Bray®

THE HIGH PERFORMANCE COMPANY

Series 70
Electric Actuator
Technical Manual

TM-1055 Electric Actuators - 6/2017

Technical Manual - Table of Contents

Sizes 003-065

Sizes 130-180

Specifications

CONSTRUCTION	
Housing	ASTM B85 pressure die cast aluminum Polyester powder coated Seacorr coated (optional)
Exposed Fasteners	Stainless steel
Travel Stops	Externally adjustable at both 0 and 90 degrees
Conduit Entries	S70-003 to S70-006: 2 x 1/2" NPT or 2 x M20 S70-008 to S70-180: 2 x 3/4" NPT or 2 x M25
Worm Gearing	Worm: Chromoly, self locking Worm gear: Aluminum bronze
Spur Gearing	AGMA class 9, nitride hardened alloy steel
Bearings	Indicator shaft and motor gear: Permanently sealed ball bearing Worm shaft: Sintered bronze bushing with heavy duty thrust bearing
Lubrication	High temperature synthetic grease
Motor	120/220 VAC: Single phase, reversible, permanent split capacitor induction motor 24V: Permanent magnet-brush DC motor
Capacitor	110/220 VAC: Metalized polyester
Heater	Optional, 5 watt PTC style
Terminal Strip	Switch Plate: 12 - 22 AWG (2.0 - 0.65mm) Servo: 14 - 24 AWG (1.63 - 0.51mm)
Torque Limiting	Optional, open and close preset at factory
Limit Switches	SPDT: 120VAC -10A-1/3 HP 220VAC -10A-1/2 HP 250VDC - 1/4A 12VDC - 2A

PERFORMANCE	
Output Torque	See Torque Chart
Voltages	See Motor Chart
Ambient Temperature	-20°F to 150°F (-29°C to 65°C)
Motor Insulation	120/ 220 VAC: Class F, 311°F (155°C) thermal trip at 275°F (135°C) 24V: Class B, slow blow fuse 5A@250VAC
Continuous Duty	Will operate continuously at a max. ambient temperature of 104°F (40°C)
Intermittent Duty (25%):	One motor-on period followed by three motor-off periods
Manual Operation	Pull to engage, push to disengage
Enclosure	Designed to meet NEMA Type 4, 4x and IP65 specifications
Certifications	UL, CSA and CE approved (most models) UL approved (USA & Canadian Std) for hazardous location S70-708 to S70-720: 120VAC Class I, DIV 1 & 2, Group C, D Class II, DIV 1 & 2, Group E, F, G

Battery Backup Unit (BBU) 24V Specifications

CONSTRUCTION AND PERFORMANCE	
Housing	ASTM B85 pressure die cast aluminum Polyester powder coated Seacorr coated (optional)
Exposed Fasteners	Stainless steel
Batteries	Two 12V 1.4AH sealed lead acid batteries wired in series
Battery Monitoring	Local LED indicator and voltage free 2-wire normally open contact for remote monitoring
Battery Charging	Automatic smart charge
Battery Conservation	Shut-off batteries after one minute or when actuator stops
Operating Temperature	-4°F (-20°C) to 122°F (50°C) LED light may not function below -20°F (-29°C)
Power Protection	Two 5 amp fuses, one for the external power output circuit and the other for the battery output circuit
Current Draw @ 24 VAC	BBU only maximum 10mA standby (0.25 VA) Max. 420mA charging (10 VA)
Current Draw of Actuator with BBU	600 lb-in - 1.9A (with load) 2,000 lb-in - 2.7A (with load) 5,000 lb-in - 4.1A (with load)
Power Requirements	24-27VAC or 30-38VDC (the minimum voltage is required to provide proper battery charging) Use dedicated Class 2 non-bonded transformer rated 100VA per BBU
Power Output	BBU output with 24VAC supply is 30-38 VDC On failure of AC supply, battery output is 24-25.5 VDC BBU will provide fail open or fail close operation

BATTERY SPECIFICATIONS	
Batteries	Two 12 volt 1.4 ampere-hour (AH) rechargeable sealed lead acid battery wired in series
Features	Valve regulated, spill proof construction allows safe operation in any position Rugged impact resistant ABS case and cover (UL94-HB) U.L. Recognized under file number MH 20845
Specifications	Battery case: ABS plastic Maximum discharge current (7 minutes): 4.2 amperes Shelf Life (% of nominal capacity at 68°F (20°C) 1 month = 97% 3 months = 91% 6 months = 83%
Operating Temperature	Charge: -4°F to 122°F (-20°C to 50°C) Discharge: -40°F to 140°F (-40°C to 60°C) The BBU should be powered up for a minimum of 12 hours

Although charging will not work at -4°F (-20°C), the batteries will still hold their charge for an extended period of time as described under Shelf Life. See Bray Series 70 BBU Operation and Maintenance Manual for detailed information.

