



1326AB 230V Torque Plus Series Servomotors for the 1391-DES AC Servo Drive

Product Data



Introduction

This publication provides product information about 2.7 to 56.5 N-m (24 to 500 lb-in.) 1326AB Torque Plus Series 230V AC Servomotors. The topics covered in this publication include:

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Basic Servomotor Description

The 1326AB Torque Plus Series Servomotors are an addition to the popular 1326AB Servomotor line. The Torque Plus motors feature a specially engineered housing to provide reduced length and increased torque ratings from 2.7 to 56.5 N-m (24 to 500 lb-in.). These high performance, three-phase, brushless, AC, synchronous servomotors are designed by Allen-Bradley to meet the stringent requirements of high performance motion systems. This series of AC servomotors is intended to be used with the Allen-Bradley 1391 Digital (1391-DES) AC Servo Drive (230V AC input). The typical speed-torque curve shows the operational envelope of different 1326AB Torque Plus/1391-DES drive combinations.

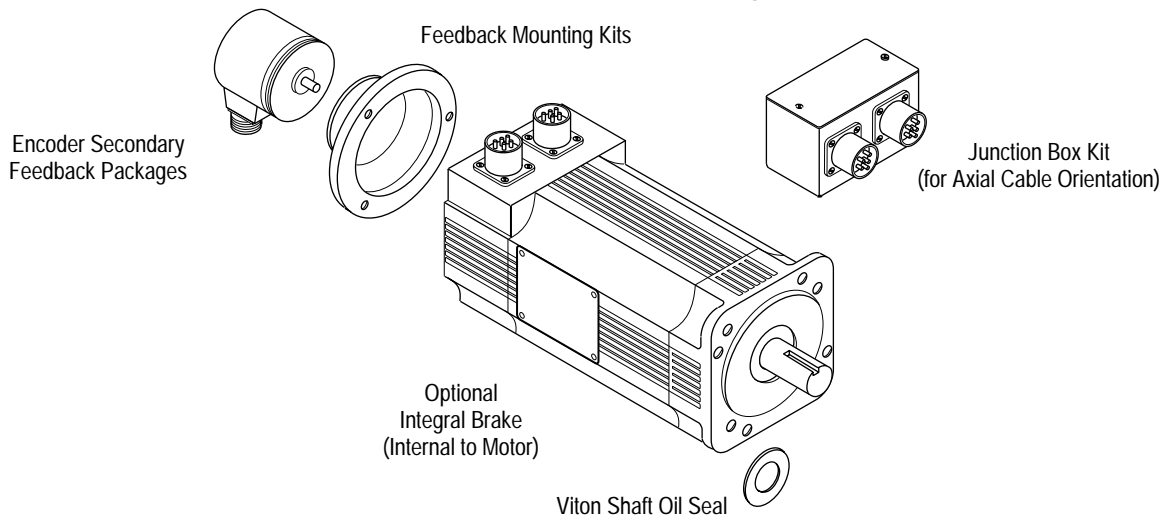
Each motor has the following standard features:

- Special flux profile permanent magnets engineered by Allen-Bradley that provide increased servo response.
- A three-phase, sinusoidally wound stator field for direct transfer of heat to ambient temperature, and smooth operation at low speeds.
- A brushless resolver supplies position, commutation and velocity feedback information. This also provides durability in harsh environments as on-board electronics in the motor. 1391 A Quad B (optional) encoder output (adjustable from 512 to 2048 ppr) is generated via resolver feedback.
- 100% continuous rated output torque at stall (zero rpm).
- A precision balance of 0.0127 mm (0.0005 in.) total peak-to-peak displacement.
- A UL Listed insulation system (file #E57948).
- The ability to be vertically mounted at any angle with the shaft up or down.
- TENV construction. The aluminum housing has fins that provide increased heat transfer.
- IEC 529 enclosure protection IP65 (when used with the Shaft Seal option) to withstand harsh environments. The motor is dust-tight and able to withstand pulsating water jets.

Important: 1326AB Torque Plus servomotors lose the IP65 rating when an externally mounted encoder package is used.

- A normally closed thermal switch in the motor winding (rated 115V AC at 1A, 24V DC at 1A) that provides thermal overload indication.
- Environmentally sealed power and feedback cable packages. Power and resolver feedback cables can be ordered in tray or cable track style for lengths up to 300 ft.
- MIL spec connectors.
- CEI/IEC 72-1: 1991 metric flange mount (-21) with metric shafts.
- Threaded hole on the face of the shaft for securing couplings.

Figure 1
1326AB Torque Plus Series Servomotor Configuration and Options



Servomotor Options

Options available for the 1326AB 230V AC Torque Plus Series include (the option code or catalog number is in parenthesis):

- Integral spring-set holding brakes with 90V DC (–A4, –A5, –A7) or 24V DC coils (–K4, –K5, –K7). A Power supply (1326–MOD–BPS) is available for 90V DC brakes.
- A Shaft Oil Seal kit, (1326AB-MOD-SSV-xx) for installing a Viton shaft oil seal on a motor in the field. Motor disassembly is not required. When the shaft oil seal is installed, the motor is dust tight, able to withstand pulsating water jets and meets the IP65 requirements of the IEC 529 standard.

Important: 1326AB servomotors lose the IP65 rating when an externally mounted encoder package is used.

- Junction box kit (1326AB-MOD-RJxx) available with axially mounted connectors. Connector version allows the motor connectors to be brought out axially to the motor (rather than radially) without further wiring.
- Secondary feedback mounting kits (1326AB-MOD-Mxx) for field installation of an Allen-Bradley Encoder (845H).

Note: When using the 1391–DESxx–AQB, an encoder feedback up to 2048 ppr is provided by the drive. This eliminates the need for a secondary feedback device.

Important: 1326AB Torque Plus servomotors lose the IP65 rating when an externally mounted encoder package is used.

- Cables for power (1326-CPx...), commutation (1326-CFx...), and encoders (1326-CEx...) are available in lengths up to 100 ft (30m) for standard and high-flex applications. Power (1326ES-CPxx...) and communication (1326ES-CFx...) cables between 100 ft (30m), and 300 ft (90m) are available when using a 1391–DES drive only.

90V DC Brake Power Supply Rectifier

1326AB – MOD – BPS

First Position	Second Position	Third Position
Bulletin Number	Type	Description
	Code Description	Code Description
	MOD Modification Kit	BPS Single-phase, full wave, screw mount rectifier with surge suppressor network. 115V AC input, for use with 90V DC Brakes.

Note: Up to four brakes per rectifier can be used.

Motor Junction Box Kit

1326AB – MOD – RJAB

First Position	Second Position	Third Position
Bulletin Number	Type	Description
	Code Description	Code Description
	MOD Modification Kit	RJAB For all AB-A4 and -A5 series motors RJBC For all AB-A7 series motors

Note: The motor comes standard with IP65 plug style connectors mounted radially to the motor. This kit allows the connectors to be brought out axially to the motor without further wiring. Kit includes motor junction box and mounting hardware.

Feedback Mounting Adapter Kit

1326AB – MOD – M40

First Position	Second Position	Third Position
Bulletin Number	Type	Mounting Adapter Kit for . . .
	Code Description	Code Description
	MOD Modification Kit	M40 A-B 845H encoder for AB-A4 series motors M50 A-B 845H encoder for AB-A5 series motors M60 A-B 845H encoder for AB-A7 series motors

Note: All kits contain a feedback device, mounting adapter, mounting hardware and motor encoder coupling.

Power and Feedback Cables

1326 – C P AB T 15

First Position		Second Position		Third Position		Fourth Position		Fifth Position		Sixth Position		
Bulletin Number		Type		Function		Motor Size Used On		Power Track Cable		Cable Length		
Letter	Description	Letter	Description	Letter	Description	Code	Type	Letter	Description	Code	Description	
Blank	Standard cable	C	Connector and cable assembly	P	Power connection	AB	Series A4 & A5	T	All series used for high flex applications	15	4.6m (15 ft)	
ES	Extended length cable used with 1391-ES and 1391-DES only					C	Series A7				30	9.1m (30 ft)
				F	Commutation and feedback connection	U	All series		Blank Standard cable	50	15.2m (50 ft)	
				E	845H encoder						100	30.4m (100 ft)
											150	45.7m (150 ft)
										200	61m (200 ft)	
										250	76.2m (250 ft)	
										300	91.4m (300 ft)	

Note: The extended length option is available for 1326-CFUxx, CPABxx and CPCxx cables when lengths exceed 100 ft and can only be used with the 1391-DES drive.

Servomotor Performance Data

The following section contains 1326AB performance data. Included is a selection list detailing the performance parameters of selected amplifier/motor combinations, term definitions and typical speed-torque curves.

Table A
Torque Plus Performance Data and Selection List

Motor Catalog Number	Continuous Stall Torque (N-m/lb-in.)	Peak Stall Torque (N-m/lb-in.)	Rated Speed (rpm)	Motor Speed w/1391-DES (rpm)	Rotor Inertia kg-m ² lb-in.-s ²	Amperes at Continuous Torque	Rated Output (kW)	Servo Drive Catalog Number
1326AB-A410G-21	2.7/24	8.1/72	5000	6000	0.0005/0.004	7.1	1.2	1391-DES15
1326AB-A420E-21	4.5/40	13.6/120	3000	4000	0.0008/0.007	7.0	1.3	1391-DES15
1326AB-A430E-21	6.6/58	19.7/174	3000	4000	0.001/0.010	9.5	1.9	1391-DES15
1326AB-A515E-21	10.4/92	20.5/181.5	3000	4000	0.0043/0.038	15.2	3.0	1391-DES15
1326AB-A515E-21	10.4/92	30.8/272	3000	4000	0.0043/0.038	15.2	3.0	1391-DES22
1326AB-A520E-21	12.0/106	28.0/248	3000	4000	0.006/0.050	19.2	3.5	1391-DES22
1326AB-A520E-21	12.0/106	35.9/318	3000	4000	0.006/0.050	19.2	3.5	1391-DES45
1326AB-A530E-21	18.4/163	55.2/487	3000	4000	0.009/0.080	28.4	5.5	1391-DES45
1326AB-A720E-21	27.9/247	59.4/526	3000	4000	0.015 (0.140)	42.25	8.2	1391-DES45
1326AB-A730E-21	35/310	61.6/545	3000	4000	0.024 (0.22)	51.2	10.3	1391-DES45
1326AB-A740C-21	47.6/421	92.0 (814)	2000	3000	0.032 (0.29)	46.6	10.5	1391-DES45
1326AB-A740B-21	56.5/500	132/1168	1600	2000	0.032/0.290	38.5	8.3	1391-DES45

All ratings are for 40° C motor ambient, 90° C case and 60° C amplifier ambient. For extended ratings at lower ambient temperatures, contact Allen-Bradley.

