VISUAL INSPECTION ON PORTABLE EARTHING LANCES

Portable earthing lances are to be inspected immediately before use, (see EN 61219, C.3), as all other devices for earthing and short circuiting. The examination is to contribute to identification of unsafe or inoperable devices, and to exclude them from further use.

The examination is carried out as visual inspection, and to a limited extent as function check. In the case that damages or impairments will be found, at first the earthing lance or the earth fixed point are to be withdrawn from further use.

The following examinations are carried out on the lying earthing lance (mind a clean ground), by one person only.

Examination of the earth fixed point is mostly possible to be carried out from the ground, in exceptional cases with the aid of a ladder.

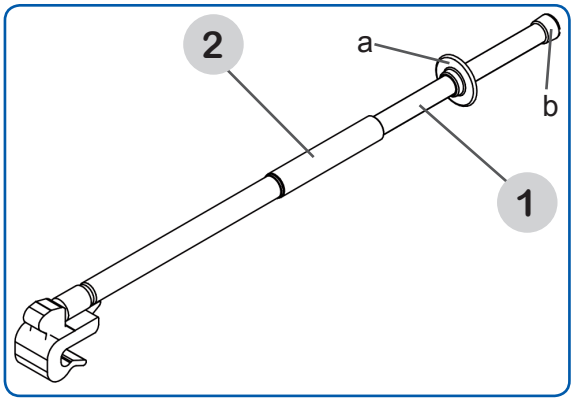
By means of the following checklist, within the scope of a visual or functional examination, one will be able to decide on site whether the respective earthing lances and earth fixed points are still safe or not. Questions are placed in a way to exclude a use when the answer is “no”, or to just allow use with reservations.

Use with reservations means that the devices may be used one more time for a short period, but immediately afterwards have to be separated for further evaluation (repair, scrapping)!

Checklist for evaluation:

General:

Test characteristic	Type of examination	Hints	Use with reservations	Use excluded
Is the earthing lance classified for the respective earthing point?	Visual inspection	Important in particular when different earthing lances are available in the substation!		X
Is the instruction for use attached or is it available on site?	Visual inspection	With lack of knowledge about correct use function and safety are jeopardised!		X
Are type lable and other markings clearly legible?	Visual inspection	Required for the clear identification of the earthing lance!	X	
Is the earthing lance complete – as far as recognisable?	Visual inspection	Missing parts may jeopardise the faultless function!		X
Is the earthing lance straight?	Visual inspection	On a bent earthing lance the internal mechanism will not operate faultlessly!		X

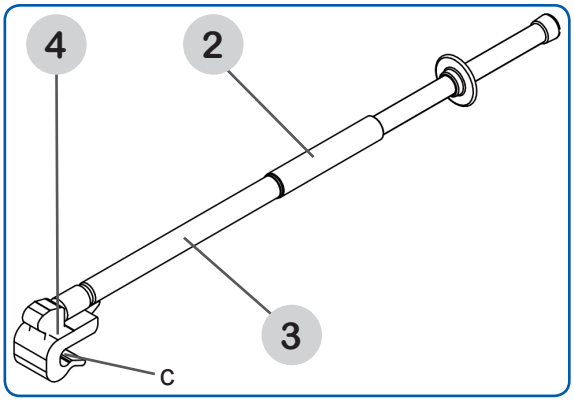


Earthing lance – insulating tube (item 1):

Test characteristic	Type of examination	Hints	Use with reservations	Use excluded
Is the varnish of the insulating tube still in good order?	Visual inspection	In case of defective varnish, water may enter and reduce the insulating properties. Furthermore, free glassfibres may cause hand injuries!	X	
Is the insulating tube free of fissures, cracks, or other distortions?	Visual inspection	Fissures, cracks, etc., reduce mechanic stability and may cause accidents when the earthing lance is handled!		X
Is the hand protection disc (a) mounted and safely fixed to the insulating tube?	Visual inspection	In case the hand protection disc is missing or movable, the end of the handle area is unclear!		X
Is the end cap (b) at the end of the insulating tube mounted?	Visual inspection	In case the end cap is missing, moisture and dirt may enter the tube and reduce the insulating properties!	X	
Is the insulating tube completely turned back counter-clockwise?	Visual inspection	When the insulating tube is not turned back completely, also the contacts are not completely opened which impedes handling of the earthing lance, or may cause damages on the contact areas!	X	
Is the insulating tube easy to turn?	Function check	A rough-running insulating tube will possibly reduce the necessary contact forces at the fixed points which jeopardises safety!		X

Earthing lance – earth contact (item 2):

Test characteristic	Type of examination	Hints	Use with reservations	Use excluded
Are the slots in the aluminium tube completely stress-relieved (parallel edges)?	Visual inspection	Expanded slots (despite completely turned back insulating tube) indicate a plastic deformation of the contact area!	X	
Are the slots in the aluminium tube free of soiling?	Visual inspection	Entering dirt, particularly sand or similar, cause a rough-running mechanism at the inside!	X	
Is the surface of the aluminium tube, particularly in the area between the red dots (contact area), metallic bright, and free of fissures, cracks, roughness, burnings?	Visual inspection	Between the red dots the contact towards the earth fixed point is made. This area needs to be free of damages, otherwise a safe electric and mechanic contact is not given!		X



Earthing lance – earth contact (item 2) - continued:

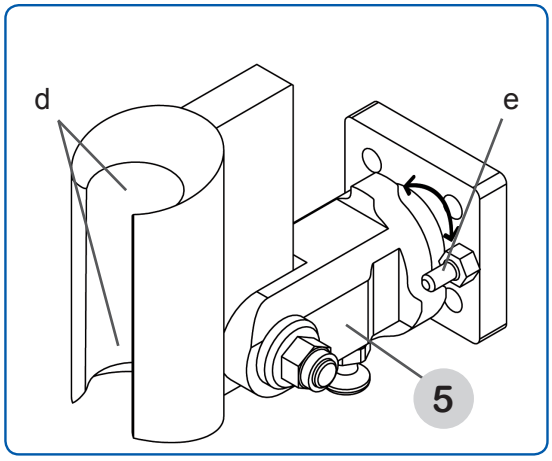
Test characteristic	Type of examination	Hints	Use with reservations	Use excluded
Are the slots widening up when the insulating tube is turned?	Function check	Beginning from a completely turned back position, the insulating tube will be turned approximately 3 to 4 times in clockwise direction. Be sure not to turn the insulating tube any further as this will damage the mechanism. In this process one can examine whether the slots are widening up by means of placing fingers (without gloves) onto the centre of the slots. In case the slots are not widening up damages on the mechanism inside the earthing lance are indicated.		X

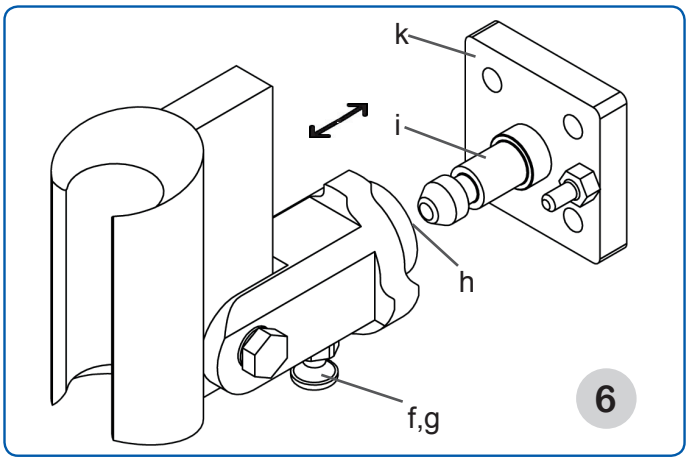
Earthing lance – transition between contacts (item 3):

Test characteristic	Type of examination	Hints	Use with reservations	Use excluded
Is the surface of the aluminium tube free of fissures, cracks, deformations, or deep scratches?	Visual inspection	Damages on the surface may jeopardise the safety of the earthing lance and damage the contact areas in the earth fixed point when sliding the earthing lance through!		X

Earthing lance – phase contact (item 4):

Test characteristic	Type of examination	Hints	Use with reservations	Use excluded
Is the surface of the contact area metallic bright, free of fissures, cracks, breakings, roughness, burnings?	Visual inspection	This area needs to be free of damages, otherwise a safe electric and mechanic contact is not given!		X
Is the centre of the clamp part (c) movable?	Function check	Beginning from a completely turned back position, the insulating tube will be turned approximately 3 to 4 times in clockwise direction. Be sure not to turn the insulating tube any further as this will damage the mechanism. Next a check is made whether the clamp part has moved (a mark with a felt pen in a suitable place facilitates evaluation). An immovable clamp part points to damages on the mechanism inside the earthing lance!		X
Is the head of the earthing lance clean and free of heavy soiling (sand, soil, etc.)?	Visual inspection	A soiled head is rough-running and is not able to build up a safe contact towards the phase fixed point!	X	





Earth fixed point (item 5):

Test characteristic	Type of examination	Hints	Use with reservations	Use excluded
Is the surface inside the earth fixed point free of fissures, cracks, roughness, burnings, as far as visible?	Visual inspection	This area needs to be free of damages, otherwise a safe electric and mechanic contact is not given!		X
Is the earth fixed point complete (particularly the stainless steel rings (d) on both ends of the earth fixed point), as far as recognisable?	Visual inspection	In case stainless steel rings (d) are missing damages may occur on the contact areas when sliding the earthing lance through!		X
Is the earth fixed point rotatable – as far as the adjustment of the rotation range limitation (e) allows?	Function check	A rough-running or blocked earth fixed point impedes handling of the earthing lance!	X	

Additional aspects for detachable earth fixed point (item 6):

Test characteristic	Type of examination	Hints	Use with reservations	Use excluded
Is the spring at the safety knob (f) clearly effective?	Function check	When the spring is too weak or ineffective, the earth fixed point may be thrown off with high speed in a short circuit!		X
Does the locking bolt (g) clearly extend into the receiving bore (h) (by approx. 3 mm)?	Visual inspection	When the protrusion of the locking bolt is too short, the earth fixed point may be thrown off with high speed in a short circuit!		X
Is the surface of the receiving bore (h) free of roughness and burnings?	Visual inspection	This area needs to be free of damages, otherwise a reliable electric contact is not given!		X
Is the surface of the contact bolt (i) – as far as recognisable – metallic bare and free of roughness, burnings, fissures or cracks?	Visual inspection	This area needs to be free of damages, otherwise a reliable electric and mechanic contact is not given!		X
Is the contact bolt (i) firmly connected to the bolt flange (k)?	Function check	In case of a loose contact bolt (i) a reliable electric and mechanic contact is not given!		X

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