

**CHARTS**  
**FOR**  
**TROUBLESHOOTING**  
**THERMOCOUPLES AND**  
**POWERPILE SYSTEMS**

## **TROUBLESHOOTING CHARTS**

**These charts are to assist the technician in properly diagnosing problems with 30 millivolt thermocouple systems and 750 millivolt Powerpile Systems.**

**Charts 1 and 2 are for use on 30 millivolt systems. Chart 1 is for use on systems with no built in ECO (Energy Cutoff). Chart 2 is for systems with an ECO, typically all water heaters are required to have an ECO as a safety to shut off the millivolts to the water heater control is the water temperature reaches 195° F. It is a one time fusible link device that if it opens it will mean replacing the water heater control.**

**Charts 3 and 4 are for the older 250 millivolt controls that were used on a lot of wall furnaces and thru the wall room heaters. Chart 3 is for diagnosing the Pilotstat part of the control. Chart 4 is for the valve coil itself.**

**Charts 5 and 6 are for the 750 millivolt valves for testing and diagnosing the power units (magnet assembly). Chart 5 covers the older 23 ohm assemblies. Chart 6 is for the newer combination gas valves such as Honeywell VS-820, Robertshaw and White Rodgers newer valves.**

**Chart 7 is for troubleshooting the 750 millivolt valve circuit.**

**MILLIVOLT  
CHARTS**

# TESTING 30-MILLIVOLT CIRCUITS

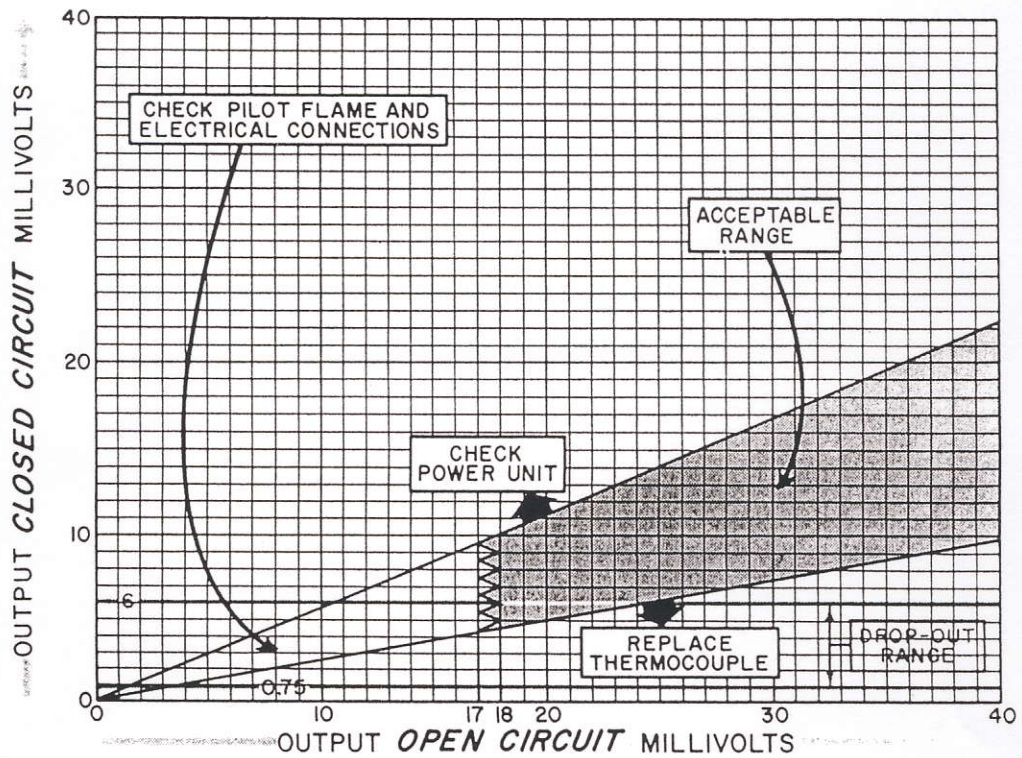


Chart 1—30 Millivolt Pilotstat Control.

