

BABCOCK

DISPLAY PRODUCTS DIVISION

MODEL: **SP-410-XXX**

XXX denotes dash numbers below

DUAL ELEMENT BARGRAPHS

Babcock's dual element bargraphs have high brightness making them viewable from extended distances. The thin design makes the display suitable for mounting in most front panel layouts. The sealed lead construction provides a true hermetic-sealed glass package for maximum protection against temperature and humidity.

The displays are constructed by screen printing thick film material on to glass plates to form dielectric cells and electrodes. The front and rear glass plates are sealed together using a high temperature glass frit around the perimeter, leaving a narrow gap between the glass plates which is back-filled with a special inert gas mixture and sealed.

SPECIFICATIONS

DASH NUMBERS

Model Number	SP-410-XXX			-002	-003	-005	-006	-007	-009	-010
PARAMETER	Notes	Units								
Overall Size (LxWxD) minus fill tube		Inch	6.0 x 1.4 x 0.29	4.5 x 1.2 x 0.23	4.5 x 1.1 x 0.20	4.5 x 1.1 x 0.23	5.5 x 1.2 x 0.24	5.6 x 1.34 x 0.21	4.5 x 1.2 x 0.21	
Bar Size (each)		Inch	5.0 x 0.25	4.0 x 0.1	4.0 x 0.1	4.0 x 0.1	5.0 x 0.1	5.0 x 0.1	4.0 x 0.1	
Number of Elements (each column)			101	201	201	201	201	201	201	201
Number of Phases			5	5	3	5	5	5	5	5
Brightness (typical)	2.0	fL (cd/m ²)	40 (137)	40 (137)	30 (102)	40 (137)	40 (137)	40 (137)	40 (137)	40 (137)
Viewing Angle (min.)		degrees	130	130	130	130	130	130	130	130
Supply Voltage (typical)		Volts (Vdc)	325	250	250	250	250	250	250	250
Sustaining Voltage (typical)		Volts (Vdc)	160	150	150	150	150	150	150	150
Firing Voltage (maximum)		Volts (Vdc)	185	185	185	185	186	185	185	185
Cathode Bias Voltage (maximum)		Volts (Vdc)	100	76	120	76	76	76	76	76
Peak Bar Current Density (typical)	1.0	mA	10	3.0	3.0	3.0	4.0	4.0	5.0	
Keep-Alive Current (typical)		µA	300	100	100	100	100	100	100	100
Reionization Time (typical)		µSeconds (µS)	7	7	7	7	7	7	7	7
Segment On-Time (typical)		µSeconds (µS)	70	70	70	70	70	70	70	70
Scan Time (typical)		Milliseconds (mS)	10	14.3	14.3	14.3	14.3	14.3	14.3	14.3
Reset Time (typical)		µSeconds (µS)	150	140	100	140	140	140	140	140
Anode Voltage, Instantaneous (max)		Volts (Vdc)	400	265	265	265	265	265	265	265
Anode Current, Instantaneous (max)		mA	15	50	50	50	50	50	50	50

Notes:

- 1.0 The bargraph shall operate throughout this range without 'prefiring' or scanning the elements non-sequentially.
- 2.0 Color: Neon-Orange (5850 A peak)

SPECIFICATIONS ARE FOR REFERENCE ONLY

9200-0094 Rev. A

Phone: (714) 994-6500 **14930 East Alondra Blvd., La Mirada, CA 90638-5752** Fax: (714) 994-3013

