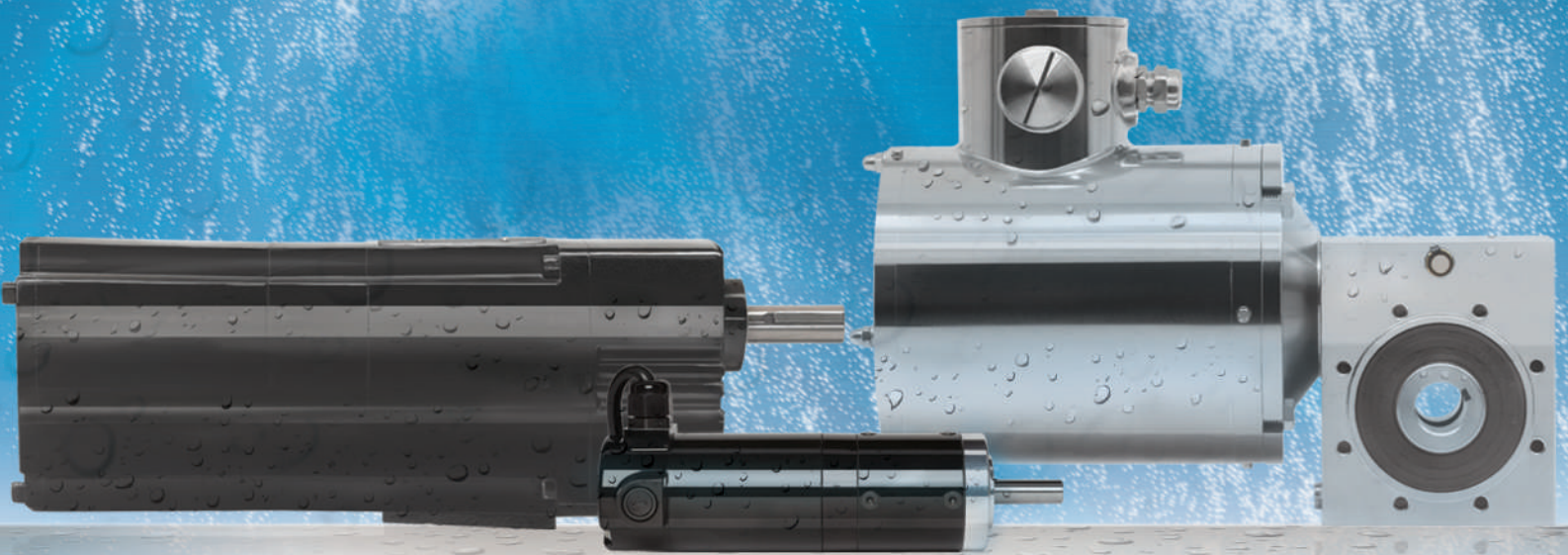


# Gearmotors Designed for Demanding Environments



BODINE  
ELECTRIC  
COMPANY

# WHAT ARE IP RATINGS?

SOLIDS		LIQUIDS	
0	Not protected	0	Not protected
1	A solid object greater than 500 mm, such as a hand	1	Vertical dripping water
2	A solid object greater than 12 mm, such as a finger	2	Vertical dripping water when tilted up 15°
3	A solid object greater than 2.5 mm, such as a screwdriver	3	Spraying water at an angle of 60°
4	A solid object greater than 1 mm, such as most screws and wire	4	Splashes of water at any angle
5	Dust protected. Prevents ingress of dust sufficient to cause harm	5	Low pressure water jets from any direction
6	Dust tight. No ingress of dust	6	High pressure water jets from any direction
		7	The effects of immersion in water between 15 cm and 1m for 30 minutes
		8	The effects of immersion in water under pressure for long periods
		9	Close-range, high-pressure, high-temperature water jets
		9K	Close-range, high-pressure, high-temperature water jets, for road vehicles (ISO 20653)

## EXAMPLE IP-66

**THE INGRESS PROTECTION (IP) RATING** is a measure of how a gearmotor is affected by water and solid particles. They usually have two numbers: the first indicates the level of protection against solid material, the second against liquids. IP ratings are determined by the international standard EN 60529 (British BS EN 60529: 1992 – Degrees of protection provided by enclosures (IP Code) and European IEC 60509: 1989 – Degrees of protection provided by enclosures (IP Code).

