CD7220/CD3220

VACUUM FLUORESCENT

CUSTOMER DISPLAY

MANUAL

CD7220/CD3220 CUSTOMER DISPLAY

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CD7220/CD3220 CUSTOMER DISPLAY

INTRODUCTION

Thank you for choosing the CD-7220/CD-3220 VFD Customer Pole Display. The CD-7220/CD-3220 provides both reliability and performance in a professional looking design. In this guide, you will find connection and configuration information to help you connect the display to your computer. If you are a programmer, you will find interface command details to allow you to exploit the advanced features of the display.

The CD-7220/CD-3220 customer pole display uses a vacuum fluorescent display (VFD) tube presenting bright and easy to read characters. Because of the VFD technology the display is viewable from a wide angle. Users will appreciate not having to remain in a fixed viewing position to see the display, they will be free to move forward in line and still keep the display readable. The CD-7220/CD-3220 customer pole display has 2 pole sections giving you the choice of 4 different display heights. The display can be rotated up to 270° The head of the display can tilt by up to 35°. The combination of these features gives you flexibility to tailor the display position to your unique application.

Data can be displayed on single side (CD-7220) or two sides (CD-7220D) of the display. You can choose to show same or different message on the double-sided display. With 2 lines of 20 characters on each side CD-7220 can display alphanumeric messages with 13 international characters. Additionally, software utility is provided to transfer character dot pattern to ASCII code giving you the ability to defined characters and demo message to download to the display EEPROM.

The CD7220/CD3220 customer pole display uses an easy to connect RS-232C serial port connection with a wide range of available communication speeds from 300 to 38,400bps. CD7220' s pass through function allows you to connect another serial device by sharing one single serial port on computer. CD-7220/CD3220 also offers a variety of emulation modes including CD-5220II, Epson, ADM787, ADM788, Aedes, Emax and Ultimate. The CD-7220' s universal design gives you the flexibility to choose the application software best suited for your POS requirement.

CD7220/CD3220 CUSTOMER DISPLAY

1. FEATURES

- 20 columns x 2 lines for each side (7220/3220 single sided, 7220D double sided.)
- Double-sided display (7220D) can have different data on each side.
- Display panel is adjustable both by tilting vertically and rotating horizontally.
- Configuration of baud rate, command emulation mode, and user defined font is selectable by window based support software or by using external setting box.
- Command emulation modes include CD5220II, Epson, ADM787, ADM788, Aedex, Emax and Ultimate.
- Support software has facility for designing user-defined characters and downloading setup parameters to the display. Once in the display new characters are stored in non-volatile EEPROM.
- Reverse characters (black characters on blue green background) can be specified using the Epson command set.
- Display windowing commands are available using CD5220 or Epson command sets.
- Uses RS-232 serial interface with communication speeds from 300 to 38400 BPS.
- Display pass through function allows printer and display to share one port.

2. ORDER INFORMATION

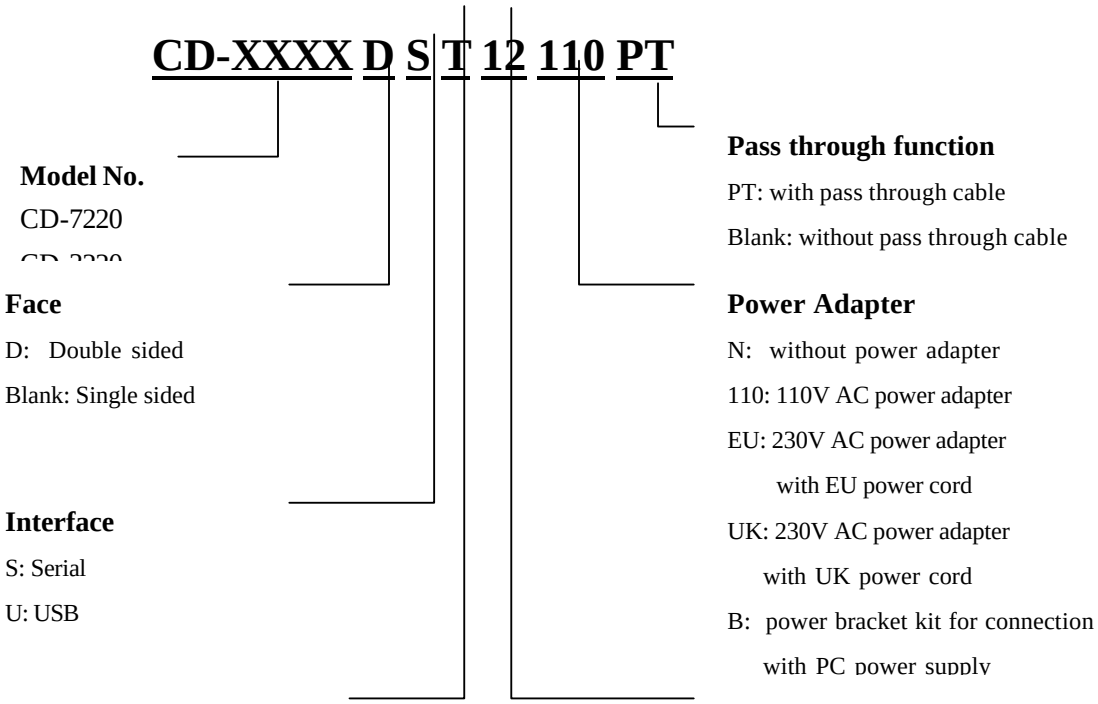


Table 1-1

3. GENERAL SPECIFICATIONS

ITEM	CD7220D		CD7220
Display method	Vacuum fluorescent display		
Display color	Blue green		
Number of characters	80 characters (20 columns x 2 lines with double side)		40 characters (20 columns x 2 lines)
Brightness	700 cd/m2		
Character type	96 alphanumeric 13 kinds of international character set and 1 user-define character set		
Character font	5 x 7 dot matrix, comma, decimal point		
Character size	9.2mm x 5.25mm		
Character pitch	8.3mm		
Power supply	5VDC or 12VDC or 24VDC or 33VDC		
Power consumption	8W		4.5W
MTBF(power on time)	25000 hours		
Dimensions	230(W)x100(H)x42(D)mm		
Viewing angle	±30 degrees		
Rotation angle	Maximum 270 degrees		
Weight	0.9 Kg		
Environmental Condition	**Operating**	Temperature	5 - 45℃
		Humidity	Less then 95%
	Storage	**Temperature**	-5 - 55℃
		Humidity	Less then 95%
Safety	**FCC class B 、CE**		

Table 1-2

CD7220/CD3220 CUSTOMER DISPLAY

ITEM	CD3220		
Display method	Vacuum fluorescent display		
Display color	Blue green		
Number of characters	40 characters(20 columns × 2lines)		
Brightness	700 cd/m2		
Character type	96 alphanumeric 13 kinds of international character set and 1 user-define set		
Character font	5 ×7dot matrix		
Character size	3.5mm×5.0mm		
Character pitch	2mm		
Power supply	5VDC or 12VDC or 24VDC		
Power consumption	5W		
MTBF(power on time)	25000hours		
Dimensions	170(W)×70(H)×45(D)mm		
Viewing angle	± 30 degrees		
Rotation angle	Maximum 270 degrees		
Weight	0.9Kg		
Environmental Conditions	Operating	Temperature	5-45℃
		Humidity	Less then 95%
	Storage	Temperature	-5-55℃
		Humidity	Less then 95%
Safety	**FCC class B 、CE**		

CD7220/CD3220 CUSTOMER DISPLAY

4. INTERFACE SPECIFICATIONS

4.1 Serial port (RS232C)

4.1.1 Serial port (RS232C) communication

(a) This interface specification is based on EIA RS232C baud rate 300 to 38400 BPS,

8 data bits, none parity, 1 or more stop bits

(b) Serial port (RS232C) communication data link

Data link flow chart:

PC/HOST	display	display	printer	printer	PC/HOST

Control for RTS and DTR :

PC/HOST	display	display	printer	printer	PC/HOST

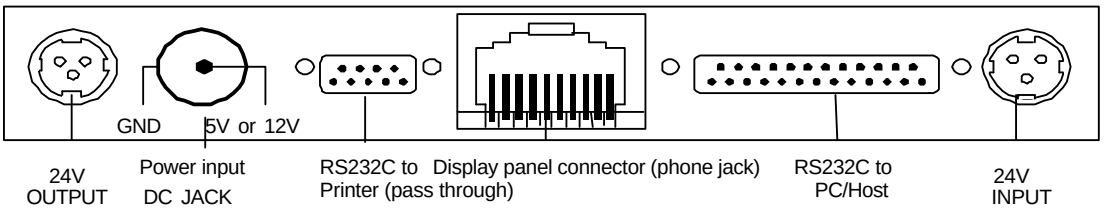
(c) CD7220 will activate DTR or RTS signal to PC/host in the following two conditions:

1. Printer will activate DTR or RTS signal.
2. The pass through buffer in CD7220/CD3220 is full (200 bytes) .

* If PC/host keep transmitting the data to printer when CD7220/CD3220 activate DTR or RTS, the data will be lost.

