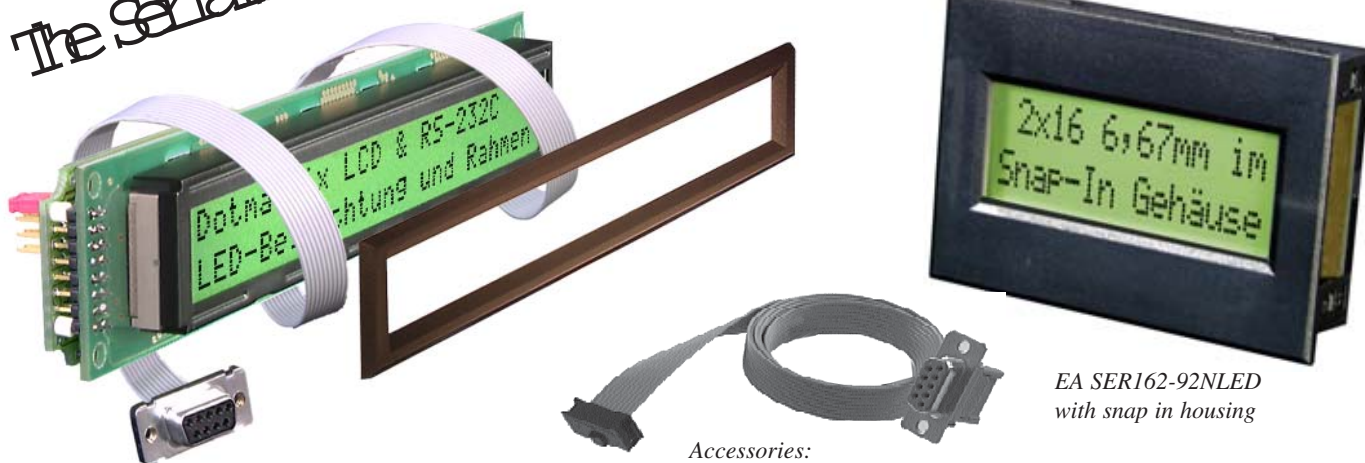


# THE SERIALS

## DOTMATRIX DISPLAYS WITH RS-232

The Serials



EA SER162-92NLED  
with snap in housing

Accessories:  
cable EA KV24-9B  
length: 1,50 m

### FEATURES

- \* 32 DIFFERENT SIZES OF DISPLAYS AVAILABLE (1x8 UP TO 16x40)
- \* SUPPLY VOLTAGE +5V OR OPTIONAL 9..35V<sup>1)</sup>
- \* INCL. LED-ILLUMINATION SWITCHABLE BY MEANS OF SOFTWARE
- \* 25 DISPLAYS WITH YELLOW/GREEN LED-BACKLIGHT
- \* 7 DISPLAYS WITH LOW POWER WHITE LED-BACKLIGHT
- \* 3 DISPLAYS WITH SNAP IN HOUSING
- \* HIGH CONTRAST SUPERTWIST LCD
- \* INCL. FRONTAL BEZEL WITH ANTIGLARE GLASS<sup>2)</sup>
- \* AUTOMATIC LINE MANAGEMENT
- \* CR / LF / SCROLL / CURSOR POSITIONING
- \* BAUDRATE SETTING BY JUMPER: 300, 1200, 2400 OR 9600 BAUD
- \* POTI FOR CONTRAST ADJUSTMENT ON BOARD
- \* MULTIPLE DISPLAYS ON SINGLE RS-232C

### OPTIONS

- \* SUPPLY +9..35V= INSTEAD OF +5V=
- \* RS-422 INTERFACE INSTEAD OF RS-232 (STANDARD)
- \* DIP-SWITCH FOR ADDRESS INSTEAD OF SOLDERBRIDGE

EA OPT-9/35V<sup>1)</sup>  
EA OPT-RS422<sup>1)</sup>  
EA OPT-DIP6<sup>1)</sup>

### ACCESSORIES

- \* CABLE WITH 9-PIN D-SUB FEMALE PLUG FOR PC

EA KV24-9B

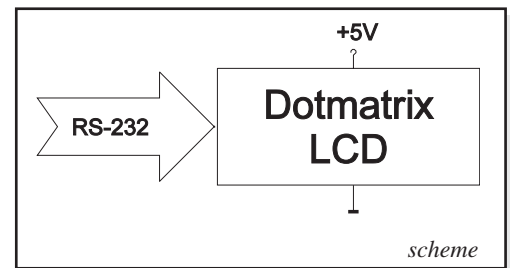
<sup>1)</sup> not available with SER308, SER408, SER3016 and SER4016

<sup>2)</sup> not available with SER082-C, SER204-4, SER242-B, SER3016 and SER4016

**ELECTRONIC  
ASSEMBLY**  
making things easy

## General

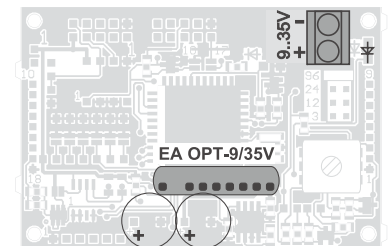
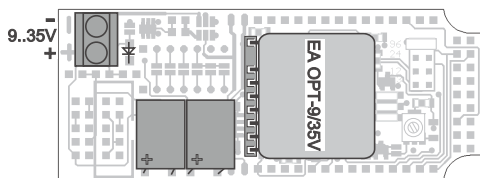
**The Serials** represents a complete LCD-Dotmatrix family with input circuit and frontal bezel. These LCD-modules also includes a RS-232 interface (or optional RS-422). The mounting is done through holes of the LCD-module, the data connection is made to a standard RS-232C/RS-422 interface. Transfer rate can be set by jumper on 300, 1200, 2400 or 9600 Baud. All cursor controls (line feed etc.) are performed automatically. All displays feature LED-backlight illumination. Matching frontal bezel with antiglare glass is included also.



## Power SUPPLY / CONTRAST ADJUSTMENT

Supply voltage is +5V, current consumption depends on type of display and its illumination (100-800 mA, see table on page 20). The Serials can be connected to power either by screw terminals or with RS-232 connector. Display contrast is adjustable by potentiometer.

important: It is imperative that the polarity is correct. Even very brief polarity reversal can damage the entire operating unit immediately and irreparably.

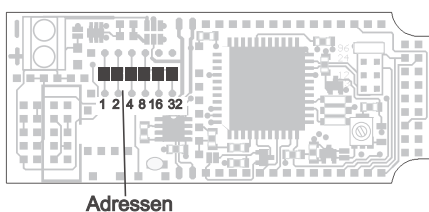


9..35V Versorgung bei Displays im Snap-In

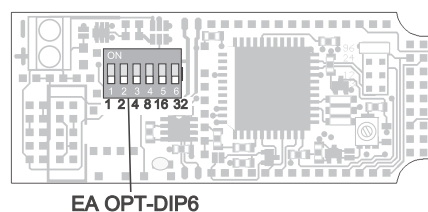
## Multiple Displays on a single RS-232C

A single RS-232C can operate a number of displays. For that an individual address must be assigned to each display. Commands "Select/Deselect" will target each individual display.

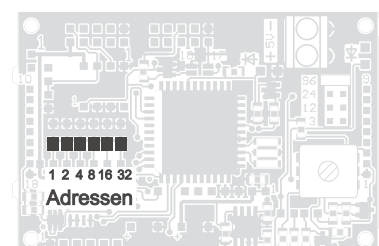
Adresseinstellung per Lötbrücken



Adresseinstellung über DIP-Schalter



Adresseinstellung bei Displays im Snap-In



<sup>1)</sup> not available with SER308, SER408, SER3016 and SER4016

<sup>2)</sup> not available with SER082-C, SER204-4, SER242-B, SER3016 and SER4016

**COMMANDS, DATA TRANSFER**

All incoming datas will be largely interpreted as ASCII datas. When display fills up, the characters automatically scroll to the top. CR/LF will be recognized and executed. FF (12d/\$0C) clears the display. Cursor can be set manually by command i.e. "ESC O" (ESC=27d/\$1B).

| TABLE OF COMMANDS       |      |   |     |    | after Reset   |          |
|-------------------------|------|---|-----|----|---|----------|
| Command                 | Code |   |     |    | Remark  |          |
| Formfeed FF (dec.:12)   | ^L   |   |     |    | Clear screen and place cursor to home position (1,1)  |          |
| Carriage Return CR (13) | ^M   |   |     |    | Set cursor into first column left hand                |          |
| Linefeed LF (dec.:10)   | ^J   |   |     |    | Move cursor down to next line                         |          |
| Cursor positioning      | ESC  | O | n1  | n2 | n1=column; n2=line; home-position (1,1) top left hand | 1,1      |
| Cursor Form             | ESC  | C | 0   |    | Hidden cursor   | 3        |
|                         |      |   | 1   |    | Cursor in form of a flashing block                    |          |
|                         |      |   | 2   |    | Cursor as an underscore                               |          |
|                         |      |   | 3   |    | Cursor in form of a flashing block with an underscore |          |
| Display Mode            | ESC  | M | 1   |    | Clear-mode; autoflow OFF                              | 4        |
|                         |      |   | 2   |    | Clear-mode; autoflow ON                               |          |
|                         |      |   | 3   |    | Scroll-mode; autoflow OFF                             |          |
|                         |      |   | 4   |    | Scroll-mode; autoflow ON                              |          |
| Select / Deselect       | ESC  | S | adr |    | Select interface adress adr=0..254; (adr 255=all)     | selected |
|                         |      | D |     |    | Deselect interface adress adr=0..254; (adr 255=all)   |          |

The 1-line, 2-line and 4-line displays offer beside standard-commands additional options:

| additional commands for 1..4 line displays |      |   |    |             | after Reset   |          |
|--|------|---|----|-------------|---|----------|
| Command                                    | Code |   |    |             | Remark  |          |
| Display Mode                               | ESC  | M | 5  |             | Overwrite-mode; autoflow OFF  | 4        |
|  |      |   | 6  |             | Overwrite-mode; autoflow ON   |          |
| Convert Character Code                     | ESC  | U | 0  |             | no character code conversion  | 1        |
|  |      |   | 1  |             | convert character code to IBM-Code (for english/japanisch character set)  |          |
| Define character                           | ESC  | Z | n1 | 8 x data... | n1=character no. (0..7); data = 8x bytes for new character  |          |
| LED backlit on/off                         | ESC  | L | n1 |             | LED backlit n1=0: off, n1=1: on; n1=2: invert; n1=3..255 n1/10 sec. on  | on       |
| Write output port                          | ESC  | Y | n1 | n2          | n1=0: Set all 6 output ports in accordance with n2 (=6-bit binary value)<br>n1=1..8: Reset output port n1 (n2=0); set (n2=1); invert (n2=2) | all<br>1 |
| Version Number                             | ESC  | V |    |             | Shows the version number on the display   |          |
| Reset                                      | ESC  | R |    |             | Resets and re-initializes the display and controller.<br>Before sending new data over the RS-232/RS-422 wait 500.                           |          |

The 8-line and 16-line displays offer beside standard-commands additional options:

| additional commands for 8- and 16-line displays |      |   |     |  | after Reset  |   |
|---|------|---|-----|--|--|---|
| Command   | Code |   |     |  | Remark   |   |
| Display Mode                                    | ESC  | M | 5   |  | Clear-mode; autoflow OFF                                       | 4 |
|   |      |   | 6   |  | Clear-mode; autoflow ON  |   |
|   |      |   | 7   |  | Scroll-mode; autoflow OFF                                      |   |
|   |      |   | 8   |  | Scroll-mode; autoflow ON                                       |   |
| Set letter type                                 | ESC  |   | N   |  | Set standard type; black letters; bright background            | N |
|   |      |   | I   |  | Set inverse letters; bright letters; black background          |   |
|   |      |   | B   |  | Flashing letters; black letters flash on bright background     |   |
|   |      |   | L   |  | Invers+flashing; bright letters flash on black background      |   |
| Save actual settings                            | ESC  | P |     |  | Saves cursorform, display-mode and font-type in EEPROM         |   |
| Select / Deselect                               | ESC  | A | adr |  | Assignes a new select/deselect adress (8 bit) to the interface |   |

## RS-232C Connection / Baud rates

Connection to RS-232C or RS-422 interface is made on a 2x5 pin type socket. With cable EA KV24-9B (accessories not for RS-422) **The Serials** are ready to be connected directly to a PC. Transfer rate can be set by jumper on 300, 1200, 2400 or 9600 Baud.

