Allen-Bradley

# Kinetix VP Low-inertia Servo Motor with 063…165 mm Frame Size

Catalog Numbers VPL-A/B0631, VPL-A/B0632, VPL-A/B0633, VPL-A/B0751, VPL-A/B0752, VPL-A/B0753, VPL-A/B1001, VPL-A/B1002, VPL-A/B1003, VPL-A/B1152, VPL-A/B1153, VPL-A/B1303, VPL-A/B1304, VPL-A/B1306, VPL-B1651, VPL-B1652, VPL-B1653, VPL-B1654

# Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included only for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

**IMPORTANT** Identifies information that is critical for successful application and understanding of the product.

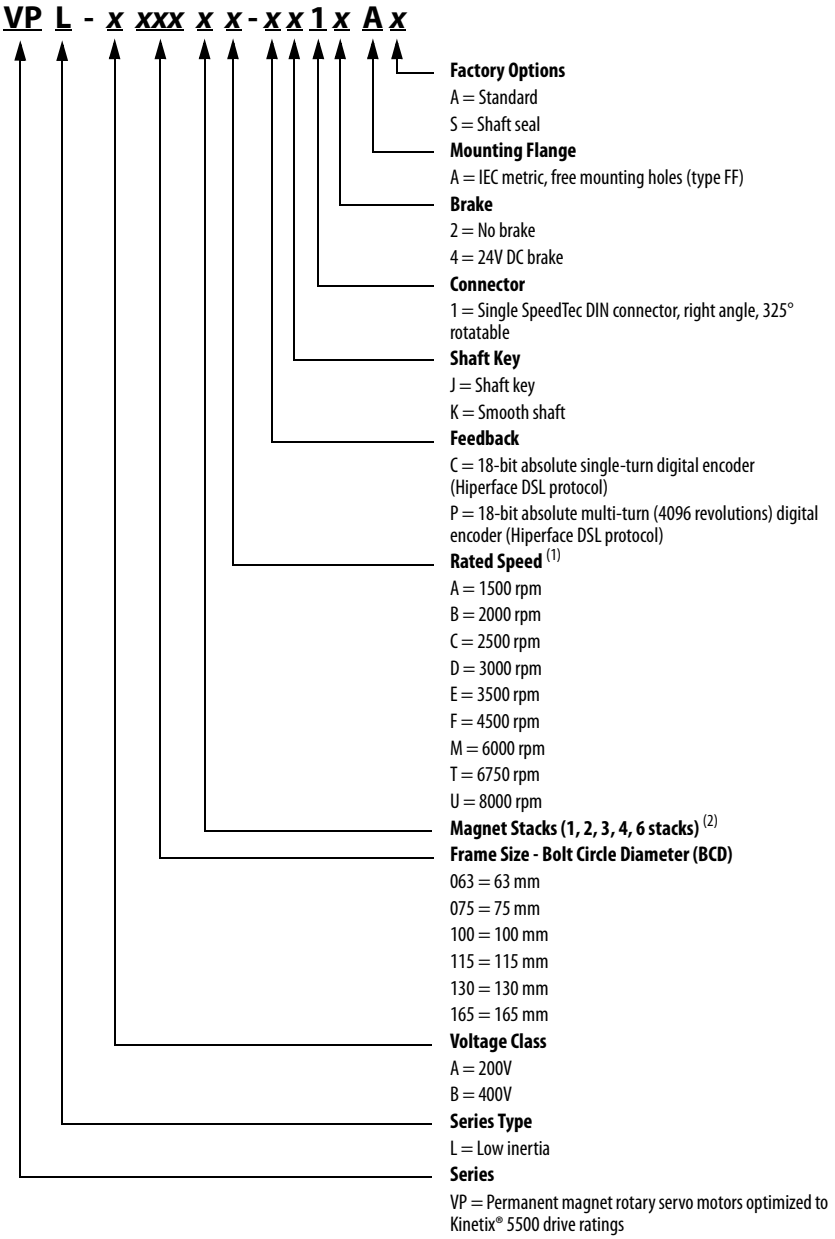
Labels may also be on or inside the equipment to provide specific precautions.

**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.

**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.

**ARC FLASH HAZARD:** Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

# Catalog Number Explanation




(1) Rated speed hierarchy is only for comparative purposes. Use Motion Analyzer software to size and select motors for your application, and/or the torque/speed curves in the Kinetix 5500 Drive System Design Guide, publication GMC-RM009.

(2) Refer to Motor Dimensions (063 and 075 mm frame sizes) on page 11 and Motor Dimensions (100…165 mm frame size) on page 13 for dimensional changes (L, LB, LD, and LE) that result from the number of magnet stacks.

# About the Kinetix VP Low-inertia Motors

Kinetix VP low-inertia motors feature single-turn or multi-turn high-resolution absolute encoders, and are available with or without 24V DC brakes. These compact brushless servo motors meet the demanding requirements of high-performance motion systems.

## Before You Begin

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 Ratings on page 28.

**ATTENTION:** To avoid personal injury and damage to the motor, do not lift or handle the motor by the motor shaft. The cap on the shaft can come loose and cause you to drop the motor.

## Before You Install the Motor

Perform the 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. 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 beyond changing the connector orientation as described on page 7. Only a qualified Rockwell Automation employee can service this motor.

## Removing the Shaft Cap

Remove the protective cap installed on the motor shaft with your hand or by prying it off with a screwdriver. Do not use a hammer or other tools as they can damage the motor shaft.

## Prolonging Motor Life

Thoughtful design and proper maintenance can increase the life of a servo motor. Follow these guidelines to maximize the life of a servo motor operated within the Environmental Ratings on page 28:

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

- If design requirements permit, 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 29 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.

## Using 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 IP66 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 Ratings on page 28 for a brief description of the IP rating for these motors.
- See Shaft Seal Kits on page 29 for seal kits compatible with your motor.
- See Kinetix Rotary Motion Specifications Technical Data, publication GMC-TD001, to find environmentally sealed connectors and cables compatible with these motors.

## Using 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 Motor Load Force Ratings on page 15 for guidelines to achieve 20,000 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.

## Preventing Electrical Noise

Electromagnetic interference (EMI), commonly called electrical noise, can reduce motor performance. Effective techniques to counter EMI include filtering the AC power, using shielded cables, shielding signal cables from power wiring, and practicing good grounding techniques.

Follow these guidelines to avoid the effects of EMI:

- Isolate the power transformers or install line filters on all AC input power lines.
- 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.

## Installing Cables

Knowledgeable cable routing and careful cable construction improves system electromagnetic compatibility (EMC).

**ATTENTION:** The overall shield on the single 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.

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

To install the single motor cable, observe these guidelines:

- Keep the cable length as short as possible.
- Ground the cable shield to prevent EMI from affecting other equipment.

**ATTENTION:** High voltage can be present on the shields of the single motor cable if the shields are not grounded.

Verify there is a connection to ground for all shields in the single motor cable.

# Installing the Motor

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.

## Change Connector Orientation

Kinetix VP low-inertia motors use a connector style that integrates the power, brake, and feedback signals within a single connector. You can identify the connector style by the variable number in the motor catalog string. For example, in catalog number VPL-A1303F-CJ**1**2AA, the **1** indicates a SpeedTec, right-angle, 325° rotatable connector (see Catalog Number Explanation on page 3).

The rotatable connector housing lets you move the connector into a position that best protects the connection from environmental contaminates and provides easy access.

**ATTENTION:** Connectors are designed to be rotated into a fixed position during motor installation, and remain in that position without further adjustment. Strictly limit the applied forces and the number of times the connector is rotated to make sure that connectors meet the International Protection (IP) rating as outlined in Environmental Ratings on page 28.

**ATTENTION:** Use only hand-applied force when changing the orientation of the connector.

Do not apply force or pull on the cable and do not use tools, such as pliers or vise-grips, to rotate the connector.

Follow these steps to rotate a connector to a new position.

1. Mount and fully seat a mating cable on the motor connector.

   This provides a larger area to grasp and extends the leverage force.
2. Grasp the mated connector and cable plug with your hands and slowly rotate the motor connector into the new position.
3. Remove the cable plug after the connector is aligned.

## 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. Allow sufficient clearances in the area of the motor for the motor to stay within its specified operating temperature range.

   See Environmental Ratings on page 28 for the operating temperature range. Do not enclose the motor unless forced air is blown across the motor for cooling. A fan blowing air across the motor improves its performance. Keep other heat producing devices away from the motor.

2. See Motor Load Force Ratings on page 15 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.

   Electronic zero or index pulse = 0 occurs when the shaft key or dimple is aligned with the connectors. See Motor Dimensions (063 and 075 mm frame sizes) on page 10 and Motor Dimensions (100...165 mm frame sizes) on page 12 for a visual reference of this alignment.

5. Attach the single motor cable that transmits the power, feedback, and brake signals as described below.

   a. Carefully align the cable connector with the motor connector.

      The flat surface on the top of the motor connector and the flat surfaces on the cable connector must align for the cable connector to mate 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 the knurled collar one-quarter turn to fully seat the cable connector.

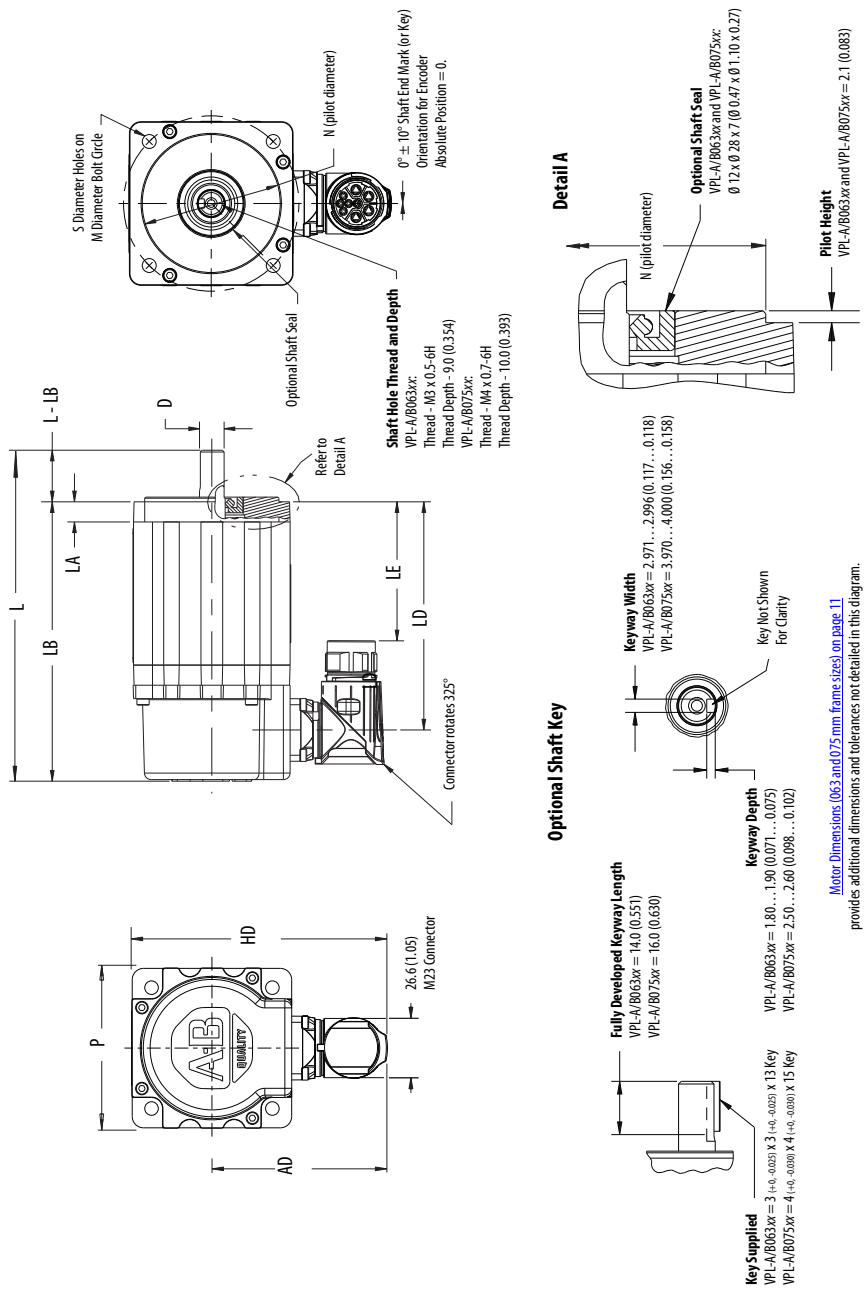
**ATTENTION:** The overall shield on the single motor cable must be grounded to obtain an effective encoder signal.

