



## Lasermatic® & Lasermatic® Z

# Cutting Heads CM2" & CM2" Z



with Contactless Distance Control  
for CO<sub>2</sub> - Laser Beam Cutting Machines

- modular system
- specially for flat bed machines
- cutting of thin and thick sheets
- quick change lens cartridges
- preadjustable focussing optics
- water cooled connector head and direct air cooled lens and nozzle body
- fault signals in case of collision, cable breakage and exceeding the measuring range

The cutting heads CM2" and CM2" Z are particularly suited for the separation with CO<sub>2</sub>-lasers. Due to the exchangeability of lens cartridges focusing optics with focal lengths of 5", 7.5" and 10" can be mounted which enables materials of different gauges to be cut.

An exchange of the lenses is easy and can therefore be realized with short refitting times. One reason for this is that the centering of the focusing optics is directly integrated in the cartridge-style lens holder. The centering can be effected via two hexagon screws on the cartridge which are accessible from outside. When inserting the cartridges an accurate positioning is possible by means of two dowel pins. Therefore a readjustment is not required. By means of a set-collar, the focal position is adjusted by axially shifting the sensor insert.

Like all other cutting heads from Precitec these two heads contain also capacitive distance sensors for a steady detection of the distance between nozzle and

work piece. The sensor signal is evaluated by the Lasermatic® electronics and used for the control of a drive.

The position of the Tool Center Point (outlet orifice of the nozzle electrode) is not changed by a lens exchange. The connections for cutting gas, upper lens cooling and water cooling are all located on the top side of the cutting head.

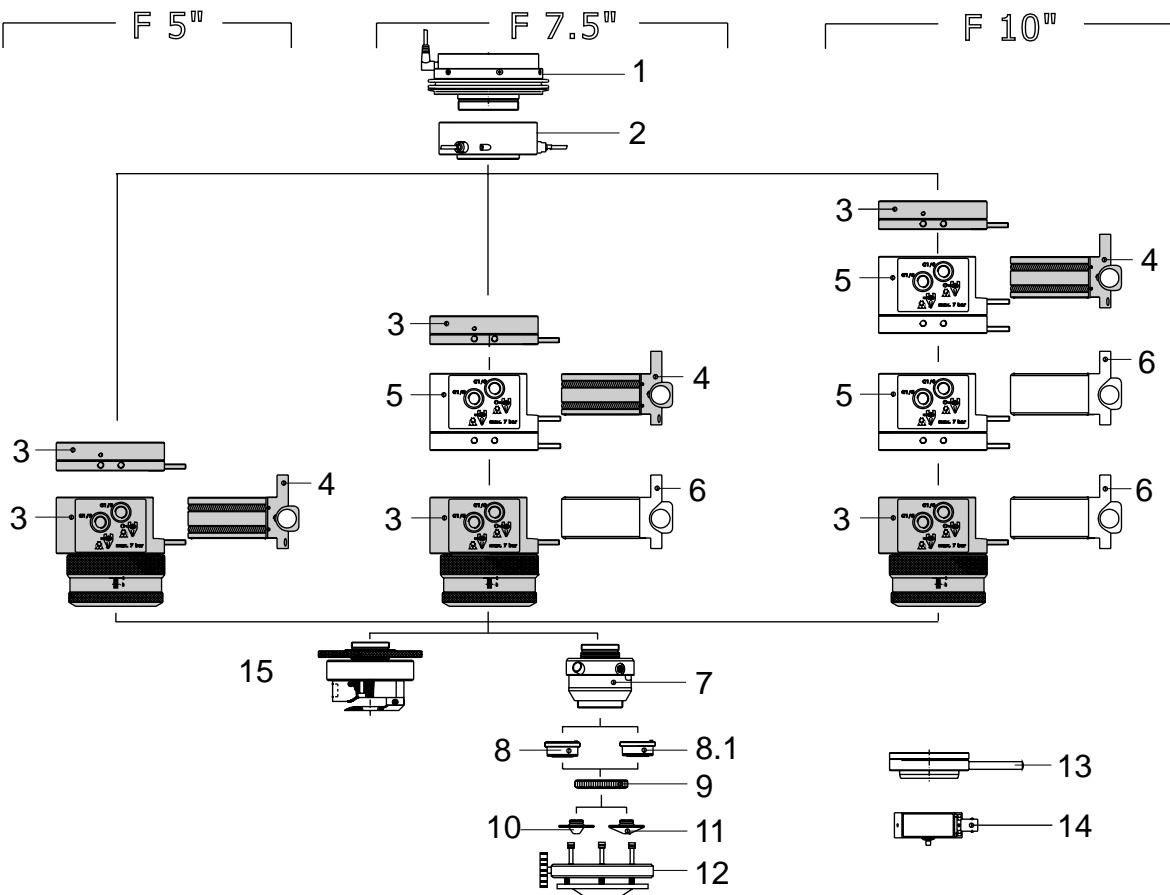
For the configuration of a distance control circuit, the use of the following Lasermatic® system components is recommended:

