

User manual

Active neutralizing electrode

JO96/1/L

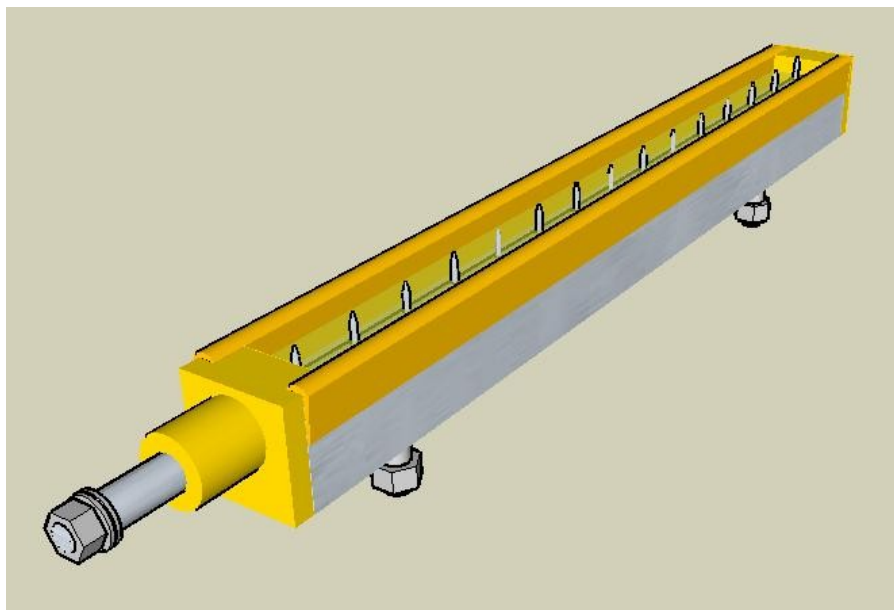


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Introduction

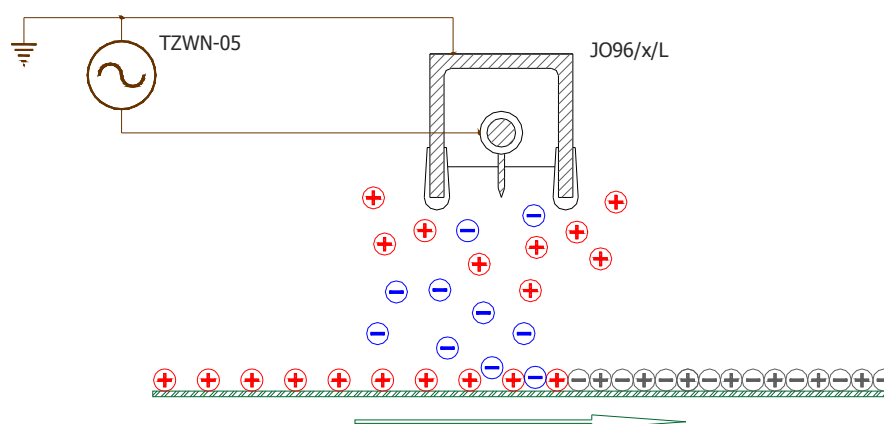
Static electricity is a phenomenon by which excessive electric charges are created on objects. That charges appear most frequently on materials of low electrical conductivity (insulators, dielectrics). In some special cases they can accumulate on conductive objects insulated from the ground (including human body).

Influence of electrostatic charges can result in numerous difficulties in technological processes, create hazards for safety of workers, danger of fire or explosions, and disturb the operation of electronic devices.

Electrode is a part of the set designed to actively neutralize excessive electrostatic charges that are created on processed materials. Complete deionizer consists of high voltage power supply (TZWN-05) and one or more pointed electrodes JO96/x/L connected to power supply with special cable. It is an active pointed neutralizer of increased hv frequency.

Principles of operation neutralizer

Electrode(s) are placed near material that is to be neutralized. Power unit function is to provide high voltage needed to create ions around the pins of electrodes. After turning power supply on, near the points of electrode a powerful electric field is created. The result of this is partial (corona) discharge. It causes intensive ionization of air molecules (disintegration to positive and negative ions). Under electrostatic forces the electrified material attracts appropriate (of opposite polarity) ions that neutralize its charge.

