Installation Instructions

Original Instructions

Kinetix TLP Multi-purpose Servo Motors with 046…235 mm Frame Size

Catalog Numbers TLP-A046-005, TLP-A046-010, TLP-A070-020, TLP-A070-040, TLP-A090-075, TLP-A100-100, TLP-A115-100, TLP-A115-200, TLP-A145-050, TLP-A145-090, TLP-A145-100, TLP-A145-150, TLP-A200-200, TLP-A200-300, TLP-A200-350, TLP-A200-450, TLP-A200-550, TLP-A200-750, TLP-A235-11K, TLP-A235-15K

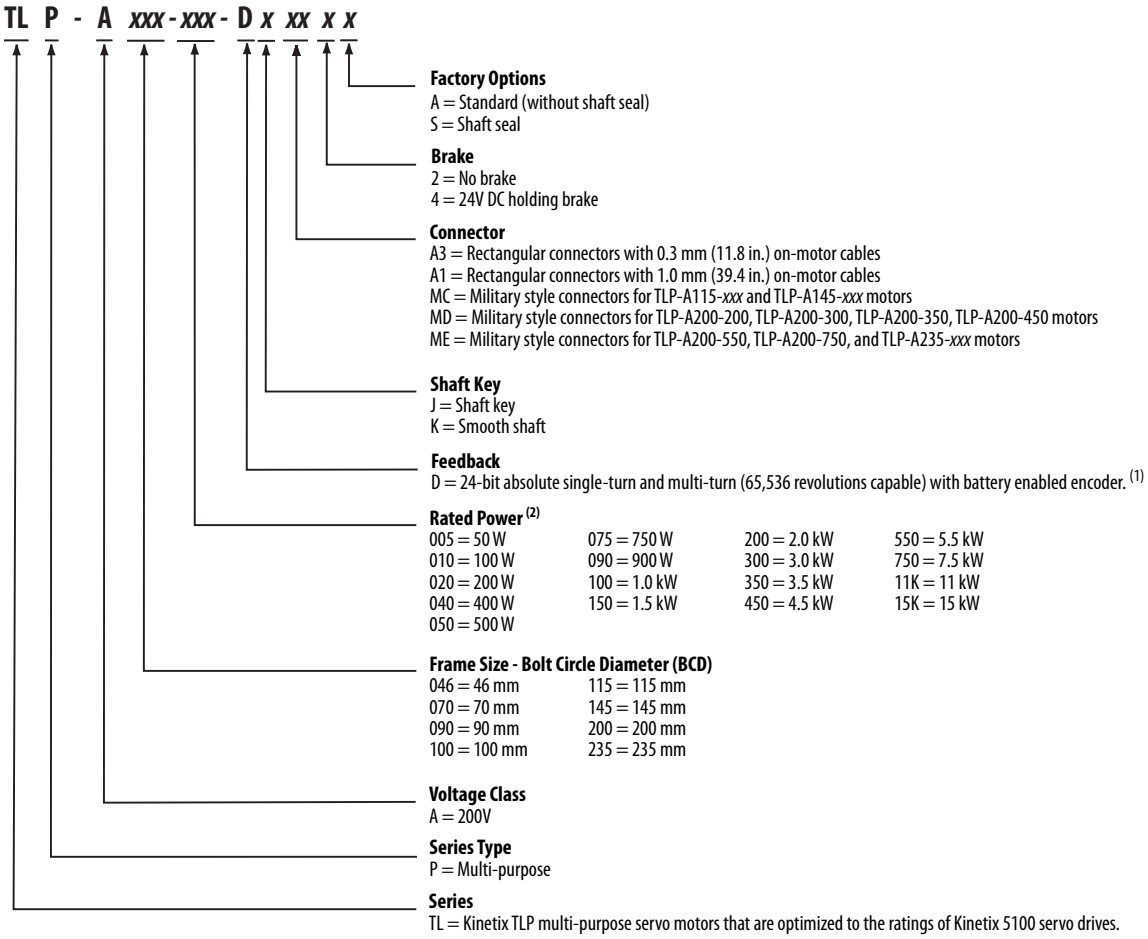
About the Kinetix TLP Servo Motors

Kinetix® TLP servo motors, tested and validated for optimal performance with Kinetix 5100 servo drives, are available with or without 24V DC holding brakes, and a wide-range of other economical and customizable options.

You are responsible for inspecting the equipment before accepting the shipment from the freight company. Check the items you receive against your purchase order. Notify the carrier of shipping damage or missing items immediately. Store or operate your motor in a clean and dry location within the Environmental Specifications on page 15.

ATTENTION: To avoid personal injury and damage to the motor, do not lift or handle the motor by the motor shaft or on-motor cable (when present). The cap on the shaft can come loose and cause you to drop the motor. Stress on the on-motor cable can disrupt the power and signal connectivity.

Catalog Number Explanation



(1) Multi-turn revolution depends on the system settings and configuration.
(2) Rated power hierarchy is only for comparative purposes. Use Motion Analyzer to size and select motors for your application, and/or the torque/speed curves in the Kinetix 5100 Drive Systems Design Guide, publication KNX-RM011.

Before You Install the Motor

Perform these inspection steps and review the guidelines for shaft seals, couplings and pulleys, and electrical noise prevention.

1. Remove the motor carefully from its shipping container.
2. Visually inspect the motor for any damage.
3. Examine the motor frame, front output shaft, and mounting pilot for any defects.
4. Notify the carrier of shipping damage immediately.

ATTENTION: Do not attempt to open and modify the motor. Only a qualified Rockwell Automation employee can service this motor.

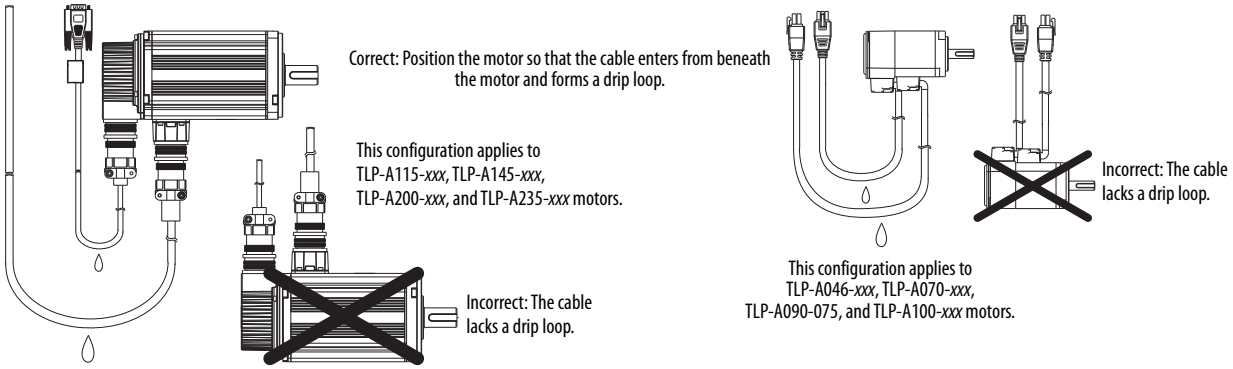
Remove the Shaft Cap

Remove the protective cap installed on the motor shaft by hand pressure only. Do not use a hammer or other tools as they can damage the motor shaft and shaft seal.

Prolong Motor Life

Proper design and maintenance can increase the life of a servo motor. Follow these guidelines to maximize the life of a servo motor operated within the Environmental Specifications on page 15:

- Always provide a drip loop to carry liquids away from the connection to the motor.