4.1.2 Serial port interface for **rectangle** basic section

(a) Serial port interface connector position for rectangle basic section



(b) Power input

Connector type: DC JACK (5.5/2.1)

Hoshiden connector for 24VDC

(c) RS232C to PC/HOST connector: D-sub 25 pin female pin assignment

Pin No.	Signal	Direction	Function description
1	FG		Frame ground
2	TXD	From printer to PC/Host	Printer status data
3	RXD	Input	Receive data
4	RTS	Output	Display/printer ready signal
5	CTS	From PC/HOST to printer Host	Ready signal
6	DSR	From PC/HOST to printer	Host ready signal
7	GND		Signal ground
16	V+	Input	If using power built-in
20	DTR	Output	Display/printer ready signal

Table 4-1

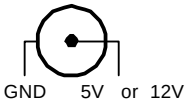
(d) RS232C to printer connector: D-sub 9 pin male pin assignment

Pin No.	Signal	Input / Output direction	Function description
2	RXD	From printer to PC/Host	Printer status data
3	TXD	Output	Transmit data
4	DTR	From PC/HOST to printer	Host ready signal
5	GND		Signal ground
6	DSR	Input	Printer ready signal
7	RTS	From PC/HOST to printer	Host ready signal
8	CTS	Input	Printer ready signal

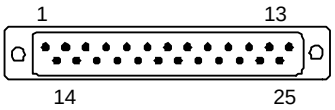
Table 4-2

4.1.3 Serial port interface to the space-saving base portion

(a) Power cable connector: DC jack (5.5/2.1)



(b) RS232C interface pass through cable connector: D-sub 25 pin female pin assignment

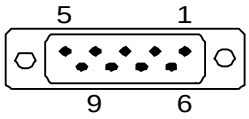


Pin No.	Signal	Input / Output direction	Function description
2	RXD	From printer to PC/Host	Printer status data
3	TXD	Output	Transmit data
4	CTS	Input	Printer ready signal
5	RTS	From PC/HOST to printer	Host ready signal
6	DTR	From PC/HOST to printer	Host ready signal
7	GND		Signal ground
20	DSR	Input	Printer ready signal

Table 4-3

(c) RS232C interface to PC/HOST cable, PC/HOST side connector pin assignment

Connector type: D-sub 9 pin (Male)



Pin No.	Signal	Direction	Function description
2	TXD	From printer to PC/Host	Printer status data
3	RXD	Input	Receive data
4	DSR	From PC/HOST to printer	Host ready signal
5	GND		Signal ground
6	DTR	Output	Display/printer ready signal
7	RTS	Output	Display/printer ready signal
8	CTS	From PC/HOST to printer	Host ready signal

Table 4-4

5. SYSTEM COMMAND DETAILS

5.1 Baud rate

STX 05 B n ETX /Set baud rate and keep it with EEPROM/
ASCII Format STX 05 B n ETX
Dec. Format [02][05][66] n [03]
Hex. Format [02h][05h] [42h] n [03h] 30h≤n≤37h
Description Change the display communication baud rate. The baud rate setting can be selected from 300 to 38400. The setting function will be saved to EEPROM.

N	Baud rate
30h	9600
31h	4800
32h	2400
33h	1200
34h	600
35h	300
36h	38400
37h	19200

5.2 International character set

STX 05 S n ETX Change international character set
ASCII Format STX 05 S n ETX
Dec. Format [02][05][83] n [03]
Hex. Format [02h][05h] [53h] n [03h] 30h≤n≤3fh
Description Change the display international character font. A total of 16 different character fonts to select from. The setting function will be saved to EEPROM.

n	International font	n	International font
30h	U.S.A	38h	JAPAN
31h	FRANCE	39h	NORWAY
32h	GERMANY	3Ah	DENMARK II
33h	U.K	3Bh	SLAVONIC
34h	DENMARK I	3Ch	RUSSIA
35h	SWEDEN	3Dh	Factory define
36h	ITALY	3Eh	Factory define
37h	SPAIN	3Fh	User define pattern

5.3 Command type select

STX 05 C n ETX Change command type
ASCII Format STX 05 C n ETX
Dec. Format [02][05][67] n [03]
Hex. Format [02h][05h] [43h] n [03h] 30h≦n ≧37h
Description This command will change the command type and initialize the display. The display emulation mode is based on CD5220II/ESC POS/ADM787/ADM788/ UTC/AEDEX/EMAX mode. The setting function will be saved to EEPROM.

n	Command type	n	Command type
30h	DSP800	34h	AEDEX
31h	ESC/POS	35h	UTC/P
32h	ADM788	36h	UTC/S
33h	ADM787	37h	CD5220

5.4 Reset EEPROM

STX 05 07 n ETX	Reset EEPROM
ASCII Format	STX 05 07 n ETX
Dec. Format	[02][05][07][n][03]
Hex. Format	[02h][05h][07h][n][03h]
Description	This command will reset the content of EEPROM (eg. demo scroll data, user-define character, baud rate setting.) n=31h clear all EEPROM contents n=32h clear upper line data message n=33h clear lower line data message

5.5 Save data for demo display

STX 05 L n m ETX	Save demo message to EEPROM
ASCII Format	STX 05 L n m ETX
Dec. Format	[02][05][76] n m [03]
Hex. Format	[02h][05h][4Ch] n m [03h]
Description	Save demo message for upper line and bottom line n = 31h save data message for upper line n = 32h save data message for lower line m = data message; the maximum data character is under 200

5.6 Run Demo message

STX 05 D 08 ETX	Run demo message
ASCII Format	STX 05 D 08 ETX
Dec. Format	[02][05][68][08][03]
Hex. Format	[02h][05h][44h][08][03h]
Description	Run demo message for the display

5.7 Set Communication Option

STX 05 P n ETX	Set the communication parity
ASCII Format	STX 05 P n ETX
Dec. Format	[02][05][80] n [03]
Hex. Format	[02h][05h][50h] n [03h] 31h≤n≤36h
Description	Change the display communication parity. Set 7 or 8 data bit and the parity set for even, odd, or non-parity.

n	Parity
31h	N-8-1
32h	N-7-1
33h	E-8-1
34h	E-7-1
35h	O-8-1
36h	O-7-1

6. COMMAND

6.1 Command list

6.1.1 CD 5220-II STANDARD MODE

Command	Code description (hex)	Function description
ESC DC1	1B 11	overwrite mode
ESC DC2	1B 12	vertical scroll mode
ESC DC3	1B 13	horizontal scroll mode
ESC Q A .....CR	1B 51 41 [n]x20 0D	set the string display mode, write string to upper line
ESC Q B .....CR	1B 51 42 [n]x20 0D	set the string display mode, write string to lower line
ESC Q D .....CR	1B 51 44 [n]x20 0D	upper line message scroll continuously
ESC [D	1B 5B 44	move cursor left
BS	08	move cursor left
ESC [C	1B 5B 43	move cursor right
HT	09	move cursor right
ESC [A	1B 5B 41	move cursor up
ESC [B	1B 5B 42	move cursor down
LF	0A	move cursor down
ESC [H	1B 5B 48	move cursor to home position
HOM	0B	move cursor to home position
ESC [L	1B 5B 4C	move cursor to left-most position
CR	0D	move cursor to left-most position
ESC [R	1B 5B 52	move cursor to right-most position
ESC [K	1B 5B 4B	move cursor to bottom position
ESC l x y	1B 6C x y 1≤x≤20,y=1,2	move cursor to specified position
ESC @	1B 40	initialize display
ESC W s x1 x2 y	1B 57 1 x1 x2 y 1≤x1≤x2≤20 y=1,2	reset window range at horizontal scroll mode
CLR	0C	clear display screen, and clear string mode
CAN	18	clear cursor line, and clear string mode
ESC * n	1B 2A n 1<=n<=4	brightness adjustment
ESC & s n m [a(p1..pa)]x (m-n+!)	1B 26 1 n m [a(p1..pa)]x (m-n+1) 20h<n<=m<=FFh a=1-5 , p1..p5 =row1..row5	define download characters.
ESC ?	1B 3F	delete download characters.
ESC %	1B 25	select/cancel download character set.
ESC _ n	1B 5F n n=0,1	set cursor ON/OFF
ESC f n	1B 66 n	select international fonts
ESC c n	1B 63 n	select fonts, ASCII code or JIS code
ESC s 1	1B 73 01	store user-define character into EEPROM
ESC d 1	1B 64 01	restore user-define character from EEPROM
ESC = n	1B 3D n n=1; enable printer, disable display n=2; disable printer, enable display n=3; enable printer, enable display n=4; message for customer side (for CD7220D only) n=5; message for operator side (for CD7220D only) default n=2	select peripheral device, display or printer: display for customer side or display for operator side

Table 6-1

(REMARK)

* While using command "ESC QA" or "ESC QB", these two commands can be used with terminal printer: TP2688 or TP3688
* While using command "ESC QA" or "ESC QB", other commands can not be used except when using command "CLR" or "CAN" to change operating mode.
* When using command "ESC QD", the upper line message will scroll continuously until a new command is received, it will then clear the upper line and move the cursor to the upper left-end position.

