

Iso-Master[™]

Noise Suppressing Isolation Transformer

125 VA to 20 kVA

Single Phase

USER'S MANUAL



User Manual

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS — This manual contains important instructions for the Phoenix Iso-Master that must be followed during installation, operation, and maintenance.

WARNING

OPENING ENCLOSURE EXPOSES HAZARDOUS VOLTAGES. REFER SERVICE TO QUALIFIED PERSONNEL ONLY.

NOTE

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this publication.

WARRANTY

Phoenix Power Systems warranty to distributors and other commercial customers: Phoenix Power Systems warrants the Iso-Master product manufactured by Phoenix Power Systems to be free from defects in materials and workmanship for a period of six years from date of manufacture. If within such period purchaser discovers such item was not as warranted above and promptly notifies the company in writing, Phoenix Power Systems shall repair or replace the item at the Company's option.

This warranty shall not apply:

- (a) to equipment repaired or altered by others than Phoenix Power Systems,
- (b) to equipment subjected to negligence, accident, or damage by circumstances beyond Phoenix Power Systems' control, or to improper operation, maintenance, or storage, or to other than normal use or service.

With respect to equipment not manufactured by Phoenix Power Systems, the warranty obligations of Phoenix Power Systems shall in all respects conform. and warranties do not cover reimbursement for labor, transportation, removal, installation, or other expenses which may be incurred in connection with repair or replacement.

Except as may be expressly provided in an authorized writing by Phoenix Power Systems, Phoenix Power Systems shall not be subject to any other obligations or liabilities whatsoever with respect to equipment manufactured by Phoenix Power Systems or services rendered by Phoenix Power Systems.

DISCLAIMER

The Phoenix Iso-Master product is not designed, intended, or authorized for use in systems intended to support or sustain life, or for any other application in which the failure of the Iso-Master product could create a situation where personal injury or death may occur. Should the buyer purchase or use this Iso-Master product for any such unintended or unauthorized application, buyer shall indemnify and hold Phoenix Power Systems and its officers, employees, and distributors harmless against all claims, costs, damages and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Phoenix Power Systems was negligent regarding the design or manufacture of the part.

Customer Service and Support

Direct questions about the operation, servicing or repair of this equipment to Phoenix Power Systems Customer Service and Support Group. Include the model number, assembly number and serial number of the unit in any correspondence. The Customer Service and Support Group is dedicated to providing responsive service and support on demand. Assistance can be obtained by calling 1-800-566-9620. If calling from outside the USA and Canada, call 1-858-450-9620.

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Introduction

GENERAL DESCRIPTION

The Phoenix Iso-Master protects sensitive electronic equipment from the voltage transients, spikes, and electrical "noise" appearing on most power lines. A unique shielding technique eliminates this interference while providing complete electrical isolation of the load from the power line.

Power line noise exists in two forms: *Common-Mode* which appears between both sides of the power line and ground (A and B in Figure 1) and *Normal-Mode* (also called *Transverse Mode*), which appears from line to line (C in Figure 1). The Iso-Master is effective in removing both types of noise.

The Phoenix Iso-Master is available in 60 Hz line cord/receptacle models rated from 125 VA to 2.4 kVA. Terminal style (field-wired) models are available for 50/60 Hz application in power ratings from 125 VA to 20 kVA. (see Description of Models table).

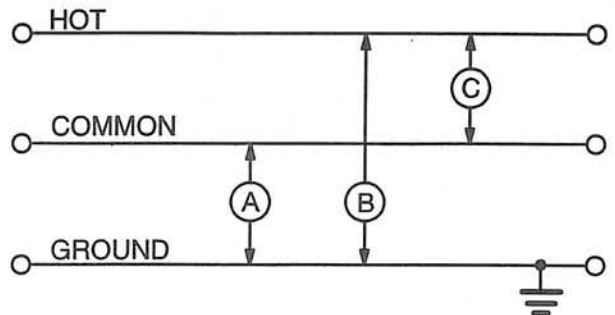


FIGURE 1. Power Line Noise

SCOPE

These instructions explain how to install and operate the Phoenix Iso-Master. Instructions regarding installation, however, do not supplant national, state, or local electrical codes. Check the applicable electrical codes to insure compliance with all regulations.

