



**FOR INDUSTRIAL USE.**

# TRANSDUCER

**PLUG-IN TYPE**



**GP | HP** SERIES  
**GM | GS | LS** SERIES

**TOYO KEIKI CO., LTD.**

CAT. NO. TRA-02

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# GP AND HP SERIES SIGNAL CONVERTER



**GP and HP** series signal converters provide uniform DC signals for measurement from various types of electric signal.

**GP and HP** series signal converters are based on 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 as plug-in types, making 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-square value type, With limiter
AC voltage transducer	VGP-□□	AC voltage	Mean value type, With limiter
	VGP-□E□	AC voltage	Root-mean-square value type, With limiter
Frequency transducer	FGP-□	Frequency	For commercial frequency use
Watt transducer	EHP-□1	1φ 2W watt	Root-mean-square value operation type
	EHP-□2	1φ 3W watt	
	EHP-□3	3φ 3W watt	
Var transducer	RHP-□1	1φ 2W var	Root-mean-square 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-□	Pt 100Ω other	Resistance temperature detector type
Temperature transducer	JGP-□	Thermocouple	Built in cold junction compensation
Potentiometer 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-square value type
- AGP-□EL : Root-mean-square 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.



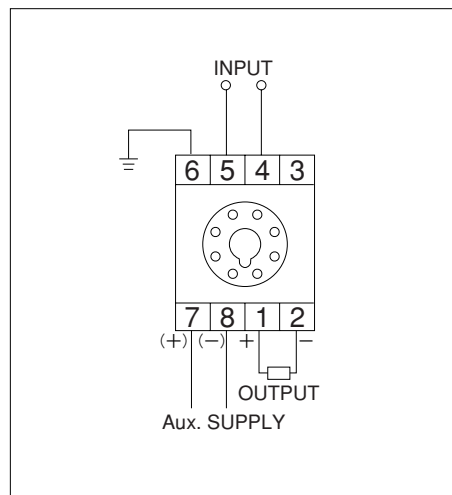
### SPECIFICATION

INPUT, CONSUMPTION WATT	OUTPUT	AUXILIARY POWER SUPPLY
0~5A 50/60Hz 0~1A 50/60Hz approx. 0.5VA	8 standard type of 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
Max. input Available with range 0.1 ~5A Available with frequency range 45Hz~10kHz	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°C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23°C±10°C 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 1~5A : ZGP-B**

### 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 ~ 5 A	50/60Hz
2	0 ~ 1 A	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-square 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.



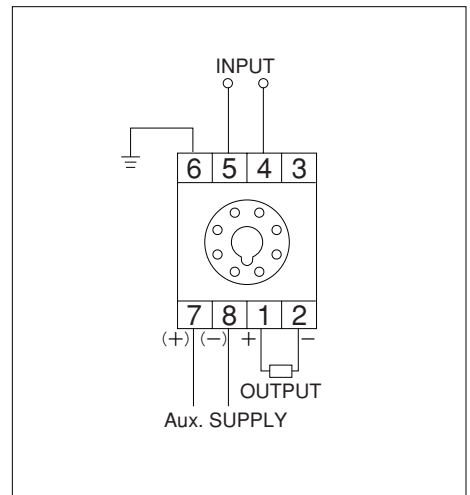
### SPECIFICATION

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
Max. input Available with range 50 ~300V Available with frequency range 45Hz ~10kHz	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°C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23°C±10°C 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.



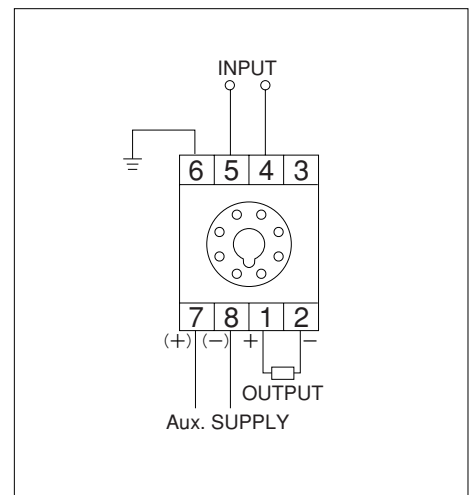
## SPECIFICATION

INPUT, RATED VOLT, CONSUMPTION WATT	OUTPUT	AUXILIARY POWER SUPPLY
45~55Hz 55~65Hz AC 110V approx. 0.5VA 55~65Hz AC 220V	8 standard type of output are available  Available with Max.voltage output 10V(600 Ω~∞)  Max.current output 20mA(0 ~550Ω)	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.
Working range Rated frequency range : 45Hz~450Hz Rated voltage range : 50V~300V		

## SPECIFIC CHARACTER

- (1) Tolerance  
±0.5% of output span. (Ambient temperature 23°C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C 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 primarily 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	AC 220V
13	45~55Hz	
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	5A	50/60Hz	
	9	OTHER				
1φ3W EHP-□2	1	0 ~ 1000W	2 ×100V	5A	50/60Hz	
	2	0 ~ 2000W	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 produce 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	2kΩ ~ ∞	
4	DC 0 ~ 10 V	5kΩ ~ ∞	
5	DC 1 ~ 5 V	2kΩ ~ ∞	
6	DC 0 ~ 1mA	0 ~ 10 kΩ	
7	DC 0 ~ 10mA	0 ~ 1 kΩ	
8	DC 4 ~ 20mA	0 ~ 550 Ω	
9	OTHER OUTPUT		

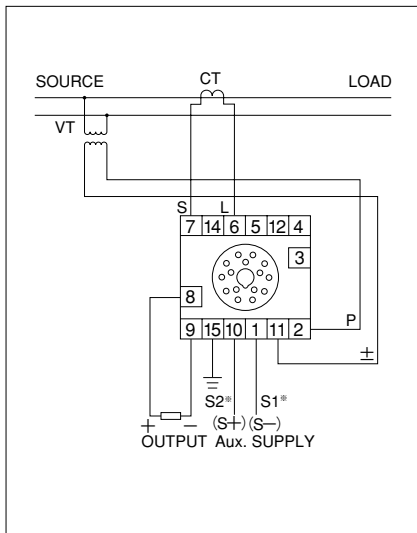
AUXILIARY POWER SUPPLY			
MARK	USE RANGE	CONSUMPTION WATT	REMARK
1	DC 19~31V	approx. 3 W	Please inquire about items not listed on the left.
4	AC 80~264V (50/60Hz) DC 80~143V	approx. 4 VA approx. 3 W	
9	OTHER		

# GP AND HP SERIES

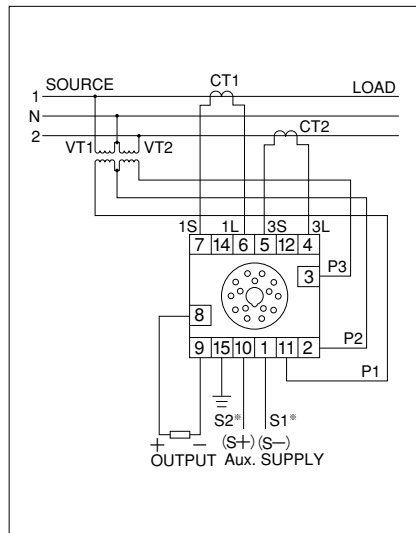
## SPECIFIC CHARACTER

- (1) Tolerance  
±0.5% of output span. (Ambient temperature 23 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C 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

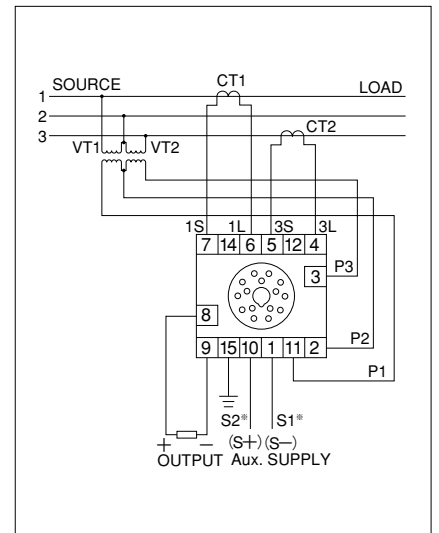
## CONNECTION DIAGRAM



EHP-□1 1PHASE 2WIRE



EHP-□2 1PHASE 3WIRE



EHP-□3 3PHASE 3WIRE

※ Only 19~31V power supply specification has polarity.

## DESIGNATION ITEM AT ORDER

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

## ORDER EXAMPLE

- ① EHP-43-2-8
- ② EHP-43-9-9 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 ~ LAG1000var	200V	5A	50Hz	
	4	LEAD 1000 ~ 0 ~ LAG1000var	200V	5A	60Hz	
	9	OTHER				
1φ3W RHP-□2	1	LEAD 1000 ~ 0 ~ LAG1000var	2×100V	5A	50Hz	
	2	LEAD 1000 ~ 0 ~ LAG1000var	2 ×100V	5A	60Hz	
	3	LEAD 2000 ~ 0 ~ LAG2000var	2 ×200V	5A	50Hz	
	4	LEAD 2000 ~ 0 ~ LAG2000var	2×200V	5A	60Hz	
	9	OTHER				
3φ3W RHP-□3	1	LEAD 1000 ~ 0 ~ LAG1000var	110V	5A	50/60Hz	
	2	LEAD 2000 ~ 0 ~ LAG2000var	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	2kΩ ~ ∞	
4	- 10 ~ 0 ~ + 10 V	5kΩ ~ ∞	
5	1 ~ 3 ~ 5 V	2kΩ ~ ∞	
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		

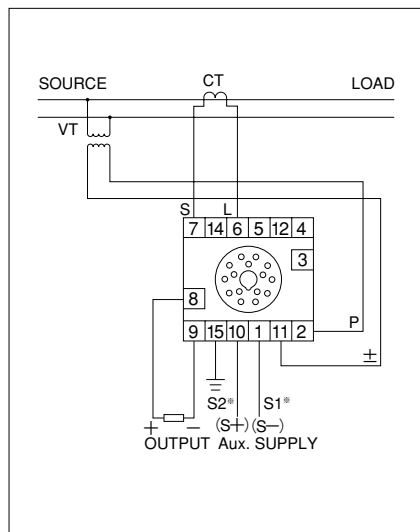
AUXILIARY POWER SUPPLY			
MARK	USE RANGE	CONSUMPTION WATT	REMARK
1	DC 19~31V	approx. 3 W	Please inquire about items not listed on the left.
4	AC 80~264V (50/60Hz) DC 80~143V	approx. 4 VA approx. 3 W	
9	OTHER		

# GP AND HP SERIES

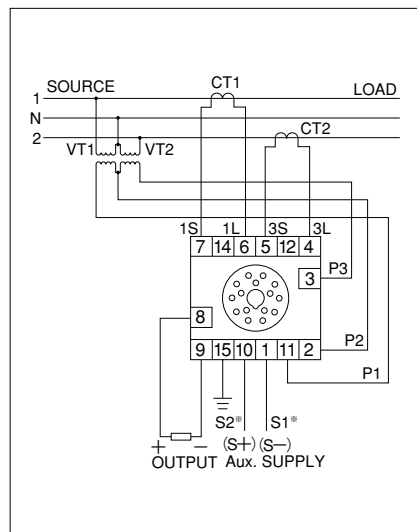
## SPECIFIC CHARACTER

- (1) Tolerance  
±0.5% of output span. (Ambient temperature 23 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C 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

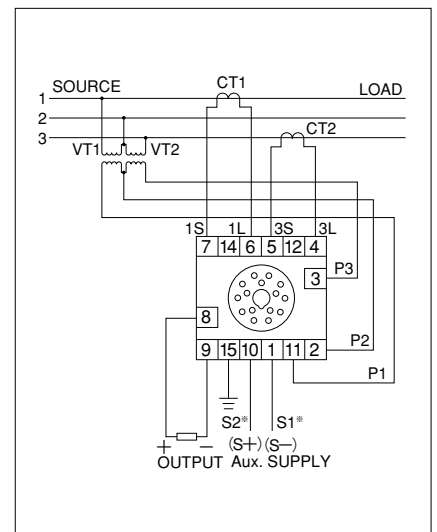
## CONNECTION DIAGRAM



RHP-□1 1PHASE 2WIRE



RHP-□2 1PHASE 3WIRE



RHP-□3 3PHASE 3WIRE

※ Only 19~31V power supply specification has polarity.

## DESIGNATION ITEM AT ORDER

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

## ORDER EXAMPLE

- ① RHP-43-2-8
- ② RHP-43-9-9 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	2kΩ ~ ∞	
4	- 10 ~ 0 ~ + 10 V	5kΩ ~ ∞	
5	1 ~ 3 ~ 5 V	2kΩ ~ ∞	
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

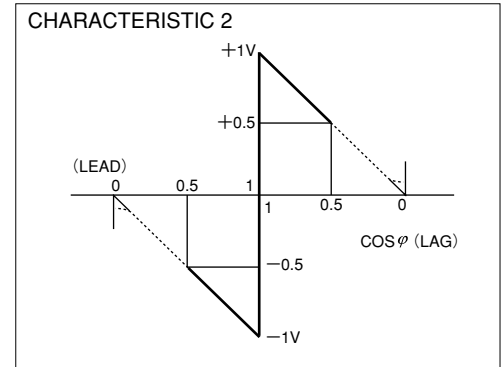
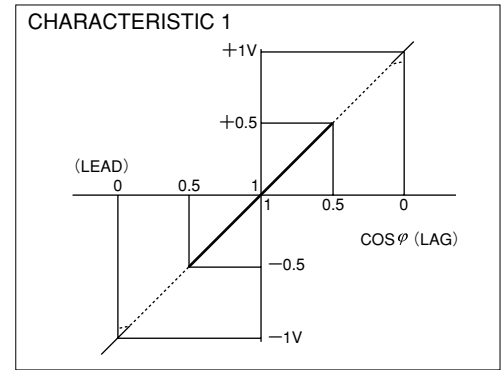
MARK	USE RANGE	CONSUMPTION WATT	REMARK
1	DC 19~31V	approx. 3 W	Please inquire about items not listed on the left.
4	AC 80~264V (50/60Hz) DC 80~143V	approx. 4 VA approx. 3 W	
9	OTHER		

# GP AND HP SERIES

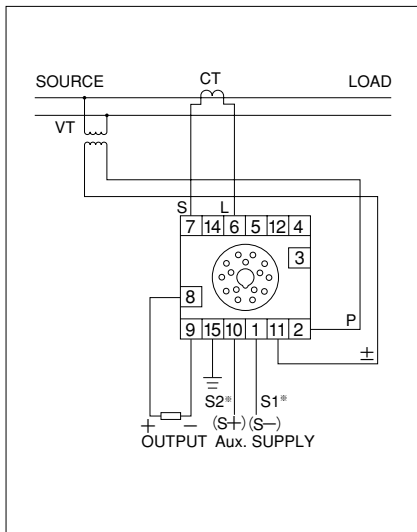
## SPECIFIC CHARACTER

- (1) Tolerance  
±2% of output span. (Ambient temperature 23 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C 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

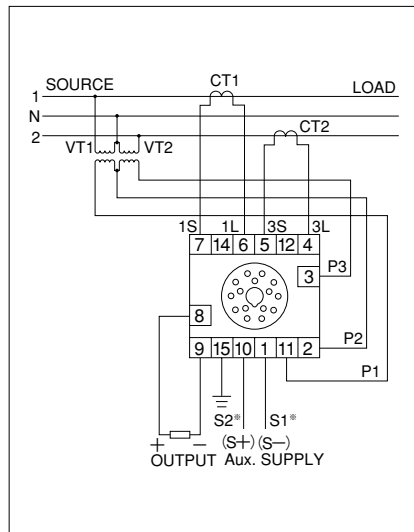
Power factor transducer may have the two types of characteristics shown below. If no preference is specified characteristics will be as shown in 1.



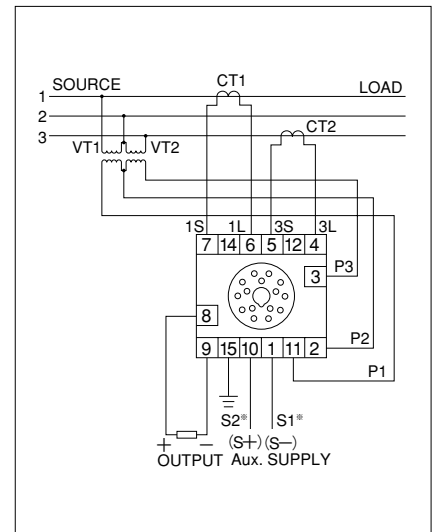
## CONNECTION DIAGRAM



NHP-□1 1PHASE 2WIRE



NHP-□2 1PHASE 3WIRE



NHP-□3 3PHASE 3WIRE

※ Only 19~31V power supply specification has polarity.

