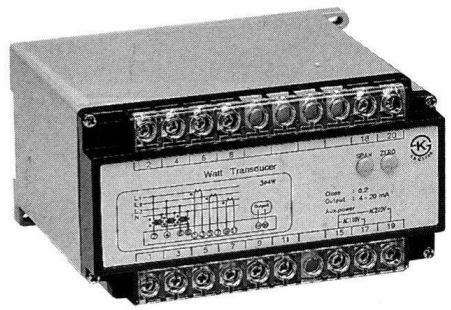
WATT TRANSDUCER



- High accuracy 0.2%
- Excellent long term stability.
- Real power-able to measure distorted waveform
- High magnetic field immunity.
- Meets IEEE SWC test.
- Outstanding overload and temperature performance.
- Stability : Maximum 0.01%. ℃

Description

DEESYS Watt transducer are designed to accept AC voltage or current and provide output(VI cosØ) with high accuracy and quick response.
Internal circuit are composed entirely of high quality components and power calibration equipment for measuring exact power energy.

Ordering procedure

DWT- □□□□□

- class : 0.2
- DEESYS Watt T/D
- SOURCE
  1. 1Ø2W, 2. 1Ø3W
  3. 3Ø3W, 4. 3Ø4W
- INPUT(I)
  1. 0~5A
  2. 0~1A
  3. Option
- INPUT(V)
  1. 0~110V or 190/√
  2. 0~220V or 380√
  3. Option
- OUTPUT
  1. DC 4~20mA
  2. DC 1~5V
  3. DC 4~12~20mA (±WATT)
  4. Option
- HZ
  1.60HZ
  2.50HZ

Standard product

Model	Output	Source
DWT-11111	DC 4~20mA	1Ø2W
DWT-21111	DC 4~20mA	1Ø3W
DWT-31111	DC 4~20mA	3Ø3W
DWT-41111	DC 4~20mA	3Ø4W
DWT-11211	DC 4~20mA	1Ø2W
DWT-21211	DC 4~20mA	1Ø3W
DWT-31211	DC 4~20mA	3Ø3W
DWT-41211	DC 4~20mA	3Ø4W

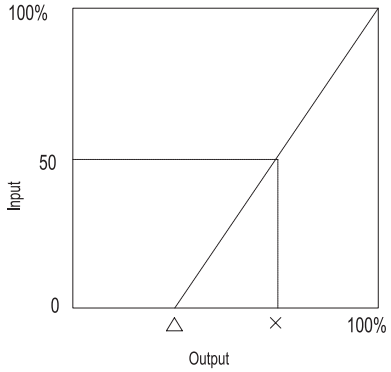
Order made is avaliable except for standard products.