Set international font for CD7220/CD3220 (Table 6-2)

n	International font set	n	International font set
A	U.S.A.	N	NORWAY
G	GERMANY	W	SWEDEN
I	ITALY	D	DENMARK I
J	JAPAN	E	DENMARK II
U	U.K.	L	SLAVONIC
F	FRANCE	R	RUSSIA
S	SPAIN		reserved

Select code for CD7220/CD3220 (Table 6-3)

n	International code set
A	Compliance with ASCII code
J	Compliance with JIS code
R	Compliance with RUSSIA code
L	Compliance with SLAVONIC code
P	PC858
W	WPC1252

6.1.2 ADM787/788 command list

Command	Code description (hex)	Function description
CLR	0C	clear display
CR	0D	carriage return
SLE1	0E	clear upper line and move cursor to upper left-end position
SLE2	0F	clear bottom line and move cursor to bottom left-end position
DC0	10 n	set period to upper line, last n position 31h≤n≤37h
DC1	11 n	set line blinking, upper line n=‘ 1’ , bottom line n=‘ 2’
DC2	12 n	clear line blinking, upper line n=‘ 1’ , bottom line n=‘ 2’
SF1	1E	clear field 1 and move cursor to field 1, first position
SF2	1F	clear field 2 and move cursor to field 2, first position

Table 6-4

6.1.3 UTC standard mode command list

Command	Code description (hex)	Function description
BS	08	back space
HT	09	horizontal tab
LF	0A	line feed
CR	0D	carriage return
DLE	0F	display position
DC1	11	overwrite display mode
DC2	12	vertical scroll mode
DC3	13	cursor on
DC4	14	cursor off
ESC d	1B 64	change to UTC enhanced mode
US	1F	clear display

Table 6-5

6.1.4 UTC enhanced mode command list

Command	Code description (hex)	Function description
ESC u A ....CR	1B 75 41 [data x 40] 0D	upper line display
ESC u B ....CR	1B 75 42 [data x 40] 0D	bottom line display
ESC u D ....CR	1B 75 44 [data x 40] 0D	upper line message scroll continuously
ESC u E ....CR	1B 75 45 hh ‘ :’ mm 0D h,m=‘ 0’ -‘ 9’	display time
ESC u F ....CR	1B 75 46 [data x 40] 0D	upper line message scroll once
ESC u H ....CR	1B 75 48 n m 0D 20h≤n,m	change attention code
ESC u I ....CR	1B 75 49 [data x 40] 0D	two line display
ESC RS CR	1B 0F 0D	change to UTC standard mode

Table 6-6

6.1.5 AEDEX mode command list

Command	Code description (hex)	Function description
! # 1 ....CR	21 23 31 [data x 40]	upper line display
! # 2 ....CR	21 23 32 [data x 40]	bottom line display
! # 4 ....CR	21 23 34 [data x 40]	upper line message scroll continuously
! # 5 ....CR	21 23 35 hh ' :' mm 0D h,m=' 0' -' 9'	display time
! # 6 ....CR	21 23 36 [data x 40]	upper line message scroll once pass
! # 8 ....CR	21 23 38 n m 0D 20h≤n,m	change attention code
! # 9 ....CR	21 23 39 [data x 40]	two line display

Table 6-7

6.1.6 DSP-800 mode command list

Command	Code description (hex)	Function descriptions
EOT SOH I n ETB	04 01 49 n 17	select international character set
EOT SOH P n ETB	04 01 50 n 17 n=31h-58h	move cursor to specified position
EOT SOH C n m ETB	04 01 43 n m 17 31h≤n≤m≤58h	clear display range from n position to m position and move cursor to n position
EOT SOH S n ETB	04 01 53 n 17 n=31h-35h	save current view message to n layer for demo view data
EOT SOH D n m ETB	04 01 44 n m 17 n=31h-4Fh m=31h-33h	display the saved demo message
EOT SOH A n ETB	04 01 41 n 17 n=31h-34h	brightness adjustment
EOT SOH F n ETB	04 01 46 n 17 00h≤n≤FFh	blink display screen
EOT SOH & n [px5] ETB	04 01 26 n p1...p5 17, 20h≤n	define download characters
EOT SOH ? n ETB	04 01 3F n 17 20h≤n	delete download characters
EOT SOH = n ETB	04 01 3D n 17	select peripheral device select printer n=' 1' , display n=' 2'
EOT SOH % ETB	04 01 25 17	initialize display
EOT SOH @ ETB	04 01 40 17	execute self-test
EOT SOH B n N ETB	04 01 42 n 4E 17 n=31h-36h	set baud rate and parity

Table 6-8

(REMARK)

* International font set (Table 6-9)

n	International font set
30h	U.S.A.
31h	France
32h	Germany
33h	U.K.
34h	Denmark I
35h	Sweden
36h	Italy
37h	Spain
38h	Japan
39h	Norway
3Ah	Denmark II

6.1.7 EPSON ESC/POS command list

Command	Code description(hex)	Function description
HT	09	move cursor right
BS	08	move cursor left
US LF	1F 0A	move cursor up
LF	0A	move cursor down
US CR	1F 0D	move cursor to right-end position
CR	0D	move cursor to left-end position
HOM	0B	move cursor to home position
US B	1F 42	move cursor to bottom position
US $ x y	1F 24 x y 1≤x≤20,y=1,2	move cursor to specified position
CLR	0C	clear display screen
CAN	18	clear cursor line
US X n	1F 58 n 1≤n≤4	brightness adjustment
US E n	1F 45 n 0≤n≤255	blink display screen
ESC @	1B 40	initialize display
ESC t n	1B 74 n 1≤n≤15	select character code table
ESC R n	1B 52 n 1≤n≤15	select international character set
US r n	1F 72 n n=0,1	select/cancel reverse character
US MD1	1F 01	specify overwrite mode
US MD2	1F 02	specify vertical scroll mode
US MD3	1F 03	specify horizontal scroll mode
ESC & s n m [a(p1..pa)]x m-n	1B 26 1 n m [a(p1..pa)]x m-n 20h<n≤m≤FFh; a=1-5, p1..p5=row1..row5	define download characters
ESC ?	1B 3F	delete download characters
ESC %	1B 25	select/cancel download character set
ESC W n s x1 y1 x2 y2	1B 57 n s x1 y1 x2 y2 n=1-4,s=0,1,1≤x1≤x2≤20; 1≤y1≤y2≤2	reset window range
ESC = n	1B 3D n (default n=2) n=1; enable printer, disable display n=2; disable printer, enable display n=3; enable printer, enable display For CD7220D only: n=4; message for customer side n=5; message for operator side	select peripheral device
US :	1F 3A	set starting/ending position to define macro
US ^ n m	1F 5E n m, 0≤(n, m)≤255	execute and quit macro
US @	1F 40	execute self-test
ESC s 1	1F 73 01	store defined download character to EEPROM
ESC d 1	1F 64 01	restore user-define character from EEPROM
ESC T h m	1B 54 h m ,0≤h≤23 0≤m≤59	display time
US . n	1F 2E n , n = a displayable character code	specify period
US , n	1F 2C n , n = a displayable character code	specify comma
US ; n	1F 3B n , n = a displayable character code	specify semicolon (period + comma)
US # n m	1F23 n m , n= 0 or 1 , 0≤m≤20	turn annunciator ON/OFF

Table 6-10

Set international font for ESC/POS (Table 6-11)

n	International font set	n	International font set
0	U.S.A.	7	SPAIN
1	FRANCE	8	JAPAN
2	GERMANY	9	NORWAY
3	U.K.	10	DENMARK II
4	DENMARK I	11	SLAVONIC
5	SWEDEN	12	RUSSIA
6	ITALY	15	Reserved

Select code for ESC/POS (Table 6-12)

n	International font set (80H-FFH)
0	Page 0,(PC437:U.S.A.,standard Europe)
1	Page 1,(Katakana for Japan)
2	Page 2,(PC850:multilingual)
3	Page 3,(PC860:Portuguese)
4	Page 4,(PC863:Canadian-French)
5	Page 5,(PC865:Nordic)
6	Page 6,(SLAVONIC)
7	Page 7,(RUSSLA)
19	Page 8,(PC858:Euro)
16	Page 9,(WPC1252)

6.2 CD7220/CD3220 standard command details

ESC DC1 /Overwrite mode/
ASCII Format ESC DC1
Dec. Format [027][017]
Hex. Format [1Bh][11h]
Description Change the display mode to the overwrite mode. In this mode, the cursor will move rightward and begin from the upper left-end position. When the cursor reached the end of the upper line, the cursor will move down to the bottom left-end position to continue. When the cursor reached the end of the bottom line, it will move up to the upper left-end position and overwrite the previous characters.

ESC DC2 /Vertical scroll mode/
ASCII Format ESC DC2
Dec. Format [027][018]
Hex. Format [1Bh][12h]
Description Change the display mode to the vertical scroll mode. In this mode, the cursor will move rightward. The cursor will begin from the upper left-end position until it reached the end of the upper line, the cursor will then move down to the bottom left-end position to continue until it reached the end of the bottom line. Then, CD7220/CD3220 will scroll the bottom line up to replace the upper line. The bottom line will be cleared, and the cursor will continue to the first position of the bottom line.

ESC DC3 /Horizontal scroll mode/
ASCII Format ESC DC3
Dec. Format [027][019]
Hex. Format [1Bh][13h]
Description Change the display mode to the horizontal mode. In this mo de, the extend of the cursor activity is bond by predefined range, limited to the upper line. (Please refer to Set or cancel window command), where the default window is the whole upper line. Once the cursor activity reached the end of the range, the characters that comes there after will push displayed characters forward from behind.

ESC Q A d1d2d3d4d5d6.....dn CR
ESC Q B d1d2d3d4d5d6.....dn CR /Set the string display mode, and write string to display/
ASCII Format ESC Q A d1d2d3d4d5d6...dn CR
ESC Q B d1d2d3d4d5d6...dn CR
Dec. Format [027][081][065] d1d2d3..dn [013]
[027][081][066] d1d2d3..dn [013]
Hex. Format [1Bh][51h][41h] d1d2d3..dn [0Dh]
[1Bh][51H][42h] d1d2d3..dn [0Dh] {20h≤dn≤ffh}
Description Set the string display mode, write to upper or lower line d1 d2 d3 . . . dn {1≤n≤20}
"A" stands for the upper line, "B" stands for the lower line. The string display mode will be cancelled and back to last mode after receive CLR or CAN.

