

INSTRUCTION MANUAL

HIGH SPEED MULTI POWER LINE TRANSDUCER

HSQT2-93A



 **DAIICHI ELECTRONICS CO., LTD.**

Thank you for purchasing DAIICHI ELECTRONICS product.

Read this instruction manual carefully before installation, wiring, and using this product.

Safety precautions

■ Environment conditions

Please be sure to use this product in a place that meets the following conditions. In places that do not meet this condition, malfunctions and failures, and performance and product life may be reduced.


- Within the range of ambient temperature -10 to +55 °C, humidity 20 to 95% RH.
- Environment with low corrosive gas, dust, salt and oil smoke. (Corrosive gas : SO₂ / H₂S, etc.)
- Environment that is not affected by vibration or shock.
- Environment with less external noise.
- Altitude 2000m or less.

■ Outdoor use conditions

- These products are not a dustproof, waterproof, and splash proof construction.
Please avoid the place with much dust. Moreover, please install in the place not exposed to rain or water drop.
- Please do not install in the place where sunlight hits directly.
Discoloration and degradation of a name plate, and deformation of the case by the surface temperature rise may occur.

■ Mounting and wiring

Please refer to this instruction manual for mounting and the wiring.

	<ul style="list-style-type: none"> ● Please refer to connection diagram for the wiring. ● Please avoid hot line work. ● Please use an electrical wire size suitable with the rated current. ● Please check the tightening of the screw.
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■ Preparation

If the product is to be connected directly to mains, a suitable external fuse must be provided. This product can change the setting of the measurement range. When changing the settings, read the instruction manual and set them correctly. If there is an error in the settings, it will not work properly.

■ CE marking

Only the DC24V auxiliary power supply of this product is CE marking compliant. Please note that the auxiliary power supply AC85 to 253V, DC80 to 143V products are not compatible.

■ Maintenance and inspection

- Inspection in energized state is dangerous.
- This product has no parts to replace during regular inspections.
- In case you need to check an output by the hot line condition, please be warned not to touch output wiring and a human body to input and auxiliary power terminal. (Please do not short-circuit a voltage output. If a current output becomes open, the voltage of about 15V will occur.)
- After wiring change and maintenance, attach the terminal cover (option).
- Please wipe off lightly with the dry soft cloth. Please do not use the organic solvent, chemicals, cleaners, etc., such as an alcohol, for cleaning.

■ Storage

Please store in a place that meets the following conditions

- The ambient temperature within -25 to +70 °C (storage temperature).
- Daily average temperature 40 °C or less.
- Location corresponding to the usage environment and use conditions.
- Aluminum electrolytic capacitors are used in products. Please energize the power supply within one year after purchase.

■ Countermeasures against troubles

If trouble occurs within the warranty period, DAIICHI ELECTRONICS will repairs this product.

■ Disposal

Please dispose this product as industrial waste (non-combustible). Mercury parts and a nickel-cadmium battery are not used for this product.

■ Warranty period

The warranty period of the product is one year after the date of delivery.

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1. Product outline

1.1 Usage of product

This product is a multi-AC transducer for a high-speed response suitable for power control.

The analog output of current (average of each phase current), voltage (3-phase 3-wire : the average of each line voltage, average of 3-phase 4-wire : each phase voltage), power, reactive power, and frequency measurement is possible, by connecting with one circuit of electric power system,

1.2 Features of product

- 120×120×130mm, Approx. 800g. Small and lightweight.
- DIN rail installation correspondence.
- Active power, reactive power, frequency, with measurement range selection change.
- The response time is high-speed. [Current, Voltage, Active power, Reactive power : Less than input 1 cycle +10ms /99%, Frequency : Less than 1 second /99%]
- As an option, hydrogen-sulfide (H₂S) gas countermeasure goods can be made.
- The product whose auxiliary supply is DC24V conforms to CE marking. (The product whose auxiliary supply are AC85 to 253V and DC80 to 143V does not conform to CE marking.)
- RoHS instruction conformity product.

1.3 Composition of type

(1) (2) (3) (4) (5) (6)
 HSQT2 - 93 A - 5 - 33 - 1

(1)

Mark	Series name
HSQT2	HSQT2 series

(2)

Mark	Outline dimension (mm)
93	120×120×130

(3)

Mark	Contents
A	With auxiliary supply

(4)

Mark	Number of measurement factors
5	5

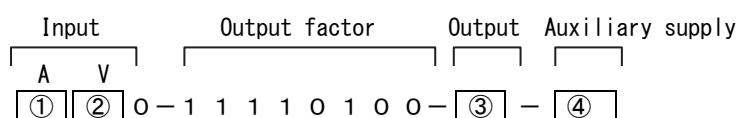
(5)

Mark	Kind of circuit
33	3-phase 3-wire circuit
34	3-phase 4-wire circuit

(6)

Mark	Output method
1	DC output

1.4 Specification code



● Input specification

Mark	① Current input	② Voltage input () is at the 3-phase 4-wire case.
1	0 to 5A (50/60Hz)	0 to 150V (0 to 150/√3V) (50/60Hz) (1)
2	0 to 1A (50/60Hz)	—

Note(1) Rated voltage is 110V (110/√3V).

● Output factor specification

The output factor of this product constitutes the next five factors.
 Current (average value of each phase current), Voltage (3-phase 3-wire: The average value of each line voltage, 3-phase 4-wire: The average value of each phase voltage), Active power, Reactive power, Frequency.
 The specification code of output factor specification is fixation as the above.

