# Kollmorgen KS Synchronous Motor

## Selection Guide



KS Series Synchronous Motor



A REGAL REXNORD BRAND

## Kollmorgen: Your Partner, In Motion.

Every solution comes from a real understanding of the challenges facing machine designers and users.

Innovators consistently rate Kollmorgen as one of their best motion systems manufacturing partners. Whether you are looking for classic servo motors, direct-drive servo motors, stepper motors, drives & amplifiers, gearing, actuation, or multi-axis motion controllers, Kollmorgen is one of the few companies in the world that actually designs and manufactures all of these products.

**Our customers** are leaders in many industries such as Aerospace & Defense, Printing, Packaging & Converting, Food & Beverage Processing, Medical Imaging, In Vitro Diagnostics & Laboratory Automation, Pharmaceutical Manufacturing, Material Forming and Cutting, Oil & Gas, and Robotics. Kollmorgen is also a leader in Warehouse Automation, including complete AGV systems, software, awareness and autonomy.

Our Automation Solutions can be found on Mars and in space, ships and submarines, O&G drilling and metrology, surgical robots and laser eye surgery, even inside artificial hearts. These are just a few applications that demand high-performance and high-quality while satisfying their specific needs.

Because motion matters, it's our focus: Motion can distinctly differentiate a specific machine and deliver a marketplace advantage by increasing its performance and dramatically improving Overall Equipment Effectiveness (OEE).

High-performance motion can make your customer's machine more reliable and energy-efficient, enhance accuracy and improve operator safety. Motion also represents endless possibilities for innovation.

We've always understood this potential, and thus have kept motion at our core and in our Vision, Mission & Values, relentlessly developing products that offer precise control of torque, velocity and position accuracy in machines that rely on complex motion.



#### Removing the Barriers of Design, Sourcing, and Time

At Kollmorgen, we know that OEM engineers can achieve a lot more when obstacles aren't in the way. So, we clear obstacles in three important ways:

#### **Integrating Standard and Custom Products**

The optimal solution is often not clear-cut. Our application expertise allows us to modify standard products or develop totally custom solutions across our whole product portfolio so that designs can take flight.

#### **Providing Motion Solutions, Not Just Components**

As companies reduce their supplier base and focus their engineering manpower on the product design, they need a total system supplier with a wide range of integrated solutions. Kollmorgen offers complete solutions as well as motion subsystems that combine programming software, engineering services and bestin-class motion components.

#### **Global Footprint**

With direct sales, engineering support, manufacturing facilities, and distributors spanning the Americas, Europe, the Middle East, and Asia, we're close to OEMs worldwide. Our proximity helps speed delivery and lend support where and when they're needed.

#### **Financial and Operational Stability**

Kollmorgen is part of Regal Rexnord. A key driver in the growth of all Regal Rexnord segments is the Regal Rexnord Business System, which relies on the principle of "kaizen" – or continuous improvement. Using worldclass tools, cross-disciplinary teams of exceptional people evaluate processes and develop plans that result in superior performance.

#### Kollmorgen: Your partner. In Motion.

#### Trademarks

AKD is a registered trademark of Kollmorgen Corporation AKM is a registered trademark of Kollmorgen Corporation Cartridge DDR is a registered trademark of Kollmorgen Corporation EnDat is a registered trademark of Dr Johannes Heidenhain GmbH EthercAT is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH Ethernet/IP is a registered trademark of ODVA, Inc. Ethernet/IP Communication Stack: copyright (0) 2009, Rockwell Automation sercos® is a registered trademark of sercos® international eV. HIPERFACE and HIPERFACE DSL are registered trademarks of Max Stegmann GmbH PROFINET is a registered trademark of SIEMENS AG SpeedTec, ytec, itec and htec are registered trademarks of TE Connectivity Ltd. Windows is a registered trademark of Microsoft Corporation

