



# THE DATASHEET OF DRT-960-24



## 960W Three Phase Industrial DIN RAIL Power Supply

## DRT-960 series



### ■ Features :

- Three-Phase AC 340 ~ 550V wide range input
- High efficiency 91% and low dissipation
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Optional parallel function(1+1)
- Cooling by free air convection
- Can be installed on DIN rail TS-35/7.5 or 15
- UL 508(industrial control equipment)approved
- EN61000-6-2(EN50082-2) industrial immunity level
- 100% full load burn-in test
- 3 years warranty

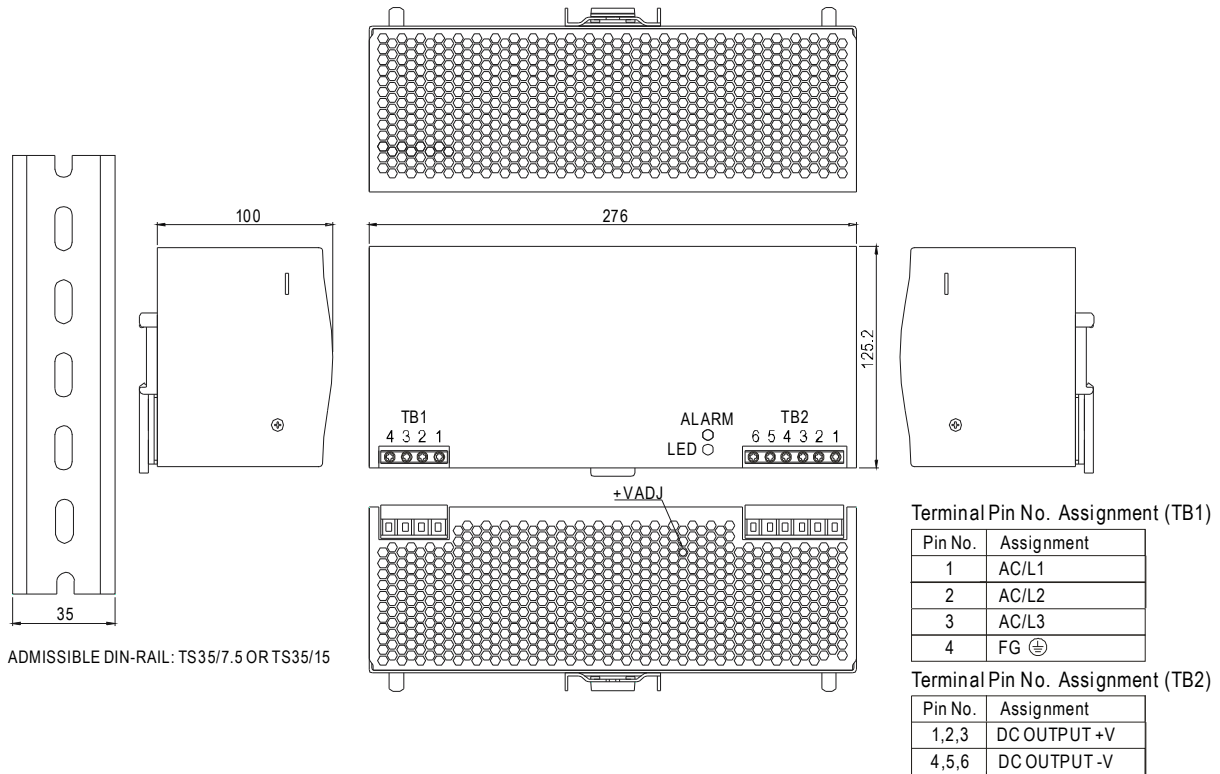


### SPECIFICATION

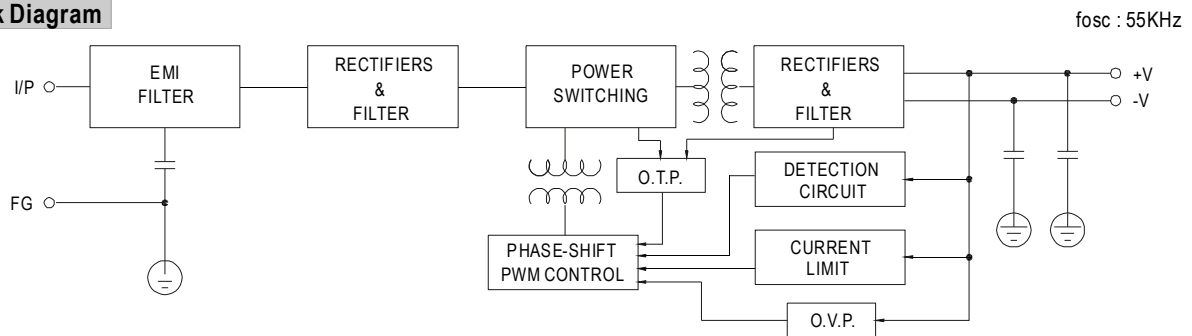
| MODEL                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | DRT-960-24                                                                                                                                                                                                |  | DRT-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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 80mVp-p                                                                                                                                                                                                   |  | 80mVp-p    |  |
|                          | VOLTAGE ADJ. RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 24 ~ 28V                                                                                                                                                                                                  |  | 48 ~ 55V   |  |
|                          | VOLTAGE TOLERANCE Note.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ±1.0%                                                                                                                                                                                                     |  | ±1.0%      |  |
|                          | LINE REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ±0.5%                                                                                                                                                                                                     |  | ±0.5%      |  |
|                          | LOAD REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ±0.5%                                                                                                                                                                                                     |  | ±0.5%      |  |
|                          | SETUP, RISE TIME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 200ms, 60ms/400VAC      200ms, 60ms/500VAC at full load                                                                                                                                                   |  |            |  |
|                          | HOLD UP TIME (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 14ms/400VAC      30ms/500VAC at full load                                                                                                                                                                 |  |            |  |
| INPUT                    | VOLTAGE RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Three-Phase 340 ~ 550 VAC (Dual phase operation possible in connecting L1,L3,FG Note.5)                                                                                                                   |  |            |  |
|                          | FREQUENCY RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 47 ~ 63Hz                                                                                                                                                                                                 |  |            |  |
|                          | EFFICIENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 91%                                                                                                                                                                                                       |  | 92%        |  |
|                          | AC CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2A/400VAC      1.6A/500VAC                                                                                                                                                                                |  |            |  |
|                          | INRUSH CURRENT (max.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | COLD START 50A                                                                                                                                                                                            |  |            |  |
|                          | LEAKAGE CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <3.5mA / 530VAC                                                                                                                                                                                           |  |            |  |
