TOYO KEIKI

FOR INDUSTRIAL USE.

TRANSDUCER

PLUG-IN TYPE

GP HP SERIES

GM GS LS SERIES

TOYO KEIKI CO., LTD.

CAT. NO. TRA-01

TABLE OF CONTENTS

GP AND HP SERIES SIGNAL CONVERTER

GP and HP series signal converters provide unifrom DC signals for mesurement from various types of electric signal.

GP and HP series signal converters are based electrical transducers,such as the L series and G series, with track records going back many years. They are compact signal converters that are small and light.

GP and HP series signal converters use fire resistant plastic throughout and are transducers you can safely use.

GP and HP series signal converters are designed plug-in type makes upkeep and changes in configuration simple.

designation	type	input signal	note
AC current transducer	AGP—□□	AC current	Mean value type,With limiter
	AGP—□E□	AC current	Root-mean-sqare value type,With limiter
AC voltage transducer	VGP—□□	AC voltage	Mean value type,With limiter
	VGP—□E□	AC voltage	Root-mean-sqare value type,With limiter
Frequency transducer	FGP—□	Frequency	For commercial frequency use
Watt transducer	EHP—□1	1φ 2W watt	Root-mean-sqare value operation type
	EHP—□2	1φ 3W watt	
	EHP—□3	3φ 3W watt	
Var transducer	RHP—□1	1φ 2W var	Root-mean-sqare value operation type
	RHP—□2	1φ 3W var	
	RHP—□3	3φ 3W var	
Power factor transducer	NHP—□1	1φ 2W p. f.	Watt and var operation type
	NHP—□2	1φ 3W p. f.	
	NHP—□3	3φ 3W p. f.	
Isolater	DGP—□□	DC cur., volt.	With limiter
2output type Isolater	DXP—□□	DC cur., volt.	With limiter
High speed Isolater	DGP—□F□	DC cur., volt.	With limiter
Temperature transducer	CGP—□	Vt 100Ω other	Resistance temperature detector type
Temperature transducer	JGP—□	Thermocouple	Built in cold junction compensation
Potentio transducer	KGP—□	Potentiometer	
rpm. transducer	TGP—□□	Frequency	AC signal and pulse sequence signal
DC-pulse transducer	EGP—□	DC cur., volt.	
Attachment	ZGP—□□		For GP series
	ZHP—B		For HP series

GP AND HP SERIES

AC CURRENT TRANSDUCER

AGP−□ : Mean value type
AGP−□L : Mean value type,With limiter
AGP−□E : Root-mean-sqare value type
AGP−□EL : Root-mean-sqare value type,With limiter

Plug-in type makes upkeep and changes in configuration simple.
Improved reliability and greater compactness through the use of custom ICs.
JIS C 1111 AC／DC transducer 0.5 class.

SPECIFICATION

INPUT,CONSUMPTION WATT	OUTPUT	AUXILIARY POWER SUPPLY
0〜5A 50／60Hz 0〜1A 50／60Hz approx. 0.5VA	8 standard type of ouput are available	AC 100／110V ±10% 50／60Hz approx. 2.5 VA AC 200／220V ±10% 50／60Hz approx. 2.5 VA DC 24V ±10% approx. 2.5 W DC 100／110V ±10% approx. 3 W types are immediately available. For types not listed above contact a company representative.
Max.input Available with range 0.1 〜5A Available with frequency range 45 〜	Available with Max.voltage output 10V (600 Ω〜∞) Max.current output 20mA (0 〜550Ω)	

SPECIFIC CHARACTER

(1) Tolerance
±0.5% of output span. (Ambient temperature 23℃)

(2) Effect of temperature
Within ±0.5% of output span. (For 23℃±10℃ variations)

(3) Effect of auxiliary power supply
Within ±0.25% of output span. (For rated voltage ±10% variations)

(4) Effect of frequency
Within ±0.25% of output span. (For standard frequency ±5% variations)

(5) Effect of load resistance
Within ±0.05% of output span. (For load resistance range)

(6) Output ripple
Within 1%p-p of output span.

(7) Response time
Shorter than 1sec. (Time to 99% output)

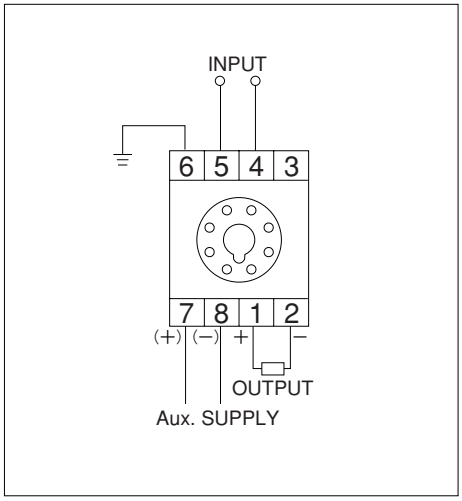
(8) Effect of wave from (AGP−□E□ type only)
Within ±0.5% of output span.
(For third harmonics equivalent to 15% of the basic frequency)

