

## FO converters - FL MC EF 1300 SM SC - 2902856

Please be informed that the data shown in this PDF Document is generated from our Online Catalog. Please find the complete data in the user's documentation. Our General Terms of Use for Downloads are valid (<http://phoenixcontact.com/download>)




FO converter with SC duplex fiber optic connection (1300 nm), for converting 10/100Base-T(X) to single mode fiberglass (9/125 μm). Auto negotiation and auto MDI(X) function. Comprehensive link diagnostics. DIN-rail mountable, 18 ... 30 V DC supply.

### Your advantages

- ✓ Transmission ranges up to 36 km
- ✓ Auto negotiation
- ✓ Auto MDI/MDI-X switch-over
- ✓ Link fault pass through (LFPT) and far end fault (FEF) functions for easy connection monitoring
- ✓ Data rates 10/100 Mbps
- ✓ Shipbuilding approval according to DNV



### Key Commercial Data

|                                      |   |
|--------------------------------------|---|
| Packing unit                         | 1 pc  |
| GTIN                                 | <br>4 046356 689212 |
| GTIN                                 | 4046356689212   |
| Weight per Piece (excluding packing) | 220.000 g   |
| Custom tariff number                 | 85176200  |
| Country of origin                    | Germany   |

### Technical data

#### Note

|                         |   |
|-------------------------|---|
| Utilization restriction | EMC: class A product, see manufacturer's declaration in the download area |
|-------------------------|---|

#### Dimensions

# FO converters - FL MC EF 1300 SM SC - 2902856

## Technical data

### Dimensions

|         |             |
|---------|-------------|
| Caption | Slim design |
| Width   | 22.5 mm     |
| Height  | 99 mm       |
| Depth   | 114.5 mm    |

### Ambient conditions

|  |  |
|--|--|
| Ambient temperature (operation)          | -40 °C ... 65 °C   |
| Ambient temperature (storage/transport)  | -40 °C ... 85 °C   |
| Permissible humidity (operation)         | 30 % ... 95 % (non-condensing)                           |
| Permissible humidity (storage/transport) | 30 % ... 95 % (non-condensing)                           |
| Altitude                                 | 5000 m (For restrictions see manufacturer's declaration) |
|  | 2000 m (With UL approval)                                |
| Degree of protection                     | IP20   |

### General

|  |   |
|--|---|
| Electrical isolation                     | according to IEEE 802.3   |
|  | VCC // FE // Ethernet   |
| Latency                                  | ± 1.3 µs (Store&Forward mode, 10/100 Mbps, depending on the frame size)                                   |
| Test voltage data interface/power supply | 1.5 kV <sub>rms</sub> (50 Hz, 1 min.)   |
| Standards/regulations                    | EN 60950-1  |
| Electromagnetic compatibility            | Conformance with EMC Directive 2014/30/EU   |
| Net weight                               | 174.4 g   |
| Housing material                         | PA 6.6-FR   |
| Color                                    | green   |
| MTBF                                     | 284 Years (Telcordia standard, 25°C temperature, 21% operating cycle (5 days a week, 8 hours a day))      |
|  | 74 Years (Telcordia standard, 40°C temperature, 34.25% operating cycle (5 days a week, 12 hours a day))   |
| MTTF                                     | 1400 Years (SN 29500 standard, temperature 25 °C, operating cycle 21 % (5 days a week, 8 hours a day))    |
|  | 599 Years (SN 29500 standard, temperature 40 °C, operating cycle 34.25 % (5 days a week, 12 hours a day)) |
|  | 101 Years (SN 29500 standard, temperature 40 °C, operating cycle 100 % (7 days a week, 24 hours a day))   |
| Conformance                              | CE-compliant  |
| ATEX                                     | # II 3 G Ex nA IIC T4 Gc X (Please follow the special installation instructions in the documentation!)    |
| UL, USA/Canada                           | cULus listed UL 508   |
|  | Class I, Zone 2, AEx nA IIC T4  |
|  | Class I, Zone 2, Ex nA IIC T4 Gc X  |

# FO converters - FL MC EF 1300 SM SC - 2902856

## Technical data

### General

|  |                                    |
|--|------------------------------------|
|  | Class I, Div. 2, Groups A, B, C, D |
|--|------------------------------------|

### Power supply

|  |   |
|--|---|
| Supply voltage range                       | 18 V DC ... 30 V DC (Screw connection)  |
|  | 18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply) |
| Typical current consumption                | < 100 mA (24 V DC)  |
| Protective circuit                         | Reverse polarity protection   |
| Connection method                          | Plug-in screw terminal block (COMBICON), redundancy possible  |
| Conductor cross section flexible max.      | 2.50 mm <sup>2</sup>  |
| Conductor cross section flexible min.      | 0.20 mm <sup>2</sup>  |
| Conductor cross section solid max.         | 2.50 mm <sup>2</sup>  |
| Conductor cross section solid min.         | 0.20 mm <sup>2</sup>  |
| Max. AWG conductor cross section, flexible | 14  |
| Min. AWG conductor cross section, flexible | 24  |
| Conductor cross section AWG max.           | 14  |
| Conductor cross section AWG min.           | 24  |

### Serial interface

|                        |  |
|------------------------|--|
| Interface 1            | Ethernet interface, 10/100Base-T(X) in acc. with IEEE 802.3u |
| No. of ports           | 1  |
| Connection method      | RJ45 socket, shielded  |
| Transmission medium    | Copper   |
| Transmission length    | 100 m (shielded twisted pair)                                |
| Auto-negotiation modes | Auto   |
| Link through           | Link fault pass through                                      |
| Basic functions        | Store-and-forward media converter                            |
| MDI-/MDI-X switchover  | Auto-MDI(X)  |
| Signal LEDs            | Activity, link status, 10/100 Mbps                           |

### Optical interface FO

|   |   |
|---|---|
| Transmit capacity, minimum                    | ≥ -15 dBm ((9/125 μm) dynamic in link mode (average)) |
| Transmit capacity, maximum                    | ≤ -8 dBm ((9/125 μm) dynamic in link mode (average))  |
| Minimum receiver sensitivity                  | -31 dBm (dynamic in link mode (average))              |
| Overrange receiver                            | -7 dBm (dynamic in link mode (average))               |
| Wavelength                                    | 1300 nm   |
| Transmission length incl. 3 dB system reserve | 36 km (With F-E 9/125 0.36 dB/km)                     |
|   | 32 km (With F-E 9/125 0.4 dB/km)                      |
|   | 26 km (With F-E 9/125 0.5 dB/km)                      |

# FO converters - FL MC EF 1300 SM SC - 2902856

## Technical data

### Optical interface FO

|                     |                        |
|---------------------|------------------------|
| Transmission medium | Single-mode fiberglass |
| Connection method   | SC duplex              |

### Standards and Regulations

|   |  |
|---|--|
| Electromagnetic compatibility                                     | Conformance with EMC Directive 2014/30/EU                      |
| Type of test  | Free fall in acc. with IEC 60068-2-32                          |
| Test result   | 1 m  |
| Type of test  | Vibration resistance in acc. with EN 60068-2-6/IEC 60068-2-6   |
| Test result   | 5g, 10...150 Hz, 2.5 h, in XYZ direction                       |
| Type of test  | Shock in acc. with EN 60068-2-27/IEC 60068-2-27                |
| Test result   | 25g, 11 ms period, half-sine shock pulse                       |
| Free from substances that could impair the application of coating | according to P-VW 3.10.7 57 65 0 VW-AUDI-Seat central standard |
| Standards/regulations   | EN 61000-4-2   |
| Contact discharge   | ± 6 kV (Test Level 3)  |
| Indirect discharge  | ± 6 kV   |
| Standards/regulations   | EN 61000-4-3   |
| Frequency range   | 80 MHz ... 3 GHz (Test Level 3)                                |
| Standards/regulations   | EN 61000-4-4   |
| Comments  | Criterion B  |
| Standards/regulations   | EN 61000-4-5   |
| Signal  | ± 1 kV (Data line, asymmetrical)                               |
| Standards/regulations   | EN 55032   |
|   | EN 61000-4-6   |
| Frequency range   | 0.15 MHz ... 80 MHz  |
| Designation   | Air clearances and creepage distances                          |
| Standards/regulations   | EN 60950-1   |
| Electrical isolation  | according to IEEE 802.3  |
| Conformance   | CE-compliant   |
| ATEX  | # II 3 G Ex nA IIC T4 Gc X                                     |
| UL, USA/Canada  | cULus listed UL 508  |
|   | Class I, Zone 2, AEx nA IIC T4                                 |
|   | Class I, Zone 2, Ex nA IIC T4 Gc X                             |
|   | Class I, Div. 2, Groups A, B, C, D                             |
| Noxious gas test  | ISA-S71.04-1985 G3 Harsh Group A                               |
| Shipbuilding approval   | DNV  |

### Environmental Product Compliance

|            |                |
|------------|----------------|
| REACH SVHC | Lead 7439-92-1 |
|------------|----------------|

# FO converters - FL MC EF 1300 SM SC - 2902856

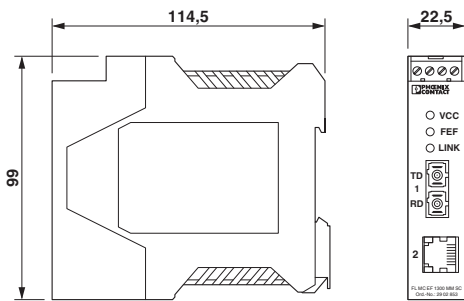
## Technical data

### Environmental Product Compliance

|            |   |
|------------|---|
| China RoHS | Environmentally Friendly Use Period = 50  |
|            | For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration" |

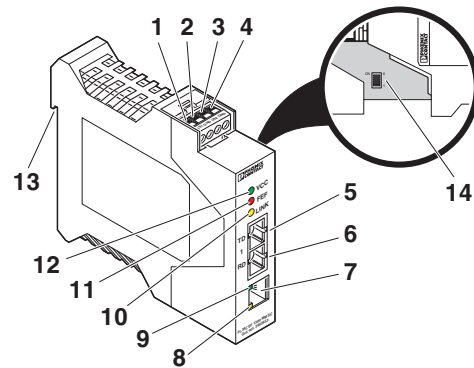
## Drawings

Dimensional drawing



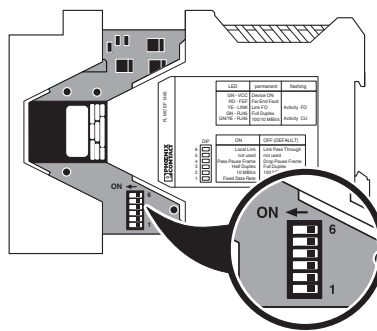
Slim design

Schematic diagram



Function elements

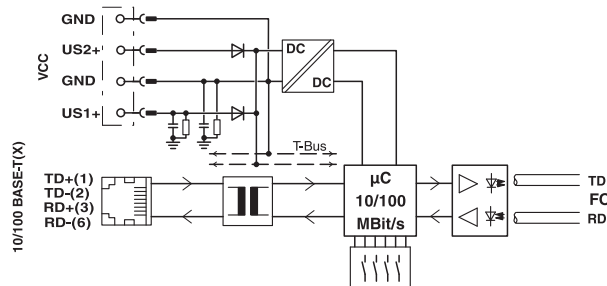
Schematic diagram



DIP switches

# FO converters - FL MC EF 1300 SM SC - 2902856

Block diagram



## Classifications

### eCl@ss

|            |          |
|------------|----------|
| eCl@ss 4.0 | 27230207 |
| eCl@ss 4.1 | 27230207 |
| eCl@ss 5.0 | 27230207 |
| eCl@ss 5.1 | 27230200 |
| eCl@ss 6.0 | 19179200 |
| eCl@ss 7.0 | 19179290 |
| eCl@ss 8.0 | 19179290 |
| eCl@ss 9.0 | 19170114 |

### ETIM

|          |          |
|----------|----------|
| ETIM 3.0 | EC000310 |
| ETIM 4.0 | EC000310 |
| ETIM 5.0 | EC001467 |
| ETIM 6.0 | EC001467 |

### UNSPSC

|               |          |
|---------------|----------|
| UNSPSC 6.01   | 30211506 |
| UNSPSC 7.0901 | 39121008 |
| UNSPSC 11     | 39121008 |
| UNSPSC 12.01  | 39121008 |
| UNSPSC 13.2   | 43222604 |

## Approvals

### Approvals

### Approvals

UL Listed / cUL Listed / EAC / DNV GL / cULus Listed

# FO converters - FL MC EF 1300 SM SC - 2902856

## Approvals

Ex Approvals

UL Listed / cUL Listed / ATEX / cULus Listed

### Approval details

|           |  |   |               |
|-----------|--|---|---------------|
| UL Listed |  | <a href="http://database.ul.com/cgi-bin/XYVV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYVV/template/LISEXT/1FRAME/index.htm</a> | FILE E 238705 |
|-----------|--|---|---------------|

|            |  |   |               |
|------------|--|---|---------------|
| cUL Listed |  | <a href="http://database.ul.com/cgi-bin/XYVV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYVV/template/LISEXT/1FRAME/index.htm</a> | FILE E 238705 |
|------------|--|---|---------------|

|     |  |  |               |
|-----|--|--|---------------|
| EAC |  |  | EAC-Zulassung |
|-----|--|--|---------------|

|        |  |   |            |
|--------|--|---|------------|
| DNV GL |  | <a href="http://exchange.dnv.com/tari/">http://exchange.dnv.com/tari/</a> | TAA00001KR |
|--------|--|---|------------|

|              |  |  |  |
|--------------|--|--|--|
| cULus Listed |  |  |  |
|--------------|--|--|--|

## Accessories

### Accessories

#### Data cable by the meter

Cable - FL CAT5 HEAVY - 2744814



CAT5-SF/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm<sup>2</sup>, solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.75 mm ± 0.15 mm diameter

## FO converters - FL MC EF 1300 SM SC - 2902856

### Accessories

Network cable - FL CAT5 FLEX - 2744830



CAT5-SF/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm<sup>2</sup>, stranded, shielded, outer sheath: 5.75 mm ± 0.15 mm diameter

---

### Data cable preassembled

FO patch cable - FL SM PATCH 1,0 LC-SC - 2989190



Assembled fiber optic cable, break-out cable, fiberglass single mode 9/125 µm (OS2, Low Water Peak Fiber) connector: LC/SC duplex, degree of protection: IP20, for installation in cable ducts or control cabinets, length: 1 m

FO patch cable - FL SM PATCH 2,0 LC-SC - 2989297



Assembled fiber optic cable, break-out cable, fiberglass single mode 9/125 µm (OS2, Low Water Peak Fiber) connector: LC/SC duplex, degree of protection: IP20, for installation in cable ducts or control cabinets, length: 2 m

FO patch cable - FL SM PATCH 5,0 LC-SC - 2901827



Assembled fiber optic cable, break-out cable, fiberglass single mode 9/125 µm (OS2, Low Water Peak Fiber) connector: LC/SC duplex, degree of protection: IP20, for installation in cable ducts or control cabinets, length: 5 m

FO patch cable - FL SM PATCH 1,0 SC-SC - 2901829



Assembled fiber optic cable, break-out cable, fiberglass single mode 9/125 µm (OS2, Low Water Peak Fiber) connector: SC duplex/SC duplex, degree of protection: IP20, for installation in cable ducts or control cabinets, length: 1 m



## FO converters - FL MC EF 1300 SM SC - 2902856

### Accessories

#### FO patch cable - FL SM PATCH 2,0 SC-SC - 2901830



Assembled fiber optic cable, break-out cable, fiberglass single mode 9/125  $\mu\text{m}$  (OS2, Low Water Peak Fiber) connector: SC duplex/SC duplex, degree of protection: IP20, for installation in cable ducts or control cabinets, length: 2 m

#### FO patch cable - FL SM PATCH 5,0 SC-SC - 2901831



Assembled fiber optic cable, break-out cable, fiberglass single mode 9/125  $\mu\text{m}$  (OS2, Low Water Peak Fiber) connector: SC duplex/SC duplex, degree of protection: IP20, for installation in cable ducts or control cabinets, length: 5 m

#### FO patch cable - FL SM PATCH 1,0 SC-ST - 2901832



Assembled fiber optic cable, break-out cable, fiberglass single mode 9/125  $\mu\text{m}$  (OS2, Low Water Peak Fiber) connector: SC duplex/B-FOC(ST®), degree of protection: IP20, for installation in cable ducts or control cabinets, length: 1 m

#### FO patch cable - FL SM PATCH 2,0 SC-ST - 2901833



Assembled fiber optic cable, break-out cable, fiberglass single mode 9/125  $\mu\text{m}$  (OS2, Low Water Peak Fiber) connector: SC duplex/B-FOC(ST®), degree of protection: IP20, for installation in cable ducts or control cabinets, length: 2 m

#### FO patch cable - FL SM PATCH 5,0 SC-ST - 2901834



Assembled fiber optic cable, break-out cable, fiberglass single mode 9/125  $\mu\text{m}$  (OS2, Low Water Peak Fiber) connector: SC duplex/B-FOC(ST®), degree of protection: IP20, for installation in cable ducts or control cabinets, length: 5 m

### Data plug

## FO converters - FL MC EF 1300 SM SC - 2902856

### Accessories

RJ45 connector - VS-08-RJ45-5-Q/IP20 - 1656725



RJ45 connector, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5 (IEC 11801:2002), material: PA, connection method: IDC fast connection, connection cross section: AWG 26- 23, cable outlet: straight, color: traffic grey A RAL 7042

---

### DIN rail connector

DIN rail bus connectors - ME 22,5 TBUS 1,5/ 5-ST-3,81 GN - 2707437



DIN rail connector, nominal current: 8 A, nominal current (Ex): 8 A, nominal voltage (Ex): 125 V, number of positions: 5, pitch: 3.81 mm, Articles with gold-plated contacts, bus connectors for connecting with electronic housings

---

Electronic housing - ME 17,5 TBUS 1,5/ 5-ST-3,81 GN - 2709561



DIN rail connector for DIN rail mounting. Universal for TBUS housing. Gold-plated contacts, 5-pos.

---

### Plug

RJ45 connector - FL PLUG RJ45 GR/2 - 2744856



RJ45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.

---

RJ45 connector - FL PLUG RJ45 GN/2 - 2744571



RJ45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.

## FO converters - FL MC EF 1300 SM SC - 2902856

### Accessories

---

#### Power supply

Power supply unit - MINI-SYS-PS-100-240AC/24DC/1.5 - 2866983



Primary-switched MINI POWER supply for DIN rail mounting, input: 1-phase, output: 24 V DC/1.5 A

---

#### Universal tools

Assembly tool - FL CRIMPTOOL - 2744869



Crimping pliers, for assembling the RJ45 plugs FL PLUG RJ45..., for assembly on site

---