect U, V, W wires to PTC Input! Severe damage to the drive will result.



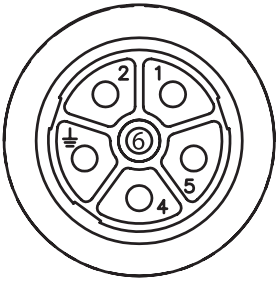
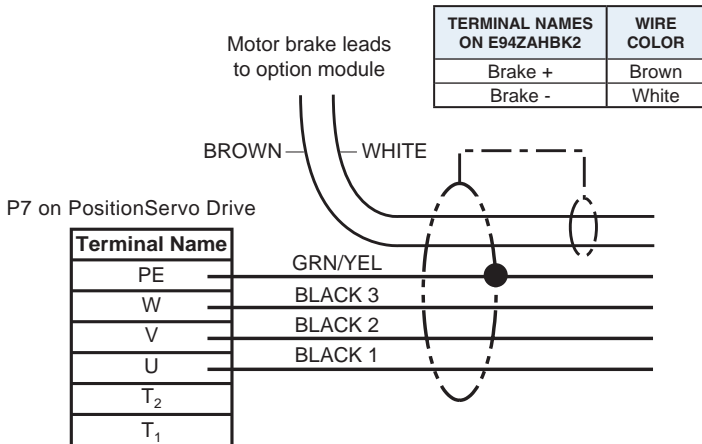
Power Cables – M23 Connector [Motor] to flying leads [Drive]		
Model #	Specifications	Length
EWLB002FE2NA:	2.5 mm <sup>2</sup> /14 AWG power cable, <= 18 amps drive output current	*L = 2.5 meters
EWLB005FE2NA:	2.5 mm <sup>2</sup> /14 AWG power cable, <= 18 amps drive output current	*L = 5.0 meters
EWLB010FE2NA:	2.5 mm <sup>2</sup> /14 AWG power cable, <= 18 amps drive output current	*L = 10.0 meters

\*Length includes brake leads. These cables can be used for both brake and non-brake motors. Dimensions are in millimeters.



**Flying Leads - wiring to PositionServo Drive**

**M23 Connector**  
401-231 Intercontec #BSTA107FR03580036000



PIN	WIRE COLOR/NUMBER	TERMINAL NAME
1	WHITE	MOTOR BRAKE -
2	BROWN	MOTOR BRAKE +
3	GRN/YEL	PE
4	BLACK 1	U (R)
5	BLACK 2	V (S)
6	BLACK 3	W (T)

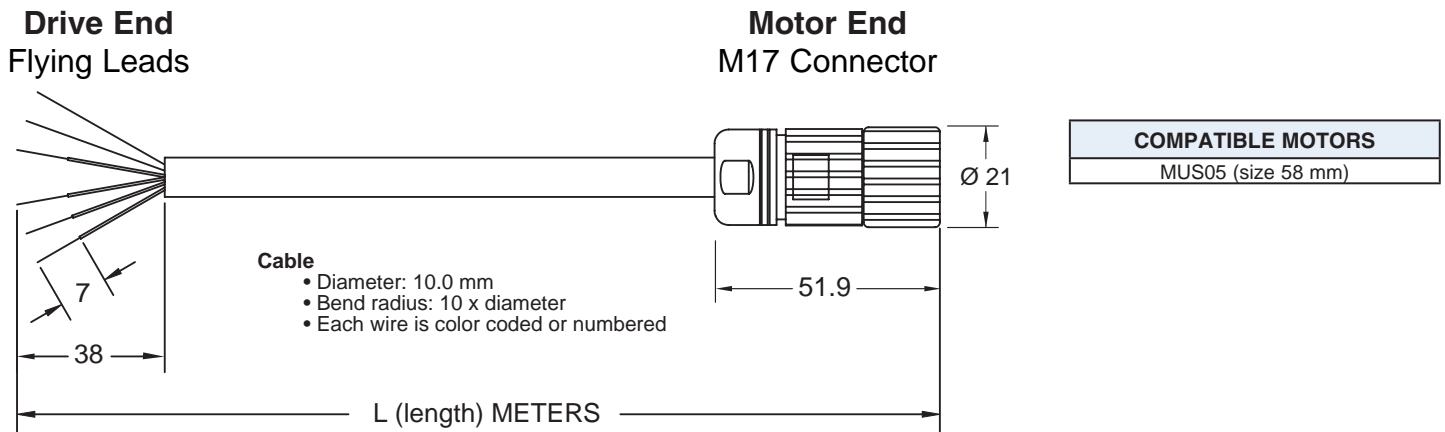
**WARNING:** Do not connect U, V, W wires to PTC Input! Severe damage to the drive will result.

## Power Cables – M17 Connector [Motor] to flying leads [Drive]

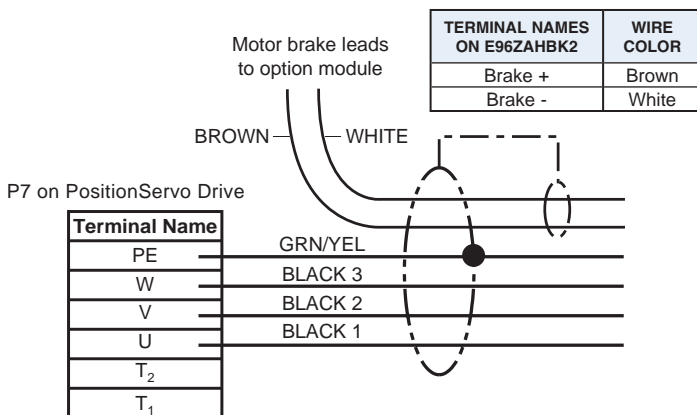
Model #	Specifications	Length
EWLB002FD1NA:	1.3 mm <sup>2</sup> /16 AWG power cable, <= 12 amps drive output current	* L = 2.5 meters
EWLB005FD1NA:	1.3 mm <sup>2</sup> /16 AWG power cable, <= 12 amps drive output current	* L = 5.0 meters
EWLB010FD1NA:	1.3 mm <sup>2</sup> /16 AWG power cable, <= 12 amps drive output current	* L = 10.0 meters

\*Length includes brake leads. These cables can be used for both brake and non-brake motors.