- Whenever possible, provide shields that protect the motor housing, shaft, seals, and their junctions from contamination by foreign matter or fluids.
- Shaft seals are subject to wear and require periodic inspection and replacement. Replacement is recommended every 3 months, not to exceed 12 months, depending on use. See Shaft Seal Kits on page 15 for more information.
- Inspect the motor and seals for damage or wear on a regular basis. If you detect damage or excessive wear, replace the item.
- The brake option on this servo motor is a spring-set holding brake that releases when voltage is applied to the brake coil. A separate power source is required to disengage the brake. This power source can be applied by a servo motor controller or manual operator control. If system main power fails, holding brakes can withstand occasional use as stopping brakes. However, this creates rotational mechanical backlash that can cause damage to the system, increase brake wear, and reduce brake life.

IMPORTANT

Holding brakes are not designed to stop rotation of the motor shaft, and they are not intended to be used as a safety device. They are designed to hold a motor shaft at 0 rpm for loads up to the rated brake holding torque. Follow these steps to prevent motor shaft rotation.

1. Command the servo drive to 0 rpm.
2. Verify the motor is at 0 rpm.
3. Engage the brake.
4. Disable the drive.

Disabling the drive removes the potential for brake wear caused by a badly-tuned servo system oscillating the shaft.

Shaft Seals

An additional seal is required on the motor shaft near the motor front bearing if the shaft is exposed to significant amounts of fine dust or fluids, such as lubricating oil from a gearbox. An IP65 rating for the motor requires a shaft seal and environmentally sealed connectors and cables.

The additional seal is not recommended in applications where the motor shaft area is free of liquids or fine dust, and a lower rating is sufficient:

- See Environmental Specifications on page 15 for a brief description of the IP rating for these motors.
- See Shaft Seal Kits on page 15 for seal kits compatible with your motor.
- See Kinetix Rotary Motion Specifications Technical Data, publication KNX-TD001, for Bulletin 2090 cables with environmentally sealed connectors compatible with these motors.

Couplings and Pulleys

Mechanical connections to the motor shaft, such as couplings and pulleys, require a torsionally rigid coupling or a reinforced timing belt. The high dynamic performance of servo motors can cause couplings, pulleys, or belts to loosen or slip over time. A loose or slipping connection causes system instability and can damage the motor shaft. All connections between the system and the servo motor shaft must be rigid to achieve acceptable response from the system. Periodically inspect connections to verify their rigidity.

When mounting couplings or pulleys to the motor shaft, verify that the connections are properly aligned and that axial and radial loads are within the specifications of the motor. See Load Force Ratings on page 10 for guidelines to achieve 40,000 hours of motor bearing life.

ATTENTION: Damage can occur to the motor bearings and the feedback device if sharp impact is applied to the shaft during installation of couplings and pulleys. Damage to the feedback device can result from applying leverage to the motor mounting face when removing devices mounted on the motor shaft.

Do not strike the shaft, couplings, or pulleys with tools during installation or removal. Use a wheel puller, to apply pressure from the user end of the shaft, when attempting to remove any device from the motor shaft.

Prevent Electrical Noise

Electromagnetic interference (EMI), commonly called electrical noise, can affect motor performance. Follow these guidelines to reduce the effects of EMI:

- Isolate the power transformers or install line filters on all AC input power lines.
- Use shielded cables.
- Shield signal cables from power wiring.
- Do not route motor cables over the vent openings on servo drives.
- Ground all equipment by using a single-point parallel ground system that employs ground bus-bars or large straps.
- If necessary, use additional electrical-noise reduction techniques to reduce EMI in noisy environments.

See System Design for Control of Electrical Noise Reference Manual, publication GMC-RM001, for additional information on reducing EMI.

Install Cables

Correct cable routing and careful cable construction improve system electromagnetic compatibility (EMC).

Follow these guidelines to build and install the cables:

- Keep the wire lengths as short as possible.
- Route noise sensitive wiring (encoder, serial, and I/O) away from input power and motor power wiring.
- Separate cables by 0.3 m (1 ft) minimum for every 9 m (30 ft) of parallel run.
- Ground both ends of the encoder cable shield and twist the signal wire pairs to help prevent EMI from other equipment.

ATTENTION: High voltage can be present on the shield of a power cable, if the shield is not grounded. Verify that there is a connection to ground for any power cable shield.

Motor Installation

Motor installation must comply with all local regulations and use of equipment and installation practices that promote safety and electromagnetic compatibility:

- All motors include a mounting pilot for aligning the motor on a machine.
- Preferred fasteners are stainless steel.

ATTENTION: Unmounted motors, disconnected mechanical couplings, loose shaft keys, and disconnected cables are dangerous if power is applied. Identify (tag-out) disassembled equipment and restrict access to (lock-out) the electrical power.

Before applying power to the motor, remove the shaft key and other mechanical couplings that could be thrown from the shaft.

ATTENTION: Verify that cables are installed and restrained to prevent uneven tension or flexing at the connector. Provide support at 3 m (10 ft) intervals throughout the cable run.

Excessive and uneven lateral force at the cable connector can result in the connector's environmental seal opening and closing as the cable flexes.

Install the Motor

Perform these steps to install the motor.

ATTENTION: Damage can occur to the motor bearings and the feedback device if sharp impact is applied to the shaft during installation of couplings and pulleys. Damage to the feedback device can result from applying leverage to the motor mounting face when removing devices mounted on the motor shaft.

Do not strike the shaft, couplings, or pulleys with tools during installation or removal. Use a wheel puller, to apply pressure from the user end of the shaft, when attempting to remove any device from the motor shaft.

1. Leave enough space around the motor so it can dissipate heat and stay within its specified operating temperature range.

   See Environmental Specifications on page 15 for the operating temperature range. Do not enclose the motor unless forced air is blown across the motor for cooling. A fan that blows air across the motor improves its performance. Keep other heat-producing devices away from the motor.
2. See Load Force Ratings on page 10 to determine the radial and axial shaft load limitations of your motor.
3. Install the motor with the connector positioned beneath the motor housing.

   This position can provide better environmental protection for the connector.

BURN HAZARD: Outer surfaces of the motor can reach a high temperature, 125 °C (257 °F), during motor operation.

Take precautions to prevent accidental contact with hot surfaces. Consider motor surface temperature when selecting motor mating connections and cables.

4. Mount and align the motor.
5. Attach the motor cables that transmit power, feedback, and brake signals as described below.
   a. Carefully align the cable connector with the motor connector.

ATTENTION: Keyed connectors must be properly aligned and hand-tightened.

Do not use tools, or apply excessive force, when mating the cable to the motor connector. If the connectors do not go together with light hand force, realign and try again.

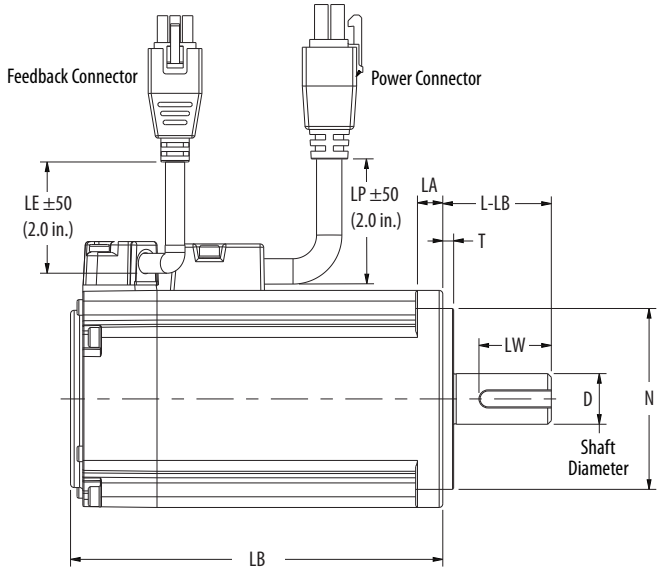
   b. Hand-tighten military style connectors on TLP-A115...TLP-A235 motors and press rectangular connectors together on TLP-A046...TLP-A100 motors until the contacts are inserted and a click is heard.

