



# APPLICATIONS NOTICE

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Form NS 006

TO:           AUTHORISED DEALERS/DISTRIBUTORS           ISSUE NO. : 02/02  
              N.Z. APPROVED INSTALLERS  
              H.O., REG'L & AUST. MANAGERS           DATE :     March 2002  
              APPLIC. NOTICE GENERAL LIST         FROM :     T King/K Edwards

SUBJECT:     Superheat Measurement

UNITS:       SPLIT SYSTEM & PACKAGED UNITS

It has come to our attention that there are a number of Service Technicians in the field who are not fully familiar with the importance of measuring and adjusting for the correct superheat.

This concerns us deeply, and hopefully this Application Notice will address this. For extra information, there was a very good article on TX Valves and Superheat in the AIRAH Journal in September 2001.

“Superheat” is the temperature difference between the external pipe wall temperature of the suction pipe measured as close as practical to the coil header outlet, and the actual suction pressure converted to temperature (saturation temperature). This is the indication of the amount of extra heat or “superheating” that the refrigerant vapour has received after it has passed through its latent phase through the heat transfer coil.

It is important to have the correct amount of superheat. Too much and the system becomes inefficient and could lose important suction gas cooling of the compressor motor. Too little and liquid refrigerant can flood back to the compressor leading to possible valve damage or oil being washed out of the compressor.

For R22 systems the superheat should be between 3°C and 5°C, for R407C systems the TX valve should be adjusted to achieve 6°C to 8°C super heat. Systems for R407C must have a TX valve fitted which allows for this adjustment to be done.

Adjustment of a TX valve is done by turning the stem clockwise to increase the superheat and reduce the refrigerant flow, or counter clockwise to reduce the superheat and increase the refrigerant flow.

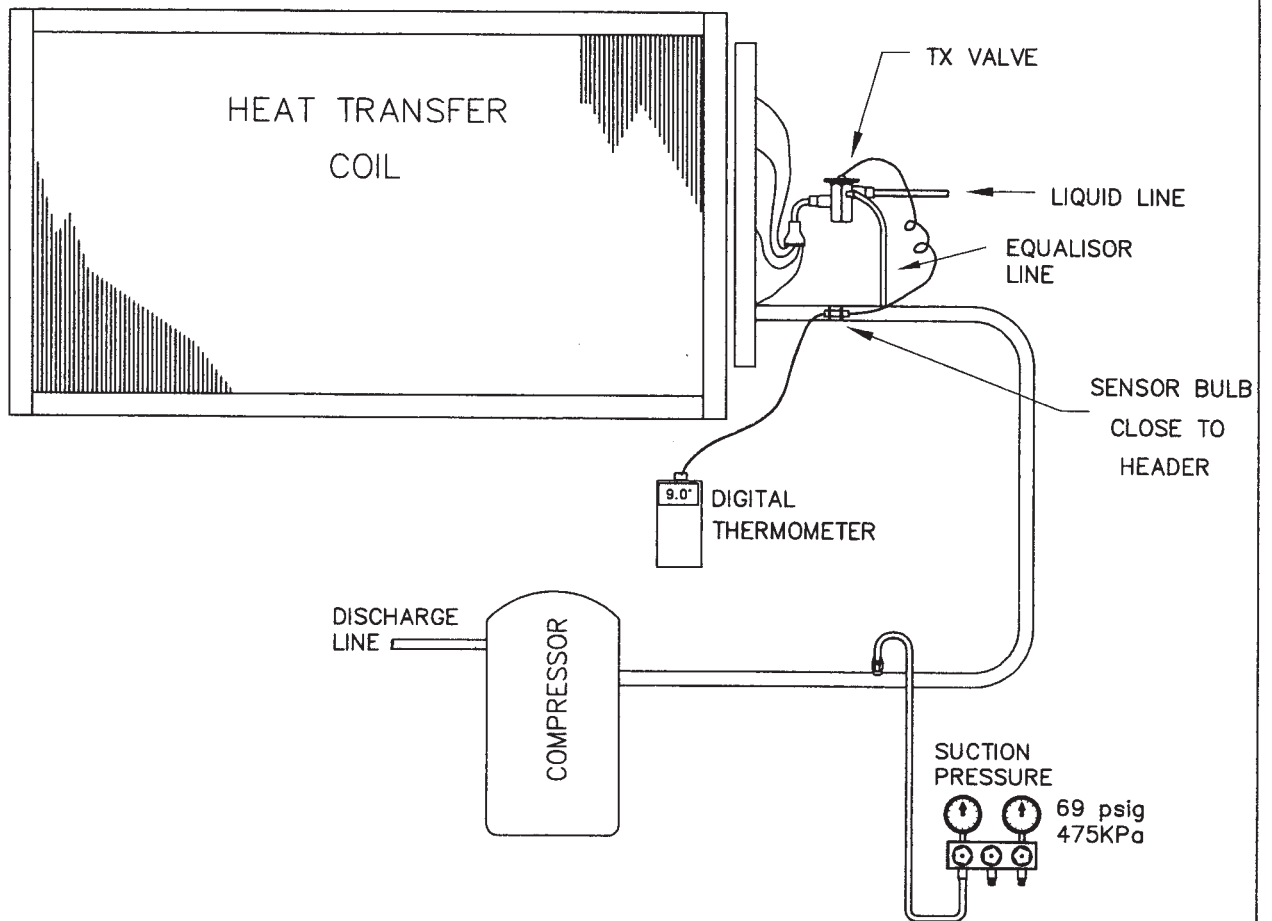
The system should have the correct measured charge before any adjustment is made.

