

TOKO

電力轉換器

POWER TRANSDUCER & TRANSMITTER



SPECIFICATIONS

| TD TYPE | A | | V | | KW KVAR | KWH KVARH | PF | F | DC Isolated | Temp. | |
|-----------------------|---|---------------|---------------|---------------|-----------------------------|--------------|--------------------------------|--------------|----------------|------------------|--|
| | 1 \emptyset | 3 \emptyset | 1 \emptyset | 3 \emptyset | | | | | | | |
| Standard | DIN/IEC 688 , DIN/IEC 255-4 , ANSI C37.90a/1974 (IEEE 472) | | | | | | | | | | |
| Accuracy | $\pm 0.2\%$ (option: 0.1%) | | | | WH: 0.2% VARH: 0.25% | | $\pm 0.5\%$ $\pm 0.3^\circ$ | $\pm 0.05\%$ | $\pm 0.10\%$ | $\pm 0.25\%$ | |
| Temp. Coefficient | $\leq 100\text{ppm}/^\circ\text{C}$ at $25^\circ\text{C} \pm 10^\circ\text{C}$ (option: $\leq 60\text{ppm}$) | | | | | | | | | | |
| Temp. Range | Operation: $0\sim 50^\circ\text{C}$, Storage: $-20\sim 60^\circ\text{C}$ | | | | | | | | | | |
| Humidity Range | Up to 95% RH | | | | | | | | | | |
| Isolation | Input / Output / Power / Case | | | | | | | | | | |
| Dielectric Test | 2KV/1min (1.5KV/1min for DC and Temp. TD) between terminals , 2.8KV/1min between terminal and case | | | | | | | | | | |
| Surge Test | 5KV , 1.2 x 50 μs | | | | | | | | | | |
| Insulation Resistance | 100M Ω or more , DC 500V | | | | | | | | | | |
| Housing Material | ABS Resin (94V-0) | | | | | | | | | | |
| Mounting | Rail 35mm | | | | | | | | | | |
| Frequency Range | 45~65Hz | | | | 50 or 60Hz $\pm 3\text{Hz}$ | | | — | | | |
| Ripple | $< 0.5\%$ P-P max. | | | | | | | | | | |
| Response Time | $\leq 400\text{ms}$ or less to 99% output | | | | | | | | | $\leq 1\text{s}$ | |
| Zero Adjustment | $\pm 5\%$ minimum | | | | | | | | | | |
| Span Adjustment | $\pm 10\%$ minimum | | | | | | | | | | |
| Overload Capacity | Voltage: 1.25 x rated: continuous (max. 600V) , 2 x rated: 10s , 4 x rated: 5s | | | | | | | | | | |
| | Current: 3 x rated: continuous , 10 x rated: 10s , 50 x rated: 1s , 80 x rated: 0.5s | | | | | | | | | | |
| Burden | Power supply: $\leq 3\text{VA}$, each voltage circuit: $\leq 0.1\text{VA}$, each current circuit: $\leq 0.2\text{VA}$ | | | | | | | | | | |
| Sensitivity | $\leq 0.5\%$ of measuring range end value | | | | | | | | | | |
| Dimension (case type) | H | I | H | I | I | I | I | I | I or C | I or C | |

★ DC power source range: Rating $\pm 10\%$

■ ORDER INFORMATION

1. AC CURRENT & VOLTAGE TRANSDUCER

AD 3 - 2 1 1
 ① ② ③ ④ ⑤

① BASIS TYPE

| | |
|----|------------|
| AD | CURRENT TD |
| VD | VOLTAGE TD |

② PHASE

| | |
|----|---------------------|
| 1 | 1 ϕ , AVERAGE |
| 1T | 1 ϕ , TRUE RMS |
| 3 | 3 ϕ , AVERAGE |
| 3T | 3 ϕ , TRUE RMS |

③ INPUT RANGE

| CURRENT | | VOLTAGE | |
|---------|-------------------|---------|--------------------|
| 1 | AC 0 ~ 1A | 1 | AC 0 ~ 150V |
| 2 | AC 0 ~ 5A | 2 | AC 0 ~ 300V |
| Y | OPTION (max. 10A) | 3 | AC 0 ~ 600V |
| | | Y | OPTION (max. 600V) |

④ DC OUTPUT

| | | | | | |
|---|-------------------------|------------------|---|---------|------------------|
| 1 | 4 ~ 20mA | $\leq 500\Omega$ | A | 0 ~ 10V | $\geq 500\Omega$ |
| 2 | 0 ~ 20mA | $\leq 500\Omega$ | B | 0 ~ 5V | $\geq 250\Omega$ |
| 3 | 0 ~ 10mA | $\leq 1K\Omega$ | C | 1 ~ 5V | $\geq 250\Omega$ |
| 4 | 0 ~ 5mA | $\leq 2K\Omega$ | D | 0 ~ 1V | $\geq 50\Omega$ |
| 5 | 0 ~ 1mA | $\leq 10K\Omega$ | | | |
| Y | OPTION (max. 20mA, 10V) | | | | |

