

True RMS Signal Isolation Transmitter

ISO RMS-P-O Series

FEATURES:	APPLICATIONS:
<ul style="list-style-type: none"> ● Accuracy grade: 0.1, 0.2, Wide Signal input 0-1KHz ● 0-200mV AC or DC Small Signal Conversion ● High Linearity (Non-linearity<0.2%) ● 1.5KVAC isolation among Input, Output and Auxiliary Power ● Auxiliary Power Supply:5VDC 12VDC, 24VDC,etc. ● International Standard UL94-V0 Package ● Flaming Retardant, 24 PIN DIP Package ● Temperature Range: -45°C to +85°C 	<ul style="list-style-type: none"> ● Analog Signal Data Acquisition and Isolation ● Measurements of AC or DC Signal RMS ● Ground Loop Elimination ● Measurements & Instrumentations ● Transducer Signal Transmitting and Receiving ● Long Distance Signal Transmitting ● Non-electric quantity signal measurement ● Signal Converter in Industrial Application

DESCRIPTION

In general, the voltage-meter is used to test DC voltage signal, while by adding an AC/DC conversion circuit for AC signal testing. Currently, the AC voltage-meters prefer to use a simple average value response AC/DC Converter to decrease the cost and predigest the circuit. The common used average value response AC/DC Converter is of that a semi-wave or full wave line commutate type composed by operational amplifier and diode. This design features high accuracy and linearity as well as its low cost and simplified circuit design. But the disadvantage is that only can be applied to the application of testing standard sine wave voltage under no distortion, and error will occur if test the distortion sine wave. Furthermore, it is also not applicable to test square, rectangle, triangle, saw-tooth, and trapezium and ladder wave on account of the testing results is not in accordance with the fact.

The RMS Isolation Amplifier is designed to meet the requirements of electronic testing at the application where need high accuracy testing of various wave as above mentioned. The core component of RMS Isolation Amplifier is the highly integrated module, and it is configured and designed upon high accuracy amplifier and latest D/S calculation techniques. It can be used to test any type voltage or current wave without considering waveform or distortion. Above all, the RMS Isolation Amplifier features high accuracy, high linearity, wide dynamic current range, quick frequency response, and comprehensive testing applications. In addition, the product is easy to be used with only a few external components linked.

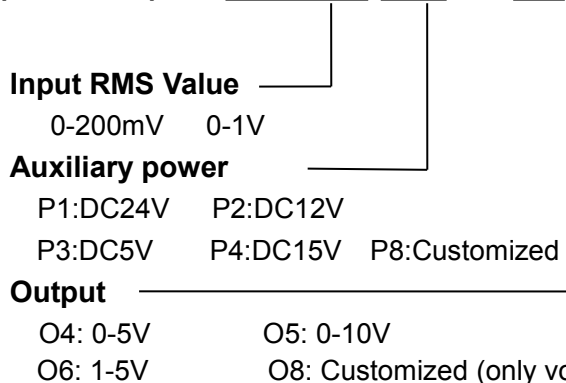
INPUT SPECIFICATIONS:

Continuous Isolation Voltage	3KVDC/rms
PW	±25%Vdd
Junction Temperature	- 25°C ~ + 70°C
Lead Temperature (<10S)	+300°C
Output Voltage Load Min	2KΩ

Note: Any input specifications from users defined exceed the above specified range will probably cause a permanent damage to the module

MODEL SELECTION:

(DIN1X1)ISO□RMS -P□ — O□



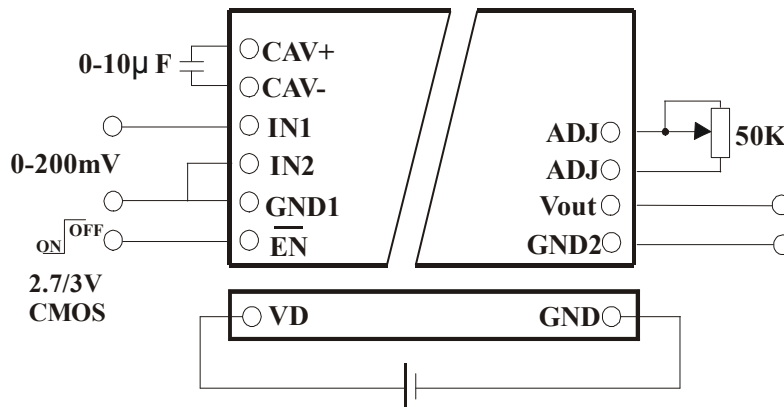
DIN1X1: for DIN Rail-mounted products.

