



## Particular requirements for muting

- Muting means that the two-hand control device can be disengaged without interrupting the work cycle (e.g. at the opening stroke if no risk of injury is possible)
- Only be possible when there is no risk of injury (while crushing or shearing risks are not present)
- In the presence of a fault in the muting function it shall not be possible to start the next stroke.

## Particular requirements for pre-selectable two hand control operation

- No unexpected false start/auto restart caused by plugging or unplugging a two-hand control device?
- No unexpected false start/auto restart caused by pre-selecting two-hand control devices?
- The press shall operate only after all pre-selected two-hand control devices have been plugged in or attached?

## Particular requirements for pluggable two-hand control devices

- No emergency stop shall be incorporated at any pluggable two-hand control devices
- The two-hand control device shall be only possible to be used at the side of the operator (consider the length of the cable).
- The minimum distance must always be considered (constructive measures, for example distancing ring, etc.)

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## Two-hand control devices at presses

Two-hand control devices are systems forcing the operator to keep the hands outside the dangerous zone to avoid hand injuries during hazardous movements (or functions) of machines.

Two-hand control devices used at power-driven presses of the metal processing industry in order to protect against hand injuries caused by hazardous closing movements or other ancillary movements (for example transfer) have to comply to EN 574 „Safety of machines – two-hand control devices – functional aspects – principle for design“

The two-hand control device must be installed in this way that in case of releasing one of the operating elements the hazardous zone cannot be reached. The grabbing speed (K) is estimated with 1600 mm/s.

According to the press standards which are currently valid the safety distance is calculated as follows:  $S = (K+T) + C$

S: minimum distance (mm) to the dangerous zone to the two-hand-control device

K: 1600 mm/s

T: response time of the total system

C: an additional distance in millimetres

In case of two-hand control devices with cover C can be zero, without cover C has to correspond to  $\geq 250$  mm

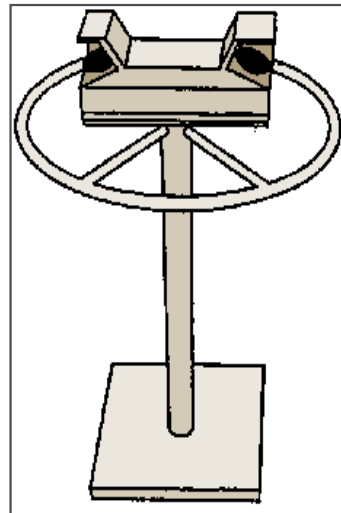
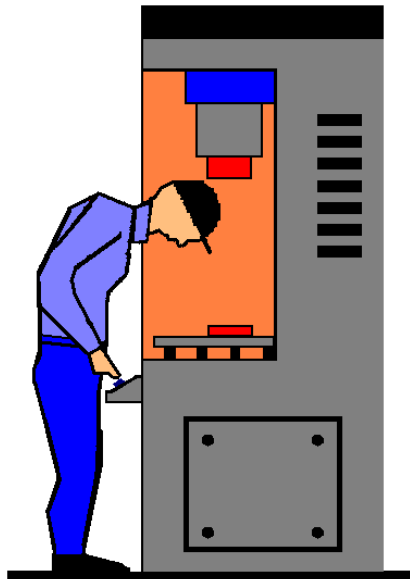
two-hand control devices with cover



The position of the two-hand control device must be selected in such a way that an acuation is not possible as long as a part of the body is inside the hazardous zone!

*Particular requirements for mobile two-hand control devices:*

- The control actuating devices must be stable in case of normal use.
- When two-hand control devices are mounted on enclosures on stands, the stands shall be provided with means for avoiding a change of the position during operation (for example heavy stand support, lockable rolls, etc).
- Measures must be taken in order to maintain and monitor the required minimum distance between the two-hand control devices and the hazardous zone (e.g. fixed mounting, distancing ring)



## List of types of two-hand control devices and minimum safety requirements

Requirments	Types				
	I	II	III		
			A	B	C
Use of both hands	x	x	x	x	x
Relationship between input signals and output signals	x	x	x	x	x
Cessation of the output signal	x	x	x	x	x
Prevention of accidental operation	x	x	x	x	x
Reinitiation of the output signal	x* )	x	x	x	x
Synchronous actuation			x	x	x

\*) If a type 1-two-hand control device has been selected it has to be identified if the characteristics of a synchronous actuation and the re-creation of the starting signal can be ignored. In this case it is of special importance that the risk assesment has been made very carefully.

## Checklist for two-hand contol devices

### General

- Follow-up movement, minimum distance at the press: indicated?
- Required minimum distance: considered?
- Is the dangerous zone visible?
- Two-hand control device: difficult to defeat (arrangement of the control elements according to EN 574)?
- Connection cable and connecting plug?
- Interruption of the stroke if a push-button is released?
- Device release monitoring (according the specified type/level)?
- Does the two-hand control device correspond to the required type according to EN 574?