

Instructions for Installation and Operation

Bodine Electric Company Type 34B6BXBL Motors & Gearmotors Brushless DC 12 and 24VDC

This apparatus is suitable for use in Hazardous Locations
Class I, Division 1, Groups C & D.



www.bodine-electric.com



BODINE LIMITED WARRANTY

The Bodine Electric Company warrants all products it manufactures to be free of defects in workmanship and materials when used under Normal Operating Conditions and when applied in accordance with nameplate specifications. When Bodine motors and gearmotors have been purchased with and used only with appropriately applied Bodine controls, this warranty shall be in effect for a period of twenty-four months from date of purchase or thirty months from date of manufacture, whichever comes first. Bodine motors and gearmotors used with non-Bodine controls and Bodine controls used with non-Bodine motors and gearmotors are covered by a standard twelve-month warranty period.

The Bodine Electric Company will repair, replace, or refund at its option, any of its products, which has been found to be defective and is within the warranty period, provided that the product is shipped freight prepaid, with previous authorization, to Bodine Electric, or to the nearest Bodine Authorized Service Center. At its option, all return shipments are F.O.B. Bodine's plant or Authorized Service Center. Bodine is not responsible for removal, installation, or any other incidental expenses incurred in shipping the products to or from Bodine.

This warranty is in lieu of any other expressed or implied warranty - including (but not limited to) any implied warranties of merchantability and/or fitness for a particular use or purpose.

Bodine's liability under this warranty shall be solely limited to repair or replacement of the Bodine product within the warranty period and Bodine shall not be liable, under any circumstances, for any consequential, incidental or indirect damages or expenses associated with the warranted products. Commutator and/or brush wear and its associated effects are normal occurrence and are not covered by this warranty unless otherwise agreed to by Bodine in writing.

Proof of purchase of motor or gearmotor and matching control as a system must be provided with any claim.

Product Type: _____ **Serial No.** _____

Date of Purchase: _____ **Place of Purchase:** _____

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This manual contains the basic information needed to install and operate a Bodine type 34B6BXBL Brushless DC motor or gearmotor that is certified for use in Class I Division 1 hazardous locations. This manual does not profess to cover all details or variations in equipment, nor to provide for every possible contingency associated with installation, operation, or maintenance. No warranty of fitness for purpose is expressed or implied. It is the responsibility of the user to determine whether the installation location is hazardous, and to what degree it is hazardous. Should further information be desired or should particular problems arise which are not covered sufficiently for the user's purpose, the matter should be referred to the Bodine Electric Company.

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RoHS COMPLIANCE

This document certifies that the Bodine Electric type 34B6BXBL motor and type 34B6BXBL-FX gearmotors are manufactured with materials and processes that comply with European Directive 2011/65/EU, as amended by council directive 2015/863/EU, on the Restriction of Hazardous Substances (RoHS).

IMPORTANT SAFETY PRECAUTIONS

The use of electric machines, like that of all other utilization of concentrated power, is potentially hazardous. The degree of hazard can be greatly reduced by proper design, selection, installation, and use, but hazards cannot be completely eliminated. The reduction of hazard is the joint responsibility of the user, the manufacturer of the driven or driving equipment, and the manufacturer of the machine.”



The Bodine type 34B6BXBL motor and 34B6BXBL-FX gearmotor were designed to meet the requirements of UL 674 and CSA C22.2 No. 145-M2017, electric motors for use in Division 1 Hazardous Locations. The motor ratings were established for operating temperatures from -20C to +40C. They have a T4A temperature code rating Reference UL file number E318315. These products bear the UL mark shown above.

Please read through this operations manual in detail and observe those paragraphs with the safety alert symbol.

WARNING

This indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

WARNING/AVERTISSEMENT

- **CAUTION**—To reduce the risk of ignition of hazardous atmospheres, disconnect the equipment from the supply circuit before opening. Keep assembly tightly closed when in operation.
- Leads factory-sealed. Do not disassemble any part of this product as that will compromise its safety in hazardous atmospheres.
- This product should be installed, inspected, and maintained by a qualified electrician only, in accordance with all applicable electrical codes.
- **ATTENTION**—Pour réduire le risque d’inflammation des atmosphères dangereuses, débranchez l’équipement du circuit d’alimentation avant de l’ouvrir. Gardez l’assemblage bien fermé lorsqu’il est en fonctionnement.
- Fils scellés en usine. Ne démontez aucune pièce de ce produit car cela compromettrait sa sécurité dans les atmosphères dangereuses.
- Ce produit doit être installé, inspecté et entretenu par un électricien qualifié seulement, conformément avec tous les codes de l’électricité pertinents.