- adjust boxes
- motor controller
- linear drives.

We will be pleased to send you further information on request.



**System Survey** **Cutting Heads CM2" and CM2" Z**



- |     |                                     |    |   |
|-----|-------------------------------------|----|---|
| 1   | collision protection ZM B2" KLS MAG | 10 | nozzle DE B2" 1.0                       |
| 2   | piercing sensor PS 130 (on request) | 11 | nozzle DE B2" 1.2                       |
| 3   | connector head AK CM2"              |    | nozzle DE B2" 1.5                       |
| 4   | cartridge ZM CM2" WK                |    | nozzle DE B2" 2.0                       |
| 5   | extension module ZM CM2" VA         |    | nozzle DE B2" 2.5                       |
| 6   | blank cartridge ZM CM2" LK          |    | nozzle DE B2" 1.0 CON                   |
| 7   | sensor insert SE CM2" / SE CM2" Z   |    | nozzle DE B2" 1.5 CON                   |
| 8   | isolation part IT B2"               |    | nozzle DE B2" 2.0 CON                   |
| 8.1 | ceramic part KT B2"                 |    | nozzle DE B2" 2.5 CON                   |
| 9   | union nut MU B2"                    | 12 | additional tactile electrode ZM B2" TAK |
|     |                                     | 13 | graticule WH 1230                       |
|     |                                     | 14 | preamplifier VV B2"                     |
|     |                                     | 15 | Cross Jet                               |

**Application**

The cutting heads CM2" and CM2" Z are used for distance controlled cutting with CO<sub>2</sub>-lasers in flatbed machines.

**Focusing Optics**

Both cutting heads CM2" and CM2" Z have been designed for focusing optics with 5", 7.5" and 10" focal lengths and a diameter of 2". Modification possibilities for a diameter of 1.5" can be requested. For the focal

length 7.5" and 10" one or two 2.5" modules can be added. The maximum clear aperture is 45.5 mm. The focusing optics are in a pressure-resistant exchangeable cassette. It can be removed laterally from the connector head after having loosened the two quick-release nuts.

The adjusting screws for the focusing optics are integrated into the exchangeable cartridge. The centering is made by means of a tool on the front side of the ex-



changeable cartridge. The adjusting range is +/- 1 mm. A large rotary ring enables the one-handed adjustment of the focus position.

The focusing lens can be removed from the top of the exchangeable cartridge. For this purpose only the face nut which clamps the lens into the lens holder must be removed. When mounting it, the exchangeable cartridge is exactly positioned, so a readjustment can be omitted. This applies also for a cartridge exchange for different focal lengths. Thus a changing of the focal length is possible within a very short time.