# GEARMOTORS FOR DEMANDING ENVIRONMENTS



## FOOD SERVICE EQUIPMENT

Bodine gearmotors and motors successfully power a wide range of food service equipment where quiet operation, reliability and long life are mission-critical. Applications range from cake decorating equipment and pizza ovens to mixers, pumps, and beverage dispensers. We also offer several AC, BLDC and PMDC models that are **IP-66 rated** and can withstand moisture, grime and washing with high-pressure water jets.



## FOOD PROCESSING

Our stainless steel worm gearmotors are rated **IP-69K**, and are ideal for machines and systems that are subject to particularly intensive cleaning. Their hygienic properties, long operating life and low maintenance make them particularly well suited to production conditions in the food and beverage industry, pharmaceutical industry, and in permanently wet environments.



## CHEMICAL INJECTION PUMP

Many chemical injection pumps used in remote gas pipelines are solar powered and require maximum efficiency for continuous operation in harsh outdoor conditions. We developed an **IP-55 rated** brushless DC parallel shaft gearmotor with an optimized 12V winding efficiency point, a parallel shaft gearhead spur and helical gearing, with a low number of stages to improve efficiency.



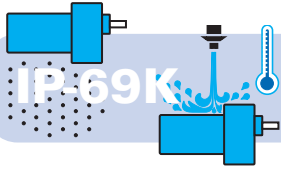
## MOBILE ANTENNA SYSTEMS

A mobile antenna system required two gearmotors to precisely position the antenna to connect to orbiting telecommunications satellites. Not only did the gearmotors deliver precise motion to calibrate with the satellite, they were **rated IP-66** to withstand wind-driven rain in the outdoor installations.



## BOAT LIFT

The application demanded that the gearmotor be suitable for long-term use in a harsh, outdoor waterfront environment, deliver high starting and running torque, positive locking capability when not running, and it needed to be powered by a 24 volt DC battery/solar cell system. Although it was shielded by a water-resistant shroud, our **IP-44 rated** gearmotor provided extra protection against extreme weather events.



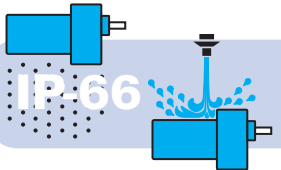
**APPLICATIONS:** Food processing equipment such as pharmaceutical manufacturing machinery and applications where hygiene and cleanliness are critical



### AC Variable Speed Stainless Steel Gearmotor Type 56R1BSPP-50JW/H

- Stainless Steel construction throughout. Sealed against water and dust ingress.
- 230/460VAC, 1/2 HP inverter-duty, 3-phase winding
- Meet EU hygienic standard for food machinery.

Fixed Speed Rating					Variable Speed (SOA) Ratings <sup>1</sup>							Radial Load (lbs.)	Product Type	Model No.
Speed (rpm)	Torque (lb-in.)	Motor HP	(230/460V)		Speed Range (rpm)	Frequency Range (Hz)	Torque Type	Torque (lb-in)						
			Amps	Gear Ratio				@ 10 Hz	@ 10 Hz	@ 90 Hz				
29	594	1/2	1.6 / 0.78	60:1	4.6-44	10-90	Variable	345	594	348	823	56R1B-SPP-50JW/H	9006	
35	638	1/2	1.6 / 0.78	50:1	5.5-53	10-90	Variable	330	638	322	767		9005	
44	499	1/2	1.6 / 0.78	40:1	6.9-66	10-90	Variable	304	499	286	719		9004	
59	368	1/2	1.6 / 0.78	30:1	9.2-88	10-90	Variable	268	368	239	647		9003	
88	274	1/2	1.6 / 0.78	20:1	14-132	10-90	Variable	210	274	176	569		9002	
176	158	1/2	1.6 / 0.78	10:1	28-264	10-90	Variable	88	158	97	447		9001	



**APPLICATIONS:** Washdown and outdoor applications found in factory, rooftop, or agricultural settings such as chemical injection pumps for the oil and gas industry



### Class I / Division 1 Gearmotors for Hazardous Locations Inverter-Duty AC and Brushless DC

- UL Listed for environments where ignitable concentrations of flammable gases, vapors or liquids are likely to exist
- BLDC: type 34B-FX, 12 and 24 VDC, 8-Pole, 120° commutation

