The Heat Pump Water Heater is an application with very demanding operating parameters and will require a continual review of the recommendations listed herein. It will be important to discuss any deviations from the listed parameters with your Tecumseh representative.

1. Heat Pump Water Heater Types:

	Evap.	Cond.	System
A.	Air to Water		Package Including Water Tank
B.	Air to Water		Remote Less Water Tank
C.	Water to Water		Package Including Water Tank
D.	Water to Water		Remote Less Water Tank

E. Solar assist on any one of A, B, C, or D.

2. Operating Parameters:

Approved Refrigerant	R12	R134a	R500	R22*
Evaporator (E_T) Min./Max. .F .C	25/55 -3.9/12.8	25/55 -3.9/12.8	25/55 -3.9/12.8	30/55 -1.1/12.8
Condenser (C_T Max.) .F/.C (P Max.) psig/kPa	150/65.6 235/1620	150/65.6 263/1813	150/65.6 281/1937	150/65.6 382/2634
Safety Control Settings:				
Head Pressure Max. .F/psig .C/kPa	155/250 68.3/1724	155/281 68.3/1937	155/300 68.3/2068	155/405 68.3/2792
Suction Pressure Max. .F/psig .C/kPa	65/64 18.3/441	65/64 18.3/441	65/79 18.3/545	65/111 18.3/765

Set Ambient Switch to prevent evaporator freeze up.
For maximum discharge temperature see EP-4 in Policy Bulletin No. 112.

Return gas superheat is dictated by proper motor and discharge gas cooling. A design range of 10 to 40ºF (5.6 to 22.2ºC) superheat is suggested.

*R22 approval is being investigated - consult Tecumseh Products.
R502 is not an approved refrigerant for this application.

3. Design Approval Tests:

Design recognition of the listed points should be reviewed under any development program in order to determine the approval test requirements.

A. Cycle Types

1.) Jacket Losses - long off and short on.
2.) Thermostat - change to a higher setting without equalization time.
3.) Initial Start Up
4.) Water Draw

B. Load Points

1.) High ambient thermostat setting may produce suction pressures in excess of the 55ºF (12.8ºC) E_T suction maximum. If system design allows this to occur, then some means of maximum evaporator temperature control should be provided, such as a high ambient switch or evaporator pressure control of fan.

2.) Low ambient with high thermostat setting may cause evaporator freeze up and compressor operation below the approved evaporator limits. A low ambient switch is required to prevent freeze up.

3.) Low ambient on a heavy water draw may produce an iced coil. (See B2)

4.) Circulating pump failure (remote-type units) will produce high head pressures. The compressor overload will not protect against high head pressures. A high pressure control is required.

5.) Thermostat settings or location can allow the compressor to operate at head pressures beyond the approved parameter. The compressor overload will not protect against high head pressures. A high pressure control is required.

6.) Compressor overloads are designed to protect motors against high temperatures and excessive current. The compressor overload will not protect against high pressures, high discharge temperatures, or high compression ratios. Other system safety controls are required for these functions. Since the overload is not designed to be a control switch, it should not be used to cycle the compressor off due to high ambient loads. Some means should be provided to guard against routine high motor loading other than the compressor overload. (See B1)