Model Selection Example:
E.g.1: Input: 0-200mV AC or DC, Output: 0-5 V, Aux. Power Supply: 12VDC Model No.: ISO-200RMS-P2-O4

E.g.2: DIN Rial, Input: 0-200mV AC or DC, Output: 0-5 V, Aux. Power Supply: 12VDC. Model No.: DIN1X1 ISO-200RMS-P2-O4

GENERAL PARAMETERS:

Items	Test Condition	Min.	Typ.	Max.	Unit	
Isolated Voltage	AC / 50Hz / 1min	1500	3000		V (rms)	
Signal Input			0.2	1	V	
Min RMS Input				5	mV	
CMRRI			7	100	$\mu\text{V}/\text{V}$	
Gain Adj.	50 K Ω Multi-turn potentiometer		10		V/V	
Gain Temperature Drift			100		ppm/ $^{\circ}\text{C}$	
Non-linearity			0.2	0.5	%FSR	
Maladjusted Input Voltage			0.2	1	mV	
Input Impedance (Differential Mode)			8		M Ω	
Input Impedance (Common Mode)			100		M Ω	
Signal Output			2	10	V	
Frequency Response	Vin<1V		1		KHz	
Loading Capability	Vout=10V	2			K Ω	
Output Ripple	No Filtering			10	mV	
Voltage Temperature Drift			25		$\mu\text{V}/^{\circ}\text{C}$	
Auxiliary Power Supply	Voltage	Users Defined	3.3	12	24	VDC
	Current	VD=12V(RL=2K)		15		mA
Ambient Temperature		-45		+85	$^{\circ}\text{C}$	
Storage Temperature		-55		+125	$^{\circ}\text{C}$	

TYPICAL CONNECTION: (See Figure 1)

Figure 1: Typical Connection
Note:

- CAV is an average value capacitor, and is used to calculate the average value to low frequency signal.
- If wave peak $KP \leq 2$, no CAV connected and just applies to test the sine or triangle wave.
- If wave peak $2 < KP \leq 4$, the CAV capacitor is needed and its capacitance is of that between 1-10 μF , and the membrane capacitor is recommended.
- IN1 & IN2: the differential input, DC coupling and independent of signal polarity.
- OUT: The Voltage Output (Vout)
- EN: Input. If EN connected with VDD or No Connection, TRMS will be off function as can not obtain offset voltage. While at nominal working condition, it should be connected with GND or VSS.

TYPICAL APPLICATION

1: AC Signal RMS Testing (See Figure 2)

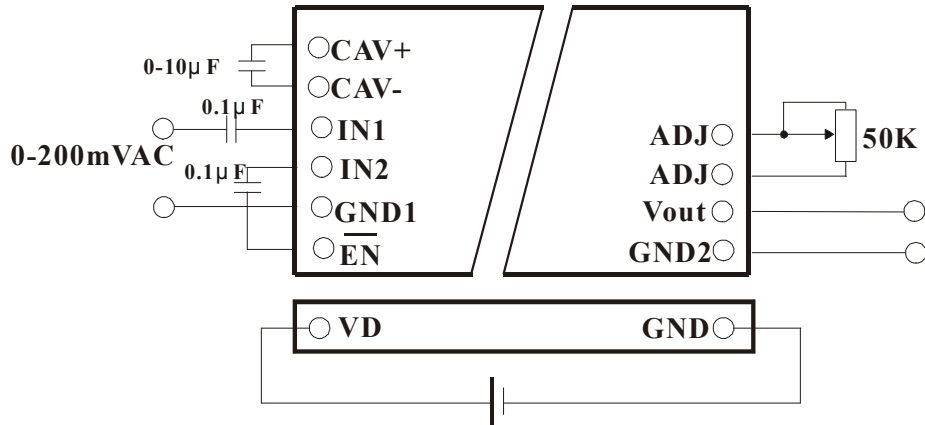


Figure 2: AC Signal RMS Testing

2: Large AC Signal RMS Testing (See Figure 3)