Fixed Speed Rating					Variable Speed (SOA Ratings <sup>1</sup> )							Radial Load (Lb-in.)	Product Type	Model Number	
Speed (rpm)	Rated Torque (lb-in)	Motor (HP)	Rated Current (A)		Speed (rpm)	Frequency Range (Hz)	Torque Type	Torque (lb-in)							
			230V	460V				Gear Ratio	@10 Hz	@60 Hz	@90 Hz			230VAC	460VAC

**Inverter-Duty AC Gearmotor: 34R6-FX: Three-Phase, , Explosion-Proof Class I, Division 1  
230 or 460 VAC (TENV), IP-66, TENV (Groups C and D; Temperature Codes T3C and T4A)**

5.3	350	1/4	0.98	0.49	300:1	0.7-7.9	10-90	Constant	350	350	350	274	34R6BXPP-FX4	3229	3274
8.9	350	1/4	0.98	0.49	180:1	1.2-13	10-90	Constant	350	350	350	274	34R6BXPP-FX4	3228	3273
13	350	1/4	0.98	0.49	120:1	1.8-20	10-90	Constant	350	350	350	274	34R6BXPP-FX4	3227	3272
27	350	1/4	0.98	0.49	60:1	3.6-40	10-90	Variable	350	350	321	274	34R6BXPP-FX3	3226	3271
40	265	1/4	0.98	0.49	40:1	5.4-59	10-90	Variable	257	265	214	300	34R6BXPP-FX3	3225	3270
53	267	1/4	0.98	0.49	30:1	7.1-79	10-90	Variable	192	267	160	300	34R6BXPP-FX3	3224	3269
80	178	1/4	0.98	0.49	20:1	11-119	10-90	Variable	128	178	107	300	34R6BXPP-FX3	3223	3268
107	133	1/4	0.98	0.49	15:1	14-158	10-90	Variable	96	133	80	300	34R6BXPP-FX2	3222	3267
160	89	1/4	0.98	0.49	10:1	21-237	10-90	Variable	64	89	53	300	34R6BXPP-FX2	3221	3266
320	46	1/4	0.98	0.49	5:1	43-474	10-90	Variable	33	46	28	60	34R6BXPP-FX1	3220	3265

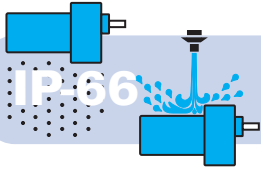
Speed (rpm)		Torque (lb-in)		Power (HP)		Rated Current (Amps)		Gear Ratio	Radial Load (lbs)	Product Type	Model Number	
12VDC	24VDC	12VDC	24VDC	12VDC	24VDC	12VDC	24VDC				12VDC	24VDC

**Brushless DC Gearmotor: 34B6-FX 12V or 24 VDC, TENV Explosion-Proof Class I, Division 1**

7.3	9.3	350	350	0.47 <sup>2</sup>	0.66 <sup>2</sup>	38	25	300:1	274	34B6BXBL-FX4	3209	3219
12	16	350	350	0.47	0.66	38	25	180:1	274	34B6BXBL-FX4	3208	3218
18	23	350	350	0.47	0.66	38	25	120:1	274	34B6BXBL-FX4	3207	3217
37	47	350	350	0.47	0.66	38	25	60:1	274	34B6BXBL-FX3	3206	3216
55	70	265	265	0.47	0.66	38	25	40:1	291	34B6BXBL-FX3	3205	3215
73	93	270	270	0.47	0.66	38	25	30:1	300	34B6BXBL-FX3	3204	3214
110	140	240	240	0.47	0.66	38	25	20:1	300	34B6BXBL-FX3	3203	3213
147	187	181	186	0.47	0.66	38	25	15:1	300	34B6BXBL-FX2	3202	3212
220	280	121	124	0.47	0.66	38	25	10:1	300	34B6BXBL-FX2	3201	3211
440	560	58	58	0.47	0.66	38	25	5:1	56	34B6BXBL-FX1	3200	3210

<sup>1</sup> SOA: Contact the factory for detailed speed/torque information (Safe Operating Area).

<sup>2</sup> The radial (overhung) load ratings are calculated at 20mm (.787 in) from the end of the shaft on either side.