Dimensions are in millimeters.

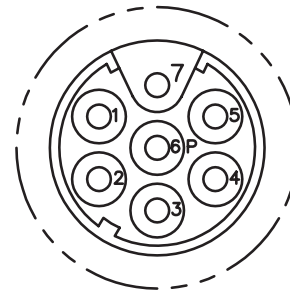


## Flying Leads - wiring to PositionServo Drive



## M17 Connector

401-210 Intercontec# BSTA880FR0886001A000



PIN	WIRE COLOR/NUMBER	TERMINAL NAME
1	WHITE	MOTOR BRAKE -
2	BROWN	MOTOR BRAKE +
3		
4	BLACK 1	U (R)
5	BLACK 2	V (S)
6	BLACK 3	W (T)
7	GRN/YEL	PE



**WARNING:** Do not connect U, V, W wires to PTC Input! Severe damage to the drive will result.

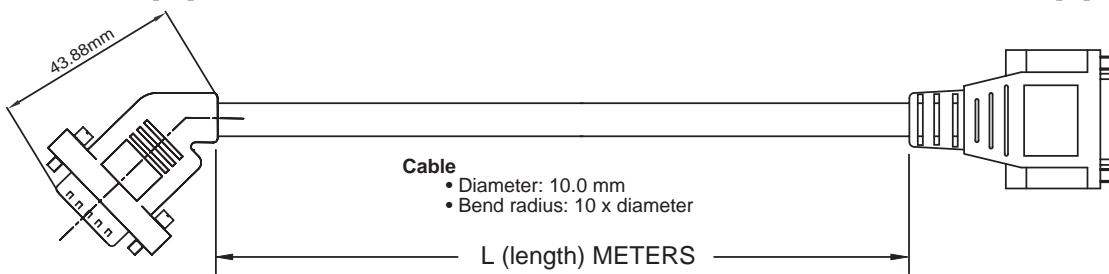
## Encoder Cables – DB-15 Connectors

Model #	Specifications	Length
EWLE002AB1NA:	DB-15 [M] connector on drive end, DB-15 [F] connector on motor end	L = 2.5 meters
EWLE005AB1NA:	DB-15 [M] connector on drive end, DB-15 [F] connector on motor end	L = 5.0 meters
EWLE010AB1NA:	DB-15 [M] connector on drive end, DB-15 [F] connector on motor end	L = 10.0 meters

### Drive End DB-15 [M]

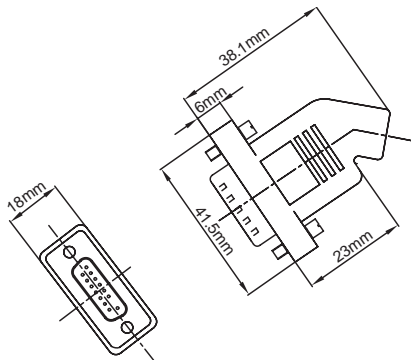
### Motor End DB-15 [F]

Dimensions are in millimeters.

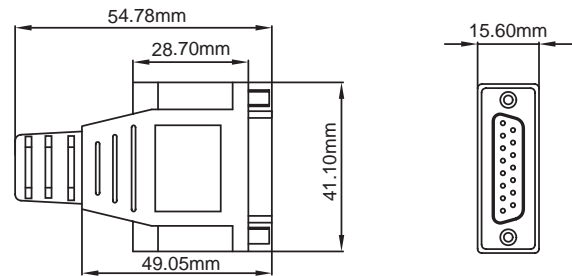


COMPATIBLE MOTORS
MAS Motors (MAS _____ -BB0)
MAS Motors (MAS _____ -CB0)
MAS Motors (MAS _____ -DB0)

