

**§ BOX TRANSDUCER §**  
TYPE CODE DESIGNATION

■ **TYPE CODE DESIGNATION**

● SMALL SIZED AC TRANSDUCER

TT2-90A series    ① TT2 ② A - ③

① Kind of input

Mark	Kind of input
A or AE	AC current
V or VE	AC voltage
W	AC power
WV	Reactive power
S	V-V phase angle
P	V-I phase angle
SP	Power factor
F	Frequency

② Kind of outer case and its dimensions

Mark	Material of outer case	Dimensions (mm)
		Length × Width × Height
91	Fire-retardant ABS resin	120×40×130
92	Fire-retardant ABS resin	120×56×130

③ Kind of circuit

Mark	Kind of circuit
12	Single phase 2 wire
13	Single phase 3 wire
33	3 phase 3 wire
34	3 phase 4 wire

● AC TRANSDUCER

TT2-80A series    ① TT2 ② A ③ - ④

① Kind of input

Mark	Kind of input
AE	AC current
VE	AC voltage
W	AC power
MDA	Maximum demand
MDV	Maximum indication voltage

<b>Dielectric strength voltage</b> AC2,000V (50/60Hz) for 1 min. between input and output
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③ For the use of cycle control

Mark	Kind
No mark	General circuit
C	Cycle control

② Kind of outer case and its dimensions

Mark	Material of outer case	Dimensions (mm)
		Length × Width × Height
82	Fire-retardant ABS resin	120× 56×130
83	Fire-retardant ABS resin	120×110×130

④ Kind of circuit

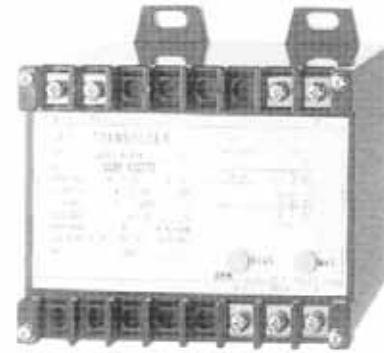
Mark	Kind of circuit
12	Single phase 2 wire
13	Single phase 3 wire
33	3 phase 3 wire
34	3 phase 4 wire

# § BOX TRANSDUCER § AC SPECIAL TRANSDUCER

# MAXIMUM DEMAND TRANSDUCER

## Standard specifications

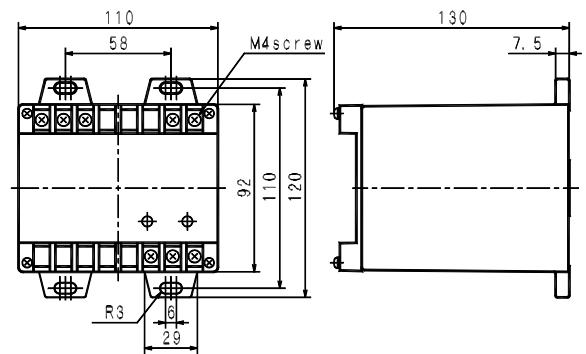
Item	Specification
Type	MDATT2-83A
Standard	In conformity with JIS C1111-1989
Tolerance	± 1%
Input	1A, 5A (product range: 50-300A)
Output (load resistance)	5V 10V 1-5V 1mA 4-20mA ( 1k ) ( 2k ) ( 1k ) ( 10k ) ( 500 )
Auxiliary supply	AC100/110V ± 15% (50/60Hz) 3VA AC 200/220V ± 15% (50/60Hz) 3VA DC 100/110V 6W
Period	Time it takes to reach 95% (±2%) of final steady value 1 min, 3 min, 5 min,
Warm-up time	Times equals period after the power was turned on.
Output ripple	1% P-P against output span
Influence of temperature	23 ± 20 ± 1%
Over current	Input 40 times 1 sec. 1.2 times continuity Auxiliary supply 1.5 times 10 sec. 1.2 times continuity
Overvoltage	
Insulation resistance	Between input terminal/output terminal/auxiliary supply/outer case (earth) 50M at DC500V
Withstand voltage	Between input terminal/output terminal/auxiliary supply/outer case (earth): AC2, 000V (50/60Hz) 1 min.
Impulse withstand voltage	Between electric circuit and outer case (earth) 5kV 1.2/50µs positive/negative polarity 3 times each
Appearance color	Black (munsell N1.5)
Operating temperature/humidity range	-10 + 55 , 30-85%RH
Storage temperature range	-40 + 70
Weight	Approx. 1.2kg