IMPORTANT

Read this manual completely and carefully before making any connections. Pay special attention to all warnings, cautions, and safety rules. Failure to follow the instructions could produce safety hazards, which could injure personnel or damage the motor, gearmotor, or other equipment. If you have any doubts about how to connect the motor or gearmotor, refer to the detailed sections of this manual.

PRODUCT SPECIFICATIONS

The 34B6BXBL is a 3-Phase Brushless DC Permanent Magnet motor, available with or without an integral gearbox, and a normally closed, self-resetting thermal switch attached to the motor windings.

Table 1 lists the specifications common to all variations of this product. Table 2 lists the specifications unique to each gear ratio that is offered.

TABLE 1 – Specifications

Parameter	Specification
Locations:	Hazardous locations Class I, Division 1, Groups C & D, or unclassified (non-hazardous) locations.
Temperature Code:	T4A or T3C
Volts:	12 VDC, 24 VDC, 130 VDC, and 260 VDC (separate models)
Current:	See Tables 2 – 5 below and on next page
Horsepower:	See Tables 2 – 5 below and on next page
Ambient Temperature:	-20C to 40C
Insulation:	F8
Number of Poles:	8 poles (stock models) or 4 poles (certain custom models)
Commutation Angle:	120 degrees (stock models) or 60 degrees (certain custom models)

**TABLE 2 – Nameplate ratings for 12 volt 8-pole stock models
(see Bodine “INFS” drawings for custom models)**

Product Type	Gear Ratio	12 VOLT 8-POLE MODELS			
		HP	Speed (rpm)	Torque (lb-in)	Current (ADC)
34B6XBBL	N/A	0.47	2200	13.4	38
34B6XBBL-FX1	5:1	0.47	440	58	38
34B6XBBL-FX2	10:1	0.47	220	121	38
34B6XBBL-FX2	15:1	0.47	147	183	38
34B6XBBL-FX3	20:1	0.47	110	240	38
34B6XBBL-FX3	30:1	0.47	73	270	38
34B6XBBL-FX3	40:1	0.47	55	265	38
34B6XBBL-FX3	60:1	0.47	37	350	38
34B6XBBL-FX4	120:1	0.47	18	350	38
34B6XBBL-FX4	180:1	0.47	12	350	38
34B6XBBL-FX4	300:1	0.47	7.3	350	38

**TABLE 3 – Nameplate ratings for 24 volt 8-pole stock models
(see Bodine “INFS” drawings for custom models)**

Product Type	Gear Ratio	24 VOLT 8-POLE MODELS			
		HP	Speed (rpm)	Torque (lb-in)	Current (ADC)
34B6BXBL	N/A	0.66	2800	13.4	25
34B6BXBL-FX1	5:1	0.66	560	58	25
34B6BXBL-FX2	10:1	0.66	280	121	25
34B6BXBL-FX2	15:1	0.66	187	183	25
34B6BXBL-FX3	20:1	0.66	140	240	25
34B6BXBL-FX3	30:1	0.66	93	270	25
34B6BXBL-FX3	40:1	0.66	70	265	25
34B6BXBL-FX3	60:1	0.66	47	350	25
34B6BXBL-FX4	120:1	0.66	23	350	25
34B6BXBL-FX4	180:1	0.66	16	350	25
34B6BXBL-FX4	300:1	0.66	9.3	350	25

**TABLE 4 – Nameplate ratings for 130 volt 8-pole stock models
(see Bodine “INFS” drawings for custom models)**

Product Type	Gear Ratio	130 VOLT 8-POLE MODELS			
		HP	Speed (rpm)	Torque (lb-in)	Current (ADC)
34B6BXBL	N/A	0.61	2600	13.4	4.3
34B6BXBL-FX1	5:1	0.61	520	58	4.3
34B6BXBL-FX2	10:1	0.61	260	121	4.3
34B6BXBL-FX2	15:1	0.61	173	183	4.3
34B6BXBL-FX3	20:1	0.61	130	240	4.3
34B6BXBL-FX3	30:1	0.61	87	270	4.3
34B6BXBL-FX3	40:1	0.61	65	265	4.3
34B6BXBL-FX3	60:1	0.61	43	350	4.3
34B6BXBL-FX4	120:1	0.61	22	350	4.3
34B6BXBL-FX4	180:1	0.61	14	350	4.3
34B6BXBL-FX4	300:1	0.61	8.7	350	4.3

