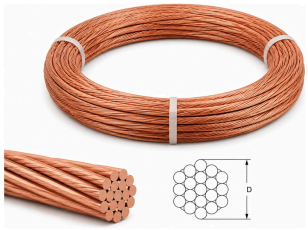
Bare copper conductor (bare copper earth wire) for earthing and lightning protection



KALOT Group bare copper conductor is an uninsulated stranded copper conductor used in earthing and lightning protection as an earth electrode, earthing conductor, down conductor and bonding conductor. We supply it in two types: soft (annealed), in sizes from 6 to 400, and hard-drawn, in sizes from 35 to 95 mm². Soft conductor bends easily in trenches, earth pits and around components, and is mostly used in earth grids and rings, earth pits and bonding; hard-drawn conductor stays straighter on long runs and between supports.

- Bare stranded copper conductor: soft 6 to 400 and hard-drawn 35 to 95 mm²
- Earth grids and rings, earth pits, down conductors and roof grids
- KALOT brass clamps, cable lugs and exothermic welding for the joints
- Supplied in coils or on drums, cut to the length you order

Technical specifications

Product type	Bare (uninsulated) stranded copper conductor for earthing, lightning protection and bonding
Material	Bare copper, uninsulated
Copper purity	99.95 to 99.99 percent
Conductor type	Soft (annealed) and hard-drawn
Size (cross-section)	Soft conductor 6 to 400 and hard-drawn conductor 35 to 95 mm²
Number of strands	Soft conductor 7, 19, 37 or 61 strands depending on size; hard-drawn conductor 7 strands (35 to 70) and 37 strands (95)
Weight per metre	From 0.05 kg (size 6) to 3.53 kg (size 400); size 50: 0.43 kg
Supply form	Coil or drum; coil and drum lengths to customer order
Order code	BSCC for soft conductor and BSCD for hard-drawn conductor
Connections	KALOT brass clamps, cable lugs and exothermic welding
Compatibility	With copper, tinned copper and brass; no galvanised parts
Main application	Earth grids and rings, earth pits, earthing conductors, down conductors and roof grids, bonding

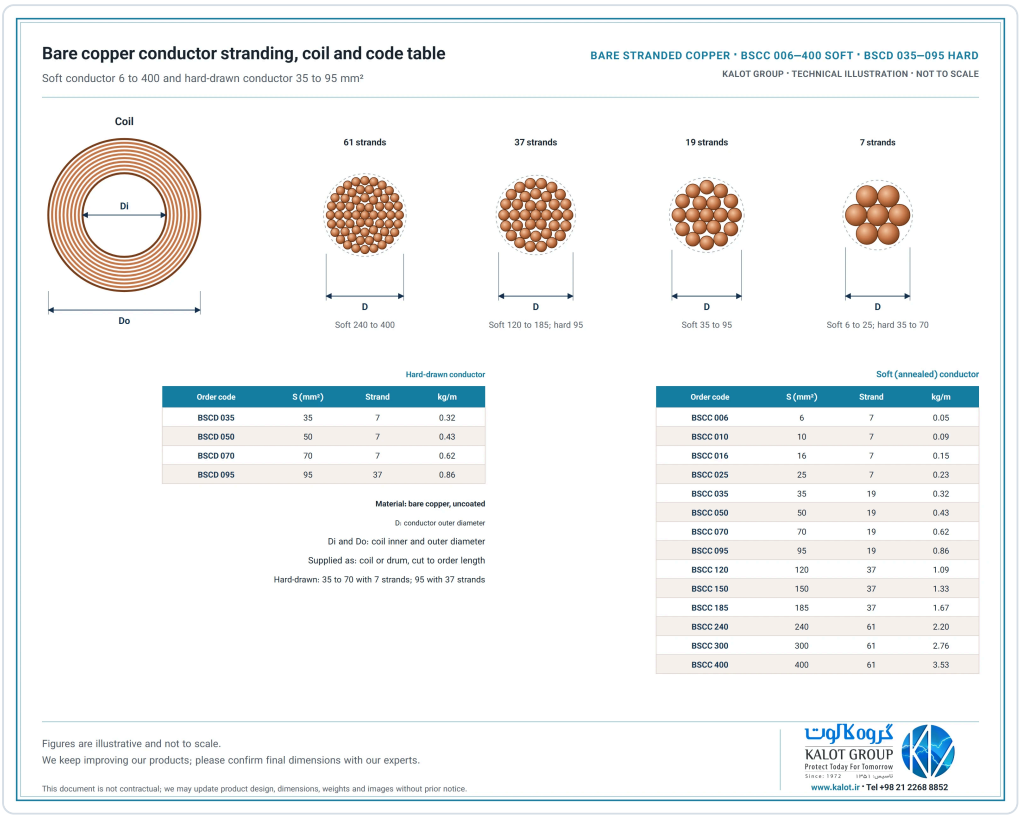
'Size' is the nominal cross-section of the conductor in mm²; for stranded copper conductors, standards define the cross-section by electrical resistance (IEC 60228). We supply bare copper conductor in coils or on drums, cut to the length ordered. Our products are continuously improved; please confirm the final specifications with our experts before purchase.

