# 960W Three Phase Industrial DIN RAIL with PFC Function TDR-960 series




## Features :

- Three-Phase 340 ~ 550VAC wide range input (Dual phase operation possible)
- Width only 110mm
- Built-in active PFC function compliance to BS EN/EN61000-3-2
- High efficiency 94.5% and low power dissipation
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Cooling by free air convection
- Built-in constant current limiting circuit
- Can be installed on DIN rail TS-35/7.5 or 15
- UL508(industrial control equipment)approved
- BS EN/EN61000-6-2(BS EN/EN50082-2) industrial immunity level
- Current sharing up to 3840W(3+1)
- Built-in DC OK relay contact
- 100% full load burn-in test
- 3 years warranty

User's Manual Click Me

## GTIN CODE

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Parallel IS 13252 (only for 24V) UL508 TPTC004 IEC62368-1

## SPECIFICATION

| MODEL | | TDR-960-24 | TDR-960-48 |
|---|---|---|---|
| OUTPUT | DC VOLTAGE | 24V | 48V |
| | RATED CURRENT | 40A | 20A |
| | CURRENT RANGE | 0 ~ 40A | 0 ~ 20A |
| | RATED POWER | 960W | 960W |
| | RIPPLE & NOISE (max.) Note.2 | 180mVp-p | 250mVp-p |
| | VOLTAGE ADJ. RANGE | 24 ~ 28V | 48 ~ 55V |
| | VOLTAGE TOLERANCE Note.3 | ±1.0% | ±1.0% |
| | LINE REGULATION | ±0.5% | ±0.5% |
| | LOAD REGULATION | ±1.0% | ±1.0% |
| | SETUP, RISE TIME | 1000ms, 100ms/400VAC 800ms, 100ms/500VAC at full load | |
| | HOLD UP TIME (Typ.) | 12ms / 400VAC 14ms / 500VAC at full load | |
| INPUT | VOLTAGE RANGE Note.4 | Three-Phase 340 ~ 550VAC (Dual phase operation possible) 480 ~ 780VDC | |
| | FREQUENCY RANGE | 47 ~ 63Hz | |
| | POWER FACTOR (Typ.) | PF≧0.88/400VAC PF≧0.86/500VAC at full load | |
| | EFFICIENCY (Typ.) | 94% | 94.5% |
| | AC CURRENT (Typ.) | 2A/400VAC 1.4A/500VAC | |
| | INRUSH CURRENT (Typ.) | COLD START 60A | |
| | LEAKAGE CURRENT | <3.5mA / 530VAC | |
| PROTECTION | OVERLOAD | 105 ~ 130% rated output power | |
| | | Protection type : Constant current limiting, unit will shut down after 3 sec. ,re-power on to recover | |
| | OVER VOLTAGE | 29 ~ 33V | 56 ~ 65V |
| | | Protection type : Shut down o/p voltage, re-power on to recover | |
| | OVER TEMPERATURE | Shut down o/p voltage, recovers automatically after temperature goes down | |
| FUNCTION | DC OK REALY CONTACT RATINGS (max.) | 60Vdc/0.3A, 30Vdc/1A, 30Vac/0.5A resistive load | |
| | CURRENT SHARING | Please refer to function manual | |
| ENVIRONMENT | WORKING TEMP. Note.5 | -30 ~ +70℃ (Refer to "Derating Curve") | |
| | WORKING HUMIDITY | 20 ~ 95% RH non-condensing | |
| | STORAGE TEMP., HUMIDITY | -40 ~ +85℃, 10 ~ 95% RH non-condensing | |
| | TEMP. COEFFICIENT | ±0.03%/℃ (0 ~ 50℃) | |
| | VIBRATION | Component:10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: Compliance to IEC60068-2-6 | |
| SAFETY & EMC (Note 6) | SAFETY STANDARDS | UL508, AS/NZS62368.1, BIS IS13252(Part1) (only for 24V), EAC TP TC 004 approved, IEC62368-1 CB approved by SIQ; Design refer to BS EN/EN62368-1 | |
| | WITHSTAND VOLTAGE | I/P-O/P:3KVAC I/P-FG:2KVAC O/P-FG:0.5KVAC O/P-DC OK:0.5KVAC | |
| | ISOLATION RESISTANCE | I/P-O/P, I/P-FG, O/P-FG:>100M Ohms / 500VDC / 25℃/ 70% RH | |
| | EMC EMISSION | Compliance to BS EN/EN55032 (CISPR32), BS EN/EN61204-3 Class B, BS EN/EN61000-3-2,-3, EAC TP TC 020 | |
| | EMC IMMUNITY | Compliance to BS EN/EN61000-4-2,3,4,5,6,8,11, BS EN/EN55035, BS EN/EN61000-6-2 (BS EN/EN50082-2), BS EN/EN61204-3, heavy industry level, EAC TP TC 020 | |
| OTHERS | MTBF | 647.1K hrs min. Telcordia SR-332 (Bellcore) ; 59.5K hrs min. MIL-HDBK-217F (25℃) | |
| | DIMENSION | 110*125.2*150mm (W*H*D) | |
| | PACKING | 2.47Kg ; 6pcs/15.8Kg/1.47CUFT | |

