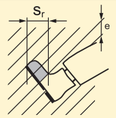
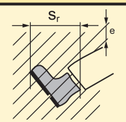
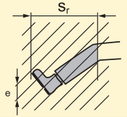
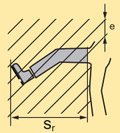
Protection against reaching through openings, dimensions for lower limbs

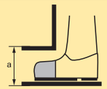
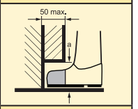
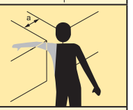
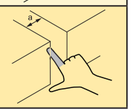
The values in the following table apply only to persons who are at least 14 years old.
Values in mm.

Annex B of EN ISO 13857 describes special instances where a safety device only restricts access by a standing person. Where the risk is one of slipping - and this can never be completely excluded in the normal industrial environment - the values that it gives are not practical. Therefore we have not quoted them.

Part of the body	Figure	Opening	Safety distance	
			Slot	Square/ circular
Tip of toe		e ≤ 5	0	0
		5 < e ≤ 15	≥ 10	0
Toe		15 < e ≤ 35	≥ 80	≥ 25
Foot		35 < e ≤ 60	≥ 180	≥ 80
		60 < e ≤ 80	≥ 650	≥ 180
Leg (as far as the knee)		80 < e ≤ 95	≥ 1100	≥ 650
Leg (as far as the crotch)		95 < e ≤ 180	≥ 1100	≥ 1100
		180 < e ≤ 240	Not allowed	≥ 1100

The coloured area shows which part of the body is restricted by the size of the opening.
If a slot is ≤ 75 mm long the safety distance can be reduced to ≥ 50 mm.
Slots > 180 mm and square or circular openings > 240 mm permit full body access. Additional protective measures must be taken.

Distances to prevent crushing, EN 349

Part of the body	Minimum distance (a)	Figure
Body	500	
Head	300	
Leg	180	
Foot	120	
Toes	50	
Arm	120	
Hand, wrist, fist	100	
Finger	25	

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Important! In June 2008 EN 294 and EN 811 were replaced by EN ISO 13857. This flyer gives the updated dimensions from EN ISO 13857 and EN 349. Any decision concerning protective measures must always be based on a risk assessment. For example where liquids can splash out only guards made from impermeable materials are suitable. All values are given without liability, the original standards and their instructions for use take precedence.

Dimensions, data and facts for compliance with safety standards on safety devices

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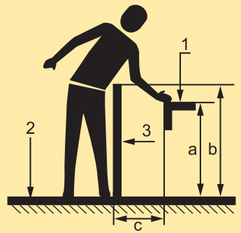
Protection against reaching over, dimensions for upper limbs



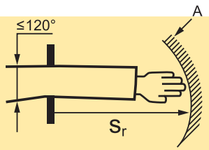
The dimensions given in EN ISO 13857 for *low* risk (Table 1) are only to be used when long-term damage or permanent injury are *not* anticipated (cf. section 4.1.2).
For this reason we only quote the values from the table for *high* risk. These should normally be used in machine construction.

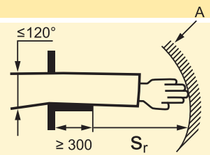
Values in mm.

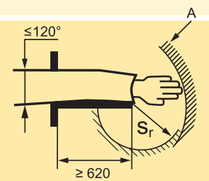
Height of hazard zone a	Height of protective structure b									
	1000	1200	1400	1600	1800	2000	2200	2400	2500	2700
	Horizontal safety distance from hazard zone c									
2700	0	0	0	0	0	0	0	0	0	0
2600	900	800	700	600	600	500	400	300	100	0
2400	1100	1000	900	800	700	600	400	300	100	0
2200	1300	1200	1000	900	800	600	400	300	0	0
2000	1400	1300	1100	900	800	600	400	0	0	0
1800	1500	1400	1100	900	800	600	0	0	0	0
1600	1500	1400	1100	900	800	500	0	0	0	0
1400	1500	1400	1100	900	800	0	0	0	0	0
1200	1500	1400	1100	900	700	0	0	0	0	0
1000	1500	1400	1000	800	0	0	0	0	0	0
800	1500	1300	900	600	0	0	0	0	0	0
600	1400	1300	800	0	0	0	0	0	0	0
400	1400	1200	400	0	0	0	0	0	0	0
200	1200	900	0	0	0	0	0	0	0	0

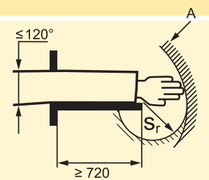
Protective structures measuring less than 1400 mm should not be used without additional safety measures.

Protection against reaching round, dimensions for upper limbs





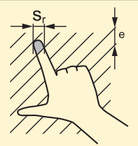
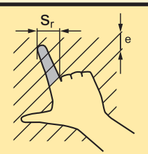
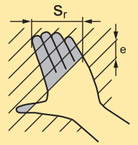
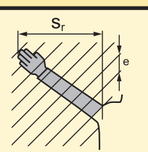




A = Range of arm movement
Sr = Radial safety distance
a = Diameter of a circular aperture or width of a square aperture or slot

Protection against reaching through openings, dimensions for upper limbs

The values in the following table apply only to persons who are at least 14 years old. Values in mm.

Part of the body	Figure	Opening	Safety distance		
			Slot	Square	Circular
Fingertip		e ≤ 4	≥ 2	≥ 2	≥ 2
		4 < e ≤ 6	≥ 10	≥ 5	≥ 5
Finger up to knuckle where finger joins hand		6 < e ≤ 8	≥ 20	≥ 15	≥ 5
		8 < e ≤ 10	≥ 80	≥ 25	≥ 20
Hand		10 < e ≤ 12	≥ 100	≥ 80	≥ 80
		12 < e ≤ 20	≥ 120	≥ 120	≥ 120
		20 < e ≤ 30	≥ 850 [1]	≥ 120	≥ 120
Arm up to shoulder		30 < e ≤ 40	≥ 850	≥ 200	≥ 120
		40 < e ≤ 120	≥ 850	≥ 850	≥ 850

The coloured area shows which part of the body is restricted by the size of the opening.
For openings > 120 mm the safety distances for reaching over must be used and additional safety measures taken.

[1] If the length of a slot is ≤ 65 mm, the thumb acts as a stop. The safety distance can then be reduced to 200 mm.

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