

Bray **CONTROLS**

A Division of BRAY INTERNATIONAL, Inc.



Bray Pneumatic Actuators & Accessories

Technical Manual



Bray Pneumatic Actuators & Accessories

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Actuator Installation Notes

These notes apply to the installation of Bray S92/93 pneumatic valve actuators.

- Verify that the valve and the actuator are both in the same position (both open or both closed) before mounting the actuator to the valve.
- Apply a light coating of grease to the inside of the actuator output bore before installing the actuator on the valve. This will allow the actuator to be more easily removed from the valve stem even after years of service.
- If stem adapters are required to match the actuator output bore to the valve stem, apply a light coating of grease to the inside of the stem adapter as well as the inside of the actuator output bore.
- Some stem adapters are kits consisting of multiple components. These kits may contain spacers that look like stem adapters, but are designed to keep the stem adapter in place during operation of the actuator. Verify that all stem adapters and spacers are installed in the proper position and sequence.
- If keyed stem adapters are used, the key must be held in the keyway so that it will not work loose during operation of the actuator. The key may be retained by any one of several methods:
 If the valve stem height matches the depth of the actuator output bore, use a key that fits the full length of the keyway. Tack weld the key to the adapter before installation in the actuator.
 Upset the end of the keyway after the key has been installed in the shaft by using a punch or chisel.
- If mounting studs are used instead of bolts, thread the studs completely into the actuator before placing the actuator on the valve. This assures that the full strength of the connection is achieved.
- While the mounting bolts are only finger tight, cycle the actuator fully open and fully closed to verify proper alignment on the valve.
- Tighten the mounting bolts or nuts in a diagonal pattern to evenly distribute stress in the bolts.

Actuator Mounting Codes for S92/93 - Imperial (In)

Actuator Sizes	Valve Code	Inner Bolt Circle			Outer Bolt Circle			Stem Hole			
		Bolt Circle (+/- .005)	No. Holes	Bolt Size	Bolt Circle (+/- .005)	No. Holes	Bolt Size	Bore Diameter (+/- .004)	Across Flats (+ .002-.0)	Depth	Keyway Width (+ .002-.0)
48	AA	1.42	4	#10-32	1.97	4	1/4-20	0.4	0.32	1.3	NA
63	A	1.969	4	1/4-20	2.756	4	5/16-18	0.552	0.395	1.38	NA
83	C	1.969	4	1/4-20	2.756	4	5/16-18	0.749	0.513	1.46	NA
93	C	1.969	4	1/4-20	2.756	4	5/16-18	0.749	0.513	1.46	NA
119	E	2.756	4	5/16-18	4.921	4	1/2-13	1.182	0.867	2.2	NA
128	E	2.756	4	5/16-18	4.921	4	1/2-13	1.182	0.867	2.2	NA
160A	E	NA	NA	NA	4.921	4	1/2-13	1.182	0.867	2.2	NA
160B	F	NA	NA	NA	4.921	4	1/2-13	1.38	NA	2.38	0.394
210	G	4.921	4	1/2-13	6.496	4	5/8-11	1.97	NA	2.76	0.472
255A	H	6.496	4	5/8-11	4.724 X 7.874	4	5/8-11	2.505	NA	4.25	0.625
255B	K	6.496	4	5/8-11	4.724 X 7.874	4	5/8-11	3.006	NA	4.25	0.750

Actuator Mounting Codes for S92/93 - Metric (mm)