## **Table of Contents**

KS Series AC Synchronous Motors	4
Nomenclature	5
Single-Phase Connection Diagrams	5
KS06 Synchronous Motor	6
Dimensional Data and Drawings	6
Performance Data	7
KS09 Synchronous Motor	8
Dimensional Data and Drawings	8
Performance Data	10
KS11 Synchronous Motor	12
Dimensional Data and Drawings	12
Performance Data	13

# **KS Synchronous Motors**

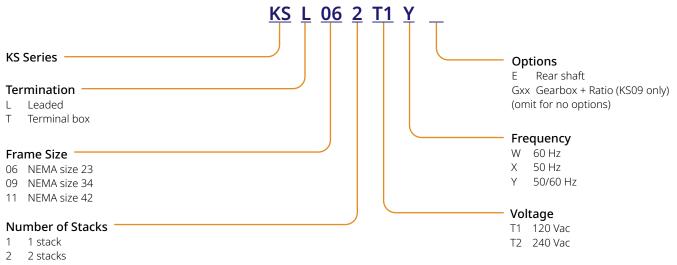
Our high pole count motors naturally turn at slower speeds (72 or 60 rpm). They only need a resistor-capacitor (RC) network to operate from single-phase AC utility power. These motors provide the highest torque in an AC synchronous motor for loads that operate at 72 rpm or slower. They are available in three frame sizes.

### Features

- » Latest high torque construction
- » Motor torque up to 1,500 oz-in (1059 N-cm)
- » 72 rpm at 60 Hz, 60 rpm at 50 Hz
- » 120 and 240 volt AC versions
- » RRC network for smoother operation
- » Leaded or terminal box connections
- » Gearboxes available on KS09, NEMA 34 motors
- » KS06, KS09, KS11 Series High Torque NEMA 23, 34, 42



#### KS Series Synchronous Motor Nomenclature

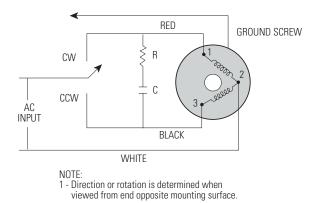


3 3 stacks

#### Single-Phase KS Motor Connection Diagrams

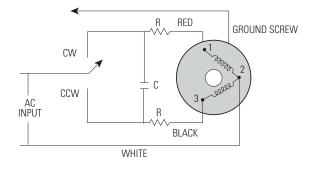
#### **R/C Connection**

Single-Phase Operation



R/R/C Connection

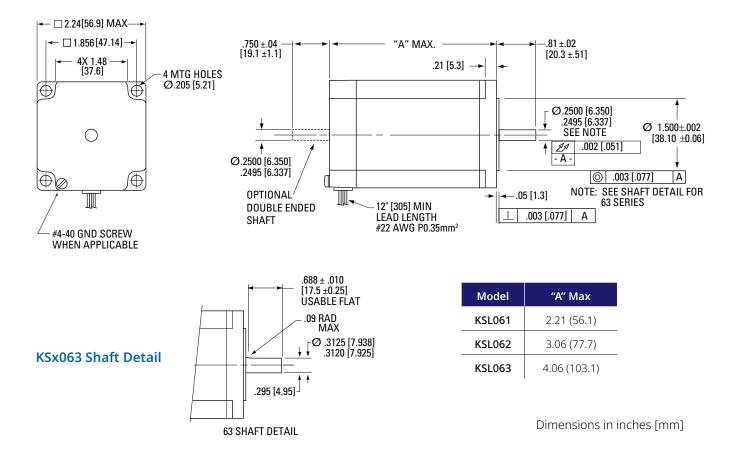
#### Single-Phase Operation



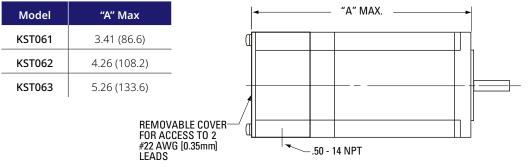
2 - Number in diagrams represent terminal connection when motors are supplied with terminal boards.