BABCOCK

DISPLAY PRODUCTS DIVISION

MODEL: **SP-410-XXX**
XXX denotes dash numbers below
DUAL ELEMENT BARGRAPHS

Environmental Characteristics

SP-410-003, -005, -006, -007, -009, -010

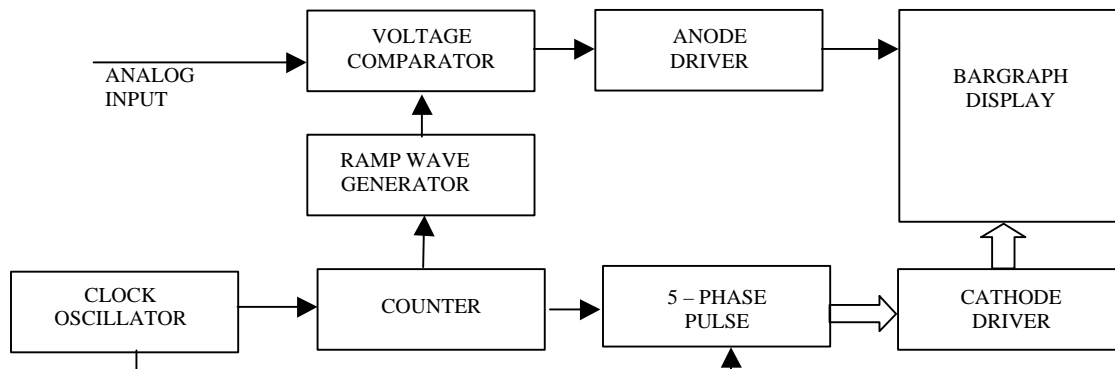
SP-410-002

Operating Temperature	0 to 70° C	0 to 50° C
Storage Temperature	-40 to +85° C	-40 to +75° C
Operating Altitude	15,000 ft.	15,000 ft.
Storage Altitude	70,000 ft.	50,000 ft.
Relative Humidity	10 to 90% non-condensing	5 to 95% non-condensing
Vibration	5 to 14 @ 0.03" p-p displacement 14 to 200 Hz @ 0.3g to be applied in each of three orthogonal axes	5 to 14 @ 0.03" p-p displacement 14 to 200 Hz @ 0.3g to be applied in each of three orthogonal axes
Shock	50g, ½ sine, 11 msec., 5 shocks in each of three orthogonal axes	50g, ½ sine, 11 msec., 5 shocks in each of three orthogonal axes

Pin Connection Table

SP-410-XXX	-002	-003	-005	-006	-007	-009	-010
Pin Number							
1	Left Anode	Left Anode	Anode No. 1	Anode No. 1	Anode No. 1	Anode No. 1	Left Anode
2	Keep Alive Cathode	Phase 2 Cathode	Phase 1 Cathode	Phase 2 Cathode	Phase 2 Cathode	Phase 2 Cathode	Phase 2 Cathode
3	Reset Cathode	Phase 1 Cathode	Phase 3 Cathode	Phase 1 Cathode	Phase 1 Cathode	Phase 1 Cathode	Phase 1 Cathode
4	Phase 5 Cathode	Reset Cathode	Reset Cathode	Reset Cathode	Reset Cathode	Reset Cathode	Reset Cathode
5	Keep-Alive Anode	Keep-Alive Anode	Keep-Alive Anode	Keep Alive Anode	Keep-Alive Anode	Keep-Alive Anode	Keep-Alive Anode
6	Phase 4 Cathode	Keep Alive Cathode	Keep Alive Cathode	Keep-Alive Anode	Keep Alive Cathode	Keep Alive Cathode	Keep Alive Cathode
7	Phase 3 Cathode	Phase 4 Cathode	Phase 2 Cathode	Phase 4 Cathode	Phase 4 Cathode	Phase 4 Cathode	Phase 4 Cathode
8	Phase 2 Cathode	Phase 3 Cathode	Anode No. 2	Phase 3 Cathode	Phase 3 Cathode	Phase 3 Cathode	Phase 3 Cathode
9	Phase 1 Cathode	Phase 5 Cathode		Phase 5 Cathode	Phase 5 Cathode	Phase 5 Cathode	Phase 5 Cathode
10	Right Anode	Right Anode		Anode No. 2	Anode No. 2	Anode No. 2	Right Anode

BLOCK DIAGRAM (TYPICAL)