Actuator Sizes	Valve Code	Inner Bolt Circle			Outer Bolt Circle			Stem Hole			
		Bolt Circle (+/- .127)	No. Holes	Bolt Size	Bolt Circle (+/- .127)	No. Holes	Bolt Size	Bore Dia. (+/- .102)	Across Flats (+ .050-.0)	Depth	Keyway Width
48	AA	36	4	M5 x 0.8P	50	4	M6 x 1.0P	10	8	33	NA
63	A	50	4	M6 x 1.0P	70	4	M8 x 1.25P	14	10	35	NA
83	C	50	4	M6 x 1.0P	70	4	M8 x 1.25P	19	13	37	NA
93	C	50	4	M6 x 1.0P	70	4	M8 x 1.25P	19	13	37	NA
119	E	70	4	M8 x 1.25P	125	4	M12 x 1.75P	30	22	56	NA
128	E	70	4	M8 x 1.25P	125	4	M12 x 1.75P	30	22	56	NA
160A	E	NA	NA	NA	125	4	M12 x 1.75P	30	22	56	NA
160B	F	NA	NA	NA	125	4	M12 x 1.75P	35	NA	60	10
210	G	125	4	M12 x 1.75-6H	165	4	M16 x 2 - 6H	50	NA	70	12
255A	H	165	4	M16 x 2 - 6H	120 x 200	4	M16 x 2 - 6H	64	NA	108	16
255B	K	165	4	M16 x 2 - 6H	120 x 200	4	M16 x 2 - 6H	76	NA	108	19

Pneumatic Actuator Data (Imperial)

Actuator Speeds (Seconds)									
Size	48	63	83	93	119	128	160	210	255
90° Travel	1/4	1/4	1/4	1/4	1/2	1/2	1	2	2 3/4

Note: Times shown are in seconds at 80 PSIG supply pressure with 6ft. tubing having an internal diameter of approximately 1/4". Bray S92/93 actuation times are very dependent on the flow capacity of their air supply. The use of smaller port solenoids, solenoid manifolds, smaller I.D. air supply tubing and/or extended lengths of tubing can significantly reduce the actuation time and/or initial response to the command signal.

Actuator Weights (lbs)									
Size	48	63	83	93	119	128	160	210	255
Double Acting	2.0	3.3	6.3	8.5	18.0	21.5	39.0	78.0	143.5
Spring Return	2.3	3.9	8.1	10.9	23.4	28.1	53.4	111.0	214.9

Weights are in lbs. Spring Return unit weights are with full set of springs on each piston.

Actuator Volumes (in ³)									
Size	48	63	83	93	119	128	160	210	255
Counter-Clockwise	5.7	9.6	24.8	39.0	81.0	106.5	187.5	360.0	750.0
Clockwise	4.8	13.4	32.6	50.1	102.7	140.6	259.6	450.0	900.0

Counter-clockwise: Air volume in cubic inches required to push pistons apart, full travel.

Clockwise: Air volume in cubic inches required to push pistons together, full travel.

Pneumatic Actuator Data (Metric)

Actuator Speeds (Seconds)									
Size	48	63	83	93	119	128	160	210	255
90° Travel	1/4	1/4	1/4	1/4	1/2	1/2	1	2	2 3/4

Note: Times shown are in seconds at 5.5 bar supply pressure with 1.8 meter tubing having an internal diameter of approximately (6.35 mm). Bray S92/93 actuation times are very dependent on the flow capacity of their air supply. The use of smaller port solenoids, solenoid manifolds, smaller I.D. air supply tubing and/or extended lengths of tubing can significantly reduce the actuation time and/or initial response to the command signal.

Actuator Weights (kg)									
Size	48	63	83	93	119	128	160	210	255
Double Acting	0.9	1.5	2.9	3.9	8.2	9.8	17.7	35.4	65.1
Spring Return	1.0	1.8	3.7	4.9	10.6	12.7	24.2	50.3	115.7

Weights are in kg Spring Return unit weights are with full set of springs on each piston.

Actuator Volumes (cm ³)									
Size	48	63	83	93	119	128	160	210	255
Counter-Clockwise	93.4	157.3	406.4	638.6	1327.5	1744.5	3072.6	5899.3	12290.3
Clockwise	78.7	219.6	534.2	820.5	1683.1	2303.3	4254.1	7374.2	14748.4

Counter-clockwise: Air volume in cubic millimeters required to push pistons apart, full travel.

Clockwise: Air volume in cubic millimeters required to push pistons together, full travel.