## DESIGNATION ITEM AT ORDER

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

## ORDER EXAMPLE

- ① NHP-43-2-8
- ② NHP-43-9-8 INPUT : LEAD 0.5~1~LAG 0.5, 115V, 5A

※ Power factor measurement in circuits that have tidal currents

The effective 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 receipt 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.

# GP AND HP SERIES

## ISOLATOR

DGP-□

DGP-□L : With limiter

Plug-in type makes upkeep and changes in configuration simple.  
Improved reliability and greater compactness through the use of custom ICs.  
Photocouple provides complete insulation between input and output.



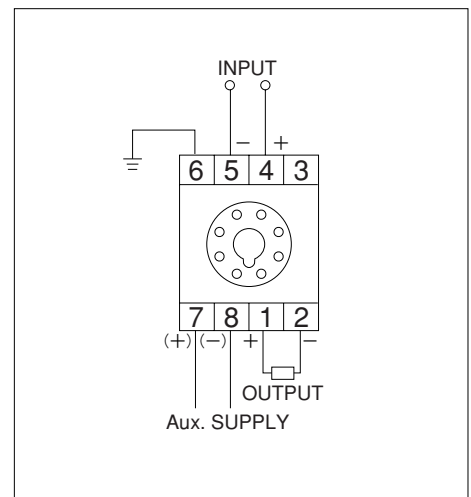
### SPECIFICATION

INPUT	OUTPUT	AUXILIARY POWER SUPPLY
8 standard type of input are available	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. 2.5 W DC 48V (38~62V) approx. 2.5 W
Available with voltage input range DC 0.1mA~100mA current input range DC 10mV~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  
±0.25% of output span. (Ambient temperature 23 °C)  
In case of input or output range at below 50mV :  
±0.5% of output span.
- (2) Effect of temperature  
Within ±0.25% of output span. (For 23°C±10°C variations)  
In case of input or output range at below 50mV:  
±0.5% of output span.
- (3) Effect of auxiliary power supply  
Within ±0.1% of output span. (For rated voltage ±10% variations)
- (4) Effect of load resistance  
Within ±0.05% of output span. (For load resistance range)
- (5) Output ripple  
Within 0.5%p-p of output span.
- (6) Response time  
Shorter than 0.5sec. (Time to 99% output)
- (7) Dielectric strength  
2000V AC,1min. (50/60Hz)  
(Between input,output,auxiliary power supply and external case)
- (8) Insulation resistance  
Higher than 100MΩ at 500V megger.  
(Between input,output,auxiliary power supply and external case)
- (9) Weight  
Approx.410g

### CONNECTION DIAGRAM



### DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT	4. H LIMITER, L LIMITER
DGP-□ DGP-□L	-□	-□	-□ □

AUXILIARY POWER SUPPLY		INPUT		INPUT IMP.	OUTPUT		LOAD RESIS.	LIMITER SET POINT(%)		
1	DC 24V	1	DC 0 ~ 100mV	100 kΩ	1	DC 0 ~ 100mV	600Ω ~ ∞	1	H SIDE SET POINT	110
2	AC 100V/110V 50/60Hz	2	DC 0 ~ 1 V	1MΩ	2	DC 0 ~ 1 V	600Ω ~ ∞	2		100
3	AC 200V/220V 50/60Hz	3	DC 0 ~ 5 V	1MΩ	3	DC 0 ~ 5 V	600Ω ~ ∞	3		80
		4	DC 0 ~ 10 V	1MΩ	4	DC 0 ~ 10 V	600Ω ~ ∞	4		70
5	DC 100V/110V	5	DC 1 ~ 5 V	1MΩ	5	DC 1 ~ 5 V	600Ω ~ ∞	5	L SIDE SET POINT	30
6	DC 48V	6	DC 0 ~ 1mA	100 Ω	6	DC 0 ~ 1mA	0 ~ 10kΩ	6		20
		7	DC 0 ~ 10mA	10 Ω	7	DC 0 ~ 10mA	0 ~ 1kΩ	7		0
		8	DC 4 ~ 20mA	10 Ω	8	DC 4 ~ 20mA	0 ~ 550 Ω	8		-10
9	OTHER	9	OTHER INPUT		9	OTHER OUTPUT		9	OTHER	
								0	NO LIMITER	

### ORDER EXAMPLE

- ① DGP-1-1-8
- ② DGP-2L-8-4-27
- ③ DGP-2-9-9 INPUT : DC 0~5mA, OUTPUT : DC 0~7V

※For special specifications please consult company representatives.

# GP AND HP SERIES

## 2 OUTPUT TYPE ISOLATOR

DXP-□

DXP-□L : With limiter

Plug-in type makes upkeep and changes in configuration simple.  
Improved reliability and greater compactness through the use of custom ICs.  
Photocouple provides complete insulation between input and output.



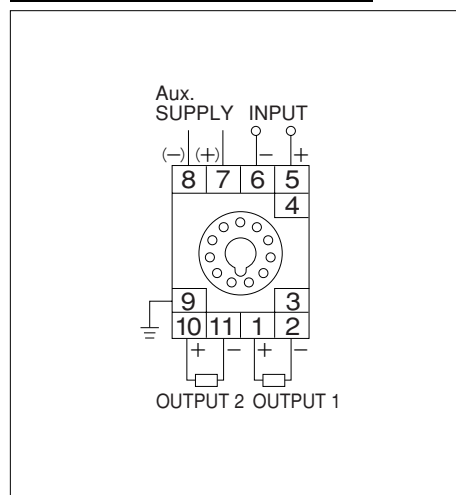
### SPECIFICATION

INPUT	OUTPUT	AUXILIARY POWER SUPPLY
8 standard type of input are available	8 standard type of output are available	AC 100/110V(+30~-20%) 50/60Hz approx. 7.5 VA AC 200/220V(+15~-20%) 50/60Hz approx.13 VA DC 24V (+15~-20%) approx. 3.5 W DC 100/110V(+30~-20%) approx. 3.5 W types are immediately available. For types not listed above contact a company representative.
Available with voltage input range DC 0.1mA~100mA  current input range DC 10mV~100V	Available with Max.voltage output 10V (600Ω~∞)  Max.current output 20mA (0 ~550Ω)	

### SPECIFIC CHARACTER

- (1) Tolerance  
±0.25% of output span. (Ambient temperature 23 °C)  
In case of input or output range at below 50mV:  
±0.5% of output span.
- (2) Effect of temperature  
Within ±0.25% of output span. (For 23°C±10°C variations)  
In case of input or output range at below 50mV:  
±0.5% of output span.
- (3) Effect of auxiliary power supply  
Within ±0.1% of output span. (For rated voltage ±10% variations)
- (4) Effect of load resistance  
Within ±0.05% of output span. (For load resistance range)
- (5) Output ripple  
Within 0.5%p-p of output span.
- (6) Response time  
Shorter than 0.5sec. (Time to 99% output)
- (7) Dielectric strength  
2000V AC,1min.(50/60Hz)  
(Between input,output,auxiliary power supply and external case)  
500V AC,1min.(50/60Hz)  
(Between output1 and output2)
- (8) Insulation resistance  
Higher than 100MΩ at 500V megger.  
(Between input,output1,output2,auxiliary power supply and external case)
- (9) Weight  
Approx.410g

### CONNECTION DIAGRAM



### DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT1	4. OUTPUT2	5. H LIMITER, L LIMITER
DXP-□ DXP-□L	-□	-□	-□	-□ □

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

	INPUT	INPUT IMP.
1	DC 0 ~ 100mV	100 kΩ
2	DC 0 ~ 1 V	1 MΩ
3	DC 0 ~ 5 V	1 MΩ
4	DC 0 ~ 10 V	1 MΩ
5	DC 1 ~ 5 V	1 MΩ
6	DC 0 ~ 1mA	100 Ω
7	DC 0 ~ 10mA	10 Ω
8	DC 4 ~ 20mA	10 Ω
9	OTHER INPUT	

	OUTPUT	LOAD RESIS.
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	

	LIMITER SET POINT(%)
1	110
2	100
3	80
4	70
5	30
6	20
7	0
8	-10
9	OTHER
0	NO LIMITER

### ORDER EXAMPLE

- ① DXP-1-1-85
- ② DXP-2L-8-46-27
- ③ DXP-2-9-99 INPUT : DC 0~5mA, OUTPUT1 : DC 0~7V,OUTPUT2 : DC 0~5mA

※For special specifications please consult company representatives.

# GP AND HP SERIES

# HIGH SPEED ISOLATOR

DGP-□F

DGP-□FL : With limiter

Plug-in type makes upkeep and changes in configuration simple.  
Improved reliability and greater compactness through the use of custom ICs.  
Photocouple provides complete insulation between input and output.  
500μsec response. 0%-90% achieved.



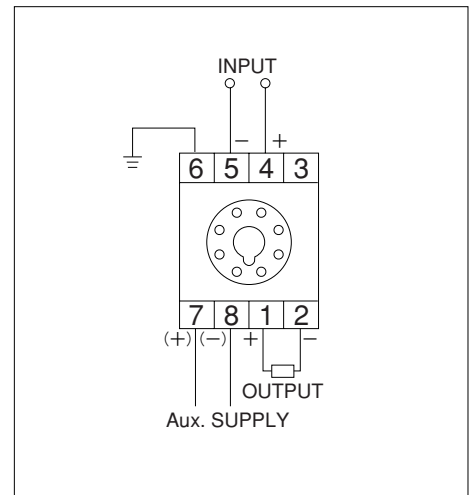
## SPECIFICATION

INPUT	OUTPUT	AUXILIARY POWER SUPPLY
8 standard type of input are available	8 standard type of output are available	AC 100/110V ±10% 50/60Hz approx. 3.5 VA AC 200/220V ±10% 50/60Hz approx. 3.5 VA DC 24V ±10% approx. 3.5 W DC 100/110V ±10% approx. 3.5 W
Available with voltage input range DC 0.1mA~100mA current input range DC 0.10mV~300V	Available with Max.voltage output 10V (5k Ω~∞) Max.current output 20mA (0 ~550Ω)	types are immediately available. For types not listed above contact a company representative.

## SPECIFIC CHARACTER

- (1) Tolerance  
±0.25% of output span. (Ambient temperature 23 °C)  
In case of input or output range at below 50mV:  
±0.5% of output span.
- (2) Effect of temperature  
Within ±0.25% of output span. (For 23 °C±10°C variations)  
In case of input or output range at below 50mV:  
±0.5% of output span.
- (3) Effect of auxiliary power supply  
Within ±0.1% of output span. (For rated voltage ±10% variations)
- (4) Effect of load resistance  
Within ±0.05% of output span. (For load resistance range)
- (5) Output ripple  
Within 0.5%p-p of output span.
- (6) Response time  
Shorter than 500μsec. (Time to 90% output)
- (7) Dielectric strength  
2000V AC, 1min. (50/60Hz)  
(Between input, output, auxiliary power supply and external case)
- (8) Insulation resistance  
Higher than 100MΩ at 500V megger.  
(Between input, output, auxiliary power supply and external case)
- (9) Weight  
Approx. 410g

## CONNECTION DIAGRAM



## DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT	4. H LIMITER, L LIMITER
DGP-□F DGP-□FL	-□	-□	-□ □

AUXILIARY POWER SUPPLY		INPUT		INPUT IMP.	OUTPUT		LOAD RESIS.	LIMITER SET POINT(%)		
1	DC 24V	1	DC 0 ~ 100mV	100 kΩ	1	DC 0 ~ 100mV	10 kΩ ~ ∞	1	H SIDE SET POINT	110
2	AC 100V/110V 50/60Hz	2	DC 0 ~ 1 V	1 MΩ	2	DC 0 ~ 1 V	500 Ω ~ ∞	2		100
3	AC 200V/220V 50/60Hz	3	DC 0 ~ 5 V	1 MΩ	3	DC 0 ~ 5 V	2.5kΩ ~ ∞	3		80
		4	DC 0 ~ 10 V	1 MΩ	4	DC 0 ~ 10 V	5 kΩ ~ ∞	4		70
5	DC 100V/110V	5	DC 1 ~ 5 V	1 MΩ	5	DC 1 ~ 5 V	2.5 Ω ~ ∞	5	L SIDE SET POINT	30
		6	DC 0 ~ 1mA	100 Ω	6	DC 0 ~ 1mA	0 ~ 10 kΩ	6		20
		7	DC 0 ~ 10mA	10 Ω	7	DC 0 ~ 10mA	0 ~ 1 kΩ	7		0
		8	DC 4 ~ 20mA	10 Ω	8	DC 4 ~ 20mA	0 ~ 500 Ω	8		-10
9	OTHER	9	OTHER INPUT		9	OTHER OUTPUT		9	OTHER	
								0	NO LIMITER	

## ORDER EXAMPLE

- ① DGP-1F-1-8
  - ② DGP-2FL-8-4-27
  - ③ DGP-2F-9-9 INPUT : DC 0~5mA, OUTPUT : DC 0~7V
- ※ For special specifications please consult company representatives.

# GP AND HP SERIES

## TEMPERATURE TRANSDUCER

**CGP-□** : As a temperature sensor the resistance temperature detector is a temperature-DC conversion device.

Generous input specifications. •From  $-200^{\circ}\text{C}$  to  $+500^{\circ}\text{C}$ .  
Photocouple provides complete insulation between input and output-the influence of common mode noise is excluded and stable operation is ensured (AC 2000V, 1 min.).

Linearizer is standard. •Linearity below  $\pm 0.2\%$ .

Influence of connecting cable is excluded. -Resistance temperature detector drives a constant, the type of measurement errors that are caused by the use of a connecting cable do not happen.

Equipped with burnout function. •Sensor circuit failure immediately detected and output.

Plug-in type makes upkeep and changes in configuration simple.



### SPECIFICATION

INPUT	OUTPUT	AUXILIARY POWER SUPPLY
Platinum resistance temperature detector, 3-lead type : Pt100 $\Omega$ , JPt100 $\Omega$ . Standard six bands of measured temperature range. Regulated sensor current : DC 2mA	8 standard type of output are available. Burnout : Upper	AC 100/110V $\pm 10\%$ 50/60Hz approx. 3 VA AC 200/220V $\pm 10\%$ 50/60Hz approx. 3 VA DC 24V $\pm 10\%$ approx. 3 W DC 100/110V $\pm 10\%$ approx. 3.5 W DC 48V (38~62V) approx. 3 W
Available resistance temperature detectors Platinum(Pt, JPt)100 $\Omega$ (0 $^{\circ}\text{C}$ ) -input span of over 50 $^{\circ}\text{C}$ When resistance temperature detectors not conforming to JISC 1604-1997 are specified please indicate the resistans line curve.	Available with Max.voltage output 10V (600 $\Omega$ ~ $\infty$ ) Max.current output 20mA (0~550 $\Omega$ ) The burnout value may be lowered according to your needs.	types are immediately available. For types not listed above contact a company representative.

### SPECIFIC CHARACTER

#### (1) Available resistance temperature detectors

Platinum(Pt, JPt)100 $\Omega$  -input span of over  $50^{\circ}\text{C}$

Platinum(Pt)50 $\Omega$  -input span of over  $100^{\circ}\text{C}$

at JIS C 1604-1997(resistance temperature detector)

As well as nickel, platinum-cobalt, and copper resistance temperature

detectors that conform to JIS C 1604-1997 are also available;

please contact a company representative and explain your need.

Input system 3-lead type (permissible line resistance, 200 $\Omega$  per lead)

#### (2) Regulated sensor current

DC 2mA

#### (3) Tolerance

$\pm 0.5\%$  of output span. (Ambient temperature  $23^{\circ}\text{C}$ )

#### (4) Effect of temperature

Within  $\pm 0.2\%$  of output span. (For  $23^{\circ}\text{C} \pm 10^{\circ}\text{C}$  variations)

#### (5) Effect of auxiliary power supply

Within  $\pm 0.1\%$  of output span. (For rated voltage  $\pm 10^{\circ}\text{C}$  variations)

#### (6) Effect of load resistance

Within  $\pm 0.05\%$  of output span. (For load resistance range)

#### (7) Output ripple

Within 0.5%p-p of output span.

