Installation Instructions

Original Instructions

# Kinetix VP Food Grade Servo Motors with 063…165 mm Frame Size

Catalog Numbers VPF-A0632, VPF-A0633, VPF-A0752, VPF-A0753, VPF-A1001, VPF-A1002, VPF-A1003, VPF-A1153, VPF-A1303, VPF-A1304, VPF-B0632, VPF-B0633, VPF-B0752, VPF-B0753, VPF-B1001, VPF-B1002, VPF-B1003, VPF-B1153, VPF-B1303, VPF-B1304, VPF-B1652


| Topic | Page |
|---|---|
| Summary of Changes | 1 |
| About the Kinetix VP Food Grade Motors | 1 |
| Catalog Number Explanation | 2 |
| Before You Install the Motor | 2 |
| Functional Safety | 4 |
| Motor Installation | 5 |
| Motor Dimensions (063 mm and 075 mm frame sizes) | 7 |

| Topic | Page |
|---|---|
| Motor Dimensions (100…165 mm frame sizes) | 8 |
| Connector Data | 10 |
| Load Force Ratings | 11 |
| Environmental Specifications | 21 |
| Motor Accessories | 21 |
| Additional Resources | 23 |


## Summary of Changes

This publication contains new and updated information as indicated in the following table.

| Topic | Page |
|---|---|
| Added the -W and -Q safety catalog number designators to the catalog number Feedback field | 2 |
| Added the Functional Safety topic | 4 |
| Updated Motor Installation with text and an ATTENTION statement regarding the use of stainless steel washers when mounting Bulletin VPF motors | 5 |
| Updated the Relative humidity specification | 21 |
| Added the Mounting Flange Washer Kits topic | 22 |
| Added Kinetix 5700 publications to Additional Resources | 23 |

## About the Kinetix VP Food Grade Motors

Kinetix® VP food-grade 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 combine the characteristics of the Kinetix VP low-inertia motors with unique features designed for food and beverage applications. The motors also have a corrosion-resistant stainless steel shaft and food-grade paint.

You are responsible for inspecting the equipment before accepting the shipment from the freight company. Check the items that 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 21.



**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.

## Catalog Number Explanation

**VP F - x xxx x x - x J 1 x A F**

**Factory Options**
F= Food-grade shaft seal, Fluoroloy G4 (PTFE)

**Mounting Flange**
A = IEC metric, free mounting holes (type FF)

**Brake**
2 = No Brake
4 = 24V DC Brake

**Connector**
1 = Single SpeedTec DIN connector, right angle, 315° rotatable

**Shaft Key**
J = Shaft key

**Feedback**
C = 18-bit absolute single-turn digital encoder (Hiperface DSL protocol)
P = 18-bit absolute multi-turn (4096 revolutions) digital encoder (Hiperface DSL protocol)
Q = 23-bit absolute multi-turn digital encoder (Hiperface DSL protocol) SIL2/PLd rated, 12-bit secondary safety channel (1)
W = 18-bit absolute multi-turn digital encoder (Hiperface DSL protocol) SIL2/PLd rated, 9-bit secondary safety channel (2)

**Rated Speed (3)**

| | | |
|---|---|---|
| A = 1500 rpm | D = 3000 rpm | M= 6000 rpm |
| B = 2000 rpm | E = 3500 rpm | T = 6750 rpm |
| C = 2500 rpm | F = 4500 rpm | U = 8000 rpm |

**Magnet Stack Length (1, 2, 3, 4 stacks) (4)**

**Frame Size - Bolt Circle Diameter (BCD)**

| | |
|---|---|
| 063 = 63 mm | 115 = 115 mm |
| 075 = 75 mm | 130 = 130 mm |
| 100 = 100 mm | 165 = 165 mm |

**Voltage Class**
A = 200V
B = 400V

**Series Type**
F = Food Grade enclosure (including food-grade shaft seal)

**Series**
VP = Permanent magnet rotary servo motors optimized to the ratings of Kinetix 5500 and Kinetix 5700 servo drives.

(1) This encoder option is available with only VPF-A/B100*xx*, VPF-A/B115*xx*, VPF-A/B130*xx*, and VPF-B165*xx* motor frame sizes.
(2) This encoder option is available with only VPF-B063*xx* and VPF-B075*xx* motor frame sizes.
(3) 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 KNX-RM009 and the Kinetix 5700 Drive System Design Guide, publication KNX-RM010.
(4) See Motor Dimensions (063 mm and 075 mm frame sizes) on page 7 and Motor Dimensions (100…165 mm frame sizes) on page 8 for dimensional changes (L, LB, LD, and LE) that result from the number of magnet stacks.

## 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. 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 5. Only a qualified Rockwell Automation employee can service this motor.

### Remove 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.

## 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 that is operated within the Environmental Specifications on page 21:

- Create a drip loop in the single motor cable to carry liquids away from the connector.
- 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 21 for more information.
- Inspect the motor and seals for damage or wear regularly. If you detect damage or excessive wear, replace the item.

## Shaft Seals

A shaft seal is required for Kinetix VP food-grade motors. An IP66 or IP67 rating for the motor requires a shaft seal and Bulletin 2090 cables with environmentally sealed connectors.

See the following information on environmental ratings, shaft seals, and environmentally sealed connectors and cables compatible with the Kinetix VP food-grade motors:

- See Environmental Specifications on page 21 for a brief description of the IP ratings.
- See Shaft Seal Kits on page 21 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 11 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 any 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 removing 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 more information on reducing EMI.

## Install Cables

Proper 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. Make sure that 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 that there is a connection to ground for all shields in the single motor cable.

## Functional Safety

Motors that are equipped with a Hiperface DSL functional safety-rated feedback sensor are designed in compliance with the requirements of the following SICK STEGMANN GmbH documentation to maintain the functional safety rating of the feedback sensor attached. See Catalog Number Explanation on page 2 for details about each option.

| Motor Cat. No. | Feedback Sensor Functional-safety Reference Documentation (SICK STEGMANN GmbH) | |
|---|---|---|
| VPF-*xxxxxx*-Q | HIPERFACE DSL Safety Manual, publication 8017596/YLR0 | EFM50-2 Safe Motor Feedback Systems Operating Instructions, publication 8019321/2016-02-17 |
| VPF-*xxxxxx*-W | | EKM36-2 Safe Motor Feedback Systems Operating Instructions, publication 8019481/2016-02-23 |

**IMPORTANT** In accordance with the feedback sensor manufacturer, you must mount a HIPERFACE DSL motor feedback system (used for a safety function) in an installation situation with a minimum protection class of IP54 according to standard IEC60529:1989 + A1:1999 + A2:2013.

### Certification

The TÜV Rheinland group has approved Kinetix VP low-inertia servo motors equipped with functional-safety certified Hiperface DSL feedback sensors to enable a system to be capable of achieving a functional safety rating up to Performance Level d (PLd) and safety category 3 (CAT. 3) per EN ISO 13849, and SIL 2 per IEC 61508, EN 61800-5-2, and EN 62061 when used in conjunction with variable frequency drives that satisfy functional safety requirements of the HIPERFACE DSL Safety Manual (SICK STEGMANN GmbH, publication 8017596/YLR0).

To view the TÜV Rheinland certificate and other product certifications currently available from Rockwell Automation, go to http://www.rockwellautomation.com/global/certification/overview. page.

### Important Safety Considerations

In addition to following the instructions throughout this document, you are responsible for the following:

- Complete a machine-level risk assessment.
- Certification of the machine to the desired EN ISO 13849 performance level or EN 62061 SIL level.
- Project management and proof testing in accordance with EN 61800-5-2.
- The safe-motor feedback system has a maximum Mission Time of 20 years. After this time, the feedback system must be taken out of service.
- The motor feedback system cannot support safety functions that are based on the absolute position without additional measures. In the case of safety functions that are based on the safe absolute position, the motor feedback system supplies only one channel without safety-related diagnostics upon powerup. You must implement a second channel by using other measures.
- The motor feedback system is not able to create a safe state for the drive system independently. The drive system creates the safe state as a response to an error displayed by the motor feedback system.
- To plan and use motors equipped with safety-rated feedback sensors requires technical skills that are not explained in this document.

**ATTENTION:** To avoid damage to the equipment, do not establish or remove electrical connections to the motor feedback system with the voltage switched on.

### Performance Level (PL) and Safety Integrity Level (SIL)

For safety-related control systems, Performance Level (PL), according to EN ISO 13849-1, and SIL levels, according to IEC EN 61508 and EN 62061, include a rating of the system's ability to perform its safety functions. All of the safety related components of the control system must be included in a risk assessment and the determination of the achieved levels.

Refer to the EN ISO 13849-1, IEC EN 61508, and EN 62061 standards for complete information on the requirements for PL and SIL determination.

### Safety Related Parameters

A motor that is equipped with a HIPERFACE DSL functional safety-rated feedback sensor is designed to maintain the functional safety rating of the feedback sensor attached. The safety parameters of the feedback sensors are as follows.

| Attribute | Motor Cat. No. | |
|---|---|---|
| | **VPF-*xxxxxx*-WJ1*x*AF** | **VPF-*xxxxxx*-QJ1*x*AF** |
| Safety Integrity Level (SIL) | SIL2 (IEC 61508), SIL CL2 (EN 62061) | |
| Probability of a Dangerous Failure per Hour (PFH) | 4.0 E-08 1/h | 3.80 E-08 1/h |
| Safety Category | CAT. 3 (EN ISO 13849) | |
| Performance Level (PL) | PLd (EN ISO 13849) | |

## Motor Installation

All motors include a mounting pilot for aligning the motor on a machine. Stainless steel fasteners are preferred. Stainless steel washers inserted between the fastener head and motor flange are also recommended as a best mounting practice and are included with Bulletin VPF motors. Motor installation must comply with all local regulations and use of equipment and installation practices that promote safety and electromagnetic compatibility.



**ATTENTION:** To further protect the finish on the motor, it is recommended to insert stainless steel washers (smooth side on paint) between the fastener head and motor flange. See the Mounting Flange Washer Kits on page 22 for washer kit catalog numbers.



