3. Laser system description

3.1 Intended purpose

The PowerLine L 400 is an electronically controlled component that can be integrated into an existing laser system.
The PowerLine L 400 is a technical tool that is only intended for professional use in material processing, like e.g. precision welding, precision cutting, micro stucturing and micro drilling.

3.2 Incorrect use

Danger!

The operator shall assume all liability for use of the laser system for anything other than its intended purpose.

The PowerLine L 400 may not be used for any purpose other than those described under "Intended purpose"!

The laser beam must not be directed to any creatures!

3.3 System description

3.3.1 General

The PowerLine L 400 was specifically designed for the fields of science, research and development, and for industrial applications. When properly installed and with correct coolant provided, the PowerLine L 400 will give long, trouble free service.

The standard output configuration for all models is the pulsed, multi-transverse mode, at a wavelength of 1064 nm.

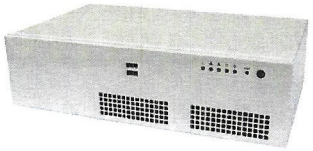
3.3.2 System Configuration

Laser PowerLine L 400 consists of:

Upcollimation Unit and Deflection head (Galvo head) and focusing lens

Laser rail

2U Industrial PC



Supply Unit

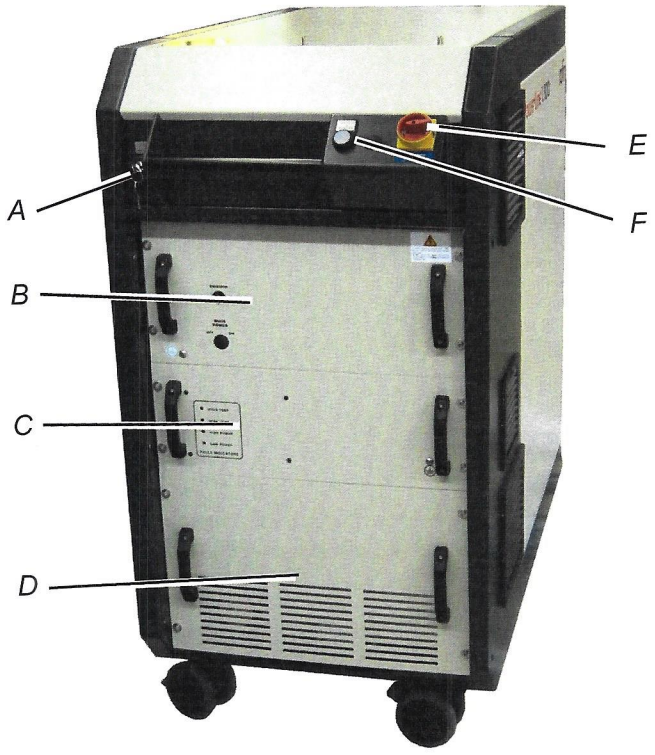
3.3.3 Supply Unit

The Supply Unit consists of a rugged steel frame, which contains the main controller, diode power supply, power distribution and cooling system. Snap-on side and top panels can be easily removed for access to components in the power station.