#### (8) Response time

Shorter than 0.5sec. (Time to 99% output)

#### (9) Dielectric strength

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

#### (10) Insulation resistance

Higher than 100M $\Omega$  at 500V megger. (Between input, output, auxiliary power supply and external case)

#### (11) Built-in Functions

Isolation (photo-couple method)-standard

Linearizer (linearity within  $\pm 0.2\%$ )-standard

Burnout function-In the standard specification burnout is set for when the following upper limit is exceeded: when the output value = max. output value + 10~15% of the output span (e.g., 21.6~22.4mA when the output is 4~20mA).

The burnout value may be lowered according to your needs.

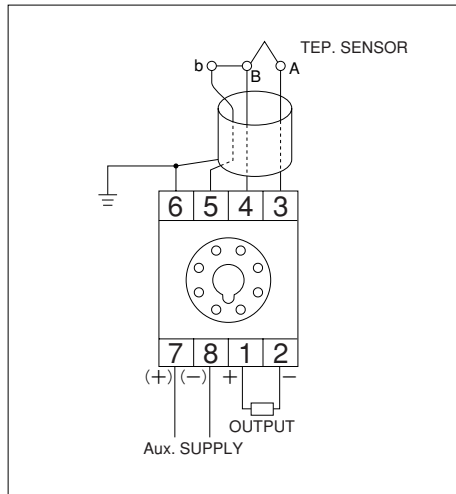
#### (12) Weight

Approx. 410g



# GP AND HP SERIES

## CONNECTION DIAGRAM



## DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
CGP-□	-□□	-□

	AUXILIARY POWER SUPPLY
1	DC 24V
2	AC 100V/110V 50/60Hz
3	AC 200V/220V 50/60Hz
4	
5	DC 100V/110V
6	DC 48V
7	
8	
9	OTHER

	TEP.SENSOR		INPUT
1	Pt 100Ω	1	0 ~ 100°C
2	JPt 100Ω	2	0 ~ 200°C
3		3	0 ~ 300°C
4		4	0 ~ 400°C
5		5	-50 ~ 50°C
6		6	-100 ~ 200°C
7			
8			
9	OTHER	9	OTHER

	OUTPUT	LOAD RESIS.
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 CGP-1-12-8

② CGP-2-99-9 INPUT : 0~150°C, JPt 50Ω, OUTPUT : DC 0~7V

※For special specifications please consult company representatives.

# GP AND HP SERIES

## TEMPERATURE TRANSDUCER

**JGP-□** : As a temperature sensor the thermocouple is a temperature-DC conversion device.

Generous input specifications. •Covers the seven types of sensor, ranging from 0~1700°C, regulated by JIS C 1602-1995(thermocouples).

Photocouple provides complete insulation between input and output-the influence of common mode noise is excluded and stable operation is ensured(AC 2000V, 1 min.).

Linearizer is standard. •Linearity below  $\pm 0.3\%$ .

Cold junction compensation(standard junction compensation) is standard ambient temperature range  $-10^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$

Equipped with burnout function.-Sensor circuit failure immediately detected and output.

Plug-in type makes upkeep and changes in configuration simple.



### SPECIFICATION

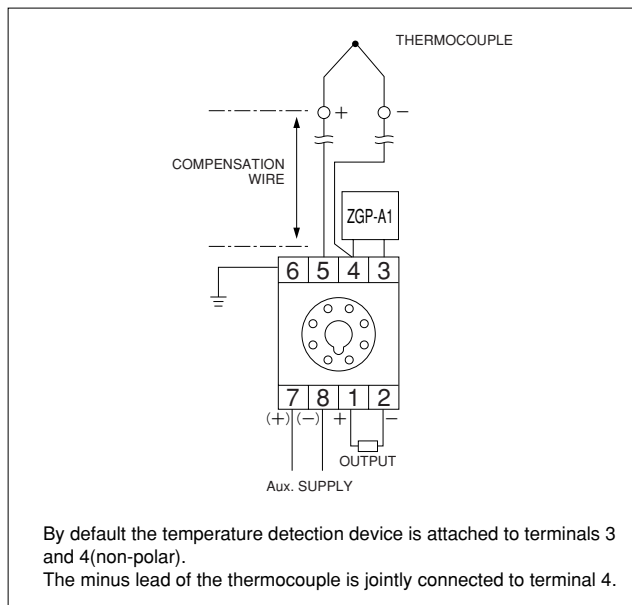
INPUT	OUTPUT	AUXILIARY POWER SUPPLY
Three types of B, R, S, K, E, J, T, N thermocouples conforming to JIS C 1602-1995. Six bands of measurement temperature range are standard. Cold junction compensation built-in.	8 standard type of output are available. Burnout: Upper	AC 100/110V $\pm 10\%$ 50/60Hz approx. 3 VA AC 200/220V $\pm 10\%$ 50/60Hz approx. 3 VA DC 24V $\pm 10\%$ approx. 3 W DC 100/110V $\pm 10\%$ approx. 3 W DC 48V (38~62V) approx. 3 W
Available types of thermocouple standards Thermocouples based on JIS C 1602-1995 Corresponding to B,R,S,K(CA),E(CRC),J(IC),T(CC) For special temperature measurement ranges please contact a company representative and explain you needs	Available with Max.voltage output 10V (600 $\Omega$ ~ $\infty$ ) Max.current output 20mA (0~550 $\Omega$ ) The burnout value may be lowered according to your needs.	types are immediately available. For types not listed above contact a company representative.

### SPECIFIC CHARACTER

- (1) Available types of thermocouple  
B, R, S, K(CA), E(CRC), J(IC), T(CC), N thermocouples conforming to on JIS C 1602-1995(letters in brackets refer to former JIS designations).
- (2) Tolerance  
 $\pm 0.5\%$  of output span. (Ambient temperature  $23^{\circ}\text{C}$ )
- (3) Effect of temperature  
Within  $\pm 0.2\%$  of output span. (For  $23^{\circ}\text{C} \pm 10^{\circ}\text{C}$  variations)
- (4) Effect of auxiliary power supply  
Within  $\pm 0.1\%$  of output span. (For rated voltage  $\pm 10\%$  variations)
- (5) Effect of load resistance  
Within  $\pm 0.05\%$  of output span. (For load resistance range)
- (6) Output ripple  
Within 0.5%p-p of output span.
- (7) Response time  
Shorter than 0.5sec. (Time to 99% output)
- (8) Dielectric strength  
2000V AC, 1min. (50/60Hz)  
(Between input,output,auxiliary power supply and external case)
- (9) Insulation resistance  
Higher than 100M $\Omega$  at 500V megger.  
(Between input,output,auxiliary power supply and external case)
- (10) Built-in Functions  
Isolation(photo-couple method)-standard  
Linearizer(linearity within  $\pm 0.3\%$ )-standard  
Burnout function - In the standard specification burnout is set for when the following upper limit is exceeded: when the output value = max.output value + 10~15% of the output span (e.g., 21.6~22.4mA when the output is 4~20mA).  
The burnout value may be lowered according to your needs.
- (11) Attachment  
Temperature detection device for Cold junction compensation  
Type : ZGP-A1
- (12) Weight  
Approx. 410g

# GP AND HP SERIES

## CONNECTION DIAGRAM



## AVAILABLE WORKING RANGE

SENSOR TYPE	AVAILABLE WORKING RANGE	MIN. TEMP. RANGE OF AVAILABLE TYPES
B	300°C ~ 1820°C	1000°C
R	-50°C ~ 0°C ~ 1760°C	1000°C
S	-50°C ~ 0°C ~ 1760°C	1000°C
K(CA)	-270°C ~ 0°C ~ 1370°C	100°C
E(CRC)	-270°C ~ 0°C ~ 1000°C	100°C
J(IC)	-270°C ~ 0°C ~ 1200°C	100°C
T(CC)	-270°C ~ 0°C ~ 400°C	100°C
N	-270°C ~ 0°C ~ 1300°C	200°C

## DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
JGP-□	-□□	-□

	AUXILIARY POWER SUPPLY
1	DC 24V
2	AC 100V/110V 50/60Hz
3	AC 200V/220V 50/60Hz
5	DC 100V/110V
6	DC 48V
9	OTHER

	TEMP. SENSOR		INPUT
1	K(CA)	1	0 ~ 100°C
2	E(CRC)	2	0 ~ 200°C
3	J(IC)	3	0 ~ 300°C
4	T	4	0 ~ 400°C
5	R	5	0 ~ 500°C
6	B	6	0 ~ 800°C
7	S	7	0 ~ 1000°C
8	N	8	0 ~ 1200°C
9	OTHER	9	OTHER

	OUTPUT	LOAD RESIS.
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 JGP-1-12-8

② JGP-2-99-9 INPUT : 0~300°C,T(CC), OUTPUT : DC 0~7V

※ For special specifications please consult company representatives.

# GP AND HP SERIES

## POTENTIOMETER TRANSDUCER

**KGP-□** : To fit all types of opening a rotating sensor is used.  
A transducer that performs input as a potentiometer.

Plug-in type makes upkeep and changes in configuration simple.  
Potentiometer not selected resistance ranges from 100Ω to 10kΩ.  
The rared output can be adjusted if it is 50% over the operating range.  
Photocouple provides complete insulation between input and output.



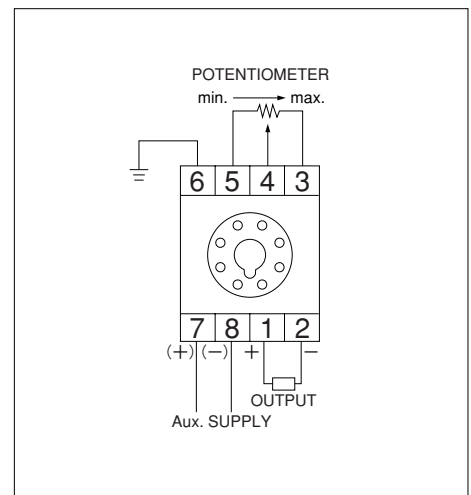
### SPECIFICATION

INPUT	OUTPUT	AUXILIARY POWER SUPPLY
Potentiometer standard is set for when resistance values are between 100Ω to 10kΩ and when the entire operating range is 50% higher.	8 standard type of output are available	AC 100/110V ±10% 50/60Hz approx. 3 VA AC 200/220V ±10% 50/60Hz approx. 3 VA DC 24V ±10% approx. 3 W DC 100/110V ±10% approx. 3 W
Potentiometers which work in ranges that are 33% higher than the entire operating range are also available.	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 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C variations)  
In case of input or output range
- (3) Effect of auxiliary power supply  
Within ±0.25% of output span. (For rated voltage ±10% variations)
- (4) Effect of load resistance  
Within ±0.05% of output span. (For load resistance range)
- (5) Output ripple  
Within 0.5%p-p of output span.
- (6) Response time  
Shorter than 1sec. (Time to 99% output)
- (7) Dielectric strength  
2000V AC, 1min. (50/60Hz)  
(Between input, output, auxiliary power supply and external case)
- (8) Insulation resistance  
Higher than 100MΩ at 500V megger.  
(Between input, output, auxiliary power supply and external case)
- (9) Weight  
Approx. 410g

### CONNECTION DIAGRAM



### DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
KGP-□	-□	-□

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

	INPUT
1	RESISTANCE RANGES FROM 100Ω TO 10kΩ AND 50% OVER THE OPERATING RANGE
9	OTHER INPUT

	OUTPUT	LOAD RESIS.
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 KGP-1-1-8
- ② KGP-2-9-9 INPUT : 1kΩ, 0~80%, OUTPUT : DC 0~8V

※For special specifications please consult company representatives.

# GP AND HP SERIES

## rpm TRANSDUCER

TGP-□

TGP-□S : Slow pulse input type

TGP-□D : With power supply for sensor

A transducer that outputs a DC signal in proportion to AC signal and pulse sequence signal frequency.  
A combination alternating current device generator and pulse encoder that supplies a direct current signal in proportion to the number of revolutions and the speed.



Plug-in type makes upkeep and changes in configuration simple.  
Improved reliability and greater compactness through the use of custom ICs.  
The rared output can be adjusted if it is 50% over the operating range.  
Photocouple provides complete insulation between input and output.

### SPECIFICATION

INPUT	OUTPUT	AUXILIARY POWER SUPPLY
3 standard type of sensor and 7 standard type of input are available	8 standard type of output are available	AC 100/110V ±10% 50/60Hz approx. 3.5 VA AC 200/220V ±10% 50/60Hz approx. 3.5 VA DC 24V ±10% approx. 3 W DC 100/110V ±10% approx. 3.5 W
Available with frequency input range : 9Hz~30kHz Available with sensor range AC voltage : below 200Vrms Voltage pulse : below 50V Contact signal : below 15V, 10mA	Available with Max.voltage output 10V(600Ω~∞) Max.current output 20mA(0~500Ω)	types are immediately available. For types not listed above contact a company representative.

SPECIFICATION	ATTENTION
Input frequency is a slow pulse specification of below 25Hz. Either slow pulse specification electric pulse or contact signal can become the input.	When the input frequency is simultaneously converted output overshoot of about 5% may occur. When the input signal is AC there may be no response at voltages of less than 5%.

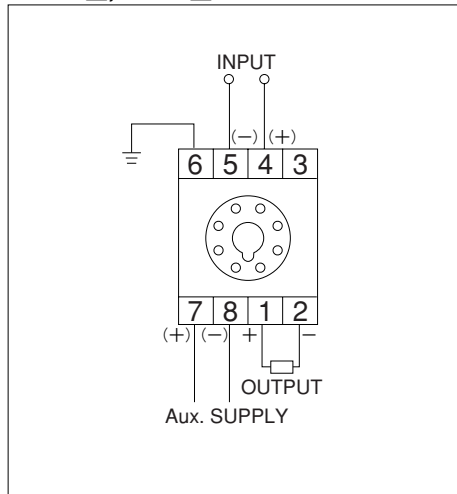
### SPECIFIC CHARACTER

- (1) Tolerance  
±0.5% of output span. (Ambient temperature 23°C)  
Not providing of below 5% at input range (TGP-□, TGP-□D)  
Not providing of below 10% at input range (TGP-□S)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23°C±10°C variations)
- (3) Effect of auxiliary power supply  
Within ±0.25% of output span. (For rated voltage ±10% variations)
- (4) Effect of load resistance  
Within ±0.05% of output span. (For load resistance range)
- (5) Output ripple  
Within 0.5%p-p of output span.
- (6) Response time (Time to 99% output)  
Input : abov 100Hz Shorter than 1sec. 50Hz~100Hz Shorter than 2sec.  
below 50Hz Shorter than 3sec.
- (7) Dielectric strength  
2000V AC, 1min. (50/60Hz)  
(Between input, output, auxiliary power supply and external case)
- (8) Insulation resistance  
Higher than 100MΩ at 500V megger.  
(Between input, output, auxiliary power supply and external case)
- (9) Power supply for sensor (TGP-□D only)  
DC 12V ±1V, max. 30mA
- (10) Weight  
Approx. 410g

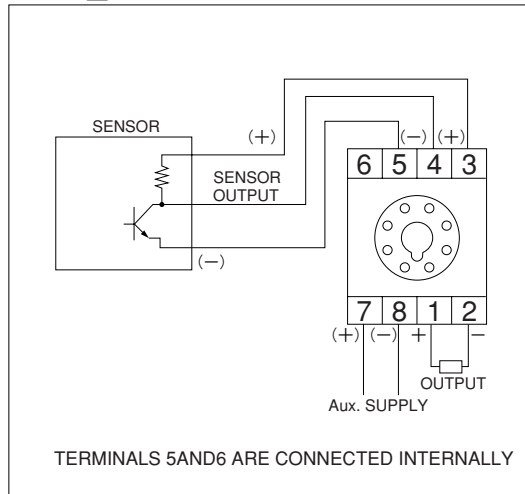
# GP AND HP SERIES

## CONNECTION DIAGRAM

TGP-□, TGP-□S



TGP-□D



### DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
TGP-□ TGP-□S TGP-□D	-□□	-□

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

TYPE	SENSOR		INPUT	
TGP-□ TGP-□D	1	AC voltage	1	0 ~ 25 Hz
	2	Voltage pulse	2	0 ~ 30 Hz
	3	Contact signal	3	0 ~ 50 Hz
			4	0 ~ 100 Hz
			5	0 ~ 200 Hz
			6	0 ~ 500 Hz
			7	0 ~ 1000 Hz
			8	0 ~ 5000 Hz
	9	OTHER	9	OTHER

	OUTPUT		LOAD RESIS.
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 ~ 500 Ω	
9	OTHER OUTPUT		

TYPE	SENSOR		INPUT	
TGP-□S	1	AC voltage	1	0 ~ 9 Hz
	2	Voltage pulse	2	0 ~ 12 Hz
	3	Contact signal	3	0 ~ 15 Hz
			4	0 ~ 18 Hz
			5	0 ~ 20 Hz
			6	
			7	
			8	
	9	OTHER	9	OTHER

### ORDER EXAMPLE

- ① TGP-1-12-8 SENSOR AC 30V
- ② CGP-2-29-9 INPUT : 0~150Hz, SENSOR DC 12V, OUTPUT : DC 0~7V

※For special specifications please consult company representatives.

