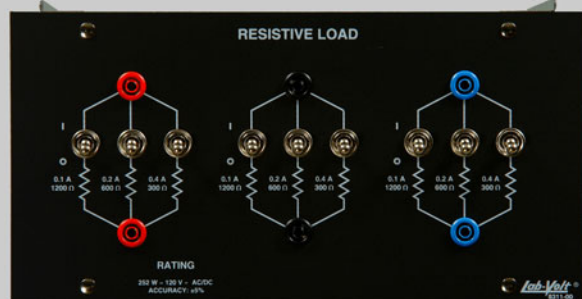




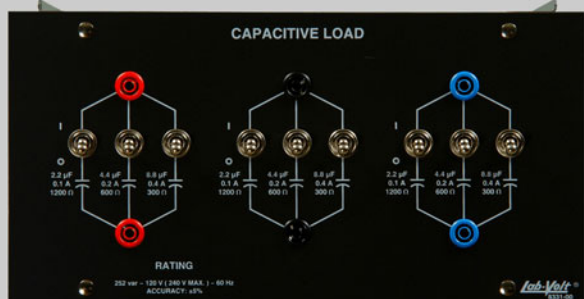
ELECTRICAL LOADS MODELS 8311, 8321, 8331, AND 8333

Electric Power / Controls

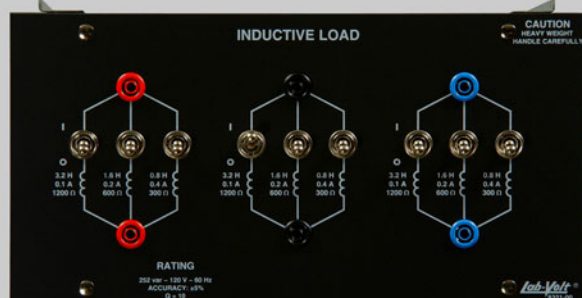
0.2 kW



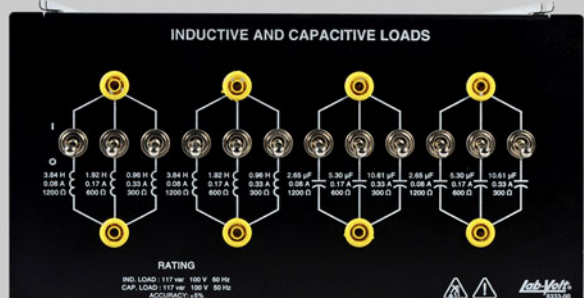
8311



8331



8321



8333

GENERAL DESCRIPTION

The Lab-Volt 0.2 kW Electromechanical Training System (EMS) features four electrical load modules: the Resistive Load, Model 8311, Inductive Load, Model 8321, Capacitive Load, Model 8331, and the Inductive and Capacitive Loads, Model 8333.

Each model comes as half-size EMS module. The loads are identified on the module front panel by schematic symbols and enabled using toggle switches. Connections are made through 4 mm safety banana jacks.

Models 8311, 8321, and 8331 are equipped with nine load components (resistors, inductors, and capacitors respectively) arranged in three identical groups for balanced or unbalanced, 3-phase delta or star (wye) loading. Each group can be independently varied in seven steps of loading. The three groups can also be connected in parallel to create a single-phase load variable in 21 steps.

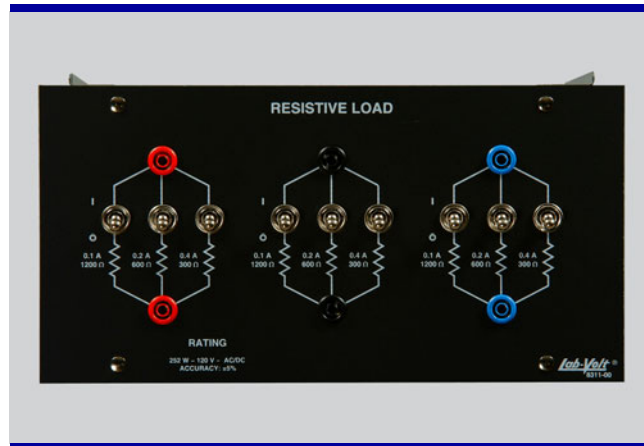
These models provide impedance levels that are adjustable for load equality, allowing students to measure the effects of identical resistive and reactive loads on voltage and current in a circuit, as well as observe, using a wattmeter or a varmeter, the differences that each type of load has on an ac signal source. Furthermore, because complex loads are possible through the interconnection of these models, power factor correction and resonance phenomena are easily demonstrated in laboratory exercises.

