

The following document describes the construction and operation of a standard air or nitrogen heater used in our effusion cesiators. The take-away should be this. When completed, a flow sensor (dwyer Part # P2-17) will cut off the signal to the solid state relay, and thereby remove power to the heater if flow is not set to at least 2.5 cubic feet per minute. Dwyer sells sensors that trip at lower flows, but the Omega 750 watt heater needs this minimum.

Parts to build an effusion cesiator nitrogen heater.

Parts required:

A: McMaster-Carr part # 4464K527 ¼" by ¼" NPT female reducing coupling. Quantity 2

B: McMaster-Carr part # 5388K22 worm-drive hose clamp

C: Omega.com part # **AHP-7561** 750 Watt heater (\$105)

D: Omega.com part # AHP-NPT34 Thermocouple T-fitting (\$94)

(note: One could also use a cheap normal ¼" tee after it has been adapted down to ¼" with part A)

E: Omega.com part # **TC-K-NPT-G-72** Thermocouple Pipe probe(\$38)

F: Omega.com part # OST-K-M Thermocouple round pin male connector (\$2.75)

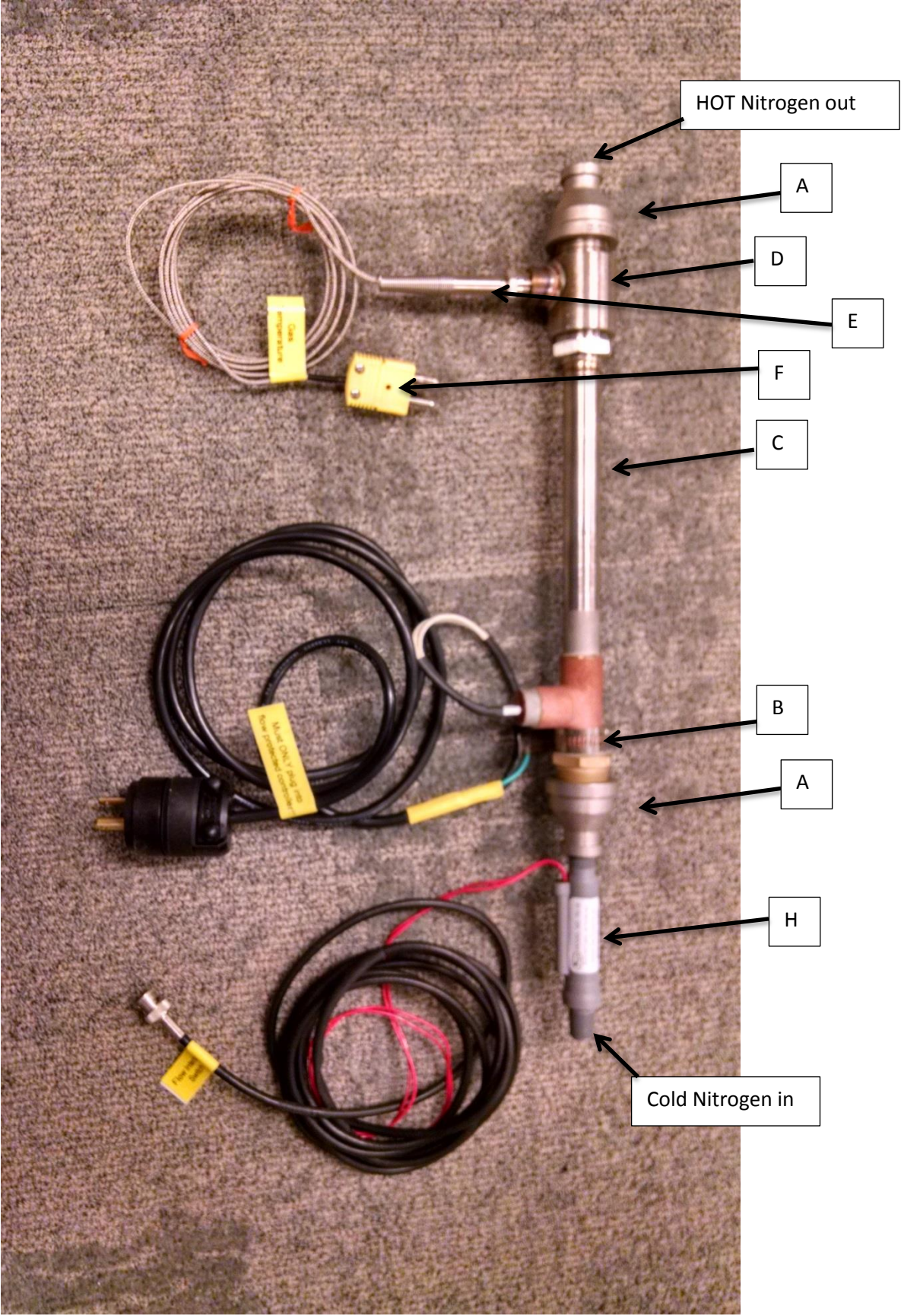
G: Omega.com part # UPJ-K-F Thermocouple female connector for controller panel (\$2.75)