ESC Q D d1d2d3d4d5d6.....dn CR / Upper line message scroll continuously
ASCII Format ESC Q D d1d2d3d4d5d6...dn CR
Dec. Format [027][081][068] d1d2d3..dn [013]
Hex. Format [1Bh][51h][44h] d1d2d3..dn [0Dh] {20h≤dn≤ffh}
Description The message (previously defined) will scroll continuously in the horizontal direction until a new command is received.

ESC [D /Move cursor left/
BS /Move cursor left/
ASCII Format ESC [D
Dec. Format [027][091][068]
Hex. Format [1Bh][5Bh][44h]
ASCII Format BS
Dec. Format [008]
Hex. Format [08h]
Description When the current cursor is at the left-end position, this command operates differently depends on the display mode.

1. Overwrite mode: When the cursor reached the left-end of the lower line, it will continue to the right-end of the upper line, overwrite previous characters. When it reached the left end of the upper line, it will continue to the right-end of the lower line.
2. Vertical scroll mode: When the cursor reached the left-end of the lower line, the lower line will scroll up and replace the previous upper line, the lower line will be cleared and the cursor will continue to the right end of the lower line.
3. Horizontal scroll mode: The cursor will remain stationary.

ESC [C /Move cursor right/
HT /Move cursor right/
ASCII Format ESC [C
Dec. Format [027][091][067]
Hex. Format [1Bh][5Bh][43h]
ASCII Format HT
Dec. Format [009]
Hex. Format [09h]
Description Move the cursor to the right. When the cursor reached the right-end, this command operates differently depending on the display mode.

1. Overwrite mode: When the cursor reached the right-end of the lower line, it will continue to the left-end of the upper line, overwrite previous characters. When it reached the right-end of the upper line, it will continue to the right-end of the lower line.
2. Vertical scroll mode: When the cursor reached the right-end of the lower line, the lower line will scroll up to replace the upper line, the lower line is cleared and ready to continue characters there after.
3. Horizontal scroll mode: The cursor will remain stationary.

ESC [A /Move cursor up/
ASCII Forma t ESC [A
Dec. Format [027][091][065]
Hex. Format [1Bh][5Bh][41h]
Description Move the cursor up one line. When the cursor is on the upper line, this command operates differently depending on the display mode.

1. Overwrite mode: The cursor is moved to the same column on the lower line.
2. Vertical scroll mode: The characters display on the upper line are scrolled to the lower line, and the upper line is cleared. The cursor will remain at the same position.
3. Horizontal scroll mode: The cursor will remain stationary.

ESC [B /Move cursor down/
L F /Move cursor down/
ASCII Format ESC [B
Dec. Format [027][091][066]
Hex. Format [1Bh][5Bh][42h]
ASCII Format LF
Dec. Format [010]
Hex. Format [0Ah]
Description Move the cursor down one line. When the cursor reached the lower line, this command operates differently depending on the display mode.

1. Overwrite mode: The cursor is moved to the same column on the upper line.
2. Vertical scroll mode: The characters display on the lower line are scrolled to the upper line, and the lower line is cleared. The cursor will remain at the same position.
3. Horizontal scroll mode: The cursor will remain stationary.

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ESC [H /Move cursor to home position/
HOM /Move cursor to home position/
ASCII Format ESC [H
Dec. Format [027][091][072]
Hex. Format [1Bh][5Bh][48h]
ASCII Format HOM
Dec. Format [011]
Hex. Format [0Bh]
Description The cursor will move to the left-end position of the upper line

ESC [L /Move cursor to left-most position/
CR /Move cursor to left-most position/
ASCII Format ESC [L
Dec. Format [027][091][076]
Hex. Fomat [1Bh][5Bh][4Ch]
ASCII Format CR
Dec. Format [013]
Hex. Format [0Dh]
Description The cursor will be moved to the left-end position of the current line.

ESC [R /Move cursor to right-most position/
ASCII Format ESC [R
Dec. Format [027][091][082]
Hex. Format [1Bh][5Bh][52h]
Description The cursor will be moved to the right-end position of the current line.

ESC [K /Move cursor to bottom position/
ASCII Format ESC [K
Dec. Format [027][091][075]
Hex. Format [1Bh][5Bh][4Bh]
Description The cursor will be moved to the right-end position on the lower line.

ESC 1 x y /Move cursor to specified position/
ASCII Format ESC l x y
Dec. Format [027][108] x y { $1 \le x \le 20$, $1 \le y \le 2$ }
Hex. Format [1Bh][6Ch][x][y]
Description The cursor will be moved to the x column on the y line.

ESC @ /Initialize display/
ASCII Format ESC @
Dec. Format [027][064]
Hex. Format [1Bh][40h]
Description The data in the input buffer will be cleared and reset from default.

ESC W s x1x2 y /Reset the window/
ASCII Format ESC W s x1 x2 y
Dec. Format [027][087][000]
[027][087][001] x1 x2 y { 1<=x1<=x2<=20 , 1<=y<=2 }
Hex. Format [1Bh][57h][000]
[1Bh][57H][01h][x1][x2][y]
Description Reset the window on the display. When s = 0, window is cancelled (values: x1, x2, and y are not required.)
When s = 1 the window will be reset (values: x1, x2, and y are required.) The x1 and x2 set the position of the left column and right column, respectively, of the window. The y sets the upper line or the lower line of the window. This function is valid within the horizontal mode.

CLR /Clear display screen, and clear string mode/
ASCII Format CLR
Dec. Format [012]
Hex. Format [0Ch]
Description All the display characters will be cleared, and the string mode will be cancelled.

CAN /Clear current line, and cancel string mode/
ASCII Format CAN
Dec. Format [024]
Hex. Format [18h]
Description The current line is cleared, and the string mode is cancelled.

ESC * n /Brightness adjustment /
ASCII Format ESC * n
Dec. Format [027][042] n {3<=n<=4}
Hex. Format [1Bh][2Ah][n]
Description Adjust the brightness of the vacuum fluorescent display.
When n = 3 ,brightness = 70 %
When n = 4 ,brightness =100 %

ESC _ n /Set cursor ON or OFF /
ASCII Format ESC _ n
Dec. Format [027][095] n {0<=n<=1}
Hex. Format [1Bh][5Fh][n]
Description: Set cursor ON or OFF
When n = 0, cursor is OFF
When n = 1, cursor is ON

ESC f n /Select international font/
ASCII Format ESC f n
Dec. Format [027][102] n
Hex. Format [1Bh][66h][n]
Description Set international font

n	International font set	n	International font set
A	U.S.A.	N	NORWAY
G	GERMANY	W	SWEDEN
I	ITALY	D	DENMARK I
J	JAPAN	E	DENMARK II
U	U.K.	L	SLAVONIC
F	FRANCE	R	RUSSIA
S	SPAIN		reserved

Table 6-11

ESC c n /Select fonts /
ASCII Format ESC c n
Dec. Format [027][099] n
Hex. Format [1Bh][63h][n]
Description Select fonts

n	International font set	n	International
A	compliance with ASCII code	R	compliance with RUSSIA code
J	compliance with JIS code	L	compliance with SLAVONIC code

Table 6-12

ESC = n	/Select peripheral device, Display or Printer/
ASCII Format	ESC = n
Dec. Format	[027][061] n {n=1,2,3}
Hex. Format	[1Bh][3Dh][n]
Description	Select peripheral device When n = 01h, enable printer, disable display When n = 02h, disable printer, enable display When n = 03h, enable printer, enable display For CD7220D only: When n = 04h, display message for customer side When n = 05h, display message for operator side
ESC & s n m [a(p1...pa)] x(m-n+1) n	/Set user-defined characters/
ASCII Format	ESC & s n m [a(p1...pa)] x (m-n+1) s=1
Dec. Format	[027][038][001] n m [a(p1...pa)] x (m-n+1) 20h≤n≤m≤FFh
Hex. Format	[1Bh][26h][01h][n][m][a(p1...pa)] x (m-n+1) 0≤a≤5 0≤p1...pa≤255
Description	The n defines the beginning character code, and m defines the ending character code. When only one character is defined, use n = m The "a" denotes the number of dots in the horizontal direction. When a <5, the dot pattern fo "a" on the right side of the user-defined characters are padded with spaces p1... pa, the dot data is to defined the characters. This indicates the dot pattern for "a" in the horizontal direction from the left side.
ESC % n	/Reset user defined character set/
ASCII Format	ESC % n
Dec. Format	[027][037] n {n=0 or 1 }
Hex. Format	[1Bh][25h][n]
Description	When n=1, user-defined characters are selected. When the user-defined characters are not defined by the ESC & command, the internal character set will be displayed. When n=0, user-defined characters are cancelled and the international character set is selected.
ESC ? n	/Cancel user defined characters/
ASCII Format	ESC ? n
Dec. Format	[027][063] n {20h<=n<=FFh or 1 }
Hex. Format	[1Bh][3Fh][n]
Description	User-defined characters are cancelled. This command cancels the defined characters specified by n. If specified code is transmitted after the pattern is cancelled, the international character will be displayed.
ESC s 1	/Store the user defined character into EEPROM. (EEPROM type only)/
ASCII Format	ESC s 1
Dec. Format	[027][115] [001]
Hex. Format	[1Bh][73h][01h]
Description	This command is successful when the display is selected under command ESC=03h If EEPROM is not supported, this command is ignored.
ESC d 1	/Restore the user defined character from EEPROM. (EEPROM type only)/
ASCII Format	ESC d 1
Dec. Format	[027][100] [001]
Hex. Format	[1Bh][64h][01h]
Description	CD7220/CD3220 will restore user-defined characters from EEPROM, and the user-defined characters will be selected. If EEPROM is not supported, this command is ignored.