Systems with “Accurators” where there is no available adjustment, it is critical to add or remove refrigerant charge to achieve the 3°C to 5°C superheat.

It is also important when taking superheat measurements to ensure the system is working under load, to this end we recommend that the room temperature/air onto the inside coil is raised to between 21°C to 27°C and the head pressure on the high side of the system is raised (artificially by blanking the outdoor coil if necessary) to between 1650 kPag (240 psig) and 1950 kPag (280 psig).

A simple drawing is attached showing where the measurements are to be taken.

EXAMPLE



- 1 - Measure temperature at TX Valve Sensor Bulb (cooling cycle) = 9.0°C
- 2 - Measure Suction Pressure and add 15 kpag (2 psig)  
 $\text{pressure drop} = 475 + 15 = 490 \text{ kpag} \quad (69 + 2) = 71 \text{ psig} \quad = 5.0^\circ\text{C}$
- 3 - deduct 2 from 1 = Super Heat = 4.0°C

For R22 maintain 3-5°C Super Heat

For R407C adjust TX Valve to achieve 6-8°C Super Heat

ISSUE	MODIFICATION	ECN	DATE	APRVD	DRG No.	DESCRIPTION	Mat.l	FINISH	ASSY No.


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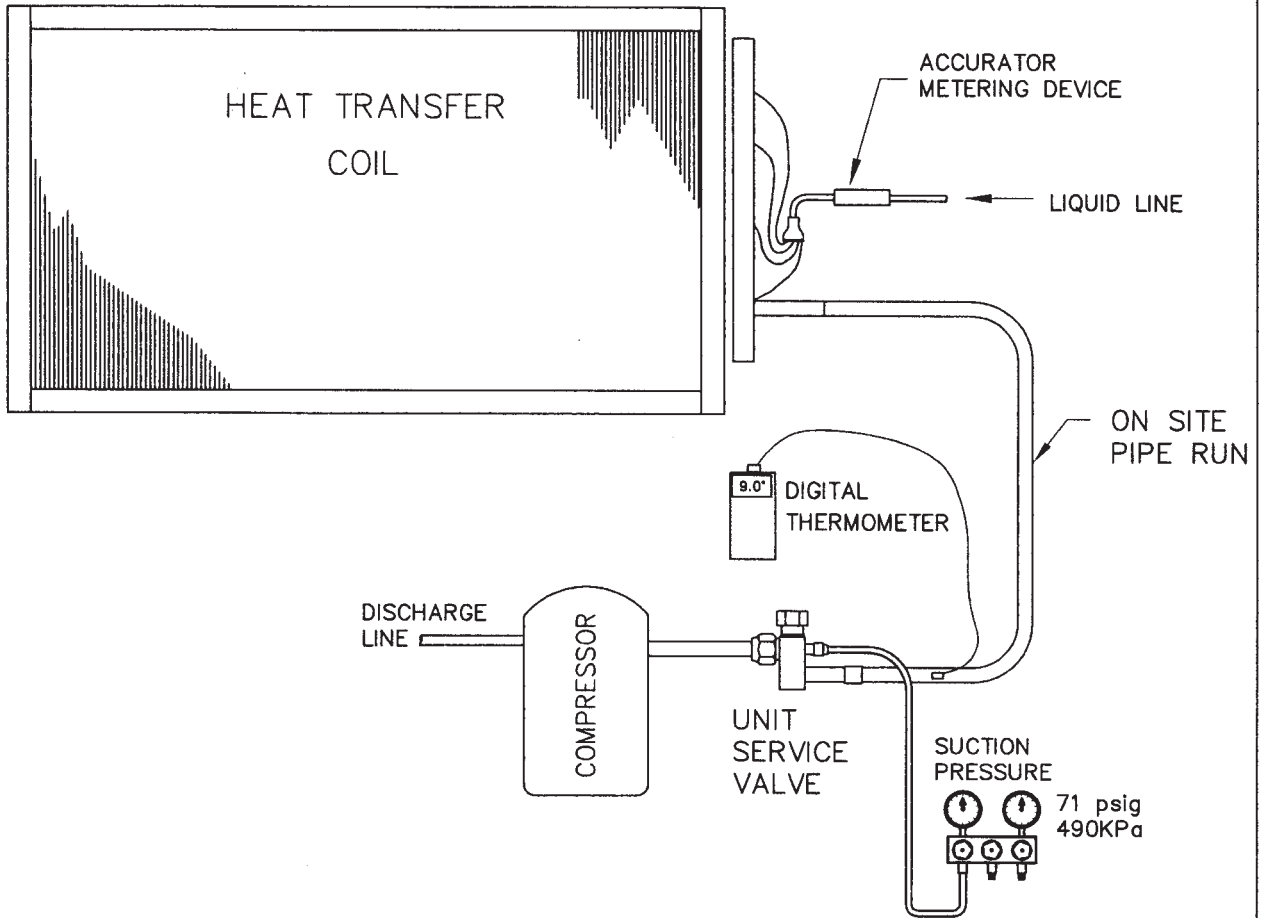
Title  
**SUPERHEAT MEASUREMENT**

PACKAGED UNITS  
WITH TX VALVE.



Drawn B.P.	Date 01-03-02	Drawing No.	Revision
Scale	Aprvd <i>[Signature]</i>	TOK-MEASURE1	

EXAMPLE



- 1 – Measure temperature at Suction line entry to outdoor unit (cooling cycle) = 9.0°C
- 2 – Measure Suction Pressure at outdoor unit Service Valve  
and convert to temperature 490kpag (71 psig) = 5.0°C
- 3 – deduct 2 from 1 = Super Heat = 4.0°C

For R22 maintain 3°C Super Heat with 21°C Air on to Evaporator  
5°C Super Heat with 27°C Air on to Evaporator