The Inductive and Capacitive Loads module, Model 8333, is equipped with twelve load components (six inductors and six capacitors) and each type of load components is arranged in two identical groups. This model has been specifically designed for the Renewable Energy Training Systems (Series 8010) to familiarize students with reactive loads in single-phase ac power circuits at a reduced network voltage of 100 V.

ELECTRICAL LOADS

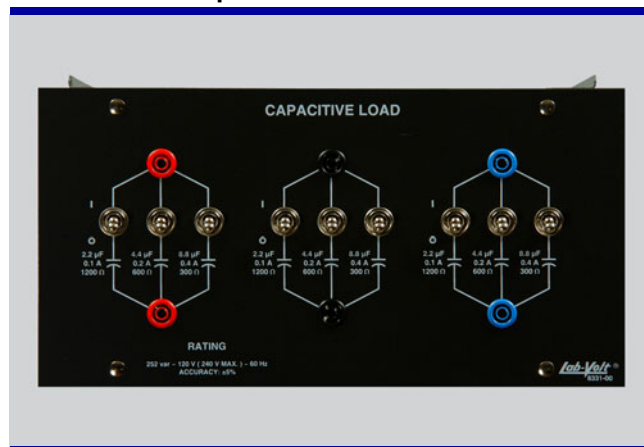
MODELS 8311, 8321, 8331, AND 8333

Model 8311 – Resistive Load



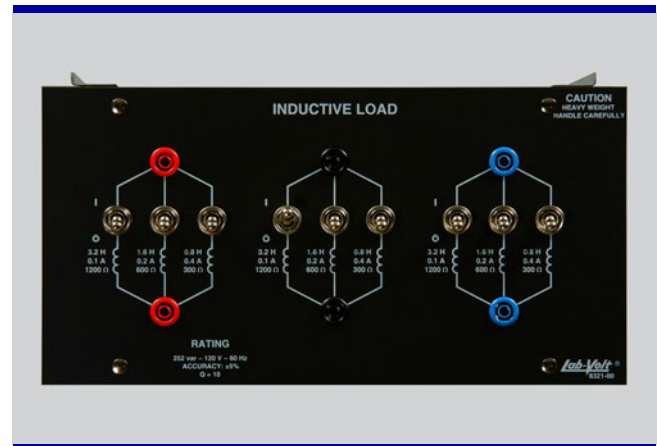
The Resistive Load Module, Model 8311, is equipped with 9 wire-wound power resistors. Each resistor is identified by a schematic symbol, the resistance value, as well as the current that will flow through it when connected to a nominal voltage power source. Each resistor is within 5% tolerance of the stated resistance value.

Model 8331 – Capacitive Load



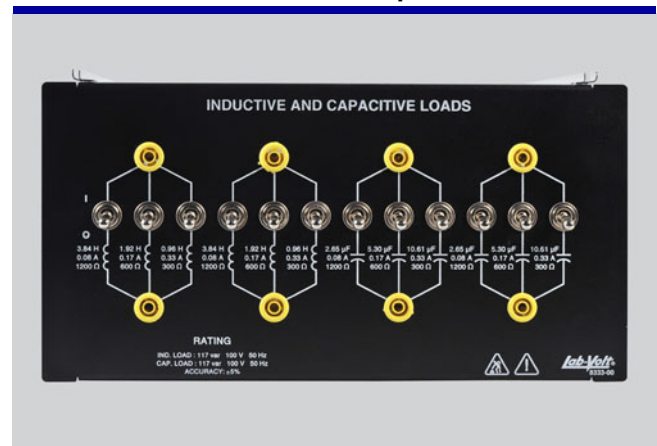
The Capacitive Load Module, Model 8331, is equipped with 9 oil-filled capacitors. Each capacitor is identified by a schematic symbol, the capacitance value, the capacitive reactance, as well as the current that will flow through it when connected to a nominal voltage power source. Each capacitor is within 5% tolerance of the stated capacitance value. A permanently connected discharge resistor reduces the voltage across each capacitor group to 5% of the applied voltage within 15 seconds after the load is disconnected from the supply.