● Output specification

Mark	③ A, V, W, var, Hz output signal
3	DC0 to 5V (Over 600Ω)
4	DC0 to 10V (Over 2kΩ)
5	DC1 to 5V (Over 600Ω)
8	DC±5V (Over 600Ω)
9	DC±10V (Over 2kΩ)
B	DC4 to 20mA (Below 550Ω)

● Auxiliary supply specification

Mark	④ Auxiliary supply
1	AC85 to 253V (50/60Hz) (Rated voltage 100/110V, 200/220V) DC80 to 143V (Rated voltage 100/110V) For both AC and DC uses.
2	DC24V ±15%

2. Specification

2.1 Rating

Item	Rating		
Input	Voltage	3φ3W: AC100V, 110V, 115V, 120V Designation 50/60Hz 3φ4W: AC100/√3V, 110/√3V, 115/√3V, 120/√3V Designation 50/60Hz	Input consumption VA : Below 0.25VA
	Current	AC5A or AC1A Designation 50/60Hz	Input consumption VA : Below 0.1VA
Auxiliary supply	AC100/110V, 200/220V (AC85 to 253V) 50/60Hz 13VA DC100/110V (DC80 to 143V) Below 10W For both AC and DC uses. or DC24V (±15%) Below 10W Designation		
Output	5 analog outputs (Current, Voltage, Active power, Reactive power, Frequency) Between outputs is non-insulation. DC0 to 5V (Over 600Ω) DC0 to 10V (Over 2kΩ) DC1 to 5V (Over 600Ω) DC±5V (Over 600Ω) DC±10V (Over 2kΩ) DC4 to 20mA (Below 550Ω) Designation		

2.2 Measurement parameter

Measurement parameter	Measuring range ⁽⁶⁾		Class index	Operation method	Note
Current [A]	Rating 5A	0 to 5A	0.5 ⁽⁷⁾	Effective-value arithmetic	Average value of each phase current (R, S, T) ⁽⁸⁾
	Rating 1A	0 to 1A			
Voltage [V]	0 to 150V (3 ϕ 3W) 0 to 150/ $\sqrt{3}$ V (3 ϕ 4W)		0.5 ⁽⁷⁾	Fundamental-wave effective-value arithmetic	3 ϕ 3W : Average value of each line voltage (RS, ST, TR) ⁽⁸⁾ 3 ϕ 4W : Average value of each phase voltage (RN, SN, TN)
Active power [W]	Rating 5A	(1) 0 to 1000W (2) 0 to 833.3W (3) 0 to 750W (4) 0 to 500W (5) -1000 to +1000W (6) -833.3 to +833.3W (7) -750 to +750W (8) -500 to +500W	0.5 ⁽⁷⁾	Time division multiplication	The measurement range can be changed from (1) to (8) using the front DIP switch.
	Rating 1A	(1) 0 to 200W (2) 0 to 166.7W (3) 0 to 150W (4) 0 to 100W (5) -200 to +200W (6) -166.7 to +166.7W (7) -150 to +150W (8) -100 to +100W			
Reactive power [var]	Rating 5A	(1) LEAD 1000 to LAG 1000var (2) LEAD 833.3 to LAG 833.3var (3) LEAD 750 to LAG 750var (4) LEAD 500 to LAG 500var	0.5 ⁽⁷⁾	Time division multiplication	The measurement range can be changed from (1) to (4) using the front DIP switch.
	Rating 1A	(1) LEAD 200 to LAG 200var (2) LEAD 166.7 to LAG 166.7var (3) LEAD 150 to LAG 150var (4) LEAD 100 to LAG 100var			
Frequency [Hz]	(1) 45 to 55Hz (2) 55 to 65Hz (3) 45 to 65Hz		0.5 ⁽⁷⁾	Zero cross cycle arithmetic	Voltage V(RS) or V(RN) is measured. The measurement range can be changed from (1) to (3) using the front DIP switch.

About measurement

- (1) A class index is a rated-frequency 50/60Hz $\pm 10\%$ value. Linearity is within $\pm 0.3\%$.
- (2) In $\pm 10\%$ of rated frequencies, current, voltage, power, and reactive power are normally measured, in case the voltage between input lines is 10V or more. If the voltage between input lines is 60V or more, it is measurable to the frequency of 168Hz. (However, outside of an accuracy guarantee)
- (3) In case the voltage between input lines is 30V or more, frequency is measured normally.

Note⁽⁶⁾ The critical value of measuring range constitutes the following.

Current : 0 to 120% of measuring range

Voltage : 0 to 156V(3-phase 3-wire), 0 to 156/ $\sqrt{3}$ V(3-phase 4-wire)

[Measures to +30% at the 120V(120/ $\sqrt{3}$ V) cases of rating]

Active power (One-side swing) : -20 to +120% of measuring range,

Active power (Both swing), Reactive power : -120 to +120% of measuring range.

Note⁽⁷⁾ In case current, power, and reactive power measure the next inverter output directly, an error becomes large. Cycle control, SCR phase angle control, PWM control.

Note⁽⁸⁾ S phase current of 3-phase 3-wire is for 2CT input, calculates in R phase and T phase current combination. And, TR line voltage is for 2VT input, calculates in RS and ST line voltage combination.