**MDATT2-83A**

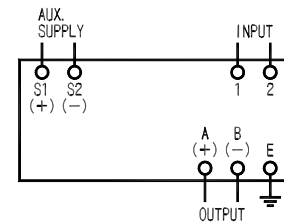
(120 × 110 × 130mm/1.2kg)

### Dimensions (mm)

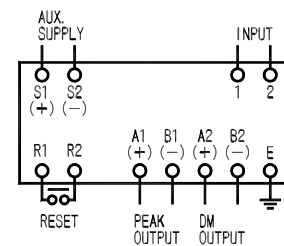


### Connection diagram

- Demand output only



- W/ peak hold (option)



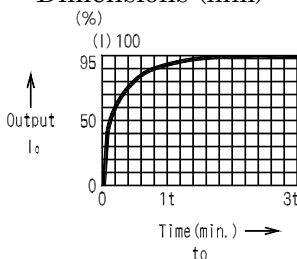
### Option

With peak-hold output

Item	Specifications
Output (load resistance)	5V 10V 1-5V 1mA 4-20mA ( 1k ) ( 2k ) ( 1k ) ( 10k ) ( 500 )
Power consumption (VA)	5VA
Reset method	External switch
Reset time	20ms

Non-insulation between demand output and peak output terminals. (Minus common)  
Make sure to reset the device before use each time the power is turned on.

### Dimensions (mm)



When applied continuously a constant input I, it operates according to exponential function and outputs I<sub>0</sub>.

The device outputs the average value of input at 3t.

$$I_0 = I(1 - e^{-3t/t_0})$$

### Purchase specifications

Type	Input
Output	Load resistance
Auxiliary supply	
Period	Quantity

# § BOX TRANSDUCER §

AC SPECIAL TRANSDUCER

MAXIMUM INDICATING VOLTAGE TRANSDUCER

## Standard specifications

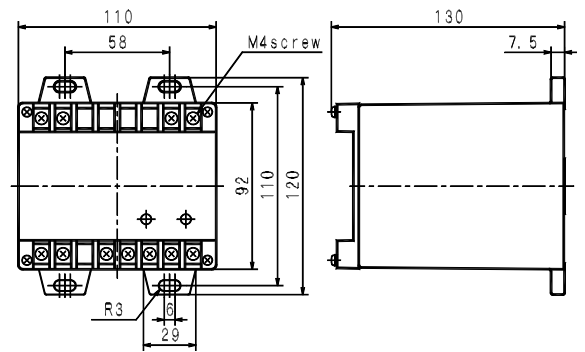
Item	Specification		
Type	MDVTT2-83A		
Standard	In conformity with JIS C1111-1989		
Tolerance	± 1%		
Input	150V, 259V, 300V (product range: 50-300V)		
Output (load resistance)	5V ( 1k )	10V ( 2k )	
	1-5V ( 1k )	1mA ( 10k )	
		4-20mA ( 500 )	
Reset method	External switch (peak hold output)		
Reset time	20ms (peak hold output)		
Auxiliary supply	AC100/110V ± 15% (50/60Hz) 5VA	5VA	
	AC 200/220V ± 15% (50/60Hz) 5VA	5VA	
	DC 100/110V 8W		
Response time	0.2 sec. (time it takes to reach 90% of final steady value)		
Output ripple	1% P-P against output span		
Influence of temperature	23 ± 20 ± 1%		
Overvoltage	Input	2 times 10 sec. 1.2 times continuity	
	Auxiliary supply	1.5 times 10 sec. 1.2 times continuity	
Insulation resistance	Between electric circuit and outer case (earth)	DC500V megger	50MΩ
	Between input terminal and output/reset terminal		
	Between input/output/reset and auxiliary supply terminal		
	Between reset terminal and output		
Withstand voltage	Between electric circuit and outer case (earth)	AC2000V (50/60Hz) 1 min.	No abnormality
	Between input terminal and output/reset terminal		
	Between input/output/reset and auxiliary supply terminal		
	Between reset terminal and output	AC500V 1min.	
Impulse withstand voltage	Between electric circuit and outer case (earth)	5kV 1.2/50µs positive/negative polarity 3 times each	No abnormality
	Between input/ output/ reset and auxiliary supply terminal		
Appearance color	Black (munsell N1.5)		
Operating temperature/humidity range	-10- + 55 , 30-85%RH		
Storage temperature range	-40- + 70		
Weight	Approx. 1.2kg		