Series 92 Torque Data

Series 92 Actuator Torque Data (Lb-in)

Double Acting Pneumatic Operated, Torque Output

Actuator Size	Air Supply Pressure (PSIG)				
	40	60	80	100	120
48	75	113	150	188	225
63	145	221	297	373	449
83	351	536	721	906	1091
93	493	753	1013	1272	1532
119	1058	1615	2171	2728	3285
128	1410	2152	2894	3636	4378
160	2797	4270	5742	7214	8687
210	5783	8826	11870	14914	17957
255	14211	21691	29171	36650	44130

Series 92 Actuator Torque Data (N-m)

Double Acting Pneumatic Operated, Torque Output

Actuator Size	Air Supply Pressure (Bar)				
	2.8	4.1	5.5	6.9	8.3
48	9	13	17	21	25
63	16	25	34	42	51
83	40	61	82	102	123
93	56	85	115	144	173
119	120	183	245	308	371
128	159	243	327	411	495
160	316	482	649	815	982
210	653	997	1341	1685	2029
255	1606	2451	3296	4141	4986

Series 93 Actuator Torque Data (Lb-In) Air Operated, With Spring Return, Torque Output

Actuator Size	No. Springs per Piston	Air Supply Pressure (PSIG)										Spring	
		40		60		80		100		120		Spring Start	Stroke End
		Start	End	Start	End	Start	End	Start	End	Start	End		
48	1	51	32	89	70	126	107	164	145	201	182	43	24
	2/1	39	10	77	48	114	85	152	123	189	160	65	36
	2			64	27	101	64	139	102	176	139	86	49
	3/2			52	5	89	42	127	80	164	117	108	61
	3					77	21	115	59	152	96	129	73
63	2	91	65	167	141	243	217	319	293	395	369	80	54
	3	64	27	140	103	216	179	292	255	368	331	118	81
	4			113	65	189	141	265	217	341	293	156	108
	5			86	27	162	103	238	179	314	255	194	135
	6					135	65	211	141	287	217	232	162
83	2	210	167	395	352	580	537	765	722	950	907	184	141
	3	156	76	341	261	526	446	711	631	896	816	275	195
	4			281	176	466	361	651	546	836	731	360	255
	5			220	97	405	282	590	467	775	652	439	316
	6					369	185	554	370	739	555	536	352
93	2	310	232	570	492	830	752	1089	1011	1349	1271	261	183
	3	218	101	478	361	738	621	997	880	1257	1140	392	275
	4			386	231	646	491	905	750	1165	1010	522	367
	5			294	94	554	354	813	613	1073	873	659	459
	6					462	229	721	488	981	748	784	551
119	2	692	469	1249	1026	1805	1582	2362	2139	2919	2696	589	366
	3	509	174	1066	731	1622	1287	2179	1844	2736	2401	884	549
	4			883	437	1439	993	1996	1550	2553	2107	1178	732
	5			700	142	1256	698	1813	1255	2370	1812	1473	915
	6					1073	404	1630	961	2187	1518	1767	1098
128	2	880	465	1622	1207	2364	1949	3106	2691	3848	3433	945	530
	3			1357	733	2099	1475	2841	2217	3583	2959	1419	795
	4			1094	261	1836	1003	2578	1745	3320	2487	1891	1058
	5					1568	529	2310	1271	3052	2013	2365	1326
	6					1302	57	2044	799	2786	1541	2837	1592
160	2	1819	1118	3292	2591	4764	4063	6236	5535	7709	7008	1679	978
	3	1399	349	2872	1822	4344	3294	5816	4766	7289	6239	2448	1398
	4			2452	1123	3924	2595	5396	4067	6869	5540	3147	1818
	5			2030	353	3502	1825	4974	3297	6447	4770	3917	2240
	6					3154	1196	4626	2668	6099	4141	4546	2588
210	2	3833	2508	6876	5551	9920	8595	12964	11639	16007	14682	3275	1950
	3	2859	868	5902	3911	8946	6955	11990	9999	15033	13042	4915	2924
	4			4930	2275	7974	5319	11018	8363	14061	11406	6551	3896
	5			3949	638	6993	3682	10037	6726	13080	9769	8188	4877
	6					6022	2031	9066	5075	12109	8118	9839	5848
255	2	9487	6747	16967	14227	24447	21707	31926	29186	39406	36666	7464	4724
	3	7125	3015	14605	10495	22085	17975	29564	25454	37044	32934	11196	7086
	4			12243	6762	19723	14242	27202	21721	34682	29201	14929	9448
	5			9880	3030	17360	10510	24839	17989	32319	25469	18661	11811
	6					14998	6778	22477	14257	29957	21737	22393	14173