## **KS06 Series AC Synchronous Motors**

### **KSL06 Outline Drawings**



### **KST06 Outline Drawing**



Dimensions in inches [mm]



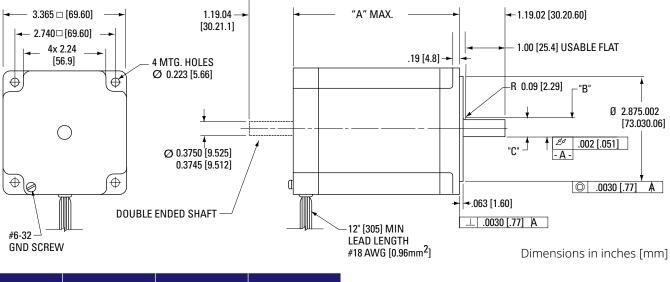
#### **KS06 Performance Data**

	N.d.	Load	1.500		Shaft L	oading		Pha	ise Shift	ing Con	ponents	
Model	Min. Torque	Inertia <sup>2</sup>	Line Current	Weight	Radial Force	Axial Force		Resistor		1	Capacitor (240 Vac)	
	oz-in (Nm)	oz-in-s² (kg-m² x 10-³)	A (RMS/Ø)	lb (kg)	lb (N)	lb (N)		Resistor part no.	Ohms	Watts	Capacitor part no.	μF
60 Hz, 120 \	/ac, 72 RI	РМ										
KSx061T1Y <sup>1</sup>	70 (0.49)	0.021 (1.5)	0.25	1.6 (0.73)	15 (67)	25 (111)	R/R/C	201052-034	600	12	201053-068	1.5
KSx061T1Y	80 (0.56)	0.028 (2)	0.25	1.6 (0.73)	15 (67)	25 (111)	R/C	201052-033	1000	12	201053-038	2
KSx062T1Y	140 (0.99)	0.084 (5.9)	0.35	2.3 (1.04)	15 (67)	25 (111)	R/C	201052-035	600	25	201053-044	3
KSx063T1Y	185 (1.31)	0.17 (12)	0.4	3.2 (1.45)	15 (67)	25 (110)	R/C	201052-049	400	50	201053-076	5
60 Hz, 240 \	/ac, 72 RI	PM										
KSx062T2Y	140 (0.99)	0.095 (6.7)	0.15	2.3 (1.04)	15 (67)	25 (111)	R/R/C	201052-036	1100	25	201053-063	0.75
KSx063T2Y	185 (1.31)	0.11 (7.6)	0.2	3.2 (1.45)	15 (67)	25 (111)	R/R/C	201052-050	1000	25	201053-063	0.75
50 Hz, 240	Vac, 60 R	РМ										
KSx062T2Y	140 (0.99)	0.095 (6.7)	0.15	2.3 (1.04)	15 (67)	25 (111)	R/R/C	201052-036	1100	25	201053-063	0.75
KSx063T2Y	185 (1.31)	0.11 (7.6)	0.2	3.2 (1.45)	15 (67)	25 (111)	R/R/C	201052-050	1000	25	201053-070	1

Using RRC phase shifting arrangement to achieve very smooth operation.
This is the maximum rigidly attached load inertia the motor will reliably start. If the load is attached to the motor with a 5° flex coupling, the motor will start loads up to seven times listed.

