

Appendix RJ – Charge Indicator Light

RJ.1 Purpose and Scope

ACM RJ-2008 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 RJ-1 summarizes the algorithms that are affected by the charge indicator light.

Table RJ-1 – Summary

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

RJ.2 Standard for a Charge Indicator Light

This section specifies the Standard for a charge indicator light.

RJ.2.1 Instrumentation Specifications

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

RJ.2.1.1 Temperature Sensors

The temperature sensors shall have :

Accuracy: $\pm 1^\circ \text{F}$.

RJ.2.1.2 Refrigerant Pressure Sensors (if used)

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

RJ.2.1.3 Parameters Measured

The following parameters shall be measured:

Suction line temperature

Liquid line temperature

Evaporator saturation temperature or low side refrigerant pressure

Condenser saturation temperature or high side refrigerant pressure

Return air wet bulb temperature or humidity

Return air dry bulb temperature

Condenser air entering dry bulb temperature

Supply air dry bulb temperature

RJ 2.2 Charge Error Indication

The charge error indicator light shall:

be clearly visible to occupants of the home in normal operation.

be on or within one foot of (one of) the thermostat(s) controlling the air conditioner.

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 XXX.

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 XXX.

RJ 2.3 Additional Error Indication

The charge error indicator light may be set to tighter specifications than those in RJ 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 RJ 2.2.