

### 3.7 Others

#### (1) Detection circuit for abnormal operation

##### (a) FAULT signal

This circuit detects abnormal operations of the main circuit and outputs them to the console as FAULT signals.

Refer to Table 3.7.1.

**Table 3.7.1**

FAULT signal	Abnormal operation signal	Significance
TKV BR	TKV OVER TKV UNDER	Measured tube voltage KV+, KV- > 90KV Measured tube voltage 67% UNDER
PKV OVER	PKV OVER	Set tube voltage signal, when PKV exceeds 157 kV.
CHG BR	CHG OVER	Charging voltage for main circuit capacitor is more than 395V.

##### (b) TKV OVER

Refer to Fig. 3.7.1.

When a measured tube voltage KV+ or KV- is more than 90 kV, the output terminal 1.14 of operational amplifier A7 becomes HIGH, the set terminal 8 of flip-flop M36 becomes HIGH, and LED **TOV** is turned on. Then, FAULT signal is output to the console. At the same time, the reset terminal 10 of flip-flop M21 in the oscillation circuit (refer to (1) in section 3.3) becomes HIGH and the inverter stops oscillating.

##### (c) TKV UNDER

Refer to Fig. 3.7.1.

When a measured tube voltage is less than 67% of the set tube voltage, the output terminal 8 of operational amplifier A6 becomes HIGH, the set terminal 6 of flip-flop M36 becomes HIGH, and LED **TUN** is turned on. When the operation is not in check mode (check terminals **CHK1** and **CHK2** are not short-circuited), FAULT signal, TKVBR, is output to the console. The circuit including a diode D11 clamps TKV so that it does not become less than 2.5 V, in order to prevent circuit malfunctions. (When the set tube voltage is less than 75 kV, TKV UNDER does not work.)

Whereas this abnormal operation detection works only during X-ray exposure period, it does not work during the startup delay time of TKV signal. The period the