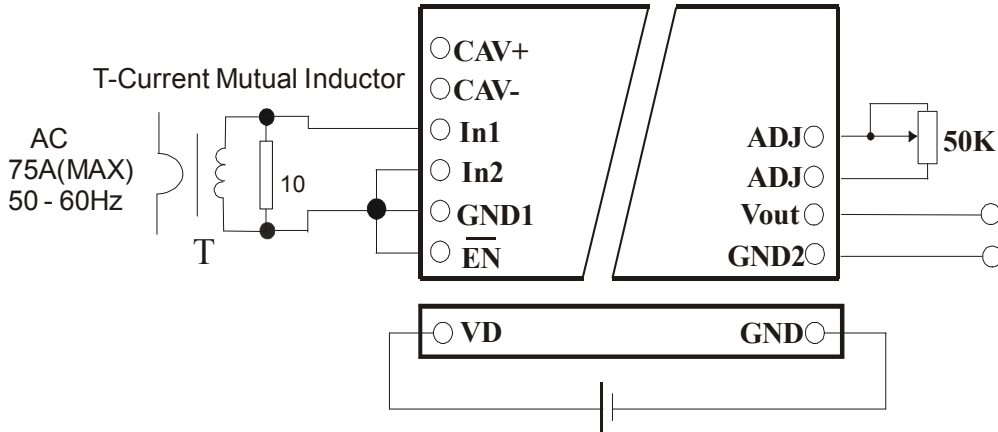


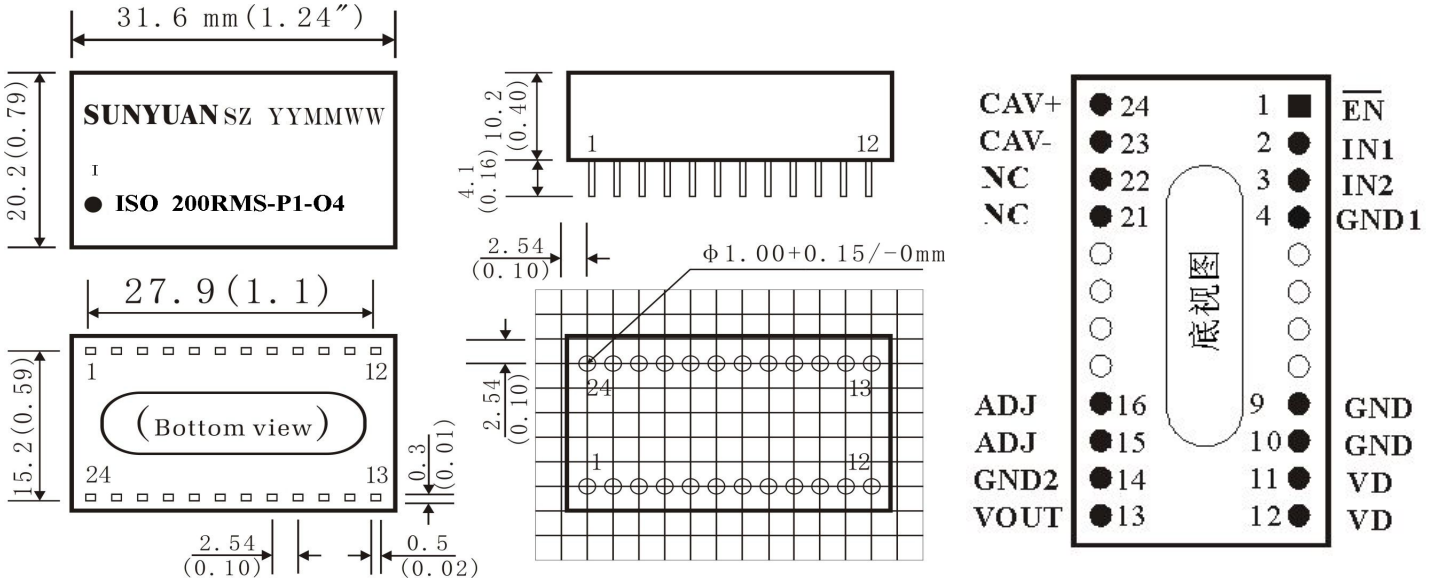
Figure 3: Large AC Signal RMS Testing

ERROR COMPARISON

Signal Testing (Wave Form)		Wave Peak Factor Kp	Wave Form Factor Kf	RMS Up/Kp =Urms	Average (Absolute Value) Urms/Kf = U	Average Comparative Error(γ)
No Distortion Sine Wave		1.414	1.111	0.707Up	0.637Up	0
Semi-wave Commutation		2	1.571	0.5Up	0.318Up	-29.40%
Square Wave	D=50%	1	1	Up	Up	11.10%
Rectangle Wave	D=25%	2	2	0.5Up	0.25Up	-44.60%
	D=1%	10	10	0.577Up	0.01Up	-99%
Triangle Wave		1.732	1.155	0.577Up	0.5Up	-3.80%
Saw-tooth Wave		1.732	1.155	0.577Up	0.5Up	-3.80%
SCR Wave	θ =110°	2.5	0.8	0.4Up	0.5Up	-39%
	θ =148°	4	0.69	0.25Up	0.36Up	-59%