The motor contains two thermal switches wired in series that will open on an overtemperature condition. They are set to open at 155° C (typical) and close at 90-100° C (typical). Contacts are rated for 1A at 115V AC, 1A at 24V DC.

The 1326 Torque Plus motors have a standard rated maximum operating speed as a name plate rating. When the 1391-DES drive is used, the rated speed is increased as listed above.

General Speed-Torque Curve Definitions

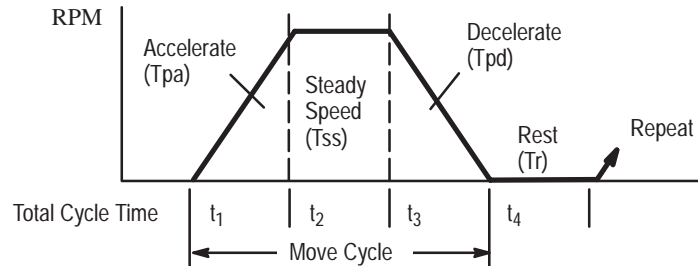
T_c – Rated torque of motor with windings at rated temperature and an ambient temperature of 40° C.

T_p – The peak torque that can be produced by the motor/drive combination with both at rated temperature. Higher peak torques are permissible where RMS torque is less than or equal to the rated torque (T_c).

Rated Speed – The operating speed of the drive and motor combination at which a minimum of 70% of continuous rated torque (T_c) can be developed. This point is defined with the motor at 25° C.

Rated Operation Area – Boundary of speed-torque curve where the motor and controller combination may operate on a servo basis without exceeding the RMS rating of either.

Duty Cycle Profile



$$\text{RMS Torque} = \sqrt{\frac{(T_{pa}^2)(t_1) + (T_{ss}^2)(t_2) + (T_{pd}^2)(t_3) + (T_r^2)(t_4)}{t_1 + t_2 + t_3 + t_4}}$$

where:

- Trms** The motors RMS or average torque over the duty cycle. (Expressed in lb-in. or lb-ft. The same units must be used throughout the formula.)
- Tpa** Motor peak torque to accelerate to maximum speed. (Expressed in lb-in. or lb-ft. The same units must be used throughout the formula.)
- Tss** Motor torque present at the motor shaft during constant speed segment. (Expressed in lb.-in. or lb-ft. The same units must be used throughout the formula.)
- Tpd** Motor peak torque to decelerate to zero speed. (Expressed in lb-in. or lb-ft. The same units must be used throughout the formula.)
- Tr** Torque when motor is at zero speed.
- t₁, t₂, t₃, t₄** Time for each portion of the duty cycle in seconds.

Intermittent Operation Area – Boundary of speed-torque curve where the motor and controller combination may operate in acceleration-deceleration mode without exceeding peak rating of either, provided that the duty cycle RMS continuous torque limit is not exceeded.

Continuous Current – Rated current of a motor with windings at a rated temperature and an ambient temperature of 40° C. The controller is operating at a rated ambient temperature of 60° C.

Peak Current – Amount of current that can be applied to the motor without causing damage to the motor.

Mechanical Time Constant – Time required for the motor to reach 63% of its final speed when a step voltage is applied.

Electrical Time Constant – Time required for the motor to reach 63% of its rated current.

Max. Ambient Temperature – Maximum environmental temperature in which the motor can be operated at rated loads without exceeding its insulation–type temperature rise limits.

Insulation Class – Designation of the operating temperature limits for motor insulation materials.

Thermal Time Constant – Time required for motor windings to reach 63% of continuous temperature rise with constant watts loss.

Torque Constant – Amount of torque developed for one ampere of motor current at the stated motor temperature.

Voltage Constant – Value of the generated voltage at a specified speed when the rotor is moved mechanically in the magnetic field.

Terminal Resistance – Winding resistance.

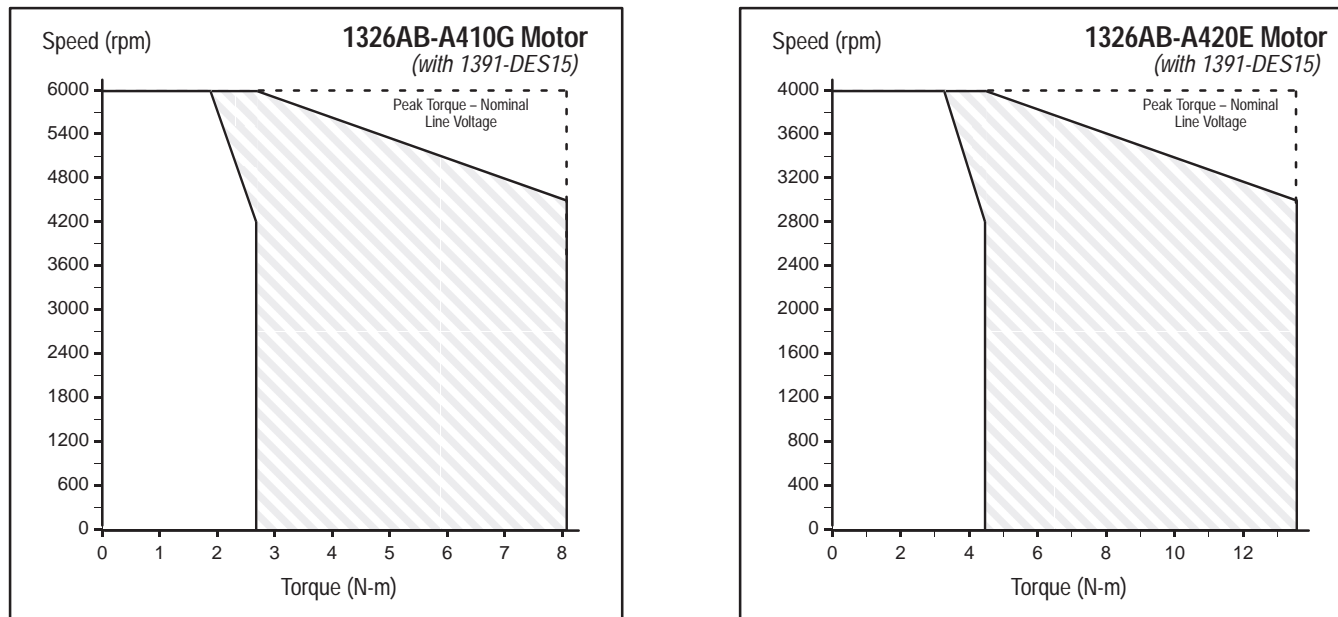
Inductance – Winding inductance measured by a step input of zero impedance voltage applied to the locked rotor.

Rotor Polar Moment of Inertia – Moment of inertia about the axis of rotation.

Motor Weight – Weight of the complete motor (including brake, if supplied) less the weight of options.

Balance – Compensation of rotor weight distribution to reduce vibrational resonance. Motors are factory balanced under running speeds.

Figure 3
1326AB-A410G and A420E Motor Performance Curves



Rated Operation
 Intermittent Operation

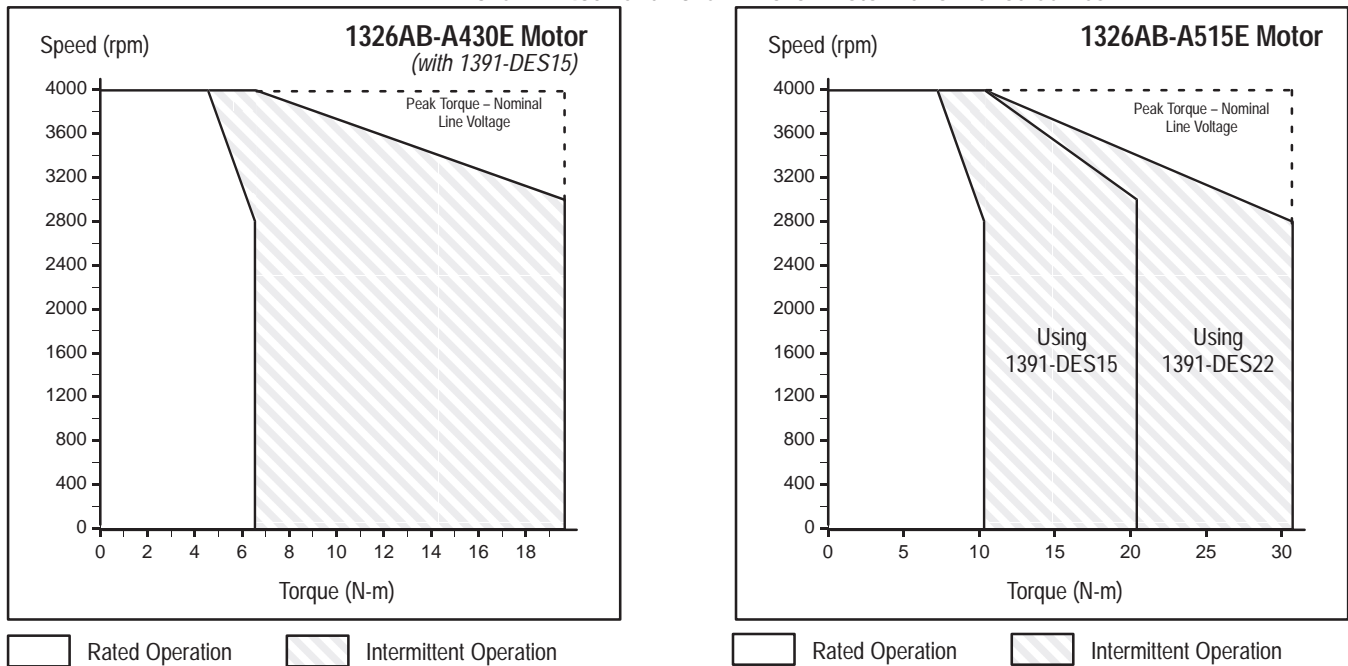
Speed-torque curves show the rated performance of the servomotor at a 40° C ambient temperature. Torque ratings are determined with the motor mounted to a 304.8 mm x 304.8 mm x 25.4 mm (12 in. x 12 in. x 1 in.) steel mounting bracket. The motor case temperature is at approximately 100° C with the motor windings at an 80° C rise over ambient. Motor thermal switches are set at 155° C ± 10%.