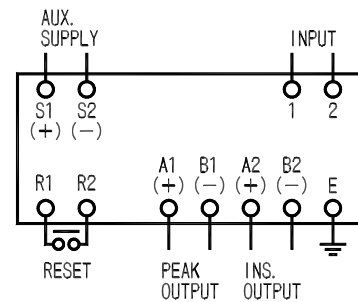
MDVTT2-83A

(120 × 110 × 130mm/1.2kg)

## Dimensions (mm)



## Connection diagram



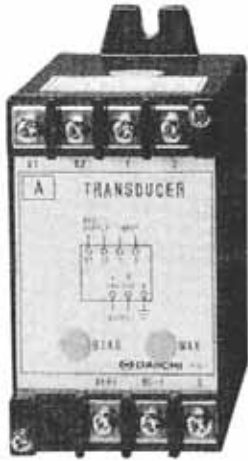
Non-insulation (minus common) between instantaneous output and peak output terminals.

Make sure to reset the device before use each time the power is turned on.

As a special response, 0.1s/99% (only available during start-up) is manufacturable.

## Purchase specifications

Type	Input	Output	Load resistance
Auxiliary supply	Quantity		



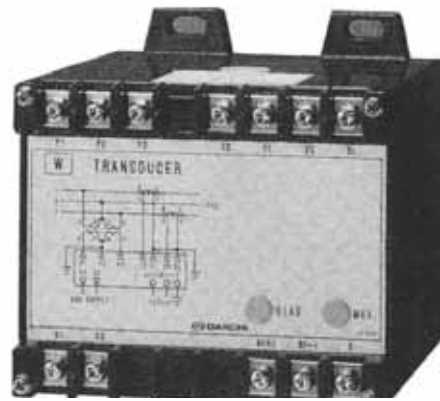
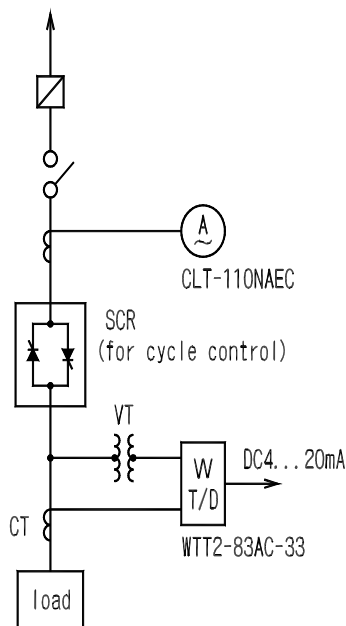
**AETT2-82AC**  
(120 × 56 × 130mm/700g)

**Use**

When electric furnace is controlled by SCR (cyclic control), current/voltage and power fluctuate periodically and those can not be read by general indicating instrument or transducer.