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

Before you apply 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 environmental seal opening and closing as the cable flexes.

### Change Connector Orientation

Kinetix VP food-grade motors use a connector style that integrates the power, brake, and feedback signals within one connector. You can identify the connector style by the variable number in the motor catalog string. For example, in catalog number VPF-A1303F-CJ**1**2AA, the **1** indicates a SpeedTec, right-angle, 315° rotatable connector (see Catalog Number Explanation on page 2).

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 Specifications on page 21.

**ATTENTION:** Excessive force can damage the connector. Do not pull on the cable and do not use tools, such as pliers or vise-grips, to rotate the connector. Use your hands 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 step 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. Leave enough space around the motor so it can dissipate heat and stay within its specified operating temperature range.
   See Environmental Specifications on page 21 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 11 to determine the maximum radial and axial shaft load ratings for your motor.
3. Install the motor with the connector positioned beneath the motor housing.
   This position provides 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 the motor mating connections and cables.

4. Mount and align the motor.
5. Attach the single motor cable that transmits the power, feedback, and brake signals as described in the following steps.
   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.

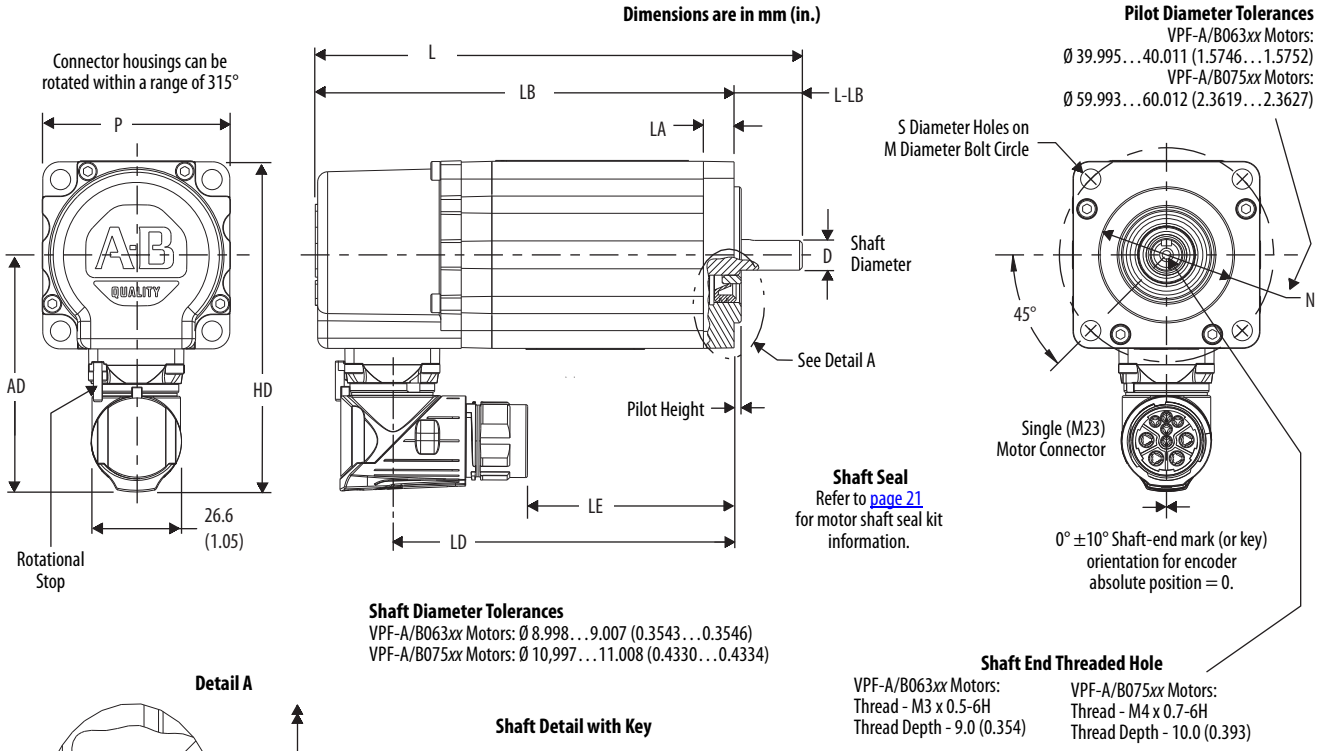
      **ATTENTION:** The overall shield on the single motor cable must be grounded to obtain an effective encoder signal.

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

      Be sure that 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 mm and 075 mm frame sizes)




| Shaft, Pilot, and Keyway Tolerances | VPF-A/B063xx | VPF-A/B075xx |
|---|---|---|
| Shaft Runout (T.I.R.) | 0.030 (0.0012) | 0.035 (0.0014) |
| Pilot Eccentricity (T.I.R.) | 0.08 (0.0031) | 0.08 (0.0031) |
| Max Face Runout (T.I.R.) | 0.08 (0.0031) | 0.08 (0.0031) |
| Keyway Depth (GE) | 1.80…1.90 (0.071…0.075) | 2.50…2.60 (0.098…0.102) |
| Keyway Width (F) | 2.971…2.996 (0.117…0.118) | 3.970…4.000 (0.156…0.158) |

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

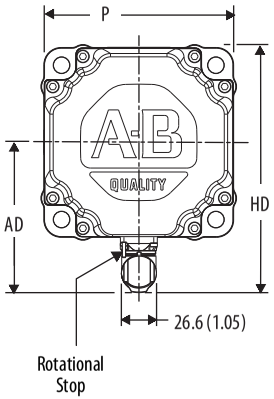
| Motor Cat. No. | AD mm (in.) | HD mm (in.) | LA mm (in.) | LD (1) mm (in.) | LE (1) mm (in.) | L (1) mm (in.) | LB (1) mm (in.) | L-LB (2) mm (in.) | D (3) mm (in.) | M mm (in.) | S (4) mm (in.) | N (3) mm (in.) | P mm (in.) | GE (3) mm (in.) | F (3) mm (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VPF-A/B0632 | 69.5 (2.74) | 97.0 (3.82) | 9.0 (0.35) | 125.2 (4.93) | 85.3 (3.36) | 168.1 (6.61) | 148.1 (5.83) | 20.0 (0.787) | 9.0 (0.354) | 63.0 (2.480) | 5.80 (0.234) | 40.0 (1.575) | 55.0 (2.17) | 1.90 (0.075) | 3.0 (0.118) |
| VPF-A/B0633 | | | | 150.2 (5.91) | 110.3 (4.34) | 193.1 (7.59) | 173.1 (6.81) | | | | | | | | |
| VPF-A/B0752 | 77.0 (3.03) | 112.0 (4.41) | 9.0 (0.35) | 127.0 (5.00) | 87.1 (3.43) | 172.9 (6.80) | 149.9 (5.90) | 23.0 (0.906) | 11.0 (0.433) | 75.0 (2.953) | 5.80 (0.234) | 60.0 (2.362) | 70.0 (2.76) | 2.60 (0.102) | 4.0 (0.157) |
| VPF-A/B0753 | | | | 152.0 (5.98) | 112.1 (4.41) | 197.9 (7.79) | 174.9 (6.89) | | | | | | | | |

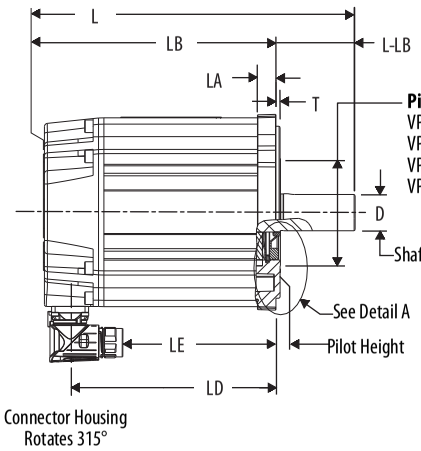
(1) If ordering an VPF-A/B063*xx* or VPF-A/B075*xx* motor with brake, add 30.6 mm (1.20 in.) to dimension L, LB, LE, and LD.
(2) Tolerance for this dimension is ±0.7 mm (±0.028 in.).
(3) For keyway, shaft diameter, and pilot diameter tolerances, see the diagram or Shaft, Pilot, and Keyway Tolerances table above.
(4) Tolerance for this dimension is 0.3, -0.0 mm (±0.006 in.).

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

# Motor Dimensions (100…165 mm frame sizes)

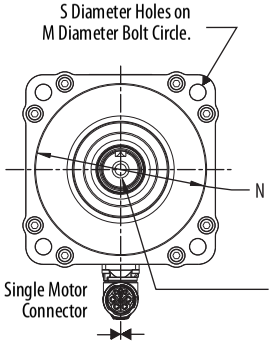
**Dimensions are in mm (in.)**



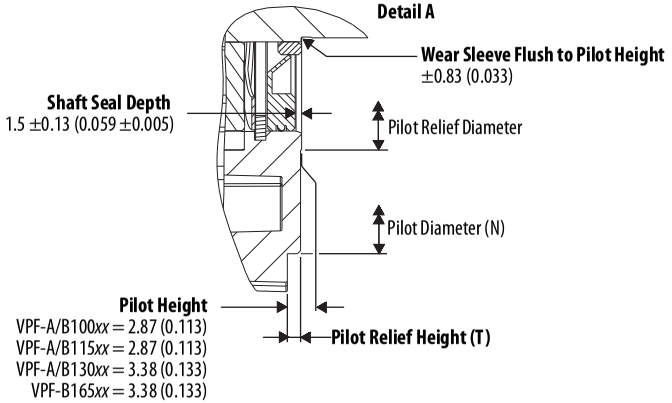

**Pilot Relief Diameter**
VPF-A/B100*xx* Motors = Ø 53.3 (2.10)
VPF-A/B115*xx* Motors = Ø 59.7 (2.35)
VPF-A/B130*xx* Motors = Ø 71.1 (2.80)
VPF-B165*xx* Motors = Ø 81.0 (3.19)