Important: Curves and performance data shown are for motor and 1391-DES combinations where the amplifier rating is equal to or greater than the continuous stall current of the motor. All values shown below have a tolerance of ±10%.

Category	Parameter	Ambient Temp.	Units	1326AB-A410G	1326AB-A420E
General	Continuous Stall Torque	at 40° C	N-m (lb-in.)	2.7 (24.0)	4.5 (40.0)
	Rated Output		kW	1.2	1.3
	Peak Stall Torque	at 40° C	N-m (lb-in.)	8.1 (72.0)	13.6 (120.0)
	Continuous Stall Current	at 40° C	amperes	7.1	7.0
	Peak Stall Current	at 40° C	amperes	21.3	21.0
	Mechanical Time Constant	at 40° C	milliseconds	10.0	9.2
	Electrical Time Constant	at 40° C	milliseconds	3.4	3.4
	DES Rated Speed	at 40° C	rpm	6000	4000
Thermal	Maximum Ambient Temperature (without derating)		degrees C	40.0	40.0
	Insulation Class			H	H
	Thermal Time Constant		minutes	23	33
Winding	Torque Constant		N-m (lb-in.)/A	0.44 (3.9)	0.082 (7.23)
	Voltage Constant		volts/1000 rpm	28.5	49.5
	Terminal Resistance		ohms	1.61	1.82
	Inductance		millihenry	8.4	12.7
Mechanical	Rotor Polar Moment of Inertia		kg-m ² (lb-in.-s ²)	0.0005 (0.004)	0.0008 (0.007)
	Motor Weight		kg (lb)	10.0 (22)	12.7 (28)
	Balance ¹		mm (in.) ²	0.0127 (0.0005)	0.0127 (0.0005)

¹ To obtain vibration velocity in inches (mm)/second, use the following formula: $V_v = D_{p-p} \times \text{rpm}/27.01$
 where:
 V_v = Vibration velocity in mm (in.)/second
 D_{p-p} = Peak-to-peak displacement in mm (in.)
 rpm = Motor speed

Figure 4
1326AB-A430E and 1326AB-A515E Motor Performance Curves



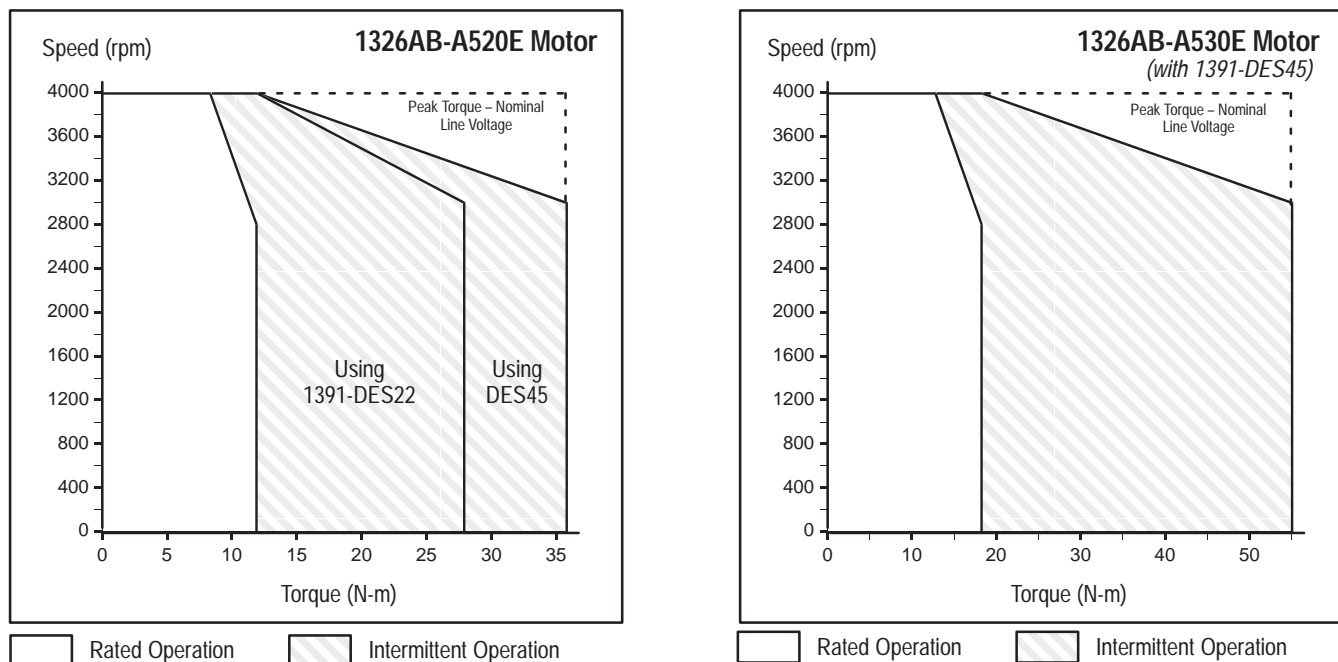
Speed-torque curves show the rated performance of the servomotor at a 40° C ambient temperature. Torque ratings are determined with the motor mounted to a 304.8 mm x 304.8 mm x 25.4 mm (12 in. x 12 in. x 1 in.) steel mounting bracket. The motor case temperature is at approximately 100° C with the motor windings at an 80° C rise over ambient. Motor thermal switches are set at 155° C ± 10%.

Important: Curves and performance data shown are for motor and 1391-DES combinations where the amplifier rating is equal to or greater than the continuous stall current of the motor. All values shown below have a tolerance of ±10%.

Category	Parameter	Ambient Temp.	Units	1326AB-A430E	1326AB-A515E
General	Continuous Stall Torque	at 40° C	N-m (lb-in.)	6.6 (58.0)	10.4 (92.0)
	Rated Output		kW	1.9	3.0
	Peak Stall Torque	at 40° C w/DES15	N-m (lb-in.)	19.7 (174.0)	20.5 (181.5)
	Peak Stall Torque	at 40° C w/DES22	N-m (lb-in.)	not applicable	30.8 (272.0)
	Continuous Stall Current	at 40° C	amperes	9.5	15.2
	Peak Stall Current	at 40° C w/DES15	amperes	28.5	30
	Peak Stall Current	at 40° C w/DES22	amperes	not applicable	45
	Mechanical Time Constant	at 40° C	milliseconds	8.6	8.2
	Electrical Time Constant	at 40° C	milliseconds	3.4	7.5
	DES Rated Speed	at 40° C	rpm	4000	4000
	Thermal	Maximum Ambient Temperature (without derating)		degrees C	40.0
Insulation Class				H	H
Thermal Time Constant			minutes	38	45
Winding	Torque Constant		N-m (lb-in.)/A	0.82 (7.24)	0.83 (7.31)
	Voltage Constant		volts/1000 rpm	49.5	51.4
	Terminal Resistance		ohms	1.08	0.707
	Inductance		millihenry	8.4	5.0
Mechanical	Rotor Polar Moment of Inertia		kg-m ² (lb-in.-s ²)	0.001 (0.010)	0.0043 (0.038)
	Motor Weight		kg (lb)	16.8 (37)	21.3 (47)
	Balance ¹		mm (in.) ²	0.0127 (0.0005)	0.0127 (0.0005)

¹ To obtain vibration velocity in inches (mm)/second, use the following formula: $V_v = D_p \cdot p \times \text{rpm} / 27.01$
where:
 V_v = Vibration velocity in mm (in.)/second
 D_{p-p} = Peak-to-peak displacement in mm (in.)
rpm = Motor speed

Figure 5
1326AB-A520G and 1326AB-A530E Motor Performance Curves



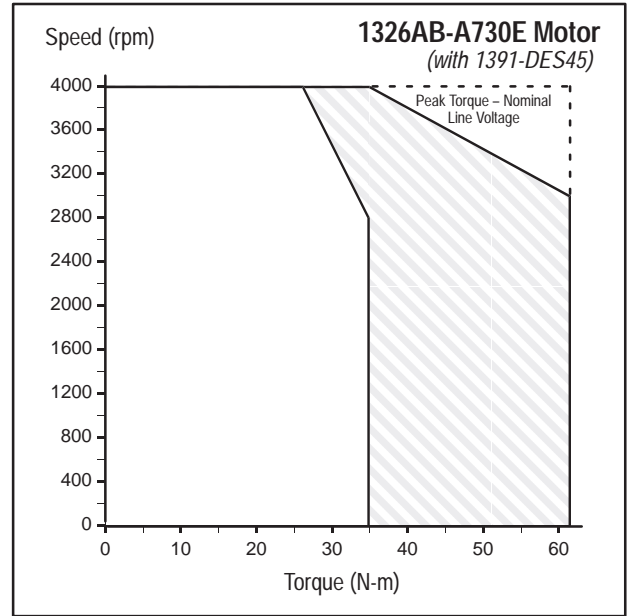
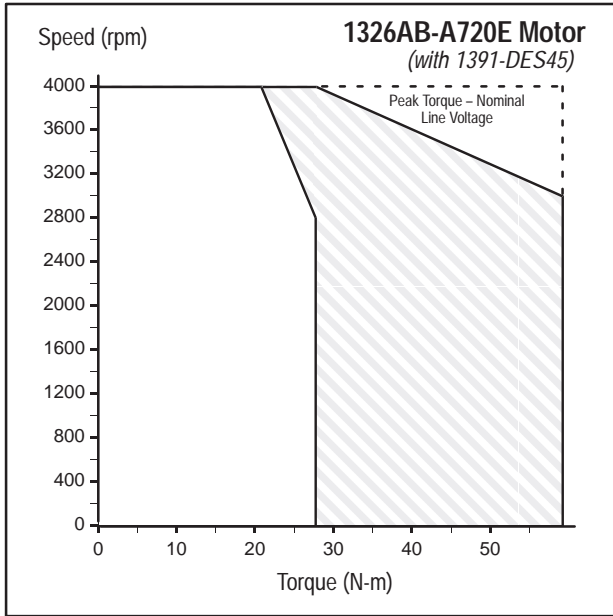
Speed-torque curves show the rated performance of the servomotor at a 40° C ambient temperature. Torque ratings are determined with the motor mounted to a 304.8 mm x 304.8 mm x 25.4 mm (12 in. x 12 in. x 1 in.) steel mounting bracket. The motor case temperature is at approximately 100° C with the motor windings at an 80° C rise over ambient. Motor thermal switches are set at 155° C ± 10%.