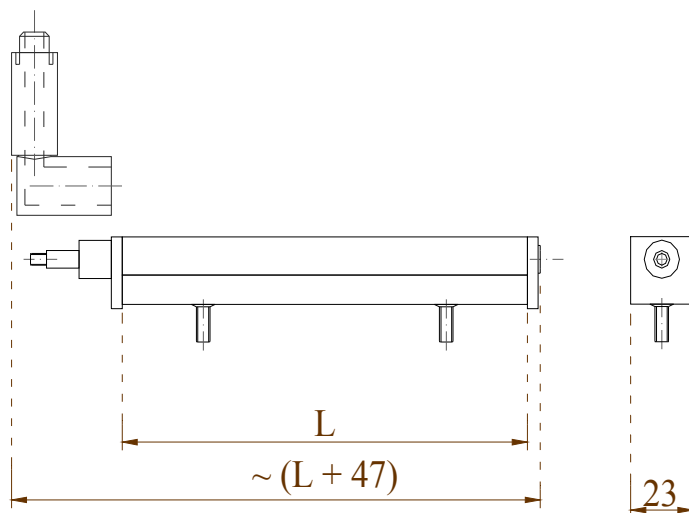


Description of electrode

Electrode JO96 / 1 / L is designed for supply voltage 7kV 1,2kHz. It is built as monoblock, nondemountable element. Duralumin 20x20x2mm C-bar constitutes the structure. Inside it there is a conductive core with embedded pins. Ends are terminated with proper plastic insulators. Interiors of electrodes are filled with insulation resin. At the bottom there are M5 threaded rods attached, which serve for mounting on the machine. Electrode is combined to power supply output by high-voltage cable. Body of electrode should be fastened to frame of machine. Device is designed for continuous operation.



Electrodes are manufactured on an individual order. Available usable length range of electrodes is 100mm – 1900mm.



Manner of marking:

pinned electrode **JO96/1/L**

JO96 - model
/1 - one connection terminal
/L - electrode's usable length [mm]

Note:

The electrode's length together with the connection is about 50 mm longer than the usable length of electrode!

If more than one electrode is in use, the total usable length of all the electrodes should also not exceed 2600mm!

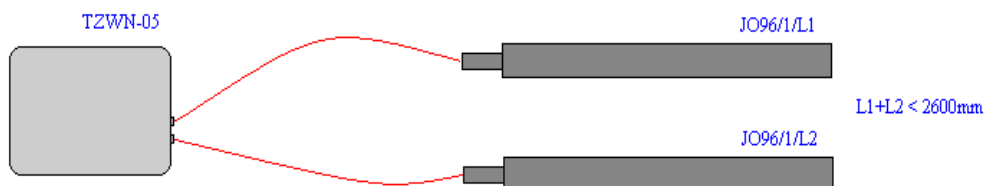
Rated data

Type	JO96/1/L
Compatible item	power unit TZWN-05
Supply voltage	7kVac, 1,2kHz
Length of a single electrode	100 - 1900mm
Maximum total usable length of electrodes	2600 mm
Recommended total usable length of electrodes	< 2000 mm
Installation distance	3 – 20 mm
Max. number of electrodes for one power supply	2
Operation mode	continuous
Ambient temperature	273-333 K
Air humidity	<80 %, non-condensing
Operating position	any
Montage	M5 threaded rods
Dimensions: width x height x length	23 x 23 x (L+50) mm
Weight	0,65 kg/m