**APPLICATIONS:** Washdown and outdoor applications found in factory, rooftop, or agricultural settings such as chemical injection pumps for the oil and gas industry

## PMDC Planetary Gearmotors Type 24A-60P (with optional shaft seal kit)

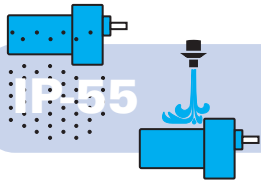
- Twice the torque of conventional helical/spur parallel shaft gearboxes of similar size
- Lower-cost alternative to high-end servo systems
- Unvented gearhousing mounts in any orientation
- Permanently lubricated with high-performance lubricant



Speed (rpm)	Rated Torque (lb-in.)	Rate Current (Amps)	Peak Torque (lb-in.)	Power (HP)	Gear Ratio	Radial Load (lbs.)	Product Type	Model Number
<b>90/130VDC, Totally Enclosed, Non-ventilated, Class F Insulation</b>								
11 / 15	176 / 226	0.56 / 0.81	315	1/23 / 1/11	162.1:1	145	24A4BEPM-60P3	7011
19 / 28	96 / 151	0.56 / 0.81	278	1/23 / 1/11	89.9:1	120	24A4BEPM-60P3	7009
27 / 39	72 / 113	0.56 / 0.81	254	1/23 / 1/11	64:1	107	24A4BEPM-60P2	7008
57 / 83	34 / 54	0.56 / 0.81	245	1/23 / 1/11	30.4:1	86	24A4BEPM-60P2	7006
101 / 147	19 / 30	0.56 / 0.81	182	1/23 / 1/11	17.1:1	72	24A4BEPM-60P2	7004
136 / 197	14 / 22	0.56 / 0.81	136	1/23 / 1/11	12.7:1	66	24A4BEPM-60P2	7003
216 / 313	10 / 15	0.56 / 0.81	91	1/23 / 1/11	8:1	56	24A4BEPM-60P1	7002
454 / 658	4.6 / 7.1	0.56 / 0.81	43	1/23 / 1/11	3.8:1	44	24A4BEPM-60P1	7001

<sup>1</sup> SOA: Contact the factory for detailed speed/torque information (Safe Operating Area).

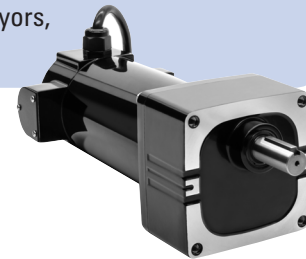
<sup>2</sup> The radial (overhung) load ratings are calculated at 20mm (.787 in) from the end of the shaft on either side.



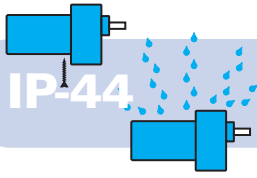
**APPLICATIONS:** Industrial automation applications such as conveyors, pumps, and packaging equipment

## PMDC Low Voltage 12VDC Type 33A-WX

- Ideal for mobile or remote location, battery or solar-powered applications.
- 12VDC (at 2500 rpm). Insulation Class F. TENV.
- Cartridge style brushes for easy routine brush maintenance, and longer life.



Speed (rpm)	Rated Torque (lb-in.)	Rate Current (Amps)	Motor (HP)	Gear Ratio	Peak Torque (lb-in.)	Radial Load (lbs.) <sup>2</sup>	Product Type	Item Number
<b>12 VDC, Totally Enclosed, Non-ventilated, Class F Insulation with 2500 rpm windings, Rated IP-55</b>								
26	185	14	1/6	97.5:1	263	300	33A7BEPM-WX4	1229
38	190	14	1/6	65.5:1	251	290	33A7BEPM-WX3	1228
57	142	14	1/6	43.9:1	222	262	33A7BEPM-WX3	1226
123	70	14	1/6	20.4:1	221	234	33A7BEPM-WX2	1225
266	29	14	1/6	9.4:1	124	199	33A7BEPM-WX2	1224
455	17	14	1/6	5.5:1	72	173	33A7BEPM-WX2	1223



IP-44

**APPLICATIONS:** Industrial automation equipment such as conveyors, pumps, and packaging equipment



### AC Fixed speed and Inverter-Duty Gearmotors CI/D2 Type 34R-FX

- Meets NEC Class I/Division 2 (Groups A, B, C, and D) for applications in hazardous locations
- Rated for up to +40°C ambient. Environmental
- UL Listed for US and Canada