NOTE

1. All parameters NOT specially mentioned are measured at 400VAC input, rated load and 25℃ of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. Dual phase operation is allowed under certain derating to output load. Please refer to derating curves for details.
5. Installation clearances : 40mm on top, 20mm on the bottom, 5mm on the left and right side are recommended when loaded permanently with full power. In case the adjacent device is a heat source, 15mm clearance is recommended.
6. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.
7. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft).

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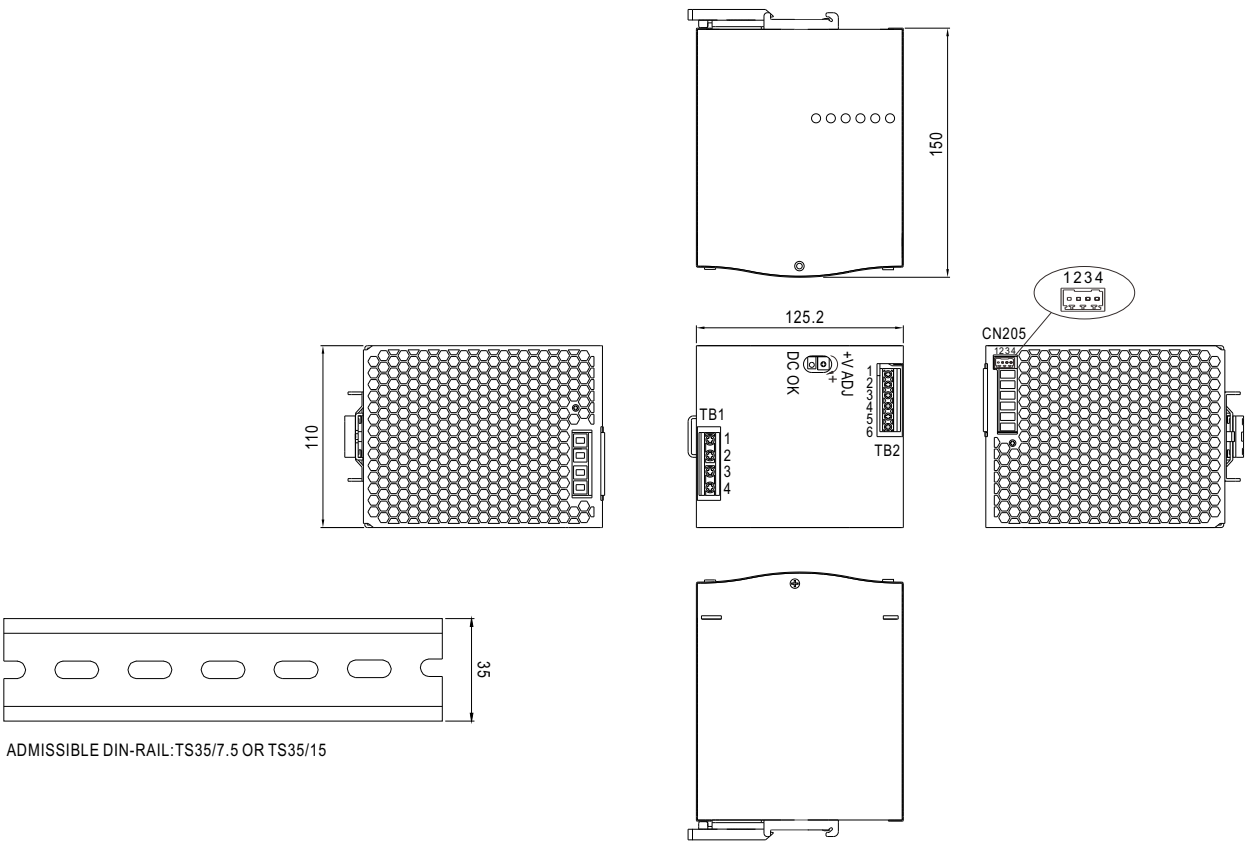