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

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

   c. Form a drip loop in the cable to carry liquids away from the connectors.

# Motor Dimensions (063 and 075 mm frame sizes)



## Motor Dimensions (063 and 075 mm frame sizes)

| Motor Cat. No. | AD mm (in.) | D (1) Ø mm (in.) | HD mm (in.) | L (2) mm (in.) | L-LB (1) mm (in.) | LA mm (in.) | LB (2) mm (in.) | LD (2) mm (in.) | LE (2) mm (in.) | M Ø mm (in.) | N (1) Ø mm (in.) | P mm (in.) | S (1) Ø mm (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VPL-A/B0631 | 69.5 (2.74) | 9.0 (0.354) | 97.0 (3.82) | 143.1 (5.63) | 20.0 (0.787) | 9.0 (0.35) | 123.1 (4.85) | 100.2 (3.94) | 60.3 (2.37) | 63.0 (2.480) | 40.0 (1.575) | 55.0 (2.17) | 5.8 (0.234) |
| VPL-A/B0632 | | | | 168.1 (6.61) | | | 148.1 (5.83) | 125.2 (4.93) | 85.3 (3.36) | | | | |
| VPL-A/B0633 | | | | 193.1 (7.59) | | | 173.1 (6.81) | 150.2 (5.91) | 110.3 (4.34) | | | | |
| VPL-A/B0751 | 77.0 (3.03) | 11.0 (0.433) | 112.0 (4.41) | 147.9 (5.82) | 23.0 (0.906) | 9.0 (0.35) | 124.9 (4.92) | 102.0 (4.02) | 62.1 (2.44) | 75.0 (2.953) | 60.0 (2.362) | 70.0 (2.76) | 5.8 (0.234) |
| VPL-A/B0752 | | | | 172.9 (6.80) | | | 149.9 (5.90) | 127.0 (5.00) | 87.1 (3.43) | | | | |
| VPL-A/B0753 | | | | 197.9 (7.79) | | | 174.9 (6.89) | 152.0 (5.98) | 112.1 (4.41) | | | | |

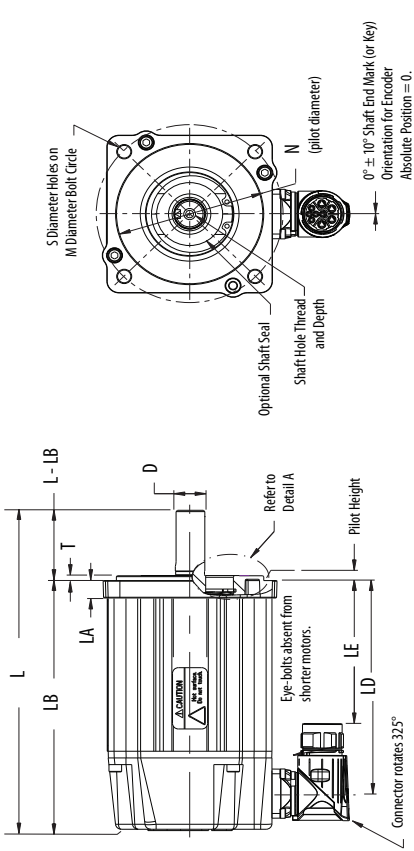
(1) For tolerances on this dimension refer to the table below.

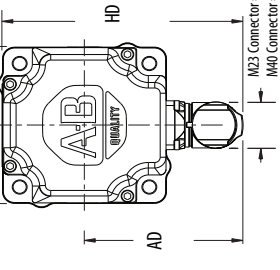
(2) Add this value to the dimension for Kinetix VP motors with a brake: VPL-A/B063*xx* and VPL-A/B075*xx* add 30.6 mm (1.20 in.) to L, LB, LE, and LD.

## Dimension Tolerances (063 and 075 mm frame sizes)

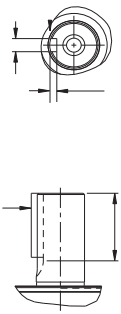
| Motor Cat. No. | D Ø mm (in.) | L-LB mm (in.) | N Ø mm (in.) | S Ø mm (in.) |
|---|---|---|---|---|
| VPL-A/B063*x* | 8.998…9.007 (0.3543…0.3546) | ± 0.7 (±0.028) | 39.995…40.011 (1.5746…1.5752) | +0.3, -0.0 (±0.006) |
| VPL-A/B075*x* | 10.997…11.008 (0.4330…0.4334) | | 59.993…60.012 (2.3619…2.3627) | |

# Motor Dimensions (100…165 mm frame sizes)




## Optional Shaft Key




**Key Supplied**

VPL-A/B100xx = 5 (+0, -0.030) x 5 (+0, -0.030) x 24 Key
VPL-A/B115xx = 6 (+0, -0.030) x 6 (+0, -0.030) x 24 Key
VPL-A/B130xx = 8 (+0, -0.036) x 7 (+0, -0.090) x 31 Key
VPL-B165xx = 8 (+0, -0.036) x 7 (+0, -0.090) x 39 Key

**Keyway Width**

VPL-A/B100xx = 4.97…5.00 (0.196…0.197)
VPL-A/B115xx = 5.97…6.00 (0.235…0.236)
VPL-A/B130xx = 7.96…8.00 (0.314…0.315)
VPL-B165xx = 7.96…8.00 (0.314…0.315)

**Keyway Length**

VPL-A/B100xx = 25.4 (1.00)
VPL-A/B115xx = 25.4 (1.00)
VPL-A/B130xx = 32.3 (1.27)
VPL-B165xx = 41.1 (1.62)

**Keyway Depth**

VPL-A/B100xx = 3.00…3.10 (0.118…0.122)
VPL-A/B115xx = 3.50…3.60 (0.138…0.142)
VPL-A/B130xx = 4.00…4.20 (0.158…0.165)
VPL-B165xx = 4.00…4.20 (0.158…0.165)

Motor Dimensions (100…165 mm frame size) on page 13 and Tolerances and Supplemental Dimensions (100…165 mm frame sizes) on page 14 provides additional dimensions and tolerances not detailed in this diagram.

## Motor Dimensions (100…165 mm frame size)

| Motor Cat. No. | AD mm (in.) | D (1) Ø mm (in.) | HD mm (in.) | L (2) mm (in.) | L-LB (1) mm (in.) | LA mm (in.) | LB (2) mm (in.) | LD (2) mm (in.) | LE (2) mm (in.) | M Ø mm (in.) | N (1) Ø mm (in.) | P mm (in.) | S (1) Ø mm (in.) | T mm (in.) | Shaft Hole Thread and Min Thread Depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VPL-A/B1001*x* | 86.5 (3.40) | 16.0 (0.630) | 131.2 (5.17) | 169.8 (6.68) | 40.0 (1.575) | 9.9 (0.39) | 129.8 (5.11) | 108.7 (4.28) | 68.9 (2.71) | 100.0 (3.937) | 80.0 (3.15) | 89.4 (3.52) | 7.0 (0.283) | 2.74 (0.108) | M5 x 0.8-6H x 12.5 (0.49) |
| VPL-A/B1002*x* | | | | 195.2 (7.68) | | | 155.2 (6.11) | 134.1 (5.28) | 94.3 (3.71) | | | | | | |
| VPL-A/B1003*x* | | | | 220.6 (8.68) | | | 180.6 (7.11) | 159.5 (6.28) | 119.7 (4.71) | | | | | | |
| VPL-A/B1152*x* | 90.8 (3.58) | 19.0 (0.748) | 140.0 (5.51) | 191.6 (7.54) | 40.0 (1.575) | 10.16 (0.40) | 151.6 (5.97) | 130.6 (5.14) | 90.7 (3.57) | 115.0 (4.528) | 95.0 (3.74) | 98.3 (3.87) | 10.0 (0.401) | 2.74 (0.108) | M6 x 1.0-6H x 16 (0.63) |
| VPL-A/B1153*x* | | | | 217.0 (8.54) | | | 177.0 (6.97) | 156.0 (6.14) | 116.1 (4.57) | | | | | | |
| VPL-A/B1303*x* | 98.6 (3.88) | 24.0 (0.945) | 155.4 (6.12) | 230.3 (9.06) | 50.0 (1.969) | 12.19 (0.48) | 180.3 (7.10) | 159.3 (6.27) | 119.4 (4.70) | 130.0 (5.118) | 110.0 (4.33) | 113.7 (4.48) | 10.0 (0.401) | 2.74 (0.108) | M8 x 1.25-6H x 19.1 (0.75) |
| VPL-A/B1304*x* | | | | 255.7 (10.06) | | | 205.7 (8.10) | 184.7 (7.27) | 144.8 (5.70) | | | | | | |
| VPL-A/B1306*x* | | | | 306.5 (12.06) | | | 256.5 (10.10) | 235.5 (9.27) | 195.6 (7.70) | | | | | | |
| VPL-B1651*x* | 113.3 (4.46) | 28.0 (1.1025) | 185.0 (7.28) | 235.6 (9.27) | 60.0 (2.362) | 14.0 (0.55) | 175.6 (6.92) | 155.4 (6.12) | 115.6 (4.55) | 165.0 (6.496) | 130.0 (5.118) | 143.5 (5.65) | 12.0 (0.481) | 3.12 (0.123) | M10 x 1.5-6H x 22.1 (0.87) |
| VPL-B1652*x* | | | | 286.4 (11.27) | | | 226.4 (8.92) | 206.2 (8.12) | 166.4 (6.55) | | | | | | |
| VPL-B1653*x* | | | | 337.2 (13.27) | | | 277.2 (10.92) | 257.0 (10.12) | 217.2 (8.55) | | | | | | |
| VPL-B1654B | | | | 388.0 (15.28) | | | 328.0 (12.92) | 307.8 (12.12) | 268.0 (10.55) | | | | | | |
| VPL-B1654D | 132.90 (5.23) | | 204.6 (8.06) | | | | | 306.8 (12.08) | 235.8 (9.28) | | | | | | |

(1) For tolerances on this dimension refer to the table on the next page.

