



## Series 70 (Modulating) — Submittal/Technical Data

800-18,000 lb.-in. — Non-Spring Return — Modulating — Auxiliary Switches

Construction		
Housing	ASTM B85 Pressure Die Cast Aluminum - Polyester Powder Coated	
Motor	120 VAC 24 VAC/DC	Single Phase, Reversible, Permanent Split Capacitor Induction Motor Permanent Magnet-Brush D.C. Motor
Heater	5 Watt PTC style (Heater operation required for humid environments)	
Terminal Strip	Switch Plate Servo	12 - 22 AWG (2.0 - 0.65mm) 14 - 24 AWG (1.63 - 0.51mm)
Torque Limiting	Optional, Open and Closed preset at factory - Standard on 13,000 & 18,000 lb.-in.	
Auxiliary/Limit Switches: SPDT	120 VAC	10A - 1/3 HP
	220 VAC	10A - 1/2 HP
	250 VDC	1/4A
	12 VDC	2A
Exposed Fasteners	Stainless Steel	
Travel Stops	Externally adjustable at both 0 and 90 degrees	
Conduit Entries	800 lb.-in.	Two 1/2" NPT
	1200 lb.-in. and Higher	Two 3/4" NPT
Weight	See Dimensions	
Enclosure	Designed to meet NEMA Type 4, 4x and IP65 specifications	
Warranty	3 Years	
Certifications	UL/CSA 120V. CE 24 & 120V	

Operating Conditions		
Motor Insulation	120 VAC: 24 VAC/DC:	Class F, 311°F (155°C) thermal trip at 275°F (135°C) Class B, Fast Blow Fuse 5A 250 VAC
Ambient Temperature	-20 to 150°F (-29° to 65°C)	
Continuous Duty	Will operate continuously at a maximum ambient temperature of 104°F (40°C)	
Manual Operation	Pull to Engage, Push to Disengage - 30:1 drive ratio, 13 & 18K lb.-in. models are 90:1	

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

Torque and Motor Data						
24 V Models	Voltage 50/60 Hz	(lb.in)	(NM)	Stroke Time*	Full Load Amps	Power Consumption VA
70-24-0081SVH	24 VAC/DC	800	90	60 Sec.	2.90	70
70-24-0201SVH	24 VAC/DC	2000	226	80 Sec.	3.50	84
70-24-0501SVH	24 VAC/DC	5000	565	90 Sec	4.00	96

All 24V current ratings include heaters and servos

- 24V heater = 208 mA
- 24V modulating servo current draw = 0.3 A

Torque and Motor Data						
120 VAC Models	Voltage 50/60 Hz	(lb.in)	(NM)	Stroke Time*	Full Load Amps	Locked Rotor Amps
70-0081SVH	120 VAC	800	90	30 Sec	0.80	1.00
70-0121SVH	120 VAC	1,200	135	30 Sec	0.75	2.10
70-0201SVH	120 VAC	2,000	226	30 Sec	0.85	2.10
70-E301SVH	120 VAC	3,000	339	30 Sec	1.00	2.10
70-0501SVH	120 VAC	5,000	565	30 Sec	1.60	3.00
70-0651SVH	120 VAC	6,500	734	30 Sec	2.30	3.10
70-1300SVH	120 VAC	13,000	1,470	110 Sec	2.30	3.10
70-1800SVH	120 VAC	18,000	2,034	110 Sec	2.50	3.10

For 120V models, heater and servo current draws are additive

- 120V Heater + 42 mA
- 120V servo + 0.3 A

\*Stroke Times shown are with 60 Hz power.

Actuators with 50 Hz power supply will be 20% slower.