⑤ POWER SOURCE

| | |
|---|------------------------|
| 1 | AC 115~230V $\pm 15\%$ |
| A | DC 24V |
| B | DC 48V |
| C | DC 110V |
| Y | OPTION |

2. WATT & VAR TRANSDUCER

WD 33 - 2 2 1 1
 ① ② ③ ④ ⑤ ⑥

① BASIS TYPE

| | |
|-----|------------|
| WD | KW TD |
| RD | KVAR TD |
| WRD | KW+KVAR TD |

② SYSTEM

| | |
|----|-------------|
| 12 | 1 ϕ 2W |
| 13 | 1 ϕ 3W |
| 33 | 3 ϕ 3W |
| 34 | 3 ϕ 4W |

③ INPUT RANGE

| | |
|---|-------------------------|
| 1 | AC 120V, 5A |
| 2 | AC 240V, 5A |
| 3 | AC208/120V, 5A |
| 4 | AC416/240V, 5A |
| Y | OPTION (max. 600V, 10A) |

④ INPUT FREQUENCY

| | |
|---|----------------|
| 1 | 50Hz \pm 3Hz |
| 2 | 60Hz \pm 3Hz |

⑤ DC OUTPUT

| | | | | | |
|---|---------------------------------------|------------------|---|-----------|------------------|
| 1 | 4 ~ 20mA | $\leq 500\Omega$ | A | 0 ~ 10V | $\geq 500\Omega$ |
| 2 | 0 ~ 20mA | $\leq 500\Omega$ | B | 0 ~ 5V | $\geq 250\Omega$ |
| 3 | 0 ~ 10mA | $\leq 1K\Omega$ | C | 1 ~ 5V | $\geq 250\Omega$ |
| 4 | 0 ~ 1mA | $\leq 10K\Omega$ | D | 0 ~ 1V | $\geq 50\Omega$ |
| 5 | -10~0~10mA | $\leq 1K\Omega$ | E | -10~0~10V | $\geq 500\Omega$ |
| 6 | -1~0~1mA | $\leq 10K\Omega$ | F | -1~0~1V | $\geq 50\Omega$ |
| Y | OPTION (max. ± 20 mA, ± 10 V) | | | | |

⑥ POWER SOURCE

| | |
|---|------------------------|
| 1 | AC 115~230V $\pm 15\%$ |
| A | DC 24V |
| B | DC 48V |
| C | DC 110V |
| Y | OPTION |

3. WATT HOUR & VAR HOUR TRANSDUCER

HD 34 - 2 2 1 1 1 N 1
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① BASIS TYPE

| | |
|-----|---------------|
| HD | KWH TD |
| QD | KVARH TD |
| HWD | KWH+KW TD |
| QRD | KVARH+KVAR TD |

② SYSTEM

| | |
|----|-------------|
| 12 | 1 ϕ 2W |
| 13 | 1 ϕ 3W |
| 33 | 3 ϕ 3W |
| 34 | 3 ϕ 4W |

③ INPUT RANGE

| | |
|---|-------------------------|
| 1 | AC 120V, 5A |
| 2 | AC 240V, 5A |
| 3 | AC208/120V, 5A |
| 4 | AC416/240V, 5A |
| Y | OPTION (max. 600V, 10A) |

④ INPUT FREQUENCY

| | |
|---|----------------|
| 1 | 50Hz \pm 3Hz |
| 2 | 60Hz \pm 3Hz |

⑤ PULSE OUTPUT

| | |
|---|------------------------------|
| 1 | 1 Pulse / $\frac{Wh}{VARh}$ |
| 2 | 10 Pulse / $\frac{Wh}{VARh}$ |
| Y | OPTION |

⑥ PULSE OUTPUT MODE

| | |
|---|----------------|
| 1 | Open Collector |
| 2 | Reed Relay |

⑦ POWER SOURCE

| | |
|---|-----------------|
| 1 | AC 115~230V±15% |
| A | DC 24V |
| B | DC 48V |
| C | DC 110V |
| Y | OPTION |

⑧ TWO FREQUENCY OUTPUT

| | |
|---|-------------------|
| Y | Forward + Reverse |
| N | Forward only |

⑨ DC OUTPUT

| | | | | | |
|---|----------------------------|--------|---|-----------|--------|
| 1 | 4 ~ 20mA | ≤ 500Ω | A | 0 ~ 10V | ≥ 500Ω |
| 2 | 0 ~ 20mA | ≤ 500Ω | B | 0 ~ 5V | ≥ 250Ω |
| 3 | 0 ~ 10mA | ≤ 1KΩ | C | 1 ~ 5V | ≥ 250Ω |
| 4 | 0 ~ 1mA | ≤ 10KΩ | D | 0 ~ 1V | ≥ 50Ω |
| 5 | -10~0~10mA | ≤ 1KΩ | E | -10~0~10V | ≥ 500Ω |
| 6 | -1~0~1mA | ≤ 10KΩ | F | -1~0~1V | ≥ 50Ω |
| Y | OPTION (max. ±20mA , ±10V) | | | | |