Data format:



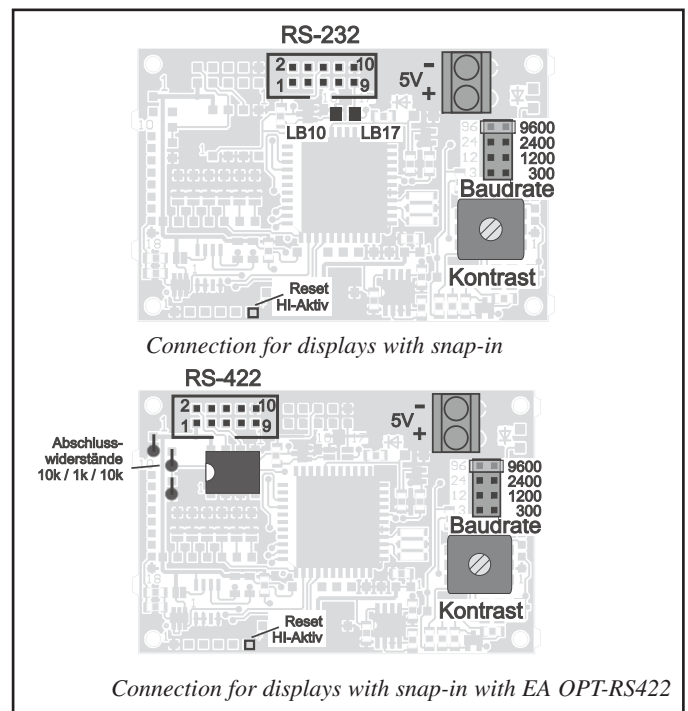
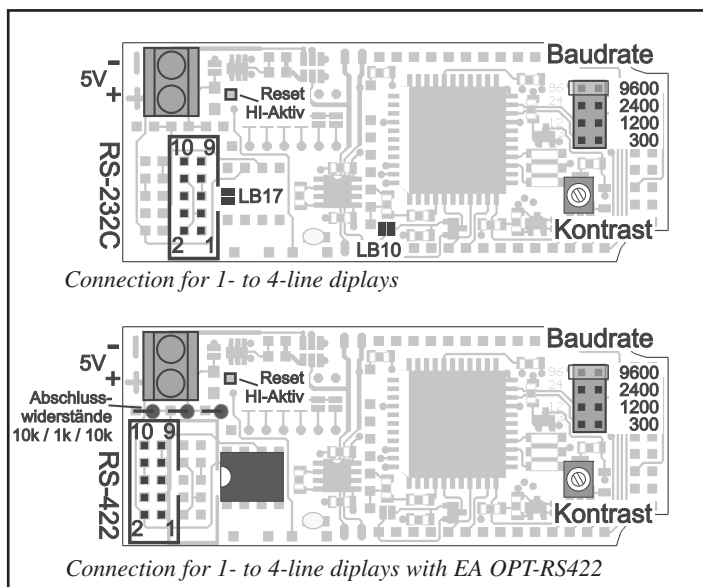
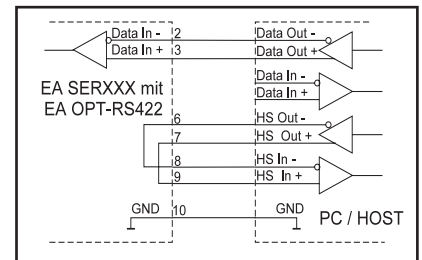
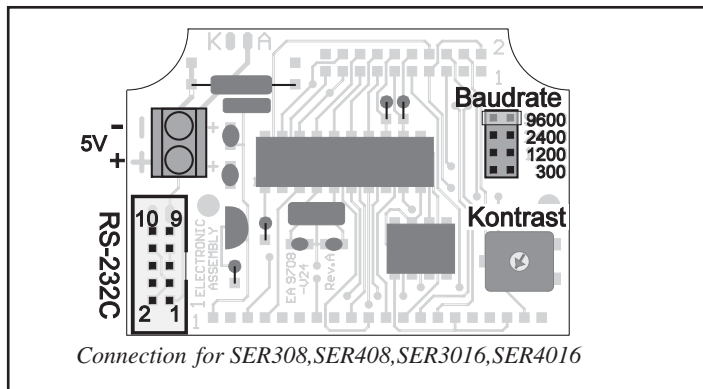
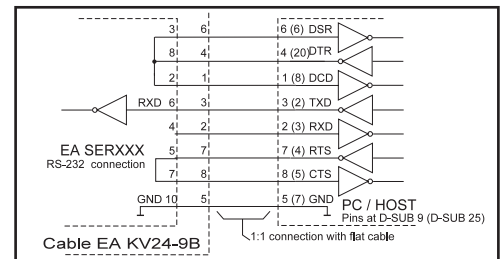
If no jumper is set during power on, the display switches into self test mode and shows its character set.

If the operating unit is ordered together with the EA OPT-RS422 option, special RS-422 drivers are fitted. The pin assignment in the table on the right then applies.

Incidentally, the same serial data with 5V level and CMOS logic is available at Pin 9. These level are suitable for direct connection to a  $\mu$ C. If these signal is used, the solder straps LB 10 + LB 17 must be closed!

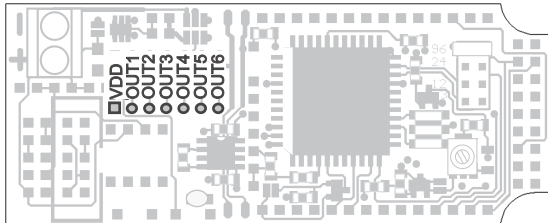
| RS-232C socket (2x5 pins) |           |                           |     |        |                           |
|---------------------------|-----------|---------------------------|-----|--------|---------------------------|
| Pin                       | Symbol    | Function                  | Pin | Symbol | Function                  |
| 1                         | VDD       | +5V                       | 2   | DCD    | connection to DSR and DTR |
| 3                         | DSR       | connection to DCD and DTR | 4   | NC     | not connected             |
| 5                         | CTS       | CTS and RTS bridged       | 6   | RXD    | data input                |
| 7                         | RTS       |                           | 8   | DTR    | connection to DSR and DCD |
| 9                         | RXD5 CMOS | close LB10+LB17           | 10  | GND    | 0V                        |

| RS-422 socket (2x5 pins) |          |                            |     |          |                           |
|--------------------------|----------|----------------------------|-----|----------|---------------------------|
| Pin                      | Symbol   | Function                   | Pin | Symbol   | Function                  |
| 1                        | VDD      | +5V                        | 2   | Data In- | Receive Data              |
| 3                        | Data In+ | Receive Data               | 4   | NC       | not connected             |
| 5                        | NC       | not connected              | 6   | HS In-   | HS In- and HS Out-bridged |
| 7                        | HS In+   | HS In+ and HS Out+ bridged | 8   | HS Out-  |                           |
| 9                        | HS Out+  |                            | 10  | GND      | 0V                        |

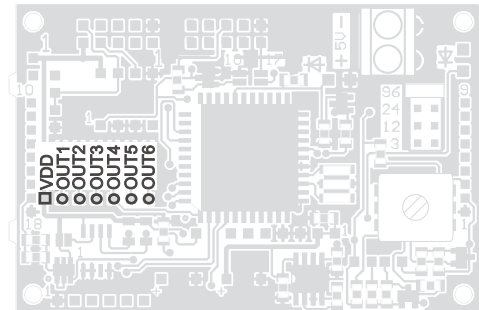


**Digital output<sup>1)</sup>**

There are up to 6 digital outputs OUT1..OUT6. They share with the solder link for address setting (cannot be used with EA OPT-DIP6). When one or more outputs are used, the possibility for address set is limited automatically.



All versions except EA S ERxx-92



Displays with Snap-In case (EA SERxx-92)

After Power-On all output are set to HIGH. Setting an output will be done by following command:

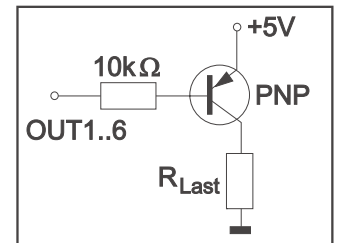
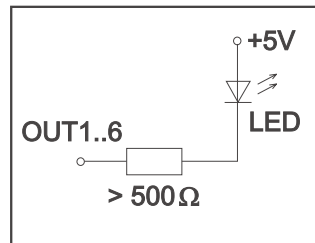
**'ESC Y n1 n2'**

**n1:** Output no. 1, 2, 3, 4, 5 or 6

**n2=0:** Output set to LOW (0V); **n2=1:** Output set to HIGH (5V); **n2=2:** Invert output

**Application example<sup>1)</sup>**

Each output line provides a NPN transistor with about 50kOhm pull-up resistor; i.e. only LO level is able to supply about 10mA. In summary current for OUT1..OUT6 may not exceed 15mA. HIGH level is able to source up to 100µA only. Driving a higher load signal must be amplified by an external transistor or MOSFET.



<sup>1)</sup> not for SER308, SER408, SER3016 and SER4016

**Self defined character<sup>1)</sup>**

8 character (ASCII codes \$00..\$07) are presetted with " ", "±", "2", "3", "β", "Ä", "Ö", "Ü" and can be redefined with the command "ESC Z n1 data...". After re-definition the presetted codes are no longer available. It makes sense to switch off the relocation of ASCII codes via command 'ESC U 0'.

After power-on or reset the predefined codes are available again.

**Example:**

ESC Z \$00 \$04 \$04 \$04 \$04 \$15 \$0E \$04 \$00

After that, character code \$00 is defined as an downside arrow.

Note: For definition 8 data bytes are necessary.

|    |   | character data |   |   |   |           |
|----|---|----------------|---|---|---|-----------|
|    |   | bit value      |   |   |   |           |
| 16 | 8 | 4              | 2 | 1 |   |           |
| 0  | 0 | 1              | 0 | 0 | 0 | \$04 (4)  |
| 0  | 0 | 1              | 0 | 0 | 0 | \$04 (4)  |
| 0  | 0 | 1              | 0 | 0 | 0 | \$04 (4)  |
| 0  | 0 | 1              | 0 | 0 | 0 | \$04 (4)  |
| 1  | 0 | 1              | 0 | 1 | 1 | \$15 (21) |
| 0  | 1 | 1              | 1 | 0 | 0 | \$0E (14) |
| 0  | 0 | 1              | 0 | 0 | 0 | \$04 (4)  |
| 0  | 0 | 0              | 0 | 0 | 0 | \$00 (0)  |

<sup>1)</sup> not for SER308, SER408, SER3016 and SER4016: only the complete character set can be exchanged



**Character set:**

**1- to 4-line displays**

All character listed beside are built-in for the 1- to 4-line displays.

| Lower 4 bit \ Upper 4 bit | 0000 (\$0x) | 0001 (\$1x) | 0010 (\$2x) | 0011 (\$3x) | 0100 (\$4x) | 0101 (\$5x) | 0110 (\$6x) | 0111 (\$7x) | 1000 (\$8x) | 1001 (\$9x) | 1010 (\$Ax) | 1011 (\$Bx) | 1100 (\$Cx) | 1101 (\$Dx) | 1110 (\$Ex) | 1111 (\$Fx) |
|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| xxxx0000 (\$x0)           |             |             |             | 0           | 1           | P           | '           | P           |             |             | -           | 9           | E           | α           | ρ           |             |
| xxxx0001 (\$x1)           | ±           |             | !           | 1           | A           | Q           | a           | q           | Ü           |             | °           | °           | °           | °           | °           | ±           |
| xxxx0010 (\$x2)           | ±           |             | "           | 2           | B           | R           | b           | r           |             |             | °           | °           | °           | °           | °           |             |
| xxxx0011 (\$x3)           | ±           |             | #           | 3           | C           | S           | c           | s           |             |             | °           | °           | °           | °           | °           |             |
| xxxx0100 (\$x4)           | ±           |             | \$          | 4           | D           | T           | d           | t           | ä           | ö           | °           | °           | °           | °           | °           |             |
| xxxx0101 (\$x5)           | ±           |             | %           | 5           | E           | U           | e           | u           |             |             | °           | °           | °           | °           | °           |             |
| xxxx0110 (\$x6)           | ±           |             | &           | 6           | F           | V           | f           | v           |             |             | °           | °           | °           | °           | °           |             |
| xxxx0111 (\$x7)           | ±           |             | '           | 7           | G           | W           | g           | w           |             |             | °           | °           | °           | °           | °           |             |
| xxxx1000 (\$x8)           | ±           |             | (           | 8           | H           | X           | h           | x           |             |             | °           | °           | °           | °           | °           |             |
| xxxx1001 (\$x9)           | ±           |             | )           | 9           | I           | Y           | i           | y           |             |             | °           | °           | °           | °           | °           |             |
| xxxx1010 (\$xA)           | LF          |             | *           | :           | J           | Z           | j           | z           |             |             | °           | °           | °           | °           | °           |             |
| xxxx1011 (\$xB)           | ±           | ESC         | +           | :           | K           | [           | k           | <           |             |             | °           | °           | °           | °           | °           |             |
| xxxx1100 (\$xC)           | FF          |             | ,           | <           | L           | ¥           | l           |             |             |             | °           | °           | °           | °           | °           |             |
| xxxx1101 (\$xD)           | CR          |             | -           | =           | M           | ]           | m           | >           |             |             | °           | °           | °           | °           | °           |             |
| xxxx1110 (\$xE)           | ±           |             | .           | >           | N           | ^           | n           | →           | ±           | ±           | °           | °           | °           | °           | °           |             |
| xxxx1111 (\$xF)           | ±           |             | /           | ?           | O           | _           | o           | ←           |             |             | °           | °           | °           | °           | °           |             |

**Character set:**

**EA SER204-92HNLED**

The EA SER204-92HNLED do have a different character set.