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Torque and Motor Data

		S70-003	S70-006	S70-008 S70-708*	S70-012 S70-712*	S70-020 S70-720*	S70-030	S70-050	S70-065	S70-130	S70-180
Torque	lb-in	300	600	800	1200	2000	3000	5000	6500	13000	18000
	Nm	34	68	90	136	226	339	565	734	1469	2034
MANUAL OVERRIDE											
Handwheel Dia.	in	3.5	3.5	8	8	8	12	12	12	12	12
	mm	89	89	203	203	203	300	300	300	300	300
Gear Ratio		30:1	30:1	30:1	30:1	30:1	30:1	30:1	30:1	90:1	90:1
Rim Pull	lbs	16	32	18	28	46	37	62	80	80	80
	kg	7.2	14.5	8.2	12.7	20.8	16.8	28.1	36.3	36.3	36.3
Actuator Weight Approx.	lbs	11	11	25	25	27	45	46	45	118	118
	kg	5	5	11	11	12	20	21	20	54	54

* Hazardous Location Units

120VAC

Travel Time 90° (Sec)		S70-003		S70-006		S70-008 S70-708*		S70-012 S70-712*		S70-020 S70-720*		S70-030		S70-050		S70-065		S70-130		S70-180	
		Current Draw in Amps																			
60 Hz	50 Hz	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA
10	12					1.20	2.10	1.40	2.30												
15	18					0.78	2.10	1.20	2.10	1.70	2.30										
18	22											1.80	3.00	2.30	3.10						
30	36	0.60	1.00	0.80	1.00	0.60	2.10	0.78	2.10	1.00	2.10	1.20	3.00	1.60	3.00	2.30	3.10				
110	132																	2.30	3.10	2.50	3.10

* Hazardous Location Units

220VAC

Travel Time 90° (Sec)		S70-003		S70-006		S70-008 S70-708		S70-012 S70-712		S70-020 S70-720		S70-030		S70-050		S70-065		S70-130		S70-180	
		Current Draw in Amps																			
60 Hz	50 Hz	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA
10	12					0.50	0.76	0.60	0.81												
15	18					0.38	0.90	0.50	0.76	0.55	0.90										
18	22											0.78	1.40	1.10	1.40						
30	36	0.60	0.75	0.65	0.75	0.38	0.90	0.45	0.90	0.50	0.81	0.75	1.2	0.90	1.40	1.10	1.40				
110	132																	1.30	2.70	1.50	2.70

FLA - Full Load Amperage
LRA - Locked Rotor Amperage

24VAC

Travel Time 90° (Sec)		S70-006	S70-012	S70-050
		Current Draw in Amps		
60 Hz	50 Hz	FLA	FLA	FLA
60	72	1.80	2.00	4.00

24VDC

Travel Time 90° (Sec)	S70-006	S70-012	S70-050
	Current Draw in Amps		
	FLA	FLA	FLA
40	1.80		
60		2.00	4.00

Travel Time - Motors

30, 40, 60, 110 second motors are continuous duty
10, 15, 18 second motors are intermittent duty

For all other information such as dimensional drawings, wiring diagrams, and EDS files please visit www.bray.com or contact your local Bray representative.

