♦ PRECISION INSTRUMENTS FOR TEST AND MEASUREMENT ♦

W50HM

Variac
Operation Manual

W50HM IM / October 2016

IET LABS, INC.

www.ietlabs.com
TEL: (516) 334-5959 • (800) 899-8438 • FAX: (516) 334-5988

www.ietlabs.com
Email: info@ietlabs.com
TEL: (516) 334-5959 • FAX: (516) 334-5988

WARRANTY

We warrant that this product is free from defects in material and workmanship and, when properly used, will perform in accordance with applicable IET specifications. If within one year after original shipment, it is found not to meet this standard, it will be repaired or, at the option of IET, replaced at no charge when returned to IET. Changes in this product not approved by IET or application of voltages or currents greater than those allowed by the specifications shall void this warranty. IET shall not be liable for any indirect, special, or consequential damages, even if notice has been given to the possibility of such damages.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

WARNING

OBSERVE ALL SAFETY RULES
WHEN WORKING WITH HIGH VOLTAGES OR LINE VOLTAGES.

Dangerous voltages may be present inside this instrument. Do not open the case
Refer servicing to qualified personnel

HIGH VOLTAGES MAY BE PRESENT AT THE TERMINALS OF THIS INSTRUMENT

WHENEVER HAZARDOUS VOLTAGES (> 45 V) ARE USED, TAKE ALL MEASURES TO AVOID ACCIDENTAL CONTACT WITH ANY LIVE COMPONENTS.

USE MAXIMUM INSULATION AND MINIMIZE THE USE OF BARE CONDUCTORS WHEN USING THIS INSTRUMENT.

Use extreme caution when working with bare conductors or bus bars.

WHEN WORKING WITH HIGH VOLTAGES, POST WARNING SIGNS AND KEEP UNREQUIRED PERSONNEL SAFELY AWAY.

CAUTION

DO NOT APPLY ANY VOLTAGES OR CURRENTS TO THE TERMINALS OF THIS INSTRUMENT IN EXCESS OF THE MAXIMUM LIMITS INDICATED ON THE FRONT PANEL OR THE OPERATING GUIDE LABEL.

CONTENTS

Chapter 1
INTRODUCTION

1.1 Line voltage and frequency

The W series Variac® autotransformers are designed for use at a minimum frequency of 50 Hz for the stated line voltage (120 V for standard models, 240 V for Type H models).

Variac autotransformers cannot be operated on direct current. Any attempt to do so will result in a burned-out unit.

1.2 Fuses and line capacity

Protect your unit by placing a fusing device of proper rating between terminal 3 and the load.

The input line capacity must be adequate for the Variac® autotransformer, it's load, additional loads that maybe required, and a margin for slight overload. Because these transformers are iron-core devices using high-performance core material, normal inrush surges up to 10 times the rated current of the unit may be encountered when it is first connected to the line.

Fuses must be selected with this in mind. Slow-blow (thermal delay) fuses or magnetic or thermal time-current integrating breakers are preferable to the quickblow fuse, for the input line and the load circuits.

The short-term overload curve, Figure l, shows what your autotransformer will stand under initial surge conditions (such Figure 1. Overload limits for line-voltage connection.

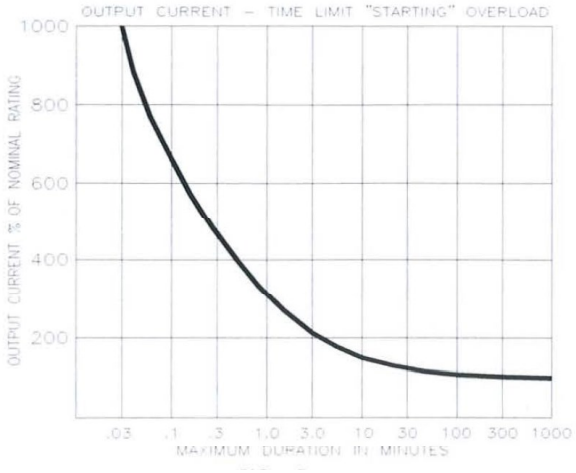


Figure 1. Overload Current

1.3 Loads

Variac autotransformers are adaptable to any load that is subject to control by voltage variation. As a rule, induction motors cannot thus be smoothly controlled. However, dc motors (with rectifiers), universal motors (with or without rectifiers) , capacitor motors with fan loads, heaters, lights, and many other devices are suitable for such control.