2.3 Option

Item	Specification
The countermeasure against hydrogen-sulfide (H ₂ S) gas	Environmental conditions : Hydrogen sulfide, 1ppm, 40°C, 80%RH, Air supplying amount, Less than 1000L/H

2.4 Specification and performance

Item	Specification	
Compliant standard	Electrical measuring transducers for converting a.c. electrical quantities to analogue or digital signals. JIS C 1111 : 2006 [IEC 60688 : 1992, Amendment 1 (1997), Amendment 2 (2001)]	
CE compliant directive	Electro-magnetic compatibility directive (EMC Directive) 2014/30/EU Low voltage directive (LVD) 2014/35/EU RoHS Directive 2011/65/EU+(EU) 2015/863 Only auxiliary supply DC24V specification conforms.	
Safety	JIS C 1010-1 (IEC 61010-1) Measurement category III (The category to the measurement performed with fabric equipment) Maximum use voltage, 300V Degree of contamination, 2 (Usually, the grade which only contamination of non-conductivity causes. However, temporary conductivity, which originates in dew condensation depending on the case occurs.)	
Influence of temperature	Use group I (For indoors. It is used in the place where the equipment is careful and is dealt with under the conditions generally seen at a laboratory, a factory, etc.) 10 to 35°C : Inside of class index. 0 to 45°C : Within 2 times of class index. -10 to +55°C : Within 3 times of class index.	
Update time of measured value	5ms	
Response time	Time within $\pm 1\%$ of final constant value, when step input is charge. [A, V, W, var] With no moving average : Less than input one cycle +10ms. 2 times of moving average : Less than input one cycle +15ms. 3 times of moving average : Less than input one cycle +20ms. [Hz] Less than 1 second.	
Ripple of output	Less than 1% peak-to-peak to output span.	
Momentary power interruption allowable time	20ms	
Power-supply rush current	AC110V : Below 5.5A (Time constant : below 10ms) AC220V : Below 11.0A (Time constant : below 10ms) DC110V : Below 4.0A (Time constant : below 10ms) DC24V : Below 6.5A (Time constant : below 10ms)	
Insulation resistance	Between electric circuit and case (ground).	Above 50M Ω at DC500V
	Between input and output and auxiliary supply.	
	Between analog outputs non-insulates (minus common).	
Voltage tests (Withstand voltage)	Between electric circuit and case (ground).	AC2210V (50/60Hz) 5 seconds
	Between input and output and auxiliary supply.	
	Between analog outputs non-insulates (minus common).	
Impulse voltage tests (Lightning impulse withstand voltage)	Between electric circuit (analog output excludes) and case (ground).	5kV 1.2/50 μ s Both positive and negative polarity, for 3 times each.
	Between input and auxiliary supply (output is ground connection).	
Vibration	JIS C 60068-2-6 (IEC 60068-2-6). Vibration frequency range : 10 to 55Hz, Vibration amplitude : 0.15mm (Single-sided amplitude), Number of sweep cycles : 10 times	
Shock	JIS C 60068-2-27 (IEC 60068-2-27) Peak acceleration : 500m/s ²	

Item		Specification
Over load capacity	Input	2 times 10 seconds and 1.2 times continuation of rated voltage. 40 times 1 second, 20 times 4 seconds, 10 times 16 seconds and 1.2 times continuation of rated current.
	Auxiliary supply	1.5 times 10 seconds and 1.2 times continuation of rated voltage. (AC100/110V, AC200/220V, DC24V) 1.5 times 10 seconds and 1.3 times continuation of rated voltage. (DC110V)
	Output	Voltage output : Short circuit for 1 second 10 times at 10 second intervals, 1 time for 5 seconds. 70% continuous of rated output load. Current output : Open continuation. 130% continuous of rated output load.
Output line surge		1250A 8/20 μ s Positive and negative polarity.
Noise-capacity ANSI C37.90a JEA B-402 IEC801-2	<p>(1) Oscillatory surge voltage If a vibration damping waveform (1 to 1.5MHz, peak voltage : 2.5 to 3kV) is repeated for 30 seconds and applied, within $\pm 10\%$ of errors. (Auxiliary supply circuit. Voltage circuit. Current circuit)</p> <p>(2) Square wave impulse noise If a noise (1μs, 100ns width) is repeated and it applies for 5 minutes, within $\pm 10\%$ of errors. Auxiliary supply circuit, Voltage circuit (Normal / Common) Over 1.5kV Current circuit (Common) Over 1.5kV Analog output (Induction) Over 1.0kV</p> <p>(3) Electromagnetic wave noise The electromagnetic wave (5W, 1m) of 150MHz and 430MHz band is irradiated. And, the electromagnetic wave of a cellular phone 2GHz is irradiated by 0.5m. Within $\pm 10\%$ of errors.</p> <p>(4) Electrostatic noise At the 8kV at power distribution, error is less than $\pm 10\%$. There needs to be no 10kV damage at the case of the non-power distribution. Condenser charge form</p>	
External adjustment of output	BIAS and MAX adjustment (front switch). Adjustable range : $\pm 5\%$ to an output span.	
Count setting of moving average	The count of a moving average of A, V, W, and var can be altered. 1 time (With no average) to 3 times Change with front DIP switches S10 and S11 is possible.	
Structure	Outline dimension	120 \times 120 \times 130mm [W \times H \times D]
	Material	Case : Flame-resistant ABS (V-0). Terminal cover : Polycarbonate.
	Case color	Black (Munsell N1.5)
	Terminal screw	Input, Auxiliary supply, Ground terminal : M4 screw Output terminal : M3 screw
	Mass	Approx. 800g
Operating temperature and humidity limits	-10 to +55 $^{\circ}$ C , 20 to 95% RH (Non condensing)	
Storage temperature limits	-25 to +70 $^{\circ}$ C	