**Shaft Seal**
Refer to page 21 for Kinetix VP motor shaft seal kit information.




**Pilot Diameter Tolerances**
VPF-A/B100*xx* Motors:
Ø 79.993…80.012 (3.1493…3.1501)
VPF-A/B115*xx* Motors:
Ø 94.991…95.013 (3.7398…3.7407)
VPF-A/B130*xx* Motors:
Ø 109.991…110.013 (4.3303…4.3312)
VPF-B165*xx* Motors:
Ø 129.991…130.014 (5.1178…5.1187)

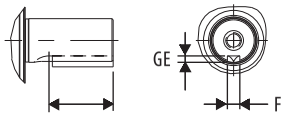
**Shaft End Threaded Hole**
VPF-A/B100*xx* Motors:
Thread - M5 x 0.8-6H
Thread Depth - 12.5 (0.49)
VPF-A/B115*xx* Motors:
Thread - M6 x 1.0-6H
Thread Depth - 16.0 (0.63)
VPF-A/B130*xx* Motors:
Thread - M8 x 1.25-6H
Thread Depth - 19.1 (0.75)
VPF-B165*xx* Motors:
Thread - M10 x 1.5-6H
Thread Depth - 22.1 (0.87)




**Shaft Diameter Tolerances**
VPF-A/B100*xx* = Ø 15.997…16.008 (0.6298…0.6302)
VPF-A/B115*xx* = Ø 18.996…19.009 (0.7479…0.7483)
VPF-A/B130*xx* = Ø 23.996…24.009 (0.9448…0.9451)
VPF-B165*xx* = Ø 27.996…28.009 (1.1022…1.1027)

**Keyway Length**
VPF-A/B100*xx* = 25.4 (1.00)
VPF-A/B115*xx* = 25.4 (1.00)
VPF-A/B130*xx* = 32.3 (1.27)
VPF-B165*xx* = 41.1 (1.62)

**Shaft Detail with Key**




**Key Supplied**
VPF-A/B100*xx* = $5_{(+0,\ -0.030)}$ x $5_{(+0,\ -0.030)}$ x 22 Key
VPF-A/B115*xx* = $6_{(+0,\ -0.030)}$ x $6_{(+0,\ -0.030)}$ x 24 Key
VPF-A/B130*xx* = $8_{(+0,\ -0.036)}$ x $7_{(+0,\ -0.090)}$ x 31 Key
VPF-B165*xx* = $8_{(+0,\ -0.036)}$ x $7_{(+0,\ -0.090)}$ x 39 Key

| Shaft, Pilot, and Keyway Tolerances | VPF-A/B100*xx* | VPF-A/B115*xx* | VPF-A/B130*xx* VPF-B165*xx* |
|---|---|---|---|
| Shaft Runout (T.I.R.) | 0.04 (0.0016) | | |
| Pilot Eccentricity (T.I.R.) | 0.078 (0.0031) | | |
| Max Face Runout (T.I.R.) | 0.078 (0.0031) | | |
| Keyway Depth (GE) | 3.00…3.10 (0.118…0.122) | 3.50…3.60 (0.138…0.142) | 4.00…4.20 (0.158…0.165) |
| Keyway Width (F) | 4.97…5.00 (0.196…0.197) | 5.97…6.00 (0.235…0.236) | 7.96…8.00 (0.314…0.315) |

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

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

| Motor Cat. No. | AD mm (in.) | HD mm (in.) | T mm (in.) | LA mm (in.) | LD (1) mm (in.) | LE (1) mm (in.) | L (1) mm (in.) | LB (1) mm (in.) | L-LB (2) mm (in.) | D (3) mm (in.) | M mm (in.) | S mm (in.) | N (3) mm (in.) | P mm (in.) | GE (3) mm (in.) | F (3) mm (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VPF-A/B1001 | 86.5 (3.40) | 131.2 (5.17) | 2.74 (0.108) | 9.90 (0.39) | 108.7 (4.28) | 68.9 (2.71) | 169.8 (6.68) | 129.8 (5.11) | 40.0 (1.575) | 16.0 (0.630) | 100.0 (3.937) | 7.00 (4) (0.283) | 80.0 (3.15) | 89.4 (3.52) | 3.0 (0.118) | 5.0 (0.197) |
| VPF-A/B1002 | | | | | 134.1 (5.28) | 94.3 (3.71) | 195.2 (7.68) | 155.2 (6.11) | | | | | | | | |
| VPF-A/B1003 | | | | | 159.5 (6.28) | 119.7 (4.71) | 220.6 (8.68) | 180.6 (7.11) | | | | | | | | |
| VPF-A/B1153 | 90.8 (3.58) | 140.0 (5.51) | 2.74 (0.108) | 10.16 (0.40) | 156.0 (6.14) | 116.1 (4.57) | 217.0 (8.54) | 177.0 (6.97) | 40.0 (1.575) | 19.0 (0.748) | 115.0 (4.528) | 10.00 (4) (0.401) | 95.0 (3.74) | 98.3 (3.87) | 3.5 (0.138) | 6.0 (0.236) |
| VPF-A/B1303 | 98.6 (3.88) | 155.4 (6.12) | 2.74 (0.108) | 12.19 (0.48) | 159.3 (6.27) | 119.4 (4.70) | 230.3 (9.06) | 180.3 (7.10) | 50.0 (1.969) | 24.0 (0.945) | 130.0 (5.118) | 10.00 (4) (0.401) | 110.0 (4.331) | 113.7 (4.48) | 4.0 (0.158) | 8.0 (0.315) |
| VPF-A/B1304 | | | | | 184.7 (7.27) | 144.8 (5.70) | 255.7 (10.06) | 205.7 (8.10) | | | | | | | | |
| VPF-B1652 | 113.3 (4.46) | 185.0 (7.28) | 3.12 (0.123) | 14.0 (0.55) | 206.2 (8.12) | 166.4 (6.55) | 286.4 (11.27) | 226.4 (8.92) | 60.0 (2.362) | 28.0 (1.102) | 165.0 (6.496) | 12.00 (5) (0.481) | 130.0 (5.118) | 143.5 (5.65) | 4.0 (0.158) | 8.0 (0.315) |

(1) If ordering a VPF-A/B100*xx-xxx4xx* motor with brake, add 34.5 mm (1.36 in.) to dimensions L, LB, LE, and LD.
If ordering a VPF-A/B115*xx-xxx4xx* motor with brake, add 48.5 mm (1.91 in.) to dimensions L, LB, LE, and LD.
If ordering a VPF-A/B130*xx-xxx4xx* motor with brake, add 48.5 mm (1.91 in.) to dimensions L, LB, LE, and LD.
If ordering a VPF-B165*xx-xxx4xx* motor with brake, add 51.5 mm (2.03 in.) to dimensions L, LB, LE, and LD.

(2) Tolerance for this dimension is ±0.7 mm (±0.028 in.).

(3) For keyway, shaft diameter, and pilot diameter tolerances, see the diagram or Shaft, Pilot, and Keyway Tolerances table on page 8.

(4) Tolerance for this dimension is +0.36, -0.0 mm (±0.007 in.).

(5) Tolerance for this dimension is +0.43 -0.0 mm (±0.008 in.).

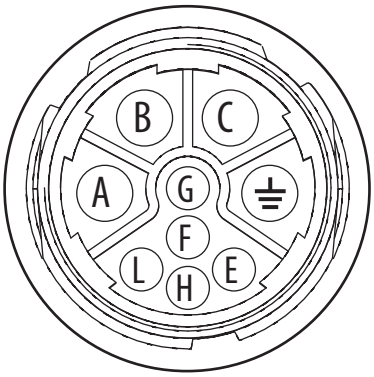
Motors are designed to metric dimensions. Inch dimensions are approximate conversions from millimeters. Dimensions without tolerances are for reference.

## Connector Data

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

### M23 Motor Connector Pinouts

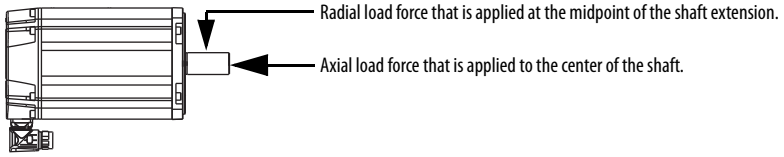
| Pin | High-resolution Encoder |
|---|---|
| A | Phase U |
| B | Phase V |
| C | Phase W |
| ⏚ | Ground |
| E | DATA+ |
| F | MBRK+ |
| G | MBRK- |
| H | DATA- |
| L | Reserved |



## Load Force Ratings

Motors can operate 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 $L_{10}$ 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.

## Kinetix Food Grade Motors (063 mm and 075 mm frame size)

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

| Motor Cat. No. (1) | Speed, max rpm | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 500 kgf | 1000 kgf | 1500 kgf | 2000 kgf | 2500 kgf | 3000 kgf | 3500 kgf | 4000 kgf | 4500 kgf | 5000 kgf | 6000 kgf | 6500 kgf | 7000 kgf | 7500 kgf | 8000 kgf |
| VPF-A0632F | 4800 | – | 28.9 | 25.2 | – | – | 21.0 * | – | – | – | 17.1 * | – | – | – | – | – |
| VPF-A0633C | 3000 | 38.1 | 30.3 | 27.4 * | – | – | 21.0 | – | – | – | – | – | – | – | – | – |
| VPF-A0633F | 4500 | 38.1 | – | 26.4 | – | – | 21.0 | – | – | 18.3 | – | – | – | – | – | – |
| VPF-A0752C | 3300 | 36.1 | 28.6 | 25.9 * | – | – | – | 19.2 * | – | – | – | – | – | – | – | – |
| VPF-A0752E | 4800 | 36.1 | 28.6 | – | – | 21.8 * | – | – | – | – | 17.0 * | – | – | – | – | – |
| VPF-A0753C | 3300 | 37.8 | 30.0 | 27.5 * | – | – | – | 20.2 * | – | – | – | – | – | – | – | – |
| VPF-A0753E | 4600 | 37.8 | 30.0 | – | – | 23.3 * | – | – | – | – | 18.0 * | – | – | – | – | – |
| VPF-B0632F | 4800 | – | 28.9 | 25.2 | – | – | 21.0 * | – | – | – | 17.1 * | – | – | – | – | – |
| VPF-B0632T | 8000 | – | – | – | 22.9 | – | – | – | 18.2 | – | – | – | 15.6 * | – | – | 14.4 |
| VPF-B0633M | 6900 | – | 30.3 | – | 24.0 | – | – | – | 19.2 * | – | – | – | – | 15.9 * | – | – |
| VPF-B0633T | 8000 | – | – | 26.4 | – | – | 21.0 | – | – | – | – | 16.8 * | – | – | – | 15.1 |
| VPF-B0752E | 4800 | 36.1 | 28.6 | – | – | 22.0 * | – | – | – | – | 17.0 * | – | – | – | – | – |
| VPF-B0752F | 7000 | – | 28.6 | – | 22.7 | – | – | 19.3 * | – | – | – | – | – | 15.0 | – | – |
| VPF-B0752M | 8000 | – | – | 25.0 | – | – | 20.8 | – | – | – | 16.8 * | – | – | – | – | 14.3 |
| VPF-B0753E | 4500 | 37.8 | 30.0 | – | 23.8 | – | – | – | – | 18.2 | – | – | – | – | – | – |
| VPF-B0753F | 6500 | – | 30.0 | – | 23.8 | – | | 20.6 * | – | – | – | – | 16.1 | – | – | – |
| VPF-B0753M | 8000 | – | – | 26.2 | – | – | 19.8 | – | – | – | 18.0 * | – | – | – | – | 15.0 |

