

DESCRIPTION

The TM201 series comprising single and multiple output models for 150 to 200 watts of continuous output power is specially designed for dental and medical applications. They operate at 90 to 264VAC input voltage without the need of a selector strap. All auxiliary outputs are with magnetic amplifier linear regulator to keep regulation. The units are constructed on a printed circuit board with a U-bracket for mechanical support and heat sinking. A cover-and-fan assembly can be added during manufacturing.

FEATURES

- Low safety ground leakage current
- Meet EN 55011 and FCC Class B
- Power Factor 0.98 typical
- Short-circuit protection
- Power Fail Detect (PFD) signal
- 100% burn-in at full rated load
- Optional cover-and-fan assembly
- Remote inhibit - TTL high disables output
- Compliant with RoHS requirements

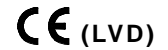
INPUT SPECIFICATIONS

| | |
|-------------------------|---|
| Input voltage : | 90 to 264VAC |
| Input frequency : | 47 to 63Hz |
| Input current : | 3.2A (rms) for 115VAC 1.6A (rms) for 230VAC |
| Earth leakage current : | 90µA max. @ 115VAC, 60Hz 150µA max. @ 230VAC, 50Hz |

OUTPUT SPECIFICATIONS

| | |
|---------------------------|--|
| Output voltage/current : | See rating chart |
| Total output power : | 200 watts maximum |
| Ripple and noise : | 2% peak to peak maximum |
| Overvoltage protection : | Provided on output #1 only; set at 112-132% of its nominal output voltage |
| Overcurrent protection : | All outputs protected to short circuit conditions |
| Temperature coefficient : | All outputs $\pm 0.04/^{\circ}\text{C}$ maximum |
| Transient response : | Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500µs after a 25% step load change |
| PFD signal : | TTL logic high for normal operation and TTL logic low upon loss of input power. This signal appears at least 1ms prior to +5V output dropping 5% below its nominal value. This signal also provides a minimum delay of 100ms after +5V is within regulation. |

TM201 SERIES



RoHS



Safety Standard Approvals:



UL 60601-1
CSA C22.2 No. 601.1



TÜV EN60601-1

ENVIRONMENTAL SPECIFICATIONS

| | |
|------------------------|--|
| Operating temperature: | 0°C to +70°C |
| Storage temperature: | -40°C to +85°C |
| Relative humidity: | 5% to 95% non-condensing |
| Derating: | Derate from 100% at +50°C linearly to 50% at +70°C |
| Cooling: | 10.8 CFM forced air provided on "C" version; 25 CFM forced air to be provided for U-bracket version by user. |

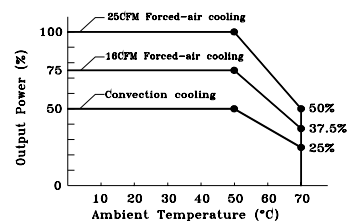
GENERAL SPECIFICATIONS

| | |
|-------------------------------------|--|
| Switching frequency : | 88 KHz –112 KHz |
| Efficiency : | 70% minimum on all models |
| Hold-up time : | 20 msec minimum at 110VAC |
| Line regulation : | $\pm 0.5\%$ maximum at full load |
| Inrush current : | 20 amps @ 115VAC or 40 amps @ 230VAC, at 25°C cold start |
| Withstand voltage : | 4000VAC from input to output 1500VAC from input to ground 500VAC from output to ground |
| MTBF : | 350,000 hours at full load at 25°C ambient, calculated per MIL-HDBK-217F |
| EMC Performance (EN60601-1-2: 2001) | |
| EN55011: | Class B conducted, Class B radiated |
| EN61000-3-2: | Harmonic distortion, Class A and D |
| EN61000-3-3: | Line flicker |
| EN61000-4-2: | ESD, $\pm 8\text{KV}$ air and $\pm 6\text{KV}$ contact |
| EN61000-4-3: | Radiated immunity, 3V/m |
| EN61000-4-4: | Fast transient/burst, $\pm 2\text{KV}$ |
| EN61000-4-5: | Surge, $\pm 1\text{KV}$ diff, $\pm 2\text{KV}$ com. |
| EN61000-4-6: | Conducted immunity, 3Vrms |
| EN61000-4-8: | Magnetic field immunity, 3A/m |
| EN61000-4-11: | Voltage dips, 30% reduction for 500ms, 60% reduction for 100ms and >95% reduction for 10ms |