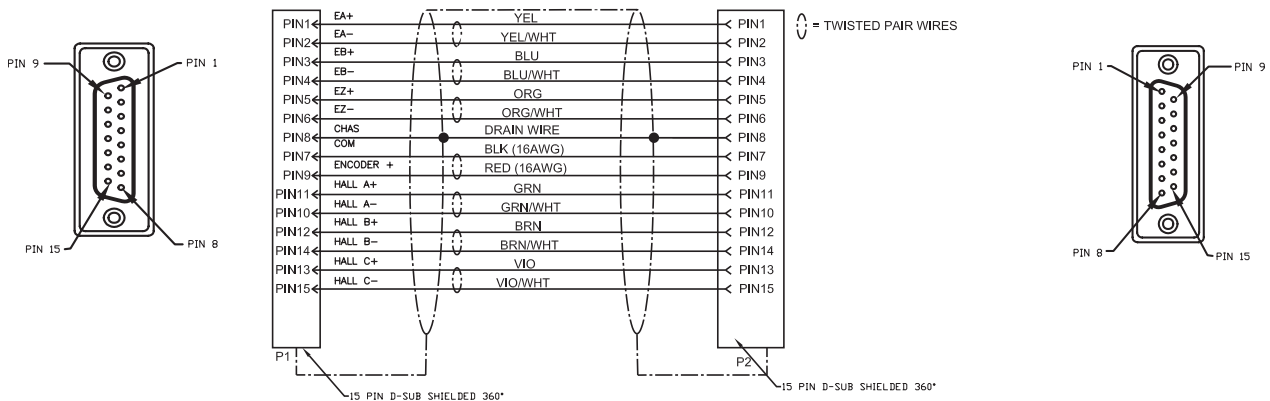
### DB-15 [F] Connector



### DB-15 [M] Connector Dimensions



### Pin Outs

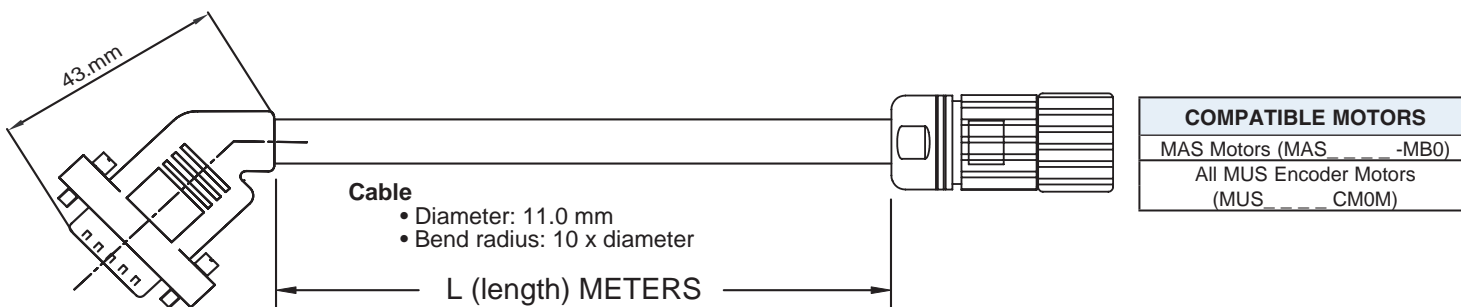


## Encoder Cables – M17 [Motor] and DB-15 [Drive] connectors

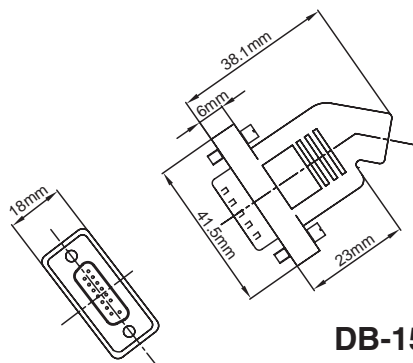
Model #	Specifications	Length
EWLE002AD1NA:	DB-15 [M] connector on drive end, M17 [F] connector on motor end	L = 2.5 meters
EWLE005AD1NA:	DB-15 [M] connector on drive end, M17 [F] connector on motor end,	L = 5.0 meters
EWLE010AD1NA:	DB-15 [M] connector on drive end, M17 [F] connector on motor end	L = 10.0 meters

### Drive End DB-15 [M] Connector

### Motor End M17 [F] Connector

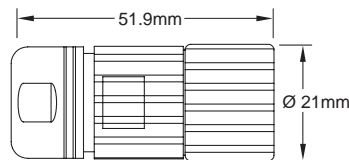


### DB-15 [M] Connector Dimensions

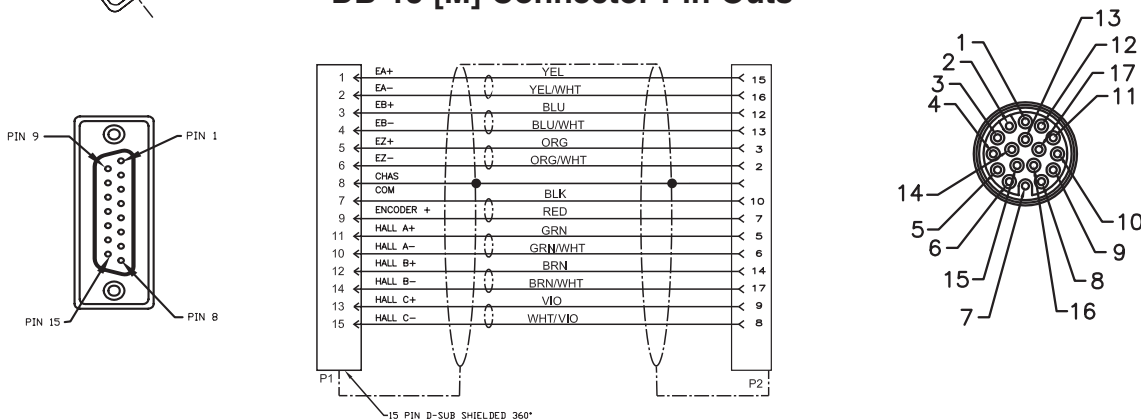


### M17 Connector

401-212 Intercontec # ASTA876FR1086001A000



### DB-15 [M] Connector Pin Outs

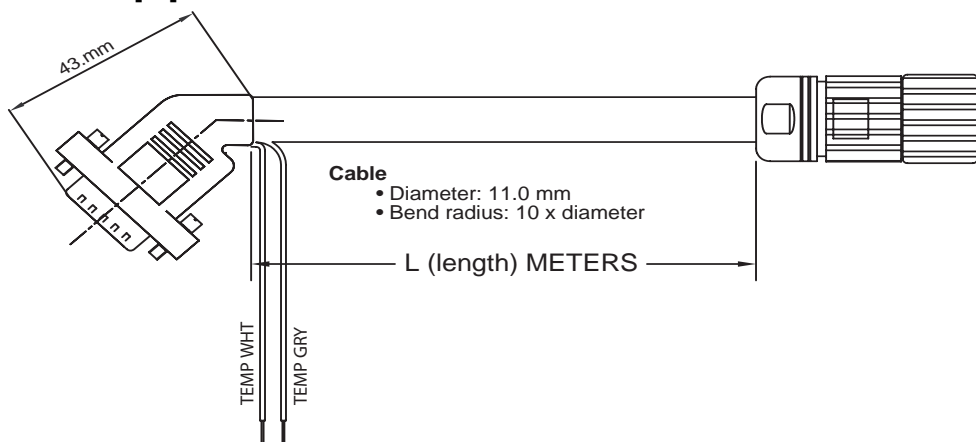


## Encoder Cables – M23 [Motor] and DB-15 [Drive] connectors

Model #	Specifications	Length
EWLE002AE1NA:	DB-15 [M] connector on drive end, M23 connector on motor end	L = 2.5 meters
EWLE005AE1NA:	DB-15 [M] connector on drive end, M23 connector on motor end	L = 5.0 meters
EWLE010AE1NA:	DB-15 [M] connector on drive end, M23 connector on motor end	L = 10.0 meters