2.5 CE marking (Only auxiliary supply DC24V specification product.)

(1) Conformity technical standard

• EMC conformity technical standard

EMI (Emission) EN61000-6-4

EMS (Immunity) EN61000-6-2

• Safety technical standard

EN61010-1 CAT III (Maximum circuit voltage, 300V), Pollution degree 2

(2) Specification according to EMC test item

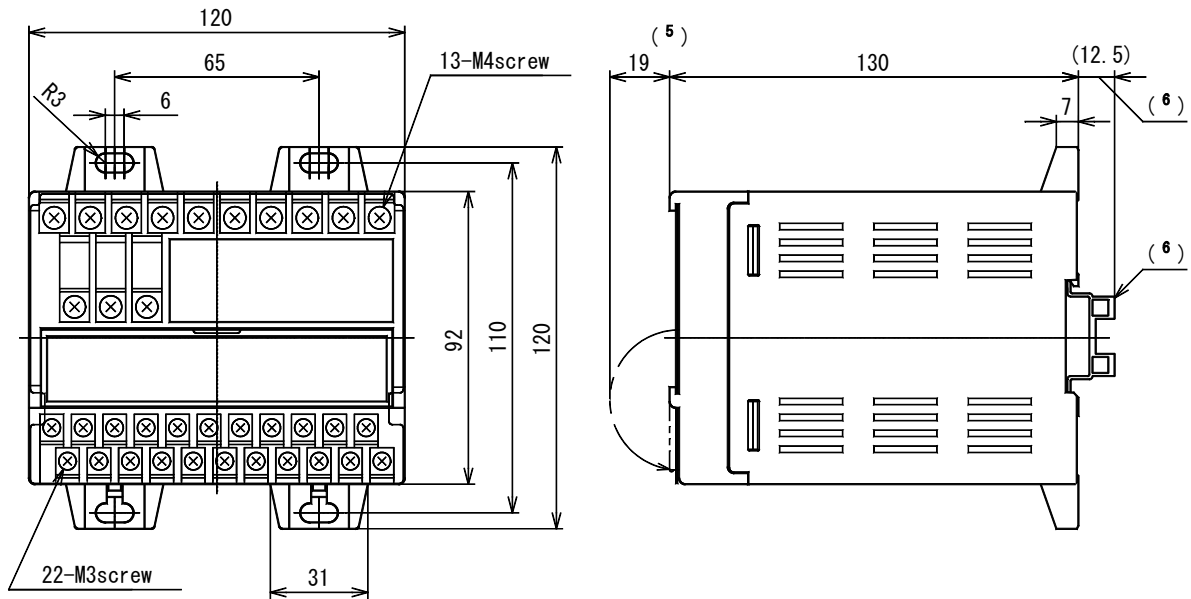
EMC test item		Limits	Conforming standard		
EMI	Electromagnetic radiation disturbance	Frequency band	Quasi-peak 10m distance		
		30 to 230MHz	40dB (μ V/m)		
		230 to 1000MHz	47dB (μ V/m)		
			EN61000-6-4 EN55011 classA, Group1		
EMS	Electrostatic discharge	Contact discharge ± 4 kV (Charge voltage)	After test, Output variation $\pm 0.5\%$	EN61000-6-2 EN61000-4-2	
		Air discharge ± 8 kV (Charge voltage)			
	Radio-frequency amplitude modulated electromagnetic field	Frequency	Field strength	During test : Output variation $\pm 20\%$ After test : Output variation $\pm 0.5\%$	EN61000-6-2 EN61000-4-3
		80 to 1000MHz	10V/m, 80% AM(1kHz)		
		1.4 to 2.0GHz	3V/m, 80% AM(1kHz)		
		2.0 to 2.7GHz	1V/m, 80% AM(1kHz)		
Fast transients	Power port : Line to earth ± 2.0 kV Signal port : Line to earth ± 1.0 kV	After test : Output variation $\pm 0.5\%$	EN61000-6-2 EN61000-4-4		
Surge	Power port : Line to line ± 0.5 kV Signal port : Line to earth ± 0.5 kV Signal port : Line to earth ± 1.0 kV	After test : Output variation $\pm 0.5\%$	EN61000-6-2 EN61000-4-5		
Radio-frequency common mode	Frequency : 0.15 to 80MHz Voltage level : 10V 80% AM(1kHz)	During test : Output variation $\pm 20\%$ After test : Output variation $\pm 0.5\%$	EN61000-6-2 EN61000-4-6		
Power-frequency magnetic field	Frequency : 50/60Hz Field strength : 30A/m	During test : Output variation $\pm 20\%$ After test : Output variation $\pm 0.5\%$	EN61000-6-2 EN61000-4-8		

(3) Installation environment

Over voltage Category III

3. Handling explanation

3.1 Outline dimension



Note⁽⁹⁾ In case of DIN rail (height 15mm) installation. (Please use DIN standard 35mm rail.)

Note⁽¹⁰⁾ The dimensions which the switch cover is opening.

3.2 Mounting instruction

The environmental conditions of installation space. Please select indoors without low mechanical vibration, dust, and corrosive gas.

