

X-Ray Generator Power Requirements

The following information serves as guidelines for pre-installation planning of electrical wiring and power distribution.

Always follow the National Electrical Code and applicable local codes.

For an in depth explanation of these specifications, please see [“Power Requirements Explained”](#) on page 1-5.

For the [ATC 725 \(50 kW\) Generator](#), see [Table 1-1 on page 1-2](#).

For the [ATC 525, APX 625, VAP 625 \(40 kW\) Generator](#), see [Table 1-2 on page 1-2](#).

**For the [Generator Types \(30 kW\)](#) listed below, see [Table 1-3 on page 1-3](#).
[AP 500, APX 525, ATC 525 \(single phase\), GX525, HF-30, HF-30 AP, MP500, MPX 525, RX 525, VAP 525, VM 525](#)**

For the [AV Choice, DV Choice, HE425, Vet Vision LC/400, Vet Vision HF-AP and Visionary V425](#), see [Table 1-4 on page 1-3](#).

For the [ANTHEM generator](#), see [Table 1-5 on page 1-3](#).

All three phase power configurations consists of three “hot” wires and one “earth ground”. A neutral connection is not required for our use of three phase.

Single phase power configurations consists of three wires in one of the following combinations:

- one “hot” wire, one “return” (neutral) and one “earth ground”
- two “hot” wires and one “earth ground”

If any one of the requirements on these pages are not met, the x-ray generator output may not comply with the stringent regulations set forth by the FDA and/or state and local governments. Failure to follow these guidelines may also cause damage to the equipment and possibly void certain warranty claims.

NOTE: All power lines are required to be relatively free from spikes, glitches and interruptions.

Table 1-1: 50 kW, high frequency generators

Incoming Line Voltage	Dist. XFMR or Dedicated Energy Source	Minimum Copper Wire Size					Min. Switch, Fuse, or Breaker Rating	Max. Momentary Current Draw*
		Distance in Feet from Distribution Point to Disconnect Panel			Ground	Disconnect to Generator (15' max)		
		50'	100'	200'				
208 VAC 3 phase	80 kVA	#00	250 MCM	N/A	#6	#2	150 A	280 A
240 VAC 3 phase	80 kVA	#0	#0000	400 MCM	#6	#2	125 A	244 A
380 VAC 3 phase	80 kVA	#4	#0	#000	#6	#2	100 A	160 A
480 VAC 3 phase	80 kVA	#4	#2	#0	#6	#4	75 A	126 A

Table 1-2: 40 kW, high frequency generators

Incoming Line Voltage	Dist. XFMR or Dedicated Energy Source	Minimum Copper Wire Size					Min. Switch, Fuse, or Breaker Rating	Max. Momentary Current Draw*
		Distance in Feet from Distribution Point to Disconnect Panel			Ground	Disconnect to Generator (15' max)		
		50'	100'	200'				
208 VAC 3 phase	65 kVA	#2	#00	#0000	#6	#2	125 A	210 A
240 VAC 3 phase	65 kVA	#2	#00	#0000	#6	#2	100 A	190 A
380 VAC 3 phase	65 kVA	#4	#0	#00	#6	#4	75 A	127 A
480 VAC 3 phase	65 kVA	#4	#0	#00	#6	#4	60 A	105 A

Table 1-3: 30 kW, high frequency generators

Incoming Line Voltage	Dist. XFMR or Dedicated Energy Source	Minimum Copper Wire Size					Min. Switch, Fuse, or Breaker Rating	Max. Momentary Current Draw*
		Distance in Feet from Distribution Point to Disconnect Panel			Ground	Disconnect to Generator (15' max)		
		50'	100'	200'				
208 VAC 1 phase	50 kVA	#0	#000	300 MCM	#6	#1	200 A	366 A
240 VAC 1 phase	50 kVA	#1	#0	#000	#6	#1	150 A	293 A
277 VAC 1 phase	50 kVA	#2	#1	#0	#6	#1	150 A	270 A
208 VAC 3 phase	50 kVA	#4	#0	#00	#6	#2	100 A	152 A
240 VAC 3 phase	50 kVA	#4	#0	#00	#6	#4	75 A	135 A
380 VAC 3 phase	50 kVA	#6	#2	#0	#6	#6	75 A	98 A
480 VAC 3 phase	50 kVA	#6	#4	#0	#6	#6	50 A	82 A