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Actuator Mounting

Imperial (in)

Actuator Size	Inner Bolt Circle				Outer Bolt Circle				Stem Hole			
	Bolt Circle		No. Holes	Bolt Size	Bolt Circle		No. Holes	Bolt Size	Dia.	Across Flats	Depth	Keyway Width
S70-003	F07	2.76	4	5/16 - 18	-	-	-	-	0.75	0.51	1.75	-
S70-006	F07	2.76	4	5/16 - 18	-	-	-	-	0.75	0.51	1.75	-
S70-008 S70-708	F07	2.76	4	5/16 - 18	F12	4.92	4	1/2 - 13	1.18	0.87	2.20	-
S70-012 S70-712	F07	2.76	4	5/16 - 18	F12	4.92	4	1/2 - 13	1.18	0.87	2.20	-
S70-020 S70-720	F07	2.76	4	5/16 - 18	F12	4.92	4	1/2 - 13	1.18	0.87	2.20	-
S70-030	F12	4.92	4	1/2 - 13	F16	6.50	4	3/4 - 10	1.97	-	2.60	2 x 7/16
S70-050	F12	4.92	4	1/2 - 13	F16	6.50	4	3/4 - 10	1.97	-	2.60	2 x 7/16
S70-065	F12	4.92	4	1/2 - 13	F16	6.50	4	3/4 - 10	1.97	-	2.60	2 x 7/16
S70-130	F12	4.92	4	1/2 - 13	F16	6.50	4	3/4 - 10	1.97	-	5.40	4 x 7/16
S70-130	F12	4.92	4	1/2 - 13	F16	6.50	4	3/4 - 10	2.50	-	5.40	4 x 5/8
S70-180	F12	4.92	4	1/2 - 13	F16	6.50	4	3/4 - 10	1.97	-	5.40	4 x 7/16
S70-180	F12	4.92	4	1/2 - 13	F16	6.50	4	3/4 - 10	2.50	-	5.40	4 x 5/8

Metric (mm)

Actuator Size	Inner Bolt Circle				Outer Bolt Circle				Stem Hole			
	Bolt Circle		No. Holes	Bolt Size	Bolt Circle		No. Holes	Bolt Size	Dia.	Across Flats	Depth	Keyway Width
S70-003	F07	70	4	M8 x 1.25	-	-	-	-	19	13	44.5	-
S70-006	F07	70	4	M8 x 1.25	-	-	-	-	19	13	44.5	-
S70-008	F07	70	4	M8 x 1.25	F12	125	4	M12 x 1.25	30	22	55.9	-
S70-012	F07	70	4	M8 x 1.25	F12	125	4	M12 x 1.25	30	22	55.9	-
S70-020	F07	70	4	M8 x 1.25	F12	125	4	M12 x 1.25	30	22	55.9	-
S70-030	F12	125	4	M12 x 1.75	F16	165	4	M20 x 1.75	50.04	-	66	2 x 12.0
S70-050	F12	125	4	M12 x 1.75	F16	165	4	M20 x 1.75	50.04	-	66	2 x 12.0
S70-065	F12	125	4	M12 x 1.75	F16	165	4	M20 x 1.75	50.04	-	66	2 x 12.0
S70-130	F12	125	4	M12 x 1.75	F16	165	4	M20 x 1.75	50.04	-	137.2	4 x 12.0
S70-130	F12	125	4	M12 x 1.75	F16	165	4	M20 x 1.75	63.50	-	137.2	4 x 16.0
S70-180	F12	125	4	M12 x 1.75	F16	165	4	M20 x 1.75	50.04	-	137.2	4 x 12.0
S70-180	F12	125	4	M12 x 1.75	F16	165	4	M20 x 1.75	63.50	-	137.2	4 x 16.0

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Standard Drawings

Standard Dimensional Drawings	
Imperial Standard	GA-17500
Metric Standard	GA-17499
Imperial Hazardous Location	ES11A-0526
Imperial 13,000-18,000 lb-in	ES11A-0708
Metric 13,000-18,000 lb-in	ES12A-0708

Standard Wiring Diagrams	
120/220 VAC On/Off w/ IRB	WD-000044
120/220 VAC Servo NXT	WD-000338
120/220 VAC Servo Pro	WD-000116
24 VAC On/Off w/Aux Switch - S70-003 to 006	WD-000276
24 VAC On/Off w/Aux Switch - S70-008 to 020	WD-000234
24 VAC On/Off w/Aux Switch - S70-030 to 065	WD-000111
24 VAC Servo Pro	WD-000145
BBU 24V On/Off w/ Aux Switch - S70-003 to 006	WD-000285
BBU 24V On/Off w/ Aux Switch - S70-008 to 020	WD-000289
BBU 24V On/Off w/ Aux Switch - S70-030 to 065	WD-000270
BBU 24V Servo Pro w/ Aux Switch - S70-003 to 006	WD-000159
BBU 24V Servo Pro w/ Aux Switch - S70-008 to 065	WD-000266

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