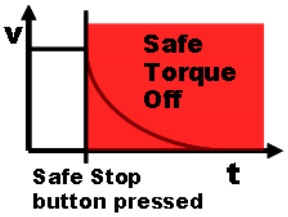
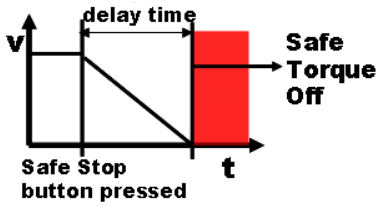
Explanations of integrated Safety functions:



Safe Torque Off (STO):

The electrical machine is powered off and the load is stopped *in an uncontrolled manner*.



Safe Stop 1 (SS1):

The electrical machine is powered off after the load is stopped *in a controlled manner*. When the motor is in standstill the motor torque is switched off.

➔ Safe Stop 1 requires the option card MR-J3-D05.

Emergency Off (EMG Off):

The amplifier input will be galvanically disconnected from the main circuit power supply and the motor stops immediately *in an uncontrolled manner*. The motor operation after the EMG button is pressed is corresponding to Safe Torque Off (STO).

➔ Emergency Off requires the option card MR-J3-D05.

Emergency Stop 1 (EMG Stop):

After the EMG switch is activated the motor decelerates *in a controlled manner*. When the motor is in standstill the amplifier is galvanically disconnected from the main circuit power supply.The motor operations correspond to Safe Stop 1 (SS1).

➔ Emergency Off requires the option card MR-J3-D05.

Benefits of drive integrated safety

- **Integrated STO function replaces external safety relay and magnetic contactor**
  This results in simplified wiring and saves space inside electrical cabinets and so installation costs are reduced.

- **Drive Integrated Safety assists machine builders to certify machines according to the Machinery Directive**
  The servo integrated STO and SS 1 functions are already TÜV certified for functional and machine safety. This significantly reduces the effort for machine builders to assure safety of the entire machine. Consequently the design time is reduced and so new machines can be offered more quickly to market.

- **Increased productivity thanks to Safety functions**
  STO and SS 1 ensure machine safety in dangerous situations for operating personnel without disconnecting the amplifier from the power supply. This results in reduced stress for DC link capacitors and increases the product's life cycle. Since the power off and restart interval of the amplifier is omitted a significantly faster restart of machines can be achieved.
  Hence downtime is reduced and consequently machine productivity can be increased.