Installation and Operation

INSTALLATION

Installation to be performed by qualified Personnel only.

LIFTING INSTRUCTIONS

The following instructions cover the recommended lifting means for all Iso-Master units weighing over 70 pounds.

Use a lifting sling and crane rated for a minimum of 460 pounds. Place the sling under each endbell as shown in Figure 2. Secure the top of the sling over the crane hook and lift the unit straight up. The Iso-Master may now be moved into place and lowered.

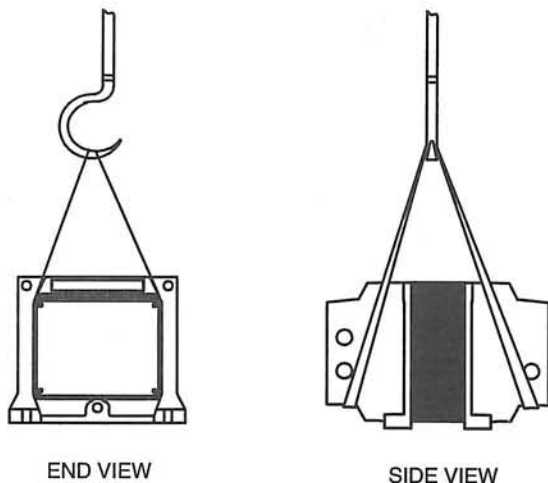


FIGURE 2. Lifting Instructions

LOCATION

The Iso-Master is designed for installation in a protected environment. Factors to consider in locating the Iso-Master are ventilation and environmental conditions.

- The Iso-Master is cooled by radiation and natural convection. Allow at least six inches between the unit and nearby walls or equipment.
- The Iso-Master should be installed in locations free from excessive dust and chemical fumes.
- The highest degree of noise suppression will be obtained by locating the Iso-Master as near to the load as possible.

PRIMARY CIRCUIT PROTECTION

Iso-Masters rated 1 kVA and less are protected by an integral primary fuse. Terminal style units in this range have dual input voltage rating of either 120 or 240 Vac. The nominal input voltage depends on the primary jumper link connections (see Figure 3). Individual units are shipped with the links connected for 120 Vac, and with the corresponding fuse rating installed. The fuse for 240 Vac is shipped separately in a plastic bag. If you change the input connection links to operate at 240 Vac, be sure to change the fuse also so that the unit is adequately protected against overcurrent. Table 2 shows fuse ratings for the two input voltages at various power ratings.

Iso-Masters rated above 1 kVA depend upon the primary branch circuit protection. Table 1 shows the recommended branch circuit fuse or circuit breaker rating for adequate protection. When installing the Iso-

Master, verify that the proper branch circuit protection is in place.

CONNECTION

Make certain that the input and output voltage and power ratings of the Iso-Master match the available line voltage and phasing, and the load voltage and power requirements before making any connections.

Line Cord/Receptacle Models

If for some reason you wish to operate with the output neutral ungrounded, you may remove the wire that bonds the neutral terminal of the output receptacles to the ground terminal. Note, however, that this will significantly reduce the common-mode noise attenuation of the Iso-Master.

Plug the input line cord of the Iso-Master into a suitable AC power receptacle. Plug the input cord(s) of the load into the output receptacles(s) of the Iso-Master.

Terminal Style Models

If you desire to have the output neutral ungrounded, the bonding jumper connector between output terminal X4 and ground may be removed. Note, however, that this will significantly reduce the Common-Mode

noise attenuation of the Iso-Master.

These Iso-Master units have dual primary and secondary windings that permit connection in any combination of the listed input and output voltages by moving jumper links on the input and output terminal blocks. The connections are shown in Figure 3.

1. Remove the input and output end plates by removing the four screws holding each one.
2. Use a hammer and punch to open the appropriate input and output entrance holes (knockouts).
3. If conduit is to be used for input or output cables, route the conduit to the knockout holes. If conduit is not used, install a UL recognized cable strain-relief in the knockout hole.
4. Connect the jumper links at the input and output terminal blocks in accordance with input AC line voltage and desired output (load) voltage. See Figure 3.
5. Input and output cables must be large enough to handle the currents listed in Table 4. Use cable rated for at least 90°C. For units rated 750 VA or less, use wire no larger than 14 AWG.
6. Connect input and output cables as shown in Figure 3.
7. Replace the input and output end plates.

