

# GENERALIZED A.C./A.C. CONVERTER EXPERIMENTAL SET UP

SINGLE PHASE/THREE PHASE MODE

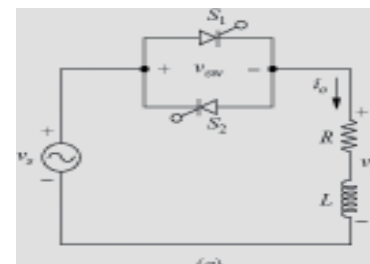
GACDCSCR-Series

## Introduction & operating principle:

GACACSCR series of generalized S.C.R. based A.C./A.C. converter(series/parallel-RL Load) set ups/tools are available (single phase/three phase) topologies with/without source transformer offers general experimental facility to characterize their voltage/current behavior, delayed commutation viz-viz change in firing angle, smoothing/stray inductance, source resistance and switching frequency and impact of controller gains on steady state/transient behaviour. These may be used for bidirectional power transfer application. Available in more than three regular and custom specification models virtually offering all research and development/academic solution. These useful diagnostic tool for real time simulation for telecom, non-conventional resources, railway, defense, computer, academics automobile, medical, aerospace, and many research & development applications, avionics, heavy electrical engineering, solid state physics application, applications etc. These are available in various power ranges from 1-100 kilo watts and frequency from 50-2000 s.

## Operating Principle:

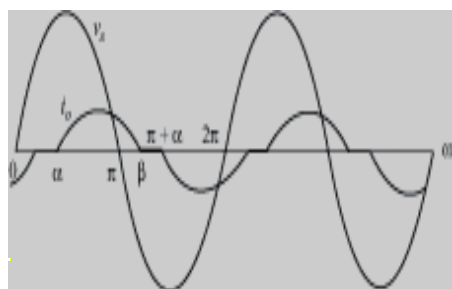
Single/three phase A.C. controllers consist of anti parallel S.C.R. to either control output voltage control of bidirectional power transfer. These may be used for high current high voltage rectifier or bidirectional power transfer simulation. Converter works in controlled mode when are fired at angle  $\alpha$ , current flows and continue till next half cycle depending on inductance/load resistance. This effect limits not only firing angle but effects average voltage and current both apart from ripple factor, form factor, ripple factor conduction range. Delayed firing effects healthy commutation and control range as well. While working in feed back, these parametric variation effects controllability and stability.



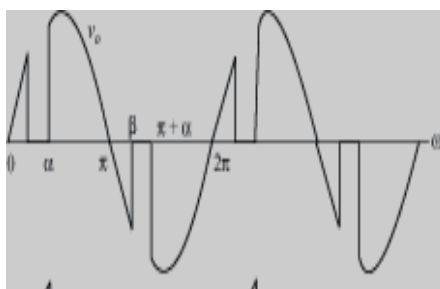
A.C./A.C. converter

## Benefit:

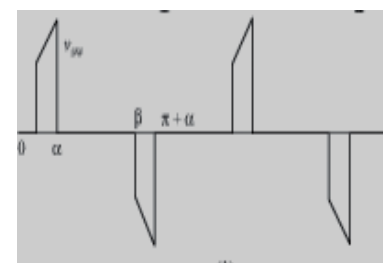
Simple installation and operational compatibility /Consistent S.C./Over/under voltage protection



Source voltage/current waveform



Output voltage waveform

switch voltage waveform  
Power 500-2000 watts

## Electrical/Mechanical specifications of of A.C./A.C.controller experimental set up

MODEL	V.A.	Vin D.C.	Vout D.C	Frequency Hz	%Firing angle range	Inductance/ source resistance step	controllers
GACACBSCR-00001	500.0	0-220	0-220	10/20/40	0-100%	Three	PID/SLM
GACACBSCR-00002	1000.0	0-220	0-220	10/20/40	0-100%	Three	PID/SLM
GACACBSCR-00005	2000.0	0-220	0-220	10/20/40	0-100%	Three	PID/SLM
GACACBSCR-00010	5000.0	0-220	0-220	10/20/40	0-100%	Three	PID/SLM

## General specification of generalized S.C.R. based A.C./A.C. converter set ups:

Operating voltage: 110/220 volts A.C.,50 HZ

Output voltage: depending on gain,load, firing angle

Real power control range: : 500/1000/2000/5000 watts

Rreactive power range: 80% of real power(var)

Parametric variation: source resistance, smoothing inductance, firing angle  
Frequency, load in three steps

Controller type gain parameter: PID and sliding mode

topologies: half wave, half bridge, full bridge

Display: Regulation of O/P voltage: better than 0.5 % of measurement

Repeatability of O/P voltage: 100 percent

Display: 3 digit LED/LCD for source resistance, smoothing inductance,  
firing angle, Frequency, load, efficiency, voltage, current  
PID and sliding mode in three steps

Interface: analogue;0-10 volts D.C. to state variables

Protection: S.C./Over/under voltage/over temperature indication

## Dimensional specs of on line AC TO AC CONVERTER :

GACACBSCR-00001	12x24x15 inch	10 kg	GACACBSCR-00002	15x24x20 inch	16 kg
GACACBSCR-00005	18x24x24 inch	26 kg	GACACBSCR-00010	24x24x30 inch	47 kg



GACACBSCR-00002

MOTORON SEMICONDUCTORS CORPORATION

33, Shri nagar colony, Shakti nagar extension, DELHI-110052. Tel: 011-23644180/23655454

e.mail: [motoron@hotmail.com](mailto:motoron@hotmail.com)