Series 93 Actuator Torque Data (N-m) Air Operated, With Spring Return, Torque Output

Actuator Size	No. Springs per Piston	Air Supply Pressure (Bar)										Spring	
		2.8		4.1		5.5		6.9		8.3		Spring Start	Stroke End
		Start	End	Start	End	Start	End	Start	End	Start	End		
48	1	6	4	10	8	14	12	19	16	23	21	5	3
	2/1	4	1	9	5	13	10	17	14	21	18	7	4
	2			7	3	11	7	16	12	20	16	10	6
	3/2			6	1	10	5	14	9	19	13	12	7
	3					9	2	13	7	17	11	15	8
63	2	10	7	19	16	28	25	36	33	45	42	9	6
	3	7	3	16	12	24	20	33	29	42	37	13	9
	4			13	7	21	16	30	25	39	33	18	12
	5			10	3	18	12	27	20	36	29	22	15
	6					15	7	24	16	32	25	26	18
83	2	24	19	45	40	66	61	86	82	107	103	21	16
	3	18	9	39	30	59	50	80	71	101	92	31	22
	4			32	20	53	41	74	62	95	83	41	29
	5			25	11	46	32	67	53	88	74	50	36
	6					42	21	63	42	84	63	61	40
93	2	35	26	64	56	94	85	123	114	152	144	30	21
	3	25	11	54	41	83	70	113	99	142	129	44	31
	4			44	26	73	56	102	85	132	114	59	42
	5			33	11	63	40	92	69	121	99	75	52
	6					52	26	82	55	111	85	89	62
119	2	78	53	141	116	204	179	267	242	330	305	67	41
	3	58	20	120	83	183	145	246	208	309	271	100	62
	4			100	49	163	112	226	175	289	238	133	83
	5			79	16	142	79	205	142	268	205	166	103
	6					121	46	184	109	247	172	200	124
128	2	99	53	183	136	267	220	351	304	435	388	107	60
	3			153	83	237	167	321	251	405	334	160	90
	4			124	30	207	113	291	197	375	281	214	120
	5					177	60	261	144	345	227	267	150
	6					147	6	231	90	315	174	321	180
160	2	206	126	372	293	538	459	705	625	871	792	190	111
	3	158	39	325	206	491	372	657	539	824	705	277	158
	4			277	127	443	293	610	460	776	626	356	205
	5			229	40	396	206	562	373	728	539	443	253
	6					356	135	523	301	689	468	514	292
210	2	433	283	777	627	1121	971	1465	1315	1809	1659	370	220
	3	323	98	667	442	1011	786	1355	1130	1699	1474	555	330
	4			557	257	901	601	1245	945	1589	1289	740	440
	5			446	72	790	416	1134	760	1478	1104	925	551
	6					680	230	1024	573	1368	917	1112	661
255	2	1072	762	1917	1607	2762	2453	3607	3298	4452	4143	843	534
	3	805	341	1650	1186	2495	2031	3340	2876	4185	3721	1265	801
	4			1383	764	2228	1609	3073	2454	3919	3299	1687	1068
	5			1116	342	1961	1188	2806	2033	3652	2878	2108	1335
	6					1695	766	2540	1611	3385	2456	2530	1601

