
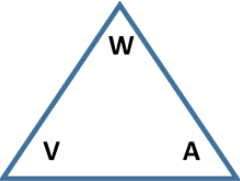


Technical Bulletin No: 21-2016



Title:	Transformer and Generator Selection and Specification	
Priority	 	Amber – Audit Rating: Non-Conformance-Minor
Legislation:	E@WR, Management Regs	
Brief Description:	A number of in-use failures of equipment and subsequent exchanges are the result of insufficient power supply. This affects both HAE and EHA members.	
Equipment Affected:	Transformers, Generators and all hired electrical equipment	
<p>Calculating electricity supply requirements for hire fleet items needs careful consideration. Many transformers may have an Intermittent Rating in large print on the casing however the Continuous Rating can be as little as half this value (as per image).</p> <p>At the Intermittent (highest) value, transformers are normally rated for a 25% duty cycle e.g. in one hour, the trigger is only pulled for fifteen minutes total.</p> <p>For generators, the majority of manufacturers quote a maximum capacity and a 75% duty cycle for continuous operation. i.e. 75% average loading during the working period.</p> <p>An added complication is the Power Factor (PF) for different types of electrical equipment. This is related to how efficiently current is converted into work done. The data table overleaf allows for a worst case PF of 0.8</p>		 <p>1.5 kVA Intermittent 0.75 kVA Continuous</p>
<p>Calculations:</p> <p>The table overleaf is based on the watts (W) of power to be used / demanded by all the different loads. These include any tools and equipment to be powered added together. If current is quoted and not power e.g. 19A for a grinder, calculating watts is simple using Ohms law.</p> <p>19A grinder with 110v supply. Calculation = $110 \times 19 = 2,090$ watts</p> <p>You also need to identify whether the equipment being used is a continuous or intermittent load. The following table gives simple examples of each. If intermittent, referring to the maximum kVA for the transformer may suffice.</p>		 <p>Watts / Amps = Volts Volts x Amps = Watts Watts / Volts = Amps</p>
<p style="text-align: center;">Intermittent Demand Equipment</p> <ul style="list-style-type: none"> • Drilling equipment • Grinders – used in welding / fabrication • Impact wrenches • Reciprocating saws • Chop saws • Routers • Jigsaws 		<p style="text-align: center;">Continuous Demand Equipment</p> <ul style="list-style-type: none"> • Heaters / dehumidifiers / driers • Lighting • Catering equipment • Floor grinding equipment • Pressure washers • Wall chasers • Mixers
Additional Information:	<ul style="list-style-type: none"> • Consider using table overleaf directly with clients as a ready reckoner. For site distribution, a competent electrician will calculate loads, allow for diversity and specify the correct site transformer • Supplying extra capacity is low cost and ensures a successful hire • For EHA members, ensuring catering customers know how many amps are required is key e.g. if running units from an existing supply • Higher capacity transformers are now available with higher Continuous Ratings compared to Intermittent Rating – review product supply / provision 	
Circulation:	workshops, mobile service and management teams	

Title:	Transformer & Generator Specification	Bulletin Number:	21 - 2016	Creation Date:	25/04/2016
Authors:	TfH Ltd	Reviewed by:	Tech. H&S	Revision:	V1.0

Transformer and Generator Specification

110v Transformer Specification				
Transformer Continuous Rating	Continuous Use Equipment		Intermittent Use (25% duty cycle)	
	Watts	Amps	Watts	Amps
1	800	8	1,600	15
1.5	1,200	11	2,400	22
1.7	1,360	13	2,720	25
2	1,600	15	3,200	30
2.3	1,840	17	3,680	34
2.5	2,000	19	4,000	37
2.7	2,160	20	4,320	40
3	2,400	22	4,800	44
3.2	2,560	24	5,120	47
3.5	2,800	26	5,600	51
3.7	2,960	27	5,920	54
4	3,200	30	6,400	59
4.5	3,600	33	7,200	66
5	4,000	37	8,000	73
5.5	4,400	40	8,800	80
6	4,800	44	9,600	88
6.5	5,200	48	10,400	95
7	5,600	51	11,200	102
7.5	6,000	55	12,000	110
8	6,400	59	12,800	117
8.5	6,800	62	13,600	124
9	7,200	66	14,400	131
9.5	7,600	70	15,200	139
10	8,000	73	16,000	146

Generator Requirement Calculator		
Continuous – 75% duty	Intermittent Maximum	Generator Requirement
Watts	Watts	kVA Rating
600	800	1
900	1200	1.5
1020	1360	1.7
1200	1600	2
1380	1840	2.3
1500	2000	2.5
1620	2160	2.7
1800	2400	3
1920	2560	3.2
2100	2800	3.5
2220	2960	3.7
2400	3200	4
2700	3600	4.5
3000	4000	5
3300	4400	5.5
3600	4800	6
3900	5200	6.5
4200	5600	7
4500	6000	7.5
4800	6400	8
5100	6800	8.5
5400	7200	9
5700	7600	9.5
6000	8000	10

The table above simplifies choosing the correct power supply to cope with demands.

Two worked examples:

A customer is hiring a turbo oven and a fridge unit for an event.

Turbo oven = 2,960 watts

Fridge = 600 watts

Using the table, as these would be continuous loads a minimum 6kVA generator would be required.

A client hires a dehumidifier and red rad heater:

Dehum = 1,500 watts

Red Rad = 2,800 watts

A minimum 5.5 kVA Continuous rating transformer would be required or supply two separate units of suitable capacity.

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