Model 8321 – Inductive Load



The Inductive Load Module, Model 8321, is equipped with 9 iron-core power inductors, which have a nominal Q of 10. Each inductor is identified by a schematic symbol, the inductance value, the inductive reactance, as well as the current that will flow through it when connected to a nominal voltage power source. Each inductor is within 5% tolerance of the stated inductance value.

Model 8333 – Inductive and Capacitive Loads



The Inductive and Capacitive Loads, Model 8333, is equipped with 6 iron-core power inductors and 6 metallized film capacitors. The inductors and capacitors are within 5% tolerance of their stated inductance or capacitance value, and are identified by their schematic symbol, inductance or capacitance value, inductive or capacitive reactance, as well as the current that will flow through them when connected to a nominal voltage power source. A permanently connected discharge resistor reduces the voltage across each capacitor group to 5% of the applied voltage within 15 seconds after the load is disconnected from the supply.

SPECIFICATIONS

Model 8311 – Resistive Load		120/208 V – 60 Hz	220/380 V – 50 Hz	220/380 V – 60 Hz	240/415 V – 50 Hz
Resistors	Number	Three groups of three resistors			
	Resistance (group)	300/600/1200 Ω	1100/2200/4400 Ω		1200/2400/4800 Ω
	Nominal Voltage	120 V – AC/DC	220 V – AC/DC		240 V – AC/DC
	Accuracy	± 5%			
Load at Nominal Voltage (branch)	Power	12-84 W	11-77 W		12-84 W
	Current	0.1-0.7 A	0.05-0.35 A		
	Number of Steps	Seven of equal increment			
	Current Increment	0.1 A	0.05 A		
Physical Characteristics	Dimensions (H x W x D)	154 x 287 x 410 mm (6.1 x 11.3 x 16.1 in)			
	Net Weight	4.5 kg (9.9 lb)			
Model 8311-A – Resistive Load		120/208 V – 60 Hz	220/380 V – 50 Hz	220/380 V – 60 Hz	240/415 V – 50 Hz
Resistors	Number	N/A ¹			Three groups of three resistors
	Resistance (group)	N/A			300/600/1200 Ω
	Nominal Voltage	N/A			120 V – AC/DC
	Accuracy	N/A			± 5%
Load at Nominal Voltage (group)	Power	N/A			12-84 W
	Current	N/A			0.1-0.7 A
	Number of Steps	N/A			Seven of equal increment
	Current Increment	N/A			0.1 A
Physical Characteristics	Dimensions (H x W x D)	N/A			154 x 287 x 410 mm (6.1 x 11.3 x 16.1 in)
	Net Weight	N/A			4.5 kg (9.9 lb)
Model 8321 – Inductive Load		120/208 V – 60 Hz	220/380 V – 50 Hz	220/380 V – 60 Hz	240/415 V – 50 Hz
Inductors	Number	Three groups of three inductors			
	Inductance (group)	0.8/1.6/3.2 H	3.5/7/14 H	2.92/5.84/11.67 H	3.8/7.6/15.3 H
	Reactance (group)	300/600/1200 Ω	1100/2200/4400 Ω		1200/2400/4800 Ω
	Nominal Voltage	120 V – 60 Hz	220 V – 50 Hz	220 V – 60 Hz	240 V – 50 Hz
	Accuracy	± 5%			
Load at Nominal Voltage	Reactive Power	12-84 var	11-77 var		12-84 var
	Current	0.1-0.7 A	0.05-0.35 A		
	Number of Steps	Seven of equal increment			
	Current Increment	0.1 A	0.05 A		
Physical Characteristics	Dimensions (H x W x D)	154 x 287 x 410 mm (6.1 x 11.3 x 16.1 in)			
	Net Weight	10.1 kg (22.3 lb)			
Model 8331 – Capacitive Load		120/208 V – 60 Hz	220/380 V – 50 Hz	220/380 V – 60 Hz	240/415 V – 50 Hz
Capacitors	Number	Three groups of three capacitors			
	Capacitance (group)	2.2/4.4/8.8 µF	0.72/1.45/2.89 µF	0.60/1.21/2.41 µF	0.66/1.33/2.65 µF
	Reactance (group)	300/600/1200 Ω	1100/2200/4400 Ω		1200/2400/4800 Ω
	Nominal Voltage	120 V – 60 Hz	220 V – 50 Hz	220 V – 60 Hz	240 V – 50 Hz
	Accuracy	± 5%			

