

## 8. System Control and Reset

### 8.1 Resetting the AVR

During reset, all I/O Registers are set to their initial values, and the program starts execution from the Reset Vector. For the ATmega168P, the instruction placed at the Reset Vector must be a JMP – Absolute Jump – instruction to the reset handling routine. For the ATmega48P and ATmega88P, the instruction placed at the Reset Vector must be an RJMP – Relative Jump – instruction to the reset handling routine. If the program never enables an interrupt source, the Interrupt Vectors are not used, and regular program code can be placed at these locations. This is also the case if the Reset Vector is in the Application section while the Interrupt Vectors are in the Boot section or vice versa (ATmega88P/168P only). The circuit diagram in [Figure 8-1 on page 47](#) shows the reset logic. [Table 26-3 on page 320](#) defines the electrical parameters of the reset circuitry.

The I/O ports of the AVR are immediately reset to their initial state when a reset source goes active. This does not require any clock source to be running.

After all reset sources have gone inactive, a delay counter is invoked, stretching the internal reset. This allows the power to reach a stable level before normal operation starts. The time-out period of the delay counter is defined by the user through the SUT and CKSEL Fuses. The different selections for the delay period are presented in ["Clock Sources" on page 27](#).

### 8.2 Reset Sources

The ATmega48P/88P/168P/328P has four sources of reset:

- Power-on Reset. The MCU is reset when the supply voltage is below the Power-on Reset threshold ( $V_{POT}$ ).
- External Reset. The MCU is reset when a low level is present on the  $\overline{RESET}$  pin for longer than the minimum pulse length.
- Watchdog System Reset. The MCU is reset when the Watchdog Timer period expires and the Watchdog System Reset mode is enabled.
- Brown-out Reset. The MCU is reset when the supply voltage  $V_{CC}$  is below the Brown-out Reset threshold ( $V_{BOT}$ ) and the Brown-out Detector is enabled.