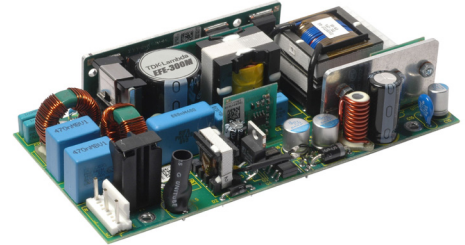


## 300W and 400W, High Density AC-DC, digital power solution

| Features                            | Benefits                     |
|-------------------------------------|------------------------------|
| • Reinforced isolation              | Simplifies equipment design  |
| • Full digital control              | Improves product performance |
| • High efficiency                   | Minimises heat in system     |
| • Temperature controlled fan option | Reduces noise in system      |
| • 5 year warranty                   | Low cost of ownership        |



| Input                 |  |                 |   |
|-----------------------|--|-----------------|---|
| Input Voltage         | 90-264Vac  | Input Frequency | 45 - 63Hz<br>(440Hz with reduced PFC - consult sales office)                  |
| Input Harmonics       | EN61000-3-2 compliant  | Inrush Current  | <40A at 25°C and 230Vac (cold start)<br>(meets EN61000-3-3). <50A for EFE400M |
| Input Fuse            | Dual fuses (Live + Neutral)<br>Fast acting (not user accessible)   |                 |   |
| Earth Leakage Current | 123µA at 120Vac (60Hz), 257µA max at 240Vac (60Hz)<br>Worst case leakage current is less than 300µA at 264Vac, 63Hz (normal condition, 0.5mA Single Fault Condition) |                 |   |

| Quick Selector (Standard models). Additional variants available - see below |         |                       |            |                       |            |                       |            |
|---|---------|-----------------------|------------|-----------------------|------------|-----------------------|------------|
| Output Voltage  | Current | Units without fan     |            |                       |            | Units with end fan    |            |
|   |         | Open Frame            |            | Cover + Chassis       |            | Cover + Chassis       |            |
|   |         | Description           | Order Code | Description           | Order Code | Description           | Order Code |
| 12V   | 25A     | EFE300M-12-5-HNMDL-YT | U5Y0020    | EFE300M-12-5-HCMDL-YT | U5Y001Z    | EFE300M-12-5-ECMDL-YT | U5Y0031    |
|   | 33.3A   | EFE400M-12-5-HNMDL-YT | U6Y001H    | EFE400M-12-5-HCMDL-YT | U6Y004L    | EFE400M-12-5-ECMDL-YT | U6Y007P    |
| 24V   | 12.5A   | EFE300M-24-5-HNMDL-YT | U5Y0053    | EFE300M-24-5-HCMDL-YT | U5Y0042    | EFE300M-24-5-ECMDL-YT | U5Y0064    |
|   | 16.7A   | EFE400M-24-5-HNMDL-YT | U6Y002J    | EFE400M-24-5-HCMDL-YT | U6Y005M    | EFE400M-24-5-ECMDL-YT | U6Y008Q    |
| 48V   | 6.25A   | EFE300M-48-5-HNMDL-YT | U5Y0201    | EFE300M-48-5-HCMDL-YT | U5Y0223    | EFE300M-48-5-ECMDL-YT | U5Y0166    |
|   | 8.3A    | EFE400M-48-5-HNMDL-YT | U6Y003K    | EFE400M-48-5-HCMDL-YT | U6Y006N    | EFE400M-48-5-ECMDL-YT | U6Y009R    |

### How To Create A Product Description

| Output | Factory Setting Range |              |
|--------|-----------------------|--------------|
|        | EFE300M               | EFE400M      |
| 12     | 11.4 - 13.2V          | 11.4 - 13.2V |
| 24     | 22.8 - 26.4V          | 22.8 - 26.4V |
| 28     | 27 - 32V              |              |
| 48     | 47-50V                | 47-50V       |
| 50     | 50-54V                |              |