(9) Dielectric strength
2000V AC,1min.(50／60Hz)
(Between input,output,auxiliary power supply and external case)

(10) Insulation resistance
Higher than 100MΩ at 500V megger.
(Between input,output,auxiliary power supply and external case)

(11) Weight
Approx.410g

CONNECTION DIAGRAM



ACCESSORIES

When removed from socket,to prevent the CT secondary circuit from remaining open use the proper accessory parts

AC 5A : ZGP−B1
AC 1A : ZGP−B2

DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
AGP−□ AGP−□L AGP−□E AGP−□EL	−□	−□

	AUXILIARY POWER SUPPLY
1	DC 24V
2	AC 100V／110V 50／60Hz
3	AC 200V／220V 50／60Hz
5	DC 100V／110V

	INPUT	FREQUENCY
1	AC 0 〜 5A	50／60Hz
2	0 〜 1A	50／60Hz
9	OTHER INPUT	

	OUTPUT	LOAD RESISTANCE
1	DC 0 〜 100mV	600Ω 〜 ∞
2	DC 0 〜 1 V	600Ω 〜 ∞
3	DC 0 〜 5 V	600Ω 〜 ∞
4	DC 0 〜 10 V	600Ω 〜 ∞
5	DC 1 〜 5 V	600Ω 〜 ∞
6	DC 0 〜 1mA	0 〜 10kΩ
7	DC 0 〜 10mA	0 〜 1kΩ
8	DC 4 〜 20mA	0 〜 550 Ω
9	OTHER OUTPUT	

ORDER EXAMPLE
① AGP−1−1−8
② AGP−2E−9−9
INPUT : AC 0〜0.5A, OUTPUT : DC 0〜7.5V
※For special specifications please consult company representatives.

GP AND HP SERIES

AC VOLTAGE TRANSDUCER

VGP−□ : Mean value type

VGP−□E : Root-mean-sqare value type

Plug-in type makes upkeep and changes in configuration simple.
Improved reliability and greater compactness through the use of custom ICs.
JIS C 1111 AC／DC transducer 0.5 class.

SPECIFICATION

INPUT,CONSUMPTION WATT	OUTPUT	AUXILIARY POWER SUPPLY
0～150V 50／60Hz 0～300V 50／60Hz approx. 0.5VA	8 standard type of output are available	AC 100／110V ±10% 50／60Hz approx. 2.5 VA AC 200／220V ±10% 50／60Hz approx. 2.5 VA DC 24V ±10% approx. 2.5 W DC 100／110V(80～143V) ±10% approx. 3 W types are immediately available. For types not listed above contact a company representative.
Max.input Available with range 50 ～300V Available with fraquency range 45 ～10kHz	Available with Max.voltage output 10V (600 Ω～∞) Max.current output 20mA (0 ～550Ω)	

SPECIFIC CHARACTER

(1) Tolerance
±0.5% of output span. (Ambient temperature 23℃)

(2) Effect of temperature
Within ±0.5% of output span. (For 23℃±10℃ variations)

(3) Effect of auxiliary power supply
Within ±0.25% of output span. (For rated voltage ±10% variations)

(4) Effect of frequency
Within ±0.25% of output span. (For standard frequency ±5% variations)

(5) Effect of load resistance
Within ±0.05% of output span. (For load resistance range)

(6) Output ripple
Within 1%p-p of output span.

(7) Response time
Shorter than 1sec. (Time to 99% output)

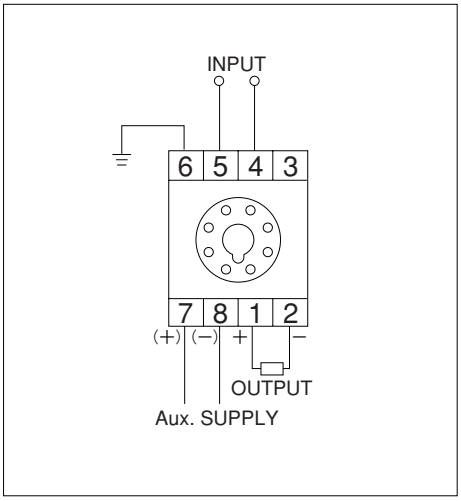
(8) Effect of wave from (VGP−□E type only)
Within ±0.5% of output span.
(For third harmonics equivalent to 15% of the basic frequency)

(9) Dielectric strength
2000V AC,1min.(50／60Hz)
(Between input,output,auxiliary power supply and external case)

(10) Insulation resistance
Higher than 100MΩ at 500V megger.
(Between input,output,auxiliary power supply and external case)

(11) Weight
Approx.500g

CONNECTION DIAGRAM



DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
VGP−□ VGP−□E	−□	−□

	AUXILIARY POWER SUPPLY
1	DC 24V
2	AC 100V／110V 50／60Hz
3	AC 200V／220V 50／60Hz
5	DC 100V／110V

	INPUT	FREQUENCY
1	AC 0 ～ 150 V	50／60Hz
2	0 ～ 300 V	50／60Hz
9	OTHER INPUT	

	OUTPUT	LOAD RESISTANCE
1	DC 0 ～ 100mV	600Ω ～ ∞
2	DC 0 ～ 1 V	600Ω ～ ∞
3	DC 0 ～ 5 V	600Ω ～ ∞
4	DC 0 ～ 10 V	600Ω ～ ∞
5	DC 1 ～ 5 V	600Ω ～ ∞
6	DC 0 ～ 1mA	0 ～ 10kΩ
7	DC 0 ～ 10mA	0 ～ 1kΩ
8	DC 4 ～ 20mA	0 ～ 550 Ω
9	OTHER OUTPUT	

ORDER EXAMPLE
① VGP−1−1−8
② VGP−2E−9−9
INPUT : AC 0～110V, OUTPUT : DC 0～7.5V
※For special specifications please consult company representatives.