Important: Curves and performance data shown are for motor and 1391-DES combinations where the amplifier rating is equal to or greater than the continuous stall current of the motor. All values shown below have a tolerance of ±10%.

Category	Parameter	Ambient Temp.	Units	1326AB-A520E	1326AB-A530E
General	Continuous Stall Torque	at 40° C	N-m (lb-in.)	12.0 (106.0)	18.4 (163.0)
	Rated Output		kW	3.5	5.5
	Peak Stall Torque	at 40° C w/DES22	N-m (lb-in.)	28.0 (248)	NA
	Peak Stall Torque	at 40° C w/DES45	N-m (lb-in.)	35.9 (318)	55.2 (489.0)
	Continuous Stall Current	at 40° C	amperes	19.2	28.4
	Peak Stall Current	at 40° C w/DES22	amperes	45	NA
	Peak Stall Current	at 40° C w/DES45		57.6	90
	Mechanical Time Constant	at 40° C	milliseconds	7.8	8.6
	Electrical Time Constant	at 40° C	milliseconds	7.7	7.4
	DES Rated Speed	at 40° C	rpm	4000	4000
	Thermal	Maximum Ambient Temperature (without derating)		degrees C	40.0
Insulation Class				H	H
Thermal Time Constant			minutes	56	66
Winding	Torque Constant		N-m (lb-in.)/A	0.83 (7.31)	0.82 (7.3)
	Voltage Constant		volts/1000 rpm	49.9	49.9
	Terminal Resistance		ohms	0.35	0.182
	Inductance		millihenry	3.52	2.37
Mechanical	Rotor Polar Moment of Inertia		kg-m ² (lb-in.-s ²)	0.006 (0.050)	0.009 (0.080)
	Motor Weight		kg (lb)	27.7 (61)	34.5 (76)
	Balance ¹		mm (in.) ²	0.0127 (0.0005)	0.0127 (0.0005)

¹ To obtain vibration velocity in inches (mm)/second, use the following formula: $V_v = D_{p-p} \times \text{rpm} / 27.01$
where:
 V_v = Vibration velocity in mm (in.)/second
 D_{p-p} = Peak-to-peak displacement in mm (in.)
rpm = Motor speed

1326AB-A720E and 1326AB-A730E Motor Performance Curves



Rated Operation Intermittent Operation

Rated Operation Intermittent Operation

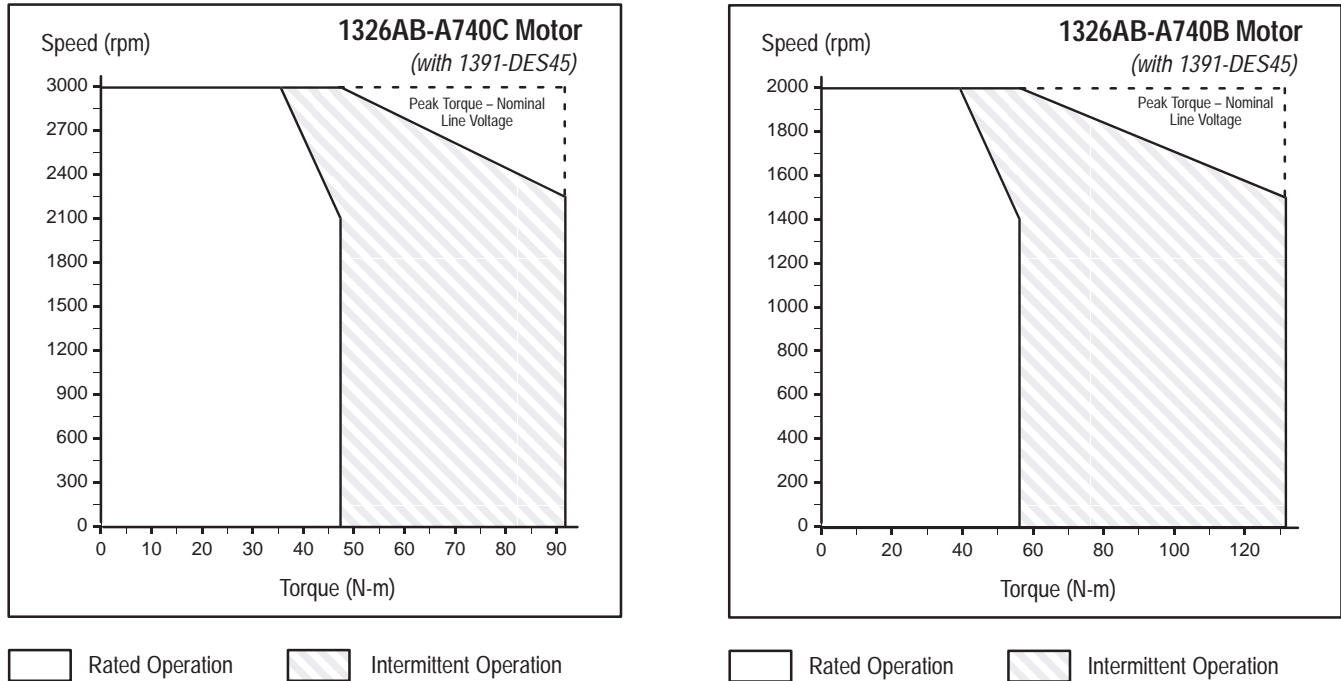
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Important: Curves and performance data shown are for motor and 1391-DES combinations where the amplifier rating is equal to or greater than the continuous stall current of the motor. All values shown below have a tolerance of ±10%.

Category	Parameter	Ambient Temp.	Units	1326AB-A720E	1326AB-A730E
General	Continuous Stall Torque	at 40° C	N-m (lb-in.)	27.9 (247)	35 (310)
	Rated Output		kW	8.2	10.3
	Peak Stall Torque	at 40° C	N-m (lb-in.)	59.4 (526)	61.6 (545)
	Continuous Stall Current	at 40° C	amperes	42.25	51.2
	Peak Stall Current	at 40° C	amperes	90	90
	Mechanical Time Constant	at 40° C	milliseconds	5.3	6.0
	Electrical Time Constant	at 40° C	milliseconds	13.1	13.0
	DES Rated Speed	at 40° C	rpm	4000	4000
Thermal	Maximum Ambient Temperature (without derating)		degrees C	40	40
	Insulation Class			H	H
	Thermal Time Constant		minutes	71	86
Winding	Torque Constant		N-m (lb-in.)/A	0.84 (7.44)	0.84 (7.44)
	Voltage Constant		volts/1000 rpm	50.5	50.5
	Terminal Resistance		ohms	0.088	0.059
	Inductance		millihenry	1.5	1.0
Mechanical	Rotor Polar Moment of Inertia		kg-m ² (lb-in.-s ²)	0.015 (0.140)	0.024 (0.22)
	Motor Weight		kg (lb)	46.3 (102)	62.6 (170)
	Balance ¹		mm (in.) ²	0.0127 (0.005)	0.0127 (0.005)

¹ To obtain vibration velocity in inches (mm)/second, use the following formula: $V_v = D_{p-p} \times \text{rpm}/27.01$
 where:
 V_v = Vibration velocity in mm (in.)/second
 D_{p-p} = Peak-to-peak displacement in mm (in.)
 rpm = Motor speed

Figure 6
1326AB-A740C and 1326AB-A740B Motor Performance Curves



Speed-torque curves show the rated performance of the servomotor at a 40° C ambient temperature. Torque ratings are determined with the motor mounted to a 304.8 mm x 304.8 mm x 25.4 mm (12 in. x 12 in. x 1 in.) steel mounting bracket. The motor case temperature is at approximately 100° C with the motor windings at an 80° C rise over ambient. Motor thermal switches are set at 155° C ± 10%.

Important: Curves and performance data shown are for motor and 1391-DES combinations where the amplifier rating is equal to or greater than the continuous stall current of the motor. All values shown below have a tolerance of ±10%.