OUTPUT VOLTAGE/CURRENT RATING CHART

| Product No. | Output #1 | | | | Output #2 | | | | Output #3 | | | | Output #4 | | | | Maximum Output |
|-------------|-----------|-------|-------|------|-----------|-------|-------|-------|-----------|-------|-------|-------|-----------|-------|-------|-------|----------------|
| | Vnom. | Imin. | Imax. | Tol. | Vnom. | Imin. | Imax. | Tol. | Vnom. | Imin. | Imax. | Tol. | Vnom. | Imin. | Imax. | Tol. | Power |
| TM201-S5.1 | 5.1V | 3.0A | 35A | 2% | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | 175W |
| TM201-S3.3 | 3.3V | 3.0A | 46A | 3% | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | 150W |
| TM201-S12 | 12V | 1.2A | 16.7A | 2% | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-S15 | 15V | 1.0A | 13.4A | 2% | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-S24 | 24V | 0.6A | 8.4A | 2% | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-S30 | 30V | 0.5A | 6.7A | 2% | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-S48 | 48V | 0.5A | 4.2A | 2% | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-D23 | +5.1V | 3.0A | 30A | 2% | +12V | 0A | 8A | 4% | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-D24 | +5.1V | 3.0A | 30A | 2% | +15V | 0A | 6A | 4% | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-D25 | +5.1V | 3.0A | 30A | 2% | +24V | 0A | 4A | 4% | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-D27 | +12V | 1.0A | 8.7A | 2% | +24V | 0A | 4A | 4% | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-T30 | +5.1V | 3.0A | 30A | 2% | +12V | 0A | 8A | 4% | -5V | 0A | 6A | 4% | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-T31 | +5.1V | 3.0A | 30A | 2% | +12V | 0A | 8A | 4% | -12V | 0A | 4A | 4% | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-T32 | +5.1V | 3.0A | 30A | 2% | +15V | 0A | 6A | 4% | -15V | 0A | 4A | 4% | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-T33 | +5.1V | 3.0A | 30A | 2% | +15V | 0A | 6A | 4% | -12V | 0A | 4A | 4% | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-T36 | +5.1V | 3.0A | 30A | 2% | +12V | 0A | 8A | 4% | 24V | 0A | 4A | 4% | (N/A) | (N/A) | (N/A) | (N/A) | 200W |
| TM201-Q40 | +5.1V | 3.0A | 30A | 2% | +12V | 0A | 8A | 4% | -12V | 0A | 4A | 4% | 5V | 0A | 6A | 4% | 200W |
| TM201-Q41 | +5.1V | 3.0A | 30A | 2% | +15V | 0A | 6A | 4% | -15V | 0A | 4A | 4% | 24V | 0A | 4A | 4% | 200W |
| TM201-Q42 | +5.1V | 3.0A | 30A | 2% | +12V | 0A | 8A | 4% | -12V | 0A | 4A | 4% | 12V | 0A | 4A | 4% | 200W |
| TM201-Q44 | +5.1V | 3.0A | 30A | 2% | +12V | 0A | 8A | 4% | -15V | 0A | 4A | 4% | 15V | 0A | 4A | 4% | 200W |
| TM201-Q45 | +5.1V | 3.0A | 30A | 2% | +12V | 0A | 8A | 4% | -12V | 0A | 4A | 4% | 24V | 0A | 4A | 4% | 200W |
| TM201-Q403 | +3.3V | 3.0A | 30A | 3% | +5.1V | 0A | 8A | 4% | -12V | 0A | 4A | 4% | 12V | 0A | 4A | 4% | 175W |

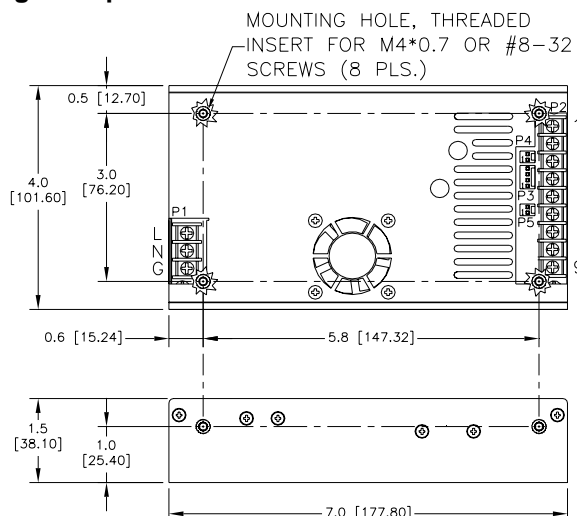
- NOTES:
1. Add suffix "C" for enclosed format with option fan control, e.g. TM201-Q45C.
 2. Peak current is 12A on +12V, 9A on +15V and 6A on +24V.
 3. Output #4 is floating. It can be connected externally for positive or negative output.
 4. 200 watts for "C" version with a cover-and-fan assembly. 100 watts for U-bracket version without moving air (maximum current of output #1 & #2 derated to 50%), or 200 watts with 25 CFM forced air provided by user.
 5. When the remote Sense facility is not used, +Sense must be connected to +V, and -Sense to return, on P2 connector.
 6. All models may be operated at no-load. At no-load, output voltage tolerance increases to 10%.