Table 1-4: AV- and DV Choice, HE425, Vet Vision and Visionary Generators

Incoming Line Voltage	Dist. XFMR or Dedicated Energy Source	Minimum Copper Wire Size					Min. Switch, Fuse, or Breaker Rating	Max. Momentary Current Draw*
		Distance in Feet from Distribution Point to Disconnect Panel			Ground	Disconnect to Generator (15' max)		
		50'	100'	200'				
208 VAC 1 phase	40 kVA	#2	#00	250 MCM	#8	#6	100 A	190 A
240 VAC 1 phase	40 kVA	#2	#00	250 MCM	#8	#8	100 A	153 A

Table 1-5: ANTHEM generator

Generator Model / Incoming Line Voltage	Dist. XFMR or Dedicated Energy Source	Minimum Copper Wire Size					Min. Switch, Fuse, or Breaker Rating	Max. Momentary Current Draw	Apparent Mains Resistance
		Distance in Feet from Distribution Point to Disconnect Panel			Ground	Disconnect to Generator (15' max.)			
		50' (15m)	100' (30m)	200' (60m)					
30kW, 400mA 208VAC 1 phase	50 kVA	#0 50mm ²	#00 95mm ²	300mcm 150mm ²	#6 16mm ²	#6 16mm ²	120 A	230 A	0.09 Ω
30kW, 400mA 240VAC 1 phase	50 kVA	#0 50mm ²	#00 95mm ²	300mcm 150mm ²	#6 16mm ²	#6 16mm ²	100 A	198 A	0.095 Ω
30kW, 500mA 208VAC 1 phase	50 kVA	#0 50mm ²	#00 95mm ²	300mcm 150mm ²	#6 16mm ²	#6 16mm ²	150 A	278 A	0.075 Ω
30kW, 500mA 240VAC 1 phase	50 kVA	#1 50mm ²	#0 50mm ²	#000 95mm ²	#6 16mm ²	#6 16mm ²	120 A	240 A	0.08 Ω

Generator Model / Incoming Line Voltage	Dist. XFMR or Dedicated Energy Source	Minimum Copper Wire Size					Min. Switch, Fuse, or Breaker Rating	Max. Momentary Current Draw	Apparent Mains Resistance
		Distance in Feet from Distribution Point to Disconnect Panel			Ground	Disconnect to Generator (15' max.)			
		50' (15m)	100' (30m)	200' (60m)					
40kW, 500mA 208VAC 1 phase	50 kVA	#0 50mm ²	#00 95mm ²	300mcm 150mm ²	#6 16mm ²	#6 16mm ²	200 A	346 A	0.070 Ω
40kW, 500mA 240VAC 1 phase	50 kVA	#1 50mm ²	#0 50mm ²	#000 95mm ²	#6 16mm ²	#6 16mm ²	150 A	300 A	0.064 Ω
32kW, 500mA 208VAC 3 phase	50 kVA	#4 25mm ²	#0 50mm ²	#00 95mm ²	#6 16mm ²	#6 16mm ²	80 A	158 A	0.15 Ω
32kW, 500mA 240VAC 3 phase	50 kVA	#4 25mm ²	#0 50mm ²	#00 95mm ²	#6 16mm ²	#6 16mm ²	70 A	136 A	0.20 Ω
32kW, 500mA 380VAC 3 phase	50 kVA	#6 16mm ²	#2 35mm ²	#0 50mm ²	#6 16mm ²	#6 16mm ²	50 A	86 A	0.24 Ω
32kW, 500mA 480VAC 3 phase	50 kVA	#6 16mm ²	#4 25mm ²	#0 50mm ²	#6 16mm ²	#6 16mm ²	50 A	68 A	0.32 Ω
40kW, 600mA 208VAC 3 phase	65 kVA	#1 50mm ²	#0 50mm ²	#00 95mm ²	#6 16mm ²	#6 16mm ²	100 A	197 A	0.25 Ω
40kW, 600mA 240VAC 3 phase	65 kVA	#2 35mm ²	#0 50mm ²	#00 95mm ²	#6 16mm ²	#6 16mm ²	100 A	174 A	0.30 Ω
40kW, 600mA 380VAC 3 phase	65 kVA	#2 35mm ²	#1 50mm ²	#0 50mm ²	#6 16mm ²	#6 16mm ²	60 A	110 A	0.32 Ω
40kW, 600mA 480VAC 3 phase	65 kVA	#4 25mm ²	#1 50mm ²	#0 50mm ²	#6 16mm ²	#6 16mm ²	50 A	87 A	0.34 Ω
50kW, 650mA 208VAC 3 phase	65 kVA	#1 50mm ²	#0 50mm ²	#00 95mm ²	#6 16mm ²	#6 16mm ²	120 A	230 A	0.20 Ω
50kW, 650mA 240VAC 3 phase	65 kVA	#2 35mm ²	#0 50mm ²	#00 95mm ²	#6 16mm ²	#6 16mm ²	100 A	200 A	0.25 Ω
50kW, 650mA 380VAC 3 phase	65 kVA	#2 35mm ²	#1 50mm ²	#0 50mm ²	#6 16mm ²	#6 16mm ²	70 A	126 A	0.30 Ω
50kW, 650mA 480VAC 3 phase	65 kVA	#4 25mm ²	#1 50mm ²	#0 50mm ²	#6 16mm ²	#6 16mm ²	50 A	100 A	0.32 Ω