This document is not contractual; we may update product design, dimensions, weights and images without prior notice.

Structure and supply form of bare copper conductor

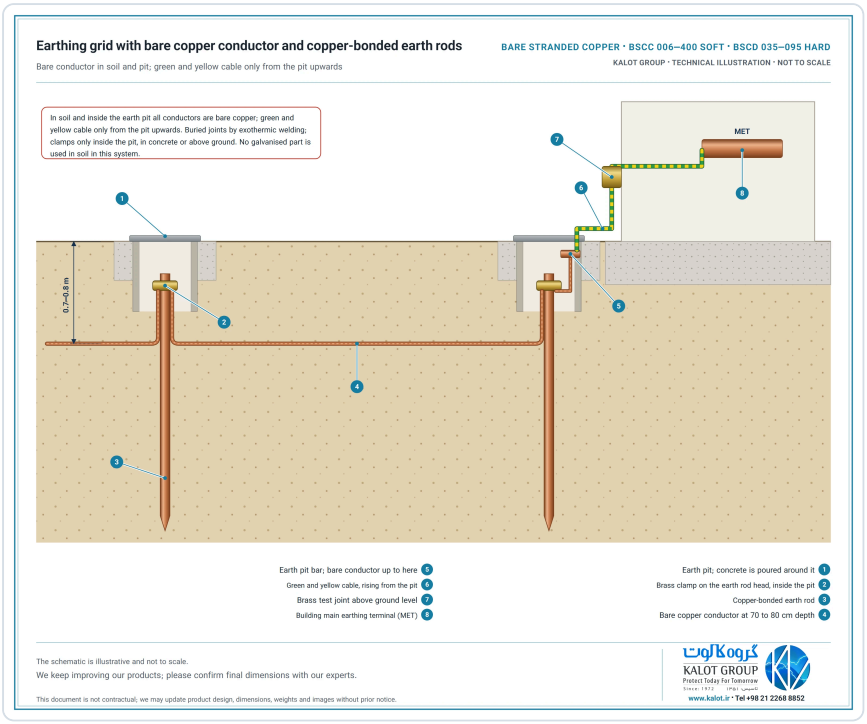
Bare copper conductor is made of copper strands laid in concentric layers around a central strand: 7, 19, 37 or 61 strands, depending on the size. Soft (annealed) conductor is heat-treated after drawing and bends easily; hard-drawn conductor is not heat-treated, has higher tensile strength and stays straighter on long runs. We supply it in coils for short lengths and on drums for long lengths, cut to the length ordered.

Stranding, coils and code table



The full print-quality version of this drawing (PDF) can be downloaded from the product page at www.kalot.ir.

Earth grid schematic



The full print-quality version of this drawing (PDF) can be downloaded from the product page at www.kalot.ir.

