ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Rockwell / Allen-Bradley F-4030-Q-H00AA* at our website: ***Click HERE***

Installation Instructions

F-Series Brushless Servo Motor

(Catalog Number F-4030, F-4050, F-4075, F-6100, F-6200, and F-6300)

These *Installation Instructions* describe how to install the F-Series motors. Use this document if you are responsible for designing, installing, or troubleshooting the Allen-Bradley® F-Series motor products. Read all instructions before installing this motor.

For:	See Page
Receiving and Maintenance Information	2
Motor Catalog Number Identification	2
Before You Install the Motor	3
Using Shaft Seals	3
Using Couplings and Pulleys	3
Preventing Electrical Noise	4
Building and Installing Cables	6
Installing Your Motor	7
Guidelines for Installation	8
Mounting Dimensions	9
Connector Data	11
Encoder Connector	10
Power Connector and Brake Connector	11
Motor Load Force Ratings	13
Motor Radial Load Force Ratings	12
Cables and Connector Kits	14
Shaft Seal Kits	13

Publication 1398-IN516B-EN-P — February 2002

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

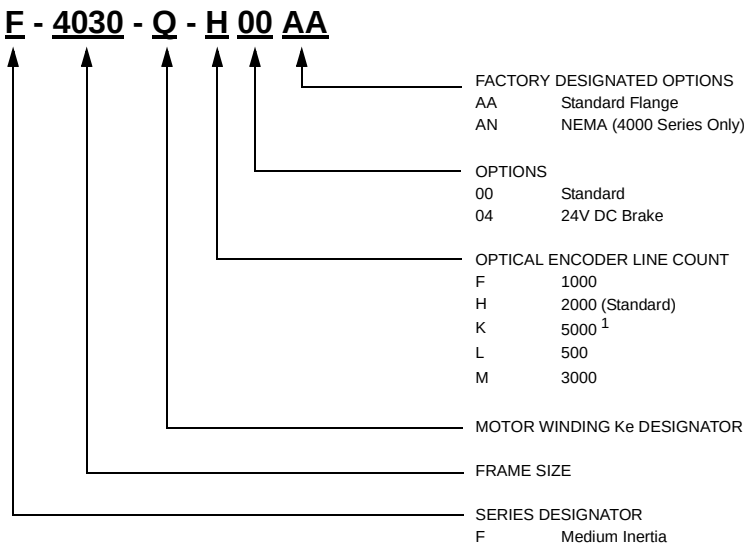
Receiving and Maintenance Information

The customer is responsible for inspecting the equipment before accepting the shipment from the freight company. Check the item(s) you receive against your purchase order.

Maintain your motor within the following environmental conditions:

- in a clean, dry location
- within the operating temperature range, 0° to 40° C (32° to 104° F)
- within the storage temperature range, -30° to 70° C (-25° to 158° F)
- within the relative humidity range, 5% to 95% non-condensing
- in a non-corrosive atmosphere

Motor Catalog Number Identification



1 The 5000 line count encoder limits the motor's top speed to 3600 RPM due to frequency output limit of the encoder. Check drive system configuration data for additional restrictions imposed by drive input.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Before You Install the Motor

Before installing or storing the motor:

1. Remove the motor carefully from its shipping container.

2. Visually inspect the motor for any damage.

3. Examine the motor frame, front output shaft, and mounting pilot for any defects.

4. Notify the carrier of any shipping damage immediately.

ATTENTION



Do not open or attempt to open the motor.

Only a qualified Allen-Bradley employee can service this type of motor.

Failure to observe these safety procedures could result in personal injury or equipment damage.

Using Shaft Seals

An additional seal is required on the motor shaft near the motor front bearing, if the shaft is exposed to fluids or significant amounts of fine dust. This includes lubricating oil from a gearbox. The motor ingress protection (IP) rating depends on the usage of shaft seals and environmentally sealed connectors/cables. The additional seal is not recommended in applications where the motor shaft area is free of liquids or fine dust. Refer to *Shaft Seal Kits* on page 14 to find the catalog number of the seal kit for your F-Series motor.