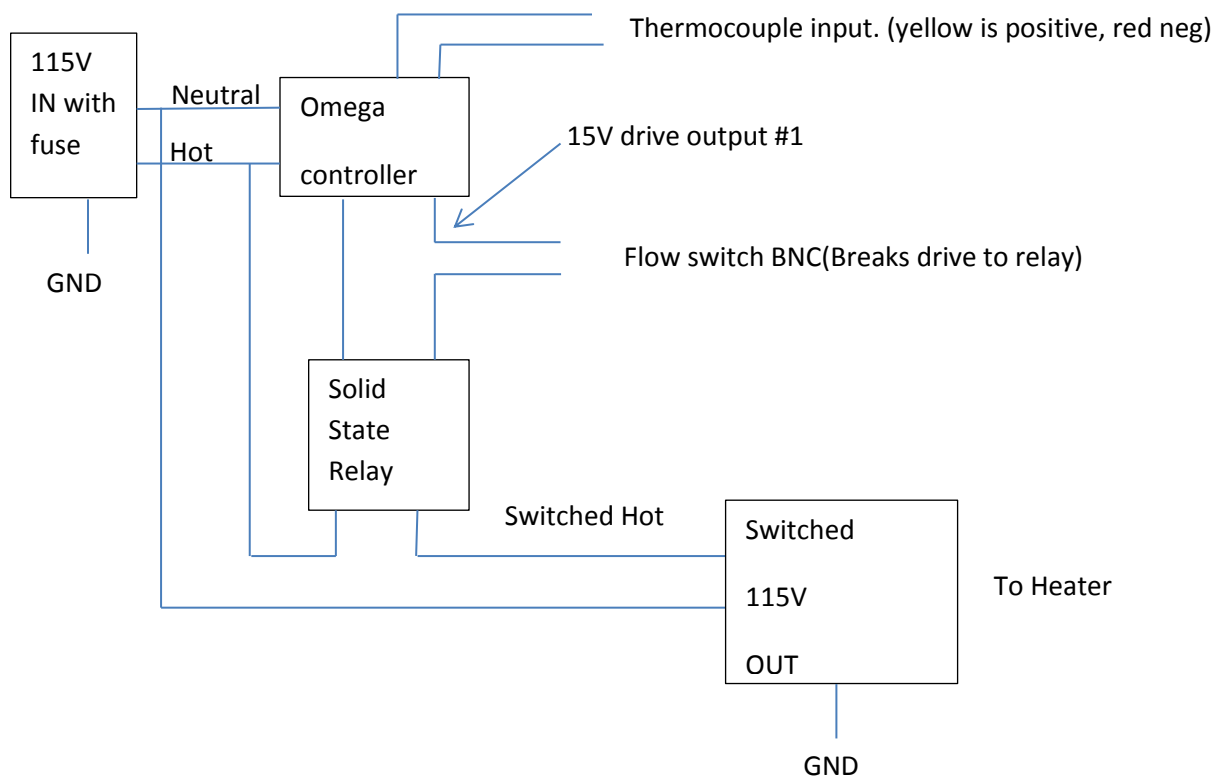
H: Dwyer-inst.com part # P2-17 gas flow switch (\$64.50)

I: Automationdirect.com Part# SL4824-VR temperature controller. (\$90)

J: Automationdirect.com Part# AD-SSR625-AC-280A Solid State Relay. (\$23.50)

K: Suitable enclosure and power connectors, bnc connectors and cables, etc.





Must Connect earth ground to heater! Should also use a GFCI outlet as the power source to this system.