GP AND HP SERIES
FREQUENCY TRANSDUCER

FGP−□

Plug-in type makes upkeep and changes in configuration simple.
Improved reliability and greater compactness through the use of custom ICs.
JIS C 1111 AC／DC transducer 0.5 class.

SPECIFICATION

INPUT,RATED VOLT,CONSUMPTION WATT	OUTPUT	AUXILIARY POWER SUPPLY
45～55Hz AC 110V 55～65Hz AC 220V approx. 0.5VA 55～65Hz	8 standard type of output are available	AC 100／110V ±10% 50／60Hz approx. 2.5 VA AC 200／220V ±10% 50／60Hz approx. 2.5 VA DC 24V ±10% approx. 2.5 W DC 100／110V ±10% approx. 3 W
Working range Rated frequency range : 45Hz～450Hz Rated voltage range : 50V～300V	Available with Max.voltage output 10V(600 Ω～∞) Max.current output 20mA(0 ～550Ω)	types are immediately available. For types not listed above contact a company representative.

SPECIFIC CHARACTER

(1) Tolerance
±0.5% of output span. (Ambient temperature 23℃)

(2) Effect of temperature
Within ±0.5% of output span. (For 23 ℃±10℃ variations)

(3) Effect of input voltage
Within ±0.25% of output span. (For rated voltage ±10% variations)

(4) Effect of auxiliary power supply
Within ±0.25% of output span. (For rated voltage ±10% variations)

(5) Effect of load resistance
Within ±0.05% of output span. (For load resistance range)

(6) Output ripple
Within 1%p-p of output span.

(7) Response time
Shorter than 2sec. (Time to 99% output)

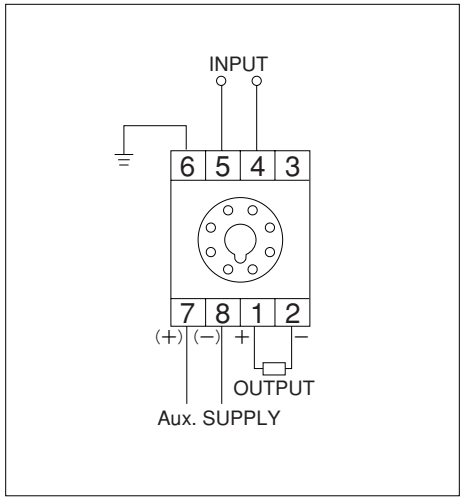
(8) Effect of wave from
Within ±0.5% of output span.
(For third harmonics equivalent to 15% of the basic frequency)

(9) Dielectric strength
2000V AC,1min.(50／60Hz)
(Between input,output,auxiliary power supply and external case)

(10) Insulation resistance
Higher than 100MΩ at 500V megger.
(Between input,output,auxiliary power supply and external case)

(11) Weight
Approx.410g

CONNECTION DIAGRAM



As the FGP−□ is primary designed as transducer that operates within commercial frequency band power frequencies,the ordinary VT secondary voltage becomes the input.
When generator and other types of sensor output become the input the TGP−□ is suitable.

DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
FGP−□	−□	−□

	AUXILIARY POWER SUPPLY
1	DC 24V
2	AC 100V／110V 50／60Hz
3	AC 200V／220V 50／60Hz
5	DC 100V／110V

	INPUT	RATED VOLT.
12	45～55Hz	AC 110V
22	55～65Hz	
32	45～65Hz	
13	45～55Hz	AC 220V
23	55～65Hz	
33	45～65Hz	
99	OTHER INPUT	

	OUTPUT	LOAD RESISTANCE
1	DC 0～100mV	600Ω ～ ∞
2	DC 0～ 1 V	600Ω ～ ∞
3	DC 0～ 5 V	600Ω ～ ∞
4	DC 0～ 10 V	600Ω ～ ∞
5	DC 1～ 5 V	600Ω ～ ∞
6	DC 0～ 1mA	0 ～ 10kΩ
7	DC 0～ 10mA	0 ～ 1kΩ
8	DC 4～ 20mA	0 ～ 550 Ω
9	OTHER OUTPUT	

ORDER EXAMPLE
① FGP−1−12−8
② FGP−2−99−9
INPUT : 45～75Hz, AC115V, OUTPUT : DC 0～7.5V
※For special specifications please consult company representatives.

