

# Световые завесы безопасности без мертвых зон EFR

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## EFP Series

# No Dead-zone Safety Light Curtain

EFP series is no dead-zone safety light curtain, in accordance with EU type 4 safety standards. Adopting the internal MCU redundancy design, the safety light curtain has periodic self-inspection & mutual check function. Curtain loop is redundant dual output loop to ensure high security.

### Product features

- Designed according to EU type 4
- Adopt Self-check and cross-check design: Periodic double cross-check improves security.
- Independent & Redundant dual loop: In case of any safety hazards caused by single loop failure
- Wire synchronization technology: Effectively avoid interference of external infrared light



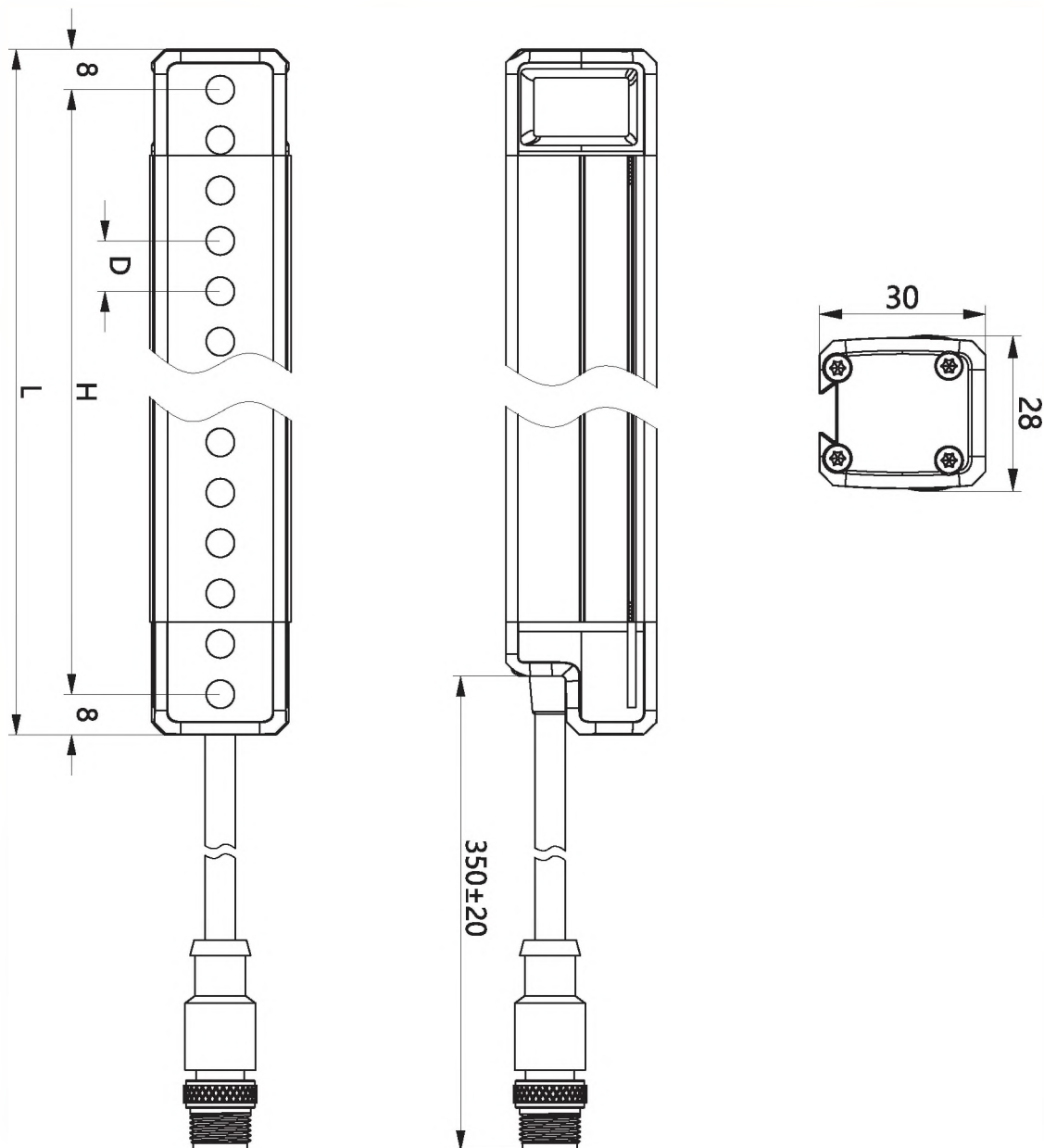
## Technical Parameter

|                               |                                                                                                                                               |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Reference standard            | EN 61496-1 (Type 4 ESPE)<br>EN 61496-2 (Type 4 ESPE)<br>EN ISO 13849-1 (Type 4, PL e)                                                         |
| Safety level                  | Type 4                                                                                                                                        |
| Supply voltage                | DC24V±20%                                                                                                                                     |
| Capacity                      | <5W                                                                                                                                           |
| Beam space                    | 10mm,20mm                                                                                                                                     |
| Resolution                    | 15mm,25mm                                                                                                                                     |
| Beams                         | 10mm beam space: 16, 20.....160<br>20mm beam space: 8, 10.....80                                                                              |
| Protective height             | Protective height = (N-1 )*beam gap, N is beam quantity.                                                                                      |
| Wave length                   | 940nm                                                                                                                                         |
| Response time                 | Response time =(N*0.1ms)+0.4ms, N is beam quantity.                                                                                           |
| Type of output (OSSD)         | PNP/NPN semiconductors, current<200mA, residual voltage: 1V max. leakage current: 1 mA max.<br>( Except voltage influenced by lengthen wire). |
| Protective circuit            | Overload voltage protection, power supply reverse polarity protection, over current protection.                                               |
| Sensing distance              | 0.1~2m, 0.1~5m (remark: If have light reflection, please let us know)                                                                         |
| Anti-optical interference     | 10000Lux                                                                                                                                      |
| Sensing method                | Through-beam type                                                                                                                             |
| Synchronization               | Wire synchronization                                                                                                                          |
| Enclosure material            | Aluminum alloy                                                                                                                                |
| Enclosure rating              | IP65                                                                                                                                          |
| Housing cross- section        | 30*28mm                                                                                                                                       |
| Vibration resistance          | 10 Hz ~55 Hz, amplitude 0.35±0.05mm, 20 times each in X, Y, Z direction                                                                       |
| Ambient operating temperature | -10°C~55°C (no freezing)                                                                                                                      |
| Storage temperature           | -30°C~70°C (no freezing)                                                                                                                      |
| Ambient operating humidity    | When temperature is 20°C, humidity max 85%                                                                                                    |

## Explanation of model (For example: EFP1620NEL-2)

| EFP        | 16            | 20           | N                    | E                                                                                                           | L                           | — | 2                      |
|------------|---------------|--------------|----------------------|-------------------------------------------------------------------------------------------------------------|-----------------------------|---|------------------------|
| ▼          | ▼             | ▼            | ▼                    | ▼                                                                                                           | ▼                           |   | ▼                      |
| Model      | Beams         | Beam space   | Output               | Function                                                                                                    | Brackets                    |   | Sensing distance       |
| EFP series | 08、10、12..... | 10mm<br>20mm | N: NPN*2<br>P: PNP*2 | No EDM& manual reset function<br>E: With EDM function<br>R: With manual reset<br>A: With EDM & manual reset | L: Side-mounting<br>bracket |   | 2: 0.1~2M<br>5: 0.5~5M |

## Size of product



D: Beam space

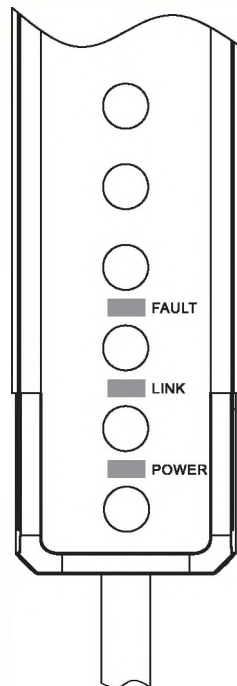
H: Protective height

L: Total height

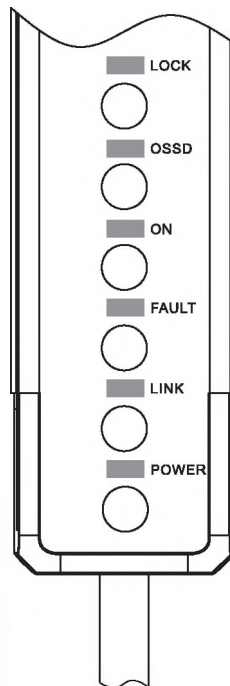
L=upper & bottom cover + upper & bottom dead zone + protective height

H=(Beams-1)\* beam space

## Wire synchronization



Emitter



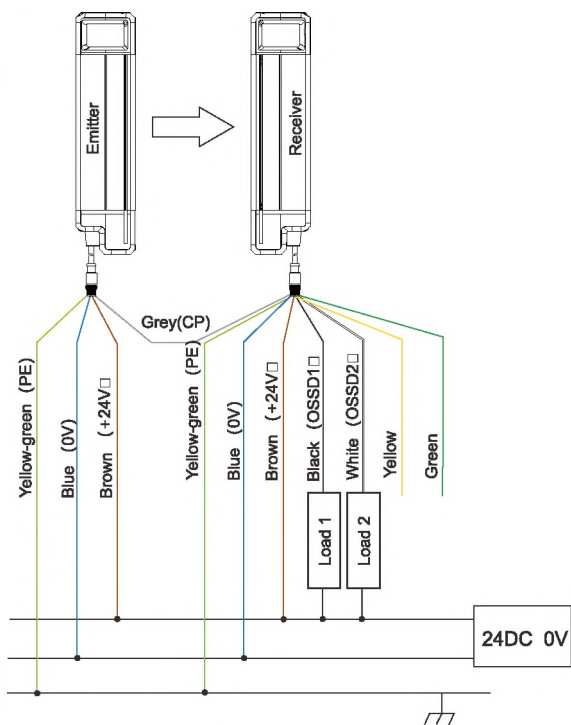
Receiver

| Transmitter indicator light specification |                        |                                                                                             |
|-------------------------------------------|------------------------|---------------------------------------------------------------------------------------------|
| Indicator light                           | Indicator light status | Function                                                                                    |
| POWER (green)                             | Lighted                | The power indicator light works normally.                                                   |
|                                           | Turned off             | Receiving EEPROM checksum error.                                                            |
|                                           | Flashing at 1Hz        | Under voltage.                                                                              |
|                                           | Flashing at 2Hz        | Over voltage.                                                                               |
| LINK (green)                              | Turned off             | Normal operation.                                                                           |
|                                           | Flashing at 2Hz        | Internal detection abnormal.                                                                |
| FAULT (red)                               | Lighted                | Internal detection abnormal.                                                                |
|                                           | Turned off             | Normal operation.                                                                           |
|                                           | Flashing at 2Hz        | Transmission pulse number detection abnormal / transmission board length detection abnormal |

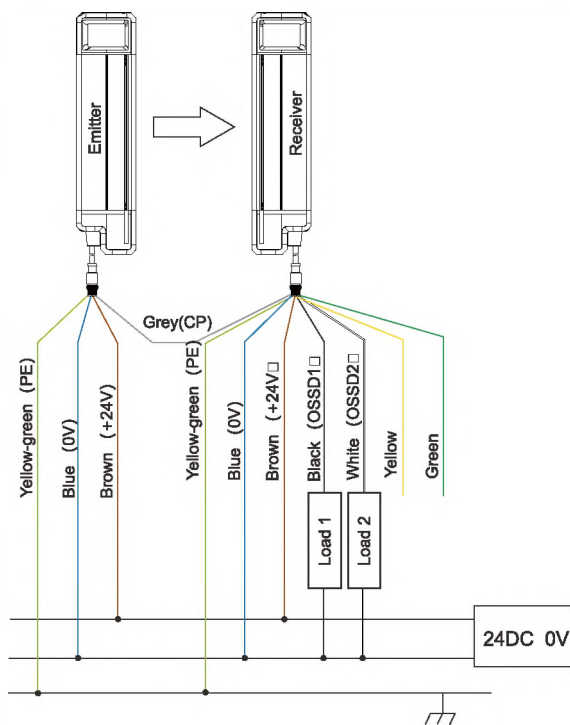
| Receiver indicator specification |                        |                                                                               |
|----------------------------------|------------------------|-------------------------------------------------------------------------------|
| Indicator light                  | Indicator light status | Function                                                                      |
| POWER (green)                    | Lighted                | Normal operation.                                                             |
|                                  | Turned off             | Receiving EEPROM checksum error.                                              |
|                                  | Flashing at 1Hz        | Under voltage.                                                                |
|                                  | Flashing at 2Hz        | Over voltage.                                                                 |
| LINK (green)                     | Turned off             | Normal operation.                                                             |
|                                  | Flashing at 2Hz        | Internal detection abnormal.                                                  |
| FAULT (red)                      | Lighted                | Internal detection abnormal.                                                  |
|                                  | Turned off             | Normal operation.                                                             |
|                                  | Flashing at 2Hz        | Overload / EDM detection abnormal / receiving board length detection abnormal |
| ON (green)                       | Lighted                | Light through                                                                 |
|                                  | Flashing at 1Hz        | EDM failure                                                                   |
|                                  | Turned off             | Block light                                                                   |
| OSSD (red and green)             | Green light on         | Output open                                                                   |
|                                  | Red light on           | Output closed                                                                 |
| LOCK (Yellow)                    | Lighted                | Waiting for reset                                                             |
|                                  | Flashing at 1Hz        | Wiring fault                                                                  |
|                                  | Turned off             | Normal operation.                                                             |

## Wire connection

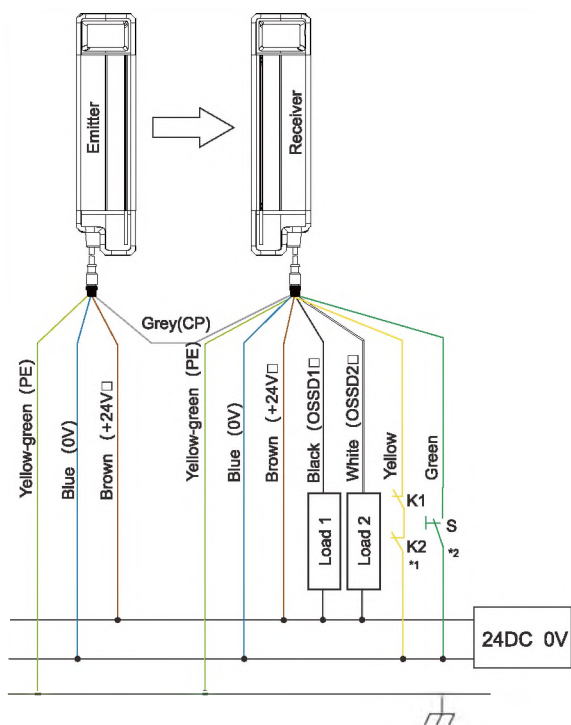
### NPN (without EDM & reset)



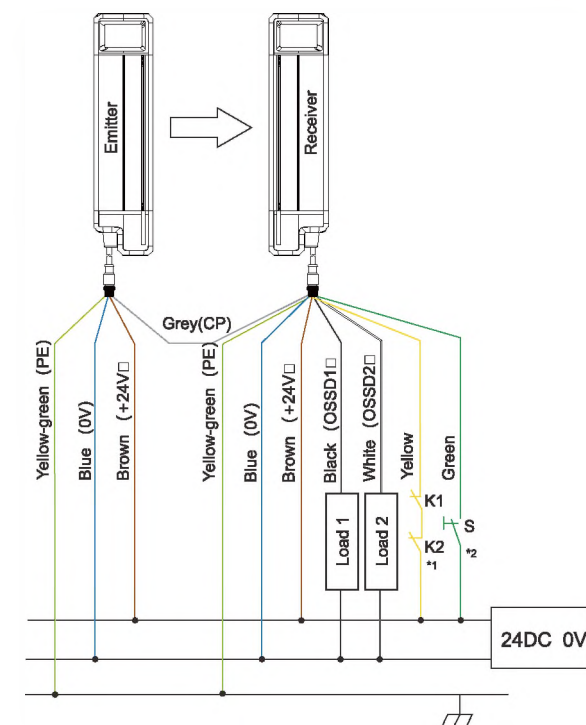
### PNP (without EDM & reset)



### NPN (with EDM & reset)



### PNP (with EDM & reset)



\*1 When there is no EDM function, this signal is left unconnected.

\*2 When there is no reset function, this signal is left unconnected.

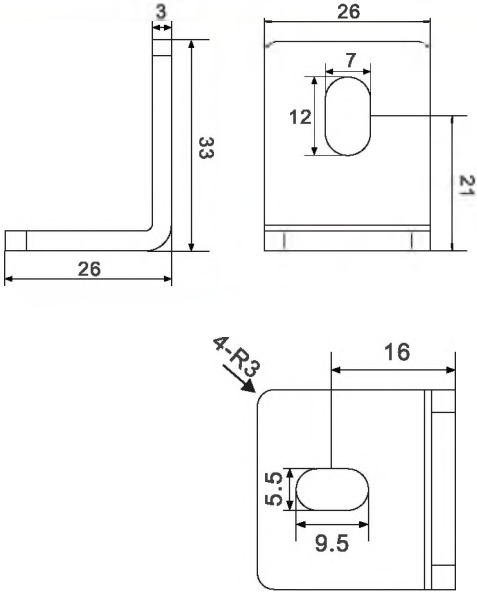
\*1 When there is no EDM function, this signal is left unconnected.

\*2 When there is no reset function, this signal is left unconnected.

## Cable explanation

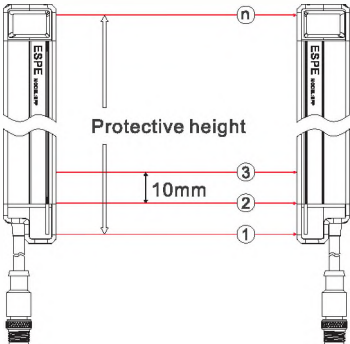
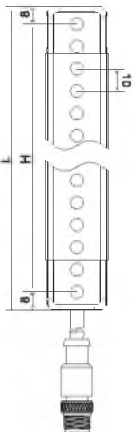
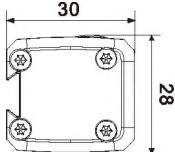
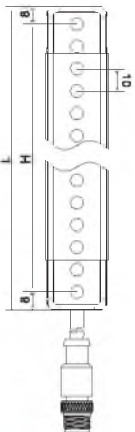
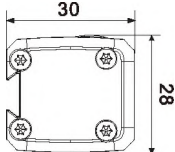
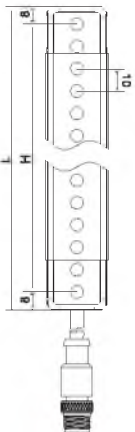
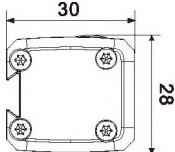
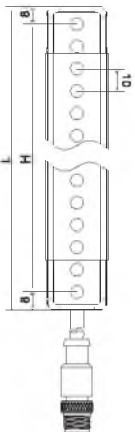
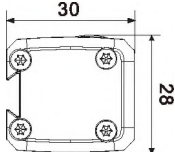
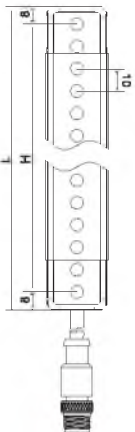
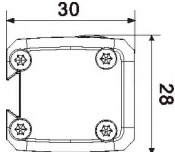
| Light curtain | Cable color  | Cable mark | Function                   | Wiring Explanation                                  |
|---------------|--------------|------------|----------------------------|-----------------------------------------------------|
| Emitter       | Brown        | 24V        | Positive pole              | Connect DC power 24V positive pole                  |
|               | Blue         | 0V         | Negative pole              | Connect DC power 0V negative pole                   |
|               | Grey         | CP         | Sync cord                  | Connect receiver CP                                 |
|               | Yellow green | PE         | Shielded line              | Ground/Connect GND                                  |
| Receiver      | Brown        | 24V        | Positive pole              | Connect DC power 24V positive pole                  |
|               | Blue         | 0V         | Negative pole              | Connect DC power 0V negative pole                   |
|               | Grey         | CP         | Sync cord                  | Connect emitter CP                                  |
|               | Yellow green | PE         | Shielded line              | Ground/Connect GND                                  |
|               | Black        | OSSD1      | Output signal 1            | Connect safety input interface 1                    |
|               | White        | OSSD2      | Output signal 2            | Connect safety input interface 2                    |
|               | Yellow       | EDM        | External device monitoring | Connect external normally closed monitoring contact |
|               | Green        | RESET      | Reset                      | Connect reset button                                |

## Option for brackets

| Picture                                                                             | Bracket Name            | Accessories                                                                                                                          | Bracket size                                                                         |
|-------------------------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  | L side-mounting bracket | L brackets (4 pcs)<br>M5 sliding blocks (4 pcs)<br>M6 grommet (4 pcs)<br>M6 pad (4 pcs)<br>M6*16 screw (4 pcs)<br>M5*6 screw (4 pcs) |  |

# EFP selection sheet

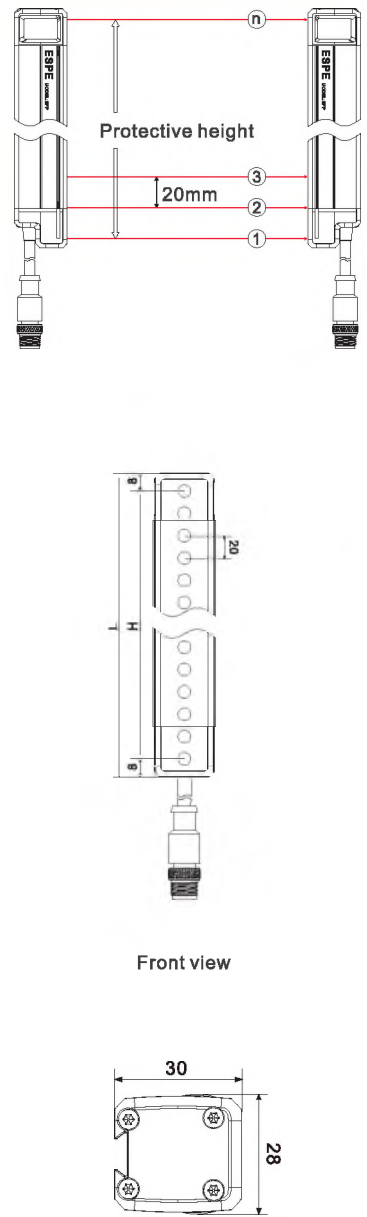
- Beam space 10mm, resolution 15mm

| Picture(mm)                                                                         | Beams<br>(n) | Protective height<br>(mm) | Total height<br>(mm) | Model    | SizeL*W*H<br>(mm) |
|-------------------------------------------------------------------------------------|--------------|---------------------------|----------------------|----------|-------------------|
|    | 16           | 150                       | 166                  | EFP1610  | 30*28*166         |
|                                                                                     | 20           | 190                       | 206                  | EFP2010  | 30*28*206         |
|                                                                                     | 24           | 230                       | 246                  | EFP2410  | 30*28*246         |
|   | 28           | 270                       | 286                  | EFP2810  | 30*28*286         |
|                                                                                     | 32           | 310                       | 326                  | EFP3210  | 30*28*326         |
|                                                                                     | 36           | 350                       | 366                  | EFP3610  | 30*28*366         |
|  | 40           | 390                       | 406                  | EFP4010  | 30*28*406         |
|                                                                                     | 44           | 430                       | 446                  | EFP4410  | 30*28*446         |
|                                                                                     | 48           | 470                       | 486                  | EFP4810  | 30*28*486         |
|   | 52           | 510                       | 526                  | EFP5210  | 30*28*526         |
|                                                                                     | 56           | 550                       | 566                  | EFP5610  | 30*28*566         |
|                                                                                     | 60           | 590                       | 606                  | EFP6010  | 30*28*606         |
|  | 64           | 630                       | 646                  | EFP6410  | 30*28*646         |
|                                                                                     | 68           | 670                       | 686                  | EFP6810  | 30*28*686         |
|                                                                                     | 72           | 710                       | 726                  | EFP7210  | 30*28*726         |
|   | 76           | 750                       | 766                  | EFP7610  | 30*28*766         |
|                                                                                     | 80           | 790                       | 806                  | EFP8010  | 30*28*806         |
|                                                                                     | 84           | 830                       | 846                  | EFP8410  | 30*28*846         |
|  | 88           | 870                       | 886                  | EFP8810  | 30*28*886         |
|                                                                                     | 92           | 910                       | 926                  | EFP9210  | 30*28*926         |
|                                                                                     | 96           | 950                       | 966                  | EFP9610  | 30*28*966         |
|   | 100          | 990                       | 1006                 | EFP10010 | 30*28*1006        |
|                                                                                     | 104          | 1030                      | 1046                 | EFP10410 | 30*28*1046        |
|                                                                                     | 108          | 1070                      | 1086                 | EFP10810 | 30*28*1086        |
|  | 112          | 1110                      | 1126                 | EFP11210 | 30*28*1126        |
|                                                                                     | 116          | 1150                      | 1166                 | EFP11610 | 30*28*1166        |
|                                                                                     | 120          | 1190                      | 1206                 | EFP12010 | 30*28*1206        |
|   | 124          | 1230                      | 1246                 | EFP12410 | 30*28*1246        |
|                                                                                     | 128          | 1270                      | 1286                 | EFP12810 | 30*28*1286        |
|                                                                                     | 132          | 1310                      | 1326                 | EFP13210 | 30*28*1326        |
|  | 136          | 1350                      | 1366                 | EFP13610 | 30*28*1366        |
|                                                                                     | .....        | .....                     | .....                | .....    | .....             |
|                                                                                     | 160          | 1590                      | 1606                 | EFP16010 | 30*28*1606        |

H is protective height:  $H = (\text{beams} - 1) \times \text{beam space}$   
L is total height: L=upper and bottom cover+ upper and bottom blind spot+ protective height

## EFP selection sheet

- Beam space 20mm, resolution 25mm

| Picture(mm)                                                                                                                                                                   | Beams<br>(n) | Protective height<br>(mm) | Total height<br>(mm) | Model   | Size<br>L*W*H(mm) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------|----------------------|---------|-------------------|
|  <p>Protective height</p> <p>20mm</p> <p>Front view</p> <p>Top view</p> <p>30</p> <p>28</p> | 8            | 140                       | 156                  | EFP0820 | 30*28*156         |
|                                                                                                                                                                               | 10           | 180                       | 196                  | EFP1020 | 30*28*196         |
|                                                                                                                                                                               | 12           | 220                       | 236                  | EFP1220 | 30*28*236         |
|                                                                                                                                                                               | 14           | 260                       | 276                  | EFP1420 | 30*28*276         |
|                                                                                                                                                                               | 16           | 300                       | 316                  | EFP1620 | 30*28*316         |
|                                                                                                                                                                               | 18           | 340                       | 356                  | EFP1820 | 30*28*356         |
|                                                                                                                                                                               | 20           | 380                       | 396                  | EFP2020 | 30*28*396         |
|                                                                                                                                                                               | 22           | 420                       | 436                  | EFP2220 | 30*28*436         |
|                                                                                                                                                                               | 24           | 460                       | 476                  | EFP2420 | 30*28*476         |
|                                                                                                                                                                               | 26           | 500                       | 516                  | EFP2620 | 30*28*516         |
|                                                                                                                                                                               | 28           | 540                       | 556                  | EFP2820 | 30*28*556         |
|                                                                                                                                                                               | 30           | 580                       | 596                  | EFP3020 | 30*28*596         |
|                                                                                                                                                                               | 32           | 620                       | 636                  | EFP3220 | 30*28*636         |
|                                                                                                                                                                               | 34           | 660                       | 676                  | EFP3420 | 30*28*676         |
|                                                                                                                                                                               | 36           | 700                       | 716                  | EFP3620 | 30*28*716         |
|                                                                                                                                                                               | 38           | 740                       | 756                  | EFP3820 | 30*28*756         |
|                                                                                                                                                                               | 40           | 780                       | 796                  | EFP4020 | 30*28*796         |
|                                                                                                                                                                               | 42           | 820                       | 836                  | EFP4220 | 30*28*836         |
|                                                                                                                                                                               | 44           | 860                       | 876                  | EFP4420 | 30*28*876         |
|                                                                                                                                                                               | 46           | 900                       | 916                  | EFP4620 | 30*28*916         |
|                                                                                                                                                                               | 48           | 940                       | 956                  | EFP4820 | 30*28*956         |
|                                                                                                                                                                               | 50           | 980                       | 996                  | EFP5020 | 30*28*996         |
|                                                                                                                                                                               | 52           | 1020                      | 1036                 | EFP5220 | 30*28*1036        |
|                                                                                                                                                                               | 54           | 1060                      | 1076                 | EFP5420 | 30*28*1076        |
|                                                                                                                                                                               | 56           | 1100                      | 1116                 | EFP5620 | 30*28*1116        |
|                                                                                                                                                                               | 58           | 1140                      | 1156                 | EFP5820 | 30*28*1156        |
|                                                                                                                                                                               | 60           | 1180                      | 1196                 | EFP6020 | 30*28*1196        |
|                                                                                                                                                                               | 62           | 1220                      | 1236                 | EFP6220 | 30*28*1236        |
|                                                                                                                                                                               | 64           | 1260                      | 1276                 | EFP6420 | 30*28*1276        |
|                                                                                                                                                                               | 66           | 1300                      | 1316                 | EFP6620 | 30*28*1316        |
|                                                                                                                                                                               | 68           | 1340                      | 1356                 | EFP6820 | 30*28*1356        |
|                                                                                                                                                                               | .....        | .....                     | .....                | .....   | .....             |
|                                                                                                                                                                               | 80           | 1580                      | 1596                 | EFP8020 | 30*28*1596        |

H is protective height:  $H = (\text{beams} - 1) \times \text{beam space}$

L is total height: L = upper and bottom cover + upper and bottom blind spot + protective height

## По вопросам продаж и поддержки обращайтесь:

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