Applications of bare copper conductor in earthing and lightning protection

- Earth grid and earth ring: horizontal electrode around the building, 1 m from the outer walls, and earth grids for substations, power plants and factories, at a depth of 70 to 80 cm; buried joints by exothermic welding.
- Earth rod connection: connecting copper-bonded earth rods and copper earth rods to each other and to the inspection pit bar, with a brass clamp on the earth rod head, inside the inspection pit.
- Earth pit: according to Topic 13, bare copper conductor in an earth pit is preferable to a copper plate: it costs less, and the electrode and earthing conductor are one continuous piece with no joints. We lay the end of the conductor in the pit as a five-turn spiral, 50 cm in diameter, and bring the bare conductor up in one piece to the inspection pit bar; from the inspection pit up to the main earth bar, green and yellow copper earth cable is used. For earth pits, we recommend 50 mm² conductor.
- Earthing conductor: from the electrode to the main earth bar; the section laid bare in the soil must be sized as an electrode, and from the inspection pit upwards green and yellow copper earth cable is used.
- Down conductor and roof network: down conductors at the building corners and at 10 to 20 m intervals around it (depending on the protection class), and the air termination conductor network on the roof, with two-piece brass clamps, one-hole copper clips (OHCC) and brass four-way clamps; for an introduction to the components, see Lightning protection system and its components.
- Bonding: connecting bonding bars, steel frames and tanks, towers and cable trays to the earthing system, with TECD, TECS and PTEC clamps and cable lugs. Make connections to galvanised towers, structures or cable trays only in air and above ground level, use tinned cable lugs or brass clamps, cover the joint with an anti-corrosion coating, and do not run copper conductor above galvanised parts; see Bonding and equipotential bonding.
- Foundation earthing: bare copper conductor can also be used inside concrete and on the foundation reinforcement, connected directly to the reinforcing bars; see Earthing system based on foundation earthing.