**NO ECO**

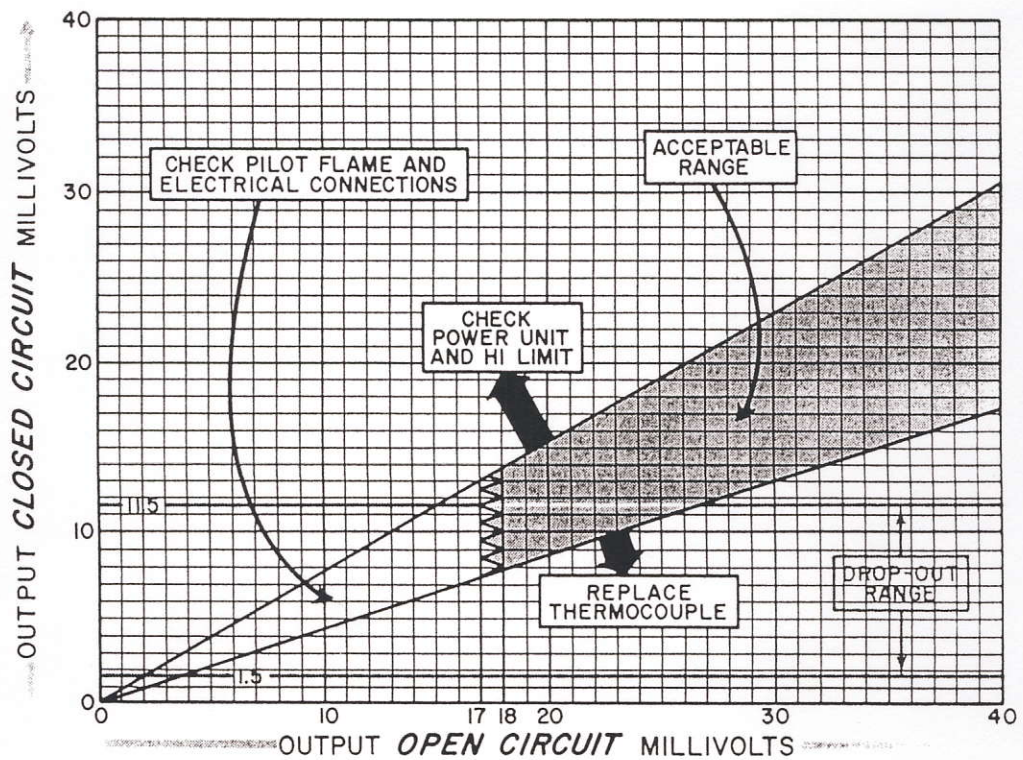


Chart 2—30 Millivolt Pilotstat and Hi Limit.

**WITH ECO**

# TESTING 250-MILLIVOLT CIRCUITS

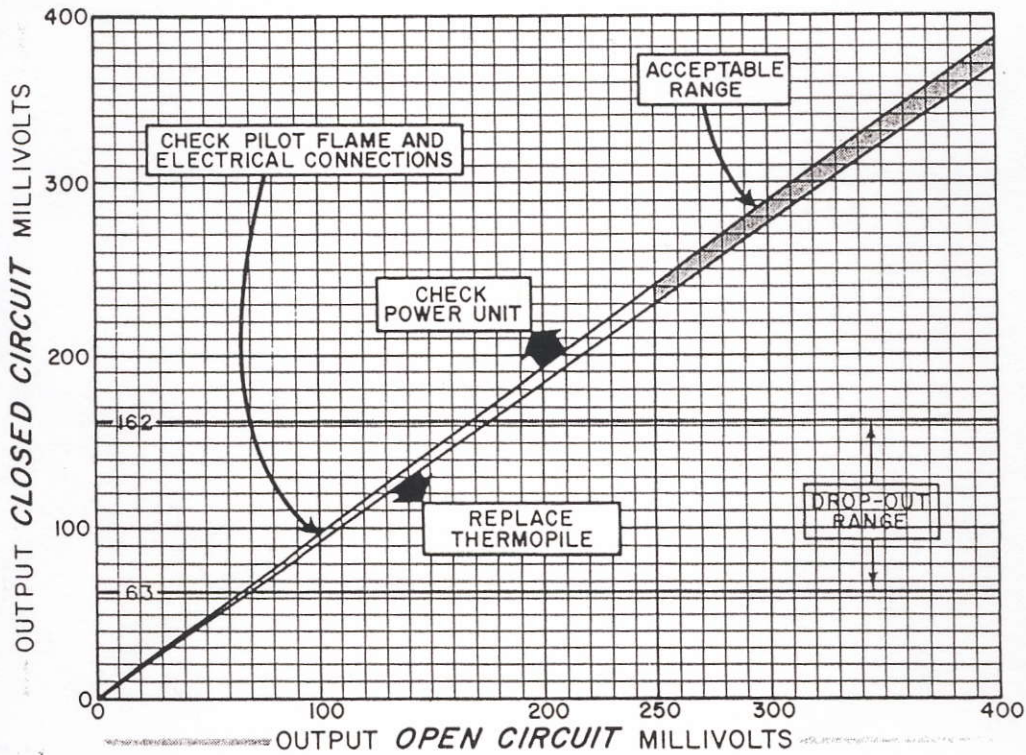


Chart 3—250 Millivolt Pilotstat Control.