ATTENTION: The overall shield on the motor cable must be grounded to obtain an effective encoder signal.

The encoder data signal is transmitted through an impedance-matched twisted-wire pair that requires effective shielding for optimum performance.

Make sure there is an effective connection between the motor cable shield and the drive system ground.

Motor Dimensions (046…100 mm frame sizes)

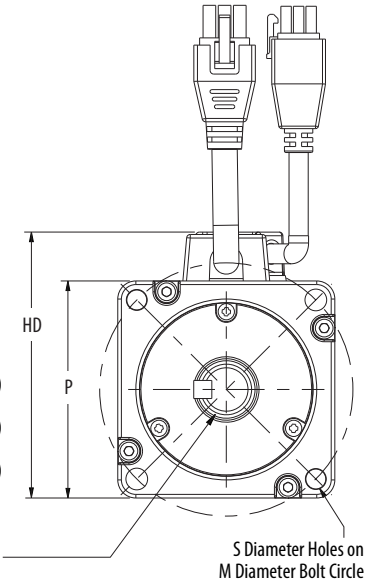


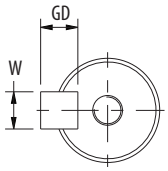
Dimensions are in mm (in.)

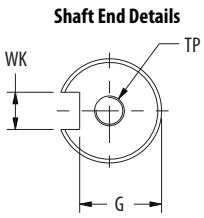
Pilot Diameter Tolerances
TLP-A046*xx* Motors:
Ø 29.979…30.000 (1.180…1.181)
TLP-A070*xx* Motors:
Ø 49.975…50.000 (1.967…1.968)
TLP-A090*xx* Motors:
Ø 69.970…70.000 (2.754…2.755)
TLP-A100*xx* Motors:
Ø 79.970…80.000 (3.148…3.149)

Shaft Diameter Tolerances
TLP-A046*xx* Motors:
Ø 7.991…8.000 (0.3146…0.3149)
TLP-A070*xx* Motors:
Ø 13.989…14.000 (0.5507…0.5512)
TLP-A090*xx* Motors:
Ø 18.987…19.000 (0.7475…0.7480)
TLP-A100*xx* Motors:
Ø 15.989…16.000 (0.6295…0.6299)

Optional Shaft Seal
Refer to page 15 for motor shaft seal kit information.







Shaft and Pilot Tolerances	TLP-A046*xx*	TLP-A070*xx*	TLP-A090*xx*	TLP-A100*xx*
Shaft Runout (T.I.R.)	0.02 (0.0008)	0.02 (0.0008)	0.02 (0.0008)	0.02 (0.0008)
Pilot Eccentricity (T.I.R.)	0.04 (0.0016)	0.30 (0.0118)	0.04 (0.0016)	0.04 (0.0016)
Max Face Runout (T.I.R.)	0.04 (0.0016)	0.04 (0.0016)	0.04 (0.0016)	0.04 (0.0016)
Shaft-end Threaded Hole (TP)	M3x0.5-6H, ↧ 6	M4x0.7-6H, ↧ 8	M6x1.0-6H, ↧ 10	M5x0.8-6H, ↧ 15
On-motor Cable Length (LE/LP)	A1 Connector = 1.0 m (39.4 in.), A3 Connector = 300 mm (11.8 in.)			

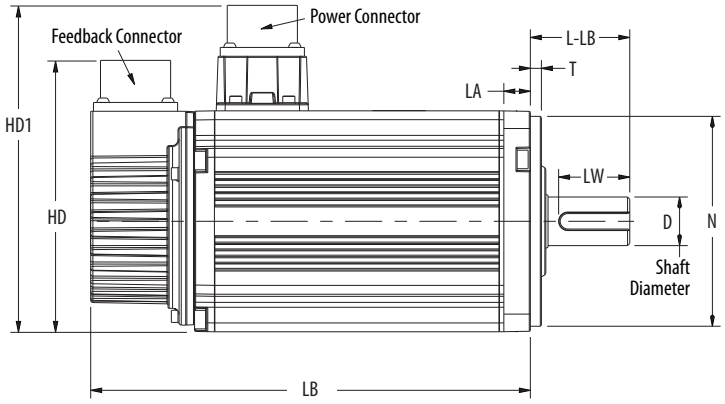
Motor Dimensions (046…100 mm frame sizes)

Motor Cat. No.	HD mm (in.)	LA mm (in.)	LB (1) mm (in.)	L-LB (2) mm (in.)	LW mm (in.)	D mm (in.)	M mm (in.)	S mm (in.)	N (5) mm (in.)	P mm (in.)	G mm (in.)	GD mm (in.)	W mm (in.)	WK mm (in.)
TLP-A046-005	53.8 (2.12)	5.0 (0.20)	71.9 (2.83)	25.0 (0.98)	16.0 (0.630)	8.0 (0.3149)	46.0 (1.811)	4.50 (3) (0.177)	30.0 (1.181)	40.0 (1.57)	6.20 (0.244)	3.0 (0.118)	3.0 (6) (0.118)	3.0 (8) (0.118)
TLP-A046-010			86.0 (3.39)											
TLP-A070-020	74.1 (2.92)	7.5 (0.30)	84.7 (3.33)	30.0 (1.18)	20.0 (0.787)	14.0 (0.5512)	70.0 (2.756)	5.50 (4) (0.216)	50.0 (1.968)	60.0 (2.36)	11.0 (0.433)	5.0 (0.197)	5.0 (7) (0.197)	5.0 (7) (0.197)
TLP-A070-040			106.7 (4.20)											
TLP-A090-075	94.1 (3.70)	8.0 (0.31)	116.5 (4.59)	40.0 (1.57)	25.0 (0.984)	19.0 (0.7480)	90.0 (3.543)	6.60 (4) (0.260)	70.0 (2.755)	80.0 (3.15)	15.5 (0.610)	6.0 (0.236)	6.0 (7) (0.236)	6.0 (7) (0.236)
TLP-A100-100	98.8 (3.89)		153.9 (6.06)	35.0 (1.38)	20.0 (0.787)	16.0 (0.6299)	100 (3.937)	6.60 (3) (0.260)	80.0 (3.149)	86.0 (3.38)	13.0 (0.630)	5.0 (0.197)	5.0 (7) (0.197)	5.0 (7) (0.197)

(1) For TLP-A046-005 motors with brake, add 34.2 mm (1.35 in.). For TLP-A046-010 motors with brake, add 34.8 mm (1.37 in.).
For TLP-A070-020 motors with brake, add 33.6 mm (1.32 in.). For TLP-A070-040 motors with brake, add 33.7 mm (1.33 in.).
For TLP-A090-075 motors with brake, add 37.4 mm (1.47 in.).
For TLP-A100-100 motors with brake, add 31.1 mm (1.22 in.).
(2) Tolerance for this dimension is ±0.50 mm (±0.020 in.).
(3) Tolerance for this dimension is ±0.10 mm (±0.0039 in.).
(4) Tolerance for this dimension is ±0.20 mm (±0.0079 in.).
(5) See dimensions diagram for tolerances.
(6) Tolerance for this dimension is -0.004, -0.029 mm (0.000157, -0.001141 in.).
(7) Tolerance for this dimension is +0, -0.030 mm (+0, -0.001181 in.).
(8) Tolerance for this dimension is +0, -0.025 mm (+0, -0.000984 in.).