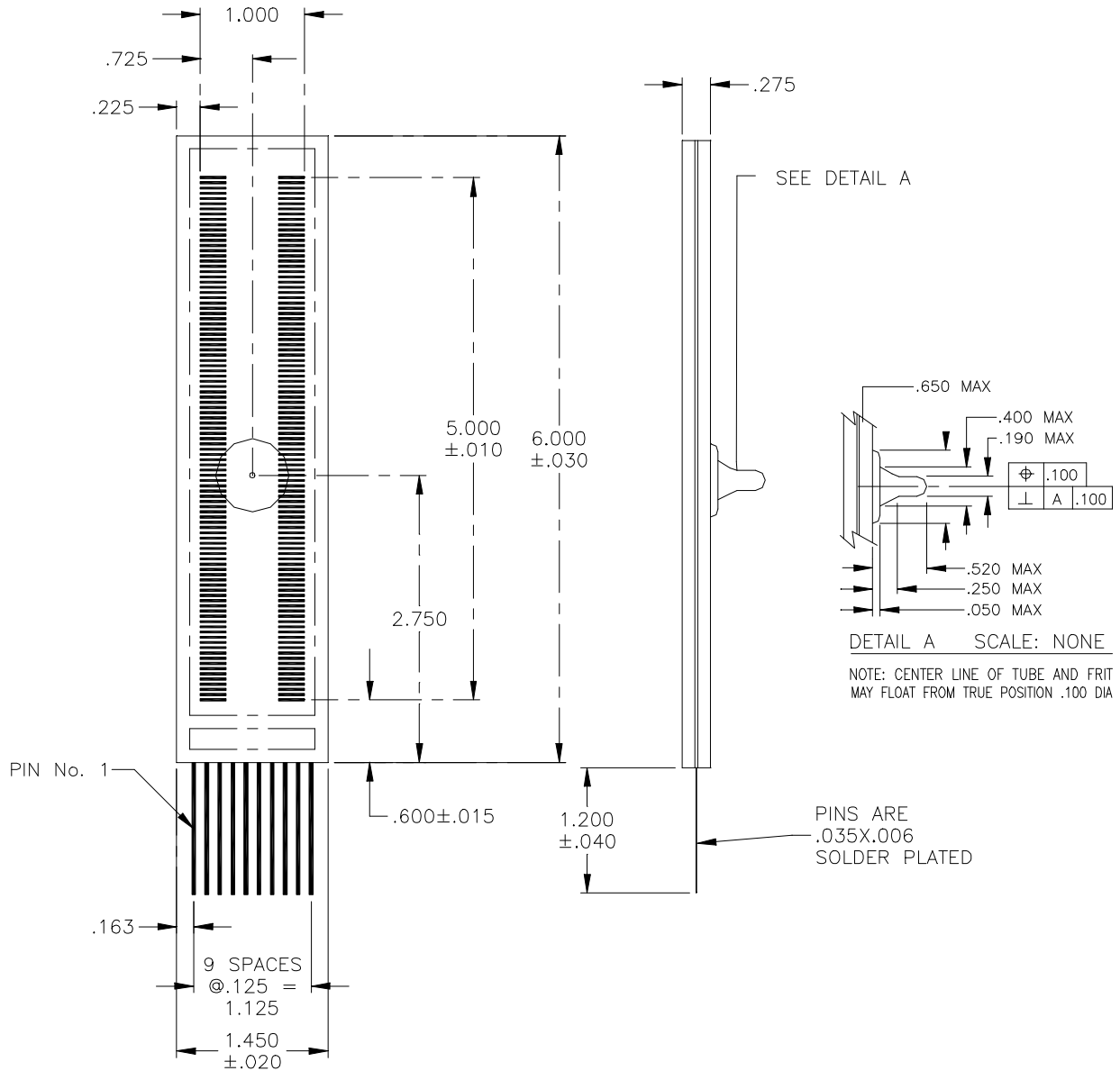
SPECIFICATIONS ARE FOR REFERENCE ONLY

9200-0094 Rev. A

Phone: (714) 994-6500 14930 East Alondra Blvd., La Mirada, CA 90638-5752 Fax: (714) 994-3013

Outline and Mounting Dimensions:

SP-410-002



BABCOCK

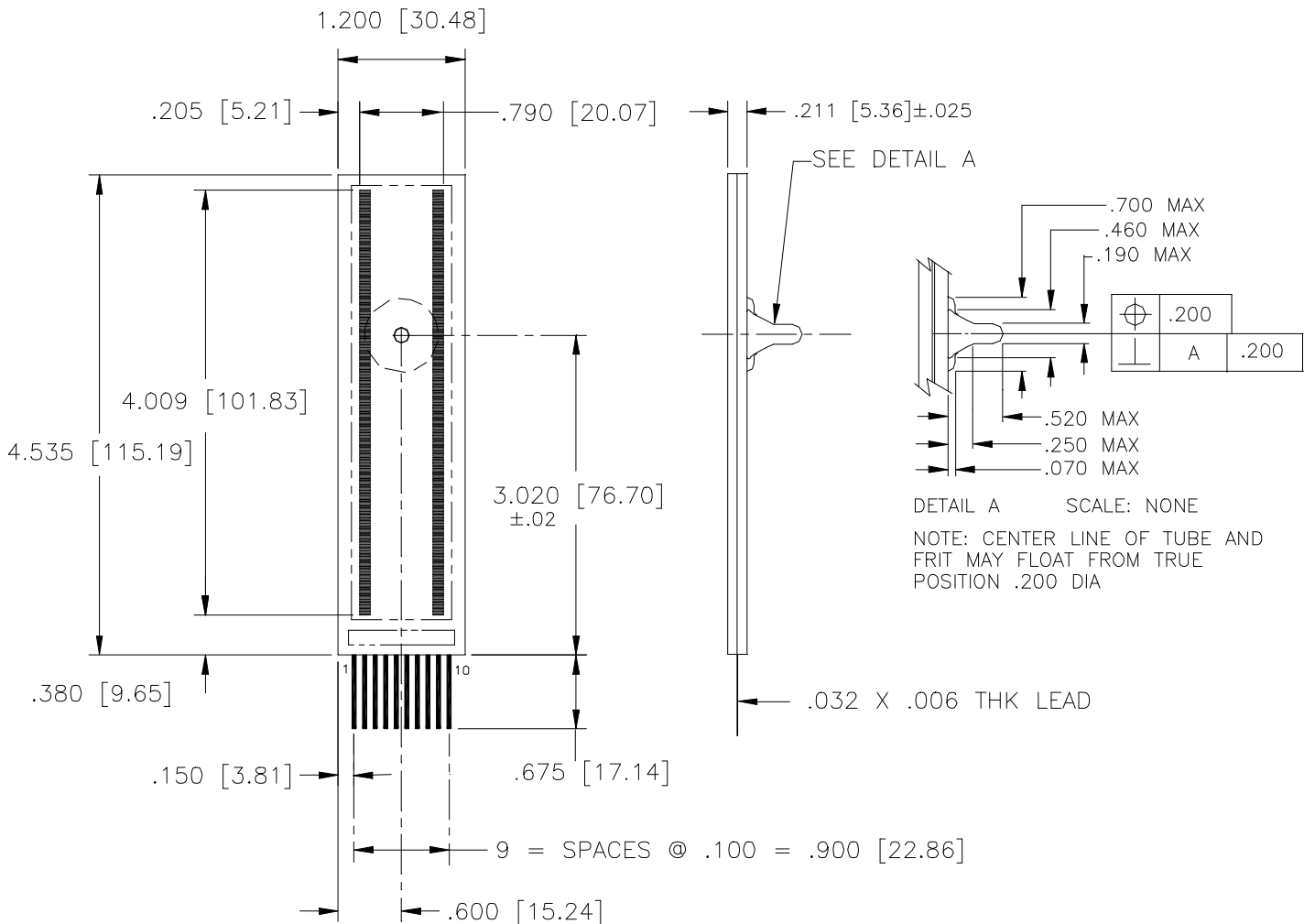
DISPLAY PRODUCTS DIVISION

MODEL: **SP-410-XXX**

XXX denotes dash numbers below

DUAL ELEMENT BARGRAPHS

SP-410-003



SPECIFICATIONS ARE FOR REFERENCE ONLY

9200-0094 Rev. A

Phone: (714) 994-6500 14930 East Alondra Blvd., La Mirada, CA 90638-5752 Fax: (714) 994-3013