There is no limit of a mounting position.

A mounting instruction can select 35mm width DIN rail mounting and screw mounting. In screw mounting, please install with M4 screw or M5 screw. (However, the screw is not attached. The tightening torque of a screw, M4 : 1.0 to 1.3

N·m, M5 : 2.0 to 2.5N·m)

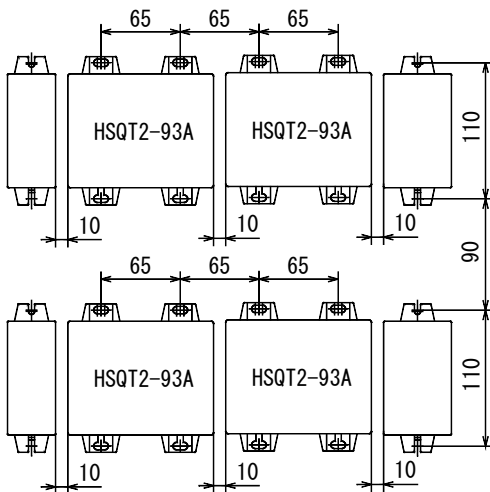
Please detach an interval lining up side-by-side above 10mm in consideration of radiation.

A vertical interval should prepare space 90mm or more in consideration of radiation and a wiring space.

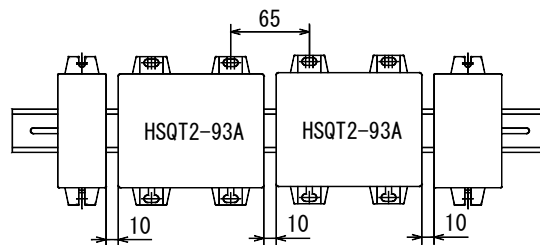
Please secure the space distance of a terminal and a metal panel 10mm or more.

3.3 The example of combination mounting dimension (Unit mm)

■ Screw installation



■ Rail installation



Please use rail of IEC, DIN technical standard 35mm width rail (strong type).

《Recommendation product》 Fuji electric Co., Ltd. TH35-15AL

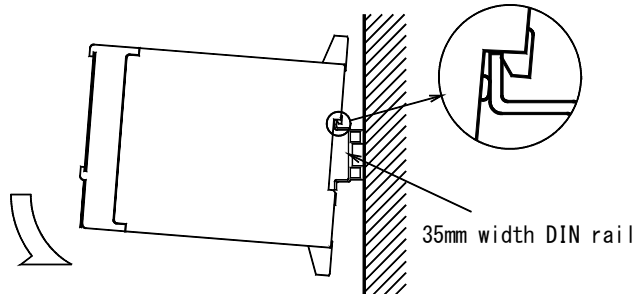
3.4 Installation and removal to a rail

Please use the rail based on the DIN standard of 35mm width.

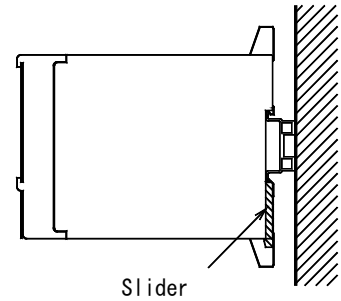
● Rail installation

The upside nail of the slot for rail installation in a BOX bottom is inserted in a rail. Next, if it pushes against the lower side (arrow), it is fixed with a lower slider.

I



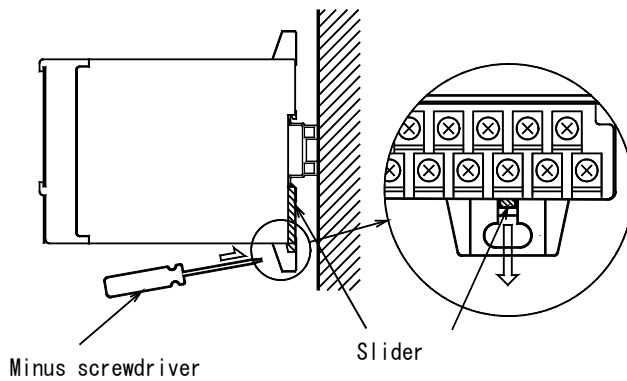
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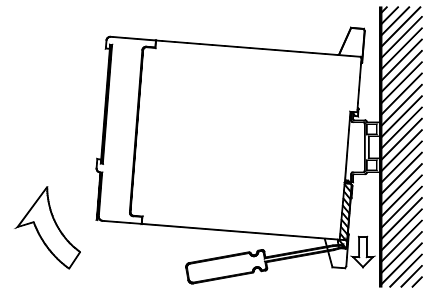
● Removal from a rail

A minus screwdriver is inserted in the square socket of a slider. Please pull up BOX to the front, lowering a minus screwdriver in the direction of an arrow. <Caution> BOX may be damaged, if BOX is pulled up without lowering a slider completely.