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

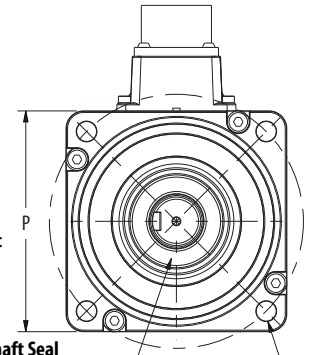
Motor Dimensions (115 and 145 mm frame sizes)



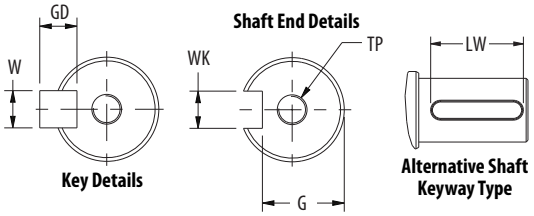
Dimensions are in mm (in.)

Pilot Diameter Tolerances
TLP-A115*xx* Motors:
Ø 94.965…95.000 (3.739…3.740)
TLP-A145*xx* Motors:
Ø 109.965…110.000 (4.329…4.330)

Shaft Diameter Tolerances
TLP-A115*xx* Motors:
Ø 21.987…22.000 (0.9656…0.8661)
TLP-A145-050… TLP-A145-150 Motors:
Ø 21.987…22.000 (0.9656…0.8661)



Optional Shaft Seal
Refer to page 15 for motor shaft seal kit information.



Shaft and Pilot Tolerances	TLP-A115*xx*	TLP-A145*xx*
Shaft Runout (T.I.R.)	0.02 (0.0008)	0.02 (0.0008)
Pilot Eccentricity (T.I.R.)	0.04 (0.0016)	0.04 (0.0016)
Max Face Runout (T.I.R.)	0.02 (0.0008)	0.04 (0.0016)
Shaft-end Threaded Hole (TP)	M6x1.0-6H, ↧ 20	M6x1.0-6H, ↧ 20

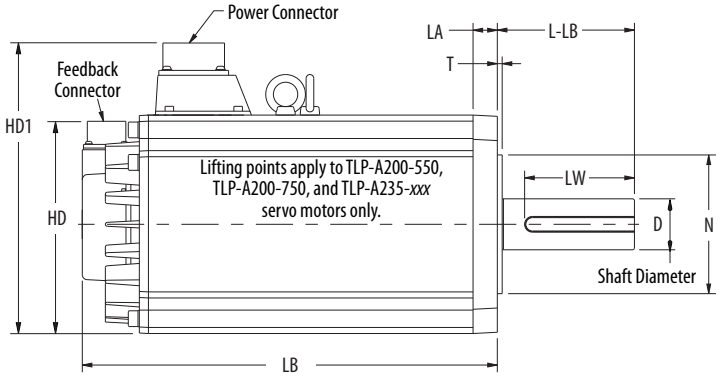
Motor Dimensions (115 and 145 mm frame sizes)

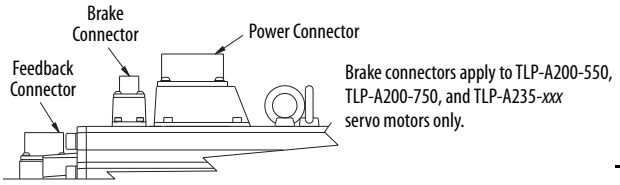
Motor Cat. No.	HD mm (in.)	HD1 mm (in.)	LA mm (in.)	LB (1) mm (in.)	L-LB mm (in.)	LW mm (in.)	D (3) mm (in.)	M mm (in.)	S (4) mm (in.)	N (3) mm (in.)	P mm (in.)	G mm (in.)	GD mm (in.)	W (5) mm (in.)	WK (5) mm (in.)
TLP-A115-100	122.9 (4.84)	148.1 (5.83)	12.0 (0.47)	154.0 (6.06)	45.0 (2) (1.77)	36.0 (1.42)	22.0 (0.87)	115 (4.53)	9.0 (0.354)	95.0 (3.74)	100 (3.94)	18.0 (0.71)	7.0 (0.28)	8.0 (0.315)	8.0 (0.315)
TLP-A115-200				199.7 (7.86)											
TLP-A145-050	138.6 (5.46)	176.4 (6.94)	11.5 (0.45)	148.2 (5.83)	55.0 (2.17)			145 (5.71)		110 (4.33)	130 (5.12)				
TLP-A145-090				164.2 (6.46)											
TLP-A145-100				148.2 (5.83)											
TLP-A145-150				168.2 (6.62)											

(1) For TLP-A115-100 motors with brake, add 39.3 mm (1.55 in.).
For TLP-A115-200 motors with brake, add 27.0 mm (1.06 in.).
For TLP-A145-050 and TLP-A145-100 motors with brake, add 36.0 mm (1.42 in.).
For TLP-A145-090 and TLP-A145-150 motors with brake, add 34.5 mm (1.36 in.).
(2) Tolerance for this dimension is +0.38, -0.50 mm (+0.015, -0.020 in.).
(3) See dimensions diagram for tolerances.
(4) For TLP-A115 motors, the tolerance is ±0.10 mm (±0.0039 in.).
For TLP-A145 motors, the tolerance is ±0.30 mm (±0.0118 in.).
(5) Tolerance for this dimension is +0, -0.036 mm (+0, -0.01417 in.).

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

Motor Dimensions (200 and 235 mm frame sizes)

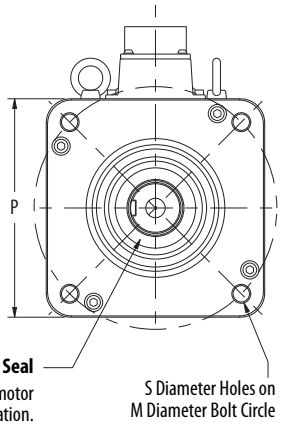


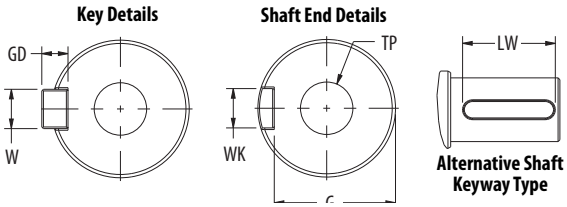


Dimensions are in mm (in.)

Pilot Diameter Tolerances
TLP-A200-200…TLP-A200-750 Motors:
Ø 114.265…114.300 (4.4986…4.500)
TLP-A235-11K…TLP-A235-15K Motors:
Ø 199.954…200.00 (7.8722…7.8740)

Shaft Diameter Tolerances
TLP-A200-200…TLP-A200-450 Motors:
Ø 34.984…35.000 (1.3773…1.3779)
TLP-A200-550…TLP-A200-750 Motors:
Ø 41.984…42.000 (1.6529…1.6535)
TLP-A235-11K Motors:
Ø 41.984…42.000 (1.6529…1.6535)
TLP-A235-15K Motors:
Ø 54.989…55.030 (2.1649…2.1665)





Shaft and Pilot Tolerances	TLP-A200-*xxx*	TLP-A235-11K	TLP-A235-15K
Shaft Runout (T.I.R.)	0.02 (0.0008)	0.04 (0.0016)	0.04 (0.0016)
Pilot Eccentricity (T.I.R.)	0.04 (0.0016)	0.04 (0.0016)	0.04 (0.0016)
Max Face Runout (T.I.R.)	0.04 (0.0016)	0.06 (0.0024)	0.06 (0.0024)
Shaft-end Threaded Hole (TP)	M12x1.75-6H, ↧ 25	M16x2.0-6H, ↧ 32	M20x2.5-6H, ↧ 40

Motor Dimensions (200 and 235 mm frame sizes)