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 will cause

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

system instability and may 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, ensure that the connections are properly aligned and that axial and radial loads are within the specifications of the motor. Refer to *Motor Load Force Ratings* on page 13 for guidelines on how to achieve 20,000 hours of motor bearing life.

ATTENTION



Damage may occur to the motor bearings and the feedback device if sharp impact to the shaft is applied during installation of couplings and pulleys. Damage to the feedback device may result by applying leverage from the motor mounting face to remove devices mounted on the motor shaft.

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

Failure to observe these safety procedures result in damage to the motor and its components.

Preventing Electrical Noise

ElectroMagnetic Interference (EMI), commonly called noise, may adversely impact motor performance by inducing stray signals. Effective techniques to counter EMI include filtering the AC power, shielding and separating signal carrying lines, and practicing good grounding techniques.

Effective AC power filtering can be achieved by using isolated AC power transformers or properly installed AC line filters.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

To help avoid EMI:

1. Physically separate signal lines from motor cabling and power wiring. Do not route signal wires with motor and power wires, or over the vent openings of servo drives.

2. Ground all equipment 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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Building and Installing Cables

Knowledgeable cable routing and careful cable construction improves system ElectroMagnetic Compatibility (EMC).

To build and install cables, perform the following steps:

1. Keep wire lengths as short as possible.
2. Route signal cables (encoder, serial, analog) away from motor and power wiring.
3. Separate cables by a minimum of 0.3 m (1 ft) for every 9 m (30 ft) of parallel run.
4. Ground both ends of the encoder cable shield, and twist the signal wire pairs to prevent electromagnetic interference (EMI) from other equipment.

ATTENTION



High voltage can be present on the shield of a power cable if the shield is not grounded.

Ensure there is a connection to ground for any power cable shield.

Failure to observe these safety procedures could result in personal injury or equipment damage.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Installing Your Motor

The installation must comply with all local regulations and use of equipment and installation practices that promote electromagnetic compatibility (EMC) and safety. Preferred fasteners are stainless steel.

ATTENTION



Unmounted motors, disconnected mechanical couplings, and/or disconnected cables are dangerous if power is applied.

Disassembled equipment should be appropriately identified (tagged-out) and access to electrical power restricted (locked-out).

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

Failure to observe these safety procedures could result in personal injury or equipment damage.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Guidelines for Installation

Observe the following for installing the motor:

1. Allow sufficient clearance around the motor to keep it within its specified operating temperature range. Refer to *Receiving and Maintenance Information* on page 2 for operating range. Do not enclose the motor unless forced air is blown across the motor for cooling. A fan blowing air across the motor will improve its performance. Keep other heat-producing devices away from the motor.

2. Refer to *Mounting Dimensions* on page 9 to determine the mounting dimensions of your motor.

3. Place the motor with connectors pointing downward.

4. Properly mount and align the motor.

5. Attach all power and encoder cables after the motor is mounted, and use a drip loop in the cable to keep liquids flowing away from the connectors.

ATTENTION



Outer surfaces of motor can reach high temperatures, 100° C (212° F) during motor operation.

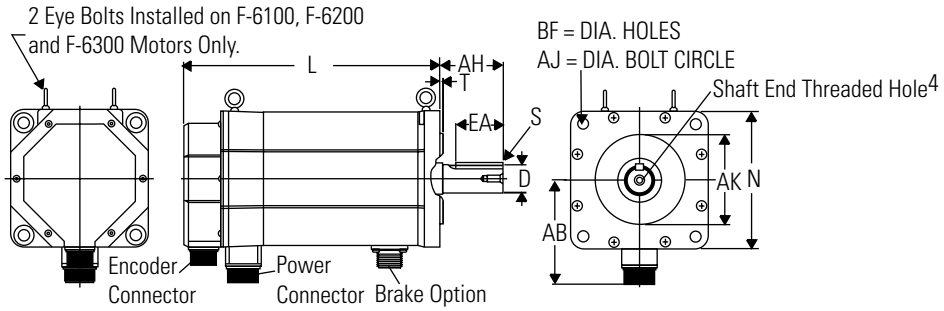
Take precautions to prevent accidental contact with hot surfaces. Consider motor surface temperature when selecting motor mating connections and cables.

