

Operation Manual

for Welding Inverter

TARA 141

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1. Description

The welding source TARA 141 (hereafter "the source") is designed for welding using covered electrodes of 1.6mm to 3.2 mm diameter. Modern principles and knowledge from the field of efficient power and control electronics have been applied for the source design. Resulting from this, the source is characterised by:

- high performance, while being a small-size and a low-weight unit
- high efficiency
- high-quality welding properties
- parameters stability, which are independent of mains voltage fluctuations
- automatic blocking in case of over-loading and of the feeding voltage disturbances

The source design is based on the principle of a frequency changer (inverter), which operates at frequencies above the zone of audibility. IGBT transistors are used for the switching elements of the inverter. Parameter stability is guaranteed by an electronic control which is comprised of source protection circuits and also of optimum welding properties circuits.

The source is mounted in a metallic cover, which is provided with a plastic handle for carrying the source and with metallic cover faces. On the cover front face, quick-acting plug connectors are mounted for connecting the welding cables, marked with "+" and "-", a potentiometer for setting the welding current magnitude, which is calibrated in amperes, and two Light Emitting Diodes, for the source function monitoring. The green LED - marked with "ON", signals that the source is switched on, while the yellow one - marked with "TEMP", signals thermal protection operation.

The source main switch and the mains feeder line are located on the back face of the cover.

The source is provided with fan-operated, forced air cooling.

2. Technical data

Input voltage	1x230V/50Hz
Input current I_1 (A) at X=100%	13,9 A
Input current I_1 (A) at X=30%	25,8 A
Welding current regulation range	3 – 140 A
Welding current regulation	Continuous
Insulation thermal class	H
Protection degree	IP 21
Power factor $\cos \phi_1$ at maximum current	0,78
Idle running voltage	98 V
Recommended protection of the line feeding	16 A, delayed-acting type
Weight	5 kg
Size (mm)	320x180x120
In compliance with the standard	ČSN EN 60 974-1
Output current at X=100%	80 A
X=60%	100 A
X=35%	140 A

Thermal protection

If the load factor is exceeded, the work environment temperature becomes too high, the source position is not suitable, etc., then the inverter function is blocked, as a result of which there is zero voltage on the source output. This condition is signalled by the signal light "TEMP" switching on, on the source front panel. Even in this state, the cooling fan is operational. Thus, do not turn the source off, leaving it connected to the mains. After cooling down the thermal protection restarts the source operation automatically, the yellow signal light extinguishes, and the welding procedure may be restarted.

WARNING!

As soon as the thermal protection starts operating, put the electrode holder onto an insulated place, to prevent a short circuit after the output voltage restart, thus preventing an injury or other material damage.

3. Connection to supply mains, welding feeder line

The source may only be connected to a service connection which meets all safety requirements.

Motor fuses or a 16A circuit breaker must be used for the service connection protection.

The connection procedure is as follows:

Switch the source main switch-over into the "0" position.

Insert the welding cables into the output quick-acting connection plugs.

Insert the source feeder plug into the mains supply connection.

Switch the source main switch into the "I" position.

After the main switch is turned on, the green signal light on the front panel will light up (the signal lamp "TEMP" will be off), the fan starts running, and the source is ready for operation. Using the setting potentiometer on the front panel, set the welding current required, to suit the particular electrode. The current magnitudes and the polarity can be found on the electrode packing box.

Warning

When positioning the setting potentiometer to its extreme minimum position, a complete blocking of the source may occur, as a result of which there is zero voltage on the source output. The source function will be restored immediately, when the potentiometer is taken off this extreme position.

For the welding line, conductors of cross section 16 mm² minimum must be applied; these must be terminated with corresponding quick-acting plug connections, with an earthing clamp, and with an electrode holder with a current rating of at least 160 A. Neither the conductors, nor the electrode holder may be damaged. The earthing clamp must be fastened to the weldment as near as possible to the place to be welded, to make sure the current may flow through an electrically sufficient cross section.

4. Conditions for trouble-free function and safety requirements

To safeguard the correct and safe function of the source, the following instructions must be followed:

- the source must not be exposed to direct atmospheric effects, which holds also for the storage. Especially, using and storing the source in rain is not permitted!
- to safeguard the cooling function, sufficient space (30 cm minimum) must be left free in front of both source faces during welding,
- penetration into the source of foreign objects, especially metallic ones, must be prevented,
- the source must not be used outside the normal environment, i.e., it must not be used in an environment including vapour action, in damp atmospheres, in fire-risk environments, in aggressive atmospheres and the like,
- the source must not be used in spaces where motion freedom is limited, and in places where dangerous inflammable objects are present,
- the welder must wear the necessary fire protective means when welding, i.e. dry leather gloves, a protective rubber apron, eye protection, such as a protective shield or a head mask with a corresponding dark glass,
- the room in which the welding is carried out must be sufficiently ventilated to exhaust the products of welding,
- when putting away the electrode holder, incidental contact with the welding periphery must be prevented (the electrode must be taken out, the holder to be put in a trouble-free and undamaged state into an insulated place). Never place the holder with the electrode near on the source cover!
- after welding, leave the source in the switched on condition for a period of at least 3 minutes, this enables the ventilator to exhaust the heat out of the source's individual blocks.

Warning

During welding there is a risk of injury from electric current, there is dangerous radiation from the electric arc, and harmful products of welding are released. The source operator must be made acquainted, therefore, with the safety requirements for the arc welding. The welding sources generally, from the viewpoint of disturbing voltages, are designed for operation in industrial zones. As long as these are used in inhabited zones, special measure for suppressing the interference must be met. It is, therefore, a duty of the user to evaluate, whether his source installation may not be a cause of electromagnetic troubles in the environment, because of interference. A special consideration deserve especially the signal and telecommunication conductors, broadcasting and television receivers and transmitters, computers, safety devices, health of persons in the nearest environment, such as those using cardiostimulators, and the like.

5. Maintenance and disposal

As a part of the maintenance, the following measures must be done at an interval of once in a year:

- a) Source cleaning

Blow out the source inner parts with dry compressed air.

Prior to removing the cover, the source must be disconnected from the mains by pulling out the connecting cord from the mains connector plug. In those cases, where the source is operated in environment with high dust concentrations, the drying must be carried out in shorter intervals.

When removing the cover, proceed as follows:

- screw out the screws of the upper cover, on the faces (6 pieces)
- bottom cover not remove

To reassemble the source, proceed in the reverse sequence.

b) Checking the electric connections and mechanical workmanship

Check all the screwed and shifted connections, screw them tight or repair them, if necessary. Check visually, whether the mechanical parts were not released or safe air distances and surface paths were not damaged slightly. Prior to further using the source, all defects must be removed.

c) Measuring the insulation resistance

Using a direct voltage of value 500 V, measure the insulation resistance. The value of the insulation resistance must meet the provisions of the standard CSN 60 974-1, Section 6.1.2. Prior to carrying out the insulation condition test, the connectors must be pressed out from the control unit, and the input suppression unit must be disconnected from the frame.

Warning

For maintenance and repairs, use original parts TARA exclusively.

In case of any problems or troubles, contact the specialised service place or the manufacturer directly.

Disposal

The source comprises no special or dangerous wastes. Resulting from this, parts thereof may be disposed of by depositing them at used material depots, metallic and plastic parts may be used for recycling processes, after the lifetime of the source elapsed.