Front view

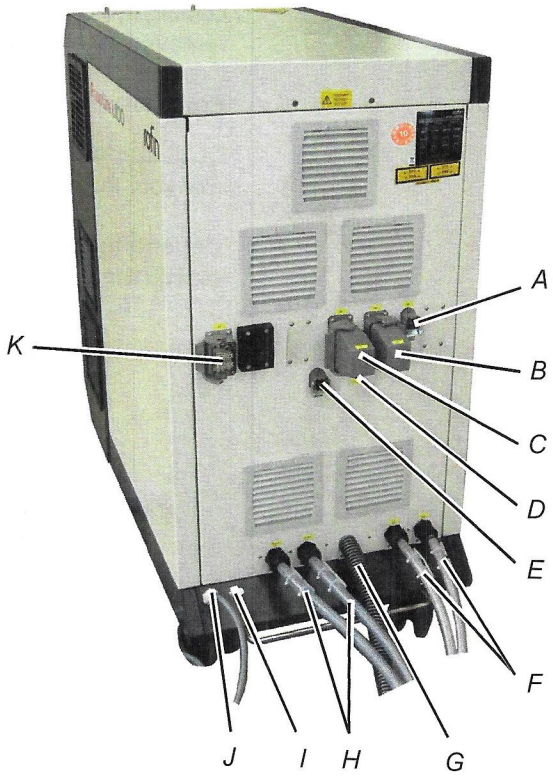
For your information

Depending on the system used certain components may not match the figures and descriptions in this operating manual.



A Key switch (LASER Enable/Disble)
B Laser Power Supply
C RF Power control for the laser system
D Cooling unit (HEX)
E Main switch
F System running indicator

Rear View

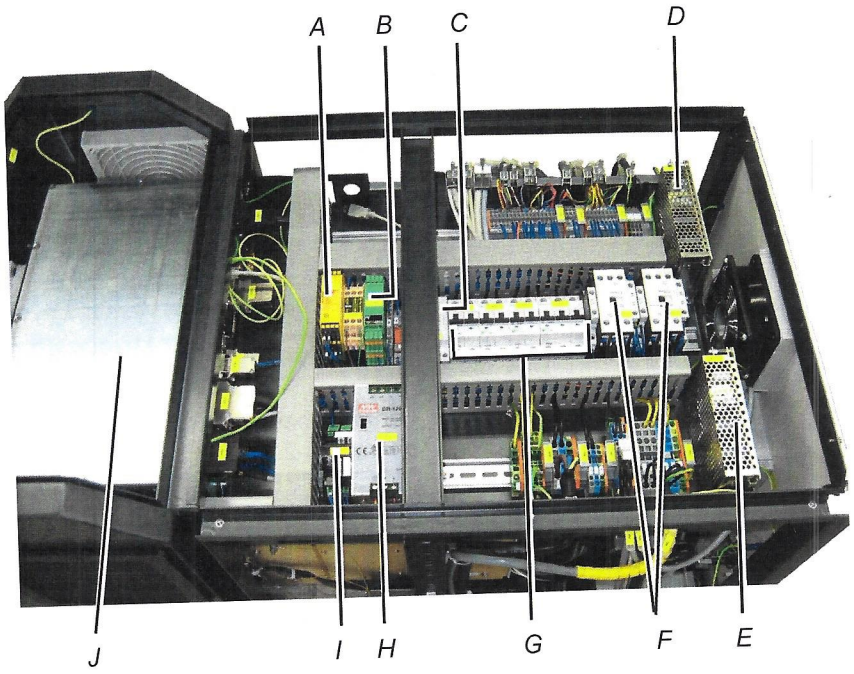


A Ethernet (Laser)
B Customer interface (Software)
C Customer interface (Hardware)
D Fuse
E Ethernet (RCU)
F DI-water supply from / to laser head
G Laser umbilical
H External water out / in
I Earthing
J Main connection
K Galvo Connector

E-Board - Top view

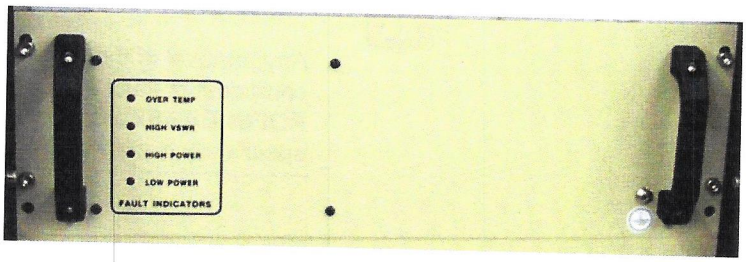
Warning!

Any removal of the laser system cover and works on electrical components must only be carried by service technicians from **ROFIN-BAASEL Lasertech GmbH & Co. KG** or on this laser type specifically trained personal, only.