BABCOCK

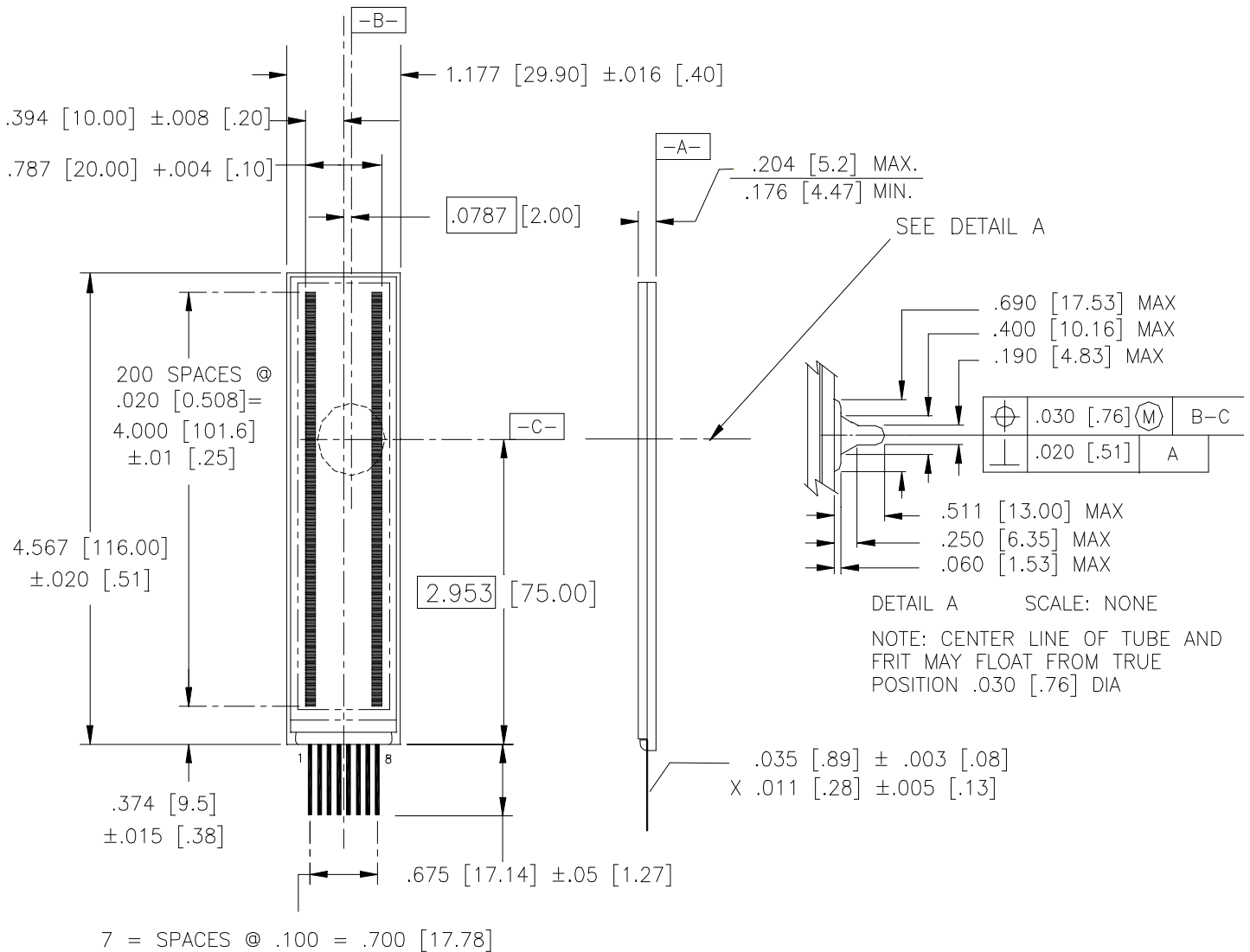
DISPLAY PRODUCTS DIVISION

MODEL: **SP-410-XXX**

XXX denotes dash numbers below

DUAL ELEMENT BARGRAPHS

SP-410-005



SPECIFICATIONS ARE FOR REFERENCE ONLY

9200-0094 Rev. A

Phone: (714) 994-6500 14930 East Alondra Blvd., La Mirada, CA 90638-5752 Fax: (714) 994-3013