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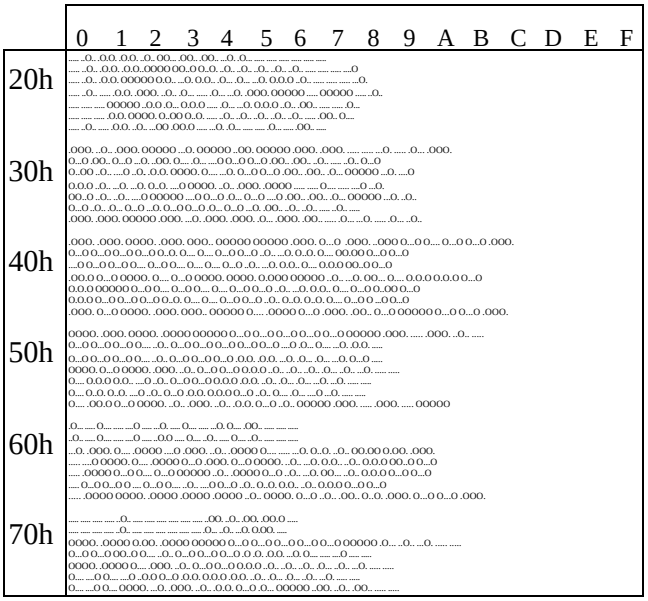
7. CHARACTER SET

(1)Control code set

HEX	CODE	HEX	CODE
00H	NULL	10H	DLE
01H	MD1	11H	DC1
02H	MD2	12H	DC2
03H	MD3	13H	DC3
04H	MD4	14H	DC4
05H	MD5	15H	
06H	MD6	16H	
07H	MD7	17H	
08H	BS,MD8	18H	CAN
09H	HT	19H	
0AH	LF	1AH	
0BH	HOM	1BH	ESC
0CH	CLR	1CH	
0DH	CR	1DH	
0EH	SLE1	1EH	SF1
0FH	RS,SLE2	1FH	US,SF2

(2)U.S.A font set



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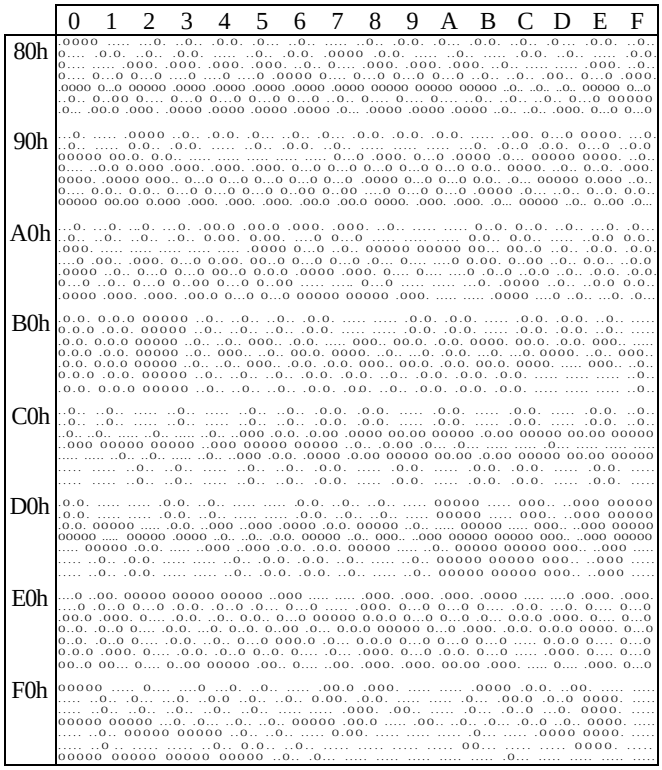
(3) International character selection
(Indicate character selection by dip switch or command)