¹ N/A = Not available

ELECTRICAL LOADS

MODELS 8311, 8321, 8331, AND 8333

Model 8331 – Capacitive Load (cont'd)		120/208 V – 60 Hz	220/380 V – 50 Hz	220/380 V – 60 Hz	240/415 V – 50 Hz
Load at Nominal Voltage	Reactive Power	12-84 var	11-77 var		12-84 var
	Current	0.1-0.7 A	0.05-0.35 A		
	Number of Steps	Seven of equal increment			
	Current Increment	0.1 A	0.05 A		
Physical Characteristics	Dimensions (H x W x D)	154 x 287 x 410 mm (6.1 x 11.3 x 16.1 in)			
	Net Weight	5.7 kg (12.6 lb)			
Model 8333 – Inductive and Capacitive Loads		120/208 V – 60 Hz	220/380 V – 50 Hz	220/380 V – 60 Hz	240/415 V – 50 Hz
Inductor	Number	N/A	Two groups of three inductors	N/A	Two groups of three inductors
	Inductance (group)	N/A	0.96/1.92/3.84 H	N/A	0.96/1.92/3.84 H
	Reactance (group)	N/A	300/600/1200 Ω	N/A	300/600/1200 Ω
Capacitors	Number	N/A	Two groups of three capacitors	N/A	Two groups of three capacitors
	Capacitance (group)	N/A	2.65/5.30/10.61 μF	N/A	2.65/5.30/10.61 μF
	Reactance (group)	N/A	300/600/1200 Ω	N/A	300/600/1200 Ω
Nominal Voltage		N/A	100 V – 50 Hz	N/A	100 V – 50 Hz
Accuracy		N/A	± 5%	N/A	± 5%
Load at Nominal Voltage (group)	Reactive Power	N/A	8-58 var	N/A	8-58 var
	Current	N/A	0.08-0.58 A	N/A	0.08-0.58 A
	Number of Steps	N/A	Seven of equal increment	N/A	Seven of equal increment
	Current Increment	N/A	0.08 A	N/A	0.08 A
Physical Characteristics	Dimensions (H x W x D)	154 x 287 x 410 mm (6.1 x 11.3 x 16.1 in)			
	Net Weight	7.3 kg (16.1 lb)			

ORDERING NUMBERS

120/208 V – 60 Hz			220/380 V – 50 Hz			220/380 V – 60 Hz	240/415 V – 50 Hz
ENGLISH	FRENCH	SPANISH	ENGLISH	FRENCH	SPANISH	ENGLISH	ENGLISH
8311-00	8311-01	8311-02	8311-05	8311-06	8311-07	8311-05	8311-0A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	8311-A0
8321-00	8321-01	8321-02	8321-05	8321-06	8321-07	8321-0E	8321-0A
8331-00	8331-01	8331-02	8331-05	8331-06	8331-07	8331-0E	8331-0A
N/A	N/A	N/A	8333-05	8333-06	8333-07	N/A	8333-0A

Table 1. Equipment Ordering Numbers

Reflecting Lab-Volt's commitment to high quality standards in product, design, development, production, installation, and service, our manufacturing and distribution facility has received the ISO 9001 certification.

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