Specifications

Specifications subject to revision without notice

Common-mode Noise Attenuation

80 dB minimum

Transverse-mode Noise Attenuation

65 dB

Overload Capacity

600% for one cycle

300% for 30 seconds

200% for 30 minutes

Operating Frequency

57–63 Hz for 60 Hz models

47–63 Hz for 50/60 Hz models

Efficiency

Typically 95%

Input Voltage Range

±10% of nominal rated voltage

Load Regulation

3.5% or less from no load to full load at 1.0 p.f.

Insulation Resistance

100 megohms minimum from windings to core, measured at 50 Vdc

Primary Surge Protection

Complies with IEEE 587– Cat A and B

Secondary Power Line Protection

Complies with NEC Article 280 and ANSI/IEEE C62–41 – 1991

Electromagnetic Interference

0.1 gauss maximum, measured at 18 inches

Audible Noise

Less than 45 dB, measured at 3 feet

Ambient Temperature

Operating: 0°C to 50°C

Storage: –40°C to 85°C

Operating Altitude

No derating required from 200 ft below mean sea level up to 6,000 ft above mean sea level at 40°C ambient temperature. Above 6,000 ft, derate power rating by 10% per 1,000 ft up to 12,000 ft at 40°C ambient.

Operating Humidity

95% relative (non-condensing)

