Pfannenberg	Tech Note	TN019
Page 1 of 5	Date: 4/24/23	**Revision: *00***
Title	**Verification of Cooling through Operational Mode & Function Test**	

Purpose

To verify function on a Pfannenberg DTS 31x5/32X5 series cooling unit through the use of the onboard controller utilizing the function test mode.

Unit Type

DTS 31X5/32X5 units built after 9/2022

Procedure

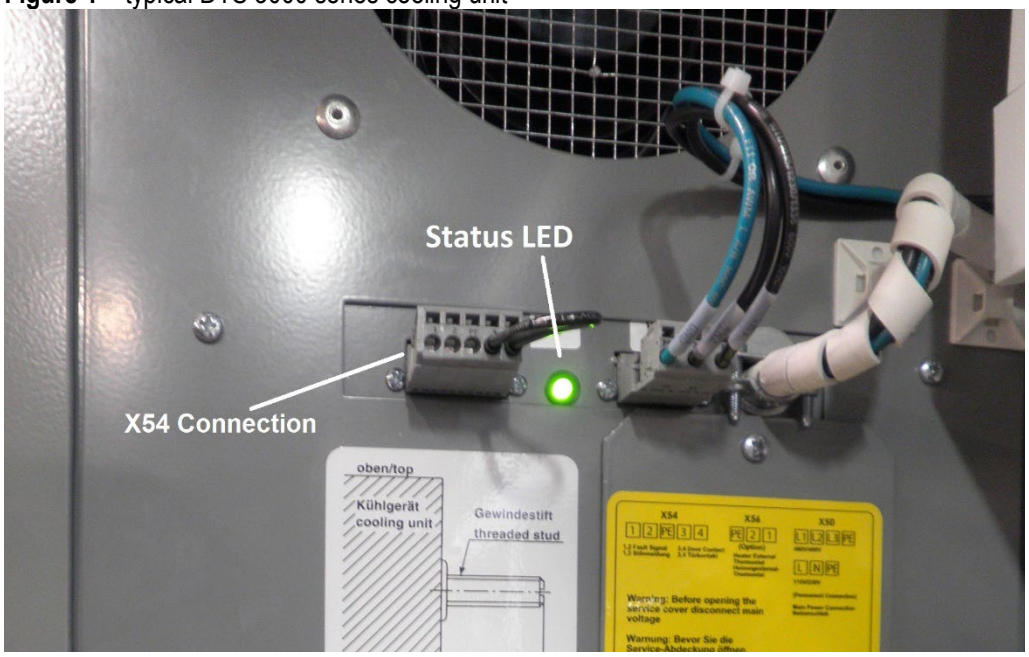
1. **Power**

   Verify power is present at the X50 terminal block and that the unit is properly fused. The voltage must be within ± 10% of the value listed on the ID plate. If the required voltage is 400v on a 460v (standard setting) system please view the Pfannenberg Tech note on the transformer tap option.

2. **Door Contactor / Jumper**

   Verify contact closure on the X54 connector. A contact switch on the door of the enclosure should be wired to the X54 wago connector at pins 3+4 to ensure the cooling cuts out when the door is open, which will keep condensation to a minimum. If no door switch is present a jumper across pins 3+4 **must** be present to avoid the unit staying in alarm sequence Er00 (see Table 1).

Figure 1 – typical DTS 3000 series cooling unit



3. Standard operating mode

When power is applied to the unit, the (Status LED) will be in a solid green state, informing you the unit is in standard operational mode. If the internal cabinet temperatures are above the set point, the compressor and external fan will begin to run until the internal temperature of the control board has been satisfied. Only the internal fan will always remain on if the internal cabinet temps are below the control board settings.

- Factory dip switch settings are set to 95°F(35°C).

4. Verify Proper Phase Orientation

When power is applied to the unit, if the indication light cycles (Status LED) to flashing mode and the compressor and fans are not on, this informs you the unit is in sequence alarm Er04 mode (Table 1). Further action is needed to correct the 3-phase power to the unit, as the cooling system is locked out and will not run.

A. Verify there is 3-phase power applied to the unit and that the unit is not experiencing single phasing.
B. Confirm the load applied is balanced from leg to leg.
C. If both A and B conditions are true, the unit is out of phase. Switching two of the power legs is required on X50 terminal block to correct an out-of-phase condition.
    i. Disconnect power to the unit, remove the service cover from the unit, and locate X50 Terminal Block.
    ii. Identify the L1 and L2 terminals and swap the wire connected to them.
    iii. Replace the service cover and re-apply power.
D. Review Steps A and B and confirm the unit functions according to Standard operating mode.
E. If further Technical support is needed, please get in touch with Pfannenberg at 716-685-6866 or service@pfannenbergusa.com

5. Function Test

If further cooling is desired and the Controller setpoint is achieved, the unit can be forced into cooling. You can obtain this by pulling the connector on the control board at X14 (Figure 2); this is the TS2 temperature sensor, and with this the indication light cycles (Status LED) to Flashing mode. All components will be set to the on state and a temperature drop will follow.

Warning:

- Do not run unit for a prolonged period of time without the cover, the unit may experience a high pressure cutout, the indication light(Status LED) cycles thru Alarm sequence Er01 (see Table 1).
- When complete Please remember to reset the unit by disconnecting power and reconnecting the TS2 temperature sensor at X14, then re-apply power.