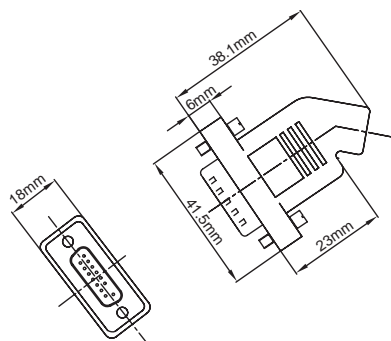
### Drive End DB-15 [M] Connector

### Motor End M23 Connector



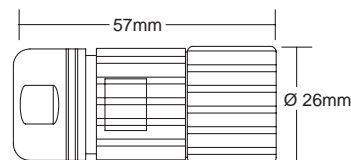
COMPATIBLE MOTORS
All MCS Encoder Motors (MCS_____C40)

### DB-15 [M] Connector Dimensions

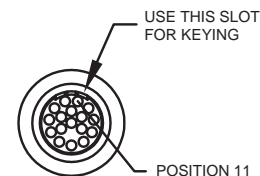
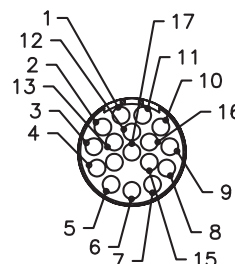
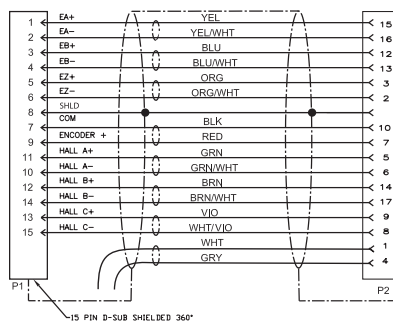
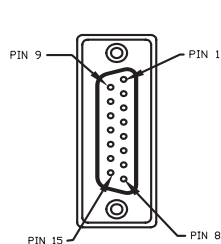


### M23 Connector

401-224 Intercontec # ASTA035FR01610035000



### DB-15 [M] Connector - Pin Outs

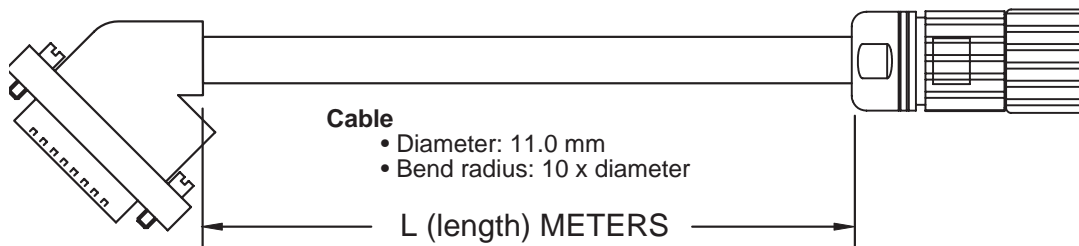




Resolver Cable - M23 [Motor] and DB-9 [Drive] Connectors		
Model #	Specifications	Length
EWLR002BE1NA:	DB-9 [M] connector on drive end, M23 connector on motor end	L = 2.5 meters
EWLR005BE1NA:	DB-9 [M] connector on drive end, M23 connector on motor end	L = 5.0 meters
EWLR010BE1NA:	DB-9 [M] connector on drive end, M23 connector on motor end	L = 10.0 meters

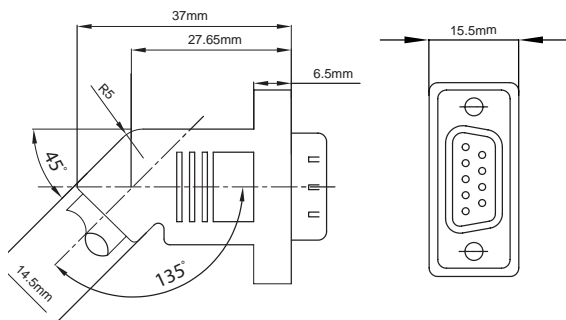
**Drive End**  
DB-9 [M] Connector

**Motor End**  
M23 Connector



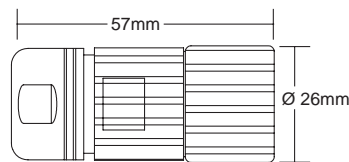
COMPATIBLE MOTORS
All MCS Resolver Motors (MCS_____RMOM)