Motor Cat. No.	HD mm (in.)	HD1 mm (in.)	LA mm (in.)	LB (1) mm (in.)	L-LB (2) mm (in.)	LW mm (in.)	D mm (in.)	M mm (in.)	S mm (in.)	N (5) mm (in.)	P mm (in.)	G mm (in.)	GD mm (in.)	W mm (in.)	WK (5) mm (in.)
TLP-A200-200	174.9 (6.89)	231.0 (9.09)	20.0 (0.79)	169.7 (6.68)	79.0 (3.11)	63.0 (2.48)	35.0 (1.38)	200.0 (7.87)	13.5 (3) (0.53)	114.3 (4.50)	180.0 (7.09)	30.0 (1.18)	8.0 (0.31)	10.0 (6) (0.394)	10.0 (6) (0.394)
TLP-A200-300				202.8 (7.98)											
TLP-A200-350															
TLP-A200-450				254.0 (10.0)											
TLP-A200-550		240.0 (9.45)		280.4 (11.04)	113.0 (4.45)	90.0 (3.54)	42.0 (1.65)		13.5 (4) (0.53)			37.0 (1.46)		12.0 (7) (0.47)	12.0 (7) (0.47)
TLP-A200-750				342.7 (13.49)											
TLP-A235-11K	194.6 (7.66)	279.1 (10.99)		372.1 (14.65)	116.0 (4.57)			235.0 (9.25)		200.0 (7.87)	220.0 (8.66)				
TLP-A235-15K				451.1 (17.76)			55.0 (2.17)					49.0 (1.93)	10.0 (0.39)	16.0 (7) (0.63)	16.0 (7) (0.63)

(1) For TLP-A200-200 and TLP-A200-750 motors with brake, add 34.1 mm (1.34 in.).
For TLP-A200-300 and TLP-A200-350 motors with brake, add 33.2 mm (1.31 in.).
For TLP-A200-450 motors with brake, add 44.0 mm (1.73 in.).
For TLP-A200-550 motors with brake, add 32.0 mm (1.26 in.).
For TLP-A235-11K and TLP-A235-15K motors with brake, add 63.0 mm (2.48 in.).
(2) Tolerance for this dimension is +0.38, -0.50 mm (+0.015, -0.020 in.).
(3) Tolerance for this dimension is ±0.10 mm (±0.0039 in.).
(4) Tolerance for this dimension is ±0.20 mm (±0.0079 in.).
(5) See dimensions diagram for tolerances.
(6) Tolerance for this dimension is +0, -0.036 mm (+0, -0.01417 in.).
(7) Tolerance for this dimension is +0, -0.043 mm (+0, -0.00169 in.).

Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

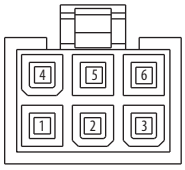
Connector Data

This section identifies the power, feedback, and brake pins on the motor connectors.

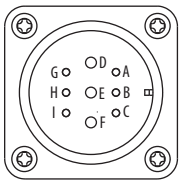
The motor power connector pinouts apply to the motor catalog numbers listed.

Motor Power Connector Pinouts

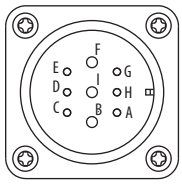
Pin	Signal	Motor Cat. No.
1	U	TLP-A046 TLP-A070 TLP-A090 TLP-A100
2	V	
3	BR+	
4	W	
5	⏚	
6	BR–	



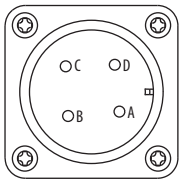
Pin	Signal	Motor Cat. No.
A	BR+	TLP-A200-200 TLP-A200-300 TLP-A200-350 TLP-A200-450
B	BR–	
C	–	
D	U	
E	V	
F	W	
G	⏚	
H	–	
J	–	



Pin	Signal	Motor Cat. No.
A	–	TLP-A115 TLP-A145
B	W	
C	–	
D	–	
E	⏚	
F	U	
G	BR+	
H	BR–	
I	V	



Pin	Signal	Motor Cat. No.
A	U	TLP-A200-550 TLP-A200-750 TLP-A235-11K TLP-A235-15K
B	V	
C	W	
D	⏚	

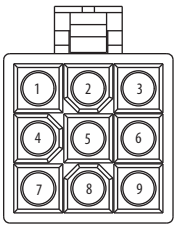


Motor Brake Connector Pinout

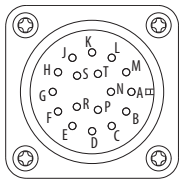
Pin	Signal	Motor Cat. No.
A	BR+	TLP-A200-550 TLP-A200-750 TLP-A235-11K TLP-A235-15K
B	BR–	

Motor Feedback Connector Pinouts

Pin	Signal	Motor Cat. No.
1	T+	TLP-A046 TLP-A070 TLP-A090 TLP-A100
2	BAT+	
3	–	
4	T–	
5	BAT–	
6	–	
7	DC+5V	
8	⏚	
9	SHIELD	



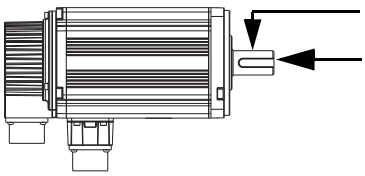
Pin	Signal	Motor Cat. No.
A	T+	TLP-A115 TLP-A145 TLP-A200 TLP-A235
B	T–	
C	BAT+	
D	BAT–	
E…K	–	
L	SHIELD	
M…P	–	
R	⏚	
S	DC+5V	
T	–	



Load Force Ratings

Motors are capable of operating with a sustained shaft load. The location and direction of radial and axial load forces are shown in the figure, and maximum load rating values are in the tables.

Load Forces on Shaft



The following tables represent 40,000-hour L_{10} bearing fatigue life at various loads and speeds. This 40,000-hour bearing life does not account for possible application-specific life reduction, such as bearing grease contamination from external sources.

Radial Load Force Ratings (maximum) for Non-brake Motors

Motor Cat. No. (1)	Speed, max rpm	RPM														
		500 kgf	750 kgf	1000 kgf	1125 kgf	1250 kgf	1500 kgf	2000 kgf	2250 kgf	2500 kgf	3000 kgf	3375 kgf	3750 kgf	4500 kgf	5000 kgf	6000 kgf
TLP-A046-005-D*xxx2x*	6000	–	–	–	–	–	8.8	–	–	–	7.0	–	–	6.1	–	5.6
TLP-A046-010-D*xxx2x*	6000	–	–	–	–	–	9.7	–	–	–	7.7	–	–	6.8	–	6.1
TLP-A070-020-D*xxx2x*	6000	–	–	–	–	–	22.4	–	–	–	17.8	–	–	15.5	–	14.1
TLP-A070-040-D*xxx2x*	6000	–	–	–	–	–	25	–	–	–	19.9	–	–	17.4	–	15.8
TLP-A090-075-D*xxx2x*	6000	–	–	–	–	–	35.6	–	–	–	28.2	–	–	24.7	–	22.4
TLP-A100-100-D*xxx2x*	3000	–	61.8	–	–	–	49.0	–	42.8	–	38.9	–	–	–	–	–
TLP-A115-100-D*xxx2x*	5000	–	–	–	–	52.9	–	–	–	42	–	–	36.7	–	33.3	–
TLP-A115-200-D*xxx2x*	5000	–	–	–	–	58.1	–	–	–	46.1	–	–	10.3	–	36.6	–
TLP-A145-050-D*xxx2x*	3000	–	106.8	–	–	–	84.7	–	74	–	67.3	–	–	–	–	–
TLP-A145-090-D*xxx2x*	2000	130.1	–	103.3	–	–	90.2	82	–	–	–	–	–	–	–	–
TLP-A145-100-D*xxx2x*	3000	–	106.8	–	–	–	84.7	–	74	–	67.3	–	–	–	–	–
TLP-A145-150-D*xxx2x*	3000	–	113.6	–	–	–	90.2	–	78.8	–	71.6	–	–	–	–	–
TLP-A200-200-D*xxx2x*	3000	–	125.9	–	–	–	99.9	–	87.3	–	79.3	–	–	–	–	–
TLP-A200-300-D*xxx2x*	2500	–	140	–	–	–	111.1	–	97.1	–	88.2	–	–	–	–	–
TLP-A200-350-D*xxx2x*	3000	–	140	–	–	–	111.1	–	97.1	–	88.2	–	–	–	–	–
TLP-A200-450-D*xxx2x*	3000	–	149.7	–	–	–	118.8	–	103.8	–	94.3	–	–	–	–	–
TLP-A200-550-D*xxx2x*	3000	–	149.2	–	–	–	118.4	–	103.4	–	94	–	–	–	–	–
TLP-A200-750-D*xxx2x*	2500	–	159.3	–	–	–	126.4	–	110.4	–	100.3	–	–	–	–	–
TLP-A235-11K-D*xxx2x*	2000	435	–	345.3	–	–	301.6	274	–	–	–	–	–	–	–	–
TLP-A235-15K-D*xxx2x*	2000	463.1	–	367.6	–	–	321.1	291.7	–	–	–	–	–	–	–	–