(1) 1.0 kgf = 2.2 lbf or 9.8 N. An asterisk (*) indicates a load rating that is 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

| Motor Cat. No. (1) | Speed, max rpm | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 500 kgf | 1000 kgf | 1500 kgf | 2000 kgf | 2500 kgf | 3000 kgf | 3500 kgf | 4000 kgf | 4500 kgf | 5000 kgf | 6000 kgf | 6500 kgf | 7000 kgf | 7500 kgf | 8000 kgf |
| VPF-A0632F | 4800 | – | 23.5 | 19.7 | – | – | 15.5 * | – | – | – | 11.9 * | – | – | – | – | – |
| VPF-A0633C | 3000 | 32.7 | 24.2 | 21.3 * | – | – | 15.0 | – | – | – | – | – | – | – | – | – |
| VPF-A0633F | 4500 | 32.7 | – | 20.3 | – | – | 15.0 | – | – | 12.6 | – | – | – | – | – | – |
| VPF-A0752C | 3300 | 31.5 | 23.3 | 20.5 * | – | – | – | 13.9 * | – | – | – | – | – | – | – | – |
| VPF-A0752E | 4800 | 31.5 | 23.3 | – | – | 16.4 * | – | – | – | – | 11.8 * | – | – | – | – | – |
| VPF-A0753C | 3300 | 32.5 | 24.1 | 21.5 * | – | – | – | 14.3 * | – | – | – | – | – | – | – | – |
| VPF-A0753E | 4600 | 32.5 | 24.1 | – | – | 17.3 * | – | – | – | – | 12.4 * | – | – | – | – | – |
| VPF-B0632F | 4800 | – | 23.5 | 19.7 | – | – | 15.5 * | – | – | – | 11.9 * | – | – | – | – | – |
| VPF-B0632T | 8000 | – | – | – | 17.4 | – | – | – | 12.9 | – | – | – | 10.6 | – | – | 9.5 |
| VPF-B0633M | 6900 | – | 24.2 | – | 17.9 | – | – | – | 13.4 * | – | – | – | – | 10.5 * | – | – |
| VPF-B0633T | 8000 | – | – | 20.3 | – | – | 15.0 | – | – | – | – | 11.3 * | – | – | – | 9.8 |
| VPF-B0752E | 4800 | 31.5 | 23.3 | – | – | 16.6 * | – | – | – | – | 11.8 * | – | – | – | – | – |
| VPF-B0752F | 7000 | – | 23.3 | – | 17.3 | – | – | 14.0 * | – | – | – | – | – | 10.0 | – | – |
| VPF-B0752M | 8000 | – | – | 19.6 | – | – | 14.5 | – | – | – | 11.7 * | – | – | – | – | 9.5 |
| VPF-B0753E | 4500 | 32.5 | 24.1 | – | 17.8 | – | – | – | – | 12.5 | – | – | – | – | – | – |
| VPF-B0753F | 6500 | – | 24.1 | – | 17.8 | – | – | 14.7 * | – | – | – | – | 10.7 | – | – | – |
| VPF-B0753M | 8000 | – | – | 20.2 | – | – | 14.9 | – | – | – | 12.4 * | – | – | – | – | 9.8 |

(1) 1.0 kgf = 2.2 lbf or 9.8 N. An asterisk (*) indicates a load rating that is 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

| Motor Cat. No. (1) | Speed, max rpm | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 500 kgf | 1000 kgf | 1500 kgf | 2000 kgf | 2500 kgf | 3000 kgf | 3500 kgf | 4000 kgf | 4500 kgf | 5000 kgf | 6000 kgf | 6500 kgf | 7000 kgf | 7500 kgf | 8000 kgf |
| VPF-A0632F | 4800 | – | 27.5 | 23.0 | – | – | 18.1 * | – | – | – | 13.9 * | – | – | – | – | – |
| VPF-A0633C | 3000 | 37.1 | 27.5 | 24.1 * | – | – | 17.1 | – | – | – | – | – | – | – | – | – |
| VPF-A0633F | 4500 | 37.1 | – | 23.0 | – | – | 17.1 | – | – | 14.3 | – | – | – | – | – | – |
| VPF-A0752C | 3300 | 37.1 | 27.5 | 24.1 * | – | – | – | 16.4 * | – | – | – | – | – | – | – | – |
| VPF-A0752E | 4800 | 37.1 | 27.5 | – | – | 19.3 * | – | – | – | – | 13.9 * | – | – | – | – | – |
| VPF-A0753C | 3300 | 37.1 | 27.5 | 24.5 * | – | – | – | 16.4 * | – | – | – | – | – | – | – | – |
| VPF-A0753E | 4600 | 37.1 | 27.5 | – | – | 19.7 * | – | – | – | – | 14.2 * | – | – | – | – | – |
| VPF-B0632F | 4800 | – | 27.5 | 23.0 | – | – | 18.1 * | – | – | – | 13.9 * | – | – | – | – | – |
| VPF-B0632T | 8000 | – | – | – | 20.3 | – | – | – | 15.1 | – | – | – | 12.4 * | – | – | 11.1 |
| VPF-B0633M | 6900 | – | 27.5 | – | 20.3 | – | – | – | 15.2 * | – | – | – | – | 11.9 * | – | – |
| VPF-B0633T | 8000 | – | – | 23.0 | – | – | 17.1 | – | – | – | – | 12.8 * | – | – | – | 11.1 |
| VPF-B0752E | 4800 | 37.1 | 27.5 | – | – | 19.5 * | – | – | – | – | 13.9 * | – | – | – | – | – |
| VPF-B0752F | 7000 | – | 27.5 | – | 20.3 | – | – | 16.5 * | – | – | – | – | – | 11.8 | – | – |
| VPF-B0752M | 8000 | – | – | 23.0 | – | – | 17.1 | – | – | – | 13.8 * | – | – | – | – | 11.1 |
| VPF-B0753E | 4500 | 37.1 | 27.5 | – | 20.3 | – | – | – | – | 14.3 | – | – | – | – | – | – |
| VPF-B0753F | 6500 | – | 27.5 | – | 20.3 | – | – | 16.8 * | – | – | – | – | 12.2 | – | – | – |
| VPF-B0753M | 8000 | – | – | 23.0 | – | – | 17.1 | – | – | – | 14.2 * | – | – | – | – | 11.1 |

(1) 1.0 kgf = 2.2 lbf or 9.8 N. An asterisk (*) indicates a load rating that is measured at an rpm value that is less than the value listed for that column.

## Radial Load Force Ratings (maximum) for Brake Motors

| Motor Cat. No. (1) | Speed, max rpm | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 500 kgf | 1000 kgf | 1500 kgf | 2000 kgf | 2500 kgf | 3000 kgf | 3500 kgf | 4000 kgf | 4500 kgf | 5000 kgf | 6000 kgf | 6500 kgf | 7000 kgf | 7500 kgf | 8000 kgf |
| VPF-A0632F | 4800 | – | 30.5 | 26.6 | – | – | 22.2 * | – | – | – | 18.1 * | – | – | – | – | – |
| VPF-A0633C | 3000 | 39.5 | 31.4 | 28.4 * | – | – | 21.8 | – | – | – | – | – | – | – | – | – |
| VPF-A0633F | 4500 | 39.5 | – | 27.4 | – | – | 21.8 | – | – | 19.0 | – | – | – | – | – | – |
| VPF-A0752C | 3300 | 38.1 | 30.3 | 27.4 | – | – | – | 20.3 * | – | – | – | – | – | – | – | – |
| VPF-A0752E | 4800 | 38.1 | 30.3 | – | – | 23.1 * | – | – | – | – | 17.9 * | – | – | – | – | – |
| VPF-A0753C | 3300 | 39.2 | 31.2 | 28.5 * | – | – | – | 20.9 * | – | – | – | – | – | – | – | – |
| VPF-A0753E | 4600 | 39.2 | 31.2 | – | – | 24.1 * | – | – | – | – | 18.7 * | – | – | – | – | – |
| VPF-B0632F | 4800 | – | 30.5 | 26.6 | – | – | 22.2 * | – | – | – | 18.1 * | – | – | – | – | – |
| VPF-B0632T | 8000 | – | – | – | 24.2 | – | – | – | 19.2 | – | – | – | 16.5 * | – | – | 15.3 |
| VPF-B0633M | 6900 | – | 31.4 | – | 24.9 | – | – | – | 19.9 * | – | – | – | – | 16.5 * | – | – |
| VPF-B0633T | 8000 | – | – | 27.4 | – | – | 21.8 | – | – | – | – | 17.5 * | – | – | – | 15.7 |
| VPF-B0752E | 4800 | 38.1 | 30.3 | – | – | 23.3 * | – | – | – | – | 17.9 * | – | – | – | – | – |
| VPF-B0752F | 7000 | – | 30.3 | – | 24.0 | – | – | 20.4 * | – | – | – | – | – | 15.8 | – | – |
| VPF-B0752M | 8000 | – | – | 26.4 | – | – | 21.0 | – | – | – | 17.8 * | – | – | – | – | 15.1 |
| VPF-B0753E | 4500 | 39.2 | 31.2 | – | 24.7 | – | – | – | – | 18.9 | – | – | – | – | – | – |
| VPF-B0753F | 6500 | – | 31.2 | – | 24.7 | – | – | 21.4 * | – | – | – | – | 16.7 | – | – | – |
| VPF-B0753M | 8000 | – | – | 27.2 | – | – | 21.6 | – | – | – | 18.7 * | – | – | – | – | 15.6 |

