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## Line Lasers

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### **Petr Provazník – Cross lasers 5mW, 635nm with converter AC/DC – Technical and safety form**

Lasers developed for marking cutting areas and planes in simple machines, NC systems, as well as in complex working systems.

#### **What else can they serve for?**

- used as an instrument to mark the spot of cutting for band, circular and rectilinear sawing machines,
- marking the cut of pneumatic shears and plate-cutting machines,
- marking the safe space at power presses,
- laying-out of a plane on construction works,
- plane marking at blow moulding of e.g. aircraft calottes on exhausters,
- punctuating road billboards and other firm signs,

#### **Equipment description**

The laser diode modulus includes a laser diode with optics for collimation of optical pencil to a laser beam, in the version for line forming the line optics. It includes a serve loop for laser diode infeed, a converter and a voltage rectifier. The modulus serves as a source of laser radiance in technical appliances with defined properties of the optical beam (see below).

#### **Connection of the laser modulus**

It concerns lasers without battery supplies. It is necessary to secure an electricity supply in the machine thalaser is installed on, or to feed the laser by means of a feeding adapter to the electricity socket. Connect the laser modulus to the voltage supply **6-30V AC/DC**. **By replacing the feeding voltage over the maximal value the laser will be destroyed!** It does not matter how the the conductors will be connected. The modulus cannot be destroyed by the reversal of poles, it will function in both connections.

#### **Laser modulus clamping**

The laser can be clamped to our laser holders with a magnetic support or to a holder with a spherical joint. Then you have to set up the light exposure spot. You can also bolt the holder on into a tapped hole in the machine or apparatus. If the laser should be working in conditions with high temperature (over 40°C), it is necessary to clamp the laser in a metallic holder provided with heat removal into the machine body or into another cooler, or at least to provide an air circuit with a ventilator. The laser optics itself has already been set up and cannot be reset without an intentional and forced damage (which means that the guarantee is no longer valid). Never let the laser shine in the eyes of people or animals, not even for a short time, or do not let it be reflected in the eyes when being used or switched on accidentally. The health risks are quoted below.

#### **Instructions when used for the first time:**

- **Read thoroughly the safety instructions!**
- Check the correct source voltage before switching it on. Wrong setting can destroy the modulus.
- Check if the laser could not shine to somebody's eyes.
- Check after 10 minutes working the running temperature. It should be appr. the same as in the room. The modulus with a converter warms only insignificantly. Overheating (over 44°C) is shown as beam-weakening. If this happens, switch the laser off immediately and improve the cooling of the laser body. Mind this particularly in summer, the modulus should not be switched on when warmed up by sun. Then the laser would be irreversibly damaged, and for this there is no guarantee



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## Security warnings

**Caution! The modulus contains a laser source Class 3R. Avoid hitting the eyes by a direct or reflected beam. Never look directly into the switched-on laser optics! Never observe the laser with binoculars! Danger of permanent eye damage! Prevent the access to children! For working with lasers, only persons over 18 are are qualified, after being instructed about the risks of this work.**

### What is a laser of the Class 3R?

This group includes lasers emitting radiance in the continual regime and in the visible part of the spectrum 400-700nm, the capacity of which does not surpass 5mW. They cannot cause eye damage by an accidental glance, the eye is protected by a natural blinking reflex of a healthy person, not influenced e.g. by drugs. A period of less than 0.25 sec. is presumed between the hitting of the eye by a laser beam and the closing of the eye-lid, or by turning away the head. This is enough for not letting the light energy surpass 0.25 milijoul to the eye retina, which is, in this case, exactly the permissible rate for exposing the eye to the direct glance into a laser beam. There is a danger during a deliberate and long-time glance into the beam, or if the beam is regarded through an optical set. It is not permissible e.g. to watch the beam through a binocular. These lasers can then cause permanent eye damage.

**Requirements for securing safety for working with a laser** are set by the Ordinance nr.124 and 125, given by the Czech Office for Work Safety, Coll. 1982, part 25, p.497, and Directive nr. 61 about the hygienic rules for working with a laser, given by the Ministry of Health Service of the Czech Republic, vol. 53/1982. Both the Ordinance and the Directive refer to lasers, whose wave length lies between 200 nm and 13000 nm. The obligations of the laser constructors, manufacturers and entrepreneurs are regulated by this Ordinance. Our lasers correspond with all of them.

### Guarantee

A guarantee during 24 months following the delivery date is given to these laser moduli. Because of this, please do not remove the modulus labels. The guarantee is given for all defects, except of those caused by manipulation mistakes, by not respecting the instructions for the installation and operation, or caused through another than usual operation of the mechanism. The guarantee expires through an interference into the modulus construction or content. This is forbidden because of safety. The guarantee and after-guarantee service is provided by our firm *Petr Provazník – čárové lasery*.



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### Technical Specifications

- **Minimal working distance 0.1 m, maximal about 2 m according to light conditions, except customer focusing**
- **Take-off angle about 45°-55°**
- **Weight of line 1-2 mm/1 m (except customer's focusing for demanded distance)**
- **Optical/mechanic deviation max. 6.25 mrad from laser body axis**
- **Laser with 3R security class – marking according to IEC 60825**
- **Laser output 5mW with wave length 635 nm**
- **Power takeoff max. 45mA according to feeding voltage**
- **Protection against polarity inversion**
- **Containing a rectifier and a voltage transformer**
- **Infeed max. 6mA to 30mA according to infeed voltage**
- **Coverage IP 65**
- **Circuitry separated in a galvanic way from framework by an electro insulating protection up to 400V**
- **No releasable parts**
- **Temperature limits 45°C , -15° C**
- **Max. temperature extent of the laser modulus -12°C to 45°C, working off this range can cause damage**
- **The temperature when working can be about 2°C higher than the actual room temperature**
- **Dimension 16 mm x 90 mm, weight 20 g (without cable)**
- **Laser casing : duralumin (black eloxal coating)**

*The proposed safety and technical form is a result of our professional knowledge and practical experience. This information is coming out of our present know-how. It is presented in good trust and as an informative character. It is to be seen as a general guideline for solving factual situations and requirements for individual installations.*