This product can measure voltage/current and power in cycle control accurately and read them in stable condition. As those can be read by data logger, etc., this product can be used for cycle control measurement.

**Operating connection diagram**

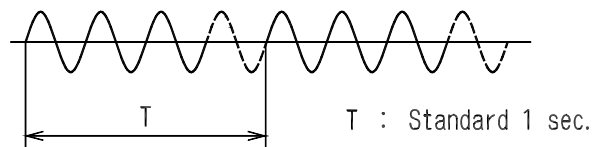


**WTT2-83AC-33**  
(120 × 110 × 130mm/1.2kg)

**Features**

- High reliability design.
- Withstand voltage between input/ output/ auxiliary supply/ earth. 2000V AC 50/60Hz 1 min.. Complete insulation.
- With electrostatic shield between primary and secondary, equipment on output side can be protected from lightning surge, etc. on input side.
- With output line surge protection (2,000A, ± 8/20 μ s), can transmit an output directly to a distant place.
- Output operation is stable against cycle control input.

**Cycle control waveform**



**Output comparison table against input continuity**

Input	Output (%)	
	Current/voltage	Power
0.05 (5%)	22.4	5.0
0.25 (25%)	50.0	25.0
0.5 (50%)	70.7	50.0
0.75 (75%)	86.6	75.0
1 (100%)	100.0	100.0
Approximate formula	A (V) = input × 100%	P=VI= input × input × 100%

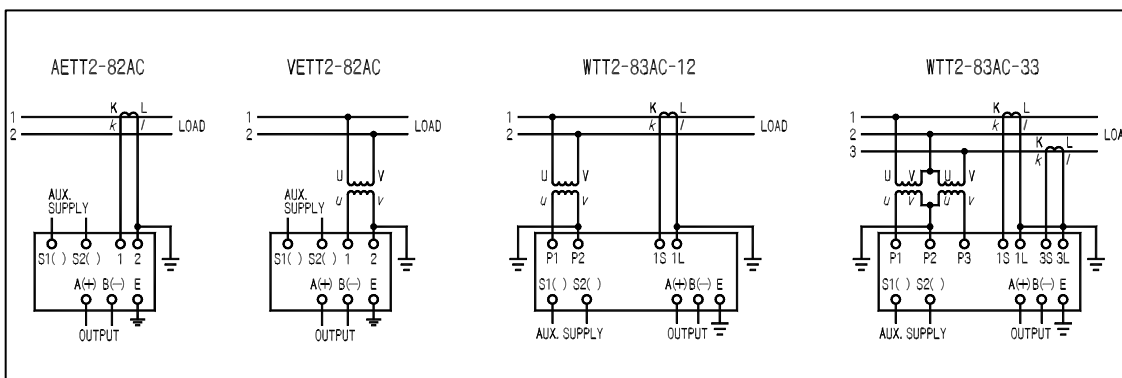
**Specifications**

Product	Operation method	Requirement of use				Type	Input	DC output (load resistance)	Tolerance	Ripple (p-p)	Response (second) <sup>*3</sup>	Approximate VA consumption			Weight
		Cycle wave form	Voltage side	Current side	Frequency							Voltage side	Current side	Auxiliary supply	
AC current	RMS value	Interval 1 sec.	-	-	50/60Hz	AETT2-82AC	5A	5V ( 1k ) 10V ( 2k ) 4-20mA ( 500 )	*1 ±1.0%	1%	Rise: 5 sec Fall: 10 sec	0.5	2	700g	
AC voltage	RMS value	Interval 1 sec.	-	-	50/60Hz	VETT2-82AC	150V or 300V	5V ( 1k ) 10V ( 2k ) 4-20mA ( 500 )	*1 ±1.0%	1%	Rise: 5 sec Fall: 10 sec	1.0	2	700g	
AC power	Single phase	Interval 1 sec.	-	-	50/60Hz	WTT2-83AC-12	100V, 5A 220V, 5A	500W 1kW	*2 ±1.0%	1%	Rise: 10 sec	1/phase	1.5	1.0kg	
	3-phase	Interval 1 sec.	unbalance	unbalance	50/60Hz	WTT2-83AC-33	110V, 5A 220V, 5A	1kW 2kW			Rise: 10 sec			1.2kg	

