

## JOINT APPENDIX 6

### Charge Indicator Display

#### 6.1 Purpose and Scope

Reference JA6 specifies the required elements of a charge indicator light that signals when the refrigerant charge or metering device performance does not meet specifications.

The following sections document the instrumentation needed, the required instrumentation accuracy, the parameters measured, and the calculations required.

The reference method algorithms adjust (improve) the efficiency of split system air conditioners and heat pumps when a charge indicator light is installed. Table JA6-1 summarizes the algorithms that are affected by the charge indicator light.

Table JA6-1 – Summary

<u>Input to the Algorithms</u>	<u>Variables and Equation Reference</u>	<u>Description</u>	<u>Standard Design Value</u>	<u>Proposed Design</u>	
				<u>Default Value</u>	<u>Procedure</u>
<u>Cooling System Refrigerant Charge and Metering</u>	<u>Fchg (Eq. R4-40 and R4-41)</u>	<u>Fchg takes on a value of 0.96 when the system has a charge indicator light meeting the specifications in JA6 or when the charge metering device have been tested and verified according to ACM RD-2008. Otherwise, Fchg has a value of 0.90.</u>	<u>Split systems are assumed to have refrigerant charge testing or a charge indicator light, when required by Package D.</u>	<u>No refrigerant charge testing and no charge indicator light.</u>	<u>JA6.2</u>

#### 6.2 Standard for a Charge Indicator Light

This section specifies the Standard for a charge indicator light.

##### 6.2.1 Instrumentation Specifications

Instrumentation for the procedures described in this section shall conform to the following specifications:

##### 6.2.1.1 Temperature Sensors

The temperature sensors shall have: accuracy of:  $\pm 1^\circ$  F.

##### 6.2.1.2 Refrigerant Pressure Sensors (if used)

Refrigerant pressure sensors, if used, shall have an accuracy of plus or minus 3%.

##### 6.2.1.3 Parameters Measured

1. The following parameters shall be measured:
2. Suction line temperature
3. Liquid line temperature
4. Evaporator saturation temperature or low side refrigerant pressure
5. Condenser saturation temperature or high side refrigerant pressure
6. Return air wet bulb temperature or humidity
7. Return air dry bulb temperature

8. Condenser air entering dry bulb temperature9. Supply air dry bulb temperature6.2.2 Charge Error Indication

The charge error indicator light shall:

1. be clearly visible to occupants of the home in normal operation.
2. be on or within one foot of (one of) the thermostat(s) controlling the air conditioner.
3. illuminate for a period of at least 7 days when any of the following occur:
  - a) the air conditioner runs for 15 minutes, the condenser air entering temperature exceeds 65°F, has a fixed metering device, and has a superheat more than 5°F different from the target superheat listed in Table RA5-2.
  - b) the air conditioner runs for 15 minutes, has a TXV or EXV, and has a subcooling more than 3°F different from the target subcooling listed by the manufacturer.
  - c) the air conditioner runs for 15 minutes, has a TXV or EXV, and has a superheat outside the range specified by the manufacturer (or outside 4°F to 25°F if there is no manufacturer's specification).
  - d) the air conditioner runs for 15 minutes, the condenser air entering temperature exceeds 65°F, and has a temperature split more than 5°F different from the target temperature split listed in Table RA5-3.

6.2.3 Additional Error Indication

The charge error indicator light may be set to tighter specifications than those in JA6 2.2. The light may also be used to signal other faults as long as these additional functions do not detract from the indications in JA6 2.2.