BABCOCK

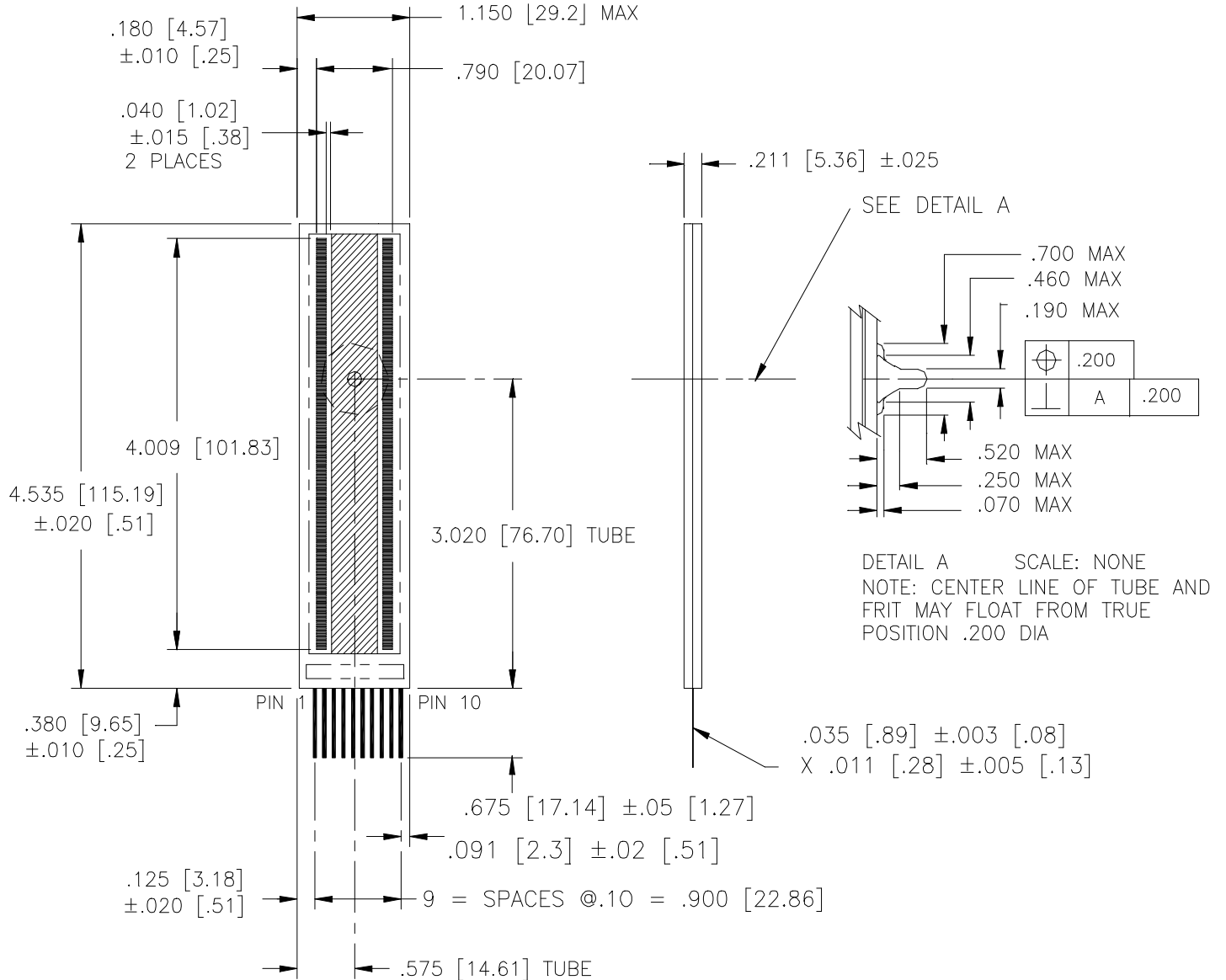
DISPLAY PRODUCTS DIVISION

MODEL: **SP-410-XXX**

XXX denotes dash numbers below

DUAL ELEMENT BARGRAPHS

SP-410-006

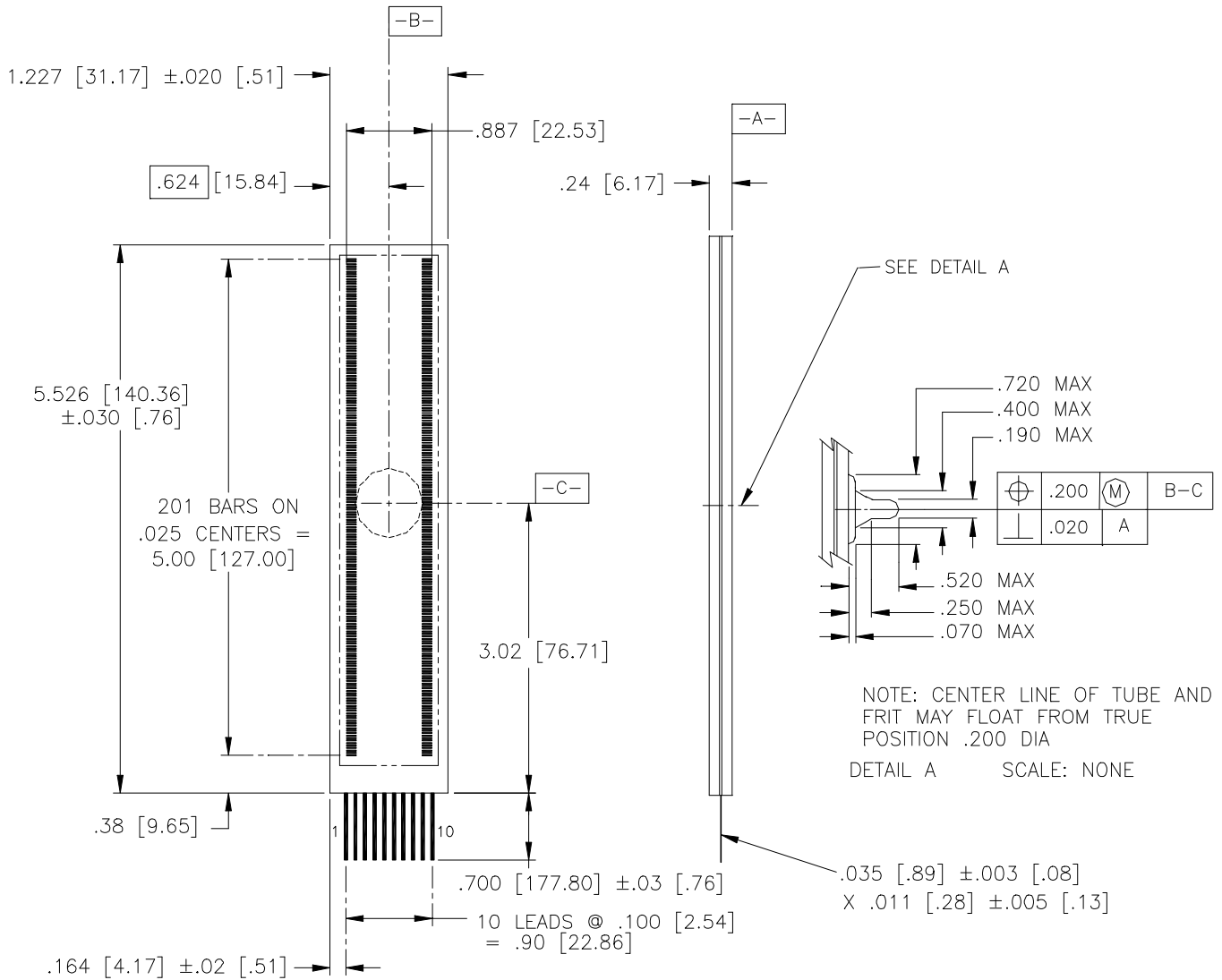


SPECIFICATIONS ARE FOR REFERENCE ONLY

9200-0094 Rev. A

Phone: (714) 994-6500 14930 East Alondra Blvd., La Mirada, CA 90638-5752 Fax: (714) 994-3013

