



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 start caused by plugging or unplugging a two-hand control device
- No unexpected start caused by plugging or unplugging a two-hand control device
- The press shall only operate only after all preselected 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.)

ISSA-Section Machine and System Safety
 Project Group "Control Devices"
 Dynamostrasse 7-11
 D – 68165 Mannheim
info@ivss.org
www.issa.int/prevention-machines



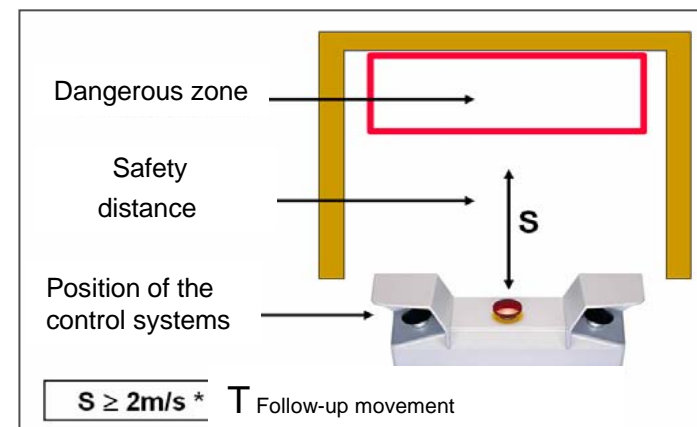
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Two-hand control device at presses

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) and shall comply to ISO 13851 „Safety of machines – two-hand control devices – functional aspects – principle for design“

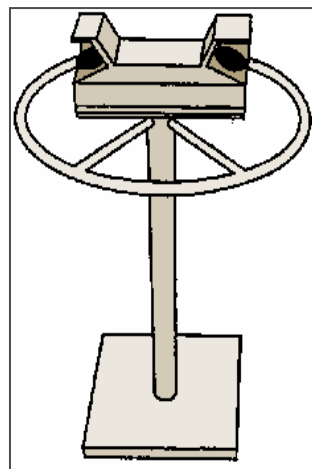
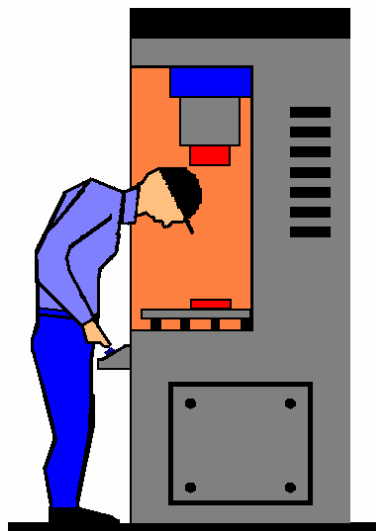
The two-hand control device must be installed in this way that in case of releasing one of the operating elements the hazardous zone cannot be reached. The approach speed (speed of accessing) is estimated with 2000 mm/s.



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

*) siehe ISO 13855

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?
- 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 ISO 13851 / product standard