4. POWER FACTOR TRANSDUCER

PD 33 - 2 1 1 1
 ① ② ③ ④ ⑤

① SYSTEM

| | |
|----|------|
| 12 | 1ø2W |
| 33 | 3ø3W |
| 34 | 3ø4W |

② INPUT RANGE

| | |
|---|--------------------------|
| 1 | AC 120V , 5A |
| 2 | AC 240V , 5A |
| 3 | AC208/120V , 5A |
| 4 | AC416/240V , 5A |
| Y | OPTION (max. 600V , 10A) |

③ INPUT FREQUENCY

| | |
|---|------------|
| 1 | 50Hz ± 3Hz |
| 2 | 60Hz ± 3Hz |

④ DC OUTPUT

| | | | | | |
|---|----------------------------|--------|---|-----------|--------|
| 1 | 4~12~20mA | ≤ 500Ω | A | 0~5~10V | ≥ 500Ω |
| 2 | -10~0~10mA | ≤ 1KΩ | B | -10~0~10V | ≥ 500Ω |
| 3 | -1~0~1mA | ≤ 10KΩ | C | -5~0~5V | ≥ 250Ω |
| | | | D | 1~3~5V | ≥ 250Ω |
| Y | OPTION (max. ±20mA , ±10V) | | | | |

⑤ POWER SOURCE

| | |
|---|-----------------|
| 1 | AC 115~230V±15% |
| A | DC 24V |
| B | DC 48V |
| C | DC 110V |
| Y | OPTION |

5. FREQUENCY TRANSDUCER

F1D 2 - A 1 1 N
 ① ② ③ ④ ⑤

① INPUT RANGE

| | | | |
|---|---------|---|---------|
| 1 | 45~55Hz | 4 | 0~100Hz |
| 2 | 55~65Hz | 5 | 0~1KHz |
| 3 | 45~65Hz | 6 | 0~10KHz |
| | | 7 | OPTION |

② INPUT VOLTAGE

| | |
|---|--------------|
| A | AC 80 ~ 600V |
| C | OPTION |

③ DC OUTPUT

| | | | | | |
|---|--------------------------|--------|---|---------|--------|
| 1 | 4 ~ 20mA | ≤ 500Ω | A | 0 ~ 10V | ≥ 500Ω |
| 2 | 0 ~ 20mA | ≤ 500Ω | B | 0 ~ 5V | ≥ 250Ω |
| 3 | 0 ~ 10mA | ≤ 1KΩ | C | 1 ~ 5V | ≥ 250Ω |
| 4 | 0 ~ 1mA | ≤ 10KΩ | D | 0 ~ 1V | ≥ 50Ω |
| Y | OPTION (max. 20mA , 10V) | | | | |

④ POWER SOURCE

| | | | |
|---|-----------------|---|---------|
| 1 | AC 115~230V±15% | C | DC 110V |
| A | DC 24V | Y | OPTION |
| B | DC 48V | | |

⑤ SENSOR AUX. POWER

| | |
|---|----|
| N | No |
|---|----|

6. DC ISOLATED SIGNAL TRANSDUCER

D2D - 2 1 1 1
 ① ② ③ ④ ⑤

① BASIS TYPE

| | |
|-----|-----------------------|
| D1D | 1 OUTPUT |
| D2D | 2 OUTPUT |
| DPD | 1 OUTPUT PLUG-IN TYPE |

② DC INPUT

| | | | |
|---|-----------------------|---|---------------|
| 1 | 4 ~ 20mA | A | 0 ~ 10V |
| 2 | 0 ~ 20mA | B | 0 ~ 5V |
| 3 | 0 ~ 10mA | C | 1 ~ 5V |
| 4 | 0 ~ 1mA | D | 0 ~ 1V |
| 5 | -10 ~ 0 ~ 10mA | E | -10 ~ 0 ~ 10V |
| Y | OPTION (max. DC 600V) | | |

③・④ DC OUTPUT

| | | | | | |
|---|-------------------------|--------|---|---------------|--------|
| 1 | 4 ~ 20mA | ≤ 500Ω | A | 0 ~ 10V | ≥ 500Ω |
| 2 | 0 ~ 20mA | ≤ 500Ω | B | 0 ~ 5V | ≥ 250Ω |
| 3 | 0 ~ 10mA | ≤ 1KΩ | C | 1 ~ 5V | ≥ 250Ω |
| 4 | 0 ~ 1mA | ≤ 10KΩ | D | 0 ~ 50mV | ≥ 2.5Ω |
| 5 | -10 ~ 0 ~ 10mA | ≤ 1KΩ | E | -10 ~ 0 ~ 10V | ≥ 500Ω |
| Y | OPTION (max. 20mA, 10V) | | | | |