| PROTECTION               | OVERLOAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 105 ~ 125% rated output power<br>Protection type : Constant current limiting, unit will shut down o/p voltage after 3 sec. , re-power on to recover                                                       |  |            |  |
|                          | OVER VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 30 ~ 36V                                                                                                                                                                                                  |  | 59 ~ 66V   |  |
|                          | OVER TEMPERATURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 110℃±5℃ (TSW1) detect on heatsink of power transistor      85℃±5℃ (TSW2) detect on heatsink of power diode<br>Protection type : Shut down o/p voltage, recovers automatically after temperature goes down |  |            |  |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                           |  |            |  |
| ENVIRONMENT              | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -20 ~ +60℃ (Refer to "Derating Curve")                                                                                                                                                                    |  |            |  |
|                          | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 20 ~ 90% RH non-condensing                                                                                                                                                                                |  |            |  |
|                          | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -40 ~ +85℃, 10 ~ 95% RH                                                                                                                                                                                   |  |            |  |
|                          | 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<br>(Note 4) | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | UL508, UL60950-1, TUV EN60950-1 approved                                                                                                                                                                  |  |            |  |
|                          | WITHSTAND VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | I/P-O/P:3KVAC    I/P-FG:2KVAC    O/P-FG:0.5KVAC                                                                                                                                                           |  |            |  |
|                          | ISOLATION RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃ / 70% RH                                                                                                                                                 |  |            |  |
|                          | EMC EMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Compliance to EN55011 (CISPR11), EN55022 (CISPR22), EN61204-3 Class B, EN61000-3-2,-3                                                                                                                     |  |            |  |
|                          | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Compliance to EN61000-4-2,3,4,5,6,8,11, EN61204-3, EN61000-6-2 (EN50082-2), heavy industry level, criteria A                                                                                              |  |            |  |
| OTHERS                   | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 122.5K hrs min.      MIL-HDBK-217F (25℃)                                                                                                                                                                  |  |            |  |
|                          | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 276*125.2*100mm (W*H*D)                                                                                                                                                                                   |  |            |  |
|                          | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.3Kg; 4pcs/14.2Kg/1.14CUFT                                                                                                                                                                               |  |            |  |
| NOTE                     | 1. All parameters NOT specially mentioned are measured at 400VAC input, rated load and 25℃ of ambient temperature.<br>2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.<br>3. Tolerance : includes set up tolerance, line regulation and load regulation.<br>4. 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.<br>5. Dual phase operation(connecting L1,L3,FG)is allowed under certain derating to output load. Please refer to the derating curves for details. |                                                                                                                                                                                                           |  |            |  |