ASCII CODE

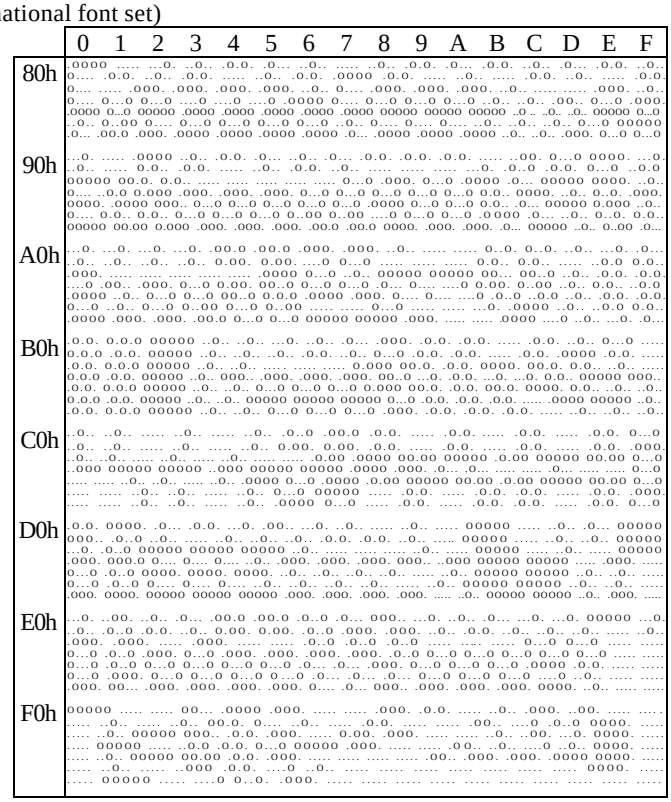
No.	International	23 24 40 5B 5C 5D 5E 60 7B 7C 7D 7E
0	USA	.O.O. ..O.. .OOO. .OOO. ..... .OOO. ..O.. ..O.. ..OO. ..O.. .OO.. .OO.O .O.O. .OOOO O...O .O... O.... ...O. .O.O. ...O. .O... ..O.. ...O. O.OO. OOOOO O.O.. O.OOO .O... .O... ...O. O...O ..... .O... ..O.. ...O. ..... .O.O. .OOO. OO..O .O... ..O.. ...O. .... O.... ....O ..... OOOOO ..O.O O.OOO .O... ...O. ...O. .... .O... ..O.. ...O. ..... .O.O. OOOO. O.... .O... ....O ...O. .... .O... ..O.. ...O. ..... .O.O. ..O.. .OOOO .OOO. ..... .OOO. ....OO. ..O.. .OO.. .....
1	FRANCE	.O.O. ..O.. .O... .OOO. .OOOO .OOO. ..O.. ..O.. ...O. .O... .O... .O.O. .O.O. .OOOO ..O.. .O.O. O.... O.... .O.O. ...O. ..O.. ..O.. ..O.. ..... OOOOO O.O.. .OOO. .OOO. O.... .OOO. O...O ..... .OOO. ..... .OOO. ..... .O.O. .OOO. ....O ..... O.... O...O .... O...O O...O O...O ..... OOOOO ..O.O .OOOO ..... .OOOO .OOO. .... OOOOO O...O OOOOO ..... .O.O. OOOO. O...O ....O.. ....O .... O.... O..OO O.... ..... .O.O. ..O.. .OOOO ..... .O... .OOO. .... .OOO. .OO.O .OOOO .....
2	GERMANY	.O.O. ..O.. .OOO. O...O O...O O...O ..O.. ..O.. .O.O. .... .OO.. .O.O. .OOOO O.... .... .O.O. ...O. ..... .O.O. .O.O. O..O. OOOOO O.O.. .OOO. .OOO. .OOO. O...O O...O ..... .OOO. .... OOO.. .O.O. .OOO. O...O O...O O...O O...O ....O .OOO. O...O O..O. OOOOO ..O.O .OOO. OOOOO O...O O...O .... .OOOO O...O O...O O..O. .O.O. OOOO. ....O O...O O...O O...O .... O...O O...O O..OO OOO.. .O.O. ..O.. .OOO. O...O .OOO. .OOO. .... .OOOO .OOO. .OO.O O...
3	U.K	..OO. ..O.. .OOO. .OOO. ..... .OOO. ..O.. ..O.. ..OO. ..O.. .OO.. .OO.O .O..O .OOOO O...O .O... O.... ...O. .O.O. ...O. .O... ..O.. ...O. O.OO. .O... O.O.. O.OOO .O... .O... ...O. O...O ..... .O... ..O.. ...O. ..... OOOO. .OOO. OO..O .O... ..O.. ...O..... ..... O.... ....O ..... .O... ..O.O O.OOO .O... ...O. ...O. .... .O... ..O.. ...O. ..... .O... OOOO. O.... .O... ....O ...O. .... .O... ..O.. ...O. ..... OOOOO ..O.. .OOOO .OOO. ..... .OOO. ....OO. ..O.. .OO.. .....
4	DENMARK I	.O .O. ..O.. .OOO. .OOOO ..O.. ..O.. ..O.. ..O.. ....O.. .OO.O .O.O. .OOOO O...O O.O.. .OOO. .O.O. .O.O. ...O. ....O. ..... O.OO. OOOOO O.O.. O.OOO O.O.. O.O.O ..O.. O...O ..... OO.O. .OOO. .OOO. ..... .O.O. .OOO. OO..O O.OOO O.O.O .OOO. ....O.O O.O.O ....O ..... OOOOO ..O.O O.OOO OOO.. O.O.O O...O .... .OOOO O.O.O .OOOO ..... .O.O. OOOO. O.... O.O.. .OOO. OOOOO .... O.O.. .OOO. O...O ..... .O.O. ..O.. .OOOO O.OOO ..O.. O...O .... OO.OO .O... .OOOO .....
5	SWEDEN	.O.O. O...O ...O. .O.O. O...O .OOO. O...O ...O. .O.O. ..... .OOO. ..... .O.O. .OOO. ..O.. .... .O.O. ....O.. ..... .O.O. .O.O. .O.O. OOOOO O...O OOOOO ..O.. .OOO. .OOO. O...O .OOO. .OOO. ..... .OOO. ..... .O.O. O...O O.... .O.O. O...O O...O O...O O...O ....O .OOO. ....O O...O OOOOO O...O OOOO. O...O O...O OOOOO O...O OOOOO .OOOO O...O .OOOO O...O .O.O. .OOO. O.... OOOOO O...O O...O O...O O.... O...O O...O O...O O..OO .O.O. O...O OOOOO O...O .OOO. O...O .OOO. .OOOO .OOOO .OOO. .OOOO .OO.O
6	ITALY	.O.O. ..O.. .OOO. .OOO. ....O. ..O.. .O... .O... .O... .O... .O... .O.O. .OOOO O...O .O.O. O.... ..O.. .O.O. ..O.. ..O.. ..O.. ..O.. ..O.. OOOOO O.O.. O.OOO .OOO. .O... .OOO. O...O ..... .OOO. ..... .OOO. ..... .O.O. .OOO. OO..O ....O.. O...O ..... O...O ....O .O OO. O...O .OO.. OOOOO ..O.O O.OOO ....O. OOOOO ..... O...O .OOOO O...O OOOOO ..O.. .O.O. OOOO. O.... ....O O.... ..... O..OO O...O O...O O.... ..O.. .O.O. ..O.. .OOOO .... .OOOO ..... .OO.O .OOOO .OOO. .OOOO .OOO.
7	SPAIN	OOOO. ..O.. .OOO. ..O.. .OO.O ..O.. ..O.. ..O.. .O.O. .OO.O .OO.. .OO.O O...O .OOOO O...O ..O.. O.OO. ..... .O.O. ...O. ..... O.OO. ...O. O.OO. OOOO. O.O.. O.OOO ....O.. O...O ....O. ..... O..O. .OOO. OO..O ..O.. OO..O .O... .... O.OO. ....O ..... O.OOO ..O.O O.OOO ..O.. O.O.O O.... .... OO..O ...O. ..... O..O. OOOO. O.... ..O.. O..OO O...O .... O...O ...O. ..... O..OO ..O.. .OOOO ..O.. O...O .OOO. .... O...O .OO.. .....
8	JAPAN	.O.O. ..O.. .OOO. .OOO. O...O.OOO. ..O.. ..O.. ..OO. ..O.. .OO.. .OO.O .O.O. .OOOO O...O .O... .O.O. ...O. .O.O. ...O. .O... ..O.. ...O. O.OO. OOOOO O.O.. O.OOO .O... OOOOO ...O. O...O ..... .O... ..O.. ...O. ..... .O.O. .OOO. OO..O .O... ..O.. ...O. .... O.... ....O ..... OOOOO ..O.O O.OOO .O... OOOOO ...O. .... .O... ..O.. ...O. ..... .O.O. OOOO. O.... .O... ..O.. ...O. .... .O... ..O.. ...O. ..... .O.O. ..O.. .OOOO .OOO. ..O.. .OOO. ....OO. ..O.. .OO.. .....
9	NORWAY	.O.O. O...O ...O. .OOOO ....O .OOO. O ...O ...O. .... .OOO. .O.O. .O.O. .OOO. ..O.. O.O.. .OOO. .O.O. ....O.. ....O. .O.O. ..... OOOOO O...O OOOOO O.O.. O..OO .OOO. O...O .OOO. OO.O. .OOO. .OOO. ..... .O.O. O...O O.... O.OOO O.O.O O...O O...O O...O ..O.O O.O.O ....O O...O OOOOO O...O OOOO. OOO.. OO..O OOOOO O...O OOOOO .OOOO O.O.O .OOOO O...O .O.O. .OOO. O.... O.O.. .OOO. O...O O...O O.... O.O.. .OOO. O...O O..OO .O.O. O...O OOOOO O.OOO O.... O...O .OOO. .OOOO OO.OO .O... .OOOO .OO.O
10	DENMARK II	.O.O. ..O.. ...O. .OOOO ....O .OOO. O...O ...O. .... .OOO. .O.O. .O.O. .OOOO ..O.. O.O.. .OOO. .O.O. ....O.. ....O. .O.O. ..... OOOOO O.O.. OOOOO O.O.. O..OO .OOO. O...O .OOO. OO.O. .OOO. .OOO. ..... .O.O. .OOO. O.... O.OOO O.O.O O...O O...O O...O ..O.O O.O.O ....O O...O OOOOO ..O.O OOOO. OOO.. OO..O OOOOO O...O OOOOO .OOOO O.O.O .OOOO O...O .O.O. OOOO. O.... O.O.. .OOO. O...O O...O O.... O.O.. .OOO. O...O O..OO .O.O. ..O.. OOOOO O.OOO O.... O...O .OOO. .OOOO OO.OO .O... .OOOO .OO.O
11	SLAVONIC	.O.O. ..O.. .OOO. .OOO. ..... .OOO. ..O.. ..O.. ..O O. ..O.. .OO.. .OO.O .O.O. .OOOO O...O .O... O.... ...O. .O.O. ...O. .O... ..O.. ...O. O.OO. OOOOO O.O.. O.OOO .O... .O... ...O. O...O ..... .O... ..O.. ...O. ..... .O.O. .OOO. OO..O .O... ..O.. ...O. .... O.... ....O ..... OOOOO ..O.O O.OOO .O... ...O. ...O. .... .O... ..O.. ...O. ..... .O.O. OOOO. O.... .O... ....O ...O. .... .O... ..O.. ...O. ..... .O.O. ..O.. .OOOO .OOO. ..... .OOO. ....OO. ..O.. .OO.. .....
12	RUSSIA	.O.O. ..O.. .OOO. .OOO. ..... .OOO. ..O.. ..O.. ..OO. ..O. .OO.. .OO.O .O.O. .OOOO O...O .O... O.... ...O. .O.O. ...O. .O... ..O.. ...O. O.OO. OOOOO O.O.. O.OOO .O... .O... ...O. O...O ..... .O... ..O.. ...O. ..... .O.O. .OOO. OO..O .O... ..O.. ...O. .... O.... ....O ..... OOOOO ..O.O O.OOO .O... ...O. ...O. .... .O... ..O.. ...O. ..... .O.O. OOOO. O.... .O... ....O ...O. .... .O... ..O.. ...O. ..... .O.O. ..O.. .OOOO .OOO. ..... .OOO. ....OO. ..O.. .OO.. .....

CD7220/CD3220 CUSTOMER DISPLAY

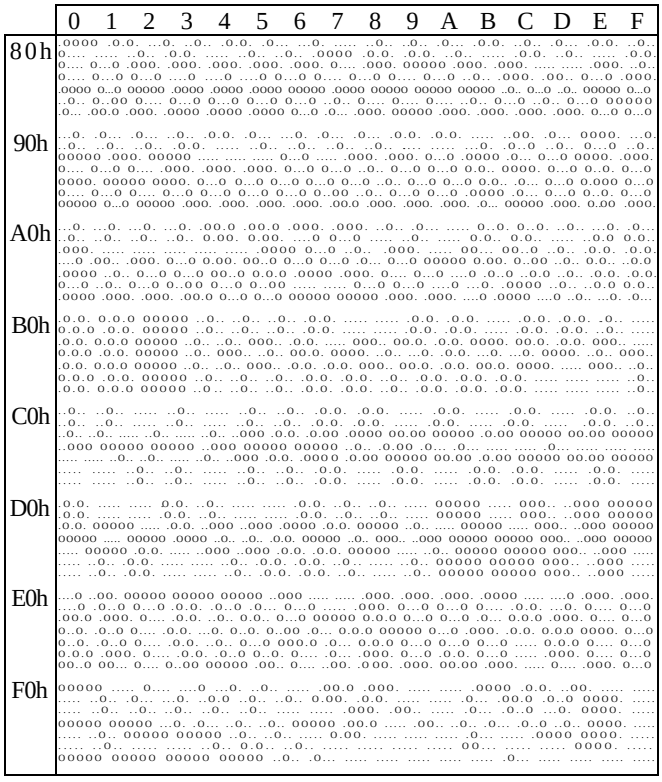
(4)PC-437 Standard Europe international font set