The over-voltage connection should be avoided where the load may be damaged by the higher-than-line voltage available.

When the over-voltage connection is omitted, with a fixed, known load, maximum current may be drawn at line voltage.

Since losses which vary with-brush setting), are at a minimum near line and zero voltages, higher current can be drawn at these settings without exceeding normal temperature ratings. This higher (maximum) current is of such value that. as the brush setting is reduced below line voltage, with a constant impedance load, the current fall-off with decreasing output voltage keeps the current within safe limits. To .find the impedance in ohms of the minimum ohmic load, divide line volts by maximum amperes. The power rating of this load in watts is the product of line volts and maximum amperes.

For continuous operation, the rated current of the transformer should not be exceeded. Derate the unit in accordance with Figure 2 for ambient temperatures above 50 C.

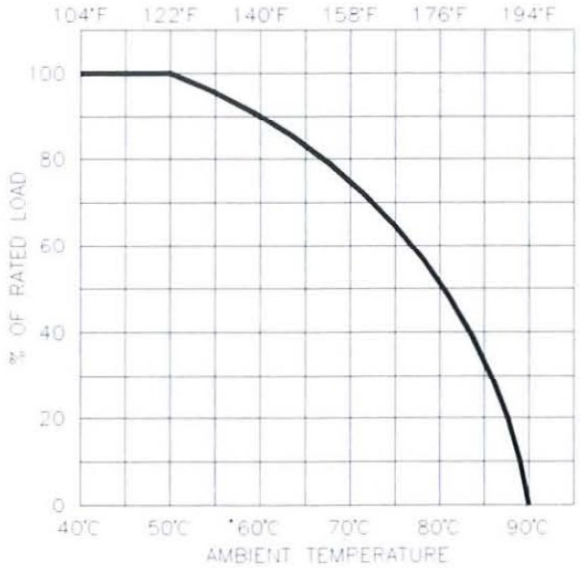


Figure 2 Ambient Temperature Derating Curve

Chapter 2
SPECIFICATIONS

For convenience to the user, the pertinent specifications are given in an OPERATING GUIDE, shown typically in Figure 2.1, affixed to the case of the instrument.

2.1 Specifications

Input Single Phase		Output			Shaft Rotation for Increased Voltage	Terminal Connections	
Volts	Hz	Volts	Max Amps	Max KV		Input	Output
240	50/60	0-240	28	6.7	CW	2-4	2-3
					CCW	4-2	4-3
		0-280	28	7.8	CW	2-5	2-3
					CCW	4-1	4-3
120	50/60	0-280	28-12#	3.4##	CW	2-6	2-3
					CCW	4-7	4-3

Maximum output current in output voltage range from 0 to 25 % above the line voltage. At higher output voltages, output current must be reduced according to rating curve Figure A.

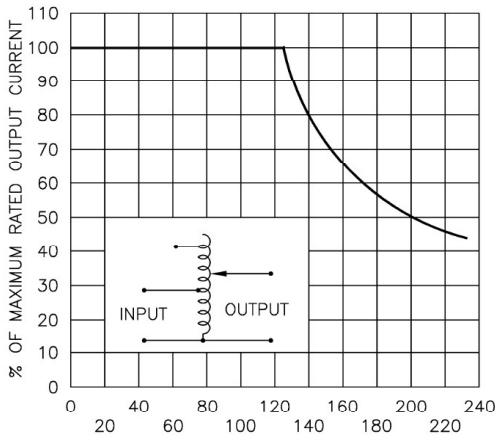
Maximum kVA at maximum output and corresponding derated current. Maximum kVA at lower output voltages may be calculated from rating curve Figure A.