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## ■ Mechanical Specification

(Unit: mm , tolerance ±0.5mm)

Case No.214A




ADMISSIBLE DIN-RAIL:TS35/7.5 OR TS35/15

Terminal Pin No. Assignment (TB1)

| Pin No. | Assignment |
|---|---|
| 1 | FG ⏚ |
| 2 | AC/L3 |
| 3 | AC/L2 |
| 4 | AC/L1 |

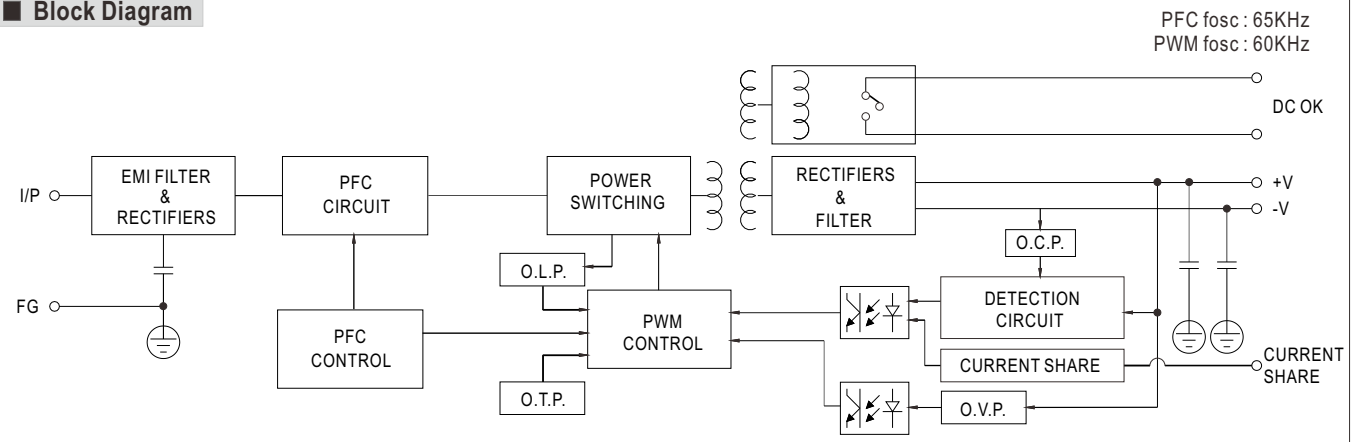
Terminal Pin No. Assignment (TB2)

| Pin No. | Assignment |
|---|---|
| 1,2,3 | DC OUTPUT +V |
| 4,5,6 | DC OUTPUT -V |

Control Pin (CN205) : DINKLE ECH250R-04P or equivalent

| Pin No. | Assignment | Mating Housing | Wire Diameter |
|---|---|---|---|
| 1 | P-(Current Share) | DINKLE ESC250V-04P or equivalent (Including in the single package) | 0.081~0.517mm² (28~20AWG) |
| 2 | P+(Current Share) | | |
| 3,4 | DC OK Relay Contact | | |

## ■ Block Diagram



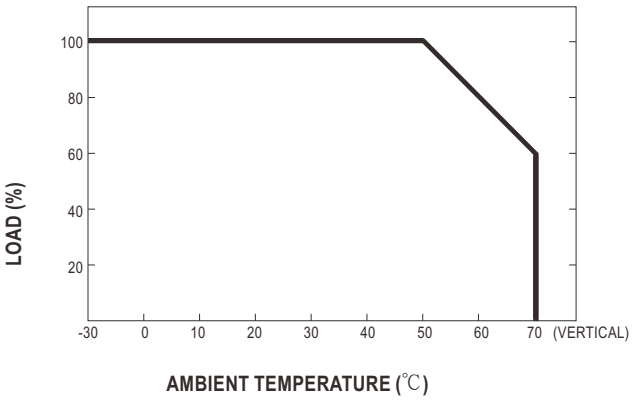

## ■ DC OK Relay Contact

| | |
|---|---|
| Contact Close | PSU turns on / DC OK. |
| Contact Open | PSU turns off / DC Fail. |
| Contact Ratings (max.) | 30V/1A resistive load. |