# GENERALIZED A.C./A.C. CONVERTER EXPERIMENTAL SET UP

## BIDIRECTIONAL PWER TRANSFER

GACDCSCR-Series

### Introduction & operating principle:

GACACSCR series of generalized S.C.R. based A.C./A.C. converter(series/parallel-RL Load) set ups/tools are available (single phase/three phase) topologies with/without source transformer offers general experimental facility to characterize their voltage/current behavior, delayed commutation viz-viz change in firing angle, smoothing/stray inductance, source resistance and switching frequency and impact of controller gains on steady state/transient behaviour. These may be used for bidirectional power transfer application. Available in more than three regular and custom specification models virtually offering all research and development/academic solution. These useful diagnostic tool for real time simulation for telecom, non-conventional resources, railway, defense, computer, academics automobile, medical, aerospace, and many research & development applications, avionics, heavy electrical engineering, solid state physics application, applications etc. These are available in various power ranges from 1-100 kilo watts and frequency from 50-2000 s.

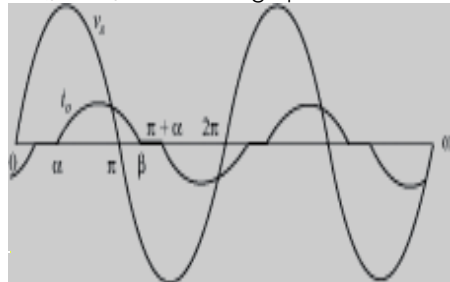
### Operating Principle:

Single/three phase A.C. controllers consist of anti parallel S.C.R. to either control output voltage control of bidirectional power transfer. These may be used for high current high voltage rectifier or bidirectional power transfer simulation. Converter works in controlled mode when are fired at angle  $\alpha$ , current flows and continue till next half cycle depending on inductance/load resistance. This effect limits not only firing angle but effects average voltage and current both apart from ripple factor, form factor, ripple factor conduction range. Delayed firing effects healthy commutation and control range as well. While working in feed back, these parametric variation effects controllability and stability.

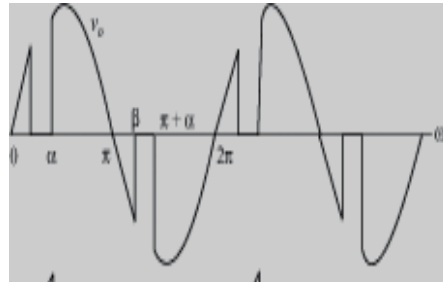
### Benefits:

#### Benefit:

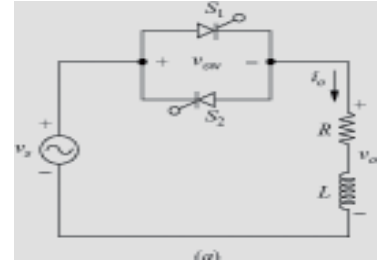
Simple installation and operational compatibility /Consistent S.C./Over/under voltage protection



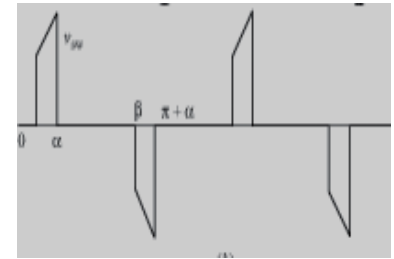
Source voltage/current waveform



Output voltage waveform



A.C./A.C. converter



switch voltage waveform  
Power 500-2000 watts

### Electrical/Mechanical specifications of of A.C./A.C.controller experimental set up

MODEL	V.A.	Vin D.C.	Vout D.C	Frequen cy Hz	%Firing angle range	Inductnce/ source resistance step	controllers
GACACBSCR-00001	500.0	0-24/48	0-24	10/20/40	0-100%	Three	PID/SLM
GACACBSCR-00002	1000.0	0-48/72	0-48	10/20/40	0-100%	Three	PID/SLM
GACACBSCR-00005	2000.0	0-72/96	0-72	10/20/40	0-100%	Three	PID/SLM
GACACBSCR-00010	5000.0	0-96/120	0-96	10/20/40	0-100%	Three	PID/SLM

### General specification of generalized S.C.R. based A.C./A.C. converter set ups:

Operating voltage: 110/220 volts A.C., 50 Hz

Output voltage: depending on gain, load, firing angle

Real power control range: : 500/1000/2000/5000 watts

Reactive power range: 80% of real power (var)

Parametric variation: source resistance, smoothing inductance, firing angle  
Frequency, load in three steps

Controller type gain parameter: PID and sliding mode

topologies: half wave. Full wave, half bridge, full bridge

Display: Regulation of O/P voltage: better than 0.5 % of measurement

Repeatability of O/P voltage: 100 percent

Display: 3 digit LED/LCD for source resistance, smoothing inductance., firing angle, Frequency, load, efficiency, voltage, current  
PID and sliding mode in three steps

Interface: analogue; 0-10 volts D.C. to state variables

Protection: S.C./Over/under voltage/over temperature indication

### Dimensional specs of on line AC TO AC CONVEITER :

GACACBSCR-00001	12x24x15 inch	10 kg	GACACBSCR-00002	15x24x20 inch	16 kg
GACACBSCR-00005	18x24x24 inch	26 kg	GACACBSCR-00010	24x24x30 inch	47 kg



GACACBSCR-00002

MOTORON SEMICONDUCTORS CORPORATION

33, Shri nagar colony, Shakti nagar extension, DELHI-110052. Tel: 011-23644180/23655454

e.mail: [motoron@hotmail.com](mailto:motoron@hotmail.com)