DERATING CURVE

MECHANICAL SPECIFICATIONS

Single Output Models



NOTES:

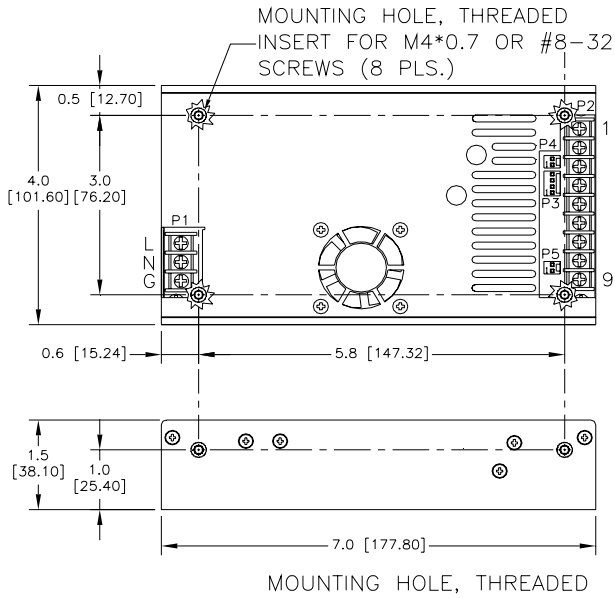
1. Dimensions shown in inch [mm]
2. Tolerance 0.02 [0.5] maximum
3. Input connector P1 is Dinkle DT-35-B01W-03 output connector P2 is Dinkle DT-35-B01W-09 screws are M3, Nickel plated.
4. Connector P3 mates with Molex housing 22-01-1043 and Molex 40445 series crimp terminal.
5. Connectors P4, P5 mates with Molex housing 22-01-1023 and Molex 40445 series crimp terminal.
6. P4 is for DC fan rated 12V/0.2A, Pin1 +V and Pin2 COM.
7. Weight:
0.82 kgs. (1.83 lbs.) approx. for U-bracket version,
0.96 kgs. (2.14 lbs.) approx. for "C" version

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Multiple Output Models



NOTES:

1. Dimensions shown in inch [mm]
2. Tolerance 0.02 [0.5] maximum
3. Input connector P1 is Dinkle DT-35-B01W-03 output connector P2 is Dinkle DT-35-B01W-09 screws are M3, Nickel plated.
4. Connector P3 mates with Molex housing 22-01-1043 and Molex 40445 series crimp terminal.
5. Connectors P4, P5 mates with Molex housing 22-01-1023 and Molex 40445 series crimp terminal.
6. P4 is for DC fan rated 24V/0.2A (models TM201-D25/D27) or 5V/0.38A (models TM201-Q403), and 12V/0.2A (other models, Pin1 +V and Pin2 COM).
7. Weight:
0.82 kgs. (1.83 lbs.) approx. for U-bracket version,
0.96 kgs. (2.14 lbs.) approx. for "C" version

PIN CHART

| Product No. | CONN PIN | P2 | | | | | | | | | P3 | | | | P5 | |
|---|--------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------------|-----------|-----|-----------|-----------|-----|----------|----------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | 2 | 3 | 4 | 1 | 2 |
| TM201-S5.1 TM201-S12 TM201-S24 TM201-S48 | TM201-S3.3 TM201-S15 TM201-S30 | -SENSE | RET. | RET. | RET. | RET. | OUTPUT #1 | OUTPUT #1 | OUTPUT #1 | +SENSE | FAN | COM. RET. | COM. RET. | PFD | INHIBIT+ | INHIBIT- |
| TM201-D23 TM201-D25 | TM201-D24 TM201-D27 | OUTPUT #1 | OUTPUT #1 | COM. RET. | COM. RET. | COM. RET. | OUTPUT #2 | N.C. | N.C. | N.C. | FAN | COM. RET. | COM. RET. | PFD | INHIBIT+ | INHIBIT- |
| TM201-T30 TM201-T32 | TM201-T31 TM201-T33 | OUTPUT #1 | OUTPUT #1 | COM. RET. | COM. RET. | COM. RET. | OUTPUT #2 | OUTPUT #3 | N.C. | N.C. | FAN | COM. RET. | COM. RET. | PFD | INHIBIT+ | INHIBIT- |
| TM201-T36 | | OUTPUT #1 | OUTPUT #1 | COM. RET. | COM. RET. | COM. RET. | OUTPUT #2 | N.C. | OUTPUT #3 RETURN | OUTPUT #3 | FAN | COM. RET. | COM. RET. | PFD | INHIBIT+ | INHIBIT- |
| TM201-Q40 TM201-Q41 TM201-Q44 | TM201-Q403 TM201-Q42 TM201-Q45 | OUTPUT #1 | OUTPUT #1 | COM. RET. | COM. RET. | COM. RET. | OUTPUT #2 | OUTPUT #3 | OUTPUT #4 RETURN | OUTPUT #4 | FAN | COM. RET. | COM. RET. | PFD | INHIBIT+ | INHIBIT- |