## Connector Dimensions

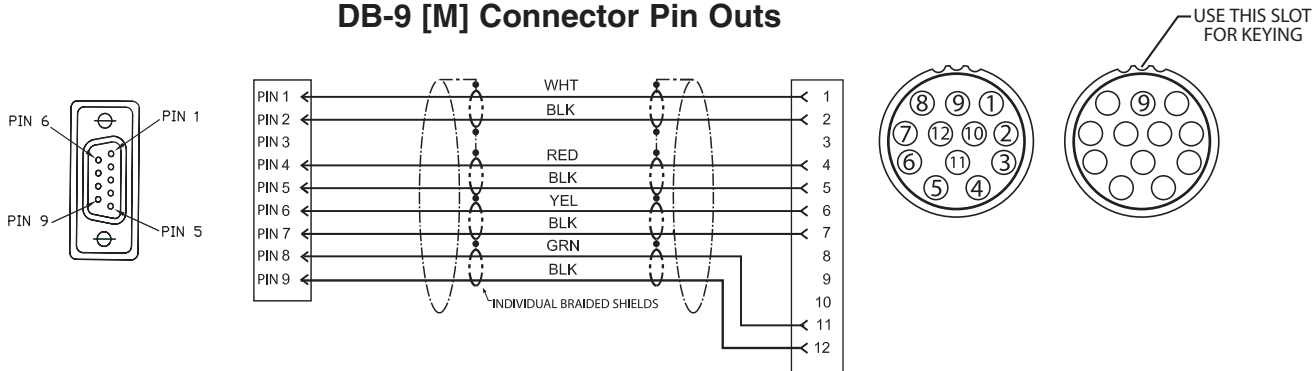


## M23 Connector

401-238 Intercontec # ASTA021FR01610035000



## DB-9 [M] Connector Pin Outs





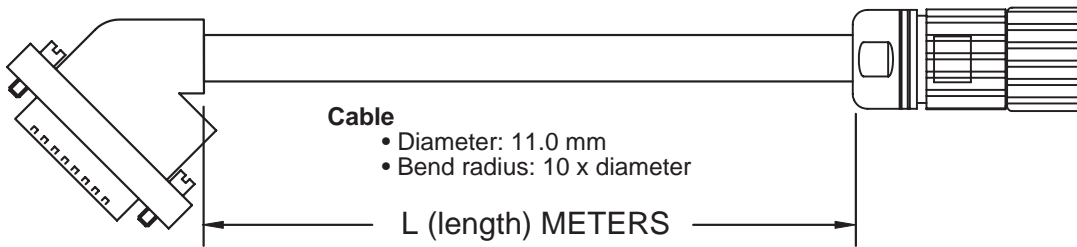


## Resolver Cable - M17 [Motor] and DB-9 [Drive] Connectors

Model #	Specifications	Length
EWLR002BD1NA:	DB-9 [M] connector on drive end, M17 [M] connector on motor end	L = 2.5 meters
EWLR005BD1NA:	DB-9 [M] connector on drive end, M17 [M] connector on motor end	L = 5.0 meters
EWLR010BD1NA:	DB-9 [M] connector on drive end, M17 [M] connector on motor end	L = 10.0 meters

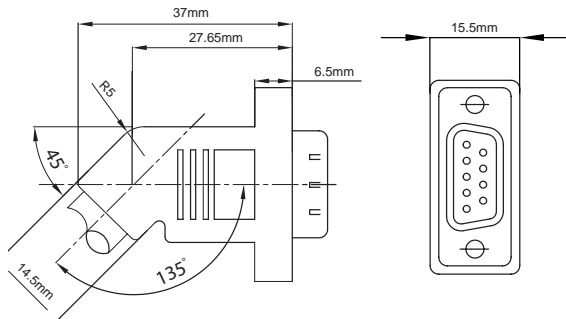
**Drive End**  
DB-9 [M] Connector

**Motor End**  
M17 [M] Connector



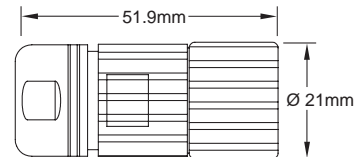
COMPATIBLE MOTORS
All MUS Resolver Motors (MUS_ _ _ _ RM0M) and (MUS_ _ _ _ RE0M)

## Connector Dimensions

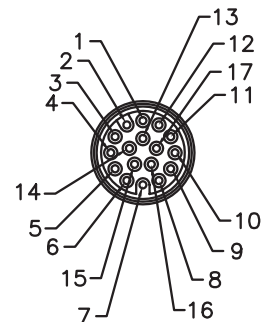
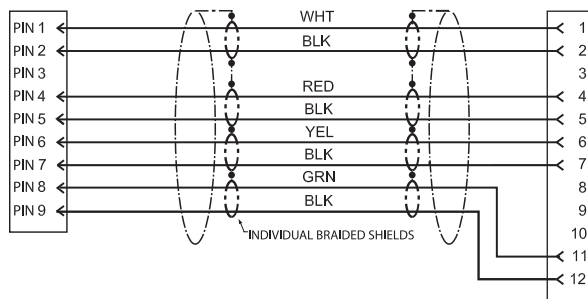
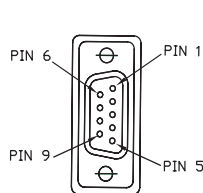


## M17 Connector

401-212 Intercontec # ASTA876FR1086001A000



## DB-9 [M] Connector Pin Outs

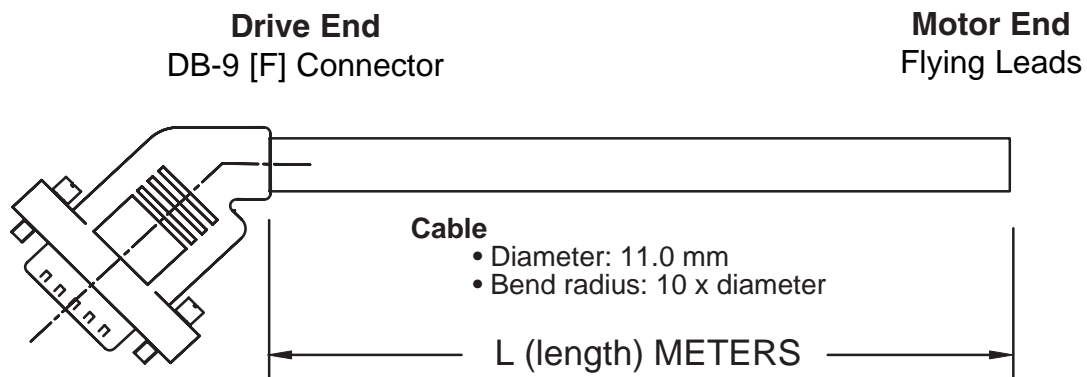




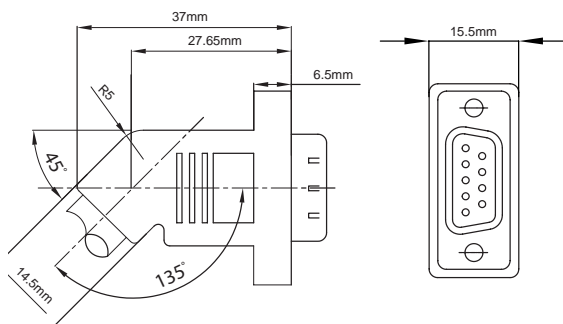
## 2nd Encoder Cable - DB-9 [Drive] Connector to flying leads