Note!

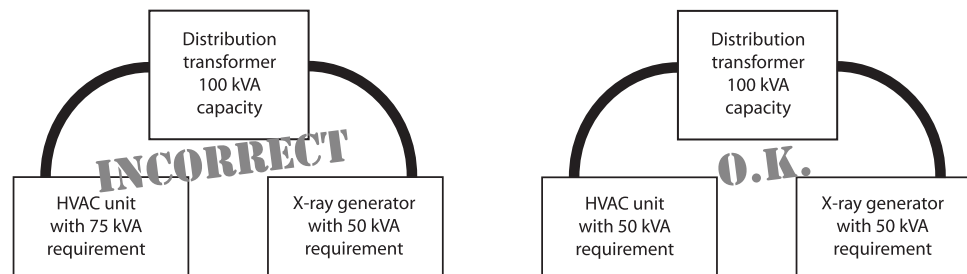
The minimum wire sizes listed above have been selected for the maximum wire resistance allowed at maximum momentary full load current. To meet National Electric Code Specifications, you must select a wire type having an amperage rating of at least 50% of the generator's peak current demand. Rating also applies to the selection of fuses or circuit breakers.

Power Requirements Explained

Key principles were used in developing these specifications. The following is an explanation of these principles and their associated specifications:

Dedicated energy requirement

This specification states the required portion of energy delivering capacity of a power distribution transformer that must be dedicated to the x-ray generator. It is acceptable for the power distribution transformer to supply power to other devices, as long as the total energy demand does not exceed its capacity. See examples in below.



The dedicated energy requirement is usually greater than the output capability of the x-ray generator (remember, kW = kVA) and this is because of the instantaneous demand of an x-ray generator. This specification is designed to deliver full power to the x-ray generator within milliseconds!

Minimum copper wire size

The main factor used in determining the wire size specification is impedance (the combined resistive and inductive properties of the wire) and *not* current carrying capacity. In other words, the reason the wire is so large is to keep the line impedance low. This is the reason that a smaller wire size can be used between the disconnect and the generator.



Caution

Aluminum wire is never acceptable for use in wiring. All wiring MUST be copper.

Minimum switch, fuse or breaker rating

The National Electrical Code requires rating of these items to be **at least** 50% of the maximum momentary current draw at full load. The maximum switch, fuse, circuit breaker rating is limited by the current capacity of the wire (please follow local code) but cost and availability of larger devices usually prevents this specification from being exceeded.

Note: In some cases the specified wire size exceeds the connector size of a disconnect switch or circuit breaker. In this instance it is acceptable to use a gauge reducing terminal so that the wire can be connected.