A Emergency stop relay
B PIF Level converter
C Operating hours counter
D Galvo power supply (Galvo head)
E Galvo power supply (Galvo head)
F Main contactor (x2)
G Fuses
H 24V-Power suply unit
I 24V Fuses
*J RCU (**R**ofin **C**ontrol **U**nit)*

Power control for the laser syste



The LED´s on the front panel of the unit indicate the operational and error status of the PowerLine L 400.

When the LED colour is

- red = an error is being reported or a function is disabled.
- green = a function has been enabled.
- amber = laser is active.

For your information

For fault messages, see 8.1.1 RF Power control - fault messages on page 8-2.

3.3.4 Laser Optical Rail Assembly

Warning!

Even when the Power-Safety-Shutter is closed there is hazardous laser radiation available inside the laser rail cover. Any removal of the laser rail cover and works inside the laser rail must only be carried by service technicians from **ROFIN-BAASEL Lasertech GmbH & Co. KG** or on this laser type specifically trained personal, only.

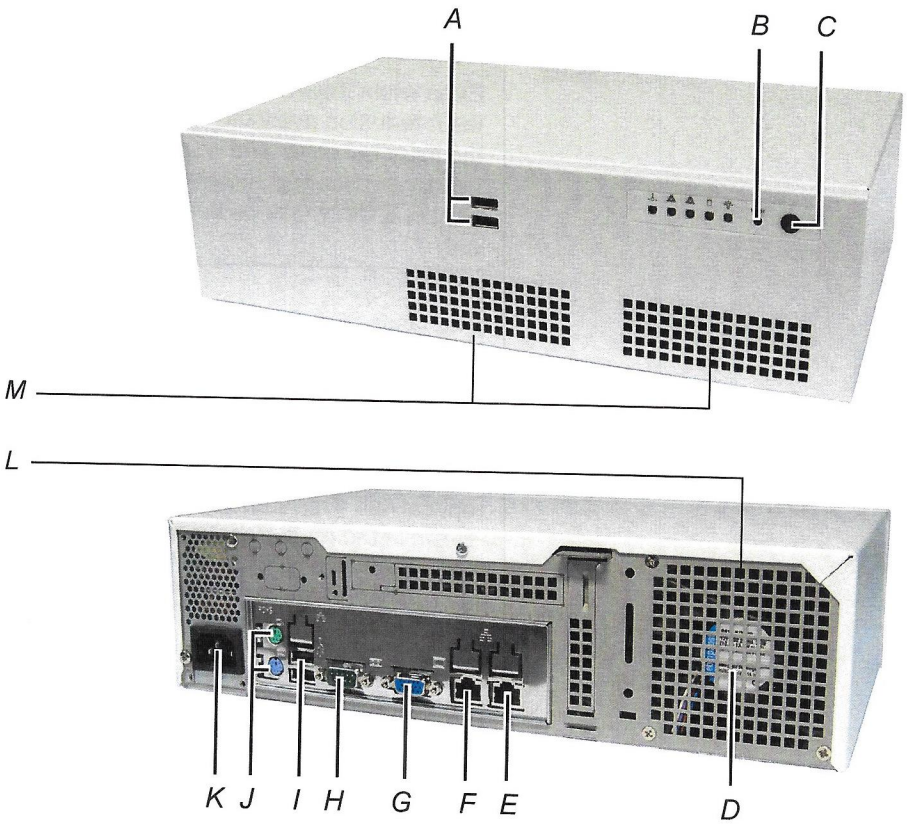
The laser optical rail assembly is mounted on a structurally rigid honeycomb optical table to assure precise beam alignment. Standard components of the rail assembly for all PowerLine L 400 product line are a laser head assembly, two adjustable mirror mounts, safety shutter assembly, two (2) Q-switches, two (2) water cooled apertures and SHG Assembly all securely attached to the optical rail. This standard configuration produces a coherent laser beam in the multi-transverse mode.