⑤ POWER SOURCE

| | |
|---|------------------------------------|
| 1 | AC 115~230V±15%* (D1D、D2D only) |
| A | DC 24V |
| B | DC 48V |
| C | DC 110V |
| Y | OPTION |

* DPD 的 AC115V 或 AC230V 需分開指定

7. TEMPERATURE TRANSDUCER

T1D - 2 1 2 8
 ① ② ③ ④ ⑤

① BASIS TYPE

| | |
|-----|--------------|
| T1D | CASE TYPE |
| TPD | PLUG-IN TYPE |

② INPUT RTD OR T/C TYPE

| | |
|---|---------------------|
| 1 | PT 100Ω (JIS) |
| 2 | PT 100Ω (DIN) |
| J | J T/C -200 ~ 760°C |
| K | K T/C -130 ~ 1370°C |
| T | T T/C -200 ~ 400°C |
| E | E T/C -200 ~ 1000°C |
| S | S T/C 0 ~ 1760°C |
| R | R T/C 0 ~ 1760°C |

③ INPUT TEMP. RANGE

| | |
|---|--------------------------------------|
| 1 | -50 ~ +50°C |
| 2 | -200 ~ +200°C |
| 3 | 0 ~ 50°C |
| 4 | 0 ~ 100°C |
| 5 | 0 ~ 150°C |
| 6 | 0 ~ 200°C |
| 7 | 0 ~ 400°C |
| 8 | 0 ~ 1000°C (T/C type only) |
| 9 | OPTION (-200~800°C max. for PT type) |

④ DC OUTPUT

| | | | | | |
|---|-------------------------|--------|---|---------------|--------|
| 1 | 4 ~ 20mA | ≤ 500Ω | A | 0 ~ 10V | ≥ 500Ω |
| 2 | 0 ~ 20mA | ≤ 500Ω | B | 0 ~ 5V | ≥ 250Ω |
| 3 | 0 ~ 10mA | ≤ 1KΩ | C | 1 ~ 5V | ≥ 250Ω |
| 4 | 0 ~ 1mA | ≤ 10KΩ | D | 0 ~ 50mV | ≥ 2.5Ω |
| 5 | -10 ~ 0 ~ 10mA | ≤ 1KΩ | E | -10 ~ 0 ~ 10V | ≥ 500Ω |
| Y | OPTION (max. 20mA, 10V) | | | | |

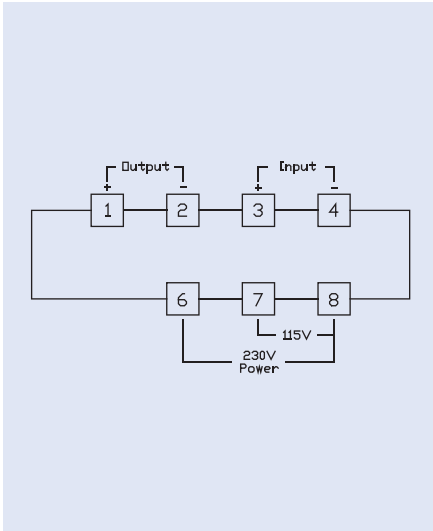
⑤ POWER SOURCE

| | |
|---|-----------------------------|
| 1 | AC 115~230V±15%* (T1D only) |
| A | DC 24V |
| B | DC 48V |
| C | DC 110V |
| Y | OPTION |