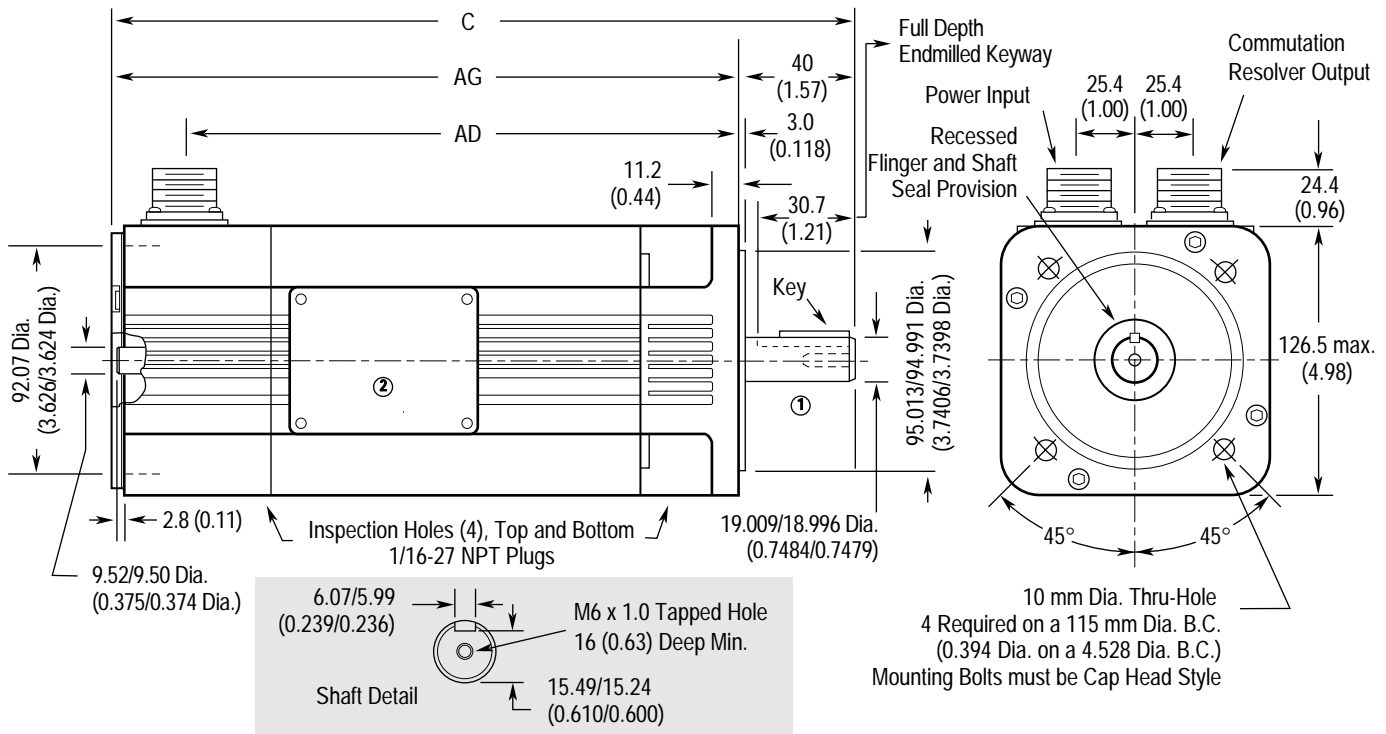
Category	Parameter	Ambient Temp.	Units	1326AB-A740C	1326AB-A740B
General	Continuous Stall Torque	at 40° C	N-m (lb-in.)	47.6 (421)	56.5 (500)
	Rated Output		kW	10.5	8.3
	Peak Stall Torque	at 40° C	N-m (lb-in.)	92.0 (814)	132 (1168)
	Continuous Stall Current	at 40° C	amperes	46.6	38.5
	Peak Stall Current	at 40° C	amperes	90	90
	Mechanical Time Constant	at 40° C	milliseconds	5.6	5.4
	Electrical Time Constant	at 40° C	milliseconds	13.1	17.6
	DES Rated Speed	at 40° C	rpm	3000	2000
Thermal	Maximum Ambient Temperature (without derating)		degrees C	40	40.0
	Insulation Class			H	H
	Thermal Time Constant		minutes	95	120
Winding	Torque Constant		N-m (lb-in.)/A	1.2 (10.6)	1.73 (15.3)
	Voltage Constant		volts/1000 rpm	72.4	100.1
	Terminal Resistance		ohms	0.09	0.162
	Inductance		millihenry	1.54	2.85
Mechanical	Rotor Polar Moment of Inertia		kg-m ² (lb-in.-s ²)	0.032 (0.29)	0.032 (0.29)
	Motor Weight		kg (lb)	77.1 (170)	77.1 (170)
	Balance ¹		mm (in.) ²	0.0127 (0.005)	0.0127 (0.005)

¹ To obtain vibration velocity in inches (mm)/second, use the following formula: $V_v = D_{p-p} \times \text{rpm} / 27.01$
 where:
 V_v = Vibration velocity in mm (in.)/second
 D_{p-p} = Peak-to-peak displacement in mm (in.)
 rpm = Motor speed

Servomotor Dimensions

The following figures provide approximate dimensions for the 1326AB 230V AC Series Motors.

Figure 7
Motor Dimensions – 1326AB-A4 Torque Plus Series Servomotor



Flange Mount in millimeters and (inches)

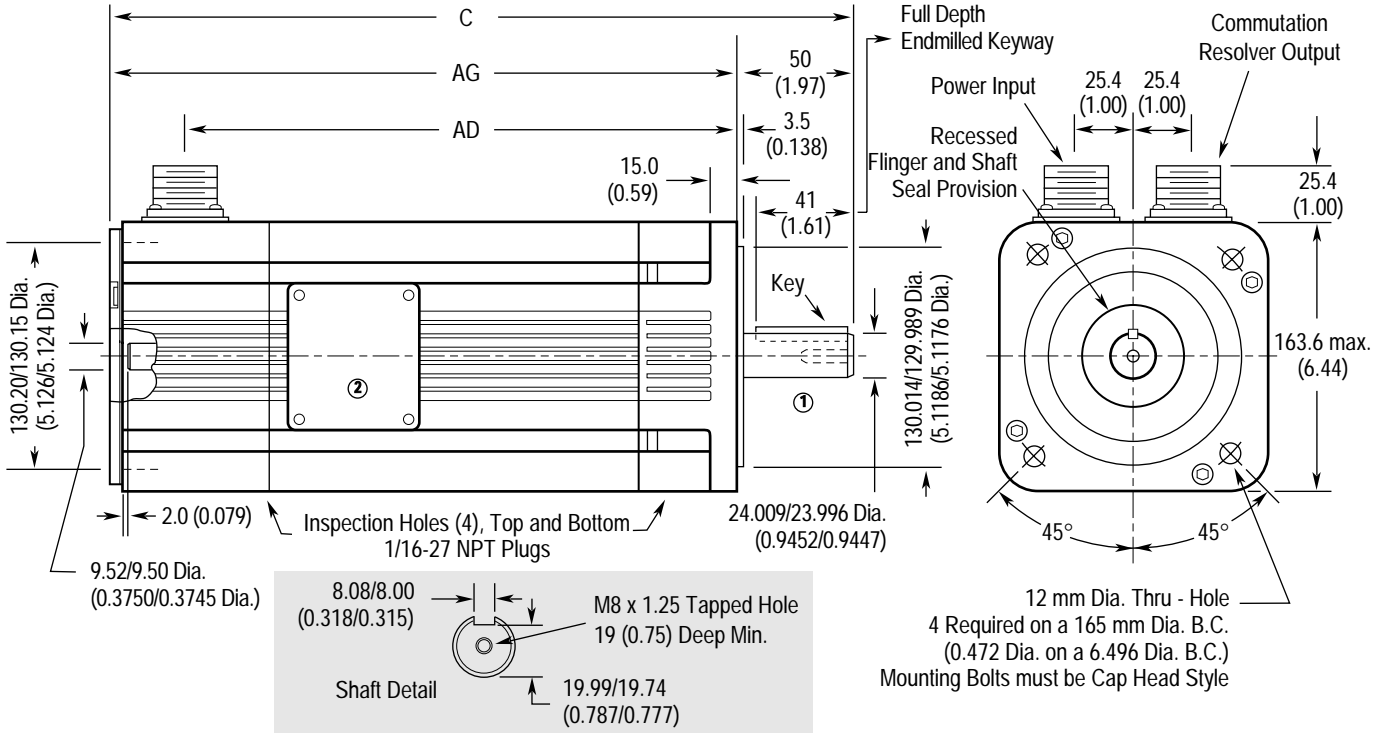
Catalog Number	Description	AD	AG	C	Key	End Milled Keyway (full depth)
1326AB-A410x-21	without brake	201.7 (7.94)	235.7 (9.28)	275.6 (10.85)	6 x 6 x 30 0.236 x 0.236 x 1.18	30.7 (1.21)
1326AB-A420x-21	without brake	258.8 (10.19)	292.9 (11.53)	330.0 (13.11)	6 x 6 x 30 0.236 x 0.236 x 1.18	30.7 (1.21)
1326AB-A430x-21	without brake	328.7 (12.94)	362.7 (14.28)	402.8 (15.86)	6 x 6 x 30 0.236 x 0.236 x 1.18	30.7 (1.21)

1326AB-Axxxx-21-K4 with optional 24V DC, 8.1 N-m (72 lb-in.) brake add 45 mm (1.75 in.) to AD, AG and C

1326AB-Axxxx-21-A4 with optional 90V DC, 8.1 N-m (72 lb-in.) brake add 45 mm (1.75 in.) to AD, AG and C

Dimensions are per NEMA Standards MG 7-2.4.1.3 and IEC 72-1. Shaft tolerance per DIN 42955, "N" tolerance.

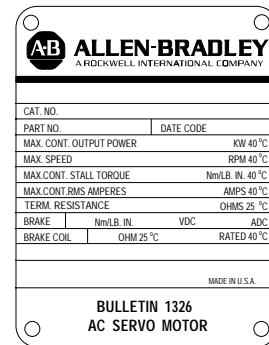
Figure 8
Motor Dimensions – 1326AB-A5 Torque Plus Series Servomotor



① **Shaft and Pilot Tolerances**

Shaft Runout	0.05 (0.002) T.I.R.
Shaft Endplay	0.0127 (0.005)
Pilot Eccentricity	0.10 (0.004) T.I.R.
Maximum Face Runout	0.10 (0.004) T.I.R.