(1) 1.0 kgf = 2.2 lbf or 9.8 N.

Axial Load Force Ratings (maximum radial load) for Non-brake Motors

Motor Cat. No. (1)	Speed, max rpm	RPM														
		500 kgf	750 kgf	1000 kgf	1125 kgf	1250 kgf	1500 kgf	2000 kgf	2250 kgf	2500 kgf	3000 kgf	3375 kgf	3750 kgf	4500 kgf	5000 kgf	6000 kgf
TLP-A046-005-D*xxx2x*	6000	–	–	–	–	–	5.6	–	–	–	4.1	–	–	3.4	–	3.0
TLP-A046-010-D*xxx2x*	6000	–	–	–	–	–	6	–	–	–	4.4	–	–	3.7	–	3.3
TLP-A070-020-D*xxx2x*	6000	–	–	–	–	–	10.1	–	–	–	7.4	–	–	6.2	–	5.5
TLP-A070-040-D*xxx2x*	6000	–	–	–	–	–	11.3	–	–	–	8.3	–	–	7.0	–	6.2
TLP-A090-075-D*xxx2x*	6000	–	–	–	–	–	13.6	–	–	–	10.1	–	–	8.5	–	7.5
TLP-A100-100-D*xxx2x*	3000	–	18.4	–	–	–	13.6	–	11.4	–	10.1	–	–	–	–	–
TLP-A115-100-D*xxx2x*	5000	–	–	–	–	18.1	–	–	–	13.4	–	–	11.2	–	9.9	–
TLP-A115-200-D*xxx2x*	5000	–	–	–	–	20.5	–	–	–	15.1	–	–	12.7	–	11.2	–
TLP-A145-050-D*xxx2x*	3000	–	28.1	–	–	–	20.8	–	17.5	–	15.4	–	–	–	–	–
TLP-A145-090-D*xxx2x*	2000	37.2	–	27.5	–	–	23.1	20.4	–	–	–	–	–	–	–	–
TLP-A145-100-D*xxx2x*	3000	–	28.1	–	–	–	20.8	–	17.5	–	15.4	–	–	–	–	–
TLP-A145-150-D*xxx2x*	3000	–	31.2	–	–	–	23.1	–	19.4	–	17.1	–	–	–	–	–
TLP-A200-200-D*xxx2x*	3000	–	54.3	–	–	–	40.2	–	33.7	–	29.7	–	–	–	–	–
TLP-A200-300-D*xxx2x*	2500	–	60.8	–	–	–	45.0	–	37.7	–	33.3	–	–	–	–	–
TLP-A200-350-D*xxx2x*	3000	–	60.8	–	–	–	45.0	–	37.7	–	33.3	–	–	–	–	–
TLP-A200-450-D*xxx2x*	3000	–	65.3	–	–	–	48.3	–	40.5	–	35.8	–	–	–	–	–
TLP-A200-550-D*xxx2x*	3000	–	65.0	–	–	–	48.1	–	40.3	–	35.6	–	–	–	–	–
TLP-A200-750-D*xxx2x*	2500	–	69.8	–	–	–	51.7	–	43.3	–	38.2	–	–	–	–	–
TLP-A235-11K-D*xxx2x*	2000	65.0	–	48.1	–	–	40.3	35.6	–	–	–	–	–	–	–	–
TLP-A235-15K-D*xxx2x*	2000	77.7	–	57.5	–	–	48.2	42.6	–	–	–	–	–	–	–	–

(1) 1.0 kgf = 2.2 lbf or 9.8 N.

Axial Load Force Ratings (zero radial load) for Non-brake Motors

Motor Cat. No. (1)	Speed, max rpm	RPM														
		500 kgf	750 kgf	1000 kgf	1125 kgf	1250 kgf	1500 kgf	2000 kgf	2250 kgf	2500 kgf	3000 kgf	3375 kgf	3750 kgf	4500 kgf	5000 kgf	6000 kgf
TLP-A046-005-D*xxx2x*	6000	–	–	–	–	–	7.8	–	–	–	5.7	–	–	4.8	–	4.2
TLP-A046-010-D*xxx2x*	6000	–	–	–	–	–	7.8	–	–	–	5.7	–	–	4.8	–	4.2
TLP-A070-020-D*xxx2x*	6000	–	–	–	–	–	15.4	–	–	–	11.4	–	–	9.5	–	8.4
TLP-A070-040-D*xxx2x*	6000	–	–	–	–	–	15.4	–	–	–	11.4	–	–	9.5	–	8.4
TLP-A090-075-D*xxx2x*	6000	–	–	–	–	–	20.4	–	–	–	15.1	–	–	12.6	–	11.1
TLP-A100-100-D*xxx2x*	3000	–	27.5	–	–	–	20.4	–	17.1	–	15.1	–	–	–	–	–
TLP-A115-100-D*xxx2x*	5000	–	–	–	–	27.9	–	–	–	20.6	–	–	17.3	–	15.3	–
TLP-A115-200-D*xxx2x*	5000	–	–	–	–	27.9	–	–	–	20.6	–	–	17.3	–	15.3	–
TLP-A145-050-D*xxx2x*	3000	–	56.4	–	–	–	41.7	–	35.0	–	30.9	–	–	–	–	–
TLP-A145-090-D*xxx2x*	2000	67.2	–	49.7	–	–	41.7	36.8	–	–	–	–	–	–	–	–
TLP-A145-100-D*xxx2x*	3000	–	56.4	–	–	–	41.7	–	35.0	–	30.9	–	–	–	–	–
TLP-A145-150-D*xxx2x*	3000	–	56.4	–	–	–	41.7	–	35.0	–	30.9	–	–	–	–	–
TLP-A200-200-D*xxx2x*	3000	–	91.9	–	–	–	68.0	–	57.0	–	50.3	–	–	–	–	–
TLP-A200-300-D*xxx2x*	2500	–	91.9	–	–	–	68.0	–	57.0	–	50.3	–	–	–	–	–

Axial Load Force Ratings (zero radial load) for Non-brake Motors (continued)

Motor Cat. No. (1)	Speed, max rpm	RPM														
		500 kgf	750 kgf	1000 kgf	1125 kgf	1250 kgf	1500 kgf	2000 kgf	2250 kgf	2500 kgf	3000 kgf	3375 kgf	3750 kgf	4500 kgf	5000 kgf	6000 kgf
TLP-A200-350-D*xxx*2*x*	3000	–	91.9	–	–	–	68.0	–	57.0	–	50.3	–	–	–	–	–
TLP-A200-450-D*xxx*2*x*	3000	–	91.9	–	–	–	68.0	–	57.0	–	50.3	–	–	–	–	–
TLP-A200-550-D*xxx*2*x*	3000	–	91.9	–	–	–	68.0	–	57.0	–	50.3	–	–	–	–	–
TLP-A200-750-D*xxx*2*x*	2500	–	91.9	–	–	–	68.0	–	57.0	–	50.3	–	–	–	–	–
TLP-A235-11K-D*xxx*2*x*	2000	136.5	–	101.0	–	–	84.7	74.8	–	–	–	–	–	–	–	–
TLP-A235-15K-D*xxx*2*x*	2000	136.5	–	101.0	–	–	84.7	74.8	–	–	–	–	–	–	–	–

(1) 1.0 kgf = 2.2 lbf or 9.8 N.