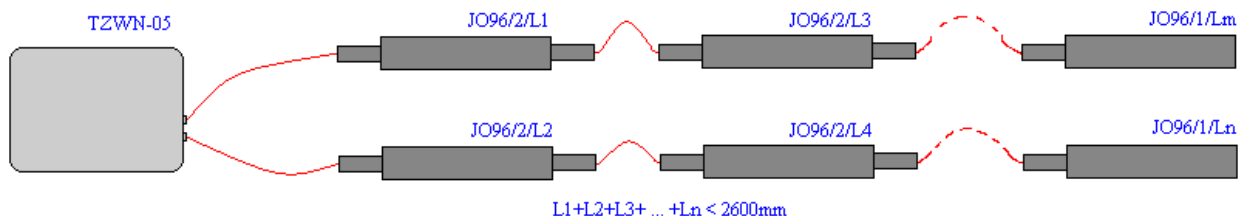


Arrangements of electrodes

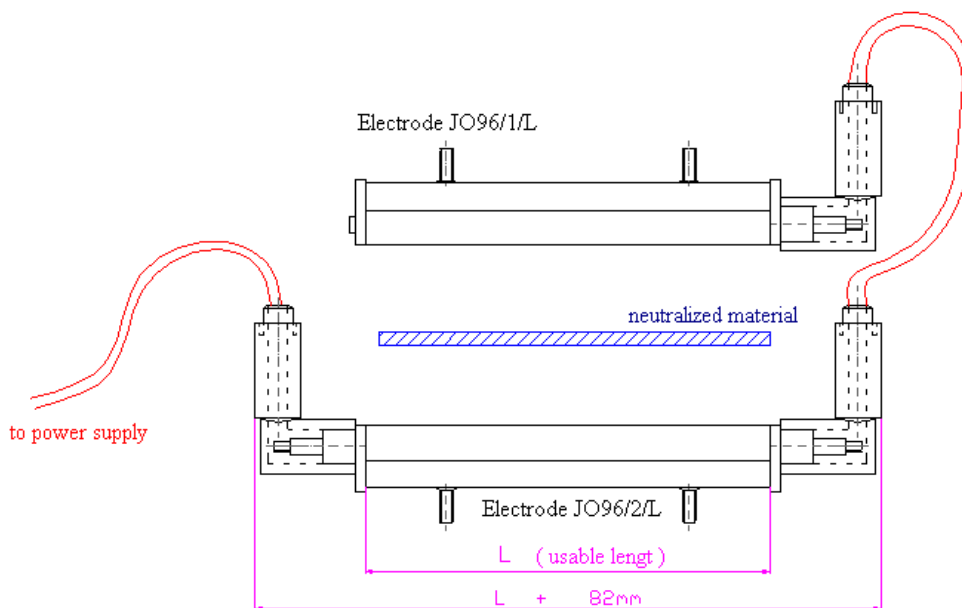
Electrode JO96/1/L is equipped with single high voltage connection terminal. That allows not more than two electrodes JO96/1/L being directly connected to the TZWN-05 power supply.



If more electrodes are necessary, transitional electrodes JO96/2/L should be applied. Electrodes JO96/2/L are equipped with high voltage connection terminals on both ends and enable cascading of the electrodes, "one after the other". Electrodes with one terminal are then applied in the final place in a sequence. The electrode's connection terminals are protected with a special covering insulators, mounted after joining the high-voltage cables.



In those cases, where two or more electrodes are required, cascading connections are recommended. High-voltage cables are shorter, which favorably affects capacitive loss of connection.



Note:

The electrode's length together with the connection is about 85 mm longer than the usable length of electrode!