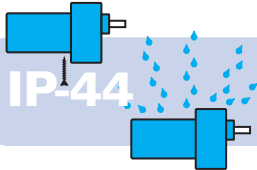
Fixed Speed Rating					Variable Speed (SOA) Ratings <sup>1</sup>							Product Type	Model Number
Speed (rpm)	Torque (lb-in)	Power (HP)	Rated Current (Amps)	Gear Ratio	Speed Range (rpm)	Frequency Range (Hz)	Torque Type	Torque (lb-in)					
								@10 Hz	@60 Hz	@90 Hz			
<b>Inverter-Duty AC: 230/460 VAC, Three-Phase, Non-Synchronous, TENV</b>													
5.7	350	1/6	1.0 / 0.53	300:1	0.4-7.3	10-90	Constant	350	350	350	34R4BFPP-FX4	3259	
9.4	350	1/6	1.0 / 0.53	180:1	0.7-12	10-90	Constant	350	350	350	34R4BFPP-FX4	3258	
14	350	1/6	1.0 / 0.53	120:1	1.0-18	10-90	Constant	350	350	350	34R4BFPP-FX4	3257	
28	321	1/6	1.0 / 0.53	60:1	2.0-36	10-90	Variable	257	350	350	34R4BFPP-FX3	3256	
43	214	1/6	1.0 / 0.53	40:1	3.0-55	10-90	Variable	171	265	265	34R4BFPP-FX3	3255	
57	160	1/6	1.0 / 0.53	30:1	4.0-73	10-90	Variable	128	255	221	34R4BFPP-FX3	3254	
85	107	1/6	1.0 / 0.53	20:1	6.0-110	10-90	Variable	86	170	147	34R4BFPP-FX3	3253	
113	80	1/6	1.0 / 0.53	15:1	8.0-145	10-90	Variable	64	127	111	34R4BFPP-FX2	3252	
170	53	1/6	1.0 / 0.53	10:1	12-218	10-90	Variable	43	85	74	34R4BFPP-FX2	3251	
340	28	1/6	1.0 / 0.53	5:1	24-436	10-90	Variable	22	44	38	34R4BFPP-FX1	3250	

Speed (rpm)	Rated Torque (lb-in)	Power (Hp)	Voltage (VAC)	Frequency (Hz)	Phase	Current (Amps)	Gear Ratio	Radial Load (Lbs)	Product Type	Model Number
<b>Fixed Speed AC: Permanent Split Capacitor, Non-synchronous 3-Wire-Reversible (TEFC)</b>										
<b>Capacitor is pre-installed</b>										
5.7	350	1/7	115	60	1	1.6	300:1	274	34R6BFCE-FX4	3249
9	350	1/7	115	60	1	1.6	180:1	274	34R6BFCE-FX4	3248
14	350	1/7	115	60	1	1.6	120:1	274	34R6BFCE-FX4	3247
28	273	1/7	115	60	1	1.6	60:1	300	34R6BFCE-FX3	3246
43	182	1/7	115	60	1	1.6	40:1	300	34R6BFCE-FX3	3245
57	137	1/7	115	60	1	1.6	30:1	300	34R6BFCE-FX3	3244
85	91	1/7	115	60	1	1.6	20:1	300	34R6BFCE-FX3	3243
113	68	1/7	115	60	1	1.6	15:1	300	34R6BFCE-FX2	3242
170	46	1/7	115	60	1	1.6	10:1	300	34R6BFCE-FX2	3241
340	24	1/7	115	60	1	1.6	5:1	62	34R6BFCE-FX1	3240

These gearmotors are supplied with a factory-installed large terminal box, terminal block, and PSC models with pre-wired run capacitor (27.5 µF/250 VAC).

<sup>1</sup> SOA: Contact the factory for detailed speed/torque information (Safe Operating Area).

<sup>2</sup> The radial (overhung) load ratings are calculated at 20mm (.787 in) from the end of the shaft on either side.