GP AND HP SERIES

WATT TRANSDUCER

EHP−□1 : 1phase 2wire
EHP−□2 : 1phase 3wire
EHP−□3 : 3phase 3wire

Plug-in type makes upkeep and changes in configuration simple.
Improved reliability and greater compactness through the use of custom ICs.
JIS C 1111 AC／DC transducer 0.5 class.

SPECIFICATION

INPUT

KIND	MARK	INPUT	RATED VOLTAGE	RATED CURRENT	FREQUENCY	CONSUMPTION WATT
1φ2W EHP−□1	1	0 ～ 500W	100V	5A	50／60Hz	Voltage input : 0.5VA at 1 element Current input : 0.5VA at 1 element
	2	0 ～ 1000W	200V	1A	50／60Hz	
	9	OTHER				
1φ3W EHP−□2	1	0 ～ 500W	2 ×100V	5A	50／60Hz	
	2	0 ～ 1000W	2 ×200V	5A	50／60Hz	
	9	OTHER				
3φ3W EHP−□3	1	0 ～ 1000W	110V	5A	50／60Hz	
	2	0 ～ 2000W	220V	5A	50／60Hz	
	3	0 ～ 833W	110V	5A	50／60Hz	
	4	0 ～ 1667W	220V	5A	50／60Hz	
	9	OTHER				

WORKING RANGE

Rated voltage range : 60V～240V
Rated current range : 0.1A～5A
Rated frequency range : 45Hz～450Hz

Input range for working range
1phase 2wire : Input range ceiling 40%～120% of (rated voltage×rated current)
1phase 3wire : Input range ceiling 40%～120% of 2× (rated voltage×rated current)
3phase 3wire : Input range ceiling 40%～130% of [root3] × (rated voltage×rated current)

OUTPUT

MARK	OUTPUT	LOAD RESISTANCE	WORKING RANGE
1	DC 0 ～ 100mV	600 Ω ～ ∞	We also produse items not included in the output table on the left which cover the ranges below. Max.voltage output : 10V Loading current : below 10mA Max.current output : 20mA Loading voltage : below 11V
2	DC 0 ～ 1 V	600 Ω ～ ∞	
3	DC 0 ～ 5 V	600 Ω ～ ∞	
4	DC 0 ～ 10 V	1kΩ ～ ∞	
5	DC 1 ～ 5 V	600 Ω ～ ∞	
6	DC 0 ～ 1mA	0 ～ 10 kΩ	
7	DC 0 ～ 10mA	0 ～ 1 kΩ	
8	DC 4 ～ 20mA	0 ～ 550 Ω	
9	OTHER OUTPUT		

AUXILIARY POWER SUPPLY

MARK	RATED	USE RANGE	CONSUMPTION WATT	REMARK
1	DC 24V	AC 19 ～ 31 V	approx. 3 W	Please inquire about items not listed on the left.
2	AC 100V／110V 50／60Hz	AC 90 ～121 V	approx. 3 VA	
3	AC 200V／220V 50／60Hz	DC 180 ～242 V	approx. 3 VA	
5	DC 100V／110V	DC 90 ～121 V	approx. 3 W	
9	OTHER			

GP AND HP SERIES

SPECIFIC CHARACTER

(1) Tolerance
±0.5% of output span. (Ambient temperature 23 ℃)

(2) Effect of temperature
Within ±0.5% of output span. (For 23 ℃±10℃ variations)

(3) Effect of auxiliary power supply
Within ±0.25% of output span. (For rated voltage ±10% variations)

(4) Effect of frequency
Within ±0.25% of output span. (For standard frequency ±5% variations)

(5) Effect of input voltage
Within ±0.25% of output span. (For standard vortage ±10% variations)

(6) Effect of power factor
Within ±0.5% of output span. (For 0.5-1 power factor variations)

(7) Effect of load resistance
Within ±0.05% of output span. (For load resistance range)

(8) Output ripple
Within 1%p-p of output span.

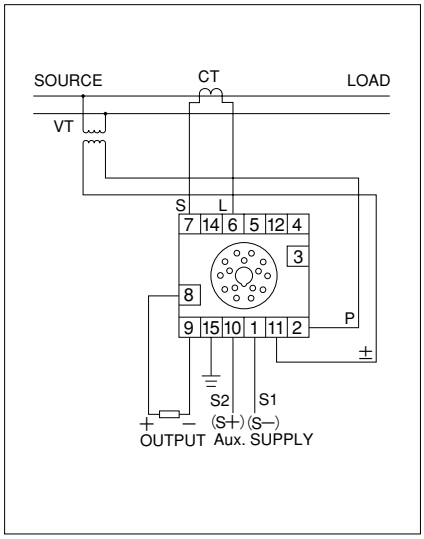
(9) Response time
Shorter than 1sec. (Time to 99% output)

(10) Dielectric strength
2000V AC,1min.(50／60Hz)
(Between input,output,auxiliary power and external case)