Output/Load resistance

Output	Load Compliance Ω
DC 4~20mA	≦ 500
1~5V	≦ 1K

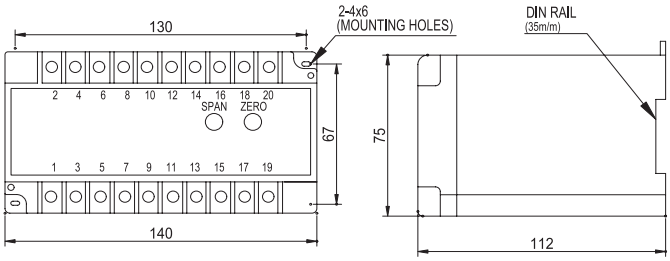
Installation and operation

Output Linearity



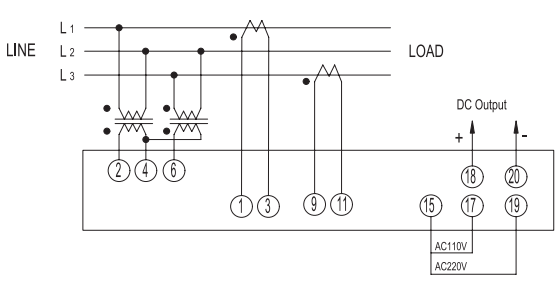
x=(100-△)x50%+△%
〈△ to rated〉

Mounting and dimension



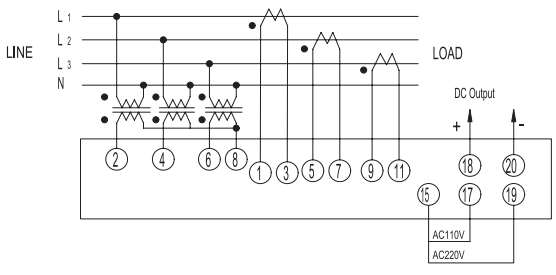
Connection diagram

DWT-3ø3W



1ø3W
3ø3W

DWT-3ø4W



3ø4W

WATT TRANSDUCER

Theory of operation

1. Watt and Var of conversional equation

Optional output P△, which in modulated according to the conversion method of watt and var transducer, are proportional to input current I△ and input voltage V△.

P△=K · V△ · I△[K:proportional constant] [1]

For the satisfaction above [1] equation. Power(P) input voltage(V) input current(I) should be set up as an integral equation including time function P(t), K, V(t), I(t)

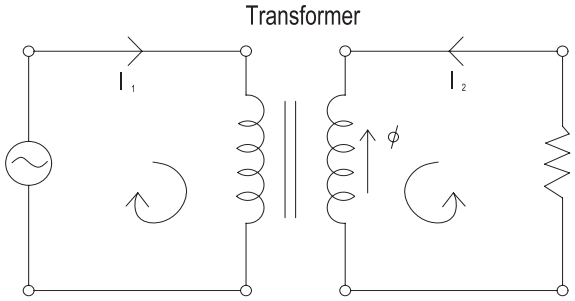
$$Pw = \frac{1}{T}\int_{o}^{T} (t)I(t)dt$$

$$Pw = VI\cos\varphi \ [watt]$$

$$Pr = VI\sin\varphi \ [var]$$

2. Linearity and phase angle of input transformer

Transducer's output linearity is depend on the transformer's primary and secondary turn ratio and phase stability. Especially under the low load transducer should be designed to maintain the linearity within 5%~10% range, which influence transducer output complience error.



Winding Ratio $a = I_1 / I_2$

$I_1 = 5\% \sim 100\%$

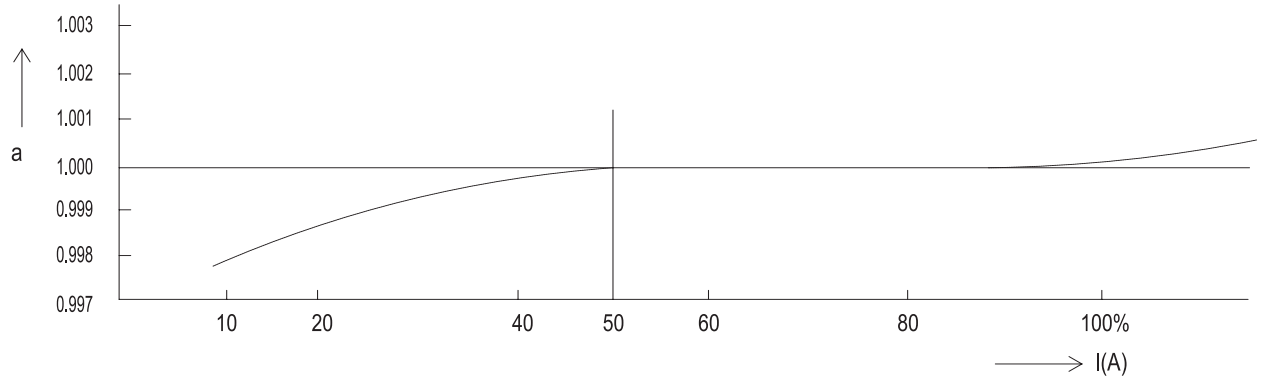
$I_1k = akI_2k$

$ak = a(1 \pm 0.025\%)$

$I_1k = a_1kI_2k$

$\varnothing \leqq I \pm 10$minutes I

Ratio lineary of input current transformer $a = \frac{I_1}{I_2}$, a=1



Theory of operation

2. Calibrating Watt/Var equation

$$\text{Cailbrating watt} = \frac{\text{Max scale value}}{\text{P.T ratio x CT ratio}}$$