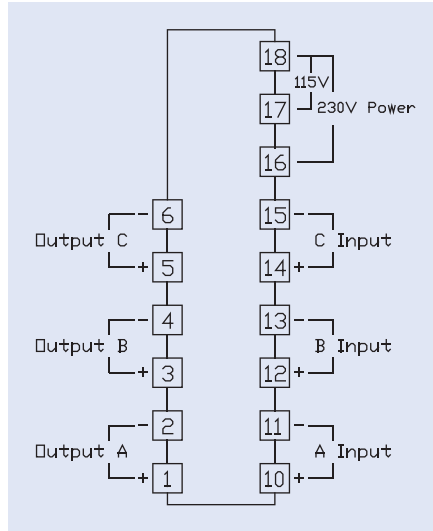
* TPD 的 AC115V 或 AC230V 需分開指定

CONNECTION DIAGRAMS

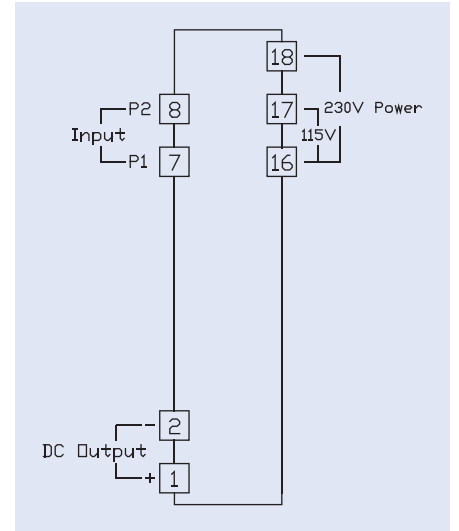
1. 1 ϕ A, V



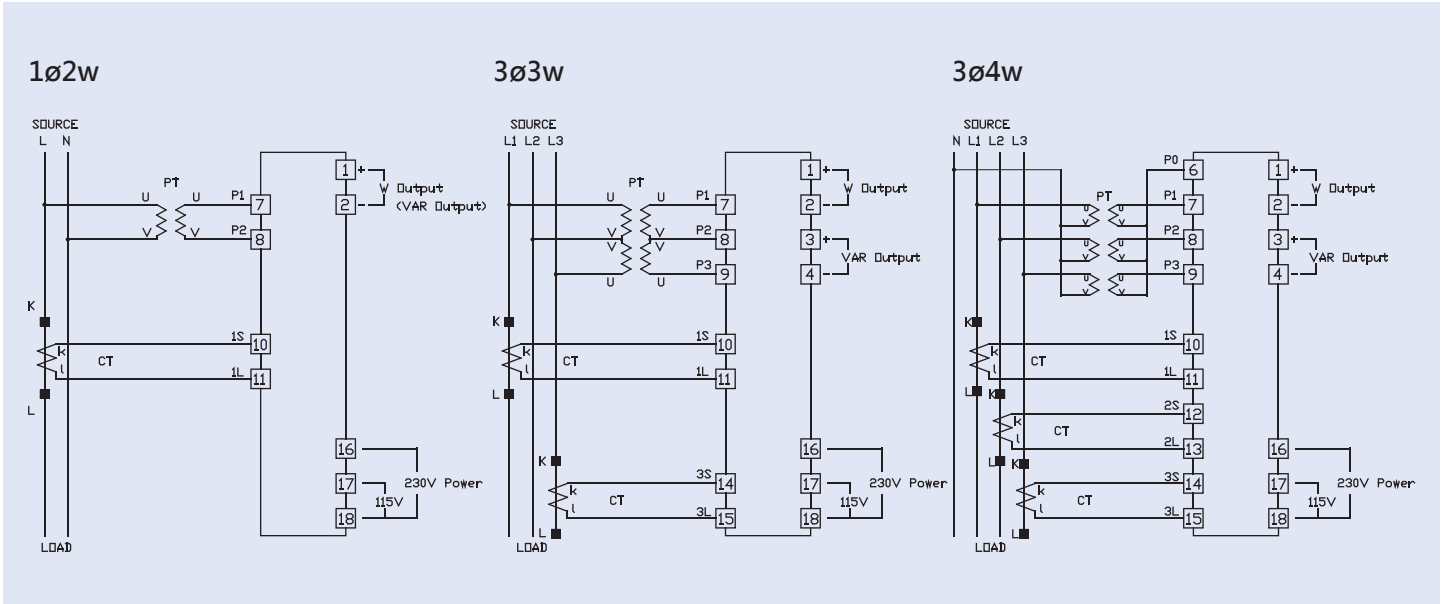
2. 3 ϕ A, V



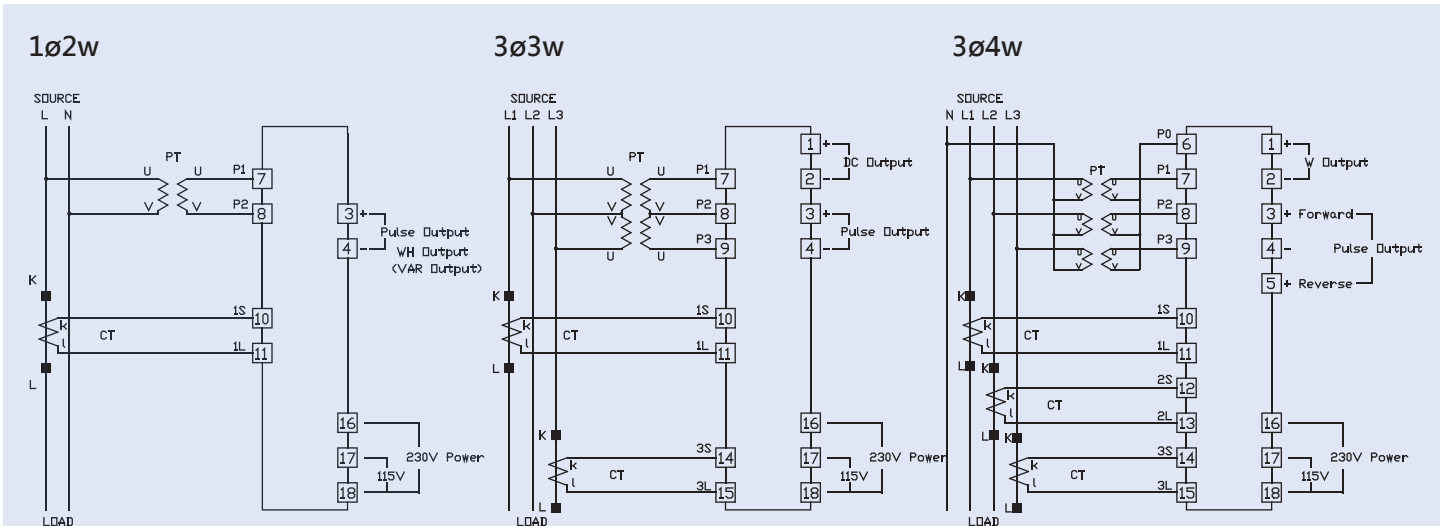