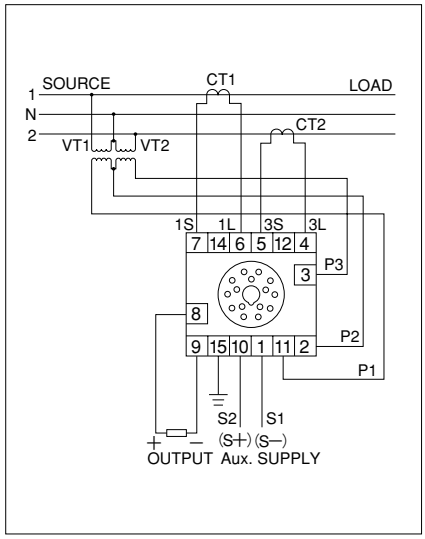
(11) Insulation resistance
Higher than 100MΩ at 500V megger.
(Between input,output,auxiliary power and external case)

(12) Weight
Approx.700g

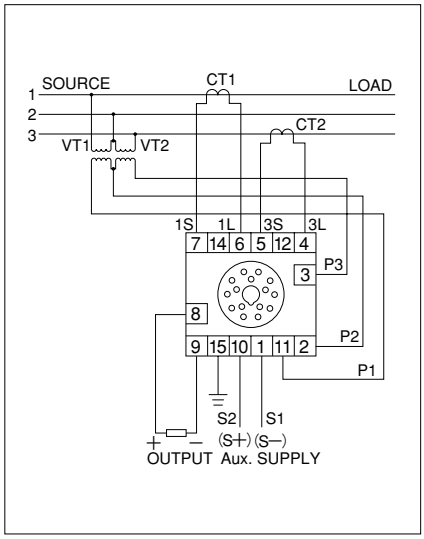
CONNECTION DIAGRAM



EHP−□1 1PHASE 2WIRE



EHP−□2 1PHASE 3WIRE



EHP−□3 3PHASE 3WIRE

DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
EHP−□□	−□	−□

ORDER EXAMPLE
① EHP−23−2−8
② EHP−23−9−9 INPUT : 0～1200W,110V,5A, OUTPUT : DC 0～7.5V

※With the input code as 9,indicate the primary input,and VT ratio and CT ratio,if VT and CT are used in combination and order is made with the primary input side.In such cases the primary input,and VT ratio and CT ratio are entered on the label.

※When items from the EHP series are removed from their sockets,to prevent the input circuits from remaining open a protector(diode unit ZHP−B)is fitted.
Inform us if this is not required.

※For special specification above contact a company representative.

GP AND HP SERIES

VAR TRANSDUCER

RHP−□1 : 1phase 2wire
RHP−□2 : 1phase 3wire
RHP−□3 : 3phase 3wire

Plug-in type makes upkeep and changes in configuration simple.
Improved reliability and greater compactness through the use of custom ICs.
JIS C 1111 AC／DC transducer 0.5 class.

SPECIFICATION

INPUT

KIND	MARK	INPUT	RATED VOLT.	RATED CUR.	FREQUENCY	CONSUMPTION WATT
1φ2W RHP−□1	1	LEAD 500 ～ 0 ～ LAG 500 var	100V	5A	50Hz	Voltage input : 0.5VA at 1 element Current input : 0.5VA at 1 element
	2	LEAD 500 ～ 0 ～ LAG 500 var	100V	5A	60Hz	
	3	LEAD 1000 ～ 0 ～ LAG1000 var	200V	5A	50Hz	
	4	LEAD 1000 ～ 0 ～ LAG1000 var	200V	5A	60Hz	
	9	OTHER				
1φ3W RHP−□2	1	LEAD 1000 ～ 0 ～ LAG1000 var	2×100V	5A	50Hz	
	2	LEAD 1000 ～ 0 ～ LAG1000 var	2 ×100V	5A	60Hz	
	3	LEAD 2000 ～ 0 ～ LAG2000 var	2 ×200V	5A	50Hz	
	4	LEAD 2000 ～ 0 ～ LAG2000 var	2×200V	5A	60Hz	
	9	OTHER				
3φ3W RHP−□3	1	LEAD 1000 ～ 0 ～ LAG1000 var	110V	5A	50／60Hz	
	2	LEAD 2000 ～ 0 ～ LAG2000 var	220V	5A	50／60Hz	
	3	LEAD 833 ～ 0 ～ LAG 833 var	110V	5A	50／60Hz	
	4	LEAD 1667 ～ 0 ～ LAG1667 var	220V	5A	50／60Hz	
	9	OTHER				

Note : 1.1phase 2wire and 1phase 3wire devices are set for a frequency of either 50Hz or 60Hz.
3phase line devices can operate at either 50Hz or 60Hz.

2. It is necessary to balance the voltage circuits of 3phase 3wire devices.
However,the current will behave normally if the circuits are not balanced.