## Mechanical Specification

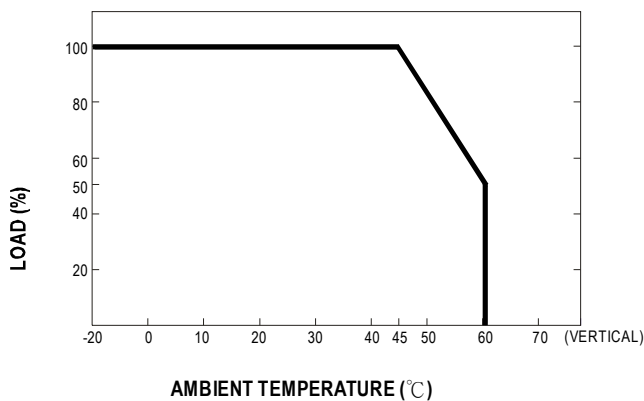
Case No.934 Unit:mm



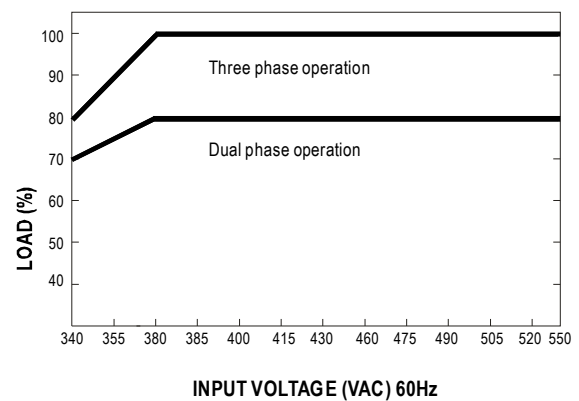
## Block Diagram



## Derating Curve

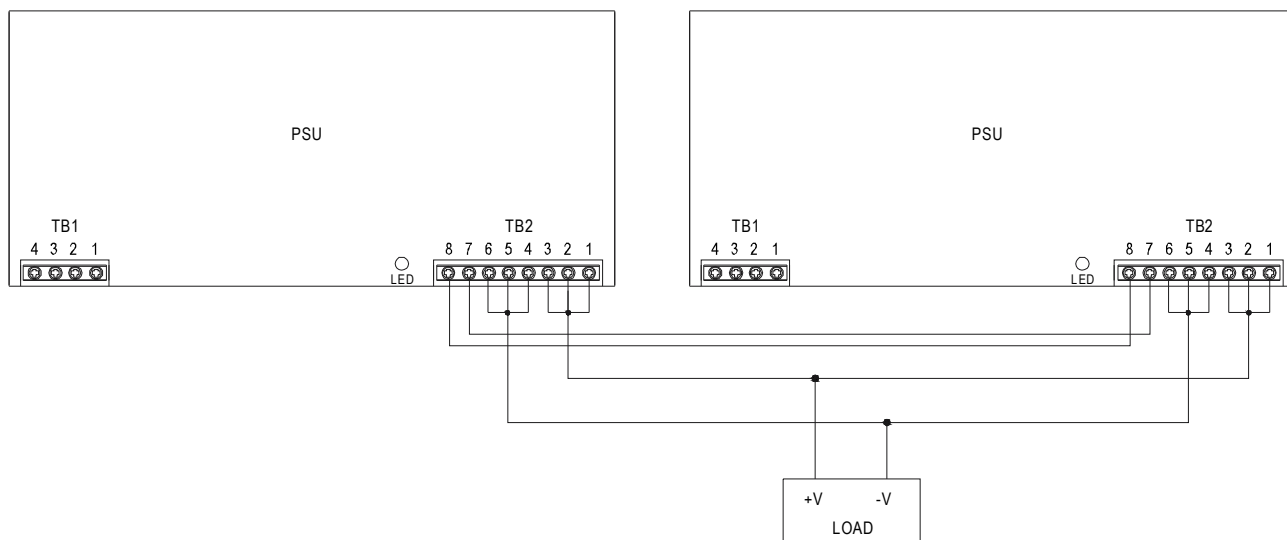


## Static Characteristics



### ■ Parallel Function (1+1)-Optional (Special order required)

When in parallel operation, the minimum output load should be greater than 3% of total output load.  
(Min. load >3% rated current per unit x number of unit)



TB1 Terminal Pin No. Assignment

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

TB2 Terminal Pin No. Assignment

| Pin No. | Assignment       |
|---------|------------------|
| 1,2,3   | DC OUTPUT +V     |
| 4,5,6   | DC OUTPUT -V     |
| 7       | GND              |
| 8       | P(Current Share) |

Note: Under parallel operation, if the load current is too small, only one PSU(master) would provide the power and hence the LED indicator of other PSUs may not light up.

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