**Character set:**

**8- and 16-line displays**

All 8- and 16-line displays EA SER308, SER408, SER3016 und SER4016 do provide the extended IBM character set (codes 32..255) incl. frame symbols. It is also possible to exchange the character set totally (e.g. for cyrillic or special codes). This can be done together with the tools on EA DISK9708<sup>\*)</sup>.

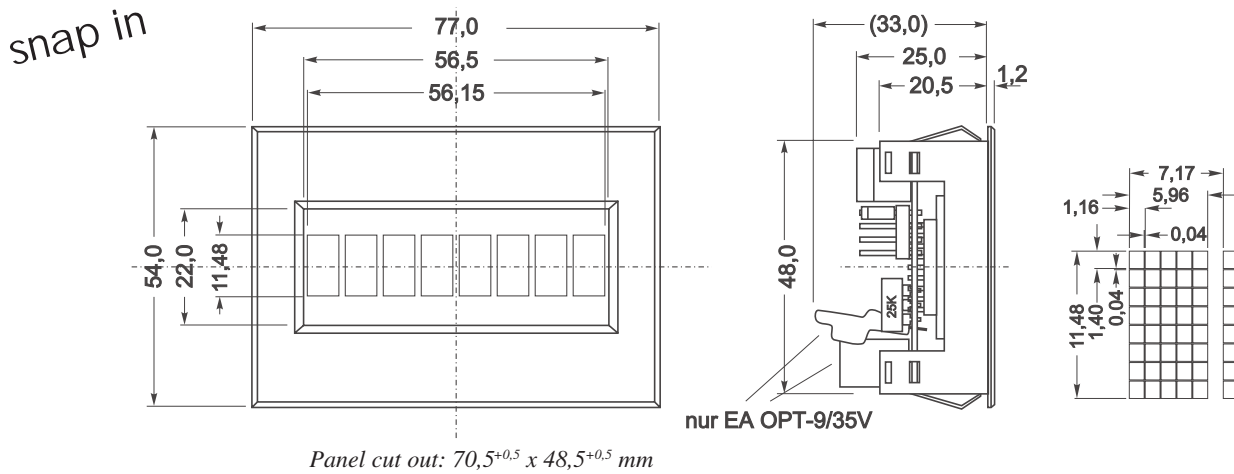
| Lower 4bit \ Upper 4bit | LLLL | LLLH | LLHL | LLHH | LHLL | LHLH | LHHL | LHGH | HLLL | HLLH | HHLH | HHLH | HHLL | HHLH | HHHH |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| LLLL                    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| LLLH                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| LLHL                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| LLHH                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| LHLL                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| LHLH                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| LHHL                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| LHGH                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| HLLL                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| HLLH                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| HHLH                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| HHLH                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| HHLL                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| HHLH                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |
| HHHH                    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    | ±    |

| + Lower Upper   | \$0 (0) | \$1 (1) | \$2 (2) | \$3 (3) | \$4 (4) | \$5 (5) | \$6 (6) | \$7 (7) | \$8 (8) | \$9 (9) | \$A (10) | \$B (11) | \$C (12) | \$D (13) | \$E (14) | \$F (15) |
|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|
| \$20 (dez: 32)  |         | !       | "       | #       | \$      | %       | &       | '       | (       | )       | *        | +        | ,        | -        | .        | /        |
| \$30 (dez: 48)  | 0       | 1       | 2       | 3       | 4       | 5       | 6       | 7       | 8       | 9       | :        | ;        | <        | =        | >        | ?        |
| \$40 (dez: 64)  | a       | b       | c       | d       | e       | f       | g       | h       | i       | j       | k        | l        | m        | n        | o        |          |
| \$50 (dez: 80)  | p       | q       | r       | s       | t       | u       | v       | w       | x       | y       | z        | [        | \        | ]        | ^        | _        |
| \$60 (dez: 96)  | `       | a       | b       | c       | d       | e       | f       | g       | h       | i       | j        | k        | l        | m        | n        | o        |
| \$70 (dez: 112) | p       | q       | r       | s       | t       | u       | v       | w       | x       | y       | z        | {        |          | }        | ~        | 0        |
| \$80 (dez: 128) | 1       | 2       | 3       | 4       | 5       | 6       | 7       | 8       | 9       | 0       | 1        | 2        | 3        | 4        | 5        | 6        |
| \$90 (dez: 144) | 7       | 8       | 9       | 0       | 1       | 2       | 3       | 4       | 5       | 6       | 7        | 8        | 9        | 0        | 1        | 2        |
| \$A0 (dez: 160) | 3       | 4       | 5       | 6       | 7       | 8       | 9       | 0       | 1       | 2       | 3        | 4        | 5        | 6        | 7        | 8        |
| \$B0 (dez: 176) | 9       | 0       | 1       | 2       | 3       | 4       | 5       | 6       | 7       | 8       | 9        | 0        | 1        | 2        | 3        | 4        |
| \$C0 (dez: 192) | 5       | 6       | 7       | 8       | 9       | 0       | 1       | 2       | 3       | 4       | 5        | 6        | 7        | 8        | 9        | 0        |
| \$D0 (dez: 208) | 1       | 2       | 3       | 4       | 5       | 6       | 7       | 8       | 9       | 0       | 1        | 2        | 3        | 4        | 5        | 6        |
| \$E0 (dez: 224) | 7       | 8       | 9       | 0       | 1       | 2       | 3       | 4       | 5       | 6       | 7        | 8        | 9        | 0        | 1        | 2        |
| \$F0 (dez: 240) | 3       | 4       | 5       | 6       | 7       | 8       | 9       | 0       | 1       | 2       | 3        | 4        | 5        | 6        | 7        | 8        |

<sup>\*)</sup> also in internet at <http://www.lcd-module.de/deu/disk/disk9708.zip>