# GP AND HP SERIES

## DC-PULSE TRANSDUCER (V-F TRANSDUCER)

**EGP-□** : A signal transducer that outputs a frequency pulse signal in proportion to analog signals.

Plug-in type makes upkeep and changes in configuration simple.

By using a high-pressure semiconductor relay it is possible to drive a current of AC 200V.

Photocouple provides complete insulation between input and output.



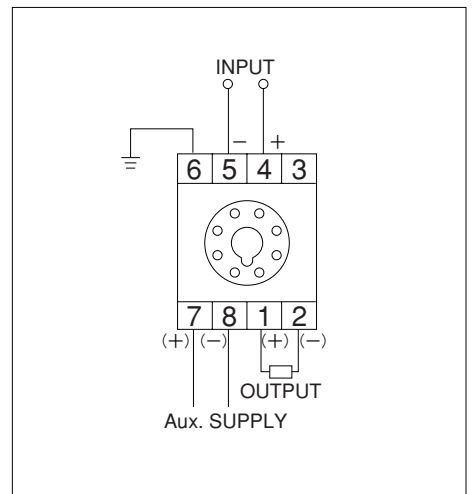
### SPECIFICATION

INPUT	OUTPUT	AUXILIARY POWER SUPPLY
8 standard type of input are available	5 standard type of output are available	AC 100/110V ±10% 50/60Hz approx. 3.5 VA AC 200/220V ±10% 50/60Hz approx. 3.5 VA DC 24V ±10% approx. 3 W
Available with voltage input range DC0.1mA~100mA current input range DC10mV~300V	Available with output range : 0.05~1000Hz	types are immediately available. For types not listed above contact a company representative.
TYPE OF OUTPUT SIGNAL	ATTENTION	
• Tow types of output are available • Non-electrical contact output • Electrical pulse output	An output signal of fixed pulse width is generated without regard to the input signal. Output range ceiling values below 10Hz : approx 50mS. Output range ceiling values over 10Hz : 1/2 the ceiling value cycle. Output cutoff : At an input range lower limit of less than approx.2% output will be shut off. Output protection : Output circuits are equipped with surge absorbers,however,under inductive loading use a device such as a clamp diode or snubber to limit spikes in the current.	

### SPECIFIC CHARACTER

- (1) Tolerance  
±0.5% of output span. (Ambient temperature 23 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C variations)
- (3) Effect of auxiliary power supply  
Within ±0.25% of output span. (For rated voltage ±10% variations)
- (4) Dielectric strength  
2000V AC,1min.(50/60Hz)  
(Between signal circuit,auxiliary power supply and external case)  
1500V AC,1min.(50/60Hz)  
(Between input and output)
- (5) Insulation resistance  
Higher than 100MΩ at 500V megger.  
(Between input,output,auxiliary power supply and external case)
- (6) Weight  
Approx. 410g

### CONNECTION DIAGRAM



### DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
EGP-□	-□	-□□

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

	INPUT	INPUT IMP.
1	DC 0 ~ 100mV	100 kΩ
2	DC 0 ~ 1 V	1MΩ
3	DC 0 ~ 5 V	1MΩ
4	DC 0 ~ 10 V	1MΩ
5	DC 1 ~ 5 V	1MΩ
6	DC 0 ~ 1mA	100Ω
7	DC 0 ~ 10mA	10 Ω
8	DC 4 ~ 20mA	10 Ω
9	OTHER INPUT	

	OUTPUT	PULSE WIDTH
1	0 ~ 1000 Hz	approx. 0.5 ms
2	0 ~ 100 Hz	approx. 5 ms
3	0 ~ 10 Hz	approx. 50 ms
4	0 ~ 1 Hz	approx. 50 ms
5	0 ~ 0.1Hz	approx. 50 ms
9	OTHER OUTPUT	

	TYPE OF OUTPUT SIGNAL
1	Non-electrical contact output (semiconductor relay) Both AC and DC current Permissible peak output voltage : ±350V Peak current : ±100mA On resistance : Max.16Ω Off current leakage : Max. 50μA
2	Electrical pulse output (positive pulse signal) Output voltage : VH=10V ±1V Load current : Max.20mA

### ORDER EXAMPLE

① EGP-1-1-21

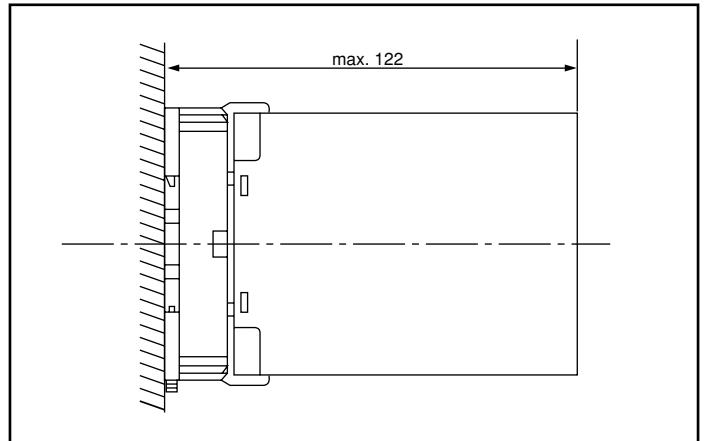
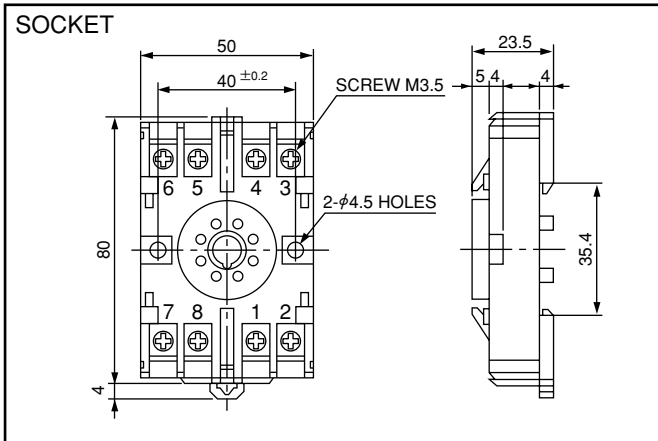
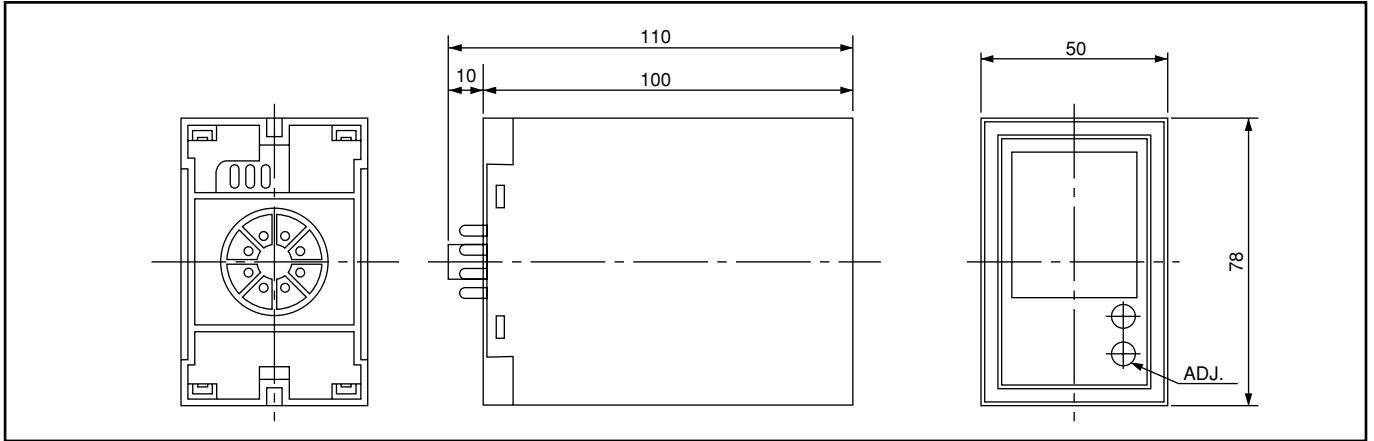
② DGP-2-9-92 INPUT : DC 0~5mA, OUTPUT : 0~50Hz

※For special specifications please consult company representatives.

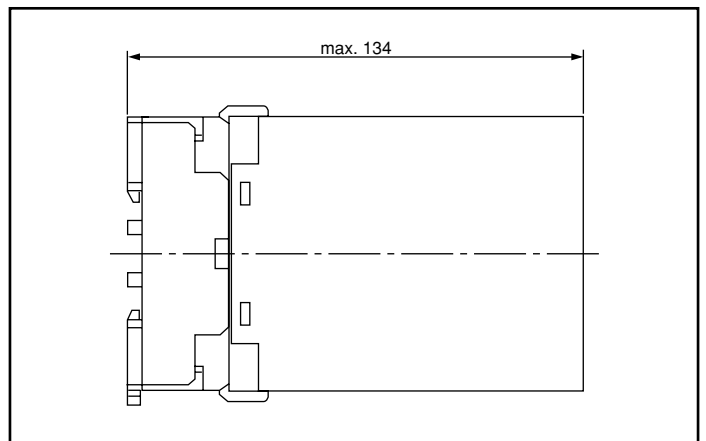
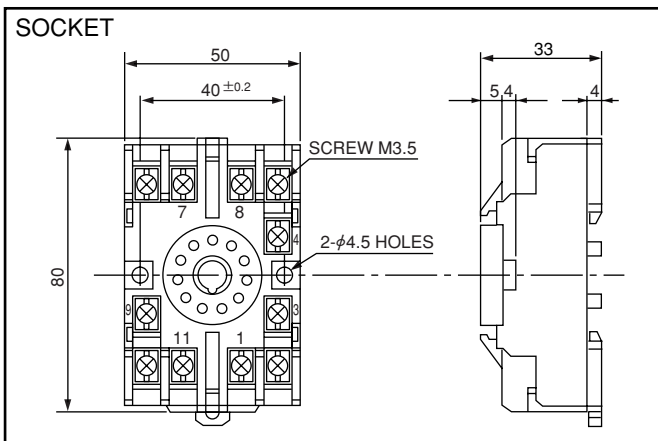
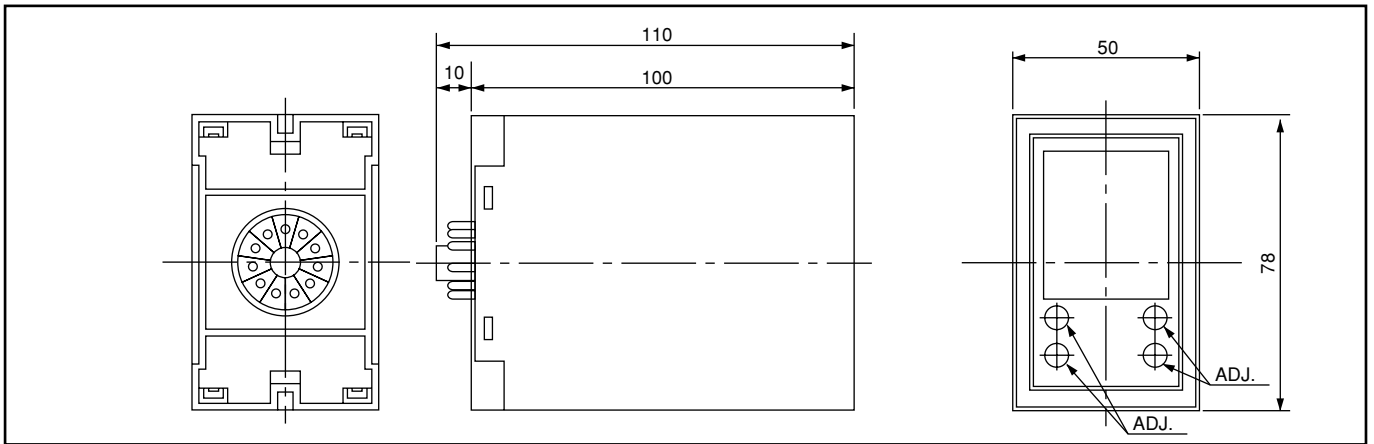
# GP AND HP SERIES

## OUTSIDE VIEW

### GP SERIES



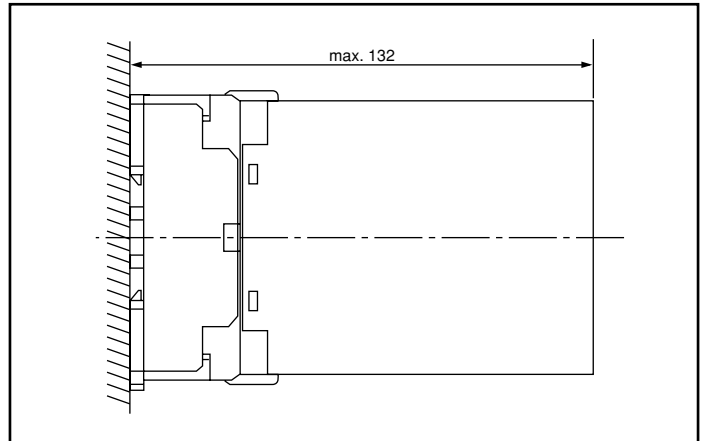
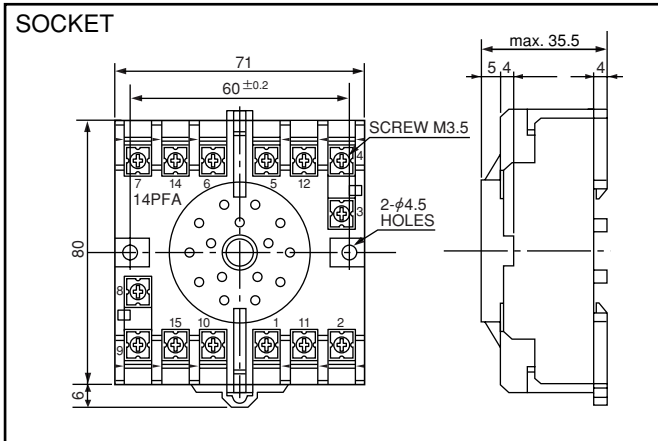
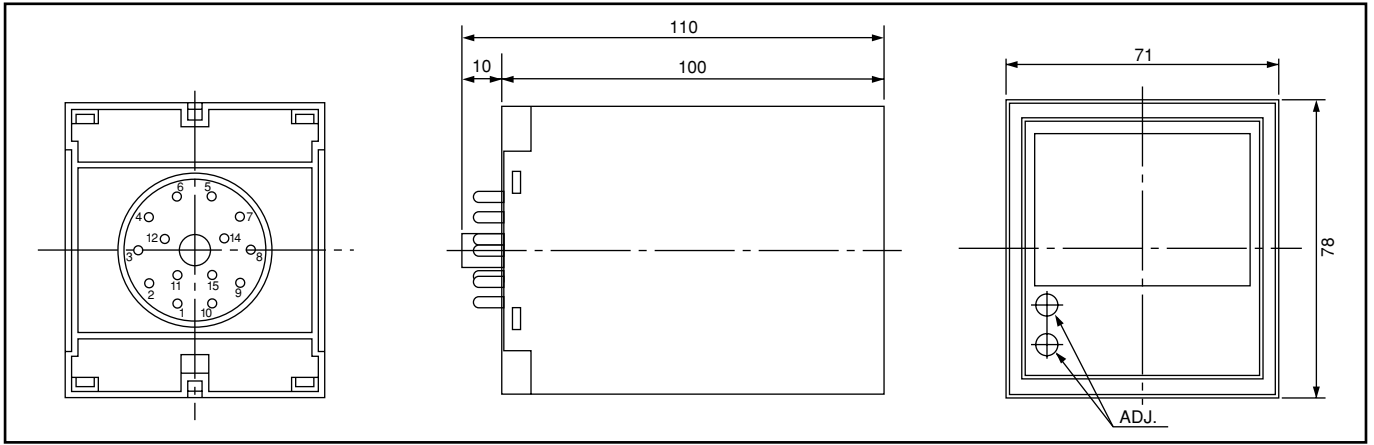
### XP SERIES





# GP AND HP SERIES

## HP SERIES



## ACCESSORIES

These are specialty-use accessories that use a combination GP and HP series signal transducers.

