ACCESSORIES

DD-700 AND DD-702 DECODER/DRIVERS

The Beckman DD-700 Decoder/Driver accepts TTL/DTL 8-4-2-1 binary coded decimal (BCD) information, and decodes this information to drive the seven segments of the Beckman display. The DD-702 accepts decoded active high information from TTL/DTL or MOS circuits to drive the display. No other circuit elements are required for either of these decoders/drivers. A current limiting resistor is required in the anode circuit of the display to interface the decoder/driver to the display.

By sinking current through appropriate segments of a Beckman display, numbers 0 thru 9 can be displayed as shown in Truth Tables for each Driver/Decoder. Codes representing the binary numbers 10 through 15 are decoded to display the letters A through F. Letters "b" and "d" are displayed as lower case letters to avoid confusion with numbers 8 and 0.

The table on the right compares the important features of the DD-700, and DD-702 Decoder/Drivers.

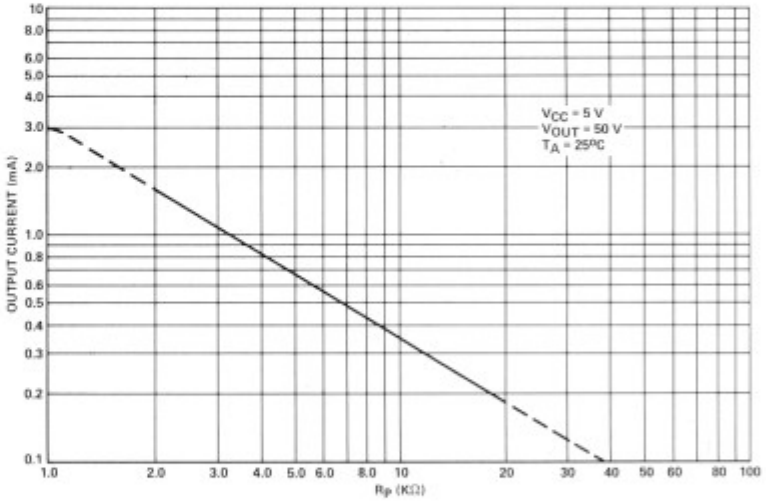
Feature	DD-700	DD-702
Direct Drive For Display	X	X
BCD Input for 7 Segment Output	X	
Six Input Decoded to Seven Outputs		X
Output Current Ratioed For Uniform Brightness. The intensity of the displays is programmable by a single resistor.	X	X
Ripple Blanking Input For Suppression of Unwanted Leading or Trailing Zones.	X	
Blanking Input For Unconditional Blanking	X	X
Saturated Switch Operation (Current Limited)	X	X
Current Regulated	X	X

Current Equalization

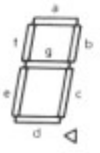
Beckman decoder/drivers have ratioed current output to ensure uniform brightness of displays. The fixed current ratio for each segment is defined in the supporting table; each segment is current ratioed for uniform brightness of the display.

Current Programming

The overall brightness of a Beckman display is determined by the current in each segment. The recommended values for the external programming resistor that controls the overall brightness of all segments are presented in the table. The accompanying graph shows segment "B" output current versus programming resistor value.



Output Current Versus Programming Resistor (R_P)

Segment Identification	Segment Output	Current Ratio	Display Pin Number	Driver Pin Number
	a	0.93	1	13
	b	1.00	2	12
	c	1.25	3	11
	d	1.00	4	10
	e	1.10	5	9
	f	0.93	6	15
	g	0.93	7	14

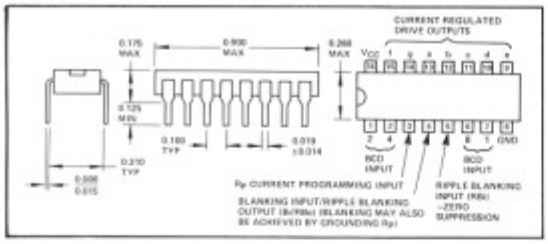
Output Current Ratio and Pin Designations

Function	SP-330 and SP-730	SP-350 and SP-750
Normal Operation	20,000 Ω	11,000 Ω
Multiplexed Operation (Six or more digits)	4,700 Ω	2,400 Ω
Saturated Switch	1,000 Ω	1,000 Ω

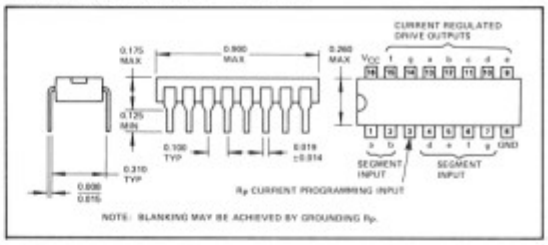
Recommended Programming Resistors for Both Decoder/Drivers