Required output voltage must be specified at time of ordering

Standby Voltage  
**0** = None (Only with EFE300M and 'N' Remote On/Off)  
**5** = 5V / 2A  
**12** = 12V / 1A

| Case / Fan Option |   |
|-------------------|---|
| <b>-HN</b>        | Open frame, no fan, with 12V / 1A fan supply    |
| <b>-HU</b>        | U chassis, no fan, with 12V / 1A fan supply     |
| <b>-HC</b>        | Cover+chassis, no fan, with 12V / 1A fan supply |
| <b>-EC</b>        | Cover+chassis, end fan (temp controlled)        |
| <b>-NN</b>        | Open frame, no fan, no fan supply               |
| <b>-NU</b>        | U chassis, no fan, no fan supply                |
| <b>-NC</b>        | Cover+chassis, no fan, no fan supply            |

**-Y** = ORing FET included  
**-N** = Without ORing FET

**blank** = right angled  
**-V** = vertical

**M** = Molex (see connection drawings for details)  
**L** = 300µA

**E** = Enable  
**T** = Inhibit  
**N** = None

Confirm availability of created product with the sales office

| Isolation       |            |   |
|-----------------|------------|---|
| Input to Output | Reinforced | 2 x MOPPs (3rd edition 60601)<br>4kVac, 5.7kVdc type tested to 4kVac (equivalent to 5.7kVdc), production tested to 4.3kVdc. |
| Input to Earth  | Basic      | 1 x MOPP (3rd edition 60601), 1.5kVac, 2.3kVdc  |
| Output to Earth | Basic      | 1 x MOPP (3rd edition 60601), 1.5kVac   |

| Output Specification        |                |         |   |
|-----------------------------|----------------|---------|---|
|                             | EFE300M        | EFE400M |   |
| Output Power                | 300W           | 400W    | Continuous (including fan supply) or RMS (including Peak power)<br>EFE400M derates below 100Vac input and units fitted with fan, vertical output connector, ORing FET derate. See handbook for details. |
| Peak Power                  | 400W           | 530W    | EFE300M - for 10 seconds. Outputs above 36V, 350W.<br>EFE400M - for 10 seconds. Outputs 47V and above, 470W.  |
| Total Regulation            | better than 4% |         | Including Line (for 90-264Vac input change), Load (for 0-100% load change) and temperature (0-50°C)   |
| Ripple & Noise              | 1.5%           |         | pk-pk, using EIAJ test method & 20MHz bandwidth   |
| Voltage Setting Accuracy    | ±1%            |         | at 50% load   |
| Turn on Time                | 1.5s max       |         | at 90 Vac & 100% rated output power. EFE400M 2s max.  |
| Efficiency                  | up to 90%      |         |   |
| Hold up                     | >16ms          |         | at 90 Vac, 75% load   |
| Min Load                    | None           |         |   |
| Transient Response          | <5%            |         | of set voltage for 50% load change<br>(in 50µs within the range 25 - 100% load)   |
| Recovery                    | <1ms           |         | for recovery to 2% of set voltage   |
| Short circuit protection    | Yes            |         | Auto recovery after removal of short circuit  |
| Over Temperature protection | Yes            |         | Primary - auto recovers, secondary - cycle power to restart   |
| Over Voltage Protection     | Yes            |         | Latching, need to cycle ac to restart unit.   |
| Fan supply                  | 12V / 1A       |         | Depending on 'Case/Fan Option' selected. See previous page for details  |

| Global Signals |  |
|----------------|--|
| Remote on/off  | Enable - TTL logic level low (relative to Standby 0V) enables channel 1 and fan supply<br>Inhibit - TTL logic level low (relative to Standby 0V) inhibits channel 1 and fan supply |
| Standby Supply | 5V / 2A or 12V / 1A, isolated supply, not affected by remote on/off.   |
| Power Good     | Logic high indicates ac supply is good and Ch1 is within regulation  |
| ORing FET      | Allows redundant connection of power supplies with no additional diodes required.  |