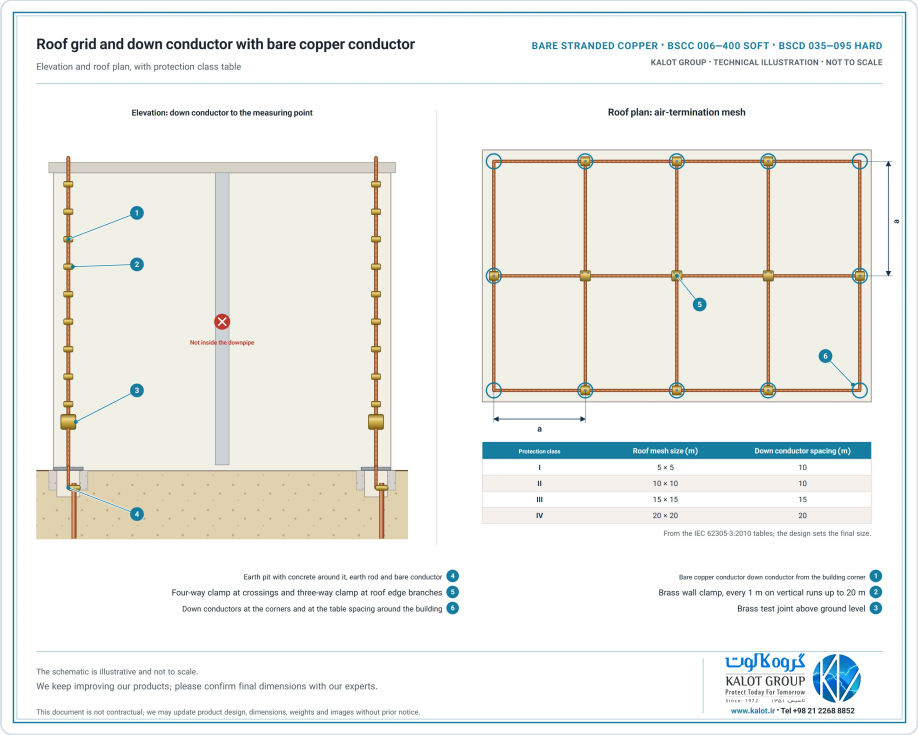






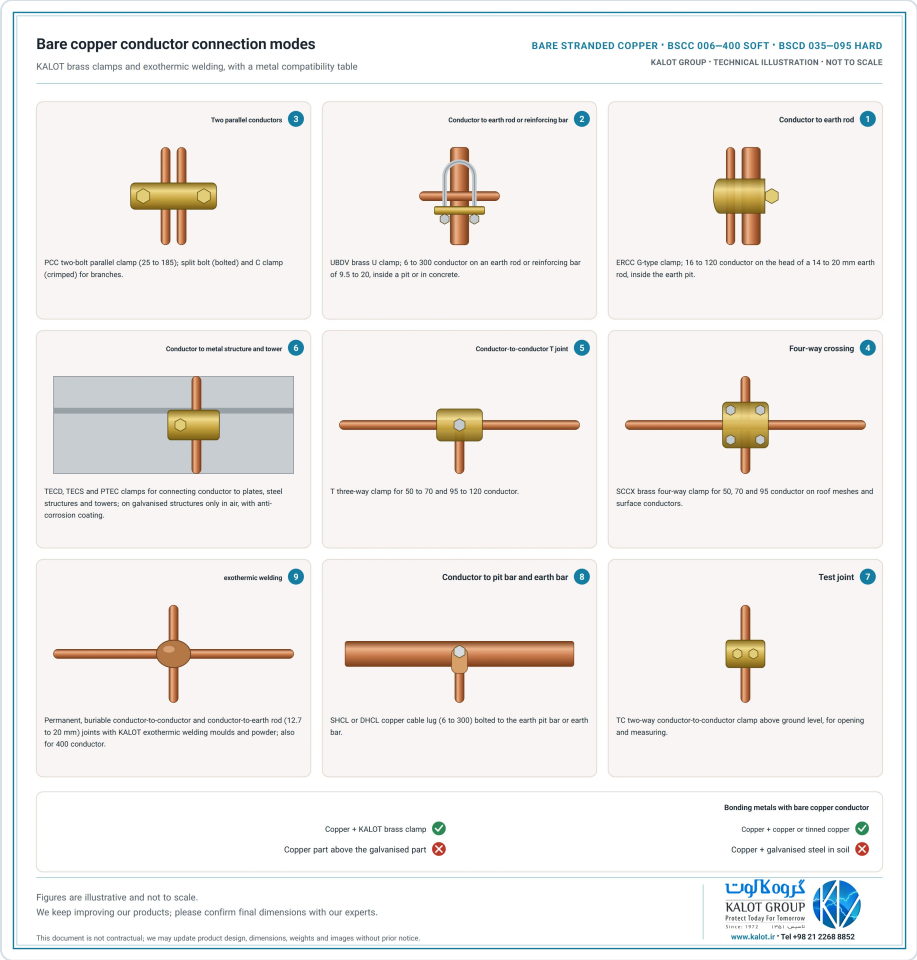
This document is not contractual; we may update product design, dimensions, weights and images without prior notice.

Roof mesh and down conductor schematic



The full print-quality version of this drawing (PDF) can be downloaded from the product page at www.kalot.ir.

Connection modes



The full print-quality version of this drawing (PDF) can be downloaded from the product page at www.kalot.ir.

Installation steps for bare copper conductor

۱. Take the grid route and the positions of the earth rods, inspection pits and main earth bar from the earthing drawing, and choose the conductor size based on its role and the fault current.

۲. Dig the trench 70 to 80 cm deep; in cold regions, lay the conductor below the frost depth. IEC 62305-3 requires the earth ring at least 0.5 m below ground, Topic 13 the horizontal electrode at a depth of 0.5 to 0.8 m, and the earthing system installation guideline at least 0.7 m.

۳. Unwind the conductor from the coil or drum without kinks or knots, and take care that the strands do not separate. In trenches we recommend soft conductor, because it bends by hand and in soil there is no need for the tensile strength of hard-drawn conductor.

۴. Drive the earth rods at each inspection pit location: copper-bonded earth rods or copper earth rods.

۵. Inside the inspection pit, fix the bare conductor to the earth rod head with a G-type clamp or a brass U clamp, and connect it to the inspection pit bar with a cable lug; pour concrete around the inspection pit. Tighten the nuts as set out in that clamp's installation instructions on its product page.

