

# OPA 6 Weld Dynamic Beam Laser

OPA 6 Weld is part of the Dynamic Beam Laser series which is based on Civan's Coherent Beam Combining (CBC) technology. The OPA 6 offers a High Power Single Mode CW Dynamic Beam Laser. By combining multiple single mode fiber lasers in an optical phased array (OPA) we achieve a true dynamic beam laser, enabling tailored control of the laser output. Configurable parameters include beam spot size and shape, focal distance and power modulation, all at MHz speed and without any additional optical elements or moving parts.



## Capabilities

- Change beam shape orientation on the fly
- Weld dissimilar materials
- Weld asymmetric materials
- Welding of crack sensitive materials
- Unique capabilities to stabilize keyhole

## Applications

- Welding
- Drilling
- Metal Additive Manufacturing
- Cutting
- Surface treatment

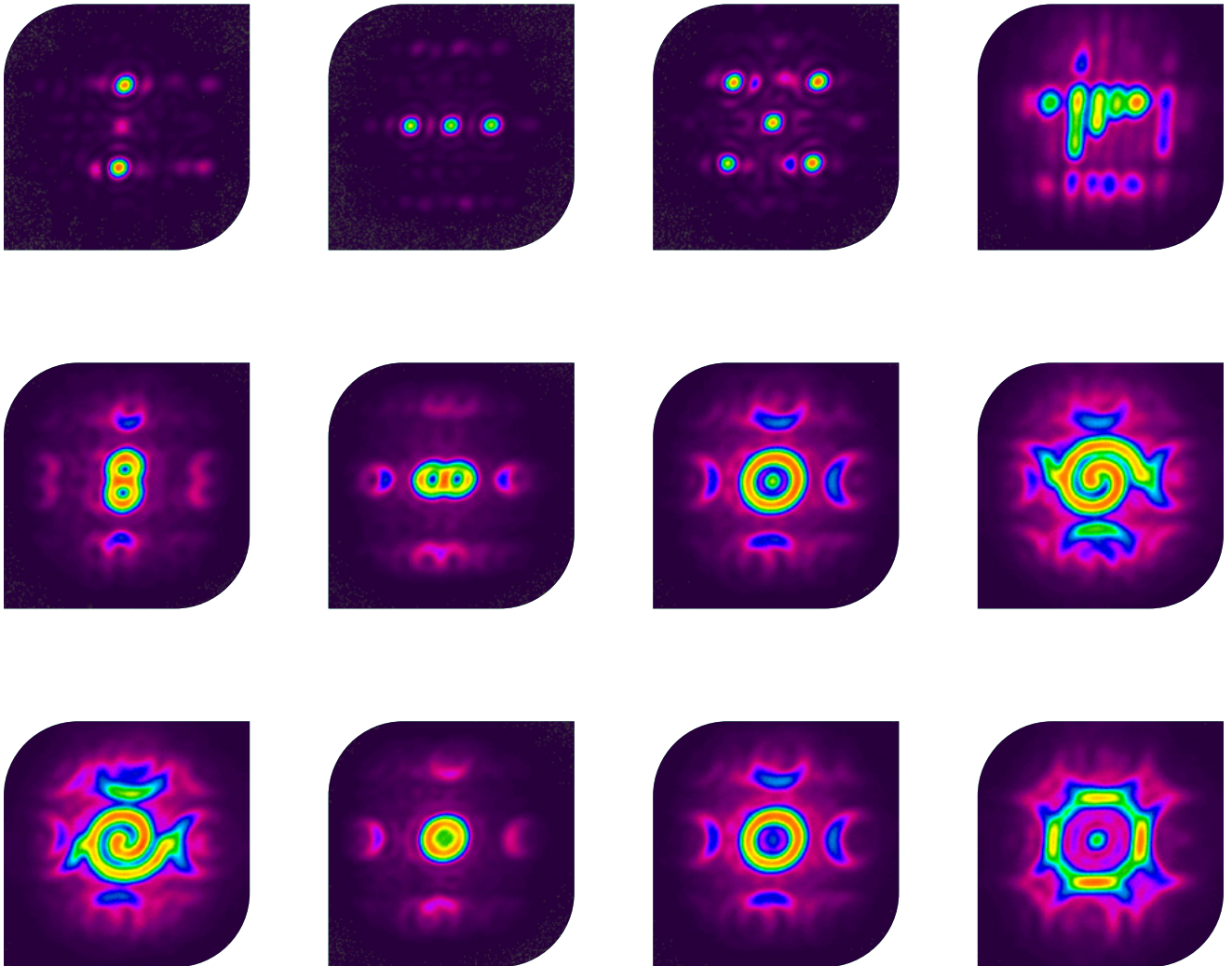
## Dynamic Beam Laser Features

- |                                                                                                                              |                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• <b>Beam shaping</b><br/>Ability to design a wide range of arbitrary shapes</li></ul> | <ul style="list-style-type: none"><li>• <b>Beam wobble</b><br/>Wide range of beam wobble from Hz to MHz</li></ul>    |
| <ul style="list-style-type: none"><li>• <b>Shape sequence</b><br/>Switch between beam shapes at microsecond speeds</li></ul> | <ul style="list-style-type: none"><li>• <b>Focus steering</b><br/>Change of focal point at MHz frequencies</li></ul> |

## Multiple Beam Shapes

The OPA 6 arrives with 20 different beam shapes and more shapes can easily be added by the user with the supplied software. Civan's unique OPA technology allows immediate switching between beam shapes.