III



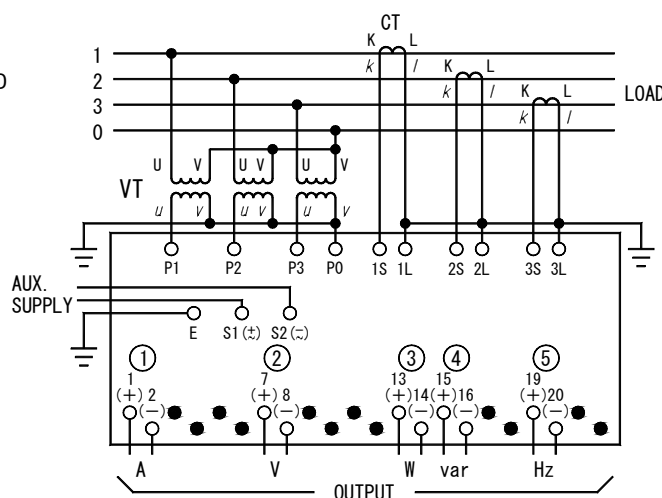
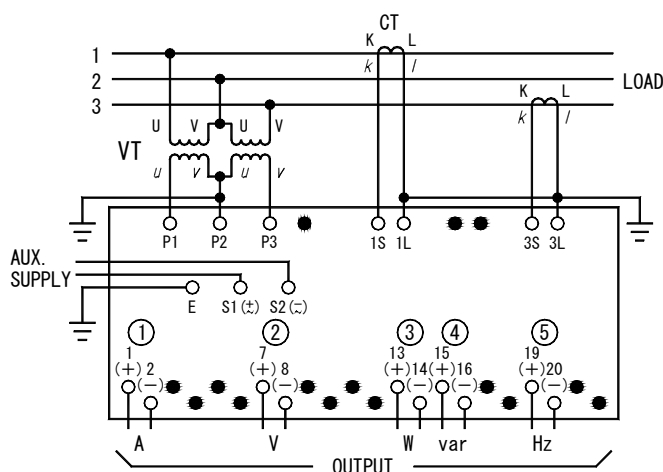
IV



3.5 Connection

● 3-Phase 3-Wire ... HSQT2-93A-5-33-1 (A, V, W, var, Hz)

● 3-Phase 4-Wire ... HSQT2-93A-5-34-1 (A, V, W, var, Hz)



< Caution > In case of low-voltage circuit, secondary side earthing of VT and CT is unnecessary.
And, VT is unnecessary in case it used direct 110V.

■ Cautions on connections

Please do connection of the wiring correctly with reference to the upper connecting diagram.

In the case of the DC power supply, it is S1(+) and S2(-).

Even in case the output of a transducer is sent to a direct distant place and there is a possibility of receiving the influence of indirect-stroke surge etc. in a transmission line, because the protection network is built in this product, the protection by the side of this product output is unnecessary.

In addition, in order to protect the apparatus by the side of a receiver, please install an about 500V arrester etc. to a receiver side between the surge protector between wires, and a transmission line and the ground.

3.6 Handling explanation

The usage of this product should perform the right usage with careful attention to the following item.

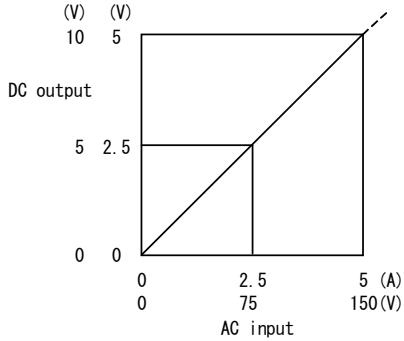
- (1) Please check that the voltage of power supply and the input signal to supply match the specification of this product before power-supply applying.
- (2) Please confirm that wiring is connected to the terminal position as specification (Indicate on name plate).
- (3) Please use output load by name plate display load resistance value within the limits. It not only becomes a mistaken output, but impose a burden on this product in case it is used other than a display load resistance value. Please avoid especially the output short circuit in a voltage output.
About a current output, even if it uses it by output open, this product is not damaged.
(However, in current output open, about 15V terminal voltage occurs.)
- (4) The range that output adjustment is possible.
BIAS : $\pm 5\%$ of the output span.
MAX : $\pm 5\%$ of the output span.
In order to make it match with a connection device, please use it, only in case adjustment is needed.
- (5) Please keep noise source away from wiring.
- (6) Inrush current flows in power-up. Please pay attention to over-current protection of power supply to use. Please refer to the 2.4th section about current value.
- (7) An output may appear also in few time at the case of power-supply ON / OFF (an input is 0).
- (8) The output (-) terminal of each factor is electrically common inside.
- (9) Please set the grounding resistance of a ground terminal (E) to 100Ω or less.
- (10) Please use it altitude of 2000m or less.

3.7 The relation of an input-output

(1) Current · Voltage

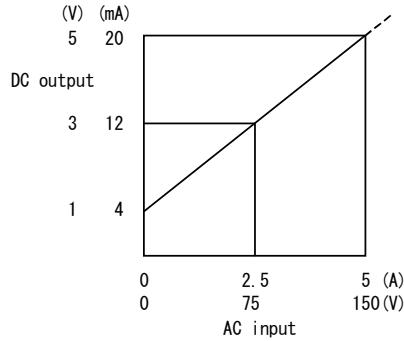
①

Input	Output
0 to 5A	0 to 5V or
0 to 150V	0 to 10V



②

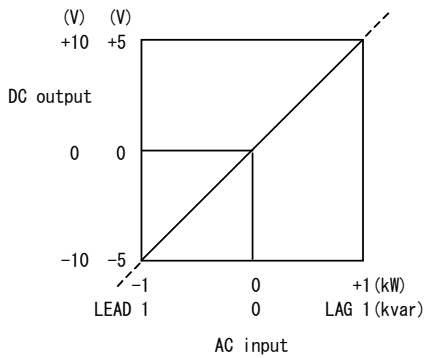
Input	Output
0 to 5A	4 to 20mA or
0 to 150V	1 to 5V