(2) Add this value to the dimension for Kinetix VP motors with a brake:
VPL-A100*x* or VPL-B100*x* add 34.5 mm (1.36 in.) to L, LB, LE, and LD.
VPL-A115*x* or VPL-B115*x* add 48.5 mm (1.91 in.) to L, LB, LE, and LD.
VPL-A130*x* or VPL-B130*x* add 48.5 mm (1.91 in.) to L, LB, LE, and LD.
VPL-B165*x* add 51.5 mm (2.03 in.) to L, LB, LE, and LD.

## Tolerances and Supplemental Dimensions (100…165 mm frame sizes)

| Tolerance | | **VPL-A/B100*x*** mm (in.) | **VPL-A/B115*x*** mm (in.) | **VPL-A/B130*x*** mm (in.) | **VPL-B165*x*** mm (in.) |
|---|---|---|---|---|---|
| D | Shaft diameter | Ø 15.997…16.008 (0.6298…0.6301) | Ø 18.996…19.009 (0.7479…0.7483) | Ø 23.996…24.009 (0.9448…0.9451) | Ø 27.996…28.009 (1.1022…1.1027) |
| L-LB | Shaft extension | ±0.7 mm (±0.028) | | | |
| N | Pilot diameter | Ø 79.993…80.012 (3.1493…3.1501) | Ø 94.991…95.013 (3.7398…3.7407) | Ø 109.991…110.013 (4.3303…4.3312) | Ø 129.991…130.014 (5.1178…5.1187) |
| S | Mounting hole diameter | Ø +0.36, -0.0 (±0.007) | | | Ø +0.43, -0.0 (±0.008) |

| **Supplemental Dimension** | **VPL-A/B100*x*** mm (in.) | **VPL-A/B115*x*** mm (in.) | **VPL-A/B130*x*** mm (in.) | **VPL-B165*x*** mm (in.) |
|---|---|---|---|---|
| Pilot height | 2.87 (0.113) | | 3.38 (0.133) | |
| Pilot relief height | 2.74 (0.108) | | | 3.12 (0.123) |
| Shaft shoulder diameter [1] | 2.87 (0.133) [2] | | | |

(1) Measured flush to pilot height.

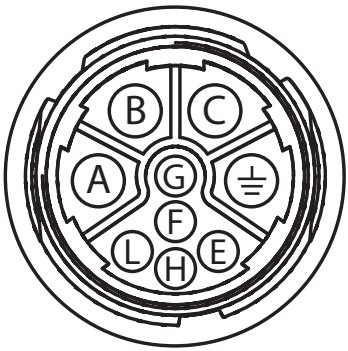
(2) Tolerance is ±0.83, (±0.033).

# Connector Data

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

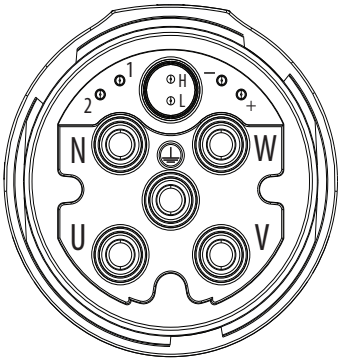
### M23 Motor Connector Pinouts (for all motors except VPL-B1654D)

| Pin | High Resolution Encoder |
|---|---|
| A | Phase U |
| B | Phase V |
| C | Phase W |
| ⏚ | Ground |
| E | DATA+ |
| F | MBRK+ |
| G | MBRK- |
| H | DATA- |
| L | Reserved |



### M40 Motor Connector Pinouts (for VPL-B1654D motors)

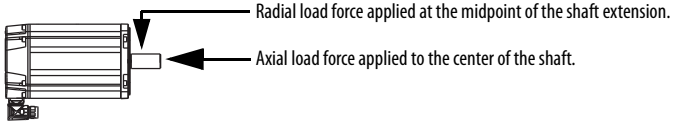
| Pin | High Resolution Encoder |
|---|---|
| U | Phase U |
| V | Phase V |
| W | Phase W |
| ⏚ | Ground |
| 1 | MBRK+ |
| 2 | MBRK- |
| L | DATA+ |
| H | DATA- |
| + | – |
| – | – |
| N | – |




## Motor 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 20,000-hour L10 bearing fatigue life at various loads and speeds. This 20,000-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 (kgf) [1] [2] (063…075 mm frame size)

| Motor Cat. No. | RPM | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 6000 | 6500 | 7000 | 7500 | 8000 |
| VPL-A0631E | – | 26.7 | – | – | 20.8* | 18.5 | – | – | 16.2 | – | – | – | – | – | – |
| VPL-A0631M | – | – | 23.3 | – | 19.7 | – | – | – | 16.7* | – | – | – | – | 13.8 | – |
| VPL-A0632F | – | 28.9 | 25.2 | – | – | 21.0* | – | – | – | 17.1* | – | – | – | – | – |
| VPL-A0633C | 38.1 | 30.3 | 27.4* | – | – | 21.0 | – | – | – | – | – | – | – | – | – |
| VPL-A0633F | 38.1 | – | 26.4 | – | – | 21.0 | – | – | 18.3 | – | – | – | – | – | – |
| VPL-A0751E | 33.3 | 26.4 | – | – | 20.6* | – | – | – | – | 15.7* | – | – | – | – | – |
| VPL-A0752C | 36.1 | 28.6 | 25.9* | – | – | – | 19.2* | – | – | – | – | – | – | – | – |
| VPL-A0752E | 36.1 | 28.6 | – | – | 21.8* | – | – | – | – | 17.0* | – | – | – | – | – |
| VPL-A0753C | 37.8 | 30.0 | 27.5* | – | – | – | 20.2* | – | – | – | – | – | – | – | – |
| VPL-A0753E | 37.8 | 30.0 | – | – | 23.3* | – | – | – | – | 18.0* | – | – | – | – | – |
| VPL-B0631T | – | – | 23.3 | – | – | 18.5 | – | – | – | – | 14.9* | – | – | – | 13.3 |
| VPL-B0631U | – | – | 23.3 | – | – | 18.5 | – | – | – | 15.6 | – | – | – | – | 13.3 |
| VPL-B0632F | – | 28.9 | 25.2 | – | – | 21.0* | – | – | – | 17.1* | – | – | – | – | – |
| VPL-B0632T | – | – | – | 22.9 | – | – | – | 18.2 | – | – | – | 15.6* | – | – | 14.4 |
| VPL-B0633M | – | 30.3 | – | 24.0 | – | – | – | 19.2* | – | – | – | – | 15.9* | – | – |
| VPL-B0633T | – | – | 26.4 | – | – | 21.0 | – | – | – | – | 16.8* | – | – | – | 15.1 |
| VPL-B0751M | – | – | 23.1 | – | – | 18.3 | – | – | – | 15.7* | – | – | – | – | 13.2 |
| VPL-B0752E | 36.1 | 28.6 | – | – | 22.0* | – | – | – | – | 17.0* | – | – | – | – | – |
| VPL-B0752F | – | 28.6 | – | 22.7 | – | – | 19.3* | – | – | – | – | – | 15.0 | – | – |
| VPL-B0752M | – | – | 25.0 | – | – | 20.8 | – | – | – | 16.8* | – | – | – | – | 14.3 |
| VPL-B0753E | 37.8 | 30.0 | – | 23.8 | – | – | – | – | 18.2 | – | – | – | – | – | – |
| VPL-B0753F | – | 30.0 | – | 23.8 | – | – | 20.6* | – | – | – | – | 16.1 | – | – | – |
| VPL-B0753M | – | – | 26.2 | – | – | 19.8 | – | – | – | 18.0* | – | – | – | – | 15.0 |

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

(2) An asterisk (*) next to a load rating indicates a load rating measured at an rpm value that is less than the value listed for that column.

## Axial Load Force Ratings (maximum radial load) for Non-brake Motors (kgf) [1] [2] (063…075 mm frame size)

| Motor Cat. No. | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 6000 | 6500 | 7000 | 7500 | 8000 |
| VPL-A0631E | – | 22.3 | – | – | 16.1* | 13.8 | – | – | 11.6 | – | – | – | – | – | – |
| VPL-A0631M | – | – | 18.7 | – | 15.0 | – | – | – | 12.1* | – | – | – | – | 9.5* | – |
| VPL-A0632F | – | 23.5 | 19.7 | – | – | 15.5* | – | – | – | 11.9* | – | – | – | – | – |
| VPL-A0633C | 32.7 | 24.2 | 21.3* | – | – | 15.0 | – | – | – | – | – | – | – | – | – |
| VPL-A0633F | 32.7 | – | 20.3 | – | – | 15.0 | – | – | 12.6 | – | – | – | – | – | – |
| VPL-A0751E | 30.0 | 22.2 | – | – | 16.1* | – | – | – | – | 11.2* | – | – | – | – | – |
| VPL-A0752C | 31.5 | 23.3 | 20.5* | – | – | – | 13.9* | – | – | – | – | – | – | – | – |
| VPL-A0752E | 31.5 | 23.3 | – | – | 16.4* | – | – | – | – | 11.8* | – | – | – | – | – |
| VPL-A0753C | 32.5 | 24.1 | 21.5* | – | – | – | 14.3* | – | – | – | – | – | – | – | – |
| VPL-A0753E | 32.5 | 24.1 | – | – | 17.3* | – | – | – | – | 12.4* | – | – | – | – | – |
| VPL-B0631T | – | – | 18.7 | – | – | 13.8 | – | – | – | – | 10.5* | – | – | – | 9.0 |
| VPL-B0631U | – | – | 18.7 | – | – | 13.8 | – | – | – | 11.1 | – | – | – | – | 9.0 |
| VPL-B0632F | – | 23.5 | 19.7 | – | – | 15.5* | – | – | – | 11.9* | – | – | – | – | – |
| VPL-B0632T | – | – | – | 17.4 | – | – | – | 12.9 | – | – | – | 10.6 | – | – | 9.5 |
| VPL-B0633M | – | 24.2 | – | 17.9 | – | – | – | 13.4* | – | – | – | – | 10.5* | – | – |
| VPL-B0633T | – | – | 20.3 | – | – | 15.0 | – | – | – | – | 11.3* | – | – | – | 9.8 |
| VPL-B0751M | – | – | 18.6 | – | – | 13.8 | – | – | – | 11.2* | – | – | – | – | 9.0 |
| VPL-B0752E | 31.5 | 23.3 | – | – | 16.6* | – | – | – | – | 11.8* | – | – | – | – | – |
| VPL-B0752F | – | 23.3 | – | 17.3 | – | – | 14.0* | – | – | – | – | – | 10.0 | – | – |
| VPL-B0752M | – | – | 19.6 | – | – | 14.5 | – | – | – | 11.7* | – | – | – | – | 9.5 |
| VPL-B0753E | 32.5 | 24.1 | – | 17.8 | – | – | – | – | 12.5 | – | – | – | – | – | – |
| VPL-B0753F | – | 24.1 | – | 17.8 | – | – | 14.7* | – | – | – | – | 10.7 | – | – | – |
| VPL-B0753M | – | – | 20.2 | – | – | 14.9 | – | – | – | 12.4* | – | – | – | – | 9.8 |

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

(2) An asterisk (*) next to a load rating indicates a load rating measured at an rpm value that is less than the value listed for that column.