WORKING RANGE

Rated voltage range : 60V～240V
Rated current range : 0.1A～5A
Rated frequency range : 45Hz～450Hz

Input range for working range
1phase 2wire : Input range ceiling 40%～120% of (rated voltage×rated current)
1phase 3wire : Input range ceiling 40%～120% of 2× (rated voltage×rated current)
3phase 3wire : Input range ceiling 40%～130% of [root3]× (rated voltage×rated current)

OUTPUT

MARK	OUTPUT	LOAD RESISTANCE	WORKING RANGE
1	−100 ～ 0 ～＋100 mV	600 Ω ～ ∞	Max.voltage output : 10V,Loading current : below 10mA Max.current output : 20mA,Loading voltage : below 11V Relationship between input and output ・Lead side input for minus output and Lag side input for positive output are standard. ・We can also make items that allow Lag side input for minus output and Lead side input for positive output.
2	− 1 ～ 0 ～＋ 1 V	600 Ω ～ ∞	
3	− 5 ～ 0 ～＋ 5 V	600 Ω ～ ∞	
4	− 10 ～ 0 ～＋ 10 V	1kΩ ～ ∞	
5	1 ～ 3 ～ 5 V	600 Ω ～ ∞	
6	− 1 ～ 0 ～＋ 1 mA	0 ～ 10 kΩ	
7	− 10 ～ 0 ～＋ 10 mA	0 ～ 1 kΩ	
8	4 ～12～ 20 mA	0 ～ 550 Ω	
9	OTHER OUTPUT		

AUXILIARY POWER SUPPLY

MARK	RATED	USE RANGE	CONSUMPTION WATT	REMARK
1	DC 24V	AC 19 ～ 31 V	approx. 3 W	Please inquire about items not listed on the left.
2	AC 100V／110V 50／60Hz	AC 90 ～121 V	approx. 4 VA	
3	AC 200V／220V 50／60Hz	DC 180 ～242 V	approx. 4 VA	
5	DC 100V／110V	DC 80 ～143 V	approx. 3 W	
9	OTHER			

GP AND HP SERIES

SPECIFIC CHARACTER

(1) Tolerance
±0.5% of output span. (Ambient temperature 23 ℃)

(2) Effect of temperature
Within ±0.5% of output span. (For 23 ℃±10℃ variations)

(3) Effect of auxiliary power supply
Within ±0.25% of output span. (For rated voltage ±10% variations)

(4) Effect of frequency
Within ±0.25% of output span. (For standard frequency ±5% variations)

(5) Effect of input voltage
Within ±0.25% of output span. (For standard vortage ±10% variations)

(6) Effect of power factor
Within ±0.5% of output span. (For 0.5-1 reactive factor variations)

(7) Effect of load resistance
Within ±0.05% of output span. (For load resistance range)

(8) Output ripple
Within 1%p-p of output span.

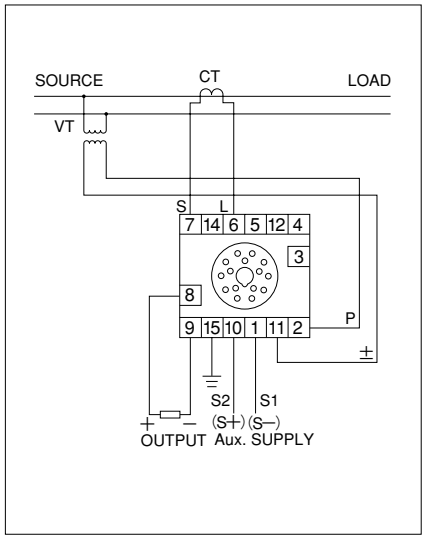
(9) Response time
Shorter than 1sec. (Time to 99% output)

(10) Dielectric strength
2000V AC,1min. (50／60Hz)
(Between input,output,auxiliary power and external case)

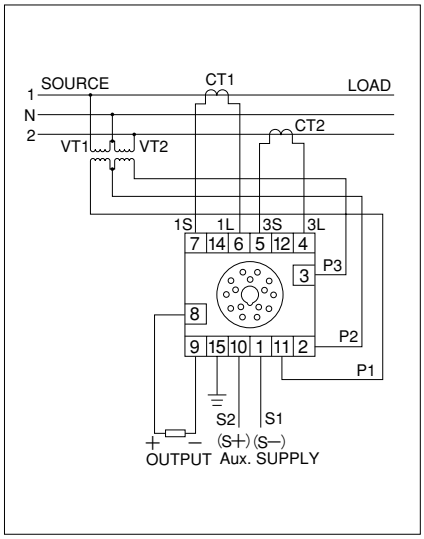
(11) Insulation resistance
Higher than 100MΩ at 500V megger.
(Between input,output,auxiliary power and external case)

(12) Weight
Approx.700g

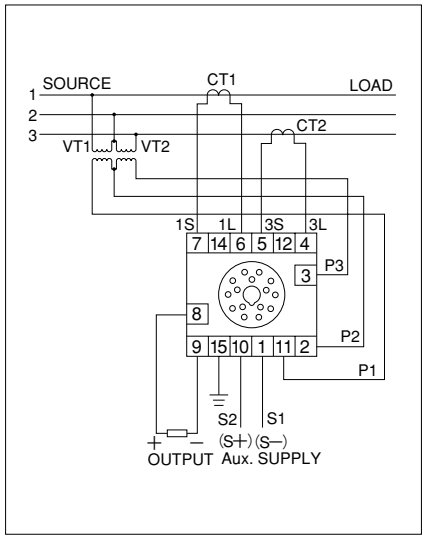
CONNECTION DIAGRAM



RHP−□1 1PHASE 2WIRE



RHP−□2 1PHASE 3WIRE



RHP−□3 3PHASE 3WIRE

DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
RHP−□□	−□	−□

ORDER EXAMPLE
① RHP−23−2−8
② RHP−23−9−9 INPUT : 0～1200var,110V,5A, OUTPUT : DC0～7.5V

※With the input code as 9,indicate the primary input,and VT ratio and CT ratio,if VT and CT are used in combination and order is made with the primary input side.In such cases the primary input,and VT ratio and CT ratio are entered on the label.