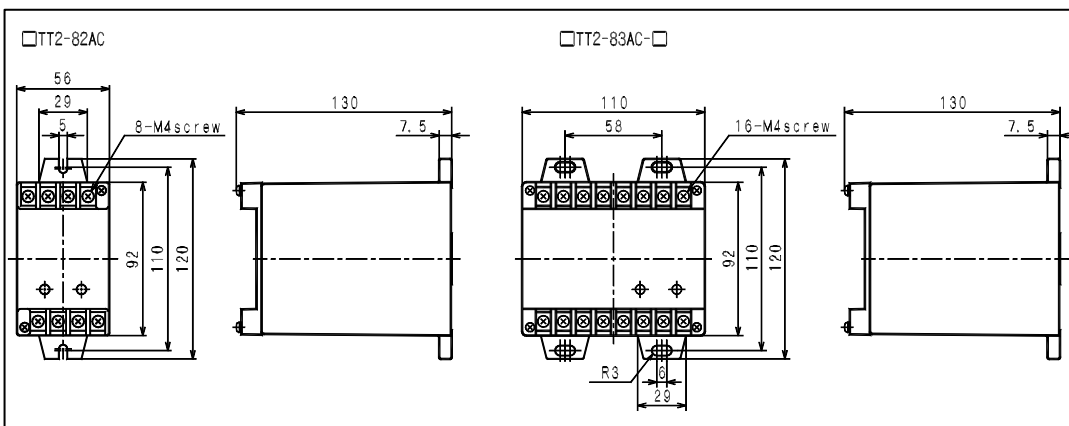
\*1. In the case of less than 50% of rated output value, tolerance doubles. \*2. In the case of less than 25% of rated output value, tolerance doubles.

\*3. Time it takes to fall within 90% and 10% of final steady state value.

**Connection diagram**



**Dimensions(mm)** See above connection diagram for terminal arrangement.



**Purchase specifications**

Type	Input	Output
Auxiliary supply	Quantity	

**INTEGRATING POWER TRANSDUCER**

**WHP-83A-**

**INTEGRATING REACTIVE POWER TRANSDUCER**

**WVHP-83A-**



**WHP-83A-33**

**Use**

This product converts power/reactive power of single phase/ 3-phase and 3-phase 4-wire to proportional pulse output/ analog output.

**Features**

1. Power/reactive power can be measured accurately in distorted wave.
2. Integrating power can be measured in short period of time such as 20-30 seconds.
3. Variety of pulse output signal method can be selected.
4. Product with analog output (option) can be manufactured.  
Analog output: with line surge (2,000A 8/20µs) protection and signal is outputted in remote place.
5. As output limiter circuit is equipped, output can be limited to approx. 1.5 times of rated value even at an excessive input.

