

### General

The Type 4944C S<sup>2</sup>MC secondary thyristor controller system provides speed regulated control of reversing/plugging travel drives or reversing hoists with mechanical load brakes using wound rotor motors. The Type 4944C system includes the controller and for separate mounting the Type 3000 secondary resistor.

The operator control is a Type 4216 stepless mill master switch. Type 4211 stepless mini master switch or Type 2015/6/7 stepless pendant pushbutton station.

Full range of motor speed from minimum to maximum is adjusted by the stepless operator. Travel speed is closely controlled by controlling the conduction period of the secondary thyristor modules.

Type 4944C controllers are available from 5 to 125 HP at 230/3/60 VAC and 10-250 HP at 460/3/60 VAC.

### Operation

Three (3) inverse parallel/full wave controlled thyristor modules are connected in delta in the secondary of the wound rotor motor. A permanent series resistor is connected in series with each of the three thyristor modules to limit motor current and maximize motor torque at minimum speed. Direction of rotation is determined by a primary reversing contactor controlled by the master switch handle.

The S<sup>2</sup>MC Secondary Adjustable Speed Control assembly controls the speed of the motor by monitoring the secondary frequency and adjusting the firing angle of the secondary thyristors until the commanded speed is met. The commanded speed is produced by the speed reference signal in proportion to the master switch handle position. Speed is held constant, independent of load, for any given master switch handle position, by the controller.

During plugging operations, the S<sup>2</sup>MC control assembly will limit the torque to the preset plugging torque value. The plugging torque level can be adjusted from zero to 150% of full load motor torque (for mechanical load brake applications the plugging torque is fixed at 150%-175%).

The Type 4944C controller is recommended for use on most single motor travel drives which require speed regulation. It is also suitable for use on medium or high voltage wound rotor motors with low voltage secondaries.

### Features

The Type 4944C standard controller includes the following major components/features:

**S<sup>2</sup>MC Compact Speed Regulator Assembly** consisting of (1) regulator PC board and (1) firing circuit board. All adjustments, potentiometers, and test points for setup and fine-tuning plus station lights are front-panel-mounted and clearly identified. Simple test setup readings require use only of a VOM meter.

Three (3) conservatively rated **Type 5410 Full Wave Thyristor Power Modules** with MOV transient voltage protection and snubbing circuits to limit rate of voltage rise. Thyristor modules for 30HP and under are mounted with the S<sup>2</sup>MC Compact Speed Regulator Assembly. Over 30 HP the SCR modules are separate mount within the controller enclosure.

In addition to the S<sup>2</sup>MC modules the Type 4944C controller features a three pole main knife switch, NEMA rated reversing contactor, (3) Inverse time trip overload relays, fused control knife switch, 120 volt control transformer and low voltage relay.

### Optional Features

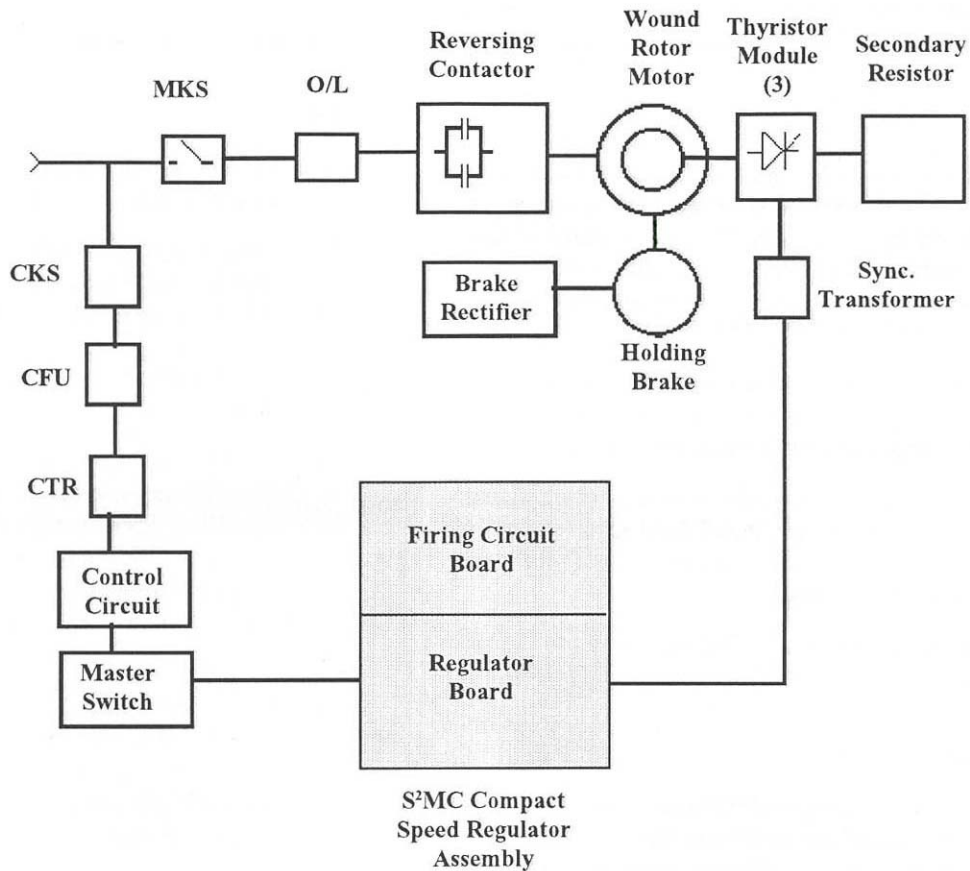
**Full Speed Contactor:** The 4944C system requires a secondary slip resistor to provide optimum torque at reduced speeds, which results in a 20% slip at full load/full speed when used with hoists with mechanical load brakes. The full speed contactor shorts out this resistor at high speed and allows the motor to obtain its maximum rated base speed. The 4944C used with travel drives do not require a full speed contactor.

**Five Step Reference Board.** This option allows the controller to operate from a standard 5 step sequential master switch or pendant. Each step can be independently set for a fixed speed.

Other standard modifications and options are available. Consult factory for assistance.



## Block Diagram



### Specifications

Input Power	Standard 230/460 60hz., Other voltages available
Horsepower Range	5 -30HP for Compact Construction 40 -250HP with external SCR's
Speed Range	Typical 10 to 1
Speed Regulation	10% Typical
Control Configuration	Reversing/Plugging
Temperature Range	- 40 degree C to +55 degree C.

### Bill of Material

Description	Symbol	Qty.
Main Knife Switch	MKS	1
Reversing Contactor	F/R	1
Compact Speed Regulator Assembly	SPA	1
Thyristor Modules	SCR	3
Overload Relays	OL	3
Low Voltage Relay	LV	1
Control Knife Switch	CKS	1
Control Fuse	CFU	3
Control Transformer	XFRR1	1



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