### Cooling of the Optics

On the lower side, the lens is cooled by the cutting gas which is guided along the lens surface. On the upper side, the lens can be cooled additionally by a cooling gas that is fed from the outside and exhausted through the beam guiding tube. In addition, the connector head is also equipped with the ability of being cooled by water. The dimensions of all connections are G1/8 and they are positioned on the top of the cutting head.

### Distance Sensor

The cutting heads are equipped with an integrated capacitive height sensor. For the interconnection of the Cutting Head CM 2" to the Lasermatic® system electronics, a preamplifier is additionally necessary between the cutting head and the connecting cable. This preamplifier is mounted on top of the cutting head. Compared to the CM2" the Cutting Head CM2" Z is connected to the Lasermatic® Z system electronics by a MCX or BNC cable.

The sensor insert is screwed together with the connector head. A ceramic insulating part is mounted from the bottom onto the sensor insert. It is locked by a snap-in device and retained by a union nut. The nozzle electrode is screwed into the ceramic part and can easily be exchanged in case of wear. Precitec nozzle electrodes and ceramic parts etc. have been worked out highly precise. A minimum concentricity tolerance reduces or prevents adjusting works in case of exchanges. The available diameters of the cylindrical nozzle are listed in the ordering information.

### Cutting Gas

The Cutting Heads CM2" and CM2" Z have a pressure retaining strength of 25 bar and one cutting gas con-

nection. All connections (G1/8) are at the upper part of the cutting head.

### Cooling of the Cutting Nozzle

If required, e.g. when cutting highly-reflective materials, gas nozzles in the union nut enable an additional cooling of the nozzle electrode. For the improvement of the cooling effect by the cooling gas, the nozzle electrode is equipped with a large-surface rim. The cooling gas circuits for the lens and the cutting nozzle are separated. Thus, there is also the possibility of using a cover gas for the cutting process. The cooling gas connection has the dimension M5 and is placed in the sensor insert.

### Collision Signals

When using Precitec system electronics, an electronic collision signal is generated which stops the motor drive or which releases an escape reaction of the motor drive.

### Collision Protection

The mechanical crash protection effects a separation of cutting head and linear Z drive in the case of lateral collisions of the cutting head. A bellows prevents the head from falling down. During the displacement the distance between the top of the nozzle and the connecting flange is increasing.

### Mounting of the Cutting Head

For the centering of the cutting head in relation to the beam guiding tube, the top side is equipped with an indentation having an inner fitting with the dimensions dia 55<sup>H7</sup>.

The cutting head is mounted by fixing the M54 x 1 thread. The inner fitting enables a precise mounting.

### Accessories

We will pleased to send you further information on accessories on request.


**Technical Data**
**Cutting Heads CM2" and CM2" Z**

focal length		5", 7.5", 10" (with 2.5" extension module)
lens diameter		2" (1.5" optional)
nozzle standoff distance		
recommended		1 mm
possible		0.3 mm...10 mm
adjusting range		
horizontal		± 1 mm
vertical <sup>1)</sup>		-8 mm...+2 mm
free aperture, max.		45.5 mm
mounting thread		M54 x 1, depth 14 mm
centering of the laser tube, indentation with inner fitting		∅55 <sup>H7</sup> depth 4 mm
pressure retaining strength		25 bar
interconnection system electronics		
Lasermatic <sup>®</sup>		over preamplifier
Lasermatic <sup>®</sup> Z		MCX or BNC
axial length <sup>2)</sup>	f=5", f=7.5", f=10"	165 mm, 228 mm, 291.5 mm
mass	f=5", f=7.5", f=10"	2.1 kg, 2.9 kg, 3.7 kg
operating temperature		
Lasermatic <sup>®</sup>		5°...55° C
Lasermatic <sup>®</sup> Z		5°...80° C

1) Depending on laser beam and nozzle orifice diameter reduction of the mechanical focal point adjusting range possible.

2) Axial length from the nozzle tip to the upper edge of the connector head in standard configuration.

**Subject to change without notice**

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