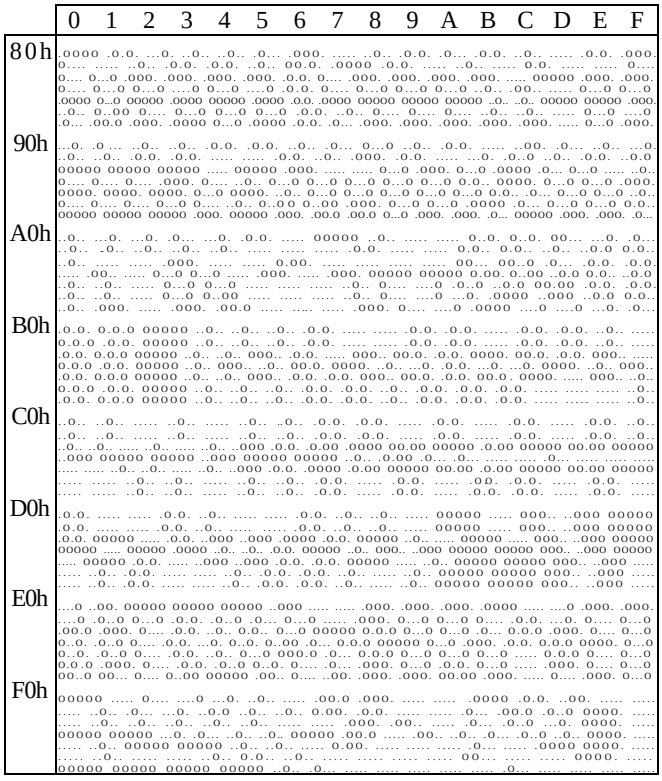
(5) PC-850 (multingual international font set)



(6) PC-860 Portuguese international font set

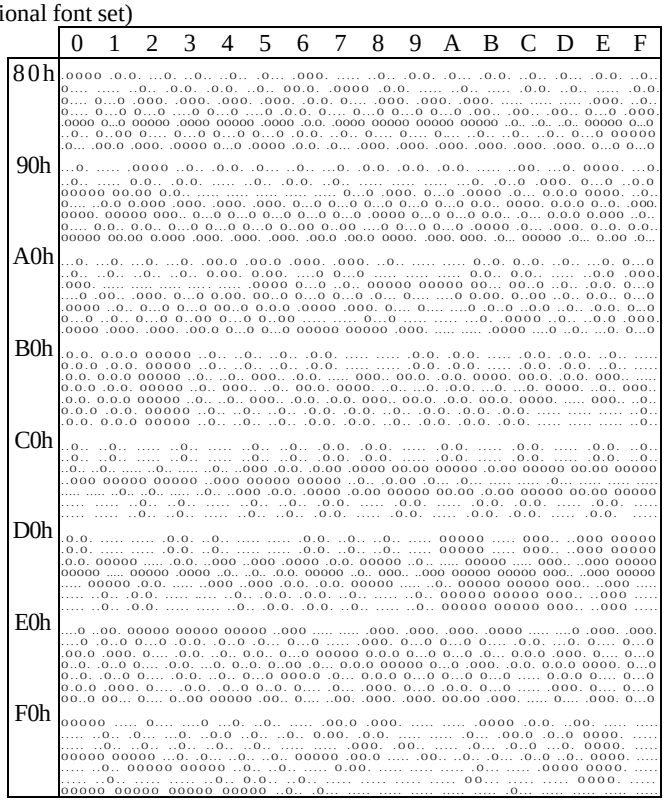


(7) PC-863 Canadian French international font set

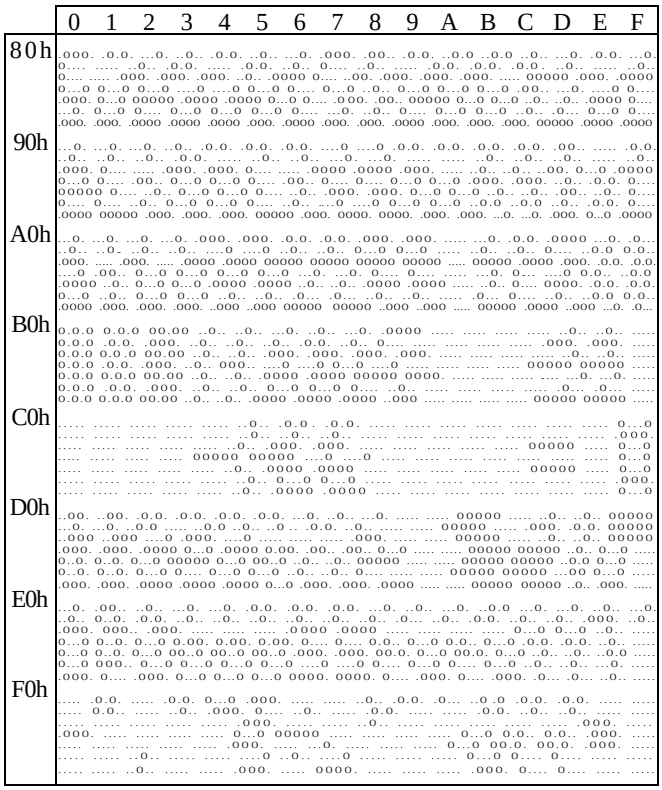


CD7220/CD3220 CUSTOMER DISPLAY

(8) PC-865 NORDIC (international font set)