※When items from the RHP series are removed from their sockets,to prevent the input circuits from remaining open a protector(diode unit ZHP−B)is fitted.
Inform us if this is not required.

※For special specification above contact a company representative.

GP AND HP SERIES

POWER FACTOR TRANSDUCER

NHP−□1 : 1phase 2wire
NHP−□2 : 1phase 3wire
NHP−□3 : 3phase 3wire

Plug-in type makes upkeep and changes in configuration simple.
Improved reliability and greater compactness through the use of custom ICs.
JIS C 1111 AC／DC transducer 2.0 class.

SPECIFICATION

INPUT

KIND	MARK	INPUT	RATED VOLT.	RATED CUR.	FREQUENCY	CONSUMPTION WATT
1φ2W NHP−□1	1	LEAD 0.5～1～LAG 0.5	100V	5A	50Hz	Voltage input:0.5VA at 1 element Current input:0.5VA at 1 element
	2	LEAD 0.5～1～LAG 0.5	100V	5A	60Hz	
	3	LEAD 0.5～1～LAG 0.5	200V	5A	50Hz	
	4	LEAD 0.5～1～LAG 0.5	200V	5A	60Hz	
	9	OTHER				
1φ3W NHP−□2	1	LEAD 0.5～1～LAG 0.5	2×100V	5A	50Hz	
	2	LEAD 0.5～1～LAG 0.5	2 ×100V	5A	60Hz	
	3	LEAD 0.5～1～LAG 0.5	2 ×200V	5A	50Hz	
	4	LEAD 0.5～1～LAG 0.5	2×200V	5A	60Hz	
	9	OTHER				
3φ3W NHP−□3	1	LEAD 0.5～1～LAG 0.5	110V	5A	50／60Hz	
	2	LEAD 0.5～1～LAG 0.5	220V	5A	50／60Hz	
	9	OTHER				

Note : 1. 1phase 2wire and 1phase 3wire devices are set for a frequency of either 50Hz or 60Hz.
3phase line devices can operate at either 50Hz or 60Hz.
2. It is necessary to balance the voltage circuits of 3phase 3wire devices.
However,the current will behave normally if the circuits are not balanced.

WORKING RANGE

Rated voltage range : 60V～240V
Rated current range : 0.1A～5A
Rated frequency range : 45Hz～450Hz
Input range for working range : LEAD 0.5～1～LAG 0.5 or LAG 0.5～1～LEAD 0.5

OUTPUT

MARK	OUTPUT	LOAD RESISTANCE	WORKING RANGE
1	−100 ～ 0 ～＋100 mV	600 Ω ～ ∞	Max.voltage output : 10V,Loading current : below 10mA Max.current output : 20mA,Loading voltage : below 11V Relationship between input and output ・Lead side input for minus output and Lag side input for positive output are standard. ・We can also make items that allow Lag side input for minus output and Lead side input for positive output. ・We can also produce items that at LEAD 0.5～1～LAG 0.5 have−50%～−／＋100%～＋50% characteristics.
2	− 1 ～ 0 ～＋ 1 V	600 Ω ～ ∞	
3	− 5 ～ 0 ～＋ 5 V	600 Ω ～ ∞	
4	− 10 ～ 0 ～＋ 10 V	1kΩ ～ ∞	
5	1 ～ 3 ～ 5 V	600 Ω ～ ∞	
6	− 1 ～ 0 ～＋ 1 mA	0 ～ 10 kΩ	
7	− 10 ～ 0 ～＋ 10 mA	0 ～ 1 kΩ	
8	4 ～12～ 20 mA	0 ～ 550 Ω	
9	OTHER OUTPUT		

AUXILIARY POWER SUPPLY

MARK	RATED	USE RANGE	CONSUMPTION WATT	REMARK
1	DC 24V	AC 19 ～ 31 V	approx. 3 W	Please inquire about items not listed on the left.
2	AC 100V／110V 50／60Hz	AC 90 ～121 V	approx. 4 VA	
3	AC 200V／220V 50／60Hz	DC 180 ～242 V	approx. 4 VA	
5	DC 100V／110V	DC 80 ～143 V	approx. 3 W	
9	OTHER			

GP AND HP SERIES

SPECIFIC CHARACTER

(1) Tolerance
±2% of output span. (Ambient temperature 23 ℃)

(2) Effect of temperature
Within ±0.5% of output span. (For 23 ℃±10℃ variations)

(3) Effect of auxiliary power supply
Within ±0.25% of output span. (For rated voltage ±10% variations)

(4) Effect of frequency
Within ±1.5% of output span. (For standard frequency ±5% variations)

(5) Effect of input voltage
Within ±1.5% of output span. (For standard voltage ±10% variations)

(6) Effect of input current
Within±3% of output span. (For 20%-120% rated current variations)

(7) Effect of load resistance
Within ±0.05% of output span. (For load resistance range)

(8) Output ripple
Within 1%p-p of output span.