3. F



4. KW, KVAR

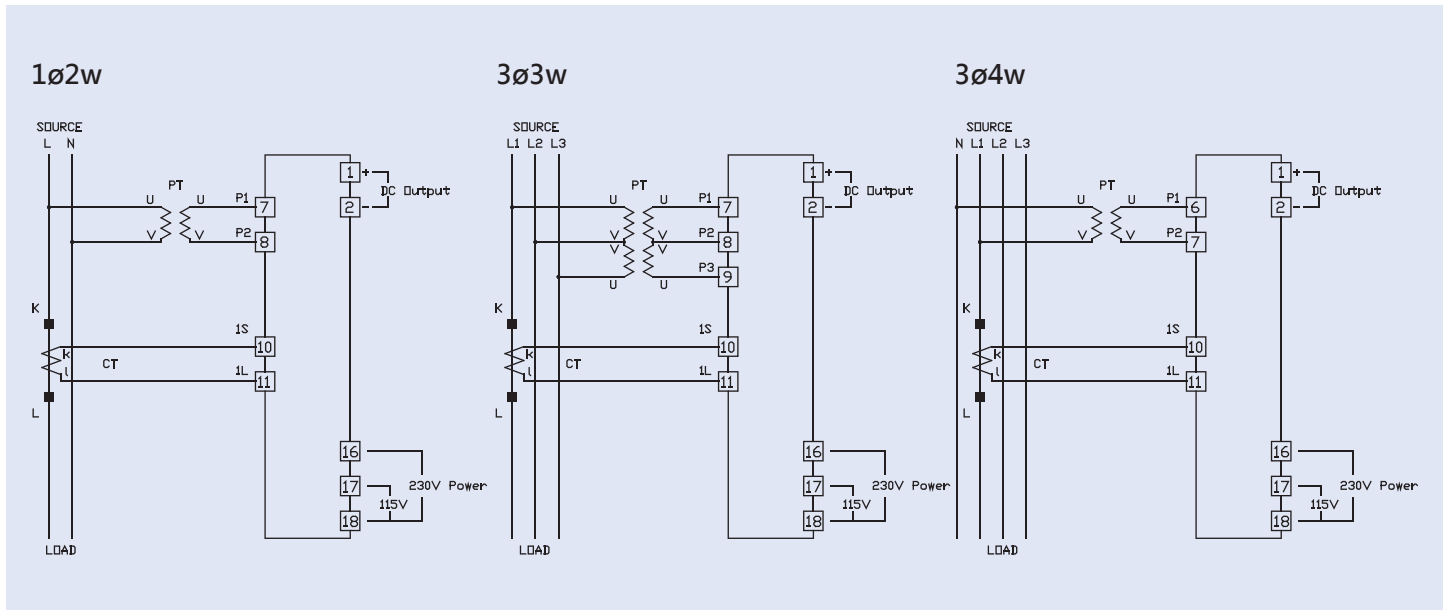


5. KWH, KVARH, KWH/KW, KVARH/KVAR

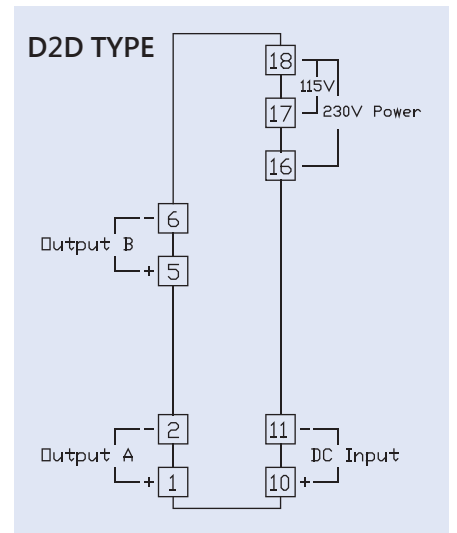
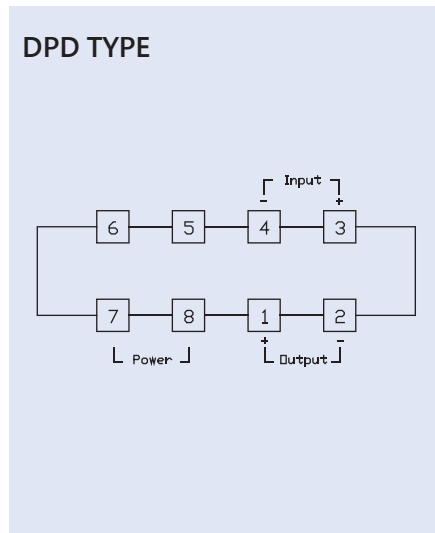
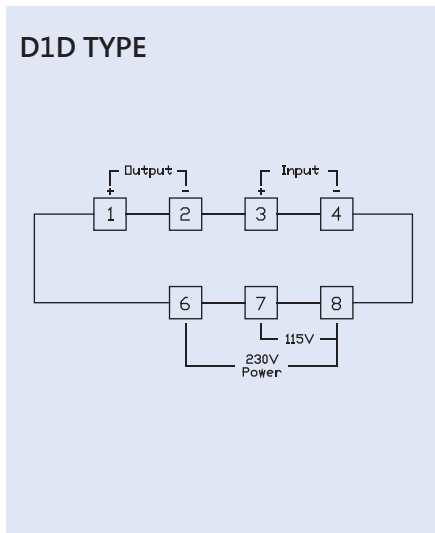