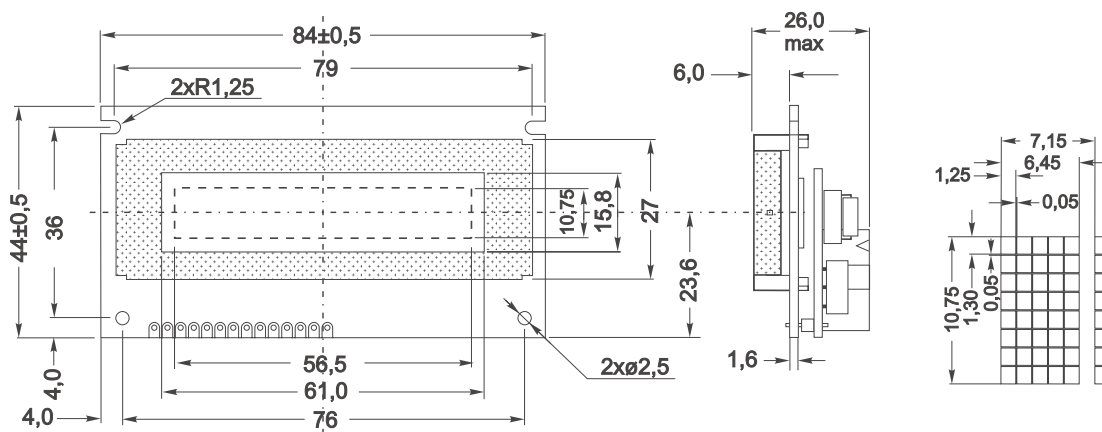
## EA SER081-92NLED

incl. snap in housing EA 0092-KE  
1x8,ZH 11.48mm



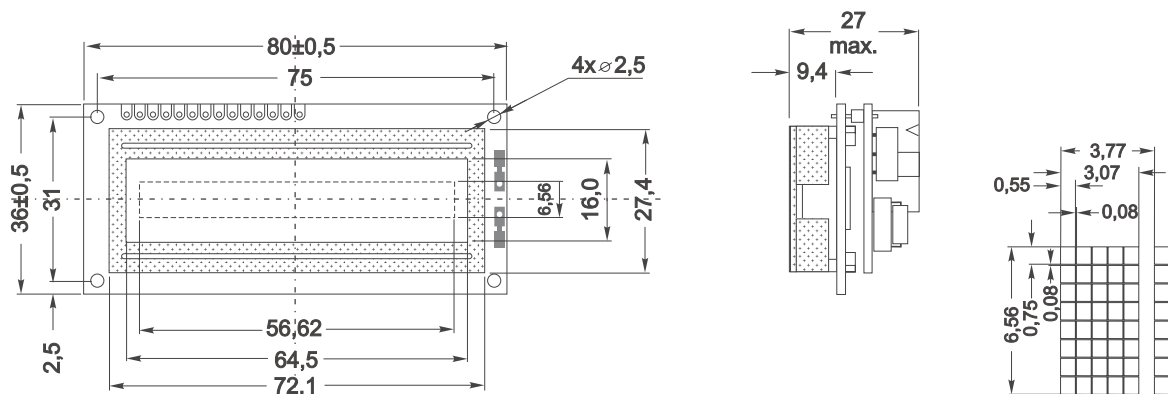
## EA SER081-CNLED

incl. frontal bezel EA 017-2UKE  
1x8,ZH 10.8mm



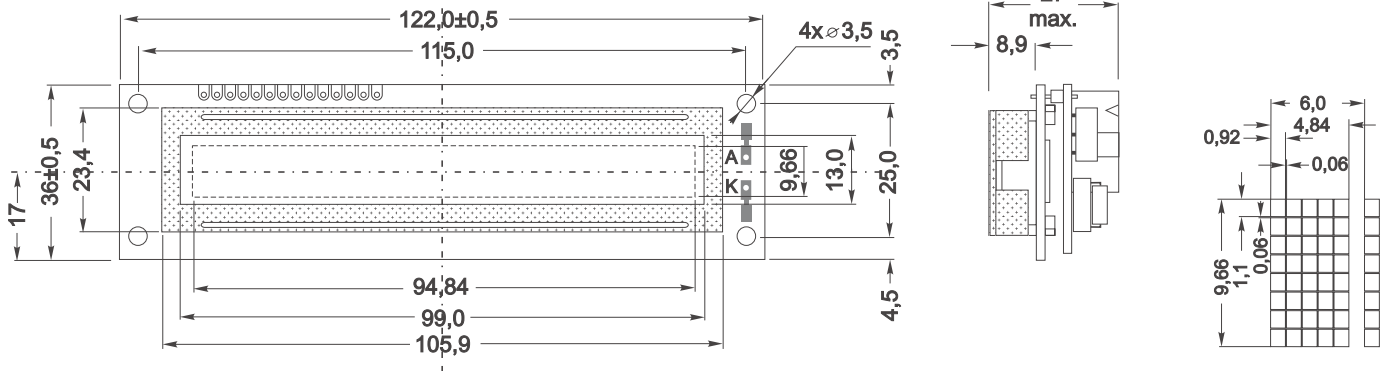
## EA SER161-DNLED

incl. frontal bezel EA 017-1UKE  
1x16,ZH 6.6mm



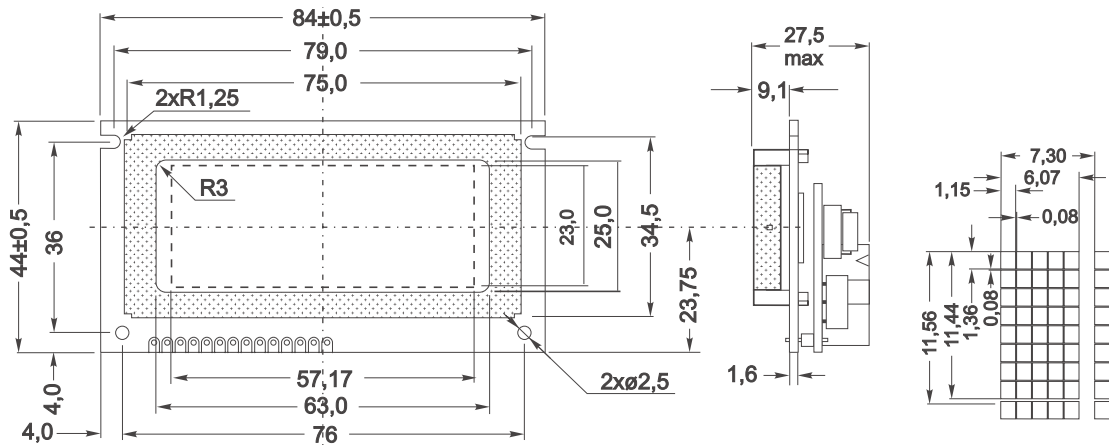
## EA SER161-ENLED

incl. frontal bezel EA 017-6UKE  
1x16,ZH 9.66mm



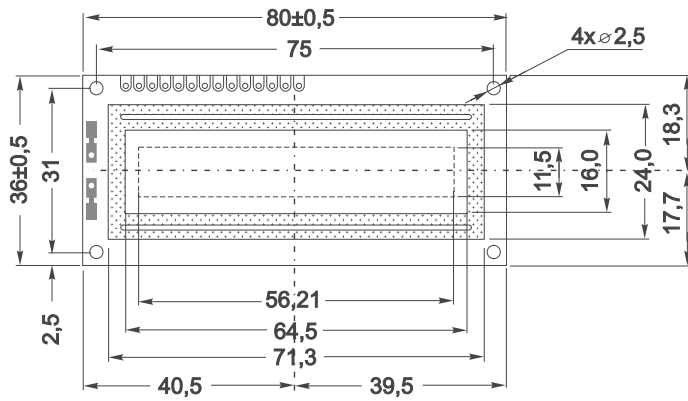
## EA SER082-CNLED

incl. frontal bezel EA 017-8UKE  
1x8,ZH 11.44mm

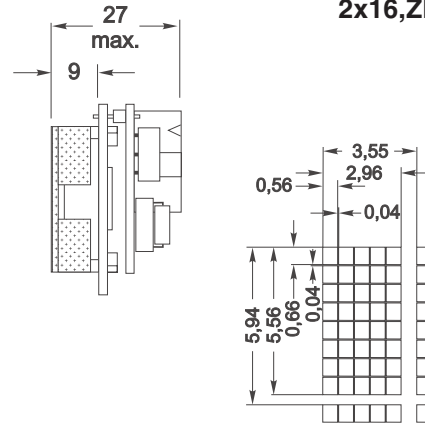




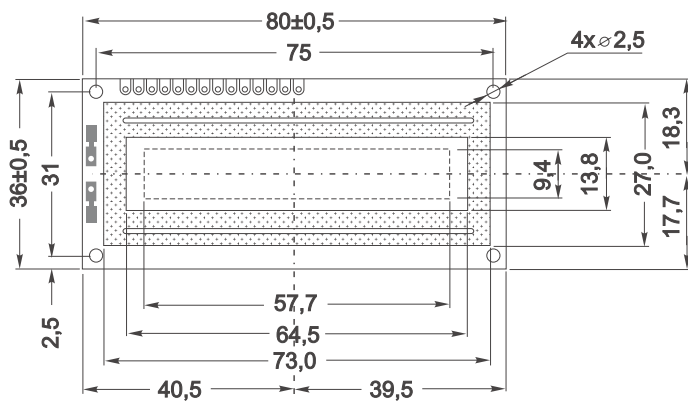
## EA SER162-N3LW *blue/white*



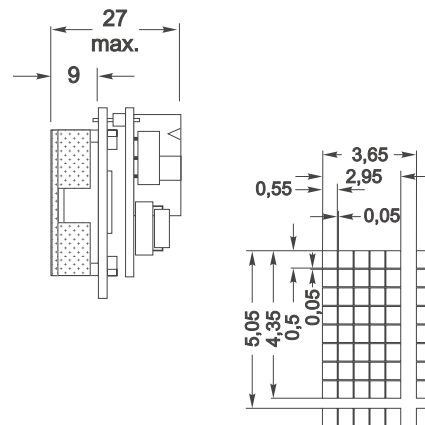
incl. frontal bezel EA 017-2UKE  
2x16,ZH 5.55mm



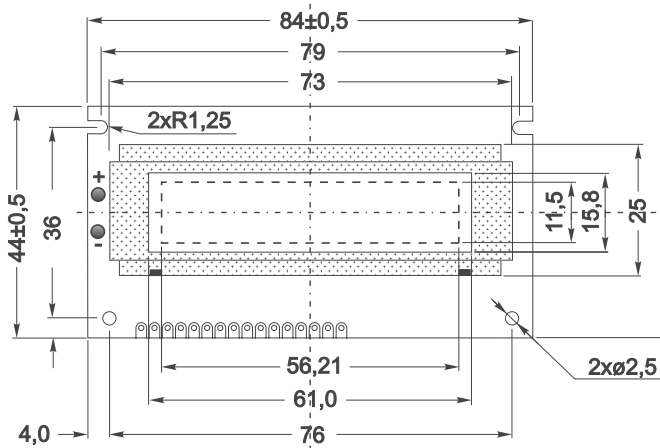
## EA SER162-CNLED



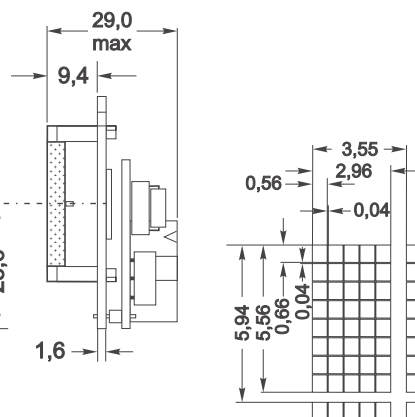
incl. frontal bezel EA 017-1UKE  
2x16,ZH 4.35mm



## EA SER162-NLED

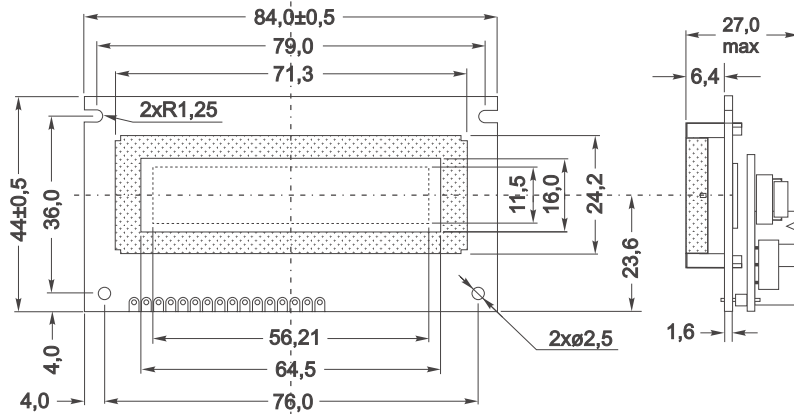


incl. frontal bezel EA 017-2UKE  
2x16,ZH 5.55mm

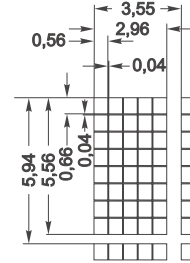


## EA SER162-NLW

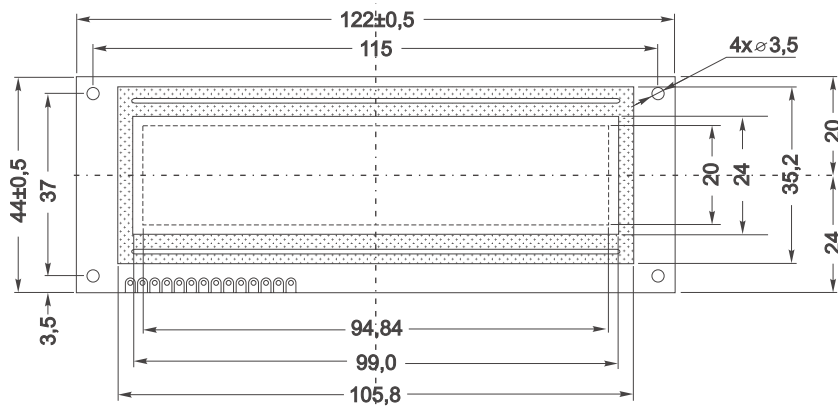
blue/white



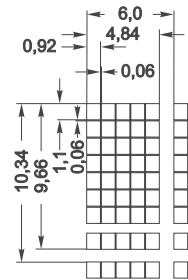
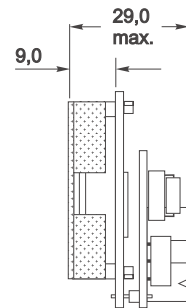
incl. frontal bezel EA 017-2UKE  
2x16,ZH 5.55mm



## EA SER162-BNLED

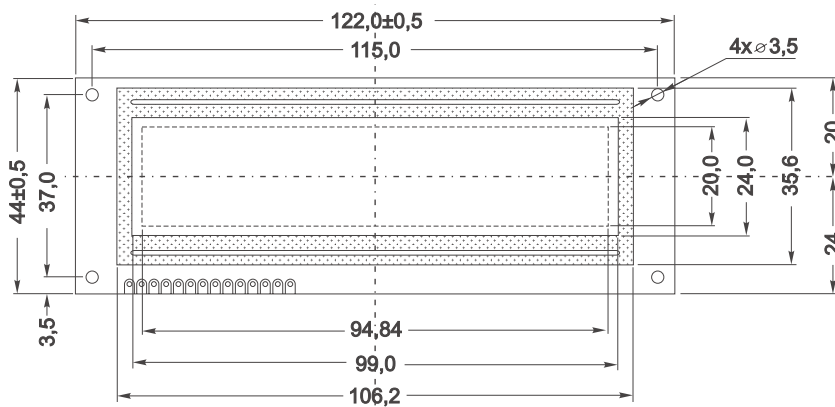


incl. frontal bezel EA 017-12UKE  
2x16,ZH 9.66mm

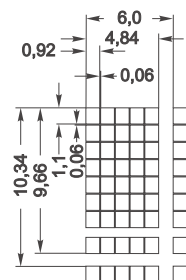
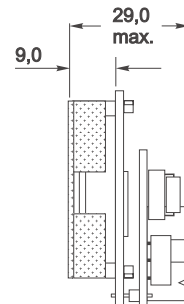