(1) 1.0 kgf = 2.2 lbf or 9.8 N. An asterisk (*) indicates a load rating that is 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

| Motor Cat. No. (1) | Speed, max rpm | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 500 kgf | 1000 kgf | 1500 kgf | 2000 kgf | 2500 kgf | 3000 kgf | 3500 kgf | 4000 kgf | 4500 kgf | 5000 kgf | 6000 kgf | 6500 kgf | 7000 kgf | 7500 kgf | 8000 kgf |
| VPF-A0632F | 4800 | – | 24.3 | 20.4 | – | – | 16.1 * | – | – | – | 12.3 * | – | – | – | – | – |
| VPF-A0633C | 3000 | 33.5 | 24.8 | 21.8 * | – | – | 15.4 | – | – | – | – | – | – | – | – | – |
| VPF-A0633F | 4500 | 33.5 | – | 20.8 | – | – | 15.4 | – | – | 12.9 | – | – | – | – | – | – |
| VPF-A0752C | 3300 | 32.7 | 24.2 | 21.3 * | – | | – | 14.4 * | – | – | – | – | – | – | – | – |
| VPF-A0752E | 4800 | 32.7 | 24.2 | – | – | 17.0 * | – | – | – | – | 12.3 * | – | – | – | – | – |
| VPF-A0753C | 3300 | 33.4 | 24.7 | 22.0 * | – | | – | 14.7 * | – | – | – | – | – | – | – | – |
| VPF-A0753E | 4600 | 33.4 | 24.7 | – | – | 17.7 * | – | – | – | – | 12.7 * | – | – | – | – | – |
| VPF-B0632F | 4800 | – | 24.3 | 20.4 | – | – | 16.1 * | – | – | – | 12.3 * | – | – | – | – | – |
| VPF-B0632T | 8000 | – | – | – | 18.0 | – | – | – | 13.3 | – | – | – | 11.0 * | – | – | 9.9 |
| VPF-B0633M | 6900 | – | 24.8 | – | 18.4 | – | – | – | 13.7 * | – | – | – | – | 10.7 * | – | – |
| VPF-B0633T | 8000 | – | – | 20.8 | – | – | 15.4 | – | – | – | – | 11.6 * | – | – | – | 10.1 |
| VPF-B0752E | 4800 | 32.7 | 24.2 | – | – | 17.2 * | – | – | – | – | 12.3 * | – | – | – | – | – |
| VPF-B0752F | 7000 | – | 24.2 | – | 17.9 | – | – | 14.5 * | – | – | – | – | – | 10.4 | – | – |
| VPF-B0752M | 8000 | – | – | 20.3 | – | – | 15.0 | – | – | – | 12.1 * | – | – | – | – | 9.8 |
| VPF-B0753E | 4500 | 33.4 | 24.7 | – | 18.3 | – | – | – | – | 12.9 | – | – | – | – | – | – |
| VPF-B0753F | 6500 | – | 24.7 | – | 18.3 | – | – | 15.1 * | – | – | – | – | 11.0 | – | – | – |
| VPF-B0753M | 8000 | – | – | 20.7 | – | – | 15.3 | – | – | – | 12.7 * | – | – | – | – | 10.0 |

(1) 1.0 kgf = 2.2 lbf or 9.8 N. An asterisk (*) indicates a load rating that is 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

| Motor Cat. No. (1) | Speed, max rpm | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 500 kgf | 1000 kgf | 1500 kgf | 2000 kgf | 2500 kgf | 3000 kgf | 3500 kgf | 4000 kgf | 4500 kgf | 5000 kgf | 6000 kgf | 6500 kgf | 7000 kgf | 7500 kgf | 8000 kgf |
| VPF-A0632F | 4800 | – | 27.5 | 23.0 | – | – | 18.1 * | – | – | – | 13.9 * | – | – | – | – | – |
| VPF-A0633C | 3000 | 37.1 | 27.5 | 24.1 * | – | – | 17.1 | – | – | – | – | – | – | – | – | – |
| VPF-A0633F | 4500 | 37.1 | – | 23.0 | – | – | 17.1 | – | – | 14.3 | – | – | – | – | – | – |
| VPF-A0752C | 3300 | 37.1 | 27.5 | 24.1 * | – | – | – | 16.4 * | – | – | – | – | – | – | – | – |
| VPF-A0752E | 4800 | 37.1 | 27.5 | – | – | 19.3 * | – | – | – | – | 13.9 * | – | – | – | – | – |
| VPF-A0753C | 3300 | 37.1 | 27.5 | 24.5 * | – | – | – | 16.4 * | – | – | – | – | – | – | – | – |
| VPF-A0753E | 4600 | 37.1 | 27.5 | – | – | 19.7 * | – | – | – | – | 14.2 * | – | – | – | – | – |
| VPF-B0632F | 4800 | – | 27.5 | 23.0 | – | – | 18.1 * | – | – | – | 13.9 * | – | – | – | – | – |
| VPF-B0632T | 8000 | – | – | – | 20.3 | – | – | – | 15.1 | – | – | – | 12.4 * | – | – | 11.1 |
| VPF-B0633M | 6900 | – | 27.5 | – | 20.3 | – | – | – | 15.2 * | – | – | – | – | 11.9 * | – | – |
| VPF-B0633T | 8000 | – | – | 23.0 | – | – | 17.1 | – | – | – | – | 12.8 * | – | – | – | 11.1 |
| VPF-B0752E | 4800 | 37.1 | 27.5 | – | – | 19.5 * | – | – | – | – | 13.9 * | – | – | – | – | – |
| VPF-B0752F | 7000 | – | 27.5 | – | 20.3 | – | – | 16.5 * | – | – | – | – | – | 11.8 | – | – |
| VPF-B0752M | 8000 | – | – | 23.0 | – | – | 17.1 | – | – | – | 13.8 * | – | – | – | – | 11.1 |
| VPF-B0753E | 4500 | 37.1 | 27.5 | – | 20.3 | – | – | – | – | 14.3 | – | – | – | – | – | – |
| VPF-B0753F | 6500 | – | 27.5 | – | 20.3 | – | – | 16.8 * | – | – | – | – | 12.2 | – | – | – |
| VPF-B0753M | 8000 | – | – | 23.0 | – | – | 17.1 | – | – | – | 14.2 * | – | – | – | – | 11.1 |

(1) 1.0 kgf = 2.2 lbf or 9.8 N. An asterisk (*) indicates a load rating that is measured at an rpm value that is less than the value listed for that column.

## Kinetix VP Food Grade Motors (100…165 mm frame sizes)

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

| Motor Cat. No. (1) | Speed, max rpm | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 500 kgf | 750 kgf | 1000 kgf | 1500 kgf | 2000 kgf | 2500 kgf | 3000 kgf | 3500 kgf | 4000 kgf | 4500 kgf | 5000 kgf | 5500 kgf | 6000 kgf | 6500 kgf | 7000 kgf |
| VPF-A1001C | 2800 | 79.1 | – | 62.8 | – | 49.8 | – | 44.6 * | – | – | – | – | – | – | – | – |
| VPF-A1001M | 6500 | – | – | – | 54.9 | – | 46.3 | – | – | – | 38.0 | – | – | – | 33.6 | – |
| VPF-A1002C | 3000 | 87.9 | – | 69.7 | – | 55.4 | – | 48.4 | – | – | – | – | – | – | – | – |
| VPF-A1002F | 5000 | – | – | 69.7 | 60.9 | – | – | 48.4 | – | – | – | 40.8 | – | – | – | – |
| VPF-A1003C | 2250 | 93.6 | – | 74.3 | 64.9 | – | 56.7 * | – | – | – | – | – | – | – | – | – |
| VPF-A1003E | 3750 | 93.6 | – | 74.3 | – | 59.0 | – | – | – | 47.8 * | – | – | – | – | – | – |
| VPF-A1003F | 5500 | – | – | – | 64.9 | – | 54.8 | – | – | 46.8 | – | – | 42.1 | – | – | – |
| VPF-A1153C | 2300 | 106.4 | – | 84.5 | 73.8 | – | 64.0 * | – | – | – | – | – | – | – | – | – |
| VPF-A1303B | 1950 | 132.9 | – | 105.5 | 92.2 | 84.4 * | – | – | – | – | – | – | – | – | – | – |
| VPF-A1303F | 4000 | – | – | 105.5 | – | 83.7 | – | 73.1 | – | 66.5 | | – | – | – | – | – |
| VPF-A1304A | 1600 | 140.2 | 122.5 | 112.2 * | – | 95.2 * | – | – | – | – | – | – | – | – | – | – |
| VPF-A1304D | 3000 | 140.2 | – | 111.3 | – | 88.3 | – | 77.2 | – | – | – | – | – | – | – | – |
| VPF-B1001M | 6000 | – | – | – | – | 49.8 | – | 43.5 | – | 39.6 | – | – | – | 34.6 | – | – |
| VPF-B1002E | 3300 | 87.9 | – | 69.7 | – | 55.4 | – | – | 46.8 * | – | – | – | – | – | – | – |
| VPF-B1002M | 6000 | – | – | – | 60.9 | – | – | 48.4 | – | – | 42.2 | – | – | 38.4 | – | – |
| VPF-B1003C | 2500 | 93.6 | – | 74.3 | 64.9 | – | 54.8 | – | – | – | – | – | – | – | – | – |
| VPF-B1003F | 4750 | – | – | 74.3 | 64.9 | – | – | 51.5 | – | – | – | 44.2 * | – | – | – | – |
| VPF-B1003T | 7000 | – | – | – | 64.9 | – | 54.8 | – | – | – | 45.0 | – | – | – | – | 38.9 |
| VPF-B1153E | 3200 | 106.4 | – | 84.5 | – | 67.0 | – | – | 57.3 * | – | – | – | – | – | – | – |
| VPF-B1153F | 5000 | – | – | 84.5 | – | 67.0 | – | 58.6 | – | – | – | 49.4 | – | – | – | – |
| VPF-B1303C | 2250 | 132.9 | – | 105.5 | 92.2 | – | 80.5 * | – | – | – | – | – | – | – | – | – |
| VPF-B1303F | 4000 | – | – | 105.5 | – | 83.7 | – | 74.0 * | – | 66.5 | – | – | – | – | – | – |
| VPF-B1304C | 2150 | 140.2 | – | 111.3 | 99.5 * | – | 86.2 * | – | – | – | – | – | – | – | – | – |
| VPF-B1304E | 3500 | – | – | 111.3 | 97.2 | – | 84.3 * | – | 73.3 | – | – | – | – | – | – | – |
| VPF-B1652C | 2700 | 180.7 | – | 143.4 | 125.3 | – | – | 103.0 * | – | – | – | – | – | – | – | – |