## Beam Shapes Examples



## Technical Specifications

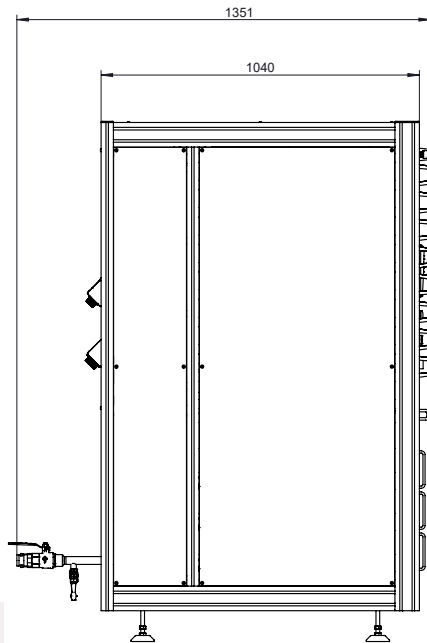
| Parameter                                               | OPA 6 7kW                                      | OPA 14kW                                       | OPA 6 28kW                                     |
|---------------------------------------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------|
| Optical characteristics                                 |                                                |                                                |                                                |
| Operation Mode                                          | CW/Modulated                                   | CW/Modulated                                   | CW/Modulated                                   |
| Efficient power[kW]                                     | 7                                              | 14                                             | 28                                             |
| Power tunability                                        | 10-100%                                        | 10-100%                                        | 10-100%                                        |
| Polarization                                            | Circular                                       | Circular                                       | Circular                                       |
| Wavelength[nm]                                          | 1064 ± 1                                       | 1064 ± 1                                       | 1064 ± 1                                       |
| Optical output                                          |                                                |                                                |                                                |
| Beam output                                             | Free Space<br>Collimated beam                  | Free Space<br>Collimated beam                  | Free Space<br>Collimated beam                  |
| Beam type                                               | Circular                                       | Circular                                       | Circular                                       |
| Fiber length                                            | 3                                              | 3                                              | 1                                              |
| General characteristics                                 |                                                |                                                |                                                |
| Environmental conditions for operation                  | -5°C to +45°C<br>humidity < 60% non-condensing | -5°C to +45°C<br>humidity < 60% non-condensing | -5°C to +45°C<br>humidity < 60% non-condensing |
| Environmental conditions for transportation and storage | +5°C to +45°C<br>humidity < 60% non-condensing | +5°C to +45°C<br>humidity < 60% non-condensing | +5°C to +45°C<br>humidity < 60% non-condensing |
| Cooling                                                 |                                                |                                                |                                                |
| Method                                                  | Tap and slightly DI-water                      |                                                |                                                |
| Cooling power consumption [kW]                          | 25                                             | 49                                             | 99                                             |
| Nominal water flow rate [LPM]                           | 130                                            | 180                                            | 330                                            |
| Cooling water temperature range                         | 21±1 °C                                        | 21±1 °C                                        | 21±1 °C                                        |
| Electrical characteristics                              |                                                |                                                |                                                |
| Supply voltage                                          | 3 x 400 V/50 Hz                                | 3 x 400 V/50 Hz                                | 3 x 400 V/50 Hz                                |
| Power consumption [kW]<br>(w/o chiller)                 | 33                                             | 65                                             | 130                                            |

\*All power levels in the range of 7 – 28kW are available for order

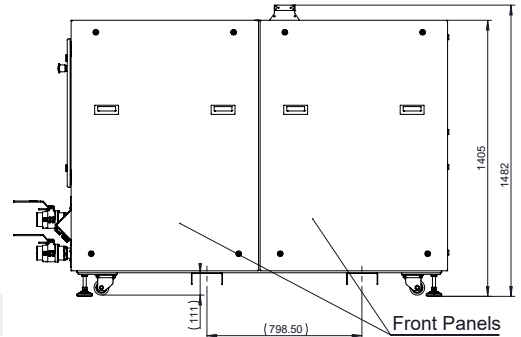
## Technical Specifications

| Parameter                               | OPA 6 7kW           | OPA 14kW            | OPA 6 28kW          |
|-----------------------------------------|---------------------|---------------------|---------------------|
| Electrical characteristics              |                     |                     |                     |
| Supply voltage                          | 400VAC 50Hz/60Hz    | 400VAC 50Hz/60Hz    | 400VAC 50Hz/60Hz    |
| Power consumption [kW]<br>(w/o chiller) | 33                  | 65                  | 130                 |
| Optical Cabinet                         |                     |                     |                     |
| Weight                                  | 1300 Kg             | 1300 Kg             | 1350 Kg             |
| Dimensions W*D*H                        | 2m *1m *1.4m        | 2m *1m *1.4m        | 2m *1m *1.4m        |
| Electrical Cabinet                      |                     |                     |                     |
| Weight                                  | 500 Kg              | 500 Kg              | 1000 Kg             |
| Dimensions W*D*H                        | 0.8m *1.04m *1.6m   | 0.8m *1.04m *1.6m   | 1.1m*1.2m*2.1m      |
| Laser Head                              |                     |                     |                     |
| Weight                                  | 50 Kg               | 50 Kg               | 50 Kg               |
| Dimensions                              | 0.385m*0.395m*0.31m | 0.385m*0.395m*0.31m | 0.385m*0.395m*0.31m |

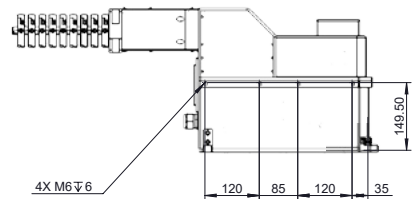
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Electrical Cabinet



Optical Cabinet



Optical Head