## EA SER162-BNLW

blue/white

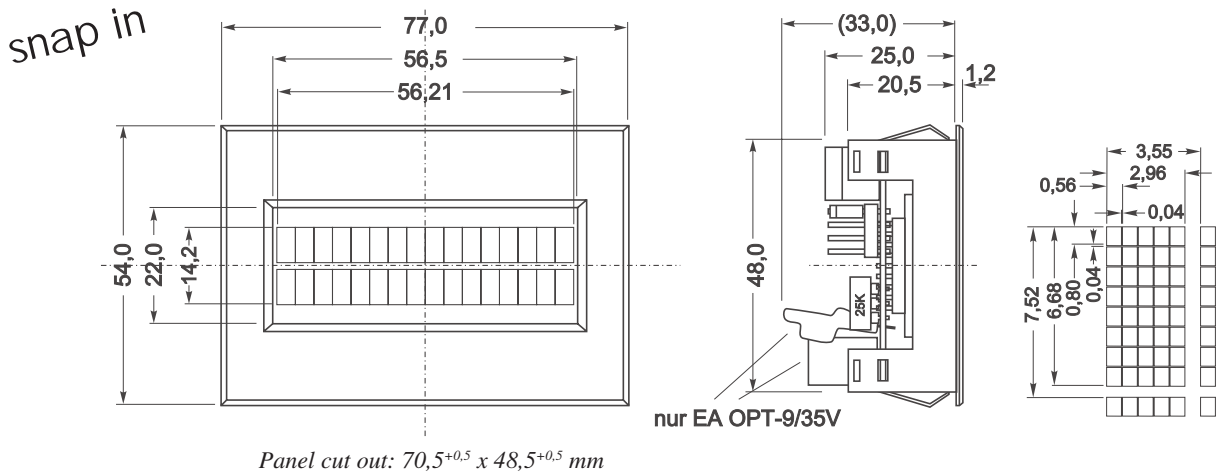


incl. frontal bezel EA 017-12UKE  
2x16,ZH 9.66mm



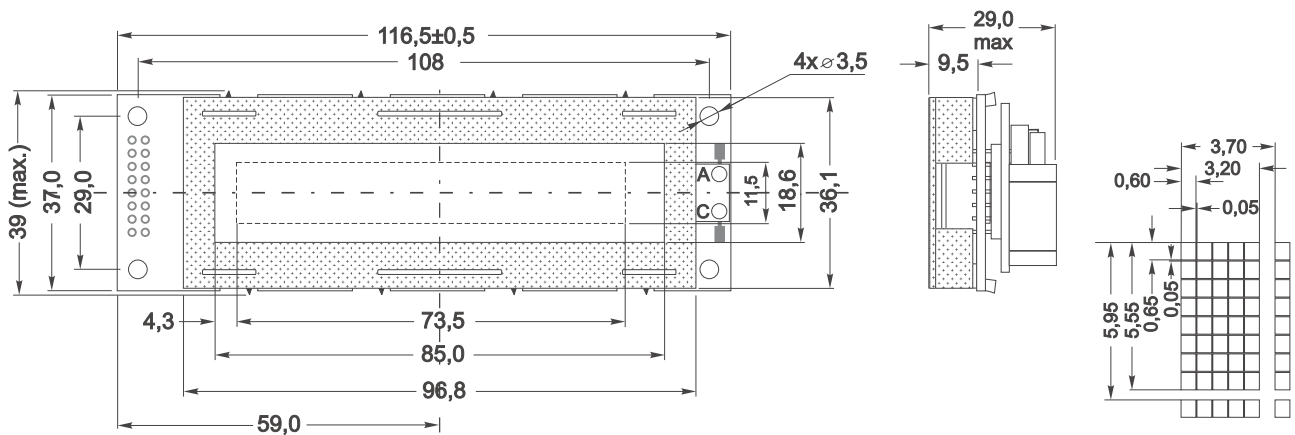
**EA SER162-92NLED**

incl. snap in housing EA 0092-KE  
2x16,ZH 6.68mm



**EA SER202-NLED**

incl. frontal bezel EA 017-7UKE  
2x20,ZH 5.55mm

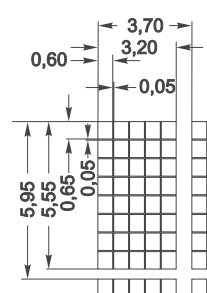
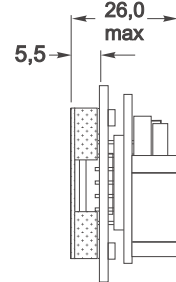
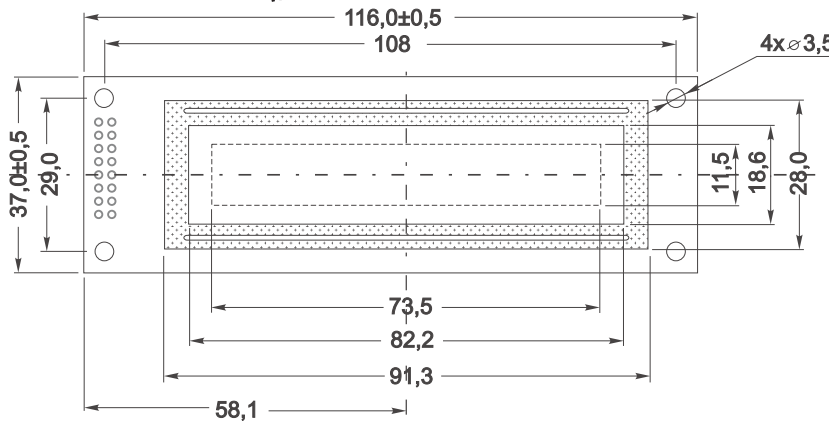


## EA SER202-NLW

blue/white

incl. frontal bezel EA 017-7UKE

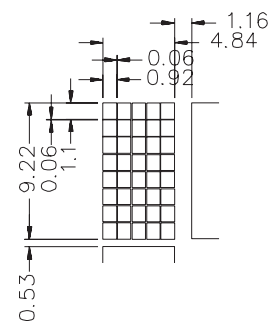
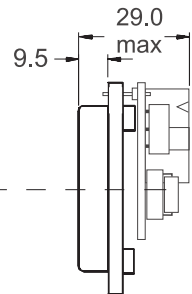
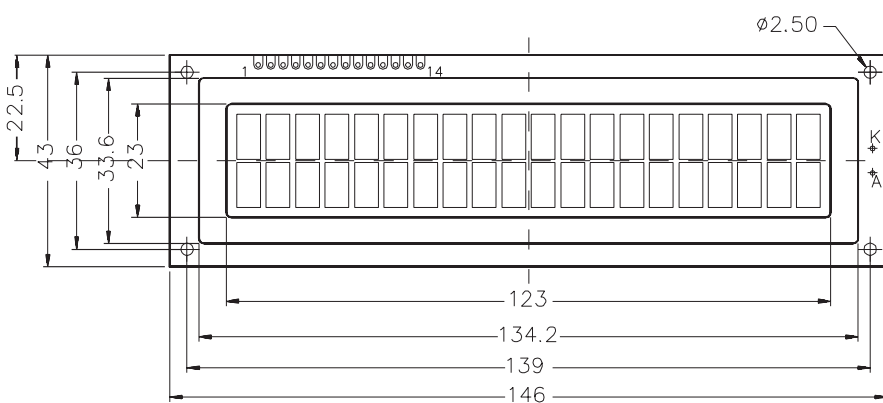
2x20, ZH 5.55mm



## EA SER202-BHNLED

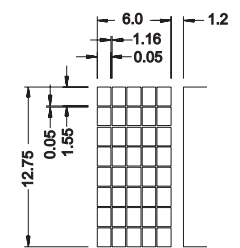
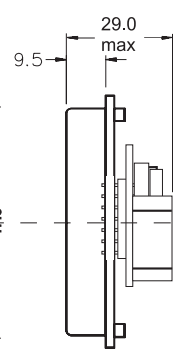
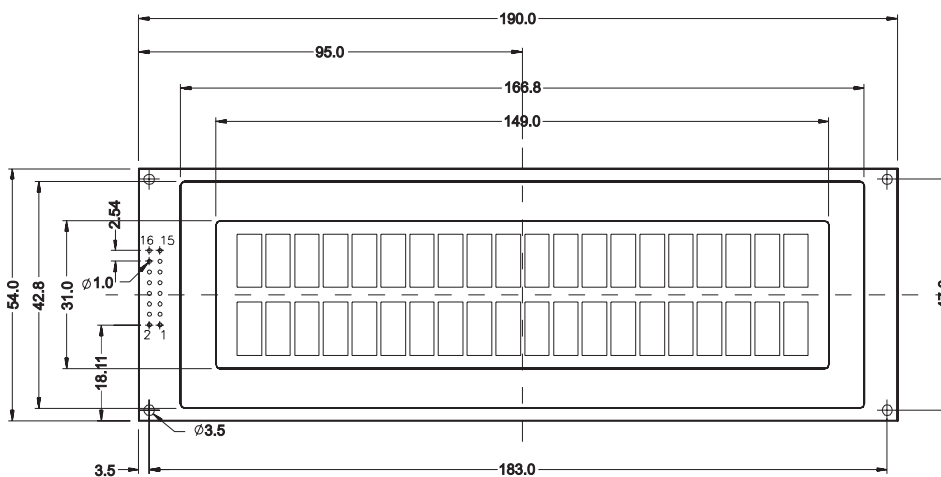
without frontal bezel