(1) 1.0 kgf = 2.2 lbf or 9.8 N. An asterisk (*) indicates a load rating that is 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

| Motor Cat. No. (1) | Speed, max rpm | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 500 kgf | 750 kgf | 1000 kgf | 1500 kgf | 2000 kgf | 2500 kgf | 3000 kgf | 3500 kgf | 4000 kgf | 4500 kgf | 5000 kgf | 5500 kgf | 6000 kgf | 6500 kgf | 7000 kgf |
| VPF-A1001C | 2800 | 25.0 | – | 19.0 | – | 10.0 | – | 10.0 * | – | – | – | – | – | – | – | – |
| VPF-A1001M | 6500 | – | – | – | 15.0 | – | 12.0 | – | – | – | 9.0 | – | – | – | 8.0 | – |
| VPF-A1002C | 3000 | 30.0 | – | 22.0 | – | 16.0 | – | 13.0 | – | – | – | – | – | – | – | – |
| VPF-A1002F | 5000 | – | – | 22.0 | 18.0 | – | – | 13.0 | – | – | – | 11.0 | – | – | – | – |
| VPF-A1003C | 2250 | 33.0 | – | 24.0 | 20.0 | – | 17.0 * | – | – | – | – | – | – | – | – | – |
| VPF-A1003E | 3750 | 33.0 | – | 24.0 | – | 18.0 | – | – | – | 13.0 * | – | – | – | – | – | – |
| VPF-A1003F | 5500 | – | – | – | 20.0 | – | 16.0 | – | – | 13.0 | – | – | 11.0 | – | – | – |
| VPF-A1153C | 2300 | 48.0 | – | 35.0 | 29.0 | – | 24.0 * | – | – | – | – | – | – | – | – | – |
| VPF-A1303B | 1950 | 39.0 | – | 29.0 | 24.0 | 22.0 * | – | – | – | – | – | – | – | – | – | – |
| VPF-A1303F | 4000 | – | – | 29.0 | – | 21.0 | – | 18.0 | – | 16.0 | – | – | – | – | – | – |
| VPF-A1304A | 1600 | 43.0 | 36.0 | 32.0 * | – | 26.0 * | – | – | – | – | – | – | – | – | – | – |
| VPF-A1304D | 3000 | 43.0 | – | 32.0 | – | 23.0 | – | 20.0 | – | – | – | – | – | – | – | – |
| VPF-B1001M | 6000 | – | – | – | – | 14.0 | – | 11.0 | – | 10.0 | – | – | – | 8.0 | – | – |
| VPF-B1002E | 3300 | 30.0 | – | 22.0 | – | 16.0 | – | – | 13.0 * | – | – | – | – | – | – | – |
| VPF-B1002M | 6000 | – | – | – | 18.0 | – | – | 13.0 | – | – | 11.0 | – | – | 10.0 | – | – |
| VPF-B1003C | 2500 | 33.0 | – | 24.0 | 20.0 | – | 16.0 | – | – | – | – | – | – | – | – | – |
| VPF-B1003F | 4750 | – | – | 24.0 | 20.0 | – | – | 15.0 | – | – | – | 12.0 * | – | – | – | – |
| VPF-B1003T | 7000 | – | – | – | 20.0 | – | 16.0 | – | – | – | 12.0 | – | – | – | – | 10.0 |
| VPF-B1153E | 3200 | 48.0 | – | 35.0 | – | 26.0 | – | – | 21.0 * | – | – | – | – | – | – | – |
| VPF-B1153F | 5000 | – | – | 35.0 | – | 26.0 | – | 22.0 | – | – | – | 17.0 | – | – | – | – |
| VPF-B1303C | 2250 | 39.0 | – | 29.0 | – | 24.0 | 20.0 * | – | – | – | – | – | – | – | – | – |
| VPF-B1303F | 4000 | – | – | 29.0 | – | 21.0 | – | 18.0 * | – | 16.0 | – | – | – | – | – | – |
| VPF-B1304C | 2150 | 43.0 | – | 32.0 | 27.0 * | – | 23.0 * | – | – | – | – | – | – | – | – | – |
| VPF-B1304E | 3500 | – | – | 32.0 | 27.0 | – | 22.0 * | – | 18.0 | – | – | – | – | – | – | – |
| VPF-B1652C | 2700 | 58.0 | – | 43.0 | 36.0 | – | – | 27.0 * | – | – | – | – | – | – | – | – |

(1) 1.0 kgf = 2.2 lbf or 9.8 N. An asterisk (*) indicates a load rating that is 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

| Motor Cat. No. (1) | Speed, max rpm | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 500 kgf | 750 kgf | 1000 kgf | 1500 kgf | 2000 kgf | 2500 kgf | 3000 kgf | 3500 kgf | 4000 kgf | 4500 kgf | 5000 kgf | 5500 kgf | 6000 kgf | 6500 kgf | 7000 kgf |
| VPF-A1001C | 2800 | 49.4 | – | 36.5 | – | 27.0 | – | 23.4 * | – | – | – | – | – | – | – | – |
| VPF-A1001M | 6500 | – | – | – | 30.6 | – | 24.5 | – | – | – | 19.0 | – | – | – | 16.2 | – |
| VPF-A1002C | 3000 | 49.4 | – | 36.5 | – | 27.0 | – | 22.7 | – | – | – | – | – | – | – | – |
| VPF-A1002F | 5000 | – | – | 36.5 | 30.6 | – | – | 22.7 | – | – | – | 18.2 | – | – | – | – |
| VPF-A1003C | 2250 | 49.4 | – | 36.5 | 30.6 | – | 25.7 * | – | – | – | – | – | – | – | – | – |
| VPF-A1003E | 3750 | 49.4 | – | 36.5 | – | 27.0 | – | – | – | 20.6 * | – | – | – | – | – | – |
| VPF-A1003F | 5500 | – | – | – | 30.6 | – | 24.5 | – | – | 20.0 | – | – | 17.4 | – | – | – |
| VPF-A1153C | 2300 | 68.3 | – | 50.5 | 42.4 | | 35.2 * | – | – | – | – | – | – | – | – | – |
| VPF-A1303B | 1950 | 68.3 | – | 50.5 | 42.4 | 37.8 * | – | – | – | – | – | – | – | – | – | – |
| VPF-A1303F | 4000 | – | – | 50.5 | – | 37.4 | – | 31.4 | – | 27.7 | – | – | – | – | – | – |
| VPF-A1304A | 1600 | 68.3 | 57.2 | 51.1 * | – | 41.2 * | – | – | – | – | – | – | – | – | – | – |
| VPF-A1304D | 3000 | 68.3 | – | 50.5 | – | 37.4 | – | 31.4 | – | – | – | – | – | – | – | – |
| VPF-B1001M | 6000 | – | – | – | – | 27.0 | – | 22.7 | – | 20.0 | – | – | – | 16.8 | – | – |
| VPF-B1002E | 3300 | 49.4 | – | 36.5 | – | 27.0 | – | – | 21.8 * | – | – | – | – | | – | – |
| VPF-B1002M | 6000 | – | – | – | 30.6 | – | – | 22.7 | – | – | 19.0 | – | – | 16.8 | – | – |
| VPF-B1003C | 2500 | 49.4 | – | 36.5 | 30.6 | – | 24.5 | – | – | – | – | – | – | – | – | – |
| VPF-B1003F | 4750 | – | – | 36.5 | 30.6 | – | – | 22.7 | – | – | – | 18.6 * | – | – | – | – |
| VPF-B1003T | 7000 | – | – | – | 30.6 | – | 24.5 | – | – | – | 19.0 | – | – | – | – | 15.7 |
| VPF-B1153E | 3200 | 68.3 | – | 50.5 | – | 37.4 | – | – | 30.5 * | – | – | – | – | – | – | – |
| VPF-B1153F | 5000 | – | – | 50.5 | – | 37.4 | – | 31.4 | – | – | – | 25.1 | – | – | – | – |
| VPF-B1303C | 2250 | 68.3 | – | 50.5 | 42.3 | – | 35.5 * | – | – | – | – | – | – | – | – | – |
| VPF-B1303F | 4000 | – | – | 50.5 | – | 37.4 | – | 31.8 * | – | 27.7 | – | – | – | – | – | – |
| VPF-B1304C | 2150 | 68.3 | – | 50.5 | 43.6 * | – | 36.2 * | – | – | – | – | – | – | – | – | – |
| VPF-B1304E | 3500 | – | – | 50.5 | 42.4 | – | 35.2 * | – | 29.3 | – | – | – | – | – | – | – |
| VPF-B1652C | 2700 | 90.1 | – | 66.7 | 55.9 | – | – | 43.3 * | – | – | – | – | – | – | – | – |

(1) 1.0 kgf = 2.2 lbf or 9.8 N. An asterisk (*) indicates a load rating that is measured at an rpm value that is less than the value listed for that column.