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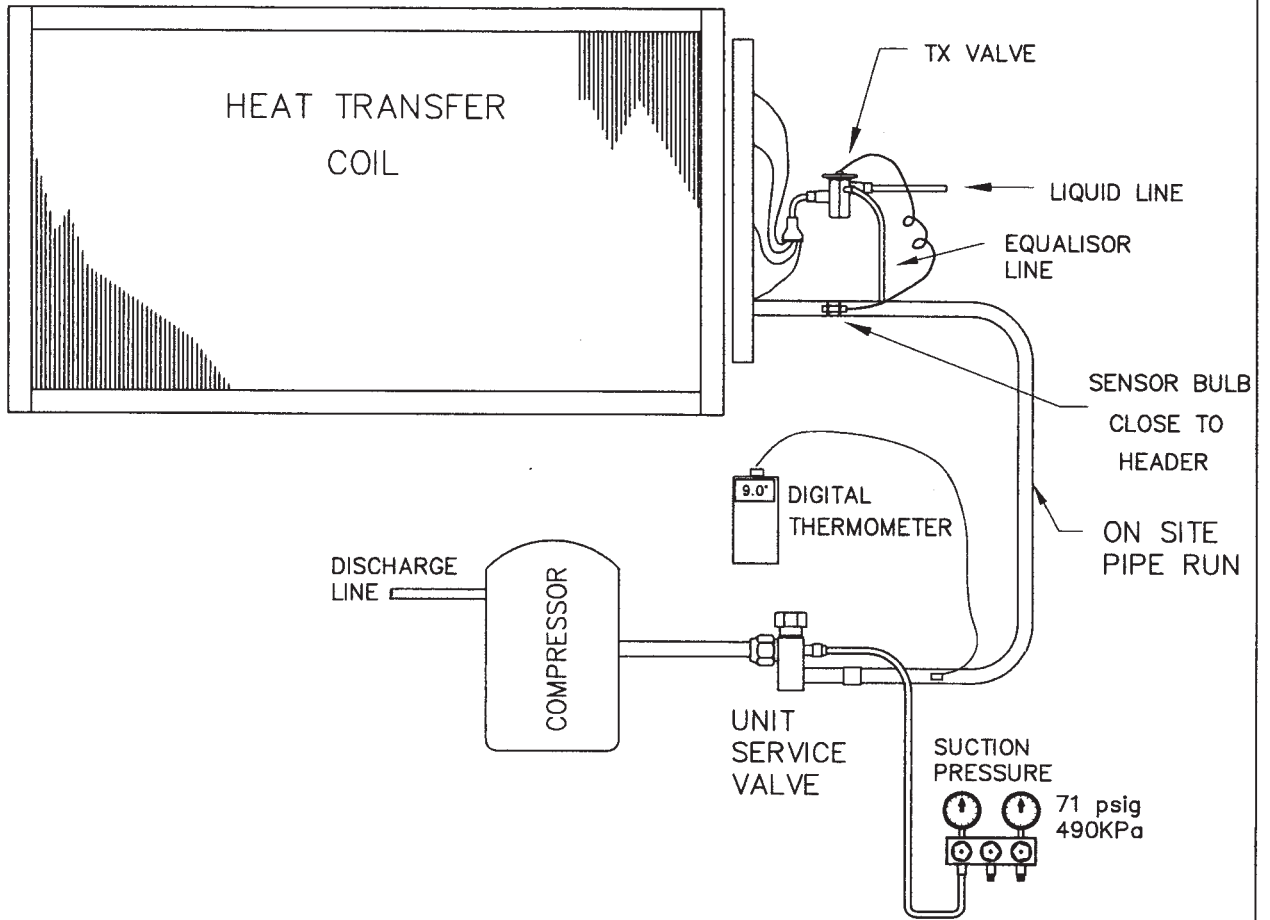
Title  
**SUPERHEAT MEASUREMENT**

SPLIT SYSTEM UNITS WITH ACCURATORS



Drawn B.P.	Date 01-03-02	Drawing No.	Revision
Scale	Aprvd <i>[Signature]</i>	TOK-MEASURE2	

EXAMPLE




- 1 - Measure temperature at Suction line entry to outdoor unit (cooling cycle) = 9.0°C
- 2 - Measure Suction Pressure at outdoor unit Service Valve  
and convert to temperature 490kpag (71 psig) = 5.0°C
- 3 - deduct 2 from 1 = Super Heat = 4.0°C

For R22 maintain 3-5°C Super Heat

For R407C adjust TX Valve to achieve 6-8°C Super Heat

ISSUE	MODIFICATION	ECN	DATE	APRVD	DRG No.	DESCRIPTION	Mat.l	FINISH	ASSY No.

Programmed by	Title <b>SUPERHEAT MEASUREMENT</b>		
PLOTTED 08-03-02 ©temperzone ltd 2002	 SPLIT SYSTEM WITH TX VALVE.		
	Drawn B.P.	Date 01-03-02	Drawing No.
	Scale	Aprvd <i>[Signature]</i>	TOK-MEASURE3
		Revision	