## Axial Load Force Ratings (zero radial load) for Non-brake Motors (kgf) [1] [2] (063…075 mm frame size)

| Motor Cat. No. | RPM | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 6000 | 6500 | 7000 | 7500 | 8000 |
| VPL-A0631E | – | 27.5 | – | – | 19.9 * | 17.1 | – | – | 14.3 | – | – | – | – | – | – |
| VPL-A0631M | – | – | 23.0 | – | 18.5 | – | – | – | 14.9 * | – | – | – | – | 11.7 * | – |
| VPL-A0632F | – | 27.5 | 23.0 | – | – | 18.1 * | – | – | – | 13.9 * | – | – | – | – | – |
| VPL-A0633C | 37.1 | 27.5 | 24.1 * | – | – | 17.1 | – | – | – | – | – | – | – | – | – |
| VPL-A0633F | 37.1 | – | 23.0 | – | – | 17.1 | – | – | 14.3 | – | – | – | – | – | – |
| VPL-A0751E | 37.1 | 27.5 | – | – | 19.9 * | – | – | – | – | 13.9 * | – | – | – | – | – |
| VPL-A0752C | 37.1 | 27.5 | 24.1 * | – | – | – | 16.4 * | – | – | – | – | – | – | – | – |
| VPL-A0752E | 37.1 | 27.5 | – | – | 19.3 * | – | – | – | – | 13.9 * | – | – | – | – | – |
| VPL-A0753C | 37.1 | 27.5 | 24.5 * | – | – | – | 16.4 * | – | – | – | – | – | – | – | – |
| VPL-A0753E | 37.1 | 27.5 | – | – | 19.7 * | – | – | – | – | 14.2 * | – | – | – | – | – |
| VPL-B0631T | – | – | 23.0 | – | – | 17.1 | – | – | – | – | 12.9 * | – | – | – | 11.1 |
| VPL-B0631U | – | – | 23.0 | – | – | 17.1 | – | – | – | 13.7 | – | – | – | – | 11.1 |
| VPL-B0632F | – | 27.5 | 23.0 | – | – | 18.1 * | – | – | – | 13.9 * | – | – | – | – | – |
| VPL-B0632T | – | – | – | 20.3 | – | – | – | 15.1 | – | – | – | 12.4 * | – | – | 11.1 |
| VPL-B0633M | – | 27.5 | – | 20.3 | – | – | – | 15.2 * | – | – | – | – | 11.9 * | – | – |
| VPL-B0633T | – | – | 23.0 | – | – | 17.1 | – | – | – | – | 12.8 * | – | – | – | 11.1 |
| VPL-B0751M | – | – | 23.0 | – | – | 17.1 | – | – | – | 13.9 * | – | – | – | – | 11.1 |
| VPL-B0752E | 37.1 | 27.5 | – | – | 19.5 * | – | – | – | – | 13.9 * | – | – | – | – | – |
| VPL-B0752F | – | 27.5 | – | 20.3 | – | – | 16.5 * | – | – | – | – | – | 11.8 | – | – |
| VPL-B0752M | – | – | 23.0 | – | – | 17.1 | – | – | – | 13.8 * | – | – | – | – | 11.1 |
| VPL-B0753E | 37.1 | 27.5 | – | 20.3 | – | – | – | – | 14.3 | – | – | – | – | – | – |
| VPL-B0753F | – | 27.5 | – | 20.3 | – | – | 16.8 * | – | – | – | – | 12.2 | – | – | – |
| VPL-B0753M | – | – | 23.0 | – | – | 17.1 | – | – | – | 14.2 * | – | – | – | – | 11.1 |

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

(2) An asterisk (*) next to a load rating indicates a load rating measured at an rpm value that is less than the value listed for that column.

## Radial Load Force Ratings (maximum) for Brake Motors (kgf) [1] [2] (063…075 mm frame size)

| Motor Cat. No. | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 6000 | 6500 | 7000 | 7500 | 8000 |
| VPL-A0631E | – | 29.2 | – | – | 22.8* | 20.3 | – | – | 17.7 | – | – | – | – | – | – |
| VPL-A0631M | – | – | 25.5 | – | 21.5 | – | – | – | 18.3* | – | – | – | – | 15.1* | – |
| VPL-A0632F | – | 30.5 | 26.6 | – | – | 22.2* | – | – | – | 18.1* | – | – | – | – | – |
| VPL-A0633C | 39.5 | 31.4 | 28.4* | – | – | 21.8 | – | – | – | – | – | – | – | – | – |
| VPL-A0633F | 39.5 | – | 27.4 | – | – | 21.8 | – | – | 19.0 | – | – | – | – | – | – |
| VPL-A0751E | 36.5 | 29.0 | – | – | 22.6* | – | – | – | – | 17.2* | – | – | – | – | – |
| VPL-A0752C | 38.1 | 30.3 | 27.4 | – | – | – | 20.3* | – | – | – | – | – | – | – | – |
| VPL-A0752E | 38.1 | 30.3 | – | – | 23.1* | – | – | – | – | 17.9* | – | – | – | – | – |
| VPL-A0753C | 39.2 | 31.2 | 28.5* | – | – | – | 20.9* | – | – | – | – | – | – | – | – |
| VPL-A0753E | 39.2 | 31.2 | – | – | 24.1* | – | – | – | – | 18.7* | – | – | – | – | – |
| VPL-B0631T | – | – | 25.5 | – | – | 20.3 | – | – | – | – | 16.4* | – | – | – | 14.6 |
| VPL-B0631U | – | – | 25.5 | – | – | 20.3 | – | – | – | 17.1 | – | – | – | – | 14.6 |
| VPL-B0632F | – | 30.5 | 26.6 | – | – | 22.2* | – | – | – | 18.1* | – | – | – | – | – |
| VPL-B0632T | – | – | – | 24.2 | – | – | – | 19.2 | – | – | – | 16.5* | – | – | 15.3 |
| VPL-B0633M | – | 31.4 | – | 24.9 | – | – | – | 19.9* | – | – | – | – | 16.5* | – | – |
| VPL-B0633T | – | – | 27.4 | – | – | 21.8 | – | – | – | – | 17.5* | – | – | – | 15.7 |
| VPL-B0751M | – | – | 25.3 | – | – | 20.1 | – | – | – | 17.2* | – | – | – | – | 14.5 |
| VPL-B0752E | 38.1 | 30.3 | – | – | 23.3* | – | – | – | – | 17.9* | – | – | – | – | – |
| VPL-B0752F | – | 30.3 | – | 24.0 | – | – | 20.4* | – | – | – | – | – | 15.8 | – | – |
| VPL-B0752M | – | – | 26.4 | – | – | 21.0 | – | – | – | 17.8* | – | – | – | – | 15.1 |
| VPL-B0753E | 39.2 | 31.2 | – | 24.7 | – | – | – | – | 18.9 | – | – | – | – | – | – |
| VPL-B0753F | – | 31.2 | – | 24.7 | – | – | 21.4* | – | – | – | – | 16.7 | – | – | – |
| VPL-B0753M | – | – | 27.2 | – | – | 21.6 | – | – | – | 18.7* | – | – | – | – | 15.6 |

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

(2) An asterisk (*) next to a load rating indicates a load rating measured at an rpm value that is less than the value listed for that column.

## Axial Load Force Ratings (maximum radial load) for Brake Motors (kgf) [1] [2] (063…075 mm frame size)

| Motor Cat. No. | RPM | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 6000 | 6500 | 7000 | 7500 | 8000 |
| VPL-A0631E | – | 23.7 | – | – | 17.2* | 14.7 | – | – | 12.3 | – | – | – | – | – | – |
| VPL-A0631M | – | – | 19.9 | – | 15.9 | – | – | – | 12.8 | – | – | – | – | 10.0* | – |
| VPL-A0632F | – | 24.3 | 20.4 | – | – | 16.1* | – | – | – | 12.3* | – | – | – | – | – |
| VPL-A0633C | 33.5 | 24.8 | 21.8* | – | – | 15.4 | – | – | – | – | – | – | – | – | – |
| VPL-A0633F | 33.5 | – | 20.8 | – | – | 15.4 | – | – | 12.9 | – | – | – | – | – | – |
| VPL-A0751E | 31.8 | 23.5 | – | – | 17.1* | – | – | – | – | 11.9* | – | – | – | – | – |
| VPL-A0752C | 32.7 | 24.2 | 21.3* | – | – | – | 14.4* | – | – | – | – | – | – | – | – |
| VPL-A0752E | 32.7 | 24.2 | – | – | 17.0* | – | – | – | – | 12.3* | – | – | – | – | – |
| VPL-A0753C | 33.4 | 24.7 | 22.0* | – | – | – | 14.7* | – | – | – | – | – | – | – | – |
| VPL-A0753E | 33.4 | 24.7 | – | – | 17.7* | – | – | – | – | 12.7* | – | – | – | – | – |
| VPL-B0631T | – | – | 19.9 | – | – | 14.7 | – | – | – | – | 11.1* | – | – | – | 9.6 |
| VPL-B0631U | – | – | 19.9 | – | – | 14.7 | – | – | – | 11.8 | – | – | – | – | 9.6 |
| VPL-B0632F | – | 24.3 | 20.4 | – | – | 16.1* | – | – | – | 12.3* | – | – | – | – | – |
| VPL-B0632T | – | – | – | 18.0 | – | – | – | 13.3 | – | – | – | 11.0* | – | – | 9.9 |
| VPL-B0633M | – | 24.8 | – | 18.4 | – | – | – | 13.7* | – | – | – | – | 10.7* | – | – |
| VPL-B0633T | – | – | 20.8 | – | – | 15.4 | – | – | – | – | 11.6* | – | – | – | 10.1 |
| VPL-B0751M | – | – | 19.7 | – | – | 14.6 | – | – | – | 11.9* | – | – | – | – | 9.5 |
| VPL-B0752E | 32.7 | 24.2 | – | – | 17.2* | – | – | – | – | 12.3* | – | – | – | – | – |
| VPL-B0752F | – | 24.2 | – | 17.9 | – | – | 14.5* | – | – | – | – | – | 10.4 | – | – |
| VPL-B0752M | – | – | 20.3 | – | – | 15.0 | – | – | – | 12.1* | – | – | – | – | 9.8 |
| VPL-B0753E | 33.4 | 24.7 | – | 18.3 | – | – | – | – | 12.9 | – | – | – | – | – | – |
| VPL-B0753F | – | 24.7 | – | 18.3 | – | – | 15.1* | – | – | – | – | 11.0 | – | – | – |
| VPL-B0753M | – | – | 20.7 | – | – | 15.3 | – | – | – | 12.7* | – | – | – | – | 10.0 |

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

(2) An asterisk (*) next to a load rating indicates a load rating measured at an rpm value that is less than the value listed for that column.