Dimensions:

35.88 cm W x 45.6 cm H x 22.9 cm D (14.13” x 17.94” x9.0 ”)

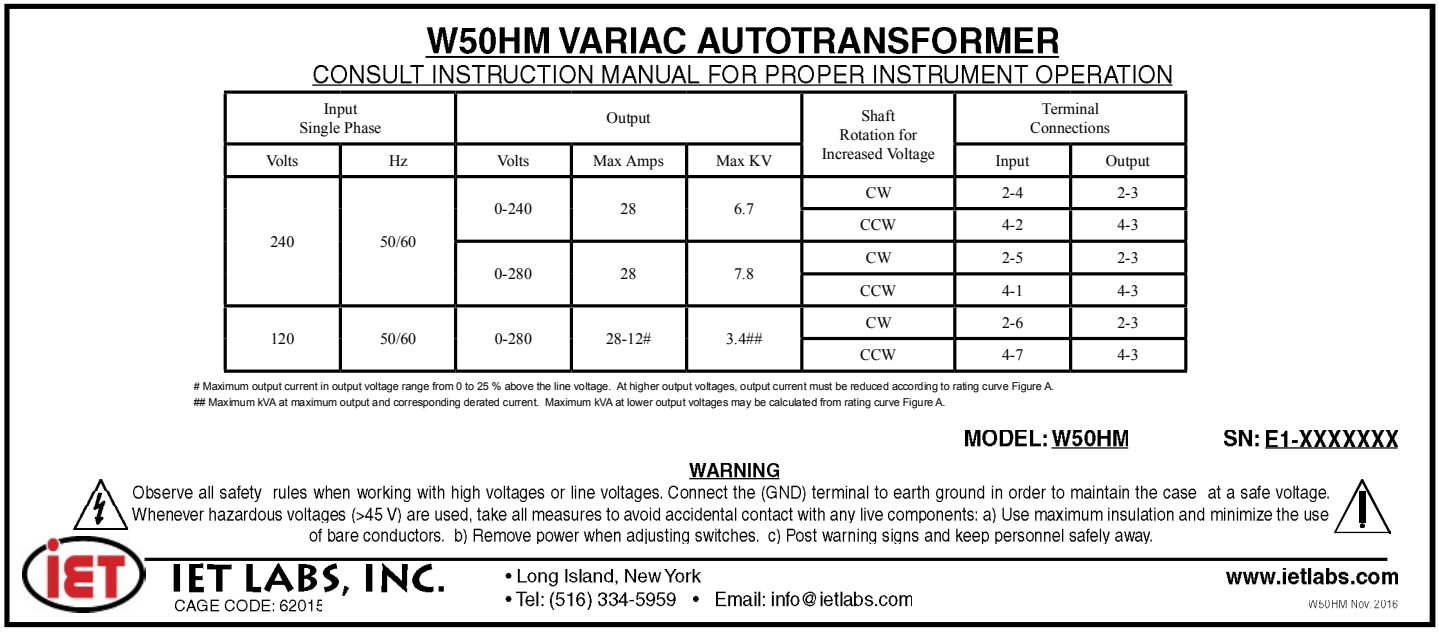
Weight:

28 kg (60lb); weight specifications are nominal



$$\frac{\text{OUTPUT VOLTAGE}}{\text{INPUT VOLTAGE}} \times 100$$

FIGURE A
MAXIMUM OUTPUT CURRENT OF ANY DUAL INPUT VOLTAGE OR VOLTAGE DOUBLER UNIT OPERATED AT LOWER INPUT VOLTAGE.