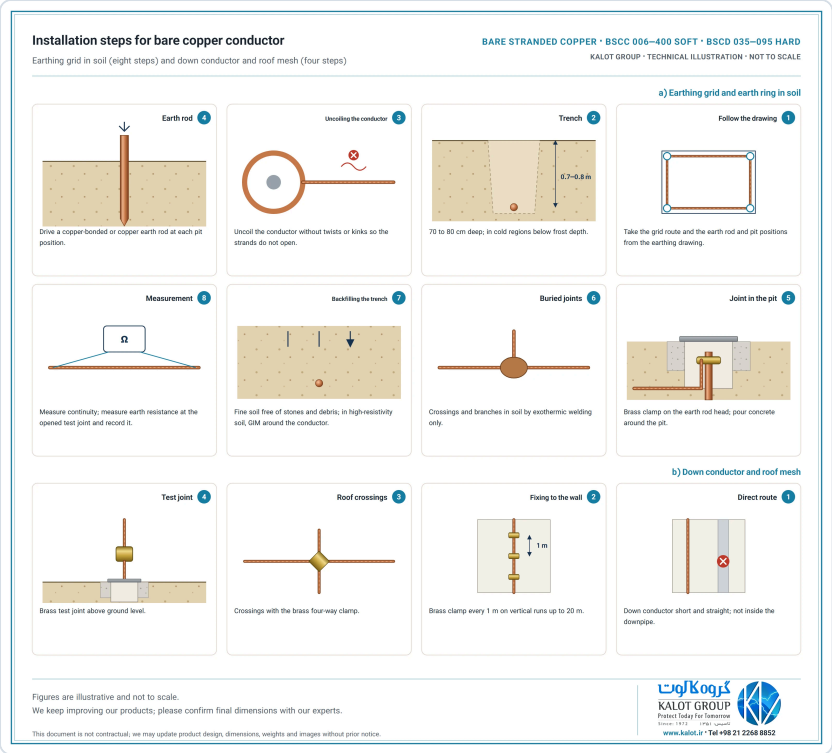
۶. Make crossings and branches that will be buried in soil by exothermic welding; do not bury clamps in soil, and use them only inside the inspection pit, inside concrete or above ground.

۷. Backfill the trench with soft, moist soil free of stones, building debris and charcoal, and compact it; in high-resistivity soil, surround the conductor with GIM ground improvement material.

۸. From the inspection pit up to the main earth bar, use green and yellow copper earth cable.

۹. Down conductor and roof network: run the down conductor straight down by the shortest route, and do not place it

Steps



The full print-quality version of this drawing (PDF) can be downloaded from the product page at www.kalot.ir.

Choosing the copper earth conductor size by its role in the design

Conductor role	Installation location	Minimum size in the standards (mm²)	Our recommendation
Earth electrode and earth ring in a lightning protection system	Soil, 70 to 80 cm deep	50, with 1.7 mm strands	BSCC 050 and above
Earth electrode, only for protection against electric shock	Soil	25	BSCC 025 or BSCC 050
Earth pit with a five-turn spiral	Earth pit	35	BSCC 050
Earthing conductor, with a lightning protection system	From the electrode to the main earth bar	16; bare part in soil 50	BSCC 050 in soil and inspection pit; green and yellow copper earth cable from the inspection pit upwards
Down conductors and roof grids	On the building	50	BSCC 050 or BSCD 050
Bonding bars to the earthing system	Inside the building	16	BSCC 016 and above
Bonding metal services inside the building	Inside the building	6	BSCC 006 and above
Substation and power plant earth grids	Soil	Based on the fault current	BSCC 070 to BSCC 400

Sizes from IEC 62561-2:2018, IEC 62305-3:2010, IEC 60364-5-54:2011, Topic 13 of the National Building Regulations and the guideline for installing earthing systems in buildings; the final size is set by the design and the fault current. For conductor and electrode materials, see Earth electrode materials.

Choosing bare copper conductor and requesting a quote

To request a quote for bare copper conductor, send our specialists the size (cross-section), type (soft or hard-drawn), length and supply form (coil or drum), application (earth grid, earth pit, down conductor, roof grid or bonding) and the clamps and accessories you need (earth rod clamps, conductor-to-conductor clamps, wall clamps, cable lugs, exothermic welding, earth inspection pits and green and yellow copper earth cable). If you also send the project's earthing drawing or lightning protection design, our specialists