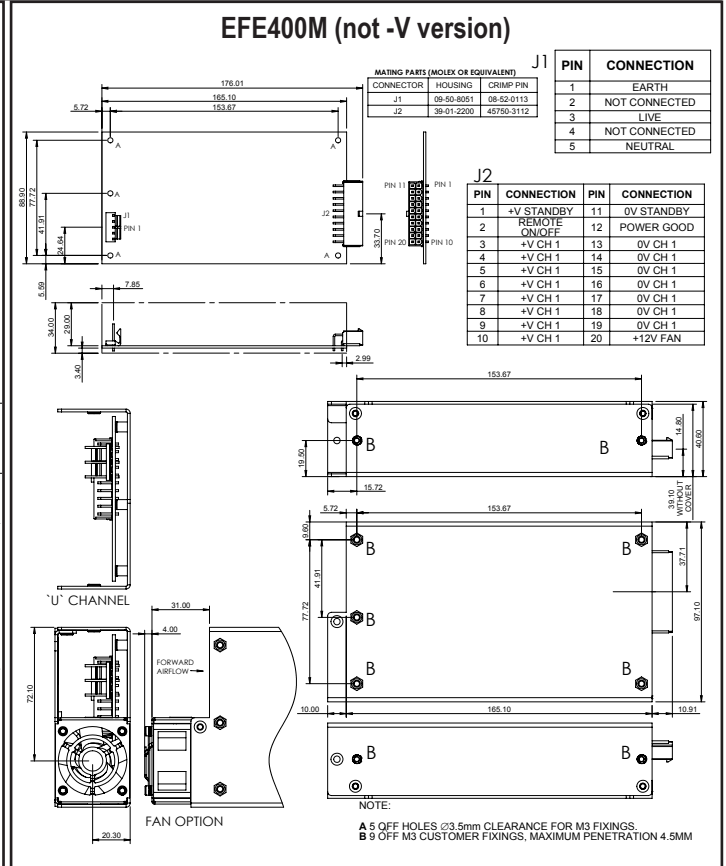
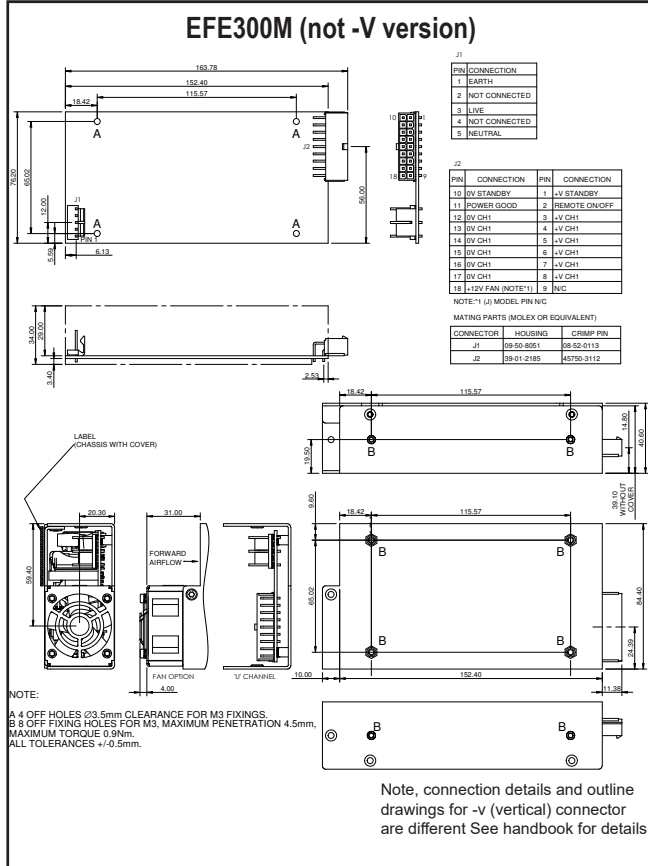
| Environment      |   |
|------------------|---|
| Temperature      | 0°C to 50°C operational, -40°C to 70°C storage.<br>Full load, with 2m/s air blown from input to output (approximately 10CFM)  |
| Derating         | 50°C to 70°C derate each output by 2.5% per °C  |
| Low Temp Startup | -20°C   |
| Humidity         | 5 - 95% RH non condensing   |
| Shock            | ±3 x 30g shocks in each plane, total 18 shocks<br>30g shock = 11ms (+/-0.5msec), half sine<br>Conforms to EN60068-2-27, EN60068-2-47, IEC68-2-27, IEC68-2-47, JIS C0041-1987.<br>Conforms to MIL-STD-810E/F, Method 516.5, Pro IV, VI                             |
| Vibration        | Single axis 10 - 500 Hz at 2g (sweep and endurance at resonance) in all 3 planes<br>Conforms to EN60068-2-6, IEC68-2-6<br>Conforms to MIL-STD-810E, Method 514.4, Pro I, Cat 1,9  |
| Altitude         | Medical approval = -200 to 3000 metres operational (-200 to 5000m storage/transportation)<br>Non medical approval = -200 to 5000 <sub>0</sub> metres operational (-200 to 5000m storage/transportation)<br>a - non open frame EFE400M units = -200 to 4000 metres |
| Pollution        | Degree 2, Material group IIIb   |

