

Failure modes in Philips STG Turnstile PLC's:

There are 2 common failures seen most often in Philips Full Height Turnstile PLC's

1 – Total PLC Burnout: This can be easily identified by the fact that there are no green LEDs lit on the front of the PLC. To be absolutely sure, Make certain that the white power connector at the bottom of the PLC is plugged in and that both Brown and Blue wires from this connector are connected to the terminal block as follows. The Brown wire must be connected to either terminal 1 or 3. The blue wire must be connected to either terminals 2, 4, 5, 6 or 13. In addition The DC voltage across terminals 1 & 2 should be greater than 22 volts. Terminal 1 is positive, 2 is negative.

If the wiring and voltage are ok then the PLC is burned out. The common cause of this burn-out failure is usually abnormally high DC voltages. Readings above 28VDC will eventually result in burnout. The higher the voltage, the more likely a burnout will occur. Unfortunately, this is due to the nature of the power supply originally designed with the unit. Abnormally high voltages are also responsible for solenoid burnout as well.

Here's the bad news. There is no easy fix for the power supply. The power supply provides unfiltered (dirty) DC to the PLC. The PLC relies on this dirty DC in order to execute its software properly. Replacing the existing power supply with a different one will cause the PLC to stop working properly.

Here's the good news: In order to change the PLC power supply, The PLC software has to be changed. But that is only one of 2 major problems. Keep reading.....

2- PLC Relay Failure: This is identified by the fact that one or both solenoids will not operate when they are supposed to. First, make certain that the problem is not a bad solenoid. Disconnect one solenoid wire (terminal 10 for CCW direction and terminal 12 for CW direction) and touch it to terminal 1. If the solenoid operates then the solenoid is not the problem. Reconnect the solenoid wire back to its original position.

What happened to the PLC to cause the internal PLC relay to fail? Motors, solenoids and all electrical devices that have wire wound coils have an inherent characteristic called inductance. In DC circuits inductance causes arcing across switching contacts when the device is turned off. Over time this arcing causes pitting and sometimes causes the switching contacts to weld together. So the failure mode can be a permanently open or shorted circuited. That is what happened to your PLC relays. It is almost entirely associated with PLC internal relays Y2 & Y3, the solenoid switching relays. In addition, because these are low power relays the MTBF is very low. A better design would have been to provide an arc quenching circuit to minimize the effect to inductive switching.

Here's the good news: In order to dramatically improve the life of the controller and minimize these types of failures, a simple arc suppression snubber circuit can be used and the switching function off loaded to a heavier duty relay.

So how is this accomplished? Modifying the existing controller, power supply, software and supporting circuits would be an onerous task. There is a simple and easy path to operational reliability. An upgrade kit, PUPKIT, can be installed in lieu of your existing problematic controller. The PUPKIT comes pre-wired and replaces the existing controller and power supply. It resolves all known deficiencies in prior units

The PUPKIT is also the universal replacement for all Robot Industries, Burle Industries and Philips full height turnstiles regardless of existing controller type.