**Standard specifications**

Item	Specifications
Tolerance	% against output span
Influence of temperature	23 ± 20 tolerance %
Influence of frequency	45-65Hz tolerance %
Characteristic	In conformity with JIS C1111-1989
Response time	Time to be within ±1% of constant output value when a stepped input of 90% output is applied.
Output ripple	P-P against rated output value 1% or less (analog output)
External adjustment to output	± 5% adjustment is possible.
Output limiter circuit	Limiting analog output (option) to approx. 1.5 times of rated value against an excessive input.
Auxiliary supply	AC100/110 or AC200/220V ±15% (50/60Hz); DC24V ±15% ; DC110V (88-143V)
Overvoltage	input 2 times of rated voltage (10 sec.), 1.2 times (continuity)
	Auxiliary supply 1.5 times of rated voltage (10 sec.), 1.2 times (continuity)
Over current	Rated current: 40 times (1 sec.), 20 times (4 sec.), 10 times (16 sec.), 1.2 times (continuity)
Insulation resistance	Between input/output/auxiliary supply and outer case (earth).
	Between pulse output terminal and analog output terminal (option) (Non-insulation between voltage output and analog output).
	DC500V 50MΩ or more.
Withstand voltage	Between input/output/auxiliary supply and outer case (earth).
	Between pulse output terminal and analog output terminal (option) (Non-insulation between voltage output and analog output).
	AC2, 000V (50/60Hz) 1min.
Impulse withstand voltage	Between electric circuit and outer case (earth).
	Between input/output/reset and auxiliary supply terminal. 5kV 1.2/50µS; positive and negative polarity 3 times each.
Appearance color	Black (munsell N1.5)
Operating temperature/ humidity range	-10- + 55 , 30-85%RH (no condensation)
Storage temperature range	-40- + 70

Specifications

Product	Operation method	Requirement of use				Type	Input		Output	Tolerance	Response (second) <sup>*3</sup>	Approximate consumption VA (W)			Weight (kg)		
		Cycle wave form	Voltage side	Current side	Frequency (50/60Hz)		Rating	Second power				Pulse output	Analog output	Pulse output		Analog output	Voltage side
INTEGRATING POWER	Hall multiplying method			unbalance	unbalance	50/60	110V/ 5A	500W	Voltage 10V $\pm$ 10% (2k $\Omega$ or more) or Transistor open collector (DC48V/DC100mA MAX) or Photo MOS FET relay (DC48V DC100mA MAX)	$\pm$ 1%	100ms + 1/16 *1	0.5	1	1.1			
															Single phase 3-wire	1kW	1.3
															3-phase	1kW	1.3
															3-phase 4-wire	2kW	1.4
INTEGRATING REACTIVE POWER	Hall multiplying method			unbalance	unbalance	50/60	100V/ 5A	LAG 1kvar		$\pm$ 0.5%	1	0.5/phase	1.3				
														Single phase	LAG 2kvar	1.3	
														3-phase	LAG 1kvar	1.4	
														3-phase 4-wire	LAG 2kvar	1.4	

\*1. fo: output frequency

\*2. AC 4.5VA, DC 2.5W in the case of a product with analog output (option) .

Product range

Item	Rating			Pulse output	Analog output (option)
	Second power	voltage	current		
Integrating power	Single phase	AC50-240V	AC0.1-5V	45-65Hz	0.01667-277.8pps (60-1,000, 000pulse/h)
	Single phase 3-wire				
	3-phase	0.25-1.2kW (110V, 5A) 0.5-2.4kW (220V, 5A)			
	3-phase 4-wire	0.25-1.2kW (110/ 3V, 5A) 0.5-2.4kW (220/ 3V, 5A)			
Integrating reactive power	3-phase	AC50-240V			DC0.1-10V DC0.1-20mA Minus output is not manufacturable.
	3-phase 4-wire				

\* Values in this table are Max. Values (except frequency).

Example: DC0.1-10V: From min. 0-0.1V to max. 0-10V can be manufactured.