## Radial Load Force Ratings (maximum) for Brake Motors

| Motor Cat. No. (1) | Speed, max rpm | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 500 kgf | 750 kgf | 1000 kgf | 1500 kgf | 2000 kgf | 2500 kgf | 3000 kgf | 3500 kgf | 4000 kgf | 4500 kgf | 5000 kgf | 5500 kgf | 6000 kgf | 6500 kgf | 7000 kgf |
| VPF-A1001C | 2800 | 90.2 | – | 71.6 | – | 56.8 | – | 50.8 * | – | – | – | – | – | – | – | – |
| VPF-A1001M | 6500 | – | – | – | 62.5 | – | 52.7 | – | – | – | 43.4 | – | – | – | 38.4 | – |
| VPF-A1002C | 3000 | 95.3 | – | 75.6 | – | 60.0 | – | 52.4 | – | – | – | – | – | – | – | – |
| VPF-A1002F | 5000 | – | – | 75.6 | 66.1 | – | – | 52.4 | – | – | – | 44.2 | – | – | – | – |
| VPF-A1003C | 2250 | 99.0 | – | 78.5 | 68.6 | – | 59.9 * | – | – | – | – | – | – | – | – | – |
| VPF-A1003E | 3750 | 99.0 | – | 78.5 | – | 62.3 | – | – | – | 50.6 * | – | – | – | – | – | – |
| VPF-A1003F | 5500 | – | – | – | 68.6 | – | 57.9 | – | – | 49.5 | – | – | 44.5 | – | – | – |
| VPF-A1153C | 2300 | 115.4 | – | 91.6 | 80.0 | – | 69.4 * | – | – | – | – | – | – | – | – | – |
| VPF-A1303B | 1950 | 145.3 | – | 115.3 | 100.7 | 92.3 * | – | – | – | – | – | – | – | – | – | – |
| VPF-A1303F | 4000 | – | – | 115.3 | – | 91.5 | – | 80.0 | – | 72.7 | – | – | – | – | – | – |
| VPF-A1304A | 1600 | 149.7 | 130.8 | 119.8 * | – | 101.6 * | – | – | – | – | – | – | – | – | – | – |
| VPF-A1304D | 3000 | 149.5 | – | 118.6 | – | 94.2 | – | 82.3 | – | – | – | – | – | – | – | – |
| VPF-B1001M | 6000 | – | – | – | – | 56.8 | – | 49.6 | – | 45.1 | – | – | – | 39.4 | – | – |
| VPF-B1002E | 3300 | 95.3 | – | 75.6 | – | 60.0 | – | – | 50.8 * | – | – | – | – | – | – | – |
| VPF-B1002M | 6000 | – | – | – | 66.1 | – | – | 52.4 | – | – | 45.8 | – | – | 41.6 | – | – |
| VPF-B1003C | 2500 | 99.0 | – | 78.5 | 68.6 | – | 57.9 | – | – | – | – | – | – | – | – | – |
| VPF-B1003F | 4750 | – | – | 78.5 | 68.6 | – | | 54.5 | – | – | – | 46.7 * | – | – | – | – |
| VPF-B1003T | 7000 | – | – | – | 68.6 | – | 57.9 | – | – | – | 47.6 | – | – | – | – | 41.1 |
| VPF-B1153E | 3200 | 115.4 | – | 91.6 | – | 72.7 | – | – | 62.2 * | – | – | – | – | – | – | – |
| VPF-B1153F | 5000 | – | – | 91.6 | – | 72.7 | – | 63.5 | – | – | – | 53.6 | – | – | – | – |
| VPF-B1303C | 2250 | 145.3 | – | 115.3 | 100.7 | – | 88.0 * | – | – | – | – | – | – | – | – | – |
| VPF-B1303F | 4000 | – | – | 115.3 | – | 91.5 | – | 80.9 * | – | 72.7 | – | – | – | – | – | – |
| VPF-B1304C | 2150 | 149.7 | – | 118.8 | 106.2 * | – | 92.0 * | – | – | – | – | – | – | – | – | – |
| VPF-B1304E | 3500 | – | – | 118.8 | 103.8 | – | 90.0 * | – | 78.2 | – | – | – | – | – | – | – |
| VPF-B1652C | 2700 | 192.5 | – | 152.8 | 133.5 | – | – | 109.7 * | – | – | – | – | – | – | – | – |

(1) 1.0 kgf = 2.2 lbf or 9.8 N. An asterisk (*) indicates a load rating that is 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

| Motor Cat. No. (1) | Speed, max rpm | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 500 kgf | 750 kgf | 1000 kgf | 1500 kgf | 2000 kgf | 2500 kgf | 3000 kgf | 3500 kgf | 4000 kgf | 4500 kgf | 5000 kgf | 5500 kgf | 6000 kgf | 6500 kgf | 7000 kgf |
| VPF-A1001C | 2800 | 31.0 | – | 23.0 | – | 17.0 | – | 14.0 * | – | – | – | – | – | – | – | – |
| VPF-A1001M | 6500 | – | – | – | 19.0 | – | 15.0 | – | – | – | 12.0 | – | – | – | 10.0 | – |
| VPF-A1002C | 3000 | 34.0 | – | 25.0 | – | 18.0 | – | 15.0 | – | – | – | – | – | – | – | – |
| VPF-A1002F | 5000 | – | – | 25.0 | 21.0 | – | – | 15.0 | – | – | – | 12.0 | – | – | – | – |
| VPF-A1003C | 2250 | 36.0 | – | 26.0 | 22.0 | – | 18.0 * | – | – | – | – | – | – | – | – | – |
| VPF-A1003E | 3750 | 36.0 | – | 26.0 | – | 19.0 | – | – | – | 15.0 * | – | – | – | – | – | – |
| VPF-A1003F | 5500 | – | – | – | 22.0 | – | 18.0 | – | – | 14.0 | – | – | 12.0 | – | – | – |
| VPF-A1153C | 2300 | 53.0 | – | 39.0 | 32.0 | – | 27.0 * | – | – | – | – | – | – | – | – | – |
| VPF-A1303B | 1950 | 46.0 | – | 34.0 | 28.0 | 25.0 * | – | – | – | – | – | – | – | – | – | – |
| VPF-A1303F | 4000 | – | – | 34.0 | – | 25.0 | – | 21.0 | – | 18.0 | – | – | – | – | – | – |
| VPF-A1304A | 1600 | 48.0 | 40.0 | 36.0 * | – | 29.0 * | – | – | – | – | – | – | – | – | – | – |
| VPF-A1304D | 3000 | 48.0 | – | 36.0 | – | 26.0 | – | 22.0 | – | – | – | – | – | – | – | – |
| VPF-B1001M | 6000 | – | – | – | – | 17.0 | – | 14.0 | – | 12.0 | – | – | – | 10.0 | – | – |
| VPF-B1002E | 3300 | 34.0 | – | 25.0 | – | 18.0 | – | – | 15.0 * | – | – | – | – | – | – | – |
| VPF-B1002M | 6000 | – | – | – | 21.0 | – | – | 15.0 | – | – | 13.0 | – | – | 11.0 | – | – |
| VPF-B1003C | 2500 | 36.0 | – | 26.0 | 22.0 | – | 18.0 | – | – | – | – | – | – | – | – | – |
| VPF-B1003F | 4750 | – | – | 26.0 | 22.0 | – | – | 16.0 | – | – | – | 13.0 * | – | – | – | – |
| VPF-B1003T | 7000 | – | – | – | 22.0 | – | 18.0 | – | – | – | 13.0 | – | – | – | – | 11.0 |
| VPF-B1153E | 3200 | 53.0 | – | 39.0 | – | 29.0 | – | – | 23.0* | – | – | – | – | – | – | – |
| VPF-B1153F | 5000 | – | – | 39.0 | – | 29.0 | – | 24.0 | – | – | – | 19.0 | – | – | – | – |
| VPF-B1303C | 2250 | 46.0 | – | 34.0 | 28.0 | – | 24.0 * | – | – | – | – | – | – | – | – | – |
| VPF-B1303F | 4000 | – | – | 34.0 | – | 25.0 | – | 21.0 * | – | 18.0 | – | – | – | – | – | – |
| VPF-B1304C | 2150 | 48.0 | – | 36.0 | 31.0 * | – | 25.0 * | – | – | – | – | – | – | – | – | – |
| VPF-B1304E | 3500 | – | – | 36.0 | 30.0 | – | 25.0 * | – | 20.0 | – | – | – | – | – | – | – |
| VPF-B1652C | 2700 | 64.0 | – | 47.0 | 39.0 | – | – | 30.0 * | – | – | – | – | – | – | – | – |