Failure to observe these safety procedures could result in personal injury or equipment damage.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Mounting Dimensions

Figure 1
F-Series Standard Mounting Dimensions

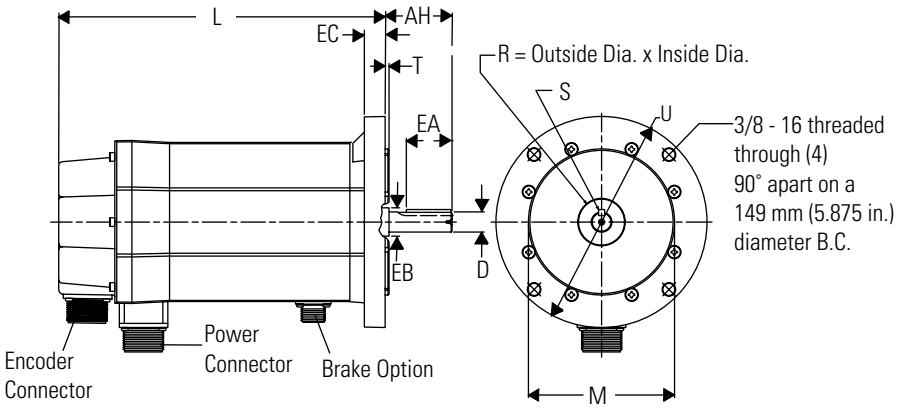


Dimension (Refer to drawing)	**Motor**					
	F-4030	**F-4050**	**F-4075**	**F-6100**	**F-6200**	**F-6300**
AB mm (in.)	102 (4.02)	102 (4.02)	102 (4.02)	131 (5.16)	131 (5.16)	131 (5.16)
AH mm (in.)	50 (1.97)[1]	50 (1.97)[1]	50 (1.97)[1]	80 (3.15)[1]	80 (3.15)[1]	80 (3.15)[1]
AK mm (in.)	110 (4.33)[2]	110 (4.33)[2]	110 (4.33)[2]	114.3 (4.5)[2]	114.3 (4.5)[2]	114.3 (4.5)[2]
D mm (in.)	19 (0.75)[3]	19 (0.75)[3]	19 (0.75)[3]	35 (1.38)[3]	35 (1.38)[3]	35 (1.38)[3]
EA mm (in.)	38 (1.49)	38 (1.49)	38 (1.49)	60 (2.36)	60 (2.36)	60 (2.36)
L mm (in.) **(No Brake)**	194 (7.64)	272 (10.71)	350 (13.78)	255 (10.04)	320 (12.6)	420 (16.53)
L mm (in.) **(Brake)**	257 (10.12)	335 (13.19)	413 (16.26)	326 (12.83)	390 (15.35)	490 (19.29)
N mm (in.)	127 (5)	127 (5)	127 (5)	173 (6.81)	173 (6.81)	173 (6.81)
S mm (in.)	6 x 6 (0.24 x 0.24)	6 x 6 (0.24 x 0.24)	6 x 6 (0.24 x 0.24)	10 x 8 (0.39 x 0.32)	10 x 8 (0.39 x 0.32)	10 x 8 (0.39 x 0.32)
T mm (in.)	3 (0.12)[3]	3 (0.12)[3]	3 (0.12)[3]	4 (0.16)[3]	4 (0.16)[3]	4 (0.16)[3]

[1] Tolerance is ±0.5 mm (0.197 in.).
[2] Tolerance is –0.035 mm (–0.001379 in.).
[3] Tolerance is –0.013 mm (–0.0005122 in.).
[4] F-4000 Thread = M6 x 1 mm (0.0394 in.) x 15 mm (0.591 in.), F-4000 Thread Depth = 14.98 mm (0.59 in.).
F-6000 Thread = M8 x 1.25 mm (0.0492 in.) x 20 mm (0.788 in.), F-6000 Thread Depth = 0.031 mm (0.79 in.).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Figure 2
F-4000 NEMA 56C Mounting Dimensions



