General Comment Temperature Controls:

The Kanto Seiki fluid temperature control system (refrigeration and for some applications heating) provides precise control of fluid temperatures. Basic lubricating oil, kerosene, cutting fluids, and water-glycol combinations can be maintained from 50 to 104 degrees F (10 – 40 deg C). The chiller working environment or ambient shop air must be maintained in the 50 to 104 degrees F (10 – 40 deg C) range.

Chiller Operation: Digital Display models KTC- ### - *S*

Display mnemonics are interpreted as follows:

A) **ATA or CTC** = “constant temperature control” (constant value control – a comparative method under the hood) or “active temperature action” (follow-up temperature control – more of an on-off direct switching). This means your temperature regulating board probably is the culprit. Check the compressor by bumping the motor starter contacts manually. If the compressor works look into the control circuit.

B) **F** = “fuse”. Control circuit fuse.

C) **GPS** = “Gas Pressure Switch”. Excess pressure; Refrigeration circuit.

D) **HTS**$_1$ = “Heater Temperature Switch-1”. Circulating fluid heater temperature is excessive.

E) **HTS**$_2$ = “Heater Temperature Switch-2”. There is a circulating fluid affect. This means the ambient (shop atmosphere) temperature is excessive and the fluid is feeling the affect.

F) **ITS** = “internal thermal switch”. A condition similar to MP, but this switch could be internally located relative to the compressor. Thermal protection techniques vary with the compressor manufacturer. The probable cause would be excessive compressor motor current draw. Also see OL.

G) **MP or THP** = “motor protection” or “thermal protection”. Compressor dome thermal is open. This is a snap action switch that will reset in due time. Some are externally mounted to the compressor, and others are internal. Variuos manufacturers employ different techniques.

H) **OL** = “Overload” of refrigeration compressor at panel supporting the motor starter.

I) **OL2** = “overload for compressor”. This means the single or three phase motor starter overload as opposed to snap action canister switches.

J) **OL21** = “overload for condenser fan motor”. Sometimes the cooling fan for the refrigeration circuit is circulating pump motor mounted. Most of the time the condenser fan motor is separate.

K) **OH** = “Open Heater”. There is a break in the heater wiring.

L) **PL1** = “power lamp 1”. The “chiller ready” light is not seeing power or the element is out.

M) **THP** = “thermal protection”. Also see MP.

1. Refrigeration Compressor – hermetic design.
2. Condenser – the heat removal component of the refrigeration circuit.
3. Condenser Fan Motor or;
4. Combination condenser fan motor and fluid circulating pump motor.
5. Fluid circulating pump.
6. Heat exchanger – the heat removal component of the circulating fluid circuit. Sometimes referred to as the chiller barrel.
7. Heating Chamber – the heat input component of the circulating fluid circuit.
8. Return Line Accumulator – part of the refrigeration circuit, attached near to or directly on the outside of the refrigeration compressor. This component reduces the chance of liquid refrigerant entering the compressor body. Compressor mounting is usually a for rotary model, and separate accumulator mounting is usually a reciprocating model.
9. Filter – Dryer
10. Expansion Device – that component which allows for high pressure refrigerant, in a liquid state, to expand into the heat exchanger (chiller barrel.) This expansion (and resulting phase change from a liquid to a gas) reduces the temperature of the refrigeration circuit so heat can move to the lower temperature fluid or surface.

SAGInoMIYA high pressure bypass control valve

This control valve (not on all models) allows for a method of “idling” the chiller’s cooling capacity because of excess refrigerant charge or a dirty condenser coil. The part number is DPR-4003D and the release pressure is 23 kg/cm$_2$ (327 psig). It is not adjustable and the best way to determine if it still functions is by feel of the copper tubing associated with the circuit.