Figure 2 – connection point of the temp sensor

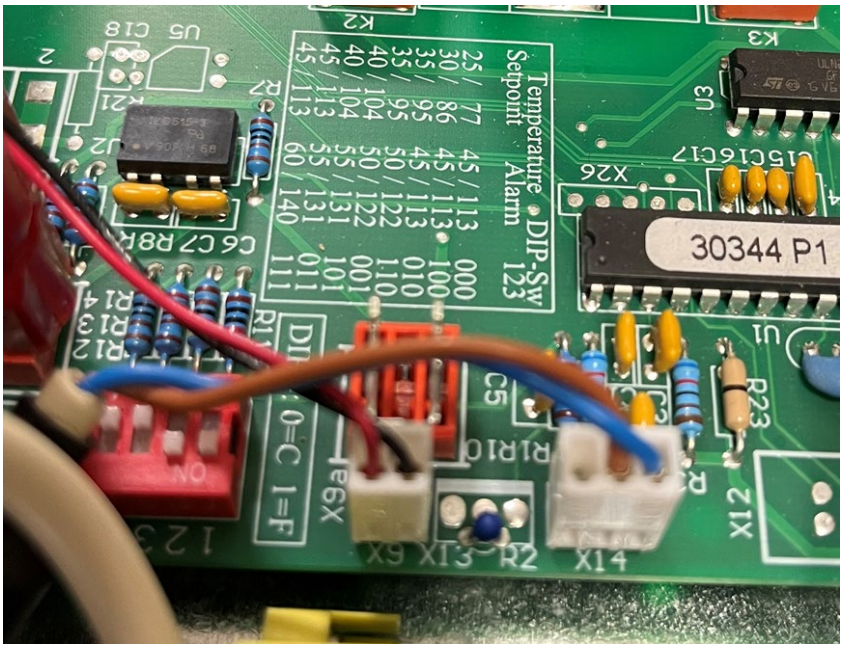


Table 1 – Error Code Table, from section 8.0 of the DTS 3000 Series Manual

NOTE

Flashing of the red LED light on the controller card is **not** a fault indication or error message.
The red LED light indicates that the cooling unit is carrying voltage.

Error no.	Fault/unit behavior		Possible causes	Remedial measures
Er00	LED:	flashes	**Door contact:** The door contact circuit is interrupted.	Close the door. Connect the door contact switch. Bridge the door contact. Check wiring.
	Compressor:	OFF		
	Evaporator fan (internal):	OFF		
	Condenser fan (external):	OFF		
	Fault signal contact::	closed		
Er01	LED:	flashes	**Pressostat tripped:** Too high pressure in the refrigeration circuit. The cooling unit cannot dissipate the heat from the refrigeration circuit.	Let the unit cool down. Clean the fins of the heat exchanger (internal/external). Check the function of the condenser fan (external).
	Compressor:	OFF		
	Evaporator fan (internal):	ON		
	Condenser fan (external):	OFF		
	Fault signal contact::	Open		
Er04	LED:	flashes	**Phase sequence/phase failure:** Failure of at least one phase or phase sequence is wrong (only in three-phase units with cam compressors).	Check field of rotation - (right-hand field of rotation is mandatory). All phases must carry rated voltage.
	Compressor:	OFF		
	Evaporator fan (internal):	OFF		
	Condenser fan (external):	OFF		
	Fault signal contact::	Open		
Er05	LED:	flashes	**Sensor 1 (TS1) defective.**	According to the unit type, replace sensor 1 (permanently soldered on the controller card) or the complete controller card.
	Compressor:	ON		
	Evaporator fan (internal):	ON		
	Condenser fan (external):	ON		
	Fault signal contact::	Open		
Er07	LED:	flashes	**Sensor 1 Maximum:** Maximum value of the switch cabinet temperature "Lit¯" (display) is reached or exceeded. The cooling unit cannot cool the air in the switch cabinet sufficiently.	Check settings of the cooling unit. Clean the fins of the heat exchanger (internal/external). Check the function of the evaporator fan (internal). Check the refrigeration circuit for spilled refrigerant or leakage. Install a cooling unit with a higher cooling capacity if necessary.
	Compressor:	ON		
	Evaporator fan (internal):	ON		
	Condenser fan (external):	ON		
	Fault signal contact::	Open		

Table 1 (cont.)

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Error no.	Fault/unit behavior		Possible causes	Remedial measures
Er08	LED:	flashes	**Sensor 2 (TS2) defective.**	Replace sensor 2 according to the unit type. Sensor 2 is plugged to the card, not permanently soldered.
	Compressor:	ON		
	Evaporator fan (internal):	ON		
	Condenser fan (external):	ON		
	Fault signal contact::	Open		
Er15	LED:	flashes	**Antifreeze (option):** Antifreeze-Sensor ≤ 1°C. Safety cut-out because the evaporator is threatening to ice up.	Restart operation after condensate has evaporated. A restart is only possible by disconnecting and reconnecting the mains voltage. No other reset is provided for safety reasons. Clean the fins of the heat exchanger (internal/external). Check switch cabinet for leakages. Select a higher switch cabinet temperature setpoint. Check the evaporator fan (internal) function.
	Compressor:	OFF		
	Evaporator fan (internal):	OFF		
	Condenser fan (external):	OFF		
	Fault signal contact::	Open		