## **KS09 Series AC Synchronous Motors**

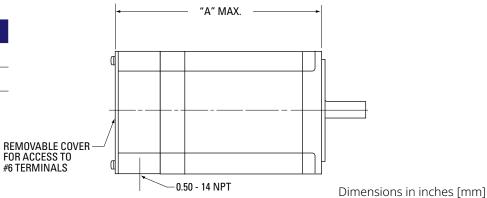
### **KSL09 Outline Drawing**



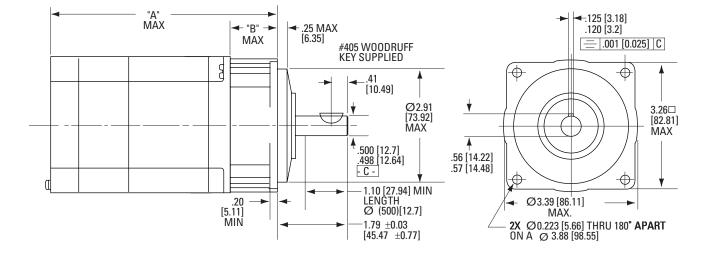
Model	"A" Max	"B" Dia.	"C" Flat			
KSL091	2.57 (65.1)	0.3750 (9.525)	0.000 (0.00)			
KSL092	3.77 (95.6)	0.3745 (9.512)	0.328 (8.33)			
KSL093	4.97 (126.0)	0.5000 (12.700) 0.4995 (12.687)	0.450 (11.43)			

### **KST09 Outline Drawing**

Model	"A" Max
KST091	3.90 (100)
KST092	5.10 (130)
KST093	6.30 (161)



⊢ Options Y – Frequency T – Voltage 2 – Stack Length 09 – Frame Size L – Termination K – Motor Series



#### KS09 Gearmotor Outline Drawing

Motor	Gea	rbox	Leaded	Motors	Terminal Box Motors		
Series	Ratio	"B" Max	Series	"A" Max	Series	"A" Max	
	3:1 thru 5:1	1.19 (30.2)		3.76 (96)		5.09 (129)	
KSx091	9:1 thru 25:1	1.81 (46.0)	KSL091	4.38 (111)	KST091	5.71 (145)	
	27:1 thru 125:1	2.38 (60.5)		4.95 (126)		6.28 (160)	
	3:1 thru 5:1	1.19 (30.2)		4.96 (126)		6.29 (160)	
KSx092	9:1 thru 25:1	1.81 (46.0)	KSL092	5.58 (142)	KST092	6.91 (176)	
	27:1 thru 125:1	2.38 (60.5)		6.15 (156)		7.48 (190)	
	3:1 thru 5:1	1.19 (30.2)		6.16 (156)		7.49 (190)	
KSx093	9:1 thru 25:1	1.81 (46.0)	KSL093	6.78 (172)	KST093	8.11 (206)	
	27:1 thru 125:1	2.38 (60.5)		7.35 (187)		8.68 (220)	