For your information

The SHG crystal temperature is maintained by the SHG TEC Controller located inside of the power supply. It may take up to 10 minutes until the LBO crystal has stabilized on the preset temperature.

This waiting time must be followed!

3.3.5 2U 19“ industrial PC (Option)

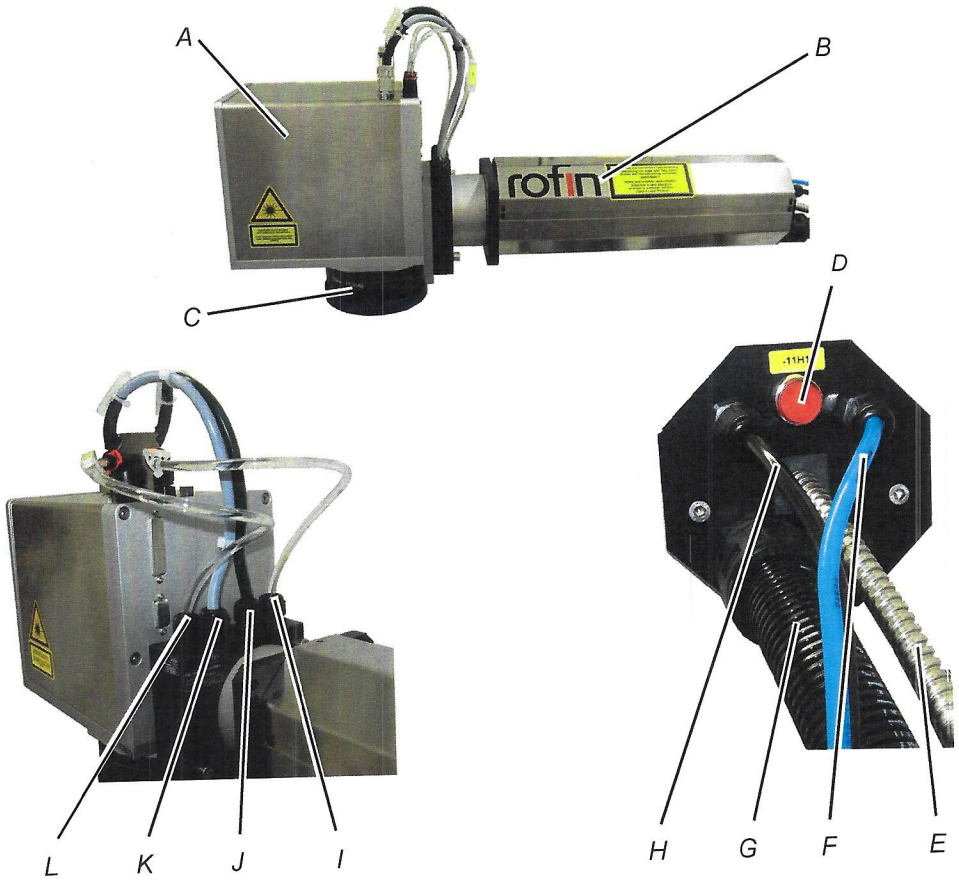


A USB connections
B Reset
C Main switch (I / O)
D Ventilator
E Network connections (Ethernet) laser system
F Network connections (Ethernet) RCU
G Monitor
H not available
I USB connections
J Mouse / Keyboard
K Network connection
L Air outlet
M Air intake

3.3.6 Deflection Head (Galvo Head) / Upcollimation Unit

To position the laser beam a deflection head (sealed housing) is inserted, which contains scanners, mirrors and electronics.

To focus the laser beam a lens is used on the beam exit of the deflection head.



A Deflection head
B Upcollimation unit
C Objectiv
D Shutter warning lamp
E Fiber
F Cooling intake, fiber
G Cable set
H Cooling return, fiber
I Cooling intake, lens
J Power supply
K Data line
L Cooling return, lens