(2) Active power · Reactive power

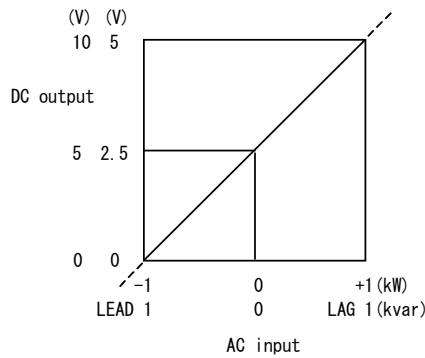
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Input	Output
-1kW to +1kW	-5 to +5V or
LEAD 1kvar to LAG 1kvar	-10 to +10V



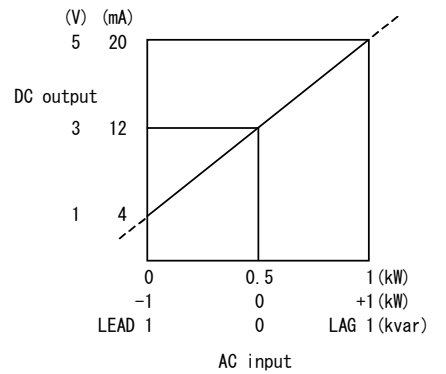
②

Input	Output
-1kW to +1kW	0 to 5V or
LEAD 1kvar to LAG 1kvar	0 to 10V



③

Input	Output
0 to 1kW	4 to 20mA or
-1kW to +1kW	or
LEAD 1kvar to LAG 1kvar	1 to 5V

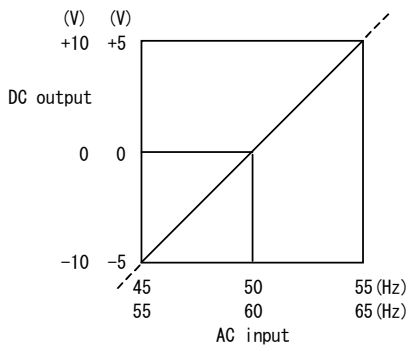


(3) Frequency

①

Input	Output
45 to 55Hz	-5 to +5V or
55 to 65Hz	-10 to +10V

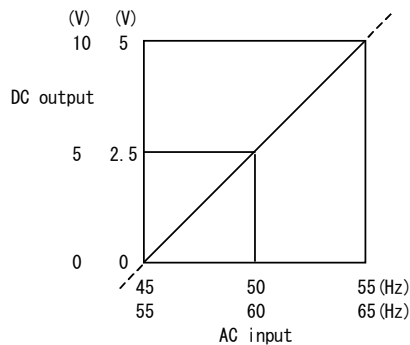
If an input voltage VRS (VRN) is less than 30V (30/√3V), output will be about -5V (or, about -10V).



②

Input	Output
45 to 55Hz	0 to 5V or
55 to 65Hz	0 to 10V

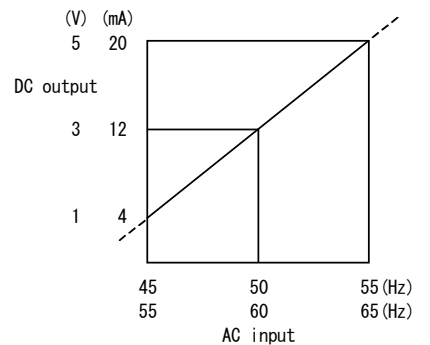
If an input voltage VRS (VRN) is less than 30V (30/√3V), output will be about 0V.



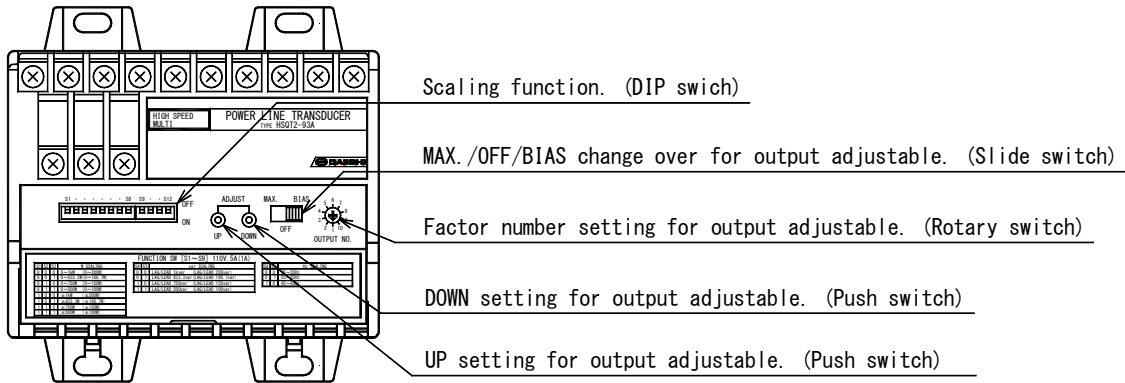
③

Input	Output
45 to 55Hz	4 to 20mA or
55 to 65Hz	1 to 5V

If an input voltage VRS (VRN) is less than 30V (30/√3V), output will be about 1V (or, about 4mA).