IMPORTANT: Make certain Powerpile valve is disconnected when testing Pilotstat control.

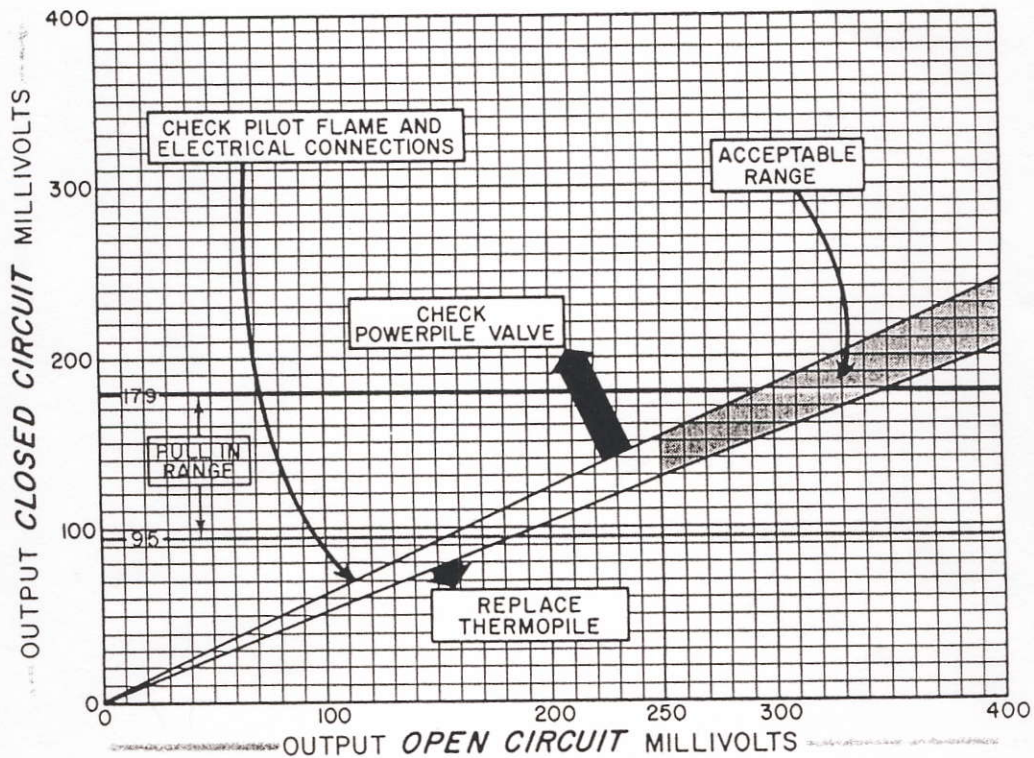


Chart 4—250 Millivolt Powerpile Valve.

IMPORTANT: Make certain Pilotstat power unit is disconnected when testing Powerpile valve.