Dimension [1] (Refer to drawing)	**Motor**		
	F-4030 NEMA 56C	**F-4050 NEMA 56C**	**F-4075 NEMA 56C**
AH mm (in.)	52 (2.06)[1]	52 (2.06)[1]	52 (2.06)[1]
D mm (in.)	15.9 (0.625)[2]	15.9 (0.625)[2]	15.9 (0.625)[2]
EA mm (in.)	36 (1.41)	36 (1.41)	36 (1.41)
EB mm (in.)	22 (0.875)	22 (0.875)	22 (0.875)
EC mm (in.)	16.3 (0.64)	16.3 (0.64)	16.3 (0.64)
L mm (in.) **(No Brake)**	194 (7.64)	272 (10.71)	350 (13.78)
L mm (in.) **(Brake)**	257 (10.12)	335 (13.19)	413 (16.26)
R mm (in.)	36.5 (1.437) x 22.2 (0.875)	36.5 (1.437) x 22.2 (0.875)	36.5 (1.437) x 22.2 (0.875)
S mm (in.)	4.8 (0.1875) x 35 (1.375)	4.8 (0.1875) x 35 (1.375)	4.8 (0.1875) x 35 (1.375)
T mm (in.)	3 (0.12)[2]	3 (0.12)[2]	3 (0.12)[2]
U mm (in.)	165 (6.5)	165 (6.5)	165 (6.5)

[1] Tolerance is ±0.508 mm (±0.02 in.).
[2] Tolerance is –0.127 mm (–0.005 in.).

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Connector Data

The tables below list the signal descriptions for the encoder, power and brake connector pins.

Encoder Connector

Pin	Signal
A	A+
B	A-
C	B+
D	B-
E	I+
F	I-
G	Encoder Case
H	ABS
J	+5V DC

Pin	Signal
K	+5V DC
L	COM
M	COM
N	Hall B
P	Hall C
R	TS+
S	TS-
T	Hall A

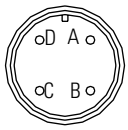


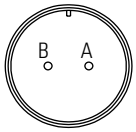
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Power Connector and Brake Connector

Power Connector	
Pin	**Signal**
A	U
B	V
C	W
D	Motor Case

Brake Connector	
Pin	**Signal**
A	BR+
B	BR-



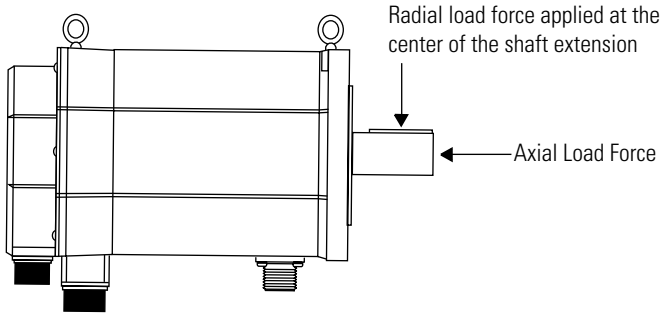


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Motor Load Force Ratings

Motors are capable of operating with sustained maximum radial or maximum axial shaft loads. The measurement points for maximum radial and axial load forces are shown in the figure below.

Figure 3
Load Forces on Shaft



Motor Radial Load Force Ratings

Motor	500 RPM kg (lbs)	1000 RPM kg (lbs)	2000 RPM kg (lbs)	3000 RPM kg (lbs)	4000 RPM kg (lbs)
F-4030	34.5 (76)	27.2 (60)	21.3 (47)	18.6 (41)	17.2 (38)
F-4050	39.9 (88)	31.3 (69)	24.9 (55)	21.8 (48)	20.0 (44)
F-4075	41.7 (92)	33.1 (73)	26.3 (58)	23.1 (51)	20.9 (46)
F-6100	72.1 (159)	57.1 (126)	45.4 (100)	39.5 (87)	–
F-6200	78 (172)	61.7 (136)	49 (108)	42.6 (94)	–
F-6300	83 (183)	65.8 (145)	52.2 (115)	45.8 (101)	–

With no radial load, the axial load rating is 100% of the radial load rating from the table above. With a radial and an axial load, the axial load rating is 44% of the radial load rating from the table above.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Cables and Connector Kits

Factory manufactured cables are available in standard cable lengths. Contact your nearest Allen-Bradley sales office or refer to your drive's installation manual for a complete listing of available cables.