② **Name Plate Detail**



Flange Mount in millimeters and (inches)

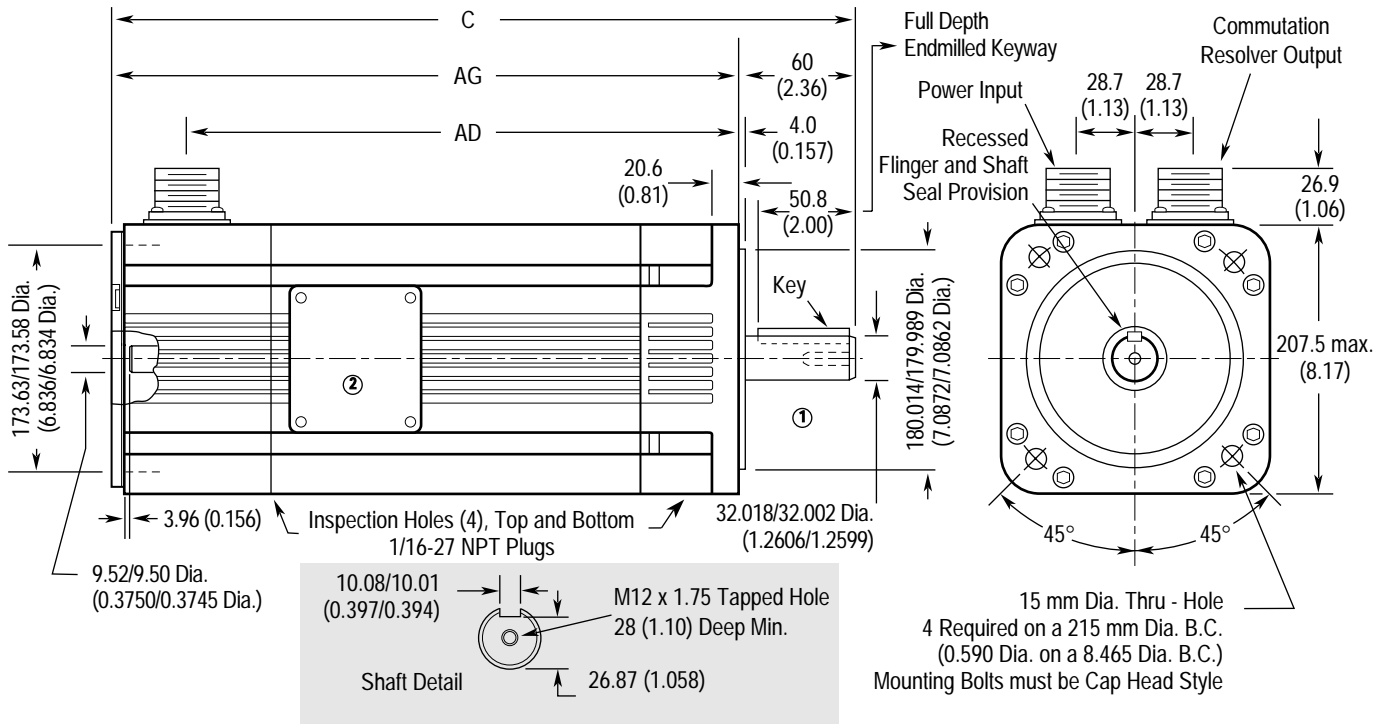
Catalog Number	Description	AD	AG	C	Key	End Milled Keyway (full depth)
1326AB-A515x-21	without brake	244.1 (9.61)	276.6 (10.89)	326.6 (12.86)	8 x 7 x 40 0.315 x 0.276 x 1.57	41.0 (1.61)
1326AB-A520x-21	without brake	282.2 (11.11)	314.7 (12.39)	364.7 (14.36)	8 x 7 x 40 0.315 x 0.276 x 1.57	41.0 (1.61)
1326AB-A530x-21	without brake	364.7 (14.36)	397.3 (15.64)	447.3 (17.61)	8 x 7 x 40 0.315 x 0.276 x 1.57	41.0 (1.61)

1326AB-Axxxx-21-K5 with optional 24V DC, 13.6 N-m (120 lb-in.) brake add 76.2 mm (3.0 in.) to AD, AG and C

1326AB-Axxxx-21-A5 with optional 90V DC, 13.6 N-m (120 lb-in.) brake add 76.2 mm (3.0 in.) to AD, AG and C

Dimensions are per NEMA Standards MG 7-2.4.1.3 and IEC 72-1. Shaft tolerance per DIN 42955, "N" tolerance.

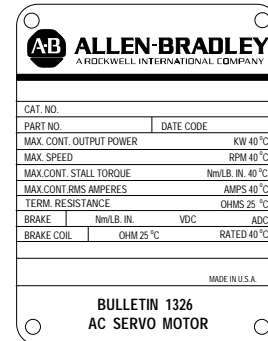
Figure 9
Motor Dimensions – 1326AB-A7 Torque Plus Series Servomotor



① Shaft and Pilot Tolerances

Shaft Runout	0.05 (0.002) T.I.R.
Shaft Endplay	0.0127 (0.005)
Pilot Eccentricity	0.10 (0.004) T.I.R.
Maximum Face Runout	0.10 (0.004) T.I.R.

② Name Plate Detail



Flange Mount in millimeters and (inches)

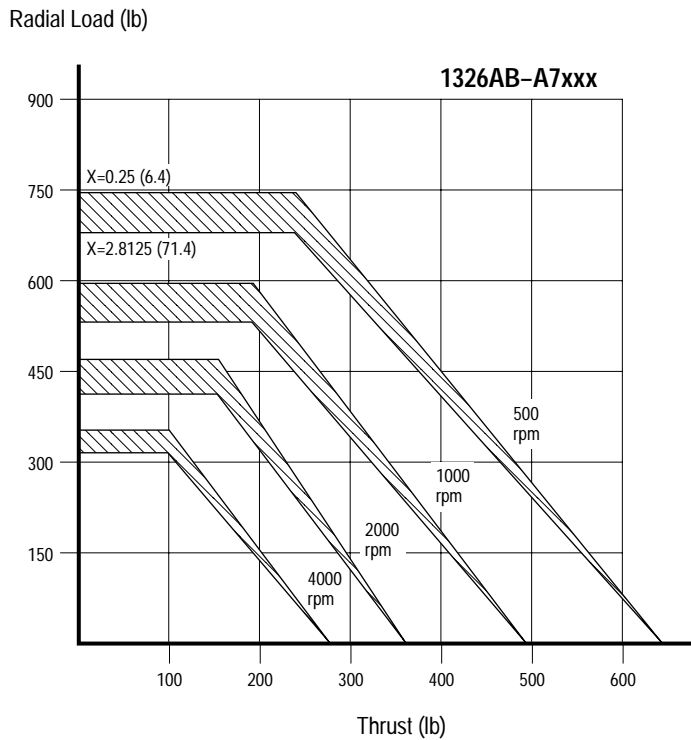
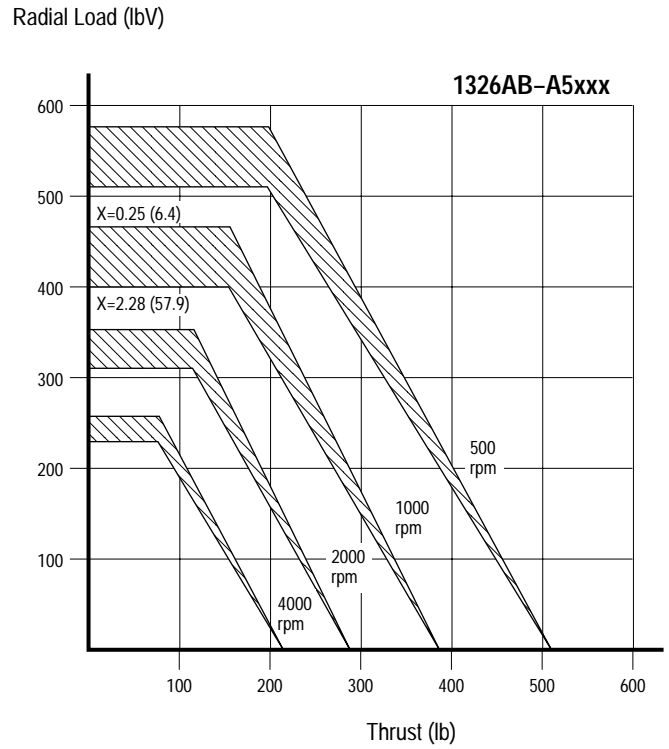
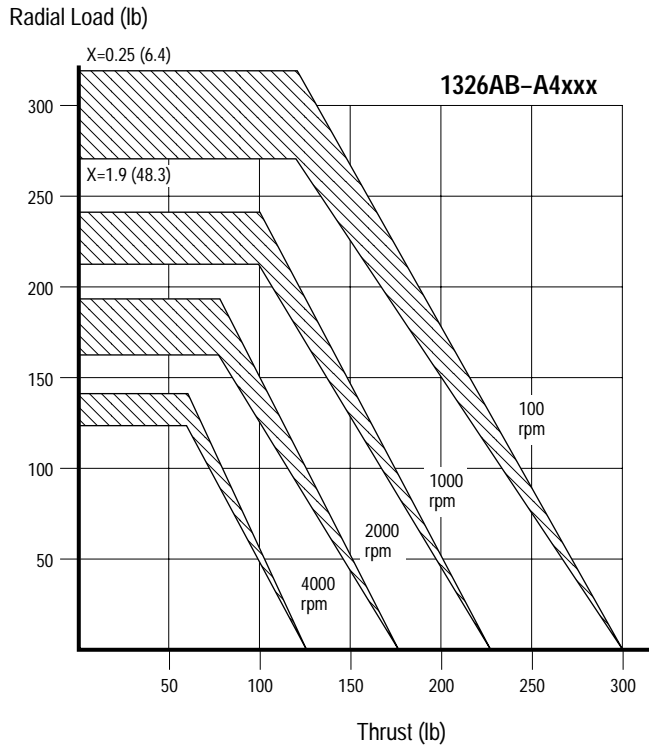
Catalog Number	Description	AD	AG	C	Key	End Milled Keyway (full depth)
1326AB-A720x-21	without brake	324.6 (12.78)	366.0 (14.41)	426.0 (16.77)	10 x 8 x 50 0.39 x 0.31 x 1.97	50.8 (2.00)
1326AB-A730x-21	without brake	413.5 (16.28)	454.9 (17.91)	514.9 (20.27)	10 x 8 x 50 0.39 x 0.31 x 1.97	50.8 (2.00)
1326AB-A740x-21	without brake	502.4 (19.78)	543.8 (21.41)	603.8 (23.77)	10 x 8 x 50 0.39 x 0.31 x 1.97	50.8 (2.00)

1326AB-Axxxx-21-K7 with optional 24V DC, 41 N-m (360 lb-in.) brake add 76.2 mm (3.0 in.) to AD, AG and C

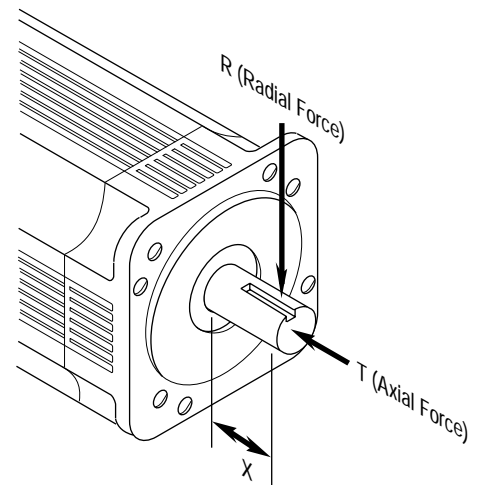
1326AB-Axxxx-21-A7 with optional 90V DC, 41 N-m (360 lb-in.) brake add 76.2 mm (3.0 in.) to AD, AG and C

Dimensions are per NEMA Standards MG 7-2.4.1.3 and IEC 72-1. Shaft tolerance per DIN 42955, "N" tolerance.