FIGURE 3. Connection Diagrams for Field Wired Models

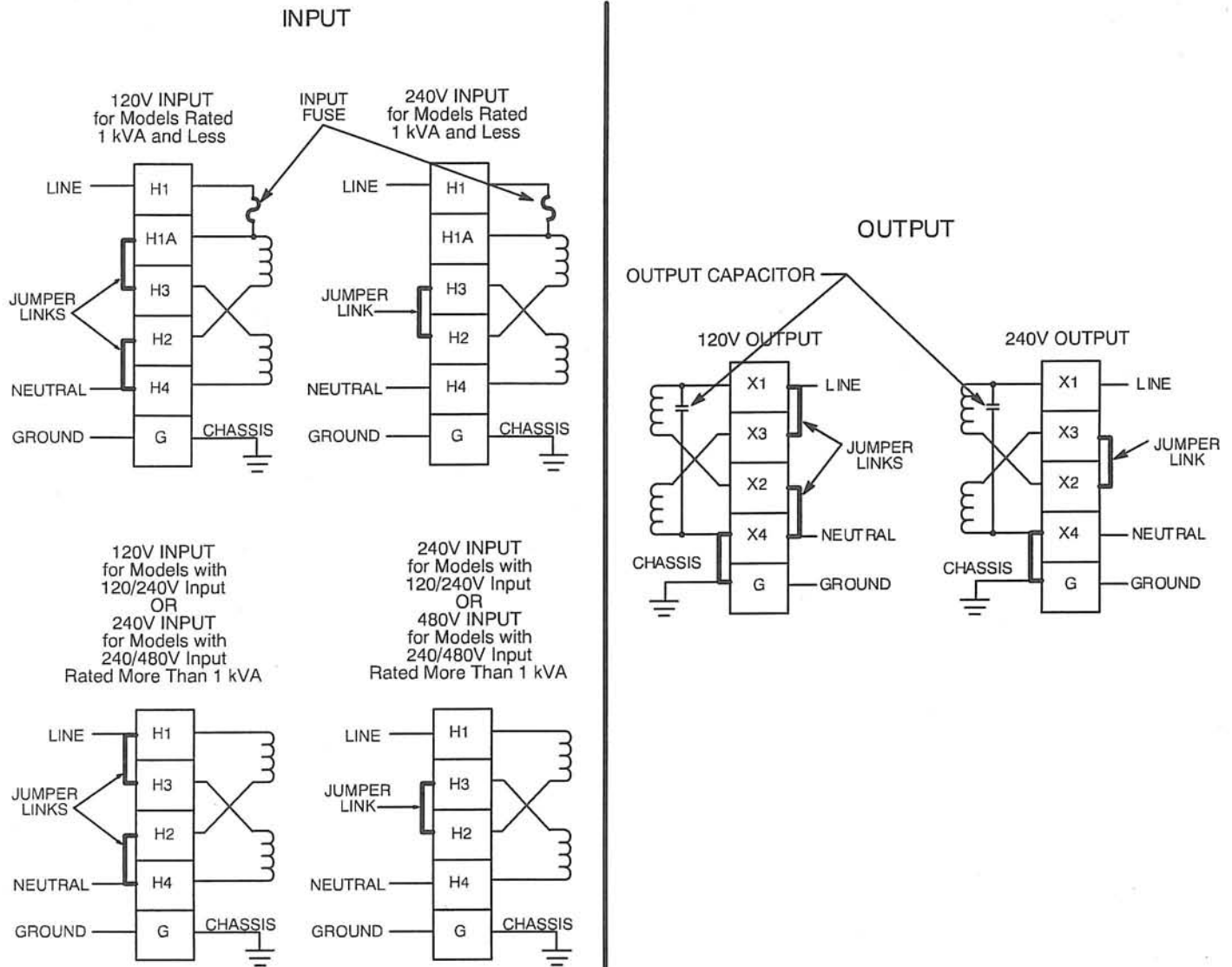


TABLE 1. Primary Branch Circuit Protection

Power Rating	Maximum Branch Circuit Fuse or Circuit Breaker Rating at Voltage of		
	120V	240V	480V
1.8 kVA	20	10	—
2.5 kVA	25	15	—
5 kVA	50	25	15
7.5 kVA	70	40	20
10 kVA	100	50	25
15 kVA	150	80	40
20 kVA	175	100	50

TABLE 2. Integral Primary Fuse Rating (Terminal Style Models 1 kVA and Below)

Power Rating	Integral Primary Fuse Rating at Voltage of	
	120V	240V
125 VA	1.25A	0.75A
250 VA	2.5A	1.25A
500 VA	5A	2.5A
750 VA	8A	4A
1 kVA	10A	5A

