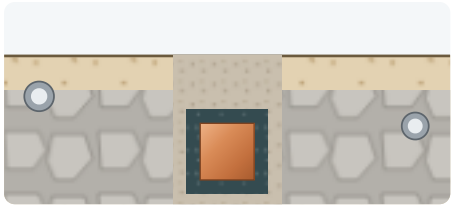
Selection guide: earth pipe or earth rod?

Which electrode for which ground: installation, moisture depth, space needed, GIM, metal weight and cost rank

KALOT EARTH ELECTRODES · HGV · GVER · ERCB · SCEP

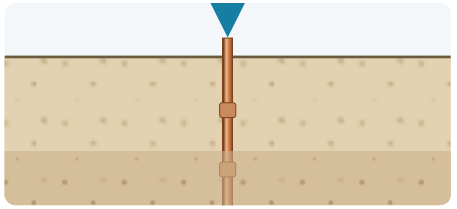
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Hard layer near the surface

or tight space

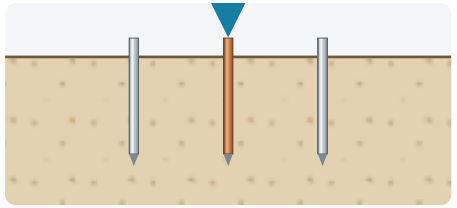
Copper plate in a GIM hole



Moisture at greater depth

and drivable soil

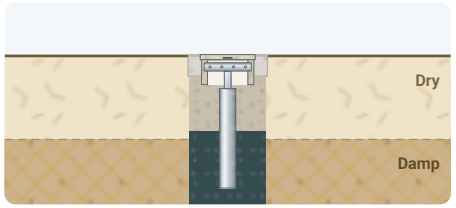
Threaded copper-bonded earth rod with coupled sections



Soft, moist soil

with enough space for several electrodes

Galvanised or copper-bonded earth rod, driven



Deep damp layer, dry topsoil

and driving to that depth is not possible

Earth pipe in a pit with GIM

Copper plate	Copper-bonded earth rod	Galvanised earth rod	Earth pipe (3 and 6 m)	Feature
Solid copper	Steel core with copper coating	Hot-dip galvanised steel	**Hot-dip galvanised or stainless steel 304L and 316**	**Material**
660 × 660 and 660 × 500; thickness 3 and 5	5/8 and 3/4 in; length 1.5 m	Diameter 16 and 20; length 1.5 and 2 m	**3 inches; lengths 3 and 6 m**	**KALOT Group sizes**
Drilled pit with GIM	Driving and coupling sections	Driving; borehole with GIM in hard ground	**40 to 60 cm pit, at least 6 m**	**Installation**
Shallow to medium	Down to the depth of the coupled sections	Shallow	**Deep**	**Suitable moisture depth**
One small pit	One point	Several earth rods, spaced apart	**One pit**	**Space needed**
37 and 24 bags	No GIM when driven	No GIM when driven	**50 cm pit: 32 to 42 bags**	**GIM ground improvement material**
8.9 to 19.5	2.0 and 2.8	2.4 to 5.0	**24.9 and 49.2 (galvanised)**	**Metal weight per electrode (kg)**
exothermic welding	Exothermic welding or clamp	Clamp	**Two-hole copper cable lug on the tab**	**Conductor connection**
44 to 96	1 and 1.3	0.4 to 0.8	**4.8 and 9.6**	**Metal value index** (1.5 m, 5/8 in copper-bonded earth rod = 1)
4 (highest) $ $ $ $	**2** $ $	**1 (lowest)** $	**3** $ $ $	**Full installation cost ranking**

Most of the cost of a pipe earth pit is drilling and GIM; the pipe itself is the smaller part. In soft moist soil with enough space, a driven earth rod costs less. **Cost**

The metal value index was calculated on 21 and 22 Mehr 1405 from official London Metal Exchange prices for zinc and copper and the day's steel price, and it changes with current me

The cost rank covers the full installation of one electrode (metal, drilling, GIM and connection). We measure the final resistance after installation.

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