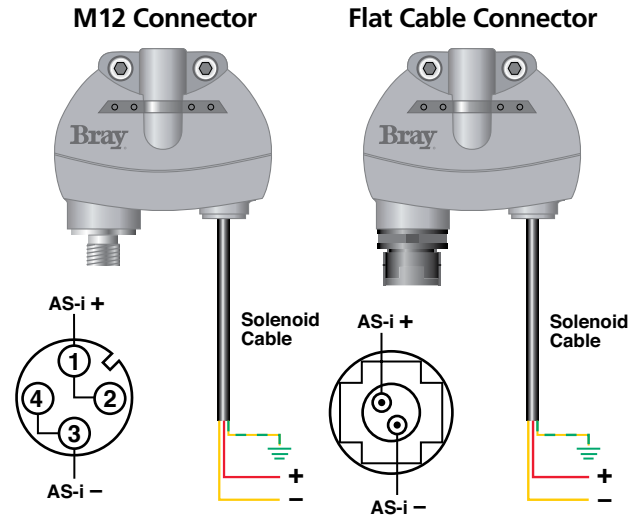
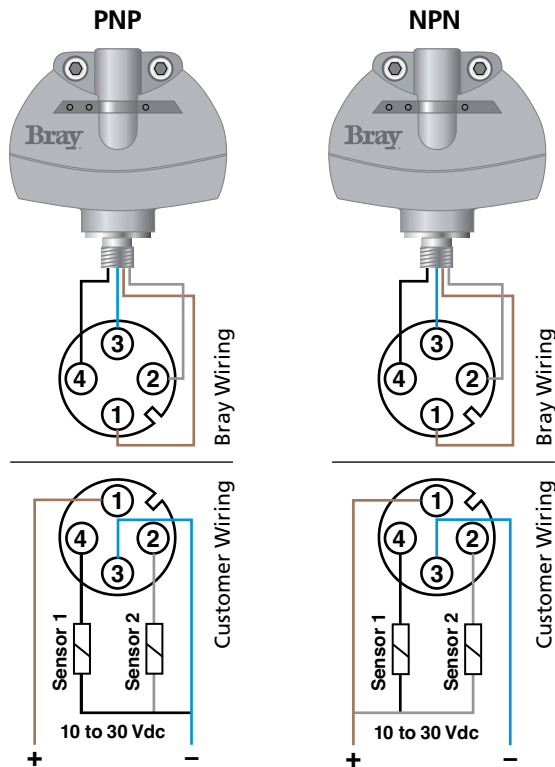
Series 52 Proximity Sensor Models