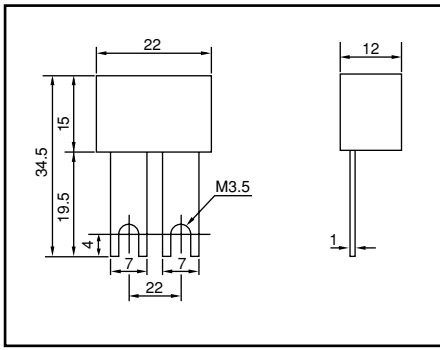
### KIND

TYPE	USE	REMARK
ZGP-A1	For JGP temp. detector	Includes a JGP type thermocouple temperatur transducdr
ZGP-B	For AGP rated 1~5A	These diode units are to prevent the input circuits from remaining open when the main unit is removed from the socket. Use the applicable diode.
ZGP-D2	For DGP curr. input	
ZHP-B	For □HP rated 5A, 1A	

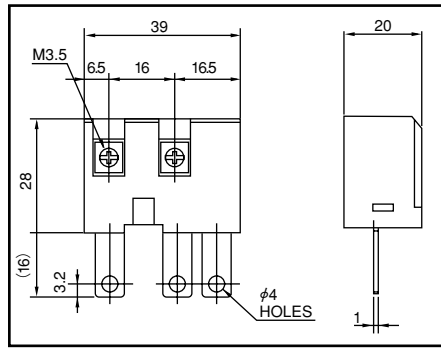
# GP AND HP SERIES

## OUTSIDE VIEW

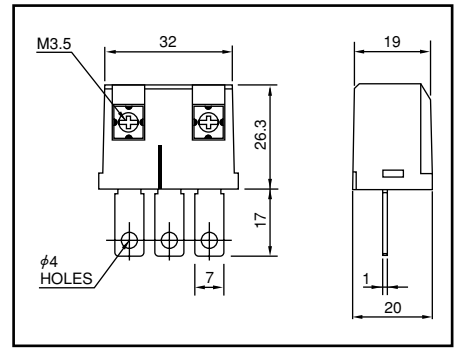
ZGP-A1



ZGP-B□, ZGP-D□

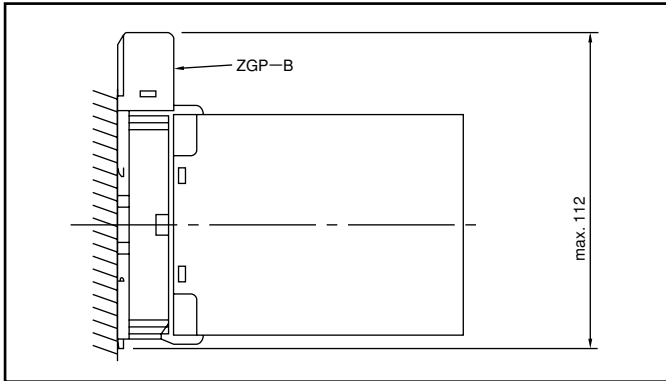


ZHP-B

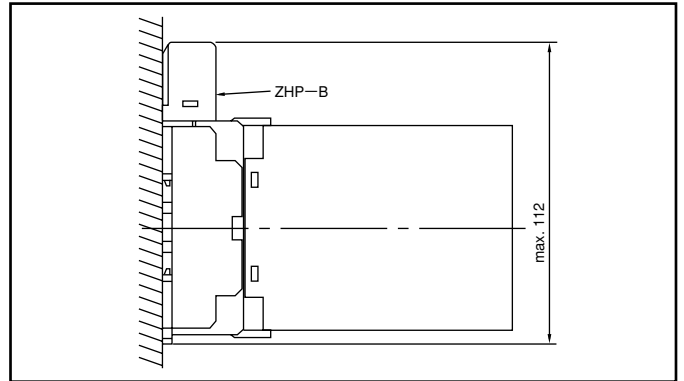


## INSTALL STATE

GP TYPE

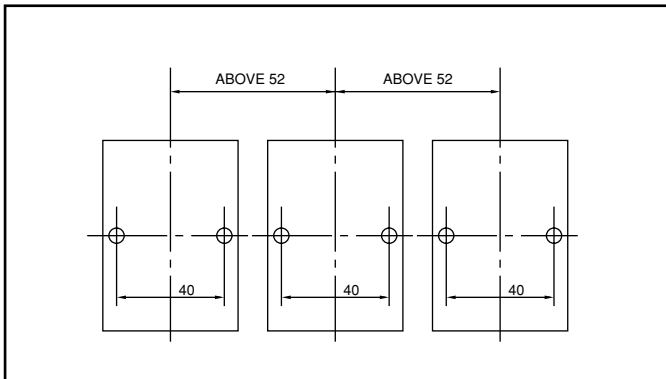


HP TYPE

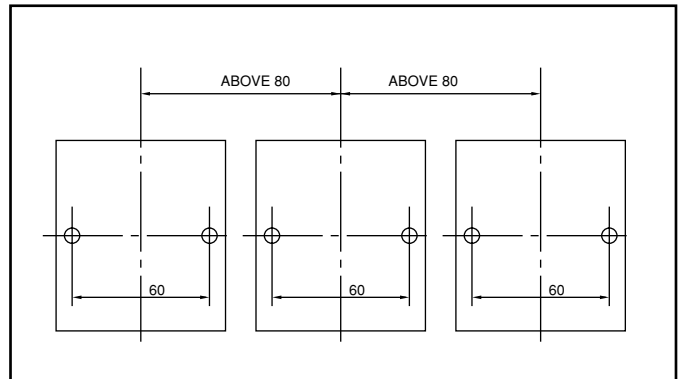


## INSTALL SIZE

GP TYPE



HP TYPE



※ Use M4 mounting screws. For air circulation allow a gap of over 10mm around the unit and adjaces.

## WORKING CONDITIONS

- Working temperature range :  $-10^{\circ}\text{C} \sim +55^{\circ}\text{C}$
- Storage temperature range :  $-30^{\circ}\text{C} \sim +70^{\circ}\text{C}$
- Relative humidity : Lower then 85%

## MATERIAL OF EXTERNAL CASE

- Case : Glass fiber reinforced polycarbonate resin.
- Terminal : Polycarbonate resin.
- Socket : Glass fiber reinforced noryl resin.

## ACCESSORIES AND OTHER

### Accessories

- Socket (GP : type name 8PFA, made by Omron. XP : type name 11PFA, made by Omron.
- HP : type name 14PFA, made by Omron.), diode units.

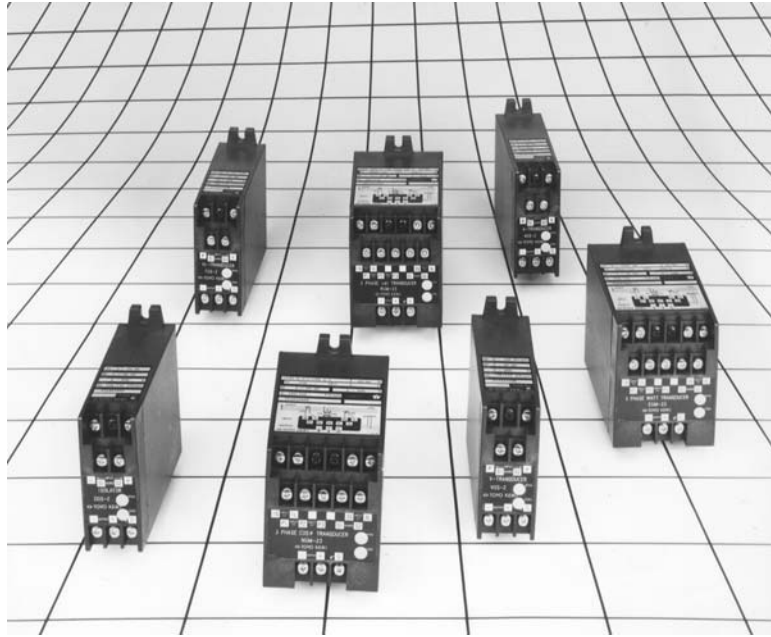
### Inspection result form

- Upon request, shipped along with the item ordered.
- (Please note that we cannot respond to request made after items have shipped.)

### Instruction manual

- Make requests to our sales staff.

**GS,GM,AND LS SERIES SIGNAL CONVERTER**



**GS,GM,and LS** series signal converters provide uniform DC signals for measurement from various types of electric signal.

**GS,GM,and LS** series signal converters are based on 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.

**GS,GM,and LS** series signal converters use fire-resistant plastic throughout and are transducers you can safely use.

**GS,GM,and LS** series signal converters are designed so that they can be freely switched between panel or DIN rail mounting.

designation	type	input signal	note
AC current transducer	AGS-□A	AC current	Mean value type
	AGS-□EA	AC current	Root-mean-square value type
AC voltage transducer	VGS-□A	AC voltage	Mean value type
	VGS-□EA	AC voltage	Root-mean-square value type
Frequency transducer	FGS-□□A	Frequency	For commercial frequency use
Watt transducer	EGM-□1A	1φ 2W watt	Root-mean-square value operation type
	EGM-□2A	1φ 3W watt	
	EGM-□3A	3φ 3W watt	
	EGM-□4A	3φ 4W watt	
Var transducer	RGM-□1A	1φ 2W var	Root-mean-square value operation type
	RGM-□2A	1φ 3W var	
	RGM-□3A	3φ 3W var	
	RGM-□4A	3φ 4W var	
Power factor transducer	NGM-□1A	1φ 2W p.f.	Watt and var operation type
	NGM-□2A	1φ 3W p.f.	
	NGM-□3A	3φ 3W p.f.	
AC current transducer	ALS-0□A	AC current	Mean value type, No power supply
AC voltage transducer	VLS-0□A	AC voltage	Mean value type, No power supply
AC current transducer	ALS-□A	AC current	Mean value type, Low price
	ALS-□EA	AC current	Root-mean-square value type, Low price
AC voltage transducer	VLS-□A	AC voltage	Mean value type, Low price
	VLS-□EA	AC voltage	Root-mean-square value type, Low price
Isolater	DGS-□A	DC current, voltage	

# GS,GM,AND LS SERIES

## AC CURRENT TRANSDUCER

**AGS-□A** : Mean value type

**AGS-□EA** : Root-mean-square value type

Lighter because plastic is used for casing.

Improved reliability and greater compactness through the use of custom ICs.

JIS c 1111 AC/DC transducer 0.5 class.



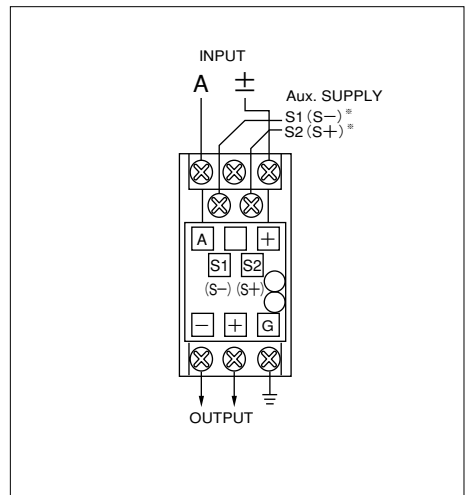
### SPECIFICATION

INPUT, CONSUMPTION WATT	OUTPUT	AUXILIARY POWER SUPPLY
0~5A 50/60Hz approx. 0.5VA 0~1A 50/60Hz	8 standard type of output are available	DC 19~31V approx. 3 W AC 80~264V 50/60Hz approx. 3.5 VA DC 80~143V approx. 3 W
Max. input Available with range 0.1 ~5A Available with frequency range 45 ~10kHz	Available with Max. voltage output 10V (5k 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 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C 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 (AGS-□EA 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



※ Only 19~31V power supply specification has polarity.

### DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
AGS-□A AGS-□EA	-□	-□

	AUXILIARY POWER SUPPLY
1	DC 19V~31V
4	AC 80V~264V 50/60Hz DC 80V~143V

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

	OUTPUT	LOAD RESISTANCE
1	DC 0 ~ 100mV	600 Ω ~ ∞
2	DC 0 ~ 1 V	600 Ω ~ ∞
3	DC 0 ~ 5 V	2kΩ ~ ∞
4	DC 0 ~ 10 V	5kΩ ~ ∞
5	DC 1 ~ 5 V	2kΩ ~ ∞
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 AGS-1A-1-8

② AGS-4EA-9-9 INPUT : AC 0~0.5A, OUTPUT : DC 0~7.5V

※ For special specifications please consult company representatives.

# GS,GM,AND LS SERIES

## AC VOLTAGE TRANSDUCER

VGS-□A : Mean value type

VGS-□EA : Root-mean-square value type

Lighter because plastic is used for casing.

Improved reliability and greater compactness through the use of custom ICs.

JIS c 1111 AC/DC transducer 0.5 class.



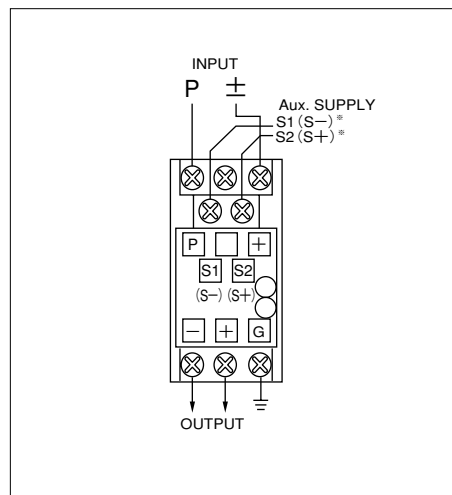
### SPECIFICATION

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	DC 19~31V approx. 3 W AC 80~264V 50/60Hz approx. 3.5 VA DC 80~143V approx. 3 W
Max. input Available with range 50~300V Available with frequency range 45 ~10kHz	Available with Max. voltage output 10V (5kΩ~∞) 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 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C 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 (VGS-□EA 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



※ Only 19~31V power supply specification has polarity.

### DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
VGS-□A VGS-□EA	-□	-□

	AUXILIARY POWER SUPPLY
1	DC 19V~31V
4	AC 80V~264V 50/60Hz DC 80V~143V

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

	OUTPUT	LOAD RESISTANCE
1	DC 0 ~ 100mV	600 Ω ~ ∞
2	DC 0 ~ 1 V	600 Ω ~ ∞
3	DC 0 ~ 5 V	2kΩ ~ ∞
4	DC 0 ~ 10 V	5kΩ ~ ∞
5	DC 1 ~ 5 V	2kΩ ~ ∞
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 VGS-1A-1-8

② VGS-4EA-9-9 INPUT : AC 0~110V, OUTPUT : DC 0~7.5V

※ For special specifications please consult company representatives.

# GS,GM,AND LS SERIES

## WATT TRANSDUCER

EGM-□1A : 1phase 2wire

EGM-□2A : 1phase 3wire

EGM-□3A : 3phase 3wire

EGM-□4A : 3phase 4wire

Lighter because plastic is used for casing.

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 EGM-□1A	01	0 ~ 500W	100V	5A	50/60Hz	Voltage input : 0.5VA at 1 element Current input : 0.5VA at 1 element
	11	0 ~ 1000W	200V	5A	50/60Hz	
	99	OTHER				
1φ3W EGM-□2A	01	0 ~ 1000W	2×100V	5A	50/60Hz	
	11	0 ~ 2000W	2 ×200V	5A	50/60Hz	
	99	OTHER				
3φ3W EGM-□3A	21	0 ~ 1000W	110V	5A	50/60Hz	
	31	0 ~ 2000W	220V	5A	50/60Hz	
	22	0 ~ 833W	110V	5A	50/60Hz	
	32	0 ~ 1667W	220V	5A	50/60Hz	
	99	OTHER				
3φ4W EGM-□3A	21	0 ~ 1000W	110/√3V	5A	50/60Hz	
	31	0 ~ 2000W	220/√3V	5A	50/60Hz	
	22	0 ~ 833W	110/√3V	5A	50/60Hz	
	32	0 ~ 1667W	220/√3V	5A	50/60Hz	
	99	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)
- 3phase 4wire : Input range ceiling 40%~120% of 3× (rated voltage×rated current)

OUTPUT			
MARK	OUTPUT	LOAD RESISTANCE	WORKING RANGE
1	DC 0 ~ 100mV	600 Ω ~ ∞	We also produce 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	2kΩ ~ ∞	
4	DC 0 ~ 10 V	5kΩ ~ ∞	
5	DC 1 ~ 5 V	2kΩ ~ ∞	
6	DC 0 ~ 1mA	0 ~ 10kΩ	
7	DC 0 ~ 10mA	0 ~ 1kΩ	
8	DC 4 ~ 20mA	0 ~ 550 Ω	
9	OTHER OUTPUT		

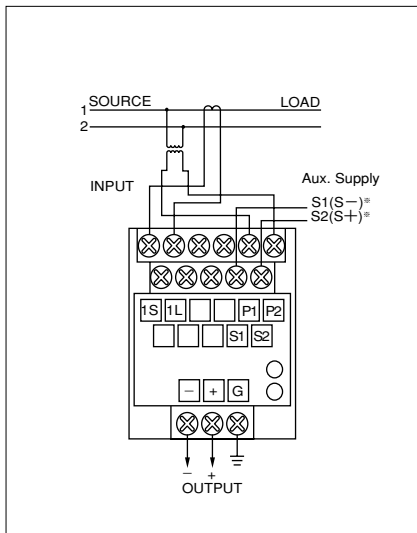
AUXILIARY POWER SUPPLY			
MARK	USE RANGE	CONSUMPTION WATT	REMARK
1	DC 19V~31V	approx. 3 W	Please inquire about items not listed on the left.
4	AC 80V~264V 50/60Hz DC 80V~143V	approx. 4 VA approx. 3 W	
9	OTHER		
0	NO ASSIST POWER SUPPLY(SELF POWER SUPPLY)		Power is supplied from VT input within the transducer.