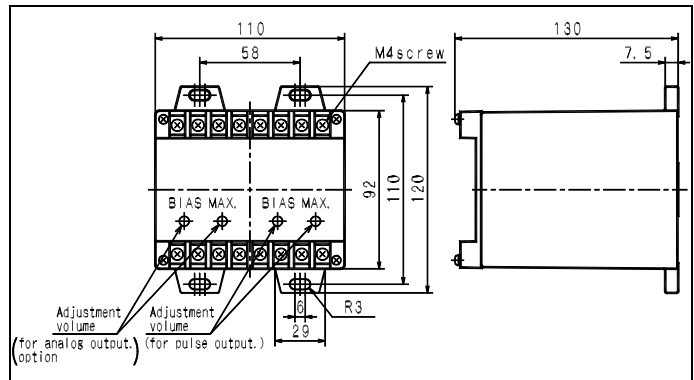
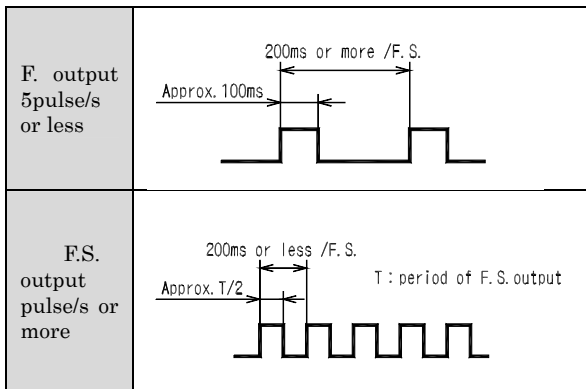
Pulse output ((Specify any one of the following))

<p><b>Voltage pulse output</b></p>	<p><b>Tr. open contactor output</b></p>	<p><b>Photo MOS/FET relay output</b></p>
<p>H.....10V±10% L..... 0.4V</p>	<p>ON OFF</p> <p>Load operates when internal transistor is ON. Do not apply reverse polarity voltage.</p>	<p>ON OFF</p> <p>Load operates when contact is ON. Connect an external assistant relay if it exceeds switching capacity.</p>

\* When inductive load such as electromagnetic relay is connected to output contact, installation of diode around load is recommended.

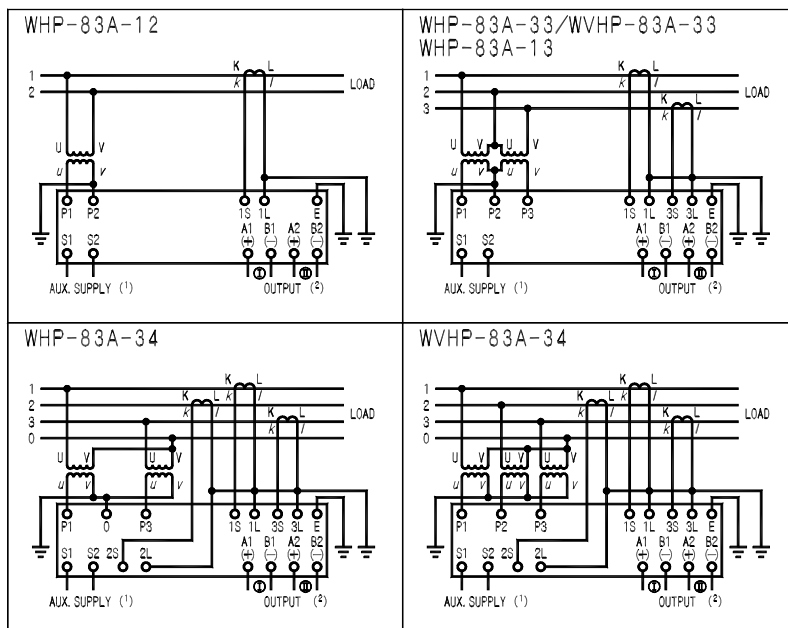
Pulse output width (standard: 100ms)

Dimensions(mm) See connection diagram for terminal arrangement.



Connection diagram

Purchase specifications



Type  
Max. input power  
Rating (voltage/current/VT  
ratio/CT ratio/frequency)  
Pulse constant  
Pulse output signal method  
Option (with analog output,  
terminal cover)  
auxiliary supply  
no. of unit

(1) In the case of DC power source: S1 (+), S2 (-).

(2) OUTPUT is analog output (option), OUTPUT is pulse output. Output notation of standard product without analog output (option) is indicated as OUTPUT