DC Inductive Proximity Sensors



AS-i Proximity Sensors with Solenoid Drive

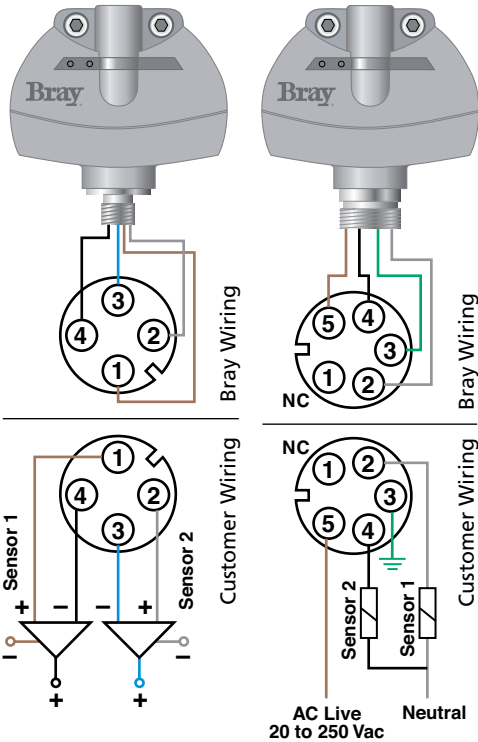


Series 52 Proximity Sensor Models

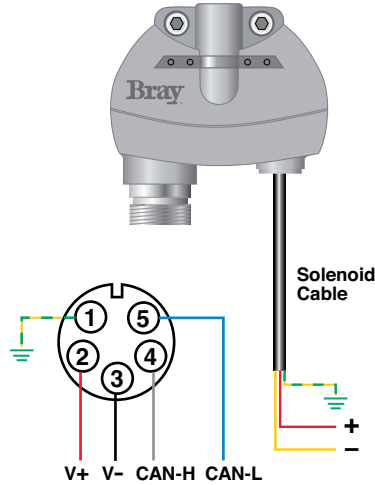
AC Inductive Proximity Sensors



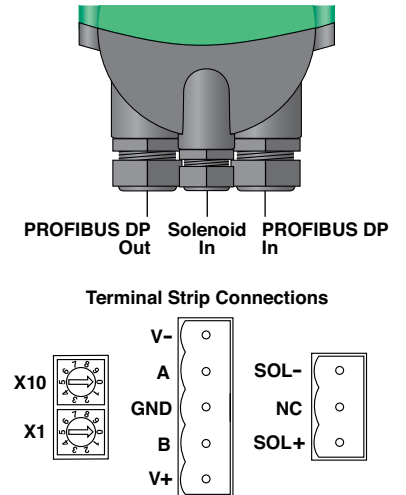
NAMUR Intrinsically Safe



DeviceNet Proximity Sensors with Solenoid Drive



PROFIBUS DP Proximity Sensors with Solenoid Drive



Series 52 Specifications

Inductive Proximity Sensors

Parameter	DC Sensor PNP	DC Sensor NPN	NAMUR Sensor Intrinsically Safe	AC Sensor
Operating Voltage	10 - 30 VDC	10 - 30 VDC	7 - 12 VDC from IS barrier	20 - 250 VAC
Power Frequency	N/A	N/A	N/A	50 - 60 Hz
Switch Type	Inductive	Inductive	Inductive	Inductive
Target Type	Metal (non-magnetic)	Metal (non-magnetic)	Metal (non-magnetic)	Metal (non-magnetic)
Electrical Configuration	DC - PNP - NO	DC - NPN - NO	(IS) NAMUR - NC	AC
Maximum Load Current	200 mA DC	200 mA DC	Limited by IS barrier	500 mA AC
Output Voltage Drop (powered)	< 2 VDC	< 2 VDC	8 VDC	< 5 VAC
Residual Current (not powered)	< 0.02 mA DC	< 0.02 mA DC	N/A	< 1 mA AC
Output Protection	Short Circuit & Overload	Short Circuit & Overload	N/A	None
Maximum Switching Frequency	400 Hz	400 Hz	400 Hz	10 Hz
Power Indicator	LED (green)	LED (green)	Uses the Position LEDs	None
Sensor Position Indicator	2 LEDs (yellow)	2 LEDs (yellow)	2 LEDs (yellow)	2 LEDs (yellow)
Housing Material	PBT VO Polymer	PBT VO Polymer	PBT VO Polymer	PBT VO Polymer
Protection Class	NEMA 4 / IP67	NEMA 4 / IP67	NEMA 4 / IP67	NEMA 4 / IP67
Output Connector	4-pin M12	4-pin M12	4-pin M12	5-pin 7/8"
Operating Temperature	-13°F (-25°C) to 158°F (70°C)	-13°F (-25°C) to 158°F (70°C)	-13°F (-25°C) to 158°F (70°C)	-13°F (-25°C) to 158°F (70°C)