## KS09 Series AC Synchronous Motors

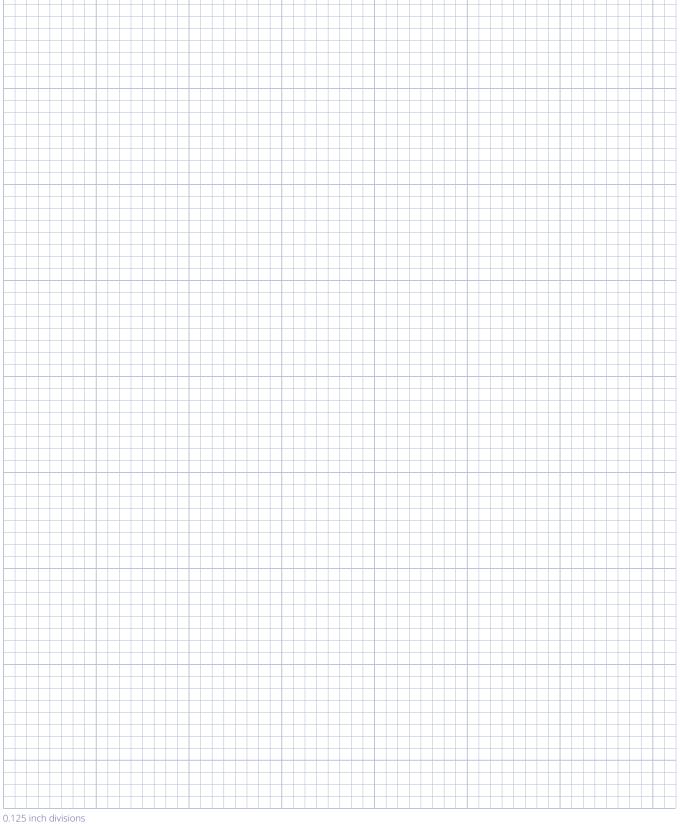
#### **KS09 Performance Data**

		Naine			Shaft L	oading		Phase Shifting Components				
Model	Min. Torque	Load Inertia*	Line Current	Weight	Radial Force	Axial Force	Wiring Diag.	Re	sistor		Capacito (240 Vao	
	oz-in (Nm)	oz-in-s² (kg-m² x 10⁻³)	A (RMS/Ø)	lb (kg)	lb (N)	lb (N)		Resistor part no.	Ohms	Watts	Capacitor part no.	μF
60 Hz, 120 \	/ac, 72 R	PM										
KSx091T1Y	240 (1.69)	0.17 (12)	0.5	3.8 (1.73)	25 (111)	50 (222)	R/C	201052-037	300	50	201053-076	5
KSx092T1Y	450 (3.18)	0.33 (23)	0.6	6.2 (2.82)	25 (111)	50 (222)	R/C	201052-041	250	50	201053-069	6
KSx093T1Y	700 (4.94)	0.54 (38)	1.0	8.7 (3.95)	25 (111)	50 (222)	R/C	201052-027	150	100	201053-074	11
60 Hz, 240 \	/ac, 72 R	PM										
KSx091T2Y	240 (1.69)	0.17 (12)	0.25	3.8 (1.73)	25 (111)	50 (222)	R/R/C	201052-039	900	50	201053-070	1
KSx092T2Y	450 (3.18)	0.37 (26)	0.35	6.2 (2.82)	25 (111)	50 (222)	R/C	201052-045	1000	100	201053-072	2
KSx093T2Y	700 (4.94)	0.58 (41)	0.5	8.7 (3.95)	25 (111)	50 (222)	R/C	201052-047	600	100	201053-073	3
50 Hz, 240	Vac, 60 R	PM										
KSx091T2Y	240 (1.69)	0.18 (13)	0.25	3.8 (1.73)	25 (111)	50 (222)	R/R/C	201052-039	900	50	201053-075	1.5
KSx092T2Y	450 (3.18)	0.33 (23)	0.35	6.2 (2.82)	25 (111)	50 (222)	R/R/C	201052-043	600	50	201053-071	1.75
KSx093T2Y	700 (4.94)	0.58 (41)	0.5	8.7 (3.95)	25 (111)	50 (222)	R/R/C	201052-046	400	100	201053-073	3

\* This is the maximum rigidly attached load inertia the motor will reliably start. If the load is attached to the motor with a 5° flex coupling, the motor will start loads up to seven times listed.

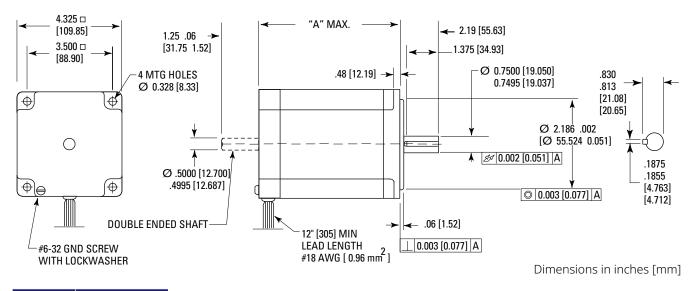


Y⊢Frequency T☐− Voltage 2← Stack Length 09−Frame Size LI− Termination K☐− Motor Series - Options



## **KS11 Series AC Synchronous Motors**

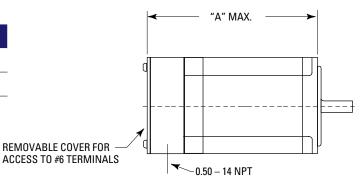
#### **KSL11 Outline Drawing**



Model	"A" Max
KSL111	3.89 (98.81)
KSL112	5.91 (150.1)
KSL113	7.92 (201.2)