Figure 11
Motor Output Shaft Radial Load vs. Thrust Load



1326AB AC Servomotor 15,000 Hour B10 Bearing Life –
 Vertical or Horizontal Mounting



Servomotor Options

The following section provides detailed information on the various options available for the 1326AB Torque Plus AC Servomotors.

Integral Holding Brake (Option -Ax, -Kx)

The disc type brake is spring-set when power is removed. It is designed to hold a load at rest and provide limited braking torque for emergency stopping. The brake is not intended to be used as a positioning brake (brake backlash is 0.8 arc-minutes maximum) or continuously cycled to assist in stopping a load. The brake must not be energized/de-energized more than 90 times an hour when used as a parking brake. A parking brake is only meant to hold a stationary load and is not intended to stop motor movement, unless a power interruption occurs. For more information, refer to Table Table B.

Table B
Holding Brake Data

Motor Catalog Number	Holding Torque Nm (lb-in.)	Current Draw when Energized		Brake Response Time Pickup/Dropout	Weight Added to Motor Weight kg (lb)	Inertia Added to Motor Inertia kg-cm-s ² (lb-in.-s ²)	Cold Resistance	
		-Ax (90V)	-Kx (24V)				-Ax (90V)	-Kx (24V)
1326AB-A4	8.1 (72)	0.26A	0.88A	120ms/20ms	1.36 (3.0)	0.001 (0.001)	382 ohms	28 ohms
1326AB-A5	13.6 (120)	0.37A	1.20A	150ms/25ms	4.08 (9.0)	0.0031 (0.0027)	270 ohms	21 ohms
1326AB-A7	45.2 (400)	0.32A	1.20A	120ms/30ms	5.90 (13.0)	0.0053 (0.0046)	306 ohms	21 ohms

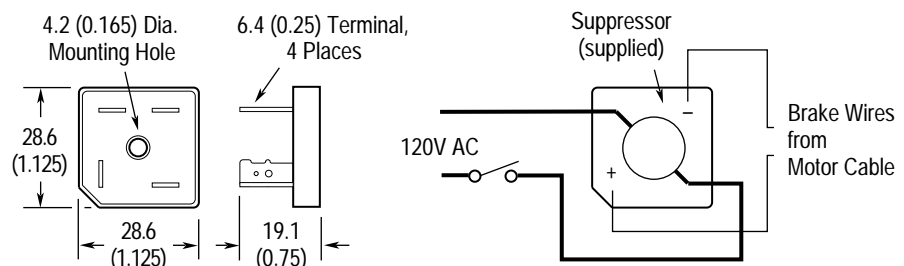
Brake Power Supply for 90V DC Brakes (1326-MOD-BPS)

The Brake Power Supply converts 120V AC to the voltage needed for 90V DC brakes. Up to four brakes can be connected to one power supply. However, if you desire independent control of multiple motors, you must use one power supply per motor. Refer to the figure below for dimension and wiring information.

Important: 24V DC brakes require a user-supplied power supply capable of producing 24V DC at 0.88A to 1.2A.

Specifications	
Power Supply Input Rating	120V AC, single-phase, +10%, -15%
Dissipation	5 watts per motor

Figure 12
Brake Power Supply Dimensions and Wiring Information

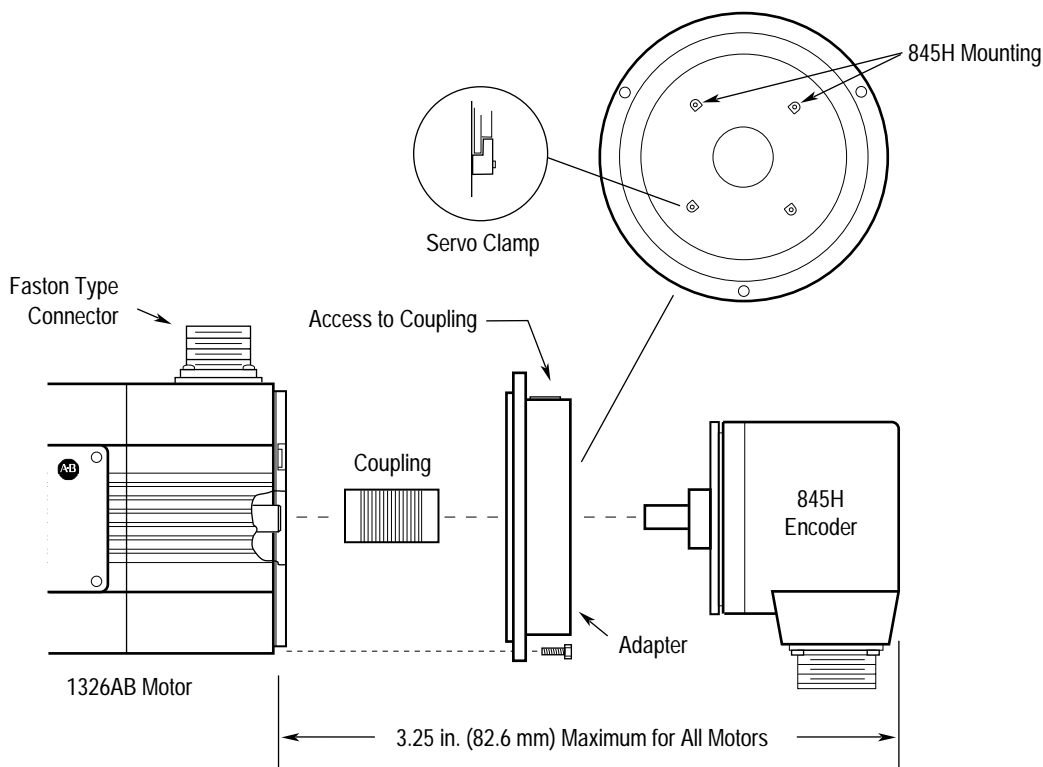


Encoder Mounting Adapters (1326AB-MOD-Mxx)

Several adapters are available for mounting Allen-Bradley 845H encoders to 1326AB Servomotors. Refer to the figure below for further information.

Important: The IP65 rating of the motor is not maintained when using this option.

Figure 13
Encoder Mounting Adapter



Note: Coupling adapts to .375 in. encoder shaft

Note: Servo clamps accommodate both English and metric servo encoder mounting configurations.

Shaft Oil Seal (1326AB-MOD-SSV-xx)

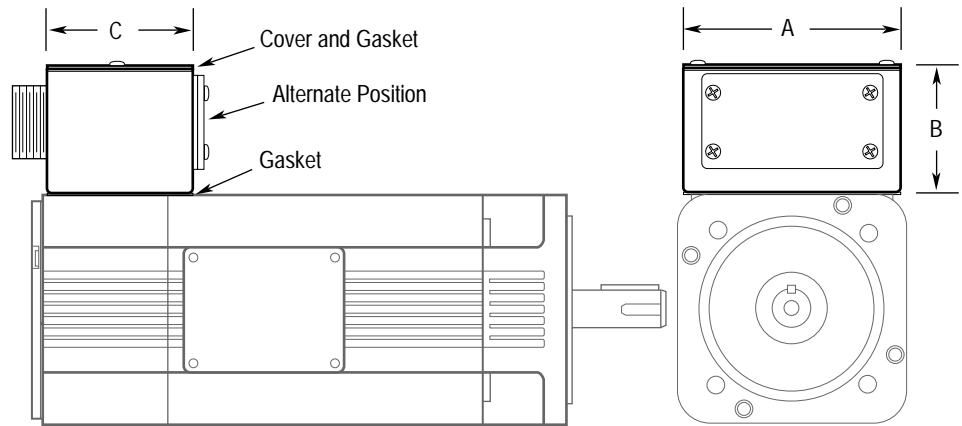
Allen-Bradley offers a Viton shaft oil seal kit that you can install on a motor in the field. Use the seal in applications where the motor shaft may be subjected to occasional oil splashes or low pressure water jetting (For example: If the motor is exposed to splashing from coolant nozzles.). A shaft seal kit must be installed on the motor to meet IP65 requirements.

Important: The kit is not intended to be used in applications where the motor shaft is partially or fully submerged in oil.

Motor Junction Box Kit (1326AB-MOD-RJxx)

The Motor Junction Box Kit provides axially mounted connectors with either front or rear exit connections. The junction box allows the motor connectors to be brought out axially to the motor without further wiring. Motors with IP65 protection maintain their rating when using this option. Refer to the figure below for junction box dimensions.