## Series 70 - Servo NXT Specifications

Specifications - Servo NXT		
Power Requirements	120 VAC	+/- 10% (50/60Hz)
	24 VAC	+/- 10% (50/60Hz)
	24 VDC	-10%, + 30%
	5VA	For NXT electronic module alone (see S70 Power Consumption for full power requirements)
	Fuse	5A Fast Blow 5mm x 20mm
Input Signal	Control Signal	4-20mA, 0-10 VDC, 0-5 VDC, 2-10 VDC
	Input impedance	>100 Meg Ohms (0-10V, 2-10V, 0-5V) and 200 Ohms (4-20mA)
Output Signal	Operating Modes	4-20mA, 0-10 VDC, 0-5 VDC
	Output Impedance	<10 Ohms (0-5VDC Output, 0-10V Output) 200 Ohms (4-20mA Output Mode)
	Loop Voltage	12 VDC (4-20mA Output)
Resolution	Absolute Position Accuracy	< 1%
	Dead Band Adjustment	1% (+/- 0.5%) to 6% (+/- 3%) (3% default) 1% minimum increment
Speed Control	Open/Close Speed	0% - 100% (default). Step size: 20%. Actuator open/close speed referenced below
Operating Mode	Normal Mode	Modulating - Follow Setpoint
	Loss of Signal	Settable to Open, Close, or Last
	Reverse Acting Modes	Flashing "ON" LED = Reversed input and output signal Solid "ON" LED = Reversed input and normal output signal
	Auto Calibration	Automation of storing calibration settings
	Manual Operation	Keypad electrical manual operation of actuator (Open, Stop, Close)
	Control Box Operation	Optional inputs available
Torque Protection	Stall Detection	Motor detected stationary > 2 Seconds (800 to 6500 lb.-in. units only)
	Torque Limit	Optional connected Open/Close Torque Limit switch
Environmental	Ambient Temperature	-22°F (-30°C) to 150°F (65°C), Non condensing humidity

**Actuator Open/Close Speed Chart**

Speed Setting	24 VAC/DC	120 VAC	120 VAC 13k/18k
Percentage	Seconds (at x %)		
100	60	30	110
80	119	59	219
60	178	88	328
40	237	117	437
20	296	146	546
0	355	175	655

The Servo NXT offers precise modulating service for accurate position control.

- One touch automatic calibration
- User-friendly interface
- Advanced control of proportional band and dead band
- Automatic pulsing mode for precise positioning
- Self diagnostics
- Action on loss of command signal
- Go to position commands