#### **KST11 Outline Drawing**

Model	"A" Max
KST111	5.20 (132.1)
KST112	7.22 (183.4)
KST113	9.23 (234.4)



Dimensions in inches [mm]

### KS11 Performance Data

	<b>N A</b> <sup>1</sup>	1	1.5		Shaft L	oading		Phase Shifting Components						
Model	Min. Torque	Load Inertia*	Line Current	Weight	Radial Force	Axial Force	Wiring Diag.	Resistor			Capacitor (240 Vac)			
	oz-in (Nm)	oz-in-s² (kg-m² x 10-³)	A (RMS/Ø)	lb (kg)	lb (N)	lb (N)		Resistor part no.	Ohms	Watts	Capacitor part no.	μF		
60 Hz, 120	/ac, 72 RI	PM												
KSx111T1W	700 (4.94)	0.28 (20)	1.2	11.0 (5.0)	75 (333)	130 (578)	R/C	201052-045	100	100	201053-032	12.5		
KSx112T1W	1100 (7.77)	0.54 (38)	1.7	18.4 (8.3)	75 (333)	130 (578)	R/C	201052-101	75	100	201053-081	20		
KSx113T1W	1500 (10.59)	0.62 (44)	2.1	25.7 (11.7)	75 (333)	130 (578)	R/C	201052-104	50	200	201053-081	20		
60 Hz, 240 V	/ac, 72 RI	PM												
KSx111T2W	700 (4.94)	0.37 (26)	0.6	11.0 (5.0)	75 (333)	130 (578)	R/C	201052-028	500	100	201053-030	3		
KSx112T2W	1100 (7.77)	0.75 (53)	0.9	18.4 (8.3)	75 (333)	130 (578)	R/C	201052-102	200	100	201053-030	3		
KSx113T2W	1500 (10.59)	0.71 (50)	1.3	25.7 (11.7)	75 (333)	130 (578)	R/C	201052-105	200	200	201053-029	6		
50 Hz, 240	Vac, 60 R	PM												
KSx111T2X	700 (4.94)	0.21 (15)	0.6	11.0 (5.0)	75 (333)	130 (578)	R/C	201052-041	250	50	201053-030	3		
KSx112T2X	1100 (7.77)	0.75 (53)	0.7	18.4 (8.3)	75 (333)	130 (578)	R/C	201052-103	250	100	201053-028	4		
KSx113T2X	1500 (10.59)	1.12 (79)	1.4	25.7 (11.7)	75 (333)	130 (578)	R/C	201052-106	150	200	201053-082	7.5		

\* This is the maximum rigidly attached load inertia the motor will reliably start. If the load is attached to the motor with a 5° flex coupling, the motor will start loads up to seven times listed.

### More Expertise for a More Successful Machine

Our global engineering, service and support network provides deep knowledge of all the major industries that rely on advanced motion control and automation technology. We offer world-class engineering expertise, self-service design tools, personalized field service, and easy access to our design, application and manufacturing centers in strategic locations across the globe.

### About Kollmorgen

Kollmorgen, a Regal Rexnord brand, has more than 100 years of motion experience, proven in the industry's highest-performing, most reliable motors, drives, linear actuators, AGV (Automated Guided Vehicle) control solutions, and automation control platforms. We deliver breakthrough solutions that combine exceptional performance, reliability and ease of use, giving machine builders an irrefutable marketplace advantage.



A REGAL REXNORD BRAND

### www.kollmorgen.com

Specifications are subject to change without notice. It is the responsibility of the product user to determine the suitability of this product for a specific application. All trademarks are the property of their respective owners

© 2024 Kollmorgen Corporation. All rights reserved

KM\_SG\_000183-KS\_RevD\_EN