

There are several different types of refrigeration systems (refrigerators, freezers and chillers etc.) available for medical applications, such as vaccine, blood and tissue sample storage.

The most common systems or units are Vapour Compression and Absorption types, their basic characteristics are :

### Vapour Compression Type

*Uses a motor to compress the vapour refrigerant. Requires a reliable electricity supply to provide precise and stable temperature control. The most reliable, durable and easiest to maintain.*

### Absorption Type

*Uses heat transfer to compress the refrigerant. Requires stable electricity supply, bottled gas or solar thermal for the heat absorption system. May require users attention at least twice daily to maintain precise and stable temperatures. The unit takes much longer to produce the desired temperature change.*

As both types of units require a reliable and stable electricity supply, the use of a Power conditioner for example an **AUTOMATIC VOLTAGE STABILISER** is recommended to maintain the accurate temperatures necessary for medical applications.

The Automatic Voltage Stabilisers suitable for running refrigeration units are of two types :

#### AVS Type - Automatic Voltage Stabiliser (Switcher)

- ◆ Uses a tapping transformer with electronic switching techniques.
- ◆ Typical Input Range Nominal Voltage -34%+25%
- ◆ Typical Output Nominal Voltage +/- 6%
- ◆ Dual Frequency 50/60Hz

#### AGT Type - Constant Voltage Transformer

- ◆ Uses no electronics only resonating capacitor(s)
- ◆ Typical Input Range Nominal Voltage +/-15%
- ◆ Typical Output Range Nominal Voltage +/- 3%
- ◆ Frequency as supply 50Hz or 60Hz

Typical test figures for both refrigeration units are :-

### VAPOUR COMPRESSION TYPE

Example Unit : ELECTROLUX Model TCW 1990  
Input 100 –115V 60Hz 155W  
16A

Typical 110V Nominal 60Hz Supply conditions are

Voltage	Current	Power	Power Factor	VA	Thermostat
110V	3.9A	260W	0.5pf	388VA	1
110V	3.7A	232W	0.5pf	390VA	3
110V	3.6A	213W	0.53pf	400VA	MAX

### ABSORPTION TYPE

Example Unit : ELECTROLUX DOMETIC Model RCW 50EG  
Input 220V 50/60Hz 120W

Typical 50Hz Supply conditions are

Voltage	Current	Power
210V	0.5A	110W
220V	0.53A	120W
230V	0.55A	130W

## FINDINGS and RECOMMENDATIONS AVS STABILISER

Successfully runs both COMPRESSION and ABSORPTION type units.

The wattage rating of the AVS must be (typically 50%) greater than the rating of the refrigeration unit. This is due to the very low power factor of vapour compression refrigerators.

## AGT STABILISER

Successfully runs the COMPRESSION and ABSORPTION type units.

When running an Absorption unit the wattage rating of the AGT must be (typically 50%) greater than the unit rating.

When running a Compression unit however, the AGT must be rated typically 10 Times greater than the unit rating. The rating is so high to overcome the High Inrush Current of the "Motor" on Start Up and to prevent stalling at low input voltages.

For further information contact:

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