# GS,GM,AND LS SERIES

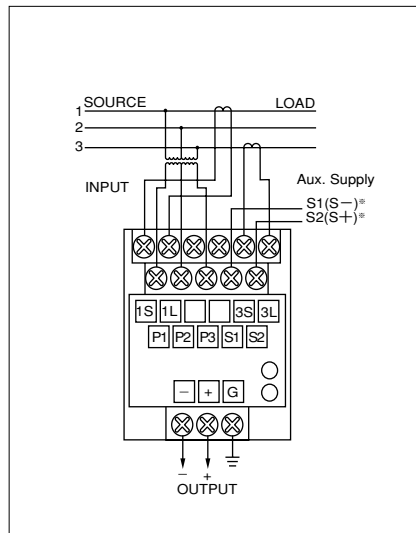
## SPECIFIC CHARACTER

- (1) Tolerance  
±0.5% of output span. (Ambient temperature 23 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C 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

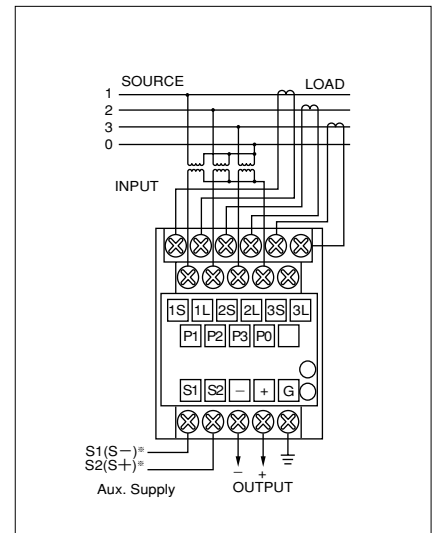
## CONNECTION DIAGRAM



EGM—□1A 1PHASE 2WIRE



EGM—□2A 1PHASE 3WIRE  
EGM—□3A 3PHASE 3WIRE



EGM—□4A 3PHASE 4WIRE

## DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
EGM—□□A	—□	—□

### ORDER EXAMPLE

- ① EGM—43A—21—8
- ② EGM—43A—99—9 INPUT : 0~120W,110V,5A, OUTPUT : DC 0~7.5V

※With the input code as 99,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.

※For special specification above contact a company representative.

※ Only 19~31V power supply specification has polarity.

# GS,GM,AND LS SERIES

## VAR TRANSDUCER

RGM-□1A : 1phase 2wire

RGM-□2A : 1phase 3wire

RGM-□3A : 3phase 3wire

RGM-□4A : 3phase 4wire

Lighter because plastic is used for casing.

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 RGM-□1A	01	LEAD 500 ~ 0 ~ LAG 500 var	100V	5A	50Hz	Voltage input : 0.5VA at 1 element Current input : 0.5VA at 1 element
	02	LEAD 500 ~ 0 ~ LAG 500 var	100V	5A	60Hz	
	11	LEAD 1000 ~ 0 ~ LAG1000var	200V	5A	50Hz	
	12	LEAD 1000 ~ 0 ~ LAG1000var	200V	5A	60Hz	
	99	OTHER				
1φ3W RGM-□2A	01	LEAD 1000 ~ 0 ~ LAG1000var	2×100V	5A	50Hz	
	02	LEAD 1000 ~ 0 ~ LAG1000var	2 ×100V	5A	60Hz	
	11	LEAD2000 ~ 0 ~ LAG2000var	2 ×200V	5A	50Hz	
	12	LEAD2000 ~ 0 ~ LAG2000var	2×200V	5A	60Hz	
	99	OTHER				
3φ3W RGM-□3A	21	LEAD 1000 ~ 0 ~ LAG1000var	110V	5A	50/60Hz	
	31	LEAD 2000 ~ 0 ~ LAG2000var	220V	5A	50/60Hz	
	22	LEAD 833 ~ 0 ~ LAG 833 var	110V	5A	50/60Hz	
	32	LEAD 1667 ~ 0 ~ LAG1667 var	220V	5A	50/60Hz	
	99	OTHER				
3φ4W RGM-□3A	21	LEAD 1000 ~ 0 ~ LAG1000var	110/√3V	5A	50/60Hz	
	31	LEAD2000 ~ 0 ~ LAG2000var	220/√3V	5A	50/60Hz	
	22	LEAD 833 ~ 0 ~ LAG 833 var	110/√3V	5A	50/60Hz	
	32	LEAD 1667 ~ 0 ~ LAG1667 var	220/√3V	5A	50/60Hz	
	99	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)  
 3phase 4wire : Input range ceiling 40%~120% of 3× (rated voltage×rated current)

OUTPUT			WORKING RANGE
MARK	OUTPUT	LOAD RESISTANCE	
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	2kΩ ~ ∞	
4	- 10 ~ 0 ~ + 10 V	5kΩ ~ ∞	
5	1 ~ 3 ~ 5 V	2kΩ ~ ∞	
6	- 1 ~ 0 ~ + 1 mA	0 ~ 10kΩ	
7	- 10 ~ 0 ~ + 10 mA	0 ~ 1kΩ	
8	4 ~ 12 ~ 20 mA	0 ~ 550 Ω	
9	OTHER OUTPUT		

AUXILIARY POWER SUPPLY			
MARK	USE RANGE	CONSUMPTION WATT	REMARK
1	DC 19V~31V	approx. 3 W	Please inquire about items not listed on the left.
4	AC 80V~264V 50/60Hz DC 80V~143V	approx. 4 VA approx. 3 W	
9	OTHER		
0	NO ASSIST POWER SUPPLY(SELF POWER SUPPLY)		Please inquire about items not listed on the left. Power is supplied from VT input within the transducer.

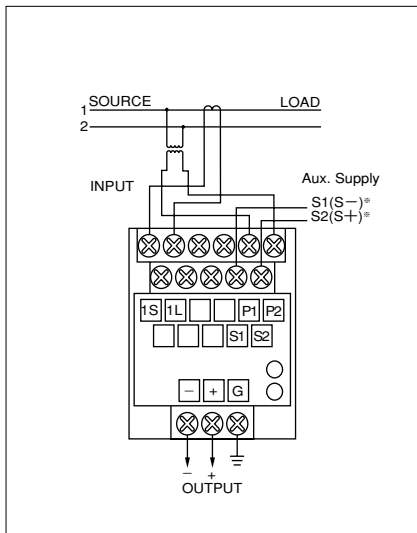


# GS,GM,AND LS SERIES

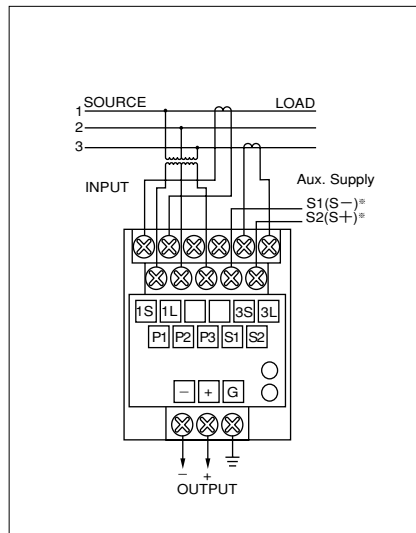
## SPECIFIC CHARACTER

- (1) Tolerance  
±0.5% of output span. (Ambient temperature 23 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C 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

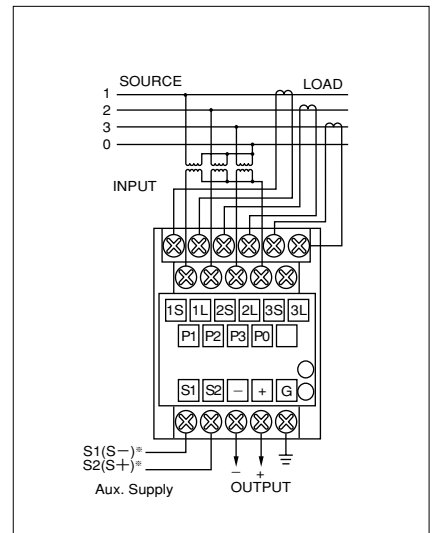
## CONNECTION DIAGRAM



RGM-□1A 1PHASE 2WIRE



RGM-□2A 1PHASE 3WIRE  
RGM-□3A 3PHASE 3WIRE



RGM-□4A 3PHASE 4WIRE

## DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
RGM-□□A	-□	-□

### ORDER EXAMPLE

- ① RGM-43A-21-8
- ② RGM-43A-99-9 INPUT : 0~120var,110V,5A, OUTPUT : DC 0~7.5V

※With the input code as 99,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.

※For special specification above contact a company representative.

※ Only 19~31V power supply specification has polarity.

# GS,GM,AND LS SERIES

## POWER FACTOR TRANSDUCER

NGM-□1A : 1phase 2wire

NGM-□2A : 1phase 3wire

NGM-□3A : 3phase 3wire

Lighter because plastic is used for casing.

Improved reliability and greater compactness through the use of custom ICs.

JIS C 1111 AC/DC transducer 3.0 class.



### SPECIFICATION

INPUT						
KIND	MARK	INPUT	RATED VOLT.	RATED CUR.	FREQUENCY	CONSUMPTION WATT
1φ2W NGM-□1A	01	LEAD 0.5 ~ 1 ~ LAG 0.5	100V	5A	50Hz	Voltage input : 0.5VA at 1 element Current input : 0.5VA at 1 element 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
	02	LEAD 0.5 ~ 1 ~ LAG 0.5	100V	5A	60Hz	
	11	LEAD 0.5 ~ 1 ~ LAG 0.5	200V	5A	50Hz	
	12	LEAD 0.5 ~ 1 ~ LAG 0.5	200V	5A	60Hz	
	99	OTHER				
1φ3W NGM-□2A	01	LEAD 0.5 ~ 1 ~ LAG 0.5	2×100V	5A	50Hz	
	02	LEAD 0.5 ~ 1 ~ LAG 0.5	2 ×100V	5A	60Hz	
	11	LEAD 0.5 ~ 1 ~ LAG 0.5	2 ×200V	5A	50Hz	
	12	LEAD 0.5 ~ 1 ~ LAG 0.5	2×200V	5A	60Hz	
	99	OTHER				
3φ3W NGM-□3A	21	LEAD 0.5 ~ 1 ~ LAG 0.5	110V	5A	50/60Hz	
	31	LEAD 0.5 ~ 1 ~ LAG 0.5	220V	5A	50/60Hz	
	99	OTHER				
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	2kΩ ~ ∞	
4	- 10 ~ 0 ~ + 10 V	5kΩ ~ ∞	
5	1 ~ 3 ~ 5 V	2kΩ ~ ∞	
6	- 1 ~ 0 ~ + 1 mA	0 ~ 10kΩ	
7	- 10 ~ 0 ~ + 10 mA	0 ~ 1kΩ	
8	4 ~12~ 20 mA	0 ~ 550 Ω	
9	OTHER OUTPUT		

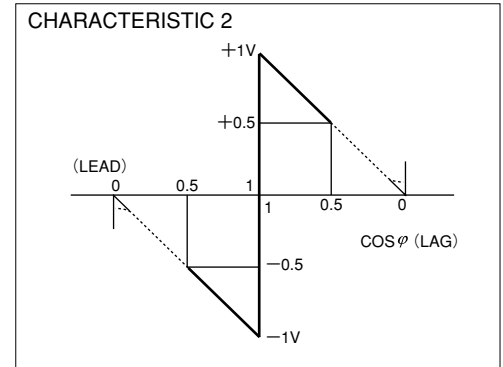
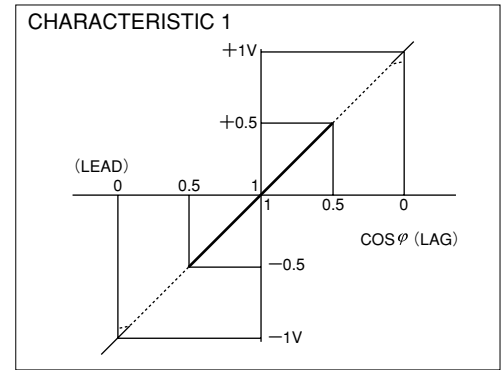
AUXILIARY POWER SUPPLY			
MARK	USE RANGE	CONSUMPTION WATT	REMARK
1	DC 19V~31V	approx. 3 W	Please inquire about items not listed on the left.
4	AC 80V~264V 50/60Hz DC 80V~143V	approx. 4 VA approx. 3 W	
9	OTHER		
0	NO ASSIST POWER SUPPLY(SELF POWER SUPPLY)		Please inquire about items not listed on the left. Power is supplied from VT input within the transducer.

# GS,GM,AND LS SERIES

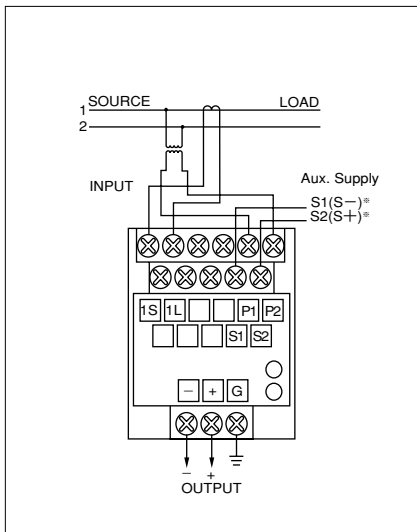
## SPECIFIC CHARACTER

- (1) Tolerance  
±3% of output span. (Ambient temperature 23 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C 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 vortage ±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)

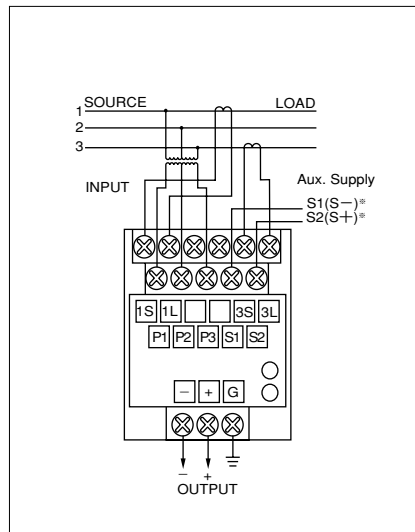
Power factor transducer may have the two types of characteristics shown below. If no preference is specified characteristics will be as shown in 1.



## CONNECTION DIAGRAM



NGM-□1A 1PHASE 2WIRE



NGM-□2A 1PHASE 3WIRE  
NGM-□3A 3PHASE 3WIRE

※ Only 19~31V power supply specification has polarity.

## DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
NGM-□□A	-□	-□

## ORDER EXAMPLE

- ① NGM-43A-21-8
- ② NGM-43A-99-8 INPUT : LEAD 0.5~1~LAG 0.5,115V,5A

※Power factor measurement in circuits that have tidal currents  
The effective measurement range of NGM type power factor transducers is LEAD 0.5~1~LAG 0.5.  
Does not operate normally during backward tidal current(the current supply and receipt flow are reversed).  
To provide power factor measurements in circuits with a tidal flow the NGM-□RA type is available.