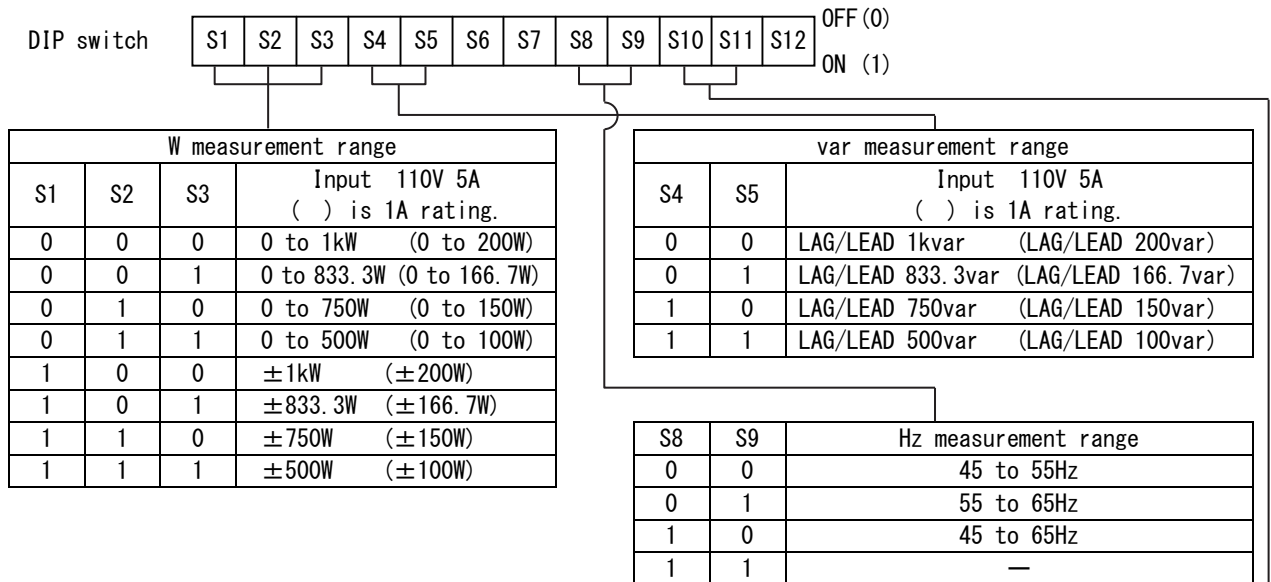
3.8 Explanation of front switch



< Caution > Setting change of a DIP switch becomes effective by applying an auxiliary supply again.

● Measurement range

A measurement range (active power, reactive power, frequency) can be altered with a front DIP switch.

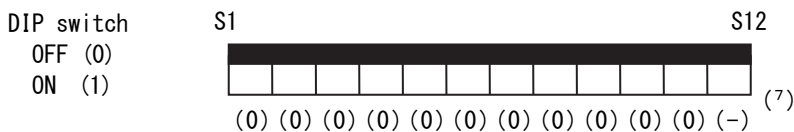


● Count setup of moving average.

With a front DIP switch (S10, S11), the count of a moving average of current, voltage, power, and reactive power can be altered.

S10	S11	Count of moving average
0	0	With no average
0	1	2 times
1	0	3 times
1	1	—

3.9 Setting of shipment (In case there is no designation at standard product)



In case of input rating 110V and 5A.
 W measurement range 0 to 1kW
 var measurement range LEAD 1 to 0 to LAG 1kvar
 Hz measurement range 45 to 55Hz
 Count of moving average With no average

Note (7) Please use DIP switch S12 in the status at the case of shipment.

4. Calibration

Because output adjustment of this product is carried out beforehand, there is no want for calibration.

However, in case an output shifts in long-term use, please adjust in the next way.

- (1) Output load should connect and adjust real load (name plate indication load-resistance within the limits) or the simulation load of resistance equivalent to it.
- (2) Please apply the input of an auxiliary supply, rated voltage, and the rated current.
Please perform a warm-up for about 30 minutes after applying.
- (3) The rotary switch sets the factor number for output adjustment.
Please make a slide switch into the BIAS side. If the input of the minimum (span) output is applied, please adjust with an ADJUST switch to become the minimum output value.
Next, please make a slide switch into a MAX side. If the input of a rated output is applied, please adjust with an ADJUST switch to become a rated-output value.
- (4) Please set a slide switch as OFF after adjustment.

● Factor number setting for output adjustable.

Corresponds to each element number in the output (see table below)

The set output element becomes the adjustment target, and the UP/DOWN switch, etc. becomes effective.

OUTPUTNo.	1	2	3	4	5
Setting factor	OUTPUT 1 A	OUTPUT 2 V	OUTPUT 3 W	OUTPUT 4 var	OUTPUT 5 Hz

● MAX./OFF/BIAS change over for output adjustable. (MAX./BIAS)

This is a changeover switch for maximum (MAX.) adjustment and bias (BIAS) adjustment of the specified element.

And, in case it does not adjust, a UP/DOWN switch becomes no effect by always setting in the state of OFF.

● UP setting for output adjustable. (UP)

This switch raises the output for the selected target for adjustment. By pushing a short-time switch, it is tuned finely. By continuing pushing a switch, a coarse adjustment becomes possible.

● DOWN setting for output adjustable. (DOWN)

This switch drops the output for the selected target for adjustment. By pushing a short-time switch, it is tuned finely. By continuing pushing a switch, a coarse adjustment becomes possible.

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