

Thermal Superheat Controller

DATASHEET

OVERVIEW

The Microstaq Thermal Superheat Controller (TSHC) is a device that is used to control a Silicon Expansion Valve (SEV). External components include only temperature sensors. No pressure sensor is included or required.

The TSHC functions to control superheat. The TSHC provides a cost-effective solution for improved performance, and efficiency in air conditioning, heat pump and refrigeration systems.

The sensing and control capabilities of the TSHC can be used to adjust flow through a SEV so that the user can maintain desired system conditions.

BENEFITS

Microstaq's technology and product capability align well with the global trends in HVAC and refrigeration, allowing manufacturers and retailers to provide more energy efficient systems with lower maintenance, improved compressor reliability, and increased capacity. The Microstaq TSHC reemphasizes Microstaq's drive for innovation in the HVAC and refrigeration sector. The TSHC offers numerous exceptional benefits and features to users, combining reliability, system savings, efficiency improvement, and performance.

RELIABILITY

- ◆ The TSHC controls a SEV to control superheat to much more precise levels and maintains a set point to within $\pm 2^{\circ}\text{F}$, while ensuring no liquid travels to the compressor, thus preventing compressor flooding issues.
- ◆ User can set TSHC parameters from a computer using a TIA 232 Port and interface cable. Once set, the computer is no longer necessary.

SYSTEM SAVINGS

- ◆ The TSHC offers simplified electronic control to enable uncomplicated operation of the SEV.

EFFICIENCY AND PERFORMANCE

- ◆ The TSHC enables better control of refrigerant flow, optimizing system performance.
- ◆ The SEV opening is directly proportional to the control signal. Hence, the position of the valve is known by the TSHC at all times, allowing precise and easier tuning and control
- ◆ The TSHC controls the SEV using temperature data from sensors to provide closed-loop feedback. It provides electronic superheat calculation and control at 1 second intervals.

FEATURES

- ◆ Configurable settings to support a range of applications
- ◆ Temperature sensing ability. No pressure sensor used
- ◆ Easy gain adjustments via TIA 232
- ◆ Fault Detection including sensor faults, high/low superheat, low refrigerant charge
- ◆ Energy efficiency increases
- ◆ Refrigerant charge reduction capability
- ◆ Reliability improvement
- ◆ Compact design

SPECIFICATIONS

Compatible Refrigerants	R410a, R404a, R134a, R22, R17a Same controller can handle different kinds of refrigerant
Compatible Oils	No contact with refrigerant or oil is made.
Functions	Measurement of temperature and calculation of superheat Maintenance of set point within $\pm 2^{\circ}\text{F}$
Maximum Working Pressure	NA – Temperature Based
Life Expectancy	10 years

TECHNICAL DATA

Supply Voltage	12 VAC/DC +/- 15%; 24VAC/DC +/- 15%. AC or DC operation must be specified when ordering.	
Communication I/O	TIA 232 with 9 pin D-shell to TSHC adapter cable. TIA 232 must be electrically isolated from TSHC power supply.	
Power Consumption	Idle ~ < 1.2W (Unpowered when compressor is off)	Operating < 20W including valve power
Plug-in Connectors	Power input connector, 1/4" male push-on connector. Other connectors provided with the SEV, TIA 232 interface cable and thermistors.	
Marking	Serial number label on the PC board	
Temperature	Storage -40 to 105C	Operating -40C to 80C
Humidity	0 – 80% non-condensing	
Weight	27g	
Mounting	4 x #6 screws	

INPUT/OUTPUT

Temperature Sensor Input Range	0-50 degrees C
Valve Drive Output	Pulse-width-modulated (PWM): 0-100%
Digital Input	Operator control via electrically isolated TIA 232 using a terminal emulation program. Control may be discontinued once unit is set up for correct operation.

TSHC PHYSICAL DIMENSIONS

Physical Dimensions	6.8 cm W x 9 cm L
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