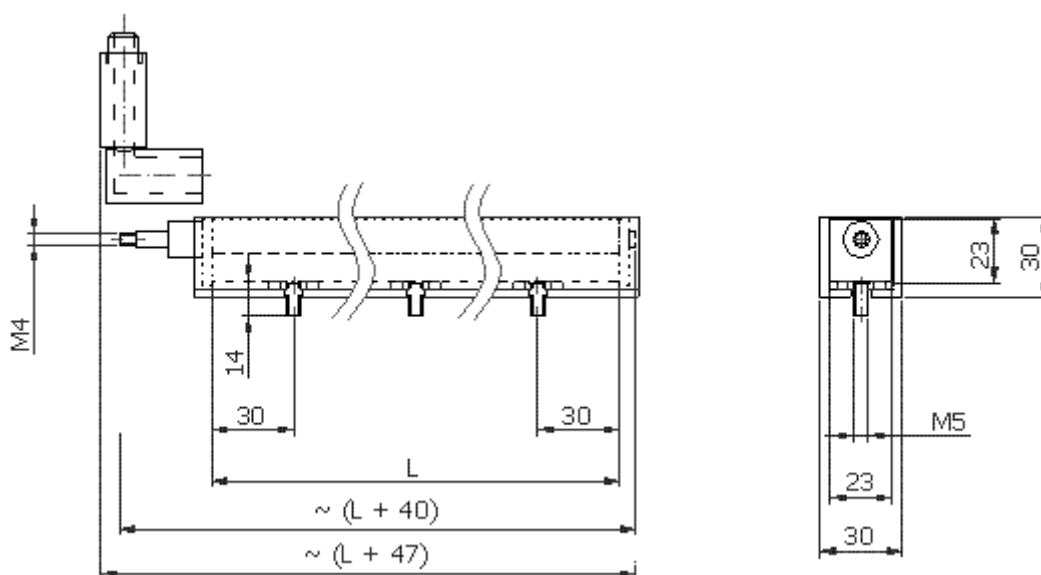
Installation

Note:

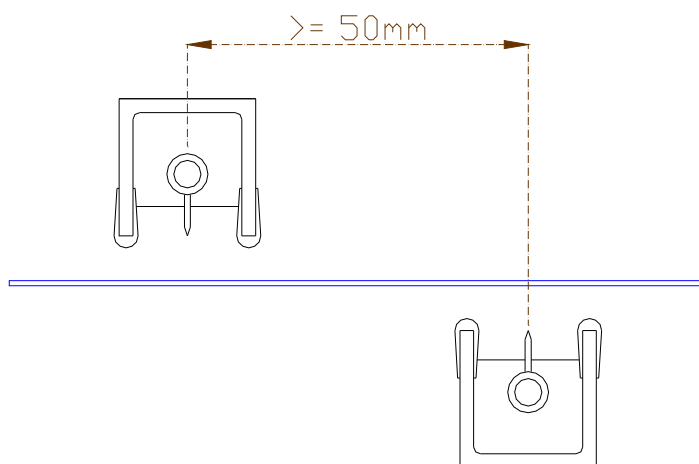
Device may not be installed in explosion hazard areas or environments with flammable substances!
Disconnect the power supply before carrying out work on the unit!
Electrical installation of device should be done by a skilled electrician with proper qualifications!

Fix electrode(s) firmly on machine, pointing its pins toward neutralized material. Electrode should be installed at a distance of 3-20mm from the moving material (usually around 5mm). Do not allow material to rub against electrode. At the bottom of electrodes there are factory-installed M5 threaded rods. Spacing between rods is $r = (L - 60)$ mm. Use brackets and screws from the assembly kit.

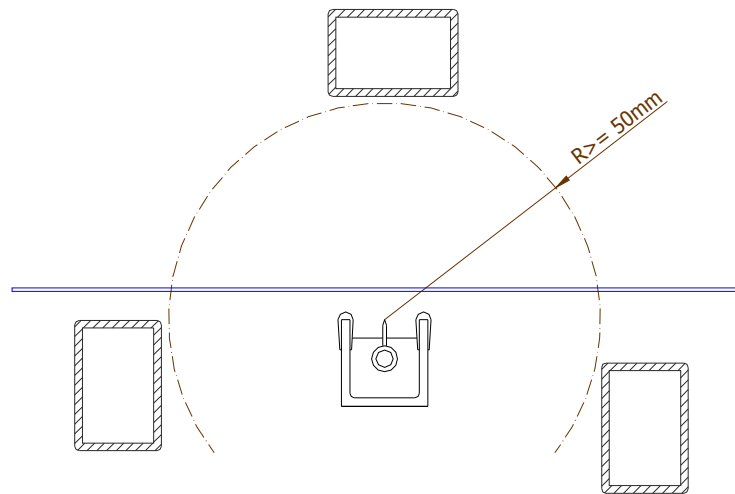
We recommend electrodes longer than 1500mm to be stiffened by embedding into alu U-profile 30x30x3 mm (as shown below). Long electrodes have a third fastening rod placed in the middle of the active length L .