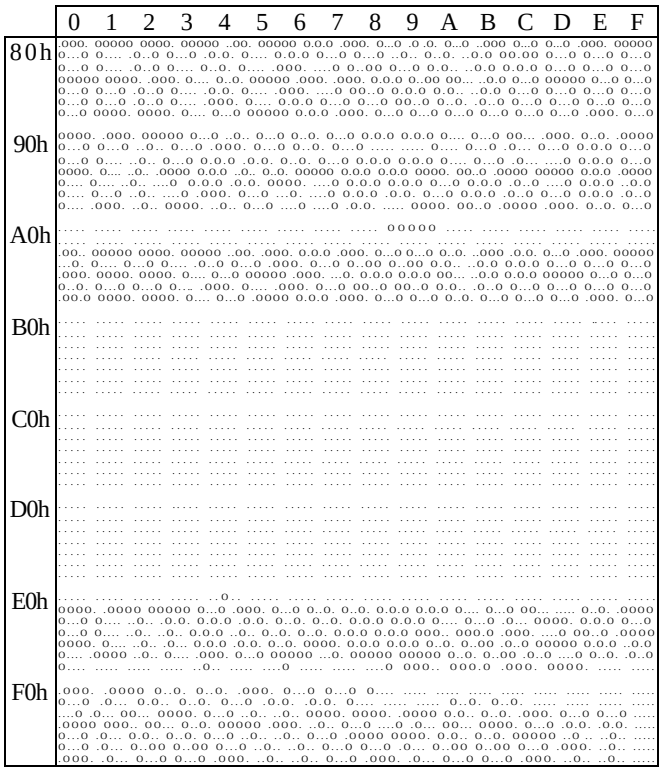


(9) SLAVONIC Font set

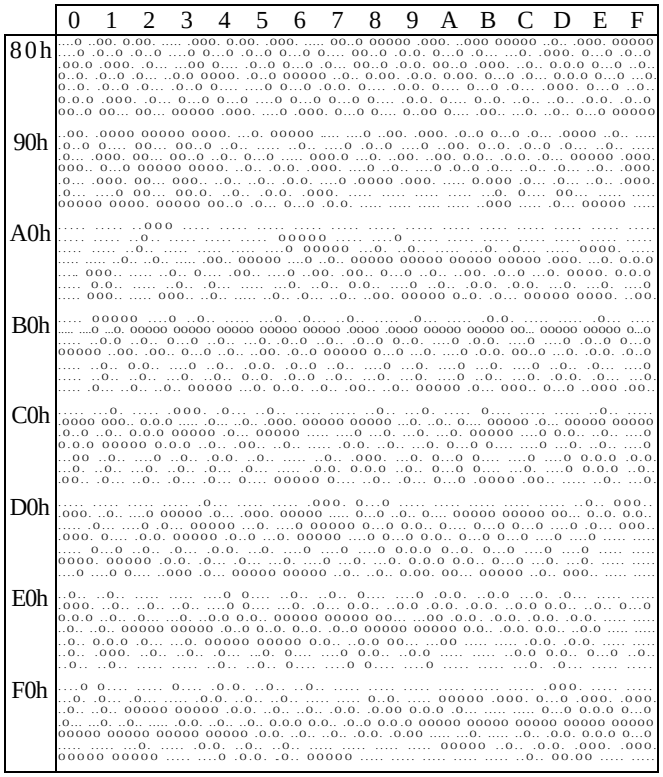


CD7220/CD3220 CUSTOMER DISPLAY

(10) RUSSIA font set

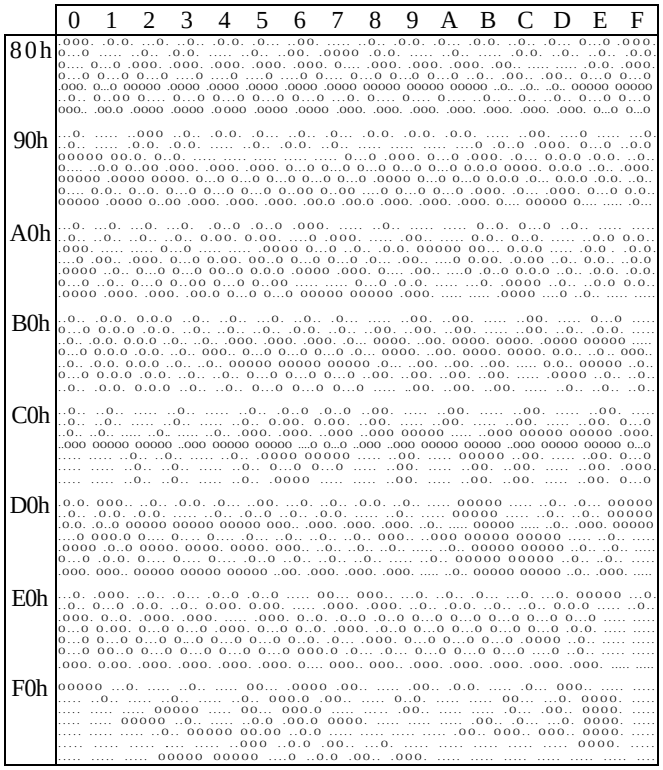


(11) Katakana font set

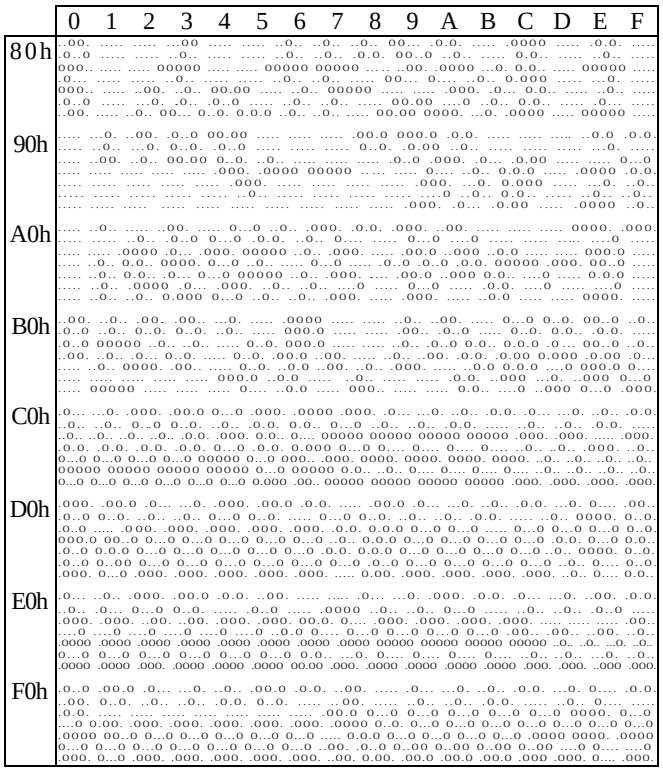


CD7220/CD3220 CUSTOMER DISPLAY

(12) PC-858



(13) WPC1252

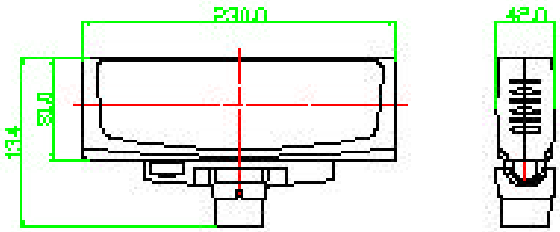


CD7220/CD3220 CUSTOMER DISPLAY

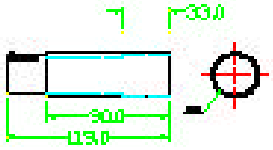
8. DIMENSION

8.1 CD7220/CD7220D

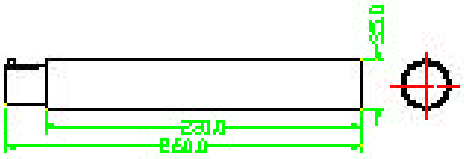
1. CD7220/CD7220D



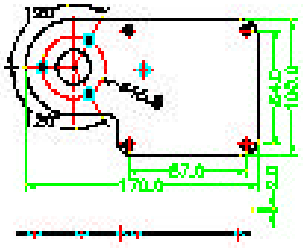
3. Short Pole



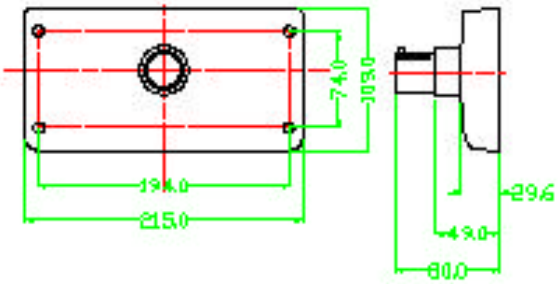
2. Long Pole



5. Metal Plate



4. Rectangle Base

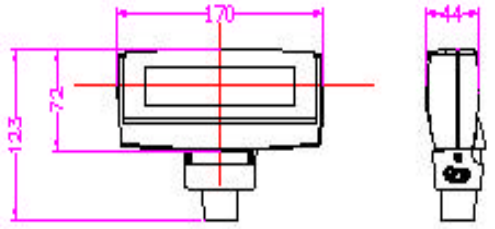


6. Circular Base

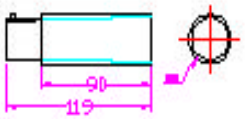
CD7220/CD3220 CUSTOMER DISPLAY

8.2 CD3220

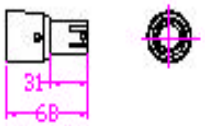
1.CD3220



3. Short Pole

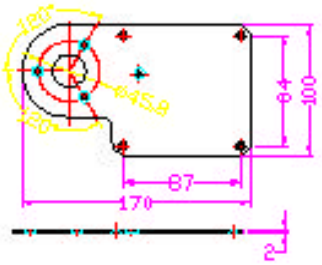


7.CD-3220-7220 Converter

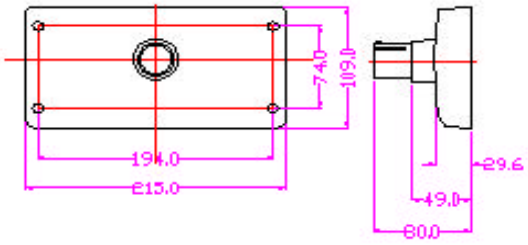


2. Long Pole

5. Metal Plate



4. Rectangle Base

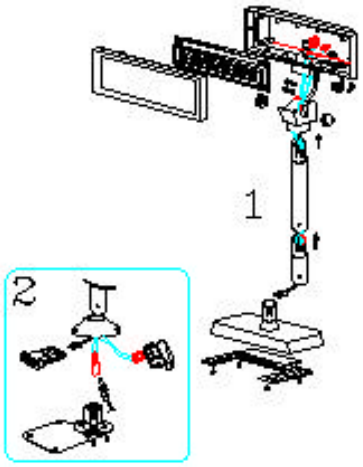


6. Circular Base

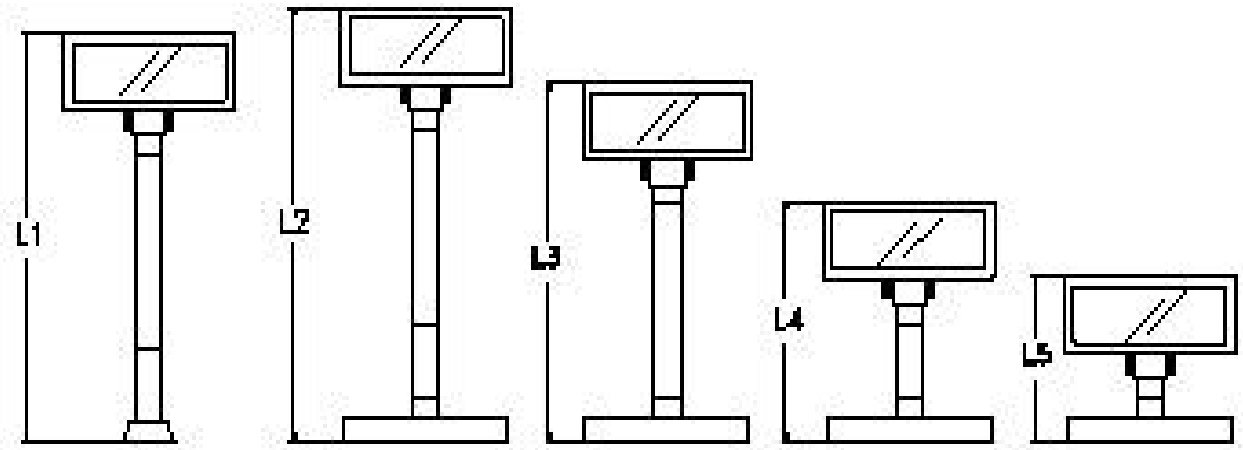
CD7220/CD3220 CUSTOMER DISPLAY

9. INSTALLATION GUIDE

9.1 CD7220/CD7220D

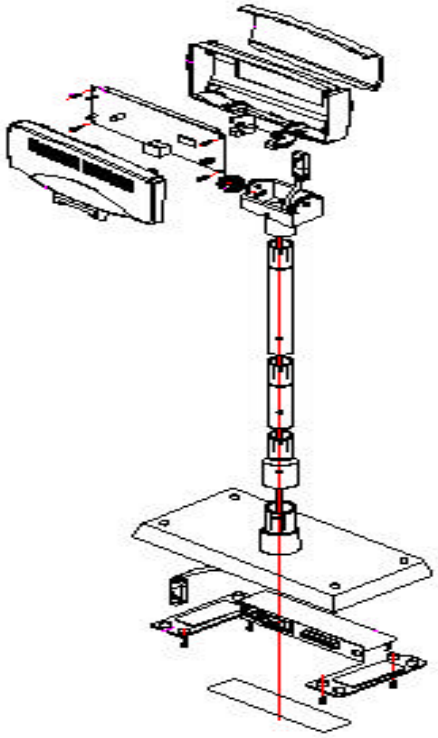


L1	L2	L3	L4	L5	
474	504	414	273	183	mm



CD7220/CD3220 CUSTOMER DISPLAY

9.2 CD3220



L1	L2	L3	L4	L5	
500	530	440	299	209	mm