**TABLE 5 – Nameplate ratings for 260 volts 8-pole stock models
(see Bodine “INFS” drawings for custom models)**

Product Type	Gear Ratio	260 VOLT 8-POLE MODELS			
		HP	Speed (rpm)	Torque (lb-in)	Current (ADC)
34B6BXBL	N/A	0.73	3100	13.4	2.5
34B6BXBL-FX1	5:1	0.73	620	58	2.5
34B6BXBL-FX2	10:1	0.73	310	121	2.5
34B6BXBL-FX2	15:1	0.73	207	183	2.5
34B6BXBL-FX3	20:1	0.73	155	240	2.5
34B6BXBL-FX3	30:1	0.73	103	270	2.5
34B6BXBL-FX3	40:1	0.73	78	265	2.5
34B6BXBL-FX3	60:1	0.73	52	350	2.5
34B6BXBL-FX4	120:1	0.73	26	350	2.5
34B6BXBL-FX4	180:1	0.73	17	350	2.5
34B6BXBL-FX4	300:1	0.73	10	350	2.5

INSTALLATION

This product should only be installed by a qualified person familiar with its operation and associated hazards, and knowledgeable about the special requirements for installation in hazardous locations. The National Electrical Code (NEC), local electrical and safety codes, and when applicable, the Occupational Safety and Health Act (OSHA) should be observed to reduce hazards to personnel and property. NEC section 500 (Hazardous Locations) is particularly important.