TABLE 3. Iso-Master List of Models

Model Number	Power Rating	Input Voltage	Output Voltage	Frequency	Heat Dissipation at Full Load	Connector Code
Line Cord/Receptacle Models						
T1K0.1C6-AAN	125 VA	120 Vac	120 Vac	60 Hz	38.6 BTU/Hr	1
T1K0.2C6-AAN	250 VA	120 Vac	120 Vac	60 Hz	63.0 BTU/Hr	1
T1K0.5C6-AAN	500 VA	120 Vac	120 Vac	60 Hz	102.2 BTU/Hr	1
T1K0.7C6-AAN	750 VA	120 Vac	120 Vac	60 Hz	145.1 BTU/Hr	1
T1K001C6-AAN	1 kVA	120 Vac	120 Vac	60 Hz	169.3 BTU/Hr	1
T1K1.8C6-AAN	1.8 kVA	120 Vac	120 Vac	60 Hz	293.6 BTU/Hr	2
T1K2.4C6-AAN	2.4 kVA	120 Vac	120 Vac	60 Hz	344.8 BTU/Hr	3
T4K0.1C5-CCN	125 VA	230 Vac	230 Vac	50 Hz	38.6 BTU/Hr	1
T4K0.2C5-CCN	250 VA	230 Vac	230 Vac	50 Hz	63.0 BTU/Hr	1
T4K0.5C5-CCN	500 VA	230 Vac	230 Vac	50 Hz	102.2 BTU/Hr	1
T4K0.7C5-CCN	750 VA	230 Vac	230 Vac	50 Hz	145.1 BTU/Hr	1
T4K001C5-CCN	1 kVA	230 Vac	230 Vac	50 Hz	169.3 BTU/Hr	1
T4K1.8C5-CCN	1.8 kVA	230 Vac	230 Vac	50 Hz	293.6 BTU/Hr	2
T4K2.4C5-CCN	2.4 kVA	230 Vac	230 Vac	50 Hz	344.8 BTU/Hr	3
Terminal Style Models						
T2K0.1C7-EEN	125 VA	120/240 Vac	120/240 Vac	50/60 Hz	36.2 BTU/Hr	4
T2K0.2C7-EEN	250 VA	120/240 Vac	120/240 Vac	50/60 Hz	60.1 BTU/Hr	4
T2K0.5C7-EEN	500 VA	120/240 Vac	120/240 Vac	50/60 Hz	97.0 BTU/Hr	4
T2K0.7C7-EEN	750 VA	120/240 Vac	120/240 Vac	50/60 Hz	154.1 BTU/Hr	4
T2K001C7-EEN	1 kVA	120/240 Vac	120/240 Vac	50/60 Hz	160.4 BTU/Hr	4
T2K1.8C7-EEN	1.8 kVA	120/240 Vac	120/240 Vac	50/60 Hz	295.5 BTU/Hr	4
T2K2.5C7-EEN	2.5 kVA	120/240 Vac	120/240 Vac	50/60 Hz	378.0 BTU/Hr	4
T2K005C7-EEN	5 kVA	120/240 Vac	120/240 Vac	50/60 Hz	634.8 BTU/Hr	4
T2K005C7-GEN	5 kVA	240/480 Vac	120/240 Vac	50/60 Hz	599.0 BTU/Hr	4
T2K007C7-EEN	7.5 kVA	120/240 Vac	120/240 Vac	50/60 Hz	796.1 BTU/Hr	4
T2K007C7-GEN	7.5 kVA	240/480 Vac	120/240 Vac	50/60 Hz	821.7 BTU/Hr	4
T2S010C7-EEN	10 kVA	120/240 Vac	120/240 Vac	50/60 Hz	1056 BTU/Hr	4
T2S010C7-GEN	10 kVA	240/480 Vac	120/240 Vac	50/60 Hz	1056 BTU/Hr	4
T2S015C7-EEN	15 kVA	120/240 Vac	120/240 Vac	50/60 Hz	1583 BTU/Hr	4
T2S015C7-GEN	15 kVA	240/480 Vac	120/240 Vac	50/60 Hz	1583 BTU/Hr	4
T2S020C7-EEN	20 kVA	120/240 Vac	120/240 Vac	50/60 Hz	2111 BTU/Hr	4
T2S020C7-GEN	20 kVA	240/480 Vac	120/240 Vac	50/60 Hz	2111 BTU/Hr	4

***Connector Code**

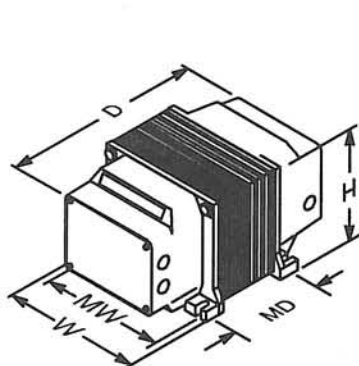
- 1 6-foot power cord with NEMA 5-15P input plug; one duplex NEMA 5-15R output receptacle
- 2 6-foot power cord with NEMA L5-20P twist-lock input plug; one duplex NEMA 5-20R output receptacle
- 3 6-foot power cord with NEMA L5-30P twist-lock input plug; one duplex NEMA 5-20R output receptacle
- 4 Input and output terminal blocks for field wiring