IP-44

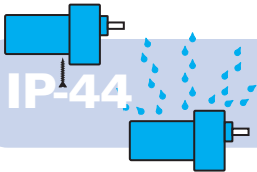
**APPLICATIONS:** Industrial automation equipment such as conveyors, pumps, and packaging equipment



### Brushless DC Gearmotors Type 22B-60P

- Up to twice the torque of conventional helical / spur parallel shaft gearboxes of similar size.
- Encoder-compatible with optional screw-in encoder shaft kit.
- Requires a 130V brushless DC control set for 120° commutation angle

Speed (rpm)	Rated Torque (lb-in.)	Rate Current (Amps)	Peak Torque (lb-in.)	Power (HP)	Gear Ratio	Radial Load (lbs.)	Product Type	Item Number
<b>130VDC, Totally Enclosed, Non-ventilated, Class B, Encoder Shaft Option; IP-44</b>								
15	226	0.88	315	1/8	162:1	145	22B4FEBL-60P3	7030
28	218	0.88	278	1/8	89:1	120	22B4FEBL-60P3	7029
39	176	0.88	254	1/8	64:1	107	22B4FEBL-60P2	7028
82	84	0.88	245	1/8	30:1	86	22B4FEBL-60P2	7026
146	47	0.88	229	1/8	17:1	72	22B4FEBL-60P2	7024
197	35	0.88	170	1/8	13:1	66	22B4FEBL-60P2	7023
313	24	0.88	114	1/8	8:1	56	22B4FEBL-60P1	7022
658	11	0.88	54	1/8	4:1	44	22B4FEBL-60P1	7021



**APPLICATIONS:** Industrial automation equipment such as conveyors, pumps, and packaging equipment



**Brushless DC INTEGRAmotor Gearmotors Type 34B/SR-WX**

- Meets NEC Class I / Division 2 standards for use in hazardous environments.
- Easy to use, easy to set up brushless DC, PWM motor speed control.
- Face mount is standard.

Speed (rpm)	Rated Torque (lb-in)		Power (HP)		Control Input Continuous Amps		Gear Ratio	Radial Load (lbs)	Product Type	Model Number	
	12 VDC	24 VDC	12 VDC	24 VDC	12 VDC	24 VDC				12 VDC	24 VDC
8	205	205	1/5	1/4	19.0	11.0	312.4:1	130	34B4BEBL/SR-WX4	3293	3893
15	200	200	1/5	1/4	19.0	11.0	172.1:1	130	34B4BEBL/SR-WX4	3292	3892
26	185	185	1/5	1/4	19.0	11.0	97.5:1	140	34B4BEBL/SR-WX4	3290	3890
38	190	190	1/5	1/4	19.0	11.0	65.5:1	140	34B4BEBL/SR-WX3	3288	3888
46	185	185	1/5	1/4	19.0	11.0	54.7:1	130	34B4BEBL/SR-WX3	3287	3887
57	180	181	1/5	1/4	19.0	11.0	43.9:1	130	34B4BEBL/SR-WX3	3286	3886
84	121	153	1/5	1/4	19.0	11.0	29.7:1	160	34B4BEBL/SR-WX3	3285	3885
123	88	111	1/5	1/4	19.0	11.0	20.4:1	60	34B4BEBL/SR-WX2	3284	3884
181	56	71	1/5	1/4	19.0	11.0	13.8:1	65	34B4BEBL/SR-WX2	3283	3883
266	36	46	1/5	1/4	19.0	11.0	9.4:1	80	34B4BEBL/SR-WX2	3282	3882
455	21	27	1/5	1/4	19.0	11.0	5.5:1	90	34B4BEBL/SR-WX2	3280	3880
658	15	18	1/5	1/4	19.0	11.0	3.8:1	65	34B4BEBL/SR-WX2	3279	3879

Visit [bodine-electric.com](http://bodine-electric.com) for IP-rated gearmotor accessories, as well as hollow shaft kits and covers, terminal boxes, mounting brackets and more.

Models 0976, 0977, and 0978 IP-44 kits provide additional protection for most type 24A, 33A, and 42A PMDC gearmotors and motors



Model 0960 Flange kit for type 60P planetary gearmotors provides IP-66 rated performance.



Bodine Electric Company offers over 1,500 standard stock products, and thousands of custom designed fractional horsepower (FHP) gearmotors, motors and motion controls (fixed and variable speed AC, brushless DC, and permanent magnet DC). Bodine gearmotors and motors are designed for demanding industrial and commercial applications such as medical devices, scientific and laboratory equipment, labeling equipment, pumping equipment, printing presses, packaging equipment, and factory automation. Bodine Electric is located in Peosta, Iowa, U.S.A. Bodine's quality management system is certified to ISO 9001.



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