Radial Load Force Ratings (maximum) for Brake Motors

Motor Cat. No. (1)	Speed, max rpm	RPM														
		500 kgf	750 kgf	1000 kgf	1125 kgf	1250 kgf	1500 kgf	2000 kgf	2250 kgf	2500 kgf	3000 kgf	3375 kgf	3750 kgf	4500 kgf	5000 kgf	6000 kgf
TLP-A046-005-D*xxx*4*x*	6000	–	–	–	–	–	10.5	–	–	–	8.4	–	–	7.3	–	6.6
TLP-A046-010-D*xxx*4*x*	6000	–	–	–	–	–	10.9	–	–	–	8.7	–	–	7.6	–	6.9
TLP-A070-020-D*xxx*4*x*	6000	–	–	–	–	–	26	–	–	–	20.6	–	–	18	–	16.4
TLP-A070-040-D*xxx*4*x*	6000	–	–	–	–	–	27.3	–	–	–	21.7	–	–	18.9	–	17.2
TLP-A090-075-D*xxx*4*x*	6000	–	–	–	–	–	39.3	–	–	–	31.2	–	–	27.2	–	24.7
TLP-A100-100-D*xxx*4*x*	3000	–	65.3	–	–	–	51.8	–	45.3	–	41.1	–	–	–	–	–
TLP-A115-100-D*xxx*4*x*	5000	–	–	–	–	57.9	–	–	–	45.9	–	–	40.1	–	36.4	–
TLP-A115-200-D*xxx*4*x*	5000	–	–	–	–	60.3	–	–	–	47.8	–	–	41.8	–	38	–
TLP-A145-050-D*xxx*4*x*	3000	–	120.3	–	–	–	95.5	–	83.4	–	75.8	–	–	–	–	–
TLP-A145-090-D*xxx*4*x*	2000	142.1	–	112.8	–	–	98.5	89.5	–	–	–	–	–	–	–	–
TLP-A145-100-D*xxx*4*x*	3000	–	120.3	–	–	–	95.5	–	83.4	–	75.8	–	–	–	–	–
TLP-A145-150-D*xxx*4*x*	3000	–	124.1	–	–	–	98.5	–	86	–	78.2	–	–	–	–	–
TLP-A200-200-D*xxx*4*x*	3000	–	140.4	–	–	–	111.4	–	97.3	–	88.4	–	–	–	–	–
TLP-A200-300-D*xxx*4*x*	2500	–	149.7	–	–	–	118.8	–	103.8	–	94.3	–	–	–	–	–
TLP-A200-350-D*xxx*4*x*	3000	–	149.7	–	–	–	118.8	–	103.8	–	94.3	–	–	–	–	–
TLP-A200-450-D*xxx*4*x*	3000	–	158.8	–	–	–	126.1	–	110.1	–	100.1	–	–	–	–	–
TLP-A200-550-D*xxx*4*x*	3000	–	154.8	–	–	–	122.9	–	107.3	–	97.5	–	–	–	–	–
TLP-A200-750-D*xxx*4*x*	2500	–	163.3	–	–	–	129.6	–	113.2	–	102.9	–	–	–	–	–
TLP-A235-11K-D*xxx*4*x*	2000	458.3	–	363.8	–	–	317.8	288.7	–	–	–	–	–	–	–	–
TLP-A235-15K-D*xxx*4*x*	2000	478.8	–	380	–	–	332	301.6	–	–	–	–	–	–	–	–

(1) 1.0 kgf = 2.2 lbf or 9.8 N.

Axial Load Force Ratings (maximum radial load) for Brake Motors

Motor Cat. No. (1)	Speed, max rpm	RPM														
		500 kgf	750 kgf	1000 kgf	1125 kgf	1250 kgf	1500 kgf	2000 kgf	2250 kgf	2500 kgf	3000 kgf	3375 kgf	3750 kgf	4500 kgf	5000 kgf	6000 kgf
TLP-A046-005-D*xxx*4*x*	6000	–	–	–	–	–	6.7	–	–	–	5	–	–	4.2	–	3.7
TLP-A046-010-D*xxx*4*x*	6000	–	–	–	–	–	6.9	–	–	–	5.1	–	–	4.3	–	3.8
TLP-A070-020-D*xxx*4*x*	6000	–	–	–	–	–	11.7	–	–	–	8.7	–	–	7.3	–	6.4
TLP-A070-040-D*xxx*4*x*	6000	–	–	–	–	–	12.3	–	–	–	9.1	–	–	7.6	–	6.7
TLP-A090-075-D*xxx*4*x*	6000	–	–	–	–	–	15.3	–	–	–	11.3	–	–	9.5	–	8.4
TLP-A100-100-D*xxx*4*x*	3000	–	20.1	–	–	–	14.9	–	12.5	–	11	–	–	–	–	–
TLP-A115-100-D*xxx*4*x*	5000	–	–	–	–	20.3	–	–	–	15	–	–	12.6	–	11.1	–
TLP-A115-200-D*xxx*4*x*	5000	–	–	–	–	21.5	–	–	–	15.9	–	–	13.3	–	11.8	–
TLP-A145-050-D*xxx*4*x*	3000	–	34.2	–	–	–	25.3	–	21.2	–	18.7	–	–	–	–	–
TLP-A145-090-D*xxx*4*x*	2000	42.9	–	31.8	–	–	26.6	23.5	–	–	–	–	–	–	–	–
TLP-A145-100-D*xxx*4*x*	3000	–	34.2	–	–	–	25.3	–	21.2	–	18.7	–	–	–	–	–
TLP-A145-150-D*xxx*4*x*	3000	–	36	–	–	–	26.6	–	22.3	–	19.7	–	–	–	–	–
TLP-A200-200-D*xxx*4*x*	3000	–	60.9	–	–	–	45.1	–	37.8	–	33.4	–	–	–	–	–
TLP-A200-300-D*xxx*4*x*	2500	–	65.3	–	–	–	48.3	–	40.5	–	35.8	–	–	–	–	–
TLP-A200-350-D*xxx*4*x*	3000	–	65.3	–	–	–	48.3	–	40.5	–	35.8	–	–	–	–	–
TLP-A200-450-D*xxx*4*x*	3000	–	69.6	–	–	–	51.5	–	43.2	–	38.1	–	–	–	–	–
TLP-A200-550-D*xxx*4*x*	3000	–	67.7	–	–	–	50.1	–	42	–	37.1	–	–	–	–	–
TLP-A200-750-D*xxx*4*x*	2500	–	71.7	–	–	–	53.1	–	44.5	–	39.3	–	–	–	–	–
TLP-A235-11K-D*xxx*4*x*	2000	75.5	–	55.9	–	–	46.8	41.3	–	–	–	–	–	–	–	–
TLP-A235-15K-D*xxx*4*x*	2000	85	–	62.9	–	–	52.8	46.6	–	–	–	–	–	–	–	–

(1) 1.0 kgf = 2.2 lbf or 9.8 N.