BUS Network Powered Proximity Sensors with Solenoid Drive

Parameter	AS-i Flat Connector	AS-i M12 Connector	DeviceNet	Profibus DP
Operating Voltage	30.5 VDC AS-i Network	30.5 VDC AS-i Network	24 VDC DN Network	24 VDC DP Network
Consumption Current	< 30 mA DC	< 30 mA DC	< 20 mA DC	< 30 mA DC
Switch Type	Hall Effect	Hall Effect	Hall Effect	Hall Effect
Target Type	Magnetic	Magnetic	Magnetic	Magnetic
Electrical Configuration	AS-i Spec 3.2 *	AS-i Spec 3.2 *	DeviceNet	PROFIBUS DP
Addressing	62 Addresses	62 Addresses	0 to 63 MAC ID	0 to 99 programmable
Data Bits	Input Bit 0: Sensor 1 Input Bit 1: Sensor 2 Output Bit 0: Solenoid Drive	Input Bit 0: Sensor 1 Input Bit 1: Sensor 2 Output Bit 0: Solenoid Drive	Input Bit 0: Sensor 1 Input Bit 1: Sensor 2 Output Bit 0: Solenoid Drive	Input Bit 0: Sensor 1 Input Bit 1: Sensor 2 Output Bit 0: Solenoid Drive
I/O and ID	I/O=3h, ID=Ah, ID2=1h	I/O=3h, ID=Ah, ID2=1h	N/A	N/A
Diagnostics	Solenoid Coil Fault	Solenoid Coil Fault	Solenoid Coil Fault Power Supply Fault	Solenoid Coil Fault Power Supply Fault
Watchdog Timer	Solenoid Output turns Off without Network Communication			
Network Indicator	Bicolor LED (red/green)	Bicolor LED (red/green)	Bicolor LED (red/green)	Bicolor LED (red/green)
Network Communication Type	Master / Slave	Master / Slave	Polled	Master / Slave
Network Comm. Connector	AS-i Flat Displacement	4-pin M12 thread	5-pin 7/8" thread	5-pin inline plug
Network Speed	N/A	N/A	125 / 250 / 500 Kbaud	Up to 1.5 Mbaud
Sensor Position Indicator	2 LEDs (yellow)	2 LEDs (yellow)	2 LEDs (yellow)	2 LEDs (yellow)
Solenoid Drive Output	24 VDC (3.6 W max.)	24 VDC (3.6 W max.)	24 VDC (3.6 W max.)	24 VDC (3.6 W max.)
Solenoid Output Indicator	LED (yellow)	LED (yellow)	LED (yellow)	LED (yellow)
Solenoid Connection	3-wire PVC cable 0.7 m long, 6.0 mm diameter black, 20 AWG copper conductors			
Housing Material	PBT VO Polymer	PBT VO Polymer	PBT VO Polymer	PBT VO Polymer
Protection Class	NEMA 4 / IP67	NEMA 4 / IP67	NEMA 4 / IP67	NEMA 4 / IP67
Operating Temperature	-13°F (-25°C) to 158°F (70°C)	-13°F (-25°C) to 158°F (70°C)	-13°F (-25°C) to 158°F (70°C)	-13°F (-25°C) to 158°F (70°C)

* **Note:** Hardware AS-i version 3.2 configured as AS-i version 2.1.

All Series 52 Valve Status Monitors are manufactured under ISO 9001 conditions.

Series 50 Switch Options

MICRO SWITCHES

Economical switches with the highest current ratings on the market.

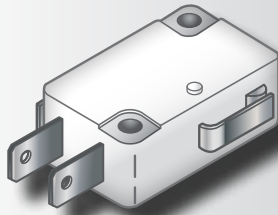
Two V3 Type SPDT SWITCHES

Contact material is fine silver.

Max. Rating: 10A-120/250 VAC
1/2A-125VDC

Max. Temperature: 176°F (80°C)

4 or more switches are available.

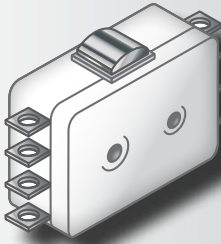


Two Type DPDT SWITCHES

Contact material is fine silver.

Max. Rating: 10A-120/250 VAC
10A-24VDC

Max. Temperature: 158°F (70°C)



PROXIMITY SWITCHES

Sealed against explosive gases and liquids, these switches offer long, trouble free life.

Two V3 Type N INDUCTIVE SWITCHES

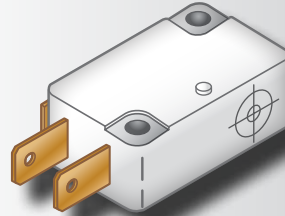
(Intrinsically Safe)

Supply Volts: 5-25VDC

Load Current: <1mA >3mA

Max. Temperature: 212°F (100°C)

Other types available, consult factory.