W50HM VARIAC AUTOTRANSFORMER

CONSULT INSTRUCTION MANUAL FOR PROPER INSTRUMENT OPERATION

Input Single Phase		Output			Shaft Rotation for Increased Voltage	Terminal Connections	
Volts	Hz	Volts	Max Amps	Max KV		Input	Output
240	50/60	0-240	28	6.7	CW	2-4	2-3
					CCW	4-2	4-3
		0-280	28	7.8	CW	2-5	2-3
					CCW	4-1	4-3
120	50/60	0-280	28-12#	3.4##	CW	2-6	2-3
					CCW	4-7	4-3

Maximum output current in output voltage range from 0 to 25 % above the line voltage. At higher output voltages, output current must be reduced according to rating curve Figure A.
Maximum kVA at maximum output and corresponding derated current. Maximum kVA at lower output voltages may be calculated from rating curve Figure A.

MODEL: W50HM SN: E1-XXXXXXX

WARNING

Observe all safety rules when working with high voltages or line voltages. Connect the (GND) terminal to earth ground in order to maintain the case at a safe voltage. Whenever hazardous voltages (>45 V) are used, take all measures to avoid accidental contact with any live components: a) Use maximum insulation and minimize the use of bare conductors. b) Remove power when adjusting switches. c) Post warning signs and keep personnel safely away.

IET LABS, INC.
CAGE CODE: 62015
• Long Island, New York
• Tel: (516) 334-5959 • Email: info@ietlabs.com
www.ietlabs.com
W50HM Nov. 2016

FIGURE 2.1 Typical OPERATING GUIDE Affixed to Unit
(Please see label affixed to your unit)

Chapter 3
OPERATION

3.1 Initial inspection and setup

Prior to installation we recommend the following.

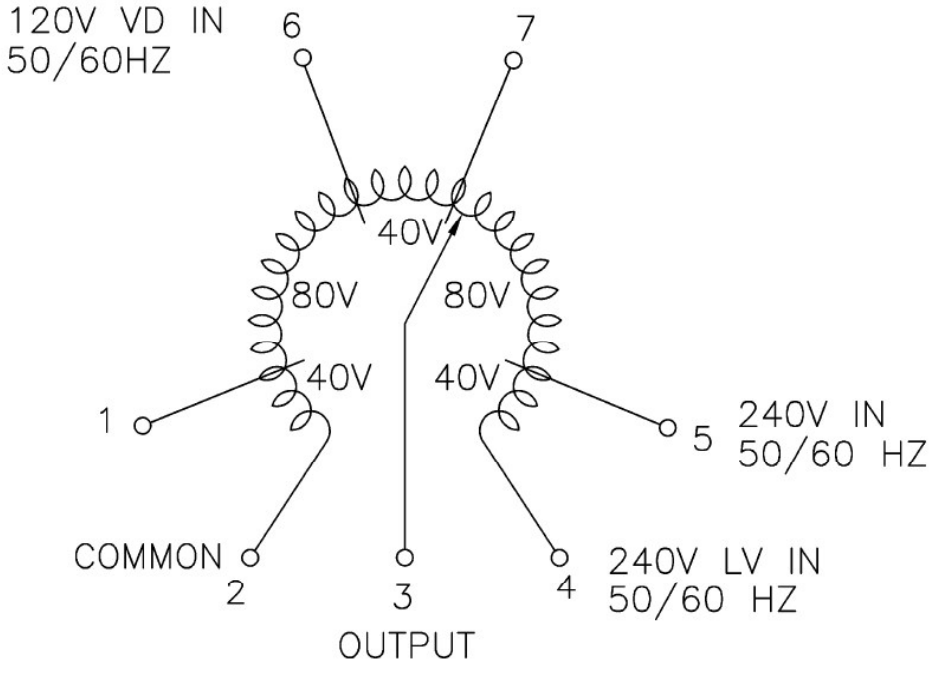
1. Check the nameplate to verify that the unit received matches the rating specified on your order.
2. Examine the unit to assure that there is no damage.
3. Report missing or damaged parts to the factory.

3.2 Precautions

1. Be absolutely certain that the input voltage, phase, frequency, and connections are correct for the unit.
2. It is recommended that the input to the variable transformer be fused with a 'SLOW-BLOW" type fuse or a magnetic type circuit breaker.

3.3 Connections

Connections for various line voltages are shown below in the schematic.