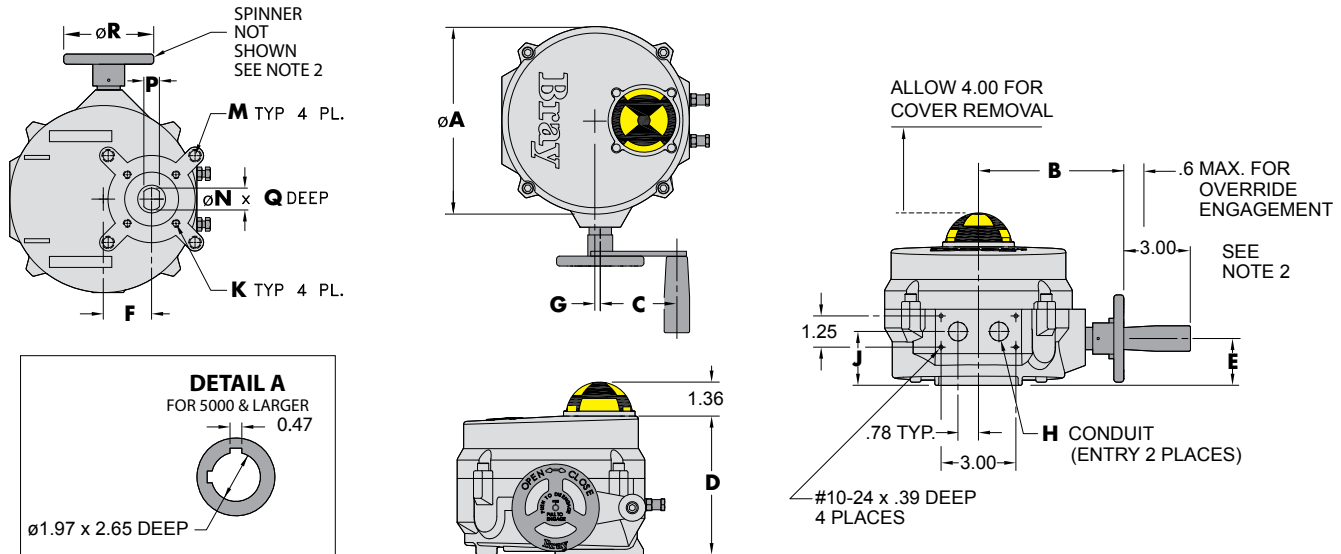
# Series 70 - Dimensions

## 70-0081 TO 70-0651

### Series 70 Actuator - DIMENSIONS In./(mm)

Actuator Model Number	øA	B	C	D	E	F	G	H	J	K (UNC) x B.C. (K x B.C.)	M (UNC) x B.C. (M x B.C.)	N	P	Q	øR	Weight lbs. (kg)
<b>S70-0081</b>	7.5 (191)	5.8 (147)	3.0 (76)	5.6 (141)	1.9 (48)	1.94 (49.2)	.19 (4.7)	1/2 NPT (M20 x 1.5)	2.2 (55)	5/16-18 x ø2.76 (M8 x 1.25 x ø70)	—	.75 (19.0)	.51 (13.0)	1.75 (44.5)	3.5 (89)	13 (6)
<b>S70-0121</b> <b>S70-0201</b> <b>S70-E301</b>	10.1 (256)	7.8 (198)	3.7 (93)	6.6 (168)	2.4 (62)	2.69 (68.3)	.56 (14.3)	3/4 NPT (M25 x 1.5)	2.6 (66)	5/16-18 x ø2.76 (M8 x 1.25 x ø70)	1/2-13 x ø4.92 (M12 x 1.75 x ø125)	1.18 (30.0)	.87 (22.0)	2.22 (56.3)	8.0 (203)	28 (13)
<b>S70-0501</b> <b>S70-0651</b>	12.1 (308)	9.5 (241)	5.5 (139)	7.2 (183)	2.9 (73)	3.19 (80.9)	.56 (14.3)	3/4 NPT (M25 x 1.5)	3.1 (78)	1/2-13 x ø4.92 (M12 x 1.75 x ø125)	3/4-10 x ø6.50 (M20 x 2.5 x ø165)	See Detail A			12.0 (305)	48 (22)

**Note:** Products are sold in **imperial units**; metric dimensions are listed for **reference only**. Items with metric dimensions are different products with different PN's—please contact **BCD Sales** for details.