Two V3 Type E2 INDUCTIVE SWITCHES

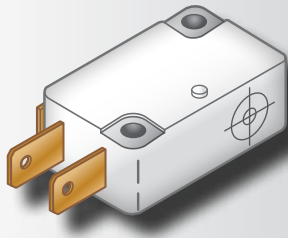
Supply Volts: 10-30VDC

PNP Type:

Load Current: 100mA

Max Temperature: 212°F (100°C)

Other types available, consult factory.



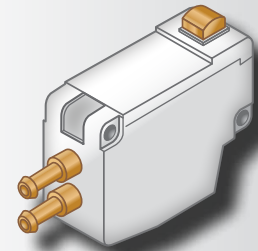
PNEUMATIC SWITCHES

For hazardous locations. 2 switches are provided with 2 ports and vents.

Rating: 150 psi (10 bar)

Connections: 1/8" NPT (BSP)

Max. Temperature: 176°F (80°C)



POTENTIOMETER

For analog feedback of precise valve position, a potentiometer can be mounted within the Series 50-0700 housing.

The standard value is 10K ohms, and the standard power rating at 158°F(70°C) is 1 watt.

REED SWITCHES

2 magnetic reed switches (hermetically sealed) are available upon request.

Bray Series 64 Positioner For Rotary Actuators



TECHNICAL SPECIFICATIONS

- **MATERIALS**
Body: Anodized Aluminum
Diaphragm: BUNA-N (Nitrile)
Valve Spool: Stainless Steel
Cover: Polycarbonate
- **CONNECTIONS**
Supply – 1/4" NPT or 1/4" BSP
Cylinder ports 'E' and 'F' – 1/8" NPT or 1/8" BSP
- **AIR SUPPLY**
30 to 100 Psi (max. 150 Psi)
2 to 7 Bar (max. 10 bar)
- **AMBIENT TEMPERATURE LIMITS**
-5°F to 160°F. (moisture free air)
-21 °C to 71°C
- **CONTROL ACTIONS**
(Direct or Reverse) The direction of operation can be changed without any additional parts, by turning the cam over and reversing air connections to the actuator
- **RANGE ADJUSTMENT** + 1 Psi (0.7 Bar)
- **PRINCIPLE OF OPERATION**
Positioning is based on a force balanced principle
- **ACCURACY WITH LINEAR CAM**
1% of full range.
- **STANDARD CAM WITH 3 PRESSURE RANGES (LINEAR CHARACTERISTICS)**
Direct-Action and Reverse-Action
3-15 Psi 0-90° (0.2 - 1 Bar)
3-15 Psi 0-65° (0.2 - 1 Bar)
3-9 or 9-15 Psi 0-65° (0.2 - 0.6 or 0.6-1 Bar)
- **AIR CONSUMPTION**
0.6 SCFM in Balanced Condition with 60 Psi (4 bar) Supply pressure
- **START POINT SELECTION**
0-9 Psi (0-0.6 Bar)
- **MOUNTING POSITION**
Can be mounted in any position
- **POWER AMPLIFICATION**
Less than 2% deviation in signal or stroke, produces full output pressure
- **WEIGHT** 1.8 lbs. (0.8 Kg)
- **SENSITIVITY**
Output is sensitive to change in control-air pressure as small as 0.1% of full range
- **ACCESSORIES**
Gauges
Supply air filter

Series 05 Declutchable Gear Operator

Specifications and Operation

- Available for 2"-36" (50mm-900mm) valves
- Manually override pneumatic actuators or rotate the valve when air pressure is not available.
- Excellent for the safe handling of spring return actuators.
- Can be installed in the field with existing Bray pneumatic actuators.

During pneumatic operation, the worm of the gear unit is disengaged. Should the valve require opening or closing in the event of power loss, manual rotation of the declutch lever will provide a camming action and engage the worm to the segmented worm gear, allowing rotation of the valve using the handwheel.

Operation Any residual air pressure in the pneumatic actuator must be vented before operation of the Declutchable Gear Operator. Bray recommends the use of a vent valve to block the incoming air supply and vent residual air. Then engage the declutching lever and rotate the valve using the handwheel. When returning to automatic operation, disengage the manual override by rotating the declutching lever, turning the vent valve to off, then restoring air pressure to the actuator.

SERIES 05