## Axial Load Force Ratings (zero radial load) for Brake Motors (kgf) [1] [2] (063…075 mm frame size)

| Motor Cat. No. | RPM | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 6000 | 6500 | 7000 | 7500 | 8000 |
| VPL-A0631E | – | 27.5 | – | – | 19.9 * | 17.1 | – | – | 14.3 | – | – | – | – | – | – |
| VPL-A0631M | – | – | 23.0 | – | 18.5 | – | – | – | 14.9 * | – | – | – | – | 11.7 * | – |
| VPL-A0632F | – | 27.5 | 23.0 | – | – | 18.1 * | – | – | – | 13.9 * | – | – | – | – | – |
| VPL-A0633C | 37.1 | 27.5 | 24.1 * | – | – | 17.1 | – | – | – | – | – | – | – | – | – |
| VPL-A0633F | 37.1 | – | 23.0 | – | – | 17.1 | – | – | 14.3 | – | – | – | – | – | – |
| VPL-A0751E | 37.1 | 27.5 | – | – | 19.9 * | – | – | – | – | 13.9 * | – | – | – | – | – |
| VPL-A0752C | 37.1 | 27.5 | 24.1 * | – | – | – | 16.4 * | – | – | – | – | – | – | – | – |
| VPL-A0752E | 37.1 | 27.5 | – | – | 19.3 * | – | – | – | – | 13.9 * | – | – | – | – | – |
| VPL-A0753C | 37.1 | 27.5 | 24.5 * | – | – | – | 16.4 * | – | – | – | – | – | – | – | – |
| VPL-A0753E | 37.1 | 27.5 | – | – | 19.7 * | – | – | – | – | 14.2 * | – | – | – | – | – |
| VPL-B0631T | – | – | 23.0 | – | – | 17.1 | – | – | – | – | 12.9 * | – | – | – | 11.1 |
| VPL-B0631U | – | – | 23.0 | – | – | 17.1 | – | – | – | 13.7 | – | – | – | – | 11.1 |
| VPL-B0632F | – | 27.5 | 23.0 | – | – | 18.1 * | – | – | – | 13.9 * | – | – | – | – | – |
| VPL-B0632T | – | – | – | 20.3 | – | – | – | 15.1 | – | – | – | 12.4 * | – | – | 11.1 |
| VPL-B0633M | – | 27.5 | – | 20.3 | – | – | – | 15.2 * | – | – | – | – | 11.9 * | – | – |
| VPL-B0633T | – | – | 23.0 | – | – | 17.1 | – | – | – | – | 12.8 * | – | – | – | 11.1 |
| VPL-B0751M | – | – | 23.0 | – | – | 17.1 | – | – | – | 13.9 * | – | – | – | – | 11.1 |
| VPL-B0752E | 37.1 | 27.5 | – | – | 19.5 * | – | – | – | – | 13.9 * | – | – | – | – | – |
| VPL-B0752F | – | 27.5 | – | 20.3 | – | – | 16.5 * | – | – | – | – | – | 11.8 | – | – |
| VPL-B0752M | – | – | 23.0 | – | – | 17.1 | – | – | – | 13.8 * | – | – | – | – | 11.1 |
| VPL-B0753E | 37.1 | 27.5 | – | 20.3 | – | – | – | – | 14.3 | – | – | – | – | – | – |
| VPL-B0753F | – | 27.5 | – | 20.3 | – | – | 16.8 * | – | – | – | – | 12.2 | – | – | – |
| VPL-B0753M | – | – | 23.0 | – | – | 17.1 | – | – | – | 14.2 * | – | – | – | – | 11.1 |

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

(2) An asterisk (*) next to a load rating indicates a load rating measured at an rpm value that is less than the value listed for that column.

## Radial Load Force Ratings (maximum) for Non-brake Motors (kgf) [1] [2] (100…165 mm frame size)

| Motor Cat. No. | RPM | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 5500 | 6000 | 6500 | 7000 |
| VPL-A1001C | 79.1 | – | 62.8 | – | 49.8 | – | 44.6* | – | – | – | – | – | – | – | – |
| VPL-A1001M | – | – | – | 54.9 | – | 46.3 | – | – | – | 38.0 | – | – | – | 33.6 | – |
| VPL-A1002C | 87.9 | – | 69.7 | – | 55.4 | – | 48.4 | – | – | – | – | – | – | – | – |
| VPL-A1002F | – | – | 69.7 | 60.9 | – | – | 48.4 | – | – | – | 40.8 | – | – | – | – |
| VPL-A1003C | 93.6 | – | 74.3 | 64.9 | – | 56.7* | – | – | – | – | – | – | – | – | – |
| VPL-A1003E | 93.6 | – | 74.3 | – | 59.0 | – | – | – | 47.8* | – | – | 42.1 | – | – | – |
| VPL-A1003F | – | – | – | 64.9 | – | 54.8 | – | – | 46.8 | – | – | – | – | – | – |
| VPL-A1152B | 98.8 | – | 78.4 | 68.5 | – | 60.8* | – | – | – | – | – | – | – | – | – |
| VPL-A1152E | 98.8 | – | 78.4 | – | 62.2 | – | – | 52.7* | – | – | – | – | – | – | – |
| VPL-A1152F | – | – | 78.4 | – | 62.2 | – | 54.4 | – | – | – | 45.9 | – | – | – | – |
| VPL-A1153C | 106.4 | – | 84.5 | 73.8 | – | 64.0* | – | – | – | – | – | – | – | – | – |
| VPL-A1303B | 132.9 | – | 105.5 | 92.2 | 84.4* | – | – | – | – | – | – | – | – | – | – |
| VPL-A1303F | – | – | 105.5 | – | 83.7 | – | 73.1 | – | 66.5 | – | – | – | – | – | – |
| VPL-A1304A | 140.2 | 122.5 | 112.2* | – | 95.2* | – | – | – | – | – | – | – | – | – | – |
| VPL-A1304D | 140.2 | – | 111.3 | – | 88.3 | – | 77.2 | – | – | – | – | – | – | – | – |
| VPL-A1306C | 150.0 | – | 128.3* | 107.7* | 94.5 | – | – | – | – | – | – | – | – | – | – |
| VPL-B1001M | – | – | – | – | 49.8 | – | 43.5 | – | 39.6 | – | – | – | 34.6 | – | – |
| VPL-B1002E | 87.9 | – | 69.7 | – | 55.4 | – | – | 46.8* | – | – | – | – | – | – | – |
| VPL-B1002M | – | – | – | 60.9 | – | – | 48.4 | – | – | 42.2 | – | – | 38.4 | – | – |
| VPL-B1003C | 93.6 | – | 74.3 | 64.9 | – | 54.8 | – | – | – | – | – | – | – | – | – |
| VPL-B1003F | – | – | 74.3 | 64.9 | – | – | 51.5 | – | – | – | 44.2* | – | – | – | – |
| VPL-B1003T | – | – | – | 64.9 | – | 54.8 | – | – | – | 45.0 | – | – | – | – | 38.9 |
| VPL-B1152C | 98.8 | – | 78.4 | 68.5 | – | 59.8* | – | – | – | – | – | – | – | – | – |
| VPL-B1152F | – | – | 78.4 | – | 62.2 | – | 54.4 | – | – | 47.5 | – | – | – | – | – |
| VPL-B1152T | – | – | – | 68.5 | – | 57.8 | – | – | 49.4 | – | – | – | – | 42.0 | – |
| VPL-B1153E | 106.4 | – | 84.5 | – | 67.0 | – | – | 57.3* | – | – | – | – | – | – | – |
| VPL-B1153F | – | – | 84.5 | – | 67.0 | – | 58.6 | – | – | 49.4 | – | – | – | – | – |
| VPL-B1303C | 132.9 | – | 105.5 | 92.2 | – | 80.5* | – | – | – | – | – | – | – | – | – |
| VPL-B1303F | – | – | 105.5 | – | 83.7 | – | 74.0* | – | 66.5 | – | – | – | – | – | – |
| VPL-B1304C | 140.2 | – | 111.3 | 99.5* | – | 86.2* | – | – | – | – | – | – | – | – | – |
| VPL-B1304E | – | – | 111.3 | 97.2 | – | 84.3* | – | 73.3 | – | – | – | – | – | – | – |
| VPL-B1306C | 150.0 | – | 119.1 | – | 100.8* | 87.7 | – | – | – | – | – | – | – | – | – |
| VPL-B1306F | – | – | 119.0 | – | 94.5 | – | 82.6 | – | – | 73.5* | – | – | – | – | – |
| VPL-B1651C | 161.3 | – | 128.0 | – | 108.3* | – | 91.4* | – | – | – | – | – | – | – | – |
| VPL-B1651F | – | – | 128.0 | – | 101.6 | – | 88.7 | – | – | – | 76.1* | – | – | – | – |
| VPL-B1652C | 180.7 | – | 143.4 | 125.3 | – | – | 103.0* | – | – | – | – | – | – | – | – |
| VPL-B1652F | – | – | 143.4 | 125.3 | – | 105.7 | – | – | 90.4 | – | – | – | – | – | – |
| VPL-B1653C | 192.4 | – | 152.7 | 136.5* | – | 115.7* | – | – | – | – | – | – | – | – | – |
| VPL-B1653D | – | – | 152.7 | 139.9* | 125.5* | – | 105.9 | – | – | – | – | – | – | – | – |
| VPL-B1654B | 200.1 | 174.8 | – | 152.5* | 129.4* | – | – | – | – | – | – | – | – | – | – |
| VPL-B1654D | – | – | 158.8 | 138.8 | 126.1 | – | 110.1 | – | – | – | – | – | – | – | – |

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

(2) An asterisk (*) next to a load rating indicates a load rating measured at an rpm value that is less than the value listed for that column.

