Standard Specification Sheet Model:MS4431

MS4400

Low Cost, Space Saving Power Transducer

OVERVIEW

This is low cost, space saving power transducer that measures power consumption of power equipment utilizing input signals from CT and PT and converts into any desired standard process signal.

- ▽ Durable for waveform, thus enabling application for inverter measurement.
- ▽ Wide allowance for power source voltage: 85～264V AC / 85～143V DC
- ▽ Low cost, space saving, light weight, low power consumption - Helps saving total cost and environmental burden at the same time.

ORDERING INFORMATION

Ordering Code	Standard Price
Single-phase Two-wired MS4431－0□□□ ①②③	OPEN
Single-phase Three-wired MS4431－1□□□ ①②③	OPEN
Three-phase Three-wired MS4431－3□□□ ①②③	OPEN
Three-phase Four-wired MS4431－4□□□ ①②③	OPEN

SPECIFICATIONS

Input Specifications

Input Signal (Specify at ① when ordering)	[MS4431-0, -1, -3] ■ 110V AC 5A ····· 1 ■ 110V AC 1A ····· 2 ■ 220V AC 1A ····· 3 ■ 220V AC 5A ····· 4 [MS4431-4] ■ 110V AC/√3 5A ····· 1 ■ 110V AC/√3 1A ····· 2 ■ 220V AC/√3 1A ····· 3 ■ 220V AC/√3 5A ····· 4
Rated Frequency	50/60Hz combined
Power Consumption	Voltage Measurement Side:0.3VA max. (Each phase at AC110V) Current Measurement Side:0.3VA max. (Each phase) Auxiliary Power Side:3VA max.
Continuous Overload	120% of rated input value
Instantaneous Overload	Twice rated voltage (10s) 10 times rated current (16s) 20 times rated current (4s) 40 times rated current (1s)

Output Specifications

Output Signal (Specify at ② when ordering)	[Unipolar] ■ 4～20mA DC (Load Resistance 600Ω max.) A ■ 0～1mA DC (Load Resistance 10kΩ max.) ·· B ■ 1～5V DC (Load Resistance 1kΩ min.) ···· C ■ 0～5V DC (Load Resistance 1kΩ min.) ···· D ■ 0～10V DC (Load Resistance 1kΩ min.) ···· E [Bipolar] ■ 4～12～20mA DC (Load Resistance 600Ω max.) G ■ -1～0～+1mA DC (Load Resistance 10kΩ max.) H ■ 1～3～5V DC (Load Resistance 1kΩ min.) ·· I ■ -5～0～+5V DC (Load Resistance 1kΩ min.) J ■ -10～0～+10V DC (Load Resistance 1kΩ min.) ·K ■ Specified range ····· Z

Power Specifications

Auxiliary Power Supply (Specify at ③ when ordering)	■ AC85～264V/DC88～143V ····· 1 ■ DC20～30V (+¥10,000) ····· 2 ■ DC40～60V (+¥10,000) ····· 3

※Please specify the input range by referring the below table and notes.

Model	Input Signal	Available Input Range (kW)	Power Consumption/Phase (VA)	
			Voltage Circuit	Current Circuit
MS4431-0	110V 5A	0.25～(0.5)～0.6	0.3	0.3
	110V 1A	0.05～(0.1)～0.12	0.3	0.3
	220V 1A	0.1～(0.2)～0.24	0.6	0.3
	220V 5A	0.5～(1.0)～1.2	0.6	0.3
MS4431-1	110V 5A	0.5～(1.0)～1.2	0.3	0.3
	110V 1A	0.1～(0.2)～0.24	0.3	0.3
MS4431-3	220V 1A	0.2～(0.4)～0.48	0.6	0.3
	220V 5A	1.0～(2.0)～2.4	0.6	0.3
MS4431-4	110V/√3 5A	0.5～(1.0)～1.2	0.3	0.3
	110V/√3 1A	0.1～(0.2)～0.24	0.3	0.3
	220V/√3 1A	0.2～(0.4)～0.48	0.6	0.3
	220V/√3 5A	1.0～(2.0)～2.4	0.6	0.3

Values shown in parenthesis are standard input ranges.
Equation for input range:
P (kW) = VT-ratio × CT-ratio × P0 (kW)
(P:Measurement Range、P0:Input Range)

Device Specifications

Construction	Boxed Construction with front terminal
Connection Method	M4 Screw Terminal

Case Material	Flame retardant black resin
Zero Adjustment	Approx. 5%
Span Adjustment	Approx. 5%

Physical Specifications

Operating Temperature Range	−10～55℃
Operating Humidity Range	40～85%RH
Storage Temperature Range	−40～70℃
Shock	Apply the shock of magnitude 490m/s^2 specified in Test Method 1 of JIS C 0912 3 times each in forward and reverse directions along three axes at right angles each other selected to include the mounting face, 18 times in total
Vibration	Apply the vibration with vibration frequency of 16.7Hz and vibration displacement of 4mm in peak-to-peak amplitude specified in 4.2 of JIS C 0911, in the directions of 3 axes at right angles each other including the mounting face each for 1h, for 3h in total
Mounting	Wall-mount or DIN-rail-mount
Weight	Approx. 300g

Performance

Compliance Standard	JIS C 1111
Tolerance	±0.5% (Relative to output span)
Output Ripple	1%p-p max. (Relative to output span)
Response Time	0.5s max. (time until the output reaches and remains with a band ±1% of the rated output when input steps from 0 to 90%)
Effect of Self-heating	±0.5% (Relative to output span)
Effect of Temperature	±0.5% (Relative to output span) Value obtained with 23±20℃ variation of ambient temperature
Effect of Frequency	±0.25% (Relative to output span) Value obtained with ± 5% variation of rated frequency
Effect of External Magnetic Field	±0.5% (Relative to output span) Value obtained with magnetic field of 400A/m
Effect of Auxiliary Power Supply Voltage	±0.25% (Relative to output span) Over full supply voltage range
Effect of Output Load	±0.25%(Relative to output span) With reference to the output at 1/2 of rated output load
Effect of Waveform	±0.5% (Relative to output span) Value obtained with input including third higher harmonic equal to ±20% of the fundamental wave
Insulation Resistance	Measure with DC500V insulation resistance tester ・ Between all electrical circuits connected together and ground terminal:50MΩ min. ・ Between input terminals connected together and output terminals connected together : 50MΩ min. ・ Between auxiliary power supply terminals connected together and input and output terminals connected together:50MΩ min.
Power Frequency Withstand Voltage	Test by applying AC2000V for 1 min. ・ Between all electrical circuits connected together and ground terminal ・ Between input terminals connected together and output terminals connected together ・ Between auxiliary power supply terminals connected together and input and output terminals connected together ・ Between output terminals connected together and ground terminal
Lightning Impulse Withstand Voltage	Apply voltage waveform of 1.2/50μs with full wave voltage 6kV ・ Between all electrical circuits connected together and ground terminal ・ Between input terminals connected together and output terminals connected together ・ Between output terminals connected together and ground terminal Apply current waveform of ±8/20μs with full wave voltage 2000V ・ Between output terminals

CONNECTION DIAGRAM