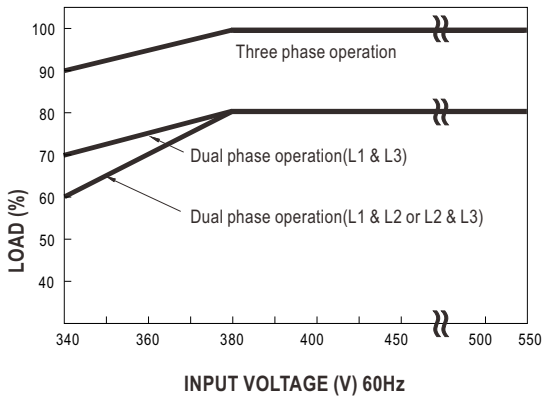


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## ■ Derating Curve

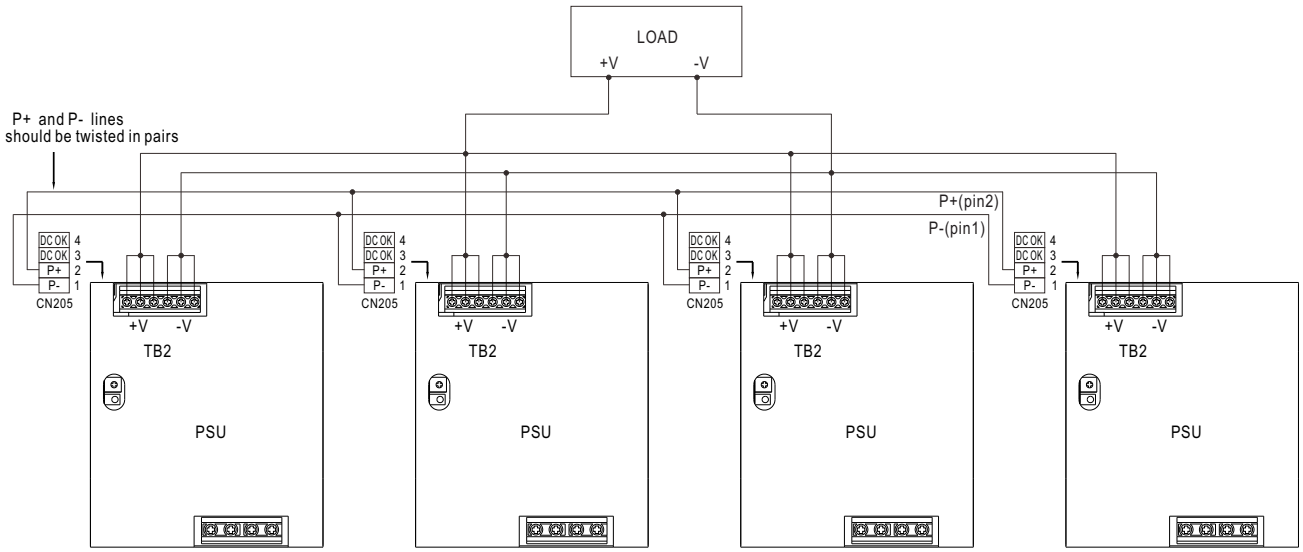



## ■ Output derating VS input voltage




## ■ Function Manual

1. Current sharing
   (1) Parallel operation is available by connecting the units shown as below (P+,P- are connected mutually in parallel).
   (2) Difference of output voltages among parallel units should be less than 0.2V.
   (3) The total output current must not exceed the value determined by the following equation (Output current at parallel operation)=(The rated current per unit) x (Number of unit) x 0.9.
   (4) In parallel operation 4 units is the maximum, please consult the manufacture for other applications.
   (5) The power supplies should be paralleled using short and large diameter wiring and then connected to the load.
   (6) When in parallel operation, the minimum output load should be greater than 5% of total output load.
   (Min. load >5% rated current per unit x number of unit)
   (7) In parallel connection, maybe only one unit (master) operate if the total output load is less than 5% of rated load condition.
   The other PSUs (slaves) may go into standby mode and their output LEDs & relays will not turn on.
   (8) Some minor noise may be heard at light load condition under parallel operation.
   This is a normal phenomenon and the performance of the PSU will not be influenced.






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