# GS,GM,AND LS SERIES

## FREQUENCY TRANSDUCER

FGS-□A

FGS-□LA : With limiter

Lighter because plastic is used for casing.

Improved reliability and greater compactness through the use of custom ICs.

JIS c 1111 AC/DC transducer 0.5 class.



### SPECIFICATION

INPUT				
MARK	INPUT	RATED VOLTAGE	CONSUMPTION WATT	WORKING RANGE
12	45 ~ 55Hz	110V	0.5VA	Rated frequency range : 45Hz~450Hz Rated voltage range : 50V~300V
22	55 ~ 65Hz	110V	0.5VA	
32	45 ~ 65Hz	110V	0.5VA	
13	45 ~ 55Hz	220V	0.5VA	
23	55 ~ 65Hz	220V	0.5VA	
33	45 ~ 65Hz	220V	0.5VA	
99	OTHER			

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

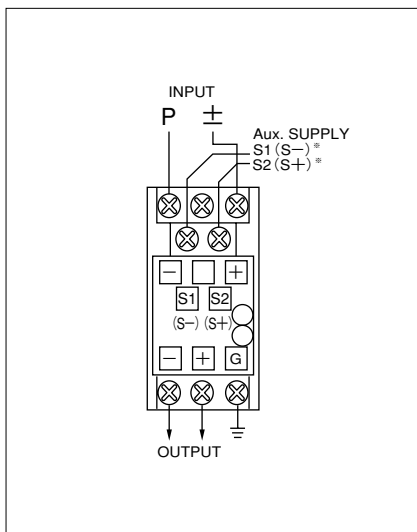
AUXILIARY POWER SUPPLY				
MARK	RATED		CONSUMPTION WATT	REMARK
1	DC 19V~31V		approx. 3 W	Please inquire about items not listed on the left.
4	AC 80V~264V 50/60Hz DC 80V~143V		approx. 3.5 VA approx. 3 W	

# GS,GM,AND LS SERIES

## SPECIFIC CHARACTER

- (1) Tolerance  
±0.5% of output span. (Ambient temperature 23 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C variations)
- (3) Effect of auxiliary power supply  
Within ±0.25% of output span. (For rated voltage ±10% variations)
- (4) Effect of input voltage  
Within ±0.25% of output span. (For standard vortage ±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 and external case)
- (10) Insulation resistance  
Higher than 100MΩ at 500V megger.  
(Between input,output,auxiliary power and external case)
- (11) Weight  
Approx.500g

## CONNECTION DIAGRAM



※ Only 19~31V power supply specification has polarity.

## DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
FGS-□A	-□□	-□

### ORDER EXAMPLE

- ① FGS-4A-12-8
- ② FGS-4A-99-9 INPUT : 45~75Hz,AC110V, OUTPUT : DC4.5~7.5V

※For special specification above contact a company representative.

# GS,GM,AND LS SERIES

## AC CURRENT TRANSDUCER

**ALS-0A** : Fixed output load type

**ALS-0CA** : Regulated output current type

No assist power supply is required.

Improved reliability and greater compactness through the use of custom ICs.  
JIS c 1111 AC/DC transducer 0.5 class.



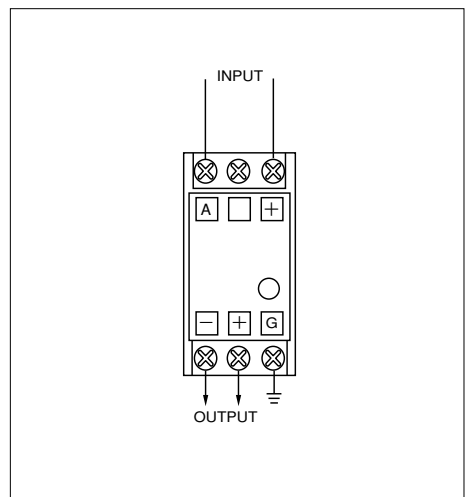
### SPECIFICATION

INPUT, CONSUMPTION WATT	OUTPUT		LOAD RESISTANCE
0~5A 50/60Hz 0~1A 50/60Hz approx. 0.5VA	ALS-0A	5 standard type of output are available	Need designation
Max.input Available with range 0.1~5A Available with frequency range 45~10kHz		Available with Max.voltage output 10V Max.current output 2mA	Voltage output : above 10kΩ Current output : below 5kΩ Need designation
	ALS-0CA	DC 0~1mA 0~10kΩ	0~10kΩ(No designation)

### SPECIFIC CHARACTER

- (1) Tolerance  
±0.5% of output span. (Ambient temperature 23 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C variations)
- (3) Effect of frequency  
Within ±0.25% of output span. (For standard frequency ±5% variations)
- (4) Effect of load resistance (ALS-0C type only)  
Within ±0.05% of output span. (For load resistance range 0 ~10kΩ)
- (5) Output ripple  
Within 2%p-p of output span.
- (6) Response time  
Shorter than 1sec. (Time to 99% output)
- (7) Dielectric strength  
2000V AC, 1min.(50/60Hz) (Between input,output and external case)
- (8) Insulation resistance  
Higher than 100MΩ at 500V megger.  
(Between input,output and external case)
- (9) Weight  
Approx.400g

### CONNECTION DIAGRAM



### DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT	4. LOAD
ALS-0A	-□	-□	-□
ALS-0CA	-□		

TYPE	INPUT		FREQUENCY	OUTPUT					LOAD RESISTANCE	
	1	2		1	2	3	4	6	7	9
ALS-0A	1	AC 0 ~ 5 A	50/60Hz	1	DC 0 ~ 100mV	1	1 MΩ			
	2	AC 0 ~ 1 A		2	DC 0 ~ 1 V	2	100 kΩ			
	9	OTHER INPUT		3	DC 0 ~ 5 V	3	10 kΩ			
				4	DC 0 ~ 10 V	4	5 kΩ			
				6	DC 0 ~ 1mA	6	1 kΩ			
				9	OTHER OUTPUT	7	500 Ω			
						9	OTHER LOAD			

TYPE	INPUT		FREQUENCY	OUTPUT	LOAD RESISTANCE
ALS-0CA	1	AC 0 ~ 5 A		50/60Hz	DC 0 ~ 1 mA
	2	AC 0 ~ 1 A			
	9	OTHER INPUT			

### ORDER EXAMPLE

- ① ALS-0A-1-1-1
- ② ALS-0CA-1
- ③ ALS-0A-9-9-9 INPUT : AC0~0.5A, OUTPUT : DC 0~7.5V, LOAD : 50kΩ

※For special specifications please consult company representatives.

# GS,GM,AND LS SERIES

## AC VOLTAGE TRANSDUCER

**VLS-0A** : Fixed output load type

**VLS-0CA** : Regulated output current type

No assist power supply is required.

Improved reliability and greater compactness through the use of custom ICs.  
JIS c 1111 AC/DC transducer 0.5 class.



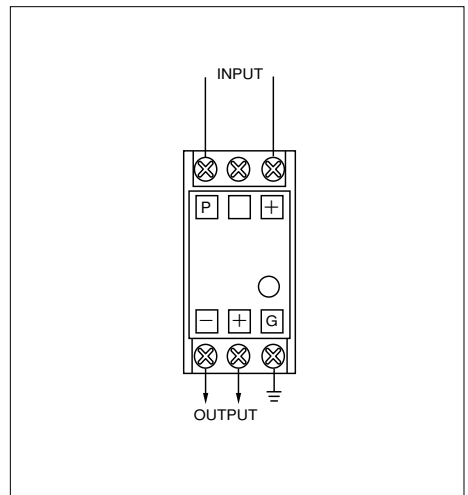
### SPECIFICATION

INPUT, CONSUMPTION WATT	OUTPUT		LOAD RESISTANCE
0~5V 50/60Hz approx. 0.5VA 0~1V 50/60Hz approx. 3.6VA	VLS-0A	5 standard type of output are available	Need designation
Max.input Available with range 50~300V Available with frequency range 45~10kHz		Available with Max.voltage output 10V Max.current output 2mA	Voltage output : above 10kΩ Current output : below 5kΩ Need designation
	VLS-0CA	DC 0~1mA	0~10kΩ(No designation)

### SPECIFIC CHARACTER

- (1) Tolerance  
±0.5% of output span. (Ambient temperature 23 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C variations)
- (3) Effect of frequency  
Within ±0.25% of output span. (For standard frequency ±5% variations)
- (4) Effect of load resistance (VLS-0C type only)  
Within ±0.05% of output span. (For load resistance range 0 ~10kΩ)
- (5) Output ripple  
Within 2%p-p of output span.
- (6) Response time  
Shorter than 1sec. (Time to 99% output)
- (7) Dielectric strength  
2000V AC, 1min.(50/60Hz) (Between input,output and external case)
- (8) Insulation resistance  
Higher than 100MΩ at 500V megger. (Between input,output and external case)
- (9) Weight  
Approx.400g

### CONNECTION DIAGRAM



### DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT	4. LOAD
VLS-0A	-□	-□	-□
VLS-0CA	-□		

TYPE	INPUT		FREQUENCY	OUTPUT					LOAD RESISTANCE		
	1	2		1	2	3	4	6	7	9	
VLS-0A	1	AC 0 ~150V	50/60Hz	1	DC 0 ~ 100mV	1	1 MΩ				
	2	AC 0 ~300V	50/60Hz	2	DC 0 ~ 1 V	2	100 kΩ				
	9	OTHER INPUT		3	DC 0 ~ 5 V	3	10 kΩ				
				4	DC 0 ~ 10 V	4	5 kΩ				
				6	DC 0 ~ 1mA	6	1 kΩ				
				9	OTHER OUTPUT	7	500 Ω				
						9	OTHER LOAD				
TYPE	INPUT		FREQUENCY	OUTPUT		LOAD RESISTANCE					
	1	2		DC 0 ~ 1 mA		0 ~ 10 kΩ					
	1	AC 0 ~150V	50/60Hz								
VLS-0CA	2	AC 0 ~300V	50/60Hz								
	9	OTHER INPUT									

### ORDER EXAMPLE

- ① VLS-0A-1-1-1
- ② VLS-0CA-1
- ③ VLS-0A-9-9-9 INPUT : AC0~110V, OUTPUT : DC 0~7.5V, LOAD : 50kΩ

※For special specifications please consult company representatives.

# GS,GM,AND LS SERIES

## AC CURRENT TRANSDUCER

**ALS-□A** : Mean value type

**ALS-□EA** : Root-mean-square value type

Lighter because plastic is used for casing.

Improved reliability and greater compactness through the use of custom ICs.

JIS c 1111 AC/DC transducer 0.5 class.



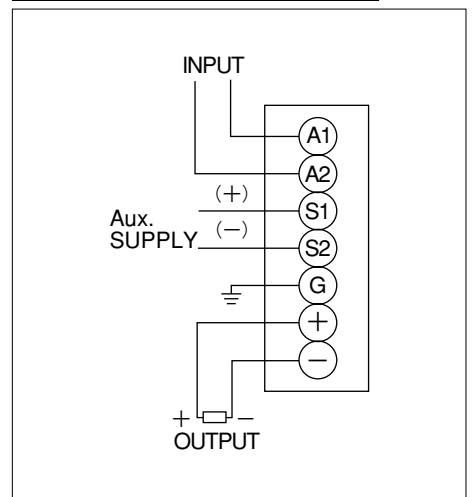
### SPECIFICATION

INPUT, CONSUMPTION WATT	OUTPUT	AUXILIARY POWER SUPPLY	
0~5A 50/60Hz 0~1A 50/60Hz 0~100mA 50/60Hz approx.0.5VA	8 standard type of output are available	AC 100/110V AC 200/220V	±10% 50/60Hz approx. 2.5 VA ±10% 50/60Hz approx. 2.5 VA

### SPECIFIC CHARACTER

- (1) Tolerance  
±0.5% of output span. (Ambient temperature 23 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23°C±10°C 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 (ALS-□EA 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. 320g

### CONNECTION DIAGRAM



### DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
ALS-□A ALS-□EA	-□	-□

	AUXILIARY POWER SUPPLY
2	AC 100V/110V 50/60Hz
3	AC 200V/220V 50/60Hz

	INPUT	FREQUENCY
1	AC 0 ~ 5 A	50/60Hz
2	AC 0 ~ 1 A	50/60Hz
3	AC 0 ~ 100mA	50/60Hz

	OUTPUT	LOAD RESISTANCE
1	DC 0 ~ 100mV	600 Ω ~ ∞
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 ~ 10kΩ
7	DC 0 ~ 10mA	0 ~ 1kΩ
8	DC 4 ~ 20mA	0 ~ 550 Ω

### ORDER EXAMPLE

① ALS-2A-1-8



# GS,GM,AND LS SERIES

## AC VOLTAGE TRANSDUCER

VLS-□A : Mean value type

VLS-□EA : Root-mean-square value type

Lighter because plastic is used for casing.

Improved reliability and greater compactness through the use of custom ICs.

JIS c 1111 AC/DC transducer 0.5 class.



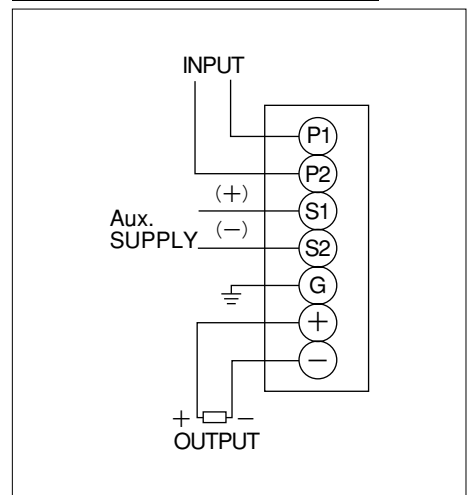
### SPECIFICATION

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 AC 200/220V	±10% 50/60Hz approx. 2.5 VA ±10% 50/60Hz approx. 2.5 VA

### SPECIFIC CHARACTER

- (1) Tolerance  
±0.5% of output span. (Ambient temperature 23 °C)
- (2) Effect of temperature  
Within ±0.5% of output span. (For 23 °C±10°C 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 (VLS-□EA 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. 320g

### CONNECTION DIAGRAM



### DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
VLS-□A VLS-□EA	-□	-□

	AUXILIARY POWER SUPPLY
2	AC 100V/110V 50/60Hz
3	AC 200V/220V 50/60Hz

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

	OUTPUT	LOAD RESISTANCE
1	DC 0 ~ 100mV	600 Ω ~ ∞
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 ~ 10kΩ
7	DC 0 ~ 10mA	0 ~ 1kΩ
8	DC 4 ~ 20mA	0 ~ 550 Ω

### ORDER EXAMPLE

① VLS-2A-1-8

# GS,GM,AND LS SERIES

# ISOLATOR

## DGS-□A

Lighter because plastic is used for casing.  
Improved reliability and greater compactness through the use of custom ICs.



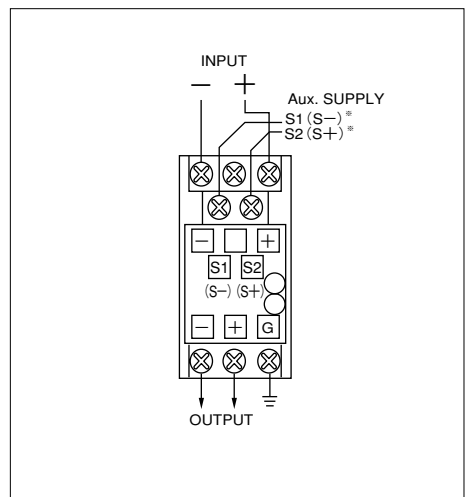
### SPECIFICATION

INPUT	OUTPUT	AUXILIARY POWER SUPPLY
8 standard type of input are available	8 standard type of output are available	DC 19~31V AC 80~264V 50/60Hz DC 80~143V DC 38~62V
Available with voltage input range DC 0.1mA~100mA current input range DC 10mV~300V	Available with Max.voltage output 10V (5k Ω~∞) Max.current output 20mA (0 ~550Ω)	approx. 3 W approx. 3.5 VA approx. 3 W approx. 3 W types are immediately available. For types not listed above contact a company representative.