| Emissions EN61000-6-3:2007, EN60601-1-2:2007 |                  |   |
|--|------------------|---|
| Radiated Electric Field                      | EN55011, EN55032 | (as per CISPR.11/22) Class B, FCC47 part 15 subpart B<br>see application note for details |
| Conducted Emissions                          | EN55011, EN55032 | (as per CISPR.11/22) Class B, FCC47 part 15 subpart B                                     |
| Conducted Harmonics                          | EN61000-3-2      | Class A<br>Class C - EFE300M at 100W and above  |
| Flicker                                      | EN61000-3-3      | Compliant - d <sub>max</sub> only   |

| Immunity EN61000-6-2:2005               |              |         |   | Criteria |
|---|--------------|---------|---|----------|
| Electrostatic Discharge                 | EN61000-4-2  | Level 4 | Air discharge 15kV, Contact discharge 8kV<br>Not applicable to open frame units                         | A        |
| Electromagnetic Field                   | EN61000-4-3  | Level 3 | 12V/m   | A        |
| Fast / Burst Transient                  | EN61000-4-4  | Level 4 | ac input tested to 4.4kV<br>dc output tested to 2.2kV   | A        |
| Surge Immunity                          | EN61000-4-5  | Level 3 | Common mode - 2.2kV<br>Differential - 1.1kV   | A        |
| Conducted RF Immunity                   | EN61000-4-6  | Level 3 | 12V   | A        |
| Power Frequency Magnetic Field          | EN61000-4-8  | Level 4 | 30A/m   | A        |
| Voltage Dips, Variations, Interruptions | EN61000-4-11 | Class 3 | Criteria B for 40% dip for 5 cycles (below 154Vac nominal), 1 cycle interruption and 5 sec interruption | A        |
| Ring Wave                               | EN61000-4-12 | Level 3 | Common mode - 2.2kV<br>Differential - 1.1kV   | A        |
| Voltage Fluctuations                    | EN61000-4-14 | Class 3 |   | A        |

| Approvals / Accreditations   |   |
|--|---|
| IEC/EN 62368-1, UL62368-1 / CSA 22.2 No 62368-1  | File E135494  |
| IEC/EN 60950-1, UL60950-1 / CSA 22.2 No 60950-1  | File E135494  |
| IEC/EN 60601-1, UL/CSA 60601-1, ANSI/AAMI ES60601-1<br>CAN/CSA-C22.2 No 60601-1-08               | File E349607  |
| IEC/EN 61010-1   | EFE300M approved (File E331788), EFE400M designed to meet   |
| CE Mark (EN62368-1)  | Low Voltage Directive (LVD), electromagnetic compatibility (EMC) and Restriction of Hazardous Substances (RoHS)               |
| UKCA (EN62368-1)   | Electrical Equipment (Safety) Regulations, electromagnetic compatibility (EMC) and Restriction of Hazardous Substances (RoHS) |
| CB certificate and Report available on request   | <i>Please check with technical sales for status of approvals</i>  |
| Designed and manufactured under the control of ISO9001 and ISO13485 (including risk management). |   |

## Outline & Connection Drawings



- Notes
1. All customer fixings M3
  2. Maximum Penetration 4.5mm
  3. Maximum torque 0.9Nm
  4. All tolerances +/-0.5mm

- Connectors are not included with the product. They are available from TDK-Lambda
- 1 off input connector and 3 crimps are available as part number is 94910.
  - 1 off output connector and 18 crimps are available as part number 94752. (EFE300M)
  - 1 off output connector and 20 crimps are available as part number 94912 (EFE400M)



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For Additional Information, please visit  
<https://product.tdk.com/en/power/>