In neutralization of discontinuous materials (fabric, yarn, fibre...) one electrode can be used. For continuous (foil, coated paper) the use of two electrodes, one on each side of the film (sheet) is recommended. In this case planes of symmetry of electrodes should be displaced for at least 50 mm.




To ensure maximum efficiency of operation, there should not be any metal elements at a distance of 50mm from the electrode.



Electrode of the neutralizer should be placed directly in front of the place, where the electrostatic charge is to be removed. The necessary amount of electrodes and their location must be determined experimentally.

Limited current capacity of high voltage source limits the length of usable electrode. Electrode JO96/x/L of a usable length of not more than 2600mm can be connected to one TZWN-05 power unit. If more than one electrode is in use, the total usable length of all the electrodes should also not exceed 2600mm. It is assumed here that the high-voltage connection cable is not longer than 1,5m. The longer the cable, the shorter the maxim total possible length of electrodes.

The power unit should be located as close as possible to the electrodes and positioned in such a way that its switch is easily accessible to operator. High voltage cable connecting the power supply with the electrode should be relatively short. It should not touch the machine body (we recommend placing in insulating tubes). It should be fixed to machine frame. Do not lay the hv cable near sharp metal parts. Do not bend beyond the natural bending radius. It is recommended to keep spacing and crossing with other cables at right angles.

Connect hv cable to the electrode's terminal and mount insulating sheath. Aluminium body of JO96/x/L electrode and earthing connector  of TZWN-05 power supply should be connected to the earthed machine frame, using delivered cables. Resistance of power supply-electrode's body connection should not exceed the 0,5Ω. It is necessary to ensure proper operation.

For more information about unit assembly - see: „Antistatic power unit TZWN-05 – user manual”.

Note:

Neutralizer is designed to be built into another machine. Therefore it should be powered from the internal circuits of that machine so that the voltage is supplied only when the machine runs and to keep safety functions!



Usage

Assembled unit is switched on with rocker button, located on the front panel, by putting it in position I. Presence of voltage 230V is indicated with the control lamps (built-in in the switch). By normal operation of TZWN-05 converter, a quiet buzz is audible, coming from the inside of housing. To needles of electrode is fed a high voltage. In a dark area blue fireflies of corona discharges should be visible on the tips of the needles.

Note:

Do not tamper with the electrodes during operation!

Maintenance and repair of equipment should be performed by qualified personnel with the appropriate qualifications!

Correctness of the electrode's operation can be checked by bringing a neon lamp placed on a insulating bar near to the electrode's points. The electric field around the needles should make the lamp glow.

Note:

Many factors (friction, pressure, temperature...) can cause electrostatic charge to be generated once again and accumulate on the material!

Electrode (as well as other modules) do not have elements that require special regular operational service. Keep the device clean: dry, free from dust, dirt and chemicals.

Hoover regularly whenever it is necessary (especially electrodes). Periodic inspections should be done paying attention to the mounting, condition of cables, isolation of the electrodes and needles wear. Once a year verify effectiveness of anti-shock protection.

Troubleshooting

Symptoms	Possible reasons	Proceeding
Inverter does not buzz, no neutralization (neon lamp placed near to hv cable or electrode's pins do not glow)	Contaminated electrode – power supply overload	Clean up
	Damaged insulation of electrode - power supply overload	Replace electrode
	Corrupted hv cable insulation	Replace hv cable
	Damaged inverter	Send power supply to the service
No neutralization, power pack works correctly	Broken hv cable	Check the cable, replace damaged section
	Defective grounding connection of electrodes or power supply	Check wires and contacts
	Unfavorable electrode arrangement	Verify according to instruction

Damage of insulation of cables and electrodes is often visible in dark environment. If the power supply itself is working properly, and the whole set causes choking of the inverter, then following sections of electrodes should be joined, until detecting the item that caused the overload.