(9) Response time
Shorter than 1sec. (Time to 99% output)

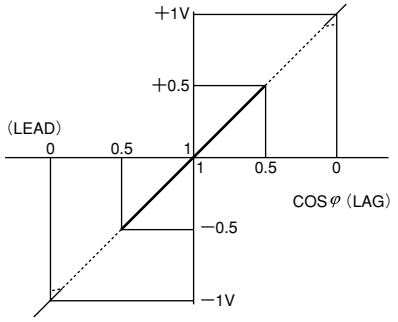
(10) Dielectric strength
2000V AC,1min. (50／60Hz)
(Between input,output,auxiliary power and external case)

(11) Insulation resistance
Higher than 100MΩ at 500V megger.
(Between input,output,auxiliary power and external case)

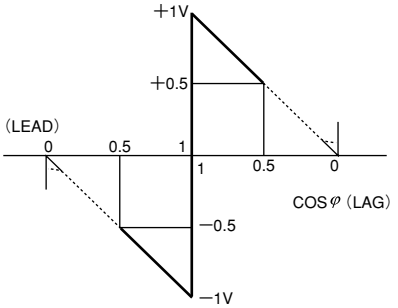
(12) Weight

Power factor transducer may have the two types of characterristics shown below.
If no preference is specified characteristics will be as shown in 1.

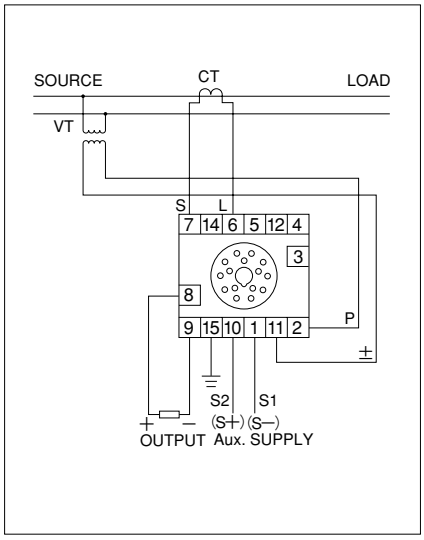
CHARACTERISTIC 1



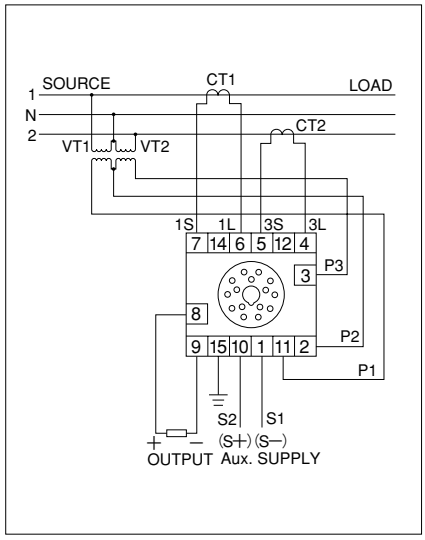
CHARACTERISTIC 2



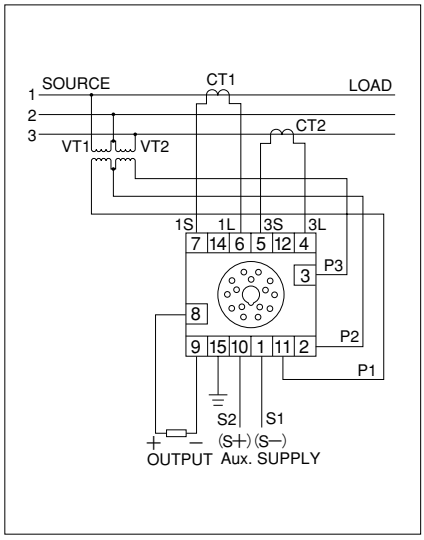
CONNECTION DIAGRAM



NHP−□1 1PHASE 2WIRE



NHP−□2 1PHASE 3WIRE



NHP−□3 3PHASE 3WIRE

DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
NHP−□□	−□	−□

ORDER EXAMPLE
① NHP−23−2−8
② NHP−23−9−8 INPUT : LEAD 0.5～1～LAG 0.5,115V,5A

※Power factor measurement in circuits that have tidal currents
The effectuve measurement range of NHP type power factor transducers is LEAD 0.5～1～LAG 0.5.
Does not operate normally during backward tidal current(the current supply and receeipt flow are reversed).

※When items from the NHP series are removed from their sockets,to prevent the input circuits from remaining open a protector(diode unit ZHP−B)is fitted.
Inform us if this is not required.

※For special specification above contact a company representative.