SP-410-007



BABCOCK

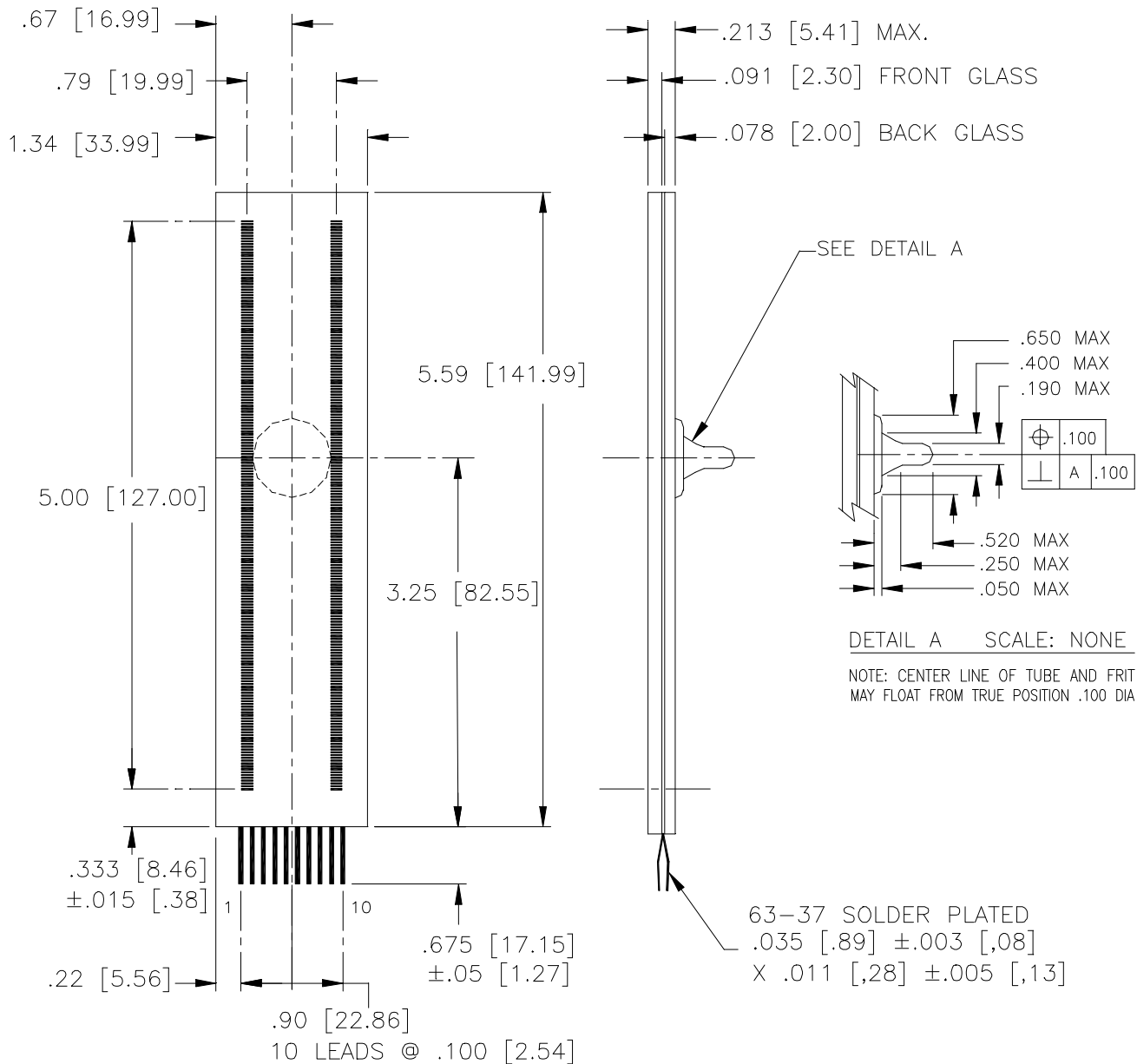
DISPLAY PRODUCTS DIVISION

MODEL: **SP-410-XXX**

XXX denotes dash numbers below

DUAL ELEMENT BARGRAPHS

SP-410-009



SPECIFICATIONS ARE FOR REFERENCE ONLY

9200-0094 Rev. A

Phone: (714) 994-6500 14930 East Alondra Blvd., La Mirada, CA 90638-5752 Fax: (714) 994-3013