SCHEMATIC

VIEW FROM BASE END

3.3 TYPE OF MOUNTING

The W50HM Variacs are designed for back of-panel, bench, wall, or floor mounting, depending on the unit and application.

Type of mounting as recommended by the factory is shown in the chart below:

3.3.1 BACK OF PANEL MOUNTING

The W50HM may be mounted to the back of the panel.

The knob rotation will be counterclockwise for voltage increase. To mount:

Installation & Operating Instructions:
1. Using the dimensional information provided, locate and drill the four mounting holes, and three dial plate mounting holes.
2. Place the unit in position and mount with 1/2” mounting bolts as required.
3. Install the knob and dial assembly so the pointer is in line with the brush assembly. Use the left-hand side of the winding as the voltage reference,or provide a reference point as desired.
4. Make the connection as required. See Rating and Connection Diagram.

3.3.2 BENCH MOUNTING

1. Using the dimensional information provided, locate, and drill the four mounting holes.
2. Place the unit in position and mount with 1/2” mounting bolts as required.
3. Install the knob and dial assembly so the pointer is in line with the brush assembly. Use the left hand side of the winding as the voltage reference, or provide a reference point as desired.
4. Make the connections as required. See Rating and Connection Diagram.

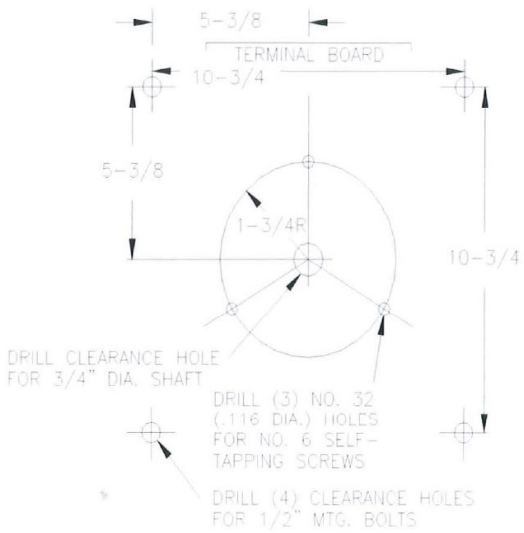


Figure 3-1 Dimensional Mounting Information

3.3.3 WALL MOUNTING

1. Using the dimensional information provided, locate and drill the four holes for mounting the unit by the wall mounting brackets.
2. Place the unit in position and mount with 1/2” mounting bolts as required.
3. Install the knob assembly so the pointer is in line with the brush assembly. Use the left hand side of the winding as the voltage reference, or provide a reference point as desired.
4. Make the connections as required .
See Rating and Connection Diagram.

3.3.4 FLOOR MOUNTING

1. Using the dimensional information provided, locate mounting method as required. The means of mounting will vary according to the type of floor on which the unit is mounted .
2. Place unit into position and mount with 1/2” mounting bolts as required.
3. Install the knob and dial assembly os the pointer is in line with the brush assembly. Use the left hand side of the winding as the voltage reference, or provide a reference point as desired.
4. Make the connection as required. See Rating and Connection Diagram.

Chapter 4
MAINTENANCE

4.1 Maintenance

The only servicing required on a variable transformer installed and operated in accordance with these instructions is periodic inspection of the brushes.

Badly worn brushes should be replaced. Use only the correct replacement brush assembly which contains the special material required for satisfactory brush operation.

To replace brushes, disconnect the electrical power, remove old brush assembly, and insert replacement. With power off, insert a piece of fine garnet paper (nonmetallic) between the brush and brush track, rough side toward the brushes. A few swings of the brush over the garnet paper will mate the brush contact face to the brush track. Remove the garnet paper and blow away loose particles before applying power.

NOTE: It will be necessary to remove the brush access cover to gain access to the brushes for removal.

Part numbers for replacement brush assemblies are:
81 2-0470 -S BRUSH ASSEMBLY

4.2 Internal Fuse

The W50HM has an internal 30 Ampere fuse part number JKS-30. For safety only replace with this type and rating of fuse.