*Forward and reverse output for 1 ϕ 2w & 3 ϕ 3w please contact for more information.

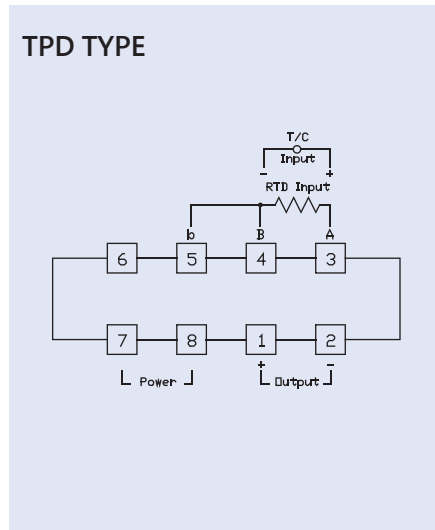
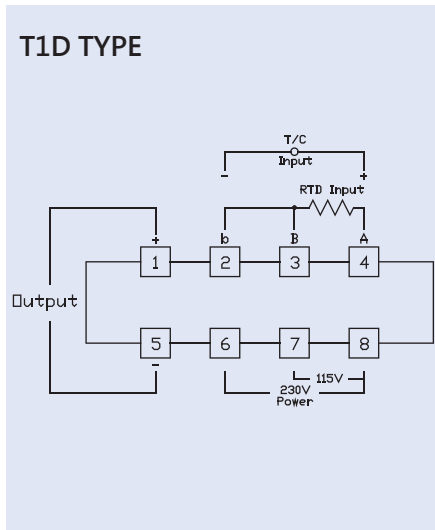
6. PF