TESTING  
750-MILLIVOLT CIRCUITS

CHART 5

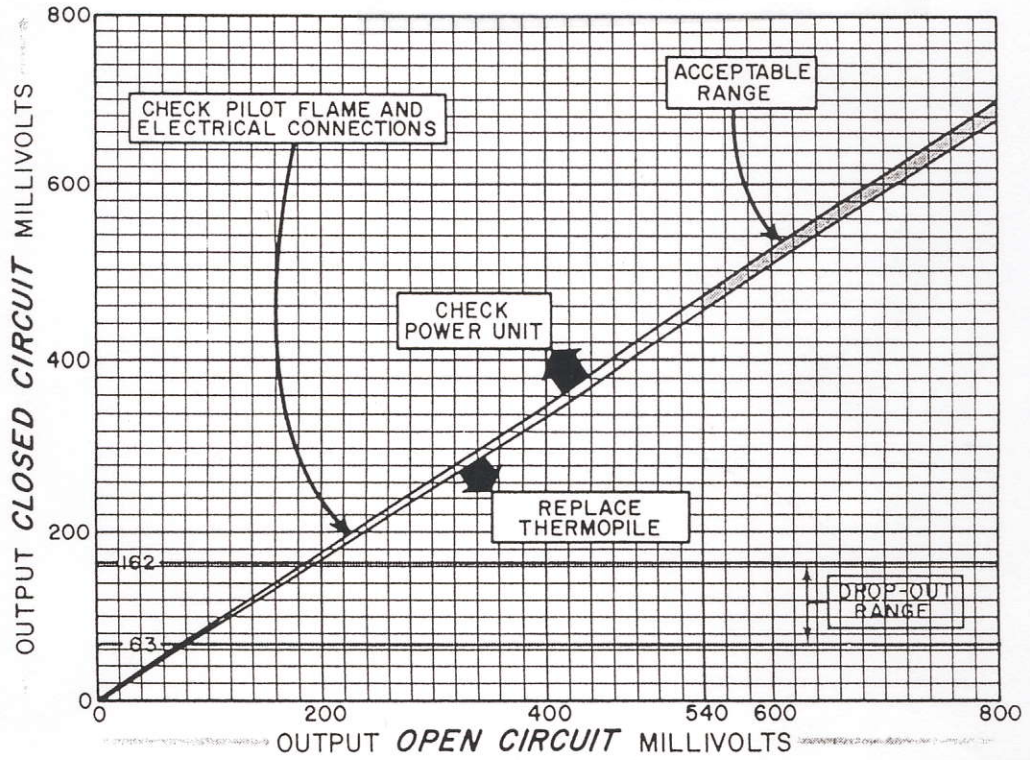
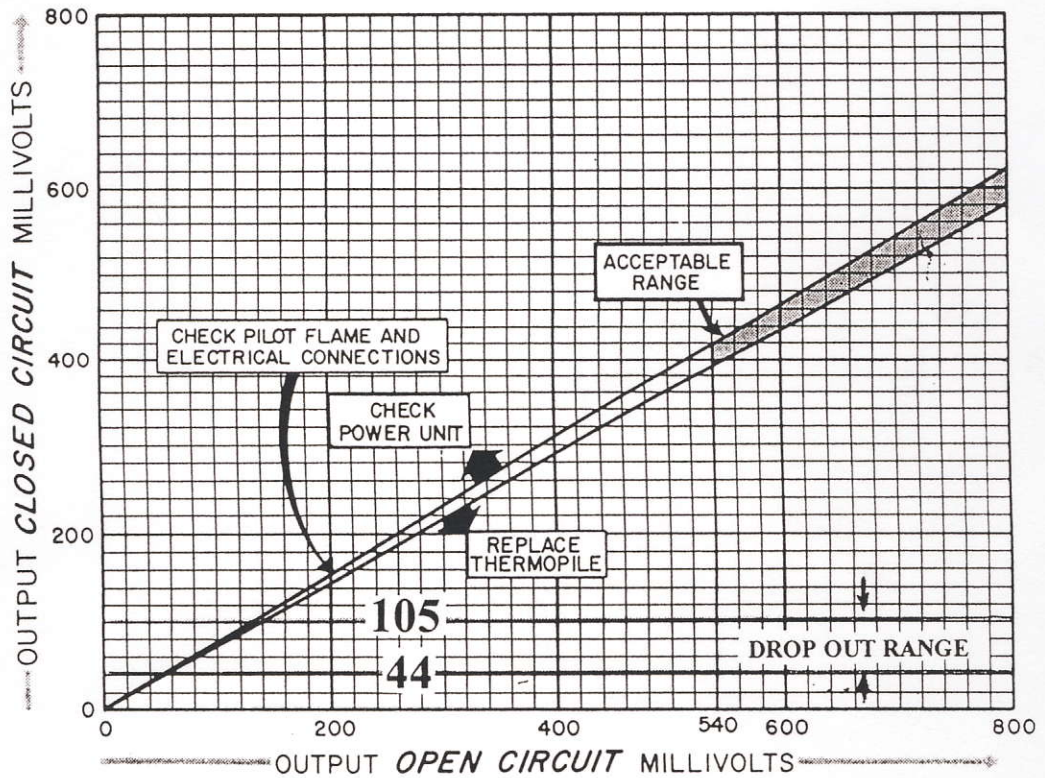