Model #	Specifications	Length
EWLE002CF1NA:	DB-9 [F] connector on drive end to flying leads	L = 2.5 meters
EWLE005CF1NA:	DB-9 [F] connector on drive end to flying leads	L = 5.0 meters
EWLE010CF1NA:	DB-9 [F] connector on drive end to flying leads	L = 10.0 meters

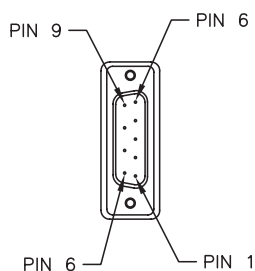
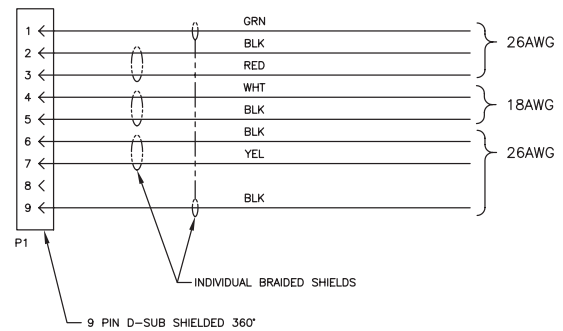
Dimensions are in millimeters.

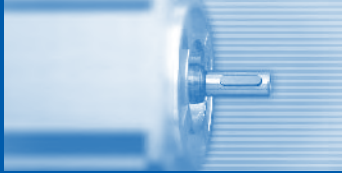


### Connector Dimensions



### Flying Leads

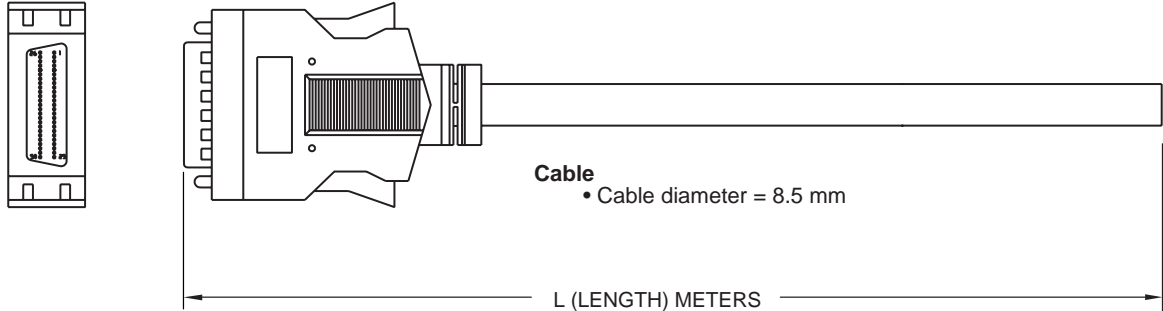




I/O Expansion Cable		
Model #	Specifications	Length
EWLN002SF1NA:	50-pin SCSI [M] on drive end to flying leads	L = 2.0 meters

**Drive End**  
SCSI (50 pin) [M] Connector

Flying Leads



**Color Codes**

HP-DB50PIN MALE	OPEN	HP-DB50PIN MALE	OPEN	HP-DB50PIN MALE	OPEN
1	YELLOW	15	PINK	26	LIGHT BLUE/BLUE
2	YELLOW/BLACK	34	PINK/BLACK	27	LIGHT BLUE/RED
3	RED	16	VIOLET	28	PINK/RED
4	RED/BLACK	35	VIOLET/WHITE	29	PINK/BLUE
5	BROWN	17	GREY	31	GREY/RED
6	BROWN/WHITE	38	GREY/BLACK	32	GREY/BLUE
7	LIGHT BLUE	18	ORANGE	36	GREEN/WHITE
8	LIGHT BLUE/BLACK	39	ORANGE/BLACK	37	LIGHT GREEN/BLUE
9	LIGHT BLUE/GREEN	19	PINK/WHITE	41	YELLOW/RED
10	LIGHT BLUE/YELLOW	40	PINK/YELLOW	42	YELLOW/BLUE
11	GREEN	20	GREY/GREEN	43	RED/WHITE
12	GREEN/BLACK	21	GREY/YELLOW	44	RED/BLUE
13	BLUE	22	WHITE/YELLOW	45	WHITE/RED
30	BLUE/WHITE	23	WHITE/GREEN	46	WHITE/BLUE
14	WHITE	24	LIGHT GREEN/RED	47	LIGHT GREEN
33	WHITE/BLACK	25	GREEN/BLUE	48	LIGHT GREEN/BLACK
				49	LIGHT GREEN/YELLOW
				50	LIGHT GREEN/GREEN