### SPECIFIC CHARACTER

- (1) Tolerance  
±0.25% of output span. (Ambient temperature 23 °C)  
In case of input or output range at below 50mV:  
±0.5% of output span.
- (2) Effect of temperature  
Within ±0.25% of output span. (For 23 °C±10°C variations)  
In case of input or output range at below 50mV:  
±0.5% of output span.
- (3) Effect of auxiliary power supply  
Within ±0.1% of output span. (For rated voltage ±10% variations)
- (4) Effect of load resistance  
Within ±0.05% of output span. (For load resistance range)
- (5) Output ripple  
Within 0.5%p-p of output span.
- (6) Response time  
Shorter than 0.5sec. (Time to 99% output)
- (7) Dielectric strength  
2000V AC,1min.(50/60Hz)  
(Between input,output,auxiliary power supply and external case)
- (8) Insulation resistance  
Higher than 100MΩ at 500V megger.  
(Between input,output,auxiliary power supply and external case)
- (9) Weight  
Approx.500g

### CONNECTION DIAGRAM



※ Only 19~31V power supply specification has polarity.

### DESIGNATION ITEM AT ORDER

1. TYPE AND AUXILIARY POWER SUPPLY	2. INPUT	3. OUTPUT
DGS-□A	-□	-□

	AUXILIARY POWER SUPPLY
1	DC 24V
4	AC 80V~264V 50/60Hz DC 80V~143V
6	DC 38~62V
9	OTHER

	INPUT	INPUT IMPEDANCE
1	DC 0 ~ 100mV	100 kΩ
2	DC 0 ~ 1 V	1MΩ
3	DC 0 ~ 5 V	1MΩ
4	DC 0 ~ 10 V	1MΩ
5	DC 1 ~ 5 V	1MΩ
6	DC 0 ~ 1mA	100 Ω
7	DC 0 ~ 10mA	10 Ω
8	DC 4 ~ 20mA	10 Ω
9	OTHER INPUT	

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

### ORDER EXAMPLE

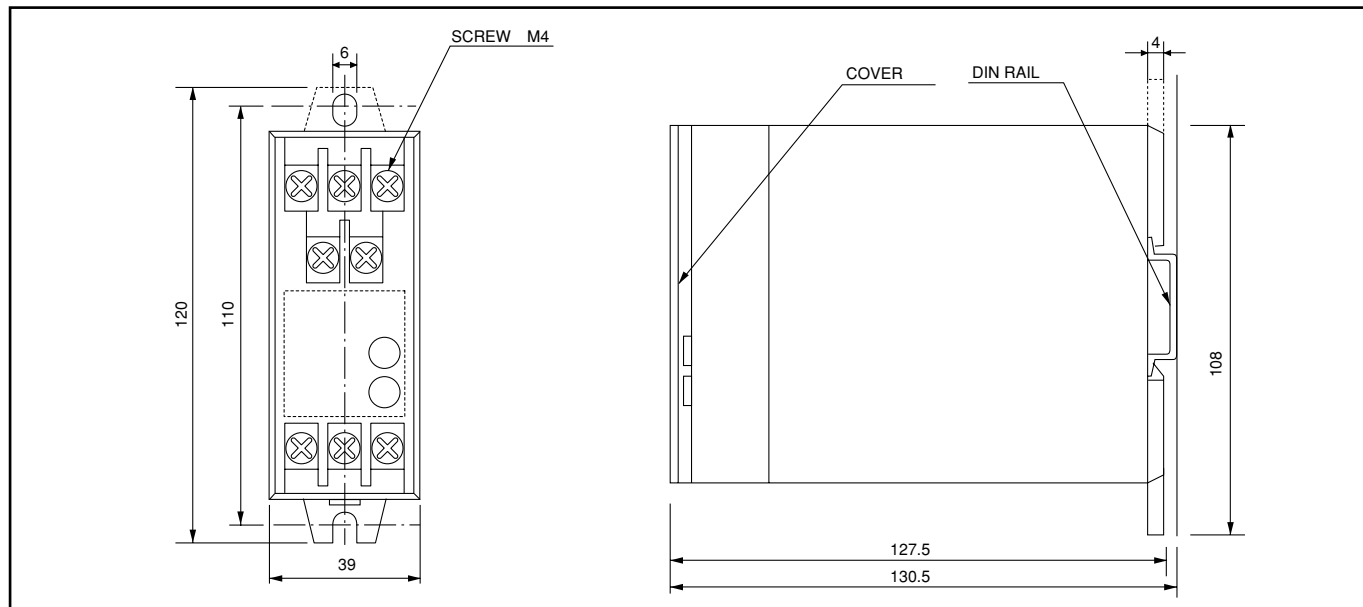
- ① DGS-1A-1-8
- ② DGS-4A-9-9 INPUT : DC0~5mA, OUTPUT : DC 0~5mA

※For special specifications please consult company representatives.

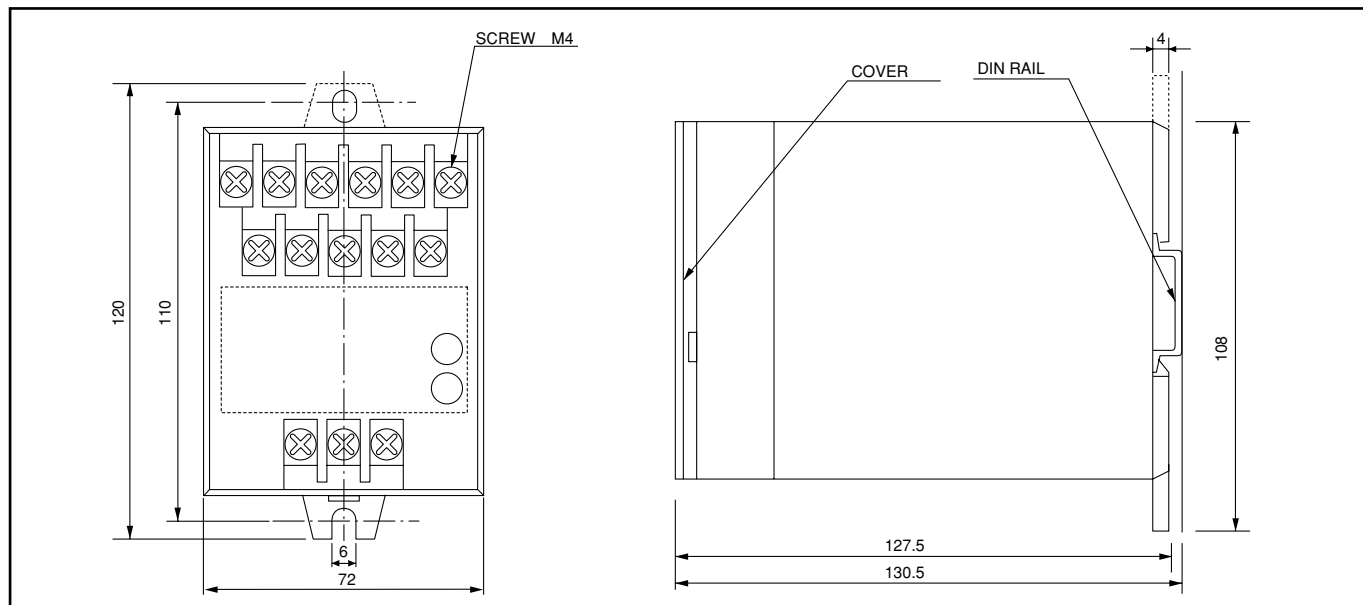
# GS,GM, AND LS SERIES

## OUTSIDE VIEW

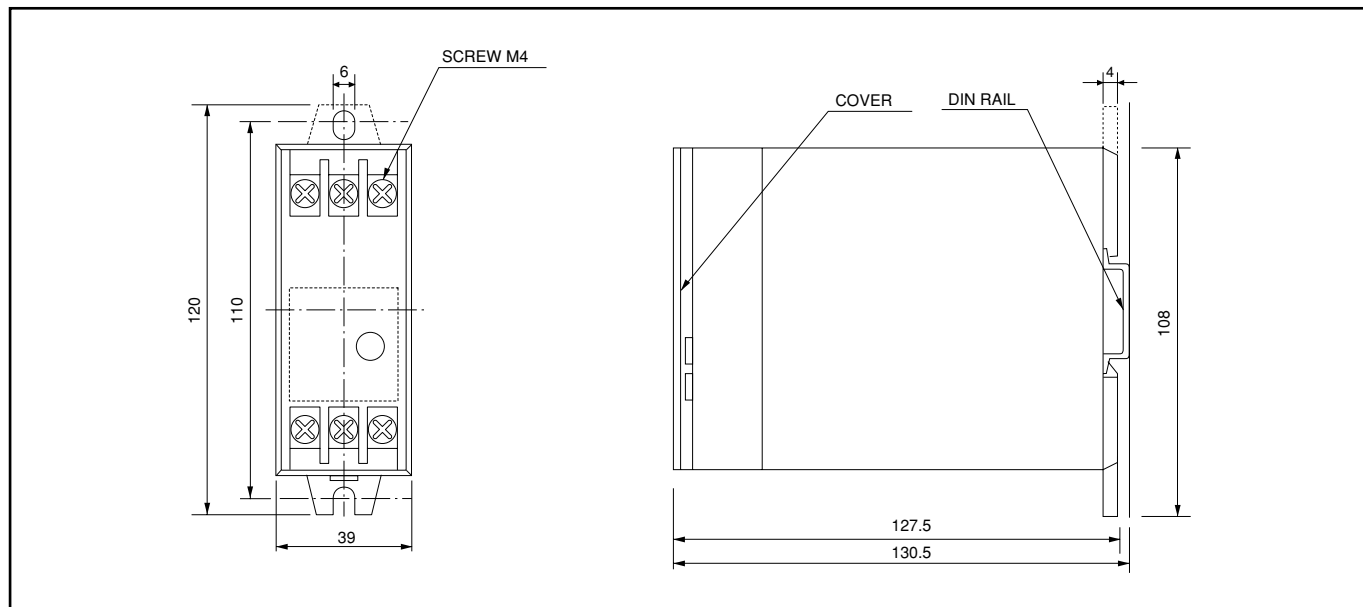
### ■ GS SERIES



### ■ GM SERIES

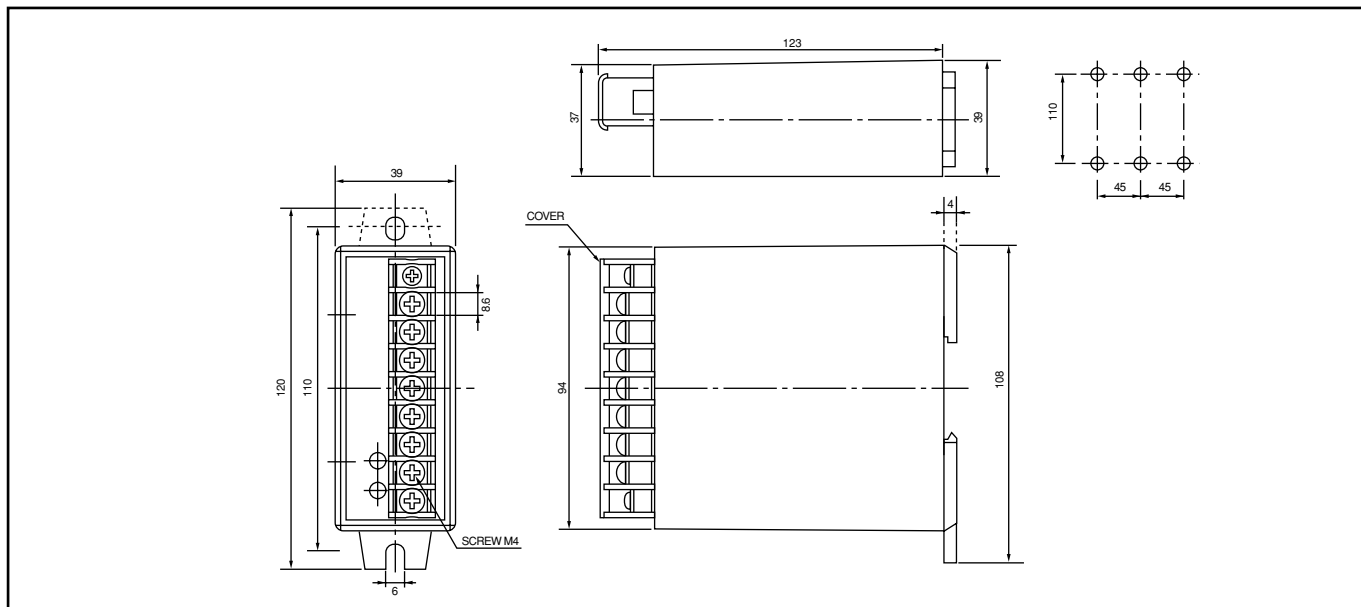


### ■ LS-0 SERIES



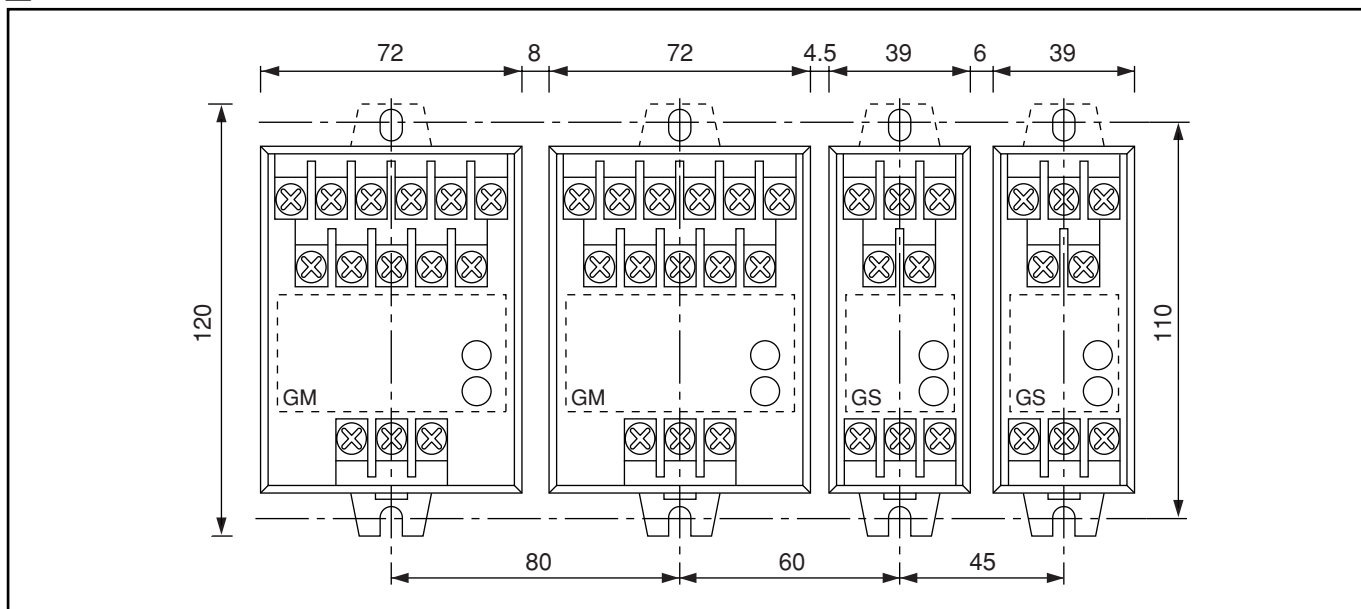
# GS,GM, AND LS SERIES

## ■ LS—□ SERIES



## INSTALL SIZE

### ■ GM SERIES



## WORKING CONDITIONS

Working temperature range :  $-10^{\circ}\text{C} \sim +55^{\circ}\text{C}$

Storage temperature range :  $-30^{\circ}\text{C} \sim +70^{\circ}\text{C}$

Relative humidity : Lower than 85%

## MATERIAL OF EXTERNAL CASE

Case : Glass fiber reinforced polycarbonate resin.

Terminal : Polycarbonate resin.

Socket : Glass fiber reinforced noryl resin.

## ACCESSORIES AND OTHER

### Accessories

Socket (GP : type name 8PFA, made by Omron. XP : type name 11PFA, made by Omron.

HP : type name 14PFA, made by Omron.), diode units.

### Inspection result form

Upon request, shipped along with the item ordered.

(Please note that we cannot respond to requests made after items have shipped.)

### Instruction manual

Make requests to our sales staff.

# MEMO

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# MEMO

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# MEMO

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# **TOYO KEIKI CO., LTD.**

## **Head Office, Export Dept.**

17-10-3, Shimoshinjo, Higashiyodogawa-Ku, Osaka, Japan.  
〒533-0021 TEL. +81-(6)6329-2441 FAX. +81-(6)6328-4112

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## **Osaka Factory**

17-10-3, Shimoshinjo, Higashiyodogawa-Ku, Osaka.

## **Toyama Factory**

1-6-2, Yasu-uchi, Yatsuo-machi, Nei-gun, Toyama.

Website : <http://www.toyokeiki.co.jp>