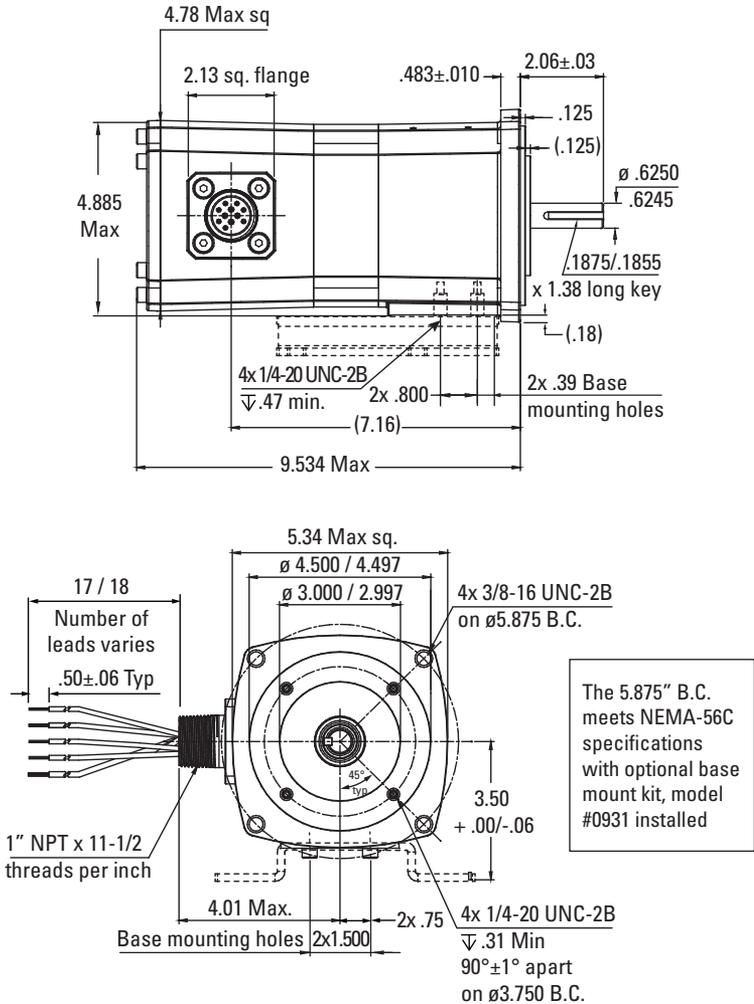
WARNING/AVERTISSEMENT

- **CAUTION**—To reduce the risk of ignition of hazardous atmospheres, disconnect the equipment from the supply circuit before opening. Keep assembly tightly closed when in operation.
 - Leads factory-sealed. Do not disassemble any part of this product as that will compromise its safety in hazardous atmospheres.
 - This product should be installed, inspected, and maintained by a qualified electrician only, in accordance with all applicable electrical codes.
-
- **ATTENTION**—Pour réduire le risque d'inflammation des atmosphères dangereuses, débranchez l'équipement du circuit d'alimentation avant de l'ouvrir. Gardez l'assemblage bien fermé lorsqu'il est en fonctionnement.
 - Fils scellés en usine. Ne démontez aucune pièce de ce produit car cela compromettrait sa sécurité dans les atmosphères dangereuses.
 - Ce produit doit être installé, inspecté et entretenu par un électricien qualifié seulement, conformément avec tous les codes de l'électricité pertinents.

Step 1: Mount the 34B6BXBL Motor or Gearmotor

Install the 34B6BXBL motor or gearmotor onto a secure mounting surface using the appropriate hardware for the desired mounting orientation, as indicated in Figure 1a and 1b. For example, if a gearmotor is to be mounted by the holes in the face where the output shaft exits, then four 1/4-28 UNF-2B screws are used (the max screw length is to be determined by the user).

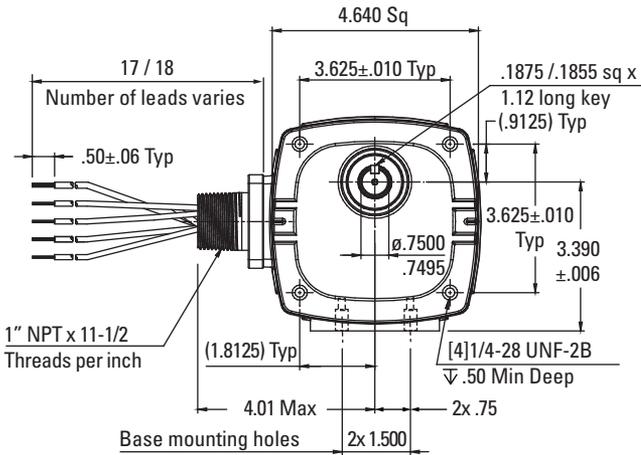
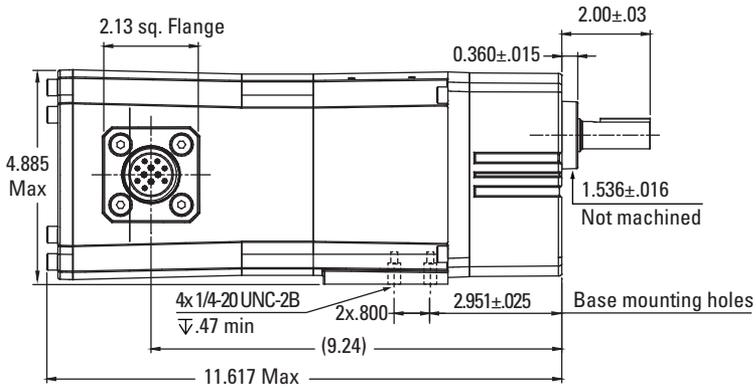
Figure 1a – Dimensions for Standard 34B6BXBL Motor



Drawings are for reference only. Please visit our website to download or view the latest revision of these CAD drawings.

If mounting from the four ¼-20 UNC-2B base holes, the screw length should not exceed a maximum thread engagement depth of 0.47". See Figure 1a and 1b for the location of the mounting holes on Bodine's stock models. For custom variations of our stock models, refer to Bodine's "INFS" drawing instead. Please visit our website for optional base mount accessory kit, [model 0931](#).

Figure 1b – Dimensions for Standard 34B6BXBL-FX Gearmotor



Drawings are for reference only. Please visit our website to download or view the latest revision of these CAD drawings.

Step 2: Attach a Conduit Outlet Box to the Motor

Proper installation of this product in a hazardous location requires the use of a conduit outlet box listed for Class I, Division 1, Groups C & D. The conduit outlet box is not supplied by Bodine with the motor, so it must be purchased separately by the user. The conduit outlet box must have a hole with a 1" NPT, 11.5 threads per inch female thread in order to fit onto the Bodine motor. A minimum of 5 threads of engagement is required to meet the UL 674 standard. This conduit outlet box should be sized per NEC 314.16. Figure 2 shows one example of an appropriate conduit outlet box and Figure 3 shows that box installed on a Bodine motor. Regardless of what box is used, follow the manufacturer's instructions for installing it onto the Bodine motor and for attaching conduit to the exit hole.