Ex1) 3P 3W Network

full scale of watt : 600kW

P.T ratio : 3300/110V

C.T ratio : 100/5A

$$\text{Cailbrating watt} = \frac{600\text{kW}}{(3300/110) \times 100/5} = 1.0\text{kW}$$

Ex3) 3P 4W Network

full scale of watt : 2000kW

$$\text{P.T ratio} : \frac{22900\text{V}}{\sqrt{3}} \Big/ \frac{190\text{V}}{\sqrt{3}}$$

C.T ratio : 50/5A

$$\text{Cailbrating watt} = \frac{2000\,\text{kW}}{\left(\frac{22900\text{V}}{\sqrt{3}} \Big/ \frac{190\text{V}}{\sqrt{3}}\right)} \times (50/5\text{A}) = 1.666\text{kW}$$

Conversion Table

Net work	1P2W	1P3W	3P3W								3P4W				
P.R, ratio(V)	110	110	220	380 /110	440 /110	3300 /110	6600 /110	22000 /110	22900 /110	154kW /110	$208\sqrt{3}$	$380\sqrt{3}$ /$190\sqrt{3}$	$380/\sqrt{3}$	$11400\sqrt{3}$ /$190\sqrt{3}$	$22900\sqrt{3}$ /$190\sqrt{3}$
C.T ratio \ Calibrating watts	0.6kW	1.0kW	2.0kW	1.158kW	1.0kW	1.0kW	1.0kW	1.0kW	0.961kW	1.0kW	2.0kW	2.0kW	2.0kW	1.666kW	1.666kW
5/5	0.6	1	2	4	4	30	60	200	200	1400	2	4	4	100	200
10/5	1.2	2	4	8	8	60	120	400	400	2800	4	8	8	200	400
15/5	1.8	3	6	12	12	90	180	600	600	4200	6	12	12	300	600
20/5	2.4	4	8	16	16	120	240	800	800	5600	8	16	16	400	800
25/5	3.0	5	10	20	20	150	300	1000	1000	7000	10	20	20	500	1000
30/5	3.6	6	12	24	24	180	360	1200	1200	8400	12	24	24	600	1200
40/5	4.8	8	16	32	32	240	480	1600	1600	11.2MW	16	32	32	800	1600
50/5	6.0	10	20	40	40	300	600	2000	2000	14.0	20	40	40	1000	2000
60/5	7.2	12	24	48	48	360	720	2400	2400	16.8	24	48	48	1200	2400
75/5	9.0	15	30	60	60	450	900	3000	3000	21.0	30	60	60	1500	3000
80/5	9.6	16	32	64	64	480	960	3200	3200	22.4	32	64	64	1600	3200
100/5	12.0	20	40	80	80	600	1200	4000	4000	28.0	40	80	80	2000	4000
120/5	14.4	24	48	96	96	720	1440	4800	4800	33.6	48	95	95	2400	4800
150/5	18.0	30	60	120	120	900	1800	6000	6000	42.0	60	120	120	3000	6000
200/5	24.0	40	80	160	160	1200	2400	8000	8000	56.0	80	160	160	4000	8000
250/5	30.0	50	100	200	200	1500	3000	10MW	10MW	70.0	100	200	200	5000	10MW
300/5	36.0	60	120	240	240	1800	3600	12	12	84.0	120	240	240	6000	12
400/5	48.0	80	160	320	320	2400	4800	16	16	112.0	160	320	320	8000	16
500/5	60.0	100	200	400	400	3000	6000	20	20	140	200	400	400	10MW	20
600/5	72.0	120	240	480	480	3600	7200	24	24	168	240	480	480	12	24
750/5	90.0	150	300	600	600	4500	9000	30	30	210	300	600	600	15	30
800/5	96.0	160	320	640	640	4800	9600	32	32	224	320	640	640	16	32
1000/5	120.0	200	400	800	800	6000	12MW	40	40	280	400	800	800	20	40
1200/5	144.0	240	480	960	960	7200	14.4	48	48	336	480	960	960	24	48
1500/5	180.0	300	600	1200	1200	9000	18.0	60	60	420	600	1200	1200	30	60
2000/5	240.0	400	800	1600	1600	12MW	24.0	80	80	560	800	1600	1600	40	80
2500/5	300.0	500	1000	2000	2000	15	30.0	100	100	700	1000	1000	1000	50	100