2x20, ZH 9.2mm



## EA SER202-CNLW

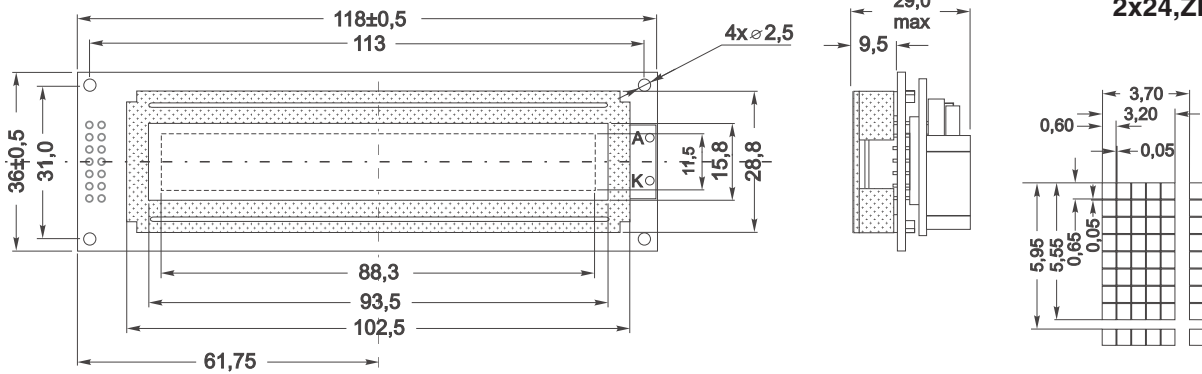
2x20, ZH 12.7mm



## EA SER242-NLED

incl. frontal bezel EA 017-14UKE

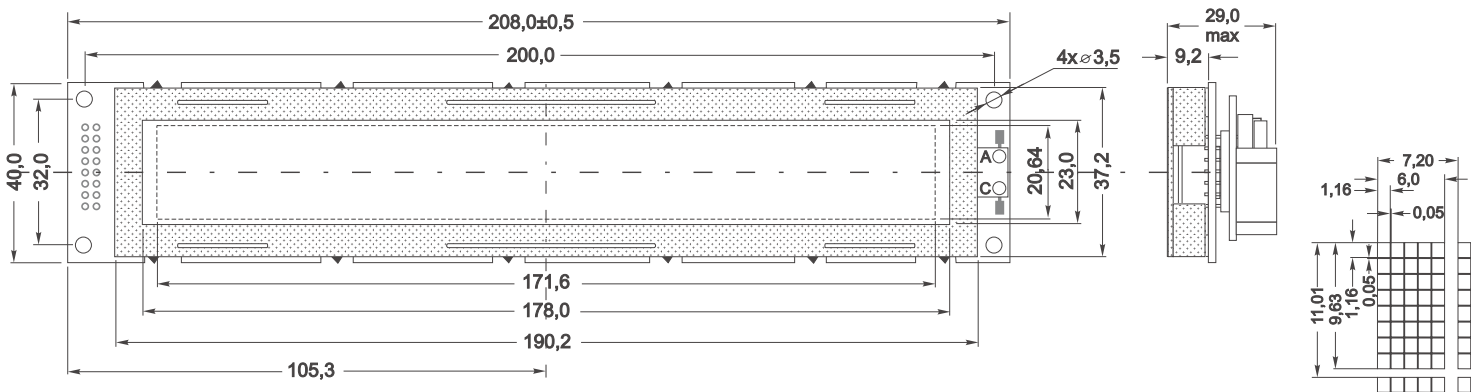
2x24,ZH 5.55mm



## EA SER242-BNLED

without frontal bezel

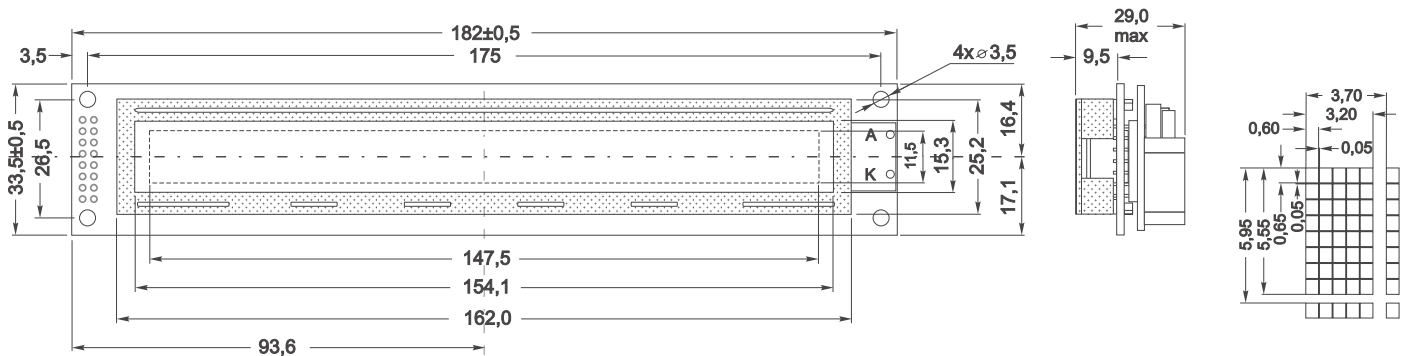
2x24,ZH 9.66mm



## EA SER402-NLED

incl. frontal bezel EA 017-4UKE

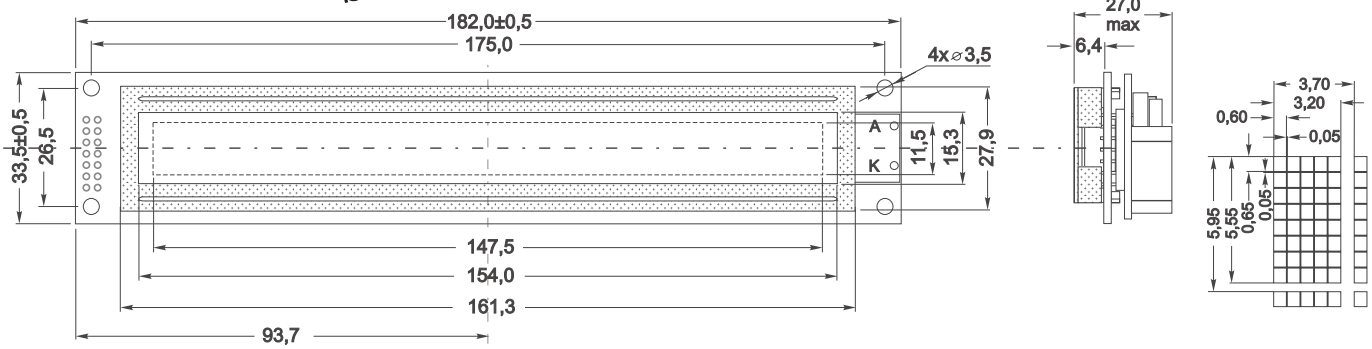
2x40,ZH 5.55mm



## EA SER402-NLW

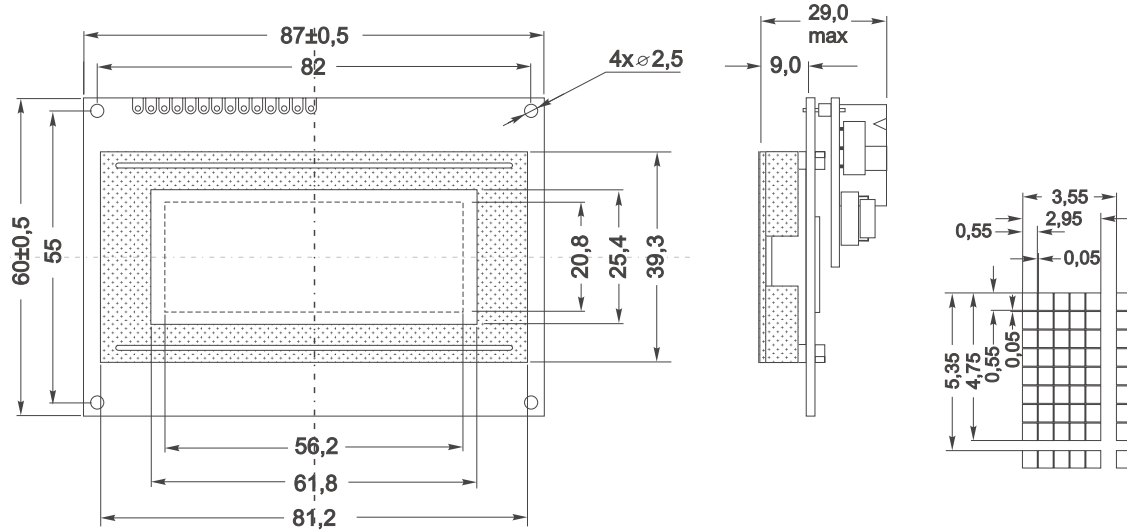
blue/white

incl. frontal bezel EA 017-4UKE  
2x40,ZH 5.55mm



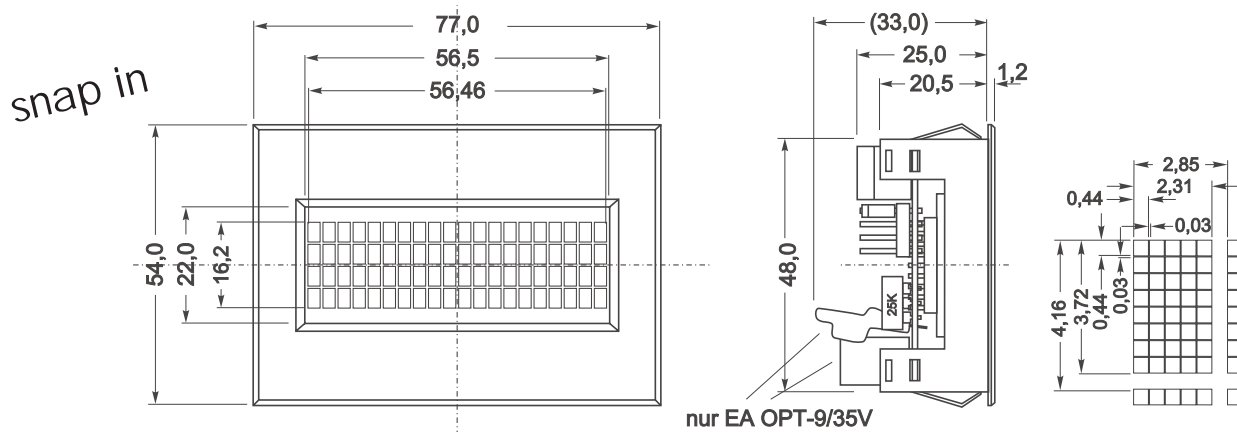
## EA SER164-NLED

incl. frontal bezel EA 017-8UKE  
4x16,ZH 4.75mm



## EA SER204-92HNLED

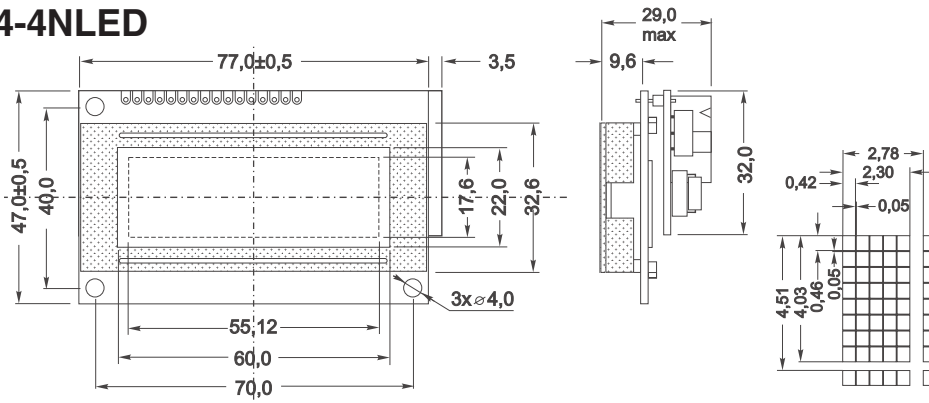
incl. snap in housing EA 0092-KE  
4x20,ZH 3.73mm