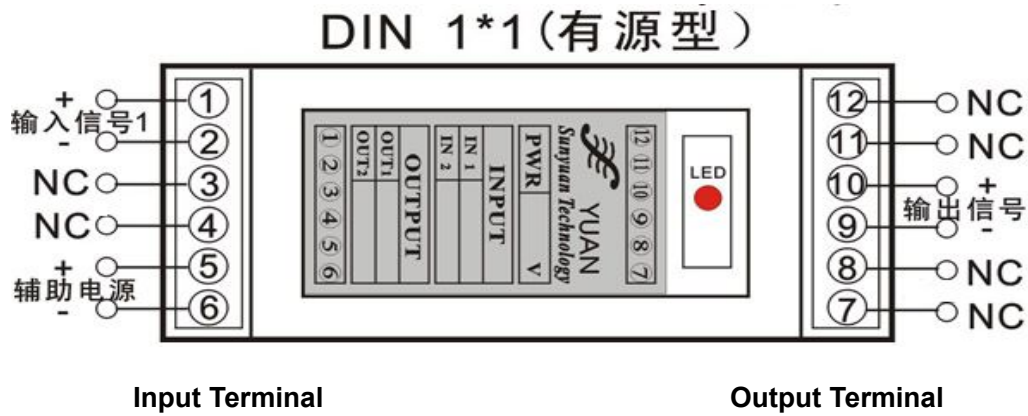
Wave Peak Factor	$K_p = U_p / U_{rms}$		
Wave Form Factor	$K_f = U_{rms} / U$		
For Sine Wave: $K_p = 1.414$; $K_f = 1.111$ So, $U_{rms} = 1.111U$			
Set Practical Value = 1.111U;		True Value = U_{rms}	
$\gamma = (\text{Practical Value} - \text{True Value}) / \text{True Value} \times 100\%$			

DIP24PIN DIMENSION & PIN DESCRIPTION



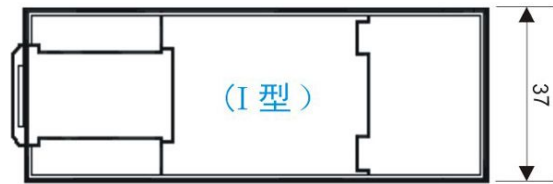
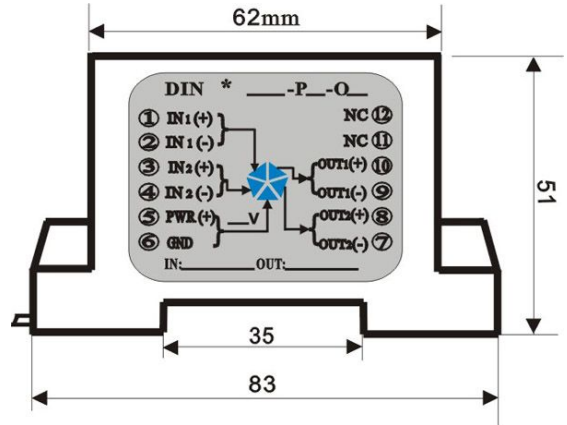
INPUT	DM INPUT	DM INPUT	Input Power Supply Negative	Aux. Power Supply Negative	Aux. Power Supply Positive	Isolated Signal Output Positive	Isolated Signal Output Negative	Gain Adjustment	NO Connection	Capacitance Negative	Capacitance Positive
EN	IN1	IN2	GND1	GND	VD	VOUT	GND2	ADJ	NC	CAV-	CAV+
1	2	3	4	9,10	11,12	13	14	15,16	21,22	23	24

DIN Rail External View & Dimension



DIN Rail Pin Definition

Pin	PIN Description	
1	Signal in	Input signal positive
2	Signal GND	Input signal negative
3	NC	No connection
4	NC	No connection
5	Power in	Auxiliary power positive
6	Power GND	Auxiliary power negative
7	NC	No connection
8	NC	No connection
9	Out-	Output signal negative
10	Out+	Output signal positive
11	NC	No connection
12	NC	No connection



External View



DIP 24PIN IC Package



DIN Rail Package