# PositionServo EMC Class A Standards

Servo Drives								
Item Number	Nominal Input Voltage	Phase	Output Current [IN]	Output Current [IMAX]	EMC Filter	Test Motor	Lead Length [m]	EN61800-382004 Compliance Category
E94_020S1N	120V & 200/240V	1	2	6	509-110	MCS06C41L	2.5	C2, C3
							5	C2, C3
							10	C2, C3
							10 w/ input ferrite	C2, C3
E94_040S1N	120V & 200/240V	1	4	12	509-120	MCS06F60L	2.5	C2, C3
							5	C2, C3
							10	C2, C3
							10 w/ input ferrite	C2, C3
E94_020S2F	200/240V	1	2	6	Integral	MCS06C41L	2.5	C2, C3
							5	C2, C3
							10	C2, C3
							15	C2, C3
							20	C2, C3
E94_040S2F	200/240V	1	4	12	Integral	MCS06F40L	2.5	C2, C3
							5	C2, C3
							10	C2, C3
							15	C2, C3
							20	C2, C3
E94_080S2F	200/240V	1	8	24	Integral	MCS09F60L	2.5	C2, C3
							5	C2, C3
							10	C2, C3
							15	C2, C3
E94_100S2F	200/240V	1	10	30	Integral	MCS12L20L	2.5	C2, C3
							5	C2, C3
							10	C2, C3
							15	C2, C3
E94_020Y2N	200/240V	3	2	6	E94ZF04T4A1	MCS06C41L	2.5	C2, C3
							5	C2, C3
							10	C2, C3
							15	C2, C3
							20	C2, C3



# PositionServo EMC Class A Standards

Servo Drives							
Item Number	Nominal Input Voltage	Phase	Output Current [IN]	Output Current [IMAX]	EMC Filter	Test Motor	EN61800-382004 Compliance Category
E94_040Y2N	200/240V	3	4	12	E94ZF07T4A1	MCS06F60L	2.5
							5
							10
							15
E94_080Y2N	200/240V	3	8	24	E94ZF15T4A1	MCS09F60L	2.5
							5
							10
							15
E94_100Y2N	200/240V	3	10	30	E94ZF15T4A2	MCS12L20L	2.5
							5
							10
							15
E94_120Y2N	200/240V	1	12	36	E94ZF24S2A1	MCS12L20L	1
							2.5
							5
							10
							15
E94_020T4N	400/480V	3	2	6	E94ZF04T4A1	MCS06F41-	2.5
							5
							10
							15
E94_040T4N	400/480V	3	4	12	E94ZF07T4A1	MCS09F60-	2.5
							5
							10
E94_050T4N	400/480V	3	5	15	E94ZF07T4A1	MCS12L20-	2.5
							5
							10
E94_060T4N	400/480V	3	6	18	E94ZF12T4A1	MCS12L20-	2.5
							5
							10
							15



EMC Emission Standards: Comparison Table				
		EN61800-3:2004	EN61800-3/A11:2000	EN55011
Comparable Levels of Emission Limits	Category: C1		1 <sup>st</sup> Environment Unrestricted Distribution	Group 1 Class B
	Category: C2		1 <sup>st</sup> Environment Restricted Distribution	Group 1 Class A
	Category: C3		2 <sup>nd</sup> Environment Unrestricted Distribution	Group 2 Class A
	Category: C4		2 <sup>nd</sup> Environment Restricted Distribution	Not Applicable

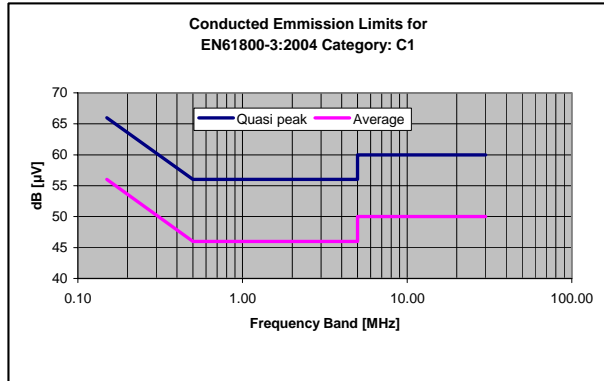
## DEFINITIONS:

- **EMC:** Electromagnetic Compatibility: referring to:
  - Emissions limits: prescribed limits of radiated and line-conducted Emissions of various frequencies.
  - Immunity requirements: levels of disturbances, at or below which, equipment must continue to operate.
- **EN 61800-3:** 2004 - The standard for EMC requirements for adjustable speed electrical Power Drive Systems (PDS). This PDS installation includes a Drive, feeders, auxiliaries and motor, but not driven equipment. This standard applies to a drive system in lieu of others; however equipment covered by product-specific standards which contains a drive still must (also) meet the product standard.
  - First Environment:** A domestic premises or an area where the AC power supply system also supplies buildings used for domestic purposes. (e.g. commercial premises in a residential building.)
  - Second Environment:** Any environment where the AC power supply system has no connection to domestic premises.
  - Category C1:** A PDS with rated voltage of less than 1000 volts and intended for use in the First Environment (domestic connection).
  - Category C2:** A PDS which is neither plug-in, nor movable, nor with rated voltage over 1000 volts, and which, if installed in the First Environment, is intended to be installed and commissioned by a person or organization skilled in power drive systems including EMC aspects.
  - Category C3:** A PDS with rated voltage of less than 1000 volts and intended for use in the Second Environment but not the First Environment.
  - Category C4:** A PDS with rated voltage over 1000 volts or 400 Amps, or intended for complex systems (e.g. IT supply) in the Second Environment.
- **EN 61800-3/A11:** 2000 - Earlier revision of this standard, where above-defined Categories (without power restrictions) were equivalently defined using the terms First Environment and Second Environment in conjunction with the terms "Restricted Distribution" and "Unrestricted Distribution" as defined as follows.
  - Restricted Distribution: Mode of sales distribution for product to be installed and commissioned by a person or organization skilled in power drive systems including EMC aspects. (A First Environment, Restricted Distribution PDS is now in Category C2)
  - Unrestricted Distribution: Mode of sales where customer or user skill EMC for drives is not required.
- **EN55011** - Standard for Emissions Limits for Industrial, Scientific and Medical equipment (ISM). This is often known as a generic emissions standard, used where other specific standards do not apply. Here equipment is classified into two Groups, defined below. Each of these Groups has two Classes which correspond to the "Environment" terms defined above. These four Group-Class categories define limits of conducted and radiated emissions. Groups and Classes are as follows:
  - Group 1:** Equipment in which RF energy is generated or used in otherwise providing the function of the equipment.
  - Group 2:** Equipment in which RF energy is generated and/or used in the form of electromagnetic radiation for treatment of a material.
  - Class B:** Same meaning as First Environment definition above (domestic connection).
  - Class A:** Same meaning as Second Environment definition above.