Figure 2 – A Typical Conduit Outlet Box

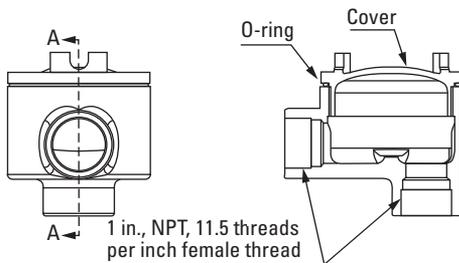


Figure 3 – Motor after Conduit Outlet Box Installation



Step 3: Make Electrical Connections

⚠ WARNING/AVERTISSEMENT

- **CAUTION**—To reduce the risk of ignition of hazardous atmospheres, disconnect the equipment from the supply circuit before opening. Keep assembly tightly closed when in operation.
- Leads factory-sealed. Do not disassemble any part of this product as that will compromise its safety in hazardous atmospheres.
- This product should be installed, inspected, and maintained by a qualified electrician only, in accordance with all applicable electrical codes.
- **ATTENTION**—Pour réduire le risque d'inflammation des atmosphères dangereuses, débranchez l'équipement du circuit d'alimentation avant de l'ouvrir. Gardez l'assemblage bien fermé lorsqu'il est en fonctionnement.
- Fils scellés en usine. Ne démontez aucune pièce de ce produit car cela compromettrait sa sécurité dans les atmosphères dangereuses.
- Ce produit doit être installé, inspecté et entretenu par un électricien qualifié seulement, conformément avec tous les codes de l'électricité pertinents.

The 34B6BXBL is a 3-Phase Brushless DC Permanent Magnet motor, with or without an integral gearbox, and a normally closed, self-resetting thermal switch attached to the motor windings and is represented schematically in Figures 4a, 4b, and 4c.

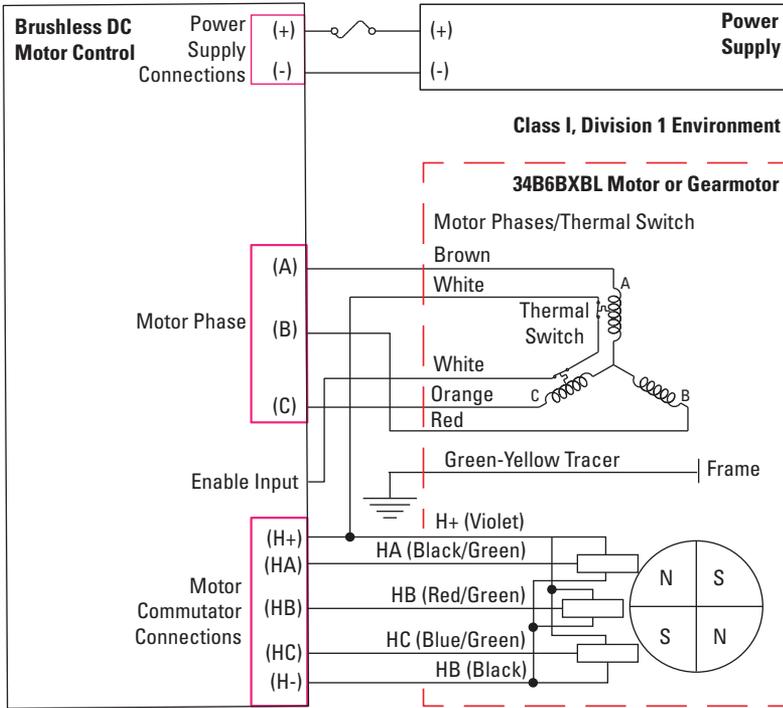
⚠ WARNING/AVERTISSEMENT

- **CAUTION**—The motor may automatically restart, depending on how it is wired to the power source, after the temperature has cooled sufficiently to allow the protector contacts to reset and if AC power is present.
- **ATTENTION**—Le moteur peut redémarrer automatiquement, en fonction de la façon dont il est câblé à la source d'alimentation, une fois que la température a suffisamment refroidi pour permettre aux contacts de protection de se réinitialiser et si une alimentation CA est présente.