Axial Load Force Ratings (zero radial load) for Brake Motors

Motor Cat. No. (1)	Speed, max rpm	RPM														
		500 kgf	750 kgf	1000 kgf	1125 kgf	1250 kgf	1500 kgf	2000 kgf	2250 kgf	2500 kgf	3000 kgf	3375 kgf	3750 kgf	4500 kgf	5000 kgf	6000 kgf
TLP-A046-005-D*xxx*4*x*	6000	–	–	–	–	–	8.1	–	–	–	6	–	–	5.0	–	4.4
TLP-A046-010-D*xxx*4*x*	6000	–	–	–	–	–	8.1	–	–	–	6	–	–	5.0	–	4.4
TLP-A070-020-D*xxx*4*x*	6000	–	–	–	–	–	15.4	–	–	–	11.4	–	–	9.5	–	8.4
TLP-A070-040-D*xxx*4*x*	6000	–	–	–	–	–	15.4	–	–	–	11.4	–	–	9.5	–	8.4
TLP-A090-075-D*xxx*4*x*	6000	–	–	–	–	–	20.4	–	–	–	15.1	–	–	12.6	–	11.1
TLP-A100-100-D*xxx*4*x*	3000	–	27.5	–	–	–	20.4	–	17.1	–	15.1	–	–	–	–	–
TLP-A115-100-D*xxx*4*x*	5000	–	–	–	–	27.9	–	–	–	20.6	–	–	17.3	–	15.3	–
TLP-A115-200-D*xxx*4*x*	5000	–	–	–	–	27.9	–	–	–	20.6	–	–	17.3	–	15.3	–
TLP-A145-050-D*xxx*4*x*	3000	–	56.4	–	–	–	41.7	–	35.0	–	30.9	–	–	–	–	–
TLP-A145-090-D*xxx*4*x*	2000	67.2	–	49.7	–	–	41.7	36.8	–	–	–	–	–	–	–	–
TLP-A145-100-D*xxx*4*x*	3000	–	56.4	–	–	–	41.7	–	35.0	–	30.9	–	–	–	–	–
TLP-A145-150-D*xxx*4*x*	3000	–	56.4	–	–	–	41.7	–	35.0	–	30.9	–	–	–	–	–
TLP-A200-200-D*xxx*4*x*	3000	–	91.9	–	–	–	68.0	–	57.0	–	50.3	–	–	–	–	–
TLP-A200-300-D*xxx*4*x*	2500	–	91.9	–	–	–	68.0	–	57.0	–	50.3	–	–	–	–	–
TLP-A200-350-D*xxx*4*x*	3000	–	91.9	–	–	–	68.0	–	57.0	–	50.3	–	–	–	–	–
TLP-A200-450-D*xxx*4*x*	3000	–	91.9	–	–	–	68.0	–	57.0	–	50.3	–	–	–	–	–
TLP-A200-550-D*xxx*4*x*	3000	–	91.9	–	–	–	68.0	–	57.0	–	50.3	–	–	–	–	–
TLP-A200-750-D*xxx*4*x*	2500	–	91.9	–	–	–	68.0	–	57.0	–	50.3	–	–	–	–	–
TLP-A235-11K-D*xxx*4*x*	2000	136.5	–	101.0	–	–	84.7	74.8	–	–	–	–	–	–	–	–
TLP-A235-15K-D*xxx*4*x*	2000	136.5	–	101.0	–	–	84.7	74.8	–	–	–	–	–	–	–	–

(1) 1.0 kgf = 2.2 lbf or 9.8 N.

Environmental Specifications

Always store motors in a clean and dry location within the environmental conditions.

Environmental Specifications

Attribute	Value
Temperature, operating	0…40 °C (32…104 °F)
Temperature, storage	-10…+80 °C (-14 …+176 °F)
Relative humidity	20…95% noncondensing

Environmental Ratings

Kinetix TLP Motors	IP Rating (1)	Dust Protection	Liquid Protection
On-motor cable connectors.	IP30	Protection from objects with a diameter of 2.5 mm (0.098 in.) or more.	No protection from liquids.
Motor with shaft seal and Bulletin 2090 environmentally sealed cable connectors.	IP65 (2)	Total protection from dust.	Protected against low-pressure jets of water from all directions.

(1) IP rating descriptions are for reference only. Refer to the international standards for more complete rating descriptions.
(2) IP40 without shaft seal installed.

Motor Accessories

The following accessories are available for Kinetix TLP servo motors.

2090-Series Motor Cables

Factory manufactured feedback, power, and brake cables are available in standard cable lengths. They provide the sealing that is needed to achieve environmental ratings and shield termination. If you choose to build your own cables, connector kits available for Kinetix TLP motors are described in the Kinetix Motion Accessories Specifications Technical Data, publication KNX-TD004.

Contact your nearest Rockwell Automation sales office or refer to the Kinetix Motion Accessories Technical Data, publication KNX-TD004, for information about available 2090-Series cables for Kinetix TLP motors.

Shaft Seal Kits

Shaft seal kits are available, as are replacement kits for field installation. A shaft seal provides a barrier that prevents moisture and particles from entering the motor bearings. Shaft seals are made of nitrile and kits and require lubrication to reduce wear.

IMPORTANT Shaft seals are subject to wear and require periodic inspection and replacement. Replacement is recommended every 3 months, not to exceed 12 months, depending on use.

Shaft Seal Kit Selection

Motor Cat. No.	Shaft Seal Kit Cat. No.
TLP-A046	TLP-SSN-F046
TLP-A070	TLP-SSN-F070
TLP-A090	TLP-SSN-F090
TLP-A100	TLP-SSN-F100

Motor Cat. No.	Shaft Seal Kit Cat. No.
TLP-A115	TLP-SSN-F115
TLP-A145	TLP-SSN-F145
TLP-A200	TLP-SSN-F200
TLP-A235	TLP-SSN-F235

See Shaft Seal Kits for Kinetix TLP Installation Instructions, publication 2090-IN044, for instructions on how to install a shaft seal.

Additional Resources

These documents contain information concerning related products from Rockwell Automation.

Resource	Description
Kinetix Rotary Motion Specifications Technical Data, publication KNX-TD001	Product specifications for Allen-Bradley® rotary motors, with performance, environmental, certifications, load force, and dimension drawings.
Kinetix Servo Drives Specifications, publication KNX-TD003	Provides product specifications for Kinetix Integrated Motion over EtherNet/IP™, Integrated Motion over Sercos interface, EtherNet/IP networking, and component servo drive families.
Kinetix Motion Accessories Specifications, publication KNX-TD004	Product specifications and dimensions for Allen-Bradley servo drive accessories.
Kinetix 5100 Servo Drives User Manual, publication 2198-UM004	Information on installing, configuring, starting, and troubleshooting a servo drive system.
Kinetix 5100 Drive System Design Guide, publication KNX-RM011	Information on drive system components and accessory items you need for your Kinetix drive/motor combination.
Shaft Seal Kits for Kinetix TLP Servo Motors Installation Instructions, publication 2090-IN044	Information on the installation of a shaft seal on Kinetix TL Pro servo motors.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.
Allen-Bradley Industrial Automation Glossary, publication AG-7.1	A glossary of industrial automation terms and abbreviations.
System Design for Control of Electrical Noise Reference Manual, publication GMC-RM001	Information, examples, and techniques that are designed to minimize system failures that are caused by electrical noise.

You can view or download publications at http://www.rockwellautomation.com/global/literature-library/overview.page.

Rockwell Automation Support

For technical support, visit http://www.rockwellautomation.com/support/overview.page.

At the end of its life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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Publication TLP-IN001A-EN-P - October 2019