Chart 5—750 Millivolt Pilotstat Control. **23 OHM**

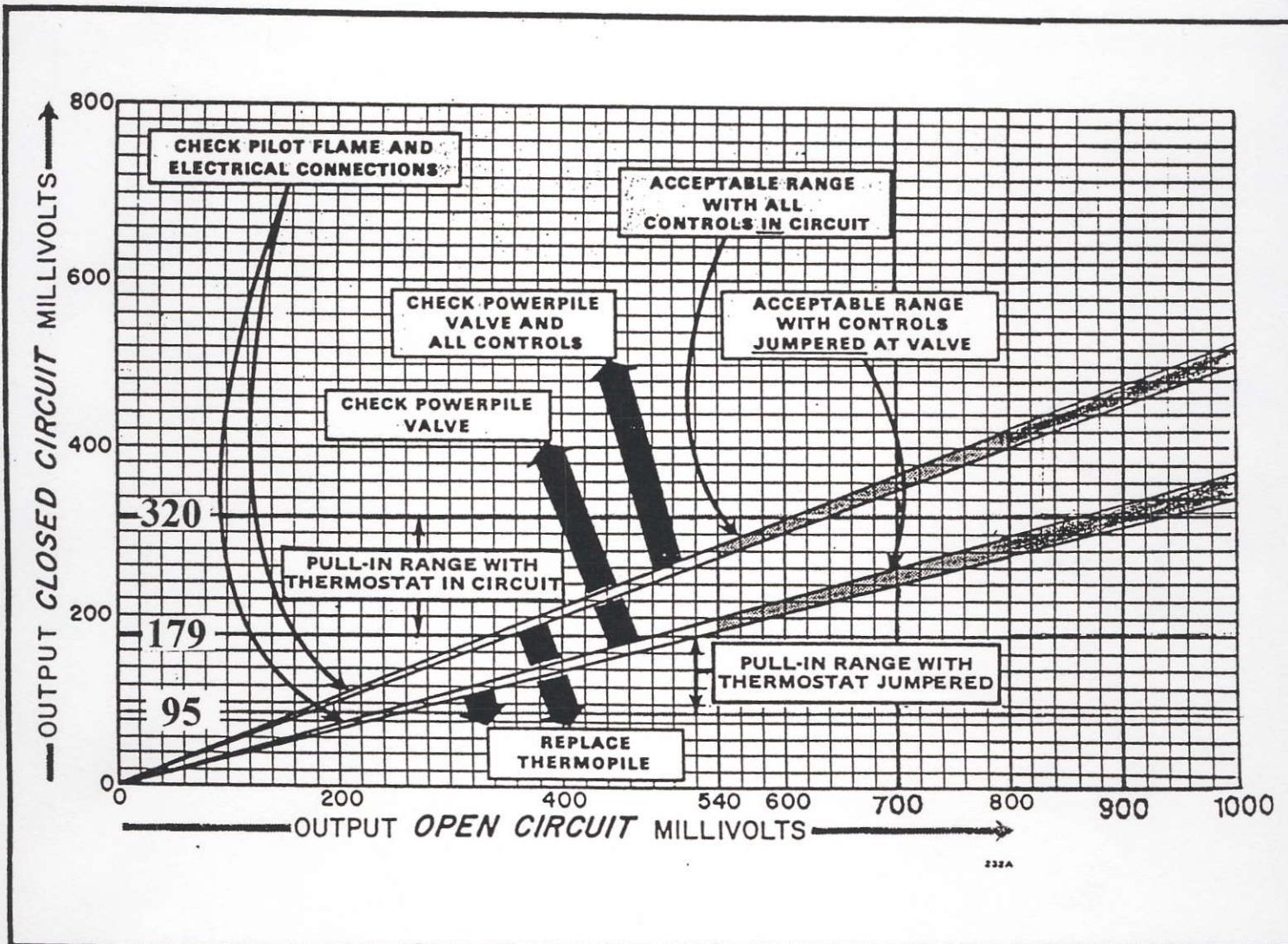
IMPORTANT: Make certain Powerpile valve is disconnected when testing Pilotstat Control.

CHART 6 —SPECIAL 11 OHM POWER UNIT (VS8204)



**11 OHM**

# CHART 7 TESTING POWERPILE VALVE CIRCUIT 750 MV (NOM.) SYSTEM



SPECIAL NOTE: Shaded area in upper band is based on the resistance of the TS86A thermostat and 30 feet of 18-gage cable. IF THERMOSTAT HAS NO HEAT ANTICIPATION HEATER, AND THERE IS A SHORT RUN OF WIRE TO THE THERMOSTAT—readings falling between the upper and lower diagonal bands also represent proper system operation.