Panel cut out: 70,5<sup>+0,5</sup> x 48,5<sup>+0,5</sup> mm

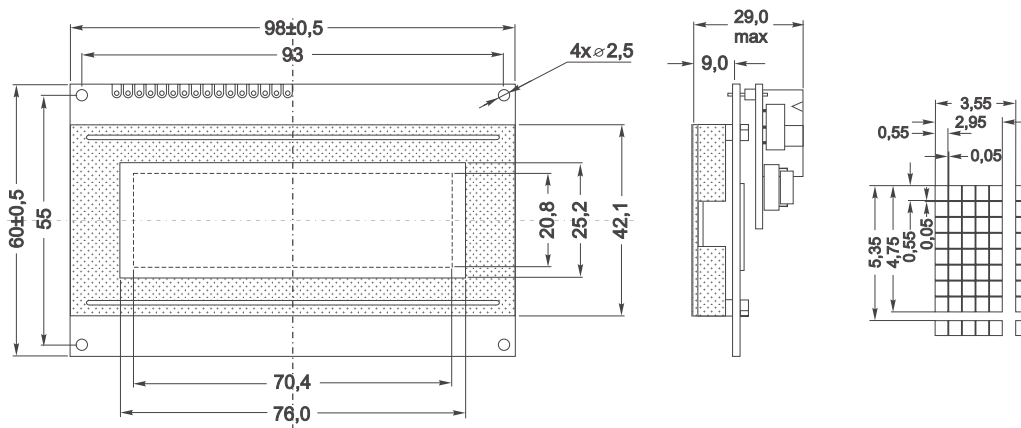


**EA SER204-4NLED**



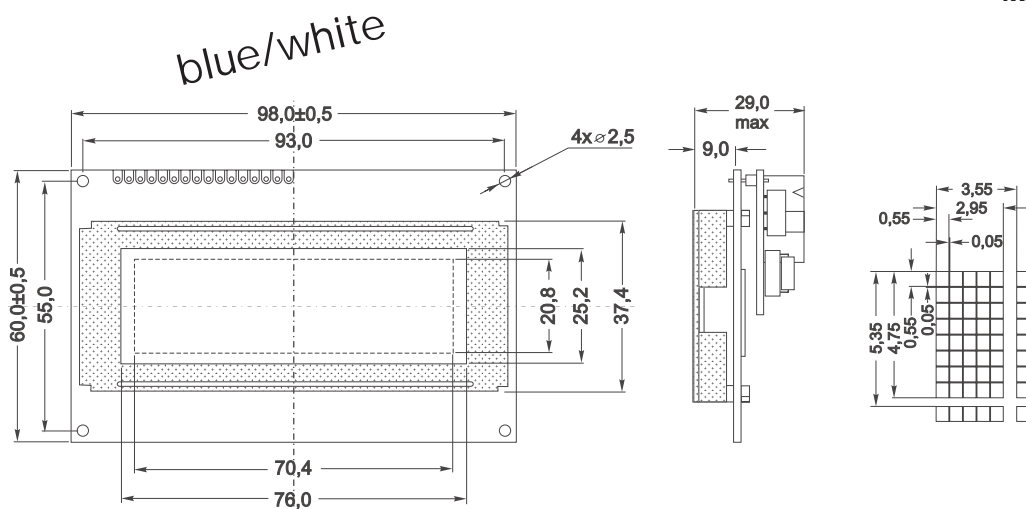
without frontal bezel  
4x20,ZH 4.03mm

**EA SER204-NLED**



incl. frontal bezel EA 017-9UKE  
4x20,ZH 4.75mm

**EA SER204-NLW**

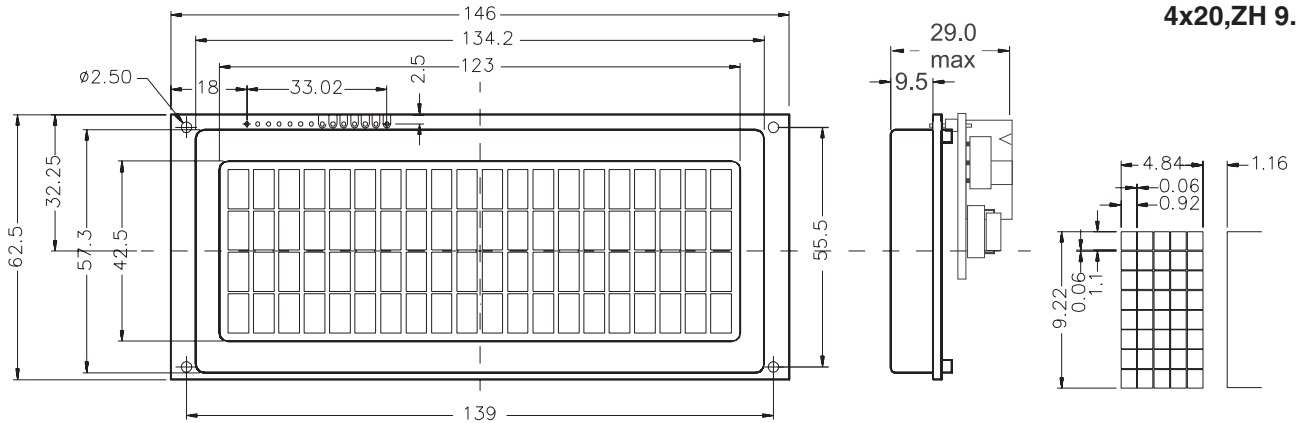


incl. frontal bezel EA 017-9UKE  
4x20,ZH 4.75mm

## EA SER204-BNLED

incl. frontal bezel EA 017-25KE

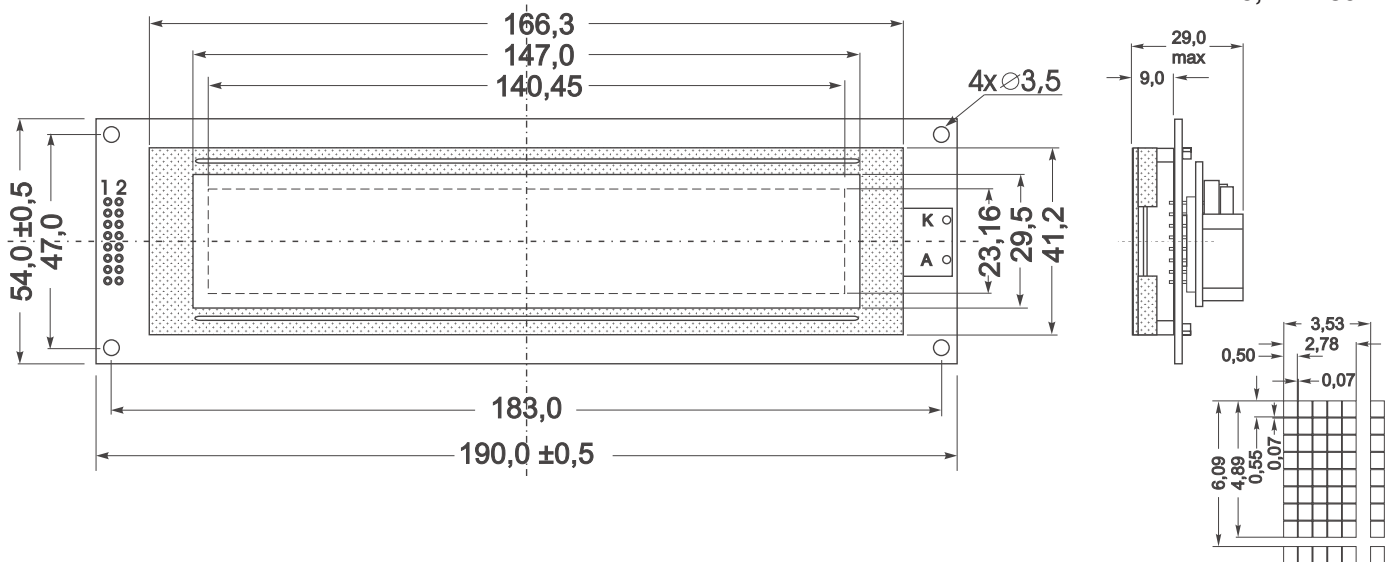
4x20,ZH 9.2mm



## EA SER404-HNLED

incl. frontal bezel EA 017-13UKE

4x40,ZH 4.89mm

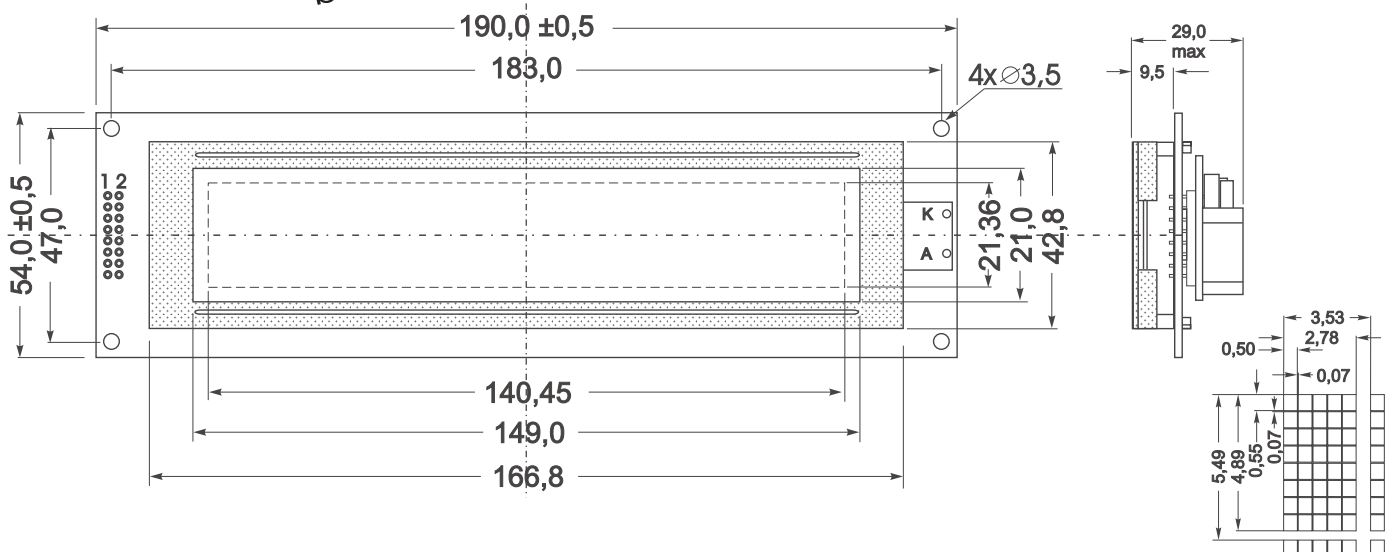


## EA SER404-NLW

blue/white

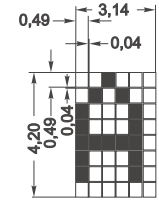
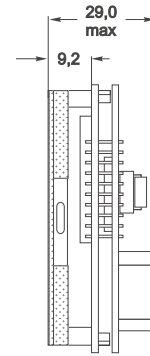
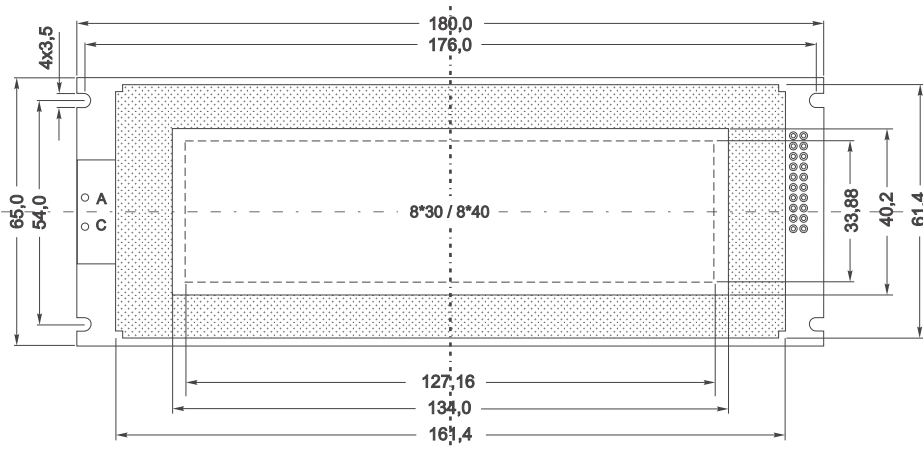
incl. frontal bezel EA 017-13UKE

4x40,ZH 4.89mm

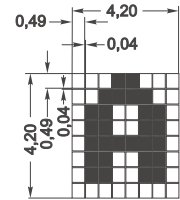


## EA SER308-NLED / SER408-NLED

incl. frontal bezel EA 017-10UKE  
8x30 bold / 8x40,ZH 4.2mm



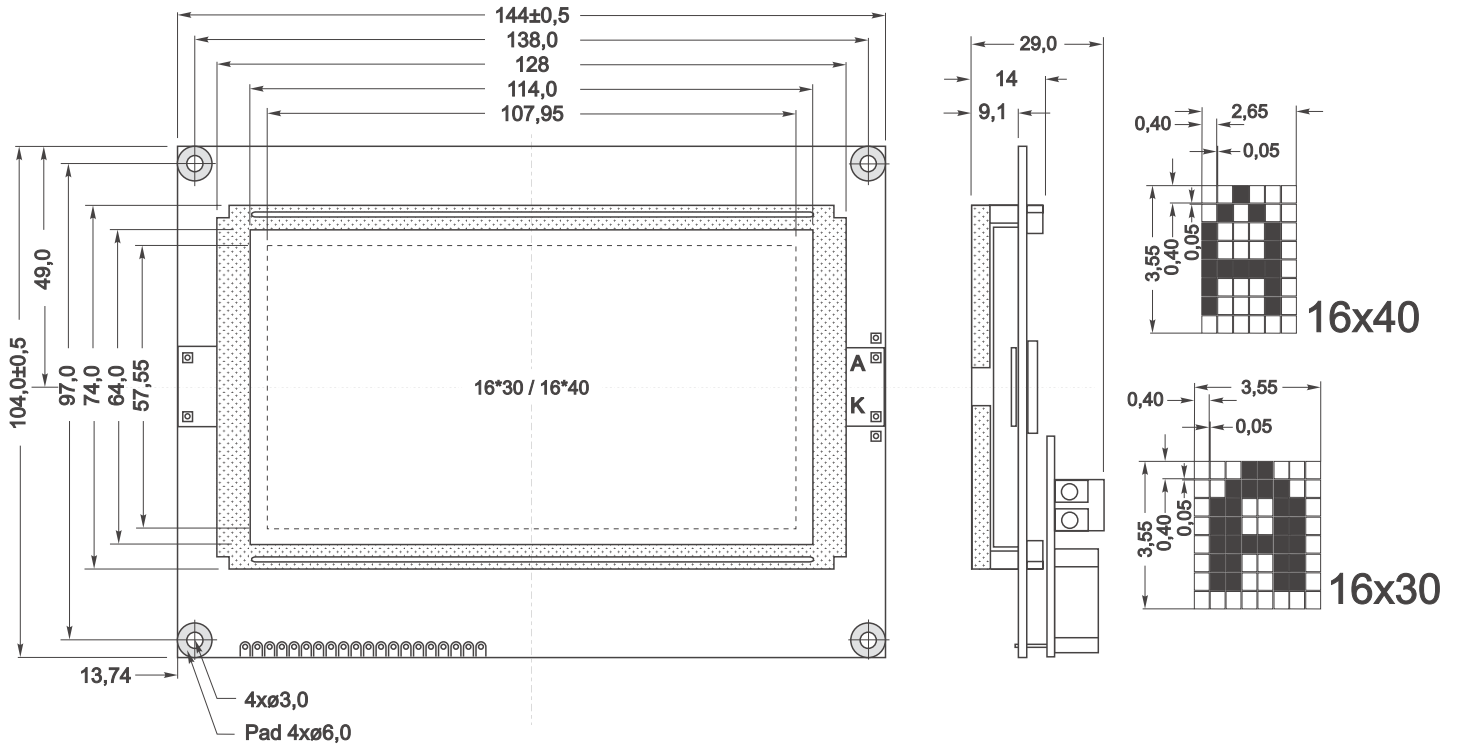
8x40



8x30

## EA SER3016-NLED / SER4016-NLED

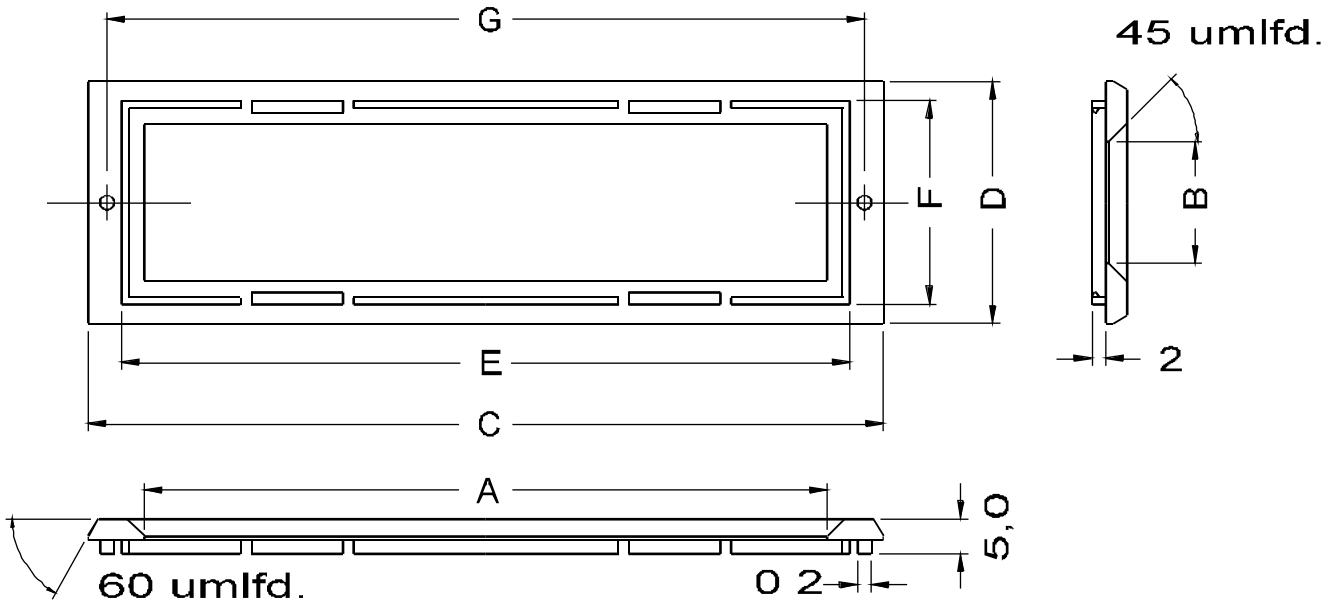
without frontal bezel  
16x30 bold / 16x40,ZH 3.55mm