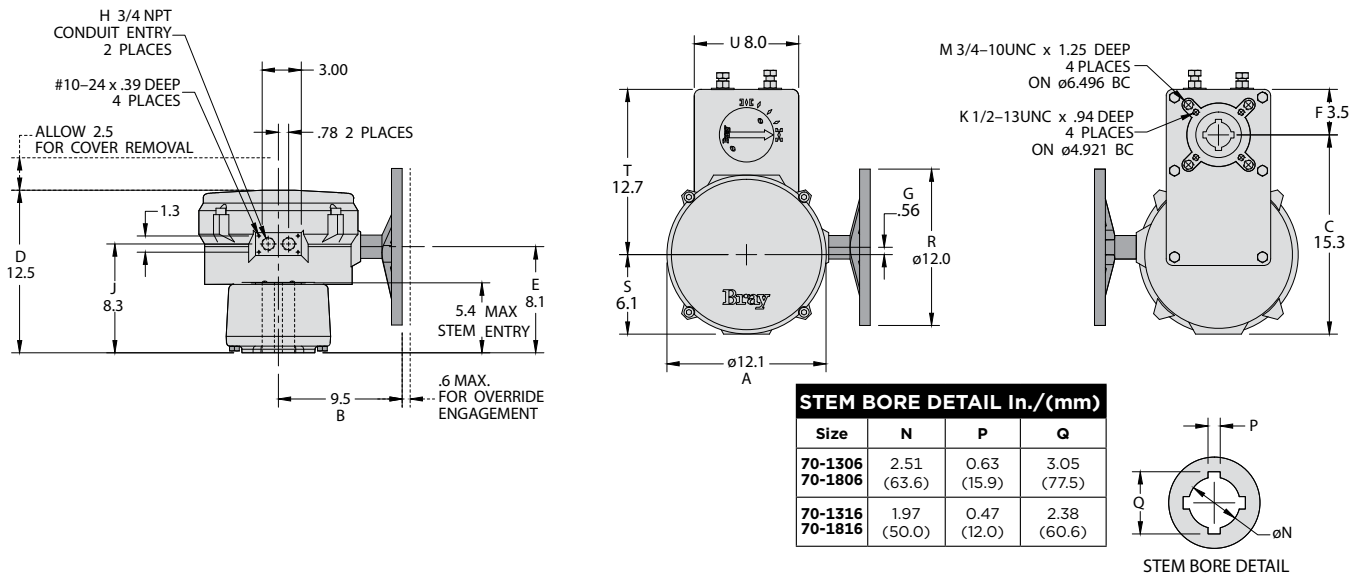


## 70-1300 TO 70-1800

### Series 70 Actuator - DIMENSIONS In./(mm)

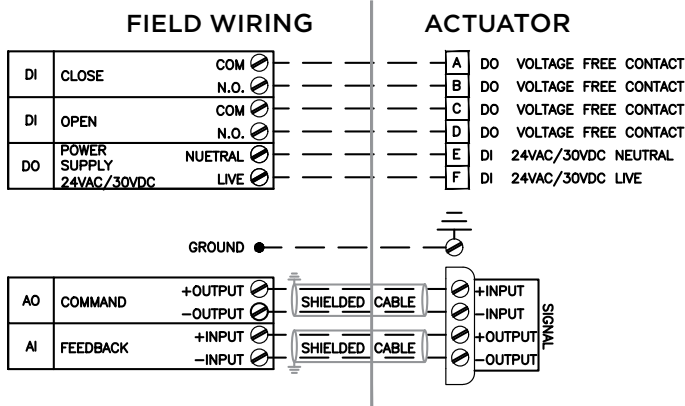
Actuator Model Number	øA	B	C	D	E	F	G	H	J	K (UNC) x B.C. (MM) x B.C.)	M (UNC) x B.C. (MM) x B.C.)	N	P	Q	øR	S	T	U	Weight lbs. (kg)
<b>S70-1300</b> <b>S70-1800</b>	12.1 (308)	9.5 (241)	15.3 (389)	12.5 (316)	8.1 (206)	3.5 (89)	.56 (14.3)	3/4 NPT (M25 x 1.5)	8.3 (211)	1/2-13 x ø4.921 F12 (12 x 125 BC x 23.9)	3/4-10 x ø6.496 F16 (20 x 165 BC x 31.8)	See Stem Bore Detail			12.0 (305)	6.1 (155)	12.7 (322)	8.0 (203)	118 (54)

**Note:** Products are sold in **imperial units**; metric dimensions are listed for **reference only**. Items with metric dimensions are different products with different PN's—please contact **BCD Sales** for details.

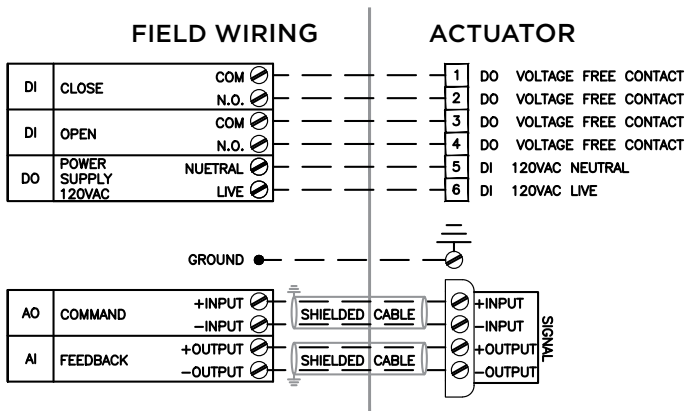


# Series 70 - Wiring - Modulating

70-24-0081SVH / 70-24-0201SVH / 70-24-0501SVH
<b>24VAC/30VDC SERVO NXT</b>
REFERENCE WIRING DIAGRAMS: WD-000347 AND WD-000554