7. DC SIGNAL

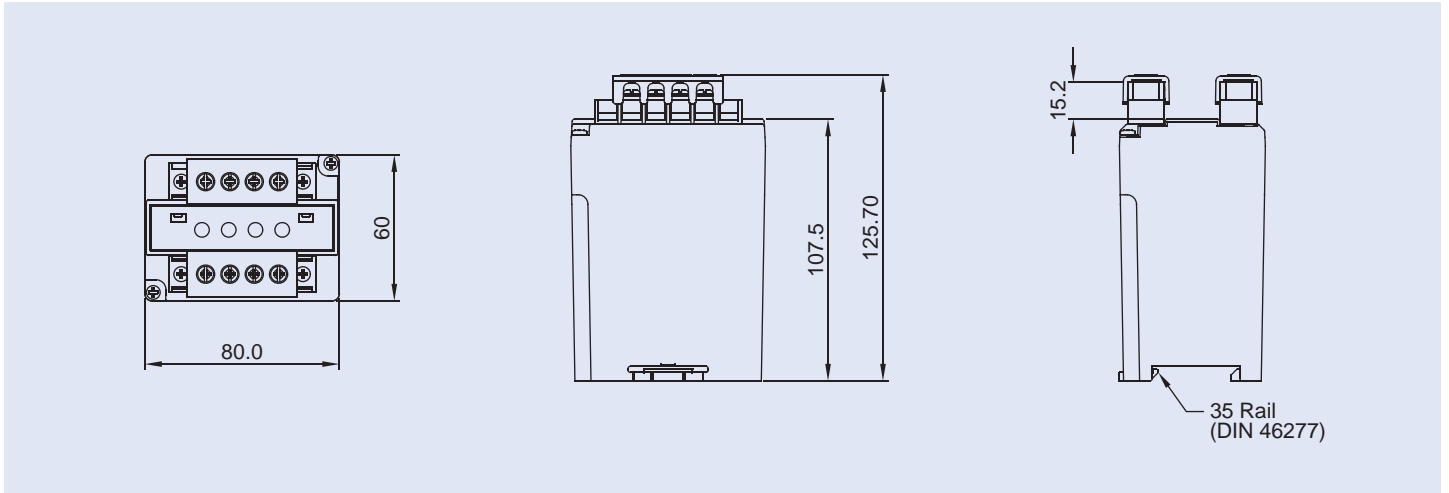


8. TEMP.

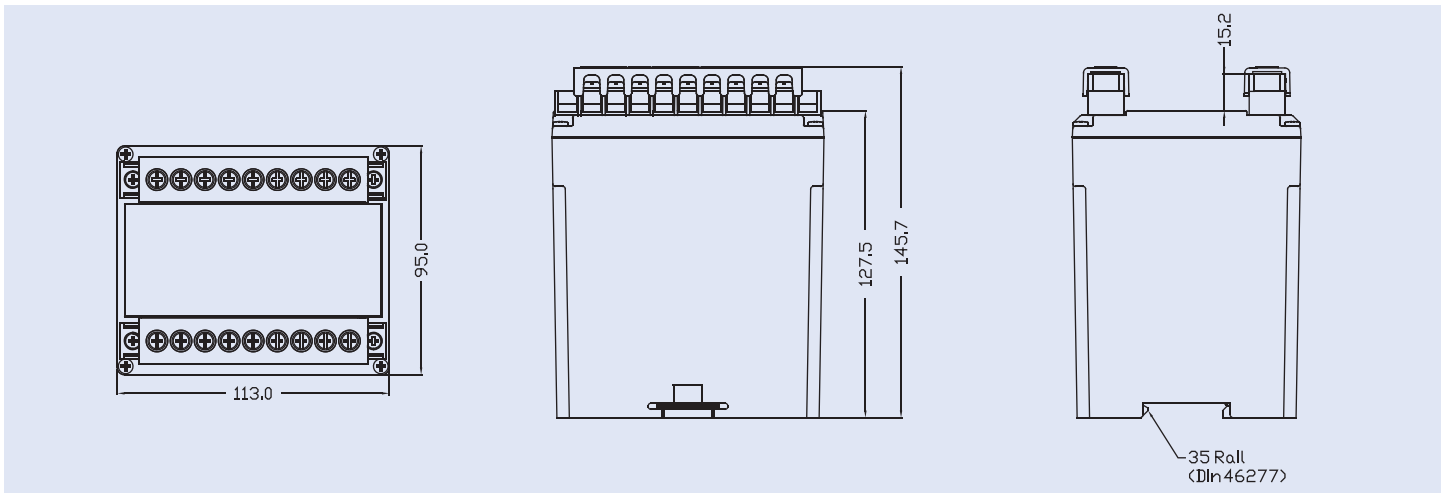


■ DIMENSIONS (mm)

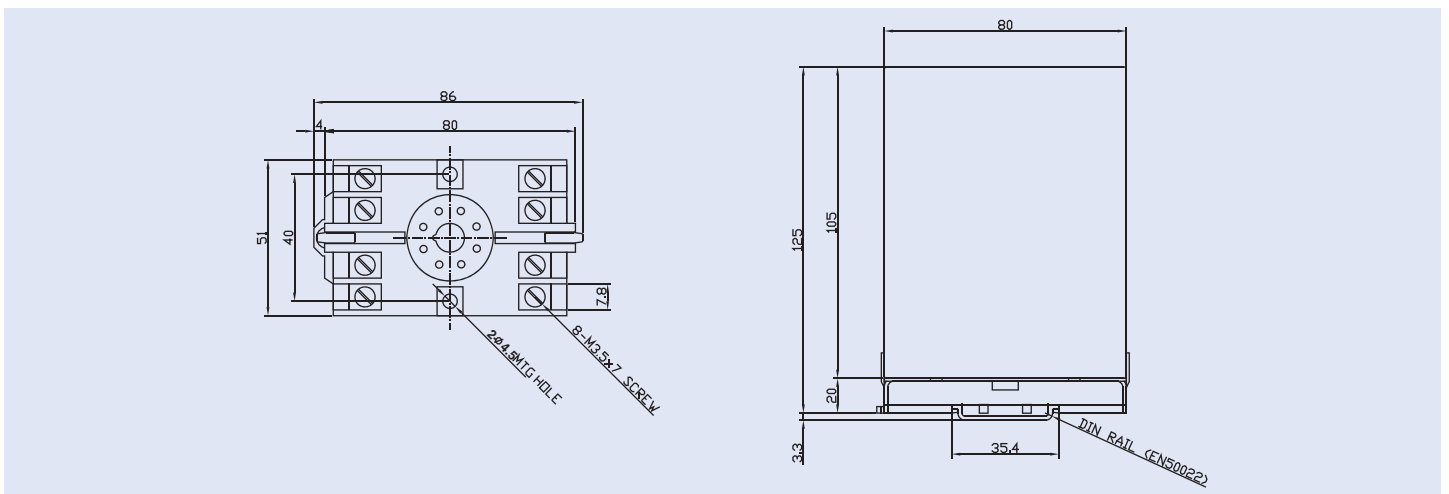
1. 1 ϕ A, V (CASE H)



2. 3 ϕ A, V, KW, KVAR, F, PF, KWH, KVARH (CASE I)



3. PLUG-IN TYPE DC, TEMP. (CASE C)



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