BABCOCK

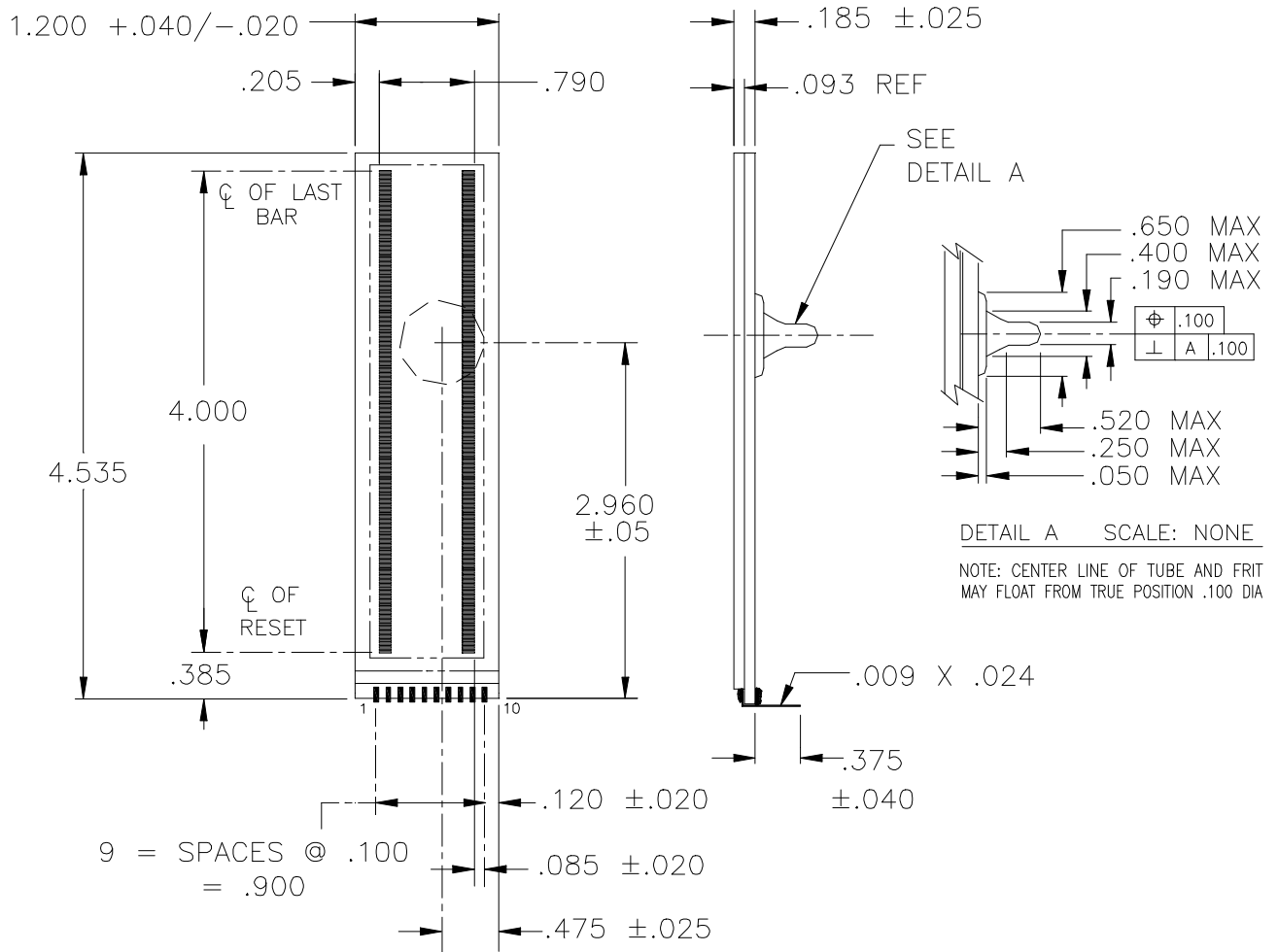
DISPLAY PRODUCTS DIVISION

MODEL: **SP-410-XXX**

XXX denotes dash numbers below

DUAL ELEMENT BARGRAPHS

SP-410-010



SPECIFICATIONS ARE FOR REFERENCE ONLY

9200-0094 Rev. A

Phone: (714) 994-6500 14930 East Alondra Blvd., La Mirada, CA 90638-5752 Fax: (714) 994-3013