## Axial Load Force Ratings (maximum radial load) for Non-brake Motors (kgf) [1] [2] (100…165 mm frame size)

| Motor Cat. No. | RPM | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 5500 | 6000 | 6500 | 7000 |
| VPL-A1001C | 25.0 | – | 19.0 | – | 10.0 | – | 10.0* | – | – | – | – | – | – | – | – |
| VPL-A1001M | – | – | – | 15.0 | – | 12.0 | – | – | – | 9.0 | – | – | – | 8.0 | – |
| VPL-A1002C | 30.0 | – | 22.0 | – | 16.0 | – | 13.0 | – | – | – | – | – | – | – | – |
| VPL-A1002F | – | – | 22.0 | 18.0 | – | – | 13.0 | – | – | – | 11.0 | – | – | – | – |
| VPL-A1003C | 33.0 | – | 24.0 | 20.0 | – | 17.0* | – | – | – | – | – | – | – | – | – |
| VPL-A1003E | 33.0 | – | 24.0 | – | 18.0 | – | – | – | 13.0* | – | – | – | – | – | – |
| VPL-A1003F | – | – | – | 20.0 | – | 16.0 | – | – | 13.0 | – | – | 11.0 | – | – | – |
| VPL-A1152B | 44.0 | – | 32.0 | 27.0 | – | 23.0* | – | – | – | – | – | – | – | – | – |
| VPL-A1152E | 44.0 | – | 32.0 | – | 24.0 | – | – | 15.0* | – | – | – | – | – | – | – |
| VPL-A1152F | – | – | 32.0 | – | 24.0 | – | 20.0 | – | – | – | 16.0 | – | – | – | – |
| VPL-A1153C | 48.0 | – | 35.0 | 29.0 | – | 24.0* | – | – | – | – | – | – | – | – | – |
| VPL-A1303B | 39.0 | – | 29.0 | 24.0 | 22.0* | – | – | – | – | – | – | – | – | – | – |
| VPL-A1303F | – | – | 29.6 | – | 21.9 | – | 18.4 | – | 16.2 | – | – | – | – | – | – |
| VPL-A1304A | 43.0 | 36.0 | 32.0* | – | 26.0* | – | – | – | – | – | – | – | – | – | – |
| VPL-A1304D | 43.0 | – | 32.0 | – | 23.0 | – | 20.0 | – | – | – | – | – | – | – | – |
| VPL-A1306C | 48.0 | – | 39.0* | 31.0* | 26.0 | – | – | – | – | – | – | – | – | – | – |
| VPL-B1001M | – | – | – | – | 14.0 | – | 11.0 | – | 10.0 | – | – | – | 8.0 | – | – |
| VPL-B1002E | 30.0 | – | 22.0 | – | 16.0 | – | – | 13.0* | – | – | – | – | – | – | – |
| VPL-B1002M | – | – | – | 18.0 | – | – | 13.0 | – | – | 11.0 | – | – | 10.0 | – | – |
| VPL-B1003C | 33.0 | – | 24.0 | 20.0 | – | 16.0 | – | – | – | – | – | – | – | – | – |
| VPL-B1003F | – | – | 24.0 | 20.0 | – | – | 15.0 | – | – | – | 12.0* | – | – | – | – |
| VPL-B1003T | – | – | – | 20.0 | – | 16.0 | – | – | – | 12.0 | – | – | – | – | 10.0 |
| VPL-B1152C | 44.0 | – | 32.0 | 27.0 | – | 22.0* | – | – | – | – | – | – | – | – | – |
| VPL-B1152F | – | – | 32.0 | – | 24.0 | – | 20.0 | – | – | 17.0 | – | – | – | – | – |
| VPL-B1152T | – | – | – | 27.0 | – | 21.0 | – | – | 17.0 | – | – | – | – | 14.0 | – |
| VPL-B1153E | 48.0 | – | 35.0 | – | 26.0 | – | – | 21.0* | – | – | – | – | – | – | – |
| VPL-B1153F | – | – | 35.0 | – | 26.0 | – | 22.0 | – | – | – | 17.0 | – | – | – | – |
| VPL-B1303C | 39.0 | – | 29.0 | – | 24.0 | 20.0* | – | – | – | – | – | – | – | – | – |
| VPL-B1303F | – | – | 29.0 | – | 21.0 | – | 18.0* | – | 16.0 | – | – | – | – | – | – |
| VPL-B1304C | 43.0 | – | 32.0 | 27.0* | – | 23.0* | – | – | – | – | – | – | – | – | – |
| VPL-B1304E | – | – | 32.0 | 27.0 | – | 22.0* | – | 18.0 | – | – | – | – | – | – | – |
| VPL-B1306C | 48.0 | – | 36.0 | – | 29.0* | 24.0 | – | – | – | – | – | – | – | – | – |
| VPL-B1306F | – | – | 36.0 | – | 26.0 | – | 22.0 | – | – | 19.0* | – | – | – | – | – |
| VPL-B1651C | 48.0 | – | 35.0 | – | 28.0* | – | 23.0* | – | – | – | – | – | – | – | – |
| VPL-B1651F | – | – | 35.0 | – | 26.0 | – | 22.0 | – | – | – | 18.0* | – | – | – | – |
| VPL-B1652C | 58.0 | – | 43.0 | 36.0 | – | – | 27.0* | – | – | – | – | – | – | – | – |
| VPL-B1652F | – | – | 43.1 | 36.1 | – | 28.9 | – | – | 23.6 | – | – | – | – | – | – |
| VPL-B1653C | 64.0 | – | 47.0 | 41.0* | – | 33.0* | – | – | – | – | – | – | – | – | – |
| VPL-B1653D | – | – | 47.6 | 42.5* | 36.9* | – | 29.5 | – | – | – | – | – | – | – | – |
| VPL-B1654B | 68.0 | – | 57.0 | 48.0* | 38.0* | – | – | – | – | – | – | – | – | – | – |
| VPL-B1654D | – | – | 50.7 | 42.5 | 37.5 | – | 31.5 | – | – | – | – | – | – | – | – |

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

(2) An asterisk (*) next to a load rating indicates a load rating measured at an rpm value that is less than the value listed for that column.

## Axial Load Force Ratings (zero radial load) for Non-brake Motors (kgf) [1] [2] (100…165 mm frame size)

| Motor Cat. No. | RPM | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 5500 | 6000 | 6500 | 7000 |
| VPL-A1001C | 49.4 | – | 36.5 | – | 27.0 | – | 23.4* | – | – | 19.0 | – | – | – | – | – |
| VPL-A1001M | – | – | – | 30.6 | – | 24.5 | – | – | – | – | – | – | – | 16.2 | – |
| VPL-A1002C | 49.4 | – | 36.5 | – | 27.0 | – | 22.7 | – | – | – | – | – | – | – | – |
| VPL-A1002F | – | – | 36.5 | 30.6 | – | – | 22.7 | – | – | – | 18.2 | – | – | – | – |
| VPL-A1003C | 49.4 | – | 36.5 | 30.6 | – | 25.7* | – | – | – | – | – | – | – | – | – |
| VPL-A1003E | 49.4 | – | 36.5 | – | 27.0 | – | – | – | 20.6* | – | – | – | – | – | – |
| VPL-A1003F | – | – | – | 30.6 | – | 24.5 | – | – | 20.0 | – | – | 17.4 | – | – | – |
| VPL-A1152B | 68.3 | – | 50.5 | 42.4 | – | 36.0* | – | – | – | – | – | – | – | – | – |
| VPL-A1152E | 68.3 | – | 50.5 | – | 37.4 | – | – | 30.1* | – | – | – | – | – | – | – |
| VPL-A1152F | – | – | 50.5 | – | 37.4 | – | 31.4 | – | – | – | 25.1 | – | – | – | – |
| VPL-A1153C | 68.3 | – | 50.5 | 42.4 | – | 35.2* | – | – | – | – | – | – | – | – | – |
| VPL-A1303B | 68.3 | – | 50.5 | 42.4 | 37.8* | – | – | – | – | – | – | – | – | – | – |
| VPL-A1303F | – | – | 50.5 | – | 37.4 | – | 31.4 | – | 27.7 | – | – | – | – | – | – |
| VPL-A1304A | 68.3 | 57.2 | 51.1* | – | 41.2* | – | – | – | – | – | – | – | – | – | – |
| VPL-A1304D | 68.3 | – | 50.5 | – | 37.4 | – | 31.4 | – | – | – | – | – | – | – | – |
| VPL-A1306C | 68.3 | – | 55.7* | 44.3* | 37.4 | – | – | – | – | – | – | – | – | – | – |
| VPL-B1001M | – | – | – | – | 27.0 | – | 22.7 | – | 20.0 | – | – | – | 16.8 | – | – |
| VPL-B1002E | 49.4 | – | 36.5 | – | 27.0 | – | – | 21.8* | – | – | – | – | – | – | – |
| VPL-B1002M | – | – | – | 30.6 | – | – | 22.7 | – | – | 19.0 | – | – | 16.8 | – | – |
| VPL-B1003C | 49.4 | – | 36.5 | 30.6 | – | 24.5 | – | – | – | – | – | – | – | – | – |
| VPL-B1003F | – | – | 36.5 | 30.6 | – | – | 22.7 | – | – | – | 18.6* | – | – | – | – |
| VPL-B1003T | – | – | – | 30.6 | – | 24.5 | – | – | – | 19.0 | – | – | – | – | 15.7 |
| VPL-B1152C | 68.3 | – | 50.5 | 42.4 | – | 35.5* | – | – | – | – | – | – | – | – | – |
| VPL-B1152F | – | – | 50.5 | – | 37.4 | – | 31.4 | – | – | 26.3 | – | – | – | – | – |
| VPL-B1152T | – | – | – | 42.4 | – | 33.9 | – | – | 27.7 | – | – | – | – | 22.4 | – |
| VPL-B1153E | 68.3 | – | 50.5 | – | 37.4 | – | – | 30.5* | – | – | 25.1 | – | – | – | – |
| VPL-B1153F | – | – | 50.5 | – | 37.4 | – | 31.4 | – | – | – | – | – | – | – | – |
| VPL-B1303C | 68.3 | – | 50.5 | 42.3 | – | 35.5* | – | – | – | – | – | – | – | – | – |
| VPL-B1303F | – | – | 50.5 | – | 37.4 | – | 31.8* | – | 27.7 | – | – | – | – | – | – |
| VPL-B1304C | 68.3 | – | 50.5 | 43.6* | – | 36.2* | – | – | – | – | – | – | – | – | – |
| VPL-B1304E | – | – | 50.5 | 42.4 | – | 35.2* | – | 29.3 | – | – | – | – | – | – | – |
| VPL-B1306C | 68.3 | – | 50.5 | – | 40.6* | 33.9 | – | – | – | – | – | – | – | – | – |
| VPL-B1306F | – | – | 50.5 | – | 37.4 | – | 31.4 | – | – | 27.0* | – | – | – | – | – |
| VPL-B1651C | 90.1 | – | 66.7 | – | 53.7* | – | 43.0* | – | – | – | 33.9* | – | – | – | – |
| VPL-B1651F | – | – | 66.7 | – | 49.4 | – | 41.4 | – | – | – | – | – | – | – | – |
| VPL-B1652C | 90.1 | – | 66.7 | 55.9 | – | – | 43.3* | – | – | – | – | – | – | – | – |
| VPL-B1652F | – | – | 66.7 | 55.9 | – | 44.8 | – | – | 36.5 | – | – | – | – | – | – |
| VPL-B1653C | 90.1 | – | 66.7 | 57.6* | – | 46.4* | – | – | – | – | – | – | – | – | – |
| VPL-B1653D | – | – | 66.7 | 59.5* | 51.7* | – | 41.4 | – | – | – | – | – | – | – | – |
| VPL-B1654B | 90.1 | 75.6 | – | 63.2* | 51.1* | – | – | – | – | – | – | – | – | – | – |
| VPL-B1654D | – | – | 66.7 | 55.9 | 49.4 | – | 41.4 | – | – | – | – | – | – | – | – |

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

(2) An asterisk (*) next to a load rating indicates a load rating measured at an rpm value that is less than the value listed for that column.

