

CALSOURCE P 350 - 3 PHASE CALIBRATION SOURCE (Secondary Injection Kit)

Introduction

CalSource P350 is a three phase calibration source designed to test and calibrate electrical instruments like voltmeter, ammeter, power and energy meter, PF meter etc. The instrument generate three voltages and three currents the amplitude and power factor angle of which are independently controllable. sinusoidal waves are digitally generated, amplified and controlled in a close loop for accuracy and low THD, The frequency is also programmable from 45Hz to 75Hz.

Principle

The System uses a digitally synthesized sinusoidal wave form with analog amplification to get low total harmonic distortion and high accuracy. The output waveform has a fundamental frequency 60dB above noise floor and stability of 0.1% at full scale,,

Features

- Three Voltage and three Current Current Sources
- 45 Hz - 65Hz variable three phase output
- Work from Single phase input power
- Variable Power factor
- Power and Energy - Per phase and Total
- Bright colour graphic LCD with easy to use interface
- Continuous digital POT for parameter setting
- Balance Mode, in which R phase setting copied to all
- Phaser Diagram
- Pulse option for auto calibration
- Rs232 for PC interfacing



Specifications

Power Input

230V +/-10%, Single phase, maximum 1A
50Hz +/- 3Hz

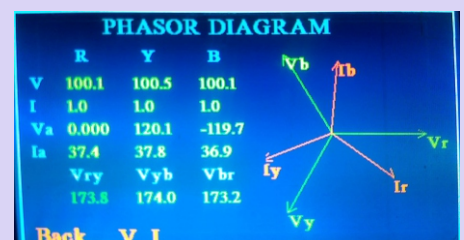
Out/put

Voltage Source

$V_R = 15V\ AC - 300VAC\ @\ 50VA$
 $V_Y = 15V\ AC - 300VAC\ @\ 50VA$
 $V_B = 15V\ AC - 300VAC\ @\ 50VA$
Resolution 0.1V
Stability & Accuracy (0.2%+0.2V from 40V - 300V)

Current Source

$I_R = 15\ mA\ AC - 15AAC\ @\ 30VA$
 $I_Y = 15\ mA\ AC - 15AAC\ @\ 30VA$
 $I_B = 15\ mA\ AC - 15AAC\ @\ 30VA$



Resolution 0.10 A

Stability and Accuracy 0.2+2mA%

Power Factor

$PF_R = 0.1$ to 1 Lead/Lag

$PF_Y = 0.1$ to 1 Lead/Lag

$PF_B = 0.1$ to 1 Lead/Lag

Resolution 0.001

Accuracy +/- 0.002

Frequency

Variable from 45 Hz to 65 Hz

Resolution 0.1 Hz, Accuracy 0.05%

Distortion

THD < 1% at full scale

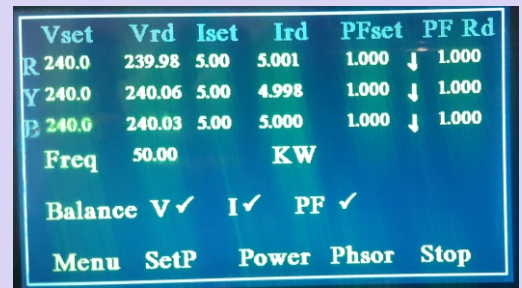
Protection

Built-in Short circuit and Thermal Protection

Mechanical

Dimensions 420mm x 425 mm x 170mm

Weight 25 kg (approx.)



	Vset	Vrd	Iset	Ird	PFset	PF Rd
R	240.0	239.98	5.00	5.001	1.000	1.000
Y	240.0	240.06	5.00	4.998	1.000	1.000
B	240.0	240.03	5.00	5.000	1.000	1.000
Freq	50.00					
				KW		
Balance	V ✓	I ✓			PF ✓	
Menu	SetP	Power	Phsor	Stop		

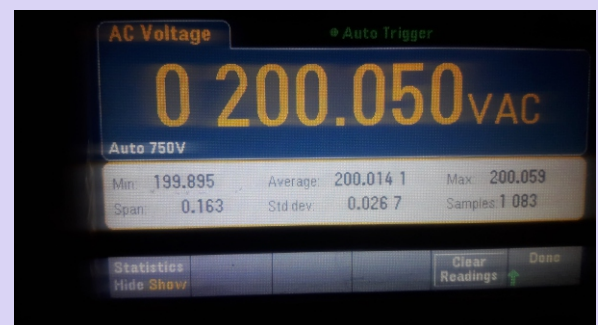


	KVA	KW	KVAR	ENRG
R Ph	1.00	1.00	0.00	0.025
Y Ph	1.00	1.00	0.00	0.025
B Ph	1.00	1.00	0.00	0.024
Total	3.00	3.00	0.01	0.073
Time	159			
V-I	Phsr	Strt	Stop	Cfg

Accuracy and Stability

For a calibration source, the two parameters of importance are the accuracy and precision (stability) of the set parameter. Accuracy can be defined as the closeness of the average value to the set value and the precision as the closeness of the values to each other. The standard deviation indicates the stability and minimum and maximum values indicate the worst case readings.

The accompanying figure shows a typical values of average minimum and maximum values and standard deviation over 1000 consecutive readings taken on Keysight DMM 34461A (basic accuracy 0.03%)



AC Voltage		* Auto Trigger	
0 200.050 VAC			
Auto 750V			
Min:	199.895	Average:	200.014 1
Span:	0.163	Std dev:	0.026 7
		Max:	200.059
		Samples:	1 083
Statistics		Clear	
Hide Show		Readings Done	

Application

Testing and Calibration of Voltmeters, ammeters, wattmeters

Testing and calibration of PF meters

Testing and calibratoion of Energy meters

Production line and field testing of control instruments

Energy Meter Calibration

Calsource P350 has an Energymeter calibration mode in which, an energymeter can be calibrated in three modes.

1. Automatic calibration with pulse sensor - In this mode the pulse rate & amount of energy to be accumulated can be programmed. An optical pulse sensor can be connected to P350 to sense the meter pulses and upon reaching the energy limit set, the error in percentage will be displayed.

2. Semi automatic calibration with revolving disc - In this mode, the maximum number of revolution should be programmed. Then begin the test when the disc reaches the mark and manually count the disc revolution. When it reaches the set value, manually stop the test and the error observed will be displayed,

3. Manual Calibration for meters without pulse/disc - In this mode the energy to be accumulated can be programmed and note down the start energy in the meter, before beginning the test. When the energy in the meter reaches the set value stop the test. The error observed will be displayed on P350.

	V	I	Pf		
R	0.000	0.000	-0.607	Pulse/kwh	1200
Y	0.000	0.000	-0.834	Revln/kwh	600
B	0.000	0.000	0.006	CT X : 1	1
Frq	50.00			PT X : 1	1
Mode	EnergyLmt	Energy	Error		
Pulsc	9200	0.000	0.00 %		
Exit	Cfg	Mode	Lmt	Begin	



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