70-0081SVH / 70-0121SVH / 70-0201SVH / 70-E301SVH / 70-0501SVH / 70-0651SVH / 70-1300SVH / 70-1800SVH
<b>120VAC SERVO NXT</b>
REFERENCE WIRING DIAGRAM: WD-000339



## CALIBRATION SEQUENCE:

PLEASE VISIT THE S70 INDUSTRIAL ELECTRIC ACTUATOR SECTION OF OUR WEBSITE AND REFER TO THE QUICK START GUIDE AND VIDEO TUTORIAL LINK IN THE DOCUMENTS SECTION.




## TERMINAL STRIP:


14-24 AWG FOR CONTROLLER & BBU, MAX TIGHTENING TORQUE 3.5 IN-LBS  
14-22 AWG FOR OTHER, MAX TIGHTENING TORQUE 8 IN-LBS  
105 °C, 300V MIN RATED WIRE


## NOTES:


1. HEATER (REQUIRED FOR HUMID ENVIRONMENTS)
2. SWITCHES ARE SPDT (FORM C).
3. WHEN USING 0-10VDC, 0-5 VDC & 2-10VDC, THE COMMON OF THE COMMAND SIGNAL SHOULD NOT BE GROUND/EARTH REFERENCED.
4. COMMAND SIGNAL AND FEEDBACK SIGNAL MUST BE ISOLATED FROM EACH OTHER AND ANY OTHER CIRCUITS.
5. COMMAND SIGNAL & FEEDBACK SIGNAL WIRES SHOULD BE SHIELDED PROPERLY & SHIELD SHOULD BE GROUNDED/EARTHED ON ONE END ONLY, PREFERABLY THE CONTROLLER END.
6. FEEDBACK LOOP IS POWERED BY THE SERVO, DO NOT SUPPLY EXTERNAL POWER.
7. FEEDBACK LOAD DEVICE NOT TO EXCEED 400 OHMS (4-20mA CONFIGURATION).
8. DO NOT INSTALL OR USE THE SERIES 70 ELECTRIC ACTUATOR IN OR NEAR ENVIRONMENTS WHERE CORROSIVE SUBSTANCES OR VAPORS COULD BE PRESENT. EXPOSURE OF THE ELECTRIC ACTUATOR TO CORROSIVE ENVIRONMENTS MAY DAMAGE THE INTERNAL COMPONENTS OF THE DEVICE, AND WILL VOID THE WARRANTY.

## LEGEND:

TERMINAL SYMBOLS   

FIELD WIRING 

FACTORY WIRING 

GROUND 

## FUSE:

FAST BLOW 250V 5A 5x20MM

## LIMIT SWITCH:

125/250VAC, 10A, 1/2 HP  
125/250VDC, 0.25A INDUCTIVE  
125/250VDC, 0.5A RESISTIVE

Wiring Distance (only applicable to 24V actuators)			
Conduit Entries (2) - 3/4" NPT Terminal Block - 14 to 24 AWG. Size wires per NEC guidelines with respect to distance and current draw.			
	Max Distance Between Actuator and Supply - ft		
Torque (in-lbs)	800	2000	5000
I <sub>load</sub> (Amps)	2.90	3.50	4.00
8 GA	3025	741	370
10 GA	1899	465	233
12 GA	1195	293	146
14 GA	752	184	92
16 GA	463	113	57
18 GA	290	71	36