Installation of this motor requires either a controller capable of operating a brushless DC motor with a 120 degree commutation angle. The controller must incorporate or be used in conjunction with one of the following capabilities to prevent the motor from exceeding its temperature ratings under overload conditions:

- A logic input that will interrupt the power to the motor windings when the thermal switch opens
- A suitable electronic overload protection system integrated within the controller
- A suitable relay circuit that can be driven by the thermal switch to interrupt the controller's power supply
- A motor protection system suitable for operation with a motor in the hazardous locations environment

Figure 4b – Electric Connections – Thermal Switch with Logic Control to Disable Motor Power



THERMAL SWITCH NOTES:

Motor thermal switch must be connected to interrupt power to the controller and / or motor windings when the contact opens to limit motor temperature.

Thermal switch contact ratings:

AC-250VAC @ 2.5A 1.0 P.F., 250VAC @ 1.6A 0.6 P.F.

DC-24VDC @ 3.5A 48VDC @ 1.5A

WARNING: motor will automatically restart if allowed by control logic.

Step 4: Operate the 34B6BXBL Motor or Gearmotor

WARNING/AVERTISSEMENT

- **CAUTION**—To reduce the risk of ignition of hazardous atmospheres, disconnect the equipment from the supply circuit before opening. Keep assembly tightly closed when in operation.
 - Leads factory-sealed. Do not disassemble any part of this product as that will compromise its safety in hazardous atmospheres.
 - This product should be installed, inspected, and maintained by a qualified electrician only, in accordance with all applicable electrical codes.
-
- **ATTENTION**—Pour réduire le risque d'inflammation des atmosphères dangereuses, débranchez l'équipement du circuit d'alimentation avant de l'ouvrir. Gardez l'assemblage bien fermé lorsqu'il est en fonctionnement.
 - Fils scellés en usine. Ne démontez aucune pièce de ce produit car cela compromettrait sa sécurité dans les atmosphères dangereuses.
 - Ce produit doit être installé, inspecté et entretenu par un électricien qualifié seulement, conformément avec tous les codes de l'électricité pertinents.

CAUTION

- Check that gearmotor is securely mounted.
- Check all rotating members. Be sure keys, pulleys, etc. are securely fastened and safety guards are in place.
- Check for proper mounting and alignment of products, and verify safe loading on shafts and gears.

1. Start the Motor or Gearmotor

- a. Turn on power to the control.
- b. Turn the control on.
- c. The motor should start running at the set speed.

2. Adjust Speed

- a. Adjust the speed setting of the control and observe if the motor also changes speed.

3. Stop the Motor or Gearmotor

- a. Turn the control off.
- b. Turn off the power to the control.

TROUBLESHOOTING

WARNING/AVERTISSEMENT

- **CAUTION**—To reduce the risk of ignition of hazardous atmospheres, disconnect the equipment from the supply circuit before opening. Keep assembly tightly closed when in operation.
 - Leads factory-sealed. Do not disassemble any part of this product as that will compromise its safety in hazardous atmospheres.
 - This product should be installed, inspected, and maintained by a qualified electrician only, in accordance with all applicable electrical codes.
-
- **ATTENTION**—Pour réduire le risque d'inflammation des atmosphères dangereuses, débranchez l'équipement du circuit d'alimentation avant de l'ouvrir. Gardez l'assemblage bien fermé lorsqu'il est en fonctionnement.
 - Fils scellés en usine. Ne démontez aucune pièce de ce produit car cela compromettrait sa sécurité dans les atmosphères dangereuses.
 - Ce produit doit être installé, inspecté et entretenu par un électricien qualifié seulement, conformément avec tous les codes de l'électricité pertinents.

If you encounter a problem, read all instructions and double-check the wiring. Even if the 34B6BXBL motor or gearmotor itself shows obvious signs of damage, it may be that another component in the system or an incorrect installation or incorrect electrical connection caused it to fail. In which case, replacing the gearmotor alone and not correcting the root cause of the failure may result in another damaged product.

If problems persist, contact your source of purchase or a Bodine Authorized Service Center and describe the problem in detail. Do not disassemble the product. Performing unauthorized repairs will void the warranty and invalidate third-party certifications.

Bodine offers over 1,400 standard gearmotors, motors and system-matched speed controls.



**Visit www.bodine-electric.com
for more information.**

Bodine offers the widest selection of variable-speed AC, permanent magnet DC and brushless DC fractional horsepower gearmotors and motors in the industry. For complete specifications, 3D CAD drawings, or to order online, visit bodine-electric.com.