If you choose to build your own cables, the following connector kits are available for F-Series motors.

Catalog Number	Description
2090-FPC-S4000	Straight Power Connector Kit Compatible with 2 and 3 kW Drives
2090-FPC-R4000	Right-Angle Power Connector Kit Compatible with 2 and 3 kW Drives
2090-FPC-S6000	Straight Power Connector Kit Compatible with 7.5 kW Drives
2090-FPC-R6000	Right-Angle Power Connector Kit Compatible with 7.5 kW Drives
2090-FFC-S	Straight Feedback Connector Kit Compatible with All Drives
2090-FBC-S	Straight Brake Connector Kit Compatible with All Drives
2090-FFC-R	Right-Angle Feedback Connector Kit Compatible with All Drives
2090-FBC-R	Right-Angle Brake Connector Kit Compatible with All Drives

Shaft Seal Kits

F-Series motors equipped with a shaft seal will have an IP65 environmental rating. The following shaft seal kits are available for F-Series motors.

Catalog Number	Description
0041-5060	Shaft Seal Kit for F-4000 Series Motors
0041-5061	Shaft Seal Kit for F-6000 Series Motors

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Notes

Publication 1398-IN516B-EN-P — February 2002

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

For more information refer to our web site at: www.ab.com/motion

Allen-Bradley is a registered trademark of Rockwell Automation.

www.rockwellautomation.com **www.ab.com**

Corporate Headquarters
Rockwell Automation, 777 East Wisconsin Avenue, Suite 1400, Milwaukee, WI, 53202-5302 USA, Tel: (1) 414.212.5200, Fax: (1) 414.212.5201

Headquarters for Allen-Bradley Products, Rockwell Software Products and Global Manufacturing Solutions
Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe: Rockwell Automation SA/NV, Vorstlaan/Boulevard du Souverain 36-BP 3A/B, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, 27/F Citicorp Centre, 18 Whitfield Road, Causeway Bay, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Headquarters for Dodge and Reliance Electric Products
Americas: Rockwell Automation, 6040 Ponders Court, Greenville, SC 29615-4617 USA, Tel: (1) 864.297.4800, Fax: (1) 864.281.2433
Europe: Rockwell Automation, Brühlstraße 22, D-74834 Elztal-Dallau, Germany, Tel: (49) 6261 9410, Fax: (49) 6261 1774
Asia Pacific: Rockwell Automation, 55 Newton Road, #11-01/02 Revenue House, Singapore 307987, Tel: (65) 351 6723, Fax: (65) 355 1733

Allen-Bradley Industrial Motion Control Technical Support
Ultra, Servo Motors (MP, F, H, Y and N-Series) and Electro-Craft products: Tel: (1) 952.914.3990, Fax: (1) 952.942.3756, E-mail: RAEPTechSupport@ra.rockwell.com
ControlLogix Motion, GMC, GML, S-Class, 1746, IMC and Creonix products: Tel: (1) 603.443.5419, Fax: (1) 603.448-5969, E-mail: RALebTechSupport@ra.rockwell.com
CNC products: (1) 440.646.6800
1394, Servo Motors (1326), 8720, and other products: Tel: (1) 262.512.8176, Fax: (1) 262.512.8450, E-mail: Support@drives.ra.rockwell.com
For Europe: Tel: 44 1270 580142, Fax: 44 1270 580141, E-mail: Ctechnicalsupport@ra.rockwell.com

Publication 1398-IN516B-EN-P — February 2002 PN 0013-1062-001 Rev C
Supersedes Publication 1398-5.6 — April 1999
Copyright © 2002 Rockwell Automation. All rights reserved. Printed in the USA.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP