

Low profile transformer  
FL



General Data

|                                         |
|-----------------------------------------|
| Rated input voltage 2 x 115 Vac         |
| Rated output voltage 2 x 5 - 2 x 24 Vac |
| Rated power 2 - 52 VA                   |
| Insulation class E                      |
| Maximum ambient temperature 40 °C       |
| Efficiency up to 81 %                   |
| Degree of protection IP 00              |

Advantages

|                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------|
| Minimum size at high output                                                                                                          |
| Low height                                                                                                                           |
| Double input voltage for series or parallel connection                                                                               |
| Double output voltage for series or parallel connection                                                                              |
| Permanent corrosion protection, high insulation value and maximum electrical reliability thanks to XtraDensiFill resin encapsulation |
| Coil shell in 2-chamber technology                                                                                                   |
| Self-extinguishing potting material                                                                                                  |

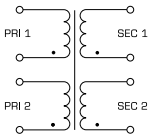
Applications

As a mains transformer for adjustment of the voltage and simple electrical isolation.

As an isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Circuit Diagram



Standards



Mains transformer  
to: VDE 0570 Teil 2-1, DIN EN 61558-2-1, EN 61558-2-1, IEC 61558-2-1, UL 5085-1/-2, CSA 22.2 No.66

Isolating transformer  
to: VDE 0570 Part 2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer  
to: VDE 0570 Part 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Certifications



ENEC 10 (VDE), UL 5085-1/-2, CSA 22.2 No.66



## Low profile transformer FL

| Electrical data       | Type                                   | FL 2/..                                                                                                                                                       | FL 4/..                                                                                                                                                       | FL 6/..                                                                                                                                                       | FL 8/..                                                                                                                                    | FL 10/..                                                                                                                                                              | FL 14/..                                                                                                                                                              |
|-----------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | Input                                  |                                                                                                                                                               |                                                                                                                                                               |                                                                                                                                                               |                                                                                                                                            |                                                                                                                                                                       |                                                                                                                                                                       |
|                       | Rated input Voltage                    | 2 x 115 Vac                                                                                                                                                   | 2 x 115 Vac                                                                                                                                                   | 2 x 115 Vac                                                                                                                                                   | 2 x 115 Vac                                                                                                                                | 2 x 115 Vac                                                                                                                                                           | 2 x 115 Vac                                                                                                                                                           |
|                       | Rated frequency                        | 50 - 60 Hz                                                                                                                                                    | 50 - 60 Hz                                                                                                                                                    | 50 - 60 Hz                                                                                                                                                    | 50 - 60 Hz                                                                                                                                 | 50 - 60 Hz                                                                                                                                                            | 50 - 60 Hz                                                                                                                                                            |
|                       | Output                                 |                                                                                                                                                               |                                                                                                                                                               |                                                                                                                                                               |                                                                                                                                            |                                                                                                                                                                       |                                                                                                                                                                       |
|                       | <b>Rated output voltage: Order no.</b> | 2x5 Vac: FL 2/5<br>2x6 Vac: FL 2/6<br>2x8 Vac: FL 2/8<br>2x9 Vac: FL 2/9<br>2x12 Vac: FL 2/12<br>2x15 Vac: FL 2/15<br>2x18 Vac: FL 2/18<br>2x24 Vac: FL 2/24* | 2x5 Vac: FL 4/5<br>2x6 Vac: FL 4/6<br>2x8 Vac: FL 4/8<br>2x9 Vac: FL 4/9<br>2x12 Vac: FL 4/12<br>2x15 Vac: FL 4/15<br>2x18 Vac: FL 4/18<br>2x24 Vac: FL 4/24* | 2x5 Vac: FL 6/5<br>2x6 Vac: FL 6/6<br>2x8 Vac: FL 6/8<br>2x9 Vac: FL 6/9<br>2x12 Vac: FL 6/12<br>2x15 Vac: FL 6/15<br>2x18 Vac: FL 6/18<br>2x24 Vac: FL 6/24* | 2x5 Vac: FL 8/6<br>2x6 Vac: FL 8/8<br>2x8 Vac: FL 8/9<br>2x12 Vac: FL 8/12<br>2x15 Vac: FL 8/15<br>2x18 Vac: FL 8/18<br>2x24 Vac: FL 8/24* | 2x5 Vac: FL 10/5<br>2x6 Vac: FL 10/6<br>2x8 Vac: FL 10/8<br>2x9 Vac: FL 10/9<br>2x12 Vac: FL 10/12<br>2x15 Vac: FL 10/15<br>2x18 Vac: FL 10/18<br>2x24 Vac: FL 10/24* | 2x5 Vac: FL 14/5<br>2x6 Vac: FL 14/6<br>2x8 Vac: FL 14/8<br>2x9 Vac: FL 14/9<br>2x12 Vac: FL 14/12<br>2x15 Vac: FL 14/15<br>2x18 Vac: FL 14/18<br>2x24 Vac: FL 14/24* |
|                       | Rated Power                            | 2.0 VA                                                                                                                                                        | 4.0 VA                                                                                                                                                        | 6.0 VA                                                                                                                                                        | 8.0 VA                                                                                                                                     | 10.0 VA                                                                                                                                                               | 14.0 VA                                                                                                                                                               |
|                       | No-load voltage (app. x factor)        | 1.35                                                                                                                                                          | 1.35                                                                                                                                                          | 1.35                                                                                                                                                          | 1.22                                                                                                                                       | 1.32                                                                                                                                                                  | 1.28                                                                                                                                                                  |
|                       | No-load loss (typ.)                    | 0.60 W                                                                                                                                                        | 0.90 W                                                                                                                                                        | 1.20 W                                                                                                                                                        | 1.30 W                                                                                                                                     | 1.10 W                                                                                                                                                                | 1.20 W                                                                                                                                                                |
|                       | Efficiency                             | 66 %                                                                                                                                                          | 66 %                                                                                                                                                          | 69 %                                                                                                                                                          | 76 %                                                                                                                                       | 72 %                                                                                                                                                                  | 74 %                                                                                                                                                                  |
| Standards             | Classification                         | Safety isolating transformer<br>*Mains transformer<br>(without VDE mark)                                                                                      | Safety isolating transformer<br>*Mains transformer<br>(without VDE mark)                                                                                      | Safety isolating transformer<br>*Mains transformer<br>(without VDE mark)                                                                                      | Safety isolating transformer<br>*Mains transformer<br>(without VDE mark)                                                                   | Safety isolating transformer<br>*Mains transformer<br>(without VDE mark)                                                                                              | Safety isolating transformer<br>*Mains transformer<br>(without VDE mark)                                                                                              |
| Approvals             | Approvals                              | cURus, ENEC 10 (VDE)                                                                                                                                          | cURus, ENEC 10 (VDE)                                                                                                                                          | cURus, ENEC 10 (VDE)                                                                                                                                          | cURus, ENEC 10 (VDE)                                                                                                                       | cURus, ENEC 10 (VDE)                                                                                                                                                  | cURus, ENEC 10 (VDE)                                                                                                                                                  |
| Environment           | Ambient temperature max.               | 40 °C                                                                                                                                                         | 40 °C                                                                                                                                                         | 40 °C                                                                                                                                                         | 40 °C                                                                                                                                      | 40 °C                                                                                                                                                                 | 40 °C                                                                                                                                                                 |
| Safety and protection | Type                                   | encapsulated                                                                                                                                                  | encapsulated                                                                                                                                                  | encapsulated                                                                                                                                                  | encapsulated                                                                                                                               | encapsulated                                                                                                                                                          | encapsulated                                                                                                                                                          |
|                       | Class of Insulation System             | VDE=E, UL=class 105                                                                                                                                           | VDE=E, UL=class 105                                                                                                                                           | VDE=E, UL=class 105                                                                                                                                           | VDE=E, UL=class 105                                                                                                                        | VDE=E, UL=class 105                                                                                                                                                   | VDE=E, UL=class 105                                                                                                                                                   |
|                       | Protection index                       | IP 00                                                                                                                                                         | IP 00                                                                                                                                                         | IP 00                                                                                                                                                         | IP 00                                                                                                                                      | IP 00                                                                                                                                                                 | IP 00                                                                                                                                                                 |
|                       | Safety class (prepared)                | II                                                                                                                                                            | II                                                                                                                                                            | II                                                                                                                                                            | II                                                                                                                                         | II                                                                                                                                                                    | II                                                                                                                                                                    |
|                       | Short circuit strength                 | non-short-circuit proof                                                                                                                                       | non-short-circuit proof                                                                                                                                       | non-short-circuit proof                                                                                                                                       | non-short-circuit proof                                                                                                                    | non-short-circuit proof                                                                                                                                               | non-short-circuit proof                                                                                                                                               |
| Order numbers         | Order Number                           | refer to rated output voltage                                                                                                                                 | refer to rated output voltage                                                                                                                                 | refer to rated output voltage                                                                                                                                 | refer to rated output voltage                                                                                                              | refer to rated output voltage                                                                                                                                         | refer to rated output voltage                                                                                                                                         |

1.1

1.2

1.3

1.4

1.5



## Low profile transformer FL

| Electrical data       | Type                                   | FL 18/..                                                                                                                                                              | FL 24/..                                                                                                                                                              | FL 30/..                                                                                                                                                              | FL 42/..                                                                                                                                                               | FL 52/..                                                                                                                                                               |
|-----------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | Input                                  |                                                                                                                                                                       |                                                                                                                                                                       |                                                                                                                                                                       |                                                                                                                                                                        |                                                                                                                                                                        |
|                       | Rated input Voltage                    | 2 x 115 Vac                                                                                                                                                           | 2 x 115 Vac                                                                                                                                                           | 2 x 115 Vac                                                                                                                                                           | 2 x 115 Vac                                                                                                                                                            | 2 x 115 Vac                                                                                                                                                            |
|                       | Rated frequency                        | 50 - 60 Hz                                                                                                                                                            | 50 - 60 Hz                                                                                                                                                            | 50 - 60 Hz                                                                                                                                                            | 50 - 60 Hz                                                                                                                                                             | 50 - 60 Hz                                                                                                                                                             |
|                       | Output                                 |                                                                                                                                                                       |                                                                                                                                                                       |                                                                                                                                                                       |                                                                                                                                                                        |                                                                                                                                                                        |
|                       | <b>Rated output voltage: Order no.</b> | 2x5 Vac: FL 18/5<br>2x6 Vac: FL 18/6<br>2x8 Vac: FL 18/8<br>2x9 Vac: FL 18/9<br>2x12 Vac: FL 18/12<br>2x15 Vac: FL 18/15<br>2x18 Vac: FL 18/18<br>2x24 Vac: FL 18/24* | 2x5 Vac: FL 24/5<br>2x6 Vac: FL 24/6<br>2x8 Vac: FL 24/8<br>2x9 Vac: FL 24/9<br>2x12 Vac: FL 24/12<br>2x15 Vac: FL 24/15<br>2x18 Vac: FL 24/18<br>2x24 Vac: FL 24/24* | 2x5 Vac: FL 30/5<br>2x6 Vac: FL 30/6<br>2x8 Vac: FL 30/8<br>2x9 Vac: FL 30/9<br>2x12 Vac: FL 30/12<br>2x15 Vac: FL 30/15<br>2x18 Vac: FL 30/18<br>2x24 Vac: FL 30/24* | 2x5 Vac: FL 42/5<br>2x6 Vac: FL 42/6<br>2x8 Vac: FL 42/8<br>2x9 Vac: FL 42/9<br>2x12 Vac: FL 42/12<br>2x15 Vac: FL 42/15<br>2x18 Vac: FL 42/18<br>2x24 Vac: FL 42/24** | 2x5 Vac: FL 52/5<br>2x6 Vac: FL 52/6<br>2x8 Vac: FL 52/8<br>2x9 Vac: FL 52/9<br>2x12 Vac: FL 52/12<br>2x15 Vac: FL 52/15<br>2x18 Vac: FL 52/18<br>2x24 Vac: FL 52/24** |
|                       | Rated Power                            | 18.0 VA                                                                                                                                                               | 24.0 VA                                                                                                                                                               | 30.0 VA                                                                                                                                                               | 42.0 VA                                                                                                                                                                | 52.0 VA                                                                                                                                                                |
|                       | No-load voltage (app. x factor)        | 1.22                                                                                                                                                                  | 1.20                                                                                                                                                                  | 1.17                                                                                                                                                                  | 1.16                                                                                                                                                                   | 1.12                                                                                                                                                                   |
|                       | No-load loss (typ.)                    | 1.50 W                                                                                                                                                                | 1.60 W                                                                                                                                                                | 1.70 W                                                                                                                                                                | 3.50 W                                                                                                                                                                 | 4.00 W                                                                                                                                                                 |
|                       | Efficiency                             | 77 %                                                                                                                                                                  | 77 %                                                                                                                                                                  | 81 %                                                                                                                                                                  | 81 %                                                                                                                                                                   | 81 %                                                                                                                                                                   |
| Standards             | Classification                         | Safety isolating transformer<br>*Mains transformer<br>(without VDE mark)                                                                                              | Safety isolating transformer<br>*Mains transformer<br>(without VDE mark)                                                                                              | Safety isolating transformer<br>**isolating transformer<br>(without VDE mark)                                                                                         | Safety isolating transformer<br>**isolating transformer<br>(without VDE mark)                                                                                          | Safety isolating transformer<br>**isolating transformer<br>(without VDE mark)                                                                                          |
|                       | Approvals                              | cURus, ENEC 10 (VDE)                                                                                                                                                  | cURus, ENEC 10 (VDE)                                                                                                                                                  | cURus, ENEC 10 (VDE)                                                                                                                                                  | cURus, ENEC 10 (VDE)                                                                                                                                                   | cURus, ENEC 10 (VDE)                                                                                                                                                   |
| Environment           | Approvals                              | cURus, ENEC 10 (VDE)                                                                                                                                                  | cURus, ENEC 10 (VDE)                                                                                                                                                  | cURus, ENEC 10 (VDE)                                                                                                                                                  | cURus, ENEC 10 (VDE)                                                                                                                                                   | cURus, ENEC 10 (VDE)                                                                                                                                                   |
|                       | Environment                            | Ambient temperature max.                                                                                                                                              | 40 °C                                                                                                                                                                 | 40 °C                                                                                                                                                                 | 40 °C                                                                                                                                                                  | 40 °C                                                                                                                                                                  |
| Safety and protection | Safety and protection                  | Type                                                                                                                                                                  | encapsulated                                                                                                                                                          | encapsulated                                                                                                                                                          | encapsulated                                                                                                                                                           | encapsulated                                                                                                                                                           |
|                       | Class of Insulation System             | VDE=E, UL=class 105                                                                                                                                                   | VDE=E, UL=class 105                                                                                                                                                   | VDE=E, UL=class 105                                                                                                                                                   | VDE=E, UL=class 105                                                                                                                                                    | VDE=E, UL=class 105                                                                                                                                                    |
| Order numbers         | Protection index                       | IP 00                                                                                                                                                                 | IP 00                                                                                                                                                                 | IP 00                                                                                                                                                                 | IP 00                                                                                                                                                                  | IP 00                                                                                                                                                                  |
|                       | Safety class (prepared)                | II                                                                                                                                                                    | II                                                                                                                                                                    | II                                                                                                                                                                    | II                                                                                                                                                                     | II                                                                                                                                                                     |
| Order numbers         | Short circuit strength                 | non-short-circuit proof                                                                                                                                               | non-short-circuit proof                                                                                                                                               | non-short-circuit proof                                                                                                                                               | non-short-circuit proof                                                                                                                                                | non-short-circuit proof                                                                                                                                                |
|                       | Order Number                           | refer to rated output voltage                                                                                                                                         | refer to rated output voltage                                                                                                                                         | refer to rated output voltage                                                                                                                                         | refer to rated output voltage                                                                                                                                          | refer to rated output voltage                                                                                                                                          |



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FL

|                 |    |    |      |           |           |        |                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-----------------|----|----|------|-----------|-----------|--------|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mechanical data | 30 | mm | Type | Terminals | Core type | Weight | Dimension picture (in mm) | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|                 |    |    |      |           |           |        |                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                 |    |    |      |           |           |        |                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                 |    |    |      |           |           |        |                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                 |    |    |      |           |           |        |                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                 |    |    |      |           |           |        |                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                 |    |    |      |           |           |        |                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                 |    |    |      |           |           |        |                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                 |    |    |      |           |           |        |                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                 |    |    |      |           |           |        |                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                 |    |    |      |           |           |        |                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Dimension pictures