Figure 14
Motor Junction Box Dimensions

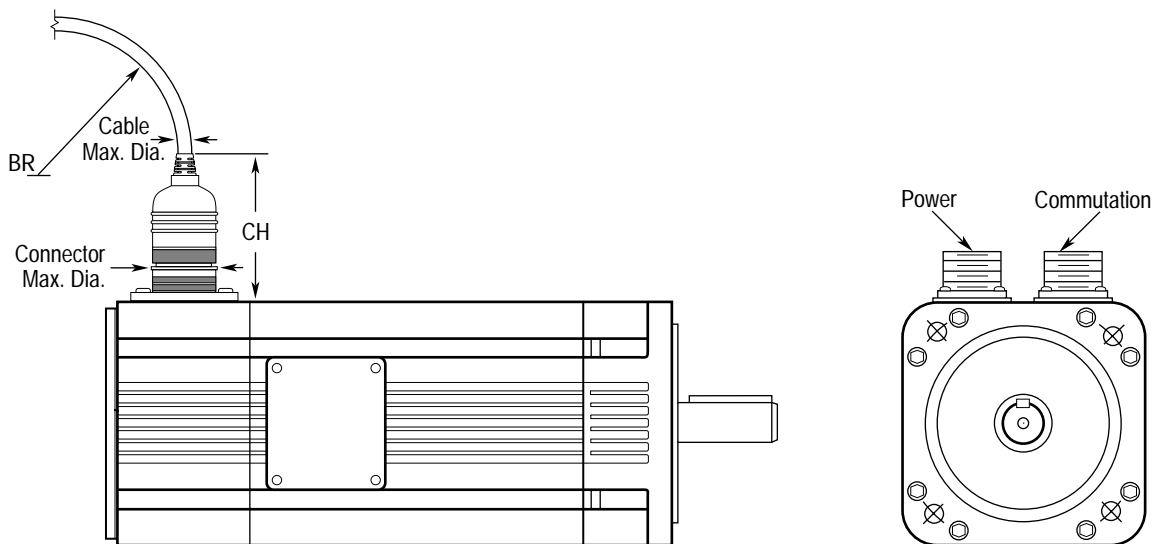


Dimension	1326AB-MOD-RJAB1	1326AB-MOD-RJC1
A	105.0 mm (4.13 in.)	120.65 mm (4.75 in.)
B	62.0 mm (2.44 in.)	66.675 mm (2.625 in.)
C	190.5 mm (2.50 in.)	66.675 mm (2.625 in.)

Servomotor Cables

The following section provides Pin-outs and interconnect information for the various 1326 cables.

Figure 10
Motor Power & Feedback Cable Dimensions



Dimensions are in millimeters and (inches)

Cable	Description	CH ¹	BR ²	Connector Max. Dia.	Cable Max. Dia.
1326-CFU _{xxx}	Commutation Feedback	101.6 (4.0)	50.8 (2.0)	31.75 (1.25)	10.92 (0.43)
1326ES-CFU _{xxx} ³	Commutation Feedback (Extended Length)	101.6 (4.0)	50.8 (2.0)	31.75 (1.25)	10.92 (0.43)
1326-CFUT _{xxx}	Commutation Feedback (High Flex)	101.6 (4.0)	172.7 (6.8)	31.75 (1.25)	17.27 (0.68)
1326ES-CFUT _{xxx} ³	Commutation Feedback (Extended Length, High Flex)	101.6 (4.0)	172.7 (6.8)	31.75 (1.25)	17.27 (0.68)
1326-CPAB _{xxx}	Motor Power – Series A4, A5	127.0 (5.0)	76.2 (3.0)	31.75 (1.25)	13.84 (0.55)
1326ES-CPAB _{xxx} ³	Motor Power – Series A4, A5 (Extended Length)	127.0 (5.0)	76.2 (3.0)	31.75 (1.25)	13.84 (0.55)
1326-CPABT _{xxx}	Motor Power – Series A4, A5 (High Flex)	127.0 (5.0)	279.4 (11.0)	31.75 (1.25)	18.54 (0.73)
1326ES-CPABT _{xxx} ³	Motor Power – Series A4, A5 (Extended Length, High Flex)	127.0 (5.0)	279.4 (11.0)	31.75 (1.25)	18.54 (0.73)
1326-CPC _{xxx}	Motor Power – Series A7	127.0 (5.0)	76.2 (3.0)	31.75 (1.25)	18.54 (0.73)
1326ES-CPC _{xxx}	Motor Power – Series A7 (Extended Length)	127.0 (5.0)	76.2 (3.0)	31.75 (1.25)	18.54 (0.73)
1326-CPCT _{xxx}	Motor Power – Series A7 (High Flex)	127.0 (5.0)	332.7 (13.1)	38.10 (1.50)	22.02 (0.87)
1326ES-CPCT _{xxx}	Motor Power – Series A7 (Extended Length, High Flex)	127.0 (5.0)	332.7 (13.1)	38.10 (1.50)	22.02 (0.87)
1326-CEU _{xxx}	Encoder Feedback	101.6 (4.0)	50.8 (2.0)	31.75 (1.25)	12.95 (0.51)

All cables should be hung or laid flat for 24 hours prior to installation. This will allow the conductors to relax into their natural state and guard against internal twisting.

- CH is described as the clearance to bend.
- BR (bend radius) is specified for standard 1326 cable assemblies. BR may vary on user-fabricated cables. For standard cable, BR is a one-time flex application. Flex cables have a much higher BR to withstand flex applications.
- 1326 communication and power cables. Standard and flex, are available in extended lengths of 150, 200, 250 and 300 ft (45.7, 61.0, 76.2, 91.4 m) when using a 1391-DES drive.

Powertrack (Linear-Flex) Applications

Standard Allen-Bradley 1326-CFUxxx (commutation) and 1326-CPABxxx (power) cables are tray rated (stationary) and should be used for one time flex applications (static).

The 1326-CFUT-xxx (commutation), 1326 CPABTxxx, and 1326-CPCTxxx (power) flex-rated cables are offered for moving (power track) installations. We recommended that standard cabling or flex cabling be used. Power track cabling is required for applications such as Cat-Track where dynamic, linear and flexing occurs more than the standard, one-time flex setup.

Typical linear flex cycle life has demonstrated to be 7.7 million cycles when properly installed at the required minimum bend radius shown below.

Linear flex is flex in a one dimensional direction. The flex cable is not rated for twist flex, which is a two dimensional direction flex. Do not use power track (linear-flex) cabling in twisting applications.

Cable	1326-CPABT-ABxxx	1326-CPCT-Fxx	1326-CFUT
Diameter	18.0 mm (0.709 in.)	21.2 mm (0.835 in.)	16.6 mm (0.654 in.)
Minimum Bend Radius	15 x Outer Diameter	15 x Outer Diameter	10 x Outer Diameter

Estimated cable life in cable carriers for other than those specified above are provided below.

% Reduction in Recommended Bend Radius	% Reduction in Cycle Life	Estimated Cycles (Millions w/25% Safety Margin)
00%	00%	7.7
10%	10%	7.0
15%	39%	4.7
20%	56%	3.4

Important: The life of the cable can be drastically reduced when it is clamped improperly, bound together, or otherwise constrained. For installation guidelines, see the Installation Guidelines section on the following page.

Calculating the Number of Flex Cable Cycles

For example:

An operating power track has a bend radius that is 12.4 times the outer diameter of the 1326-CBT-ABxxx cable.

1. Calculate the % reduction in bend radius.
 $(15 - 12.4 / 15) \times 100 = 17.3\%$
2. Select the closest points from the table above (15% and 20%).

% Reduction in Recommended Bend Radius	% Reduction in Cycle Life
15%	39%
17.3%	y
20%	56%

3. Interpolate and solve for y to determine % reduction in cycle life for a 17.3% reduction in recommended bend radius.

$$\frac{17\% - 15\%}{20\% - 15\%} = \frac{y - 39\%}{56\% - 39\%}$$

$$y = 46\%$$

4. Cable life will be reduced by 46%. Calculate the estimated cycles by reducing 7.7 million cycles (full life expectancy) by 46% (multiply by 0.54).

$$7.7 \text{ million} \times 0.54 = \mathbf{4.16 \text{ million cycles}}$$

Installation guidelines

In order to maintain power track cable reliability, read the guidelines listed below.

- Always follow installation instructions of the cable carrier manufacturer.
- Cabling should be prepared for installation into the cable carrier in such a manner that there are no twists, bends or kinks in the cable.
- It is important to lay out the cabling at least 24 hours before installation to relax any stresses resulting from transit or storage.
- When placing the cable into the cable carrier, the carrier should be laid out flat with the bending direction facing upward. It should then be fitted with the cables in working position. The cables should be laid into the cable carrier and not woven between or around other cables.
- Allow at least 10% clearance between cables and allow cables to be free to move. Use separators between cables.
- The cables must be free to move within the carrier. Do not attach the cables to the carrier or each other. Clamp cables beyond the ends of the carrier. Cycle the carrier several times before clamping.
- Place heavier cables toward track edges, clamping lighter ones in the center.
- Do not pull cables tight against the inner/outer track curves.

1326-CFUxxx, 1326ES-CFUxxx, 1326-CFUTxxx, 1326ES-CFUTxxx
Commutation Cable

Wire Color	Gauge	Connector Pin	1391-DES Terminal #
Black	#20	A	TB1-10
White	#20	B	TB1-9
Shield – drain	#20	no connection	TB1-8
Black	#20	D	TB1-7
Red	#20	E	TB1-6
Shield – drain	#20	no connection	TB1-5
Black	#20	H	TB1-4
Green	#20	G	TB1-3
Shield – drain	#20	no connection	TB1-2
Braided shield	#20	no connection	TB1-1 to
			Ground stud

1326-CPABxxx, 1326ES-CPABxxx, 1326-CPABTxxx, 1326ES-CPABTxxx
Motor Power Cable

Wire Number	Wire Color	Gauge	Connector Pin	1391-DES Terminal #
1	Black	12	F	TB5-1
2	Black	12	I	TB5-2
3	Black	12	B	TB5-3
4	Black	16	D	Ground stud
5	Black	16	E	Ground stud
6	Black	16	C	Thermal switch
7	Drain wire	16	G	Brake power (+)
8	Black	16	H	Brake power (-)
9	Black	16	A	Thermal switch
Mylar shield	Mylar shield	16	no connection	Ground stud

1326-CPCxxx, 1326ES-CPCxxx, 1326-CPCTxxx, 1326ES-CPCTxxx
Motor Power Cable

Wire Number	Wire Color	Gauge	Connector Pin	1391-DES Terminal #
1	Black	8	D	TB5-1
2	Black	8	E	TB5-2
3	Black	8	F	TB5-3
4	Drain wire	12	A	Ground stud
5	Black	12	B	Ground stud
6	Black	16	G	Thermal switch
7	Black	16	H	Brake power (+)
8	Black	16	I	Brake power (-)
9	Black	16	C	Thermal switch
Mylar shield	Mylar shield	16	no connection	Ground stud

1326-CEUxx Encoder Feedback Cable

Pair	Wire Color	Gauge	Connector Pin
1	Black	22	H
	White	22	A
2	Black	22	F
	Red	22	D
3	Black	22	J
	Orange	22	C
4	Black	22	I
	Blue	22	B
5	Black	22	F
	Green	22	E



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