## Radial Load Force Ratings (maximum) for Brake Motors (kgf) (1) (2) (100…165 mm frame size)

| Motor Cat. No. | RPM | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 5500 | 6000 | 6500 | 7000 |
| VPL-A1001C | 90.2 | – | 71.6 | – | 56.8 | – | 50.8* | – | – | – | – | – | – | – | – |
| VPL-A1001M | – | – | – | 62.5 | – | 52.7 | – | – | – | 43.4 | – | – | – | 38.4 | – |
| VPL-A1002C | 95.3 | – | 75.6 | – | 60.0 | – | 52.4 | – | – | – | – | – | – | – | – |
| VPL-A1002F | – | – | 75.6 | 66.1 | – | – | 52.4 | – | – | – | 44.2 | – | – | – | – |
| VPL-A1003C | 99.0 | – | 78.5 | 68.6 | – | 59.9* | – | – | – | – | – | – | – | – | – |
| VPL-A1003E | 99.0 | – | 78.5 | – | 62.3 | – | – | – | 50.6* | – | – | – | – | – | – |
| VPL-A1003F | – | – | – | 68.6 | – | 57.9 | – | – | 49.5 | – | – | 44.5 | – | – | – |
| VPL-A1152B | 111.3 | – | 88.4 | 77.2 | – | 68.5* | – | – | – | – | – | – | – | – | – |
| VPL-A1152E | 111.3 | – | 88.4 | – | 70.1 | – | – | 59.4* | – | – | – | – | – | – | – |
| VPL-A1152F | – | – | 88.4 | – | 70.1 | – | 61.3 | – | – | – | 51.7 | – | – | – | – |
| VPL-A1153C | 115.4 | – | 91.6 | 80.0 | – | 69.4* | – | – | – | – | – | – | – | – | – |
| VPL-A1303B | 145.3 | – | 115.3 | 100.7 | 92.3* | – | – | – | – | – | – | – | – | – | – |
| VPL-A1303F | – | – | 115.3 | – | 91.5 | – | 80.0 | – | 72.7 | – | – | – | – | – | – |
| VPL-A1304A | 149.7 | 130.8 | 119.8* | – | 101.6* | – | – | – | – | – | – | – | – | – | – |
| VPL-A1304D | 149.5 | – | 118.6 | – | 94.2 | – | 82.3 | – | – | – | – | – | – | – | – |
| VPL-A1306C | 156.0 | – | 133.4* | 112.1* | 98.3 | – | – | – | – | – | – | – | – | – | – |
| VPL-B1001M | – | – | – | – | 56.8 | – | 49.6 | – | 45.1 | – | – | – | 39.4 | – | – |
| VPL-B1002E | 95.3 | – | 75.6 | – | 60.0 | – | – | 50.8* | – | – | 45.8 | – | – | – | – |
| VPL-B1002M | 99.0 | – | – | 66.1 | – | – | 52.4 | – | – | – | – | – | 41.6 | – | – |
| VPL-B1003C | – | – | 78.5 | 68.6 | – | 57.9 | – | – | – | – | – | – | – | – | – |
| VPL-B1003F | – | – | 78.5 | 68.6 | – | – | 54.5 | – | – | – | 46.7* | – | – | – | – |
| VPL-B1003T | – | – | – | 68.6 | – | 57.9 | – | – | – | 47.6 | – | – | – | – | 41.1 |
| VPL-B1152C | 111.3 | – | 88.4 | 77.2 | – | 67.4* | – | – | – | – | – | – | – | – | – |
| VPL-B1152F | – | – | 88.4 | – | 70.1 | – | 61.3 | – | – | 53.5 | – | – | – | – | – |
| VPL-B1152T | – | – | – | 77.2 | – | 65.1 | – | – | 55.7 | – | – | – | – | 47.4 | – |
| VPL-B1153E | 115.4 | – | 91.6 | – | 72.7 | – | – | 62.2* | – | – | – | – | – | – | – |
| VPL-B1153F | – | – | 91.6 | – | 72.7 | – | 63.5 | – | – | – | 53.6 | – | – | – | – |
| VPL-B1303C | 145.3 | – | 115.3 | 100.7 | – | 88.0* | – | – | – | – | – | – | – | – | – |
| VPL-B1303F | – | – | 115.3 | – | 91.5 | – | 80.9* | – | 72.7 | – | – | – | – | – | – |
| VPL-B1304C | 149.7 | – | 118.8 | 106.2* | – | 92.0* | – | – | – | – | – | – | – | – | – |
| VPL-B1304E | – | – | 118.8 | 103.8 | – | 90.0* | – | 78.2 | – | – | – | – | – | – | – |
| VPL-B1306C | 156.0 | – | 123.8 | – | 104.8* | 91.2 | – | – | – | – | – | – | – | – | – |
| VPL-B1306F | – | – | 123.8 | – | 98.3 | – | 85.9 | – | – | 76.5* | – | – | – | – | – |
| VPL-B1651C | 180.9 | – | 143.6 | – | 121.5* | – | 102.5* | – | – | – | 85.4* | – | – | – | – |
| VPL-B1651F | – | – | 143.6 | – | 114.0 | – | 99.6 | – | – | – | – | – | – | – | – |
| VPL-B1652C | 192.5 | – | 152.8 | 133.5 | – | – | 109.7* | – | – | – | – | – | – | – | – |
| VPL-B1652F | – | – | 152.8 | 133.5 | – | 112.6 | – | – | 96.3 | – | – | – | – | – | – |
| VPL-B1653C | 200.2 | – | 158.9 | 142.1* | – | 120.4* | – | – | – | – | – | – | – | – | – |
| VPL-B1653D | – | – | 158.9 | 145.6* | 130.6* | – | 110.2 | – | – | – | – | – | – | – | – |
| VPL-B1654B | 205.7 | 179.7 | – | 156.8* | 133.0* | – | – | – | – | – | – | – | – | – | – |
| VPL-B1654D | – | – | 163.3 | 142.7 | 129.6 | – | 113.2 | – | – | – | – | – | – | – | – |

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

(2) An asterisk (*) next to a load rating indicates a load rating measured at an rpm value that is less than the value listed for that column.

## Axial Load Force Ratings (maximum radial load) for Brake Motors (kgf) [1] [2] (100…165 mm frame size)

| Motor Cat. No. | RPM | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 5500 | 6000 | 6500 | 7000 |
| VPL-A1001C | 31.0 | – | 23.0 | – | 17.0 | – | 14.0* | – | – | – | – | – | – | – | – |
| VPL-A1001M | – | – | – | 19.0 | – | 15.0 | – | – | – | 12.0 | – | – | – | 10.0 | – |
| VPL-A1002C | 34.0 | – | 25.0 | – | 18.0 | – | 15.0 | – | – | – | – | – | – | – | – |
| VPL-A1002F | – | – | 25.0 | 21.0 | – | – | 15.0 | – | – | – | 12.0 | – | – | – | – |
| VPL-A1003C | 36.0 | – | 26.0 | 22.0 | – | 18.0* | – | – | – | – | – | – | – | – | – |
| VPL-A1003E | 36.0 | – | 26.0 | – | 19.0 | – | – | – | 15.0* | – | – | – | – | – | – |
| VPL-A1003F | – | – | – | 22.0 | – | 18.0 | – | – | 14.0 | – | – | 12.0 | – | – | – |
| VPL-A1152B | 50.0 | – | 37.0 | 31.0 | – | 26.0* | – | – | – | – | – | – | – | – | – |
| VPL-A1152E | 51.0 | – | 37.0 | – | 27.0 | – | – | 22.0* | – | – | – | – | – | – | – |
| VPL-A1152F | – | – | 37.0 | – | 27.0 | – | 23.0 | – | – | – | 18.0 | – | – | – | – |
| VPL-A1153C | 53.0 | – | 39.0 | 32.0 | – | 27.0* | – | – | – | – | – | – | – | – | – |
| VPL-A1303B | 46.0 | – | 34.0 | 28.0 | 25.0* | – | – | – | – | – | – | – | – | – | – |
| VPL-A1303F | – | – | 34.4 | – | 25.4 | – | 21.3 | – | 18.8 | – | – | – | – | – | – |
| VPL-A1304A | 48.0 | 40.0 | 36.0* | – | 29.0* | – | – | – | – | – | – | – | – | – | – |
| VPL-A1304D | 48.0 | – | 36.0 | – | 26.0 | – | 22.0 | – | – | – | – | – | – | – | – |
| VPL-A1306C | 52.0 | – | 42.0* | 33.3* | 28.0 | – | – | – | – | – | – | – | – | – | – |
| VPL-B100M | – | – | – | – | 17.0 | – | 14.0 | – | 12.0 | – | – | – | 10.0 | – | – |
| VPL-B1002E | 34.0 | – | 25.0 | – | 18.0 | – | – | 15.0* | – | – | – | – | – | – | – |
| VPL-B1002M | – | – | – | 21.0 | – | – | 15.0 | – | – | 13.0 | – | – | 11.0 | – | – |
| VPL-B1003C | 36.0 | – | 26.0 | 22.0 | – | 18.0 | – | – | – | – | – | – | – | – | – |
| VPL-B1003F | – | – | 26.0 | 22.0 | – | – | 16.0 | – | – | – | 13.0* | – | – | – | – |
| VPL-B1003T | – | – | – | 22.0 | – | 18.0 | – | – | – | 13.0 | – | – | – | – | 11.0 |
| VPL-B1152C | 51.0 | – | 37.0 | 31.0 | – | 26.0* | – | – | – | – | – | – | – | – | – |
| VPL-B1152F | – | – | 37.0 | – | 27.0 | – | 23.0 | – | – | 19.0 | – | – | – | – | – |
| VPL-B1152T | – | – | – | 31.0 | – | 25.0 | – | – | 20.0 | – | – | – | – | 16.0 | – |
| VPL-B1153E | 53.0 | – | 39.0 | – | 29.0 | – | – | 23.0* | – | – | 19.0 | – | – | – | – |
| VPL-B1153F | – | – | 39.0 | – | 29.0 | – | 24.0 | – | – | – | – | – | – | – | – |
| VPL-B1303C | 46.0 | – | 34.0 | 28.0 | – | 24.0* | – | – | – | – | – | – | – | – | – |
| VPL-B1303F | – | – | 34.0 | – | 25.0 | – | 21.0* | – | 18.0 | – | – | – | – | – | – |
| VPL-B1304C | 48.0 | – | 36.0 | 31.0* | – | 25.0* | – | – | – | – | – | – | – | – | – |
| VPL-B1304E | – | – | 36.0 | 30.0 | – | 25.0* | – | 20.0 | – | – | – | – | – | – | – |
| VPL-B1306C | 52.0 | – | 38.0 | – | 31.0* | 25.0 | – | – | – | – | – | – | – | – | – |
| VPL-B1306F | – | – | 38.0 | – | 28.0 | – | 24.0 | – | – | 20.0* | – | – | – | – | – |
| VPL-B1651C | 58.0 | – | 43.0 | – | 34.0* | – | 27.0* | – | – | – | 21.0* | – | – | – | – |
| VPL-B1651F | – | – | 43.0 | – | 31.0 | – | 26.0 | – | – | – | – | – | – | – | – |
| VPL-B1652C | 64.0 | – | 47.0 | 39.0 | – | – | 30.0* | – | – | – | – | – | – | – | – |
| VPL-B1652F | – | – | 47.6 | 40.0 | – | 32.0 | – | – | 26.1 | – | – | – | – | – | – |
| VPL-B1653C | 68.0 | – | 50.0 | 43.0* | – | 35.0* | – | – | – | – | – | – | – | – | – |
| VPL-B1653D | – | – | 50.7 | 45.3* | 39.3* | – | 31.5 | – | – | – | – | – | – | – | – |
| VPL-B1654B | 71.0 | 59.0 | – | 50.0* | 40.0* | – | – | – | – | – | – | – | – | – | – |
| VPL-B1654D | – | – | 52.9 | 44.4 | 39.2 | – | 32.9 | – | – | – | – | – | – | – | – |

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

(2) An asterisk (*) next to a load rating indicates a load rating measured at an rpm value that is less than the value listed for that column.