**CAUTION!**  
Use ESD precautionary procedures  
Electrostatic sensitive components



**FRONTAL BEZEL / DIMENSIONS**



*Drawing shows the nose piece for frontal bezels EA 017-xxUKE; EA 017-xxKE have a rim on full circumference.*

| Display type                      | Viewing area |      | Outside dim. |      | Mounting size |      | G     | Frontal Bezel |
|-----------------------------------|--------------|------|--------------|------|---------------|------|-------|---------------|
|                                   | A            | B    | C            | D    | E             | F    |       |               |
| <b>1 line displays</b>            |              |      |              |      |               |      |       |               |
| EA SER081-CNLED                   | 60,0         | 14,8 | 76,0         | 27,0 | 66,2          | 21,2 | 71,0  | EA 017-2U     |
| EA SER161-DNLED                   | 63,5         | 12,8 | 79,5         | 25,0 | 69,7          | 19,2 | 74,5  | EA 017-1U     |
| EA SER161-ENLED                   | 98,5         | 12,8 | 114,5        | 25,0 | 104,7         | 19,2 | 109,5 | EA 017-6U     |
| <b>2 line displays</b>            |              |      |              |      |               |      |       |               |
| EA SER162-N3LW                    | 60,0         | 14,8 | 76,0         | 27,0 | 66,2          | 21,2 | 71,0  | EA 017-2U     |
| EA SER162-CNLED                   | 63,5         | 12,8 | 79,5         | 25,0 | 69,7          | 19,2 | 74,5  | EA 017-1U     |
| EA SER162-NLED<br>EA SER162-NLW   | 60,0         | 14,8 | 76,0         | 27,0 | 66,2          | 21,2 | 71,0  | EA 017-2U     |
| EA SER162-BNLED<br>EA SER162-BNLW | 97,4         | 22,4 | 113,4        | 34,6 | 103,6         | 28,8 | 108,4 | EA 017-12U    |
| EA SER202-NLED<br>EA SER202-NLW   | 81,5         | 17,2 | 97,5         | 29,4 | 87,7          | 23,6 | 92,5  | EA 017-7U     |
| EA SER242-NLED                    | 92,0         | 14,8 | 108,0        | 27,0 | 98,4          | 21,2 | 103,0 | EA 017-14U    |
| EA SER402-NLED<br>EA SER402-NLW   | 153,0        | 14,8 | 169,0        | 27,0 | 159,2         | 21,2 | 164,0 | EA 017-4U     |
| <b>4 line displays</b>            |              |      |              |      |               |      |       |               |
| EA SER164-NLED                    | 60,8         | 24,2 | 76,8         | 36,4 | 67,0          | 30,6 | 71,8  | EA 017-8U     |
| EA SER204-NLED<br>EA SER204-NLW   | 75,0         | 24,2 | 91,0         | 36,4 | 81,2          | 30,6 | 86,0  | EA 017-9U     |
| EA SER204-BNLED                   | 121,0        | 41,5 | 137,0        | 53,7 | 127,2         | 47,9 | 132,0 | EA 017-25     |
| EA SER404-NLED<br>EA SER404-NLW   | 145,0        | 28,0 | 161,0        | 40,2 | 151,2         | 34,4 | 156,0 | EA 017-13U    |
| <b>8 line displays</b>            |              |      |              |      |               |      |       |               |
| EA SER308-NLED<br>EA SER408-NLED  | 131,0        | 38,0 | 147,0        | 50,2 | 137,2         | 44,4 | 142,0 | EA 017-10U    |

*Dimensions in mm*

## All Serials Overview

| Serial displays with RS-232 and LED backlight |               |              |                  |       |      |              |      |           |              |      |              |         |                       |
|---|---------------|--------------|------------------|-------|------|--------------|------|-----------|--------------|------|--------------|---------|-----------------------|
| Ordering information                          | Lines x Char. | Char. height | Module dimension |       |      | Viewing area |      | Bezel     | Cutout bezel |      | Current typ. | New !   | Keypad EA OPT-TAST5x5 |
|   |               |              | W                | H     | D    | W            | H    |           | W            | H    |              |         |                       |
| <b>1 line displays</b>                        |               |              |                  |       |      |              |      |           |              |      |              |         |                       |
| EA SER081-92NLED                              | 1 x 8         | 11.48        | 77.0             | 54.0  | 26.0 | 56.5         | 22.0 | 0092-KE   | 70.5         | 48.5 | 100          | Snap-In |                       |
| EA SER081-CNLED                               | 1 x 8         | 10.8         | 84.0             | 44.0  | 26.0 | 61.0         | 15.8 | 017-2UKE  | 66.2         | 21.2 | 30           |         | optional              |
| EA SER161-DNLED                               | 1 x 16        | 6.56         | 80.0             | 36.0  | 27.0 | 64.5         | 16.0 | 017-1UKE  | 69.7         | 19.2 | 100          |         | optional              |
| EA SER161-ENLED                               | 1 x 16        | 9.66         | 122.0            | 33.0  | 27.0 | 99.0         | 13.0 | 017-6UKE  | 104.7        | 19.2 | 170          |         | optional              |
| <b>2 line displays</b>                        |               |              |                  |       |      |              |      |           |              |      |              |         |                       |
| EA SER082-CNLED                               | 2 x 8         | 11.44        | 84.0             | 44.0  | 27.5 | 63.0         | 25.0 | 017-8UKE  | 67.0         | 30.6 | 90           |         | optional              |
| EA SER162-N3LW                                | 2 x 16        | 5.55         | 80.0             | 36.0  | 27.0 | 64.5         | 16.0 | 017-2UKE  | 66.2         | 21.2 | 40           | blue    | optional              |
| EA SER162-CNLED                               | 2 x 16        | 4.35         | 80.0             | 36.0  | 27.0 | 64.5         | 13.8 | 017-1UKE  | 69.7         | 19.2 | 90           |         | optional              |
| EA SER162-NLED                                | 2 x 16        | 5.55         | 84.0             | 44.0  | 29.0 | 61.0         | 15.8 | 017-2UKE  | 66.2         | 21.2 | 120          |         | optional              |
| EA SER162-NLW                                 | 2 x 16        | 5.55         | 84.0             | 44.0  | 27.0 | 64.5         | 16.0 | 017-2UKE  | 66.2         | 21.2 | 40           | blue    | optional              |
| EA SER162-92NLED                              | 2 x 16        | 6.68         | 77.0             | 54.0  | 26.0 | 56.5         | 22.0 | 0092-KE   | 70.5         | 48.5 | 100          | Snap-In |                       |
| EA SER162-BNLED                               | 2 x 16        | 9.66         | 122.0            | 44.0  | 29.0 | 99.0         | 24.0 | 017-12UKE | 103.6        | 28.8 | 360          |         | optional              |
| EA SER162-BNLW                                | 2 x 16        | 9.66         | 122.0            | 44.0  | 29.0 | 99.0         | 24.0 | 017-12UKE | 103.6        | 28.8 | 65           | blue    | optional              |
| EA SER202-NLED                                | 2 x 20        | 5.55         | 116.5            | 39.0  | 29.0 | 85.0         | 18.6 | 017-7UKE  | 87.7         | 23.6 | 210          |         | optional              |
| EA SER202-NLW                                 | 2 x 20        | 5.55         | 116.5            | 39.0  | 26.0 | 85.0         | 18.6 | 017-7UKE  | 87.7         | 23.6 | 40           | blue    | optional              |
| EA SER202-BHNLED                              | 2 x 20        | 9.2          | 146.0            | 43.0  | 29.0 | 123.0        | 23.0 | -         | 127.2        | 28.4 | 270          |         | optional              |
| EA SER202-CNLW                                | 2 x 20        | 12.7         | 190.0            | 54.0  | 29.0 | 149.0        | 31.0 | -         | -            | -    | 100          | blue    | optional              |
| EA SER242-NLED                                | 2 x 24        | 5.55         | 118.0            | 36.0  | 29.0 | 93.5         | 15.8 | 017-14UKE | 98.4         | 21.2 | 150          |         | optional              |
| EA SER242-BNLED                               | 2 x 24        | 9.66         | 208.0            | 40.0  | 29.0 | 178.0        | 23.0 | -         | -            | -    | 190          |         | optional              |
| EA SER402-NLED                                | 2 x 40        | 5.55         | 182.0            | 33.5  | 29.0 | 154.1        | 15.3 | 017-4UKE  | 159.2        | 21.2 | 150          |         | optional              |
| EA SER402-NLW                                 | 2 x 40        | 5.55         | 182.0            | 33.5  | 27.0 | 154.1        | 15.3 | 017-4UKE  | 159.2        | 21.2 | 40           | blue    | optional              |
| <b>4 line displays</b>                        |               |              |                  |       |      |              |      |           |              |      |              |         |                       |
| EA SER164-NLED                                | 4 x 16        | 4.75         | 87.0             | 60.0  | 29.0 | 61.8         | 25.4 | 017-8UKE  | 67.0         | 30.6 | 220          |         | optional              |
| EA SER204-92HNLED                             | 4 x 20        | 3.73         | 77.0             | 54.0  | 26.0 | 56.5         | 22.0 | 0092-KE   | 70.5         | 48.5 | 100          | Snap-In |                       |
| EA SER204-4NLED                               | 4 x 20        | 4.03         | 80.8             | 47.0  | 29.0 | 60.0         | 22.0 | -         | -            | -    | 90           |         | optional              |
| EA SER204-NLED                                | 4 x 20        | 4.75         | 98.0             | 60.0  | 29.0 | 76.0         | 25.2 | 017-9UKE  | 81.2         | 30.6 | 260          |         | optional              |
| EA SER204-NLW                                 | 4 x 20        | 4.75         | 98.0             | 60.0  | 29.0 | 76.0         | 25.2 | 017-9UKE  | 81.2         | 30.6 | 45           | blue    | optional              |
| EA SER204-BNLED                               | 4 x 20        | 9.2          | 146.0            | 62.5  | 29.0 | 123.0        | 42.5 | 017-25KE  | 127.2        | 47.9 | 810          |         | optional              |
| EA SER404-HNLED                               | 4 x 40        | 4.89         | 190.0            | 54.0  | 29.0 | 147.0        | 29.5 | 017-13UKE | 151.2        | 34.4 | 440          |         | optional              |
| EA SER404-NLW                                 | 4 x 40        | 4.89         | 190.0            | 54.0  | 29.0 | 147.0        | 29.5 | 017-13UKE | 151.2        | 34.4 | 75           | blue    | optional              |
| <b>8 line displays</b>                        |               |              |                  |       |      |              |      |           |              |      |              |         |                       |
| EA SER308-NLED                                | 8 x 30        | 4.2 bold     | 180.0            | 65.0  | 29.0 | 134.0        | 40.2 | 017-10UKE | 137.2        | 44.4 | 300          |         |                       |
| EA SER408-NLED                                | 8 x 40        | 4.2          | 180.0            | 65.0  | 29.0 | 134.0        | 40.2 | 017-10UKE | 137.2        | 44.4 | 300          |         |                       |
| <b>16 line displays</b>                       |               |              |                  |       |      |              |      |           |              |      |              |         |                       |
| EA SER3016-NLED                               | 16 x 30       | 3.6 bold     | 144.0            | 104.0 | 29.0 | 114.0        | 64.0 | ---       | -            | -    | 700          |         |                       |
| EA SER4016-NLED                               | 16 x 40       | 3.6          | 144.0            | 104.0 | 29.0 | 114.0        | 64.0 | ---       | -            | -    | 700          |         |                       |

Dimensions in mm  
Current in mA



**CAUTION!**  
Use ESD precautionary procedures  
Electrostatic sensitive components

# ELECTRONIC ASSEMBLY

making things easy



Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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