TABLE 4. Full Load Currents at Various Voltages

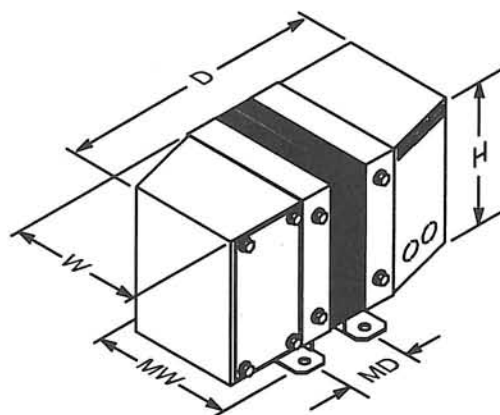
Power Rating	Input Current			Output Current	
	at 480V	at 240V	at 120V	at 240V	at 120V
125 VA	—	0.5A	1A	0.5A	1A
250 VA	—	1A	2A	1A	2A
500 VA	—	2A	4A	2A	4A
750 VA	—	3A	7A	3A	6A
1 kVA	—	4A	9A	4A	8A
1.8 kVA	—	8A	16A	7.5A	15A
2.5 kVA	—	11A	22A	14A	20A
5 kVA	11A	22A	43A	21A	42A
7.5 kVA	16A	32A	65A	31A	62A
10 kVA	21A	43A	86A	42A	83A
15 kVA	32A	64A	129A	62A	125A
20 kVA	43A	86A	172A	83A	167A

TABLE 5. Dimensions and Weights

Model Number	Height (H) (in)	Width (W) (in)	Depth (D) (in)	Mtg Width (MW) (in)	Mtg Depth (MD) (in)	Weight (lb/kg)
Line Cord/Receptacle Models						
T1K0.1C6-AAN	4.75	7.4	7.6	6.22	2.9	13/5.9
T1K0.2C6-AAN	4.75	7.4	8.0	6.22	3.3	15/6.8
T1K0.5C6-AAN	4.75	7.4	9.0	6.22	4.2	21/9.5
T1K0.7C6-AAN	4.75	7.4	9.7	6.22	4.9	25/11.3
T1K001C6-AAN	6.6	8.4	9.7	7.24	3.5	32/14.5
T1K1.8C6-AAN	6.6	8.4	10.5	7.24	4.3	42/19.1
T1K2.4C6-AAN	6.6	8.4	10.9	7.24	4.6	48/21.8
T4K0.1C5-CCN	4.75	7.4	7.8	6.22	3.18	14/6.4
T4K0.2C5-CCN	4.75	7.4	8.3	6.22	3.66	16/7.3
T4K0.5C5-CCN	4.75	7.4	9.5	6.22	4.74	23/10.4
T4K0.7C5-CCN	4.75	7.4	10.3	6.22	5.58	27/12.2
T4K001C5-CCN	6.6	8.4	10.5	7.24	3.85	36/16.3
T4K1.8C5-CCN	6.6	8.4	11.0	7.24	4.81	47/21.3
T4K2.4C5-CCN	6.6	8.4	11.5	7.24	5.17	56/25.4
Terminal Style Models						
T2K0.1C7-EEN	4.75	7.4	7.9	6.3	3.1	14/6.4
T2K0.2C7-EEN	4.75	7.4	8.3	6.3	3.5	16/7.3
T2K0.5C7-EEN	4.75	7.4	9.4	6.3	4.6	23/10.4
T2K0.7C7-EEN	4.75	7.4	10.2	6.3	5.5	27/12.2
T2K001C7-EEN	6.6	8.4	10.0	7.3	3.8	36/16.3
T2K1.8C7-EEN	6.6	8.4	11.0	7.3	4.8	46/20.1
T2K2.5C7-EEN	6.6	8.4	11.8	7.3	5.5	55/25.0
T2K005C7-EEN	6.6	8.4	15.0	7.3	8.8	93/42.2
T2K005C7-GEN	6.6	8.4	15.0	7.3	8.8	94/42.6
T2K007C7-EEN	6.6	8.4	17.5	7.3	11.3	126/57.2
T2K007C7-GEN	6.6	8.4	18.0	7.3	11.8	130/59.0
T2S010C7-EEN	13.1	12.2	22.2	9.25	6.1	250/113.4
T2S010C7-GEN	13.1	12.2	22.2	9.25	6.1	250/113.4
T2S015C7-EEN	13.1	12.2	23.5	9.25	7.4	320/145.2
T2S015C7-GEN	13.1	12.2	23.5	9.25	7.4	320/145.2
T2S020C7-EEN	13.1	12.2	24.7	9.25	8.6	367/166.5
T2S020C7-GEN	13.1	12.2	24.7	9.25	8.6	367/166.5



125 VA through 7.5 kVA



10 kVA through 20 kVA

Figure 4. Iso-Master Dimensions