## Axial Load Force Ratings (zero radial load) for Brake Motors (kgf) (1) (2) (100…165 mm frame size)

| Motor Cat. No. | RPM | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 750 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 5500 | 6000 | 6500 | 7000 |
| VPL-A1001C | 49.4 | – | 36.5 | – | 27.0 | – | 23.4* | – | – | – | – | – | – | – | – |
| VPL-A1001M | – | – | – | 30.6 | – | 24.5 | – | – | – | 19.0 | – | – | – | 16.2 | – |
| VPL-A1002C | 49.4 | – | 36.5 | – | 27.0 | – | 22.7 | – | – | – | – | – | – | – | – |
| VPL-A1002F | – | – | 36.5 | 30.6 | – | – | 22.7 | – | – | – | 18.2 | – | – | – | – |
| VPL-A1003C | 49.4 | – | 36.5 | 30.6 | – | 25.7* | – | – | – | – | – | – | – | – | – |
| VPL-A1003E | 49.4 | – | 36.5 | – | 27.0 | – | – | – | 20.6* | – | – | – | – | – | – |
| VPL-A1003F | – | – | – | 30.6 | – | 24.5 | – | – | 20.0 | – | – | 17.4 | – | – | – |
| VPL-A1152B | 68.3 | – | 50.5 | 42.4 | – | 36.2* | – | – | – | – | – | – | – | – | – |
| VPL-A1152E | 68.3 | – | 50.5 | – | 37.4 | – | – | 30.1* | – | – | – | – | – | – | – |
| VPL-A1152F | – | – | 50.5 | – | 37.4 | – | 31.4 | – | – | – | 25.1 | – | – | – | – |
| VPL-A1153C | 68.3 | – | 50.5 | 42.4 | – | 35.2* | – | – | – | – | – | – | – | – | – |
| VPL-A1303B | 68.3 | – | 50.5 | 42.4 | 37.8* | – | – | – | – | – | – | – | – | – | – |
| VPL-A1303F | – | – | 50.5 | – | 37.4 | – | 31.4 | – | 27.7 | – | – | – | – | – | – |
| VPL-A1304A | 68.3 | 57.2 | 51.1* | – | 41.2* | – | – | – | – | – | – | – | – | – | – |
| VPL-A1304D | 68.3 | – | 50.5 | – | 37.4 | – | 31.4 | – | – | – | – | – | – | – | – |
| VPL-A1306C | 68.3 | – | 55.7* | 44.3 | 37.4 | – | – | – | – | – | – | – | – | – | – |
| VPL-B1000M | – | – | – | – | 27.0 | – | 22.7 | – | 20.0 | – | – | – | 16.8 | – | – |
| VPL-B1002E | 49.4 | – | 36.5 | – | 27.0 | – | – | 21.8* | – | – | – | – | – | – | – |
| VPL-B1002M | – | – | – | 30.6 | – | – | 22.7 | – | – | 19.0 | – | – | 16.8 | – | – |
| VPL-B1003C | 49.4 | – | 36.5 | 30.6 | – | 24.5 | – | – | – | – | – | – | – | – | – |
| VPL-B1003F | – | – | 36.5 | 30.6 | – | – | 22.7 | – | – | – | 18.6* | – | – | – | – |
| VPL-B1003T | – | – | – | 30.6 | – | 24.5 | – | – | – | 19.0 | – | – | – | – | 15.7 |
| VPL-B1152C | 68.3 | – | 50.5 | 42.4 | – | 35.5* | – | – | – | – | – | – | – | – | – |
| VPL-B1152F | – | – | 50.5 | – | 37.4 | – | 31.4 | – | – | 26.3 | – | – | – | – | – |
| VPL-B1152T | – | – | – | 42.4 | – | 33.9 | – | – | 27.7 | – | – | – | – | 22.4 | – |
| VPL-B1153E | 68.3 | – | 50.5 | – | 37.4 | – | – | 30.5* | – | – | – | – | – | – | – |
| VPL-B1153F | – | – | 50.5 | – | 37.4 | – | 31.4 | – | – | – | 25.1 | – | – | – | – |
| VPL-B1303C | 68.3 | – | 50.5 | 42.4 | – | 35.5* | – | – | – | – | – | – | – | – | – |
| VPL-B1303F | – | – | 50.5 | – | 37.4 | – | 31.8* | – | 27.7 | – | – | – | – | – | – |
| VPL-B1304C | 68.3 | – | 50.5 | 43.6* | – | 36.2* | – | – | – | – | – | – | – | – | – |
| VPL-B1304E | – | – | 50.5 | 42.4 | – | 35.2* | – | 29.3 | – | – | – | – | – | – | – |
| VPL-B1306C | 68.3 | – | 50.5 | – | 40.6* | 33.9 | – | – | – | – | – | – | – | – | – |
| VPL-B1306F | – | – | 50.5 | – | 37.4 | – | 31.4 | – | – | 27.0* | – | – | – | – | – |
| VPL-B1651C | 90.1 | – | 66.7 | – | 53.7 | – | 43.0* | – | – | – | – | – | – | – | – |
| VPL-B1651F | – | – | 66.7 | – | 49.4 | – | 41.4 | – | – | – | 33.9* | – | – | – | – |
| VPL-B1652C | 90.1 | – | 66.7 | 55.9 | – | – | 43.3* | – | – | – | – | – | – | – | – |
| VPL-B1652F | – | – | 66.7 | 55.9 | – | 44.8 | – | – | 36.5 | – | – | – | – | – | – |
| VPL-B1653C | 90.1 | – | 66.7 | 57.6* | – | 46.4* | – | – | – | – | – | – | – | – | – |
| VPL-B1653D | – | – | 66.7 | 59.5* | 51.7* | – | 41.4 | – | – | – | – | – | – | – | – |
| VPL-B1654B | 90.1 | 75.6 | – | 63.2* | 51.1* | – | – | – | – | – | – | – | – | – | – |
| VPL-B1654D | – | – | 66.7 | 55.9 | 49.4 | – | 41.4 | – | – | – | – | – | – | – | – |

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

(2) An asterisk (*) next to a load rating indicates a load rating measured at an rpm value that is less than the value listed for that column.

## Environmental Ratings

| Attribute | Value |
|---|---|
| Temperature, operating | 0…40 °C (32…104 °F) (3) |
| Temperature, storage | -30…40 °C (-22…104 °F) |
| Relative humidity, storage | 5…95% noncondensing |
| Atmosphere, storage | Noncorrosive |
| IP rating (1) of motor with optional shaft seal (2) and use of environmentally sealed cable connectors | IP66 – dust tight, jet spray |
| IP rating of motor without a shaft seal, and mounted in this direction:<br>• Shaft down<br>• Shaft horizontal<br>• Shaft up | • IP53 – dust tight, powerful water jets<br>• IP51 – dust tight, water dripping vertically<br>• IP50 – dust tight, no protection from water |

(1) International Protection Code (IP66) is roughly equivalent to a NEMA 35 (dust tight, drip tight).

(2) An optional shaft seal kit is required to provide the specified IP rating for the motor. A system level rating is also dependent on the IP rating of the cable. See Additional Resources on page 29 for information on shaft seal installation instructions.

(3) To obtain this thermal rating, mount the motor on a surface with heat dissipation equivalent to the size of an aluminum heatsink as listed here:
frame 063 mm, 203.2 x 203.2 x 6.35 mm (8 x 8 x 0.25 in.);
frame 075 mm, 254.0 x 254.0 x 6.35 mm (10 x 10 x 0.25 in.);
frames 100…165 mm, 304.8 x 304.8 x 12.7 mm (12 x 12 x 0.5 in.).

## 2090-Series Single Motor Cables

Factory-manufactured single motor cables are required with Kinetix VP low-inertia motors. Single motor cables are designed to effectively isolate the power, and feedback or brake signals, within the cable. Single motor cables are available in standard cable lengths, and provide environmental and shield termination.

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

## Shaft Seal Kits

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.

Catalog numbers and dimensions for Nitrile shaft seal kits are shown below.

| Motor Cat. No. | Shaft Seal Kit Cat. No. |
|---|---|
| VPL-A063*xx* and VPL-B063*xx* | VPL-SSN-F063075 |
| VPL-A075*xx* and VPL-B075*xx* | |
| VPL-A100*xx* and VPL-B100*xx* | VPL-SSN-A3B3 |
| VPL-A115*xx* and VPL-B115*xx* | MPL-SSN-A4B4 |
| VPL-A130*xx* and VPL-B130*xx* | MPL-SSN-A5B5 |
| VPL-B165*xx* | MPL-SSN-F165 |

**IMPORTANT** Nitrile shaft seals require a lubricant to reduce wear. Lubricant is supplied with the kit.

## Additional Resources

These documents contain information concerning related products from Rockwell Automation.

| Resource | Description |
|---|---|
| Kinetix 5500 Servo Drives User Manual, publication 2198-UM001 | Information on installing, configuring, starting up, and troubleshooting a servo drive system. |
| Kinetix 5500 Drive System Design Guide, publication GMC-RM009 | Information on drive system components and accessory items you need for your Kinetix 5500 drive/motor combination. |
| Shaft-seal Kit Installation Instructions, publication 2090-IN012 | Information on the installation of a shaft seal on this and other servo motors. |
| Kinetix Rotary Motion Specifications Technical Data, publication GMC-TD001 | Product specifications for Allen-Bradley® rotary motors, with performance, environmental, certifications, load force, and dimension drawings. |
| Kinetix Motion Accessories Specifications, publication GMC-TD004 | Product specifications and dimensions for Allen-Bradley servo drive accessories. |
| 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 designed to minimize system failures caused by electrical noise. |

You can view or download publications at http://www.rockwellautomation.com/literature. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

## Notes:

## Notes:

# Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products.
At http://www.rockwellautomation.com/support you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at https://rockwellautomation.custhelp.com/ for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/services/online-phone.

## Installation Assistance

If you experience a problem within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your product up and running.

| | |
|---|---|
| United States or Canada | 1.440.646.3434 |
| Outside United States or Canada | Use the Worldwide Locator at http://www.rockwellautomation.com/rockwellautomation/support/overview.page, or contact your local Rockwell Automation representative. |

## New Product Satisfaction Return

Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

| | |
|---|---|
| United States | Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process. |
| Outside United States | Please contact your local Rockwell Automation representative for the return procedure. |

## Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at http://www.rockwellautomation.com/literature/.



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