(1) 1.0 kgf = 2.2 lbf or 9.8 N. An asterisk (*) indicates a load rating that is 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

| Motor Cat. No. (1) | Speed, max rpm | RPM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 500 kgf | 750 kgf | 1000 kgf | 1500 kgf | 2000 kgf | 2500 kgf | 3000 kgf | 3500 kgf | 4000 kgf | 4500 kgf | 5000 kgf | 5500 kgf | 6000 kgf | 6500 kgf | 7000 kgf |
| VPF-A1001C | 2800 | 49.4 | – | 36.5 | – | 27.0 | – | 23.4 * | – | – | – | – | – | – | – | – |
| VPF-A1001M | 6500 | – | – | – | 30.6 | – | 24.5 | – | – | – | 19.0 | – | – | – | 16.2 | – |
| VPF-A1002C | 3000 | 49.4 | – | 36.5 | – | 27.0 | – | 22.7 | – | – | – | – | – | – | – | – |
| VPF-A1002F | 5000 | – | – | 36.5 | 30.6 | – | – | 22.7 | – | – | – | 18.2 | – | – | – | – |
| VPF-A1003C | 2250 | 49.4 | – | 36.5 | 30.6 | – | 25.7 * | – | – | – | – | – | – | – | – | – |
| VPF-A1003E | 3750 | 49.4 | – | 36.5 | – | 27.0 | – | – | – | 20.6 * | – | – | – | – | – | – |
| VPF-A1003F | 5500 | – | – | | 30.6 | – | 24.5 | – | – | 20.0 | – | – | 17.4 | – | – | – |
| VPF-A1153C | 2300 | 68.3 | – | 50.5 | 42.4 | – | 35.2 * | – | – | – | – | – | – | – | – | – |
| VPF-A1303B | 1950 | 68.3 | – | 50.5 | 42.4 | 37.8 * | – | – | – | – | – | – | – | – | – | – |
| VPF-A1303F | 4000 | – | – | 50.5 | – | 37.4 | – | 31.4 | – | 27.7 | – | – | – | – | – | – |
| VPF-A1304A | 1600 | 68.3 | 57.2 | 51.1 * | – | 41.2 * | – | – | – | – | – | – | – | – | – | – |
| VPF-A1304D | 3000 | 68.3 | – | 50.5 | – | 37.4 | – | 31.4 | – | – | – | – | – | – | – | – |
| VPF-B1001M | 6000 | – | – | – | – | 27.0 | – | 22.7 | – | 20.0 | – | – | – | 16.8 | – | – |
| VPF-B1002E | 3300 | 49.4 | – | 36.5 | – | 27.0 | – | – | 21.8 * | – | – | – | – | – | – | – |
| VPF-B1002M | 6000 | – | – | – | 30.6 | – | – | 22.7 | – | – | 19.0 | – | – | 16.8 | – | – |
| VPF-B1003C | 2500 | 49.4 | – | 36.5 | 30.6 | – | 24.5 | – | – | – | – | – | – | – | – | – |
| VPF-B1003F | 4750 | – | – | 36.5 | 30.6 | – | – | 22.7 | – | – | – | 18.6 * | – | – | – | – |
| VPF-B1003T | 7000 | – | – | – | 30.6 | – | 24.5 | – | – | – | 19.0 | – | – | – | – | 15.7 |
| VPF-B1153E | 3200 | 68.3 | – | 50.5 | – | 37.4 | – | – | 30.5 * | – | – | – | – | – | – | – |
| VPF-B1153F | 5000 | – | – | 50.5 | – | 37.4 | – | 31.4 | – | – | – | 25.1 | – | – | – | – |
| VPF-B1303C | 2250 | 68.3 | – | 50.5 | 42.4 | – | 35.5 * | – | – | – | – | – | – | – | – | – |
| VPF-B1303F | 4000 | – | – | 50.5 | – | 37.4 | – | 31.8 * | – | 27.7 | – | – | – | – | – | – |
| VPF-B1304C | 2150 | 68.3 | – | 50.5 | 43.6 * | – | 36.2 * | – | – | – | – | – | – | – | – | – |
| VPF-B1304E | 3500 | – | – | 50.5 | 42.4 | – | 35.2 * | – | 29.3 | – | – | – | – | – | – | – |
| VPF-B1652C | 2700 | 90.1 | – | 66.7 | 55.9 | – | – | 43.3 * | – | – | – | – | – | – | – | – |

(1) 1.0 kgf = 2.2 lbf or 9.8 N. An asterisk (*) indicates a load rating that is measured at an rpm value that is less than the value listed for that column.

## Environmental Specifications

| Attribute | Value |
|---|---|
| Temperature, operating | 0…40 °C (32…104 °F) [3] |
| Temperature, storage | -30…+70 °C (-22…+158 °F) |
| Relative humidity, storage | 5…90% noncondensing |
| Atmosphere, storage | Noncorrosive |
| IP rating [1] of motor with shaft seal [2] and use of Bulletin 2090 cables with environmentally sealed connectors | IP67 – Dust tight, temporary immersion, room temperature water [4]<br>IP66 – Dust tight, powerful water jets, room temperature water [4] |

(1) The motors are dual rated with International Protection Codes (IP Ratings) for environmental protection. The motor rating excludes any reduction in the rating resulting from cables or their plugs.
(2) The 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 23 for 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.)
(4) IP rating descriptions are for reference only. See the international standards for more complete rating descriptions.

## Motor Accessories

The following accessories are available for Kinetix food-grade servo motors.

### 2090-Series Single Motor Cables

Factory-manufactured single motor cables are required with Kinetix VP food-grade 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 configurable 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 KNX-TD004, for information about available 2090-Series single motor cables.

### 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. Kinetix VP food-grade motors are shipped with a Fluoroloy G4 (PTFE) shaft seal installed and kits include a lubricant 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 seals must be lubricated with a food-grade grease.

#### Shaft Seal Kit Catalog Numbers

| Motor Cat. No. | Shaft Seal Kit Cat. No. |
|---|---|
| VPF-A063*xx* and VPF-B063*xx* | VPF-SSN-F063075 |
| VPF-A075*xx* and VPF-B075*xx* | |
| VPF-A100*xx* and VPF-B100*xx* | MPF-SST-A3B3 |
| VPF-A115*xx* and VPF-B115*xx* | MPF-SST-A4B4 |
| VPF-A130*xx* and VPF-B130*xx* | MPF-SST-A45B45 |
| VPF-B165*xx* | MPF-SST-F165 |

See the Shaft-seal Kit Installation Instructions, publication 2090-IN012, for instructions on how to install a shaft seal.

## Positive Air-pressure Accessory Kit

A positive air-pressure kit (catalog number VPF-AIR-PURGE) is available for field installation on the M23 connector. Positive air pressure that is applied to the motor provides an extra level of protection against the ingress of foreign substances and moisture. The kit replaces the M23 connector cap, provides a replacement O-ring, and includes installation instructions.

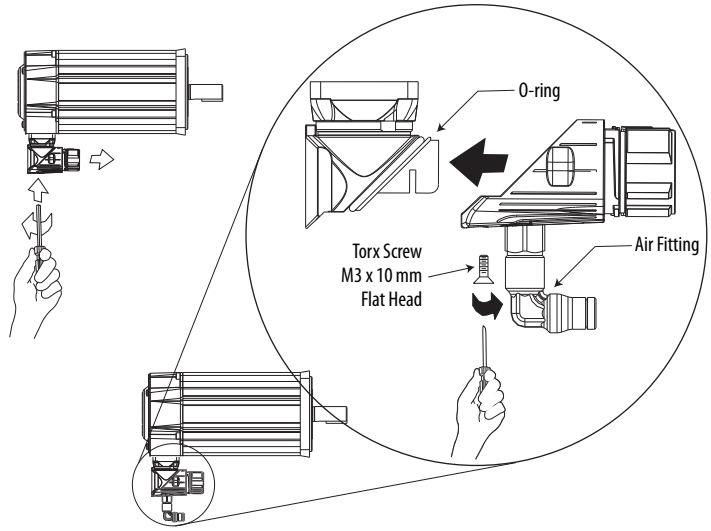
You must supply these items with the sealing plug:

- Plastic air tubing must be 4 mm (5/32 in.) OD Teflon FEP tubing.
- Air that is supplied to the motor must not exceed 0.1 bar (1.45 psi).

**ATTENTION:** Excessive air pressure or improper filtering of air can result in damage to the motor.

Air that is supplied to the motor must be clean, dry, and of instrument quality. Maximum air pressure is 0.1 bar (1.45 psi). Failure to observe these safety procedures can result in personal injury or damage to equipment.

### Positive Air-pressure Kit Installation on the M23 Connector




## Mounting Flange Washer Kits

Stainless steel washers inserted between the fastener head and motor flange are recommended as a best mounting practice and are included with Bulletin VPF motors. Replacement kits are also available.

**ATTENTION:** To further protect the finish on the motor, it is recommended to insert stainless steel washers (smooth side on paint) between the fastener head and motor flange.

### Washer Kit Catalog Numbers

| Washer Kit Cat. No. | Motor Cat. No. |
|---|---|
| VPF-WSHR-F063075 | VPF-A/B063*xx* |
| | VPF-A/B075*xx* |
| VPF-WSHR-F100 | VPF-A/B100*xx* |
| VPF-WSHR-F115 | VPF-A/B115*xx* |
| VPF-WSHR-F130 | VPF-A/B130*xx* |
| VPF-WSHR-F165 | VPF-B165*xx* |

See the Kinetix VP Food Grade Washer Kits Installation Instructions, publication VPF-IN002, for an illustration.

## 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 Motion Accessories Specifications, publication KNX-TD004 | Product specifications and dimensions for Allen-Bradley servo drive accessories. |
| Kinetix 5500 Servo Drives User Manual, publication 2198-UM001 | Information on installing, configuring, starting up, and troubleshooting a servo drive system. |
| Kinetix 5700 Servo Drives User Manual, publication 2198-UM002 | |
| Kinetix 5500 Drive System Design Guide, publication KNX-RM009 | Information on drive system components and accessory items you need for your Kinetix drive/motor combination. |
| Kinetix 5700 Drive System Design Guide, publication KNX-RM010 | |
| Shaft Seal Kit Installation Instructions, publication 2090-IN012 | Information on the installation of a shaft seal on this and other servo motors. |
| Kinetix Food Grade Washer Kits Installation Instructions, publication VPF-IN002 | Information on stainless steel washers installed with the mounting fasteners on Bulletin VPF motors. |
| Product Certifications website, http://www.rockwellautomation.com/global/certification/overview.page | 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. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

## Rockwell Automation Support

Use the following resources to access support information.

| | | |
|---|---|---|
| **Technical Support Center** | Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates. | https://rockwellautomation.custhelp.com/ |
| **Local Technical Support Phone Numbers** | Locate the phone number for your country. | http://www.rockwellautomation.com/global/support/get-support-now.page |
| **Direct Dial Codes** | Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer. | http://www.rockwellautomation.com/global/support/direct-dial.page |
| **Literature Library** | Installation Instructions, Manuals, Brochures, and Technical Data. | http://www.rockwellautomation.com/global/literature-library/overview.page |
| **Product Compatibility and Download Center (PCDC)** | Get help determining how products interact, check features and capabilities, and find associated firmware. | http://www.rockwellautomation.com/global/support/pcdc.page |

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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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