...accessories

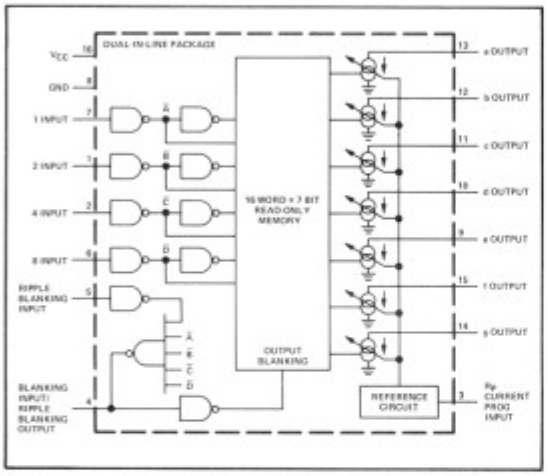
OUTLINE DRAWING – DD-700



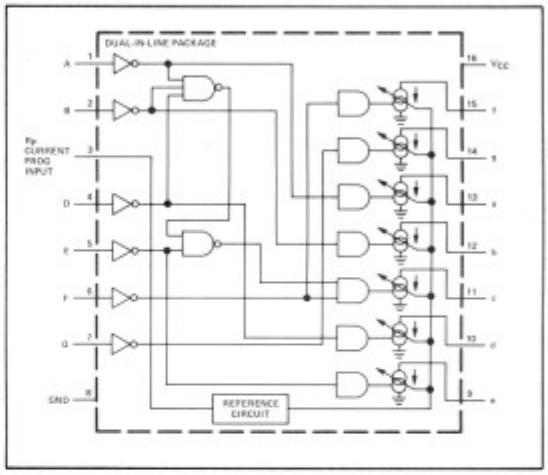
OUTLINE DRAWING – DD-702



LOGIC DIAGRAM – DD-700



LOGIC DIAGRAM – DD-702



TRUTH TABLE – DD-700

DECIMAL OR FUNCTION	RBI	BCD INPUT 8	4	2	1	BI/RBO	SEGMENT DRIVE OUTPUT a	b	c	d	e	f	g	DISPLAY
0	1	0	0	0	0	1	0	0	0	0	0	0	1	0
1	X	0	0	0	1	1	1	0	0	1	1	1	1	1
2	X	0	0	1	0	1	0	0	1	0	0	1	0	2
3	X	0	0	1	1	1	0	0	0	0	1	1	0	3
4	X	0	1	0	0	1	1	0	0	1	1	0	0	4
5	X	0	1	0	1	1	0	1	0	0	1	0	0	5
6	X	0	1	1	0	1	0	1	0	0	0	0	0	6
7	X	0	1	1	1	1	0	0	0	1	1	1	1	7
8	X	1	0	0	0	1	0	0	0	0	0	0	0	8
9	X	1	0	0	1	1	0	0	0	0	1	0	0	9
10	X	1	0	1	0	1	0	0	0	1	0	0	0	10
11	X	1	0	1	1	1	1	1	0	0	0	0	0	11
12	X	1	1	0	0	1	0	1	1	0	0	0	1	12
13	X	1	1	0	1	1	1	0	0	0	1	0	0	13
14	X	1	1	1	0	1	0	1	1	0	0	0	0	14
15	X	1	1	1	1	1	0	1	1	1	0	0	0	15
BI	X	X	X	X	X	0	1	1	1	1	1	1	1	
RBI	0	0	0	0	0	0	1	1	1	1	1	1	1	
Rp	X	X	X	X	X	X	X	X	X	X	X	X	X	

NOTE: Logic "1" on all inputs and RBO is defined as the high TTL/DTL state. Logic "0" on outputs a – g is defined as the low or current sinking state (display on state). X is defined as "don't care" condition.

TRUTH TABLE – DD-702

INPUTS A	B	D	E	F	G	DISPLAY
1	1	1	1	1	0	0
0	1	0	0	0	0	1
1	1	1	1	0	1	2
1	1	1	0	0	1	3
0	1	0	0	1	1	4
1	0	1	0	1	1	5
1	0	1	1	1	1	6
1	1	0	0	0	0	7
1	1	1	1	1	1	8
1	1	1	0	1	1	9
0	0	1	1	1	1	A
1	1	0	0	1	1	a
1	1	0	1	1	1	b
0	1	0	1	1	1	C
0	1	1	1	1	0	c
0	0	0	0	0	1	d
0	0	0	0	0	0	E

C = (Ā • B • D̄ • E) F

INPUT*	OUTPUT*
0	1 (OFF)
1	0 (ON)

*Positive Logic

MAXIMUM RATINGS	DD-700	DD-702
Supply Voltage (V_{CC})	7.0 Vdc	7.0 Vdc
Input Voltage	5.5 Vdc	6.0 Vdc
Segment Output Voltage (Offstate)	80 Vdc	80 Vdc
Power Dissipation	600 mW	600 mW
Operating Temperature	0°C to +70°C	0°C to +70°C
Storage Temperature	−65°C to +150°C	−65°C to +150°C
Lead Temperature (Soldering – 10 sec)	300°C	300°C