## EN61800-3:2004 Conducted & Radiated Emission Limits for First Environment Installations

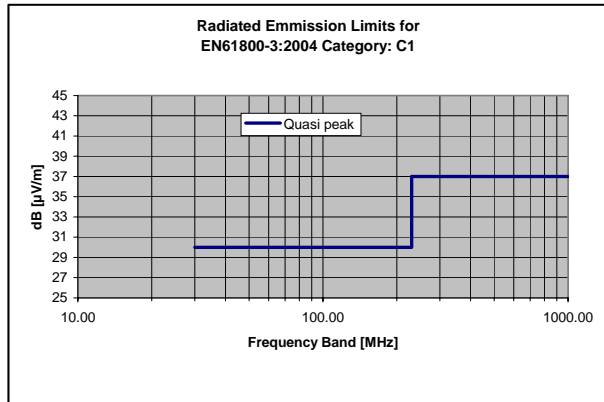
### Conducted Emission Limits for Category: C1

Frequency Band Mhz	Quasi peak dB (µV)	Average dB (µV)
0.15	66	56
0.50	56	46
0.50	56	46
5.00	56	46
5.00	60	50
30.00	60	50



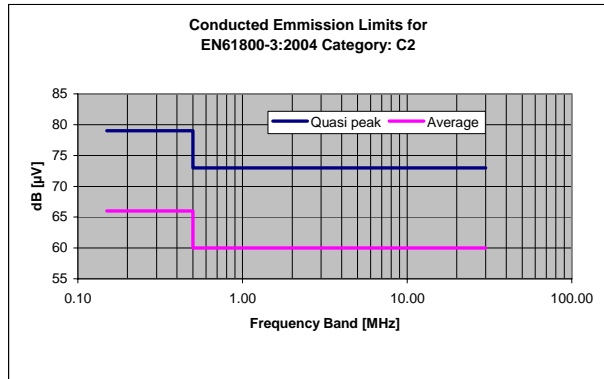
### Radiated Emission Limits for Category: C1

Frequency Band Mhz	Quasi peak dB (µV/m)
30.00	30
230.00	30
230.00	37
1000.00	37



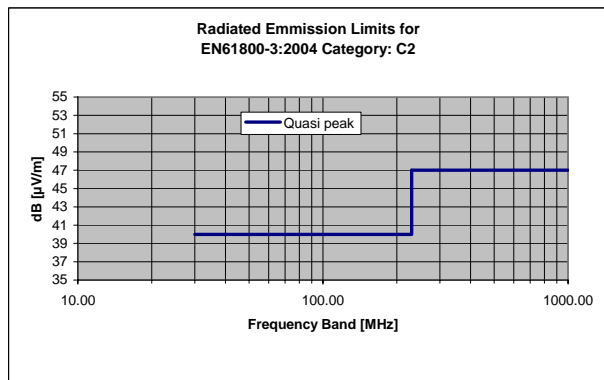
### Conducted Emission Limits for Category: C2

Frequency Band Mhz	Quasi peak dB (µV)	Average dB (µV)
0.15	79	66
0.50	79	66
0.50	73	60
5.00	73	60
5.00	73	60
30.00	73	60



### Radiated Emission Limits for Category: C2

Frequency Band Mhz	Quasi peak dB (µV/m)
30.00	40
230.00	40
230.00	47
1000.00	47



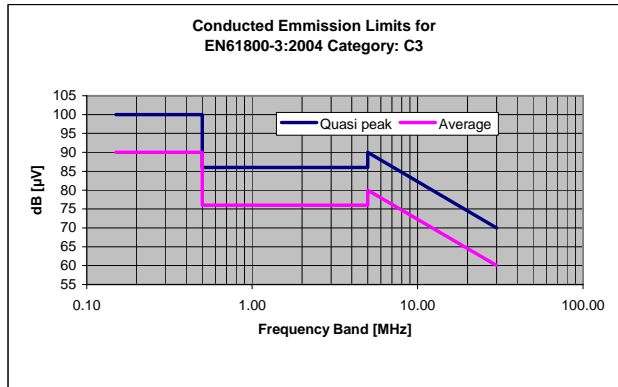


# EMC Emissions Standards

## EN61800-3:2004 Conducted & Radiated Emission Limits for Second Environment Installations

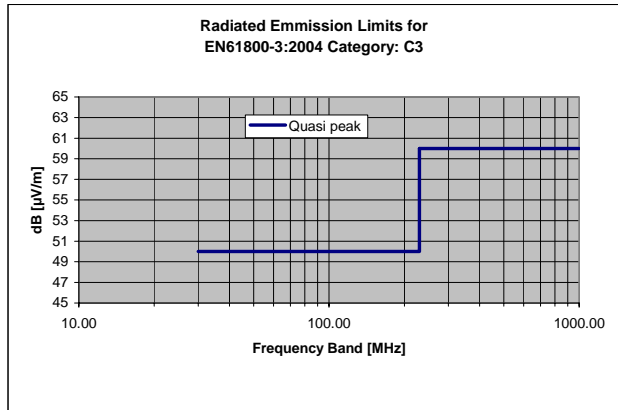
### Conducted Emission Limits for Category: C3

Frequency Band Mhz	Quasi peak dB ( $\mu$ V)	Average dB ( $\mu$ V)
0.15	100	90
0.50	100	90
0.50	86	76
5.00	86	76
5.00	90	80
30.00	70	60



### Radiated Emission Limits for Category: C3

Frequency Band Mhz	Quasi peak dB ( $\mu$ V/m)
30.00	50
230.00	50
230.00	60
1000.00	60





# NOTES:

# Worldwide Coverage

# Our Locations:

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